

Report No. : E5/2018/C0042 Page: 1 of 128

SAR TEST REPORT



The following samples were submitted and identified on behalf of the client as:

Equipment Under Test	Cellular phone
Company Name	Sharp Corporation, Mobile Communication B.U.
Company Address	2-13-1, Hachihonmatsu-Iida, Higashi-hiroshima-shi,Hiroshima 739-0192, Japan
Standards	IEEE/ANSI C95.1-1992, IEEE 1528-2013,
	KDB248227D01v02r02,KDB865664D01v01r04,
	KDB865664D02v01r02,KDB941225D01v03r01,
	KDB941225D06v02r01,KDB447498D01v06,
	KDB648474D04v01r03, KDB941225D05v02r05
FCC ID	APYHRO00269
Date of Receipt	Nov. 22, 2018
Date of Test(s)	Dec. 08, 2018 ~ Dec. 10, 2018
Date of Issue In the configuration tested, the EL	Dec. 28, 2018 JT complied with the standards specified above.

Remarks:

This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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Signed on behalf of SGS

Clerk / Ruby Ou	Engineer / Bond Tsai	Asst. Manager / John Yeh
Ruby Ou	Bonditsai	John Teh
	•	Date: Dec. 28, 2018

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	Highest SAR Summary				
Equipment class	Frequency Band	Head (Separation 0mm)	Body-worn (Separation 10mm)	Hotspot (Separation 10mm)	Highest Simultaneous Transmission 1g SAR(W/Kg)
		1g SAR(W/Kg)			
Licensed	UMTS Band II	0.80	0.98	0.98	
DTS	2.4GHz WLAN	0.21	0.18	0.22	1.16
DSS	Bluetooth	0.06	0.05	-	
Date	of Testing	sting 2018/12/08~2018/12/10			

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Revision History

Report Number	Revision	Description	Issue Date
E5/2018/C0042	Rev.00	Initial creation of document	Dec. 28, 2018

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1. General Information

1.1 Testing Laboratory

SGS Taiwan Ltd. Electronics & Communication Laboratory			
No. 2, Keji 1 st Rd., Guishan Township, Taoyuan County, 33383, Taiwan			
Tel	+886-2-2299-3279		
Fax +886-2-2298-0488			
Internet	http://www.tw.sgs.com/		

1.2 Details of Applicant

Company Name	any Name Sharp Corporation, Mobile Communication B.U.	
1 Compony / Addrood	2-13-1, Hachihonmatsu-Iida, Higashi-hiroshima-shi,Hiroshima 739-0192, Japan	

1.2.1 Details of Manufacturer

Company Name	Sharp Corporation
Company Address	1 Takumi-cho, Sakai-ku, Sakai City,Osaka 590-8522,Japan

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1.3 Description of EUT

EUT Name	Cellular phone						
FCC ID	APYHRO00269						
Made of Operation	WCDMA HSDPA HSL						
Mode of Operation	⊠LTE FDD						
	WLAN802.11 b/g/n (20M)	luetooth					
	GSM (DTM multi class B)		1/8.3				
			(1Dn4l				
	GPRS (support multi class 12 max)		3 (1Dn: (1Dn2)				
Duty Cycle			(1Dn1				
	LTE FDD	1					
	WCDMA		1				
	WLAN802.11 b/g/n (20M)		1				
	Bluetooth		1				
	GSM1900	1850	_	1910			
	WCDMA Band II	1850	—	1910			
TX Frequency Range (MHz)	LTE FDD Band 2	1850	—	1910			
(((((((((((((((((((((((((((((((((((((((WiFi 2.4GHz	2400	_	2462			
	Bluetooth	2402	—	2480			
	GSM1900	512	—	810			
Channel Number	WCDMA Band II	9262	—	9538			
Channel Number (ARFCN)	LTE FDD Band 2	18607	_	19193			
	WiFi 2.4GHz	1	_	11			
	Bluetooth	0	—	78			

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Max. SAR (1-g) (Unit: W/Kg)					
Mode	Band	Measured	Reported	Position / Channel	
	GSM 1900	0.29	0.42	Left Right Cheek Tilt <u>810</u> Channel	
	WCDMA Band II	0.58	0.80	Left Right Cheek Tilt <u>9538</u> Channel	
Head	LTE FDD Band 2	0.49	0.60	∐Left ☐Right ⊠Cheek ☐Tilt <u>19100</u> Channel	
	WLAN 802.11b	0.21	0.21	□Left ⊠Right ⊠Cheek □Tilt <u>10</u> Channel	
	Bluetooth	0.05	0.06	□Left ⊠Right ⊠Cheek □Tilt <u>78</u> Channel	

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Max. SAR (1-g) (Unit: W/Kg)					
Mode	Band	Measured	Reported	Position / Channel	
	GSM 1900	0.33	0.48	☐Front ⊠Back <u>810</u> Channel	
	WCDMA Band II	0.71	0.98	☐Front ⊠Back 9538 Channel	
Body-worn	LTE FDD Band 2	0.67	0.82	☐Front ⊠Back <u>19100</u> Channel	
	WLAN 802.11b	0.18	0.18	☐Front ⊠Back 10 _Channel	
	Bluetooth	0.04	0.05	☐Front ⊠Back Channel	

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Max. SAR (1-g) (Unit: W/Kg)					
Mode	Band	Measured	Reported	Position / Channel	
	GPRS 1900 (1Dn4UP)	0.45	0.63	☐Front ⊠Back ☐Top ☐Right ☐Left <u>512</u> Channel	
Hotspot mode	WCDMA Band II	0.71	0.98	☐Front ⊠Back ☐Top ☐Right ☐Left <u>9538</u> Channel	
mode	LTE FDD Band 2	0.67	0.82	☐Front ⊠Back ☐Top ☐Right ☐Left <u>19100</u> Channel	
	WLAN802.11 b	0.22	0.22	☐Front ☐Back ☐Top ⊠Right <u>10 C</u> hannel	

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GSM 1900 - conducted power table:

EUT mode	Frequency (MHz)	СН	Max. Rated Avg. Power +	Burst average power	Source-based time average power		
	(10172)		Max.Tolerance (dBm)	Avg. (dBm)	Avg. (dBm)		
0014000	1850.2	512	30.4	28.94	19.91		
GSM1900 (GMSK)	1800	661	30.4	28.74	19.71		
(emerty	1909.8	810	30.4	28.75	19.72		
	The di	vision factor	compared to the nu	umber of TX time slot			
	Divid	sion factor		1 TX time slot			
	DIVIS			-9.03			

GPRS 1900 - conducted power table:

	Burst average power										
	ted Avg. Powe olerance (dBr		30.4	28.2	26.4	25.2					
			1Dn1UP	1Dn2UP	1Dn3UP	1Dn4UP					
EUT modeFrequency (MHz)CHAvg. (dBm)Avg. (dBm)Avg. 											
CDDS	1850.2	512	28.94	26.55	24.95	23.77					
1900	GPRS 1880 661		28.74 26.72 25.01		25.01	23.83					
1900	1909.8	810	28.75	26.64	24.72	23.61					
		So	ource-based tim	e average powe	er						
GPRS	1850.2	512	19.91	20.53	20.69	20.76					
1900	1880	661	19.71	20.70	20.75	20.82					
1900	1909.8	810	19.72	20.62	20.46	20.60					
	The division factor compared to the number of TX time slot										
Div	ision factor		1 TX time slot	2 TX time slot	3 TX time slot	4 TX time slot					
			-9.03	-6.02	-4.26	-3.01					

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	Band		WCDMA II	
	TX Channel	9262	9400	9538
	Frequency (MHz)	1850.2	1880	1907.6
Max. Rated Av	vg. Power+Max. Tolerance (dBm)		23.10	
3GPP Rel 99	RMC 12.2Kbps	22.29	22.08	21.70
	HSDPA Subtest-1	21.20	21.11	20.81
3GPP Rel 5	HSDPA Subtest-2	20.75	20.57	20.28
	HSDPA Subtest-3	20.78	20.61	20.29
	HSDPA Subtest-4	20.78	20.62	20.29
	HSUPA Subtest-1	21.05	20.73	20.75
	HSUPA Subtest-2	19.62	19.59	19.20
3GPP Rel 6	HSUPA Subtest-3	19.18	19.14	19.17
	HSUPA Subtest-4	19.97	20.03	19.78
	HSUPA Subtest-5	21.10	21.00	20.90

WCDMA Band II - HSDPA / HSUPA Conducted power table (Unit: dBm):

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Subtests for WCDMA Release 5 HSDPA

SUB-TEST	β _c	β_d	β _d (SF)	β _c /β _d	β _{HS} (Note1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15	15/15	64	12/15	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Subtests for WCDMA Release 6 HSUPA

SUB-TEST	βc	βd	β₀ (SF)	β₀/βd	β _{HS} (Note1)	β _{ec}	^{β_{ed} (Note 5) (Note 6)}	β _{ed} (SF)	β _{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 6)	E-TFCI
1	11/15	15/15	64	11/15	22/15	209/225	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β _{ed} 1: 47/15 β _{ed} 2: 47/15	4 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15	15/15	64	15/15	30/15	24/15	134/15	4	1	1.0	0.0	21	81

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LTE FDD Band 2 - conducted power table:

				FDD Band 2				
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted pow er (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allow ed per 3GPP(dB)
				1860	18700	21.91	22.8	0
			0	1880	18900	21.83	22.8	0
				1900	19100	21.48	22.8	0
				1860	18700	22.34	22.8	0
		1 RB	50	1880	18900	22.13	22.8	0
				1900	19100	21.92	22.8	0
				1860	18700	22.06	22.8	0
			99	1880	18900	21.61	22.8	0
				1900	19100	21.51	22.8	0
	QPSK			1860	18700	21.19	21.8	0-1
			0	1880	18900	21.15	21.8	0-1
				1900	19100	20.94	21.8	0-1
			25	1860	18700	21.24	21.8	0-1
		50 RB		1880	18900	21.14	21.8	0-1
				1900	19100	20.96	21.8	0-1
				1860	18700	21.24	21.8	0-1
			50	1880	18900	21.00	21.8	0-1
				1900	19100	20.83	21.8	0-1
				1860	18700	21.23	21.8	0-1
		100)RB	1880	18900	21.17	21.8	0-1
20				1900	19100	20.84	21.8	0-1
20			0	1860	18700	20.35	21.8	0-1
				1880	18900	20.67	21.8	0-1
				1900	19100	20.39	21.8	0-1
				1860	18700	21.55	21.8	0-1
		1 RB	50	1880	18900	20.87	21.8	0-1
				1900	19100	21.01	21.8	0-1
				1860	18700	20.31	21.8	0-1
			99	1880	18900	20.34	21.8	0-1
				1900	19100	20.38	21.8	0-1
			_	1860	18700	20.36	20.8	0-2
	16-QAM		0	1880	18900	20.21	20.8	0-2
				1900	19100	19.79	20.8	0-2
				1860	18700	20.42	20.8	0-2
		50 RB	25	1880	18900	20.22	20.8	0-2
				1900	19100	19.83	20.8	0-2
				1860	18700	20.32	20.8	0-2
			50	1880	18900	20.07	20.8	0-2
				1900	19100	19.81	20.8	0-2
				1860	18700	20.30	20.8	0-2
		100)RB	1880	18900	20.24	20.8	0-2
				1900	19100	19.71	20.8	0-2

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				FDD Band 2				
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted pow er (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allow ed per 3GPP(dB)
				1857.5	18675	22.09	22.8	0
			0	1880	18900	21.96	22.8	0
				1902.5	19125	21.90	22.8	0
	QPSK			1857.5	18675	22.10	22.8	0
		1 RB	36	1880	18900	21.84	22.8	0
				1902.5	19125	21.88	22.8	0
				1857.5	18675	22.12	22.8	0
			74	1880	18900	21.84	22.8	0
				1902.5	19125	21.66	22.8	0
				1857.5	18675	21.19	21.8	0-1
			0	1880	18900	21.14	21.8	0-1
				1902.5	19125	20.88	21.8	0-1
				1857.5	18675	21.27	21.8	0-1
		36 RB	18	1880	18900	21.12	21.8	0-1
				1902.5	19125	20.95	21.8	0-1
			07	1857.5	18675	21.27	21.8	0-1
			37	1880	18900	21.05	21.8	0-1
				1902.5	19125	20.95	21.8	0-1
				1857.5	18675	21.08	21.8	0-1
		75	75RB		18900	21.09	21.8	0-1
15				1902.5	19125	20.87	21.8	0-1
10			0	1857.5	18675	20.76	21.8	0-1
				1880	18900	20.73	21.8	0-1
				1902.5	19125	20.47	21.8	0-1
				1857.5	18675	21.37	21.8	0-1
		1 RB	36	1880	18900	21.11	21.8	0-1
				1902.5	19125	21.11	21.8	0-1
				1857.5	18675	20.83	21.8	0-1
			74	1880	18900	20.39	21.8	0-1
				1902.5	19125	20.47	21.8	0-1
	40.000			1857.5	18675	20.22	20.8	0-2
	16-QAM		0	1880	18900	20.07	20.8	0-2
				1902.5	19125	19.72	20.8	0-2
		00.55		1857.5	18675	20.29	20.8	0-2
		36 RB	18	1880	18900	20.05	20.8	0-2
				1902.5	19125	19.77	20.8	0-2
			07	1857.5	18675	20.29	20.8	0-2
			37	1880	18900	20.07	20.8	0-2
				1902.5	19125	19.78	20.8	0-2
		75	RB	1857.5 1880	18675 18900	20.14 20.05	20.8 20.8	0-2 0-2
		/5	טא	1902.5	18900	20.05 19.84	20.8	0-2
				1902.5	19120	19.64	20.8	0-2

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				FDD Band 2				
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted pow er (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allow ed per 3GPP(dB)
				1855	18650	21.96	22.8	0
			0	1880	18900	21.90	22.8	0
				1905	19150	21.69	22.8	0
				1855	18650	22.10	22.8	0
	QPSK	1 RB	25	1880	18900	22.04	22.8	0
				1905	19150	21.93	22.8	0
				1855	18650	22.05	22.8	0
			49	1880	18900	21.71	22.8	0
				1905	19150	21.74	22.8	0
				1855	18650	21.25	21.8	0-1
			0	1880	18900	21.14	21.8	0-1
				1905	19150	20.87	21.8	0-1
				1855	18650	21.20	21.8	0-1
		25 RB	12	1880	18900	21.13	21.8	0-1
				1905	19150	20.95	21.8	0-1
				1855	18650	21.13	21.8	0-1
			25	1880	18900	21.15	21.8	0-1
				1905	19150	20.77	21.8	0-1
				1855	18650	21.15	21.8	0-1
		50	RB	1880	18900	21.11	21.8	0-1
10				1905	19150	20.84	21.8	0-1
10				1855	18650	20.85	21.8	0-1
			0	1880	18900	20.67	21.8	0-1
				1905	19150	20.58	21.8	0-1
				1855	18650	20.89	21.8	0-1
		1 RB	25	1880	18900	21.09	21.8	0-1
				1905	19150	20.99	21.8	0-1
				1855	18650	20.57	21.8	0-1
			49	1880	18900	20.53	21.8	0-1
				1905	19150	20.51	21.8	0-1
			_	1855	18650	20.31	20.8	0-2
	16-QAM		0	1880	18900	20.32	20.8	0-2
				1905	19150	19.92	20.8	0-2
		05 55		1855	18650	20.24	20.8	0-2
		25 RB	12	1880	18900	20.18	20.8	0-2
				1905	19150	19.99	20.8	0-2
			0.5	1855	18650	20.36	20.8	0-2
			25	1880	18900	20.18	20.8	0-2
				1905	19150	19.73	20.8	0-2
		F.04	ססנ	1855	18650	20.34	20.8	0-2
		500)RB	1880	18900	20.11	20.8	0-2
			-	1905	19150	19.74	20.8	0-2

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				FDD Band 2				
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted pow er (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allow ed per 3GPP(dB)
				1852.5	18625	22.04	22.8	0
			0	1880	18900	21.89	22.8	0
				1907.5	19175	21.81	22.8	0
				1852.5	18625	22.17	22.8	0
		1 RB	12	1880	18900	22.00	22.8	0
				1907.5	19175	21.89	22.8	0
				1852.5	18625	22.04	22.8	0
			24	1880	18900	21.66	22.8	0
				1907.5	19175	21.62	22.8	0
	QPSK			1852.5	18625	21.23	21.8	0-1
			0	1880	18900	21.02	21.8	0-1
				1907.5	19175	20.98	21.8	0-1
			6	1852.5	18625	21.27	21.8	0-1
		12 RB		1880	18900	21.02	21.8	0-1
				1907.5	19175	20.89	21.8	0-1
			10	1852.5	18625	21.21	21.8	0-1
			13	1880	18900	21.08	21.8	0-1
				1907.5	19175	20.82	21.8	0-1
				1852.5	18625	21.23	21.8	0-1
		25RB		1880	18900	21.06	21.8	0-1
5				1907.5	19175	20.91	21.8	0-1
-			0	1852.5	18625	21.27	21.8	0-1
				1880	18900	21.12	21.8	0-1
				1907.5	19175	20.44	21.8	0-1
				1852.5	18625	21.43	21.8	0-1
		1 RB	12	1880	18900	21.16	21.8	0-1
				1907.5	19175	20.74	21.8	0-1
				1852.5	18625	21.18	21.8	0-1
			24	1880	18900	21.09	21.8	0-1
				1907.5	19175	20.54	21.8	0-1
				1852.5	18625	20.22	20.8	0-2
	16-QAM		0	1880	18900	19.91	20.8	0-2
				1907.5	19175	19.69	20.8	0-2
				1852.5	18625	20.35	20.8	0-2
		12 RB	6	1880	18900	19.99	20.8	0-2
				1907.5	19175	19.71	20.8	0-2
			12	1852.5	18625	20.21	20.8	0-2
			13	1880	18900	19.98	20.8	0-2
				1907.5	19175	19.83	20.8	0-2 0-2
		9E	RB	1852.5 1880	18625 18900	20.28 20.01	20.8 20.8	0-2
		20		1907.5	18900	19.97	20.8	0-2
				1907.5	19170	19.97	20.0	0-2

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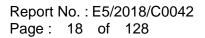
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				FDD Band 2				
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted pow er (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allow ed per 3GPP(dB)
				1851.5	18615	21.99	22.8	0
			0	1880	18900	21.94	22.8	0
				1908.5	19185	21.70	22.8	0
		1 RB		1851.5	18615	22.02	22.8	0
	QPSK		7	1880	18900	22.03	22.8	0
				1908.5	19185	21.91	22.8	0
				1851.5	18615	21.96	22.8	0
			14	1880	18900	22.08	22.8	0
				1908.5	19185	21.82	22.8	0
				1851.5	18615	21.23	21.8	0-1
			0	1880	18900	21.01	21.8	0-1
				1908.5	19185	21.08	21.8	0-1
			4	1851.5	18615	21.26	21.8	0-1
		8 RB		1880	18900	21.00	21.8	0-1
				1908.5	19185	20.95	21.8	0-1
				1851.5	18615	21.22	21.8	0-1
			7	1880	18900	21.06	21.8	0-1
				1908.5	19185	20.91	21.8	0-1
				1851.5	18615	21.23	21.8	0-1
		15	RB	1880	18900	20.96	21.8	0-1
3				1908.5	19185	20.91	21.8	0-1
Ũ			0	1851.5	18615	21.21	21.8	0-1
				1880	18900	20.51	21.8	0-1
				1908.5	19185	20.82	21.8	0-1
				1851.5	18615	21.47	21.8	0-1
		1 RB	7	1880	18900	20.92	21.8	0-1
				1908.5	19185	20.72	21.8	0-1
				1851.5	18615	21.39	21.8	0-1
			14	1880	18900	20.73	21.8	0-1
				1908.5	19185	20.49	21.8	0-1
				1851.5	18615	20.22	20.8	0-2
	16-QAM		0	1880	18900	19.93	20.8	0-2
				1908.5	19185	19.79	20.8	0-2
		םם ס	A	1851.5	18615	20.25	20.8	0-2
		8 RB	4	1880	18900	19.99	20.8	0-2
				1908.5 1851.5	19185 18615	19.60 20.30	20.8	0-2 0-2
			7	1851.5	18900	19.98	20.8	0-2
				1908.5	18900	19.98	20.8 20.8	0-2
				1908.5	18615	20.21	20.8	0-2
		15	RB	1880	18900	20.21	20.8	0-2
		10		1908.5	19185	19.93	20.8	0-2
				1900.0	19100	19.95	20.0	0-2

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				FDD Band 2				
BW(Mhz)	Modulation	RB Size	RB Offset	Frequency (MHz)	Channel	Conducted pow er (dBm)	Target Power + Max. Tolerance (dBm)	MPR Allow ed per 3GPP(dB)
				1850.7	18607	22.19	22.8	0
			0	1880	18900	21.92	22.8	0
				1909.3	19193	21.95	22.8	0
				1850.7	18607	22.23	22.8	0
		1 RB	2	1880	18900	21.99	22.8	0
				1909.3	19193	21.90	22.8	0
				1850.7	18607	22.15	22.8	0
			5	1880	18900	22.05	22.8	0
				1909.3	19193	21.83	22.8	0
				1850.7	18607	22.16	22.8	0
	QPSK		0	1880	18900	22.12	22.8	0
				1909.3	19193	22.07	22.8	0
				1850.7	18607	22.18	22.8	0
		3 RB	2	1880	18900	22.16	22.8	0
				1909.3	19193	22.00	22.8	0
				1850.7	18607	22.12	22.8	0
			3	1880	18900	22.09	22.8	0
				1909.3	19193	21.97	22.8	0
				1850.7	18607	21.13	21.8	0-1
		66	RB	1880	18900	20.94	21.8	0-1
1.4				1909.3	19193	20.91	21.8	0-1
			0	1850.7	18607	21.04	21.8	0-1
				1880	18900	20.97	21.8	0-1
				1909.3	19193	21.00	21.8	0-1
				1850.7	18607	21.09	21.8	0-1
		1 RB	2	1880	18900	21.03	21.8	0-1
				1909.3	19193	21.13	21.8	0-1
			_	1850.7	18607	21.25	21.8	0-1
			5	1880	18900	21.06	21.8	0-1
				1909.3	19193	20.47	21.8	0-1
	16 04 14		0	1850.7 1880	18607	21.24	21.8	0-1
	16-QAM		0		18900	20.92	21.8	0-1
				1909.3 1850.7	19193 18607	20.65 21.28	21.8 21.8	0-1 0-1
		3 RB	2	1850.7	18900	21.28	21.8	0-1
		JIND	<u> </u>	1909.3	18900	20.98	21.8	0-1
				1909.3	18607	20.70	21.0	0-1
			3	1880	18900	20.94	21.8	0-1
				1909.3	19193	20.94	21.8	0-1
			1	1909.3	18607	20.07	21.8	0-1
		61	RB	1880	18900	19.92	20.8	0-2
		0		1909.3	19193	19.75	20.8	0-2
				1003.0	13135	13.75	20.0	0-2

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	Main Antenna											
Band	Mode	Channel	Frequency (MHz)	Data Rate	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)						
		1	2412		12.00	11.95						
		2	2417		15.00	14.88						
	802.11b	6	2437	1Mbps	15.00	14.85						
		10	2457		15.00	14.91						
		11	2462		12.00	11.85						
		1	2412		12.00	11.84						
		2	2417		15.00	14.94						
2450 MHz	802.11g	6	2437	6Mbps	15.00	14.82						
		10	2457		15.00	14.81						
		11	2462		12.00	11.93						
		1	2412		12.00	11.82						
		2	2417		15.00	14.93						
	802.11n-HT20	6	2437	MCS0	15.00	14.74						
		10	2457		15.00	14.80						
		11	2462		12.00	11.91						

WLAN802.11 b/g/n (20M) conducted power table:

Bluetooth maximum power table:

Mode	Channel	Frequency (MHz)	Average	Max. Rated Avg. Power + Max.		
Mode	Channel		1Mbps	2Mbps	3Mbps	Tolerance (dBm)
	CH 00	2402	10.14	9.20	9.20	
BR/EDR	CH 39	2441	10.18	9.15	9.18	11.5
	CH 78	2480	10.38	9.21	9.24	

Mode	Channel	Frequency	Average Output Power (dBm)	Max. Rated Avg. Power + Max.
MODE	Channel	(MHz)	GFSK	Tolerance (dBm)
	CH 00	2402	3.73	
LE	CH 19	2440	3.73	11.5
	CH 39	2480	3.97	

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1.4 Test Environment

Ambient Temperature: 22±2° C Tissue Simulating Liquid: 22±2° C

1.5 Operation Description

- 1. The EUT is controlled by using a Radio Communication Tester (MT8820C), and the communication between the EUT and the tester is established by air link.
- 2. Measurements are performed respectively on the lowest, middle and highest channels of the operating band(s). The EUT is set to maximum power level during all tests, and at the beginning of each test the battery is fully charged.
- 3. During the SAR testing, the DASY 5 system checks power drift by comparing the e-field strength of one specific location measured at the beginning with that measured at the end of the SAR testing.
- 4. SAR test reduction for GPRS mode is determined by the source-based time-averaged output power. The data mode with highest specified time-averaged output power should be tested for SAR compliance.
- The 3G SAR test reduction procedure is applied to HSDPA with 12.2 kbps RMC as the primary mode. Since the maximum output power in a secondary mode (HSDPA) is $\leq \frac{1}{4}$ dB higher than the primary mode (WCDMA), SAR measurement is not required for the secondary mode (HSDPA). The following 4 sub-tests were completed according to Release 5 procedures in section 5.2 of 3GPP TS 34.121. A summary of these setting are illustrated below:

Sub-test	βε	βa	βα (SF)	βο/βα	β _{Hs} ⁽¹⁾⁽²⁾	CM ⁽³⁾ (dB)	MPR ⁽³⁾ (dB)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 ⁽⁴⁾	15/15 ⁽⁴⁾	64	12/15 ⁽⁴⁾	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5
Note 1: Δ _{ACK} , Δ _{NACK} and Δ _{COI} = 30/15 with β _{HS} = 30/15 * β _c . Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ _{ACK} and Δ _{NACK} = 30/15 with β _{HS} = 30/15 * β _c , and Δ _{COI} = 24/15 with β _{HS} = 24/15 * β _c .							

Note 3: CM = 1 for β_d/β_d = 12/15, β_{HS}/β_c = 24/15. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases. Note 4: For subtest 2 the β_o/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain

- factors for the reference TFC (TF1, TF1) to $\beta_c = 11/15$ and $\beta_d = 15/15$.
- 6. The 3G SAR test reduction procedure is applied to HSPA (HSUPA/HSDPA with RMC) with 12.2 kbps RMC as the primary mode. Since the maximum output power in a secondary mode (HSPA) is $\leq \frac{1}{4}$ dB higher than the primary mode (WCDMA), SAR measurement is not required for the secondary mode (HSPA). The following

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5 sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS 34.121. A summary of these setting are illustrated below:

Sub-test	βε	βd	β₀ (SF)	βc/βd	β _{HS} (1)	βes	$\beta_{ed}^{(4)(5)}$	β _{ed} (SF)	β _{ed} (Codes)	CM ⁽²⁾ (dB)	MPR (2)(6) (dB)	AG (5) Index	E-TFCI
1	11/15 (3)	15/15 (3)	64	11/15 (3)	22/15	209/225	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β⊶1:47/15 β⊶2:47/15		2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15	0	-	-	5/15	5/15	47/15	4	1	1.0	0.0	12	67
Note 2: CM diffe Note 3: For	Note 1: For sub-test 1 to 4, Δ _{ACK} , Δ _{NACK} and Δ _{COI} = 30/15 with β _{HS} = 30/15 * β _c . For sub-test 5, Δ _{ACK} , Δ _{NACK} and Δ _{COI} = 5/15 with β _{HS} = 5/15 * β _c . Note 2: CM = 1 for β ₄ /β ₄ = 12/15, β _{HS} β _c = 24/15. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference. Note 3: For subtest 1 the β ₄ /β ₄ ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to B _c = 10/15 and B ₄ = 15/15.												
Note 4: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g. Note 5: β⊷ can not be set directly; it is set by Absolute Grant Value. Note 6: For subtests 2, 3 and 4, UE may perform E-DPDCH power scaling at max power which could results in slightly smaller MPR values.													

LTE modes test according to KDB 941225D05v02r05.

a. Per Section 5.2.1, the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation.

Using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.

When the reported SAR is \leq 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel.

When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.

b. Per Section 5.2.2, the largest channel bandwidth and measure SAR for QPSK with 50% RB allocation

The procedures required for 1 RB allocation in 5.2.1 are applied to measure the SAR for QPSK with 50% RB allocation.

c. Per Section 5.2.3, the largest channel bandwidth and measure SAR for QPSK with 100% RB allocation

For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation in 5.2.1 and 5.2.2 are \leq 0.8 W/kg.

Otherwise, SAR is measured for the highest output power channel and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.

d. Per Section 5.2.4, Higher order modulations

For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, apply the QPSK procedures in sections 5.2.1, 5.2.2 and 5.2.3 to determine the QAM

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configurations that may need SAR measurement. For each configuration identified as required for testing, SAR is required only when the highest maximum output power for the configuration in the higher order modulation is > 1/2 dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg.

e. Per Section 5.3, other channel bandwidth standalone SAR test requirements

For the other channel bandwidths used by the device in a frequency band, apply all the procedures required for the largest channel bandwidth in section 5.2 to determine the channels and RB configurations that need SAR testing and only measure SAR when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is > $\frac{1}{2}$ dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the reported SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg. The equivalent channel configuration for the RB allocation, RB offset and modulation etc. is determined for the smaller channel bandwidth according to the same number of RB allocated in the largest channel bandwidth.

WLAN

802.11b DSSS SAR Test Requirements:

- 8. SAR is measured for 2.4 GHz 802.11b DSSS mode using the highest measured maximum output power channel, when the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.
- 9. When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

802.11g/n OFDM SAR Test Exclusion Requirements:

- 10.SAR is not required for 802.11g/n since the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.
- 11.BT and WLAN use the same antenna path and Bluetooth can't transmit with WLAN simultaneously.
- 12. According to KDB447498D01v06, testing of other required channels is not required when the reported 1-g SAR for the highest output channel is \leq 0.8 W/kg, when the transmission band is \leq 100MHz.

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13. According to KDB865664D01v01r04, SAR measurement variability must be assessed for each frequency band. When the original highest measured SAR is ≥ 0.8 W/kg, repeated that measurement once. Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is \geq 1.45 W/kg (~ 10% from the 1-g SAR limit)

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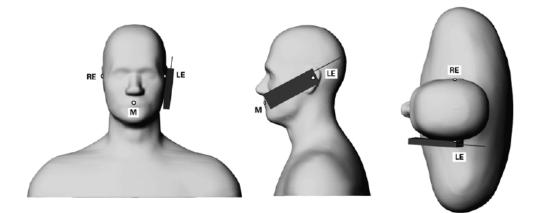
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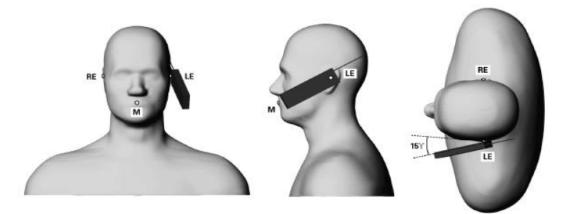
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1.6 Positioning Procedure

Head SAR measurement statement



Phone position 1, "cheek" or "touch" position. The reference points for the right ear (RE), left ear (LE) and mouth (M), which define the reference plane for phone positioning.



Phone position 2, "tilted position." The reference points for the right ear (RE), left ear (LE) and mouth (M), which define the reference plane for phone positioning.

Cheek/Touch Position:

The handset was brought toward the mouth of the head phantom by pivoting against the ear reference point until any point of the mouthpiece or keypad touched the phantom.

Ear/Tilt Position:

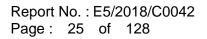
With the phone aligned in the Cheek/Touch position, the handset was tilted away from the mouth with respect to the test device reference point by 15 degrees.

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Body SAR measurement statement

1. Body-worn exposure: 10mm

Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in KDB Publication 447498 D01 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. When the same wireless transmission configuration is used for testing body-worn accessory and hotspot mode SAR, respectively, in voice and data mode, SAR results for the most conservative test separation distance configuration may be used to support both SAR conditions. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for the body-worn accessory with a headset attached to the handset.

2. Hotspot exposure: 10mm

A test separation distance of 10 mm is required between the phantom and all surfaces and edges with a transmitting antenna located within 25 mm from that surface or edge when the form factor of a handset is larger than 9 cm x 5 cm,

Test configurations of WWAN:

- (1) Front side
- (2) Back side
- (3) Bottom side
- (4) Right side
- (5) Left side

Test configurations of WLAN:

- (1) Front side
- (2) Back side
- (3) Top side
- (4) Right side
- 3. Phablet SAR test consideration

Since the device is not a phablet (overall diagonal dimension < 16.0 cm), the phablet SAR procedure is not required.

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4. Based on KDB941225D06v02r01, the hotspot mode and body-worn accessory SAR test configurations may overlap for handsets. When the same wireless mode transmission configurations for voice and data are required for SAR measurements, the more conservative configuration with a smaller separation distance should be tested for the overlapping SAR configurations. For WCDMA /LTE/WLAN, since the maximum power is the same between body-worn and hotspot mode, and the test distance of hotspot mode is the same with that of body-worn mode, hotspot mode SAR is used to support body-worn SAR. For GSM1900, since the wireless mode transmission configurations is different between body-worn and hotspot mode, body-worn SAR is performed.

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1.7 Evaluation Procedures

The entire evaluation of the spatial peak values is performed within the Post-processing engine (SEMCAD). The system always gives the maximum values for the 1 g and 10 g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

- 1. The extraction of the measured data (grid and values) from the Zoom Scan.
- 2. The calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters).
- 3. The generation of a high-resolution mesh within the measured volume.
- 4. The interpolation of all measured values from the measurement grid to the high-resolution grid.
- 5. The extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface.
- 6. The calculation of the averaged SAR within masses of 1g and 10g.

The probe is calibrated at the center of the dipole sensors that is located 1 to 2.7mm away from the probe tip. During measurements, the probe stops shortly above the phantom surface, depending on the probe and the surface detecting system. Both distances are included as parameters in the probe configuration file. The software always knows exactly how far away the measured point is from the surface. As the probe cannot directly measure at the surface, the values between the deepest measured point and the surface must be extrapolated. The angle between the probe axis and the surface normal line is less than 30 degree.

In the Area Scan, the gradient of the interpolation function is evaluated to find all the extreme of the SAR distribution. The uncertainty on the locations of the extreme is less than 1/20 of the grid size. Only local maximum within -2 dB of the global maximum are searched and passed for the Cube Scan measurement. In the Cube Scan, the interpolation function is used to extrapolate the Peak SAR from the lowest measurement points to the inner phantom surface (the extrapolation distance). The uncertainty increases with the extrapolation distance. To keep the uncertainty within 1% for the 1 g and 10 g cubes, the extrapolation distance should not be larger than 5mm.

The maximum search is automatically performed after each area scan measurement. It is based on splines in two or three dimensions. The procedure can find the maximum for most SAR distributions even with relatively large grid spacing. After the area scanning measurement, the probe is automatically moved to a position at the interpolated maximum. The following scan can directly use this position for reference, e.g., for a finer resolution grid or the cube evaluations. The 1g and 10g peak evaluations are only available for the predefined cube 7x7x7 scans.

The routines are verified and optimized for the grid dimensions used in these cube measurements. The measured volume of 30x30x30mm contains about 30g of tissue. The first procedure is an extrapolation (incl. Boundary correction) to get the points between the lowest measured plane and the surface. The next step uses 3D interpolation to get all points within the measured volume. In the last step, a 1g cube is placed numerically into the volume and its averaged SAR is calculated. This cube is

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the moved around until the highest averaged SAR is found.

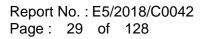
If the highest SAR is found at the edge of the measured volume, the system will issue a warning: higher SAR values might be found outside of the measured volume. In that case the cube measurement can be repeated, using the new interpolated maximum as the center.

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1.8 Probe Calibration Procedures

For the calibration of E-field probes in lossy liquids, an electric field with an accurately known field strength must be produced within the measured liquid. For standardization purposes it would be desirable if all measurements which are necessary to assess the correct field strength would be traceable to standardized measurement procedures. In the following two different calibration techniques are summarized:

1.8.1 Transfer Calibration with Temperature Probes

In lossy liquids the specific absorption rate (SAR) is related both to the electric field (E) and the temperature gradient ($\delta T / \delta t$) in the liquid.

$$SAR = C \frac{\delta T}{\delta t}$$
,

Whereby σ is the conductivity, ρ the density and c the heat capacity of the liquid.

Hence, the electric field in lossy liquid can be measured indirectly by measuring the temperature gradient in the liquid. Non-disturbing temperature probes (optical probes or thermistor probes with resistive lines) with high spatial resolution (<1-2 mm) and fast reaction time (<1 s) are available and can be easily calibrated with high precision [1]. The setup and the exciting source have no influence on the calibration; only the relative positioning uncertainties of the standard temperature probe and the E-field probe to be calibrated must be considered. However, several problems limit the available accuracy of probe calibrations with temperature probes:

1. The temperature gradient is not directly measurable but must be evaluated from temperature measurements at different time steps. Special precaution is necessary to avoid measurement errors caused by temperature gradients due to energy equalizing effects or convection currents in the liquid. Such effects cannot be completely avoided, as the measured field itself destroys the thermal equilibrium in the liquid. With a careful setup these errors can be kept

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small.

- 2. The measured volume around the temperature probe is not well defined. It is difficult to calculate the energy transfer from a surrounding gradient temperature field into the probe. These effects must be considered, since temperature probes are calibrated in liquid with homogeneous temperatures. There is no traceable standard for temperature rise measurements.
- 3. The calibration depends on the assessment of the specific density, the heat capacity and the conductivity of the medium. While the specific density and heat capacity can be measured accurately with standardized procedures (~ 2% for c; much better for ρ), there is no standard for the measurement of the conductivity. Depending on the method and liquid, the error can well exceed ±5%.
- 4. Temperature rise measurements are not very sensitive and therefore are often performed at a higher power level than the E-field measurements. The nonlinearities in the system (e.g., power measurements, different components, etc.) must be considered.

Considering these problems, the possible accuracy of the calibration of E-field probes with temperature gradient measurements in a carefully designed setup is about ±10% (RSS) [2]. Recently, a setup which is a combination of the waveguide techniques and the thermal measurements was presented in [3]. The estimated uncertainty of the setup is ±5% (RSS) when the same liquid is used for the calibration and for actual measurements and ±7-9% (RSS) when not, which is in good agreement with the estimates given in [2].

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1.8.2 Calibration with Analytical Fields

In this method a technical setup is used in which the field can be calculated analytically from measurements of other physical magnitudes (e.g., input power). This corresponds to the standard field method for probe calibration in air; however, there is no standard defined for fields in lossy liquids.

When using calculated fields in lossy liquids for probe calibration, several points must be considered in the assessment of the uncertainty:

- 1. The setup must enable accurate determination of the incident power.
- 2. The accuracy of the calculated field strength will depend on the assessment of the dielectric parameters of the liquid.
- 3. Due to the small wavelength in liquids with high permittivity, even small setups might be above the resonant cutoff frequencies. The field distribution in the setup must be carefully checked for conformity with the theoretical field distribution.

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- (1) N. Kuster, Q. Balzano, and J.C. Lin, Eds., Mobile Communications Safety, Chapman & Hall, London, 1997.
- (2) K. Meier, M. Burkhardt, T. Schmid, and N. Kuster, \Broadband calibration of E-field probes in lossy media", IEEE Transactions on Microwave Theory and Techniques, vol. 44, no. 10, pp. 1954{1962, Oct. 1996.
- (3) K. Jokela, P. Hyysalo, and L. Puranen, \Calibration of specific absorption rate (SAR) probes in waveguide at 900 MHz", IEEE Transactions on Instrumentation and Measurements, vol. 47, no. 2, pp. 432{438, Apr. 1998.

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1.9 The SAR Measurement System

A block diagram of the SAR measurement system is given in Fig. a. This SAR measurement system uses a Computer-controlled 3-D stepper motor system (SPEAG DASY 5 professional system). Model EX3DV4 field probes are used to determine the internal electric fields. The SAR can be obtained from the equation SAR= σ (|Ei|2)/ ρ where σ and ρ are the conductivity and mass density of the tissue-simulant.

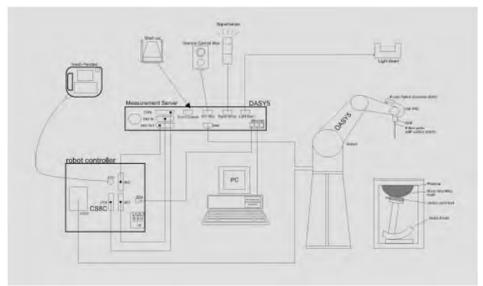


Fig. a A block diagram of the SAR measurement system

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The DASY 5 system for performing compliance tests consists of the following items:

- 1. A standard high precision 6-axis robot (Staubli RX family) with controller, teach pendant and software. An arm extension is for accommodating the data acquisition electronics (DAE).
- 2. A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
- 3. Data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- 4. The Electro-optical converter (EOC) performs the conversion between optical and electrical of the signals for the digital communication to the DAE and for the analog signal from the optical surface detection. The EOC is connected to the measurement server.
- 5. The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- 6. A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- 7. A computer operating Windows7
- 8. DASY 5 software.
- 9. Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- 10. The SAM twin phantom enabling testing left-hand and right-hand usage.
- 11. The device holder for handheld mobile phones.
- 12. Tissue simulating liquid mixed according to the given recipes.
- 13. Validation dipole kits allowing to validate the proper functioning of the system.

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1.10 System Components

EX3DV4 E-Field Probe

Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)					
Calibration	Basic Broad Band Calibration in air Conversion Factors (CF) for HSL1900/2450MHz Additional CF for other liquids and frequencies upon request					
Frequency	10 MHz to > 6 GHz, Linearity: ± 0.6 dB					
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)					
Dynamic	10 µW/g to > 100 mW/g					
Range	Linearity: $\pm 0.2 \text{ dB}$ (noise: typically < 1 μ W/g)					
Dimensions	Tip diameter: 2.5 mm					
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.					

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Phantom	
Model	Twin SAM
Construction	The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points with the robot.
Shell Thickness	2 ± 0.2 mm
Filling Volume	Approx. 25 liters
Dimensions	Height: 850 mm; Length: 1000 mm; Width: 500 mm

DEVICE HOLDER

Construction	In combination with the Twin SAM Phantom	14
	V4.0/V4.0C or Twin SAM, the Mounting	ALC: NO.
	Device (made from POM) enables the	
	rotation of the mounted transmitter in	
	spherical coordinates, whereby the rotation	
	point is the ear opening. The devices can	and the second se
	be easily and accurately positioned	1
	according to IEC, IEEE, CENELEC, FCC or	
	other specifications. The device holder can	
	be locked at different phantom locations	Device Holder
	(left head, right head, flat phantom).	

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1.11 SAR System Verification

The microwave circuit arrangement for system verification is sketched in Fig. b. The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within +/- 10% (according to KDB865664D01) from the target SAR values.

These tests were done at 1900/2450 MHz. The tests were conducted on the same days as the measurement of the DUT. The obtained results from the system accuracy verification are displayed in the table 1. During the tests, the liquid depth above the ear reference points was above 15 cm (≤3G) or 10 cm (>3G) in all the cases. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values.

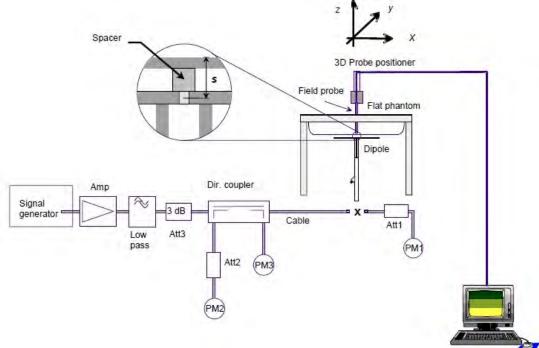


Fig. b The block diagram of system verification

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Validation Kit	S/N	Frequ (MF	-	1W Target SAR-1g (mW/g)	Pin=250mW Measured SAR-1g (mW/g)	Measured SAR-1g normalized to 1W (mW/g)	Deviation (%)	Measured Date
D1900V2	5d173	1900	Head	40.7	9.91	39.64	-2.60%	Dec. 09, 2018
D1900V2	1900 2 50173		Body	40.9	9.96	39.84	-2.59%	Dec. 10, 2018
D2450V2	727	727 2450		52.1	13.10	52.40	0.58%	Dec. 08, 2018
D2450V2 727		2400	Body	50.8	12.80	51.20	0.79%	Dec. 08, 2018

Table 1. Results of system validation

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1.12 Tissue Simulant Fluid for the Frequency Band

The dielectric properties for this Head-simulant fluid were measured by using the Agilent Model 85070E Dielectric Probe (rates frequency band 200 MHz to 20 GHz) in conjunction with Network Analyzer.

All dielectric parameters of tissue simulates were measured within 24 hours of SAR measurements. The depth of the tissue simulant in the flat section of the phantom was at least 15 cm (≤3G) or 10 cm (>3G) during all tests. (Appendix Fig. 2)

Tissue Type	Measurement Date	Measured Frequency (MHz)	Target Dielectric Constant, εr	Target Conductivity, σ (S/m)	Measured Dielectric Constant, Er	Measured Conductivity, σ (S/m)	% dev ɛr	% dev σ
		1850.2	40.000	1.400	39.528	1.375	1.18%	1.79%
		1860	40.000	1.400	39.522	1.377	1.20%	1.64%
	Dec, 09. 2018	1880	40.000	1.400	39.519	1.379	1.20%	1.50%
	Dec, 09. 2018	1900	40.000	1.400	39.497	1.384	1.26%	1.14%
		1907.6	40.000	1.400	39.478	1.386	1.31%	1.04%
		1909.8	40.000	1.400	39.446	1.388	1.39%	0.86%
		2402	39.285	1.757	39.771	1.741	-1.24%	0.93%
Head		2412	39.268	1.766	39.721	1.750	-1.15%	0.92%
		2417	39.259	1.771	39.715	1.752	-1.16%	1.05%
		2437	39.223	1.788	39.663	1.759	-1.12%	1.65%
	Dec, 08. 2018	2441	39.216	1.792	39.655	1.782	-1.12%	0.56%
		2450	39.200	1.800	39.652	1.787	-1.15%	0.72%
		2457	39.191	1.808	39.643	1.791	-1.15%	0.92%
		2462	39.185	1.813	39.641	1.801	-1.16%	0.67%
		2480	39.162	1.827	39.638	1.811	-1.22%	0.86%
		1850.2	53.300	1.520	52.802	1.505	0.93%	0.99%
		1860	53.300	1.520	52.798	1.510	0.94%	0.66%
	Dec 10 2018	1880	53.300	1.520	52.794	1.511	0.95%	0.59%
	Dec, 10. 2018	1900	53.300	1.520	52.792	1.513	0.95%	0.46%
		1907.6	53.300	1.520	52.785	1.514	0.97%	0.39%
		1909.8	53.300	1.520	52.737	1.516	1.06%	0.26%
		2402	52.764	1.904	53.143	1.920	-0.72%	-0.83%
Body		2412	52.751	1.914	53.136	1.929	-0.73%	-0.80%
		2417	52.744	1.918	53.126	1.934	-0.72%	-0.81%
		2437	52.717	1.938	53.102	1.953	-0.73%	-0.80%
	Dec, 08. 2018	2441	52.712	1.941	53.021	1.954	-0.59%	-0.65%
		2450	52.700	1.950	52.966	1.965	-0.50%	-0.77%
		2457	52.691	1.960	52.912	1.974	-0.42%	-0.72%
		2462	52.685	1.967	52.894	1.981	-0.40%	-0.71%
		2480	52.662	1.993	52.884	2.006	-0.42%	-0.68%

Table 2. Dielectric Parameters of Tissue Simulant Fluid

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The composition of the tissue simulating liquid:

Fraguanay			Ingredient									
Frequency (MHz)	Mode	DGMBE	Water	Salt	Preventol D-7	Cellulose	Sugar	Total amount				
4000	Head	444.52 g	552.42 g	3.06 g			I	1.0L(Kg)				
1900	Body	300.67 g	716.56 g	4.0 g			I	1.0L(Kg)				
0450	Head	550 g	450 g	_	_	_	I	1.0L(Kg)				
2450	Body	301.7 g	698.3 g	_			I	1.0L(Kg)				

Table 3. Recipes for tissue simulating liquid

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1.13 Test Standards and Limits

According to FCC 47CFR §2.1093(d) The limits to be used for evaluation are based generally on criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate ("SAR") in Section 4.2 of "IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz," ANSI/IEEE C95.1, By the Institute of Electrical and Electronics Engineers, Inc., New York, New York 10017. These criteria for SAR evaluation are similar to those recommended by the National Council on Radiation Protection and Measurements (NCRP) in "Biological Effects and Exposure Criteria for Radio frequency Electromagnetic Fields," NCRP Report No. 86, Section 17.4.5. Copyright NCRP, 1986, Bethesda, Maryland 20814. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards. The criteria to be used are specified in paragraphs (d)(1) and (d)(2) of this section and shall apply for portable devices transmitting in the frequency range from 100 kHz to 6 GHz. Portable devices that transmit at frequencies above 6 GHz are to be evaluated in terms of the MPE limits specified in § 1.1310 of this chapter.

Measurements and calculations to demonstrate compliance with MPE field strength or power density limits for devices operating above 6 GHz should be made at a minimum distance of 5 cm from the radiating source.

1. Limits for Occupational/Controlled exposure: 0.4 W/kg as averaged over the whole-body and spatial peak SAR not exceeding 8 W/kg as averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the hands, wrists, feet and ankles where the spatial peak SAR shall not exceed 20 W/kg, as averaged over a 10 grams of tissue (defined as a tissue volume in the shape of a cube).

Occupational/Controlled limits apply when persons are exposed as а consequence of their employment provided these persons are fully aware of and exercise control over their exposure. Awareness of exposure can be accomplished by use of warning labels or by specific training or education through appropriate means, such as an RF safety program in a work environment.

2. Limits for General Population/Uncontrolled exposure: 0.08 W/kg as averaged over the whole-body and spatial peak SAR not exceeding 1.6 W/kg as averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube).

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Exceptions are the hands, wrists, feet and ankles where the spatial peak SAR shall not exceed 4 W/kg, as averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube).

General Population/Uncontrolled limits apply when the general public may be exposed, or when persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or do not exercise control over their exposure.

Warning labels placed on consumer devices such as cellular telephones will not be sufficient reason to allow these devices to be evaluated subject to limits for occupational/controlled exposure in paragraph (d)(1) of this section. (Table .6)

Human Exposure	Uncontrolled Environment General Population	Controlled Environment Occupational
Spatial Peak SAR (Brain)	1.60 W/kg	8.00 W/kg
Spatial Average SAR (Whole Body)	0.08 W/kg	0.40 W/kg
Spatial Peak SAR (Hands/Feet/Ankle/Wrist)	4.00 W/kg	20.00 W/kg

Table 4. RF exposure limits

Notes:

- Uncontrolled environments are defined as locations where there is potential exposure of 1. individuals who have no knowledge or control of their potential exposure.
- 2. Controlled environments are defined as locations where there is potential exposure of individuals who have knowledge of their potential exposure and can exercise control over their exposure.

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2. Summary of Results

GSM 1900

Mode	Position	Distance (mm)	СН	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged S (W/	•	Plot page
								Measured	Reported	
	Re Cheek	-	512	1850.2	30.40	28.94	39.96%	0.25	0.35	-
	Re Tilt	-	512	1850.2	30.40	28.94	39.96%	0.15	0.21	-
Head	Le Cheek	-	512	1850.2	30.40	28.94	39.96%	0.27	0.38	-
(GSM)	Le Cheek	-	661	1880	30.40	28.74	46.55%	0.28	0.41	-
	Le Cheek	-	810	1909.8	30.40	28.75	46.22%	0.29	0.42	52
	Le Tilt	-	512	1850.2	30.40	28.94	39.96%	0.18	0.25	-
	Front side	10	512	1850.2	30.40	28.94	39.96%	0.23	0.32	-
Body-worn	Back side	10	512	1850.2	30.40	28.94	39.96%	0.33	0.46	-
(GSM)	Back side	10	661	1880	30.40	28.74	46.55%	0.32	0.47	-
	Back side	10	810	1909.8	30.40	28.75	46.22%	0.33	0.48	53
	Front side	10	661	1880	25.20	23.83	37.09%	0.37	0.51	-
	Back side	10	512	1850.2	25.20	23.77	39.00%	0.45	0.63	54
Hotspot	Back side	10	661	1880	25.20	23.83	37.09%	0.44	0.60	-
(GPRS)	Back side	10	810	1909.8	25.20	23.61	44.21%	0.42	0.61	-
<1Dn4Up>	Top side	10	661	1880	25.20	23.83	37.09%	0.15	0.21	-
	Right side	10	661	1880	25.20	23.83	37.09%	0.07	0.10	-
	Left side	10	661	1880	25.20	23.83	37.09%	0.23	0.32	-

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WCDMA Band II

Mode	Position	Distance (mm)	СН	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged S (W/	Plot page	
								Measured	Reported	
	RE Cheek	-	9262	1850.2	23.1	22.29	20.50%	0.45	0.54	-
	RE Tilt	-	9262	1850.2	23.1	22.29	20.50%	0.29	0.35	-
R99	LE Cheek	-	9262	1850.2	23.1	22.29	20.50%	0.49	0.59	-
(Head)	LE Cheek	-	9400	1880	23.1	22.08	26.47%	0.55	0.70	-
	LE Cheek	-	9538	1907.6	23.1	21.70	38.04%	0.58	0.80	55
	LE Tilt	-	9262	1850.2	23.1	22.29	20.50%	0.32	0.39	-
Body-worn	Front side	10	9262	1850.2	23.1	22.29	20.50%	0.48	0.58	-
Body-wolli	Back side	10	9538	1907.6	23.1	21.70	38.04%	0.71	0.98	-
	Front side	10	9262	1850.2	23.1	22.29	20.50%	0.48	0.58	-
	Back side	10	9262	1850.2	23.1	22.29	20.50%	0.66	0.80	-
	Back side	10	9400	1880	23.1	22.08	26.47%	0.69	0.87	-
Hotspot	Back side	10	9538	1907.6	23.1	21.70	38.04%	0.71	0.98	56
	Top side	10	9262	1850.2	23.1	22.29	20.50%	0.20	0.24	-
	Right side	10	9262	1850.2	23.1	22.29	20.50%	0.10	0.12	-
	Left side	10	9262	1850.2	23.1	22.29	20.50%	0.32	0.39	-

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LTE FDD Band 2

Mode	Mode Bandwidth (MHz) Modulati		odulation RB Size		Position	Distance	СН	Freq.	Max. Rated Avg. Power +	Measured Avg. Power	Scaling		SAR over V/kg)	Plot					
mode	(MHz)	modulation	10 0120	RB start	roomon	(mm)	on	(MHz)	Max. Tolerance (dBm)	(dBm)	County	Measured	Reported	page					
					RE Cheek	-	18700	1860	22.8	22.34	11.17%	0.39	0.43	-					
			1 RB		RE Tilt	-	18700	1860	22.8	22.34	11.17%	0.21	0.23	-					
				50	LE Cheek	-	18700	1860	22.8	22.34	11.17%	0.44	0.49	-					
				50	LE Cheek	-	18900	1880	22.8	22.13	16.68%	0.48	0.56	-					
					LE Cheek	-	19100	1900	22.8	21.92	22.46%	0.49	0.60	57					
					LE Tilt	-	18700	1860	22.8	22.34	11.17%	0.23	0.26	-					
Head	20MHz	QPSK				RE Cheek	-	18700	1860	21.8	21.24	13.76%	0.31	0.35	-				
riead	20101112			25	RE Tilt	-	18700	1860	21.8	21.24	13.76%	0.16	0.18	-					
				30 KD	25	LE Cheek	-	18700	1860	21.8	21.24	13.76%	0.41	0.47	-				
								LE Tilt	-	18700	1860	21.8	21.24	13.76%	0.17	0.19	-		
						RE Cheek	-	18700	1860	21.8	21.23	14.02%	0.32	0.36	-				
			100	RB	RE Tilt	-	18700	1860	21.8	21.23	14.02%	0.14	0.16	-					
			100	ND .	LE Cheek	-	18700	1860	21.8	21.23	14.02%	0.40	0.46	-					
					LE Tilt	-	18700	1860	21.8	21.23	14.02%	0.15	0.17	-					
Body-worn	20MHz	QPSK	1 RB	50	Front side	10	18700	1860	22.8	22.34	11.17%	0.46	0.51	-					
Dody-woin	20101112	QI OIX		50	Back side	10	19100	1900	22.8	21.92	22.46%	0.67	0.82	-					
										Front side	10	18700	1860	22.8	22.34	11.17%	0.46	0.51	-
					Back side	10	18700	1860	22.8	22.34	11.17%	0.63	0.70	-					
					Back side	10	18900	1880	22.8	22.13	16.68%	0.64	0.75	-					
			1 RB	50	Back side	10	19100	1900	22.8	21.92	22.46%	0.67	0.82	58					
					Top side	10	18700	1860	22.8	22.34	11.17%	0.19	0.21	-					
					Right side	10	18700	1860	22.8	22.34	11.17%	0.11	0.12	-					
				-	Left side	10	18700	1860	22.8	22.34	11.17%	0.33	0.37	-					
					Front side	10	18700	1860	21.8	21.24	13.76%	0.39	0.44	-					
Hotspot	20MHz	QPSK			Back side	10	18700	1860	21.8	21.24	13.76%	0.52	0.59	-					
			50 RB	25	Top side	10	18700	1860	21.8	21.24	13.76%	0.13	0.15	-					
				ĺ	Right side	10	18700	1860	21.8	21.24	13.76%	0.08	0.09	-					
				Left side	10	18700	1860	21.8	21.24	13.76%	0.28	0.32	-						
			100 RE		Front side	10	18700	1860	21.8	21.23	14.02%	0.39	0.44	-					
1				-	Back side	10	18700	1860	21.8	21.23	14.02%	0.54	0.62	-					
				RB	Top side	10	18700	1860	21.8	21.23	14.02%	0.14	0.16	-					
				1001	100	-	Right side	10	18700	1860	21.8	21.23	14.02%	0.08	0.09	-			
				ſ	Left side	10	18700	1860	21.8	21.23	14.02%	0.27	0.31	-					

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WLAN 802.11b

Mode	Position	Distance (mm)			Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Scaling	Averaged S (W/	0	Plot page
					Tolefance (dbin)	(dBill)		Measured	Reported	
	RE Cheek	-	1	2412	12	11.95	1.16%	0.12	0.12	-
	RE Cheek	-	2	2417	15	14.88	2.80%	0.18	0.19	-
	RE Cheek	-	6	2437	15	14.85	3.51%	0.19	0.20	-
Head	RE Cheek	-	10	2457	15	14.91	2.09%	0.21	0.21	59
neau	RE Cheek	-	11	2462	12	11.85	3.51%	0.11	0.11	-
	RE Tilt	-	10	2457	15	14.91	2.09%	0.07	0.07	-
	LE Cheek	-	10	2457	15	14.91	2.09%	0.13	0.13	-
	LE Tilt	-	10	2457	15	14.91	2.09%	0.07	0.07	-
Body-	Front side	10	10	2457	15	14.91	2.09%	0.05	0.05	-
worn	Back side	10	10	2457	15	14.91	2.09%	0.18	0.18	-
	Front side	10	10	2457	15	14.91	2.09%	0.05	0.05	-
	Back side	10	10	2457	15	14.91	2.09%	0.18	0.18	-
	Top side	10	10	2457	15	14.91	2.09%	0.02	0.02	-
Hotspot	Right side	10	1	2412	12	11.95	1.16%	0.12	0.12	-
HOISPOL	Right side	10	2	2417	15	14.88	2.80%	0.20	0.21	-
	Right side	10	6	2437	15	14.85	3.51%	0.20	0.21	-
	Right side	10	10	2457	15	14.91	2.09%	0.22	0.22	60
	Right side	10	11	2462	12	11.85	3.51%	0.13	0.13	-

Bluetooth

Mode	Position	Distance (mm) CH		CH Freq. (MHz)		Measured Avg. Power (dBm)	Scaling	Averaged S (W/	Plot page	
					Tolerance (dBm)	(ubiii)		Measured	Reported	
	RE Cheek	-	0	2402	11.5	10.14	36.77%	0.04	0.05	-
	RE Cheek	-	39	2441	11.5	10.18	35.52%	0.04	0.05	-
Head	RE Cheek	-	78	2480	11.5	10.38	29.42%	0.05	0.06	61
Tieau	RE Tilt	-	78	2480	11.5	10.38	29.42%	0.02	0.03	-
	LE Cheek	-	78	2480	11.5	10.38	29.42%	0.04	0.05	-
	LE Tilt	-	78	2480	11.5	10.38	29.42%	0.01	0.01	-
	Front side	10	78	2480	11.5	10.38	29.42%	0.01	0.01	-
Body-	Back side	10	0	2402	11.5	10.14	36.77%	0.03	0.04	-
worn	Back side	10	39	2441	11.5	10.18	35.52%	0.03	0.04	-
	Back side	10	78	2480	11.5	10.38	29.42%	0.04	0.05	62

Note:

Scaling =
$$\frac{\text{reported SAR}}{\text{measured SAR}} = \frac{P2(\text{mW})}{P1(\text{mW})} = 10^{\left(\frac{P_2 - P_1}{10}\right)(\text{dBm})}$$

Reported SAR = measured SAR * (scaling)
Where P2 is maximum specified power, P1 is measured conducted power

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3. Simultaneous Transmission Analysis **Simultaneous Transmission Scenarios:**

Simultaneous Transmit Configurations	Head	Body-Worn	Hotspot
GSM + 2.4GHz Wi-Fi	Yes	Yes	No
GPRS + 2.4GHz Wi-Fi	No	No	Yes
WCDMA + 2.4GHz Wi-Fi	Yes	Yes	Yes
LTE + 2.4GHz Wi-Fi	Yes	Yes	Yes
GSM+BT	Yes	Yes	No
GPRS + BT	No	Yes	No
WCDMA + BT	Yes	Yes	No
LTE+ BT	Yes	Yes	No

Note:

1. The device does not support DTM function. Body-worn accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for body-worn SAR.

2. Based on KDB447498D01 note 36, when SAR test exclusion is allowed by other published RF exposure KDB procedures, such as the 2.5 cm hotspot mode SAR test exclusion for an edge or surface, then estimated SAR is not required to determine simultaneous SAR test exclusion.

3: Based on KDB 648474 D04v01r03 note 6, simultaneous transmission SAR for 10-g extremity SAR requires consideration only when standalone 10-g SAR is required.

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3.1 Estimated SAR calculation

According to KDB447498 D01v06 – When standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:

> $\frac{\text{Max.tune up power (mW)}}{\text{Min.test separation distance(mm)}} \times \frac{\sqrt{f(\text{GHz})}}{7.5}$ Estimated SAR =

If the minimum test separation distance is < 5mm, a distance of 5mm is used for estimated SAR calculation. When the test separation distance is >50mm, the 0.4W/kg is used for SAR-1g.

3.2 SPLSR evaluation and analysis

Per KDB447498D01, when the sum of SAR is larger than the limit, SAR test exclusion is determined by the SAR sum to peak location separation ratio(SPLSR).

The simultaneous transmitting antennas in each operating mode and exposure condition combination must be considered one pair at a time to determine the SAR to peak location separation ratio to qualify for test exclusion.

The ratio is determined by (SAR1 + SAR2)^1.5/Ri, rounded to two decimal digits, and must be \leq 0.04 for all antenna pairs in the configuration to gualify for 1-g SAR test exclusion.

SAR1 and SAR2 are the highest reported or estimated SAR for each antenna in the pair, and Ri is the separation distance between the peak SAR locations for the antenna pair in mm.

When standalone test exclusion applies, SAR is estimated; the peak location is assumed to be at the feed-point or geometric center of the antenna.

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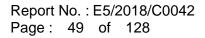
reported SAR WWAN and WLAN 2.4GHz, ΣSAR evaluation										
Frequency	Р	osition	reported \$	SAR / W/kg	ΣSAR					
band	Р	OSITION	WWAN	WLAN	<1.6W/kg					
		Right cheek	0.35	0.21	0.56					
GSM 1900	Head	Right tilt	0.21	0.07	0.28					
G3M 1900	neau	Left cheek	0.42	0.13	0.55					
		Left tilt	0.25	0.07	0.32					
		Front side	0.51	0.05	0.56					
		Back side	0.63	0.18	0.81					
GPRS 1900 (1Dn4UP)	Hotspot	Top side	0.21	0.02	0.23					
(1211101)		Right side	0.10	0.22	0.32					
		Left side	0.32	-	-					
		Right cheek	0.54	0.21	0.75					
	Head	Right tilt	0.35	0.07	0.42					
		Left cheek	0.80	0.13	0.93					
		Left tilt	0.39	0.07	0.46					
WCDMA Band II		Front side	0.58	0.05	0.63					
Dana II		Back side	0.98	0.18	1.16					
	Hotspot	Top side	0.24	0.02	0.26					
		Right side	0.12	0.22	0.34					
		Left side	0.39	-	-					
		Right cheek	0.43	0.21	0.64					
	Head	Right tilt	0.23	0.07	0.30					
	neau	Left cheek	0.60	0.13	0.73					
1 77		Left tilt	0.26	0.07	0.33					
LTE Band 2		Front side	0.51	0.05	0.56					
Dana L		Back side	0.82	0.18	1.00					
	Hotspot	Top side	0.21	0.02	0.23					
		Right side	0.12	0.22	0.34					
		Left side	0.37	-	-					

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reported SAR WWAN and WLAN 2.4GHz, Σ SAR evaluation							
Frequency	Р	osition	reported S	reported SAR / W/kg			
band		USILION	WWAN	WLAN	<1.6W/kg		
GSM 1900	body-	Front side	0.32	0.05	0.37		
G3M 1900	worn	Back side	0.48	0.18	0.66		
WCDMA Band II	body-	Front side	0.58	0.05	0.63		
	worn	Back side	0.98	0.18	1.16		
LTE Band 2	body-	Front side	0.51	0.05	0.56		
	worn	Back side	0.82	0.18	1.00		

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reported SAR WWAN and Bluetooth, Σ SAR evaluation							
Frequency		opition	reported SAR / W/kg		ΣSAR		
band	Position		WWAN	BT	<1.6W/kg		
		Right cheek	0.35	0.06	0.41		
GSM 1900	Head	Right tilt	0.21	0.03	0.24		
	Tieau	Left cheek	0.42	0.05	0.47		
G3M 1900		Left tilt	0.25	0.01	0.26		
	body-	Front side	0.32	0.01	0.33		
	worn	Back side	0.48	0.05	0.53		
WCDMA Band II	Head body- worn	Right cheek	0.54	0.06	0.60		
		Right tilt	0.35	0.03	0.38		
		Left cheek	0.80	0.05	0.85		
		Left tilt	0.39	0.01	0.40		
		Front side	0.58	0.01	0.59		
		Back side	0.98	0.05	1.03		
	Head	Right cheek	0.43	0.06	0.49		
		Right tilt	0.23	0.03	0.26		
I TE Band 2	rieau	Left cheek	0.60	0.05	0.65		
		Left tilt	0.26	0.01	0.27		
	body-	Front side	0.51	0.01	0.52		
	worn	Back side	0.82	0.05	0.87		

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4. Instruments List

Manufacturer	Device	Туре	Serial number	Date of last calibration	Date of next calibration
SPEAG	Dosimetric E-Field Probe	EX3DV4	3938	Oct.24,2018	Oct.23,2019
SPEAG	System Validation	D1900V2	5d173	Apr.25,2018	Apr.25,2019
SPEAG	Dipole	D2450V2	727	Apr.24,2018	Apr.23,2019
SPEAG	Data acquisition Electronics	DAE4	1336	Aug.06,2018	Aug.05,2019
SPEAG	Software	DASY 52 V52.8.8	N/A	Calibration not required	Calibration not required
SPEAG	Phantom	SAM	N/A	Calibration not required	Calibration not required
Network Analyzer	Agilent	E5071C	MY46107530	Feb.26,2018	Feb.25,2019
Agilent	Dielectric Probe Kit	85070E	MY44300677	Calibration not required	Calibration not required
Agilent	Dual-directional	772D	MY52180142	Jul.04,2018	Jul.03,2019
Aglient	coupler	778D	MY52180302	Jul.05,2018	Jul.04,2019
Agilent	RF Signal Generator	N5181A	MY50144143	Mar.14,2018	Mar.13,2019
Agilent	Power Meter	E4417A	MY52240003	Dec.21,2017	Dec.20,2018
Agilent	Power Sensor	E9301H	MY52200003	Dec.21,2017	Dec.20,2018
Aglient	I Ower Sensor	L930111	MY52200004	Dec.21,2017	Dec.20,2018
TECPEL	Digital thermometer	DTM-303A	TP130077	Mar.09,2018	Mar.08,2019
Anritsu	Radio Communication Test	MT8820C	6201061049	Apr.08,2018	Apr.07,2019

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5. Measurements

Date: 2018/12/9

GSM 1900 Head Le Cheek CH 810

Communication System: GSM; Frequency: 1909.8 MHz; Duty Cycle: 1:8.30042 Medium parameters used: f = 1909.8 MHz; σ = 1.388 S/m; ϵ_r = 39.446; ρ = 1000 kg/m³ Phantom section: Left Section Ambient temperature: 22.1°C; Liquid temperature: 21.6°C

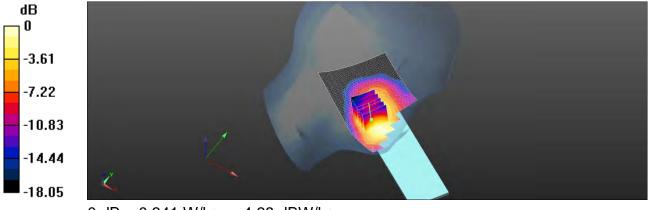
DASY5 Configuration:

- Probe: EX3DV4 SN3938; ConvF(7.95, 7.95, 7.95); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Area Scan (61x121x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.359 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm Reference Value = 1.661 V/m; Power Drift = 0.02 dB Peak SAR (extrapolated) = 0.417 W/kg SAR(1 g) = 0.286 W/kg; SAR(10 g) = 0.178 W/kgMaximum value of SAR (measured) = 0.341 W/kg



0 dB = 0.341 W/kg = -4.68 dBW/kg

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Date: 2018/12/10

GSM 1900 Body-worn Back side CH 810 10mm

Communication System: GSM; Frequency: 1909.8 MHz; Duty Cycle: 1:8.30042 Medium parameters used: f = 1909.8 MHz; σ = 1.516 S/m; ϵ_r = 52.737; ρ = 1000 kg/m³ Phantom section: Flat Section Ambient temperature: 22.1°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 SN3938; ConvF(7.52, 7.52, 7.52); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection) •
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

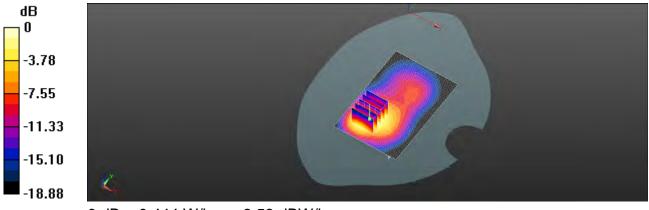
Area Scan (61x91x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.457 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm Reference Value = 6.767 V/m; Power Drift = 0.02 dB Peak SAR (extrapolated) = 0.575 W/kg

SAR(1 g) = 0.328 W/kg; SAR(10 g) = 0.180 W/kg

Maximum value of SAR (measured) = 0.444 W/kg



0 dB = 0.444 W/kg = -3.53 dBW/kg

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Date: 2018/12/10

GPRS 1900 Hotspot Back side CH 512 10mm

Communication System: GPRS (1Dn4Up); Frequency: 1850.2 MHz; Duty Cycle: 1:1.99986 Medium parameters used: f = 1850.2 MHz; σ = 1.505 S/m; ϵ_r = 52.802; ρ = 1000 kg/m³ Phantom section: Flat Section Ambient temperature: 22.1°C; Liquid temperature: 21.8°C

DASY5 Configuration:

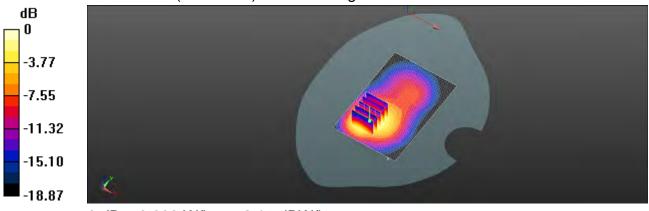
- Probe: EX3DV4 SN3938; ConvF(7.52, 7.52, 7.52); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Area Scan (61x91x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.645 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm Reference Value = 8.666 V/m; Power Drift = -0.05 dB Peak SAR (extrapolated) = 0.787 W/kg

SAR(1 g) = 0.445 W/kg; SAR(10 g) = 0.249 W/kg Maximum value of SAR (measured) = 0.609 W/kg



0 dB = 0.609 W/kg = -2.15 dBW/kg

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Report No. : E5/2018/C0042 Page: 55 of 128

Date: 2018/12/9

WCDMA Band II Head Le Cheek CH 9538

Communication System: WCDMA; Frequency: 1907.6 MHz; Duty Cycle: 1:1 Medium parameters used: f = 1907.6 MHz; σ = 1.386 S/m; ϵ_r = 39.478; ρ = 1000 kg/m³ Phantom section: Left Section Ambient temperature: 22.1°C; Liquid temperature: 21.6°C

DASY5 Configuration:

- Probe: EX3DV4 SN3938; ConvF(7.95, 7.95, 7.95); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

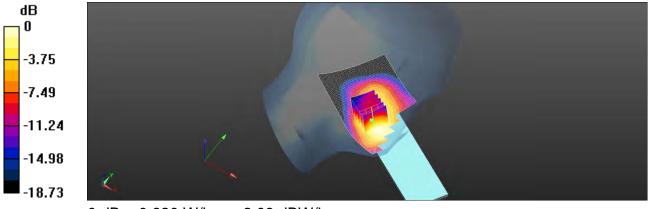
Area Scan (61x121x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.650 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm Reference Value = 2.842 V/m; Power Drift = 0.03 dB Peak SAR (extrapolated) = 0.750 W/kg

SAR(1 g) = 0.581 W/kg; SAR(10 g) = 0.397 W/kg

Maximum value of SAR (measured) = 0.620 W/kg



0 dB = 0.620 W/kg = -2.08 dBW/kg

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Report No. : E5/2018/C0042 Page: 56 of 128

Date: 2018/12/10

WCDMA Band II Hotspot Back side CH 9538 10mm

Communication System: WCDMA; Frequency: 1907.6 MHz; Duty Cycle: 1:1 Medium parameters used: f = 1907.6 MHz; σ = 1.514 S/m; ϵ_r = 52.785; ρ = 1000 kg/m³ Phantom section: Flat Section Ambient temperature: 22.1°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 SN3938; ConvF(7.52, 7.52, 7.52); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection) •
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

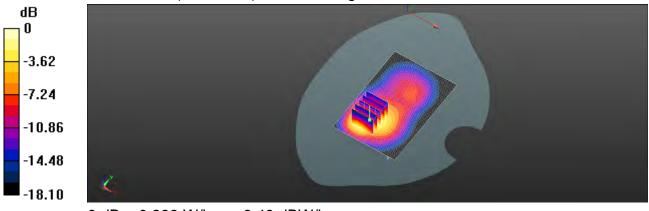
Area Scan (61x91x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.954 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm Reference Value = 9.721 V/m; Power Drift = -0.03 dB Peak SAR (extrapolated) = 1.18 W/kg

SAR(1 g) = 0.705 W/kg; SAR(10 g) = 0.414 W/kg

Maximum value of SAR (measured) = 0.893 W/kg



0 dB = 0.893 W/kg = -0.49 dBW/kg

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Report No. : E5/2018/C0042 Page: 57 of 128

Date: 2018/12/9

LTE Band 2 (20MHz) Head Le Cheek CH 19100 QPSK 1-50

Communication System: LTE; Frequency: 1900 MHz; Duty Cycle: 1:1 Medium parameters used: f = 1900 MHz; σ = 1.384 S/m; ϵ_r = 39.497; ρ = 1000 kg/m³ Phantom section: Left Section Ambient temperature: 22.1°C; Liquid temperature: 21.6°C

DASY5 Configuration:

- Probe: EX3DV4 SN3938; ConvF(7.95, 7.95, 7.95); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection) •
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

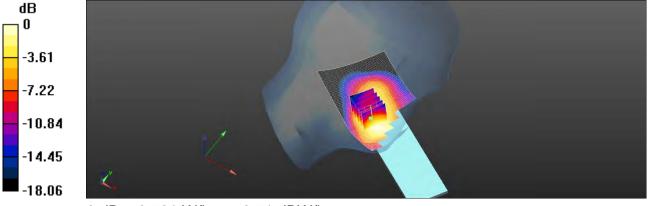
Area Scan (61x121x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.560 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm Reference Value = 3.919 V/m; Power Drift = 0.01 dB Peak SAR (extrapolated) = 0.664 W/kg

SAR(1 g) = 0.494 W/kg; SAR(10 g) = 0.298 W/kg

Maximum value of SAR (measured) = 0.561 W/kg



0 dB = 0.561 W/kg = -2.51 dBW/kg

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Date: 2018/12/10

LTE Band 2 (20MHz) Hotspot Back side CH 19100 QPSK 1-50 10mm

Communication System: LTE; Frequency: 1900 MHz; Duty Cycle: 1:1 Medium parameters used: f = 1900 MHz; σ = 1.513 S/m; ϵ_r = 52.792; ρ = 1000 kg/m³ Phantom section: Flat Section Ambient temperature: 22.1°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 SN3938; ConvF(7.52, 7.52, 7.52); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection) •
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

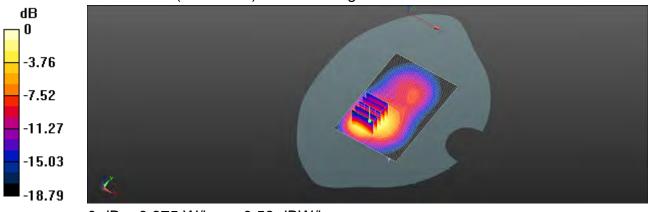
Area Scan (61x91x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.889 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm Reference Value = 9.214 V/m; Power Drift = 0.03 dB Peak SAR (extrapolated) = 1.13 W/kg

SAR(1 g) = 0.671 W/kg; SAR(10 g) = 0.345 W/kg

Maximum value of SAR (measured) = 0.875 W/kg



0 dB = 0.875 W/kg = -0.58 dBW/kg

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Report No. : E5/2018/C0042 Page: 59 of 128

Date: 2018/12/8

WLAN 802.11b Head Re Cheek CH 10

Communication System: WLAN 2.45G; Frequency: 2457 MHz; Duty Cycle: 1:1 Medium parameters used: f = 2457 MHz; σ = 1.791 S/m; ϵ_r = 39.643; ρ = 1000 kg/m³ Phantom section: Right Section Ambient temperature: 22.2°C; Liquid temperature: 21.6°C

DASY5 Configuration:

- Probe: EX3DV4 SN3938; ConvF(7.17, 7.17, 7.17); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

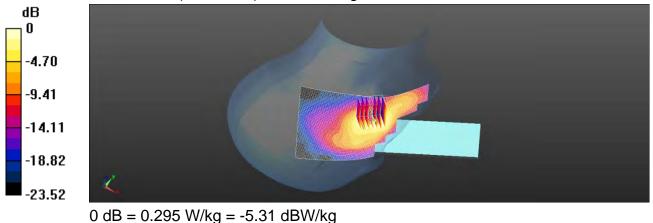
Area Scan (81x151x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.310 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 1.907 V/m; Power Drift = 0.04 dB Peak SAR (extrapolated) = 0.380 W/kg

SAR(1 g) = 0.206 W/kg; SAR(10 g) = 0.103 W/kg

Maximum value of SAR (measured) = 0.295 W/kg



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Report No. : E5/2018/C0042 Page: 60 of 128

Date: 2018/12/8

WLAN 802.11b Hotspot Right side CH 10 10mm

Communication System: WLAN 2.45G; Frequency: 2457 MHz; Duty Cycle: 1:1 Medium parameters used: f = 2457 MHz; σ = 1.974 S/m; ϵ_r = 52.912; ρ = 1000 kg/m³ Phantom section: Flat Section Ambient temperature: 22.1°C; Liquid temperature: 21.6°C

DASY5 Configuration:

- Probe: EX3DV4 SN3938; ConvF(7.3, 7.3, 7.3); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection) •
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

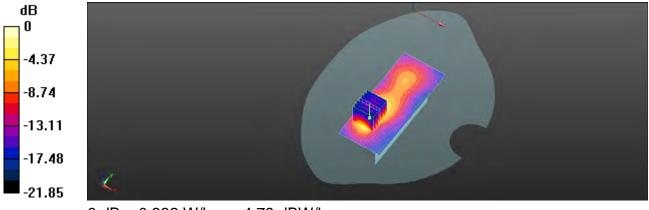
Area Scan (51x121x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.352 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 4.527 V/m; Power Drift = 0.03 dB Peak SAR (extrapolated) = 0.449 W/kg

SAR(1 g) = 0.217 W/kg; SAR(10 g) = 0.099 W/kg

Maximum value of SAR (measured) = 0.332 W/kg



0 dB = 0.332 W/kg = -4.79 dBW/kg

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Report No. : E5/2018/C0042 Page: 61 of 128

Date: 2018/12/8

Bluetooth(GFSK) Head Re Cheek CH 78

Communication System: Bluetooth; Frequency: 2480 MHz; Duty Cycle: 1:1 Medium parameters used: f = 2480 MHz; σ = 1.811 S/m; ϵ_r = 39.638; ρ = 1000 kg/m³ Phantom section: Right Section Ambient temperature: 22.2°C; Liquid temperature: 21.6°C

DASY5 Configuration:

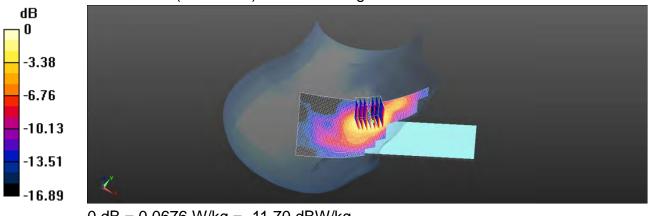
- Probe: EX3DV4 SN3938; ConvF(7.17, 7.17, 7.17); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Area Scan (71x141x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.0656 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 0.9140 V/m; Power Drift = 0.03 dB Peak SAR (extrapolated) = 0.0880 W/kg

SAR(1 g) = 0.048 W/kg; SAR(10 g) = 0.024 W/kg Maximum value of SAR (measured) = 0.0676 W/kg



0 dB = 0.0676 W/kg = -11.70 dBW/kg

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Report No. : E5/2018/C0042 Page: 62 of 128

Date: 2018/12/8

Bluetooth(GFSK)_Body-worn_Back side_CH 78_10mm

Communication System: Bluetooth; Frequency: 2480 MHz; Duty Cycle: 1:1 Medium parameters used: f = 2480 MHz; σ = 2.006 S/m; ϵ_r = 52.884; ρ = 1000 kg/m³ Phantom section: Flat Section Ambient temperature: 22.1°C; Liquid temperature: 21.6°C

DASY5 Configuration:

- Probe: EX3DV4 SN3938; ConvF(7.3, 7.3, 7.3); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

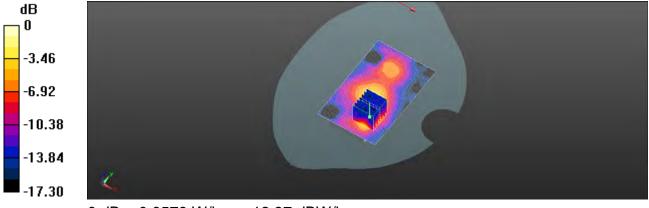
Area Scan (71x111x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.0551 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 2.774 V/m; Power Drift = 0.04 dB Peak SAR (extrapolated) = 0.0800 W/kg

SAR(1 g) = 0.038 W/kg; SAR(10 g) = 0.017 W/kg

Maximum value of SAR (measured) = 0.0579 W/kg



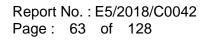
0 dB = 0.0579 W/kg = -12.37 dBW/kg

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6. SAR System Performance Verification

Date: 2018/12/9

Dipole 1900 MHz SN:5d173 Head

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1 Medium parameters used: f = 1900 MHz; σ = 1.384 S/m; ϵ_r = 39.497; ρ = 1000 kg/m³ Phantom section: Flat Section Ambient temperature: 22.1°C; Liquid temperature: 21.6°C

DASY5 Configuration:

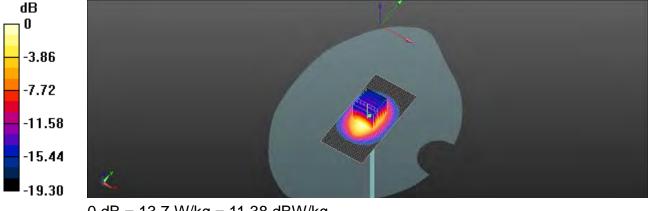
SG:

- Probe: EX3DV4 SN3938; ConvF(7.95, 7.95, 7.95); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

Area Scan (41x81x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 13.9 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 100.1 V/m; Power Drift = 0.03 dB Peak SAR (extrapolated) = 18.0 W/kg SAR(1 g) = 9.91 W/kg; SAR(10 g) = 5.23 W/kg Maximum value of SAR (measured) = 13.7 W/kg



0 dB = 13.7 W/kg = 11.38 dBW/kg

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Report No. : E5/2018/C0042 Page: 64 of 128

Date: 2018/12/10

Dipole 1900 MHz SN:5d173 Body

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1 Medium parameters used: f = 1900 MHz; σ = 1.513 S/m; ϵ_r = 52.792; ρ = 1000 kg/m³ Phantom section: Flat Section Ambient temperature: 22.1°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 SN3938; ConvF(7.52, 7.52, 7.52); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection) •
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

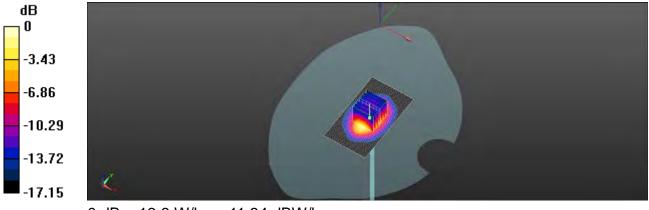
Area Scan (41x71x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 14.6 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 96.11 V/m; Power Drift = -0.01 dB Peak SAR (extrapolated) = 17.3 W/kg

SAR(1 g) = 9.96 W/kg; SAR(10 g) = 5.32 W/kg

Maximum value of SAR (measured) = 13.6 W/kg



0 dB = 13.6 W/kg = 11.34 dBW/kg

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Date: 2018/12/8

Dipole 2450 MHz SN:727 Head

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1 Medium parameters used: f = 2450 MHz; σ = 1.787 S/m; ϵ_r = 39.652; ρ = 1000 kg/m³ Phantom section: Flat Section Ambient temperature: 22.2°C; Liquid temperature: 21.6°C

DASY5 Configuration:

- Probe: EX3DV4 SN3938; ConvF(7.17, 7.17, 7.17); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection) •
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

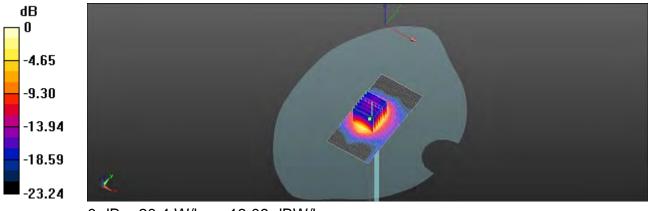
Area Scan (51x101x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 20.7 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 104.8 V/m; Power Drift = -0.03 dB Peak SAR (extrapolated) = 28.6 W/kg

SAR(1 g) = 13.1 W/kg; SAR(10 g) = 6.09 W/kg

Maximum value of SAR (measured) = 20.4 W/kg



0 dB = 20.4 W/kg = 13.09 dBW/kg

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Date: 2018/12/8

Dipole 2450 MHz SN:727 Body

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1 Medium parameters used: f = 2450 MHz; σ = 1.965 S/m; ϵ_r = 52.966; ρ = 1000 kg/m³ Phantom section: Flat Section Ambient temperature: 22.1°C; Liquid temperature: 21.6°C

DASY5 Configuration:

- Probe: EX3DV4 SN3938; ConvF(7.3, 7.3, 7.3); Calibrated: 2018/10/24;
- Sensor-Surface: 2mm (Mechanical Surface Detection) •
- Electronics: DAE4 Sn1336; Calibrated: 2018/8/6
- Phantom: SAM
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373)

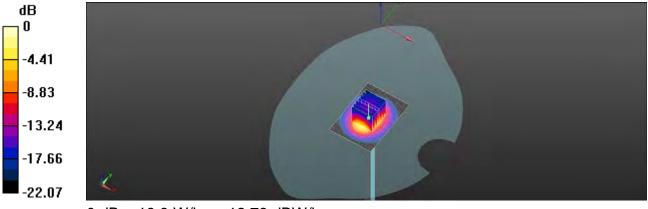
Area Scan (51x71x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 20.3 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 99.54 V/m; Power Drift = 0.04 dB Peak SAR (extrapolated) = 25.4 W/kg

SAR(1 g) = 12.8 W/kg; SAR(10 g) = 5.94 W/kg

Maximum value of SAR (measured) = 18.8 W/kg



0 dB = 18.8 W/kg = 12.73 dBW/kg

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7. DAE & Probe Calibration Certificate

Noticed by the Swiss Accreditation Service (SAS) Accreditation No.: SCS 0108 The Swiss Accreditation Service is one of the signatories to the EA buildistrait Agreement for the recognition of collibration certificates Certificase No: DAE4-1336_Aug18 Caller SGS-TW (Auder) Certificase No: DAE4-1336_Aug18 Caller DAE4 - SD 000 D04 BM - SN: 1336 Calbration procedure(s) QA CAL-05.v29 Calibration procedure for the data acquisition electronics (DAE) Calbration procedure(s) QA CAL-05.v29 Calibration procedure for the data acquisition electronics (DAE) This calibration certificate documents the traceability to national standards, which realize the physical units of measusements (SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate: All calibrations have been conducted in the closed laboratory facility: servicement temperature (22 ± 3)°C and numbry - 70%. Calbration Equipment used (METE critical for calibration) Primary Standards D 4 Cal Date (Confiscate No.) Screedued Criticeton Primary Standards D 4 Cal Date (Confiscate No.) Screedued Criticeton Secondary Blandards D 4 Cale Check Date (in house) Screedued Criticeton Secondary Blandards D 4 Cale Check Date (in house check) in house check): can-19 <td< th=""></td<>
Calibration Decentificate Corport DAE4 + SD 000 D04 BM + SN: 1336 Calibration procedure(s) DA CAL-05.v29 Calibration procedure for the data acquisition electronics (DAE) Cathrance date: August 06, 2018 This calibration conflicted documents the traceability to national standards, which realize the physical units of measurements (Si). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate. All calibrations have been conducted in the closed laboratory facility: servicement temperature (si2 ± 5)°G and numbrity < 70%. Calibration Equipment used (M&TE critical for calibration) Primary Standards: D 4 Cal Date (Contincate No.) Screedued Calibration Primary Standards D 4 Check Date (in house) Schedued Checks Secondary Standards D 4 Check Date (in house check) in house check)
Object DAE4 - SD 000 D04 BM - SN: 1336 Calibration procedure(s) QA CAL-05,v29 Calibration procedure for the data acquisition electronics (DAE) Calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI). The measurements and the uncertainties with certificate probability are given on the following pages and are part of the certificate All calibration Equipment used (M&TE critical for calibration) Primary Standards D.4 Cal Date (Certificate No.) Screeduled Certificate Aug.18 Secondary Standards D.4 Cal Date (In house) Scheduled Check Aug.17 (No:21062)
Calibration procedure(s) QA CAL-05.v29 Calibration procedure for the data acquisition electronics (DAE) Calibration date: August 06, 2018 This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate. All calibration Equipment used (M&TE critical for calibration) Primary Standards D 4 Cal Date (Certificate No.) Screedued Certification Primary Standards D 4 Check Date (in house) Scheduled Checks Secondary Standards D 4 Check Date (in house) Scheduled Checks
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Kethley Multimeter Type 2001 SN: 0810278 31-Aug-17 (No:21092) Aug-18 Secondary Standards D 4 Check Date (in house) Scheduled Check Auto DAE Calibration Unit SE UWS 053 AA 1001 04-Jan-18 (in house check) In house check; Jan-19
Secondary Standards ID 4 Check Date (in house) Scheduled Check Auto DAE Calibration Unit SE UWS 053 AA 1001 04-Jan-19 (in house check) In house check; Jan-19
Auto DAE Calibration Unit SE UWS 053 AA 1001 04-Jan-18 (in house check) In house check: Jan-19
Name Function Skynetium Calibrated by: Dominique Statler Laboratory Technician
d.
Approved by: Sven Ku'm Deputy Manager 1. V. BL UU

Certificate No: DAE4-1335_Aug18

Page 1 of 5

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Calibration Laboratory of Schmid & Partner Engineering AG aughausstrasse 43, 8004 Zurich, Switzerland Zeughau



- S C s Swiss Calibration Service
 - Schweizenscher Kallbrierdienet Service suisse d'étalonnage Servizio svizzero di taratura

Acquestanion No.: SCS 0108

Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration cortification

Glossary DAF

Connector angle

data acquisition electronics. information used in DASY system to align probe sensor X to the robot coordinate system.

Methods Applied and Interpretation of Parameters.

- DC Voltage Measurement: Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- Connector angle. The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
 - DC Voltage Measurement Linearity. Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement,
 - Common mode sensitivity: Influence of a positive or negative common mode voltage on the differential measurement.
 - Channel separation: Influence of a voltage on the neighbor channels not subject to an input voltage.
 - AD Converter Values with inputs shorted: Values on the Internal AD converter corresponding to zero input voltage
 - Input Offset Measurement: Output voltage and statistical results over a large number of zero voltage measurements.
 - Input Offset Current: Typical value for information; Maximum channel input offset current, not considering the input resistance.
 - Input resistance: Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
 - Low Battery Alarm Voltage: Typical value for information. Below this voltage, a battery alarm signal is generated.
 - Power consumption: Typical value for information. Supply currents in various operating modes.

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DC Voltage Measurement

A/D - Converter Resolution nominal High Flange: 1LSB -6.1µV full range = -100...+300 mV Low Range 1LSB = SinV tull range = -1+3mV DASY measurement parameters; Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	X	Y	z
High Range	403.344 ± 0.02% (k=2)	403.624 ± 0.02% (k=2)	403.107 ± 0.02% (k=2)
Low Range	3.95102 ± 1.50% (k=2)	3,98703 ± 1,50% (k=2)	3.99683 ± 1.50% (k=2)

Connector Angle

connector Angle to be used in DASY system	287.0° ± 1°

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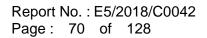
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Appendix (Additional assessments outside the scope of SCS0108)

1. DC Voltage Linearity

High Range		Reading (µV)	Difference (µV)	Error (%)
Channel X	+ Input	200042.98	8.65	0.00
Channel X	+ Input	20006.34	1.71	0.01
Channel X	- Input	-20005,65	-0.58	0.00
Channel Y	+ Input	200034.32	0.12	0.00
Channel Y	+ Input	20003.47	-1.57	0.01
Channel Y	- Input	20006.39	-1.21	0,01
Channel Z	+ Input	200032.22	-2.05	-0.00
Channel Z	+ Input	20002.78	-2.14	-0.01
Channel Z	- Input	-20007.34	-2.09	0.01

Low Range	Reading (µV)	Difference (µV)	Error (%)
Channel X + Inpul	2001.47	0.30	0,01
Channel X + Input	201.92	0.79	0,39
Channel X - Input	-198.26	0.59	-0.30
Channel Y + Input	2001,55	0.37	0.02
Channel Y + Input	200.97	-0.11	-0.05
Channel Y - Input	-199.34	-0.43	0,22
Channel Z + Input	2001.12	0.04	0.00
Channel Z + Input	200.15	-0.89	-0.44
Channel Z - Input	-200.14	1.15	0.58

2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec. Measuring time: 3 sec

	Common mode Input Voltage (mV)	High Range Average Reading (µV)	Low Range Average Reading (µV)
Channel X	200	B:04	4.72
	- 200	4.13	-4.79
Channel Y	200	-3,65	-3,78
	200	2.68	2.45
Channel Z	200	22,40	22.16
	- 200	-24.83	-25.10

3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Input Voltage (mV)	Channel X (µV)	Channel Y (µV)	Channel Z (µV)
Channel X	200	+1	6.12	+1,64
Channel Y	200	9.19		6.46
Channel Z	200	8.44	6.31	

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4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	High Range (LSB)	Low Range (LSB)
Channel X	15666	16509
Channel Y	15907	15587
Channel Z	15855	15507

5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec. Measuring time: 3 sec. Inimit 10MO

	Average (µV)	min. Offset (µV)	max. Offset (µV)	Std, Deviation (µV)
Channel X	0.87	-0.00	2.62	0.36
Channel Y	3.53	2.87	4.58	0.34
Channel Z	-0.18	-1.34	1.53	0.54

6. Input Offset Current

Nominal Input circuitry offset current on all channels <25fA

7. Input Resistance (Typical values for information)

	Zeroing (kOhm)	Measuring (MOhm)
Channel X	200	200
Channel Y	200	200
Channel Z	200	200

8. Low Battery Alarm Voltage (Typical values for information)

Typical values	Alarm Level (VDC)	
Supply (+ Vcc)	47.9	
Supply (- Vcc)	-7.6	

9. Power Consumption (Typical values for information)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.01	36	+14
Supply (- Vcc)	-0.01	В	-9

Certificate No: DAE4-1336 Aug18

Page 5 of 5.

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Report No. : E5/2018/C0042 Page: 72 of 128

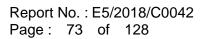
Engineering AG oughausstrasse 43, 8004 Zu	rich, Switzerland		Schweizenlacher Kalibrierdiens Service suisse d'étaionnago Bervizio evizzero di taretura Swise Calibration Service
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Silent SGS-TW (Aut	dan)	Certificate No.	EX3-3938_Oct18
CALIBRATION	CERTIFICATE		
Doject	EX3DV4 - SN:393	И	
Coliferation proceedure(in)	CAL-25.V6	A GAL 12 v9: QA CAL-14 v4, QA ture for dosimetric E-lietd probes.	
Calibration date	Ociober 24, 2018		
		bability are given on the following pages and	or of part of a far destanding
		facility: anvironment frespresture (22 \pm 3)*C $_{\rm S}$	and humidäy < 70%.
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Saibrahon Espionent used (M Permary Standards Power meler NRP	8/TE onlication calibration)	Cal Deta (Certificate No.) 08-Apr-18 (No. 217-82672(12873)	Scheduled Calibration Apr-19
Calification Explorment used (M Permany Standards Power meter NRP Power sensor NRP-281	ID SN: 104778 SN: 104778	Gal Date (Dentificate No.) 08-Apri-18 (No. 217-02672/02673) 08-Apri-18 (No. 217-02672)	Scheduled Calibration Apr-16i Apr-19
laideulison Explorment used (M Pormery Standards Powers meder NRP Powers sensor NRP-281 Power sensor NRP-291	ID SN: 104778	Cal Deta (Centicate No.) 08-Apr-18 (No. 217-0267202873) 08-Apr-16 (No. 217-02672) 08-Apr-18 (No. 217-02673)	Scheduled Calibration Apr-16 Apr-19 Apr-19
Calibration Explorment used (M Permany Standards Power meter NRP Power sensor NRP-281 Reference 20 dB Attenuator	ID SN: 104778 SN: 104778 SN: 103244 SN: 103245	Gal Date (Dentificate No.) 08-Apri-18 (No. 217-02672/02673) 08-Apri-18 (No. 217-02672)	Scheduled Calibration Apr-16i Apr-19
Caldration Explorment used (M Primary Standards Power meter NRP Power sensor NRP-281 Power sensor NRP-291 Reference 20 dB Attenuator Reference 20 dB Attenuator	ID SN: 104778 SN: 103244 SN: 103245 SN: 153245	Cal Dete (Dentificate No.) 08-Apr-16 (No. 217-02672)02673) 09-Apr-16 (No. 217-02672) 08-Apr-16 (No. 217-02673) 09-Apr-18 (No. 217-02682)	Scheduled Calibration Apr-18 Apr-19 Apr-19 Apr-19 Apr-19
Caldoalion Espajorrent used (M Permary Standards Power meter NRP Power sensor NRP-281 Power sensor NRP-291 Reference 20 dB Atlantiator Reference Probe ES30V2 (AE4	ID SN: 104778 SN: 10244 SN: 103245 SN: 2013	Cal Dete (Certificate No.) 08-Apr-18 (No. 217-0267202873) 08-Apr-16 (No. 217-02672) 08-Apr-16 (No. 217-02673) 08-Apr-18 (No. 217-02673) 30-Dete-17 (No. ES3-3013_Det=17) 21-Dete-17 (No. CAE4-660_Det=17)	Scheduled Calibration Apr-16 Apr-19 Apr-19 Apr-19 Apr-19 Dec-18 Dec-18
Calidration Explorment used (M Pennery Standards Powers medice NRP Powers sensor NRP-281 Power sensor NRP-281 Reference 20 dB Attenuator Reference 20 dB Attenuator Reference Probe ES30/2 DAE4 Secondary Standarda	ID SN: 104778 SN: 104778 SN: 103244 SN: 103245 SN: 55277 (20x) SN: 55277 (20x) SN: 560	Cal Deta (Certificate No.) 06-Apr-18 (No. 217-0267202673) Di-Apr-18 (No. 217-02672) Di-Apr-18 (No. 217-02672) Di-Apr-18 (No. 217-02673) Di-Apr-18 (No. 237-02682) 30-Dec-17 (No. ES3-3013, Dec17) 21-Dixo-17 (No. CAE4-660, Dec17) Check Date (in house)	Scheduled Calibration Apr-16 Apr-19 Apr-19 Apr-19 Dec-18 Dec-18 Dec-18 Scheduled Check
Saidealion Espigment used (M Primary Standards Noves maker NRP Power sensor NRP-281 Area sensor NRP-281 Reference 20 dB Attenuator Reference 20 dB Attenues Reference 20 dB	ID SN: 104778 SN: 104778 SN: 103244 SN: 103245 SN: 55277 (20x) SN: 55277 SN: 560 ID	Cal Dete (Certificate No.) 08-Apr-18 (No. 217-0267202873) 08-Apr-16 (No. 217-02672) 08-Apr-16 (No. 217-02673) 08-Apr-18 (No. 217-02673) 30-Dete-17 (No. ES3-3013_Det=17) 21-Dete-17 (No. CAE4-660_Det=17)	Scheduled Calibration Apr-18 Apr-19 Apr-19 Apr-19 Dec-18 Dec-18 Dec-18 Scheduled Check In house check: Jun-20
Saidralion Espigment used (M Pernery Standards Perves meter NRP Power sensor NRP-281 Power sensor NRP-281 Reference 20 dB Attentiator Reference Probe ES3CV2 DAE1 Secondary Standards Preser sarear E44138 Power sarear E44138	ID SN: 104778 SN: 103244 SN: 103245 SN: 35277 (20x) SN: 3513 SN: 560 ID SN: 66041253674	Cal Data (Dentificate No.) 08-Apr-16 (No. 217-02672)02673) 09-Apr-16 (No. 217-02672) 09-Apr-18 (No. 217-02673) 09-Apr-18 (No. 217-02673) 20-Dec-17 (No. ES3-3013_Dec17) 21-Dec-17 (No. CME4-660_Dec17) Check Date (in house) 06-Apr-16 (in house)	Scheduled Calibration Apr-16 Apr-19 Apr-19 Apr-19 Dec-18 Dec-18 Dec-18 Scheduled Check
Calibration Explorment used (M Permany Standards Power meter NRP Power sensor NRP-281 Power sensor NRP-291 Reference 20 dB Attentiator Reference 20 dB Attentiator Reference Probe ES3CV2 DAE1 Secondary Standards Power meter E44198 Power sensor E4412A	875 or 859 for calibration) ID 5%: 104778 SN: 103244 SN: 103245 SN: 35277 (200) SN: 35013 SN: 560 ID SN: GB41253674 SN: (GB41253674 SN: MY41488087	Cal Dete (Certificate No.) 08-April 6 (No. 217-0267202873) 08-April 6 (No. 217-02672) 04-April 6 (No. 217-02673) 04-April 8 (No. 217-02673) 20-Dec 17 (No. 553-5013, Dec 17) 21-Dec 17 (No. 553-5013, Dec 17) 21-Dec 17 (No. 564-660, Dec 17) Check Date (in house) 06-April 6 (in house) 06-April 6 (in house check Jun-18)	Scheduled Calibration Apr-18 Apr-18 Apr-19 Apr-19 Dec-18 Dec-18 Dec-18 Scheduled Check In house check: Jun-20 In house check: Jun-20
Calibration Explorment used (M Primary Standards Powers moder NRP Powers sensor NRP-291 Power sensor NRP-291 Reference 20 dB Artismator Reference 20 dB Artismator Reference 20 dB Artismator DAE4 Secondary Standards Power sensor E44198 Power sensor E44198 Power sensor E44198 Power sensor E44198	ID SN: 104778 SN: 104778 SN: 103244 SN: 103245 SN: 55277 (20x) SN: 550 ID SN: 560 ID SN: 560 SN: 560 SN: 560 SN: 5041253674 SN: 404148087 SN: 0001(0210)	Call Deta (Certificate No.) 08-Apri-18 (No. 217-0267202873) 09-Apri-16 (No. 217-02672) 09-Apri-16 (No. 217-02673) 09-Apri-18 (No. 217-02673) 09-Apri-18 (No. 217-02673) 20-Dec-17 (No. 553-3013_Dec17) 21-Dec-17 (No. 553-3013_Dec17) 21-Dec-17 (No. 554-660_Dec17) 21-Dec-17 (No. 554-660_Dec17) 21-Dec-17 (No. 554-660_Dec17) 06-Apri-18 (in house) 06-Apri-18 (in house check Jun-18) 06-Apri-18 (in house check Jun-18)	Scheduled Calibration Apr-16 Apr-19 Apr-19 Apr-19 Dec-18 Dec-18 Scheduled Check In house check: Jun-20 In house check: Jun-20 In house check: Jun-20
Calibration Explorment used (M Permany Standards Powers medier NRP Powers remote NRP-281 Power sensor NRP-291 Reference 20 dB Attenuator Reference 20 dB Attenuator Power sensor E44102A Prower sensor E44102A Prower sensor E44102A Reference 44102A Reference 44102A Reference 44102A Reference 44102A Reference 44102A Reference 44102A Reference 44102A	ID SN: 104778 SN: 104778 SN: 103244 SN: 103245 SN: 38277 (20x) SN: 38277 (20x) SN: 360 ID SN: 660 ID SN: 66841283674 SN: MY41485087 SN: 00110210 SN: US842U01700 SN: US841080477 Name	Cal Deta (Certificate No.) 08-Apri-18 (No. 217-02672)02673) 08-Apri-18 (No. 217-02672)02673) 09-Apri-18 (No. 217-02672) 09-Apri-18 (No. 217-02673) 20-Dec-17 (No. ES3-3013_Dec17] 21-Dec-17 (No. ES3-3013_Dec17] 21-Dec-17 (No. ES4-660_Dec17] Check Date (in house) 06-Apri-16 (in house) 06-Apri-16 (in house check Jun-18) 06-Apri-16 (in house check Jun-18) 06-Apri-16 (in house check Jun-18) 06-Apri-19 (in house check Jun-18) 06-Apri-14 (in house check Jun-18) 31-Mari-14 (in house check Cot-18) Function	Scheduled Cationation Apr-16 Apr-19 Apr-19 Apr-19 Dec-18 Dec-18 Dec-18 Scheduled Check In house check: Jun-20 In house check: Jun-20 In house check: Jun-20 In house check: Jun-20
Calibration Explorment used (M Permany Standards Powers medier NRP Powers remote NRP-281 Power sensor NRP-291 Reference 20 dB Attenuator Reference 20 dB Attenuator Power sensor E44102A Prower sensor E44102A Prower sensor E44102A Reference 44102A Reference 44102A Reference 44102A Reference 44102A Reference 44102A Reference 44102A Reference 44102A	ID SN: 104778 SN: 103244 SN: 103245 SN: 35277 (20s) SN: 3513 SN: 360 ID SN: 36041253674 SN: 000110210 SN: 000110210 SN: UBS4/2L/01700 SN: US41090477	Call Dete (Certificate No.) 00-April 8 (No. 217-0267202873) 00-April 8 (No. 217-026720 04-April 8 (No. 217-02672) 04-April 8 (No. 217-02673) 04-April 8 (No. 217-02673) 20-Dec-17 (No. ES3-3013_Dec17) 21-Dec-17 (No. ES3-3013_Dec17) 21-Dec-17 (No. ES3-3013_Dec17) 21-Dec-17 (No. ES3-3013_Dec17) 21-Dec-17 (No. ES3-3013_Dec17) 21-Dec-17 (No. ES3-3013_Dec17) 06-April 8 (In house) 06-April 8 (In house check Jun-18) 06-April 8 (In house check Jun-18) 06-April 9 (In house check Jun-18)	Scheduled Calibration Apr-19 Apr-19 Apr-19 Apr-19 Dec-18 Dec-18 Dec-18 Scheduled Check In house check: Jun-20 In house check: Oct-19
Salbrakon Explorem used (M Permary Standards Power sensor NRP-281 Power sensor NRP-291 Power sensor NRP-291 Reference 20 dB Attentiator Reference 20 dB Attentiator Reference Probe ES3CV2 DAE4 Secondary Blandards Power sensor E4452A Power sensor E4452A Power sensor E4452A Power sensor E4452A Reference 20 dB State Power sensor E4452A Power sensor E4452A Reference 20 dB State Power sensor E4452A Power sensor E4452A Reference 20 dB State Power sensor E4452A Power sensor Power E4452A Power sensor E4452A Po	ID SN: 104778 SN: 104778 SN: 103244 SN: 103245 SN: 38277 (20x) SN: 38277 (20x) SN: 360 ID SN: 660 ID SN: 66841283674 SN: MY41485087 SN: 00110210 SN: US842U01700 SN: US841080477 Name	Cal Deta (Certificate No.) 08-Apri-18 (No. 217-02672)02673) 08-Apri-18 (No. 217-02672)02673) 09-Apri-18 (No. 217-02672) 09-Apri-18 (No. 217-02673) 20-Dec-17 (No. ES3-3013_Dec17] 21-Dec-17 (No. ES3-3013_Dec17] 21-Dec-17 (No. ES4-660_Dec17] Check Date (in house) 06-Apri-16 (in house) 06-Apri-16 (in house check Jun-18) 06-Apri-16 (in house check Jun-18) 06-Apri-16 (in house check Jun-18) 06-Apri-19 (in house check Jun-18) 06-Apri-14 (in house check Jun-18) 31-Mari-14 (in house check Cot-18) Function	Scheduled Calibration Apr-19 Apr-19 Apr-19 Apr-19 Dec-18 Dec-18 Dec-18 Scheduled Check In house check: Jun-20 In house check: Oct-19
Calibration Explorment used (M Permary Standards Power meter NRP Power sector NRP-281 Power sector NRP-291 Reference 20 dB Attentiator Reference 20 dB Atte	875 ortisal for calibration) 10 84: 104778 84: 103244 54: 103245 94: 35277 (20s) 24: 3013 54: 350 35: 550 35: 5	Call Dete (Certificate No.) 08-Apri-16 (No. 217-02672012673) 08-Apri-16 (No. 217-02672) 08-Apri-16 (No. 217-02672) 09-Apri-16 (No. 217-02672) 09-Apri-16 (No. 217-02673) 09-Apri-16 (No. 217-02673) 09-Apri-16 (No. 217-02673) 09-Apri-16 (No. 217-02673) 20-Dec-17 (No. ES3-3013_Dec17) 21-Darc-17 (No. ES3-3013_Dec17) 21-Darc-17 (No. EA84-660_Dec17) Check Date (in house) 06-Apri-16 (in house) 06-Apri-16 (in house check Aun-18) 06-Apri-16 (in house check Aun-18) 06-Apri-18 (in house check Aun-18) 06-Apri-19 (in house check Aun-18) 06-Apri-10 (in house check Aun-18)	Scheduled Calibration Apr-19 Apr-19 Apr-19 Apr-19 Dec-18 Dec-18 Dec-18 Scheduled Check In house check: Jun-20 In house check: Oct-19

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Callbration Laboratory of Schmid & Partner Engineering AG Zeughtusstnasse 43, 8004 Zunch, Switzerland



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Accorditation No.: SCS 0108

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Accounting by the Swiss Accreditation Service (SAS) The Swiss Acconditation Service is one of the signatories to the EA

Multitateral Agreement for the recugnition of calibration certificants

SG

Glossary: TSL NORMK,y.z ConVF	tissue simulating liquid sensitivity in free space sensitivity in TSL / NORMx.y.z
DCP	dictic compression point crest factor (1/duty, cycle) of the RF stone)
A, B, C, D	modulation dependent lineerization parameters
Poisnzation (p	orotation around probe axis
Polonization II	9 relation around an oxis that is in the plane normal to probe axis (6) measurement center), i.e., S = 0 is normal to probe exis.

Connector Angle information used in DASY system to align proce senser X to the robot coordinalin system

Calibration is Performed According to the Following Standards:

- IEEE Str 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Witeless Communications Devices: Measurement
- Techniques: June 2013 IEC 62209-1.1 "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from handb)
- held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016 c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices
- used in close proximity to the human body (finguency range of 30 MHz to 6 GHz)*, March 2010 u) KDB 865684, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Methods Applied and Interpretation of Parameters:

- NORMx,y,z: Assessed for E-field polarization # = 0 (f ≤ 900 MHz in TEN-cell, f = 1800 MHz; R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the E²-field. uncertainty inside TSL (see below ConvF).
- NORM(()x,y,z = NORMx,y,z * frequency_response (see Frequency Response Chart), This linearization is implemented in DASY4 adfeate versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCPx, y, z: DCP are numerical linearization patameters assessed based on the data of power sweep with DW alginal (no uncurtainty required). DCP does not depend on frequency nor monia,
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- Ax, y, z', Bx, y, z', Cx, y, z', Dx, y, z', VRx, y, z', A, B, C, D are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nar-media. VR is the maximum calibration range expressed in RMS voltage across the diade.
- media. While the maximum calibration range expressed in RMS voltage across the diade. ConvF and Boundary Effect Parameters: Assessed in flat phantom using E-field (or Temperature Transfer Standard for f < 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f < 800 MHz. The same octupe are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sametimity in TSL corresponds to NORMX, y, z * ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent GowyF is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz
- Schwinchl isotropy (3D deviation from (solimpy): In a field of low gradients realized using a flat plramom exposed by a patch anterina.
- Sensor Offset: The sensor offset corresponds to the offset of virtual measurement center from the probe to (on probe axis). No tolerance required:
- Connector Angle: The angle is assessed using the information gained by determining the NORMs (no uncertainty required).

Certificate No: EX3-3938_Oct18

Page ≥ ef 39

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EX3DV4 - Sel-serge

Report No. : E5/2018/C0042 Page: 74 of 128

Chiefer 24, 2816

Probe EX3DV4

SN:3938

Manufactured: Calibrated:

May 2, 2013 October 24, 2018

Calibrated for DASY/EASY Systems (Note: non-compatible with DASY2 system!)

Certificate No: EK3 3508, Done

Pege 3 (# 30

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EX30V4-SN 3808

Optaber 24, 2018

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3938

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm [µV/(V/m) ²) ⁶	0.51	0.57	0.33	± 10.7 %
DCP (mV) ^E	103.2	100.5	107.8	2 16-1 10

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dBõV	c	D dB	VR mV	Unc ^e (k=2)
0	CW	X	0.0	0,0	1.0	0.00	164.0	±3:5 N
		- Y	0.0	0.0	1.0		1742	-
		Z	0.0	0.0	1.0		176.3	

Note: For details on UID parameters see Appendix.

Sensor Model Parameters

	G1 fF	C2 IF	a V 1	T1 ms.V-2	T2 ms.V ⁻¹	T3 ms	T4 V1	75 V"	Tê
X	59.09	436.9	35.15	26.09	1.205	5,10	1.012	0.575	1.009
¥	53.22	40B.3	37.24	24.25	1.457	5.10	0.000	0.766	1.013
Z	46.65	332.5	32.92	15.26	1.153	4.98	2.000	0.225	1.005

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%

The uncertainties of Norm X,Y,Z an installed the E¹-faint uncertainty minute TSL (see Pages 5 and 6)

* Numerical insurtation parameters interceives the containing and a TSL (and Pages 5 and 6) * Numerical insurtation parameters interceiving no required. * Numerically is determined using the mail dentation from insuronal implying michinguing dents from and is expressed for the square of the field value.

Certificate No: Ex3-3938 Oct18

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EX3DV4~EN:3938

October 24 (2017)

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3938

t (MHz) ^G	Relative Permittivity	Conductivity (S(m)	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^a (mm)	Une (k=2)
750	41.9	0.89	9.82	9.82	9,62	0.45	0.80	± 12.0 %
835	41,5	0.90	9.50	9.50	9.50	0.50	0.85	± 12.0 %
900	41,5	0.97	9.25	9.25	9.25	0.33	1.04	+120%
1450	40.5	1.20	8.53	8.53	8,53	0.30	0,88	± 12.0 %
1750	40:1	1.37	8.32	8.32	8.32	0.36	0,90	± 12.0 %
1900	40.0	1.40	7.95	7.95	7 95	0.29	0,90	± 12.0 %
2000	40.0	1.40	7.93	7.93	7:93	0.36	0.80	± 12.0 %
2300	39.5	1.67	7.69	7.59	7.53	0.37	0.80	112.0 %
2450	39.2	1.80	7.17	7,17	7:17	0.39	0.83	±12.0 %
2600	39.0	1.96	7.11	7.11	7.11	0.38	0.87	± 12.0 %
5250	35.9	4.71	5.00	5.00	5.00	0.40	1.80	£ 13.1 %
5600	35.5	6.07	4.65	4.65	4.65	0,40	1.80	± 13,1 %
5750	35.4	6.22	4.76	4.76	4.76	0,40	1.80	±13.1 %

Calibration Parameter Determined in Head Tissue Simulating Media

¹² Findumicy which where 300 MHz of ± 100 MHz andy applies the DASY v4.4 and tigher (see Page 2), tiss h is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvE uncertainty at calibration frequency and the uncertainty for the missing Hardware bench. The uncertainty is the RSS of the ConvE uncertainty at calibration frequency and the uncertainty for the missing Hardware bench. The uncertainty will be available of the ConvE assessments in 10, 64, 120, 150 and 220 MHz respectively. Above 5 GHz the equivalence values will be available of the ConvE assessments in 10, 64, 120, 150 and 220 MHz respectively. Above 5 GHz the equivalence values will be available of ± 150 MHz.
¹⁴ A transmission of the convE assessments is an in converting to the respectively. Above 5 GHz the equivalence is a split of the convE assessments in 10, 64, 120, 150 and 220 MHz respectively. Above 5 GHz the equivalence is a split of the converting to matching the time to the ConvE assessments is a split of the converting to middle table parameters.
¹⁴ An dependent back and to 5 the the uncertainty of the split of the converting to matching the table of a split and backet is a split of the uncertainty of the uncertainty of the uncertainty of the uncertainty is a split of the uncertainty of the uncertainty is a split of the uncertainty of the uncertainty of the table parameters.
¹⁵ April Depth and datamined during calibration. SPEAG vertaints that the emploring deviation due to the backet of the table of the table parameters and the table of table of the table of table

Certificate No: EX3-3938_Oct18-

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Report No. : E5/2018/C0042 Page: 77 of 128



EX30V4- SN:3935

Octobes 24, 2018

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3938

F(MHz) ¹²	Relative Permittivity	Conductivity (S/m)	ConvF X	ConvF Y	Contel	Alpha ⁰	Depth ^{is} (mm)	Une (k=2)
750	55.5	0,96	9.72	9.72	9.72	0,46	0.87	± 12.0 %
835	55.2	0.97	9.56	9.56	8.55	0.41	0.92	± 12.0 %
000	55.0	1.05	9.33	9.33	9.33	0.48	0.87	±12.0 %
1450	54.0	1,30	7.98	7,98	7.98	0.32	0.90	± 12.0 %
1750	53.4	1.49	7.83	7.83	7.83	0.43	0.90	+ 12.0 %
1900	53.3	1.52	7.52	7.52	7.52	0.33	0.95	± 12.0 %
2000	53.3	1.52	7.62	7,62	7.82	0.36	0,89	= 12.0 %
2300	52.9	1.81	7.35	7.33	7.33	0.42	11.87	= 12.0 %
2450	52.7	1,95	7.30	7.30	7.30	0.35	0.87	= 12.0 %
2600	52.5	2.16	7.15	7.15	7.16	0.33	0.95	± 12.0 %
5250	48,9	5,36	4.23	4.23	4,23	0.50	1.90	± 13.1 %
5800	48.5	5.77	3.77	3.77	3.77	0.50	1.90	±13.1%
6800	48.2	6.00	4.00	4.00	4.00	0.50	1.90	± 13.1 %

Calibration Parameter Determined In Body Tissue Simulating Media

⁶ Finguency validity dopie 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (sur Page 2), etc. It is instructed to ± 30 MHz. The anomality is the RSS of the ConvE undertainty at unitivation (inspective) and the uncertainty is the resoluted flocausity band. Finguency wanty balax 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvE assessments ± 30, 64, 128, 150 and 220 MHz respectively. None 6 GHz theorem yieldly can be evidended to ± 110 MHz. The enclosed flocausity band. Finguency wanty balax 50, 64, 128, 150 and 220 MHz respectively. None 6 GHz theorem yieldly can be evidended to ± 110 MHz. The enclosed flocausity band. Finguency wanty balax 50, 64, 128, 150 and 220 MHz respectively. None 6 GHz theorem yieldly can be evidended to ± 110 MHz. The enclosed flocausity is the respectively. None 6 GHz theorem yieldly can be evidended to ± 110 MHz to ± 110 MHz. The enclosed flocausity is the respectively. The enclosed to ± 100 Hz the witchly of issue parameters (cancel to ± 10% Hz theorem yieldly cancel to ± 10% Hz theorem yieldly cancel to ± 10% Hz theorem yieldly cancel to ± 5%. The enclosed to ± 100 Hz theorem yieldly cancel to ± 10% Hz theorem yieldly cancel to ± 5%. The enclosed to ± 10% Hz theorem yieldly of issue parameters (theorem yieldly theorem yieldly theorem

Earthcath No. EX2 3935_Oct18

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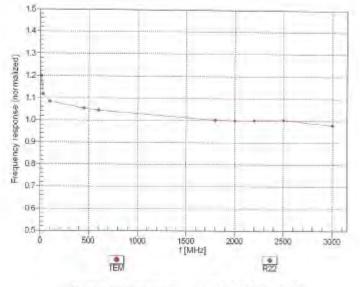


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EX3DV4- SN 3938

October 24, 2019

Frequency Response of E-Field (TEM-Cell;ifi110 EXX, Waveguide: R22)



Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Gertificate No: EX3-3938_Oct18

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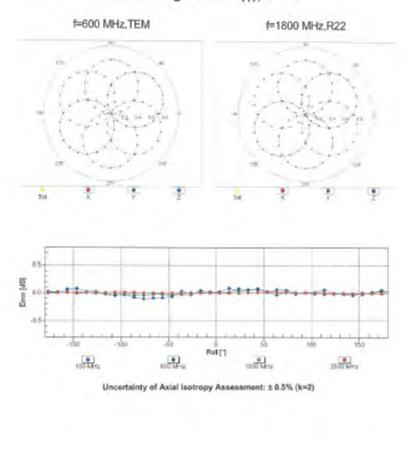
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EX3DV4-SN:3938

October 24, 2018



Receiving Pattern (\$), 9 = 0°

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EX3DV4- 5N 3938

October 24, 2018

Dynamic Range f(SAR_{head}) (TEM cell , feval[#] 1900 MHz) 10 Input Signal [M/] 10 10 10 109 10 10-1 10² SAR (mW/cm3) 10 not comper ۰ sated aled Error [dB] 6 -2 10-10: 102 in 10 SAR [mW/cm3] . * net ce Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Cartificate No: EX3-3938_Oci18

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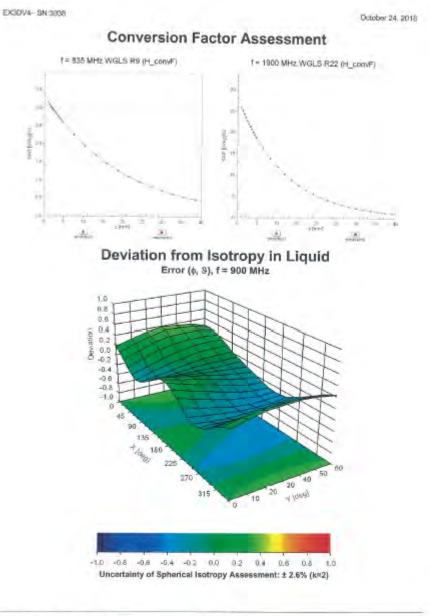
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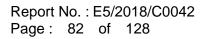
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EX30V4--SN:3838

Octoher 24, 2018

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3938

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (*)	-26.4
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	.337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diamater	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recomminided Massurement Distance from Surface	1.4 mm

Certificate No: EX3-3935_Oct18

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EX3DV4-SN:3935

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October 24, 2018
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UID	Communication System Name		A dB	B dBõV	c	D tfB	VR mV	Max Unc [*] (k=Z)
0	CW	X	0.00	0.00	1.00	0.00	164.0	± 3.5 %
	1	Y	0.00	0.00	1.00		174,2	
		Z	0.00	0.00	1.00		176.3	
10010- CAA	SAR Validation (Square, 100ms, 10ms)	x	11.84	84.28	19.03	10.00	20.0	19.6%
		Y	475	72.52	14.55		20.0	1.
		7	2.70	65.86	10.62		20.0	
10011- CAB	UMTS-FED (WCDMA)	×	1,25	71.04	17.46	0.00	150,0	196%
		Y	0.87	85.19	13,50		150.0	_
	the second	Z	1 10	89.84	16.56		150.0	
10012- CÁB	EEE 802,11b WIFI 2.4 GHz (DSSS, 1 W6ps)	x	1.29	65.77	16.62	0,43	150.0	3.9.6 %
10 million		Y.	1.13	63,57	14.74	1	150.0	
		Z	1.17	64.77	15.66		180.0	
10013- CAB	IEEE 802.11g WIFI 2.4 GHz (DSSS- OFDM, 6 Mbps)	X	5.06	87.01	17.40	1,46	150.0	±9.6%
-		Y	4.93	66,63	17.09		150.0	
		Ż	4,79	66.72	16.84		150.0	
10021- DAC	GBM-FOD (TDMA, GMSK)	×	109.00	118.51	30,68	9,39	50,0	19.8.%
		Y	100.00	117.47	30.14		50.0	_
-	AND REAL TODAY OF THE WAY OF	Z	9,68	81.65	18.25	0.00	50.0	1 N 10 11
10023- DAC	OPRS-FDD (TDMA, GMSK, TN 0)	×	100.00	118,45	30.70	9.57	50.0	± 9.6 %
		Y.	100.00	117.42	30.17		0.00	
		Z	8.28	79.56	17.55		50.0	
10024- DAC	GPRS-FDD (TDMA, GMSK, TN 0-1)	×	100.00	116.27	28.62	6,56	60.0	± 9,6 %
		Y	100.00	113.88	27.38		60.0	
		Z	17.36	88.43	18.89		60.0	
10025- DAC	EDGE-FDD (TDMA, IIPSK, TN U	x	14.85	105,19	41,18	12.57	50.0	# B.6%
1.1		Ŷ	0.09	80.06	30.32		50.0	
	and the second s	Z	5,13	73.32	26.13		50.0	
10026- DAC	EDGE-FDD (TDMA, 6PSK, TN 0-1)	×	28.61	116.31	40.38	9.56	60/0	4.0.6 %
		Ŷ.	17.18	103.12	35.82	_	60.0 60.0	
Tenne	manual states and a state and a state	Z	10.76	92.22	31.22	3.00	80.0	#9.8 %
10027- DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2)	X	100,00	116.23	27.82	4,80	80.0	2 9.6 %
_		Y Z	100.00	112.20	25.80	-	BOO	
10028- DAC	BPRS-FDD (TDMA, GMSK, TN 0-1-2-3)	X	100.00	117.56	27.68	3.55	100.0	±9.8 %
UNG		8	100.00	111.19	24.62	-	100.0	-
		12	100,00	105.05	21.28	-	100.0	
10029-	EDGE-FDD (TDMA, BPSK, TN 0-1-2)	X	14.44	99.44	33.73	7.80	80.0	19.6%
DAC	meaner medicani si steri (A.o. cel	Y	10.38	91,48	30.62	1050	80.0	
-		2	6.98	83.31	26.90	-	0.06	-
10030- CAA	IEEE 802.15.1 Bluesonth (GFSK, DH1)	8	100.00	115.12	27.62	5,30	70,0	18.6%
		Y	100.00	111.80	25.93		70.0	
	and the second second second	Z	13 15	85.08	t7.21		70.0	
10031- CAA	IEEE 802.15.1 Bluelooltr (GFSK, DH3)	X	100.00	120.41	27.44	1.88	100.0	± 9.6 %
	-	Y	100.00	105.85	20.53		100.0	
-		Z	100.00	102.30	18.53		100.0	1

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10032	IEEE 802:15 1 Bluetooth (CESK, DH5)	T X	100.00	129.17	29.93	1.17	100.0	100.0
CA4		1			1.22			1.000
_		N.	100.00	101.34	18.13	-	100-0	-
10033-	WER and it's thought the stand fighters	Ž	103.00	104.25	18.92	1.00	100.0	-
CAA	IEEE 802.15.1 Bluebath (PI4-DQPSK. DH1)	×	100.00	128.01	35,11	5.30	70,0	19.6 W
		Y	30.25	106.06	28.70		70.0	-
10034-	IEEE 802 15 1 Bluelooth (FI/4-DOPSK	X	7.06	82.85	20.38		70,0	
CAA	DH3)	1	31.82	111.52	29.61	1.88	100.0	±9.6 %
		Y	1.94	81.70	19,61	-	100,0	
10035-	IEEE 802 15 1 Blueidath (Pt/4-DQPSK	X	3.36	77.14 93.74	17.43		100.0	
CAA	DH6)		2.68			1,17	100,0	2.9.0%
		Y.	2.45	74.38 74.78	16.81		100.0	
10035-	IEEE 802.15.1 Bluexouth (8-DPSK, DH1)	X	100.00	128.23	16.51	F.00	100,0	1000
CAA	incer see (o) (degrad) (d-DPas, DPJ)	1.55	49.55	1 and 1		5.30	70.0	19.0%
-		X		114.02	30.85	-	70.0	
10037-	IEEE BIZ 15 1 Bilelooth (II-DPSK, DH3)	X	8,61	95.86 109.85	21,44 29,14	1.00	70.0	10.00
EAA	Hanne war in i parajoon (propart ona)	1.1				1.88	109.0	± 9.0%
		Y Z	0.63 3.10	80.65	15,28	-	100.0	
10038- CAA	IEEE 802 10 1 Bluniocht (R-DPSK, DH5)	X	0.40	95,18	25,08	1.17	100.0	29.6%
		Y	2.66	74.97	16.94	-	100.0	
		Z	2.52	75.38	16.85	-	100.0	
10039 CAB	CDMA2000 (1xRTT, RC1)	8	2.91	78.68	19.30	0.00	158.0	+96%
		Y	1.40	87.94	13.51	-	150.0	-
	Company of the state of the	Z	2.58	79.60	18.81		150.0	
10042 CAB	IS-54 / IS-136 FOD (TDMA/FDM, PI/4- DQPSK, Halfrate)	×	100.00	114.29	27.89	7.78	50.0	±96%
		V.	100.00	112.24	26.83		50.0	-
	and the second sec	Z	7.08	77.78	15.66		50.0	
10044- CAA	IS-BITEIAITIA-553 FOD (FDMA, FMI	×	0.00	111.10	2.98	0.00	150.0	±9,6 %
		Y	0.12	121.97	13.25	-	150.0	
		Z	0.02	124.98	11.44	-	150.0	
10046- CAA	DECT.(TDD. TDMA/FDM, GFSK, Full Skit 24)	X	100.00	120.31	32.96	13.60	25.0	19,8%
_		Y.	28.80	98.60	27.12	-	25.0	
10045-	BRANK CORD, MARK CONTRACTOR	Z.	6.10	73.04	16.68		25.0	1000
CAA	DECT (TDD, TDMA/FDM, GFSK, Double Silot (12)	X	109.00	118.79	31,99	10.79	40.0	498%
		Ŷ.	42.73	105.35	27.69		40.0	
10058-	TOTTO THE DRI BORNELL & SOLL	7	6.52	75.70	16,44		40.0	Eraca.
GAA.	UMTS-TOD (7D-SCDMA, 1-28 Mops)	x	59.92	116.40	32,89	9,03	50.0	±9.8%
		Y	20.27	96.61	26.81		50.0	
10058-	EDGE-FDO (TOMA BPSK TN 0-1-2-3)	4	8,71	81.48	20.30		- 30.0	-
DAC	ENGC-DOTTOMA BESK, TR (F1/2/3)	X	3.95	90.34	29,75	6.55	100.0	19.6%
-		Y T	7.41	E4.68	27.34		100.0	
10059-	IEEE 802 11b WIFI 2.4 GHz (DSSS, 2	X	5.31	78.46	24.34		100.0	
CAB	Mops)		1.45	68,16	17.83	0.67	118.0.	29.6 ¥
		Y	1.24	65.28	15/64		110,0	
0060-	IEEE 802.11b WIFI 24 GHz (DSSS, 5.5	X	1:24	66,08	15.24	1.00	110.0	
CAB	Albpsi	× V	100.00	136.52	28.86	1,30	110.0	788%
		Z		127.82	31.55		110.0	_
-		1.6	75.11	127/04	31.74		110.0	

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10061-	IEEE 802 110 WIFI 2 4 GH2 (DSSS. 11	X	37.93	122.29	34,76	2,04	110.0	±9.6 K
CAB	Mbps)	Y	7.04	91.70	25.29	1000	110.0	
		2	3.71	82.53	21.92	_		
0062-	IEEE 802 11a/h WIFI 5 GHz (OFDM, 6	X	4.83	66.93	16.78	0.49	110.0	
CAC	Mops)	1.1			1000	0.49	100,0	*95%
		Y	4.68	66.44	16.40	-	100.0	
		Z	4,61	66.82	16.41	-	100,0	
0063- CAC	IEEE 802,11a/h WIFI 5 GH2 (OFDM, 9 Mbps)	x	4,86	87.07	16.91	0.72	100.0	49.8.%
		Y	4.71	66.58	16.52	-	100.0	
		Z	4.62	86.89	16.47	-	100.0	
10064- CAC	IEEE 802.11a/h WIFI 5 GH2 (OFDM, 12 Mops)	×	5.19	67.38	17,15	0.86	100.0	± 9.6 %
		Y.	5.02	86.91	16.79		100.0	
		Z	4.90	67 10	16.66		100.0	
DOE5-	IEEE 802 11a/h WIFI 5 GHz (OFDM, 18 Mbps)	x	5.07	67.37	17.30	1.21	100.0	± 9,8 %
		Y	4.91	66.89	16.94		100.D	
		Z	4.77	66.99	96.73		100.0	
10066- EAC	IEEE 802.11a/n WiFi 5 GHz (OFDM, 24 Mbps)	x	5.11	67.44	17.51	1.46	100.0	±9.6 %
		Y.	4.95	66.98	17.15		100.0	
	the second s	Z	4,78	66.99	16.85	and the second second	100.0	1
10067- CAC	(EEE 802 11a/h WiFI 5 GHz (OFDM, 36 Mbps)	×	5,40	67.52	17.91	2.04	100.0	士贝氏杨
	4.1.1.2	Y.	5.26	67.17	17.62		100.0	
		Z	5.06	67.09	17.23		100.0	
10068- DAC	JEEE 802 11a/h WIFI 5 GHz (OFDM, 48 Mbbs)	X	5,51	67.80	18.25	2.55	100.0	± 9.6 %
	9.1.00	4	5.36	87.48	17.94		100,0	
_		Z	5.11	67.14	17.41		100.0	
10069- CAC	IEEE 802 11a/h WIFI 5 GHz (OFDM, 54 Mbps)	×	5.58	67.69	18.40	2.67	100,0	±9.6%
		Y	5.44	67.37	18.13		100.0	
	Anna const. and 11 col	Z	5.19	67.11	17.58		100.0	
10071- CAB	EEE 802 11g W/FI 2.4 GHz (DSSS/OFDM, 9 Mods)	×	5.17	67.17	17.75	1.99	100.0	29.6%
		Y	5.05	66.81	17.46	-	100,0	
		Z	4.88	66.78	17.09	A 1997 A 1997	100.0	2 4 5 10
10072- CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 12 Mbps)	×	5.21	67.68	18.06	2.30	100,0	±9.6 %
51 PR	Development of the local part	Y	5.08	87.27	17.74		100.0	-
	There are a second and the	Z	4.87	67.11	17.28		100.0	
10073- CAB	(EEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 18 Mbps)	×	5.30	67.92	18.44	2.83	100.0	1985
		Y	5.18	67.55	18:13		100.0	
		Z	4.94	57.26	17.56		100.0	1.00
10074- CAB	IEEE 802.11g WIFI 2.4 GHz (DSSS/OFDM, 24 Mbps)	x	5.29	67,90	18.65	3.30	100.0	+86%
		·Υ	5.19	57.54	18.34		100.0	
	and the second sec	Z	4.93	67.18	17.70	-	100.0	1
10075- CAB	(EEE 802 11g WFI 2.4 GHz (DSSS/OFDM, 36 Mbps)	×	5.40	68.28	19.10	3.82	740.8	7.0 P.W
100		Y.	5.28	67.86	18,77		90.0	-
		Z	4.98	67.33	17.99		90.0	
10076- CAB	IEEE 802.11g WIFI 2.4 GHz (DSSSIOFDM, 48 Mbps)	×	5.38	67,97	19,17	4.15	90.0	19.6%
		Y	5.29	67.64	18.88		90.0	
		Z	5.00	87.13	18,10		90.0	-
10077- CAB	(DSSS/OFDM, 54 Mbps)	×	5.41	68.03	19.26	4,30	90.0	396%
		Y.	5.32	67.72	18.98		90.0	
		Z	5.93	67.21	18.19		30.0	

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10081-	CDMA2000 (1sRTT, RC3)	TX	1.20	70.94	15.87	0.00	1 150.0	19.5%
CAE	South and the first firest	1	Tield	10,94	1.1.07	9,99	150/0	1000
		Y	0.66	63.33	10.59	1	150.0	
		Z	0.97	69.12	14.01		150.0	
10082- CAB	IS-547 IS-138 FDD. (TDMA/FDM, PV4- DQPSK, Fulirato)	×	1,35	61,30	6.54	4.77	80.0	18.6%
_		. 4	1.15	60.10	5.56		80.0	
		Z	0.90	60.00	4.82		80.0	
10090- DAC	GPRS-FDD (TDMA, GMSH, TN 0-4)	×	100.00	116.34	28.67	6.56	60.0	± 9,6 %
		1 Y	100.00	113.98	27.45		60.0	
10097	UMTS-EDD (HSDPA)	Z	16,90	88.08	18.81		0.09	
CAR	Unito FUD (HAUPA)	×	1.98	69,10	16,70	0.00	150.0	19.6%
		Z	1.88	66.14	14.64		\$50.0	
10088-	UMTS-FDD (HSUPA, Subtrast 2)	X	1.92	60.38	16.52	0.00	180.0	-
CAB	UNITE FOD (Haura, autius) 2;	12.	1.94	69.09	18.77	0.00	150,0	198%
		Y		66,08	14,59		150.0	-
100699-	EDGE-FOD (TDMA, 8PSK, TN 0-41	2	1.87	69.33	16.49	0.00	150.0	1 200
DAC	CAULTION (TONIC OF SK. (N 94)	Y	17.22	116.31	40,37	9.56	90.0	±9.6%
		2	10.80	92.24	35.83		60.0	-
10100-	LTE-FOD (SC-FDWA: 100% RB; 20	X	3.51	72.21	31.22	2.00	60.0	
CAE	MHz, QPSK)	Ŷ	2.91	69.12	17.62	0.00	159,0	±96%
		2	8.29	71.84	15,85		150.0	-
10101- CAE	LTE FDD (SC-FDMA, 100% RB, 20 MH2_16-QAM)	X	3.42	68.37	17.33	0.00	150,0 150,0	±96%
	The second second	Y	115	66.88	15.45		200.0	
		Z	3.26	58.19	15.45	-	150.0	
IO107- CAE	LTE-FDD (8C-FDMA, 100% RB, 20 MHz, 64-DAM)	X	3.51	68.25	16.50	0,00	150.0	+96%
		I Y	3.25	55.87	15.57	-	158.0	
		Z	3.35	88.16	18.28		150.0	
10103- GAG	LTE-TOD (SC-FDMA, 100% RB, 20- MHz, OPSK)	×	9.10	80,51	22.32	3.98	85.0	196%
		Y	7.71	77.60	21.05		65.0	
		2	6.72	75.88	19.85		65.0	
-50101 GAG	LTE-TDD (9C-FDMA, 100% RB; 20 MH2_16-QAM)	×	8,36	77.67	22.08	3.98	85/0	+9.6%
		¥.	7.55	75,78	21.18		65.0	
10105-	1 St. state and subject to the state	Z	6.54	73.78	19,84		65.0	
CAG	LTE-TOD (SC-FOMA, 100% RB, 20 MHz, 64-QAM)	×	8.22	77.35	.22.27	3.98	65.0	± 9,8 %
		Y.	7.00	74.28	20,84		65.0	
10108-	I BE EDD ODD STOLEN ADDRESS	Z	8.41	73.36	19.96	_	65.0	
ZAG	LITE-FOD (SC-FDMA, 100% RB, 17 MHz, QPSK)	8	3/17	71.32	17,44	0.00	150,0	±9.6 %
-		Y	2.58	68.37	15.87		150,0	
10103-	L7E-PDD (SG-FDMA, 100% RB, 10	- 2.	2.85	71.00	17,15		180.0	1.00
TAG	MPiz. 16-QAM	.X.	3.09	68,24	16,43	0.00	150.0	±88%
		Y	2.80	66.64	15.30		150.0	
0110-	LTE-FDD (SC-FDMA, 100% RB, 5 MHz	X	2.62	68.15	16.17	-	150.0	
AG	UPSK)	×		70.39	17,18	0.00	150.0	± 9/6 %
		Z	2.08	67.38	15.21		150.0	-
0111-	LTE-FDD (SC-FDMA, 100% RB, 5 MHz.	X	2.83	70.10	16.80	10.00	150.0	
CAG	te-OAN)	Ŷ	2.49	69,15	16,90	11.60	150.0	主要有特
			2.49	67.13	15.44	_	150,0	-
		- Z	211	69.56	16.7E		150.0	

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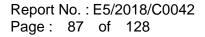
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10112-	LIE-FOO (SC-FDMA, MIDE RE, 10	*	3.20	88.93	16.43	0.00	150.0	主导反系
CAG	MH2, 64-QAMI	v	2.93	80.85	15.39	-	150.0	
_		YZ	3.04	68.13	16.21	-	150.0	-
CAIG	LITE-FOD (SC-FOIMA: 100% RB, 5 MHz	x	2.58	69.16	16.25	a.ab	150.0	1965
-nta	Du-CRAW	Y	8.64	87.31	15.65	-	150.0	-
_		ż	2.87	69.66	16.87		150.0	
0224-	GEE 802 11n (HT Greentield, 13 5	x	5.21	E7 32	16.54	0.00	150.0	1985
IAC	Moos BPSK)				1.110	0.00		1.40.4
		Y	5.08	66.85	16 21		150,0	
		Ź	5,00	67.43	16.43	-	150.0	
10115- TAC	IEEE 802.11n (HT Gronnfield, 81 Mbpc, 16-QAM)	×	5.96	67.00	16.68	0.00	150.0	±9/8 %
		Y	5.42	67.15	16.37		150.0	
11 M	1 Common and a second second second	Z	5:34	67.52	18.48		150.0	1000
10116- CAC	IEEE 802.11/n (HT Divsembeld, 135 Mbps. 64-CIAM)	x	5,33	67.52	16.60	0.00	150.0	# 19/8 G
	1	· Y	5.19	67.09	16.26		150.0	
		- Z	5.15	67.61	16.44	-	150,0	30.0
10117- GAG	IEEE 802 110 (HT Mixed, 13.5 Mbbs, BPSK)	x	5.21	67.33	15.56	0,00	150.0	±9,6 ≤
1.10	1 · · · · · · · · · · · · · · · · · · ·	4	5,06	86,76	16.10		150.0	
		Z	5/03	67.31	15.39		150.0	· · · · · · · · · · · · · · · · · · ·
10116- CAC	(EEE 802 11n (HT Mixed, 81 Mbps: 16- GAM)	×	5.63	67.75	16.76	0.00	150.0	‡9E ≈
		Y	5.50	07.54	15.45		150,0	
		Z	B.44	67.66	15.55		150.0	
10115- DAG	IEEE 802.11n (HT Minud, 135 Mbps, 64- QAM)	X	6,26	67.52	16.58	0,00	150,0	\$9.6 %
	- and	Y	5.16	67.02	16.24		150.0	
	a server of the server of	Z	0.13	87.55	16.43		150.0	
10140- CAE	LTE-FDD (SC-FDMA, (DON) RB, 15 MPIz, 16-QAM)	×	3.55	60.24	16.42	0.00	150.0	±96%
CT-C	and the starting	¥	5.29	60.88	15.49		150.0	
-		Z	1.39	68.15	10.19		150.0	-
10141- CAE	LTE-FDD (5C-FDMA, 100% RB, 15 MHz, 04-QAM)	X	3.66	68,26	11.55	00,0	150.0	20.5%
CANE.	MILL MASADING	Y.	3.42	86.98	15.00	-	tablo	-
		Ż	3.52	88.25	16.36		150.0	
10142- CAE	LTE-FDD (6C-FDMA, 100% RB, 3 MHz, OPSIO	x	2.31	70.61	17.10	10,00	150 0	*96%
GAE	(ursi)	· · ·	1 84	87.11	14.75		150.0	
		3	2.12	70.48	16.85	-	1500	1
10140- CAE	17E-FDD (SC/FDMA, 100% RB, 3 MHz, 36-0AM)	×	211	70.28	16.99	0.00	150.0	49.6%
SHITE:	10 Servini	Y	2.41	37.48	15.00	-	150.0	-
		÷ż-	2.68	70.99	16.78		150.0	
10144- CAE	LTE-FDD (6C-FDMA: 100% RB, 3 MHz, 64-0AM)	X	2.51	67.88	15.37	0.00	150.0	± 9.6 %
LIAE	Decidentif	V	214	85.60	13.59	-	150.0	
		2	2.29	57.85	14 87		150.0	1
10145- CAF	LTE-FDD (SD FDMA, 100% RB, 1.4 MHz, QPSK)	x	1.93	£0.60	15.10	0.00	150,0	主马后,你
and a	The rest set strip	Y	1.11	03.06	10.90		150.0	
		2	133.	67.08	12.73		150.0	
10146- CAF	LTE FOD (SC-FDMA, 100% RE, 1.4 MHz, 16-QAM)	X	4.24	75,06	17.12	0.00	160.0	194%
um.	and the second	Y.	2.48	6E.71	13.45	-	150.0	
_		2	2.38	66.35	12.25	1000	150.0	
10147- DAF	LTE-FDD (SC-FDMA, 100% RB; 1.4 MHz, 64-QAM)	X	6.46	B1.86	19,47	0.00	150.0	19.8 %
MAR	Miller Addressing	Y	3.10	7179	14.97		200.0	-
		Z	3.29	74.21	14.01		160.0	-

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10149=	LIE FOD (SC-FOMA, 50% RB, 20 MHz,	1.8	3,10	68.31	16.47	0.00	1 150.0	± 9.6 %
CAE	18-DAM)	1.11	-activ	00.01	10.47	0.00	150.0	± 9,6 %
		-¥.	2,81	66.69	15,35	-	150.0	
		. Z	2.93	68.23	16,22		150.0	
10150- CAE	LTE-FDD (SC-FDMA: 50% RB, 20 MHz, 84-DAM)	x	3.21	68,18	18,48	0,00	150.0	19.6%
_		·Y	2.94	66.70	15.43		150.0	
		Z	3.05	68,20	16.26		150.0	1
10161- CAG	LTE-TOD (SC-FDMA, 50% RB, 20 MHz. QPSK)	×	10.13	83.77	23.67	3.98	85.0	296%
		Y.	842	80.52	22.26		85.0	
10152-	LTE-TED (SC-FDMA, 50% RB, 20 MH)	Z	6.89	77.61	20.59		65.0	
CAG	16-GAM	×	7.13	79.08	22.05	3,96	65.0	±96%
		Y	6.04	75.91 73.68	20.98		65.0	-
10153	LTE-TED (SC-FDMA, 50% RB, 20 MHz)	X	8.44	78.82	22.75	3.98	65.0	
CAG	64-QAM)	Y	7.56	76.89	1.00	3.98	85.0	19.0%
_			6.48	76.89	21.74		65.0	
10154- CAG	LTE-FDD (BC-FDMA, 50% R8, 10 MHz, OPSK)	X	2.59	70.97	20.30 17.50	0.00	65.0 150.0	± 9.6 %
	30.000	N	2.12	67.77	15:47	-	160.0	-
		Z	2.38	70.74	12:47	-	150.0	-
10155- CAG	LTE-FDB (SC-FDMA, 50% RB, 10 MHz, 16-DAM)	×	2.83	89.15	16.90	0.00	150.0	+9,6 S
		Y	2.49	67.14	15.45		150.0	
	and a second sec	Z	2.71	89.67	16.78	-	160.0	-
10158- CAG	LTE-FDD (SC-FDMA, 50%, RB, 5 MHz, QPSK)	×	2.21	71.19	17.23	0.00	150,0	±96%
1.000		TY	1.68	67.01	14.46		150.0	
1.77.0.0		Z	2.01	71.01	16.65	1	150.0	-
10157- CAG	LTE-FDD (SC-FDMA, 50% RB, 5 MHz 16-QAM)	×	2.40	88.89	15.72	0.00	150,0	1965
		Y.	1.95	65.89	13.48		150.0	
10158-	1 Mr. Bark, 16 or Barriel and Street Street	2	2.19	68.70	14.94		150.0	
GAG	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 54-QAM)	x	2.98	69.22	17.01	0.00	150.0	198%
		1 Y .	2.65	67.36	15.65		150.0	
10159-	LTP Port into Posts pair and a state	2	2.68	69.75	16.93		150.0	
CAG	LTE-FOD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	X	2.54	69.44	16.05	0.00	150.0	±86%
		Y	2.05	86.31	13.77	1	150.0	
10160-	LTE-FOD (SC-FDMA, 50% RB, 18 MHz	2	2.34	69.42	15.34	-	150.0	
CAE	QPGK)	×	2.96	69.71	18.97	0.00	150.0	196%
		Y	2.62	67.67	15.60	-	150.0	-
ID161	LTE-FDO (SC-FDMA, 50% RB, 15 MHz; 16-GAM)	X	3.11	69,58 68,11	16.72 16:44	0.60	150.0	± 8.6 %
-	(acount)	Y	2.85	66.60	15.01	_	1000	
_		Z	2.95	68.19	15.34	-	150.0	
10162- CAE	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 64-OAW)	X	3.21	68.15	16.22	0.00	150.0 150.0	196%
		9	2.94	66.74	15.46		150.0	-
		Z	3.08	68.32	16.32	-	150.0	-
10198- EAF	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, OPSK)	x	4.07	71.03	19.91	3.01	150.0	+9.6%
_		Y	3.79	69.95	19.36		150.0	
124.02	A set order to a local difference	7	3.83	71.36	19.76		100.0	-
10187- CAF	LTE-FOO (SC-FDMA, 58% RE, 1.4 MHz, 18-OAM)	8	5.42	74.80	20.07	3.01	150.0	+0.6%
_		Ŷ	4.77	72.79	19.75		150.0	-
		2	5.29	76.01	20.77	-	150.0	

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10168-	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz,	X	6.05	77.17	21.98	3.01	150.0	± 9.6 %
AF	64-QAM)	Y	5.30	75.09	21.09		150.0	
		Z	6.36	79.86	22.71		150.0	
0169- CAE	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, OPSK)	X	3.85	72.93	20.70	3.01	150.0	± 9.6 %
		Y	3.33	70.15	19.41		150.0	
		Z	3.47	72.51	20.23		150.0	
10170- CAE	LTE-FOD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	×	6.37	81.48	23.72	3.01	150.0	±9.6 %
		Y	4,75	78.10	21.63		150.0	
10171- MAE	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	Z X	7.01 4.87	85.04 75.76	24.72 20.53	3.01	150.0 150.0	±9.6 %
-94E	64-White	Y	3.87	71.72	18.83	-	150.0	
		Z	4.54	76.13	20.23		150.0	
10172- CAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	X	80.41	131.60	39.78	6.02	65.0	± 9.6 %
		Y.	18.51	103.18	32.14		65.0	
		Z	14.22	97.99	29.18		65.0	
10173- CAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 18-QAM)	×	100.00	127.75	36.65	6.02	65.0	±9.6 %
2204		Y	30.31	107.15	31.45		65.0	
10174- CAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	X	25.08 60.73	102.02	28.13 33.35	8.02	65.0 65.0	± 9.6 %
unia.	04-unit)	Y	21.73	99.84	28.80	-	65.0	
		Z	17.08	94.57	25.40	-	65.0	
10175- CAG	LTE-FDD (SC-FDMA, 1 RB, 10 MHz. OPSK)	x	3.78	72.50	20.41	3.01	150.0	± 9.6 %
		Y	3.29	69.80	19.15		150.0	
anar		Z	3.40	71.98	19.88		150.0	
10176- CAG	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	×	6.38	81.51	23.73	3,01	150.0	± 9.6 %
		Y	4.76	76.12	21.65		150.0	
		Z	7.03	85.08	24.74		150.0	
10177- CAL	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	×	3.82	72.71	20.53	3.01	150.0	±9.6 %
		YZ	3.32	69.97 72.23	19.25		150.0	
10178-	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16-	X	6.26	81.12	20.02	3.01	150.0	±9.6%
101/8- CAG	QAM)	Ŷ	4.70	75.86	21.51	3.01	150.0	10.0.%
		Z	6.85	84.54	24.51		150.0	
10179- CAG	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	X	5.53	78.38	21.95	3.01	150.0	± 9.6 %
		Y	4.28	73.73	20.08		150.0	
		Z	5,53	80.03	22.20		150.0	
10180- CAG	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 64- QAM)	X	4.85	75.63	20.45	3.01	150.0	± 9.6 %
		Y	3.85	71.63	18.78		150.0	
100000		Z	4.51	75.97	20.14 20.52	5.01	150.0	+95%
10181- CAE	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	×	3.82	72.60	20.52	3.01	150.0	± 9.6 %
		YZ	3.31 3.44	69.95 72.20	20.01		150.0	
10182- CAE	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	X	6.25	81.00	23.54	3.01	150.0	±9.6 %
tert the	in our setter	Y	4.70	75.84	21.50		150.0	
		Z	6.83	84.50	24.49		150.0	
10183- AAD	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	×	4.84	75.60	20.44	3.01	150.0	±9.6%
		Y	3.85	71,61	18.77		150.0	
		Z	4.50	75.94	20.13		150.0	

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10184- GAE	LTE-FOD (SC-FDMA, 1 RE.3 MHz, QPSK)	8	3.83	72.74	20.54	3.01	150.0	19.6%
Ser au	Sar any	Y	3.32	70.00	19.27	-	150.0	-
		Z	3.45	72.28	20.04		150.0	-
CAE	LTE-FDD (SIC-FDMA, 1 RB, 3 MHz, 16- QAM)	x	6.29	81.18	23.59	3.01	150.0	±8,6 %
_		Y	4.72	75.91	21.53	-	150.0	-
	and the second sec	Z	5.88	84.63	24.55		150.0	
10106- AAE	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 64- QAM)	x	4.86	75.68	20.48	3.01	150.0	2.9.6 %
_		Y	3.87	71.68	18.80	-	150.0	
10187-		Z	4.53	75.04	20.17		150.0	
CAF	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz. QPSK)	×	3.84	72.79	20.60	3.01	100.0	19.6 5
_			3,33	70.05	19.38		150.0	i
10188.	LTE-FOD (SC-FOMA, 1 RB, 1.4 MHz,	Z	3.46	72.24	20.11		160.0	-
IZAF	16-OAM)	×	6.59	82.17	24,08	3.01	150.0	#96%
-		Y	4.88	76.63	21.93		150,0	
10.189 AAF	LTE-FOD (SC-FOWAL 1 RB, 1.4 MHz, 54-QAM)	X	7.44	86.21 76.28	25.23 20.81	3.01	150.0	±96%
	and sacond	Y	3.96	72.12	40.00	-	1000	-
-		2	4,72	72.12	19.08	-	150.0	-
10193- GAC	IEEE B02 11n (HT Greenfield, 6.5 Mbps. BPSK)	X	4.64	66.78	16.35	0.00	150.0 150.0	196%
GAL	drany	Y	4.48	66.72	15.91		150.0	1.1.1
	The second se	Z	4.48	66.93	15.91		150.0	
10194- CAC	IESE 802 11n (HT Greenfield 39 Mops: 16-QAM)	X	4.84	67.15	16,19	0.00	150.0	49.6%
_		8	4.66	66 55	15.03		160.0	
		Z	4.65	67.23	16.31		160.0	-
10195- CAC	IEEE 802 11n (H7 Grounbeld, 55 Mbps, 64-QAM)	X	4.88	67.16	16.47	0,00	150,0	全电后 弊
		Y	470	66.58	16.05	-	150.0	-
_	1	2	4.69	87.26	16.32		150.0	
10191 CAC	IEEE 802 11n (HT Mixed, 6.5 Mbps, BPSK)	x	4.66	88.88	15.38	0.00	150.0	主题后指
_		Y	4.49	66.29	15.93		150.0	
and allow		Z	4.48	66.99	16.21	1.000	150.0	
DAC	EEE 802 11n (HT Mood 39 Mbps. 16- GAM)	x	4,85	67.17	16.47	0.00	150.0	± 9.6 %
		N.	4,67	66,56	16.04		150.0	
10198-	IFFE BOT IT- OF LA-SI OF LE	Z	4.86	67.25	16.32	-	150.0	
CAC	IEEE 802.11n (HT Mised, 86 Mbps, 64- QAMI	×	4.89	67 18	16.48	0.00	150,0	±9.6 %
-		Y	4.70	66,60	16.06		150.0	-
10219i	IEEE 802.11n (HT Mixed, 7.2 Mbps, BPSK)	Z X	4.81	67.27 66.90	18.33 18,35	0,db	150.0 150.0	± 9.6 %
		¥	4.43	66.30	15.89	-	100.0	
		2	4.40	67,01	16.10		150,0	
10220- CAC	EEE 802.11n (HT Maxed 43.3 Mopt, 16- GAM)	×	4,86	67,15	16.10	0.00	100.0 150.0	±9.5%
_		Y	4.67	66.55	16.04		150.0	
(nou)		Z	4,65	67.22	16.31		150.0	-
0221 3AG	TEEE 802.11n (HT Mixed) 72.2 Mbps, 64- GAM)	x	4.88	67.10	10.46	0.00	150.0	主题电影
-		Y]	4.71	66.53	16.05		160.0	
0222-	International Conception of Conception	Z	4.70	67.20	18.31		150.0	1.00
0222- SAC	IEEE 802.11n (HT Mixed, 15 Mbps) BPSK)	×	5,19	87.35	16.57	0.00	150.0	10.6 %
_		Y	5.03	06,77	18.1#	1	150.0	
		Z	5.01	67.33	16.30		150.0	-

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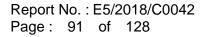
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10223- GAC	IEEE 802 11n (HT Mixed, 90 Mbbs, 16- QAM)	X	5,54	67.61	16.71	0.00	150.0	1 8.0 %
Lar year	Sacrini)	Y.	0.35	66.99	16.32		150.0	-
		Z	5.29	67.45	16.47		150.0	-
10224- CAC	JEEE 802 11n (HT Make: 150 Maps, 64- DAM)	x	5.24	67,46	16,55	.0.00	150.0	1965
	- C	Y	5.08	66.87	16.16		150.0	
1111	al and a state of the second se	2	5.06	67.45	16.38		150.0	
10225- CAB	UMITS-FDO (HSPA+)	×	2,94	66.61	15,90	0.00	150.0	598%
		¥.	2.72	65.45	14.90		150.0	
		Z	2,80	66.78	15.59		150.0	
10226- CAA	LTE-TDD (SC-FDWA, 1 RB, 1.4 MHz, 16-QAM)	×	100.00	127.97	36.79	6.62	65.0	#9.6 %
		Y	33.01	108.86	32.02	_	65.0	
	TO BE A CONTRACT DAY 1 B FR. T	Z	28.60	104.35	28.88	-	65.0	
30227- CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-GAM)	х	71.84	120.02	34.24	8.02	65.0	390 B
-		Y	27.56	104.08	30,11		65.0	
10228-	LTE-TOD (SC-FDMA, 1 RB, 1.4 MHz,	X	21.67 83.76	.98.19 133.19	26.50 40.33	6.02	65.0 65.0	±9,6 %
CAA	QPSK)	v.	27.23	111.37	34.65		65.0	
		Z	14.92	99.20	29.65		65.0	-
10228- CAC	LTE-TOD (SC-FDMA, 1 RB, 3 MH2, 16- QAM)	X	100.00	127.75	36.66	6.02	65.0	19.0%
-Mr.	Germi	Y	30.45	107.22	31.48		65.0	
		Z	25.36	102.20	28.19		65.0	
10230- DAC	LTE-TOD (SC-FDMA, 1 RB.3 MHz 64- GAM)	x	54.54	118.06	33.66	6.02	65.0	± 9,6 %
	1.00 007	Ŷ	25.67	162,71	29.64		65.0	
		Z	19.55	96.45	25.91	11.00	55.0	
10231- CAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, CPSIO	×	74.78	130.72	39.63	6.02	65.0	296%
		Y	25.26	109.74	34.10		65.0	
	The second second second second	Z	13.84	97.69	29.10		65.0	1
10232- CAF	LTE-TOD (SC-FDMA, 1 RB, 5 MHz, 16- GAM)	x	100.00	127.76	36.66	8.02	65.0	296 W
		Ŷ	30,44	107.22	31.48	-	85.0	
		Z	25.32	102.18	28.18	1 1 C	85.0	Carrow
10233- CAF	LTE-TOD (SC-FDMA, 1 RB, 5 MHz, 54- DAM)	×	64.74	118.10	33.67	8,02	65.0	法自在制
		10	25.00	102.71	29.64		85.0	1
	Second and second second	Z	19.51	96.43	25.91		65.0	1.1.0.0
1023-1- GAF	LTE-TOD (SC-FDMA, 1 RE, 5 MHz GPSK)	x	68.79	128.16	38.87	8.02	65.0	± 9,6 %,
-	the same first and the same set of the same se	Y	23.59	108.16	33.53	-	65,0	-
10235-	LTE-TDD (SC-FDMA, 1 RE, 10 MHz, 19-QAM)	X	12.92	98.23	28.52 36.66	6.02	65.0	196%
CAF	(ursenid)	Y	30.53	107.29	31.50		65.0	
		2	25.37	102.23	28.19	1	65.0	
10238- CAF	LTE-TDD (SC-FDMA, 1 RB, (0 MHz, 84-QAM)	X	65.78	118.34	33.73	0.02	05.0	±9.6\$
		Y	25.93	102.87	29,68	-	65.D	
		Ż	19.72	96.57	25.94	-	65.0	
10237- CAF	LTE-TOD (SC-FOMA, 1 RB, 10 MHz, OPSK)	х.	78.22	131-13	39 74	6.02	65.0	19.6%
		N.	25.46	109.93	34.16		65.0	-
	I A State of the second s	Z	13.89	97.78	29.12		65.0	1.000
10238- CAF	LTE-TDB (SC-FDMA, 1 RB, 15 MHz, 16-CAM)	×	100.00	127.78	36,66	6.02	65.0	± 9,6 %
r		Y.	30.42	107.23	31.4R	-	65.0	-
		2	25.26	102.15	28.17		65.0	

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1.000	LTE-TOD (SD-FDMA, 1 RB, 15 MHz.	X	64.82	118.13	33.68	6.02	65.0	1.19.6%
CAF	64-CIAM)	Y	25.62	102.71	-			-
		Z	19.45	06.40	29.64		65.0	
10240-	LTE-TDD (SC-FDMA, 1 RB, 15 MHz.	X	75.84	131.04	39.71	6.02	65.0 65.0	
CAF	QPSK)					0.02		± 9.6 %
		Y	25.37	109.88	34.14		65.0	
10241-	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz,	X	12.34	57.74	29.11	2.00	65.0	1000
CAA	16-QAM)	171	1.2.2.1	87.77	28.09	6.98	65,0	±9.8%
		Y	10.07	84,69	26.80		65.0	
18242-	LTE-TOD (SC-FDMA, 50% RB, 1.4 MHz.	Z	9.45	83.27	25.34	a second	85.0	
CAA	64-DANY	x	11.90	66.96	27.68	6.98	65.0	2 3/6 %
		Y.	9.48	82.13	25.70	1	65.0	
10243-	I ST TOP ICA POLIS TOP OF COMMENT	Z	8.88	82.07	24.81		65.0	
10243- CAA	LITE-TOD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	3	9,29	83.62	27.37	6.96	85.0	296%
_		4	7.69	79.19	25,41		65.0	1
		Z	6.90	78.25	24.23	1.11.1	85.0	
CAC	LTE-TOD (SC-FDMA, 50% RB, 3 MHz, 16-0AM)	×	11.62	86.25	22.95	3,96	85.0	± 9.6 %
_		Y.	9.05	81.02	21.07		65.0	1.1
		Z	5.99	74.19	17.01		65.0	
10245- CAC	LTE-TDD (SC-FDMA, 50% R9, 3 MHz 64-GAM)	x	11,21	84.37	22.69	3.98	85.0	19,6 %
		Y	8.74	80.23	20.72	1	85.0	
	the second se	- Z	5.76	73.60	16.72		65.0	
10246- CAC	LTE-TOD (SC-FDMA, 50% RB, 3 MHz, QPSK)	X	13,76	91.33	25.01	3.98	65.0	19.8%
-		Y	8.27	82.50	21.35		85.0	1
	and the second	Z	524	75.79	17.95	-	65.0	-
10247- CAF	LTE-TOD (SC-FDMA, 50%, RB, 5 MHz, 16-QAM)	×	8.45	80.38	21.81	3.98	65.0	19.6 %
		Y	6.57	78.53	19.78	-	86.0	-
	A REPORT OF A R	Z	5.10	72.95	17.62		85.0	-
10248+ CAF	LTE-TOD (SC-FOMA, 50% RE, 5 MHz, 64-QAM)	-8	7.96	79,46	21,43	3.98	65.0	±96%
		Y	6.50	75.86	19.49	-	85.0	
		Z	5.09	72.45	17.30	-	65.0	
10249- CAF	LTE-TOD (SC-FDMA, 50% RB 5 MHz. OPSK)	X	14.67	92.89	20.21	3.90	65,0	195%
		Y	9.72	85.51	23.23		65.0	-
		2	8.59	79.52	20.29	-	65.0	
10250- CAF	LTE-TOD (SC-FDMA, 50% RB, 10 MHz, 15-QAM)	X	8.79	81.74	23.60	3.98	65.0	196%
		19	7.53	78.89	22.19	-	- 65.0	
		ż	6.20	76.62	20.42		65.0	
0251- CAF	LTE-TOD (SC-EDMA, 50% RB, 10 MHz, 54-QAM)	X	8,02	78.77	22.12	3.98	65.0	±9.6 %
		Y	7.01	78.38	20.84		65.0	-
		2	5.03	73.77	19.14		65.0	
0252 DAF	LTE-TOD (SC-FDMA, 50% RB, 10 MHz, DPSK)	×	12.21	89.16	25,66	3.58	65.0	19.6%
		Y	8.34	B4.33	23.86	-	65.0	-
		Z	7.06	60.06	21.46		65.0	
0253- AF	LTE-TDD (SC-FDMA, BO% RB, 15 MHz, 18-DAM)	x	7.75	17.29	21.77	3.98	65.0	± 8,6%
-		Y	6.93	75.28	20.72	-	65.0	
-		Z	5.92	73.10	19.25	-	65.0	
0254- CAF	LTE-TOD (SC-FDMA, 50% RB; 15 MHz, 04-QAW)	×	£.16	78.13	22.42	3,98	65.0	±9.6%
		N	7.34	76.22	21.12	-	85.0	

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10255+	LTE-TDD (BC-FDMA, SOR RE. 15 MHz	× I	0.52	82.96	23.63 1	1.98	65.0	+9.6.%
CAF	QPSK)	101		Cases.	1	4.90	card	1.9/0-3
		Y	10.002	79.93	22.27		65.0	
	The same and a state of the state of the	Z	6.80	17.07	20.60		65,0	
10255- 3AA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-DAM)	8	10.25	82.05	21.18	3 98	-05.0	土田市市
	and the second sec	9	7,42	77.45	18.77		65.0	
	hard a second state of the second	Z	4.37	69.73	14.06		65.0	
0257- 384	LTE-TOD (SC-FOMA, 100%) RB, 1.4 MHz, 64-CAMI	8	11.67	81.35	20.00	3.98	65.0	土日石 %
		¥.	7.07	76.38	13.24		65.0	
	the Desider Text of Desider Street	Z	-4,27	69.13	13.71		65.0	
10258- GAA	LTE-TOD (SC-PDIMA: 100% RB: 1.4 MPD; GPSK)	x	11.24	87 41	23.05	3.98	65.0	1965
_		Y	6.22	77,82	18.86		65,0	
-		Z	1.68	71,16	t5.20		65.0	
0259- CAC	LTE-TDD (SC-FDMA, 100% R8, 3 MHz, 16-DAM)	x	8.37	60,75	22.38	3.98	65.0	186%
		×.	16.95	11:37	20.62	1000	55.0	
	and the second s	Z	5.53	74,09	18.58		65.0	
10260- DAC	LTE-TDD (SC-FDMA, 100% RB 3 MHz 64-DAM)	×	8.81	80.29	22.23	3.98	65,0	196%
-		Y	6.94	27.04	20.51		65.0	
-		2	5.55	73.86	18.49	1.00	65.0	
10261- CAC	LTE-TOD (SC-EDMA_100% R8_3 MHz OPEK)	×	12.47	89,95	25.58	3.98	65.0	主题原辑
_		Y	0.00	84.05	23.10		85.0	
		2	5.47	78.99	20.51	1000	65.0	1.000
10262- LINE	LTE-TOD (SC-FDMA, 100% RB 5 MHz 16-DAM)	X	878	81,69	23.56	3.98	05.0	\$8.G %
	a stranger and stranger	Y	7.52	78.83	22.15		65.0	
	and water of the second and second	Z	6,15	花舫	20.36	10000	65.0	
10263- CAF	LTE-TOD (SC-FDMA: 100% SB, 5 MHz) 64-GAM)	x	6.01	78.76	22.42	3.88	65.0	19.6%
		Y	1.00	76.35	20.65		65.0	
	and the same real sub-sub-	Z.	5.R2	73.75	19.13		65.0	
10264- CAF	LTE-TOD (SC-FDMA, 100%) RB, 5 MHz, OPSK)	*	12.07	88.92	35,56	1.98	650	196%
		· W.	8.25	84.11	23.56		68.0	
		2	7,01	79.85	21.36	1.1.1	65.0	1.000
10266- CAF	LIE-TOD (SC FDMA, 1025 RB 10 MHz, 16-DAM)	X	8.714	78.00	72.05	3.33	95.0	19.0 K
		Y	7.13	75.81	20.07	1.	65.0	
		Ž.	6.04	73.58	19.44		0.63	
10266 CAF	LTE-TOD (SC-FDMA, 1005 RB 10 MHz, 64 GAM)	X,	8.44	79.91	22.74	3.90	65.0	1965
		Y	7.55	76.88	21.73	1	85.0	-
		Z	E.47	74.68	20.29		66.0	
10267- DAF	LTE-TDO (SC-FDAVA: 100% RS 10 MHz QPSK)	×	10.11	82.53	23,66	-3,98	85,0	3089
		¥	百+1	1111 47	22.26		85.0	-
		Z	0.47	77.07	20,67		85,0	
10268- CAF	LTE-TOD (SIGFLING, OUTLINE 15) MHz: 10-DAM)	*	8.39	77.18	22.02	3.95	88.0	202.0
		Y	7.65	75.61	21,20		85.0	
		2	B.70	73.67	18.92	1.00	85.0	1.000
10289- CAF	LITE-TOD (SC-FDMA, 100% RB, 19 MHz; 84-DAW)	×	0.28	76.63	21.88	3.98	85.0	-1 B/0 %
		V	7,58	75.05	21.07	-	65.0	
	Contraction and the second sec	Z	6.67	73,30	19.83		65.0	1000
10270- CAE	LITE-TOD (SC-FOMA, 100% RE: 15 MH2; CIPSK)	×	88.8	79.53	22.20	8.99	95.0	± 9.6 %
		Y	7.84	77.34	21,20		76B (J	
		2	6.74	75.30	10.85	-	95.0	

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150.0] = 8.0	150.0	0.00	15.83	67.00	2.69	8	UMTS FDD (HSUPA Subtest 5, 30PP	10274-
			14.87	85.81	2.47	N.	Rel8.10)	CAB
	150.0		14.67	67.27	2.60	Z		
	150.0	0,00	15.98	70.14	1.83	X	UMTS-FDD (HSUPA, Sublest 5, 3GPP	10275-
150.0 ± 8.0	150.0	6.08	10.30				RelE 4	CAE
150.0	150.0		14.31	66.20	1,44	Y .		
	150.0		16.44	69.74	1,70	Z		
50.0 ±.8,0	50.0	9.03	11.35	66.44	3,83	x	PHS (QPSK)	10277- CAA
50.0	50.0		10.20	64.75	3.47	Y.		_
	50.0	and and a	7.82	62.17	2.62	Z		10278-
	50.0	9.03	23.47	89.25	14,82	×	PHIS (QPSK) BW 884MHz, Rollett 0.5)	CAA.
	50.0	1	18.87	75.00	7.61	9		-
	50.0	1000	13.7B	69.20	4.20	Z	the set of second of the ball of the second second	10279
50.0 298	50.0	5.03	23.56	89.41	14,85	x	PHS (OPSK: BW 884MHz, Rolloff 0.38)	CAA
	50.0		18.99	76.24	7.77	Y Z		
	50.0		13.93	69.44	4.39		CDMA2000, RC1 SO55, FL0 Rate	10290-
	150,0	0.00	17.08	73.72	2.10	×	Summation, RCT Subb, Full Hillin	AAB
	150.0		12.24	65.83	1.20	70		
	150.0	1.000	15.56	72:49	1.79	Z	CDMA2000, RC3, SO55, Full Rate	10291-
	150.0	0.00	15.66	70.51	1 16	×	CONV2000, RG3, SO66, Full Halle	BAN
	150.0	l	10.49	63.17	0.67	Y		
	150.0	-	13.80	68.71	D.04	Z	CDMA2000, RC3, SO32, Full Rate	10292
	150/0	0.00	19.72	78.24	1.93	×	COMP2000, RC3, SO32, FUI Rahi	AAB
	150.0		12.01	65.41	0.76	Y.		
	150.0		18.65	B0.04	2.04	Z	COMA2000, RC3; SO3, Full Rate	11293-
50.0 2.9.6	150.0	0.00	24,62	91.88	4.24	×	Connectube, reco, 503, Full Rine	AAB
50.0	150.0		14.19	63.94	0.99	¥.		-
	150.0	Sec. 1	28.51	110.82	16.88	2	COMADDIM DOL DOD LOD DU AS I	0295-
10.0 ÷0.€	9D.0	9,08	26,50	89,68	12.27	x	CDMA2000, RC1, SOS, 1/8th Rale 25 h.	AAB.
	50.0	1	24.40	85,72	10.64	Y		_
	50.0		20,11	77.74	6.99	Z	LTE-FOD (SC-FOMA, 50% RB 20 MHz	11297-
50.0 ±9,6	150.0	0.00	17.51	¥1.44	3.09	8	CPSK)	AAD
58.0	158.0		15.73	58.47	2.59	Ŷ		
	150.0		17.24	71,14	2.87	Z	LTE-FDD (SC-FDMA, 50% RB, 3 MHz.	0299
50.0 ±9.6	150.0	0,00	16.52	71.15	2.03	x	OPSK)	AD
	150.0		12.91	65.75	1.38	Y		
	150.0		15.26	70.22	1.75	ZX	LTE-FOD (SC-FDMA, 50% FB 3 MHz.	0299
	150.0	0.00	18.36	77,12	4,86	1	16-QAMI	VAD
	150.0	-	15,64	71.60	3.14	Y		
	150.0		15.70	74.00	3/75	2	LTE-FDD (SC-FDMA, 50% RB, 3 MHz,	0300-
	190.0	0.00	14.52	69.66		×.	64-QAM)	AD
	150.0		12.48	88.29	2.26	Y		
	150.0		11.62	06.32	2.17	2	IEEE 802.16e WWAX (29:10, 5ms.	0301-
10,0 ±9,8	50,0	4.17	15.36	86.98	6.32	x	19MH2, DPSK, PUSC)	AA
	50.0		18,11	66.88	0.22	Y		_
	50.0		17.38	65.61	4.67	Z	IEEE 802 16e WIMAX (29:18, 5ms,	0302-
	0.02	4:90	16.93	67.34	5.74	x	10MHz OPSK, PUSC, 3 CTRL ayribols)	AA.
	50.0		18,46	66.87	5,58	Y		
0.0	50.0		18.00	68:25	5.18	Z		_

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-E0E01	IEEE 802.16e WIMAX (31:15, 5ms, 10MHz, 64QAM, PUSC)	x	5.54	67.22	18.91	4.95	50.0	± 9.6 %
		Y	5.37	66.70	18.39		50.0	
		Z	4.93	65.95	17.95		50.0	
0304- AA	IEEE 802.16e WIMAX (29:18, 5ms, 10MHz, 64QAM, PUSC)	х	5.28	66.83	18.25	4.17	50.0	± 9.6 %
		Y	5.10	66.29	17.74		50.0	
		Z	4.73	65.82	17.46		50.0	
0306-	IEEE 802.16e WIMAX (31:15, 10ms,	X	5.67	72.27	22.34	6.02	35.0	±9.6 %
AA	10MHz, 64QAM, PUSC, 15 symbols)			12022	10000		1000	
C.1 V		Y	5.72	72.48	21.90		35.0	
12000		Z	4.66	68.90	20.05	100000	35.0	- X01014
10306- AA	IEEE 802.16s WIMAX (29:18, 10ms, 10MHz, 64QAM, PUSC, 18 symbols)	X	5.47	68.37	20.21	6.02	35.0	±9.6 %
		Y	5.52	69.50	20.64		35.0	
		Z	4.82	67.24	19.32		35.0	
10307- VAA	IEEE 802.16e WIMAX (29:18, 10ms, 10MHz, QPSK, PUSC, 18 symbols)	х	5.58	70.12	21.19	6.02	35.0	±9.6 %
		Y	5.54	70.11	20.79		35.0	
	the second s	Z	4.75	67.57	19.37		35.0	
0308-	IEEE 802.16e WIMAX (29:18, 10ms, 10MHz, 16QAM, PUSC)	X	5,58	70.46	21.39	6,02	35.0	± 9.8 %
	card and the order of the second	Y	5.56	70.49	21.00		35.0	
		Z	4.74	67.84	19.54		35.0	11111
10309- AAA	IEEE 802.16e WIMAX (29:18, 10ms, 10MHz, 16QAM, AMC 2x3, 18 symbols)	X	5.56	68.68	20.38	6.02	35.0	±9,6%
v.v.s.	Total and Total and Total Erson To appropriate	Y	5.61	69.80	20.81		35.0	
		Z	4.87	67.43	19.45		35.0	
0310- AA	IEEE 802.16e WIMAX (29:18, 10ms, 10MHz, QPSK, AMC 2x3, 18 symbols)	X	5.54	69.67	21.04	6.02	35.0	± 9.6 %
<u></u>	TOWER, GROW, HIMO 240, TO Symbolis)	Y	5.51	69.73	20.68		35.0	
		Z	4.78	67.38	19.33		35.0	
0311-	LTE-FDD (9C-FDMA, 100% RB, 15	X	3.47	70.67	17.10	0.00	150.0	±9.5 %
AAD	MHz, QPSK)	- 88.			1000	0.00	150.0	2.5.0 %
		Y	2.93	87.81	15.48			
		Z	3.26	70.40	16.86		150.0	+96%
10313- AAA	DEN 1:3	×	10.55	84.71	20.54	6.99	70.0	±9.6 %
		Y	5.52	75.51	16.93		70.0	-
	100 Street	Z	3.35	69.99	14,11		70.0	
10314- AAA	IDEN 1:6	×	24.93	102.67	28.79	10.00	30.0	±9.6 %
10/02		Y	8.40	84.46	22.81		30.0	
	The second s	Z	4.59	75.67	18.98		30.0	- needer
10315- AAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 96pc duty cycle)	×	1.16	65.40	16.44	0.17	150.0	± 9.6 %
		Y	1.01	63.11	14.44		150.0	
		Z	1.08	64.77	15.73	-	150.0	
10316- AAB	IEEE 802.11g WiFi 2.4 GHz (ERP- OFDM, 6 Mbps, 96pc duty cycle)	X	4.72	66.92	16.53	0.17	150.0	± 9.6 %
Course of	Provide and the second second second second	Y	4.56	66.38	16.12		150.0	
255.017	The second se	Z	4.51	66.86	16.22		150.0	
10317- AAC	IEEE 802.11a WiFi 5 GHz (OFDM, 6 Mbps, 96pc duty cycle)	×	4.72	66.92	16.53	0.17	150.0	±9.6%
		Y.	4,58	66.38	16.12	-	150.0	2
		Z	4.51	66.86	16.22	10.000	150.0	10000
10400- AAD	IEEE 802.11ac WiFi (20MHz, 64-QAM, 99pc duty cycle)	×	4.84	67.20	16.45	0.00	150:0	±9.6 %
		Y	4.66	66.61	16.02		150.0	
		Z	4.63	67.25	16.28		150.0	-
10401- AAD	IEEE 802.11ac WiFi (40MHz, 64-QAM, 99pc duty cycle)	×	5.48	67.20	16.49	0.00	150.0	± 9.6 %
1111		Y	5.35	66.85	16.23		150.0	
		Z	5.28	67.24	16.32		150.0	-

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14172	TEEP BUZ 11ac WIFI (SOMH), 64-QAM.	1.8	6.76	67.76	16.60	0.00	150.0	+ 9,6 9
AD	\$9pc.auty cycle)	-			1	0.00		2.010.1
		Y	5.61	67.21	16.26	-	150.0	-
1403.	CDMA2000 (1xEV-DD, Rev. 0)	Z	2.10	67.70	16.42	12.00	150.0	
AB	GENNERATING (THE Y-DIOL HEY OF	^	2.10	13.12	17.08	0.00	115.0	2 9.6 5
		Y	1.20	65.63	12:24	-	115.0	-
		Z	1.79	72.49	15,56		115.0	
1484- AS	CDMA2000 (1xEV-DD, Rev. A)	×	2:10	73.72	17.06	0.00	115.0	2.9.8.5
_		- ¥.	1.20	65.83	12.24		115.0	
14116-	CDMA2000, RC3, S032, SCH0, Full	Z	1.79	72.49	15.56		115.D	
AEI	Rate	×	100.00	122.19	31,29	0.00	100.0	19.69
		Ŷ	29.24	105.80	27.50	· · · ·	100.0	
M-10-	LTE-TOD (SC-FDMA, 1 RB, 10 MHz	X	100.00	114.73	27.11 30.81	- 10 Bar	100.0	1.000
AF	OPSK, UI. Subframe=2.3.4,7.8,9, Subframe Cotif=4)		300,00	121,00	30,81	3.23	90.0	1963
		Ŷ	100.00	121.88	31.03	-	80.0	
1.0		2	83,71	111.58	25.89		30.0	
415- M	IEEE 802.11b WF(2.4 GHz (DSSS: 1 Mbps, 99pc duty cycle)	×	1,62	63.90	15.54	0.00	150.0	±9.6 %
-		Y	0.5(1	61.92	13.65	1	150.0	
416-	IEEE and the Matrix & old restor	2	0.99	63.88	15.24		150.0	
N4 16-	DEDE 802 11g WIFI 2 4 GHz (ERP OFDM, 8 Mbps, 99pc duty cyce)	×	9,84	66.82	16.39	0.60	150.0	÷9/6 %
		×.	-0.48	66.28	15.97		150.0	
417-	IEEE 802-11a/h WIFI 5 GHz (OFDM: 6	2 ×	-0.48	66.96	16.25	-	150.0	
18	Mbps, 99pc duty cycle)	Ŷ	4.04	66,82	16,39	0,00	150.0	±9.6%
		Z	4,48	66.96	15.97	-	150.0	_
410 VA	GEE 802 11g W/Fi 2.4 GHz (DSSS- OFDM, 6 Maps, 980c 0v/ly cycle, Long prost/bule)	X	4.53	68.97	10,25	0,00	150.0	±26%
		Y	4.47	66.40	15.97		150.0	-
		Z	4.47	97.14	10.29		150.0	
419 W	IEEE 802,11g WIFI 2.4 GHz (DSSS OFDM 6 Minps (29pc duty cycle (Short) greambule)	×	4,65	96.92	16.41	0.00	150.0	± 9.6 %
-		Y.	4.49	66.36	15.96		150.0	
422-	IFFE DOD BOOMER CONTROL	Z. 1	4,49	67.06	16.28		150.0	
422- E	IEEE 802.11/1/HT Greenfield, 7.2 Mbcs- BPSK)	×	4 78	66.82	16.42	0.00	160.0	190%
-		Y	4.51	68.37	16,61	-	1.50.0	
423- B	IEEE 802.11n IHT Greenfield, 43.3 Moos. 16-GAMI	X	4.51 4.98	67,65 67.29	16.28	0.00	150.0 150.0	± 9.8 %
		Y	4,79	88.71	16.13		1000	_
		1 Z	0,77	67.36	16.39		150.0	-
424- B	IEEE 802.11n (HT Greenfield, 72.2. Mbps; 64-QAM)	X	4 89	67.34	16.52	0.00	150.0	8.0 %
-		X	4.70	66.65	16.10		150.0	
100		2	4.69	67.32	16.37		150.0	-
\$20- B	IEEE 802.11n (HT Greenfield, 15 Mbps, BPSK)	*	5,44	-67.47	16.62	0,00	155.0	±9.0 %
-		Y	5.32	67,05	16.33	12	150.0	
426	IEEE GOV 4 to A IF Change Falls for the	Z	6.25	67.48	16.46		150.0	
#20- E	IEBS 802.11n 0-IT Grownfeld, 90 Mbps, 16-QAM)	x	5.45	67,50	16.63	0.00	150.0	1907¥
-		4	5.32	87.06	16.33	1.1.1.1	150.0	
		Z	5.26	67,50	15.45		150.0	-

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10427-	IEEE 802 11n (HT Greenheld, 150 Mpps,	x	5.47	87.62	16.61	00.0	150 0	+98%
AAS .	64-QAMI							
		Y Z	533	67.50	15.31	_	150,0	-
10430-	LTE-FOD (OFDMA, 5 MHz, E-TM-3.1)	X	4.44	70.94	18.65	11.00	150.0	±0.6 %
AAD	LIEP DO (OPDIOCO MILLET M 3.1)	0	14144	10,04	10.00	11109	100.0	02 9 AL 20
		X	4.14	70.00	17.76		150.0	
	and the second sec	Z.	4.53	72.71	19.D4		150.0	
AAD	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1)	x	4,38	67.45	16.50	0.00	100	± 9.6 %
		N.	4,17	05.74	15.93		150.0	
	CAR PROPERTY AND A DECK	Z	4.70	67.00	16.51	10.000	150.0	- 1 Arm 10
10432- AAC	LIE-FDD (OFDMA, 15 MHz, E-TM 21)	8	4.87	87.30	16.51	0.00	150.0	7 0'0 A
		YZ	4.47	68.66	10.03		150.0	-
10433-	LTE FOD (OFDMA, 20 MHz E-TN 3 I)	X	4.90	87.28	16.54	0.00	150.0	1969
AAC	LIETOD (UPDMA, 20 WRS E-1613 1)	Y	4.72	66.69	16.35	0,00	150.0	196.4
		T	4.72	57.36	16.39		150.0	-
10434-	W-CDMA (BS Test Model 1, 84 DPCH)	X	4.58	71.86	18.83	0.00	150.0	+968
AAA	If Send the Line model of A line and	1.0	1.1.1.1.1	1.		- bear	1.	2.75
		Y.	421	70.69	17.07		150.0	
		Z.	4.78	74.00	19.29		150.0	1
10435 AAF	LTE-TOD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subtrame=2.3,4,7.8,9)	×	100.00	120.88	30.73	3.22	80.0	30.6.5
		Y.	100.00	(21.69)	30,95		80.0	
		Z.	66.38	108.66	25.18		80.0	
10447 AAD	LTE-FDD (OFDMA: 5 MHz, E-TM 3.1. Glipping 44%)	×	3,72	67.65	48,90	0.00	150.0	#0,6 %
		YZ	3.44	67.81	15.18	-	150.0	
104411-	LTE-FOD IOFDIMA, 10 MHz, E-TM 3.1	×	4.21	67.23	16.37	0.00	150.0	19.6 %
AAD	Clippin 44%)	1.5		66.50	15.77	4.50	150.0	± 0.0 3
		N.	4.02	67.40	15.77		150.0	
10448-	LTE-FDD (OFDMA) 15 MHz E-TM 3-1	X	4,46	67.14	16.42	0.00	150.0	3.9.6 9
A.M.	Coping 44%)	Y	4.27	66.49	15.91		150.0	
		Z	4.28	67.27	16.26		150.0	
10450-	LTE-FDD (OFDMA, 20 MHz E-TM 3.1	×	4.64	67.06	16.42	0.00	150.0	10.6 3
AAG.	Clipping 44%)	Y	4.47	65.43	15.96		150.0	
_		ż	4.47	67.16	15.26		150.0	-
10451- AAA	W-CDMA (B6 Teal Model 1, 64 DPCH Clipping 44%)	X	3.06	68.00	15,89	0.00	150.0	1969
		· .	3.33	66,69	14.77		150.0	
		Z	3.40	68.00	15,28	1.1.1	150.0	
10458 AAB	IEEE 802.11ac W/F) (168MHz: 64-DAM 99pc duty cycle)	×	8.29	68.08	16.78	0.00	150.0	2981
		Ξ¥.	6.17	67.63	15.50	-	150.0	-
-	10 million man ten ten ten ten	XX	6.11	68.01	16.58	1.25	150.0	10.00
10457- AAA	UMTS-FDD (DC-HSDPA)	1	3.83	66,45	16,13	0.60	150.0	+0.6.9
_		- Y	3.72	64.89 95.80	15.67	-	150.0	-
10458- AAA	CDMA2000 (1sEV-DO, Rev B, 2 carries)	Z X	4.16	70.93	18,07	0.00	150.0	± 9.61
Ада	carrana	Y	3.85	09.00	17.01	-	150.0	
		Z	4.35	73.12	18.40		150.0	
10459-	CDMA2000 (1sEV-DO, Rev. B. 3 califiers)	X	5.20	68.00	18:25	0.00	150.0	+9.64
		W.	5.01	£7.77	17.91		1.50.0	
		7	0.25	09.00	18.70		150 D	-

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19.6%	150.0	0.00	16.83	7277	1.12	X	LIMTS-FOD (WCOMA, AMR)	10460-
				100				AAA
-	150.0	-	13.95	80.44 71.76	0.73	Y		
- 0.0.0	150.0	3.26	18.00	126.43	100.00	X	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz,	10461-
29.63	80.0	3.20	-33,83	120,93	100.00	1	QPSK, UL_Submand=2.3,4,7,8,9)	AAA
	80.0	-	32.93	125.87	100.00	Y		
	80.0	-	27.82	116.03	90.37	Z	the second se	
主要医院	80,0	3.23	25.58	109.88	100.00	X	LTE-TOD (SC-FDNA, 1785, 1.4 MHz, 15-GAM, UL Subframer/2.3.4.7.8.9)	104812- AAA
-	83.0		25.28	109.45	100.00	Y	to a bit of occurate contractor	
	80.0		7.88	50.79	1.10	2	Decomposition and the second second	-
土田市市	30.0	3.23	24.02	108.70	100.00	X	LTE-TOD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM, UL Subframe=2.3.4,7.8.9)	10463- AAA
	80.0		22.03	.98.79	49.13	N	51 Gran (1 51 antihanto-2.5.1 (1.5.5)	
_	30.0	-	7.05	60.00	1.03	2		
±06%	80.0	3.23	32.24	124.44	100,00	X	LTE-TOD (SC-FDMA, 1 RE, 3 MHz. DPSK, UL Subtrame=2.3,4,7,8,9)	10464- AAB
	10.0		11.4 . 14.14	123.71	100.00	4	10-36, DC 30000000-2.0,4, F.C.91	nnp
	80.0 B0.0		23.07	98.94	25.98	2		
= 9.6 %	80.0	3.23	25.30	109.41	100.00	X	LTE-TOD (SC-FDMA, 1 RB, 3 MHz 16-	10460-
cad #	110.4	-unger	40.04	(married	, and and	1.4	EAM, UL Subframe=2.3.4,7,8,0)	AAB
	80.0		24.99	108.89	100.00	9		
	80.0		7.60	60.34	1.05	Z	Line and the second line of the	10456-
698 N	80.0	3.23	23.77	106,17	100.00	×	LTE-TDD (SC-FDMA, 1 RB 3 MHz, 64 QAM, UL Subirame=2(3,4,7,8,9)	AAB.
-	80.0		19.16	87.73	17.42	Y	and the set of the set	1.1
	80.0	- 11 March 1	7.00	60,00	1.03	Z	I want wanted out a second of the second of the	an hore
± 9,8/≋	80.0	3.23	32.33	124.87	100.00	8	LTE-TDD (SC-FDWA, 1 RB, 5 MHz, OPSK, UL Subframe=2,3,4,7,9,9)	10467 5AE
	80.0	1	31.88	123.85	100.00	Y		
	0.06		23.56	102.47	34.96	Z	The second se	
1989	80.0	3.23	25.58	109.58	100,00	x	LTE-TOD (SC-FDMA, T HE 5 MHz 16- QAM, UL Subframe=2,3,4,7,8,9)	TD40E- AAE
	80.0		25.07	109.05	108.00	· Y		_
	80.0	10.000	7.67	60.45	1.06	Z		10000
#98%	80.0	3.23	23.77	106.18	100.00	×	LTE-TOD (SC-FDMA, 1 HB, 5 MHz, 64- GAM, UL Subframe=2.3.4 7.8.9)	10489 AAE
	80.0		19.26	88.11	18.04	Y		
	80.D		7.00	60.00	1.03	Z	- Andrew Andrew Control of the	
±9.6 %	90.0	3.23	32.35	124.71	100.00	8	LTS-TOD (SC-FDMA, 1 RB, 18 MHz OPSK, UL Subframo=2,3,4,7,8,9)	10470- MAE
_	80.0	- 1	31.88	123.98	100.00	N .		
	50.0		23.97	102-56	35.24	2	1 100 100 00 00 1000 0000 0000 00000000	
29.8%	80.0	3,23	25.35	109.53	100.00	x	LTE-TDD (SG #DMA, 1 RB, 10 MHz, 16- GAM, UL Subtramo#2,3,4,7,9,9)	10471- AAE
	80.0		25.04	109.01	100.00	Y		_
	80.0	1	7.64	60.40	1.05	Z	I THE THEFT HAS DESCRIPTION AND ADDRESS	10000
土现在 特	80.0	3,23	23.74	106.13	100,00	*	LTE-TOD (SC-FDMA, 1 RB, 10 MHz, 64- DAM, UL Subframe=2,3,4,7,8,5)	10472- AAE
_	80.0		19,24	00.88	17.90	4		-
	90.0		8.92	60.00	1.02	2	ITT THE ACTIVATION OF THE	10479-
:96%	86.0	3.23	32.34	124.67	100.00	x	LTE-TDO (SC-FDMA, 1 RB, 15 MHz, OPSK, LL Subtramer/2,3,4,7,8,9)	10473
	80.0	1	31,87	123.85	100.00	Y		
	90,9		23:81	102:54	34.67	Z	LAR THE ISS BRAN LARS IN THE	0474
±9.6 %	80,0	3.23	25.35	103.54	100.00	x	UTE-TDD (SC-FDMA, 1 R8, 15 MHz, 16- (DAM, UL Subframe-2,3,4,7,6,9)	MAE
_	80.0		25.04	109.01	100.00	Y		
	0,08	1.000	7.63	60.39	1.05	Z	A REAL PROPERTY AND A REAL	0475
19.6 %	80.0	3,23	23,74	106,14	100.00	×	LTE TOD (SC-FDMA, 1 RB, 15 MHz, 64- GAM, UL Subframe=2 3,4,7,8,9)	NAE
	80.0	-	19.16	67.78	17.52	Y.		_
_	80.0		6,00	60.00	1.03	Z		

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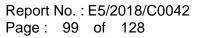
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19877-	LTE-TOD (SO-FDMA, 1 RB 20 MHz 10-	×.	100.00	109.37	25.27	3.22	80.0	± 9.6 %
A.A.F	GAM, UL Subframe<2,3,4,7,8.9)	Y	100.00	*DB B4	24.96	_	80.0	
		1	1.00	80.28	7.55		80.0	
11178- NF	LTE-TOD (SC-FDWA_1 RE, 20 MHz) #4- QAM, UL Subtrame=2,3,4,7,9,9)	8	900,001	708.29	23.12	1.22	80.0	±9,8%
	actual and actual to reflect the test	Y.	17:03	67.46	19.06		80.0	-
	A CONTRACT OF THE PARTY OF THE PARTY OF	Z	1.03	80.00	0.90		BDD	
10479- MA	LTE-TUD (SC-FDMA 50% R8, 1.4 MHz 0PSK, UL Subtrante=2,3,4,7,0,9)	A	-32.A7	108.40	30.35	3.23	80.0	+9.8 M
		÷¥.	23.42	102.56	28.35		80.0	
		E.	8,33	85.84	29.97		BD.G	1.000
10480- AAA	175-TDD (SC-FDMA, 99% RB, 1.4 MHz, 18-GAM, UL Subframe=2,3,4,7,8,9)	x	42.90	105.02	27.50	3.25	80.0	3.9,8 %
		P.,	20,70	94.12	24.14	_	80.0	
and and a		7.	6,08	7674	17.00		80.0	
10491- AAA	LTE-TOD (SC-FOMA 60% RB, 1.4 MHz, 04-OAM, UL Subframe=2,3,4,7,8,9)	×	32.63	100.01	25.80	3.23	80.0	1 0,6 %
		Y	15,67	39.36	22.38	-	80.0	-
10482- AAB	LTE-TOD (SC-FDMA 50% RB, 5 MHz, OPSA, UL Subframe=2.3,4,7,6,9)	X	4,46	72.49 87.38	15.13 23.04	2.23	80.0 \$0.0	10.6%
10425	anon, or approved 2,2,4,7,0,8	Y	3.94	74.35	17.85	-	80.0	
-		2	2.70	70.00	15.33	-	30.0	
10483- AAE	LTE-TOD (SC-FDMA, 50% R8, 3 MHz. 16-CAM, UL Subframe=2.3.4,7.5.9)	*	15.24	00,75	13,81	2.23	80.0	10.6%
		Y.	9.75	83.78	21:08		B0.0	
-		7	387	71.04	15.18		80.0	
10484- AAB	LTE-TDD (SC-FDMA, 50% R9, 3 MH) 64-DAM, UL Subhame=2.3.4,7.6,9)	×	12.87	88.08	23.00	2.23	90.DE	e 0.6 %
	a second second of sources	Y.	8.49	81,59	20,35	Provide State	0,06	
		Z	3.68	70,14	14.84		30.06	
10185- AAE	LTE-TDD ISC-FDMA 50% RB 5 MHz GPSK, UL Suthtame=2,3,4,7,8,9)	×	7.98	25,70	23.26	2.23	80.0	±9.0%
	and the second sec	- W.	4.36	75,94	机低	à	80.0	-
	I have a series of the state of the	2	345	12.55	17.26		BD.O	
10498- AAE	LTE-TDD (SC-FOMA, 50% RB, 5 MHz) 16-DAIA, UL Sabirarre=2,3,4,7,8,9)	8	5.38	76.17	19.55	2.23	80.0	19.8%
_		1	3.78	70.74	16.72	2	EO.O	
	THE REPORT OF THE PROPERTY OF	2	3.08	ES.57	15.26	1.60	80.0	
10407- AAE	LTE-TOD (SC-FDMA, 50% RB, 5 MHz, 64-DAM, UL Subframe=2,3,4,7,6,9)	X	5.22	75.40	19.25	2.23	BOO	± 9:0 %
			3.08	68.23	16.54	-	80.0	
10488- AAE	LTE-TOD (SC-FDIMA, 50% RB, 10 MHz, OPSK, UL Subhame=23.4,7.8,9)	N N	6,58	81.08	22.14	2.23	80.0	±0.6 %
Per-	All are, be obtained to a sort (sets)	Y.	4.49	74.73	19.35	1	80.0	-
		Z	2.06	72.12	17.94	1	80.0	
16489- AAE	LTE-TDD (SC-FDMA, 50% RE, 10 MHz) 16-QAM, UL S60(rame=23,4,7,8,9)	х	4.88	73.47	19,42	2.23	90,0	±9.6%
		Y	4.01	70.32	17,71	(60.0	1
	Same and a second as a second	2	3.48	00.92	16.70		0,08	
10430- AAE	LTE-TDD (SC-FDMA, 50% FB, 10 MHz 64-QAM, UL Skolmmer/2.3,4,7,0,8)	×	1.90	72.95	19.23	2.2.5	90.0	*9.8%
		Y	4,10	70.09	17.64		80.0	-
-	Company in the second	Z	3.0T	88 77	76.66	ank	60.0	1.0.0.0
10491- AAE	LTE-TOD (SC-FDMA, 50% RB, 15 MHz, QPSK, UL Subhamer 2.3.4.7,8.9)	×	5.95	76.95	20.70	2.25	0.09	±9.6 %
		Y	4,52	72.00	18.69	-	0.03	-
LOAD	Last trip (no. shints, and for 15 all all	Z	-1.62	70.84	17.60	2.23	30.0	+8.6%
10482- AAE	LTE-TTID (BC-FDMA, 50% RB, 15 MHz) 16-DAM, UL Subframe=2,3,4,7,8,0)	X	4.21	71,68	17.83	224	0.08	1.0,0 3
_		1 Z	3.83	68.32	18.75	-	-50.0	1
		1. 2.	10.01	00.34	1.007.0		0.06	

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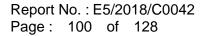
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10493-	LTE-TOD (SC-FDMA SUS RE 15 MHz	X	4.97	71.38	18.79	2.23	80.0	1 :9.6 %
AAE	64-QAM, LL Subframe=2.3,4,T,8,9)				1.000			20.0 9
_		X	4.37	69.24	17.58	1	80.0	
		Z	3.90	68.20	16.76		80.0	The second
10494- AAF	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, DPSK, UL Subhame=2,3,4,7,8,9)	×	6.95	79.86	21.50	2.23	80,0	196
		Y	4.99	74.37	19,18		0.DB	
10495	A REAL PROPERTY AND A REAL PROPERTY AND	Z	4.13	72.26	18.02		80.0	
AAF	LTE-TDD (SC-FDMA, 50% RB, 20 MHz 16-QAM, UL Subframe=2.8.4,7,8,9)	×	5.07	72,39	18.10	2.23	90.0	±969
		Y	4.37	89.87	17-84	_	80.0	-
10496-	LTE-TDD (SC = DMA, 50% RB; 20 MHz.	Ĩ	3.87	88.70	16.98		80.0	
AAF	64-QAM, UL Subframe=2,3,4,7,8,9)	X	5.07	71.80	18.98	2.23	30,0	主要臣务
-		Z	4,43	69.53	17.74	_	0.08	-
10497-	LTE-TOD (SC-FDMA, 100%, RB, 1.4	- <u>4</u> X	3.90	68.45	16.92	10.000	80.0	
	MHz OPSK, UL Subframe=2.3,4,7,9,9	Ŷ	_	64.28	21.25	2.23	80.0	1963
		Z	2.76	69.51	14.83	-	80.0	-
10498-	LTE-TDD (SC-FDMA, 100% RB, 1.4	X	4.10	65.26	12.27	2.23	80.0	10.00
AAA	MHz, 16-QAM LL Subframe=2,3,4,7,8,9)	î.	-9.90	lett	15.94	2.23	80.0	#86%
		Y	2.08	63.53	11.20	-	80.0	-
	and the second sec	Z.	1.49	60.84	9.11		80.0	
10499 AAA	1TE-TDD (SC-FDMA, 102% RB, 1.4 MHz, 64-QAM, LT, Stoftsmer-2,3,4,7,6.9)	×	388	73,30	15.38	2,23	80.0	196%
		W.	2.02	62.98	10.80		0.08	-
-	The set of	7	1.45	60,40	8.75	-	80.0	1.
AAB	LTE-TDD (SC FDMA: 100% RB, 3 MHz, QPBK, UL Subframe=2.3,4,7,8,9)	x	6.85	\$2.59	Z2.44	2.23	80.0	+8.6%
		<u>8</u>	4.30	75.01	19.09		0.05	1
shele i		Z	3 32	71.99	17.46		80.0	1.0
10001- AAB	LTE-TOD (SC-FDMA, 100% RB, 3 MHz, 16-QAM, UL Subfinime=2,3,4,7,8,9).	8	5.08	74.80	19.39	2.23	0.08	± 9.6 %
_		Y	3,90	70.59	17.11	-	88.6	
10502-	Lu indiac tout isse in any	2	3.27	68.63	15.87		0.08	
NAB	L1 E-TOD (SC-FOMA, 100% RB, 3 MHz. 84-QAM, U. Subframe=2,3,4,7,8,9)	8	5,08	74.42	19,19	2.23	80.0	±9,6 M
_		Ŷ	3.94	70.38	16.98		80,0	
10503-	LTE-TCD (SC-FDMA, 100% RB 5 MH	Z	3.32	56.58	15.78	-	80.0	1000
AVE .	QPSK. UL Subframe=2.3.4,7,8,9)	X	五47	80.7E	22,03	2.23	80.0	± 5.6 %
		Y 7	4.42	74,51	19.24		20.0	
10604-	LTE-TOD (SC-FDMA, 100% RB 5 MHz	X	3,53	71.90	17.84	-	80,0	-
AAE	15-QAM, UL Subimme=23.47.8.9	X	4.84	73.36	19.37	2.23	20,0	±9.6%
		Z	3.50	70.22	17.65	_	EGII	-
10505- AAE	LTE-TOD (SC FDMA, 100% RB, 5 MHz, 84-QAM, UL Subirame=2.3.4,7 8.9)	X	3,46	68.82 72.84	10.64 19.17	2.23	80.0 80,08	± 8.6 %
-	and a second sec	Y I	4.07	69.98	17.58		80.0	
		2	3.65	68.67	16.80	-	80.0	
10506 MAE	LTE-TDO (SC-FDMA, 109% R8, 10 MHz, OPSK, UL SurVisime=2,3,4,7,8,5)	x	6.87	79.65	21.49	2,23	90.0	1984
		Y	0.94	74.20	19.10	-	80.0	
		Z	4.10	72.10	17.94		80.0	
10507- AAE	LTE TOD (SC-FDMA, 100% RB, 10. MHZ, 16-QAM, UL Subframe=2.3.4 7,6,9)	×	5,05	72.32	19.14	223	80.0	1.8,6 %
_		Y	4.35	68.81	17.80		60.0	
		Z	2.05	68.63	16.94		80.0	

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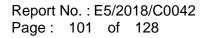
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EX3DV4-- SN:3938

October 24, 2018

10508- AAE	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM, UL Subtrame=2,3,4,7,8,9)	×	5.05	71.72	18.93	2.23	80.0	± 9.6 %
		Y.	4.41	69.46	17.70		80.0	
	States - a difference states - a second states - a second states	Z	3.93	68.38	16.87	20101000	80.0	
10609- VAE	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	×	6.42	76.31	20.23	2.23	80.0	±9.6 %
		Y	5.10	72.45	18.45		80.0	
		Z	4,44	71.04	17.56		80.0	
10510- AAE	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	5.41	71.43	18.82	2.23	80.0	± 9.6 %
	12	Y.	4.81	69.39	17.73		80.0	
	and a second	Z	4.34	68.44	16.99	CHANGE .	80.0	- Second
10511- AAE	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	×	5.40	70.96	18.67	2.23	80.0	± 9.6 %
		Y.	4.84	69.09	17.65		80.0	
		Z	4.39	68.21	16.94		80.0	
10512- AAF	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK, UL Subframe=2.3,4,7,8,9)	x	7,47	79.47	21.24	2.23	80.0	±9.6 %
		Y	5.46	74.25	18.99		80.0	
		Z	4.64	72.47	17.97		80.0	
10513- AAF	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	x	5.39	72.08	19.07	2.23	80.0	±9.6 %
		Y	4.72	69.76	17.86		80.0	
20200	PROPERTY AND A DAMAGE AND AND A DAMAGE AND A DAMAGE AND A DAMAGE AND A DAMAGE AND AND A DAMAGE AND	Z	4.23	68.69	17.07		80.0	in and
10514- AAF	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	x	5 30	71.34	18.83	2.23	80.0	±9.6 %
		Y.	4.71	69.27	17.73		80.0	1
		Z	4.25	68.30	16.97		80.08	
10515- AAA	IEEE 802.11b WIFI 2.4 GHz (DSSS, 2 Mbps, 99pc duty cycle)	X	0.99	64.18	15.67	0.00	150.0	± 9.6 %
1.2.2.2		Y	0.87	62.03	13.65		150.0	
000000	the second second second second second second second	Z	0.96	64.13	15.35	- and	150.0	Sec. 1
10516- AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 99pc duty cycle)	×	1.07	82.62	23.29	0.00	150.0	± 9.6 %
		Y	0.42	66.18	13.67		150.0	
		Z	0.79	78.03	21.08	-	150.0	1
10517- AAA	IEEE 802.11b WIFI 2.4 GHz (DSSS, 11 Mbps, 99pc duty cycle)	×	0.89	67.34	17.01	0.00	150.0	± 9.6 %
		Y	0.70	63,35	13.75		150.0	-
		Z	0.83	66.82	16.43		150.0	-
10518- AAB	IEEE 802.11a/h WIFi 5 GHz (OFDM, 9 Mbps, 99pc duty cycle)	×	4.64	66.90	16.38	0.00	150.0	± 9.6 %
		Y	4,47	66.33	15.94	-	150.0	-
10519-	IEEE 802.11ah WIFi 5 GHz (OFDM, 12	X	4.47	67.04 67.18	16.24 16.51	0.00	150.0	± 9.6 %
AAB	Mbps, 99pc duty cycle)	Y	4.67	66.59	16.08		150.0	
_		1	4.65	67.25	16.34	-	150.0	
10520-	IEEE 802.11a/h WIFI 5 GHz (OFDM, 18	X	4.05	67.17	16.45	0.00	150.0	±9.6 %
AAB	Mbps, 99pc duty cycle)	Ŷ	4.52	66.54	15.99	5.05	150.0	
		Z	4.51	67.23	16.28		150.0	
10521- AAB	IEEE 802.11a/h WIFI 5 GHz (OFDM, 24 Mbps, 99pc duty cycle)	×	4.64	67.19	16.44	0.00	150.0	± 9.6 %
	and the second second	Y	4.45	66.53	15.97		150.0	
		Z	4.44	67.24	16.27		150.0	1.1.1.1.1.1.1
10522- AAB	IEEE 802.11a/h WIFi 5 GHz (OFDM, 36 Mbps, 99pc duty cycle)	×	4.69	67.17	16.48	0.00	150.0	± 9.6 %
AAB		Y	4.51	66.60	16.04		150.0	

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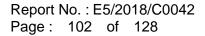
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10523-	IEEE 802 11am WiFi 5 GHz (OFDM, 48	X	4.56	67.08	16.34	0.00	150.0	1 18.6%
A/VB	Mbps, 98pc duty cycle)	0						
		9	4.28	66.45	15.88	-	150.0	_
10524-	IDEE ON STATE HER I STATE CONTRACTOR	2	4.39	67.23	16.22		150.0	
AAE	IEEE 802 11a/n WiFi & GHz (OFDM, 54 Mbps, B8pc duby cycle)	8	4.64	67.13	16.48	0.00	150.0	+9.6 %
		Y.	4.45	66.57	16.01		150.0	de la construcción de la constru
10525-	DETER DED AS INCO	Z	4.44	67.24	16.32	1000	150.0	1
AAE	IEEE 802.11ac WiFi (20MHz, MCS0) USpc outy cycle)	8	4.60	Q6.17	16.06	0.00	150.0	± 9,6 %
_		Y	4.43	65.55	15.60		150.0	
10526-	INTER AND AND ADDRESS ADDRESS ADDRESS ADDRESS	Z	16.64	86.33	15.94		150.0	1
AAE	IEEE 802, 11ao WIFI (20MHz, MCS1, 99pc ibity rycke)	X	4.80	06.57	10.20	0.00	150.0	396.2
-		Y	19.1	85.93	15.75	1	150.0	
10527-	LIFE CONTRACTOR CONTRACTOR	Z	4.61	66.68	16.07		150.0	Sec.2
10527- AAE	IEEE 802.11ac WiFr (20MHz, MCS2, 99pc duty dyon)	X	4.72	66.55	16.16	0.00	150,0	398%
_		Ý	4.52	65.88	15,69	C	150.0	
ADDRESS OF	Press State and Barry State of State	2	4.53	96.66	16.02	1.	1.50.0	
18528- AAB	(EEE 802.11ac WIFI (20MHz, MCS3, 99pc duty cycle)	×	4.73	66,57	16,19	CI.00	150.0	IBAS
		Y	4 54	85.90	16.72		150,0	
-		2	4.55	88.87	16.05		150.0	1
10529- AAB	IEEE 802.11ac VIIFI (20MHz, MCS4, 99bc dudy cycle).	X	4.73	66.57	16.19	0.00	150.0	± 9,6 %
		X	4.54	05.90	15.72		150.0	-
		Z	4.55	66.67	16.05		150.0	
10631- AAB	(EEE 802 11ac WiFi (20MHz, MCS6, 99pc duty cjicks)	×	4.74	66 72	16,22	0.00	150.0	19.6%
		Y	4.53	68.01	15.73	-	150.0	-
in the second	a second s	Z	4.53	66.77	18.00	-	150.0	-
10532+ AAB	IEEE 802.11ac WIFI (20MHz, MCS7, 99pc duty cycle)	8	# 60	66.69	16.17	0.00	156.0	296%
		Y	4.39	65.86	15.68		150.0	
-	- Andrew Contraction of the second se	2	4.40	66.64	16.01		150.0	
AAB	(EEE 802.11ac WiF) (20MHz, MCS8, 99pc duty cycle)	X	4.75	66,60	16.17	0.00	150.0	±9.6 %
		Y	4.55	65.94	15.70	-	150.0	
_	and the second sec	2	4.56	66.73	18.05		150.0	
10634 AAB	IEEE 802 11ac WIFI (40MHz, MCS0, 99bc duty cycle)	×	5.24	66.67	16.21	0.00	150.0	19.6%
_		Y	5,08	66.CS	15.82		150 0	
		Z	5,06	66.70	18.06		150.0	
10535- AAB	IEEE 802 11ac WiFr (40MHz, MCS1, 99pc duty cycle)	X	5,31	06.61	18.26	0.00	150.0	19.8.%
		Y	5.14	66.24	15:89		150.0	-
	A REAL AND A REAL PROPERTY	Z	5.12	86.85	16.13	1.000	150.0	
10536- AAB	IEEE so2.11ec WF7 (40MHz, MCS2, 99pc chily cycle)	×	5.13	66.81	16.25	0.00	150.0	19,8%
	P	Y	5,D1	86.19	15.84		150.0	
	-	2	0.00	96.34	16 11		130.0	
106,37+ AAB	IEEE 802.11ac WiFI (40MHz, MCS3, 99pc duty cycle)	x	5.24	68.77	16.23	0.00	150.0	主動情報
-		Y	5.07	66.17	15.84		150.0	_
A BASE	Terrer Add and Terrer	Z.	5.08	66.79	16.08		150.0	-
AE BAA	IEEE 002.11ac WIFI (40MHz, MCS4) B9pc duty cycle)	X	6.35	66.82	16.29	0,00	150.0	29.6%
_		Y	5.17	86.21	15.90		150.0	
		2	8.14	66.79	16.12		150.0	
0540 AE	IEEE S02 11ac WIFI (40MH); MCSB. 99pc duty cycle)	X	5.25	56,76	16.29	0.00	150.0	±9.6 %
		Y	5.09	66.21	15.91		150.0	-
				A4 14 1481-1			1.00.0	

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10541-	IEEE 802.11ec WIFi (40MHz, MCS7	TXI	5.24	66.69	16.24	0.00	150.0	1.9.8 %
AAB	99pc duty cycle)	Y	5.05	66.05	15.84			
		Z	5.05	66.69	15.84		150.0	
10542-	IEEE 802.11ac.WFI (40MHz, MCS8.	X	5.30	66.72	16.08	0.00	150.0	±9.8%
AAB	99pc duty cycle)	11	0.00	00.12	19,27	0,00	100.0	3-3/0.70
		Y.	5.22	86.16	15.50		150.0	
		Z	5.20	66.74	16:12	10.00	150.0	
10543- AAB	IEEE 802.11ec WIFi (40MHz, MCS9 99pc duty cycle)	x	5.47	66.74	16.29	0.00	150.0	±9,6 %
		Y	5.30	66.21	15.95	_	150.0	
	INTER-DOD ALL DESIGN COMPLEX. DODDOD	Z	5.27	66.76	16.14		150.0	
10544- AA田	IEEE 802.11ec WIFI (80WHz: MCS0, 98pc duty cycle)	X	5.52	66,77	16.19	0.00	150.0	1.8,6 %
		Y	5.38	66.20	15.82		750.0	
10F IF	ICER BOR AL INTER MALINI, AND A	Z	5.37	66.80	16.04	0.00	150.0	
10545- AAB	IEEE 802.11ac WiFi (80WIHz, MCS1 S9pc duty cycle)	X	5.72	67.14	16,31	0.00	150.0	±8,6%
_		Y	5,58	66.63	15.99		150.0	-
10546-	IEEE 802 11ec WIFI (80MHz, MCS2,	Z	5.53 5.61	67.12	16.15	0.00	150.0	±9.8 %
AAB	Separative syste)	*		67,04		0.00	150.0	7.9/0 A
		Y	5.45	66.44	15.91		150.0	
	and the second second second second	Z	5,43	66.99	16.10		150,8	Sec. 1
10547- AAB	IEEE 802.11ec WiFi (80MHz, MCB3, 99pc duty cycle)	x	5.70	67.12	16,31	0.00	150.0	19.6 %
		Y	5.53	66.49	15.92		150,0	
Sec. 10.		Z	5.50	67/02	15.11	-	150.0	
10548- AAB	EEE 802 11ac WFI (89MHz, MC84, 98pc duty cycle)	×	5.93	67.90	16.70	0.00	150.0	± 9.6 %
		Y	5.82	87.53	16.41		150.0	-
		2	5.64	67.E3	46.39		150.0	
10550- AAB	IEEE 802 11ec W/Fi (80MHz, MCB6, 99pc duly cycle)	×	5.63	67.00	16.27	0.00	150.0	± 9.6 %
		· 9	5.47	66.43	15.91		150.0	-
	and the second s	2	5.45	67.00	16.12		150.0	
10551- AAB	IEEE 802,11ac WIFI (80MHz, MCS7, 99pc duty cycle)	x	5,65	67.07	18,26	0,00	150.0	= 9.6 %
	and the second s	1.8	5.48	65.48	15.89		150.0	
		Z	5.46	67.04	18.10	wax.	150.0	
10552- AAB	IEEE 802 11ac WIFI (80MHz, MCS8 98pc duty cycle)	x	5.55	66.66	18.18	D.00	150.0	19.8%
		Y	5,39	66.26	15.80		150,0	-
		Z	5.39	65.89	16.04		150.0	
10553- AAB	IEEE 802 T1ac WIFI (80MHz, MCS9, 99pc duty cycle)	X	5.00	66.91	16.22	0.00	150,0	± 9.6 %
		Y	5.48 5.47	58.32	15.86		150.0	
10554- AAC	IEEE 802 11ac WIFI (100MHz, MCS0,	X	5.92	66.91 67.13	16.07 16.27	0.00	150.0	±9.69
7440	99pc duly cycle)	Y	5.78	68.58	15.93	-	150.0	-
		T	5.77	87.13	16.11	-	150.0	
10555- AAC	IEEE 802 11ac WiFi (160MHz, MCS1, 99oc duty uvde)	x	8.06	67,44	16,39	0.00	158.0	± 8.6 %
		Y	5.92	88 89	16.06	-	150.0	
		- 2	5,88	67.38	18.21	-	150.0	
10006+ AAC	IEEE 502.11ac WIFI (160MHz, MCS2. 99pc duty cycle)	x	6,07	67.47	16,40	0.00.	150,0	18.63
		Ŷ	5,94	66.94	16.07		150.D	
		Z	5.90	67.42	16.23		150.0	dine.
10557- AAC	IEEE 502.11ac WF7 (180MHz, MCS3, 98pc duty cycle)	×	8.08	67.43	16,40	0.00	150.0	29.6 %
		Y.	5.91	68.85	16.05		150.0	
		Z	5.87	67.36	16.22		150.0	

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18.6 %	150.0	- 0.00	16.50	67.60	6.11	X	IEEE BIZ I Las WIFI (180MHz, MCS4,	8000
	19919		10.000	-			99pc duty cycle)	AAC
	150.0	1	16.16	67.02	5,96	γ		
	150.0	100	16.30	67.50	5.91	2		
± 9.6 %	150.0	0,00	16,47	67.48	6.97	x	IEEE 802.11ab WIFI (160MHz. MCS8, 99pt cluby cycle)	10560- AAG
	150,0	1	18,11	66.87	5.95	N.	1.0.2 0.02	
	150.0		16.28	67.38	5.92	1	the second se	
±9.6 %	150.0	0.00	16.48	67.40	8.02	×	IEEE 802.11ab WIFI (160MHz MCS7, \$600 duty gycle)	10661 AAC
_	160.0	_	16:13	EE BA	5.87	8		_
	150.0	1000	15.29	67.33	5.84	Z	IEEE 802, 11sc WIFT (100MHz, MCSS)	10562-
29,0%	150.0	0.00	16.69	67.82	6.16	х	99pin.duty nycke)	AAS
	150.0		16.35	67.26	6.01	26		
	150.0		16.44	67.63	5.03	2	IEEE 802.11ac WiFi (160MHz, MCS9)	10563-
±9.6 %	150.0	0.00	16,80	68,29	9,47	*	Beec Box, The With TEBMHZ, MCEB Bepc duty syste)	AAC
	150.0	_	16.58	67.82	6.34	Y		-
	150.0	in the second	16.43	67.70	6.09	2	ILLE ON ITA DOLL TA DOLL MARK	10564-
5.36 N	150.0	0,46	16.53	68.98	4.97	×	DEEE 802.11g WIFI 2.4 GHz (DSSS- DFDM, 9 Mbps, 98pc duty cycle)	AAA
_	150.0		15.14	68.46	4.81	Y		_
	150.0	1000	16.32	67.02	4.78	Z	IEEE WITH the WITH A MICH INCOME.	10565-
196%	150.0	0.46	16.85	87.46	5.23	8	IEEE 832.11g WIFI 2.4 GHz (DSSS- OFDM_12 Mops_38pc duty civile)	10565- AAA
	150.0		16.A7	86.93	5,05	Y.		_
1.00	150.0		16.65	67.49	5.01	2	stor on the suit of dis shows	10566-
10.6 2	150,0	0.46	16 69	67.34	5.00	×	OFDM, 18 Mbps, 29pc 0 (y cycle)	AAA
	150.0		16.28	96.77	4.88	Ŷ		
	150.0		16.46	87.32	4,84	Z		10567
19.6%	150.0	0.46	17.04	67.74	90.09	×	GEEF 802,11g WIF/ 2.4 GHz (DSSS- OFDM, 24 Maps, 55pc duty cycle)	AAA
	150.0		16.63	87.15	4,91	¥.		
	150.0	1000	16.87	87.80	4.85	X	10 10 10 10 10 10 10 10 10 10 10 10 10 1	10568-
2 9.6 %	150.0	0.46	16,45	67 07	4.97	100	IEEE 802 11g WIF 2.4 GHz (DSSS- OFOM, 38 Mbps, 95pc duily cycle)	AAA
	150,0		16.05	68.54	4.80	Y		
1000	150.0	Sec. 10.	10.19	67.03	4.74	Z	THE REPORT OF THE PARTY OF THE	4115.000
± 9,8 %	150,0	0.46	17.08	67.78	5.03	8	IEEE 802 11g WiFi 2.4 GHz (DSSS- OFDM 48 Mbps: 39pc daty cycle)	10589+ A.A.A
	150.0	-	18.68	67.22	4.86	Y	-	
	150.0		10.95	67.93	4.85	Z.	IFFF obb at change	10570-
196 5	150.0	0.46	17,01	RT 62	5.08	x	IEEE 802 11g WIFI 2.4 GHz (DSSS- OFDM, 54 Mbp). 39b5 duty cyclej	10570- AAA
	150.0		16.62	67.08	4.90	Ŷ		
1.000	150.0		16.86	67.73	4.88	2	IEEE 802,11b WFI 2.4 GHz (D588, 1	10571-
± 0.6 %	130,0	0.46	17 12	65,77	1.32	x	Mbps: 80pc bLty sydle)	AAA
	130.0	_	15.06	64.23	1.1d	Y		
	130.0		15.80	05:20	1,17	5	IEEE 802.115 VIIE 2.4 CHz (DSSS. 2	0572-
± 9.6 %	130.0	D,46	17.58	67.80	1,36	x	Mbps, 90pc duty cycle)	NAA
	120.0		15.38	64.80	1.16	Y		
	130.0		18.20	65.98	1.19	Z	IEEE 802,115 WIFI 2,4 GHz (DSSS, 5,5	0571
±0.6 %	130.0	0.46	40.35	100.25	100,00	×	Mops, Blips duty cycle)	AA.
	138,0	-	20.21	61,80	1.94	Y		-
	130.0	2.2.1	27.76	101.40	5:37	Z	IEEE 802,116 WIF12.4 GHz (DSSS, 11	1674
196%	130/0	0,45	22:17	77.53	1.86	x	Mons, 90pp duty cycle)	NVA.
	130.0		17.98	70.31	1,28	Y		
	130.0		20.12	73.83	1,45	Z		_

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				- 25.0202	1.112511550		10.000	
	OFDM, 6 Mbps, 90pc duty cycle)	Y	4.82	66.32	16.23		130.0	
	Second and each tax was a second	Z	4.55	66.75	16.29		130.0	
0575- AA	IEEE 802.11g WIFI 2.4 GHz (DSSS- OFDM, 9 Mbps, 90pc duty cycle)	x	4.80	66.99	16.69	0.46	130.0	± 9.6 %
		Y.	4.64	66.47	16.29		130.0	
		Z	4.59	66.94	16.38		130.0	
10577- AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 12 Mbps, 90pc duty cycla)	×	5.03	67.31	16.86	0.46	130.0	±9.6%
		Y.	4.85	66.78	16.47		130.0	
	the last sector is a sector sector sector and	Z	4.78	67.21	16.54		130.0	
10578- 4AA	IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 18 Mbps, 90pc duty cycle)	×	4.93	67.50	16,96	0.46	130.0	± 9.6 %
		Ϋ́	4.75	66.94	16.57		130.0	
		Z	4,69	67.42	16.68		130.0	
10578- 104A	IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 24 Mbps, 90pc duty cycle)	x	4.69	66.84	16.33	0.46	130.0	±9.6 %
		Y	4.52	66.24	15.89		130.0	
		Z	4.43	66.57	15.89		130.0	
10580- AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 36 Mbps, 90pc duty cycla)	×	4.74	65.81	16.32	0.46	130.0	± 9.6 %
		Y	4.57	66.26	15.90		130.0	
Santa-S		Z	4.47	66.59	15.90	2-3.784	130.0	1000000
10581- AAA	IEEE 802.11g WFi 2.4 GHz (DSSS- OFDM, 48 Mbps, 90pc duty cycla)	X	4.83	67.59	16.95	0.46	130.0	±9.6 %
		Y.	4.65	66.98	16.51		130.0	
		Z	4.59	67.47	16.62	-	130.0	_
10582- AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 54 Mbps, 90pc duty cycle)	X	4.64	66.58	16.12	0.46	130.0	±9.6 %
		Y	4.47	66.00	15.67		130.0	
	Frankling and the second secon	Z	4.36	66.28	15.65		130.0	
10583- AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc duty cycle)	×	4.77	66.82	16.63	0.46	130.0	±9.6 %
	and the second second second	Y	4.62	66.32	16.23		130.0	
_		Z	4.56	66.75	16.29		130.0	
10584- AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc duty cycle)	×	4.80	66.99	16.69	0.46	130.0	± 9.6 %
	and the second sec	Y	4.64	65.47	16.29		130.0	
_		Z	4.59	65.94	16.38		130.0	
10585- AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc duty cycle)	x	5.03	67.31	16.86	0.46	130.0	± 9.6 %
	Contract of the second second	Y	4.85	66.78	16.47		130.0	
	The second	Z	4.78	67.21	16.54	in a second	130.0	1.12-1.40.0
10586- AAB	IEEE 802.11a/h WFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle)	×	4.93	67.50	16.98	0.46	130.0	± 9.6 %
		Y	4.75	66.94	16.57		130.0	
		Z	4.69	67.42	16.68		130.0	
10587- AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 90pc duty cycle)	X	4.69	66.84	16.33	0.46	130.0	± 9.6 %
		Y	4.52	66.24	15.89		130.0	
		Z	4.43	66.57	15.89		130.0	0
10588- AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 90pc duty cycle)	X	4.74	66.81	16.32	0.48	130.0	± 9.6 %
	and the second sec	Y	4.57	66.26	15.90		130.0	0
12.24	The second second second second second	Z	4.47	66.59	15,90		130.0	
10589- AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 90pc duty cycle)	×	4.83	67.59	16.95	0.46	130.0	± 9.6 %
and a feature	and the second of such	Y	4.65	66.98	16.51		130.0	1.1
		Z	4.59	67.47	16.62		130.0	-
10590- AAB	IEEE 802.11a/h WIFI 5 GHz (OFDM, 54 Mbps, 90pc duty cycle)	X	4.64	66.58	16.12	0.46	130.0	± 9.6.%
tar	under a des and abarel	Y	4.47	66.00	15,67		130.0	

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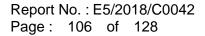
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19.69	130.0	0.46	16.71	66.87	4,02	X	IEEE 802.11n (HT Moterl, 20MHz	10591-
10.0 4		North C	1.1.1.1.1			1.1	MCSE, 90th duty cycle)	AAB
_	130.0		16.34	EE 38	4.77	Ŷ.		
	130.0		16.40	66.82	4,71	Z	OTHER DOMESTICS AND ADDRESS OF ADDRESS OF	10592-
19.6 %	130.0	0.46	16.B4	67.22	5.09	×	IEEE 802 11h (IIT Mixed, 20MHz, MCS1, 90pt duty cycle)	AAB
1.	130.0	1.0	16.47	66172	4.93	· Y ·		
	130.0	1000	16.53	87.13	4.86	2	The second second second	Cara a
29.65	130.0	0.46	16,74	67.17	5,02		IEEE 802:11n (HT Mixed, 20MHz, MGS2, 90pc duty cycle)	10593- AAE
	130.0		16.36	88.64	4.85	Y.		
	120.0		16.40	87.04	4.77	2	INTERNATION CONTRACTOR	10594-
19.61	130.0	0.46	16.85	67.32	5.07		IEE= 802.11n (HT Mixed, 20MHz, MCS3, 90pc duty cycle)	AVB
	130.0		16,51	66.80	4.80	Y		
100	130.0	10000	16.57	67.23	4,83	2	And the second s	11695-
1963	130.0	0.46	16.79	67.29	5,05	×	IEEE 802.11n (HT Mosid, 20MHz, MCS4, 90pc duty cycle)	
-	130.0	· · · · · · · · · · · · · · · · · · ·	16.40	66.75	4.87	Y		
5	130.0		16.45	67.17	4.80	2	IPPE BOARD BOTTLE -	inene
± 9,6 9	130.0	0.46	16.80	67 29	4,58	×	IEEE B02:11n (HT Model; 20MHz) MCS5, 90pc duty cycle)	10596- AAB
-	130.0		16,40	88.75	4.81	Y		
-	130.0		16.45	57.16	4.73	Z	Learning works and a second state of the second state	10597-
1965	130.0	0.46	16,70	67.23	4.94	×	IEEE 802 11n (HT Mixed, 20MHz, MCS5, 90pc duly cycle)	111597- AAB
	130.0		16.29	66.66	4:76	Y I		
	130.0	1000	15.33	67.05	4,68	Z		(TIPA)
196%	130.0	0.46	18.98	67.49	4.82	*	IEEE 502.11n (HT Mixed, 26Mirz, MCS7, 90pc duty cycle)	10598- AAB
	130.0	· · · · · · · · · · · · · · · · · · ·	16.55	86.90	4.74	Y 1		-
	130.0		16.63	67.34	4.68	Z I	Income a local difference in the second seco	10000
±9.6%	130.0	0.46	16,88	67.43	5.58	×	IEEE 802.11n (HT Mixed, 40MHz, MOS0, 90pc duty cycle)	10599- AAB
	130.0		16.56	56.96	5.44	Y.	and the second se	
	130.0		16.55	67.25	5.34	2		
196%	139,0	0.46	17.07	67.88	5.74	x	IEEE 802.11n (HT Mixed, 40MHz MOS1, 90pc duty cycle)	AAB
	130.0	-	16.79	57.47	5,60	X		
	130.0		16.64	67.51	5.43	_Z,		
±10,8 %	130.0	0.46	15.95	67.61	5,87	×	IEEE 802,11n (HT Mixed, 40MHz; MCS2, 90pc duty cycle)	1060 II AAB
	130.0		16.66	67.17	5,48	4		
	130.0		15,60	67.37	5,35	2	HERE BOR AND MINERS IN ADDRESS	10602-
+9.6%	130.0	0.46	HE.BE	67.58	15,70	X	IEEE 802.11n (HT Mixed, 40MHz, MCS3, 90pc duty byck)	VVB-
	130.0		18.58	67.17	5.56	Y		
1	130.0		16,52	67.40	5.45	Z	When more addressed to the second	0603-
± 9,6 %	130.0	0.46	17.16	67.B3	5.80	X	IEEE 802.11n (HT Mixed, 40MHz, MCS4, 90pc duty cycle)	AB
	130.0		16.87	67.48	5,65	Y		
	130.0	20.00	10.01	67.62	2.05	2	IFEE MPLATE AT A SHARE	0504-
296%	130.0	0.46.	36,87	67.37	5.58	x	IEEE 902.11n (HT Mixed, 00MHz, MCSO, 90pc duly cycla)	VAB
	130.0		16.57	86.52	5.44	Y		
	130.0		16.59	67.27	5.37	2	IEEE 302 11n (HT Mixed, 40MHz.	0055-
19.6%	130.0	0.46	17.00	67.64	0.68	8	MCSB, 90pc duty cycle)	VAB
	130.0		16.75	67,28	5,56	Ŷ		
	130.0		16.68	67.44	5.43	Z	WEEE BOZ 110 (HT Moved 40MHz	0606-
± 9.6 %	190,0	0.46	16,84	57.15	5,46	x	MCS7, 90pc duty cycle)	AB
	1.50.0		16.32	66.89	5.33	Y		
_	150.0		16.23	88.87	5.20	Z		

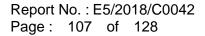
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10507-	TEEE 902 Thac WIFI (20MHz, MCSO,	X	476	95.21	16.35	0.46	4701.01
AAB	HOpe duty cycle					1.49.	130.0
_		8	4.60	35.56	15.94	_	130,0
		2	455	56.17	16.05		130.0
10008- AAB	IEEE 802.1 (ac WIFI (20MHz MCS1) 90pc duty cycle)	x	4.97	85.64	16.51	0.46	130.0
		Y	4.79	65.07	16.11		130.0
10000		Z	4,73	86.56	16.21		130.0
AAB	BEE BOE 11ac WFt (20MHz, MCS2, 90pc duty cycle)	×	4.86	68,52	18,38	0.46	130.0
_		Ý	4.63	65.92	15,94	_	130.0
		2	4.62	06.40	10.04	·	130.0
AAB	IEEE 802 11ac WIFI (20MHz, MCSS, 90pt duty cycla)	*	4.91	88,68	16,54	0.46	130.0
		Y	4.73	63.08	16.11		330.0
-		Z	\$47	86.55	16:22		120.0
AAB	IEEE 802,11ac WIF (20MHz, MC34. 90pc duty cycla)	×	4.93	88.50	16,39	0.46	130.0
_		Y	4,65	65.89	15.96		130,0
		Z	4.59	66.36	16.65		130.D
10612. AAS	IEEE 802.11ac WiFi (20MHz, MCSS. 90pc duty cycle)	×	4.85	96,66	16.44	0.46	130.0
		Y	4,66	65.04	16.00	-	130.0
		Z	4.59	66.49	16.08	100	130.0
10613- AAB	TEEE 802 11ac WIFI (20MHz. MCS6) 00pc/duty (syste)	×	4,00	66.57	16.33	0.40	130.0
	The last them.	Y.	4.67	65.94	15.89	-	750.0
-		Z	4,69	65.36	15,95		130,0
MAE	(EEE 802 11ac WIFI (20MHz, MCS7, 90ac duty cycle)	×	4.80	68.77	15.57	0.48	130.0
		Ť	4.00	66.11	16.11	-	130.0
		12	4.55	66.63	19.24		130.0
AAE	IEEE BOZ 11mp.WiF) (20MHz, MCS8, 90pp duty cycle)	×	4.83	66,33	16.17	0,48	130.0
		4	4.65	65.72	哲,74		130.0
		Z	4.57	66.14	15.78		130.0
IDG16- AAE	IEEE 932.1 (as WIF) (40MHz, MCSb, 90pc duly cycle)	8	5,40	66.72	16.51	0,46	130,0
		Ψ.	5.25	86:20	10.17		130.0
	· · · · · · · · · · · · · · · · · · ·	2	5.18	66.58	36,21		136.0
10617- AAB	IEEE 902, that WiFi (30MHz, MCS1, 90pc duty cycki)	x	5.46	66.82	16,52	0.46	120.0
		- X	5.32	66.35	16.21		130.0
		Z	5.23	66.70	1E.24	-	130.0
10618- AAB	TEEE 802 11ao WIFI MOMME MCS2, 90pc day syde)	×	5.36	68.91	16.59	0.46	130.0
		Y.	5.20	66.37	16.23	_	130.0
0.0			5,13	66,77	16.30		130.0
10815	IEEE BUZ 11as WIFI (ADMPIZ, MCS3,	X	5.38	66.73	16.44	0,46	130.0

511 540

5.1

5.47

5.33

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66.2

86.53 66.81

66.26

66 25

66.35 66.76

66.52

16.0

16.10

16.68

16.40 16.72

16.41

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主導用 %

± 9.6 %

19.6%

±10.6 %

0,8°%

=96%

19.6%

19.6%

主乐图书

主要服務

19.6%

± 9.6 %.

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IEEE 802.11ac WIFr (40MHz, MCS4)

IEEE ett2.11ec WFI (40MHz; MCS5

IEEE 802, 1 Teg WITH (40NHz, MC56

90pc duty cycle)

9(ipc duty cycle)

Dipc duty ciycle)

50pc mity cycle

Certificate No: EX3-3939, Oct18

10815 AAB

10620 AAB

10621

10622 AAE

AAB

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California anna

10823- AAB	IEEE 802,11ac WIFI (40//Hz, MC\$7, 90pc tluty cycle)	X	5.38	66.59	16.41	0.46	130.0	19.8 %
		¥ .	5.20	E6.04	16.05	1	130.0	
		Z	512	66.39	16.07		130.0	
10624- AAB	IEEE 802 11ac WEI (40MHz, MESS 90pc duty syste)	N	5.54	66,74	16.54	0.46	130.0	29.65
		Y	5,40	66.26	16.22	-	130.0	
		7	5.31	86.66	16.23	-	130.0	-
HDE25- WAE	IEEE S02 11ec WFr (40MHz, MCSB, 90pc duty cycle)	×	5.91	67.68	17.05	1),46	130.0	19.61
		Ŷ	5.81	87.35	16.82	1	130.0	-
		Z	5.60	87.33	16.65	1	130.0	
10628 AAB	JEEE 502.11an WFi (80MHz, MCS8, 90pc duty cycle)	х	5,68	86.70	16,44	Cl.46	130.0	19.53
		Y	6.54	68.25	16.12		130.0	-
	and the second second second second	- Z	5.47	88.84	16.16		130.0	
10627- AAB	JEEE 802.11ab WIFI (80MHz, MCS1, 90bb duty cycle)	×	5.90	57.28	16.64	0.40	130.0	±9.6 %
		Y	5.79	88.84	16.38	-	130.0	-
	and and the second s	2	5,67	67.08	16.34		130.0	
10628- AAB	(EEE 802) 1136 W/IT (80MHz, MCS2, 9066 duty cycla)	X	5,73	66.91	16.42	0,46	130.0	1963
		Υ.	5.58	86.38	16.08		130.0	
-		2	6.49	66.66	18.06		130.0	
10629- AAB	IEEE 802.11ac WiFI (BDMHz, MCS3, 90pc daty cycle)	×	5.81	66.97	18.43	0.46	130.0	主要股份
1.0.00		- Y -	5.67	66.48	18,13		130.0	-
	and the set of a state of a state	2	5.56	66.69	16.07	-	130.0	
10630 AAB	IEEE 882.1186 W/F) (80MHz, MCE4. 90pc duty cycle)	1.8	6.26	68,50	17 18	0,46	130.0	* 9.6 5
		Y	6.18	88.17	18,98		130.0	-
	-	Z	5.63	67.70	18.58		130.0	
10631- AAB	(EEE 802.11ad WFI (80MHz, MCS5, 90pp.duty.cvd8)	X	6.19	68.38	17.32	0.46	130.0	1963
	and the second	Y	8.03	67.83	18.99	-	130.0	
	and the second sec	Z	5.86	67.82	16.89	-	130.0	
106828 AAB	EEE 802 11sc WiFr (80MHz, MC56) 900c duly cycle)	X	5.89	67 37	16,83	0.46	130.0	*969
		14	5.75	B6.88	16.63	-	120.0	
		12	5.87	67.23	16.57	-	130.0	-
AAH	IEEE 802 11ac WiFi (80MHz, MCS7 90pc disty cycle)	x	5.81	67.14	16.55	0,46	130.0	±96%
		N.	5.84	86.53	18.18		130.0	-
	4	Z	5.57	66.89	18.21	-	130.0	-
10834- AAE	IEEE 802,11ac WFI (80MHz, MCS8, 80pc duty cycle)	X	5 79	67.15	16.62	0.48	130.0	主题图案
		Y	5.63	66.56	16.28	-	130.0	
		Z	5.56	66.95	16.31	-	130.0	
10635- AAB	IEEE 802,11ac VIIII (88/MHz, MC89, 90pc duty cycle)	X	0.68	86.48	16.03	0.48	130,0	土豆匠兔
_		W.	5,52	65.82	15.67		130.0	
		Z	6.41	66.16	15.02		130.0	
10836- AAC	IEEE 802 Trac WIFI (160MHz: MCSO, 96pc duty cycle)	x	6.07	67.13	18.52	<u>ğ</u> (16	130.0	+98%
		1 12	5.85	89.65	16.23	-	130.0	
Real of the		20	5.87	68.97	16.23		130.0	-
AC	IEEE.802.11ac WIFI (160MHz, MCS1, 30pc daty cycle)	x	6.23	67.50	18.68	0,46	130.0	÷9.6%
_		Y	6.11	57.04	15.40		130.0	-
-		Z	8.00	57.28	16.35		130.0	
AAG	IEEE 802 11ac WiFI (160MHz, MCS2, 90pc duty cycle)	x	6.23	67,47	16.65	0.46	130.0	108%
-		Y	5.11	67.00	16.38		130.0	
		Z	8.01	67.28	16.34		1.000.00	

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10539-	JEEE 802 T1ac WIFI (160MHz, MCS3.	X	6.25	67 49	18.70	0.46	1111.0	+96%
NAC-	90pc duty dycla)				100	alan.	2018	= 7 M M
_		Y	6.09	66.97	16.39	-	130.0	1
(William	OPPERATE AND A REPORT OF THE REPORT	Z	6.00	87.25	16.37		130.0	1.000
10640- AAC	IEEE 802 11a:: WFI (160MHz, MCS4, 90pc duty cycla)	×	6.25	87.53	16.67	0.46	130.0	2.9.6 %
		٧.	6.11	10,70	16.35	-	130.0	
10641-	IEEE BOZ 11ac WIFI (160MHz, MCS5	2	6.99	87.21	16.25	W 10	130.0	
AAC	Soborally cites	8		87.31	16.67	0.46	100 0	#88%
		Y	0.13	66.85	16.30	-	130.0	-
10642-	EEE 802 116c WFI (160MHz, MCS6,	Z	6.03	87.11	16.26	21.40	1000	
MC:	30pc duty cycle)	×	8.53	67.65	18,91	11.46	130.0	± 3.6 %
		¥.	0,10	67 13	16.60		130,0	-
10010	the second se	Z	6,10	67.47	16.62	-	130.0	-
10643- AAC	IEEE 802 11ac WiFi (160MHz, MCS7 90pc duty-cycle)	×	6.15	67:31	18:65	0.46	130.0	±9.6 %
		· ?	0.02	05.62	10.34	_	120.0	-
	and the second statement of the	Z	5.91	67.06	16:30	and the second	130.0	
10644 AAC	IEEE 802 11ee WIFI (160MHz, MCS8, 90pc daty cycle)	×	8,35	67.93	16,98	0,46	130.0	19.0°%
		¥.	6.21	87.40	15.65		130.0	
		Z	6.05	67.49	16.53		130.0	
10645- AAC	IEEE 802 11 ac WFH (160MHz, MCS9, 80pc duly cyde)	×	8.71	88.51	17.21	11.46	130.0	±9.6%
		18	6.68	66,36	17.03		15010	-
	and the second second second	1.2	6.25	67.70	相加	100 mg	130.0	1000
10848- AAF	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, OPSK, UL Subframe=2,7)	x	86.17	140.32	45.40	0.30	60.0	10.6 %
		Y.	39.64	122.66	40.63		60.0	1
		Z	18.10	104.43	33/83	P	60.0	1
10847- AAF	LTE-TOD (SG-FDMA, 1 RB, 20 MHz. OPSK, UL Subframe=2,7)	X	80.45	139.77	45.45	9.30	60.0	主张在地
		V	36.72	121.94	40.86	-	63.0	
		2	16.41	102.06	33.52		60.0	
10648- AAA	COMA2000 (1# Advanced)	X	10.87	96.51	13.20	0.00	150.0	1005
		- Y -	0.58	81.72	0.15		150.0	-
		Z	0.69	64.HU	11.24	-	150.0	
10652- AAD	LTE-TOD (OFDMA, E MHz, E-TM 5.1, Clipping 44%)	х	431	00.03	17.79	2.23	0,06	= 36%
(IIII)	Control of the lost	Y	3.89	67.30	16.71		90.0	
		Z	\$6.E	67.40	16.29		80.0	
10653- AAD	ETE-TDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)	X	4.72	07.91	17.64	2.22	80,0	398%
		Y	4.49	BE 72	16.87	1000	80.08	
	and the second sec	12	4.16	66.48	10,48	10.000	80.0	-
10654- AAD	LTE-TDD (OFDMA: 15 MHz E-TM 3.1 Clipping 44%)	x	4,64	67.52	17,60	2.25	80,0	19.6%
10.00		Y.	4.35	60.39	18.88		80.0	
-	and a server with the second	I	6.14	65.16	76.60		80.0	1.1.1
10855- AAE	LTE-TDD (GFOMA, 20 MHz, E-TM 3.1. Oligoing 44%)	×	4.69	137.54	17.64	2,23	60.0	3 9,6 %
	and a star	¥.	4.42	65.40	10.92		80.0	
		2	4,19	66.14	16.53		0.08	
10658- AAA	Pulso Weveform (200Hz, 10%)	8	100.00	116,89	30/15	10.00	50.0	±9.6 %
14.40		Y	27.27	97.34	24.81		50.0	
		12	5.41	73.00	18.99	5.00	60.0	
10fffl-	False Waveform (200Hz, 20%)	8	100.00	114.08	97 78	6.30	60,0	÷0,6 %
CARL.		Y.	100.00	111.98	26,70		0.00	

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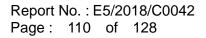
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EX3DV4- SN:3938

October 24, 2018

10660- AAA	Pulse Waveform (200Hz, 40%)	×	100.00	113.57	26.20	3.98	80.0	± 9.6 %
		Y	100.00	108.48	23.71		80.0	
		Z	17,55	86.88	16.64		0.06	
10661- AAA	Pulse Waveform (200Hz, 60%)	X	100.00	116.76	26.28	2.22	100.0	± 9.6 %
		Y	100.00	105.43	21.11		100.0	
		Z	100.00	100.82	18.62		100.0	1.1.1.1.1.1.1
10662- AAA	Pulse Waveform (200Hz, 80%)	×	100.00	127.89	28.95	0.97	120.0	± 9.6 %
		Y	3.43	74.94	10.68	-	120.0	
day warde	Exercise and the second second	Z.	100.00	98.67	16.42		120.0	-
10670- AAA	Bluetooth Low Energy	×	100.00	117.22	26.83	2.19	100.0	± 9.6 %
		Y.	100.00	107.88	22.47		100.0	
		Z	100.00	104.58	20.49	_	100.0	

² Uncartainty is determined using the max, deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

Certificate No: EX3-3938_Oct18

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8. Uncertainty Budget

A	с	D	е		f	g	h=c * f / e	i=c * g / e	k
Source of Uncertainty	Tolerance/ Uncertainty	Probability Distributio	Div	Div Value	ci (1g)	ci (10g)	Standard uncertainty	Standard uncertainty	vi, or Veff
Measurement system									
Probe calibration	6.00%	N	1	1	1	1	6.00%	6.00%	8
lsotropy , Axial	3.50%	R	√3	1.732	1	1	2.02%	2.02%	8
lsotropy, Hemispherical	9.60%	R	√3	1.732	1	1	5.54%	5.54%	~
Modulation Response	2.40%	R	√3	1.732	1	1	1.40%	1.40%	~
Boundary Effect	1.00%	R	√3	1.732	1	1	0.58%	0.58%	8
Linearity	4.70%	R	√3	1.732	1	1	2.71%	2.71%	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Detection Limits	1.00%	R	√3	1.732	1	1	0.58%	0.58%	~
Readout Electronics	0.30%	N	1	1	1	1	0.30%	0.30%	8
Response time	0.80%	R	√3	1.732	1	1	0.46%	0.46%	~
Integration Time	2.60%	R	√3	1.732	1	1	1.50%	1.50%	8
Measurement drift (class A evaluation)	1.75%	R	√3	1.732	1	1	1.01%	1.01%	~
RF ambient condition - noise	3.00%	R	√3	1.732	1	1	1.73%	1.73%	~
RF ambient conditions - reflections	3.00%	R	√3	1.732	1	1	1.73%	1.73%	~
Probe positioner Mechanical restrictions	0.40%	R	√3	1.732	1	1	0.23%	0.23%	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Probe Positioning with respect to phantom shell	2.90%	R	√3	1.732	1	1	1.67%	1.67%	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Post-processing	1.00%	R	√3	1.732	1	1	0.58%	0.58%	~
Max SAR Eval	1.00%	R	√3	1.732	1	1	0.58%	0.58%	~
Test Sample related									
Test sample positioning	2.90%	N	1	1	1	1	2.90%	2.90%	M-1
Device Holder Uncertainty	3.60%	N	1	1	1	1	3.60%	3.60%	M-1
Drift of output power	5.00%	R	√3	1.732	1	1	2.89%	2.89%	8
Phantom and Setup									
Phantom Uncertainty	4.00%	R	√3	1.732	1	1	2.31%	2.31%	8
Liquid permittivity (mea.)	1.39%	Ν	1	1	0.64	0.43	0.89%	0.60%	М
Liquid Conductivity (mea.)	1.79%	Ν	1	1	0.6	0.49	1.07%	0.88%	М
Combined standard uncertainty		RSS					11.50%	11.46%	
Expant uncertainty (95% confidence interval), K=2							23.01%	22.91%	

Measurement Uncertainty evaluation template for DUT SAR test (0.3-3G)

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f (886-2) 2298-0488



9. Phantom Description

Schmid & Panner Engineering AG

e s D

Zeughsusstnaser 43, 8004 Zurich, Switzellar Phone +41 1 245 9700, Fax +41 1 245 9779 Info@spasg.com, Http://www.spasg.com

Certificate of Conformity / First Article Inspection

item	SAM Twin Phantom V4.0	
Type No .	QD 000 P40 C	
Series No	TP-1150 and higher	
Manufacturer	SPEAG Zeughausstrasse 43 GH-8004 Zürich Switzenand	

Tests

The series production process used allows the limitation to test of first articles. Complete tests were made on the pre-series Type No. CD 000 P40 AA, Serial No. TP-1001 and on the series first article Type No. QD 000 P40 BA, Serial No. TP-1006. Certain parameters have been retested using further series items (called samples) or are tested at each item.

Test	Requirement	Details	Units tested
Dimensions	Compliant with the geometry according to the CAD model.	(T'IS CAD File (")	First article, Samples
Material thickness of shell	Compliant with the requirements according to the standards	2mm +/- 0.2mm in flat and specific areas of head section	First article, Samples, TP-1314 ff.
Material thickness at ERP	Compliant with the requirements according to the standards	6mm +/- 0.2mm at ERP	First article, All items
Material parameters	Dielectric parameters for required frequencies	300 MHz - 8 GHz: Relative permittivity < 5. Loss tangent < 0.05	Material samples
Material resistivity	The material has been tested to be compatible with the liquids defined in the standards if handled and cleaned according to the instructions. Observe technical Note for material compatibility.	DEGMBE based simulating liquids	Pre-series, First article, Material samples
Segging	Compliant with the requirements according to the standards. Sagging of the flat section when filled with tissue simulating liquid	< 1% typical < 0.8% if blied with 155mm of HSL900 and without DUT below	Prototypes, Sample testing

- CENELEC EN 50361 1234
- IEEE Std 1528-2005 IEC 62209 Part I

- The IT'IS CAD file is derived from [2] and is also within the tolerance requirements of the shapes of the other documents.

Conformity Based on the sample tests above, we certify that this item is in compliance with the uncertainty requirements of SAR measurements specified in standards [1] to [4]

Date	07.07.2005	<u>s p e a a</u>
Signature / Stamp		Solgario & Parcelle Engineering AC Thomas and a second second second second second Phones and a second second second second second Intelligence, com, http://www.speeg.com

Doc He. MIL- 00 000 P40 C - #

1112 Pape

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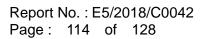
10. System Validation from Original Equipment Supplier

Engineering AG wghausatrasae 43, 8004 Zurk	ry of		Servizio svizzero di teratura
Accession by the Swess Accredit The Swiss Accreditation Servic Multilateral Agreement for the	oe is one of the signatorie	es to ihe EA	ecreditation No SCS 0108
Silent SGS-TW (Aud	en)	Certificate N	le: D1900V2-5d173_Apr1
CALIBRATION	CERTIFICATI	E	
Object	D1900V2 - SN:5	d17 <u>3</u>	
Collocation procedure(s)	QA CAL-05.v10 Calibration proce	dure for dipole validation kits ab	ove 700 MHz
Colibration date:	April 25, 2018		
	cied in the closed laborate	vy laciity environment temperature (22 ± 3)*	
All cafforations have been condu Calibration Equipment weed (M&	cied in the closed laborate		
All cafforations have been condu Calibration Equipment used (M& Primary Standards	icled in the closest laborate TE colical for calibration)	ny facility: anvironment temperature (22 ± 3)*	°C and humidity < 70%.
All Cafforations have been condu Calibration Equipment used (M& Primary Standards Romen meter NRP Romen sensor NRP-201	icited in the closed laboration TE energy for calibration) ID 8 SN: 104775 SN: 103244	ry facility: em/toorment temperature (22 ± 3)* Cal Date (Centificate No.)	'C and humklity < 70%. Schedulei) Calibration
All calibrations have been condu Calibration Equipment used (M8 Primary Standards Primary mater NRP Power sensor NRP-291 Power sensor NRP-291	cied in the closed laboration TE entical for calibration(10 # SN: 104775 SN: 103244 SN: 103245	ry ladity: environment temperature (22 ± 3)* <u>Cal Date (Certificate No.)</u> D4.Apr-18 (No. 217-Ce372)(2673) D4.Apr-18 (No. 217-Ce372) D4.Apr-18 (No. 217-Ce373)	°C and humklity < 70% Schedue() Calibration Ap∺19
All calibrations have been condu Calibration Equipment used (M& Primary Standards Power ensider NRP-201 Power sensor NRP-201 Palemance 20 cB Altenuator	ID 4 SN: 104775 SN: 103245 SN: 103245 SN: 5058 (20k)	ry laciity: emitorement temperature (22 ± 3)* Cal Date (Centiticate No.) D4-Apr-18 (No. 217-02672) D4-Apr-18 (No. 217-02672) D4-Apr-18 (No. 217-02672) D4-Apr-18 (No. 217-02672)	C and humikity < 70% Scheduleit Calibration Apr-19 Apr-19 Apr-19 Apr-19
All deficientions have been condu Calibration Equipment used (M& Primary Standards Power meter NFIP Power sensor NFIP-291 Power sensor NFIP-291 Power sensor NFIP-291 Paterence, 80 def Attenueter Type-N mismatch combinistion	ID a SN: 104776 SN: 104776 SN: 103244 SN: 103245 SN: 5068 (20k) SN: 5067.2 / 06327	ry facility: environment temperature (22 ± 3)* Cal Date (Certificate No.) D4-Apr-18 (No. 217-02672)(02673) D4-Apr-16 (No. 217-02672) D4-Apr-16 (No. 217-02672) D4-Apr-18 (No. 217-02683)	C and humklity < 70% Schaduer) Calibration Apr-19 Apr-19 Apr-19 Apr-19 Apr-19
All deficitations have been condu Calibration Equipment used (M8 Primary Standards Power meter NRIP Power sensor NRIP-291 Power sensor NRIP-291 Reference 20 dB Alternustor Tige-1 messatich combanistion Telerence Probe EX3DV4	ID 4 SN: 104775 SN: 103245 SN: 103245 SN: 5058 (20k)	ry facility: emitterent temperature (22 ± 3)* Cal Date (Centiticate No.) D4-Apr-18 (No. 217-02672) D4-Apr-18 (No. 217-02672) D4-Apr-18 (No. 217-02672) D4-Apr-18 (No. 217-02672)	C and humklity < 70% Scheduleit Calibration Apr-19 Apr-19 Apr-19 Apr-19 Apr-19
All calibrations have been condu Calibration Equipment used (M& Primary Standards Power sensor NRP-201 Power sensor NRP-201 Power sensor NRP-201 Palerance 20 GB Alternastor Type-N meanation combanetion Reference Probe EX3DV4 DAE4	Cied in the closed laboration TE entropy for calibration(ID 4 SN: 104775 SN: 103245 SN: 5068 (20k) SN: 5068 (20k) SN: 5068 (20k) SN: 5087 2 / 06927 SN: 7349 SN: 601	ry facility: environment temperature (22 ± 3)* Cal Date (Certificate No.) D4-Apr-18 (No. 217-02672)/02673) D4-Apr-18 (No. 217-02673) D4-Apr-18 (No. 217-02673) D4-Apr-18 (No. 217-02683) D4-Apr-18 (No. 217-02683) D5-Dac-17 (No. DA5-7349, Dec17) 28-Oci-17 (No. DA54-601_Oct17)	C and humikity < 70% Schaduleit Calibration Apr-19 Apr-19 Apr-19 Apr-19 Apr-19 Apr-19 Apr-18 Dec-16 Oct-18
All deficientions have been condu Calibration Equipment used (MK Primary Standards Power sensor NAP-201 Power sensor NAP-201 Power sensor NAP-201 Patienence Schol Attenuator Type-N mismatch combination Retenance Probe EXIDV4 DAE4 Secondery Standards	ID a SN: 104776 SN: 104776 SN: 103244 SN: 103245 SN: 5068 (20k) SN: 5068 (20k) SN: 5087.2 / 06927 SN: 7349 SN: 601	ry facility: emittorement temperature (22 ± 3)* Cal Date (Certificate No.) D4-Apr-18 (No. 217-02672)/02673) D4-Apr-18 (No. 217-02672) D4-Apr-18 (No. 217-02573) D4-Apr-18 (No. 217-02582) D4-Apr-18 (No. 217-02683) 30-Dac-17 (No. EX5-7349, Dec17) 28-051-17 (No. DAE4-601_0-17) Check Date (in house)-	C and humidity < 70% Schaduell Calibration Apr-19 Apr-19 Apr-19 Apr-18 Apr-18 Dec-18 Dec-18 Dec-18 Dec-18 Dec-18
All deficientions have been condu Calibration Equipment used (M8 Primary Standards Power sensor NRP-291 Power sensor NRP-291 Palenence 20 GB Attenuator Type-N mismatich combantion Reference Probe EX3DV4 DAE4 Secondery Standards Power mater EPM-442A	Cied in the closed laboration TE entropy for calibration(ID 4 SN: 104775 SN: 103245 SN: 5068 (20k) SN: 5068 (20k) SN: 5068 (20k) SN: 5087 2 / 06927 SN: 7349 SN: 601	ry facility: environment temperature (22 ± 3)* Cal Date (Certificate No.) D4-Apr-18 (No. 217-02672)(02673) D4-Apr-16 (No. 217-02672) D4-Apr-16 (No. 217-02682) D4-Apr-18 (No. 217-02683) 30-Dac-17 (No. 217-02683) 30-Dac-17 (No. 225-7349, Dec17) 28-Dai-17 (No. DAE-4-601_Oct17) Check Date (in house) 07-Oct-15 (in house check Oct-16)	C and humklity < 70% Schaduell Calibration Apr-19 Apr-19 Apr-19 Apr-19 Dec-18 Dec-18 Oct-18 Scheduel Check In house check. Oct-18
All deficitations have been condu Calibration Equipment used (M8 Primary Standards Power sensor NRP-201 Power sensor NRP-201 Power sensor NRP-201 Reference 20 dB Attenuator Type-N mismatch contraction Relenence Phobe EX3DV4 DAE4 Secondary Standards Power mater EPM-442A Power sensor HP 8481A	Eled in the closed laboration TE enfect for calibration) ID # SN: 104775 SN: 103244 SN: 103245 SN: 5068 (20k) SN: 5068 (20k) SN: 5068 (20k) SN: 5068 (20k) SN: 5067 2 / 06327 SN: 7349 SN: 601	ry facility: emittorement temperature (22 ± 3)* Cal Date (Certificate No.) D4-Apr-18 (No. 217-02672)/02673) D4-Apr-18 (No. 217-02672) D4-Apr-18 (No. 217-02573) D4-Apr-18 (No. 217-02582) D4-Apr-18 (No. 217-02683) 30-Dac-17 (No. EX5-7349, Dec17) 28-051-17 (No. DAE4-601_0-17) Check Date (in house)-	C and humidity < 70% Scheduell Calibration Apr-19 Apr-19 Apr-19 Apr-18 Apr-18 Dec-18 Dec-18 Dec-18 Dec-18 Dec-18
All cafforations have been condu Calibration Equipment used (M& Primary Standards Power sensor NRP-201 Power sensor NRP-201 Power sensor NRP-201 Palerance 20 GB Alternastor Type-N mismatch combanetion Palerance Probe EX3DV4 DAE4 Secondary Standards Power meter EPM-442A Power sensor HP 2481A Power answor HP 2481A	Cied in the closed laboration TE entreal for calibration(ID # 3N: 104775 SN: 103244 SN: 103245 SN: 5068 (20k) SN: 5068 (20k) SN: 5068 (20k) SN: 5068 (20k) SN: 5067 (2 / 06327 SN: 734 SN: 6057460704 SN: US37292763	ry facility: environment temperature (22 ± 3)* Cal Date (Certificate No.) D4-Apr-18 (No. 217-02872)(2673) D4-Apr-18 (No. 217-02872) D4-Apr-18 (No. 217-0282) D4-Apr-18 (No. 217-0288) D4-Apr-18 (No. 217-0288) D5-Apr-18 (No. 217-0288) D5-Dar-17 (No. DAE-4601_0x17) Check Date (In house check Dct-16) D7-Dat-15 (in house check Dct-16)	C and humidity < 70% Schedulet) Calibration Apr-19 Apr-19 Apr-19 Apr-19 Apr-19 Apr-19 Apr-19 Dec-18 Dec-18 Dec-18 Dec-18 Dec-18 Dec-18 Dec-18 Dec-18 Dec-18 Dec-18 Dec-18 Dec-18
All celiforations have been condu Calibration Equipment used (MK Primary Standards Power sensor NRP-201 Power sensor NRP-201 Power sensor NRP-201 Patienance 20 of Atenuator Type-N mismatch combanation Retenance Probe EXIDV4 DAE4 Secondary Standards Power sensor ERM-442A Power sensor HP 2481A Power sensor HP 2481A Power sensor HP 2481A Power sensor HP 2481A PF generator P&S SMT-06	Cied in the closed laboration TE critical for calibration) ID 4 SN: 104775 SN: 103245 SN: 5068 (20k) SN: 5068 (20k) SN: 5068 (20k) SN: 5068 (20k) SN: 5067 2 / 06327 SN: 7349 SN: 601 ID # SN: GB37460704 SN: GB37460704 SN: GB37460704 SN: GB37460704 SN: GB37460704	ry facility: environment temperature (22 ± 3)* Cal Date (Certificate No.) D4-Apr-18 (No. 217-02672) D4-Apr-18 (No. 217-02672) D4-Apr-18 (No. 217-02672) D4-Apr-18 (No. 217-02682) D4-Apr-18 (No. 217-02682) D4-Apr-18 (No. 217-02682) D4-Apr-18 (No. 217-02682) D4-Apr-18 (No. 217-02682) D4-Apr-18 (No. 217-02682) D4-Apr-18 (No. 217-02683) 30-Dac-17 (No. DAE-4-601_Oct17) Check Date (In house check Oct-16) 07-00-15 (In house check Oct-16) D7-Oct-15 (In house check Oct-16) D7-Oct-15 (In house check Oct-16)	C and humidity < 70% Scheduleit Calibration Apr-19 Apr-19 Apr-19 Apr-19 Apr-19 Apr-19 Dec-18 Oct-18 Scheduled Check In house check. Oct-18 In house check. Oct-18 In house check. Oct-18
All celibrations have been condu Calibration Equipment used (M8 Primary Standards Power sensor NRP-291 Power sensor HP 2481A Power sensor HP 2481A	Cied in the closed laboration TE critical for calibration) ID 4 SN: 104775 SN: 103245 SN: 5068 (20k) SN: 5068 (20k) SN: 5068 (20k) SN: 5067 2 / 06327 SN: 7349 SN: 601 ID # SN: GB57460704 SN: GB57460704 SN: GB57460704 SN: GB57460704 SN: US37290565 Name	ry facility: emitterement temperature (22 ± 3)* Cal Date (Certificate No.) D4-Apr-18 (No. 217-02872) D4-Apr-18 (No. 217-02872) D4-Apr-18 (No. 217-02872) D4-Apr-18 (No. 217-02873) D4-Apr-18 (No. 217-02882) D4-Apr-18 (No. 204-01_0_ct17) Check Date (In fouse check Oct-16) D7-Oct-15 (In fouse check Oct-16) D7-Oct-15 (In fouse check Oct-16) D7-Oct-15 (In fouse check Oct-16) 15-Jun-15 (In fouse check Oct-16) 15-Jun-15 (In fouse check Oct-16) 16-Oct-01 (In noise check Oct-16) 18-Oct-01 (In noise check Oct-17) Function	C and humidity < 70% Schaduell Calibration Apr-19 Apr-19 Apr-19 Apr-18 Apr-18 Dec-18 Dec-18 Dec-18 Oct-18 Scheduled Check. In house check. Oct-18 In house check. Oct-18 In house check. Oct-18 In house check. Oct-18
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Calibration Laboratory of Schmid & Partner

Engineering AG Zeugheusstrasez 43, 8604 Zurich, Switzerland



Schweizerischer Kalibrierdienst S Service suisso d'étalonnage C Servizio sviziero di taratura S Swiss Calibration Service

Accreditation No.: SCS 0108

Accredited by the Swiss Accorditation Service (SAS)

The Swiss Accreditation Service is one of the signatorias to the EA Multilateral Agreement for the recognition of calibration ourtificates

Glossary: TSL

tissue simulating liquid ConvF sensitivity in TSL / NORM x,y,z not applicable or not measured N/A

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless. communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)*, March 2010
- dy KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions: Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL: The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss: These parameters are measured with the dipole. positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay: One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured: SAR measured at the stated antenna input power.
- SAR normalized. SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Camilcate No: D1900V2-5d173 April

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Measurement Conditions

DASY system configuration, as far as not given on page

DASY5	V52:10.0
Advanced Extrapolation	
Modular Fist Phantom	
10 mm	with Spacer
cbi, dyi, dz. – 5 mm	
1900 MHz ± 1 MHz	
	Advanced Extrapolation Modular Fist Phantam 10 mm cbc, dy, dz. – § mm

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	411±8%	1,35 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.89 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	40.7 W/kg = 17.0 % (k=2)
SAB averaged over 10 cm ² (10 p) of Head TSL	oppetition	
SAR averaged over 10 cm ² (10 g) of Head TSL SAR measured	opridition 250 mW input power	5.21 W/kg

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	55.3 ± 6 %	1.47 mho/m±6 %
Body TSL temperature change during test	≤ 0.5 °C		

SAR result with Body TSL

SAR averaged over 1 cm ² (1 g) of Body TSL	Contition	
SAR measured	250 mW input power	9.93 W/kg
SAR for nominal Body TSL parameters	W1 of besilemon	40.9 W/kg ± 17.0 % (k=2)
264		
SAR averaged over 10 cm ² (10 g) of Body TSL	condition	
SAR averaged over 10 cm ³ (10 g) of Body TSL SAR measured	condition 250 mW input power	5.30 W/kg

Certificate No: D1900V2-5d173_April8

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Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	5140+510
Return Loss	- 25,6 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed pully	47.3 41 + 7.2 j0
Return Loss	- 22 1 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1,195 ns
electronic for the presentation of the second s	1.190 /05

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The clipple is made of standard semirigid conxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipola. The antenna is therefore short-circuited for DC-signals, Or nome of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurament Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	June 08, 2012

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DASY5 Validation Report for Head TSL

Date: 25.04.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d173

Communication System: UID 0 - CW: Frequency: 1900 MHz Medium parameters used: f = 1900 MHz; $\sigma = 1.35$ S/m; $\varepsilon_c = 41.1$; $\rho = 1000$ kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 SN7349; ConvF(8.18, 8.18, 8.18); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26,10.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 110.9 V/m; Power Drift = -0.01 dB Peak SAR (extrapolated) = 18.3 W/kg SAR(1 g) = 9.89 W/kg; SAR(10 g) = 5.21 W/kg

Maximum value of SAR (measured) = 15.2 W/kg



0 dB = 15.2 W/kg = 11.82 dBW/kg

Certificate No: D1900V2-5d173_Apr18

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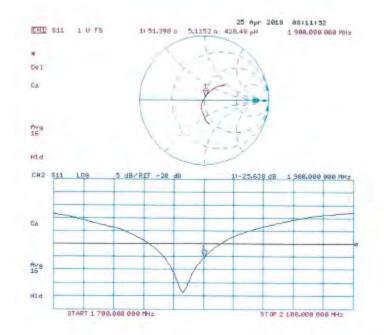
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Impedance Measurement Plot for Head TSL



Certificate No: D1900V2-5d173 Apr18

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DASY5 Validation Report for Body TSL

Date: 25.04.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d173

Communication System: UID 0 - CW; Frequency: 1900 MHz Medium parameters used: f = 1900 MHz; $\sigma = 1.47 \text{ S/m}$; $c_f = 55.3$; $p = 1000 \text{ kg/m}^3$ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 SN7349; ConvF(8.15, 8.15, 8.15); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26,10,2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Señal: 1002
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 104.6 V/m; Power Drift = -0.09 dB Peak SAR (extrapolated) = 17.7 W/kg SAR(1 g) = 9.93 W/kg; SAR(10 g) = 5.3 W/kg Maximum value of SAR (measured) = 14.7 W/kg



0 dB = 14.7 W/kg = 11.67 dBW/kg

Certificate No: D1900V2-5d173_Apr18

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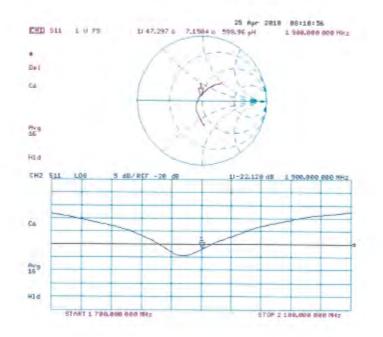
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Impedance Measurement Plot for Body TSL



Certificate No: D1900V2-5d173_Apr18

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Report No. : E5/2018/C0042 Page: 121 of 128

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Certificate No: D2450V2-727_Apr18

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Report No. : E5/2018/C0042 Page: 122 of 128

Calibration Laboratory of Schmid & Partner Engineering AG astrases 43, 8004 Zurich, Switzerland Zeugh



Sanweizerischer Kallbrierdi s Service suisse d'italonnage C Servizio svizzero di tarati s Swiss Calibration Service

Accreditation No.: SCS 0108

Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of collibution comflicative Glossary:

tissue simulating liquid TSL sensitivity in TSL / NORM x,y,z ConvF not applicable or not measured N/A

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate 6) (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010.
- d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions: Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL: The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented. parallel to the body axis.
- Feed Point impedance and Return Loss: These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay: One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured: SAR measured at the stated antenna input power.
- SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Certificate No: 02450V2-727_April 8

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Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASYS	V52.10.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	da, dy, dz. = 5 mm	
Frequency	2450 MHz = 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 "C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.3 ± 8 %	1.86 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		

SAR result with Head TSL

SAR averaged over 1 cm ⁵ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.3 W/kg
SAR for nominal Head TSL parameters	Wt of besilemon	52.1 W/kg ± 17.0 % (k=2)
SAR averaged over 10 cm ² (10 g) of Head TSL	condition	
SAR averaged over 10 cm ³ (10 g) of Head TSL SAR measured	condition 250 mW input power	8.16 W/kg

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mhd/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.5 ± 6 %	2.01 mhc/m = 6 %.
Body TSL temperature change during test	< 0,5 °C	_	(max)

SAR result with Body TSL

SAR sveraged over 1 cm ¹ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	12.9 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	50.8 W/kg ± 17.0 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Body TSL	conclition	
SAR averaged over 10 cm ³ (10 g) of Body TSL SAR measured	condition 250 mW input power	8.00 W/kg

Certificale No: D2450V2-727_Apr18

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Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	55.2 Ω + 2.7 JΩ
Return Loss	= 25.1 dB

Antenna Parameters with Body TSL

Impledance, transformed to lead point	51.2 (Q + 5.6 (Q
Return Loss	- 25.0 dB

General Antenna Parameters and Design

ictrical Delay (one direction)	1.149 ns
--------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semingid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAP data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole emits, because they might both or the soldered connections rear the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG	
Manufactured on	January 09, 2003	

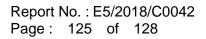
Certificate No: D2450V2-727_Apr18

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Date: 24.04.2018



DASY5 Validation Report for Head TSL

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:727

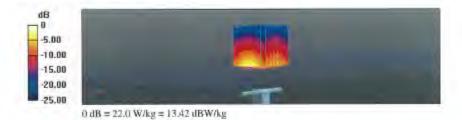
Communication System: UID 0 - CW; Frequency: 2450 MHz Medium parameters used: f = 2450 MHz; $\sigma = 1.86$ S/m; $\varepsilon_t = 38.3$; $\rho = 1000$ kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 SN7349; ConvF(7.88, 7.88, 7.88); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017 .
- Phantom: Flat Phantom 5.0 (front); Type; QD 000 P50 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 116.0 V/m; Power Drift = -0.06 dB Peak SAR (extrapolated) = 26.7 W/kg SAR(1 g) = 13.3 W/kg; SAR(10 g) = 6.16 W/kg Maximum value of SAR (measured) = 22.0 W/kg



Certificate No: D2450V2-727_April8

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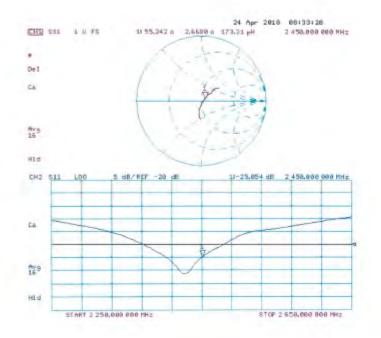
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Impedance Measurement Plot for Head TSL



Certificate No: D2450V2-727 Apr18

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DASY5 Validation Report for Body TSL

Date: 24.04.2018

Test Laboratory: SPEAG, Zurich, Switzerland

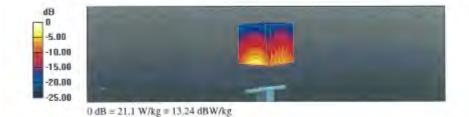
DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:727

Communication System: UID 0 - CW; Frequency: 2450 MHz Medium parameters used: f = 2450 MHz; $\sigma = 2.01$ S/m; $v_r = 52.5$; $\rho = 1000$ kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 SN7349; ConvF(8.01, 8.01, 8.01); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 108.4 V/m; Power Drift = -0.07 dB Peak SAR (extrapolated) = 25.5 W/kg SAR(1 g) = 12.9 W/kg; SAR(10 g) = 6 W/kg Maximum value of SAR (measured) = 21.1 W/kg



Certificate No: D2450V2-727 April8

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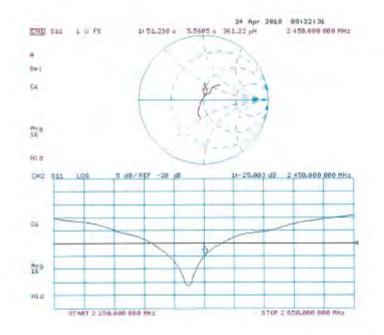
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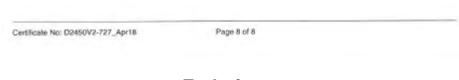
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Impedance Measurement Plot for Body TSL





- End of report -

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