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Accreditation No.: SCS 0108

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Glossary:

NORMx,y,z ConvF tissue simulating liquid sensitivity in free space sensitivity in TSL / NORMx,y,z diode compression point

DCP CF A, B, C, D

crest factor (1/duty_cycle) of the RF signal modulation dependent linearization parameters

Polarization φ

o rotation around probe axis

Polarization 9

9 rotation around an axis that is in the plane normal to probe axis (at measurement center),

i.e., 9 = 0 is normal to probe axis

Connector Angle

information used in DASY system to align probe sensor X to the robot coordinate system

Calibration is Performed According to the Following Standards:

- 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
- d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Methods Applied and Interpretation of Parameters:

- NORMx,y,z: Assessed for E-field polarization 9 = 0 (f ≤ 900 MHz in TEM-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(f)x,y,z = NORMx,y,z * frequency_response (see Frequency Response Chart). This linearization is
 implemented in DASY4 software 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 parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- 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 nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- 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 setups 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 sensitivity in TSL corresponds to NORMx,y,z * ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz
- Spherical isotropy (3D deviation from isotropy): in a field of low gradients realized using a flat phantom
 exposed by a patch antenna.
- Sensor Offset: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- Connector Angle: The angle is assessed using the information gained by determining the NORMx (no uncertainty required).

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DASY/EASY - Parameters of Probe: EX3DV4 - SN:7307

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm $(\mu V/(V/m)^2)^A$	0.43	0.56	0.62	± 10.1 %
DCP (mV) ^B	100.0	98.2	100.3	

Calibration Results for Modulation Response

UID	Communication System Name		A dB	B dBõV	С	D dB	VR mV	Max dev.	Max Unc ^E (k=2)
0	CW	X	0.00	0.00	1.00	0.00	153.0	± 3.0 %	± 4.7 %
	8	Y	0.00	0.00	1.00		151.6	333333333333333333333333333333333333333	AND AND SHOULD SHOULD
		Z	0.00	0.00	1.00		158.4		
10352-	Pulse Waveform (200Hz, 10%)	X	1.84	62.62	7.81	10.00	60.0	± 4.6 %	± 9.6 %
AAA		Y	6.38	76.27	14.75	,7	60.0		
		Z	1.45	61.01	7.00		60.0		
10353-	Pulse Waveform (200Hz, 20%)	X	0.81	60.00	5.70	6.99	80.0	± 3.2 %	± 9.6 %
AAA		Y	20.00	88.66	17.39		80.0		
		Z	0.86	60.00	5.68		80.0		
10354-	Pulse Waveform (200Hz, 40%)	X	0.45	60.00	4.93	3.98	95.0	± 1.7 %	± 9.6 %
AAA		Y	20.00	91.41	17.41		95.0		
		Z	0.51	60.00	5.04	1	95.0		
10355- AAA	Pulse Waveform (200Hz, 60%)	X	0.29	60.62	5.22	2.22	120.0	± 1.2 %	± 9.6 %
		Y	20.00	96.26	18.63		120.0		15
		Z	38.00	82.00	11.00		120.0		
10387-	QPSK Waveform, 1 MHz	X	1.69	67.29	15.38	1.00	150.0	± 1.8 %	± 9.6 %
AAA	**	Y	1.57	65.07	14.15		150.0		
		Z	1.73	66.94	15.28		150.0		
10388-	QPSK Waveform, 10 MHz	X	2.20	68.11	15.92	0.00	150.0	± 1.1 %	± 9.6 %
AAA		Y	2.08	66.56	14.89		150.0		
	19	Z	2.29	68.47	15.98		150.0		
10396-	64-QAM Waveform, 100 kHz	X	2.35	68.48	18.03	3.01	150.0	± 0.8 %	± 9.6 %
AAA		Y	2.51	68.48	17.79		150.0		
		Z	2.53	69.19	18.31		150.0		
10399- 64-Q	64-QAM Waveform, 40 MHz	X	3.38	66.64	15.59	0.00	150.0	± 0.9 %	± 9.6 %
AAA		Y	3.47	66.68	15.44		150.0		
		Z	3.45	66.86	15.65		150.0		
10414-	WLAN CCDF, 64-QAM, 40MHz	X	4.67	65.35	15.39	0.00	150.0	± 1.9 %	± 9.6 %
AAA		Y	4.64	64.85	15.04		150.0		
		Z	4.77	65.48	15.43		150.0		

Note: For details on UID parameters see Appendix

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%.

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A The uncertainties of Norm X,Y,Z do not affect the E²-field uncertainty inside TSL (see Pages 5 and 6).

B Numerical linearization parameter: uncertainty not required.

E Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the





DASY/EASY - Parameters of Probe: EX3DV4 - SN:7307

Sensor Model Parameters

	C1 fF	C2 fF	α V ⁻¹	T1 ms.V ⁻²	T2 ms.V ⁻¹	T3 ms	T4 V ⁻²	T5 V ⁻¹	Т6
X	35.6	260.75	34.45	5.76	0.00	4.90	1.28	0.00	1.00
Υ	41.0	304.44	35.07	7.30	0.00	5.01	1.33	0.09	1.01
Z	40.7	299.93	34.68	9.21	0.00	4.91	0.98	0.11	1.00

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	23.6
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 Diameter	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
Recommended Measurement Distance from Surface	1.4 mm

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DASY/EASY - Parameters of Probe: EX3DV4 - SN:7307

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF_Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unc (k=2)
64	54.2	0.75	14.38	14.38	14.38	0.00	1.00	± 13.3 %
150	52.3	0.76	13.49	13.49	13.49	0.00	1.00	± 13.3 %
300	45.3	0.87	11.83	11.83	11.83	0.10	1.20	± 13.3 %
450	43.5	0.87	11.16	11.16	11.16	0.12	1.30	± 13.3 %
750	41.9	0.89	10.41	10.41	10.41	0.55	0.80	± 12.0 %
835	41.5	0.90	10.20	10.20	10.20	0.47	0.80	± 12.0 %
900	41.5	0.97	9.95	9.95	9.95	0.44	0.87	± 12.0 %
1450	40.5	1.20	8.85	8.85	8.85	0.40	0.80	± 12.0 %
1640	40.2	1.31	8.74	8.74	8.74	0.39	0.86	± 12.0 %
1750	40.1	1.37	8.64	8.64	8.64	0.39	0.86	± 12.0 %
1810	40.0	1.40	8.39	8.39	8.39	0.38	0.86	± 12.0 %
1900	40.0	1.40	8.33	8.33	8.33	0.35	0.86	± 12.0 %
2000	40.0	1.40	8.31	8.31	8.31	0.35	0.88	± 12.0 %
2100	39.8	1.49	8.29	8.29	8.29	0.30	0.88	± 12.0 %
2300	39.5	1.67	8.15	8.15	8.15	0.33	0.90	± 12.0 %
2450	39.2	1.80	7.77	7.77	7.77	0.34	0.90	± 12.0 %
2600	39.0	1.96	7.61	7.61	7.61	0.35	0.90	± 12.0 %
3300	38.2	2.71	7.09	7.09	7.09	0.35	1.30	± 13.1 %
3500	37.9	2.91	6.72	6.72	6.72	0.35	1.30	± 13.1 %
3700	37.7	3.12	6.50	6.50	6.50	0.35	1.30	± 13.1 %
3900	37.5	3.32	6.60	6.60	6.60	0.40	1.60	± 13.1 %
4100	37.2	3.53	6.50	6.50	6.50	0.40	1.60	± 13.1 %
4200	37.1	3.63	6.40	6.40	6.40	0.40	1.70	± 13.1 %
4400	36.9	3.84	6.30	6.30	6.30	0.40	1.70	± 13.1 %
4600	36.7	4.04	6.22	6.22	6.22	0.40	1.70	± 13.1 9
4800	36.4	4.25	6.18	6.18	6.18	0.40	1.80	± 13.1 9
4950	36.3	4.40	5.90	5.90	5.90	0.40	1.80	± 13.1 9
5200	36.0	4.66	5.72	5.72	5.72	0.40	1.80	± 13.1 9
5250	35.9	4.71	5.61	5.61	5.61	0.40	1.80	± 13.1 9
5300	35.9	4.76	5.51	5.51	5.51	0.40	1.80	± 13.1 9
5500	35.6	4.96	5.20	5.20	5.20	0.40	1.80	± 13.1 9
5600	35.5	5.07	5.10	5.10	5.10	0.40	1.80	± 13.1 9
5750	35.4	5.22	5.05	5.05	5.05	0.40	1.80	± 13.1 9
5800	35.3	5.27	4.95	4.95	4.95	0.40	1.80	± 13.1 9

^C Frequency validity above 300 MHz of \pm 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to \pm 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty, for the indicated frequency band. Frequency validity below 300 MHz is \pm 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Validity of ConvF assessed at 6 MHz is \pm 4.9 MHz, and ConvF assessed at 13 MHz is \pm 9.19 MHz. Above 5 GHz frequency validity can be extended to \pm 110 MHz.

F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to \pm 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to \pm 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

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the ConvF uncertainty for indicated target tissue parameters.

Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.





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DASY/EASY - Parameters of Probe: EX3DV4 - SN:7307

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) ^C	Relative Permittivity F	Conductivity (S/m) F	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unc (k=2)
150	61.9	0.80	13.01	13.01	13.01	0.00	1.00	± 13.3 %
300	58.2	0.92	11.81	11.81	11.81	0.06	1.20	± 13.3 %
450	56.7	0.94	11.33	11.33	11.33	0.07	1.30	± 13.3 %
750	55.5	0.96	10.47	10.47	10.47	0.34	0.95	± 12.0 %
835	55.2	0.97	10.12	10.12	10.12	0.51	0.80	± 12.0 %
900	55.0	1.05	9.88	9.88	9.88	0.43	0.88	± 12.0 %
1450	54.0	1.30	8.90	8.90	8.90	0.34	0.80	± 12.0 %
1640	53.7	1.42	8.70	8.70	8.70	0.39	0.86	± 12.0 %
1750	53.4	1.49	8.41	8.41	8.41	0.45	0.86	± 12.0 %
1810	53.3	1.52	8.34	8.34	8.34	0.45	0.86	± 12.0 %
1900	53.3	1.52	8.30	8.30	8.30	0.32	0.88	± 12.0 %
2000	53.3	1.52	8.27	8.27	8.27	0.32	0.88	± 12.0 %
2100	53.2	1.62	8.24	8.24	8.24	0.42	0.88	± 12.0 %
2300	52.9	1.81	7.91	7.91	7.91	0.40	0.90	± 12.0 %
2450	52.7	1.95	7.79	7.79	7.79	0.34	0.90	± 12.0 %
2600	52.5	2.16	7.63	7.63	7.63	0.27	0.90	± 12.0 %
3300	51.6	3.08	6.66	6.66	6.66	0.40	1.30	± 13.1 %
3500	51.3	3.31	6.36	6.36	6.36	0.40	1.40	± 13.1 %
3700	51.0	3.55	6.27	6.27	6.27	0.40	1.40	± 13.1 %
3900	51.2	3.78	6.24	6.24	6.24	0.40	1.60	± 13.1 %
4100	50.5	4.01	6.20	6.20	6.20	0.40	1.60	± 13.1 %
4200	50.4	4.13	6.10	6.10	6.10	0.40	1.60	± 13.1 9
4400	50.1	4.37	6.02	6.02	6.02	0.40	1.70	± 13.1 9
4600	49.8	4.60	5.81	5.81	5.81	0.40	1.70	± 13.1 9
4800	49.6	4.83	5.50	5.50	5.50	0.50	1.90	± 13.1 %
4950	49.4	5.01	5.30	5.30	5.30	0.50	1.90	± 13.1 9
5200	49.0	5.30	4.85	4.85	4.85	0.50	1.90	± 13.1 9
5250	48.9	5.36	4.81	4.81	4.81	0.50	1.90	± 13.1 9
5300	48.9	5.42	4.80	4.80	4.80	0.50	1.90	± 13.1 9
5500	48.6	5.65	4.47	4.47	4.47	0.50	1.90	± 13.1 9
5600	48.5	5.77	4.37	4.37	4.37	0.50	1.90	± 13.1 9
5750	48.3	5.94	4.45	4.45	4.45	0.50	1.90	± 13.1 9
5800	48.2	6.00	4.31	4.31	4.31	0.50	1.90	± 13.1 9

^C Frequency validity above 300 MHz of \pm 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to \pm 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is \pm 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Validity of ConvF assessed at 6 MHz is 4-9 MHz, and ConvF assessed at 13 MHz is 9-19 MHz. Above 5 GHz frequency validity can be extended to \pm 110 MHz. Fat frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to \pm 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to \pm 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters. (ϵ and ϵ) below 10 minutes a parameters. Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than \pm 1% for frequencies below 3 GHz and below \pm 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

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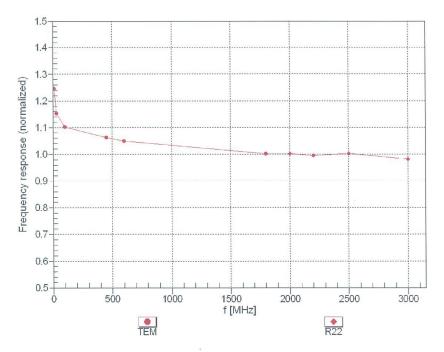
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Frequency Response of E-Field (TEM-Cell:ifi110 EXX, Waveguide: R22)



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

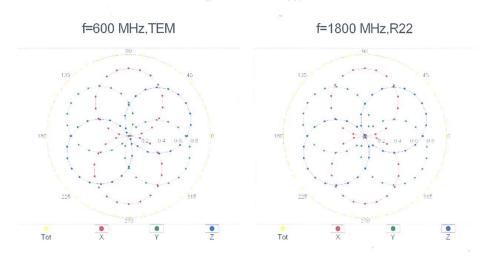
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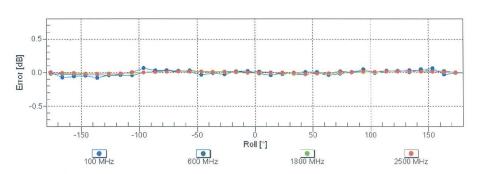
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Receiving Pattern (ϕ), $\vartheta = 0^{\circ}$





Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

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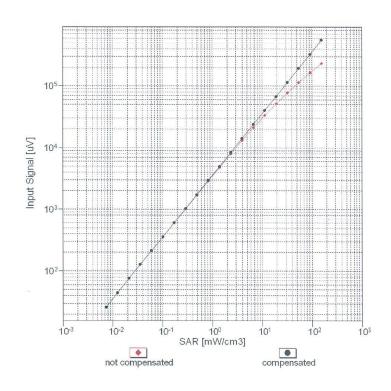
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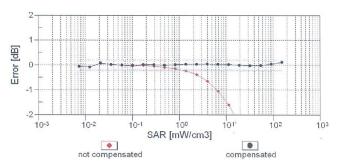




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Uncertainty of Linearity Assessment: ± 0.6% (k=2)

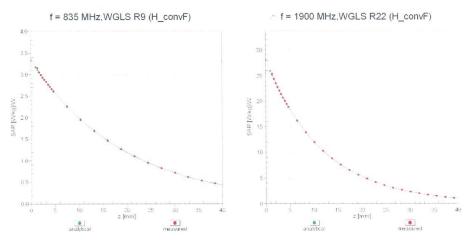
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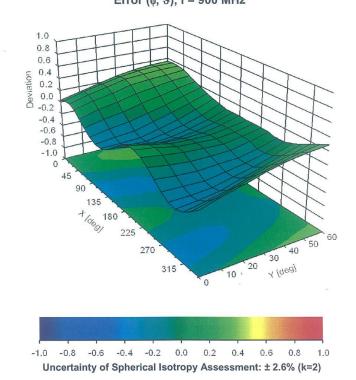




Conversion Factor Assessment



Deviation from Isotropy in Liquid Error (ϕ, ϑ) , f = 900 MHz



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Appendix: Modulation Calibration Parameters

UID	Rev	Communication System Name	Group	PAR (dB)	Unc ^E (k=2)
0		CW	CW	0.00	± 4.7 %
10010	CAA	SAR Validation (Square, 100ms, 10ms)	Test	10.00	± 9.6 %
10011	CAB	UMTS-FDD (WCDMA)	WCDMA	2.91	± 9.6 %
10012	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps)	WLAN	1.87	± 9.6 %
10013	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps)	WLAN	9.46	± 9.6 %
10021	DAC	GSM-FDD (TDMA, GMSK)	GSM	9.39	± 9.6 %
10023	DAC	GPRS-FDD (TDMA, GMSK, TN 0)	GSM	9.57	± 9.6 %
10024	DAC	GPRS-FDD (TDMA, GMSK, TN 0-1)	GSM	6.56	± 9.6 %
10025	DAC	EDGE-FDD (TDMA, 8PSK, TN 0)	GSM	12.62	± 9.6 %
10026	DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1)	GSM	9.55	± 9.6 %
10027	DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2)	GSM	4.80	± 9.6 %
10028	DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2-3)	GSM	3.55	± 9.6 %
10029	DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2)	GSM	7.78	± 9.6 %
10030	CAA	IEEE 802.15.1 Bluetooth (GFSK, DH1)	Bluetooth	5.30	± 9.6 %
10031	CAA	IEEE 802.15.1 Bluetooth (GFSK, DH3)	Bluetooth	1.87	± 9.6 %
10032	CAA	IEEE 802.15.1 Bluetooth (GFSK, DH5)	Bluetooth	1.16	± 9.6 %
10033	CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH1)	Bluetooth	7.74	± 9.6 %
10034	CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH3)	Bluetooth	4.53	± 9.6 %
10035	CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH5)	Bluetooth	3.83	± 9.6 %
10036	CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH1)	Bluetooth	8.01	± 9.6 %
10037	CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH3)	Bluetooth	4.77	± 9.6 %
10037	CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH5)	Bluetooth	4.10	± 9.6 %
10039	CAB	CDMA2000 (1xRTT, RC1)	CDMA2000	4.57	± 9.6 %
10033	CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Halfrate)	AMPS	7.78	± 9.6 %
10042	CAA	IS-91/EIA/TIA-553 FDD (FDMA, FM)	AMPS	0.00	± 9.6 %
10044	CAA	DECT (TDD, TDMA/FDM, GFSK, Full Slot, 24)	DECT	13.80	± 9.6 %
10049	CAA	DECT (TDD, TDMA/FDM, GFSK, Double Slot, 12)	DECT	10.79	± 9.6 %
10043	CAA	UMTS-TDD (TD-SCDMA, 1.28 Mcps)	TD-SCDMA	11.01	± 9.6 %
10058	DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2-3)	GSM	6.52	± 9.6 %
10059	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps)	WLAN	2.12	± 9.6 %
10060	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps)	WLAN	2.83	± 9.6 %
10061	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps)	WLAN	3.60	± 9.6 %
10062	CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps)	WLAN	8.68	± 9.6 %
10062	CAC	IEEE 802.11a/n WiFi 5 GHz (OFDM, 9 Mbps)	WLAN	8.63	± 9.6 %
10064	CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps)	WLAN	9.09	± 9.6 %
10065	CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps)	WLAN	9.00	± 9.6 %
10066	CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 16 Mbps)	WLAN	9.38	± 9.6 %
10067	CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps)	WLAN	10.12	± 9.6 %
10068	CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps)	WLAN	10.12	± 9.6 %
10069	CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps)	WLAN	10.24	± 9.6 %
10003	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 9 Mbps)	WLAN	9.83	± 9.6 %
10071	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 9 Mbps)	WLAN	9.62	± 9.6 %
10072	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 12 Mbps)	WLAN	9.02	± 9.6 %
10073	CAB	IEEE 802.11g WiF1 2.4 GHz (DSSS/OFDM, 18 Mbps)	WLAN	10.30	± 9.6 %
10074	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 24 Mbps)	WLAN	10.30	± 9.6 %
10075	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 36 Mbps)	WLAN	10.77	± 9.6 %
10076	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 46 Mbps)	WLAN	11.00	± 9.6 %
10077	CAB	CDMA2000 (1xRTT, RC3)	CDMA2000	3.97	± 9.6 %
10081	CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Fullrate)	AMPS	4.77	± 9.6 %
10082	DAC	GPRS-FDD (TDMA, GMSK, TN 0-4)	GSM	6.56	
10090	CAB	UMTS-FDD (HSDPA)	WCDMA		± 9.6 %
10097	CAB	UMTS-FDD (HSUPA) UMTS-FDD (HSUPA, Subtest 2)	WCDMA	3.98	± 9.6 %
10098	DAC	EDGE-FDD (HSUPA, Subtest 2)		3.98	± 9.6 %
10100	CAE			0.00	± 9.6 %
	CAE	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD LTE-FDD	5.67	± 9.6 %
10101		LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)		6.42	± 9.6 %
10102	CAE	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	6.60	± 9.6 %
		A CONTRACT OF THE PROPERTY OF	LTE-TDD	9.29	± 9.6 %
10104	CAG	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	LTE-TDD	9.97	± 9.6 %
10105	CAG	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	LTE-TDD	10.01	± 9.6 %
	LAG	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	LTE-FDD	5.80	± 9.6 %

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10109	CAG	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	LTE-FDD	6.43	± 9.6 %
10110	CAG	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	LTE-FDD	5.75	± 9.6 %
10111	CAG	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	LTE-FDD	6.44	± 9.6 %
10112	CAG	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	LTE-FDD	6.59	± 9.6 %
10113	CAG	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	LTE-FDD	6.62	± 9.6 %
10114	CAC	IEEE 802.11n (HT Greenfield, 13.5 Mbps, BPSK)	WLAN	8.10	± 9.6 %
10115	CAC	IEEE 802.11n (HT Greenfield, 81 Mbps, 16-QAM)	WLAN	8.46	± 9.6 %
10116	CAC	IEEE 802.11n (HT Greenfield, 135 Mbps, 64-QAM)	WLAN	8.15	± 9.6 %
10117	CAC	IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK)	WLAN	8.07	± 9.6 %
10118	CAC	IEEE 802.11n (HT Mixed, 81 Mbps, 16-QAM)	WLAN	8.59	± 9.6 %
10119	CAC	IEEE 802.11n (HT Mixed, 135 Mbps, 64-QAM)	WLAN	8.13	± 9.6 %
10140	CAE	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	LTE-FDD	6.49	± 9.6 %
10141	CAE	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	LTE-FDD	6.53	± 9.6 %
10142	CAE	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	LTE-FDD	5.73	± 9.6 %
10143	CAE	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	LTE-FDD	6.35	± 9.6 %
10144	CAE	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	LTE-FDD	6.65	± 9.6 %
10145	CAF	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	LTE-FDD	5.76	± 9.6 %
10146	CAF	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	LTE-FDD	6.41	± 9.6 %
10147	CAF	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	LTE-FDD	6.72	± 9.6 %
10147	CAE	LTE-FDD (SC-FDMA, 100 % RB, 1.4 MHz, 16-QAM)	LTE-FDD	6.42	± 9.6 %
10149	CAE	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	LTE-FDD	6.60	± 9.6 %
10150	CAG	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	LTE-FDD		
10151	CAG	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	LTE-TDD	9.28 9.92	± 9.6 % ± 9.6 %
10152	CAG	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	LTE-TDD		
10153	CAG	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	LTE-TOD	10.05	± 9.6 %
10154				5.75	± 9.6 %
	CAG	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM) LTE-FDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	LTE-FDD	6.43	± 9.6 %
10156	CAG		LTE-FDD	5.79	± 9.6 %
10157	CAG	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	LTE-FDD	6.49	± 9.6 %
10158	CAG	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	LTE-FDD	6.62	± 9.6 %
10159	CAG	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	LTE-FDD	6.56	± 9.6 %
10160	CAE	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	LTE-FDD	5.82	± 9.6 %
10161	CAE	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	LTE-FDD	6.43	± 9.6 %
10162	CAE	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	LTE-FDD	6.58	± 9.6 %
10166	CAF	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	LTE-FDD	5.46	± 9.6 %
10167	CAF	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	LTE-FDD	6.21	± 9.6 %
10168	CAF	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	LTE-FDD	6.79	± 9.6 %
10169	CAE	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	LTE-FDD	5.73	± 9.6 %
10170	CAE	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	LTE-FDD	6.52	± 9.6 %
10171	AAE	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	LTE-FDD	6.49	± 9.6 %
10172	CAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	LTE-TDD	9.21	± 9.6 %
10173	CAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	LTE-TDD	9.48	± 9.6 %
10174	CAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	LTE-TDD	10.25	± 9.6 %
10175	CAG	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	LTE-FDD	5.72	± 9.6 %
10176	CAG	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	LTE-FDD	6.52	± 9.6 %
10177	CAI	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	LTE-FDD	5.73	± 9.6 %
10178	CAG	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	LTE-FDD	6.52	± 9.6 %
10179	CAG	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	LTE-FDD	6.50	± 9.6 %
10180	CAG	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	LTE-FDD	6.50	± 9.6 %
10181	CAE	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	LTE-FDD	5.72	± 9.6 %
10182	CAE	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	6.52	± 9.6 %
10183	AAD	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	LTE-FDD	6.50	± 9.6 %
10184	CAE	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	LTE-FDD	5.73	± 9.6 %
10185	CAE	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	LTE-FDD	6.51	± 9.6 %
10186	AAE	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	LTE-FDD	6.50	± 9.6 %
10187	CAF	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	LTE-FDD	5.73	± 9.6 %
10188	CAF	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	\ LTE-FDD	6.52	± 9.6 %
10189	AAF	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	LTE-FDD	6.50	± 9.6 %
10193	CAC	IEEE 802.11n (HT Greenfield, 6.5 Mbps, BPSK)	WLAN	8.09	± 9.6 %
10194	CAC	IEEE 802.11n (HT Greenfield, 39 Mbps, 16-QAM)	WLAN	8.12	± 9.6 %
10195	CAC	IEEE 802.11n (HT Greenfield, 65 Mbps, 64-QAM)	WLAN	8.21	± 9.6 %
10196	CAC	IEEE 802.11n (HT Mixed, 6.5 Mbps, BPSK)	WLAN	8.10	± 9.6 %
10197	CAC	IEEE 802.11n (HT Mixed, 39 Mbps, 16-QAM)	WLAN	8.13	± 9.6 %
		IEEE 802.11n (HT Mixed, 65 Mbps, 64-QAM)			
10198	CAC	TEEE 802.11ft (FT MIXED, 65 MDDS, 64-QAM)	WLAN	8.27	± 9.6 %

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10220	CAC	IEEE 802.11n (HT Mixed, 43.3 Mbps, 16-QAM)	WLAN	8.13	± 9.6 %
10221	CAC	IEEE 802.11n (HT Mixed, 72.2 Mbps, 64-QAM)	WLAN	8.27	± 9.6 %
10222	CAC	IEEE 802.11n (HT Mixed, 15 Mbps, BPSK)	WLAN	8.06	± 9.6 %
10223	CAC	IEEE 802.11n (HT Mixed, 90 Mbps, 16-QAM)	WLAN	8.48	± 9.6 %
10224	CAC	IEEE 802.11n (HT Mixed, 35 Mbps, 64-QAM)	WLAN	8.08	± 9.6 %
10225	CAB	UMTS-FDD (HSPA+)	WCDMA	5.97	± 9.6 %
10226	CAB	LTE-TDD (SC-FDMA, 1 RB, 1,4 MHz, 16-QAM)	LTE-TDD	9.49	± 9.6 %
10227	CAB	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	LTE-TDD	10.26	± 9.6 %
10227	CAB	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	LTE-TDD	9.22	± 9.6 %
10228	CAD		LTE-TDD		
		LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	LTE-TDD	9.48	± 9.6 %
10230	CAD	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM) LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK)		10.25	± 9.6 %
10231	CAD		LTE-TDD	9.19	± 9.6 %
0232	CAG	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	LTE-TDD	9.48	± 9.6 %
10233	CAG	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	LTE-TDD	10.25	± 9.6 %
0234	CAG	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	LTE-TDD	9.21	± 9.6 %
10235	CAG	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	LTE-TDD	9.48	± 9.6 %
10236	CAG	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	LTE-TDD	10.25	± 9.6 9
10237	CAG	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	LTE-TDD	9.21	± 9.6 %
10238	CAF	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-TDD	9.48	± 9.6 9
0239	CAF	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	LTE-TDD	10.25	± 9.6 9
0240	CAF	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	LTE-TDD	9.21	± 9.6 °
0241	CAB	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	LTE-TDD	9.82	± 9.6
0242	CAB	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	LTE-TDD	9.86	± 9.6
0243	CAB	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	LTE-TDD	9.46	± 9.6
0244	CAD	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	LTE-TDD	10.06	± 9.6
10245	CAD	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	LTE-TDD	10.06	± 9.6
10246	CAD	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	LTE-TDD	9.30	± 9.6
10247	CAG	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	LTE-TDD	9.91	± 9.6
10248	CAG	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	LTE-TDD	10.09	± 9.6
10249	CAG	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	LTE-TDD	9.29	± 9.6
10250	CAG	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	LTE-TDD	9.81	± 9.6
10251	CAG	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	LTE-TDD	10.17	± 9.6
10252	CAG	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	LTE-TDD	9.24	± 9.6
10253	CAF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	LTE-TDD	9.90	± 9.6
10254	CAF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	LTE-TDD	10.14	± 9.6
10255	CAF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	LTE-TDD	9.20	± 9.6
10256	CAB	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	LTE-TDD	9.96	± 9.6
10257	CAB	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	LTE-TDD	10.08	± 9.6
10257	CAB	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 04-QAM)	LTE-TDD	9.34	± 9.6
1100 1100 1100			LTE-TDD		
10259	CAD	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)		9.98	± 9.6
10260	CAD	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	LTE-TDD	9.97	± 9.6
10261	CAD	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	LTE-TDD	9.24	± 9.6
10262	CAG	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	LTE-TDD	9.83	± 9.6
10263	CAG	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	LTE-TDD	10.16	± 9.6
10264	CAG	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	LTE-TDD	9.23	± 9.6
10265	CAG	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	LTE-TDD	9.92	± 9.6
10266	CAG	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	LTE-TDD	10.07	± 9.6
10267	CAG	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	LTE-TDD	9.30	± 9.6
10268	CAF	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	LTE-TDD	10.06	± 9.6
10269	CAF	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	LTE-TDD	10.13	± 9.6
10270	CAF	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	LTE-TDD	9.58	± 9.6
10274	CAB	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.10)	WCDMA	4.87	± 9.6
10275	CAB	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.4)	WCDMA	3.96	± 9.6
10277	CAA	PHS (QPSK)	PHS	11.81	± 9.6
	CAA	PHS (QPSK, BW 884MHz, Rolloff 0.5)	PHS	11.81	± 9.6
10278	CAA	PHS (QPSK, BW 884MHz, Rolloff 0.38)	PHS	12.18	± 9.6
		CDMA2000, RC1, SO55, Full Rate	CDMA2000	3.91	± 9.6
10279	I AAB	CDMA2000, RC3, SO55, Full Rate	CDMA2000	3.46	± 9.6
10279 10290	AAB			5.40	
10279 10290 10291	AAB		CDMA2000	3 39	1 + 9 6
10279 10290 10291 10292	AAB AAB	CDMA2000, RC3, SO32, Full Rate	CDMA2000	3.39	
10279 10290 10291 10292 10293	AAB AAB	CDMA2000, RC3, SO32, Full Rate CDMA2000, RC3, SO3, Full Rate	CDMA2000	3.50	± 9.6
10278 10279 10290 10291 10292 10293 10295	AAB AAB AAB	CDMA2000, RC3, SO32, Full Rate CDMA2000, RC3, SO3, Full Rate CDMA2000, RC1, SO3, 1/8th Rate 25 fr.	CDMA2000 CDMA2000	3.50 12.49	± 9.6 ± 9.6 ± 9.6
10279 10290 10291 10292 10293	AAB AAB	CDMA2000, RC3, SO32, Full Rate CDMA2000, RC3, SO3, Full Rate	CDMA2000	3.50	± 9.6

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