

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C AND RSS 247 REQUIREMENT

	OF
Applicant:	Quanta Computer Inc.
	No. 188, Wenhua 2nd Road, Guishan District, Taoyuan City 33377,
	Taiwan
Product Name:	Clover Mini Enterprise/Clover Station Pro Terminal
Brand Name:	clover
Model No.:	C303, C503
Model Difference:	C303 is a standalone POS terminal. C503 includes the same
	POS terminal (C303) but comes with an included peripheral
	display (S503).
FCC ID:	HFS-CX03U
IC:	1787B-CX03U
Report Number:	T190612W02-RP5
FCC Rule Part:	§15.247, Cat: DSS
IC Rule Part:	RSS-247 issue 2 Feb 2017
Issue Date:	Jul. 12, 2019
Date of Test:	Jun. 14, 2019 ~ Jul. 09, 2019
Date of EUT Received:	Jun. 14, 2019
Issued by	Compliance Certification Services Inc.Wugu Lab.
	No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan.
	(R.O.C.)
	service@ccsrf.com

The test Result was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were given in ANSI C63.10: 2013 and compliance standards.

The test results of this report relate only to the tested sample (EUT) identified in this report. The test Report of full or partial shall not copy. Without written approval of Compliance Certification Services Inc. (Wugu Laboratory).

Tested By:

one Hirer

Hone Hsieh / Engineer

/m

Approved By:

Kevin Tsai / Deputy Manager



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Revision History

Report Number	Revision	Description	Effected Page	Issue Date	Revised By
T190612W02-RP5	Rev.00	Initial creation of document	All	Jul. 12, 2019	Elle Chang

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GENERAL INFORMATION 1

1.1 Product description

General:

Product Name:	Clover Mini Enterprise/Clover Station Pro Terminal		
Brand Name:	clover		
Model No.:	C303, C503		
Model Difference:	C303 is a standalone POS terminal. C503 includes the same POS terminal (C303) but comes with an included peripheral display (S503)		
Product SW/HW version:	N/A / 4.01		
Radio SW/HW version:	N/A / N/A		
Test SW Version:	N/A		
RF power setting in TEST SW:	N/A		
Micro Hub:	Model No.: H303, Supplier: clover		
	12V from Hub and Adapter		
Power Supply:	Battery: Model No.: YJ3B, Supplier: N/A		
	Adapter: Model No.: FSP040-RHBN3, Supplier: FSP		

Bluetooth_BR+EDR:

Bluetooth Version:	Bluetooth V5.0 Dual Mode
Channel number:	79 channels
Modulation type:	GFSK + π/4DQPSK + 8DPSK
Transmit Power:	7.03 dBm
Frequency Range:	2.402GHz – 2.480GHz
Dwell Time:	<= 0.4s
Antenna Designation:	 PIFA Antenna, 1. P/N: GD9320-15-001-R, Supplier: SAA, Antenna Gain: 0.08dBi (Main) 2. P/N: LA81FP017-1H, Supplier: Luxshare-ICT Antenna Gain: 2.1dBi (Main)

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1.2 Test Methodology of Applied Standards

Canada RSS-247 issue 2 Feb. 2017 RSS-Gen. issue 5 Apr. 2018 FCC Part 15, Subpart C §15.247

ANSI C63.10:2013

Note: All test items have been performed and record as per the above standards.

1.3 Test Facility

Compliance Certification Services Inc. Wugu Lab. No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan. (R.O.C.) (TAF code 1309)

FCC Designation number: TW1309

Canada Registration Number: TW1309

1.4 Special Accessories

There is no special accessory used while test was conducted.

1.5 Equipment Modifications

There was no modification incorporated into the EUT.

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2 SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

An engineering test mode (software/firmware) that applicant provided was utilized to manipulate the EUT into transmit, selection of the test channel, and modulation scheme.

2.3 Test Procedure

2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plan. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz,. The CISPR Quasi-Peak and Average detector mode is employed according to §15.207. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

2.3.2 Radiated Emissions

The EUT is a placed on as turn table. For emissions testing at or below 1 GHz, the table height shall be 0.8 m above the reference ground plan. For emission measurements above 1 GHz, the table height shall be 1.5 m. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated

emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.

2.4 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuation factor between EUT conducted port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly EUT RF output level.

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2.5 Configuration of Tested System

Fig. 2-1 Radiated Emission Configuration

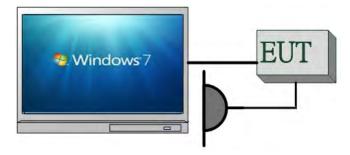


Fig. 2-2 Conducted Emission Configuration



Fig.2-2 Conduction (AC Power Line) Configuration

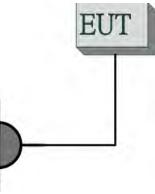


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1	Bluetooth Test Software	N/A	N/A	N/A	N/A	N/A
2.	Notebook	Lenovo	L420	S0012467	Shielded	Unshielded

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UMMARY OF TEST RESULTS 3

FCC Rules	IC Rules	Description Of Test	Result
§15.207(a)	RSS-Gen §8.8	AC Power Line Conducted Emission	Compliant
§15.247(b)(1)	RSS-247 §5.4 (2)	Peak Output Power	Compliant
§15.247(a)(1)	RSS-247 §5.1 (1) RSS-Gen §6.6	20dB & 99% Bandwidth	Compliant
§15.247(d)	RSS-247 §5.5	Conducted Band Edge and Spurious Emission	Compliant
§15.247(d)	RSS-247 §5.5	Radiated Band Edge and Spurious Emission	Compliant
§15.247(a)(1)	RSS-247 §5.1 (2)	Frequency Separation	Compliant
§15.247(a)(1)(iii)	RSS-247 §5.1 (4)	Number of hopping frequency	Compliant
§15.247(a)(1)(iii)	RSS-247 §5.1 (4)	Time of Occupancy	Compliant
§15.203 §15.247(b)	RSS- Gen §6.8	Antenna Requirement	Compliant

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DESCRIPTION OF TEST MODES 4

4.1 Operated in 2400 ~ 2483.5MHz Band

79 channels are provided for Bluetooth

ITEM	FREQUENCY	ITEM	FREQUENCY	ITEM	FREQUENCY	ITEM	FREQUENCY
1	2402 MHz	21	2422 MHz	41	2442 MHz	71	2462 MHz
2	2403 MHz	22	2423 MHz	42	2443 MHz	72	2463 MHz
3	2404 MHz	23	2424 MHz	43	2444 MHz	73	2464 MHz
4	2405 MHz	24	2425 MHz	44	2445 MHz	74	2465 MHz
5	2406 MHz	25	2426 MHz	45	2446 MHz	75	2466 MHz
6	2407 MHz	26	2427 MHz	46	2447 MHz	76	2467 MHz
7	2408 MHz	27	2428 MHz	47	2448 MHz	77	2468 MHz
8	2409 MHz	28	2429 MHz	48	2449 MHz	78	2469 MHz
9	2410 MHz	29	2430 MHz	49	2450 MHz	79	2470 MHz
10	2411 MHz	30	2431 MHz	50	2451 MHz	70	2471 MHz
11	2412 MHz	31	2432 MHz	51	2452 MHz	71	2472 MHz
12	2413 MHz	32	2433 MHz	52	2453 MHz	72	2473 MHz
13	2414 MHz	33	2434 MHz	53	2454 MHz	73	2474 MHz
14	2415 MHz	34	2435 MHz	54	2455 MHz	74	2475 MHz
15	2416 MHz	35	2436 MHz	55	2456 MHz	75	2476 MHz
16	2417 MHz	36	2437 MHz	56	2457 MHz	76	2477 MHz
17	2418 MHz	37	2438 MHz	57	2458 MHz	77	2478 MHz
18	2419 MHz	38	2439 MHz	58	2459 MHz	78	2479 MHz
19	2420 MHz	39	2440 MHz	59	2460 MHz	79	2480 MHz
20	2421 MHz	40	2441 MHz	60	2461 MHz		

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4.2 The Worst Test Modes and Channel Details

- The EUT has been tested under operating condition. 1
- 2 Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.
- Investigation has been done on all the possible configurations for searching the worst 3 case.

AC POWER LINE CONDUCTED EMISSION TEST:

Test Condition	AC Power line conducted emission for line and neutral
Worst Case	Operation in normal mode

RADIATED EMISSION TEST:

RADIATED EMISSION TEST (BELOW 1 GHz)						
MODE	AVAILABLE FREQUENCY (MHz)	TESTED FREQUENCY (MHz)	MODULATION	PACKET TYPE		
Bluetooth	2402 to 2480	2441	GFSK	DH5		
	RADIATED EMISSION TEST (ABOVE 1 GHz)					
Bluetooth	2402 to 2480	2402, 2441, 2480	GFSK	DH5		

Note:

The field strength of radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for Bluetooth BR+EDR Transmitter for channel Low, Mid and High, the worst case E2 position was reported.

ANTENNA PORT CONDUCTED MEASUREMENT:

	CONDUCTED TEST					
		Peak Output Power,	20dB Band Width			
MODE	AVAILABLE FREQUENCY (MHz)	TESTED FREQUENCY (MHz)	MODULATION	PACKET TYPE		
Bluetooth	2402 to 2480	2402, 2441, 2480	GFSK, π/4-DQPSK, 8DPSK	DH5		
	Band Edge					
Bluetooth	2402 to 2480	2402, 2441, 2480	GFSK, 8DPSK	DH5		
		Frequency S	Separation			
Bluetooth	2402 to 2480	2402, 2441, 2480	GFSK	DH5		
		Number of hopp	ing frequency			
Bluetooth	2402 to 2480	2402, 2441, 2480	GFSK	DH5		
Time of Occupancy (Dwell time)						
Bluetooth	2402 to 2480	2402, 2441, 2480	GFSK	DH1/DH3/DH5		
Bluetooth	2402 to 2480	2441	π/4-DQPSK, 8DPSK	DH1/DH3/DH5		

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MEASUREMENT UNCERTAINTY 5

PARAMETER	UNCERTAINTY
AC Powerline Conducted Emission	+/- 1.2575 dB
Peak Output Power	+/- 1.924 dB
20dB Bandwidth	+/- 147.256 Hz
100 kHz Bandwidth of Frequency Band Edges	+/- 1.924 dB
Frequency Separation	+/- 147.256 Hz
Number of hopping frequency	+/- 147.256 Hz
Time of Occupancy	+/- 147.256 Hz
3M Semi Anechoic Chamber / 30M~200M	+/- 4.12 dB
3M Semi Anechoic Chamber / 200M~1000M	+/- 4.68 dB
3M Semi Anechoic Chamber / 1G~8G	+/- 5.18 dB
3M Semi Anechoic Chamber / 8G~18G	+/- 5.47 dB
3M Semi Anechoic Chamber / 18G~26G	+/- 3.81 dB
3M Semi Anechoic Chamber / 26G~40G	+/- 3.87 dB

Note:

- 1. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
- 2. The conformity assessment statement in this report is based solely on the test results, measurement uncertainty is excluded.

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CONDUCTED EMISSION TEST

6.1 Standard Applicable

Frequency within 150 kHz to 30MHz shall not exceed the limit table as below.

Frequency range	Lin dB(nits uV)
MHz	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Note

1. The lower limit shall apply at the transition frequencies

2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

6.2 Measurement Equipment Used

	Conducted Emission Test Site					
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.	
TYPE		NUMBER	NUMBER	CAL.		
CABLE	EMCI	CFD300-NL	CERF	06/29/2018	06/28/2019	
EMI Test Receiver	R&S	ESCI	100064	07/24/2018	07/23/2019	
LISN	SCHWARZBECK	NSLK 8127	8127-541	01/31/2019	01/30/2020	
LISN	SCHAFFNER	NNB 41	03/10013	02/13/2019	02/12/2020	
Software		EZ-EMC(CCS-3A1-CE)			

6.3 EUT Setup

- 1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI 63.10:2013.
- 2. The AC/DC Power adaptor of EUT was plug-in LISN. The EUT was placed flushed with the rear of the table.
- 3. The LISN was connected with 120Vac/60Hz power source.

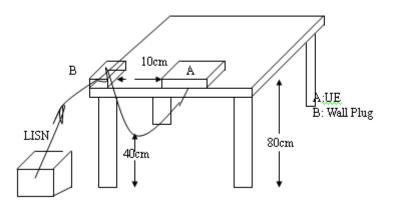
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6.4 Test SET-UP (Block Diagram of Configuration)



6.5 Measurement Procedure

- 1. The EUT was placed on a table which is 0.8m above ground plan.
- 2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 3. Repeat above procedures until all frequency measured were complete.

6.6 Measurement Result

Note: Refer to next page for measurement data and plots. Note2: The * reveals the worst-case results that closet to the limit

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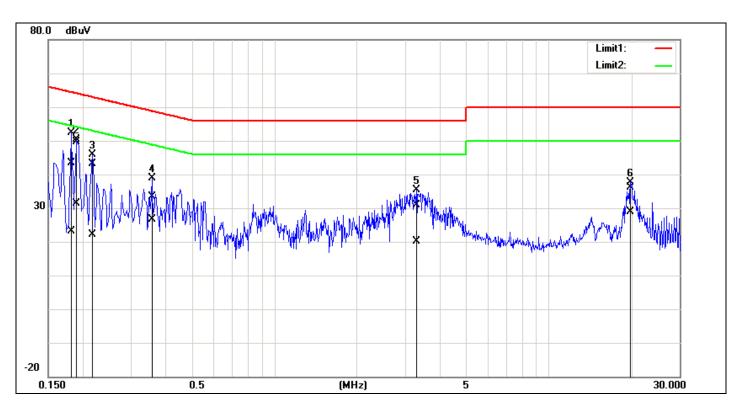
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AC POWER LINE CONDUCTED EMISSION TEST DATA

Description:	Operation	Date:	2019/6/21
Line:	L1	Temp.(℃)/Hum.(%):	26.9(℃)/67%
Test Voltage: Job No.:	AC 120V/60Hz T190612W02	Test By:	Henry



No.	Frequency	QuasiPeak	Average	Correction	QuasiPeak	Average	QuasiPeak	Average	QuasiPeak	Average	Remark
		reading	reading	factor	result	result	limit	limit	margin	margin	
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1	0.1819	33.32	13.08	10.13	43.45	23.21	64.39	54.40	-20.94	-31.19	Pass
2*	0.1900	39.57	21.21	10.13	49.70	31.34	64.03	54.04	-14.33	-22.70	Pass
3	0.2180	33.06	11.91	10.13	43.19	22.04	62.89	52.89	-19.70	-30.85	Pass
4	0.3580	23.24	16.59	10.14	33.38	26.73	58.77	48.77	-25.39	-22.04	Pass
5	3.3020	20.69	9.81	10.22	30.91	20.03	56.00	46.00	-25.09	-25.97	Pass
6	19.9180	25.72	18.45	10.37	36.09	28.82	60.00	50.00	-23.91	-21.18	Pass

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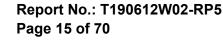
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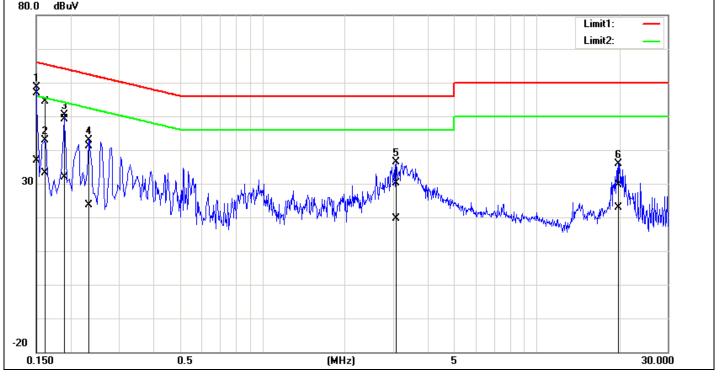
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Description:	Operation	Date:	2019/6/21
Line:	N	Temp.(℃)/Hum.(%):	26.9(°C)/67%
Test Voltage:	AC 120V/60Hz	Test By:	Henry
Job No.:	T190612W02	,	,



No.	Frequency	QuasiPeak	Average	Correction	QuasiPeak	Average	QuasiPeak	Average	QuasiPeak	Average	Remark
		reading	reading	factor	result	result	limit	limit	margin	margin	
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1*	0.1500	46.87	26.82	10.02	56.89	36.84	65.99	56.00	-9.10	-19.16	Pass
2	0.1620	44.27	23.03	10.02	54.29	33.05	65.36	55.36	-11.07	-22.31	Pass
3	0.1900	39.05	21.93	10.02	49.07	31.95	64.03	54.04	-14.96	-22.09	Pass
4	0.2340	31.20	13.69	10.02	41.22	23.71	62.30	52.31	-21.08	-28.60	Pass
5	3.0820	20.00	9.45	10.08	30.08	19.53	56.00	46.00	-25.92	-26.47	Pass
6	19.9100	19.28	12.68	10.27	29.55	22.95	60.00	50.00	-30.45	-27.05	Pass

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7 PEAK OUTPUT POWER MEASUREMENT

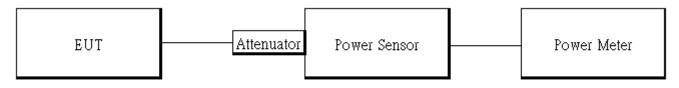
7.1 Standard Applicable

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 hopping channels, The Limit: 1Watt. For all other frequency hopping systems in the 2400 – 2483.5MHz band: The Limit: 0.125 Watts. The power limit for 1Mbps is 1watt, and 2Mbps, 3Mbps and AFH mode are 0.125 watts and the e.i.r.p. shall not exceed 0.5 W if the hop set uses less than 75 hopping channels.

7.2 Measurement Equipment Used

	Conducted Emission Test Site						
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.		
TYPE		NUMBER	NUMBER	CAL.			
Power Meter	Anritsu	ML2496A	1326001	08/03/2018	08/02/2019		
Power Sensor	Anritsu	MA2411B	1315048	08/03/2018	08/02/2019		
Power Sensor	Anritsu	MA2411B	1315049	08/03/2018	08/02/2019		
Attenuator	Marvelous	MVE2213-10	RF80	02/26/2019	02/25/2020		
DC Block	PASTERNACK	PE8210	RF256	02/26/2019	02/25/2020		
Spectrum Analyzer	Agilent	N9010A	MY53400256	11/21/2018	11/20/2019		

7.3 Test Set-up:



7.4 Measurement Procedure:

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. The testing follows ANSI C63.10:2013. Measurement Guidelines.
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter or spectrum. (Max Hold, Detector = Peak, RBW >=20dB bandwidth)
- 4. Record the max. reading.
- 5. Repeat above procedures until all default test channel is completed.

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7.5 Measurement Result

1M BF	R mode (P	eak):			1M BF	R mode (Av	erage):		
СН	Freq. (MHz)	Peak Output Power (dBm)	Output Power (mW)	Limit (mW)	СН	Freq. (MHz)	Max. Output include tune up tolerance Power (dBm)	Output Power (mW)	Limit (mW)
Low	2402	6.65	4.624	1000	Low	2402	6.44	4.409	1000
Mid	2441	6.29	4.256	1000	Mid	2441	5.61	3.642	1000
High	2480	7.03	5.047	1000	High	2480	6.99	5.005	1000

2M EDR mode (Peak):

СН	Freq. (MHz)	Peak Output Power (dBm)	Output Power (mW)	Limit (mW)
Low	2402	5.86	3.855	125
Mid	2441	5.49	3.540	125
High	2480	6.45	4.416	125

2M EDR mode (Average):

			U ·		
			Max. Avg.Output		
٤			include	Output	Linait
t)C	CH	Freq. (MHz)	tune up	Power	Limit
		(MHZ)	tolerance	(mW)	(mW)
			Power (dBm)	· · /	
	Lov	/ 2402	3.26	2.120	125
	Mic	2441	2.77	1.894	125
	Higl	า 2480	3.82	2.412	125

3M EDR mode (Peak):

СН	Freq. (MHz)	Peak Output Power (dBm)	Output Power (mW)	Limit (mW)
Low	2402	6.32	4.285	125
Mid	2441	5.87	3.864	125
High	2480	6.86	4.853	125

3M	EDR	mode	(Average	e):
0.01	LDIX	mouo	(n monuge	· .

			Max. Avg.Output		
:		Erog	include	Output	Limit
	CH	H Freq. (MHz)	tune up	Power	
)			tolerance	(mW)	(mW)
			Power (dBm)		
	Low	2402	3.23	2.106	125
	Mid	2441	2.78	1.898	125
	High	2480	3.84	2.423	125
	***				2

*NOTE: cable loss as 10.4dB that offsets in the s₁ *Note: Max. Output include tune up tolerance Power* measured by using average detector.

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1M BR mode EIRP

Channel	Frequency (MHz)	Max. Output include tune up tolerance Power (dBm)	Antenna Gain (dBi)	EIRP (mW)	Limit (mW)
Low	2402	6.44	2.10	7.151	4000
Mid	2441	5.61	2.10	5.907	4000
High	2480	6.99	2.10	8.117	4000

2M EDR mode EIRP

Channel	Frequency (MHz)	Max. Avg.Output include tune up tolerance	Antenna Gain (dBi)	EIRP (mW)	Limit (mW)
Low	2402	3.26	2.10	3.439	4000
Mid	2441	2.77	2.10	3.072	4000
High	2480	3.82	2.10	3.912	4000

3M EDR mode EIRP

Channel	Frequency (MHz)	Max. Avg.Output include tune up tolerance	Antenna Gain (dBi)	EIRP (mW)	Limit (mW)
Low	2402	3.23	2.10	3.415	4000
Mid	2441	2.78	2.10	3.079	4000
High	2480	3.84	2.10	3.930	4000

* Note: EIRP = Average Power + Gain

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8 20dB & 99% BANDWIDTH MEASUREMENT

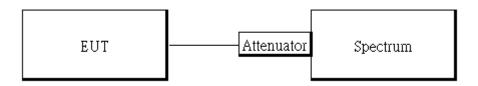
8.1 Standard Applicable

For frequency hopping systems operating in the 2400MHz-2483.5 MHz no limit for 20dB bandwidth.

8.2 Measurement Equipment Used

Conducted Emission Test Site											
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.						
DC Block	PASTERNACK	PE8210	RF256	02/26/2019	02/25/2020						
Spectrum Analyzer	Agilent	N9010A	MY53400256	11/21/2018	11/20/2019						
Attenuator	Marvelous	MVE2213-10	RF80	02/26/2019	02/25/2020						

8.3 Test Set-up



8.4 Measurement Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. The testing follows ANSI C63.10:2013. Measurement Guidelines.
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- Set the spectrum analyzer as RBW=10 kHz (1 % of 20 dB Bandwidth.), VBW = 30 kHz, Span= 3MHz, Sweep=auto, Detector = Peak, and Max hold for 20dB Bandwidth test.
- 5. Mark the peak frequency and –20dB (upper and lower) frequency
- 6. Turn on the 99% bandwidth function, max reading.
- 7. Repeat above procedures until all test default channel is completed

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8.5 Measurement Result

GFSK			π/4	-D	QPSK
СН	20 dB BW	2/3 BW	С	Н	20 dE BW
	(MHz)	(MHz)			(MHz
Low	0.8814	0.59	Lo	W	1.254
Mid	0.8818	0.59	Μ	id	1.256
High	0.8808	0.59	Hig	gh	1.255

	4. 0	
	20 dB	2/3
СН	BW	BW
	(MHz)	(MHz)
Low	1.254	0.84
Mid	1.256	0.84
High	1.255	0.84

8-DPSK								
	20 dB	2/3						
СН	BW	BW						
	(MHz)	(MHz)						
Low	1.254	0.84						
Mid	1.253	0.84						
High	1.253	0.84						

GF	S	Κ
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π/4-DQPSK

8-DPSK 99% 99% 99% СН **Bandwidth** Bandwidth CH CH Bandwidth (MHz) (MHz) (MHz) 0.8125 Low 1.1709 1.1705 Low Low Mid 0.81413 Mid 1.1709 Mid 1.1705 0.81385 1.1705 1.1734 High High High

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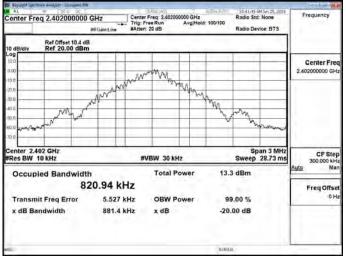
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OBW 20dB_GFSK_1M_DH5_2402MHz



OBW 20dB_GFSK_1M_DH5_2441MHz

Center Fre	q 2.441000000	GHz #FGainLow	Center F	Freq: 2.4410 ee Run 20 d5	Avg	Hz Hold: 100/100	Radio St	AM Jun 25, 2019 d: None avice: BTS	Freq	uency
15 dB/div	Ref Offset 10.4 dB Ref 20.00 dBm	C	11							
500		, m		man	man					nter Fred
40.0	min	Marine				www	m			
700				-				min		
-100										
Center 2.44			***	BW 30 K	U.7			pan 3 MHz 28.73 ms		CF Step
#Res BW 10 kHz Occupied Bandwidth		r		Total F	-	1	2.9 dBm	20.7 3 115	Auto 30	00.000 kH Ma
	82	0.48 kH	łz						Fr	eq Offse
Transmi	t Freq Error	5.323 k	Hz	OBW F	ower		99.00 %		100	0 H
x dB Bar	ndwidth	881.8 k	Hz	x dB		-2	0.00 dB			

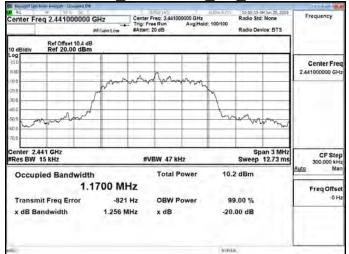
OBW 20dB_GFSK_1M_DH5_2480MHz

RL I	q 2.480000000	GHz Cen	ter Freq: 2.480000000 Free Run Av en: 20 dB	Disor Diro GHz vg Hold: 100/100	Radio Std: I Radio Devic	None	Frequency
15 dB/div	Ref Offset 10.4 dB Ref 20.00 dBm		0				
5 n0 -10.0		Norman	many	me			Center Free 2.480000000 GH:
40.0	mont	when a		. www.	m		
70.0			-				
-100			-				
Center 2.48 #Res BW 1			#VBW 30 kHz	1	Spa Sweep 2		CF Stej 300.000 kH
Occupi	ed Bandwidt	ñ	Total Pow	er 14.	0 dBm		Auto Ma
	8	15.79 kHz				1.0	Freq Offse
Transmi	t Freq Error	1.526 kHz	OBW Pow	er 9	9.00 %	1.1	OH
x dB Bar	ndwidth	880.8 kHz	x dB	-20	.00 dB		
-				50800	a		

OBW 20dB_π/4DQPSK_2M_2402MHz

BL .	2.402000000	Trig:	Freq: 2.402000000 GHz Free Run AvgiHo n: 20 dB	80,504 50700 (d: 100/100	Radio Device	one	Frequency
15 dB/div	Ref Offset 10.4 dB Ref 20.00 dBm				10.1		
5.00 -10.0 -25.0		man	-	2			Center Free 2.402000000 GH
40.0 -55.0	mand			from	m	ma	
-85.0 -100							
Center 2.402 #Res BW 15			VBW 47 kHz		Spar Sweep 1		CF Ste 300.000 kH
Occupied Bandwidth 1 1695 M		695 MHz	Total Power		10.8 dBm		Auto Ma
Transmit x dB Banc	Freq Error Iwidth	-658 Hz 1.254 MHz	OBW Power x dB		9.00 % .00 dB		он
etc.				5180	0		-

OBW 20dB π/4DQPSK 2M 2441MHz



OBW 20dB π/4DQPSK 2M 2480MHz



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OBW 20dB 8DPSK 3M DH5 2402MHz

	non-dent/jutr - D(counted Bits					in taken
	q 2.402000000	Trig:	er Freq: 2.402000000 GHz Free Run AvgiHol m: 20 dB	Ra d: 100/100	dio Std: None dio Device: BTS	Frequency
10 dB/div	Ref Offset 10.4 dE Ref 20.00 dBm				1.1	
100		man	-			Center Freq 2.402000000 GHz
-30.0 -50.0 -50.0 -70.0	marne			ha	hum	
Center 2.4 #Res BW 1			#VBW 47 kHz	Sv	Span 3 MHz veep 12.73 ms	CF Step 300.000 kHz
Occupi	ied Bandwidt 1.	h 1684 MHz	Total Power	10.9 di	Bm	Auto Man Freq Offsel
	it Freq Error ndwidth	-1.710 kHz 1.253 MHz	OBW Power x dB	99.00 -20.00	Y.	OHz
				51810.0		

OBW 20dB 8DPSK 3M DH5 2441MHz

Center Freq	2.441000000 G	14.84		Run	AvgiHol	d: 100/100	Radio Der		Fr	equancy
10 dB/div	Ref Offset 10.4 dB Ref 20.00 dBm									
100 100 -190 -200		Jon	inner		-^^w-~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~					Center Freq 1000000 GHz
-300 -300 -500 -500	walnut					h	n Mun	m		
Center 2.44 #Res BW 15			#VB	W 47 kł	łż		Sp Sweep	an 3 MHz 12.73 ms		CF Step 300.000 kHz
Occupie	d Bandwidth	582 MH	z	Total P	ower	10.4	4 dBm		Auto	Man Freq Offset
Transmit x dB Banı	Freq Error dwidth	-2.275 kH 1.253 MH		OBW P x dB	ower		9.00 % .00 dB			0 Hz
						2080	_			

OBW 20dB 8DPSK 3M DH5 2480MHz

Equipit Spectrum Analyzer - D	(conted. 670				-		(Seles)
Center Freq 2.4800	00000 GHz PfGainLow	Center Trig: F	Freq: 2.480000000 GHz Free Run Avg Hol 1: 20 dB	id: 100/100	Radio Std		Frequency
10 dB/div Ref Offse		1.1	1				
100		nom	Mann.				Center Fre 2.480000000 GH
-20.0	1			1			
200 500 500 700	man			W	www.	m	
Center 2.48 GHz #Res BW 15 kHz		#	VBW 47 kHz	1		an 3 MHz 12.73 ms	CF Ste 300.000 kH
Occupied Band	dwidth 1.1697	MHz	Total Power	11.	6 dBm		Auto Ma Freq Offse
Transmit Freq Er x dB Bandwidth		5 kHz 3 MHz	OBW Power x dB		9.00 % .00 dB		01
40.				51810	a.		

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IC OBW 99%_GFSK_1M_DH5_2402MHz

Reynight Spect	trans analyzer - D(counted free					Sou kilta			1012 4
	eq 2.402000000	GHz #FGainLow	Center				Radio Sto		Frequency
15 dB/div	Ref Offset 10.4 dB Ref 20.00 dBm		10.10						
5.00 -10.0		man	~~~	m	~~~~	~			Center Free 2.402000000 GHz
42.0	~~~~						-	~	
-85.0				-					
-100									
Center 2.4 #Res BW			#V	BW 62 KH	z			oan 2 MHz ap 4.8 ms	CF Step 200.000 kHz
Occup	ied Bandwidth 81	12.50 kl	Hz	Total P	ower	13.1	8 dBm		Auto Mar Freq Offsel
	it Freq Error Indwidth	1.746 1		OBW P	ower		0.00 %		01
						51800	i		-

IC OBW 99%_GFSK_1M_DH5_2441MHz

Feynight Spectri	non Analyzer - D(couled Bits	1				Res Line		1	ie iei
	q 2.441000000	GHz	Center Fr				Radio De		Frequency
15 dB/div	Ref Offset 10.4 dE Ref 20.00 dBm		11.1				201		
500 -10.0	~		~~~	m	~~~	5			Center Fr 2.441000000 G
40.0 ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~							- Marine	~	
-70.0 -85.0 -100									
-115									
Center 2.44 #Res BW 2			#VE	SW 62 KH	z		Swee	an 2 MHz p 4.8 ms	CF St 200.000 k
Occupi	ed Bandwidt	n .		Total P	ower	13.4	4 dBm		Auto N
	8	14.13 kH	łz						Freq Off
Transmi	it Freq Error	1.220 k	Hz	OBW P	ower	99	9.00 %		0
x dB Ba	ndwidth	855.1 k	Hz	x dB		-20.	00 dB		
-						51800	-		

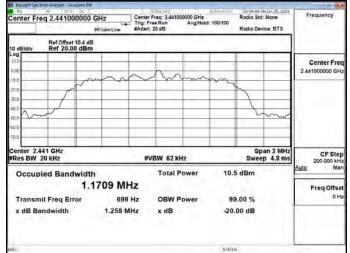
IC OBW 99%_GFSK_1M_DH5_2480MHz

Center Fre	eq 2.48000000	Tri	and Infi Inter Freq: 2.4800000 g: Free Run tten: 20 dB	00 GHz Avg Hold: 100/100	Radio Std Radio Dev		Frequency
15 dB/div	Ref Offset 10.4 dl Ref 20.00 dBm						
5.00	~	mm	m	m			Center Free 2.480000000 GH:
40.0	~~~				m	~	
70 0 -85 0							
-100						-	
Center 2.4 #Res BW			#VBW 62 kHz	-	Sp Swee	an 2 MHz p 4.8 ms	CF Ster 200.000 kH
Occup	ied Bandwidt	h	Total Pov	wer 14.	5 dBm		Auto Mar
	8	13.85 kHz					Freq Offset
Transm	it Freq Error	-1.379 kHz	OBW Por	wer 9	9.00 %		0 Ha
x dB Ba	ndwidth	855.1 kHz	x dB	-20	.00 dB		
WRIGE (5180	a.		

IC OBW 99%_π/4DQPSK_2M_2402MHz

Center Fred	q 2.402000000	Trig: 1	r Freq: 2.402000000 GHz Free Run AvgiHold h: 20 d5	Radio 5	e 4M Aun 25, 2019 Std: None Device: BTS	Frequency
10 dB/div	Ref Offset 10.4 dB Ref 20.00 dBm		1		1.1	
100	~		hum	m		Center Free 2.402000000 GH
-30.0						
-50.0					mm	
Center 2.40 #Res BW 20			VBW 62 kHz		Span 2 MHz eep 4.8 ms	CF Step 200.000 kH
Occupie	ed Bandwidth 1.1	, 1709 MHz	Total Power	11.0 dBm		Auto Mar Freg Offse
Transmit x dB Ban	t Freq Error ndwidth	962 Hz 1.257 MHz	OBW Power x dB	99.00 % -20.00 dB	2 f	он
MD.				518/04	4	

IC OBW 99%_π/4DQPSK_2M_2441MHz



IC OBW 99% π/4DQPSK 2M 2480MHz



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IC OBW 99% 8DPSK 3M DH5 2402MHz

	throw analyzer - D(counted, 648					teria de
Center Fr	eq 2.402000000	Trig:	Freq: 2.402000000 GHz FreeRun Avg Hold: n: 20 dB	100/100	Radio Std: None Radio Device: BTS	Frequency
15 dB/div	Ref Offset 10.4 dE Ref 20.00 dBm					
-10.0 -25.0 -25.0 -40.0 -25.0					~~~	Center Freq 2.402000000 GHz
-100 -115 Center 2.4 #Res BW			EVBW 62 kHz		Span 2 M Sweep 4.8 r	
Occup	bied Bandwidtl 1.1	1705 MHz	Total Power	11.2	dBm	FreqOffset
	nit Freq Error andwidth	-769 Hz 1.260 MHz	OBW Power x dB	99. -20.0	00 % 0 dB	OHz
				SIRKE		

IC OBW 99%_8DPSK_3M_DH5_2441MHz

	num dentificte - Dicement Bits						Dista Inter
Center Fre	eq 2.441000000	Trig:	r Freq: 2.441000000 GHz Free Run AvgiHold n: 20 dB	2259 Auto	Radio Std: Nor Radio Device: I	e	Frequency
10 dB/div	Ref Offset 10.4 dB Ref 20.00 dBm		1				
10 0		mar	m				Center Freq 2.441000000 GHz
30.0	1			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			
50.0 ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~					~~~~	24	
Center 2.4 Res BW 2		#	VBW 62 kHz		Span 2 Sweep 4	.8 ms	CF Step 200.000 kHz
Occup	ied Bandwidt	h	Total Power	10.6	6 dBm	Au	to Man
	1.	1705 MHz					Freq Offset
Transmi	it Freq Error	-993 Hz	OBW Power	99	.00 %	1.1	0 Hz
x dB Ba	ndwidth	1.258 MHz	x dB	-20.	00 dB		
-				5180.0			_

IC OBW 99% 8DPSK 3M DH5 2480MHz

Feyngert Spectrum Analyze	T · D(conted.678							in the second
Center Freq 2.48		T	Center Freq: 2,4800 rig: Free Run Atten: 20 dB		100/100	tadio Sto	W Xm 25, 2019 I: None vice: BTS	Frequency
10 dB/div Ref 2	fset 10.4 dB 20.00 dBm		14 J - T		-			
100			m	Lin				Center Fre 2.480000000 GH
-10.0	A				M	1		
40.0						7	m	
60.0 70.0	-						-	
Center 2.48 GHz #Res BW 20 kHz	-		#VBW 62 k	Hz			an 2 MHz p 4.8 ms	CF Ste 200.000 kH
Occupied Ba	andwidth	0	Total I	Power	11.8 d	Bm		<u>Auto</u> Ma
Transmit Freq		734 MHz		ower	99.0	0 %		Freq Offse
x dB Bandwid		1.258 MH			-20.00	· · · ·		
MILL.					518/09			

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(マケアフロルマ) 山地和口和不識到別知人で体の口具、「同时山体和正体由知人。今年期日本定年公司會国計山、个山即辺復寝。 This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/terms and conditions.htm</u> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms - edocument.htm</u>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

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9 CONDUCTED BAND EDGES AND SPURIOUS EMISSION MEASUREMENT

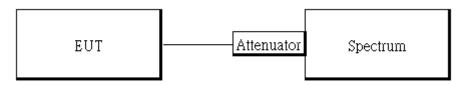
9.1 Standard Applicable

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) & RSS-Gen §8.9 limit.

9.2 Measurement Equipment Used

	Conducted Emission Test Site								
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.				
TYPE		NUMBER	NUMBER	CAL.					
DC Block	PASTERNACK	PE8210	RF256	02/26/2019	02/25/2020				
Spectrum Analyzer	Agilent	N9010A	MY53400256	11/21/2018	11/20/2019				
Attenuator	Marvelous	MVE2213-10	RF80	02/26/2019	02/25/2020				

9.3 Test SET-UP



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9.4 Measurement Procedure

Conducted Band Edge:

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. The testing follows ANSI C63.10:2013. Measurement Guidelines.
- Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 4. Set center frequency of spectrum analyzer = operating frequency.
- 5. Set the spectrum analyzer as RBW=100 kHz, VBW=300 kHz, Sweep = auto
- 6. Mark Peak, 2.3999GHz and 2.4836GHz and record the max. level.
- 7. Repeat above procedures until all frequency measured were complete.

Conducted Spurious Emission:

- 1. To connect Antenna Port of EUT to Spectrum.
- 2. The testing follows ANSI C63.10:2013. Measurement Guidelines.
- 3. Set RBW = 100 kHz & VBW = 300 kHz, Detector = Peak, Sweep = Auto
- 4. Allow trace to fully stabilize.
- 5. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
- Repeat above procedures until all default test channel measured were complete.

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

9.5 Measurement Result

Note: Refer to next page spectrum analyzer data chart and tabular data sheets.

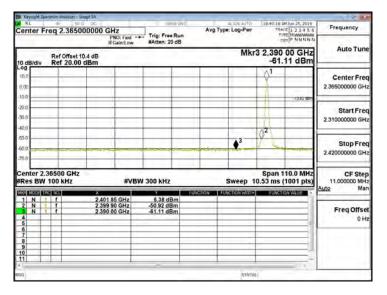
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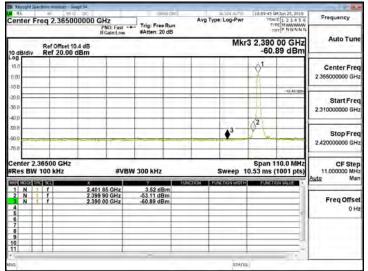
Band Edge_GFSK_1M_DH5_2402MHz



Band Edge_GFSK_1M_DH5_2480MHz

Keysight Spectrum Resiliges - S				and a second	
enter Freg 2.4875	500000 GHz	Trata estate:	Avg Type: Log-Pwr	10:43:12 AM hin 25, 2019 TRACE 1:2 3:4 5 6	Frequency
	PNO: Fast	#Atten: 20 dB	1.4.00 0.000	DIT P NNNNN	205
Ref Offset 1 0 dB/div Ref 20.00		1.000	Mkr3	2.483 600 GHz -58.57 dBm	Auto Tur
0.0	\$ ¹				Center Fr
.00	A				2.487500000 G
0.0				-4272-64	
0.0					Start Fr 2.475000000 G
0,0	2				2.475000000 G
0.0	1 ³				Stop Fr
0,0	Contraction of the second				2.50000000 G
enter 2.48750 GHz Res BW 100 kHz	#VB	W 300 kHz	Sweep 2	Span 25.00 MHz 400 ms (1001 pts)	CF St 2.500000 M
	2 480 000 GHz	7.28 dBm	UNCTION FUNCTION WOTH	FUNCTION WALVE	Auto N
	2.483 500 GHz 2.483 600 GHz	-58.91 dBm -58.57 dBm			Freq Offs
4	2.403.000.012	-99.07. upm			0
6 7					
8					
0				2	

Band Edge_8DPSK_3M_DH5_2402MHz



Band Edge_8DPSK_3M_DH5_2480MHz

Frequency	11:02:45 AM hin 25, 2019	OTLA KIT		100 STREET	1			50.0			. R
	THE NUMBER	Log-Pwr	Avg	g: Free Run			en				
A	and some of		_	tten: 20 dB	DW	Gain:Lo	1Ê				
Auto Tur	483 600 GHz -59.71 dBm	Mkr3 2				_		Offset 10 20.00		B/div	
Center Fre		_					1	_			og in n
2.487500000 GH							X			1	1.00
2.401000000							1	1			0.0
A Provinces	35.49 (80)		-	-	-	+	1	-	-	-	0.0
Start Fre											0.0
2.475000000 GH		_				-		al			40.0
1					2			1			50.0
Stop Fre			-	-	°	-		<u> </u>	and the	-	20.0
2.50000000 GH						1	-		_	1	70.0
CF Ste	Span 25.00 MHz	_	1		_	1	-	CH7	48750	tor 2	en
2.500000 Mi	0 ms (1001 pts)	weep 2.4		kHz	VBW :	#\			100		
Auto Ma	FUNCTION WALVE	TION WOTH	INCTION				×		RC SCI	MODE	KR.
1			-	.51 dBm			2,480 02 2,483 50	-	1 1	NN	12
Freq Offs				71 dBm		00 GHz	2.483 60		11	N	3
01		-			-	_		_		-	4
					-					-	6
				-		_				-	8
											10
			_	_	-	-			11	_	11
		STATUS								-	90

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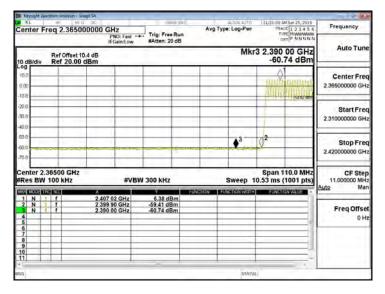
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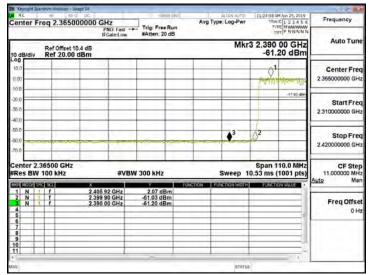
Hopping Band Edge_GFSK_1M_DH5_2402MHz



Hopping Band Edge_GFSK_1M_DH5_2480MHz

Keysight Spectrum Hours		2 10 4	Trans.	1	OThe Mid-	Treate and has	her 36, 3646	2.2.8
enter Freq 2.487500000 GHz		er Freq 2.487500000 GHz Avg			g Type: Log-Pwr TMACE [1 2 3 4 5 1 TYPE MWWWWW Cert P NN NM		1.12456	Frequency
	IFGain		20 dB			· Der	PNNNNN	6.44 To
10 dB/div Ref 20	set 10.4 dB 0.00 dBm				Mkr3	2.483 60	00 GHz 4 dBm	Auto Tun
								Center Fre
DOM TON	a A		-					2.487500000 GH
100	VV I		-				-1281	2010/04/2012
20.0			-	-	-	-		Start Fre
0.0			-	-	-	_	-	2.475000000 GH
40,0	i.		+	-	-		-	
0.0	P(1)	A3	1		-	-		Stop Fre
20.0	-			and the second				2.50000000 GH
enter 2.48750 G	-					Span 25	00.101	-
Res BW 100 kHz		#VBW 300 kH	2	s	weep 2.	400 ms (1	001 pts)	CF Ste 2.500000 Mi
KR MODE THE SEL	x	Y Y		CTION FUNC	THOM MOTH	FUNCTION	WALKER -	Auto Mi
1 N 1 f	2.477 025 G	tz -60.14 c	Bm			-		
3 N 1 1	2.483 600 G	iz -61.24 c	Bm	-	_			Freq Offs
5		-		-				
7 8		-	-			-		
9		_	_	-				
11							-	
C			1			-	- t	
90					INTATUS.			

Hopping Band Edge_8DPSK_3M_DH5_2402MHz



Hopping Band Edge_8DPSK_3M_DH5_2480MHz

Frequency	08 AM hin 25, 2019		STIN ATO	rt).	0.000000			50.0			. 4
Frequency	THACE 1 2 3 4 5 6 THE NWWWWW	WF	Type: Log-Pwi		Trig: Free Ru	Z O: Fast +++	.48750	req 2	iter l	Cer	
202	DET PNNNNN				#Atten: 20 dE	ain:Low					
Auto Tur	3 600 GHz 50.01 dBm	r3 2.4	Mkr					Offset 10 20.00 d		Bidiv	
Center Fre						1	1	1			in.o
2.487500000 GH							K	and and	22	1	0.00
2.401000000							7	A P	3	87	10.0
	-15.78 dBm	-		-			1.	_	-	-	20.0
Start Fre									-		30.0
2.475000000 GH										1	-40.0
						1.1	NWY.				50.0
Stop Fre					· · · · · · · · · · · · · · · · · · ·	A3					-60 0
2.50000000 GH		-		-		Contraction of	100				70.0
			_								
CF Ste 2.500000 MP	n 25.00 MHz ns (1001 pts)		Sweep		300 kHz	#VBW			48750		
Auto Ma	INCTION WALKE	DTH	FUNCTION WOT	FINCT			x		RC 901		
			-		4.22 dBm -61.28 dBm		2.478 000	_	1 :	N	1
Freq Offs		-	-		-60.01 dBm	GHz	2 483 600		11	N	3
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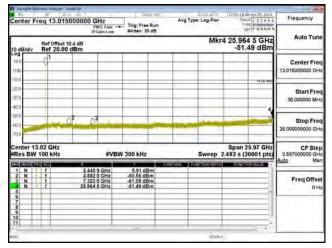
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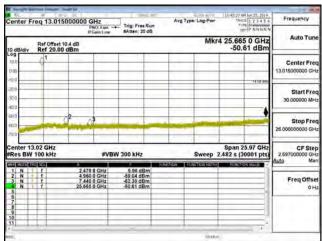
Spurious Emission_GFSK_1M_DH5_2402MHz

	ar La				-
Center Freq 13.0150	000000 GHz	Trig: Free Run	Avg Type: Log-Pwr	10-52-36 24 Jun 25, 2019 TRACE 1 2 3 4 5 6 TOPE STUDIES	Frequency
Ref Offset 10	#GainLow	#Atten: 20 dB	Mkr	4 25.639 0 GHz -51.27 dBm	Auto Tun
00 01 00 01					Center Fre 13.015000000 GP
					Start Fre 30 000000 Mi
200 200	2 () ³				Stop Fre 26.00000000 Gi
Center 13.02 GHz Res BW 100 kHz	#VB\	V 300 kHz	Sweep 2	Span 25.97 GHz 2.482 s (30001 pts)	CF Ste 2.597000000 GH Auto Mi
1 N T T 2 N T T 3 N T T 3 N T T 5 6	2.401 9 GHz 4.804 0 GHz 7 206 0 GHz 26.639 0 GHz	5.80 dBm -59.38 dBm -60.69 dBm -51.27 dBm			Freq Offs 0 ł
7 8 9 10 11					
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Spurious Emission _GFSK_1M_DH5_2441MHz



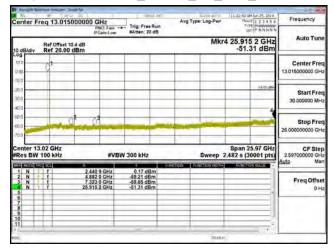
Spurious Emission_GFSK_1M_DH5_2480MHz



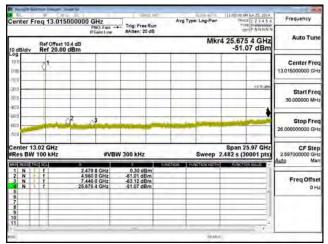
Spurious Emission _8DPSK_3M_DH5_2402MHz

Nonget lase	the locate of	inge La			e. 010	-	5.00 4/0	111.072.00.0	4 Jun 25, 2019	
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10.0		-		2 1						Center Fre
0.00	Q.		_			1			-	13.015000000 GH
0.0	+					-	-		_	
0.0	+		_				-		211400	Start Fre
0.0	-	-				-	-		-	30.000000 MF
410	1		-			-			4	-
0.0	1 mil	1 03			1.00	1. 10	-			Stop Fre
10			-		-				1	26.00000000 GH
			-							-
Res BW			#VB	W 300 kHz			Sweep 1	Span 2 2,482 s (3		CF Ste 2.597000000 G
THE ROLL NO.	150	×		1			METER WORK	H-NO D	NVEILE -	Auto Ma
1 N 1 2 N 1	1	2,402 8		-1.19 dBr		-		_		-
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5					-	-		-		
7 8					-					
9					-	-		_		
ŭ 🗌					1					1.1.1.1
							STATIC	1	-	

Spurious Emission _8DPSK_3M_DH5_2441MHz



Spurious Emission _8DPSK_3M_DH5_2480MHz



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10 RADIATED BANDEDGE AND SPURIOUS EMISSION MEASUREMENT

10.1 Standard Applicable

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands, must also comply with the §15.209 & RSS-Gen §8.10 Table 6 limit.

And according to §15.33(a) (1) & RSS-Gen §8.9 Table 4 & 5, for an intentional radiator operates below 10GHz, the frequency range of measurements: to the tenth harmonic of the highest fundamental frequency or to 40GHz, whichever is lower.

Frequency (MHz)	Field strength (microvolts/meter)	Distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Note:

- 1. The lower limit shall apply at the transition frequencies.
- 2. Emission level ($dB\mu V/m$) = 20 log Emission level ($dB\mu V/m$)

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10.2 Measurement Equipment Used

		966A Chamber	ŗ		
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.
ТҮРЕ		NUMBER	NUMBER	CAL.	
Low Pass Filter	EWT	EWT-56-0019	RF46	02/26/2019	02/25/2020
High Pass Filter	R&S	F13 HPF 3GHz	RF64	02/26/2019	02/25/2020
Band Reject Filters	MICRO TRONICS	BRM 50702	120	02/26/2019	02/25/2020
Bilog Antenna	Sunol Sciences	JB3	A030105	07/13/2018	07/12/2019
Cable	HUBER SUHNER	SUCOFLEX 104PEA	25157	02/26/2019	02/25/2020
Cable	HUBER SUHNER	SUCOFLEX 104PEA	20995	02/26/2019	02/25/2020
Digital Thermo-Hygro Meter	WISEWIND	1206	D07	01/30/2019	01/29/2020
double Ridged Guide Horn Antenna	ETC	MCTD 1209	DRH13M02003	08/20/2018	08/19/2019
Loop Antenna	COM-POWER	AL-130	121051	03/22/2019	03/21/2020
Horn Antenna	ETS LINDGREN	3116	00026370	12/26/2018	12/25/2019
Pre-Amplifier	EMEC	EM330	060609	02/26/2019	02/25/2020
Pre-Amplifier	HP	8449B	3008A00965	02/26/2019	02/25/2020
PSA Series Spectrum Analyzer	Agilent	E4446A	MY46180323	05/29/2019	05/28/2020
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R	N.C.R
Turn Table	CCS	CC-T-1F	N/A	N.C.R	N.C.R
Software		e3 V6	.11-20180413		

NOTE: N.C.R refers to Not Calibrated Required.

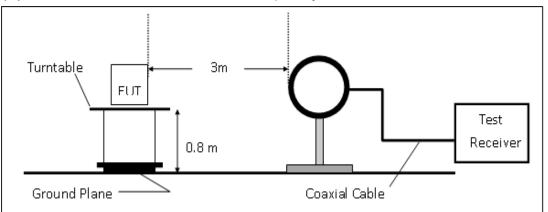
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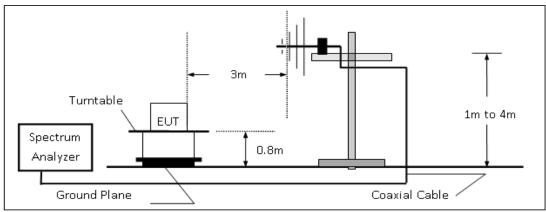
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10.3 Test SET-UP

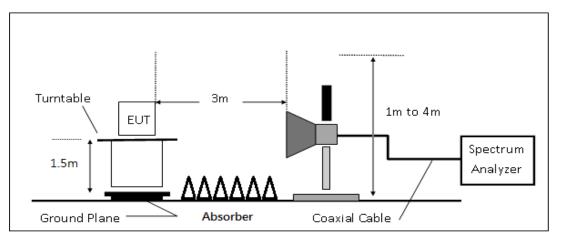
(A) Radiated Emission Test Set-UP Frequency Below 30MHz.



(B) Radiated Emission Test Set-Up, Frequency form 30MHz to 1000MHz



(C) Radiated Emission Test Set-UP Frequency Over 1 GHz



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10.4 Measurement Procedure

Radiated Emission

- 1. The testing follows ANSI C63.10:2013. Measurement Guidelines.
- 2. The EUT was placed on a turn table with 0.8m for frequency< 1GHz and 1.5m for frequency> 1GHz above ground plan.
- 3. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
- 4. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
- 5. Use the follow spectrum analyzer setting:
 - (1) Span = wide enough to fully capture the emission being measured
 - (2) RBW = 1 MHz for f ≥ 1 GHz, 100 kHz for f < 1 GHz, VBW ≥ RBW, Sweep = auto, Detector function = peak, Trace = max hold
 - (3) For average measurement: use duty cycle correction factor method per 15.35(c)

Duty Cycle = On time/100 milliseconds

On time = N1*L1=N2*L2+...+N(n-1)*LN(n-1)+N(n)*L(n)

Where N1 is number of type 1 pulses, L1 is length of type 1 pulses, etc.

Average Emission Level = Peak Emission Level + 20*log (duty Cycle)

- 6. When measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.
- 7. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 8. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 9. Repeat above procedures until all frequency of the interest measured were complete.

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10.5 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

The limit of the emission level is expressed in dBuV/m, which converts 20*log(uV/m)

Actual FS($dB\mu V/m$) = SPA. Reading level($dB\mu V$) + Factor(dB)

Factor(dB) = Antenna Factor(dBµV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

10.6 Test Results of Radiated Spurious Emissions form 9 KHz to 30 MHz

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit per 15.31(o) was not reported.

10.7 Measurement Result

Note: Refer to next page spectrum analyzer data chart and tabular data sheets.

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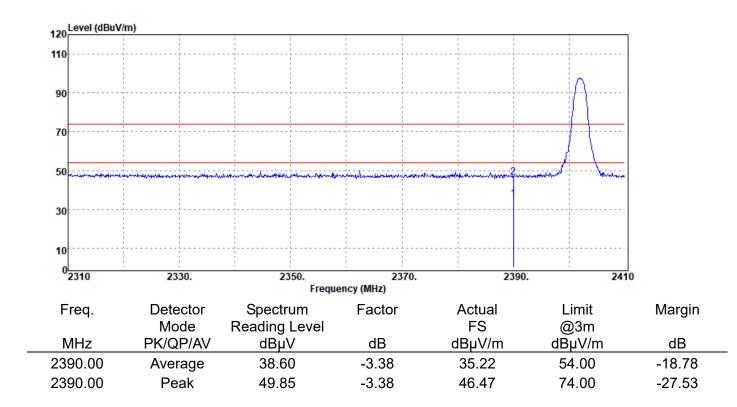


Report No.: T190612W02-RP5 Page 35 of 70

Radiated Band Edge Measurement Result:

Report Number	:T190612W02
Operation Band	:BT BR
Frequency	:2402 MHz
Operation Mode	:BE CH Low
EUT Pol.	:E2 Plan

Test Date	:2019-06-27
Temp./Humi.	:21/49
Antenna Pol.	:VERTICAL
Engineer	:Kane



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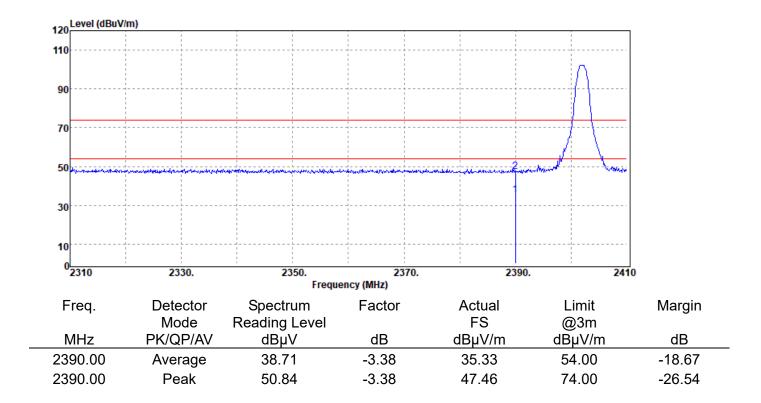
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:T190612W02
:BT BR
:2402 MHz
:BE CH Low
:E2 Plan

Test Date	:2019-06-27
Temp./Humi.	:21/49
Antenna Pol.	:HORIZONTAL
Engineer	:Kane



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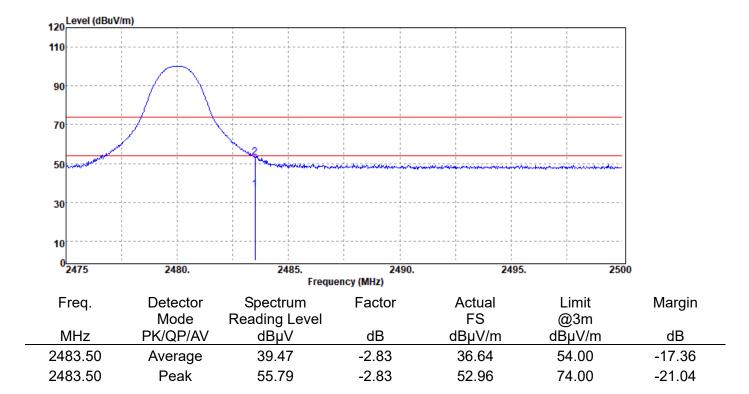
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Report Number	:T190612W02
Operation Band	:BT BR
Frequency	:2480 MHz
Operation Mode	:BE CH High
EUT Pol.	:E2 Plan

Test Date	:2019-06-27
Temp./Humi.	:21/49
Antenna Pol.	:VERTICAL
Engineer	:Kane



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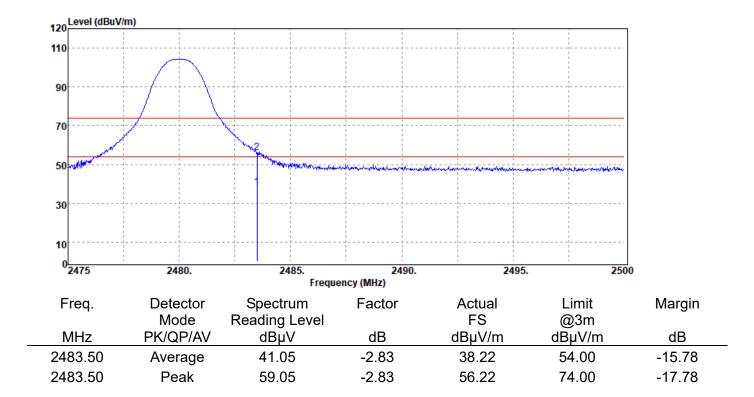
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Report Number	:T190612W02
Operation Band	:BT BR
Frequency	:2480 MHz
Operation Mode	:BE CH High
EUT Pol.	:E2 Plan

Test Date	:2019-06-27
Temp./Humi.	:21/49
Antenna Pol.	:HORIZONTAL
Engineer	:Kane



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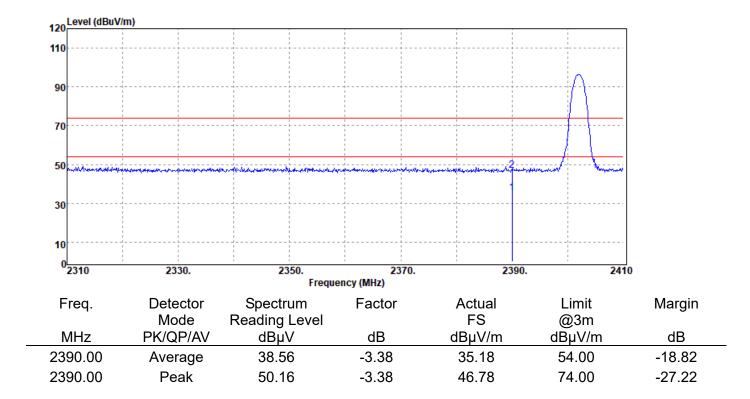
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程智科技股份有限公司



Report Number	:T190612W02
Operation Band	:BT EDR
Frequency	:2402 MHz
Operation Mode	:BE CH Low
EUT Pol.	:E2 Plan

Test Date	:2019-06-27
Temp./Humi.	:21/49
Antenna Pol.	:VERTICAL
Engineer	:Kane



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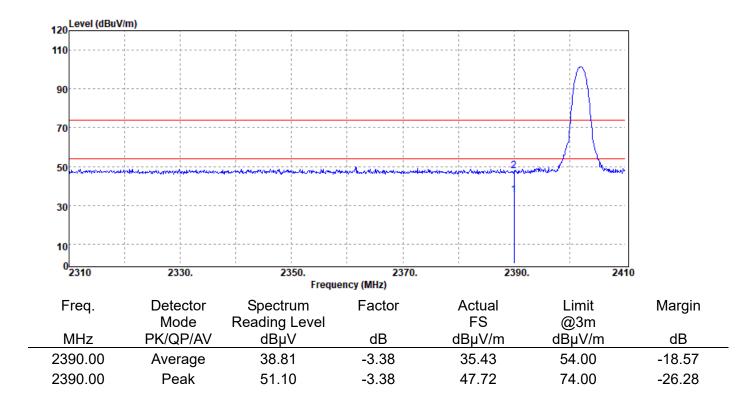
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Report Number	:T190612W02
Operation Band	:BT EDR
Frequency	:2402 MHz
Operation Mode	:BE CH Low
EUT Pol.	:E2 Plan

Test Date	:2019-06-27
Temp./Humi.	:21/49
Antenna Pol.	:HORIZONTAL
Engineer	:Kane



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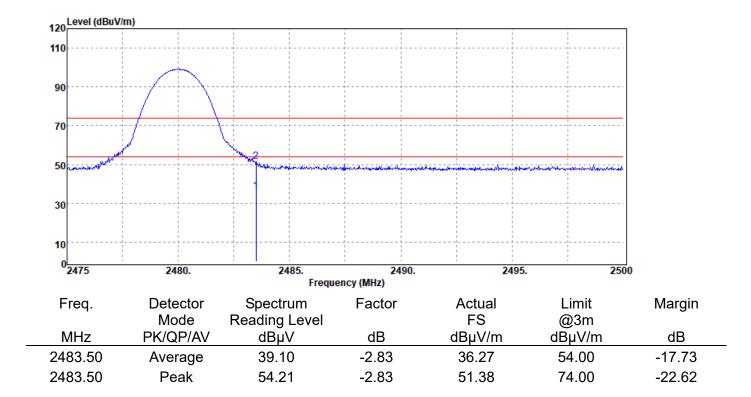
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Report Number	:T190612W02
Operation Band	:BT EDR
Frequency	:2480 MHz
Operation Mode	:BE CH High
EUT Pol.	:E2 Plan

Test Date	:2019-06-27
Temp./Humi.	:21/49
Antenna Pol.	:VERTICAL
Engineer	:Kane



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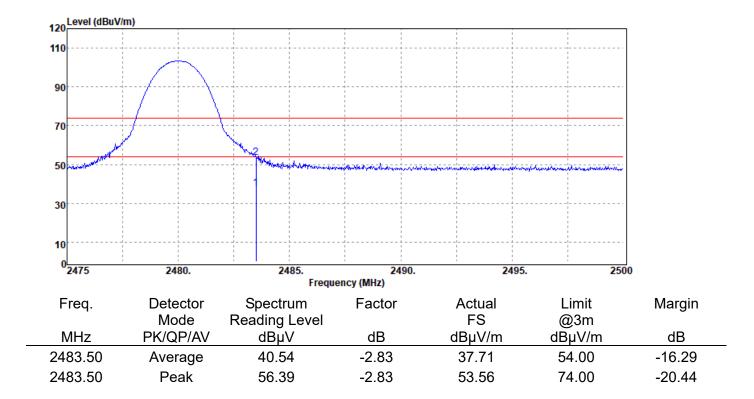
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程智科技股份有限公司



Report Number	:T190612W02
Operation Band	:BT EDR
Frequency	:2480 MHz
Operation Mode	:BE CH High
EUT Pol.	:E2 Plan

Test Date	:2019-06-27
Temp./Humi.	:21/49
Antenna Pol.	:HORIZONTAL
Engineer	:Kane



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Test Date



:T190612W02

Report Number

Operation Band Frequency Operation Mode EUT Pol.	:BT BR Hop :2402 MHz :BE CH Low :E2 Plan			Temp./Humi Antenna Pol Engineer		
120 Level (dBuV/m)						
110						
					······	
90						
70						
50 mm	m have a show how have	store and the second		mantheman	www.	
30	 					
10			i			
⁰ 2310	2330.	2350. Frequer	2370. ncy (MHz)	2390.	2410	
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
		Reading Level		FS	@3m	
	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.00	Average	38.35	-3.38	34.97	54.00	-19.03
2390.00	Peak	50.63	-3.38	47.25	74.00	-26.75

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Test Date



:T190612W02

Report Number

2390.00

Frequ Oper EUT		:BT BR Hop :2402 MHz :BE CH Lov :E2 Plan			Temp./Hun Antenna P Engineer		TAL
12	Level (dBuV/m)						
11(
						······	
90	D						
7(0						
50	monton mary as	- Andrew Contraction of the second	population and the second s	adation	man	mmh	
30	D		· · · · · · · · · · · · · · · · · · ·				
10	D	 					
(0 <mark></mark> 2310	2330.	2350.	2370.	2390.	2410	
				iency (MHz)			
I	Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
	MHz	Mode PK/QP/AV	Reading Level dBµV	dB	FS dBµV/m	@3m dBµV/m	dB
	390.00	Average	38.76	-3.38	35.38	54.00	-18.62

-3.38

46.14

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49.52

Peak

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74.00

-27.86



Report Number	:T190612W02			Test Date	:2019-06-27
Operation Band	:BT BR Hopping			Temp./Humi.	:21/49
Frequency	:2480 MHz			Antenna Pol.	:VERTICAL
Operation Mode	:BE CH High			Engineer	:Kane
EUT Pol.	:E2 Plan				
120 Level (dBuV/m)					
110			· · · · · · · · · · · · · · · · · · ·		
90				·	
70					
50	\		· · · · · · · · · · · · · · · · · · ·		
30		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	episana ang ang ang ang ang ang ang ang ang	- Manna - Marine - Ma	manner
30					
10			· · · · · · · · · · · · · · · · · · ·	·	
0 ^L 2475	2480.	2485.	2490.	2495.	2500

	Frequency (MHz)								
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin			
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB			
2483.50	Average	38.81	-2.83	35.98	54.00	-18.02			
2483.50	Peak	49.42	-2.83	46.59	74.00	-27.41			

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10

Report Number	:T190612W02				Test Date	:2019-06-27
Operation Band	:BT BR Hopping				Temp./Humi.	:21/49
Frequency	:2480 MHz				Antenna Pol.	:HORIZONTAL
Operation Mode	:BE CH High				Engineer	:Kane
EUT Pol.	:E2 Plan					
120 Level (dBuV/m)						
110		·	 	 		
90			 	 		
	↓ ↓	1			: :	

2475	2480.	2485. Freque	2490. ency (MHz)	2495.	2500	0
Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2483.50	Average	40.84	-2.83	38.01	54.00	-15.99
2483.50	Peak	50.26	-2.83	47.43	74.00	-26.57

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SGS Compliance Certification Services Inc.

程智科技股份有限公司

Test Date



:T190612W02

Report Number

Fre Ope	eration Band quency eration Mode T Pol.	:BT EDR H :2402 MHz :BE CH Lov :E2 Plan			Temp./Hum Antenna Po Engineer		L
	120 Level (dBuV/m)						
	110						
	90					······	
	70						
	50 manna	www.www.w	Lon-Malling	an the the terminant of the	n mar man mar and	matuna	
	30						
	10						
	0 <mark></mark>	2330.	2350.	2370.	2390.	241	0
	2510	2550.		ency (MHz)	2350.	241	0
	Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
	MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
	2390.00	Average	38.38	-3.38	35.00	54.00	-19.00
	2390.00	Peak	49.72	-3.38	46.34	74.00	-27.66

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Member of the SGS Group (SGS SA)

Test Date



:T190612W02

Report Number

Opera Frequ	ation Band lencv	:BT EDR H :2402 MHz			Temp./Hum Antenna Po		NTAL
-	ation Mode	:BE CH Lo			Engineer	:Kane	
EUTI	Pol.	:E2 Plan			-		
	Level (dBuV/m)						
110						m	
90)						
70							
50	- mar mar mar and a fam.	-	an mark mark the mark mark	And the second second second		April	
30					1		
10							
(2310	2330.	2350. Freque	2370. ency (MHz)	2390.	241	0
F	req.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
	MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
23	90.00	Average	38.74	-3.38	35.36	54.00	-18.64
23	90.00	Peak	50.99	-3.38	47.61	74.00	-26.39

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-17.89

-26.69

Test Date



:T190612W02

Report Number

2483.50

2483.50

Average

Peak

Frequ	ation Mode	:BT EDR Ho :2480 MHz :BE CH Higi :E2 Plan					Temp./H Antenna Enginee	a Pol.	:21/49 :VERTICA :Kane	۱L
120	Level (dBuV/m)							:		
110	1			 				; ; ; ; ; ;		
90								1 1 1 4 • • • • • • • • • • • • • • • • • • •		
70								I I *		
50			hungan	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	v.m.m.k.h	philippine	+	manuther		
30							 	- - - - - - - - - - - - - - - - - - -		
10							 	 		
0	2475	2480.	248	5. Frequen	24 cy (MHz)	90.	24	495.	250	0
F	req.	Detector Mode	Spectru Reading L		Factor		Actual FS		Limit @3m	Margin
N	MHz	PK/QP/AV	dBµV		dB	C	dBµV/m		BµV/m	dB

-2.83

-2.83

36.11

47.31

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38.94

50.14

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54.00

74.00

Test Date



:T190612W02

Report Number

2483.50

2483.50

Average

Peak

Frequ	tion Mode	:BT EDR Ho :2480 MHz :BE CH Higl :E2 Plan			Temp./Humi. Antenna Pol. Engineer	:21/49 :HORIZONTAL :Kane	
120	Level (dBuV/m)	:	<u>.</u>	: .			
110			 				
90							
70							
50	 	 	N Francisco - March	mannan	nontrante	the star and the start of the s	
30			1				
10							
0	2475	2480.	2485. Freque	2490. ency (MHz)	2495.	2500	
F	req.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit Mar @3m	gin
Ν	/IHz	PK/QP/AV	dBµV	dB		dBµV/m dl	В

-2.83

-2.83

37.91

47.78

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40.74

50.61

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54.00

74.00

-16.09

-26.22

Report No.: T190612W02-RP5 Page 51 of 70

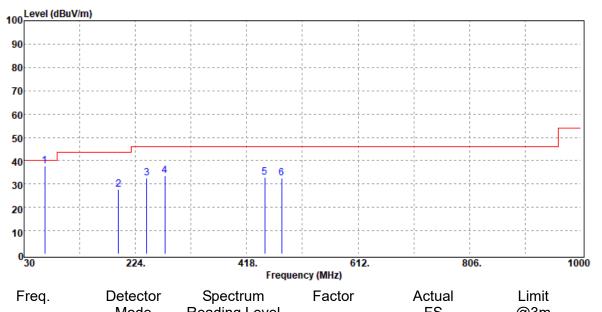


Radiated Spurious Emission Measurement Result:

Frequency form 30MHz to 1000MHz

Report Number	:T190612W02
Operation Band	:BT BR
Frequency	:2441 MHz
Operation Mode	:Tx CH Mid
EUT Pol.	:E2 Plan

Test Date	:2019-06-28
Temp./Humi.	:21/49
Antenna Pol.	:VERTICAL
Engineer	:Kane



Freq.	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
65.89	Peak	52.92	-15.35	37.57	40.00	-2.43
194.90	Peak	37.88	-10.06	27.82	43.50	-15.68
243.40	Peak	42.96	-10.28	32.68	46.00	-13.32
275.41	Peak	41.97	-8.42	33.55	46.00	-12.45
449.04	Peak	36.84	-3.88	32.96	46.00	-13.04
479.11	Peak	35.63	-2.98	32.65	46.00	-13.35

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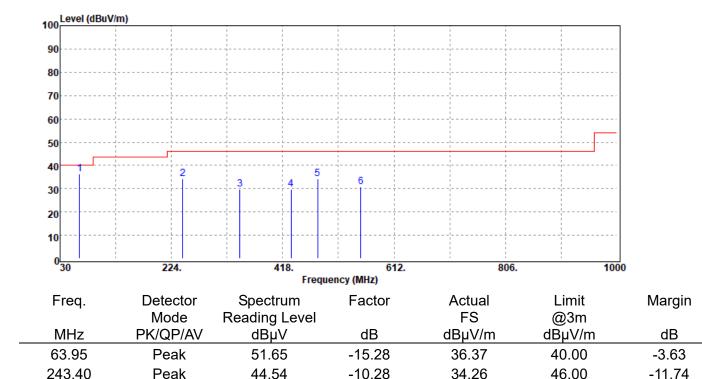
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612W02
R
MHz
H Mid
lan

Test Date	:2019-06-28
Temp./Humi.	:21/49
Antenna Pol.	:HORIZONTAL
Engineer	:Kane



-7.14

-4.32

-2.98

-2.29

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37.04

34.01

37.34

33.22

Peak

Peak

Peak

Peak

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343.31

432.55

479.11

553.80

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29.90

29.69

34.36

30.93

46.00

46.00

46.00

46.00

-16.10

-16.31

-11.64

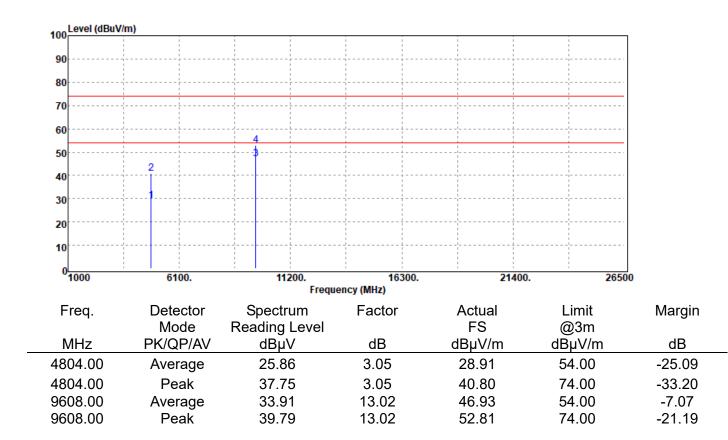
-15.07



Frequency above 1 GHz

Report Number	:T190612W02
Operation Band	:BT BR
Frequency	:2402 MHz
Operation Mode	:Tx CH Low
EUT Pol.	:E2 Plan

Test Date	:2019-06-27
Temp./Humi.	:21/49
Antenna Pol.	:VERTICAL
Engineer	:Kane



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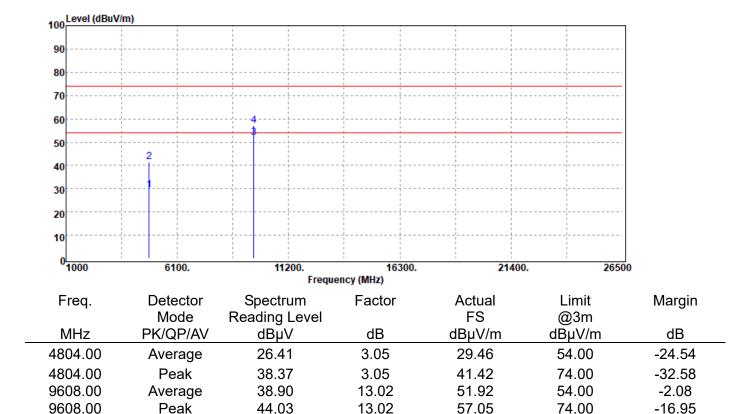
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Report Number	:T190612W02
Operation Band	:BT BR
Frequency	:2402 MHz
Operation Mode	:Tx CH Low
EUT Pol.	:E2 Plan

Test Date	:2019-06-27
Temp./Humi.	:21/49
Antenna Pol.	:HORIZONTAL
Engineer	:Kane



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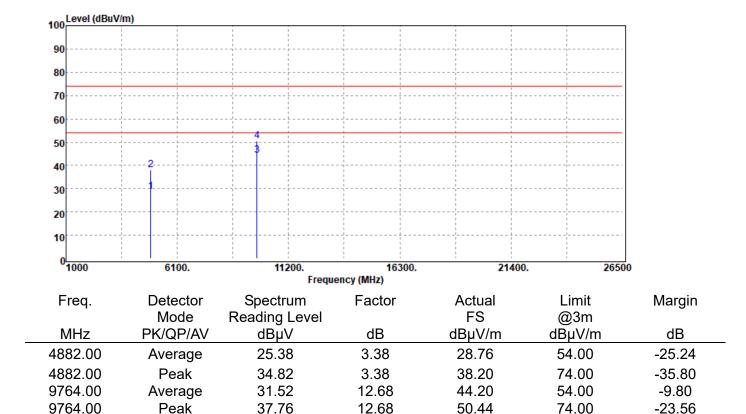
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Report Number	:T190612W02
Operation Band	:BT BR
Frequency	:2441 MHz
Operation Mode	:Tx CH Mid
EUT Pol.	:E2 Plan
EUT Pol.	:E2 Plan

Test Date	:2019-06-27
Temp./Humi.	:21/49
Antenna Pol.	:VERTICAL
Engineer	:Kane



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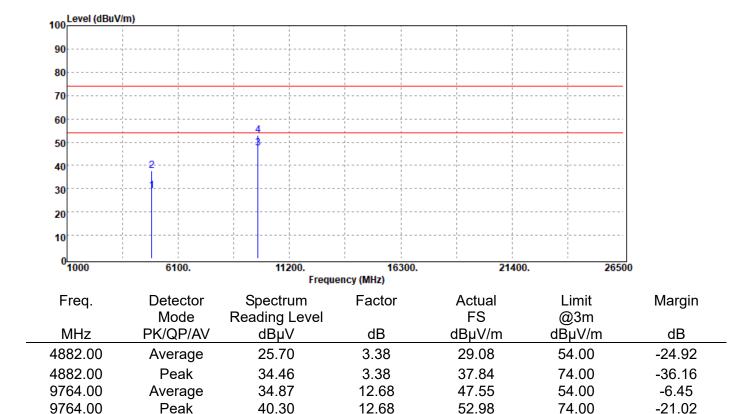
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Report Number	:T190612W02
Operation Band	:BT BR
Frequency	:2441 MHz
Operation Mode	:Tx CH Mid
EUT Pol.	:E2 Plan
EUT Pol.	:E2 Plan

Test Date	:2019-06-27
Temp./Humi.	:21/49
Antenna Pol.	:HORIZONTAL
Engineer	:Kane



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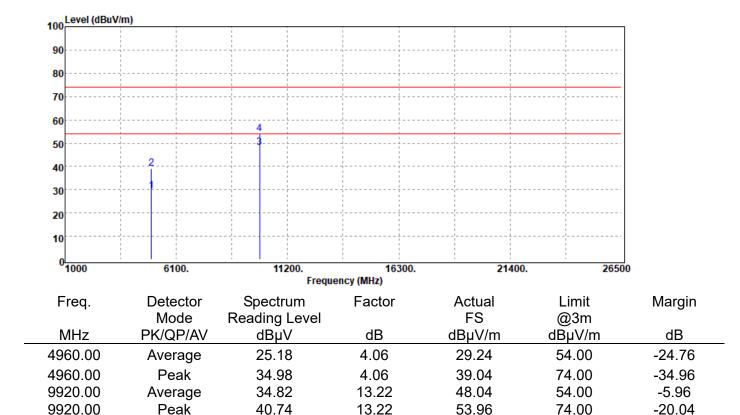
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Report Number	:T190612W02
Operation Band	:BT BR
Frequency	:2480 MHz
Operation Mode	:Tx CH High
EUT Pol.	:E2 Plan

Test Date	:2019-06-27
Temp./Humi.	:21/49
Antenna Pol.	:VERTICAL
Engineer	:Kane



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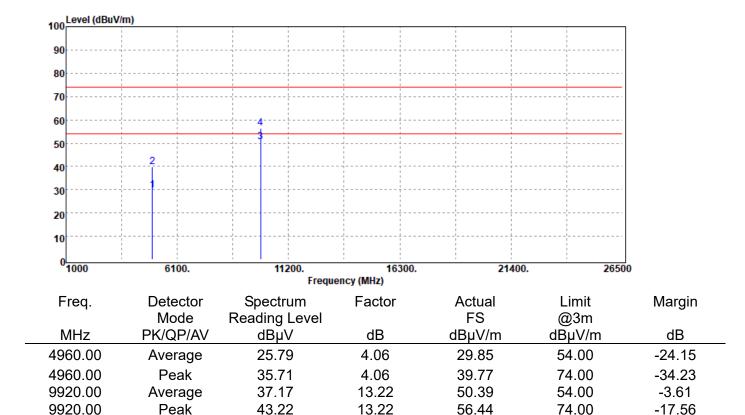
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Report Number	:T190612W02
Operation Band	:BT BR
Frequency	:2480 MHz
Operation Mode	:Tx CH High
EUT Pol.	:E2 Plan

Test Date	:2019-06-27
Temp./Humi.	:21/49
Antenna Pol.	:HORIZONTAL
Engineer	:Kane



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11 FREQUENCY SEPARATION

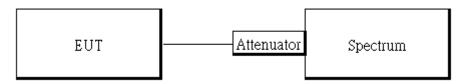
11.1 Standard Applicable

Frequency hopping systems shall have hopping channel carrier frequencies separated by minimum of 25 kHz or the 2/3*20dB bandwidth of the hopping channel, whichever is greater.

11.2 Measurement Equipment Used

Conducted Emission Test Site						
EQUIPMENT MFR MODEL SERIAL LAST CAL DU						
TYPE		NUMBER	NUMBER	CAL.		
DC Block	PASTERNACK	PE8210	RF256	02/26/2019	02/25/2020	
Spectrum Analyzer	Agilent	N9010A	MY53400256	11/21/2018	11/20/2019	
Attenuator	Marvelous	MVE2213-10	RF80	02/26/2019	02/25/2020	

11.3 Test Set-up



11.4 Measurement Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. The testing follows ANSI C63.10:2013. Measurement Guidelines.
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 4. Set center frequency of spectrum analyzer = middle of hopping channel.
- 5. Set the spectrum analyzer as RBW, VBW=100 kHz, Adjust Span to 5MHz, Sweep = auto.
- 6. Max hold. Mark 3 Peaks of hopping channel and record the 3 peaks frequency.

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11.5 Measurement Result

Channel separation (MHz)	Limit	Result
1	>=25 kHz or 2/3 times 20dB bandwidth	PASS

Frequency Separation Test Data

Freque	ncy Separ	ation_GFS	SK_1M_DH5_	CH0CH1CH2	<u>)</u>
📁 Keysight Spectrum Analyzer - Swept SA					
₩ RL RF 50 Ω DC Center Freq 2.40300000		SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr	11:32:16 AM Jun 25, 2019 TRACE 1 2 3 4 5 6 TYPE M WWWW	Frequency
		Trig: Free Run #Atten: 20 dB		DET P NNNN	Auto Tune
Ref Offset 10.4 dB 10 dB/div Ref 20.00 dBm				1kr3 1.000 MHz 0.16 dB	Auto Tune
		_1∆2	3∆4		Center Freq
0.00	2	m An	- my	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	2.403000000 GHz
-20.0					Start Fred
-30.0					2.400500000 GHz
-40.0					
-60.0					Stop Fred 2.405500000 GHz
-70.0					
Center 2.403000 GHz #Res BW 100 kHz	#VBW 1	00 kHz	Sweep 1	Span 5.000 MHz 000 ms (1001 pts).	CF Step 500.000 kHz
MKR MODE TRC SCL X			NCTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Mar
	1.000 MHz (Δ) 02 000 GHz	-0.24 dB 5.40 dBm			Eron Offent
	1.000 MHz (Δ) 03 000 GHz	0.16 dB 5.15 dBm			Freq Offset
5 6				E	
7 8					
9 10 11					
11		m		*	
MSG			STATUS		

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12 NUMBER OF HOPPING FREQUENCY

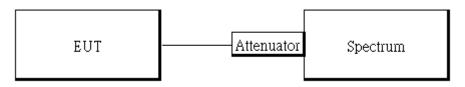
12.1 Standard Applicable

Frequency hopping systems operating in the 2400MHz-2483.5 MHz bands shall use at least 15 hopping frequencies.

12.2 Measurement Equipment Used

Conducted Emission Test Site						
EQUIPMENT MFR MODEL SERIAL LAST CAL DU						
TYPE		NUMBER	NUMBER	CAL.		
DC Block	PASTERNACK	PE8210	RF256	02/26/2019	02/25/2020	
Spectrum Analyzer	Agilent	N9010A	MY53400256	11/21/2018	11/20/2019	
Attenuator	Marvelous	MVE2213-10	RF80	02/26/2019	02/25/2020	

12.3 Test Set-up



12.4 Measurement Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. The testing follows ANSI C63.10:2013. Measurement Guidelines.
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 4. Set spectrum analyzer Start=2400MHz, Stop = 2483.5MHz, Sweep = auto.
- 5. Set the spectrum analyzer as RBW=430 kHz, VBW=1.5MHz., Detector = Peak
- 6. Max hold, view and count how many channel in the band.

12.5 Measurement Result

Tabular Data of Total Channel Number

	Channel Number	Limit
2.4 GHz – 2.441GHz	40	
2.441 GHz – 2.4835GHz	39	>15
2.4GHz ~2.4835GHz	(40+39) = 79	

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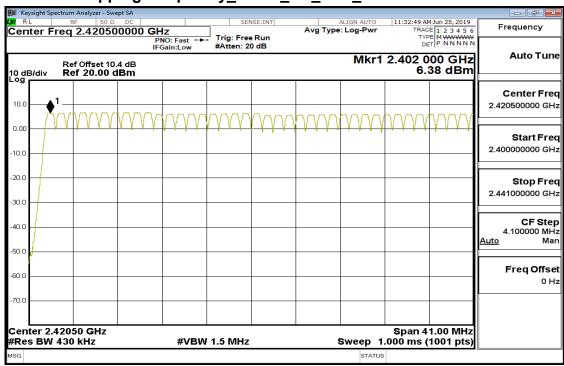
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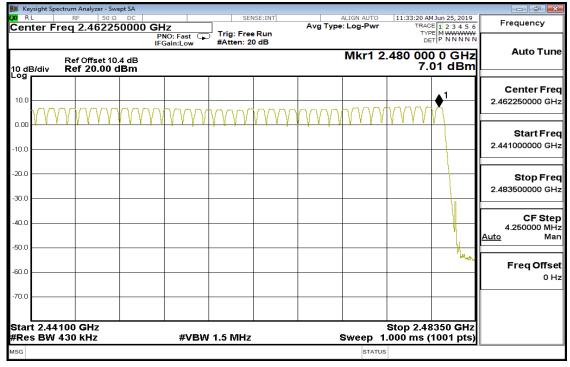


Channel Number



Hopping Frequency_GFSK_1M_DH5_2400-2441

Hopping Frequency_GFSK_1M_DH5_2441-2480



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13 TIME OF OCCUPANCY (DWELL TIME)

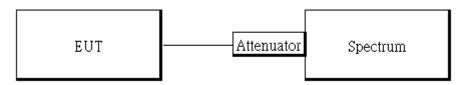
13.1 Standard Applicable

Frequency hopping systems operating in the 2400MHz-2483.5MHz. The average time of occupancy on any frequency shall not greater than 0.4 s within period of 0.4 seconds multiplied by the number of hopping channel employed.

13.2 Measurement Equipment Used

Conducted Emission Test Site					
EQUIPMENT MFR MODEL SERIAL LAST CAL DUE					
TYPE		NUMBER	NUMBER	CAL.	
DC Block	PASTERNACK	PE8210	RF256	02/26/2019	02/25/2020
Spectrum Analyzer	Agilent	N9010A	MY53400256	11/21/2018	11/20/2019
Attenuator	Marvelous	MVE2213-10	RF80	02/26/2019	02/25/2020

13.3 Test Set-up



13.4 Measurement Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. The testing follows ANSI C63.10:2013. Measurement Guidelines.
- 3.Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 4. Set center frequency of spectrum analyzer = operating frequency.
- 5. Set the spectrum analyzer as RBW, VBW=1MHz, 3MHz, Span = 0Hz , Detector = Peak, Adjust Sweep = 2~8ms.
- 6. Repeat above procedures until all frequency of the interest measured were complete.

Formula Deduced: time occupancy of one time slot X Hopping rate / total slot in one channel / total channel that hops X period of working channels.

Where, standard hopping rate is 1600 hops/s, slot in one channel for DH1, DH3, and DH5 is 2, 4, and 6, respectively.

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DH1 consists of single time slot of the uplink, and one slot of the downlink Total Slot: 2 DH3 consists of three time slot of the uplink, and one slot of the downlink. Total Slot: 4 DH5 consists of five time slot of the uplink, and one slot of the downlink. Total Slot: 6

In AFH mode, hopping rate is 800 hop/s with 6 slots in 20 hopping channels with channel hopping rate (800 / 6 / 20) in Occupancy Time Limit (0.4 * 20) (S), Hop Over Occupancy Time comes to (800 / 6 / 20)*(0.4 *20) =53.33

Note: the result of the complete test default channel at 1Mbps is recorded on the test report, 2Mbps, and 3Mbps only records the measurement result at middle channel that reveals no much deviation.

Tabular Result of the Measurement 13.5

OFOK	
Gran	(1Mbps)

Channel	PACKET TYPE	Measurement Result (ms)	Limit (ms)	1/T (kHz)	VBW setting (kHz)
	DH1	123.20	400ms	2.60	3.00
Low	DH3	262.40	400ms	0.61	1.00
[[DH5	308.80	400ms	0.35	1.00
	DH1	121.60	400ms	2.63	3.00
Mid	DH3	262.40	400ms	0.61	1.00
	DH5	308.80	400ms	0.35	1.00
	DH1	123.20	400ms	2.60	3.00
High	DH3	260.80	400ms	0.61	1.00
	DH5	308.80	400ms	0.00	1.00

$\pi/4$ DQPSK (2Mbps)

Channel	PACKET TYPE	Measurement Result (ms)	Limit (ms)	1/T (kHz)	VBW setting (kHz)
	DH1	124.80	400ms	2.56	3.00
Mid	DH3	262.40	400ms	0.61	1.00
	DH5	308.80	400ms	0.35	1.00

8-DPSK (3Mbps)

Channel	PACKET TYPE	Measurement Result (ms)	Limit (ms)	1/T (kHz)	VBW setting (kHz)
	DH1	123.20	400ms	2.60	3.00
Mid	DH3	262.40	400ms	0.61	1.00
	DH5	308.80	400ms	0.35	1.00

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A period time = 0.4 (s) * 79 = 31.6 (s)

GFSK (1Mbps):

CH Low	DH1 time slot = DH3 time slot = DH5 time slot =	0.385 * 1.640 * 2.895 *	(1600/2/79) * (1600/4/79) * (1600/6/79) *	31.6 = 31.6 = 31.6 =	123.20 (ms) 262.40 (ms) 308.80 (ms)
CH Mid	DH1 time slot = DH3 time slot = DH5 time slot =	0.380 * 1.640 * 2.895 *	(1600/2/79) * (1600/4/79) * (1600/6/79) *	31.6 = 31.6 = 31.6 =	121.60 (ms) 262.40 (ms) 308.80 (ms)
CH High	DH1 time slot = DH3 time slot = DH5 time slot =	0.385 * 1.630 * 2.895 *	(1600/2/79) * (1600/4/79) * (1600/6/79) *	31.6 = 31.6 = 31.6 =	123.20 (ms) 260.80 (ms) 308.80 (ms)
π/4 -DQPS	K (2Mbps):				
CH Mid	DH1 time slot =	0.390 *	(1600/2/79) *	31.6 =	124.80 (ms)
	DH3 time slot =	1.640 *	(1600/4/79) *	31.6 =	262.40 (ms)
	DH5 time slot =	2.895 *	(1600/6/79) *	31.6 =	308.80 (ms)

8-DPSK (3Mbps):

CH Mid	DH1 time slot =	0.385 *	(1600/2/79) *	31.6 =	123.20 (ms)
	DH3 time slot =	1.640 *	(1600/4/79) *	31.6 =	262.40 (ms)
	DH5 time slot =	2.895 *	(1600/6/79) *	31.6 =	308.80 (ms)

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GFSK (1Mbps) for AFH Mode									
Hopping Channel	PACKET TYPE	Measurement Result	Limit						
Number	PACKETTIPE	(ms)	(ms)						
20	DH5	154.40	400ms						
π/4 DQPSK (2Mbps) for AFH Mode									
Hopping Channel	Hopping Channel PACKET TYPE Measurement Result Limit								
Number	PACKETTIPE	(ms)	(ms)						
20	2DH5	154.40	400ms						
	8-DPSK (3Mbps	s) for AFH Mode							
Hopping Channel	PACKET TYPE	Measurement Result	Limit						
Number	FAGRETTIPE	(ms)	(ms)						
20	3DH5	154.40	400ms						

GFSK (1Mbps):

DH5 time sl =	2.895	(ms)	*	(800/6/20)* 8 =	154.40	(ms)
π/4 -DQPSK (2Mbps						
DH5 time sl =	2.895	(ms)	*	(800/6/20)* 8 =	154.40	(ms)
8-DPSK (3Mbps):						
DH5 time sl =	2.895	(ms)	*	(800/6/20)* 8 =	154.40	(ms)

13.6 **Measurement Result**

Note: Refer to next page for plots.

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Dwell Time_GFSK_1M_DH1_2402MHz

enter Fred	2.402000000	SHZ PNO: Fast	Trig: Free Run #Atten: 20 dB	Ave Type: Log-Pwr	1024 19 41 Sin 25, 2019 1024 19 41 Sin 25, 2019 12 3 4 5 6 7/16 / 12 3 4 5 6 2011 1 1 1 1 1 1 1 1	Frequency
0 dB/div R	ef Offset 10.4 dB			۵	Mkr3 1.250 ms 0.67 dB	Auto Tune
000 X2	142	364 -				Center Free 2.402000000 GH
00						Start Free 2,402000000 GH
	iynus olyiskidesmiskyir	Webbe	altractively	nym,ashabuhhuyanyiyidini	and the physics where	Stop Free 2.402000000 GH
enter 2.403 es BW 1.0		#VBW	3.0 MHz		Span 0 Hz .000 ms (1001 pts)	CF Step 1.000000 MH Auto Mar
2 F	1 (Δ) 1	385.0 μs (Δ) 110.0 μs 1.250 ms (Δ) 110.0 μs	5.14 dB 0.47 dBm 0.67 dB 0.47 dBm	UNCTION FUNCTION (40714)	EUNCTION WARE	Freq Offse 0 H
7 8 9 10 11						

Dwell Time_GFSK_1M_DH1_2441MHz

Receipt Growing Streets	10110			-			2 P 2
Center Freq 2.441	PNO: Fr		g: Free Run	Avg Type: I	.0g-Pwr	TYTE WWWWW	Frequency
Ref Offset		tre sAt	ten: 20 dB		ΔMkr3	1.250 ms 0.01 dB	Auto Tuni
0.00	142	364 -					Center Fre 2.441000000 GH
200 200 400 200		-					Start Fre 2.441000000 GH
	anthe hear when the	We ¹	Yyerry/Internet	shel ja	handshiptowalles	1944	Stop Fre 2,441000000 GH
Center 2.441000000 Res BW 1.0 MHz		VBW 3.0			veep 5.000 m		CF Ste 1.000000 Mi Auto Ma
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	380.0 µ 620.0 µ 1.250 m 620.0 µ	s (Δ)	0.16 dB 11 dBm 0.01 dB 11 dBm				Freq Offse 0 H
8 9 10 11					entites		

Dwell Time_GFSK_1M_DH1_2480MHz

2.480000000 0	24.1	THE ROLES	Avp Type: Log-Pwr	18 23 41 AV 3in 25, 7819	Frequency
	ENC: East	#Atten: 20 dB	Cite Ster stat at	TUTE VILLAND	
ef Offset 10.4 dB			۵١	Akr3 1.250 ms -0.54 dB	Auto Tun
162	34				Center Fre
					2.480000000 GH
					Start Fre 2,48000000 GR
Haltherworkstotige	1	att up Now your	hard the state of	4. Angle and Alan	
	-				Stop Fre 2.480000000 GH
0000000 GHz MHz	#VBV	V 3.0 MHz	Sweep 5.0	Span 0 Hz 00 ms (1001 pts)	CF Ste
C) X					Auto M
1 1 (Δ)	170.0 us	-8.90 dBm -0.54 dB -8.90 dBm			Freq Offs
	_				
	er Offset 10.4 dB er 10.00 dBm 1Δ2 9%/#φ.μετείε τρ 9%/#φ.μετείε τρ 9%/#φ.μετε	Proc. Fast -= #Comext 10.4 dB #C 10.90 dBm 1 102 30.4 1 102 30.4 1 102 30.4 1 102 30.4 1 102 30.4 1 102 30.6 1 102 30	PAGE Task They line Run Bickins.com of Offset 10.4 dB ef Offset 10.4 dB ef 0000000 30.4 1.02 30.4 1.02 30.4 1.04 30.4 1.02 30.4 1.04 30.4 1.05 30.4 1.06 1.06 1.00000000 GHz MHz 1.01 1.52.2 dB 1.01 1.52.2 dB 1.03 3.0.5 bjg (a) 1.03 3.0.5 bjg (a) 1.04 3.0.5 bjg (a) 1.04 3.0.5 bjg (a) 1.04 3.0.5 bjg (a) 1.04 3.0.5 bjg (a)	Page Trail Trail Tree Run Science. Trail Tree Run Science. ΔΛ ef Offset 10.4 dB ef 000e0 3.04 ΔΛ ΔΛ 1.02 3.04	Plass / Lead Trig / Free Run & Anter: 20 dB Trig / Free Run & Anter: 20 dB ef Offset 10.4 dB ΔMKr3 1.250 ms ef Offset 10.4 dB -0.54 dB 11.02 30.4 11.02 30.4 93041, update -0.54 dB 93044, update -0.54 dB 93050, update -0.54 dB 93000000 GHz -0.54 dB 10000000 GHz -0.54 dB 10000000 GHz -0.54 dB 10000000 GHz -0.54 dB

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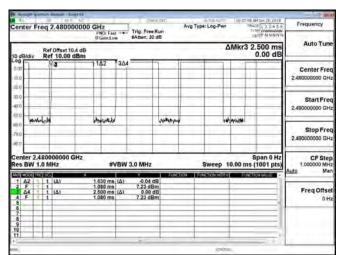
Dwell Time_GFSK_1M_DH3_2402MHz

Center Freq 2.402	000000 GHz PNO: Fast	Trig: Free Run #Atten: 20 dB	Ava Type: Log-Pwr	128/13 443/0 25, 2019 19620 1 2 3 4 5 6 19780 WWWWWW 2817 P MNNNN	Frequency
Ref Offset			ΔΜ	-0.03 dB	Auto Tune
00	¥1∆2 ¥3∆4				Center Fre 2.402000000 GH
10					Start Fre 2.402000000 GH
	ranna	ganisyiyin	his realized	-	Stop Fre 2.402000000 GH
enter 2.40200000 es BW 1.0 MHz		3.0 MHz		Span 0 Hz 0 ms (1001 pts)	CF Ste 1.000000 MH
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	1.640 ms (Δ) 850.0 μs 2.500 ms (Δ) 850.0 μs	1.46 dB 6.08 dBm -0.03 dB 6.08 dBm			Freq Offse 0 H
7 6 9					

Dwell Time_GFSK_1M_DH3_2441MHz

B Remain Games	And Address of Family State			ctived out		TALL'S			
Center Freq	2.441000000	FNO: Fast -	Trig	FreeRun	Avg Type:		TRACE TYPE	123454	Frequency
	ef Offset 10.4 dB	FGentlow	sAth	en: 20 dB		۵	Mkr3 2.	to Section 7	Auto Tun
0.00 (0.00	#10.00 dBill		1Δ2	304					Center Fre 2.441000000 GH
200 300 400			F						Start Fre 2.441000000 GH
500 600 700 400	t-significantly		saliyaris M		in stanystay		44	49.24.	Stop Fre 2.441000000 GH
Center 2.441 Res BW 1.01		#VBI	W 3.0 M		S INCTOON FUNC		Sj).00 ms (1		CF Ste 1.000000 Mi Auto Ma
2 F 1 4 F 1 5 6 7		1.640 ms (Δ 2.120 ms 2.500 ms (Δ 2.120 ms) 6,1	0.02 dB 04 dBm 0.00 dB 04 dBm		(1947(01))	+UK TQ	* WALDE	Freq Offs 01
8 9 10 11								=	122

Dwell Time_GFSK_1M_DH3_2480MHz





Dwell Time_GFSK_1M_DH5_2402MHz

Frequency	TRACE 1 2 3 4 5 8 TYPE CRIT P NUNN N	Type: Log-Pwr		Trig: Free Ru #Atten: 20 di	Fast	00000 GHz	q 2.4020	er Fr
Auto Tun	Mkr3 3.750 ms -0.01 dB	Δ	1				Ref Offset 10 Ref 20.00	i/div
Center Fre 2.402000000 GH		-	F		3∆4	102	a	1
Start Fre 2.402000000 GH								
Stop Fre 2.402000000 GH	e l	(mark	~	v		1.00		www
CF Ste 1.000000 MH Auto Ma	Span 0 Hz 5.00 ms (1001 pts)	Sweep 15	Same Ta	3.0 MHz	#VBW	Hz		er 2.4 BW 1.
Freq Offse 0 H				-17.45 dB 6.53 dBm -0.01 dB 6.53 dBm	ms (Δ)	1.035	1 (Δ) 1 (Δ) 1 (Δ)	12 F 14 F
		STATIS						

Dwell Time_GFSK_1M_DH5_2441MHz

nia di sur pran	- Small AA				2 2 2
ter Freq 2.44	1000000 GHz	Trig: Free Run	Avg Type: Log-Pwr	10:49:21 AV 3in 25:7819 3:025 1 2 3 4 5 4 Type Vision Vi	Frequency
	IF Gain(Low	#Atten: 20 dB	-	Akr3 3.750 ms	Auto Tune
	et 10.4 dB 00 dBm			-0.01 dB	
×.	_⊖ ^{1∆2}			and the later	Center Fre
mod					2.441000000 GH
					StartFre
					2.441000000 GH
di-	RUT YES	-	miller		Stop Fred 2.441000000 GH2
ter 2.4410000		P I		Span 0 Hz	CF Ste
BW 1.0 MHz	#VBW	3.0 MHz		00 ms (1001 pts)	1.000000 MH Auto Ma
Δ2 1 (Δ) F 1	2.895 ms (Δ) 630.0 μs	-3.63 dB 6.08 dBm			Freg Offse
Δ4 1 (Δ) F 1	3,750 ms (Δ) 630,0 μs	-0.01 dB 6.08 dBm	_		OH
111		-	-		
			STRATES		

Dwell Time_GFSK_1M_DH5_2480MHz

a design	-9-1							-		covel out	-	-	the later	10423	44 310 29	7819	
Cente	er Fr	eq				PN	3: Fast		Trig	Free Run			Log-Pwr	16		1424	Frequency
10 dB/	viio		Offse 20.0			(FG	ind on		sAth	en: 20 dB			۵	Mkr3	south in	ms	Auto Tun
10.0 10.0 0.00					a	-	-	-	0102	344		1		_	1-	F	Center Fre 2.480000000 GH
- 0.05 30.0						-		-									Start Fre 2.480000000 Gr
50.0 50.0 70.0			-	1.10				-	Wies						13.42	~	Stop Fre 2.480000000 GH
	er 2.4 SW 1.			O GH	łz		#\	BW	3.0 M	1Hz		s	weep 1		Span (1001		CF Ste 1.000000 Mi
	2	1		-	х	2.00	5 ms	(4)	¥	.77 dB	FUNCTION	FUN	TKIN WIDTH	EUK	TION WAL	E ·	Auto Ma
2 F 4 F 6 7	4	1	(Δ)	-		3.24	0 ms 0 ms 0 ms		7.	8 dBm 2 01 dB 8 dBm							Freq Offs 01
8 9 10	-						_	-					-			Ę	-
11	1	-						-				+			_	0	

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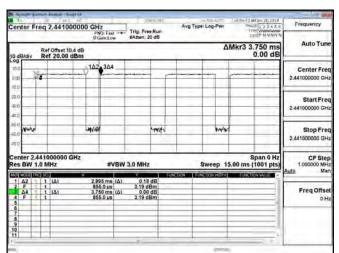
$Dwell \ Time_\pi/4DQPSK_2M_DH1_2441MHz$

Frequency	THICE 123.45.6	7	Log-Pw	Avg Typ	Run	Trig: Free		GHz PNO: Fas	000000	2.441	Freq	inter
Auto Tur	3 1.250 ms	AMkr				PALLEN, D		C GARALO	10.4 dB			dR/di
Center Fre 2.441000000 GH		1	F				-	204		Δ2		a 1/2
Start Fre 2.441000000 GH												10
Stop Fre 2,441000000 GH	white you have he	4	rapping	mautosoul		1	-17 m	- 5	conductant	11114	4	10
CF Ste 1.000000 Mi Auto Ma	Span 0 Hz ns (1001 pts)					3.0 MHz	/BW	#1	GHz		1.0 N	enter es BV
Freq Offs 0 H					1B Im 1B	-0.39 (2.80 dB 0.04 (2.50 dB		390.0 µs 45.00 µs 1.250 ms 45.09 µs		(Δ) (Δ)	1.1	
							-		_		-	

Dwell Time_ $\pi/4DQPSK_2M_DH3_2441MHz$

a symptotic	and the second second	100		cova out		1.58.625		1 am 25. 2019	0 0 00
Center F	req 2.441	000000 GHz	Trig	FreeRun	Ave Typ	e: Log-Pwr	1444	1 2 3 4 5 4 1 2 3 4 5 4	Frequency
10 dB/div	Ref Offset Ref 10.00	IFGillet		n: 20 dB		4	Mkr3 2	500 ms	Auto Tun
0.00 tho	×5	1.44	2 34		-				Center Fre 2.441000000 GH
20 0 20 0 40 0									Start Fre 2.441000000 GH
-70.0 -70.0	weiner fer	er.,	hand .	Y	MANNAN .		Hendericky		Stop Fre 2.441000000 GH
Center 2. Res BW			VBW 3.0 M	10. 10.1		Sweep 1	0.00 ms (CF Ste 1.000000 M Auto M
1 Δ2 2 F 1 Δ4 4 F 5 6 7	τ (Δ) τ τ (Δ) τ	1.640 m 1.469 m 2,500 m 1.460 m	3.1 (A) 0	96 dB 4 dBm 000 dB 4 dBm	NCCON 74		ELACO		Freq Offs 01
8 9 10 11						statis			

Dwell Time_ π /4DQPSK_2M_DH5_2441MHz



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Dwell Time 8DPSK 3M DH1 2441MHz

enter	Fre	q 2.44	100000	DO GH	Z C: Fast	Trig Pr	ree Run	Ave Ty	pe: Log-Pwr	7,5#	123454	Frequency
-	_	_	-		andow	#Atten:	20 dB		_		PROMININ	Auto Tune
D dB/d		tef Offse								AMkr3 1.2	50 ms 02 dB	
00	-		and a	/1Δ2		344	2	1	-		m	Center Free
00	_	-		-	_		-	-				2.441000000 GH
00-	_	-		-	-		-	-			_	
0.0	-	+	++-	-	-	-	-	+ +	-			Start Free
00	-					11	1.	11			· · · · · · · ·	2.441000000 GH
	14-44	Arriver,		hely	harishpish	4d	Newlin	willow the	494	AMANYA		
10		-		-	-	-		1			-	Stop Frei 2.441000000 GH
00	-	-	-	-		-	-	-	-	-	-	2.44100000 54
		100000	0 GHz	-			-	-	Danmar A		an 0 Hz	CF Step
es Bl	-				#VBN	N 3.0 MH				5.000 ms (1		1.000000 MH Auto Mar
1 42		τ (Δ)			5.0 us (A)		5 dB	NCTON .	LINCTRON WORK	EUNCTION	WINE	
2 F	1	1 1 (Δ)		83	5.0 us 50 ms (Δ)	3.22	dBm 2 dB			-		Freq Offse
4 F		1		83	5.0 μπ	3.22	dBm					OH
6		-	_	_		_		-		-		1
8		-			-		-					
9		-		_	-		-	-	_	-		
1		-		-							2	
	_	_		_		-						

Dwell Time_8DPSK_3M_DH3_2441MHz

10			
0000 GHz	Avg Type: L	Og-Pwr THACE 12.1.4	Frequency
If Gainclow #Atten: 1 dB Bm	10 dB	ΔMkr3 2.500 r 0.00 c	Auto Tune
¥1Δ2 ¥3Δ4			Center Freq 2.441000000 GHz
			Start Free 2.441000000 GH
Novpenhant	'y awfaiwyd	envelopi	Stop Free 2,441000000 GH:
1.640 ms (Δ) 1.07 1.370 ms 3.20 d 2.500 ms (Δ) 0.00	dB Bm dB		Freq Offse OH
	Kon tail → 1000 GH2 Frig. Fast Frig.	Avg Type: L Avg Type: L Proof Fast Trig: Pres Run BAtter: 30 dB Avg Type: L dB Avg Type: L Bvg Type: L dB Avg Type: L Bvg Type: L <	Constrained Constrained <thconstrained< th=""> <thconstrained< th=""></thconstrained<></thconstrained<>

Dwell Time_8DPSK_3M_DH5_2441MHz

		5 NC	_	00068	OVT TWO	104,556,4670	11:00:53 AH 3in 25, 7819	F Shire to be
enter Fr	eq 2.4410		łz NO: Fast ↔ Gain Low	Trig: Free R	in	ype: Log-Pwr	TRUCE 1 2 3 4 5 4	
-	-		Gainclow	EAtten: 20 a		-	Mkr3 3.750 ms	Auto Tim
0 dB/div	Ref Offset 1 Ref 20.00					-	0.01 dB	
10.0				142, 344				Center Fre
100	man	Marin		-Y			- man	2.441000000 GH
10.0			1		1 1			
0.0	-		-					Start Fre
30.0	-		-					2.441000000 GH
411.0	-	11	-					
50.0	-	inal		hange	_	wind	MARIN	Stop Free
0.0		Beards		LAW			-	2.441000000 GH
40.0	-	-		-	-	-		
	41000000	GHz		- Z Z.			Span 0 Hz	CF Ste
Res BW 1	.0 MHz	2	#VB	N 3.0 MHz		Sweep 1	5.00 ms (1001 pts)	1.000000 MH Auto Ma
1 A2		X	95 ms (Δ	0.76 dB		FUNCTION WORTH	EUNCTION WILLE	C502 104
2 F	1	3.3	30 ms	3.16 dBm				Freq Offse
4 F	1 (Δ) 1	3.3	50 ms (Δ	0.01 dB	-			OH
5	-	_	-	-				
7 8			-					
9								
11								

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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(マケアフ クロルマ) 単小取 ロ 和本 (電 ジ) 例は入 (本 の 中見 、) (同 対 山 依 印 崖 下 由 ツ 人 、 今 本 取 古 不歴 平 公 (2) 書 田 計 リ ・ 个 リ 即 辺 復栄 * This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/terms and conditions.htm</u> and for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms e-document.htm</u>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereion reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Com-pany's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

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14 ANTENNA REQUIREMENT

14.1 Standard Applicable

For intentional device, according to §15.203, an intentional radiator shall be designed to ensure that no antenna other than furnished by the responsible party shall be used with the device. If the transmitting antenna is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi.

14.2 Antenna Connected Construction

An embedded-in antenna design is used.

The antenna connector is designed with unique type RF connector and no consideration of replacement. Please see EUT photo and antenna spec. for details.

~ End of Report ~

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