

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

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INTENTIONAL RADIATOR CERTIFICATION TO **FCC PART 15 SUBPART C REQUIREMENT**

	OF	
Brand Name:	Sony	
FCC ID:	PY7-55364J	
Report No.:	ER/2016/C0048	
Issue Date:	Mar. 01, 2017	
FCC Rule Part:	§15.247, Cat: DSS	
Prepared for:	Sony Mobile Communications Inc. 4-12-3, Higashi-Shinagawa, Shinagawa-ku, Tokyo, 140-0002 Japan	
Prepared by:	SGS Taiwan Ltd. Electronics & Communication Laboratory No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803	
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VERIFICATION OF COMPLIANCE

Applicant:	Sony Mobile Communications Inc. 4-12-3, Higashi-Shinagawa, Shinagawa-ku, Tokyo, 140-0002 Japan
Brand Name:	Sony
FCC ID:	PY7-55364J
Report Number:	ER/2016/C0048
Date of test:	Dec. 09, 2016 ~ Jan. 09, 2017
Date of EUT Received:	Dec. 09, 2016

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10:2013 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits.

The test results of this report relate only to the tested sample identified in this report.

Test By: Date: Mar. 01, 2017 Louis Chen / Engineer Carev Prepared By: Mar. 01, 2017 Date: Karen Huang / Clerk Approved By: Date: Mar. 01, 2017

Jim Chang / Asst. Manager

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Revision History

Report Number	Revision	Description	Issue Date
ER/2016/C0048	Rev.00	Initial creation of document	Jan. 09, 2017
ER/2016/C0048	Rev.01	Provide measurement plot of radiation, please refer to Appendix I.	Jan. 23, 2017
ER/2016/C0048	Rev.02	Update general information & add MPE evaluation.	Feb. 06, 2017
ER/2016/C0048	Rev.03	Add ferrite core & update conduction setup photo.	Mar. 01, 2017

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GENERAL INFORMATION 1

1.1 Product description

General:

Brand Name:	Sony	Sony		
Hardware Version:	A	A		
Software Version:	0.20			
Data Cable (USB):	Model No.	: UCB20, Supplier: Sony, Length:100 cm		
BT Headset:	Model No.: MW600, Supplier: Sony			
HDMI Cable:	Model No.: DLC-HEU10A, Supplier: Sony			
Ferrite Core:	Type No.: ZCAT-2035-0930A-BK, Supplier: TDK			
	11.1Vdc			
Power Supply:	Battery:	Model No.: N/A, Supplier: N/A		
	Adapter:	Model No.:UCH30C, Supplier: Sony		

Bluetooth BR+EDR:

Frequency Range:	2.402GHz – 2.480GHz	
Bluetooth Version	BT V4.2 dual mode	
Channel number:	79 channels	
Modulation type:	GFSK + π/4DQPSK + 8DPSK	
Transmit Power:	7.50dBm (Peak)	
Antenna Designation:	Internal Antenna, Gain: 0.8dBi	

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1.2 Product Feature of Equipment Under Test

The equipment under Test (Hereafter Called: EUT) supports below functions.

Product Feature			
Bluetooth Version V4.2 dual mode			
Wi-Fi- Specification802.11a/b/g/n/ac			
NFC Specification NFC			

Note: The above EUT information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

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1.3 Test Methodology of Applied Standards

FCC Part 15, Subpart C §15.247

FCC Public Notice DA 00-705 Measurement Guidelines

ANSI C63.10:2013

Note:

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

1.4 Test Facility

SGS Taiwan Ltd. Electronics & Communication Laboratory No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803 (TAF code 0513)

FCC Registration Numbers are: 509634

Canada Registration Number: 4620A-5.

1.5 Special Accessories

There is no special accessory used while test was conducted.

1.6 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 hand-held 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. **Note:**

NOIE: The spec

The spectrum analyzer offset is derived from RF cable loss and attenuator factor. Following shows an offset computation example with cable loss 0.7dB and 10dB attenuator.

Offset:

= RF cable loss (dB)+ attenuation factor(dB) dB =10.7dB

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2.5 Configuration of Tested System



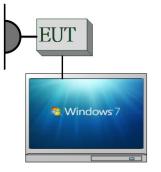


Fig. 2-2 Conducted (Antenna Port) Configuration

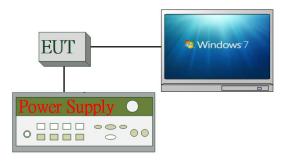


Fig. 2-3 AC Power Line Conducted Emission Configuration

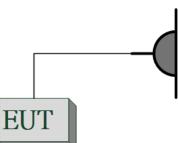


Table 2-1 Equipment Used in Tested System

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	R400	7440AV6	N/A	Un-shield
3.	DC Power Supply	Agilent	E3640A	KR93300208	N/A	N/A

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SUMMARY OF TEST RESULTS 3

FCC Rules	Description Of Test	Result
§15.207(a)	AC Power Line Conducted Emission	Compliant
§15.247(b)(1)	Peak Output Power	Compliant
§15.247(a)(1)	20dB Bandwidth	Compliant
§15.247(d)	Conducted Band Edge and Spurious Emission	Compliant
§15.247(d)	Radiated Band Edge and Spurious Emission	Compliant
§15.247(a)(1)	Frequency Separation	Compliant
§15.247(a)(1)(iii)	Number of hopping frequency	Compliant
§15.247(a)(1)(iii)	Time of Occupancy	Compliant
§15.203 §15.247(b)	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

СН	FREQUENCY	СН	FREQUENCY	СН	FREQUENCY	СН	FREQUENCY
0	2402 MHz	20	2422 MHz	40	2442 MHz	70	2462 MHz
1	2403 MHz	21	2423 MHz	41	2443 MHz	71	2463 MHz
2	2404 MHz	22	2424 MHz	42	2444 MHz	72	2464 MHz
3	2405 MHz	23	2425 MHz	43	2445 MHz	73	2465 MHz
4	2406 MHz	24	2426 MHz	44	2446 MHz	74	2466 MHz
5	2407 MHz	25	2427 MHz	45	2447 MHz	75	2467 MHz
6	2408 MHz	26	2428 MHz	46	2448 MHz	76	2468 MHz
7	2409 MHz	27	2429 MHz	47	2449 MHz	77	2469 MHz
8	2410 MHz	28	2430 MHz	48	2450 MHz	78	2470 MHz
9	2411 MHz	29	2431 MHz	49	2451 MHz	79	2471 MHz
10	2412 MHz	30	2432 MHz	50	2452 MHz	70	2472 MHz
11	2413 MHz	31	2433 MHz	51	2453 MHz	71	2473 MHz
12	2414 MHz	32	2434 MHz	52	2454 MHz	72	2474 MHz
13	2415 MHz	33	2435 MHz	53	2455 MHz	73	2475 MHz
14	2416 MHz	34	2436 MHz	54	2456 MHz	74	2476 MHz
15	2417 MHz	35	2437 MHz	55	2457 MHz	75	2477 MHz
16	2418 MHz	36	2438 MHz	56	2458 MHz	76	2478 MHz
17	2419 MHz	37	2439 MHz	57	2459 MHz	77	2479 MHz
18	2420 MHz	38	2440 MHz	58	2460 MHz	78	2480 MHz
19	2421 MHz	39	2441 MHz	59	2461 MHz		

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4.2 The Worst Test Modes and Channel Details

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

RADIATED TEST						
	Radiated	I Emission Test	(BELOW 1 GHz) (Wo	orst case)		
MODE	AVAILABLE	TESTED	MODULATION	PACKET		
NODE	CHANNEL	CHANNEL	WODULATION	TYPE		
Bluetooth	0 to 78	0,39,78	GFSK	DH5		
	Radiated Emission Test (ABOVE 1 GHz) (Worst case)					
MODE	AVAILABLE	TESTED	MODULATION	PACKET		
MODE	CHANNEL	CHANNEL	WODULATION	TYPE		
Bluetooth	0 to 78	0,39,78	GFSK	DH5		
Band Edge						
Bluetooth	0 to 78	0,78	GFSK	DH5		
Bluetooth	0 to 78	0,78	8-DPSK	3DH5		

Note: The field strength of radiation emission was measured as Bluetooth BR+EDR Transmitter for channel Low, Mid and High, the worst case was reported.

ANTENNA PORT CONDUCTED TEST						
	F	Peak Output Pov	ver, 20dB Band Wid	th		
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	PACKET TYPE		
	0 to 78	0,39,78	GFSK	DH5		
Bluetooth	0 to 78	0,39,78	π/4-DQPSK	2DH5		
	0 to 78	0,39,78	8-DPSK	3DH5		
		Band Edge & C	onducted Emission	l		
Bluetooth	0 to 78	0,78	GFSK	DH5		
Bluetooth	0 to 78	0,78	8-DPSK	3DH5		
		Frequen	cy Separation			
Bluetooth 0 to 78 0,39,78 G		GFSK	DH5			
		Number of h	opping frequency			
Bluetooth	0 to 78	0 to 78	GFSK	DH5		
Time of Occupancy (Dwell time)						
Bluetooth	0 to 78	0,39,78	GFSK	DH1/DH3/DH5		
Bluetooth	0 to 78	39	π/4-DQPSK	DH1/DH3/DH5		
Bluetooth	0 to 78	39	8-DPSK	DH1/DH3/DH5		

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ASUREMENT UNCERTAINTY 5

Test Items	Uncertainty
AC Power Line Conducted Emission	+/- 2.586 dB
Peak Output Power	+/- 0.84 dB
20dB Bandwidth	+/- 51.33 Hz
100 KHz Bandwidth Of Frequency Band Edges	+/- 0.84 dB
Frequency Separation	+/- 51.33 Hz
Number of hopping frequency	+/- 51.33 Hz
Time of Occupancy	+/- 51.33 Hz
Temperature	+/- 0.65 °C
Humidity	+/- 4.6 %
DC / AC Power Source	DC= +/- 0.13%, AC= +/- 0.2%

Radiated Spurious Emission:

	9kHz – 30MHz: +/- 2.87 dB
	30MHz - 180MHz: +/- 3.37dB
Measurement uncertainty	180MHz -417MHz: +/- 3.19dB
(Polarization : Vertical)	0.417GHz-1GHz: +/- 3.19dB
	1GHz - 18GHz: +/- 4.04dB
	18GHz - 40GHz: +/- 4.04dB

	9kHz – 30MHz: +/- 2.87 dB
	30MHz - 167MHz: +/- 4.22dB
Measurement uncertainty	167MHz -500MHz: +/- 3.44dB
(Polarization : Horizontal)	0.5GHz-1GHz: +/- 3.39dB
	1GHz - 18GHz: +/- 4.08dB
	18GHz - 40GHz: +/- 4.08dB

This uncertainty represents an expanded uncertainty expressed at approximately the

95% confidence level using a coverage factor of k=2.

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CONDUCTED EMISSION TEST 6

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	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.			
EMI Test Receiver	R&S	ESCI7	100760	05/10/2016	05/09/2017		
LISN	SCHWARZBECK	NSLK 8127	8127-649	05/16/2016	05/15/2017		
LISN	MESS TEC	FCC-LISN-50/250 -25-2-01	4034	05/16/2016	05/15/2017		
Coaxial Cables	N/A	WK CE Cable	N/A	11/26/2016	11/25/2017		

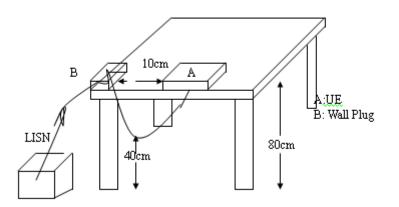
6.3 EUT Setup

- 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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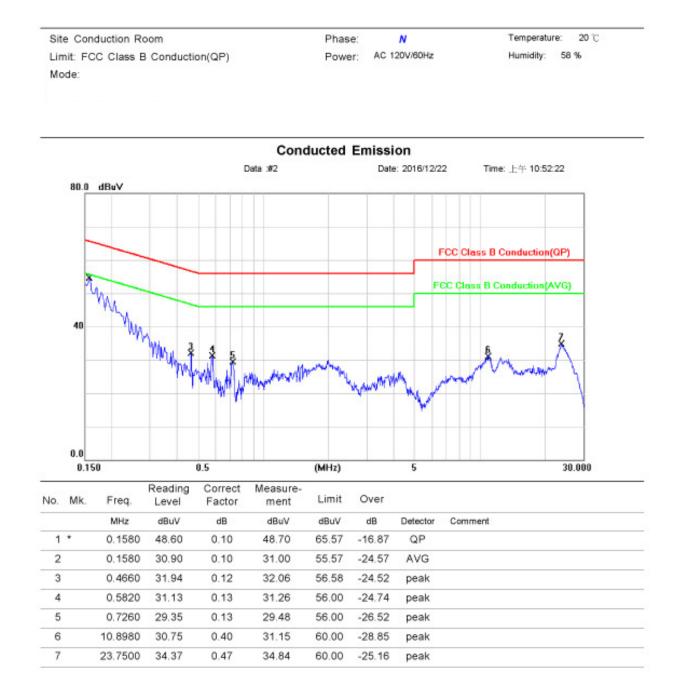
AC POWER LINE CONDUCTED EMISSION TEST DATA

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									Phase	:	L1 / N
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No.	0.0 0.19 Mk.	Freq.	Reading Level	Correct Factor	ment	Limit		5	m	iduction()	×
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1 2 3	0.0 0.15 Mk.	Freq. MHz 0.1700 0.1700 0.5780	Reading Level dBuV 45.80 26.90 30.62	Correct Factor dB 0.10 0.10 0.13	ment dBuV 45.90 27.00 30.75	Limit dBuV 64.96 54.96 56.00	dB -19.06 -27.96 -25.25	Detector QP AVG peak	m	iduction()	×
1 2 3 4	0.0 0.15 Mk.	Freq. MHz 0.1700 0.1700 0.5780 0.7820	Reading Level dBuV 45.80 26.90 30.62 27.73	Correct Factor dB 0.10 0.10 0.13 0.13	ment dBuV 45.90 27.00 30.75 27.86	Limit dBuV 64.96 54.96 56.00 56.00	dB -19.06 -27.96 -25.25 -28.14	5 Detector QP AVG peak peak	m	iduction()	×

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7 PEAK OUTPUT POWER MEASUREMENT

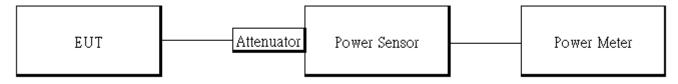
7.1 Standard Applicable

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.

7.2 Measurement Equipment Used

SGS Conducted Room							
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.		
TYPE		NUMBER	NUMBER	CAL.			
Power Meter	Anritsu	ML2495A	1005007	12/15/2016	12/14/2017		
Power Sensor	Anritsu	MA2411B	917032	12/15/2016	12/14/2017		
EXA Spectrum Analyzer	Agilent	N9030A	MY53120760	02/26/2016	02/25/2017		
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2016	01/01/2017		
Coaxial Cable	HUBER+SUHNER	SUCOFLEX 102	23670/2	01/02/2016	01/01/2017		
Attenuator	Mini-Circuit	BW-S10W2+	2	01/02/2016	01/01/2017		
Splitter	Agilent	11636B	N/A	01/02/2016	01/01/2017		
DC Power Supply	Agilent	E3640A	MY52410006	11/21/2016	11/20/2017		
Temperature Chamber	TERCHY	MHG-120LF	911009	05/17/2016	05/16/2017		

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 FCC Public Notice DA 00-705 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 BR mode (Peak):

СН	Freq. (MHz)	Peak Output Power (dBm)	Output Power (mW)	Limit (mW)
0	2402	7.03	5.047	125
39	2441	7.50	5.623	125
78	2480	6.20	4.169	125

1M BR mode (Average):

СН	Freq. (MHz)	Avg. Output Power (dBm)	Output Power (mW)	Limit (mW)
0	2402	6.06	4.036	125
39	2441	6.23	4.198	125
78	2480	4.85	3.055	125

2M EDR mode (Peak):

СН	Freq. (MHz)	Peak Output Power (dBm)	Output Power (mW)	Limit (mW)
0	2402	5.86	3.855	125
39	2441	6.07	4.046	125
78	2480	4.67	2.931	125

2M EDR mode (Average):

СН	Freq. (MHz)	Avg. Output Power (dBm)	Output Power (mW)	Limit (mW)
0	2402	2.55	1.799	125
39	2441	2.67	1.849	125
78	2480	1.23	1.327	125

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3M EDR mode (Peak):

СН	Freq. (MHz)	Peak Output Power (dBm)	Output Power (mW)	Limit (mW)
0	2402	5.84	3.837	125
39	2441	6.07	4.046	125
78	2480	4.65	2.917	125

3M EDR mode (Average):

СН	Freq. (MHz)	Avg. Output Power (dBm)	Output Power (mW)	Limit (mW)
0	2402	2.49	1.774	125
39	2441	2.97	1.982	125
78	2480	1.14	1.300	125

NOTE: cable loss as 10.7dB that offsets in the spectrum

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20DB BANDWIDTH MEASUREMENT 8

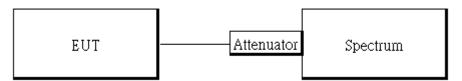
8.1 Standard Applicable

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

8.2 Measurement Equipment Used

SGS Conducted Room							
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.		
TYPE		NUMBER	NUMBER	CAL.			
Power Meter	Anritsu	ML2495A	1005007	12/15/2016	12/14/2017		
Power Sensor	Anritsu	MA2411B	917032	12/15/2016	12/14/2017		
EXA Spectrum Analyzer	Agilent	N9030A	MY53120760	02/26/2016	02/25/2017		
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2016	01/01/2017		
Coaxial Cable	HUBER+SUHNER	SUCOFLEX 102	23670/2	01/02/2016	01/01/2017		
Attenuator	Mini-Circuit	BW-S10W2+	2	01/02/2016	01/01/2017		
Splitter	Agilent	11636B	N/A	01/02/2016	01/01/2017		
DC Power Supply	Agilent	E3640A	MY52410006	11/21/2016	11/20/2017		
Temperature Chamber	TERCHY	MHG-120LF	911009	05/17/2016	05/16/2017		

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 FCC Public Notice DA 00-705 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 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. Repeat above procedures until all test default channel is completed

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8.5 Measurement Result

GFSK

СН	20 dB BW (MHz)	2/3 BW (MHz)
Low	0.7728	0.52
Mid	0.7729	0.52
High	0.7664	0.51

π/4-DQPSK

	20 dB	2/3	
СН	BW	BW	
	(MHz)	(MHz)	
Low	1.280	0.85	
Mid	1.279	0.85	
High	1.280	0.85	

8-DPSK

	20 dB	2/3	
СН	BW	BW	
	(MHz)	(MHz)	
Low	1.272	0.85	
Mid	1.272	0.85	
High	1.272	0.85	

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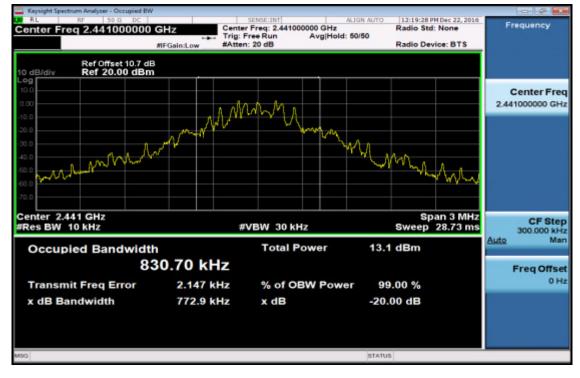
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20dB Band Width Test Data CH-Low (GFSK mode)



20dB Band Width Test Data CH-Mid (GFSK mode)



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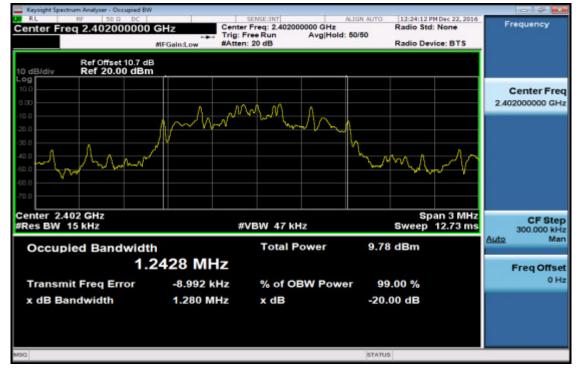
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20dB Band Width Test Data CH-High (GFSK mode)



20dB Band Width Test Data CH-Low (π/4-DQPSK mode)

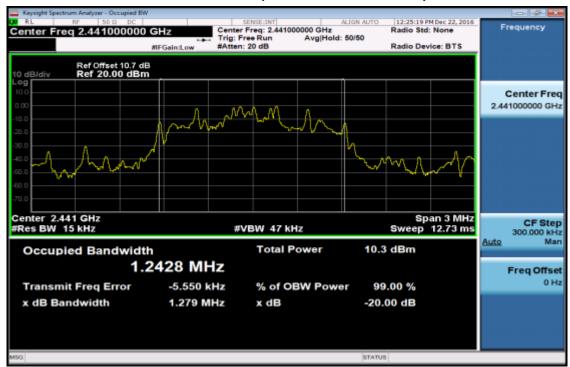


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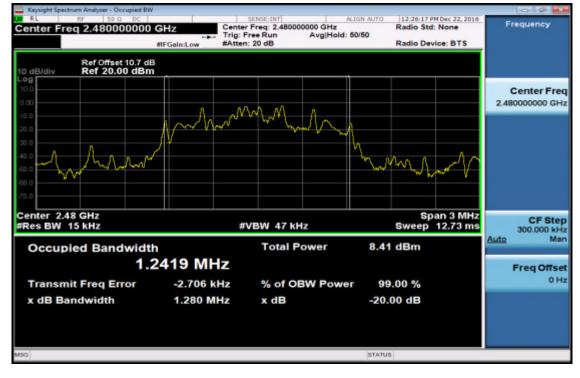
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20dB Band Width Test Data CH-Mid (π/4-DQPSK mode)



20dB Band Width Test Data CH-High (π/4-DQPSK mode)

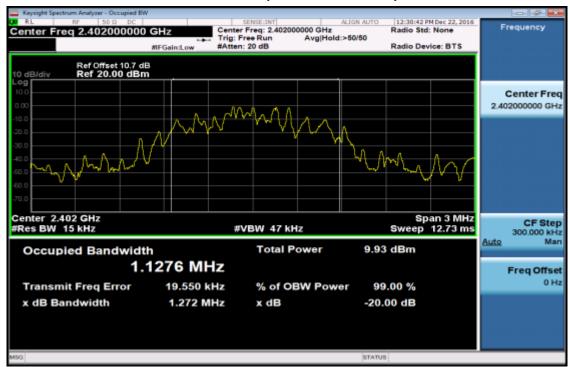


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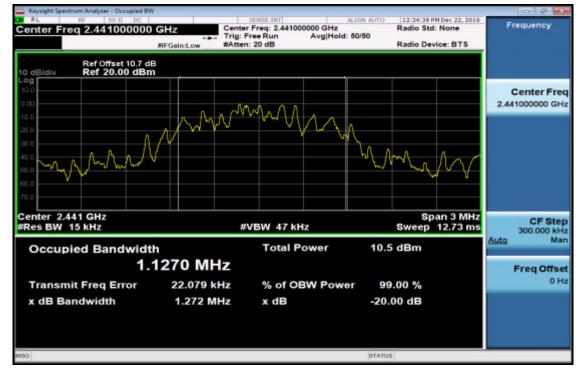
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20dB Band Width Test Data CH-Low (8-DPSK mode)



20dB Band Width Test Data CH-Mid (8-DPSK mode)

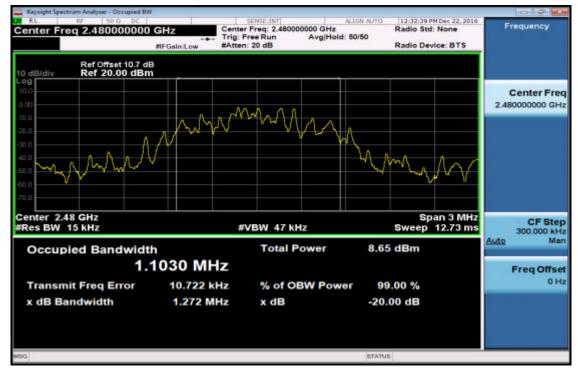


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20dB Width Test Data CH-High (8-DPSK mode)



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CONDUCTED BAND EDGES AND SPURIOUS EMISSION MEASUREMENT 9

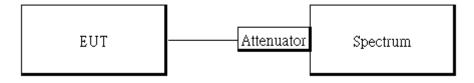
9.1 Standard Applicable

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).

SGS Conducted Room							
EQUIPMENT MFR		MODEL	SERIAL	LAST	CAL DUE.		
TYPE		NUMBER	NUMBER	CAL.			
Power Meter	Anritsu	ML2495A	1005007	12/15/2016	12/14/2017		
Power Sensor	Anritsu	MA2411B	917032	12/15/2016	12/14/2017		
EXA Spectrum Analyzer	Agilent	N9030A	MY53120760	02/26/2016	02/25/2017		
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2016	01/01/2017		
Coaxial Cable	HUBER+SUHNER	SUCOFLEX 102	23670/2	01/02/2016	01/01/2017		
Attenuator	Mini-Circuit	BW-S10W2+	2	01/02/2016	01/01/2017		
Splitter	Agilent	11636B	N/A	01/02/2016	01/01/2017		
DC Power Supply	Agilent	E3640A	MY52410006	11/21/2016	11/20/2017		
Temperature Chamber	TERCHY	MHG-120LF	911009	05/17/2016	05/16/2017		

9.2 Measurement Equipment Used

9.3 Test SET-UP



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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9.4 Measurement Procedure

Conducted Band Edge:

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. The testing follows FCC Public Notice DA 00-705 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=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 FCC Public Notice DA 00-705 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.
- 6. 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.

- 1. Cable loss as 10.7dB that offsets in the spectrum
- 2. The occurrence of the spike on the conducted emission is the signal of the fundamental emission.

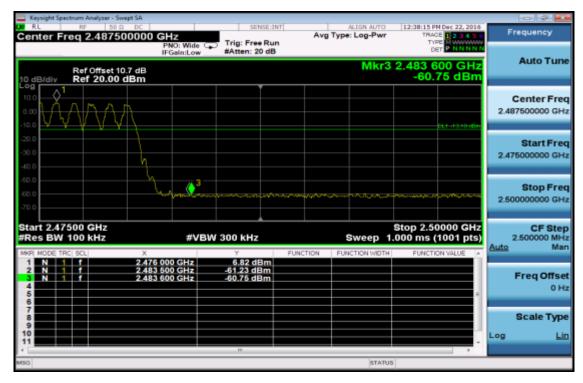
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12:38:00 PM Dec 22, 2016 Frequency Avg Type: Log-Pwr Center Freq 2.365000000 GHz Trig: Free Run #Atten: 20 dB PNO: Fast 😱 IFGain:Low Auto Tune Mkr3 2.390 00 GHz Ref Offset 10.7 dB Ref 20.00 dBm -61.45 dBm |Center Freq 2.365000000 GHz HAT MILLIN Start Freq 2.310000000 GHz 02 3 Stop Freq 2.42000000 GHz Start 2.31000 GHz #Res BW 100 kHz Stop 2.42000 GHz Sweep 1.000 ms (1001 pts) **CF** Step 11.000000 MH #VBW 300 kHz Auto 2.407 13 2.399 90 2.390 00 60.43 dBm 61.45 dBm Freq Offset 0 H2 Scale Type Log Lin

Band Edges Test Data CH-Low (Hopping mode)(BR mode)

Band Edges Test Data CH-High



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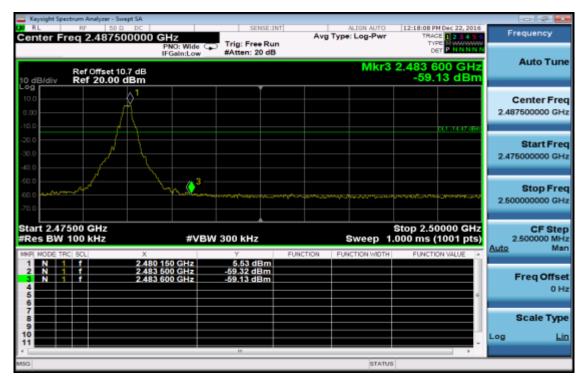
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12:16:18 PM Dec 22, 201 Frequency Avg Type: Log-Pwr Center Freq 2.365000000 GHz Trig: Free Run #Atten: 20 dB DE PNO: Fast 😱 IFGain:Low Auto Tune Mkr3 2.390 00 GHz Ref Offset 10.7 dB Ref 20.00 dBm -61.78 dBm 0 Center Freq 2.365000000 GHz Start Freq 2.310000000 GHz 102 3 Stop Freq 2.42000000 GHz Start 2.31000 GHz #Res BW 100 kHz Stop 2.42000 GHz Sweep 1.000 ms (1001 pts) **CF** Step 11.000000 MHz Mar #VBW 300 kHz Auto 2,399,90 53.97 dBm 61.78 dBm Freq Offset 0 Hz Scale Type Log Lin

Band Edges Test Data CH-Low (Non-Hopping mode)

Band Edges Test Data CH-High



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Band Edges Test Data CH-Low (Hopping mode) (EDR mode)

Band Edges Test Data CH-High



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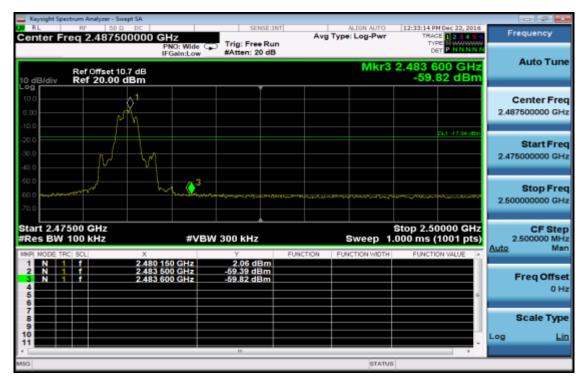
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12:31:21 PM Dec 22, 201 Frequency Avg Type: Log-Pwr Center Freq 2.365000000 GHz Trig: Free Run #Atten: 20 dB DE PNO: Fast 😱 IFGain:Low Auto Tune Mkr3 2.390 00 GHz Ref Offset 10.7 dB Ref 20.00 dBm -61.37 dBm ∂^1 Center Freq 2.365000000 GHz Start Freq 2.310000000 GHz $\sqrt{2}$ 3 Stop Freq 2.42000000 GHz Start 2.31000 GHz #Res BW 100 kHz Stop 2.42000 GHz Sweep 1.000 ms (1001 pts) **CF** Step 11.000000 MHz Mar #VBW 300 kHz Auto 2.399 90 51.99 dBm 61.37 dBm Freq Offset 0 Hz Scale Type Log Lin

Band Edges Test Data CH-Low (Non-Hopping mode)

Band Edges Test Data CH-High



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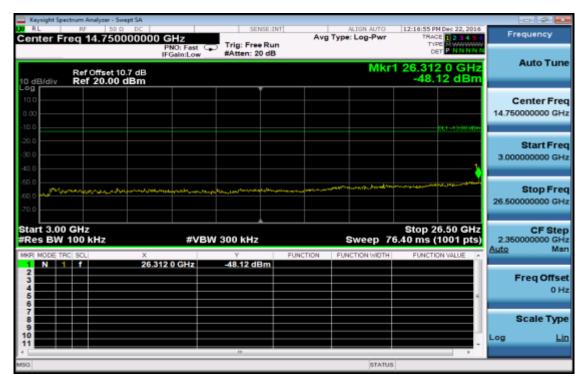
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Conducted Spurious Emission Measurement Result (BR mode) Ch Low 30MHz – 3GHz

Keysight Spec	ctrum Analyzer - Swept SA						
Center Fr	eq 1.51500000) GHz	SENSE:1	Avg	ALIGN AUTO Type: Log-Pwr	12:16:38 PM Dec 22, 2016 TRACE 1 2 3 4 5	Frequency
10 dB/div	Ref Offset 10.7 dB Ref 20.00 dBm	PN0: Fast IFGain:Low	Trig: Free Run #Atten: 20 dB	n	Mk	r1 2.403 0 GHz 7.00 dBm	Auto Tune
10.0 0.00						1 pL1-1000104	Center Freq 1.515000000 GHz
-20.0 -30.0 -40.0							Start Freq 30.000000 MHz
-50.0 -60.0 -70.0	1	رور و میرون و موجو و مراح و موجو و	a a a a a a a a a a a a a a a a a a a	unu da ga gintakan	ر مار و رو الرو و رو	a da ya da a a a a a a a a a a a a a a a	Stop Freq 3.000000000 GHz
Start 0.030 #Res BW	100 kHz		/ 300 kHz	FUNCTION	Sweep 9	Stop 3.000 GHz .667 ms (1001 pts FUNCTION VALUE	
1 N 1 2 3 4 5 6		2.403 0 GHz	7.00 dBm				Freq Offset 0 Hz
7 8 9 10 11			17				Scale Type Log <u>Lin</u>
MBG					STATUS	1	

Ch Low 3GHz – 26.5GHz



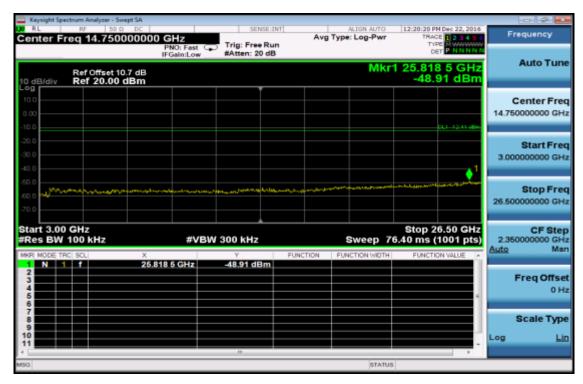
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Ch Mid 30MHz – 3GHz

Keysight Spectrum Analyzer - Swept SA				
Center Freq 1.515000000		Auton Auto Avg Type: Log-Pwr	12:20:01 PM Dec 22, 2016 TRACE 1 2 3 4 5 6 TYPE	Frequency
Ref Offset 10.7 dB	PNO: Fast Trig: Free Run IFGain:Low #Atten: 20 dB	M	r1 2.441 6 GHz 7.59 dBm	Auto Tune
10.0 0.00 -10.0			0L1 12.41 48H	Center Freq 1.51500000 GHz
-20.0				Start Free 30.000000 MH;
-50.0 -60.0 -70.0	ngulanaa agaya ayaa ayaa ayaa ahaa ahaa ahaa a	محمدية يتعاومه ومعرورة فرار فيتسر ورحيهم وا		Stop Free 3.000000000 GH;
Start 0.030 GHz #Res BW 100 kHz MKR MODE TRC SCL X	#VBW 300 kHz	Sweep 9	Stop 3.000 GHz .667 ms (1001 pts)	CF Step 297.000000 MH: Auto Mar
1 N 1 f 2 2 3 4 4 5 6 6	.441 6 GHz 7.59 dBm			Freq Offse 0 H
7 8 9 10 11				Scale Type Log <u>Lir</u>
MBG		STATU	3	

Ch Mid 3GHz – 26.5GHz



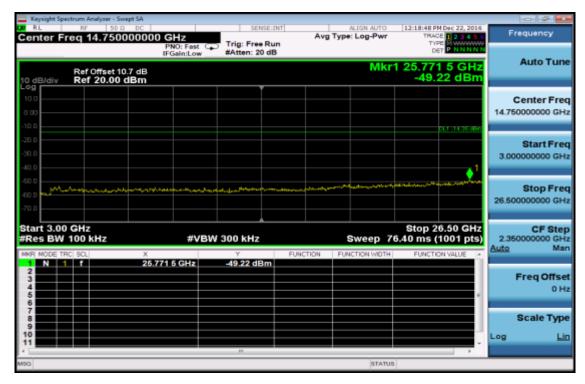
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Ch High 30MHz – 3GHz

Keysight Spectrum Analyzer - Swept SA				
Center Freq 1.515000000	GHZ SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr	12:18:29 PM Dec 22, 2016 TRACE 1 2 3 4 5 6	Frequency
Ref Offset 10.7 dB	PNO: Fast Trig: Free Run IFGain:Low #Atten: 20 dB	Mk	r1 2.480 3 GHz 5.65 dBm	Auto Tune
10.0 0.00			↓	Center Freq 1.51500000 GHz
-20.0				Start Freq 30.000000 MHz
-50.0 -60.0 -70.0	1919 - 19	h. Sayan di sasat dan daya ya sa		Stop Free 3.000000000 GHz
Start 0.030 GHz #Res BW 100 kHz	#VBW 300 kHz	Sweep 9.	Stop 3.000 GHz 667 ms (1001 pts)	CF Step 297.000000 MHz <u>Auto</u> Man
1 N 1 f 2, 2 3 4 4 5 6	480 3 GHz 5.65 dBm			Freq Offset 0 Hz
7 8 9 10 11				Scale Type
MSG	17	STATUS		

Ch High 3GHz – 26.5GHz



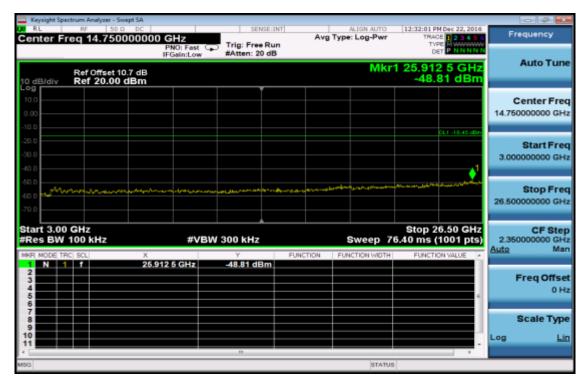
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Conducted Spurious Emission Measurement Result (EDR mode) Ch Low 30MHz – 3GHz

Keysight Spectrum Analyzer - Swept SA					-
Center Freq 1.515000000	PNO: East ()	rig: Free Run Atten: 20 dB	Avg Type: Log-Pwr	12:31:40 PM Dec 22, 2016 TRACE 1 2 3 4 5 6 TVPE 0 DET P NNNN	Frequency
Ref Offset 10.7 dB	IFGain:Low #	Atten: 20 GB	Mk	r1 2.403 0 GHz 3.55 dBm	Auto Tune
10.0 -10.0				1	Center Freq 1.515000000 GHz
-20.0				CL1 -10.45 dBm	Start Freq 30.000000 MHz
-50.0 -50.0 -70.0	100 ¹⁰⁰⁰ -10000	94-94-9 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	ىمەر مەر ئورار مەر <u>ئەر مەر مەر مەر مەر مەر مەر مەر مەر مەر م</u>	յուն, ախութ, ույնքու տոն ֆեկ Պուները էս, թետն ա	Stop Freq 3.000000000 GHz
Start 0.030 GHz #Res BW 100 kHz	#VBW 30		Sweep 9.	Stop 3.000 GHz .667 ms (1001 pts)	CF Step 297.000000 MHz Auto Mar
1 N 1 f 2 2 3 4 5 6	.403 0 GHz	3.55 dBm			Freq Offset 0 Ha
7 8 9 10 11					Scale Type
MSG		11	STATUS	*	

Ch Low 3GHz – 26.5GHz



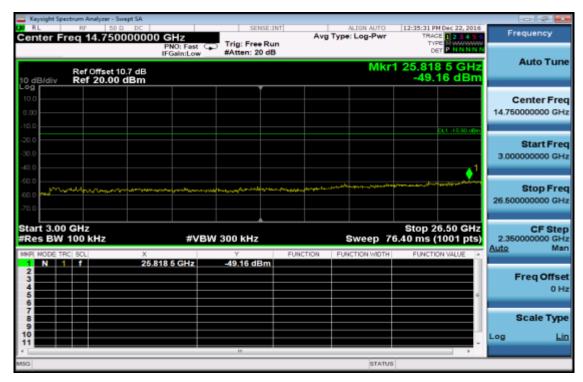
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Ch Mid 30MHz – 3GHz

Keysight Spectrum Analy						
Center Freq 1.5		SENSE:INT	Aug Type: Log	Pwr TR	PM Dec 22, 2016	Frequency
10 dB/div Ref 20	PN0: Fast IFGain:Low set 10.7 dB 0.00 dBm	#Atten: 20 dB		Mkr1 2.44	41 6 GHz	Auto Tune
10.0 0.00				1		Center Free 1.515000000 GH
-20.0					04.1 -1 5 90 aller	Start Free 30.000000 MH
-50.0 -60.0 -70.0	ئېلېمادە ئارانيا تېرىلى _{كەر} بىرا _{نى ك} ې بىرايى		م الأربي من المراجع ال	And the second sec	had has in period and	Stop Fre 3.000000000 GH
Start 0.030 GHz #Res BW 100 kHz MKR MODE TRC SCL	х	BW 300 kHz Y	SWC	ep 9.667 ms	3.000 GHz (1001 pts)	CF Step 297.000000 MH Auto Mar
1 N 1 1 2 3 4 5 6	2.441 6 GHz	4.10 dBm			+	Freq Offse 0 H
7 8 9 10 11						Scale Type
490		18		STATUS	,	

Ch Mid 3GHz – 26.5GHz



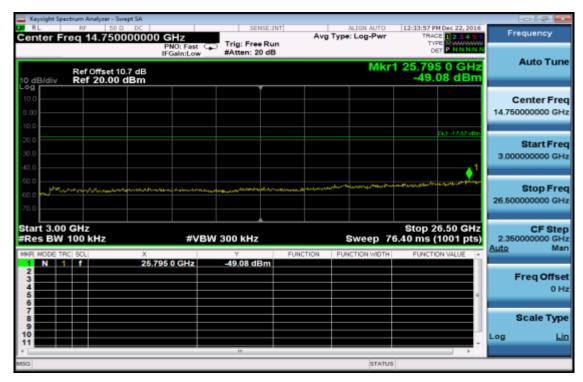
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Ch High 30MHz – 3GHz

Keysight Spectrum An								
Center Freq 1.	50 D DC	GHz	SENSE:1N	Avg	ALIGN AUTO Type: Log-Pwr		123456	Frequency
Ref 0 10 dB/div Ref	0ffset 10.7 dB 20.00 dBm	PNO: Fast G	Trig: Free Rur #Atten: 20 dB	1	Mk	r1 2.480	⁹ NNNNN 3 GHz 3 dBm	Auto Tune
10.0 0.00						• ¹		Center Freq 1.515000000 GHz
-20.0							L1 -17.67 dBm	Start Freq 30.000000 MHz
-50.0 -60.0 -70.0	يەر يەر يېرىكى بىرى مەر يەر يېرى يەر يەر يەر يېرى يەر	ontransmission and a stranger		مەنبەلەر چەرزىرارىرىسە ا			مىيەر مەرىپەر يەرە مەرىپ	Stop Freq 3.000000000 GHz
Start 0.030 GH2 #Res BW 100 k		#VBV	V 300 kHz	FUNCTION	Sweep 9	Stop 3.0 .667 ms (1	001 pts)	CF Step 297.000000 MHz Auto Man
1 N 1 f 2 3 3 4 5 6		80 3 GHz	2.13 dBm	TONCHON		T GROTHER	-	Freq Offset 0 Hz
7 8 9 10 11								Scale Type
MSG					STATUS			

Ch High 3GHz – 26.5GHz



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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 limit as below.

And according to §15.33(a) (1), 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

	-	SGS SAC-II	<u> </u>		
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.
ТҮРЕ		NUMBER	NUMBER	CAL.	
EMI Test Receiver	R&S	ESCI7	100760	05/10/2016	05/09/2017
Spectrum Analyzer	Agilent	E4446A	MY51100003	01/29/2016	01/28/2017
Loop Antenna	ETS-Lindgren	6502	148045	09/20/2016	09/19/2017
Bilog Antenna	SCHWAZBECK	VULB9168	378	12/19/2016	12/18/2017
Horn Antenna	Schwarzbeck	BBHA9120D	1441	08/01/2016	07/31/2017
Pre-Amplifier	Agilent	8447D	2944A07676	01/02/2016	01/01/2017
Pre-Amplifier	EMC Instruments Corp.	EMC0126530	980038	01/02/2016	01/01/2017
Turn Table	HD	DT420	N/A	N.C.R	N.C.R
Antenna Tower	ChamPro	AM-BS-4500-B	060776-ABS	N.C.R	N.C.R
Controller	ChamPro	EM1000	60776	N.C.R	N.C.R
Low Loss Cable	Huber Suhner	966_RX	9	01/02/2016	01/01/2017
3m Site NSA	SGS	966 chamber	N/A	07/01/2016	06/30/2017
Low Loss Cable	Huber Suhner	966 TX	1	01/02/2016	01/01/2017
Horn Antenna	Schwarzbeck	BBHA9170	184	12/12/2016	12/11/2017
Pre-Amplifier	EMC Instruments Corp.	EMC184045	980135	01/02/2016	01/01/2017

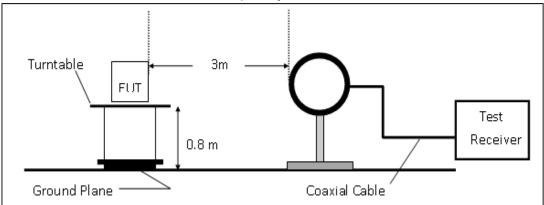
Note: N.C.R refers to Not Calibrated Required.

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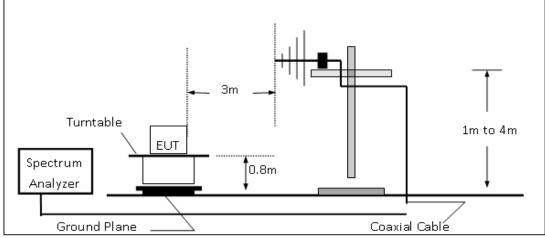


10.3 Test SET-UP

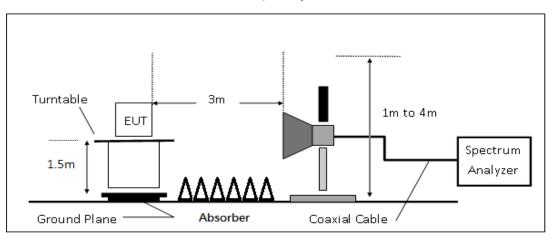




(B) Radiated Emission Test Set-Up, Frequency form 30MHz to 1000MHz



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



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10.4 Measurement Procedure

Radiated Emission

- 1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
- 2. The EUT was placed on a turn table with 0.8m for frequency< 1GHz and 0.8m 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 $f \ge 1$ GHz, 100 kHz for f < 1 GHz, VBW \ge 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 μ V/m) = SPA. Reading level(dB μ V) + Factor(dB)

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

Note :

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

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. Note: For measurement plot of radiation revealing the compliance of 15.247, please refer to Appendix I.

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Radiated Band Edge Measurement Result: (Hopping Mode)

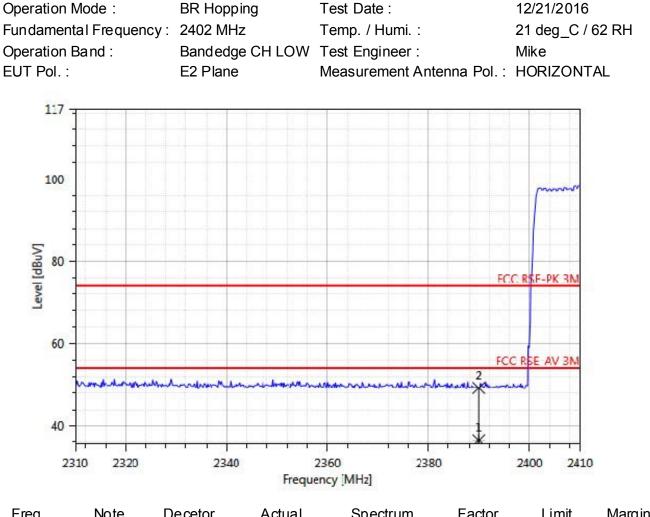
Operation Mode : Fundamental Frequer Operation Band : EUT Pol. :	BR Hopping hcy: 2402 MHz Bandedge CH LOW E2 Plane	Test Date : Temp. / Humi. : Test Engineer : Measurement Antenna	12/21/2016 21 deg_C / 62 RH Mike Pol. : VERTICAL
117			
100 -			
evel [dBuV]			FCC RSE-PK 3M
60 -			FCC RSE-AV 3M
40 -			*
2310 2320	2340 Frequ	2360 2380 uency [MHz]	2400 2410

Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
		Mode	Reading Level	FS		@3m	
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
2390.00	Е	Average	36.55	38.29	-1.74	54.00	-17.45
2390.00	Е	Peak	50.46	52.20	-1.74	74.00	-23.54

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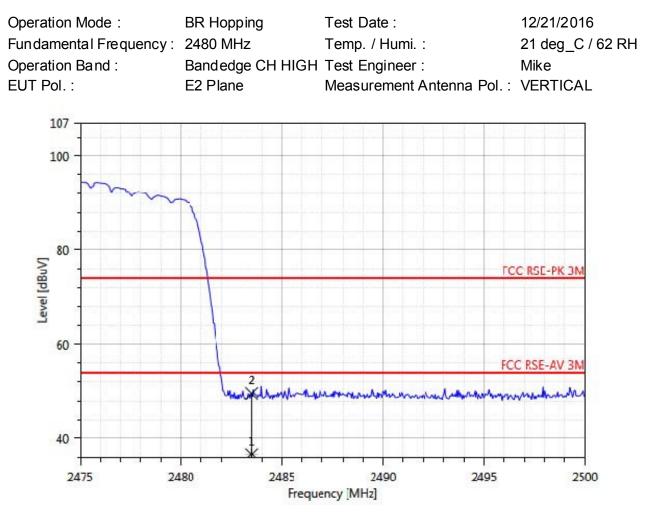




	rieq.	note	Decetor	Actual	Spectrum	Factor		margin	
			Mode	Reading Level	FS		@3m		
_	MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB	
	2390.00	Е	Average	36.54	38.28	-1.74	54.00	-17.46	_
	2390.00	E	Peak	49.23	50.97	-1.74	74.00	-24.77	

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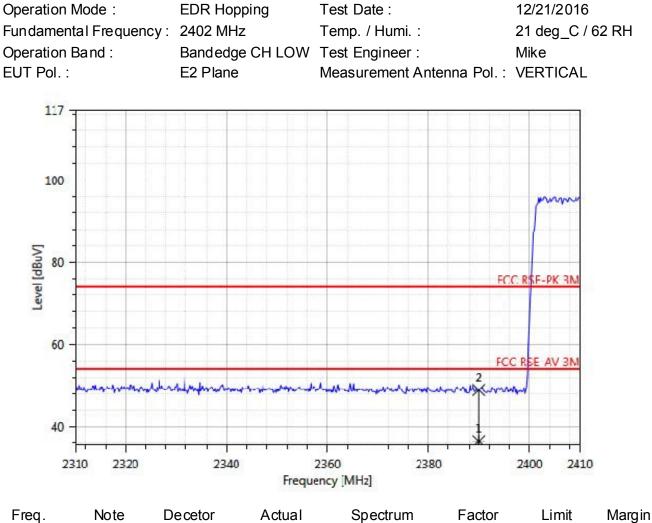
Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
		Mode	Reading Level	FS		@3m	
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
2483.50	Е	Average	36.63	38.25	-1.62	54.00	-17.37
2483.50	Е	Peak	49.56	51.18	-1.62	74.00	-24.44





Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
		Mode	Reading Level	FS		@3m	
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
2483.50	Е	Average	36.65	38.27	-1.62	54.00	-17.35
2483.50	Е	Peak	49.15	50.77	-1.62	74.00	-24.85

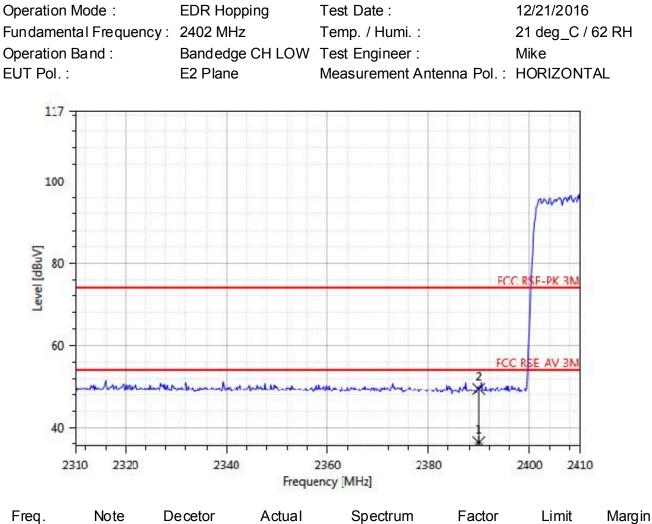




						•
	Mode	Reading Level	FS		@3m	
F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
Е	Average	36.53	38.27	-1.74	54.00	-17.47
Е	Peak	48.98	50.72	-1.74	74.00	-25.02
		F/H/E/S QP/AV/PK E Average	F/H/E/SQP/AV/PKdBµV/mEAverage36.53	F/H/E/SQP/AV/PKdBµV/mdBµV/mEAverage36.5338.27	F/H/E/S QP/AV/PK dBµV/m dBµV/m dB E Average 36.53 38.27 -1.74	F/H/E/S QP/AV/PK dBμV/m dBμV/m dB dBuV/m E Average 36.53 38.27 -1.74 54.00

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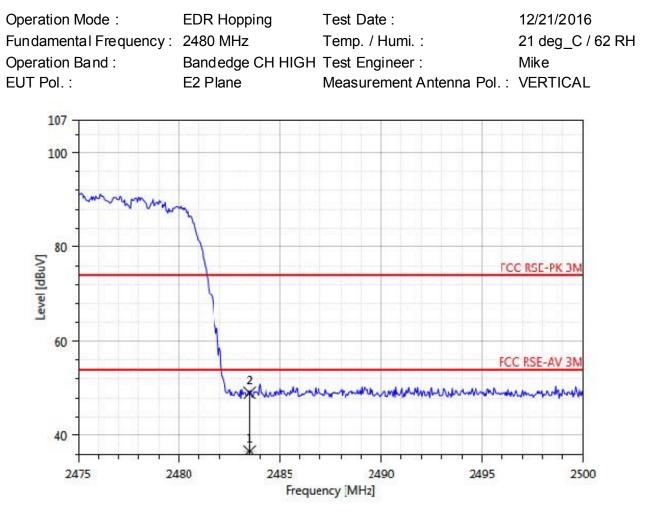




		Mode	Reading Level	FS		@3m	
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
2390.00	Е	Average	36.51	38.25	-1.74	54.00	-17.49
2390.00	Е	Peak	49.44	51.18	-1.74	74.00	-24.56

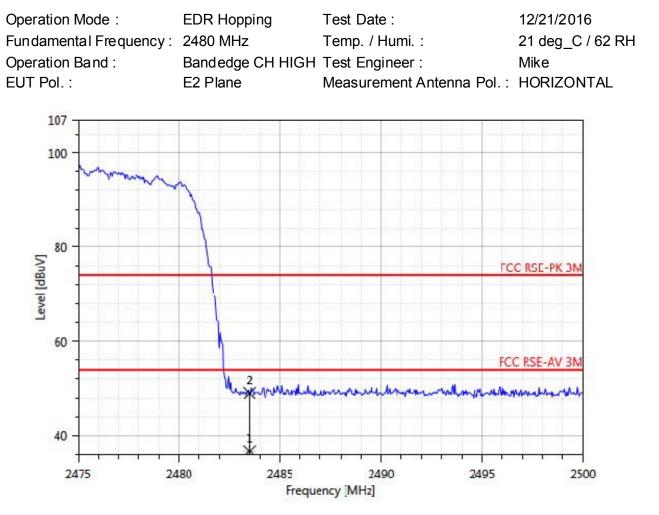
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Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
		Mode	Reading Level	FS		@3m	
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
2483.50	Е	Average	36.65	38.27	-1.62	54.00	-17.35
2483.50	Е	Peak	49.06	50.68	-1.62	74.00	-24.94





Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
		Mode	Reading Level	FS		@3m	
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
2483.50	Е	Average	36.66	38.28	-1.62	54.00	-17.34
2483.50	Е	Peak	49.02	50.63	-1.62	74.00	-24.98



Radiated Emission – Band Edge (Non-Hopping Mode):

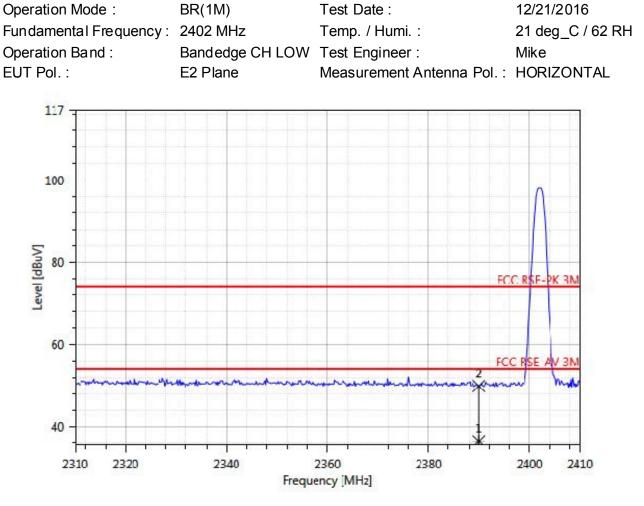
Operation Mode : Fundamental Frequency : Operation Band : EUT Pol. :	BR(1M) 2402 MHz Bandedge CH LOW E2 Plane	Test Date : Temp. / Humi. : Test Engineer : Measurement Antenna Pol. :	12/21/2016 21 deg_C / 62 RH Mike VERTICAL
117			
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			CC RSE-PK 3M
60		F	CC PSE-AV 3M
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40			
2310 2320	2340 Frequ	2360 2380 ency [MHz]	2400 2410

Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
		Mode	Reading Level	FS		@3m	
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
2390.00	Е	Average	36.58	38.32	-1.74	54.00	-17.42
2390.00	Е	Peak	49.77	51.51	-1.74	74.00	-24.23

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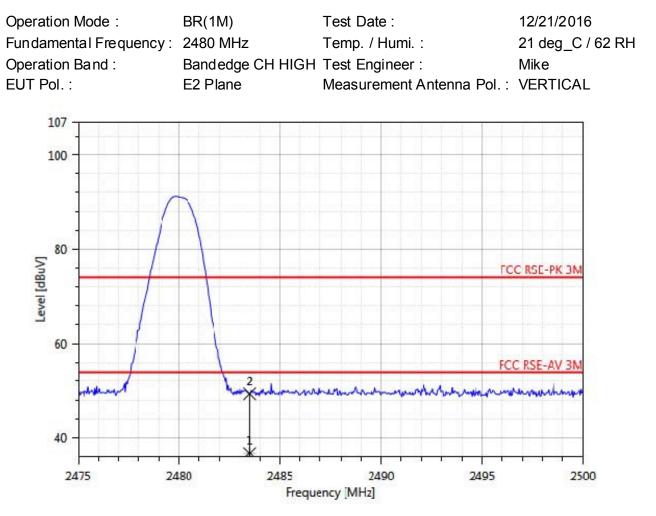
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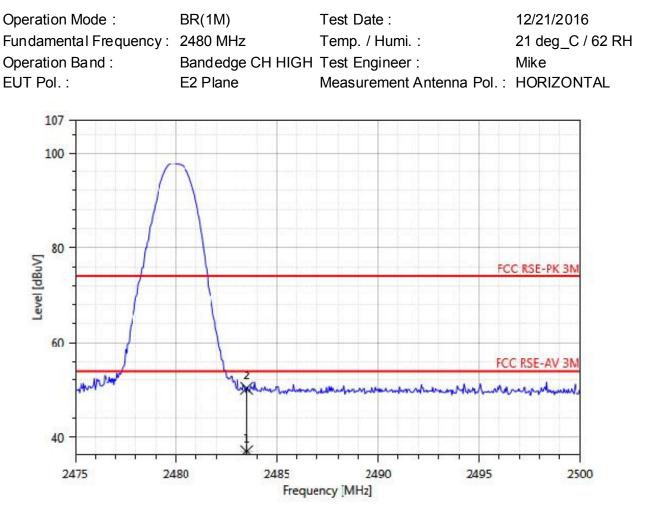
Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
		Mode	Reading Level	FS		@3m	
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
2390.00	E	Average	36.52	38.26	-1.74	54.00	-17.48
2390.00	Е	Peak	49.92	51.67	-1.74	74.00	-24.08





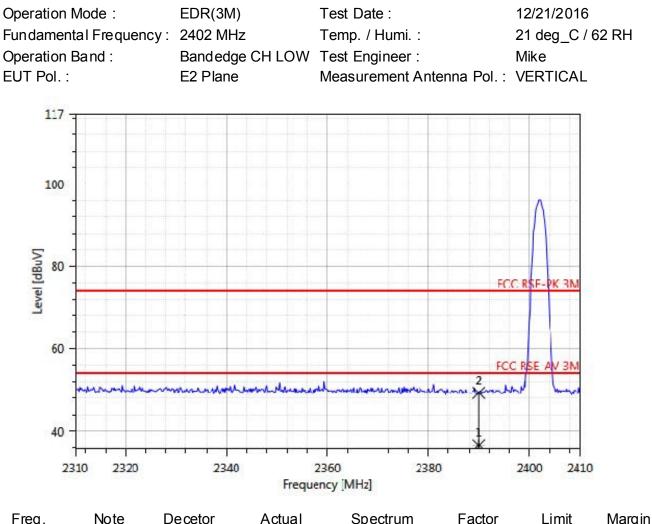
Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
		Mode	Reading Level	FS		@3m	
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
2483.50	Е	Average	36.77	38.39	-1.62	54.00	-17.23
2483.50	Е	Peak	49.41	51.03	-1.62	74.00	-24.59





Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
		Mode	Reading Level	FS		@3m	
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
2483.50	Е	Average	37.03	38.65	-1.62	54.00	-16.97
2483.50	Е	Peak	50.34	51.96	-1.62	74.00	-23.66

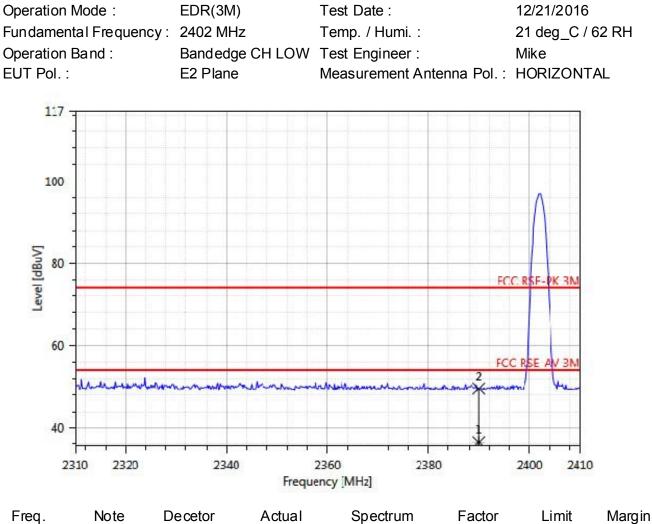




			Mode	Reading Level	FS		@3m		
	MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB	_
-	2390.00	Е	Average	36.57	38.31	-1.74	54.00	-17.43	-
	2390.00	Е	Peak	49.26	51.01	-1.74	74.00	-24.74	

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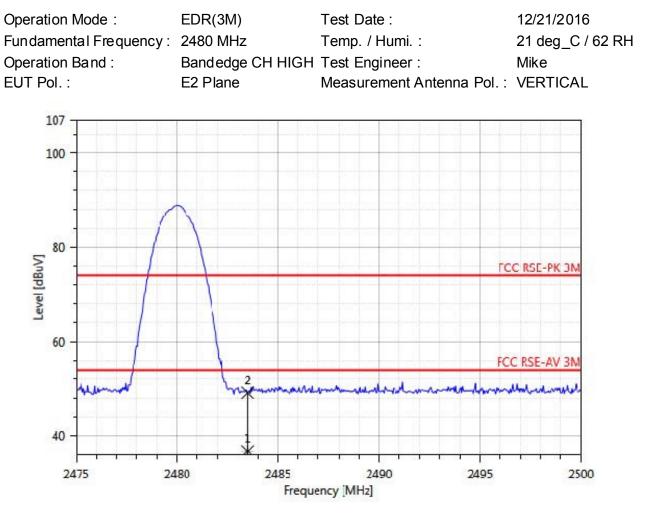




	Mode	Reading Level	FS		@3m	•	
MHz F/H/E/3	S QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB	_
2390.00 E	Average	36.55	38.29	-1.74	54.00	-17.45	-
2390.00 E	Peak	49.56	51.30	-1.74	74.00	-24.44	

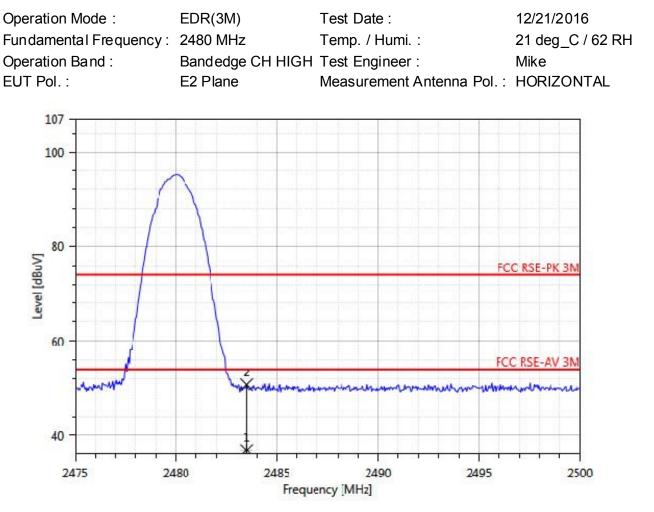
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Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
		Mode	Reading Level	FS		@3m	
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
2483.50	Е	Average	36.73	38.35	-1.62	54.00	-17.27
2483.50	Е	Peak	49.16	50.77	-1.62	74.00	-24.84



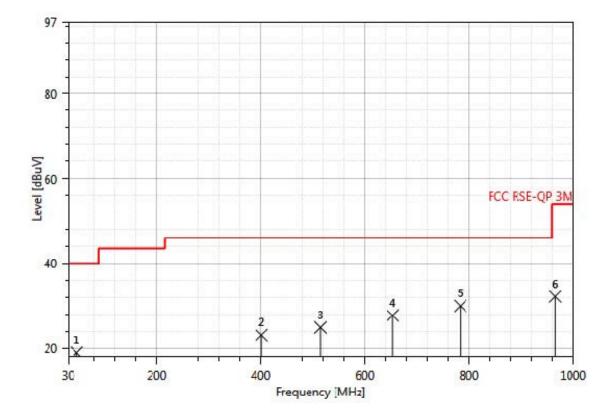


Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
		Mode	Reading Level	FS		@3m	
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
2483.50	Е	Average	36.85	38.47	-1.62	54.00	-17.15
2483.50	E	Peak	50.74	52.35	-1.62	74.00	-23.26



Radiated Spurious Emission Measurement Result: (Worst Case) For Frequency form 30MHz to 1000MHz

Operation Mode :	BR(1M)	Test Date :	12/21/2016
Fundamental Frequency :	2402 MHz	Temp. / Humi. :	21 deg_C / 62 RH
Operation Band :	Tx CH LOW	Test Engineer :	Mike
EUT Pol. :	E2 Plane	Measurement Antenna Pol.:	VERTICAL



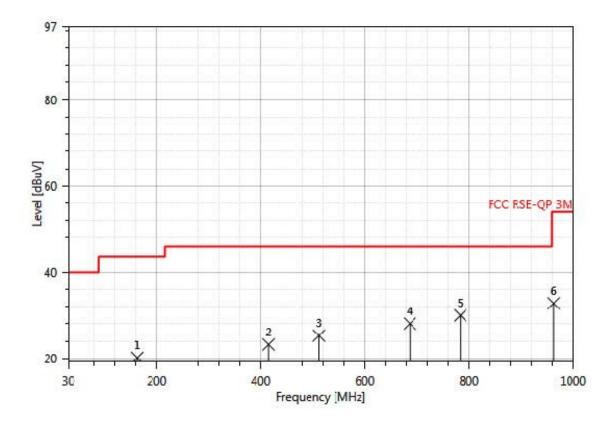
Freq.	Note	De cetor Mode	Actual Reading Level	Spectrum FS	Factor	Limit @3m	Margin
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
46.49	S	Peak	18.91	26.82	-7.91	40.00	-21.09
401.51	S	Peak	23.12	27.07	-3.95	46.00	-22.88
515.00	S	Peak	24.89	26.83	-1.94	46.00	-21.11
653.71	S	Peak	27.72	27.24	0.47	46.00	-18.28
783.69	S	Peak	29.96	27.22	2.75	46.00	-16.04
966.05	S	Peak	32.17	26.21	5.97	54.00	-21.83

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Operation Mode : BR(1M) Test Date : Fundamental Frequency: 2402 MHz Temp. / Humi. : Operation Band : **Tx CH LOW** Test Engineer : EUT Pol. : E2 Plane Measurement Antenna Pol.: HORIZONTAL

12/21/2016 21 deg_C / 62 RH Mike

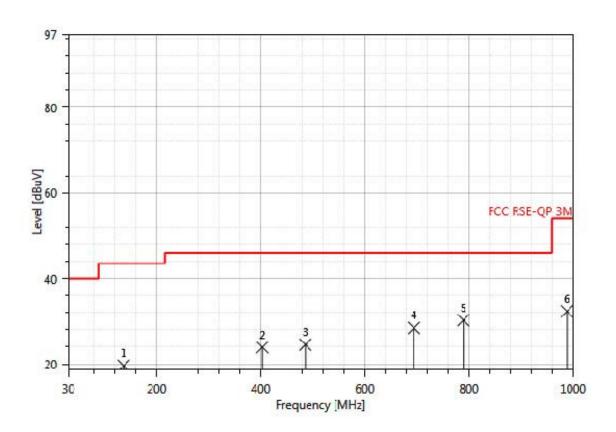


Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
		Mode	Reading Level	FS		@3m	
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
162.89	S	Peak	20.15	27.64	-7.48	43.50	-23.35
415.09	S	Peak	23.24	26.44	-3.21	46.00	-22.76
512.09	S	Peak	25.29	27.27	-1.98	46.00	-20.71
686.69	S	Peak	28.08	26.87	1.21	46.00	-17.92
783.69	S	Peak	29.99	27.24	2.75	46.00	-16.01
963.14	S	Peak	32.78	26.72	6.06	54.00	-21.22

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Operation Mode : BR(1M) Test Date : 12/21/2016 Fundamental Frequency: 2441 MHz Temp. / Humi. : 21 deg C / 62 RH Operation Band : Tx CH MID Test Engineer : Mike EUT Pol. : E2 Plane Measurement Antenna Pol.: VERTICAL

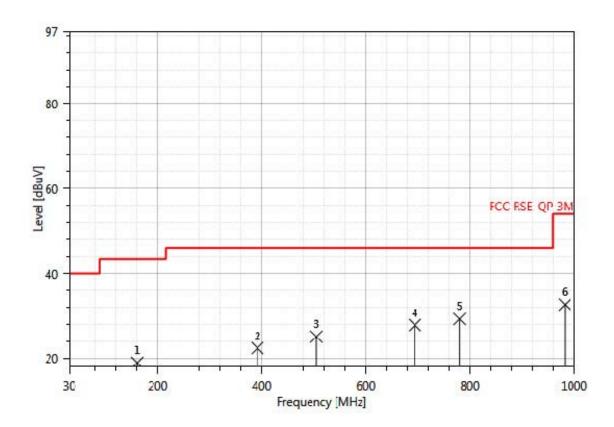


Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
		Mode	Reading Level	FS		@3m	
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
136.70	S	Peak	19.61	28.23	-8.62	43.50	-23.89
403.45	S	Peak	23.92	27.85	-3.92	46.00	-22.08
485.90	S	Peak	24.54	26.87	-2.33	46.00	-21.46
694.45	S	Peak	28.43	27.07	1.35	46.00	-17.57
789.51	S	Peak	30.24	27.42	2.82	46.00	-15.76
988.36	S	Peak	32.34	26.34	6.00	54.00	-21.66

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Operation Mode : BR(1M) Test Date : 12/21/2016 Fundamental Frequency: 2441 MHz Temp. / Humi. : 21 deg_C / 62 RH Operation Band : Tx CH MID Mike Test Engineer : EUT Pol. : E2 Plane Measurement Antenna Pol.: HORIZONTAL



Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
		Mode	Reading Level	FS		@3m	
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
160.95	S	Peak	18.96	26.40	-7.44	43.50	-24.54
391.81	S	Peak	22.42	26.57	-4.15	46.00	-23.58
505.30	S	Peak	25.11	27.29	-2.19	46.00	-20.89
694.45	S	Peak	27.83	26.47	1.35	46.00	-18.17
779.81	S	Peak	29.27	26.69	2.58	46.00	-16.73
982.54	S	Peak	32.66	26.64	6.02	54.00	-21.34

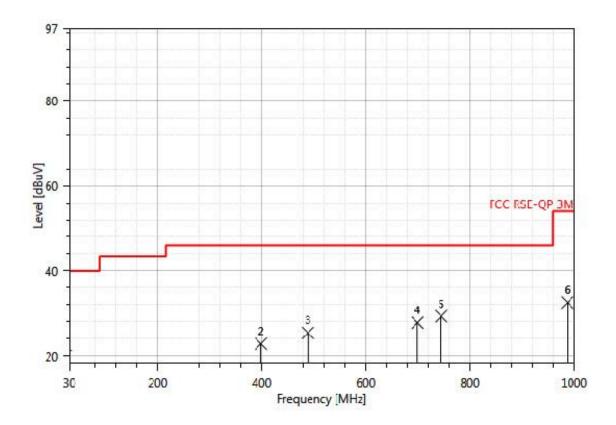
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Operation Mode : BR(1M) Fundamental Frequency: 2480 MHz Operation Band : **Tx CH HIGH** EUT Pol. : E2 Plane

Test Date : 12/21/2016 Temp. / Humi. : 21 deg C / 62 RH Test Engineer : Mike Measurement Antenna Pol.: VERTICAL

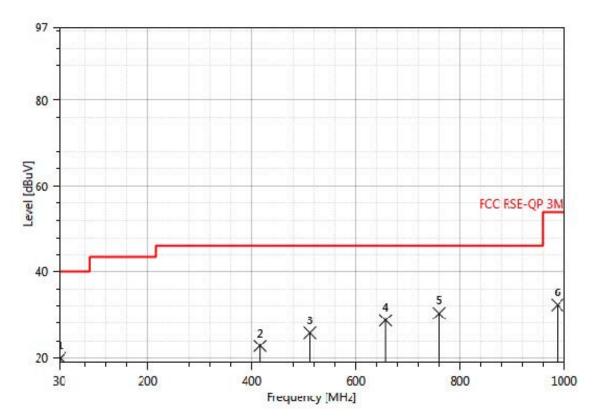


Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
		Mode	Reading Level	FS		@3m	
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
30.00	S	Peak	19.09	28.28	-9.19	40.00	-20.91
398.60	S	Peak	22.84	26.81	-3.97	46.00	-23.16
488.81	S	Peak	25.40	27.78	-2.38	46.00	-20.60
699.30	S	Peak	27.81	26.36	1.44	46.00	-18.19
744.89	S	Peak	29.32	27.06	2.25	46.00	-16.68
987.39	S	Peak	32.57	26.53	6.04	54.00	-21.43

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Operation Mode : BR(1M) Test Date : 12/21/2016 Fundamental Frequency: 2480 MHz Temp. / Humi. : 21 deg_C / 62 RH Operation Band : **Tx CH HIGH** Mike Test Engineer : EUT Pol. : E2 Plane Measurement Antenna Pol.: HORIZONTAL



Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
		Mode	Reading Level	FS		@3m	
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
31.94	S	Peak	19.90	29.01	-9.11	40.00	-20.10
416.06	S	Peak	22.77	26.04	-3.27	46.00	-23.23
512.09	S	Peak	25.81	27.79	-1.98	46.00	-20.19
657.59	S	Peak	28.72	28.42	0.30	46.00	-17.28
760.41	S	Peak	30.35	27.40	2.95	46.00	-15.65
987.39	S	Peak	32.26	26.22	6.04	54.00	-21.74

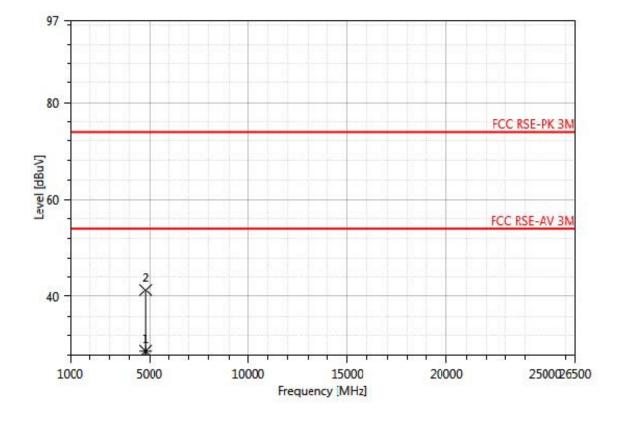
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Radiated Spurious Emission Measurement Result: For Frequency above 1 GHz

Operation Mode :	BR(1M)	Test Date :	12/21/2016
Fundamental Frequency:	2402 MHz	Temp. / Humi. :	21 deg_C / 62 RH
Operation Band :	Tx CH LOW	Test Engineer :	Mike
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	VERTICAL

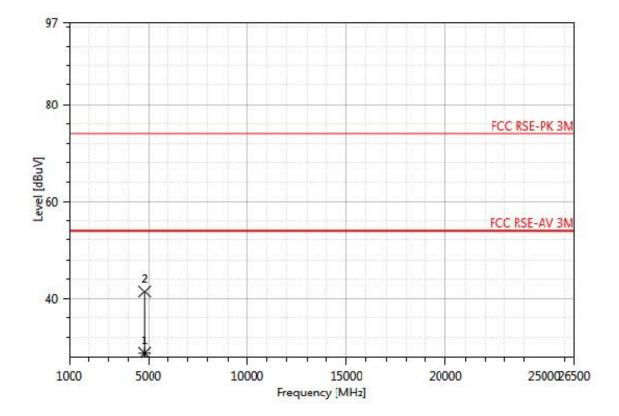


Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
		Mode	Reading Level	FS		@3m	
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
4804.00	Н	Average	28.65	23.73	4.92	54.00	-25.35
4804.00	Н	Peak	41.30	36.38	4.92	74.00	-32.70

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Operation Mode : BR(1M) Test Date : 12/21/2016 Fundamental Frequency: 2402 MHz Temp. / Humi. : 21 deg C / 62 RH **Tx CH LOW** Operation Band : Test Engineer : Mike EUT Pol. : E2 Plane Measurement Antenna Pol.: HORIZONTAL

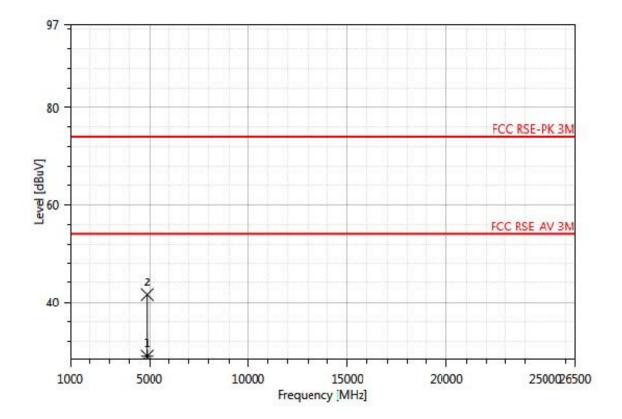


	Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
			Mode	Reading Level	FS		@3m	
_	MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
	4804.00	Н	Average	28.72	23.80	4.92	54.00	-25.28
	4804.00	Н	Peak	41.45	36.53	4.92	74.00	-32.55

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Operation Mode : BR(1M) Test Date : 12/21/2016 Fundamental Frequency: 2441 MHz Temp. / Humi. : 21 deg C / 62 RH Operation Band : Tx CH MID Test Engineer : Mike EUT Pol. : E2 Plane Measurement Antenna Pol.: VERTICAL

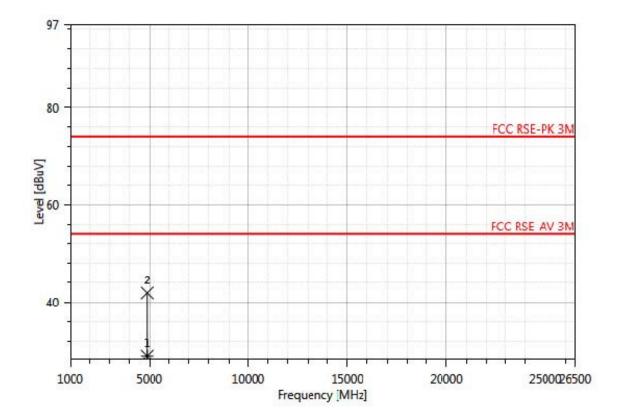


Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
		Mode	Reading Level	FS		@3m	
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
4882.00	Н	Average	29.05	23.87	5.18	54.00	-24.95
4882.00	Н	Peak	41.62	36.44	5.18	74.00	-32.38

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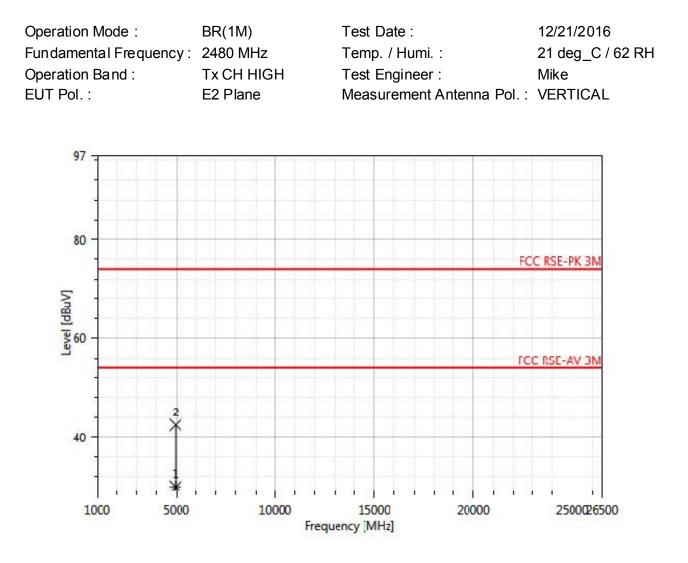
Operation Mode : BR(1M) Test Date : 12/21/2016 Fundamental Frequency: 2441 MHz Temp. / Humi. : 21 deg_C / 62 RH Operation Band : Tx CH MID Mike Test Engineer : EUT Pol. : E2 Plane Measurement Antenna Pol.: HORIZONTAL



Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
		Mode	Reading Level	FS		@3m	
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
4882.00	Н	Average	29.03	23.85	5.18	54.00	-24.97
4882.00	Н	Peak	41.92	36.74	5.18	74.00	-32.08

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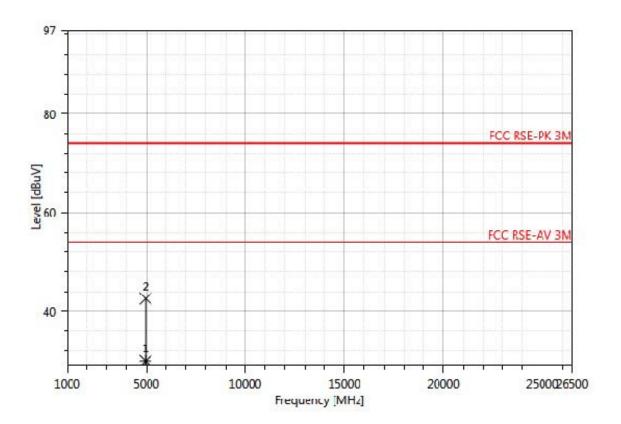


Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
		Mode	Reading Level	FS		@3m	
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
4960.00	Н	Average	29.89	24.60	5.29	54.00	-24.11
4960.00	Н	Peak	42.47	37.18	5.29	74.00	-31.53

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Operation Mode : BR(1M) Test Date : 12/21/2016 Fundamental Frequency: 2480 MHz Temp. / Humi. : 21 deg_C / 62 RH Operation Band : **Tx CH HIGH** Mike Test Engineer : EUT Pol. : E2 Plane Measurement Antenna Pol.: HORIZONTAL



Freq.	Note	Decetor	Actual	Spectrum	Factor	Limit	Margin
		Mode	Reading Level	FS		@3m	
MHz	F/H/E/S	QP/AV/PK	dBµV/m	dBµV/m	dB	dBuV/m	dB
4960.00	Н	Average	29.92	24.63	5.29	54.00	-24.08
4960.00	Н	Peak	42.59	37.31	5.29	74.00	-31.41

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11 FREQUENCY SEPARATION

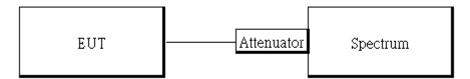
11.1 Standard Applicable

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

SGS Conducted Room						
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.	
ТҮРЕ		NUMBER	NUMBER	CAL.		
Power Meter	Anritsu	ML2495A	1005007	12/15/2016	12/14/2017	
Power Sensor	Anritsu	MA2411B	917032	12/15/2016	12/14/2017	
EXA Spectrum Analyzer	Agilent	N9030A	MY53120760	02/26/2016	02/25/2017	
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2016	01/01/2017	
Coaxial Cable	HUBER+SUHNER	SUCOFLEX 102	23670/2	01/02/2016	01/01/2017	
Attenuator	Mini-Circuit	BW-S10W2+	2	01/02/2016	01/01/2017	
Splitter	Agilent	11636B	N/A	01/02/2016	01/01/2017	
DC Power Supply	Agilent	E3640A	MY52410006	11/21/2016	11/20/2017	
Temperature Chamber	TERCHY	MHG-120LF	911009	05/17/2016	05/16/2017	

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 FCC Public Notice DA 00-705 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



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12 NUMBER OF HOPPING FREQUENCY

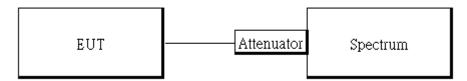
12.1 Standard Applicable

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

12.2 Measurement Equipment Used

SGS Conducted Room						
EQUIPMENT	MFR	MFR MODEL S		LAST	CAL DUE.	
ТҮРЕ		NUMBER	NUMBER	CAL.		
Power Meter	Anritsu	ML2495A	1005007	12/15/2016	12/14/2017	
Power Sensor	Anritsu	MA2411B	917032	12/15/2016	12/14/2017	
EXA Spectrum Analyzer	Agilent	N9030A	MY53120760	02/26/2016	02/25/2017	
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2016	01/01/2017	
Coaxial Cable	HUBER+SUHNER	SUCOFLEX 102	23670/2	01/02/2016	01/01/2017	
Attenuator	Mini-Circuit	BW-S10W2+	2	01/02/2016	01/01/2017	
Splitter	Agilent	11636B	N/A	01/02/2016	01/01/2017	
DC Power Supply	Agilent	E3640A	MY52410006	11/21/2016	11/20/2017	
Temperature Chamber	TERCHY	MHG-120LF	911009	05/17/2016	05/16/2017	

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 FCC Public Notice DA 00-705 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.

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12.5 Measurement Result

Tabular Data of Total Channel Number

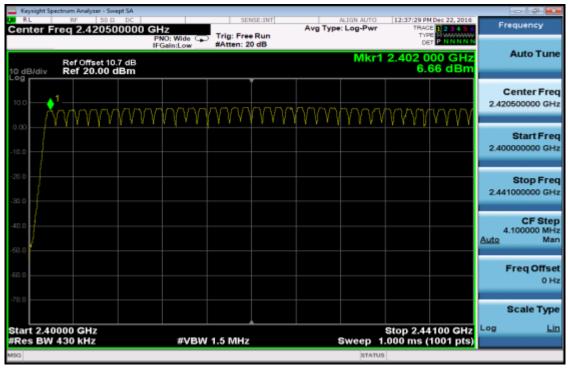
	Channel Number	Limit
2.4 GHz – 2.441GHz	40	
2.441 GHz – 2.4835GHz	39	>15
2.4GHz ~2.4835GHz	(40+39) = 79	

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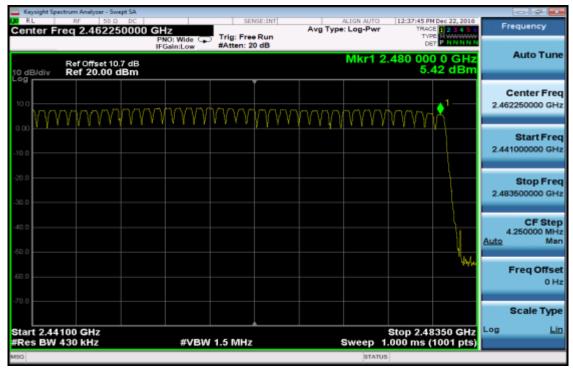


Channel Number



2.4 GHz – 2.441GHz

2.441 GHz – 2.4835GHz



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13 TIME OF OCCUPANCY (DWELL TIME)

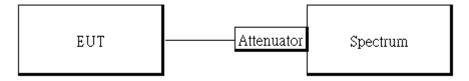
13.1 Standard Applicable

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

SGS Conducted Room						
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.	
TYPE		NUMBER	NUMBER	CAL.		
Power Meter	Anritsu	ML2495A	1005007	12/15/2016	12/14/2017	
Power Sensor	Anritsu	MA2411B	917032	12/15/2016	12/14/2017	
EXA Spectrum Analyzer	Agilent	N9030A	MY53120760	02/26/2016	02/25/2017	
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2016	01/01/2017	
Coaxial Cable	HUBER+SUHNER	SUCOFLEX 102	23670/2	01/02/2016	01/01/2017	
Attenuator	Mini-Circuit	BW-S10W2+	2	01/02/2016	01/01/2017	
Splitter	Agilent	11636B	N/A	01/02/2016	01/01/2017	
DC Power Supply	Agilent	E3640A	MY52410006	11/21/2016	11/20/2017	
Temperature Chamber	TERCHY	MHG-120LF	911009	05/17/2016	05/16/2017	

13.3 Test Set-up



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13.4 Measurement Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. The testing follows FCC Public Notice DA 00-705 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.

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.

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13.5 Tabular Result of the Measurement

GFSK (1Mbps)

Channel	PACKET TYPE	Measurement Result	Limit
		(ms)	(ms)
	DH1	112.00	400ms
0	DH3	257.60	400ms
	DH5	304.00	400ms
	DH1	112.00	400ms
39	DH3	257.60	400ms
	DH5	304.00	400ms
	DH1	112.00	400ms
78	DH3	256.00	400ms
	DH5	304.00	400ms

π/4 DQPSK (2Mbps)

Channel	PACKET TYPE	Measurement Result (ms)	Limit (ms)
	DH1	112.00	400ms
39	DH3	257.60	400ms
	DH5	305.07	400ms

8-DPSK (3Mbps)

Channel	PACKET TYPE	Measurement Result (ms)	Limit (ms)
	DH1	112.00	400ms
39	DH3	257.60	400ms
	DH5	305.07	400ms

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

GFSK (1Mbps):

CH Low	DH1 time slot =	0.350 *	(1600/2/79) *	31.6 =	112.00 (ms)
	DH3 time slot =	1.610 *	(1600/4/79) *	31.6 =	257.60 (ms)
	DH5 time slot =	2.850 *	(1600/6/79) *	31.6 =	304.00 (ms)
CH Mid	DH1 time slot =	0.350 *	(1600/2/79) *	31.6 =	112.00 (ms)
	DH3 time slot =	1.610 *	(1600/4/79) *	31.6 =	257.60 (ms)
	DH5 time slot =	2.850 *	(1600/6/79) *	31.6 =	304.00 (ms)
CH High	DH1 time slot =	0.350 *	(1600/2/79) *	31.6 =	112.00 (ms)
	DH3 time slot =	1.600 *	(1600/4/79) *	31.6 =	256.00 (ms)
	DH5 time slot =	2.850 *	(1600/6/79) *	31.6 =	304.00 (ms)

$\pi/4$ -DQPSK (2Mbps):

CH Mid	2DH1 time slot=	0.350 *	(1600/2/79) *	31.6 =	112.00 (ms)
	2DH3 time slot=	1.610 *	(1600/4/79) *	31.6 =	257.60 (ms)
	2DH5 time slot=	2.860 *	(1600/6/79) *	31.6 =	305.07 (ms)

8-DPSK (3Mbps):

CH Mid	3DH1 time slot=	0.350 *	(1600/2/79) *	31.6 =	112.00 (ms)
	3DH3 time slot=	1.610 *	(1600/4/79) *	31.6 =	257.60 (ms)
	3DH5 time slot=	2.860 *	(1600/6/79) *	31.6 =	305.07 (ms)

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GFSK (1Mbps) for AFH Mode					
Hopping Channel Number	PACKET TYPE	Measurement Result (ms)	Limit (ms)		
20	DH5	152.00	400ms		
	π/4 DQPSK (2Mbps) for Mode				
Hopping Channel Number	PACKET TYPE	Measurement Result (ms)	Limit (ms)		
20	DH5	152.53	400ms		
	8-DPSK (3Mbps) for AFH Mode				
Hopping Channel Number					
20	DH5	152.53	400ms		

GFSK (1Mbps):

DH5 time sl =	2.850	(ms) *	(800/6/20)*8 =	152.00	(ms)
$\pi/4$ -DQPSK (2Mbps					
2DH5 time :=	2.860	(ms) *	(800/6/20)*8 =	152.53	(ms)
8-DPSK (3Mbps):					
3DH5 time :=	2.860	(ms) *	(800/6/20)*8 =	152.53	(ms)

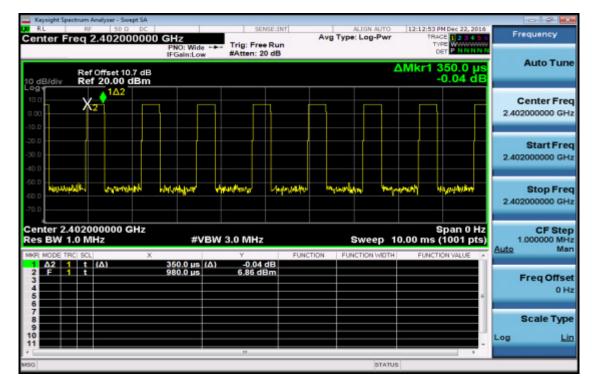
13.6 Measurement Result

Note: Refer to next page for plots.

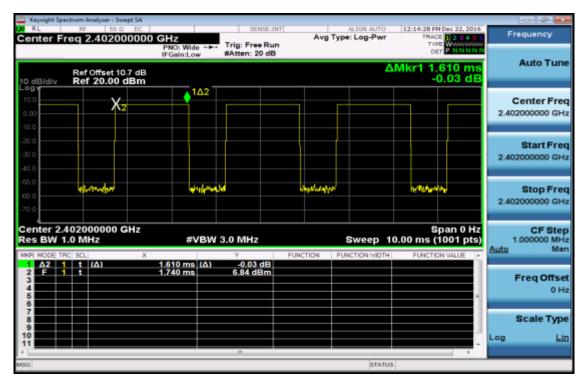
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CH-Low DH1



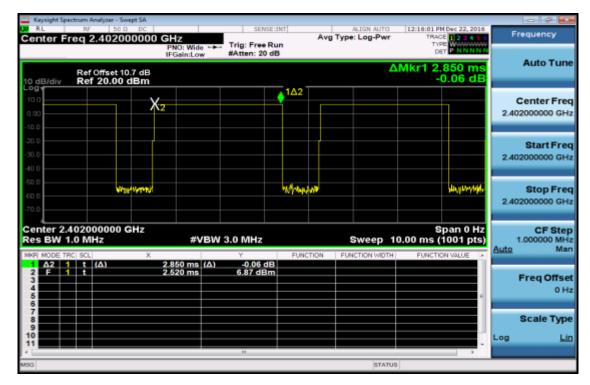
DH3



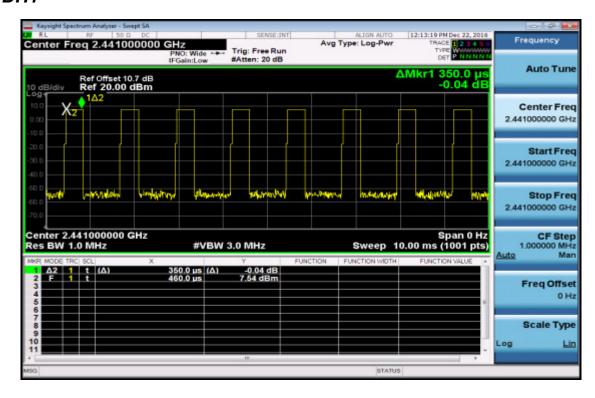
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DH5



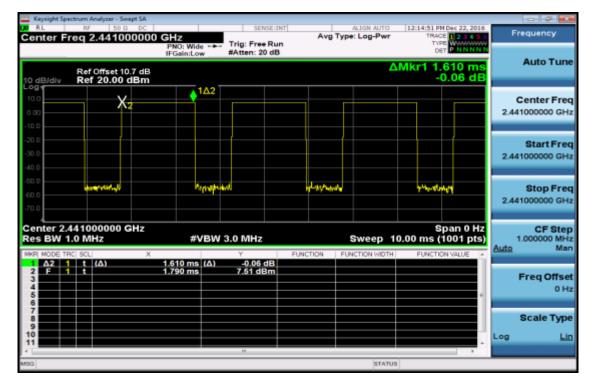
CH-Mid DH1



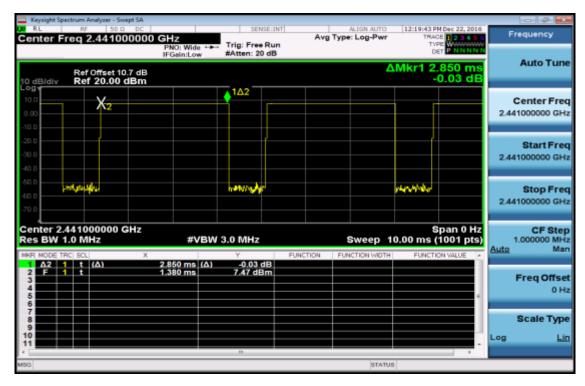
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DH3



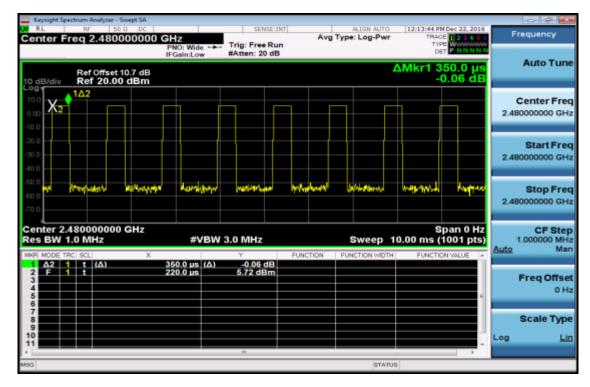
DH5



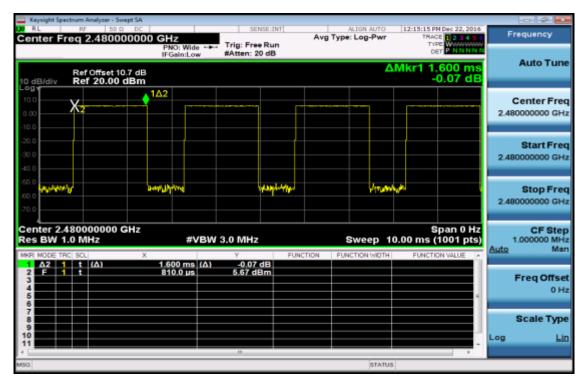
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CH-High DH1



DH3



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DH5

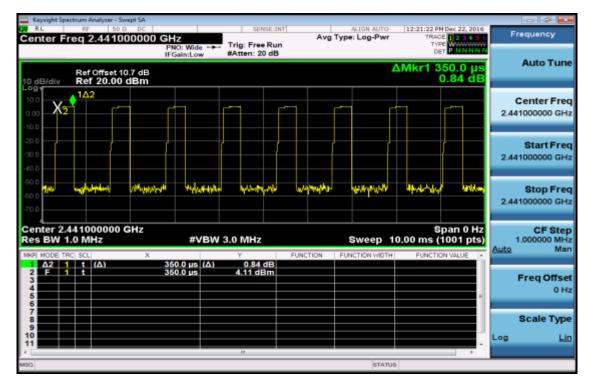
	ectrum Analyzer - Swept SA							
Center F	req 2.480000000	GHz	Trig: Free Ru	Ave	g Type: Log-Pwr	12:17:50 PM Dec 22, 20 TRACE 1 2 3 4 TYPE	56	Frequency
10 dB/div	Ref Offset 10.7 dB Ref 20.00 dBm	IFGain:Low	#Atten: 20 dE		Δ	Mkr1 2.850 m -0.05 d	s	Auto Tune
10.0 0.00							2	Center Freq 480000000 GHz
-20.0 -30.0 -40.0							2	Start Freq 48000000 GHz
-50.0 -60.0 -70.0		lar-lagister			han the state of t		2	Stop Freq 48000000 GHz
Res BW 1	RC SCL X		3.0 MHz	FUNCTION	Sweep 1	Span 0 F 0.00 ms (1001 pt FUNCTION VALUE	1Z S) Aut	CF Step 1.000000 MHz Man
1 Δ2 1 2 F 3 4 5 6	t (Δ)	2.850 ms (Δ) 370.0 μs	-0.05 dB 5.65 dBm					Freq Offset 0 Hz
7 8 9 10 11							- Log	Scale Type
<			11					
MSG					STATUS			

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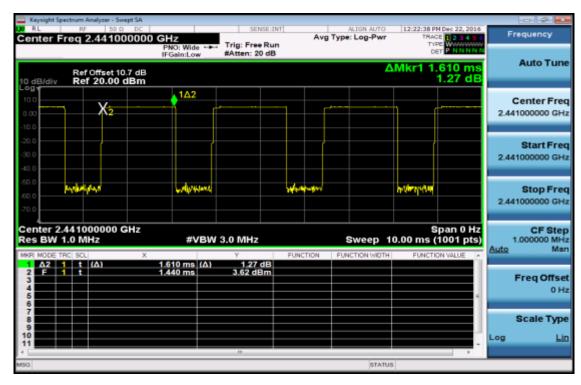
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CH-Mid 2DH1



2DH3



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2DH5

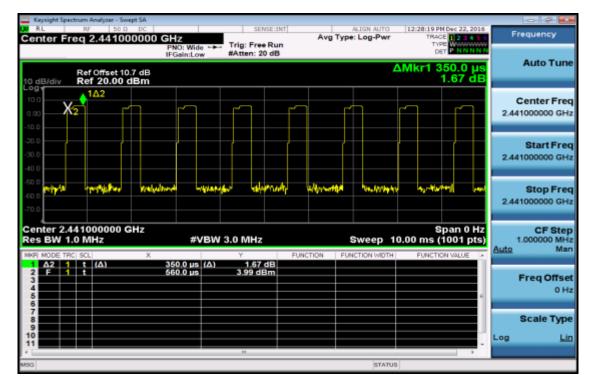
Keysight Spectrum Analyzer - Swept SA			
Center Freq 2.441000000		ALIGN AUTO 12:25:39 PM Dec 22, 20 Avg Type: Log-Pwr TRACE 1234	Frequency
Ref Offset 10.7 dB	PNO: Wide Trig: Free Run IFGain:Low #Atten: 20 dB	ΔMkr1 2.860 m 0.84 d	Auto Tune
10.0 0.00 X2			Center Freq 2.441000000 GHz
-20.0			Start Freq 2.441000000 GHz
-50.0	, apaga ang	Apati marked	Stop Freq 2.441000000 GHz
Center 2.441000000 GHz Res BW 1.0 MHz	#VBW 3.0 MHz	Span 0 H Sweep 10.00 ms (1001 pt TION FUNCTION WIDTH FUNCTION VALUE	(z CF Step s) 1.000000 MHz Auto Man
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	2.860 ms (Δ) 0.84 dB 950.0 μs 4.07 dBm		Freq Offset 0 Hz
7 8 9 10 11			Scale Type
MSG		STATUS	

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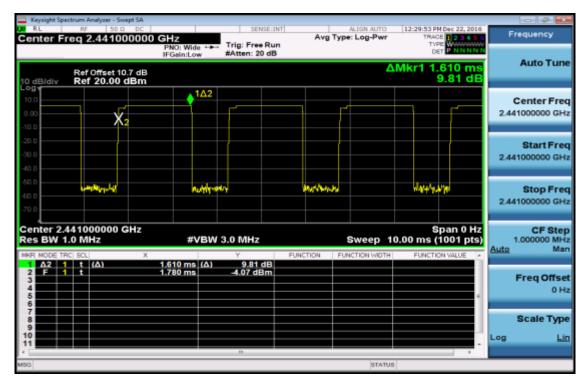
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CH-Mid **3DH1**



3DH3



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3DH5

Keysight Spectrum Analyzer - Swe			- Chief And Construction of the	
Center Freq 2.44100		Avg Type: Log-Pwr	12:34:56 PM Dec 22, 2016 TRACE 1 2 3 4 5 6 TYPE DET P NN NN N	Frequency
Ref Offset 10. 10 dB/div Ref 20.00 d	IFGain:Low #Atten: 20 dt		Mkr1 2.860 ms 5.43 dB	Auto Tune
10.0 0.00 X2			ſ	Center Free 2.441000000 GH2
-20.0				Start Free 2.441000000 GH
-50.0 -60.0 -70.0	water and the second	and the second se		Stop Free 2.441000000 GH
Center 2.441000000 G Res BW 1.0 MHz	#VBW 3.0 MHz		Span 0 Hz 0.00 ms (1001 pts)	CF Step 1.000000 MH Auto Mar
MKR MODE TRC SCL 1 Δ2 1 t (Δ) 2 F 1 t 3 4 5 6	X Y 2.850 ms (Δ) 5.43 dB 610.0 μs 0.28 dBm	FUNCTION FUNCTION WIDTH	FUNCTION VALUE +	Freq Offse 0 H
7 8 9 10 11				Scale Type Log Lir
490		STATUS		

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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 is designed as permanently attached and no consideration of replacement. Please see EUT photo and antenna spec. for details.

The antenna gain is less than 6dBi. Therefore, it is not necessary to reduce maximum output power limit.

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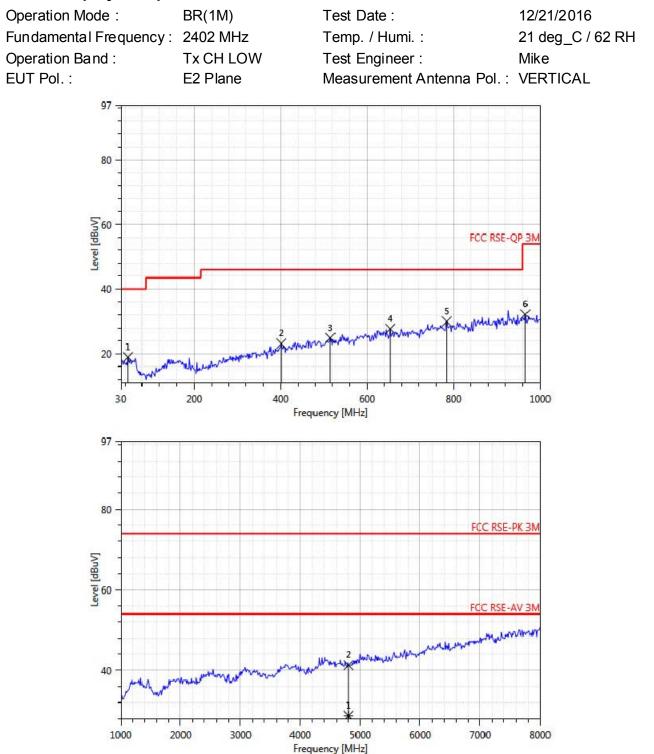
APPENDIX I MEASUREMENT PLOT OF RADIATED SPURIOUS EMISSION

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Radiated Spurious Emission Measurement photos Result

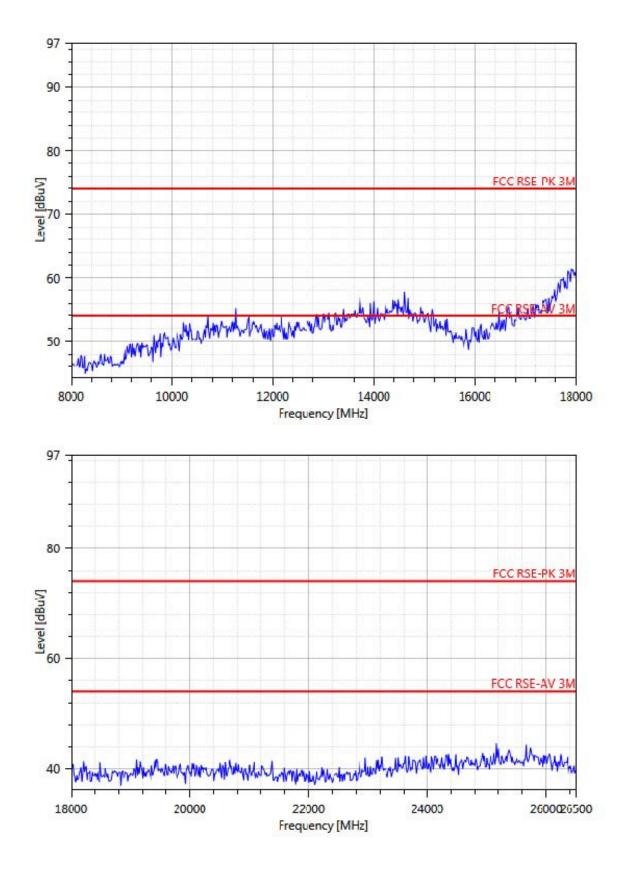
Note: The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.



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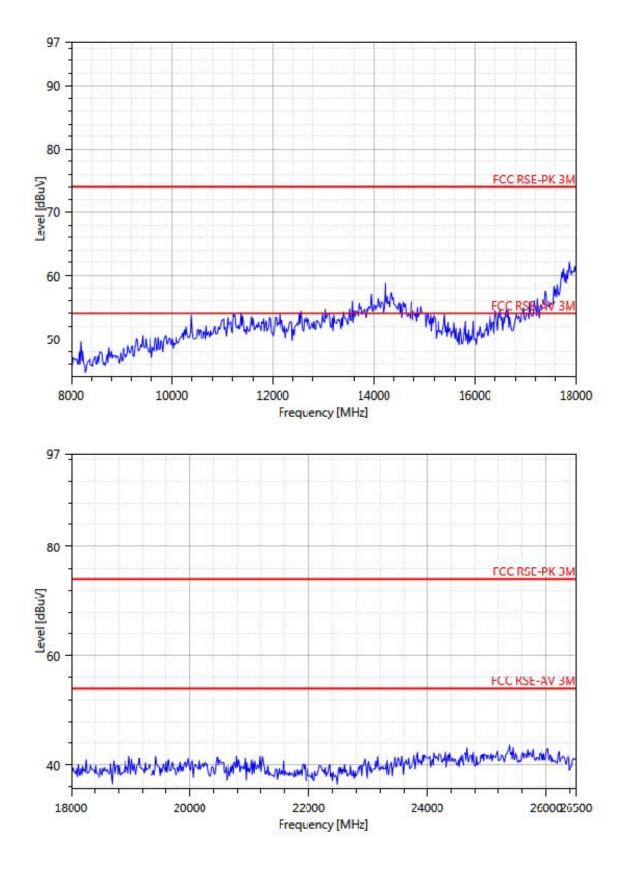
Operation Mode : BR(1M) Test Date : 12/21/2016 Fundamental Frequency: 2402 MHz Temp. / Humi. : 21 deg_C / 62 RH **Operation Band :** Tx CH LOW Mike Test Engineer : EUT Pol. : E2 Plane Measurement Antenna Pol.: HORIZONTAL 97 80 Level [dBuV] 00 FCC RSE-QP 3M 40 5 20 30 200 600 800 1000 400 Frequency [MHz] 97 80 FCC RSE-PK 3N Level [dBuV] FCC RSE-AV 3M 40 1000 2000 3000 4000 5000 6000 7000 8000

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Frequency [MHz]

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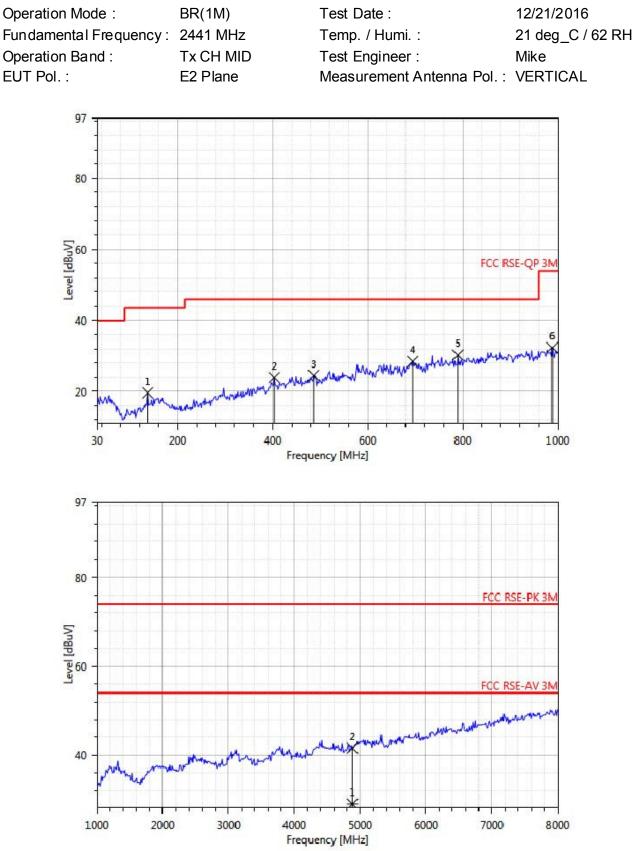


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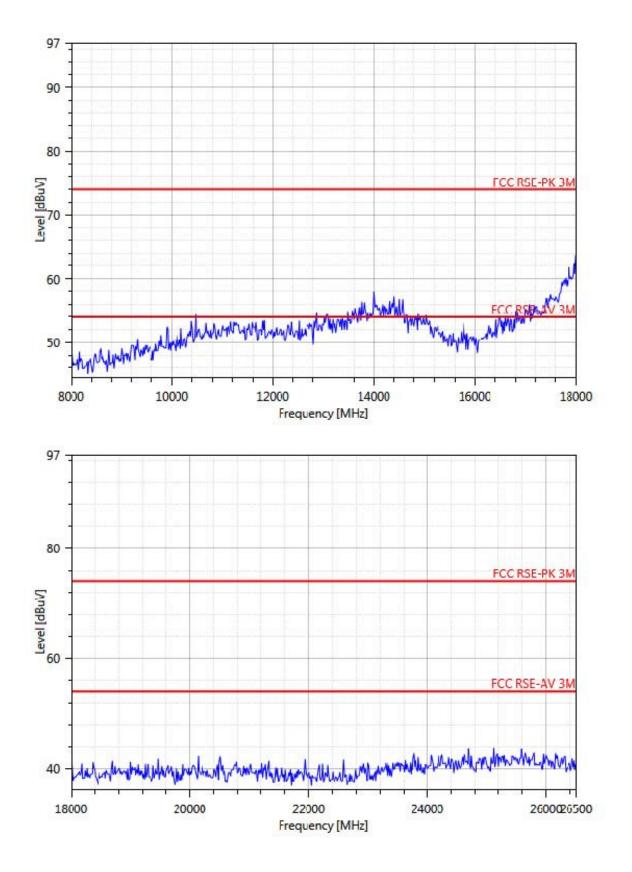
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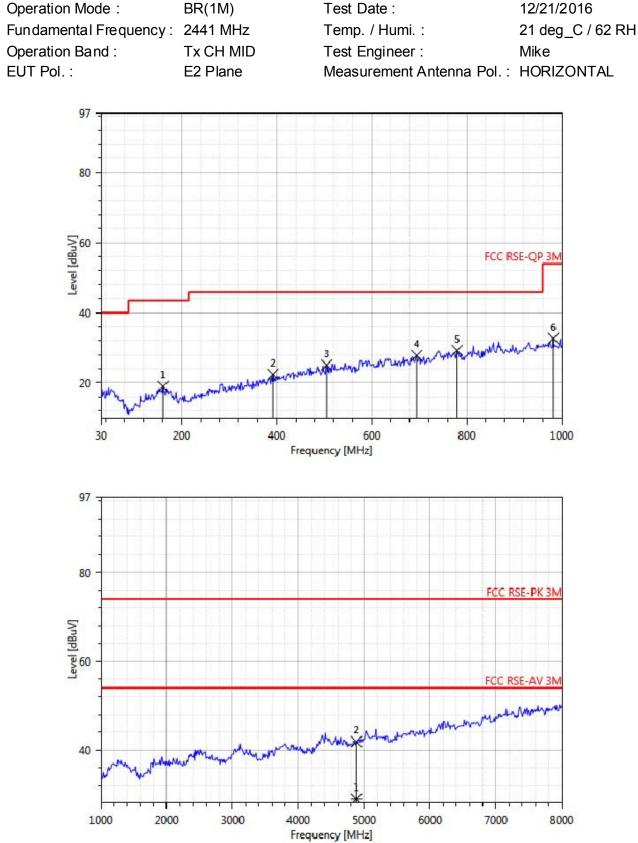
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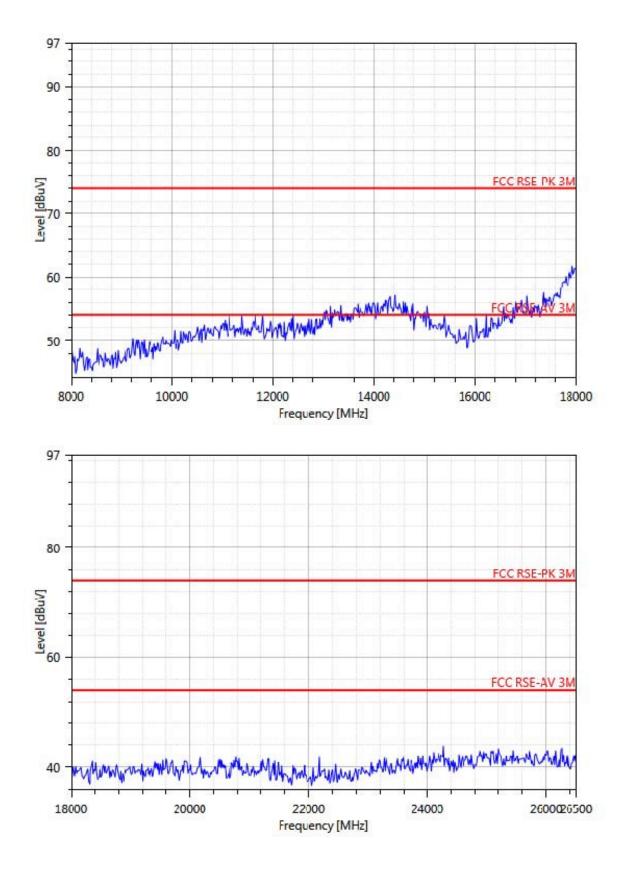
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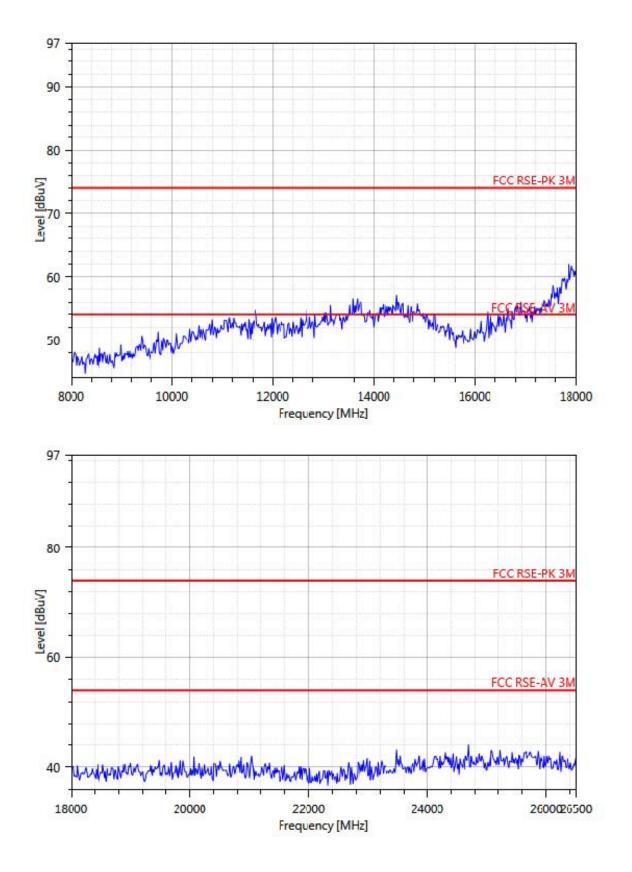
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Operation Mode : BR(1M) Test Date : 12/21/2016 Fundamental Frequency: 2480 MHz Temp. / Humi. : 21 deg C / 62 RH **Operation Band : Tx CH HIGH** Mike Test Engineer : EUT Pol. : E2 Plane Measurement Antenna Pol.: VERTICAL 97 80 Level [dBuV] 00 FCC RSE-QP 3N 40 20 30 800 1000 200 400 600 Frequency [MHz] 97 80 FCC RSE-PK 3M Level [dBuV] FCC RSE-AV 3M 40 1000 2000 3000 4000 5000 6000 7000 8000 Frequency [MHz]

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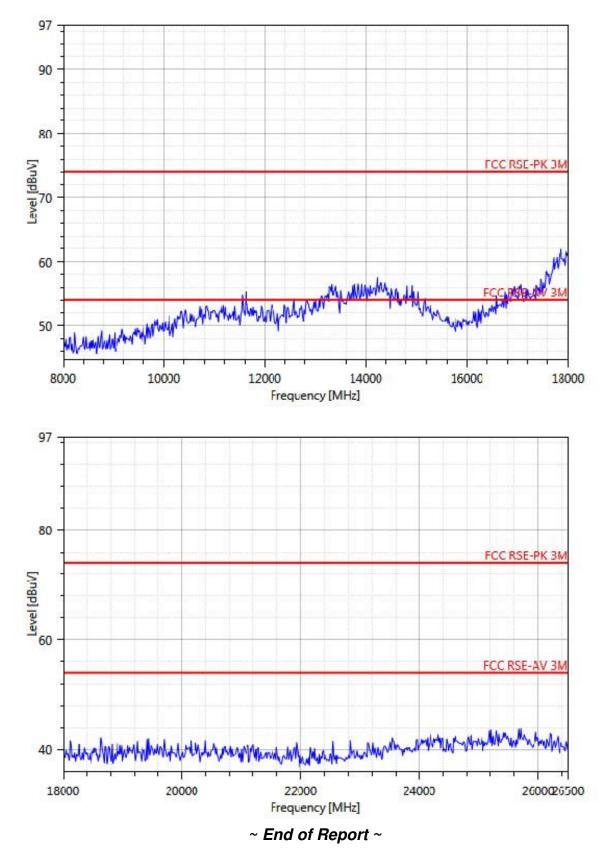
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