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## TEST REPORT For FCC

Test Report No. : CTK-2012-00870  
Date of Issue : August 23, 2012  
FCC ID : U5MSPP-R300-MSO  
Model/Type No. : SPP-R300  
Kind of Product : Mobile Printer  
Applicant : BIXOLON Co., Ltd.  
Applicant Address : 7th~8th FL, Miraeasset Venture Tower, 685, Sampyeong-dong, Bundang-gu Seongnam-si, Gyeonggi-do, Korea  
Manufacturer : BIXOLON Co., Ltd.  
Manufacturer Address : 7th~8th FL, Miraeasset Venture Tower, 685, Sampyeong-dong, Bundang-gu Seongnam-si, Gyeonggi-do, Korea  
Contact Person : Hyun-suk Son / Assistant Manager  
Telephone : +82-31-218-5582  
Received Date : July 25, 2012  
Test period : Start : August 17, 2012      End : August 22, 2012

The test results presented in this report relate only to the object tested.

Tested by

Young-taek Lee  
Test Engineer  
Date: August 23, 2012

Reviewed by

Young-Joon, Park  
Technical Manager  
Date: August 23, 2012



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## REPORT REVISION HISTORY

Date	Revision	Page No
August 23, 2012	Issued (CTK-2012-00870)	All

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## 1.0 General Product Description

Equipment model name	: SPP-R300
Serial number	: Prototype
EUT condition	: Pre-production, not damaged
Antenna type	: Chip antenna Gain -0.47 dBi
Frequency Range	: 2402 MHz - 2480 MHz
RF power	: -8.986 dBm Peak Conducted (GFSK) : -0.754 dBm Peak Conducted (8-DPSK)
Type of Modulation	: Frequency Hopping Spread Spectrum
Number of channels	: 79
Channel Spacing	: 1MHz
Channel Access Protocol	: Frequency Hopping
Type of Modulation	: GFSK(1Mbps), DQPSK(2Mbps), 8-DPSK(3Mbps)
Power Source	: Lithium-ion Battery Pack(Rechargeable battery) 7.4 Vdc/2600 mAh

### 1.1 Tested Frequency

	<b>LOW</b>	<b>MID</b>	<b>HIGH</b>
<b>Frequency (MHz)</b>	2402	2441	2480

### 1.2 Tested Mode

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

<b>Tested Ch</b>	<b>Modulation Technology</b>	<b>Modulation Type</b>	<b>Packet Type</b>
Low, Mid, High	FHSS	GFSK	DH 5
Low, Mid, High	FHSS	8-DPSK	3DH 5



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## 1.3 Model Differences

Not applicable

## 1.4 Device Modifications

The following modifications were necessary for compliance:

Not applicable

## 1.5 Peripheral Devices

Device	Manufacturer	Model No.	Serial No.
Battery Charger (for EUT)	BridgePower Corp.	BL607080085600NK	K 1105000624
Personal Computer	Samsung Electronics Co., Ltd.	DB-A150	ZMSI96BSB00124E
LCD Monitor	LG Electronics Co., Ltd.	M2294D-PM	902KCVU6M135
Keyboard (PS/2 type)	-	SK-2880	B943C0ACPS740M
Mouse (USB type)	INTECH ELECTRONICS CORP., SHEN ZHEN ZHI	3D-510	510080601807
Notebook Computer	TOSHIBA CORPORATION	PSL48K-00L00K	Z7037769R

## 1.6 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable to the Korea Research Institute of Standards and Science (KRISS), therefore, all test data recorded in this report is traceable to KRISS.

## 1.7 Test Facility

The measurement facility is located at 386-1, Ho-dong, Cheoin-gu, Yongin-si, Gyeonggi-do, 449-100, Korea.



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## 1.8 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3 m & 10 m OATS, 3 m & 10 m SAC and Conducted Test Site to perform FCC Part 15/18 measurements	 805871
JAPAN	VCCI	10 m OATS, 3 m & 10 m SAC and Conducted Test Site	 R-948, C-986 T-1843
KOREA	KCC	EMI (10 m OATS, 10 m SAC and Conducted Test Site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and Interruptions)	 No. 51, KR0025
International	KOLAS	EMC	



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## 2.0 Summary of tests

FCC Part Section(s)	Parameter	Limit	Test Condition	Status (note 1)
15.247(a)	Carrier Frequency Separation	> 25 kHz	Conducted	C
15.247(a)	Number of Hopping Frequencies	> 15 hops		C
15.247(a)	20 dB Bandwidth	NA		C
15.247	Dwell Time	< 0.4 seconds		C
15.247(b)	Transmitter Output Power	< 0.125 Watts		C
15.247(d)	Conducted Spurious emission	> 20 dBc		C
15.247(d)	Band Edge	> 20 dBc		C
15.209	Field Strength of Harmonics	15.209(a)	Radiated	C
15.207	AC Conducted Emissions	15.207(a)	Line Conducted	C

Note 1: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable

Note 2: The data in this test report are traceable to the national or international standards.

The sample was tested according to the following specification:

- FCC Part 15.247, ANSI C63.4-2003

The tests were performed according to the method of measurements prescribed in DA 00-705.

## 2.1 Transmitter Requirements

### 2.1.1 Carrier Frequency Separation

#### Test Location

RF Test Room

#### Test Procedures

The carrier frequency separation was measured with a spectrum analyzer connected to the antenna terminal, while EUT has its hopping function enabled.

After the trace being stable, the reading value between the peaks of the adjacent channels using the marker-delta function was recorded as the measurement results.

The spectrum analyzer is set to:

Span = 3 MHz (wide enough to capture the peaks of two adjacent channels)

RBW = 30 kHz ( $\geq$  1% of the span) Sweep = auto

VBW = 30 kHz ( $\geq$  RBW) Detector function = peak

Trace = max hold

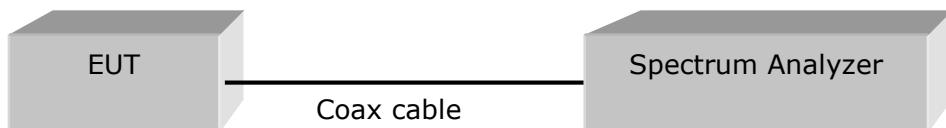


Figure 1 : Measurement setup for the carrier frequency separation

#### Limit

§15.247(a)(1) Frequency hopping system operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-third of 20dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

#### Test Results

##### Test mode : GFSK, CFG PKT Packet Type : 15 Packet Size : 339(DH5)

Channel	Adjacent Hopping Channel Separation (kHz)	Two-third of 20dB bandwidth (kHz)	Minimum Bandwidth (kHz)	Result
2441MHz	1000	623.9	25	Complies

##### Test mode : 8-DPSK, CFG PKT Packet Type : 31 Packet Size : 1021(3DH5)

Channel	Adjacent Hopping Channel Separation (kHz)	Two-third of 20dB bandwidth (kHz)	Minimum Bandwidth (kHz)	Result
2441MHz	995	839.3	25	Complies

See next pages for actual measured spectrum plots.



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## Carrier Frequency Separation

### Data Rate : GFSK



### Data Rate : 8-DPSK



## 2.1.2 Number of Hopping Frequencies

### Test Location

RF Test Room

### Test Procedures

The number of hopping frequencies was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function enabled.

The spectrum analyzer is set to:

Frequency range      1: Start = 2389.5 MHz, Stop = 2439.5 MHz  
                          2: Start = 2439.5 MHz, Stop = 2489.5 MHz

Span = 50 MHz

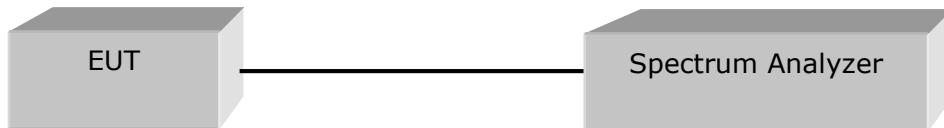
RBW = 300 kHz ( $\geq$  1% of the span)

VBW = 300 kHz ( $\geq$  RBW)

Trace = max hold

Sweep = auto

Detector function = peak



### Limit

§15.247(a)(1)(iii) For frequency hopping system operating in the 2400-2483.5 MHz band shall use at least 15 hopping frequencies.

### Test Results

#### Test mode : GFSK, CFG PKT Packet Type : 15 Packet Size : 339(DH5)

Total number of Hopping Channels	Result
79	Complies

#### Test mode : 8-DPSK, CFG PKT Packet Type : 31 Packet Size : 1021(3DH5)

Total number of Hopping Channels	Result
79	Complies

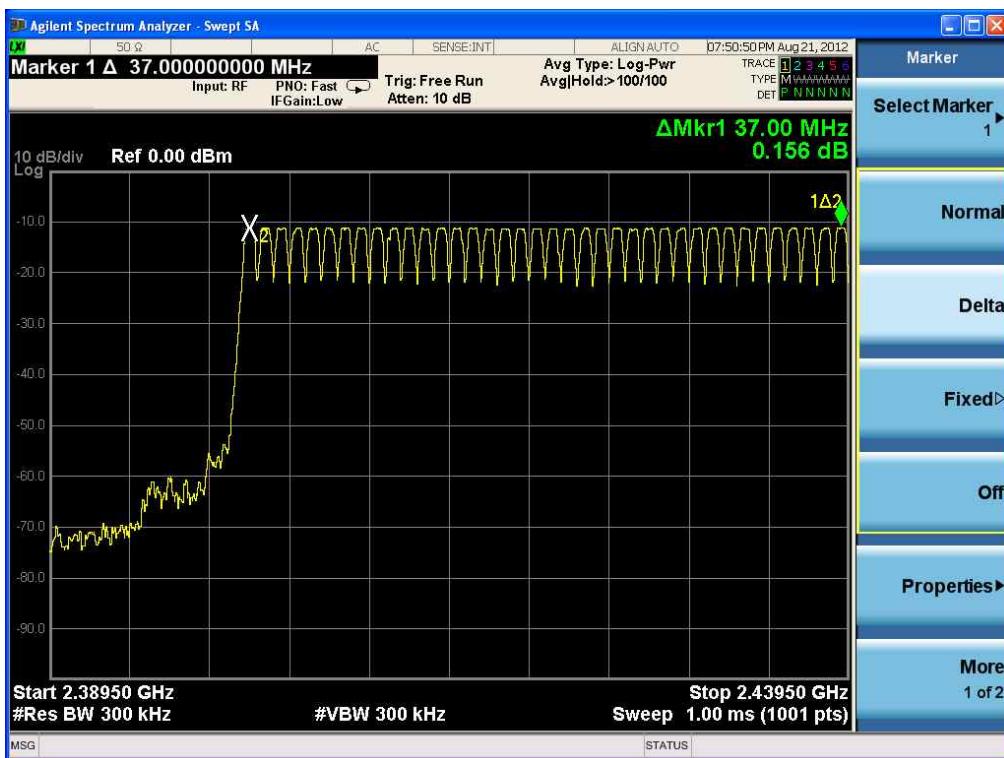
See next pages for actual measured spectrum plots.



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## Number of Hopping Frequencies(GFSK)





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## Number of Hopping Frequencies(8-DPSK)





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## 2.1.3 20 dB bandwidth

### Test Location

RF Test Room

### Test Procedures

The bandwidth at 20 dB below the highest inband spectral density was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function disabled at the highest, middle and the lowest available channels.

After the trace being stable, Use the marker-to peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth of the emission.

#### The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

Span = 2 MHz (approximately 2 or 3 times of the 20 dB bandwidth)

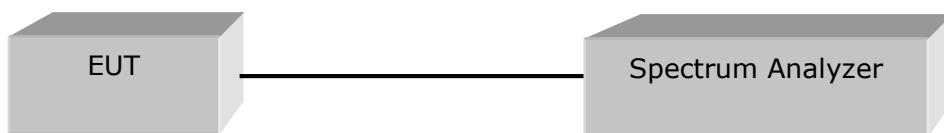
RBW = 30 kHz ( $\geq$  1% of the span)

Sweep = auto

VBW = 30 kHz ( $\geq$  RBW)

Detector function = peak

Trace = max hold



### Limit

Limit : N/A



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## Test Results

### Test mode : GFSK, CFG PKT Packet Type : 15 Packet Size : 339(DH5)

Frequency (MHz)	Channel Number.	Measured Bandwidth (MHz)	Result
2402	0	0.9373	Complies
2441	39	0.9358	Complies
2480	78	0.9354	Complies

### Test mode : 8-DPSK, CFG PKT Packet Type : 31 Packet Size : 1021(3DH5)

Frequency (MHz)	Channel Number.	Measured Bandwidth (MHz)	Result
2402	0	1.252	Complies
2441	39	1.259	Complies
2480	78	1.257	Complies

See next pages for actual measured spectrum plots.



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## 20 dB Bandwidth - GFSK





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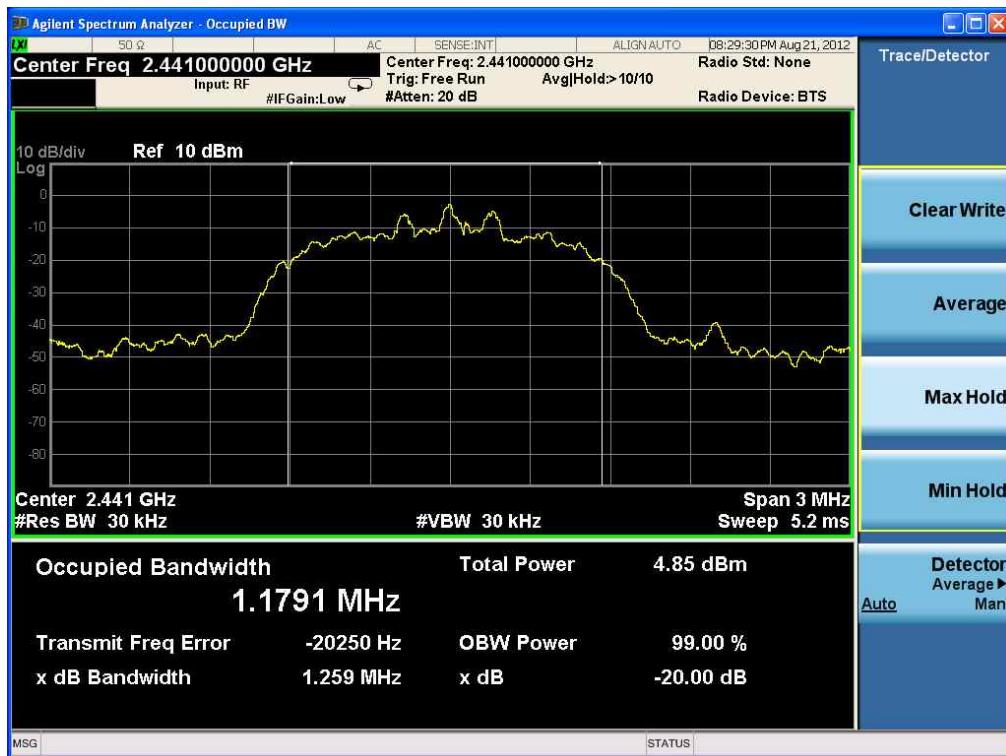




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## 20 dB Bandwidth - 8-DPSK





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## 2.1.4 Time of Occupancy (Dwell Time)

### Test Location

RF Test Room

### Test Procedures

The dwell time was measured with a spectrum analyzer connected to the antenna terminal, while EUT has its hopping function enabled.

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in test setup without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
3. Adjust the center frequency of spectrum analyzer on any frequency to be measured and set spectrum analyzer to zero span mode. And then, set RBW and VBW of spectrum analyzer to proper value.
4. Measure the time duration of one transmission on the measured frequency. And then plot the result with time difference of this time duration.
5. Repeat above procedures until all frequencies measured were complete.
6. The SPP-R300 has 3 type of payload, DH1, DH3, DH5. The hopping rate is 1600 per second.

#### The spectrum analyzer is set to:

Center frequency = the highest, middle, and the lowest channels

Span = zero

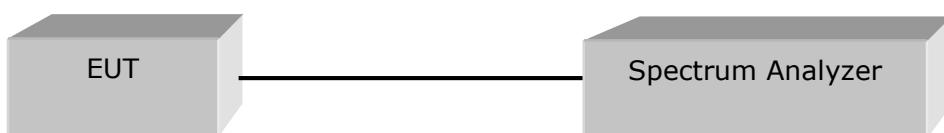
RBW = 1 MHz

Trace = max hold

VBW = 1 MHz ( $\geq$  RBW)

Detector function = peak

Sweep = as necessary to capture the entire dwell time per hopping channel



### Limit

§15.247(a)(1)(iii) For frequency hopping system operating in 2400-2483.5 MHz band, the average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.



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## Test Results

Time of occupancy on the TX channel in 31.6 sec = time domain slot length × hop rate ÷ number of hop per channel × 31.6

### Test mode : GFSK

Channel Frequency (MHz)	Packet Type	Dwell Time (ms)	Test Results	
			Time of occupancy on the TX channel in 31.6sec (ms)	Result
2441	DH 1	0.395	126.40	Complies
	DH 3	1.650	264.00	Complies
	DH 5	2.900	309.33	Complies

$$\text{DH1 Dwell time} = 0.395 \text{ ms} \times (1600 \div 2) \div 79 \times 31.6 = 126.40 \text{ ms}$$

$$\text{DH3 Dwell time} = 1.650 \text{ ms} \times (1600 \div 4) \div 79 \times 31.6 = 264.00 \text{ ms}$$

$$\text{DH5 Dwell time} = 2.900 \text{ ms} \times (1600 \div 6) \div 79 \times 31.6 = 309.33 \text{ ms}$$

### Test mode : 8-DPSK

Channel Frequency (MHz)	Packet Type	Dwell Time (ms)	Test Results	
			Time of occupancy on the TX channel in 31.6sec (ms)	Result
2441	3DH 1	0.410	131.20	Complies
	3DH 3	1.640	262.40	Complies
	3DH 5	2.900	309.33	Complies

$$\text{3DH1 Dwell time} = 0.410 \text{ ms} \times (1600 \div 2) \div 79 \times 31.6 = 131.20 \text{ ms}$$

$$\text{3DH3 Dwell time} = 1.640 \text{ ms} \times (1600 \div 4) \div 79 \times 31.6 = 262.40 \text{ ms}$$

$$\text{3DH5 Dwell time} = 2.900 \text{ ms} \times (1600 \div 6) \div 79 \times 31.6 = 309.33 \text{ ms}$$

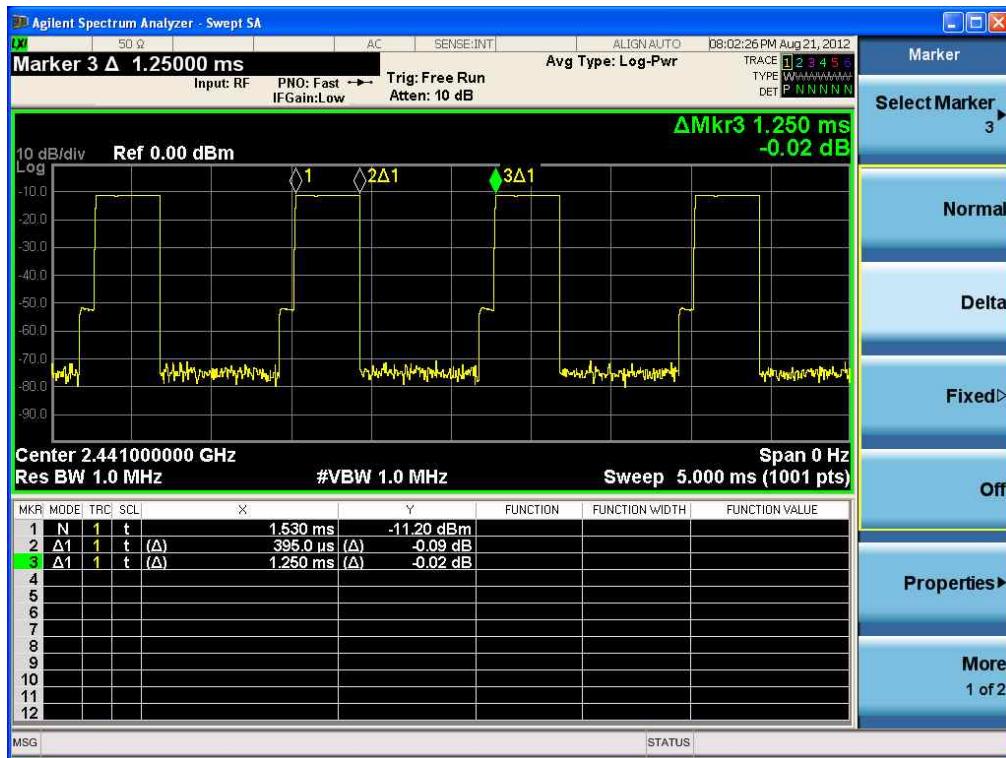
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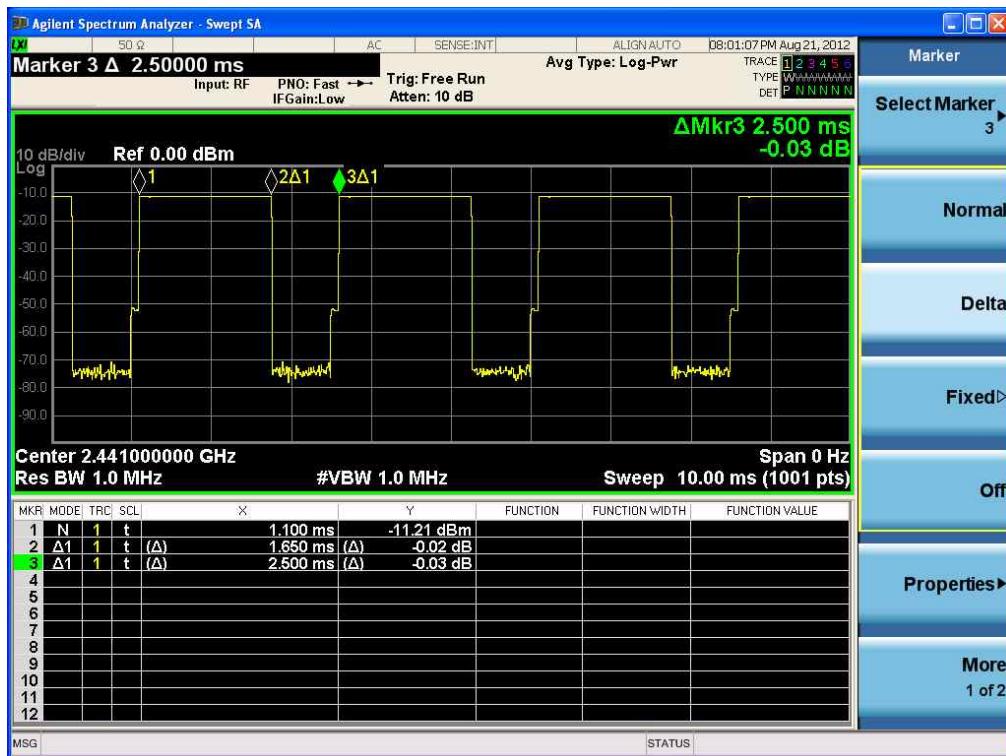
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### Time of Occupancy for PACKET Type DH1(GFSK)



### Time of Occupancy for PACKET Type DH3(GFSK)

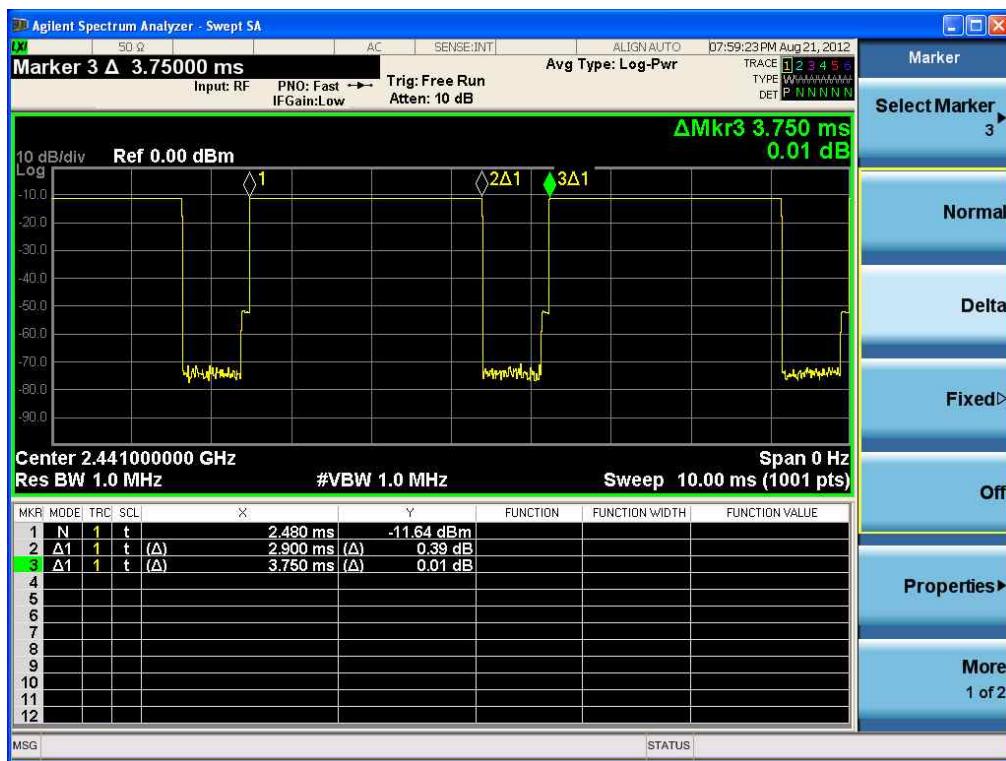




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### Time of Occupancy for PACKET Type DH5(GFSK)

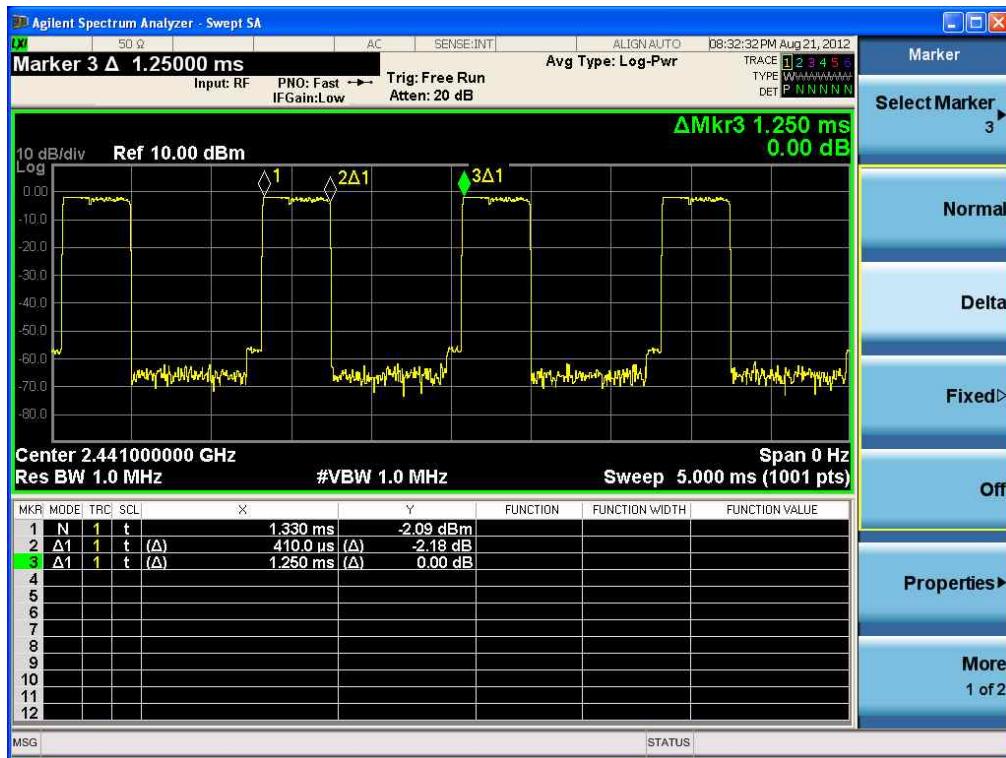




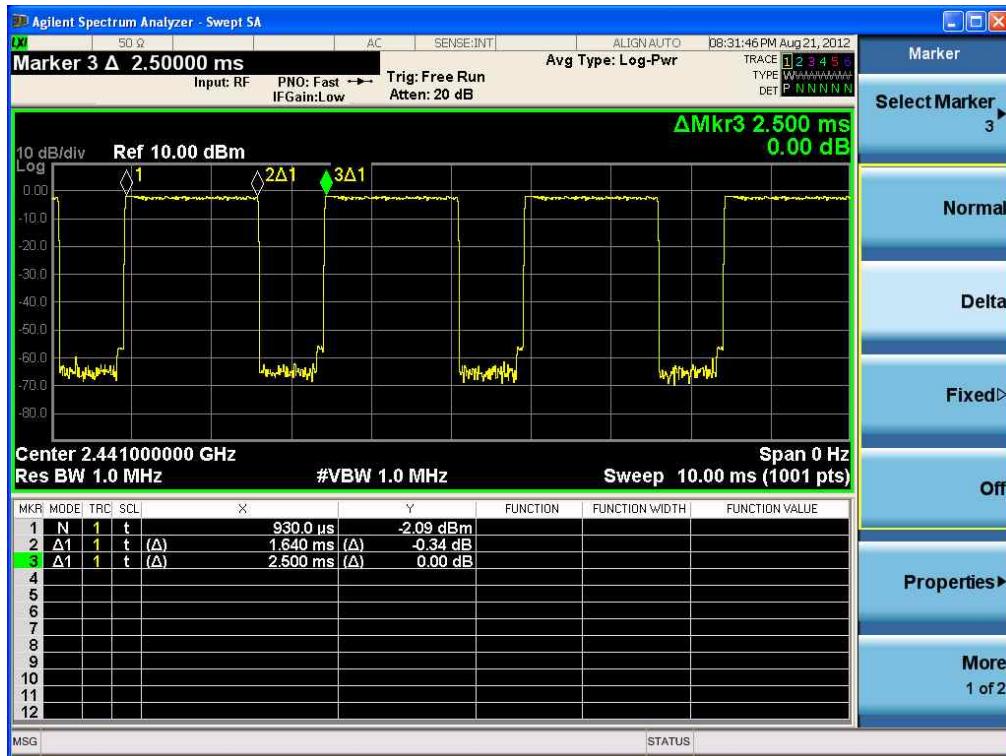
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### Time of Occupancy for PACKET Type 3DH1(8-DPSK)



### Time of Occupancy for PACKET Type 3DH3(8-DPSK)

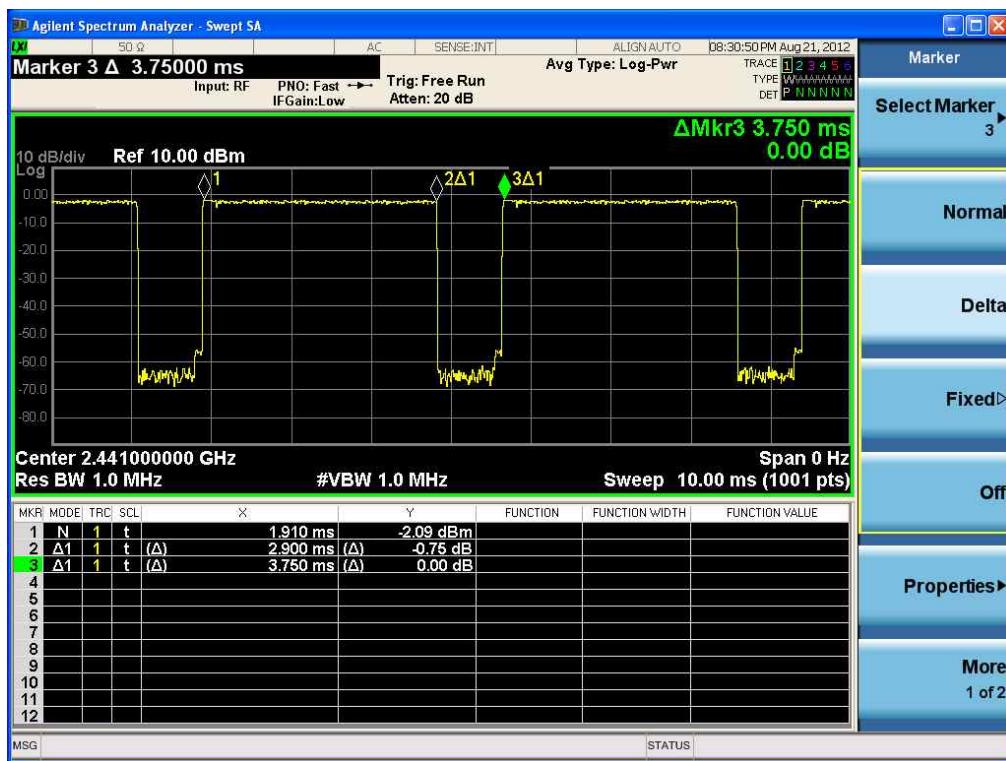




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### Time of Occupancy for PACKET Type 3DH5(8-DPSK)



## 2.1.5 Maximum peak Conducted Output Power

### Test Location

RF Test Room

### Test Procedures

The maximum peak conducted output power was measured with a spectrum analyzer connected to the antenna terminal, while EUT has its hopping function disabled at the highest, middle and the lowest available channels.

The spectrum analyzer is set to:

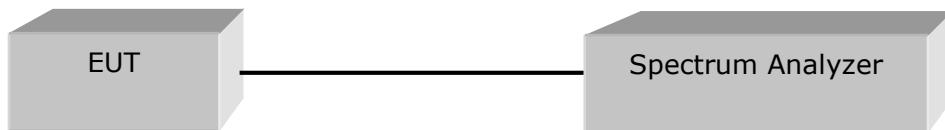
Center frequency = the highest, middle, and the lowest channels

Span = 5 MHz (approximately 5 times of the 20 dB bandwidth)

RBW = 1 MHz (greater than the 20 dB bandwidth of the emission being measured)

VBW = 1 MHz ( $\geq$  RBW)      Detector function = peak

Trace = max hold      Sweep = auto



### Limit

§5.247(b)(1) The Maximum Peak Output Power Measurement is 0.125 Watts for frequency hopping system operating in 2400-2483.5 MHz employing at least 15 Hopping channels.

### Test Results

**Test mode : GPSK, CFG PKT Packet Type : 15 Packet Size : 339(DH5)**

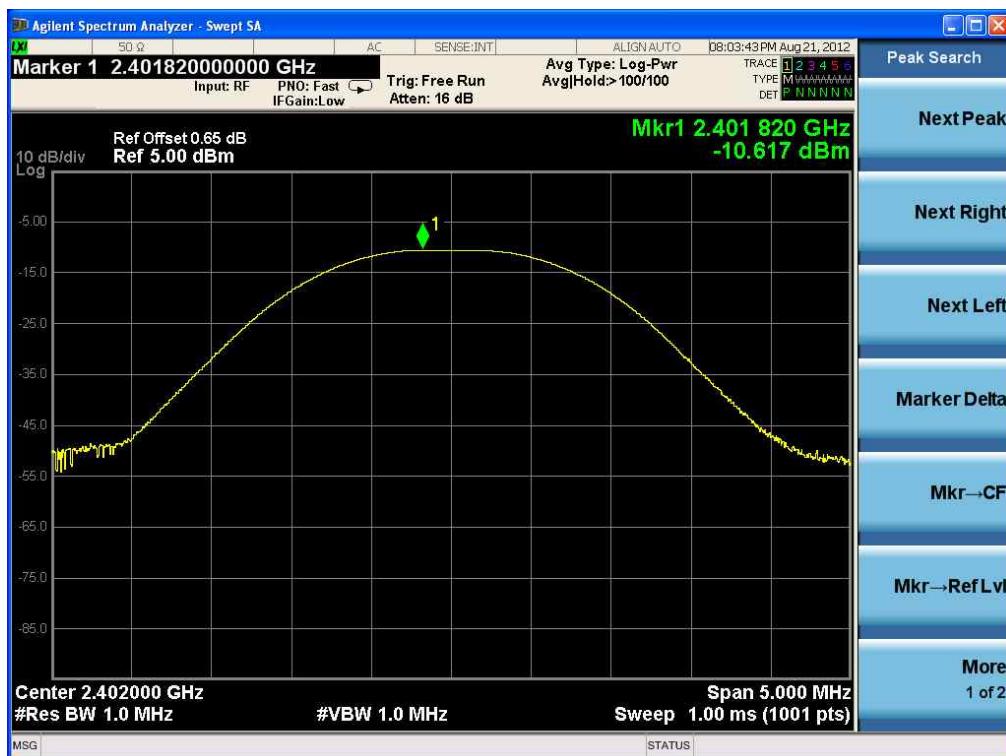
Frequency (MHz)	Channel No.	Peak output power(dBm)	Peak output power(mW)	Result
2402	0	-10.617	0.087	Complies
2441	39	-10.192	0.096	Complies
2480	78	-8.986	0.126	Complies

**Test mode : 8-DPSK, CFG PKT Packet Type : 31 Packet Size : 1021(3DH5)**

Frequency (MHz)	Channel No.	Peak output power(dBm)	Peak output power(mW)	Result
2402	0	-1.137	0.770	Complies
2441	39	-1.031	0.789	Complies
2480	78	-0.754	0.841	Complies

See next pages for actual measured spectrum plots.

### Maximum peak Conducted Output Power - GFSK





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### Maximum peak Conducted Output Power - 8-DPSK





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## 2.1.6 Band-edge

### Test Location

RF Test Room

### Test Procedures

The bandwidth at 20 dB down from the highest inband spectral density was measured with a spectrum analyzer connected to the antenna terminal, while EUT has its hopping function disabled at the highest, middle and the lowest available channels.

The spectrum analyzer is set to:

Center frequency = the highest, middle, and the lowest channels

RBW = 100 kHz

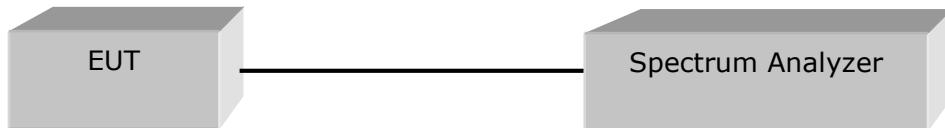
VBW = 100 kHz ( $\geq$  RBW)

Span = 10 MHz

Trace = max hold

Detector function = peak

Sweep = auto



### Limit

> 20 dBc

### Test Results

All conducted emission in any 100 kHz bandwidth outside of the spectrum band was at least 20 dB lower than the highest level of the inband spectral density. Therefore the applying equipment meets the requirement.

See next pages for actual measured spectrum plots.



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### Band - edge (with Hopping) - GFSK





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### Band - edge (with Hopping) - 8-DPSK





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### Band - edge (without Hopping) - GFSK



### Band - edge (without Hopping) - 8-DPSK



**Band – edge (at 20 dB blow) – Low channel**  
**Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic**  
**(Test mode : GFSK)**



**Band – edge (at 20 dB blow) – Mid channel  
Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic  
(Test mode : GFSK)**



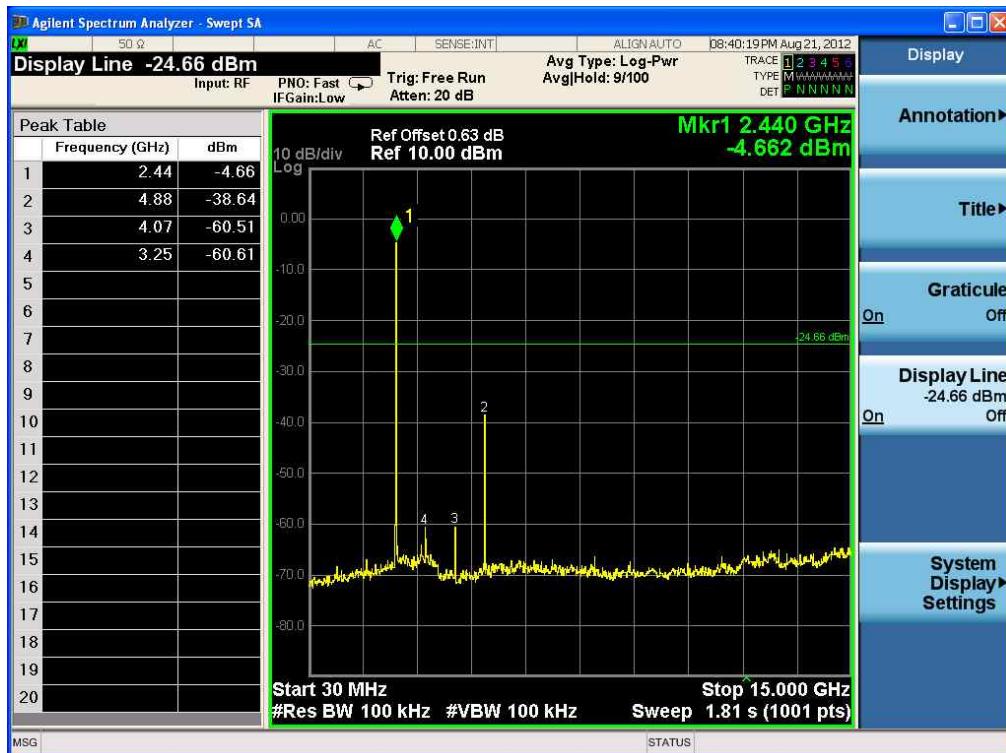
**Band – edge (at 20 dB blow) – High channel  
Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic  
(Test mode : GFSK)**



**Band – edge (at 20 dB blow) – Low channel  
Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic  
(Test mode : 8-DPSK)**



**Band – edge (at 20 dB blow) – Mid channel  
Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic  
(Test mode : 8-DPSK)**



**Band – edge (at 20 dB blow) – High channel  
Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic  
(Test mode : 8-DPSK)**





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## 2.1.7 Field Strength of Emissions

### Test Location

- 10 m SAC (test distance :  10 m,  3 m)
- 3 m SAC (test distance : 3 m)

### Test Procedures

- 1) In the frequency range of 9 kHz to 30 MHz, magnetic field is measured with Loop Antenna. The Test Antenna is positioned with its plane vertical at 1m distance from the EUT. The center of the Loop Test Antenna is 1m above the ground. During the measurement the Loop Test Antenna rotates about its vertical axis for maximum response at each azimuth about the EUT.
- 2) In the frequency range above 30 MHz, Bi-Log Test Antenna(30 MHz to 1 GHz) and Horn Test Antenna(above 1 GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is carried from 1m to 4m above the ground to determine the maximum value of the field strength. The emissions levels at both horizontal and vertical polarizations should be tested.

The spectrum analyzer is set to:

Frequency Range = 9 kHz ~ 25 GHz (2.4 GHz 10<sup>th</sup> harmonic)

RBW = 1 MHz for f ≥ 1 GHz, 100 kHz for f < 1 GHz, 9 kHz for f < 30 MHz

VBW ≥ RBW

Sweep = auto

### Limit

#### - 15.209(a)

Frequency(MHz)	Field Strength uV/m@3m	Field Strength dBuV/m@3m
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100**	40
88-216	150**	43.5
216-960	200**	46
Above 960	500	54

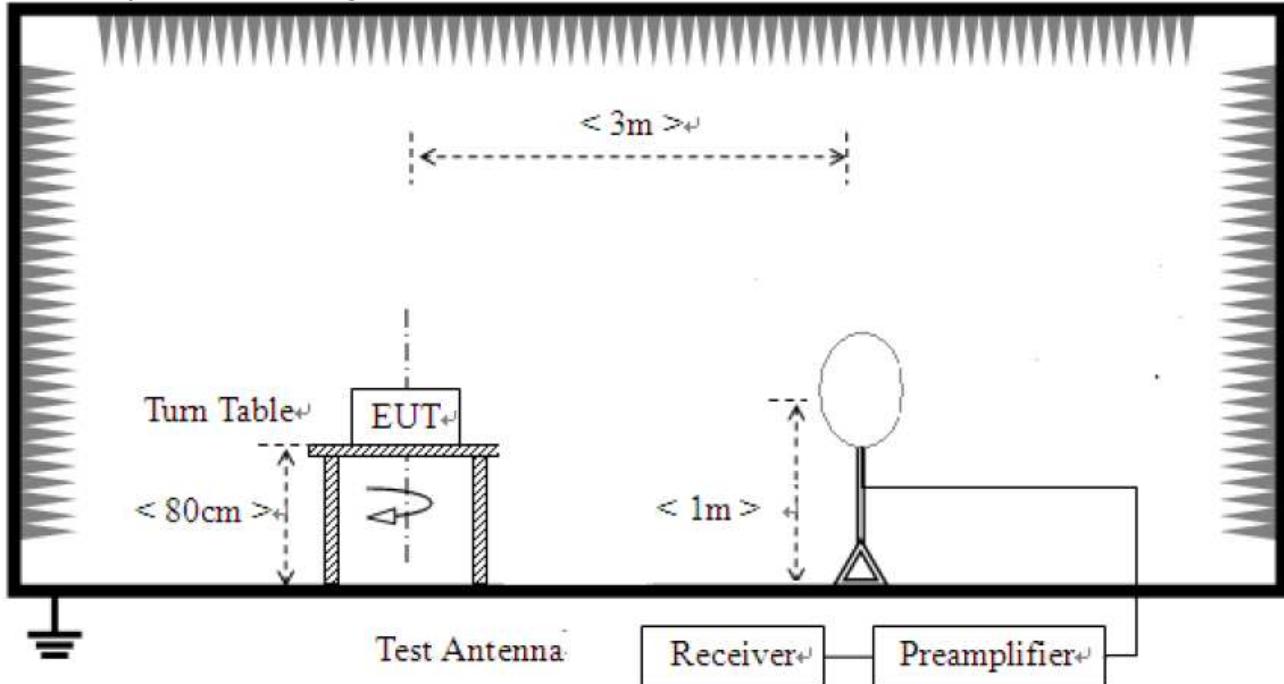
\*\* Except as provided in 15.209(g).fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72MHz, 76-88MHz, 174-216MHz, 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g.15.231 and 15.241.

Note :

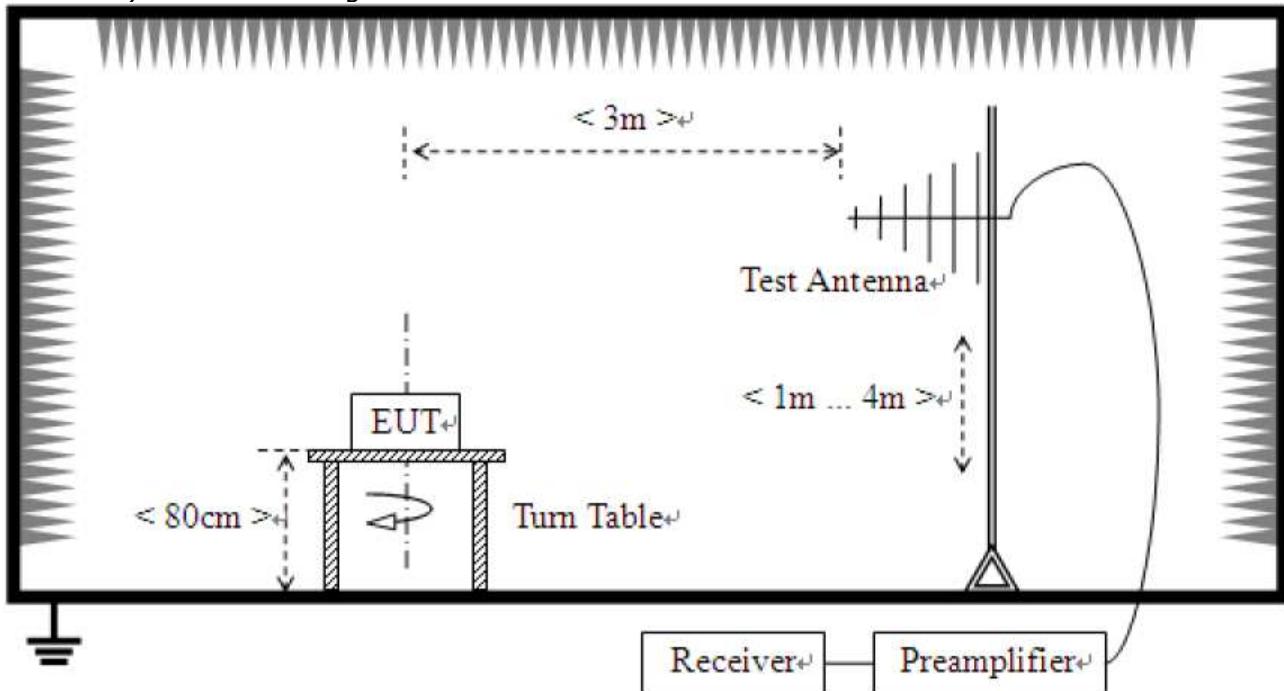
- 1) For above 1 GHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.
- 2) For above 1 GHz, limit field strength of harmonics : 54 dBuV/m@3m (AV) and 74 dBuV/m@3m (PK)

### Test Setup:

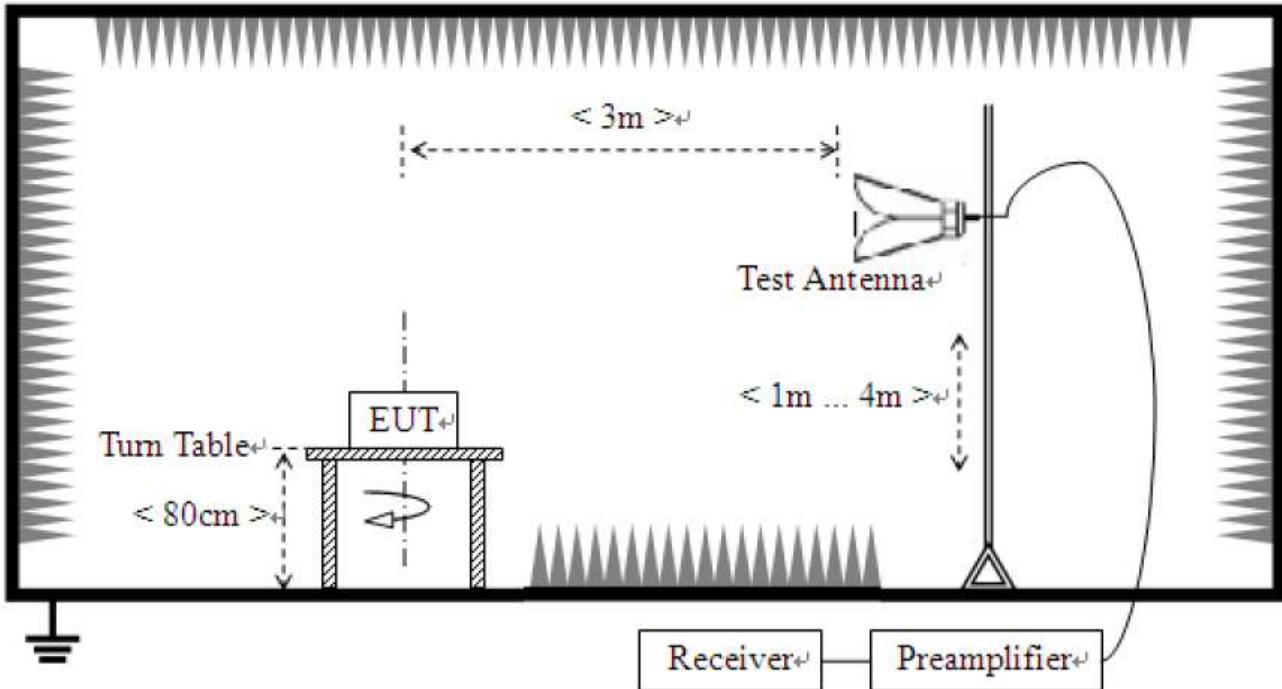
- 1) For field strength of emissions from 9 kHz to 30 MHz



- 2) For field strength of emissions from 30 MHz to 1 GHz



### 3) For field strength of emissions above 1 GHz



#### Test Results

##### 1) 9 kHz to 30 MHz

EUT	Mobile Printer	Measurement Detail	
Model	SPP-R300	Frequency Range	9 kHz – 30 MHz
Test mode	GFSK (Worst case)	Detector function	Quasi-Peak

The requirements are:

Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
-	-	-	See note

#### Note :

The amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

Distance extrapolation factor =  $40 \log (\text{specific distance} / \text{test distance})$  (dB)



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## 2) 30 MHz to 1 GHz

**Test mode : Hopping(GFSK), CFG PKT Packet Type : 15 Packet Size : 339(DH5)**

EUT	Mobile Printer	Measurement Detail	
Model	SPP-R300	Frequency Range	Below 1000MHz
Test mode	GFSK (Worst case)	Detector function	Quasi-Peak

The requirements are:

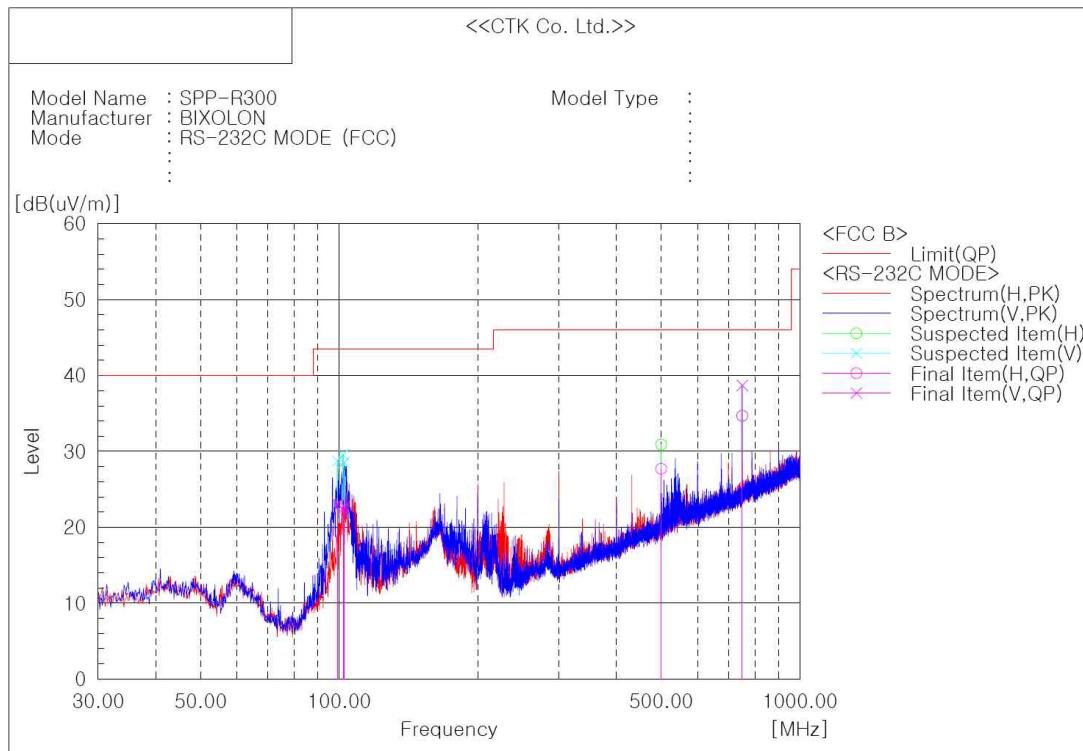
Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
750.104	38.7	7.3	Quasi-Peak

### Test Data

#### Remark :

1. The field strength of spurious emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in stand-up position(Z axis) and the worst case was recorded.



#### Final Result

No.	Frequency (P) [MHz]	Reading QP [dB(uV)]	c.f. [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]
1	99.234	V 36.8	-13.7	23.1	43.5	20.4	100.0	253.0
2	102.023	V 35.9	-13.6	22.3	43.5	21.2	100.0	253.0
3	102.629	V 36.3	-13.6	22.7	43.5	20.8	100.0	253.0
4	499.965	H 32.5	-4.8	27.7	46.0	18.3	207.0	66.0
5	750.104	V 37.9	0.8	38.7	46.0	7.3	100.0	0.0
6	750.104	H 33.9	0.8	34.7	46.0	11.3	207.0	178.0



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### 3) above 1 GHz

**Test mode : GFSK, CFG PKT Packet Type : 15 Packet Size : 339(DH5)**

EUT	Mobile Printer	Measurement Detail	
Model	SPP-R300	Frequency Range	1-25GHz
Channel	Channel 0	Detector function	Peak
Test Mode	GFSK		

#### Remarks

We have tested three mode (X, Y, Z). The worst mode (X axis) for final test.

The requirements are:

Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
4804.00	46.1 / 65.0	7.9 / 9.0	Average / Peak

#### Test Data

Frequency [MHz]	Reading [dBuV/m] AV / Peak	Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak	Result [dBuV/m] AV / Peak	Margin [dB] AV / Peak
				Antenna	Amp. Gain	Cable			
4804.00	36.9 : 55.8	V	1.0	32.7	34.9	11.4	54.0 : 74.0	46.1 : 65.0	7.9 : 9.0

#### Restricted band edge test data

Measured frequency range : 2310-2390 MHz, 2483.5-2500 MHz

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									



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**Test mode : GFSK, CFG PKT Packet Type : 15 Packet Size : 339(DH5)**

EUT	Mobile Printer	Measurement Detail	
Model	SPP-R300	Frequency Range	1-25GHz
Channel	Channel 39	Detector function	Peak
Test Mode	GFSK		

**Remarks**

We have tested three mode (X, Y, Z). The worst mode (X axis) for final test.

The requirements are:

Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
4882.00	42.0 / 60.4	12.0 / 13.6	Average / Peak

**Test Data**

Frequency [MHz]	Reading [dBuV/m] AV / Peak	Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak	Result [dBuV/m] AV / Peak	Margin [dB] AV / Peak
				Antenna	Amp. Gain	Cable			
4882.00	32.8 : 51.2	V	1.0	32.7	34.9	11.4	54.0 : 74.0	42.0 : 60.4	12.0 : 13.6

**Restricted band edge test data**

Measured frequency range : 2310-2390 MHz, 2483.5-2500 MHz

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									



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**Test mode : GFSK, CFG PKT Packet Type : 15 Packet Size : 339(DH5)**

EUT	Mobile Printer	Measurement Detail	
Model	SPP-R300	Frequency Range	1-25GHz
Channel	Channel 78	Detector function	Peak
Test Mode	GFSK		

**Remarks**

We have tested three mode (X, Y, Z). The worst mode (X axis) for final test.

The requirements are:

Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
4960	40.9 / 59.0	13.1 / 15.0	Average / Peak

**Test Data**

Frequency [MHz]	Reading [dBuV/m] AV / Peak	Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak	Result [dBuV/m] AV / Peak	Margin [dB] AV / Peak
				Antenna	Amp. Gain	Cable			
4960.00	31.7 : 49.8	V	1.0	32.7	34.9	11.4	54.0 : 74.0	40.9 : 59.0	13.1 : 15.0

**Restricted band edge test data**

Measured frequency range : 2310-2390 MHz, 2483.5-2500 MHz

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									



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**Test mode : 8-DPSK, CFG PKT Packet Type : 31, Packet Size : 1021(3DH5)**

EUT	Mobile Printer	Measurement Detail	
Model	SPP-R300	Frequency Range	1-25GHz
Channel	Channel 0	Detector function	Peak
Test Mode	8-DPSK		

**Remarks**

We have tested three mode (X, Y, Z). The worst mode (X axis) for final test.

The requirements are:

Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
4804.00	42.2 / 60.9	11.8 / 13.1	Average / Peak

**Test Data**

Frequency [MHz]	Reading [dBuV/m] AV / Peak	Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak	Result [dBuV/m] AV / Peak	Margin [dB] AV / Peak
				Antenna	Amp. Gain	Cable			
4804.00	33.0 : 51.7	V	1.0	32.7	34.9	11.4	54.0 : 74.0	42.2 : 60.9	11.8 : 13.1

**Restricted band edge test data**

Measured frequency range : 2310-2390 MHz, 2483.5-2500 MHz

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									



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**Test mode : 8-DPSK, CFG PKT Packet Type : 31, Packet Size : 1021(3DH5)**

EUT	Mobile Printer	Measurement Detail	
Model	SPP-R300	Frequency Range	1-25GHz
Channel	Channel 39	Detector function	Peak
Test Mode	8-DPSK		

**Remarks**

We have tested three mode (X, Y, Z). The worst mode (X axis) for final test.

The requirements are:

Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
4882.00	37.9 / 56.0	16.1 / 18.0	Average / Peak

**Test Data**

Frequency [MHz]	Reading [dBuV/m] AV / Peak	Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak	Result [dBuV/m] AV / Peak	Margin [dB] AV / Peak
				Antenna	Amp. Gain	Cable			
4882.00	28.7 : 46.8	V	1.0	32.7	34.9	11.4	54.0 : 74.0	37.9 : 56.0	16.1 : 18.0

**Restricted band edge test data**

Measured frequency range : 2310-2390 MHz, 2483.5-2500 MHz

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									



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**Test mode : 8-DPSK, CFG PKT Packet Type : 31, Packet Size : 1021(3DH5)**

EUT	Mobile Printer	Measurement Detail	
Model	SPP-R300	Frequency Range	1-25GHz
Channel	Channel 78	Detector function	Peak
Test Mode	8-DPSK		

**Remarks**

We have tested three mode (X, Y, Z). The worst mode (X axis) for final test.

The requirements are:

Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
4960	34.3 / 50.8	19.7 / 23.3	Average / Peak

**Test Data**

Frequency [MHz]	Reading [dBuV/m] AV / Peak	Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak	Result [dBuV/m] AV / Peak	Margin [dB] AV / Peak
				Antenna	Amp. Gain	Cable			
4960.00	25.1 / 41.6	V	1.0	32.7	34.9	11.4	54.0 / 74.0	34.3 / 50.8	19.7 / 23.2

**Restricted band edge test data**

Measured frequency range : 2310-2390 MHz, 2483.5-2500 MHz

Frequency [MHz]	Reading [dBuV/m] AV / Peak	Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak	Result [dBuV/m] AV / Peak	Margin [dB] AV / Peak
				Antenna	Amp. Gain	Cable			
2483.50	28.2 / 43.6	V	1.0	28.2	35.3	7.4	54.0 / 74.0	28.5 / 43.9	25.6 / 30.1



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## 2.1.8 AC Conducted Emissions

### Test Location

Shielded Room

### Frequency Range of Measurement

150 kHz to 30 MHz

### Instrument Settings

IF Band Width: 9 kHz

### Test Procedures

The EUT was placed on a non-metallic table 0.8m above the metallic, grounded floor and 0.4m from the reference ground plane wall. The distance to other metallic surfaces was at least 0.8m.

Amplitude measurements were performed with a quasi-peak detector and an average detector.

### Limit

#### - 15.207(a)

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56*	56 to 46*
0.5 ~ 5	56	46
5 ~ 30	60	50

\* Decreases with the logarithm of the frequency.

### Test Results

The requirements are:

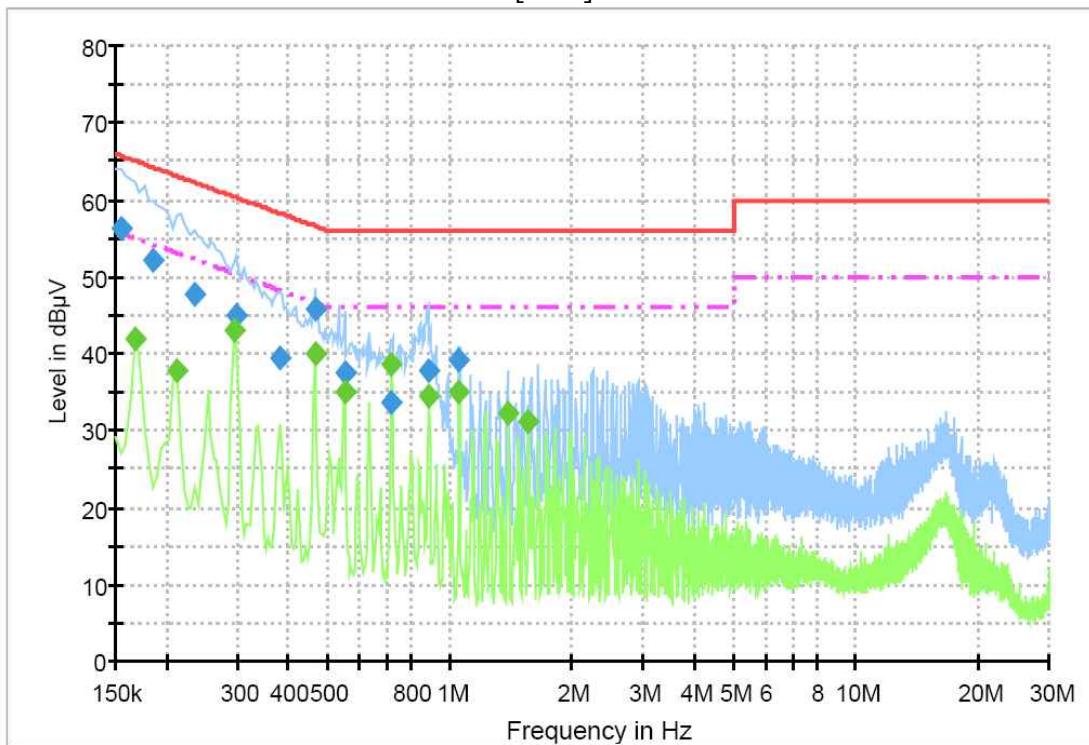
Complies

**Test mode : Hopping(GFSK), CFG PKT Packet Type : 15,  
Packet Size : 339(DH5), Hopping mode**

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
0.888	39.6	6.4	Average

## Test Data

[HOT]



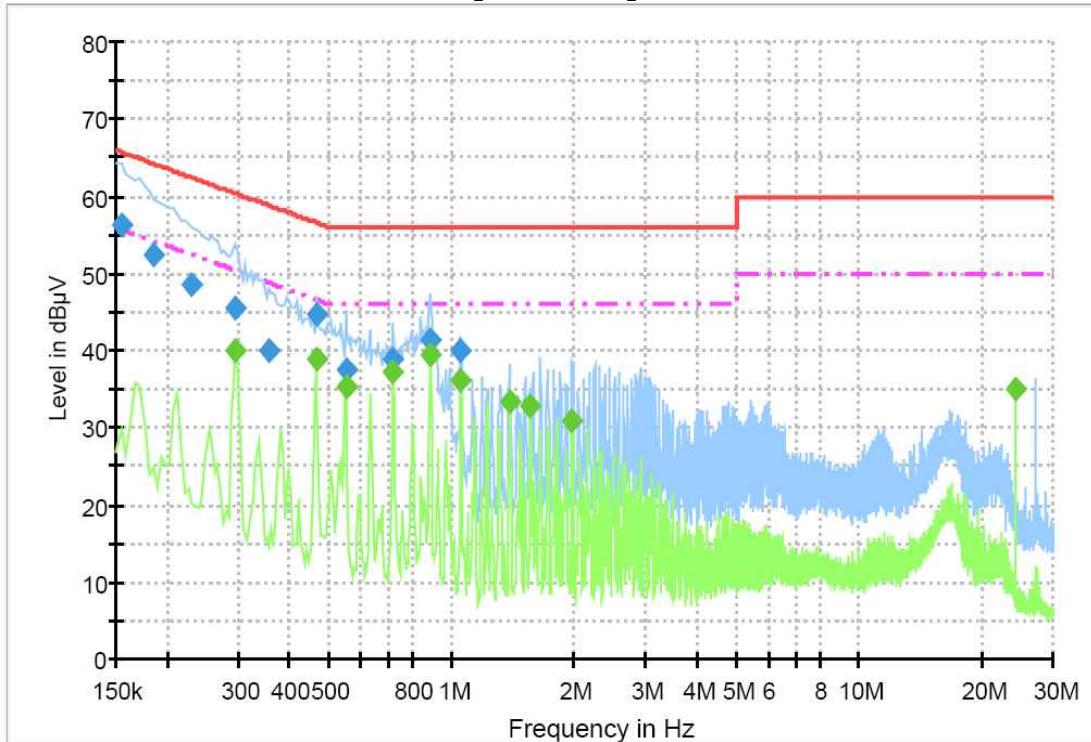
## Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.154500	56.2	1000.0	9.000	On	L1	10.1	9.6	65.8
0.186000	52.2	1000.0	9.000	On	L1	10.0	12.0	64.2
0.235500	47.8	1000.0	9.000	On	L1	10.1	14.4	62.3
0.298500	44.9	1000.0	9.000	On	L1	10.1	15.4	60.3
0.379500	39.5	1000.0	9.000	On	L1	10.0	18.8	58.3
0.465000	45.8	1000.0	9.000	On	L1	10.0	10.8	56.6
0.550500	37.5	1000.0	9.000	On	L1	10.0	18.5	56.0
0.712500	33.6	1000.0	9.000	On	L1	10.1	22.4	56.0
0.883500	37.7	1000.0	9.000	On	L1	10.0	18.3	56.0
1.054500	39.1	1000.0	9.000	On	L1	10.0	16.9	56.0

## Final Result 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.168000	42.0	1000.0	9.000	On	L1	9.9	13.0	55.1
0.213000	37.8	1000.0	9.000	On	L1	10.1	15.3	53.1
0.294000	43.0	1000.0	9.000	On	L1	10.1	7.4	50.4
0.465000	39.9	1000.0	9.000	On	L1	10.0	6.7	46.6
0.550500	35.0	1000.0	9.000	On	L1	10.0	11.0	46.0
0.717000	38.6	1000.0	9.000	On	L1	10.1	7.4	46.0
0.888000	34.5	1000.0	9.000	On	L1	10.0	11.5	46.0
1.054500	35.1	1000.0	9.000	On	L1	10.0	11.0	46.0
1.392000	32.2	1000.0	9.000	On	L1	10.0	13.8	46.0
1.563000	31.2	1000.0	9.000	On	L1	9.9	14.8	46.0

**[NEUTRAL]**



**Final Result 1**

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.154500	56.4	1000.0	9.000	On	N	10.1	9.4	65.8
0.186000	52.4	1000.0	9.000	On	N	10.1	11.9	64.2
0.231000	48.5	1000.0	9.000	On	N	10.2	14.0	62.4
0.294000	45.4	1000.0	9.000	On	N	10.1	15.0	60.4
0.357000	40.1	1000.0	9.000	On	N	10.0	18.7	58.8
0.465000	44.6	1000.0	9.000	On	N	9.9	12.0	56.6
0.550500	37.5	1000.0	9.000	On	N	10.0	18.5	56.0
0.717000	38.8	1000.0	9.000	On	N	10.1	17.2	56.0
0.883500	41.4	1000.0	9.000	On	N	10.0	14.6	56.0
1.054500	39.9	1000.0	9.000	On	N	10.0	16.1	56.0

**Final Result 2**

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.294000	39.9	1000.0	9.000	On	N	10.1	10.5	50.4
0.465000	38.9	1000.0	9.000	On	N	9.9	7.7	46.6
0.550500	35.2	1000.0	9.000	On	N	10.0	10.8	46.0
0.717000	37.3	1000.0	9.000	On	N	10.1	8.7	46.0
0.888000	39.6	1000.0	9.000	On	N	10.0	6.4	46.0
1.054500	36.2	1000.0	9.000	On	N	10.0	9.8	46.0
1.392000	33.3	1000.0	9.000	On	N	10.0	12.7	46.0
1.563000	32.9	1000.0	9.000	On	N	9.9	13.1	46.0
1.981500	30.9	1000.0	9.000	On	N	9.9	15.1	46.0
24.148500	34.9	1000.0	9.000	On	N	10.1	15.1	50.0



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## APPENDIX A – Test Equipment Used For Tests

	Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
1	Signal Analyzer	Agilent	N9020A	MY48011598	2012-11-10
2	Spectrum Analyzer	Rohde & Schwarz	FSP-30	100994	2012-11-10
3	ULTRA Broadband Antenna	Rohde & Schwarz	HL562	100203	2013-07-05
4	LOOP ANTENNA	EMCO	6502	9107-2652	2012-10-29
5	Attenuator	HP	8494A	3308A33351	2012-11-14
6	EPM Series Power Meter	HP	E4418A	GB38272734	2012-11-10
7	Power Sensor	HP	8487A	3318A03524	2013-07-10
8	Audio Analyzer	HP	8903B	2747A03432	2012-11-10
9	ESG-D Series Signal Generator	Agilent	E4432B	US40054094	2012-11-21
10	SYNTHESIZED SWEEPER	HP	8341B	2819A01563	2012-11-10
11	Modulation Analyzer	HP	8901B	3438A05228	2012-11-18
12	Attenuator	BIRD	1000-WA-MFN-30	236	2012-11-14
13	Temp&Humi Chamber	Kunpoong	JT-TH-556-1	9QE5-002	2013-01-12
14	DC POWER SUPPLY	Agilent	E3632A	MY40011638	2012-11-10
15	EMC Analyzer	Agilent	E7405A	MY45110859	2013-02-13
16	Horn Antenna	ETS-Lindgren	3115	00078894	2013-03-22
17	Horn Antenna	ETS-Lindgren	3115	00078895	2013-03-22
18	OPT H64 AMPLIFIER	HP	8447F	3113A06814	2013-03-27
19	PREAMPLIFIER	Agilent	8449B	3008A02307	2012-11-17
20	Radio Communication Tester	Rohde & Schwarz	CMU200	106765	2013-02-09
21	LISN	Rohde & Schwarz	ESH3-Z5	101235	2013-08-06
22	LISN	Rohde & Schwarz	ENV216	101236	2013-08-06
23	DC POWER SUPPLY	Agilent	E3632A	MY40011638	2012-11-10
24	EMI Test Receiver	Rohde & Schwarz	ESCI3	100032	2013-02-09
25	EMI Test Receiver	Rohde & Schwarz	ESCI7	100814	2012-12-13
26	AMPLIFIER	Sonoma Instrument Co.	310	291721	2013-03-27
27	Active Loop Antenna	SCHWARZBECK	FMZB 1513	1513-125	2014-06-06
28	Horn Antenna	ETS-Lindgren	3116	00062504	2013-03-22