



中国认可
国际互认
检测
TESTING
CNAS L2264

RF TEST REPORT

Applicant ZTE Corporation
FCC ID SRQ-ZTEB2017G
Product LTE/WCDMA/CDMA/GSM(GPRS)
Mutil-Mode Digital Mobile Phone
Brand ZTE
Model ZTE B2017G
Report No. RXA1607-0132RF04R1
Issue Date September 8, 2016

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 15C (2016)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

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Summary of Measurement Results

Number	Summary of measurements of results	Clause in FCC rules	Verdict
1	Peak Power Output -Conducted	15.247(b)(1)	PASS
2	Occupied Bandwidth (20dB)	15.247(a)(1)	PASS
3	Frequency Separation	15.247(a)(1)	PASS
4	Time of Occupancy (Dwell Time)	15.247(a)(1)(iii)	PASS
5	Band Edge Compliance	15.247(d)	PASS
6	Spurious Radiated Emissions in the restricted band	15.247(d),15.205,15.209	PASS
7	Number of Hopping Frequency	15.247(a)(1)(iii)	PASS
8	Spurious RF Conducted Emissions	15.247(d)	PASS
9	Radiates Emission	15.247(d),15.205,15.209	PASS
10	AC Power Line Conducted Emission	15.207	PASS
Date of Testing: July 10, 2016~ August 12, 2016			

1 Test Laboratory

1.1 Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of TA technology (shanghai) co., Ltd. The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above. This report must not be used by the client to claim product certification, approval, or endorsement by CNAS or any government agencies.

1.2 Test facility

CNAS (accreditation number: L2264)

TA Technology (Shanghai) Co., Ltd. has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS).

FCC (recognition number is 428261)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

IC (recognition number is 8510A)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Canada to perform electromagnetic emission measurement.

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

1.3 Testing Location

Company: TA Technology (Shanghai) Co., Ltd.
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City: Shanghai
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2 General Description of Equipment under Test

Client Information

Applicant	ZTE Corporation
Applicant address	ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong,518057,P.R. China
Manufacturer	ZTE Corporation
Manufacturer address	ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong,518057,P.R. China

General information

EUT Description			
Model:	ZTE B2017G		
IMEI:	SIM1:860935030016782 SIM2:860935030018788		
HW Version:	uj3A		
SW Version:	ZTE B2017G_USAV1.0.0B01		
Power Supply:	Battery/AC adapter		
Antenna Type:	Internal Antenna		
Test Mode(s):	Basic Rate	Enhanced Data Rate(EDR)	
Modulation Type:	Frequency Hopping Spread Spectrum (FHSS)		
	GFSK	$\pi/4$ DQPSK	8DQPSK
Packet Type: (Maximum Payload)	DH5	2DH5	3DH5
Max. Conducted Power	8.65dBm		
Tested Frequency Range(s):	2400 ~ 2483.5 MHz		
EUT Accessory			
Battery 1	Manufacturer: SHENZHEN RUIDE ELECTRONIC INDUSTRIAL CO.,LTD Model: Li3927T44P8h726044 Power Rating: 3.85V/2705mAh		
Battery 2	Manufacturer: SCUD (Fujian) Electronics Co., Ltd. Model: Li3927T44P8h726044 Power Rating: 3.85V/2705mAh		
Earphone	Manufacturer: KINGSTATE ELECTRONICS CORP. Model: KJAG4020AWKCB-2		
Adapter	Manufacturer: Salcomp (Shenzhen) Co., Ltd Model: STC-A5915A-Z Input power: 100-240Vac, 50/60Hz, 0.45A		



	Output power: 5.0V, 1.5A/9.0V, 1.5A
Phone cover	Manufacturer: Shenzhen senyuanxiang Technology Co. Ltd. Model: senyuanxiang
Note: 1. The information of the EUT is declared by the manufacturer. Please refer to the specifications or user manual for details.	



2.1 Applied Standards

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standards

- **FCC CFR47 Part 15C (2016) Radio Frequency Devices**
- **ANSI C63.10 (2013)**
- **DA00-705 Filing and Frequency Measurement Guidelines For Frequency Hopping Spread Spectrum System (2000).**

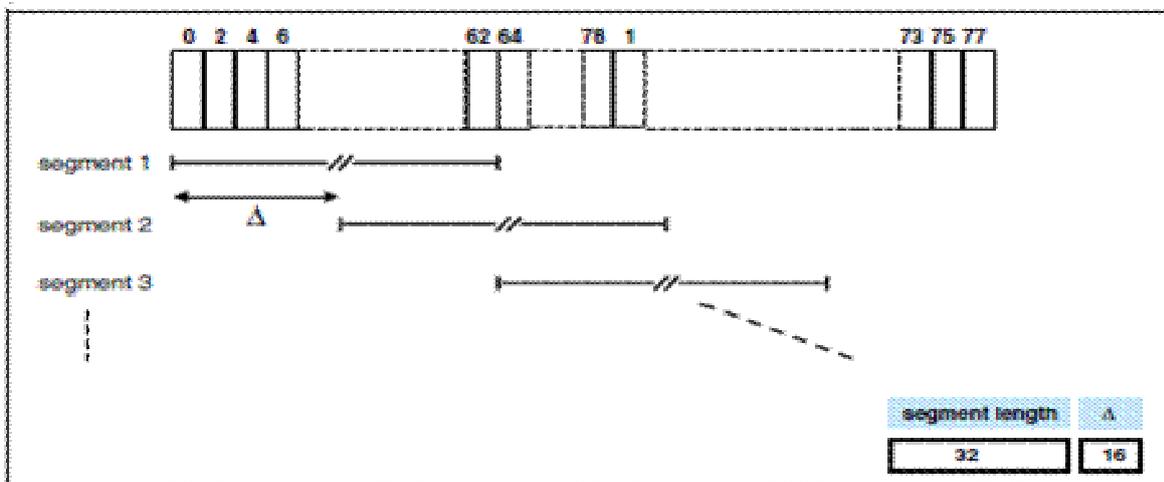
3 Information about the FHSS characteristics

3.1 Pseudorandom Frequency Hopping Sequence

Frequency Hopping Systems. A spread spectrum system in which the carrier is modulated with the coded information in a conventional manner causing a conventional spreading of the RF energy about the frequency carrier. The frequency of the carrier is not fixed but changes at fixed intervals under the direction of a coded sequence. The wide RF bandwidth needed by such a system is not required by spreading of the RF energy about the carrier but rather to accommodate the range of frequencies to which the carrier frequency can hop. The test of a frequency hopping system is that the near term distribution of hops appears random, the long term distribution appears evenly distributed over the hop set, and sequential hops are randomly distributed in both direction and magnitude of change in the hop set.

The selection scheme chooses a segment of 32 hop frequencies spanning about 64 MHz and visits these hops in a pseudo-random order. Next, a different 32-hop segment is chosen, etc. In the page, master page response, slave page response, page scan, inquiry, inquiry response and inquiry scan hopping sequences, the same 32-hop segment is used all the time (the segment is selected by the address; different devices will have different paging segments).

When the basic channel hopping sequence is selected, the output constitutes a pseudo-random sequence that slides through the 79 hops. The principle is depicted in the figure below.



Hop selection scheme in CONNECTION state.

Pseudorandom Frequency Hopping Sequence Table as below:

Channel: 08, 24, 40, 56, 40, 56, 72, 09, 01, 09, 33, 41, 33, 41, 65, 73, 53, 69, 06, 22, 04, 20, 36, 52, 38, 46, 70, 78, 68, 76, 21, 29, 10, 26, 42, 58, 44, 60, 76, 13, 03, 11, 35, 43, 37, 45, 69, 77, 55, 71, 08, 24, 08, 24, 40, 56, 40, 48, 72, 01, 72, 01, 25, 33, 12, 28, 44, 60, 42, 58, 74, 11, 05, 13, 37, 45, etc.

Each frequency used equally on the average by each transmitter.

The system receiver have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals.

3.2 Equal Hopping Frequency Use

All Bluetooth units participating in the Pico net are time and hop-synchronized to the channel. Each new transmission event begins on the next channel in the hopping sequence after the final channel used in the previous transmission event.

3.3 System Receiver Input Bandwidth

Each channel bandwidth is 1MHz. The system receivers have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals.

4 Test Information

4.1 Test Mode

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

The radiated 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.

Test Modes		
Band	Radiated Test Cases	Conducted Test Cases
BT	DH5 GFSK (Channel 0/39/78)	DH5 GFSK(Channel 0/39/78) 2DH5 $\pi/4$ -DQPSK(Channel 0/39/78) 3DH5 8DQPSK(Channel 0/39/78)

Note: The maximum RF output power levels are DH5 for GFSK modulation, For RSE and CSE, only the maximum RF output power is chosen.

4.2 Peak Power Output –Conducted

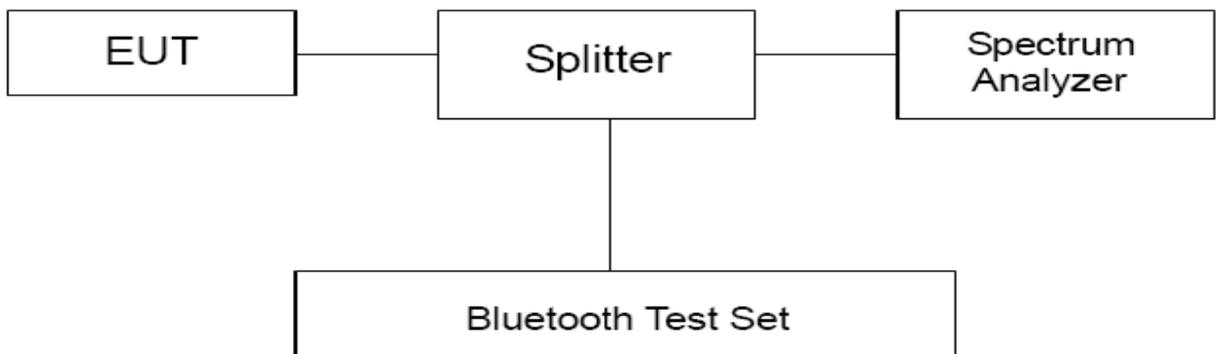
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

During the process of the testing, The EUT was connected to the spectrum analyzer and Bluetooth test set via a power splitter with a known loss. The EUT is controlled by the Bluetooth test set to ensure max power transmission with proper modulation. The peak detector is used. RBW is set to 2 MHz; VBW is set to 6 MHz. These measurements have been tested at following channels: 0, 39, and 78.

Test Setup



Limits

Rule Part 15.247 (b) (1) specifies that " For frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725–5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts."

Peak Output Power	≤ 0.125W (21dBm)
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Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U=0.44$ dB.

**Test Results**

Channel	Frequency (MHz)	Peak Output Power (dBm)			Conclusion
		DH5	2DH5	3DH5	
0	2402	7.39	7.20	7.05	PASS
39	2441	8.65	8.48	8.41	PASS
78	2480	7.58	7.58	7.27	PASS

Note: The measured power density (dBm) has the offset with cable loss already.

4.3 Occupied Bandwidth (20dB)

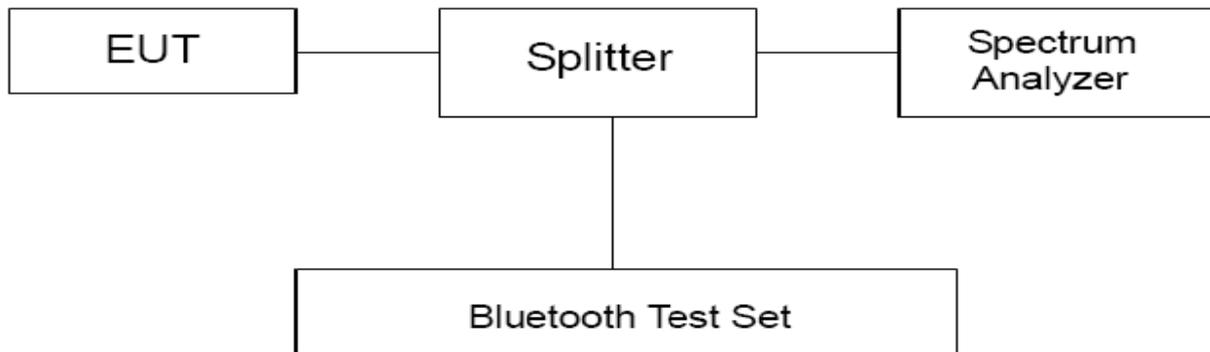
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to the spectrum analyzer and Bluetooth test set via a power splitter with a known loss. The occupied bandwidth is measured using spectrum analyzer. RBW is set to 30kHz and VBW is set to 100kHz on spectrum analyzer. -20dB occupied bandwidths are recorded.

Test Setup



Limits

No specific occupied bandwidth requirements in part 15.247(a) (1).

Measurement Uncertainty

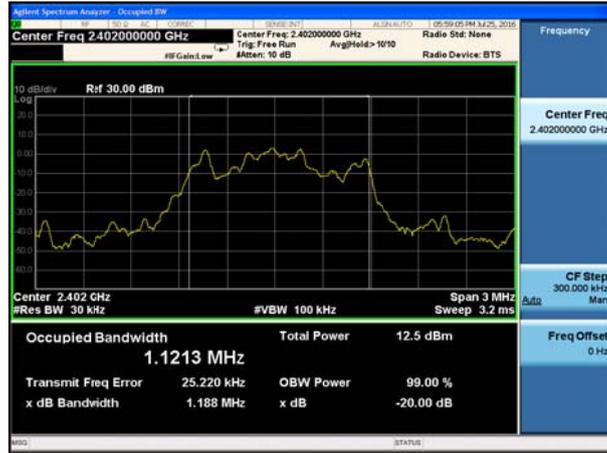
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U=936$ Hz.

**Test Results**

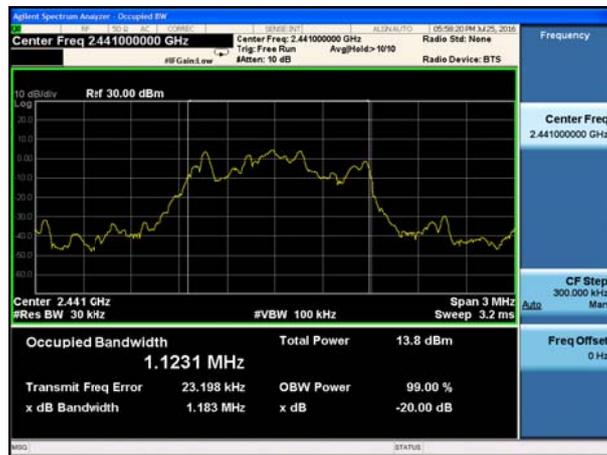
Mode	Channel	Frequency (MHz)	20dB Bandwidth(kHz)
DH5	0	2402	1046
DH5	39	2441	1048
DH5	78	2480	1049
2DH5	0	2402	1241
2DH5	39	2441	1243
2DH5	78	2480	1241
3DH5	0	2402	1188
3DH5	39	2441	1183
3DH5	78	2480	1191



BT 3DH5 CH0, Carrier frequency (MHz): 2402



BT 3DH5 CH39, Carrier frequency (MHz): 2441



BT 3DH5 CH78, Carrier frequency (MHz): 2480



4.4 Frequency Separation

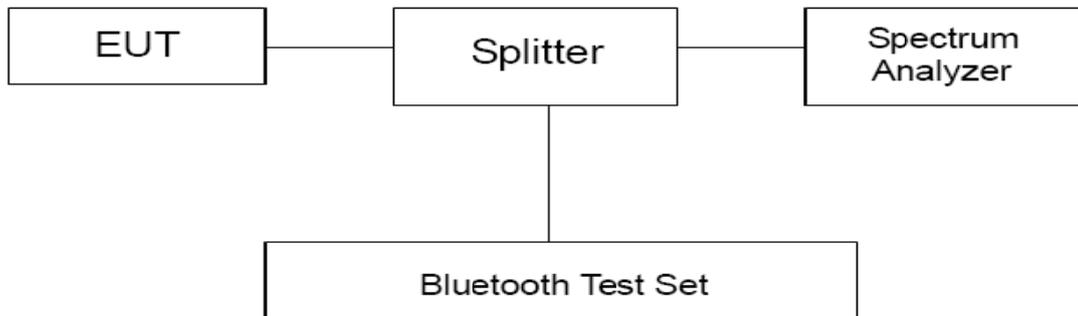
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to the spectrum analyzer and Bluetooth test set via a power splitter with a known loss. RBW is set to 30 kHz and VBW is set to 100 kHz on spectrum analyzer. Set EUT on Hopping on mode.

Test setup



Limits

Rule Part 15.247(a)(1) specifies that “Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. ”

Note: The value of two-thirds of 20 dB bandwidth is always greater than 25 kHz.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U=936$ Hz.

Test Results:

Packet type	Carrier frequency (MHz)	Carrier frequency separation(kHz)	20dB Bandwidth(kHz)	Limit (kHz)	Conclusion
DH5	2441	999	1048	698.67	PASS
2DH5	2441	999	1243	828.67	PASS
3DH5	2441	1002	1183	788.67	PASS

Note: The limit is two-thirds of 20 dB bandwidth.

BT DH5 CH39, Carrier frequency (MHz): 2441



BT 2DH5 CH39, Carrier frequency (MHz): 2441



BT 3DH5 CH39, Carrier frequency (MHz): 2441



4.5 Time of Occupancy (Dwell Time)

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

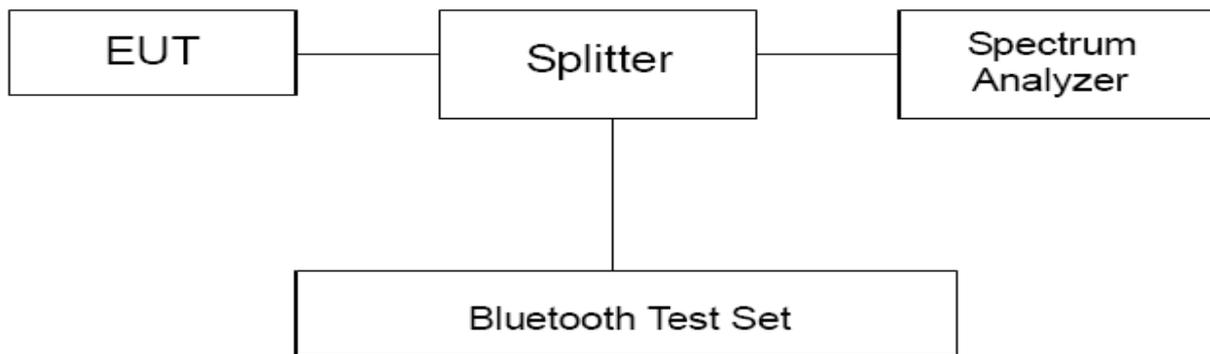
Methods of Measurement

The EUT was connected to the spectrum analyzer and Bluetooth test set via a power splitter with a known loss. RBW is set to 1MHz and VBW is set to 3MHz on spectrum analyzer .The time slot length is measured of three different packet types, which are available in the Bluetooth technology. Those are DH1, DH3 and DH5 packets. The dwell time is calculated by:

Dwell time = time slot length * hop rate * 0.4s with:

- hop rate=1600 * 1/s for DH1 packet =1600
- hop rate=1600/3 * 1/s for DH3 packet =533.33
- hop rate=1600/5 * 1/s for DH5 packet =320

Test Setup



Limits

Rule Part 22.913(a) specifies that " Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. 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."

Dwell time	≤ 400ms
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Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$.

Requirements	Uncertainty	
Dwell Time	DH1	$U=0.64\text{ms}$
	DH3	$U=0.80\text{ms}$
	DH5	$U=0.70\text{ms}$
	2DH1	$U=0.64\text{ms}$
	2DH3	$U=0.80\text{ms}$
	2DH5	$U=0.70\text{ms}$
	3DH1	$U=0.64\text{ms}$
	3DH3	$U=0.80\text{ms}$
	3DH5	$U=0.70\text{ms}$

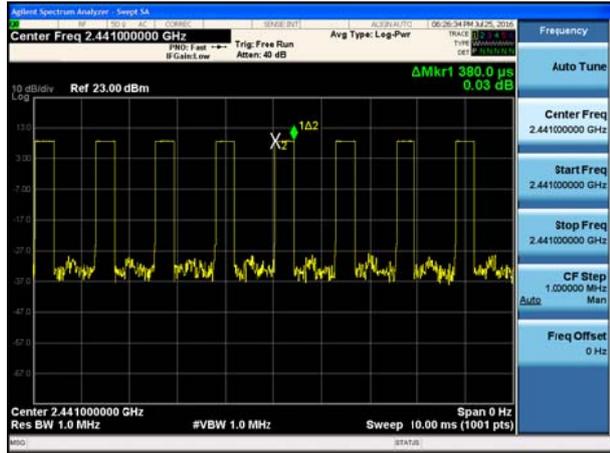
Test Results:

Channel 39					
Packet type	hop rate (1/s)	Time slot length(ms)	Dwell time (ms)	Limit (ms)	Conclusion
DH1	1600	0.38	243.20	400	PASS
DH3	533.33	1.64	349.86	400	PASS
DH5	320	2.88	368.64	400	PASS
2DH1	1600	0.38	243.20	400	PASS
2DH3	533.33	1.63	347.73	400	PASS
2DH5	320	2.88	368.64	400	PASS
3DH1	1600	0.39	249.60	400	PASS
3DH3	533.33	1.64	349.86	400	PASS
3DH5	320	2.89	369.92	400	PASS

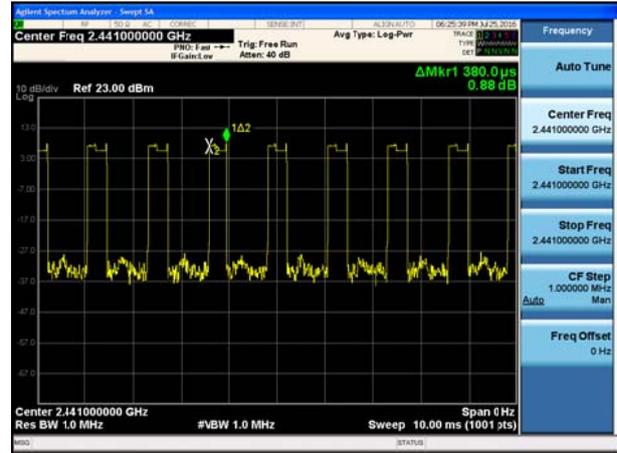
Note: Dwell time = time slot length * hop rate * 0.4s



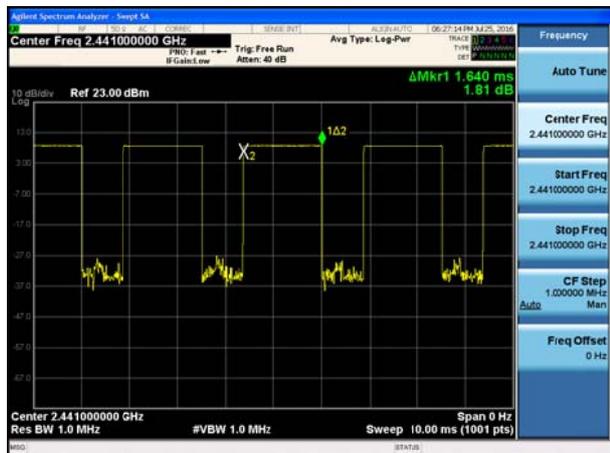
BT DH1 CH39, Carrier frequency (MHz): 2441



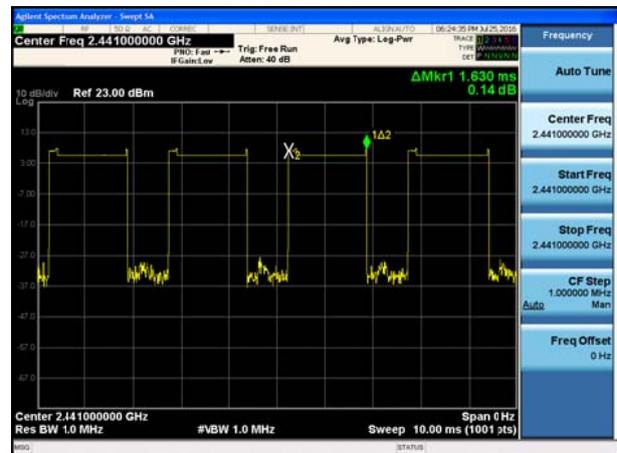
BT 2DH1 CH39, Carrier frequency (MHz): 2441



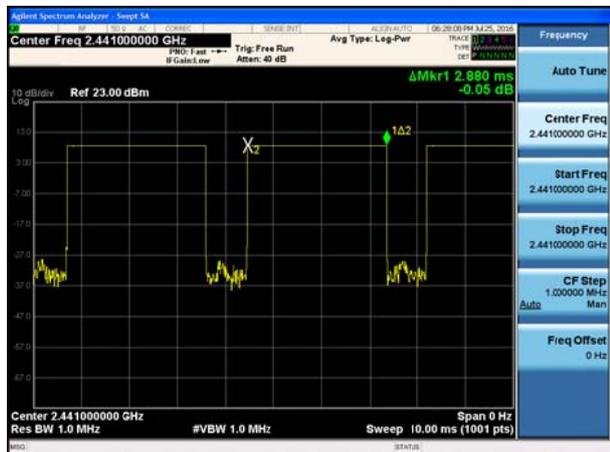
BT DH3 CH39, Carrier frequency (MHz): 2441



BT 2DH3 CH39, Carrier frequency (MHz): 2441



BT DH5 CH39, Carrier frequency (MHz): 2441

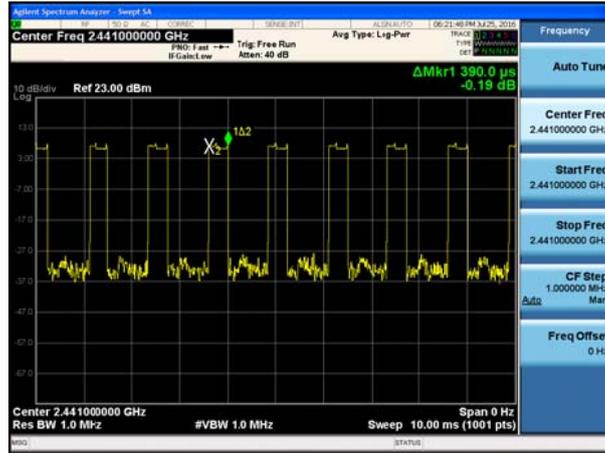


BT 2DH5 CH39, Carrier frequency (MHz): 2441

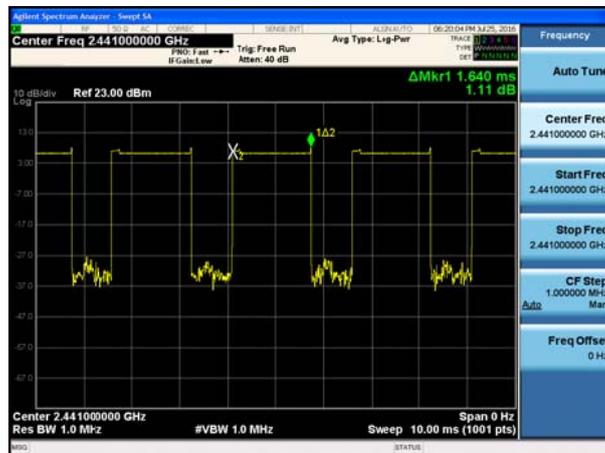




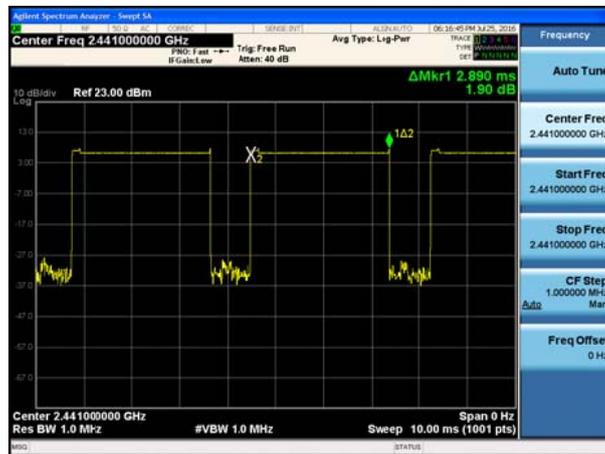
BT 3DH1 CH39, Carrier frequency (MHz): 2441



BT 3DH3 CH39, Carrier frequency (MHz): 2441



BT 3DH5 CH39, Carrier frequency (MHz): 2441



4.6 Band Edge Compliance

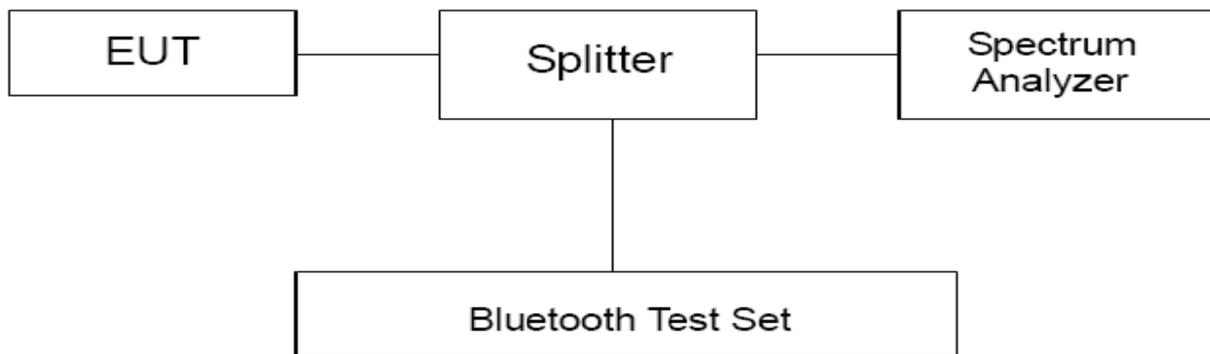
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to the spectrum analyzer and Bluetooth test set via a power splitter with a known loss. The lowest and highest channels were measured. The peak detector is used. RBW is set to 100 kHz and VBW is set to 300 kHz on spectrum analyzer. EUT test for Hopping On mode and Hopping Off mode.

Test Setup



Limits

Rule Part 15.247(d) specifies that “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.”

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

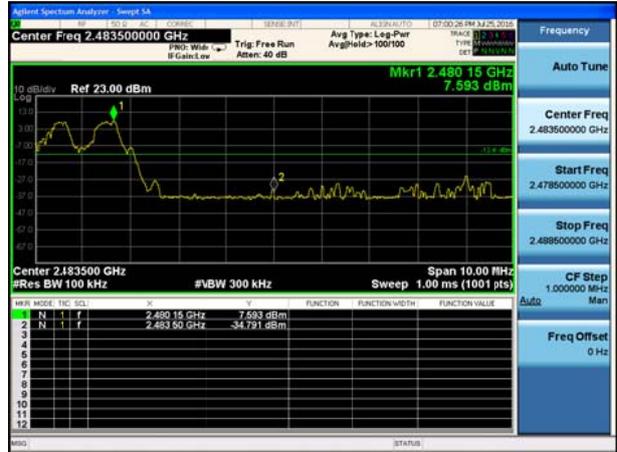
Frequency	Uncertainty
2GHz-3GHz	1.407 dB

Test Results
Hopping On

BT DH5 CH0, Carrier frequency (MHz): 2402



BT DH5 CH78, Carrier frequency (MHz): 2480



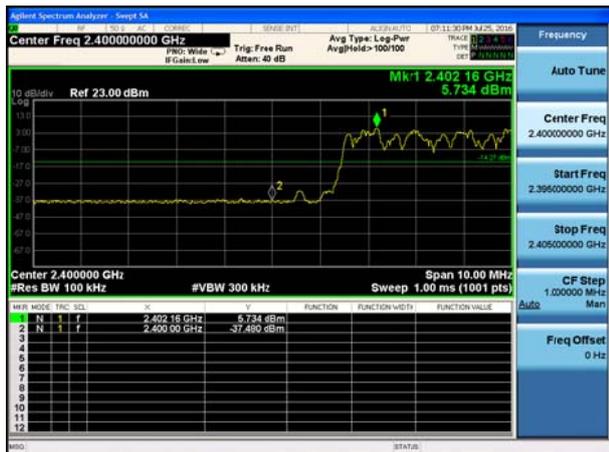
BT 2DH5 CH0, Carrier frequency (MHz): 2402



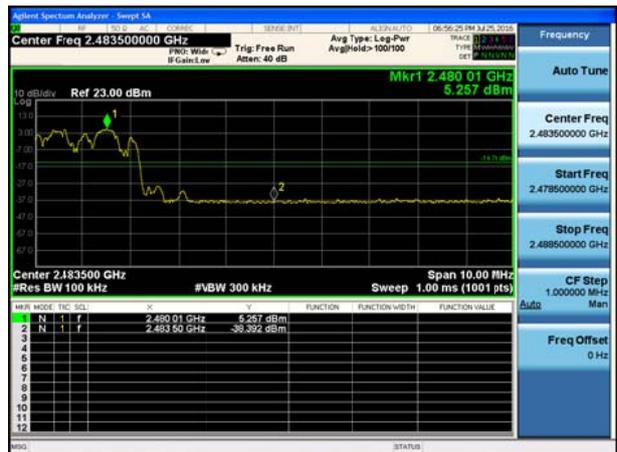
BT 2DH5 CH78, Carrier frequency (MHz): 2480



BT 3DH5 CH0, Carrier frequency (MHz): 2402



BT 3DH5 CH78, Carrier frequency (MHz): 2480



Hopping Off

BT DH5 CH0, Carrier frequency (MHz): 2402



BT DH5 CH78, Carrier frequency (MHz): 2480



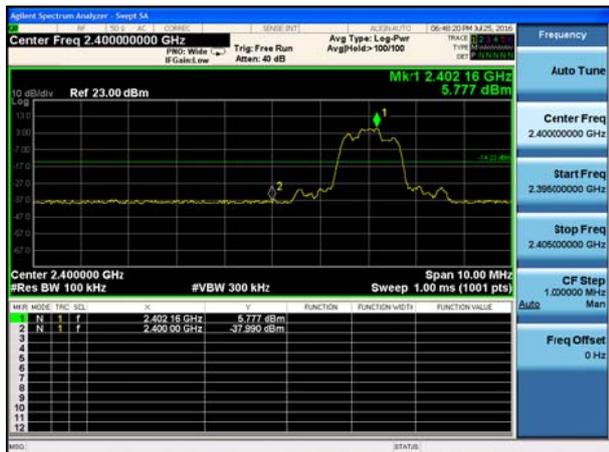
BT 2DH5 CH0, Carrier frequency (MHz): 2402



BT 2DH5 CH78, Carrier frequency (MHz): 2480



BT 3DH5 CH0, Carrier frequency (MHz): 2402



BT 3DH5 CH78, Carrier frequency (MHz): 2480



4.7 Spurious Radiated Emissions in the Restricted Band

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

The Equipment Under Test (EUT) was set up on a non-conductive table in the semi-anechoic chamber. The test was performed at the distance of 3 m between the EUT and the receiving antenna. The turntable shall be rotated from 0 to 360 degrees for detecting the maximum of radiated spurious signal level. The measurements shall be repeated with orthogonal polarization of the test antenna. The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing.

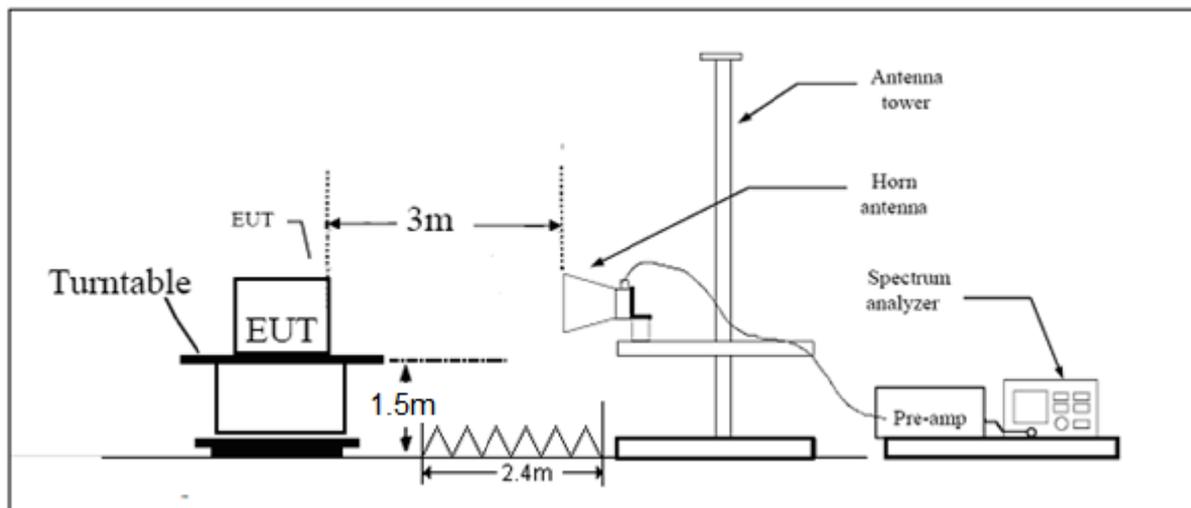
Set the spectrum analyzer in the following:

- (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
- (b) The dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a “duty cycle correction factor”, derived from $20\log(\text{dwell time}/100 \text{ ms})$, in an effort to demonstrate compliance with the 15.209 limit. If the emission is pulsed, modify the unit for continuous operation; use the settings shown above, then correct the reading by subtracting the peak- average correction factor, derived from the appropriate duty cycle calculation.

This setting method can refer to **DA00-705**.

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

Test setup



Note: Area side: 2.4mX3.6m

Limits

Spurious Radiated Emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)
13.36 - 13.41			

Limit in restricted band

Frequency of emission (MHz)	Field strength(uV/m)	Field strength(dBuV/m)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above960	500	54

§15.35(b)

There is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.

Peak Limit=74dBuV/m

Average Limit=54dBuV/m

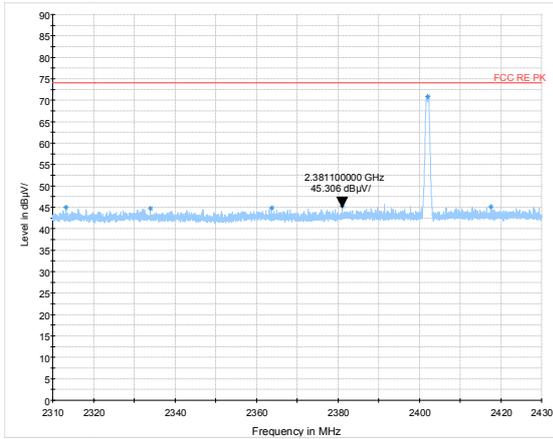
Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$, $U = 3.55$ dB.

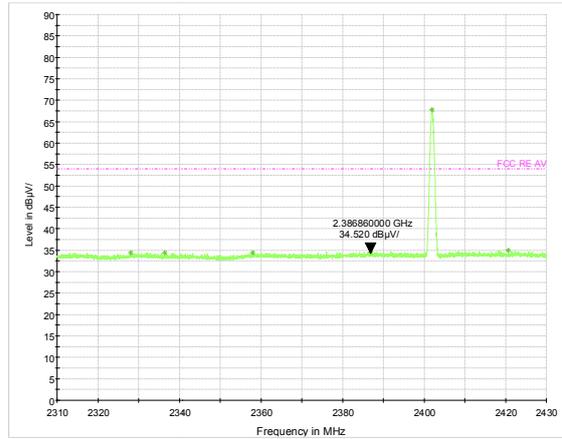


Test Results:

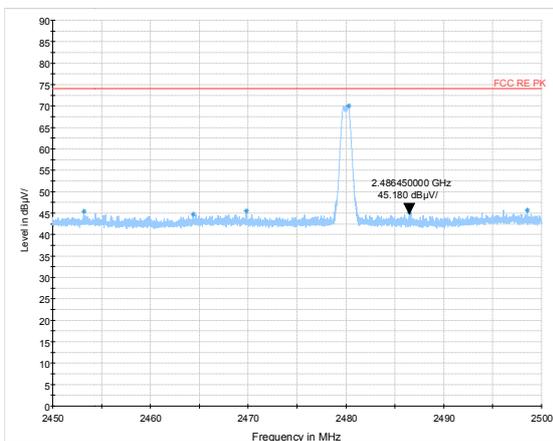
DH5-Channel 0: Peak



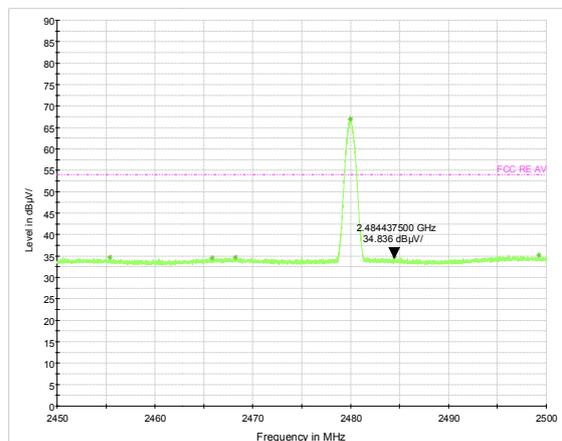
DH5-Channel 0: Average



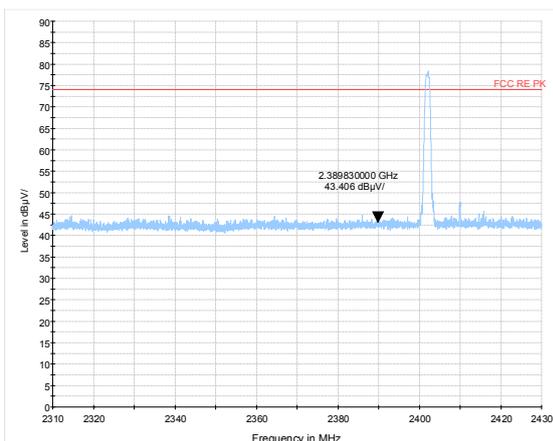
DH5-Channel 78: Peak



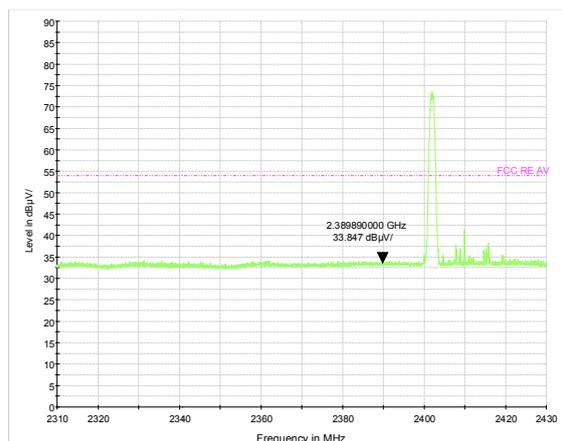
DH5-Channel 78: Average



3DH5-Channel 0: Peak

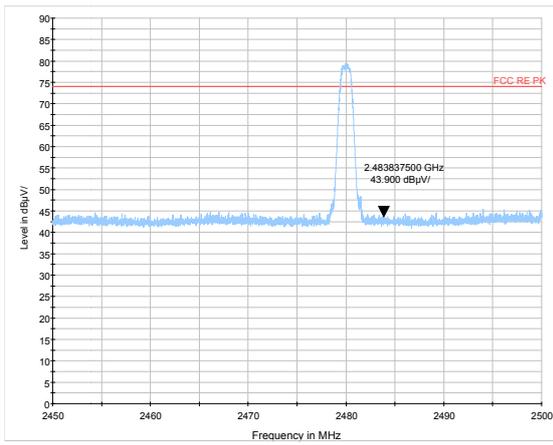


3DH5-Channel 0: Average

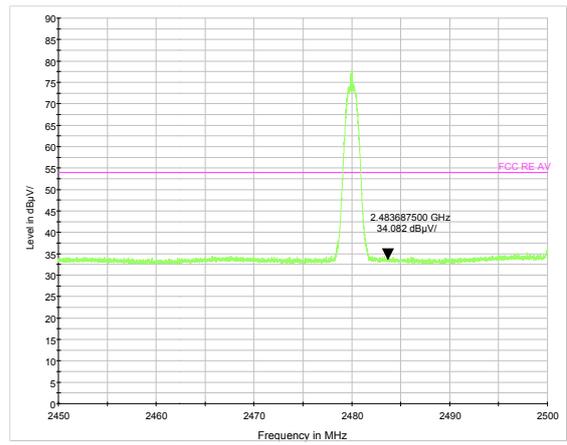




3DH5-Channel 78: Peak



3DH5-Channel 78: Average



4.8 Number of hopping Frequency

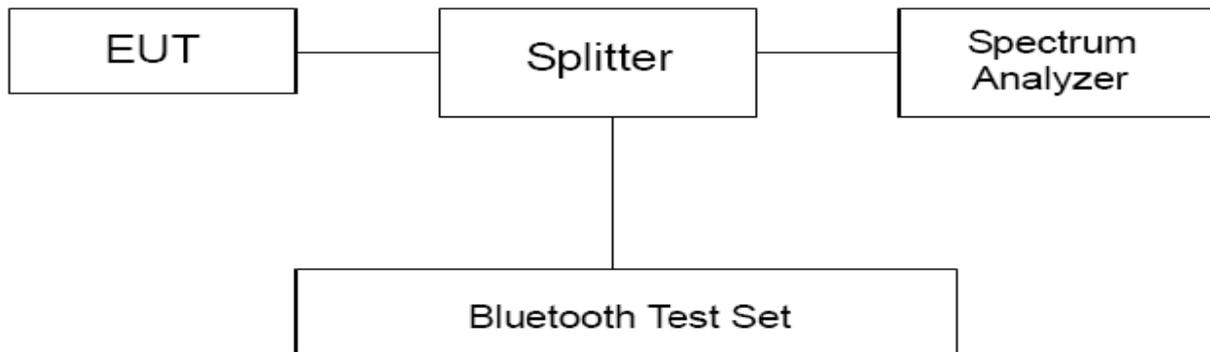
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to the spectrum analyzer and Bluetooth test set via a power splitter with a known loss. RBW is set to 1MHz and VBW is set to 1 MHz on spectrum analyzer. Set EUT on Hopping on mode.

Test setup



Limits

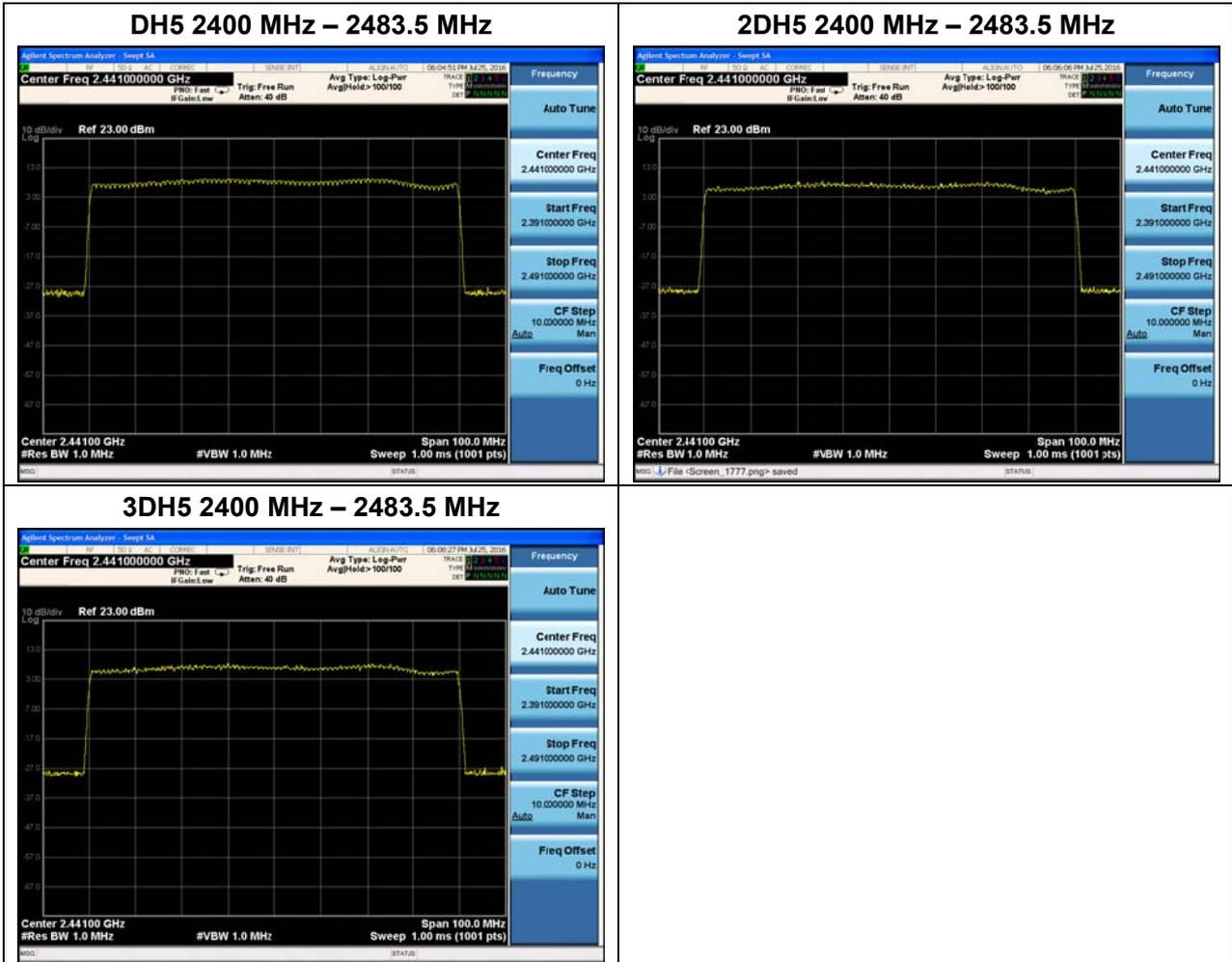
Rule Part 15.247(a) (1) (iii) specifies that” Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels.”

Limits	≥ 15 channels
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Test Results:

	Number of hopping channels	conclusion
DH5	79	PASS
2DH5	79	PASS
3DH5	79	PASS



4.9 Spurious RF Conducted Emissions

Ambient condition

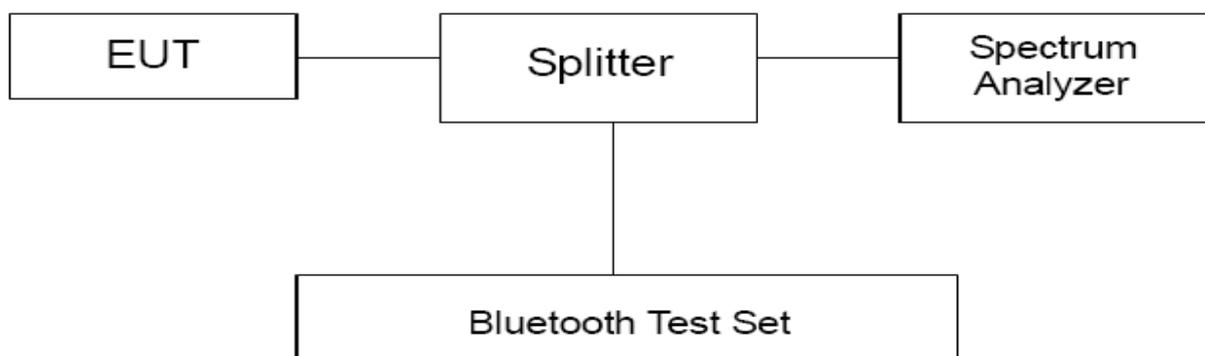
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to the spectrum analyzer and Bluetooth test set via a power splitter with a known loss. The spectrum analyzer scans from 30MHz to the 10th harmonic of the carrier. The peak detector is used. RBW and VBW are set to 100 kHz, Sweep is set to ATUO.

The test is in transmitting mode.

Test setup



Limits

Rule Part 15.247(d) pacifies that “In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.”

Mode	Carrier frequency (MHz)	Reference value (dBm)	Limit
DH5	2402	1.491	-18.509
	2441	6.156	-13.844
	2480	-0.265	-20.265
EDR (3DH5)	2402	6.144	-13.856
	2441	0.539	-19.461
	2480	1.664	-18.336



Measurement Uncertainty

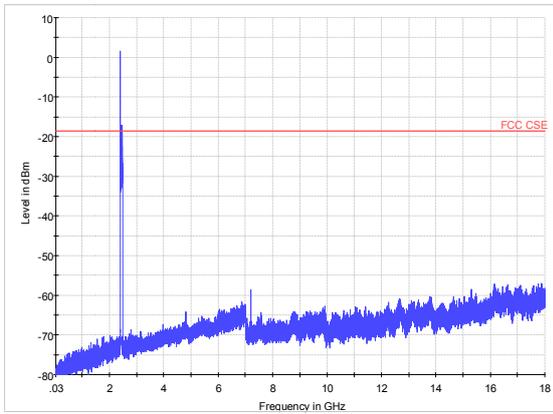
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

Frequency	Uncertainty
100kHz-2GHz	0.684 dB
2GHz-26GHz	1.407 dB

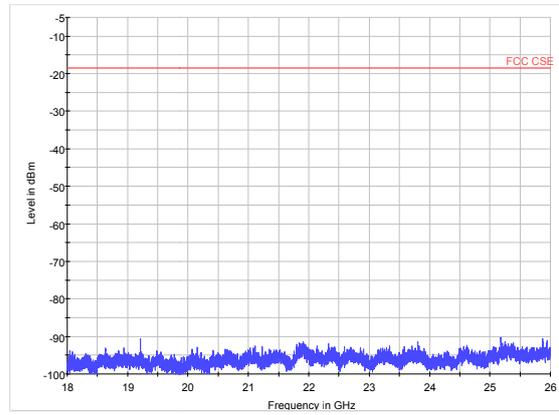


Test Results:

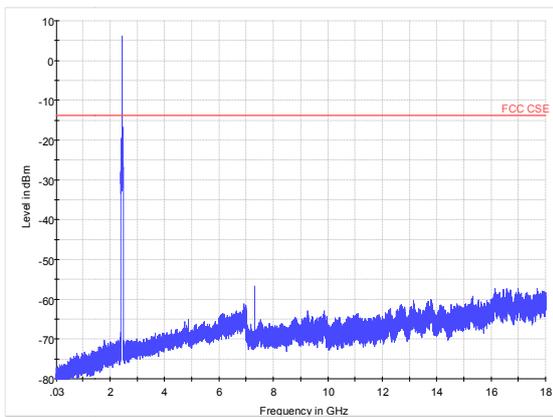
GFSK-CH0 30MHz to 18GHz



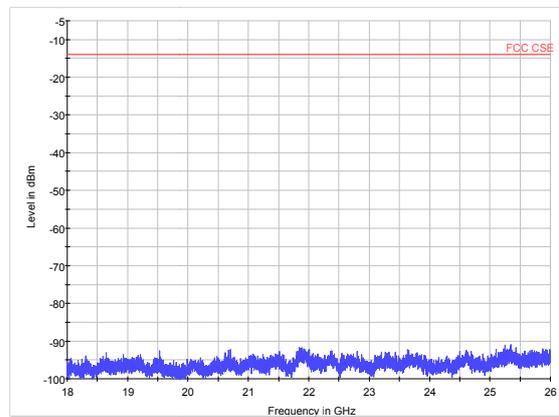
GFSK-CH0 18GHz to 26GHz



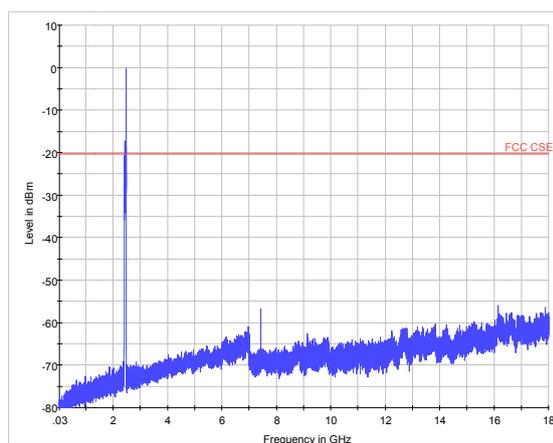
GFSK-CH39 30MHz to 18GHz



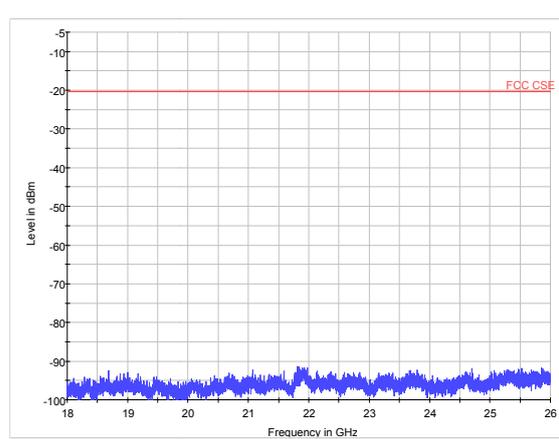
GFSK-CH39 18GHz to 26GHz



GFSK-CH78 30MHz to 18GHz

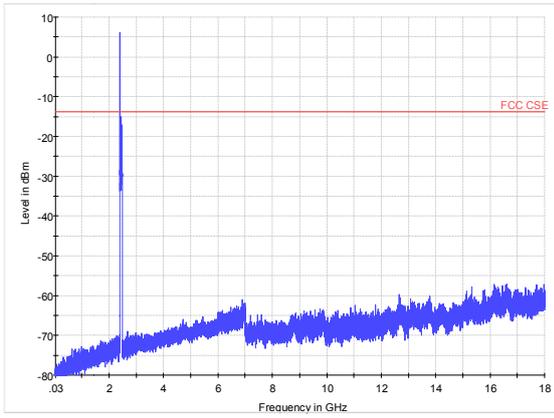


GFSK-CH78 18GHz to 26GHz

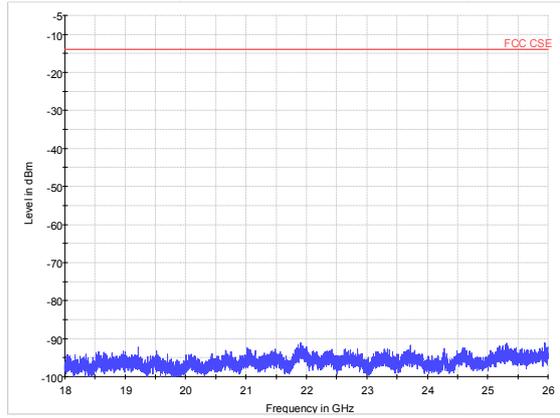




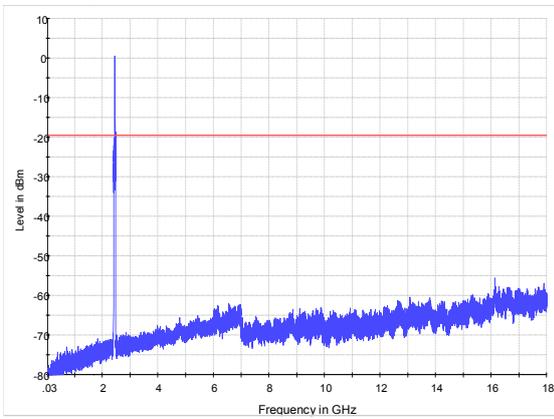
EDR-CH0 30MHz to 18GHz



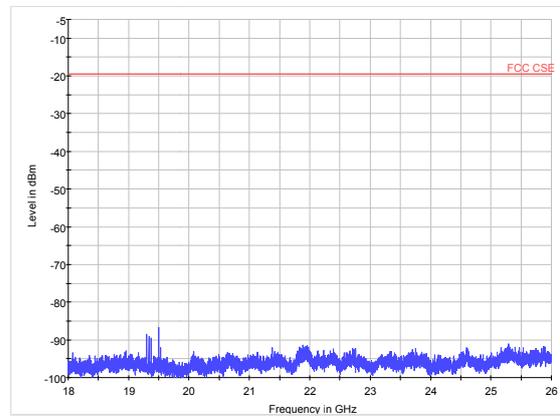
EDR-CH0 18GHz to 26GHz



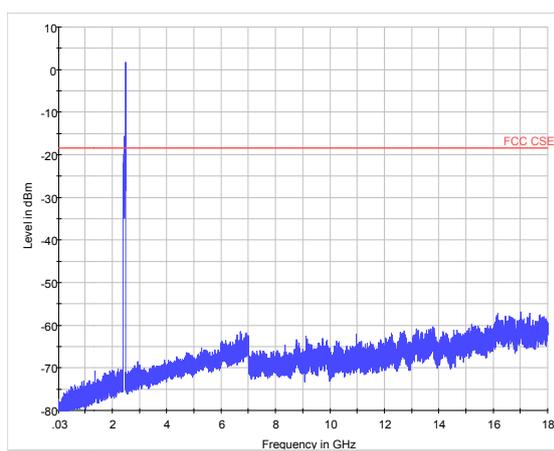
EDR-CH39 30MHz to 18GHz



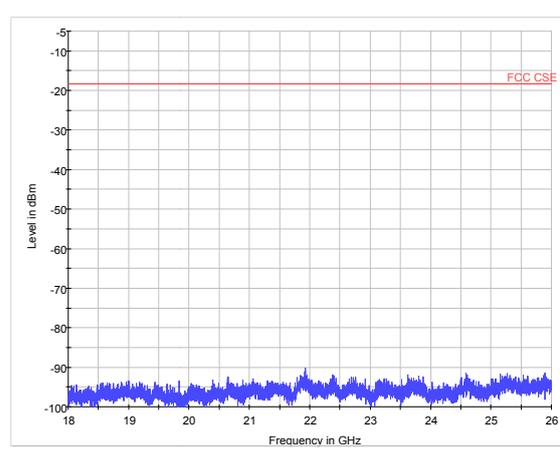
EDR-CH39 18GHz to 26GHz



EDR-CH78 30MHz to 18GHz



EDR-CH78 18GHz to 26GHz



4.10 Radiates Emission

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	102.5kPa

Method of Measurement

The test set-up was made in accordance to the general provisions of ANSI C63.10-2013. The Equipment Under Test (EUT) was set up on a non-conductive table in the semi-anechoic chamber. The test was performed at the distance of 3 m between the EUT and the receiving antenna. The radiated emissions measurements were made in a typical installation configuration.

Sweep the whole frequency band through the range from 9 kHz to the 10th harmonic of the carrier, and the emissions less than 20 dB below the permissible value are reported.

During the test, below 30MHz, the center of the loop shall be 1 meters; above 30MHz, the height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turntable shall be rotated from 0 to 360 degrees for detecting the maximum of radiated spurious signal level. The measurements shall be repeated with orthogonal polarization of the test antenna. The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing.

Set the spectrum analyzer in the following:

Below 1GHz (detector: Peak and Quasi-Peak)

RBW=100kHz / VBW=300kHz / Sweep=AUTO

Above 1GHz(detector: Peak):

(a) PEAK: RBW=1MHz VBW=3MHz/ Sweep=AUTO

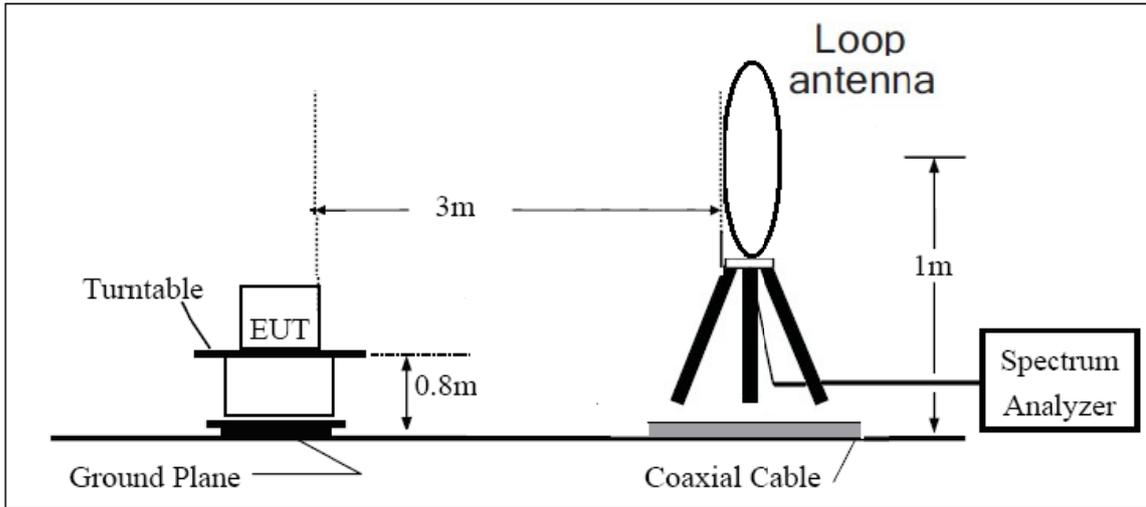
(b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO

The radiated 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. Then this mode was measured in the following mode: EUT with cradle and EUT without cradle. The worst emission was found in EUT with cradle mode and the worst case was recorded.

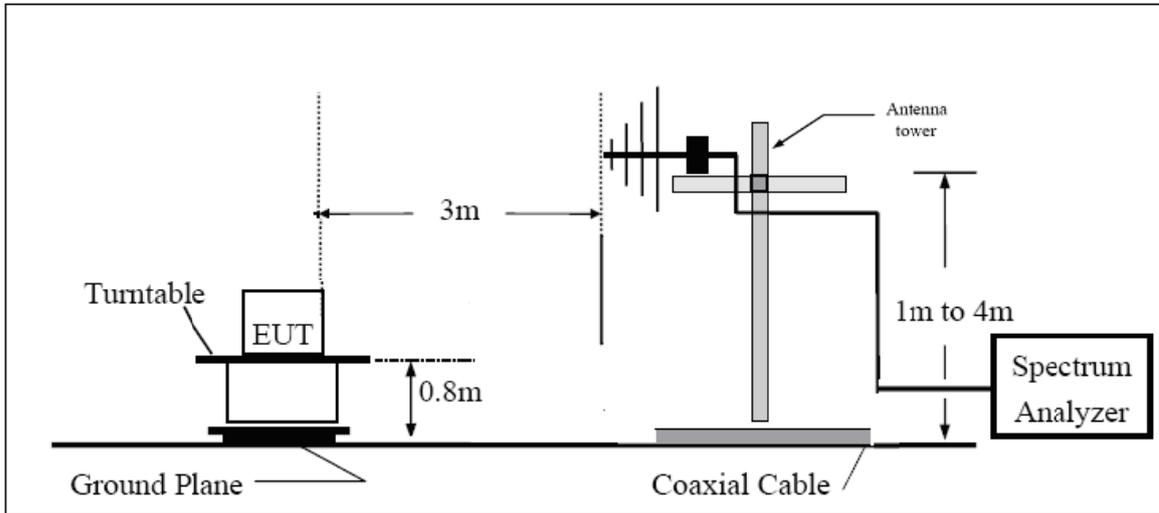
The test is in transmitting mode.

Test setup

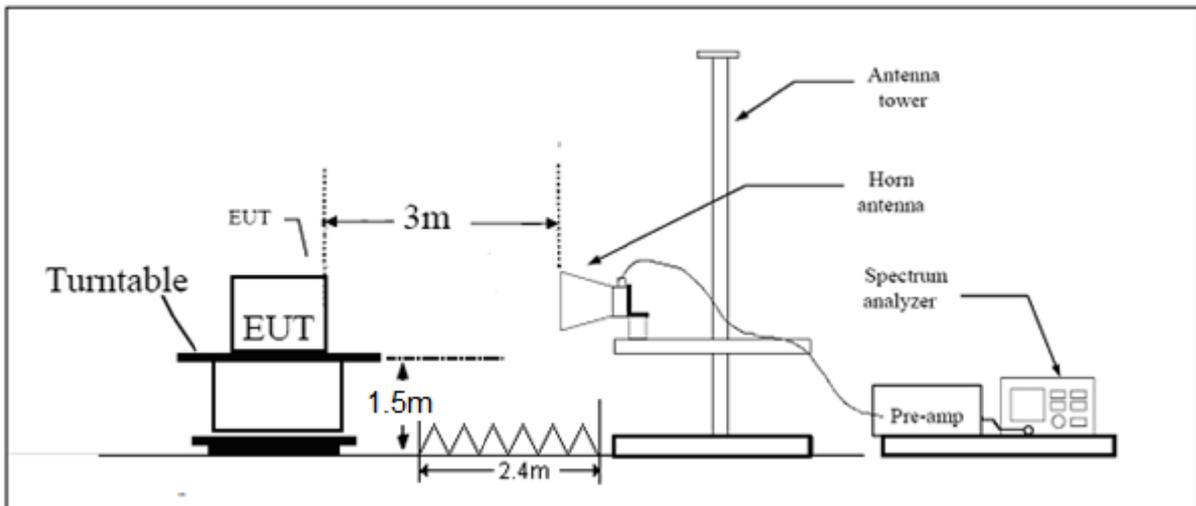
9KHz~~~ 30MHz



30MHz~~~ 1GHz



Above 1GHz



Limits

Rule Part 15.247(d) specifies that “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) (see § 15.205(c)).”

Limit in restricted band

Frequency of emission (MHz)	Field strength(uV/m)	Field strength(dBuV/m)
0.009–0.490	2400/F(kHz)	/
0.490–1.705	24000/F(kHz)	/
1.705–30.0	30	/
30-88	100	40
88-216	150	43.5
216-960	200	46
Above960	500	54

§15.35(b)

There is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

Frequency	Uncertainty
9KHz-30MHz	3.55 dB
30MHz-200MHz	4.19 dB
200MHz-1GHz	3.63 dB
Above 1GHz	3.68 dB

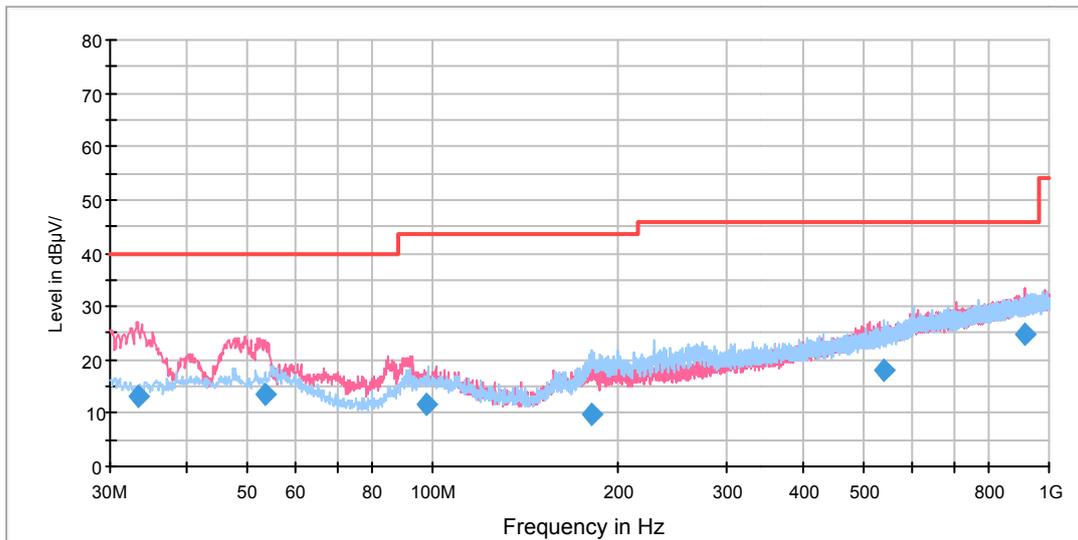
Test result

Sweep from 9 kHz to 30MHz, and the emissions more than 20 dB below the permissible value are not reported.

The following graphs display the maximum values of horizontal and vertical by software.

For above 1GHz, Blue trace uses the peak detection, Green trace uses the average detection.

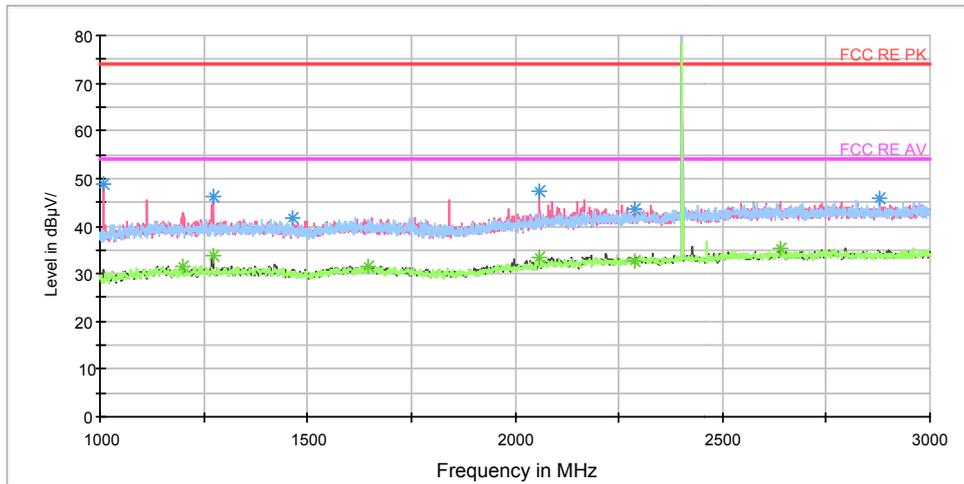
GFSK-Channel 0



Radiates Emission from 30MHz to 1GHz

Note: This graph displays the maximum values of horizontal and vertical by software

Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
33.393750	13.0	100.0	V	287.0	24.9	11.9	27.0	40.0
53.568750	13.6	100.0	V	249.0	26.4	12.8	26.4	40.0
97.942500	11.5	125.0	H	123.0	24.4	12.9	32.0	43.5
181.637500	9.9	125.0	H	258.0	20.8	10.9	33.6	43.5
539.858750	18.2	100.0	H	165.0	39.0	20.8	27.8	46.0
914.881250	24.7	100.0	V	82.0	50.5	25.8	21.3	46.0

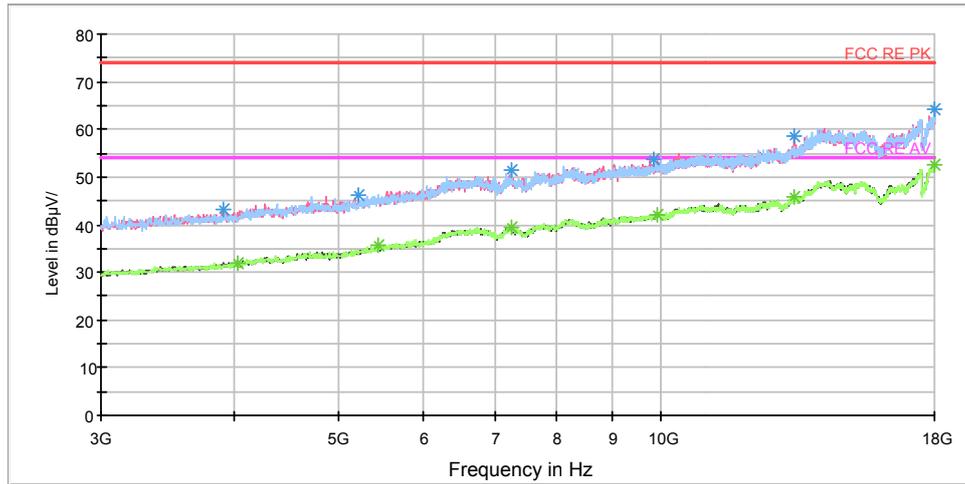


Radiates Emission from 1GHz to 3GHz
 Note: The signal beyond the limit is carrier.

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1010.000000	48.9	100.0	V	193.0	51.2	-2.3	25.1	74
1271.500000	46.0	100.0	V	355.0	46.3	-0.3	28.0	74
1465.000000	41.8	100.0	H	4.0	42.0	-0.2	32.2	74
2058.000000	47.3	100.0	V	0.0	49.9	2.6	26.7	74
2289.500000	43.5	100.0	H	106.0	47.4	3.9	30.5	74
2877.000000	45.9	100.0	V	336.0	51.7	5.8	28.1	74

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1200.500000	31.7	100.0	V	353.0	32.4	-0.7	22.3	54
1271.500000	33.9	100.0	V	355.0	34.2	-0.3	20.1	54
1645.000000	31.6	100.0	H	7.0	32.8	1.2	22.4	54
2057.000000	33.4	100.0	V	0.0	36.0	2.6	20.6	54
2286.500000	32.6	100.0	V	295.0	36.5	3.9	21.4	54
2640.000000	35.4	100.0	V	0.0	40.8	5.4	18.6	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)



Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
3907.500000	43.0	100.0	H	137.0	45.2	-2.2	31.0	74
5220.000000	46.3	100.0	H	27.0	46.3	0.0	27.7	74
7256.250000	51.3	100.0	H	274.0	56.8	5.5	22.7	74
9843.750000	53.7	100.0	H	20.0	64.9	11.2	20.3	74
13327.500000	58.5	100.0	V	357.0	76.2	17.7	15.5	74
17992.500000	64.1	100.0	H	193.0	89.9	25.8	9.9	74

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
4027.500000	31.9	100.0	H	0.0	33.9	-2.0	22.1	54
5437.500000	35.6	100.0	H	235.0	36.8	1.2	18.4	54
7237.500000	39.5	100.0	H	15.0	45.0	5.5	14.5	54
9903.750000	42.2	100.0	H	3.0	53.6	11.4	11.8	54
13308.750000	45.9	100.0	V	106.0	63.6	17.7	8.1	54
17996.250000	52.7	100.0	V	347.0	78.5	25.8	1.3	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)



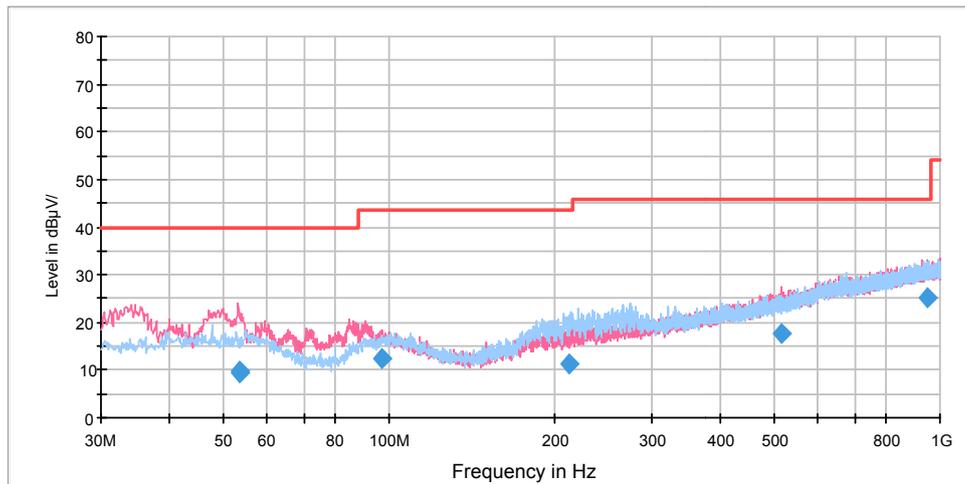
Radiates Emission from 18GHz to 26.5GHz

Frequency (MHz)	Peak (dBuV/m)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18440.937500	33.9	V	178.0	37.4	-3.5	40.1	74
19708.500000	33.8	V	246.0	38.5	-4.7	40.2	74
20884.687500	31.6	V	272.0	36.6	-5.0	42.4	74
22517.750000	31.9	V	285.0	36.3	-4.4	42.1	74
23548.375000	30.9	H	60.0	36.1	-5.2	43.1	74
24895.625000	31.6	V	329.0	37.4	-5.8	42.4	74

Frequency (MHz)	Average (dBuV/m)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18449.437500	22.7	H	54.0	26.2	-3.5	31.3	54
19761.625000	22.8	V	197.0	27.5	-4.7	31.2	54
20807.125000	19.9	V	0.0	24.8	-4.9	34.1	54
22890.687500	20.0	V	323.0	24.5	-4.5	34.0	54
23520.750000	19.6	V	329.0	24.8	-5.2	34.4	54
26202.500000	20.2	H	54.0	25.3	-5.1	33.8	54

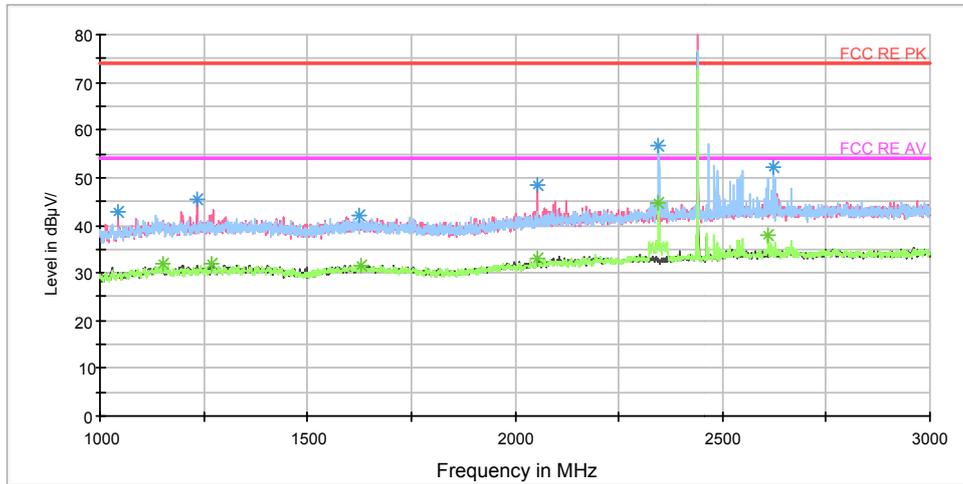
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

GFSK-Channel 39



Radiates Emission from 30MHz to 1GHz

Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
53.406250	9.4	116.0	V	343.0	22.2	12.8	30.6	40.0
53.440000	9.6	100.0	V	286.0	22.4	12.8	30.4	40.0
97.133750	12.5	100.0	V	34.0	25.4	12.9	31.0	43.5
212.851250	11.2	100.0	H	261.0	23.8	12.6	32.3	43.5
514.997500	17.7	100.0	V	24.0	38.0	20.3	28.3	46.0
948.960000	25.0	100.0	V	148.0	51.0	26.0	21.0	46.0

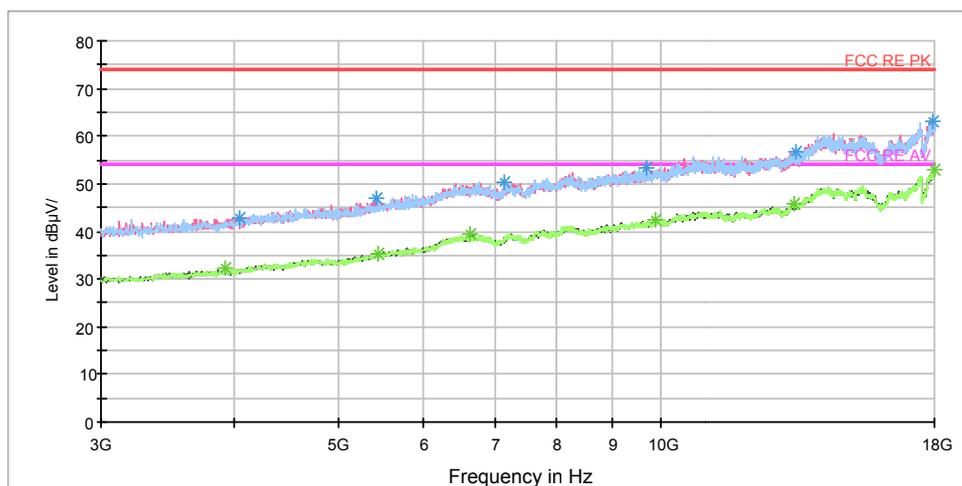


Radiates Emission from 1GHz to 3GHz
 Note: The signal beyond the limit is carrier.

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1045.000000	42.8	100.0	V	316.0	44.6	-1.8	31.2	74
1235.000000	45.4	100.0	V	122.0	45.9	-0.5	28.6	74
1626.500000	42.2	100.0	H	235.0	43.3	1.1	31.8	74
2055.500000	48.4	100.0	V	0.0	51	2.6	25.6	74
2347.000000	56.5	100.0	H	235.0	60.6	4.1	17.5	74
2621.500000	52.3	100.0	H	235.0	57.7	5.4	21.7	74

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1150.000000	31.8	100.0	H	90.0	32.6	-0.8	22.2	54
1268.500000	31.9	100.0	V	343.0	32.2	-0.3	22.1	54
1627.000000	31.6	100.0	V	229.0	32.7	1.1	22.4	54
2056.000000	33.0	100.0	V	0.0	35.6	2.6	21.0	54
2347.000000	44.9	100.0	H	235.0	49	4.1	9.1	54
2611.000000	38.1	100.0	H	227.0	43.5	5.4	15.9	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

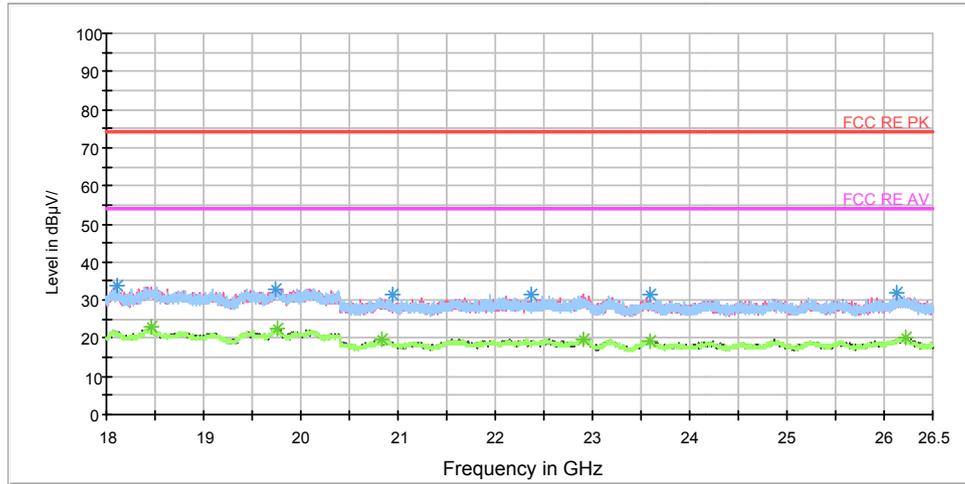


Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
4038.750000	42.6	100.0	H	100.0	44.5	-1.9	31.4	74
5433.750000	47.0	100.0	H	45.0	48.2	1.2	27	74
7140.000000	50.5	100.0	H	15.0	55.8	5.3	23.5	74
9693.750000	53.5	100.0	H	5.0	64.6	11.1	20.5	74
13338.750000	56.6	100.0	V	300.0	74.4	17.8	17.4	74
17947.500000	63.2	100.0	V	263.0	88.4	25.2	10.8	74

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
3911.250000	32.1	100.0	H	0.0	34.3	-2.2	21.9	54
5437.500000	35.4	100.0	H	357.0	36.6	1.2	18.6	54
6626.250000	39.5	100.0	V	263.0	44.6	5.1	14.5	54
9885.000000	42.5	100.0	H	63.0	53.9	11.4	11.5	54
13331.250000	45.8	100.0	H	217.0	63.5	17.7	8.2	54
17996.250000	52.9	100.0	V	347.0	78.7	25.8	1.1	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)



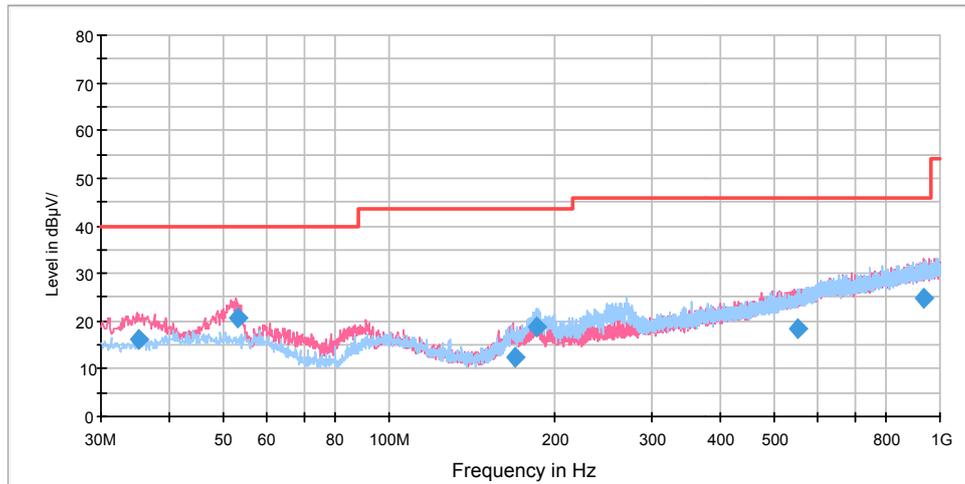
Radiates Emission from 18GHz to 26.5GHz

Frequency (MHz)	Peak (dBuV/m)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18106.250000	34.0	V	76.0	37.6	-3.6	40.0	74
19735.062500	33.0	H	0.0	37.7	-4.7	41.0	74
20938.875000	31.2	H	0.0	36.2	-5.0	42.8	74
22364.750000	31.6	H	85.0	36.1	-4.5	42.4	74
23595.125000	31.2	H	9.0	36.5	-5.3	42.8	74
26126.000000	31.7	V	70.0	36.9	-5.2	42.3	74

Frequency (MHz)	Average (dBuV/m)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18457.937500	22.8	H	6.0	26.3	-3.5	31.2	54
19755.250000	22.6	H	34.0	27.3	-4.7	31.4	54
20826.250000	19.6	H	0.0	24.5	-4.9	34.4	54
22901.312500	19.9	V	80.0	24.4	-4.5	34.1	54
23583.437500	19.3	H	0.0	24.6	-5.3	34.7	54
26221.625000	20.4	V	64.0	25.4	-5.0	33.6	54

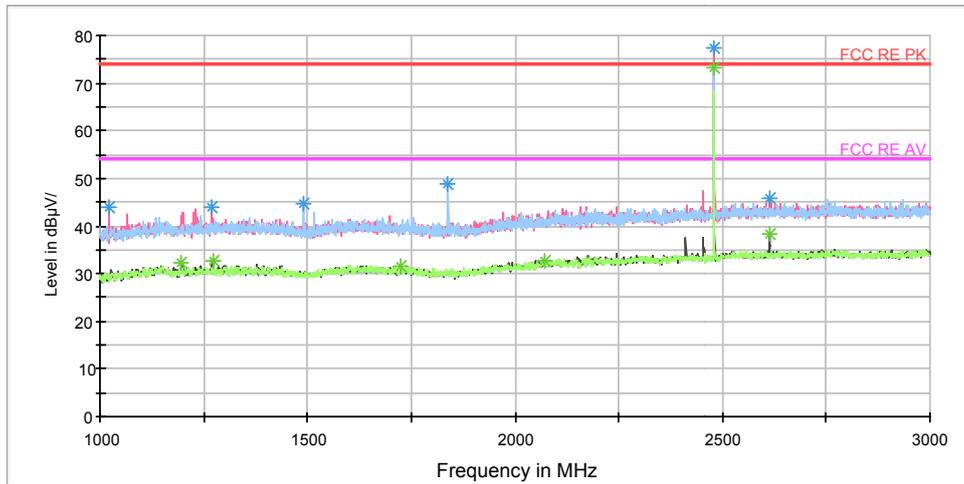
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

GFSK-Channel 78



Radiates Emission from 30MHz to 1GHz

Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
35.178750	16.2	100.0	V	0.0	23.8	11.9	23.8	40.0
53.116250	20.7	125.0	V	184.0	19.3	12.8	19.3	40.0
168.987500	12.3	100.0	V	0.0	31.2	10.2	31.2	43.5
185.165000	18.8	125.0	H	270.0	24.7	11.1	24.7	43.5
553.190000	18.6	125.0	H	22.0	27.4	21.1	27.4	46.0
933.676250	24.9	114.0	V	283.0	21.1	25.9	21.1	46.0

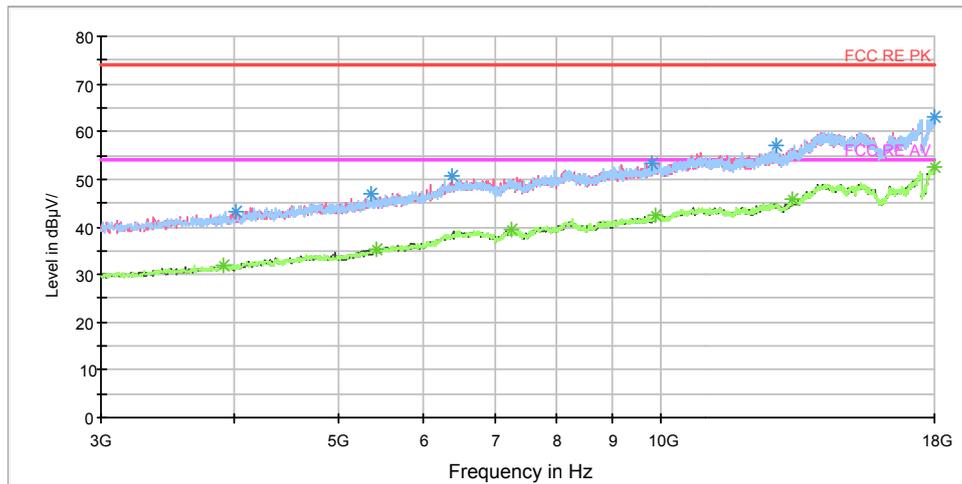


Radiates Emission from 1GHz to 3GHz
 Note: The signal beyond the limit is carrier.

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1023.000000	44.1	100.0	V	309.0	46.2	-2.1	29.9	74
1268.500000	44.0	100.0	V	339.0	44.3	-0.3	30.0	74
1489.500000	44.7	100.0	H	15.0	45.1	-0.4	29.3	74
1839.000000	48.7	100.0	H	262.0	50.5	1.8	25.3	74
2613.000000	45.9	100.0	V	221.0	51.3	5.4	28.1	74

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1197.000000	32.1	100.0	V	348.0	32.8	-0.7	21.9	54
1271.500000	32.5	100.0	V	348.0	32.8	-0.3	21.5	54
1724.500000	31.7	100.0	H	3.0	33.1	1.4	22.3	54
2072.000000	32.7	100.0	V	326.0	35.4	2.7	21.3	54
2614.500000	38.3	100.0	V	221.0	43.7	5.4	15.7	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

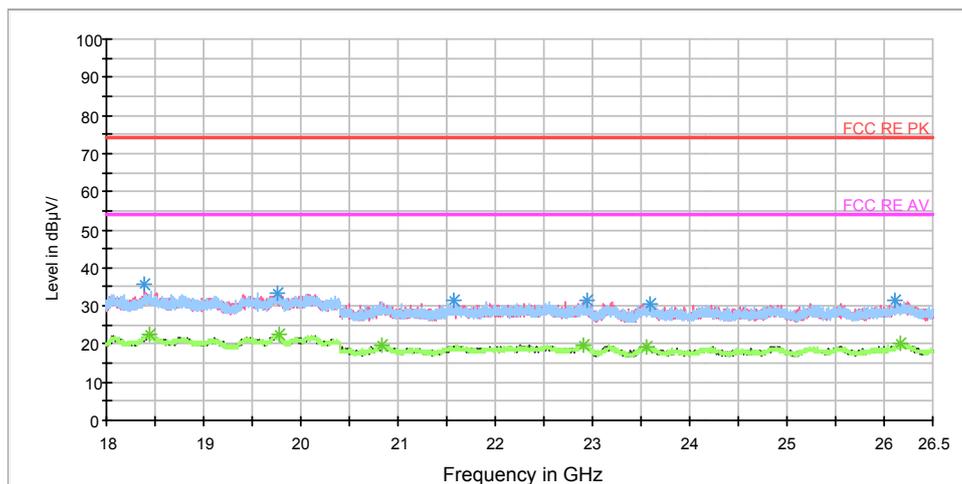


Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
4005.000000	43.2	100.0	V	351.0	43.2	-2.1	30.8	74
5358.750000	46.9	100.0	V	357.0	46.9	0.8	27.1	74
6382.500000	50.5	100.0	V	181.0	50.5	4.9	23.5	74
9806.250000	53.5	100.0	H	264.0	53.5	11.0	20.5	74
12787.500000	57.1	100.0	V	37.0	57.1	16.9	16.9	74
17985.000000	63.0	100.0	V	354.0	63.0	25.7	11.0	74

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
3907.500000	32.0	100.0	H	160.0	34.2	-2.2	22.0	54
5433.750000	35.4	100.0	H	169.0	36.6	1.2	18.6	54
7245.000000	39.3	100.0	H	169.0	44.8	5.5	14.7	54
9866.250000	42.5	100.0	H	302.0	53.8	11.3	11.5	54
13278.750000	45.7	100.0	H	86.0	63.4	17.7	8.3	54
17988.750000	52.6	100.0	V	356.0	78.3	25.7	1.4	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)



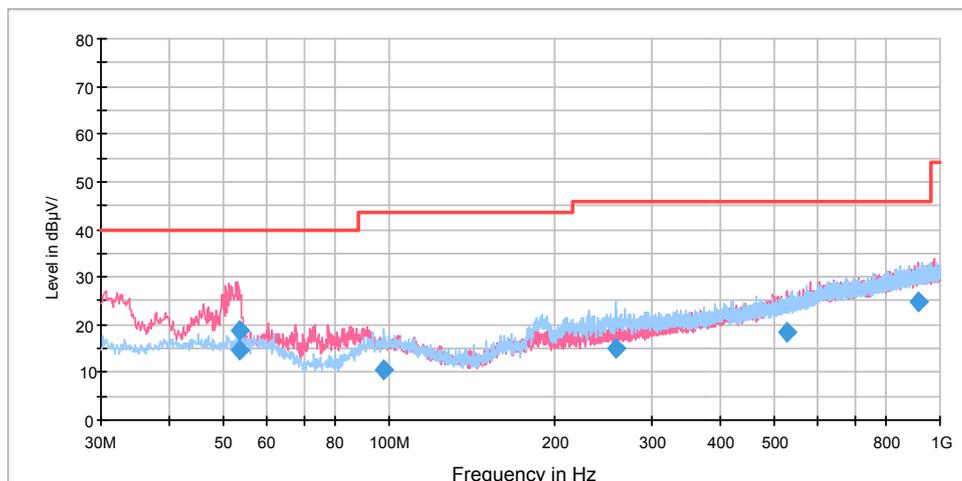
Radiates Emission from 18GHz to 26.5GHz

Frequency (MHz)	Peak (dBuV/m)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18393.125000	35.7	V	56.0	39.2	-3.5	38.3	74
19763.750000	33.3	V	90.0	38.0	-4.7	40.7	74
21567.875000	31.5	H	14.0	36.8	-5.3	42.5	74
22944.875000	31.6	V	90.0	36.2	-4.6	42.4	74
23587.687500	30.4	V	33.0	35.7	-5.3	43.6	74
26104.750000	31.4	H	0.0	36.7	-5.3	42.6	74

Frequency (MHz)	Average (dBuV/m)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18438.812500	22.7	H	6.0	26.2	-3.5	31.3	54
19776.500000	22.4	V	90.0	27.1	-4.7	31.6	54
20834.750000	19.7	V	87.0	24.6	-4.9	34.3	54
22913.000000	19.9	H	3.0	24.4	-4.5	34.1	54
23547.312500	19.3	V	56.0	24.5	-5.2	34.7	54
26170.625000	20.0	H	66.0	25.1	-5.1	34.0	54

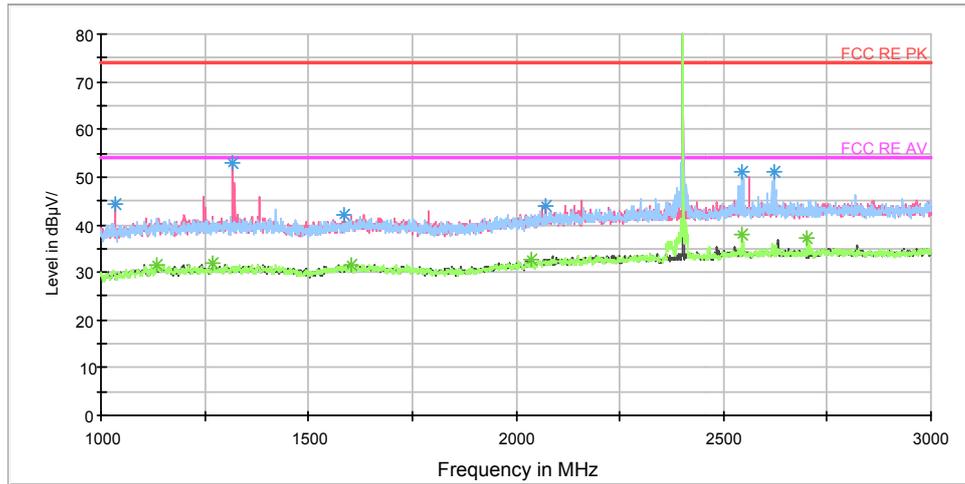
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

EDR-Channel 0



Radiates Emission from 30MHz to 1GHz

Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
53.395000	14.7	100.0	V	328.0	40.0	25.3	25.3	40.0
53.566250	18.8	114.0	V	170.0	40.0	21.2	21.2	40.0
97.581250	10.6	125.0	H	92.0	43.5	32.9	32.9	43.5
257.551250	15.2	100.0	H	79.0	46.0	30.8	30.8	46.0
527.090000	18.4	100.0	V	183.0	46.0	27.6	27.6	46.0
912.537500	24.6	100.0	V	309.0	46.0	21.4	21.4	46.0

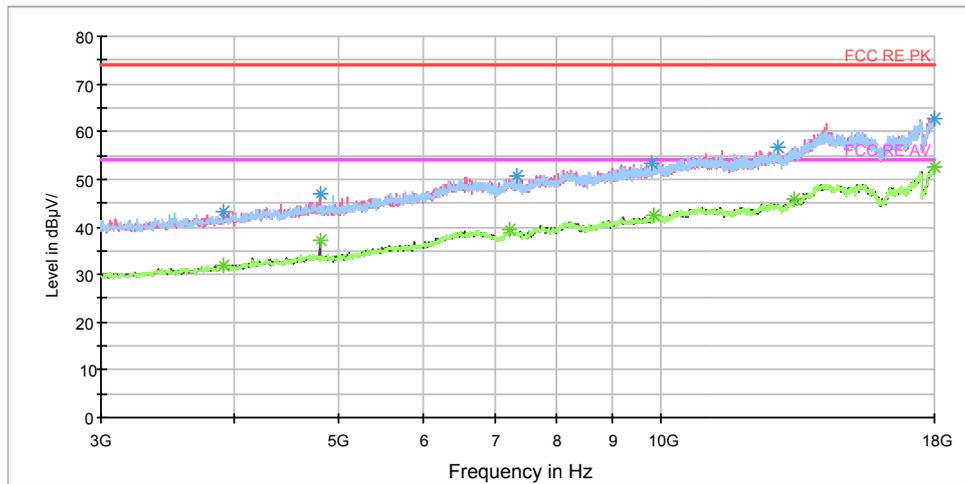


Radiates Emission from 1GHz to 3GHz
 Note: The signal beyond the limit is carrier.

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1034.500000	44.3	100.0	V	302.0	46.2	-1.9	29.7	74
1317.000000	53.0	100.0	V	206.0	53.1	-0.1	21.0	74
1585.500000	42.0	100.0	V	286.0	42.8	0.8	32.0	74
2073.000000	44.0	100.0	V	348.0	46.7	2.7	30.0	74
2543.500000	51.2	100.0	H	0.0	56.4	5.2	22.8	74
2621.000000	51.2	100.0	H	0.0	56.6	5.4	22.8	74

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1135.000000	31.7	100.0	V	348.0	32.6	-0.9	22.3	54
1270.500000	32.0	100.0	V	356.0	32.3	-0.3	22.0	54
1603.000000	31.7	100.0	V	348.0	32.7	1.0	22.3	54
2038.000000	32.8	100.0	V	348.0	35.3	2.5	21.2	54
2543.500000	37.9	100.0	H	0.0	43.1	5.2	16.1	54
2702.500000	37.2	100.0	H	0.0	42.7	5.5	16.8	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

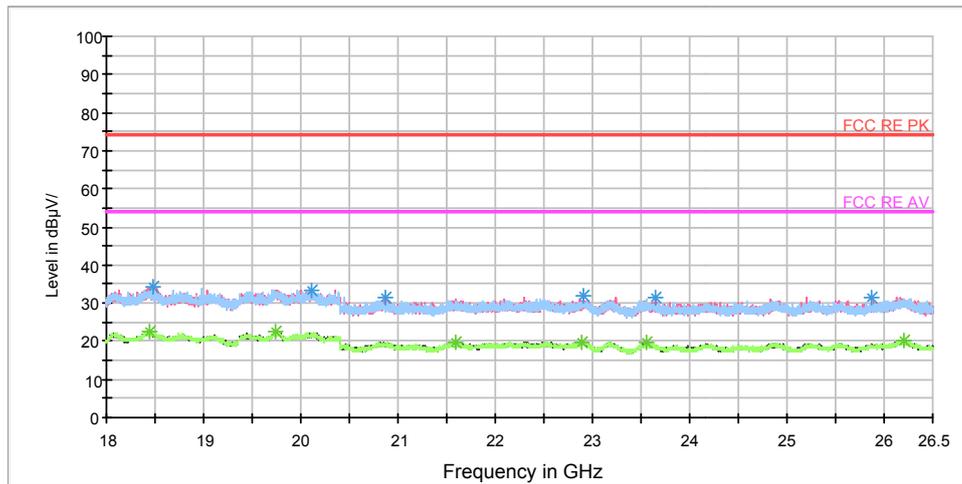


Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
3903.750000	43.1	100.0	V	208.0	45.3	-2.2	30.9	74
4803.750000	47.1	100.0	V	235.0	47.6	-0.5	26.9	74
7346.250000	50.8	100.0	V	114.0	56.5	5.7	23.2	74
9795.000000	53.2	100.0	H	28.0	64.2	11.0	20.8	74
12866.250000	56.7	100.0	H	28.0	73.6	16.9	17.3	74
17973.750000	62.9	100.0	H	180.0	88.4	25.5	11.1	74

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
3903.750000	31.9	100.0	V	208.0	34.1	-2.2	22.1	54
4803.750000	37.0	100.0	V	235.0	37.5	-0.5	17.0	54
7226.250000	39.3	100.0	V	358.0	44.8	5.5	14.7	54
9843.750000	42.3	100.0	V	0.0	53.5	11.2	11.7	54
13320.000000	45.9	100.0	V	161.0	63.6	17.7	8.1	54
17996.250000	52.6	100.0	V	327.0	78.4	25.8	1.4	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

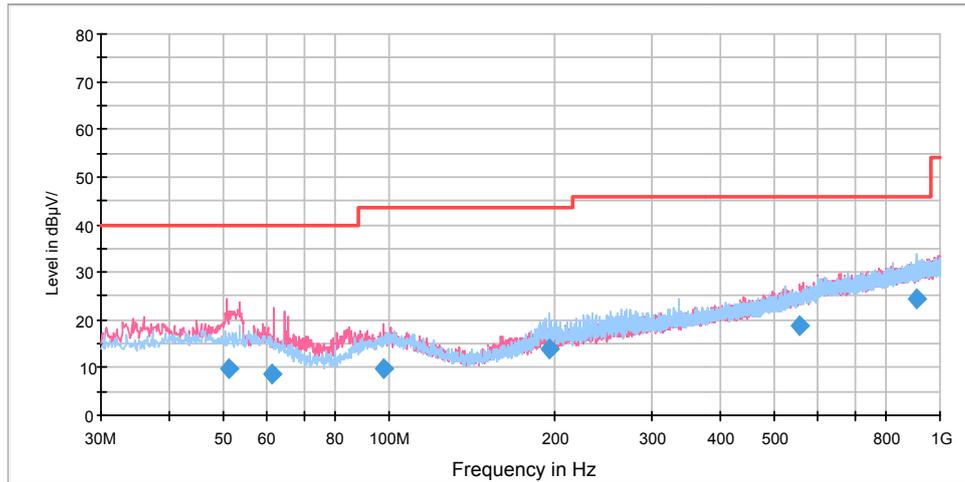


Radiates Emission from 18GHz to 26.5GHz

Frequency (MHz)	Peak (dBuV/m)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18484.500000	34.2	V	329.0	37.6	-3.4	39.8	74
20109.062500	33.5	V	348.0	38.4	-4.9	40.5	74
20878.312500	31.5	V	196.0	36.5	-5.0	42.5	74
22900.250000	31.8	V	341.0	36.3	-4.5	42.2	74
23645.062500	31.4	V	0.0	36.8	-5.4	42.6	74
25873.125000	31.4	H	64.0	37.1	-5.7	42.6	74

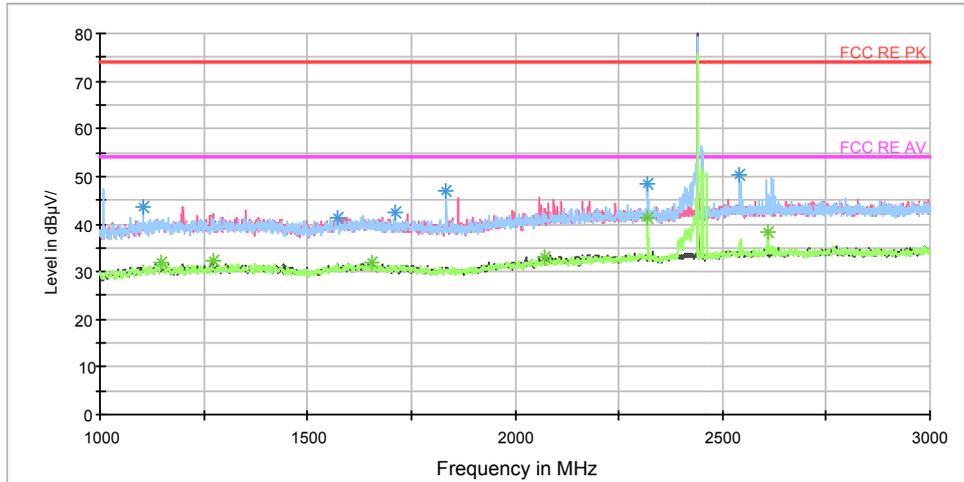
Frequency (MHz)	Average (dBuV/m)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18447.312500	22.7	V	0.0	26.2	-3.5	31.3	54
19741.437500	22.5	H	57.0	27.2	-4.7	31.5	54
21592.312500	19.7	H	124.0	25.0	-5.3	34.3	54
22885.375000	19.9	H	57.0	24.4	-4.5	34.1	54
23564.312500	19.6	V	270.0	24.9	-5.3	34.4	54
26212.062500	20.2	H	110.0	25.3	-5.1	33.8	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)



Radiates Emission from 30MHz to 1GHz

Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
51.333750	9.7	100.0	V	0.0	22.6	12.9	30.3	40.0
61.328750	8.6	100.0	V	275.0	20.6	12.0	31.4	40.0
97.578750	9.8	114.0	V	338.0	22.7	12.9	33.7	43.5
195.147500	13.8	125.0	H	73.0	25.6	11.8	29.7	43.5
556.671250	18.6	100.0	V	0.0	39.8	21.2	27.4	46.0
906.235000	24.6	100.0	H	286.0	50.3	25.7	21.4	46.0



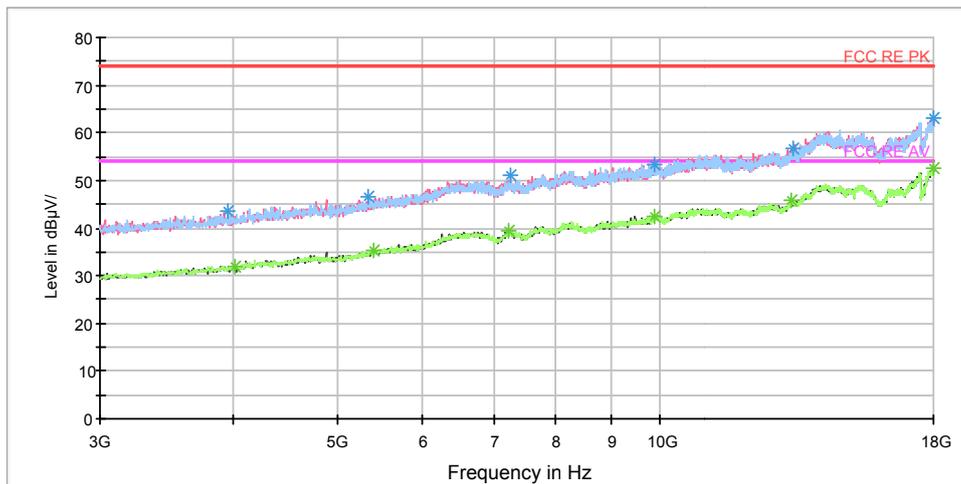
Radiates Emission from 1GHz to 3GHz

Note: The signal beyond the limit is carrier.

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1105.500000	43.5	100.0	H	3.0	44.5	-1.0	30.5	74
1571.000000	41.5	100.0	V	222.0	42.1	0.6	32.5	74
1712.000000	42.4	100.0	H	0.0	43.7	1.3	31.6	74
1835.000000	46.8	100.0	H	177.0	48.6	1.8	27.2	74
2318.500000	48.6	100.0	H	0.0	52.6	4.0	25.4	74
2542.000000	50.3	100.0	H	0.0	55.4	5.1	23.7	74

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1146.000000	31.8	100.0	V	180.0	32.6	-0.8	22.2	54
1272.500000	32.2	100.0	V	358.0	32.5	-0.3	21.8	54
1654.000000	31.9	100.0	H	331.0	33.1	1.2	22.1	54
2070.000000	33.1	100.0	V	358.0	35.8	2.7	20.9	54
2318.000000	41.5	100.0	H	0.0	45.5	4.0	12.5	54
2608.500000	38.5	100.0	H	0.0	43.9	5.4	15.5	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)



Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
3948.750000	43.4	100.0	H	141.0	45.5	-2.1	30.6	74
5336.250000	46.4	100.0	H	178.0	47.0	0.6	27.6	74
7252.500000	51.0	100.0	H	18.0	56.5	5.5	23.0	74
9896.250000	53.4	100.0	H	323.0	64.8	11.4	20.6	74
13293.750000	56.7	100.0	V	296.0	74.4	17.7	17.3	74
17996.250000	63.0	100.0	V	306.0	88.8	25.8	11.0	74

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
4008.750000	32.1	100.0	H	105.0	34.1	-2.0	21.9	54
5411.250000	35.4	100.0	H	132.0	36.5	1.1	18.6	54
7233.750000	39.4	100.0	H	4.0	44.9	5.5	14.6	54
9896.250000	42.5	100.0	H	323.0	53.9	11.4	11.5	54
13241.250000	45.8	100.0	V	358.0	63.4	17.6	8.2	54
17992.500000	52.8	100.0	V	306.0	78.6	25.8	1.2	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)



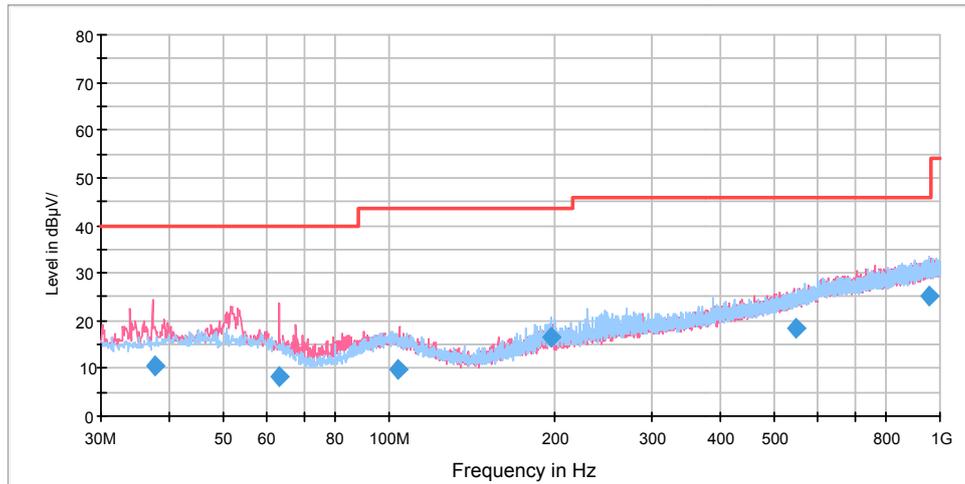
Radiates Emission from 18GHz to 26.5GHz

Frequency (MHz)	Peak (dBuV/m)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18427.125000	33.8	V	143.0	37.3	-3.5	40.2	74
20110.125000	33.8	V	298.0	38.7	-4.9	40.2	74
20844.312500	31.3	H	0.0	36.3	-5.0	42.7	74
22926.812500	31.8	V	0.0	36.4	-4.6	42.2	74
23632.312500	31.1	V	0.0	36.4	-5.3	42.9	74
26212.062500	31.6	H	1.0	36.7	-5.1	42.4	74

Frequency (MHz)	Average (dBuV/m)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18419.687500	22.7	V	170.0	26.2	-3.5	31.3	54
19762.687500	22.4	H	232.0	27.1	-4.7	31.6	54
20836.875000	19.9	H	108.0	24.8	-4.9	34.1	54
22916.187500	20.2	V	304.0	24.7	-4.5	33.8	54
23536.687500	19.3	H	95.0	24.5	-5.2	34.7	54
26188.687500	20.3	V	358.0	25.4	-5.1	33.7	54

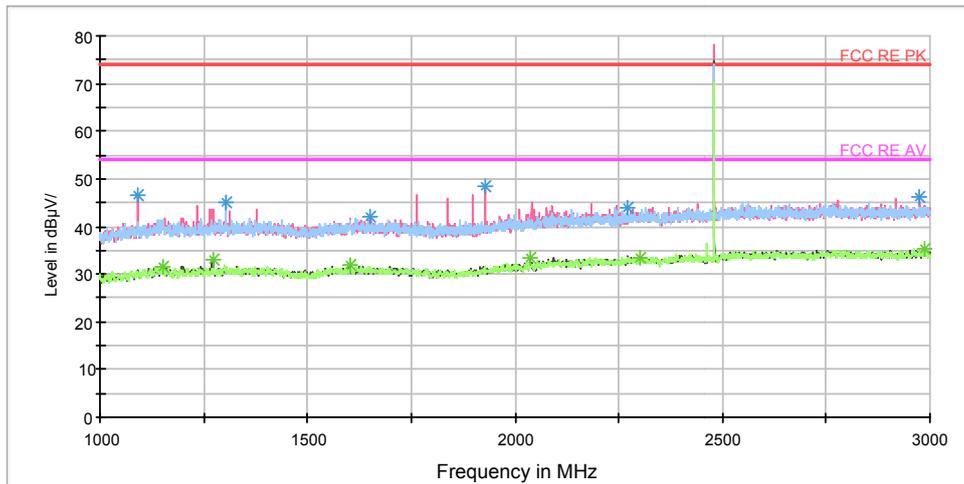
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

EDR-Channel 78



Radiates Emission from 30MHz to 1GHz

Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
37.515000	10.4	100.0	V	334.0	22.9	12.5	29.6	40.0
63.301250	8.1	100.0	V	334.0	19.3	11.2	31.9	40.0
103.726250	9.7	100.0	V	22.0	22.6	12.9	33.8	43.5
196.520000	16.4	100.0	H	79.0	28.2	11.8	27.1	43.5
546.033750	18.3	100.0	V	172.0	39.2	20.9	27.7	46.0
957.160000	25.2	125.0	H	22.0	51.3	26.1	20.8	46.0



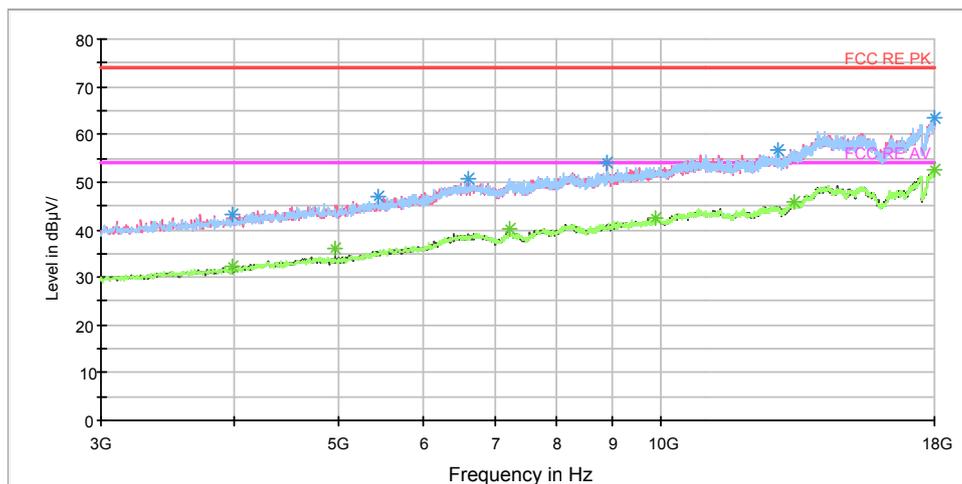
Radiates Emission from 1GHz to 3GHz

Note: The signal beyond the limit is carrier.

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1092.000000	46.4	100.0	V	274.0	47.5	-1.1	27.6	74
1302.500000	45.0	100.0	H	236.0	45.1	-0.1	29.0	74
1652.500000	41.9	100.0	V	266.0	43.1	1.2	32.1	74
1929.500000	48.6	100.0	V	290.0	50.6	2.0	25.4	74
2272.500000	43.9	100.0	H	162.0	47.7	3.8	30.1	74
2976.000000	46.3	100.0	V	274.0	52.3	6.0	27.7	74

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1151.500000	31.6	100.0	V	290.0	32.4	-0.8	22.4	54
1272.500000	33.1	100.0	V	350.0	33.4	-0.3	20.9	54
1604.000000	31.9	100.0	V	342.0	32.9	1.0	22.1	54
2038.000000	33.4	100.0	V	353.0	35.9	2.5	20.6	54
2300.000000	33.5	100.0	V	85.0	37.5	4.0	20.5	54
2988.000000	35.3	100.0	H	154.0	41.3	6.0	18.7	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

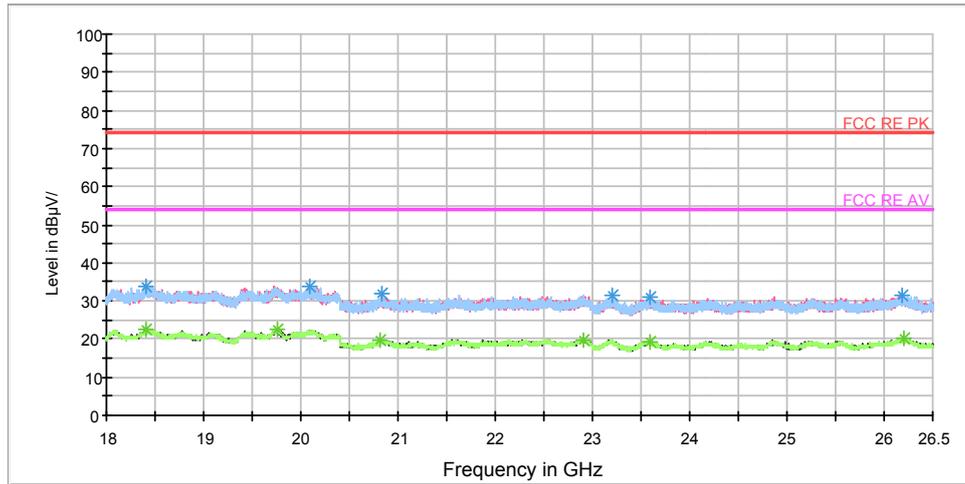


Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
3975.000000	43.3	100.0	V	208.0	45.4	-2.1	30.7	74
5445.000000	46.8	100.0	H	68.0	48.0	1.2	27.2	74
6618.750000	50.6	100.0	H	95.0	55.7	5.1	23.4	74
8906.250000	53.9	100.0	V	114.0	62.8	8.9	20.1	74
12870.000000	56.7	100.0	H	142.0	73.6	16.9	17.3	74
18000.000000	63.5	100.0	H	303.0	89.4	25.9	10.5	74

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
3978.750000	32.2	100.0	V	161.0	34.3	-2.1	21.8	54
4957.500000	36.2	100.0	V	199.0	36.6	-0.4	17.8	54
7218.750000	40.2	100.0	H	0.0	45.7	5.5	13.8	54
9896.250000	42.5	100.0	H	0.0	53.9	11.4	11.5	54
13301.250000	45.8	100.0	V	359.0	63.5	17.7	8.2	54
17988.750000	52.5	100.0	H	123.0	78.2	25.7	1.5	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)



Radiates Emission from 18GHz to 26.5GHz

Frequency (MHz)	Peak (dBuV/m)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18413.312500	33.8	H	0.0	37.3	-3.5	40.2	74
20096.312500	33.8	H	196.0	38.7	-4.9	40.2	74
20840.062500	31.9	V	272.0	36.9	-5.0	42.1	74
23205.187500	31.5	H	3.0	36.4	-4.9	42.5	74
23596.187500	31.1	H	1.0	36.4	-5.3	42.9	74
26177.000000	31.4	V	272.0	36.5	-5.1	42.6	74

Frequency (MHz)	Average (dBuV/m)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18401.625000	22.7	H	36.0	26.2	-3.5	31.3	54
19751.000000	22.5	H	42.0	27.2	-4.7	31.5	54
20820.937500	20.0	H	17.0	24.9	-4.9	34.0	54
22914.062500	20.0	V	166.0	24.5	-4.5	34.0	54
23593.000000	19.4	H	0.0	24.7	-5.3	34.6	54
26209.937500	20.3	H	13.0	25.4	-5.1	33.7	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

4.11 Conducted Emission

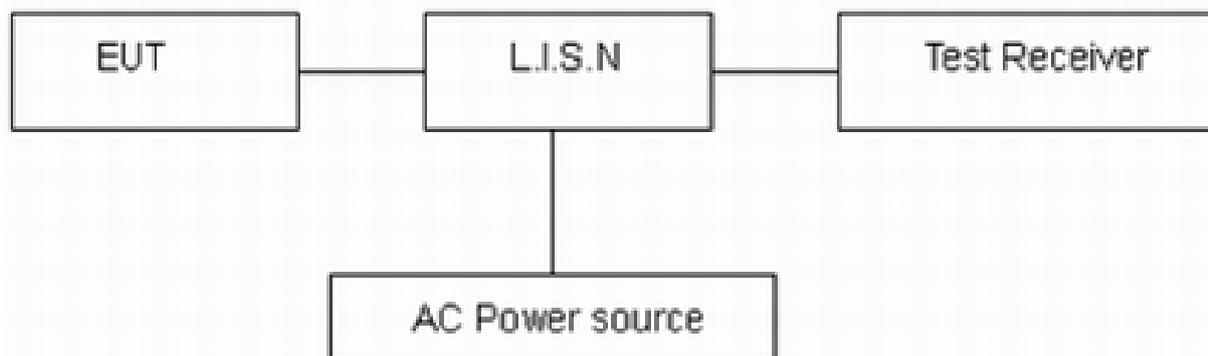
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

The EUT is placed on a non-metallic table of 80cm height above the horizontal metal reference ground plane. During the test, the EUT was operating in its typical mode. The test method is according to ANSI C63.10-2013. Connect the AC power line of the EUT to the L.I.S.N. Use EMI receiver to detect the average and Quasi-peak value. RBW is set to 9 kHz, VBW is set to 30kHz. The measurement result should include both L line and N line. The test is in transmitting mode.

Test Setup



Note: AC Power source is used to change the voltage from 220V/50Hz to 110V/60Hz.

Limits

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

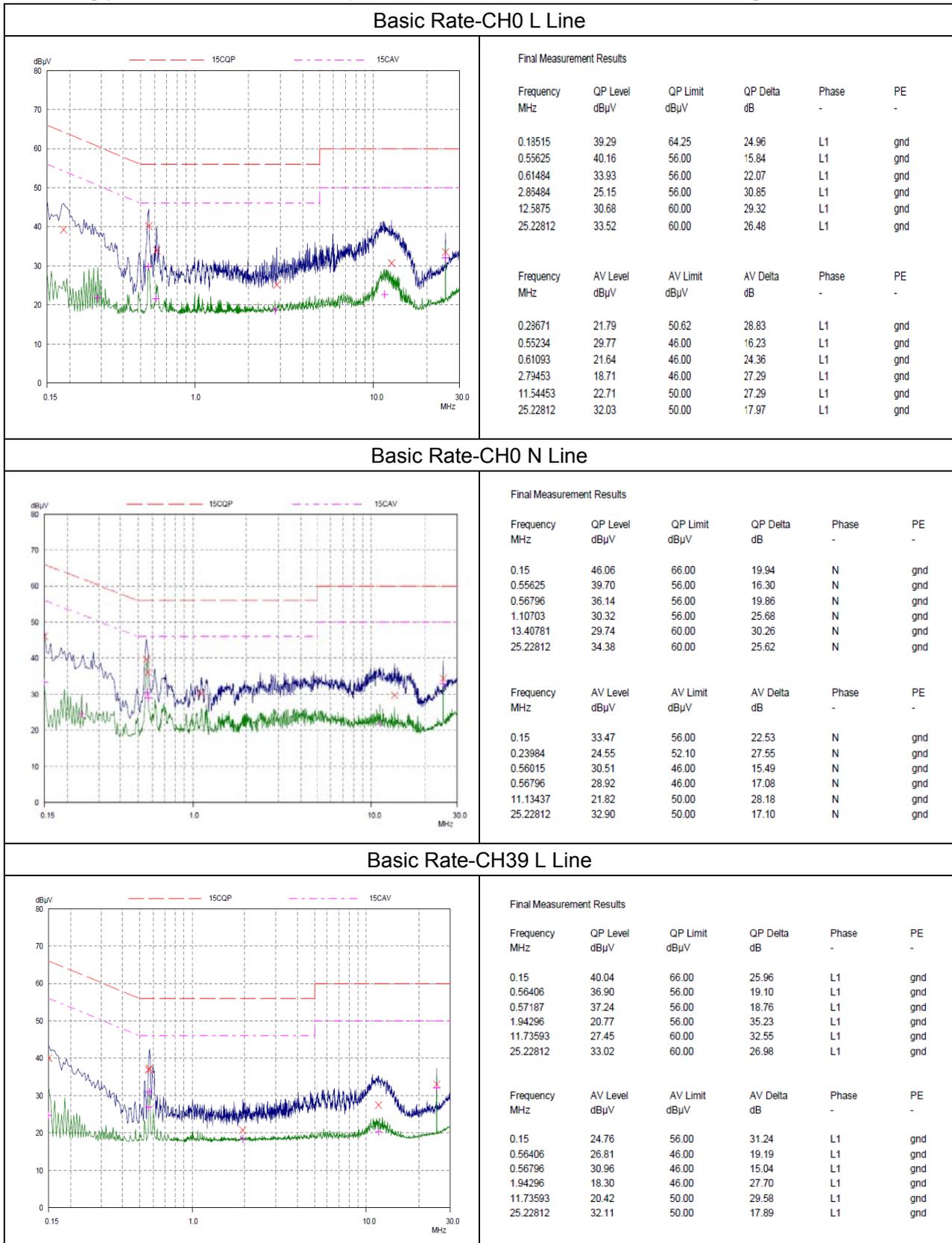
*: Decreases with the logarithm of the frequency.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$, $U=2.69$ dB.

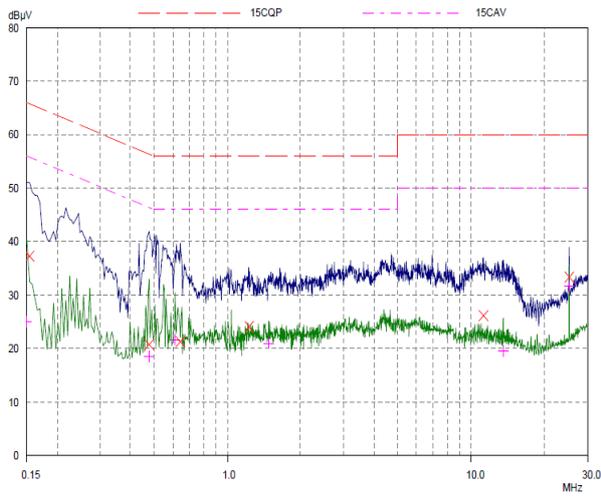
Test Results:

Following plots, Blue trace uses the peak detection, Green trace uses the average detection.





Basic Rate-CH39 N Line

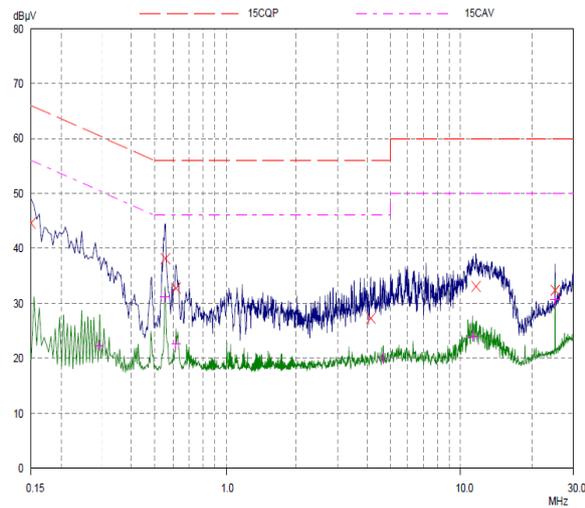


Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase	PE
0.1539	37.26	65.79	28.53	N	gnd
0.47812	20.73	56.37	35.64	N	gnd
0.64218	21.25	56.00	34.75	N	gnd
1.23203	24.06	56.00	31.94	N	gnd
11.18906	26.15	60.00	33.85	N	gnd
25.22812	33.34	60.00	26.66	N	gnd

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase	PE
0.15	25.06	56.00	30.94	N	gnd
0.47812	18.48	46.37	27.89	N	gnd
0.61093	21.70	46.00	24.30	N	gnd
1.48593	20.96	46.00	25.04	N	gnd
13.47421	19.54	50.00	30.46	N	gnd
25.23203	31.65	50.00	18.35	N	gnd

Basic Rate-CH78 L Line

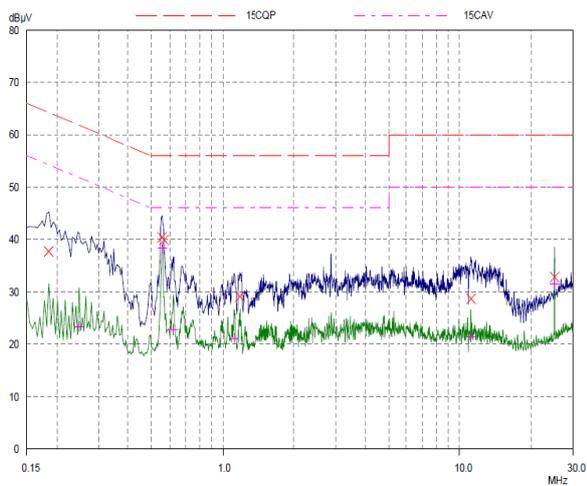


Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase	PE
0.15	44.58	66.00	21.42	L1	gnd
0.55625	38.14	56.00	17.86	L1	gnd
0.61484	32.75	56.00	23.25	L1	gnd
4.14609	27.30	56.00	28.70	L1	gnd
11.62265	33.05	60.00	26.95	L1	gnd
25.23203	32.36	60.00	27.64	L1	gnd

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase	PE
0.29062	22.36	50.51	28.15	L1	gnd
0.55234	31.18	46.00	14.82	L1	gnd
0.61484	22.61	46.00	23.39	L1	gnd
4.67734	20.03	46.00	25.97	L1	gnd
11.22812	24.07	50.00	25.93	L1	gnd
25.23203	30.56	50.00	19.44	L1	gnd

Basic Rate-CH78 N Line



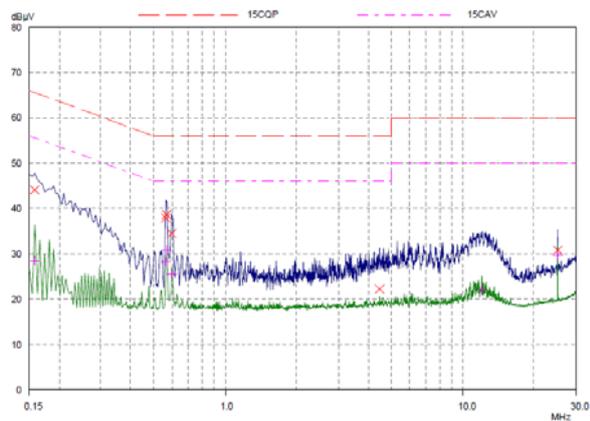
Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase	PE
0.18515	37.71	64.25	26.54	N	gnd
0.55625	40.42	56.00	15.58	N	gnd
0.56796	39.90	56.00	16.10	N	gnd
1.17734	29.14	56.00	26.86	N	gnd
11.16171	28.67	60.00	31.33	N	gnd
25.22812	32.80	60.00	27.20	N	gnd

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase	PE
0.24765	23.38	51.84	28.46	N	gnd
0.56015	38.42	46.00	7.58	N	gnd
0.61875	22.80	46.00	23.20	N	gnd
1.11093	21.12	46.00	24.88	N	gnd
11.15781	21.48	50.00	28.52	N	gnd
25.22812	31.49	50.00	18.51	N	gnd



EDR-CH0 L Line

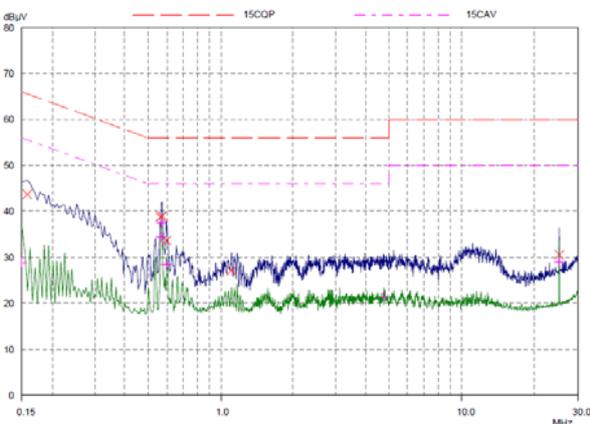


Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase	PE
0.15781	44.10	65.58	21.48	L1	gnd
0.56406	37.90	56.00	18.10	L1	gnd
0.56796	38.64	56.00	17.36	L1	gnd
0.59531	34.48	56.00	21.52	L1	gnd
4.43515	22.23	56.00	33.77	L1	gnd
25.22812	30.82	60.00	29.18	L1	gnd

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase	PE
0.15781	28.51	55.58	27.07	L1	gnd
0.56406	28.24	46.00	17.76	L1	gnd
0.56796	30.89	46.00	15.11	L1	gnd
0.59531	25.59	46.00	20.41	L1	gnd
11.9664	22.06	50.00	27.94	L1	gnd
25.22812	29.56	50.00	20.44	L1	gnd

EDR-CH0 N Line

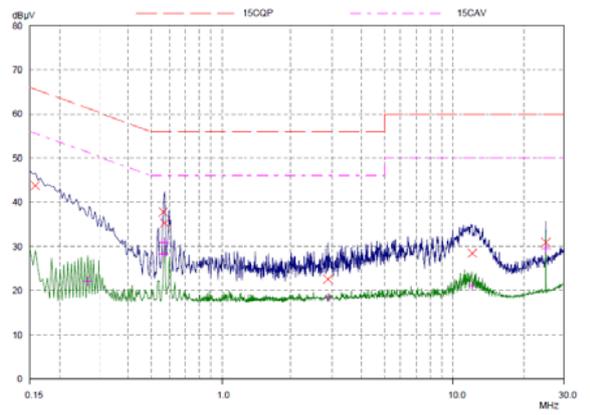


Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase	PE
0.15781	43.70	65.58	21.88	N	gnd
0.56406	38.80	56.00	17.20	N	gnd
0.57187	39.02	56.00	16.98	N	gnd
0.59531	33.66	56.00	22.34	N	gnd
1.10312	27.10	56.00	28.90	N	gnd
25.22812	30.58	60.00	29.42	N	gnd

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase	PE
0.15	28.85	56.00	27.15	N	gnd
0.56406	34.46	46.00	11.54	N	gnd
0.56796	37.49	46.00	8.51	N	gnd
0.59531	28.44	46.00	17.56	N	gnd
4.75937	21.43	46.00	24.57	N	gnd
25.22812	29.04	50.00	20.96	N	gnd

EDR-CH39 L Line



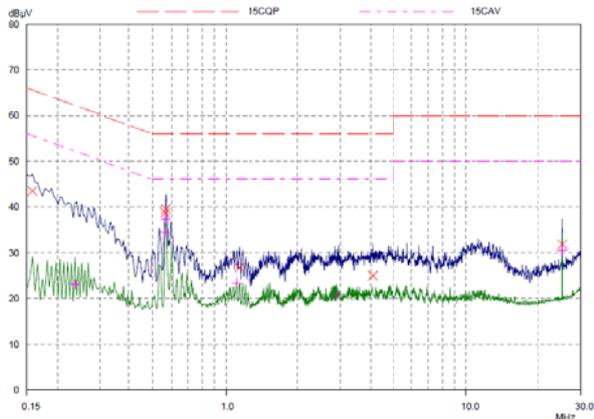
Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase	PE
0.15781	43.76	65.58	21.82	L1	gnd
0.56406	37.80	56.00	18.20	L1	gnd
0.57187	35.28	56.00	20.72	L1	gnd
2.88046	22.59	56.00	33.41	L1	gnd
12.0875	28.50	60.00	31.50	L1	gnd
25.22812	30.90	60.00	29.10	L1	gnd

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase	PE
0.26328	22.06	51.33	29.27	L1	gnd
0.56406	28.19	46.00	17.81	L1	gnd
0.56796	30.89	46.00	15.11	L1	gnd
2.88046	18.40	46.00	27.60	L1	gnd
12.0875	21.05	50.00	28.95	L1	gnd
25.22812	29.41	50.00	20.59	L1	gnd



EDR-CH39 N Line

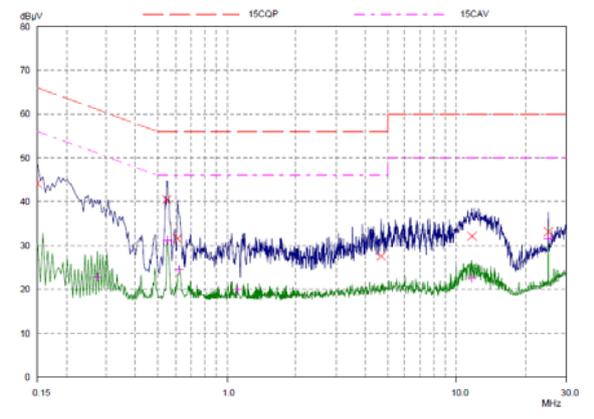


Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase	PE
0.15781	43.48	65.58	22.10	N	gnd
0.56406	38.74	56.00	17.26	N	gnd
0.56796	39.56	56.00	16.44	N	gnd
1.13437	26.74	56.00	29.26	N	gnd
4.07578	24.96	56.00	31.04	N	gnd
25.22812	31.82	60.00	28.18	N	gnd

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase	PE
0.23593	23.15	52.24	29.09	N	gnd
0.56406	34.36	46.00	11.64	N	gnd
0.56796	37.42	46.00	8.58	N	gnd
1.10312	23.39	46.00	22.61	N	gnd
2.88046	20.55	46.00	25.45	N	gnd
25.22812	30.51	50.00	19.49	N	gnd

EDR-CH78 L Line

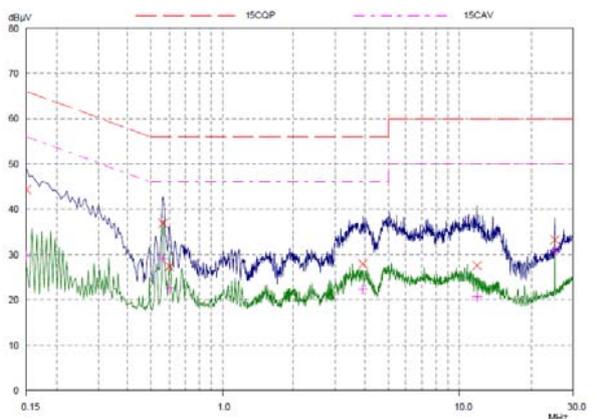


Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase	PE
0.15	44.14	66.00	21.86	L1	gnd
0.54843	40.48	56.00	15.52	L1	gnd
0.61093	31.60	56.00	24.40	L1	gnd
4.68906	27.62	56.00	28.38	L1	gnd
11.7164	32.15	60.00	27.85	L1	gnd
25.22812	33.16	60.00	26.84	L1	gnd

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase	PE
0.27109	22.86	51.08	28.22	L1	gnd
0.55234	31.18	46.00	14.82	L1	gnd
0.61875	24.48	46.00	21.52	L1	gnd
1.10312	20.08	46.00	25.92	L1	gnd
11.66171	22.57	50.00	27.43	L1	gnd
25.22812	31.57	50.00	18.43	L1	gnd

EDR-CH78 N Line



Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase	PE
0.15	44.38	66.00	21.62	N	gnd
0.56406	36.88	56.00	19.12	N	gnd
0.59921	27.38	56.00	28.62	N	gnd
3.91562	27.96	56.00	28.04	N	gnd
11.33359	27.55	60.00	32.45	N	gnd
25.22812	33.24	60.00	26.76	N	gnd

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase	PE
0.15	29.59	56.00	26.41	N	gnd
0.56406	29.20	46.00	16.80	N	gnd
0.59921	22.67	46.00	23.33	N	gnd
3.91562	22.26	46.00	23.74	N	gnd
11.33359	20.67	50.00	29.33	N	gnd
25.22812	30.91	50.00	19.09	N	gnd

5 Main Test Instruments

Name	Type	Manufacturer	Serial Number	Calibration Date	Expiration Time
BT Base Station Simulator	CBT	R&S	100271	2016-05-21	2017-05-20
Loop Antenna	FMZB1519	SCHWARZBEC K	1519-047	2014-02-29	2017-02-28
EMI Test Receiver	ESCS30	R&S	100138	2015-12-17	2016-12-16
Artificial main network	ENV216	R&S	101171	2013-12-18	2016-12-17
Signal Analyzer	FSV30	R&S	100815	2015-12-17	2016-12-16
EMI Test Receiver	ESCI	R&S	100948	2016-06-01	2017-05-31
TRILOG Broadband Antenna	VULB 9163	Schwarzbeck	9163-201	2014-12-06	2017-12-05
Double Ridged Waveguide Horn Antenna	HF907	R&S	100126	2014-12-06	2017-12-05
Power Splitter	SHX-GF2-2-13	Hua Xiang	10120101	NA	NA
Spectrum Analyzer	N9010A	Agilent	MY47191109	2016-05-21	2017-05-20
Standard Gain Horn	3160-09	ETS-Lindgren	00102644	2015-01-30	2018-01-29
RF Cable	SMA 15cm	Agilent	0001	2017-06-06	2018-08-05

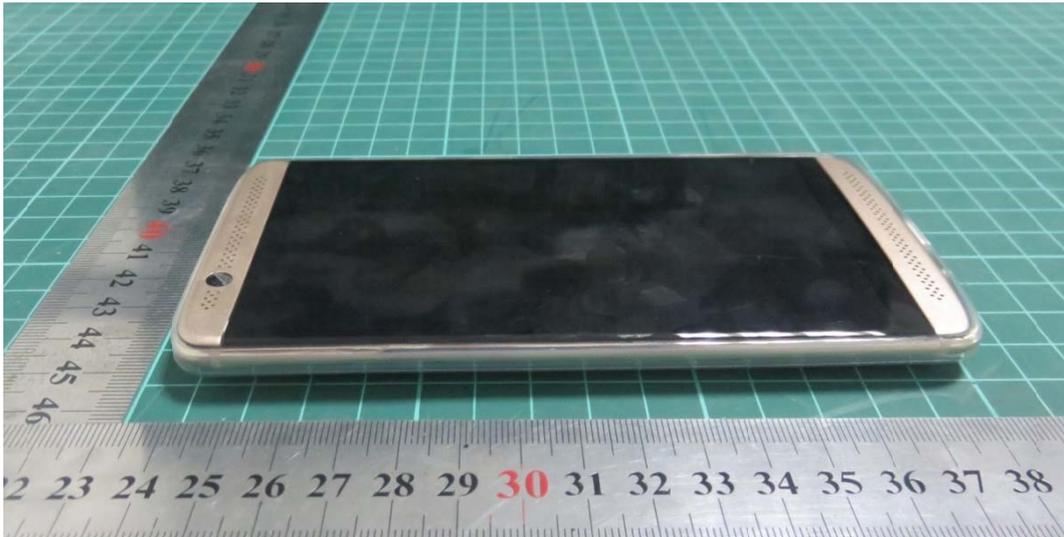
*****END OF REPORT *****

ANNEX A: EUT Appearance and Test Setup

A.1 EUT Appearance



a1: EUT

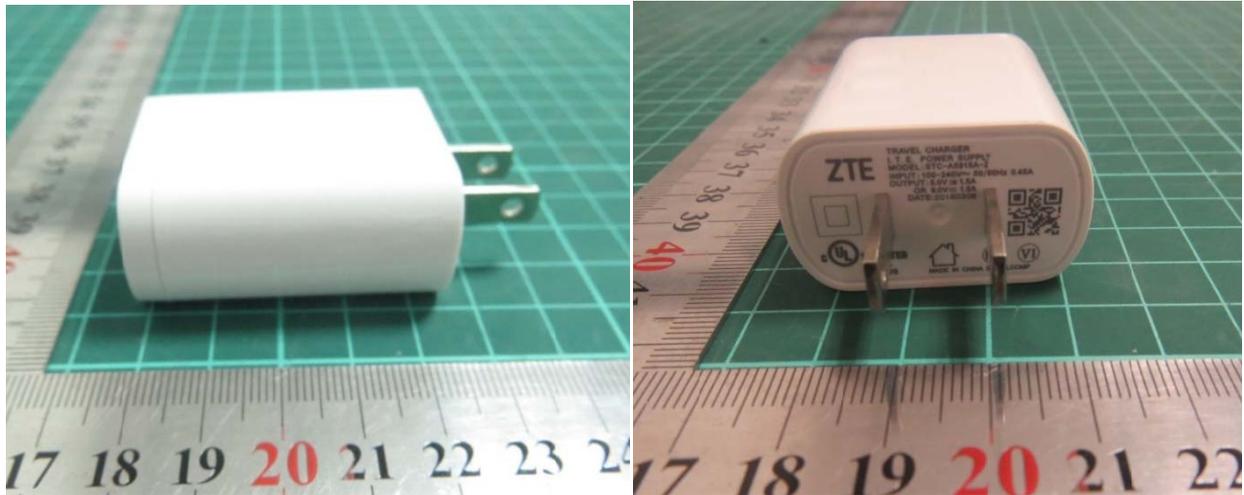


a2: EUT with Phone cover

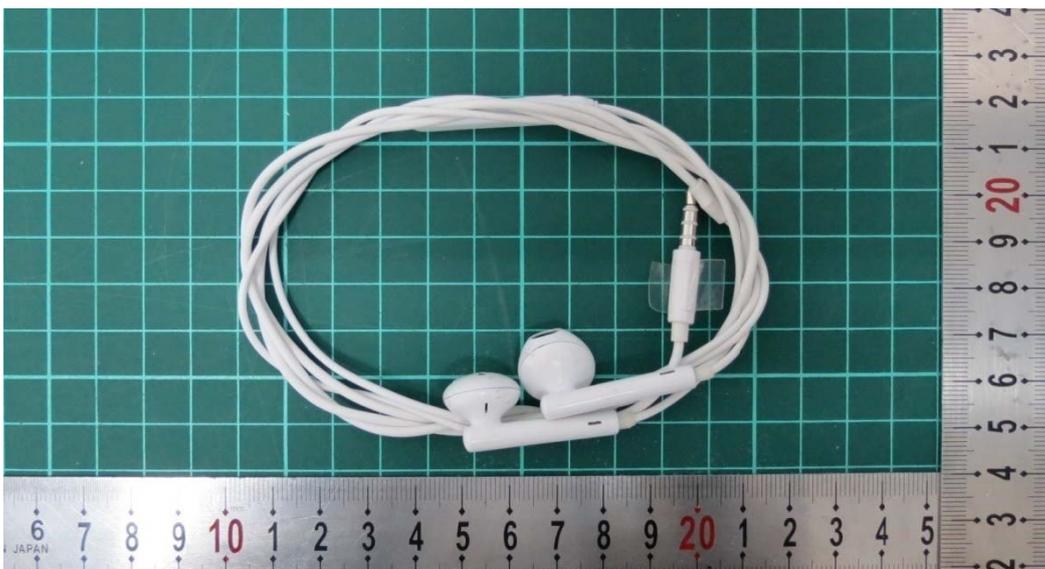
a: EUT



Phone cover



Adapter



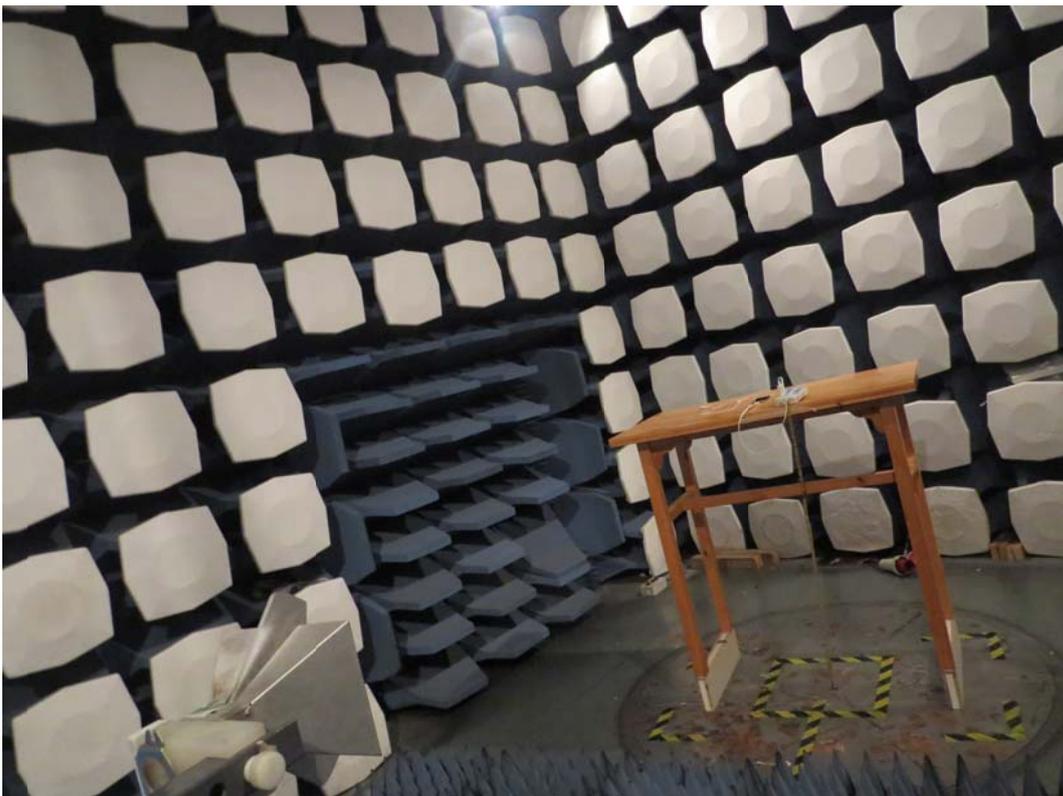
Earphone

Picture 1 Constituents of EUT

A.2 Test Setup

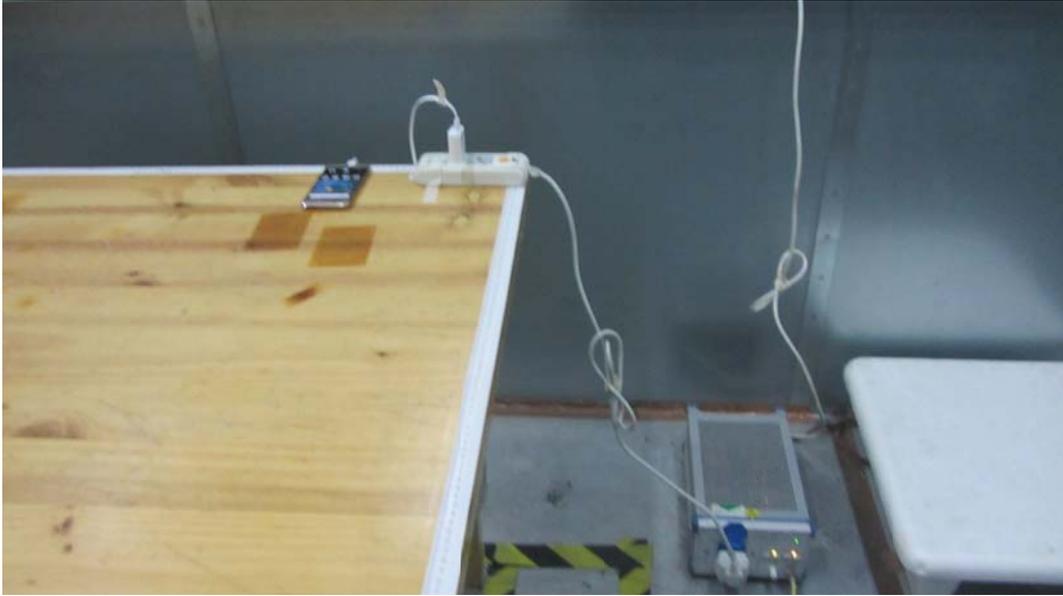


Below 1GHz



Above 1GHz

Picture 2 Radiated Emission Test Setup



Picture 3 Conducted Emission Test Setup