Certification of Compliance

CFR 47 Part 15 Subpart C

Order No.	:	**CSTS-C1107-138**
Test Report No.	:	**CSTS-A11-FCC034**
Applicant	:	**Namsung Corporation.**
Address of Applicant	:	**13F Crown Plaza, 197-22, Guro-dong, Guro-gu, Seoul, Korea (152-050)**

Equipment Under Test (EUT)

Kind of Product	:	**Bluetooth Module**
Model Name	:	**XDMAR6720BT**
FCC ID	:	**GJWXDMAR6720BT**
Standards	:	**FCC CFR Part 15 Subpart C : 2008** **ANSI C63.4:2003**

Date of Receipt : 10 July, 2011
Date of Test : 16 September, 2011
Date of Issue : 06 October, 2011

Test Result : ■ **Positive** □ **Negative**

Ji Hwan, Kim / Testing By Engineer

Jae Yeon, Choi / Senior Engineer

In the configuration tested, the EUT complied with the standards specified above.

Remarks :
This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.
This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

Contents

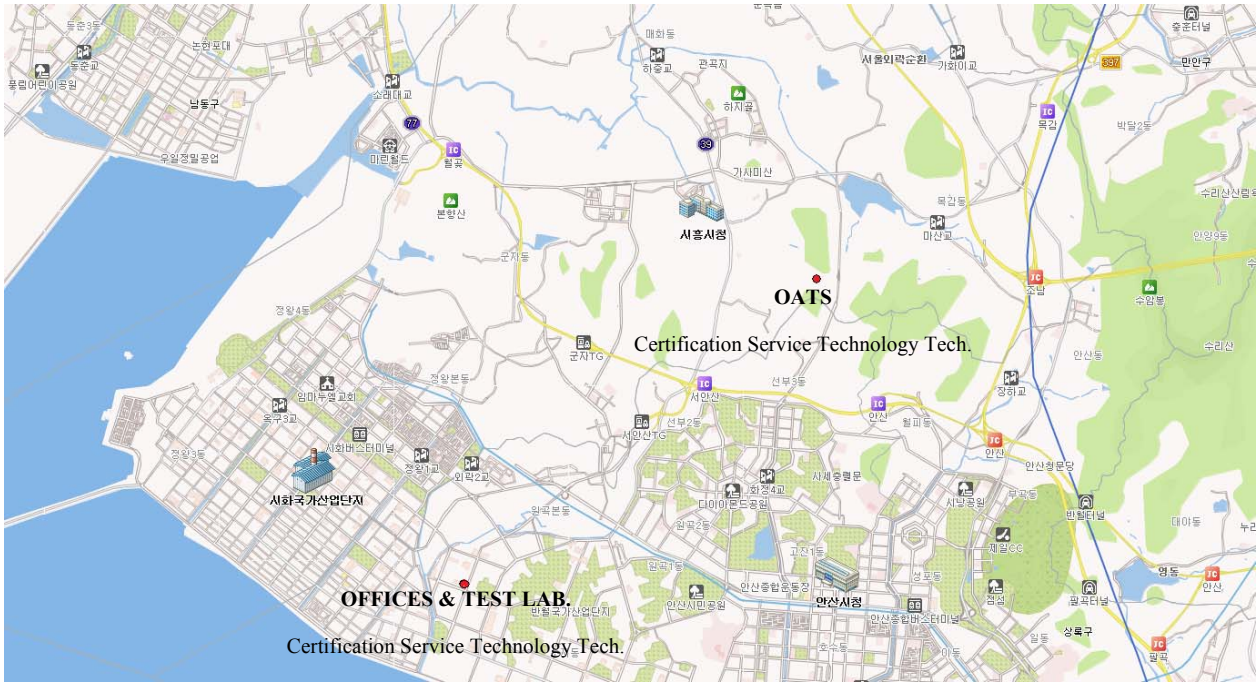
1. General Information

1.1 Information of Test Laboratory.

FCC E-Failing : Registration Number:289252

Name	:	Certification Service Technology Inc.
Address		
Radiated Emission (3m Full Chamber) Conducted Emission	:	2F/1055, Shingil-dong, Danwon-gu, Ansan-City, Gyeonggi-do Korea, 425-839
Radiated Emission (OATS)	:	456 Sanhyeun-dong, Sihung-City, Gyeonggi-do Korea
Tel/Fax	:	+82-31-493-2001 / +82-31-493-2055

Web site : http://www.cstlab.co.kr E-mail : jychoi@cstlab.co.kr

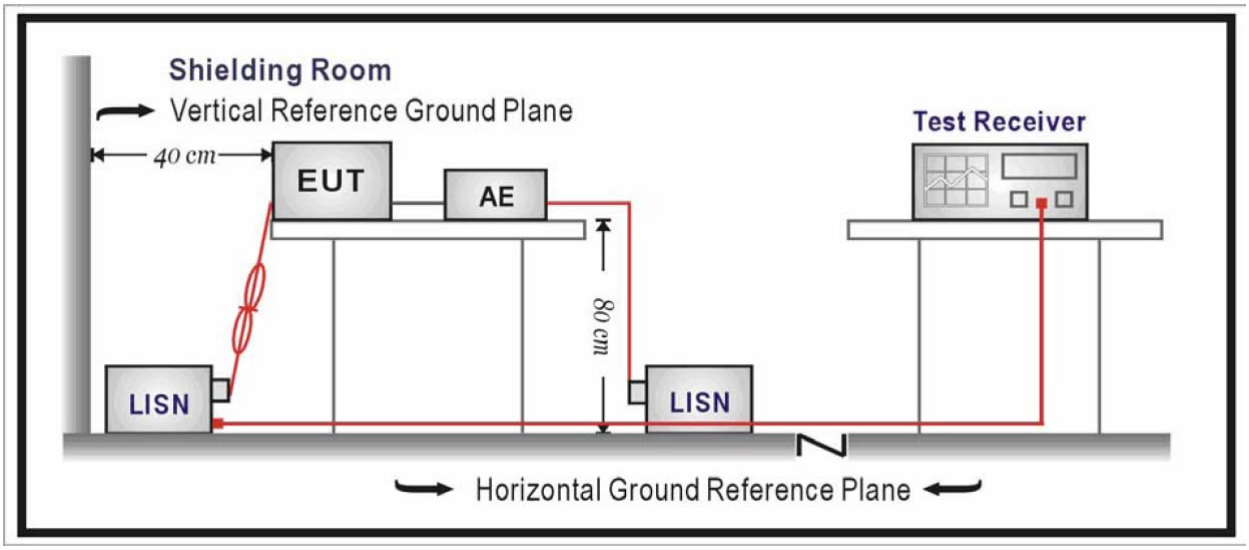


We , Certification Service Technology Inc. are an independent EMC and RF consultancy that was established the whole facility in our laboratories. The test facility has been accredited by the following accreditation Bodies in compliance with ISO 17025:

1.2 Description of Test

Conducted Emissions:

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50 uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50 ohm/50 uH coupling impedance with 50 ohm termination.(Please refers to the block diagram of the test setup and photographs.)
Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed on conducted measurement.
Conducted emissions were invested over the frequency range from 0.15 MHz to 30 MHz using a receiver bandwidth of 9 kHz.



Limit Of Conducted Emission:

Test Specification
: According to FCC CFR Title 47 Part 15 Subpart C Section 15.207

FREQUENCY (MHz)	Limit	
	Quasi-peak	Average
0.15 to 0.5	66 to 56*	56 to 46*
0.5 to 5.0	56	46
5.0 to 30.0	60	50

*Decreases with the logarithm of the frequency.

Radiated Emissions:

The measurement was performed over the frequency range of 30 MHz to 1 GHz using antenna as the input transducer to a Spectrum analyzer or a Field Intensity Meter. The measurement was made with the detector set for "quasi-peak" within a bandwidth of 120 kHz.

Procedure of Test

Preliminary measurements were made at 3 meter using bi-log antennas, and spectrum analyzer to determine the frequency producing the max. emission in anechoic chamber. Appropriate precaution was taken to ensure that all emission from the EUT were maximized and investigated. The system configuration, mode of operation, turn-table azimuth and height with respect to the antenna were noted for each frequency found. The spectrum was scanned from 30 MHz to 1000 MHz using bi-log antenna. Above 1 GHz, linearly polarized double ridge horn antennas were used. Final measurements were made at open site with 3-meters test distance using bi-log antenna or horn antenna. The OATS have been verified in regular for its normalized site attenuation. The test equipment was placed on a wooden table. Sufficient time for the EUT, peripheral equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. Each frequency found during pre-scan measurements was re-examined by manual. The detector function was set to CISPR quasi-peak mode and the bandwidth of the receiver was set to 120 kHz or 1 MHz depending on the frequency of type of signal. The EUT, peripheral equipment and interconnecting cables were re-configured to the set-up producing the max. emission for the frequency and were placed on top of a 0.8-meter high nonmetallic 1 x 1.5 meter table. The EUT, peripheral equipment, and interconnecting cables were re-arranged and manipulated to maximize each emission. The turntable containing the system was rotated; the antenna height was varied 1 to 4 meters and stopped at the azimuth or height producing the maximum emission. Each emission was maximized by: varying the mode of operation to the EUT and/or peripheral equipment and changing the polarity of the antenna, whichever determined the worst-case emission.(The bandwidth below 1 GHz setting on the field strength meter is 120 kHz and above 1 GHz is 1 MHz.)

Radiated Emissions: , 9 kHz to 30 MHz (Magnetic Field Test)

1. The preliminary radiated measurements were performed to determine the frequency producing the maximum emissions at a distance of 3 meters according to Section 15.31(f)(2).
2. The EUT was placed on the top of the 0.8-meter height, 1 x 1.5 meter non-metallic table.
3. Emissions from the EUT are maximized by adjusting the orientation of the Loop antenna and rotating the EUT on the turntable. Manipulating the system cables also maximizes EUT emissions if applicable.
4. To obtain the final measurement data, each frequency found during preliminary measurements was re-examined and investigated. The test-receiver system was set up to average, peak, and quasi-peak detector with specified bandwidth.

Limit Of Radiated Emission :

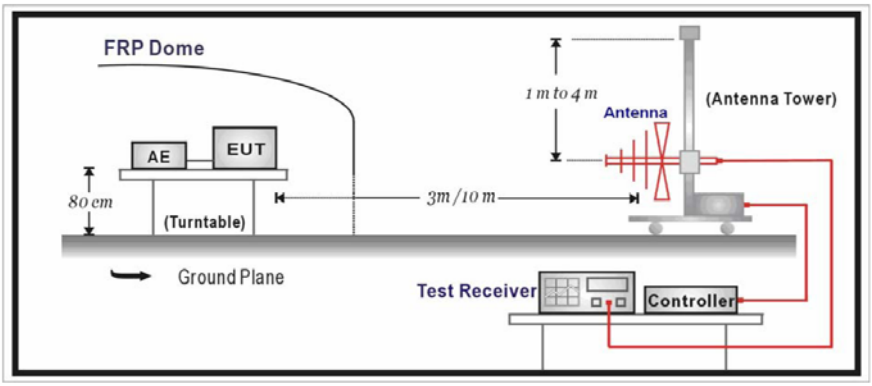
Test Specification
: According to FCC CFR Title 47 Part 15 Subpart C Section 15.209, 15.247

Limits			
Frequency (MHz)	Field Strength (μV/meter)	Measurement Distance (meters)	dBμV/meter
0.009 – 0.490	2400/F (kHz)	300	88.52 – 53.80
0.490 – 1.705	24000/F (kHz)	30	53.80 – 42.97
1.705 – 30.0	30	30	49.54 – 49.54
30 – 88	100	3	40.00
88 – 216	150	3	43.52
216 – 960	200	3	46.02
Above 960	500	3	53.98

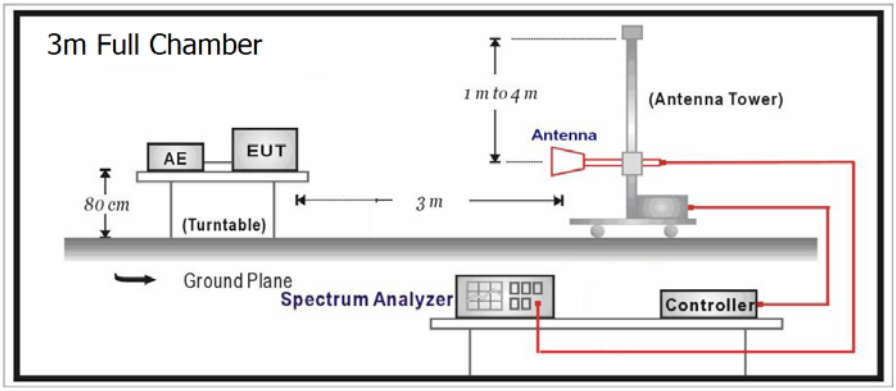
Remarks :

1. RF Voltage(dBuv)=20log RF Voltage(uV)
2. In the Above Table, the tighter limit applies at the band edges.
3. Distance refers to the distance in meters between the measuring
   Instrument antenna and the closed point of any part of the device or System.

Below 1GHz Test Setup:



Above 1GHz Test Setup:



1.3 Measurement Uncertainty Calculations

Conducted Emissions

TYPE	Contribution	Probability Distribution	Uncertainty	Remark
B	LISN			
	Impedance	normal(k=2)	±1.3	CAL.
	Voltage Division Factor	normal(k=2)	±0.12	CAL.
	cable	normal (k=2)	±0.2	NONCAL.
	Receiver			CAL.
	Input Impedance	normal(k=1.64)	±0.0070	
	QP Sine-Wave Voltage Accuracy	normal(k=2)	±0.20 dB	
	QP-Pulse Amplitude Sensibility	normal(k=2)	±0.40 dB	
	QP-Pulse Frequency Response	normal(k=2)	±0.57 dB	
	Random Noise	normal(k=2)	±0.35 dB	
	Mismatch AMN to Receiver	U-Shaped	+0.7/-0.8	CISPR Theory
A	System Repeatability	Std deviation	±0.0721	
Combined Standard Uncertainty		normal	± 1.1155 [dB]	
Expanded Uncertainty U		normal(k=2)	*± 2.23*	*95.45 %*

Radiated Emission

TYPE	Contribution	Probability Distribution	Uncertainty 3/10m	Remark
B	Antenna			
	factor	normal(k=2)	±0.5 dB	
	frequency interpolation			
	height variation	rectangular	±0.1039 dB	NPL
	direcvalupsy difference	rectangular	+1.5/-2.6 dB	NAMAS
	phase center location	rectangular	+0/-1.0 dB ±1.0 dB	NAMAS
	Cable loss	normal(k=2)	±0.5 dB	
	Receiver			
	Input Impedance	normal(k=1.64)	±0.0070	
	QP Sine-Wave Voltage Accuracy	normal(k=2)	±0.20 dB	
	QP-Pulse Amplitude Sensibility	normal(k=2)	±0.40 dB	
	QP-Pulse Frequency Response	normal(k=2)	±0.57 dB	
	Random Noise	normal(k=2)	±0.35 dB	
	Mismatch : AMN – receiver $\lvert\Gamma_{antenna}\rvert$ =0.33 $\lvert\Gamma_{receiver}\rvert$ =0.33	U-Shaped	+0.9/-1.0 dB	CISPR
A	System repeatibility	Std deviation	±0.1149 dB	
Combined standard Uncertainty		normal	±1.3193 [dB]	
Expanded Uncertainty U		normal(k=2)	*± 2.63*	*95.45 %*

1.4 Manufacturer Information

Manufacturer	:	Namsung Corporation.
Address		13F Crown Plaza, 197-22, Guro-dong, Guro-gu, Seoul, Korea (152-050)

1.5 General Description of EUT

Name	:	Bluetoot Module
Model No.	:	XDMAR6720BT
FCC ID	:	GJW
Serial No.	:	N/A

1.6 Details of EUT

Section	Specification
Frequency Range	2 402 MHz ~ 2 480 MHz
Modulation Method	FHSS (Frequency Hopping Spread Spectrum)
Antenna	Chip Antenna
The Number of Channel	79 Channels
Input Voltage	DC 3.3 V, 50 mAh
Operating Temperature Range	0 ~ 40 °C
Modulation Type	Bluetooth (1Mbps) : GFSK Bluetooth (2Mbps) : π/4-DQPSK Bleutooth (3Mbps) : 8-DPSK
Maximum Output Power to Antenna	Bluetooth (1Mbps) : -7.30 dBm Bluetooth (2Mbps) : -7.20 dBm Bleutooth (3Mbps) : -6.55 dBm
Communication Mode	Duplex

- Please refer to user's manual.

1.7 Description of Support Units

Product	Model No.	Serial No.	Manufacturer	Certification
Bluetooth Module	XDMAR6720BT	N/A	Namsung Corporation.	EUT
Test Zig Board	N/A	N/A	N/A	N/A
AC/DC Adaptor (Test Zig Board)	SGS-510	20090402-012	Grace & Bless Electronics Co., Ltd	CoC
Notebook Computer	TG AVEARTEC 3700	N/A	Trigem Computer Inc.	DoC
AC Adaptor (Notebook Computer)	PA-1750-01	460013690A	Dongguang Lite Power 2nd Plant	CoC

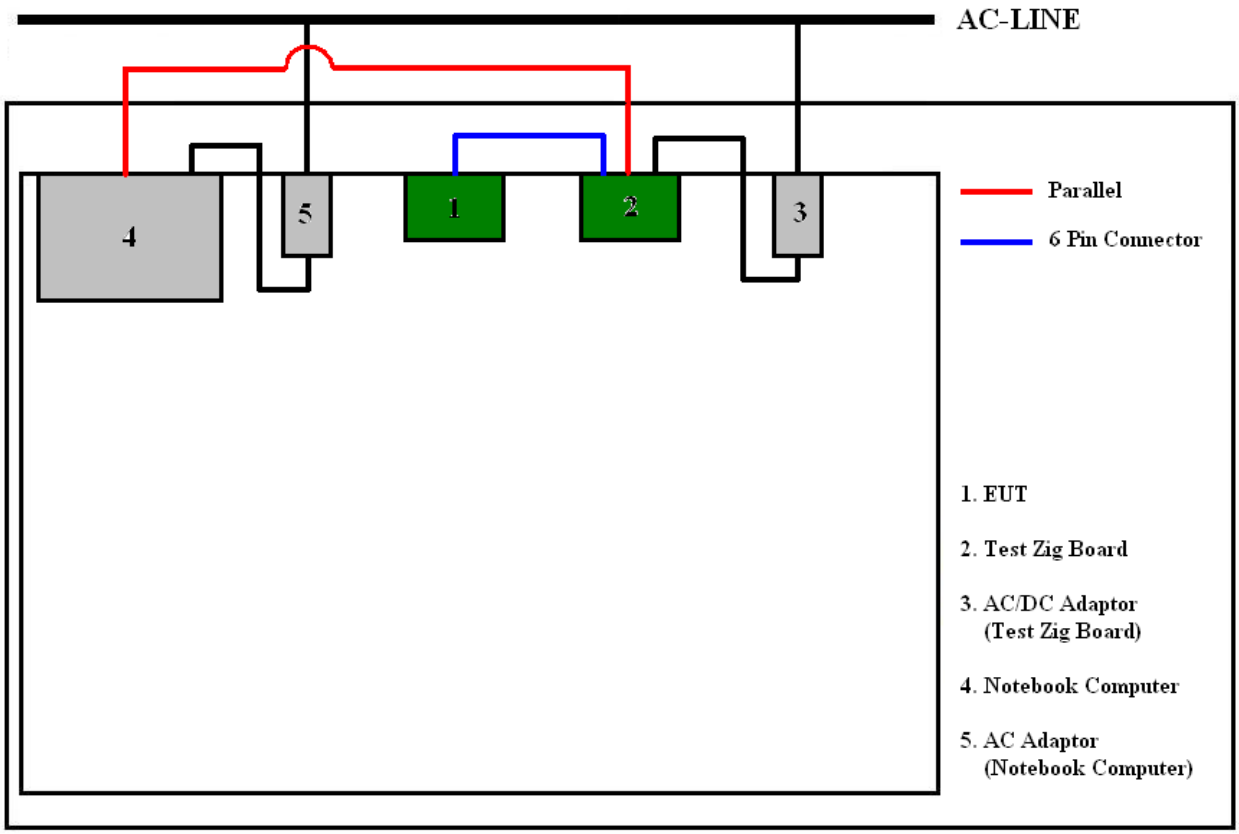
1.8 Cable List

Start		END		Cable Spec	
Name	I/O Port	Name	I/O Port	Lenth	Shield
EUT	6 Pin Connector	Test Zig Board	6 Pin Connector	0.2	Unshielded
Test Zig Board	Parallel	Notebook Computer	Parallel	2.0	Shielded
	DC-IN	AC/DC Adaptor	DC-OUT	1.6	Shielded
AC/DC Adapter (Test Zig Board)	AC-IN	AC-LINE	AC-OUT	1.1	Unshielded
Notebook Computer	DC-IN	AC/DC Adaptor	DC-OUT	1.8	Shielded
AC Adpator (Notebook Computer)	AC-IN	AC-LINE	AC-OUT	2.0	Unshielded

1.9 System Configuration

Description	Model	Serial No.	Manufacturer
-	-	-	-

1.10 Test Set-Up Configuration



1.11 Test Methodology And Configuration

Test Program used to control the EUT for staying in continuous Tx and Rx mode is programmed.

1.12 Standards Applicable for Testing

Table of tests to be carried out under FCC Part 15 Subpart C

Test Standards	Status
FCC Part 15 Subpart C	A
Deviation from Standard	No Deviation

Note) N/A : Indicates that the test is not applicable
A : Indicates that the test is applicable

2. SUMMARY

Test Descriptions

- **Conducted Emission**
  -Conducted Emission Result — **N/A**
- **Radiated Emission**
  Radiated Emission Result — **PASS**
- **Number of Hopping Frequency Used**
  Test Result — **PASS**
- **Dwell Time in Each Channels**
  Test Result — **PASS**
- **Channel Bandwidth**
  Test Result — **PASS**
- **Hopping Channel Separaion**
  Test Result — **PASS**
- **Maximum Peak Output Power Test Result**
  Test Result — **PASS**
- **Band Edge**
  Test Result — **PASS**

RF Output Power

Preliminary tests were performed in different data rate and recorded the RF output power in the following table :

Channel	Frequency	Bluetooth RF Output Power Data Rate / Modulation		
		GFSK	π/4-DQPSK	8-DPSK
		1 Mbps	2 Mbps	3 Mbps
F_L	2402 MHz	-8.02 dBm	-7.95 dBm	-6.99 dBm
F_M	2441 MHz	-7.30 dBm	-7.20 dBm	-6.55 dBm
F_H	2480 MHz	-7.85 dBm	-7.80 dBm	-6.95 dBm

Remark :

1. The data rate was set in 3 Mbps for all test items due to the highest RF out power.
2. The EUT is Programmed to transmit signals continuously for all testing.

2.1. Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated : conduction (150 kHz to 30 MHz), radiation (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

Pre-scanned tests wer conducted to determine the final congiguration from all passible combinatinons. The following tables are showing the test modes as the worst cases and recorded in this report.

Test Cases			
Test Items	Data Rate / Modulation		
	Bluetooth 1 Mbps GFSK	Bluetooth 2 Mbps π/4-DQPSK	Bluetooth 3 Mbps 8-DPSK
Conducted Test Cases	CH00 : 2402 MHz CH39 : 2441 MHz CH78 : 2480 MHz	CH00 : 2402 MHz CH39 : 2441 MHz CH78 : 2480 MHz	CH00 : 2402 MHz CH39 : 2441 MHz CH78 : 2480 MHz
Radiated Test Cases	N/A	N/A	CH00 : 2402 MHz CH39 : 2441 MHz CH78 : 2480 MHz
AC Conducted Emission	N/A	N/A	CH00 : 2402 MHz CH39 : 2441 MHz CH78 : 2480 MHz
Remark : For radiated and AC Conducted Emission Test Cases, the datarate was set in 3 Mbps due to the highest RF output power : only the data of these modes was reported.			

3. Equipment Under Test

3.1 Conducted Emission

3.1.1 Test Instruments

Description	Manufacturer	Model No.	Serial No.	Next of Calibration
Test Receiver	LIG NEX1	ER-30	L0804A003	Sep. 07, 2012
LISN	EMCIS	LN2-16	LN10010	Mar. 30, 2012
LISN	EMCO	3825/2	9006-1666	Mar. 30, 2012
Transient Limiter	HP	11947A	3107A00640	Sep. 07, 2012
Shielded Room	BRADEN	N/A	DAC-60-005	-

Note : 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to RRL, KRISS, KTL and HCT.

2. The calibration interval of horn ant. and loop ant. is 24 months

3.1.2 Test Area

Conducted Room (Shielded Room)

3.1.3 Operation of EUT Continues TX mode.

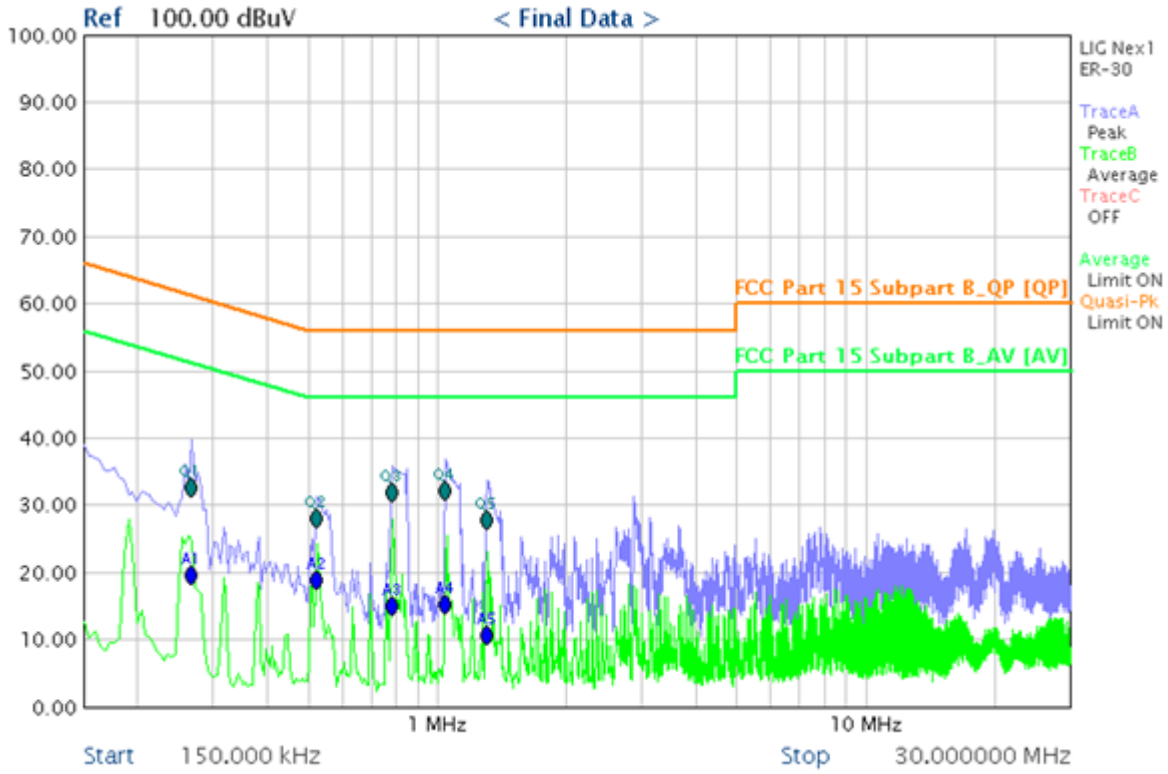
Operating Environment

Temperature	:	22.4	degree C
Humidity	:	51	%R.H.
Atmospheric Pressure	:	98.3	kPa

3.1.4 Test Date 05. Oct. 2011

3.1.5 Conducted Emissions Result

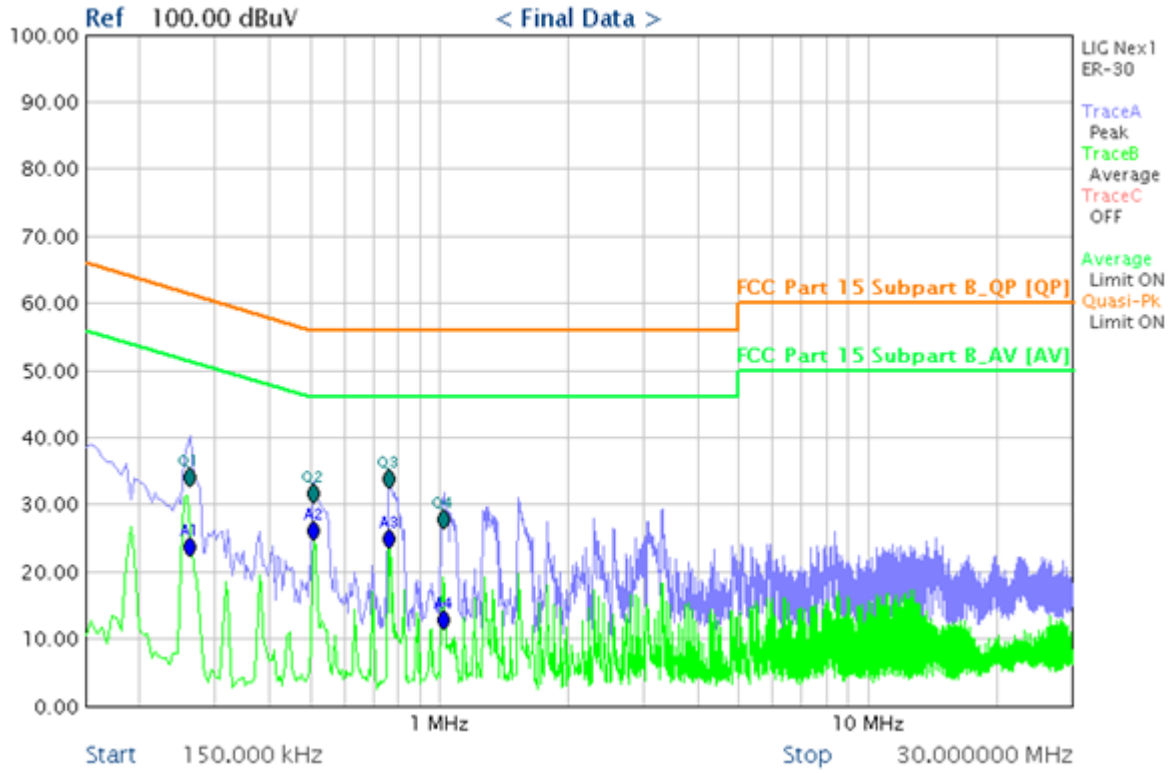
Test Frequency	0.15 kHz to 30 MHz	Test Mode	Continuous Tx - F1 (2 402 MHz)
Modulation	**8-DPSK**	Test Phase	Live
Test Result	PASS		



Freq. [MHz]	Measurement [dBµV]		Limit [dBµV]		Insertion Loss	Cable Loss	Result [dBµV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	[dB]	[dBµV]	Q-peak	Average	Q-peak	Average
0.267	32.27	19.29	61.21	51.21	0.13	0.05	32.45	19.47	28.76	31.74
0.524	27.76	18.63	56.00	46.00	0.07	0.07	27.90	18.77	28.10	27.23
0.789	31.66	14.68	56.00	46.00	0.06	0.09	31.81	14.83	24.19	31.17
1.046	31.95	14.90	56.00	46.00	0.05	0.11	32.11	15.06	23.89	30.94
1.307	27.39	10.34	56.00	46.00	0.04	0.12	27.55	10.50	28.45	35.50

Note :

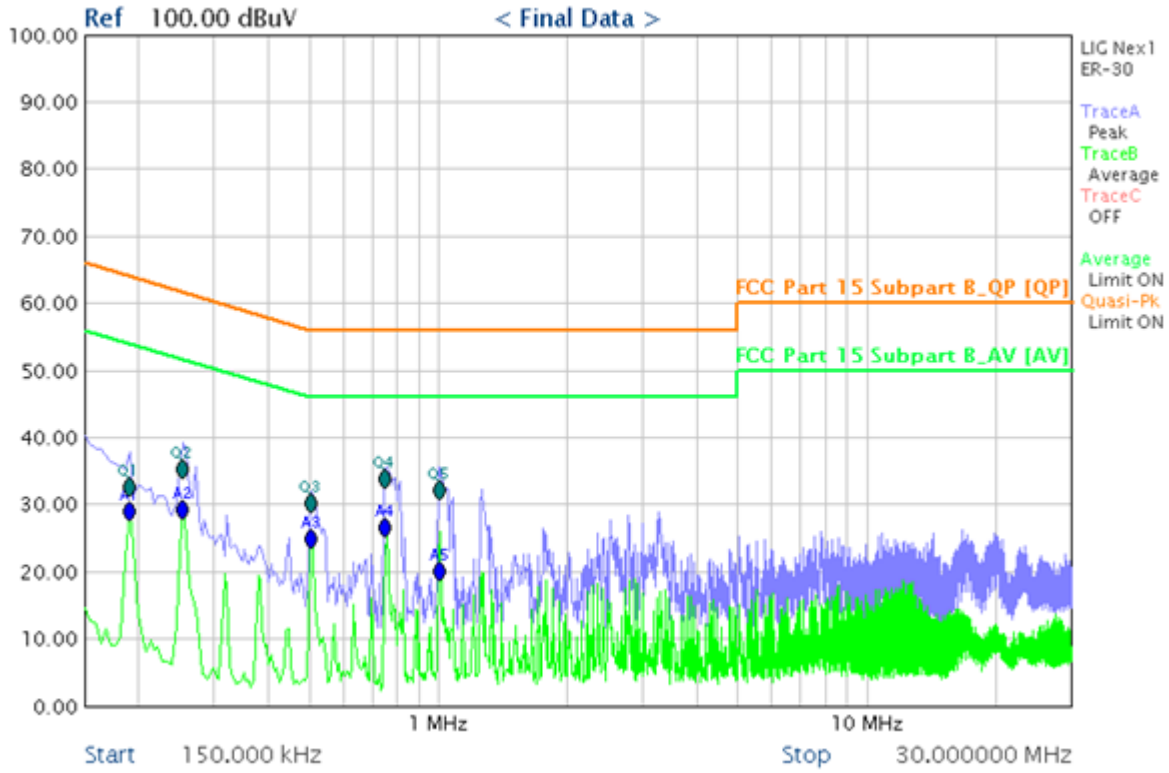
Test Frequency	0.15 kHz to 30 MHz	Test Mode	Continuous Tx - F1 (2 402 MHz)
Modulation	**8-DPSK**	Test Phase	Neutral
Test Result	PASS		



Freq. [MHz]	Measurement [dBµV]		Limit [dBµV]		Insertion Loss	Cable Loss	Result [dBµV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	[dB]	[dBµV]	Q-peak	Average	Q-peak	Average
0.263	33.79	23.52	61.35	51.35	0.09	0.05	33.93	23.66	27.42	27.69
0.510	31.31	25.81	56.00	46.00	0.06	0.07	31.44	25.94	24.56	20.06
0.767	33.54	24.57	56.00	46.00	0.04	0.09	33.67	24.70	22.33	21.30
1.028	27.63	12.62	56.00	46.00	0.04	0.11	27.78	12.77	28.22	33.23

Note :

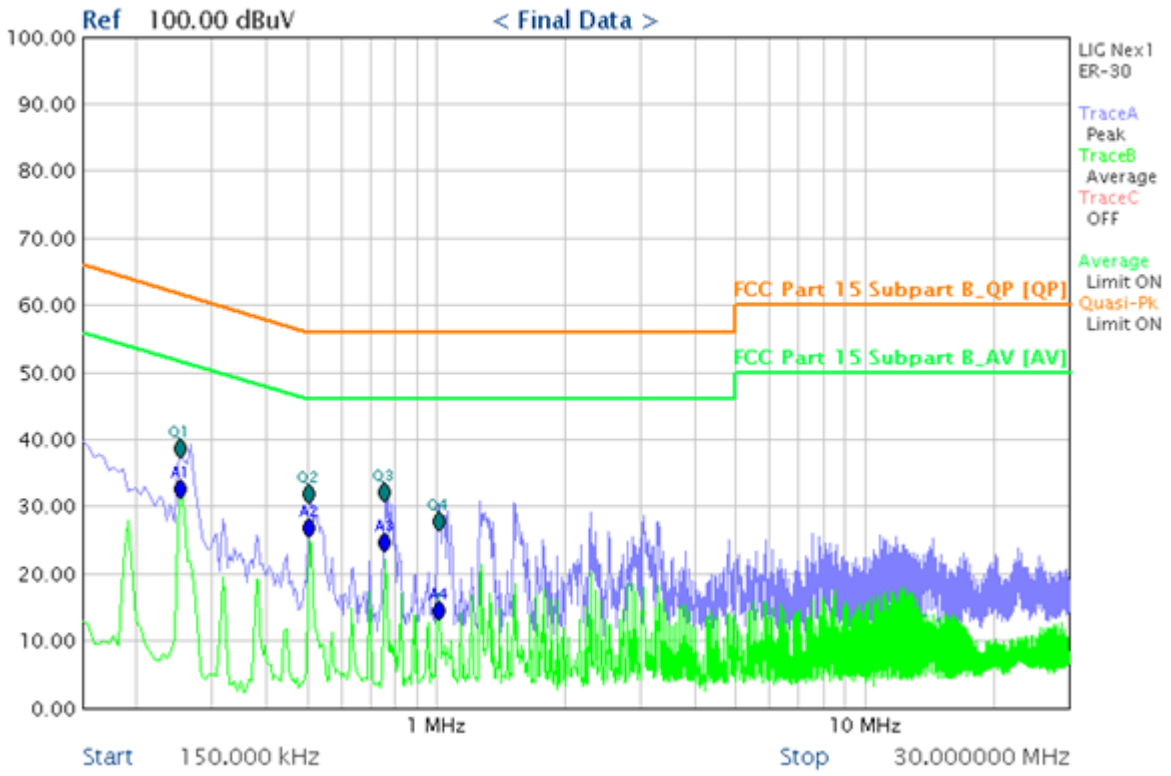
Test Frequency	0.15 kHz to 30 MHz	Test Mode	Continuous Tx – F2 (2 441 MHz)
Modulation	**8-DPSK**	Test Phase	Live
Test Result	PASS		



Freq. [MHz]	Measurement [dBµV]		Limit [dBµV]		Insertion Loss	Cable Loss	Result [dBµV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	[dB]	[dBµV]	Q-peak	Average	Q-peak	Average
0.191	32.30	28.61	64.01	54.01	0.19	0.08	32.57	28.88	31.44	25.13
0.254	35.08	28.92	61.64	51.64	0.13	0.05	35.26	29.10	26.38	22.54
0.506	29.98	24.73	56.00	46.00	0.07	0.07	30.12	24.87	25.88	21.13
0.753	33.51	26.18	56.00	46.00	0.06	0.09	33.66	26.33	22.34	19.67
1.014	31.80	19.87	56.00	46.00	0.05	0.11	31.96	20.03	24.04	25.97

Note :

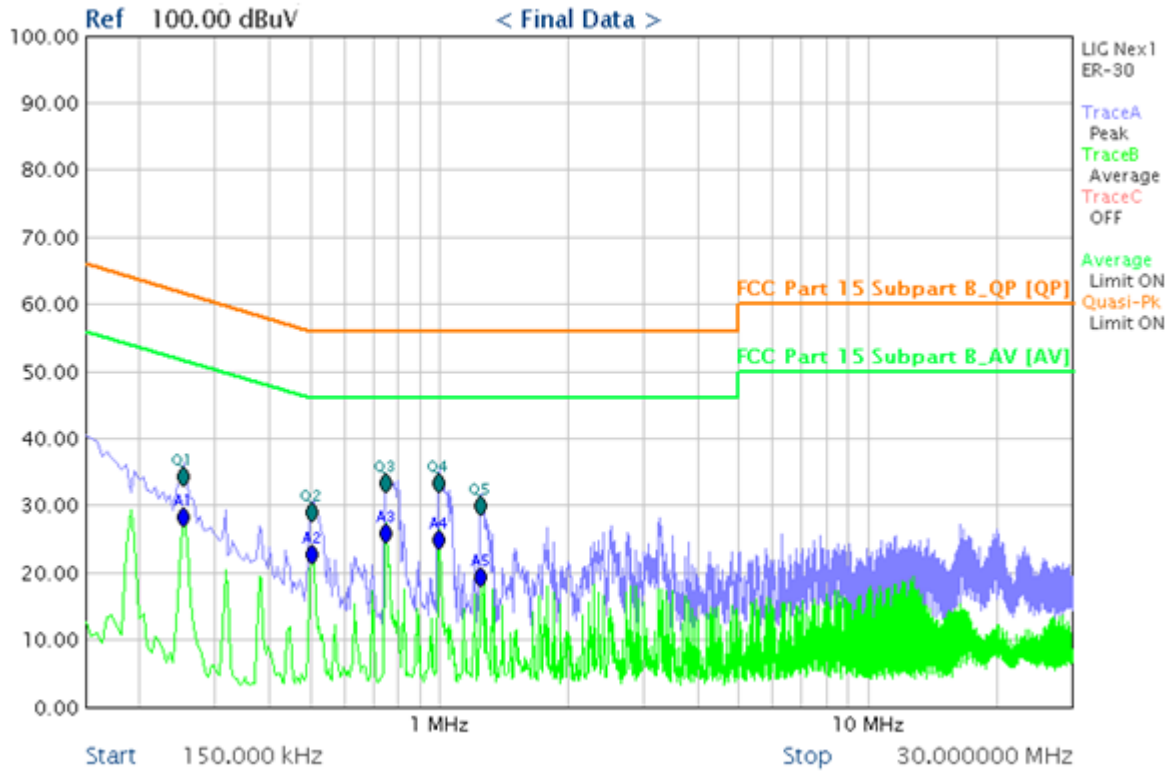
Test Frequency	0.15 kHz to 30 MHz	Test Mode	Continuous Tx – F2 (2 441 MHz)
Modulation	**8-DPSK**	Test Phase	Neutral
Test Result	PASS		



Freq. [MHz]	Measurement [dBµV]		Limit [dBµV]		Insertion Loss	Cable Loss	Result [dBµV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	[dB]	[dBµV]	Q-peak	Average	Q-peak	Average
0.254	38.39	32.31	61.64	51.64	0.10	0.05	38.54	32.46	23.10	19.18
0.506	31.60	26.46	56.00	46.00	0.06	0.07	31.73	26.59	24.27	19.41
0.575	31.89	24.33	56.00	46.00	0.05	0.08	32.02	24.46	23.98	21.54
1.019	27.60	14.34	56.00	46.00	0.04	0.11	27.75	14.49	28.25	31.51

Note :

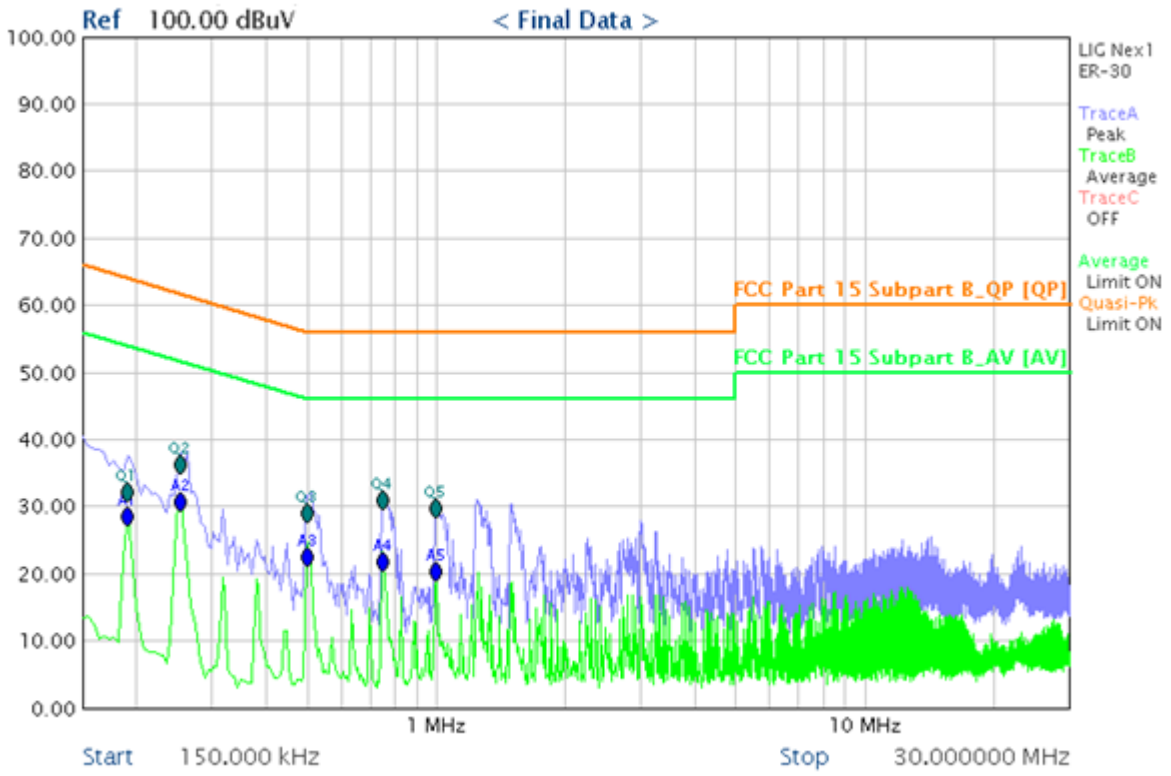
Test Frequency	0.15 kHz to 30 MHz	Test Mode	Continuous Tx – F3 (2 480 MHz)
Modulation	**8-DPSK**	Test Phase	Live
Test Result	PASS		



Freq. [MHz]	Measurement [dBµV]		Limit [dBµV]		Insertion Loss	Cable Loss	Result [dBµV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	[dB]	[dBµV]	Q-peak	Average	Q-peak	Average
0.254	34.05	27.93	61.64	51.64	0.13	0.05	34.23	28.11	27.41	23.53
0.506	28.68	22.51	56.00	46.00	0.07	0.07	28.82	22.65	27.18	23.35
0.753	33.11	25.60	56.00	46.00	0.06	0.09	33.26	25.75	22.74	20.25
1.001	33.13	24.64	56.00	46.00	0.05	0.11	33.29	24.80	22.71	21.20
1.248	29.56	18.97	56.00	46.00	0.05	0.11	29.72	19.13	26.28	26.87

Note :

Test Frequency	0.15 kHz to 30 MHz	Test Mode	Continuous Tx – F3 (2 480 MHz)
Modulation	**8-DPSK**	Test Phase	Neutral
Test Result	PASS		



Freq. [MHz]	Measurement [dBµV]		Limit [dBµV]		Insertion Loss	Cable Loss	Result [dBµV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	[dB]	[dBµV]	Q-peak	Average	Q-peak	Average
0.191	31.83	28.16	64.01	54.01	0.14	0.08	32.05	28.38	31.96	25.63
0.254	35.92	30.32	61.64	51.64	0.10	0.05	36.07	30.47	25.57	21.17
0.501	28.71	22.16	56.00	46.00	0.06	0.07	28.84	22.29	27.16	23.71
0.753	30.75	21.54	56.00	46.00	0.04	0.09	30.88	21.67	25.12	24.33
1.001	29.38	19.99	56.00	46.00	0.04	0.11	29.53	20.14	26.47	25.86

Note :

3.2 Radieted Emission

3.2.1 Test Instruments

Description	Manufacturer	Model No.	Serial No.	Next of Calibration
Test Receiver	LIG NEX1	ER-265	L0804B002	Jul. 14, 2012
BICONILOG ANT.	EMCO	3142	9107-1128	Apr. 27, 2012
LOOP ANT.	Schwarz beck	HFH2-Z2	100187	Jul. 21, 2013
Horn Antenna	Schwarzbeck	BBHA9120D	0501	Aug. 31 2012
Horn Antenna	Schwarzbeck	BBHA9170	BBHA9170152	Aug. 31. 2012
BICONICAL ANT.	EMCO	3104C	9012-4380	Mar. 26, 2012
LOGPERIODIC ANT.	EMCO	3146	9008-2863	Mar. 28, 2012
Turn Table	EMCO	D-TT 06	N/A	-
Ant. Mast	EMCO	D-AM 06	N/A	-
Controller	EMCO	D-CTR 06	N/A	-
T-TABLE CONTROLLER	EMCO	1060-1.511	9101-1517	-
CHAMBER	BRADEN	RF Shielded door Assembly	DAC-60-004	-

Note : 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to RRL, KRISS, KTL and HCT.

2. The calibration interval of horn ant. and loop ant. is 24 months

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. For the limit is employed average value, therefore the peak value can be transferred to average value by subtracting the duty factor. The basic equation with a sample calculation is as follows:

Peak = Reading + Corrected Factor

Where

Corr. Factor = Antenna Factor + Cable Factor - Amplifier Gain (if any)

3.2.2 Test Area

3m Full Chamber

3.2.3 Operation of EUT

Operating Environment

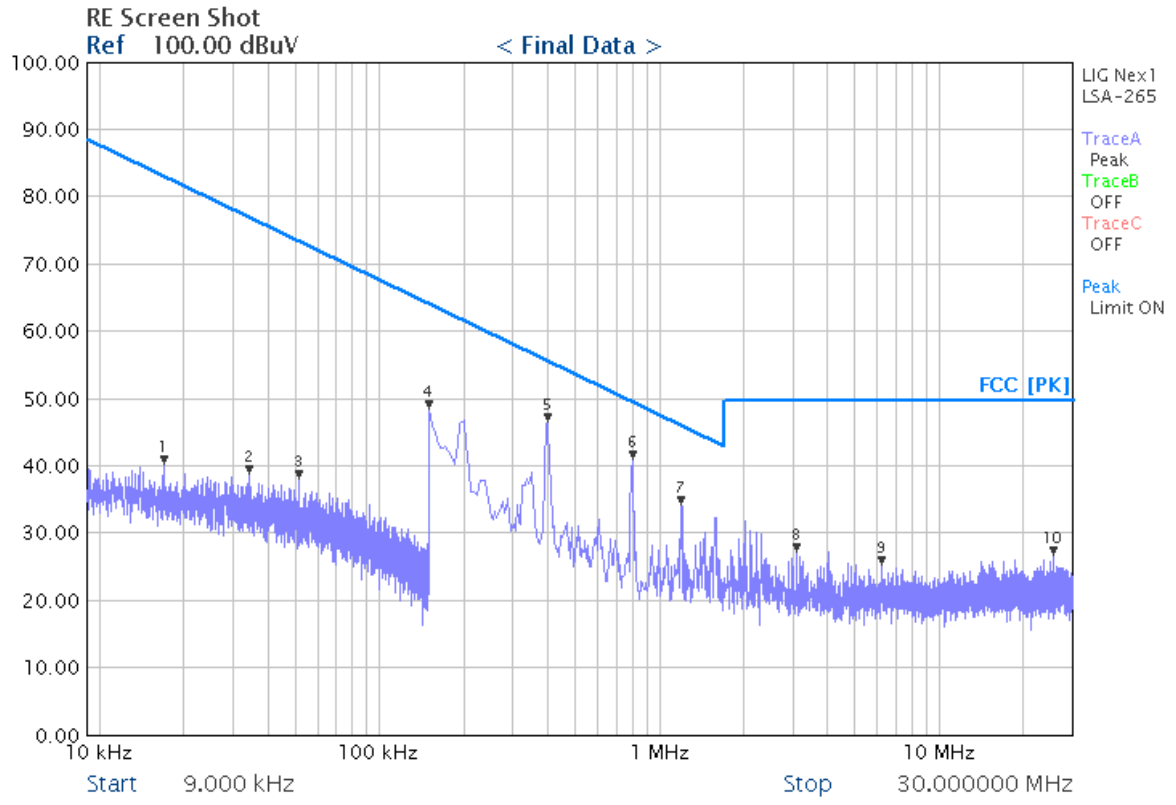
Temperature	:	22.8	degree C
Humidity	:	50	%R.H.
Atmospheric Pressure	:	98.1	kPa

3.2.4 Test Date

15 September, 2011

3.2.5 Radiated Emission Result (9 kHz ~ 30 MHz)

Test Frequency	9 kHz to 30 MHz	Polarization	Horizontal
Test Mode	Continuous Tx - F1 (2 402 MHz)	Modulation	**8-DPSK**
Test Result	PASS		



Frequency (MHz)	Reading (dBuV)	P (H, V)	Correct Factor (dB)	Amp Gain (dB)	Limit (dBuV)	Total (dBuV)	Margin (dB)
0.150	29.41	H	19.03	–	64.08	48.44	15.64
0.401	27.45	H	19.03	–	55.53	46.48	9.05
0.799	21.75	H	19.10	–	49.56	40.85	8.71
1.196	15.03	H	19.16	–	46.05	34.19	11.86

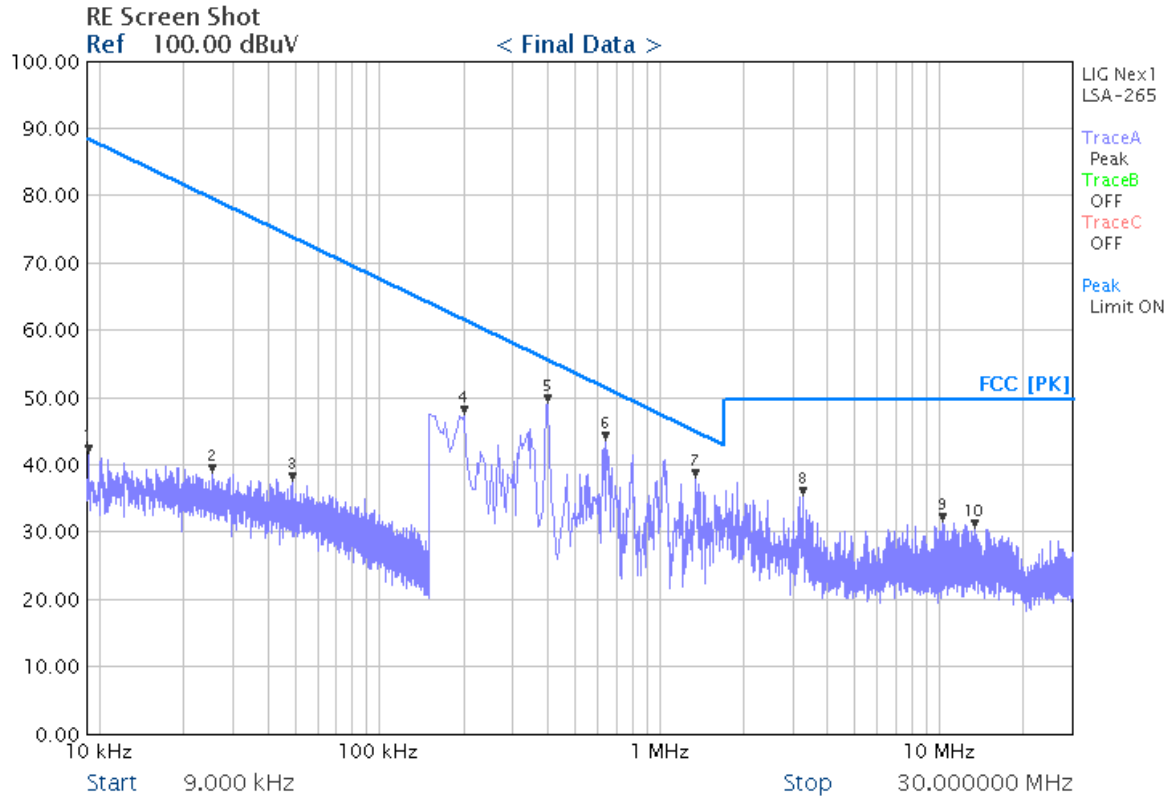
Note : 1. All reading levels are Quasi-peak value.

2. Measurement level = reading level + correct factor (Antenna Factor + Cable loss)

3. Other emissions don't exceed the level of 20 dB below the applicable Limit.

4. Z axis plane was the worst test result than X axis plane and Y axis plane.

Test Frequency	9 kHz to 30 MHz	Polarization	Vetical
Test Mode	Continuous Tx - F1 (2 402 MHz)	Modulation	**8-DPSK**
Test Result	PASS		



Frequency (MHz)	Reading (dBuV)	P (H, V)	Correct Factor (dB)	Amp Gain (dB)	Limit (dBuV)	Total (dBuV)	Margin (dB)
0.401	30.17	V	19.03	–	55.53	49.20	6.33
0.642	24.43	V	19.08	–	51.45	43.51	7.94
1.345	18.99	V	19.17	–	45.03	38.16	6.87
3.244	16.08	V	19.19	–	49.54	35.27	14.27
10.328	11.67	V	19.93	–	49.54	31.60	17.94

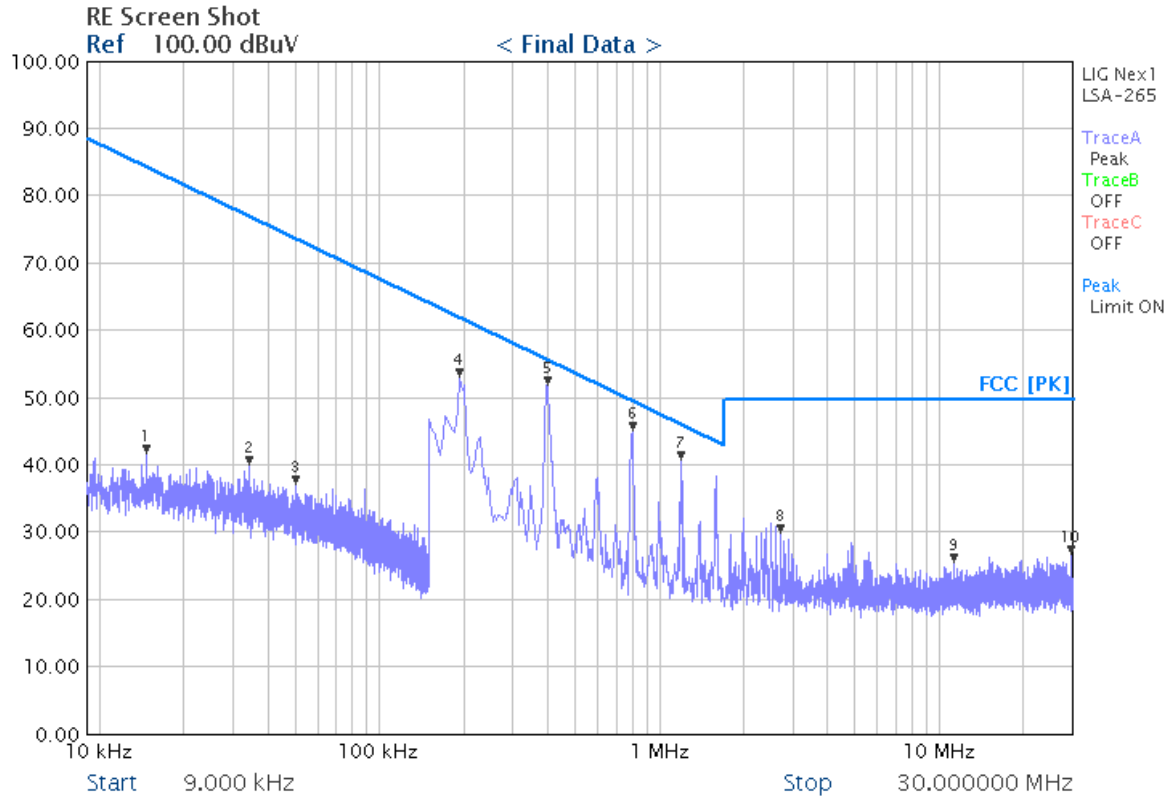
Note : 1. All reading levels are Quasi-peak value.

2. Measurement level = reading level + correct factor (Antenna Factor + Cable loss)

3. Other emissions don't exceed the level of 20 dB below the applicable Limit.

4. Z axis plane was the worst test result than X axis plane and Y axis plane.

Test Frequency	9 kHz to 30 MHz	Polarization	Horizontal
Test Mode	Continuous Tx - F2 (2 441 MHz)	Modulation	**8-DPSK**
Test Result	PASS		



Frequency (MHz)	Reading (dBuV)	P (H, V)	Correct Factor (dB)	Amp Gain (dB)	Limit (dBuV)	Total (dBuV)	Margin (dB)
0.194	33.93	H	19.03	–	61.86	52.96	8.90
0.401	32.81	H	19.03	–	55.53	51.84	3.69
0.799	26.03	H	19.10	–	49.56	45.13	4.43
1.196	21.61	H	19.16	–	46.05	40.77	5.28
2.701	10.60	H	19.20	–	49.54	29.80	19.74

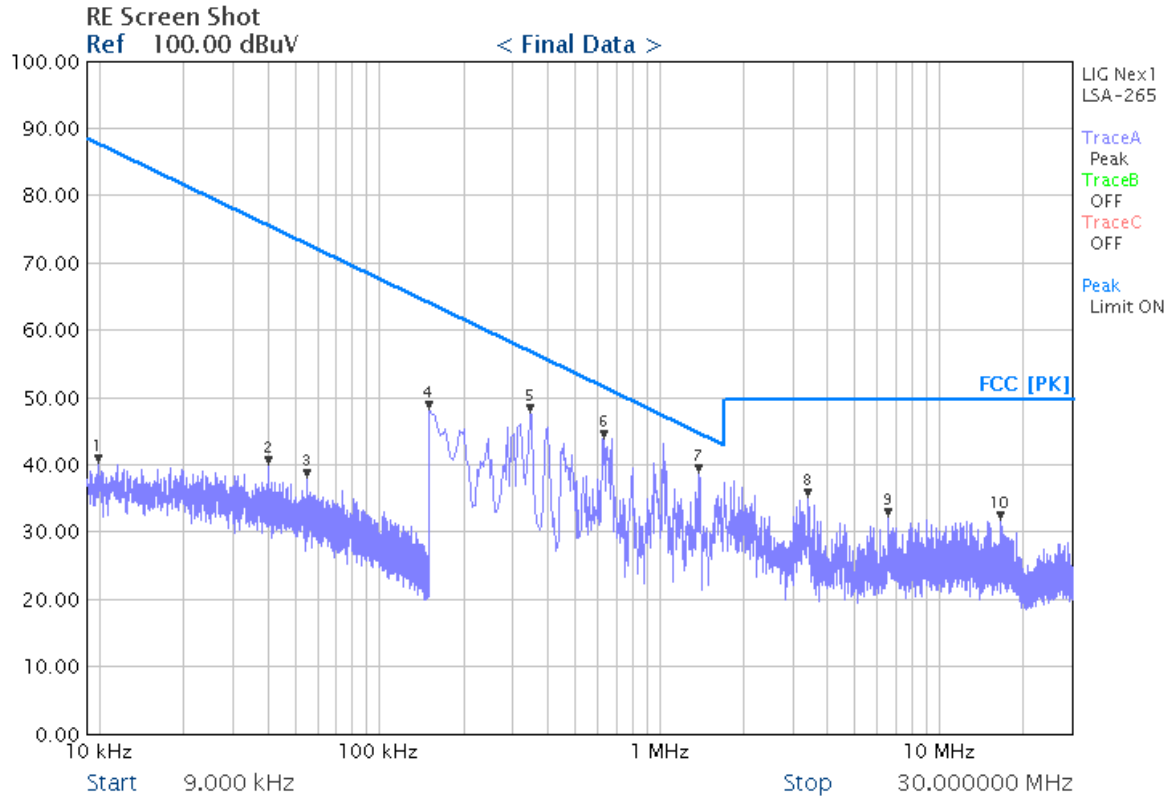
Note : 1. All reading levels are Quasi-peak value.

2. Measurement level = reading level + correct factor (Antenna Factor + Cable loss)

3. Other emissions don't exceed the level of 20 dB below the applicable Limit.

4. Z axis plane was the worst test result than X axis plane and Y axis plane.

Test Frequency	9 kHz to 30 MHz	Polarization	Vetical
Test Mode	Continuous Tx - F2 (2 441 MHz)	Modulation	**8-DPSK**
Test Result	PASS		



Frequency (MHz)	Reading (dBuV)	P (H, V)	Correct Factor (dB)	Amp Gain (dB)	Limit (dBuV)	Total (dBuV)	Margin (dB)
0.150	29.04	V	19.03	–	64.08	48.07	16.01
0.343	28.68	V	19.02	–	56.89	47.70	9.19
0.635	24.86	V	19.08	–	51.55	43.94	7.61
1.374	19.69	V	19.17	–	44.84	38.86	5.98
3.397	15.95	V	19.18	–	49.54	35.13	14.41

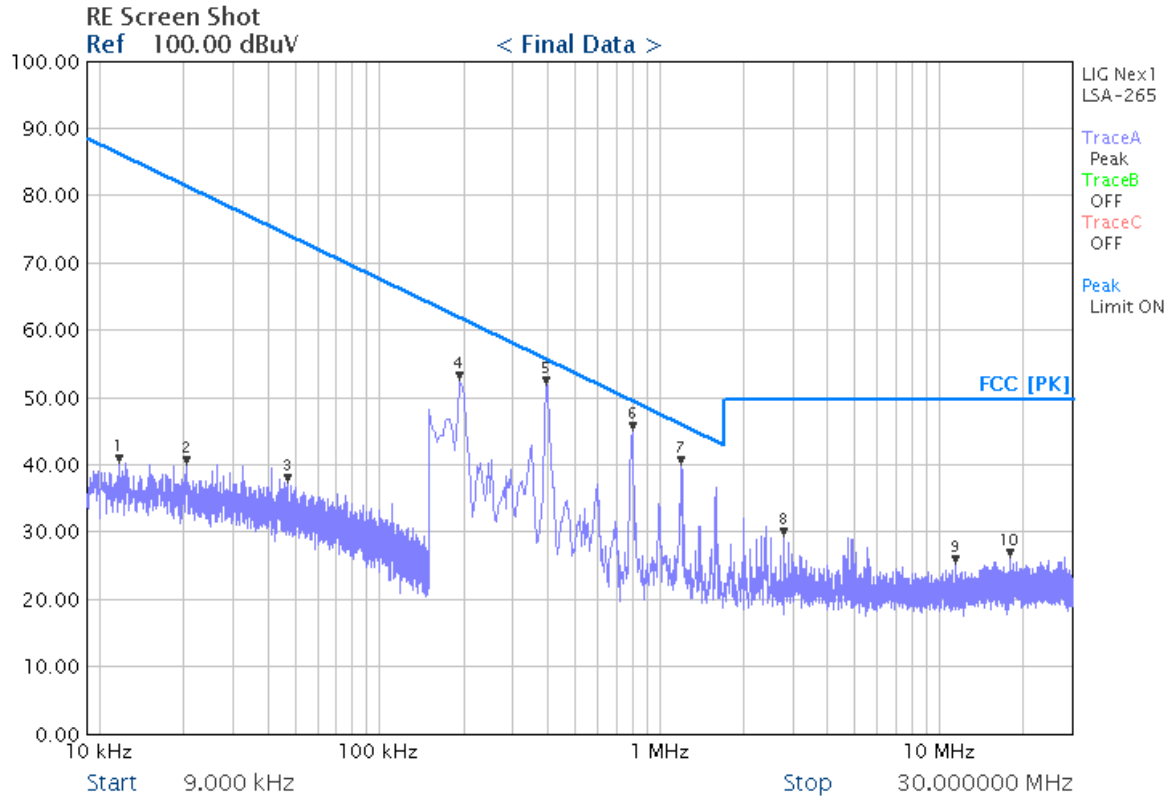
Note : 1. All reading levels are Quasi-peak value.

2. Measurement level = reading level + correct factor (Antenna Factor + Cable loss)

3. Other emissions don't exceed the level of 20 dB below the applicable Limit.

4. Z axis plane was the worst test result than X axis plane and Y axis plane.

Test Frequency	9 kHz to 30 MHz	Polarization	Horizontal
Test Mode	Continuous Tx - F3 (2 480 MHz)	Modulation	**8-DPSK**
Test Result	PASS		



Frequency (MHz)	Reading (dBuV)	P (H, V)	Correct Factor (dB)	Amp Gain (dB)	Limit (dBuV)	Total (dBuV)	Margin (dB)
0.194	33.47	H	19.03	–	61.86	52.50	9.36
0.394	32.85	H	19.03	–	55.69	51.88	3.81
0.799	25.96	H	19.10	–	49.56	45.06	4.50
1.196	20.81	H	19.16	–	46.05	39.97	6.08

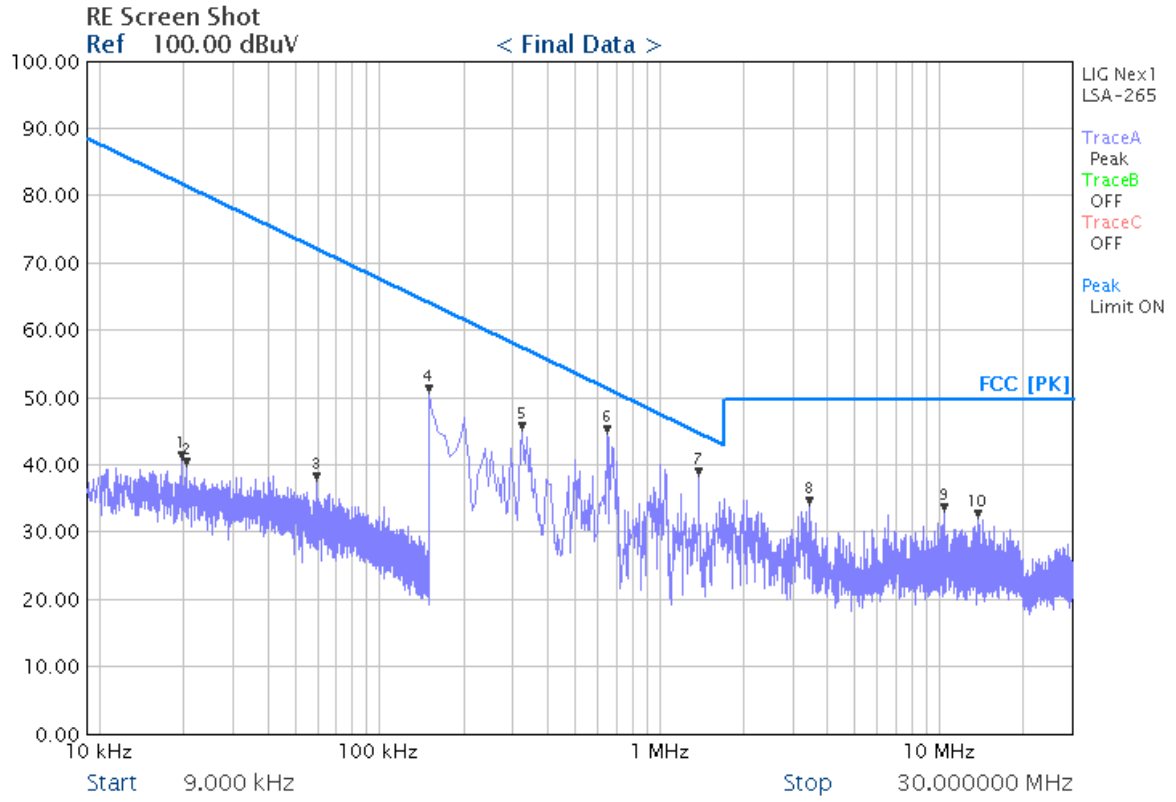
Note : 1. All reading levels are Quasi-peak value.

2. Measurement level = reading level + correct factor (Antenna Factor + Cable loss)

3. Other emissions don't exceed the level of 20 dB below the applicable Limit.

4. Z axis plane was the worst test result than X axis plane and Y axis plane.

Test Frequency	9 kHz to 30 MHz	Polarization	Vetical
Test Mode	Continuous Tx - F3 (2 480 MHz)	Modulation	**8-DPSK**
Test Result	PASS		



Frequency (MHz)	Reading (dBuV)	P (H, V)	Correct Factor (dB)	Amp Gain (dB)	Limit (dBuV)	Total (dBuV)	Margin (dB)
0.150	31.49	V	19.03	–	64.08	50.52	13.56
0.325	26.09	V	19.02	–	57.37	45.11	12.25
0.649	25.40	V	19.08	–	51.36	44.48	6.87
1.382	19.21	V	19.17	–	44.80	38.38	6.41
3.433	14.70	V	19.18	–	49.54	33.88	15.66

Note : 1. All reading levels are Quasi-peak value.

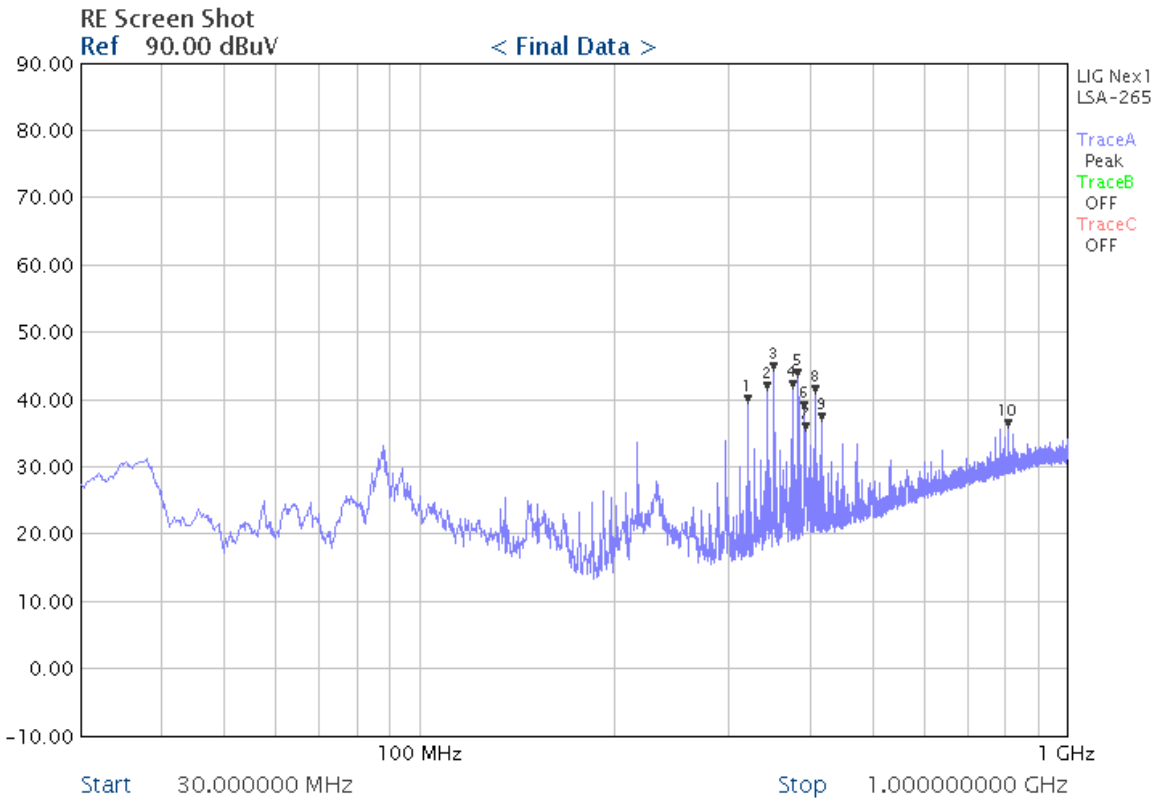
2. Measurement level = reading level + correct factor (Antenna Factor + Cable loss)

3. Other emissions don't exceed the level of 20 dB below the applicable Limit.

4. Z axis plane was the worst test result than X axis plane and Y axis plane.

3.2.6 Radiated Emission Result (30 MHz ~ 1000 MHz)

Test Frequency	30 MHz to 1000 MHz	Polarization	Horizontal+Vertical
Test Mode	Continuous Tx – F1 (2 402 MHz)	Modulation	**8-DPSK**
Test Result	PASS		



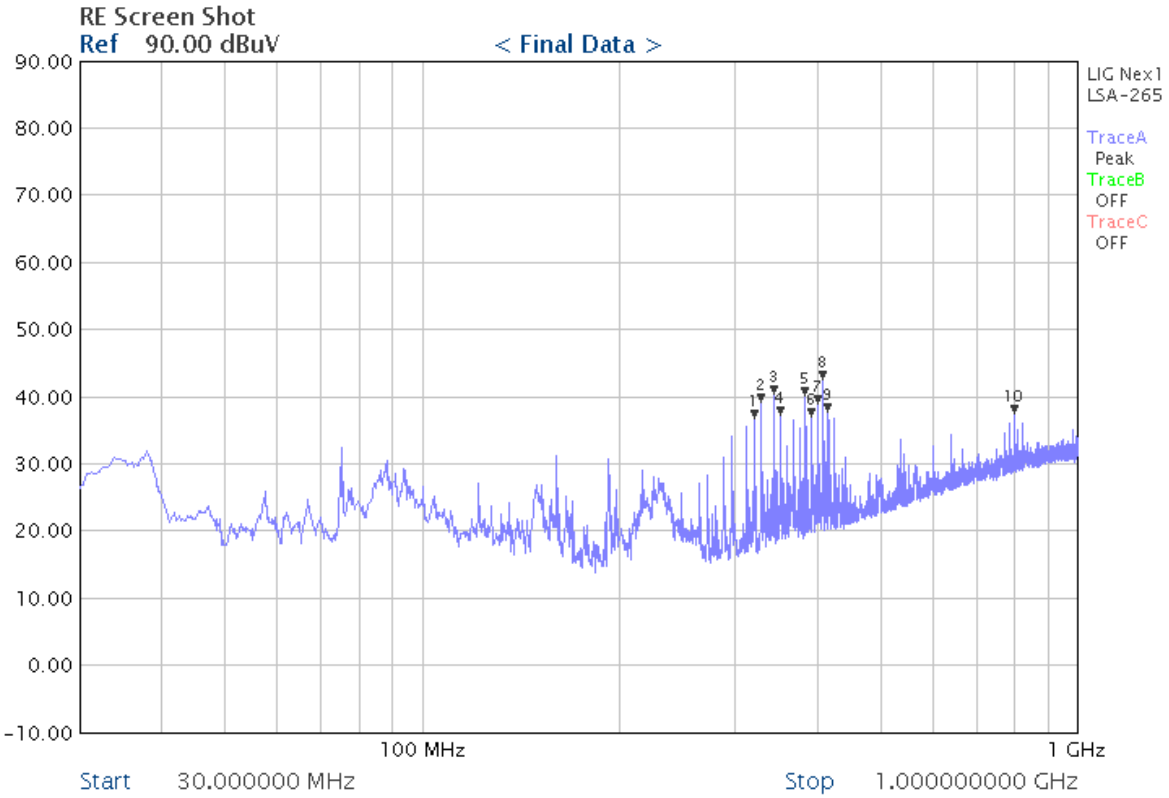
Frequency (MHz)	Reading (dBuV)	P (H, V)	Correct Factor (dB)	Amp Gain (dB)	Limit (dBuV)	Total (dBuV)	Margin (dB)
344.41	23.63	H	17.65	–	46.02	41.28	4.74
352.23	24.29	H	17.94	–	46.02	42.23	3.79
376.27	22.79	H	18.76	–	46.02	41.55	4.47
384.08	24.16	H	19.09	–	46.02	43.25	2.77
408.12	20.93	H	19.83	–	46.02	40.76	5.26

Note : 1. All reading levels are Quasi-peak value.

2. Measurement level = reading level + correct factor (Antenna Factor + Cable loss)

3. Z axis plane was the worst test result than X axis plane and Y axis plane.

Test Frequency	30 MHz to 1000 MHz	Polarization	Horizontal+Vertical
Test Mode	Continuous Tx – F2 (2 441 MHz)	Modulation	**8-DPSK**
Test Result	PASS		



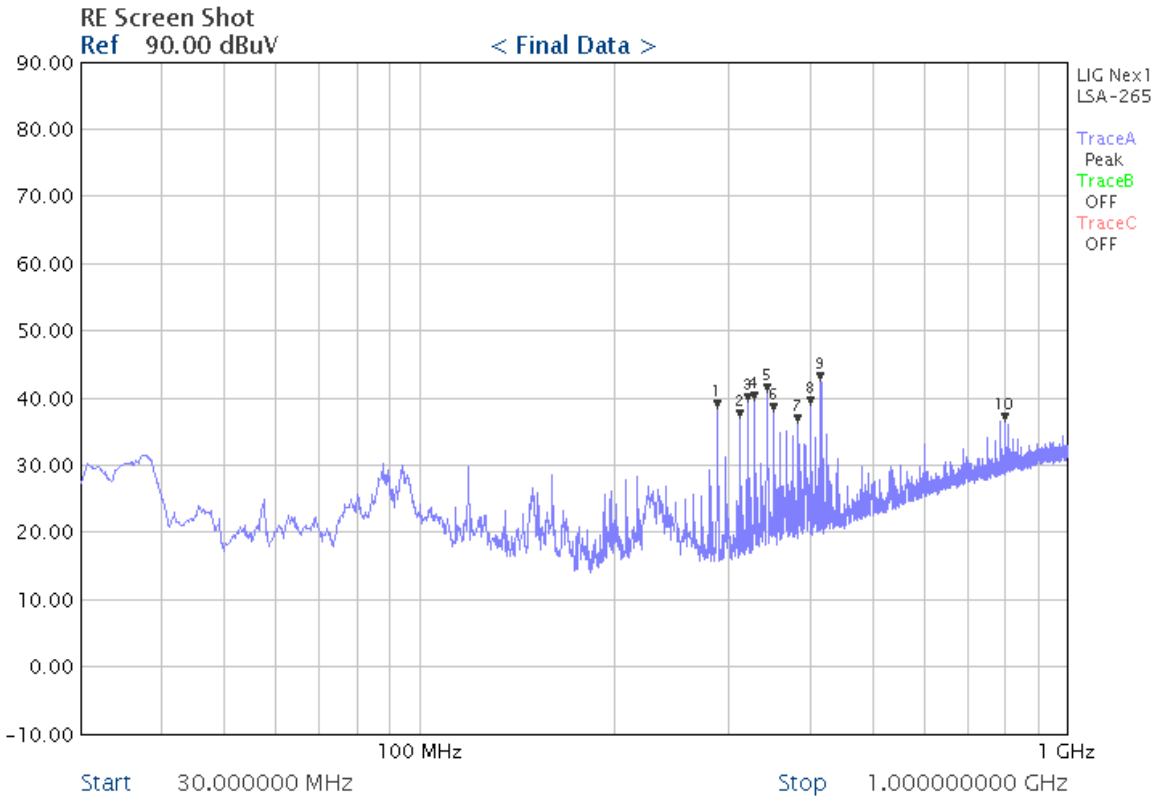
Frequency (MHz)	Reading (dBuV)	P (H, V)	Correct Factor (dB)	Amp Gain (dB)	Limit (dBuV)	Total (dBuV)	Margin (dB)
328.19	22.14	H	17.00	–	46.02	39.14	6.88
344.41	22.62	H	17.65	–	46.02	40.27	5.75
384.08	21.03	H	19.09	–	46.02	40.12	5.90
400.31	19.29	H	19.64	–	46.02	38.93	7.09
408.12	23.31	H	19.83	–	46.02	43.14	2.88

Note : 1. All reading levels are Quasi-peak value.

2. Measurement level = reading level + correct factor (Antenna Factor + Cable loss)

3. Z axis plane was the worst test result than X axis plane and Y axis plane.

Test Frequency	30 MHz to 1000 MHz	Polarization	Horizontal+Vertical
Test Mode	Continuous Tx – F3 (2 480 MHz)	Modulation	**8-DPSK**
Test Result	PASS		



Frequency (MHz)	Reading (dBuV)	P (H, V)	Correct Factor (dB)	Amp Gain (dB)	Limit (dBuV)	Total (dBuV)	Margin (dB)
320.37	22.72	H	16.71	–	46.02	39.43	6.59
328.19	22.58	H	17.00	–	46.02	39.58	6.44
344.41	23.20	V	17.65	–	46.02	40.85	5.17
400.31	19.29	H	19.64	–	46.02	38.93	7.09
415.94	22.57	H	20.06	–	46.02	42.63	3.39

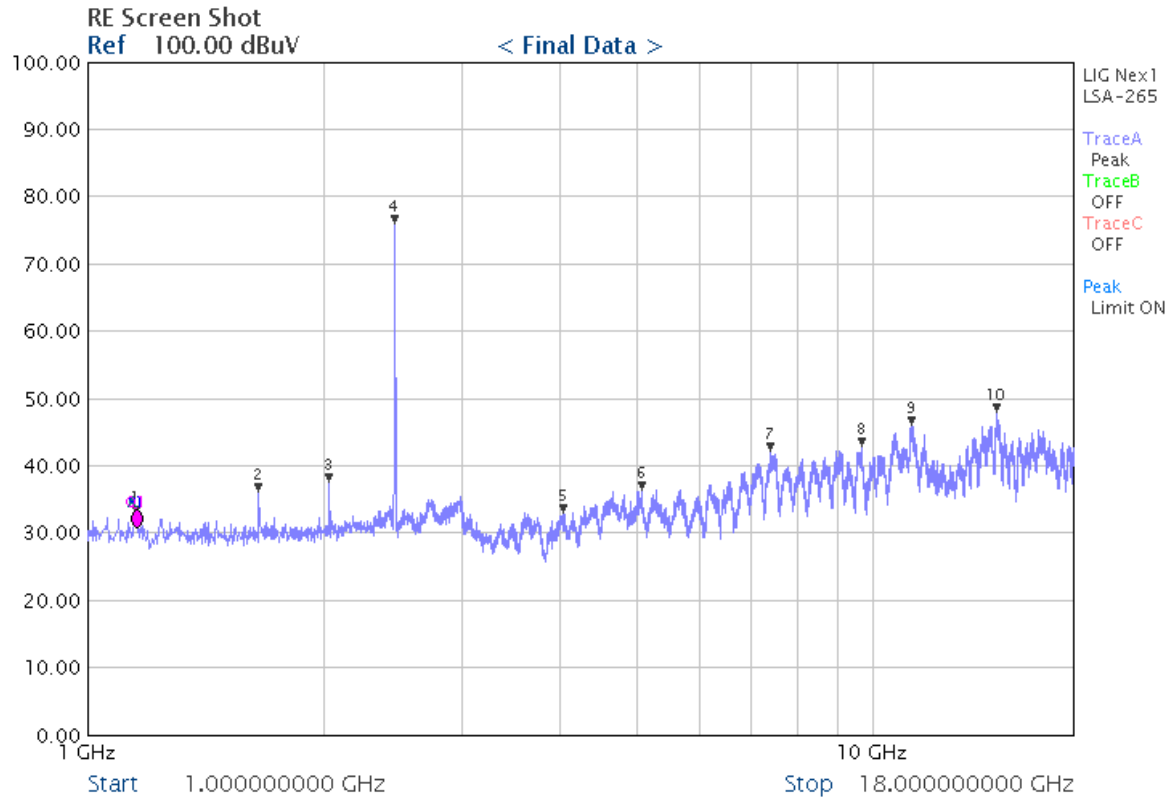
Note : 1. All reading levels are Quasi-peak value.

2. Measurement level = reading level + correct factor (Antenna Factor + Cable loss)

3. Z axis plane was the worst test result than X axis plane and Y axis plane.

3.2.7 Fundamental & Hamonics Radiated Emission Result (1 GHz ~ 18 GHz)

Test Frequency	1 GHz to 18 GHz	Polarization	Horizontal
Test Mode	Continuous Tx – F1 (2 402 MHz)	Modulation	**8-DPSK**
Test Result	PASS		



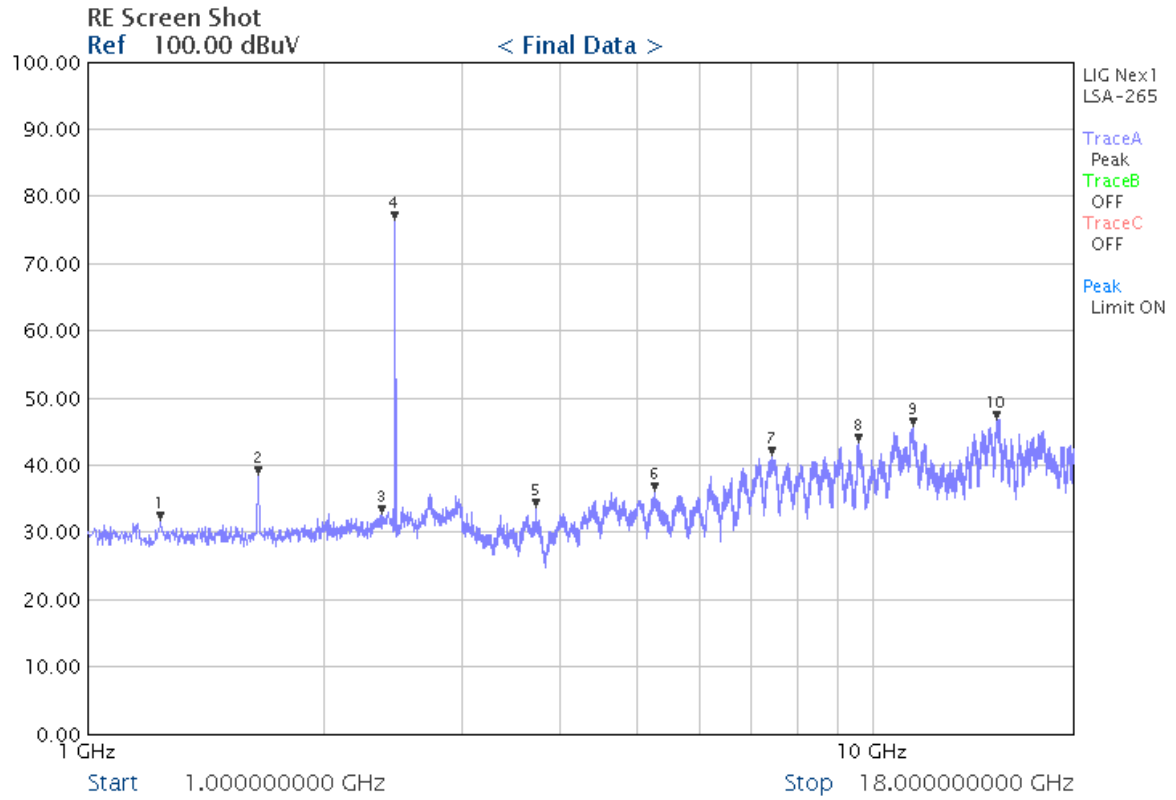
Frequency (MHz)	Reading (PK/AV) (dBuV)	P (H, V)	Correct Factor (dB)	Limit (PK/AV) (dBuV)	Total (PK/AV) (dBuV)	Margin (PK/AV) (dB)
2 402.00	42.40/30.29	H	33.53	114/94	75.93/63.82	38.07/30.18
–	–	–	–	–	–	–

Note : 1. Measurement level = reading level + correct factor (Antenna Factor + Cable loss)

2. Other emissions don't exceed the level of 20 dB below the applicable Limit.

3. Z axis plane was the worst test result than X axis plane and Y axis plane.

Test Frequency	1 GHz to 18 GHz	Polarization	Vertical
Test Mode	Continuous Tx – F1 (2 402 MHz)	Modulation	**8-DPSK**
Test Result	PASS		



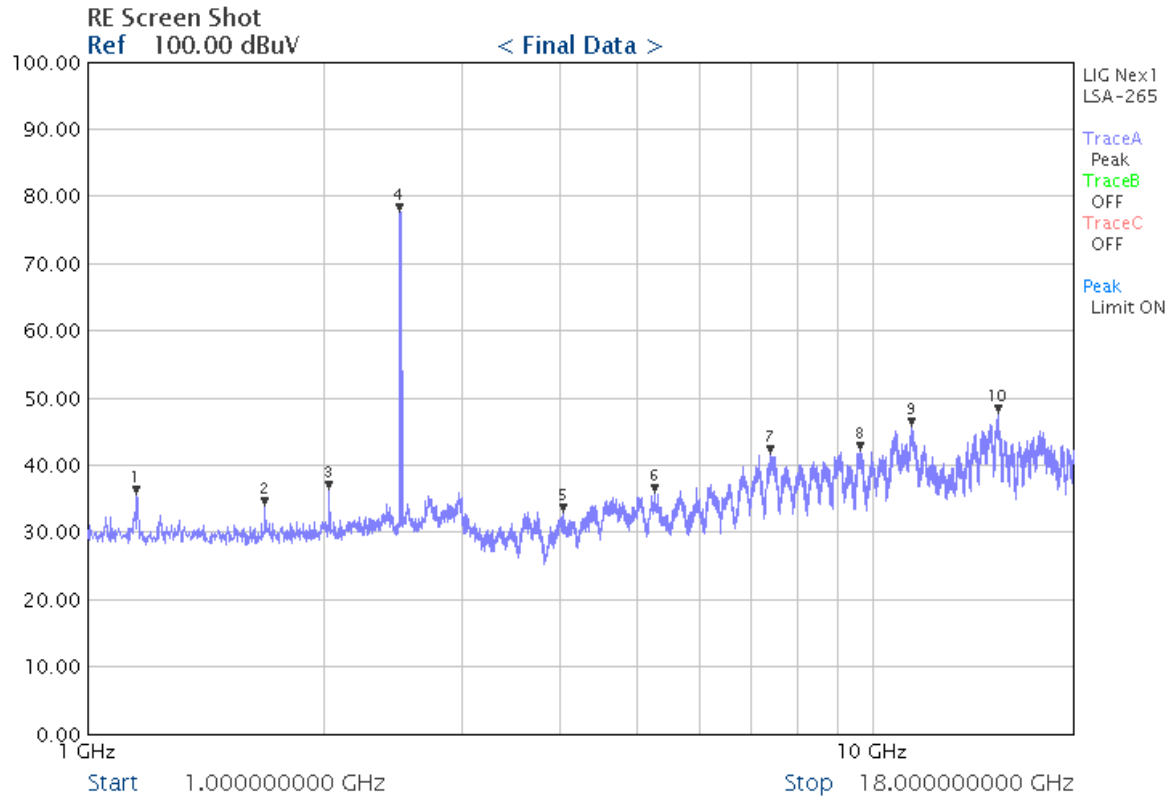
Frequency (MHz)	Reading (PK/AV) (dBuV)	P (H, V)	Correct Factor (dB)	Limit (PK/AV) (dBuV)	Total (PK/AV) (dBuV)	Margin (PK/AV) (dB)
2 402.00	43.02/34.62	V	33.53	114/94	76.55/68.15	37.45/25.85
–	–	–	–	–	–	–

Note : 1. Measurement level = reading level + correct factor (Antenna Factor + Cable loss)

2. Other emissions don't exceed the level of 20 dB below the applicable Limit.

3. Z axis plane was the worst test result than X axis plane and Y axis plane.

Test Frequency	1 GHz to 18 GHz	Polarization	Horizontal
Test Mode	Continuous Tx – F2 (2 441 MHz)	Modulation	**8-DPSK**
Test Result	PASS		



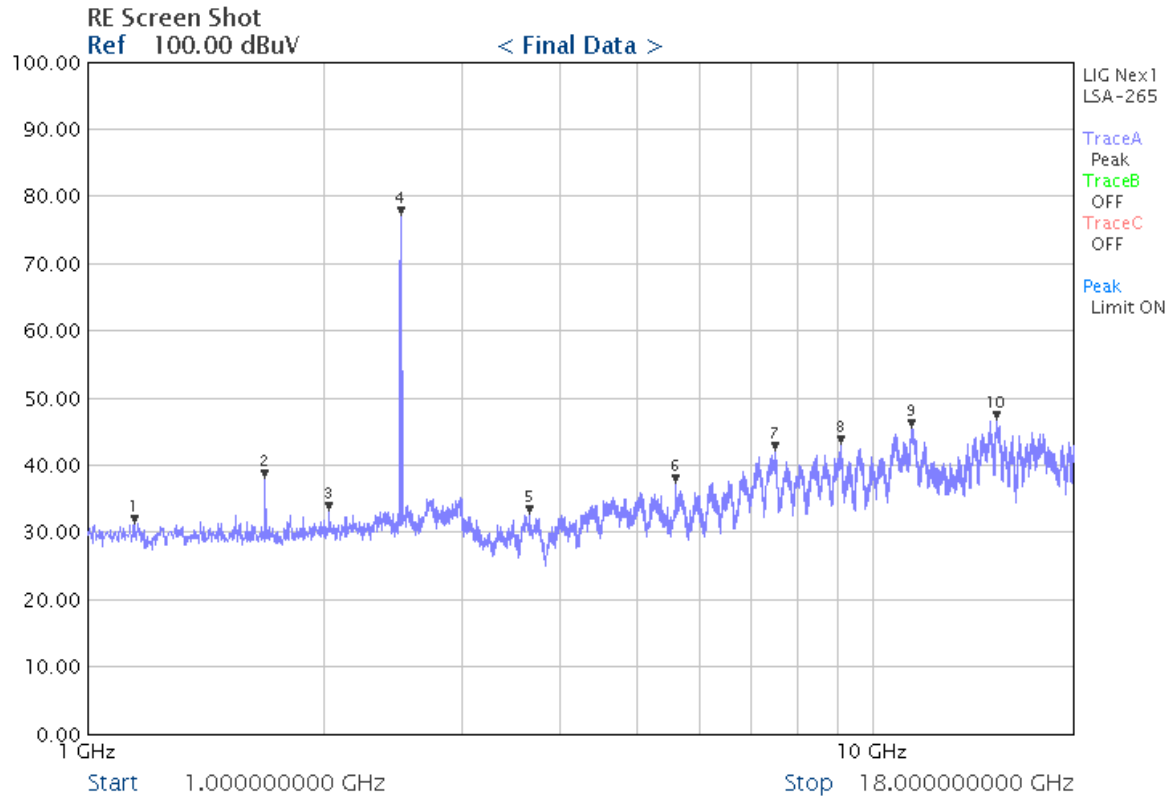
Frequency (MHz)	Reading (PK/AV) (dBuV)	P (H, V)	Correct Factor (dB)	Limit (PK/AV) (dBuV)	Total (PK/AV) (dBuV)	Margin (PK/AV) (dB)
2 441.00	43.99/34.60	H	33.71	114/94	77.70/68.31	36.30/25.69
–	–	–	–	–	–	–

Note : 1. Measurement level = reading level + correct factor (Antenna Factor + Cable loss)

2. Other emissions don't exceed the level of 20 dB below the applicable Limit.

3. Z axis plane was the worst test result than X axis plane and Y axis plane.

Test Frequency	1 GHz to 18 GHz	Polarization	Vertical
Test Mode	Continuous Tx – F2 (2 441 MHz)	Modulation	**8-DPSK**
Test Result	PASS		



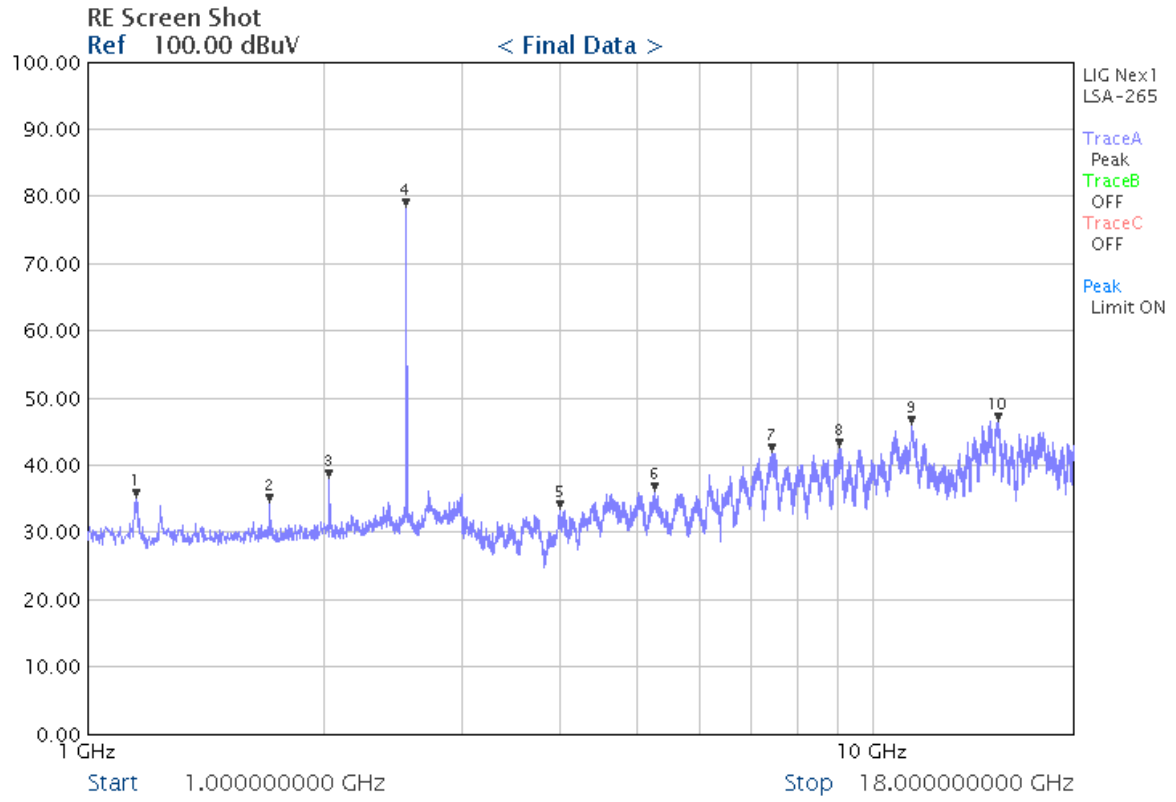
Frequency (MHz)	Reading (PK/AV) (dBuV)	P (H, V)	Correct Factor (dB)	Limit (PK/AV) (dBuV)	Total (PK/AV) (dBuV)	Margin (PK/AV) (dB)
2 441.00	43.56/33.21	V	33.71	114/94	77.27/66.92	36.73/27.08
–	–	–	–	–	–	–

Note : 1. Measurement level = reading level + correct factor (Antenna Factor + Cable loss)

2. Other emissions don't exceed the level of 20 dB below the applicable Limit.

3. Z axis plane was the worst test result than X axis plane and Y axis plane.

Test Frequency	1 GHz to 18 GHz	Polarization	Horizontal
Test Mode	Continuous Tx – F3 (2 480 MHz)	Modulation	**8-DPSK**
Test Result	PASS		



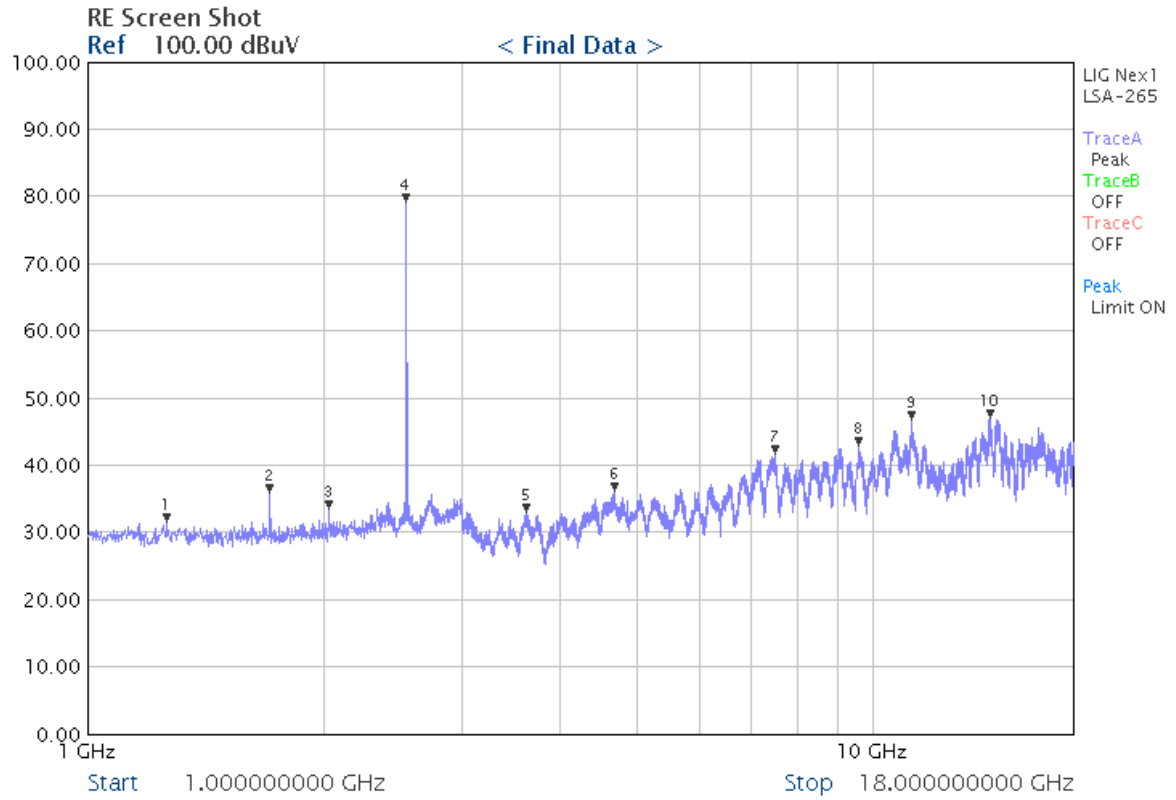
Frequency (MHz)	Reading (PK/AV) (dBuV)	P (H, V)	Correct Factor (dB)	Limit (PK/AV) (dBuV)	Total (PK/AV) (dBuV)	Margin (PK/AV) (dB)
2 480.00	38.25/29.13	V	40.18	114/94	78.43/69.31	35.57/24.69
–	–	–	–	–	–	–

Note : 1. Measurement level = reading level + correct factor (Antenna Factor + Cable loss)

2. Other emissions don't exceed the level of 20 dB below the applicable Limit.

3. Z axis plane was the worst test result than X axis plane and Y axis plane.

Test Frequency	1 GHz to 18 GHz	Polarization	Vertical
Test Mode	Continuous Tx – F3 (2 480 MHz)	Modulation	**8-DPSK**
Test Result	PASS		



Frequency (MHz)	Reading (PK/AV) (dBuV)	P (H, V)	Correct Factor (dB)	Limit (PK/AV) (dBuV)	Total (PK/AV) (dBuV)	Margin (PK/AV) (dB)
2 480.00	38.87/27.38	V	40.18	114/94	79.05/67.56	34.95/26.44
–	–	–	–	–	–	–

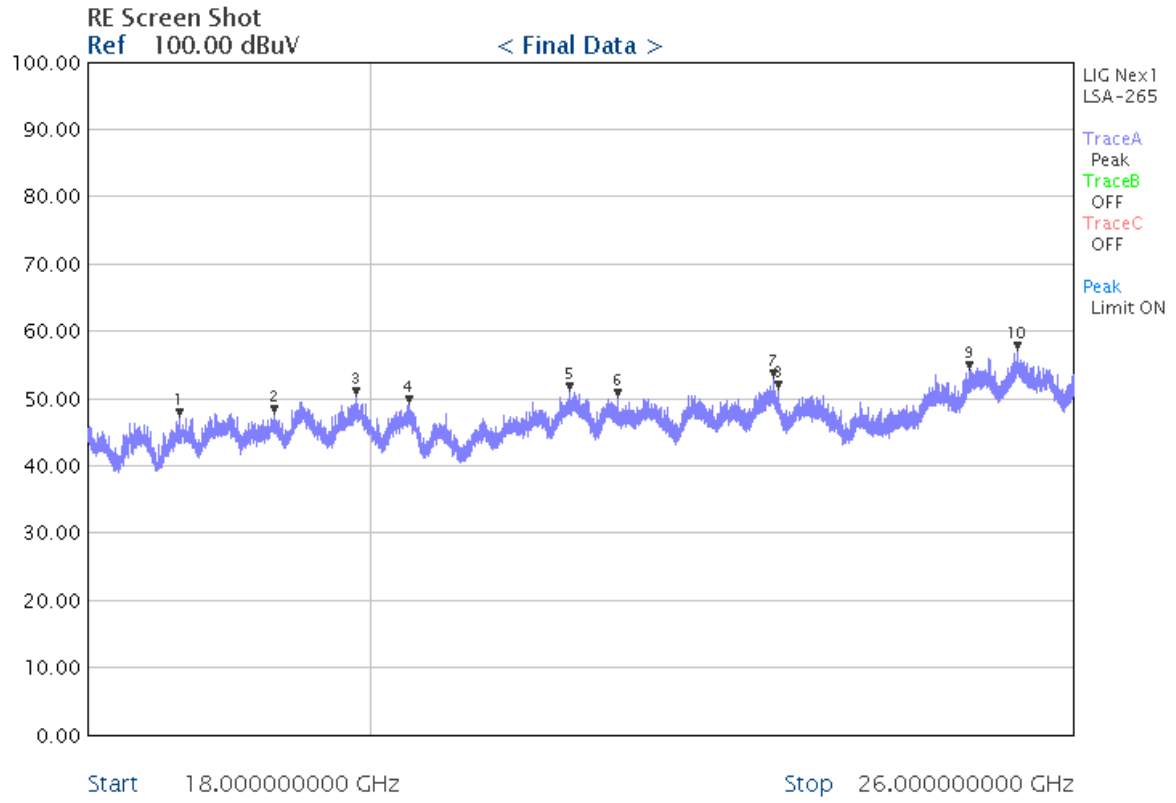
Note : 1. Measurement level = reading level + correct factor (Antenna Factor + Cable loss)

2. Other emissions don't exceed the level of 20 dB below the applicable Limit.

3. Z axis plane was the worst test result than X axis plane and Y axis plane.

3.2.8 Fundamental & Hamonics Radiated Emission Result (18 GHz ~ 26 GHz)

Test Frequency	18 GHz to 26 GHz	Polarization	Horizontal
Test Mode	Continuous Tx – F1 (2 402 MHz)	Modulation	**8-DPSK**
Test Result	PASS		



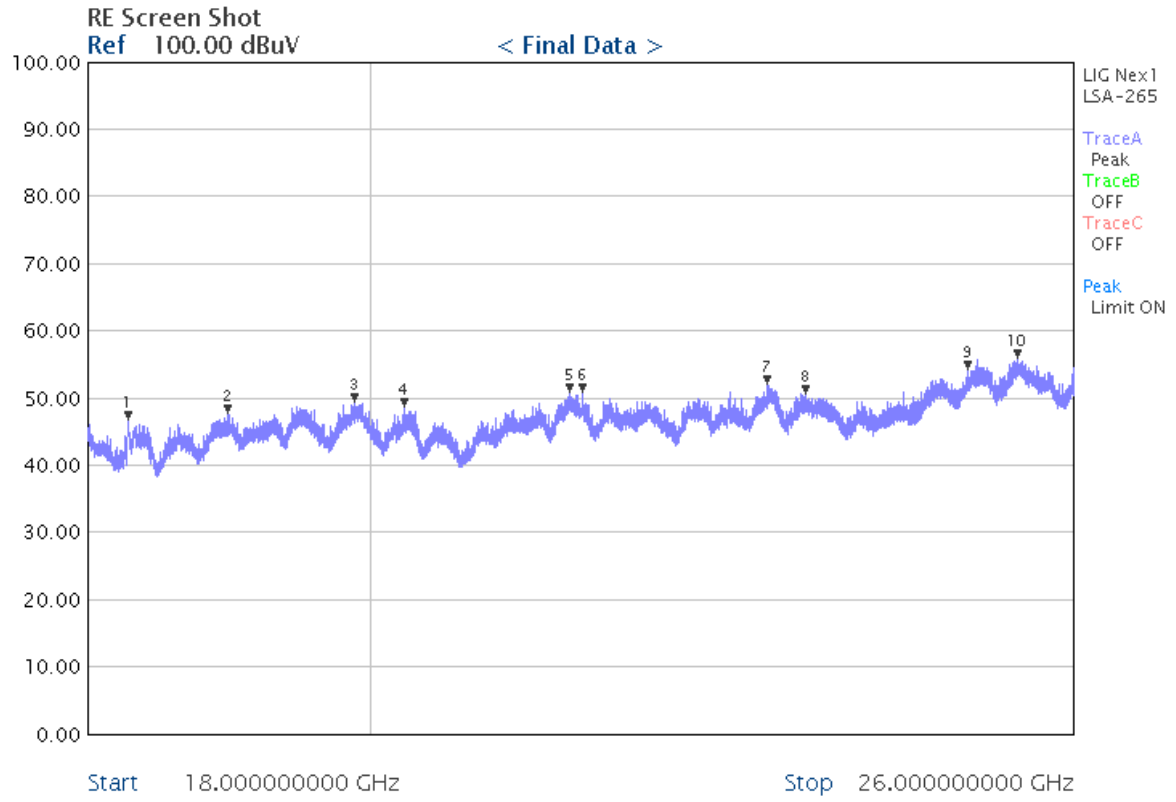
Frequency (MHz)	Reading (PK/AV) (dBuV)	P (H, V)	Correct Factor (dB)	Limit (PK/AV) (dBuV)	Total (PK/AV) (dBuV)	Margin (PK/AV) (dB)
–	–	–	–	–	–	–
–	–	–	–	–	–	–

Note : 1. Measurement level = reading level + correct factor (Antenna Factor + Cable loss)

2. Other emissions don't exceed the level of 20 dB below the applicable Limit.

3. Z axis plane was the worst test result than X axis plane and Y axis plane.

Test Frequency	18 GHz to 26 GHz	Polarization	Vertical
Test Mode	Continuous Tx – F1 (2 402 MHz)	Modulation	**8-DPSK**
Test Result	PASS		



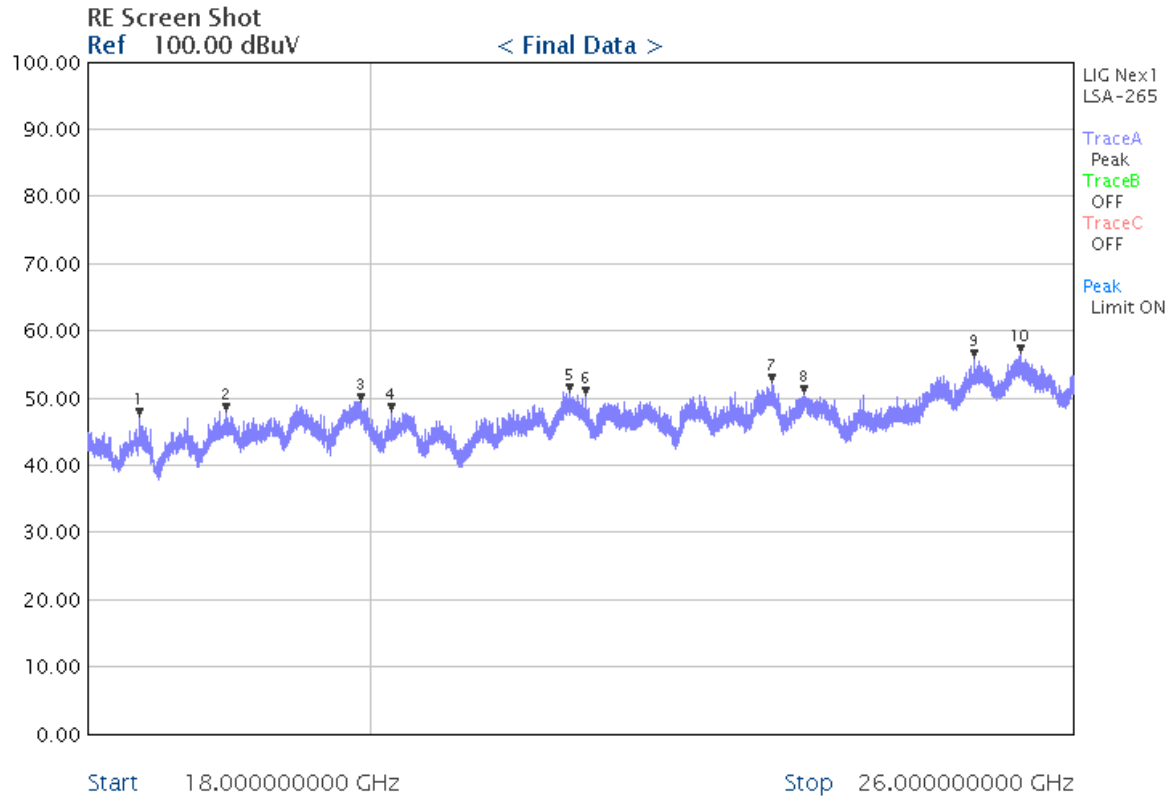
Frequency (MHz)	Reading (PK/AV) (dBuV)	P (H, V)	Correct Factor (dB)	Limit (PK/AV) (dBuV)	Total (PK/AV) (dBuV)	Margin (PK/AV) (dB)
–	–	–	–	–	–	–
–	–	–	–	–	–	–

Note : 1. Measurement level = reading level + correct factor (Antenna Factor + Cable loss)

2. Other emissions don't exceed the level of 20 dB below the applicable Limit.

3. Z axis plane was the worst test result than X axis plane and Y axis plane.

Test Frequency	18 GHz to 26 GHz	Polarization	Horizontal
Test Mode	Continuous Tx – F2 (2 441 MHz)	Modulation	**8-DPSK**
Test Result	PASS		



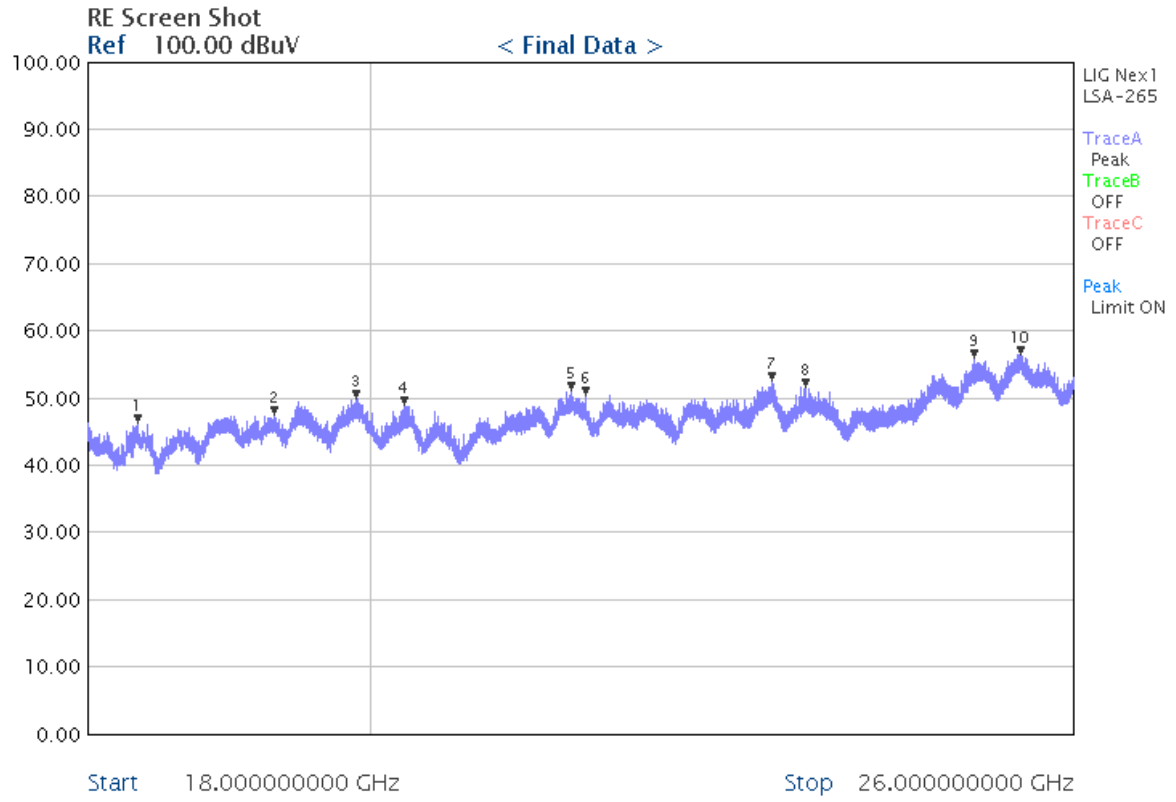
Frequency (MHz)	Reading (PK/AV) (dBuV)	P (H, V)	Correct Factor (dB)	Limit (PK/AV) (dBuV)	Total (PK/AV) (dBuV)	Margin (PK/AV) (dB)
–	–	–	–	–	–	–
–	–	–	–	–	–	–

Note : 1. Measurement level = reading level + correct factor (Antenna Factor + Cable loss)

2. Other emissions don't exceed the level of 20 dB below the applicable Limit.

3. Z axis plane was the worst test result than X axis plane and Y axis plane.

Test Frequency	18 GHz to 26 GHz	Polarization	Vertical
Test Mode	Continuous Tx – F2 (2 441 MHz)	Modulation	**8-DPSK**
Test Result	PASS		



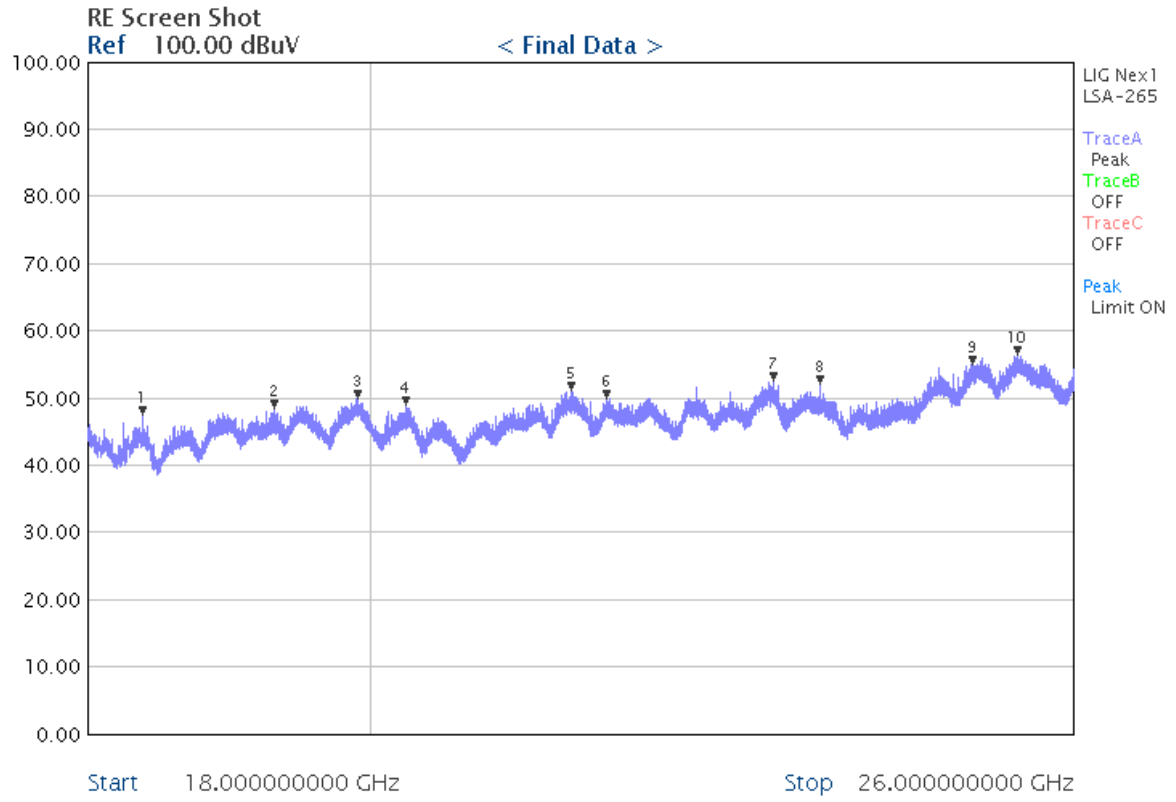
Frequency (MHz)	Reading (PK/AV) (dBuV)	P (H, V)	Correct Factor (dB)	Limit (PK/AV) (dBuV)	Total (PK/AV) (dBuV)	Margin (PK/AV) (dB)
–	–	–	–	–	–	–
–	–	–	–	–	–	–

Note : 1. Measurement level = reading level + correct factor (Antenna Factor + Cable loss)

2. Other emissions don't exceed the level of 20 dB below the applicable Limit.

3. Z axis plane was the worst test result than X axis plane and Y axis plane.

Test Frequency	18 GHz to 26 GHz	Polarization	Horizontal
Test Mode	Continuous Tx – F3 (2 480 MHz)	Modulation	**8-DPSK**
Test Result	PASS		



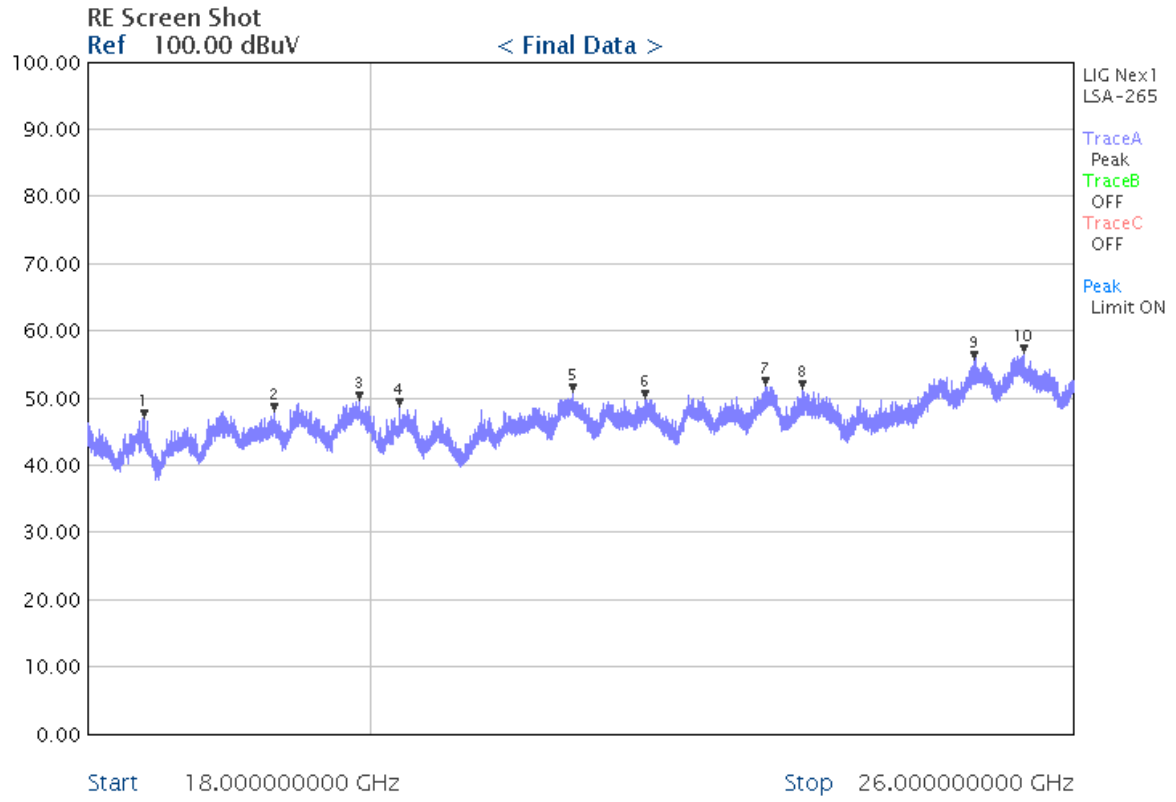
Frequency (MHz)	Reading (PK/AV) (dBuV)	P (H, V)	Correct Factor (dB)	Limit (PK/AV) (dBuV)	Total (PK/AV) (dBuV)	Margin (PK/AV) (dB)
–	–	–	–	–	–	–
–	–	–	–	–	–	–

Note : 1. Measurement level = reading level + correct factor (Antenna Factor + Cable loss)

2. Other emissions don't exceed the level of 20 dB below the applicable Limit.

3. Z axis plane was the worst test result than X axis plane and Y axis plane.

Test Frequency	18 GHz to 26 GHz	Polarization	Vertical
Test Mode	Continuous Tx – F3 (2 480 MHz)	Modulation	**8-DPSK**
Test Result	PASS		



Frequency (MHz)	Reading (PK/AV) (dBuV)	P (H, V)	Correct Factor (dB)	Limit (PK/AV) (dBuV)	Total (PK/AV) (dBuV)	Margin (PK/AV) (dB)
–	–	–	–	–	–	–
–	–	–	–	–	–	–

Note : 1. Measurement level = reading level + correct factor (Antenna Factor + Cable loss)

2. Other emissions don't exceed the level of 20 dB below the applicable Limit.

3. Z axis plane was the worst test result than X axis plane and Y axis plane.

3.3 Number of Hopping Frequency Used

3.3.1 Test Instruments

Description	Manufacturer	Model No.	Serial No.	Next of Calibration
Spectrum Analyzer	Advantest	R3273	121100554	Jun. 15, 2012
RF Test Room	-	-	-	-

Note : 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to RRL, KRISS, KTL and HCT.

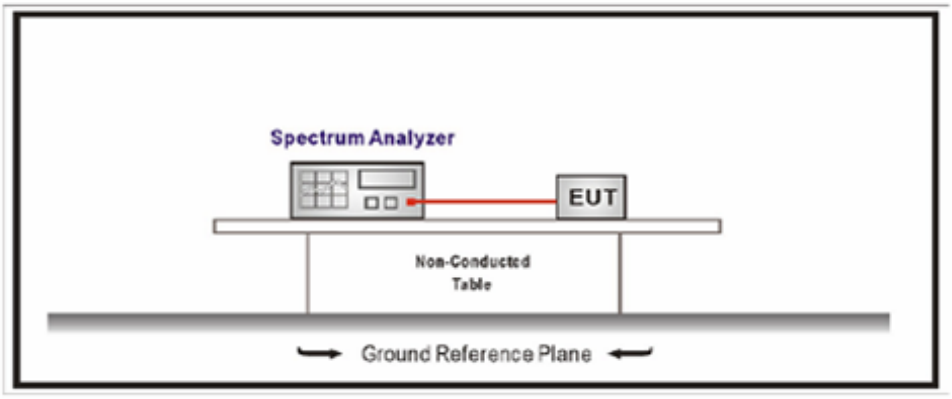
2. The calibration interval of horn ant. and loop ant. is 24 months

3.3.2 Limit

At least 15 channels frequencies, and should be equally spaced.

3.3.3 Test Configuration

RF Conducted Measurement:

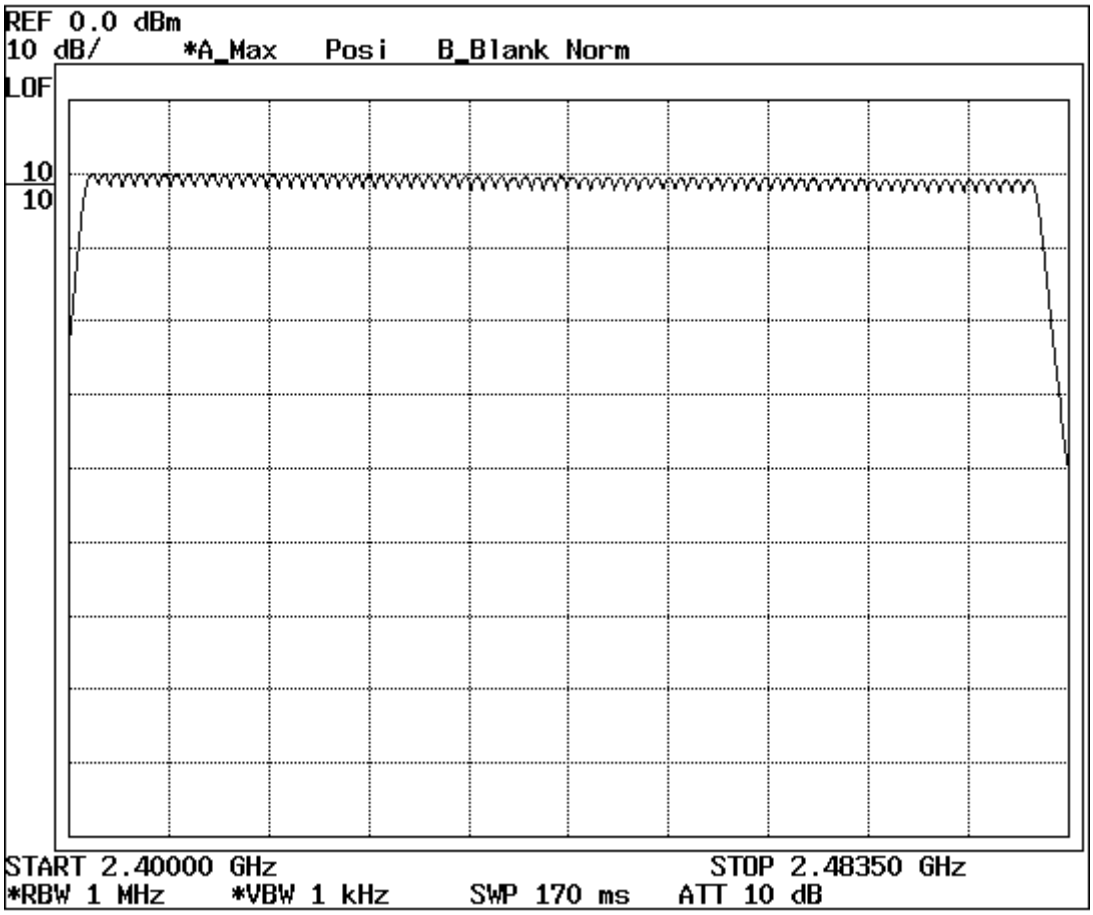


3.3.4 Test Procedure

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator of a known signal form a external generator.
2. Turn ofthe EUT and connect its antenna terminal to measurement via a low loss calbe. Then set it to any one measured frequency within its oprerating range and make sur the instrument is operating range and make sure the instrument is operated in its linear range.
3. Set the SA on MaxHold Mode, and the keep the EUT is hoping mdoe. Record all the signals from each channel until each one has been recorded.
4. Set th SA on View Mode and the plot the result on SA screen.
5. Repeat above procedures until all frequencies measured were complete.

3.3.5 Number of Hopping Frequency Test Result

Test Mode	**8-DPSK**	Test Site	RF Test Room
Test Result	PASS		



3.4 Dwell Time On Each Channel

3.4.1 Test Instruments

Description	Manufacturer	Model No.	Serial No.	Next of Calibration
Spectrum Analyzer	Advantest	R3273	121100554	Jun. 15, 2012
RF Test Room	-	-	-	-

Note : 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to RRL, KRISS, KTL and HCT.

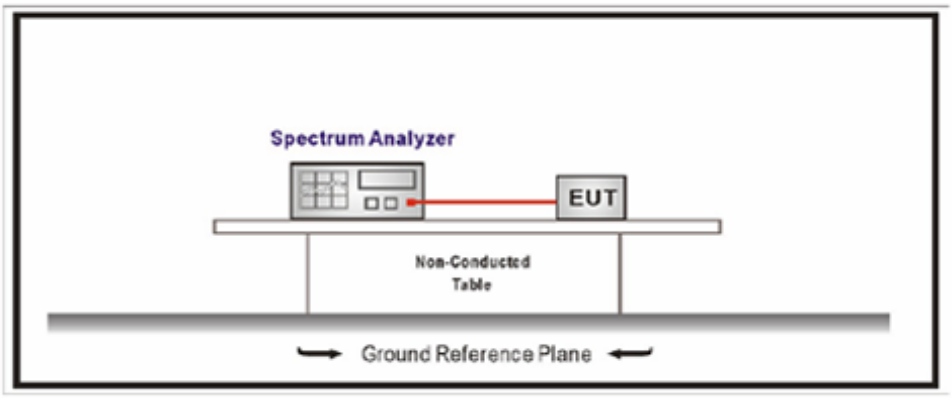
2. The calibration interval of horn ant. and loop ant. is 24 months

3.4.2 Limit

The average time of occupancy on any channel shall not be greater the 0.4 seconds within a period fo 04. Seconds multiplied by the number of hopping channels employed.

3.4.3 Test Configuration

RF Conducted Measurement:



3.4.4 Test Procedure

1. Check the calibration of the measuring instrument (SA) using ither an internal
2. Turn on the EUT and connect its antenna terminal to measurementvia a low loss cable. The set it to any one measured frequency within its operating range and make sure the instrument is operatd in its linear range.
3. Adjust the center frequency of SA on any frequency be measured nd set SA to ero span mode. And then, set RBW and VBW of spectrum analyzer to proper value.
4. Measure the time duration of one transmission in the measured frequency. And then plot the result with time difference of this time duration.
5. Repeat above procedures until all different time-slot modes have been completed.

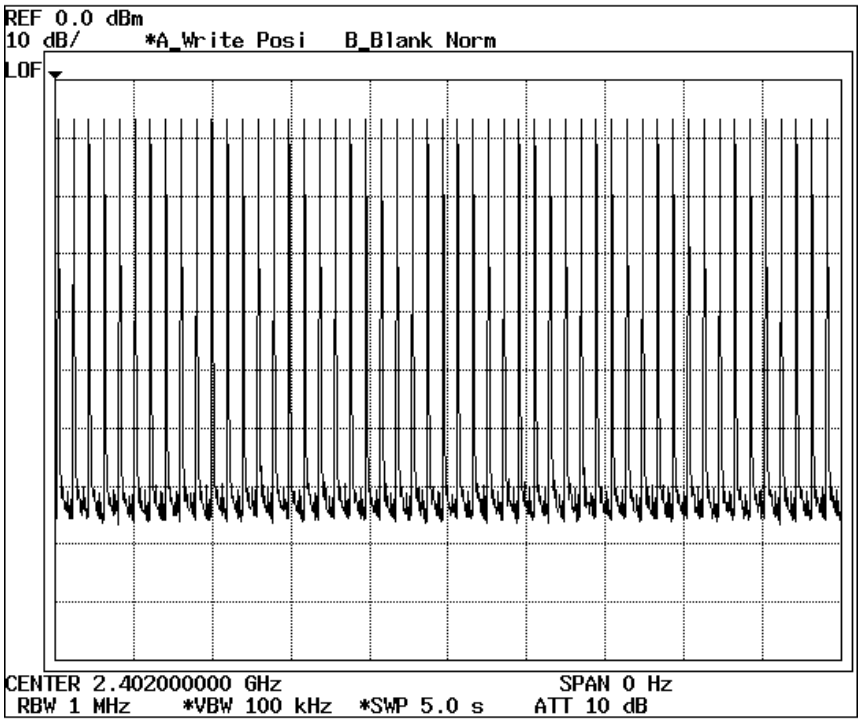
3.4.5 Dwell Time Test Result

Test Mode	**8-DPSK**	Test Site	RF Test Room
Test Result	PASS		

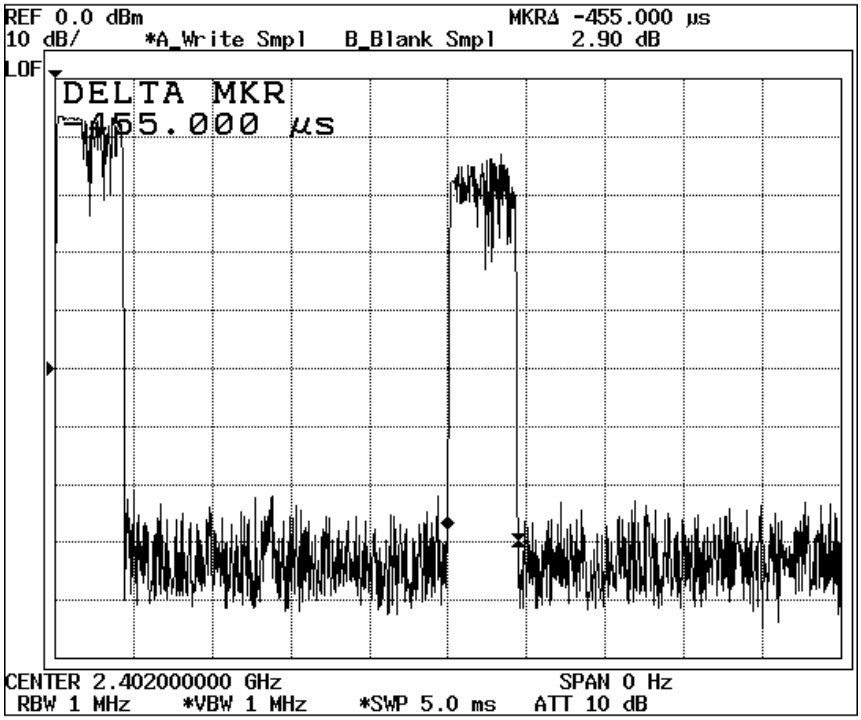
Mode	Number of transmission in a 31.6 (79 Hopping*0.4)	Length of transmission time (msec)	Result (msec)	Limit (msec)
DH1	51 (times / 5 sec)*6.32 = 322.32times	0.455	146.66	400
DH3	26 (times / 5 sec)*6.32 = 164.32times	1.720	282.63	400
DH5	17 (times / 5 sec)*6.32 = 107.44times	2.970	319.10	400

Note) 1. Test plots of the transmitting time slot are shown on next 6 pages.
2. Dwell Time = 79(Channels) x 0.4(s) x average hopping channel x package transfer time

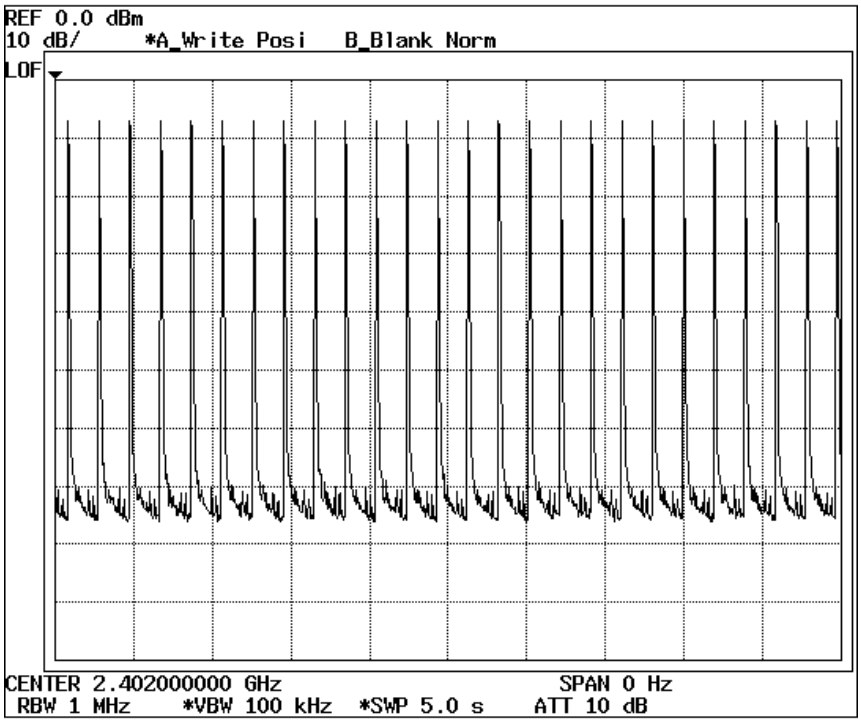
DH1



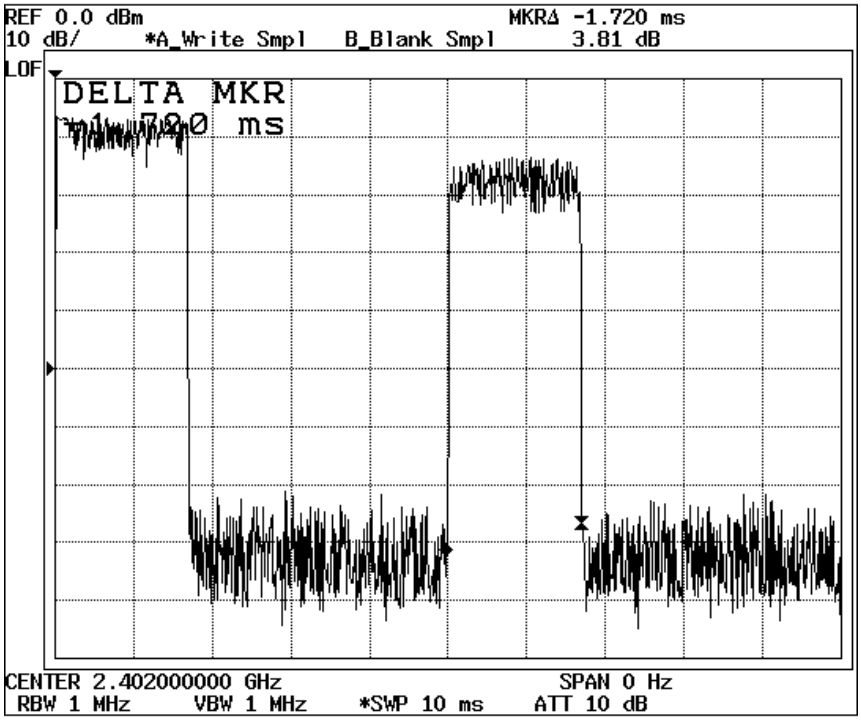
DH1-Dwell Time



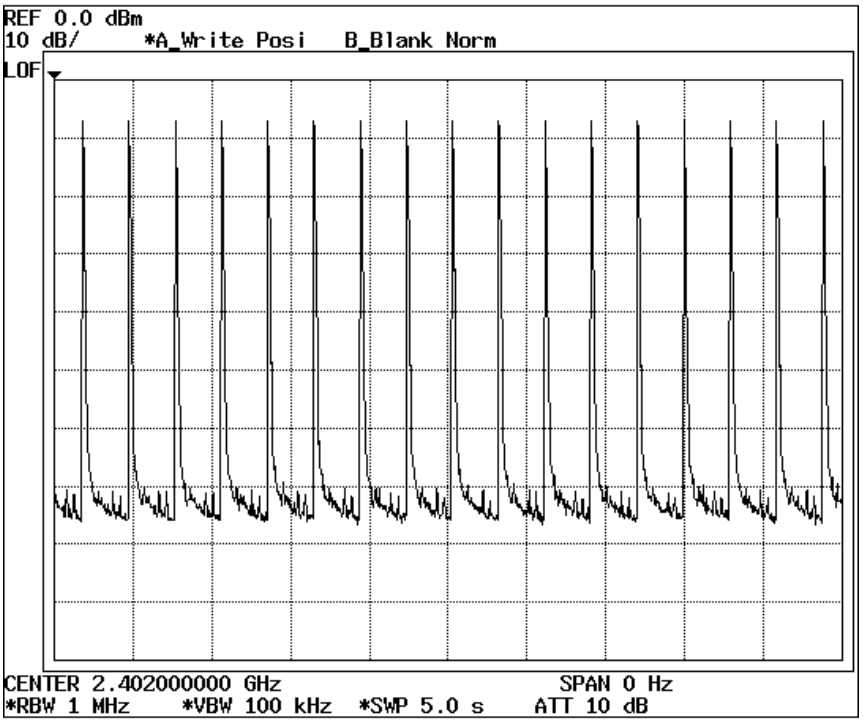
DH3



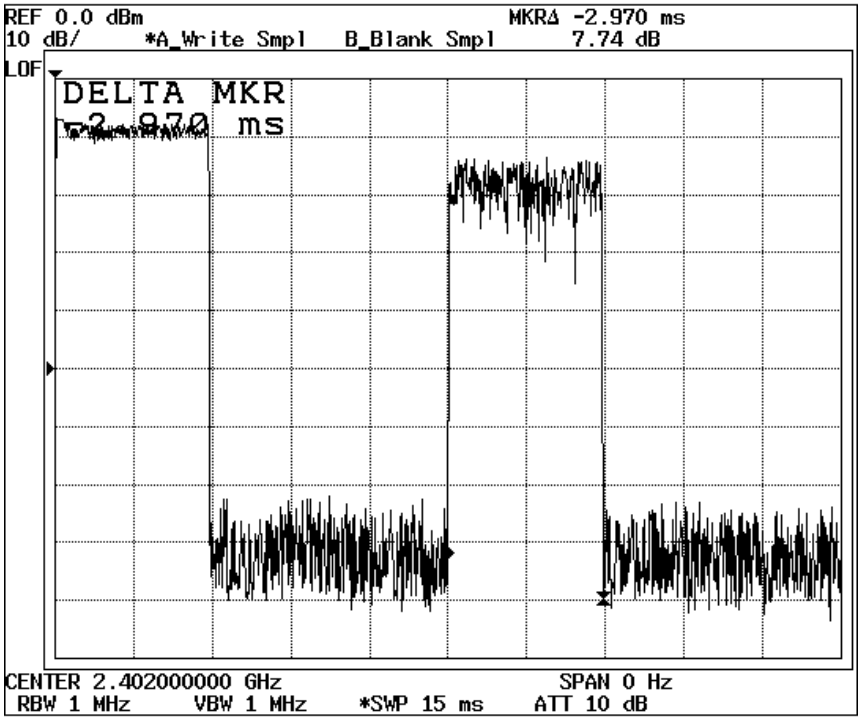
DH3-Dwell Time



DH5



DH5-Dwell Time



3.5 Channel Bandwidth

3.5.1 Test Instruments

Description	Manufacturer	Model No.	Serial No.	Next of Calibration
Spectrum Analyzer	Advantest	R3273	121100554	Jun. 15, 2012
RF Test Room	-	-	-	-

Note : 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to RRL, KRISS, KTL and HCT.

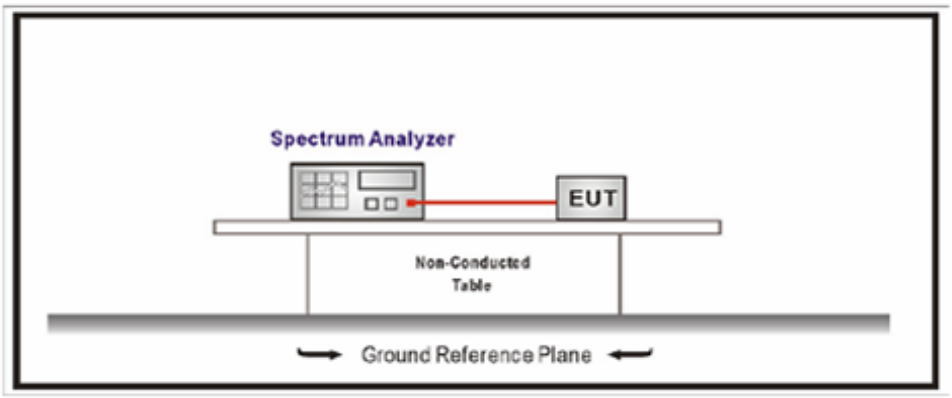
2. The calibration interval of horn ant. and loop ant. is 24 months

3.5.2 Limit

For frequency hopping system operating in the 2400-2483.5 MHz, if the 20 dB bandwidth of hopping channel is greater than 25 kHz, tow-thirds 20 dB bandwidth of hopping channel shell be a minimum limit for the hopping channel separation.

3.5.3 Test Configuration

RF Conducted Measurement:



3.5.4 Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that wre attenuated 20 dB from the reference level. Record the the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

3.5.5 Channel Bandwidth Test Result

Test Mode	DH1	Test Site	RF Test Room
Test Result	PASS		

Channels	CHANNEL FREQUENCY (MHz)	20 dB bandwidth (MHz)
00	2 402	1.205
39	2 441	1.205
78	2 480	1.210

CH 00 (2 402 MHz)

CH 39 (2 441 MHz)

CH 78 (2 480 MHz)

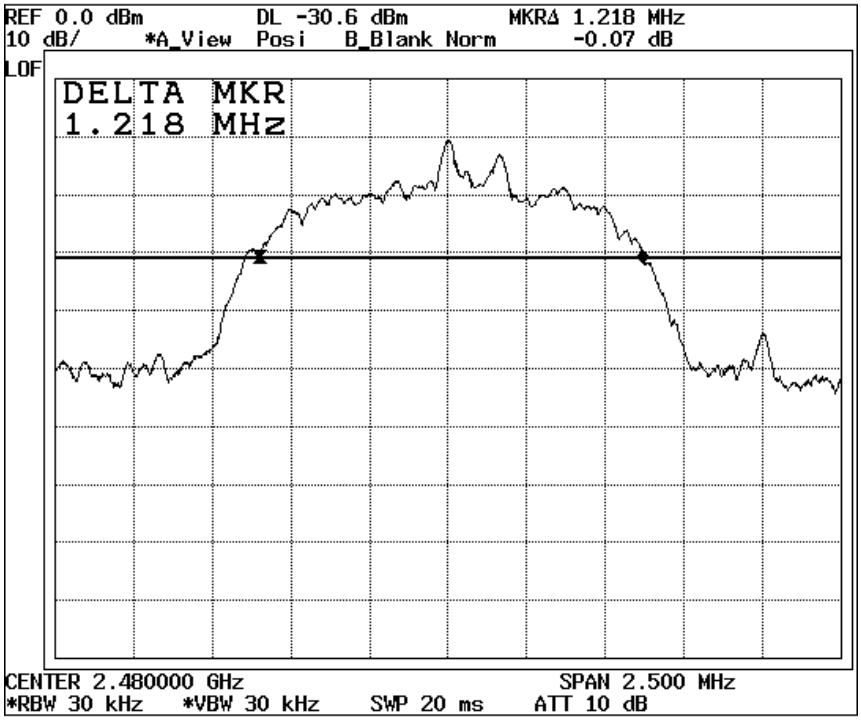
Test Mode	DH3	Test Site	RF Test Room
Test Result	PASS		

Channels	CHANNEL FREQUENCY (MHz)	20 dB bandwidth (MHz)
00	2 402	1.215
39	2 441	1.215
78	2 480	1.218

CH 00 (2 402 MHz)

CH 39 (2 441 MHz)

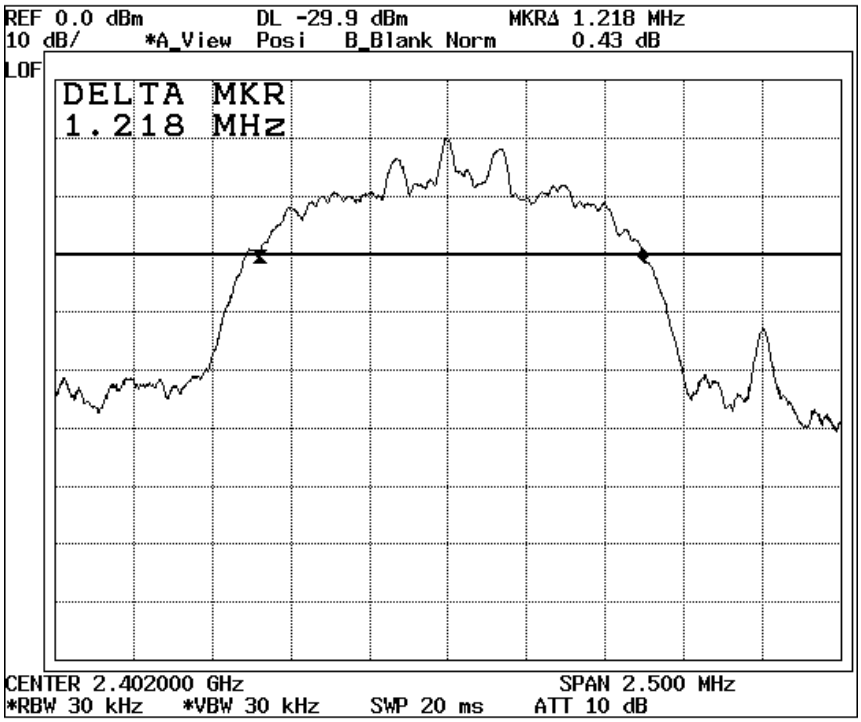
CH 78 (2 480 MHz)



Test Mode	DH5	Test Site	RF Test Room
Test Result	PASS		

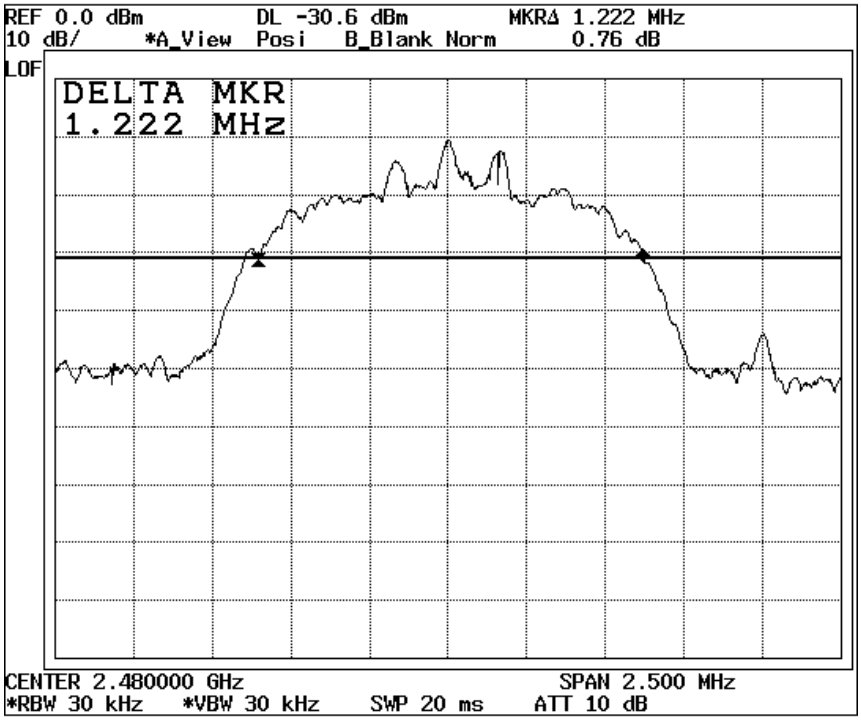
Channels	CHANNEL FREQUENCY (MHz)	20 dB bandwidth (MHz)
00	2 402	1.218
39	2 441	1.215
78	2 480	1.220

CH 00 (2 402 MHz)



CH 39 (2 441 MHz)

CH 78 (2 480 MHz)



3.6 Hopping Channel Separation

3.6.1 Test Instruments

Description	Manufacturer	Model No.	Serial No.	Next of Calibration
Spectrum Analyzer	Advantest	R3273	121100554	Jun. 15, 2012
RF Test Room	-	-	-	-

Note : 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to RRL, KRISS, KTL and HCT.

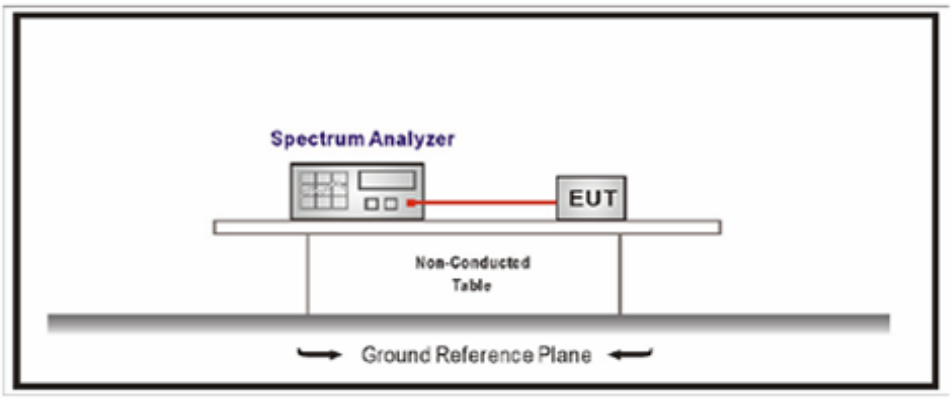
2. The calibration interval of horn ant. and loop ant. is 24 months

3.6.2 Limit

At least 25 kHz or two-third of 20 dB hopping Channel bandwidth (whichever is greater).

3.6.3 Test Configuration

RF Conducted Measurement:



3.6.4 Test Procedure

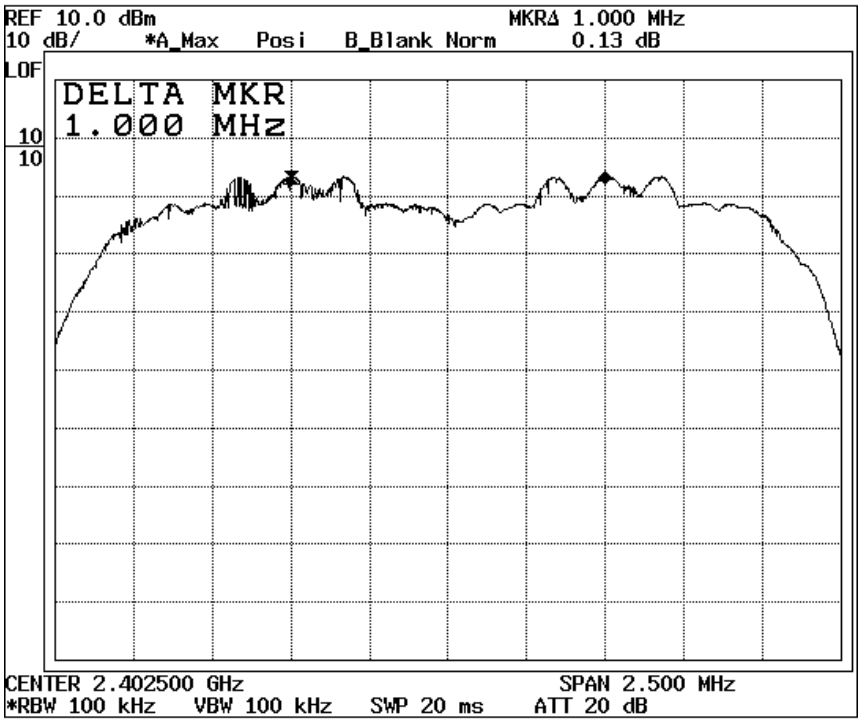
1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an eternal generator.
2. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range.
3. By using the Maxhold fuction record the separation of two adjacent channels.
4. Measure the frequency difference of these two adjacent channels by SA mark function. And then plot the result on SA screen.

3.6.5 Hopping Channel Separation Test Result

Test Mode	**8-DPSK**	Test Site	RF Test Room
Test Result	PASS		

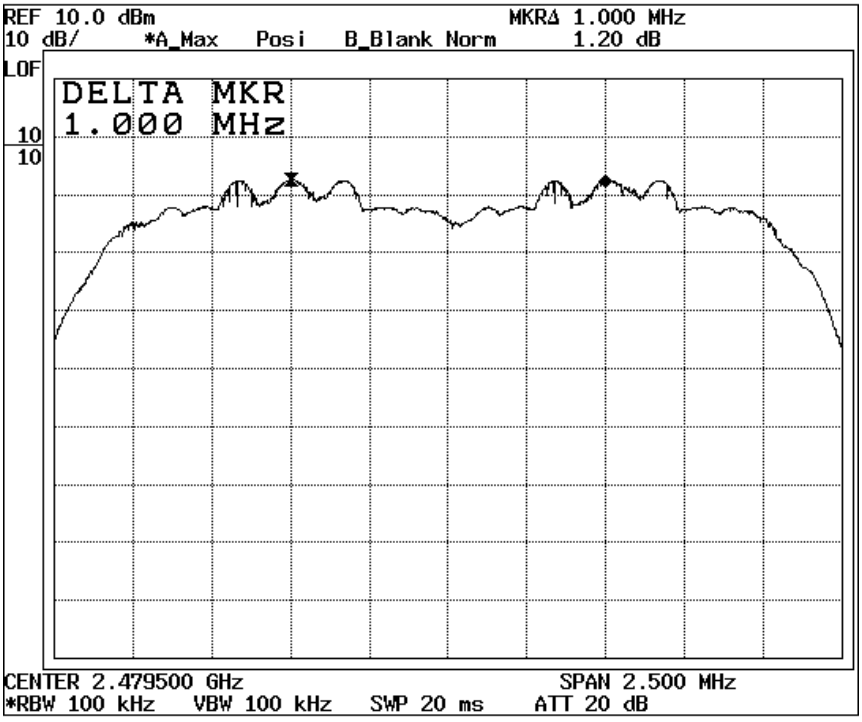
Channels	FREQUENCY (MHz)	ADJACENT CHANNEL SEPARATION (MHz)	Result
00	2 402	1.000	PASS
39	2 441	1.000	PASS
78	2 480	1.000	PASS

CH 00 (2 402 MHz)



CH 39 (2 441 MHz)

CH 78 (2 480 MHz)



3.7 Maximum Peak Output Power

3.7.1 Test Instruments

Description	Manufacturer	Model No.	Serial No.	Next of Calibration
Spectrum Analyzer	Advantest	R3273	121100554	Jun. 15, 2012
RF Test Room	-	-	-	-

Note : 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to RRL, KRISS, KTL and HCT.

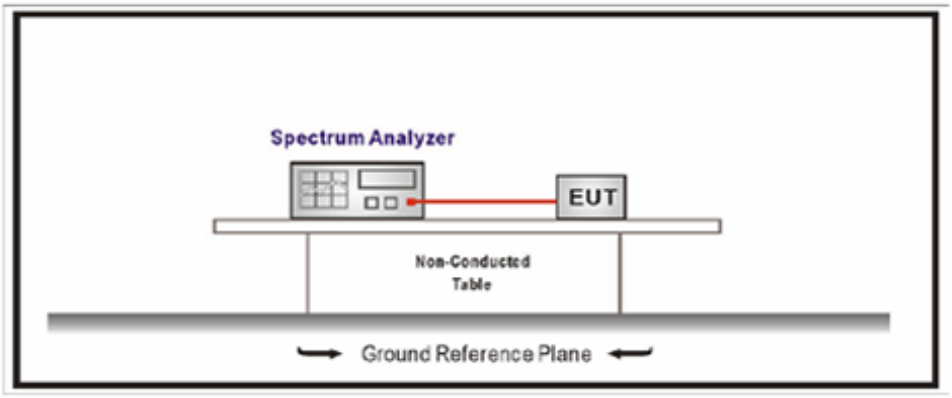
2. The calibration interval of horn ant. and loop ant. is 24 months

3.7.2 Limit

The maximum antenna gain is less than 6 dBi, therefore the limit is 30 dBm.

3.7.3 Test Configuration

RF Conducted Measurement:



3.7.4 Test Procedure

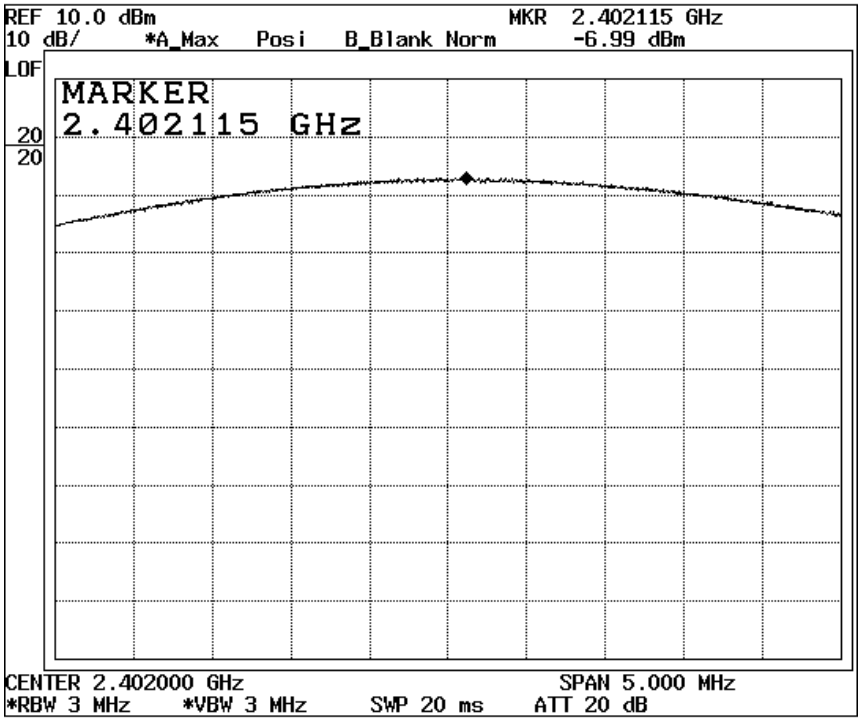
1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operation rage. Set a reference level on the measuring instrument equal to the highest peak value.
3. The center frequency og the spectrum analyzer is set to the fundamental frequency and using 3 MHz RBW and 3 MHz VBW.
4. Measure the captured power within the band and recording the plot.
5. Repeat above procedures until all frequencies required were complete.

3.7.5 Maximum Peak Output Power Test Result

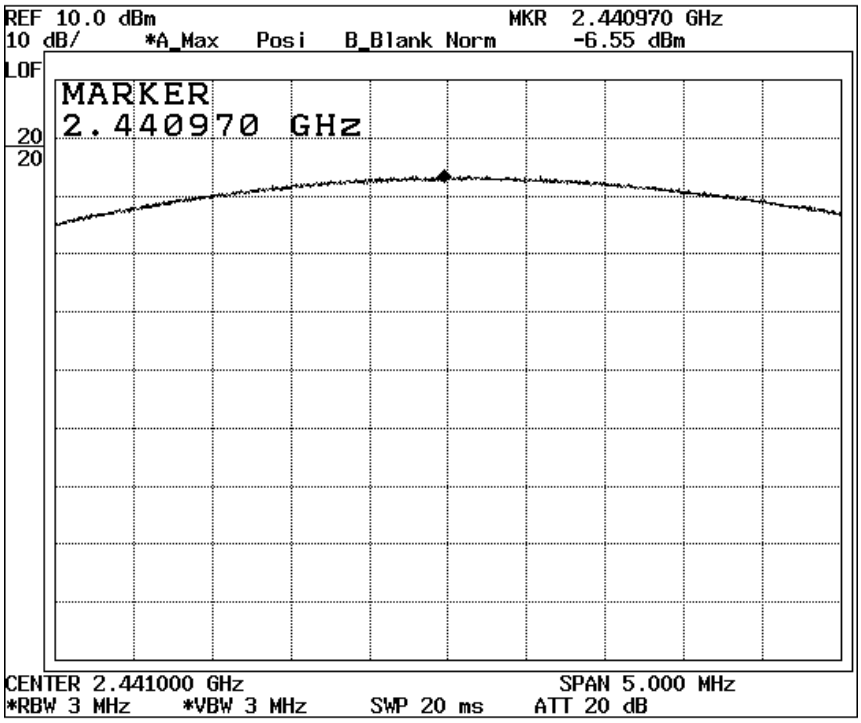
Test Mode	**8-DPSK**	Test Site	RF Test Room
Test Result	PASS		

Channel No.	Frequency (MHz)	Measue Leve (dBm)	Limit (dBm)	Result
00	2 402	-6.99	1Watt = 30 dBm	PASS
39	2 441	-6.55	1Watt = 30 dBm	PASS
78	2 480	-6.95	1Watt = 30 dBm	PASS

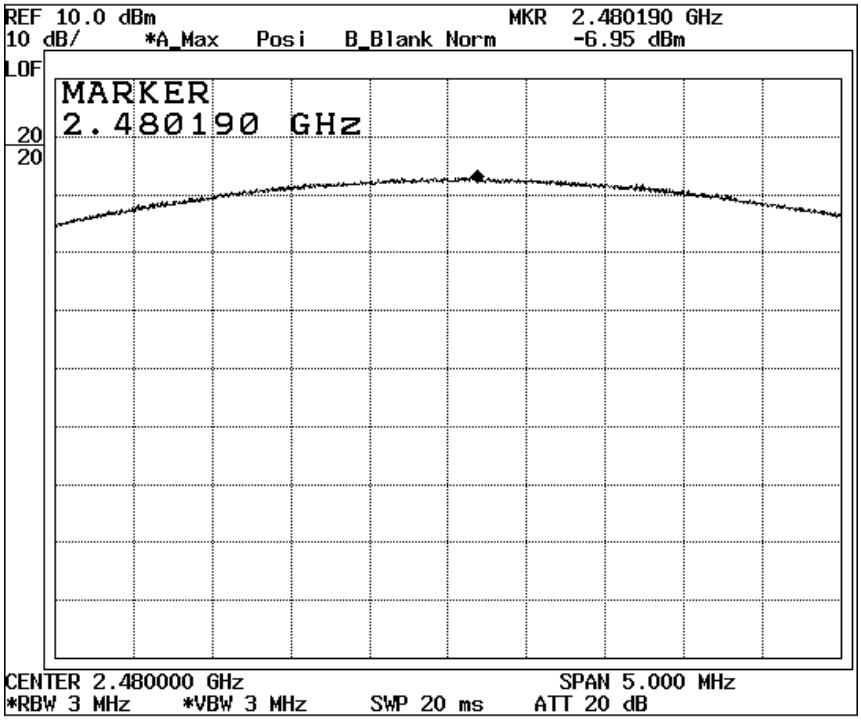
CH 00 (2 402 MHz)



CH 39 (2 441 MHz)



CH 78 (2 480 MHz)



3.8 Band Edge

3.8.1 Test Instruments

Description	Manufacturer	Model No.	Serial No.	Next of Calibration
Test Receiver	LIG NEX1	ER-265	L0804B002	Jul. 14, 2012
Horn Antenna	Schwarzbeck	BBHA9120D	0501	Sep. 10 2012
Horn Antenna	Schwarzbeck	BBHA9170	BBHA9170152	Sep. 16. 2012

Note : 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to RRL, KRISS, KTL and HCT.

2. The calibration interval of horn ant. and loop ant. is 24 months

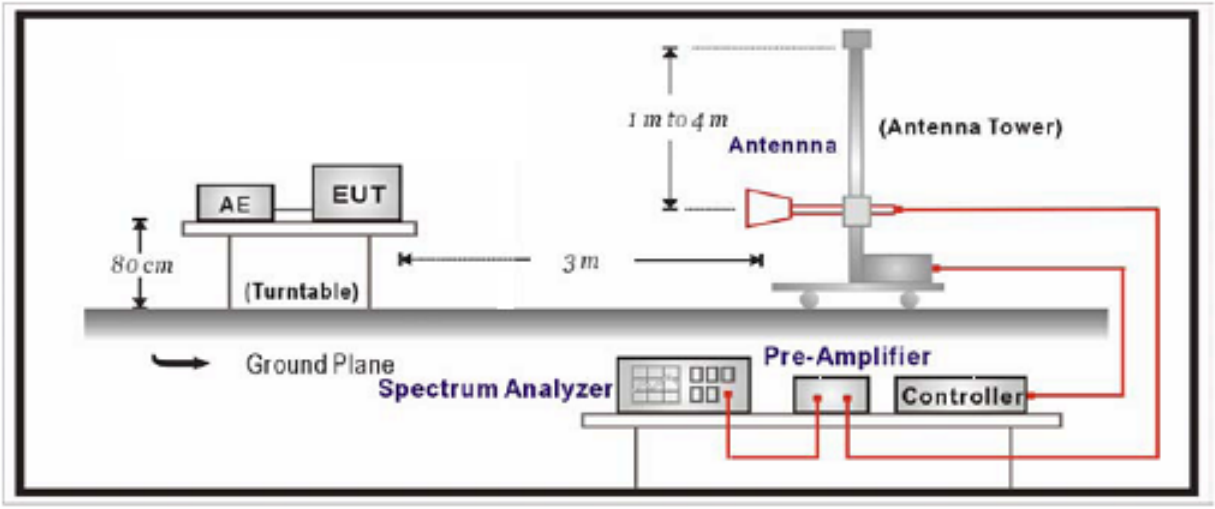
3.8.2 Limit

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, based on either an RF conducted or a radiated measurement.

Attenuation below the general limits specified in section 15.209(a) is not required. In addition, radiated emission which fall in the restricted bands, as defined in section 15.205(a), must also comply with the radiated emission limits specified in section 15.209(a)(see Section 15.205(c)).

3.8.3 Test Configuration

Radiated Measurement : 3 m Full Chamber



3.8.4 Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters. The antenna can move up and down between 1 meter and 4 meters to fine out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4:2003 on radiated measurement.

The bandwidth below 1 GHz setting on the field strength meter is 100 kHz, above 1GHz are 1MHz.

3.8.5 Test Result Method of Band Edge Test Result of Radiated Test.

Emission Level(dBuV/m) = Reading Level + Correct Factor.

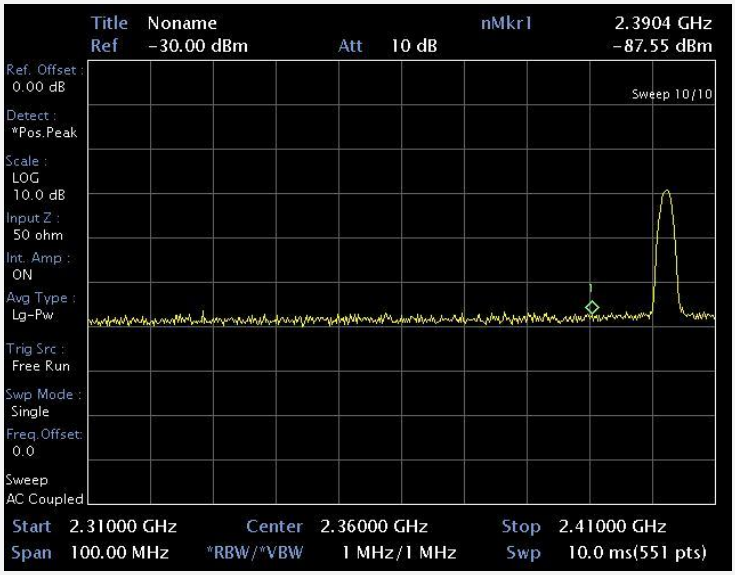
Note : Correct Factor = AF + CL

AF – Antenna Factor , CL-Cable Loss

3.8.6 Band Edge Test Result

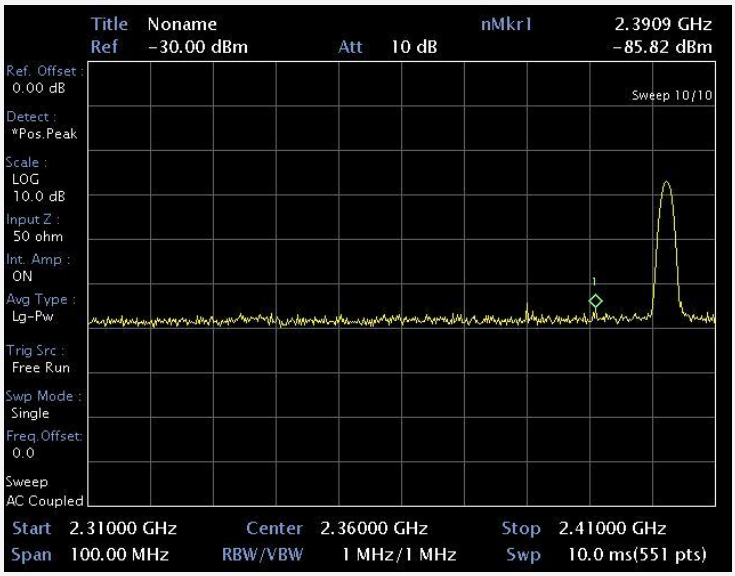
Detect mode	Peak	Mode	Continuous Tx
Note	F1 (2 402 MHz)	Modulation	**8-DPSK**

HOR



Frequency (MHz)	Reading PK (dBuV/m)	Factor(dB) CL+AF	Limits PK (dBuV/m)	Result PK (dBuV/m)	Margin PK (dB)
2 390	19.44	33.39	74	52.83	21.17

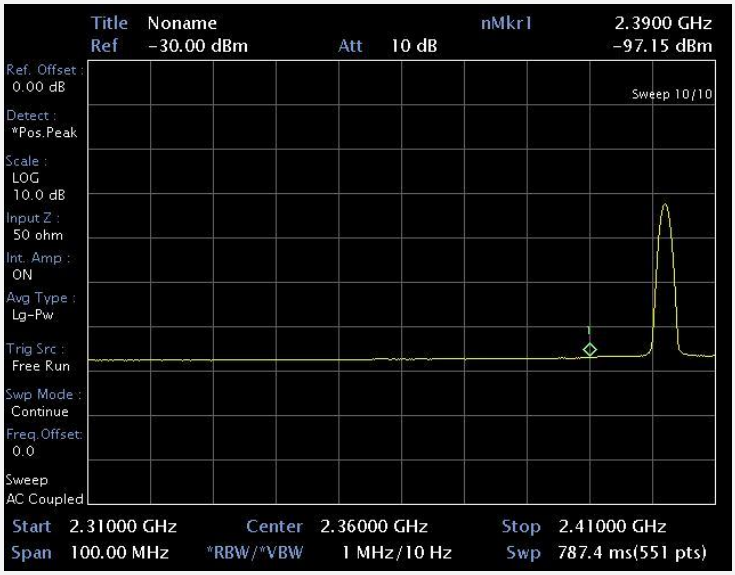
VER



Frequency (MHz)	Reading PK (dBuV/m)	Factor(dB) CL+AF	Limits PK (dBuV/m)	Result PK (dBuV/m)	Margin PK (dB)
2 390	21.17	33.39	74	54.56	19.44

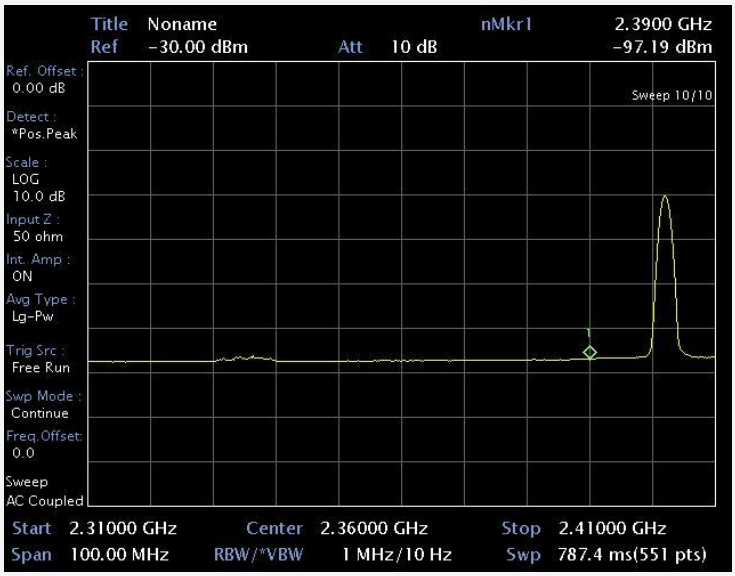
Detect mode	Average	Mode	Continuous Tx
Note	F1 (2 402 MHz)	Modulation	**8-DPSK**

HOR



Frequency (MHz)	Reading PK (dBuV/m)	Factor(dB) CL+AF	Limits PK (dBuV/m)	Result PK (dBuV/m)	Margin PK (dB)
2 390	9.84	33.39	54	43.23	10.77

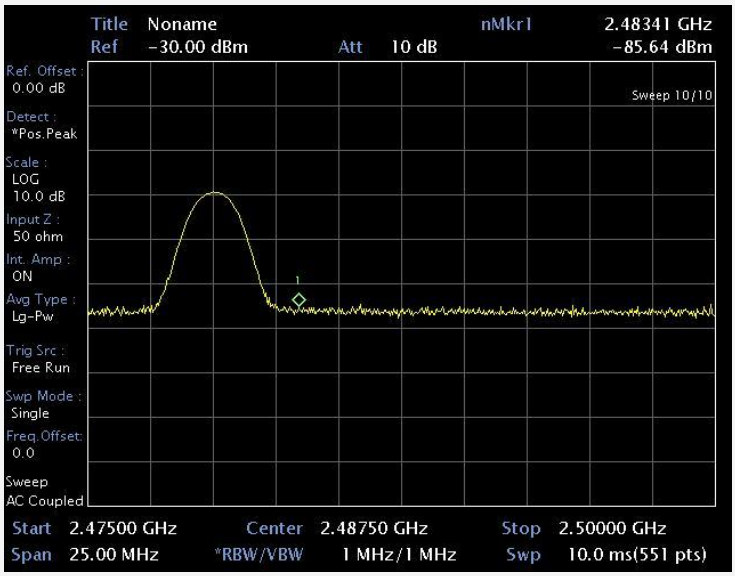
VER



Frequency (MHz)	Reading PK (dBuV/m)	Factor(dB) CL+AF	Limits PK (dBuV/m)	Result PK (dBuV/m)	Margin PK (dB)
2 390	9.80	33.39	54	43.19	10.81

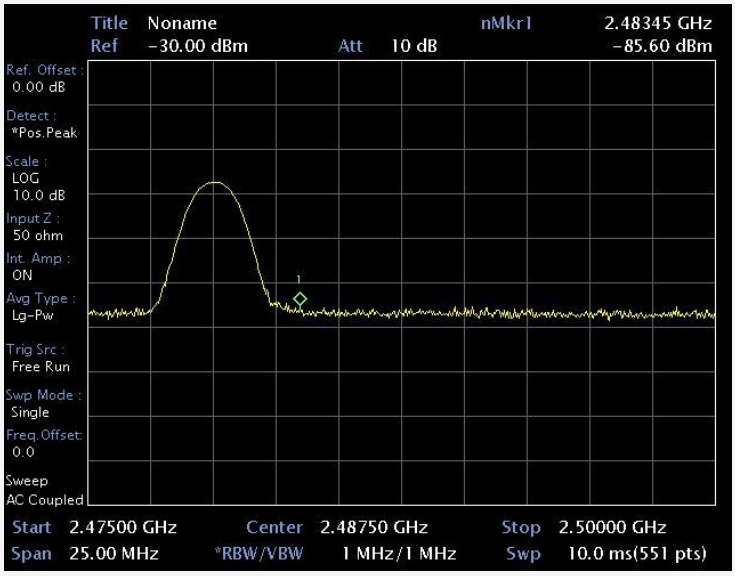
Detect mode	Peak	Mode	Continuous Tx
Note	F3 (2480 MHz)	Modulation	**8-DPSK**

HOR



Frequency (MHz)	Reading PK (dBuV/m)	Factor(dB) CL+AF	Limits PK (dBuV/m)	Result PK (dBuV/m)	Margin PK (dB)
2 483.5	21.35	33.73	74	55.08	18.92

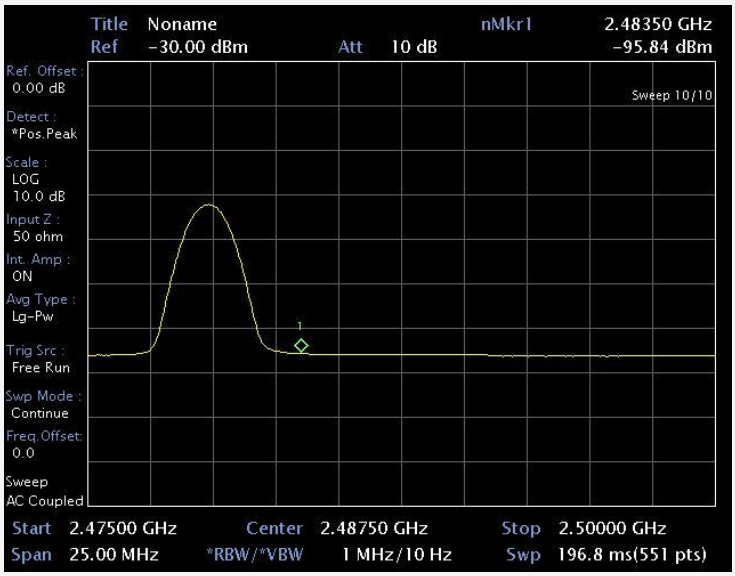
VER



Frequency (MHz)	Reading PK (dBuV/m)	Factor(dB) CL+AF	Limits PK (dBuV/m)	Result PK (dBuV/m)	Margin PK (dB)
2 483.5	21.39	33.73	74	55.12	18.88

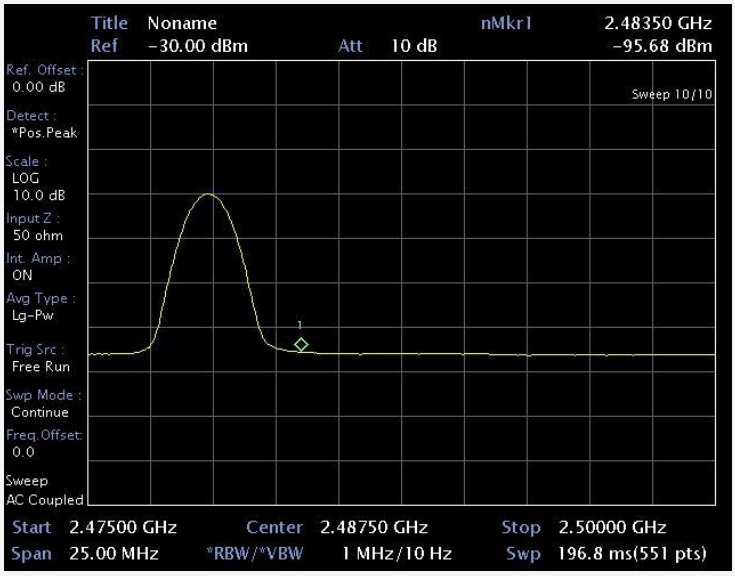
Detect mode	Average	Mode	Continuous Tx
Note	F3 (2480 MHz)	Modulation	**8-DPSK**

HOR



Frequency (MHz)	Reading PK (dBuV/m)	Factor(dB) CL+AF	Limits PK (dBuV/m)	Result PK (dBuV/m)	Margin PK (dB)
2 483.5	11.15	33.73	54	44.88	9.12

VER



Frequency (MHz)	Reading PK (dBuV/m)	Factor(dB) CL+AF	Limits PK (dBuV/m)	Result PK (dBuV/m)	Margin PK (dB)
2 483.5	11.31	33.73	54	45.04	8.96

4.0 Antenna Requirement

Applicalbe Standard

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses the intentional radiator shall be considered sufficient to comply with the provisions of this section.
The antennas type used in this product is Chip Antenna without connector and it is considered to meet antenna requirement. The antenna peak gain of EUT is less than 6 dBi. The antenna peak gain is 0 dBi.
Test Result : Pass

Appendix A. The Photo of Test Setup

Front View of Conducted Emission

Rear View of Conducted Emission

Front View of Radiated Emission (Below 30 MHz)

Rear View of Radiated Emission (Below 30 MHz)

Front View of Radiated Emission (Below 1 GHz)

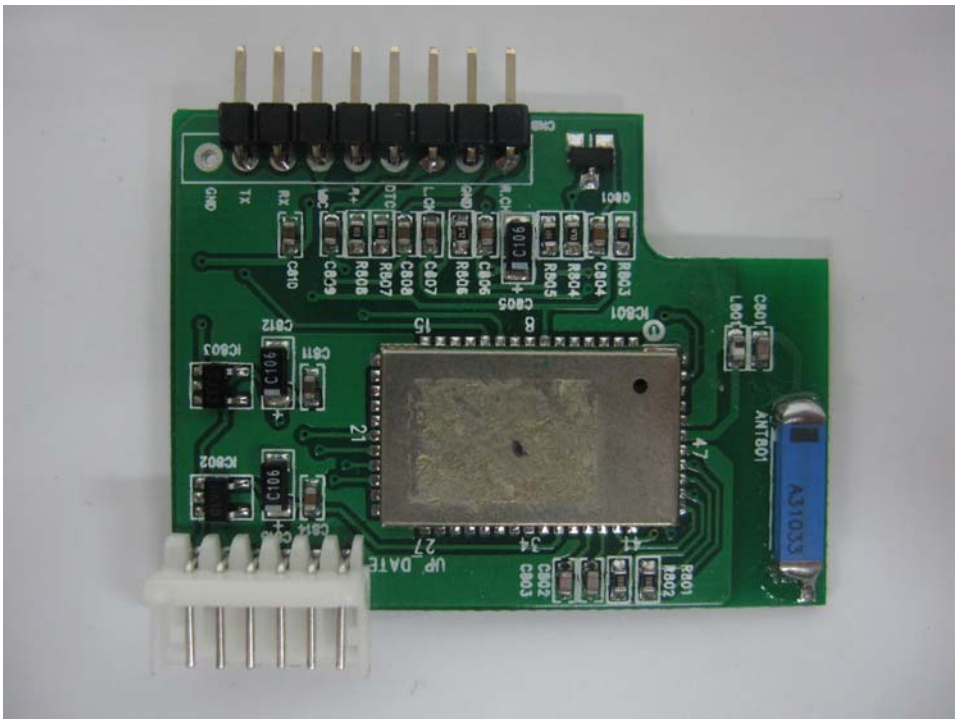
Rear View of Radiated Emission (Below 1 GHz)

Front View of Radiated Emission (Above 1 GHz)

Rear View of Radiated Emission (Above 1 GHz)

Appendix B. The Photo of Equipment Under Test

Front View of EUT



Rear View of EUT

Inside View of EUT