

FCC Test Report

Report No.: AGC03061180302FE08

FCC ID : AL8-BF3100S
APPLICATION PURPOSE : Original Equipment
PRODUCT DESIGNATION : Stereo Bluetooth Headset
BRAND NAME : Plantronics
MODEL NAME : BF3100S
CLIENT : Plantronics, Inc.
DATE OF ISSUE : Apr. 16, 2018
STANDARD(S) : FCC Part 15 Subpart C Section 15.247
REPORT VERSION : V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd

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Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Apr. 16, 2018	Valid	Initial release

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1. VERIFICATION OF COMPLIANCE

Applicant	Plantronics, Inc.
Address	345 Encinal Street, Santa Cruz, California 95060 United States
Manufacturer	Plantronics, Inc.
Address	345 Encinal Street, Santa Cruz, California 95060 United States
Product Designation	Stereo Bluetooth Headset
Brand Name	Plantronics
Test Model	BF3100S
Date of test	Apr. 02, 2018 to Apr. 10, 2018
Deviation	None
Condition of Test Sample	Normal
Report Template	AGCRT-US-BLE/RF (2013-03-01)

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. The test data, the energy emitted by the sample tested as described in this report is in compliance with the requirements of FCC Rules Part 15.247. The test results of this report relate only to the tested sample identified in this report.

Tested By



Berg Lu(Lu Bing)

Apr. 10, 2018

Reviewed By



Forrest Lei(Lei Yonggang)

Apr. 16, 2018

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2. GENERAL INFORMATION

2.1 PRODUCT DESCRIPTION

The EUT is designed as a "Stereo Bluetooth Headset". It is designed by way of utilizing the FHSS technology to achieve the system operation.

A major technical description of EUT is described as following

Operation Frequency	2.402 GHz to 2.480GHz
RF Output Power	3.63dBm(Max)
Bluetooth Version	V5.0
Modulation	GFSK for BLE
Number of channels	40 Channel(37 Hopping Channel,3 advertising Channel)
Antenna Designation	Fixed Antenna
Antenna Gain	-2.67dBi
Hardware Version	VB2
Software Version	V12
Power Supply	DC 3.7V by Battery
Note: 1. The EUT comprises left and right channel earphone, both are the same and have been tested and only the test data of left earphone recorded in this report. 2. The BT function of EUT didn't work when charging.	

2.2 TEST METHOD

All measurements contained in this report were conducted with ANSI C63.10-2013.

2.3 EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

2.4 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%.

- Uncertainty of Radiated Emission below 1GHz, $U_c = \pm 3.9$ dB
- Uncertainty of Radiated Emission above 1GHz, $U_c = \pm 4.8$ dB

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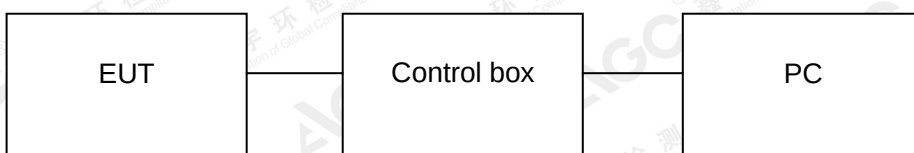
3. SYSTEM TEST CONFIGURATION

3.1 CONFIGURATION OF TESTED SYSTEM

Configure 1: (Normal hopping)



Configuration: Continuous TX



3.2 EQUIPMENT USED IN TESTED SYSTEM

Item	Equipment	Mfr/Brand	Model/Type No.	Remark
1	Stereo Bluetooth Headset	Plantronics	BF3100S	EUT
2	Battery	VDL	1644C	Accessory
3	PC	APPLE	A1465	A.E
4	Control box	AIROHA	N/A	A.E
5	Temporary Antenna Connector	T10	N/A	A.E
6	USB Cable	N/A	1m Unshielded	A.E

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3.3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.203	Antenna Requirement	Compliant
§15.209 §15.247(d)	Radiated Emission	Compliant
§15.247(d)	Band Edges	Compliant
§15.247(a) (2)	6 dB Bandwidth	Compliant
§15.247(b)	Conducted Output Power	Compliant
§15.247(d)	Conducted Spurious Emission	Compliant
§15.247(e)	Conducted Power Spectral Density	Compliant
§15.207	Line Conduction Emission	N/A

Note: N/A means it's not applicable to this item.

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4. DESCRIPTION OF TEST MODES

The EUT has been operated in one modulation: GFSK.

NO.	TEST MODE DESCRIPTION
1	Low channel GFSK
2	Middle channel GFSK
3	High channel GFSK
4	BT Link
Note: 1. Only the result of the worst case was recorded in the report if no any records. 2. For Radiated Emission, 3axis were chosen for testing for each applicable mode. 3. Transmitting duty cycle >98%, The average correction factor is about -0.18 4. The EUT used fully-charged battery when tested.	

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Software Setting

Airoha AB152x (verC) LAB Test Tool - Version 2.1.0.11688

View Options Help Engineer: Login Logout

COM7   

TX RX Crystal Trim Test Mode Controller Mode

CTX_START RF Freq.(MHz) 2480

CTX_DATA Tx GC 30

BTX_PACKET PKT Type DH1

LE Transmitter Test Data Type PN sequence

☐ Hopping on

☐ Temperature Compensation

[15:00:20] BTx Packet Complete!

[15:00:37] BTx Packet Complete!

[15:01:59] BTx Packet Complete!

[15:02:48] BTx Packet Complete!

[15:03:07] BTx Packet Complete!

[15:03:08] BTx Packet Complete!

Serial Port Settings BaudRate: 3000000, Parity: None, Handshake: None **Status** SysMode: Device, Boot Rea

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5. TEST FACILITY

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location	1-2F., Bldg.2, No.1-4, Chaxi Sanwei Technical Industrial Park, Gushu, Xixiang, Bao'an District B112-B113, Bldg.12, Baoan Bldg Materials Center, No.1 of Xixiang Inner Ring Road, Baoan District, Shenzhen 518012
NVLAP Lab Code	600153-0
Designation Number	CN5028
Test Firm Registration Number	682566
Description	Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by National Voluntary Laboratory Accreditation program, NVLAP Code 600153-0

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6. TEST EQUIPMENT LIST

TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	Jun.20, 2017	Jun.19, 2018
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec.08, 2017	Dec.07, 2018
Horn antenna	SCHWARZBECK	BBHA 9170	#768	Sep.20, 2017	Sep.19, 2018
preamplifier	ChengYi	EMC184045SE	980508	Sep.15, 2017	Sep.14, 2018
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	May 18, 2017	May 17, 2019
Broadband Preamplifier	SCHWARZBECK	BBV 9718	9718-205	Jun.20, 2017	Jun.19, 2018
ANTENNA	SCHWARZBECK	VULB9168	D69250	Sep.28, 2017	Sep.27, 2018
Loop Antenna	LAPLACE	RF300	--	Mar. 01, 2018	Feb. 28, 2020
Radiation Cable 1	MXT	RS1	R005	June 6, 2017	June 5, 2018
Radiation Cable 2	MXT	RS1	R006	June 6, 2017	June 5, 2018

Note: The test frequency range for Radiation Cable 1& Radiation Cable 2 is 9KHz to 25GHz.

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7. ANTENNA REQUIREMENT

7.1. STANDARD APPLICABLE

According to FCC 15.203, 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 a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

7.2. TEST RESULT

This product has a fixed antenna, fulfill the requirement of this section.

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8. RADIATED EMISSION

8.1 LIMITS

Frequency (MHz)	Distance Meters	Field Strengths Limit	
		$\mu\text{V/m}$	$\text{dB}(\mu\text{V})/\text{m}$
0.009 ~ 0.490	300	2400/F(kHz)	---
0.490 ~ 1.705	30	24000/F(kHz)	---
1.705 ~ 30	30	30	---
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	Other:74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	

Remark: (1) Emission level $\text{dB}\mu\text{V} = 20 \log \text{Emission level } \mu\text{V/m}$
 (2) The smaller limit shall apply at the cross point between two frequency bands.
 (3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

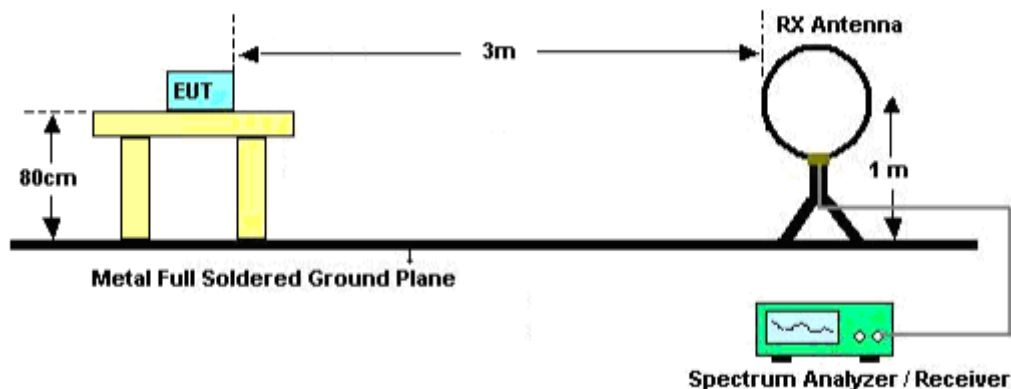
8.2 MEASUREMENT PROCEDURE

- The measuring distance of 3m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation(Below 1GHz)
- The measuring distance of 3m shall used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation(Above 1GHz)
- The height of the test antenna shall vary between 1m to 4m.Both horizontal and vertical polarization Of the antenna are set to make the measurement.
- The initial step in collecting radiated emission data is a receive peak detector mode. Pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- All readings are peak unless otherwise stated QP in column of Note. Peak denoted that the Peak reading compliance with the QP limits and then QP Mode measurement didn't perform(Below 1GHz)
- All readings are Peak mode value unless otherwise stated AVG in column of Note. If the Peak mode measured value compliance with the Peak limits and lower than AVG Limits, the EUT shall be deemed to meet Peak&AVG limits and then only Peak mode was measured, but AVG mode didn't perform.(Above 1GHz)

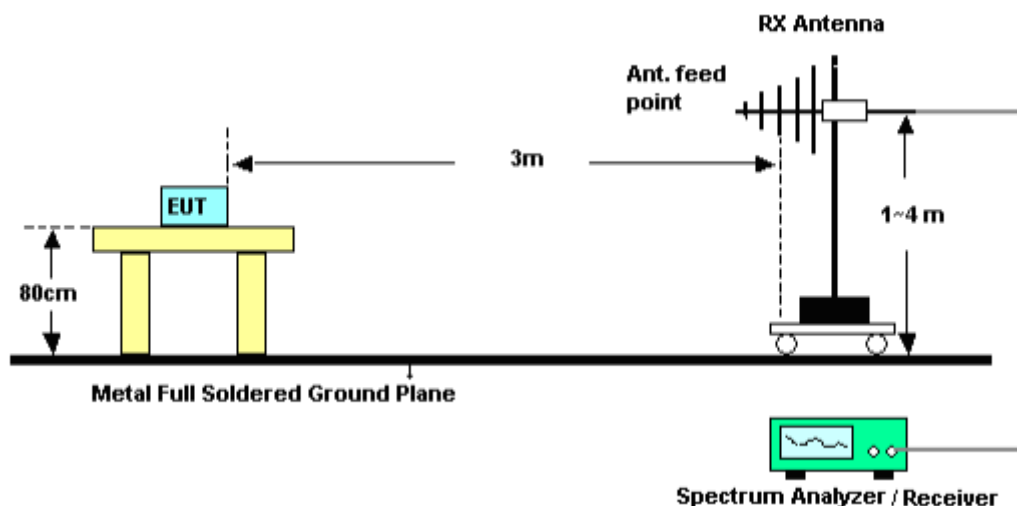
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8.3 TEST SETUP

RADIATED EMISSION TEST SETUP BELOW 30MHz

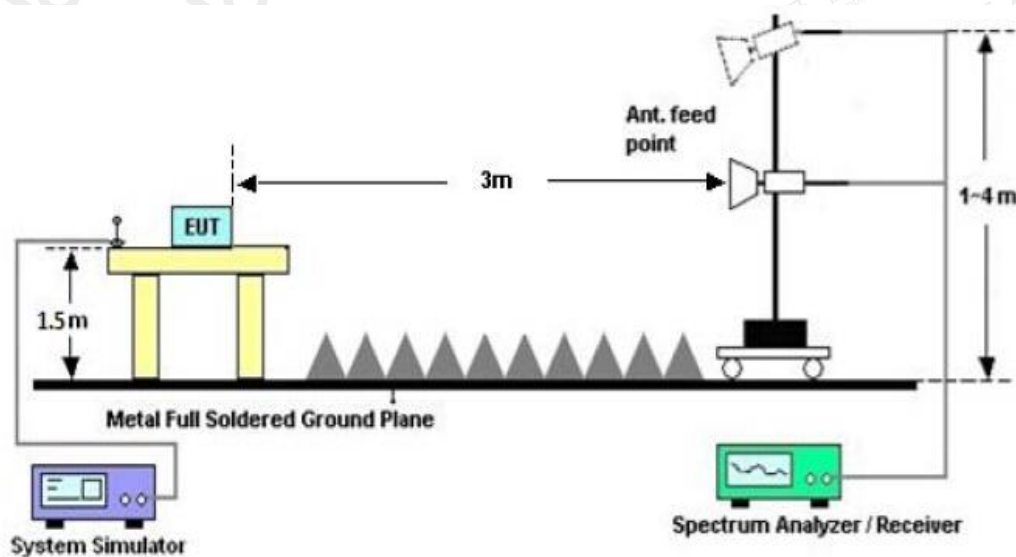


RADIATED EMISSION TEST SETUP 30MHz-1000MHz



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RADIATED EMISSION TEST SETUP ABOVE 1000MHz



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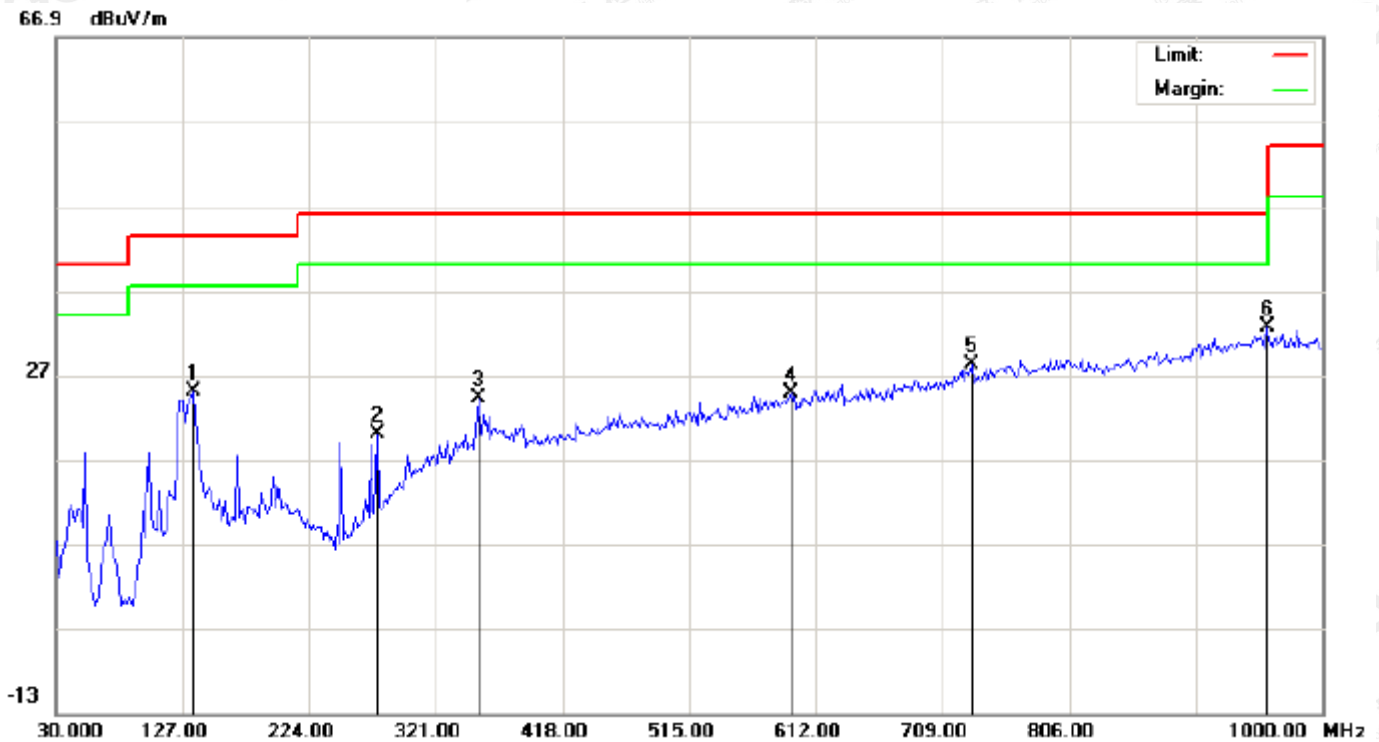
8.4 TEST RESULT (Worst Modulation: GFSK)

RADIATED EMISSION BELOW 30MHz

No emission found between lowest internal used/generated frequencies to 30MHz.

RADIATED EMISSION BELOW 1GHz

RADIATED EMISSION TEST- (30MHz-1GHz)-LOW CHANNEL-HORIZONTAL

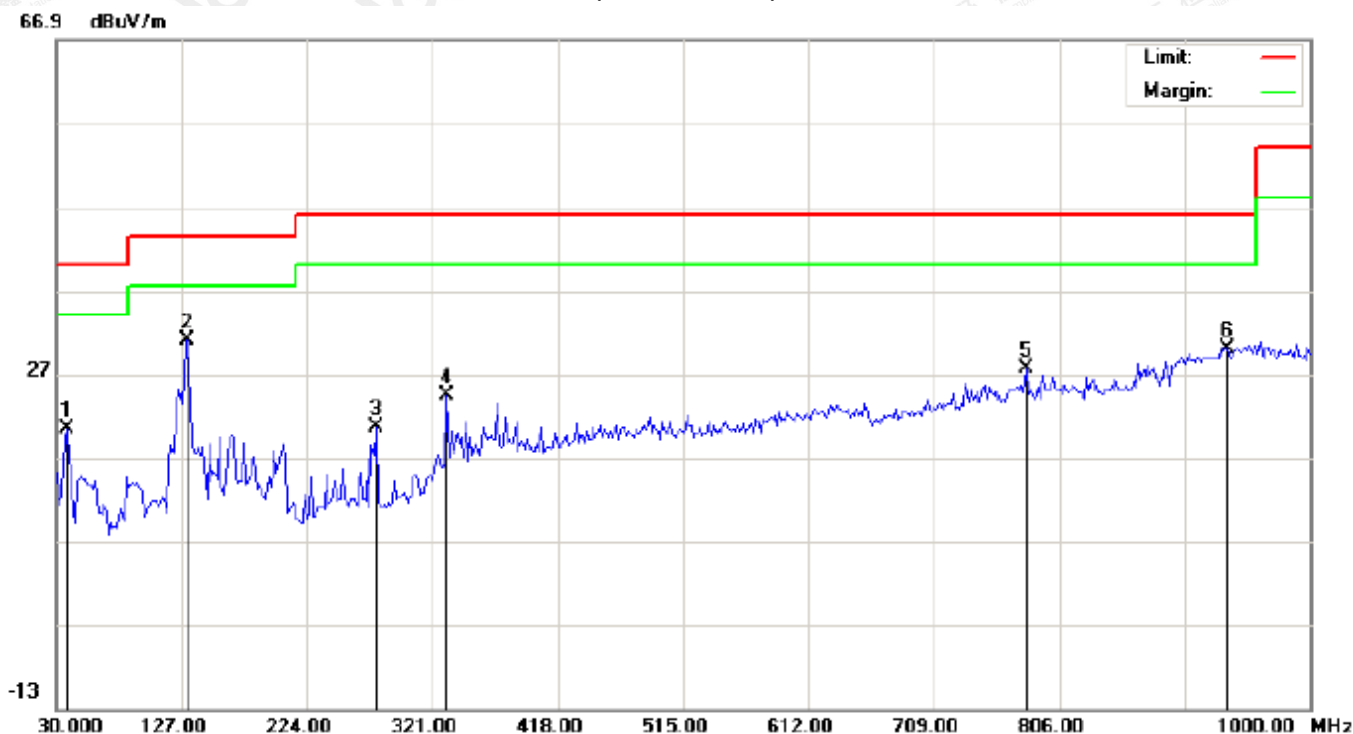


No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		135.0833	12.07	12.90	24.97	43.50	-18.53	peak			
2		275.7333	8.77	11.28	20.05	46.00	-25.95	peak			
3		353.3333	5.46	18.76	24.22	46.00	-21.78	peak			
4		592.6000	1.34	23.55	24.89	46.00	-21.11	peak			
5		731.6333	2.04	26.11	28.15	46.00	-17.85	peak			
6	*	957.9667	2.76	29.92	32.68	46.00	-13.32	peak			

RESULT: PASS

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RADIATED EMISSION TEST- (30MHz-1GHz)-LOW CHANNEL -VERTICAL



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		38.0833	14.11	6.39	20.50	40.00	-19.50	peak			
2	*	131.8500	19.18	11.80	30.98	43.50	-12.52	peak			
3		277.3500	5.78	14.73	20.51	46.00	-25.49	peak			
4		332.3167	6.89	17.56	24.45	46.00	-21.55	peak			
5		780.1333	0.50	27.05	27.55	46.00	-18.45	peak			
6		935.3333	0.50	29.59	30.09	46.00	-15.91	peak			

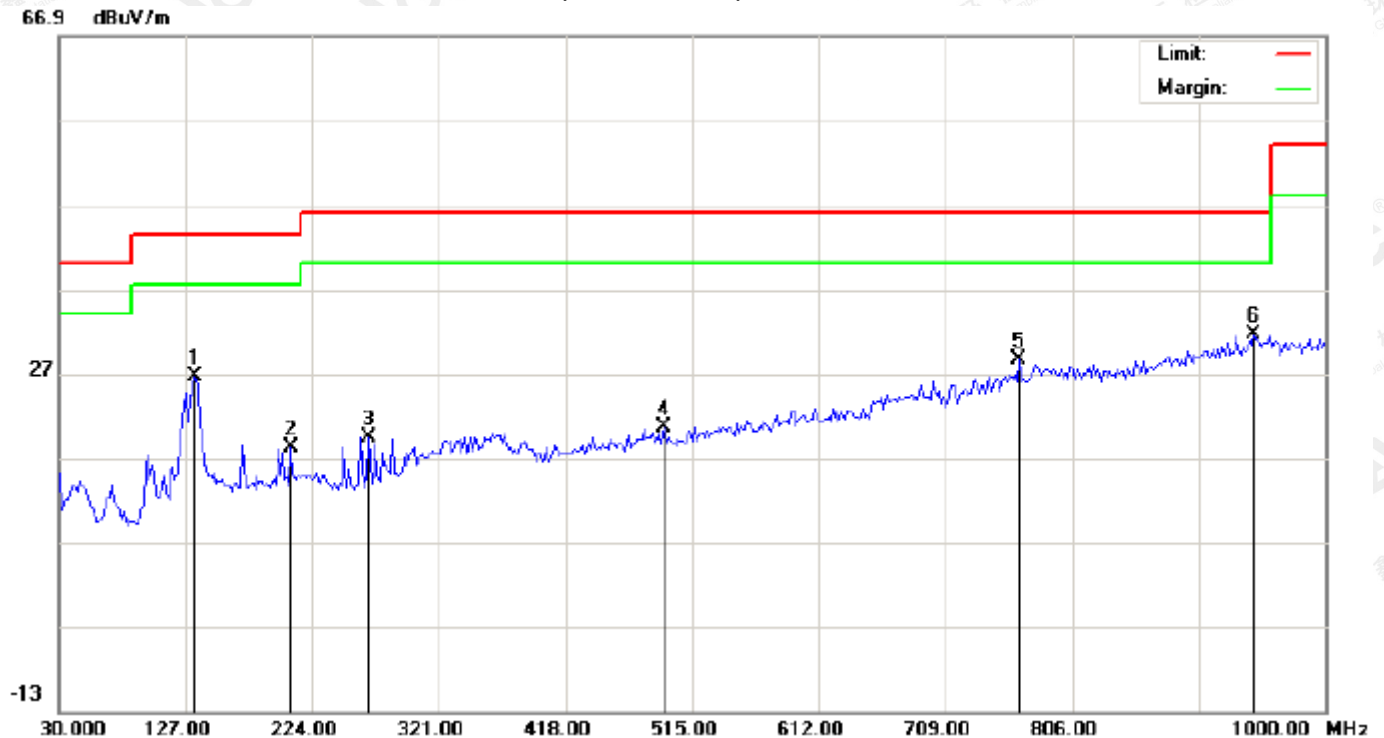
RESULT: PASS

Note: 1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.

2. The "Factor" value can be calculated automatically by software of measurement system.

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RADIATED EMISSION TEST- (30MHz-1GHz)-MIDDLE CHANNEL-HORIZONTAL

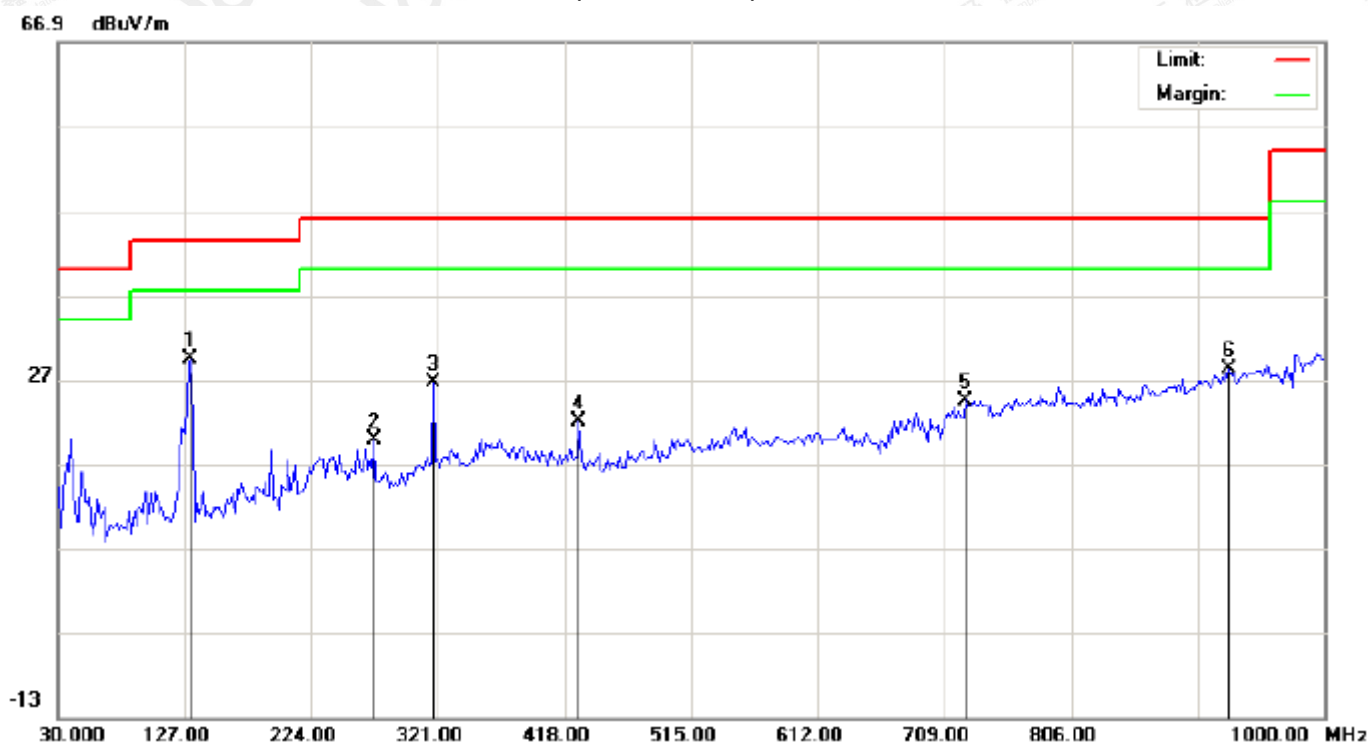


No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		133.4667	14.54	12.15	26.69	43.50	-16.81	peak			
2		207.8333	7.01	11.20	18.21	43.50	-25.29	peak			
3		267.6500	9.48	9.90	19.38	46.00	-26.62	peak			
4		493.9833	-0.45	21.07	20.62	46.00	-25.38	peak			
5		765.5833	1.69	26.85	28.54	46.00	-17.46	peak			
6	*	945.0333	1.65	29.86	31.51	46.00	-14.49	peak			

RESULT: PASS

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RADIATED EMISSION TEST- (30MHz-1GHz)- MIDDLE CHANNEL -VERTICAL



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	131.8500	17.56	11.80	29.36	43.50	-14.14	peak			
2		272.5000	5.20	14.58	19.78	46.00	-26.22	peak			
3		317.7667	9.97	16.59	26.56	46.00	-19.44	peak			
4		429.3167	1.95	19.96	21.91	46.00	-24.09	peak			
5		725.1667	-1.41	25.91	24.50	46.00	-21.50	peak			
6		927.2500	-1.21	29.37	28.16	46.00	-17.84	peak			

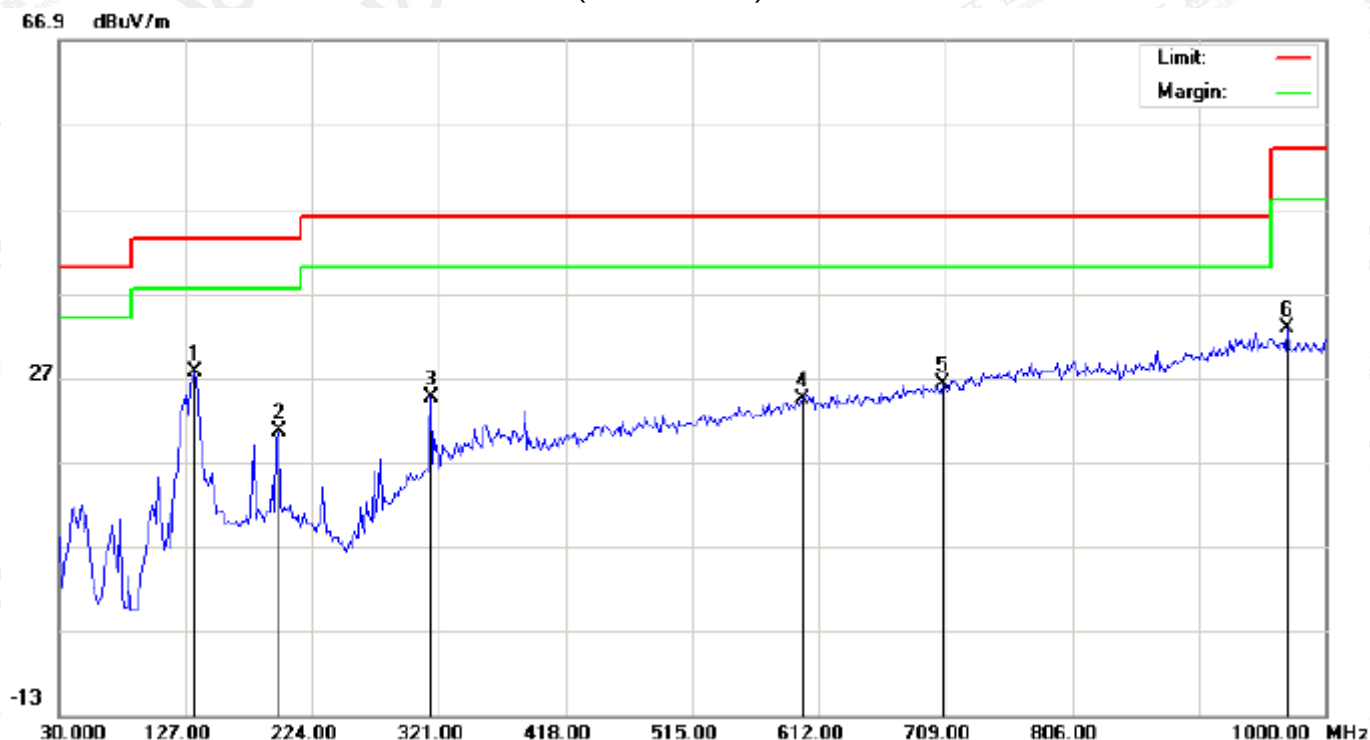
RESULT: PASS

Note: 1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.

2. The "Factor" value can be calculated automatically by software of measurement system.

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RADIATED EMISSION TEST- (30MHz-1GHz)-HIGH CHANNEL-HORIZONTAL



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	133.4667	15.41	12.15	27.56	43.50	-15.94	peak			
2		198.1333	8.60	11.91	20.51	43.50	-22.99	peak			
3		314.5333	8.23	16.38	24.61	46.00	-21.39	peak			
4		599.0667	0.71	23.71	24.42	46.00	-21.58	peak			
5		707.3833	0.68	25.43	26.11	46.00	-19.89	peak			
6		970.9000	2.92	29.80	32.72	54.00	-21.28	peak			

RESULT: PASS

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RADIATED EMISSION TEST- (30MHz-1GHz)-HIGH CHANNEL -VERTICAL



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	130.2333	15.00	11.13	26.13	43.50	-17.37	peak			
2		170.6500	9.75	14.66	24.41	43.50	-19.09	peak			
3		266.0333	8.55	14.38	22.93	46.00	-23.07	peak			
4		384.0500	5.59	18.96	24.55	46.00	-21.45	peak			
5		673.4333	0.36	24.48	24.84	46.00	-21.16	peak			
6		961.2000	0.15	29.89	30.04	54.00	-23.96	peak			

RESULT: PASS

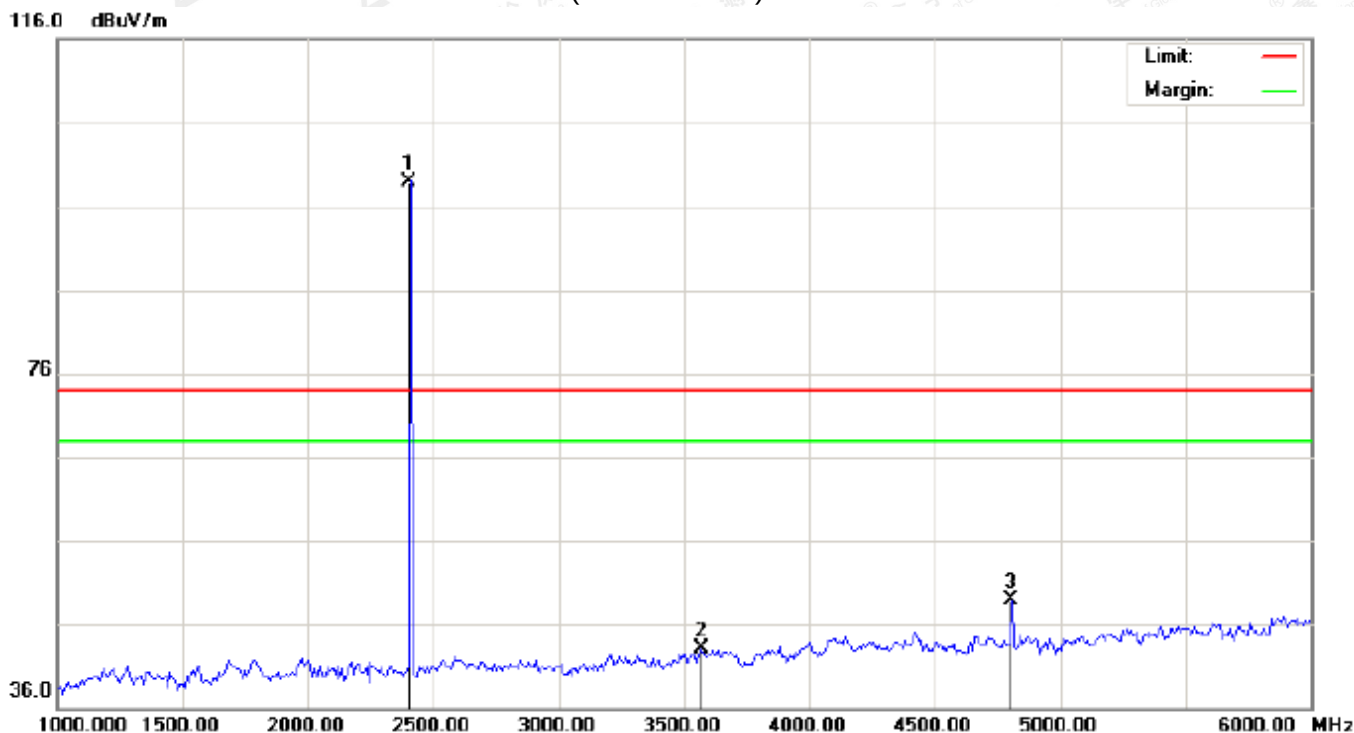
Note: 1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.

2. The "Factor" value can be calculated automatically by software of measurement system.

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RADIATED EMISSION ABOVE 1GHz

RADIATED EMISSION TEST- (ABOVE 1GHz)-LOW CHANNEL-HORIZONTAL

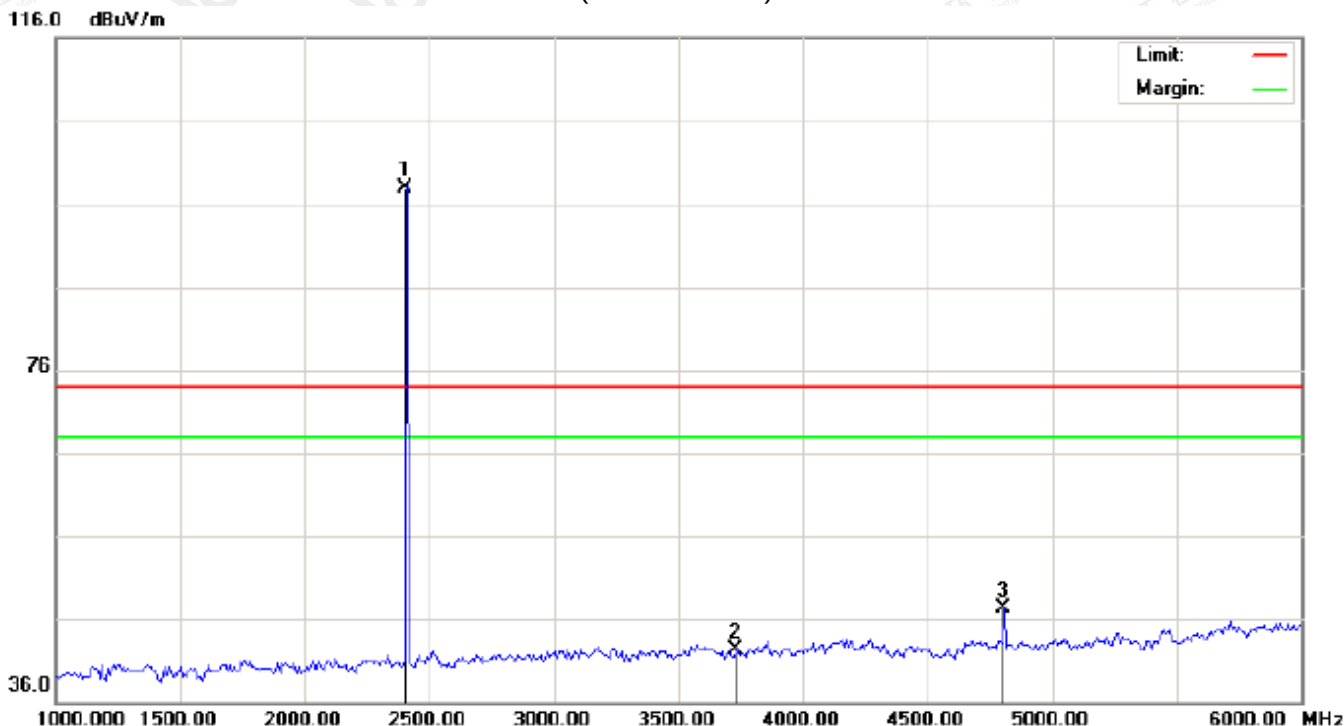


No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2402.000	88.51	10.32	98.83	74.00	24.83	peak			
2		3566.667	30.50	12.52	43.02	74.00	-30.98	peak			
3		4804.000	41.21	7.69	48.90	74.00	-25.10	peak			

RESULT: PASS

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RADIATED EMISSION TEST-(ABOVE 1GHz)-LOW CHANNEL-VERTICAL



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2402.000	87.66	10.32	97.98	74.00	23.98	peak			
2		3733.333	28.84	13.55	42.39	74.00	-31.61	peak			
3		4804.000	39.55	7.69	47.24	74.00	-26.76	peak			

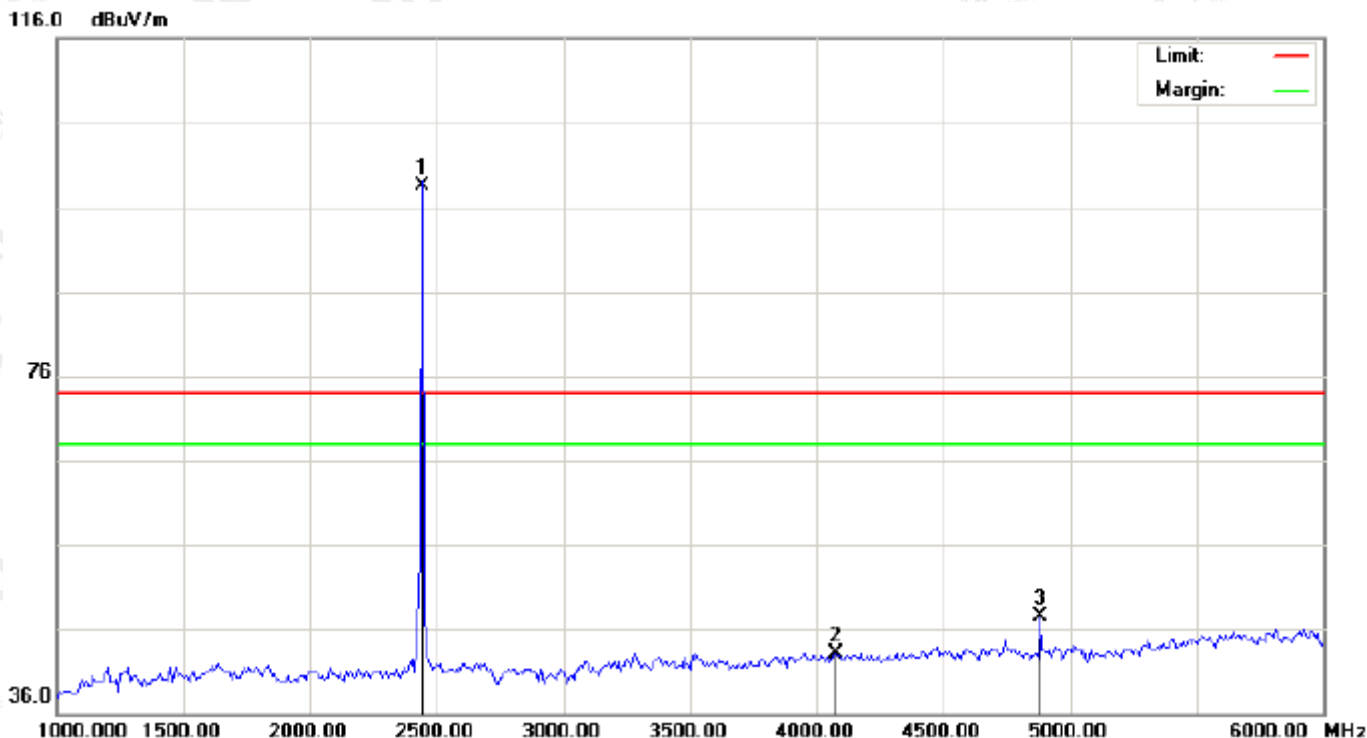
RESULT: PASS

Note: 1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.

2. The "Factor" value can be calculated automatically by software of measurement system.

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RADIATED EMISSION TEST-(ABOVE 1GHz)-MIDDLE CHANNEL-HORIZONTAL

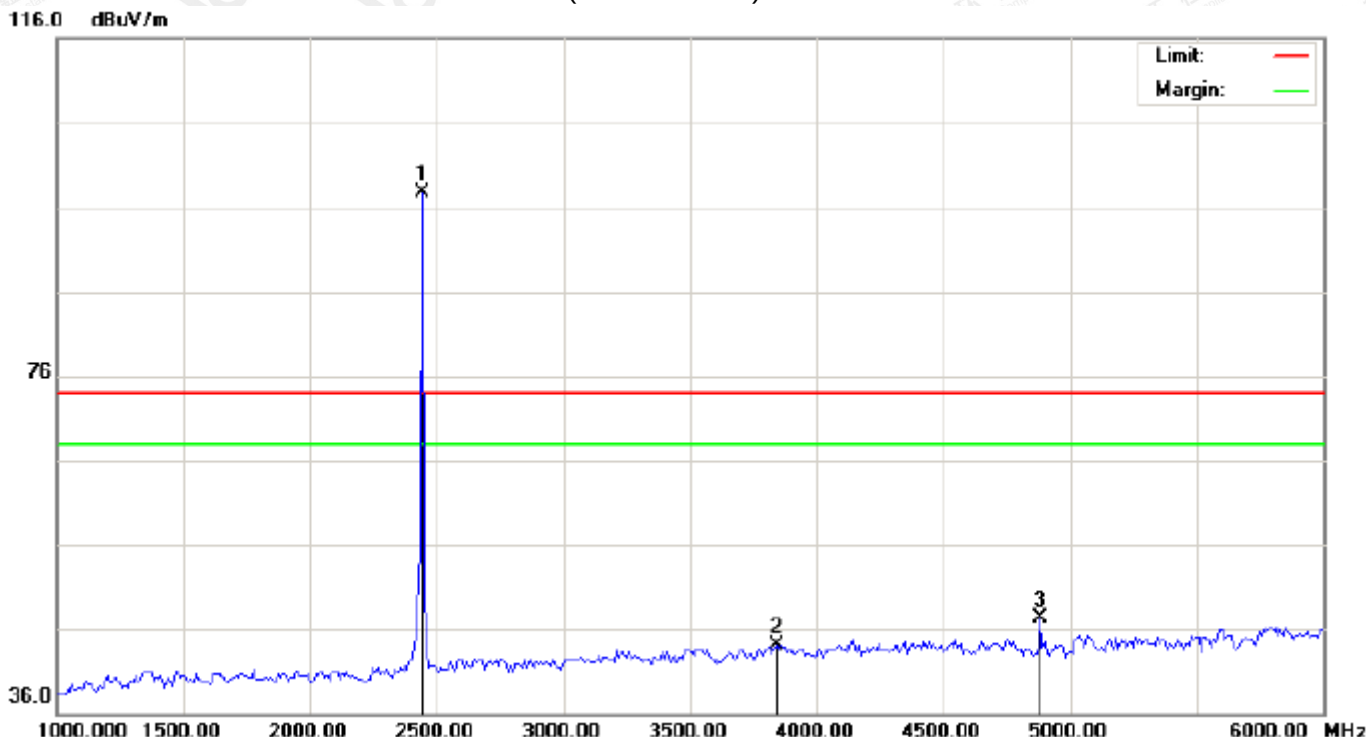


No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2440.000	88.23	10.36	98.59	74.00	24.59	peak			
2		4075.000	29.19	13.94	43.13	74.00	-30.87	peak			
3		4882.000	39.66	7.89	47.55	74.00	-26.45	peak			

RESULT: PASS

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RADIATED EMISSION TEST-(ABOVE 1GHz)-MIDDLE CHANNEL-VERTICAL



No.	Mk	Freq. MHz	Reading dBuV	Factor dB/m	Measurement dBuV/m	Limit dBuV/m	Over dB	Detector	Antenna Height cm	Table Degree degree	Comment
1	*	2440.000	87.38	10.36	97.74	74.00	23.74	peak			
2		3841.667	29.86	14.21	44.07	74.00	-29.93	peak			
3		4882.000	39.39	7.89	47.28	74.00	-26.72	peak			

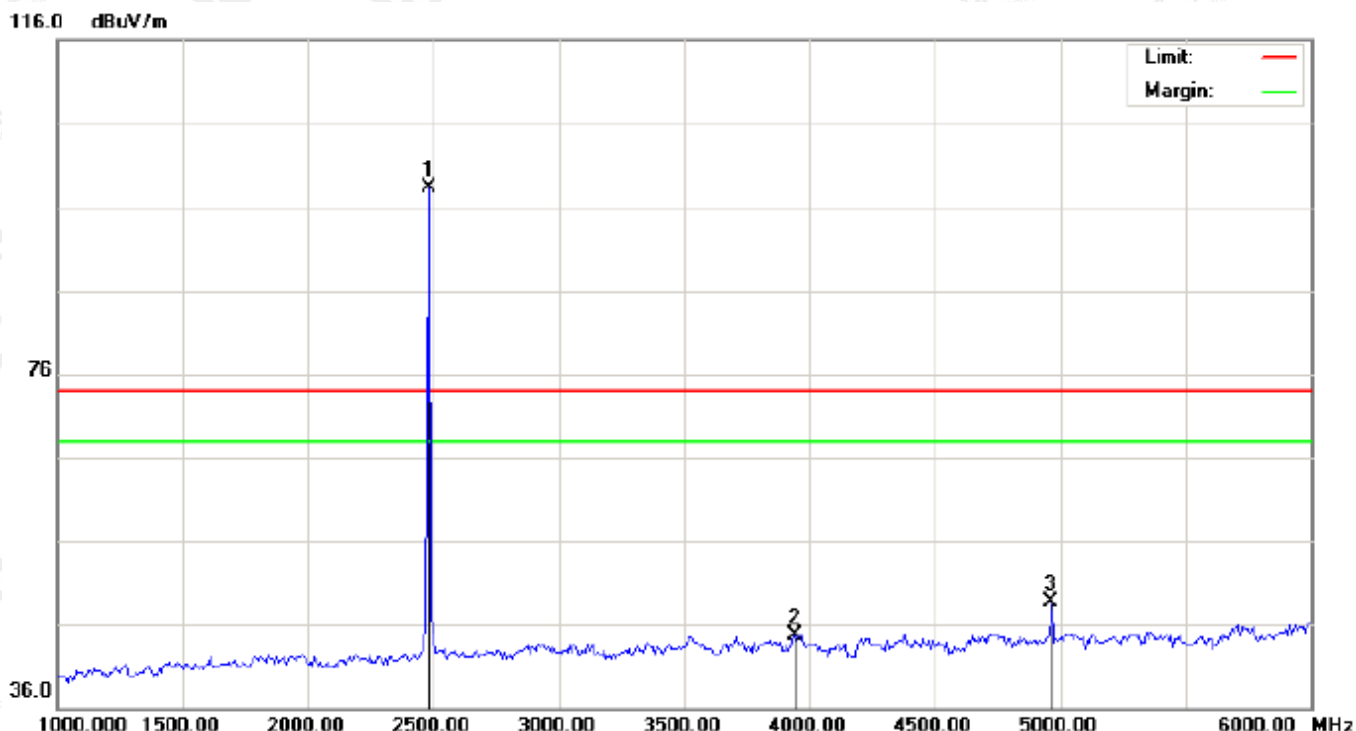
RESULT: PASS

Note: 1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.

2. The "Factor" value can be calculated automatically by software of measurement system.

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RADIATED EMISSION TEST-(ABOVE 1GHz)-HIGH CHANNEL-HORIZONTAL

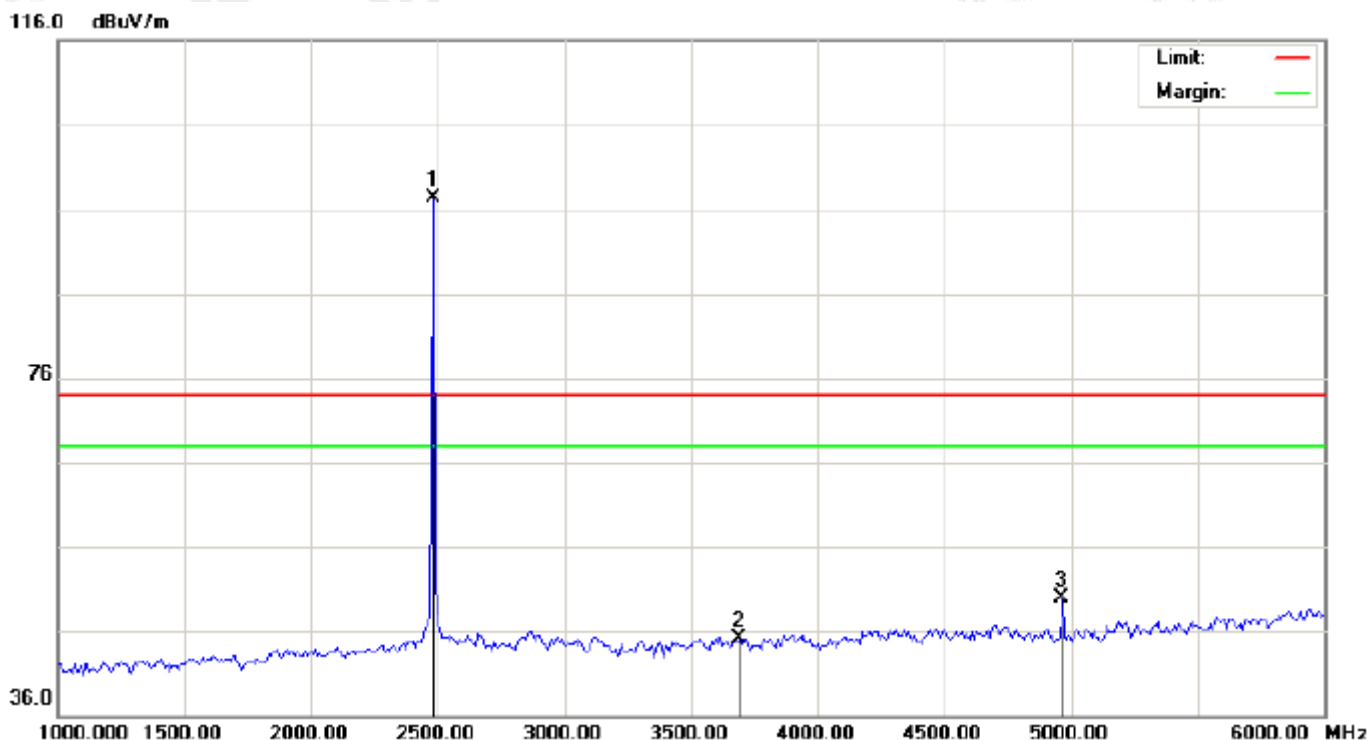


No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2480.000	87.80	10.41	98.21	74.00	24.21	peak			
2		3941.667	29.94	14.83	44.77	74.00	-29.23	peak			
3		4960.000	40.60	8.09	48.69	74.00	-25.31	peak			

RESULT: PASS

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RADIATED EMISSION TEST-(ABOVE 1GHz)-HIGH CHANNEL-VERTICAL



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2480.000	86.95	10.41	97.36	74.00	23.36	peak			
2		3691.667	31.88	13.29	45.17	74.00	-28.83	peak			
3		4960.000	41.91	8.09	50.00	74.00	-24.00	peak			

RESULT: PASS

Note: 6~25GHz at least have 20dB margin. No recording in the test report.

Factor=Antenna Factor+ Cable loss-Amplifier gain,

Margin=Measurement-Limit.

The "Factor" value can be calculated automatically by software of measurement system.

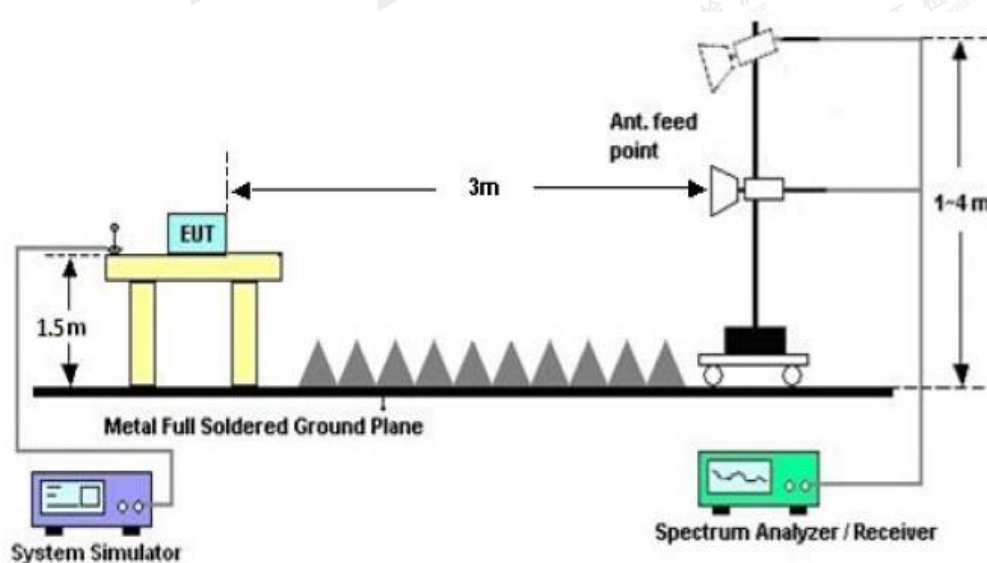
The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by AGC, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.agc-cert.com>.

9. BAND EDGE EMISSION

9.1. MEASUREMENT PROCEDURE

1. Set the EUT Work on the top, the bottom operation frequency individually.
2. Set SPA Start or Stop Frequency=Operation Frequency,
For unrestricted band: RBW=100kHz, VBW=300kHz
For restricted band: RBW=1MHz, VBW=3*RBW
Center frequency =Operation frequency
3. The band edges was measured and recorded.

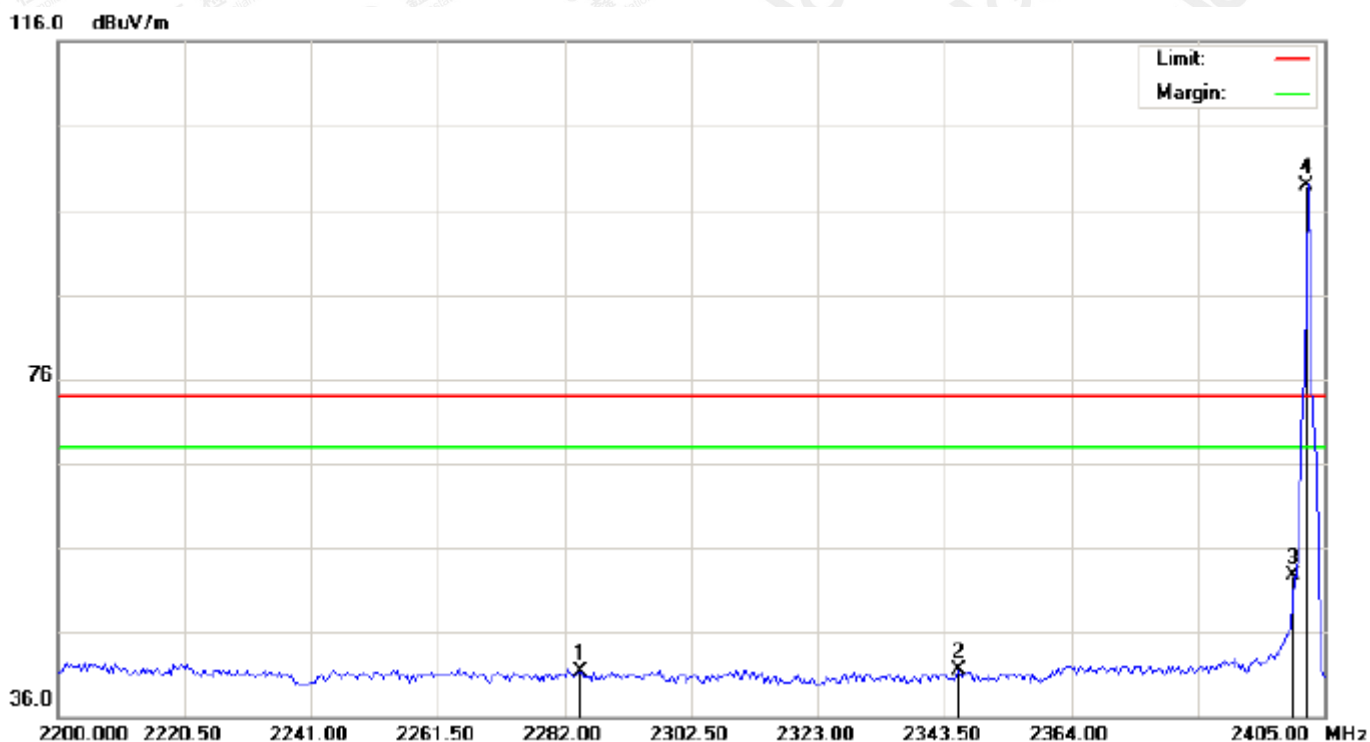
9.2. TEST SET-UP



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9.3. TEST RESULT

TEST PLOT OF BAND EDGE FOR LOW CHANNEL -Horizontal



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2284.733	31.11	10.19	41.30	74.00	-32.70	peak			
2		2345.892	31.18	10.26	41.44	74.00	-32.56	peak			
3		2400.000	42.47	10.32	52.79	74.00	-21.21	peak			
4	*	2402.000	88.56	10.32	98.88	74.00	24.88	peak			

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TEST PLOT OF BAND EDGE FOR LOW CHANNEL - Vertical

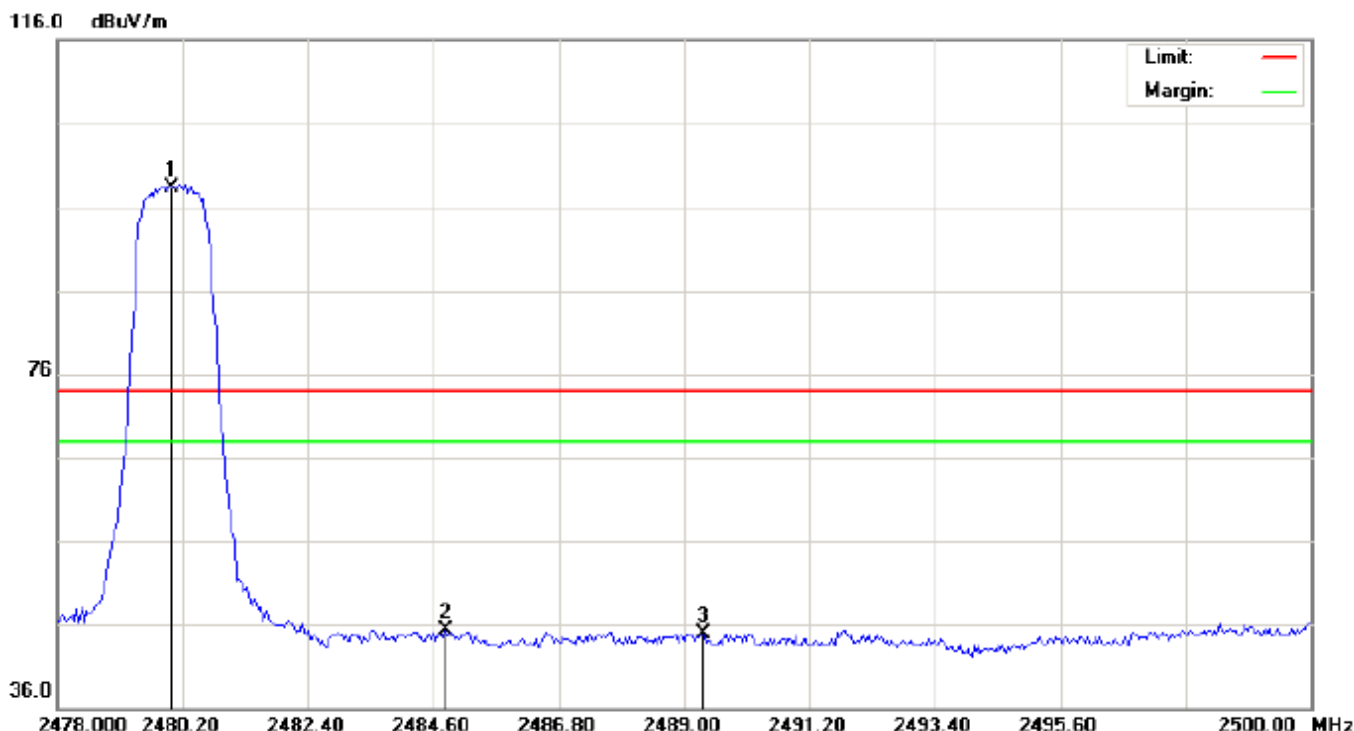


No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2262.183	31.27	10.17	41.44	74.00	-32.56	peak			
2		2326.758	30.86	10.24	41.10	74.00	-32.90	peak			
3		2400.000	36.06	10.32	46.38	74.00	-27.62	peak			
4	*	2402.000	87.71	10.32	98.03	74.00	24.03	peak			

RESULT: PASS

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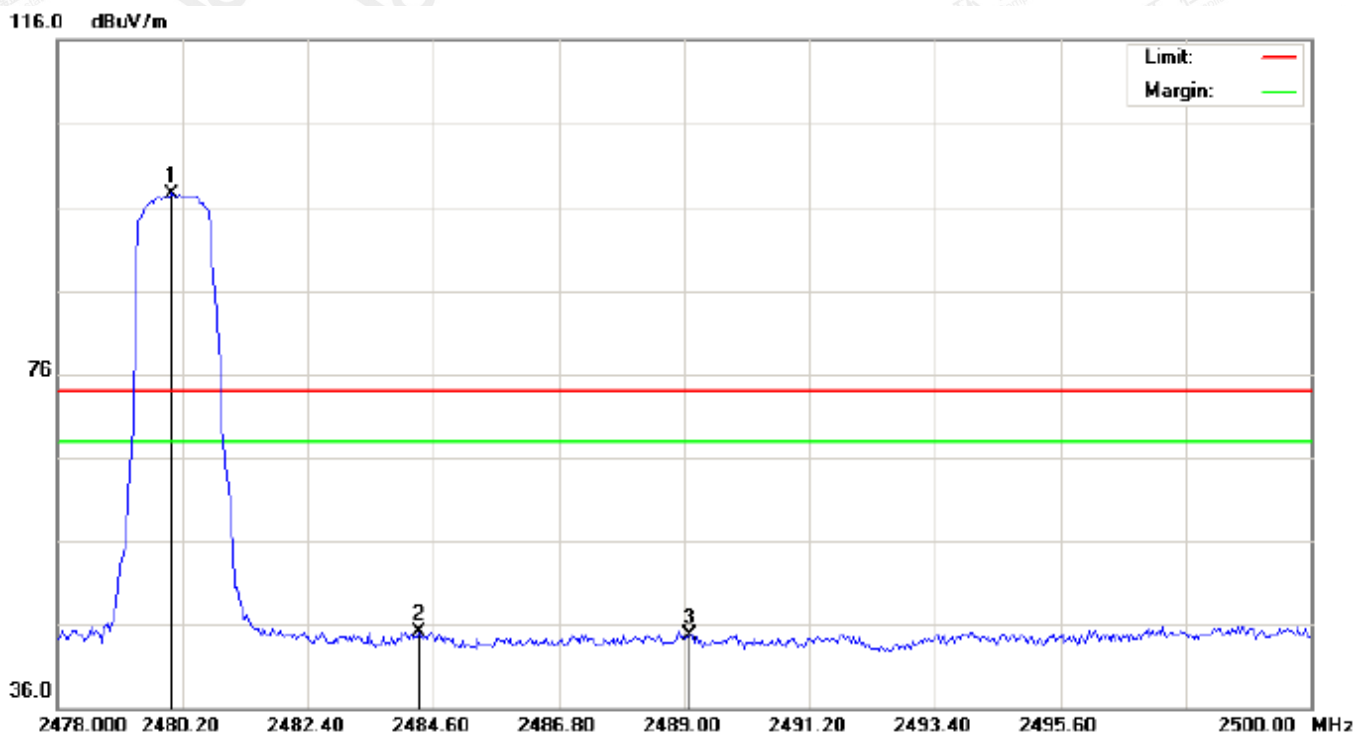
TEST PLOT OF BAND EDGE FOR HIGH CHANNEL –Horizontal



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2480.000	87.84	10.41	98.25	74.00	24.25	peak			
2		2484.820	34.86	10.41	45.27	74.00	-28.73	peak			
3		2489.330	34.46	10.42	44.88	74.00	-29.12	peak			

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TEST PLOT OF BAND EDGE FOR HIGH CHANNEL -Vertical



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2480.000	87.01	10.41	97.42	74.00	23.42	peak			
2		2484.343	34.68	10.41	45.09	74.00	-28.91	peak			
3		2489.110	34.27	10.42	44.69	74.00	-29.31	peak			

RESULT: PASS

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10. 6DB BANDWIDTH

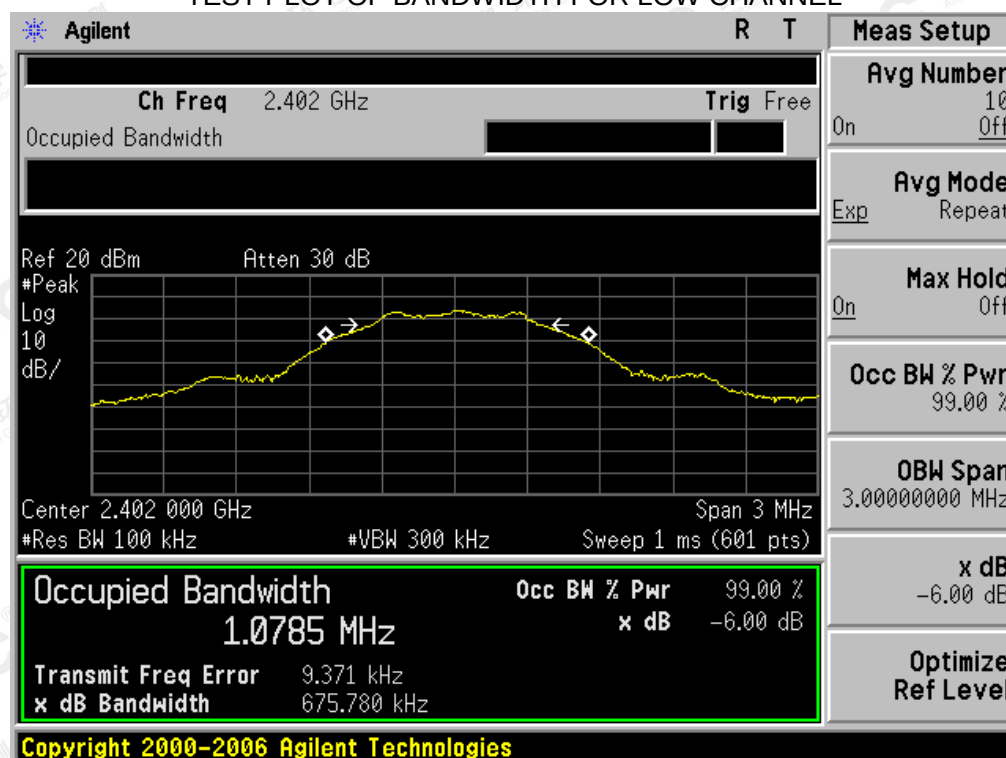
10.1. TEST PROCEDURE

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set SPA Centre Frequency = Operation Frequency, RBW= 100 KHz, VBW $\geq$ 3*RBW.
4. Set SPA Trace 1 Max hold, then View.

10.2. SUMMARY OF TEST RESULTS/PLOTS

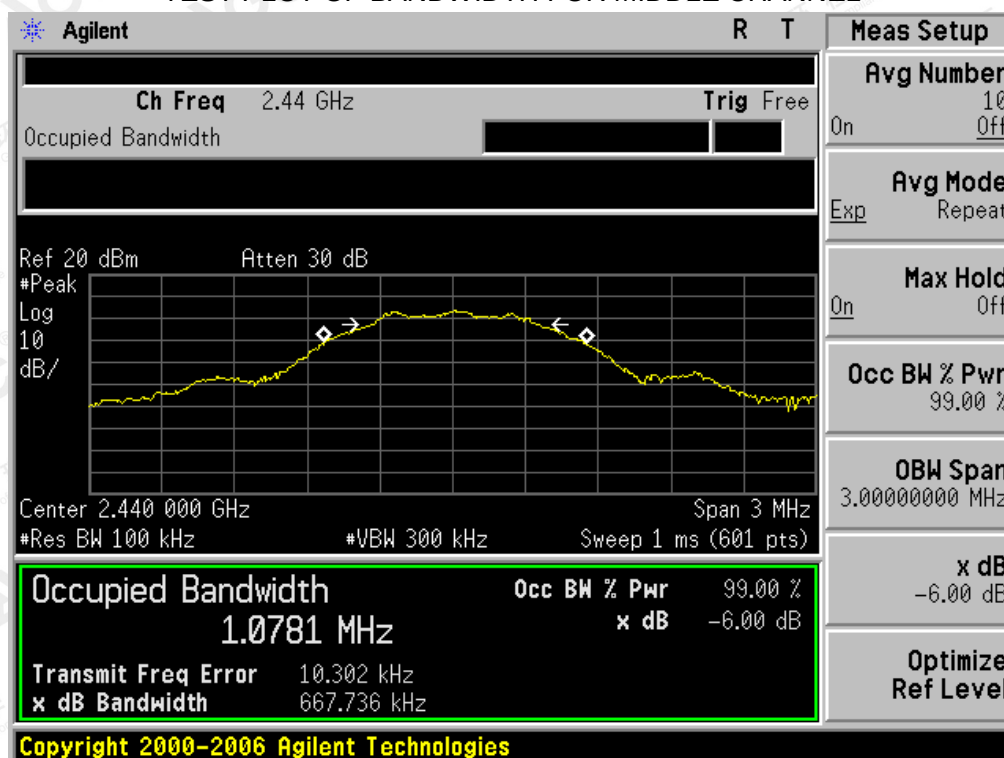
Channel	6dB Bandwidth (KHz)	Minimum Limit (KHz)	Pass/Fail
Low	676	500KHz	Pass
Middle	668		Pass
High	664		Pass

TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

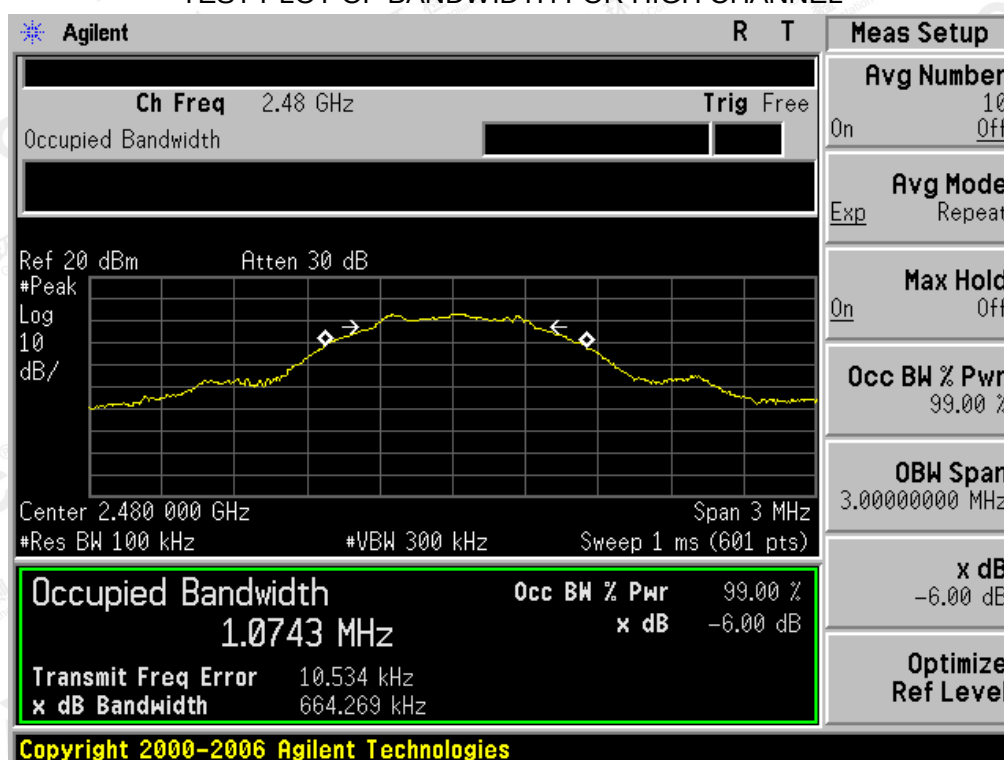


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TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



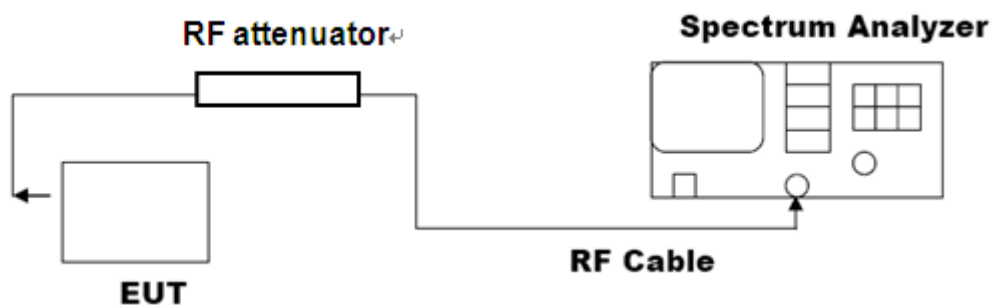
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11. CONDUCTED OUTPUT POWER

11.1. MEASUREMENT PROCEDURE

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the top, middle and the bottom operation frequency individually.
3. Use the following spectrum analyzer settings:
 - a) Set the RBW $\geq$ DTS bandwidth.
 - b) Set VBW $\geq$ 3 RBW.
 - c) Set span $\geq$ 3 x RBW
 - d) Sweep time = auto couple.
 - e) Detector = peak.
 - f) Trace mode = max hold.
 - g) Allow trace to fully stabilize.
 - h) Use peak marker function to determine the peak amplitude level.
4. Allow the trace to stabilize.
5. Record the result form the Spectrum Analyzer.

11.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

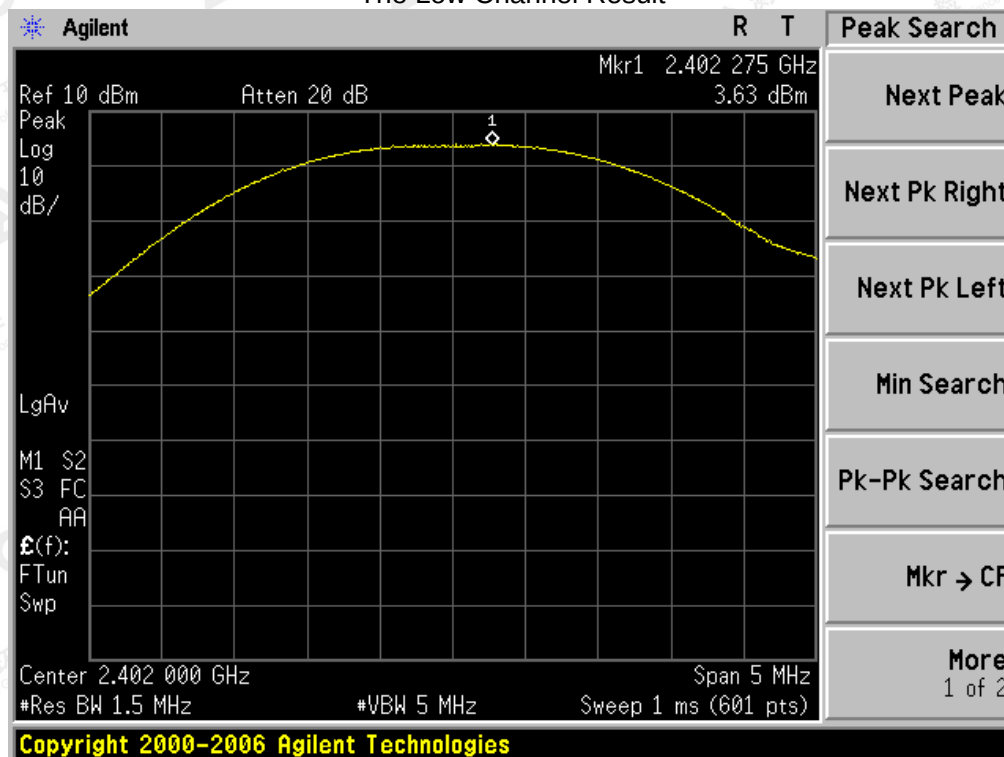


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11.3. LIMITS AND MEASUREMENT RESULT

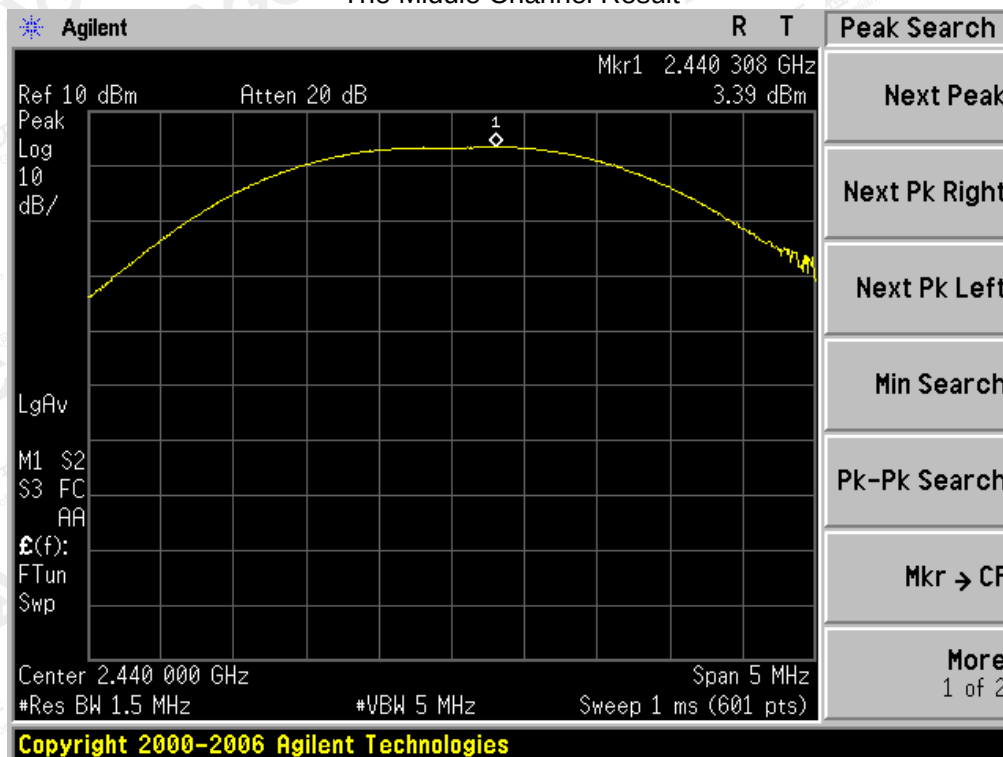
Channel	Peak Power (dBm)	Applicable Limits (dBm)	Pass/Fail
Low Channel	3.63	30	Pass
Middle Channel	3.39	30	Pass
High Channel	3.01	30	Pass

The Low Channel Result

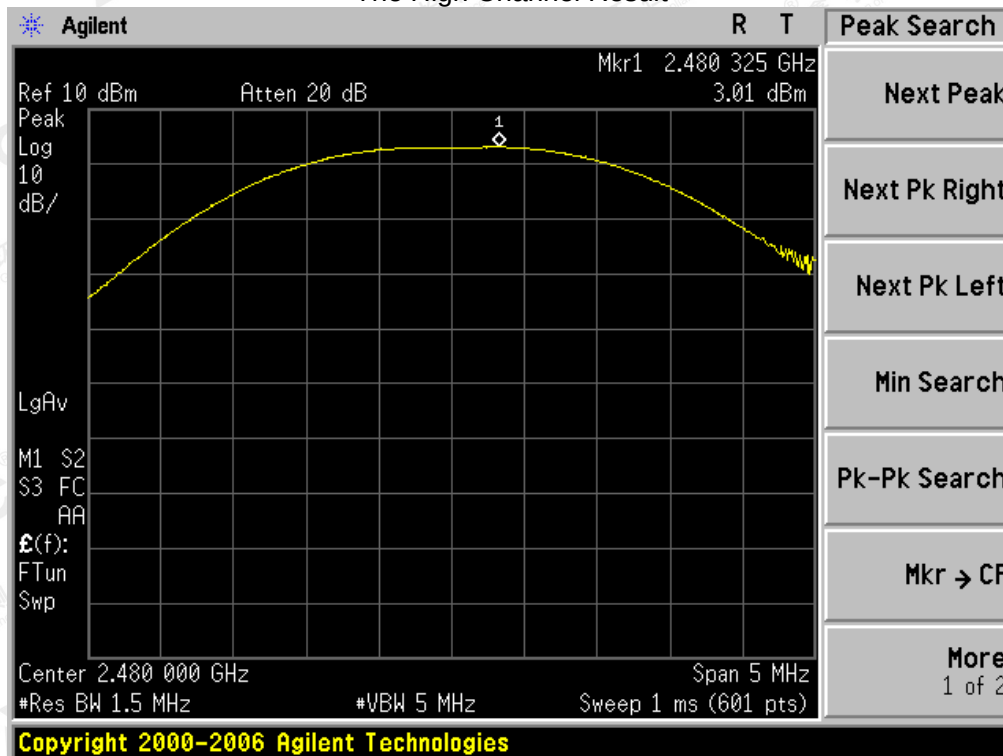


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The Middle Channel Result



The High Channel Result



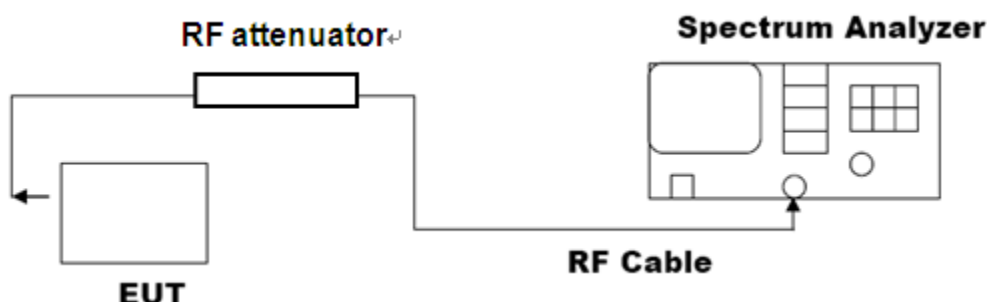
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12. CONDUCTED SPURIOUS EMISSION

12.1. MEASUREMENT PROCEDURE

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the top, the Middle and the bottom operation frequency individually.
3. Set the Span = wide enough to capture the peak level of the in-band emission and all spurious emissions from the lowest frequency generated in the EUT up through the 10th harmonic.
RBW = 100kHz; VBW $\geq$ 3 RBW; Sweep = auto; Detector function = peak.
4. Set SPA Trace 1 Max hold, then View.

12.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

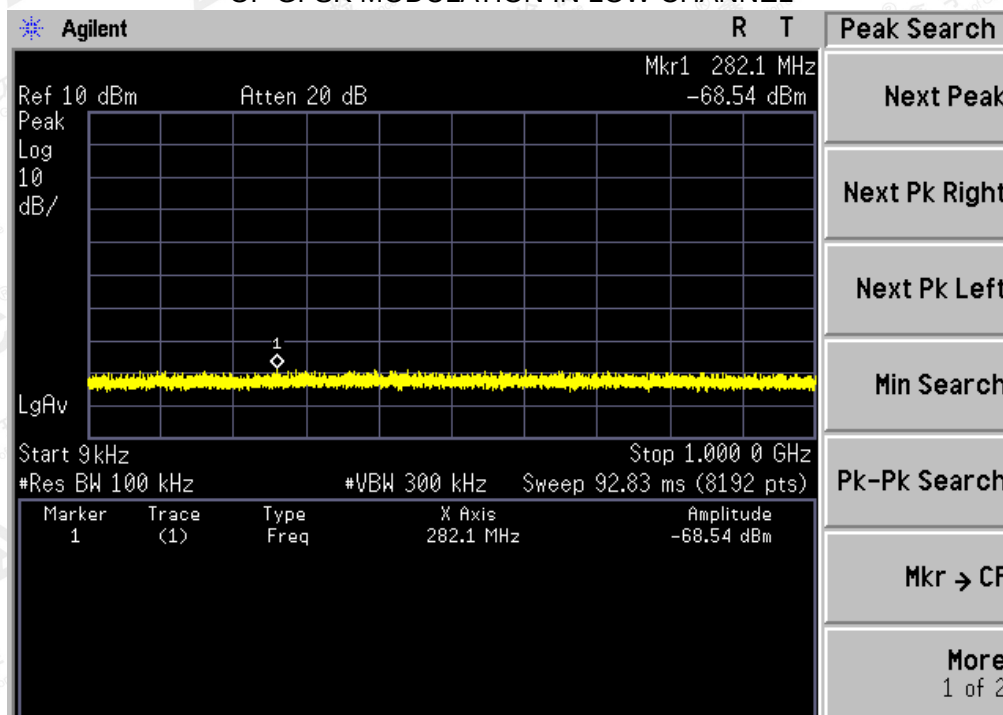


12.3. LIMITS AND MEASUREMENT RESULT

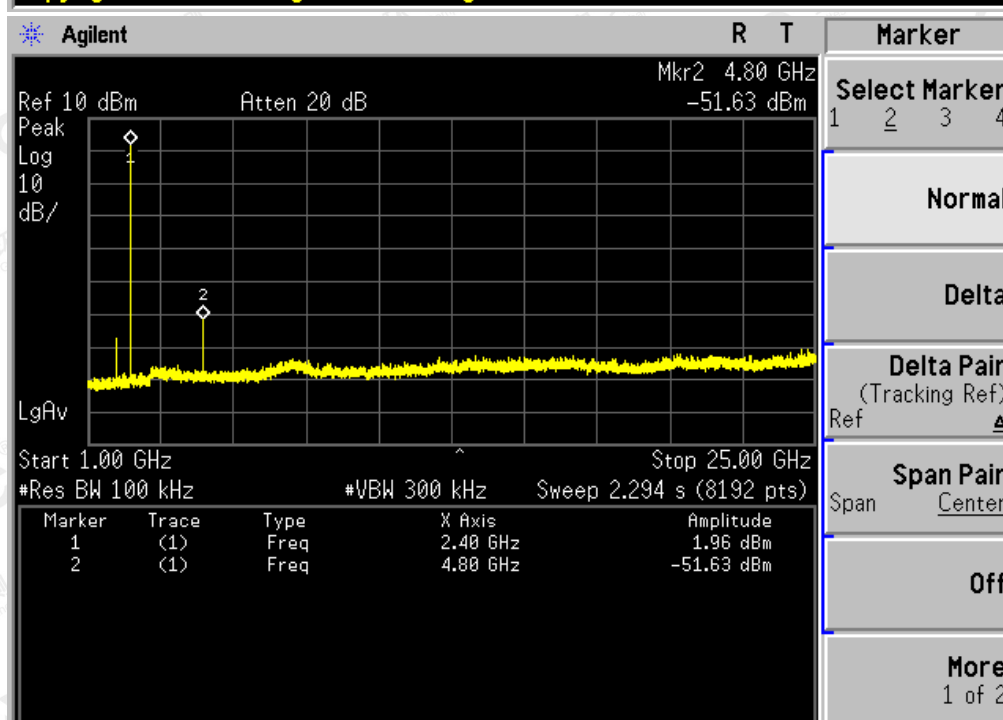
LIMITS AND MEASUREMENT RESULT		
Applicable Limits	Measurement Result	
	Test Data	Result
In any 100 KHz Bandwidth Outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produce by the intentional radiator shall be at least 20 dB below that in 100KHz bandwidth within the band that contains the highest level of the desired power. In addition, radiation 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)	At least -20dBc than the limit Specified on the BOTTOM Channel	PASS
	At least -20dBc than the limit Specified on the TOP Channel	PASS

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TEST PLOT OF OUT OF BAND EMISSIONS WITH THE WORST CASE
OF GFSK MODULATION IN LOW CHANNEL



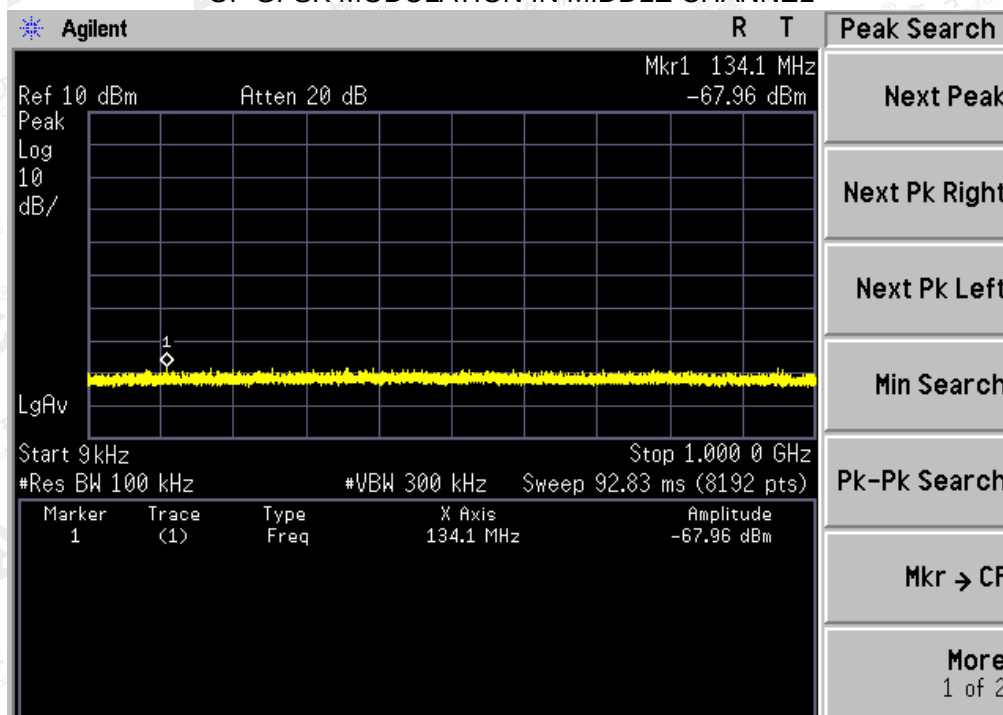
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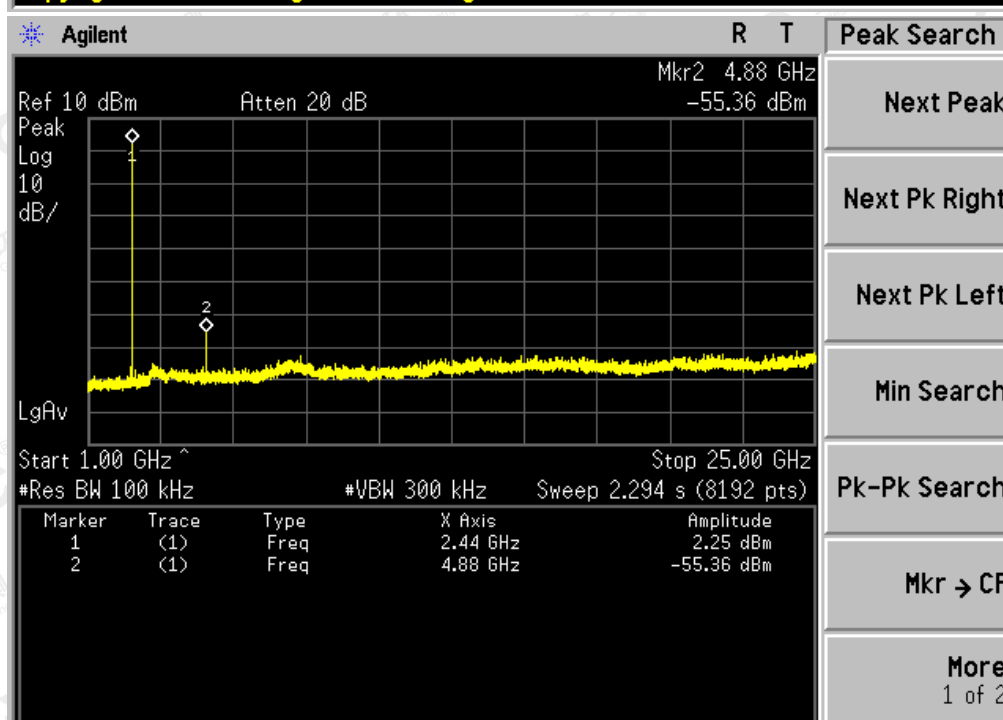
Copyright 2000-2006 Agilent Technologies

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TEST PLOT OF OUT OF BAND EMISSIONS
OF GFSK MODULATION IN MIDDLE CHANNEL



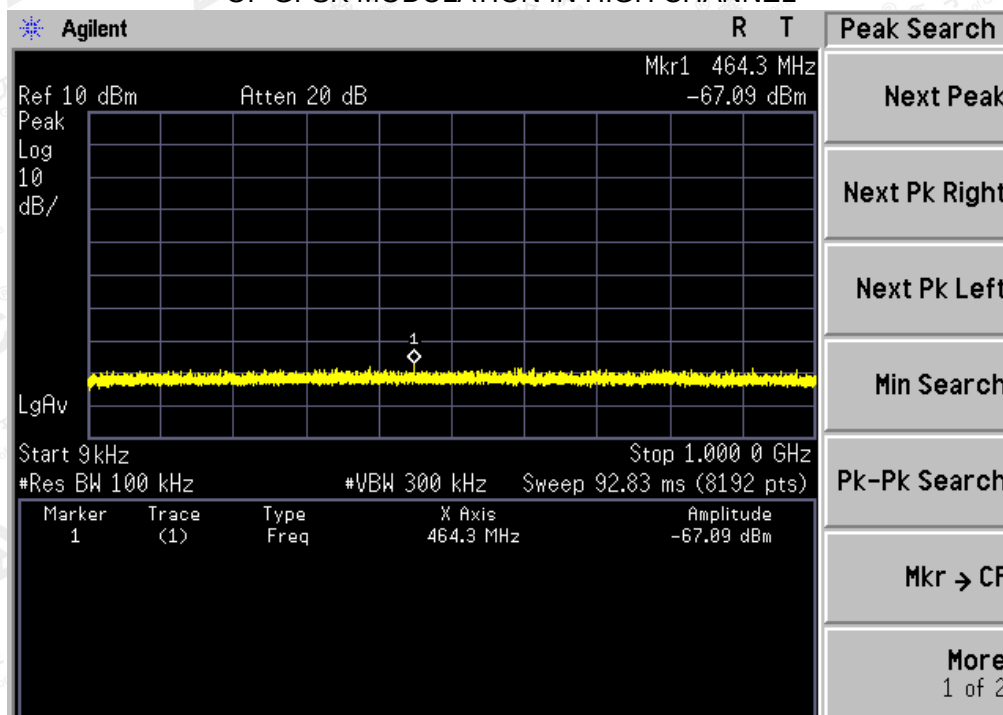
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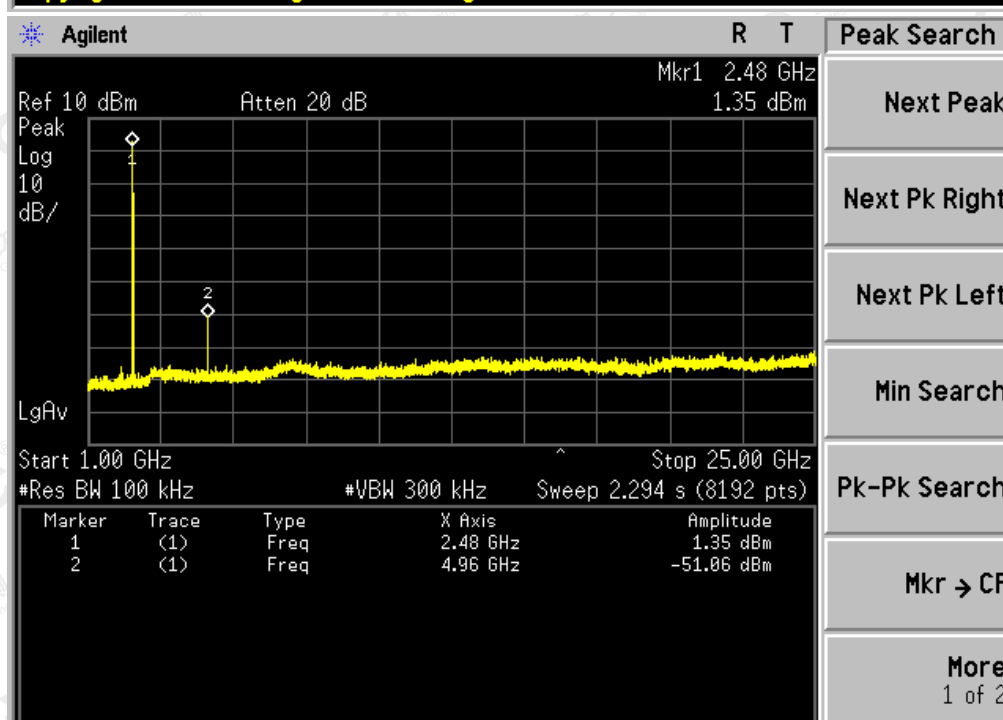
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TEST PLOT OF OUT OF BAND EMISSIONS
OF GFSK MODULATION IN HIGH CHANNEL



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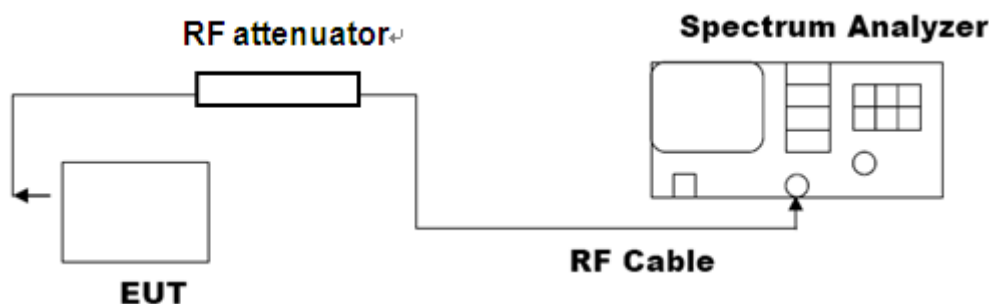
13. CONDUCTED OUTPUT POWER SPECTRAL DENSITY

13.1 MEASUREMENT PROCEDURE

- (1). Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- (2). Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- (3). Set the span to 1.5times the DTS bandwidth, RBW: $3\text{kHz} \leq \text{RBW} \leq 100\text{kHz}$, VBW $\geq 3 \times \text{RBW}$
- (4). Set SPA Trace 1 Max hold, then View.

Note: The EUT was tested according to KDB 558074 for compliance to FCC 47CFR 15.247 requirements.

13.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

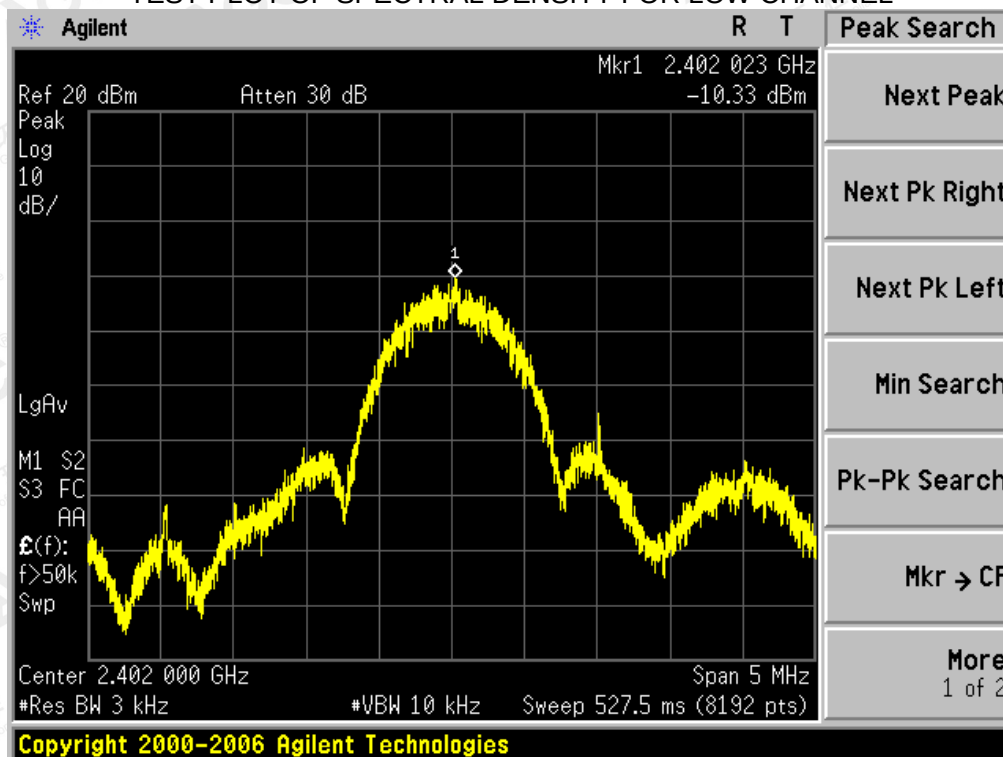


13.3 LIMITS AND MEASUREMENT RESULT

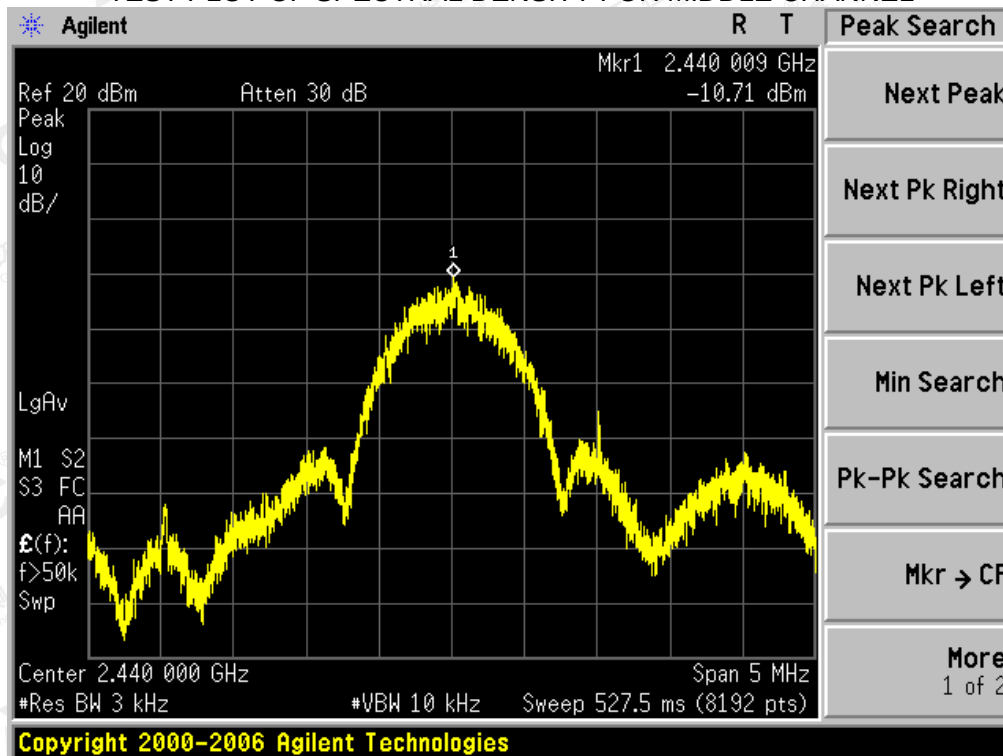
Channel No.	PSD (dBm/3KHz)	Limit (dBm/3KHz)	Result
Low Channel	-10.33	8	Pass
Middle Channel	-10.71	8	Pass
High Channel	-11.96	8	Pass

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TEST PLOT OF SPECTRAL DENSITY FOR LOW CHANNEL

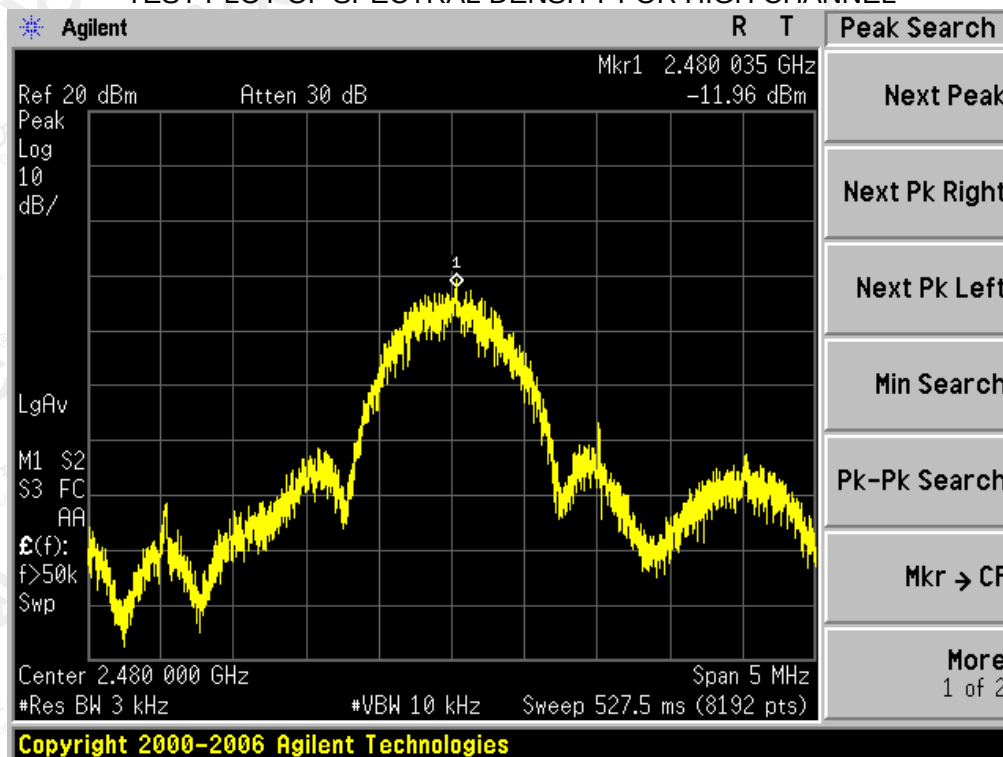


TEST PLOT OF SPECTRAL DENSITY FOR MIDDLE CHANNEL



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TEST PLOT OF SPECTRAL DENSITY FOR HIGH CHANNEL



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14. LINE CONDUCTED EMISSION TEST

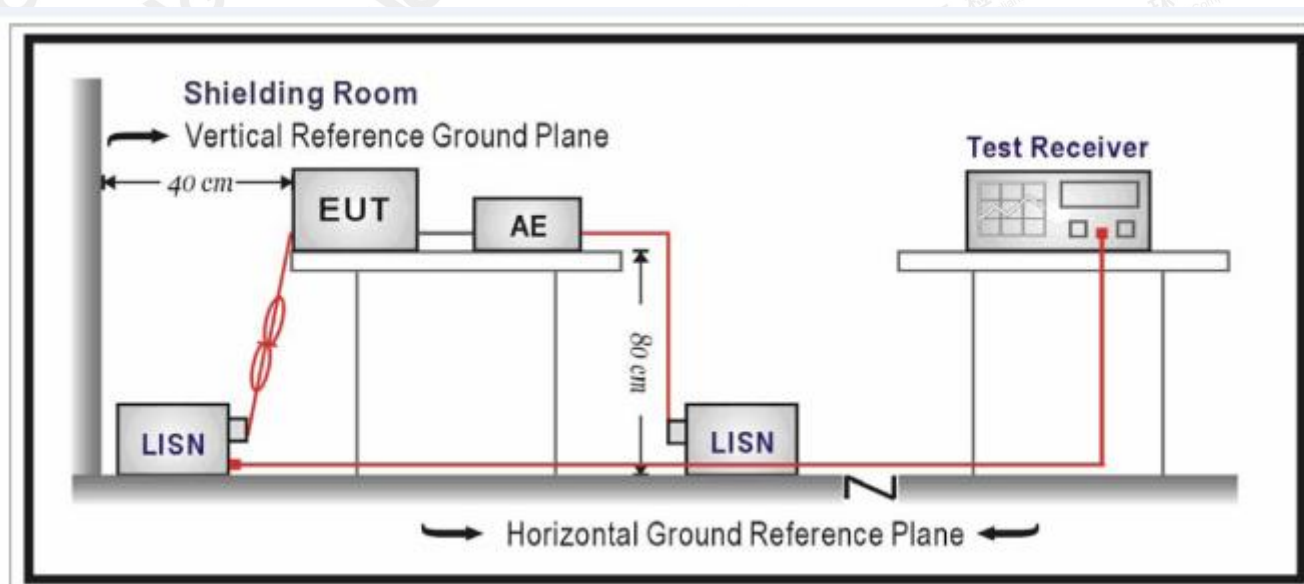
14.1 LIMITS

Frequency	Maximum RF Line Voltage	
	Q.P.(dBuV)	Average(dBuV)
150kHz~500kHz	66-56	56-46
500kHz~5MHz	56	46
5MHz~30MHz	60	50

Note: 1. The lower limit shall apply at the transition frequency.

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

14.2 TEST SETUP



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14.3 PRELIMINARY PROCEDURE

- 1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- 2) Support equipment, if needed, was placed as per ANSI C63.10.
- 3) All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
- 4) All support equipments received AC120V/60Hz power from a LISN, if any.
- 5) The EUT received DC charging voltage by adapter which received 120V/60Hz power by a LISN.
- 6) The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7) Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
- 8) During the above scans, the emissions were maximized by cable manipulation.
- 9) The following test mode(s) were scanned during the preliminary test.
Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

14.4 FINAL TEST PROCEDURE

- 1) EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
- 2) A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less -2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
- 3) The test data of the worst case condition(s) was reported on the Summary Data page.

14.5 TEST RESULT OF POWER LINE

N/A

Note: The BT function of EUT didn't work when charging.

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APPENDIX A: PHOTOGRAPHS OF TEST SETUP

Refer to Attached file(appendix I)

APPENDIX B: PHOTOGRAPHS OF EUT

Refer to Attached file(appendix I)

-----END OF REPORT-----

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