



JAPAN RADIO TEST REPORT

Product Name:	Digital Broadcasting Device (D34.1)
Trademark:	SONY
Model Number:	D34.1
Prepared For:	Sony Mobile Communications Inc
Address:	4-12-3 Higashi-Shinagawa, Shinagawa-Ku, Tokyo, 140-0002, Japan
Prepared By:	Shenzhen BCTC Testing Co., Ltd.
Address:	BCTC Building & 1-2F, East of B Building, Pengzhou Industrial, Fuyuan 1st Road, Qiaotou Community, Fuyong Street, Bao'an District, Shenzhen, China
Test Date:	Jun. 19 - Jun. 26, 2018
Date of Report:	Jun. 26, 2018
Report No.:	BCTC-LH180601582J



TEST RESULT CERTIFICATION

Applicant's name..... **Sony Mobile Communications Inc**

Address..... 4-12-3 Higashi-Shinagawa, Shinagawa-Ku, Tokyo, 140-0002, Japan

Manufacturer's Name..... **Shenzhen Minew Technologies Co., Ltd**

Address..... 3th Floor, I Building, Gangzhilong Science Park, Qinglong Road, Longhua District, Shenzhen City, China

Test specification:

Standard..... ARIB STD T-66 Ver.3.7(2014)
MIC public notice 88:2004, annex 43

Test item description

Product name..... Digital Broadcasting Device (D34.1)

Model and/or type reference : D34.1

Rating(s) DC 3V

This device described above has been tested by BCTC, and the test results show that the equipment under test (EUT) is in compliance with the ARIB STD T-66 requirements. And it is applicable only to the tested sample identified in the report.

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Test Result : **Pass**

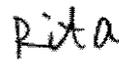
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1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

Part	Rule Section	Description of Test	Result
4.1	3	Frequency Error	Complies
4.2	4	Occupied Bandwidth (99%) and Spread-spectrum Bandwidth (90%)	Complies
4.3	5	Unwanted Emission Intensity	Complies
4.4	6	Antenna Power Error	Complies
4.5	7	Limitation of Collateral Emission of Receiver	Complies
4.6	8	Transmission Antenna Gain (EIRP Antenna Power)	Complies
4.7	9	Transmission Radiation Angle Width (3dB Beamwidth)	N/A
4.8	10	Radio Interference Prevention Capability	Complies
4.9	Note1	Carrier Sense Capability	N/A
4.10	Note 2	Construction Protection Confirmation	Complies

NOTE:

- (1) "N/A" denotes test is not applicable in this Test Report
- (2) MIC Notice No.88 Appendix No.43
- (3) MIC Ordinance Regulating Radio Equipment Section 4.17 of Article 49.20



1.1 TEST FACILITY

Shenzhen BCTC Testing Co., Ltd.

Add. : BCTC Building & 1-2F, East of B Building, Pengzhou Industrial, Fuyuan 1st Road, Qiaotou Community, Fuyong Street, Bao'an District, Shenzhen, China

FCC Test Firm Registration Number: 712850

IC Registered No.: 23583

1.2 MEASUREMENT UNCERTAINTY

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

No.	Item	Uncertainty
1	RF power, conducted	$\pm 0.16\text{dB}$
2	Spurious emissions, conducted	$\pm 0.21\text{dB}$
3	frequency error ppm	$\pm 0.5\text{ppm}$



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Digital Broadcasting Device (D34.1)	
Model Name	D34.1	
Trademark	SONY	
Serial Model	N/A	
Model Difference	N/A	
Product Description	Operation Frequency:	2402~2480 MHz
	Bit Rate of Transmitter:	GFSK
	BT Version:	V4.0
	Number Of Channel:	40 CH
	Antenna Designation:	Please see Note 3.
	Antenna Gain(Peak):	-1.86dBi
	Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical Specification. Please refer to the User's Manual.	
Channel List	Please refer to the Note 2.	
Battery	DC 3 V	
Hardware Version	V1.2	
Software Version	SV01	



Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2.

Channel List					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2402	11	2422	21	2442
02	2404	12	2424	22	2444
03	2406	13	2426	23	2446
~	~	~	~	~	~
09	2418	19	2438	20	2440
10	2420	20	2440	40	2480

3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Gain (dBi)	NOTE
1	N/A	ANT-2G4-03	PCB Antenna	-1.86dBi	



2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possibly have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description	
Mode1	CH01	GFSK
Mode2	CH20	
Mode3	CH40	
Mode4	RX	

Pretest Mode	Conducted Emission	
Mode1	CH01	GFSK
Mode2	CH20	
Mode3	CH40	
Mode4	RX	

2.3 TEST CONDITIONS

The Digital Broadcasting Device (D34.1) was tested while in a continuous transmitter/receiver mode. The EUT was tuned to a low, middle, and high channel for all tests. For all test case pre/scans were completed in all Modes to determine worst case levels.

Power Supply Voltage Fluctuation Test

Voltage Fluctuation Test	Normal Voltage	High Voltage +10% of Normal Voltage	Low Voltage -10% of Normal Voltage
Input DC Power	3 V	3.3V	2.7V
Voltage Variation (%)	0%	+10%	-10%

NOTE:

Voltage Variation (%)

= (Output high or Low Voltage - Output Normal Voltage) / Output Normal Voltage * 100

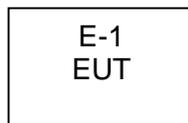


2.4 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of FHSS

Test software Version	Test program: 1.0		
Frequency	2402 MHz	2440 MHz	2480 MHz
Parameters	DEF	DEF	DEF

2.5 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED





2.6 DESCRIPTION OF SUPPORT UNITS (CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	Digital Broadcasting Device (D34.1)	SONY	D34.1	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.



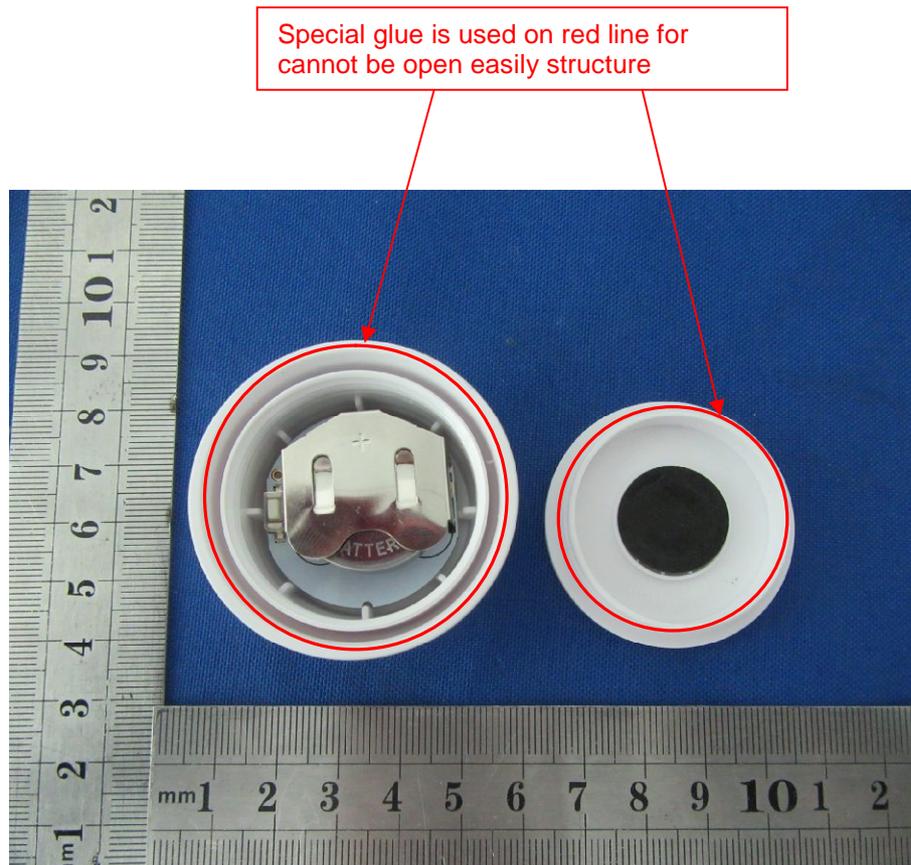
2.7 EQUIPMENTS LIST FOR ALL TEST ITEMS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	SPECTRUM ANALYZER	AGILENT	E4407B	160400005	2017.07.05	2018.07.06
2	TEST RECEIVER	R&S	ESPI	101318	2017.07.05	2018.07.06
3	BILOG ANTENNA	TESEQ	CBL6111D	31216	2017.07.05	2018.07.06
4	50Ω COAXIAL SWITCH	ANRITSU	MP59B	6200264416	2017.07.05	2018.07.06
5	SPECTRUM ANALYZER	ADVANTEST	R3132	150900201	2017.07.05	2018.07.06
6	HORN ANTENNA	EM	EM-AH-10180	2011071402	2017.07.05	2018.07.06
7	HORN ANT	SCHWARZBECK	BBHA 9170	9170-181	2017.07.05	2018.07.06
8	AMPLIFIER	EM	EM-30180	060538	2017.07.10	2018.07.11
9	LOOP ANTENNA	ARA	PLA-1030/B	1029	2017.07.10	2018.07.11
10	POWER METER	R&S	NRVS	100696	2017.07.10	2018.07.11
11	TEST RECEIVER	R&S	ESCI	101160	2017.07.05	2018.07.06
12	LISN	R&S	ENV216	101313	2017.07.05	2018.07.06
13	LISN	EMCO	3816/2	00042990	2017.07.05	2018.07.06
14	50Ω COAXIAL SWITCH	ANRITSU	MP59B	6200264417	2017.07.05	2018.07.06
15	POWER SENSORS	R&S	NRP8SN	100524	2017.07.10	2018.07.11

3. RF SHIELDING METHOD

Enclosure:

The product structure is stuck by glue and thread sewn together, it's shell will have to engineering plastic processing, If the shell will be open, so the product should be damage. See below the structure:



4. TEST RESULT FOR BLUETOOTH

4.1 FREQUENCY ERROR

4.2 LIMIT

Item	Limits
Frequency Error	±50ppm

4.3 MEASURING INSTRUMENTS AND SETTING

The following table is the setting of Spectrum Analyzer.

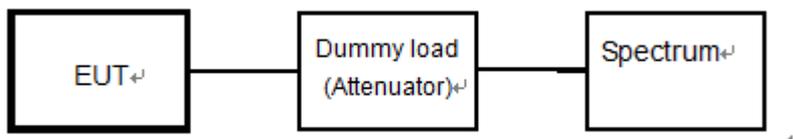
Spectrum Parameter	Setting
Attenuation	Auto
RB / VB	10KHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

4.4 TEST PROCEDURES

- (1) In the case of unmodulated signal (continuous or continuous burst), measure the frequency directly by a frequency meter.
- (2) In the case of burst waves, the measurement shall be done for enough time in order to obtain the enough measuring accuracy, and the average of the measured values becomes the final value.
- (3) In the case of a test mode with a specific frequency spectrum, measure the frequency of the specific spectrum by a spectrum analyzer.
- (4) In the cases above, if the frequency equivalent to the test frequency is not directly measured in principle, it shall be obtained by necessary calculation.

In the case of modulated signal, if there is no specific spectrum measurable by a spectrum analyzer but a specific dip is observed, it is allowed to measure the frequency with the signal generator (synthesized). That is, observe a signal of the signal generator concurrently (or alternately) with the tested signal using the spectrum analyzer while setting the frequency of the signal generator to the position of the dip on the screen of the spectrum analyzer, and determine the frequency of the signal generator at the time as a measured value.

4.5 TEST SETUP LAYOUT



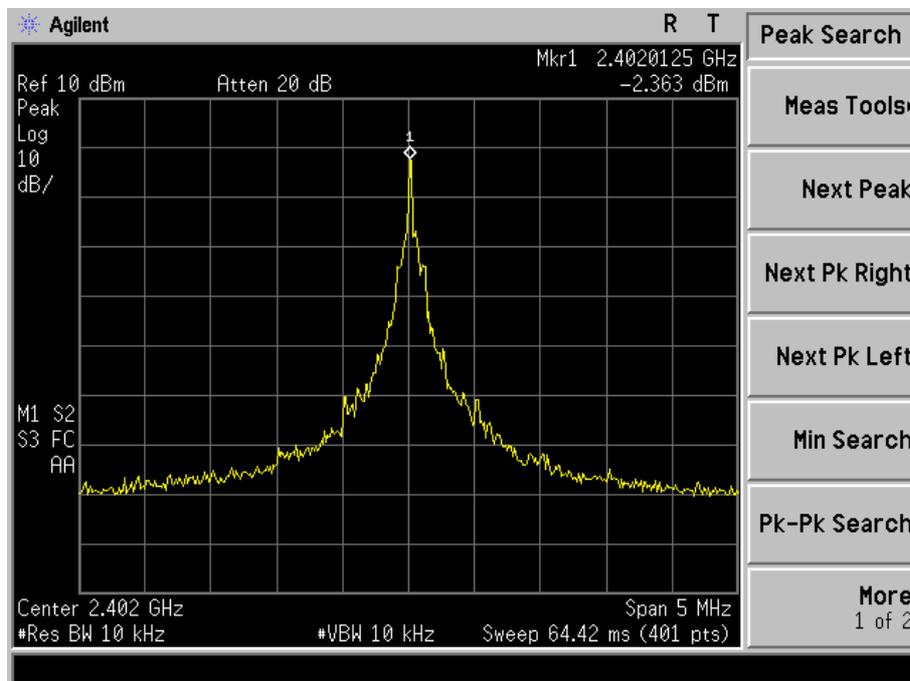
EUT OPERATION DURING TEST

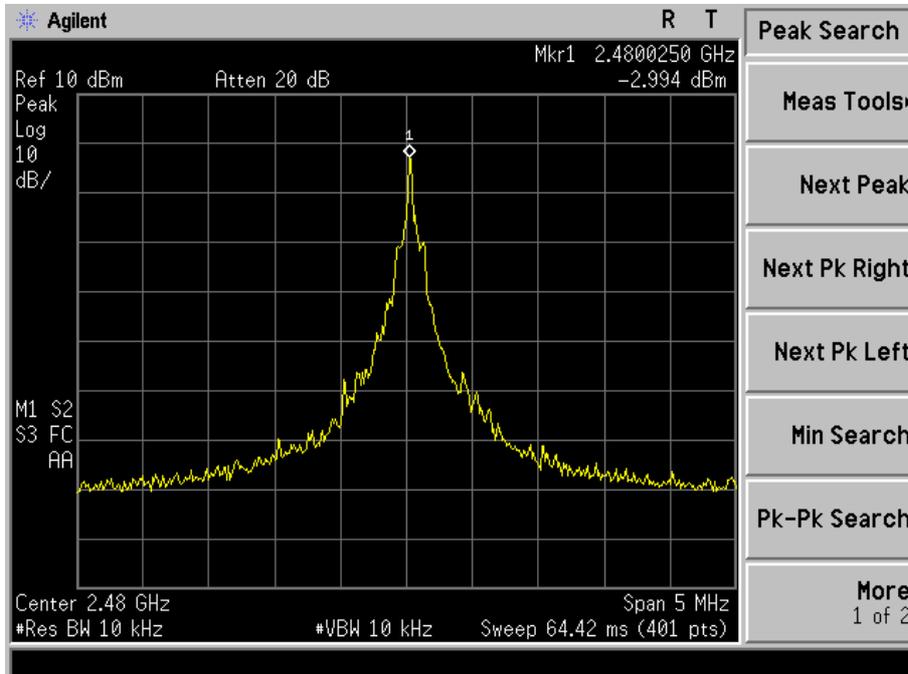
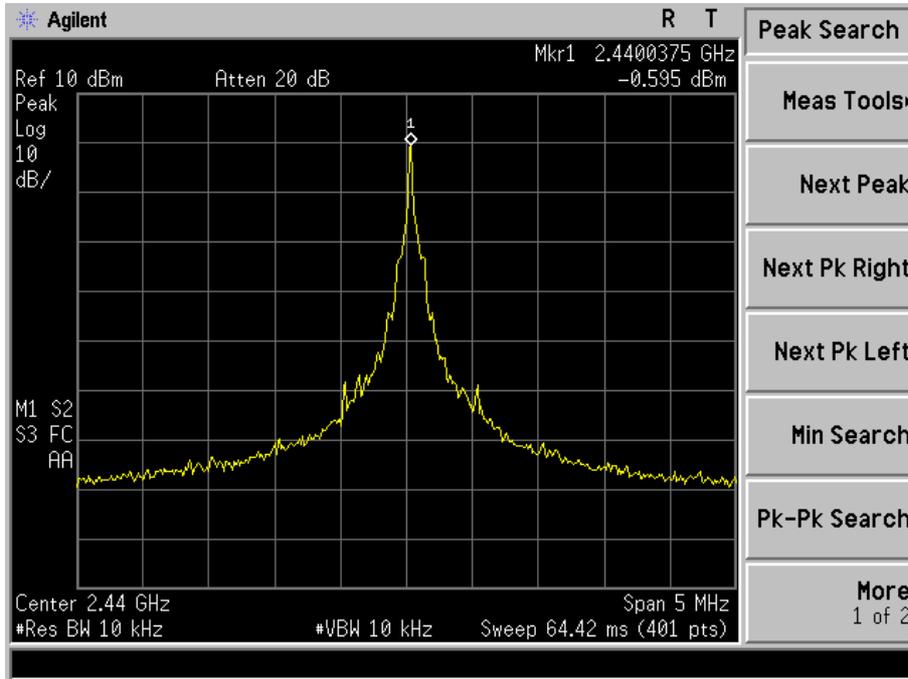


The EUT was placed on the test table and programmed in un-modulation function.

4.5.1 TEST RESULT

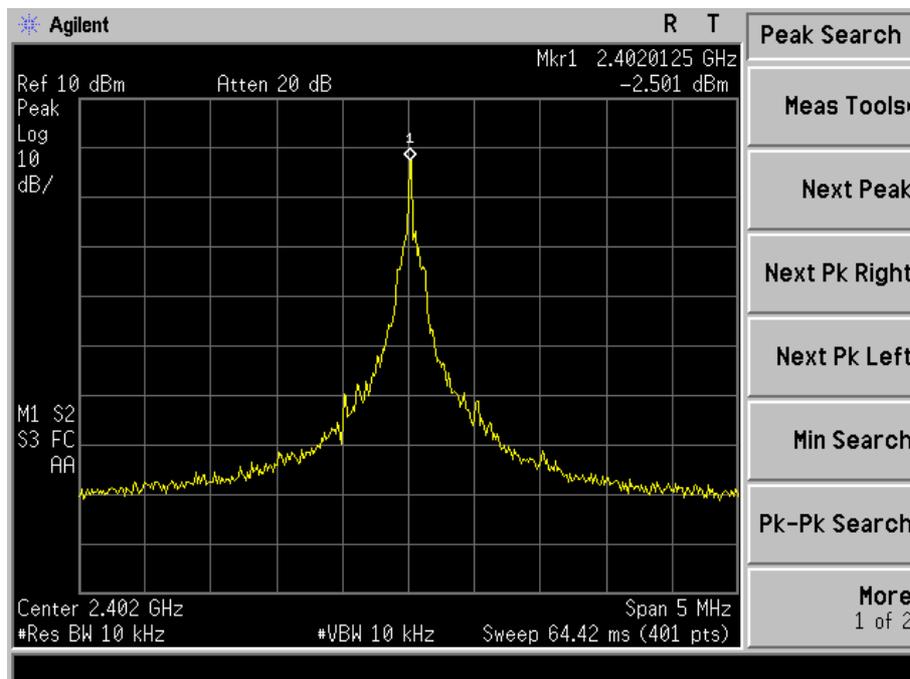
Voltage	Frequency	Reading	Tolerance	Limit
Normal Voltage	MHz	MHz	ppm	(ppm)
	2402	2402.0125	5.20	±50
	2440	2440.0375	15.37	±50
	2480	2480.0250	10.08	±50

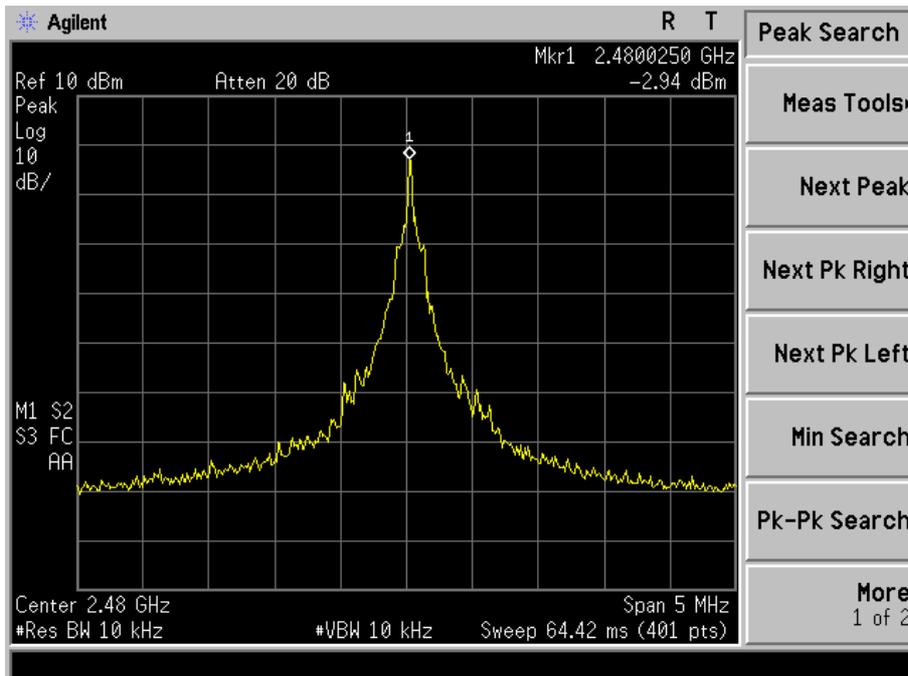
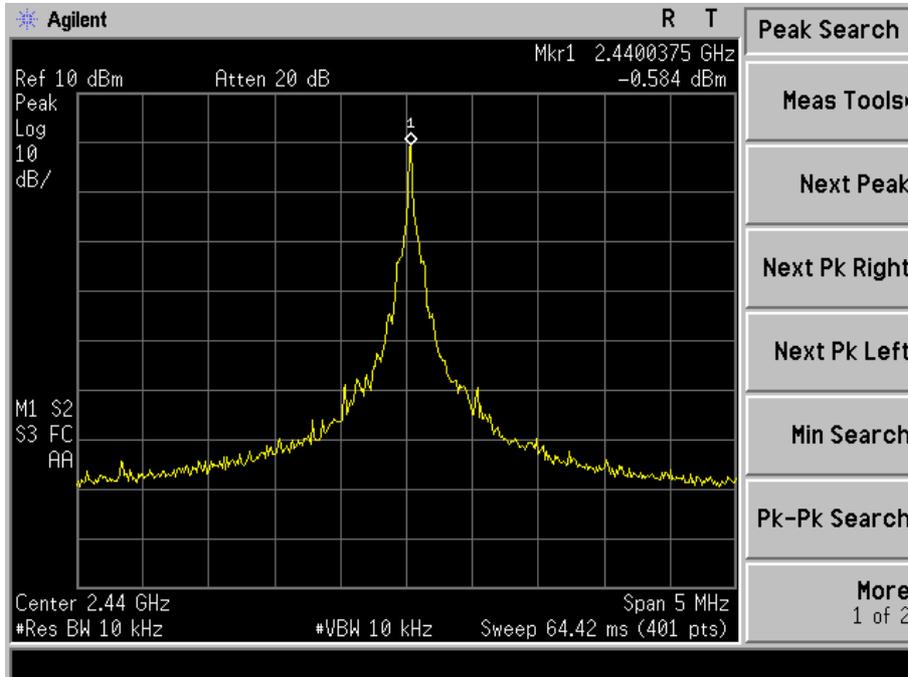






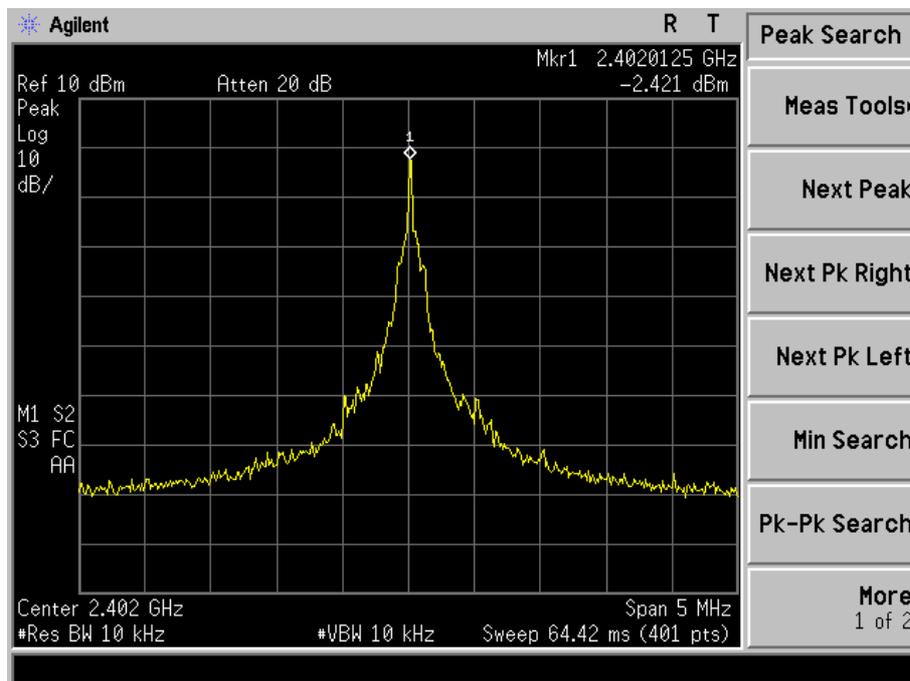
Voltage	Frequency	Reading	Tolerance	Limit
Normal Voltage +10%	MHz	MHz	ppm	(ppm)
	2402	2402.0125	5.20	±50
	2440	2440.0375	15.37	±50
	2480	2480.0250	10.08	±50

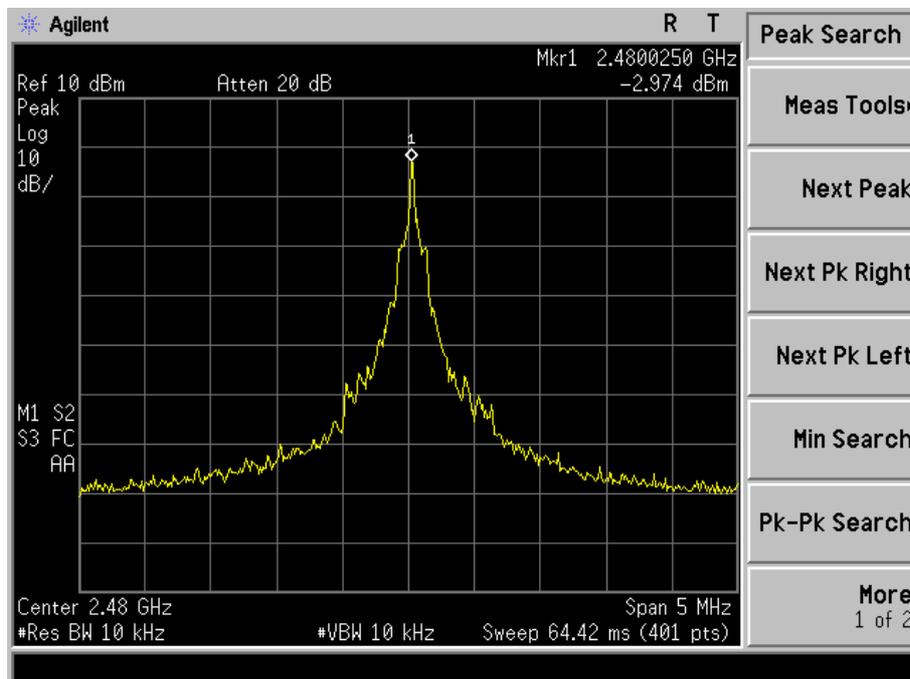
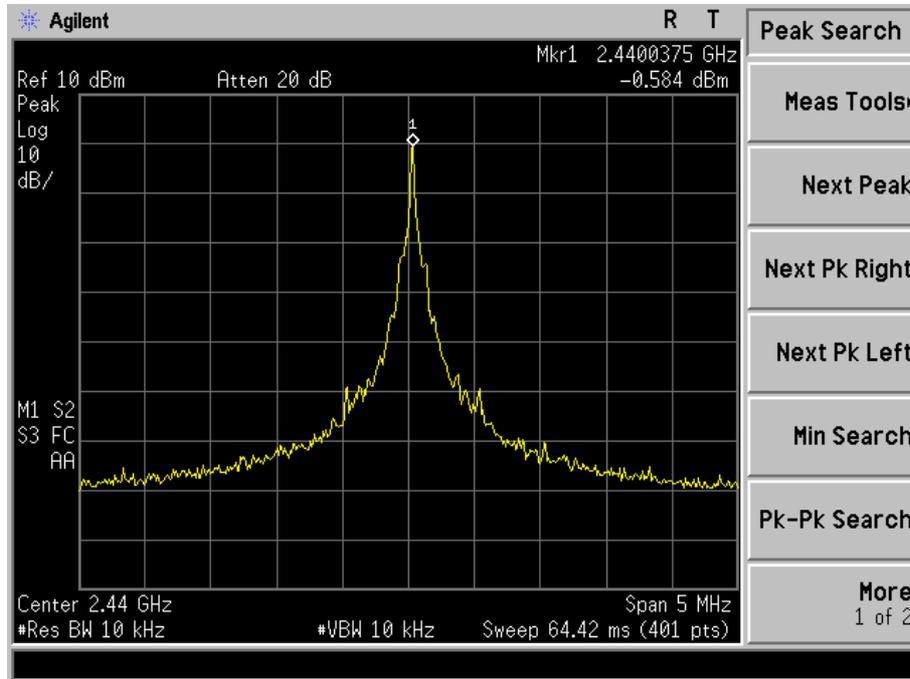






Voltage	Frequency	Reading	Tolerance	Limit
Normal Voltage -10%	MHz	MHz	ppm	(ppm)
	2402	2402.0125	5.20	±50
	2440	2440.0375	15.37	±50
	2480	2480.0250	10.08	±50



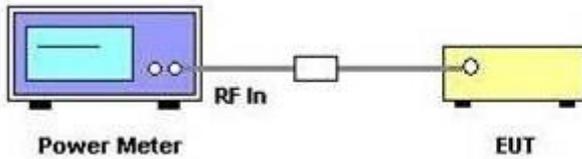


5. ANTENNA POWER

5.1 LIMIT

Item	Limits
Antenna Power Density	$\leq 3\text{mW/MHz}$ (FH form 2427 - 2470.75 MHz) $\leq 10\text{mW/MHz}$ (OFDM,DS from 2400~2483.5MHz) $\leq 10\text{mW}$ (Other from 2400~2483.5MHz)
Antenna Power Error	+20%, -80% (Base on manufacturer declare antenna power density)

5.2 TEST SETUP LAYOUT



5.3 TEST DEVIATION

There is no deviation with the original standard.



5.4 TEST RESULT

Voltage		Test Frequency	Conducted RF output power density (mW)	Rated power density (mW)	Limit (mW)	Antenna Power Error (%)
Normal Voltage	DC3V	CH 01	1.035	1	10	3.50
		CH 20	1.014			1.40
		CH 40	0.738			-26.20
High Voltage	DC3.3V	CH 01	1.047			4.70
		CH 20	1.035			3.50
		CH 40	0.773			-22.70
Low Voltage	DC2.7V	CH 01	1.019			1.90
		CH 20	0.966			-3.40
		CH 40	0.740			-26.00
Limit : +20%, -80% (Base on manufacturer declare antenna power density)						

Voltage	Test Frequency	Conducted RF output power density (dBm)	Antenna Gain (dBi)	EIRP Power (dBm)
Normal Voltage	2402MHz	0.15	-1.86	-1.71
	2440MHz	0.06	-1.86	-1.80
	2480 MHz	-1.32	-1.86	-3.18
High Voltage	2402MHz	0.20	-1.86	-1.66
	2440MHz	0.15	-1.86	-1.71
	2480 MHz	-1.12	-1.86	-2.98
Low Voltage	2402MHz	0.08	-1.86	-1.78
	2440MHz	-0.15	-1.86	-2.01
	2480 MHz	-1.31	-1.86	-3.17

6. OCCUPIED BANDWIDTH

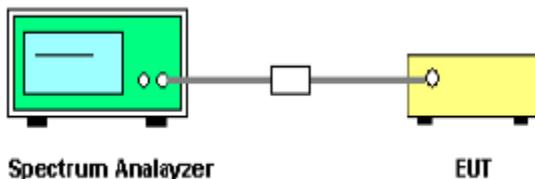
6.1 LIMIT

Item	Limits
Occupied Band Width:	FH 83.5MHz; OFDM,DS $\leq 26\text{MHz}$; Others $\leq 26\text{MHz}$
Spreading Bandwidth:	$\geq 500\text{ kHz}$ (FH, DS)

6.2 TEST PROCEDURES

1. Setting of SA is following as: RB: 300kHz / VB:300kHz / SPAN: 3MHz / AT: 20dB Ref: 10dBm / Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold
2. EUT have transmitted the maximum modulation signal and fixed channelize (For DSSS or OFDM Device) or continuous maximum power of hopping mode(For FHSS Device). SA set to 99% of occupied bandwidth to measure occupied bandwidth. The limit is less than 26MHz (For DSSS or OFDM Device) or 83.5MHz (For FHSS Device).
3. SA set to 90% of occupied bandwidth to measure Spread Spectrum Bandwidth and must greater than 500kHz.
4. Spread Spectrum Factor = Spread Spectrum Bandwidth / modulation rate of EUT.
5. Spread Spectrum Factor limit is greater than 5

6.1 TEST SETUP LAYOUT



TEST DEVIATION

There is no deviation with the original standard.

EUT OPERATION DURING TEST

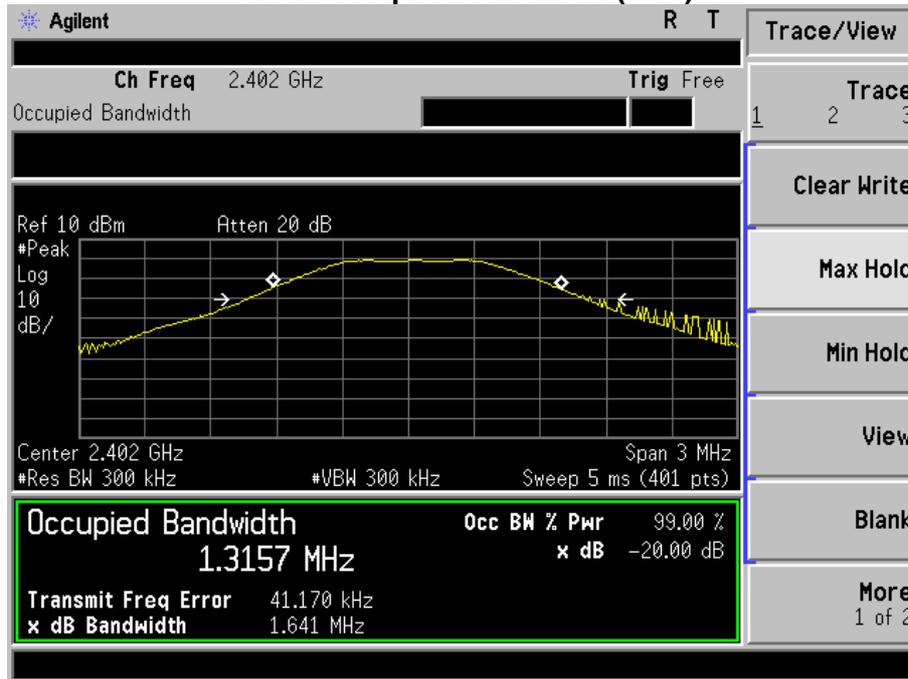
The EUT was programmed to be in continuously transmitting mode.



6.2 TEST RESULT

	Voltage	99%Occupied bandwidth MHz	Occupied Bandwidth Limit MHz	90%Spread bandwidth MHz	Spread Bandwidth Limit
GFSK	Normal Voltage	1.3157	≅ 26MH	0.8556	≅ 500 kHz

CH01 Occupied bandwidth (99%)



CH01 Occupied bandwidth (90%)





	Voltage	99%Occupied bandwidth MHz	Occupied Bandwidth Limit MHz	90%Spread bandwidth MHz	Spread Bandwidth Limit
GFSK	Normal Voltage	1.5444	≅ 26MH	0.8664	≅ 500 kHz

CH20 Occupied bandwidth (99%)



CH20 Occupied bandwidth (90%)



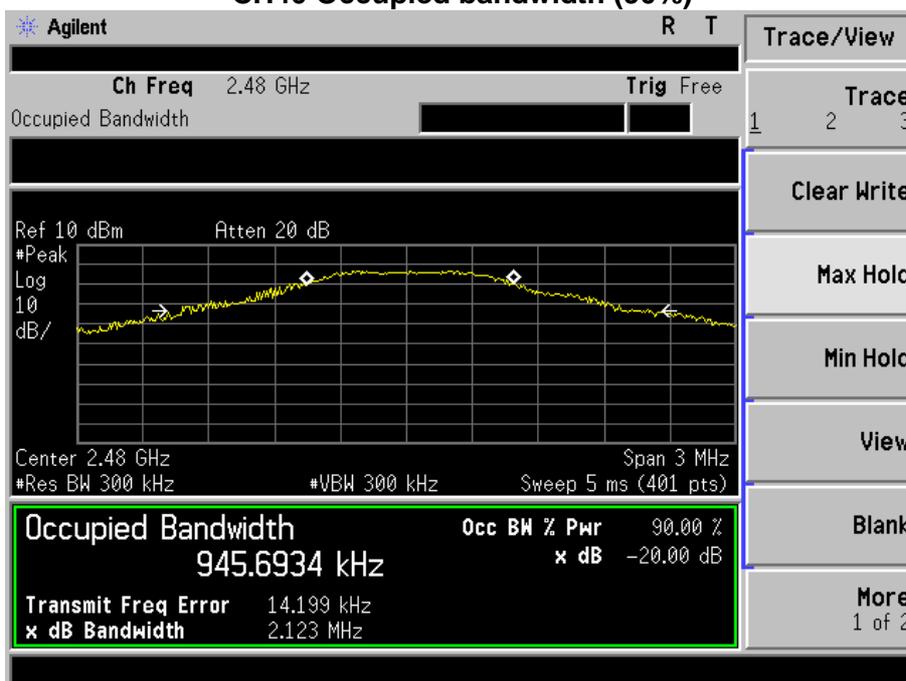


	Voltage	99%Occupied bandwidth MHz	Occupied Bandwidth Limit MHz	90%Spread bandwidth MHz	Spread Bandwidth Limit
GFSK	Normal Voltage	1.7709	≅ 26MH	0.9457	≅ 500 kHz

CH40 Occupied bandwidth (99%)



CH40 Occupied bandwidth (90%)



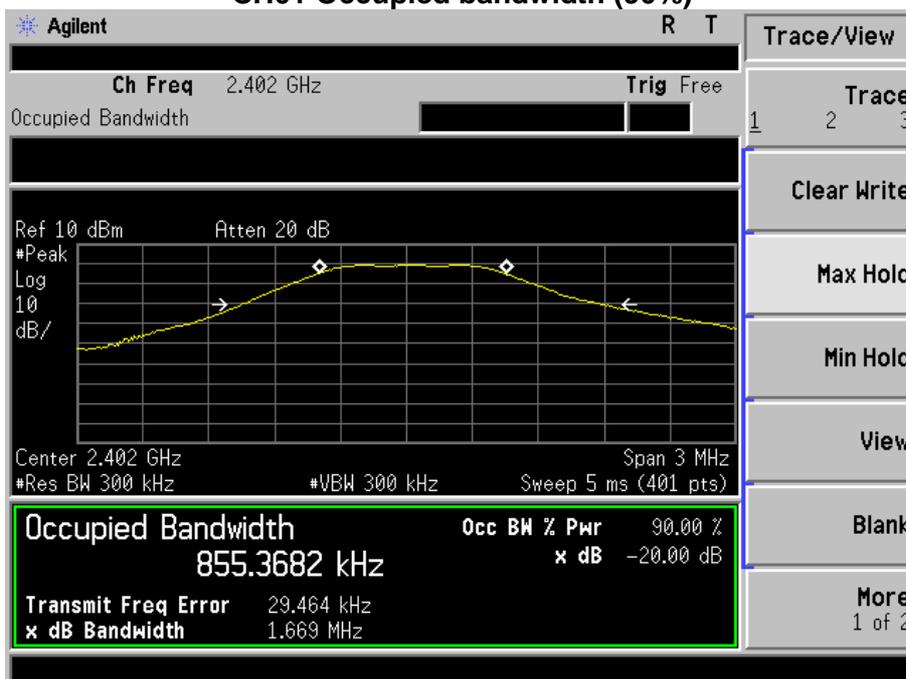


	Voltage	99%Occupied bandwidth MHz	Occupied Bandwidth Limit MHz	90%Spread bandwidth MHz	Spread Bandwidth Limit
GFSK	Normal Voltage +10%	1.3495	≅ 26MH	0.8554	≅ 500 kHz

CH01 Occupied bandwidth (99%)



CH01 Occupied bandwidth (90%)



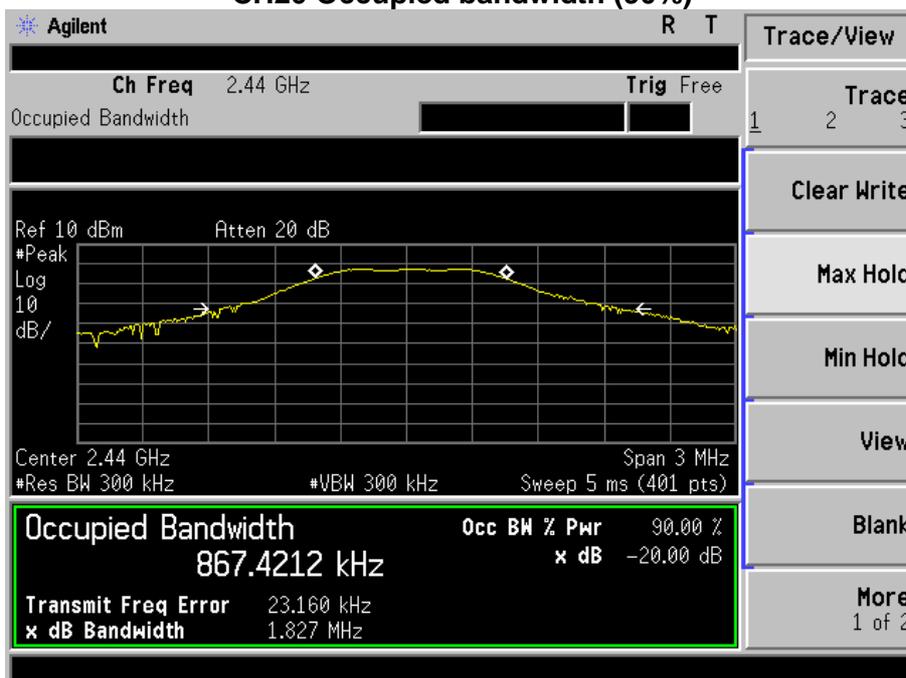


	Voltage	99%Occupied bandwidth MHz	Occupied Bandwidth Limit MHz	90%Spread bandwidth MHz	Spread Bandwidth Limit
GFSK	Normal Voltage +10%	1.5488	≅ 26MH	0.8674	≅ 500 kHz

CH20 Occupied bandwidth (99%)



CH20 Occupied bandwidth (90%)





	Voltage	99%Occupied bandwidth MHz	Occupied Bandwidth Limit MHz	90%Spread bandwidth MHz	Spread Bandwidth Limit
GFSK	Normal Voltage +10%	1.7862	≅ 26MH	0.9490	≅ 500 kHz

CH40 Occupied bandwidth (99%)



CH40 Occupied bandwidth (90%)





	Voltage	99%Occupied bandwidth MHz	Occupied Bandwidth Limit MHz	90%Spread bandwidth MHz	Spread Bandwidth Limit
GFSK	Normal Voltage -10%	1.3666	≅ 26MH	0.8553	≅ 500 kHz

GFSK CH01 Occupied bandwidth (99%)



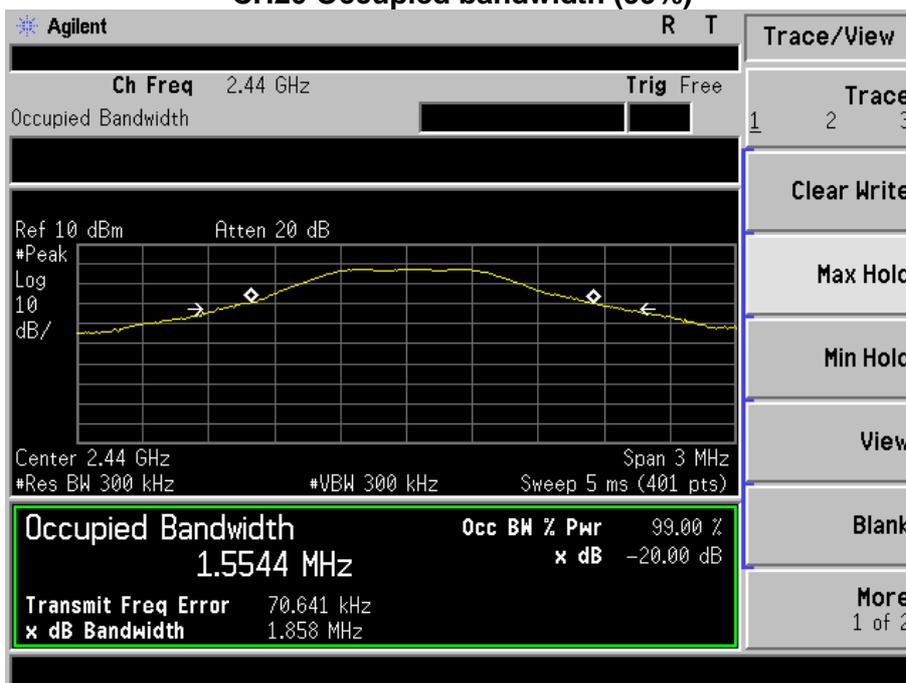
CH01 Occupied bandwidth (90%)



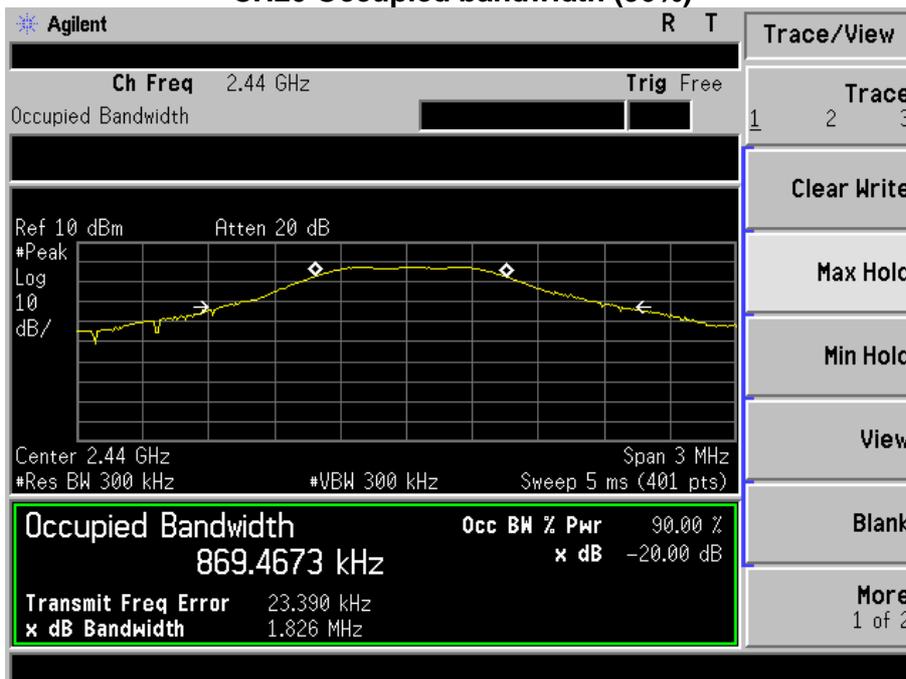


	Voltage	99%Occupied bandwidth MHz	Occupied Bandwidth Limit MHz	90%Spread bandwidth MHz	Spread Bandwidth Limit
GFSK	Normal Voltage -10%	1.5544	≦ 26MH	0.8695	≧ 500 kHz

CH20 Occupied bandwidth (99%)



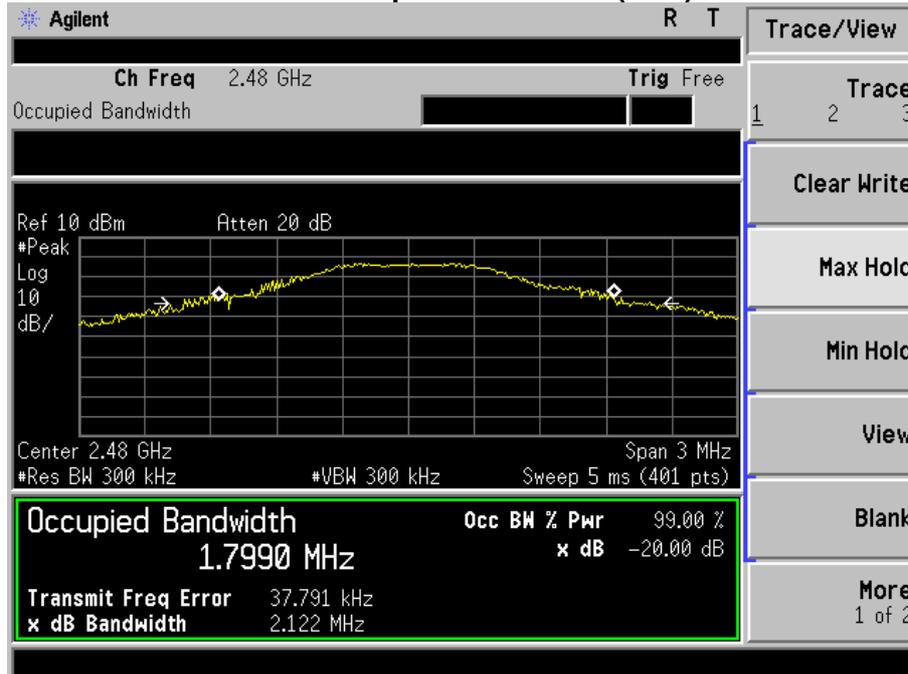
CH20 Occupied bandwidth (90%)





	Voltage	99%Occupied bandwidth MHz	Occupied Bandwidth Limit MHz	90%Spread bandwidth MHz	Spread Bandwidth Limit
GFSK	Normal Voltage -10%	1.7990	≅ 26MH	0.9512	≅ 500 kHz

CH40 Occupied bandwidth (99%)



CH40 Occupied bandwidth (90%)





7. UNWANTED EMISSION INTENSITY MEASUREMENT

7.1 LIMIT

Item	Limits
TX Spurious Emission	$\leq 0.25 \mu\text{W}$ ($30\text{MHz} \leq f \leq 1000\text{MHz}$)
	$\leq 2.5 \mu\text{W}$ ($1000\text{MHz} < f \leq 2387\text{MHz}$)
	$\leq 25 \mu\text{W}$ ($2387\text{MHz} < f \leq 2400\text{MHz}$)
	$\leq 25 \mu\text{W}$ ($2483.5\text{MHz} \leq f < 2496.5\text{MHz}$)
	$\leq 2.5 \mu\text{W}$ ($2496.5\text{MHz} \leq f < 12500\text{MHz}$)

7.2. MEASURING INSTRUMENTS AND SETTING

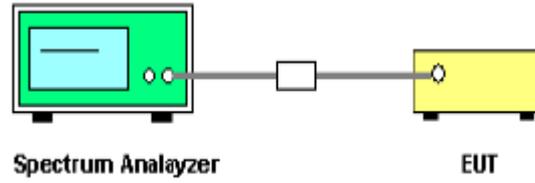
Please refer to section 5 in this report. The following table is the setting of Spectrum Analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
RB / VB	1 MHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

7.3. TEST PROCEDURES

- EUT have transmitted the maximum modulation signal and fixed channelize.
- Setting of SA is following as: Below 1GHz RB:100KHz / VB:100KHz
Above 1GHz RB:1MHz / VB:1MHz / AT: 10dB Ref: 0dBm / Sweep time: Auto
Sweep Mode: Continuous sweep / Detect mode: Positive peak
Trace mode: Max hold
- Setting of SA is following as 30MHz and stop frequency 1000MHz Then to mark peak reading value + cable loss shall be less than $0.25\mu\text{W}$.
- Setting of SA is following as 1000MHz and stop frequency 2387MHz Then to mark peak reading value + cable loss shall be less than $2.5\mu\text{W}$.
- SA adjusted to start frequency 2387MHz and stop frequency 2400MHz. Then to mark peak reading value + cable loss shall be less than $25\mu\text{W}$.
- SA adjusted to start frequency 2483.5MHz and stop frequency 2496.5MHz Then to mark peak reading value + cable loss shall be less than $25\mu\text{W}$
- SA adjusted to start frequency 2496.5MHz and stop frequency 12500MHz Then to mark peak reading value + cable loss shall be less than $2.5\mu\text{W}$
- Measure side band spurious as follows: For 2.4GHz band: 2374MHz~2400MHz and 2483.5MHz~2509.5MHz RBW = VBW = 30kHz, Result_Value = Measured_Value + 15.2 [dBm]
- If the Result_Value is over the requirement, take total sum of 1MHz band centered at the spur frequency like ACLP measurement as Result_Value.

7.4. TEST SETUP LAYOUT



7.5. TEST DEVIATION

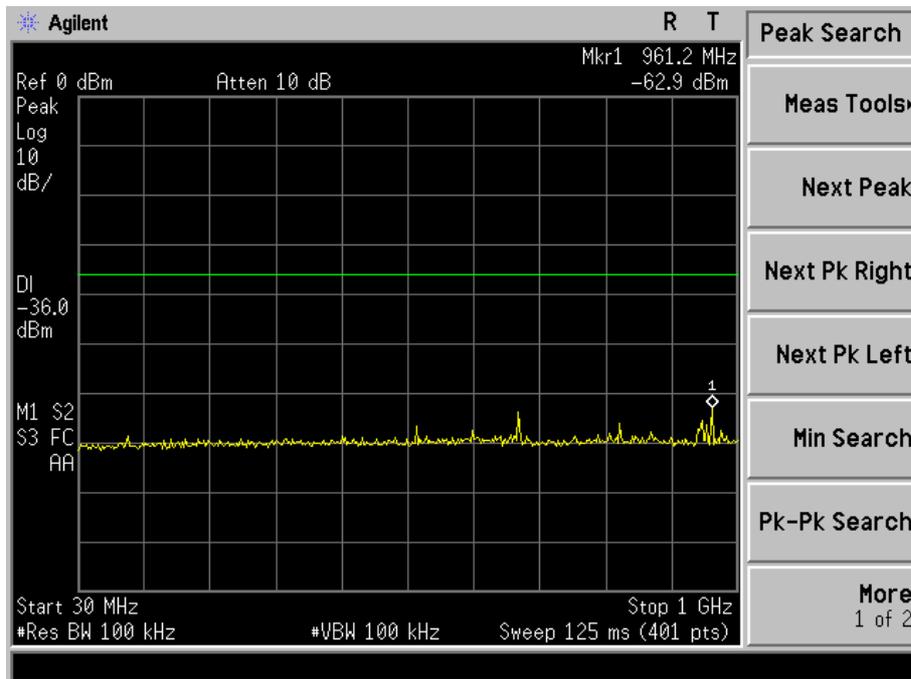
There is no deviation with the original standard.



7.6. TEST RESULT

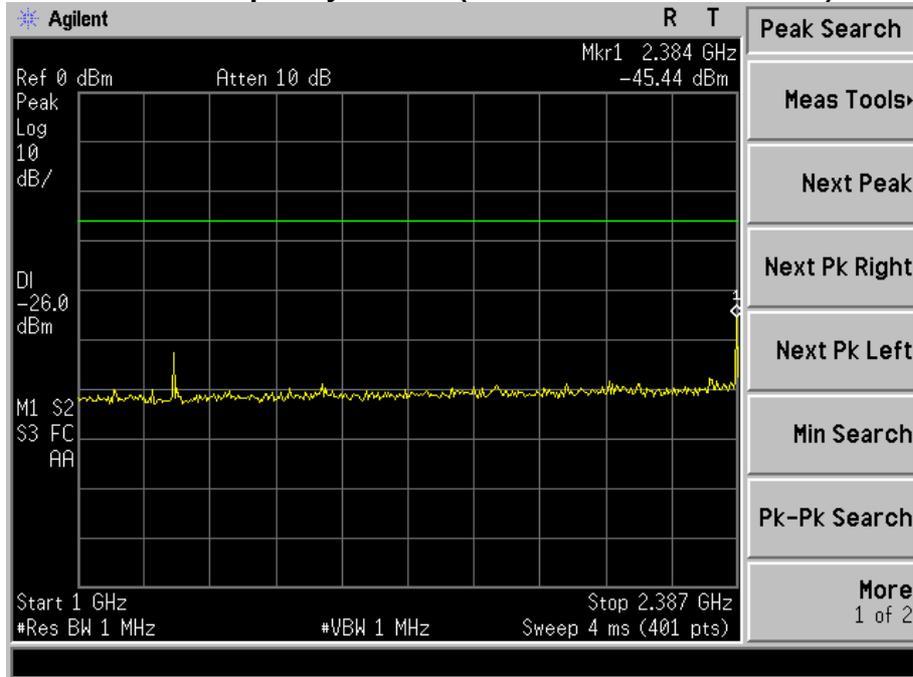
EUT:	Digital Broadcasting Device (D34.1)		
Temperature:	25°C		
Humidity:	55 % RH	Test Voltage	DC 3V
Operation Mode:	GFSK TX ; Normal Voltage (DC 3V)		

CH 01- Frequency Band 1 (30 MHz \leq f \leq 1000 MHz)

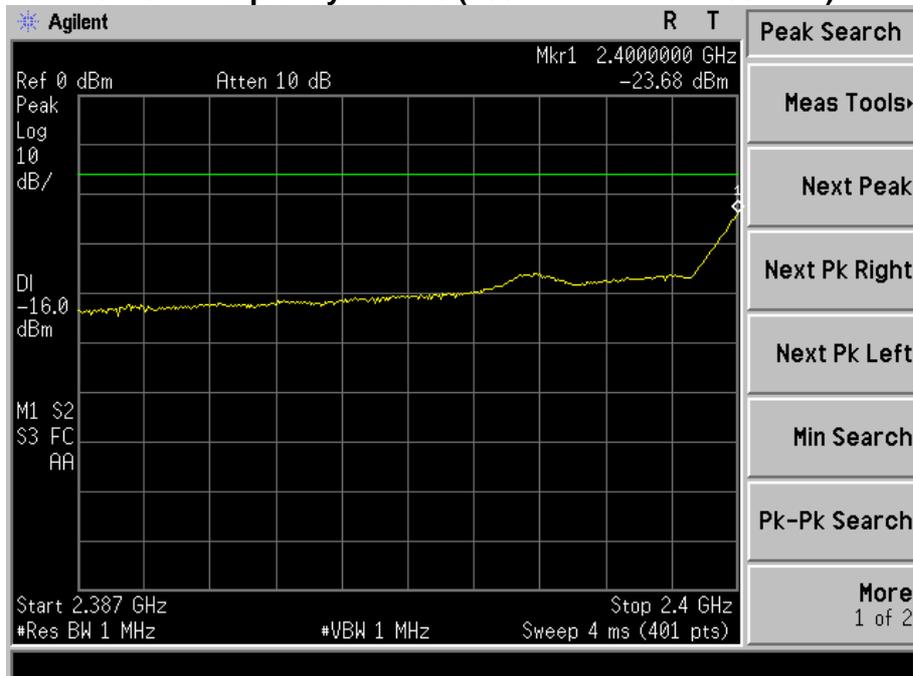




CH 01- Frequency Band 2 (1000 MHz < f ≤ 2387 MHz)

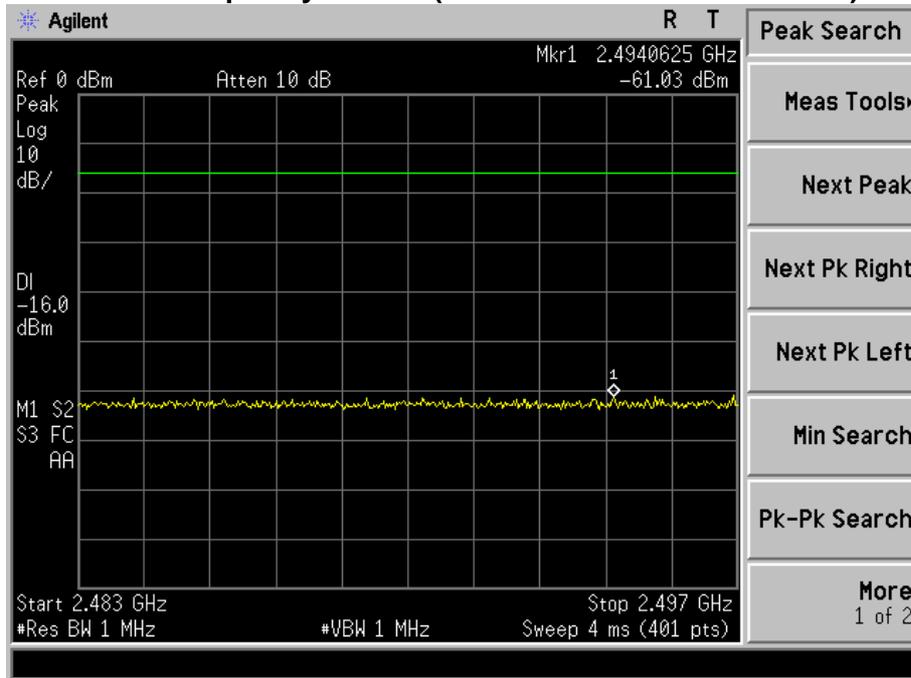


CH 01- Frequency Band 3 (2387 MHz < f ≤ 2400 MHz)

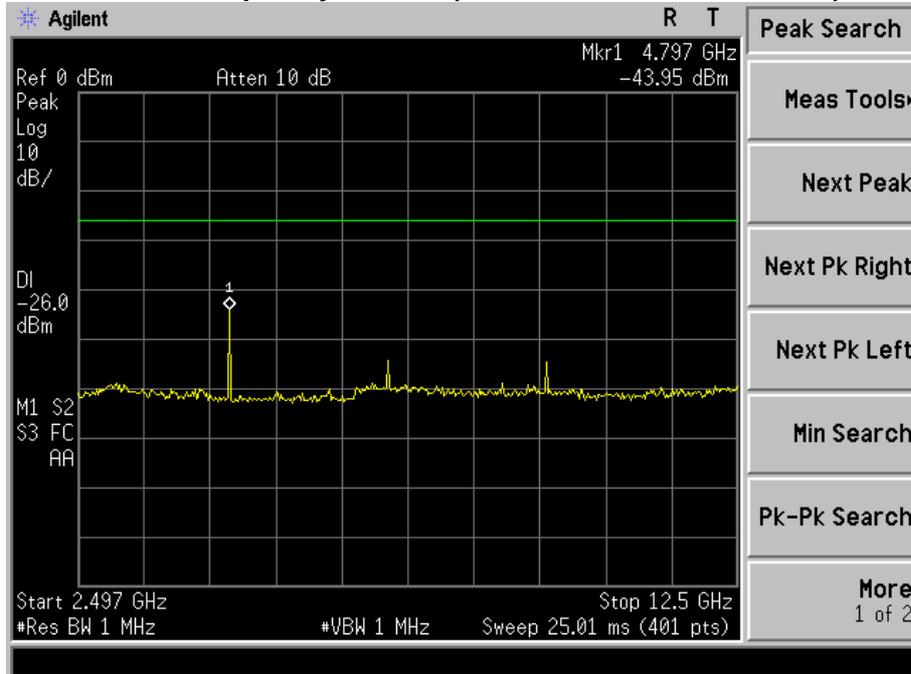




CH 01- Frequency Band 4 (2483.5 MHz \cong f < 2496.5 MHz)

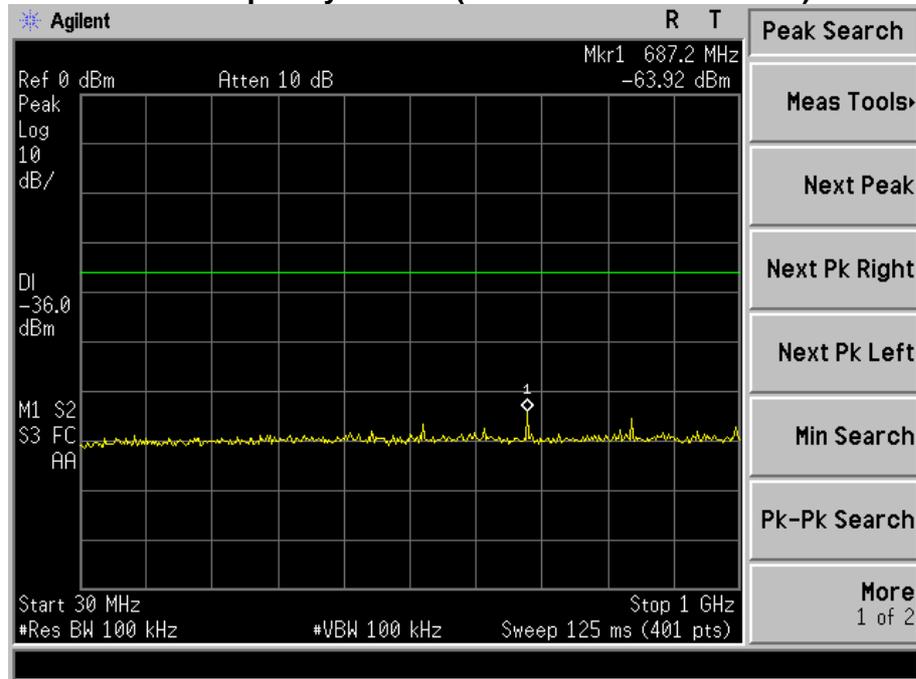


CH 01- Frequency Band 5 (2496.5 MHz \cong f < 12.5 GHz)

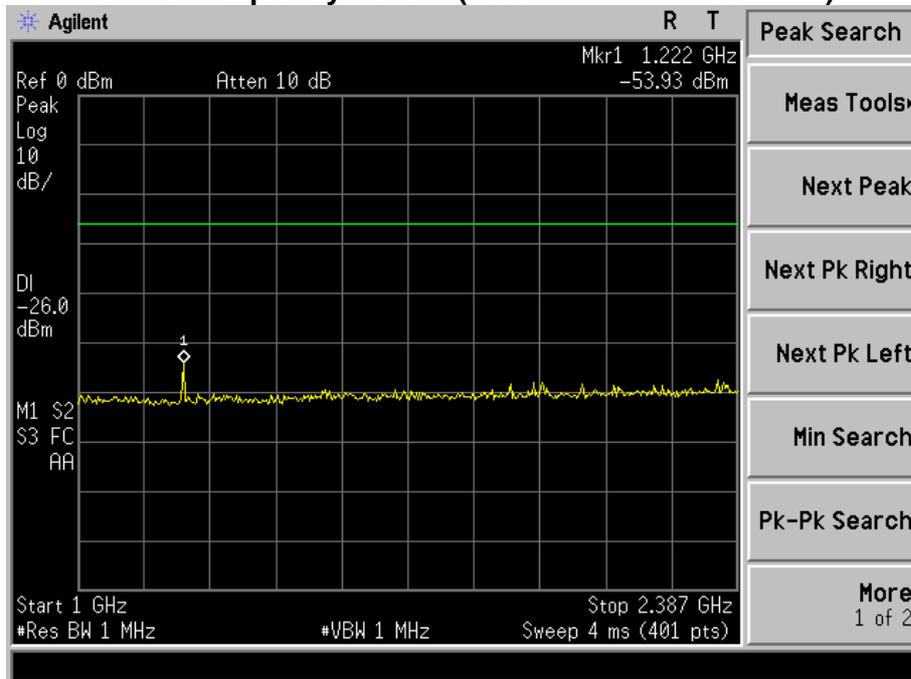




CH 20- Frequency Band 1 (30 MHz \leq f \leq 1000 MHz)

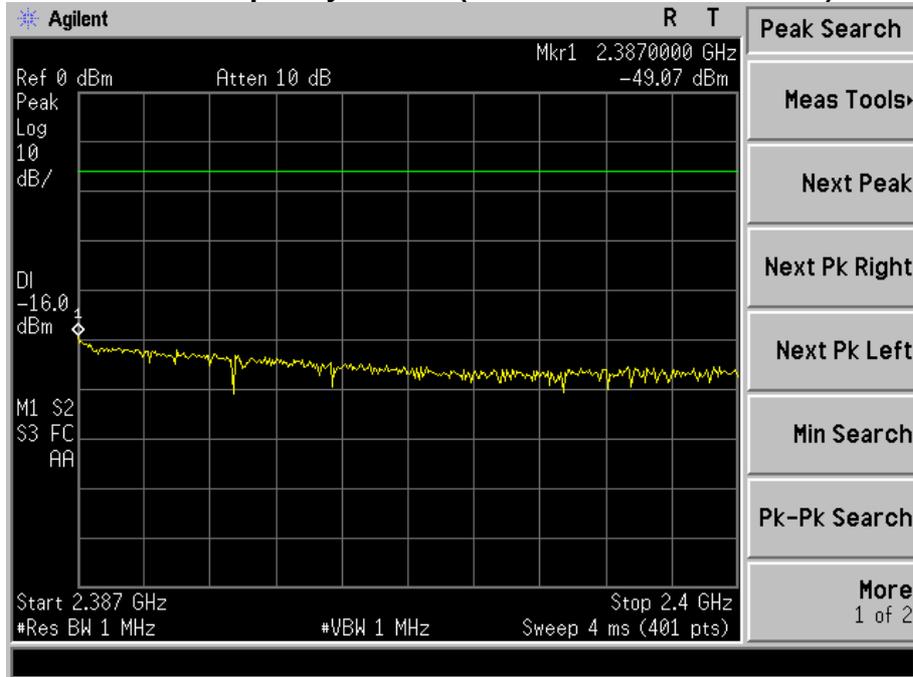


CH 20- Frequency Band 2 (1000 MHz < f \leq 2387 MHz)

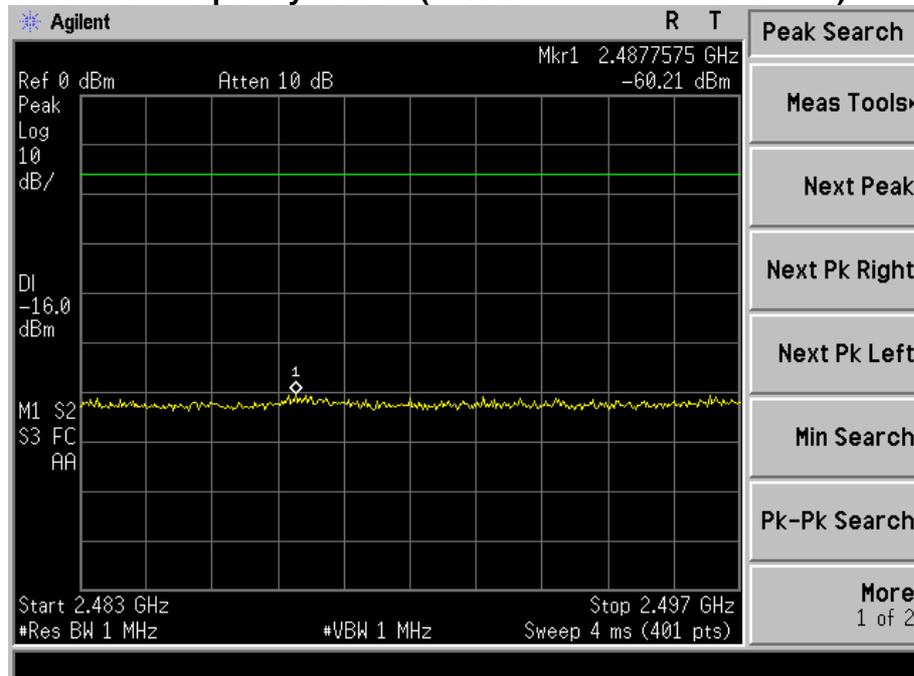




CH 20- Frequency Band 3 (2387 MHz < f ≤ 2400 MHz)

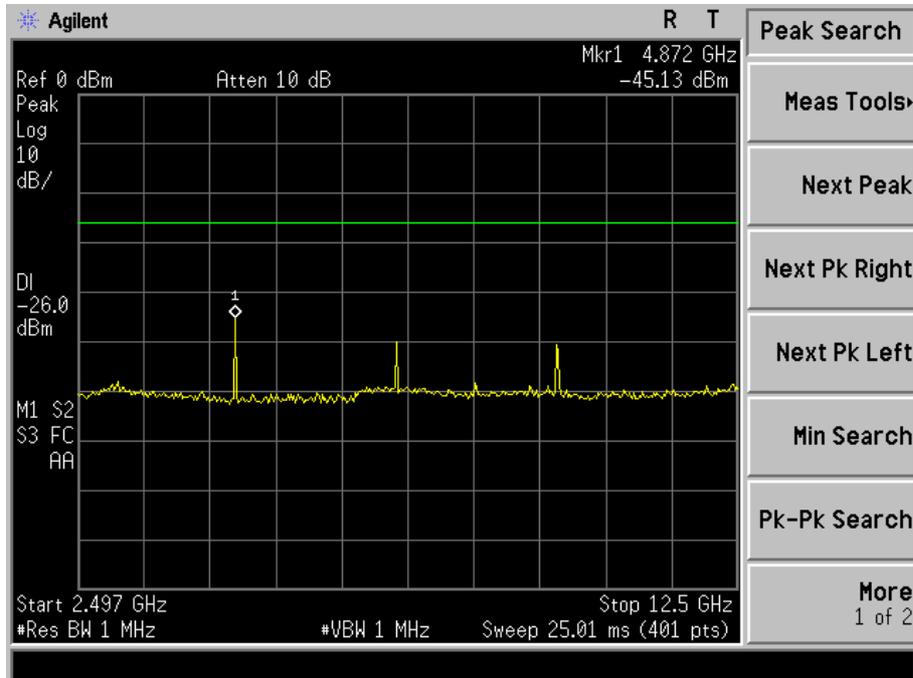


CH 20- Frequency Band 4 (2483.5 MHz ≤ f < 2496.5 MHz)



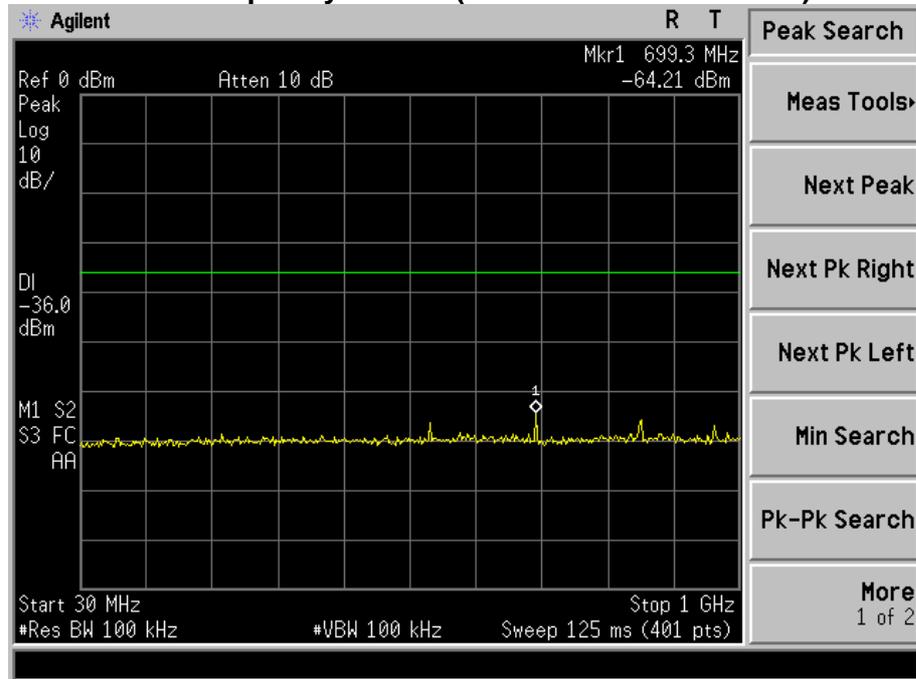


CH 20- Frequency Band 5 (2496.5 MHz \cong f < 12.5 GHz)

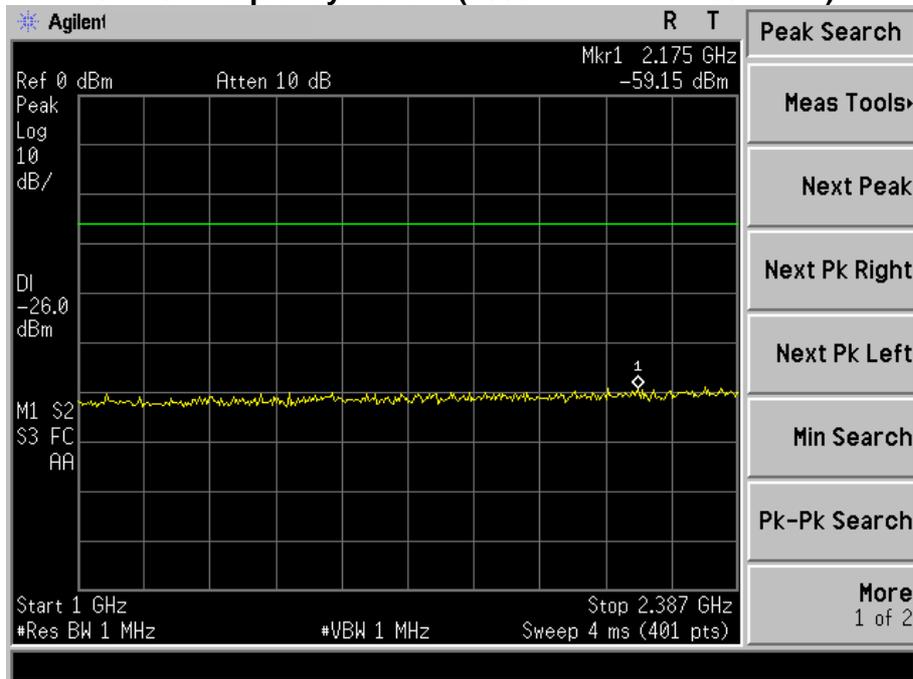




CH 40- Frequency Band 1 (30 MHz \leq f \leq 1000 MHz)

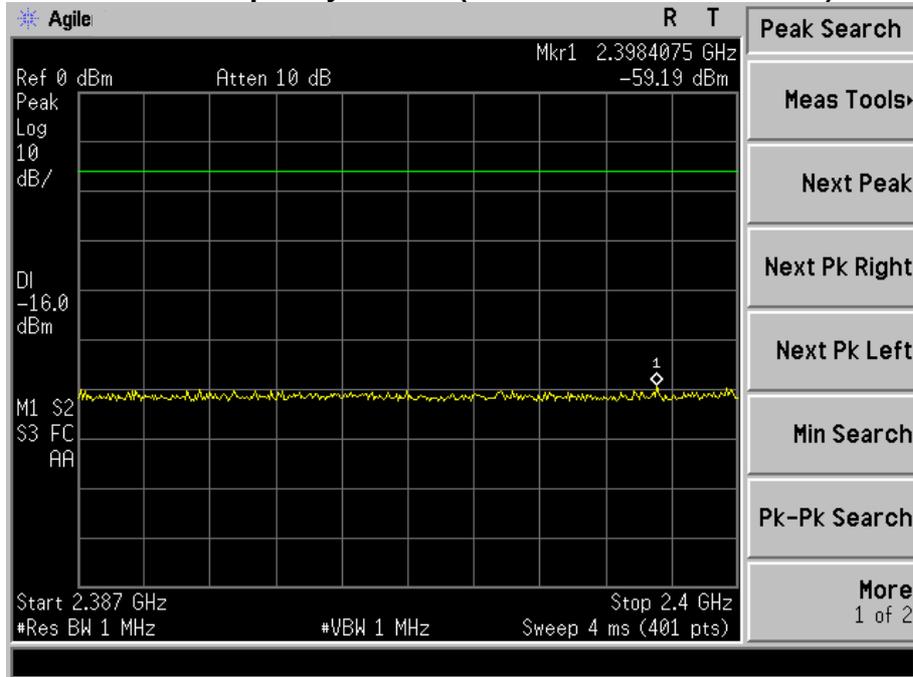


CH 40- Frequency Band 2 (1000 MHz < f \leq 2387 MHz)

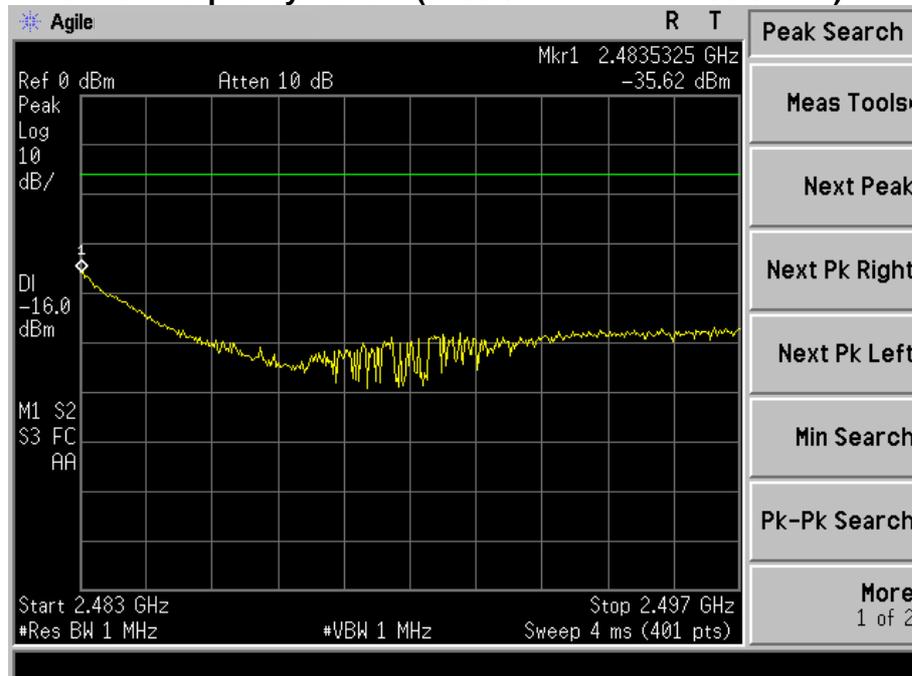




CH 40- Frequency Band 3 (2387 MHz < f ≤ 2400 MHz)

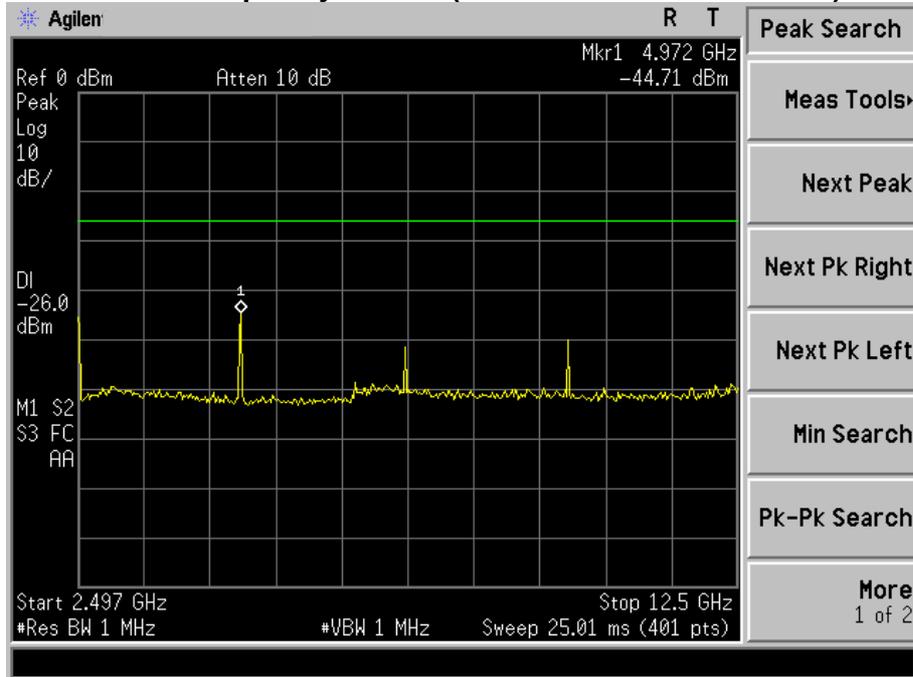


CH40- Frequency Band 4 (2483.5 MHz ≤ f < 2496.5 MHz)





CH 40- Frequency Band 5 (2496.5 MHz \leq f < 12.5 GHz)





8. IMITATION OF COLLATERAL EMISSION OF RECEIVER MEASUREMENT

8.1 LIMIT

Item	Limits
RX Spurious Emission:	$\cong 4\text{nW}$ ($f < 1\text{GHz}$)
	$\cong 20\text{nW}$ ($1\text{GHz} \cong f$)

8.2 MEASURING INSTRUMENTS AND SETTING

Please refer to section 5 in this report. The following table is the setting of Spectrum Analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
RB	100 kHz (below 1GHz emissions) 1 MHz (above 1GHz emissions)
VB	100 kHz (below 1GHz emissions) 1 MHz (above 1GHz emissions)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

8.3 TEST PROCEDURES

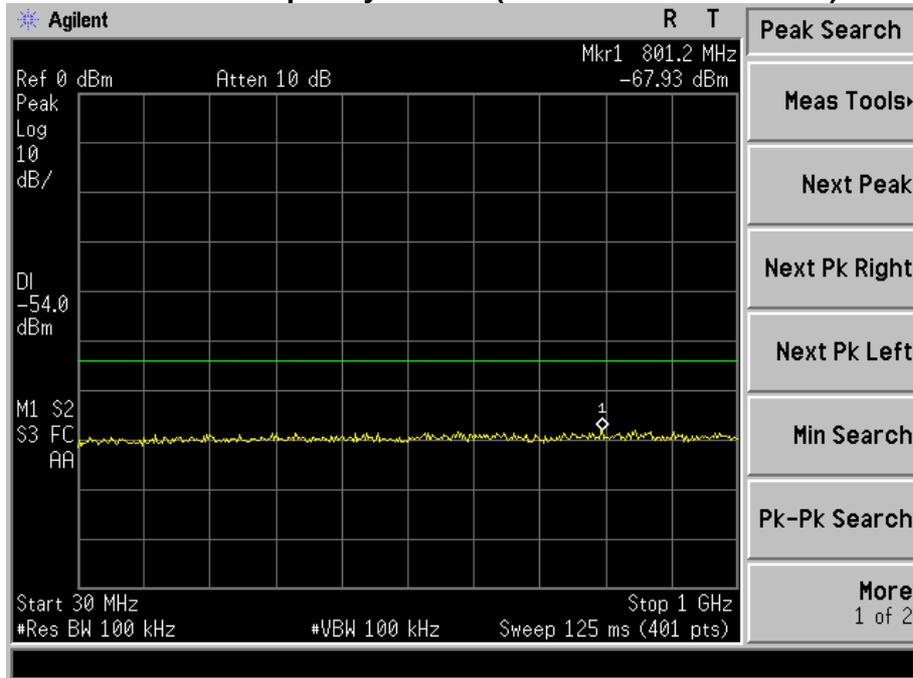
1. EUT have the continuous reception mode and fixed only one channelize.
2. Setting of SA is following as RB / VB: 100 kHz (below 1GHz emissions) / 1 MHz (above 1GHz emissions) / AT: 10dB / Ref: 0dBm / Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold
3. SA set RB: 100kHz and VB: 100kHz. Then adjust to start frequency 30MHz and stop frequency 1000MHz. Search to mark peak reading value + cable loss shall be less than 4nW
4. SA set RB: 1MHz and VB: 1MHz. Then adjust to start frequency 1000MHz and stop frequency 12500MHz. Search to mark peak reading value + cable loss shall be less than 20nW
5. If power level of lower emissions are more than 1/10 of limit (.0.4nW for $f < 1\text{GHz}$, 2nW for $f \geq 1\text{GHz}$), all those are to be indicated in the 2nd and 3rd lines. If others are 1/10 or less more of the limit, no necessary to be indicated.



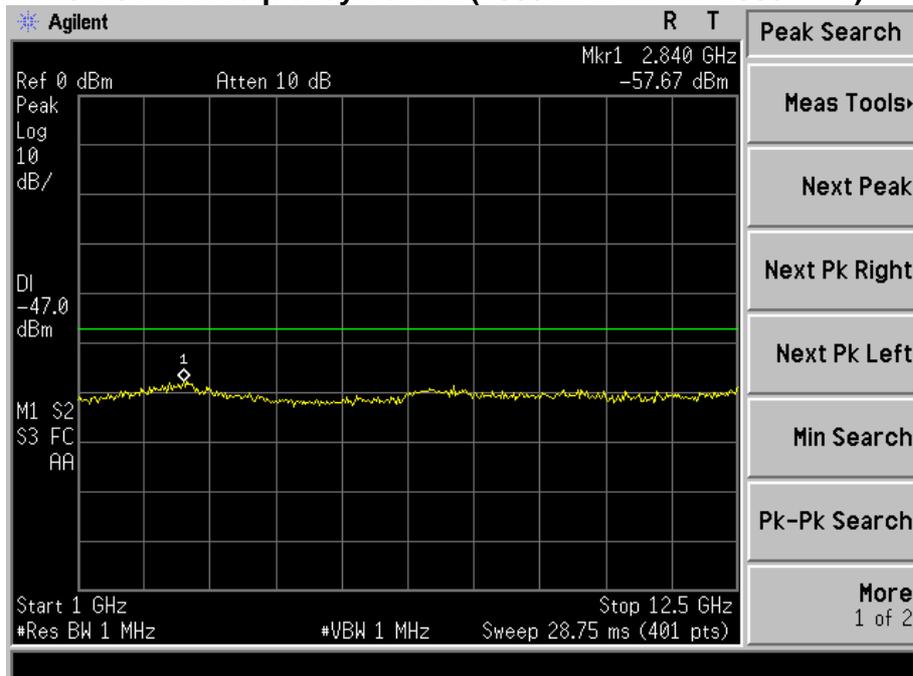
8.4 TEST RESULT

EUT:	Digital Broadcasting Device (D34.1)		
Temperature:	25°C		
Humidity:	55 % RH	Test Voltage	DC 3V
Operation Mode:	GFSK		

CH 01 RX-Frequency Band 1 (30 MHz \leq f < 1000 MHz)

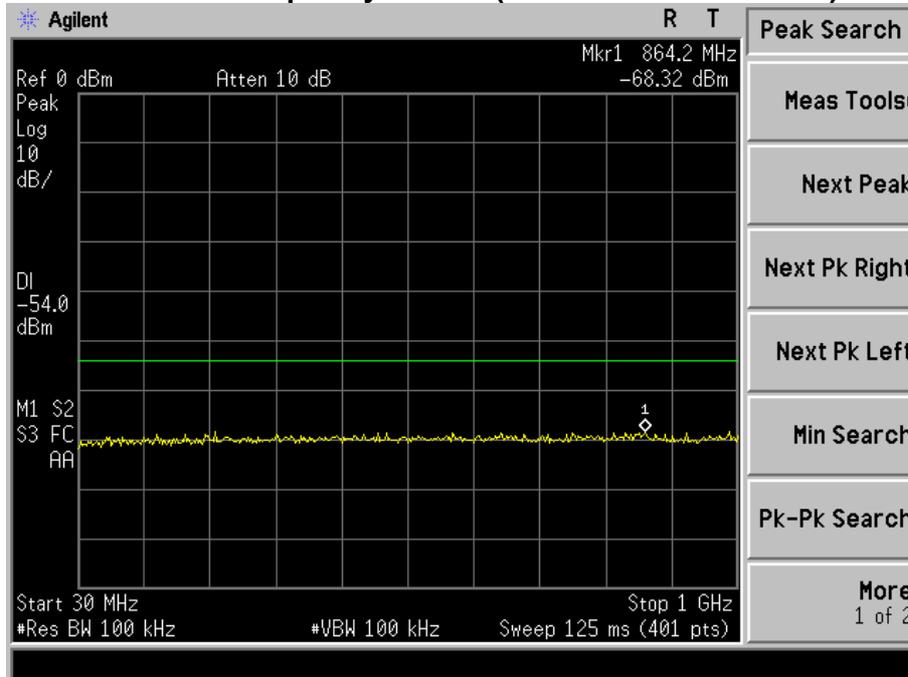


CH 01 RX-Frequency Band 2 (1000 MHz \leq f < 12500 MHz)

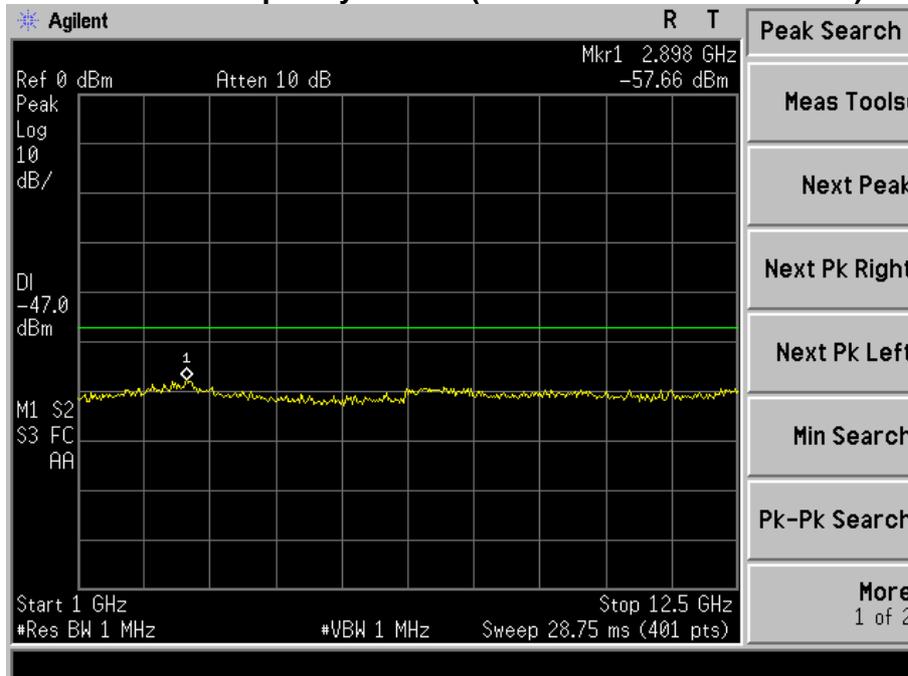




CH 20 RX-Frequency Band 1 (30 MHz \leq f < 1000 MHz)

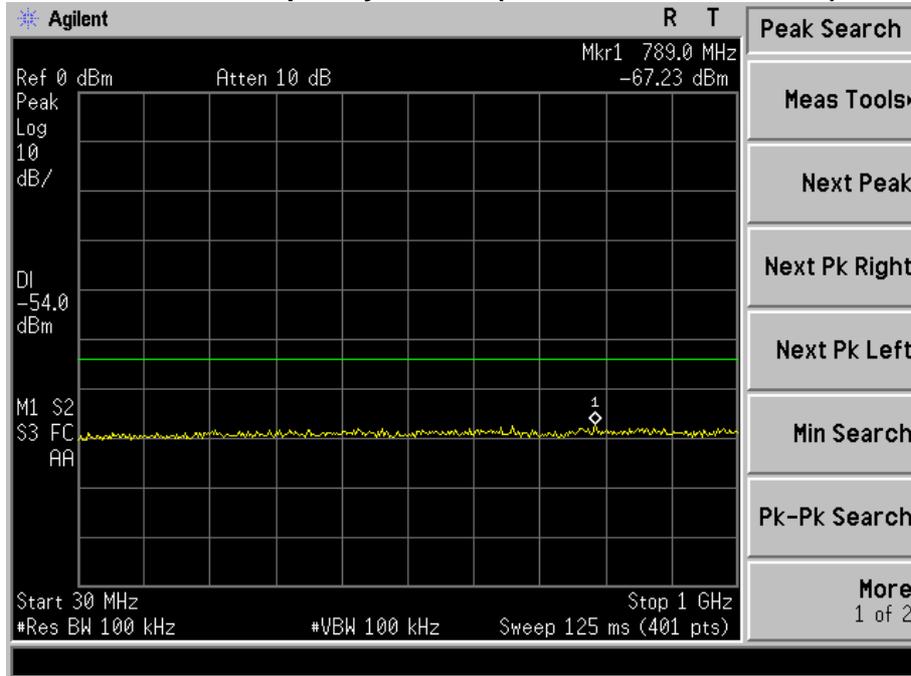


CH 20 RX-Frequency Band 2 (1000 MHz \leq f < 12500 MHz)

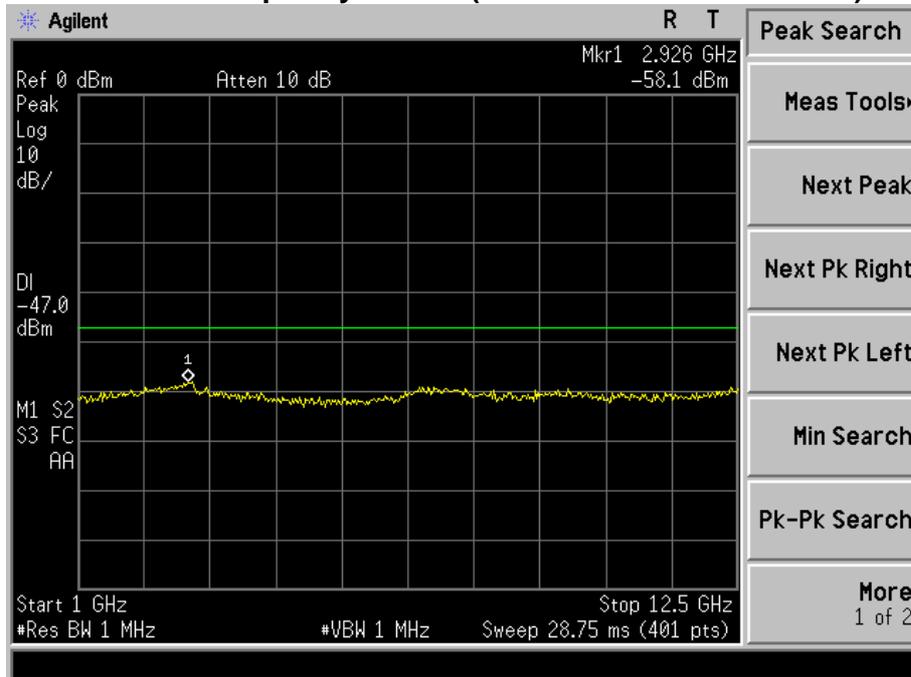




CH 40 RX-Frequency Band 1 (30 MHz \leq f < 1000 MHz)



CH 40 RX-Frequency Band 2 (1000 MHz \leq f < 12500 MHz)





9. TRANSMISSION ANTENNA GAIN (EIRP ANTENNA POWER) MEASUREMENT

9.1 LIMIT

Item	Limits
EIRP Power Density	$\leq 16.91\text{dBm/MHz}$ (FH form 2427 - 2470.75 MHz) $\leq 22.14\text{dBm/MHz}$ (OFDM,DS from 2400~2483.5MHz) $\leq 22.14\text{dBm}$ (Other from 2400~2483.5MHz)
Note: This test item is not applied for radio equipment with equivalent isotropic radiation power lower than 12.14dBm/MHz, but Antenna Power(Conducted) limit is 10 mW/MHz (10 dBm/MHz), So the test item will not be applied to the transmission antenna which has a gain of 2.14dBi or less	

9.2 MEASURING INSTRUMENTS AND SETTING

Please refer to section 5 in this report. The following table is the setting of spectrum analyzer.

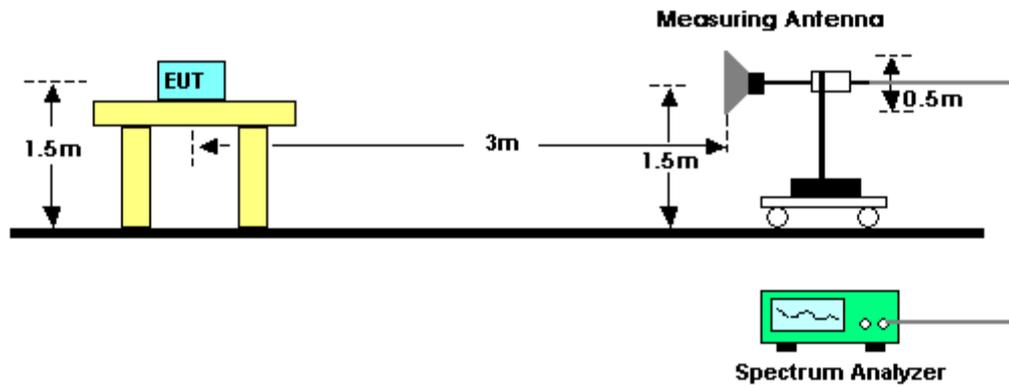
Spectrum Parameter	Setting
Attenuation	Auto
RB/VB	1 MHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

9.2.1 TEST PROCEDURES

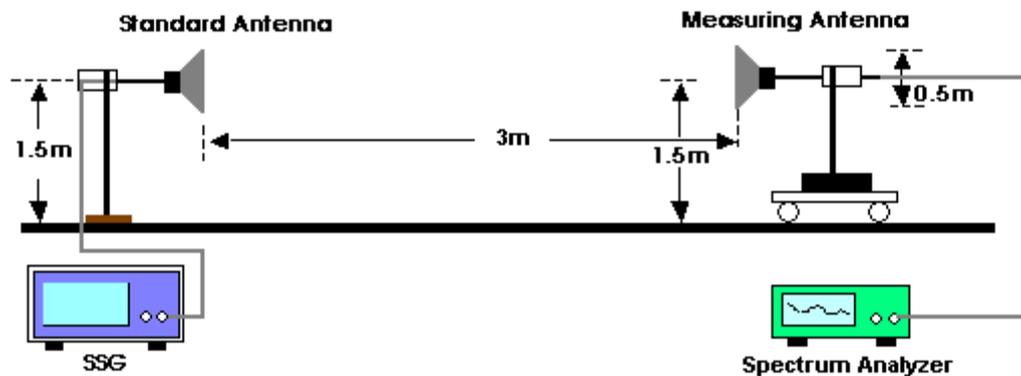
1. Set EUT ad measuring antenna at the same height and roughly facing each other.
2. Move the measuring antenna height up and down within $\pm 50\text{cm}$ of EUT height and swing it to find the maximum output of the measuring antenna. The output level at the spectrum analyzer is read sa "E".
3. Remove the EUT from the turn table and put the replacing antenna facing to measuring antenna at same height. Set the standard signal generator (SSG) at same frequency and transmit on then receive the signal
4. Swing the replacing antenna give a maximum receiving level.
5. Move the measuring antenna height up and down within $\pm 50\text{cm}$ of replacing antenna height and swing it to find the maximum receiving level.
6. Set SSG output power at Pt to give the equivalent output level of "E" or caluate Pt with SSG output which gives the nearest of "E" and difference ($\pm 1\text{dB}$). Record the Pt.
7. Calculate EIRP by the formula below $\text{EIRP} = \text{Gt} - \text{L} + \text{Pt}$.
Gt: gain of replacing antenna (dBi)
L: feeder loss between SSG and replacing antenna
Pt: Output power of the SSG
8. If the antenna for the EUT has circular polarization, sum of V-field and H-field will be result if measuring antenna is linear polarization.

9.3 TEST SETUP LAYOUT

For EUT radiation measurement



For standard antenna measurement



9.4 TEST DEVIATION

There is no deviation with the original standard.

9.5 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

9.6 RESULTS OF TRANSMISSION ANTENNA GAIN

Note: This test item will not be applied to the transmission antenna which has a gain of -1.86dBi or less



10. TRANSMISSION RADIATION ANGLE WIDTH (3DB BEAMWIDTH) MEASUREMENT

10.1 LIMIT

Item	Limits
3dB antenna beam width	$360/A$ (If $A < 1$; then $A = 1$) $A = \{\text{EIRP Power [mW]} / 16.36 \text{ for DS, OFDM}\}$ or $A = \{\text{EIRP Power [mW]} / 4.9 \text{ for FH}\}$
Note: This test item is not applied for radio equipment with equivalent isotropic radiation power lower than 12.14dBm/MHz, but Antenna Power(Conducted) limit is 10 mW/MHz (10 dBm/MHz), So the test item will not be applied to the transmission antenna which has a gain of 2.14dBi or less	

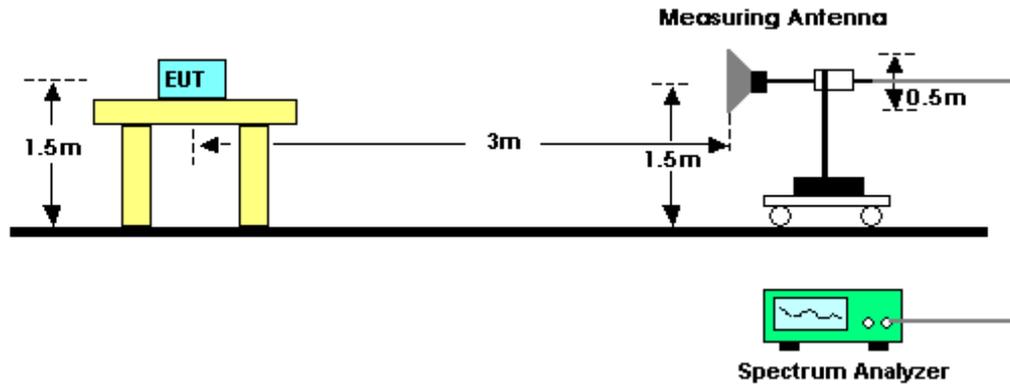
10.2 MEASURING INSTRUMENTS AND SETTING

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	0 MHz
RB	1 MHz
VB	1 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

10.3 TEST PROCEDURES

1. Set EUT and measuring antenna at the same height and roughly facing each other.
2. Set spectrum analyzer with condition in section 4.7.2 and tune reference level to observe receiving signal position.
3. Rotate directions of the EUT horizontally and vertically to find the maximum receiving power.
4. Move the measuring antenna height up and down within $\pm 50\text{cm}$ of EUT height and swing it to find the maximum output of measuring antenna. The output level at the spectrum analyzer is read as "E"
5. Calculate permitted radiation angle in horizontal and vertical using EIRP measured in another test method.
6. Calculate 3dB antenna beam width by the formula below $360/A$ (If $A < 1$; then $A = 1$).
 $A = \{\text{EIRP Power [mW]} / 16.36 \text{ for DS, OFDM}\}$ or
 $A = \{\text{EIRP Power [mW]} / 4.9 \text{ for FH}\}$

10.4 TEST SETUP LAYOUT



10.5 TEST DEVIATION

There is no deviation with the original standard.

10.6 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

10.7 TEST RESULT OF TRANSMISSION RADIATION ANGLE WIDTH (3DB BEAMWIDTH)

The test item will not be applied to the transmission antenna which has a gain of -1.86 dBi or less

11. RADIO INTERFERENCE PREVENTION CAPABILITY MEASUREMENT

11.1 LIMIT

Item	Limits
Identification code	≥ 48 bits

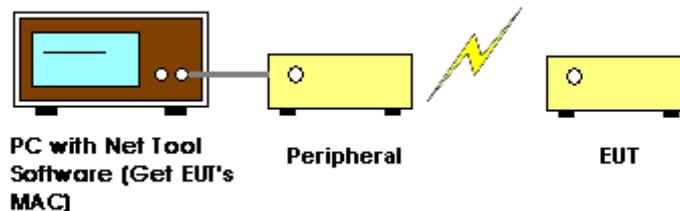
11.2 MEASURING ID CODE SOFTWARE

Item	Limits
MAC IP List	MAC Scan

11.3 TEST PROCEDURES

- In the case that the EUT has the function of automatically transmitting the identification code: a. Transmit the predetermined identification codes form EUT. b. Check the transmitted identification codes with the demodulator.
- In the case of receiving the identification ocde: a. Transmit the predetermined identification codes form the counterpart. b . Check if communication is normal. c. Transmit the signals other than predetermined ID codes form the counterpart. d. check if the EUT stops the transmission, or if it displays that idnetification codes are different from the predetermined ones.

11.4 TEST SETUP LAYOUT



11.5 TEST DEVIATION

There is no deviation with the original standard.

11.6 EUT OPERATION DURING TEST

The EUT was programmed to be in normal transmitting mode.

11.7 TEST RESULT OF RADIO INTERFERENCE PREVENTION CAPABILIT

EUT:	Digital Broadcasting Device (D34.1)		
Temperature:	25°C		
Humidity:	55 % RH	Test Voltage	DC 3V
Operation Mode:	GFSK		

Bluetooth Device Address: 0C-5B-63-D9-E4-EC-34

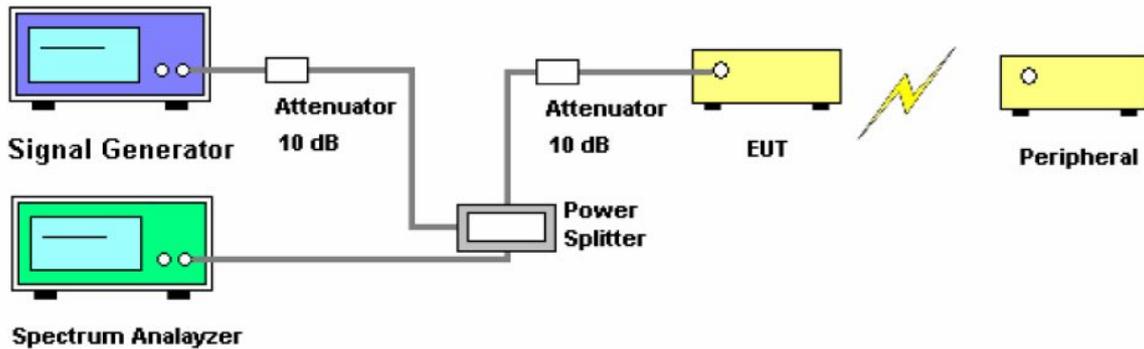
12. CARRIER SENSE CAPABILITY

Limit

EUT stop RF transmission signal after carrier inject to EUT

Test Procedure

Measurement System Diagram



1. SG adjusted the frequency as same as the EUT transmitted signal and emitted the absence of modulation from SG and power level is $(on\ 22.79+G-20*\log(f)dBm)$ (G is the antenna gain, f is the test frequency).
2. turn off the RF signal of the SG.
3. EUT have transmitted the maximum modulation signal and fixed channelize.
4. Setting of SA :RBW/VBW=1MHz/1MHz, Span=50MHz, Sweep time=auto, Sweep mode=continuous, Detect mode=positive peak
5. SG RF signal on.
6. EUT shall be stop the transmitted any signal and SG RF signal off, the EUT will be continuous transmitted signal.

	Normal Voltage	High Voltage	Low Voltage
Result	N/A	N/A	N/A

13. EUT TEST PHOTO

Measurement Photos



14. EUT PHOTOS



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