



# FCC TEST REPORT

Prepared For :	Hopeful Electric CO., LTD
Product Name:	MID
Model :	MID727BT-RK326,SRF79,A7X,MID727BT-RK326A MID727BT-RK326B,MID727BT-RK326C
Prepared By :	Shenzhen BATT Testing Technology Co., Ltd. 11F, Bldg.B, Xinbaoyuan, Xinnanhu Commercial city, Bao'an District, Shenzhen, Guangdong, China. Tel: 86-755-27753991 Fax: 86-755-27754182
Test Date:	April 18, 2014 to July 25, 2014
Date of Report :	July 28, 2014
Report No.:	BATT201407098-02FCC

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# 1 TEST CERTIFICATION

<b>Product:</b>	MID
<b>Model:</b>	MID727BT-RK326,SRF79,A7X, MID727BT-RK326A,MID727BT-RK326B,MID727BT-RK326C
<b>Applicant:</b>	Hopeful Electric CO., LTD 22 Floor, Changhong Building, Hi-Tech Park, Nanshan District, Shenzhen City, P.R.China
<b>Factory:</b>	Hopeful Electric CO., LTD / Associate Electronic Co.,Ltd 148, Ronggui Road (Mid), Ronggui Town, Shunde District, Foshan City, Guangdong Prov., China / 4, Guixindong Road, Ronggui Town, Shunde District, Foshan City, Guangdong Prov., China
<b>Trade Mark:</b>	N/A
<b>Tested:</b>	April 18, 2014 to July 25, 2014
<b>Test Voltage:</b>	DC5V Powered by power supply
<b>Operational Frequency Range:</b>	Bluetooth: 2402-2480MHz
<b>Modulation Type:</b>	Bluetooth: GFSK, $\pi/4$ DQPSK, 8DPSK
<b>Number of Channel</b>	79Channel for Bluetooth
<b>Frequency Selection</b>	By software
<b>Antenna:</b>	Integral antenna with Gain 2.0 dBi
<b>Power Supply:</b>	Model No.: HP0515D2-NA Input:100-240V, 0.3A, 50/60Hz; Output: +5V, 1.5A Max
<b>FCC ID:</b>	2AAQZMID727B1-RK326
<b>Applicable Standards:</b>	FCC Part 15.247

The test report was prepared by Shenzhen BATT Testing Technology Co., Ltd. and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.



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## 2.0 Test Equipments

Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver	ROHDE&SCHWARZ	ESPI 3	100379	2013-08-27	2014-08-26
EMI Test Receiver	Rohde & Schwarz	ESU	1302.6005.26	2013-08-27	2014-08-26
Impuls-Begrenzer	ROHDE&SCHWARZ	ESH3-Z2	100281	2013-08-27	2014-08-26
Loop Antenna	EMCO	6502	00042960	2013-06-25	2014-06-24
ESPI Test Receiver	ROHDE&SCHWARZ	ESI26	838786/013	2013-08-27	2014-08-26
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170399	2013-09-15	2014-09-14
Horn Antenna	SCHWARZBECK	BBHA 9120	D143	2013-09-15	2014-09-14
Power meter	Anritsu	ML2487A	6K00003613	2013-08-27	2014-08-26
Power sensor	Anritsu	MA2491A	32263	2013-08-27	2014-08-26
Bilog Antenna	Schwarebeck	VULB916 3	9163/142	2013-12-13	2014-12-12
LISN (Three Phase)	Schwarebeck	NSLK 8126	8126453	2013-08-27	2014-08-26
9*6*6 Anechoic	--	--	N/A	2013-08-27	2014-08-26
EMI Test Receiver	RS	ESCS30	100139	2013-08-27	2014-08-26
LISN	RS	ESH2-Z5	100225	2013-08-27	2014-08-26
Pre-Amplifier	A.H.	PAM-0126	1415261	2014-07-23	2015-07-22



### 3.0 Technical Details

#### 3.1 Summary of test results

**The EUT has been tested according to the following specifications:**

Requirement	CFR 47 Section	Result	Notes
Antenna Requirement	15.203, 15.247(b)(4)	PASS	Complies
Maximum Peak Out Power	15.247 (b)(1), (4)	PASS	Complies
Carrier Frequency Separation	15.247(a)(1)	PASS	Complies
20dB Channel Bandwidth	15.247 (a)(1)	PASS	Complies
Number of Hopping Channels	15.247(a)(iii), 15.247(b)(1)	PASS	Complies
Time of Occupancy (Dwell Time)	15.247(a)(iii)	PASS	Complies
Spurious Emission, Band Edge, and Restricted bands	15.247(d), 15.205(a), 15.209 (a), 15.109	PASS	Complies
Conducted Emissions	15.207(a), 15.107	PASS	Complies
RF Exposure	15.247(i), 1.1307(b)(1)	PASS	Complies

Note: This test report was based on original test of FCC ID: **2AAQZMID727BT-RK326**.

Products of FCC ID 2AAQZMID727B1-RK326 are electrically identical with original products of FCC ID:

**2AAQZMID727BT-RK326 except** FCC ID 2AAQZMID727B1-RK326 include additional battery package, so 0.15kHz to 30MHz conducted emission test and 30MHz to 1GHz radiated emission test are done at samples with additional battery package, Other data are from original report of FCC ID: **2AAQZMID727BT-RK326**

### 4.0 Test LAB Details

All Tests Performed at

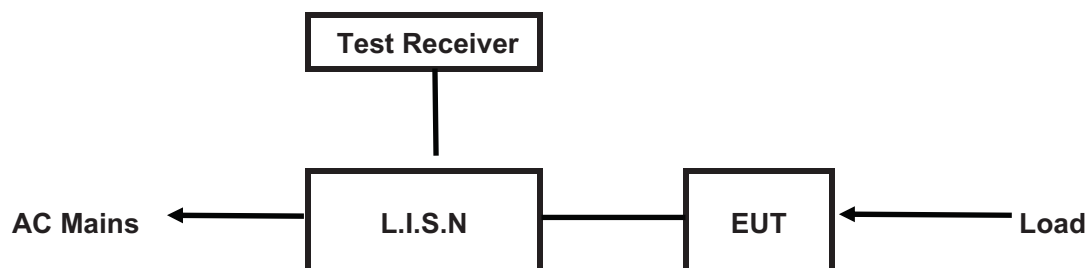
Name: Shenzhen Emtek Co., Ltd.

Address: Bldg. 69, Majialong Industry Zone,,Nanshan District,Shenzhen, Guangdong, 518052China

FCC Registration Number: 406365

## 5. Power Line Conducted Emission Test

### 5.1 Schematics of the test



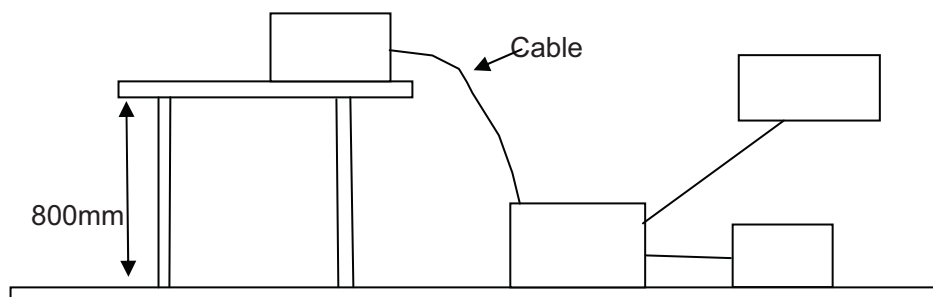
EUT: Equipment Under Test

### 5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.4-2003. The Frequency spectrum From 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.4 -2003.

Test Voltage: 120V~, 60Hz

Block diagram of Test setup



### 5.3 Configuration of The EUT

The EUT was configured according to ANSI C63.4-2003. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

79 channels are provided to the EUT



## A. EUT

Device	Manufacturer	Model	FCC ID
MID	Hopeful Electric CO., LTD / Associate Electronic Co., Ltd	MID727BT-RK326,SRF79,A7X,MID727BT-RK326,MID727BT-RK326A,MID727BT-RK326B,MID727BT-RK326C,MID727BT-RK326	2AAQMID727B1-RK326

## B. Internal Device

Device	Manufacturer	Model	FCC ID/DOC
N/A			

## C. Peripherals

Device	Manufacturer	Model	FCC ID/DOC	Cable
--	--	--	--	--

## 5.4 EUT Operating Condition

Operating condition is according to ANSI C63.4 -2003.

A Setup the EUT and simulators as shown on follow

B Enable AF signal and confirm EUT active to normal condition

## 5.5 Power line conducted Emission Limit according to Paragraph 15.107, 15.207

Frequency (MHz)	Class A Limits (dB $\mu$ V)		Class B Limits (dB $\mu$ V)	
	Quasi-peak Level	Average Level	Quasi-peak Level	Average Level
0.15 ~ 0.50	79.0	66.0	66.0~56.0*	56.0~46.0*
0.50 ~ 5.00	73.0	60.0	56.0	46.0
5.00 ~ 30.00	73.0	60.0	60.0	50.0

Notes: 1. \*Decreasing linearly with logarithm of frequency.

2. The tighter limit shall apply at the transition frequencies

## 5.6 Test Results

The frequency spectrum from 0.15MHz to 30MHz was investigated. All reading are quasi-peak values with a resolution bandwidth of 9kHz.

Worse case were recorded.



**A: Conducted Emission on Live Terminal (150kHz to 30MHz)**

**EUT Operating Environment**

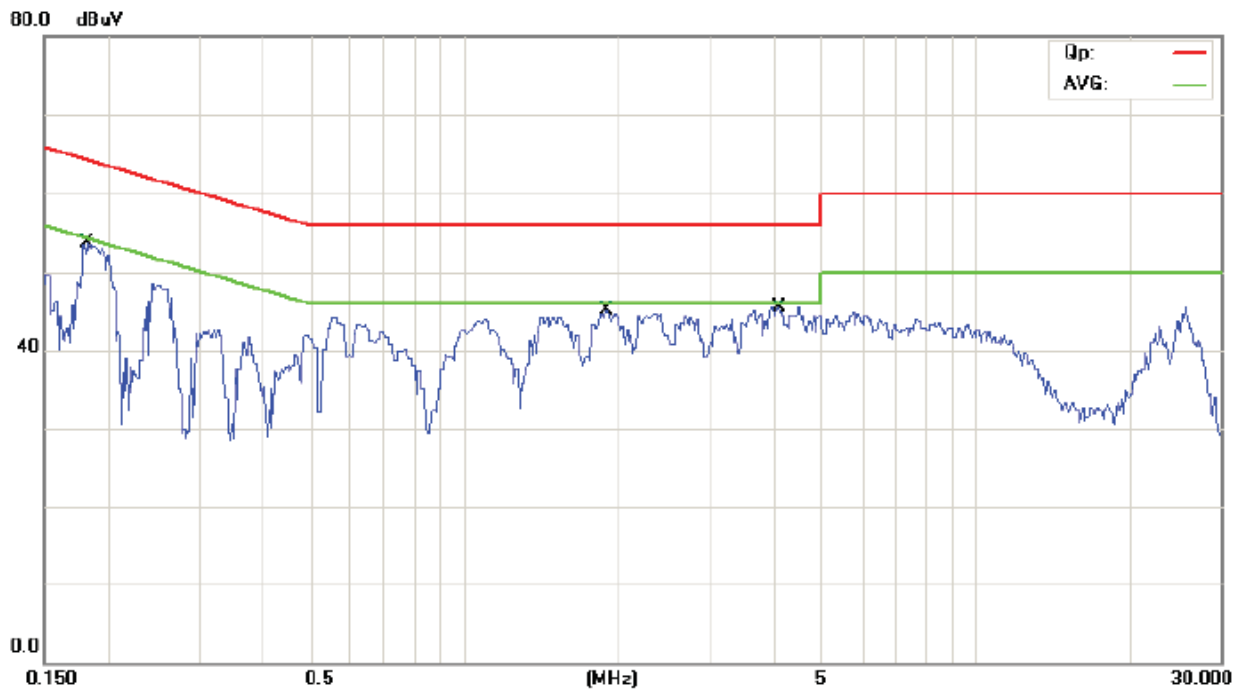
Temperature: 25°C Humidity: 75%RH Atmospheric Pressure: 101 KPa

**EUT set Condition: Keep BT Transmitting**

**Equipment Level: Class B**

**Results: Pass**

Please refer to following diagram for individual



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.1810	41.50	11.03	52.53	64.44	-11.91	QP	
2		0.1810	23.90	11.03	34.93	54.44	-19.51	AVG	
3		1.8950	31.80	12.26	44.06	56.00	-11.94	QP	
4		1.8950	18.40	12.26	30.66	46.00	-15.34	AVG	
5		4.1167	28.10	13.15	41.25	56.00	-14.75	QP	
6		4.1167	20.00	13.15	33.15	46.00	-12.85	AVG	

## B: Conducted Emission on Neutral Terminal (150kHz to 30MHz)

### EUT Operating Environment

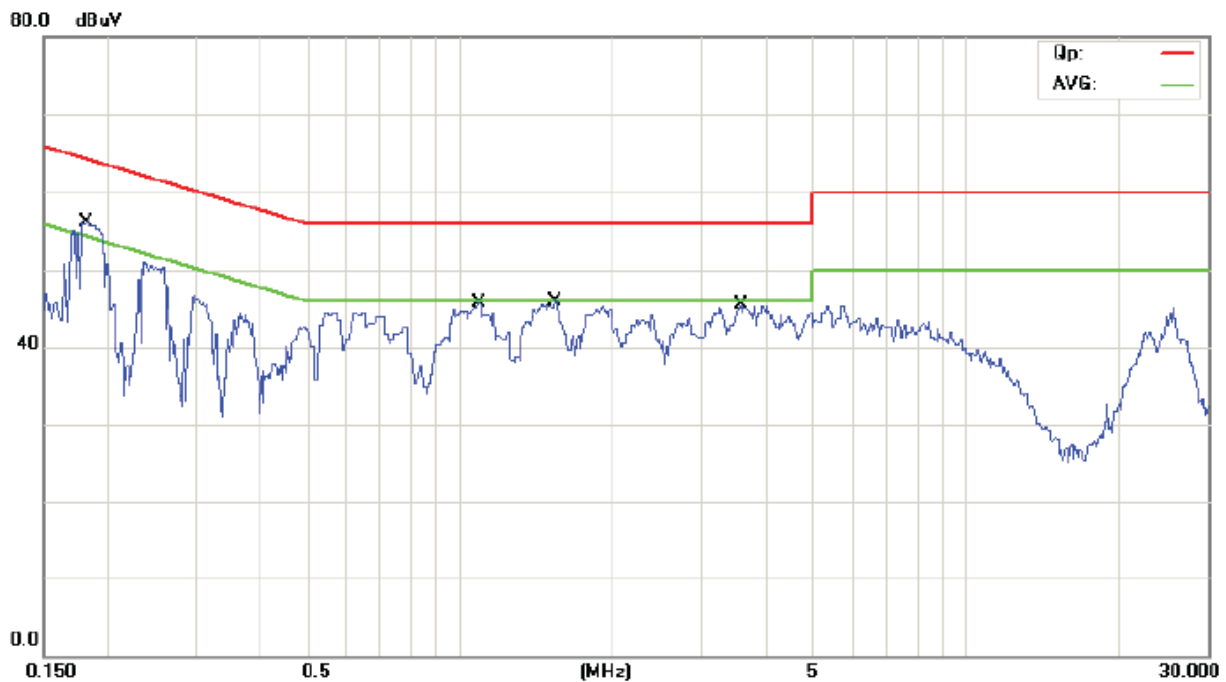
Temperature: 25°C Humidity: 75%RH Atmospheric Pressure: 101 KPa

EUT set Condition: Keep BT Transmitting

Equipment Level: Class B

Results: Pass

Please refer to following diagram for individual



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1	*	0.1816	43.10	11.03	54.13	64.41	-10.28	QP	
2		0.1816	28.70	11.03	39.73	54.41	-14.68	AVG	
3		1.0790	31.30	11.93	43.23	56.00	-12.77	QP	
4		1.0790	21.80	11.93	33.73	46.00	-12.27	AVG	
5		1.5440	29.90	12.12	42.02	56.00	-13.98	QP	
6		1.5440	20.10	12.12	32.22	46.00	-13.78	AVG	
7		3.5824	31.55	12.93	44.48	56.00	-11.52	QP	
8		3.5824	17.45	12.93	30.38	46.00	-15.62	AVG	

# C: Conducted Emission on Live Terminal (150kHz to 30MHz)

## EUT Operating Environment

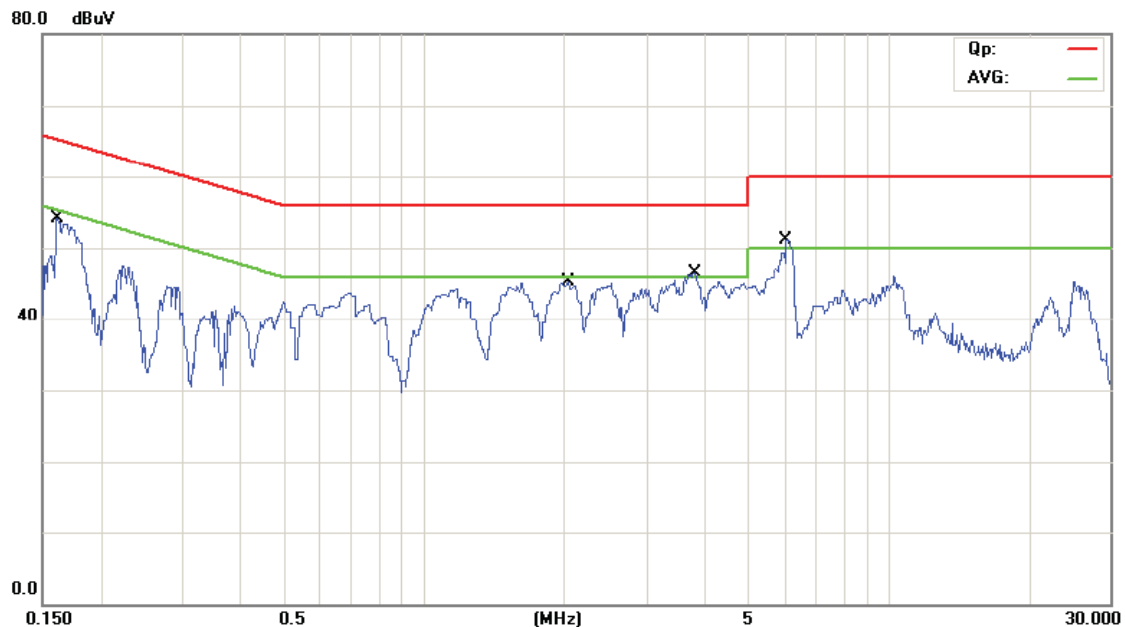
Temperature: 25°C Humidity: 75%RH Atmospheric Pressure: 101 KPa

EUT set Condition: Keep BT Transmitting

Equipment Level: Class B

Results: Pass

Please refer to following diagram for individual



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB	dBuV	dBuV	dB	
1		0.1614	31.30	11.01	42.31	65.39	-23.08	QP
2		0.1614	10.70	11.01	21.71	55.39	-33.68	AVG
3		2.0283	30.30	12.31	42.61	56.00	-13.39	QP
4		2.0283	21.70	12.31	34.01	46.00	-11.99	AVG
5		3.7976	30.50	13.02	43.52	56.00	-12.48	QP
6	*	3.7976	23.90	13.02	36.92	46.00	-9.08	AVG
7		6.1205	33.70	13.03	46.73	60.00	-13.27	QP
8		6.1205	25.60	13.03	38.63	50.00	-11.37	AVG

Note: Test on additional battery and worse case was recorded.

# D: Conducted Emission on Neutral Terminal (150kHz to 30MHz)

## EUT Operating Environment

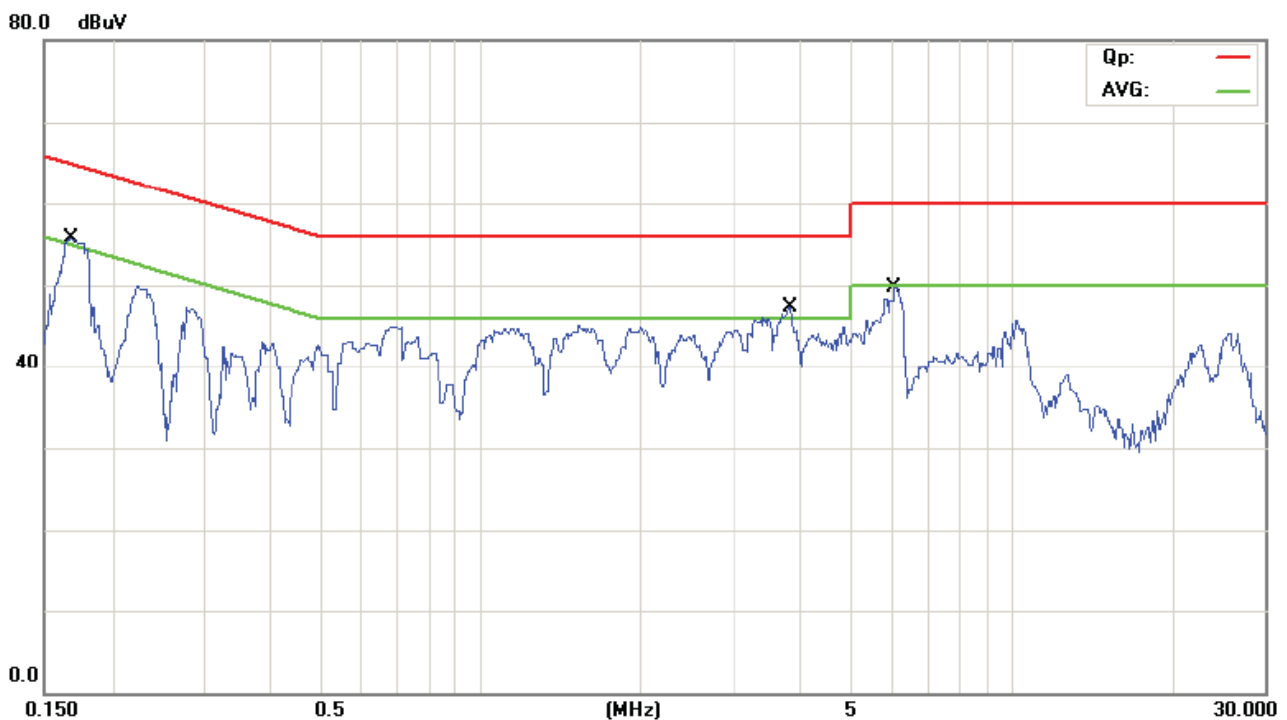
Temperature: 25°C Humidity: 75%RH Atmospheric Pressure: 101 KPa

EUT set Condition: Keep BT Transmitting

Equipment Level: Class B

Results: Pass

Please refer to following diagram for individual



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1685	43.40	11.02	54.42	65.03	-10.61	QP
2		0.1685	29.50	11.02	40.52	55.03	-14.51	AVG
3		3.8050	30.70	13.02	43.72	56.00	-12.28	QP
4	*	3.8050	23.50	13.02	36.52	46.00	-9.48	AVG
5		6.0502	32.60	13.06	45.66	60.00	-14.34	QP
6		6.0502	24.40	13.06	37.46	50.00	-12.54	AVG

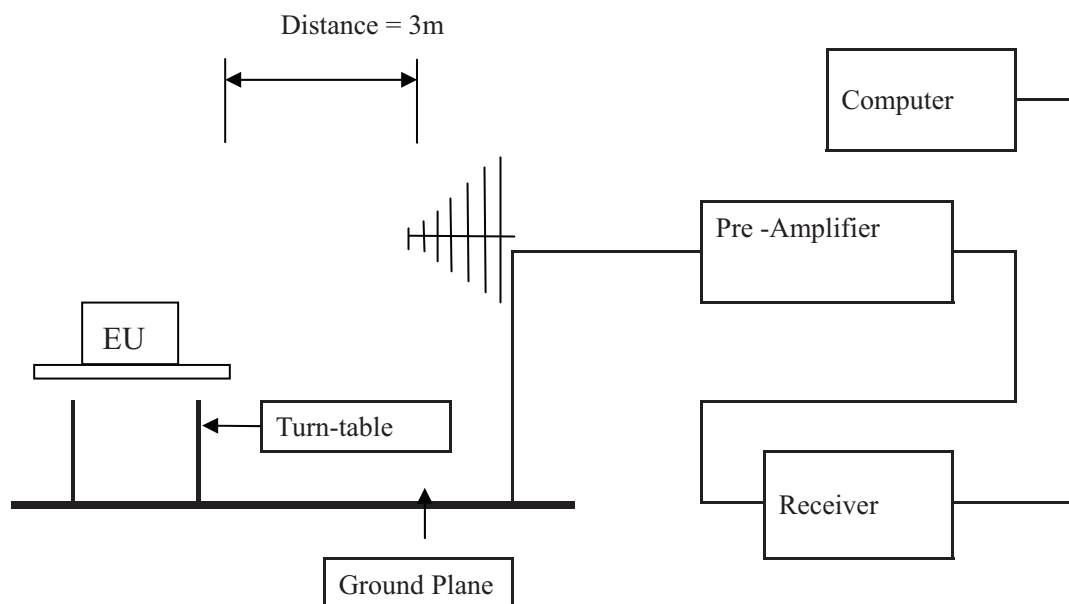
Note: Test on additional battery and worse case was recorded.

## 6 Radiated Emission Test

### 6.1 Test Method and test Procedure:

- (1) The EUT was tested according to ANSI C63.4 –2003. The radiated test was performed at Timeway Laboratory. This site is on file with the FCC laboratory division, Registration No.899988
- (2) The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.4-2003.
- (3) The frequency spectrum from 30 MHz to 25 GHz was investigated. All readings from 30 MHz to 1 GHz are Quasi-peak values with a resolution bandwidth of 120 kHz. For measurement above 1GHz, peak values with RBW=VBW=1MHz and PK detector. AV value with RBW=1MHz, VBW=10Hz and PK detector. Measurements were made at 3 meters.
- (4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
- (5) Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations. All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB of specification limit), and are distinguished with a "QP" in the data table.
- (6) The antenna polarization : Vertical polarization and Horizontal polarization.

#### Block diagram of Test setup



### 6.2 Configuration of The EUT

Same as section 5.3 of this report

### 6.3 EUT Operating Condition



Same as section 5.4 of this report.

#### 6.4 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

**Frequencies in restricted band are complied to limit on Paragraph 15.209 and 15.109**

Frequency Range (MHz)	Distance (m)	Field strength (dB $\mu$ V/m)
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

- Note:
1. RF Voltage (dBuV) = 20 log RF Voltage ( $\mu$ V)
  2. In the Above Table, the higher limit applies at the band edges.
  3. Distance refers to the distance in meters between the measuring instrument antenna and the EUT
  4. This is a handheld device. The radiated emissions should be tested under 3-axes position (Lying, Side, and Stand), After pre-test. It was found that the worse radiated emission was get at the lying position.
  5. GFSK Modulation was the worst case

## Test result

### General Radiated Emission Data and Harmonics Radiated Emission Data

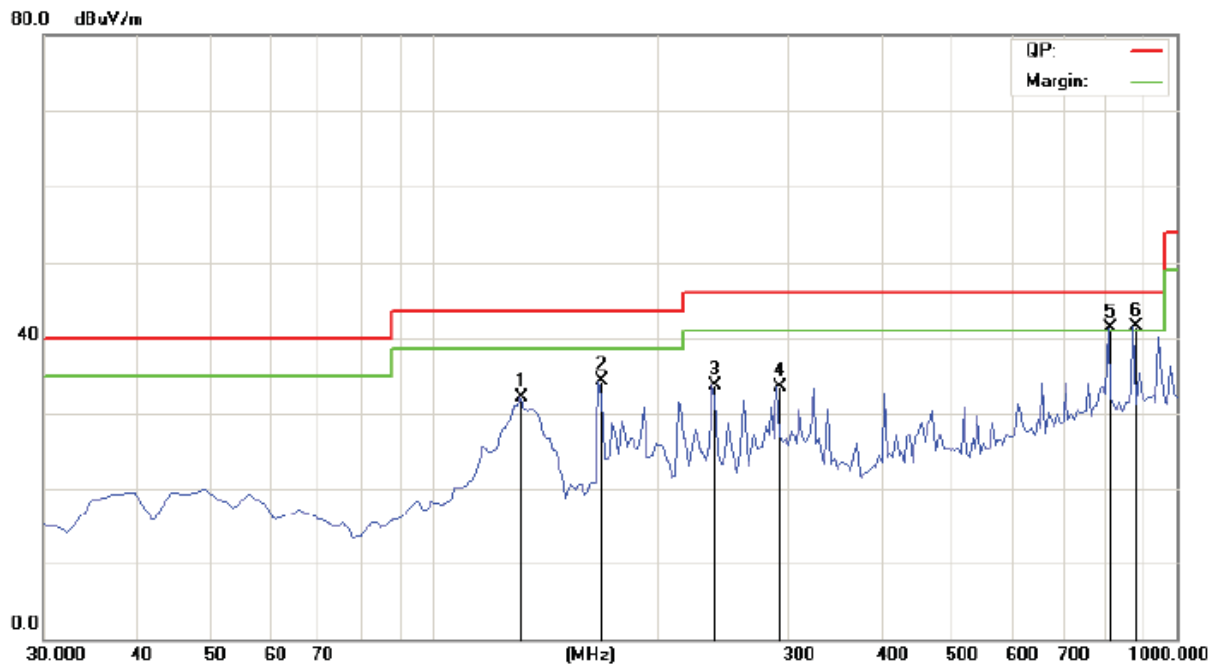
#### Radiated Emission In Horizontal (30MHz---1000MHz)

EUT set Condition: Keep BT Transmitting

Results: Pass

Test Figure:

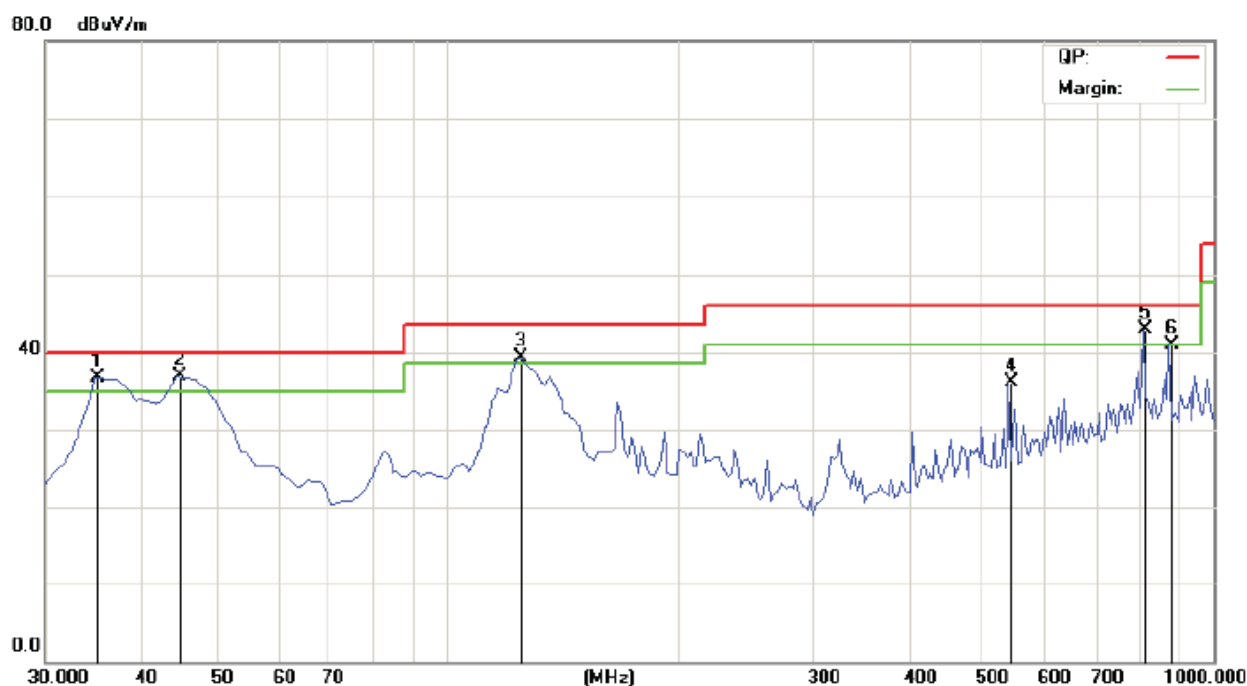
V



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1		131.8500	47.01	-14.92	32.09	43.50	-11.41	peak	0	
2		168.2250	48.38	-14.03	34.35	43.50	-9.15	peak	0	
3		238.5500	43.53	-9.87	33.66	46.00	-12.34	peak	0	
4		291.9000	41.98	-8.39	33.59	46.00	-12.41	peak	0	
5	!	813.2750	38.54	2.73	41.27	46.00	-4.73	peak	0	
6	*	883.6000	37.43	4.01	41.44	46.00	-4.56	peak	0	

Test Figure:

H



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1	!	34.8500	49.73	-13.05	36.68	40.00	-3.32	peak	0	
2	!	44.5500	48.39	-11.56	36.83	40.00	-3.17	peak	0	
3	!	124.5750	53.57	-14.19	39.38	43.50	-4.12	peak	0	
4		544.1000	38.40	-2.26	36.14	46.00	-9.86	peak	0	
5	*	813.2750	40.23	2.73	42.96	46.00	-3.04	peak	0	
6		883.6000	36.97	4.01	40.98	46.00	-5.02	peak	0	



## Test result

### General Radiated Emission Data and Harmonics Radiated Emission Data

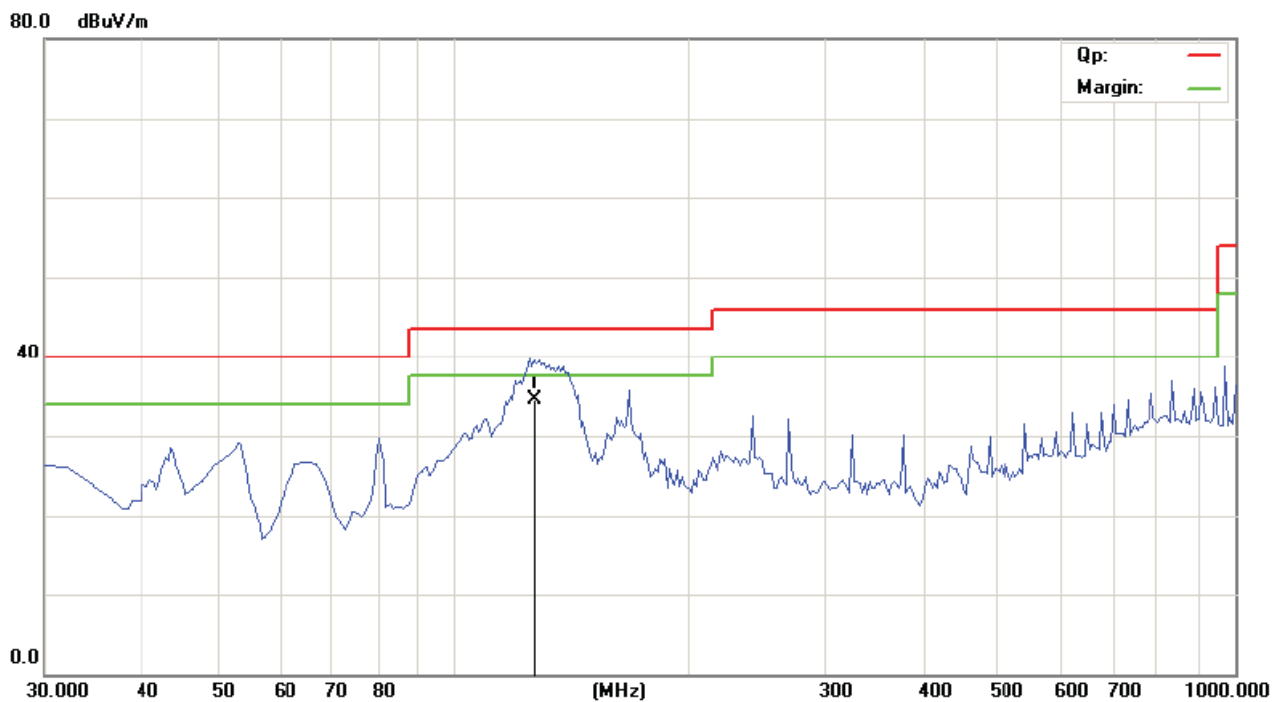
#### Radiated Emission In Horizontal (30MHz---1000MHz)

EUT set Condition: Keep BT Transmitting

Results: Pass

Test Figure:

H



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB
1	*	127.0000	48.89	-14.47	34.42	43.50	-9.08

Note: Test on additional battery and worse case was recorded.

Test Figure:

V



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB
1		238.5620	44.02	-9.87	34.15	46.00	-11.85
2	*	131.2235	50.95	-14.87	36.08	43.50	-7.42

**Note:** Test on additional battery and worse case was recorded.

**Operation Mode: Transmitting under Low Channel (2402MHz)**

Frequency (MHz)	Level@3m (dB $\mu$ V/m)	Antenna Polarity	Limit@3m (dB $\mu$ V/m)
2402	88.61 ( PK )	H	Fundamental Frequency
2402	89.21 ( PK )	V	
4804	47.39 ( PK )	H	74(Peak)/ 54(AV)
4804	46.79 ( PK )	V	74(Peak)/ 54(AV)
7206	--	H/V	74(Peak)/ 54(AV)
9608	--	H/V	74(Peak)/ 54(AV)
12010	--	H/V	74(Peak)/ 54(AV)
14412	--	H/V	74(Peak)/ 54(AV)
16814	--	H/V	74(Peak)/ 54(AV)
19216	--	H/V	74(Peak)/ 54(AV)
21618	--	H/V	74(Peak)/ 54(AV)
24020	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

**Operation Mode: Transmitting g under Middle Channel (2441MHz)**

Frequency (MHz)	Level@3m (dB $\mu$ V/m)	Antenna Polarity	Limit@3m (dB $\mu$ V/m)
2441	89.33 ( PK )	H	Fundamental Frequency
2441	89.29 ( PK )	V	
4882	47.08 ( PK )	H	74(Peak)/ 54(AV)
4882	49.17 ( PK )	V	74(Peak)/ 54(AV)
7323	--	H/V	74(Peak)/ 54(AV)
9764	--	H/V	74(Peak)/ 54(AV)
12205	--	H/V	74(Peak)/ 54(AV)
14646	--	H/V	74(Peak)/ 54(AV)
17087	--	H/V	74(Peak)/ 54(AV)
19528	--	H/V	74(Peak)/ 54(AV)
21969	--	H/V	74(Peak)/ 54(AV)
24410	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

**Operation Mode: Transmitting under High Channel (2480MHz)**

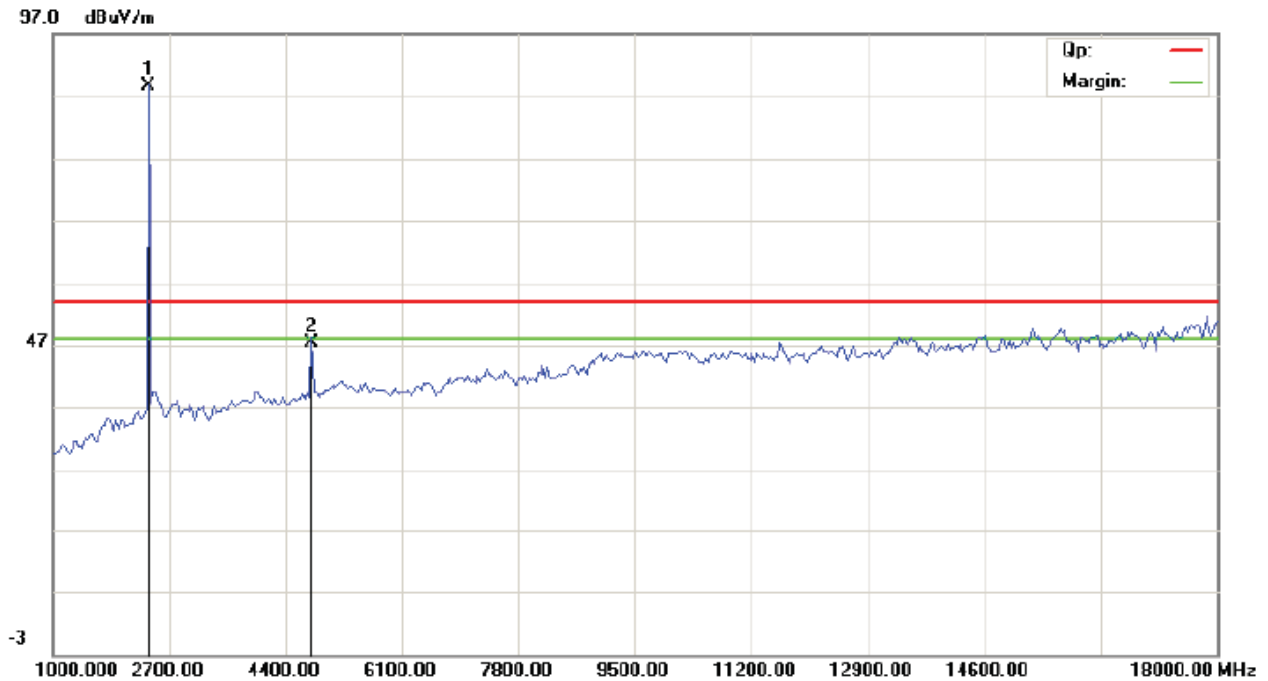
Frequency (MHz)	Level@3m (dB $\mu$ V/m)	Antenna Polarity	Limit@3m (dB $\mu$ V/m)
2480	88.70 ( PK )	H	Fundamental Frequency
2480	89.16 ( PK )	V	
4960.	46.32 ( PK )	H	74(Peak)/ 54(AV)
4960.	46.27 ( PK )	V	74(Peak)/ 54(AV)
7440	--	H/V	74(Peak)/ 54(AV)
9920	--	H/V	74(Peak)/ 54(AV)
12400	--	H/V	74(Peak)/ 54(AV)
14880	--	H/V	74(Peak)/ 54(AV)
17360	--	H/V	74(Peak)/ 54(AV)
19840	--	H/V	74(Peak)/ 54(AV)
22320	--	H/V	74(Peak)/ 54(AV)
24800	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

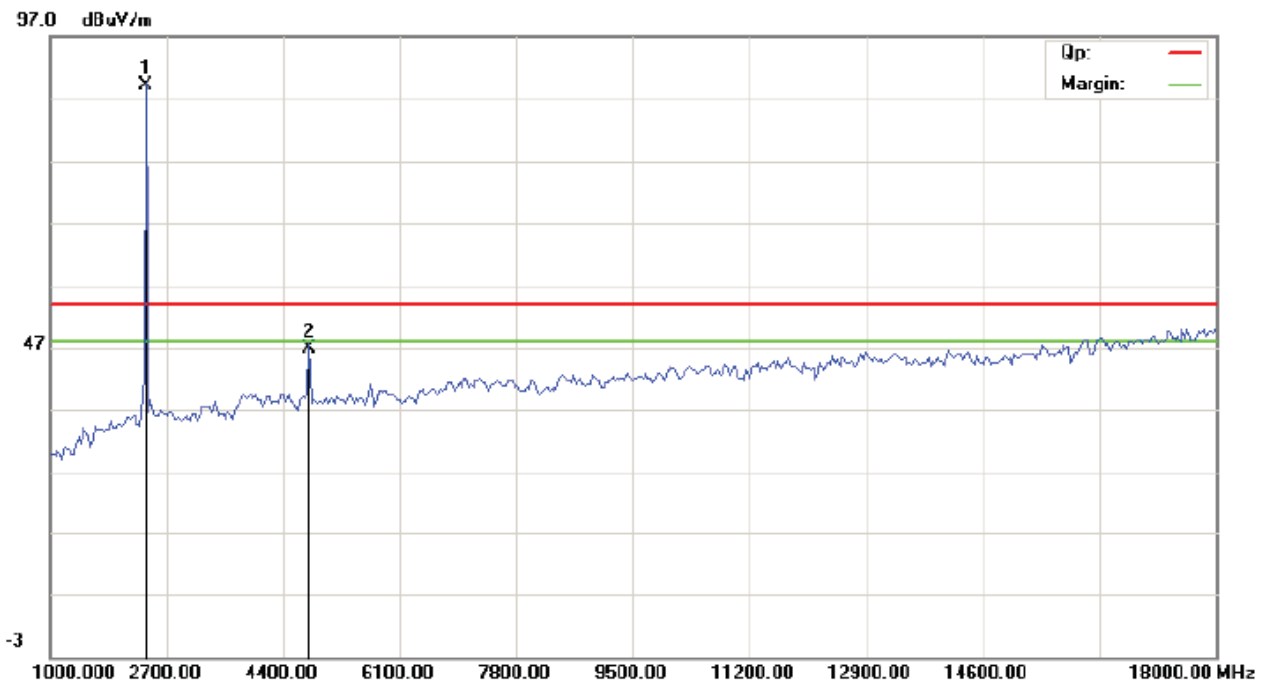
2. Remark “---” means that the emissions level is too low to be measured

Please refer to the following test plots for details:

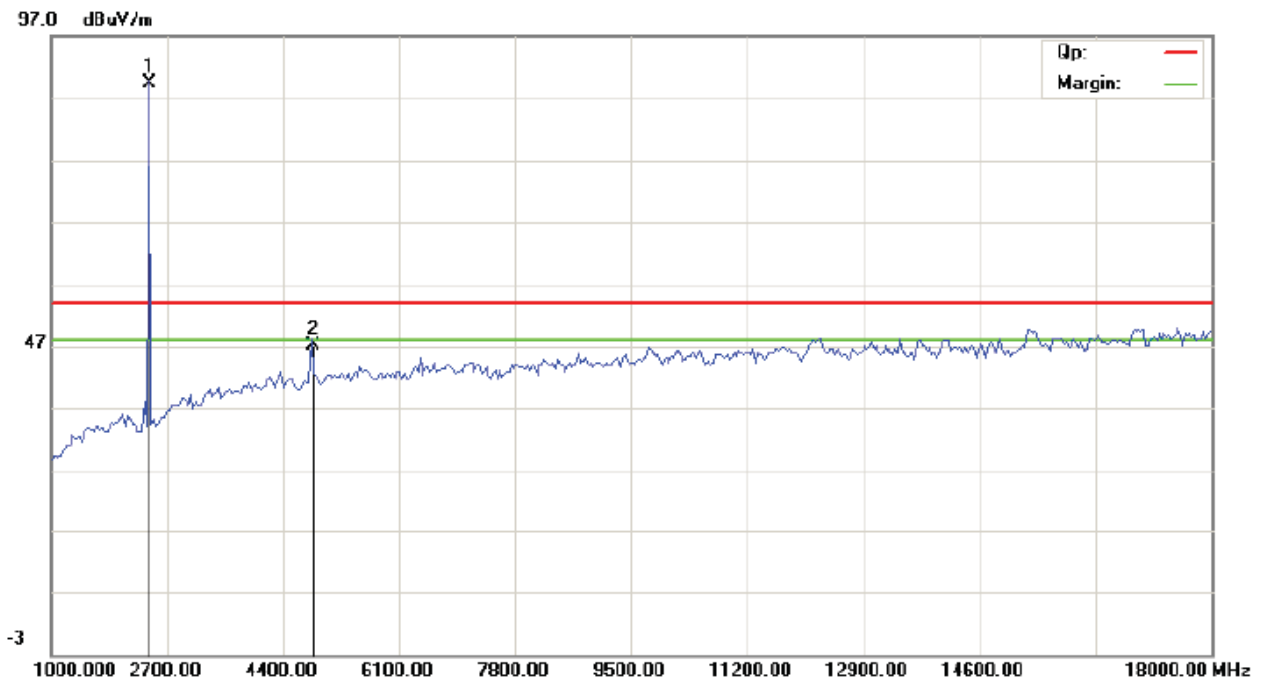
### Low Channel: Horizontal



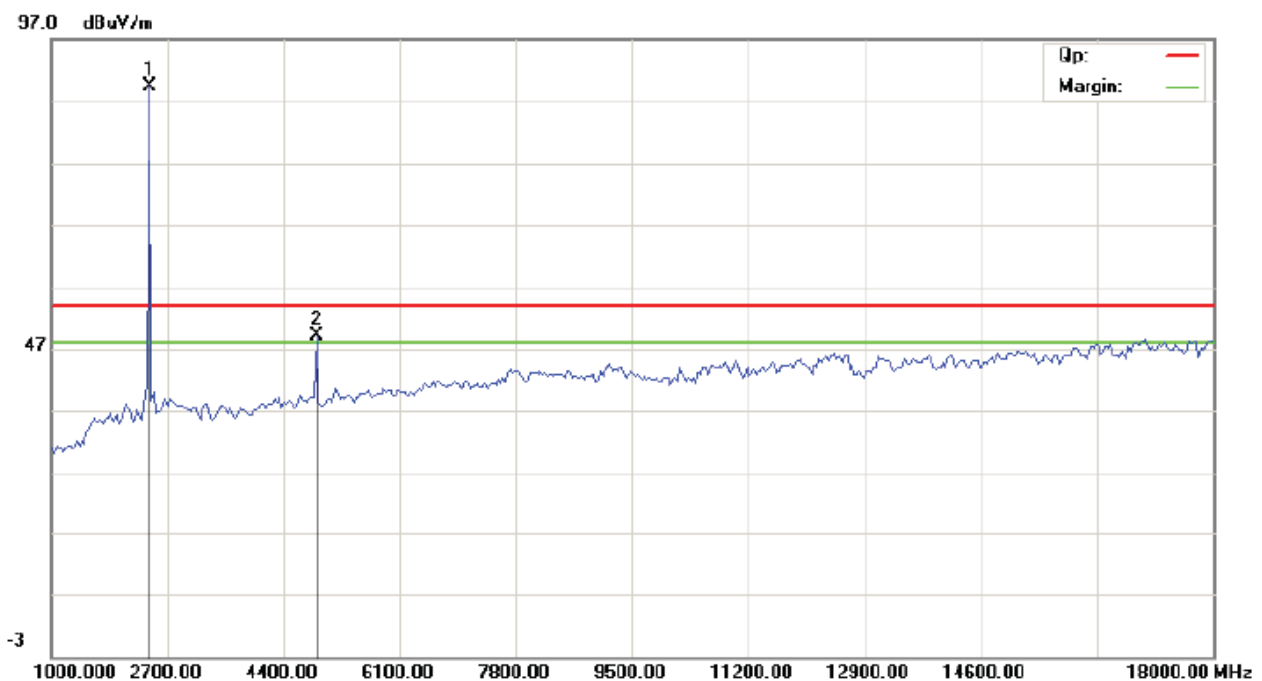
### Low Channel : Vertical



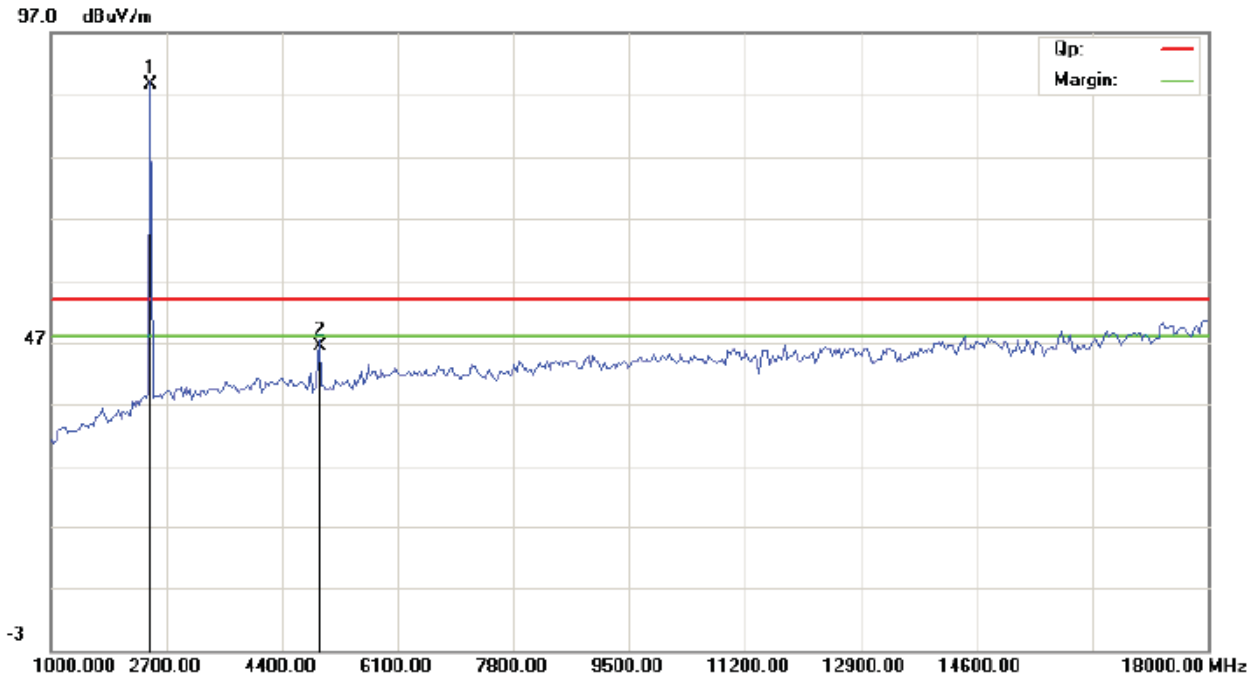
### Middle Channel : Horizontal



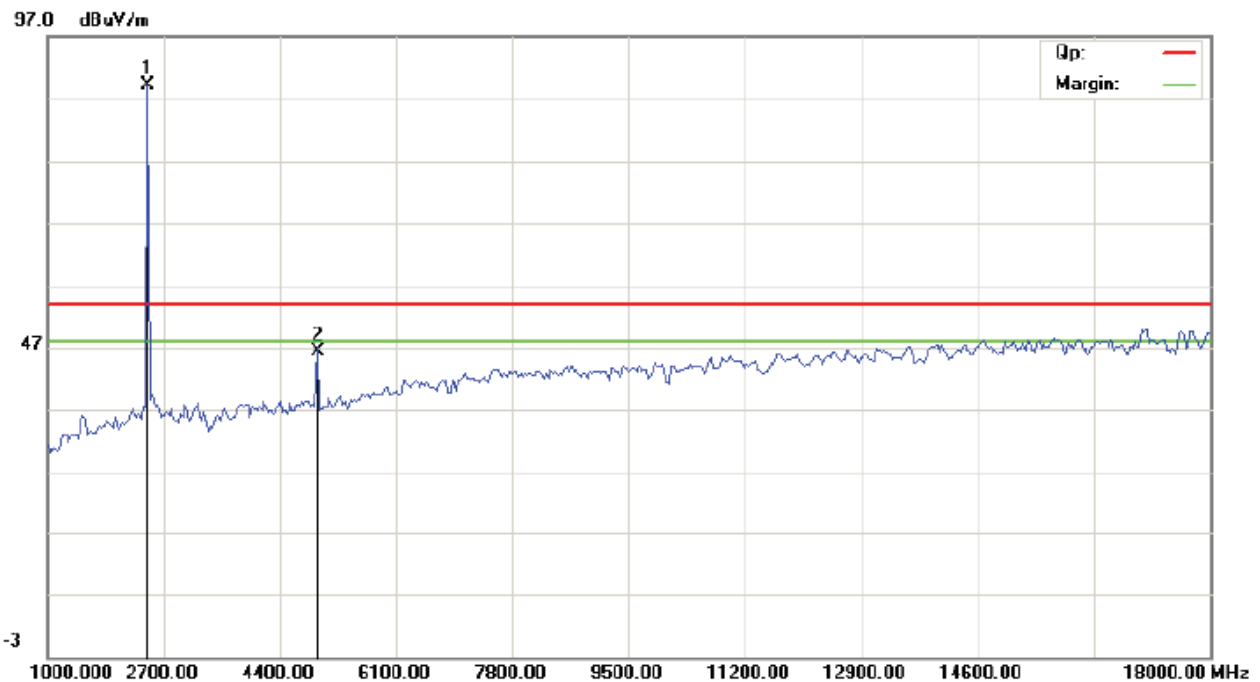
### Middle Channel :: Vertical



### High Channel : Horizontal



### High Channel : Vertical



Note: for the radiated emissions above 18G, it is the floor noise.



## 7.0 20dB Bandwidth Measurement

### 7.1 Regulation

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

### 7.2 Limits of 20dB Bandwidth Measurement

N/A

### 7.3 Test Procedure.

1. Check the calibration of the measuring instrument (spectrum analyzer) using either an internal calibrator or a known signal from an external generator.
2. Set the spectrum analyzer as follows: Span =5MHz, VBW =30 kHz, RBW=100 kHz, Sweep = auto  
Detector function = peak, Trace = max hold
3. Measure the highest amplitude appearing on spectral display and record the level to calculate results.
6. Repeat above procedures until all frequencies measured were complete.

### 7.4 Test Result

#### Type of Modulation: GFSK

EUT	MID		Model	MID727BT-RK326
Mode	Keep Transmitting		Input Voltage	AC120V
Temperature	24 deg. C,		Humidity	56% RH
Channel	Channel Frequency (MHz)	20 dB Bandwidth (kHz)	Maximum Limit (kHz)	Pass/ Fail
Low	2402	858	--	Pass
Middle	2441	840	--	Pass
High	2480	864	--	Pass



Test Figure:

## 1. Condition: Low Channel


**MARKER 1**

2.402018 GHz

Ref 10 dBm

\* Att 20 dB

\* RBW 30 kHz

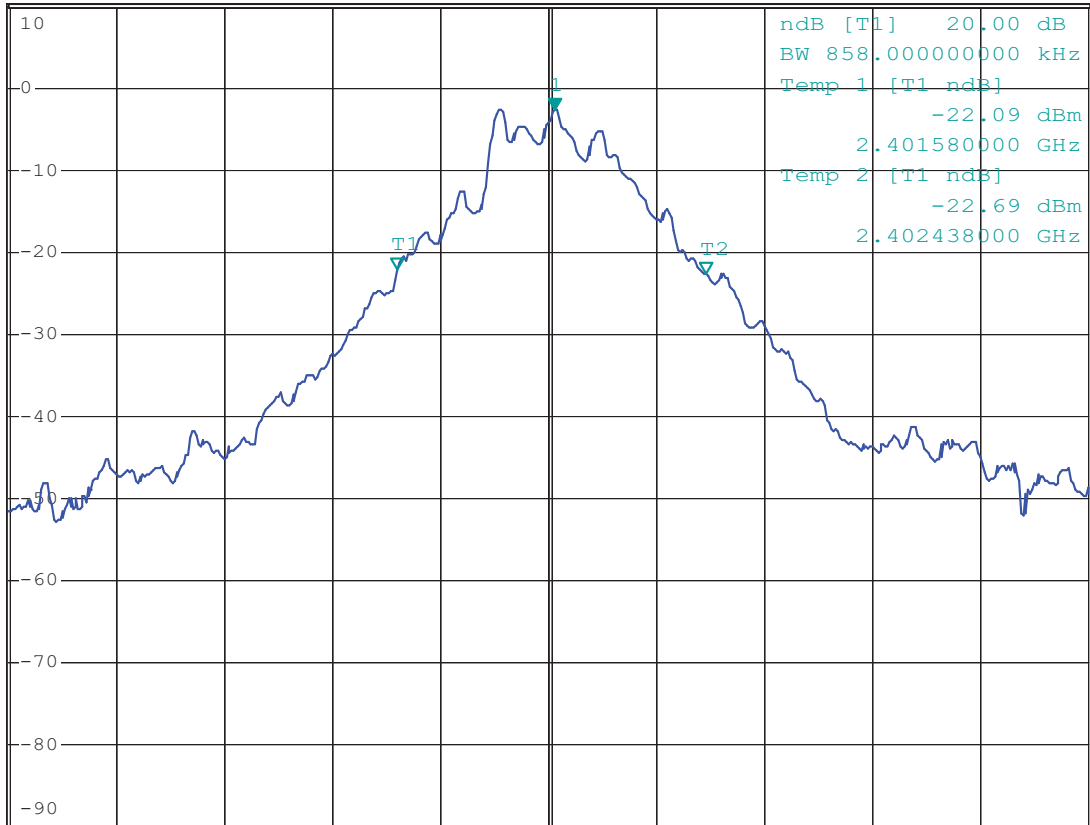
\* VBW 100 kHz

\* SWT 5 ms

Marker 1 [T1 ]

-2.66 dBm

2.402018000 GHz

1 PK  
MAXH


Center 2.402 GHz

300 kHz/

Span 3 MHz

## 2. Condition: Middle Channel



MARKER 1

2.441018 GHz

Ref 10 dBm

\* Att 20 dB

\* RBW 30 kHz

\* VBW 100 kHz

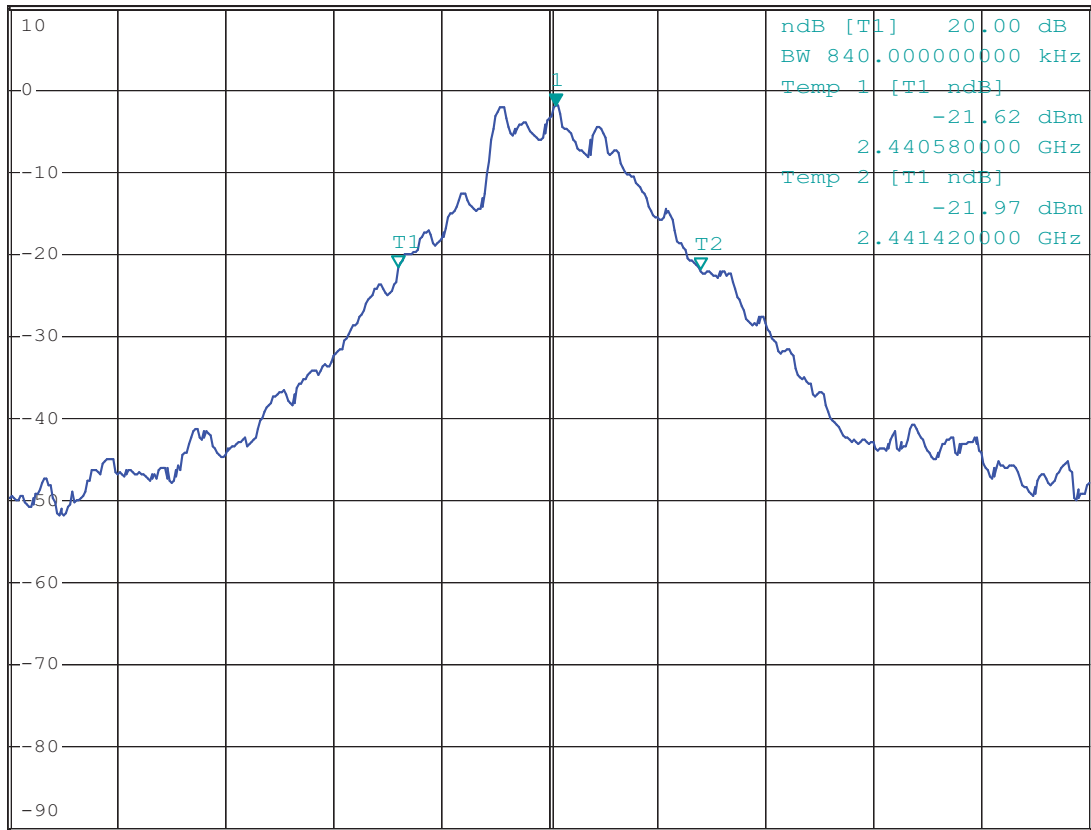
\* SWT 5 ms

Marker 1 [T1]

-2.02 dBm

2.441018000 GHz

1 PK  
MAXH



Center 2.441 GHz

300 kHz/

Span 3 MHz

### 3. High Channel


**MARKER 1**

2.480018 GHz

Ref 10 dBm

\* Att 20 dB

\* RBW 30 kHz

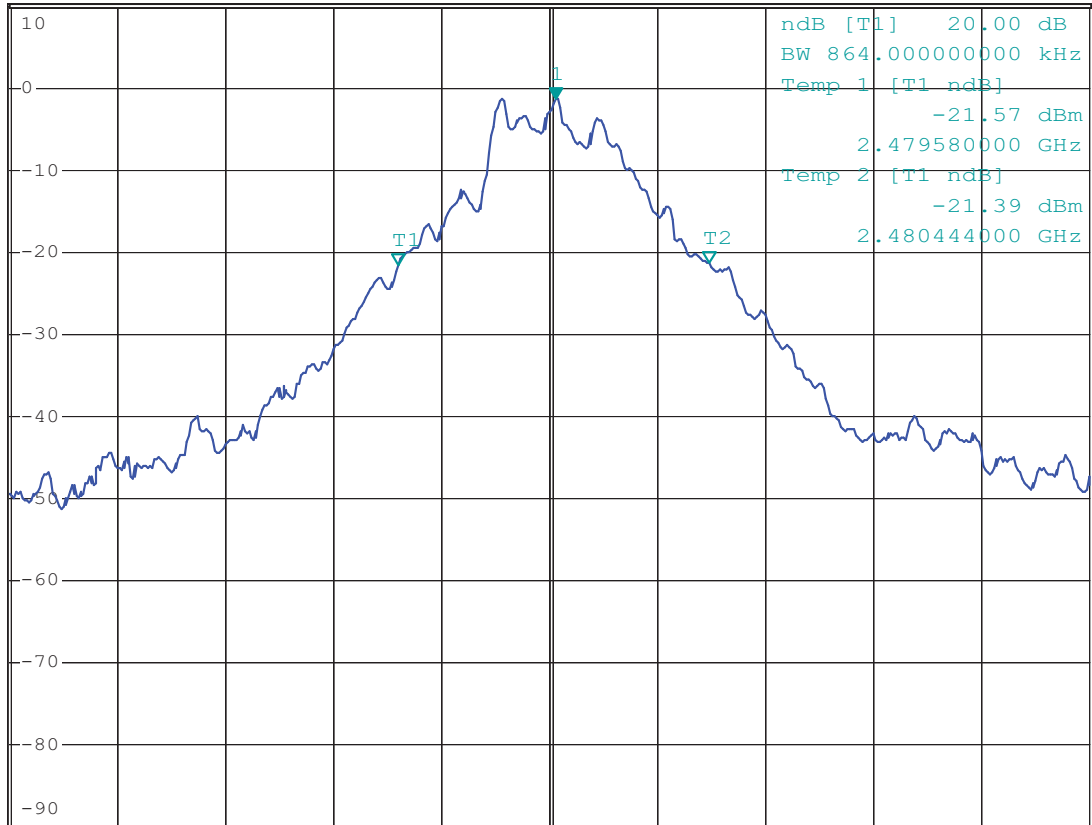
\* VBW 100 kHz

\* SWT 5 ms

Marker 1 [T1 ]

-1.47 dBm

2.480018000 GHz

1 PK  
MAXH


Center 2.48 GHz

300 kHz/

Span 3 MHz

**Test Result****Type of Modulation:  $\pi/4$ DQPSK**

EUT	MID		Model	MID727BT-RK326
Mode	Keep Transmitting		Input Voltage	AC120V
Temperature	24 deg. C,		Humidity	56% RH
Channel	Channel Frequency (MHz)	20 dB Bandwidth (kHz)	Maximum Limit (kHz)	Pass/ Fail
Low	2402	1224	--	Pass
Middle	2441	1218	--	Pass
High	2480	1218	--	Pass

Test Figure:

### 1. Condition: Low Channel


**MARKER 1**

2.402018 GHz

Ref 10 dBm

\* Att 20 dB

\* RBW 30 kHz

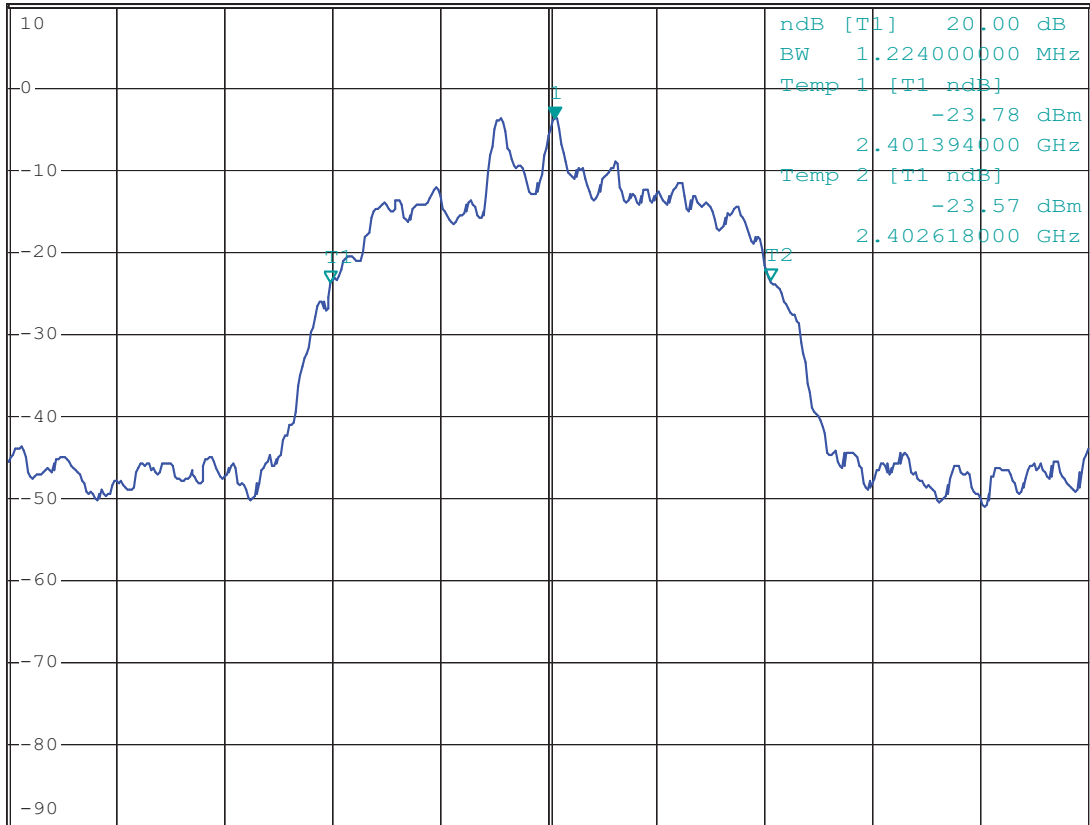
\* VBW 100 kHz

\* SWT 5 ms

Marker 1 [T1 ]

-3.73 dBm

2.402018000 GHz

1 PK  
MAXH


Center 2.402 GHz

300 kHz/

Span 3 MHz



## 2. Condition: Middle Channel

**MARKER 1**

2.441018 GHz

Ref 10 dBm

\* Att 20 dB

\* RBW 30 kHz

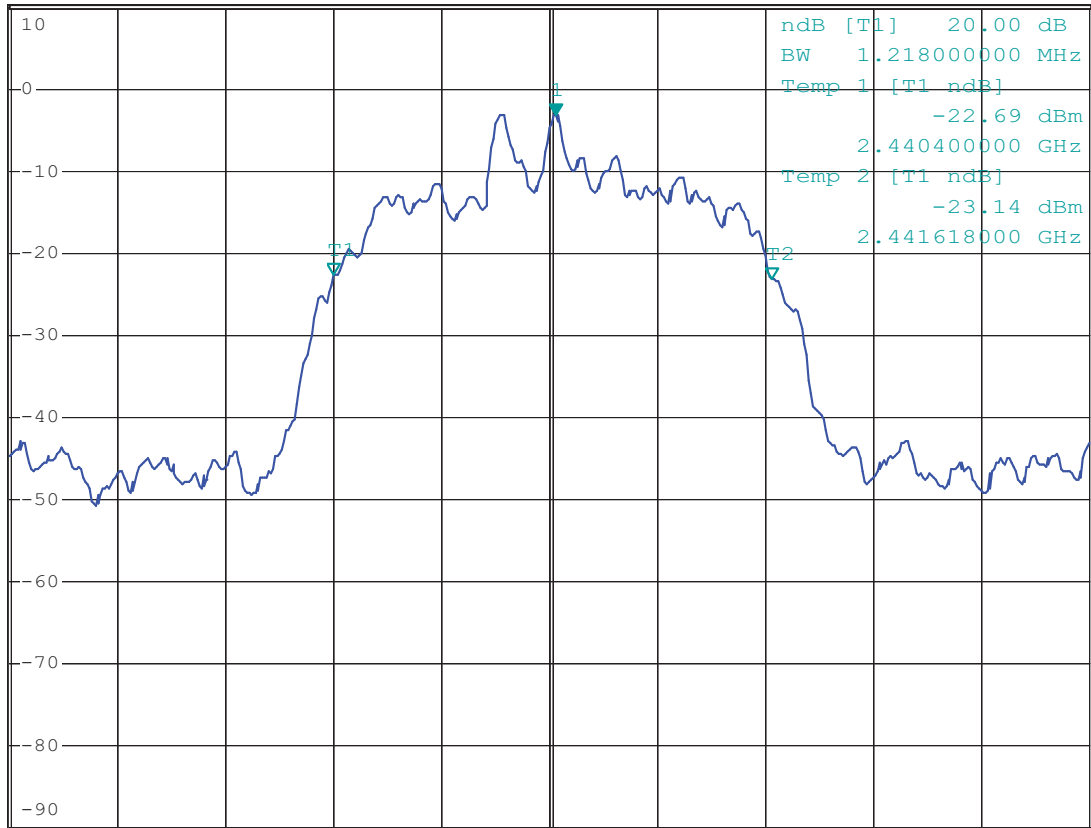
\* VBW 100 kHz

\* SWT 5 ms

Marker 1 [T1]

-3.16 dBm

2.441018000 GHz

1 PK  
MAXH

Center 2.441 GHz

300 kHz/

Span 3 MHz



### 3. High Channel

**MARKER 1**

2.480024 GHz

Ref 10 dBm

\* Att 20 dB

\* RBW 30 kHz

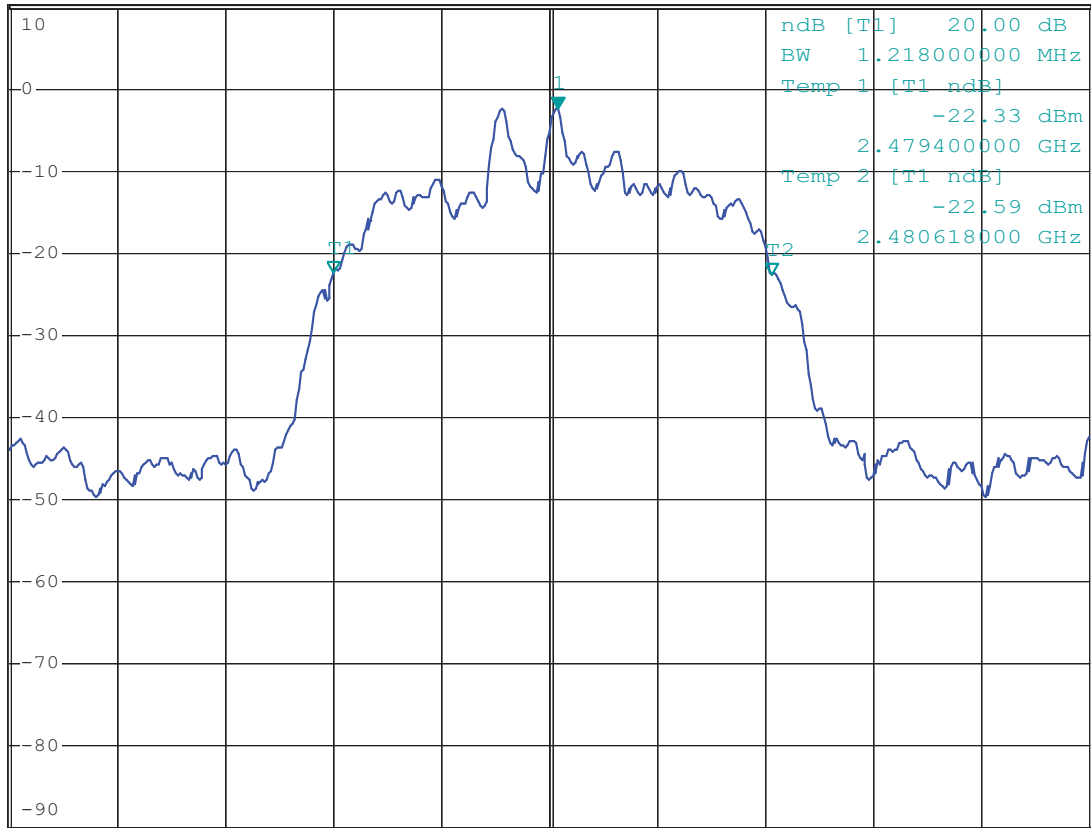
\* VBW 100 kHz

\* SWT 5 ms

Marker 1 [T1]

-2.47 dBm

2.480024000 GHz

1 PK  
MAXH

Center 2.48 GHz

300 kHz/

Span 3 MHz

**Test Result****Type of Modulation: 8DPSK**

EUT	MID		Model	MID727BT-RK326
Mode	Keep Transmitting		Input Voltage	AC120V
Temperature	24 deg. C,		Humidity	56% RH
Channel	Channel Frequency (MHz)	20 dB Bandwidth (kHz)	Maximum Limit (kHz)	Pass/ Fail
Low	2402	1218	--	Pass
Middle	2441	1218	--	Pass
High	2480	1212	--	Pass



Test Figure:

### 1. Condition: Low Channel


**MARKER 1**

2.402018 GHz

Ref 10 dBm

\* Att 20 dB

\* RBW 30 kHz

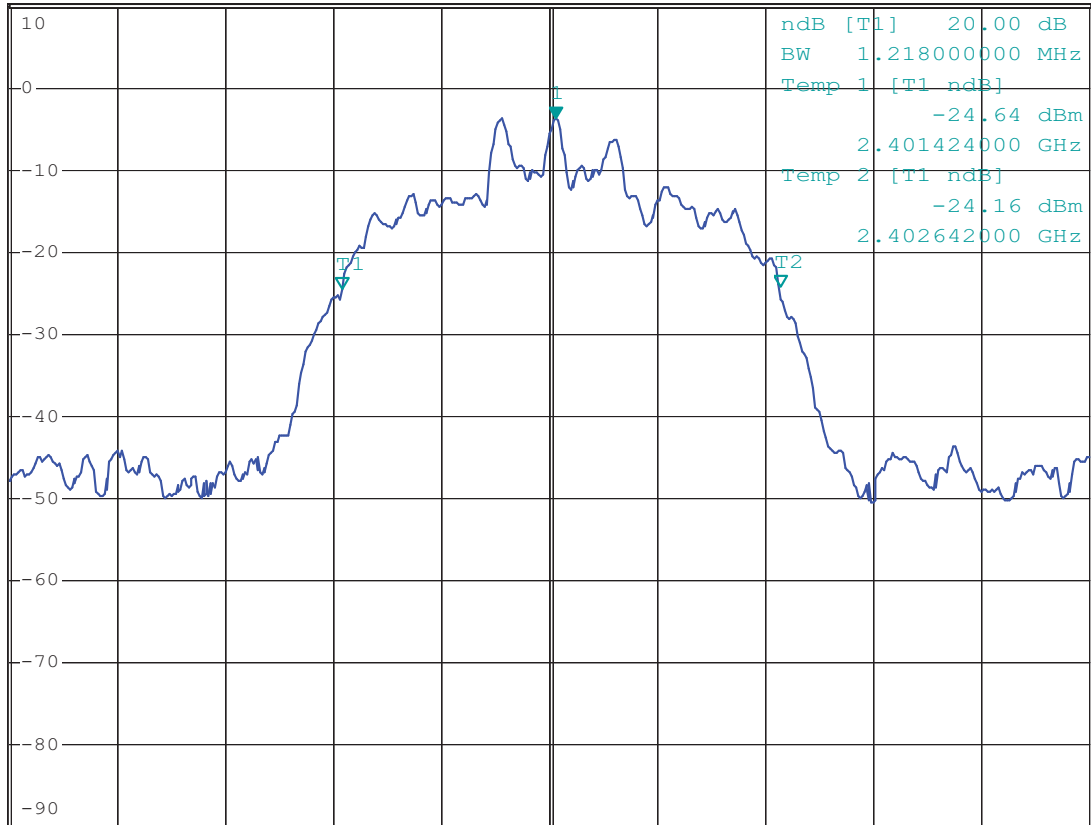
\* VBW 100 kHz

\* SWT 5 ms

Marker 1 [T1 ]

-3.78 dBm

2.402018000 GHz

1 PK  
MAXH


Center 2.402 GHz

300 kHz/

Span 3 MHz

## 2. Condition: Middle Channel



MARKER 1

2.441018 GHz

Ref 10 dBm

\* Att 20 dB

\* RBW 30 kHz

\* VBW 100 kHz

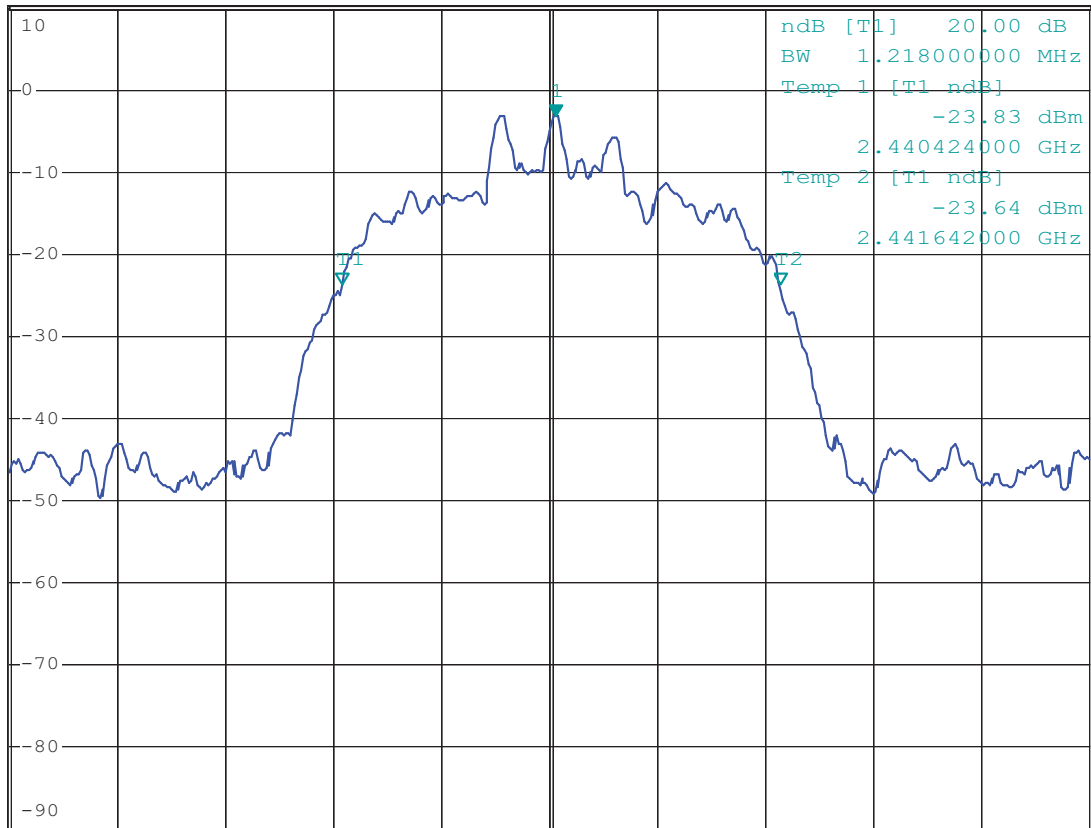
\* SWT 5 ms

Marker 1 [T1]

-3.17 dBm

2.441018000 GHz

1 PK  
MAXH



Center 2.441 GHz

300 kHz/

Span 3 MHz

### 3. High Channel


**MARKER 1**

2.480018 GHz

Ref 10 dBm

\* Att 20 dB

\* RBW 30 kHz

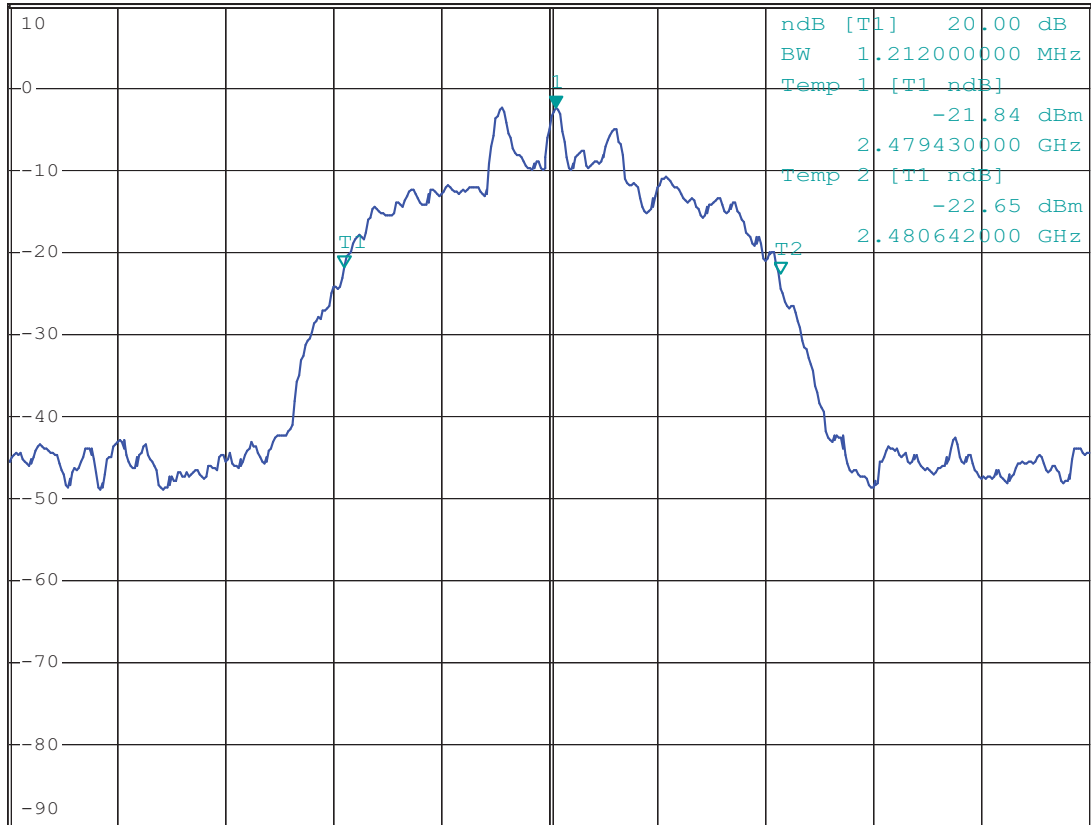
\* VBW 100 kHz

\* SWT 5 ms

Marker 1 [T1 ]

-2.46 dBm

2.480018000 GHz

1 PK  
MAXH


Center 2.48 GHz

300 kHz/

Span 3 MHz



## **8. Maximum Peak Output Power**

### **8.1 Regulation**

According to §15.247(b)(1), for frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5MHz band: 0.125 watts. According to §15.247(b)(4), the conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### **8.2 Limits of Maximum Peak Output Power**

The Maximum Peak Output Power Measurement is 30dBm.

### **8.3 Test Procedure**

1. Check the calibration of the measuring instrument (spectrum analyzer) using either an internal calibrator or a known signal from an external generator.
2. Set the spectrum analyzer as follows: Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel ; RBW > the 20 dB bandwidth of the emission being measured ; VBW = RBW=3MHz ; Sweep = auto ; Detector function = peak ; Trace = max hold
3. Measure the highest amplitude appearing on spectral display and record the level to calculate results.
4. Repeat above procedures until all frequencies measured were complete.

**8.4 Test Results****Type of Modulation: GFSK**

EUT	MID		Model	MID727BT-RK326
Mode	Keep Transmitting		Input Voltage	AC120V
Temperature	24 deg. C,		Humidity	56% RH
Channel	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Pass/ Fail
Low	2402	-0.77	30	Pass
Middle	2441	-0.10	30	Pass
High	2480	0.45	30	Pass

Note: 1. the result basic equation calculation as follow:

$$\text{Peak Power Output} = \text{Peak Power Reading} + \text{Cable loss} + \text{Attenuator}$$

2. The worse case was recorded

**Type of Modulation: 11/4DQPSK**

EUT	MID		Model	MID727BT-RK326
Mode	Keep Transmitting		Input Voltage	AC120V
Temperature	24 deg. C,		Humidity	56% RH
Channel	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Pass/ Fail
Low	2402	-1.84	30	Pass
Middle	2441	-1.14	30	Pass
High	2480	-0.56	30	Pass

Note: 1. the result basic equation calculation as follow:

$$\text{Peak Power Output} = \text{Peak Power Reading} + \text{Cable loss} + \text{Attenuator}$$

2. The worse case was recorded

**Type of Modulation: 8DPSK**

EUT	MID		Model	MID727BT-RK326
Mode	Keep Transmitting		Input Voltage	AC120V
Temperature	24 deg. C,		Humidity	56% RH
Channel	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Pass/ Fail
Low	2402	-1.60	30	Pass
Middle	2441	-0.96	30	Pass
High	2480	-0.41	30	Pass

Note: 1. the result basic equation calculation as follow:

$$\text{Peak Power Output} = \text{Peak Power Reading} + \text{Cable loss} + \text{Attenuator}$$

2. The worse case was recorded



## **9. Carrier Frequency Separation**

### **9.1 Regulation**

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

### **9.2 Limits of Carrier Frequency Separation**

The Maximum Power Spectral Density Measurement is 25kHz or two-thirds of the 20dB bandwidth of the hopping Channel which is great.

### **9.3 Test Procedure**

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Set the spectrum analyzer as follows: Span = wide enough to capture the peaks of two adjacent channels: Resolution (or IF) Bandwidth (RBW)  $\geq$  1% of the span; Video (or Average) Bandwidth (VBW)  $\geq$  RBW; Sweep = auto; Detector function = peak; Trace = max hold
3. Measure the separation between the peaks of the adjacent channels using the marker-delta function.
4. Repeat above procedures until all frequencies measured were complete.



## 9.4 Test Result

### Type of Modulation: GFSK

EUT	MID	Model	MID727BT-RK326
Mode	Hopping On	Input Voltage	AC120V
Temperature	24 deg. C,	Humidity	56% RH
Carrier Frequency Separation		Limit	Pass/ Fail
1.000MHz		≥ 25 kHz or 2/3 of 20 dB bandwidth	Pass

## Test Plots



### DELTA MARKER 3

-1 MHz

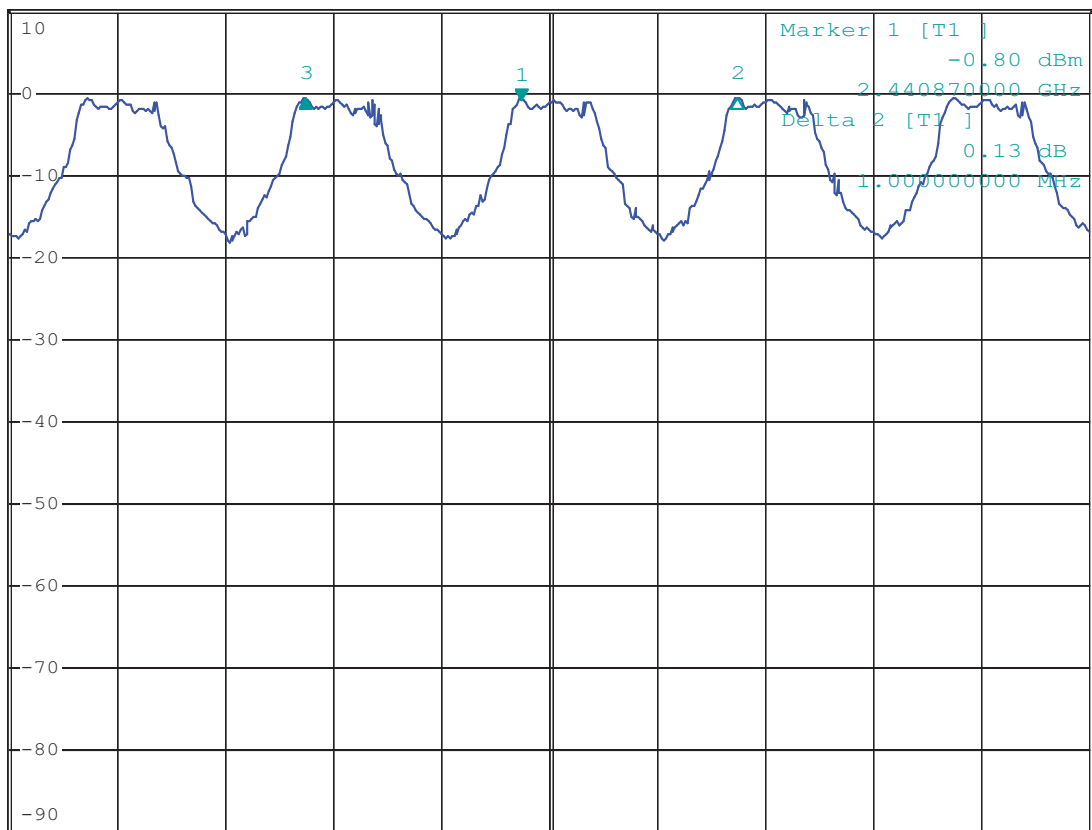
Ref 10 dBm

\* Att 20 dB

\* RBW 100 kHz Delta 3 [T1 ]

\* VBW 300 kHz 0.07 dB

\* SWT 10 ms -1.000000000 MHz

1 PK  
MAXH

Center 2.441 GHz

500 kHz/

Span 5 MHz



**Type of Modulation:  $\pi/4$ DQPSK**

EUT	MID	Model	MID727BT-RK326
Mode	Hopping On	Input Voltage	AC120V
Temperature	24 deg. C,	Humidity	56% RH
Carrier Frequency Separation		Limit	Pass/ Fail
1.000MHz		$\geq 25$ kHz or 2/3 of 20 dB bandwidth	Pass

**Test Plots****DELTA MARKER 3**

-1 MHz

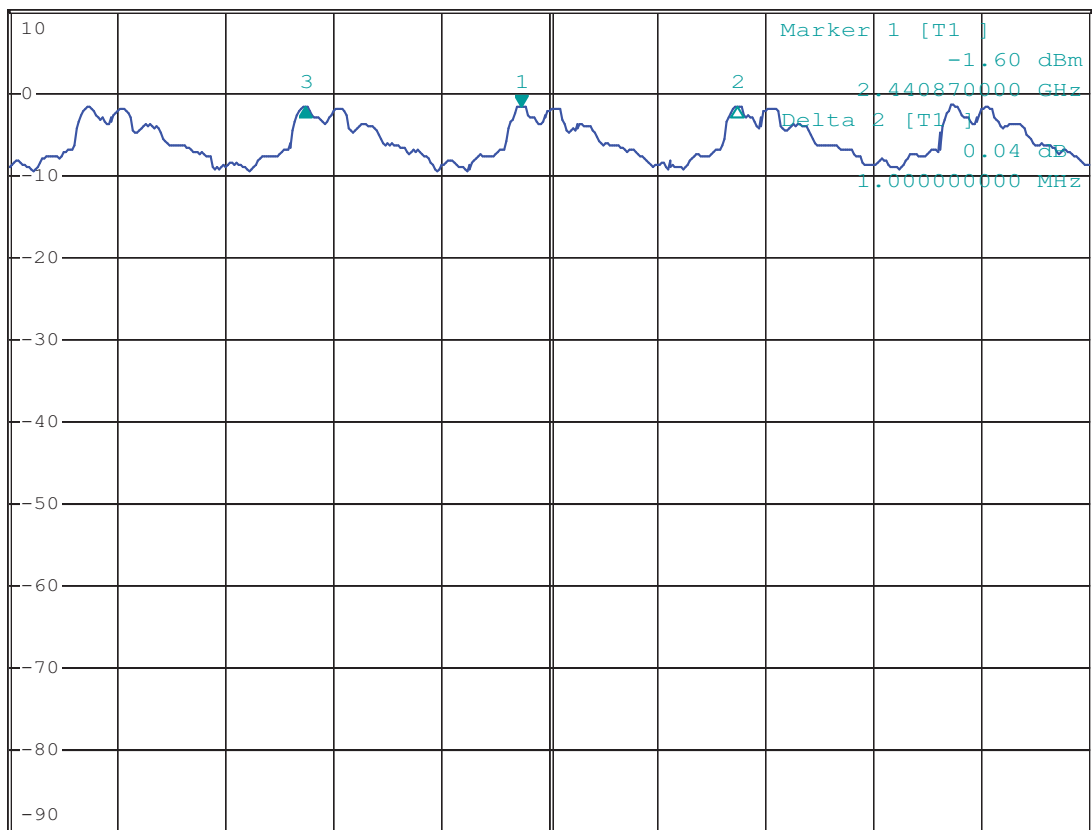
Ref 10 dBm

\* Att 20 dB

\* RBW 100 kHz Delta 3 [T1 ]

\* VBW 300 kHz -0.09 dB

\* SWT 10 ms -1.000000000 MHz

1 PK  
MAXH

Center 2.441 GHz

500 kHz/

Span 5 MHz

**Type of Modulation: 8DPSK**

EUT	MID	Model	MID727BT-RK326
Mode	Hopping On	Input Voltage	AC120V
Temperature	24 deg. C,	Humidity	56% RH
Carrier Frequency Separation		Limit	Pass/ Fail
1.000MHz		≥ 25 kHz or 2/3 of 20 dB bandwidth	Pass

**Test Plots****DELTA MARKER 3**

-1 MHz

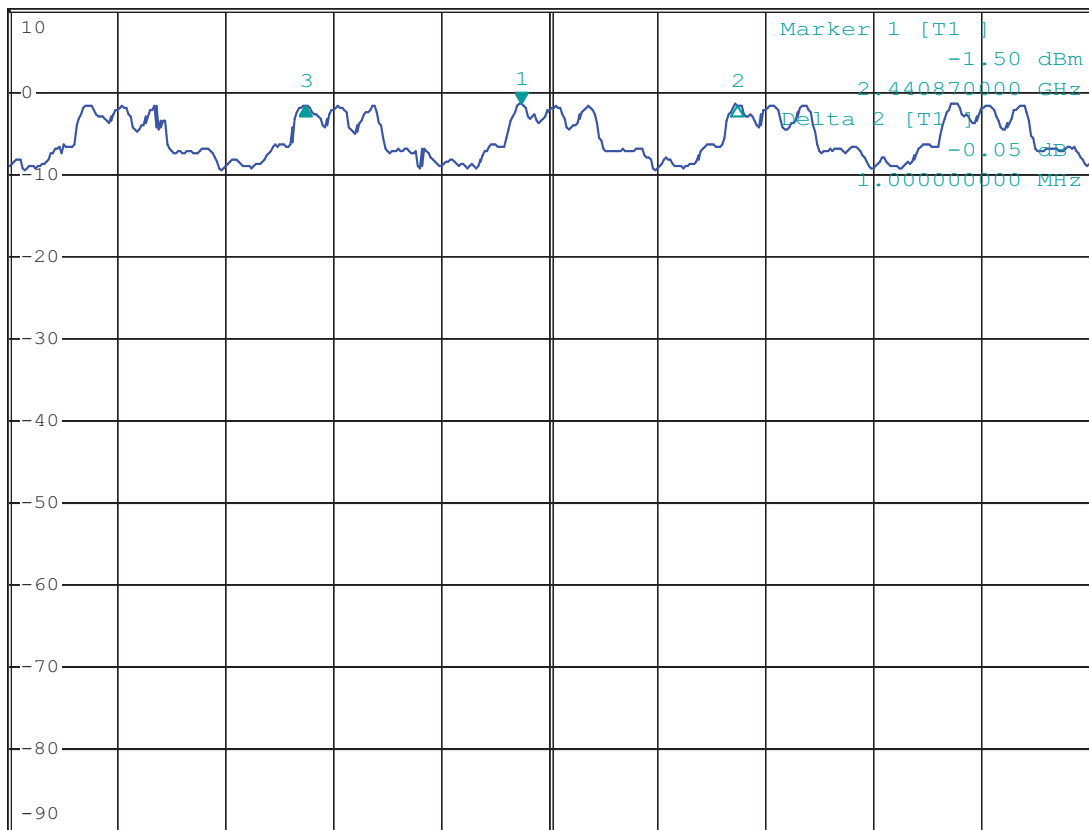
Ref 10 dBm

\* Att 20 dB

\* RBW 100 kHz Delta 3 [T1 ]

\* VBW 300 kHz -0.20 dB

\* SWT 10 ms -1.000000000 MHz

1 PK  
MAXH

Center 2.441 GHz

500 kHz/

Span 5 MHz



## **10. Number of Hopping Channels**

### **10.1 Regulation**

According to §15.247(a)(1)(iii), frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used. According to §15.247(b)(1), for frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

### **10.2 Limits of Number of Hopping Channels**

The frequency hopping systems in the 2400-2483.5MHz band shall use at least 15 channels.

### **10.3 Test Procedure**

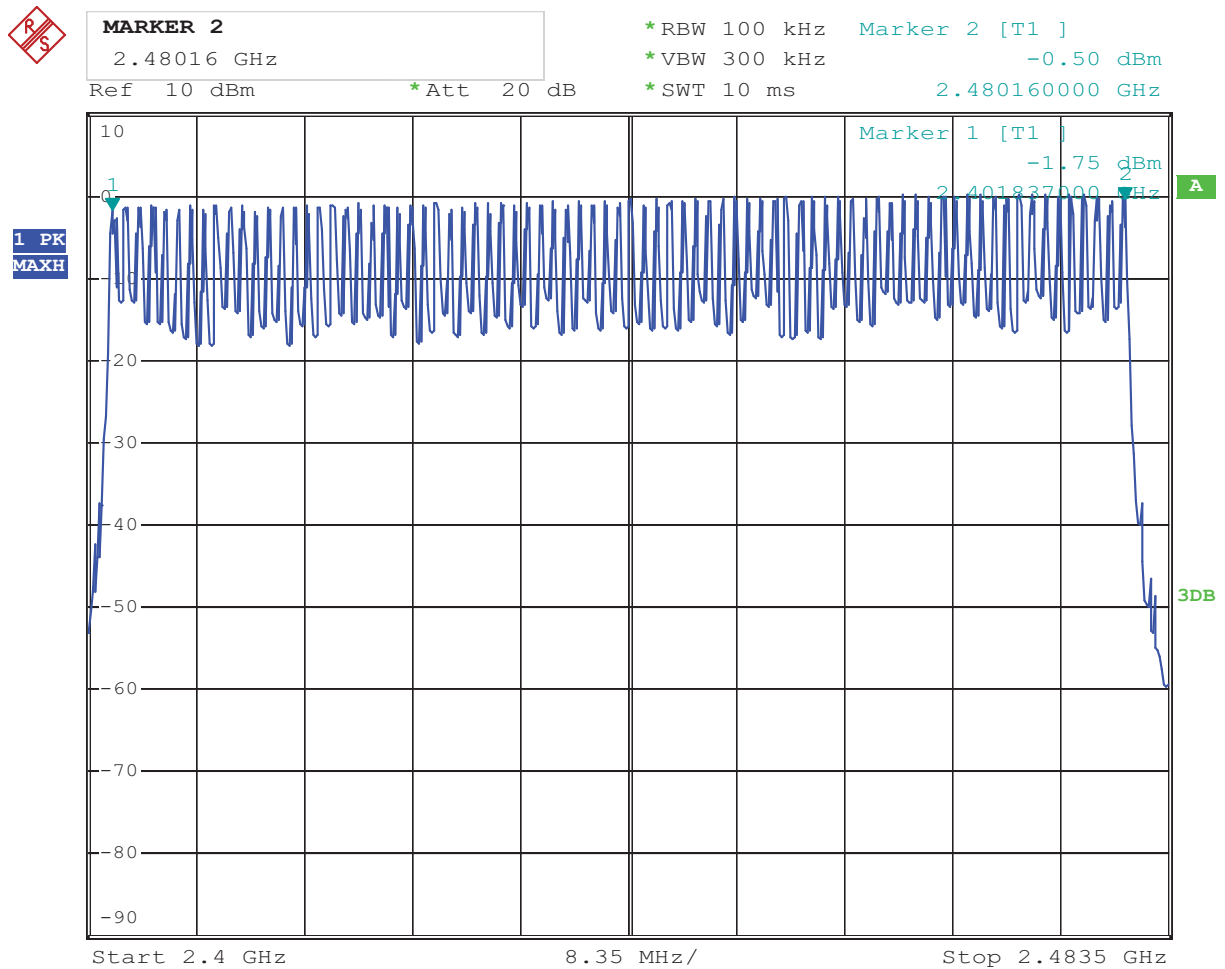
1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Set the spectrum analyzer as follows: Span = the frequency band of operation; RBW=100kHz, VBW=300 kHz;  
Sweep = auto; Detector function = peak; Trace = max hold
3. Record the number of hopping channels.

## 10.4 Test Result

### Type of Modulation: GFSK

EUT	MID	Model	MID727BT-RK326
Mode	Hopping On	Input Voltage	AC120V
Temperature	24 deg. C,	Humidity	56% RH
Operating Frequency	Number of hopping channels	Limit	Pass/ Fail
2402-2480MHz	79	≥ 15	Pass

### Test Plot



Type of Modulation:  $\pi/4$ DQPSK

EUT	MID	Model	MID727BT-RK326
Mode	Hopping On	Input Voltage	AC120V
Temperature	24 deg. C,	Humidity	56% RH
Operating Frequency	Number of hopping channels	Limit	Pass/ Fail
2402-2480MHz	79	$\geq 15$	Pass

## Test Plot



## MARKER 2

2.479993 GHz

Ref 10 dBm

\* Att 20 dB

\* RBW 100 kHz

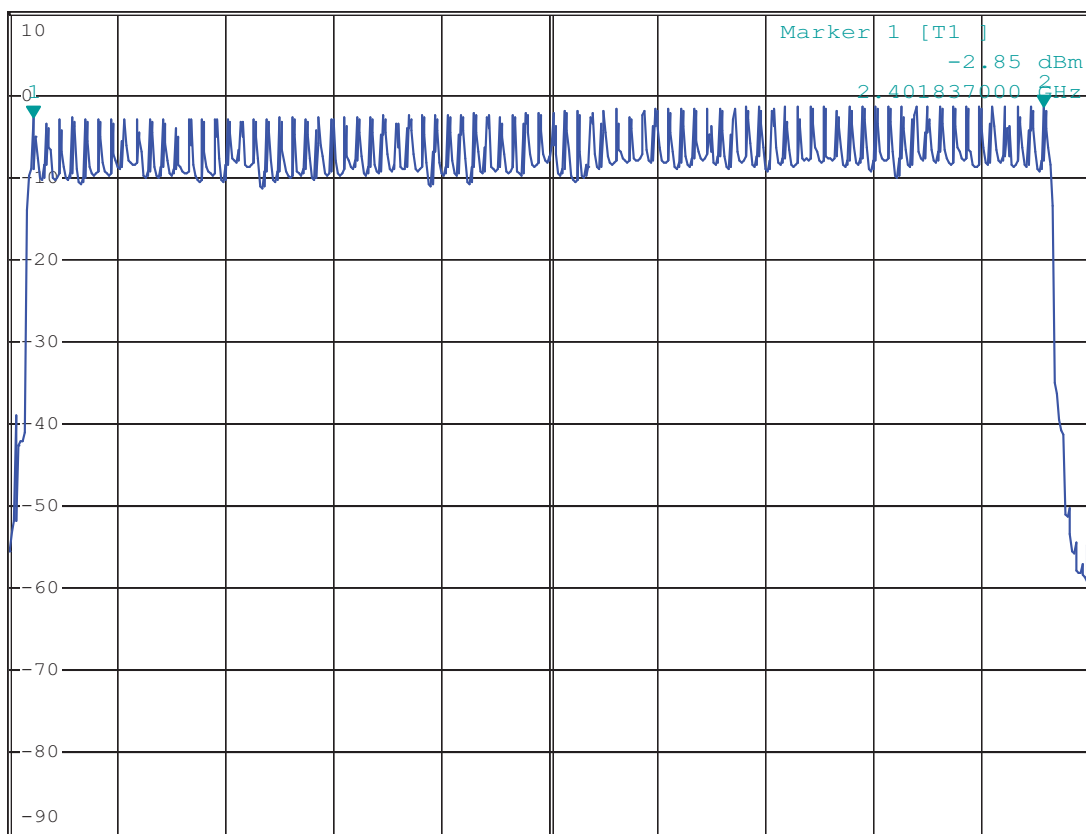
Marker 2 [T1 ]

\* VBW 300 kHz

-1.47 dBm

\* SWT 15 ms

2.479993000 GHz

1 PK  
MAXH

Start 2.4 GHz

8.35 MHz/

Stop 2.4835 GHz

**Type of Modulation: 8DPSK**

EUT	MID	Model	MID727BT-RK326
Mode	Hopping On	Input Voltage	AC120V
Temperature	24 deg. C,	Humidity	56% RH
Operating Frequency	Number of hopping channels	Limit	Pass/ Fail
2402-2480MHz	79	≥ 15	Pass

**Test Plot****MARKER 2**

2.479993 GHz

Ref 10 dBm

\* Att 20 dB

\* RBW 100 kHz

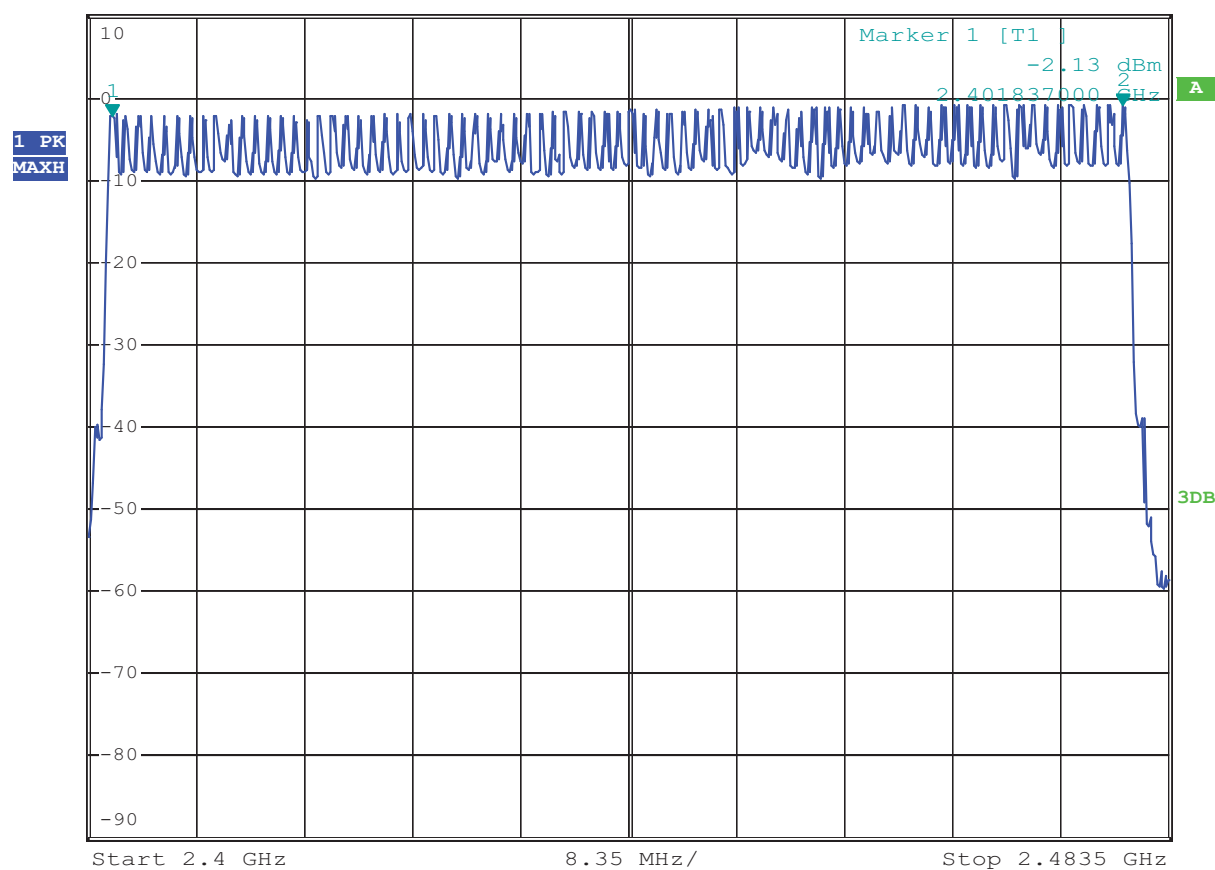
Marker 2 [T1 ]

\* VBW 300 kHz

-1.00 dBm

\* SWT 10 ms

2.479993000 GHz





## **11. Time of Occupancy (Dwell Time)**

### **11.1 Regulation**

According to §15.247(a)(1)(iii), frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

### **11.2 Limits of Carrier Frequency Separation**

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

### **11.3 Test Procedure**

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Set the spectrum analyzer as follows: Span = zero span, centered on a hopping channel; RBW = 1 MHz; VBW  $\geq$  RBW; Sweep = as necessary to capture the entire dwell time per hopping channel; Detector function = peak; Trace = max hold
3. Measure the dwell time using the marker-delta function.
4. Repeat above procedures until all frequencies measured were complete.
5. Repeat this test for different modes of operation (e.g., data rate, modulation format, etc.), if applicable.

**11.4 Test Result****Type of Modulation: GFSK**

EUT	MID		Model	MID727BT-RK326
Mode	Keep Transmitting		Input Voltage	AC120V
Temperature	24 deg. C,		Humidity	56% RH
Channel	Reading	Hopping Rate	Actual	Limit
Low	2.98ms	266.667 hop/s	0.318s	0.4s
Middle	2.96ms	266.667 hop/s	0.316s	0.4s
High	2.96ms	266.667 hop/s	0.316s	0.4s

Actual = Reading × (Hopping rate / Number of channels) × Test period, Test period = 0.4 [seconds / channel] × 79 [channel] = 31.6 [seconds] NOTE: The EUT makes worst case 1600 hops per second or 1 time slot has a length of 625μs with 79 channels. A DH5 Packet needs 5 time slot for transmitting and 1 time slot for receiving. Then the EUT makes worst case 266.667 hops per second with 79 channels.

**Note: DH5 was the worse case**





Test Plots:

Low Channel:



DELTA MARKER 2

2.98 ms

Ref 10 dBm

\*Att 20 dB

RBW 1 MHz

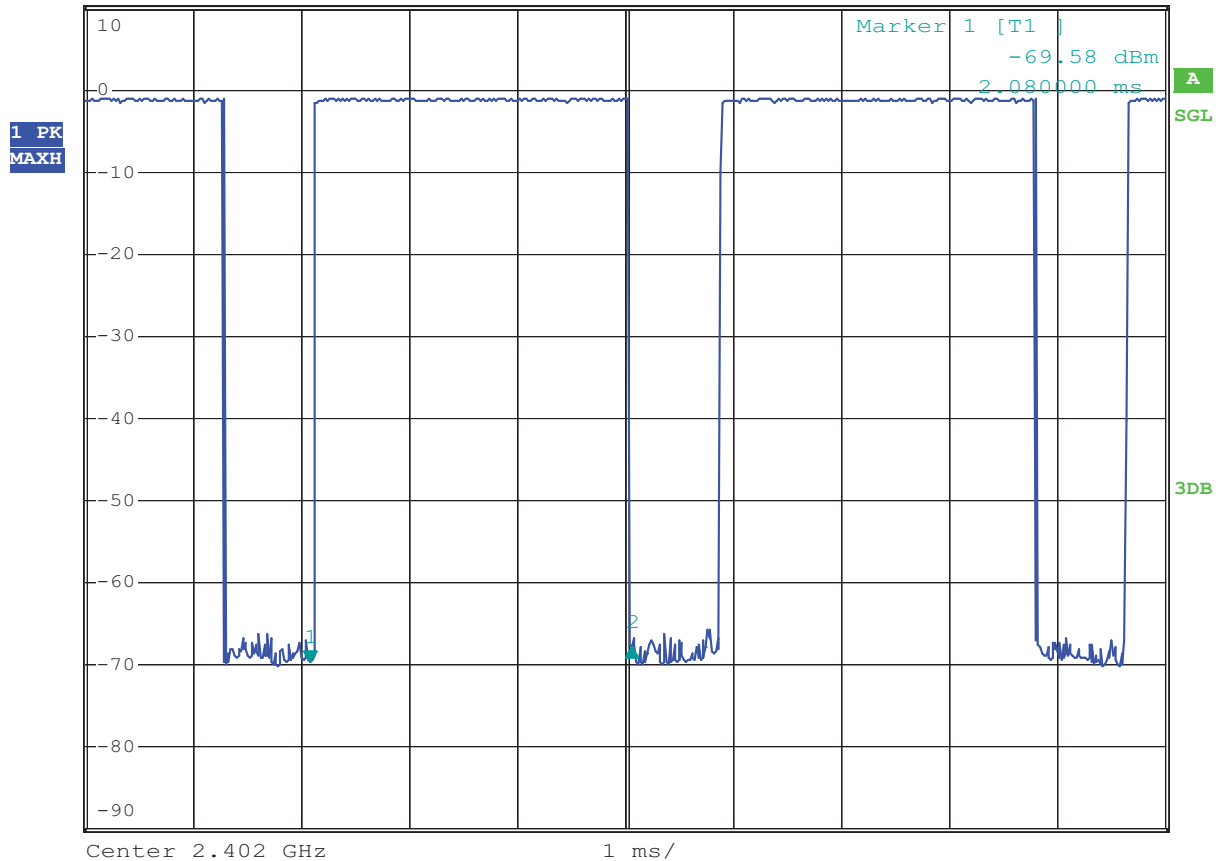
\*VBW 1 MHz

SWT 10 ms

Delta 2 [T1 ]

1.74 dB

2.980000 ms





Middle Channel:



**DELTA MARKER 2**

2.96 ms

Ref 10 dBm

\*Att 20 dB

RBW 1 MHz

\*VBW 1 MHz

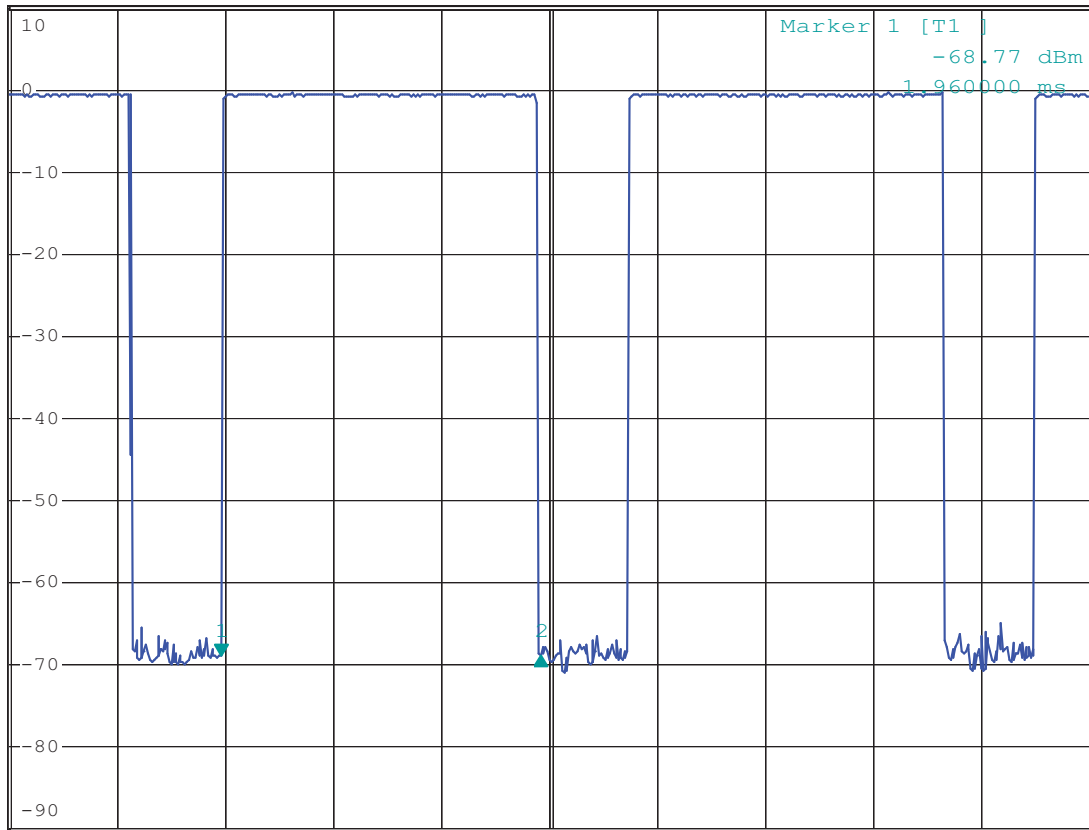
SWT 10 ms

Delta 2 [T1 ]

-0.13 dB

2.960000 ms

1 PK  
MAXH



Center 2.441 GHz

1 ms/



# High Channel



## DELTA MARKER 2

2.96 ms

Ref 10 dBm

\*Att 20 dB

RBW 1 MHz

\*VBW 1 MHz

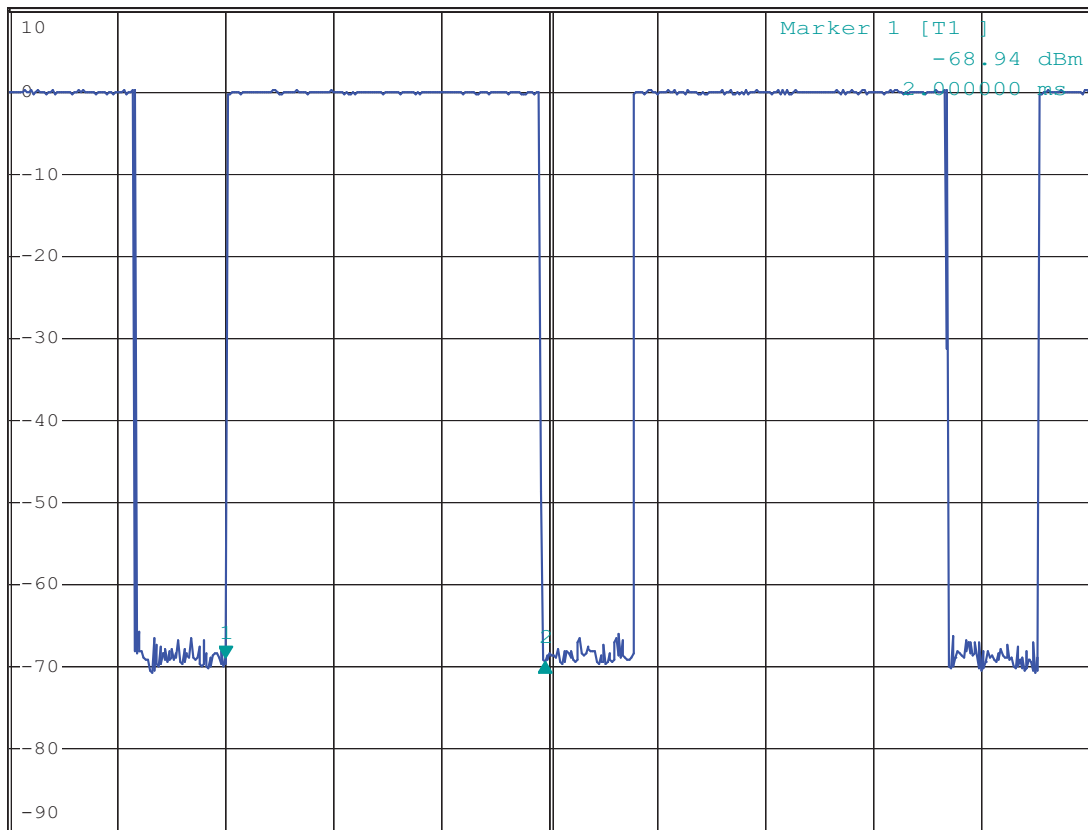
SWT 10 ms

Delta 2 [T1 ]

-0.46 dB

2.960000 ms

1 PK  
MAXH



Center 2.48 GHz

1 ms/

A  
SGL

3DB

**Test Result****Type of Modulation:  $\pi/4$ DQPSK**

EUT	MID		Model	MID727BT-RK326	
Mode	Keep Transmitting		Input Voltage	AC120V	
Temperature	24 deg. C,		Humidity	56% RH	
Channel	Reading	Hopping Rate	Actual	Limit	
Low	2.98ms	266.667 hop/s	0.318s	0.4s	
Middle	3.02ms	266.667 hop/s	0.322s	0.4s	
High	2.98ms	266.667 hop/s	0.318s	0.4s	

Actual = Reading  $\times$  (Hopping rate / Number of channels)  $\times$  Test period, Test period = 0.4 [seconds / channel]  $\times$  79 [channel] = 31.6 [seconds] NOTE: The EUT makes worst case 1600 hops per second or 1 time slot has a length of 625 $\mu$ s with 79 channels. A DH5 Packet needs 5 time slot for transmitting and 1 time slot for receiving. Then the EUT makes worst case 266.667 hops per second with 79 channels.

**Note: DH5 was the worse case**



Test Plots:

Low Channel:



**DELTA MARKER 2**

2.98 ms

Ref 10 dBm

\*Att 20 dB

RBW 1 MHz

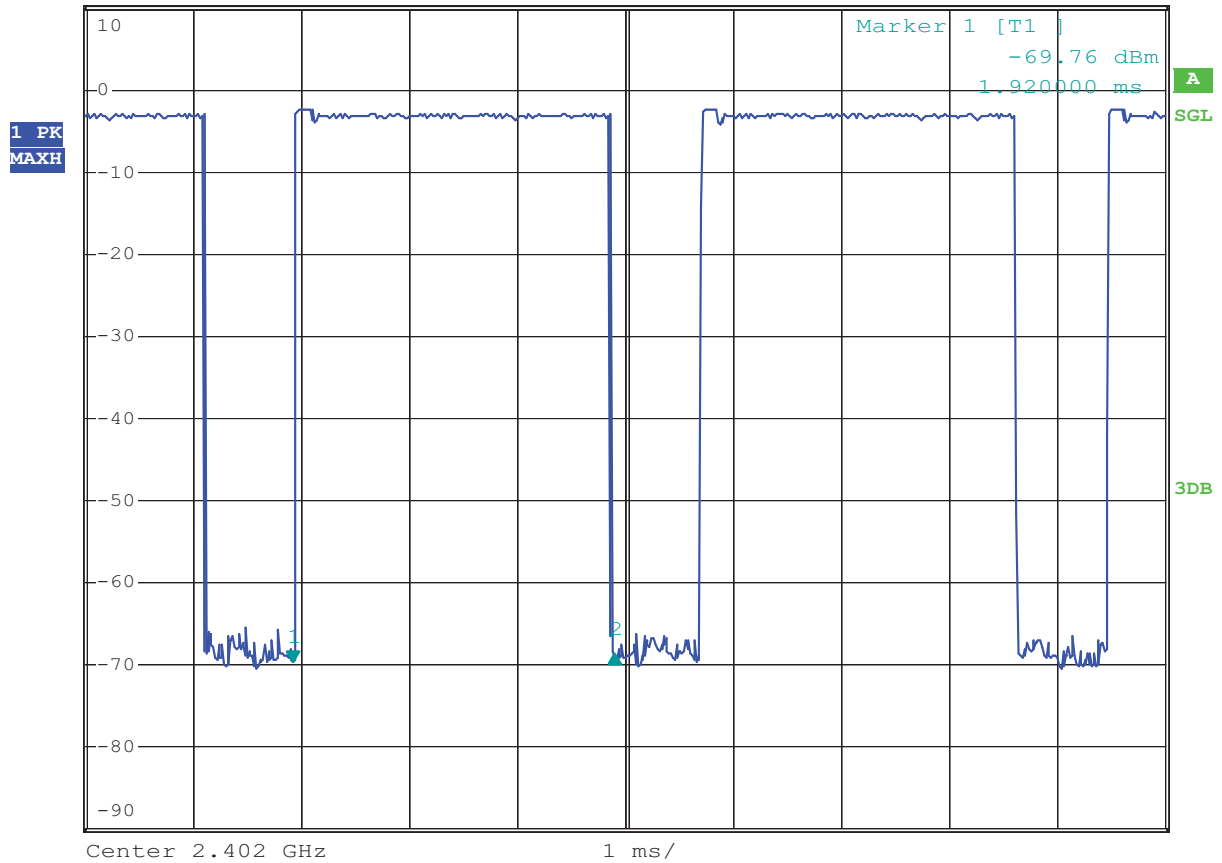
\*VBW 1 MHz

SWT 10 ms

Delta 2 [T1 ]

1.03 dB

2.980000 ms





Middle Channel:



DELTA MARKER 2

3.02 ms

Ref 10 dBm

\*Att 20 dB

RBW 1 MHz

\*VBW 1 MHz

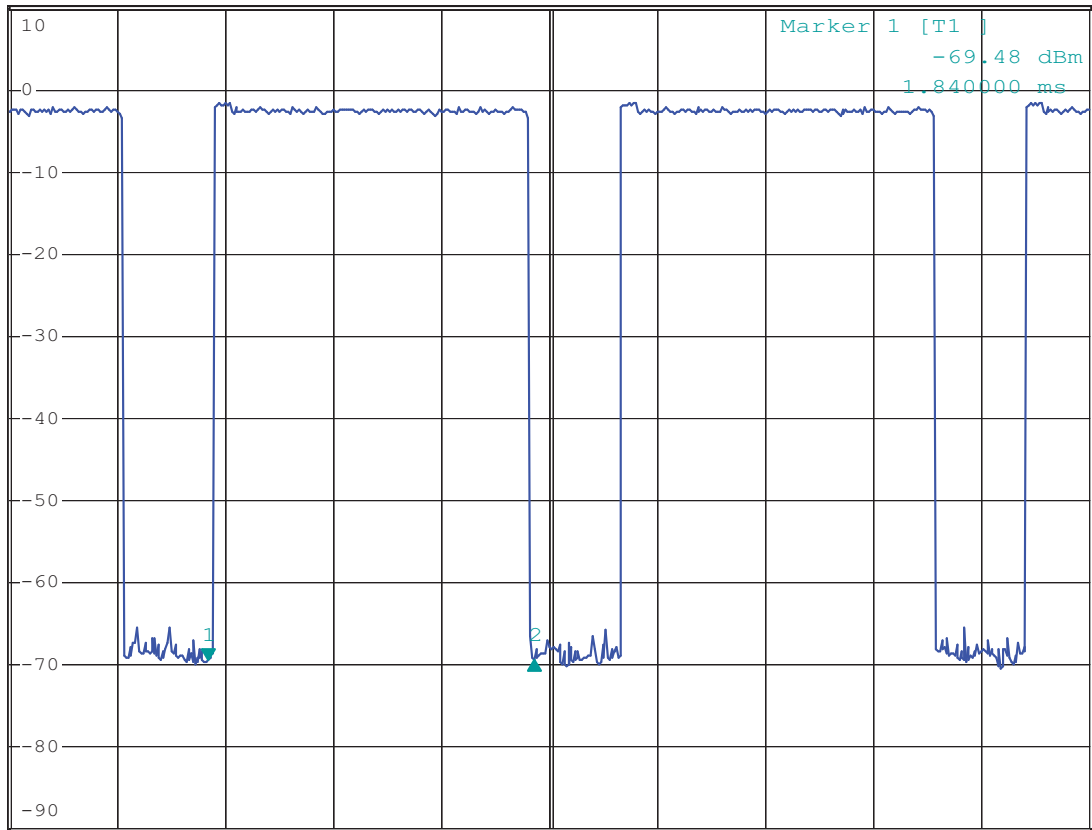
SWT 10 ms

Delta 2 [T1 ]

0.16 dB

3.020000 ms

1 PK  
MAXH



Center 2.441 GHz

1 ms/



## High Channel



### DELTA MARKER 2

2.98 ms

Ref 10 dBm

\*Att 20 dB

RBW 1 MHz

\*VBW 1 MHz

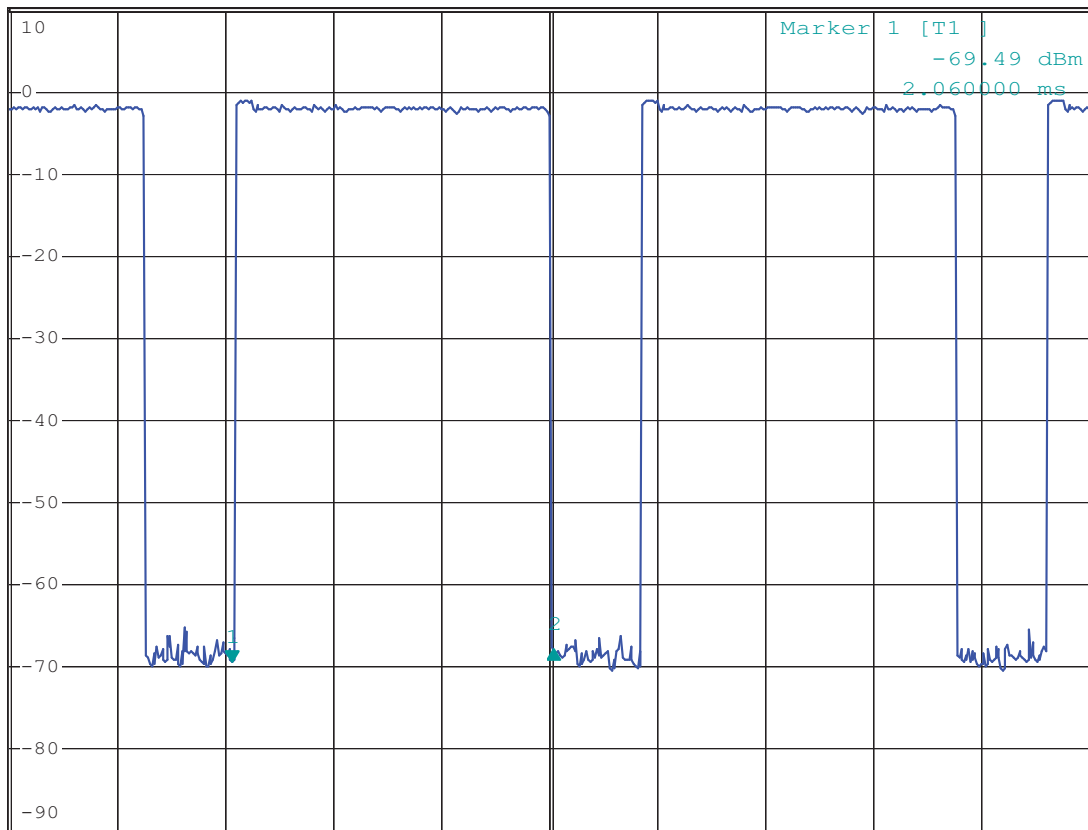
SWT 10 ms

Delta 2 [T1 ]

1.69 dB

2.980000 ms

1 PK  
MAXH



**Type of Modulation: 8DPSK**

EUT	MID		Model	MID727BT-RK326	
Mode	Keep Transmitting		Input Voltage	AC120V	
Temperature	24 deg. C,		Humidity	56% RH	
Channel	Reading	Hopping Rate	Actual	Limit	
Low	3.00ms	266.667 hop/s	0.320s	0.4s	
Middle	3.04ms	266.667 hop/s	0.324s	0.4s	
High	3.00ms	266.667 hop/s	0.320s	0.4s	

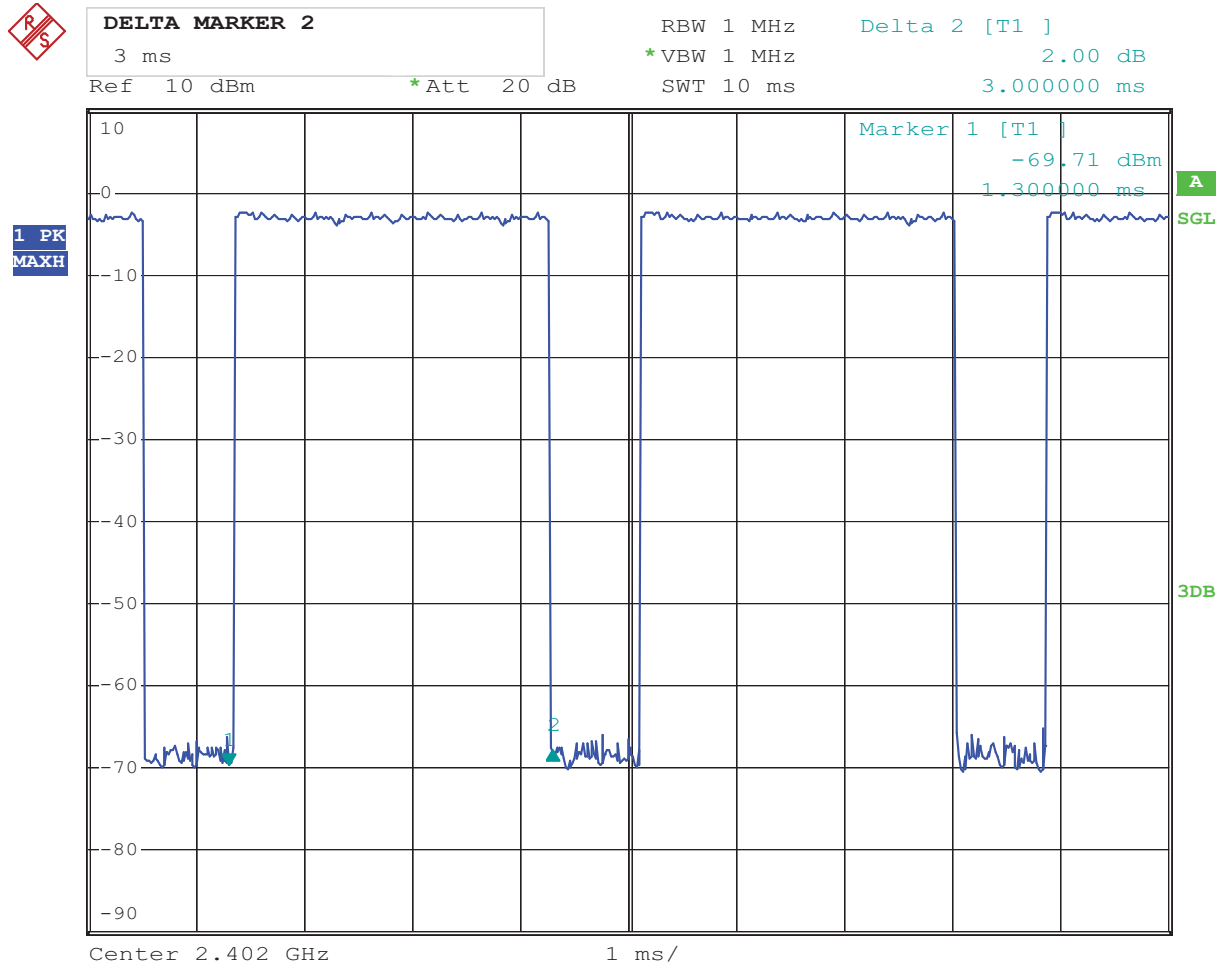
Actual = Reading × (Hopping rate / Number of channels) × Test period, Test period = 0.4 [seconds / channel] × 79 [channel] = 31.6 [seconds] NOTE: The EUT makes worst case 1600 hops per second or 1 time slot has a length of 625μs with 79 channels. A DH5 Packet needs 5 time slot for transmitting and 1 time slot for receiving. Then the EUT makes worst case 266.667 hops per second with 79 channels.

**Note: DH5 was the worse case**



### Test Plots:

Low Channel:





Middle Channel:



**DELTA MARKER 2**

3.04 ms

Ref 10 dBm

\*Att 20 dB

RBW 1 MHz

\*VBW 1 MHz

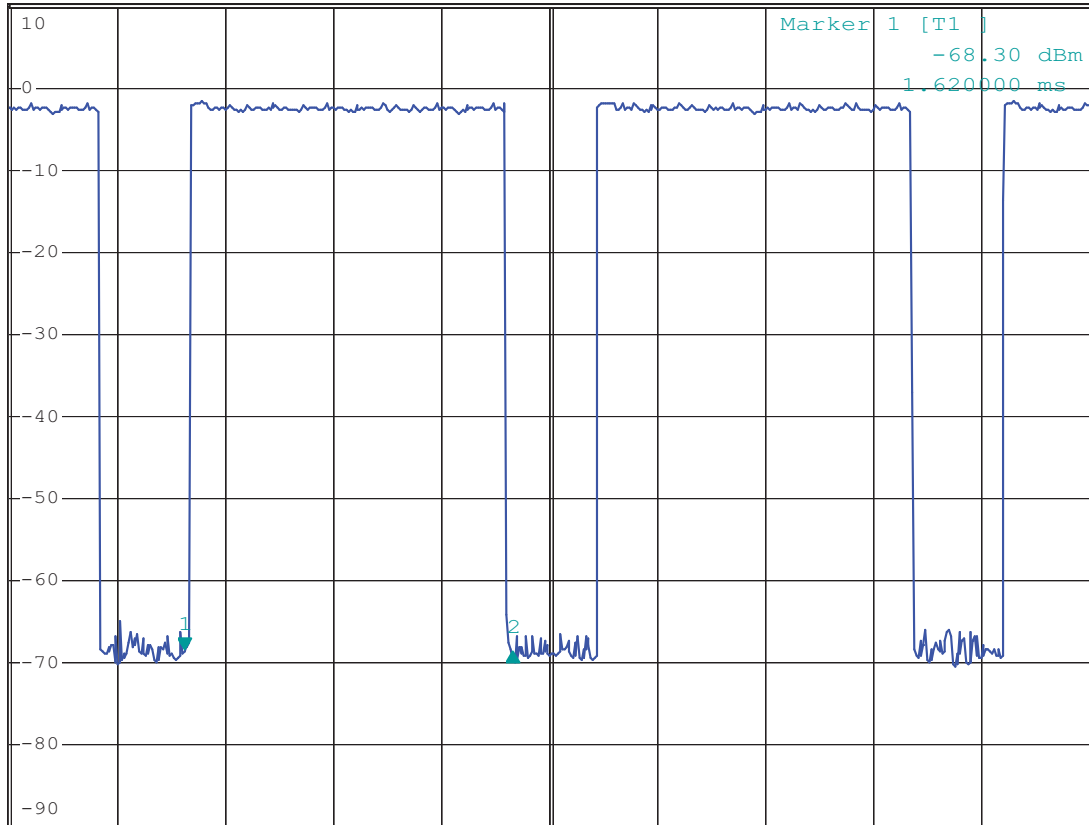
SWT 10 ms

Delta 2 [T1 ]

-0.29 dB

3.040000 ms

1 PK  
MAXH



Center 2.441 GHz

1 ms/



# High Channel



## DELTA MARKER 2

3 ms

Ref 10 dBm

\*Att 20 dB

RBW 1 MHz

\*VBW 1 MHz

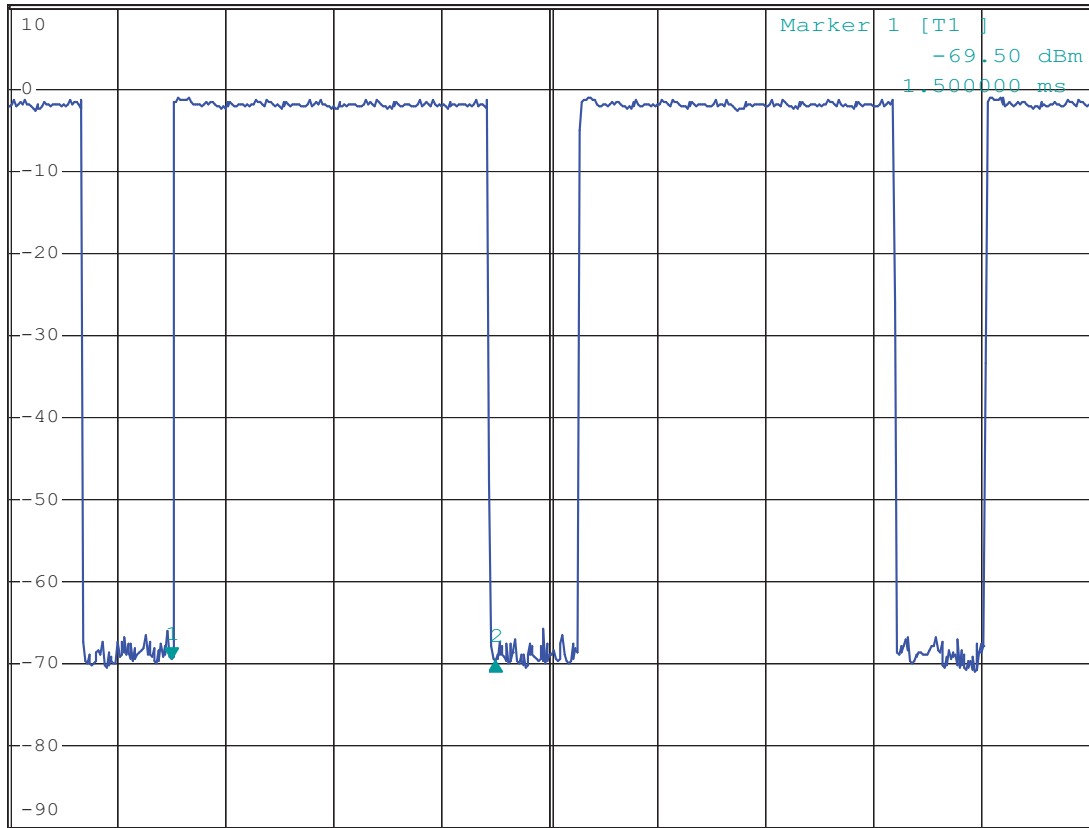
SWT 10 ms

Delta 2 [T1 ]

-0.26 dB

3.000000 ms

1 PK  
MAXH



A  
SGL

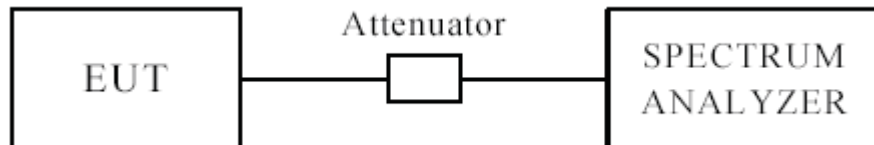
3DB

Center 2.48 GHz

1 ms/

## 12 Out of Band Measurement

### 12.1 Test Setup



The restricted band requirement based on radiated emission test; please see the clause 6 for the test setup

### 12.2 Limits of Out of Band Emissions Measurement

1. Below -20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).
2. Fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209.

### 12.3 Test Procedure

For signals in the restricted bands above and below the 2.4-2.483GHz allocated band a measurement was made of

radiated emission test. Peak values with RBW=VBW=1MHz and PK detector.

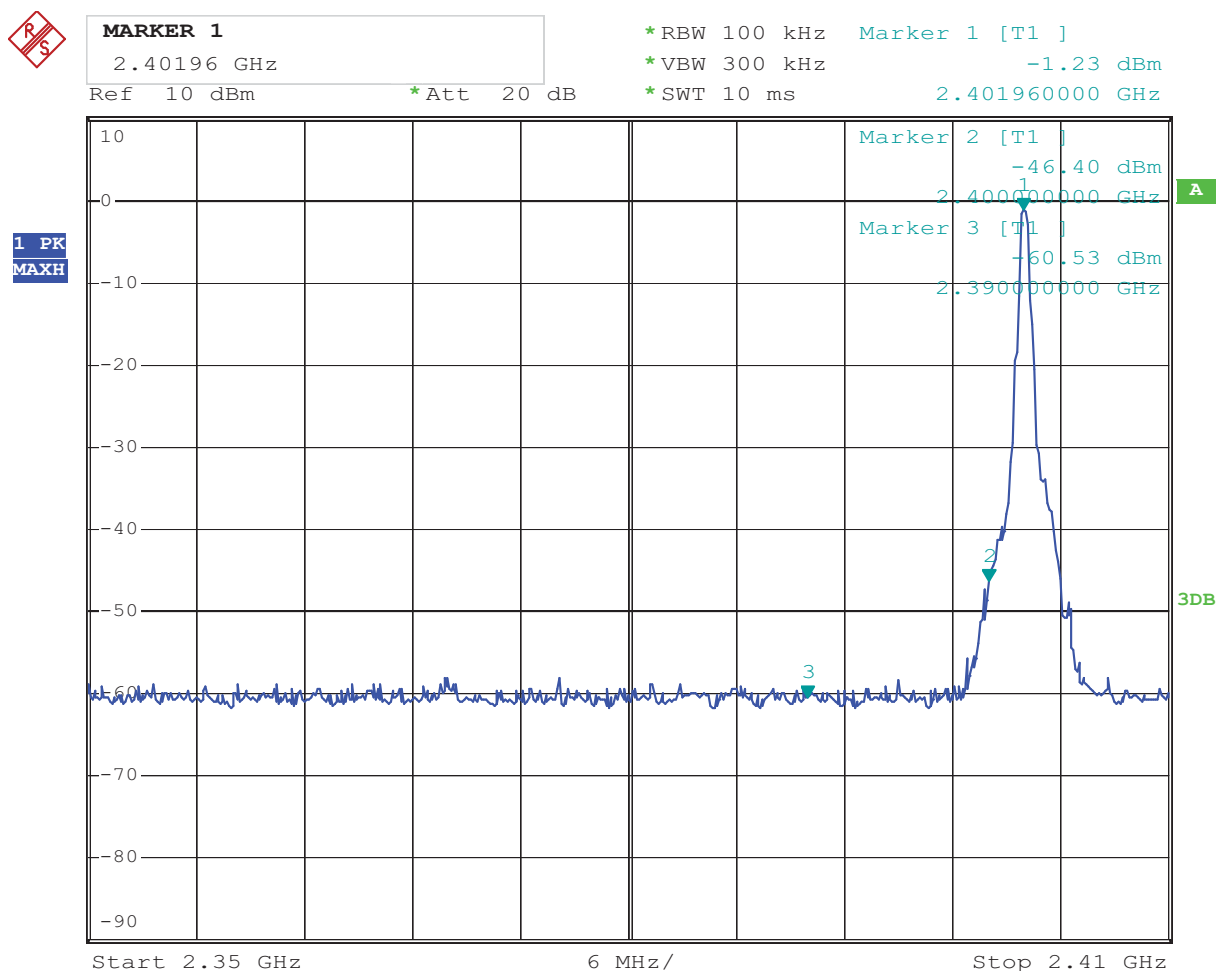
For bandage test, the spectrum set as follows: RBW=100, VBW=300 kHz. A conducted measurement used

Note: 1. this is a handheld device. The radiated emissions should be tested under 3-axes position (Lying, Side, and Stand), after pre-test. It was found that the worse radiated emission was get at the lying position. the worse case was recorded

2. For band-edge measurement, the frequency from 30MHz-25GHz was tested. And It met the FCC rule.

**Type of Modulation: GFSK****12.4 Out of Band Test Result**

Product:	MID		Test Mode:	Low Channel
Mode	Keeping Transmitting		Input Voltage	AC120V
Temperature	24 deg. C		Humidity	56% RH
Test Result:	Pass		Detector	PK
The Max. FS in Restrict Band 2390MHz	PK (dB $\mu$ V/m)	37.3	Limit	74(dB $\mu$ V/m)
	AV(dB $\mu$ V/m)	--		54(dB $\mu$ V/m)

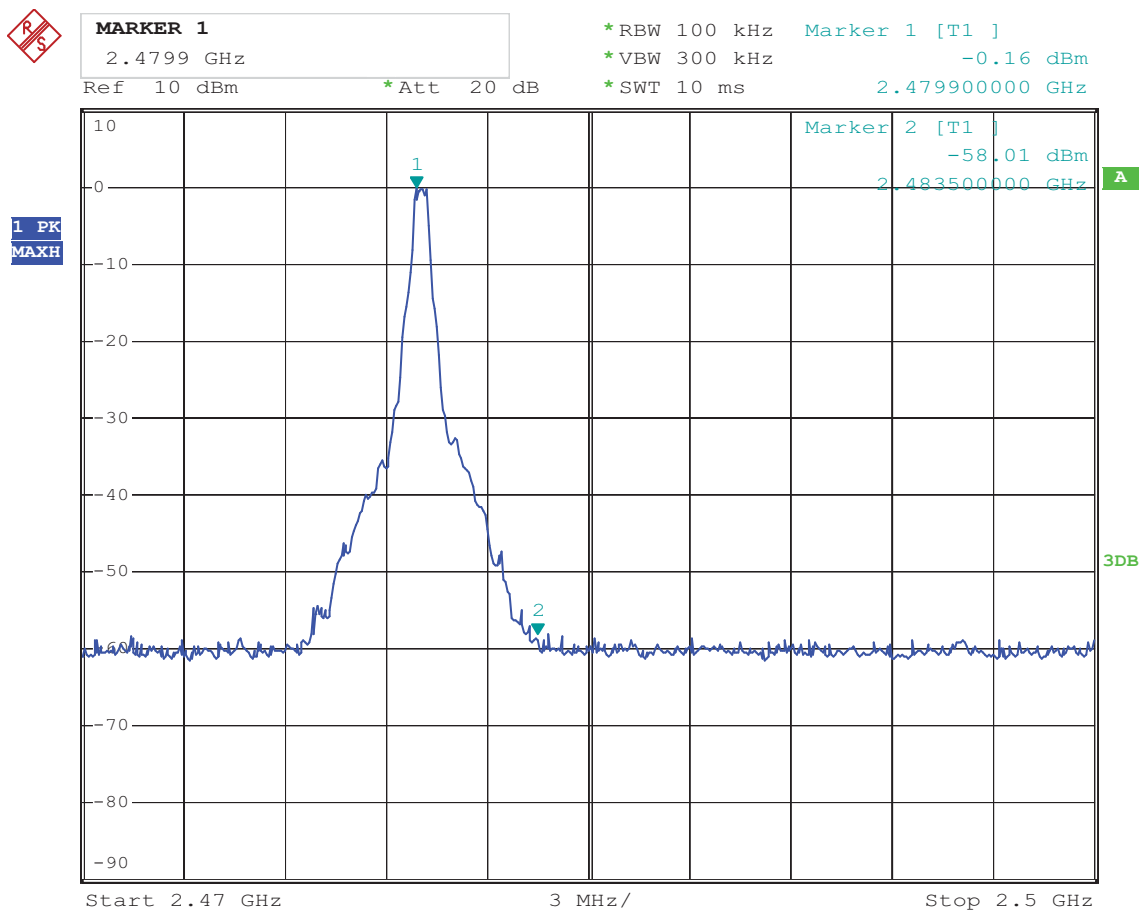
**Test Figure:**

## Type of Modulation: GFSK

### 12.4 Out of Band Test Result

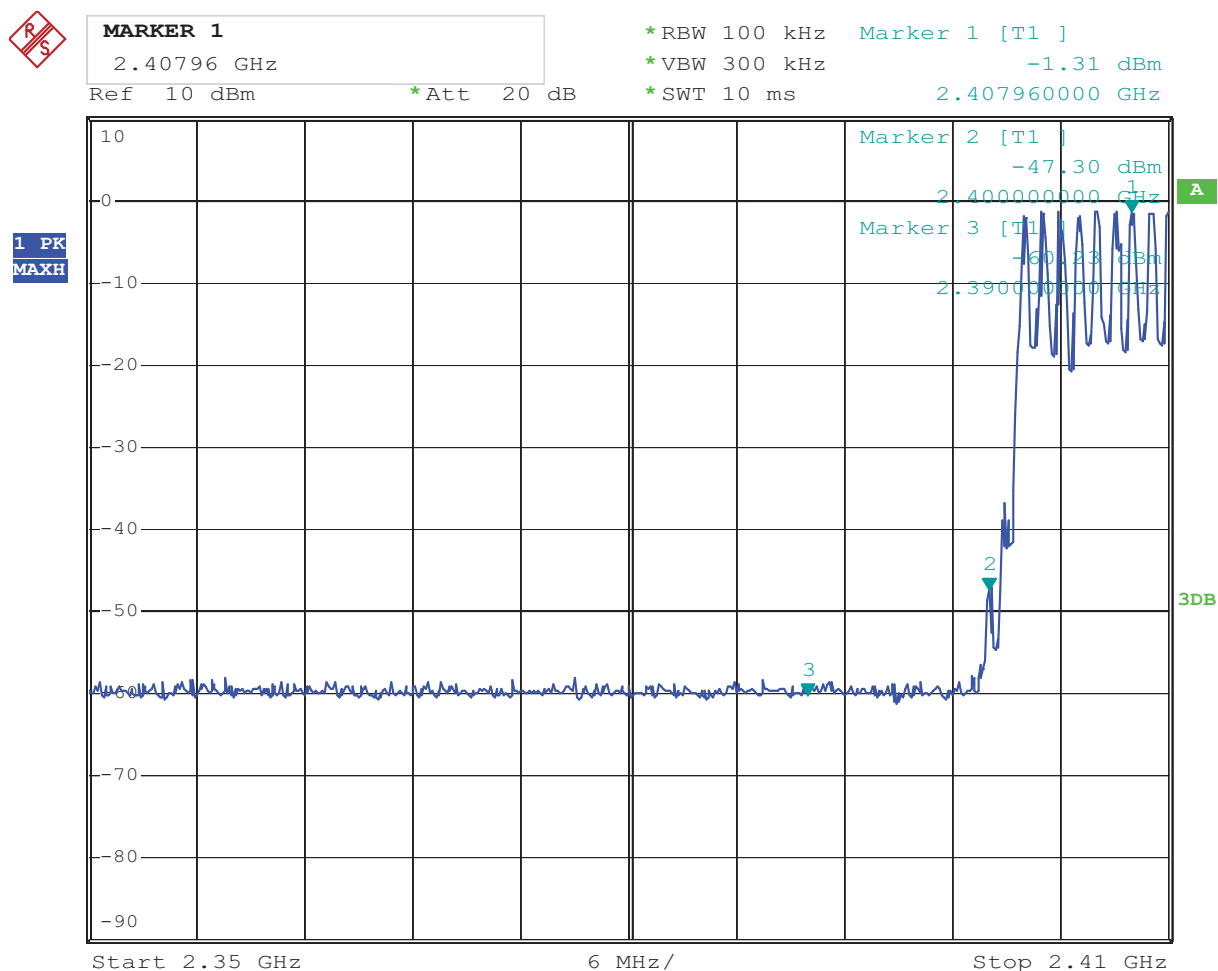
Product:	MID		Test Mode:	High Channel
Mode	Keeping Transmitting		Input Voltage	AC120V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
The Max. FS in Restrict Band 2483.5MHz	PK (dBμV/m)	38.9	Limit	74(dBμV/m)
	AV(dBμV/m)	--		54(dBμV/m)

### Test Figure:



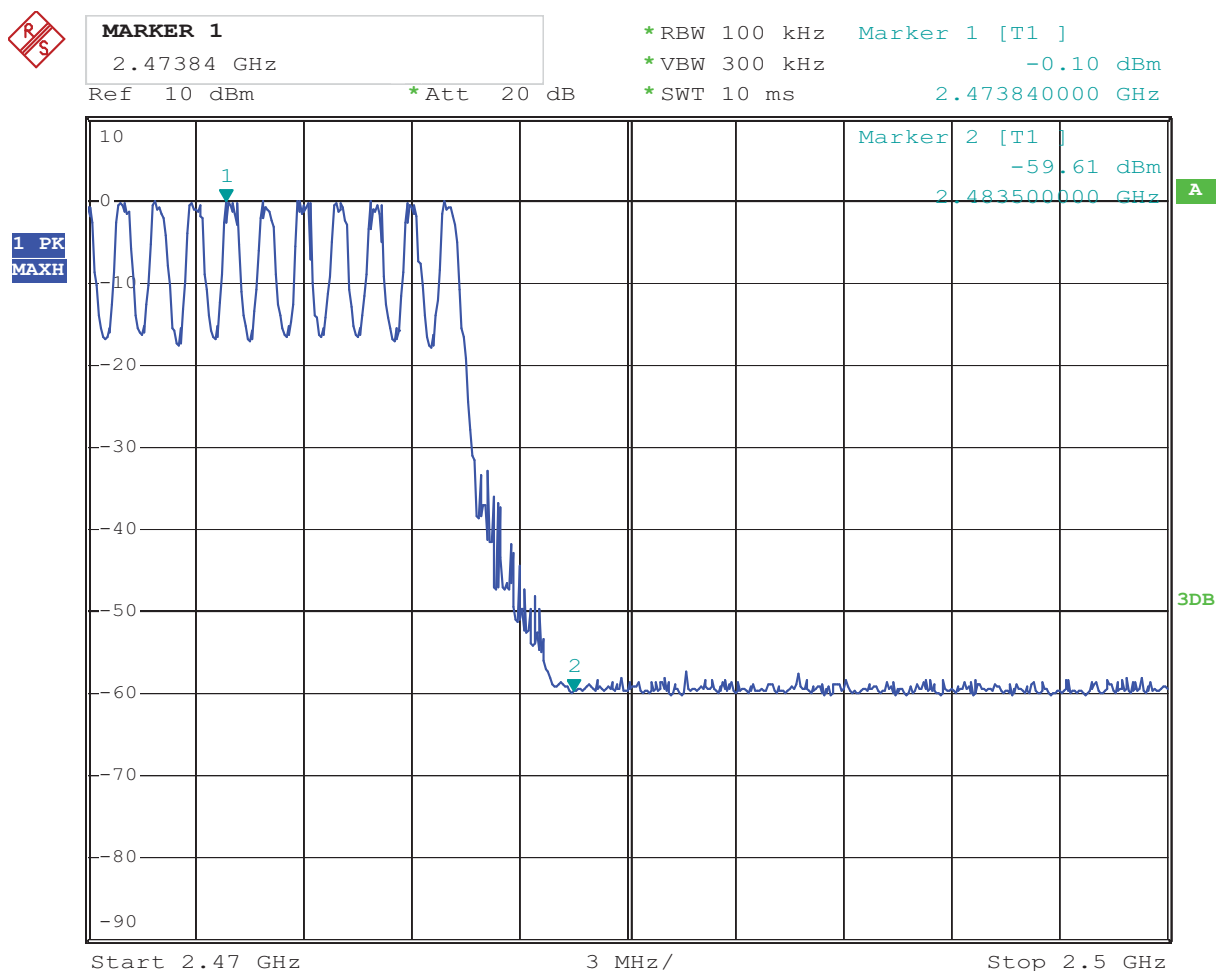
**Type of Modulation: GFSK****12.4 Out of Band Test Result**

Product:	MID		Test Mode:	Hopping mode
Mode	Hopping On		Input Voltage	AC120V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
The Max. FS in Restrict Band 2390MHz	PK (dBμV/m)	37.2	Limit	74(dBμV/m)
	AV(dBμV/m)	--		54(dBμV/m)

**Test Figure:**

**Type of Modulation: GFSK****12.4 Out of Band Test Result**

Product:	MID		Test Mode:	Hopping mode
Mode	Hopping On		Input Voltage	AC120V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
The Max. FS in Restrict Band 2483.5MHz	PK (dBμV/m)	37.8	Limit	74(dBμV/m)
	AV(dBμV/m)	--		54(dBμV/m)

**Test Figure:**

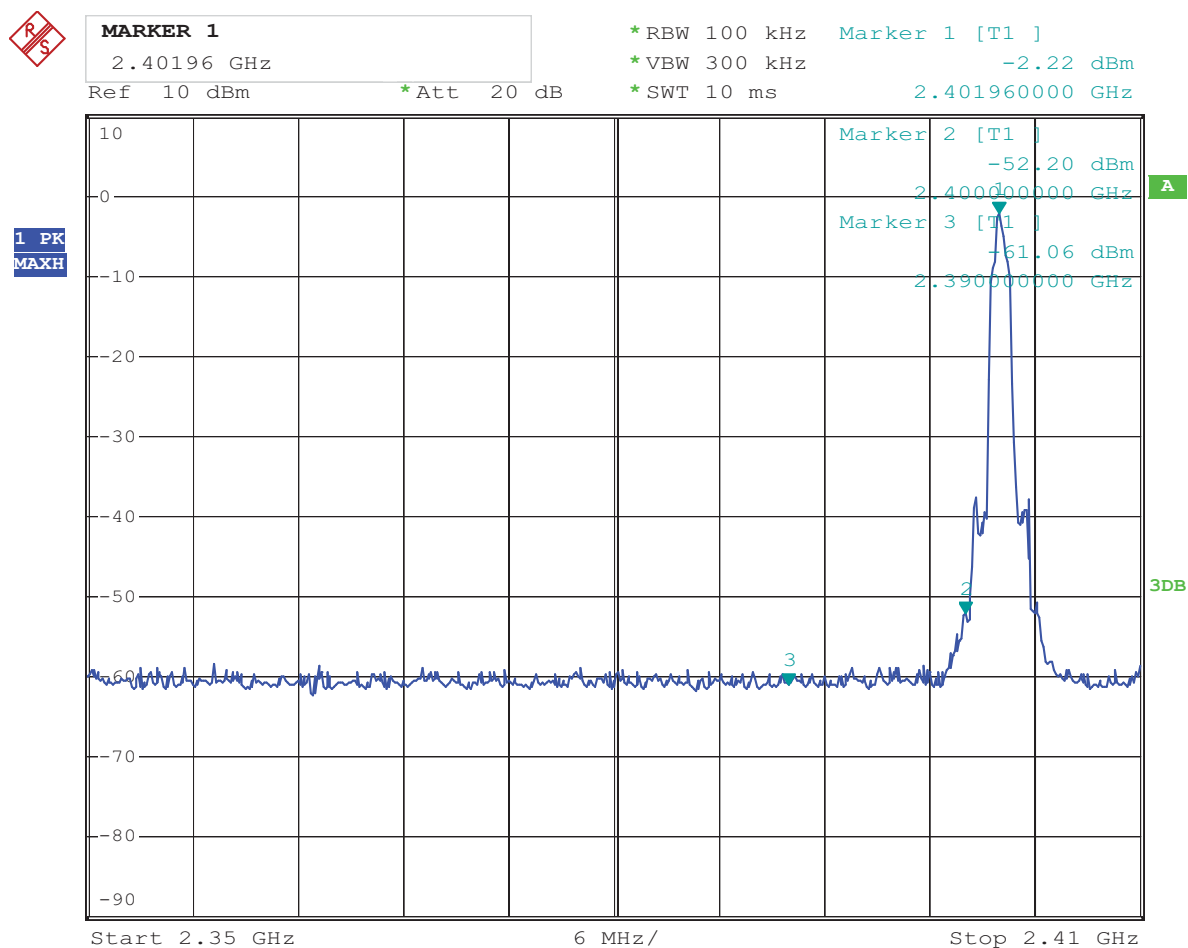


## Type of Modulation: $\pi/4$ DQPSK

### 12.4 Out of Band Test Result

Product:	MID		Test Mode:	Low Channel
Mode	Keeping Transmitting		Input Voltage	AC120V
Temperature	24 deg. C		Humidity	56% RH
Test Result:	Pass		Detector	PK
The Max. FS in Restrict Band 2390MHz	PK (dB $\mu$ V/m)	36.5	Limit	74(dB $\mu$ V/m)
	AV(dB $\mu$ V/m)	--		54(dB $\mu$ V/m)

### Test Figure:



**Type of Modulation:  $\pi/4$ DQPSK****12.4 Out of Band Test Result**

Product:	MID		Test Mode:	High Channel
Mode	Keeping Transmitting		Input Voltage	AC120V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
The Max. FS in Restrict Band 2483.5MHz	PK (dB $\mu$ V/m)	38.5	Limit	74(dB $\mu$ V/m)
	AV(dB $\mu$ V/m)	--		54(dB $\mu$ V/m)

**Test Figure:****MARKER 1**

2.4799 GHz

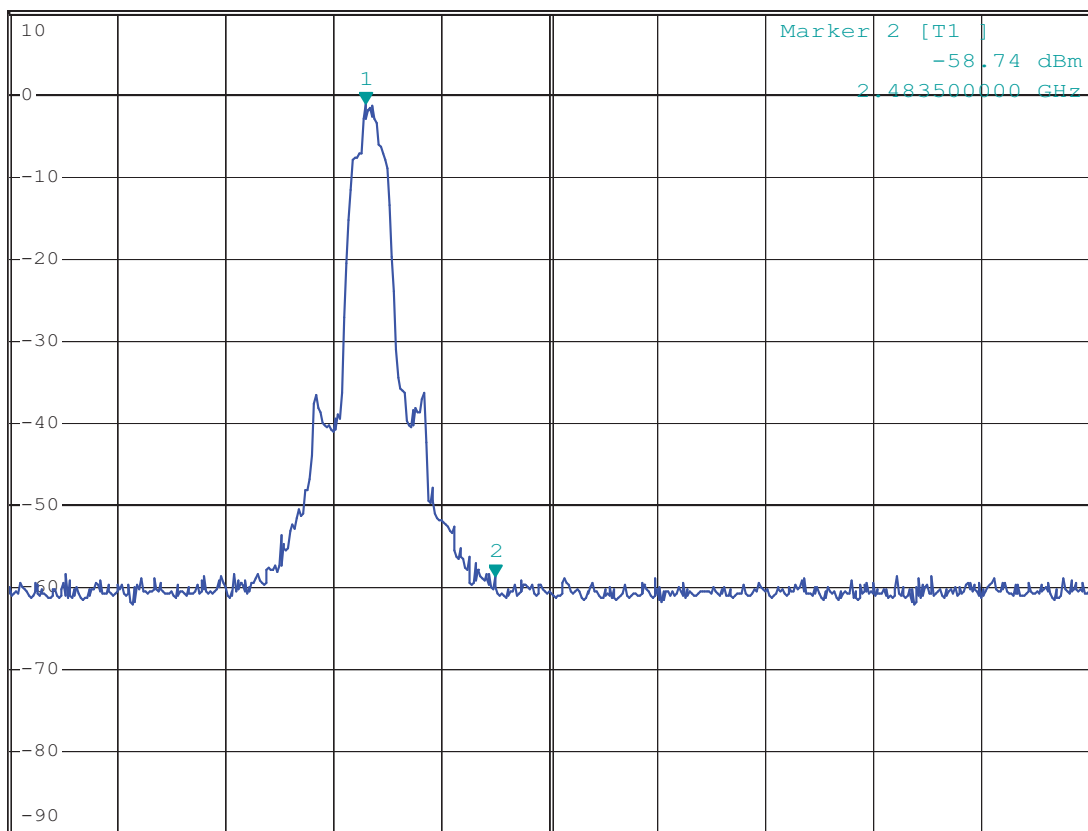
Ref 10 dBm

\* Att 20 dB

\* RBW 100 kHz Marker 1 [T1 ]

\* VBW 300 kHz -1.19 dBm

\* SWT 10 ms 2.479900000 GHz

1 PK  
MAXH

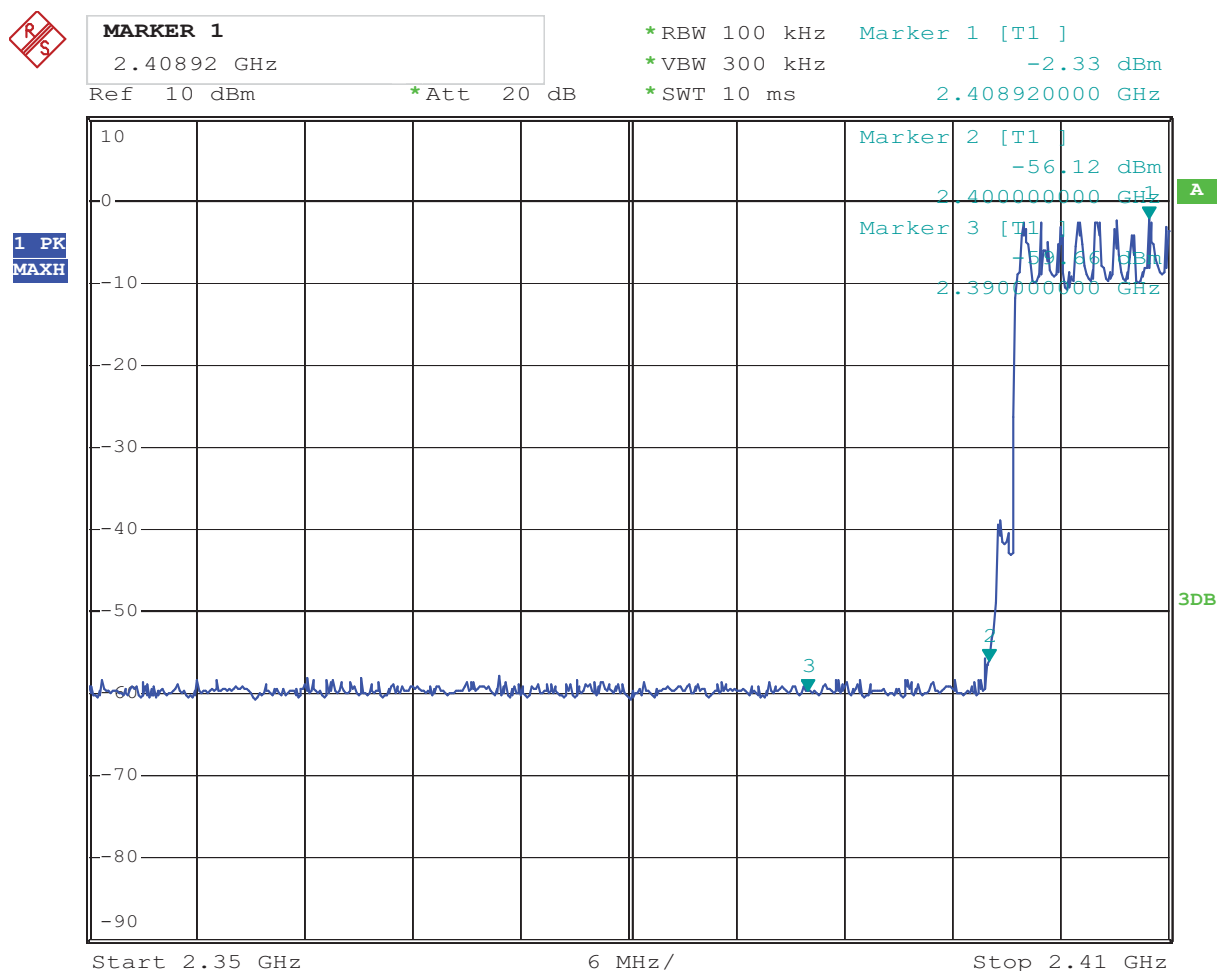
Start 2.47 GHz

3 MHz/

Stop 2.5 GHz

**Type of Modulation:  $\pi/4$ DQPSK****12.4 Out of Band Test Result**

Product:	MID		Test Mode:	Hopping mode
Mode	Hopping On		Input Voltage	AC120V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
The Max. FS in Restrict Band 2390MHz	PK (dB $\mu$ V/m)	37.4	Limit	74(dB $\mu$ V/m)
	AV(dB $\mu$ V/m)	--		54(dB $\mu$ V/m)

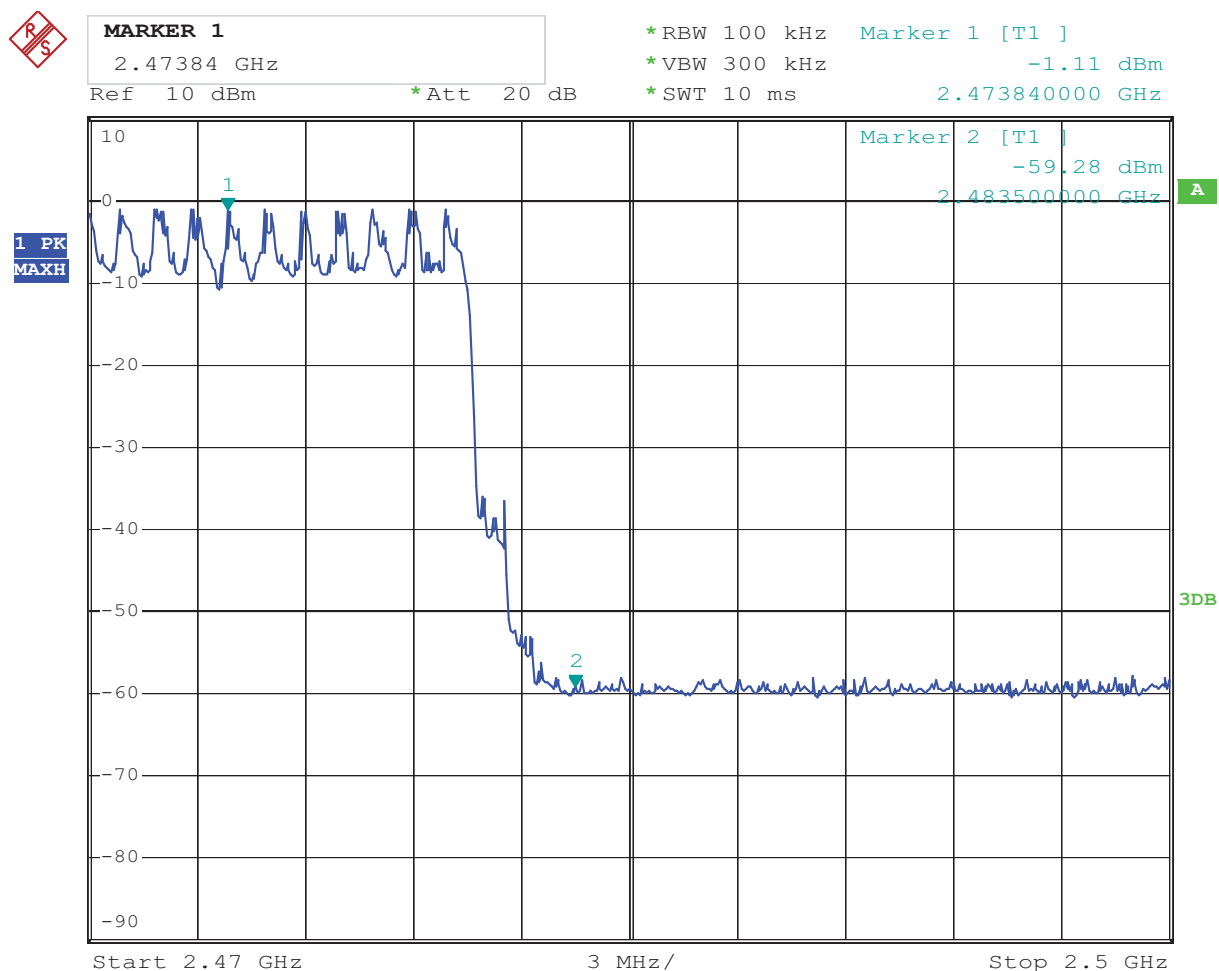
**Test Figure:**

## Type of Modulation: $\pi/4$ DQPSK

### 12.4 Out of Band Test Result

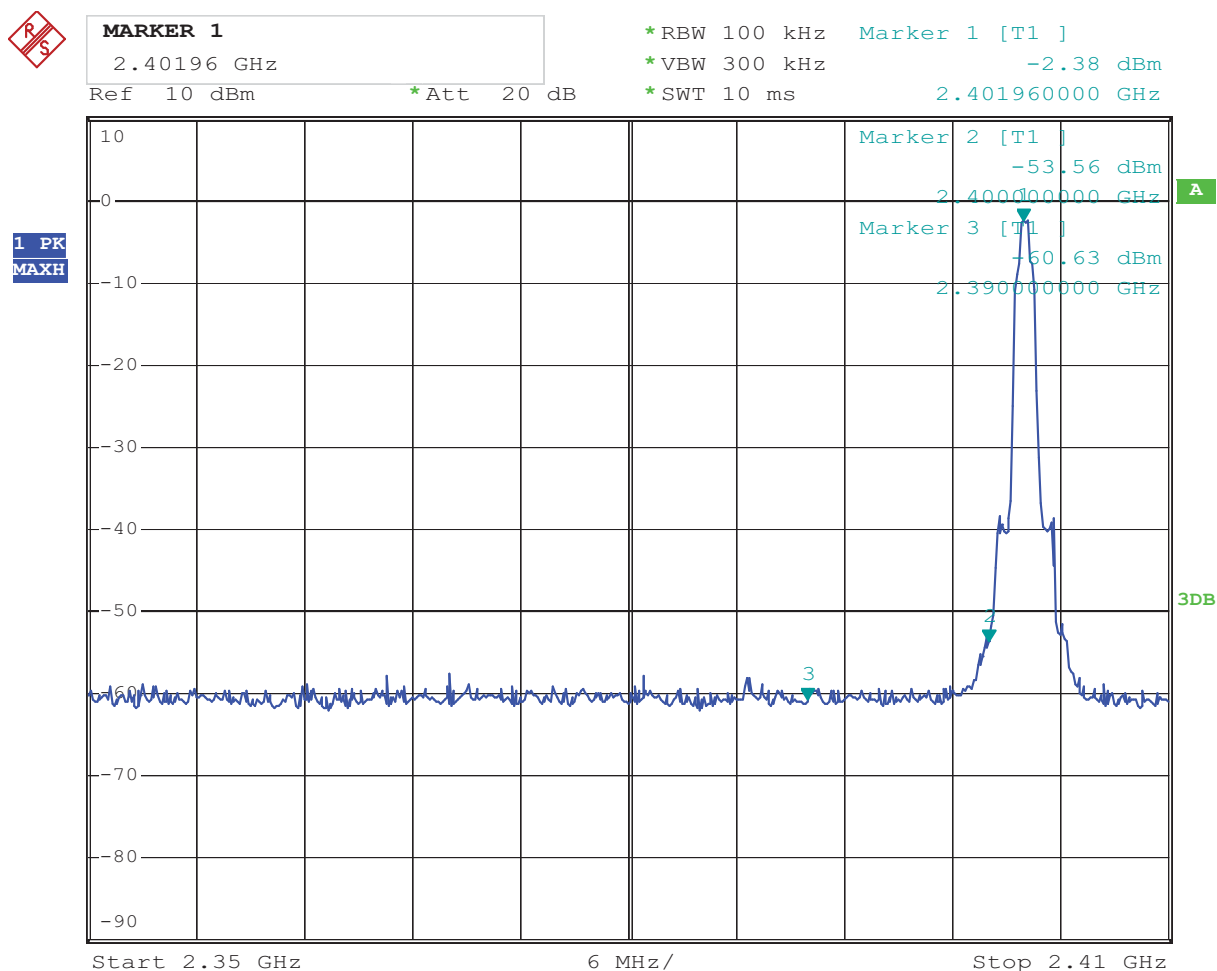
Product:	MID		Test Mode:	Hopping mode
Mode	Hopping On		Input Voltage	AC120V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
The Max. FS in Restrict Band 2483.5MHz	PK (dB $\mu$ V/m)	38.3	Limit	74(dB $\mu$ V/m)
	AV(dB $\mu$ V/m)	--		54(dB $\mu$ V/m)

### Test Figure:



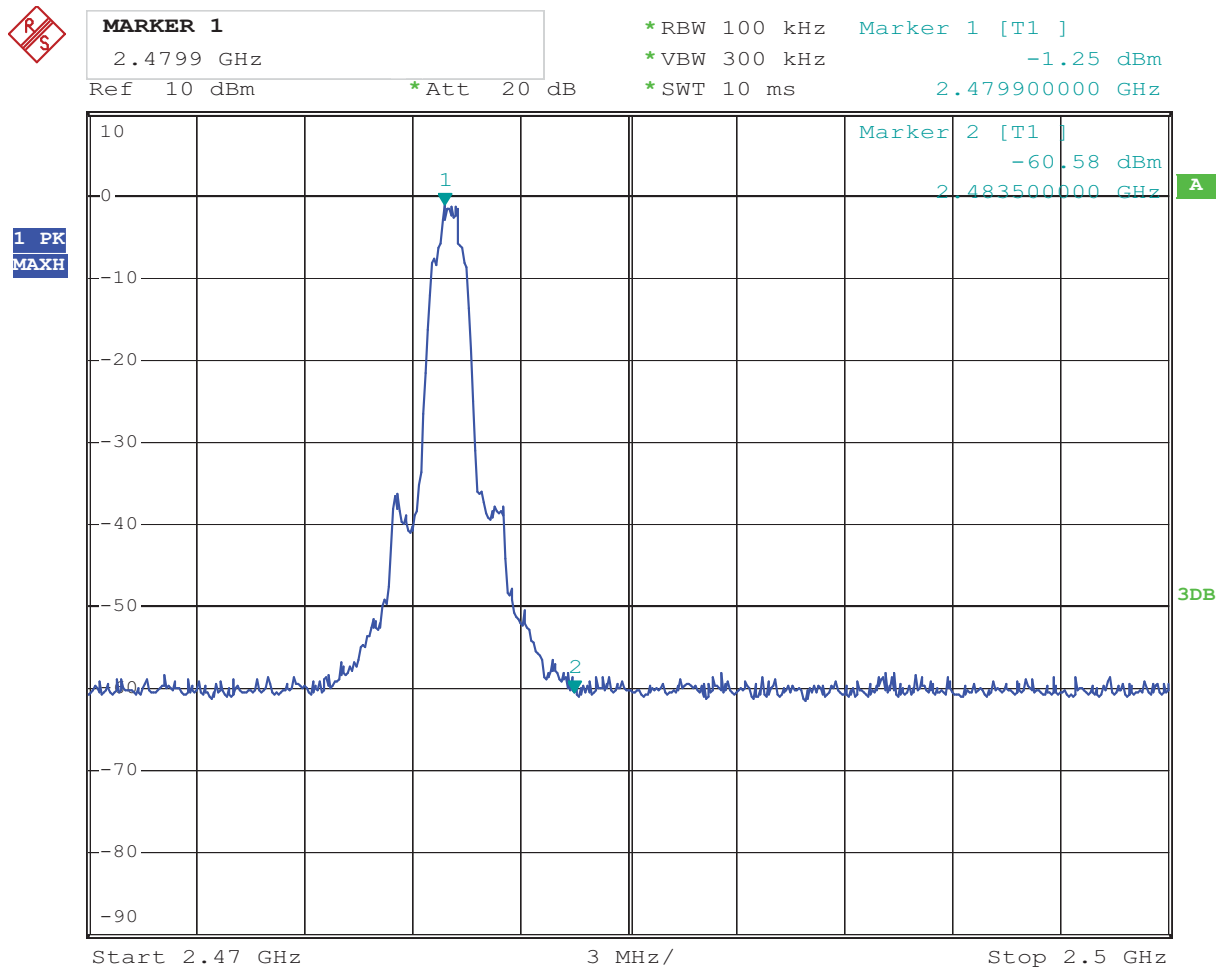
**Type of Modulation: 8DPSK****12.4 Out of Band Test Result**

Product:	MID		Test Mode:	Low Channel
Mode	Keeping Transmitting		Input Voltage	AC120V
Temperature	24 deg. C		Humidity	56% RH
Test Result:	Pass		Detector	PK
The Max. FS in Restrict Band 2390MHz	PK (dBμV/m)	37.3	Limit	74(dBμV/m)
	AV(dBμV/m)	--		54(dBμV/m)

**Test Figure:**

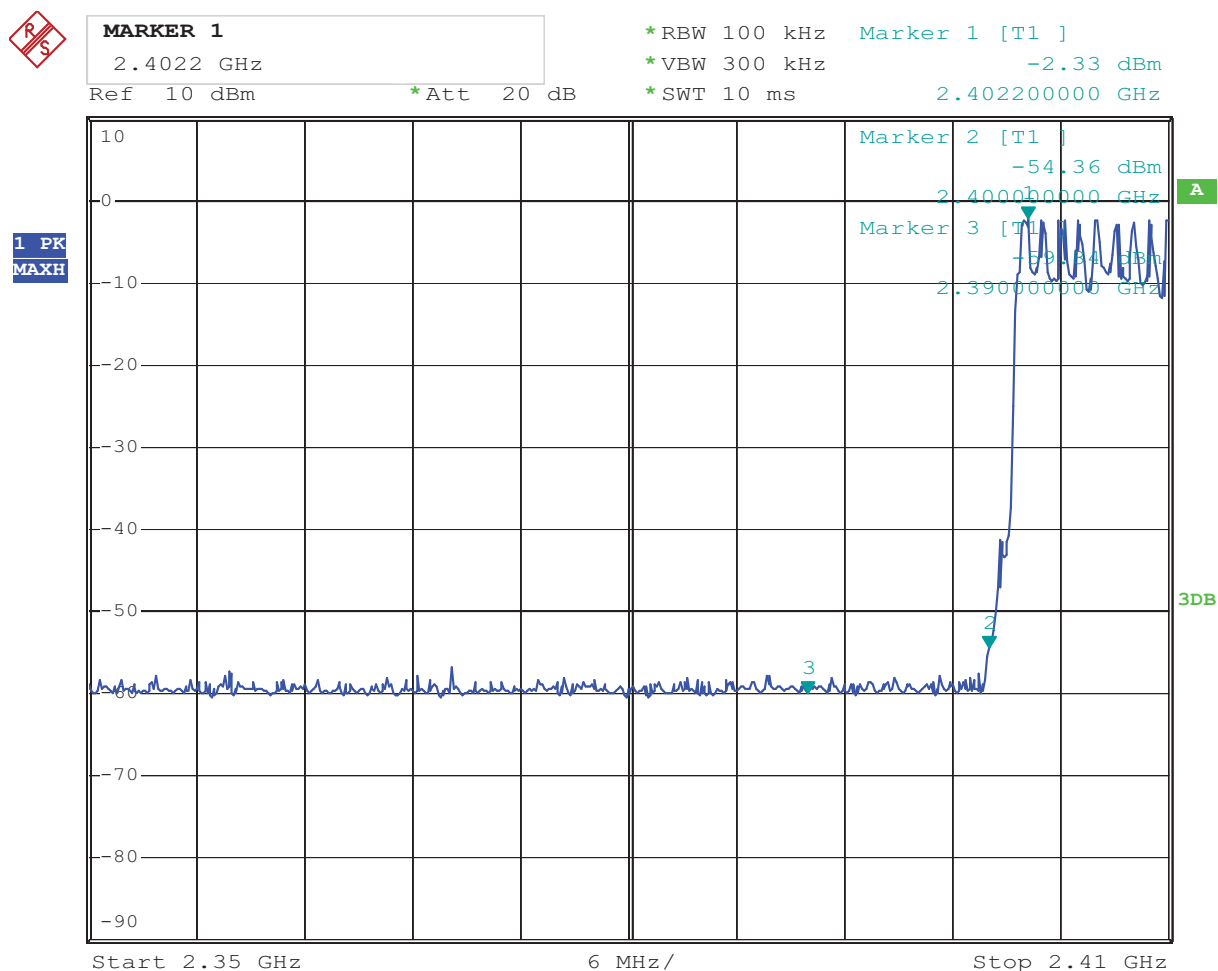
**Type of Modulation: 8DPSK****12.4 Out of Band Test Result**

Product:	MID		Test Mode:	High Channel
Mode	Keeping Transmitting		Input Voltage	AC120V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
The Max. FS in Restrict Band 2483.5MHz	PK (dB $\mu$ V/m)	38.6	Limit	74(dB $\mu$ V/m)
	AV(dB $\mu$ V/m)	--		54(dB $\mu$ V/m)

**Test Figure:**

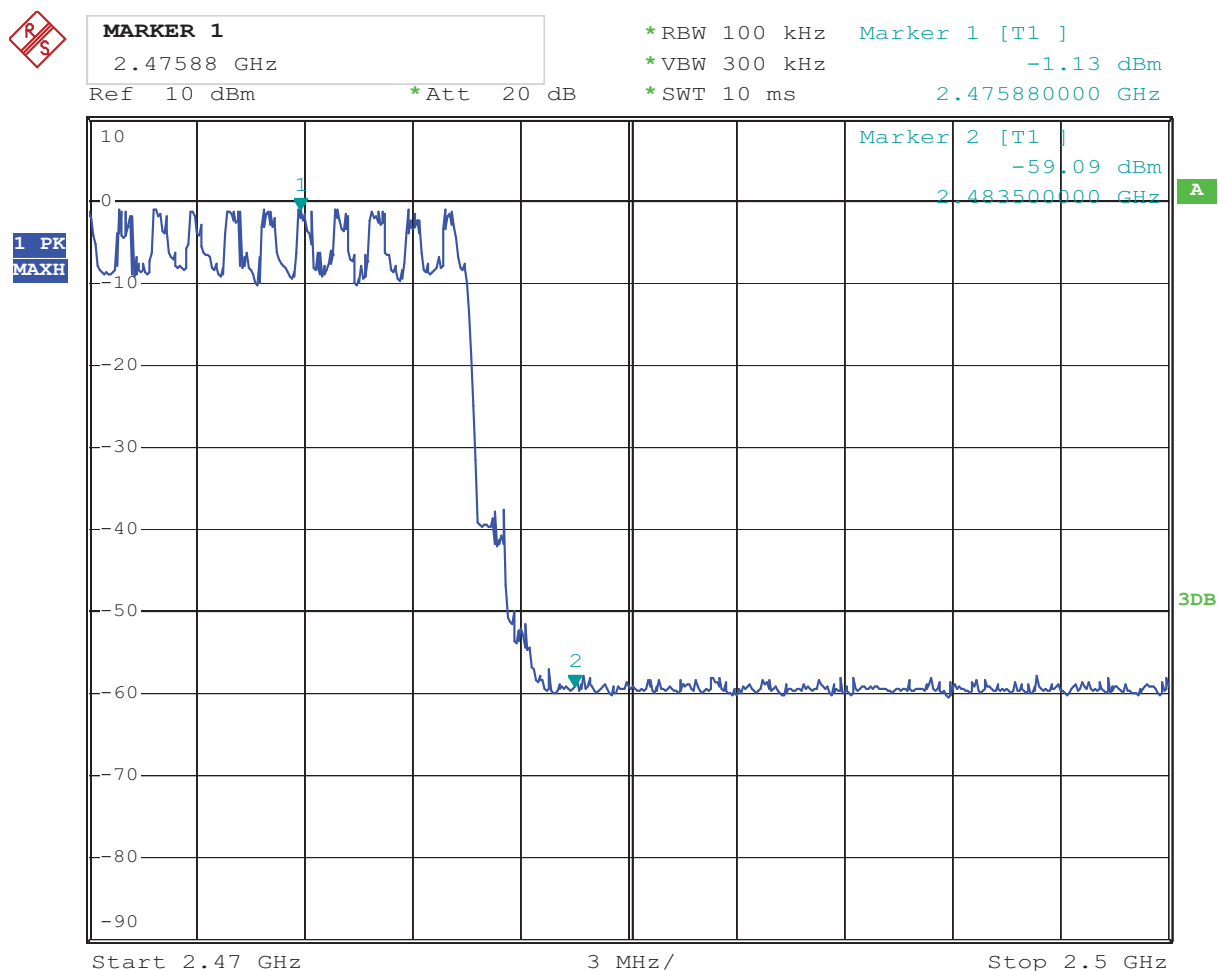
**Type of Modulation: 8DPSK****12.4 Out of Band Test Result**

Product:	MID		Test Mode:	Hopping mode
Mode	Hopping On		Input Voltage	AC120V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
The Max. FS in Restrict Band 2390MHz	PK (dB $\mu$ V/m)	37.1	Limit	74(dB $\mu$ V/m)
	AV(dB $\mu$ V/m)	--		54(dB $\mu$ V/m)

**Test Figure:**

**Type of Modulation: 8DPSK****12.4 Out of Band Test Result**

Product:	MID		Test Mode:	Hopping mode
Mode	Hopping On		Input Voltage	AC120V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
The Max. FS in Restrict Band 2483.5MHz	PK (dB $\mu$ V/m)	39.2	Limit	74(dB $\mu$ V/m)
	AV(dB $\mu$ V/m)	--		54(dB $\mu$ V/m)

**Test Figure:**





### 13.0 Antenna Requirement

#### 13.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 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.

And according to FCC 47 CFR Section 15.247 (b), if transmitter antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

#### 13.2 Antenna Connected constructions

The antenna is integral antenna. The maximum Gain of this antenna is 2.0dBi

#### 14.0 FCC ID Label

**FCC ID: 2AAQZMID727B1-RK326**

**This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.**

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

##### Mark Location:



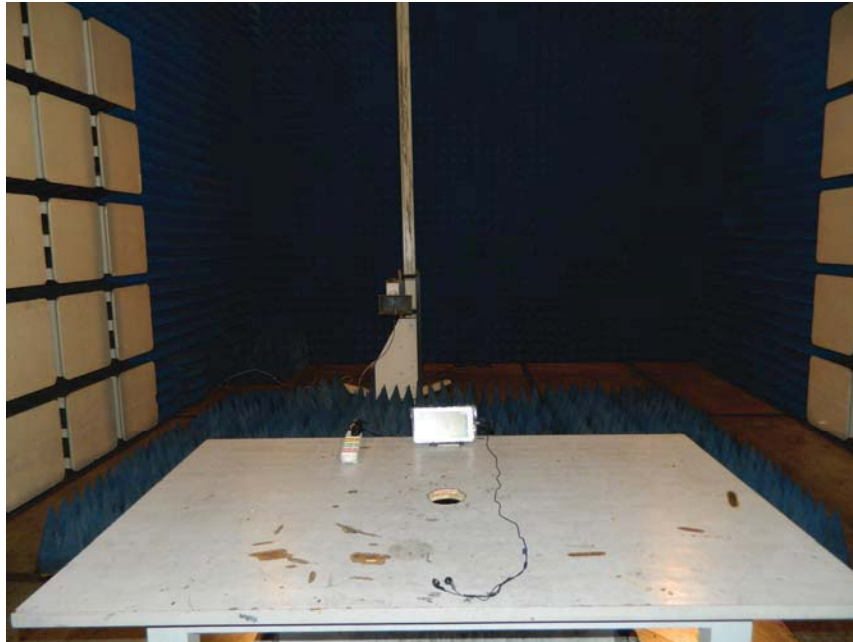
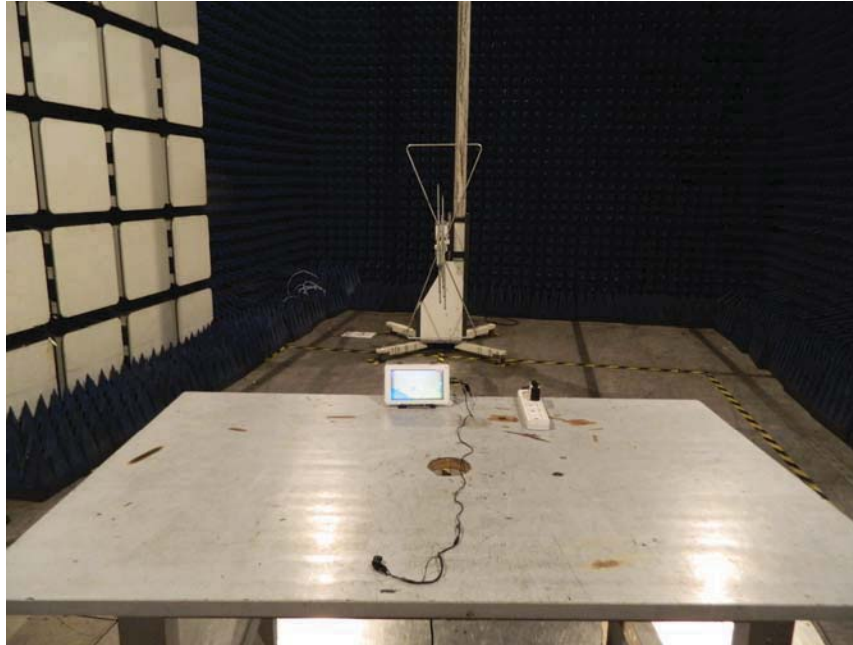
FCC ID Label

## 15 PHOTOGRAPHS OF THE TEST CONFIGURATION

### Conducted Emissions



## Radiated Emissions





## PHOTOGRAPHS OF EUT



Photo 1



Photo 2



Photo 3



Photo 4





Photo 5



Photo 6



Photo 7



Photo 8





Photo 9



Photo 10



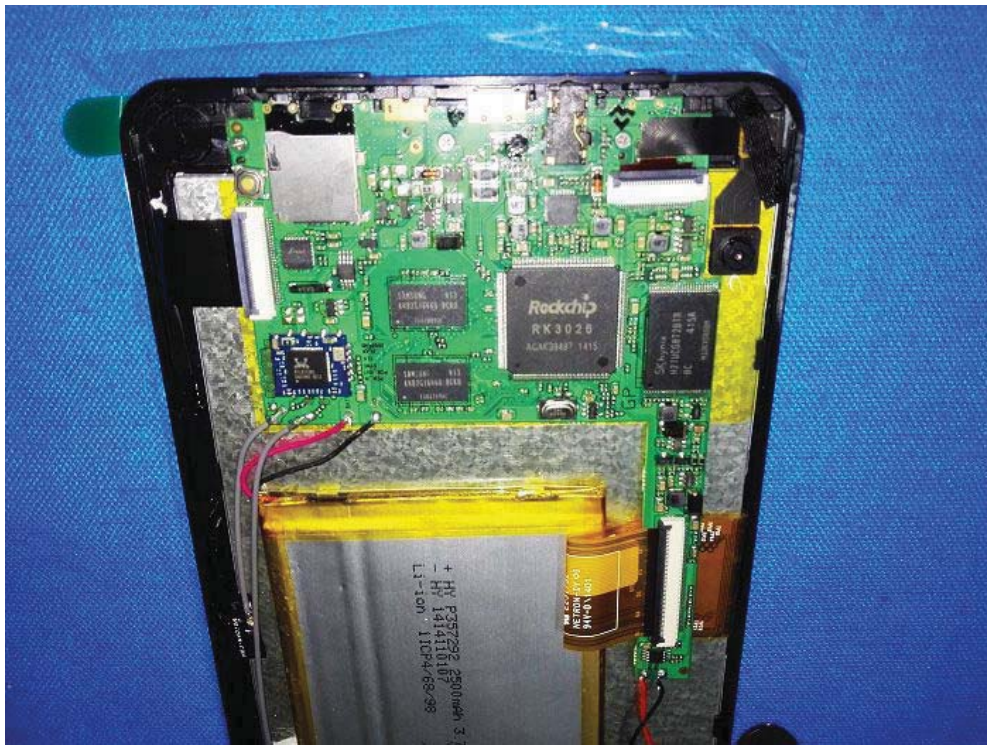


Photo 11



Photo 12



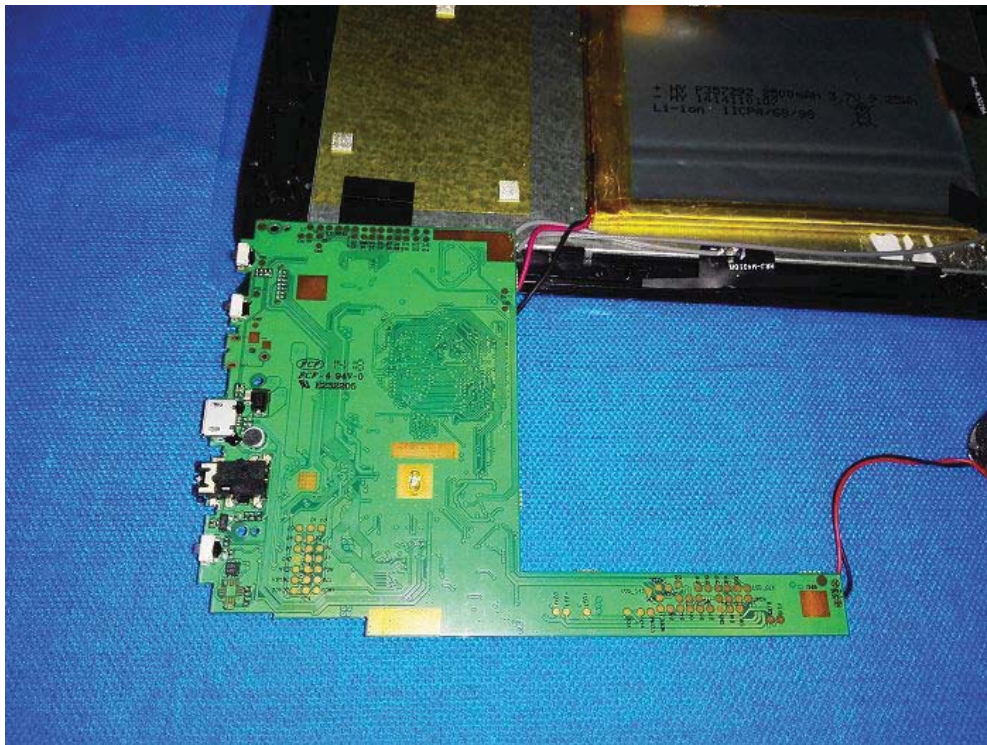


Photo 13



Photo 14 (Alternative Battery)

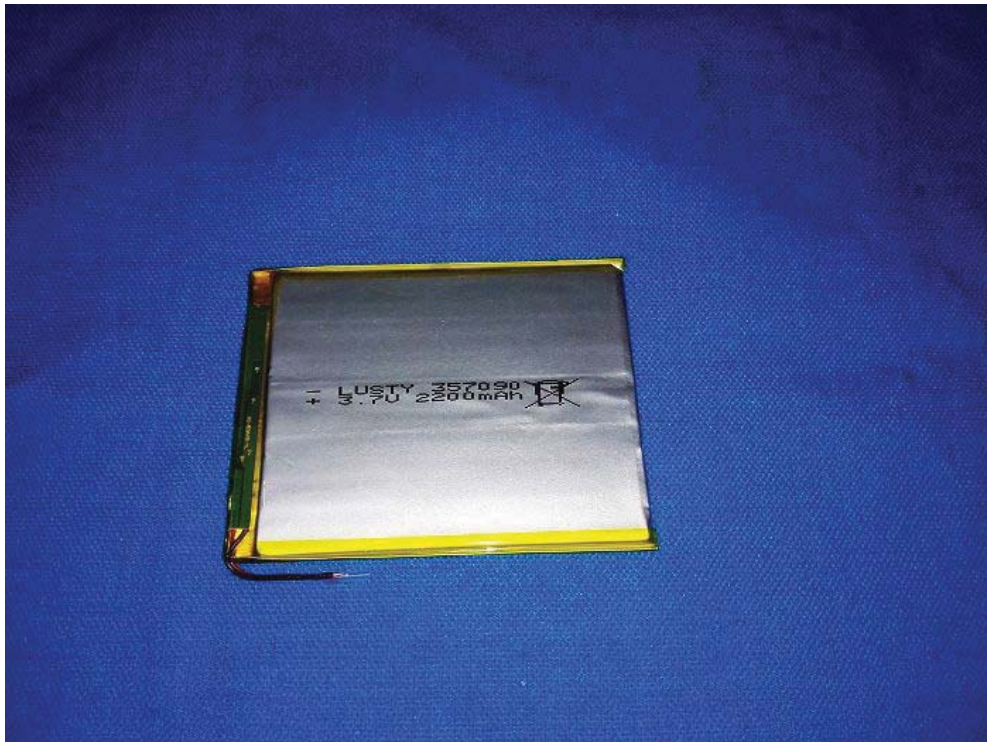


Photo 15 (Additional Battery)



Photo 16 (Additional Battery)





Photo 17 (Additional Battery)

**The Report End**