



### 4.3 NUMBER OF HOPPING FREQUENCY USED

#### 4.3.1 LIMIT OF HOPPING FREQUENCY USED

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

#### 4.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
SPECTRUM ANALYZER	FSEK30	100049	Aug. 14, 2006

**NOTE:** The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

#### 4.3.3 TEST PROCEDURES

- a. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
- b. Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
- c. Set the SA on MaxHold Mode, and then keep the EUT in hopping mode. Record all the signals from each channel until each one has been recorded.
- d. Set the SA on View mode and then plot the result on SA screen.
- e. Repeat above procedures until all frequencies measured were complete.



#### 4.3.4 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.3.5 TEST SETUP

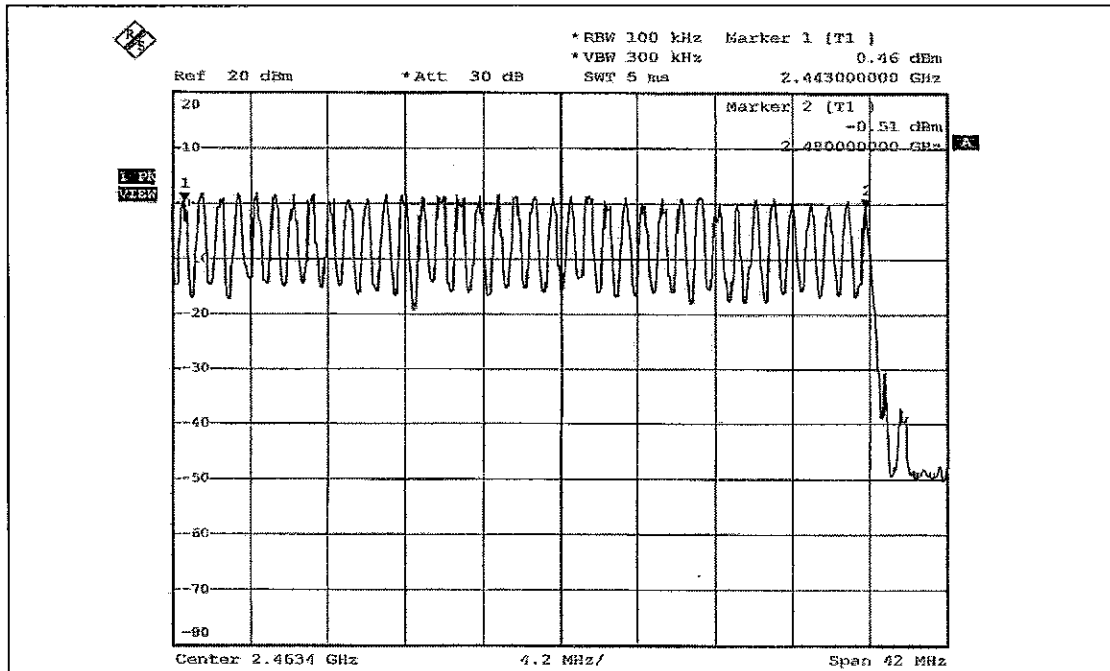
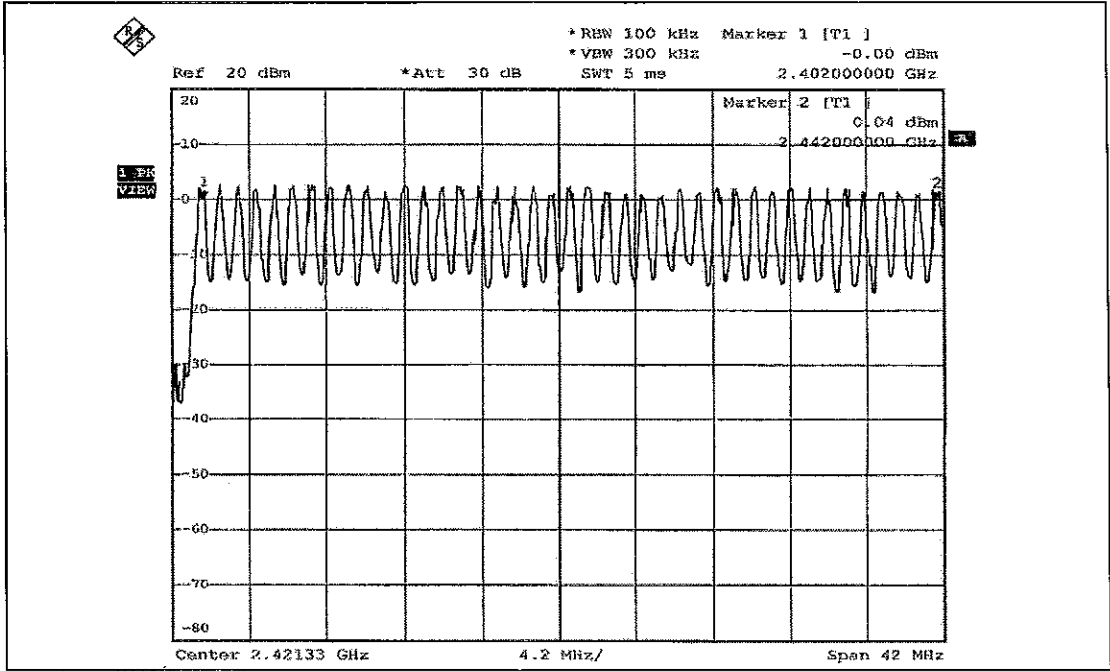


#### 4.3.6 TEST RESULTS

There are 79 hopping frequencies in the hopping mode. Please refer to next two pages for the test result. On the plots, it shows that the hopping frequencies are equally spaced.

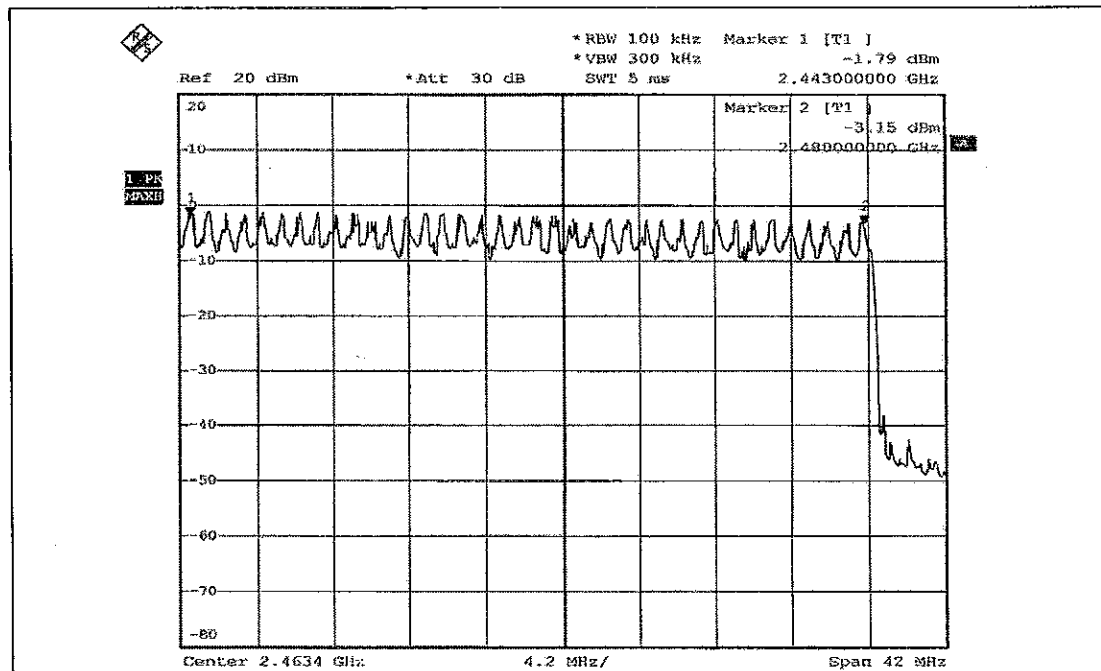
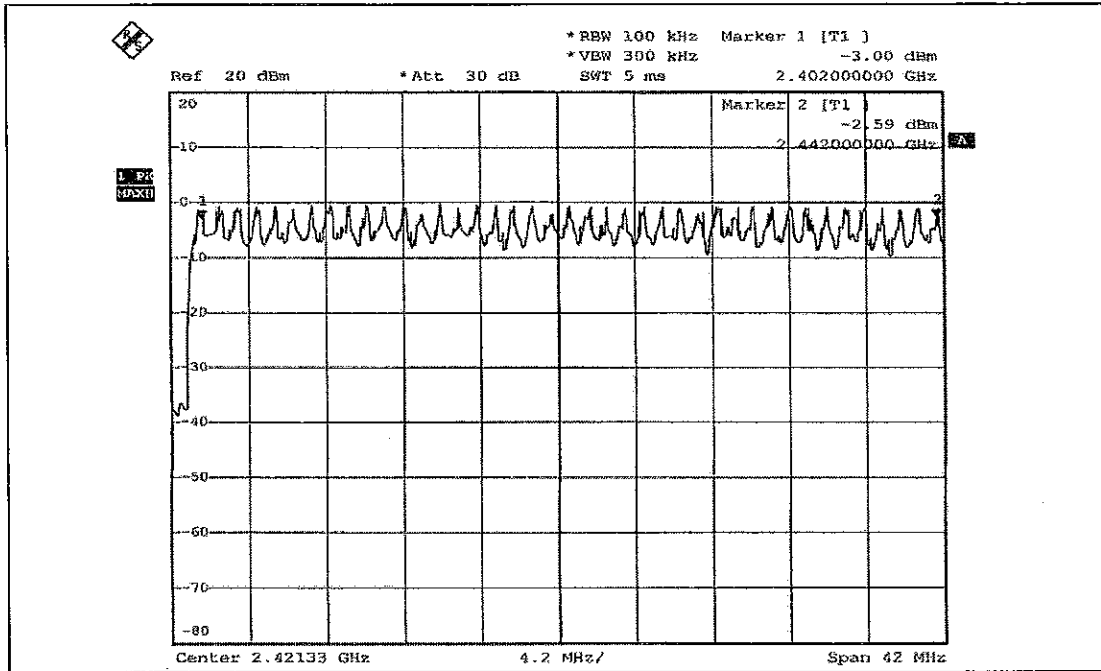


MODE A FOR GFSK





MODE B FOR 8DPSK





#### 4.4 DWELL TIME ON EACH CHANNEL

##### 4.4.1 LIMIT OF DWELL TIME USED

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.

##### 4.4.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
SPECTRUM ANALYZER	FSEK30	100049	Aug. 14, 2006

**NOTES:** The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

##### 4.4.3 TEST PROCEDURES

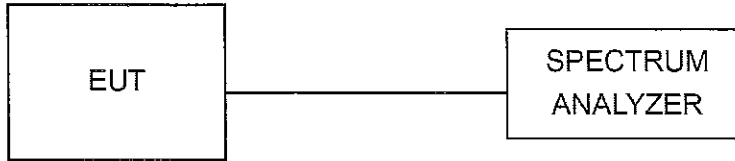
- a. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
- b. Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
- c. Adjust the center frequency of SA on any frequency be measured and set SA to zero span mode. And then, set RBW and VBW of spectrum analyzer to proper value.
- d. Measure the time duration of one transmission on the measured frequency. And then plot the result with time difference of this time duration.
- e. Repeat above procedures until all different time-slot modes have been completed.

##### 4.4.4 DEVIATION FROM TEST STANDARD

No deviation.



4.4.5 TEST SETUP



4.4.6 TEST RESULTS

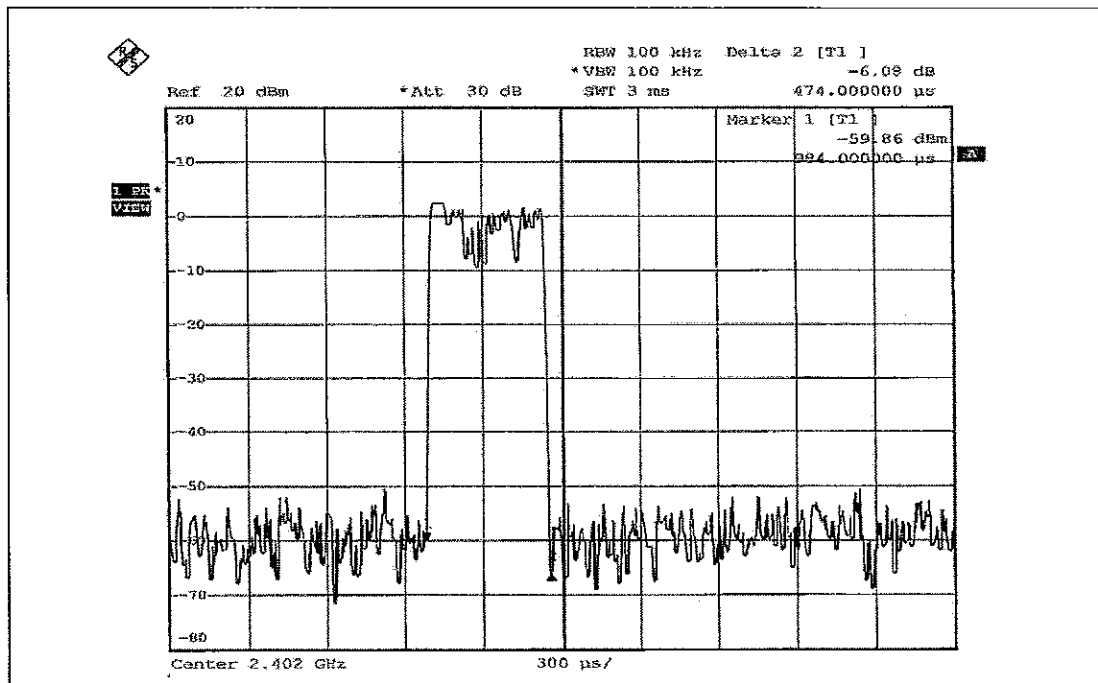
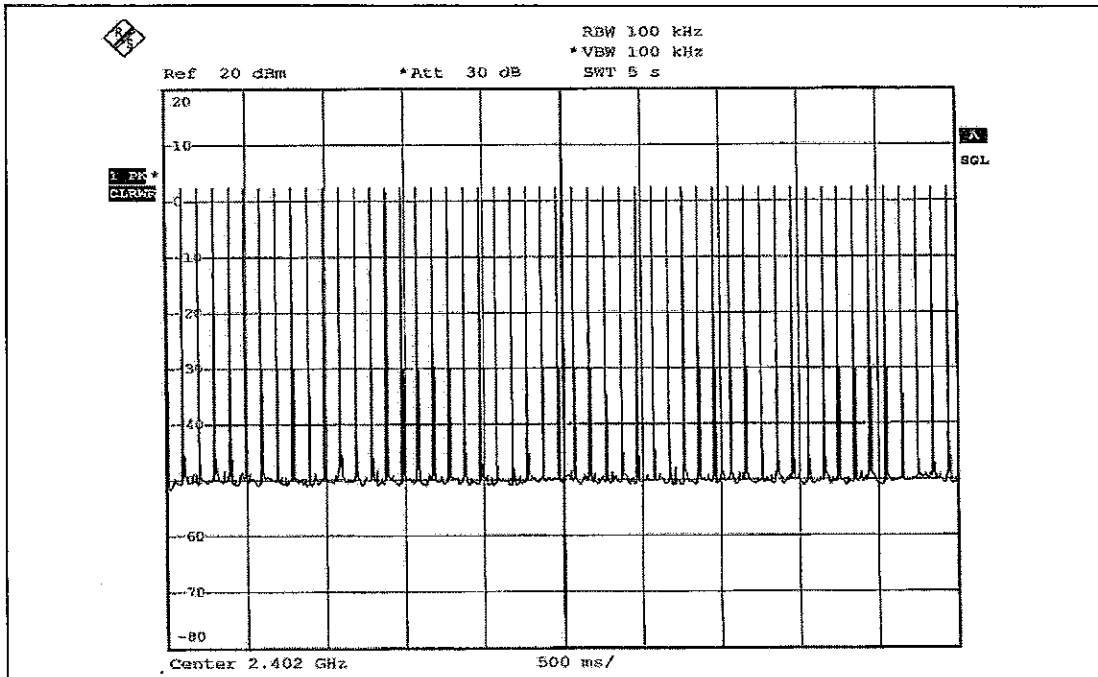
MODE A FOR GFSK

Mode	Number of transmission in a 31.6 (79Hopping*0.4)	Length of transmission time (msec)	Result (msec)	Limit (msec)
DH1	50 (times / 5 sec) *6.32=316.00 times	0.474	149.784	400
DH3	25 (times / 5 sec) *6.32=158.00 times	1.746	275.868	400
DH5	17 (times / 5 sec) *6.32=107.44 times	3.000	322.320	400

NOTE: Test plots of the transmitting time slot are shown on next 3 pages.

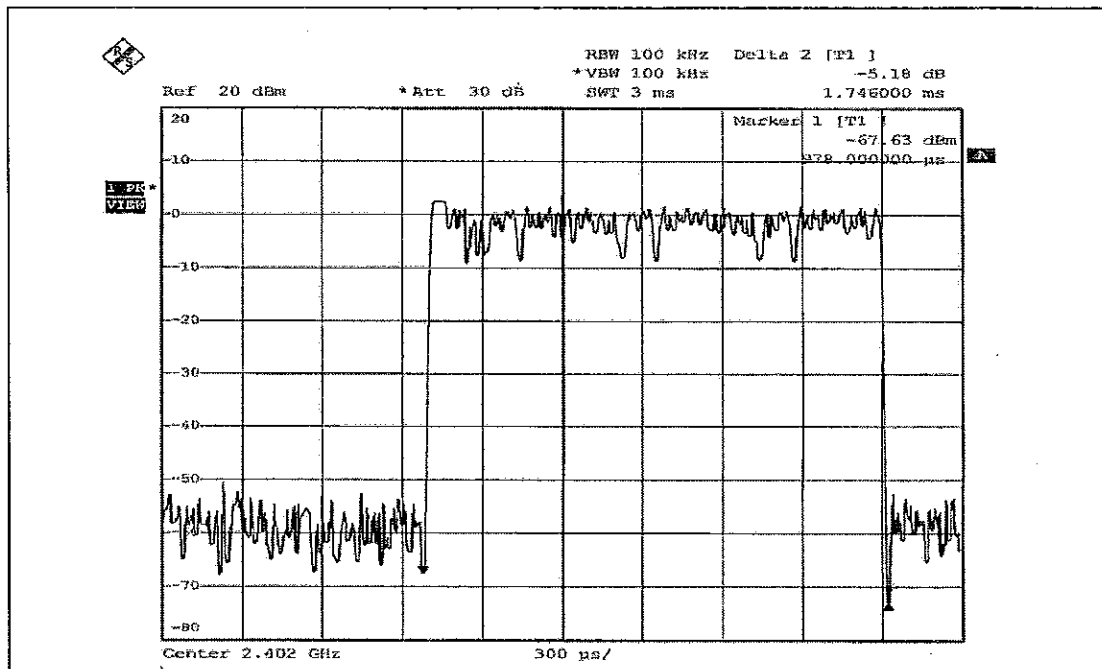
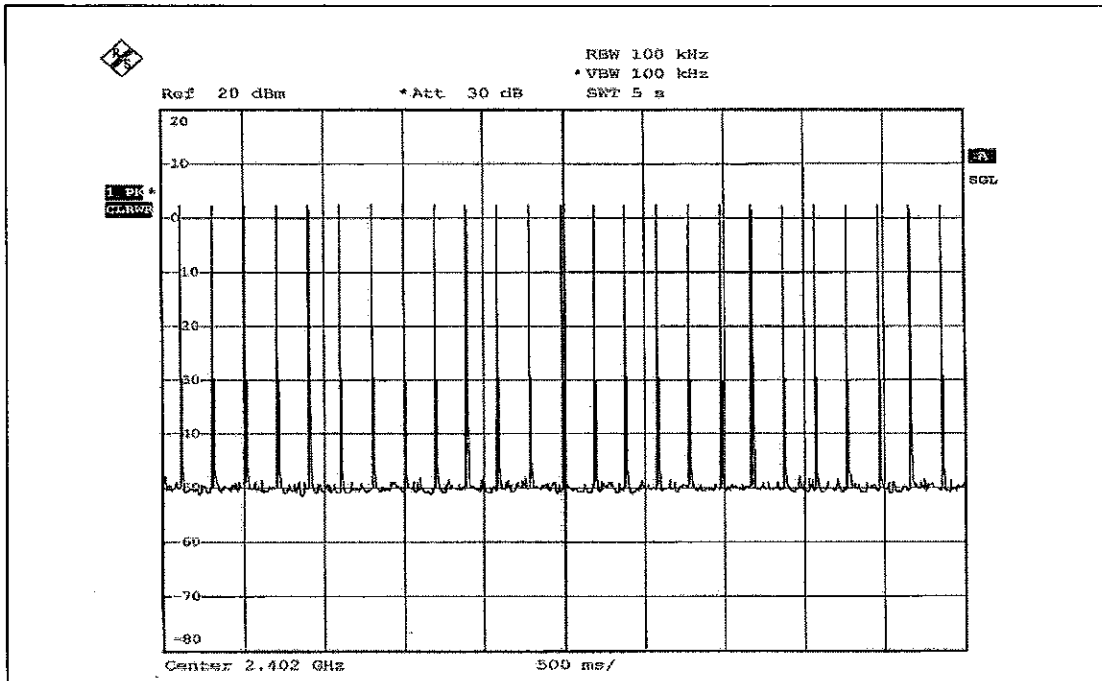


DH1





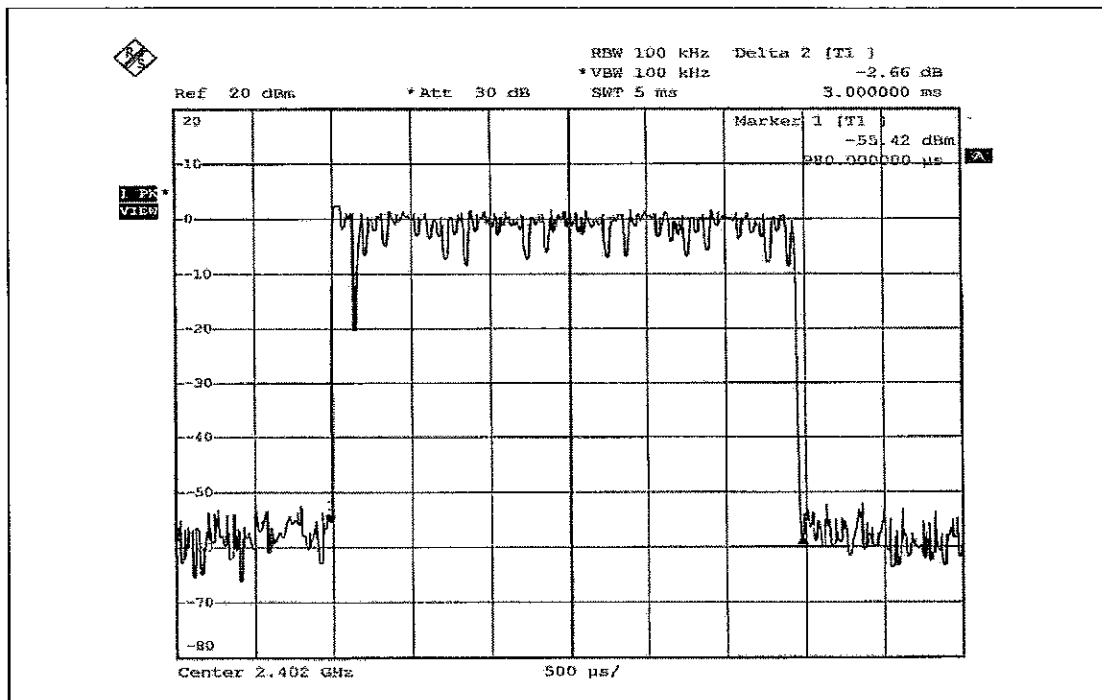
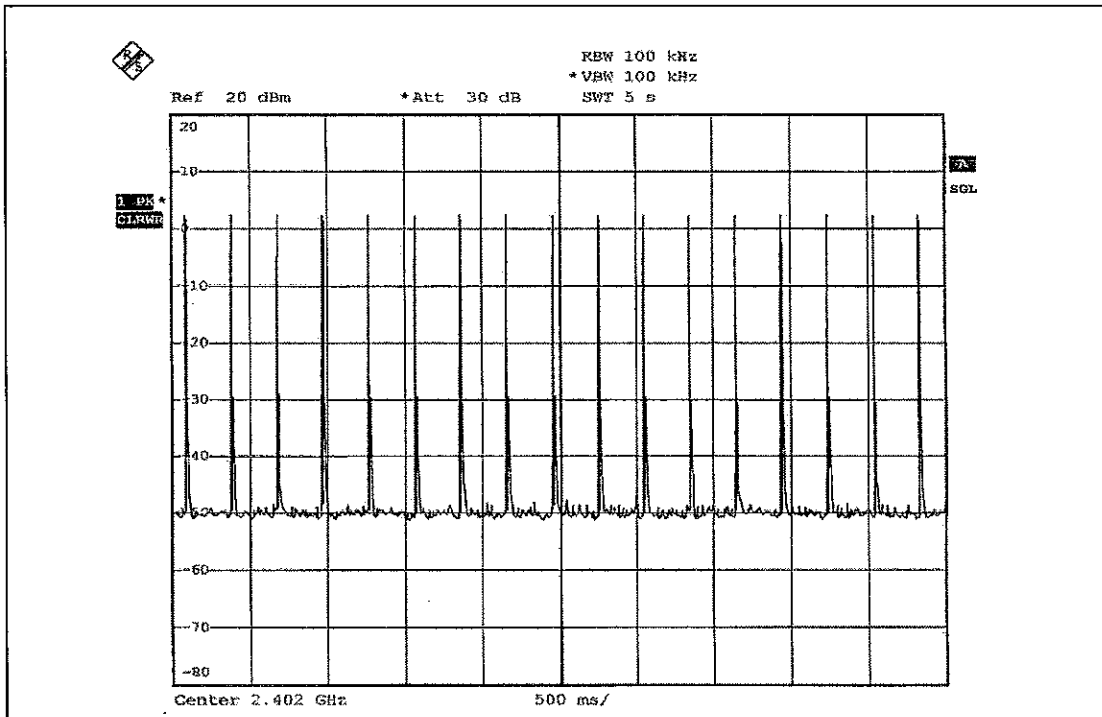
DH3







DH5





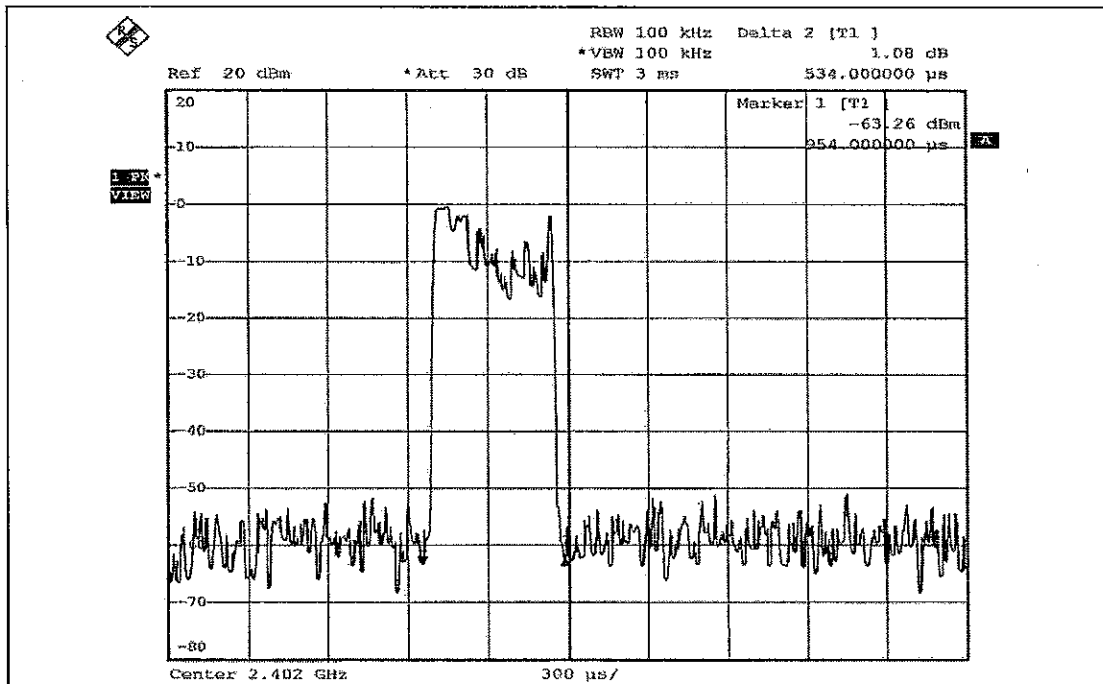
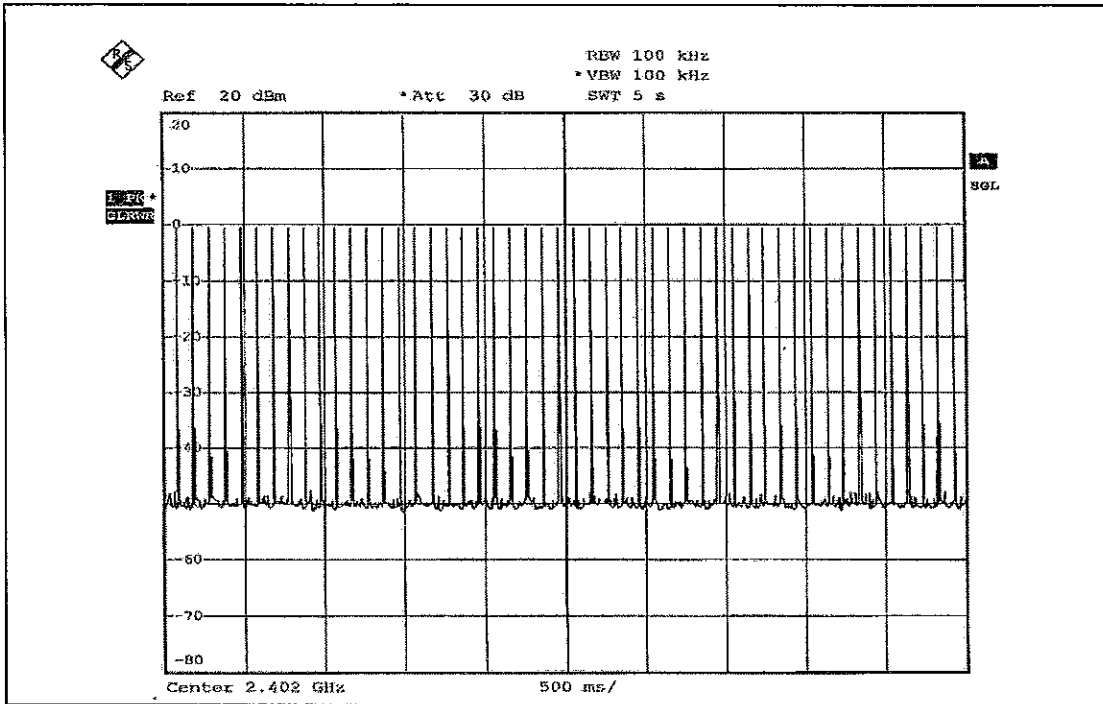
## MODE B FOR 8DPSK

Mode	Number of transmission in a 31.6 (79Hopping*0.4)	Length of transmission time (msec)	Result (msec)	Limit (msec)
DH1	50 (times / 5 sec) *6.32=316.00 times	0.534	168.744	400
DH3	25 (times / 5 sec) *6.32=158.00 times	1.818	287.244	400
DH5	17 (times / 5 sec) *6.32=107.44 times	3.010	323.394	400

**NOTE:** Test plots of the transmitting time slot are shown on next 3 pages.

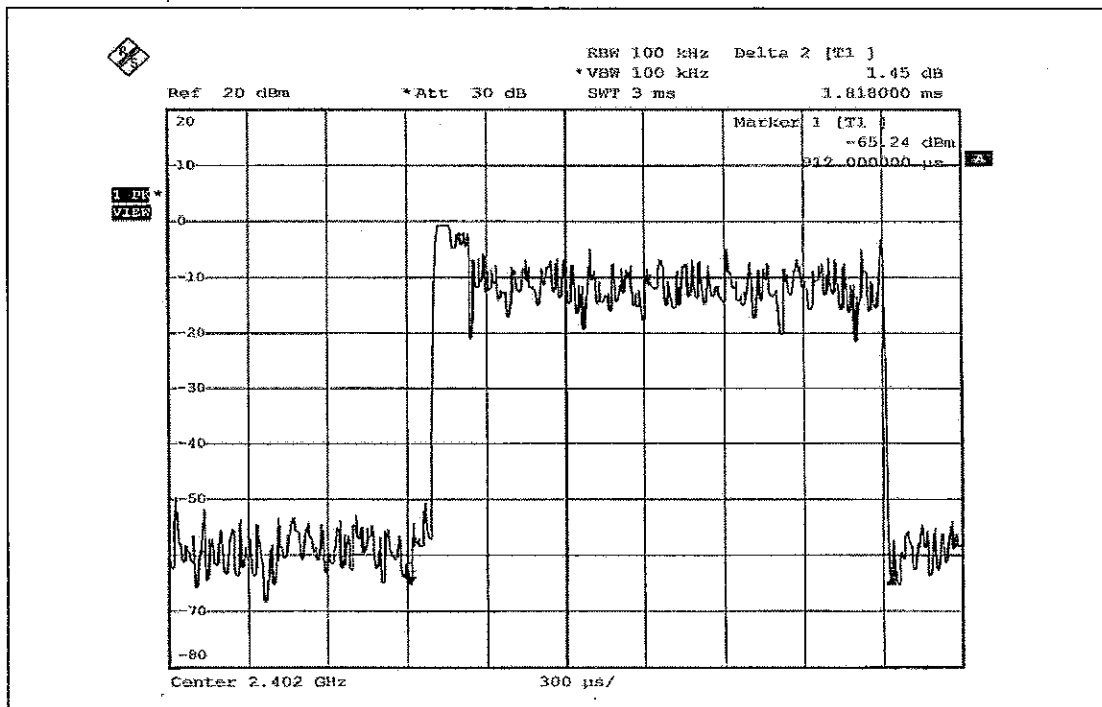
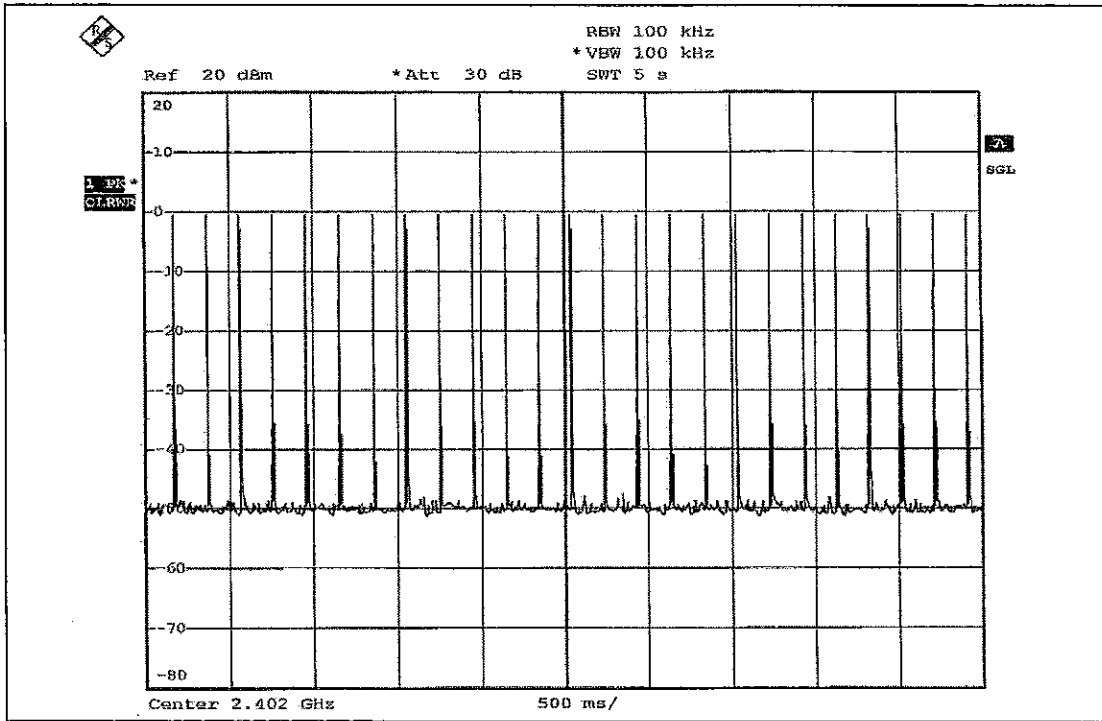


DH1



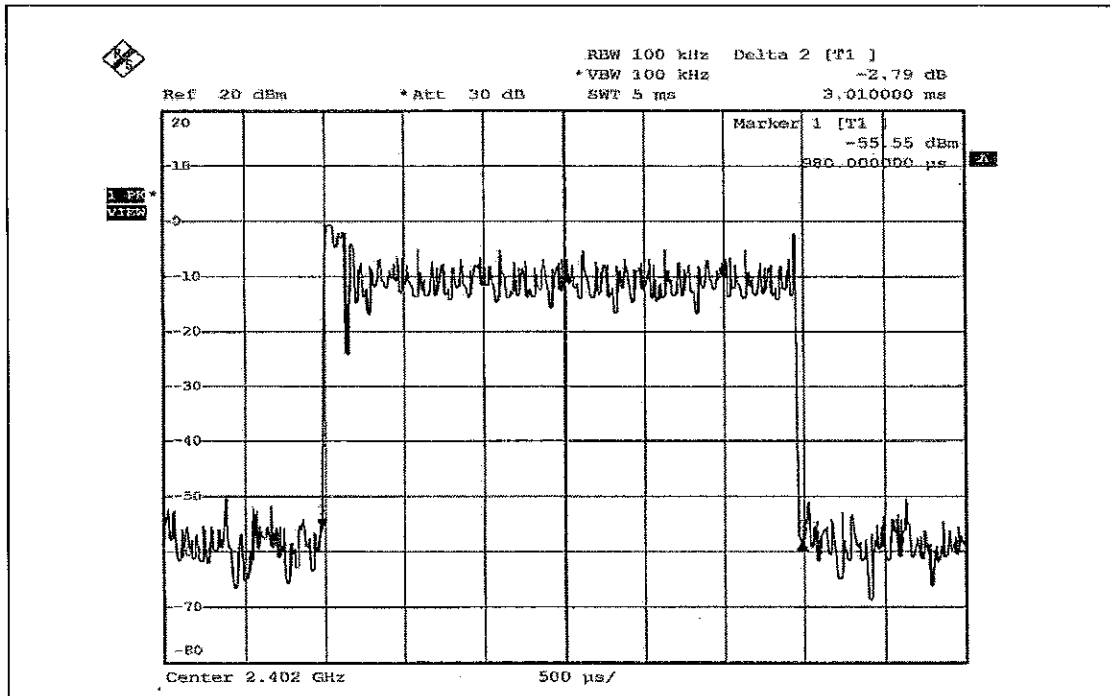
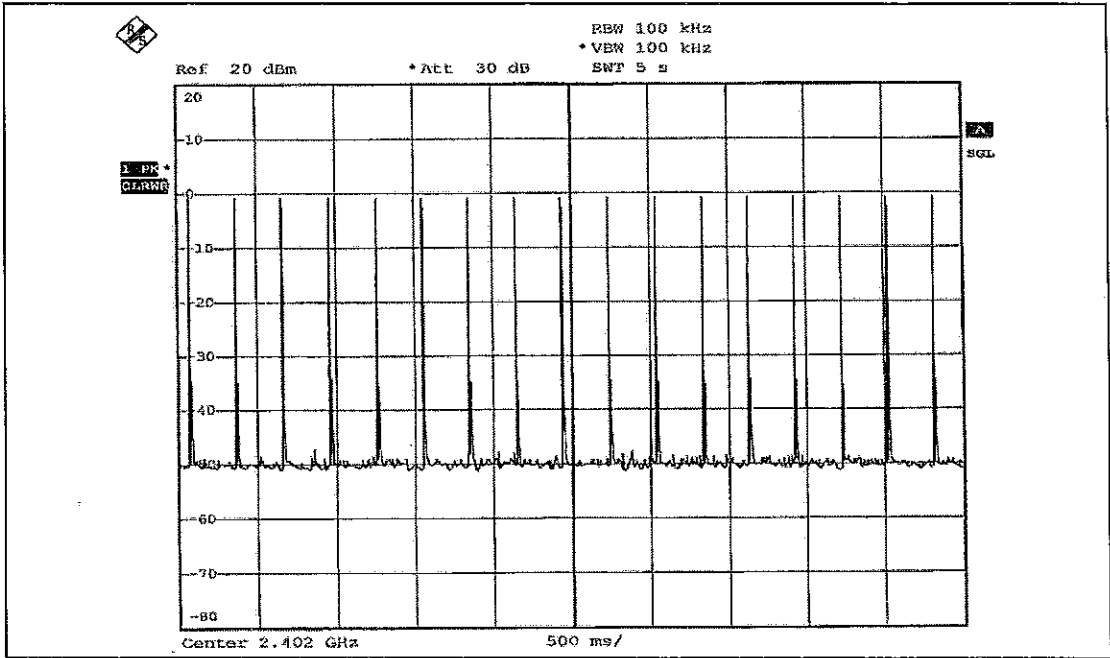


DH3





DH5





## 4.5 CHANNEL BANDWIDTH

### 4.5.1 LIMITS OF CHANNEL BANDWIDTH

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

### 4.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
SPECTRUM ANALYZER	FSEK30	100049	Aug. 14, 2006

**NOTE:** The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

### 4.5.3 TEST PROCEDURE

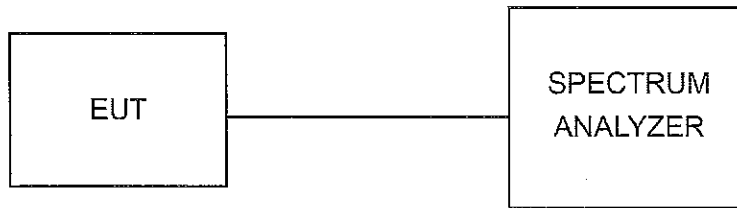
- a. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the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



4.5.4 DEVIATION FROM TEST STANDARD

No deviation.

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITION

The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

4.5.7 TEST RESULTS

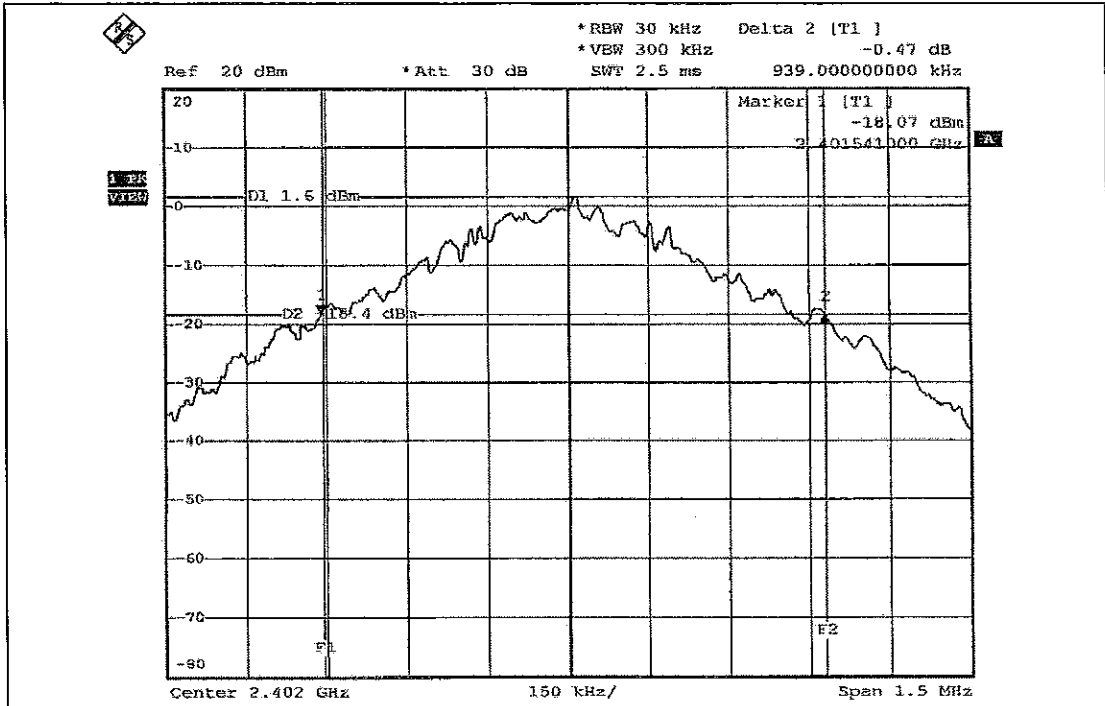
MODE A FOR GFSK

EUT TEST CONDITION		MEASUREMENT DETAIL	
MODULATION TYPE	GFSK	ENVIRONMENTAL CONDITIONS	27deg. C, 65%RH, 991hPa
TESTED BY	Long Chen	INPUT POWER (SYSTEM)	120Vac, 60 Hz

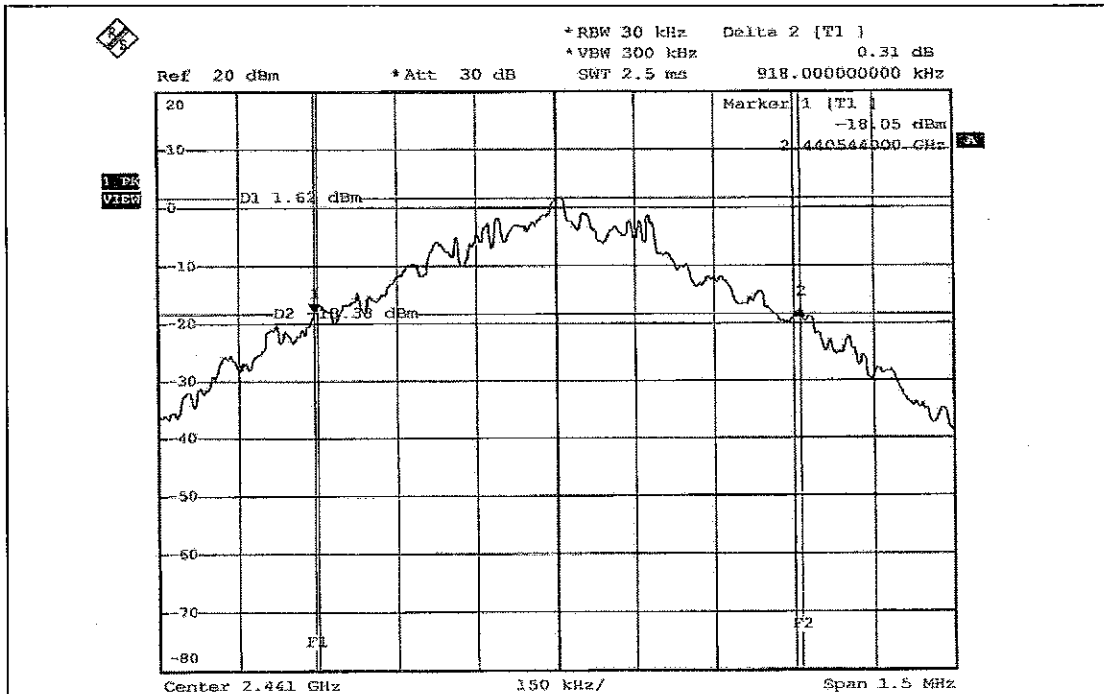
CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (MHz)
0	2402	0.939
39	2441	0.918
78	2480	0.933



CH 0



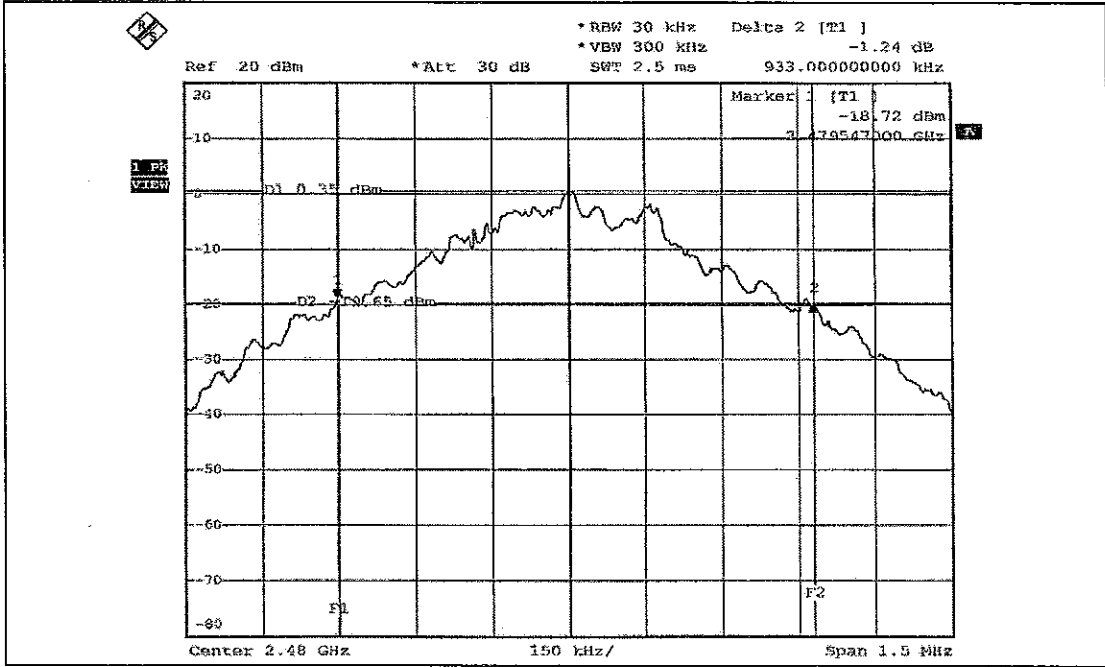
CH 39







CH 78





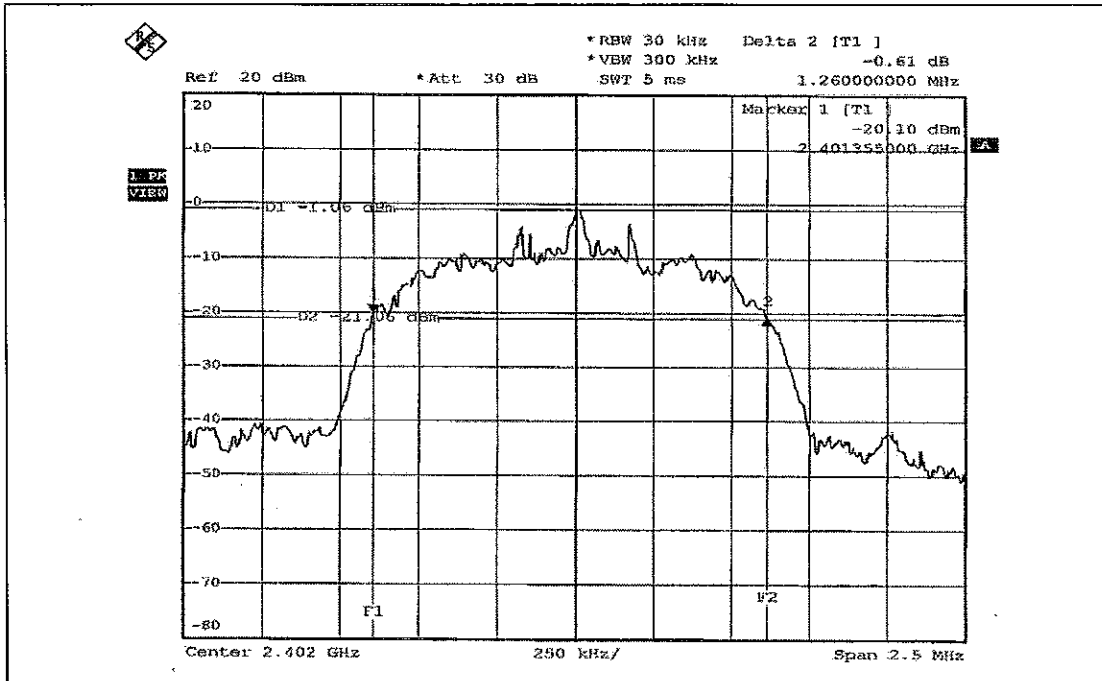
MODE B FOR 8DPSK

EUT TEST CONDITION		MEASUREMENT DETAIL	
MODULATION TYPE	8DPSK	ENVIRONMENTAL CONDITIONS	27deg. C, 65%RH, 991hPa
TESTED BY	Long Chen	INPUT POWER (SYSTEM)	120Vac, 60 Hz

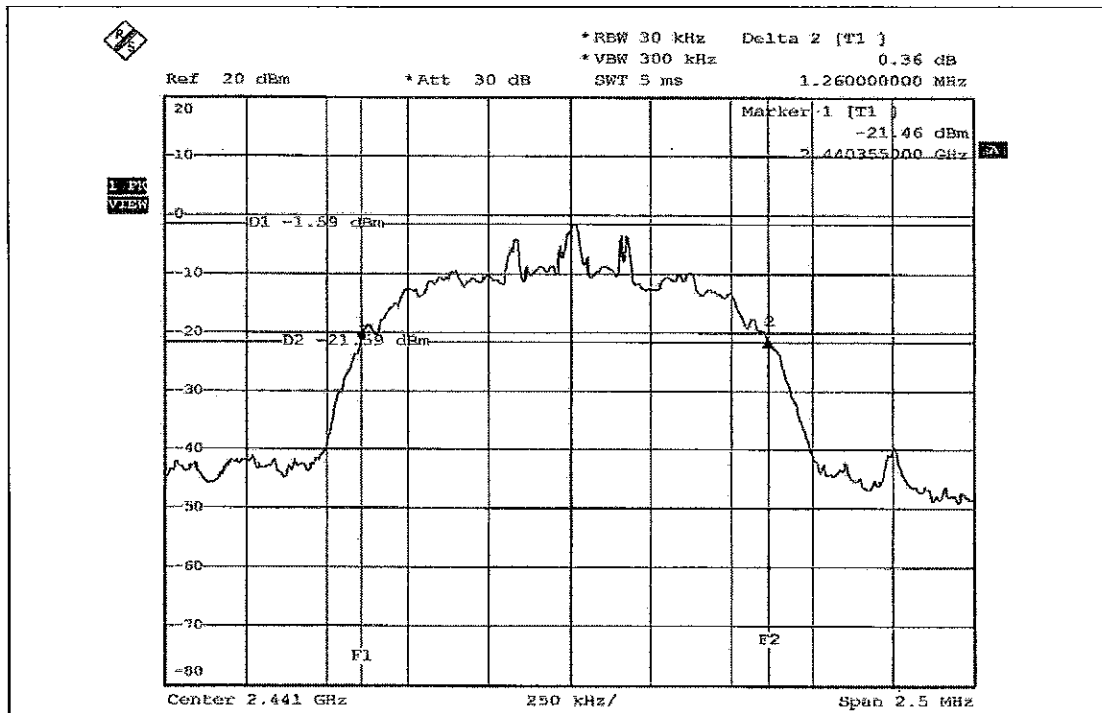
CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (MHz)
0	2402	1.260
39	2441	1.260
78	2480	1.265



CH 0

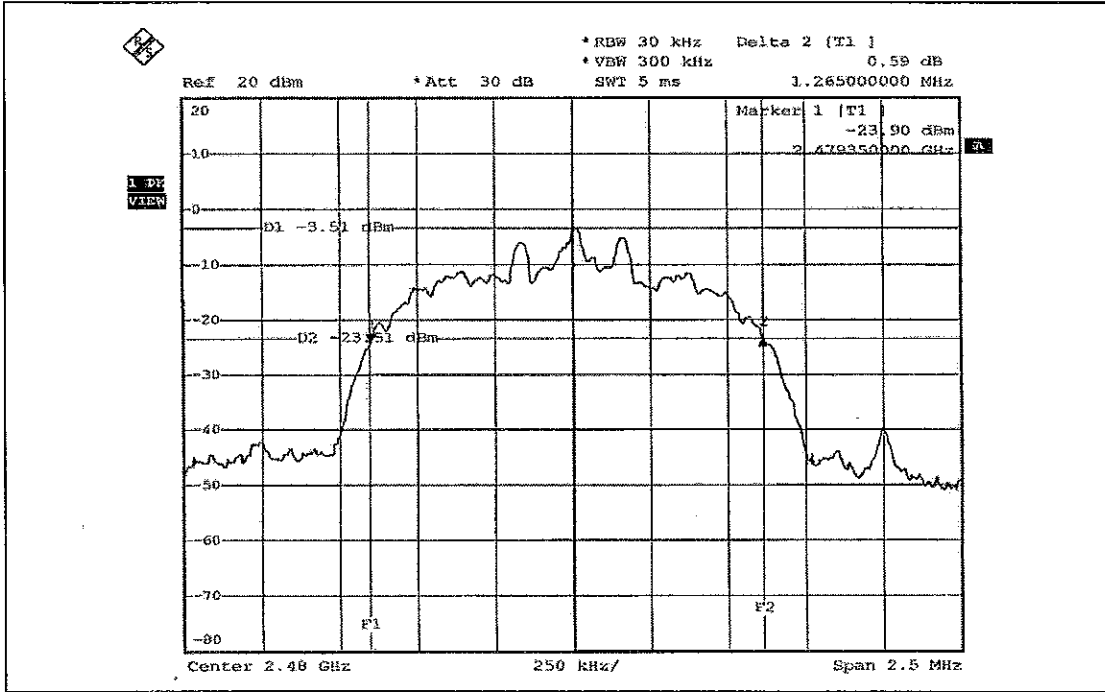


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## 4.6 HOPPING CHANNEL SEPARATION

### 4.6.1 LIMIT OF HOPPING CHANNEL SEPARATION

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

### 4.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
SPECTRUM ANALYZER	FSEK30	100049	Aug. 14, 2006

**NOTES:** The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

### 4.6.3 TEST PROCEDURES

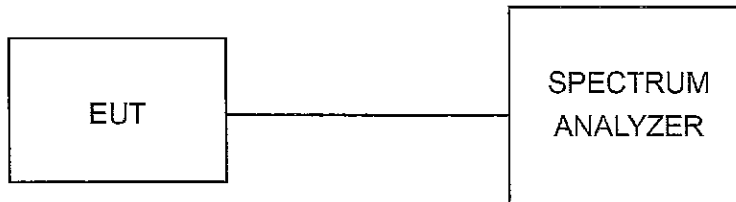
1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range.
3. By using the MaxHold function record the separation of two adjacent channels.
4. Measure the frequency difference of these two adjacent channels by SA MARK function. And then plot the result on SA screen.
5. Repeat above procedures until all frequencies measured were complete.



4.6.4 DEVIATION FROM TEST STANDARD

No deviation.

4.6.5 TEST SETUP



4.6.6 TEST RESULTS

MODE A FOR GFSK

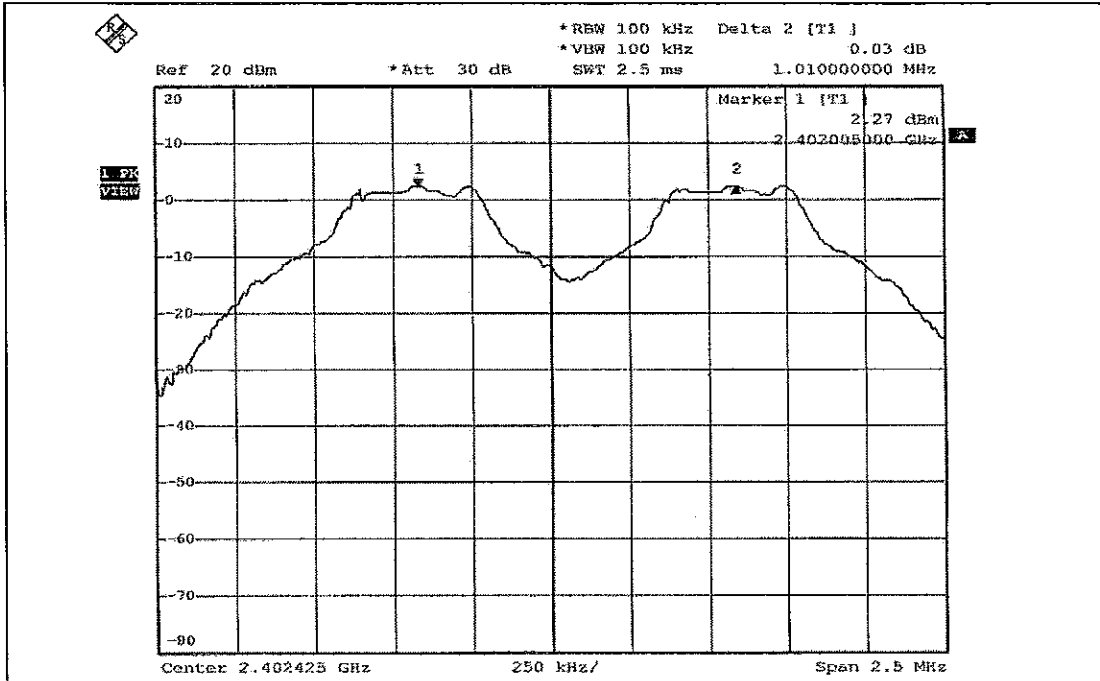
EUT TEST CONDITION		MEASUREMENT DETAIL	
MODULATION TYPE	GFSK	ENVIRONMENTAL CONDITIONS	27deg. C, 65%RH, 991hPa
TESTED BY	Long Chen	INPUT POWER (SYSTEM)	120Vac, 60 Hz

CHANNEL	FREQUENCY (MHz)	ADJACENT CHANNEL SEPARATION (MHz)	20dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
0	2402	1.010	0.939	0.626	PASS
39	2441	1.010	0.918	0.612	PASS
78	2480	1.005	0.933	0.622	PASS

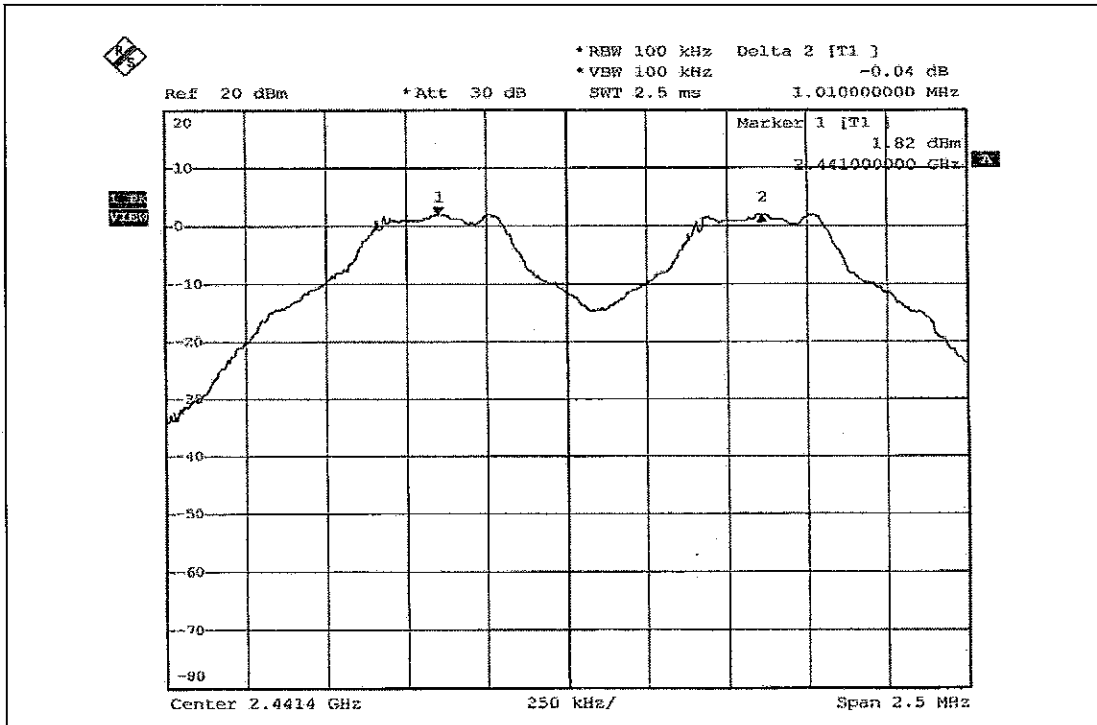
NOTE: The minimum limit is two-third 20dB bandwidth. Test results please refer to next two pages.



CH 0

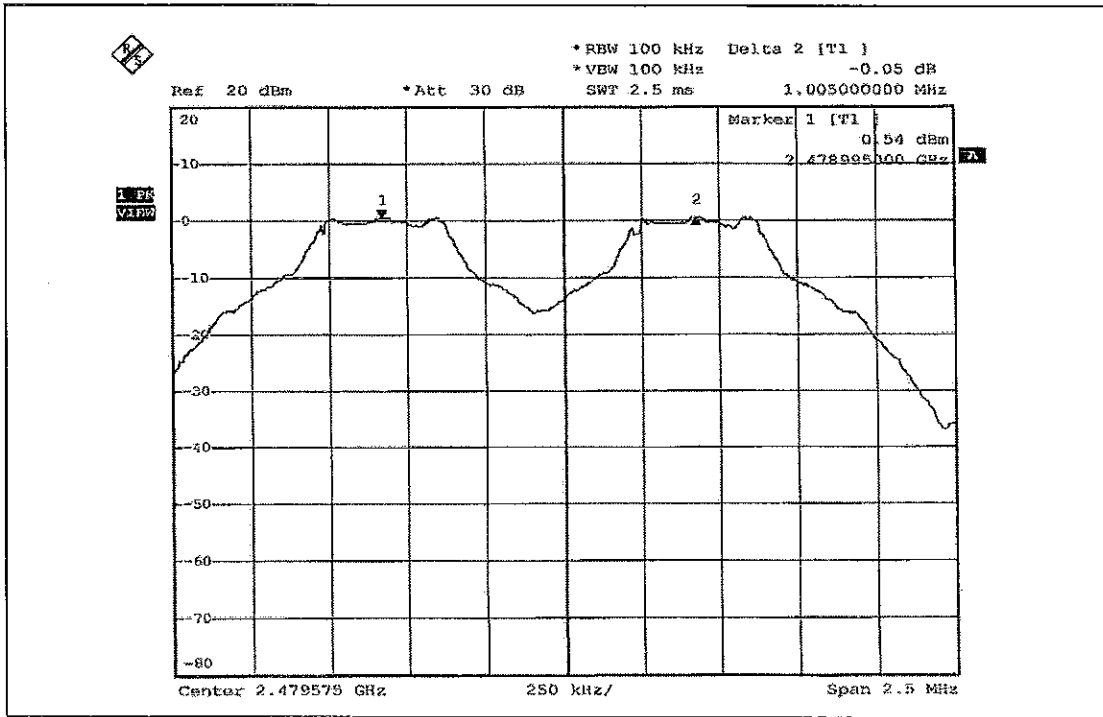


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## MODE B FOR 8DPSK

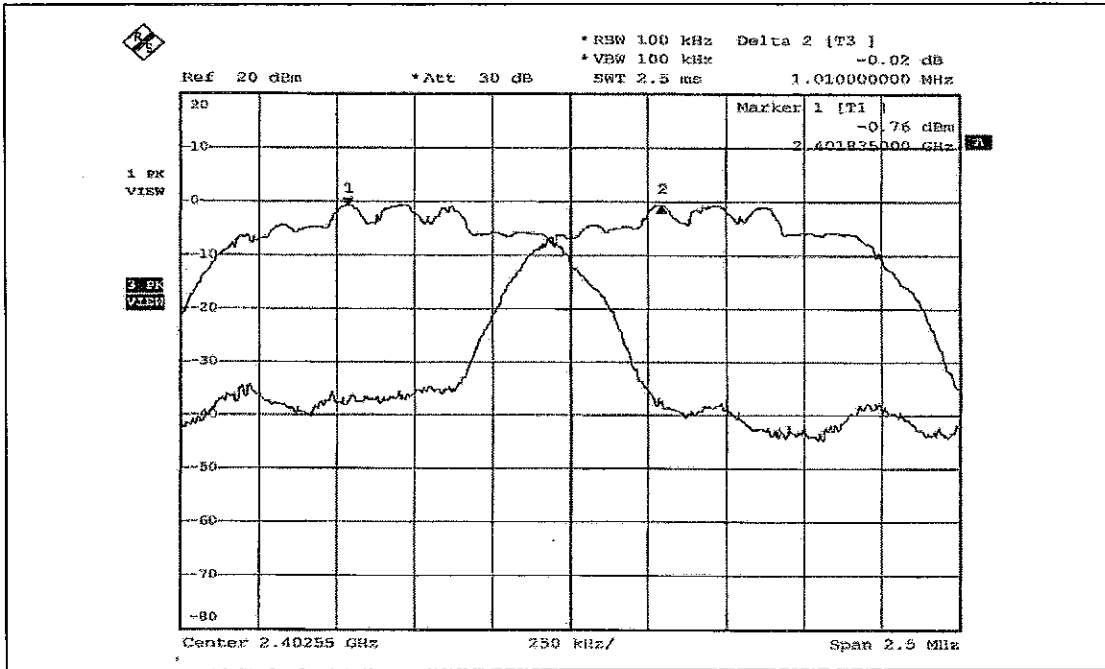
EUT TEST CONDITION		MEASUREMENT DETAIL	
MODULATION TYPE	8DPSK	ENVIRONMENTAL CONDITIONS	27deg. C, 65%RH, 991hPa
TESTED BY	Long Chen	INPUT POWER (SYSTEM)	120Vac, 60 Hz

CHANNEL	FREQUENCY (MHz)	ADJACENT CHANNEL SEPARATION (MHz)	20dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
0	2402	1.010	1.260	0.840	PASS
39	2441	1.000	1.260	0.840	PASS
78	2480	1.000	1.265	0.843	PASS

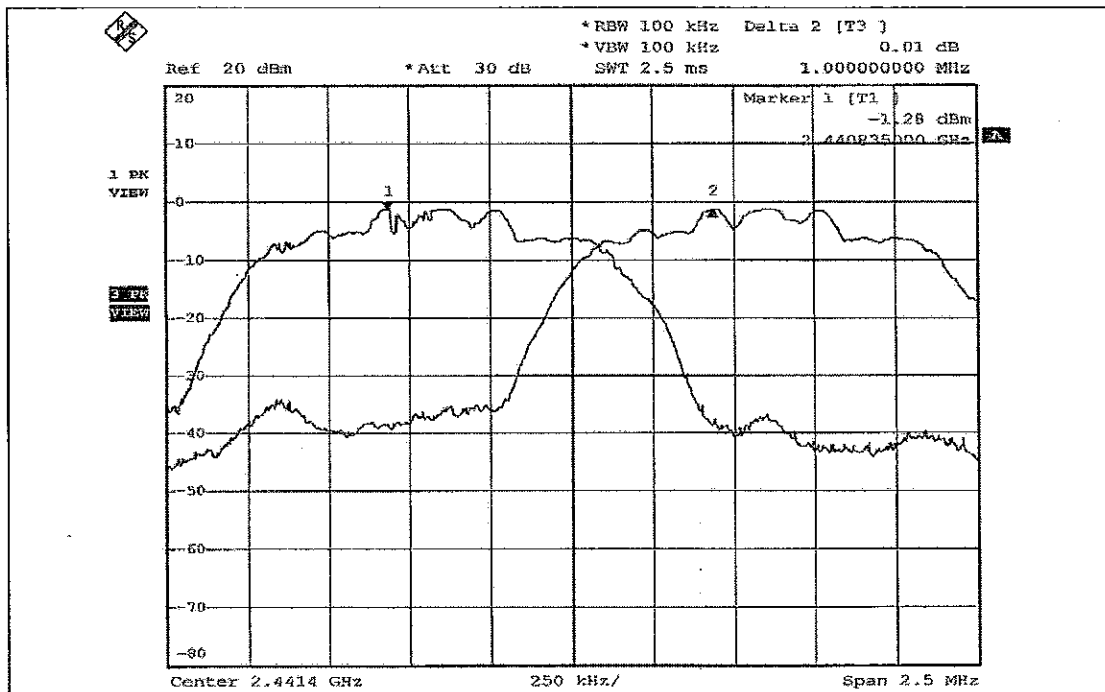
NOTE: The minimum limit is two-third 20dB bandwidth. Test results please refer to next two pages.



CH 0



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