FCC TEST REPORT

REPORT NO.: RF980305H02C
MODEL NO.: 21-121559
RECEIVED: Sep. 25, 2009
TESTED: Oct. 12 to Nov. 09, 2009
ISSUED: Nov. 18, 2009

APPLICANT: Motorola Inc.

ADDRESS: One Motorola Plaza Holtsville, NY 11742

ISSUED BY: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

LAB LOCATION: No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan

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1 CERTIFICATION

PRODUCT :	21-121559-01
BRAND NAME :	motorola
MODEL NO. :	21-121559
APPLICANT :	Motorola Inc.
TESTED DATE:	Oct. 12 to Nov. 09, 2009
TEST SAMPLE :	ENGINEERING SAMPLE
STANDARDS :	47 CFR Part 15, Subpart C (Section 15.247), ANSI C63.4-2003

The above equipment (Model: 21-121559) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : _____ , **DATE:** Nov. 18, 2009
(Midoli Peng, Specialist)

TECHNICAL ACCEPTANCE : _____ , **DATE:** Nov. 18, 2009
(Hank Chung, Deputy Manager)

APPROVED BY : _____ , **DATE:** Nov. 18, 2009
(May Chen, Deputy Manager)

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: 47 CFR Part 15, Subpart C			
Standard Section	**Test Type and Limit**	**Result**	**REMARK**
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit Minimum passing margin is -16.95dB at 4.098 MHz
15.247(a)(1)(I)	Number of Hopping Frequency Used Spec.:	PASS	Meet the requirement of limit
15.247(a)(1)(i)	Dwell Time on Each Channel Spec. : Max. 0.4 second	PASS	Meet the requirement of limit
15.247(a)(1)	Hopping Channel Separation Spec. : Min. 25 kHz or 20 dB bandwidth, which ever is greater	PASS	Meet the requirement of limit
15.247(a)(1)(i)	Spectrum Bandwidth of a Frequency Hopping Sequence Spread Spectrum System Spec.: Max. 0.5 MHz	PASS	Meet the requirement of limit
15.247(b)(2)	Maximum Peak Output Power Spec.: max. 30dBm	PASS	Meet the requirement of limit
15.247(d)	Transmitter Radiated Emissions Spec.: Table 15.209	PASS	Meet the requirement of limit Minimum passing margin is -8.19dB at 900.00MHz
15.247(d)	Conducted Out-Band Emission Measurement	PASS	Meet the requirement of limit

2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Measurement	Value
Conducted emissions	2.44 dB
Radiated emissions (30MHz-1GHz)	3.94 dB
Radiated emissions (1GHz ~18GHz)	2.49 dB
Radiated emissions (18GHz ~40GHz)	2.70 dB

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	21-121559-01
MODEL NO.	21-121559
FCC ID	UZ721121559
POWER SUPPLY	DC 5V from DC power supply
MODULATION TYPE	For 500kHz PR-ASK(DRM), DSB-ASK(MRM), PR-ASK(XRM)
	For 200kHz PR-ASK(DRM), PR-ASK(XRM)
MODULATION TECHNOLOGY	FHSS
FREQUENCY RANGE	902.75MHz ~ 927.25MHz <500kHz> 902.6MHz ~927.4 MHz <200kHz>
NUMBER OF CHANNEL	For 500kHz : 50 For 200kHz : 125
OUTPUT POWER	For 500kHz PR-ASK(XRM): 812.8mW PR-ASK(DRM): 602.6mW DSB-ASK(MRM): 776.2mW
	For 200kHz PR-ASK(XRM): 794.3mW PR-ASK(DRM): 575.4mW
ANTENNA TYPE	Please see note 2
DATA CABLE	NA
I/O PORTS	NA
ASSOCIATED DEVICES	NA

NOTE:

1. This report is prepared for FCC class II permissive change. The difference compared with the Report No.: RF980305H02B design is as the following:
   - ◆ Adding 200K channels by firmware enabling and fine tuning R42, R49 and RN1 for better DC supply efficiency. All other RF characteristics remains no change.
2. There is one antenna provided to this EUT:

Antenna Type	Connector Type	Gain (dBi)	Cable loss (dB)	Net Gain (dBi)
Dipole Antenna	SMA Female	2	0.3	1.7

3. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 DESCRIPTION OF TEST MODES

500kHz: Frequency Range <902.75MHz ~ 927.25>

50 channels are provided to this EUT.

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
0	902.75	21	913.25	42	923.75
1	903.25	22	913.75	43	924.25
2	903.75	23	914.25	44	924.75
3	904.25	24	914.75	45	925.25
4	904.75	25	915.25	46	925.75
5	905.25	26	915.75	47	926.25
6	905.75	27	916.25	48	926.75
7	906.25	28	916.75	49	927.25
8	906.75	29	917.25		
9	907.25	30	917.75		
10	907.75	31	918.25		
11	908.25	32	918.75		
12	908.75	33	919.25		
13	909.25	34	919.75		
14	909.75	35	920.25		
15	910.25	36	920.75		
16	910.75	37	921.25		
17	911.25	38	921.75		
18	911.75	39	922.25		
19	912.25	40	922.75		
20	912.75	41	923.25		

200kHz: Frequency Range <902.6MHz ~927.4 MHz >

125 channels are provided to this EUT.

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
0	902.60	32	909.00	64	915.40	96	921.80
1	902.80	33	909.20	65	915.60	97	922.00
2	903.00	34	909.40	66	915.80	98	922.20
3	903.20	35	909.60	67	916.00	99	922.40
4	903.40	36	909.80	68	916.20	100	922.60
5	903.60	37	910.00	69	916.40	101	922.80
6	903.80	38	910.20	70	916.60	102	923.00
7	904.00	39	910.40	71	916.80	103	923.20
8	904.20	40	910.60	72	917.00	104	923.40
9	904.40	41	910.80	73	917.20	105	923.60
10	904.60	42	911.00	74	917.40	106	923.80
11	904.80	43	911.20	75	917.60	107	924.00
12	905.00	44	911.40	76	917.80	108	924.20
13	905.20	45	911.60	77	918.00	109	924.40
14	905.40	46	911.80	78	918.20	110	924.60
15	905.60	47	912.00	79	918.40	111	924.80
16	905.80	48	912.20	80	918.60	112	925.00
17	906.00	49	912.40	81	918.80	113	925.20
18	906.20	50	912.60	82	919.00	114	925.40
19	906.40	51	912.80	83	919.20	115	925.60
20	906.60	52	913.00	84	919.40	116	925.80
21	906.80	53	913.20	85	919.60	117	926.00
22	907.00	54	913.40	86	919.80	118	926.20
23	907.20	55	913.60	87	920.00	119	926.40
24	907.40	56	913.80	88	920.20	120	926.60
25	907.60	57	914.00	89	920.40	121	926.80
26	907.80	58	914.20	90	920.60	122	927.00
27	908.00	59	914.40	91	920.80	123	927.20
28	908.20	60	914.60	92	921.00	124	927.40
29	908.40	61	914.80	93	921.20		
30	908.60	62	915.00	94	921.40		
31	908.80	63	915.20	95	921.60		

3.3 TEST MODE APPLICABLITY AND TESTED CHANNEL DETAIL:

EUT configure mode	Applicable to				Description
	PLC	RE<1G	RE≥1G	APCM	
A	√	√	√	√	500KHz
B	√	√	√	√	200KHz

Where PLC: Power Line Conducted Emission RE<1G RE: Radiated Emission below 1GHz
RE≥1G: Radiated Emission above 1GHz APCM: Antenna Port Conducted Measurement

Power Line Conducted Emission:

☒ Pre-Scan to determine the worst-case mode from all possible combinations between available modulations and packet types.

☒ Following channel(s) was (were) selected for the final test as listed below.

Available Channel	Tested Channel	Modulation Technology	Modulation Type	EUT configure mode
0 to 49	49	FHSS	PR-ASK(XRM)	A
0 to 124	124	FHSS	PR-ASK(XRM)	B

Radiated Emission Test (Below 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

Available Channel	Tested Channel	Modulation Technology	Modulation Type	EUT configure mode
0 to 49	0	FHSS	PR-ASK(XRM)	A
0 to 49	0	FHSS	DSB-ASK(MRM)	A
0 to 49	0	FHSS	PR-ASK(DRM)	A
0 to 124	0	FHSS	PR-ASK(XRM)	B
0 to 124	0	FHSS	PR-ASK(DRM)	B

Radiated Emission Test (Above 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

Available Channel	Tested Channel	Modulation Technology	Modulation Type	EUT configure mode
0 to 49	0, 24, 49	FHSS	PR-ASK(DRM)	A
0 to 49	0, 24, 49	FHSS	DSB-ASK(MRM)	A
0 to 49	0, 24, 49	FHSS	PR-ASK(XRM)	A
0 to 124	0, 60, 124	FHSS	PR-ASK(XRM)	B
0 to 124	0, 60, 124	FHSS	PR-ASK(DRM)	B

CONDUCTED OUT-BAND EMISSION Measurement:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

Available Channel	Tested Channel	Modulation Technology	Modulation Type	EUT configure mode
0 to 124	0, 124	FHSS	PR-ASK(XRM)	B
0 to 124	0, 124	FHSS	PR-ASK(DRM)	B

Antenna Port Conducted Measurement:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

Available Channel	Tested Channel	Modulation Technology	Modulation Type	EUT configure mode
0 to 49	0, 24, 49	FHSS	PR-ASK(DRM)	A
0 to 49	0, 24, 49	FHSS	DSB-ASK(MRM)	A
0 to 49	0, 24, 49	FHSS	PR-ASK(XRM)	A
0 to 124	0, 60, 124	FHSS	PR-ASK(XRM)	B
0 to 124	0, 60, 124	FHSS	PR-ASK(DRM)	B

3.4 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a 21-121559-01. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

47 CFR Part 15, Subpart C. (15.247)
ANSI C63.4 : 2003

All test items have been performed and recorded as per the above standards.

NOTE: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

3.5 DESCRIPTION OF SUPPORT UNITS

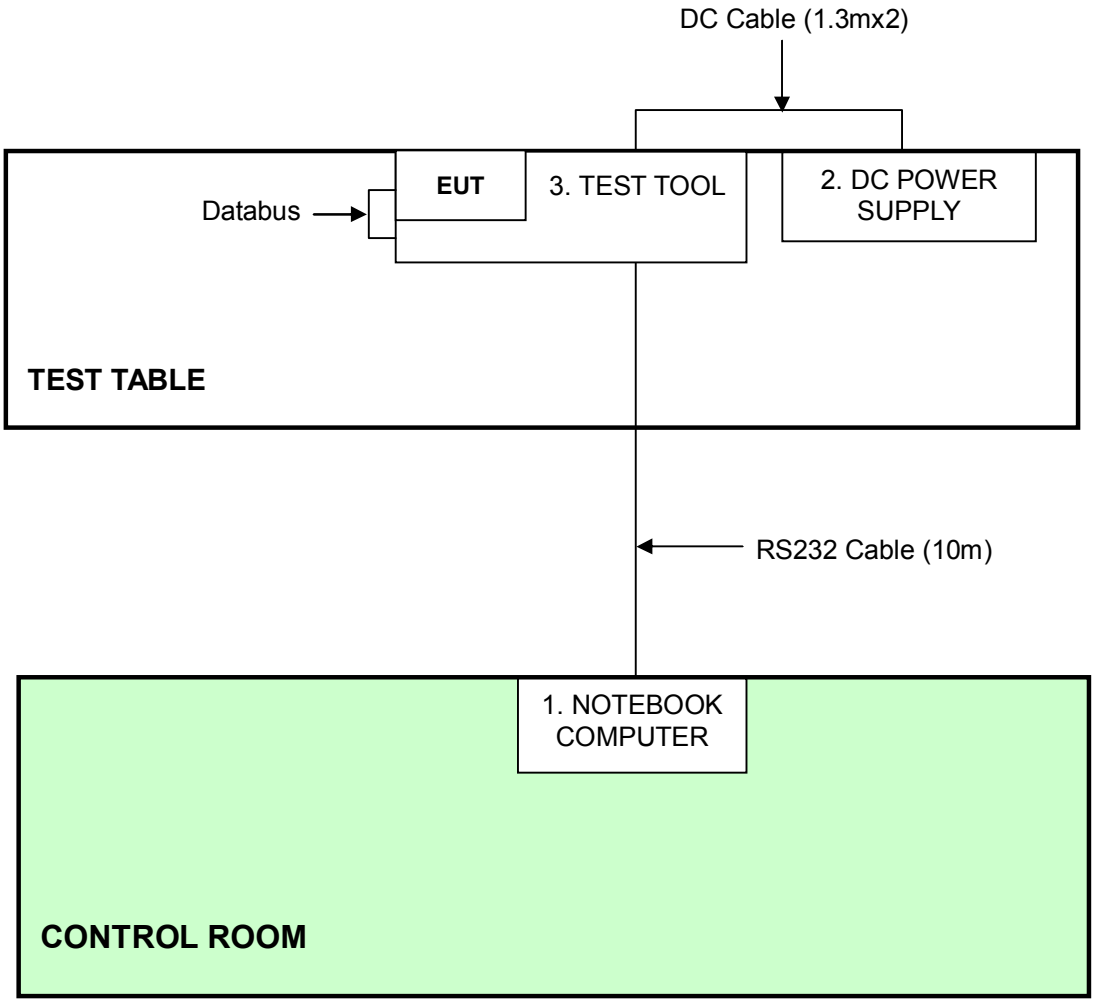
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	D531	CN-0XM006-48643-86L-4472	QDS-BRCM1019
2	DC POWER SUPPLY	GOOD WILL INSTRUMENT CO., LTD.	GPC-3030D	EG812707	NA
3	TEST TOOL	MTI	NA	NA	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	NA
3	NA

NOTE: All power cords of the above support units are non shielded (1.8m).

3.6 CONFIGURATION OF SYSTEM UNDER TEST



4 TEST PROCEDURES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	Quasi-peak	Average
0.15-0.5 0.5-5 5-30	66 to 56 56 60	56 to 46 46 50

Notes:

1. The lower limit shall apply at the transition frequencies.
2. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver	ESCS 30	100375	Mar. 23, 2009	Mar. 22, 2010
Line-Impedance Stabilization Network (for Peripheral)	ENV-216	100071	Nov. 26, 2008	Nov. 25, 2009
Line-Impedance Stabilization Network (for EUT)	ESH3-Z5	848773/004	Oct. 26, 2009	Oct. 25, 2010
RF Cable (JYEBAO)	5DFB	COBCAB-001	Aug. 14, 2009	Aug. 13, 2010
50 ohms Terminator	50	3	Nov. 05, 2009	Nov. 04, 2010
Software	BV ADT_Cond_V7.3.7	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. B.
3 The VCCI Con B Registration No. is C-2193.

4.1.3 TEST PROCEDURES

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

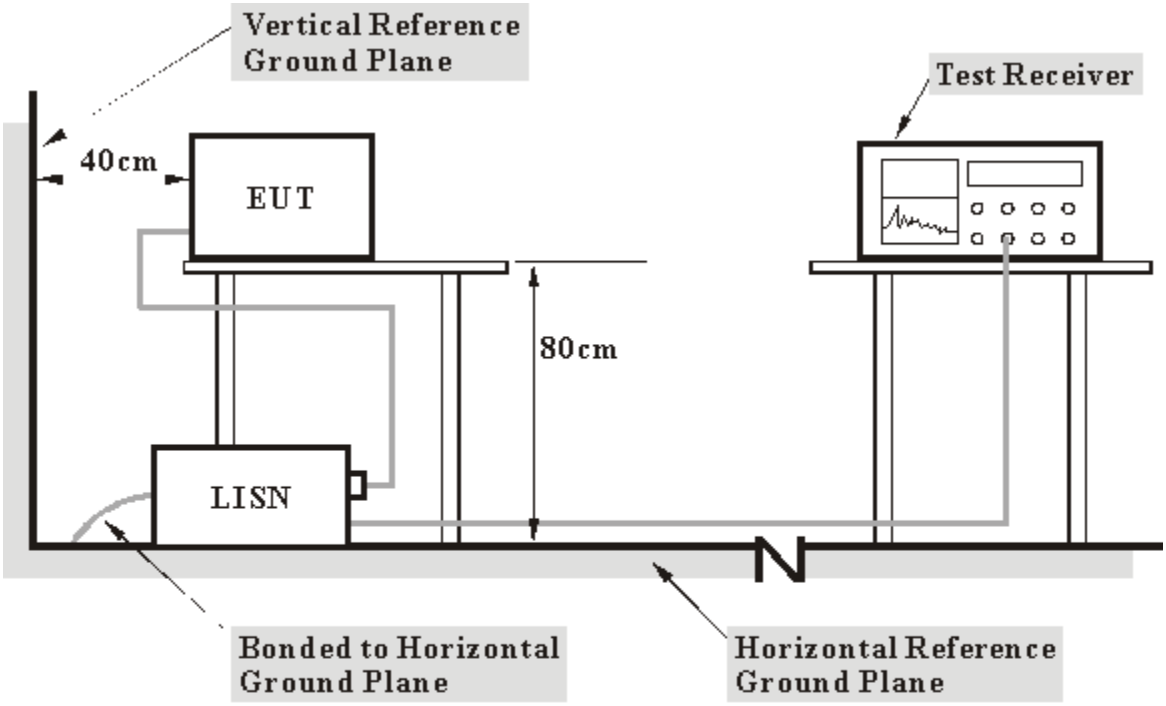
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

c. The frequency range from 150kHz to 30MHz was searched. Emission levels under Limit - 20dB was not recorded.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.1.6 EUT OPERATING CONDITIONS

a. Placed the EUT on the testing table.

b. Connect the EUT with the support unit 1 (Notebook computer) which placed outside of testing area.

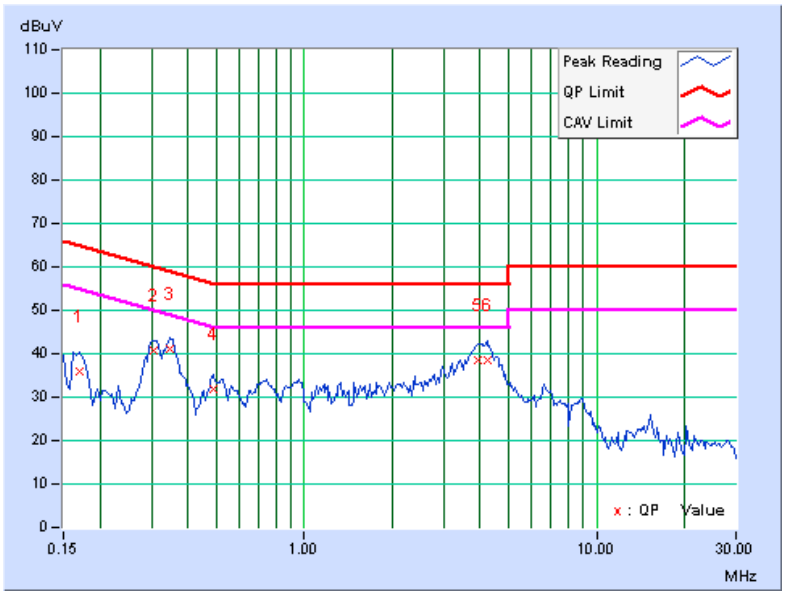
c. The support unit 1 (Notebook computer) run test program “RFIDDemo W32” to enable EUT under transmission condition continuously at specific channel frequency.

4.1.7 TEST RESULTS (MODE A)

INPUT POWER (SYSTEM)	120Vac, 60 Hz	**6dB BANDWIDTH**	9 kHz
ENVIRONMENTAL CONDITIONS	20 deg. C, 50%RH, 1015 hPa	**PHASE**	Line (L)
TESTED BY	Moris Lin		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.170	0.17	35.63	-	35.80	-	64.98	54.98	-29.18	-
2	0.306	0.19	40.65	-	40.84	-	60.07	50.07	-19.24	-
3	0.345	0.19	41.04	-	41.23	-	59.07	49.07	-17.85	-
4	0.490	0.23	31.69	-	31.92	-	56.17	46.17	-24.25	-
5	3.926	0.62	37.74	-	38.36	-	56.00	46.00	-17.64	-
6	4.215	0.63	37.94	-	38.57	-	56.00	46.00	-17.43	-

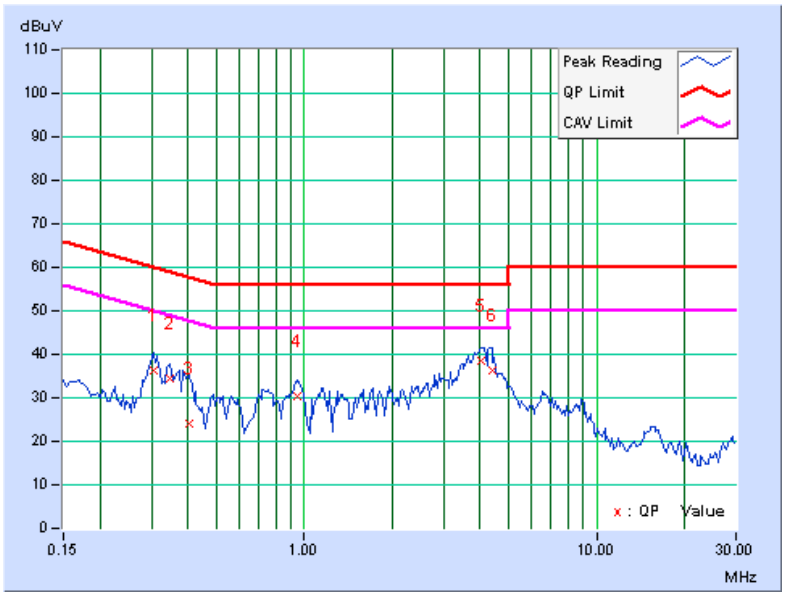
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



INPUT POWER (SYSTEM)	120Vac, 60 Hz	**6dB BANDWIDTH**	9 kHz
ENVIRONMENTAL CONDITIONS	20 deg. C, 50%RH, 1015 hPa	**PHASE**	Neutral (N)
TESTED BY	Moris Lin		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.306	0.12	36.17	-	36.29	-	60.07	50.07	-23.78	-
2	0.345	0.12	34.24	-	34.36	-	59.07	49.07	-24.71	-
3	0.404	0.13	24.06	-	24.19	-	57.77	47.77	-33.58	-
4	0.943	0.33	29.87	-	30.20	-	56.00	46.00	-25.80	-
5	4.047	0.55	38.15	-	38.70	-	56.00	46.00	-17.30	-
6	4.395	0.57	35.90	-	36.47	-	56.00	46.00	-19.53	-

REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.

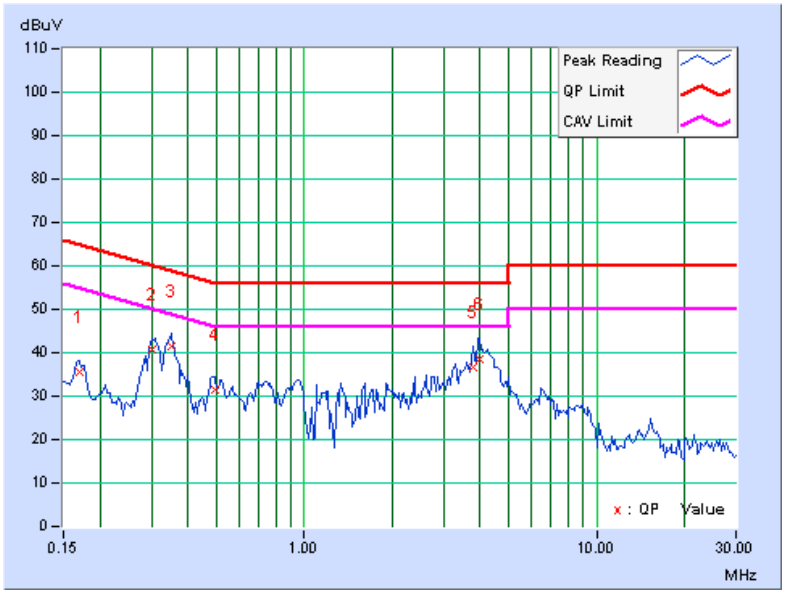


4.1.8 TEST RESULTS (MODE B)

INPUT POWER (SYSTEM)	120Vac, 60 Hz	**6dB BANDWIDTH**	9 kHz
ENVIRONMENTAL CONDITIONS	20 deg. C, 50%RH, 1015 hPa	**PHASE**	Line (L)
TESTED BY	Moris Lin		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.170	0.17	35.24	-	35.41	-	64.98	54.98	-29.57	-
2	0.302	0.19	40.43	-	40.62	-	60.18	50.18	-19.56	-
3	0.349	0.19	41.16	-	41.35	-	58.98	48.98	-17.63	-
4	0.494	0.23	31.24	-	31.47	-	56.10	46.10	-24.64	-
5	3.770	0.61	36.10	-	36.71	-	56.00	46.00	-19.29	-
6	3.992	0.62	38.05	-	38.67	-	56.00	46.00	-17.33	-

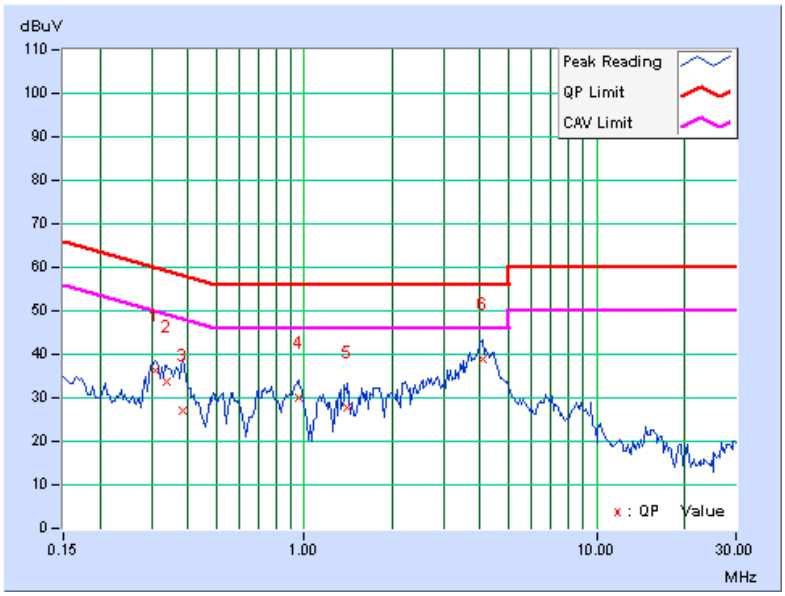
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



INPUT POWER (SYSTEM)	120Vac, 60 Hz	**6dB BANDWIDTH**	9 kHz
ENVIRONMENTAL CONDITIONS	20 deg. C, 50%RH, 1015 hPa	**PHASE**	Neutral (N)
TESTED BY	Moris Lin		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.310	0.12	36.26	-	36.38	-	59.97	49.97	-23.59	-
2	0.338	0.12	33.48	-	33.60	-	59.26	49.26	-25.66	-
3	0.384	0.13	26.92	-	27.05	-	58.18	48.18	-31.14	-
4	0.955	0.33	29.63	-	29.96	-	56.00	46.00	-26.04	-
5	1.410	0.39	27.31	-	27.70	-	56.00	46.00	-28.30	-
6	**4.098**	**0.56**	**38.49**	**-**	**39.05**	**-**	**56.00**	**46.00**	**-16.95**	**-**

REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



4.2 NUMBER OF HOPPING FREQUENCY USED

4.2.1 LIMIT OF HOPPING FREQUENCY USED

At least 50 hopping frequencies, and should be equally spaced.

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100037	Aug. 03, 2009	Aug. 02, 2010

NOTE:

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

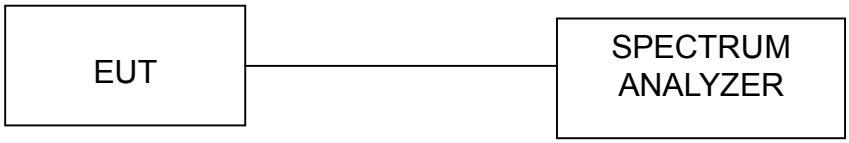
4.2.3 TEST PROCEDURES

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
2. 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.
3. 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.
4. Set the SA on View mode and then plot the result on SA screen.
5. Repeat above procedures until all frequencies measured were complete.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation

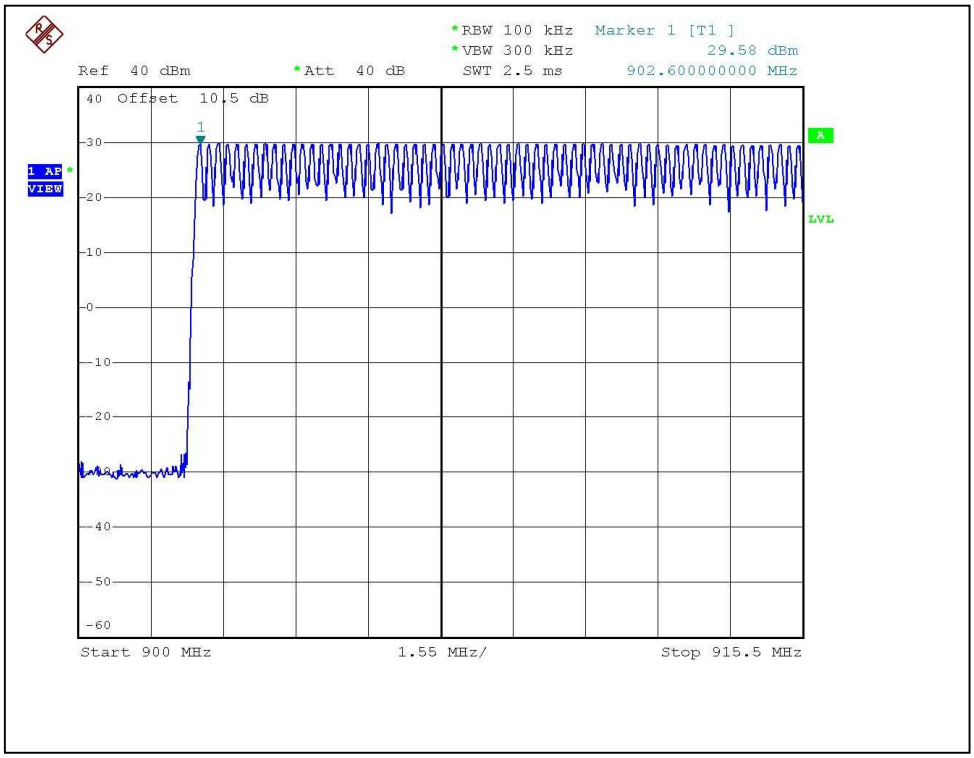
4.2.5 TEST SETUP

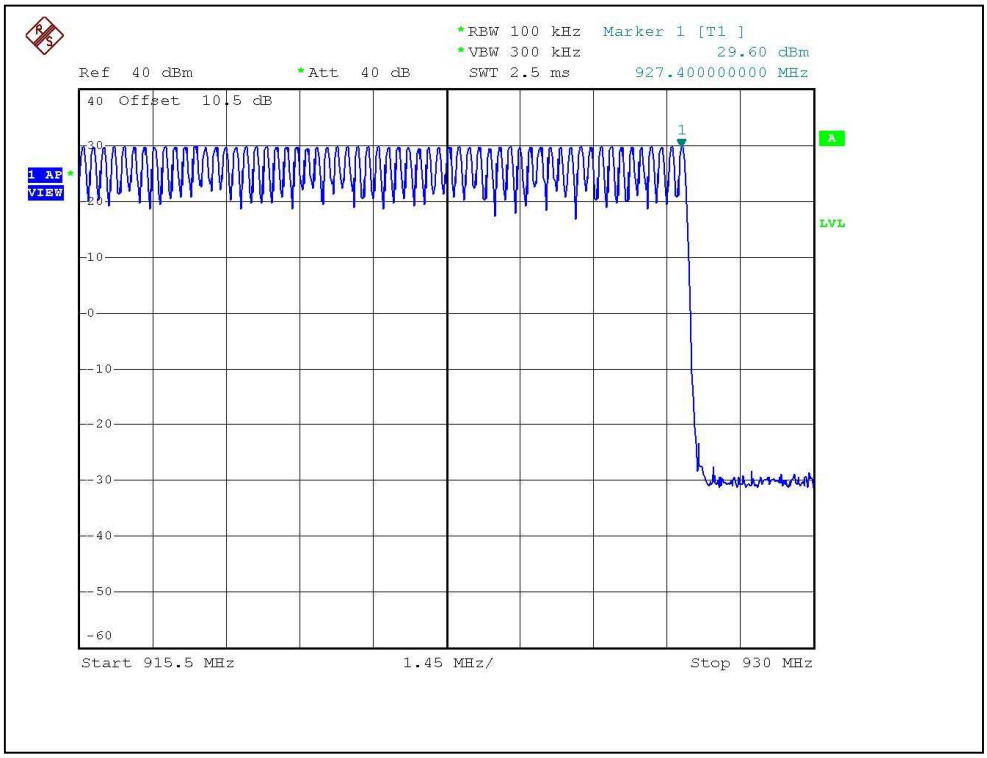


4.2.6 TEST RESULTS (MODE B)

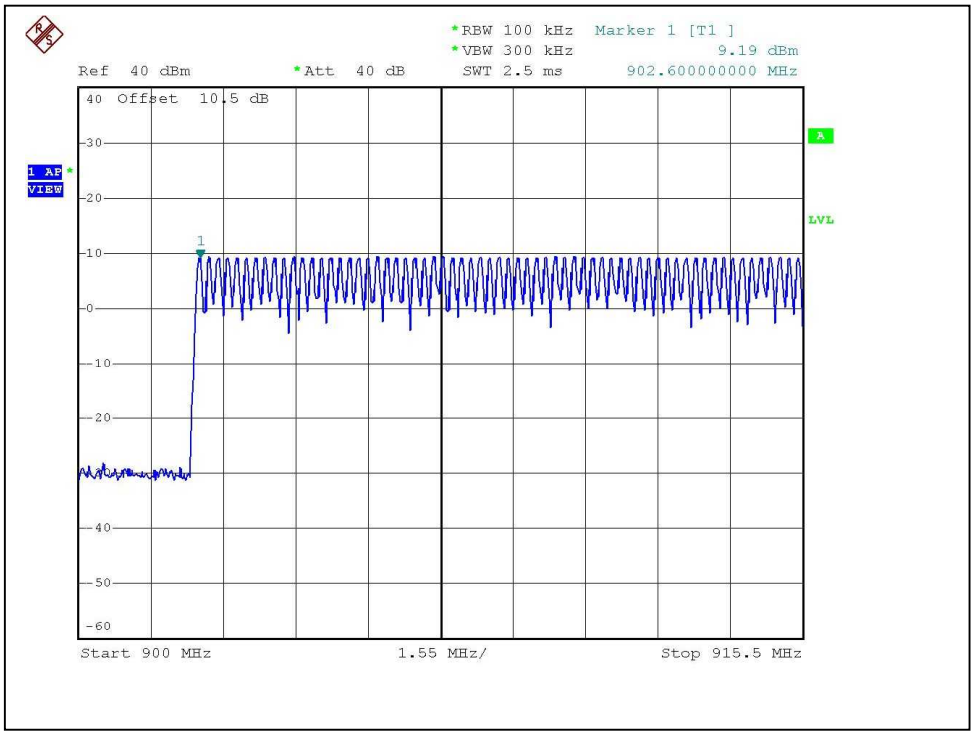
There are 125 hopping frequencies in the hopping mode. Please refer to following pages for the test result. On the plots, it shows that the hopping frequencies are equally spaced.

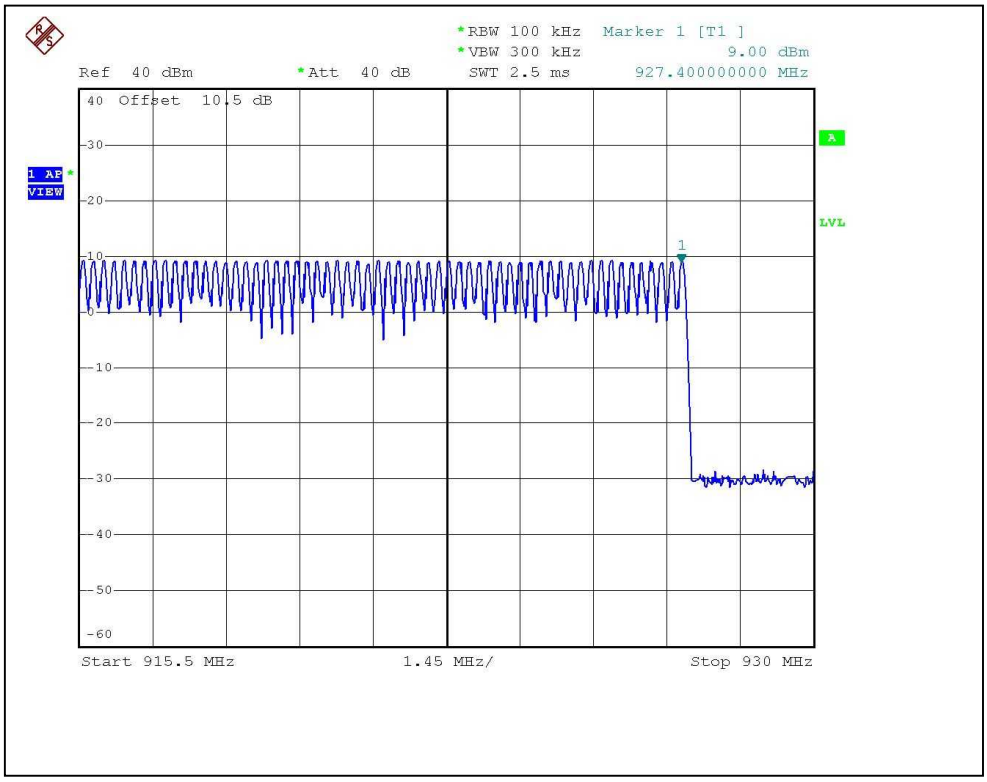
For PR-ASK(XRM) – High Power:



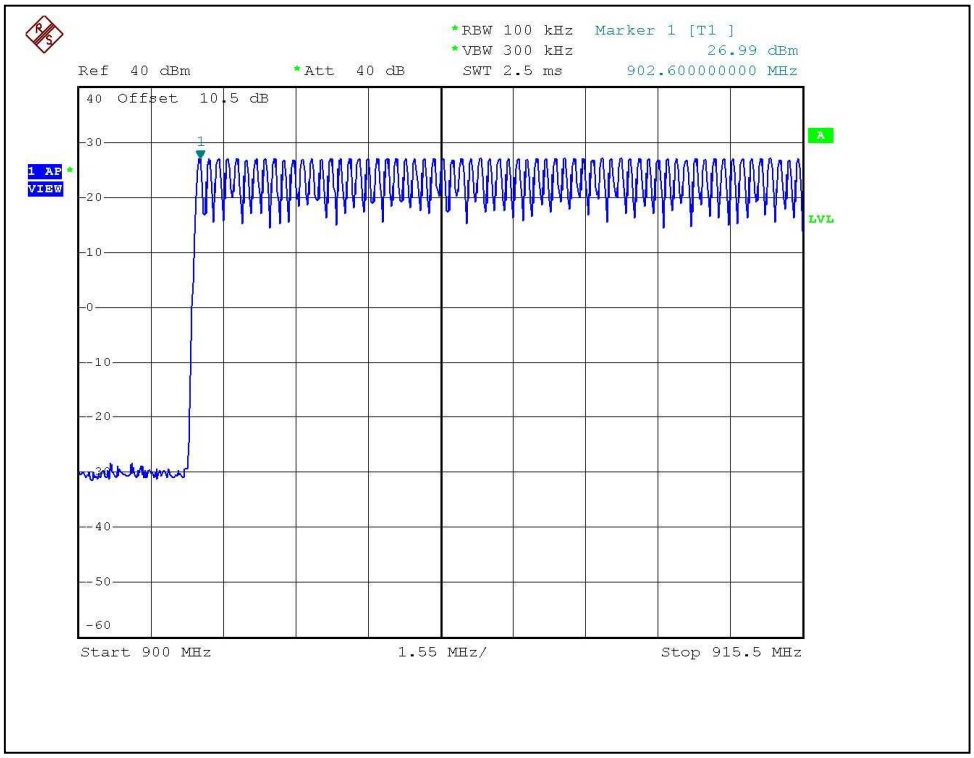


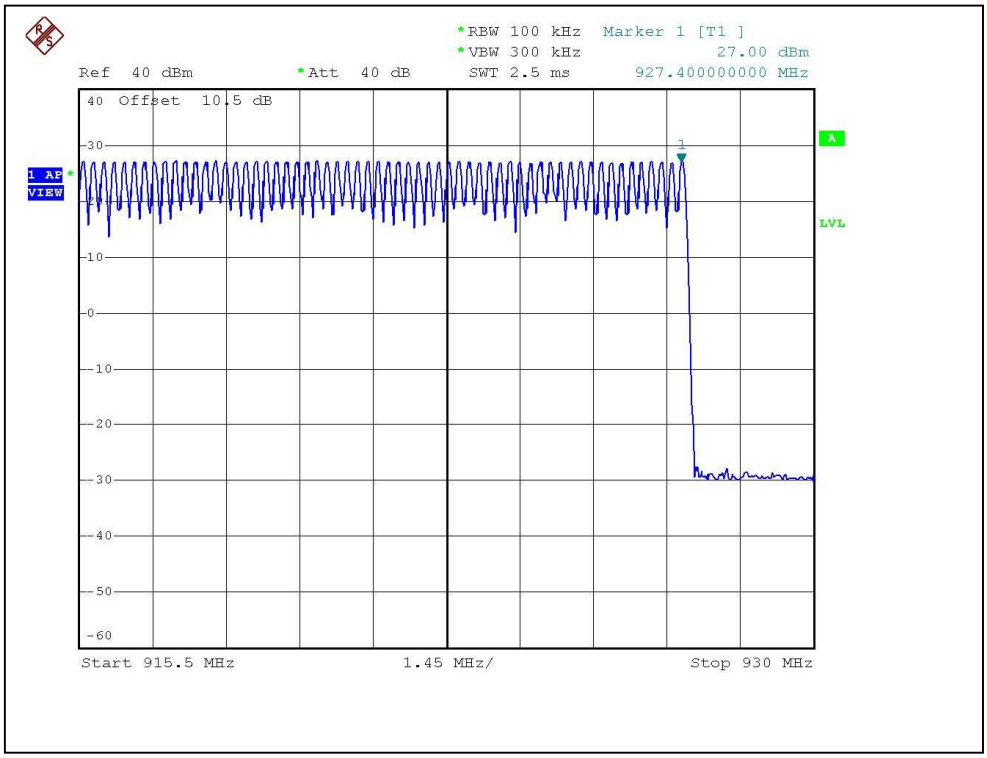
For PR-ASK(XRM) – Low Power:



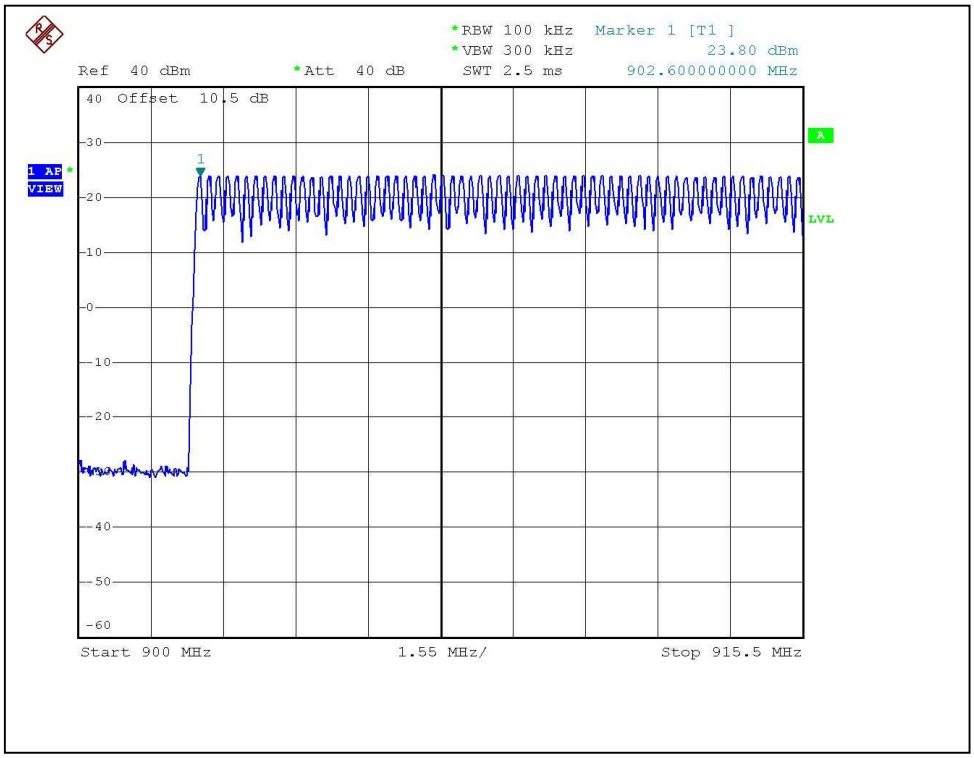


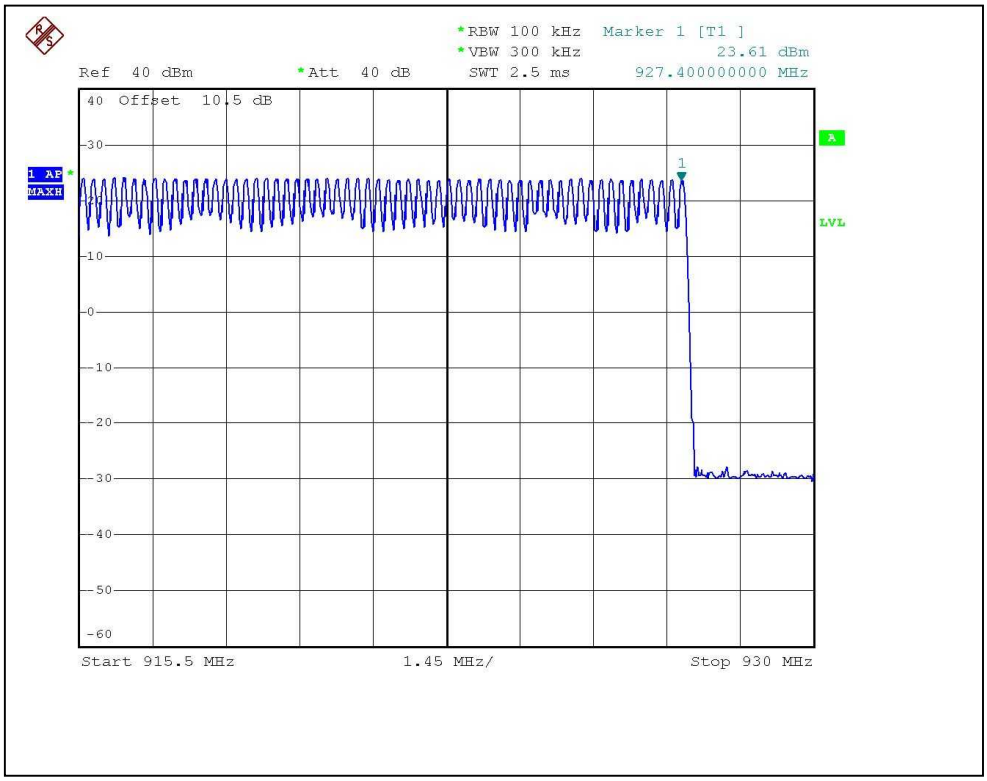
For PR-ASK(DRM) – High Power:





For PR-ASK(DRM) – Low Power:





4.3 DWELL TIME ON EACH CHANNEL

4.3.1 LIMIT OF DWELL TIME USED

For FHSS, the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period. For hybrid systems, the average time of occupancy on any frequency should not exceed 0.4 seconds within a time period in seconds equal to the number of hopping frequencies employed multiplied by 0.4.

4.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100037	Aug. 03, 2009	Aug. 02, 2010

NOTE:

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

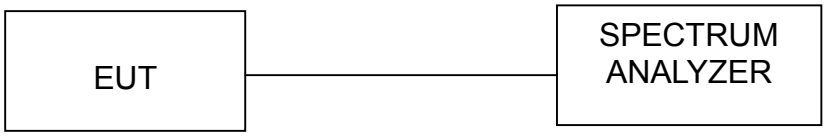
4.3.3 TEST PROCEDURES

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
2. 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.
3. 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.
4. Measure the time duration of one transmission on the measured frequency. And then plot the result with time difference of this time duration.
5. 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 (MODE B)

For PR-ASK(XRM) – High Power:

Number of transmission in a 20 s	Length of transmission time (msec)	Result (msec)	Limit (msec)
10 times	27.2	272	400

For PR-ASK(XRM) – Low Power:

Number of transmission in a 20 s	Length of transmission time (msec)	Result (msec)	Limit (msec)
10 times	27.2	272	400

For PR-ASK(DRM) – High Power:

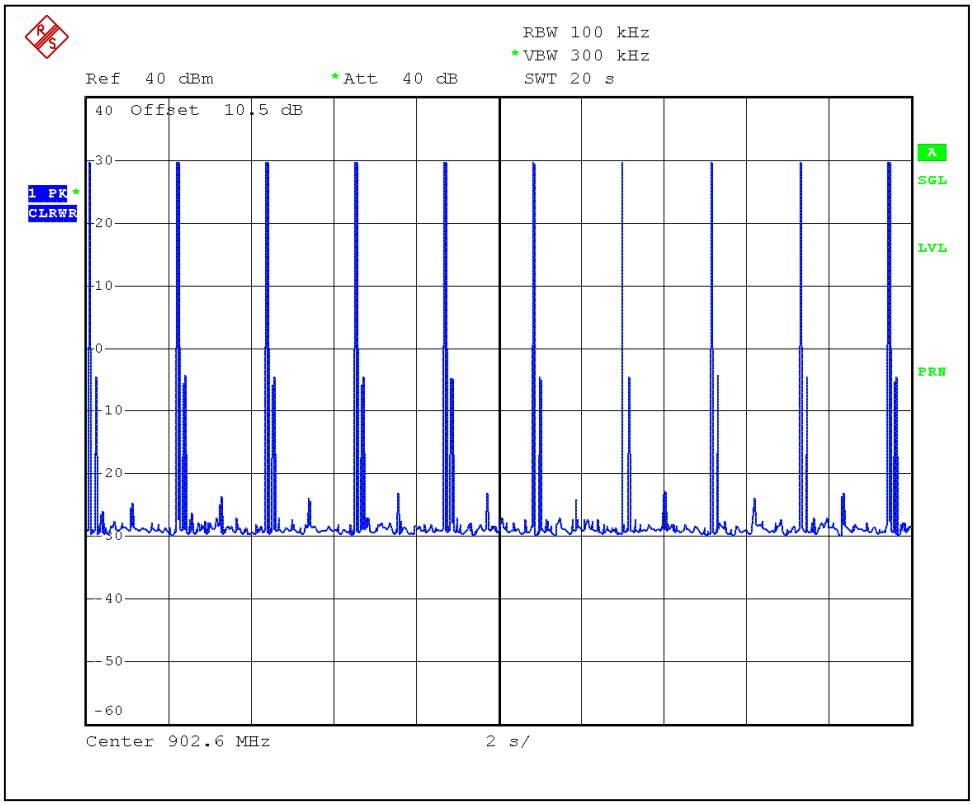
Number of transmission in a 20 s	Length of transmission time (msec)	Result (msec)	Limit (msec)
10 times	27.6	276	400

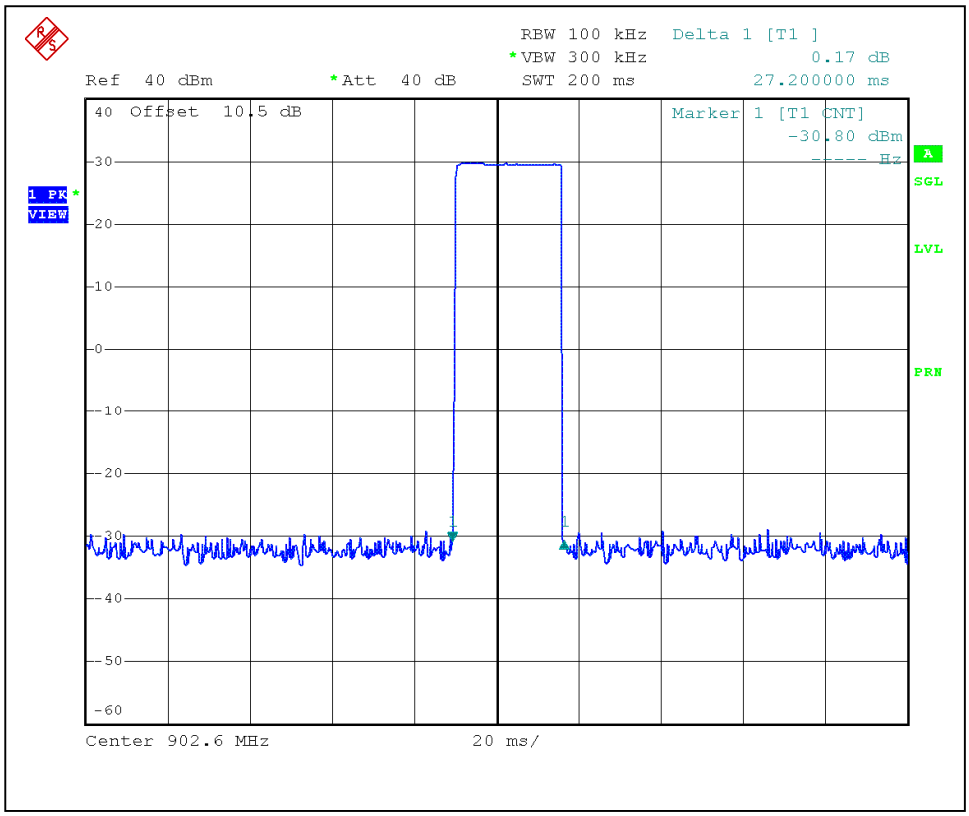
For PR-ASK(DRM) – Low Power:

Number of transmission in a 20 s	Length of transmission time (msec)	Result (msec)	Limit (msec)
10 times	27.6	276	400

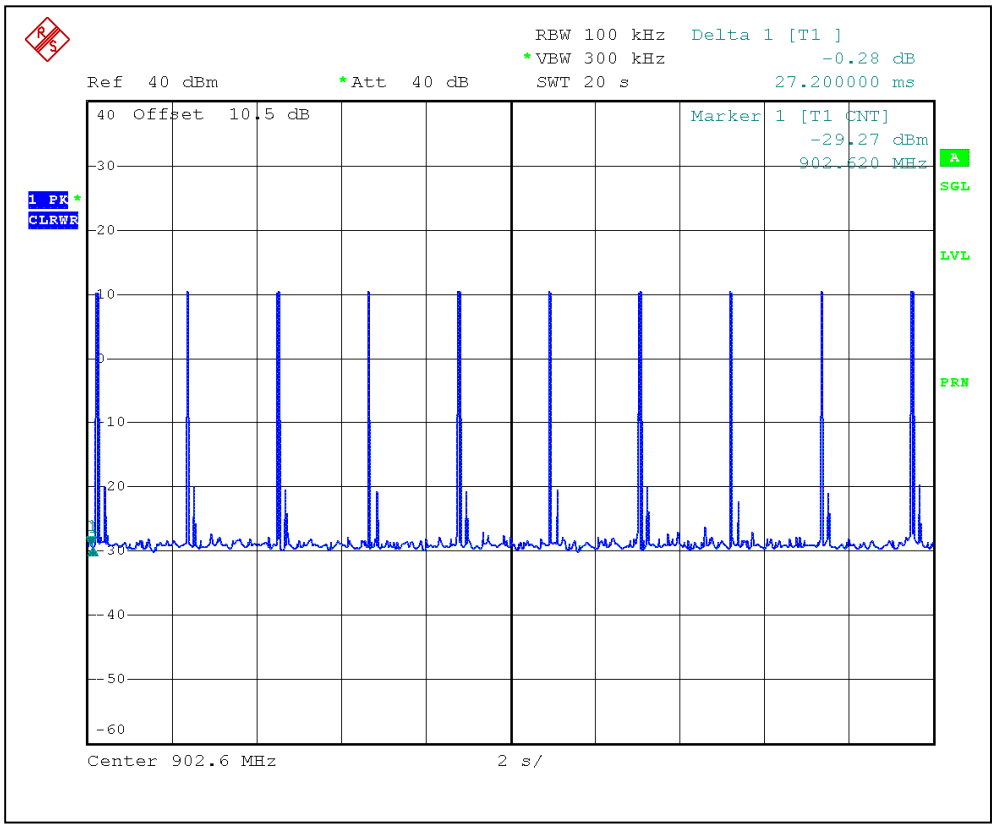
Test plots of the transmitting time slot are shown on following pages.

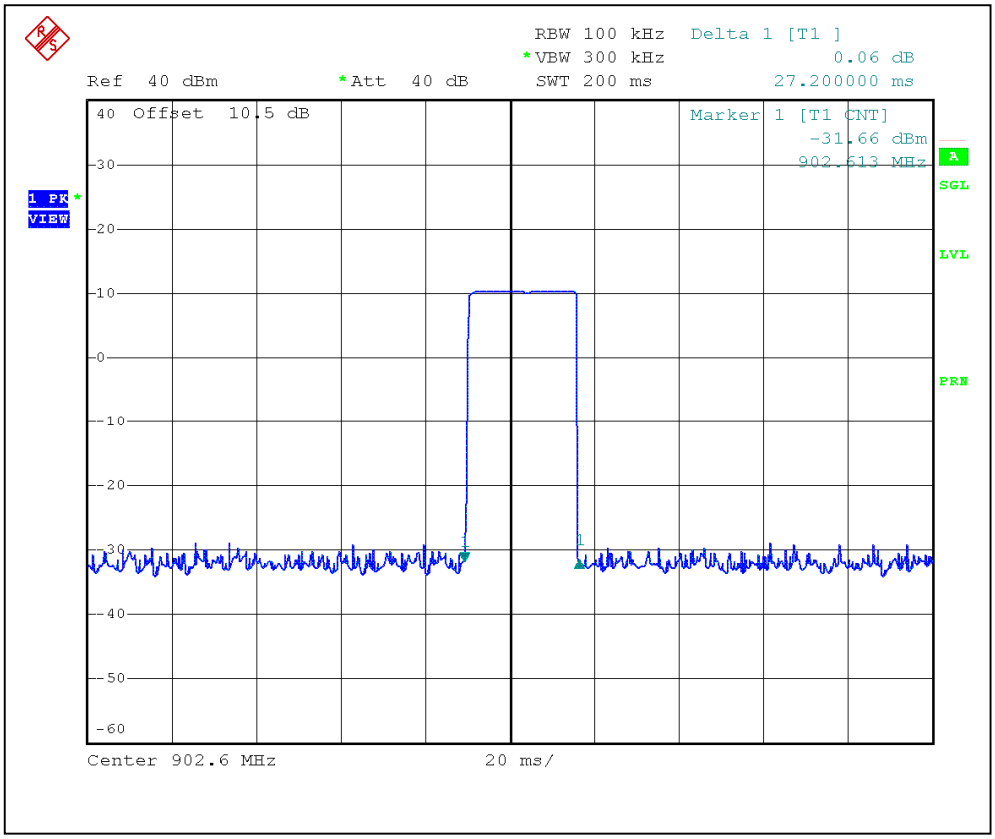
For PR-ASK(XRM) – High Power:



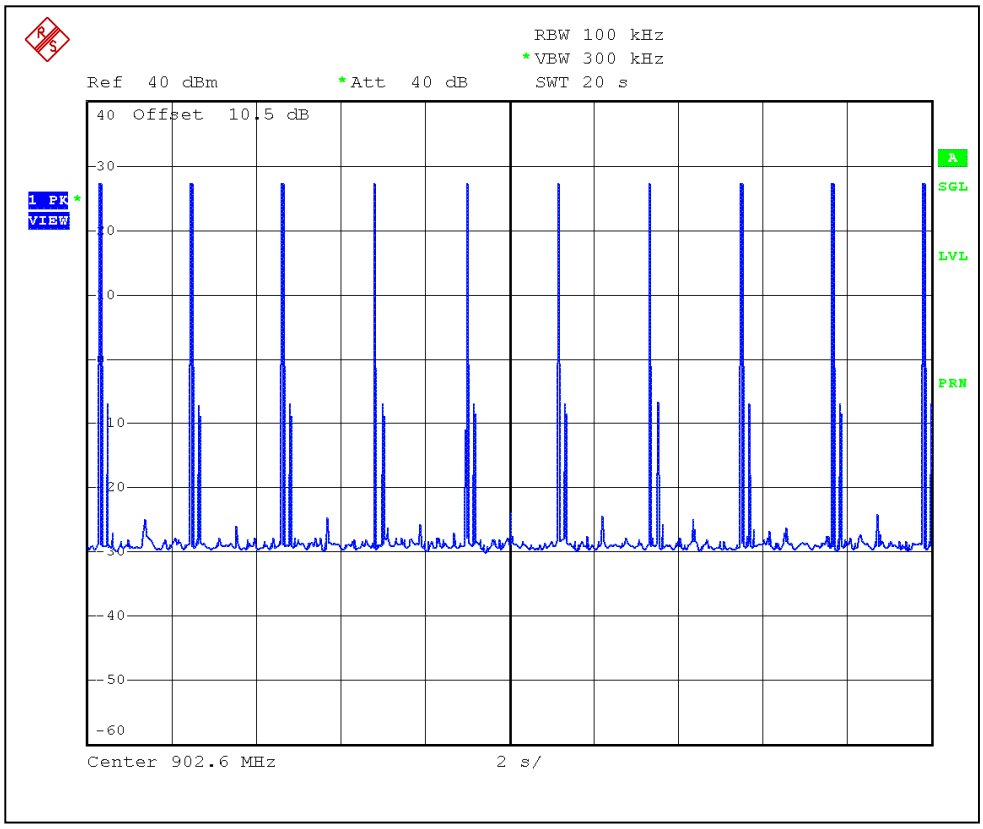


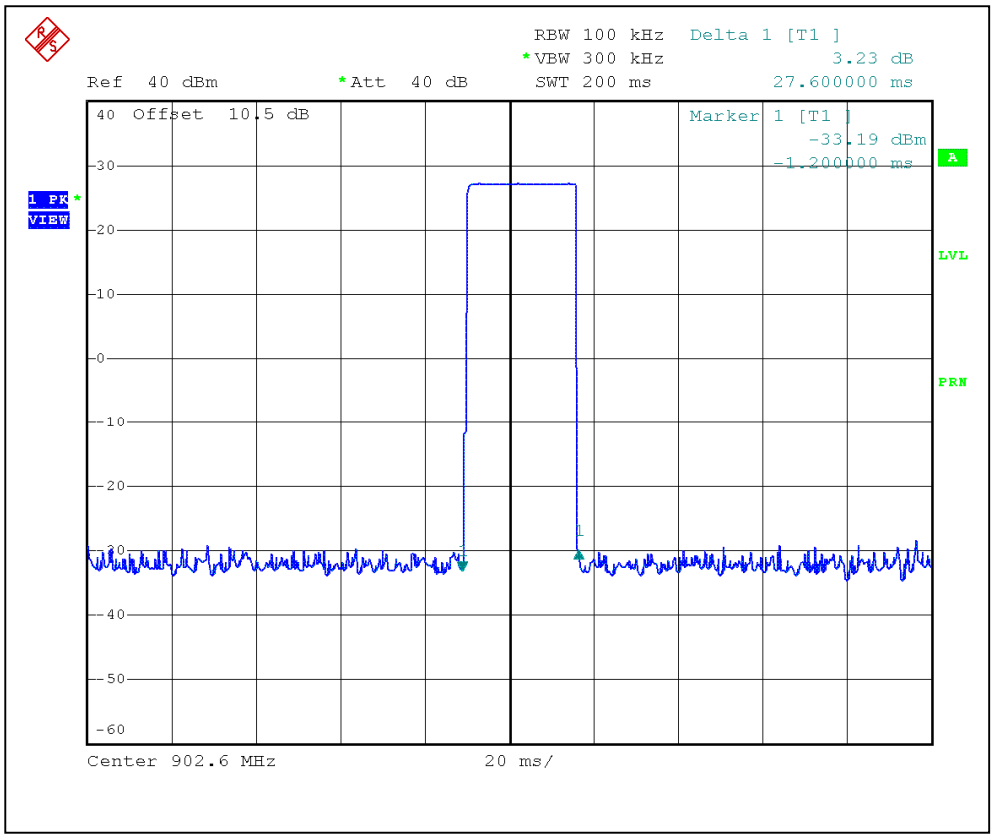
For PR-ASK(XRM) – Low Power:



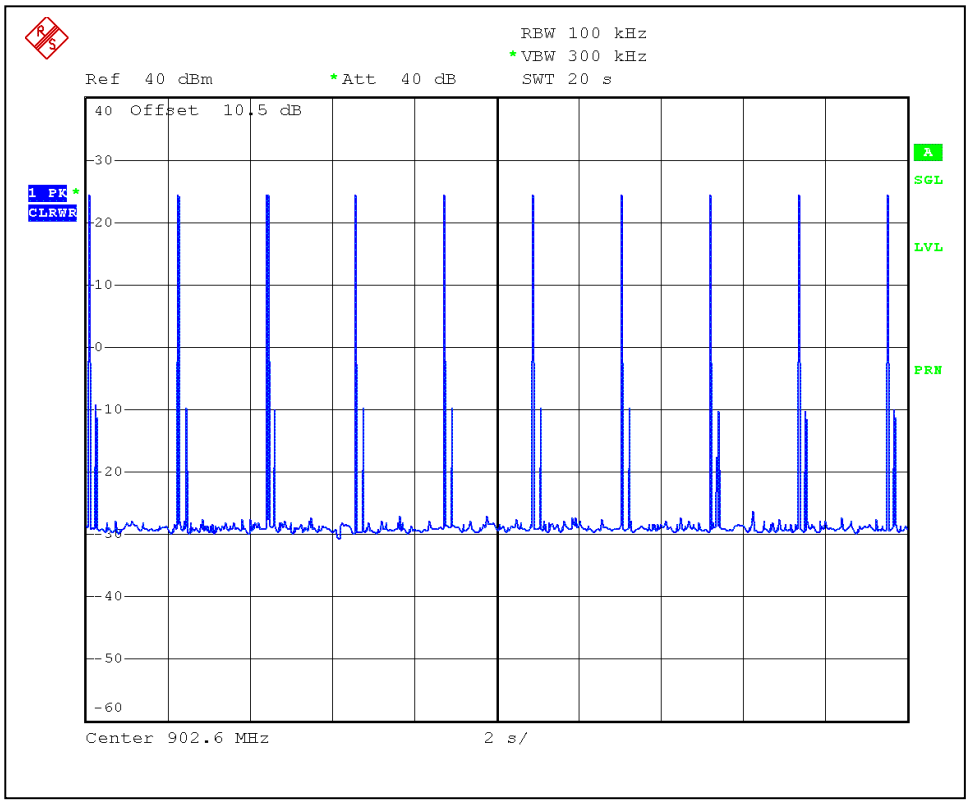


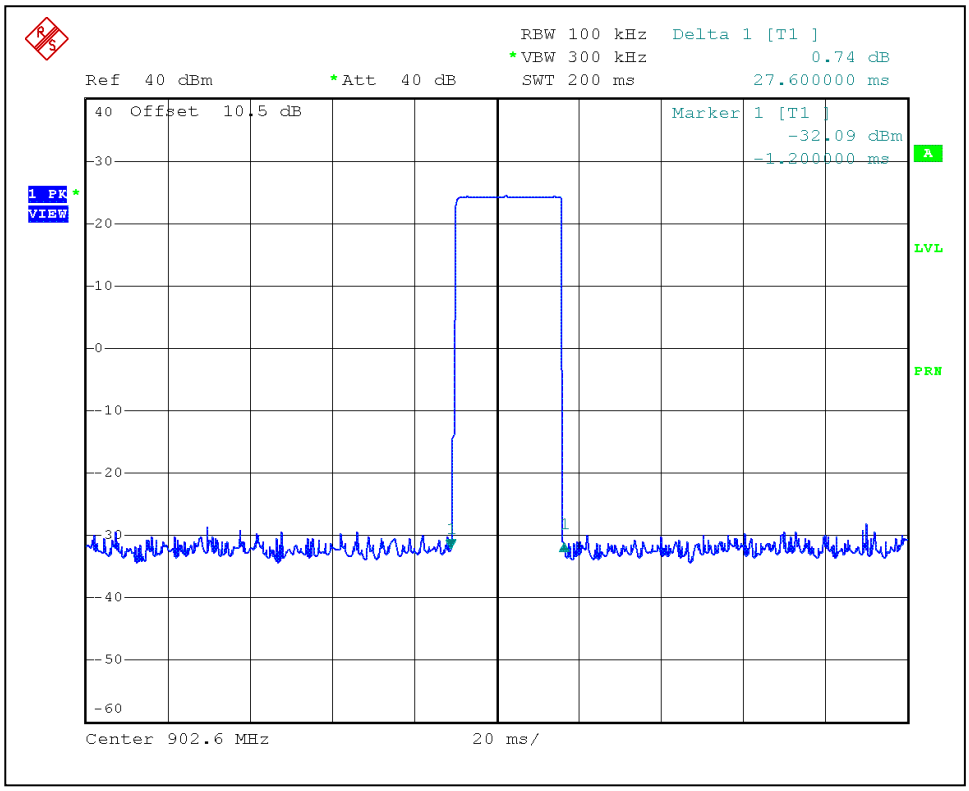
For PR-ASK(DRM) – High Power:





For PR-ASK(DRM) – Low Power:





4.4 CHANNEL BANDWIDTH

For frequency hopping system operating in the 902-928MHz, If the 20dB bandwidth of hopping channel is greater than 25kHz, 20dBbandwidth of hopping channel shell be a minimum limit for the hopping channel separation.

4.4.1 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100037	Aug. 03, 2009	Aug. 02, 2010

NOTE:

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

4.4.2 TEST PROCEDURE

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

4.4.3 DEVIATION FROM TEST STANDARD

No deviation

4.4.4 TEST SETUP

4.4.5 EUT OPERATING CONDITION

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

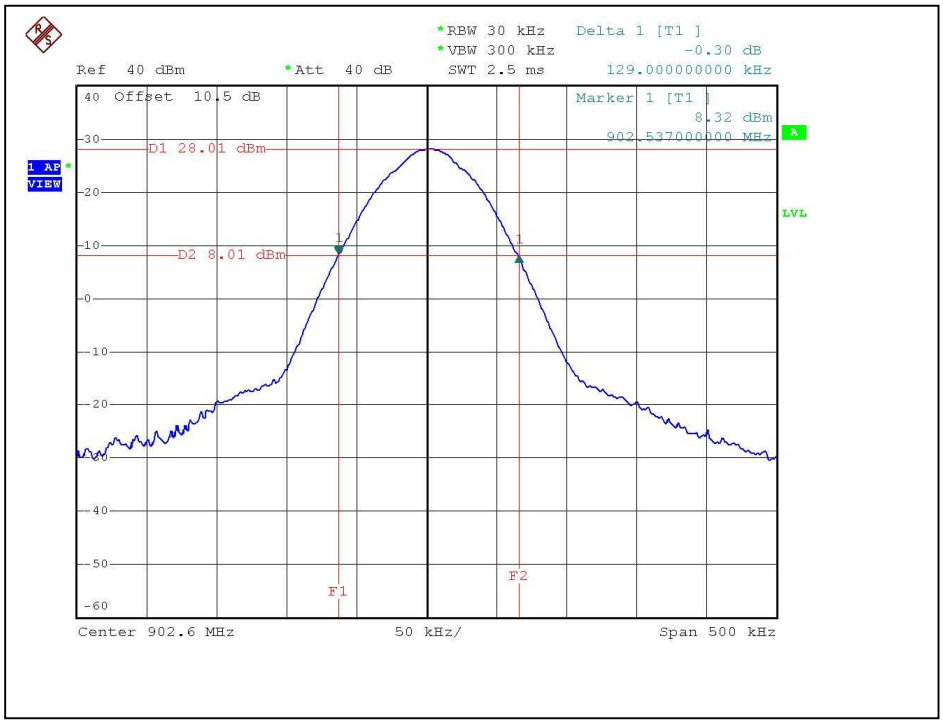
4.4.6 TEST RESULTS (MODE B)

For PR-ASK(XRM) – High Power:

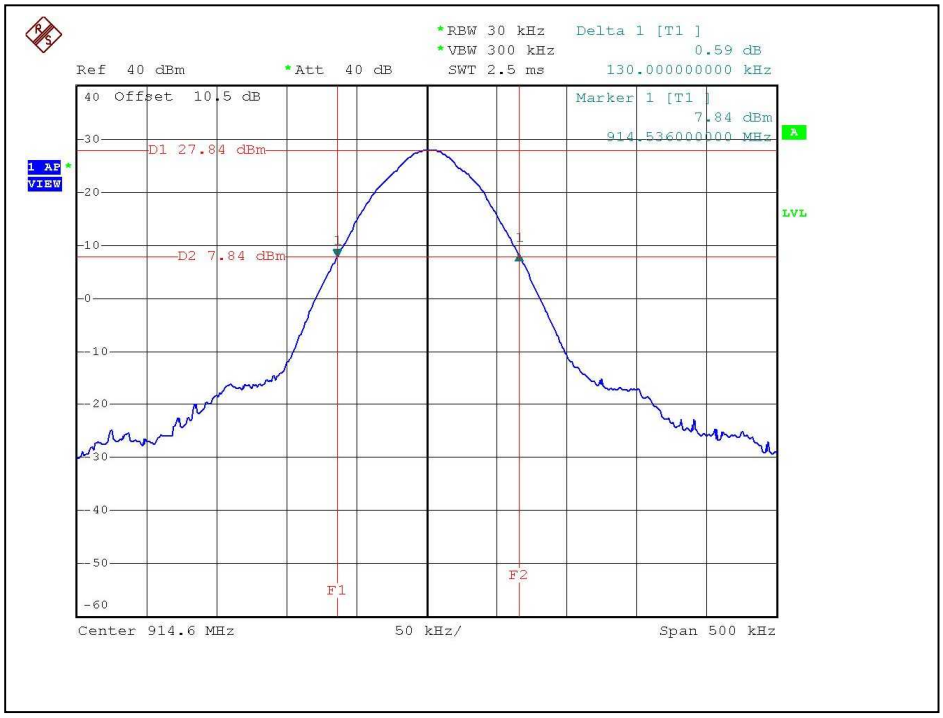
ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 1015 hPa	**INPUT POWER (SYSTEM)**	120Vac, 60 Hz
TESTED BY	Wen Yu		

CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (kHz)
0	902.6	129
60	914.6	130
124	927.4	129

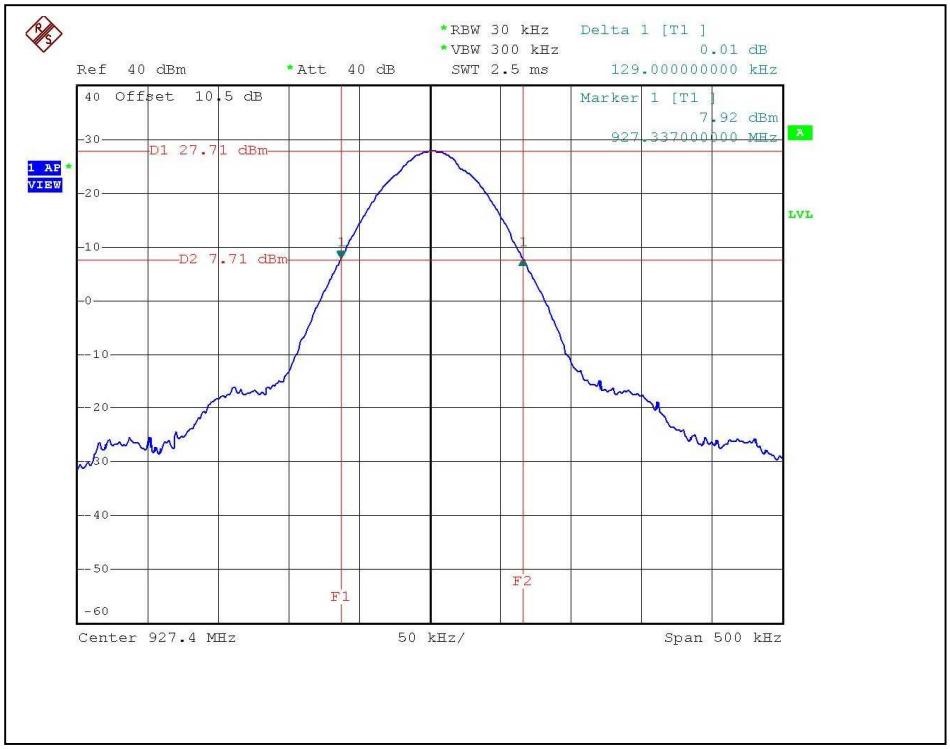
Channel 0



Channel 60



Channel 124

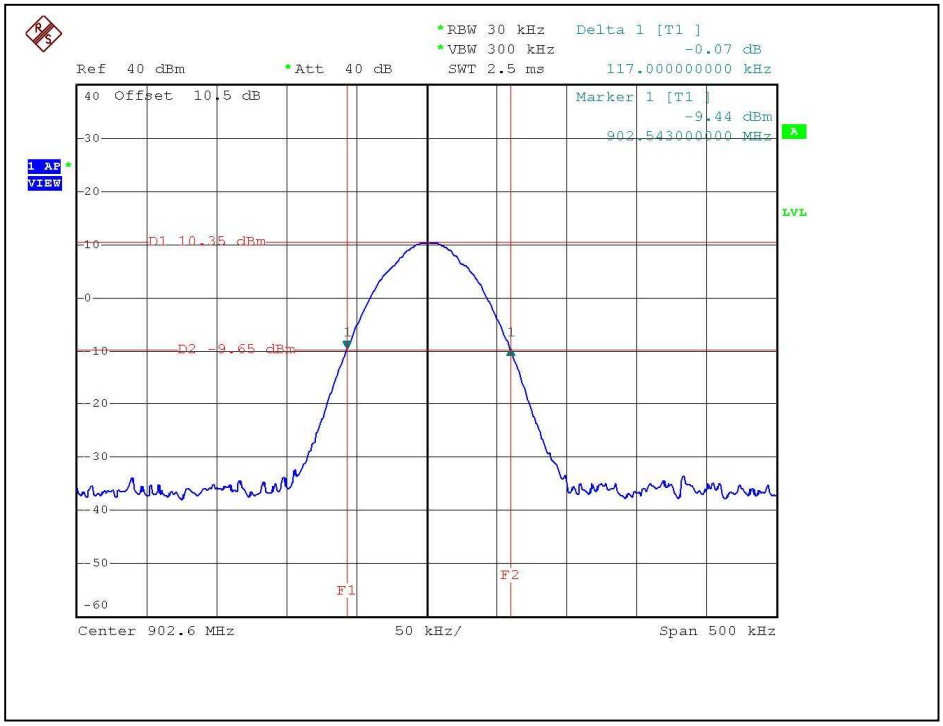


For PR-ASK(XRM) – Low Power:

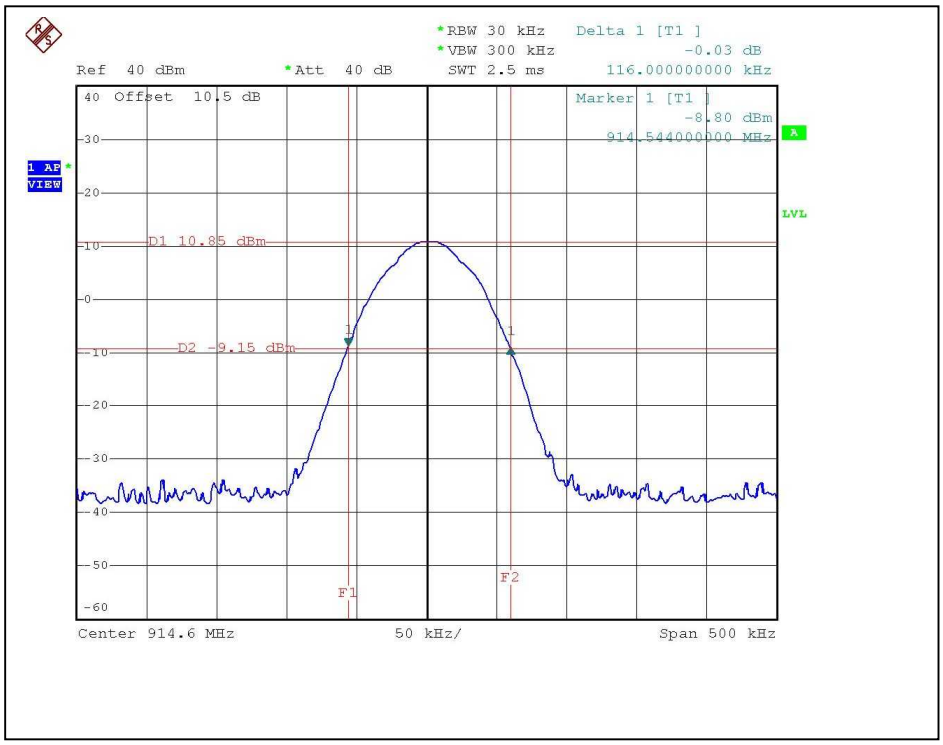
ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 1015 hPa	**INPUT POWER (SYSTEM)**	120Vac, 60 Hz
TESTED BY	Wen Yu		

CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (kHz)
0	902.6	117
60	914.6	116
124	927.4	116

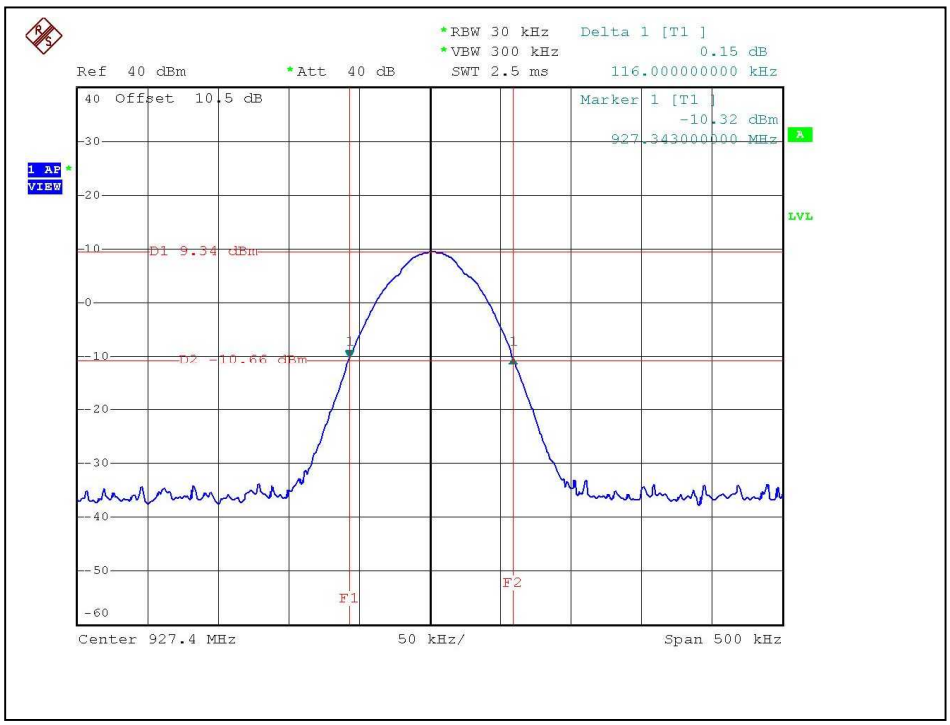
Channel 0



Channel 60



Channel 124

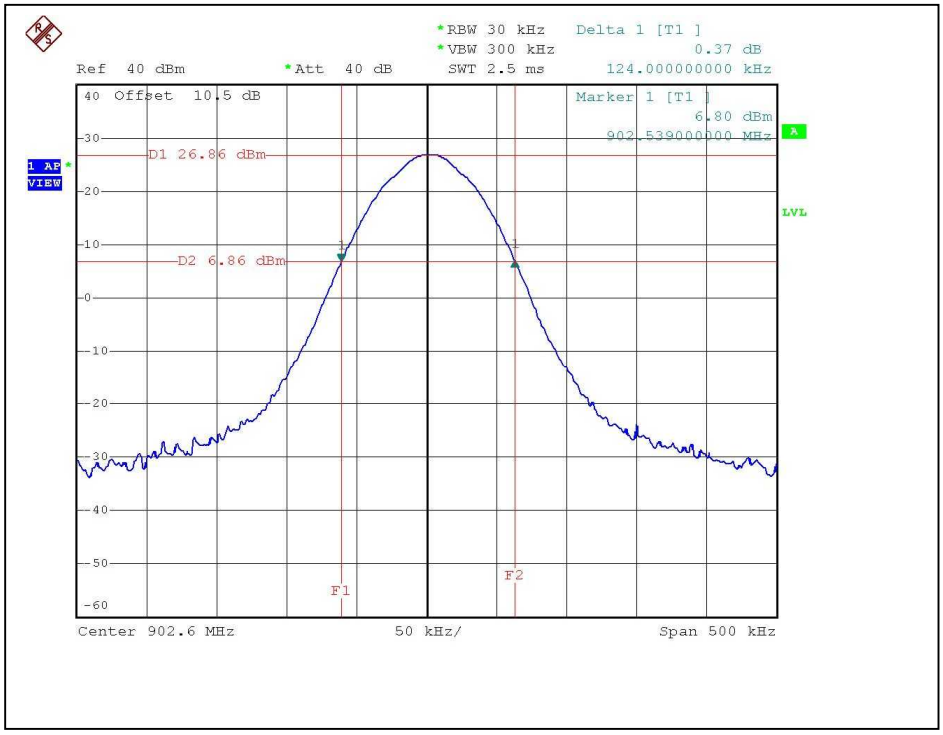


For PR-ASK(DRM) – High Power:

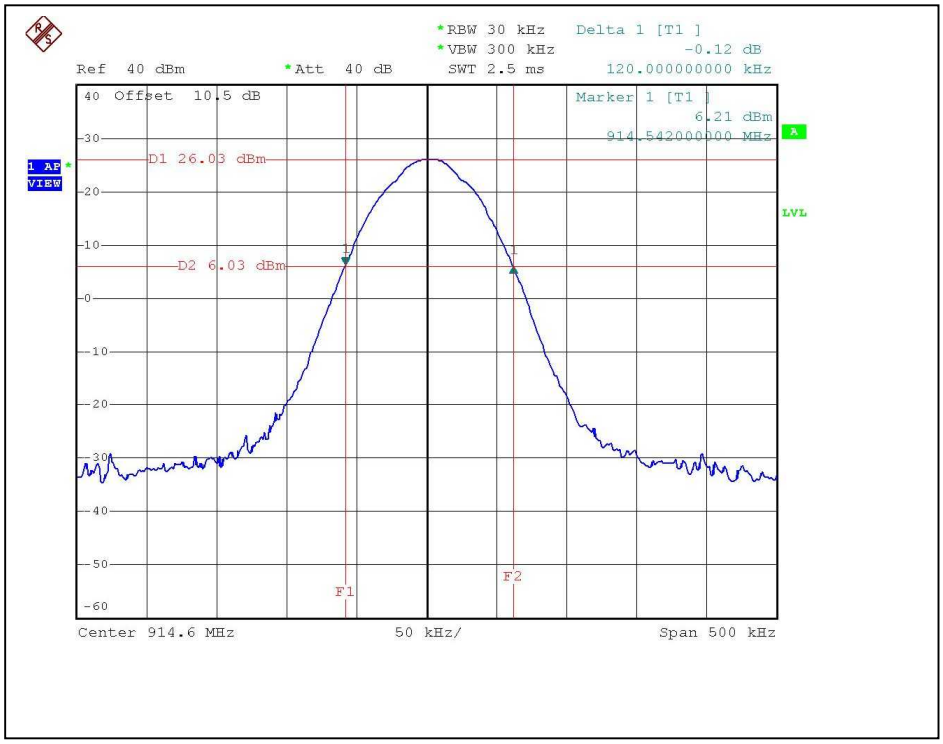
ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 1015 hPa	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Wen Yu		

CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (kHz)
0	902.6	124
60	914.6	120
124	927.4	119

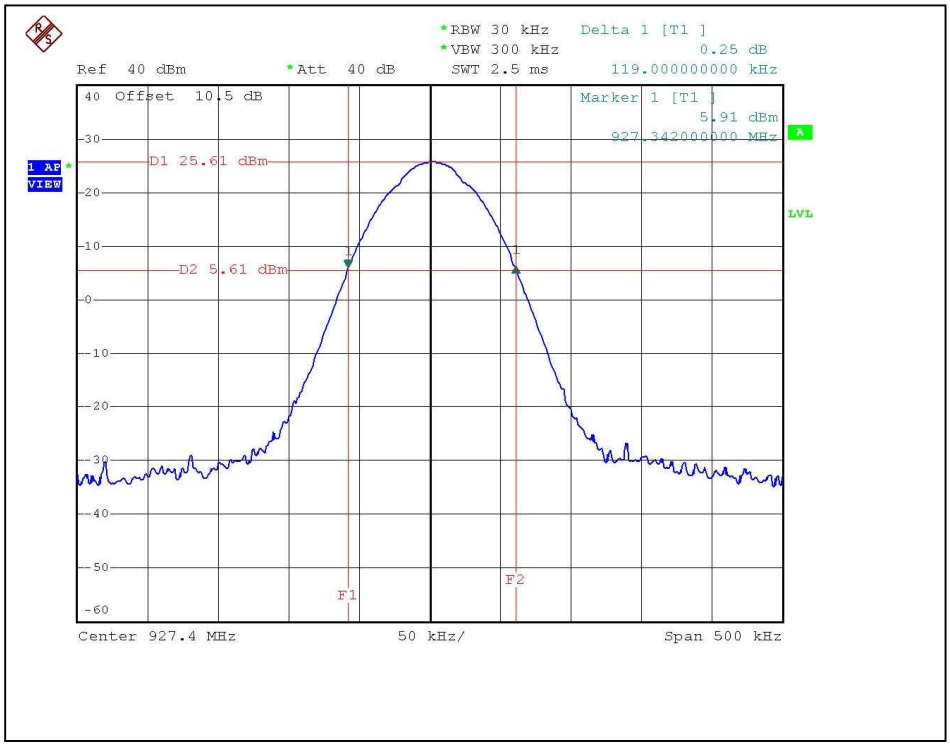
Channel 0



Channel 60



Channel 124

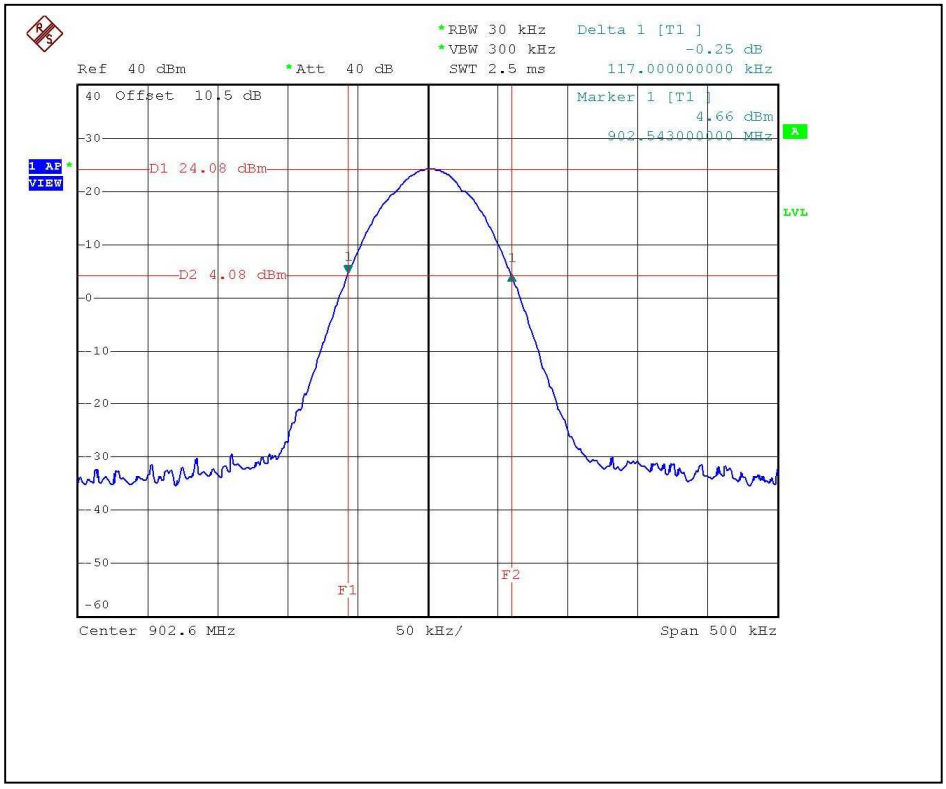


For PR-ASK(DRM) – Low Power:

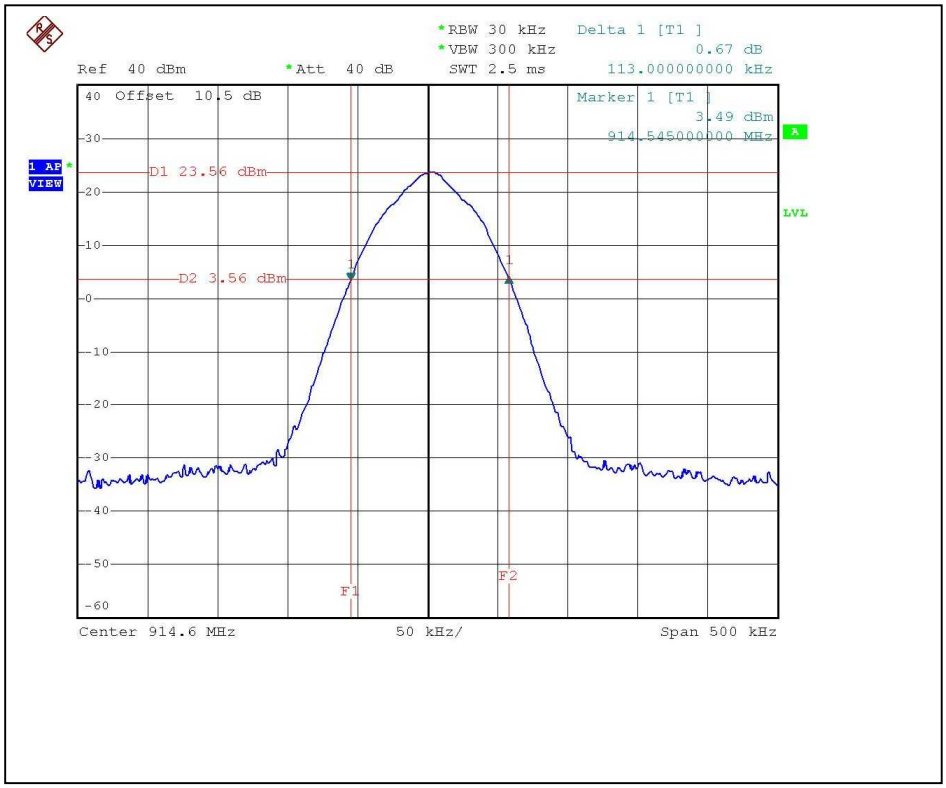
ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 1015 hPa	**INPUT POWER (SYSTEM)**	120Vac, 60 Hz
TESTED BY	Wen Yu		

CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (kHz)
0	902.6	117
60	914.6	113
124	927.4	117

Channel 0



Channel 60



Channel 124