FCC PART 15C
TEST REPORT

No. 2013TAR559

for

TCT Mobile Limited

HSUPA/HSDPA/UMTS triband/GSM quadband mobile phone

Model Name: California 2SIM US

Marketing Name: ONE TOUCH 6012E

FCC ID: RAD391

with

Hardware Version: Proto2

Software Version: 3A0B

Issued Date: 2013-08-21

DAkkS Deutsche Akkreditierungsstelle D-PL-12123-01-01

DAR accreditation (DIN EN ISO/IEC 17025): No. D-PL-12123-01-01
FCC 2.948 Listed: No.733176
IC O.A.T.S listed: No.6629B

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of TMC Beijing.

Test Laboratory:

TMC Beijing, Telecommunication Metrology Center of Ministry of Industry and Information Technology

Shouxiang Science Building, No 51, Xueyuan Road, Haidian District, Beijing, P.R.China 100191

Tel:+86(0)10-62304633-2678, Fax:+86(0)10-62304633 Email:welcome@emcite.com. www.emcite.com

©Copyright. All rights reserved by TMC Beijing.

CONTENTS

©Copyright. All rights reserved by TMC Beijing.

1. Test Laboratory

1.1. Testing Location

Company Name:	TMC Beijing, Telecommunication Metrology Center of MIIT
Address:	Shouxiang Science Building, No 51, Xueyuan Road, Haidian District, Beijing, P.R.China
Postal Code:	100191
Telephone:	00861062304633
Fax:	00861062304793

1.2. Testing Environment

Normal Temperature:	15-35℃
Extreme Temperature:	-20/+55℃
Relative Humidity:	20-75%

1.3. Project data

Project Leader:	Zi Xiaogang
Testing Start Date:	2013-07-11
Testing End Date:	2013-08-20

1.4. Signature

Zi Xiaogang
(Prepared this test report)

Sun Xiangqian
(Reviewed this test report)

Lu Bingsong
Deputy Director of the laboratory
(Approved this test report)

©Copyright. All rights reserved by TMC Beijing.

2. Client Information

2.1. Applicant Information

Company Name:	TCT Mobile Limited
Address /Post:	12F/B, TCL Tower, Gaoxin Nanyi Road, Nanshan District, Shenzhen, Guangdong, P.R. China. 518057
Contact:	Lv Meixian
Email:	meixian.lv@tcl.com
Telephone:	0086-755-33956929
Fax:	0086-755-36645072

2.2. Manufacturer Information

Company Name:	TCT Mobile Limited
Address /Post:	12F/B, TCL Tower, Gaoxin Nanyi Road, Nanshan District, Shenzhen, Guangdong, P.R. China. 518057
Contact:	Lv Meixian
Email:	meixian.lv@tcl.com
Telephone:	0086-755-33956929
Fax:	0086-755-36645072

©Copyright. All rights reserved by TMC Beijing.

3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Description	HSUPA/HSDPA/UMTS triband/GSM quadband mobile phone
Model Name	California 2SIM US
Marketing Name	ONE TOUCH 6012E
FCC ID	RAD391
Frequency Band	ISM 2400MHz~2483.5MHz
Type of Modulation	GFSK/π/4 DQPSK/8DPSK
Number of Channels	79
Power Supply	3.8V DC by Battery

Note: The EUT is a variant model of ONE TOUCH 6012A. All the result is coming from the initial model.

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
N14	013769000100318	Proto2	3A0B

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE used during the test

AE ID*	Description
AE1	Battery
AE2	Battery
AE3	Charger
AE4	Charger

AE1

Model	TLp017A1
Manufacturer	BYD
Capacitance	1700mAh
Nominal Voltage	3.8V

AE2

Model	TLp017A2
Manufacturer	SCUD
Capacitance	1700mAh
Nominal Voltage	3.8V

AE3

Model	CBA3007AG0C1

©Copyright. All rights reserved by TMC Beijing.

Manufacturer	BYD

AE4

Model	CBA3007AG0C2
Manufacturer	Tenpao

*AE ID: is used to identify the test sample in the lab internally.

3.4. Normal Accessory setting

Fully charged battery should be used during the test.

3.5. General Description

The Equipment Under Test (EUT) is a model of HSUPA/HSDPA/UMTS triband/GSM quadband mobile phone with integrated antenna. It consists of normal options: lithium battery, charger. Manual and specifications of the EUT were provided to fulfil the test. Samples undergoing test were selected by the Client.

©Copyright. All rights reserved by TMC Beijing.

4. Reference Documents

4.1. Documents supplied by applicant

EUT feature information is supplied by the applicant or manufacturer, which is the basis of testing.

4.2. Reference Documents for testing

The following documents listed in this section are referred for testing.

FCC Part15	FCC CFR 47, Part 15, Subpart C: 15.205 Restricted bands of operation; 15.209 Radiated emission limits, general requirements; 15.247 Operation within the bands 902–928MHz, 2400–2483.5 MHz, and 5725–5850 MHz.	10-1-12
ANSI C63.4	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2009
FCC Public Notice DA 00-705	Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems	March 2000
KDB412172 D01	Guidelines for Determining the Effective Radiated Power (ERP) and Equivalent Isotropically Radiated Power (EIRP) of a RF Transmitting System	2011

©Copyright. All rights reserved by TMC Beijing.

5. LABORATORY ENVIRONMENT

Control room / conducted chamber did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 35 ℃
Relative humidity	Min. =20 %, Max. = 80 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 2 MΩ
Ground system resistance	< 0.5 Ω

Fully-anechoic chamber 2 (8.6 meters×6.1 meters×3.85 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 30 ℃
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 2 MΩ
Ground system resistance	< 1 Ω
Site voltage standing-wave ratio (S_{VSWR})	Between 0 and 6 dB, from 1GHz to 18GHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 4000 MHz

Semi-anechoic chamber 2 / Fully-anechoic chamber 3 (10 meters×6.7 meters×6.15 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 30 ℃
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 2 MΩ
Ground system resistance	< 0.5 Ω
Normalised site attenuation (NSA)	< ±3.5 dB, 3 m distance
Site voltage standing-wave ratio (S_{VSWR})	Between 0 and 6 dB, from 1GHz to 18GHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 3000 MHz

©Copyright. All rights reserved by TMC Beijing.

6. SUMMARY OF TEST RESULTS

6.1. Summary of Test Results

Abbreviations used in this clause:

P Pass, The EUT complies with the essential requirements in the standard.

F Fail, The EUT does not comply with the essential requirements in the standard

NA Not Applicable, The test was not applicable

NP Not Performed, The test was not performed by TMC

SUMMARY OF MEASUREMENT RESULTS	Sub-clause	Verdict
Peak Output Power - Conducted	15.247 (b)(1)	**P**
Frequency Band Edges	15.247 (d)	**P**
Conducted Emission	15.247 (d)	**P**
Radiated Emission	15.247, 15.205, 15.209	**P**
Time of Occupancy (Dwell Time)	15.247 (a) (1)(iii)	**P**
20dB Bandwidth	15.247 (a)(1)	**NA**
Carrier Frequency Separation	15.247 (a)(1)	**P**
Number of hopping channels	15.247 (a)(b)(iii)	**P**
AC Powerline Conducted Emission	15.107, 15.207	**P**

Please refer to **ANNEX A** for detail.

The measurement is made according to Public notice DA 00-705 and ANSI C63.4.

6.2. Statements

TMC has evaluated the test cases requested by the applicant /manufacturer as listed in section 6.1 of this report for the EUT specified in section 3 according to the standards or reference documents listed in section 4.2

©Copyright. All rights reserved by TMC Beijing.

7. Test Equipments Utilized

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date
1	Vector Signal Analyzer	FSU26	200030	Rohde & Schwarz	2014-06-12
2	Bluetooth Tester	CBT32	100649	Rohde & Schwarz	2014-02-03

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date
1	Test Receiver	ESU26	100376	Rohde & Schwarz	2013-11-07
2	EMI Antenna	VULB 9163	9163482	Schwarzbeck	2014-02-17
3	EMI Antenna	3117	00119024	EMCO	2014-02-03
4	Dual-Ridge Waveguide Horn Antenna	3116	2663	ETS-Lindgren	2014-06-30
5	Dual-Ridge Waveguide Horn Antenna	3116	2661	ETS-Lindgren	2014-06-30
6	Bluetooth Tester	CBT	100153	Rohde & Schwarz	2013-09-13
7	LISN	ESH2-Z5	829991/012	Rohde & Schwarz	2014-03-17
8	Pre-amplifier(18GHz)	SCU18	1005277	Rohde & Schwarz	/
9	Pre-amplifier(26.5GHz)	SCU26	1006788	Rohde & Schwarz	/

Anechoic chamber

Fully anechoic chamber by Frankonia German.

©Copyright. All rights reserved by TMC Beijing.

ANNEX A: MEASUREMENT RESULTS

A.1. Measurement Method

A.1.1. Conducted Measurements

The measurement is made according to Public notice DA 00-705 and ANSI C63.4.

1). Connect the EUT to the test system correctly.

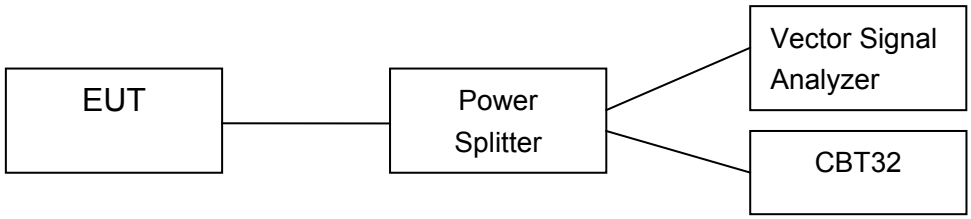
2). Set the EUT to the required work mode (Transmitter, receiver or transmitter & receiver).

3). Set the EUT to the required channel.

4). Set the EUT hopping mode (hopping or hopping off).

5). Set the spectrum analyzer to start measurement.

6). Record the values. Vector Signal Analyzer



A.1.2. Radiated Emission Measurements

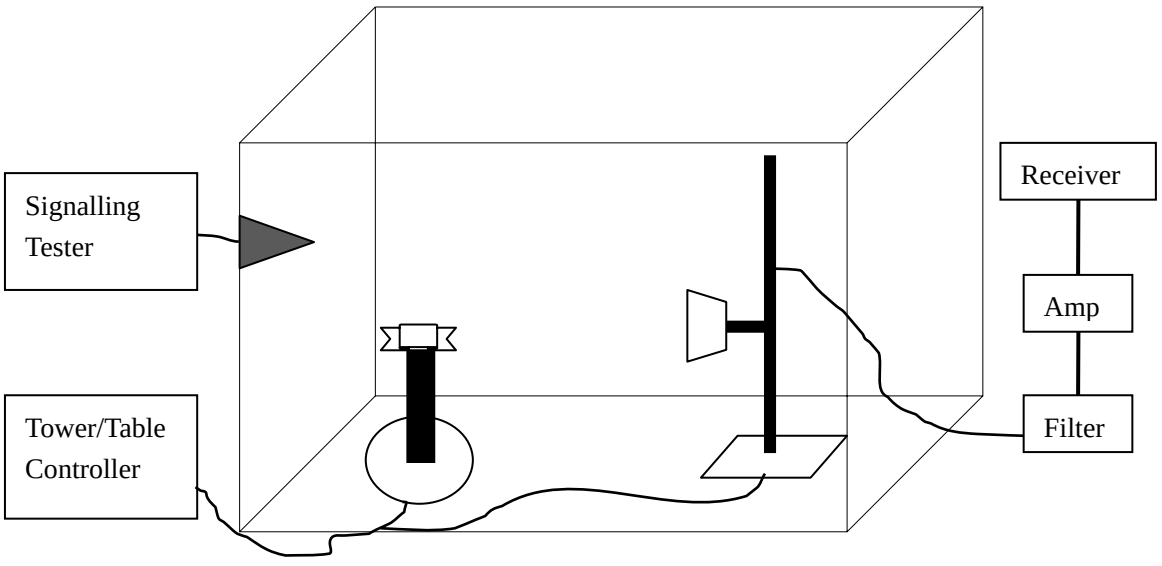
The measurement is made according to Public notice DA 00-705 and ANSI C63.4

The radiated emission test is performed in semi-anechoic chamber. The distance from the EUT to the reference point of measurement antenna is 3m. The test is carried out on both vertical and horizontal polarization and only maximization result of both polarizations is kept. During the test, the turntable is rotated 360° and the measurement antenna is moved from 1m to 4m to get the maximization result.

In the case of radiated emission, the used settings are as follows,

Sweep frequency from 30 MHz to 1GHz, RBW = 100 kHz, VBW = 300 kHz;

Sweep frequency from 1 GHz to 26GHz, RBW = 1MHz, VBW = 1MHz;



©Copyright. All rights reserved by TMC Beijing.

A.2. Peak Output Power - Conducted

Measurement Limit:

Standard	Limit (dBm)
FCC Part 15.247(b)(1)	< 30

The measurement is made according to Public notice DA 00-705 and ANSI C63.4.

Test Condition

Hopping Mode	RBW	VBW	Span	Sweeptime
Hopping OFF	3MHz	3MHz	5MHz	2.5ms

Measurement Results:

For GFSK

Channel	Ch 0 2402 MHz	Ch 39 2441 MHz	Ch 78 2480 MHz	Conclusion
Peak Conducted Output Power (dBm)	6.60	7.36	7.54	P

Forπ/4 DQPSK

Channel	Ch 0 2402 MHz	Ch 39 2441 MHz	Ch 78 2480 MHz	Conclusion
Peak Conducted Output Power (dBm)	6.43	7.18	7.45	P

For 8DPSK

Channel	Ch 0 2402 MHz	Ch 39 2441 MHz	Ch 78 2480 MHz	Conclusion
Peak Conducted Output Power (dBm)	6.67	7.45	7.71	P

Conclusion: PASS

©Copyright. All rights reserved by TMC Beijing.

A.3. Frequency Band Edges - Conducted

Measurement Limit:

Standard	Limit (dBc)
FCC 47 CFR Part 15.247 (d)	> 20

The measurement is made according to Public notice DA 00-705 and ANSI C63.4.

Measurement Result:

For GFSK

Channel	Hopping	Band Edge Power (dBc)		Conclusion
0	Hopping OFF	Fig.1	-52.23	P
	Hopping ON	Fig.2	-53.23	P
78	Hopping OFF	Fig.3	-55.99	P
	Hopping ON	Fig.4	-55.52	P

Forπ/4 DQPSK

Channel	Hopping	Band Edge Power (dBc)		Conclusion
0	Hopping OFF	Fig.5	-54.37	P
	Hopping ON	Fig.6	-55.98	P
78	Hopping OFF	Fig.7	-59.13	P
	Hopping ON	Fig.8	-53.30	P

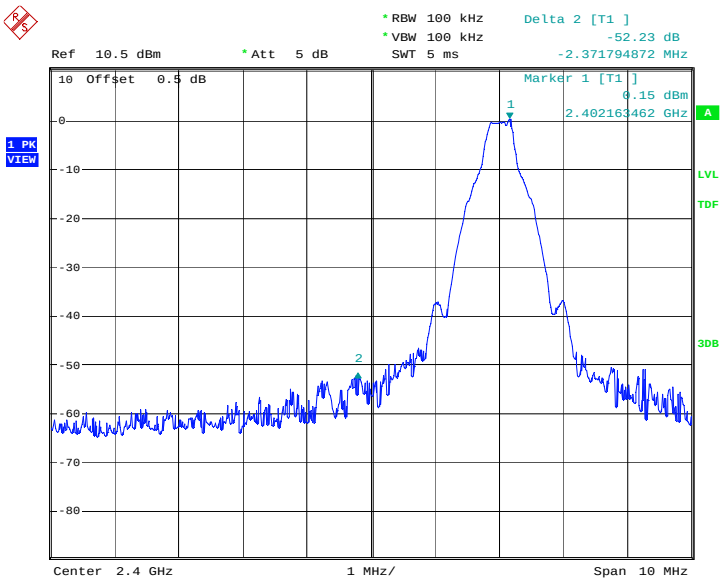
For 8DPSK

Channel	Hopping	Band Edge Power (dBc)		Conclusion
0	Hopping OFF	Fig.9	-52.86	P
	Hopping ON	Fig.10	-54.06	P
78	Hopping OFF	Fig.11	-57.12	P
	Hopping ON	Fig.12	-56.61	P

Conclusion: PASS

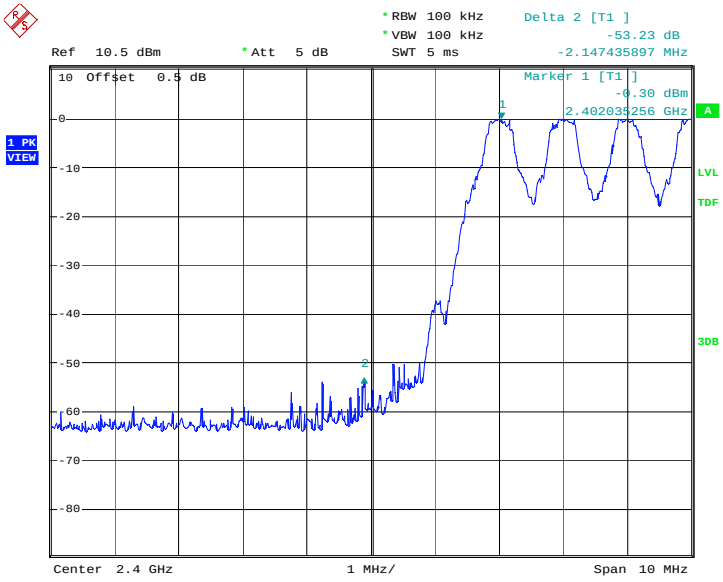
Test graphs as below

©Copyright. All rights reserved by TMC Beijing.



Date: 11.JUL.2013 06:18:26

Fig.1. Frequency Band Edges: GFSK, Channel 0, Hopping Off



Date: 11.JUL.2013 06:20:46

Fig.2. Frequency Band Edges: GFSK, Channel 0, Hopping On

©Copyright. All rights reserved by TMC Beijing.

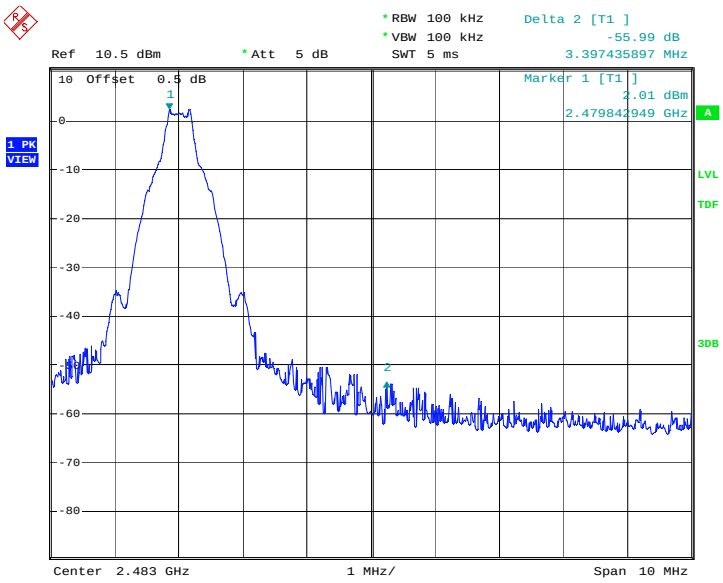


Fig.3. Frequency Band Edges: GFSK, Channel 78, Hopping Off

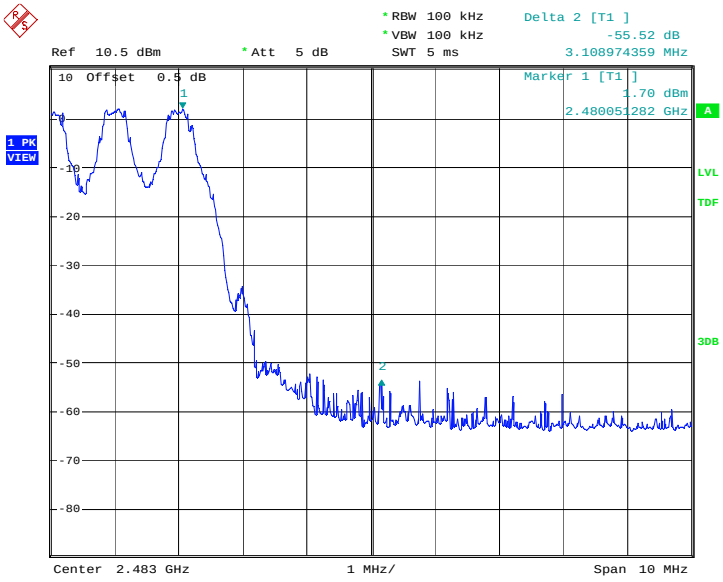


Fig.4. Frequency Band Edges: GFSK, Channel 78, Hopping On

©Copyright. All rights reserved by TMC Beijing.

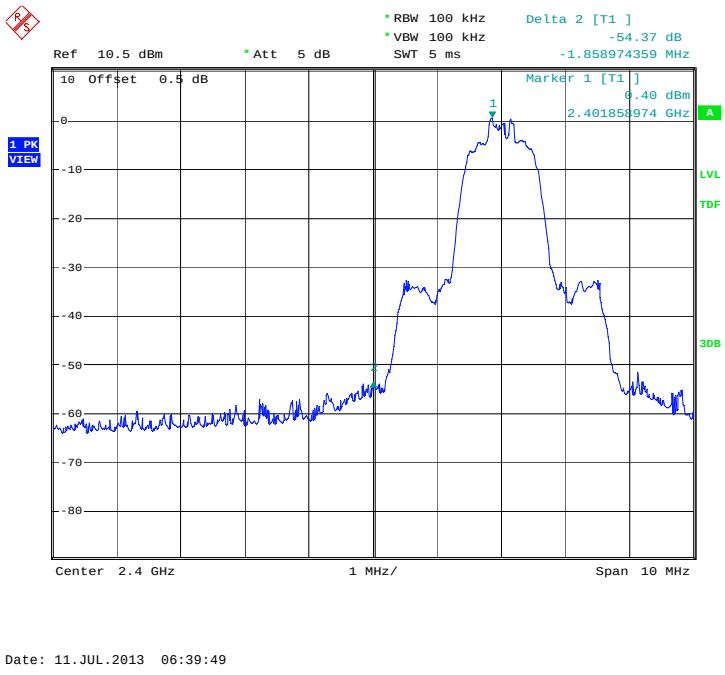


Fig.5. Frequency Band Edges: π/4 DQPSK, Channel 0, Hopping Off

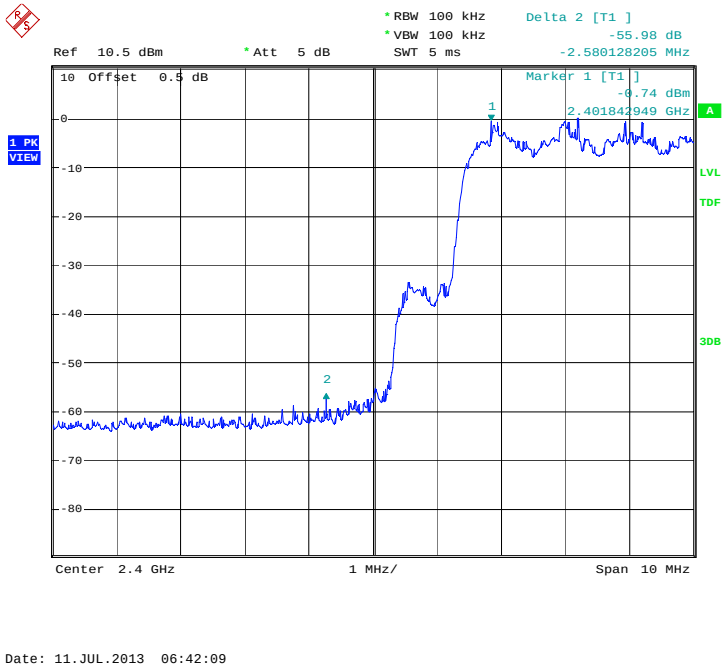


Fig.6. Frequency Band Edges: π/4 DQPSK, Channel 0, Hopping On

©Copyright. All rights reserved by TMC Beijing.

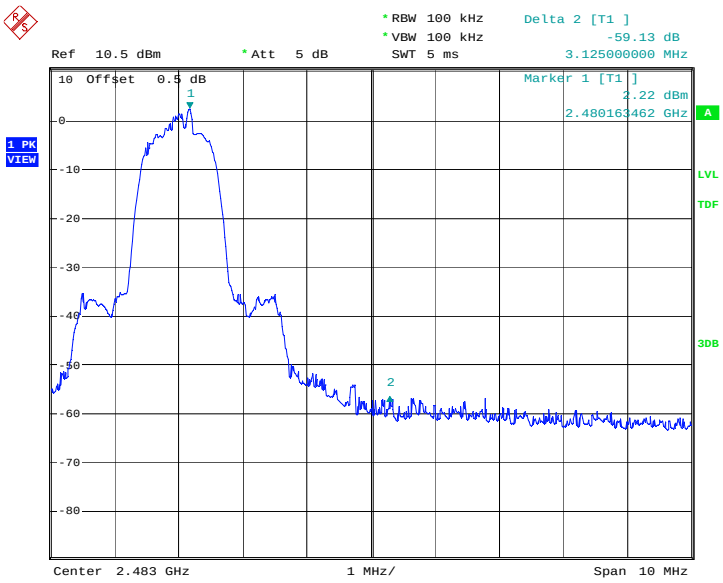


Fig.7. Frequency Band Edges: π/4 DQPSK, Channel 78, Hopping Off

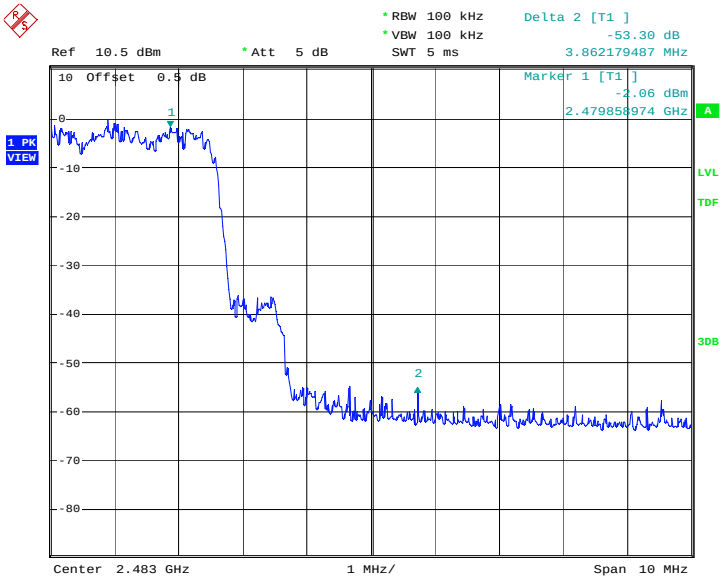


Fig.8. Frequency Band Edges: π/4 DQPSK, Channel 78, Hopping On

©Copyright. All rights reserved by TMC Beijing.

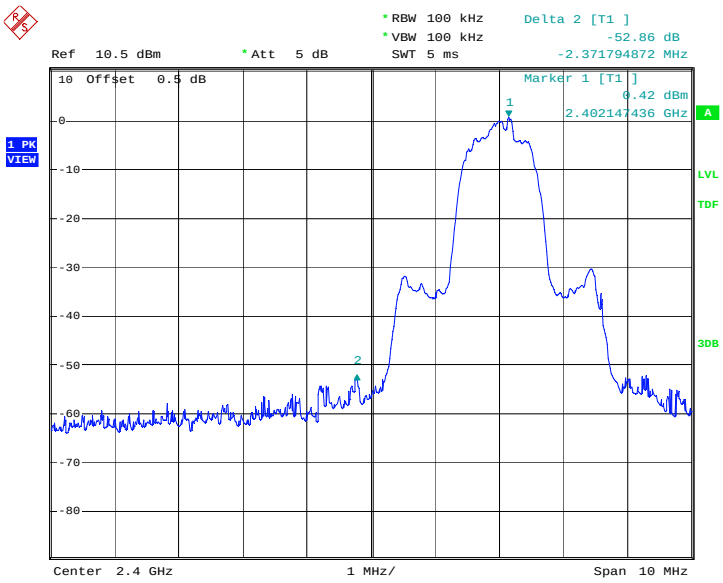


Fig.9. Frequency Band Edges: 8DPSK, Channel 0, Hopping Off

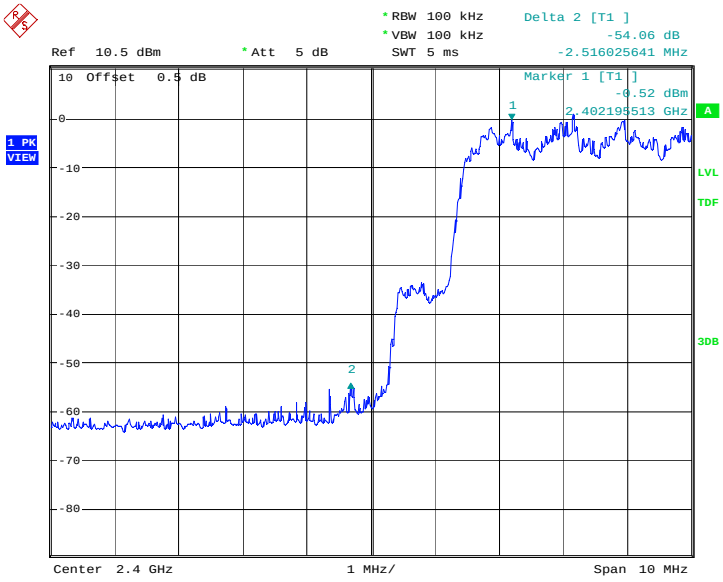


Fig.10. Frequency Band Edges: 8DPSK, Channel 0, Hopping On

©Copyright. All rights reserved by TMC Beijing.

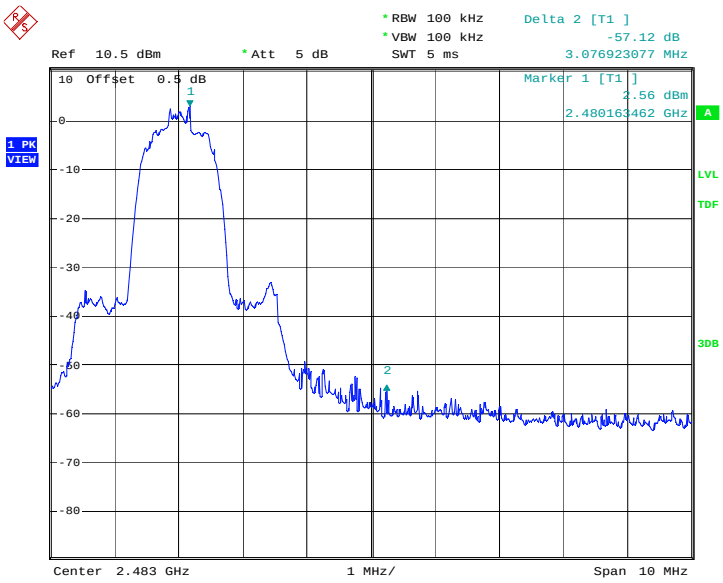


Fig.11. Frequency Band Edges: 8DPSK, Channel 78, Hopping Off

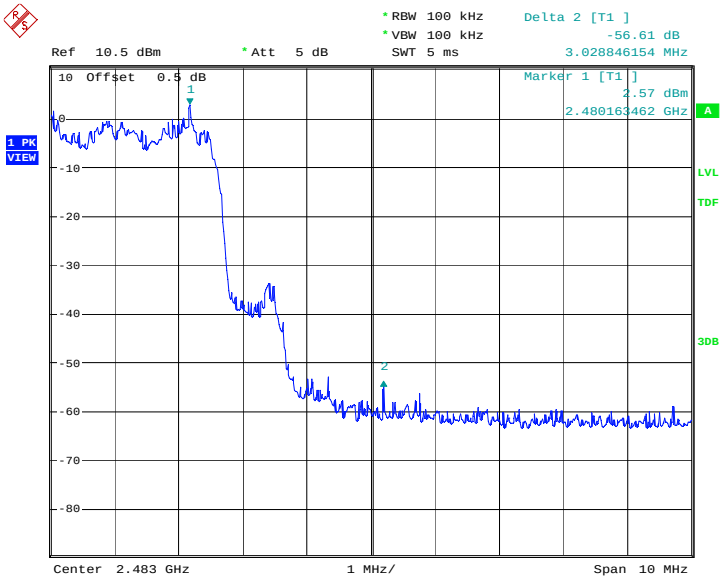


Fig.12. Frequency Band Edges: 8DPSK, Channel 78, Hopping On

©Copyright. All rights reserved by TMC Beijing.

A.4. Conducted Emission

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247 (d)	20dB below peak output power in 100 kHz bandwidth

The measurement is made according to Public notice DA 00-705 and ANSI C63.4

Measurement Results:

For GFSK

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	Center Frequency	Fig.13	P
	30 MHz ~ 1 GHz	Fig.14	P
	1 GHz ~ 3 GHz	Fig.15	P
	3 GHz ~ 10 GHz	Fig.16	P
	10 GHz ~ 26 GHz	Fig.17	P
Ch 39 2441 MHz	Center Frequency	Fig.18	P
	30 MHz ~ 1 GHz	Fig.19	P
	1 GHz ~ 3 GHz	Fig.20	P
	3 GHz ~ 10 GHz	Fig.21	P
	10 GHz ~ 26 GHz	Fig.22	P
Ch 78 2480 MHz	Center Frequency	Fig.23	P
	30 MHz ~ 1 GHz	Fig.24	P
	1 GHz ~ 3 GHz	Fig.25	P
	3 GHz ~ 10 GHz	Fig.26	P
	10 GHz ~ 26 GHz	Fig.27	P

For π/4 DQPSK

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	Center Frequency	Fig.28	P
	30 MHz ~ 1 GHz	Fig.29	P
	1 GHz ~ 3 GHz	Fig.30	P
	3 GHz ~ 10 GHz	Fig.31	P
	10 GHz ~ 26 GHz	Fig.32	P
Ch 39 2441 MHz	Center Frequency	Fig.33	P
	30 MHz ~ 1 GHz	Fig.34	P
	1 GHz ~ 3 GHz	Fig.35	P
	3 GHz ~ 10 GHz	Fig.36	P
	10 GHz ~ 26 GHz	Fig.37	P
Ch 78 2480 MHz	Center Frequency	Fig.38	P
	30 MHz ~ 1 GHz	Fig.39	P

©Copyright. All rights reserved by TMC Beijing.

	1 GHz ~ 3 GHz	Fig.40	P
	3 GHz ~ 10 GHz	Fig.41	P
	10 GHz ~ 26 GHz	Fig.42	P

For 8DPSK

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	Center Frequency	Fig.43	P
	30 MHz ~ 1 GHz	Fig.44	P
	1 GHz ~ 3 GHz	Fig.45	P
	3 GHz ~ 10 GHz	Fig.46	P
	10 GHz ~ 26 GHz	Fig.47	P
Ch 39 2441 MHz	Center Frequency	Fig.48	P
	30 MHz ~ 1 GHz	Fig.49	P
	1 GHz ~ 3 GHz	Fig.50	P
	3 GHz ~ 10 GHz	Fig.51	P
	10 GHz ~ 26 GHz	Fig.52	P
Ch 78 2480 MHz	Center Frequency	Fig.53	P
	30 MHz ~ 1 GHz	Fig.54	P
	1 GHz ~ 3 GHz	Fig.55	P
	3 GHz ~ 10 GHz	Fig.56	P
	10 GHz ~ 26 GHz	Fig.57	P

Conclusion: PASS

Test graphs as below

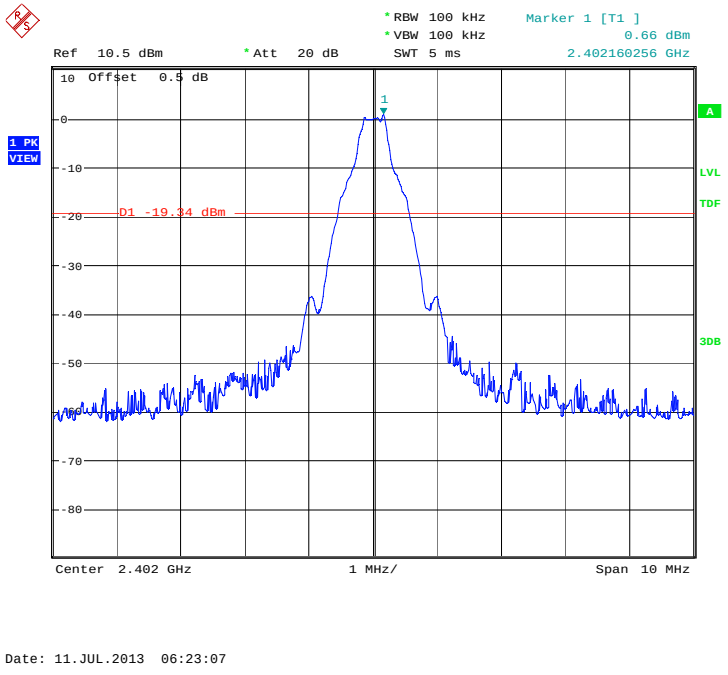


Fig.13. Conducted spurious emission: GFSK, Channel 0,2402MHz

©Copyright. All rights reserved by TMC Beijing.

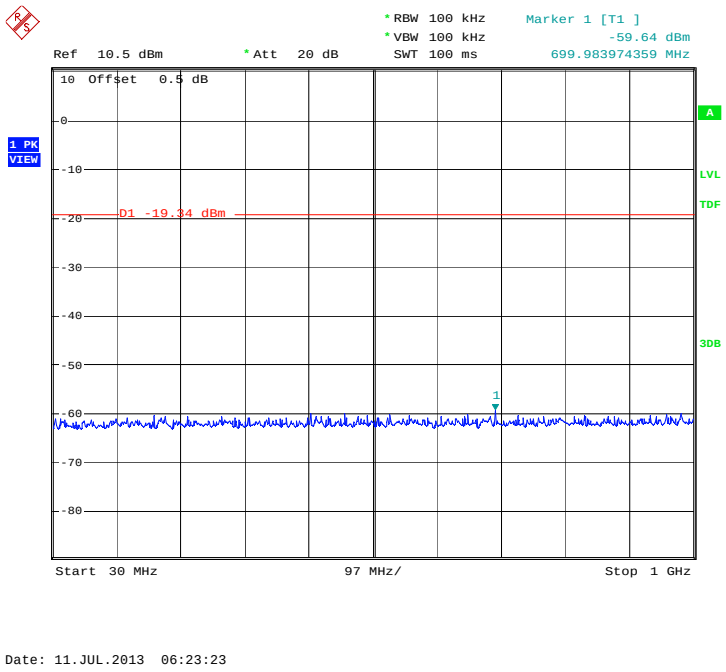


Fig.14. Conducted spurious emission: GFSK, Channel 0, 30MHz - 1GHz

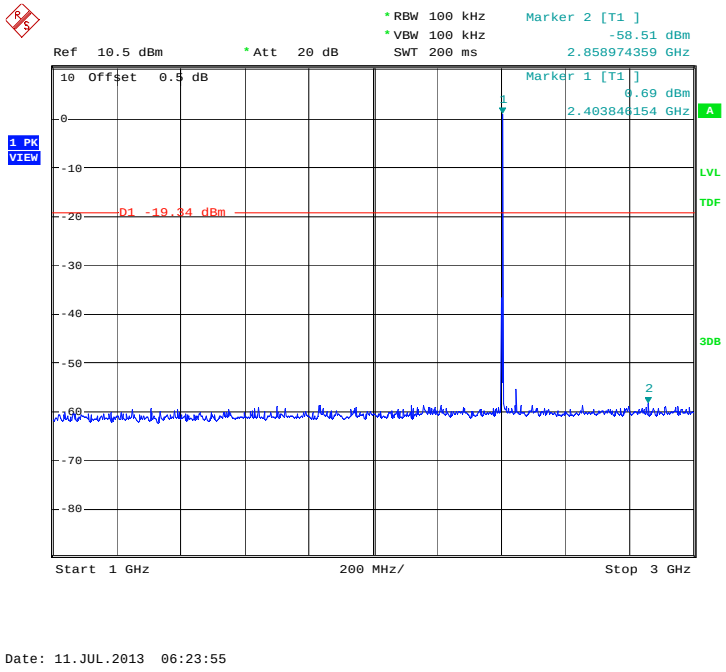


Fig.15. Conducted spurious emission: GFSK, Channel 0, 1GHz - 3GHz

©Copyright. All rights reserved by TMC Beijing.

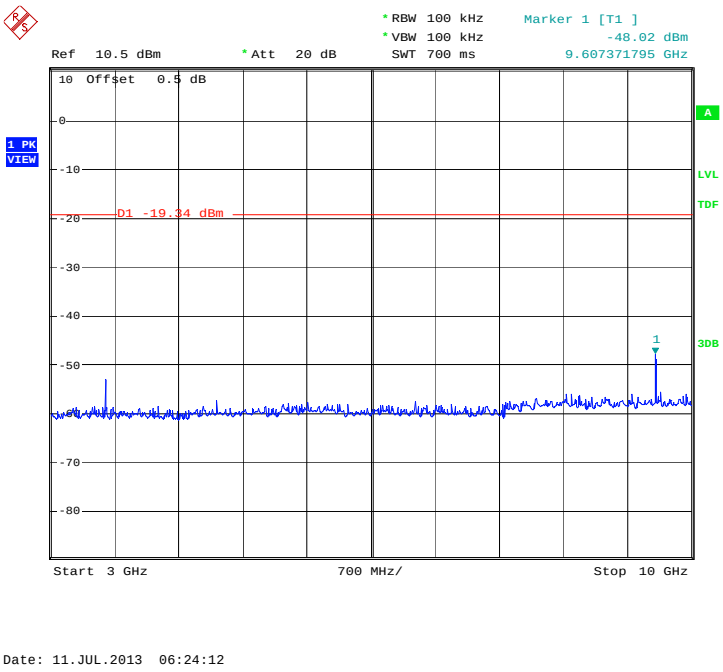


Fig.16. Conducted spurious emission: GFSK, Channel 0, 3GHz - 10GHz

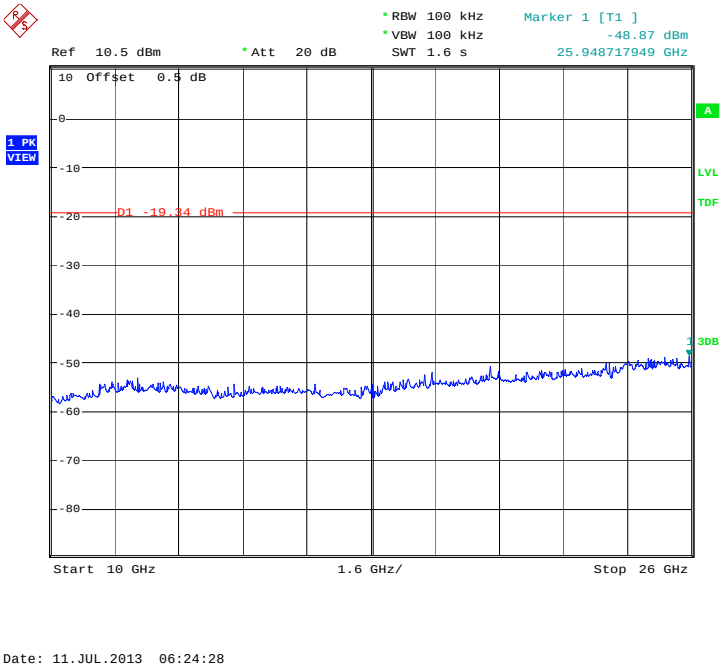


Fig.17. Conducted spurious emission: GFSK, Channel 0,10GHz - 26GHz

©Copyright. All rights reserved by TMC Beijing.

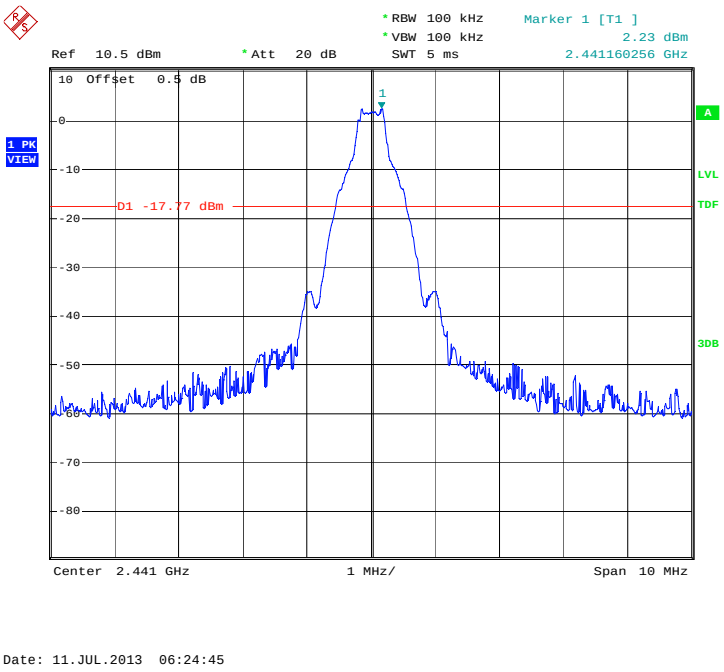


Fig.18. Conducted spurious emission: GFSK, Channel 39, 2441MHz

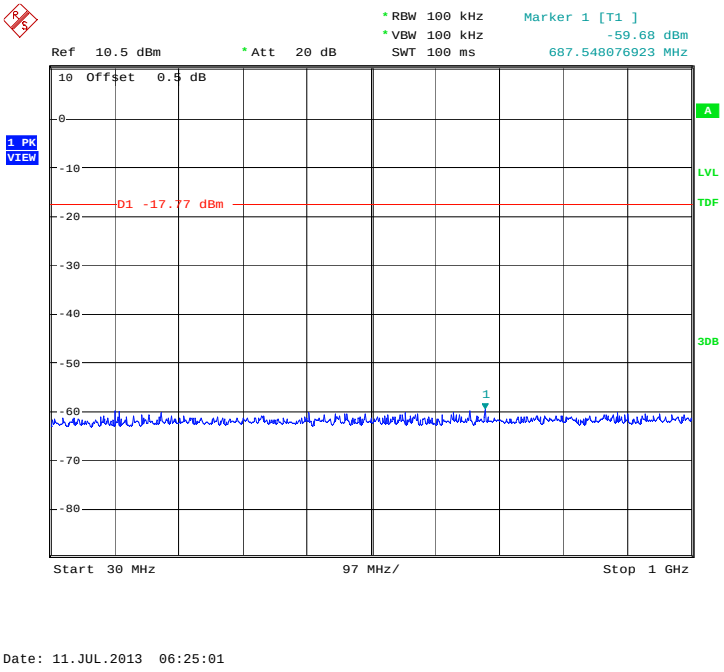


Fig.19. Conducted spurious emission: GFSK, Channel 39, 30MHz - 1GHz

©Copyright. All rights reserved by TMC Beijing.

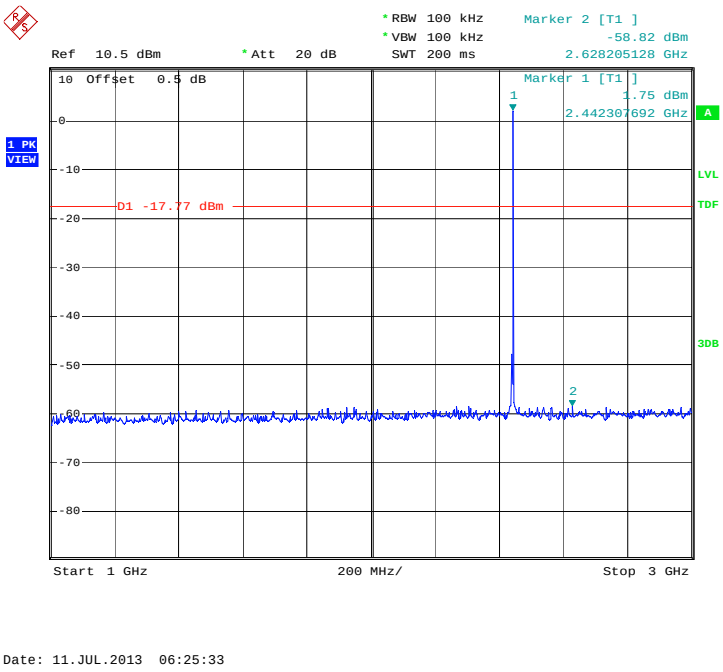


Fig.20. Conducted spurious emission: GFSK, Channel 39, 1GHz – 3GHz

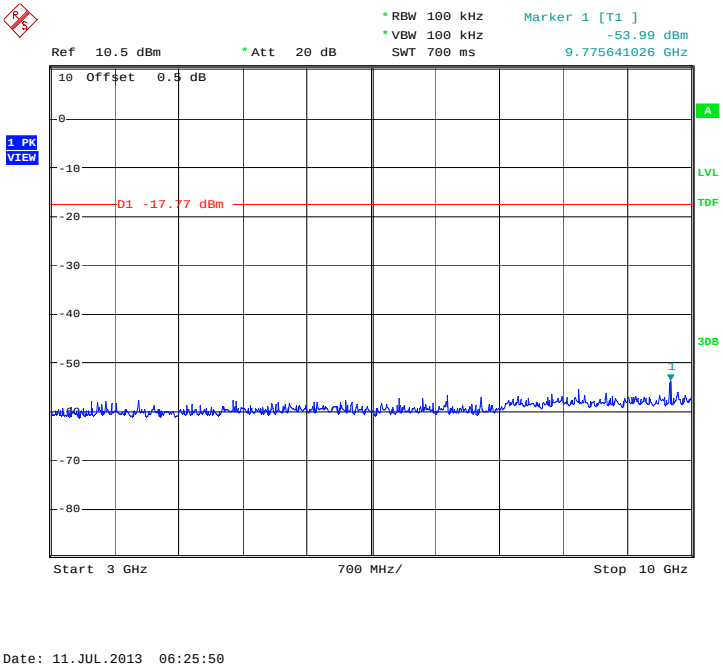


Fig.21. Conducted spurious emission: GFSK, Channel 39, 3GHz – 10GHz

©Copyright. All rights reserved by TMC Beijing.

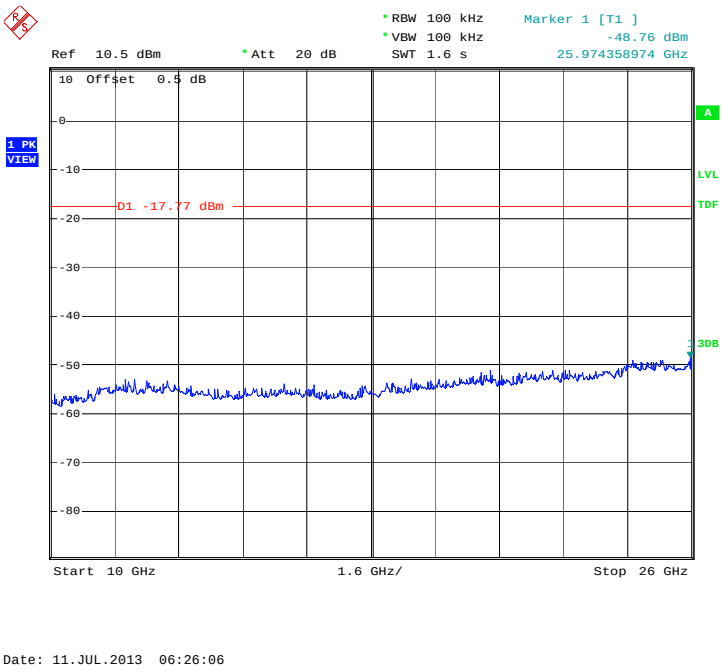


Fig.22. Conducted spurious emission: GFSK, Channel 39, 10GHz – 26GHz

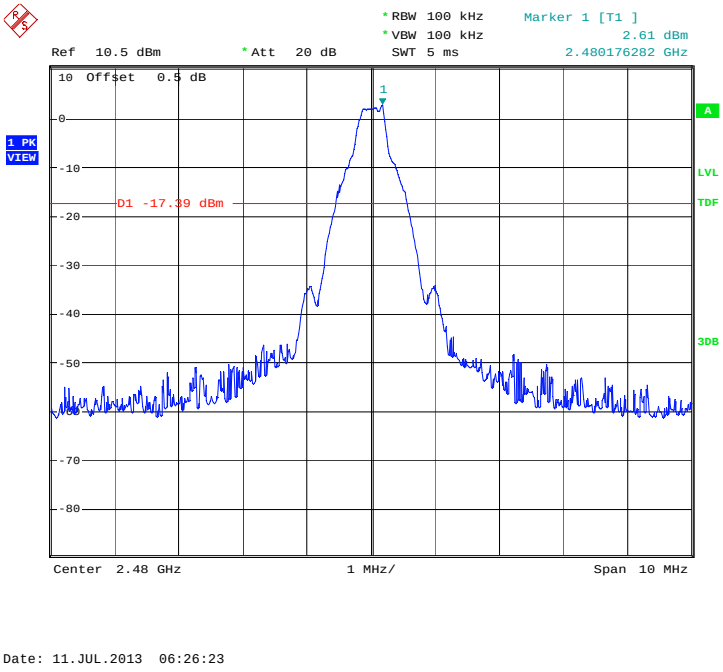


Fig.23. Conducted spurious emission: GFSK, Channel 78, 2480MHz

©Copyright. All rights reserved by TMC Beijing.

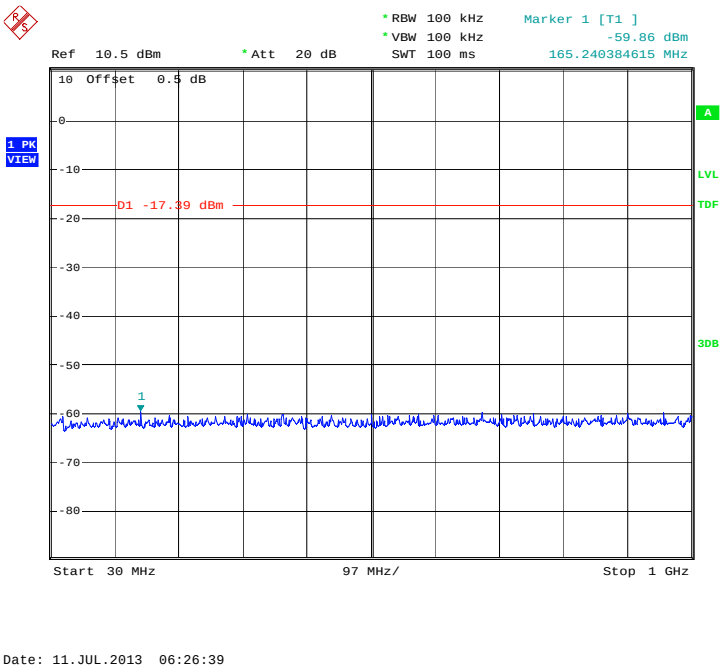


Fig.24. Conducted spurious emission: GFSK, Channel 78, 30MHz - 1GHz

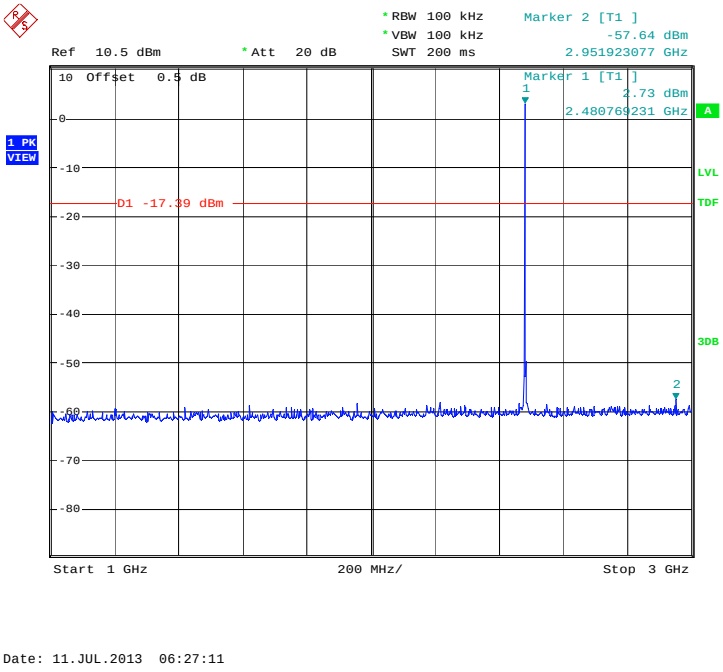


Fig.25. Conducted spurious emission: GFSK, Channel 78, 1GHz - 3GHz

©Copyright. All rights reserved by TMC Beijing.

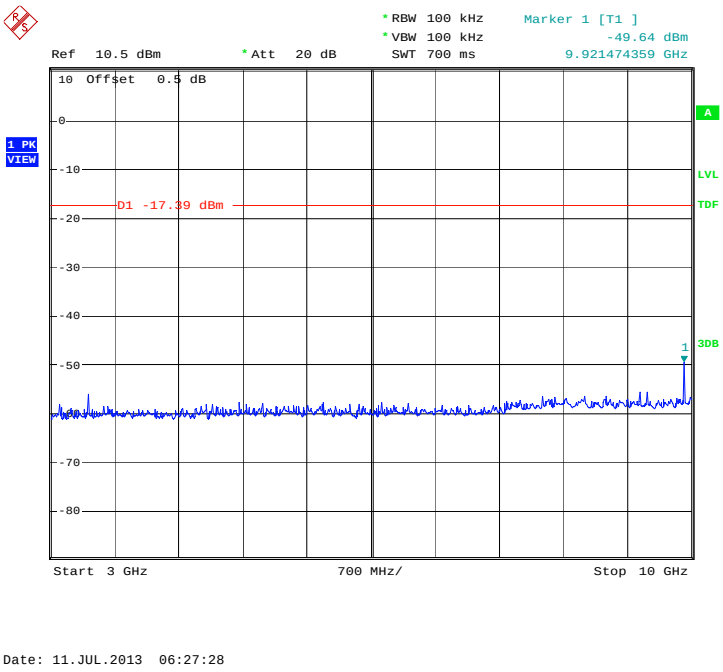


Fig.26. Conducted spurious emission: GFSK, Channel 78, 3GHz - 10GHz

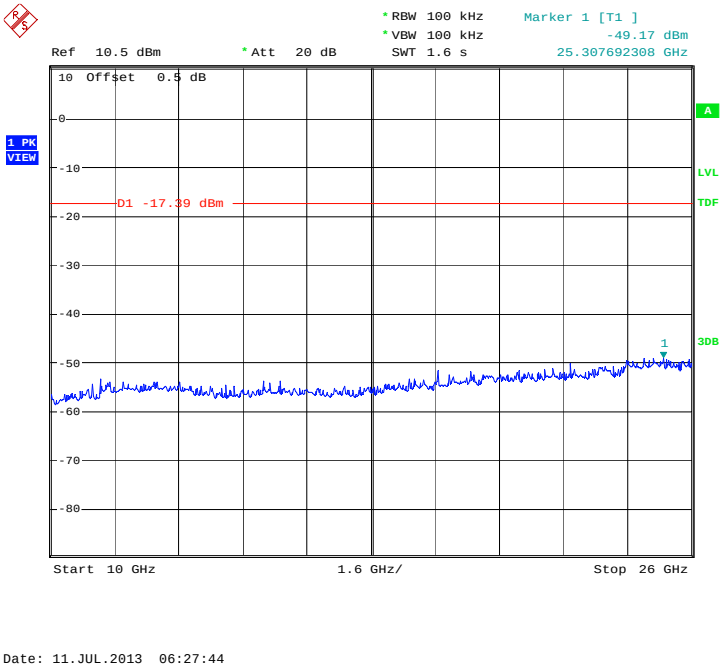


Fig.27. Conducted spurious emission: GFSK, Channel 78, 10GHz - 26GHz

©Copyright. All rights reserved by TMC Beijing.

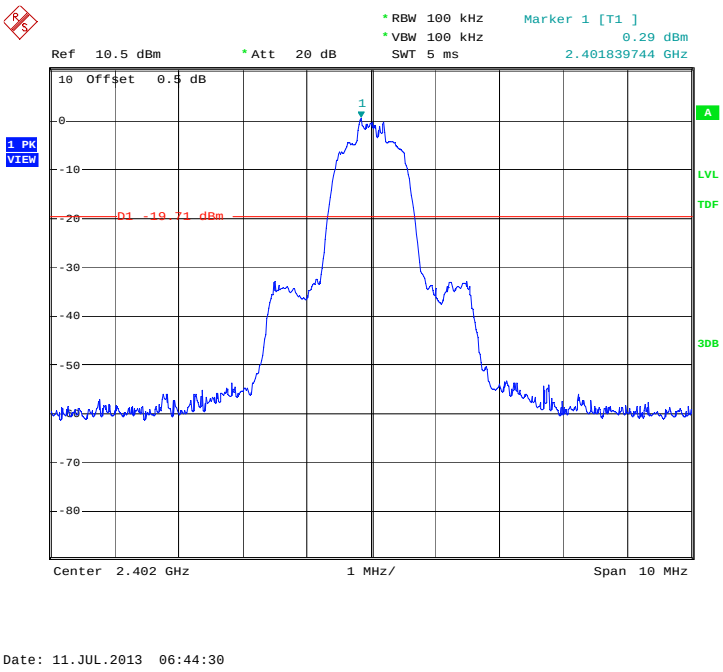


Fig.28. Conducted spurious emission: π/4 DQPSK, Channel 0,2402MHz

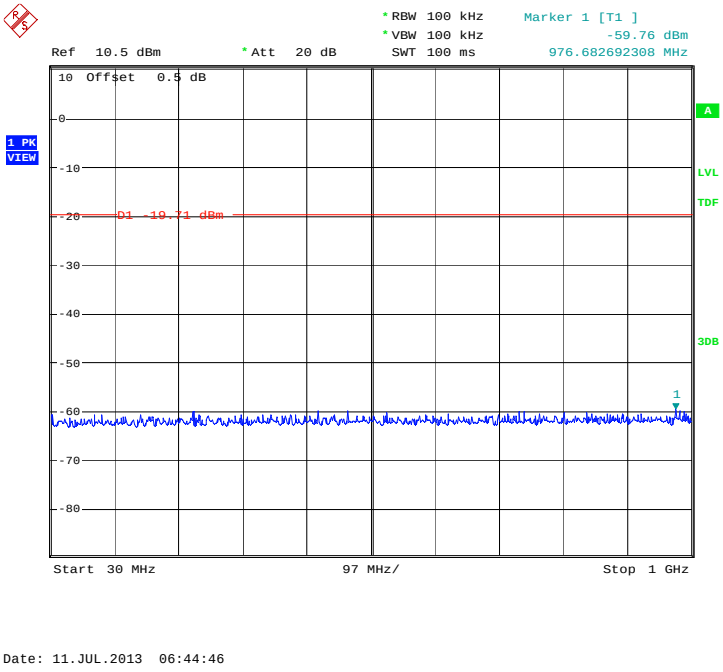


Fig.29. Conducted spurious emission: π/4 DQPSK, Channel 0, 30MHz - 1GHz

©Copyright. All rights reserved by TMC Beijing.

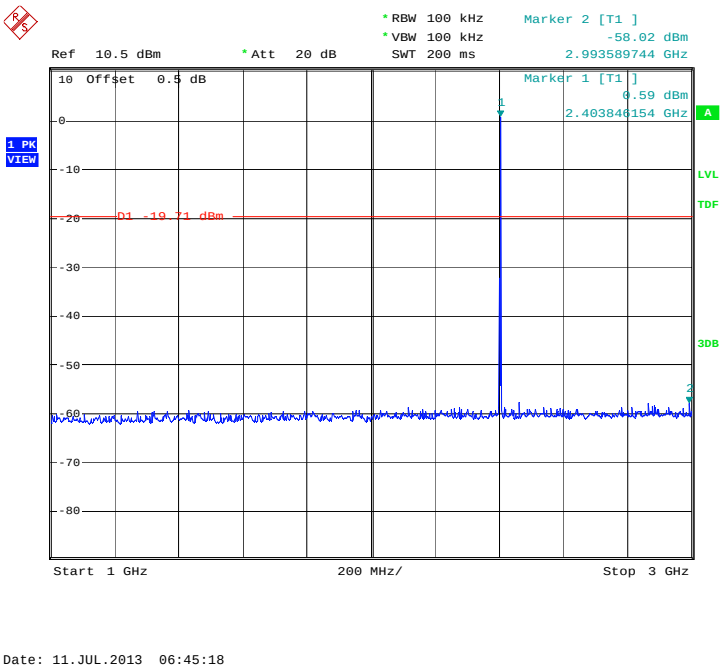


Fig.30. Conducted spurious emission: π/4 DQPSK, Channel 0, 1GHz - 3GHz

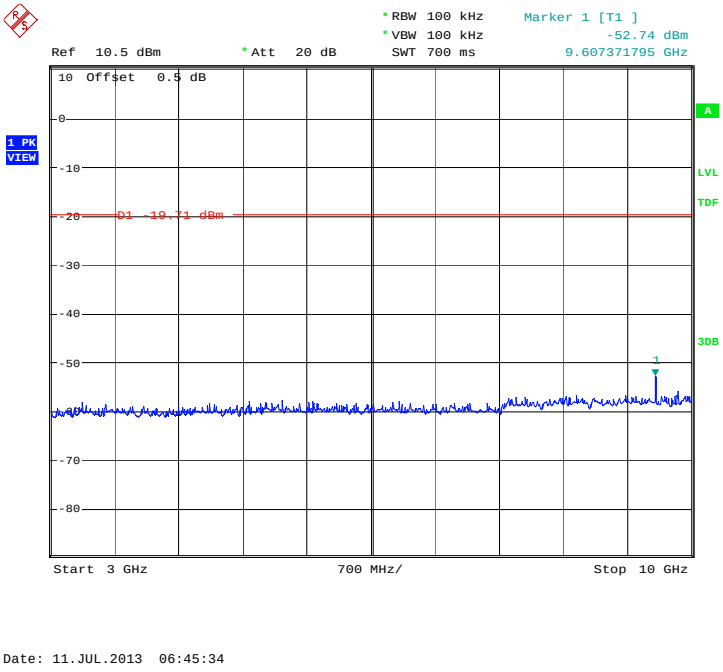


Fig.31. Conducted spurious emission: π/4 DQPSK, Channel 0, 3GHz - 10GHz

©Copyright. All rights reserved by TMC Beijing.

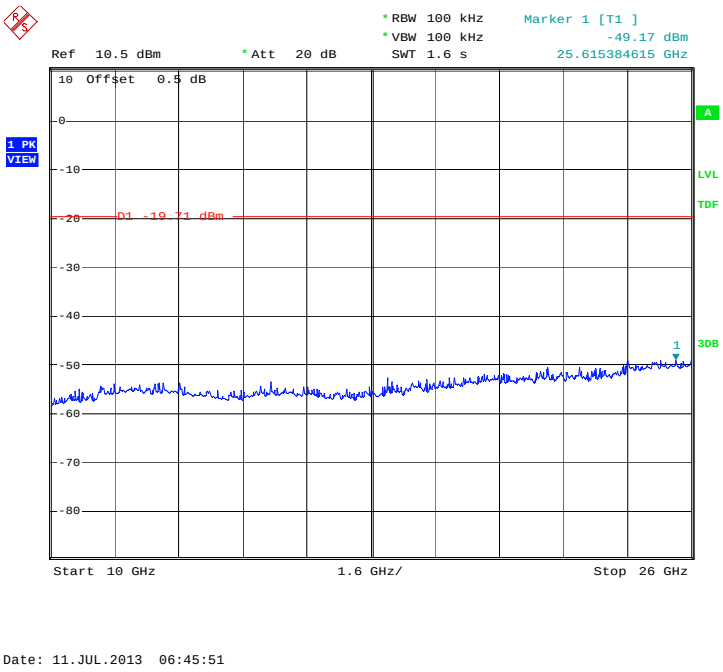


Fig.32. Conducted spurious emission: π/4 DQPSK, Channel 0,10GHz - 26GHz

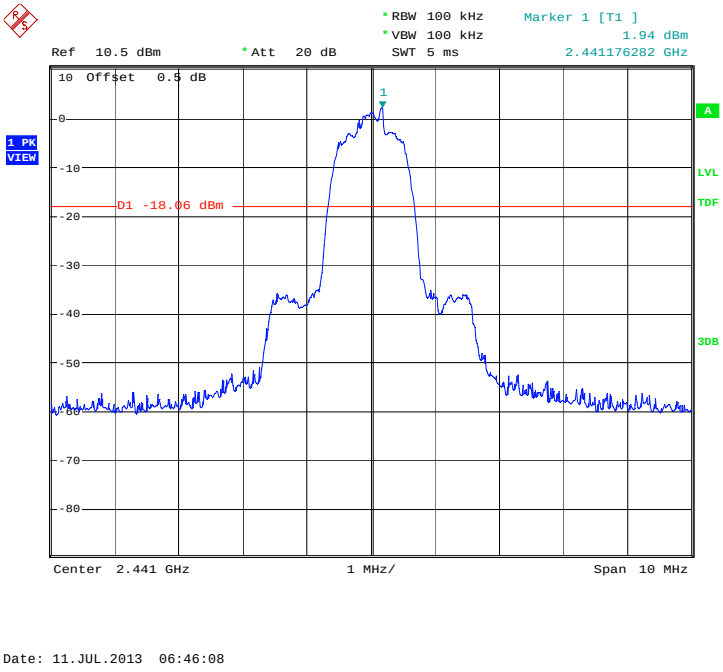


Fig.33. Conducted spurious emission: π/4 DQPSK, Channel 39, 2441MHz

©Copyright. All rights reserved by TMC Beijing.

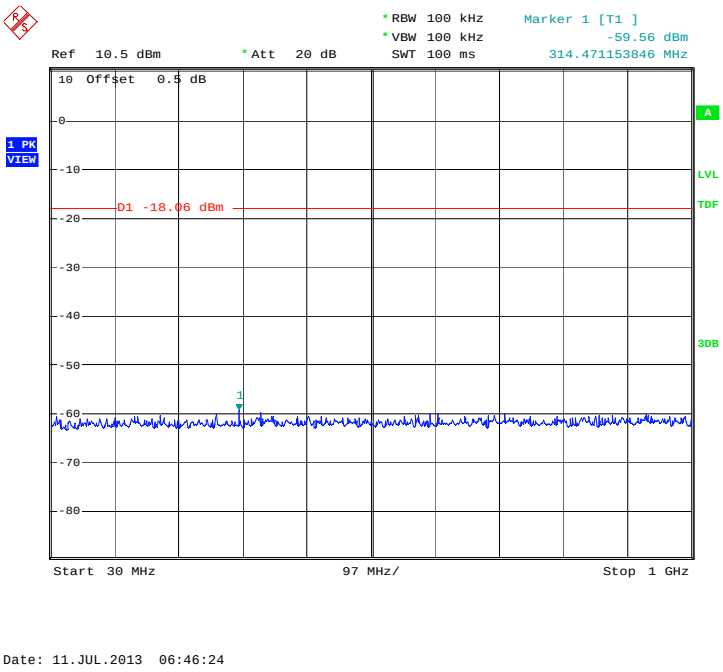


Fig.34. Conducted spurious emission: π/4 DQPSK, Channel 39, 30MHz - 1GHz

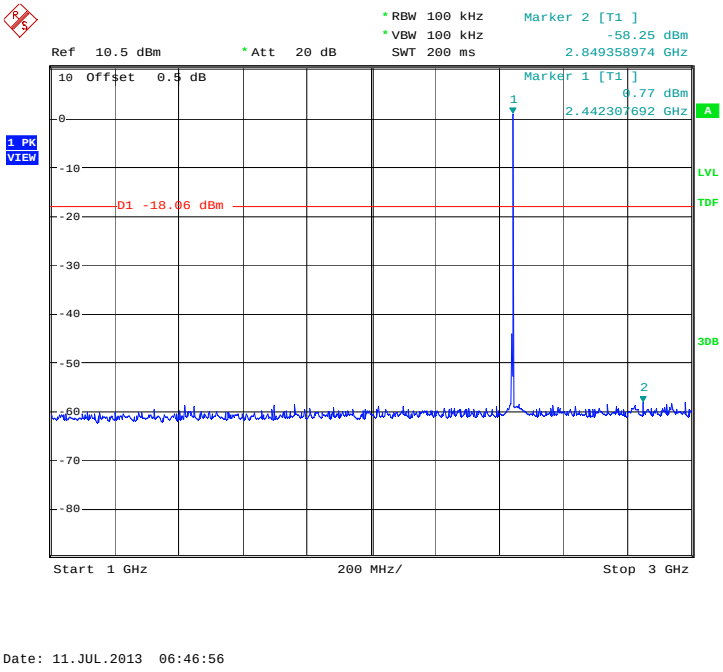


Fig.35. Conducted spurious emission: π/4 DQPSK, Channel 39, 1GHz - 3GHz

©Copyright. All rights reserved by TMC Beijing.

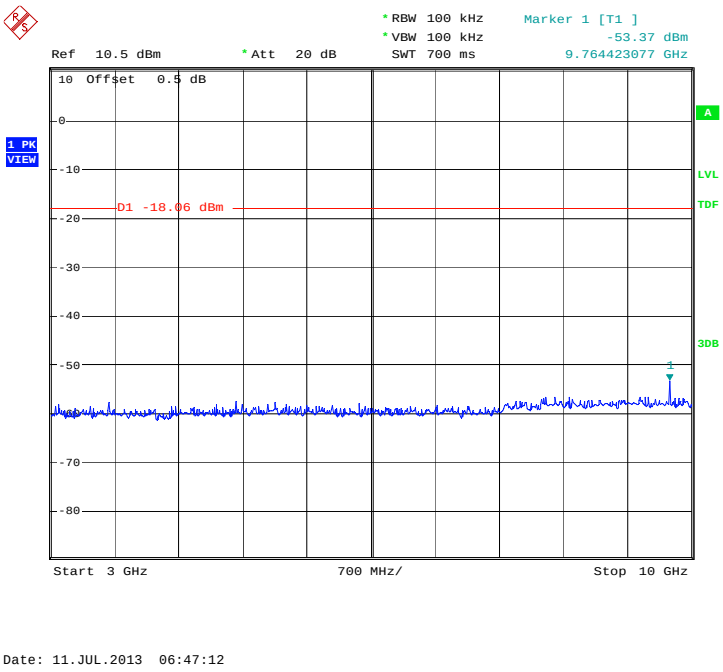


Fig.36. Conducted spurious emission: π/4 DQPSK, Channel 39, 3GHz - 10GHz

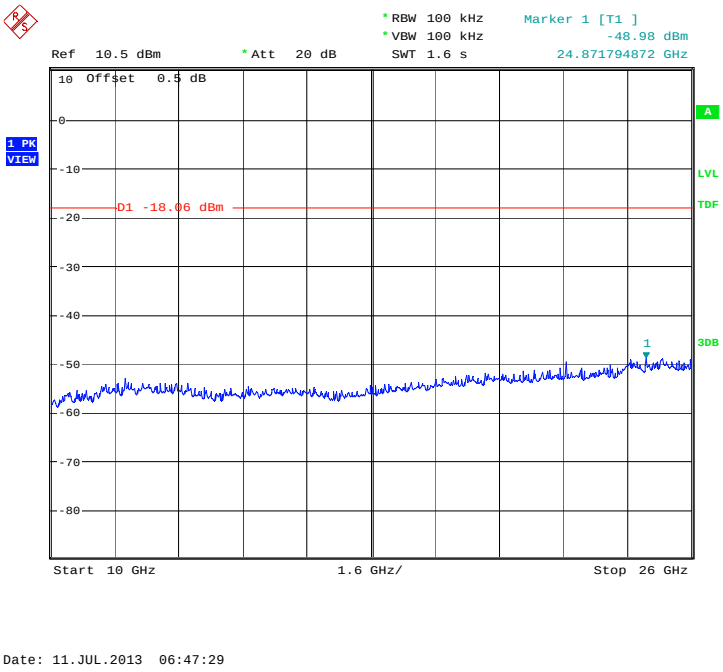


Fig.37. Conducted spurious emission: π/4 DQPSK, Channel 39, 10GHz – 26GHz

©Copyright. All rights reserved by TMC Beijing.

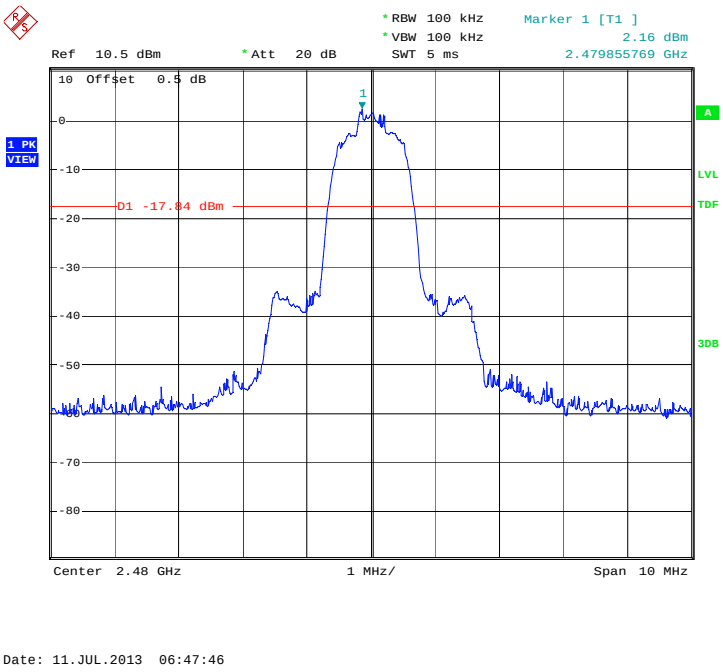


Fig.38. Conducted spurious emission: π/4 DQPSK, Channel 78, 2480MHz

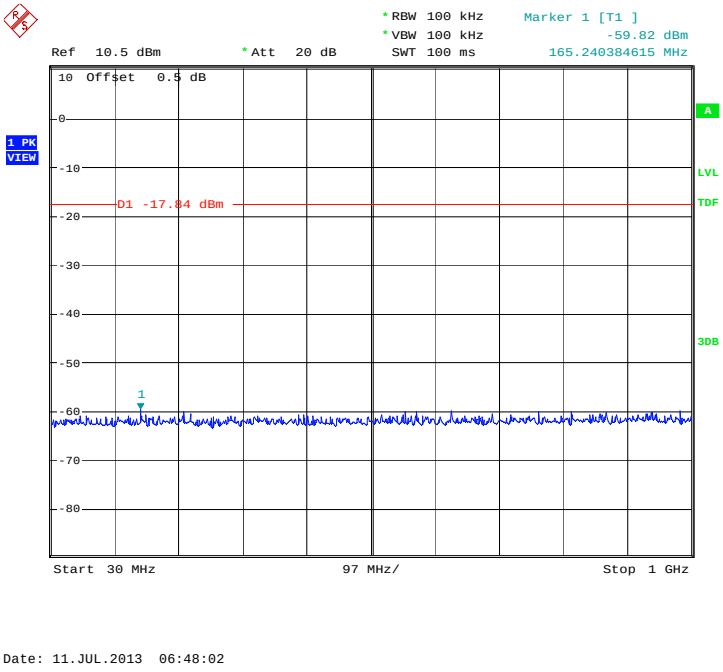


Fig.39. Conducted spurious emission: π/4 DQPSK, Channel 78, 30MHz - 1GHz

©Copyright. All rights reserved by TMC Beijing.

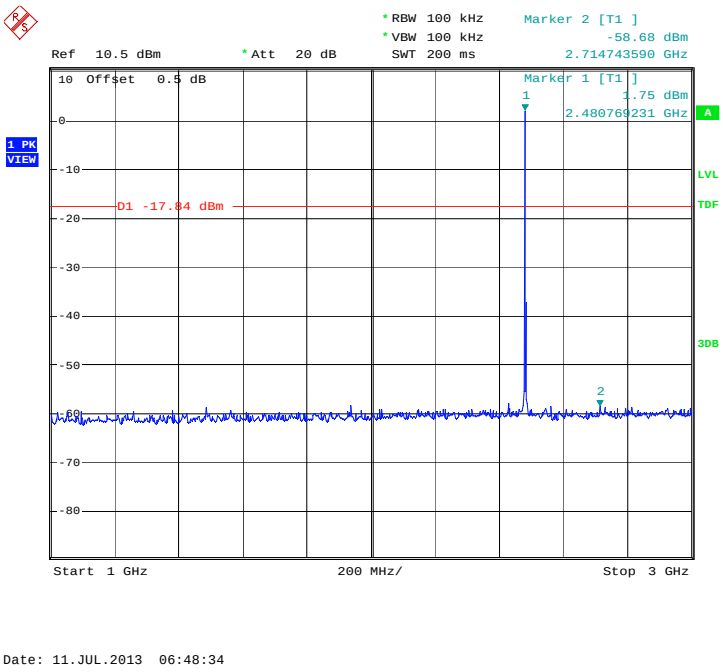


Fig.40. Conducted spurious emission: π/4 DQPSK, Channel 78, 1GHz - 3GHz

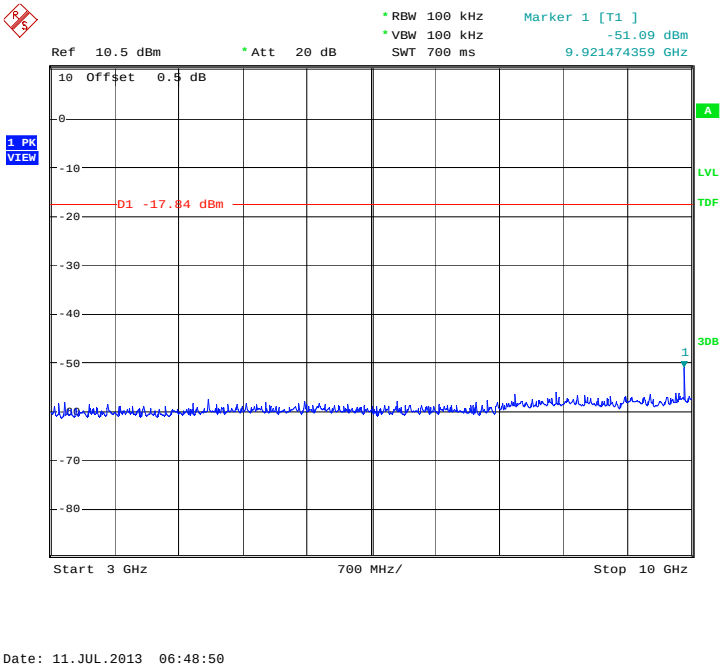


Fig.41. Conducted spurious emission: π/4 DQPSK, Channel 78, 3GHz - 10GHz

©Copyright. All rights reserved by TMC Beijing.

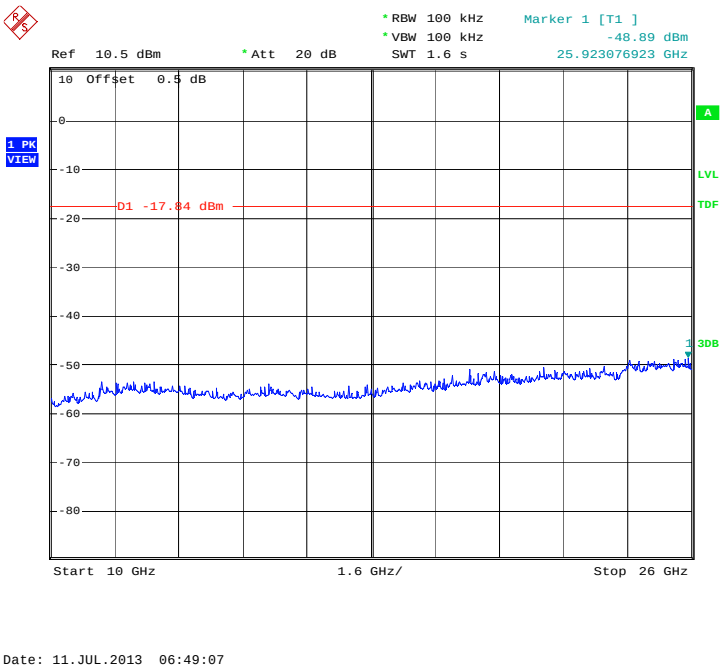


Fig.42. Fig.30 Conducted spurious emission: π/4 DQPSK, Channel 78, 10GHz - 26GHz

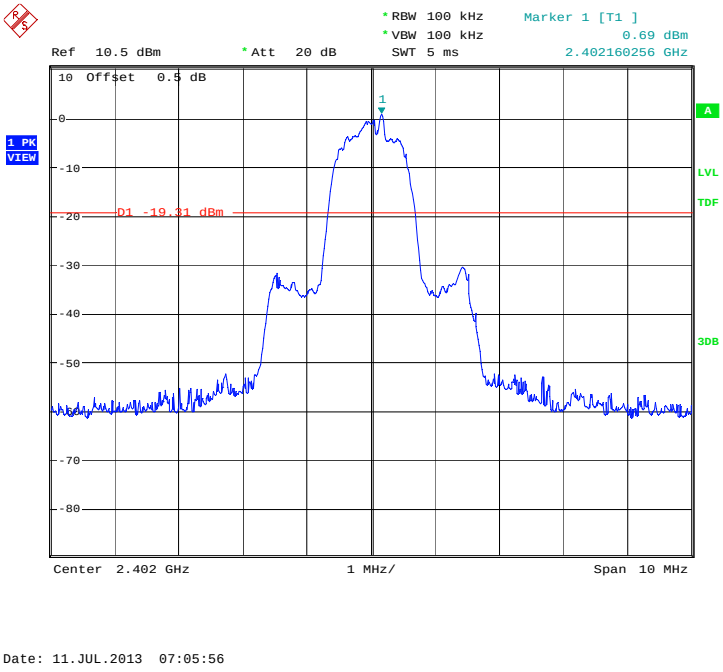


Fig.43. Conducted spurious emission: 8DPSK, Channel 0,2402MHz

©Copyright. All rights reserved by TMC Beijing.

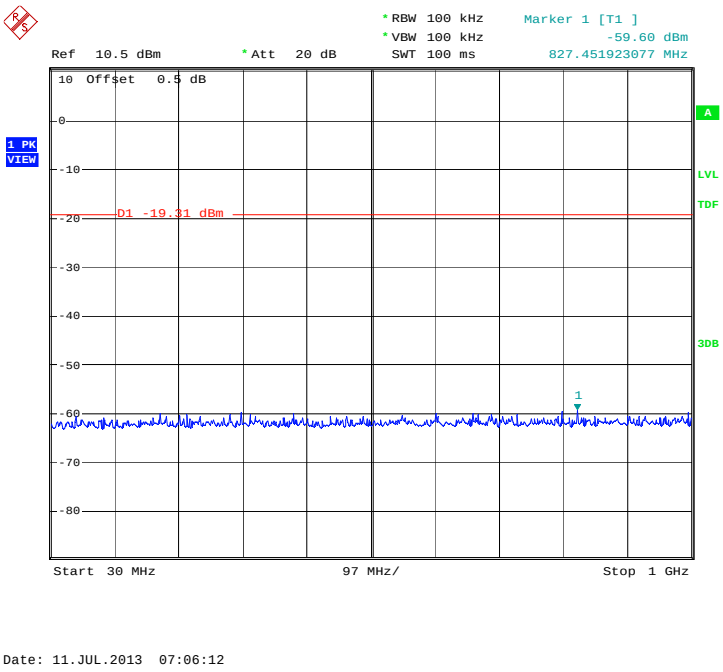


Fig.44. Conducted spurious emission: 8DPSK, Channel 0, 30MHz - 1GHz

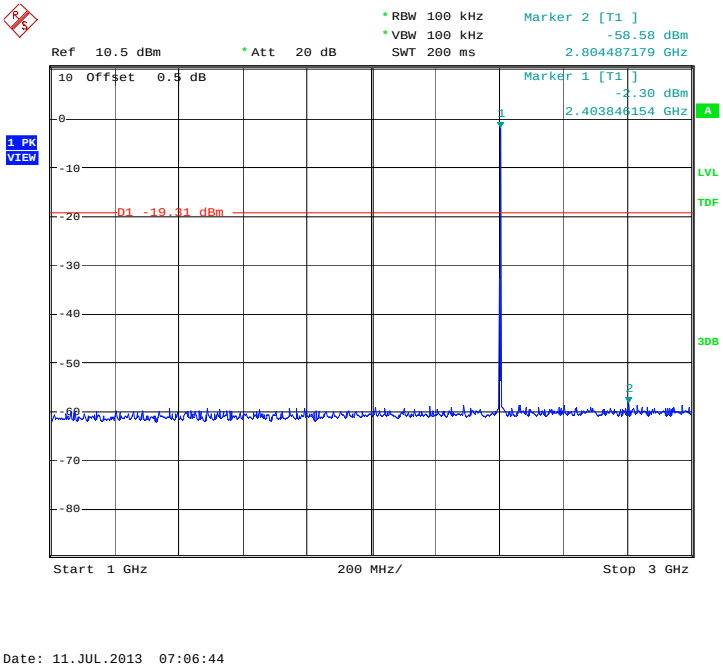


Fig.45. Conducted spurious emission: 8DPSK, Channel 0, 1GHz - 3GHz

©Copyright. All rights reserved by TMC Beijing.

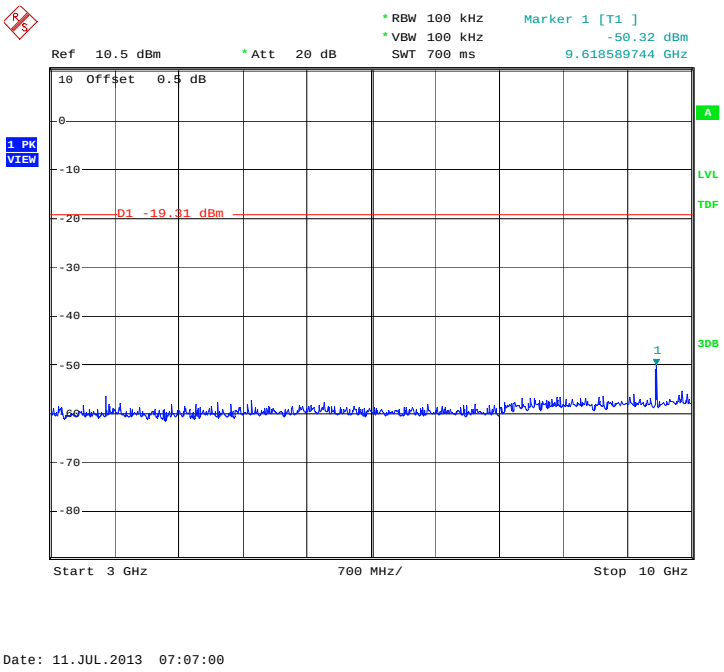


Fig.46. Conducted spurious emission: 8DPSK, Channel 0, 3GHz - 10GHz

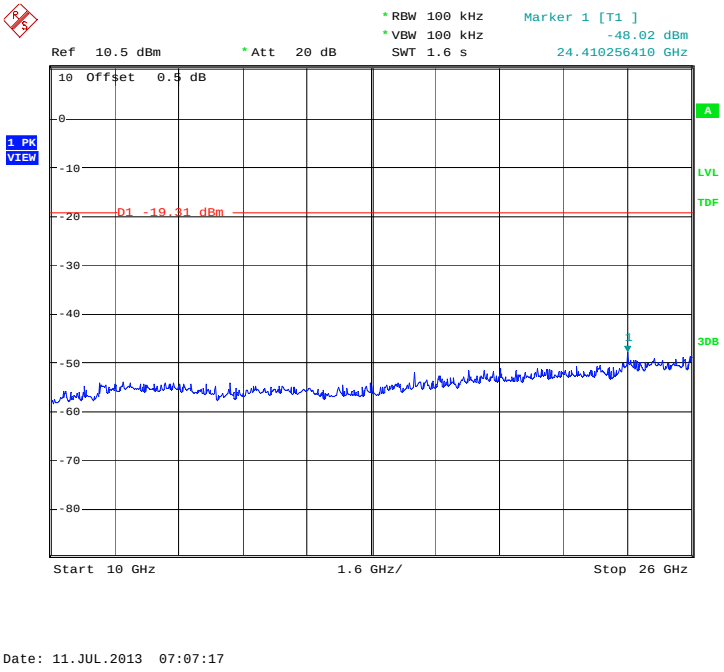


Fig.47. Conducted spurious emission: 8DPSK, Channel 0,10GHz - 26GHz

©Copyright. All rights reserved by TMC Beijing.

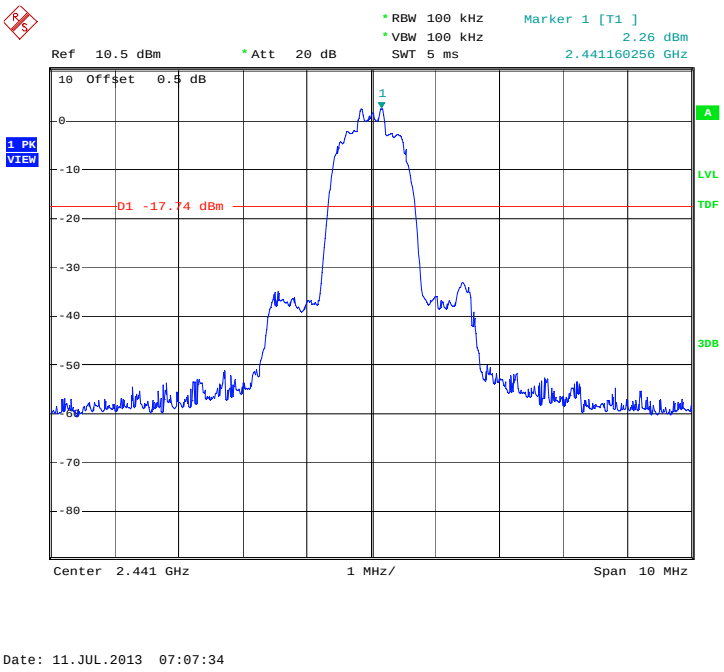


Fig.48. Conducted spurious emission: 8DPSK, Channel 39, 2441MHz

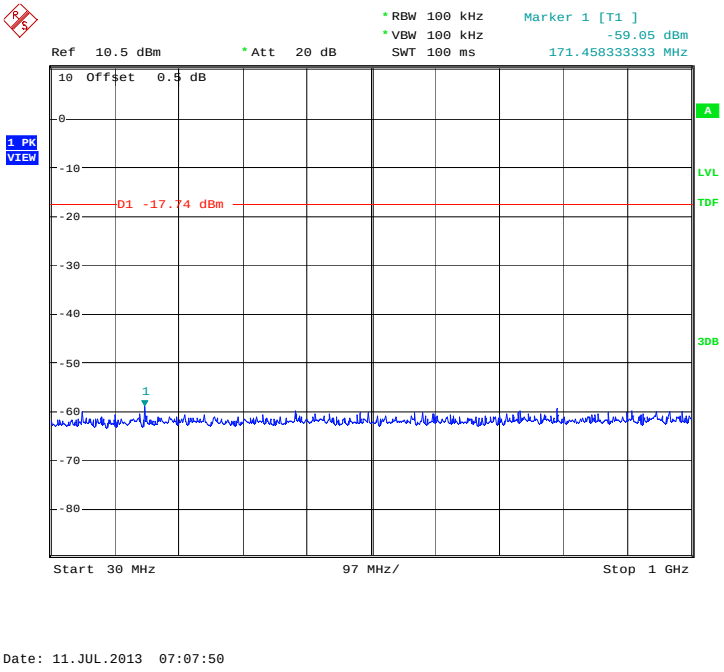


Fig.49. Conducted spurious emission: 8DPSK, Channel 39, 30MHz - 1GHz

©Copyright. All rights reserved by TMC Beijing.

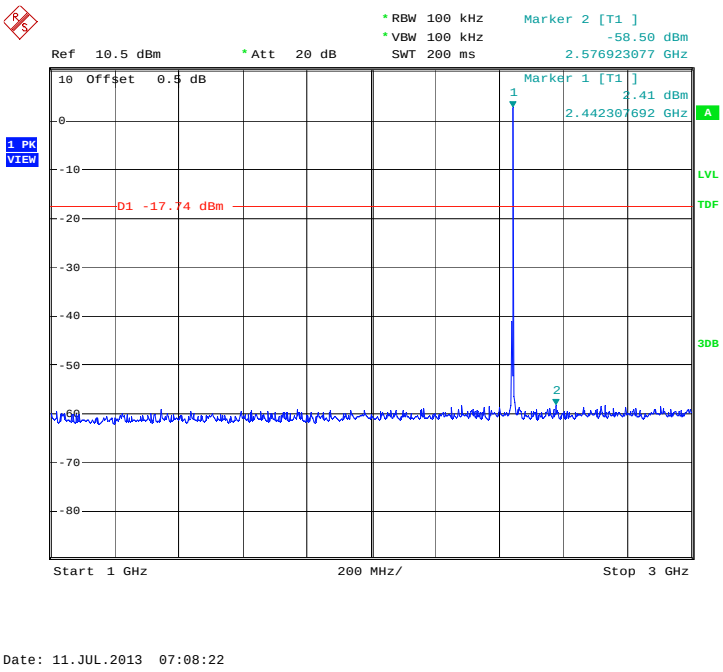


Fig.50. Conducted spurious emission: 8DPSK, Channel 39, 1GHz - 3GHz

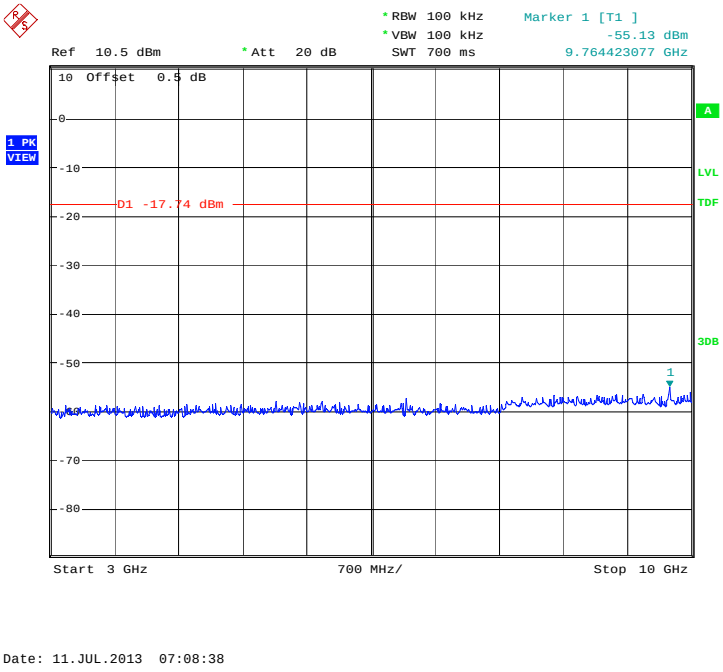


Fig.51. Conducted spurious emission: 8DPSK, Channel 39, 3GHz - 10GHz

©Copyright. All rights reserved by TMC Beijing.

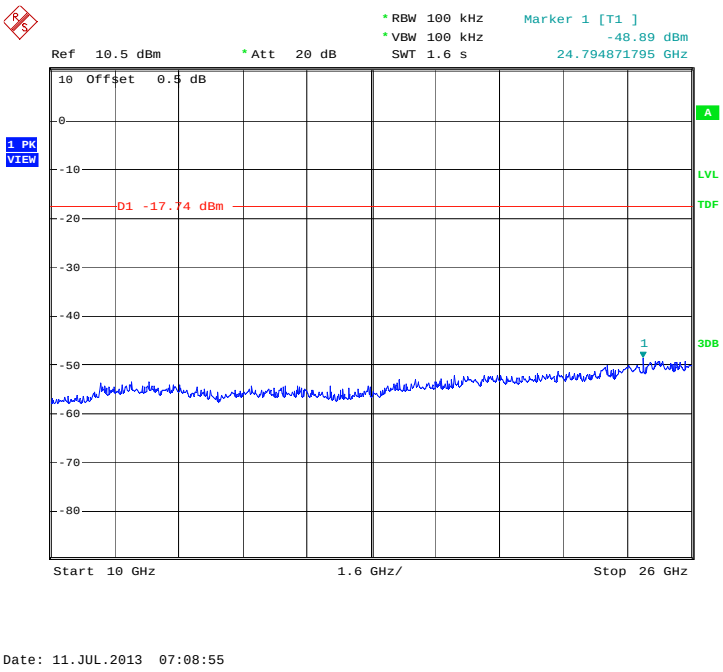


Fig.52. Conducted spurious emission: 8DPSK, Channel 39, 10GHz – 26GHz

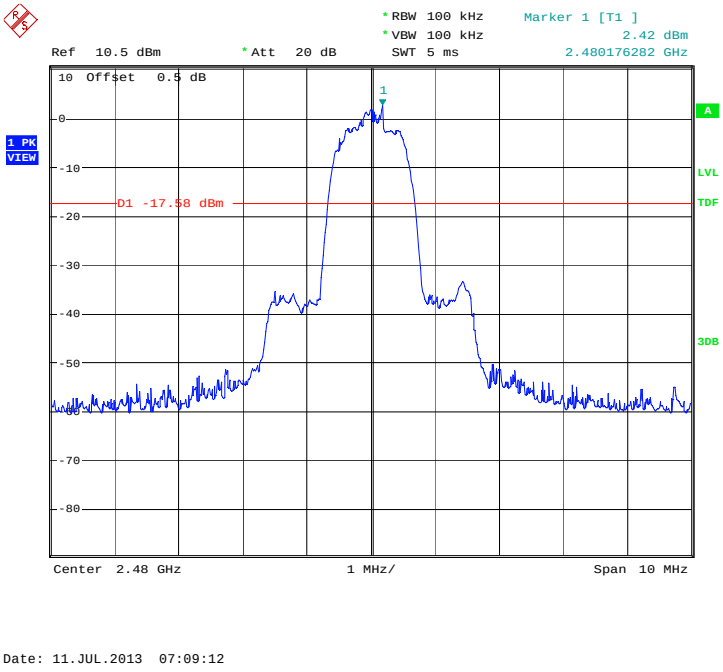


Fig.53. Conducted spurious emission: 8DPSK, Channel 78, 2480MHz

©Copyright. All rights reserved by TMC Beijing.

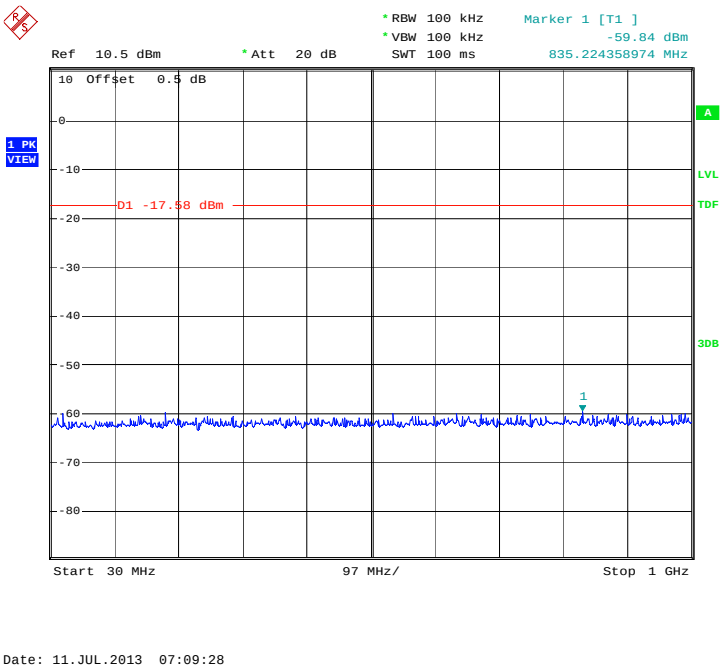


Fig.54. Conducted spurious emission: 8DPSK, Channel 78, 30MHz - 1GHz

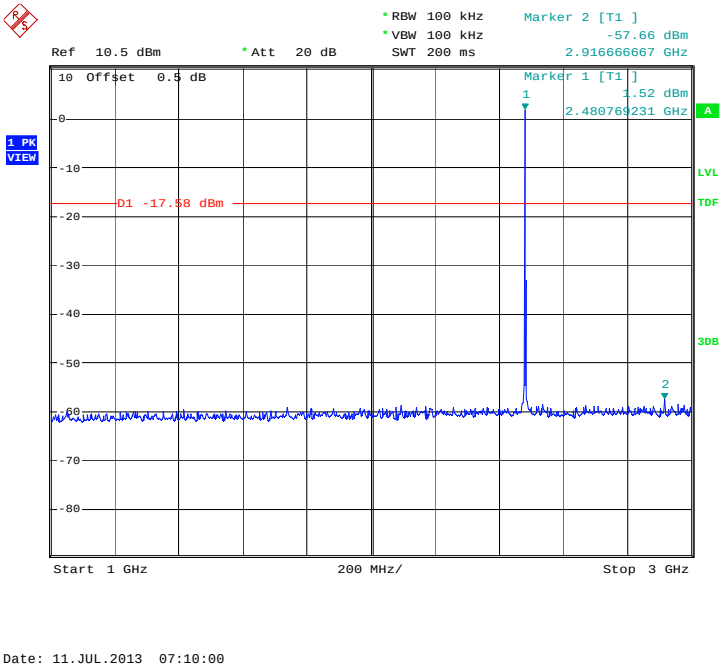


Fig.55. Conducted spurious emission: 8DPSK, Channel 78, 1GHz - 3GHz

©Copyright. All rights reserved by TMC Beijing.

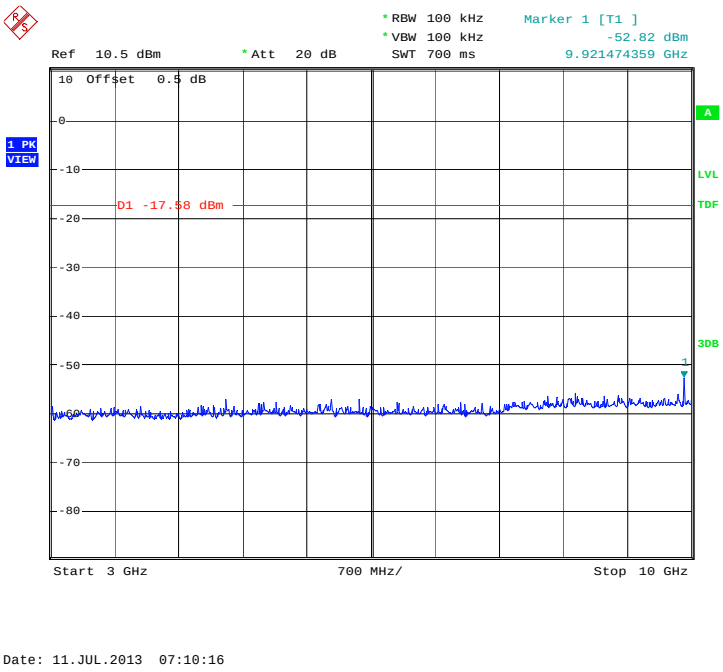


Fig.56. Conducted spurious emission: 8DPSK, Channel 78, 3GHz - 10GHz

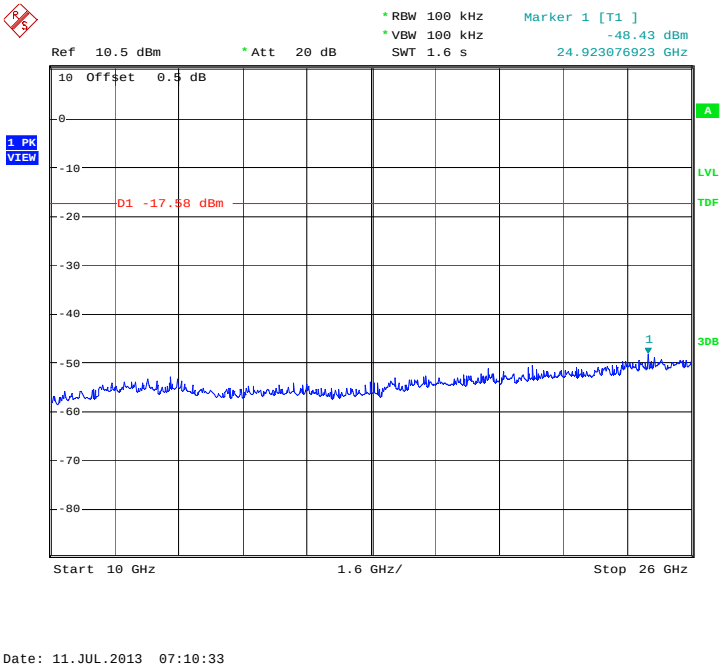


Fig.57. Conducted spurious emission: 8DPSK, Channel 78, 10GHz - 26GHz

©Copyright. All rights reserved by TMC Beijing.

A.5. Radiated Emission

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247, 15.205, 15.209	20dB below peak output power

In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

The measurement is made according to Public notice DA 00-705 and ANSI C63.4

Limit in restricted band:

Frequency of emission (MHz)	Field strength(uV/m)	Field strength(dBuV/m)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Test Condition

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

Frequency of emission (MHz)	RBW/VBW	Sweep Time(s)
30-1000	100KHz/300KHz	5
1000-4000	1MHz/1MHz	15
4000-18000	1MHz/1MHz	40
18000-26500	1MHz/1MHz	20

Measurement Results:

A "reference path loss" is established and the A_{Rpl} is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable los.

The measurement results are obtained as described below:

$Result=P_{Mea}+A_{Rpl}$

For GFSK

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	30 MHz ~ 1 GHz	Fig.58	P
	1 GHz ~ 3 GHz	Fig.59	P
	3 GHz ~ 18 GHz	Fig.60	P
Ch 39 2441 MHz	30 MHz ~ 1 GHz	Fig.61	P
	1 GHz ~ 3 GHz	Fig.62	P
	3 GHz ~ 18 GHz	Fig.63	P

©Copyright. All rights reserved by TMC Beijing.

Ch 78 2480 MHz	30 MHz ~ 1 GHz	Fig.64	P
	1 GHz ~ 3 GHz	Fig.65	P
	3 GHz ~ 18 GHz	Fig.66	P
Power	2.38GHz~2.4GHz---L	Fig.67	P
Power	2.45GHz~2.5GHz---H	Fig.68	P
For all channels	18 GHz ~ 26 GHz	Fig.69	P

Forπ/4 DQPSK

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	30 MHz ~ 1 GHz	Fig.70	P
	1 GHz ~ 3 GHz	Fig.71	P
	3 GHz ~ 18 GHz	Fig.72	P
Ch 39 2441 MHz	30 MHz ~ 1 GHz	Fig.73	P
	1 GHz ~ 3 GHz	Fig.74	P
	3 GHz ~ 18 GHz	Fig.75	P
Ch 78 2480 MHz	30 MHz ~ 1 GHz	Fig.76	P
	1 GHz ~ 3 GHz	Fig.77	P
	3 GHz ~ 18 GHz	Fig.78	P
Power	2.38GHz~2.4GHz---L	Fig.79	P
Power	2.45GHz~2.5GHz---H	Fig.80	P
For all channels	18 GHz ~ 26 GHz	Fig.81	P

For 8DPSK

Channel	Frequency Range	Test Results	Conclusion
Ch 0 2402 MHz	30 MHz ~ 1 GHz	Fig.82	P
	1 GHz ~ 3 GHz	Fig.83	P
	3 GHz ~ 18 GHz	Fig.84	P
Ch 39 2441 MHz	30 MHz ~ 1 GHz	Fig.85	P
	1 GHz ~ 3 GHz	Fig.86	P
	3 GHz ~ 18 GHz	Fig.87	P
Ch 78 2480 MHz	30 MHz ~ 1 GHz	Fig.88	P
	1 GHz ~ 3 GHz	Fig.89	P
	3 GHz ~ 18 GHz	Fig.90	P
Power	2.38GHz~2.4GHz---L	Fig.91	P
Power	2.45GHz~2.5GHz---H	Fig.92	P
For all channels	18 GHz ~ 26 GHz	Fig.93	P

GFSK Ch 0-PK

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
17570.250	57.9	19.52	38.425	V
17508.750	57.6	20.02	37.615	H
17480.250	57.5	20.22	37.245	H
17553.000	57.5	19.52	38.025	H

©Copyright. All rights reserved by TMC Beijing.

17900.250	57.5	19.82	37.733	H
17672.250	57.5	19.86	37.671	V

GFSK Ch 0-AV

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
17570.250	45.1	19.52	25.625	V
17508.750	45.6	20.02	25.615	H
17480.250	45.3	20.22	25.045	H
17553.000	45.3	19.52	25.825	H
17900.250	45.1	19.82	25.333	H
17415.750	45.0	18.98	26.013	V

GFSK Ch 39-PK

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
17148.000	58.1	18.54	39.553	V
17776.500	58.0	19.16	38.891	H
17652.750	57.7	19.86	37.871	H
17545.500	57.7	20.12	37.555	V
17731.500	57.5	19.26	38.261	V
17497.500	57.4	20.22	37.145	H

GFSK Ch 39-AV

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
17497.500	45.9	20.22	25.645	H
17485.500	45.8	20.22	25.545	H
17475.000	45.8	20.22	25.545	H
17442.000	45.7	18.98	26.683	H
17498.250	45.7	20.22	25.445	V
17523.750	45.7	20.02	25.715	H

GFSK Ch 78-PK

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
17490.000	57.8	20.22	37.545	V
18000.000	57.8	20.28	37.479	V
17500.500	57.8	20.02	37.815	V
17496.000	57.8	20.22	37.545	V
17713.500	57.6	19.96	37.611	H
17472.750	57.3	19.82	37.485	V

GFSK Ch 78-AV

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
17490.000	45.7	20.22	25.445	V
17479.500	45.1	20.22	24.845	H

©Copyright. All rights reserved by TMC Beijing.

17819.250	44.9	20.02	24.843	V
17454.000	45.3	18.88	26.423	V
17777.250	45.0	19.16	25.891	V
16913.250	44.3	19.15	25.159	V

π/4 DQPSK Ch 0-PK

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
17451.750	58.1	18.88	39.223	V
17682.750	57.9	19.46	38.401	H
17341.500	57.5	18.88	38.593	H
17365.500	57.4	19.28	38.153	H
17925.000	57.4	19.52	37.893	V
17415.750	45.0	18.98	26.013	V

π/4 DQPSK Ch 0-AV

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
17487.000	45.8	20.22	25.545	V
17509.500	45.8	20.02	25.815	V
17483.250	45.8	20.22	25.545	H
17488.500	45.8	20.22	25.545	V
17524.500	45.7	20.02	25.715	H
17495.250	45.7	20.22	25.445	H

π/4 DQPSK Ch 39-PK

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
17505.000	57.6	20.02	37.615	V
17365.500	57.6	19.28	38.353	H
17655.750	57.6	19.86	37.771	H
17481.000	57.6	20.22	37.345	V
17252.250	57.5	19.54	37.943	H
17448.750	57.3	18.98	38.283	H

π/4 DQPSK Ch 39-AV

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
17460.000	45.9	19.82	26.085	V
17447.250	45.8	18.98	26.783	H
17490.750	45.8	20.22	25.545	V
17514.000	45.8	20.02	25.815	H
17472.000	45.7	19.82	25.885	V
17492.250	45.7	20.22	25.445	V

π/4 DQPSK Ch 78-PK

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity

©Copyright. All rights reserved by TMC Beijing.

17532.000	57.6	20.12	37.455	H
17950.500	57.5	19.82	37.683	H
17724.000	57.5	19.96	37.511	H
17961.000	57.5	19.82	37.683	H
17582.250	57.3	19.92	37.375	V
18000.000	57.3	20.28	36.979	V

π/4 DQPSK Ch 78-AV

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
17475.750	45.9	20.22	25.645	V
17523.750	45.8	20.02	25.815	H
17482.500	45.8	20.22	25.545	V
17520.000	45.7	20.02	25.715	H
17511.750	45.7	20.02	25.715	V
17552.250	45.7	19.52	26.225	V

8DPSK Ch 0-PK

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
17484.000	57.9	20.22	37.645	V
17079.750	57.7	18.93	38.800	V
17445.000	57.7	18.98	38.683	V
17490.750	57.7	20.22	37.445	V
17677.500	57.6	19.46	38.101	V
17979.000	57.6	19.42	38.223	H

8DPSK Ch 0-AV

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
17478.750	45.9	20.22	25.645	V
17454.750	45.8	18.88	26.923	H
17476.500	45.8	20.22	25.545	H
17515.500	45.7	20.02	25.715	H
17492.250	45.7	20.22	25.445	H
17472.000	45.7	19.82	25.885	V

8DPSK Ch 39-PK

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
17478.000	57.8	20.22	37.545	H
17451.750	57.7	18.88	38.823	V
17942.250	57.6	19.52	38.093	V
17749.500	57.4	19.26	38.161	H
17726.250	57.3	19.26	38.061	H
17786.250	57.3	19.16	38.191	V

©Copyright. All rights reserved by TMC Beijing.

8DPSK Ch 39-AV

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
17463.000	45.8	19.82	25.985	H
17479.500	45.8	20.22	25.545	H
17493.000	45.8	20.22	25.545	H
17498.250	45.8	20.22	25.545	V
17462.250	45.8	19.82	25.985	H
17477.250	45.8	20.22	25.545	V

8DPSK Ch 78-PK

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
17943.750	57.5	19.52	37.993	H
17499.000	57.4	20.22	37.145	V
17514.000	57.3	20.02	37.315	H
17576.250	57.3	19.92	37.375	V
17252.250	57.3	19.54	37.743	V
17487.750	57.1	20.22	36.845	H

8DPSK Ch 78-AV

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
17466.000	45.8	19.82	25.985	V
17446.500	45.8	18.98	26.783	V
17482.500	45.8	20.22	25.545	H
17499.000	45.7	20.22	25.445	H
17535.000	45.7	20.12	25.555	H
17458.500	45.7	19.82	25.885	H

Conclusion: PASS

Test graphs as below:

©Copyright. All rights reserved by TMC Beijing.

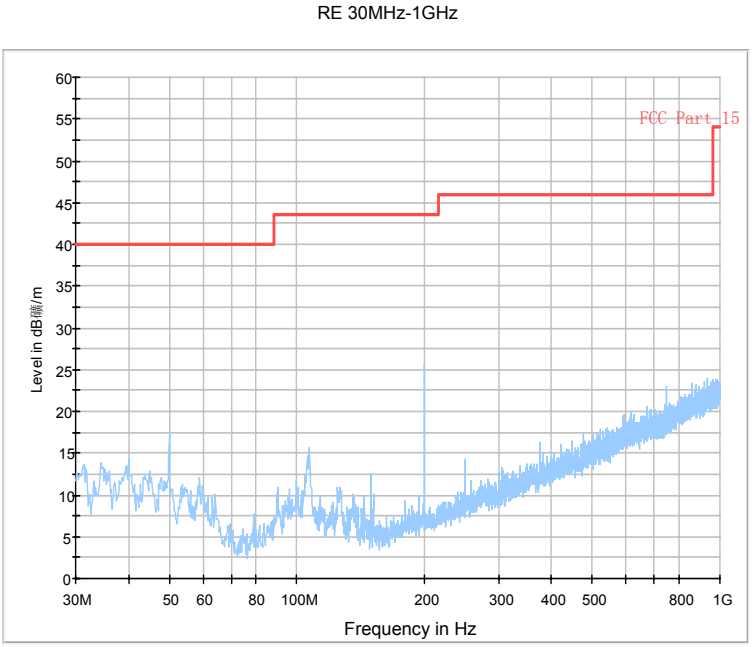


Fig.58. Radiated emission: GFSK, Channel 0, 30 MHz - 1 GHz

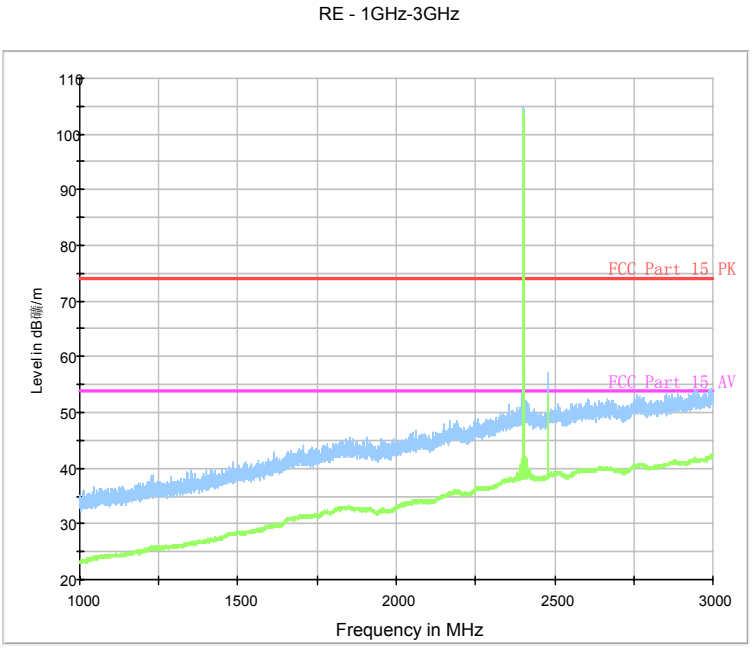


Fig.59. Radiated emission: GFSK, Channel 0, 1 GHz - 3 GHz

©Copyright. All rights reserved by TMC Beijing.

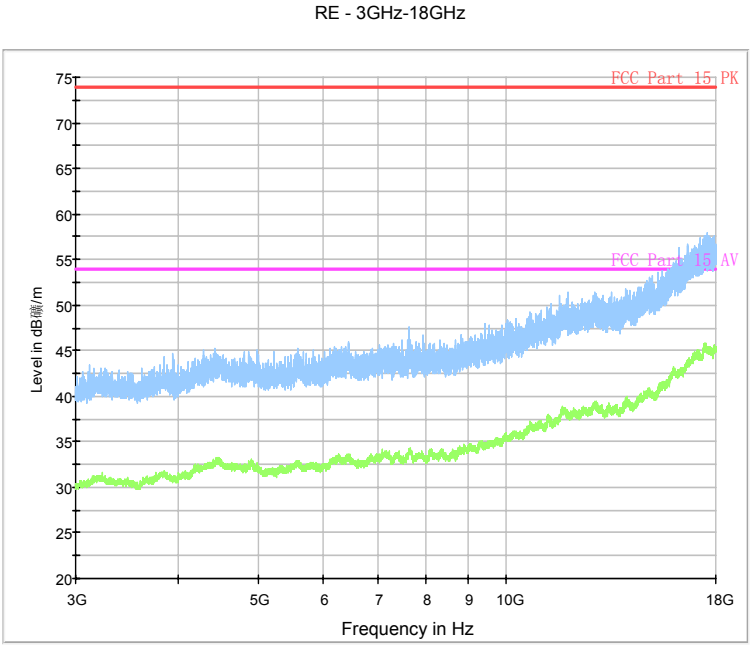


Fig.60. Radiated emission: GFSK, Channel 0, 3 GHz - 18 GHz

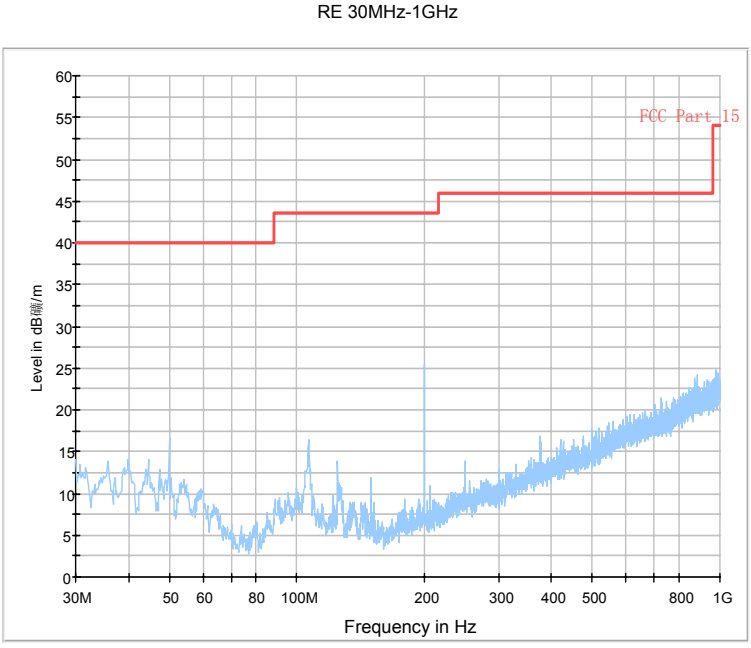


Fig.61. Radiated emission: GFSK, Channel 39, 30 MHz - 1 GHz

©Copyright. All rights reserved by TMC Beijing.

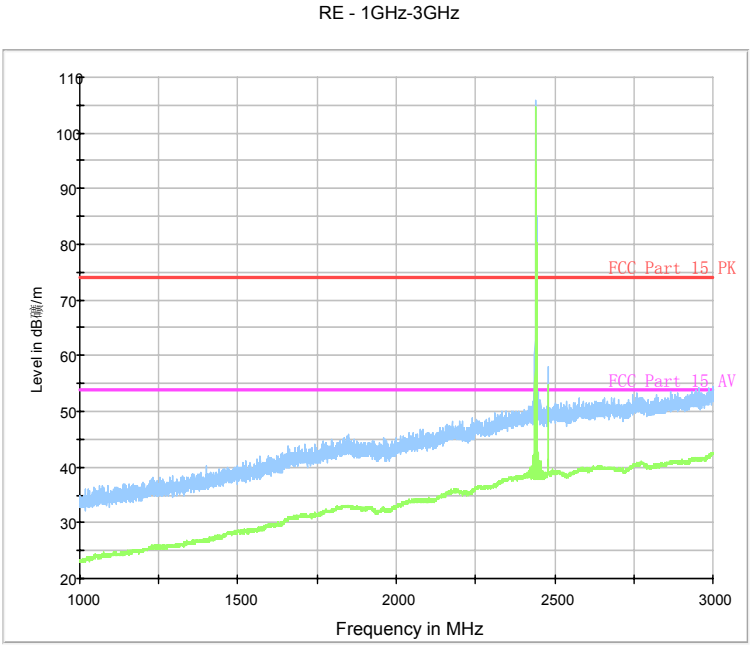


Fig.62. Radiated emission: GFSK, Channel 39, 1 GHz - 3 GHz

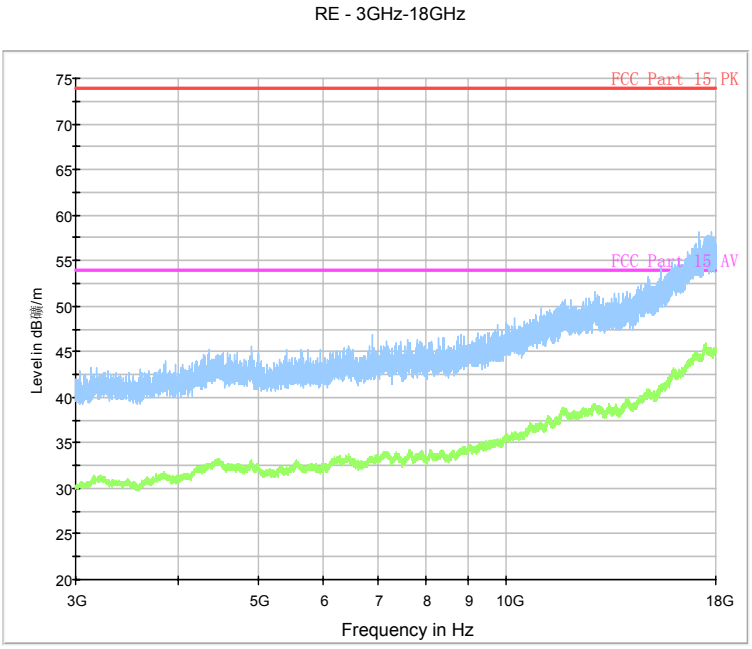


Fig.63. Radiated emission: GFSK, Channel 39, 3 GHz - 18 GHz

©Copyright. All rights reserved by TMC Beijing.

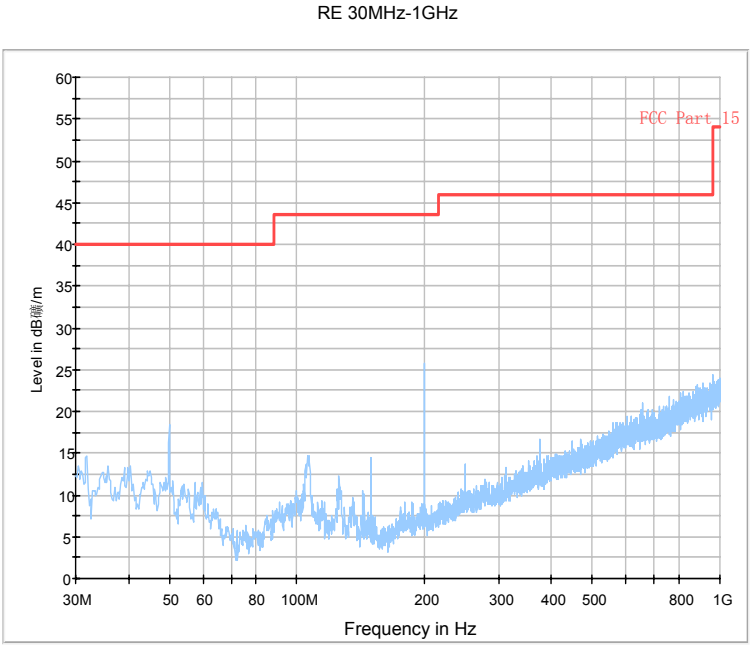


Fig.64. Radiated emission: GFSK, Channel 78, 30 MHz - 1 GHz

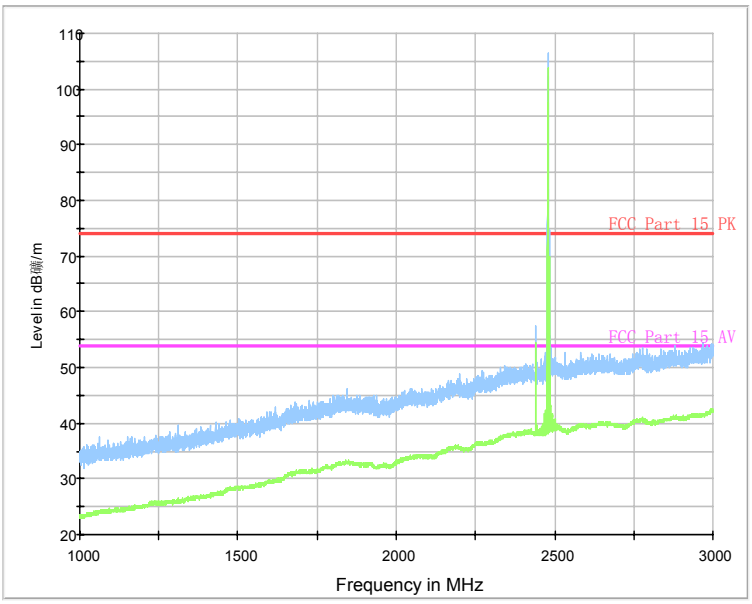


Fig.65. Fig.47 Radiated emission: GFSK, Channel 78, 1 GHz - 3 GHz

©Copyright. All rights reserved by TMC Beijing.

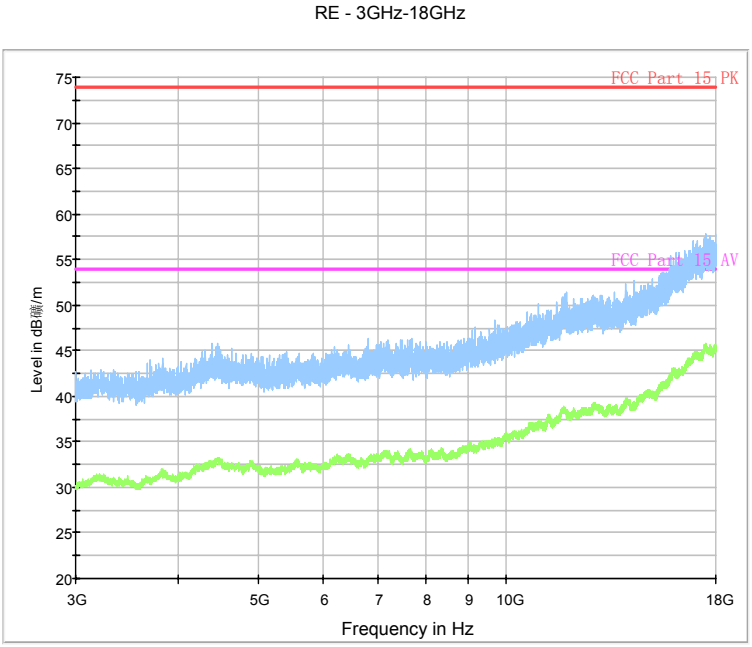


Fig.66. Radiated emission: GFSK, Channel 78, 3 GHz - 18 GHz

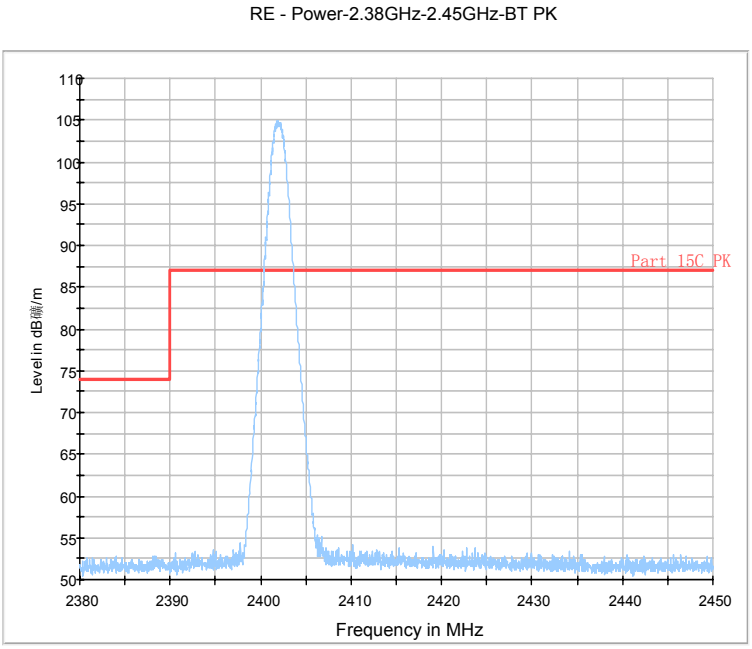


Fig.67. Radiated emission (Power): GFSK, low channel

©Copyright. All rights reserved by TMC Beijing.

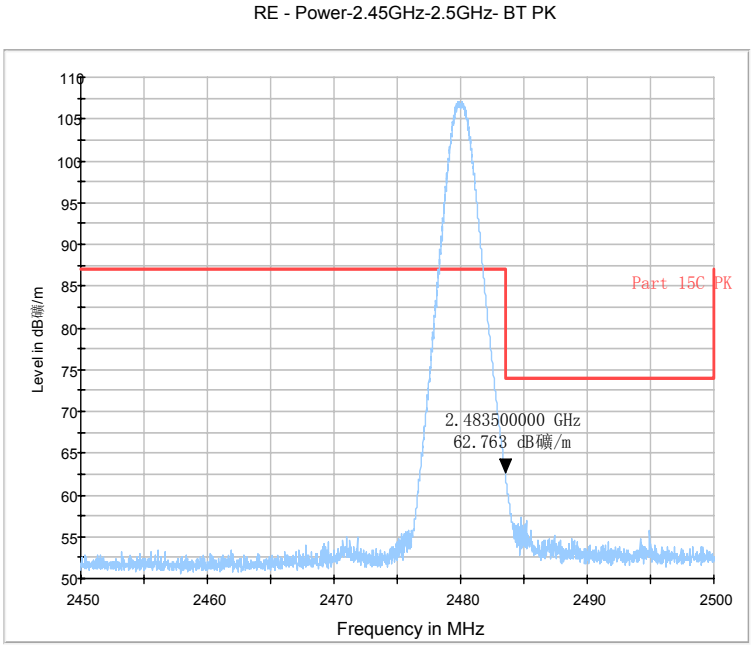


Fig.68. Radiated emission (Power) GFSK, high channel

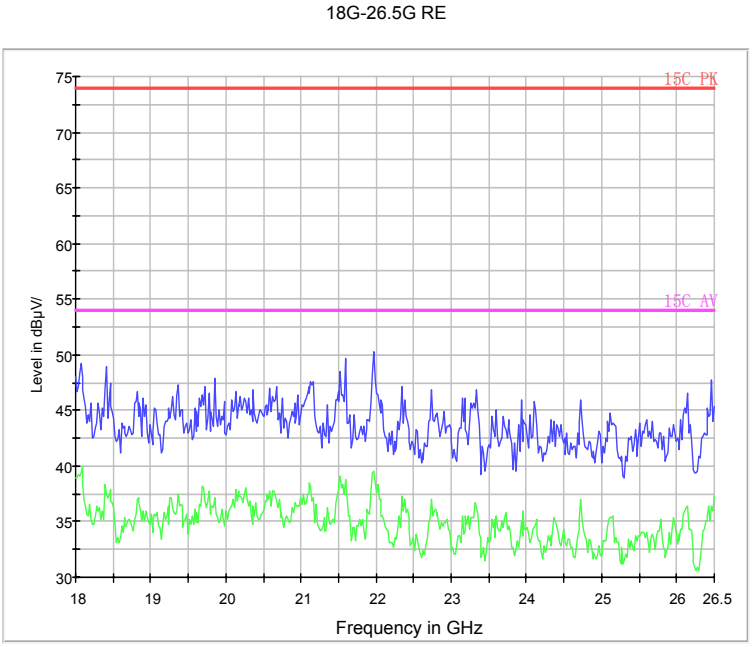


Fig.69. Radiated emission: GFSK, 18 GHz - 26 GHz

©Copyright. All rights reserved by TMC Beijing.

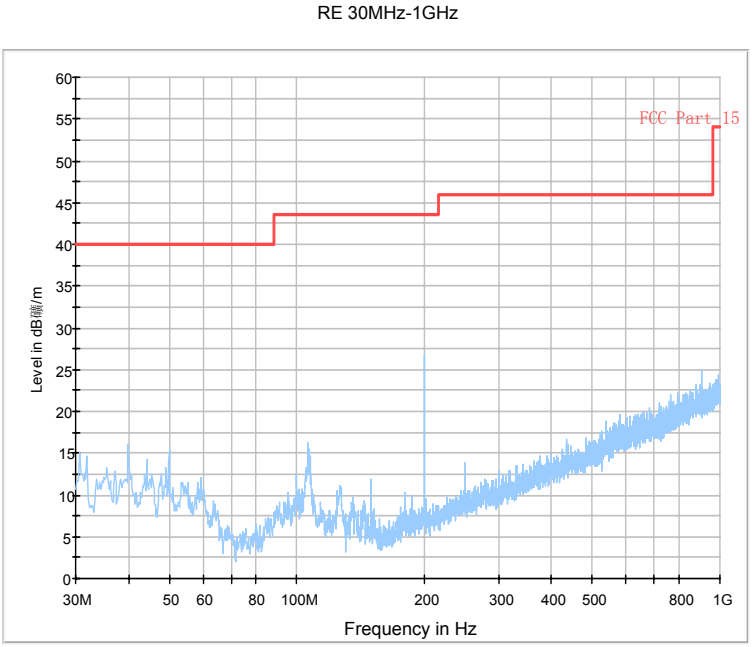


Fig.70. Radiated emission: π/4 DQPSK, Channel 0, 30 MHz - 1 GHz

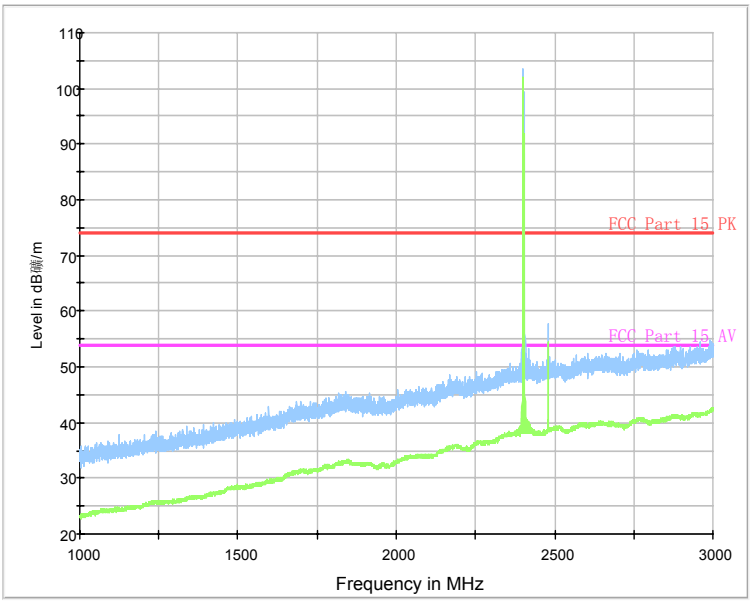


Fig.71. Radiated emission: π/4 DQPSK, Channel 0, 1 GHz - 3 GHz

©Copyright. All rights reserved by TMC Beijing.

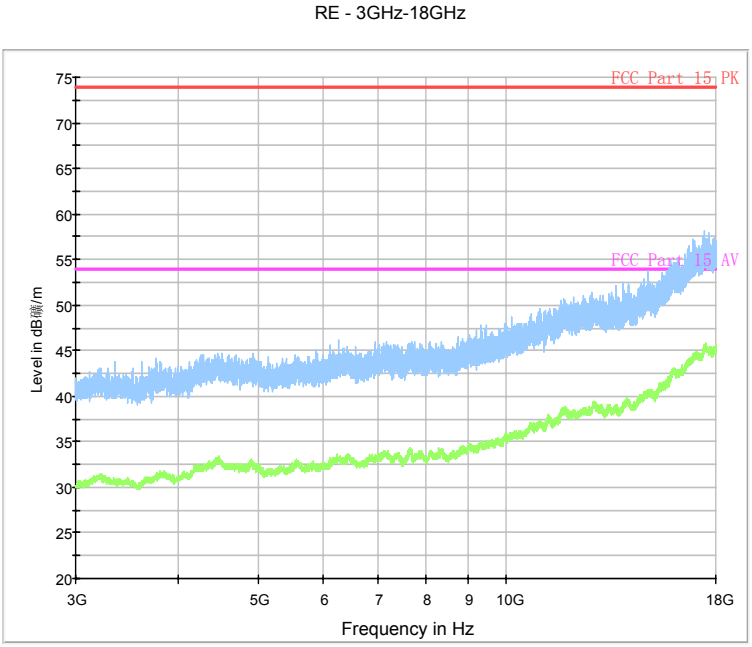


Fig.72. Radiated emission: π/4 DQPSK, Channel 0, 3 GHz - 18 GHz

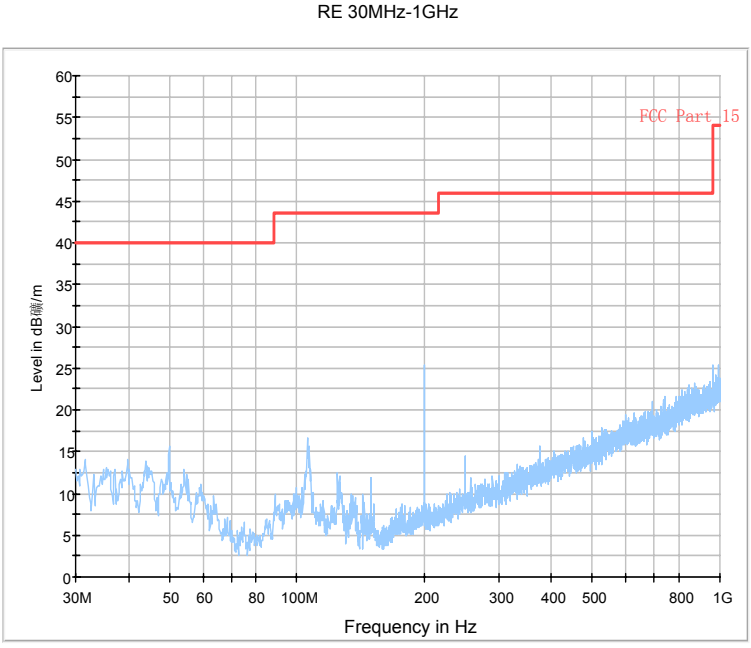


Fig.73. Radiated emission: π/4 DQPSK, Channel 39, 30 MHz - 1 GHz

©Copyright. All rights reserved by TMC Beijing.

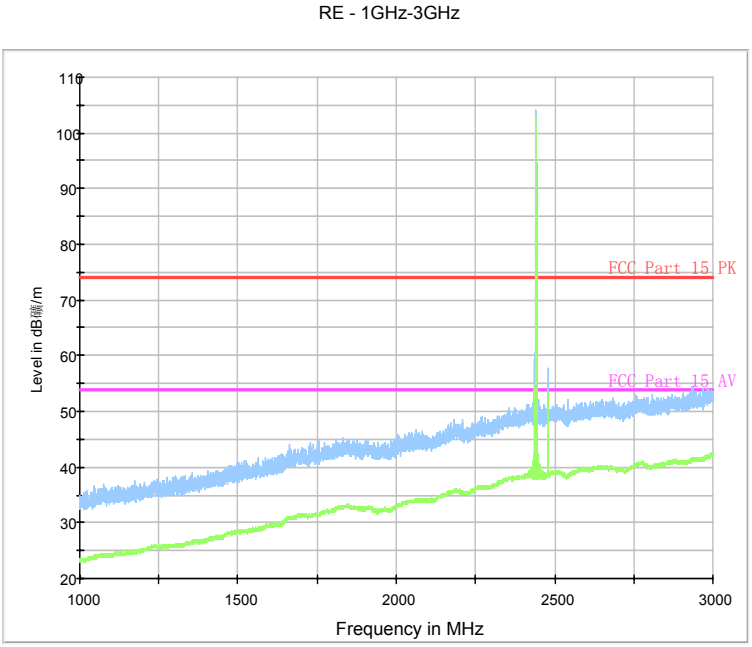


Fig.74. Radiated emission: π/4 DQPSK, Channel 39, 1 GHz - 3 GHz

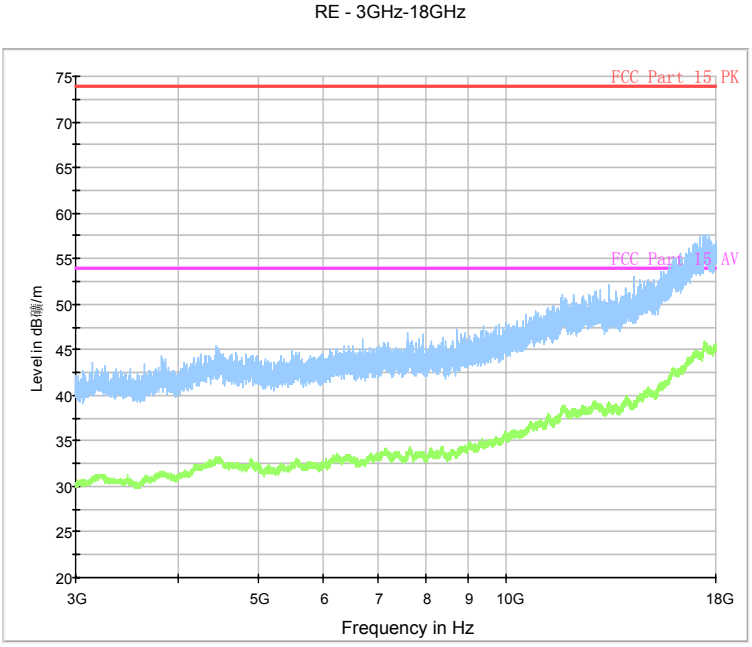


Fig.75. Radiated emission: π/4 DQPSK, Channel 39, 3 GHz - 18 GHz

©Copyright. All rights reserved by TMC Beijing.

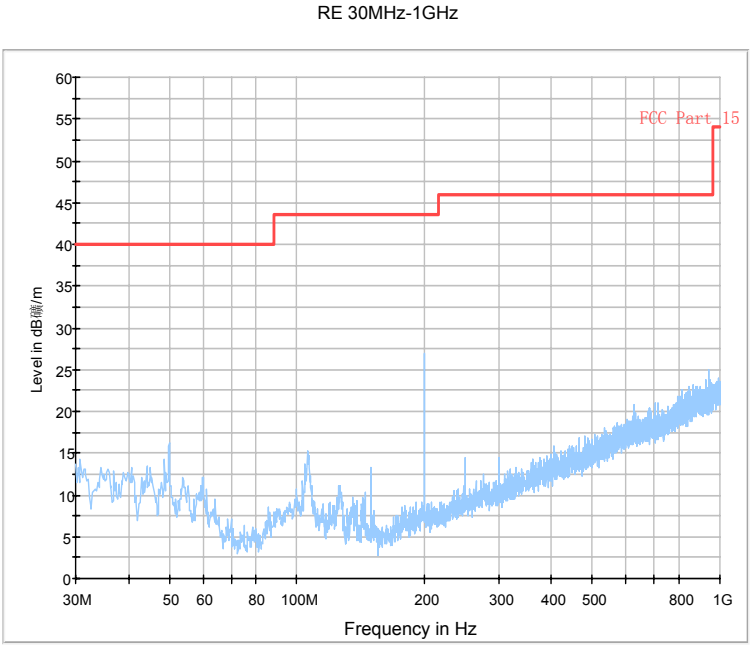


Fig.76. Radiated emission: π/4 DQPSK, Channel 78, 30 MHz - 1 GHz

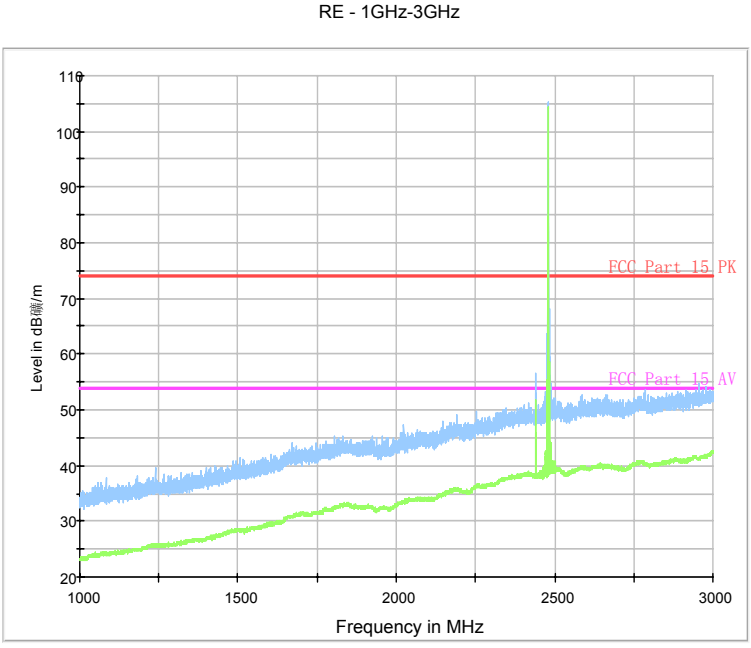


Fig.77. Radiated emission: π/4 DQPSK, Channel 78, 1 GHz - 3 GHz

©Copyright. All rights reserved by TMC Beijing.

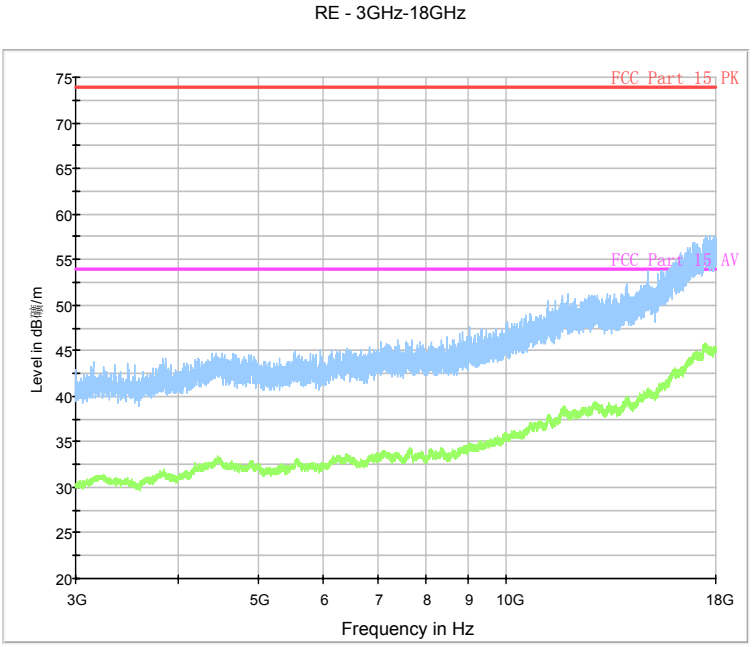


Fig.78. Radiated emission: π/4 DQPSK, Channel 78, 3 GHz - 18 GHz

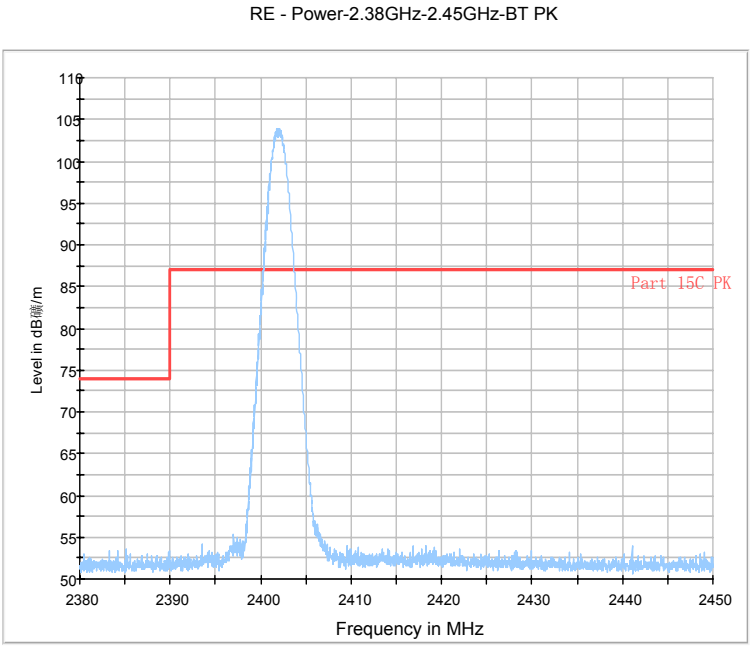


Fig.79. Radiated emission (Power): π/4 DQPSK, low channel

©Copyright. All rights reserved by TMC Beijing.

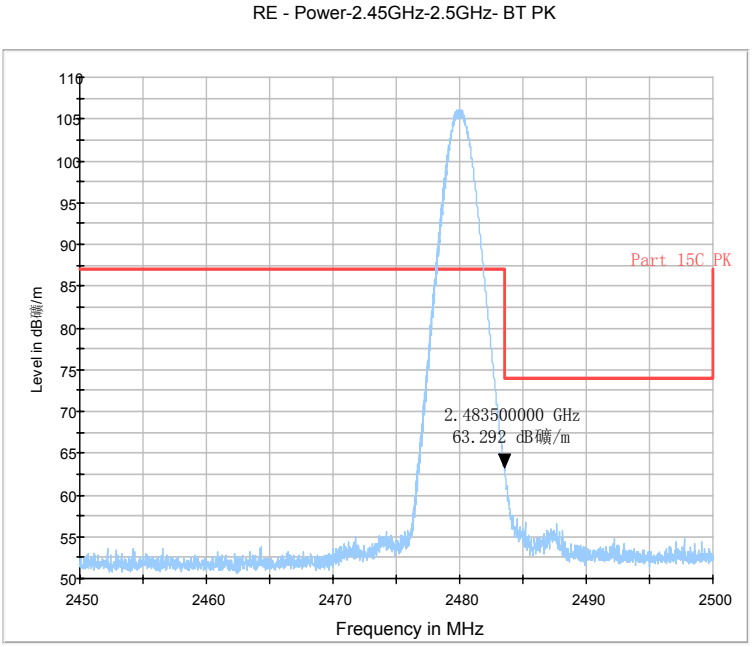


Fig.80. Radiated emission (Power): π/4 DQPSK, high channel

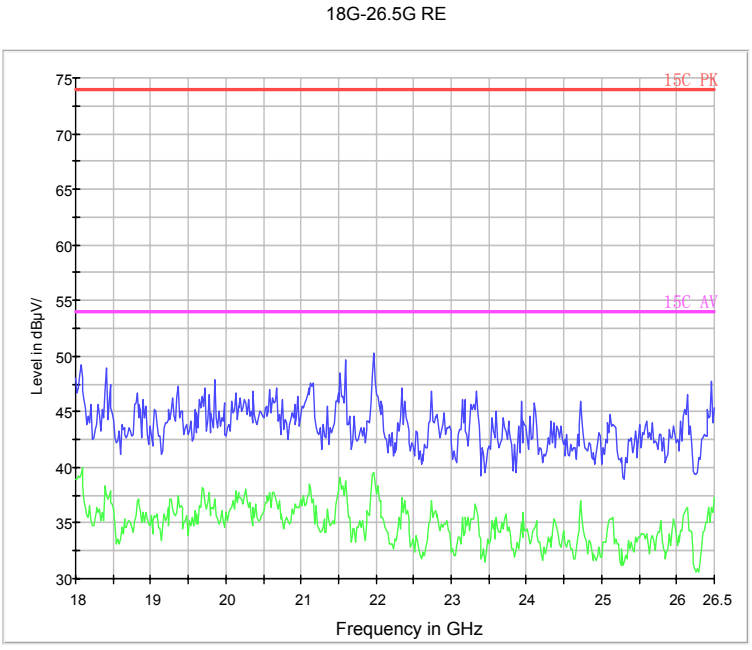


Fig.81. Radiated emission: π/4 DQPSK, 18 GHz - 26 GHz

©Copyright. All rights reserved by TMC Beijing.

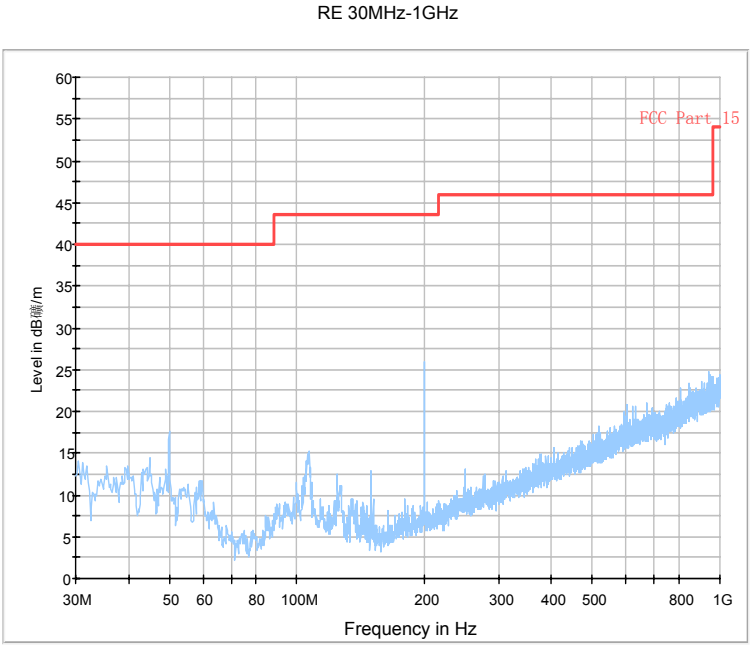


Fig.82. Radiated emission: 8DPSK, Channel 0, 30 MHz - 1 GHz

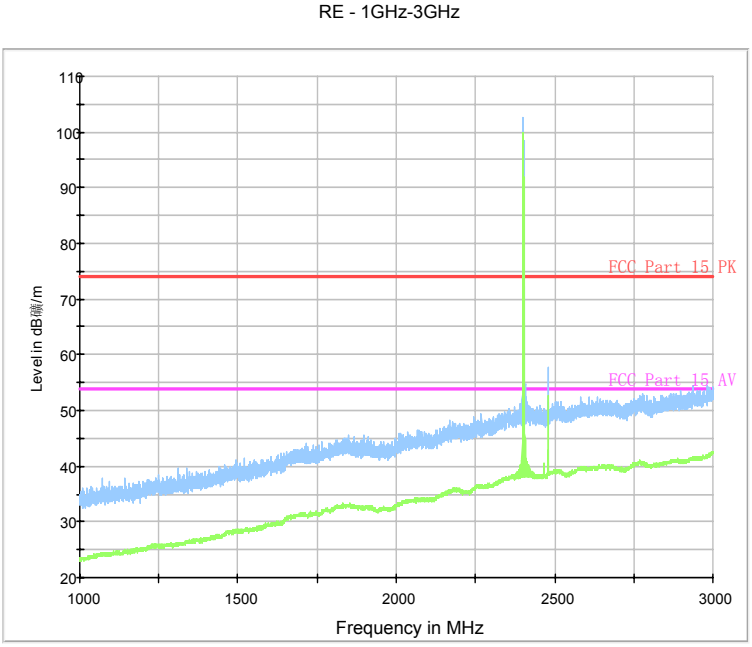


Fig.83. Radiated emission: 8DPSK, Channel 0, 1 GHz - 3 GHz

©Copyright. All rights reserved by TMC Beijing.

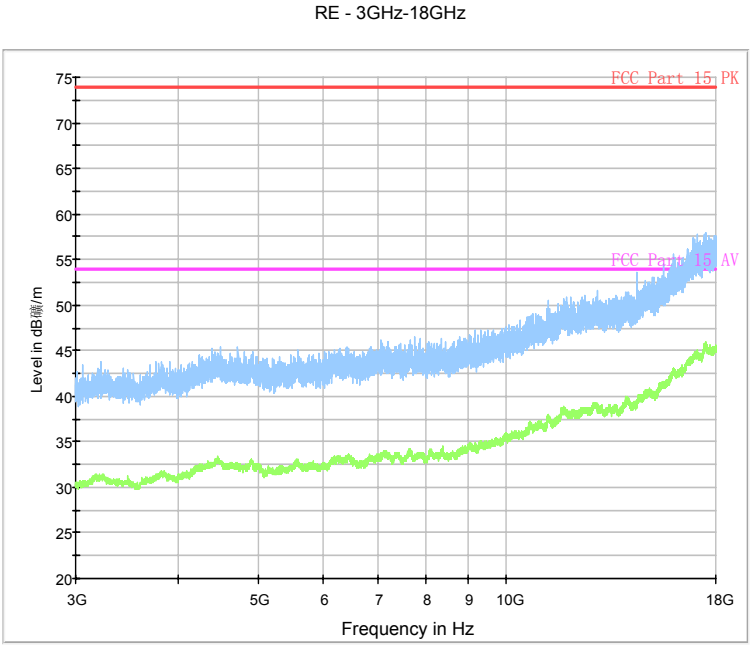


Fig.84. Radiated emission: 8DPSK, Channel 0, 3 GHz - 18 GHz

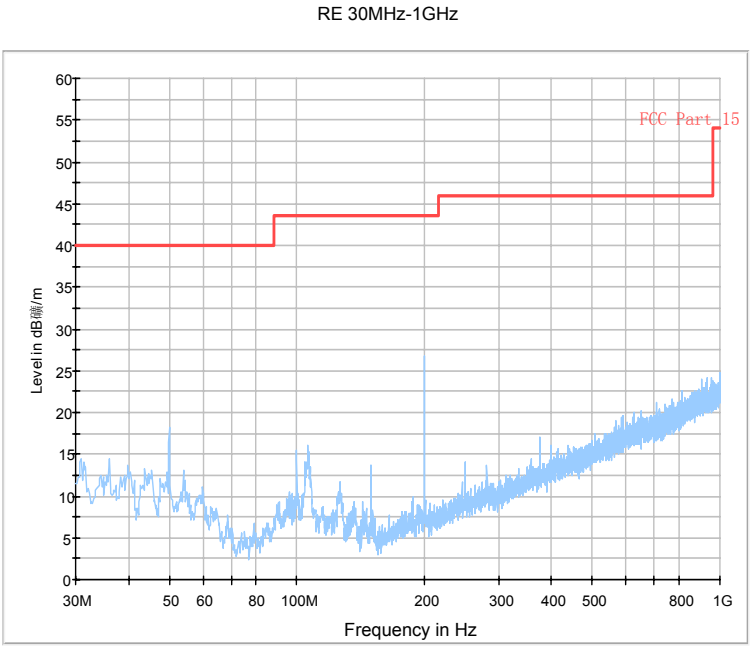


Fig.85. Radiated emission: 8DPSK, Channel 39, 30 MHz - 1 GHz

©Copyright. All rights reserved by TMC Beijing.

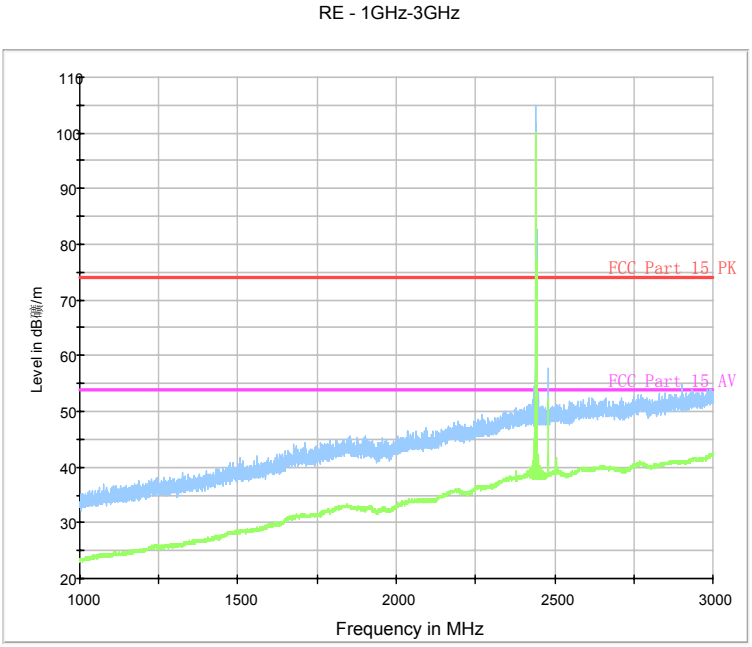


Fig.86. Radiated emission: 8DPSK, Channel 39, 1 GHz - 3 GHz

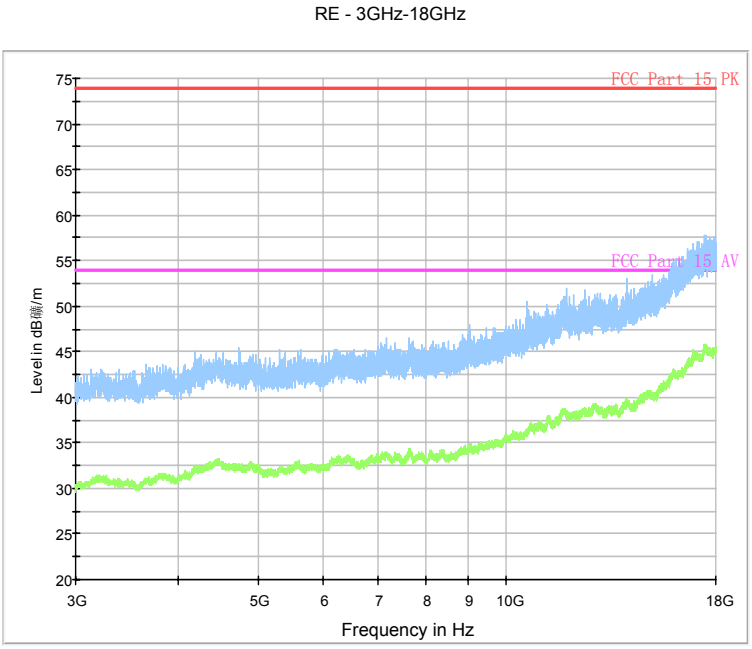


Fig.87. Radiated emission: 8DPSK, Channel 39, 3 GHz - 18 GHz

©Copyright. All rights reserved by TMC Beijing.

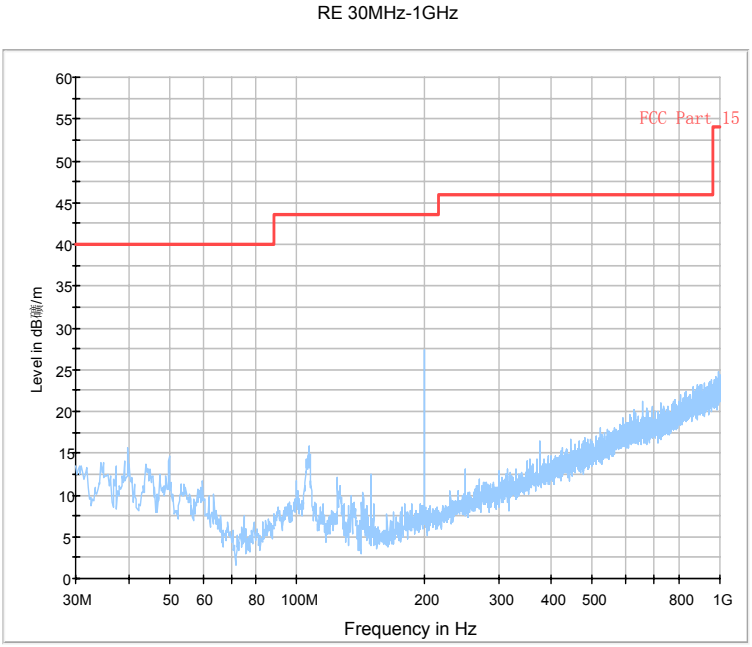


Fig.88. Radiated emission: 8DPSK, Channel 78, 30 MHz - 1 GHz

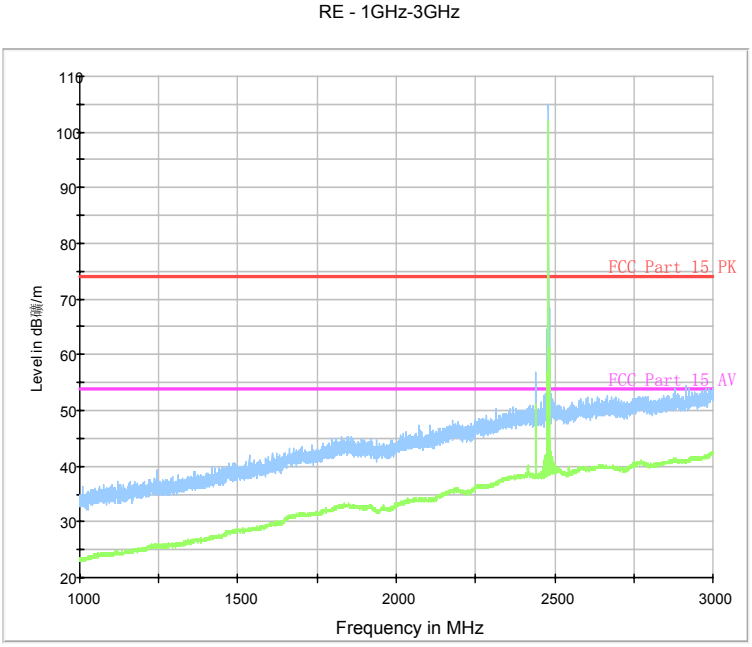


Fig.89. Radiated emission: 8DPSK, Channel 78, 1 GHz - 3 GHz

©Copyright. All rights reserved by TMC Beijing.

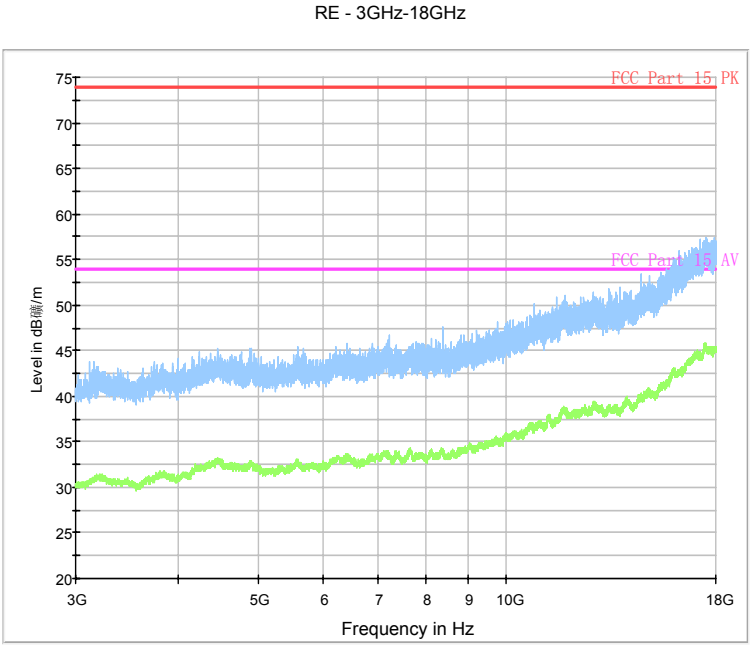


Fig.90. Radiated emission: 8DPSK, Channel 78, 3 GHz - 18 GHz

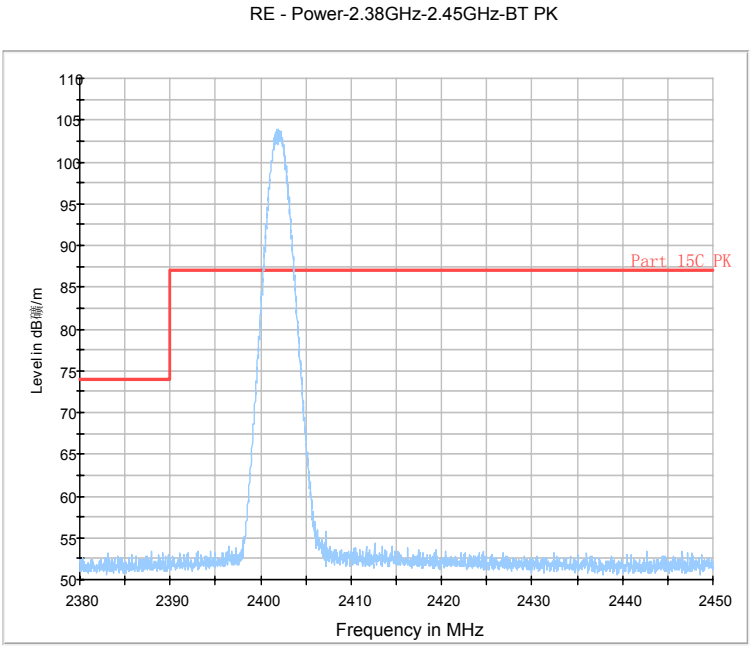


Fig.91. Radiated emission (Power): 8DPSK, low channel

©Copyright. All rights reserved by TMC Beijing.

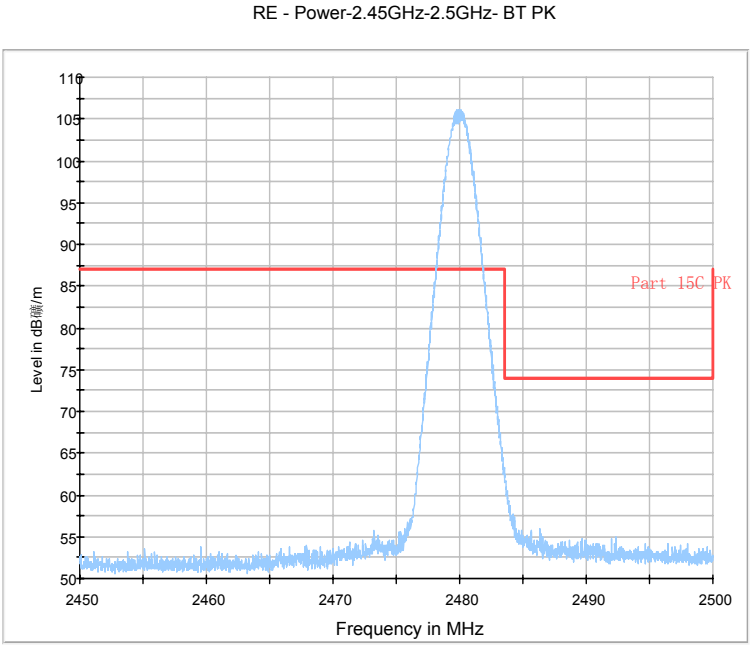


Fig.92. Radiated emission (Power): 8DPSK, high channel

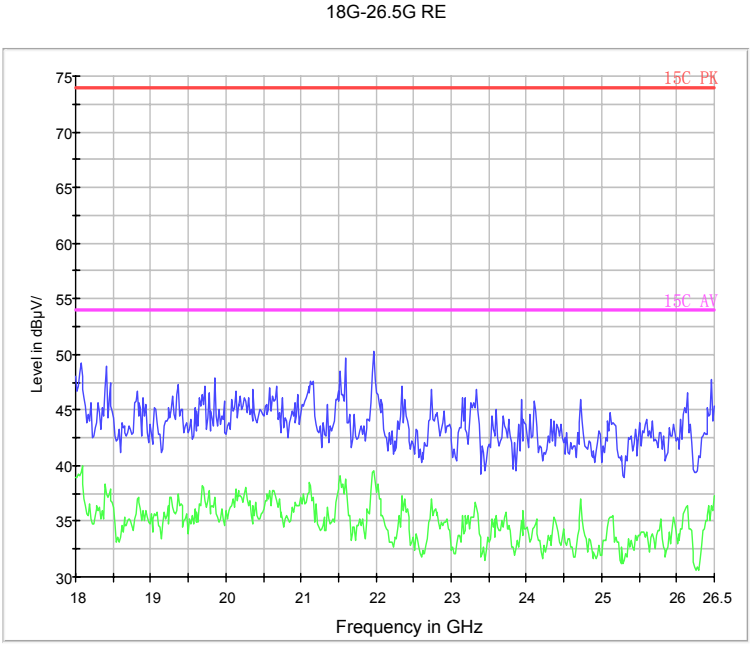


Fig.93. Radiated emission: 8DPSK, 18 GHz - 26 GHz

©Copyright. All rights reserved by TMC Beijing.

A.6. Time of Occupancy (Dwell Time)

Measurement Limit:

Standard	Limit (ms)
FCC 47 CFR Part 15.247(a) (1)(iii)	< 400

The measurement is made according to Public notice DA 00-705 and ANSI C63.4

Measurement Result:

For GFSK

Channel	Packet	Dwell Time (ms)		Conclusion
39	DH1	Fig.94	107.01	P
		Fig.95		
	DH3	Fig.96	190.17	P
		Fig.97		
	DH5	Fig.98	182.58	P
		Fig.99		

For π/4 DQPSK

Channel	Packet	Dwell Time (ms)		Conclusion
39	DH1	Fig.100	110.04	P
		Fig.101		
	DH3	Fig.102	163.94	P
		Fig.103		
	DH5	Fig.104	156.50	P
		Fig.105		

For 8DPSK

Channel	Packet	Dwell Time (ms)		Conclusion
39	DH1	Fig.106	105.47	P
		Fig.107		
	DH3	Fig.108	169.41	P
		Fig.109		
	DH5	Fig.110	217.75	P
		Fig.111		

Conclusion: PASS

Test graphs as below:

©Copyright. All rights reserved by TMC Beijing.

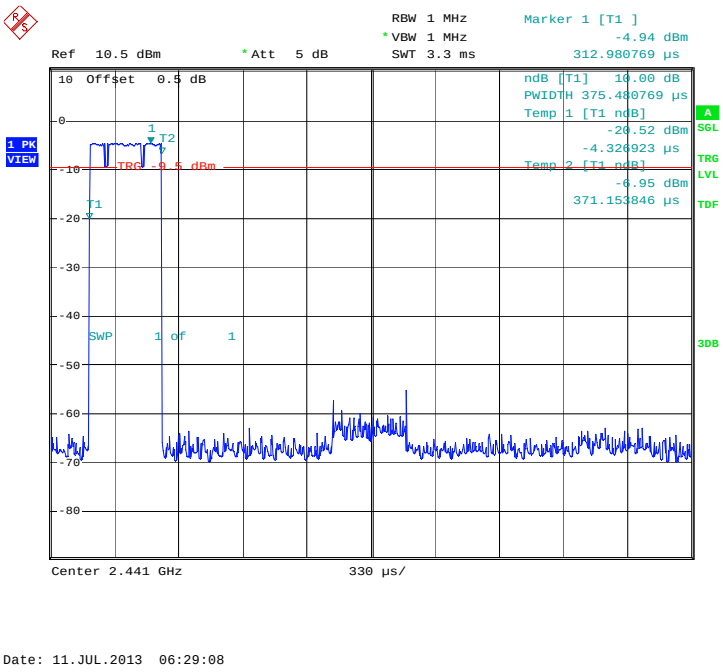


Fig.94. Time of occupancy (Dwell Time): Channel 39, Packet DH1

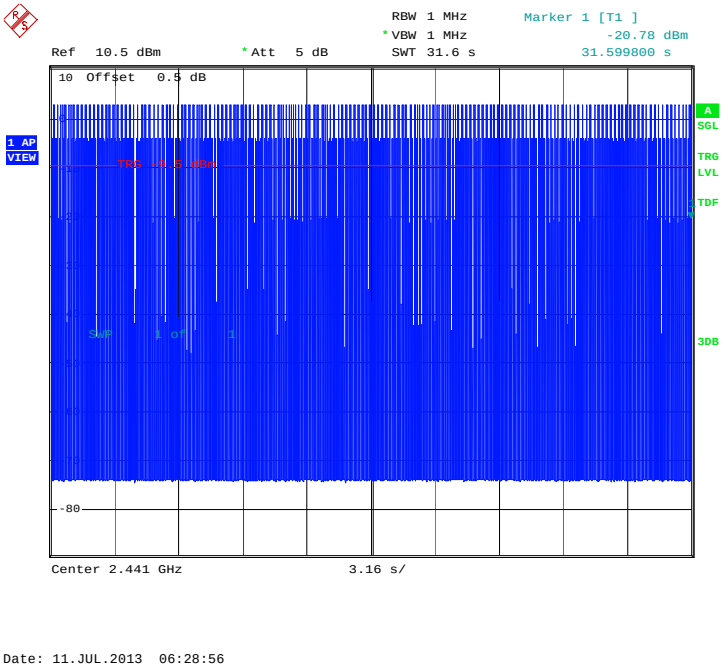


Fig.95. Number of Transmissions Measurement:Channel 39,Packet DH1

©Copyright. All rights reserved by TMC Beijing.

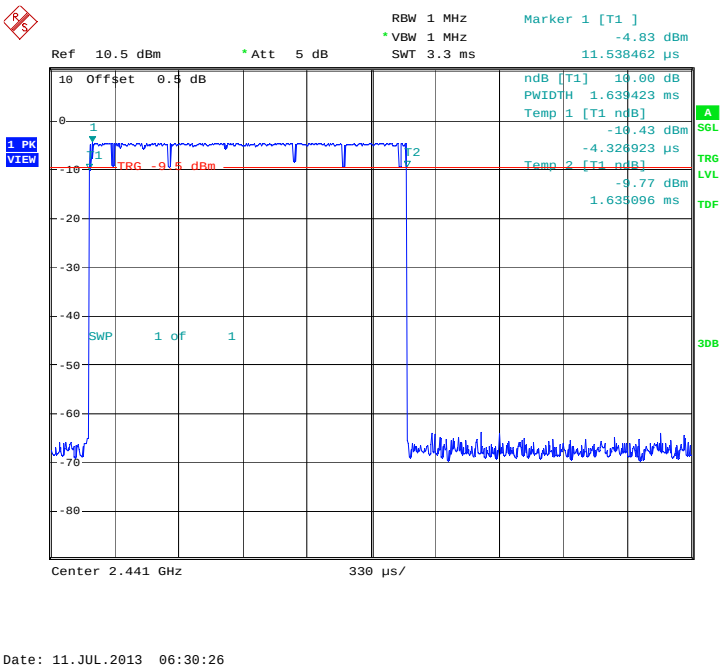


Fig.96. Time of occupancy (Dwell Time): Channel 39, Packet DH3

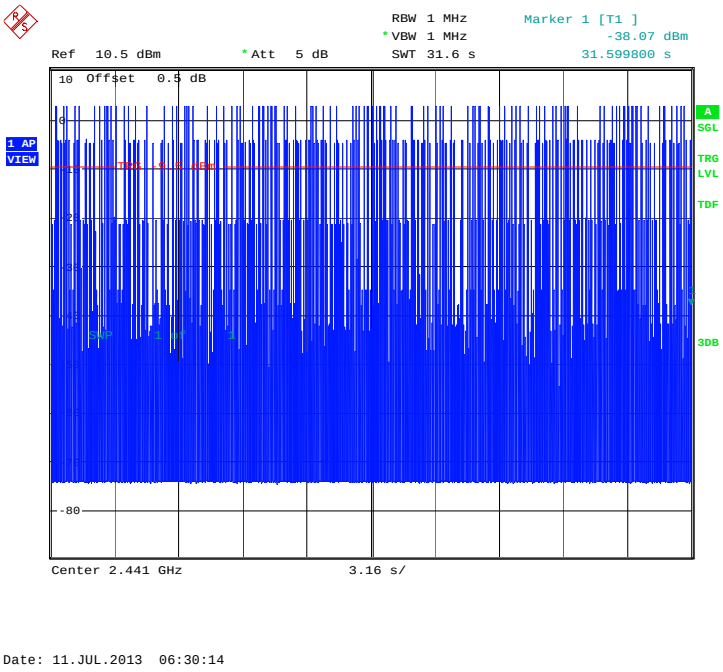


Fig.97. Number of Transmissions Measurement:Channel 39,Packet DH3

©Copyright. All rights reserved by TMC Beijing.

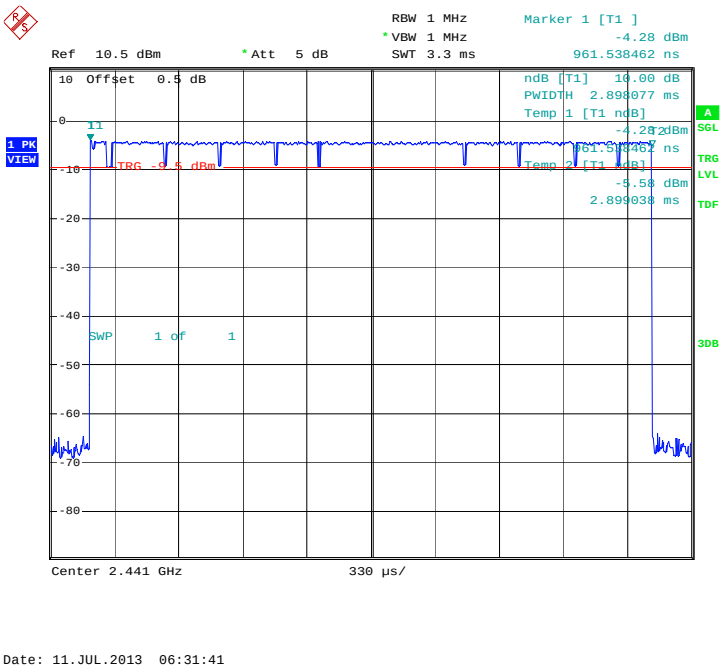


Fig.98. Time of occupancy (Dwell Time): Channel 39, Packet DH5

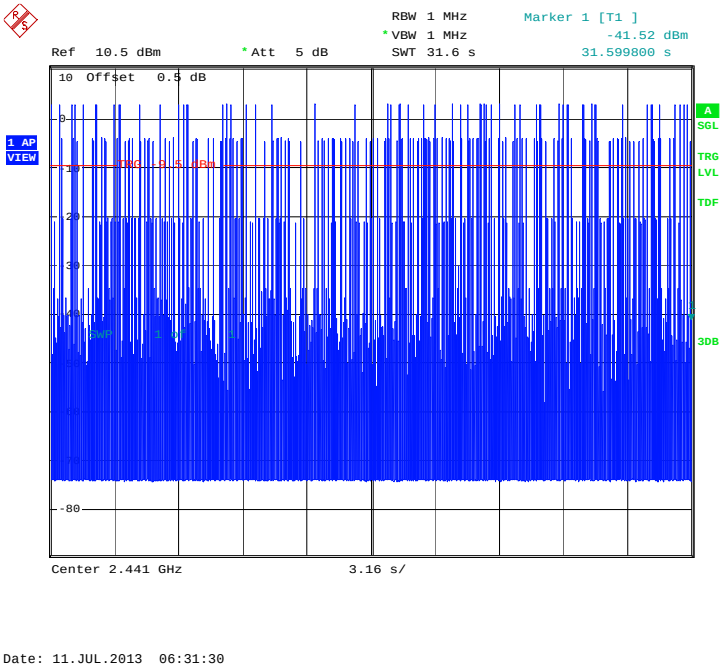


Fig.99. Number of Transmissions Measurement:Channel 39,Packet DH5

©Copyright. All rights reserved by TMC Beijing.

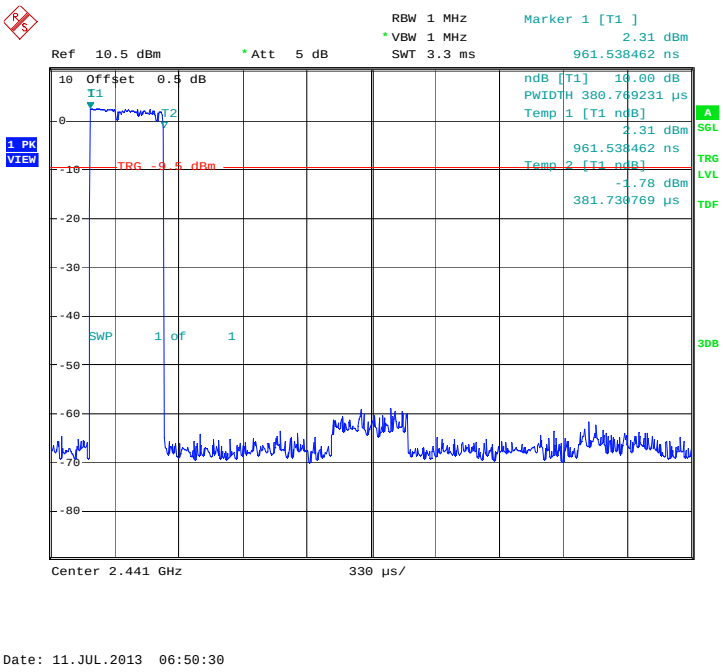


Fig.100. Time of occupancy (Dwell Time): Channel 39, Packet 2-DH1

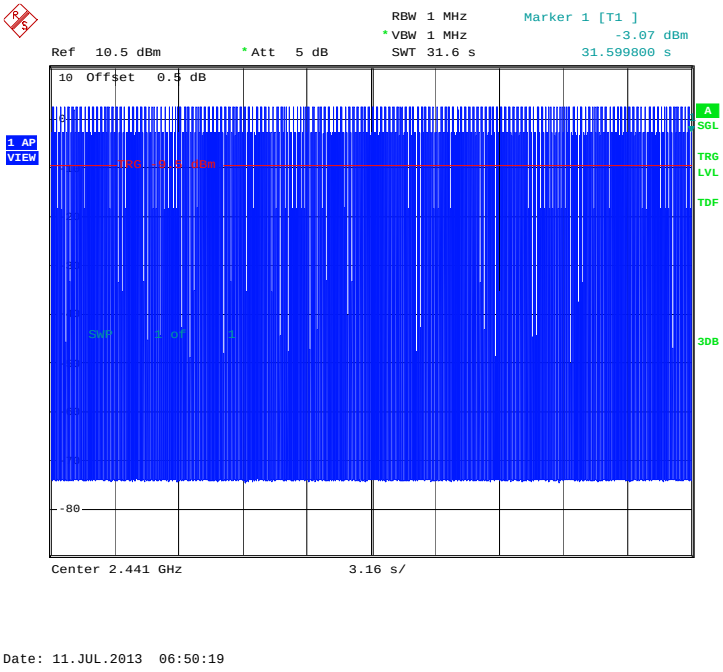


Fig.101. Number of Transmissions Measurement:Channel 39,Packet 2-DH1

©Copyright. All rights reserved by TMC Beijing.

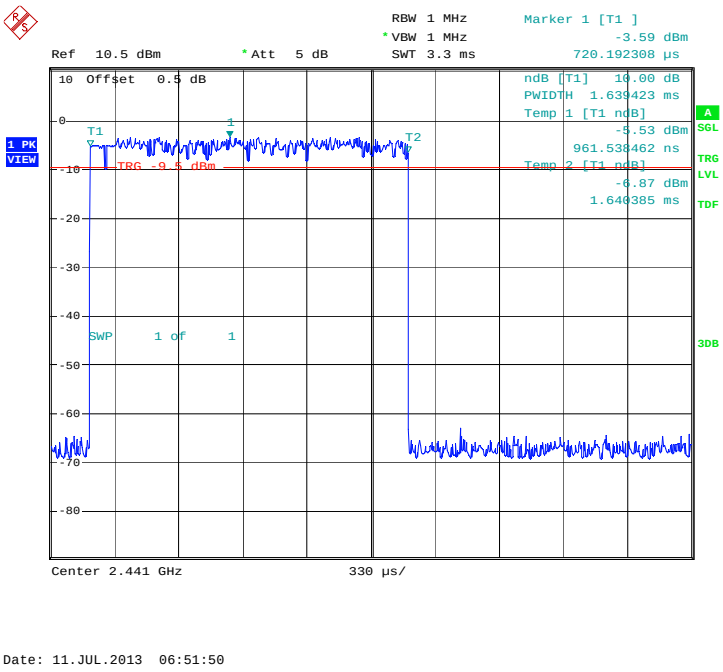


Fig.102. Time of occupancy (Dwell Time): Channel 39, Packet 2-DH3

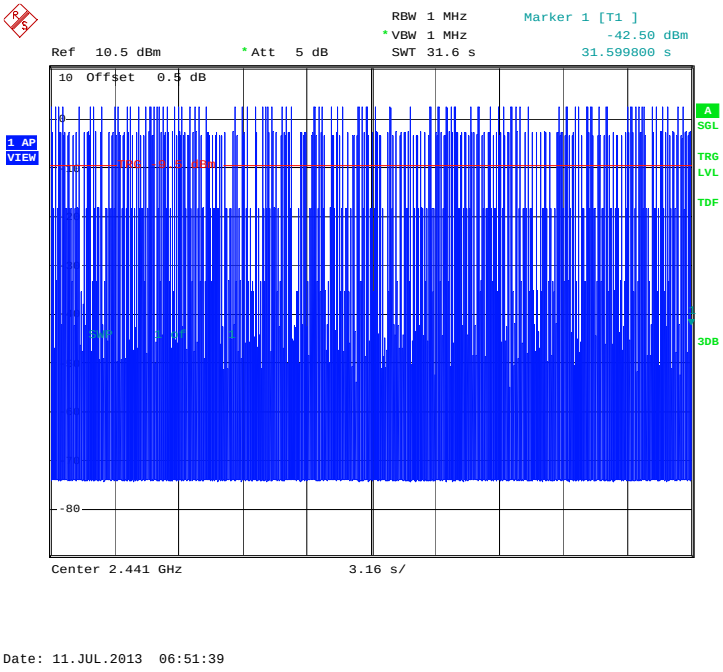


Fig.103. Number of Transmissions Measurement:Channel 39,Packet 2-DH3

©Copyright. All rights reserved by TMC Beijing.

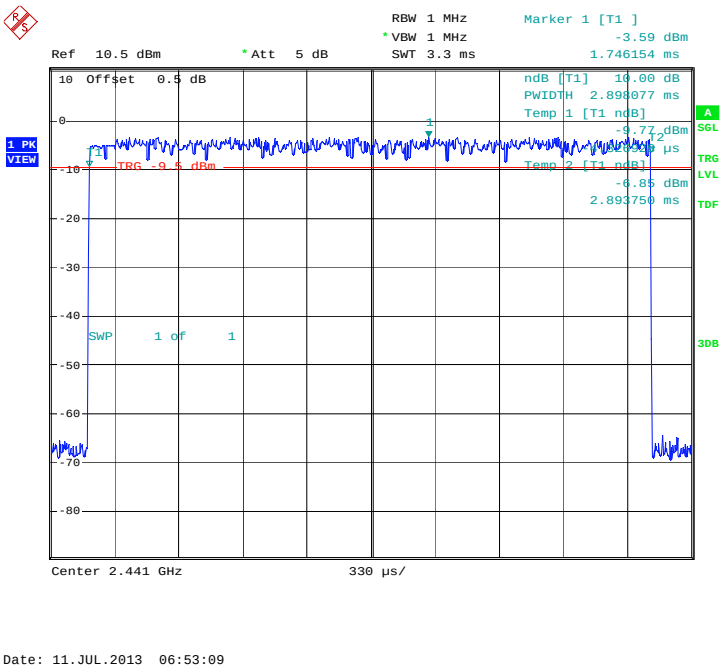


Fig.104. Time of occupancy (Dwell Time): Channel 39, Packet 2-DH5

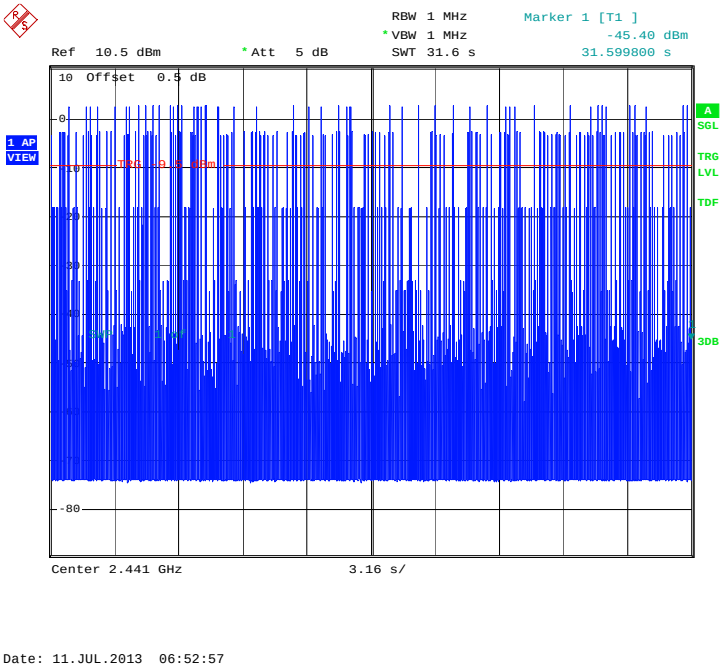


Fig.105. Number of Transmissions Measurement:Channel 39,Packet 2-DH5

©Copyright. All rights reserved by TMC Beijing.

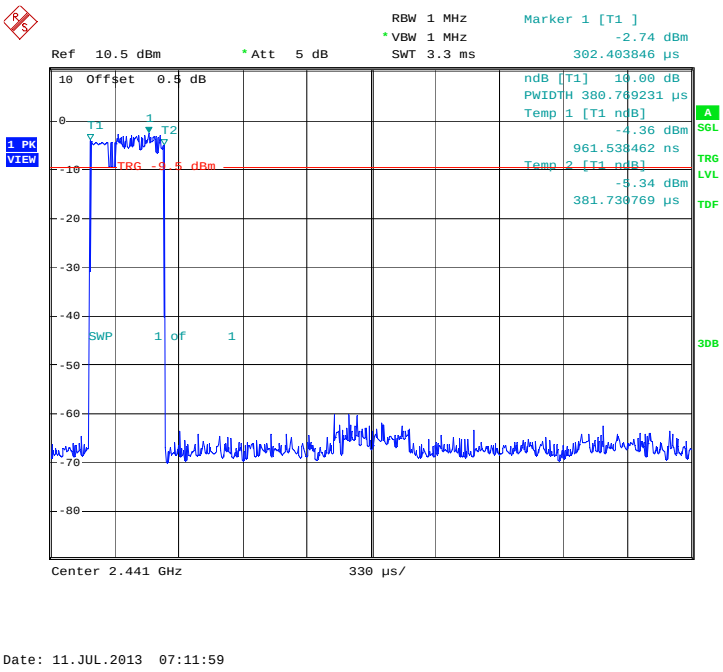


Fig.106. Time of occupancy (Dwell Time): Channel 39, Packet 3-DH1

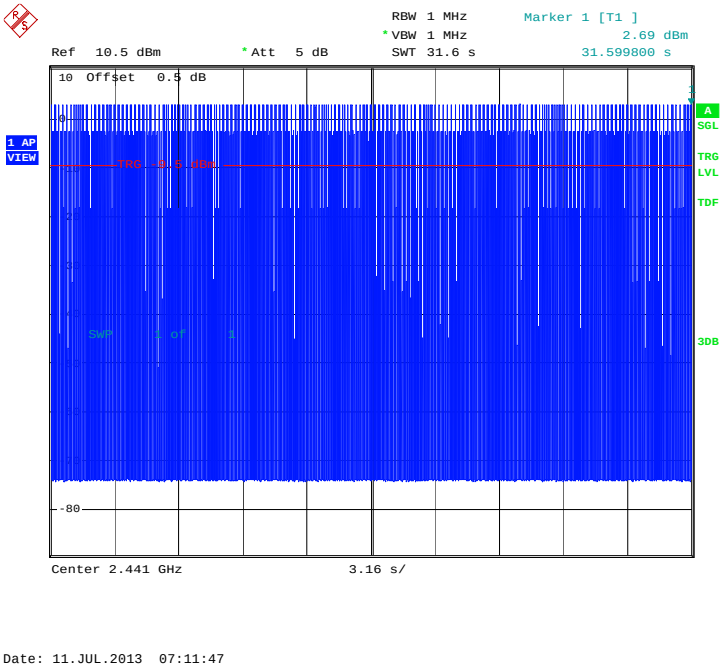


Fig.107. Number of Transmissions Measurement:Channel 39,Packet 3-DH1

©Copyright. All rights reserved by TMC Beijing.

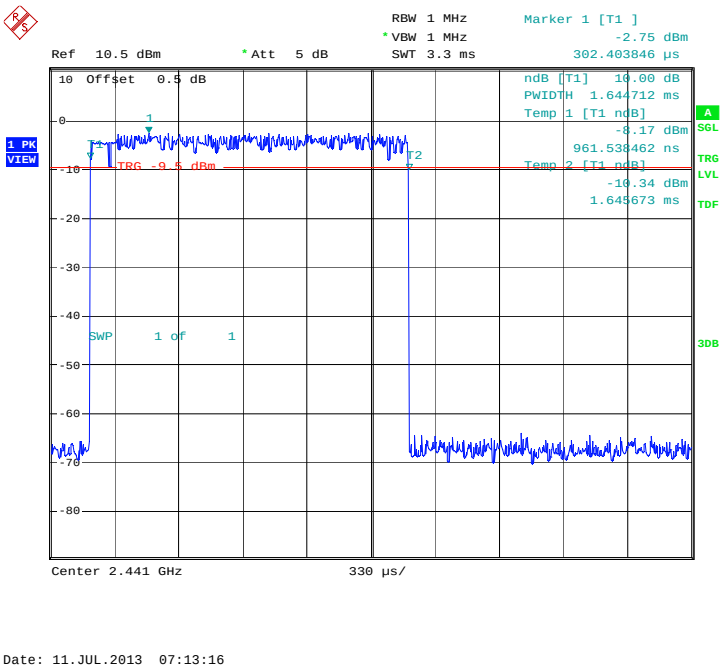


Fig.108. Time of occupancy (Dwell Time): Channel 39, Packet 3-DH3

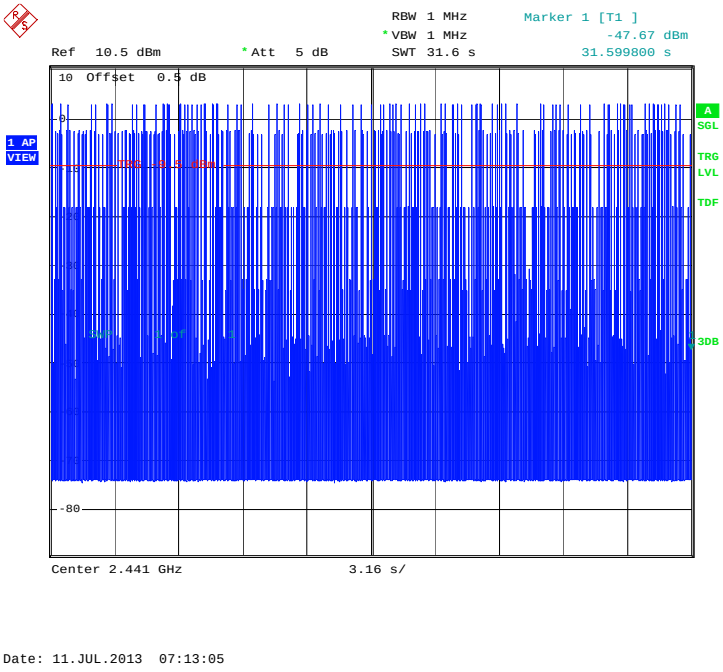


Fig.109. Number of Transmissions Measurement:Channel 39,Packet 3-DH3

©Copyright. All rights reserved by TMC Beijing.

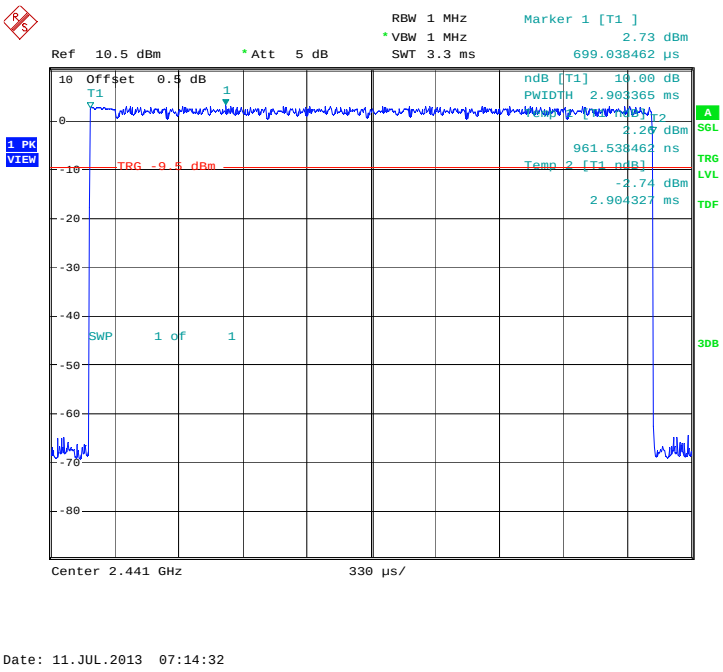


Fig.110. Time of occupancy (Dwell Time): Channel 39, Packet 3-DH5

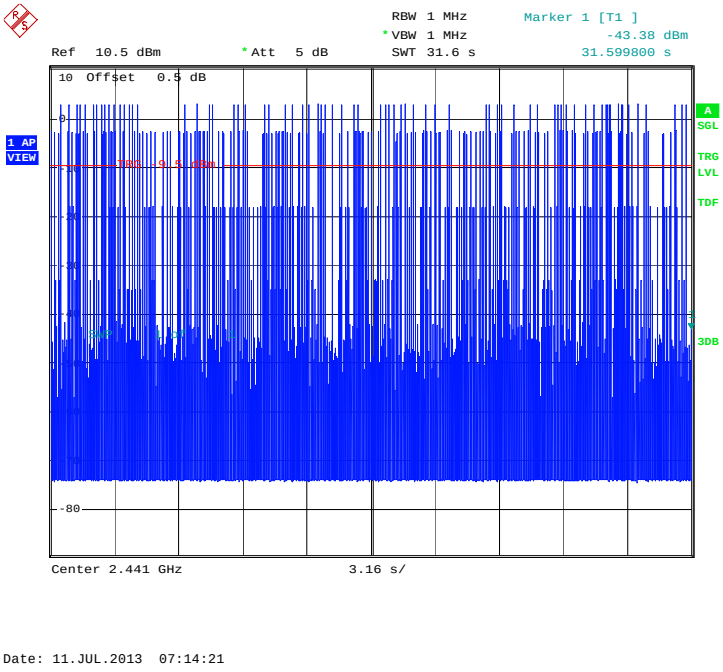


Fig.111. Number of Transmissions Measurement:Channel 39,Packet 3-DH5

©Copyright. All rights reserved by TMC Beijing.

A.7. 20dB Bandwidth

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247(a)(1)	NA *

The measurement is made according to Public notice DA 00-705 and ANSI C63.4

* Comment: This test case is not required according to the latest FCC 47 CFR Part 15.247. But the test results are necessary for “carrier frequency separation” test case, in Annex A.8.

Measurement Results:

For GFSK

Channel	20dB Bandwidth (kHz)		Conclusion
0	Fig.112	831.73	NA
39	Fig.113	870.19	NA
78	Fig.114	865.38	NA

Forπ/4 DQPSK

Channel	20dB Bandwidth (kHz)		Conclusion
0	Fig.115	1274.04	NA
39	Fig.116	1259.62	NA
78	Fig.117	1269.23	NA

For 8DPSK

Channel	20dB Bandwidth (kHz)		Conclusion
0	Fig.118	1274.04	NA
39	Fig.119	1254.81	NA
78	Fig.120	1274.04	NA

Conclusion: NA

Test graphs as below:

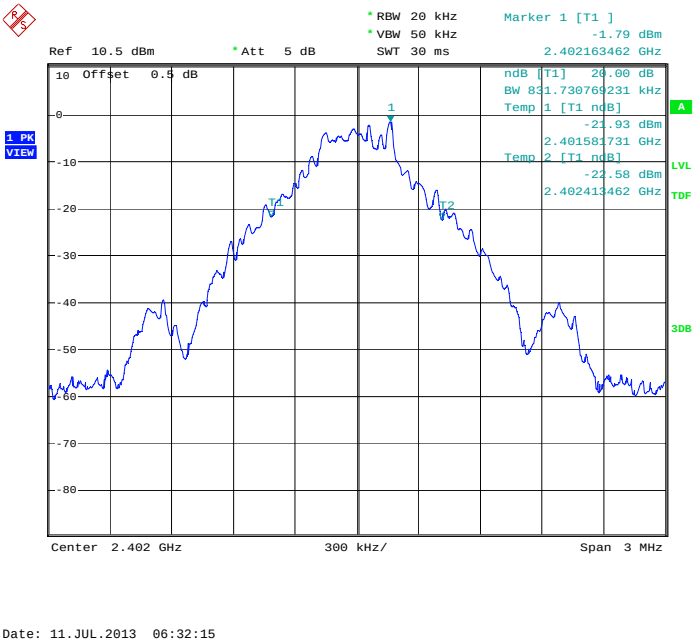
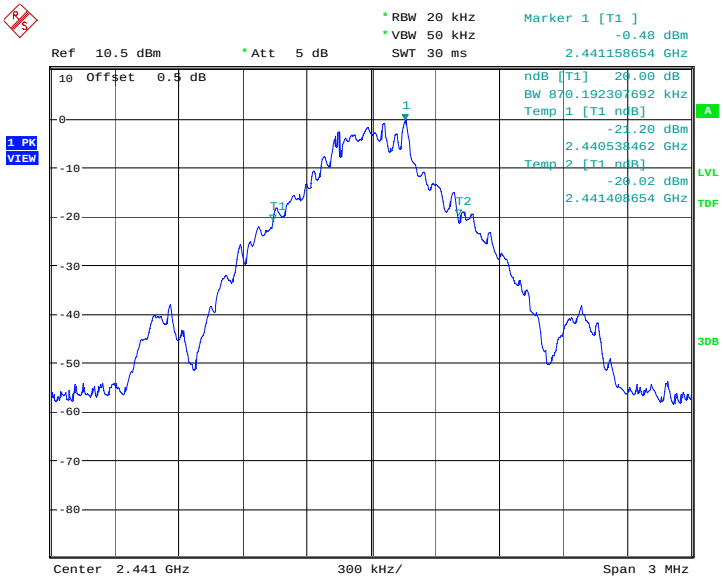


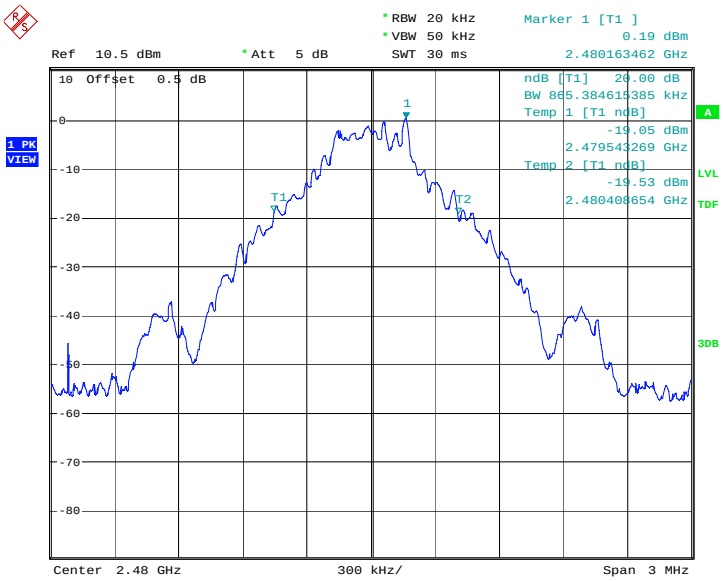
Fig.112. 20dB Bandwidth: GFSK, Channel 0

©Copyright. All rights reserved by TMC Beijing.



Date: 11.JUL.2013 06:32:47

Fig.113. 20dB Bandwidth: GFSK, Channel 39



Date: 11.JUL.2013 06:33:19

Fig.114. 20dB Bandwidth: GFSK, Channel 78

©Copyright. All rights reserved by TMC Beijing.

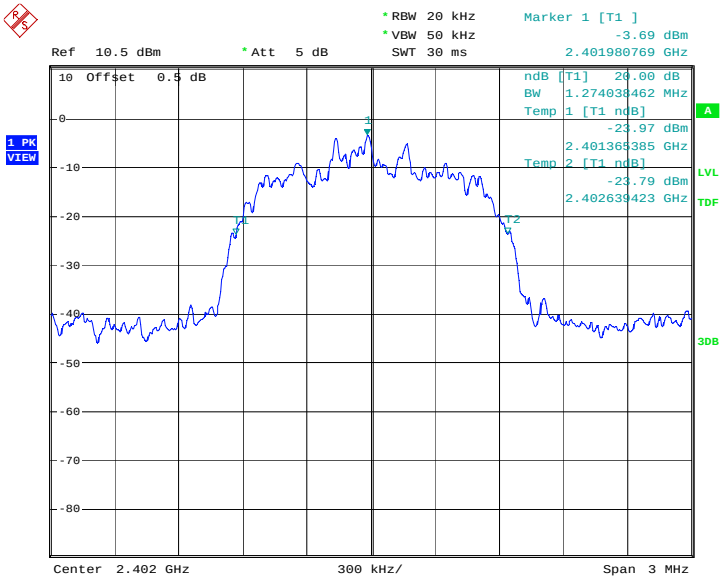


Fig.115. 20dB Bandwidth: π/4 DQPSK, Channel 0

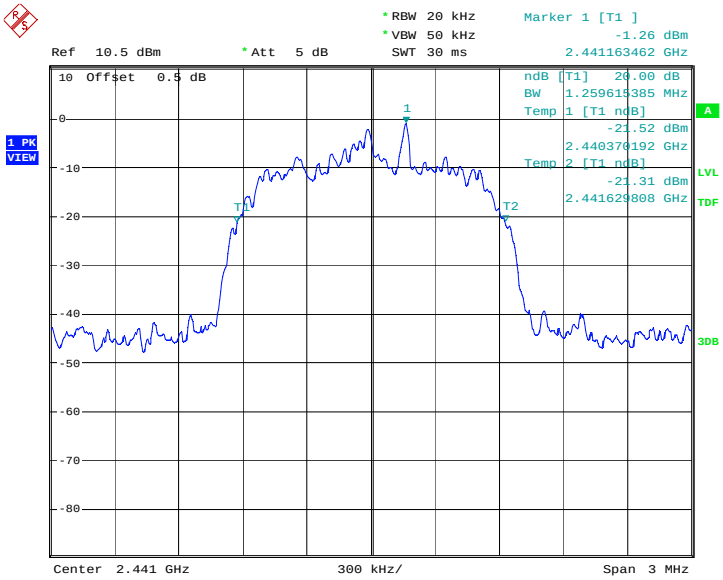


Fig.116. 20dB Bandwidth: π/4 DQPSK, Channel 39

©Copyright. All rights reserved by TMC Beijing.

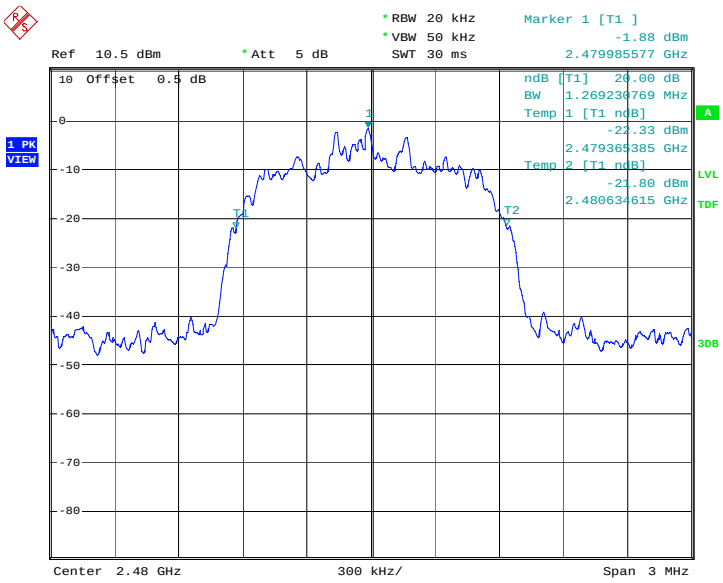


Fig.117. 20dB Bandwidth: π/4 DQPSK, Channel 78

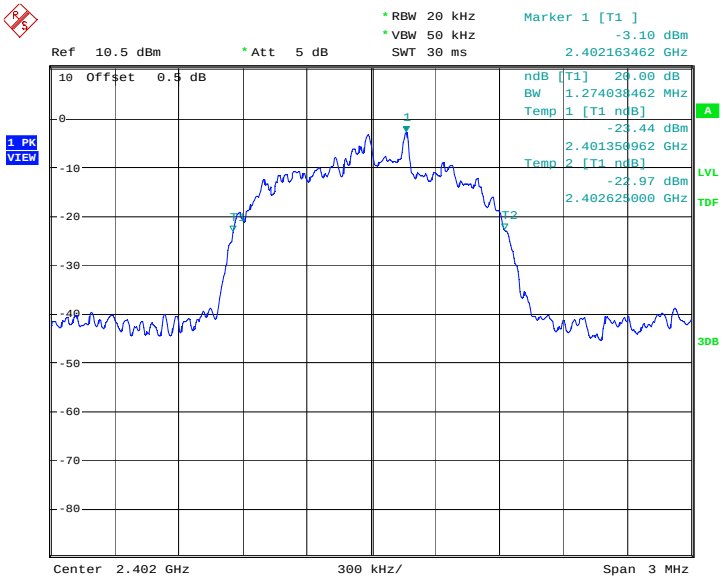


Fig.118. 20dB Bandwidth: 8DPSK, Channel 0

©Copyright. All rights reserved by TMC Beijing.

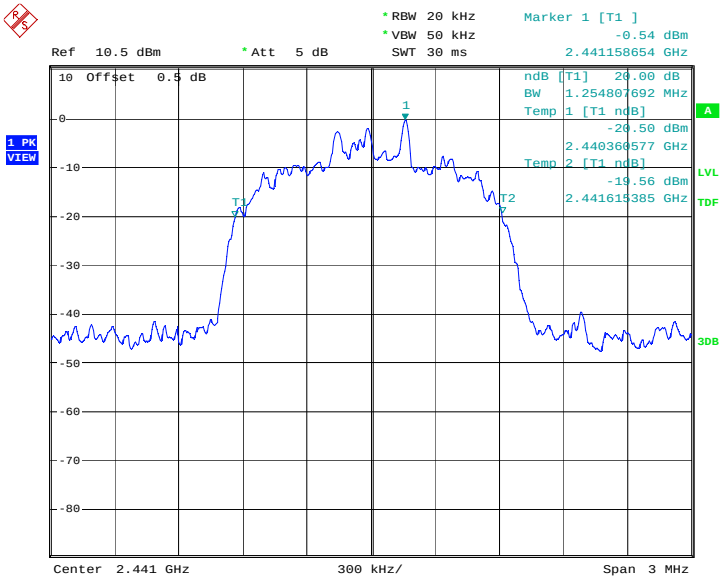


Fig.119. 20dB Bandwidth: 8DPSK, Channel 39

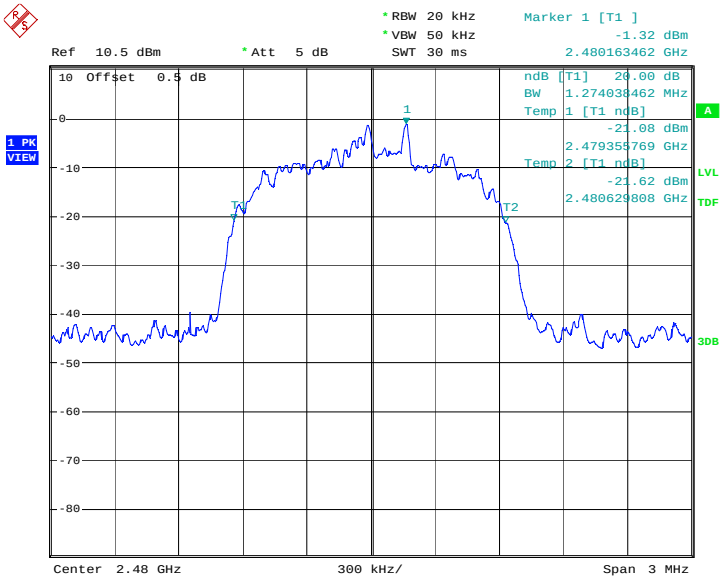


Fig.120. 20dB Bandwidth: 8DPSK, Channel 78

©Copyright. All rights reserved by TMC Beijing.

A.8. Carrier Frequency Separation

Measurement Limit:

Standard	Limit(kHz)
FCC 47 CFR Part 15.247(a)(1)	over 25 kHz or (2/3) * 20dB bandwidth

The measurement is made according to Public notice DA 00-705 and ANSI C63.4

* Comment: This limit should be over 25 kHz or (2/3) * 20dB bandwidth, whichever is greater.

Measurement Result:

For GFSK

Channel	Carrier frequency separation (kHz)		Conclusion
39	Fig.121	1004.81	P

For π/4 DQPSK

Channel	Carrier frequency separation (kHz)		Conclusion
39	Fig.122	1009.62	P

For 8DPSK

Channel	Carrier frequency separation (kHz)		Conclusion
39	Fig.123	1322.12	P

Conclusion: PASS

Test graphs as below:

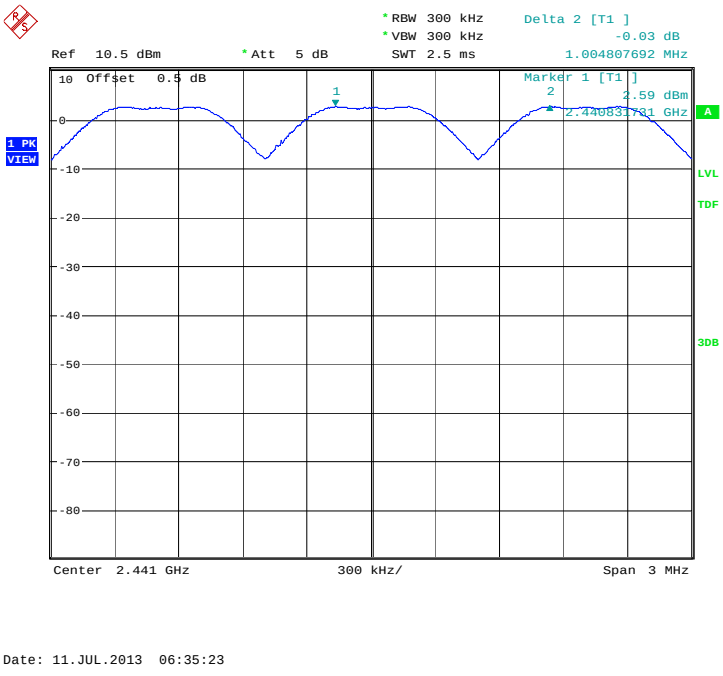


Fig.121. Carrier frequency separation measurement: GFSK, Channel 39

©Copyright. All rights reserved by TMC Beijing.

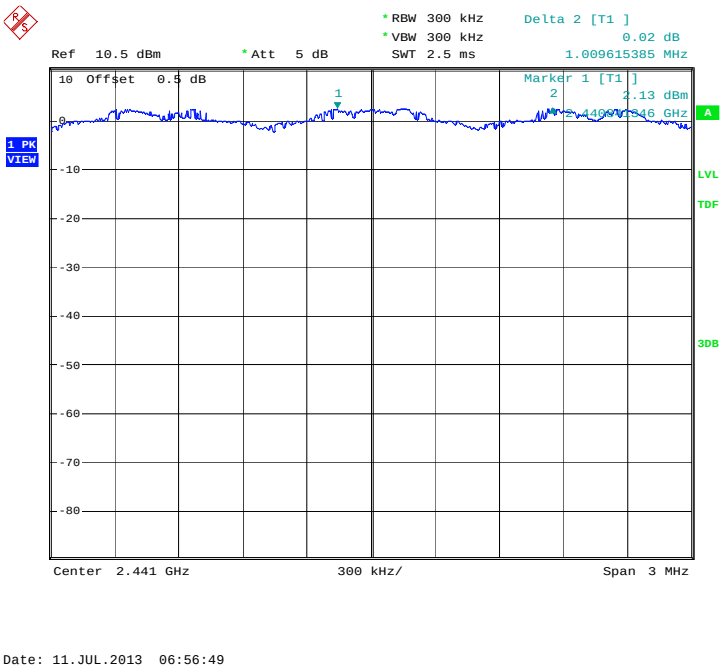


Fig.122. Carrier frequency separation measurement: π/4 DQPSK, Channel 39

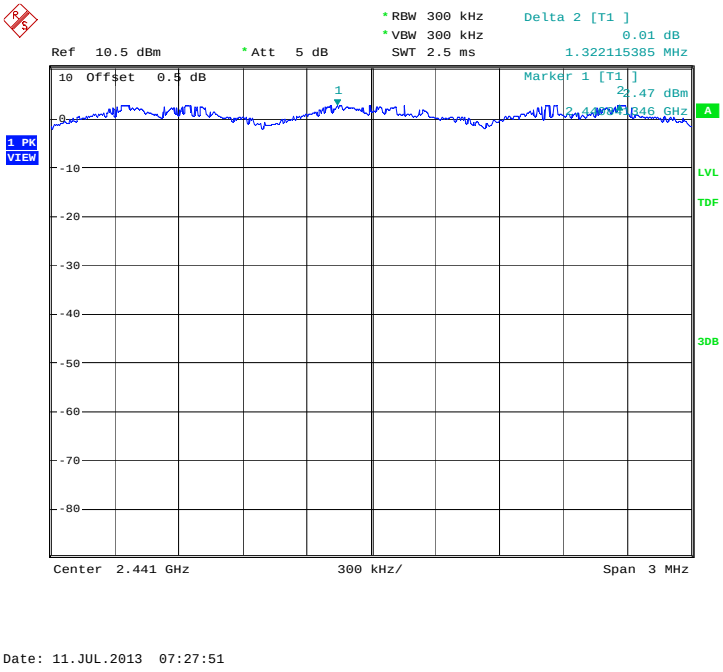


Fig.123. Carrier frequency separation measurement: 8DPSK, Channel 39

©Copyright. All rights reserved by TMC Beijing.

A.9. Number of Hopping Channels

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247(a) (1)(iii)	At least 15 non-overlapping channels

The measurement is made according to Public notice DA 00-705 and ANSI C63.4

Measurement Result:

For GFSK

Channel	Number of hopping channels		Conclusion
0~39	Fig.124	79	P
40~78	Fig.125		

Forπ/4 DQPSK

Channel	Number of hopping channels		Conclusion
0~39	Fig.126	79	P
40~78	Fig.127		

For 8DPSK

Channel	Number of hopping channels		Conclusion
0~39	Fig.128	79	P
40~78	Fig.129		

Conclusion: PASS

Test graphs as below:

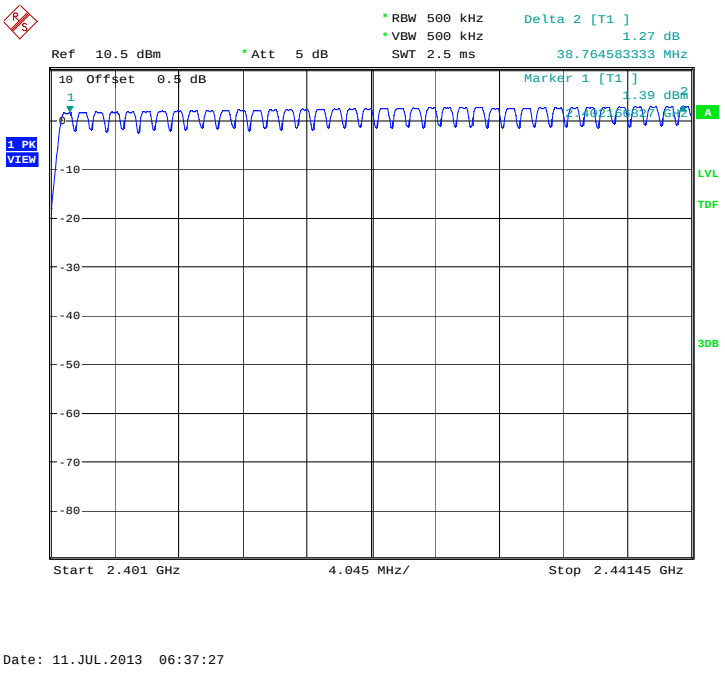


Fig.124. Number of hopping frequencies: GFSK, Channel 0 - 39

©Copyright. All rights reserved by TMC Beijing.

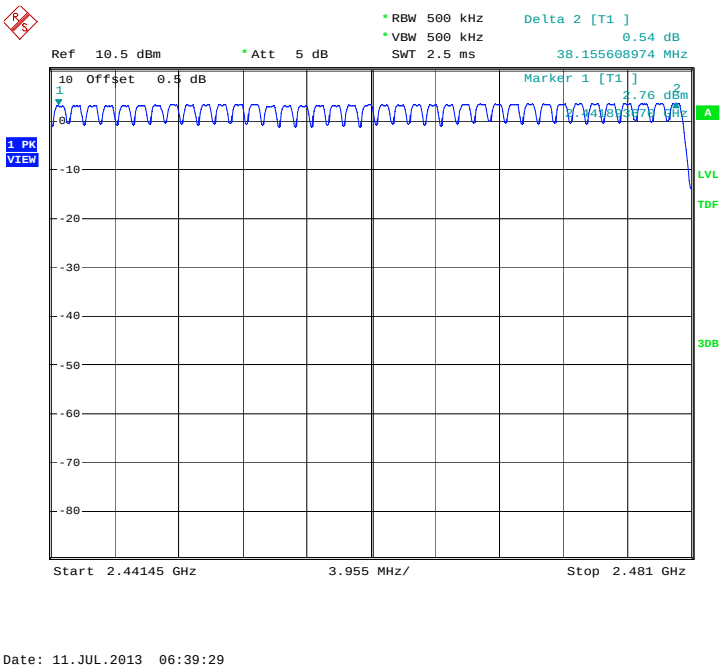


Fig.125. Number of hopping frequencies: GFSK, Channel 40 - 78

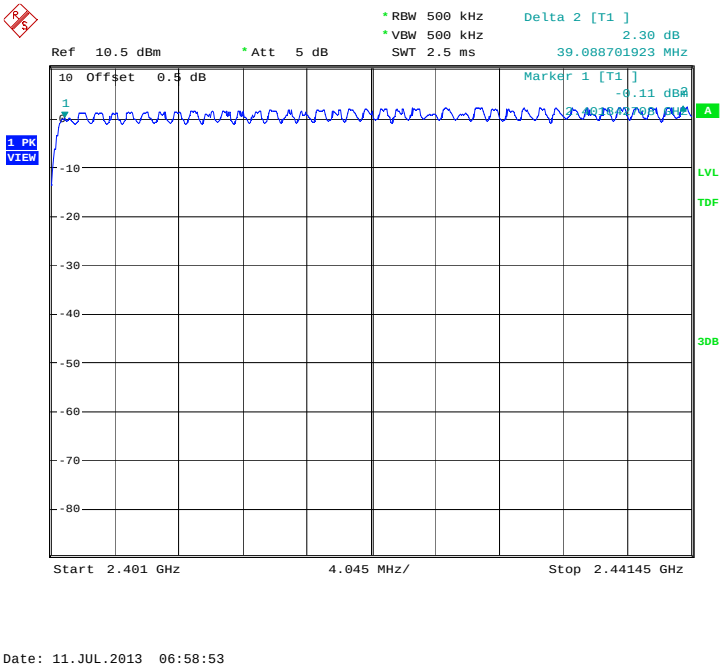


Fig.126. Number of hopping frequencies: π/4 DQPSK, Channel 0 - 39

©Copyright. All rights reserved by TMC Beijing.

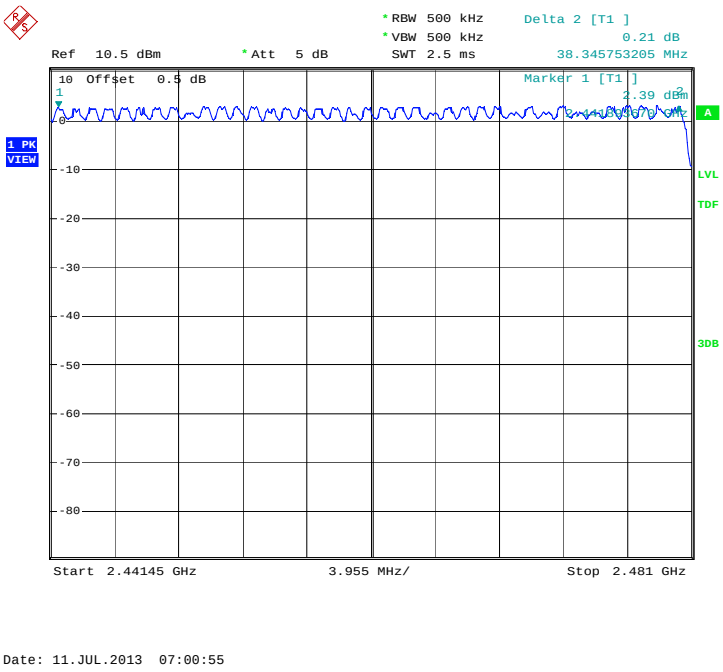


Fig.127. Number of hopping frequencies: π/4 DQPSK, Channel 40 - 78

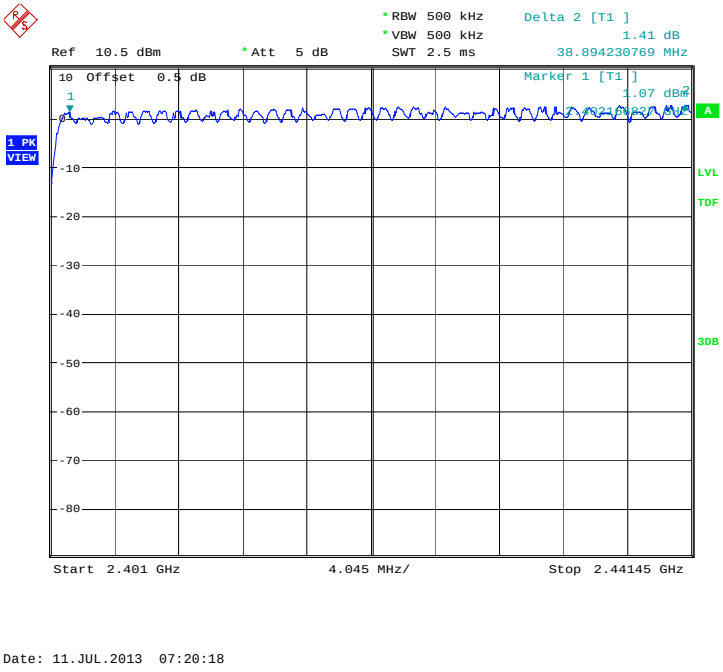


Fig.128. Number of hopping frequencies: 8DPSK, Channel 0 - 39

©Copyright. All rights reserved by TMC Beijing.

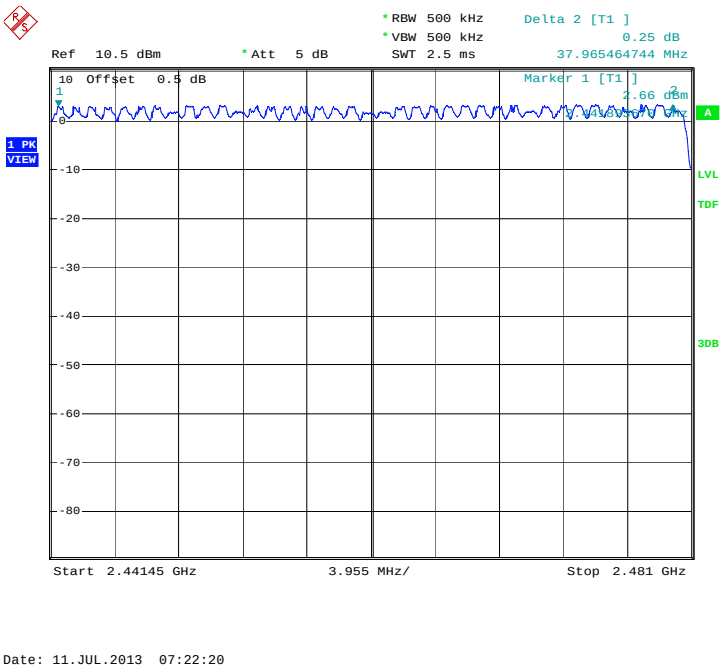


Fig.129. Number of hopping frequencies: 8DPSK, Channel 40 - 78

©Copyright. All rights reserved by TMC Beijing.

A.10. AC Powerline Conducted Emission

Test Condition

Voltage（V）	Frequency（Hz）
120	60

Measurement Result and limit:

Bluetooth (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Conclusion
0.15 to 0.5	66 o 56	P
0.5 to 5	56	
5 to 30	60	
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.		

Bluetooth (Average Limit)

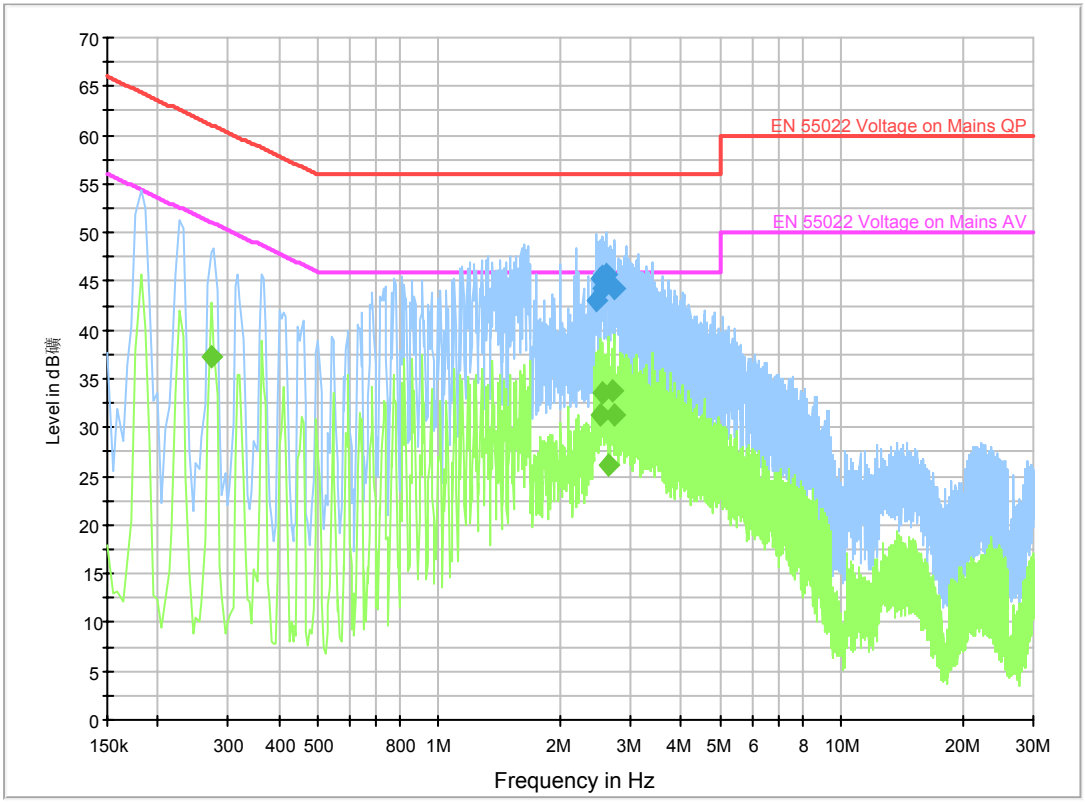
Frequency range (MHz)	Average Limit (dBμV)	Conclusion
0.15 to 0.5	56 to 46	P
0.5 to 5	46	
5 to 30	50	
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.		

The measurement is made according to Public notice DA 00-705 and ANSI C63.4

Conclusion: PASS

Test graphs as below:

©Copyright. All rights reserved by TMC Beijing.



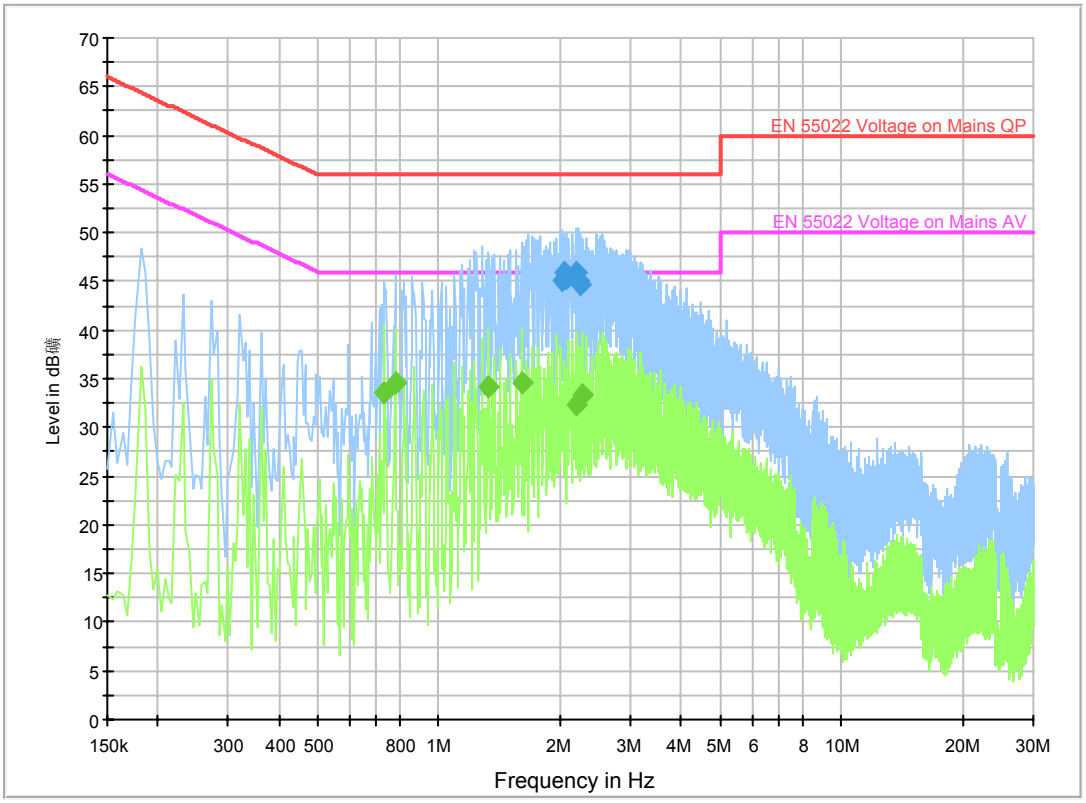
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
2.472001	43.0	GND	N	9.9	13.0	56.0
2.521501	45.3	GND	N	9.9	10.7	56.0
2.535001	44.3	GND	N	9.9	11.7	56.0
2.553001	45.4	GND	N	9.9	10.6	56.0
2.598001	45.6	GND	N	9.9	10.4	56.0
2.737501	44.3	GND	N	9.9	11.7	56.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.271501	37.2	GND	N	9.9	13.9	51.1
2.521501	31.2	GND	N	9.9	14.8	46.0
2.553001	33.6	GND	N	9.9	12.5	46.0
2.629501	26.0	GND	N	9.9	20.0	46.0
2.692501	33.7	GND	N	9.9	12.3	46.0
2.724001	31.4	GND	N	9.9	14.6	46.0

©Copyright. All rights reserved by TMC Beijing.



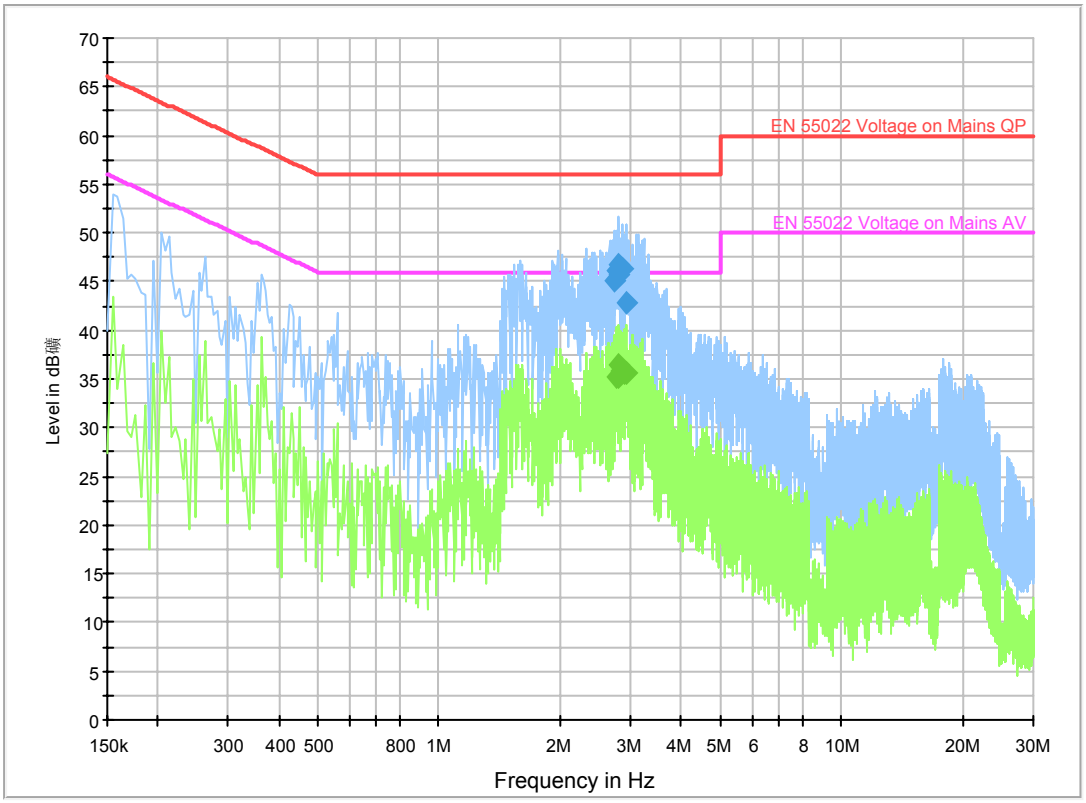
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
2.031001	45.1	GND	N	9.9	10.9	56.0
2.058001	45.9	GND	N	9.9	10.1	56.0
2.076001	45.4	GND	N	9.9	10.6	56.0
2.184001	46.0	GND	N	9.9	10.0	56.0
2.215501	45.1	GND	N	9.9	10.9	56.0
2.247001	44.7	GND	N	9.9	11.3	56.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.730501	33.6	GND	N	9.9	12.4	46.0
0.780001	34.6	GND	N	9.9	11.4	46.0
1.329001	34.1	GND	N	9.9	11.9	46.0
1.603501	34.7	GND	N	9.9	11.3	46.0
2.184001	32.3	GND	N	9.9	13.7	46.0
2.278501	33.4	GND	N	9.9	12.6	46.0

©Copyright. All rights reserved by TMC Beijing.



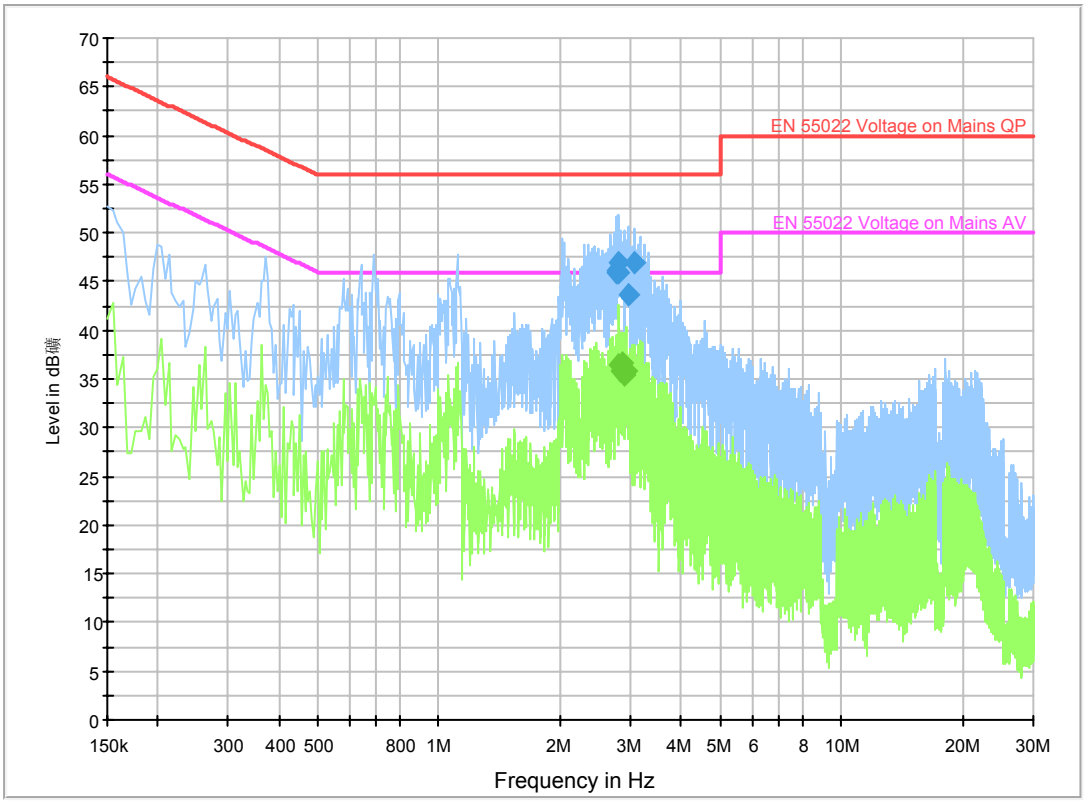
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
2.715001	45.1	GND	N	9.9	10.9	56.0
2.746501	46.1	GND	N	9.9	9.9	56.0
2.778001	45.8	GND	N	9.9	10.2	56.0
2.809501	46.7	GND	N	9.9	9.3	56.0
2.854501	46.3	GND	N	9.9	9.7	56.0
2.917501	42.9	GND	N	9.9	13.1	56.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
2.746501	35.2	GND	N	9.9	10.8	46.0
2.778001	35.2	GND	N	9.9	10.8	46.0
2.809501	36.5	GND	N	9.9	9.5	46.0
2.841001	35.8	GND	N	9.9	10.2	46.0
2.904001	35.6	GND	N	9.9	10.4	46.0
2.917501	35.6	GND	N	9.9	10.4	46.0

©Copyright. All rights reserved by TMC Beijing.



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
2.746501	46.1	GND	N	9.9	9.9	56.0
2.764501	45.9	GND	N	9.9	10.1	56.0
2.778001	45.9	GND	N	9.9	10.1	56.0
2.809501	46.9	GND	N	9.9	9.1	56.0
2.962501	43.6	GND	N	9.9	12.4	56.0
3.075001	47.0	GND	N	9.9	9.0	56.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
2.809501	36.5	GND	N	9.9	9.5	46.0
2.841001	35.8	GND	N	9.9	10.2	46.0
2.863501	36.6	GND	N	9.9	9.4	46.0
2.886001	35.5	GND	N	9.9	10.5	46.0
2.904001	35.6	GND	N	9.9	10.4	46.0
2.917501	35.7	GND	N	9.9	10.3	46.0

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

©Copyright. All rights reserved by TMC Beijing.