

Date of Issue: Sep. 12, 2018 Report No.: WH-FCC-R18091011-1

FCC 47 CFR PART 15 SUBPART C 15.247 TEST REPORT FOR

Trekstor Primebook C13B

Model : CFPN5SW02464, CFCN4SW02464

Issued to TREKSTOR GmbH Berliner Ring 7, 64625 Bensheim, Germany

> Issued by WH Technology Corp.



EMC Test Site	Xizhi Office and Lab	Datong Rd. Xizhi Dist. New Taipei City Taiwan				
	Tel.: +886-2-7729-7707 Fax: +886-2- 8648-1311					

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APPENDIX 1 PHOTOS OF TEST CONFIGURATION PHOTOS OF EUT



1. General Information

Applicant :		TREKSTOR GmbH		
Address	:	Berliner Ring 7, 64625 Bensheim, Germany		
Manufacturer	:	Heyuan Vastking Electronic Co.,Ltd		
Address	:	No.13, Hepu Avenue, Yuancheng District, Heyuan City, Guangdong Province, China.		
EUT		Trekstor Primebook C13B		
Model Name	:	CFPN5SW02464, CFCN4SW02464		
Model Differences		Only model name different.		

Is here with confirmed to comply with the requirements set out in the FCC Rules and Regulations Part 15 Subpart C and the measurement procedures were according to ANSI C63.10-2013. The said equipment in the configuration described in this report shows the maximum emission levels emanating

FCC part 15 subpart C

Receipt Date : 08/30/2018

Final Test Date : 09/11/2018

Tested By:

Bing Chang/ Engineer

Sept. 12, 2018 Date

Sept. 12, 2018

Date

Bell Wei / Manager Designation Number: TW2954

Tested By:



2. Report of Measurements and Examinations

2.1 List of Measurements and Examinations

FCC Rule	Description of Test	Result
Maximum Peak Output Power	FCC Part 15: 15.247(b)(1) RSS-247 5.4(2) & ANSI C63.10 :2013	Pass
Bandwidth	FCC Part 15: 15.215 RSS-247 5.1(2) & ANSI C63.10 :2013	Pass
Carrier Frequency Separation	FCC Part 15: 15.247(a)(1) RSS-247 5.1(2) & ANSI C63.10 :2013	Pass
Number Of Hopping Channel	FCC Part 15: 15.247(a)(1)(iii) RSS-247 5.1(4) & ANSI C63.10 :2013	Pass
Dwell Time	FCC Part 15: 15.247(a)(1)(iii) RSS-247 5.1(4) & ANSI C63.10 :2013	Pass
Radiated Emission	FCC Part 15: 15.209 FCC Part 15: 15.247(d) RSS-247 Section 5.5& ANSI C63.10 :2013	Pass
Band Edge Compliance	FCC Part 15: 15.247(d) RSS-247 Section 5.5& ANSI C63.10 :2013	Pass
Power Line Conducted Emissions	FCC Part 15: 15.207 IC RSS Gen, Section 7.2.4& ANSI C63.10 :2013	Pass
Antenna requirement	15: 15.203 &IC RSS Gen, Section 7.1.4	Pass



3. Test Configuration of Equipment under Test

3.1 Description of the tested samples

EUT Name	: Trekstor Primebook C13B	
Model Number	: CFPN5SW02464	
FCCID	: 2ALTX-CFPN5SW02464	
Receipt Date	: 08/30/2018	
Power From	. ☑Inside ☑Outside ☑Adaptor ☑Battery □AC Power Source □DC Power Source □Support Unit PC or NB	
Adapter	. JHD-AP024U-120200BA-A . INPUT: AC100-240V~ 50/60Hz 0.45A, Output: DC12V 2000mA	
Battery	: 7.4V	
Operate Frequency	: Refer to the channel list as described below (2.402 ~2.480 GHz	.)
Modulation Technique	: GFSK, π/4-DQPSK, 8DPSK(1/2/3Mbps)	
Number of Channels	: 79	
Channel spacing	: 🗆 N/A 🗹 <u>1 M</u> Hz	
Operating Mode	: DSimplex I Half Duplex	
Antenna Type	: FPCB Antenna	
Antenna gain	1.0 dBi	



3.2 Carrier Frequency of Channels

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	27	2429	54	2456
01	2403	28	2430	55	2457
02	2404	29	2431	56	2458
03	2405	30	2432	57	2459
04	2406	31	2433	58	2460
05	2407	32	2434	59	2461
06	2408	33	2435	60	2462
07	2409	34	2436	61	2463
08	2410	35	2437	62	2464
09	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2472
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451	76	2478
23	2425	50	2452	77	2479
24	2426	51	2453	78	2480
25	2427	52	2454		
26	2428	53	2455		



3.3 Test Mode and Test Software

- a. During testing, the interface cables and equipment positions were varied according to ANSI C63.4.
- b. The complete test system included Notebook and EUT for RF test.
- c. Test Software: Radio Test.exe
- d. New Battery was used for all testing and the worst radiated emission case from X,Y and Z axis evaluation was selected for testing.
- e. The following test modes were performed for test:
 - BT: CH00: 2402MHz, CH40: 2441MHz, CH78: 2480MHz



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3.4 TEST Methodology & General Test Procedures

All testing as described bellowed were performed in accordance with ANSI C63.4:2014 and ANSI C63.10:2013.

Conducted Emissions

The EUT is placed on a wood table, which is at 0.8 m above ground plane acceding to clause 15.207 and requirements of ANSI C63.4:2014. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz are using CISPR Quasi-Peak / Average detectors.

Radiated Emissions

The EUT is a placed on a turn table, which is 0.8 m above ground plane. The turntable was rotated through 360 degrees to determine the position of maximum emission level. The EUT is placed at 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

- 1) Putting the EUT on the platform and turning on the EUT (on/off button on the bottom of the EUT).
- 2) Setting test channel described as "Channel setting and operating condition", and testing channel by channel.
- For the maximum output power measurement, we followed the method of measurement KDB558074 D01.
- 4) For the spurious emission test based on ANSI(2014), at the frequency where below 1GHz used quasi-peak detector mode; where above 1GHz used the peak and average detector mode. IF the peak value may be under average limit, the average mode will not be performed.



3.5 Measurement Uncertainty

Measurement Item	Uncertainty
Peak Output Power(conducted)	±1.345dB
Power Spectral Density	±1.347dB
Radiated emission(1G-25GHz)	±5.00dB
Radiated emission(30M-1GHz)	±3.89dB
Conducted emission	±1.81dB

3.6 Description of the Support Equipments

Setup Diagram

See test photographs attached in appendix 1 for the actual connections between EUT and support equipment.

Support Equipment

Peripherals Devices:

	OUTSIDE SUPPORT EQUIPMENT						
No.	Equipment	Model	Serial No.	FCC ID/	Trade	Data Cable	Power Cord
INU.	Equipment	WOUEI		BSMI ID	name		
1.	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			INSIDE SUP	PORT EQUIPN	MENT		
No.	Equipment	Model	Serial No.	FCC ID/	Trade	Data Cable	Power Cord
INU.	Equipment	WIDGEI		BSMI ID	name		
1.	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Note: All the above equipment /cable were placed in worse case position to maximize emission signals during emission test

Grounding: Grounding was in accordance with the manufacturer's requirement and conditions for the intended use.



4. Test and measurement equipment

4.1 calibration

The measuring equipment utilized to perform the tests documented in the report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2 equipment

The following list contains measurement equipment used for testing. The equipment conforms to the requirement of CISPR 16-1, ANSI C63.2 and. Other required standards. Calibration of all test and measurement, including any accessories that may effect such calibration, is checked frequently to ensure the accuracy. Adjustments are made and correction factors are applied in accordance with the instructions contained in the respective.



Test Site	Instrument	Manufacturer	Model No.	S/N	Next Cal. Date
	Spectrum (9K3GHz)	R&S	FSP3	833387/010	2018/09/20
	EMI Receiver	R&S	ESHS10	830223/008	2019/05/22
Conduction	LISN	Rolf Heine Hochfrequenztechni k	NNB-2/16z	98062	2019/05/25
	ISN	Schwarzbeck	8-Wire ISN CAT5	CAT5-8158-0094	2018/09/21
	RF Cable	N/A	N/A	EMI-3	2018/10/19
	Bilog antenna(30M -1G)	ETC	MCTD2786B	BLB16M04004/J B-5-004	2019/05/03
	Double Ridged Guide Horn antenna(1G- 18G)	ETC	MCTD 1209	DRH15N0 2009	2018/11/23
	Horn antenna (18G-26G)	com-power	AH-826	81000	2019/08/14
Radiation	LOOP Antenna (Below 30M)	com-power	AL-130	17117	2018/10/04
	Pre amplifier (30M-1G)	EMC INSTRUMENT	EMC9135	980334	2019/05/04
	Microwave Preamplifier (1G-18G)	EMC INSTRUMENT	EMC051845	980108&AT -18001	2018/10/23
	Pre amplifier (18G~26G)	MITEQ	JS4-18002600-3 0-5A	808329	2019/08/09
	EMI Test	R&S	ESVS30	826006/002	2018/11/28

TABLELIST OF TEST AND MEASUREMENT EQUIPMENT



Receiver		(20M-1000MHz)		
		N male on end		2018/10/19
RF Cable	EMCI	of	30m	
(open site)	EMO	both sides	3011	2010/10/10
		(EMI4)		
RF CABLE	HARBOUT	LL142MI(4M+4M)	NA	2019/03/08
(1~26.5G)	INDUSTRIES		14/ 1	2010/00/00
RF CABLE	HARBOUR	LL142MI(7M)	NA	2019/08/10
(1~26.5G)	INDUSTRIES			2010/00/10
Spectrum	R&S	FSP7	830180/006	2019/03/25
(9K7GHz)			000100/000	2010/00/20
Spectrum	AGILENT	8564EC	4046A0032	2019/03/01
(9K40GHz)	AGIELIA	000+20	4040/0002	2010/00/01
 Power Meter	R&S	NRVS	100696	2019/08/09
 Power	R&S	URV5-Z4	0395.1619.05	2019/08/09
 Sensor	100			2013/00/09

*CALIBRATION INTERVAL OF INSTRUMENTS LISTED ABOVE IS ONE YEAR



5. Antenna Requirements

5.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

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

5.2 Antenna Construction and Directional Gain

Antenna Type: FPCB Antenna Antenna Gain: 1.0 dBi



6. Test of Conducted Emission

6.1 Test Limit

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz on the 110 VAC power and return leads of the EUT according to the methods defined in ANSI C63.4-2014 Section 3.1. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 2.2. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

Frequency (MHz)	Quasi Peak (dB µ V)	Average (dB μ V)
0.15 – 0.5	66-56*	56-46*
0.5 - 5.0	56	46
5.0 - 30.0	60	50

*Decreases with the logarithm of the frequency.

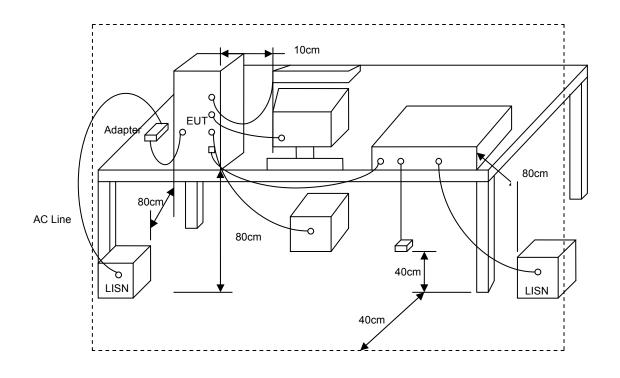
6.2 Test Procedures

- a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- b. Connect EUT to the power mains through a line impedance stabilization network (LISN).
- c. All the support units are connecting to the other LISN.
- d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
- e. The FCC states that a 50 ohm, 50 micro-Henry LISN should be used.
- f. Both sides of AC line were checked for maximum conducted interference.
- g. The frequency range from 150 kHz to 30 MHz was searched.
- h. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.



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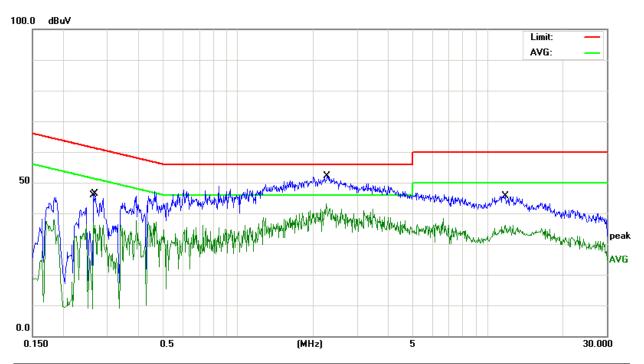
6.3 Typical Test Setup





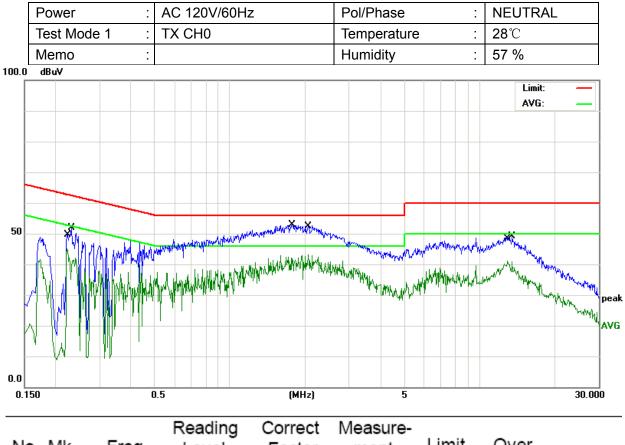
6.4 Test Result and Data

Power	AC 120V/60Hz	Pol/Phase :	LINE
Test Mode 1	TX CH0	Temperature :	28 ℃
Memo		Humidity :	57 %



No. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
	MHz	dBuV	dB	dBuV	dBu∨	dB	Detector
1	0.2630	35.14	1.82	36.96	51.33	-14.37	AVG
2	0.2671	44.49	1.81	46.30	61.20	-14.90	QP
3 *	2.2580	42.29	0.85	43.14	46.00	-2.86	AVG
4	2.2820	51.40	0.85	52.25	56.00	-3.75	QP
5	11.8056	35.52	10.23	45.75	60.00	-14.25	QP
6	11.8056	25.92	10.23	36.15	50.00	-13.85	AVG





No.	Mk.	Freq.	Level	Factor	ment	Limit	Over	
		MHz	dBu∨	dB	dBuV	dBuV	dB	Detector
1		0.2220	43.23	1.94	45.17	52.74	-7.57	AVG
2		0.2316	49.89	1.91	51.80	62.39	-10.59	QP
3	*	1.7740	52.12	0.83	52.95	56.00	-3.05	QP
4		2.0579	42.00	0.84	42.84	46.00	-3.16	AVG
5		12.9859	30.93	10.24	41.17	50.00	-8.83	AVG
6		13.5297	38.80	10.25	49.05	60.00	-10.95	QP

Note:

All the modulation modes were tested, the data of the worst mode are recorded in the above pages and the others modulation methods do not exceed the limits.



7. Test of Radiated Emission

7.1 Test Limit

In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. If the transmitter measurement is based on the maximum conducted output power, the attenuation required under this paragraph shall be 30dB instead of 20dB. In addition, radiated emissions which fall in section 15.205(a) the restricted bands must also comply with the radiated emission limit specified in section 15.209(a).

Frequency (MHz)	Field Strength (microvolt/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

7.2 Test Procedures

- a. The EUT was placed on a rotatable table top 0.8 meter above ground.
- b. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- c. The table was rotated 360 degrees to determine the position of the highest radiation.
- d. The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
- e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
- f. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.
- h. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in

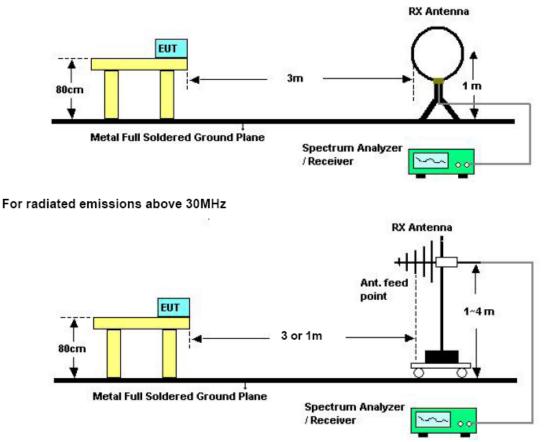


average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

i. "Cone of radiation" has been considered to be 3dB bandwidth of the measurement antenna.

7.3 Typical Test Setup

For radiated emissions below 30MHz



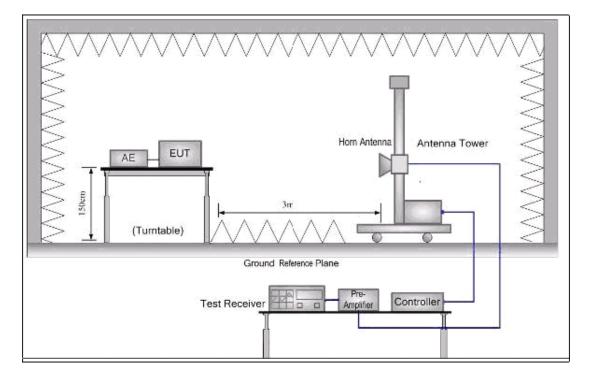
Above 10 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1m.

Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1m]) (dB); Limit line = specific limits (dBuV) + distance extrapolation factor [9.54 dB].



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For radiated emissions frequency above 1GHz



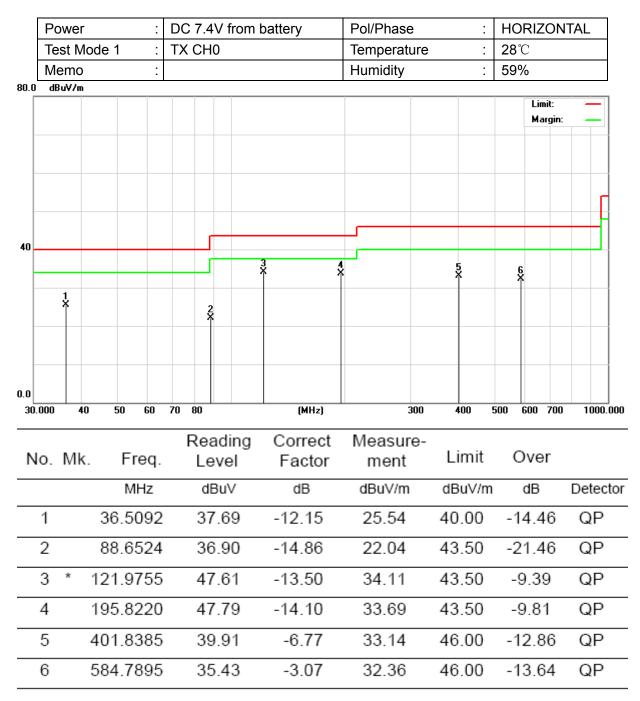
Note: For harmonic emissions test a appropriate high pass filter was inserted in the input port of AMP.



7.4 Test Result and Data (9kHz ~ 30MHz)

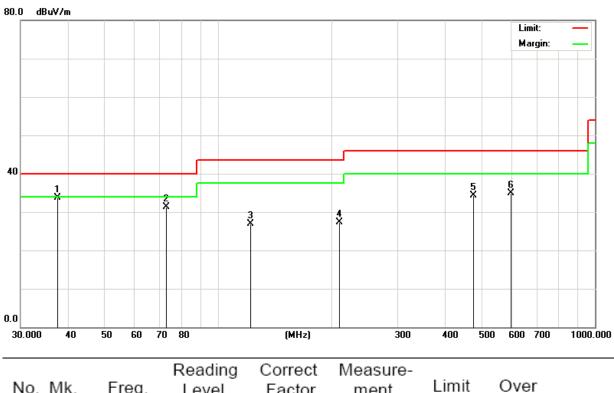
The 9kHz - 30MHz spurious emission is under limit 20dB more.

7.5 Test Result and Data (30MHz ~ 1GHz, worst emissions found)





Power	:	DC 7.4V from battery	Pol/Phase	:	VERTICAL
Test Mode 1	:	TX CH0	Temperature	••	28 ℃
Memo	:		Humidity	:	59%



No.	Mk.	Freq.	Level	Factor	ment	Limit	Over	
		MHz	dBu∨	dB	dBuV/m	dBuV/m	dB	Detector
1	*	37.6798	45.90	-12.15	33.75	40.00	-6.25	QP
2		73.1025	47.02	-15.70	31.32	40.00	-8.68	QP
3	,	121.9755	41.96	-15.04	26.92	43.50	-16.58	QP
4	2	210.0482	36.61	-9.36	27.25	43.50	-16.25	QP
5	4	473.8347	40.27	-5.91	34.36	46.00	-11.64	QP
6	Į	597.2234	37.08	-2.17	34.91	46.00	-11.09	QP

Note:

All the modulation modes were tested, the data of the worst mode are recorded in the above pages and the others modulation methods do not exceed the limits.



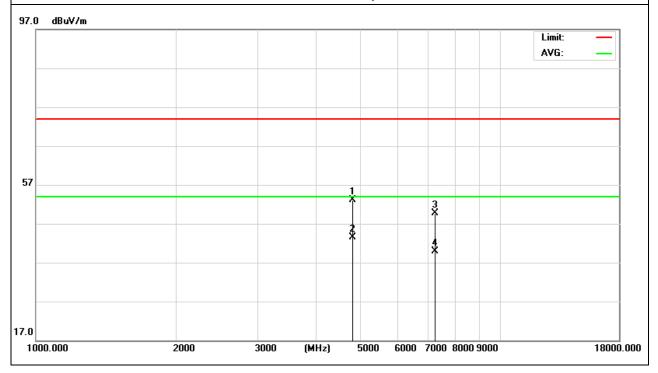
7.6 Test Result and Data (Between 1~25 GHz)

Power :	DC 7.4V from battery	Pol/Phase :	HORIZONTAL
Test Mode 1 :	TX 1Mbps CH0	Temperature :	30 °C
Memo :		Humidity :	59 %

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Turne	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type	
4804.000	48.03	5.06	53.09	74.00	-20.91	peak	
4804.000	38.41	5.06	43.47	54.00	-10.53	AVG	
7206.000	42.61	7.03	49.64	74.00	-24.36	peak	
7206.000	32.90	7.03	39.93	54.00	-14.07	AVG	

Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

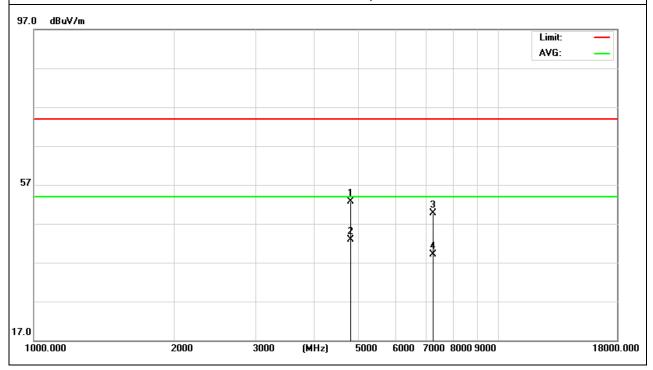




Power :	DC 7.4V from battery	Pol/Phase :	VERTICAL
Test Mode 1 :	TX 1Mbps CH0	Temperature :	30 °C
Memo :		Humidity :	59 %

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type	
4804.000	47.69	5.06	52.75	74.00	-21.25	peak	
4804.000	37.93	5.06	42.99	54.00	-11.01	AVG	
7206.000	42.69	7.03	49.72	74.00	-24.28	peak	
7206.000	32.13	7.03	39.16	54.00	-14.84	AVG	

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.



Note:

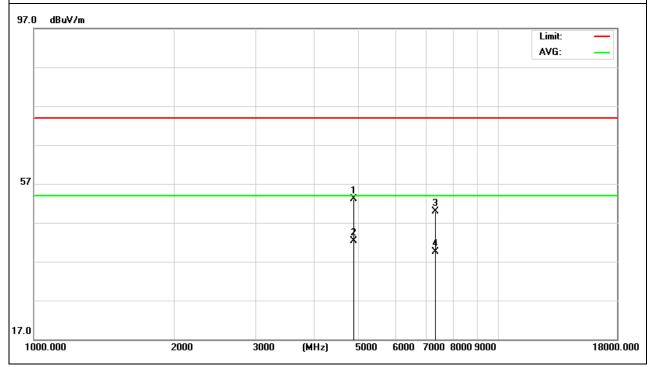
The disturbance above 18GHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.



Power :	DC 7.4V from battery	Pol/Phase :	HORIZONTAL
Test Mode 1 :	TX 1Mbps CH39	Temperature :	30 °C
Memo :		Humidity :	59 %

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type	
4882.000	48.03	5.14	53.17	74.00	-20.83	peak	
4882.000	37.06	5.14	42.20	54.00	-11.80	AVG	
7323.000	42.36	7.54	49.90	74.00	-24.10	peak	
7323.000	32.06	7.54	39.60	54.00	-14.40	AVG	

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

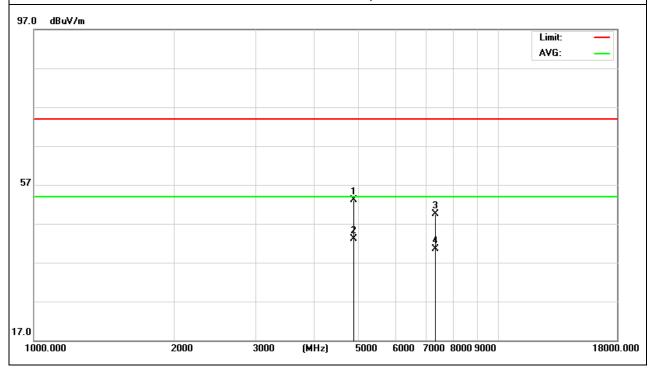




Power :	DC 7.4V from battery	Pol/Phase :	VERTICAL
Test Mode 1 :	TX 1Mbps CH39	Temperature :	30 °C
Memo :		Humidity :	59 %

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Turne
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type
4882.000	48.06	5.14	53.20	74.00	-20.80	peak
4882.000	37.99	5.14	43.13	54.00	-10.87	AVG
7323.000	42.06	7.54	49.60	74.00	-24.40	peak
7323.000	32.90	7.54	40.44	54.00	-13.56	AVG

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.



Note:

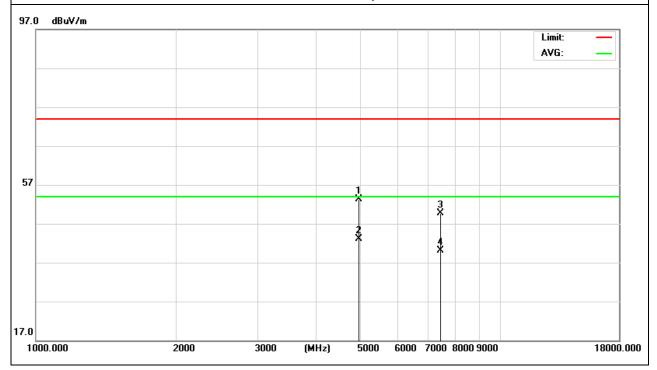
The disturbance above 18GHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.



Power :	DC 7.4V from battery	Pol/Phase :	HORIZONTAL
Test Mode 1 :	TX 1Mbps CH78	Temperature :	30 °C
Memo :		Humidity :	59 %

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type
4960.000	48.11	5.22	53.33	74.00	-20.67	peak
4960.000	37.91	5.22	43.13	54.00	-10.87	AVG
7440.000	41.69	8.06	49.75	74.00	-24.25	peak
7440.000	32.06	8.06	40.12	54.00	-13.88	AVG

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

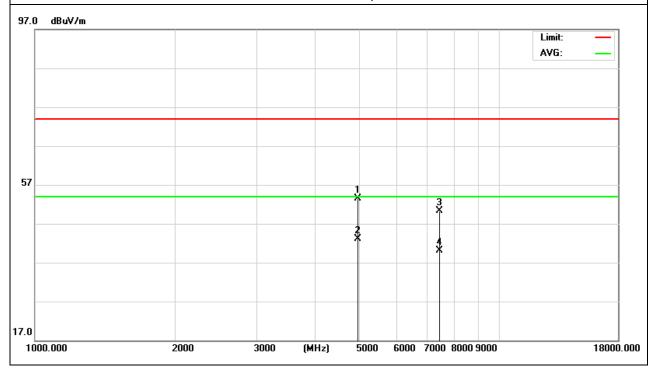




Power :	DC 7.4V from battery	Pol/Phase :	VERTICAL
Test Mode 1 :	TX 1Mbps CH78	Temperature :	30 °C
Memo :		Humidity :	59 %

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Turne
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type
4960.000	48.11	5.22	53.33	74.00	-20.67	peak
4960.000	37.91	5.22	43.13	54.00	-10.87	AVG
7440.000	41.69	8.06	49.75	74.00	-24.25	peak
7440.000	32.06	8.06	40.12	54.00	-13.88	AVG

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.



Note:

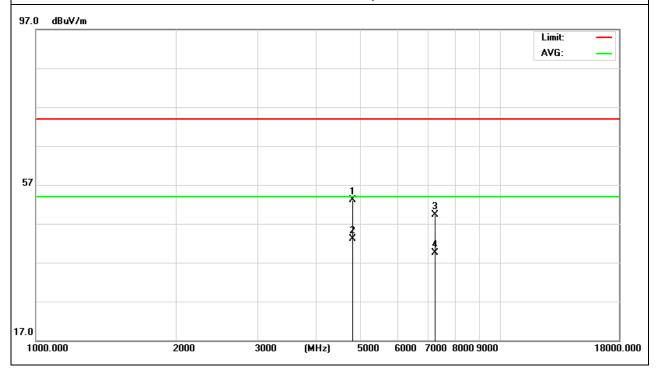
The disturbance above 18GHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.



Power :	DC 7.4V from battery	Pol/Phase :	HORIZONTAL
Test Mode 1 :	TX 3Mbps CH0	Temperature :	30 °C
Memo :		Humidity :	59 %

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type
4804.000	47.99	5.06	53.05	74.00	-20.95	peak
4804.000	37.96	5.06	43.02	54.00	-10.98	AVG
7206.000	42.33	7.03	49.36	74.00	-24.64	peak
7206.000	32.46	7.03	39.49	54.00	-14.51	AVG

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

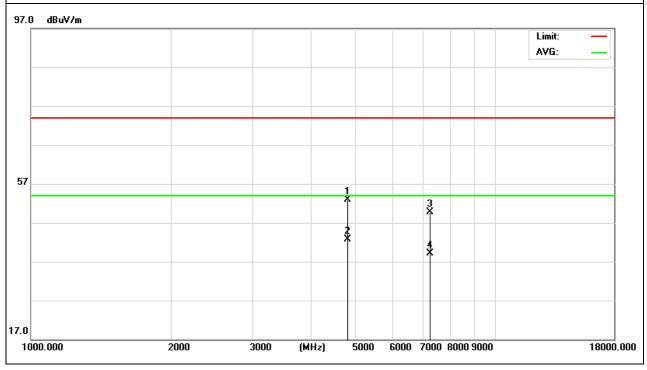




Power :	DC 7.4V from battery	Pol/Phase :	VERTICAL
Test Mode 1 :	TX 3Mbps CH0	Temperature :	30 °C
Memo :		Humidity :	59 %

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type
4804.000	47.93	5.06	52.99	74.00	-21.01	peak
4804.000	37.63	5.06	42.69	54.00	-11.31	AVG
7206.000	42.61	7.03	49.64	74.00	-24.36	peak
7206.000	32.09	7.03	39.12	54.00	-14.88	AVG

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.



Note:

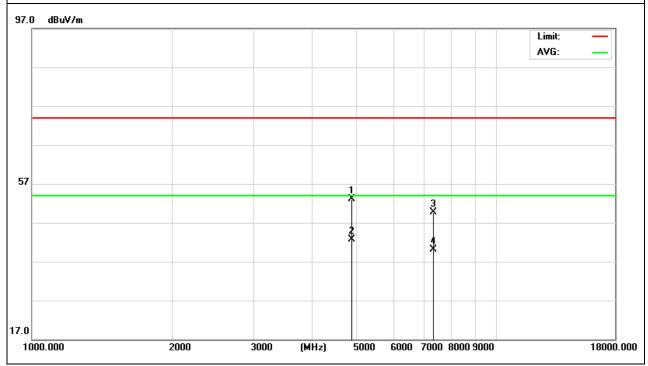
The disturbance above 18GHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.



Power :	DC 7.4V from battery	Pol/Phase :	HORIZONTAL
Test Mode 1 :	TX 3Mbps CH39	Temperature :	30 °C
Memo :		Humidity :	59 %

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type
4882.000	47.95	5.14	53.09	74.00	-20.91	peak
4882.000	37.64	5.14	42.78	54.00	-11.22	AVG
7323.000	42.16	7.54	49.70	74.00	-24.30	peak
7323.000	32.49	7.54	40.03	54.00	-13.97	AVG

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

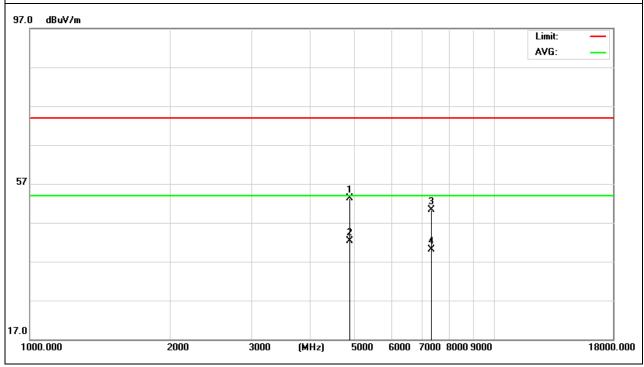




Power :	DC 7.4V from battery	Pol/Phase :	VERTICAL
Test Mode 1 :	TX 3Mbps CH39	Temperature :	30 °C
Memo :		Humidity :	59 %

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type
4882.000	48.16	5.14	53.30	74.00	-20.70	peak
4882.000	37.18	5.14	42.32	54.00	-11.68	AVG
7323.000	42.79	7.54	50.33	74.00	-23.67	peak
7323.000	32.48	7.54	40.02	54.00	-13.98	AVG

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.



Note:

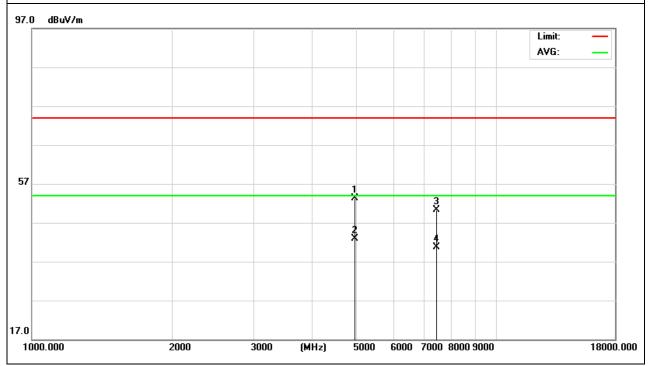
The disturbance above 18GHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.



Power :	DC 7.4V from battery	Pol/Phase :	HORIZONTAL
Test Mode 1 :	TX 3Mbps CH78	Temperature :	30 °C
Memo :		Humidity :	59 %

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type
4960.000	48.09	5.22	53.31	74.00	-20.69	peak
4960.000	37.69	5.22	42.91	54.00	-11.09	AVG
7440.000	42.16	8.06	50.22	74.00	-23.78	peak
7440.000	32.64	8.06	40.70	54.00	-13.30	AVG

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

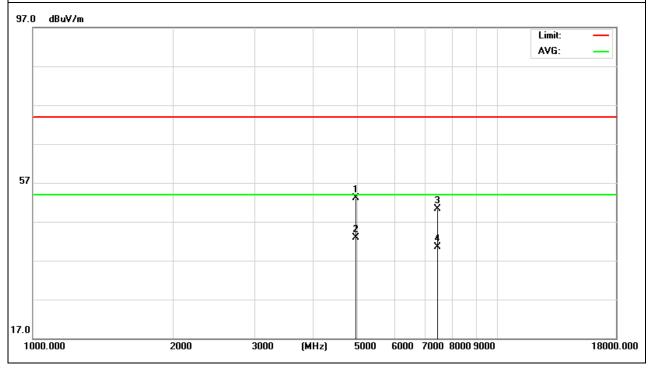




Power :	DC 7.4V from battery	Pol/Phase :	VERTICAL
Test Mode 1 :	TX 3Mbps CH78	Temperature :	30 °C
Memo :		Humidity :	59 %

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type
4960.000	47.98	5.22	53.20	74.00	-20.80	peak
4960.000	37.64	5.22	42.86	54.00	-11.14	AVG
7440.000	42.19	8.06	50.25	74.00	-23.75	peak
7440.000	32.48	8.06	40.54	54.00	-13.46	AVG

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.



Note:

1. The disturbance above 18GHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.

2. GFSK, Pi/4 DQPSK,8DPSK all have been tested, only report worse case GFSK, 8DPSK is reported.



7.7 Restrict Band Emission Measurement Data

Radiated Method

Power	DC 7.4V from battery	Pol/Phase :	H/V
Test Mode 1	GFSK / π/4 DQPSK / 8- DPSK	Temperature :	30 °C
Test Date	Sept. 7, 2018	Humidity :	59 %

GFSK

Channel 0						Fu	ndamei	ntal Frequ	ency: 24	102 MHz
Frequency	Ant-Pol	Meter Reading	Corrected Factor	Result	Remark	Lin (dBu\		Margin	Table	Ant High
(MHz)	H/V	(dBuV)	(dB)	. ,	1 tomant	Peak	Ave	(dB)	Deg.	(m)
2390	Н	42.97	-5.81	37.16	Peak	74	54	-36.84	360	1.5
	Н				Ave	74	54			
2390	V	41.83	-5.81	36.02	Peak	74	54	-37.98	181	1.5
	V				Ave	74	54			
Channel78 Fundamental Frequency: 2480 MHz										
Channel78						Fur	ndamer	ntal Frequ	ency: 24	80 MHz
	Ant-Pol	Meter	Corrected	Result		Lin	nit			Ant
Frequency	Ant-Pol H/V	Reading	Factor	Result (dBuV/m)	Remark	Lin (dBu\	nit //m)	Margin	Table	Ant High
_	Ant-Pol H/V		_	Result (dBuV/m)	Remark	Lin	nit			Ant
Frequency		Reading	Factor		Remark Peak	Lin (dBu\	nit //m)	Margin	Table	Ant High
Frequency (MHz)	H/V	Reading (dBuV)	Factor (dB)	(dBuV/m)		Lim (dBu\ Peak	nit //m) Ave	Margin (dB)	Table Deg.	Ant High (m)
Frequency (MHz)	H/V H	Reading (dBuV) 40.66	Factor (dB)	(dBuV/m)	Peak	Lin (dBu\ Peak 74	nit //m) Ave 54	Margin (dB) -38.26	Table Deg. 360	Ant High (m) 1.5



π/4 DQPSK

Channel 0						Fu	ndamer	ntal Frequ	ency: 24	02 MHz
Frequency	Ant-Pol	Meter Reading	Corrected Factor	Result	Remark	Lim (dBu\		Margin	Table	Ant High
(MHz)	H/V	(dBuV)	(dB)	(dBuV/m)	uV/m)		Ave	(dB)	Deg.	(m)
2390	Н	41.64	-5.81	35.83	Peak	74	54	-38.17	360	1.5
	Н				Ave	74	54			
2390	V	41.78	-5.81	35.97	Peak	74	54	-38.03	181	1.5
	V				Ave	74	54			
Channel78						Fur	ndamer	tal Frequ	ency: 24	80 MHz
Frequency	Ant-Pol	Meter Reading	Corrected Factor	Result	Remark	Lim (dBu\		Margin	Table	Ant High
(MHz)	H/V	(dBuV)	(dB)	(dBuV/m)	rtomant	Peak	Ave	(dB)	Deg.	(m)
2483.5	Н	41.41	-4.92	36.49	Peak	74	54	-37.51	360	1.5
	Н				Ave	74	54			
2483.5	V	42.23	-4.92	37.31	Peak	74	54	-36.69	182	1.5
	V				Ave	74	54			

8- DPSK

Channel 0						F	undam	ental Frec	Juency: 24	02 MHz
Frequency	Ant-Pol	Meter Reading	Corrected Factor	Result	Remark	Lin (dBu\		Margin	Table	Ant High
(MHz)	(MHz) H/V (dBuV) (dB) (dBuV/m)		Peak	Ave	(dB)	Deg.	(m)			
2390	Н	41.58	-5.81	35.77	Peak	74	54	-38.23	360	1.5
	Н				Ave	74	54			
2390	V	42.12	-5.81	36.31	Peak	74	54	-37.69	181	1.5
	V				Ave	74	54			
Channel78						Fu	undame	ental Freq	uency: 248	30 MHz
Frequency	Ant-Pol	Meter	Corrected	Result		Lin		Margin	Table	Ant
	H/V	Reading	Factor		Remark	(dBu\	//m)	-		High
(MHz)		(dBuV)	(dB)	(dBuV/m)		Peak	Ave	(dB)	Deg.	(m)
2483.5	Н	40.19	-4.92	35.27	Peak	74	54	-38.73	360	1.5
	Н				Ave	74	54			
2483.5	V	41.15	-4.92	36.23	Peak	74	54	-37.77	182	1.5
	V				Ave	74	54			



Note:

- 1. Emission level = Reading level + Correction factor
- 2. Correction factor : Antenna factor, Cable loss, Pre-Amp, etc.
- All emissions as described above were determining by rotating the EUT through three orthogonal axes to maximizing the emissions if the EUT belongs to hand-held or body-worn devices.
- 4. Measurements above 1000 MHz, Peak detector setting: 1 MHz RBW with 1 MHz VBW (Peak Detector).
- Measurements above 1000 MHz, Average detector setting: 1 MHz RBW with 10Hz VBW (AV Detector).
- 6. Peak detector measurement data will represent the worst case results.

Where limits are specified for both average and peak detector functions, if the peak measured value complies with the average limit, it is unnecessary to perform an average measurement.



8. Bandwidth Measurement Data

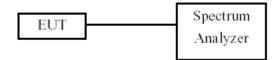
8.1 Test Limit

Please refer RSS-247 & section 15.247.

8.2 Test Procedures

- a. The transmitter output was connected to the spectrum analyzer.
- b. Spectrum Setting : RBW= 30KHz, VBW=100KHz, Sweep time = Auto.

8.3 Test Setup Layout





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8.4 Test Result and Data

Test Date: Sept. 7, 2018 Atmospheric pressure: 1000 hPa

Temperature: 26℃ Humidity: 55%

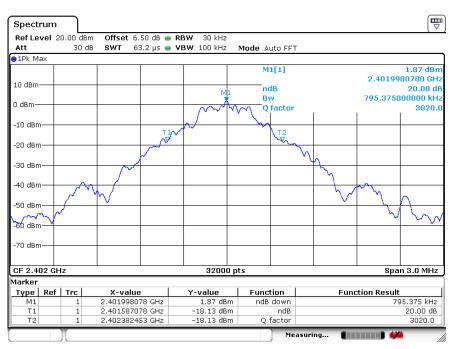
Modulation Standard	Channel	Frequency (MHz)	20dB Bandwidth (MHz)
	0	2402	0.795
GFSK	39	2441	0.794
	79	2480	0.795
	0	2402	1.42
π/4-DQPSK	39	2441	1.42
	79	2480	1.42
	0	2402	1.43
8- DPSK	39	2441	1.43
	78	2480	1.43



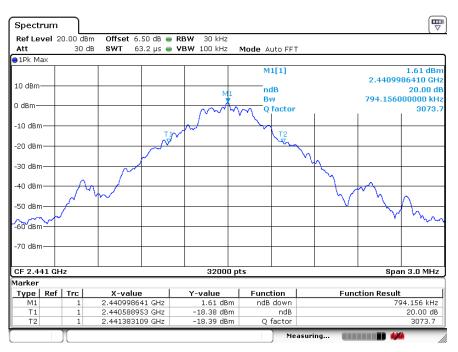
Date of Issue: Sep. 12, 2018 Report No.: WH-FCC-R18091011-1

Result plot as follows:

Modulation Standard: GFSK Channel: 0

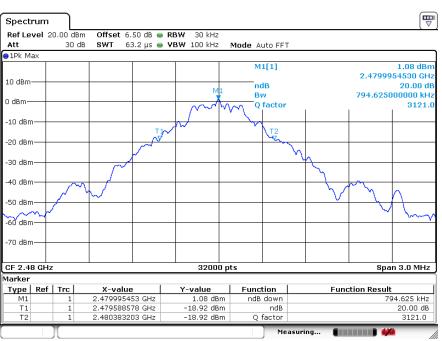


Modulation Standard: GFSK Channel: 39

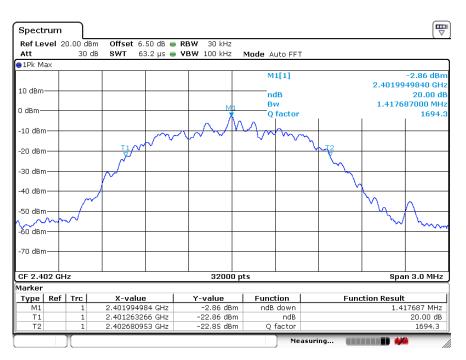




Modulation Standard: GFSK Channel: 78

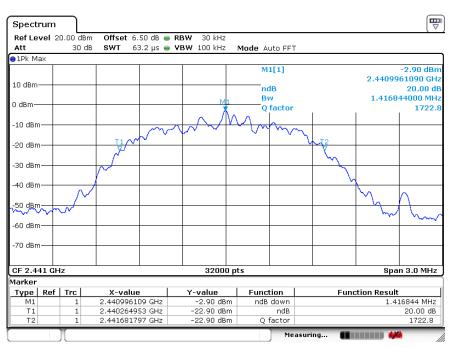


Modulation Standard: π/4-DQPSK Channel: 0

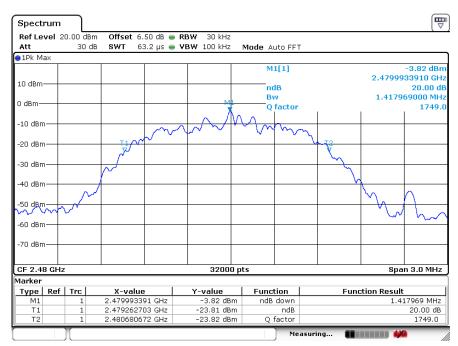




Modulation Standard: π /4-DQPSK Channel: 39



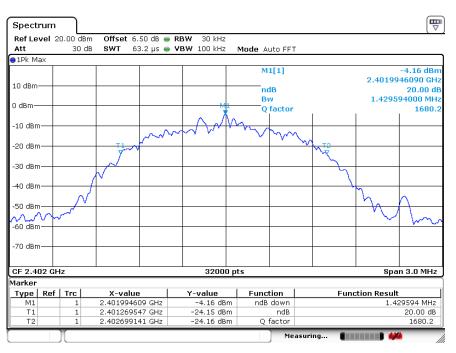
Modulation Standard: π/4-DQPSK Channel: 78



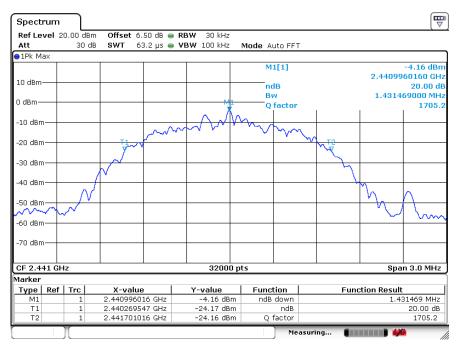


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Modulation Standard: 8DPSK Channel: 0



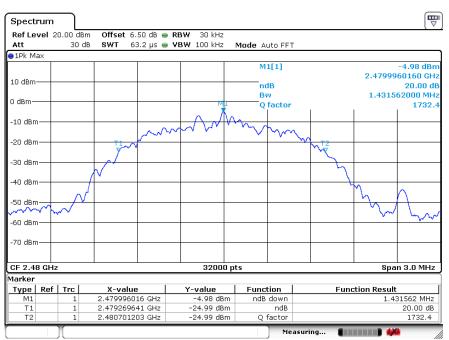
Modulation Standard: 8DPSK Channel: 39





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Modulation Standard: 8DPSK Channel: 78





9. Maximum Peak Output Power

9.1 Test Limit

The Maximum Peak Output Power Measurement is 1W or 0.125W.

9.2 Test Procedures

- a. Peak power is measured using the wideband power meter.
- b. Power is integrated over a bandwidth greater than or equal to the 99% bandwidth.
- c. The Peak Output Power was measured and recorded.

9.3 Test Setup Layout





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9.4 Test Result and Data

Test Date: Sept. 7, 2018 Atmospheric pressure: 1000hPa Temperature: 26°C Humidity: 55%

Modulation Standard	Channel	Frequency (MHz)	Peak Power Output (dBm)	Peak Power Output (mW)
	0	2402	1.90	1.55
GFSK	39	2441	2.16	1.64
	78	2480	2.71	1.87
	0	2402	0.34	1.08
π/4-DQPSK	39	2441	0.43	1.10
	78	2480	1.10	1.29
	0	2402	-1.48	0.71
8- DPSK	39	2441	-1.21	0.76
	78	2480	-0.56	0.88



10. Carrier Frequency Separation

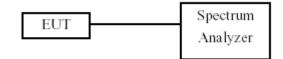
10.1 Test Limit

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

10.2 Test Procedures

- b. The transmitter output was connected to spectrum analyzer.
- c. The spectrum analyzer's resolution bandwidth were set at 100KHz RBW and 300KHz VBW as that of the fundamental frequency. Set the sweep time=auto couple.
- d. The Carrier Frequency Separation was measured and recorded.

10.3 Test Setup Layout



Note: GFSK, Pi/4 DQPSK,8DPSK all have been tested, only report worse case GFSK, 8DPSK is reported.



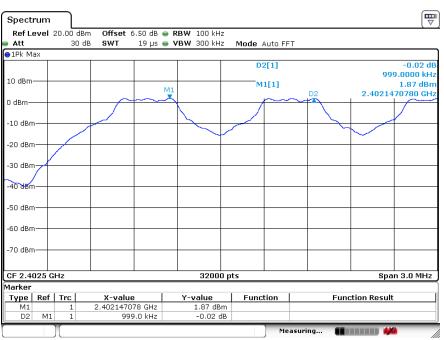
Date of Issue: Sep. 12, 2018 Report No.: WH-FCC-R18091011-1

10.4 Test Result and Data

Test Date: Sept. 7, 2018 Atmospheric pressure: 1000 hPa Temperature: 26℃ Humidity: 55%

Mode/Channel	Channel separation (KHz)	20dB Bandwidth (KHz)	Limit (KHz) > 20dB bandwidth	Conclusio n
GFSK CH0	999.9	1089	0.795	PASS
GFSK CH39	999.9	1101	0.794	PASS
GFSK CH78	999.9	1090	0.795	PASS

Modulation Standard: GFSK Channel: 0

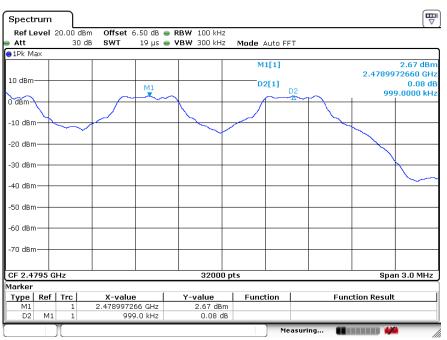




₽ Spectrum Ref Level 20.00 dBm Offset 6.50 dB 👄 RBW 100 kHz Att 19 µs 👄 **VBW** 300 kHz Mode Auto FFT 30 dB SWT 1Pk Max M1[1] 2.06 dBn 2.4411486720 GHz 10 dBm D2[1] -0.03 dB M1 999.0000 kHz 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm Span 3.0 MHz CF 2.4415 GHz 32000 pts Marker Type | Ref | Trc | X-value 2.441148672 GHz 999.0 kHz Function Function Result Y-value 2.06 dBm -0.03 dB M1 D2 1 M1 Measuring... •••••

Modulation Standard: GFSK Channel: 39

Modulation Standard: GFSK Channel: 78





Mode/Channel	Channel separation (KHz)	20dB Bandwidth (KHz)	Limit (KHz) > 2/3 of 20dB bandwidth	Conclusion
8- DPSK CH0	999.9	1356	0.953	PASS
8- DPSK CH39	999.9	1358	0.953	PASS
8- DPSK CH78	999.9	1356	0.953	PASS

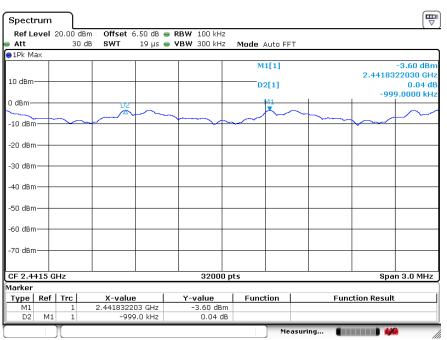
Modulation Standard: 8- DPSK Channel: 0

Spectrum					
Ref Level 20.00 dBr	m Offset 6.50 dB 👄	RBW 100 kHz			(*
Att 30 d		VBW 300 kHz	Mode Auto FFT		
●1Pk Max					
10 dBm			D2[1] M1[1]		-0.02 dB 999.0000 kHz -3.70 dBm
0 dBm	M1			2	2.4019971720 GHz
-10 dBm			~~~	~~~~	\sim
-20 dBm					
-30 dBm					
-50 dBm					
-60 dBm					
-70 dBm					
CF 2.4025 GHz		32000 pt	· c		Span 3.0 MHz
Marker		32000 pt	.3		opan 0.0 MHz
Type Ref Trc	X-value	Y-value	Function	Eun	ction Result
M1 1 D2 M1 1	2.401997172 GHz 999.0 kHz	-3.70 dBm -0.02 dB			
	I		Mea	suring 🚺	



Date of Issue: Sep. 12, 2018 Report No.: WH-FCC-R18091011-1

Modulation Standard: 8- DPSK Channel: 39



Modulation Standard: 8- DPSK Channel: 78

Spectru	m											
Ref Lev	el 20.00) dBm	Offset (5.50 dB 🔵	RBW	100 kHz						
Att		30 dB	SWT	19 µs (• vbw	300 kHz	Mode .	Auto FFT				
∋1Pk Max												
							D	2[1]				-0.03 dB
10 dBm-											99	99.0000 kHz
10 ubiii—							M	1[1]				-2.95 dBm
0 dBm			M1					h	1		2.4788	259840 GHz
			<u> </u>	\sim								
-10 dBm-			·			\sim	~~~	-		~~~	\sim	
-10 abiii												
-20 dBm—											<u> </u>	\mathbf{h}
20 00111												
-30 dBm—												
00 00.00												
-40 dBm—	_											
-50 dBm—	_											
-60 dBm—	_											
-70 dBm—	_											
CF 2.479	5 0113					32000	nte				80	an 3.0 MHz
Varker	J GHZ					32000	prs				sp	an 3.0 MHz
	ef Trc		X-value	. 1	v	value	Func	tion I		Euro	tion Resu	•
Type R M1		L	2.4788259			value -2.95 dBm		uun		runc	cion kesu	IL
		L		9.0 kHz		-0.03 dB						
	1 11											
								Meas	uring			//



11. Number Of Hopping Channel

11.1 Test Limit

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels

11.2 Test Procedure

- a. The transmitter output was connected to the spectrum analyzer via a low lose cable.
- The transmitter output was coupled to a spectrum analyzer via a antenna. The number of hopping channel was measured by spectrum analyzer with 100kHz RBW and 300KHz VBW.
- c. The number of hopping channel was measured and recorded.

11.3 Test Setup Layout



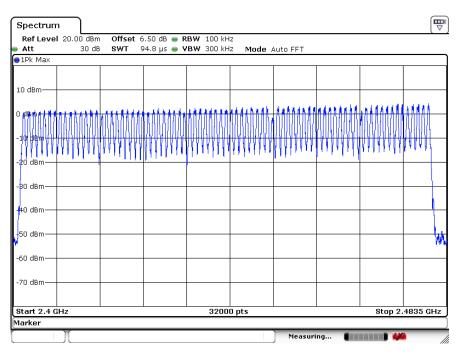


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11.4 Test Result and Data

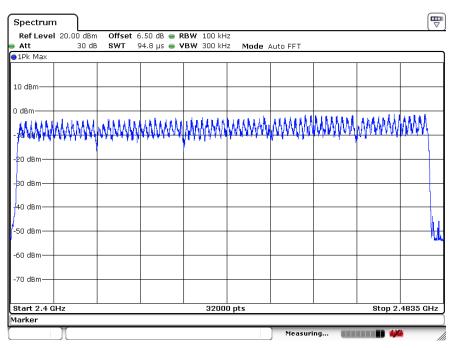
Original test data for hopping channel number

GFSK





8- DPSK





12. Dwell Time

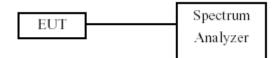
12.1 Test Limit

Please refer RSS-247 & section15.247

12.2 Test Procedure

- d. The transmitter output was connected to the spectrum analyzer via a low lose cable.
- e. The transmitter output was coupled to a spectrum analyzer via a antenna. Set center frequency of spectrum analyzer = operating frequency
- f. Set the spectrum analyzer as RBW, VBW=1MHz, Span = 0Hz, Sweep = auto.
- g. Repeat above procedures until all frequency measured were complete

12.3 Test Setup Layout



Note:GFSK, Pi/4 DQPSK,8DPSK all have been tested, only report worse case GFSK, 8DPSK is reported.



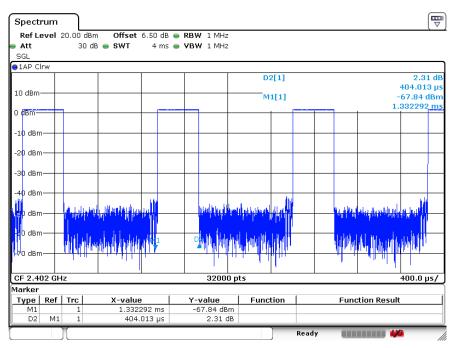
12.4 Test Result and Data

Original test data see the following page.

Mode	Data Packet	Frequency (MHz)	Pulse Duration (ms)	Dwell Time (s)	Limit (s)	Conclusion				
	DH1	2402	0.404	0.1293	<0.4	PASS				
GFSK	DH3	2402	1.666	0.2666	<0.4	PASS				
	DH5	2402	2.914	0.3108	<0.4	PASS				
	DH1	2402	0.410	0.1312	<0.4	PASS				
8- DPSK	DH3	2402	1.672	0.2675	<0.4	PASS				
	DH5	2402	2.921	0.3116	<0.4	PASS				
Note: 1 A pe	riod time = 0	0.4 (s) * 79 = 3	31.6(s)							
2 DH1	2 DH1 time slot = Pulse Duration * (1600/(1*79)) * A period									
time I	time DH3 time slot = Pulse Duration * (1600/(3*79)) * A									
perio	d time DH5 t	ime slot = Pul	lse Duration	* (1600/(5*7	9))					
* A pe	eriod time									

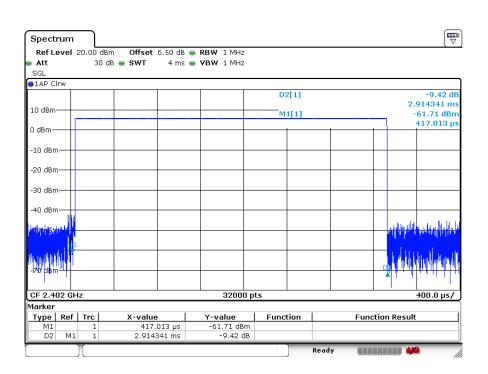


GFSK DH1/DH3/DH5

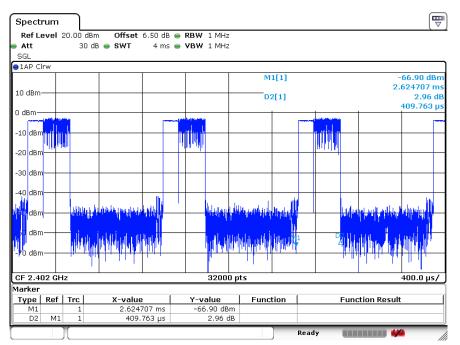


Spectrum									
Ref Level			50 dB 👄 F	RBW 1 MHz					
Att	30	dB 👄 SWT	4 ms 😑 🍾	BW 1 MHz					
SGL									
1AP Clrw									
					M	1[1]			56.65 dBm
10 dBm								1.	081659 ms
					D	2[1]	-		-4.10 dP
D dBm								1.	003332 115
-10 dBm							++		
-20 dBm									
-30 dBm									
-40 dBm									
-+0 ubiii		tu						1	
-50 dB	l i Lundi	panel to by a table					I I I BARNER MILLING	dis not dimente	
1							out d'anna an	i n sr h	
-60 dBr <mark>aha</mark> a	de la ca	a ha a h						atialicia 🗄	
al deal	alat da						all the latter		
-70 dBm 🕂	t hall						- 11 14 to 01 to 10	<u> 111 - 114 - 114 - 114 - 114 - 114 - 114 - 114 - 114 - 114 - 114 - 114 - 114 - 114 - 114 - 114 - 114 - 114 - 114</u>	
n									
CF 2.402 GH	lz			32000	ots		I	1	400.0 µs/
1arker									
Type Ref	Trc	X-value		Y-value	Func	tion	Fun	ction Result	
M1	1	1.081659		-56.65 dBm					
D2 M1	1	1.665552	ms	-4.10 dB					
	1					R	eady 👘	ana ana ang 👹	



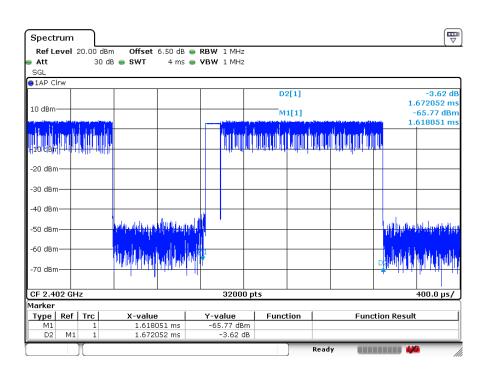


8- DPSK DH1/DH3/DH5





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Spect	rum											
	evel :	20.00 d			🖷 RBW 1 MHz							
🗎 Att		30	dB 👄 SWT	4 ms	🔵 VBW 1 MHz							
SGL	lass s											
OIAP C	irw						M 1	[1]				-64.71 dBm
							1011	[+]				391.262 µs
10 dBm					-		D2	[1]				-2.97 dB
0 dBm-										and an an and a	2	.921216 ms
o ubiii-		that is	n an dia amin'ny amin'ny fi	n shatka h	t anaithn ar bhailte	Datado	to de H	diff of the	a ha mak	nduk i danat	10	
-10 dBn												
			1		- 11			10.1			1	
-20 dBn												
-30 dBn		_									_	
-40 dBn												
-40 000	11											
											իլիացիի	
	" I.											The transform
all in	∎ 1 ₩ -		-								- i laat	ليتم الملطة
WI PIYPI,											D a ll, i	
-70 dBh	אין א										41.1	<u> II. I. I. I. I.</u>
	11											
CF 2.4	02 GH	z			3200) pts						400.0 µs/
Marker												
Type M1	Ref		X-value		<u>Y-value</u> -64.71 dB		Funct	ion		Func	tion Resul	t
M1 D2	M1	1	2.9212	262 µs	-64.71 dB -2.97 d							
02		1	2.5212	10 115	2.57 0			_		(an and 100		-
		Л							Ready			M



13. Band Edges Measurement

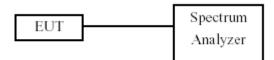
13.1 Test Limit

Below –20dB of the highest emission level of operating band (In 100 kHz Resolution Bandwidth)

13.2 Test Procedure

- h. The transmitter output was connected to the spectrum analyzer via a low lose cable.
- i. Set RBW of spectrum analyzer to 100 KHz and VBW of spectrum analyzer to 300 KHz with convenient frequency span including 100 KHz bandwidth from band edge.
- j. Peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20dB relative to the maximum measured in-band peak PSD level.
- k. The band edges was measured and recorded.

13.3 Test Setup Layout



Note:GFSK, Pi/4 DQPSK,8DPSK all have been tested, only report worse case GFSK, 8DPSK is reported.



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13.4 Test Result and Data

Test Date:Sept. 7, 2018 Atmospheric pressure: 1000hPa Temperature: 26°C Humidity: 55%

Modulation Standard: GFSK

Spectrum						
Ref Level Att	20.00 dBr 30 d		 RBW 100 kHz VBW 300 kHz 	Mode Auto F	FT	
)1Pk Max						
				M1[1]		1.63 dBm
10 dBm				MOLT		2.40214840 GHz -52.25 dBm
				M2[1]		2.4000000 GHz
D dBm						2.100000000
-10 dBm						
	10.07					
-20 dBm	1 -18.370	J aBW				
-30 dBm						
-40 dBm						
-40 uBm						
-50 dBm						Ma L
when we we we we we we	بناؤر إباكمنعمهم	a sustilized and the states	المرامع حجراحتا الإسراما المالية	والماحية المرجم والمرجمة	Mana manuful minimum	man M
-60 dBm	•	•			*	
-70 dBm						
Start 2.31 G	Hz		32000 pt	5		Stop 2.41 GHz
1arker						
Type Ref	Trc	X-value	Y-value	Function	Function	Result
M1	1	2.4021484 GHz	1.63 dBm			
M2	1	2.4 GHz	-52.25 dBm			

Spectru	um											
Ref Lev Att	vel 2				 RBW 100 VBW 300 		Mode	Auto F	FT			
⊖1Pk Ma>	<											
							м	1[1]				2.28 dBm
10 dBm—								2[1]				99840 GHz
	M1						INI.	2[1]				54.02 UBIT
0 dBm—	-i-										+	
-10 dBm-						_						
		-17.7	20 dBm									
-20 dBm-			20 0.0.11			+						
-30 dBm-	Ш											
-30 ubiii-												
-40 dBm-	11											
	III.											
-50 dBm-	44	42	_			_						
in the second second second	1	" Concluding	www.	filled and a	the last states and a state of the states	the same	evel the grave	or the set	A section of a	had the state of the second	the states and a states	and the state of the second
-60 dBm-			_			_						
-70 dBm-						-						
Start 2.4	17 GH	Ηz			320	00 pt	s				Stop	2.57 GHz
larker												
	Ref	Trc	X-valu		Y-value		Func	tion		Fund	ction Result	
M1 M2		1	2.47999	184 GHZ 135 GHZ	2.28 (
1/12		-	2,40		54.02 (1			74
	IJ	L						Me	asuring			



Modulation Standard: 8- DPSK

Spectrur	n					
Ref Leve Att	l 20.00 dBr 30 d		8 👄 RBW 100 kHz 5 👄 VBW 300 kHz			
ALL 1Pk Max	30 u	B 9WI 113.7 h	5 - YDYY 300 KH2	Mode Auto FFT		
TEK MAY				M1[1]		-3.97 dBm
					2	.40183590 GHz
10 dBm				M2[1]		-46.87 dBm
o 10					2	.4000000 GHz
0 dBm						T
-10 dBm						A
-10 ubiii-						
-20 dBm						
-20 ubiii-	D1 -23.970) dBm				
-30 dBm						
-50 4011						
-40 dBm						
ie dem						M⊉ \
-50 dBm						¥
here the second second	anerite sta	and any discount and the party	where the stand and the state	تين البجانين البرانية الماجار بال	ومعادية والمعادية والمعادية والمعادية والمعادة	how white here and
-60 dBm	· ·			· · ·		
-70 dBm—						
Start 2.31	GHz		32000 p	hs		Stop 2.41 GHz
Marker						
Type Re	f	X-value	Y-value	Function	Function R	esult
M1	1	2.4018359 GHz	-3.97 dBm			
M2	1	2.4 GHz	-46.87 dBm			
)(Measu	ıring	

Spectrum										
Ref Level :	20.00 dBr 30 d			RBW 100 k						
Att 1Pk Max	3U a	3 SWT 1	.13.7 µs	😑 VBW 300 k	HZ Mode	Auto F	·FI			
10 dBm						1[1] 2[1]			2.479	-3.04 dBm 82970 GHz 55.23 dBm
0 dBm1										50000 GHz
-10 dBm										
-20 dBm	1 -23.040	udBm								
-30 dBm										
-40 dBm	u I									
-50 dBm	Wine work	where we are a set of the set of	-	ender and set of the date	and the state of the	MELLINA	4mainte	hunglingstation	want attended to the	a the state of the
-60 dBm										
-70 dBm										
Start 2.47 G	Hz			3200	0 pts				Stop	2.57 GHz
Marker										
Type Ref		X-value		Y-value	Func	tion		Fund	tion Result	
M1 M2	1	2.479829 2.483	97 GHz 35 GHz	-3.04 dE -55.23 dE						
)[Me	asuring.			



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Hopping

Modulation Standard: GFSK

Spectrum	<u> </u>								
Ref Level	20.00 dBm	Offset	6.50 dB (• RBW 100 kH	łz				(
Att	30 dB	SWT 1	13.7 µs (● VBW 300 kH	lz Mode	Auto FF	т		
∋1Pk Max									
					M	1[1]			0.95 dBm
10 dBm								2	2.40785470 GHz
					M	2[1]			-54.24 dBm
0 dBm							1	2	2.40000000 CHz
U UBIII									147804W
-10 dBm									hulainn
-10 0011									
-20 dBm	D1 -18.050	dBm							
20 0011									
-30 dBm									
oo abiii									
-40 dBm									
									1
-50 dBm			la di a						. Ma
-	ationshipsipal proverty	hills all he he high a string	North Street Life	hilling	phyladipulation	v Lipi, that	ndeter glight and the	millioldy til	h ha han han han han han han han han han
-60 dBm									
-70 dBm									
Start 2.31	GHz			32000) pts				Stop 2.41 GHz
Aarker									
Type Ref	Trc	X-value	.	Y-value	Func	tion	F	unction R	esult
M1	1	2.40785		0.95 dBi					
M2	1	2	.4 GHz	-54.24 dB	n				
)(Meas	suring		

Spectrum										
Ref Level				RBW 100 k						· · · ·
Att 1Pk Max	30 d	B SWT 1	13.7 µs i	9 VBW 300 k	Hz Mode	Auto F	FI			
						1[1] 2[1]			-	4.05 dBr 15160 GH 52.86 dBr 50000 GH
100 dBm	1 -15.950) dBm								
-30 dBm										
-50 dBm			بالأراحي أربسا	Manuhana	الهادا والمارية	[.l.l.mineli	wether whether	without	Wal Man	allinensiyanalla
-60 dBm										
Start 2.47 G 1arker	Hz			3200	0 pts				Stop	2.57 GHz
Type Ref	Trc	X-value	1	Y-value	Func	tion		Funct	ion Result	
M1 M2	1	2.47315:		4.05 dB -52.86 dB	m			. unct	ion Result	
1912		2,403	oo anz	-32.80 UB		Me	asuring			



Modulation Standard: 8- DPSK

Spectrum									
Ref Level	20.00 dBn 30 dB			RBW 100 kH VBW 300 kH		Auto FFT			
1Pk Max	50 41	5 641 11	5.1 p5 🕳	1011 300 KH	2 moue	Auto FFT			
10 dBm						1[1] 2[1]		2.408	-4.35 dBm 83590 GHz 55.23 dBm
					141.	2[1]			00000 GHz
0 dBm									M1
-10 dBm									MMM
-20 dBm	01 -24.350	l dBm							l li cui
-30 dBm									
-40 dBm									
-50 dBm	lantha mu	Handershunder	and the second second		u dia 1.186 meneral di	malian a	ويعجون وسرقته ألقذه وقتر	touris, dataitikada	4
-60 dBm	******* \		61 M		And a start of the				,
-70 dBm									
Start 2.31 G	GHz			32000	pts			Stop	2.41 GHz
Marker	1						-		
Type Ref M1	1 Trc	2.4088359	GHz	<u>Y-value</u> -4.35 dBn	Funct	ion	Fun	ction Result	
M2	1		GHz	-55.23 dBn					
)[Measu	ring		

Spectrum											
Ref Level	20.00 dBi 30 d			RBW 100 NBW 200			1				
■ Att ● 1Pk Max	30 u	5 3WI 1	.15.7 µS	VBW 300	КПИ	Mode	AULU F	FI			
10 dBm							1[1] 2[1]				-2.17 dBm 82970 GHz
							2[1]				50000 GHz
0 dBm								-			-
AD GEN TH					-						
-20 dBm											
-20 0000-0	01 -22.17) dBm									
-30 dBm											
-40 dBm											
-50 dBm	When have	and any community of the state	والبدرية والمارية	nun anti-	n polenni	ini, Ryana di Ja	d ag ag dag personal	wal		and themas	an and a state
-60 dBm			•								
-70 dBm				_							
Start 2.47 (GHz	·		320	00 pts					Stop	2.57 GHz
larker											
	Trc	X-value		Y-value		Func	tion		Fund	ction Result	
M1 M2	1	2.47582	97 GHz 35 GHz	-2.17 c -54.61 c							
)[) Me	asurin	g 🔳		4



14. Restricted Bands of Operation

Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.09000 – 0.11000	16.42000 – 16.42300	399.9 - 410.0	4.500 – 5.150
0.49500 - 0.505**	16.69475 – 16.69525	608.0 - 614.0	5.350 - 5.460
2.17350 – 2.19050	16.80425 – 16.80475	960.0 – 1240.0	7.250 – 7.750
4.12500 - 4.12800	25.50000 - 25.67000	1300.0 – 1427.0	8.025 - 8.500
4.17725 – 4.17775	37.50000 - 38.25000	1435.0 – 1626.5	9.000 - 9.200
4.20725 – 4.20775	73.00000 - 74.60000	1645.5 – 1646.5	9.300 - 9.500
6.21500 - 6.21800	74.80000 – 75.20000	1660.0 – 1710.0	10.600 – 12.700
6.26775 – 6.26825	108.00000 - 121.94000	1718.8 – 1722.2	13.250 – 13.400
6.31175 – 6.31225	123.00000 - 138.00000	2200.0 - 2300.0	14.470 – 14.500
8.29100 - 8.29400	149.90000 - 150.05000	2310.0 – 2390.0	15.350 – 16.200
8.36200 - 8.36600	156.52475 – 156.52525	2483.5 – 2500.0	17.700 – 21.400
8.37625 - 8.38675	156.70000 - 156.90000	2655.0 – 2900.0	22.010 – 23.120
8.41425 – 8.41475	162.01250 - 167.17000	3260.0 - 3267.0	23.600 - 24.000
12.29000 - 12.29300	167.72000 - 173.20000	3332.0 - 3339.0	31.200 – 31.800
12.51975 – 12.52025	240.00000 - 285.00000	3345.8 – 3358.0	36.430 - 36.500
12.57675 – 12.57725	322.00000 - 335.40000	3600.0 - 4400.0	Above 38.6
13.36000 – 13.41000			

**: Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

14.1 Labeling Requirement

The device shall bear the following statement in a conspicuous location on the device: This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.