



FCC RADIO TEST REPORT

Applicant : Sperry Corporation

Address : 8F-7, No. 369, Fuxing N. Rd., Songshan Dist.,
Taipei City 105, Taiwan (R.O.C.)

Equipment : Dual Catchmon

Model No. : DC-1218

Trade Name : MEGACOM

FCC ID : 2ASCN-DC1218

I HEREBY CERTIFY THAT :

The sample was received on Jan. 25, 2019 and the testing was completed on Mar. 06, 2019 at CerpPASS Technology Corp. The test result refers exclusively to the test presented test model / sample. Without written approval of CerpPASS Technology Corp., the test report shall not be reproduced except in full.

Approved by:

Mark Liao / Supervisor

Tested by:

Spree Yeh / Engineer

Laboratory Accreditation:

CerpPASS Technology Corporation Test Laboratory





Contents

1. Summary of Test Procedure and Test Results.....	4
1.1 Applicable Standards	4
2. Test Configuration of Equipment under Test.....	5
2.1 Feature of Equipment under Test.....	5
2.2 Carrier Frequency of Channels.....	5
2.3 Test Mode and Test Software	6
2.4 Description of Test System.....	6
2.5 General Information of Test.....	7
2.6 Measurement Uncertainty	7
3. Test Equipment and Ancillaries Used for Tests	8
4. Test of AC Power Line Conducted Emission	9
5. Test of Spurious Emission (Radiated)	10
5.1 Test Limit	10
5.2 Test Procedures	10
5.3 Typical Test Setup	11
5.4 Test Result and Data (9kHz ~ 30MHz).....	12
5.5 Test Result and Data (30MHz ~ 1GHz).....	12
5.6 Test Result and Data (1GHz ~ 25GHz).....	14
5.7 Restricted Bands of Operation	16
5.8 Test Photographs (30MHz ~ 1GHz)	17
5.9 Test Photographs (1GHz ~ 25GHz)	18



History of this test report

Report No.	Issue Date	Description
TEFU1901254	Mar. 13, 2019	Original



1. Summary of Test Procedure and Test Results

1.1 Applicable Standards

ANSI C63.4:2014

ANSI C63.10:2013

FCC Rule	Description of Test	Result
15.203	CO-LOCATION	PASS



2. Test Configuration of Equipment under Test

2.1 Feature of Equipment under Test

Operation Frequency	2402MHz~2483.5MHz
Channel Spacing	2 MHz
Modulation Type	GFSK
Number of Channel	40
Power rating	DC 3V, AAA batteries*2
Data Rate	GFSK: 1Mbps
Antenna Type	ANT A / B: PCB Antenna
Antenna Gain	ANT A / B: -6.72dBi

Note:

For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2.2 Carrier Frequency of Channels

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
*00	2402	14	2430	28	2458
01	2404	15	2432	29	2460
02	2406	16	2434	30	2462
03	2408	17	2436	31	2464
04	2410	18	2438	32	2466
05	2412	*19	2440	33	2468
06	2414	20	2442	34	2470
07	2416	21	2444	35	2472
08	2418	22	2446	36	2474
09	2420	23	2448	37	2476
10	2422	24	2450	38	2478
11	2424	25	2452	*39	2480
12	2426	26	2454	--	--
13	2428	27	2456	--	--



2.3 Test Mode and Test Software

- a. During testing, the interface cables and equipment positions were varied according to ANSI C63.4.
- b. An executive program was executed to transmit and receive data via Bluetooth.
- c. The following test modes were performed for the test:

Test Mode	Operating Description
1	GFSK (1Mbps), ANT A: CH19+ANT B: CH00

2.4 Description of Test System

The EUT was tested alone. No support devices are needed for testing.



2.5 General Information of Test

Test Site	CerpPASS Technology Corporation Test Laboratory Address: No.10, Ln. 2, Lianfu St., Luzhu Dist., Taoyuan City 33848, Taiwan (R.O.C.) Tel:+886-3-3226-888 Fax:+886-3-3226-881 Address: No.68-1, Shihbachongsi, Shihding Township, New Taipei City 223, Taiwan, R.O.C. Tel: +886-2-2663-8582	
	FCC	TW1079, TW1061, TW1439
	IC	4934E-1, 4934E-2
	VCCI	T-2205 for Telecommunication test C-4663 for Conducted emission test R-4399, R-4218 for Radiated emission test G-10812, G-10813 for radiated disturbance above 1GHz
Frequency Range Investigated:	Conducted: from 150kHz to 30 MHz Radiation: from 30 MHz to 25,000MHz	
Test Distance:	The test distance of radiated emission from antenna to EUT is 3 M.	

2.6 Measurement Uncertainty

Measurement Item	Uncertainty
Radiated Spurious Emission(9KHz~30MHz)	$\pm 5.007\text{dB}$
Radiated Spurious Emission(30MHz~1GHz)	$\pm 5.157\text{dB}$
Radiated Spurious Emission(1GHz~18GHz)	$\pm 6.383\text{dB}$
Radiated Spurious Emission(18GHz~40GHz)	$\pm 6.648\text{dB}$
Conducted Spurious Emission	$\pm 1.253\text{dB}$
6dB Bandwidth	$\pm 6.89\%$
Power Spectral Density	$\pm 0.630\text{dB}$
26 dB Occupied Bandwidth	$\pm 6.10\%$
Frequency Stability	$\pm 375\text{KHz}$
Channel Frequencies Separation	$\pm 6.10\%$
20dB Bandwidth	$\pm 6.12\%$
Dwell Time	$\pm 1.34\%$
Peak Output Power(Conducted Power Meter)	$\pm 0.86\text{dB}$
Temperature	$\pm 1.2^\circ\text{C}$
Humidity	$\pm 2.7\%$
Channel Move Time	$\pm 4.53\%$
Channel Closing Transmission Time	$\pm 6.61\%$
Threshold	$\pm 0.631\text{dB}$
Non occupancy period	$\pm 1.17\%$



3. Test Equipment and Ancillaries Used for Tests

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
Bilog Antenna	Schwarzbeck	VULB9168	275	2018/09/17	2019/09/16
Active Loop Antenna	EMCO	6507	40855	2018/05/22	2019/05/21
Horn Antenna	EMCO	3115	31589	2018/04/02	2019/04/01
Horn Antenna	EMCO	3116	31974	2018/09/07	2019/09/06
EMI Receiver	ROHDE & SCHWARZ	ESCI 3	101423	2018/06/11	2019/06/10
Spectrum Analyzer	ROHDE & SCHWARZ	FSP40	100047	2018/03/20	2019/03/19
Preamplifier	EM Electronics corp.	EM330	60659	2018/03/20	2019/03/19
Preamplifier	EMC INSTRUMENTS	EMC051845SE	980333	2018/09/18	2019/09/17
BLUETOOTH TESTER	ROHDE & SCHWARZ	CBT	101133	2018/04/02	2019/04/01
Cable-3in1-(30M-1G)	HARBOUR INDUSTRIES	LL142	CCE1315	2018/04/20	2019/04/19
Cable-0.5m-(1G-40G)	Rapidtek	40GHZ 50CM	38MS-38MS50314	2018/03/27	2019/03/26
Cable-3m-(1G-40G)	Rapidtek	40GHZ 300CM	38MS-38MS300314	2018/03/27	2019/03/26
Cable-8m-(1G-40G)	Rapidtek	40GHZ 800CM	38MS-38MS800314	2018/03/27	2019/03/26
E3	AUDIX	v8.2014-8-6	RK-000529	NA	NA
Spectrum Analyzer	ROHDE & SCHWARZ	FSP40	100219	2018/07/03	2019/07/02
BLUETOOTH TESTER	ROHDE & SCHWARZ	CBT	101133	2018/04/02	2019/04/01
Attenuator	KEYSIGHT	8491B	MY39250705	2018/09/04	2019/09/03
TEMP & HUMI CHAMBER	T-MACHINE	TMJ-9712	T-12-040111	2018/08/30	2019/08/29
Power Sensor	Anritsu	MA2411B	1207295	2018/03/23	2019/03/22



4. Test of AC Power Line Conducted Emission

The power supply is DC source, so this item doesn't require testing.



5. Test of Spurious Emission (Radiated)

5.1 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

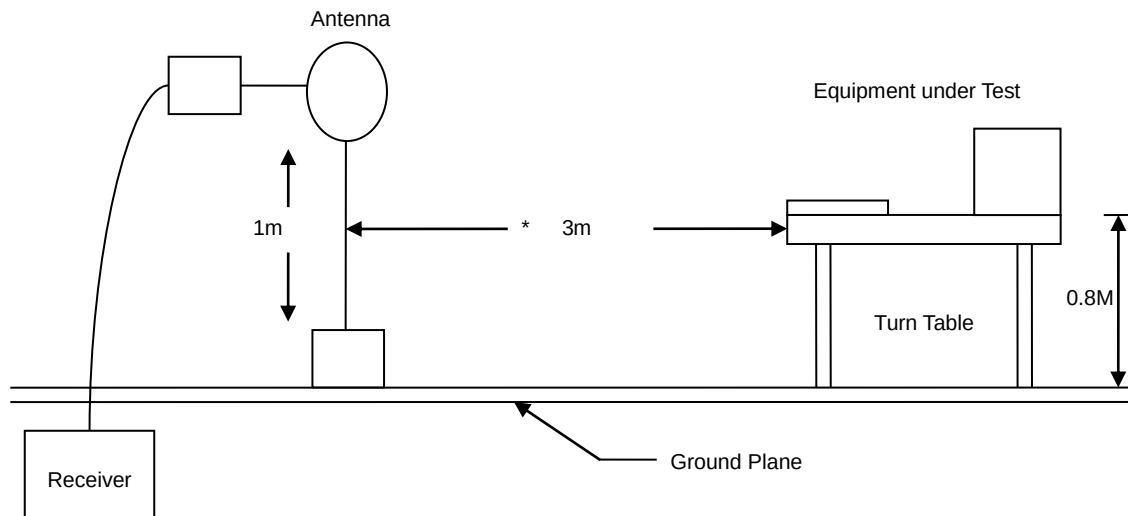
5.2 Test Procedures

- The EUT was placed on a rotatable table top 0.8 meter above ground.
- The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- The table was rotated 360 degrees to determine the position of the highest radiation.
- 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.
- 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.
- Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
- 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.
- 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.
- "Cone of radiation" has been considered to be 3dB bandwidth of the measurement antenna.

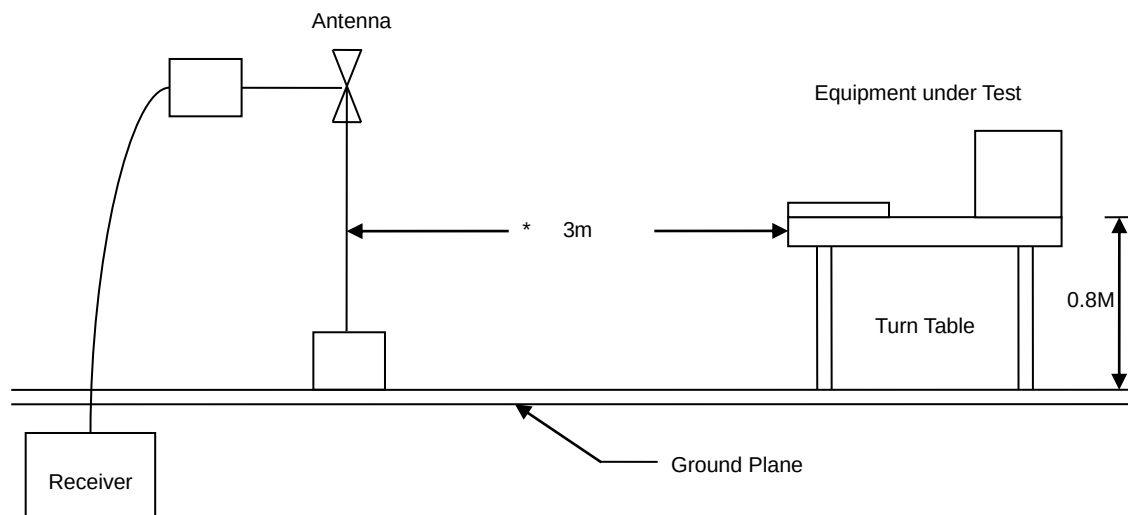


5.3 Typical Test Setup

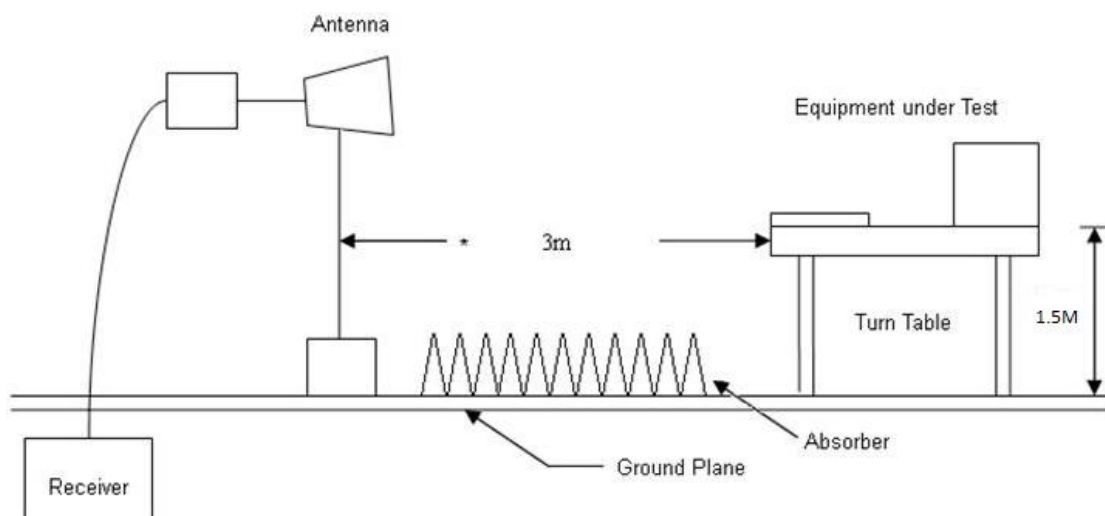
Below 30MHz test setup



30MHz- 1GHz Test Setup



Above 1GHz Test Setup



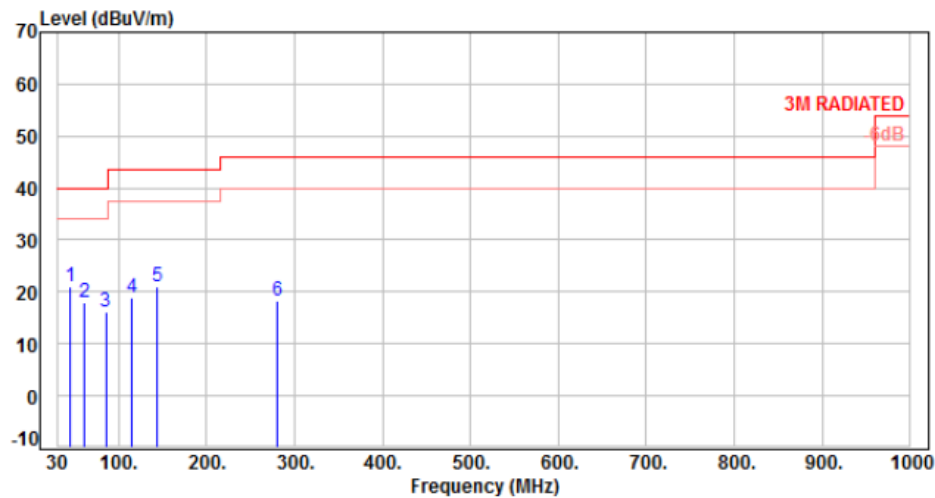


5.4 Test Result and Data (9kHz ~ 30MHz)

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

5.5 Test Result and Data (30MHz ~ 1GHz)

Power	:	DC 3V	Pol/Phase	:	VERTICAL
Test Mode	:	Mode 1	Temperature	:	23 °C
Test Date	:	Mar. 06, 2019	Humidity	:	59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	45.52	-9.77	30.69	20.92	40.00	-19.08	Peak	400	0	P
2	61.04	-10.49	28.43	17.94	40.00	-22.06	Peak	400	0	P
3	85.29	-15.06	31.32	16.26	40.00	-23.74	Peak	400	0	P
4	114.39	-12.59	31.39	18.80	43.50	-24.70	Peak	400	0	P
5	143.49	-9.86	30.93	21.07	43.50	-22.43	Peak	400	0	P
6	281.23	-9.25	27.50	18.25	46.00	-27.75	Peak	400	0	P

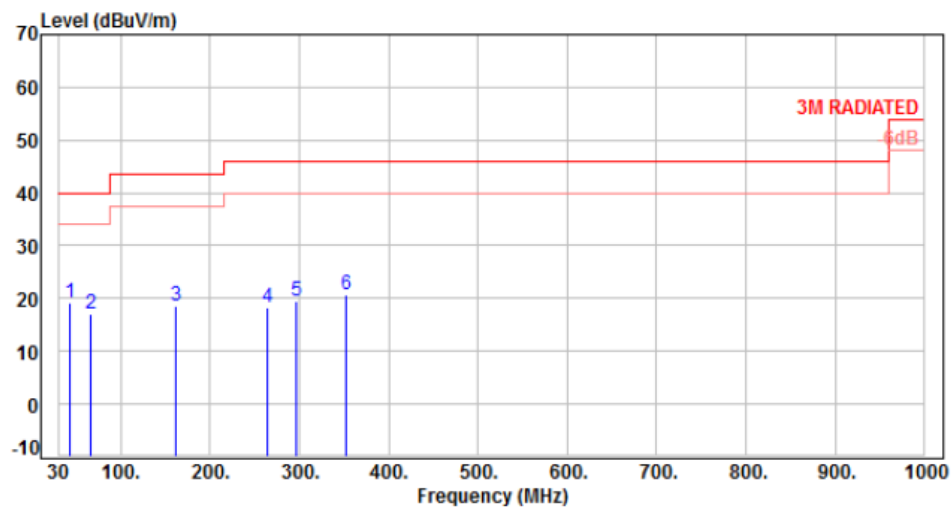
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: DC 3V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 1	Temperature	: 23 °C
Test Date	: Mar. 06, 2019	Humidity	: 59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	43.58	-9.82	28.88	19.06	40.00	-20.94	Peak	100	0	P
2	66.86	-11.28	28.27	16.99	40.00	-23.01	Peak	100	0	P
3	160.95	-9.58	28.15	18.57	43.50	-24.93	Peak	100	0	P
4	264.74	-10.04	28.33	18.29	46.00	-27.71	Peak	100	0	P
5	295.78	-8.86	28.33	19.47	46.00	-26.53	Peak	100	0	P
6	353.01	-7.33	28.01	20.68	46.00	-25.32	Peak	100	0	P

Note: Level=Reading+Factor

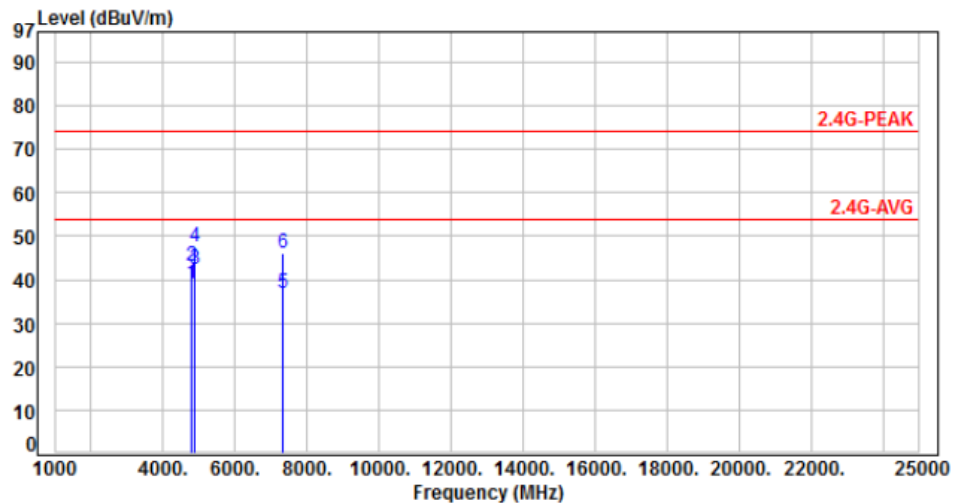
Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



5.6 Test Result and Data (1GHz ~ 25GHz)

Power	: DC 3V	Pol/Phase	: VERTICAL
Test Mode	: Mode 1	Temperature	: 23 °C
Test Date	: Mar. 06, 2019	Humidity	: 59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	4804.00	-8.53	47.50	38.97	54.00	-15.03	Average	100	60	P
2	4804.00	-8.53	51.60	43.07	74.00	-30.93	Peak	100	60	P
3	4880.00	-8.30	50.79	42.49	54.00	-11.51	Average	100	297	P
4	4880.00	-8.30	55.89	47.59	74.00	-26.41	Peak	100	297	P
5	7320.00	-3.83	40.69	36.86	54.00	-17.14	Average	100	320	P
6	7320.00	-3.83	49.89	46.06	74.00	-27.94	Peak	100	320	P

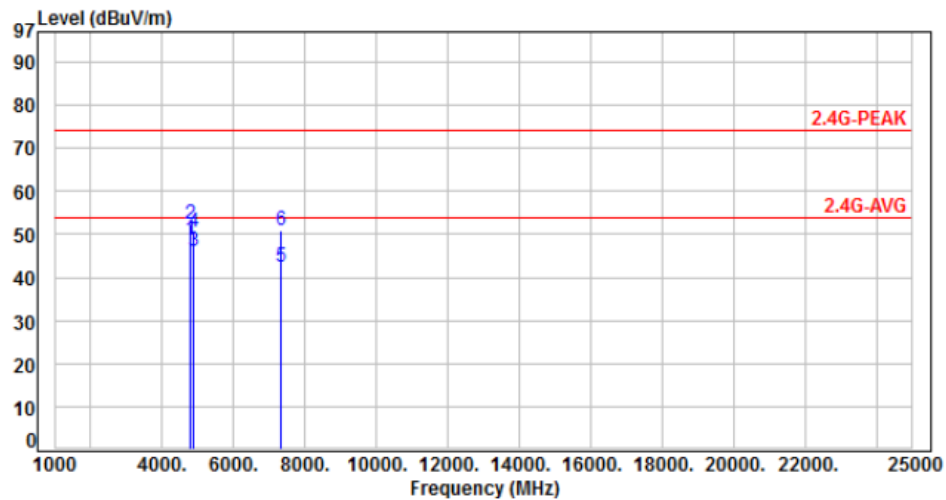
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: DC 3V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 1	Temperature	: 23 °C
Test Date	: Mar. 06, 2019	Humidity	: 59 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBUV)	Level (dBUV/m)	Limit (dBUV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	4804.00	-8.53	57.30	48.77	54.00	-5.23	Average	101	256	P
2	4804.00	-8.53	60.90	52.37	74.00	-21.63	Peak	101	256	P
3	4880.00	-8.30	54.54	46.24	54.00	-7.76	Average	108	360	P
4	4880.00	-8.30	58.89	50.59	74.00	-23.41	Peak	108	360	P
5	7320.00	-3.83	46.29	42.46	54.00	-11.54	Average	132	334	P
6	7320.00	-3.83	54.59	50.76	74.00	-23.24	Peak	132	334	P

Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



5.7 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 – 5.250
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