

FCC 47 CFR PART 22H and 24E

Test Report

Applicant : ATOP Technologies, INC.

Product Type : Industrial M2M Cellular Serial Gateway

Trade Name : atop

Model Number : SE5901B-WW-wwww-XXX-x-Y-yy-bb
MB5901B-WW-wwww-XXX-x-Y-yy-ZZ-bb
PG5901B-WW-wwww-XXX-x-Y-yy-zzaa-zzaa-bb

Test Specification : FCC 47 CFR PART 22H
FCC 47 CFR PART 24E
ANSI/TIA-603-D 2010

Receive Date : Oct. 04, 2016

Test Period : Oct. 19 ~ Oct. 26, 2016

Issue Date : Dec. 30, 2016

Issue by

A Test Lab Techno Corp.
No. 140-1, Changan Street, Bade District,
Taoyuan City 33465, Taiwan (R.O.C)
Tel : +886-3-2710188 / Fax : +886-3-2710190



Taiwan Accreditation Foundation accreditation number: 1330

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Revision History

Rev.	Issue Date	Revisions	Revised By
00	Dec. 30, 2016	Initial Issue	Snow Wang



Verification of Compliance

Issued Date: Dec. 30, 2016

Applicant : ATOP Technologies, INC.

Product Type : Industrial M2M Cellular Serial Gateway

Trade Name : atop

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 MB5901B-WW-wwww-XXX-x-Y-yy-ZZ-bb
 PG5901B-WW-wwww-XXX-x-Y-yy-zzaa-zzaa-bb

FCC ID : RPV-SE-MB-PG5901B

EUT Rated Voltage : DC 9V ~ 48V, 0.8A

Test Voltage : DC 9V, DC12V, DC48V

Applicable Standard : FCC 47 CFR PART 22H
 FCC 47 CFR PART 24E
 ANSI/TIA-603-D 2010

Test Result : Complied

Performing Lab. : A Test Lab Techno Corp.
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<http://www.atl-lab.com.tw/e-index.htm>



A Test Lab Techno Corp. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by A Test Lab Techno Corp. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Approved By : Fly Lu Reviewed By : Eric Ou Yang
 (Manager) (Fly Lu) (Testing Engineer) (Eric Ou Yang)



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1 General Information

1.1. EUT Description

Applicant	ATOP Technologies, INC. 1F, 30, R&D Rd. II, Science-Based Industrial Park, Hsinchu, Taiwan 30076
Manufacturer	ATOP Technologies, INC. 1F, 30, R&D Rd. II, Science-Based Industrial Park, Hsinchu, Taiwan 30076
Product Type	Industrial M2M Cellular Serial Gateway
Trade Name	atop
Model Number	SE5901B-WW-wwww-XXX-x-Y-yy-bb MB5901B-WW-wwww-XXX-x-Y-yy-ZZ-bb PG5901B-WW-wwww-XXX-x-Y-yy-zzaa-zzaa-bb
Model Different Description	<p>WW =IO or Blank www =D3G or 4G or Blank XXX=GPS or Blank x = B or Blank Y = S or Blank yy = US or EU or TW ZZ =CT or Blank ; zz =00-99 or AA-ZZ or Blank; aa = SS,SM,ES or EC or Blank; bb=00-99 or AA-ZZ or aa-zz or Blank; (Customer Code)</p> <ul style="list-style-type: none"> - WW can be IO or Blank, for COM port type. Blank: D-sub connector IO: Terminal Block with COM, relay and DI/O function - www can be D3G or 4G D3G: support 3G 4G: support 4G Blank: No 3G or 4G function - XXX can be GPS or Blank, for GPS function GPS: Support GPS function Blank: no GPS function - x can be B or Blank, for Internal battery B: support internal battery Blank: no internal battery - Y can be S or Blank, for SD card S: support SD card Blank: no SD card - yy can be US or EU or TW, for country US: North America EU: Europe TW: Taiwan - ZZ can be CT or Blank, for software function CT: concentrator Blank: No concentrator - zz can be 00-99 or AA-ZZ or Blank, for software function - aa can be SS,SM,ES,EC or Blank, for software function - bb can be 00-99,AA-ZZ,aa-zz or Blank, for Customer Code



FCC ID	RPV-SE-MB-PG5901B				
IMEI No.	868323020000003				
Mode	Band	UL Frequency (MHz)	DL Frequency (MHz)	Modulation	
GPRS/EGPRS	850	824.2 ~ 848.8	869.2 ~ 893.8	GMSK/8PSK	
	1900	1850.2 ~ 1909.8	1930.2 ~ 1989.8	GMSK/8PSK	
WCDMA(RMC12.2K)/ HSDPA/ HSUPA	Band	UL Frequency (MHz)	DL Frequency (MHz)	Modulation	
	II	1852.4 ~ 1907.6	1932.4 ~ 1987.6	QPSK	
	V	826.4 ~ 846.6	871.4 ~ 891.6	QPSK	
Channel Control	Auto				
Module use	QUECTEL, EC20				
Antenna information	Ant No.	Model Number	Type	Frequency Band	Max. Gain (dBi)
	1	59908151G	Whip Antenna	GPRS/EGPRS 850	2.16
				GPRS/EGPRS 1900	1.76
				WCDMA/ HSDPA/ HSUPA Band II	1.76
				WCDMA/ HSDPA/ HSUPA Band V	2.16
	2	59908151G	Whip Antenna	GPRS/EGPRS 850	1.65
				GPRS/EGPRS 1900	2.74
				WCDMA/ HSDPA/ HSUPA Band II	2.74
WCDMA/ HSDPA/ HSUPA Band V				1.65	

Frequency Band	Max. RF Output Power (W)	E.R.P. /E.I.R.P. (W)	
GPRS 850	1.718	1.416	(E.R.P.)
EGPRS 850	0.889	0.638	(E.R.P.)
GPRS 1900	0.881	1.104	(E.I.R.P.)
EGPRS 1900	0.714	0.555	(E.I.R.P.)
WCDMA/ HSDPA/ HSUPA Band II	0.370	0.222	(E.I.R.P.)
WCDMA/ HSDPA/ HSUPA Band V	0.402	0.243	(E.R.P.)

Frequency Band	Occupied Bandwidth (MHz)	Emission Designator
GPRS 850	0.246	246KG7W
EGPRS 850	0.248	248KG7W
GPRS 1900	0.246	246KG7W
EGPRS 1900	0.246	246KG7W
WCDMA/ HSDPA/ HSUPA Band II	4.164	4M16F9W
WCDMA/ HSDPA/ HSUPA Band V	4.171	4M17F9W



1.2. Mode of Operation

In the test report use EUT model: SE5901B-IO-4G-GPS-B-S-US to operate testing.

ATL has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode
Mode 1: GPRS 850 Link Mode
Mode 2: GPRS 1900 Link Mode
Mode 3: EGPRS 850 Link Mode
Mode 4: EGPRS 1900 Link Mode
Mode 5: WCDMA Band II Link Mode
Mode 6: WCDMA Band V Link Mode

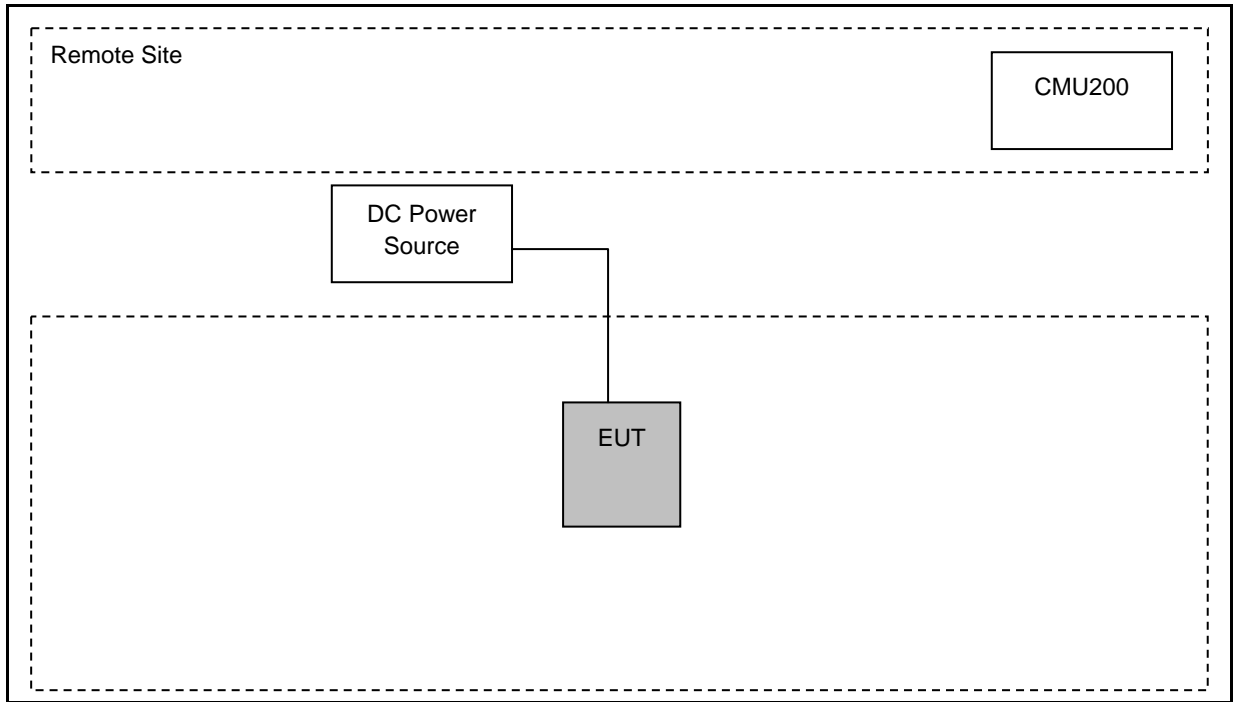
Note: Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report.

By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that "X axis" position was the worst, then the final test was executed the worst condition and test data were recorded in this report.

1.3. EUT Exercise Software

1	Setup the EUT and Base Station (CMU200) as shown on 1.4.
2	Turn on the power of all equipment.

1.4. Configuration of Test System Details



1.5. Test Site Environment

Items	Required (IEC 60068-1)	Actual
Temperature (°C)	15-35	26
Humidity (%RH)	25-75	60
Barometric pressure (mbar)	860-1060	950

**1.6. Summary of Test Result**

FCC Rule	Description	Result
§2.1046	Conducted Output Power	Pass
§22.913(a)(2)	Effective Radiated Power	Pass
§24.232(c)	Equivalent Isotropic Radiated Power	Pass
§24.232(d) KDB 971168 D01 (5.7.1)	Peak to average ratio	Pass
§2.1049 §22.917(a) §24.238(a)	Emission Bandwidth & Occupied Bandwidth	Pass
§2.1051 §22.917(a) §24.238(a)	Band Edge Measurement	Pass
§2.1051 §22.917(a) §24.238(a)	Conducted Spurious Emission	Pass
§2.1053 §22.917(a) §24.238(a)	Field Strength of Spurious Radiation	Pass
§2.1055 §22.355 §24.235	Frequency Stability for Temperature & Voltage	Pass

2 Test Results

2.1. RF Output Power Test

■ **Limit**

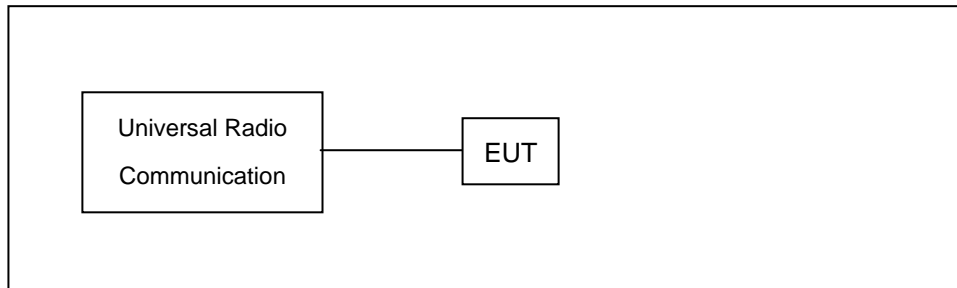
N/A

■ **Test Instruments**

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Cycle
Universal Radio Communication Tester	R & S	CMU200	112387	02/25/2016	1 year
Test Site	ATL	TE05	TE05	N.C.R.	-----

Note: N.C.R. = No Calibration Request.

■ **Test Setup**



■ **Test Procedure**

- a. The EUT was set up for the maximum power with with simulator.
- b. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

■ **Uncertainty**

The measurement uncertainty is defined as for RF output power measurement is 1.2 dB.



■ Test Result

Date of Test		10/19/2016					
Bands	Modulation Type	Data Rate	Frequency (MHz)	Burst Average Power		Peak Power	
				(dBm)	(W)	(dBm)	(W)
GRRS 850 Multi Class :12 Max Up:4 Max Down:4 Sum:5	GMSK	4Down1Up (Duty Factor 1/8)	824.2	32.18	1.652	32.35	1.718
			836.6	32.11	1.626	32.30	1.698
			848.8	32.08	1.614	32.26	1.683
		3Down2Up (Duty Factor 2/8)	824.2	31.33	1.358	31.50	1.413
			836.6	31.26	1.337	31.42	1.387
			848.8	31.21	1.321	31.36	1.368
		2Down3Up (Duty Factor 3/8)	824.2	28.62	0.728	28.76	0.752
			836.6	28.54	0.714	28.69	0.740
			848.8	28.48	0.705	28.66	0.735
		1Down4Up (Duty Factor 4/8)	824.2	27.63	0.579	27.83	0.607
			836.6	27.55	0.569	27.74	0.594
			848.8	27.46	0.557	27.63	0.579
EGPRS 850 Multi Class :12 Max Up:4 Max Down:4 Sum:5	8PSK	4Down1Up (Duty Factor 1/8)	824.2	26.24	0.421	29.49	0.889
			836.6	26.18	0.415	29.42	0.875
			848.8	25.94	0.393	29.15	0.822
		3Down2Up (Duty Factor 2/8)	824.2	24.31	0.270	27.55	0.569
			836.6	24.22	0.264	27.48	0.560
			848.8	23.98	0.250	27.22	0.527
		2Down3Up (Duty Factor 3/8)	824.2	22.65	0.184	25.91	0.390
			836.6	22.53	0.179	25.78	0.378
			848.8	22.33	0.171	25.56	0.360
		1Down4Up (Duty Factor 4/8)	824.2	21.13	0.130	24.38	0.274
			836.6	20.99	0.126	24.24	0.265
			848.8	20.78	0.120	24.02	0.252

Note: The peak power testing result was used peak detector.



Date of Test		10/19/2016					
Bands	Modulation Type	Data Rate	Frequency (MHz)	Burst Average Power		Peak Power	
				(dBm)	(W)	(dBm)	(W)
GRRS 1900 Multi Class :12 Max Up:4 Max Down:4 Sum:5	GMSK	4Down1Up (Duty Factor 1/8)	1850.2	29.28	0.847	29.45	0.881
			1880.0	29.16	0.824	29.32	0.855
			1909.8	29.03	0.800	29.21	0.834
		3Down2Up (Duty Factor 2/8)	1850.2	27.68	0.586	27.83	0.607
			1880.0	27.54	0.568	27.70	0.589
			1909.8	27.40	0.550	27.55	0.569
		2Down3Up (Duty Factor 3/8)	1850.2	26.23	0.420	26.38	0.435
			1880.0	26.07	0.405	26.21	0.418
			1909.8	25.90	0.389	26.07	0.405
		1Down4Up (Duty Factor 4/8)	1850.2	24.38	0.274	24.55	0.285
			1880.0	24.21	0.264	24.40	0.275
			1909.8	24.05	0.254	24.22	0.264
EGPRS 1900 Multi Class :12 Max Up:4 Max Down:4 Sum:5	8PSK	4Down1Up (Duty Factor 1/8)	1850.2	25.31	0.340	28.54	0.714
			1880.0	25.22	0.333	28.45	0.700
			1909.8	25.08	0.322	28.30	0.676
		3Down2Up (Duty Factor 2/8)	1850.2	24.08	0.256	27.32	0.540
			1880.0	23.98	0.250	27.21	0.526
			1909.8	23.81	0.240	27.04	0.506
		2Down3Up (Duty Factor 3/8)	1850.2	22.77	0.189	26.03	0.401
			1880.0	22.64	0.184	25.91	0.390
			1909.8	22.43	0.175	25.69	0.371
		1Down4Up (Duty Factor 4/8)	1850.2	21.43	0.139	24.65	0.292
			1880.0	21.24	0.133	24.48	0.281
			1909.8	21.01	0.126	24.24	0.265

Note: The peak power testing result was used peak detector.



Date of Test		10/19/2016					
Bands	Modulation Type	Sub-Test	Frequency (MHz)	Burst Average Power		Peak Power	
				(dBm)	(W)	(dBm)	(W)
WCDMA Band II	QPSK	-----	1852.4	22.45	0.176	25.68	0.370
			1880.0	22.23	0.167	25.47	0.352
			1907.6	22.16	0.164	25.41	0.348
HSDPA Band II	QPSK	1	1852.4	21.62	0.145	24.87	0.307
			1880.0	21.37	0.137	24.62	0.290
			1907.6	21.33	0.136	24.57	0.286
		2	1852.4	21.53	0.142	24.78	0.301
			1880.0	21.27	0.134	24.50	0.282
			1907.6	21.21	0.132	24.43	0.277
		3	1852.4	21.08	0.128	24.29	0.269
			1880.0	20.85	0.122	24.06	0.255
			1907.6	20.82	0.121	24.02	0.252
		4	1852.4	21.04	0.127	24.25	0.266
			1880.0	20.78	0.120	23.98	0.250
			1907.6	20.71	0.118	23.92	0.247
HSUPA Band II	QPSK	1	1852.4	20.99	0.126	24.24	0.265
			1880.0	20.73	0.118	23.97	0.249
			1907.6	20.68	0.117	23.92	0.247
		2	1852.4	18.99	0.079	22.20	0.166
			1880.0	18.76	0.075	21.99	0.158
			1907.6	18.67	0.074	21.90	0.155
		3	1852.4	19.96	0.099	23.21	0.209
			1880.0	19.67	0.093	22.91	0.195
			1907.6	19.61	0.091	22.86	0.193
		4	1852.4	18.95	0.079	22.16	0.164
			1880.0	18.64	0.073	21.86	0.153
			1907.6	18.77	0.075	21.97	0.157
		5	1852.4	20.79	0.120	24.04	0.254
			1880.0	20.55	0.114	23.78	0.239
			1907.6	20.49	0.112	23.71	0.235

Note: The peak power testing result was used peak detector.



Date of Test		10/19/2016					
Bands	Modulation Type	Sub-Test	Frequency (MHz)	Burst Average Power		Peak Power	
				(dBm)	(W)	(dBm)	(W)
WCDMA Band V	QPSK	-----	826.4	22.78	0.190	26.04	0.402
			836.6	22.63	0.183	25.87	0.386
			846.6	22.45	0.176	25.68	0.370
HSDPA Band V	QPSK	1	826.4	21.93	0.156	25.19	0.330
			836.6	21.74	0.149	24.99	0.316
			846.6	21.57	0.144	24.84	0.305
		2	826.4	21.83	0.152	25.06	0.321
			836.6	21.62	0.145	24.87	0.307
			846.6	21.41	0.138	24.64	0.291
		3	826.4	21.43	0.139	24.63	0.290
			836.6	21.22	0.132	24.43	0.277
			846.6	21.01	0.126	24.22	0.264
		4	826.4	21.36	0.137	24.59	0.288
			836.6	21.16	0.131	24.37	0.274
			846.6	21.01	0.126	24.25	0.266
HSUPA Band V	QPSK	1	826.4	21.28	0.134	24.49	0.281
			836.6	21.08	0.128	24.32	0.270
			846.6	20.91	0.123	24.15	0.260
		2	826.4	19.28	0.085	22.50	0.178
			836.6	19.02	0.080	22.22	0.167
			846.6	18.89	0.077	22.11	0.163
		3	826.4	20.22	0.105	23.45	0.221
			836.6	20.03	0.101	23.28	0.213
			846.6	19.85	0.097	23.08	0.203
		4	826.4	19.21	0.083	22.43	0.175
			836.6	19.02	0.080	22.23	0.167
			846.6	18.86	0.077	22.08	0.161
		5	826.4	21.12	0.129	24.33	0.271
			836.6	20.93	0.124	24.15	0.260
			846.6	20.75	0.119	23.98	0.250

Note: The peak power testing result was used peak detector.



2.2. Effective Radiated Power / Equivalent Isotropic Radiated Power Test

■ Limit

For FCC Part 22.913(a)(2): The E.R.P. of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

For FCC Part 24.232(c): The E.I.R.P. of mobile transmitters and auxiliary test transmitters must not exceed 2 Watts.

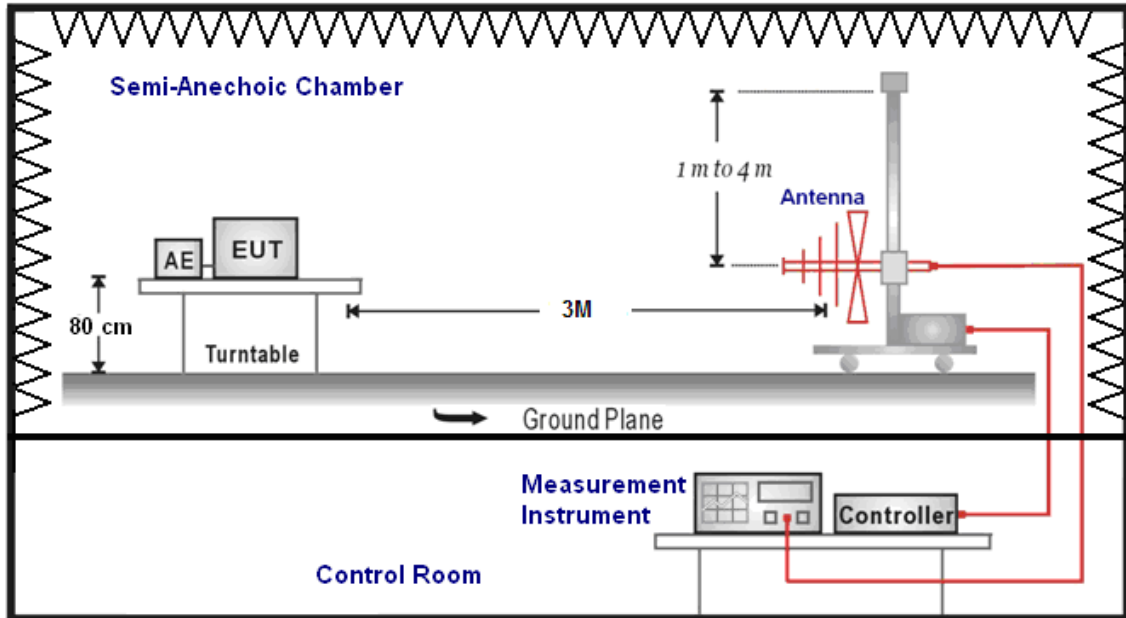
■ Test Instruments

3 Meter Chamber					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Cycle
RF Pre-selector	Agilent	N9039A	MY46520256	01/08/2016	1 year
Spectrum Analyzer	Agilent	E4446A	MY46180578	01/08/2016	1 year
Pre Amplifier	Agilent	8449B	3008A02237	10/11/2016	1 year
Pre Amplifier	Agilent	8447D	2944A11119	01/11/2016	1 year
Broadband Antenna (30MHz~1GHz)	SCHWARZBECK MESS-ELEKTRONIK	VULB9168	416	10/13/2016	1 year
Broadband Antenna (30MHz~1GHz)	SCHWARZBECK MESS-ELEKTRONIK	VULB 9168	419	11/03/2016	1 year
Horn Antenna (1~18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	06/06/2016	1 year
Horn Antenna (18~40GHz)	ETS	3116	00086467	09/05/2016	1 year
Horn Antenna (18~40GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9170	9170-320	07/18/2016	1 year
Microwave Cable	EMCI	EMC102-KM-KM- 14000	151001	02/23/2016	1 year
Microwave Cable	EMCI	EMC-104-SM-SM -14000	140202	02/23/2016	1 year
Microwave Cable	EMCI	EMC104-SM-SM- 600	140301	02/23/2016	1 year
Signal Generator	Agilent	E8257D	MY44320425	02/25/2016	1 year
Test Site	ATL	TE01	888001	08/29/2016	1 year

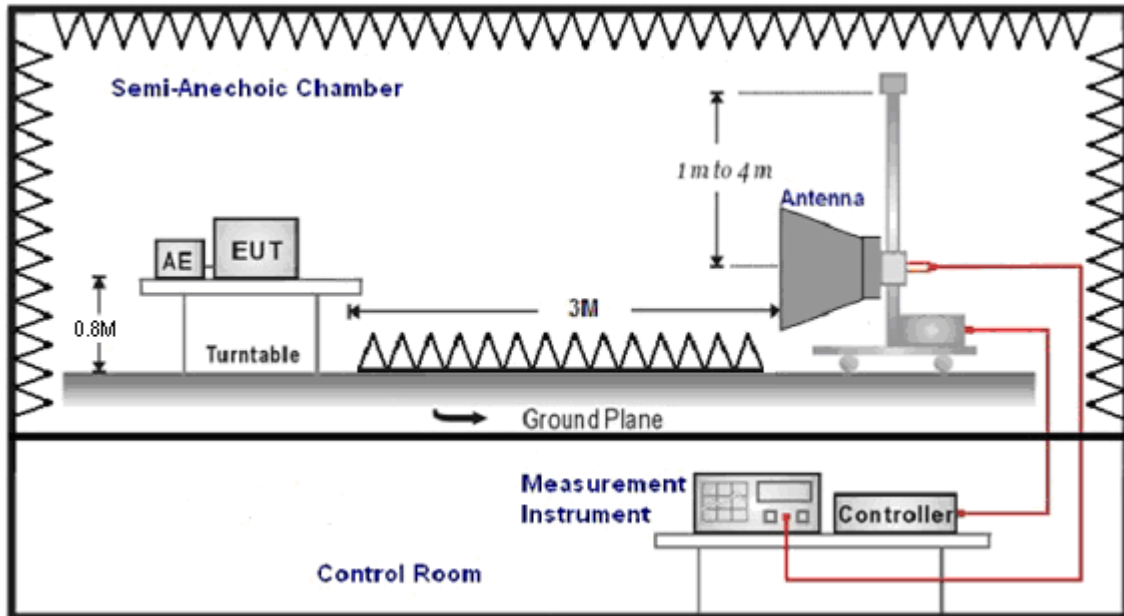
Note: N.C.R. = No Calibration Request.

■ Setup

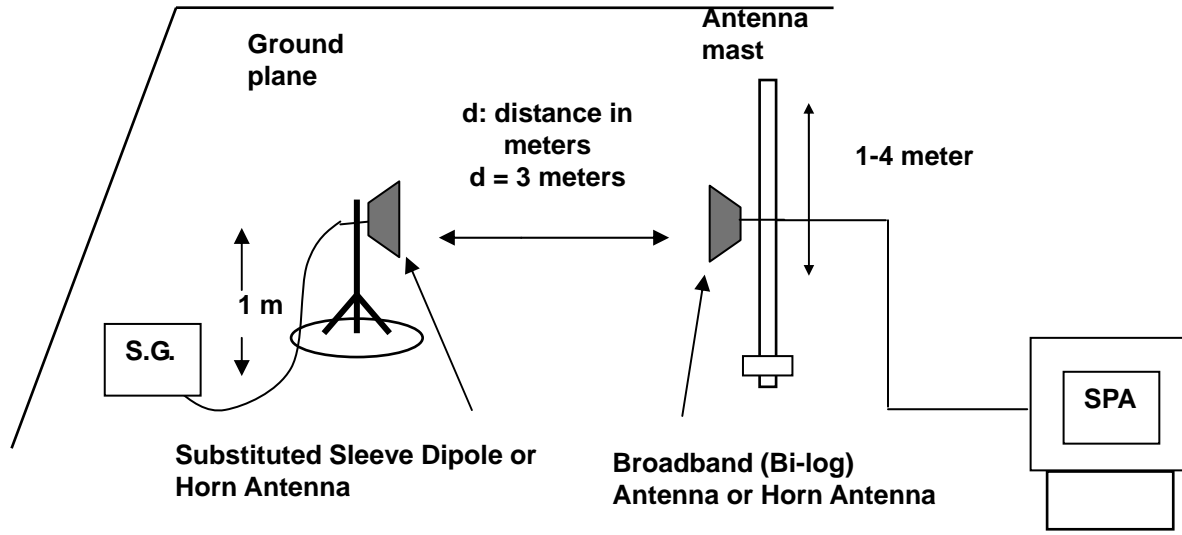
Below 1 GHz



Above 1 GHz



For Substituted Method Test Set-UP



■ Test Procedure

- a. The EUT was set up for the maximum power with LTE link data modulation. The power was measured with Spectrum Analyzer. All measurements were done at 3 channels (low, middle and high operational frequency range). RWB and VBW is 5MHz for LTE mode.
- b. E.I.R.P power measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- c. The substitution antenna (Note:1 & 2) is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value" of step a. Record the power level of S.G.
- d. $E.I.R.P. = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}$
- e. $E.R.P. = E.I.R.P. - 2.15 \text{ dB}$

Note: 1. Below 1 GHz Substituted Method Test : Sleeve dipole antenna to Bi-Log Antenna

2. Above 1 GHz Substituted Method Test : Horn antenna to Horn Antenna

■ Uncertainty

The measurement uncertainty is defined as for Field Strength of Spurious Radiation measurement is $\pm 3.072 \text{ dB}$.



■ Test Result

Date of Test		10/19/2016						
Bands	Modulation Type	Frequency (MHz)	Ant. Polar.	Read Level (dBm)	Correction Factor (dBm)	E.R.P.		Limit (W)
						(dBm)	(W)	
GPRS 850	GMSK	824.2	H	16.87	11.24	28.11	0.647	< 7
			V	20.22	11.24	31.46	1.400	< 7
		836.6	H	16.96	11.42	28.38	0.689	< 7
			V	19.93	11.42	31.35	1.365	< 7
		848.8	H	16.33	11.60	27.93	0.621	< 7
			V	19.91	11.60	31.51	1.416	< 7
EGPRS 850	8PSK	824.2	H	13.35	11.24	24.59	0.288	< 7
			V	16.56	11.24	27.80	0.603	< 7
		836.6	H	14.43	11.42	25.85	0.385	< 7
			V	16.63	11.42	28.05	0.638	< 7
		848.8	H	13.47	11.59	25.06	0.321	< 7
			V	16.11	11.60	27.71	0.590	< 7

Date of Test		10/19/2016						
Bands	Modulation Type	Frequency (MHz)	Ant. Polar.	Read Level (dBm)	Correction Factor (dBm)	E.I.R.P.		Limit (W)
						(dBm)	(W)	
GPRS 1900	GMSK	1850.20	H	16.74	9.56	26.30	0.427	< 2
			V	20.77	9.56	30.33	1.079	< 2
		1880.00	H	16.75	9.67	26.42	0.439	< 2
			V	20.76	9.67	30.43	1.104	< 2
		1909.80	H	16.56	9.80	26.36	0.433	< 2
			V	20.59	9.80	30.39	1.094	< 2
EGPRS 1900	8PSK	1850.20	H	14.98	9.56	24.54	0.284	< 2
			V	17.74	9.56	27.30	0.537	< 2
		1880.00	H	14.95	9.67	24.62	0.290	< 2
			V	17.77	9.67	27.44	0.555	< 2
		1909.80	H	14.66	9.80	24.46	0.279	< 2
			V	17.57	9.80	27.37	0.546	< 2

Note: 1. E.R.P./E.I.R.P. = Read Level + Correction factor.

2. For WCDMA and CDMA signals, a peak detector is used with RBW = VBW = 5MHz.

3. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW= 1 MHz.



Date of Test		10/19/2016						
Bands	Modulation Type	Frequency (MHz)	Ant. Polar.	Read Level (dBm)	Correction Factor (dBm)	E.I.R.P.		Limit
						(dBm)	(W)	
WCDMA Band II	QPSK	1852.4	H	11.06	9.56	20.62	0.115	< 2W
			V	13.68	9.56	23.24	0.211	< 2W
		1880.0	H	10.47	9.68	20.15	0.104	< 2W
			V	13.49	9.67	23.16	0.207	< 2W
		1907.6	H	10.43	9.78	20.21	0.105	< 2W
			V	13.68	9.79	23.47	0.222	< 2W

Date of Test		10/19/2016						
Bands	Modulation Type	Frequency (MHz)	Ant. Polar.	Read Level (dBm)	Correction Factor (dBm)	E.R.P.		Limit
						(dBm)	(W)	
WCDMA Band V	QPSK	826.4	H	10.19	11.28	21.47	0.140	< 7W
			V	12.58	11.28	23.86	0.243	< 7W
		836.6	H	9.82	11.42	21.24	0.133	< 7W
			V	12.19	11.42	23.61	0.230	< 7W
		846.6	H	9.94	11.56	21.50	0.141	< 7W
			H	12.27	11.55	23.82	0.241	< 7W

Note: 1. E.R.P./E.I.R.P. = Read Level + Correction factor.

2. For WCDMA signals, a peak detector is used with RBW = VBW = 5MHz.

3. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW= 1 MHz.

2.3. Peak to Average Ratio Test

■ Limit

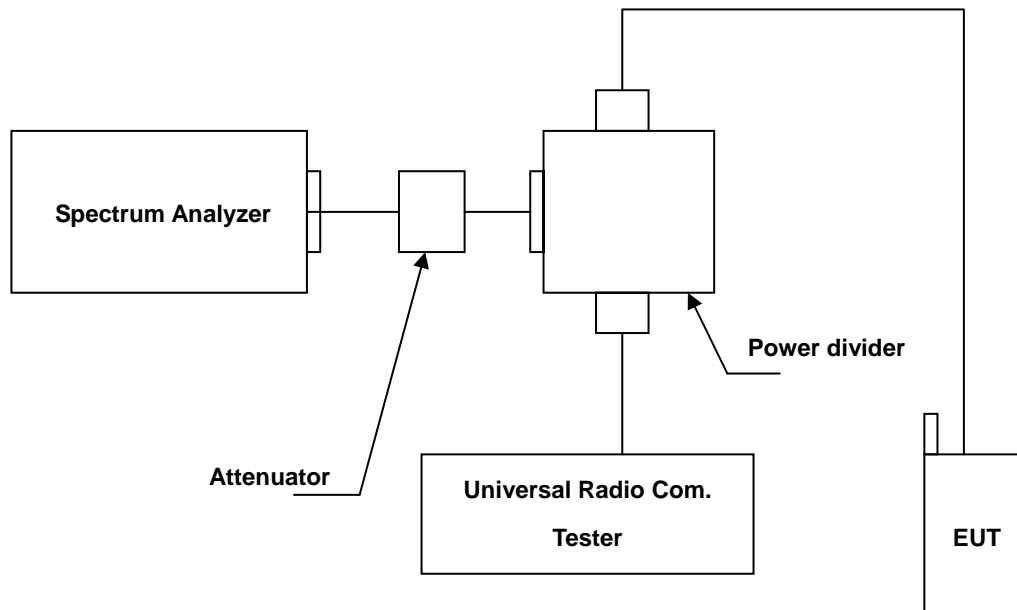
In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB.

■ Test Instruments

Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Cycle
Universal Radio Communication Tester	R & S	CMU200	112387	02/25/2016	1 year
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/15/2015	1 year
Spectrum Analyzer	Agilent	N9030A	MY53120541	12/14/2015	1 year
Attenuator	Woken	WK0602-10	001	06/06/2016	2 year
Power Divider	Agilent	87302C	3239A00760	N.C.R.	-----
Test Site	ATL	TE05	TE05	N.C.R.	-----

Note: N.C.R. = No Calibration Request.

■ Setup





■ **Test Procedure**

The measurement is made according to FCC rules:

- a. Set resolution/measurement bandwidth signal's occupied bandwidth;
- b. Set the number of counts to a value that stabilizes the measured CCDF curve;
- c. Record the maximum PAPR level associated with a probability of 0.1%.

■ **Uncertainty**

The measurement uncertainty is defined as for Conducted Power measurement is 1.2 dB.

■ **Test Result**

Date of Test	10/21/2016			
Bands	Channel	Frequency (MHz)	Peak to Average Ratio (dB)	Limit (dB)
WCDMA Band II	9262	1852.4	2.69	< 13
	9400	1880.0	2.82	< 13
	9538	1907.6	2.83	< 13



■ Test Graphs

Mode 5: WCDMA Band II Link Mode																	
1850.20 MHz	<p>Average Power 22.49 dBm 54.83 % at 0dB</p> <table border="1"> <tr><td>10.0 %</td><td>1.54 dB</td></tr> <tr><td>1.0 %</td><td>2.28 dB</td></tr> <tr><td>0.1 %</td><td>2.69 dB</td></tr> <tr><td>0.01 %</td><td>2.89 dB</td></tr> <tr><td>0.001 %</td><td>3.01 dB</td></tr> <tr><td>0.0001 %</td><td>3.07 dB</td></tr> <tr><td>Peak</td><td>3.10 dB</td></tr> <tr><td></td><td>25.59 dBm</td></tr> </table>	10.0 %	1.54 dB	1.0 %	2.28 dB	0.1 %	2.69 dB	0.01 %	2.89 dB	0.001 %	3.01 dB	0.0001 %	3.07 dB	Peak	3.10 dB		25.59 dBm
10.0 %	1.54 dB																
1.0 %	2.28 dB																
0.1 %	2.69 dB																
0.01 %	2.89 dB																
0.001 %	3.01 dB																
0.0001 %	3.07 dB																
Peak	3.10 dB																
	25.59 dBm																
1880.00 MHz	<p>Average Power 22.28 dBm 54.30 % at 0dB</p> <table border="1"> <tr><td>10.0 %</td><td>1.59 dB</td></tr> <tr><td>1.0 %</td><td>2.37 dB</td></tr> <tr><td>0.1 %</td><td>2.82 dB</td></tr> <tr><td>0.01 %</td><td>3.04 dB</td></tr> <tr><td>0.001 %</td><td>3.18 dB</td></tr> <tr><td>0.0001 %</td><td>3.24 dB</td></tr> <tr><td>Peak</td><td>3.27 dB</td></tr> <tr><td></td><td>25.55 dBm</td></tr> </table>	10.0 %	1.59 dB	1.0 %	2.37 dB	0.1 %	2.82 dB	0.01 %	3.04 dB	0.001 %	3.18 dB	0.0001 %	3.24 dB	Peak	3.27 dB		25.55 dBm
10.0 %	1.59 dB																
1.0 %	2.37 dB																
0.1 %	2.82 dB																
0.01 %	3.04 dB																
0.001 %	3.18 dB																
0.0001 %	3.24 dB																
Peak	3.27 dB																
	25.55 dBm																
1909.80 MHz	<p>Average Power 22.14 dBm 53.95 % at 0dB</p> <table border="1"> <tr><td>10.0 %</td><td>1.60 dB</td></tr> <tr><td>1.0 %</td><td>2.40 dB</td></tr> <tr><td>0.1 %</td><td>2.83 dB</td></tr> <tr><td>0.01 %</td><td>3.04 dB</td></tr> <tr><td>0.001 %</td><td>3.15 dB</td></tr> <tr><td>0.0001 %</td><td>3.22 dB</td></tr> <tr><td>Peak</td><td>3.25 dB</td></tr> <tr><td></td><td>25.39 dBm</td></tr> </table>	10.0 %	1.60 dB	1.0 %	2.40 dB	0.1 %	2.83 dB	0.01 %	3.04 dB	0.001 %	3.15 dB	0.0001 %	3.22 dB	Peak	3.25 dB		25.39 dBm
10.0 %	1.60 dB																
1.0 %	2.40 dB																
0.1 %	2.83 dB																
0.01 %	3.04 dB																
0.001 %	3.15 dB																
0.0001 %	3.22 dB																
Peak	3.25 dB																
	25.39 dBm																

2.4. Emission Bandwidth & Occupied Bandwidth Test

■ Limit

The Occupied Bandwidth Limit:

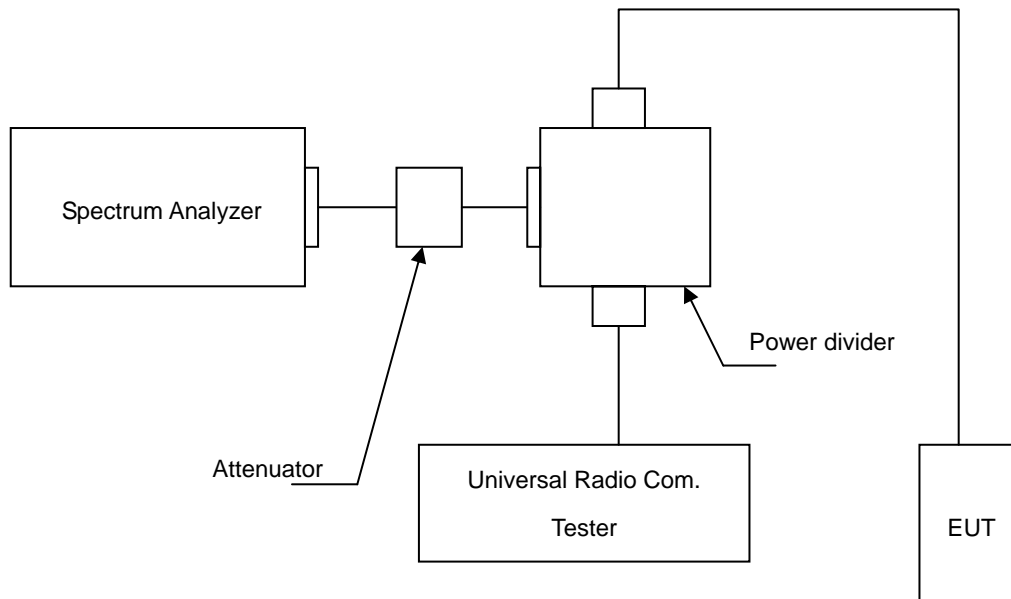
N/A.

■ Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Cycle
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/15/2015	1 year
Spectrum Analyzer	Agilent	N9030A	MY53120541	12/14/2015	1 year
Universal Radio Communication Tester	R & S	CMU200	112387	02/25/2016	1 year
Attenuator	Woken	WK0602-10	001	06/06/2016	2 year
Power divider	Agilent	87302C	3239A00760	N.C.R.	-----
Test Site	ATL	TE05	TE05	N.C.R.	-----

Note: N.C.R. = No Calibration Request.

■ Setup





■ **Test Procedure**

The measurement is made according to FCC rules part 22 and 24:

1. The EUT was connected to Spectrum Analyzer and Base Station via Power Divider.
2. The occupied bandwidth of middle channel for the highest and lowest RF powers was measured.

■ **Uncertainty**

The measurement uncertainty is defined as $\pm 10\text{Hz}$

■ **Test Result**

Date of Test	10/20/2016				
Bands	Channel	Frequency (MHz)	-26dB Bandwidth (kHz)	99% Bandwidth (kHz)	Note
GPRS 850	128	824.2	319.862	242.7188	RBW:10KHz , VBW:30KHz
	190	836.6	312.208	240.0088	RBW:10KHz , VBW:30KHz
	251	848.8	312.441	246.2031	RBW:10KHz , VBW:30KHz
GPRS 1900	512	1850.20	314.748	246.1002	RBW:10KHz , VBW:30KHz
	661	1880.00	316.825	241.7881	RBW:10KHz , VBW:30KHz
	810	1909.80	308.852	243.1957	RBW:10KHz , VBW:30KHz
EGPRS 850	128	824.2	320.417	247.5384	RBW:10KHz , VBW:30KHz
	190	836.6	302.379	244.3391	RBW:10KHz , VBW:30KHz
	251	848.8	309.032	241.0860	RBW:10KHz , VBW:30KHz
EGPRS 1900	512	1850.20	307.169	242.7009	RBW:10KHz , VBW:30KHz
	661	1880.00	310.070	245.8664	RBW:10KHz , VBW:30KHz
	810	1909.80	313.290	242.3104	RBW:10KHz , VBW:30KHz
WCDMA Band II	9262	1852.4	4.673	4.1641	RBW:100KHz , VBW:300KHz
	9400	1880.0	4.703	4.1610	RBW:100KHz , VBW:300KHz
	9538	1907.6	4.699	4.1589	RBW:100KHz , VBW:300KHz
WCDMA Band V	4132	826.4	4.692	4.1711	RBW:100KHz , VBW:300KHz
	4183	836.6	4.696	4.1708	RBW:100KHz , VBW:300KHz
	4233	846.6	4.681	4.1432	RBW:100KHz , VBW:300KHz



■ Test Graphs

Mode 1: GPRS 850 Link Mode	
824.2 MHz	<p>Agilent R T Freq/Channel</p> <p>Ch Freq 824.2 MHz Trig Free</p> <p>Center Freq 824.200000 MHz</p> <p>Start Freq 823.700000 MHz</p> <p>Stop Freq 824.700000 MHz</p> <p>CF Step 100.000000 kHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Ref 40 dBm Atten 40 dB</p> <p>*Peak</p> <p>Log 10</p> <p>dB/ Offst 14.5 dB</p> <p>Center 824.200 MHz Span 1 MHz</p> <p>*Res BW 10 kHz *VBW 30 kHz Sweep 9.56 ms (601 pts)</p> <p>Occupied Bandwidth 242.7188 kHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 812.236 Hz</p> <p>x dB Bandwidth 319.862 kHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>
836.6 MHz	<p>Agilent R T Freq/Channel</p> <p>Ch Freq 836.6 MHz Trig Free</p> <p>Center Freq 836.600000 MHz</p> <p>Start Freq 836.100000 MHz</p> <p>Stop Freq 837.100000 MHz</p> <p>CF Step 100.000000 kHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Ref 40 dBm Atten 40 dB</p> <p>*Peak</p> <p>Log 10</p> <p>dB/ Offst 14.5 dB</p> <p>Center 836.600 MHz Span 1 MHz</p> <p>*Res BW 10 kHz *VBW 30 kHz Sweep 9.56 ms (601 pts)</p> <p>Occupied Bandwidth 240.0088 kHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error -419.879 Hz</p> <p>x dB Bandwidth 312.208 kHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>
848.8 MHz	<p>Agilent R T Freq/Channel</p> <p>Ch Freq 848.8 MHz Trig Free</p> <p>Center Freq 848.800000 MHz</p> <p>Start Freq 848.300000 MHz</p> <p>Stop Freq 849.300000 MHz</p> <p>CF Step 100.000000 kHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Ref 40 dBm Atten 40 dB</p> <p>*Peak</p> <p>Log 10</p> <p>dB/ Offst 14.5 dB</p> <p>Center 848.800 MHz Span 1 MHz</p> <p>*Res BW 10 kHz *VBW 30 kHz Sweep 9.56 ms (601 pts)</p> <p>Occupied Bandwidth 246.2031 kHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 840.560 Hz</p> <p>x dB Bandwidth 312.441 kHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>



Mode 2: GPRS 1900 Link Mode	
<p>1850.20 MHz</p>	
<p>1880.00 MHz</p>	
<p>1909.80 MHz</p>	



Mode 3: EGPRS 850 Link Mode	
824.2 MHz	<p>Agilent R T Freq/Channel</p> <p>Ch Freq 824.2 MHz Trig Free</p> <p>Center Freq 824.200000 MHz</p> <p>Start Freq 823.700000 MHz</p> <p>Stop Freq 824.700000 MHz</p> <p>CF Step 100.000000 kHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Ref 40 dBm Atten 40 dB</p> <p>Occupied Bandwidth 247.5384 kHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 244.198 Hz</p> <p>x dB Bandwidth 320.417 kHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>
836.6 MHz	<p>Agilent R T Freq/Channel</p> <p>Ch Freq 836.6 MHz Trig Free</p> <p>Center Freq 836.600000 MHz</p> <p>Start Freq 836.100000 MHz</p> <p>Stop Freq 837.100000 MHz</p> <p>CF Step 100.000000 kHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Ref 40 dBm Atten 40 dB</p> <p>Occupied Bandwidth 244.3391 kHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 1.065 kHz</p> <p>x dB Bandwidth 302.379 kHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>
848.8 MHz	<p>Agilent R T Freq/Channel</p> <p>Ch Freq 848.8 MHz Trig Free</p> <p>Center Freq 848.800000 MHz</p> <p>Start Freq 848.300000 MHz</p> <p>Stop Freq 849.300000 MHz</p> <p>CF Step 100.000000 kHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Ref 40 dBm Atten 40 dB</p> <p>Occupied Bandwidth 241.0860 kHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error -122.737 Hz</p> <p>x dB Bandwidth 309.032 kHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>



Mode 4: EGPRS 1900 Link Mode	
<p>1850.20 MHz</p>	<p>Agilent R T Freq/Channel</p> <p>Ch Freq 1.8502 GHz Trig Free</p> <p>Center Freq 1.85020000 GHz</p> <p>Start Freq 1.84970000 GHz</p> <p>Stop Freq 1.85070000 GHz</p> <p>CF Step 100.000000 kHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Ref 40 dBm Atten 40 dB</p> <p>Occupied Bandwidth 242.7009 kHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 1.293 kHz</p> <p>x dB Bandwidth 307.169 kHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>
<p>1880.00 MHz</p>	<p>Agilent R T Freq/Channel</p> <p>Ch Freq 1.88 GHz Trig Free</p> <p>Center Freq 1.88000000 GHz</p> <p>Start Freq 1.87950000 GHz</p> <p>Stop Freq 1.88050000 GHz</p> <p>CF Step 100.000000 kHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Ref 40 dBm Atten 40 dB</p> <p>Occupied Bandwidth 245.8664 kHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 1.670 kHz</p> <p>x dB Bandwidth 310.070 kHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>
<p>1909.80 MHz</p>	<p>Agilent R T Freq/Channel</p> <p>Ch Freq 1.9098 GHz Trig Free</p> <p>Center Freq 1.90980000 GHz</p> <p>Start Freq 1.90930000 GHz</p> <p>Stop Freq 1.91030000 GHz</p> <p>CF Step 100.000000 kHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Ref 40 dBm Atten 40 dB</p> <p>Occupied Bandwidth 242.3104 kHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 2.898 kHz</p> <p>x dB Bandwidth 313.290 kHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>



Mode 5: WCDMA Band II Link Mode	
<p>1850.20 MHz</p>	<p>Agilent R T Freq/Channel</p> <p>Ch Freq 1.8524 GHz Trig Free</p> <p>Center Freq 1.85240000 GHz</p> <p>Start Freq 1.84740000 GHz</p> <p>Stop Freq 1.85740000 GHz</p> <p>CF Step 1.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Ref 30 dBm Atten 30 dB</p> <p>*Peak Log 10 dB/Offst 15.2 dB</p> <p>Center 1.852 40 GHz Span 10 MHz</p> <p>*Res BW 100 kHz #VBW 300 kHz Sweep 1 ms (601 pts)</p> <p>Occupied Bandwidth 4.1641 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 10.450 kHz</p> <p>x dB Bandwidth 4.673 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>
<p>1880.00 MHz</p>	<p>Agilent R T Freq/Channel</p> <p>Ch Freq 1.88 GHz Trig Free</p> <p>Center Freq 1.88000000 GHz</p> <p>Start Freq 1.87500000 GHz</p> <p>Stop Freq 1.88500000 GHz</p> <p>CF Step 1.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Ref 30 dBm Atten 30 dB</p> <p>*Peak Log 10 dB/Offst 15.2 dB</p> <p>Center 1.880 00 GHz Span 10 MHz</p> <p>*Res BW 100 kHz #VBW 300 kHz Sweep 1 ms (601 pts)</p> <p>Occupied Bandwidth 4.1610 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 1.565 kHz</p> <p>x dB Bandwidth 4.703 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>
<p>1909.80 MHz</p>	<p>Agilent R T Freq/Channel</p> <p>Ch Freq 1.9076 GHz Trig Free</p> <p>Center Freq 1.90760000 GHz</p> <p>Start Freq 1.90260000 GHz</p> <p>Stop Freq 1.91260000 GHz</p> <p>CF Step 1.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Ref 30 dBm Atten 30 dB</p> <p>*Peak Log 10 dB/Offst 15.2 dB</p> <p>Center 1.907 60 GHz Span 10 MHz</p> <p>*Res BW 100 kHz #VBW 300 kHz Sweep 1 ms (601 pts)</p> <p>Occupied Bandwidth 4.1589 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error -6.204 kHz</p> <p>x dB Bandwidth 4.699 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>



Mode 6: WCDMA Band V Link Mode	
826.4 MHz	<p>Agilent R T Freq/Channel</p> <p>Ch Freq 826.4 MHz Trig Free</p> <p>Center Freq 826.400000 MHz</p> <p>Start Freq 821.400000 MHz</p> <p>Stop Freq 831.400000 MHz</p> <p>CF Step 1.00000000 MHz</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Ref 30 dBm Atten 30 dB</p> <p>*Peak Log 10 dB/Offst 14.5 dB</p> <p>Center 826.40 MHz Span 10 MHz</p> <p>*Res BW 100 kHz #VBW 300 kHz Sweep 1 ms (601 pts)</p> <p>Occupied Bandwidth 4.1711 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 6.546 kHz</p> <p>x dB Bandwidth 4.692 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>
836.6 MHz	<p>Agilent R T Freq/Channel</p> <p>Ch Freq 836.6 MHz Trig Free</p> <p>Center Freq 836.600000 MHz</p> <p>Start Freq 831.600000 MHz</p> <p>Stop Freq 841.600000 MHz</p> <p>CF Step 1.00000000 MHz</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Ref 30 dBm Atten 30 dB</p> <p>*Peak Log 10 dB/Offst 14.5 dB</p> <p>Center 836.60 MHz Span 10 MHz</p> <p>*Res BW 100 kHz #VBW 300 kHz Sweep 1 ms (601 pts)</p> <p>Occupied Bandwidth 4.1708 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 1.272 kHz</p> <p>x dB Bandwidth 4.696 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>
846.6 MHz	<p>Agilent R T Freq/Channel</p> <p>Ch Freq 846.6 MHz Trig Free</p> <p>Center Freq 846.600000 MHz</p> <p>Start Freq 841.600000 MHz</p> <p>Stop Freq 851.600000 MHz</p> <p>CF Step 1.00000000 MHz</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Ref 30 dBm Atten 30 dB</p> <p>*Peak Log 10 dB/Offst 14.5 dB</p> <p>Center 846.60 MHz Span 10 MHz</p> <p>*Res BW 100 kHz #VBW 300 kHz Sweep 1 ms (601 pts)</p> <p>Occupied Bandwidth 4.1432 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error -8.680 kHz</p> <p>x dB Bandwidth 4.681 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>

2.5. Band Edge Test

■ Limit

The Band Edge Limit:

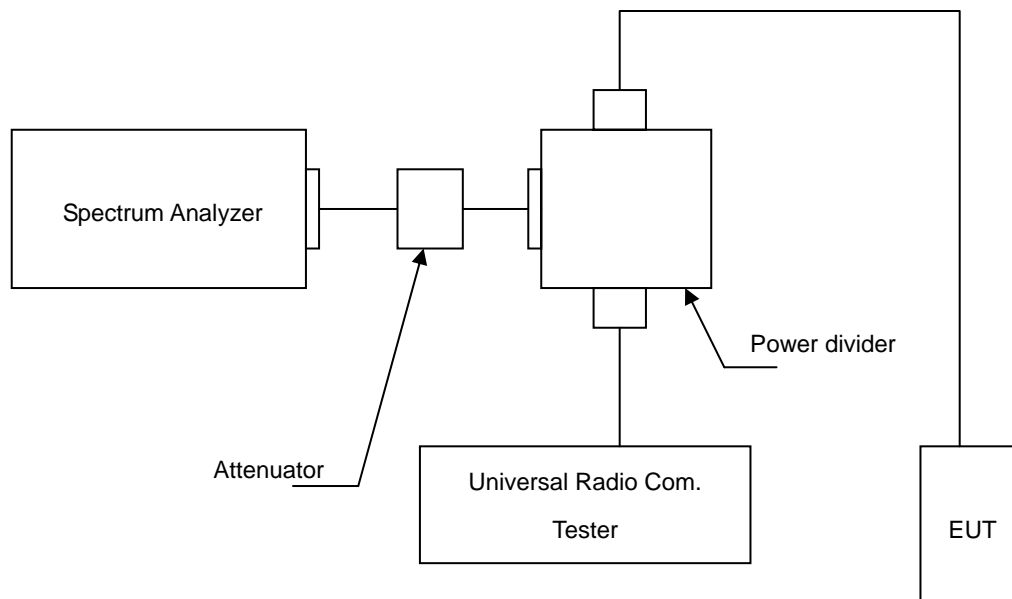
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10\log(P)$ dB.

■ Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Cycle
Universal Radio Communication Tester	R & S	CMU200	112387	02/25/2016	1 year
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/15/2015	1 year
Spectrum Analyzer	Agilent	N9030A	MY53120541	12/14/2015	1 year
Attenuator	Woken	WK0602-10	001	06/06/2016	2 year
Power Divider	Agilent	87302C	3239A00760	N.C.R.	-----
Test Site	ATL	TE05	TE05	N.C.R.	-----

Note: N.C.R. = No Calibration Request.

■ Setup



**■ Test Procedure**

The measurement is made according to FCC rules part 22 and 24:

1. The EUT was connected to Spectrum Analyzer and Base Station via Power Divider.
2. The band edge of low and high channels for the highest RF powers within the transmitting frequency band were measured. Setting RBW as roughly BW/100.
3. The band edge setting:
 - a. RB=10 kHz; VB=30 kHz for GSM 850 and PCS 1900.
 - b. RB=51 kHz; VB=160 kHz for WCDMA Band V and WCDMA Band II.

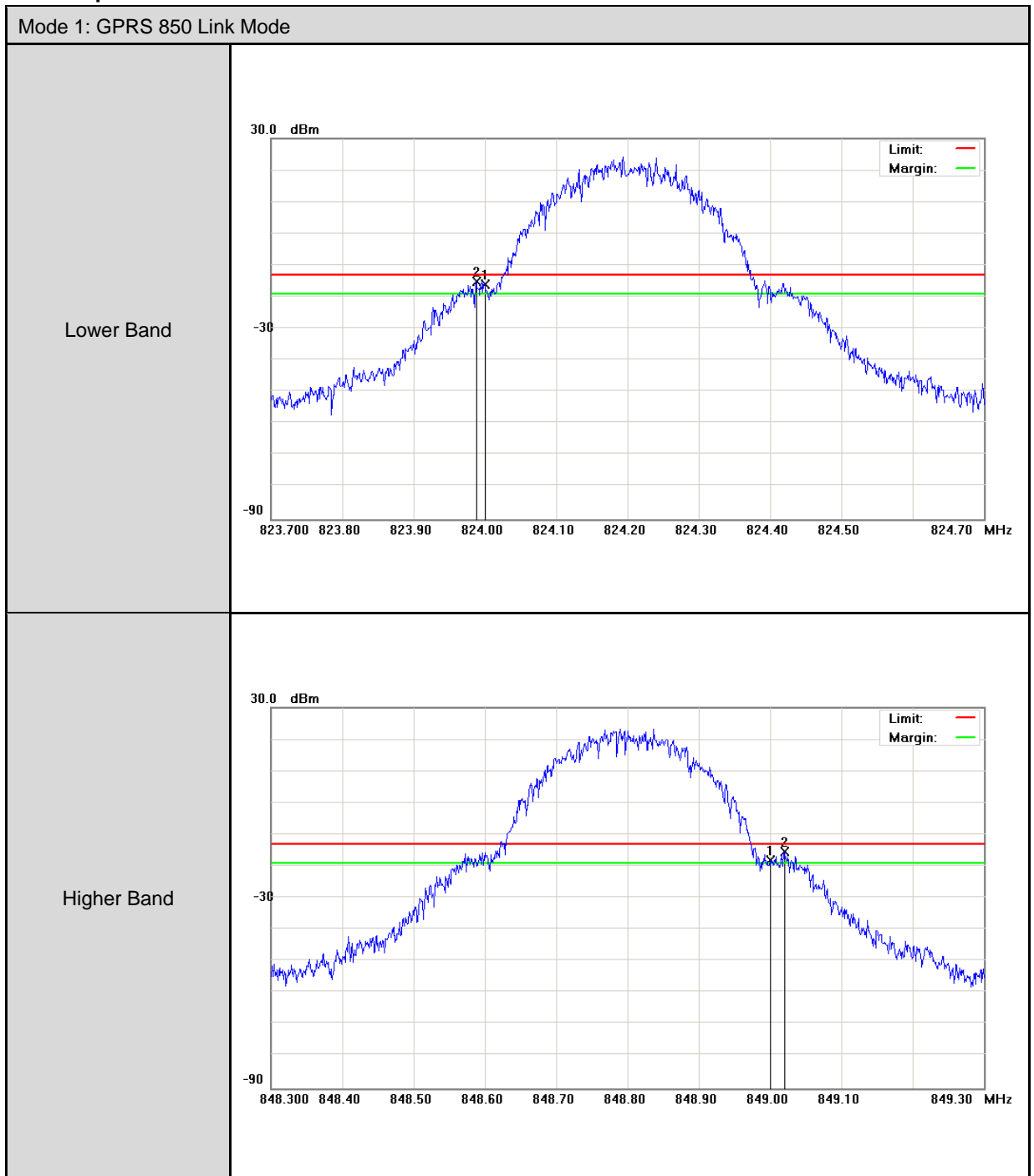
■ Uncertainty

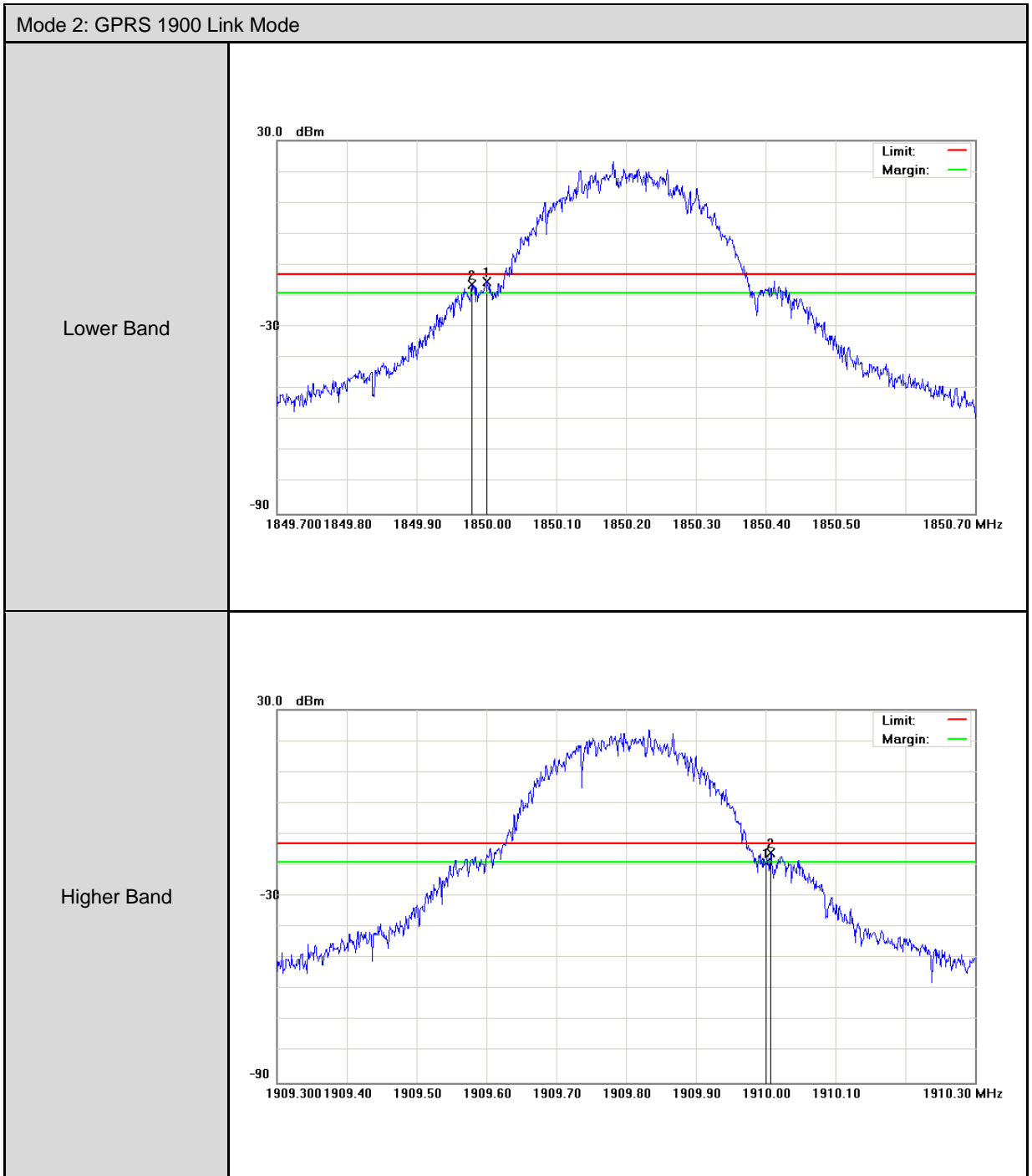
The measurement uncertainty is defined as $\pm 10\text{Hz}$

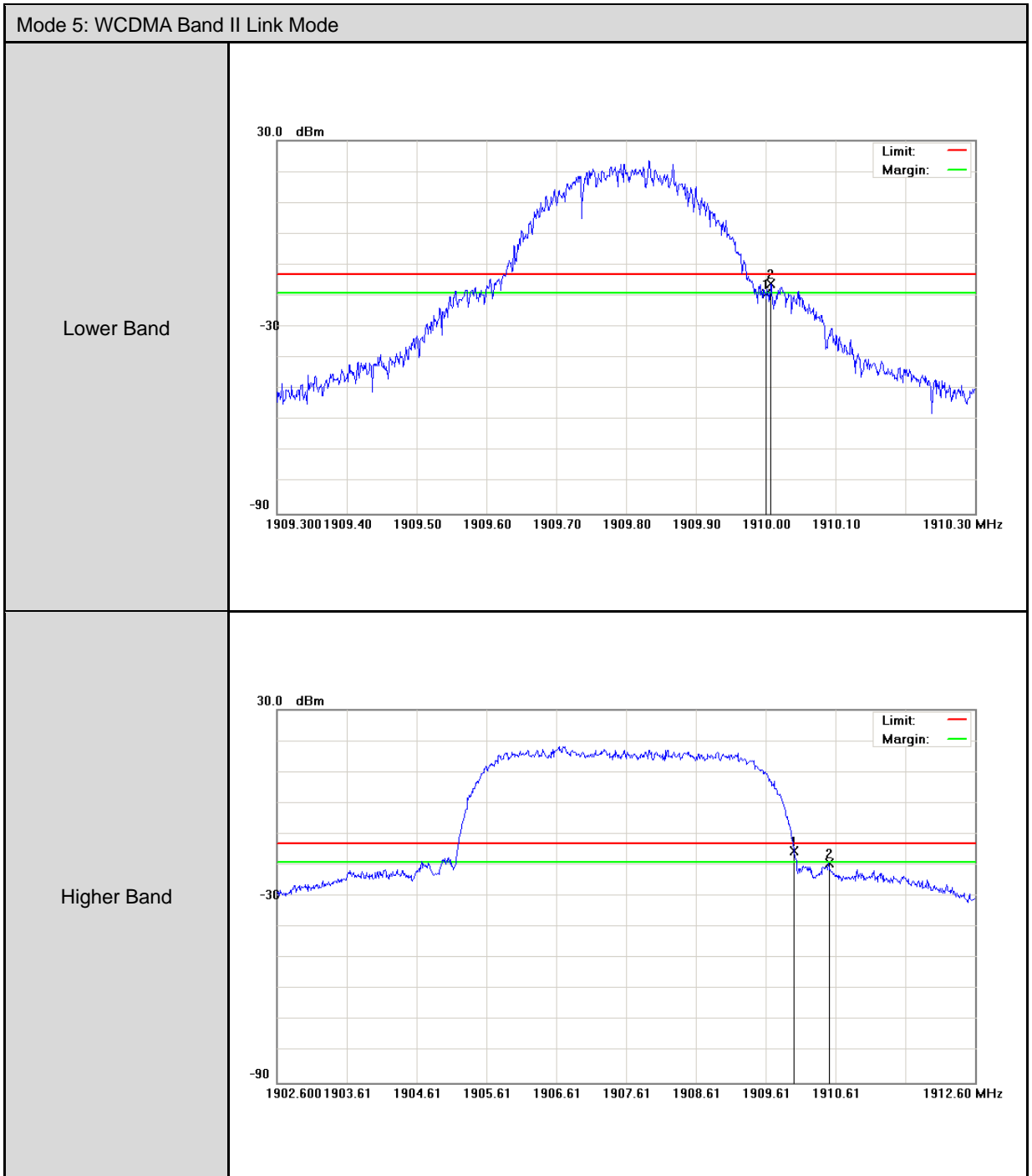
■ Test Result

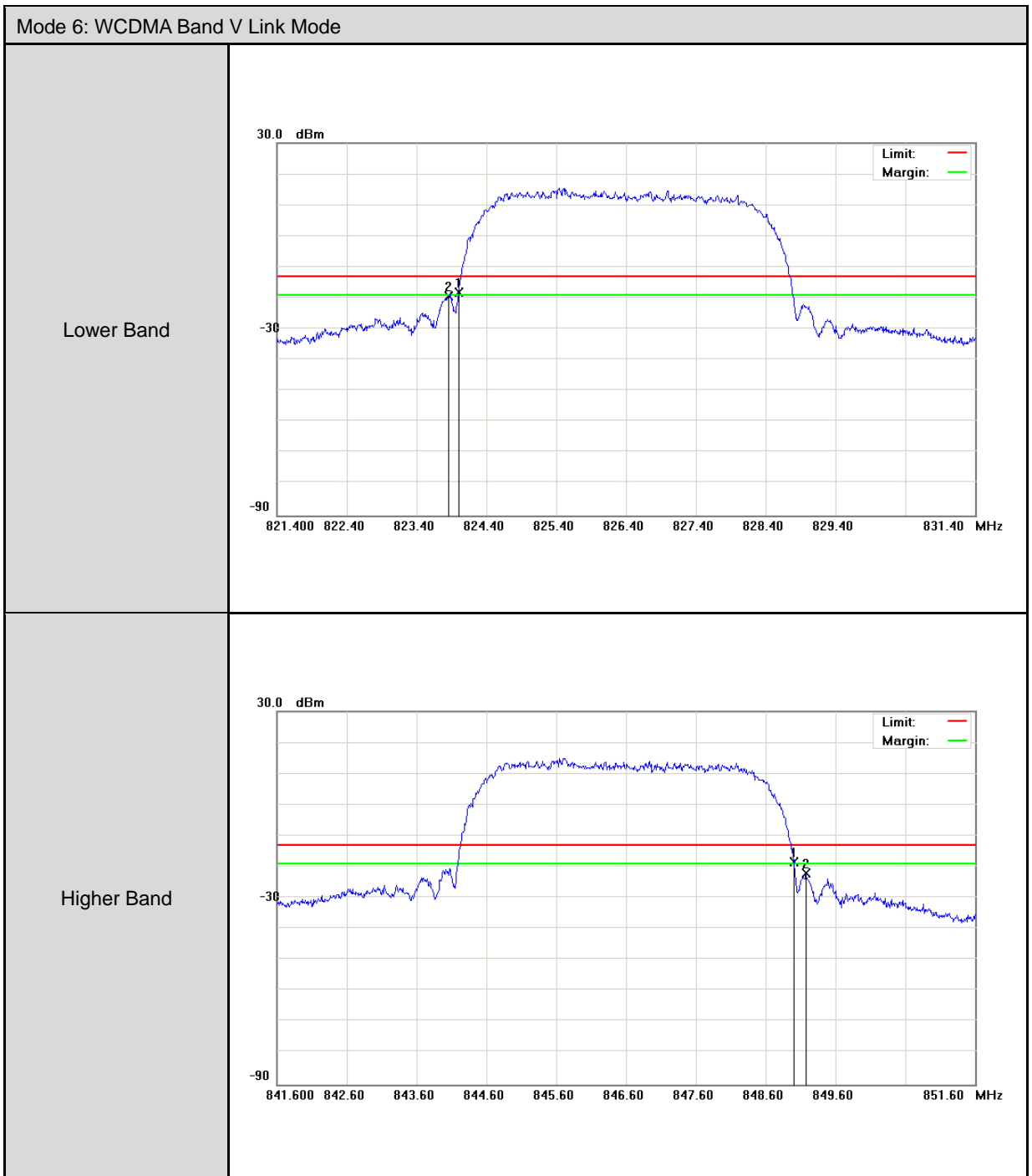
Date of Test		10/20/2016				
Bands		Channel	Frequency (MHz)	Bandwidth (dBm)	Limit (dBm)	Result
GPRS 850	Lower	128	824.0000	-15.21	-13	Pass
	Higher	251	849.0000	-15.44	-13	Pass
GPRS 1900	Lower	512	1850.000	-15.55	-13	Pass
	Higher	810	1910.000	-15.90	-13	Pass
WCDMA Band II	Lower	9262	1850.000	-15.93	-13	Pass
	Higher	9538	1910.000	-15.53	-13	Pass
WCDMA Band V	Lower	4132	824.0000	-18.05	-13	Pass
	Higher	4233	849.0000	-18.54	-13	Pass

■ Test Graphs









2.6. Conducted Spurious Emission Test

■ Limit

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10\log(P)$ dB.

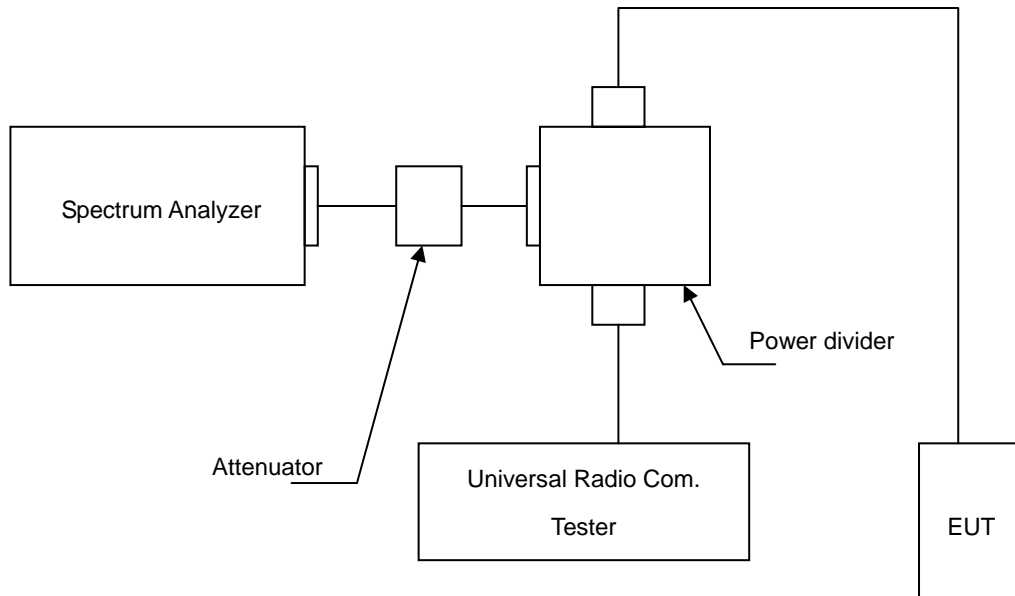
■ Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Cycle
Universal Radio Communication Tester	R & S	CMU200	112387	02/25/2016	1 year
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/15/2015	1 year
Spectrum Analyzer	Agilent	N9030A	MY53120541	12/14/2015	1 year
Attenuator	Woken	WK0602-10	001	06/06/2016	2 year
Power Divider	Agilent	87302C	3239A00760	N.C.R.	-----
Test Site	ATL	TE02	TE02	N.C.R.	-----

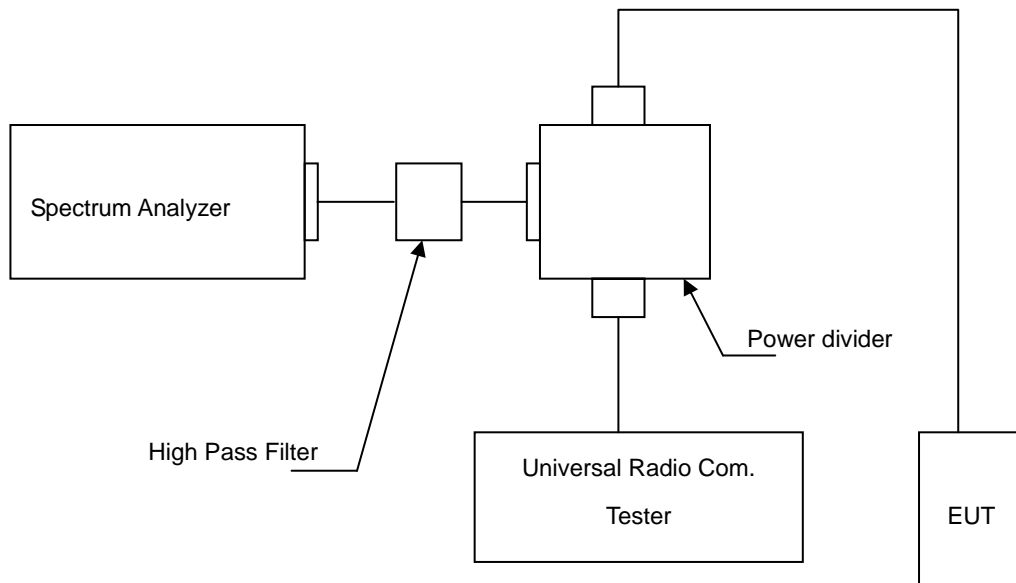
Note: N.C.R. = No Calibration Request.

■ Setup

Below 2.8GHz



Above 2.8GHz



■ **Test Procedure**

1. The EUT was connected to Spectrum Analyzer and Base Station via Power Divider.
2. The middle channel for the highest RF power within the transmitting frequency was measured.
3. The conducted spurious emission for the whole frequency range was taken.

■ **Uncertainty**

The measurement uncertainty is evaluated as ± 2.24 dB.

■ **Test Result**

Test Mode	Mode 1 / Mode 2 / Mode 4 / Mode 5
Date of Test	10/20/2016, 10/21/2016

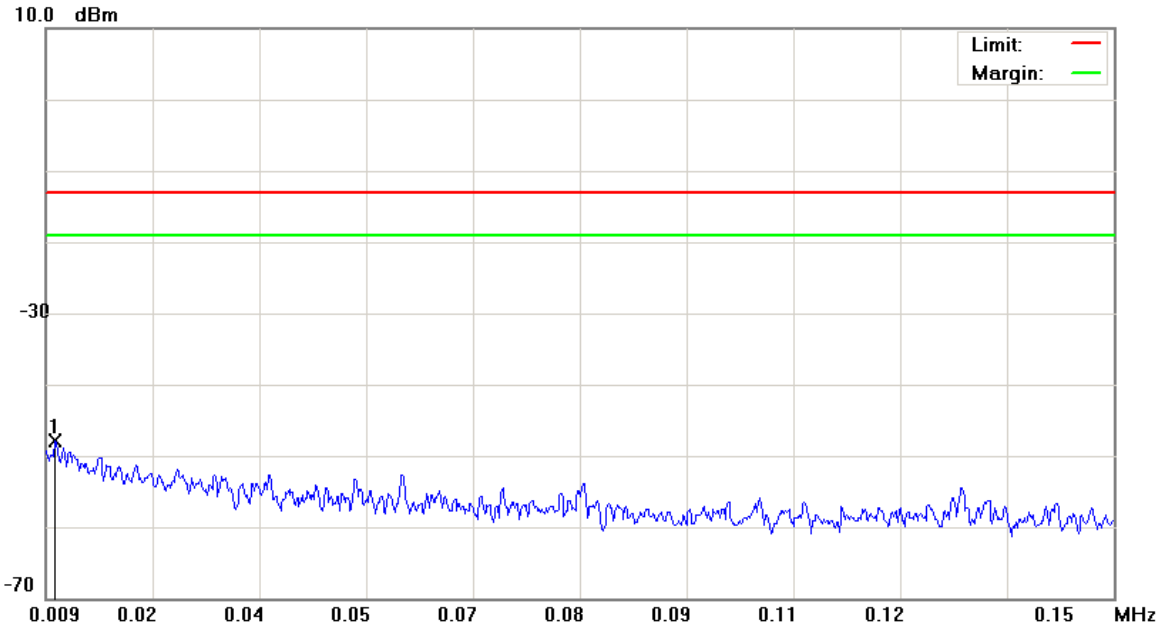


File :Module_EC20-A(CH128)

Data :#1

Date: 2016/10/20

Time: 下午 02:06:50



Site: site #1
 Limit: FCC Part 22 conducted(9k-12.75G)
 EUT: Industrial M2M Cellular Serial Gateway
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: GPRS 850
 Note:

Polarization: **Conducted**
 Power: DC 12V
 Distance:

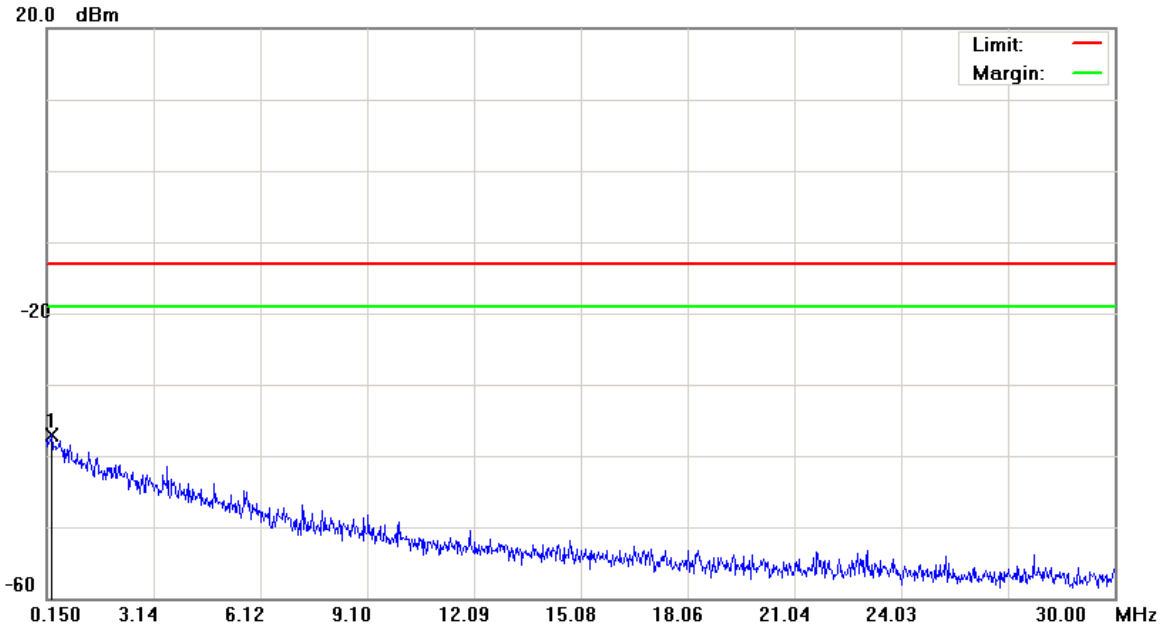
Temperature: 26 °C
 Humidity: 55 %
 RBW: 1 KHz VBW: 3 KHz

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Comment
1	*	0.0103	-78.49	30.57	-47.92	-13.00	-34.92	peak		

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH128) Data :#2 Date: 2016/10/20 Time: 下午 02:07:14



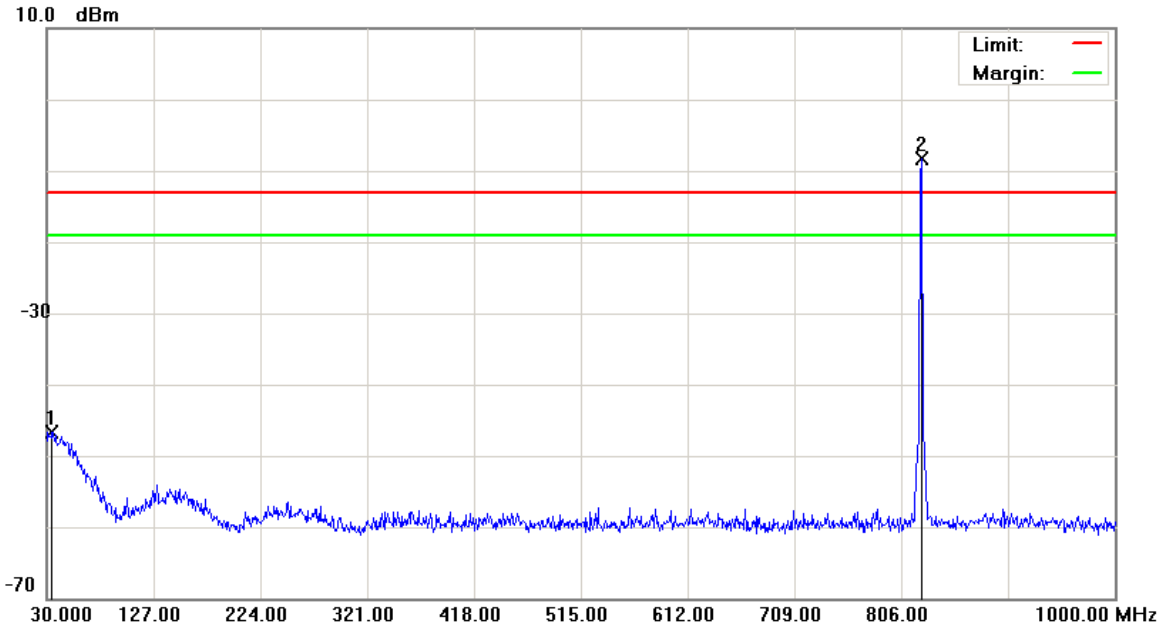
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 22 conducted(9k-12.75G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 10 KHz VBW: 30 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: GPRS 850
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Detector	Comment
1	*	0.2993	-68.73	31.73	-37.00	-13.00	-24.00			peak	

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH128) Data :#3 Date: 2016/10/20 Time: 下午 02:07:38



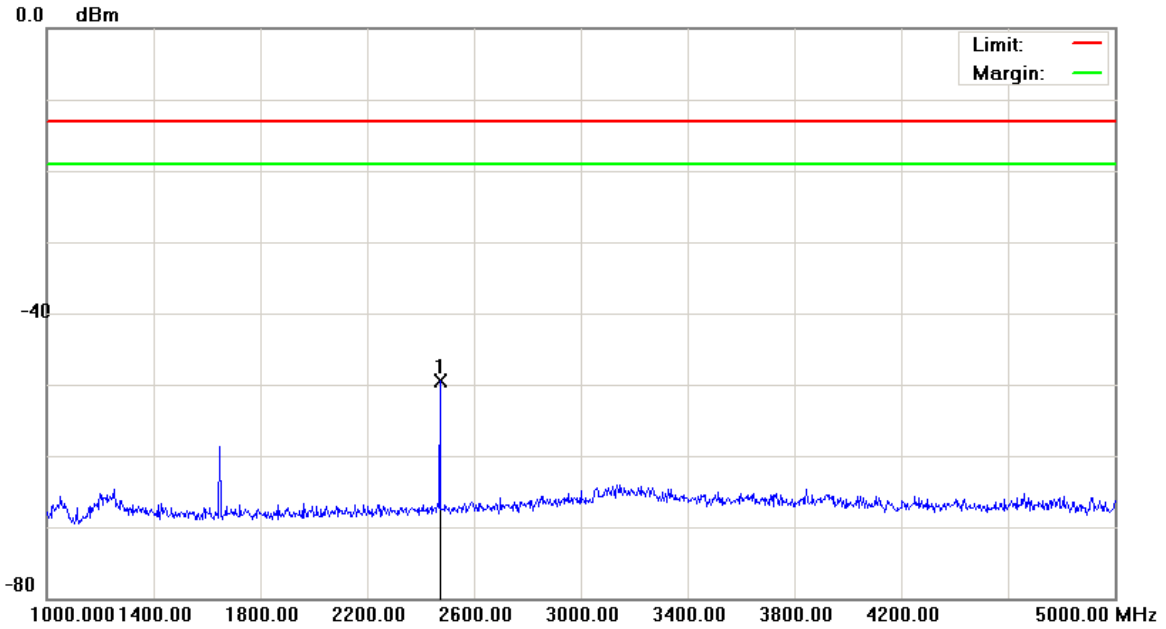
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 22 conducted(9k-12.75G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 100 KHz VBW: 300 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: GPRS 850
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree degree	Detector	Comment
1		34.8500	-63.33	16.66	-46.67	-13.00	-33.67			peak	
2	*	824.4300	-12.07	3.84	-8.23	-13.00	4.77			peak	Tx

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH128) Data :#4 Date: 2016/10/20 Time: 下午 03:05:22



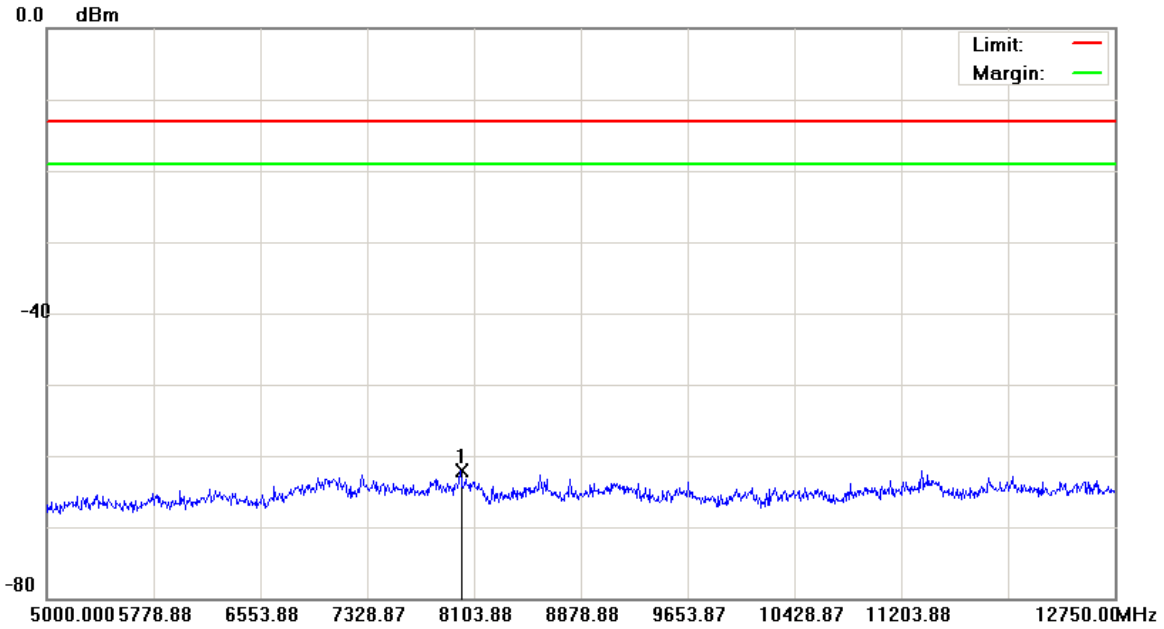
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 22 conducted(9k-12.75G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 1000 KHz VBW: 3000 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: GPRS 850
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Detector	Comment
1	*	2472.000	-53.97	4.45	-49.52	-13.00	-36.52			peak	

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH128) Data :#5 Date: 2016/10/20 Time: 下午 03:05:45



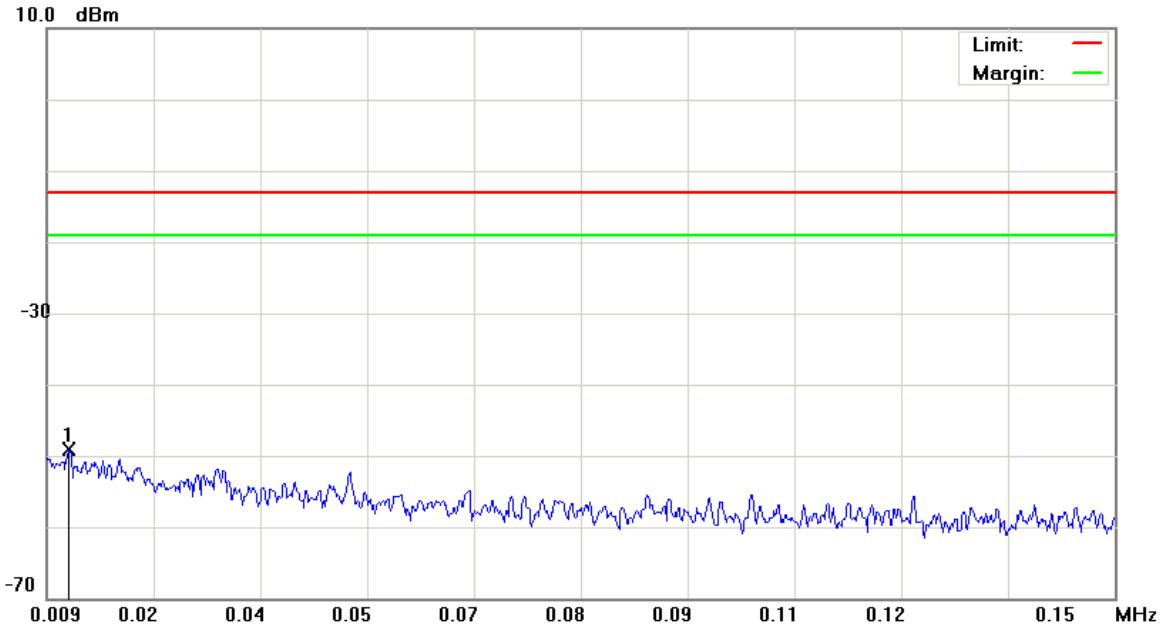
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 22 conducted(9k-12.75G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 1000 KHz VBW: 3000 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: GPRS 850
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Comment
1	*	8003.125	-67.74	5.56	-62.18	-13.00	-49.18			peak

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH190) Data :#1 Date: 2016/10/20 Time: 下午 02:08:59



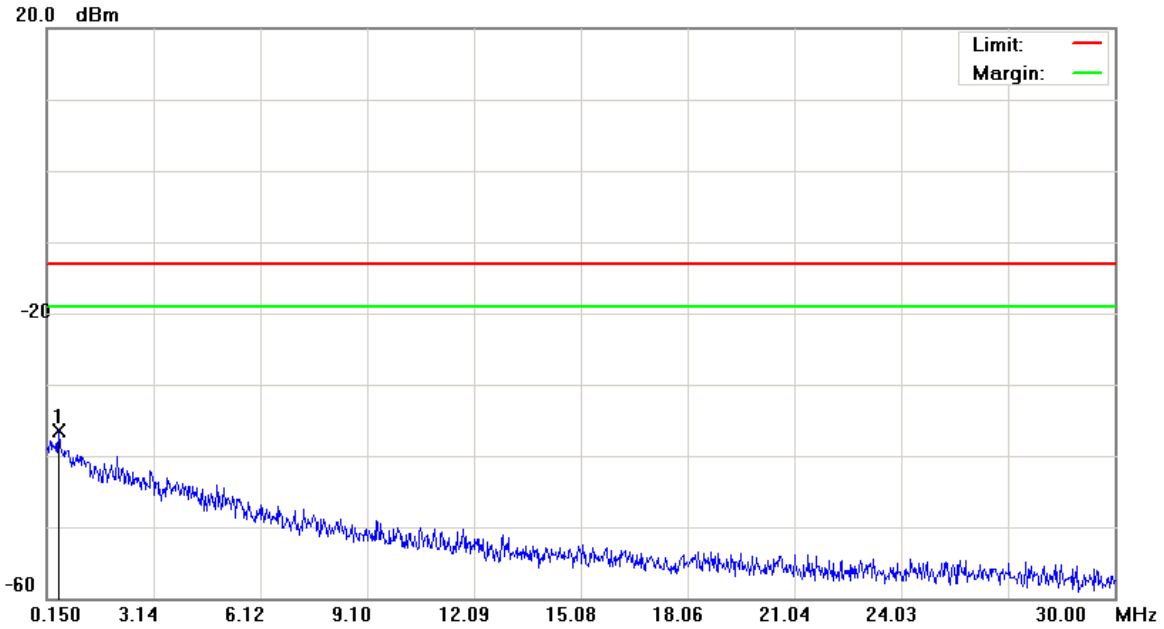
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 22 conducted(9k-12.75G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 1 KHz VBW: 3 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: GPRS 850
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Comment
1	*	0.0120	-79.70	30.57	-49.13	-13.00	-36.13	peak		

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH190) Data :#2 Date: 2016/10/20 Time: 下午 02:09:23



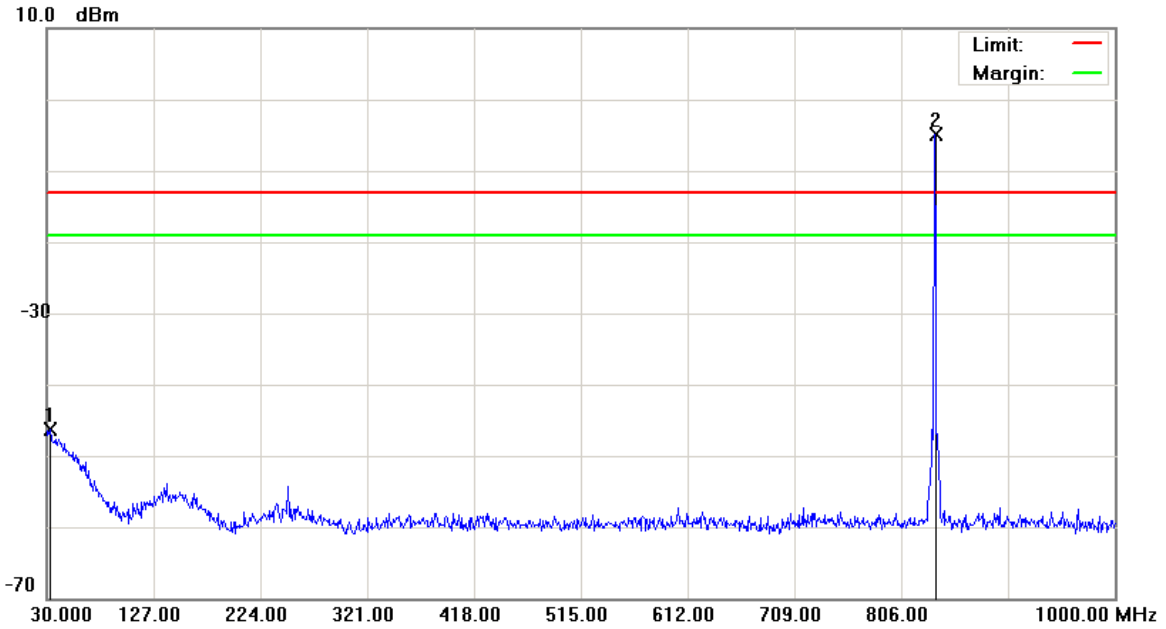
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 22 conducted(9k-12.75G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 10 KHz VBW: 30 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: GPRS 850
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Detector	Comment
1	*	0.4784	-68.46	31.99	-36.47	-13.00	-23.47			peak	

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH190) Data :#3 Date: 2016/10/20 Time: 下午 02:09:47



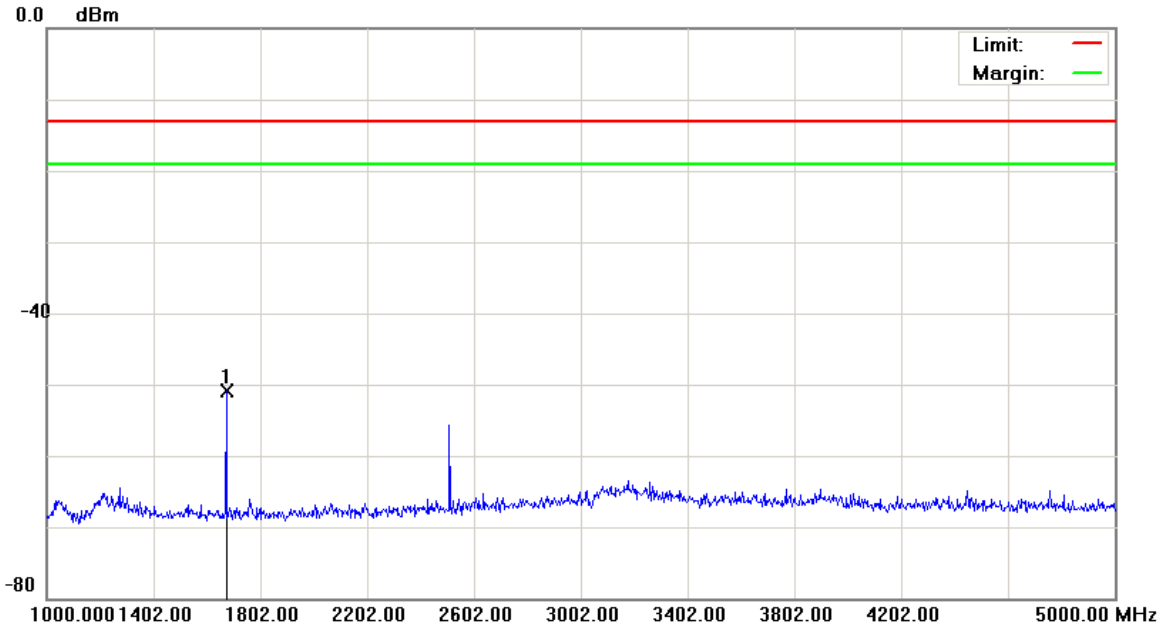
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 22 conducted(9k-12.75G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 100 KHz VBW: 300 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: GPRS 850
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree degree	Comment
1		32.9100	-63.27	16.88	-46.39	-13.00	-33.39	peak		
2	*	836.5550	-8.81	3.96	-4.85	-13.00	8.15	peak		Tx

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH190) Data :#4 Date: 2016/10/20 Time: 下午 03:06:18



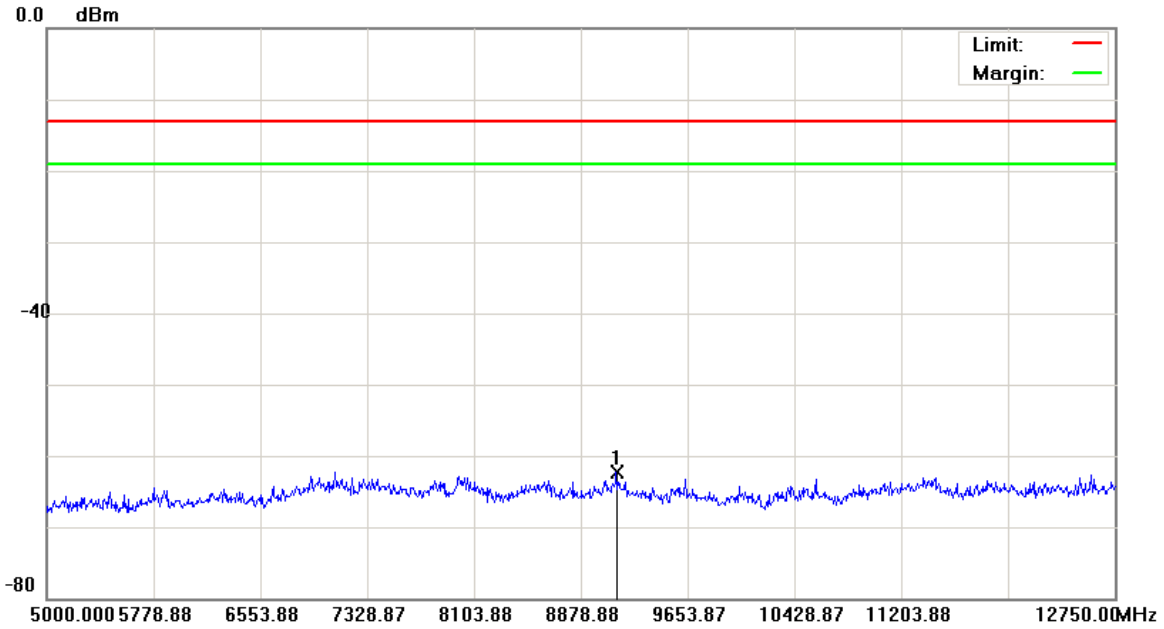
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 22 conducted(9k-12.75G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 1000 KHz VBW: 3000 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: GPRS 850
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Comment
1	*	1674.000	-55.41	4.46	-50.95	-13.00	-37.95	peak		

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH190) Data :#5 Date: 2016/10/20 Time: 下午 03:06:41



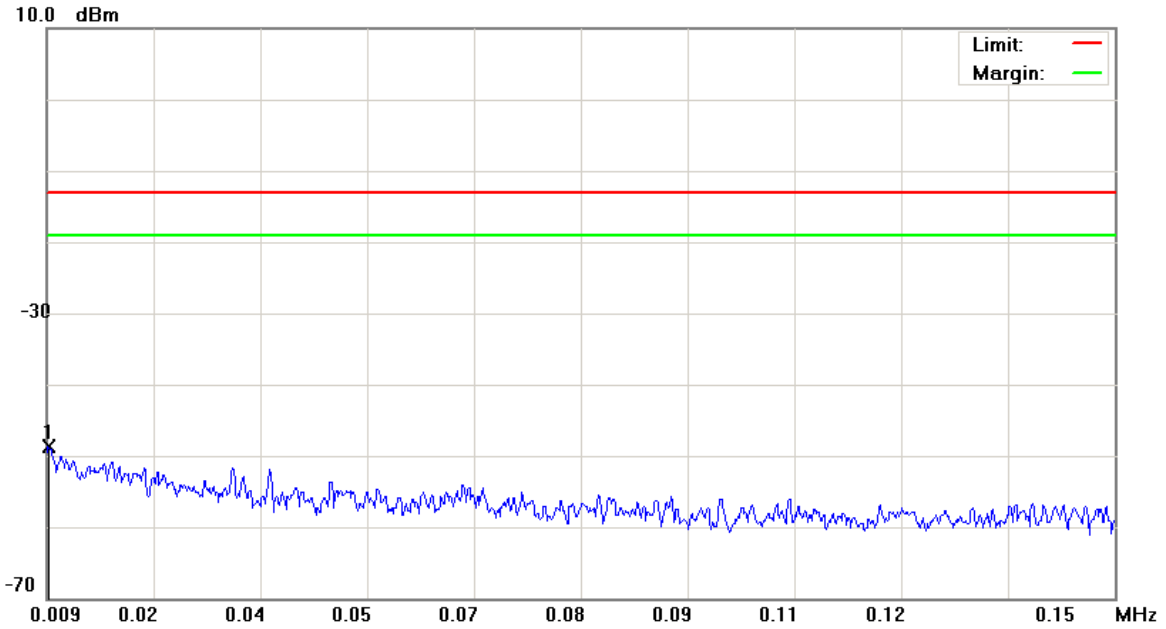
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 22 conducted(9k-12.75G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 1000 KHz VBW: 3000 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: GPRS 850
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Detector	Comment
1	*	9134.625	-68.10	5.90	-62.20	-13.00	-49.20			peak	

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH251) Data :#1 Date: 2016/10/20 Time: 下午 02:10:58



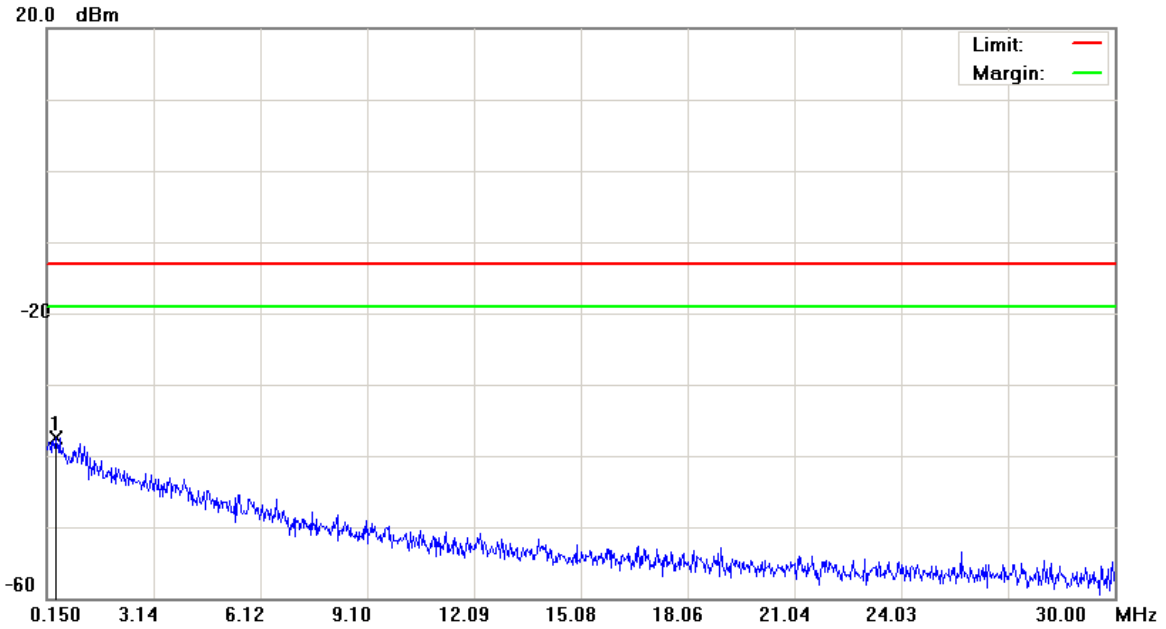
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 22 conducted(9k-12.75G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 1 KHz VBW: 3 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: GPRS 850
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Comment
1	*	0.0092	-79.32	30.58	-48.74	-13.00	-35.74	peak		

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH251) Data :#2 Date: 2016/10/20 Time: 下午 02:11:22



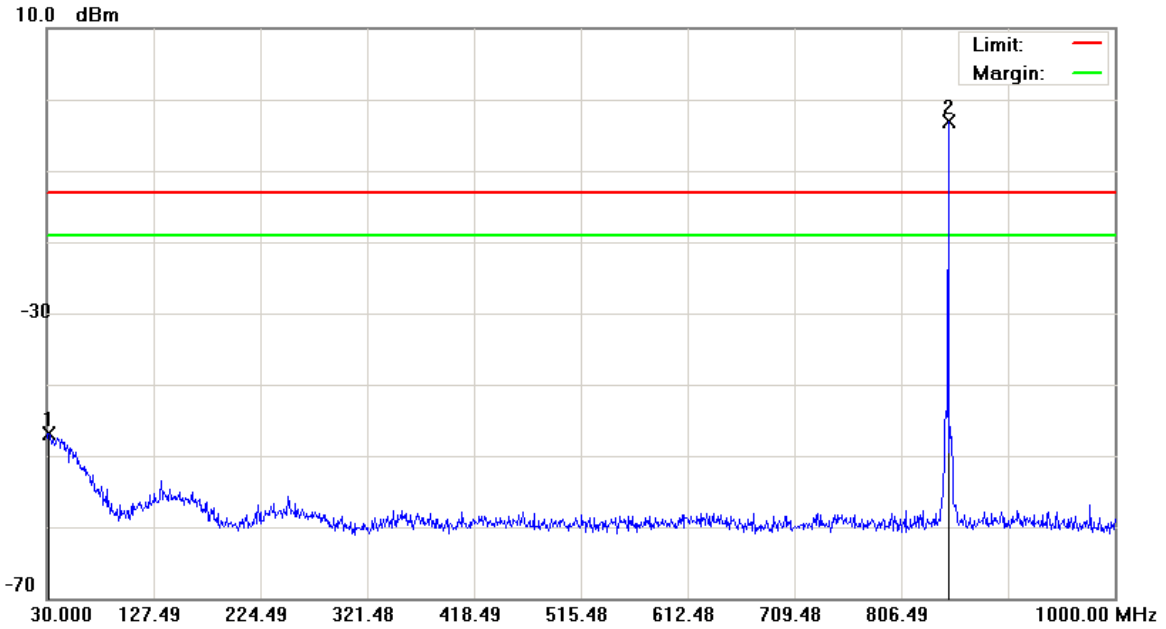
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 22 conducted(9k-12.75G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 10 KHz VBW: 30 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: GPRS 850
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Degree	Comment
1	*	0.4037	-69.33	31.91	-37.42	-13.00	-24.42				peak

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH251) Data :#3 Date: 2016/10/20 Time: 下午 02:11:46



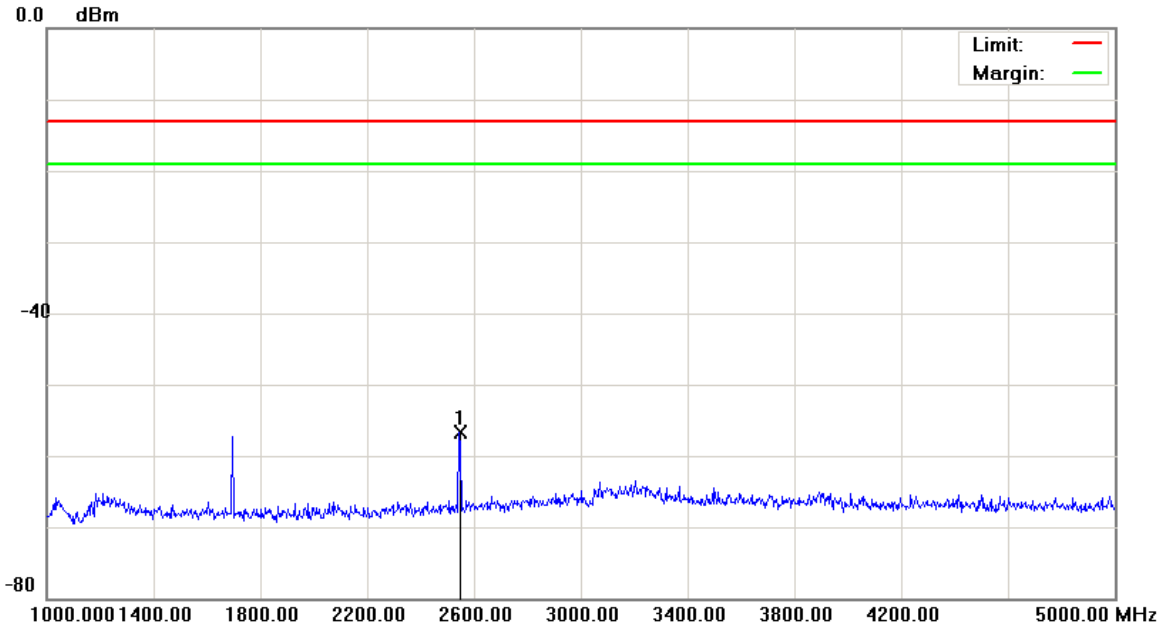
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 22 conducted(9k-12.75G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 100 KHz VBW: 300 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: GPRS 850
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree degree	Detector	Comment
1		31.4550	-63.95	17.05	-46.90	-13.00	-33.90			peak	
2	*	848.6800	-7.16	3.98	-3.18	-13.00	9.82			peak	Tx

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH251) Data :#4 Date: 2016/10/20 Time: 下午 03:07:15



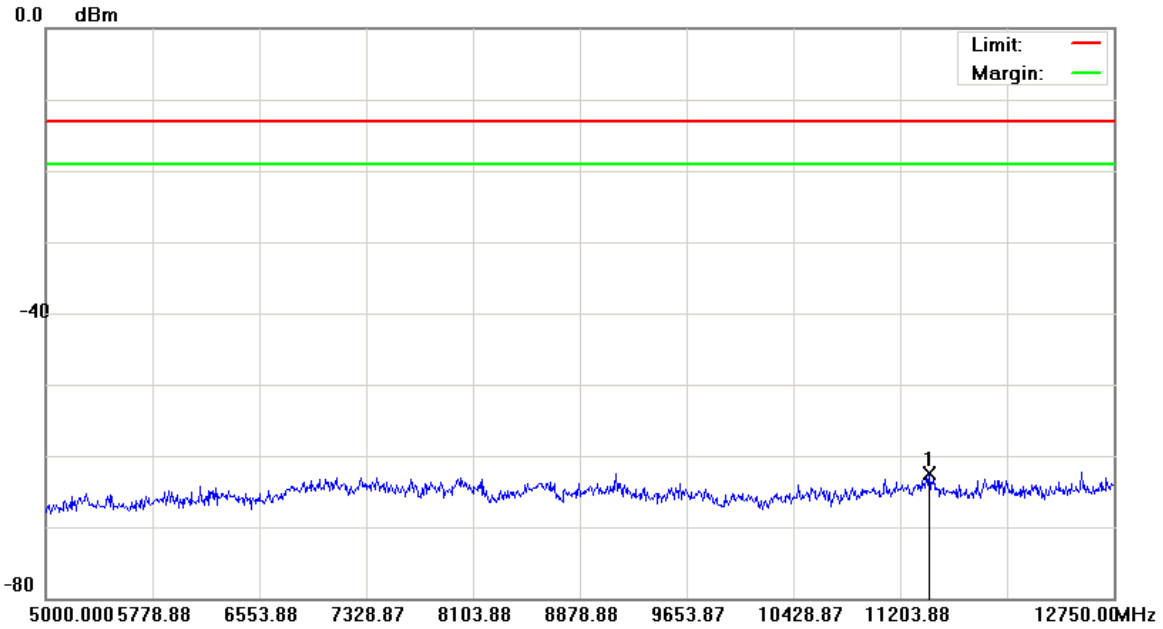
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 22 conducted(9k-12.75G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 1000 KHz VBW: 3000 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: GPRS 850
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Detector	Comment
1	*	2546.000	-61.18	4.45	-56.73	-13.00	-43.73			peak	

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH251) Data :#5 Date: 2016/10/20 Time: 下午 03:07:38



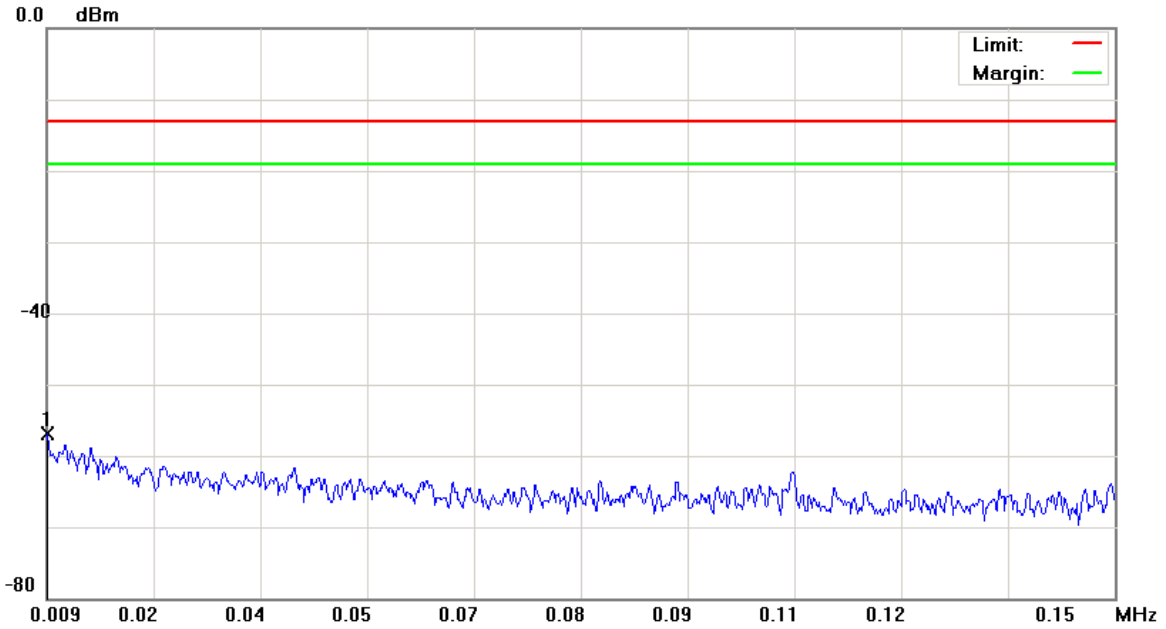
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 22 conducted(9k-12.75G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 1000 KHz VBW: 3000 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: GPRS 850
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Comment
1	*	11409.250	-67.96	5.56	-62.40	-13.00	-49.40	peak		

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH512) Data :#1 Date: 2016/10/20 Time: 下午 01:55:45



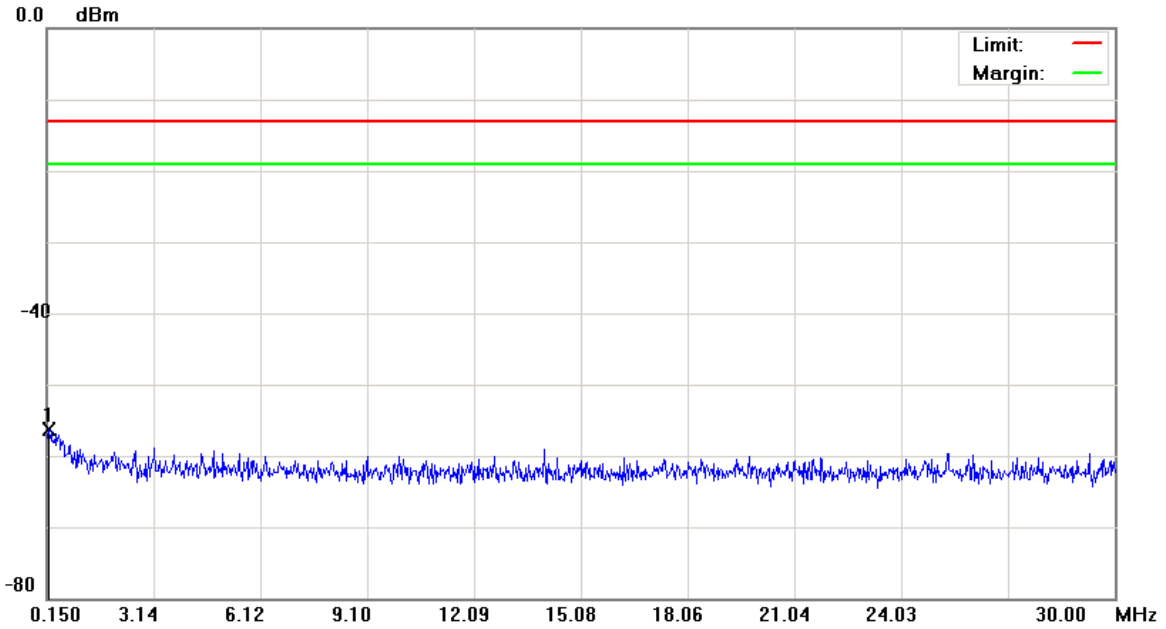
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 24 conducted(9k-26.5G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 1 KHz VBW: 3 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: GPRS 1900
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Comment
1	*	0.0091	-68.30	11.32	-56.98	-13.00	-43.98	peak		

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH512) Data :#2 Date: 2016/10/20 Time: 下午 01:56:09



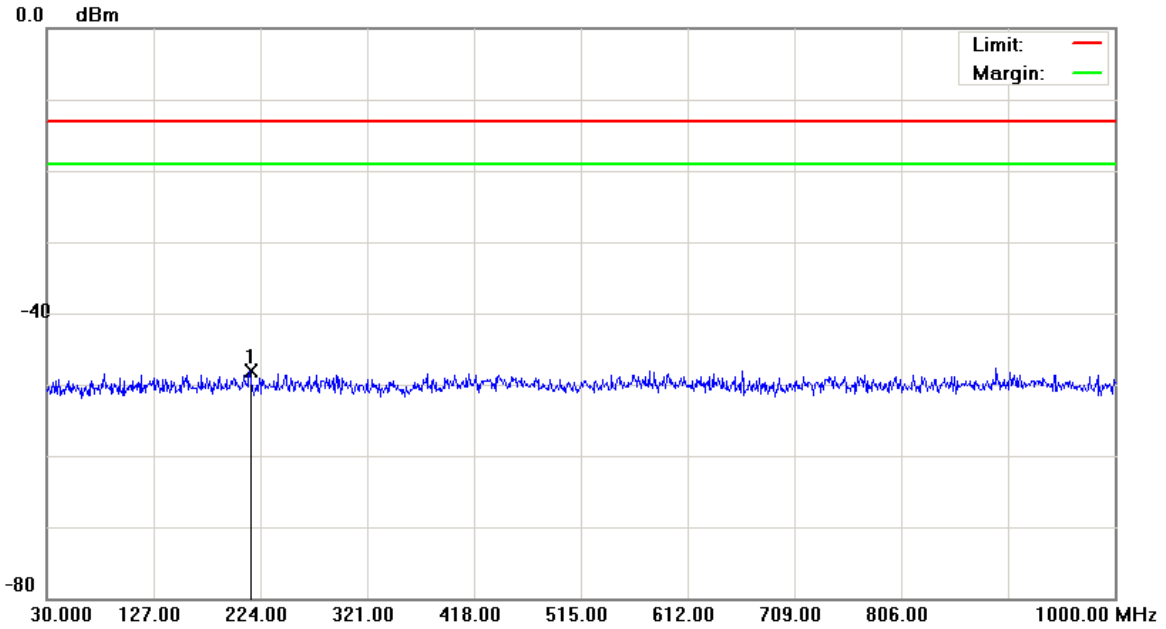
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 24 conducted(9k-26.5G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 10 KHz VBW: 30 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: GPRS 1900
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Comment
1	*	0.2097	-68.71	12.44	-56.27	-13.00	-43.27	peak		

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH512) Data :#3 Date: 2016/10/20 Time: 下午 01:56:33



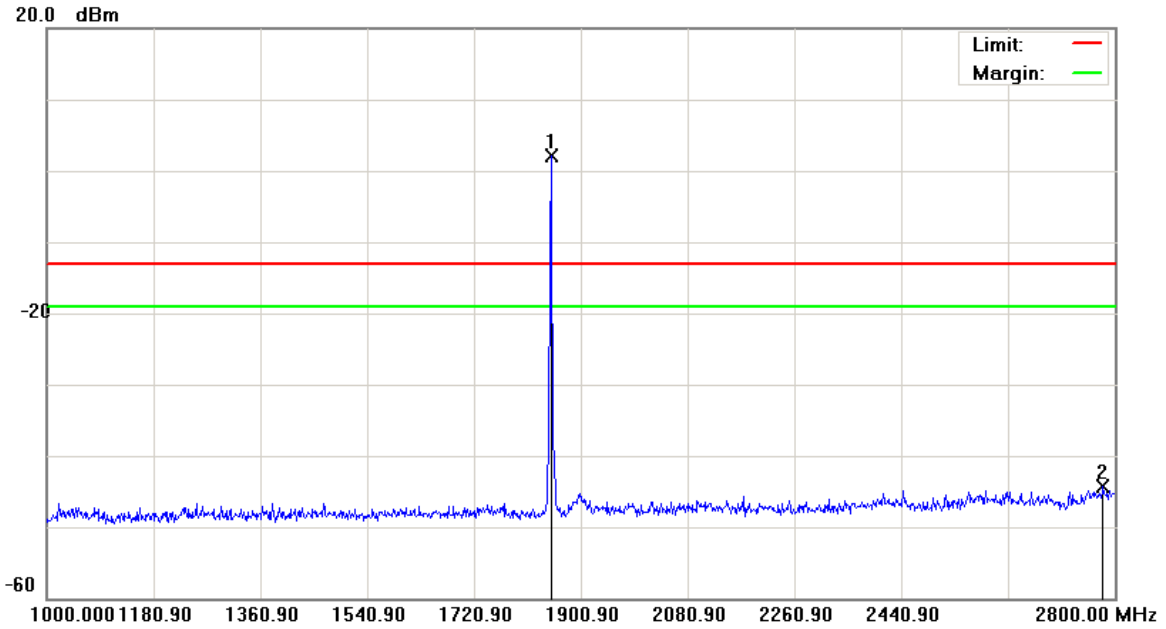
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 24 conducted(9k-26.5G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 100 KHz VBW: 300 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: GPRS 1900
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Comment
1	*	214.7850	-61.35	13.21	-48.14	-13.00	-35.14	peak		

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH512) Data :#4 Date: 2016/10/20 Time: 下午 02:01:28



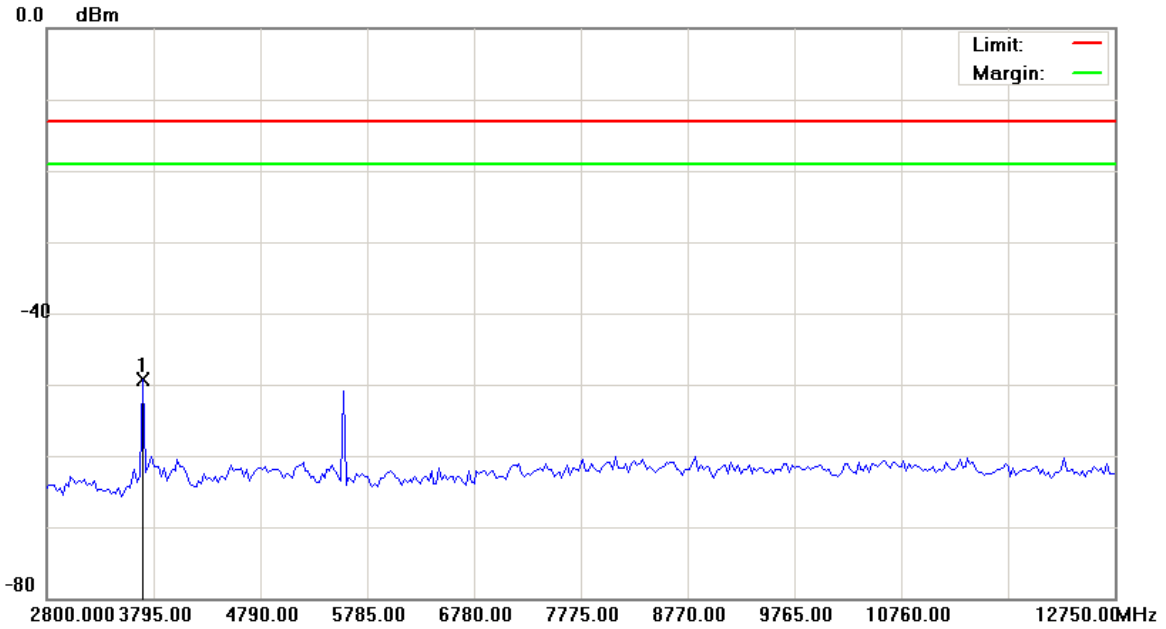
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 24 conducted(9k-26.5G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 1000 KHz VBW: 3000 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: GPRS 1900
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree degree	Detector	Comment
1	*	1850.500	-2.14	4.26	2.12	-13.00	15.12			peak	Tx
2		2780.200	-50.19	5.88	-44.31	-13.00	-31.31			peak	

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH512) Data :#5 Date: 2016/10/21 Time: 下午 05:15:44



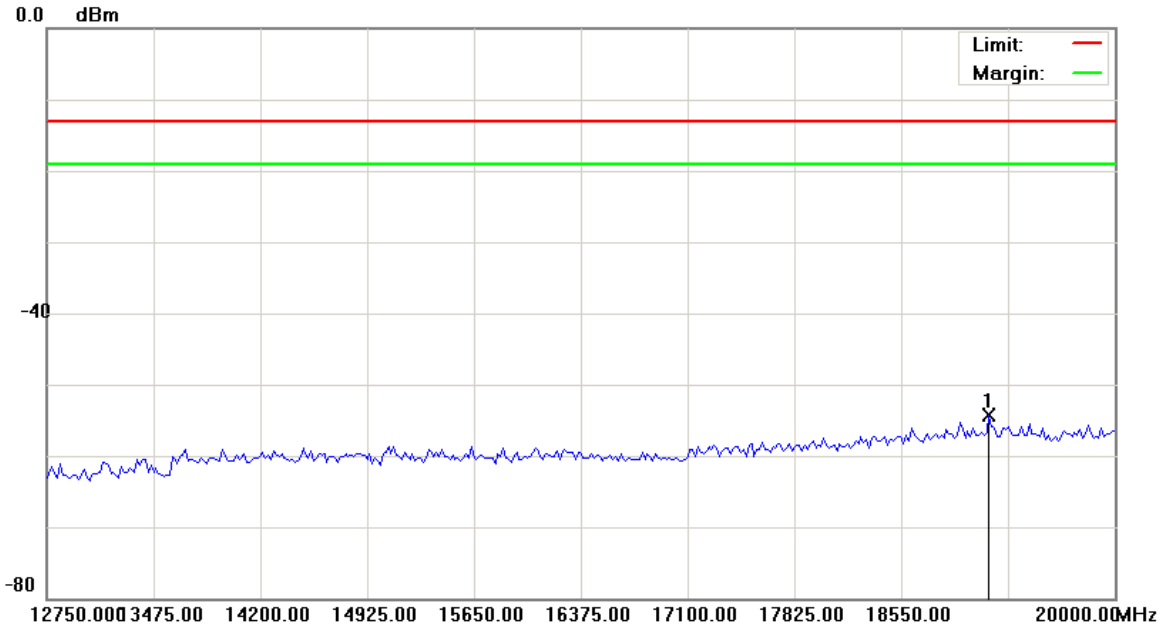
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 24 conducted(9k-26.5G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 1000 KHz VBW: 3000 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: GPRS 1900
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Detector	Comment
1	*	3695.500	-54.21	4.87	-49.34	-13.00	-36.34			peak	

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH512) Data :#6 Date: 2016/10/21 Time: 下午 05:16:02



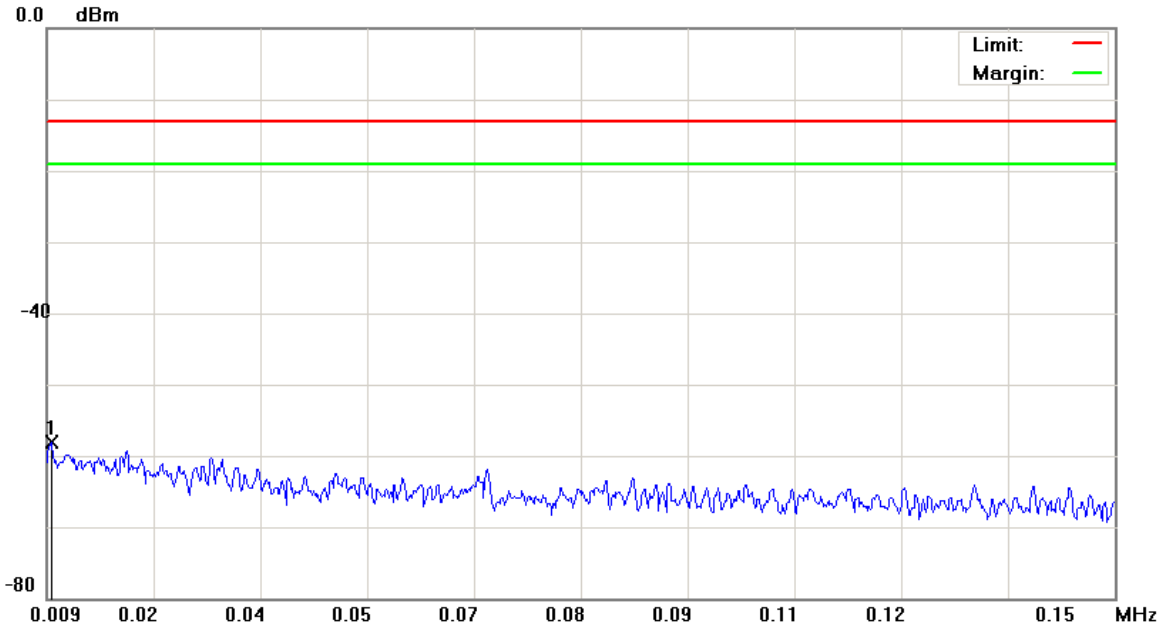
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 24 conducted(9k-26.5G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 1000 KHz VBW: 3000 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: GPRS 1900
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Comment
1	*	19148.125	-61.59	7.20	-54.39	-13.00	-41.39	peak		

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH661) Data :#1 Date: 2016/10/20 Time: 下午 01:57:27



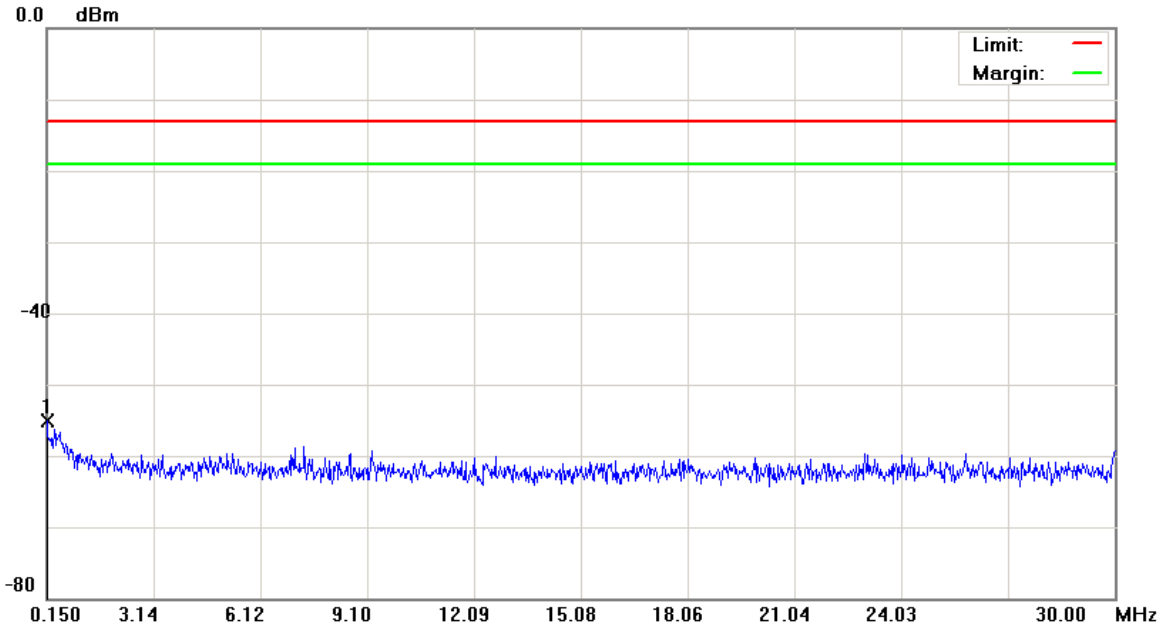
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 24 conducted(9k-26.5G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 1 KHz VBW: 3 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: GPRS 1900
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Comment
1	*	0.0096	-69.51	11.33	-58.18	-13.00	-45.18			peak

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH661) Data :#2 Date: 2016/10/20 Time: 下午 01:57:51



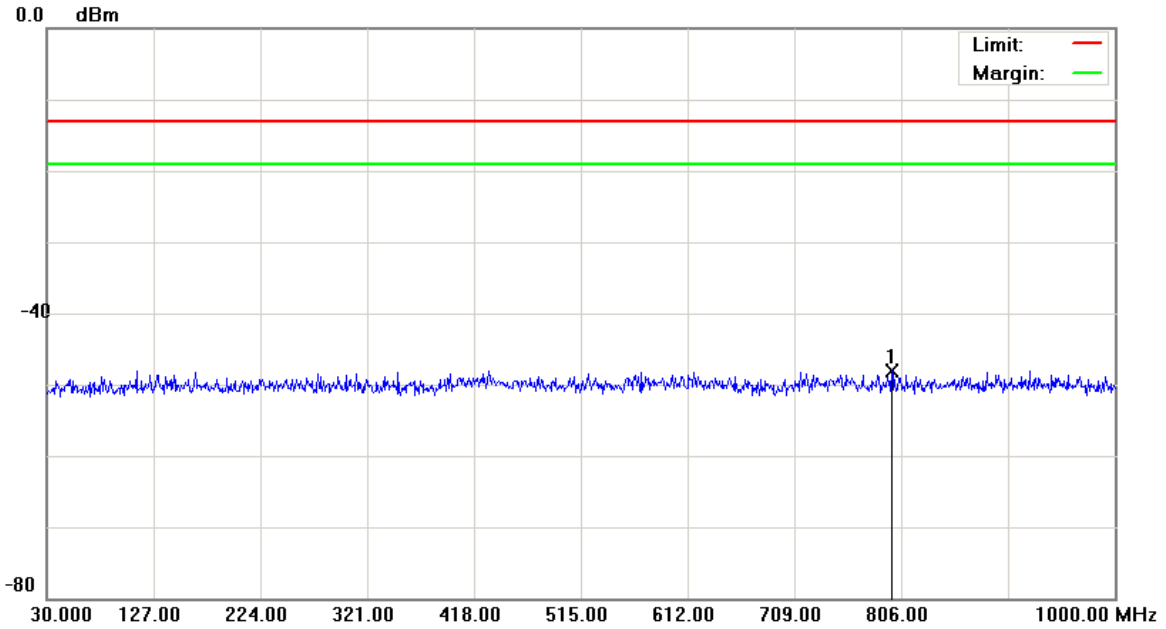
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 24 conducted(9k-26.5G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 10 KHz VBW: 30 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: GPRS 1900
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Detector	Comment
1	*	0.1500	-67.54	12.47	-55.07	-13.00	-42.07			peak	

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH661) Data :#3 Date: 2016/10/20 Time: 下午 01:58:15



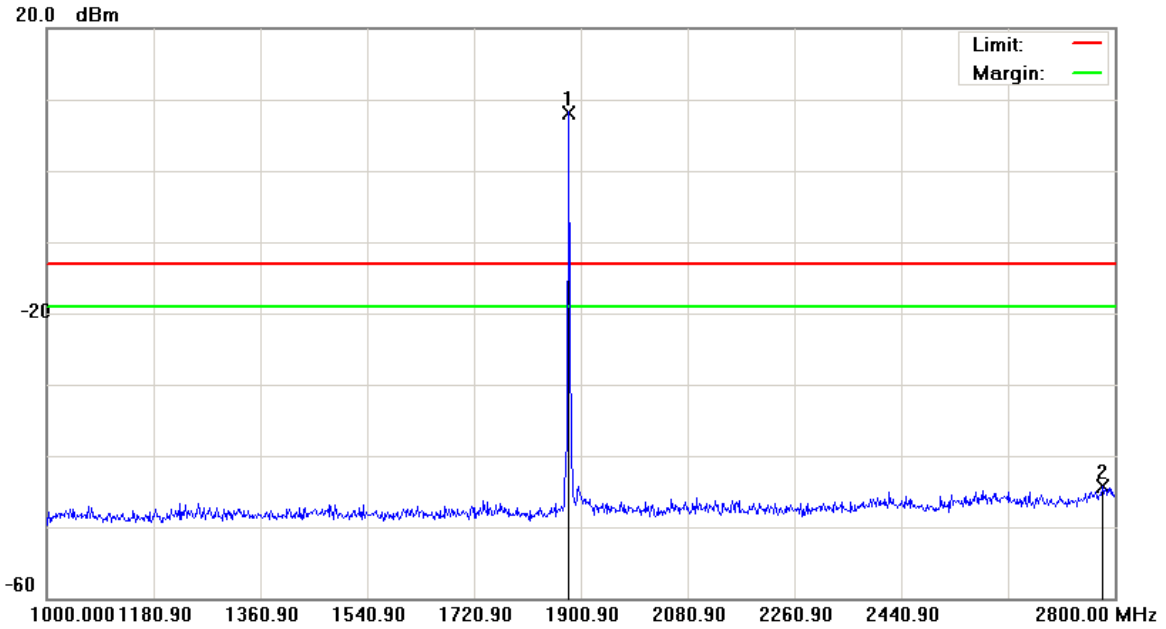
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 24 conducted(9k-26.5G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 100 KHz VBW: 300 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: GPRS 1900
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Comment
1	*	797.2700	-61.18	13.18	-48.00	-13.00	-35.00	Detector		peak

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH661) Data :#4 Date: 2016/10/20 Time: 下午 02:02:48



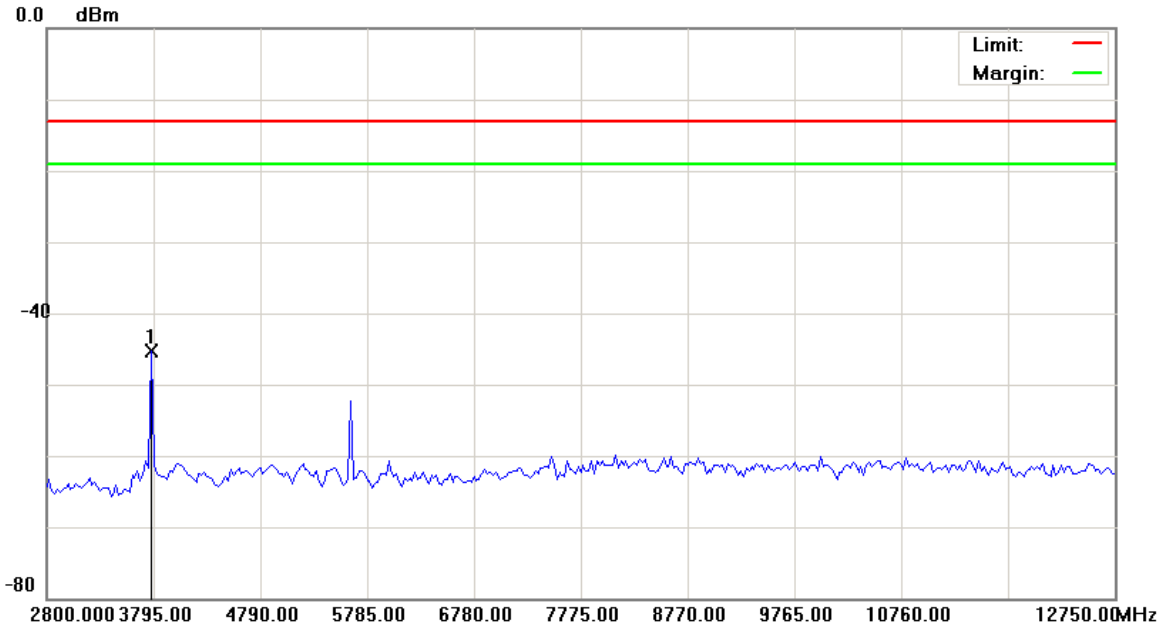
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 24 conducted(9k-26.5G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 1000 KHz VBW: 3000 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: GPRS 1900
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Detector	Antenna Height cm	Table Degree degree	Comment
1	*	1880.200	3.55	4.65	8.20	-13.00	21.20	peak			Tx
2		2780.200	-50.17	5.88	-44.29	-13.00	-31.29	peak			

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH661) Data :#5 Date: 2016/10/21 Time: 下午 05:16:32



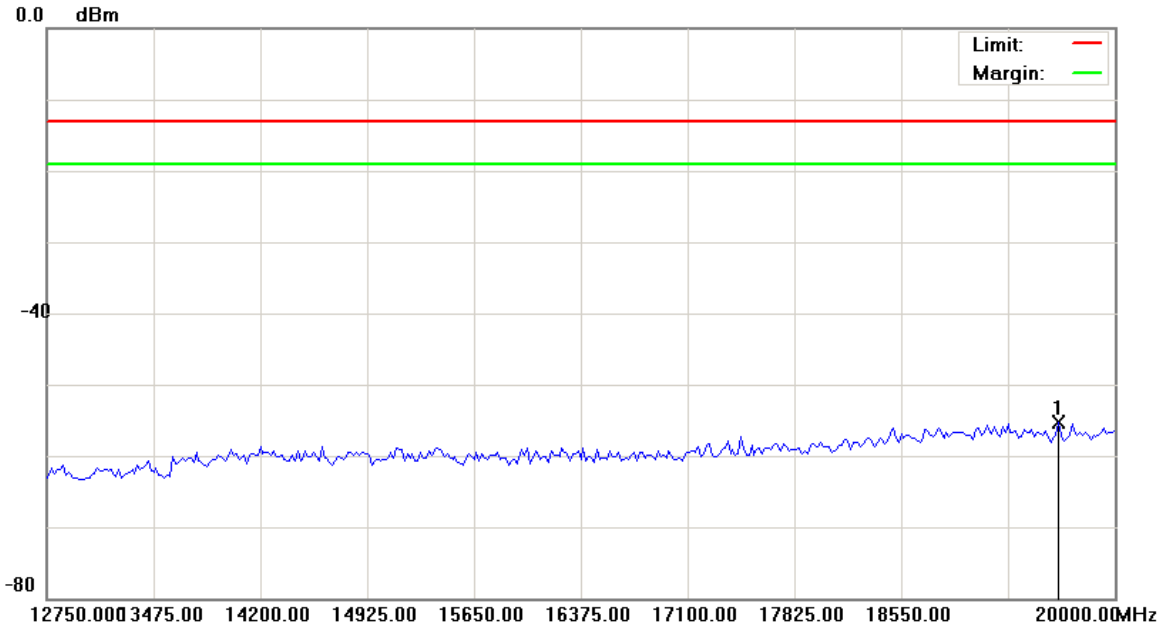
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 24 conducted(9k-26.5G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 1000 KHz VBW: 3000 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: GPRS 1900
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Detector	Comment
1	*	3770.125	-50.31	4.93	-45.38	-13.00	-32.38			peak	

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH661) Data :#6 Date: 2016/10/21 Time: 下午 05:16:51



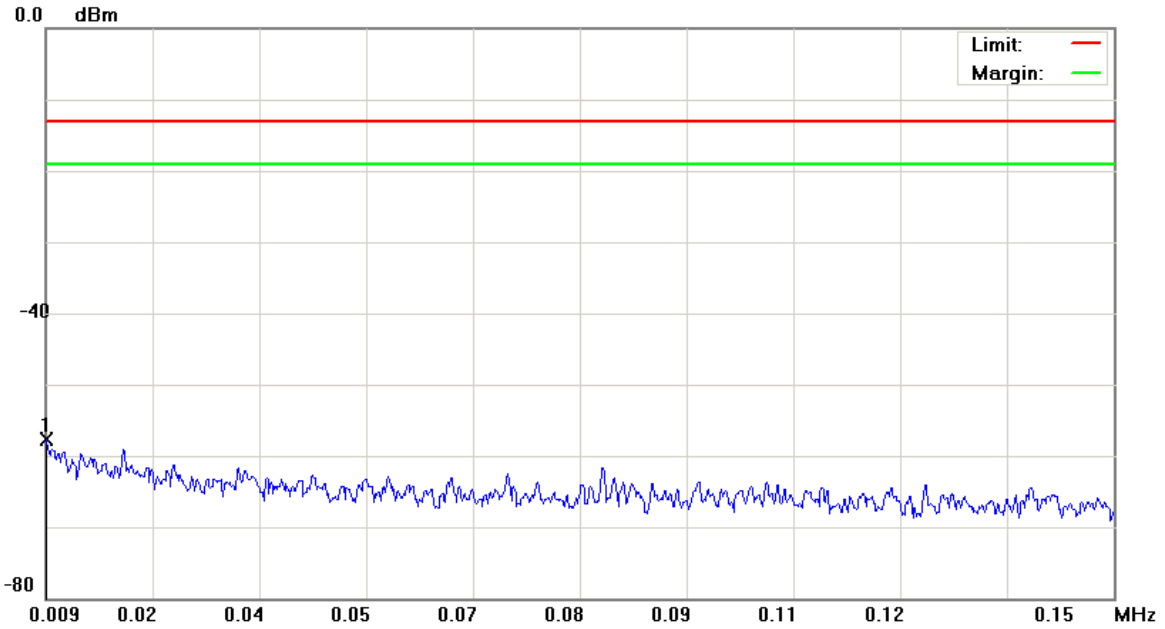
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 24 conducted(9k-26.5G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 1000 KHz VBW: 3000 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: GPRS 1900
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Detector	Comment
1	*	19619.375	-62.58	7.33	-55.25	-13.00	-42.25			peak	

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH810) Data :#1 Date: 2016/10/20 Time: 下午 01:58:58



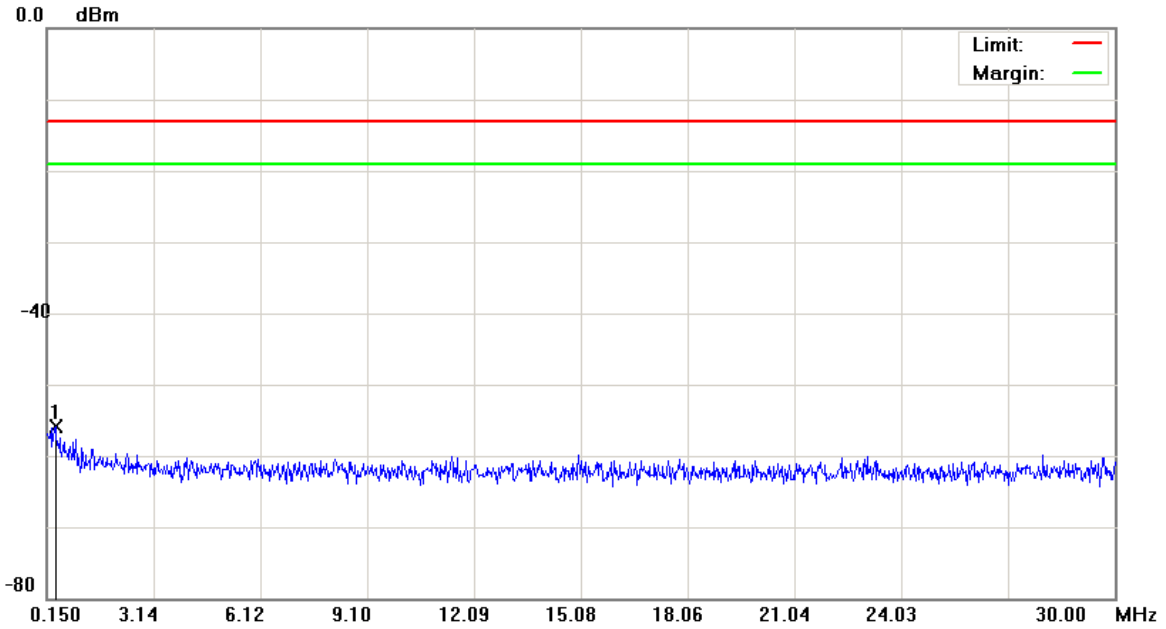
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 24 conducted(9k-26.5G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 1 KHz VBW: 3 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: GPRS 1900
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Comment
1	*	0.0091	-69.11	11.32	-57.79	-13.00	-44.79	peak		

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH810) Data :#2 Date: 2016/10/20 Time: 下午 01:59:22



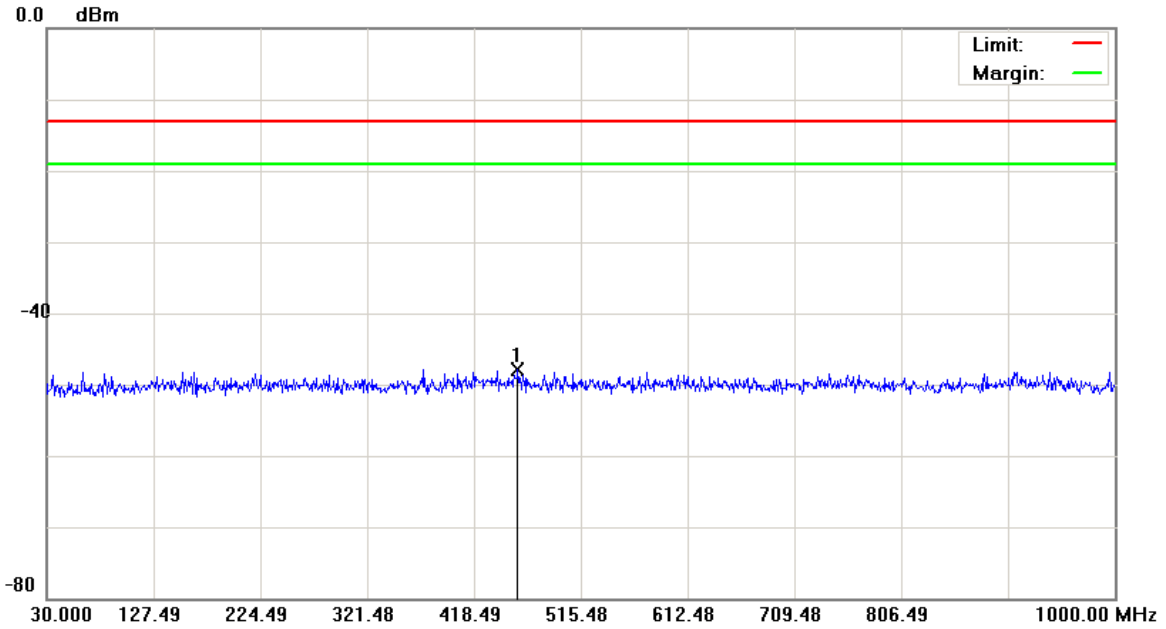
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 24 conducted(9k-26.5G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 10 KHz VBW: 30 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: GPRS 1900
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Comment
1	*	0.3888	-68.74	12.79	-55.95	-13.00	-42.95	peak		

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH810) Data :#3 Date: 2016/10/20 Time: 下午 01:59:46



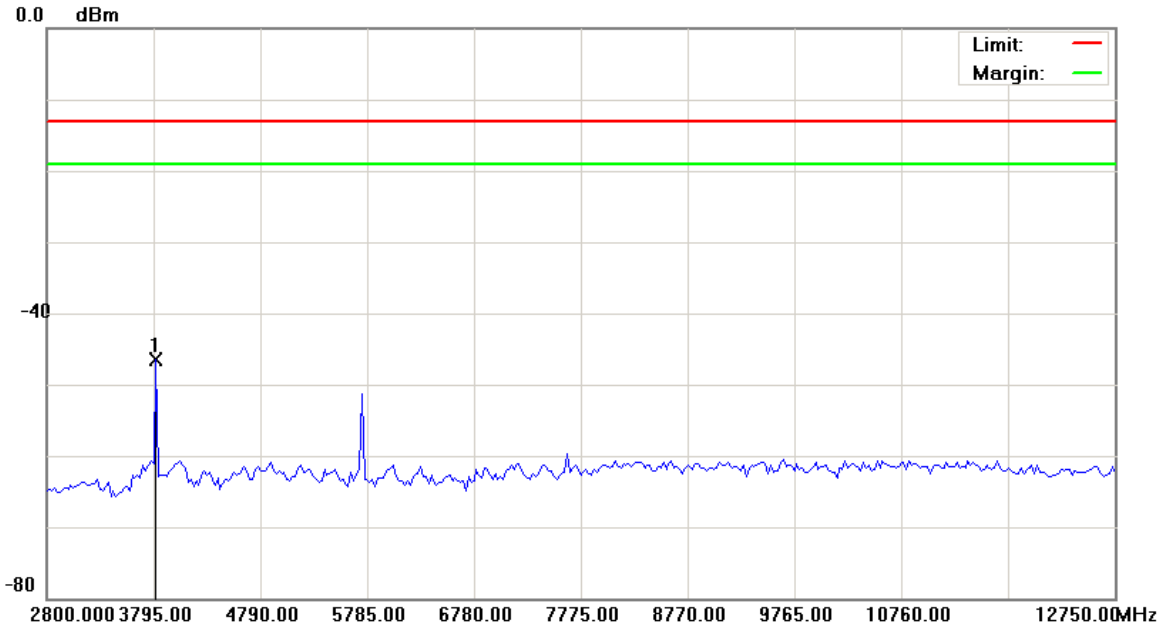
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 24 conducted(9k-26.5G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 100 KHz VBW: 300 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: GPRS 1900
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Comment
1	*	457.7700	-61.11	13.21	-47.90	-13.00	-34.90			peak

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH810) Data :#5 Date: 2016/10/21 Time: 下午 05:18:29



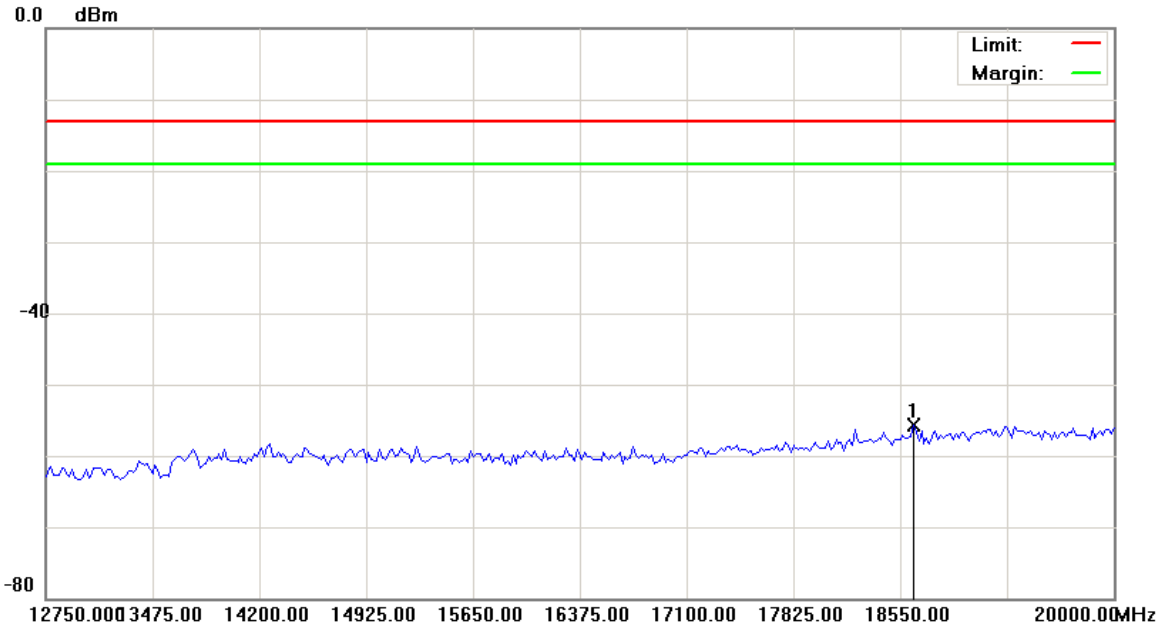
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 24 conducted(9k-26.5G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 1000 KHz VBW: 3000 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: GPRS 1900
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Detector	Comment
1	*	3819.875	-51.36	4.91	-46.45	-13.00	-33.45			peak	

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH810) Data :#6 Date: 2016/10/21 Time: 下午 05:18:48



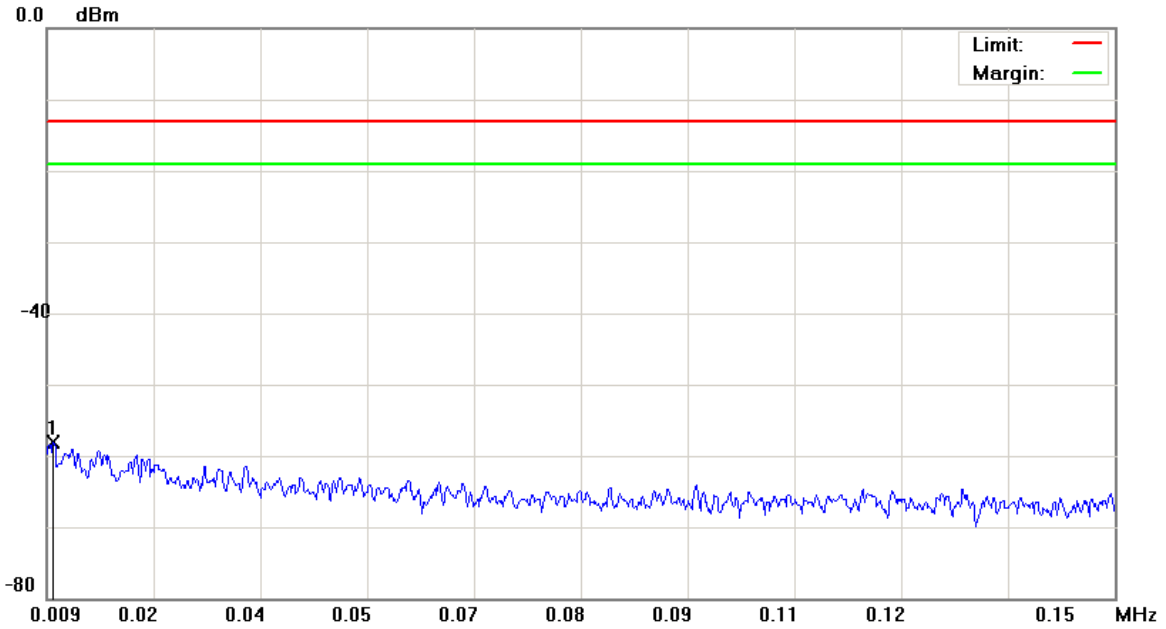
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 24 conducted(9k-26.5G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 1000 KHz VBW: 3000 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: GPRS 1900
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Comment
1	*	18640.625	-62.84	7.05	-55.79	-13.00	-42.79	peak		

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH9262) Data :#1 Date: 2016/10/20 Time: 下午 02:24:24



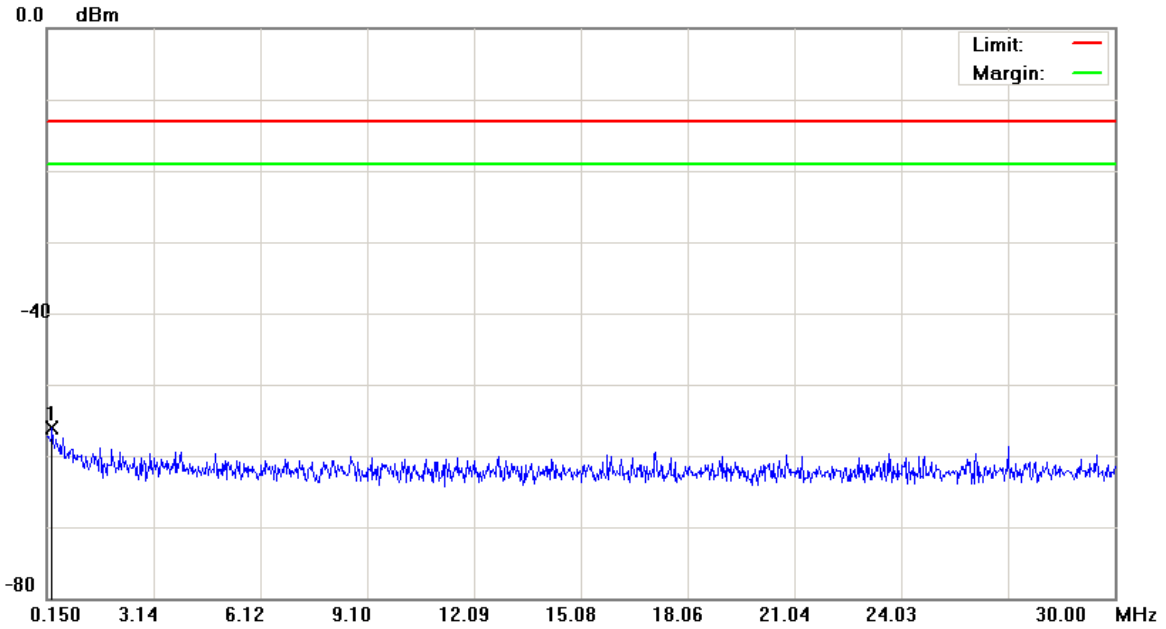
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 24 conducted(9k-26.5G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 1 KHz VBW: 3 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: WCDMA Band II
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Comment
1	*	0.0098	-69.38	11.33	-58.05	-13.00	-45.05			peak

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH9262) Data :#2 Date: 2016/10/20 Time: 下午 02:24:48



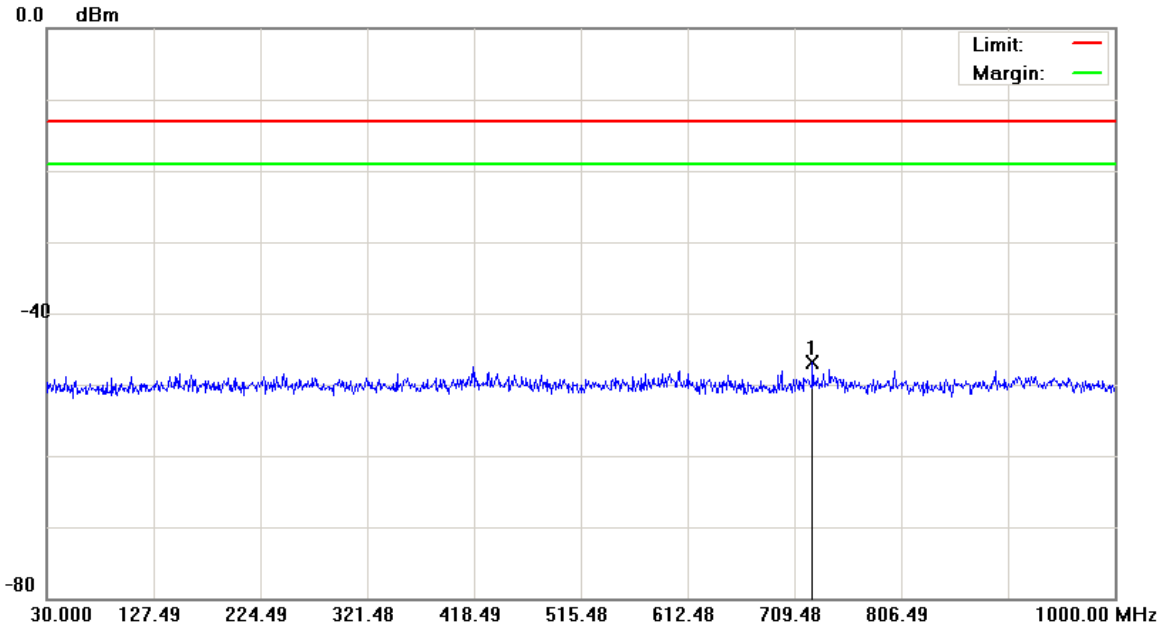
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 24 conducted(9k-26.5G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 10 KHz VBW: 30 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: WCDMA Band II
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Comment
1	*	0.2993	-68.65	12.62	-56.03	-13.00	-43.03	peak		

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH9262) Data :#3 Date: 2016/10/20 Time: 下午 02:25:12



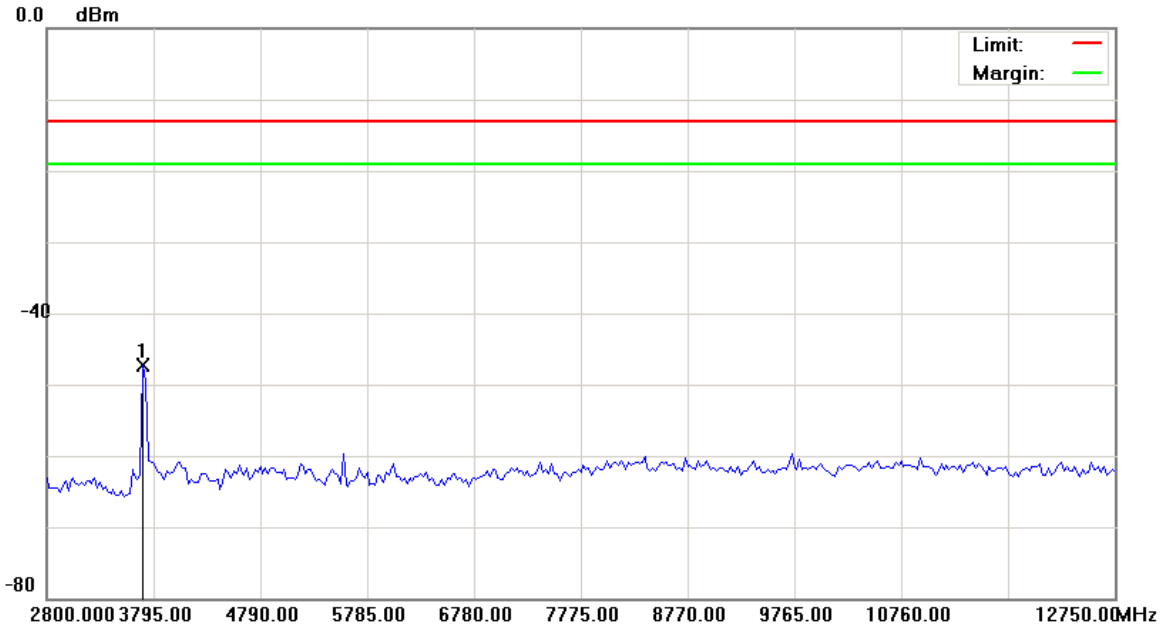
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 24 conducted(9k-26.5G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 100 KHz VBW: 300 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: WCDMA Band II
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Comment
1	*	725.4900	-60.11	13.13	-46.98	-13.00	-33.98			peak

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH9262) Data :#5 Date: 2016/10/21 Time: 下午 05:04:02



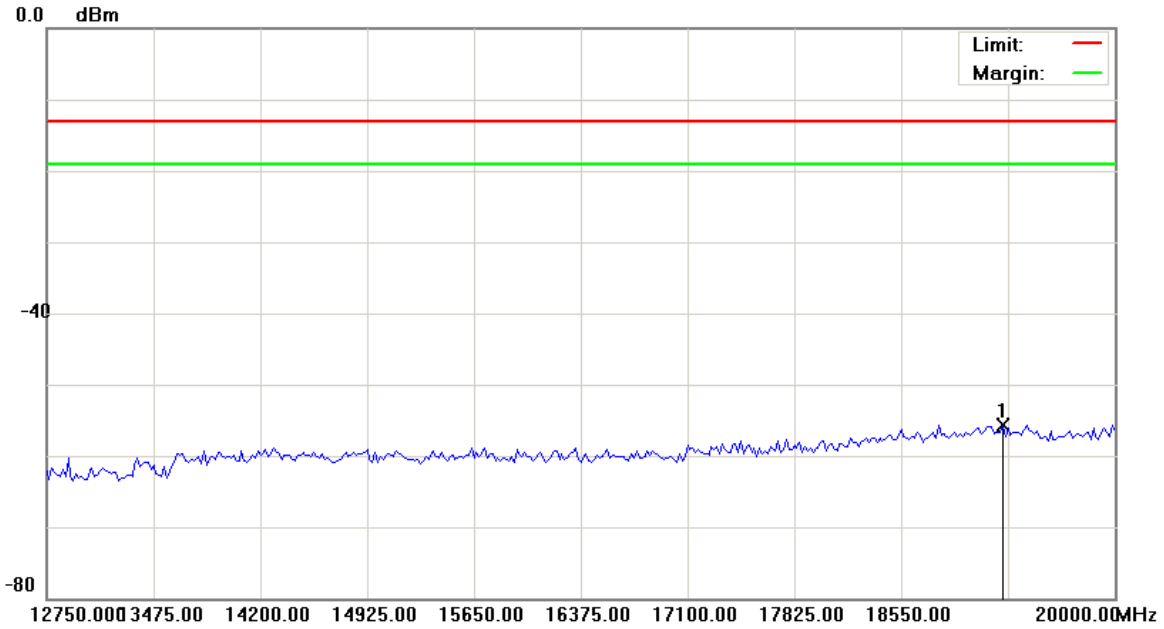
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 24 conducted(9k-26.5G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 1000 KHz VBW: 3000 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: WCDMA Band II
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Detector	Comment
1	*	3695.500	-52.18	4.87	-47.31	-13.00	-34.31			peak	

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH9262) Data :#6 Date: 2016/10/21 Time: 下午 05:04:21



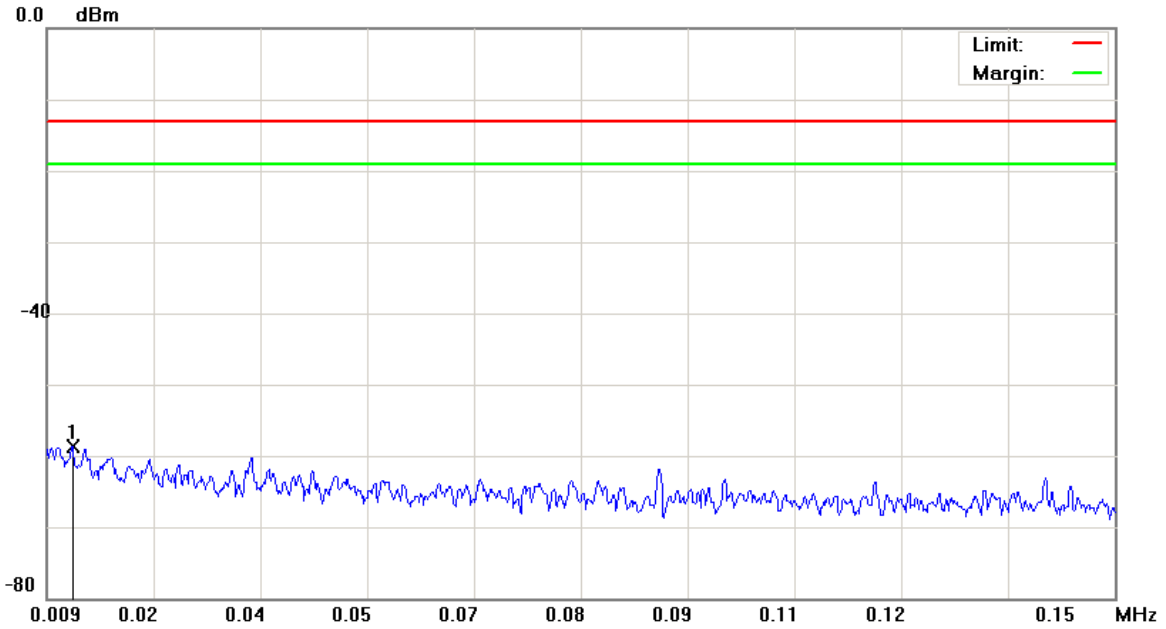
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 24 conducted(9k-26.5G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 1000 KHz VBW: 3000 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: WCDMA Band II
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Detector	Comment
1	*	19238.750	-62.90	7.22	-55.68	-13.00	-42.68			peak	

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH9400) Data :#1 Date: 2016/10/20 Time: 下午 02:26:25



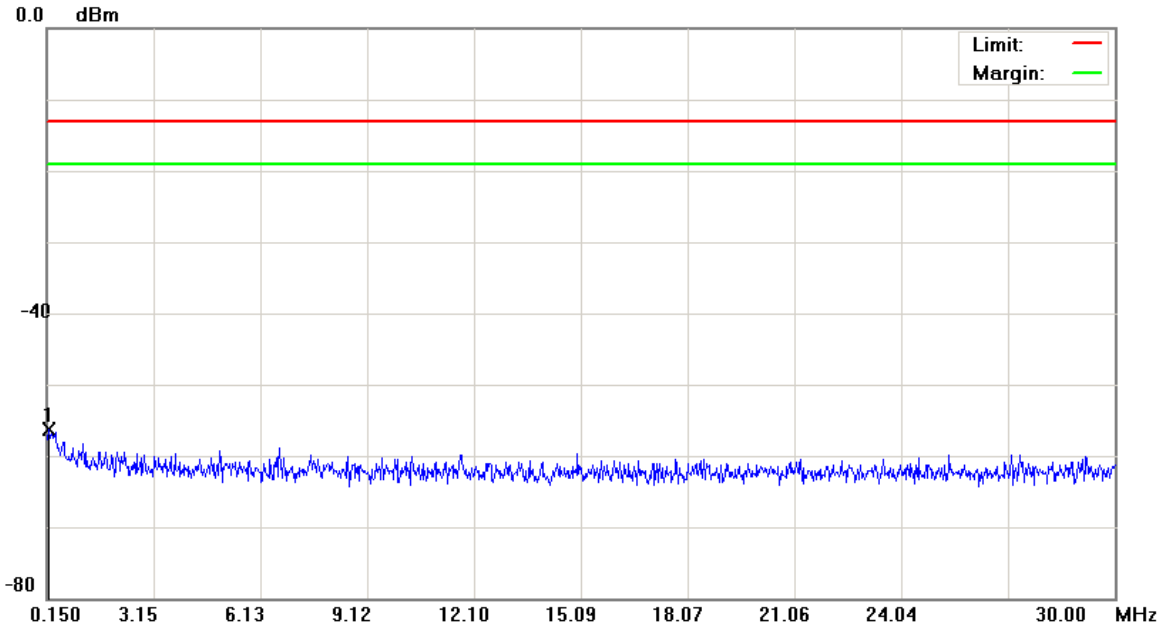
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 24 conducted(9k-26.5G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 1 KHz VBW: 3 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: WCDMA Band II
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Detector	Comment
1	*	0.0123	-70.05	11.36	-58.69	-13.00	-45.69			peak	

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH9400) Data :#2 Date: 2016/10/20 Time: 下午 02:26:49



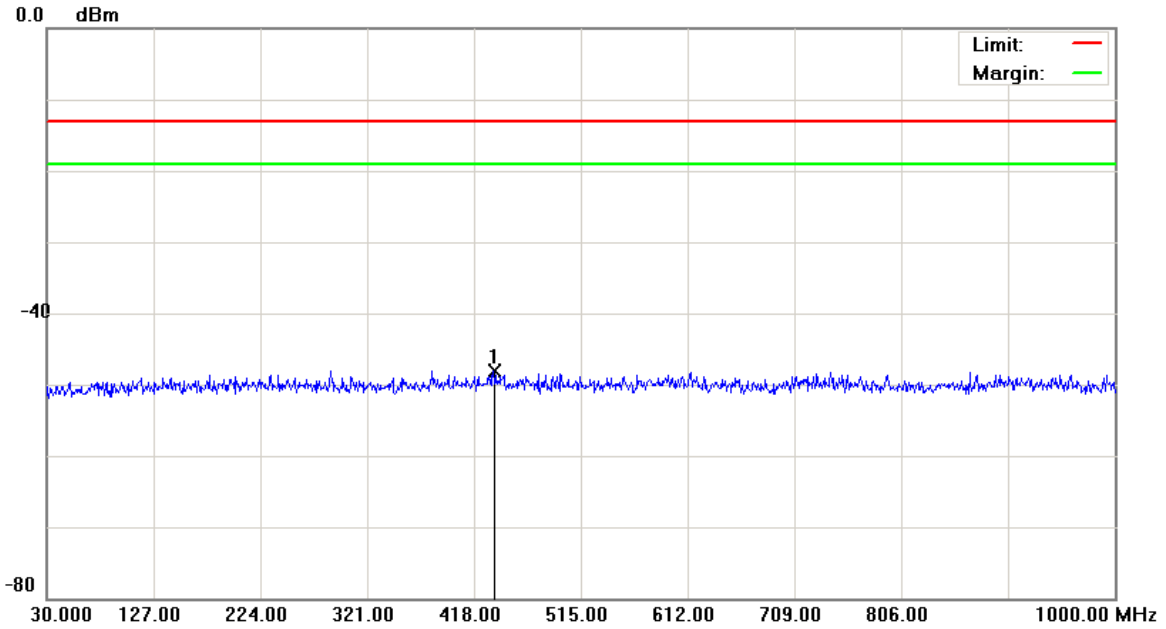
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 24 conducted(9k-26.5G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 10 KHz VBW: 30 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: WCDMA Band II
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Comment
1	*	0.2097	-68.67	12.44	-56.23	-13.00	-43.23	peak		

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH9400) Data :#3 Date: 2016/10/20 Time: 下午 02:27:13



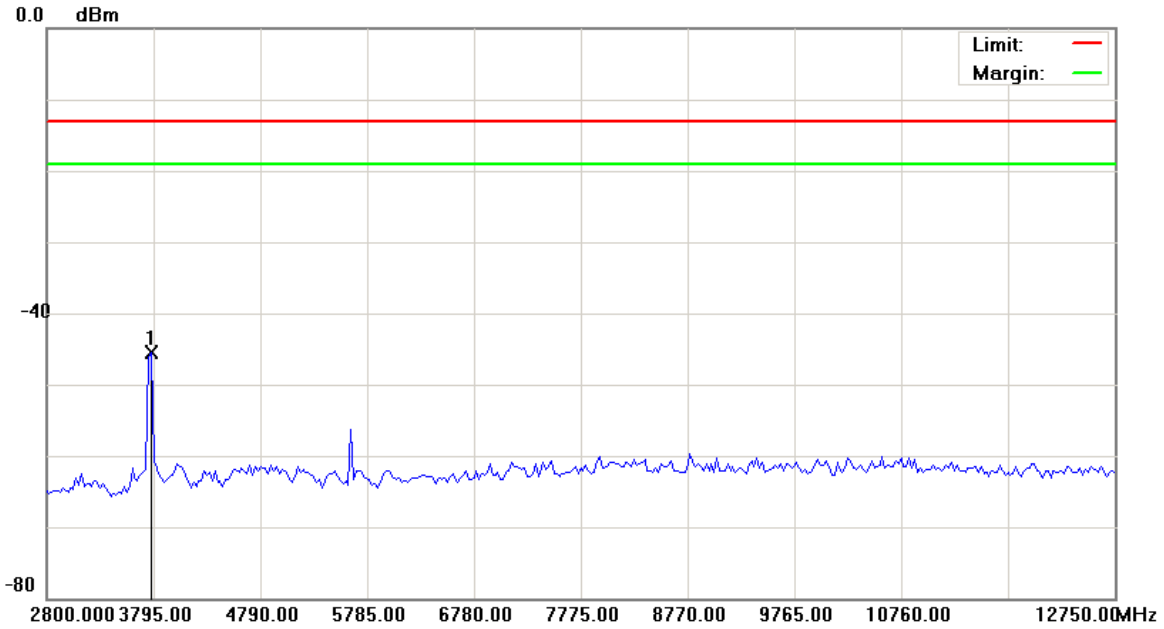
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 24 conducted(9k-26.5G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 100 KHz VBW: 300 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: WCDMA Band II
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Comment
1	*	435.9450	-61.38	13.24	-48.14	-13.00	-35.14	peak		

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH9400) Data :#5 Date: 2016/10/21 Time: 下午 05:05:01



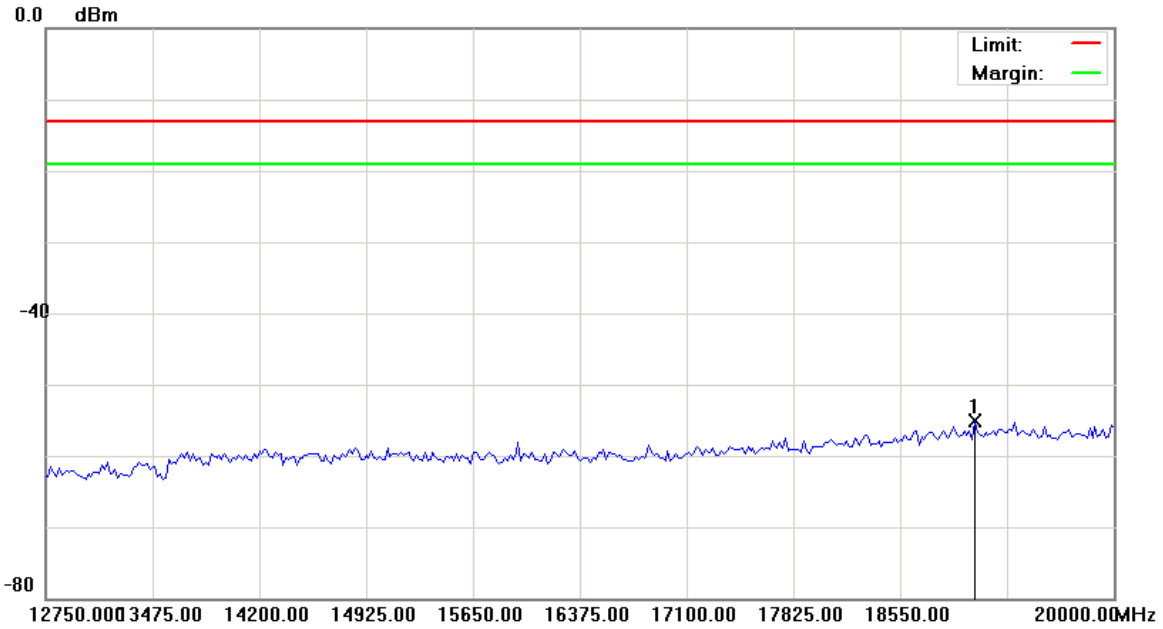
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 24 conducted(9k-26.5G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 1000 KHz VBW: 3000 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: WCDMA Band II
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Detector	Comment
1	*	3770.125	-50.44	4.93	-45.51	-13.00	-32.51			peak	

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH9400) Data :#6 Date: 2016/10/21 Time: 下午 05:05:20



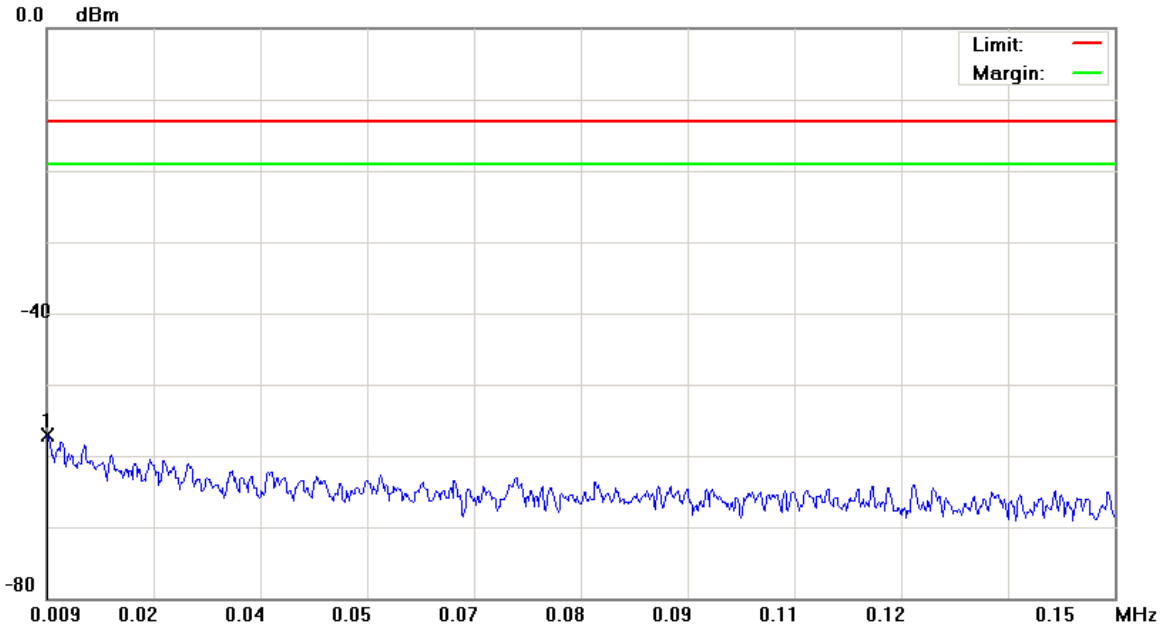
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 24 conducted(9k-26.5G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 1000 KHz VBW: 3000 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: WCDMA Band II
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Detector	Comment
1	*	19057.500	-62.25	7.17	-55.08	-13.00	-42.08			peak	

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH9538) Data :#1 Date: 2016/10/20 Time: 下午 02:27:51



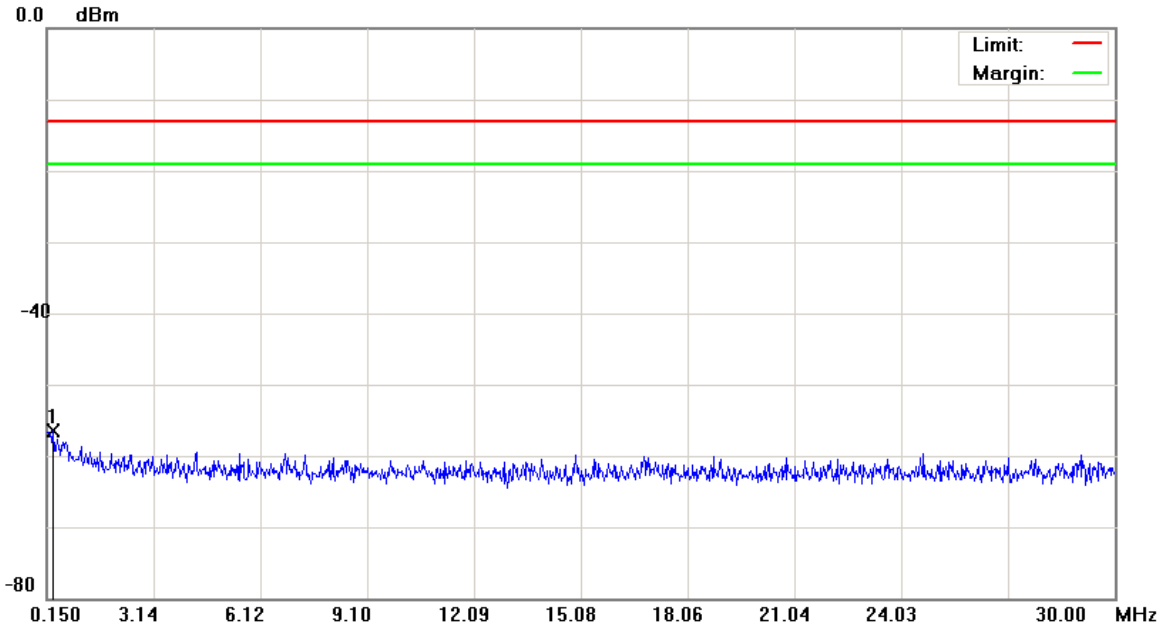
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 24 conducted(9k-26.5G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 1 KHz VBW: 3 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: WCDMA Band II
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Comment
1	*	0.0091	-68.44	11.32	-57.12	-13.00	-44.12	peak		

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH9538) Data :#2 Date: 2016/10/20 Time: 下午 02:28:15



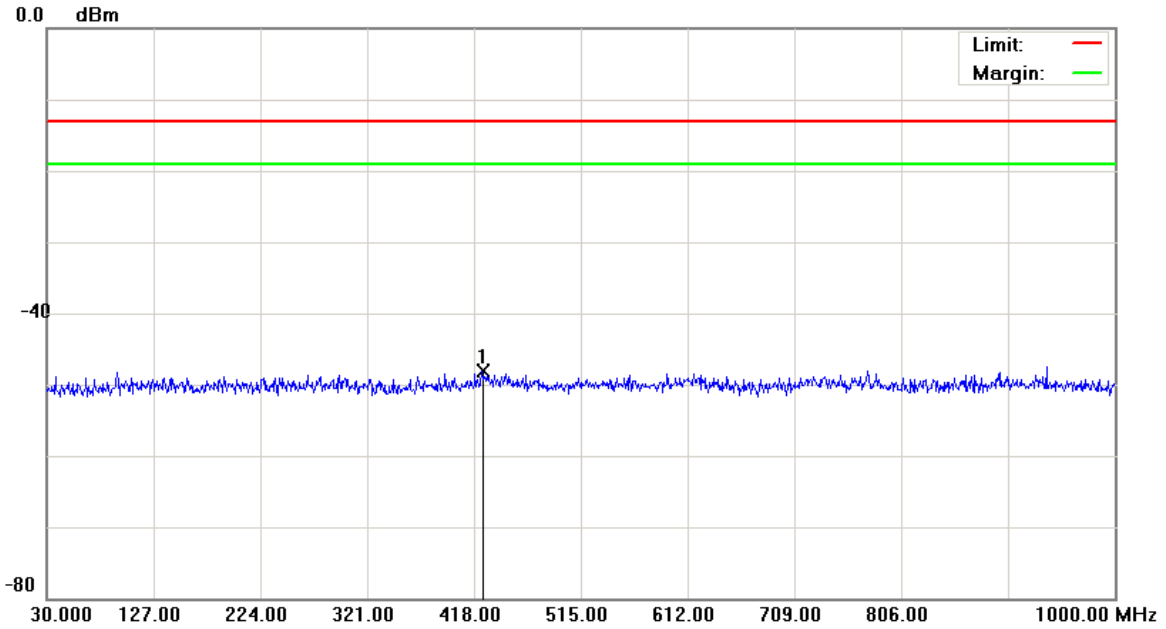
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 24 conducted(9k-26.5G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 10 KHz VBW: 30 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: WCDMA Band II
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Detector	Comment
1	*	0.3291	-69.26	12.67	-56.59	-13.00	-43.59			peak	

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH9538) Data :#3 Date: 2016/10/20 Time: 下午 02:28:39



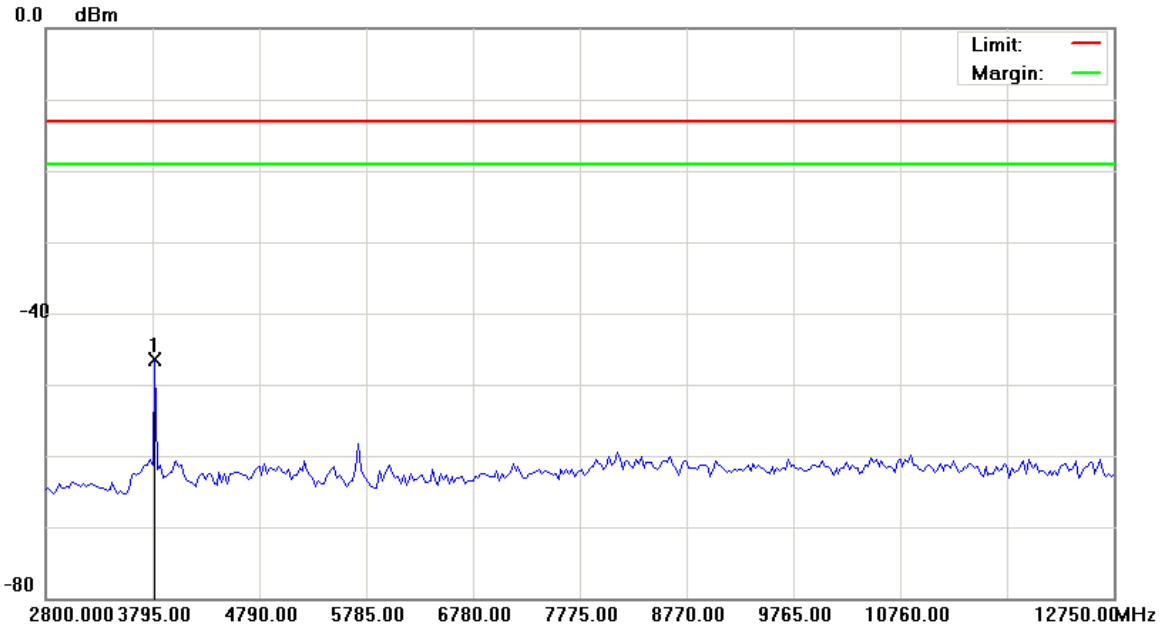
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 24 conducted(9k-26.5G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 100 KHz VBW: 300 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: WCDMA Band II
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Comment
1	*	425.2750	-61.40	13.24	-48.16	-13.00	-35.16	peak		

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH9538) Data :#5 Date: 2016/10/21 Time: 下午 05:06:23



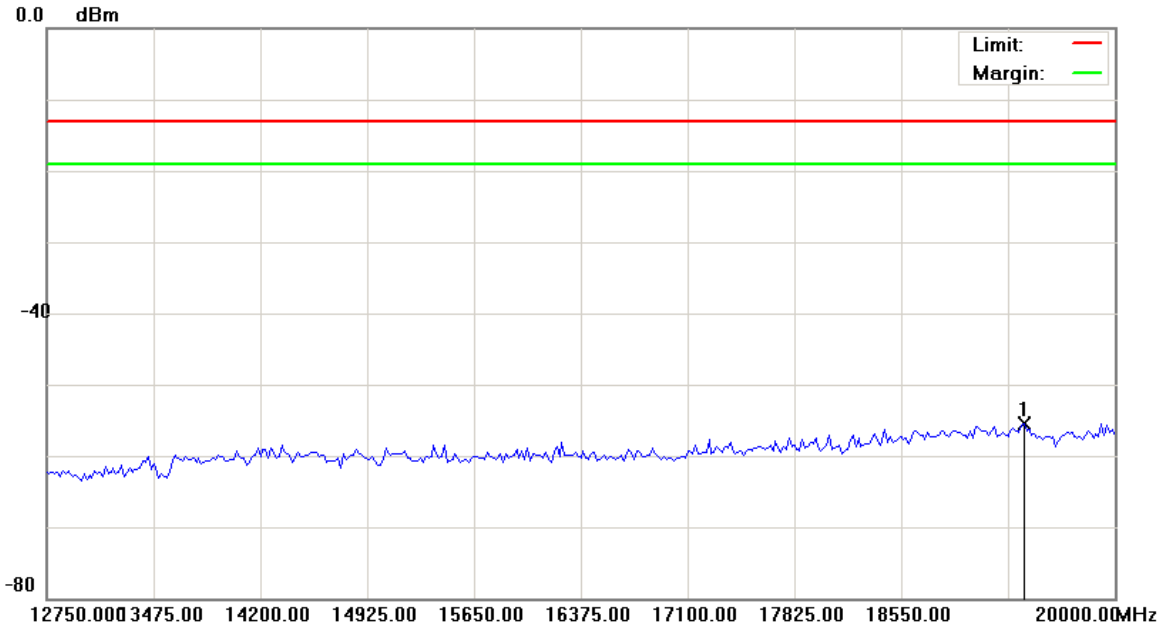
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 24 conducted(9k-26.5G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 1000 KHz VBW: 3000 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: WCDMA Band II
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Detector	Comment
1	*	3819.875	-51.43	4.91	-46.52	-13.00	-33.52			peak	

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH9538) Data :#6 Date: 2016/10/21 Time: 下午 05:06:41



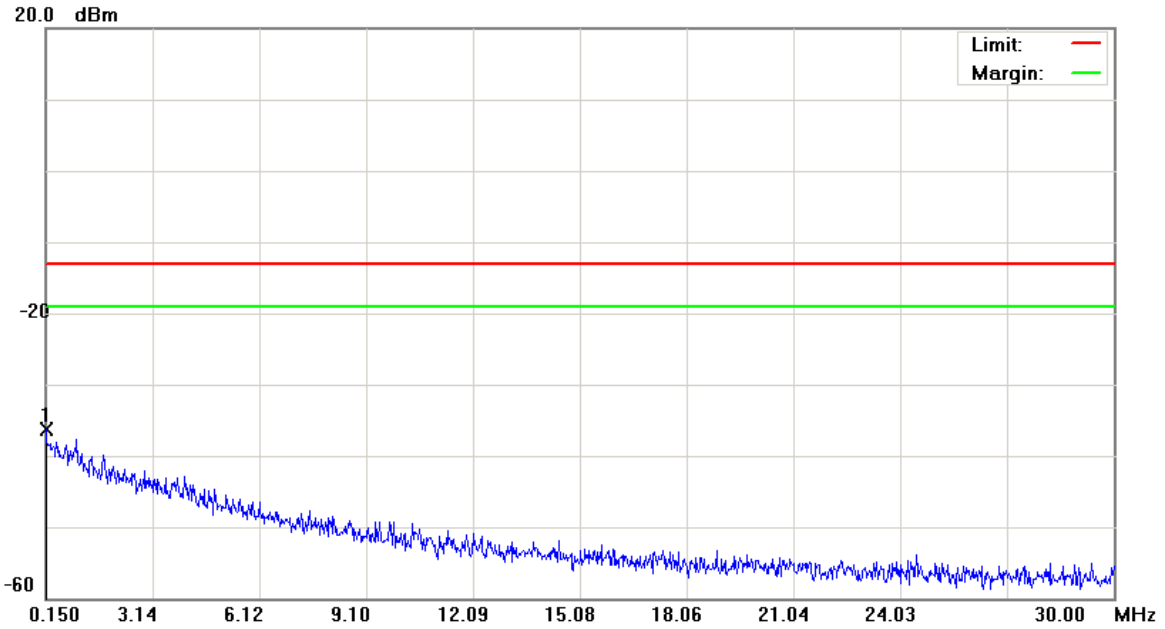
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 24 conducted(9k-26.5G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 1000 KHz VBW: 3000 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: WCDMA Band II
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Comment
1	*	19383.750	-62.68	7.26	-55.42	-13.00	-42.42	peak		

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH4132) Data :#2 Date: 2016/10/20 Time: 下午 02:16:56



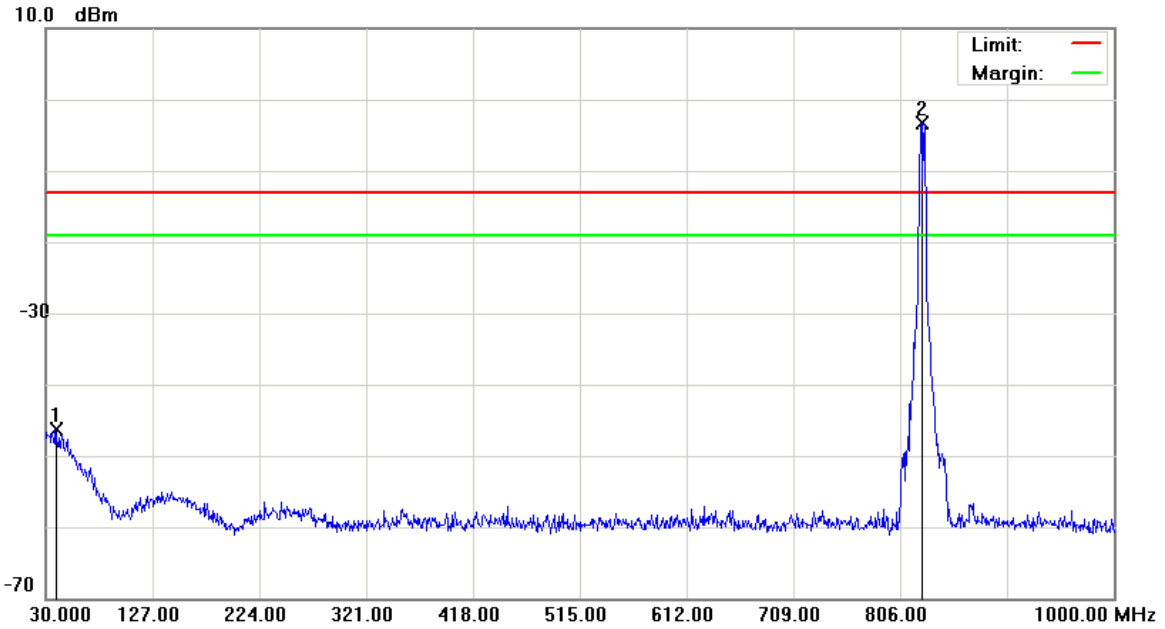
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 22 conducted(9k-12.75G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 10 KHz VBW: 30 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: WCDMA Band V
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Comment
1	*	0.1500	-66.82	30.51	-36.31	-13.00	-23.31	peak		

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH4132) Data :#3 Date: 2016/10/20 Time: 下午 02:17:20



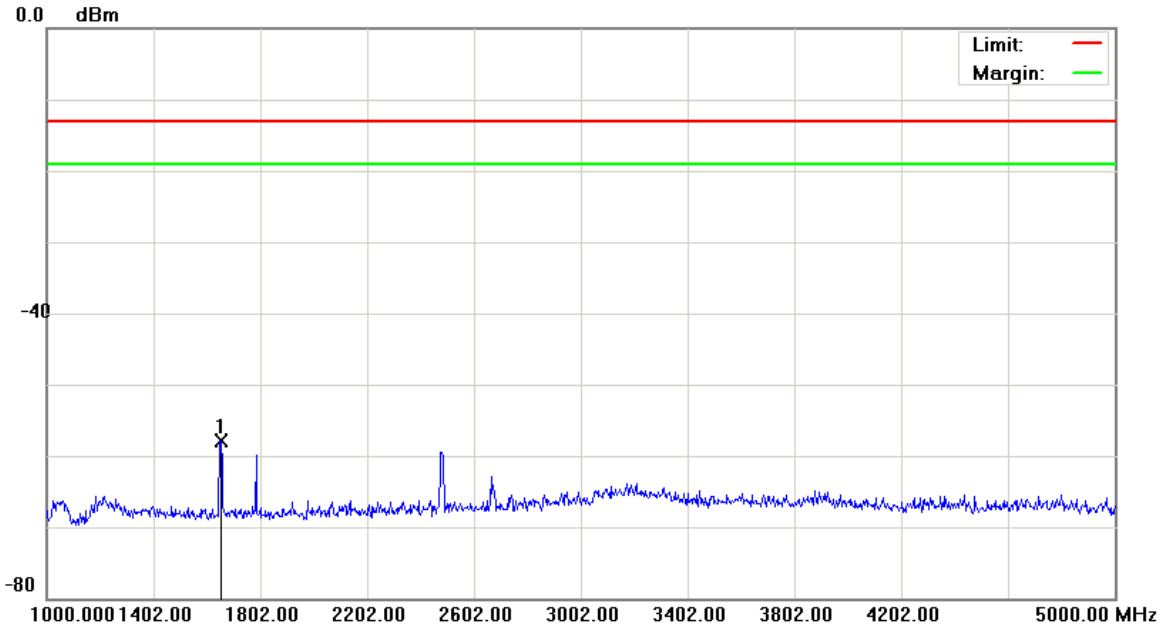
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 22 conducted(9k-12.75G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 100 KHz VBW: 300 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: WCDMA Band V
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree degree	Comment
1		39.2150	-62.43	16.17	-46.26	-13.00	-33.26	peak		
2	*	825.4000	-7.23	3.84	-3.39	-13.00	9.61	peak		Tx

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH4132) Data :#4 Date: 2016/10/20 Time: 下午 02:47:44



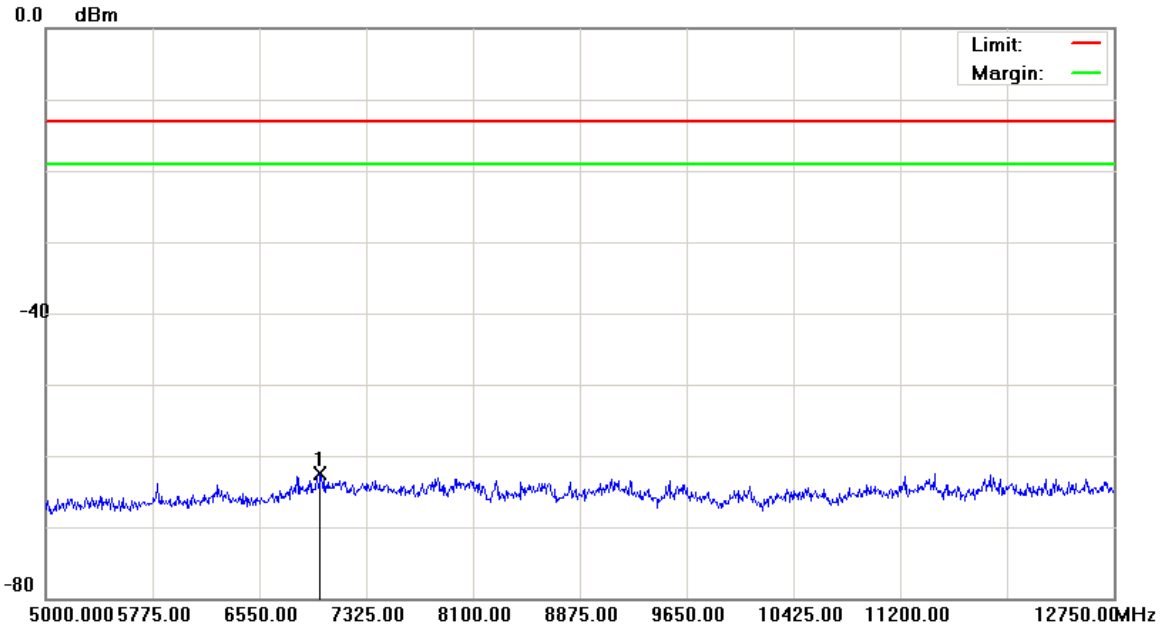
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 22 conducted(9k-12.75G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 1000 KHz VBW: 3000 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: WCDMA Band V
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Comment
1	*	1650.000	-62.34	4.45	-57.89	-13.00	-44.89	peak		

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH4132) Data :#5 Date: 2016/10/20 Time: 下午 02:48:07



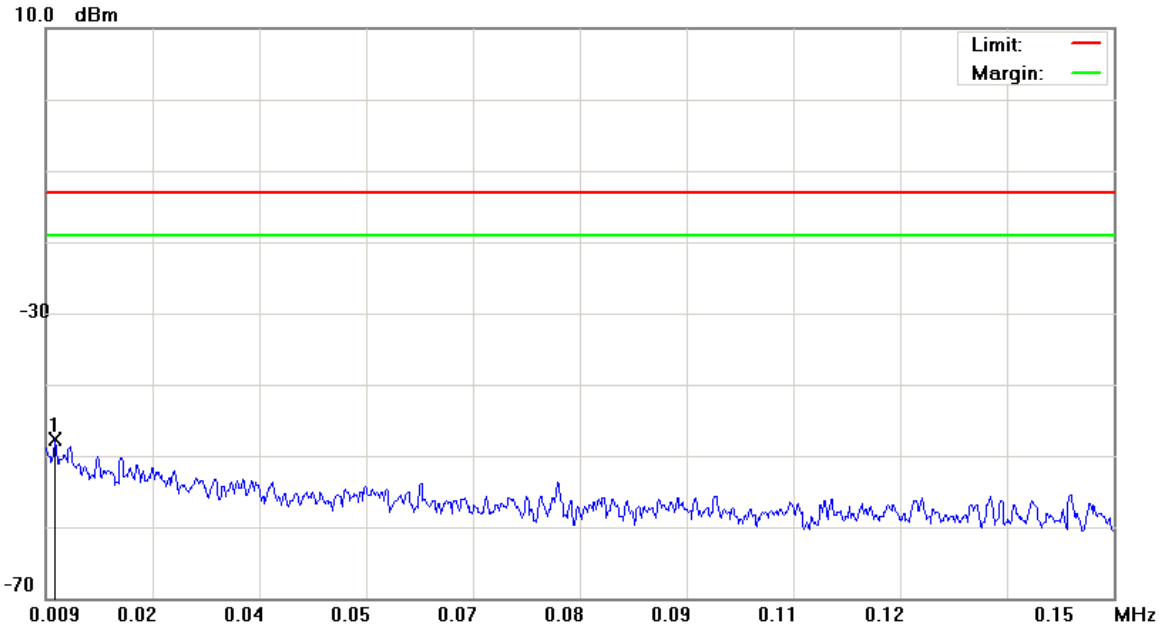
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 22 conducted(9k-12.75G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 1000 KHz VBW: 3000 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: WCDMA Band V
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Detector	Comment
1	*	6991.750	-67.40	4.94	-62.46	-13.00	-49.46			peak	

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH4183) Data :#1 Date: 2016/10/20 Time: 下午 02:19:24



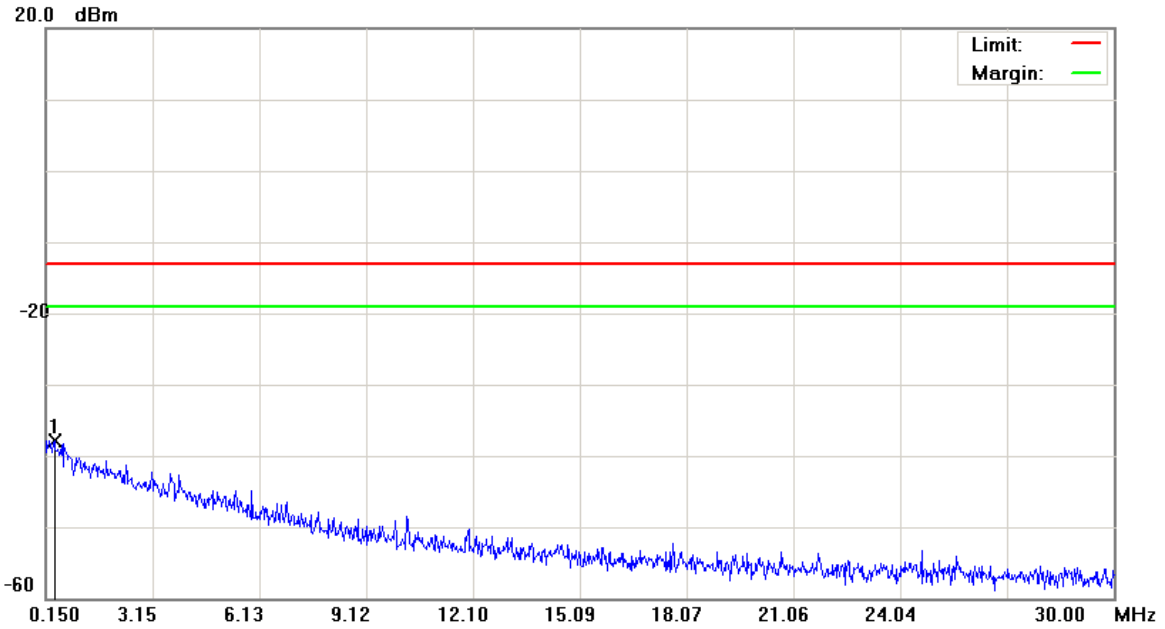
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 22 conducted(9k-12.75G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 1 KHz VBW: 3 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: WCDMA Band V
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Comment
1	*	0.0102	-78.33	30.57	-47.76	-13.00	-34.76	peak		

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH4183) Data :#2 Date: 2016/10/20 Time: 下午 02:19:48



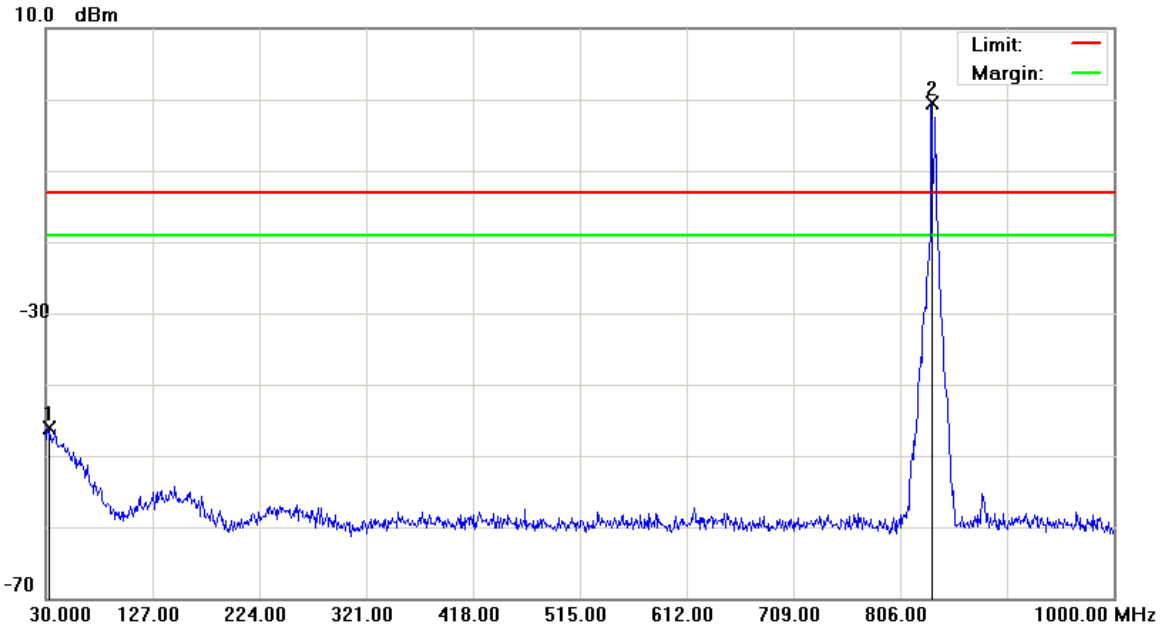
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 22 conducted(9k-12.75G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 10 KHz VBW: 30 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: WCDMA Band V
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Detector	Comment
1	*	0.4037	-69.80	31.91	-37.89	-13.00	-24.89			peak	

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH4183) Data :#3 Date: 2016/10/20 Time: 下午 02:20:12



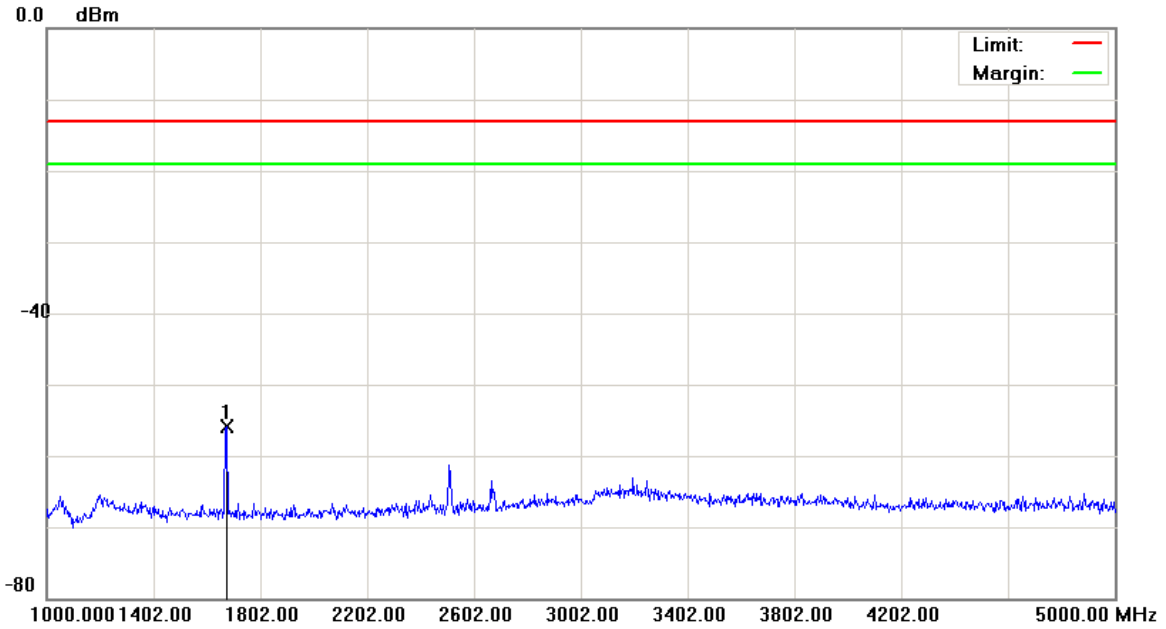
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 22 conducted(9k-12.75G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 100 KHz VBW: 300 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: WCDMA Band V
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree degree	Detector	Comment
1		32.4250	-63.12	16.94	-46.18	-13.00	-33.18			peak	
2	*	834.6150	-4.46	3.95	-0.51	-13.00	12.49			peak	Tx

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH4183) Data :#4 Date: 2016/10/20 Time: 下午 03:00:41



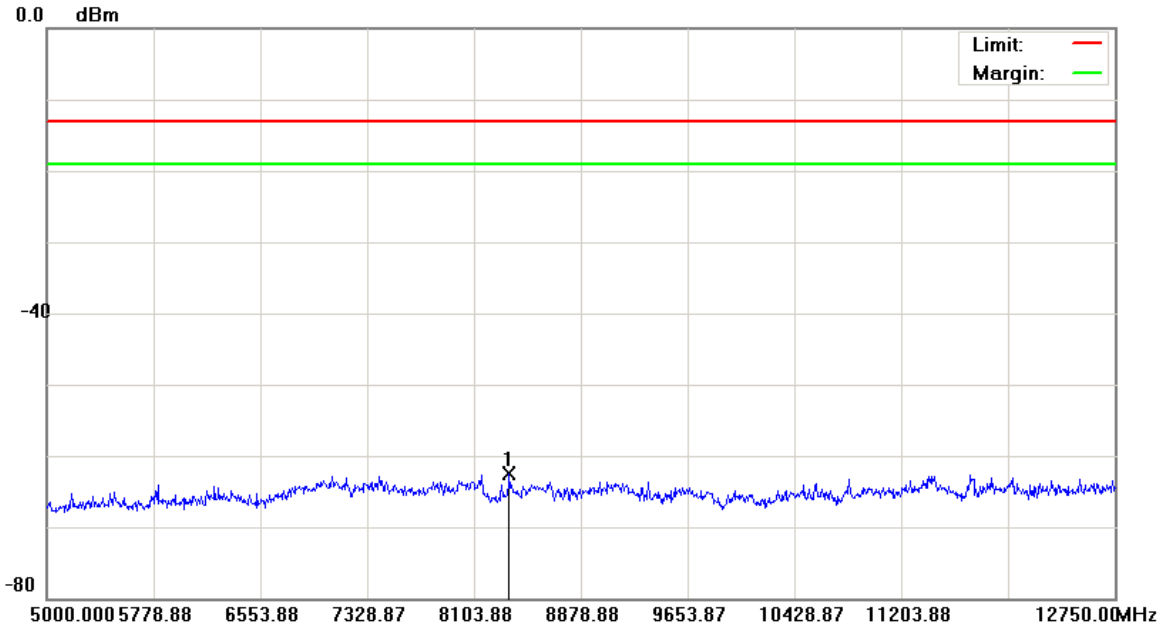
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 22 conducted(9k-12.75G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 1000 KHz VBW: 3000 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: WCDMA Band V
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Comment
1	*	1672.000	-60.39	4.46	-55.93	-13.00	-42.93	peak		

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH4183) Data :#5 Date: 2016/10/20 Time: 下午 03:01:04



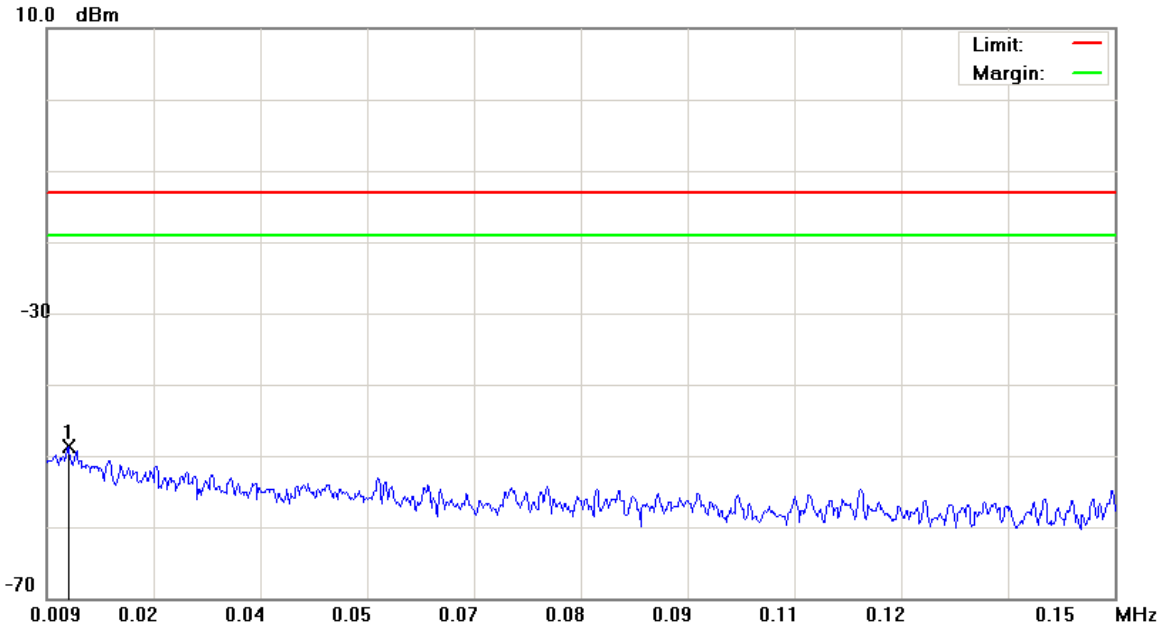
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 22 conducted(9k-12.75G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 1000 KHz VBW: 3000 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: WCDMA Band V
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Detector	Comment
1	*	8355.750	-67.81	5.22	-62.59	-13.00	-49.59			peak	

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH4233) Data :#1 Date: 2016/10/20 Time: 下午 02:21:30



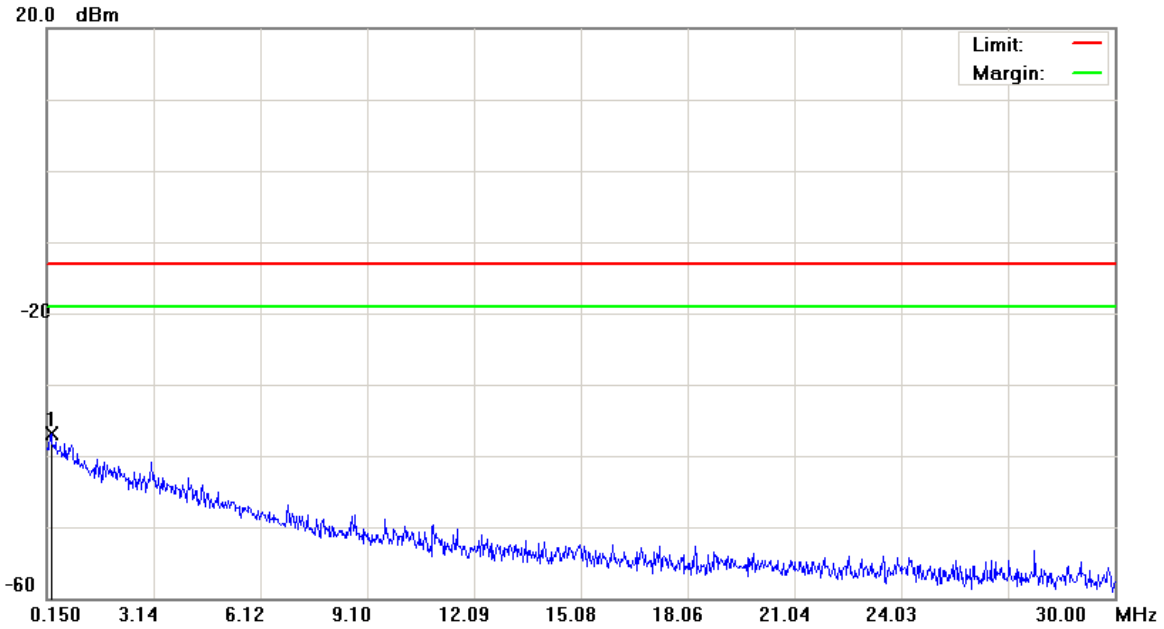
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 22 conducted(9k-12.75G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 1 KHz VBW: 3 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: WCDMA Band V
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Detector	Comment
1	*	0.0118	-79.28	30.57	-48.71	-13.00	-35.71			peak	

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH4233) Data :#2 Date: 2016/10/20 Time: 下午 02:21:54



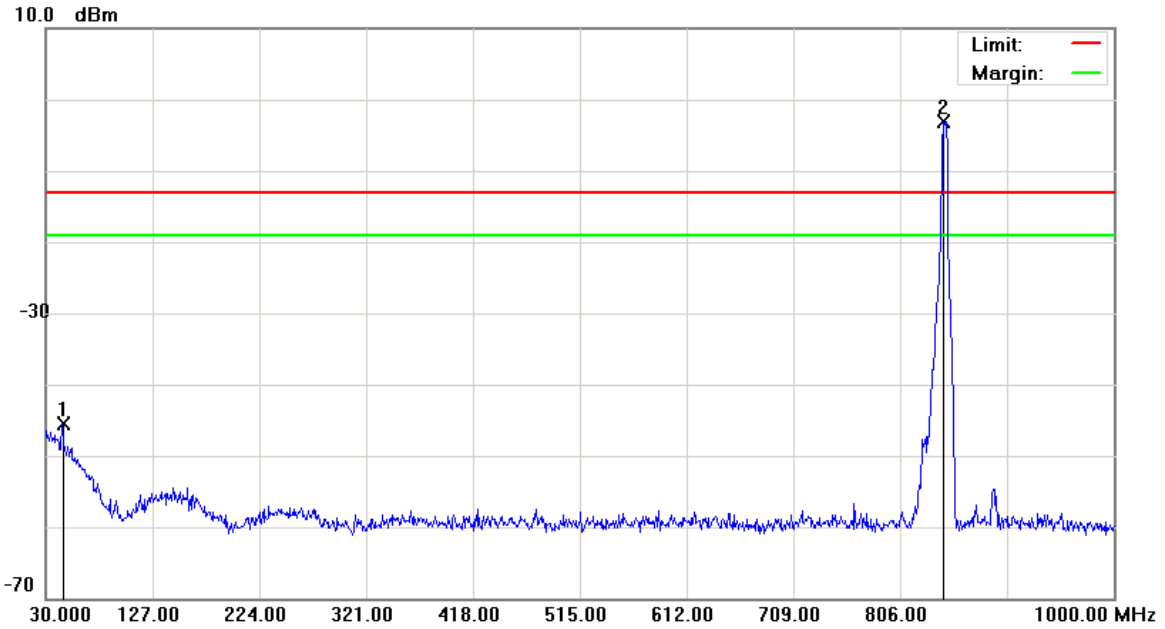
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 22 conducted(9k-12.75G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 10 KHz VBW: 30 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: WCDMA Band V
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Comment
1	*	0.2694	-68.41	31.49	-36.92	-13.00	-23.92	Detector	peak	

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH4233) Data :#3 Date: 2016/10/20 Time: 下午 02:22:18



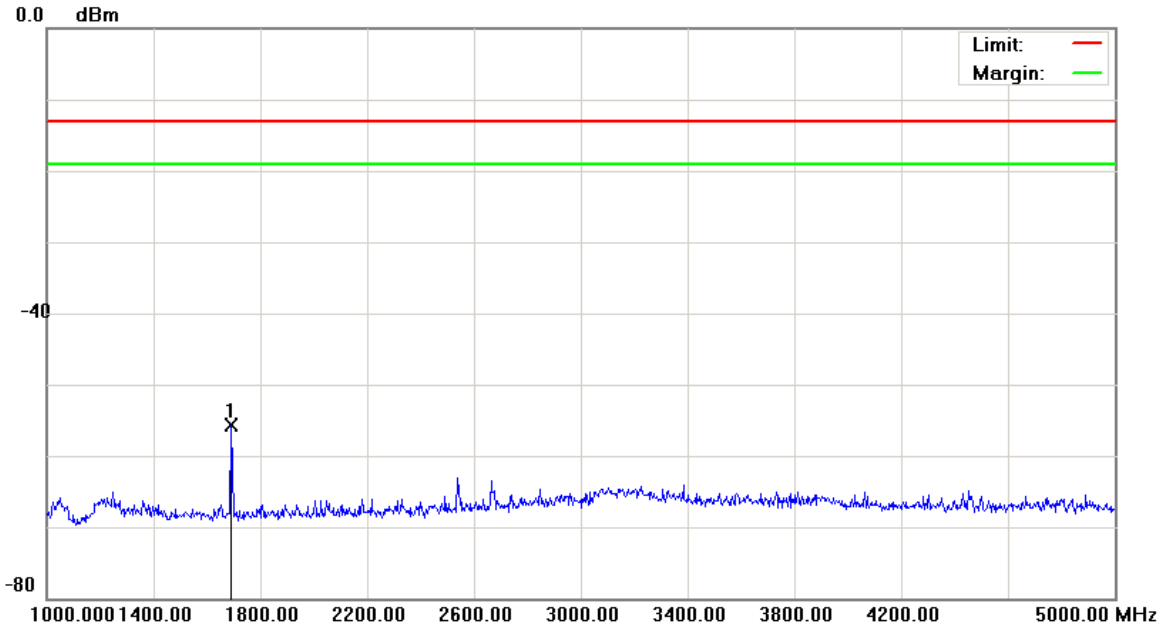
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 22 conducted(9k-12.75G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 100 KHz VBW: 300 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: WCDMA Band V
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree degree	Detector	Comment
1		45.0350	-61.07	15.50	-45.57	-13.00	-32.57			peak	
2	*	845.7700	-7.07	3.99	-3.08	-13.00	9.92			peak	Tx

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH4233) Data :#4 Date: 2016/10/20 Time: 下午 03:01:37



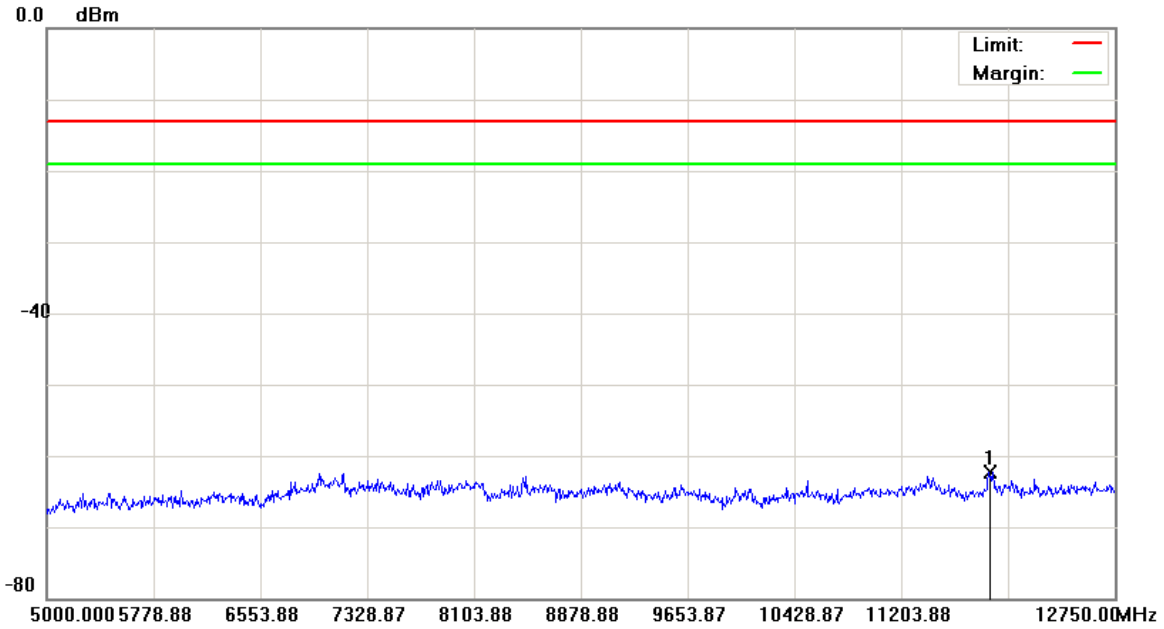
Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 22 conducted(9k-12.75G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 1000 KHz VBW: 3000 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: WCDMA Band V
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Detector	Comment
1	*	1692.000	-60.15	4.48	-55.67	-13.00	-42.67			peak	

*:Maximum data x:Over limit !:over margin



File :Module_EC20-A(CH4233) Data :#5 Date: 2016/10/20 Time: 下午 03:02:01



Site: site #1 Polarization: **Conducted** Temperature: 26 °C
 Limit: FCC Part 22 conducted(9k-12.75G) Power: DC 12V Humidity: 55 %
 EUT: Industrial M2M Cellular Serial Gateway Distance: RBW: 1000 KHz VBW: 3000 KHz
 M/N: SE5901B-IO-4G-GPS-B-S-US
 Mode: WCDMA Band V
 Note:

No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBm	Limit dBm	Over dB	Antenna Height cm	Table Degree	Detector	Comment
1	*	11839.375	-67.94	5.62	-62.32	-13.00	-49.32			peak	

*:Maximum data x:Over limit !:over margin



2.7. Field Strength of Spurious Radiation Test

■ Limit

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10\log(P)$ dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

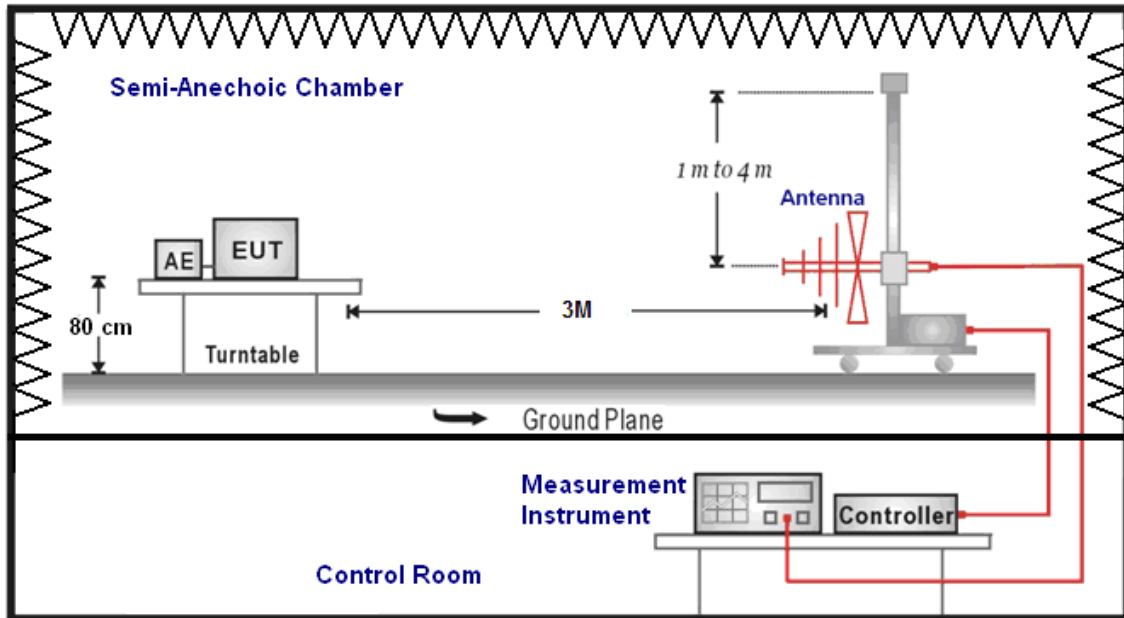
■ Test Instruments

3 Meter Chamber					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
RF Pre-selector	Agilent	N9039A	MY46520256	01/08/2016	1 year
Spectrum Analyzer	Agilent	E4446A	MY46180578	01/08/2016	1 year
Pre Amplifier	Agilent	8449B	3008A02237	10/11/2016	1 year
Pre Amplifier	Agilent	8447D	2944A11119	01/11/2016	1 year
Broadband Antenna (30MHz~1GHz)	SCHWARZBECK MESS-ELEKTRONIK	VULB9168	416	10/13/2016	1 year
Broadband Antenna (30MHz~1GHz)	SCHWARZBECK MESS-ELEKTRONIK	VULB 9168	419	11/03/2016	1 year
Horn Antenna (1~18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	06/06/2016	1 year
Horn Antenna (18~40GHz)	ETS	3116	00086467	09/05/2016	1 year
Horn Antenna (18~40GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9170	9170-320	07/18/2016	1 year
Microwave Cable	EMCI	EMC102-KM-KM-1 4000	151001	02/23/2016	1 year
Microwave Cable	EMCI	EMC-104-SM-SM-1 4000	140202	02/23/2016	1 year
Microwave Cable	EMCI	EMC104-SM-SM-6 00	140301	02/23/2016	1 year
Signal Generator	Agilent	E8257D	MY44320425	02/25/2016	1 year
Test Site	ATL	TE01	888001	08/29/2016	1 year

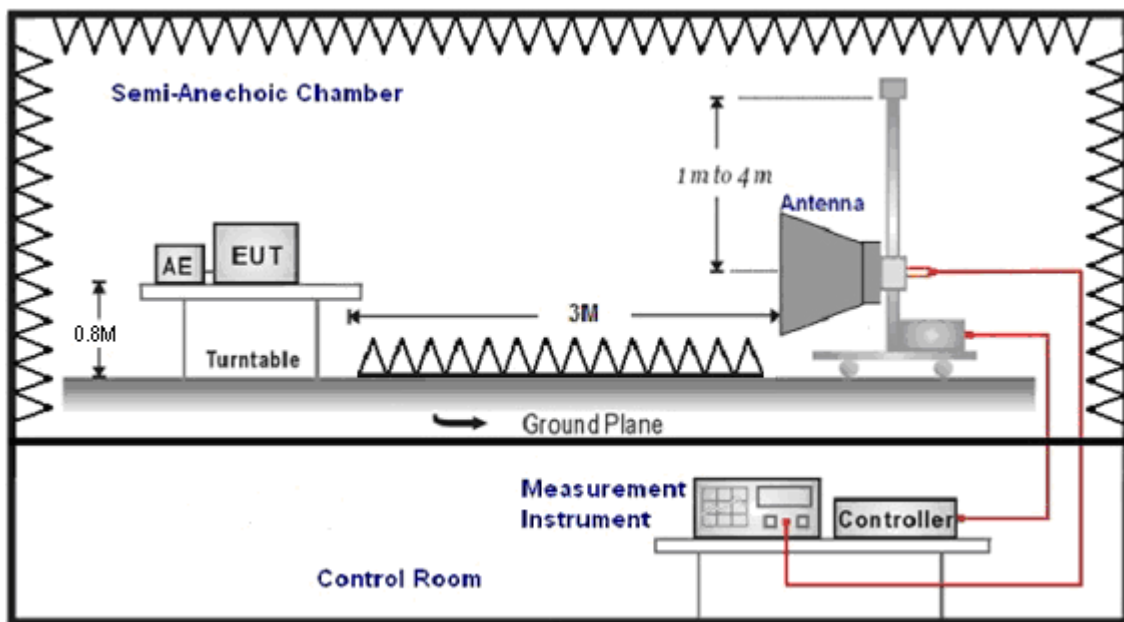
Note: N.C.R. = No Calibration Request.

■ **Setup**

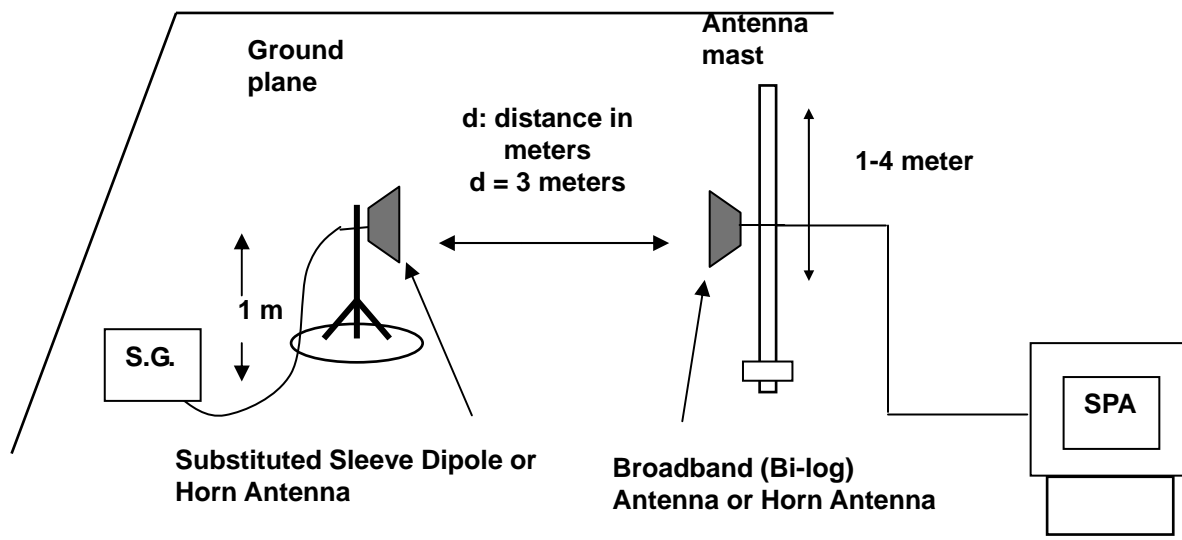
Below 1GHz



Above 1GHz



For Substituted Method Test Set-UP



■ Test Procedure

- The EUT was set up for the maximum power with LTE link data modulation. The power was measured with Spectrum Analyzer. All measurements were done at 3 channels (low, middle and high operational frequency range). RWB and VBW is 5MHz for LTE mode.
- E.I.R.P power measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- The substitution antenna (Note:1 & 2) is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value" of step a. Record the power level of S.G.
- $E.I.R.P. = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}$
- $E.R.P. = E.I.R.P. - 2.15 \text{ dB}$

Note: 1. Below 1 GHz Substituted Method Test : Sleeve dipole antenna to Bi-Log Antenna

2. Above 1 GHz Substituted Method Test : Horn antenna to Horn Antenna

■ Uncertainty

The measurement uncertainty is defined as for Field Strength of Spurious Radiation measurement is ± 3.072 dB.



■ **Test Result**

Standard:	FCC Part 22	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Mode:	1	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Frequency:	824.2 MHz	Date:	10/20/2016

Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark	Ant.Polar. H / V
5848.000	-59.77	5.90	-53.87	-13.00	-40.87	peak	H
4792.000	-56.69	3.87	-52.82	-13.00	-39.82	peak	V

Standard:	FCC Part 22	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Mode:	1	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Frequency:	836.6 MHz	Date:	10/20/2016

Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark	Ant.Polar. H / V
7252.000	-60.87	10.89	-49.98	-13.00	-36.98	peak	H
4816.000	-57.28	3.94	-53.34	-13.00	-40.34	peak	V

Standard:	FCC Part 22	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Mode:	1	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Frequency:	848.8 MHz	Date:	10/20/2016

Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark	Ant.Polar. H / V
7732.000	-62.92	12.57	-50.35	-13.00	-37.35	peak	H
6088.000	-61.70	6.66	-55.04	-13.00	-42.04	peak	V



Standard:	FCC Part 24	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Mode:	2	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Frequency:	1850.2 MHz	Date:	10/20/2016

Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark	Ant.Polar. H / V
5272.000	-57.58	4.77	-52.81	-13.00	-39.81	peak	H
4768.000	-56.71	3.79	-52.92	-13.00	-39.92	peak	V

Standard:	FCC Part 24	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Mode:	2	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Frequency:	1880.0 MHz	Date:	10/20/2016

Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark	Ant.Polar. H / V
7948.000	-60.51	13.15	-47.36	-13.00	-34.36	peak	H
6484.000	-59.31	8.25	-51.06	-13.00	-38.06	peak	V

Standard:	FCC Part 24	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Mode:	2	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Frequency:	1909.8 MHz	Date:	10/20/2016

Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark	Ant.Polar. H / V
7696.000	-60.33	12.47	-47.86	-13.00	-34.86	peak	H
6112.000	-59.10	6.75	-52.35	-13.00	-39.35	peak	V



Standard:	FCC Part 24	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Mode:	5	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Frequency:	1852.4 MHz	Date:	10/20/2016

Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark	Ant.Polar. H / V
6508.000	-59.02	8.34	-50.68	-13.00	-37.68	peak	H
8320.000	-60.81	13.16	-47.65	-13.00	-34.65	peak	V

Standard:	FCC Part 24	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Mode:	5	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Frequency:	1880.0 MHz	Date:	10/20/2016

Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark	Ant.Polar. H / V
7660.000	-61.87	12.37	-49.50	-13.00	-36.50	peak	H
5896.000	-59.58	6.02	-53.56	-13.00	-40.56	peak	V

Standard:	FCC Part 24	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Mode:	5	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Frequency:	1907.6 MHz	Date:	10/20/2016

Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark	Ant.Polar. H / V
5404.000	-58.84	4.90	-53.94	-13.00	-40.94	peak	H
8992.000	-63.86	13.57	-50.29	-13.00	-37.29	peak	V



Standard:	FCC Part 22	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Mode:	6	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Frequency:	826.4 MHz	Date:	10/20/2016

Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark	Ant.Polar. H / V
7948.000	-61.73	13.15	-48.58	-13.00	-35.58	peak	H
6544.000	-56.10	8.46	-47.64	-13.00	-34.64	peak	V

Standard:	FCC Part 22	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Mode:	6	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Frequency:	836.6 MHz	Date:	10/20/2016

Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark	Ant.Polar. H / V
7396.000	-61.20	11.52	-49.68	-13.00	-36.68	peak	H
5272.000	-59.00	4.77	-54.23	-13.00	-41.23	peak	V

Standard:	FCC Part 22	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Mode:	6	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Frequency:	846.6 MHz	Date:	10/20/2016

Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark	Ant.Polar. H / V
9628.000	-65.63	15.50	-50.13	-13.00	-37.13	peak	H
6856.000	-59.73	9.41	-50.32	-13.00	-37.32	peak	V

2.8. Frequency Stability (Temperature & Voltage Variation) Test

■ Limit

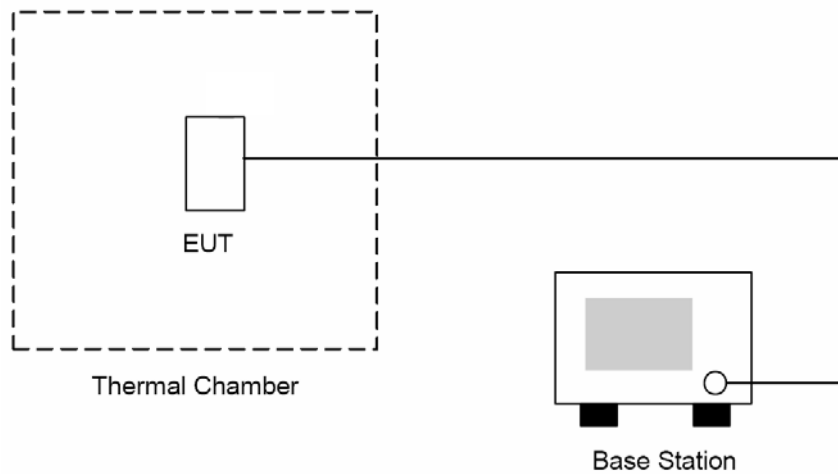
The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ ($\pm 2.5\text{ppm}$) of the center frequency.

■ Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Cycle
Universal Radio Communication Tester	R & S	CMU200	112387	02/25/2016	1 year
Temperature & Humidity Chamber	TAICHY	MHU-225LA	980729	04/18/2016	1 year
Test Site	ATL	TE05	TE05	N.C.R.	-----

Note: N.C.R. = No Calibration Request.

■ Setup





■ Test Procedure

The measurement is made according to FCC rules:

1. The EUT and test equipment were set up as shown on the following section.
2. With all power removed, the temperature was decreased to -30°C and permitted to stabilize for three hours. Power was applied and the maximum change in frequency was note within one minute.
3. With power OFF, the temperature was raised in 10°C steps. The sample was permitted to stabilize at each step for at least one-half hour. Power was applied and the maximum frequency change was noted within one minute.
4. The EUT was placed in a temperature chamber at $25 \pm 5^{\circ}\text{C}$ and connected as the following section.
5. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
6. The temperature tests were performed for the worst case.
7. Test data was recorded.

■ Uncertainty

The measurement uncertainty is defined as for Frequency Stability (Temperature Variation) measurement is $\pm 10\text{Hz}$.



■ **Test Result**

Date of Test	10/26/2016					
GPRS/EGPRS 850						
Voltage						
Frequency (MHz)	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Result
836.4	48	20	1.35	0.002	±2.5	Pass
	12	20	17.65	0.021	±2.5	Pass
	9	20	0.36	0.000	±2.5	Pass
Temperature						
836.4	12	0	-6.16	-0.007	±2.5	Pass
	12	10	8.5	0.010	±2.5	Pass
	12	30	-4.3	-0.005	±2.5	Pass
	12	40	2.41	0.003	±2.5	Pass
	12	50	-13.54	-0.016	±2.5	Pass

Date of Test	10/26/2016					
GPRS/EGPRS 1900						
Voltage						
Frequency (MHz)	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Result
1880.0	48	20	4.31	0.002	±2.5	Pass
	12	20	11.75	0.006	±2.5	Pass
	9	20	1.54	0.001	±2.5	Pass
Temperature						
1880.0	12	0	-19.2	-0.010	±2.5	Pass
	12	10	3.26	0.002	±2.5	Pass
	12	30	-7.16	-0.004	±2.5	Pass
	12	40	2.71	0.001	±2.5	Pass
	12	50	-12.39	-0.007	±2.5	Pass



Date of Test	10/26/2016					
WCDMA Band II						
Frequency (MHz)	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Result
1880.0	48	20	7.89	0.009	±2.5	Pass
	12	20	2.16	0.003	±2.5	Pass
	9	20	-2.22	-0.003	±2.5	Pass
Temperature						
1880.0	3.70	0	-8.6	-0.010	±2.5	Pass
	3.70	10	9.66	0.012	±2.5	Pass
	3.70	30	1.3	0.002	±2.5	Pass
	3.70	40	20.11	0.024	±2.5	Pass
	3.70	50	-10.38	-0.012	±2.5	Pass

Date of Test	10/26/2016					
WCDMA Band V						
Frequency (MHz)	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Result
836.6	48	20	20.95	0.011	±2.5	Pass
	12	20	-10.61	-0.006	±2.5	Pass
	9	20	-4.97	-0.003	±2.5	Pass
Temperature						
836.6	12	0	-9.23	-0.005	±2.5	Pass
	12	10	14.01	0.007	±2.5	Pass
	12	30	8.65	0.005	±2.5	Pass
	12	40	5.54	0.003	±2.5	Pass
	12	50	-6.11	-0.003	±2.5	Pass