FCC Test Report

(Part 22&24)

Product Name : Logistic Monitoring Gateway
Model No : GWS-CSCG
FCC ID : WL6GWS-CSCG

Applicant : ELITEGROUP COMPUTER SYSTEMS CO., LTD
Address : No.239, Sec. 2, Ti Ding Blvd., Taipei, Taiwan

Date of Receipt : 2017/04/15
Issued Date : 2017/05/31
Report No. : 1740404R-HPUSP46V00
Report Version : V1.0

Testing Laboratory
3023

Test Report

Issued Date : 2017/05/31
Report No.: 1740404R-HPUSP46V00

Product Name	:	Logistic Monitoring Gateway
Applicant	:	ELITEGROUP COMPUTER SYSTEMS CO., LTD
Address	:	No.239, Sec. 2, Ti Ding Blvd., Taipei, Taiwan
Manufacturer	:	Golden Elite Technology (SHENZHEN) CO., LTD.
Trade Name	:	ECS
Model No.	:	GWS-CSCG
EUT Rated Voltage	:	DC 3.75-4.4V
EUT Test Voltage		DC 4.2V
Measurement Standard	:	FCC CFR Title 47 Part 2 22 24
Measurement	:	TIA/EIA 603-D 2010
Test Result	:	Complied

Documented By : Elephant Chen
(Adm. Assistant / Elephant Chen)

Tested By : Vorana Chen
(Senior Engineer / Vorana Chen)

Approved By :
(Director /Vincent Lin)

TABLE OF CONTENTS

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Logistic Monitoring Gateway
Model No.	GWS-CSCG
Trade Name	ECS
IMEI No.	01500500
FCC ID	WL6GWS-CSCG
TX Frequency	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8MHz WCDMA Band 2: 1852.4 MHz ~ 1907.6 MHz WCDMA Band 5: 826.4 MHz ~ 846.6 MHz
Rx Frequency	GSM850: 869.2 MHz ~ 893.8 MHz GSM1900: 1930.2 MHz ~ 1989.8 MHz WCDMA Band 2: 1932.4 MHz ~ 1987.6 MHz WCDMA Band 5: 871.4 MHz ~ 891.6 MHz
Type of modulation	GPRS: GMSK; EGPRS: GMSK WCDMA: QPSK (Uplink); HSDPA: QPSK (Uplink); HSUPA: QPSK (Uplink)
Modem FW Version	SF_3GR_MAINT_01.1709.05_SP_MB
HW Version	GWB-CSCG V:1.0
SW Version	CSCG-GW-01.00.00
Antenna Type	PIFA Antenna

1.2. Antenna List

No	Manufacturer	Part No	Antenna Type	Peak Gain
1	JEM	IAHA20170408 (WWAN)	PIFA Antenna	0.81 dBi for 824-894 MHz 4.07 dBi for 1710-1990 MHz

1.3. Operational Description

The information contained within this report is intended to show verification of compliance of the 850/1900MHz to the requirements of FCC 47 CFR Part 2, 22, 24

The EUT provide all functions described as above. The EUT is tested with maximum rated TX power via the Base Station simulator.

DEKRA 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:

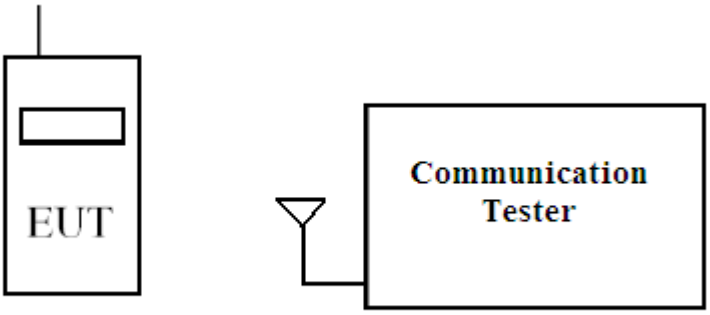
Test Mode:	GSM 850 GPRS
	GSM 850 EGPRS
	PCS 1900 GPRS
	PCS 1900 EGPRS
	WCDMA BAND 2 (RMC/HSDPA/HSUPA)
	WCDMA BAND 5 (RMC/HSDPA/HSUPA)

Note:

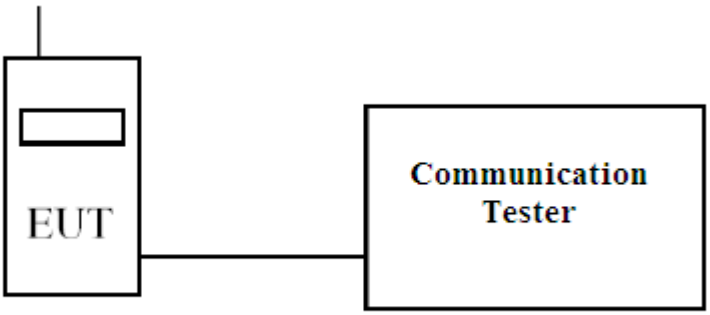
The maximum power levels are GPRS class10 mode for GSM 850/1900, EGPRS class10 mode for GSM 850/1900, RMC 12.2K mode for WCDMA Band 2/5, only these modes were used for all tests.

1.4. Configuration of tested System

(a) Configuration of Radiated measurement



(b) Configuration of Conducted measurement



1.5. EUT Setup Procedures

(1) Setup the EUT and simulators as shown on 1.3
(2) Turn on the power of all equipments.
(3) The EUT was set to communicate with communication tester.
(4) Repeat the above procedure (3).

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	22.7
Humidity (%RH)	25-75	48
Barometric pressure (mbar)	860-1060	982

The related certificate for our laboratories about the test site and management system can be downloaded from DEKRA Testing and Certification Co., Ltd. Web Site:
http://www.dekra.com.tw/english/about/certificates.aspx?bval=5
The address and introduction of DEKRA Testing and Certification Co., Ltd. laboratories can be founded in our Web site: http://www.dekra.com.tw/index_en.aspx

Site Description: File on
Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046
FCC Registration Number :92195

Site Name: DEKRA Testing and Certification Co., Ltd

Lin Kou Laboratory:
No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451,
Taiwan, R.O.C.
TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789
E-Mail : info.tw@dekra.com

FCC Accreditation Number: TW1014

1.7. Type of Emission

System	Type of modulation	Emission Designator
GSM850 GPRS class 12	GMSK	244KGXW
GSM850 EGPRS class 12	8PSK	246KG7W
GSM1900 GPRS class 12	GMSK	246KGXW
GSM1900 EGPRS class 12	8PSK	246KG7W
WCDMA Band 2 RMC 12.2kbps	QPSK	4M07F9W
WCDMA Band 5 RMC 12.2kbps	QPSK	4M06F9W

1.8. Voltages and DC currents

GSM 850 GPRS		
EUT Transmitting (in maximum power)	:	DC voltage : 4.2V , DC current : 0.35A
EUT Standby	:	DC voltage : 4.2V , DC current : 0.18A
GSM 850 EGPRS		
EUT Transmitting (in maximum power)	:	DC voltage : 4.2V , DC current : 0.28A
EUT Standby	:	DC voltage : 4.2V , DC current : 0.18A
PCS 1900 GPRS		
EUT Transmitting (in maximum power)	:	DC voltage : 4.2V , DC current : 0.35A
EUT Standby	:	DC voltage : 4.2V , DC current : 0.18A
PCS 1900 EGPRS		
EUT Transmitting (in maximum power)	:	DC voltage : 4.2V , DC current : 0.26A
EUT Standby	:	DC voltage : 4.2V , DC current : 0.18A
WCDMA Band 2 RMC 12.2K		
EUT Transmitting (in maximum power)	:	DC voltage : 4.2V , DC current : 0.30A
EUT Standby	:	DC voltage : 4.2V , DC current : 0.23A
WCDMA Band 5 RMC 12.2K		
EUT Transmitting (in maximum power)	:	DC voltage : 4.2V , DC current : 0.28A
EUT Standby	:	DC voltage : 4.2V , DC current : 0.23A

2. Technical Test

2.1. Summary of test result

Standard	Test Item	Result	Note
2.1046	Conducted Output Power	Pass	
22.913(a)			
24.232(c)			
2.1049	Occupied Bandwidth	Pass	
22.917(a)			
24.238(b)			
2.1051	Spurious Emission at Antenna Terminals	Pass	
22.917(a)			
24.238(a)			
2.1051	Conducted Emission	Pass	
22.917(a)			
24.238(a)			
2.1053	Field Strength of Spurious Radiation	Pass	
22.917(a)			
24.238(a)			
2.1055	Frequency Stability for Temperature & Voltage	Pass	
22.355			
24.235			
24.232	Peak to Average Ratio	Pass	

2.2. List of test Equipment

Conducted /CTR

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Spectrum Analyzer	Agilent	N9010A	MY54510317	2016/07/22
Directional coupler	Agilent	87300C	MY44300353	2016/11/04
Directional coupler	Agilent	778D-012	50550	2016/11/08
Standard Temperature & Humidity Chamber	WIT	TH-1S-B	EQ-201-00146	2016/11/28
DC power supply	Agilent	E3610A	MY40009845	2016/07/14
Communication Tester	R&S	CMU200	104846	2016/07/07

Radiated / Site3

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Bilog Antenna	Schaffner Chase	CBL6112B	2707	2016/06/11
Horn Antenna	R&S	9120D	556	2017/01/25
Pre-Amplifier	Agilent	87405C	MY47010653	2016/08/11
Spectrum Analyzer	Agilent	N9010A	MY54510317	2016/07/22
Communication Tester	R&S	CMU200	104846	2016/07/07

2.3. Measurement Uncertainty

Conducted Emission

The measurement uncertainty of confidence of 95% is evaluated as ± 1.52 dB

Radiated Emission (Below 1GHz)

The measurement uncertainty of confidence of 95% is evaluated as ± 3.44 dB .

Radiated Emission (Above 1GHz)

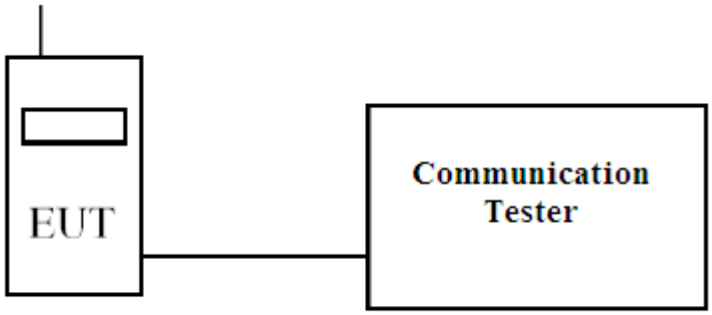
The measurement uncertainty of confidence of 95% is evaluated as ± 4.08 dB

3. Conducted & Radiated Output Power Measurment

3.1. Test Specification

According to Part 2.1046, 22.913, 24.232

3.2. Conducted Test Setup



3.3. Conducted & Radiated Power Limits

Band	Limit
850	<7W
1900	<2W
AWS(1700)	<1W

3.4. Conducted Test Procedure

The EUT is tested with maximum rated TX power via the Base Station simulator, and the output power was measured at the antenna terminals of the EUT.

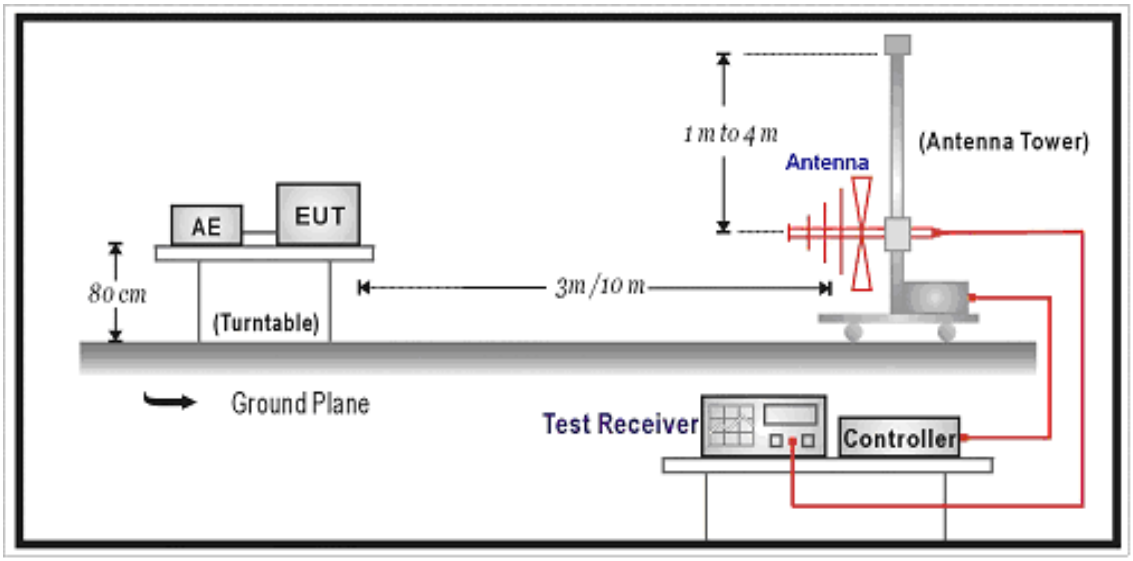
3.5. Test Result of Maximum Power Output

Product	Logistic Monitoring Gateway		
Test Mode	RF Output Power (Conducted)		
Date of Test	2017/05/24	Test Site	CTR

Band	GSM 850			GSM 1900		
CHANNEL	128	189	251	512	661	810
VOICE	N/A	N/A	N/A	N/A	N/A	N/A
GPRS Class 8	33.50	33.59	**33.60**	31.05	31.40	**31.57**
GPRS Class 10	31.93	32.00	31.95	29.78	29.87	29.81
GPRS Class 11	N/A	N/A	N/A	N/A	N/A	N/A
GPRS Class 12	N/A	N/A	N/A	N/A	N/A	N/A
EGPRS Class 8	27.67	27.64	27.58	26.65	26.86	26.74
EGPRS Class 10	**27.71**	27.70	27.62	26.65	**26.87**	26.77
EGPRS Class 11	N/A	N/A	N/A	N/A	N/A	N/A
EGPRS Class 12	N/A	N/A	N/A	N/A	N/A	N/A
Note: Unit : dBm						

Band	WCDMA Band 2			WCDMA Band 5		
CHANNEL	9262	9400	9538	4132	4183	4233
VOICE	N/A	N/A	N/A	N/A	N/A	N/A
RMC	**23.73**	23.01	23.50	**24.01**	23.91	23.80
HSDPA Set 1	**23.22**	22.57	23.11	**23.16**	23.09	22.95
HSDPA Set 2	22.55	21.96	22.52	22.64	22.59	22.46
HSDPA Set 3	22.34	21.69	22.25	22.35	22.34	22.22
HSDPA Set 4	22.07	21.46	22.00	22.07	22.03	21.92
HSUPA Set 1	22.63	22.26	22.68	22.75	22.71	22.57
HSUPA Set 2	20.82	20.23	20.71	20.64	20.74	20.69
HSUPA Set 3	21.67	20.92	21.48	21.46	21.51	21.36
HSUPA Set 4	21.03	20.45	20.93	21.06	20.96	20.85
HSUPA Set 5	**22.73**	22.14	22.65	22.69	22.70	**22.86**
Note: Unit : dBm						

3.6 Radiated Test Setup



3.7 Radiated Test Procedure

The Spectrum Analyzer was tuned to the test frequency. The EUT was tested in three The device was put into Transmit mode then rotated through 360 degrees until the highest power level was observed in both horizontal and vertical polarization. The device was then replaced with a substitution antenna, which input signal was adjusted until the received level matched that of the previously detected emission.

(1) The EUT is tested with maximum rated TX power via the Base Station simulator.

(2) The EUT is tested in three orthogonal planes , The worst case test configuration was found in the horizontal position.

3.8 Test Result of Maximum Power Output

Product	Logistic Monitoring Gateway		
Test Mode	RF Output Power (Radiated)		
Date of Test	2017/06/02	Test Site	OATS 3
Test Condition	GSM 850		

Maximum Power- GPRS 850

Frequency (MHz)	Reading Level (dBm)	Substitution Level (dBm)	Substitution Antenna Gain (dBi)	Cable Loss (dB)	Result EIRP (dBm)	Result ERP (W)
824.2	-1.32	28.75	2.85	0.6	31.00	1.26
836.4	-0.73	29.31	2.85	0.6	31.56	1.43
848.8	-0.37	29.65	2.85	0.6	31.90	1.55

Maximum Power- EGPRS 850

Frequency (MHz)	Reading Level (dBm)	Substitution Level (dBm)	Substitution Antenna Gain (dBi)	Cable Loss (dB)	Result EIRP (dBm)	Result ERP (W)
824.2	-7.99	22.32	2.85	0.6	24.57	0.29
836.4	-7.43	22.86	2.85	0.6	25.11	0.32
848.8	-7.08	23.21	2.85	0.6	25.46	0.35

Note:

1. The EUT meets the requirements of FCC CFR 47: Part 22, Section 22.913(a) for Effective Radiated Power.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz
3. Result ERP = Substitution Level + Substitution Antenna Gain - Cable Loss

Product	Logistic Monitoring Gateway		
Test Mode	RF Output Power (Radiated)		
Date of Test	2017/06/02	Test Site	OATS 3
Test Condition	PCS 1900		

Maximum Power- GPRS 1900

Frequency (MHz)	Reading Level (dBm)	Substitution Level (dBm)	Substitution Antenna Gain (dBi)	Cable Loss (dB)	Result EIRP (dBm)	Result ERP (W)
1850.2	-8.71	23.477	10.4	1.020	32.857	1.93
1880.0	-8.85	23.552	10.4	1.020	32.932	1.96
1909.8	-9.50	22.941	10.4	1.020	32.321	1.71

Maximum Power- EGPRS 1900

Frequency (MHz)	Reading Level (dBm)	Substitution Level (dBm)	Substitution Antenna Gain (dBi)	Cable Loss (dB)	Result EIRP (dBm)	Result ERP (W)
1850.2	-13.36	18.827	10.4	1.020	28.207	0.66
1880.0	-14.17	18.232	10.4	1.020	27.612	0.58
1909.8	-15.66	16.781	10.4	1.020	26.161	0.41

Note:

1. The EUT meets the requirements of FCC CFR 47: Part 24, Section 24.232(b) for Effective Isotropically Radiated Power.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz
3. Result EIRP = Substitution Level + Substitution Antenna Gain - Cable Loss

Product	Logistic Monitoring Gateway		
Test Mode	RF Output Power (Radiated)		
Date of Test	2017/06/02	Test Site	OATS 3
Test Condition	WCDMA		

Maximum Power- WCDMA Band 2 RMC

Frequency (MHz)	Reading Level (dBm)	Substitution Level (dBm)	Substitution Antenna Gain (dBi)	Cable Loss (dB)	Result EIRP (dBm)	Result ERP (W)
1852.4	-14.34	17.864	10.4	1.020	27.244	0.53
1880	-13.77	18.632	10.4	1.020	28.012	0.63
1907.6	-15.10	17.340	10.4	1.020	26.720	0.47

Note:

1. The EUT meets the requirements of FCC CFR 47: Part 22, Section 22.913(a) for Effective Radiated Power.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz
3. Result EIRP = Substitution Level + Substitution Antenna Gain - Cable Loss

Maximum Power- WCDMA Band 5 RMC

Frequency (MHz)	Reading Level (dBm)	Substitution Level (dBm)	Substitution Antenna Gain (dBi)	Cable Loss (dB)	Result EIRP (dBm)	Result ERP (W)
826.4	-9.13	21.20	2.85	0.6	23.45	0.22
836.6	-9.17	21.16	2.85	0.6	23.41	0.22
846.6	-9.61	20.73	2.85	0.6	22.98	0.20

Note:

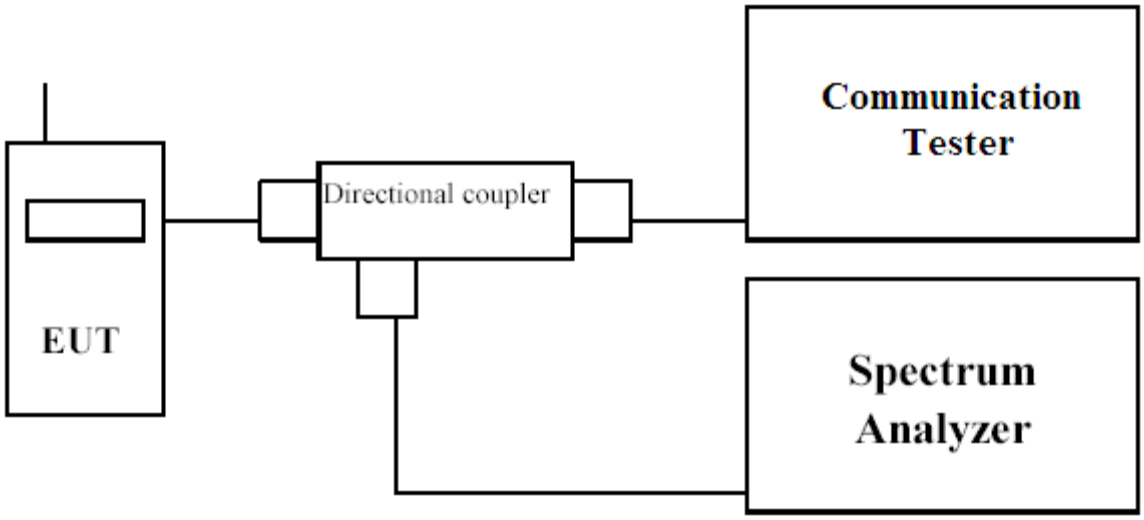
1. The EUT meets the requirements of FCC CFR 47: Part 24, Section 24.232(b) for Effective Isotropically Radiated Power.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz
3. Result EIRP = Substitution Level + Substitution Antenna Gain - Cable Loss

4 Occupied Bandwidth

4.6 Test Specification

According to Part 2.1049, 22.917, 24.238

4.7 Test Setup



4.8 Test Procedure

The EUT is tested with maximum rated TX power via the Base Station simulator, and the occupied bandwidth was measured at the antenna terminals of the EUT.

The Resolution BW of the analyzer is set to 1 % of the emission bandwidth. The EUT's occupied bandwidth is measured as the width of the signal between two points, one below the carrier center frequency and one above the carrier frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.
The plots below show the resultant display from the Spectrum Analyser.

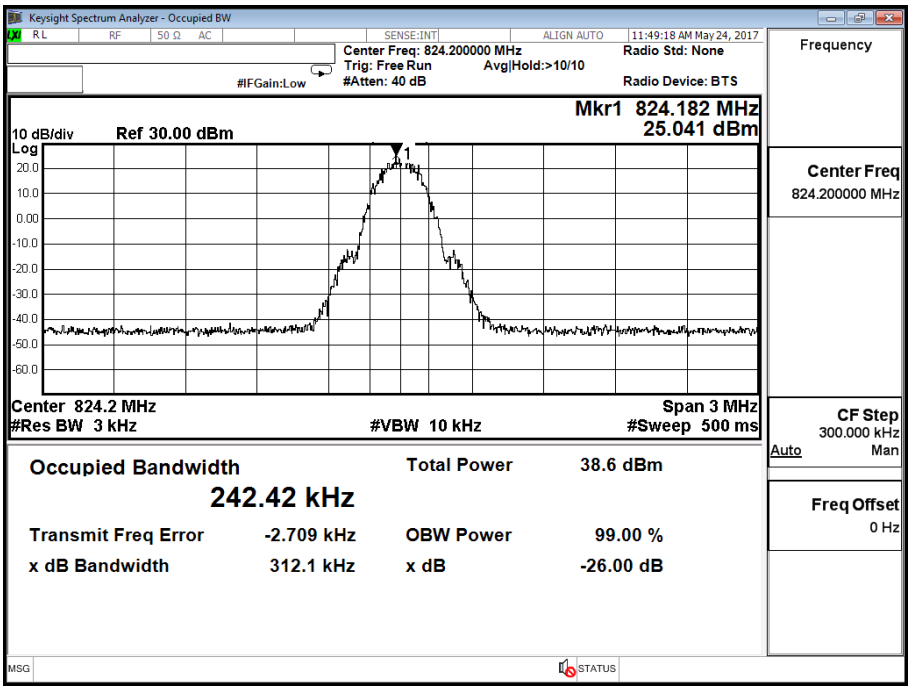
4.9 Test Result of Occupied Bandwidth

Product	Logistic Monitoring Gateway
Test Mode	Occupied Bandwidth
Test Site	CTR

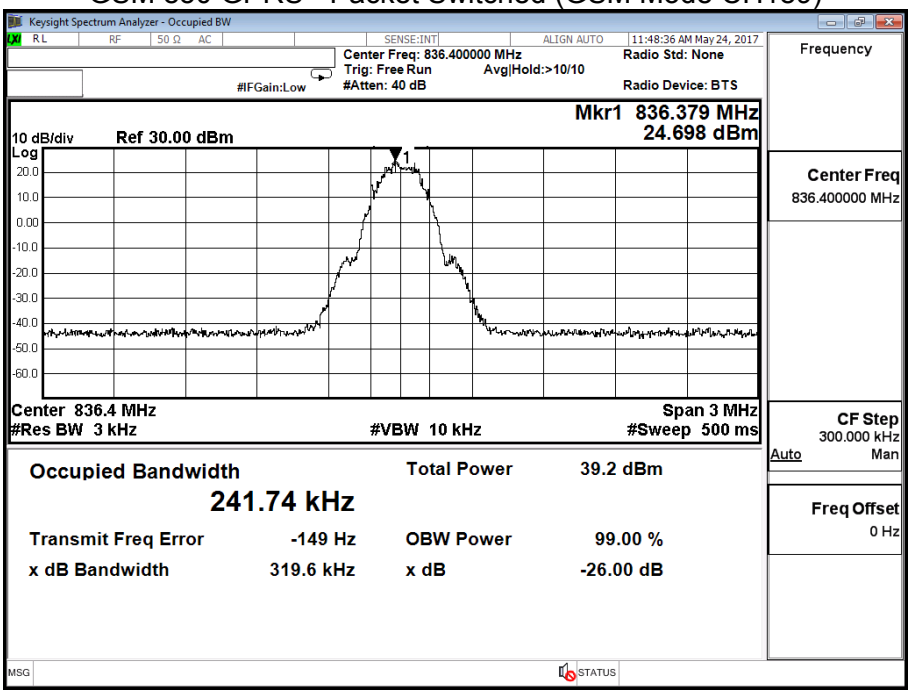
Test Mode	Channel	TX Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB bandwidth (kHz)	Result
GSM 850 GPRS	128	824.2	242.42	312.1	Pass
	189	836.4	241.74	319.6	Pass
	251	848.8	243.83	313.7	Pass
GSM 850 EGPRS	128	824.2	244.63	299.6	Pass
	189	836.4	242.44	314.9	Pass
	251	848.8	246.02	314.4	Pass
PCS 1900 GPRS	512	1850.2	244.12	304.6	Pass
	661	1880	242.59	322.4	Pass
	810	1909.8	246.34	311.4	Pass
PCS 1900 EGPRS	512	1850.2	246.44	317.3	Pass
	661	1880	244.33	317.0	Pass
	810	1909.8	243.67	315.0	Pass
WCDMA Band 2	9262	1852.4	4.0516	4.625	Pass
	9400	1880	4.0629	4.634	Pass
	9538	1907.6	4.0671	4.643	Pass
WCDMA Band 5	4132	826.4	4.0551	4.619	Pass
	4183	836.6	4.0581	4.603	Pass
	4233	846.6	4.0448	4.604	Pass

Product	Logistic Monitoring Gateway		
Test Mode	Occupied Bandwidth		
Date of Test	2017/05/24	Test Site	CTR
Test Condition	GSM 850 GPRS		

GSM 850 GPRS - Packet Switched (GSM Mode CH 128)

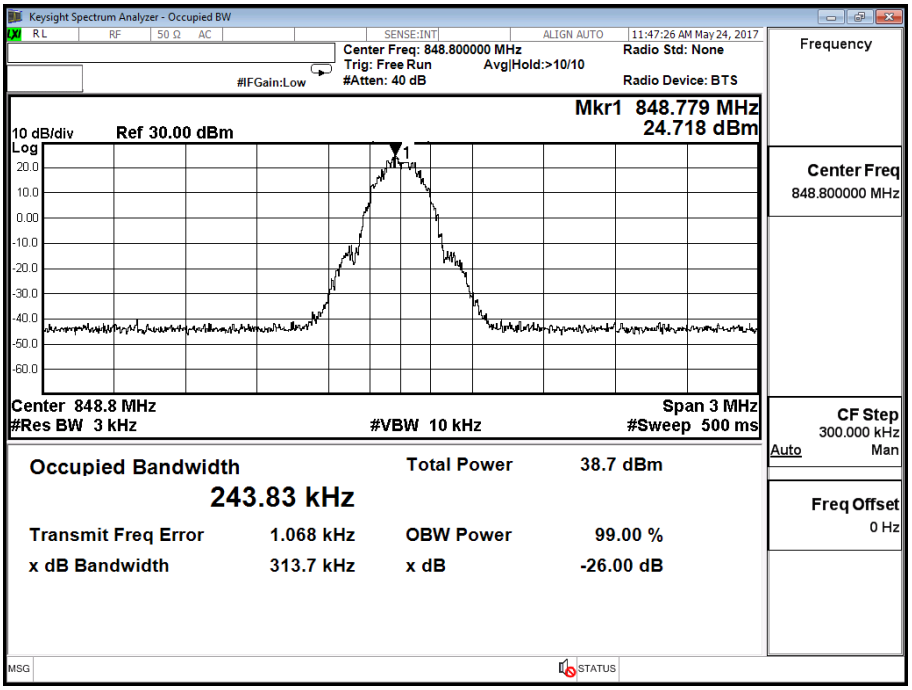


GSM 850 GPRS - Packet Switched (GSM Mode CH189)



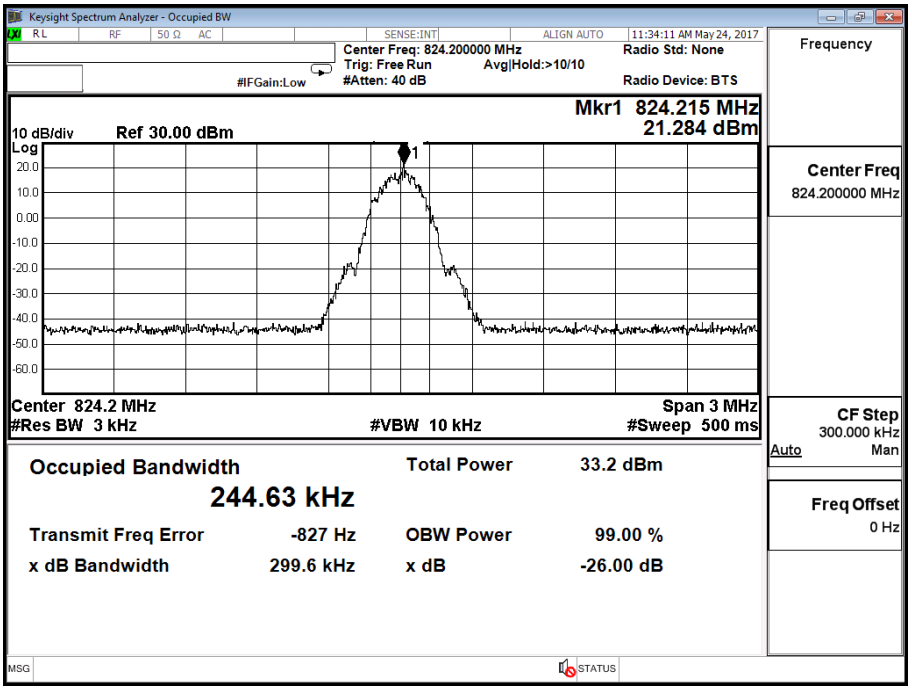
Product	Logistic Monitoring Gateway		
Test Mode	Occupied Bandwidth		
Date of Test	2017/05/24	Test Site	CTR
Test Condition	GSM 850 GPRS		

GSM 850 GPRS - Packet Switched (GSM Mode CH 251)

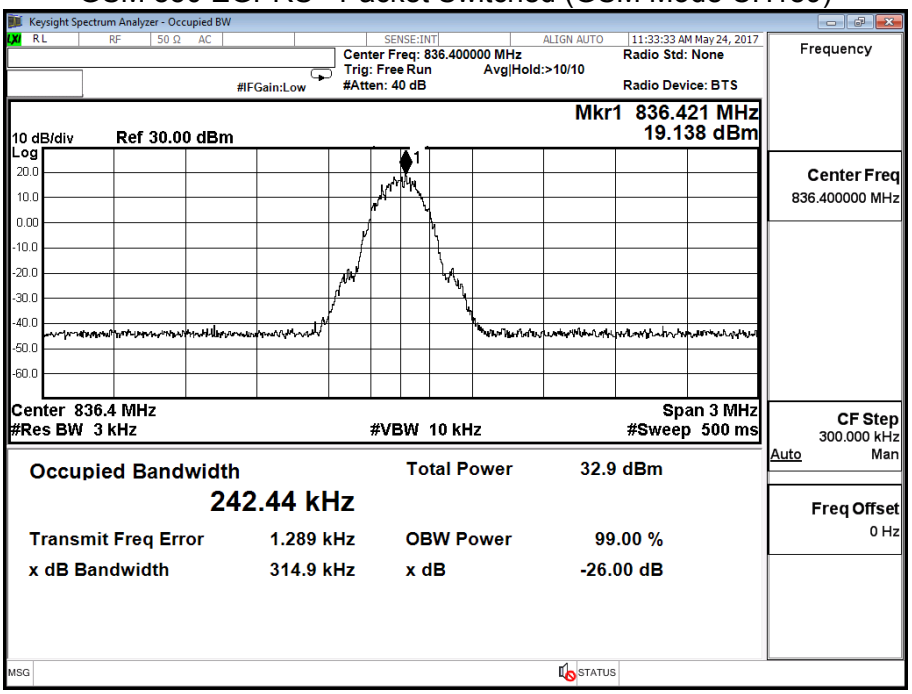


Product	Logistic Monitoring Gateway		
Test Mode	Occupied Bandwidth		
Date of Test	2017/05/24	Test Site	CTR
Test Condition	GSM 850 EGPRS		

GSM 850 EGPRS - Packet Switched (GSM Mode CH 128)

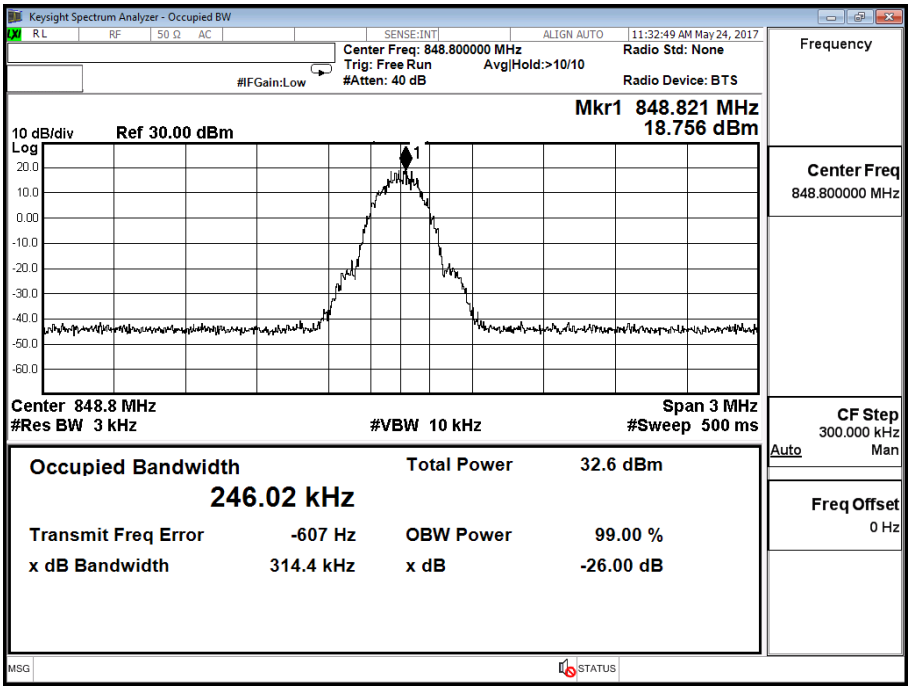


GSM 850 EGPRS - Packet Switched (GSM Mode CH189)



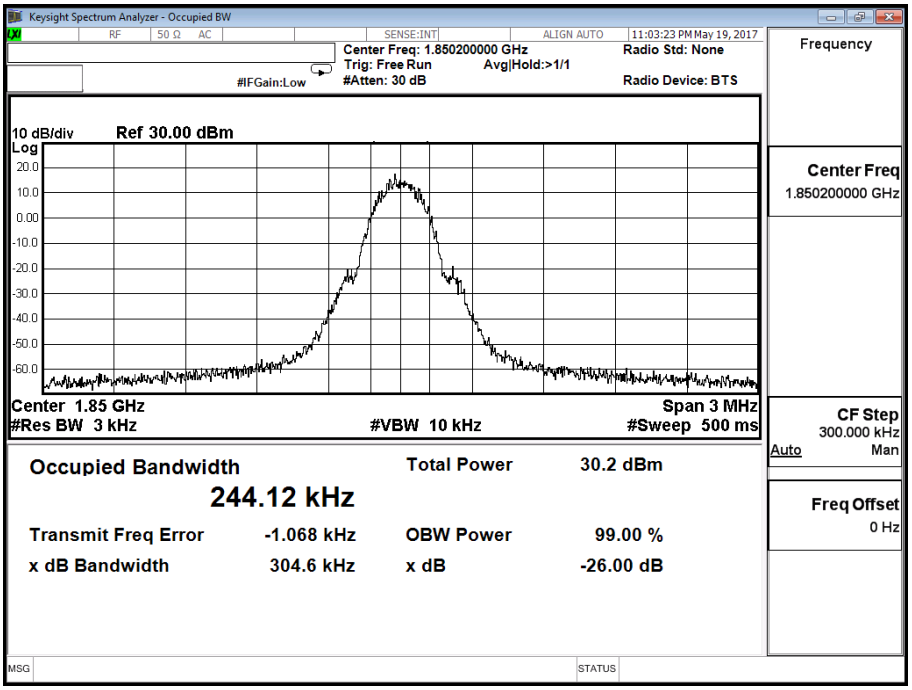
Product	Logistic Monitoring Gateway		
Test Mode	Occupied Bandwidth		
Date of Test	2017/05/24	Test Site	CTR
Test Condition	GSM 850 EGPRS		

GSM 850 EGPRS - Packet Switched (GSM Mode CH 251)

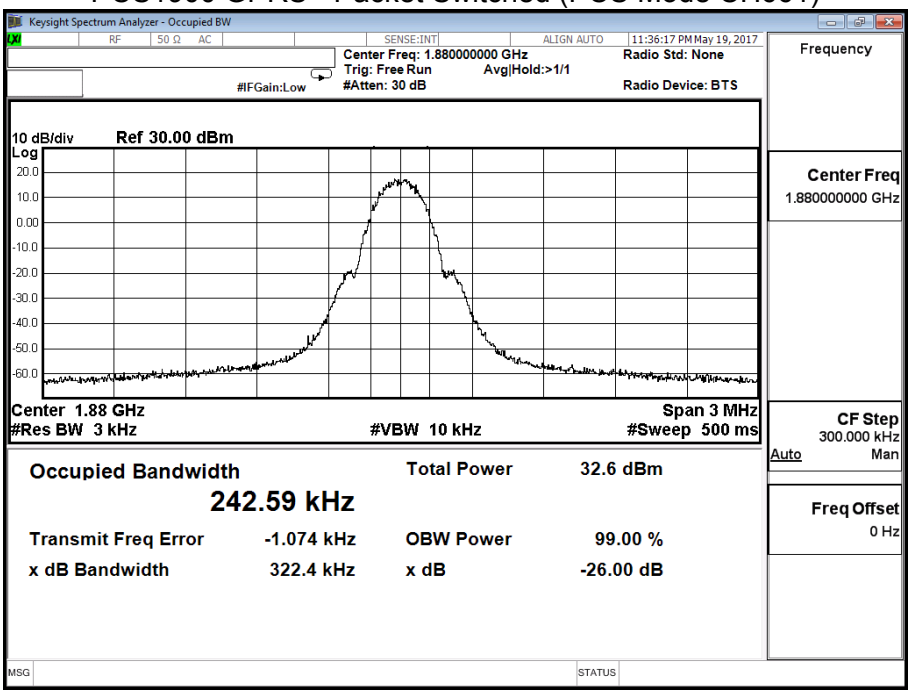


Product	Logistic Monitoring Gateway		
Test Mode	Occupied Bandwidth		
Date of Test	2017/05/19	Test Site	CTR
Test Condition	PCS1900 GPRS		

PCS1900 GPRS - Packet Switched (PCS Mode CH 512)

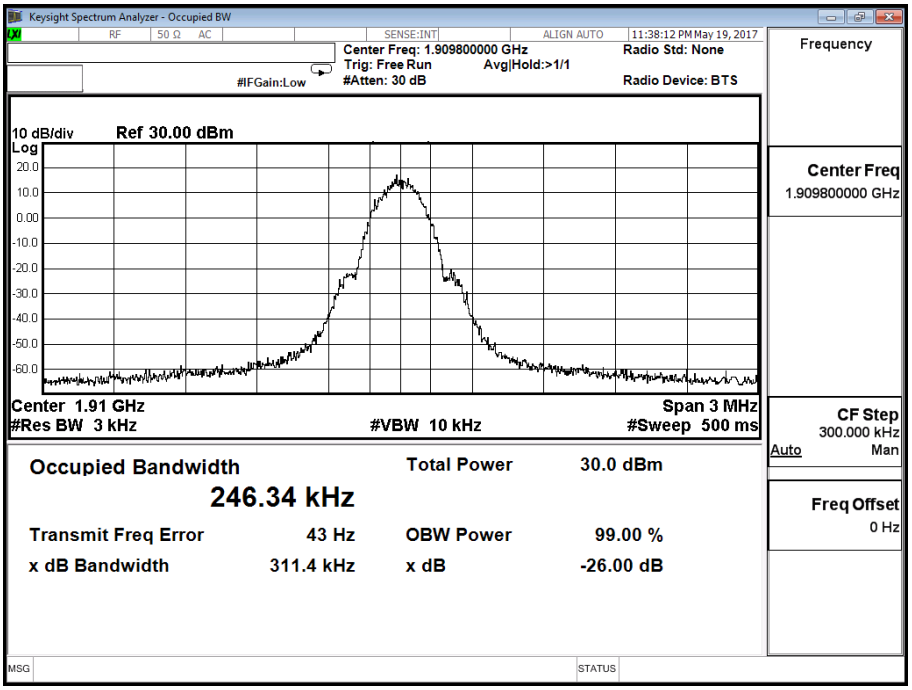


PCS1900 GPRS - Packet Switched (PCS Mode CH661)



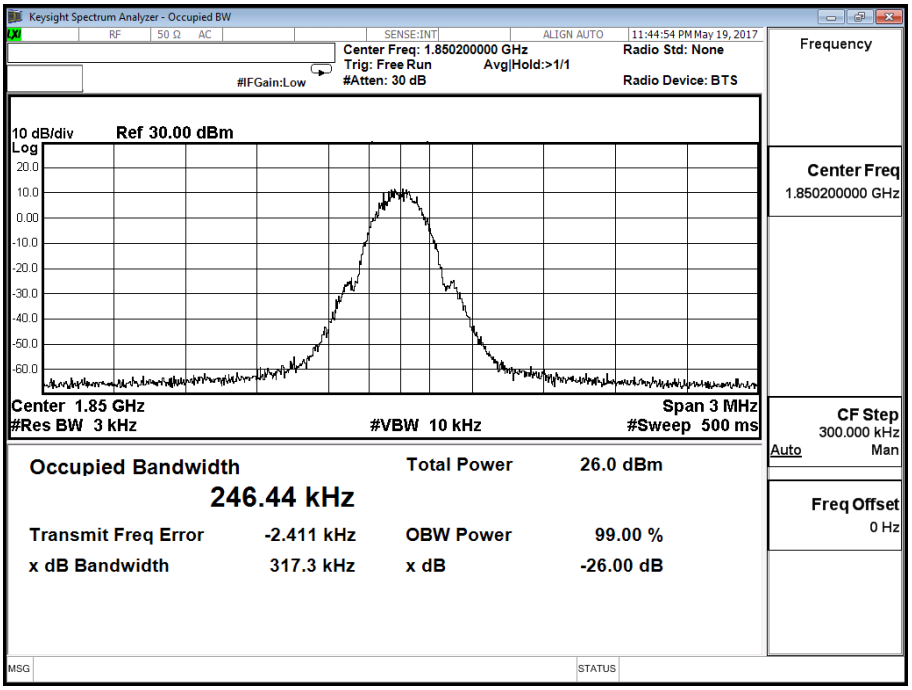
Product	Logistic Monitoring Gateway		
Test Mode	Occupied Bandwidth		
Date of Test	2017/05/19	Test Site	CTR
Test Condition	PCS1900 GPRS		

PCS1900 GPRS - Packet Switched (PCS Mode CH 810)

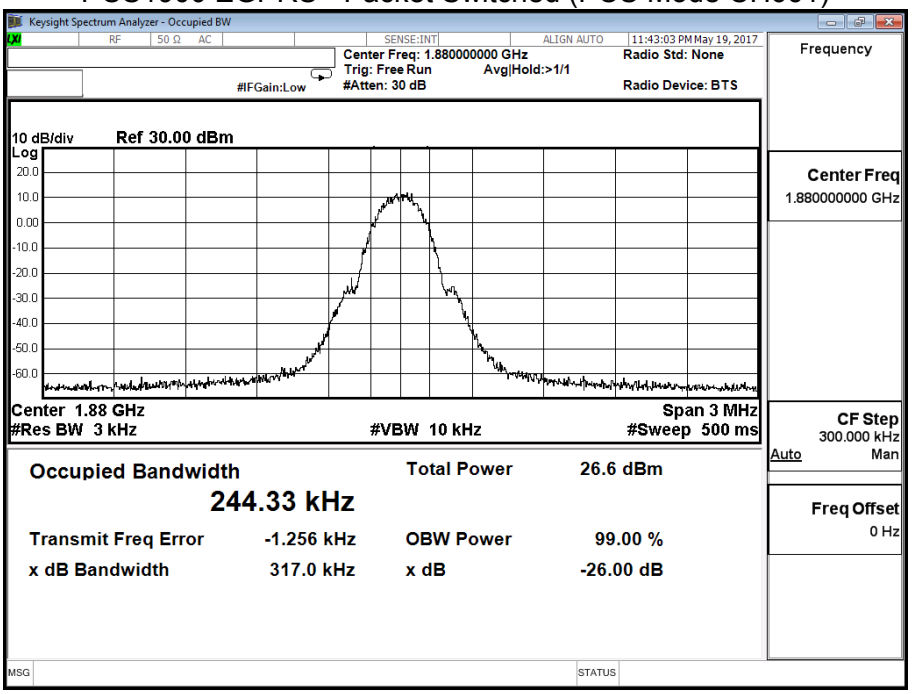


Product	Logistic Monitoring Gateway		
Test Mode	Occupied Bandwidth		
Date of Test	2017/05/19	Test Site	CTR
Test Condition	PCS1900 EGPRS		

PCS1900 EGPRS - Packet Switched (PCS Mode CH 512)

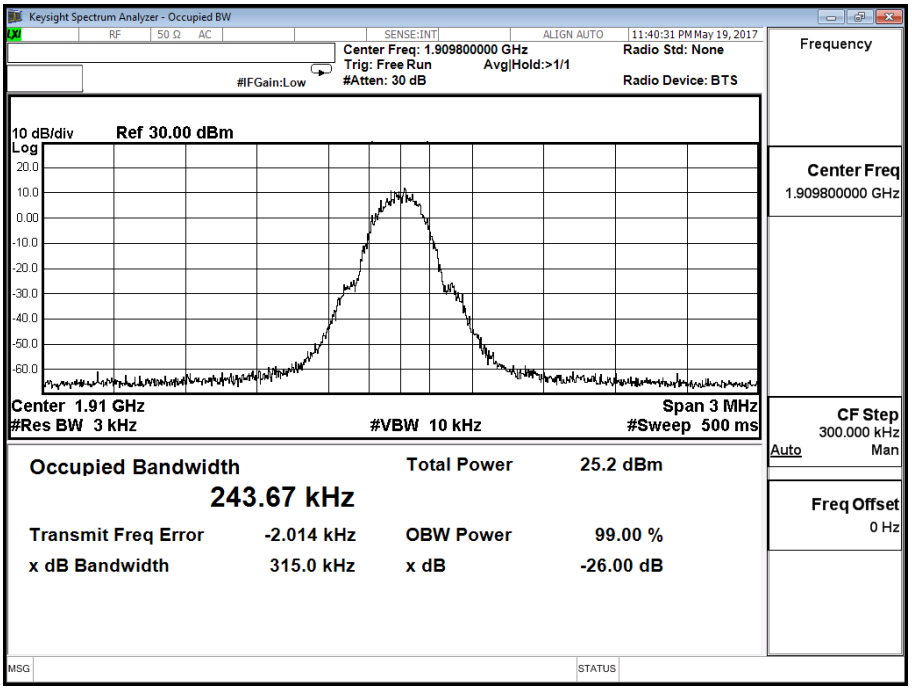


PCS1900 EGPRS - Packet Switched (PCS Mode CH661)



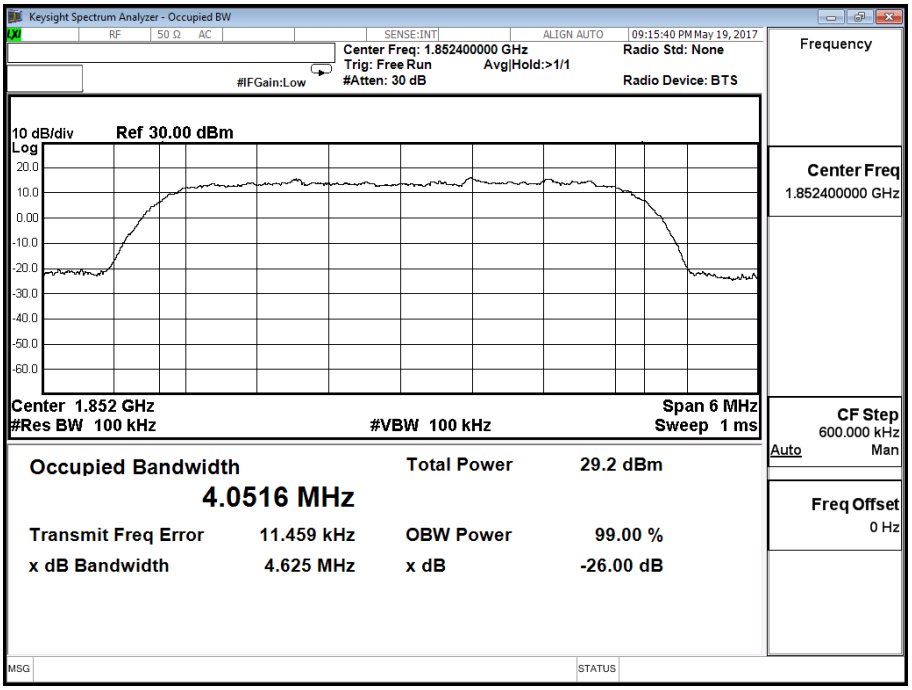
Product	Logistic Monitoring Gateway		
Test Mode	Occupied Bandwidth		
Date of Test	2017/05/24	Test Site	CTR
Test Condition	PCS1900 EGPRS		

PCS1900 EGPRS - Packet Switched (PCS Mode CH 810)

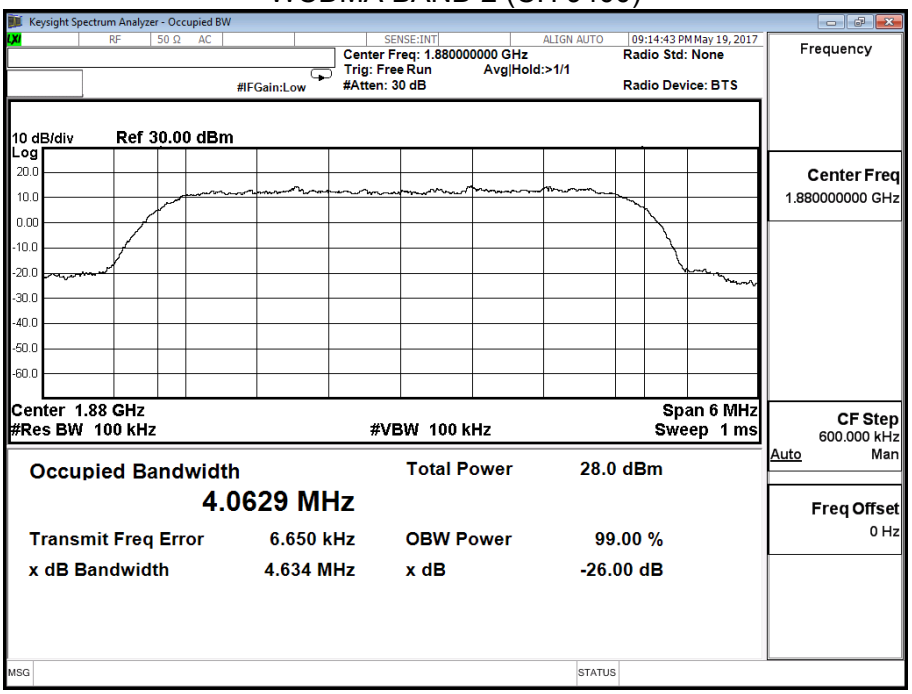


Product	Logistic Monitoring Gateway		
Test Mode	Occupied Bandwidth		
Date of Test	2017/05/24	Test Site	CTR
Test Condition	WCDMA BAND 2		

WCDMA BAND 2 (CH 9262)

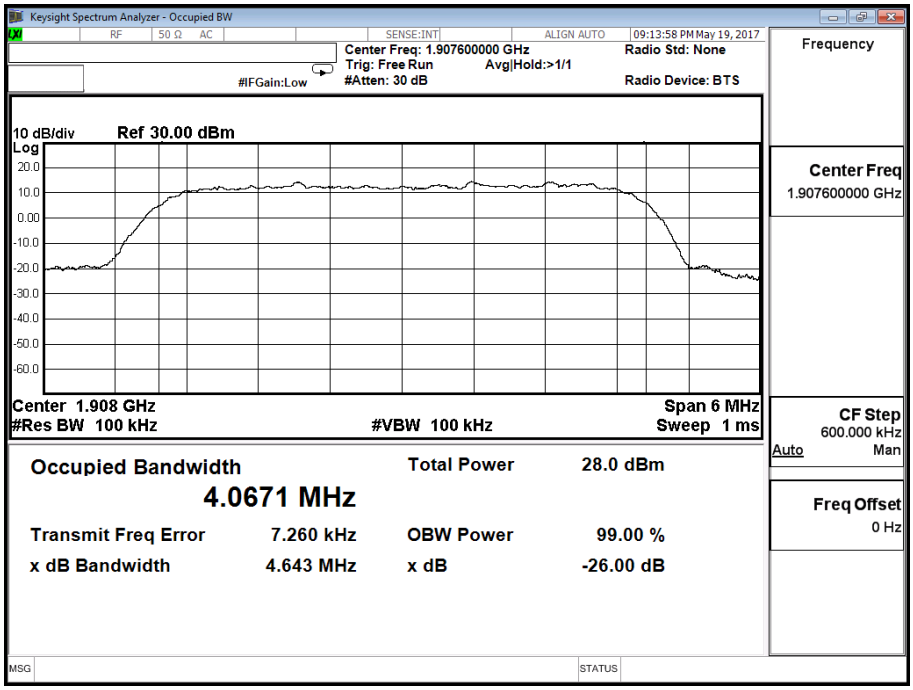


WCDMA BAND 2 (CH 9400)



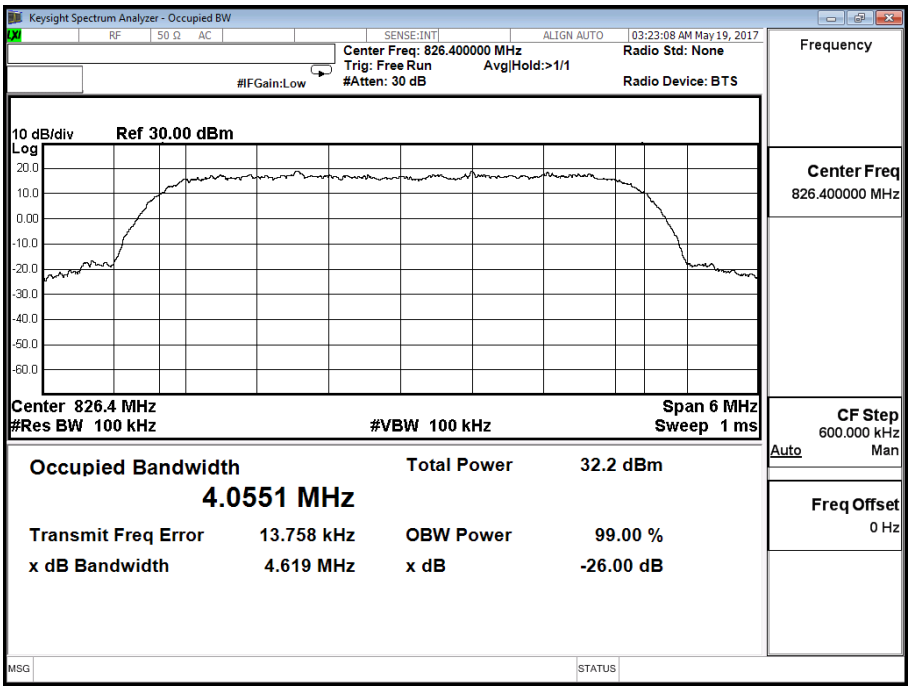
Product	Logistic Monitoring Gateway		
Test Mode	Occupied Bandwidth		
Date of Test	2017/05/19	Test Site	CTR
Test Condition	WCDMA BAND 2		

WCDMA BAND 2 (CH 9538)

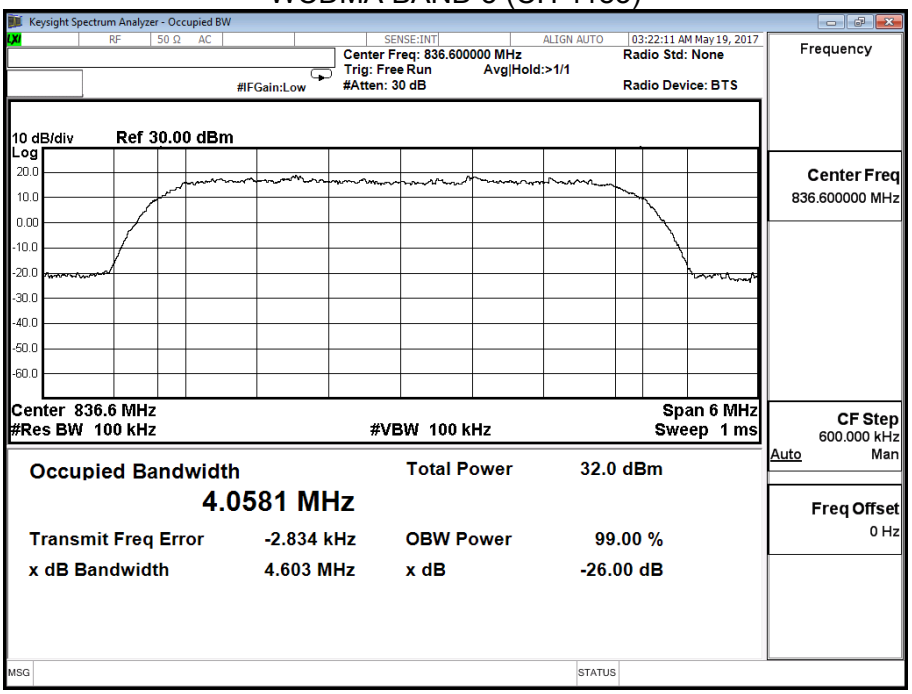


Product	Logistic Monitoring Gateway		
Test Mode	Occupied Bandwidth		
Date of Test	2017/05/19	Test Site	CTR
Test Condition	WCDMA BAND 5		

WCDMA BAND 5 (CH 4132)

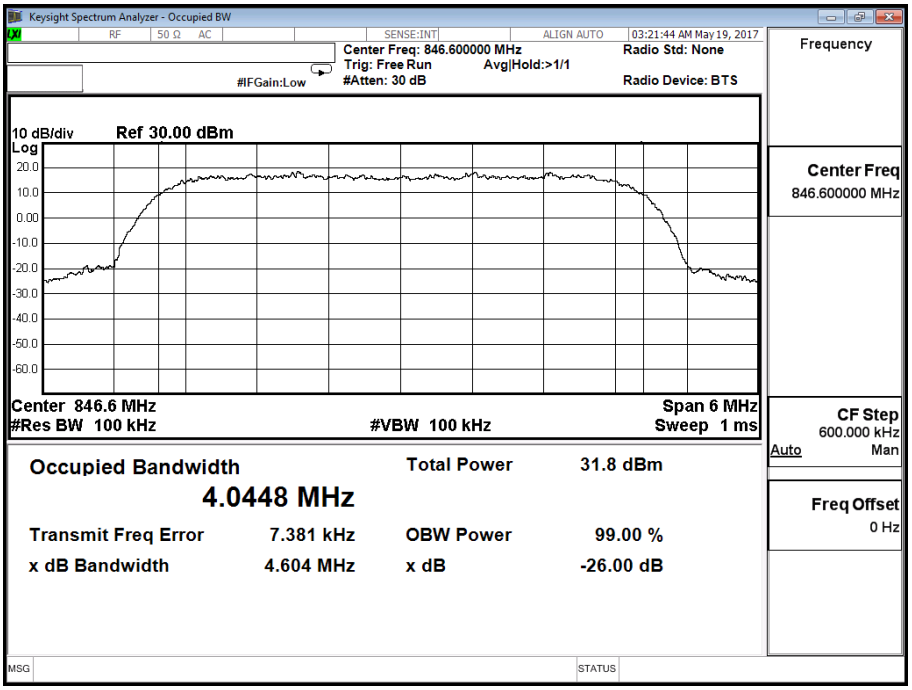


WCDMA BAND 5 (CH 4183)



Product	Logistic Monitoring Gateway		
Test Mode	Occupied Bandwidth		
Date of Test	2017/05/19	Test Site	CTR
Test Condition	WCDMA BAND 5		

WCDMA BAND 5 (CH 4233)

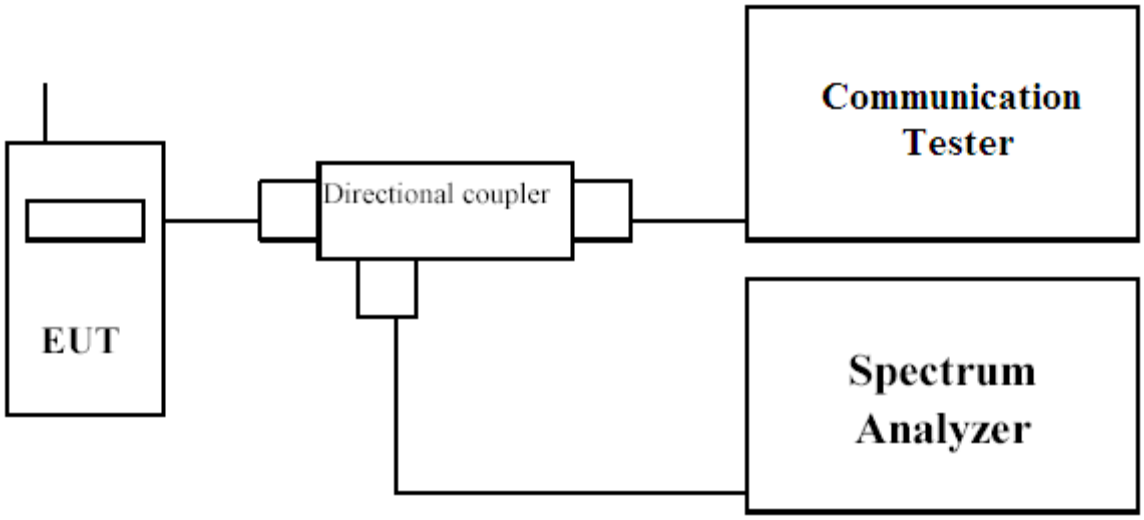


5 Spurious Emission At Antenna Terminals (+/-1MHz)

5.6 Test Specification

According to Part 2.1049, 22.917, 24.238

5.7 Setup



5.8 Limits

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.

5.9 Test Procedure

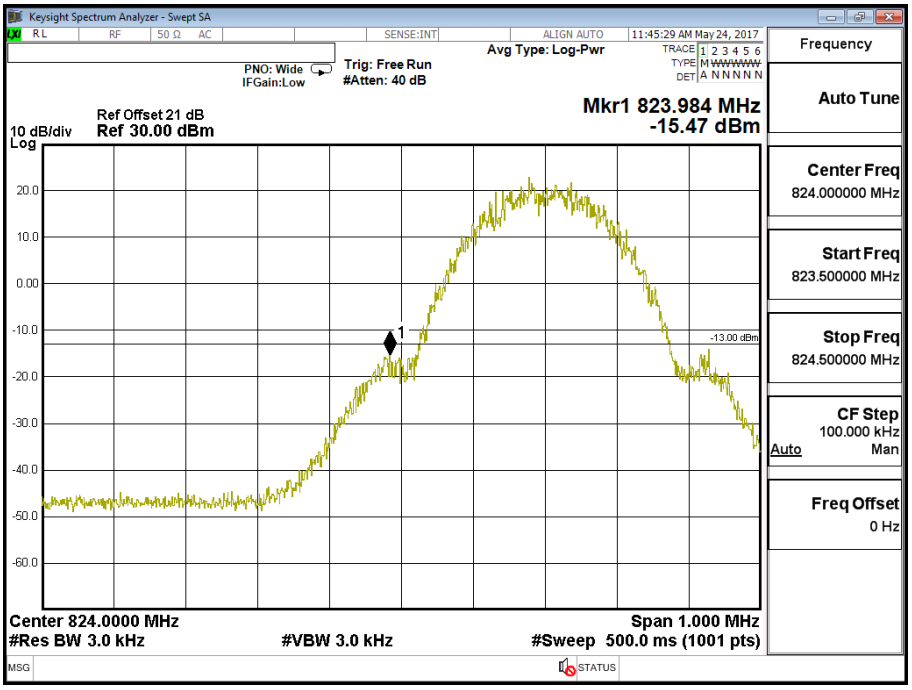
In accordance with Part 22.917, 24.238, at least 1% of the emission bandwidth was used for the resolution and video bandwidths up to 1MHz away from the Block Edge. At greater than 1MHz, the resolution and video bandwidth were set 3 x RBW.

The reference power and path losses of all channels used for testing in each frequency block were measured.

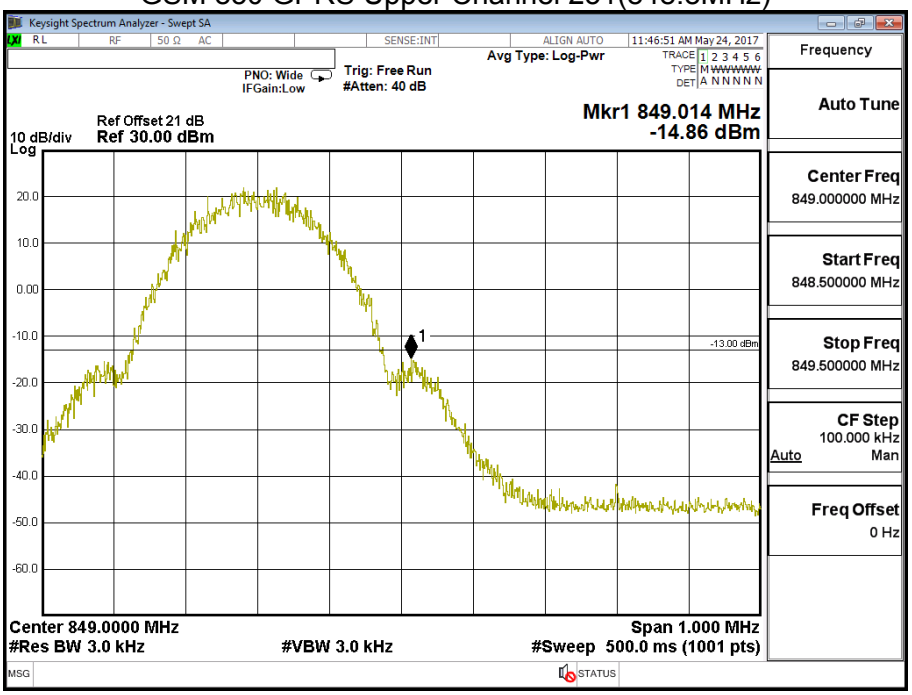
5.10Test Result of Spurious Emission At Antenna Terminals (+/-1MHz)

Product	Logistic Monitoring Gateway		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2017/05/24	Test Site	CTR
Test Condition	Block Edge Test (GSM 850 GPRS)		

GSM 850 GPRS Lower Channel 128 (824.2MHz)

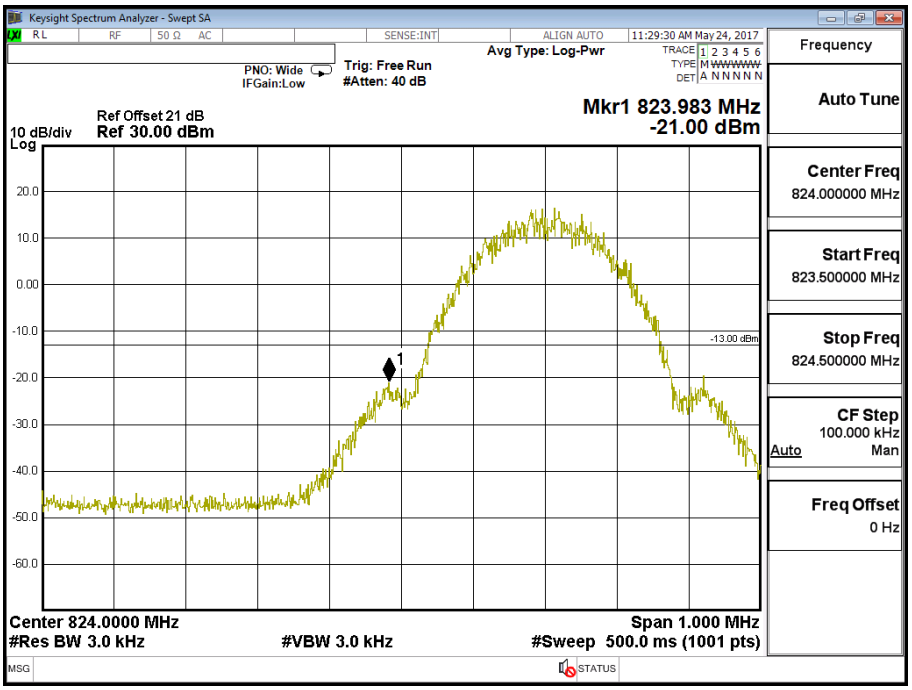


GSM 850 GPRS Upper Channel 251(848.8MHz)

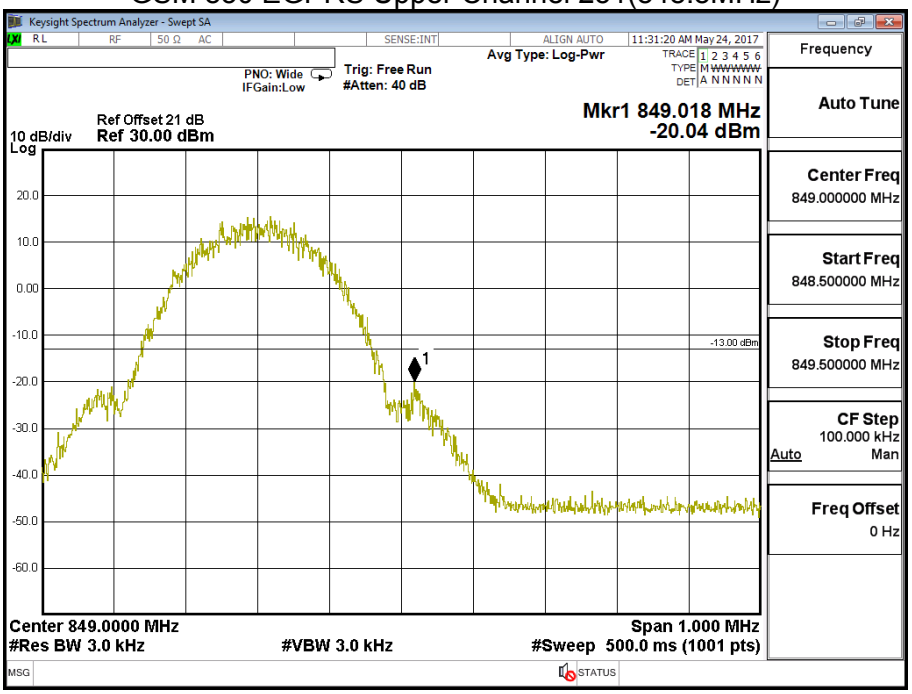


Product	Logistic Monitoring Gateway		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2017/05/20	Test Site	CTR
Test Condition	Block Edge Test (GSM 850 EGPRS)		

GSM 850 EGPRS Lower Channel 128 (824.2MHz)

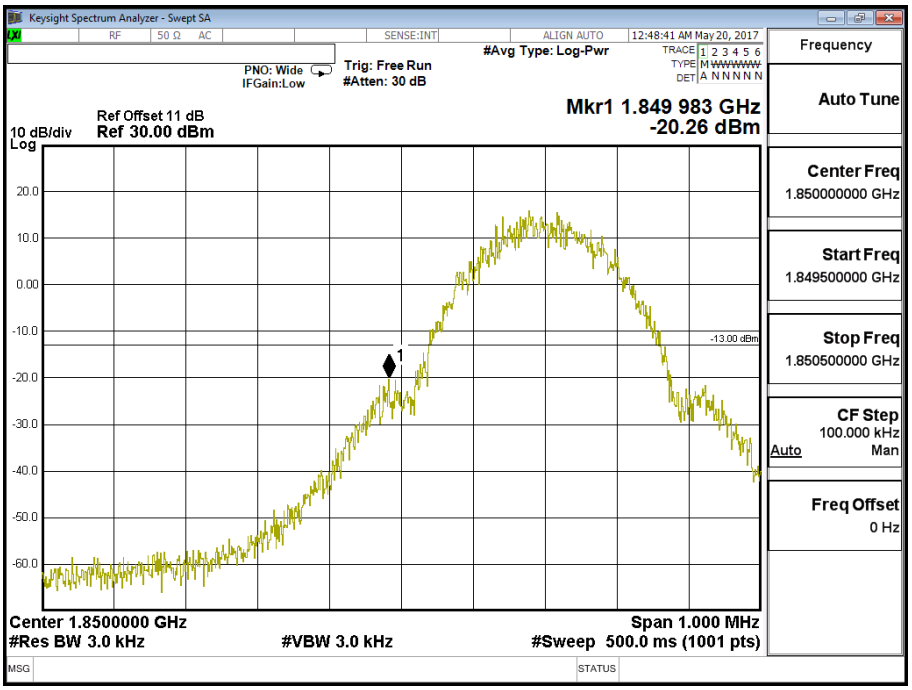


GSM 850 EGPRS Upper Channel 251(848.8MHz)

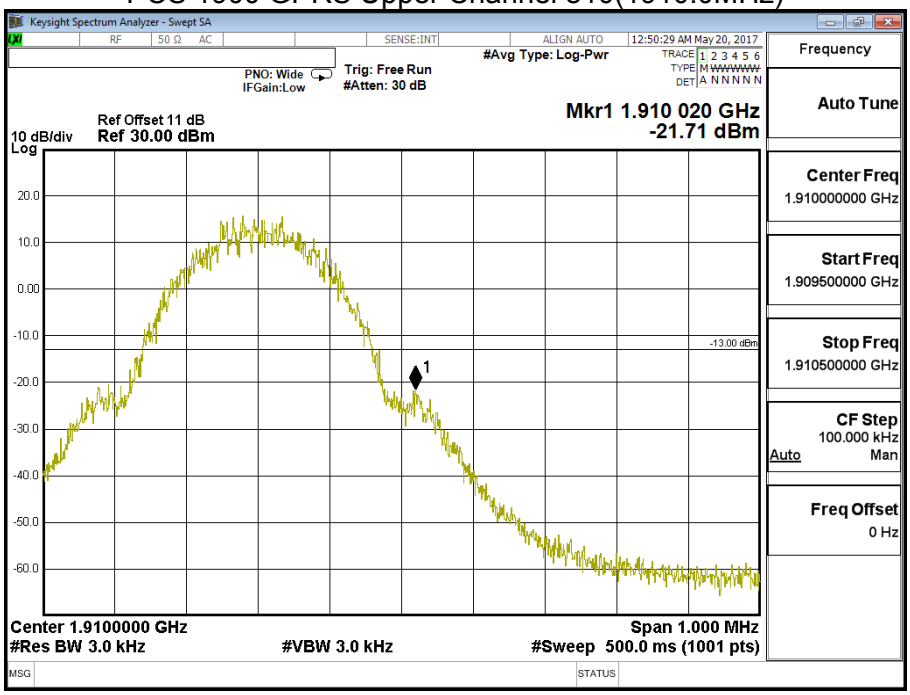


Product	Logistic Monitoring Gateway		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2017/05/20	Test Site	CTR
Test Condition	Block Edge Test (PCS 1900 GPRS)		

PCS 1900 GPRS Lower Channel 512 (1850.2MHz)

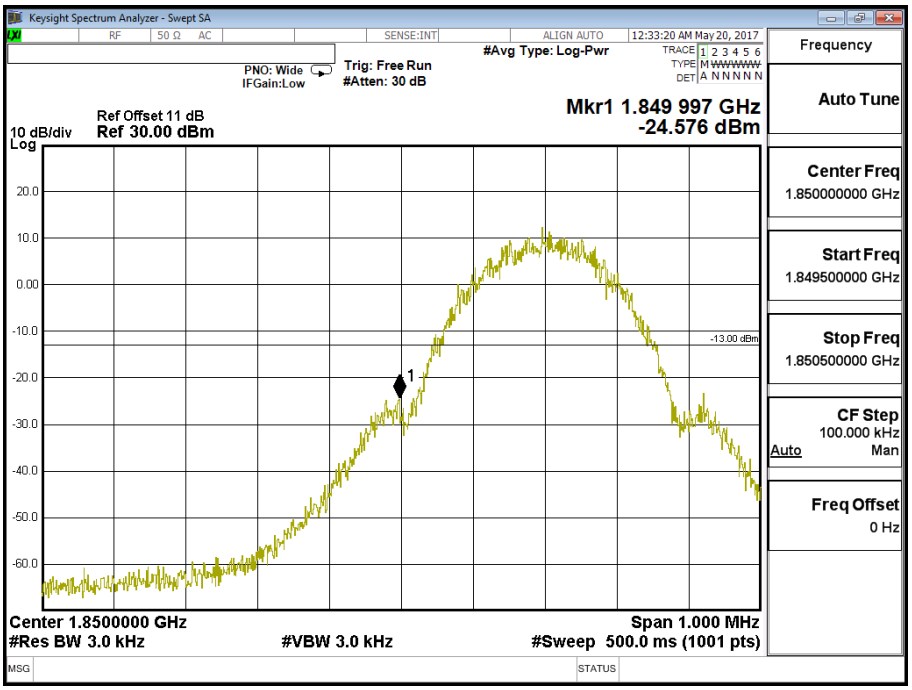


PCS 1900 GPRS Upper Channel 810(1910.0MHz)

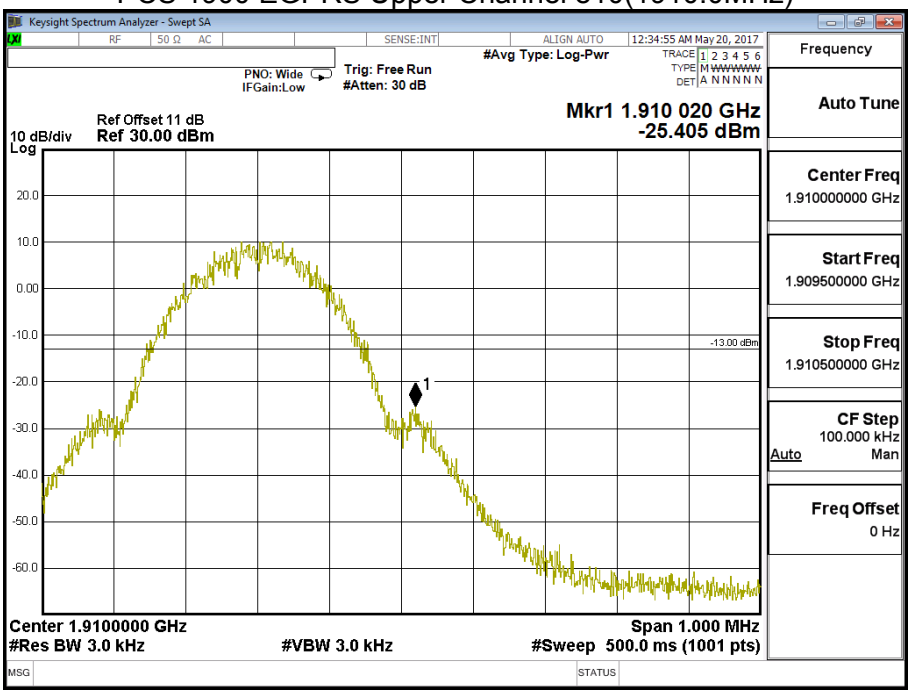


Product	Logistic Monitoring Gateway		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2017/05/20	Test Site	CTR
Test Condition	Block Edge Test (PCS 1900 EGPRS)		

PCS 1900 EGPRS Lower Channel 512 (1850.2MHz)

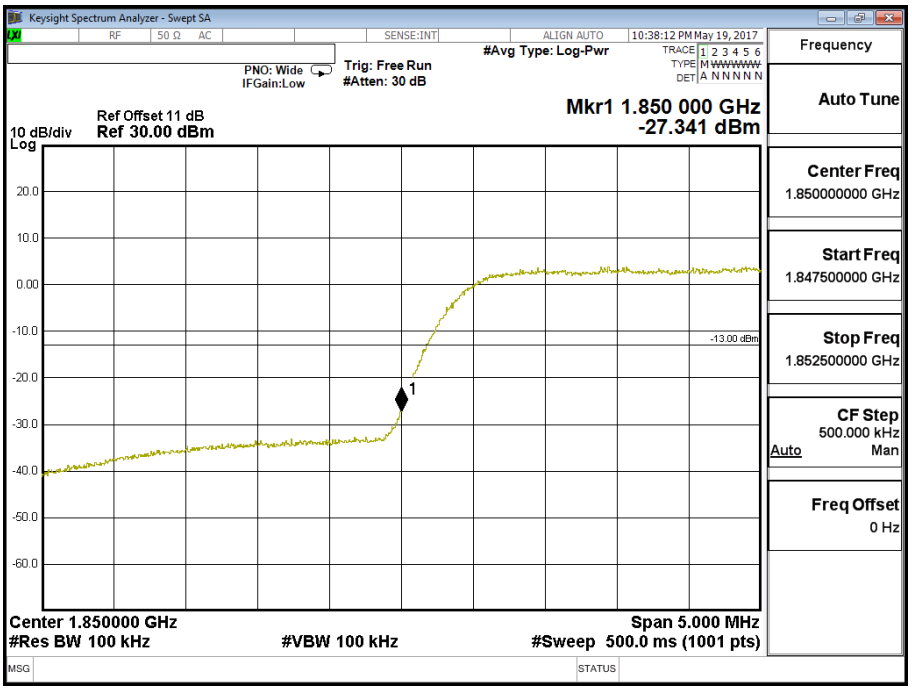


PCS 1900 EGPRS Upper Channel 810(1910.0MHz)

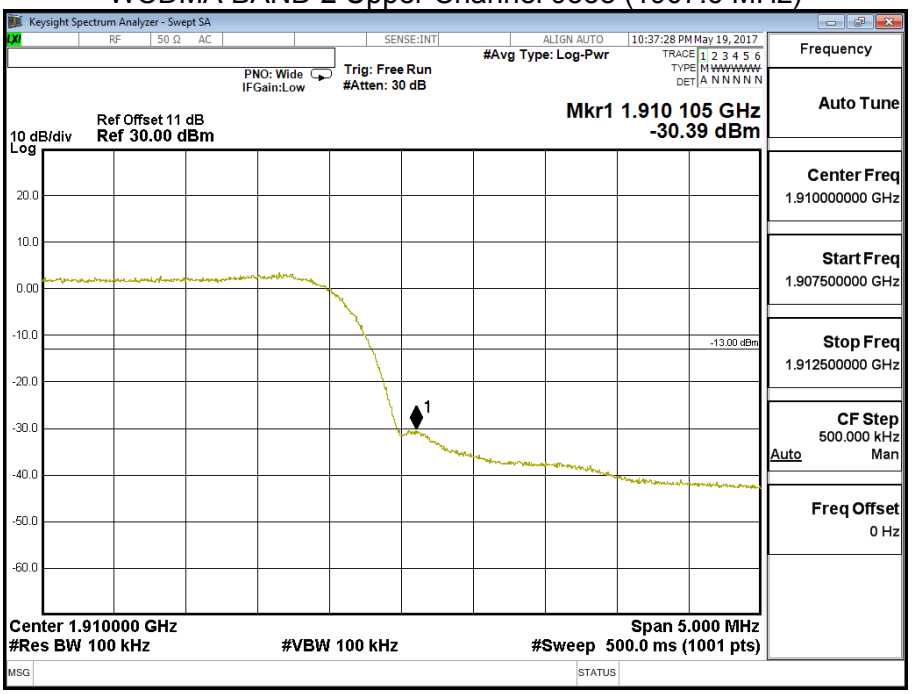


Product	Logistic Monitoring Gateway		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2017/05/19	Test Site	CTR
Test Condition	Block Edge Test (WCDMA BAND 2)		

WCDMA BAND 2 Lower Channel 9262 (1852.4MHz)

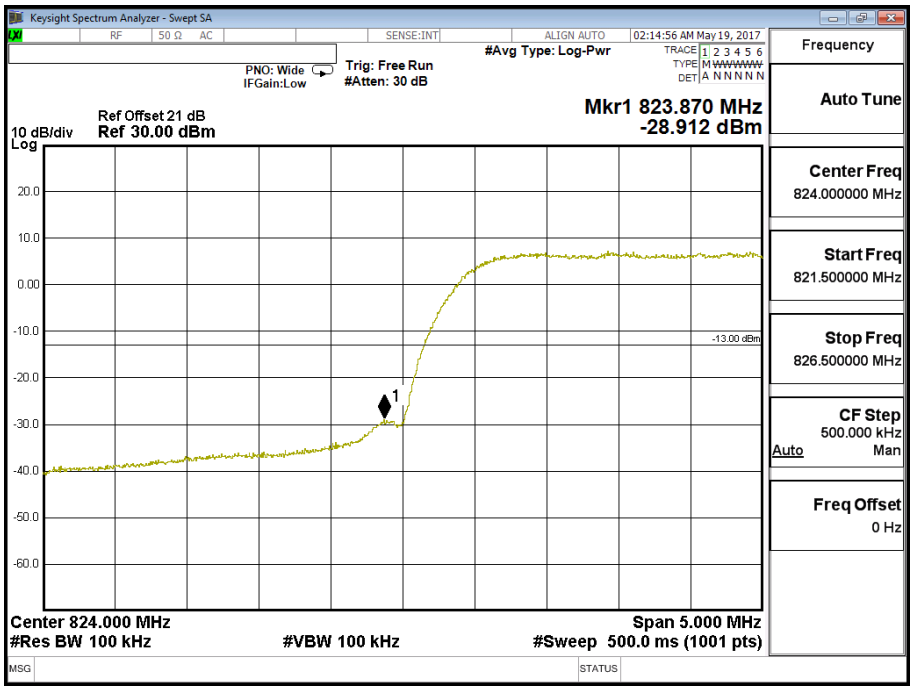


WCDMA BAND 2 Upper Channel 9538 (1907.6 MHz)

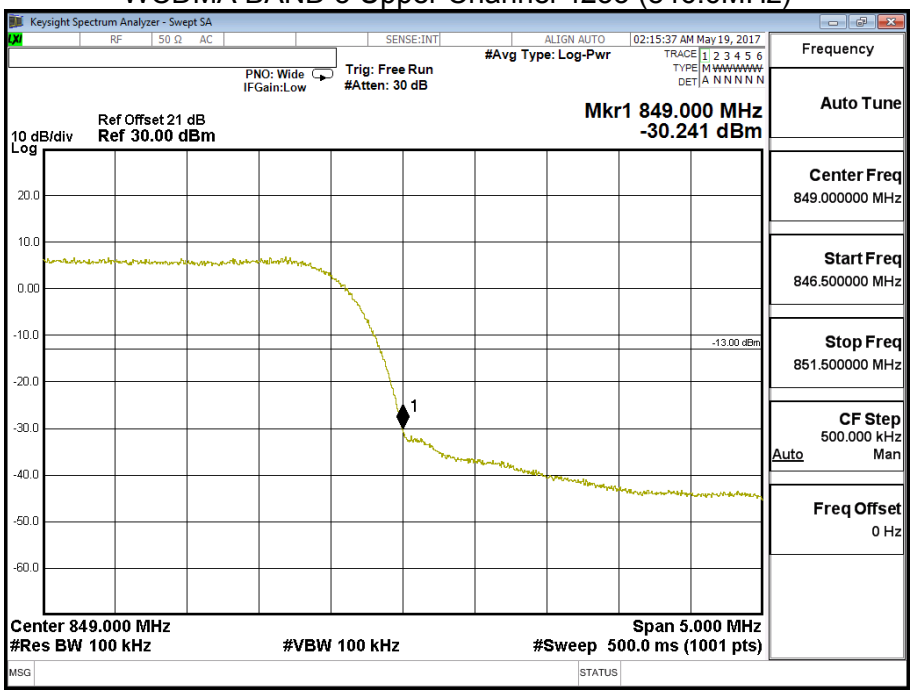


Product	Logistic Monitoring Gateway		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2017/05/19	Test Site	CTR
Test Condition	Block Edge Test (WCDMA BAND 5)		

WCDMA BAND 5 Lower Channel 4132 (826.4MHz)



WCDMA BAND 5 Upper Channel 4233 (846.6MHz)



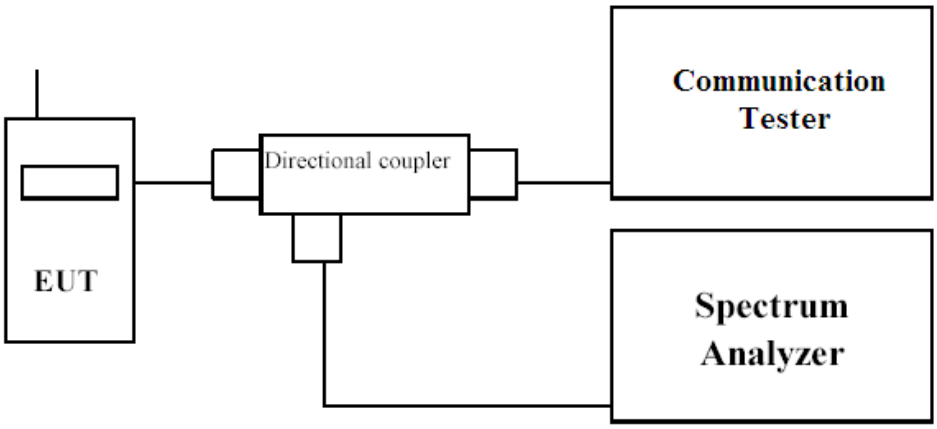
6 Spurious Emission

6.6 Test Specification

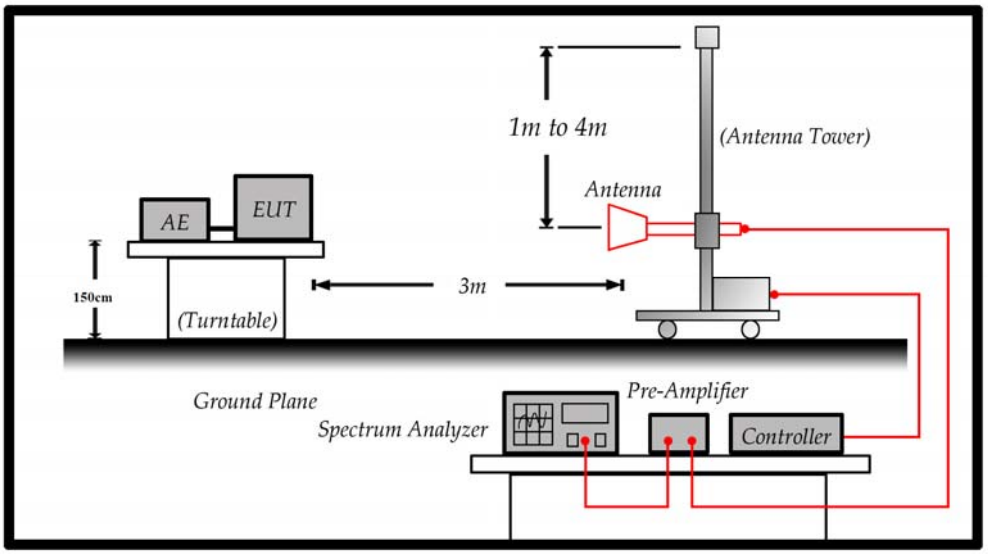
According to Part 2.1051, 2.1053, 22.917(a), 24.238(a).

6.7 Test Setup

6.1.1 Spurious emissions at antenna terminals.



6.1.2 Field strength of spurious radiation.



6.8 Limits

Limit	<-13dBm

43 + 10Log(P) down on the carrier where P is the power in Watts.

6.9 Test Procedure

In accordance with Part 2.1051/2.1053, the spurious emissions from the EUT were measured. The transmitter output power was attenuated using a combination of filters and attenuators and the frequency spectrum investigated from 30MHz to 20GHz. The EUT was set to transmit on full power. The resolution and video bandwidth was set to 1MHz and 3 x RBW. in accordance with Part 22.917 & 24.238. The spectrum analyzer detector was set to Max Hold. In addition, measurements were made up to the 10^{th} harmonic of the fundamental. The device was then replaced with a substitution antenna, which input signal was adjusted until the received level matched that of the previously detected emission.

(1) The EUT is tested with maximum rated TX power via the Base Station simulator.

(2) The EUT is tested in three orthogonal planes; The worst case test configuration was record on report.

The EUT is placed on a turn table which is 1.5 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

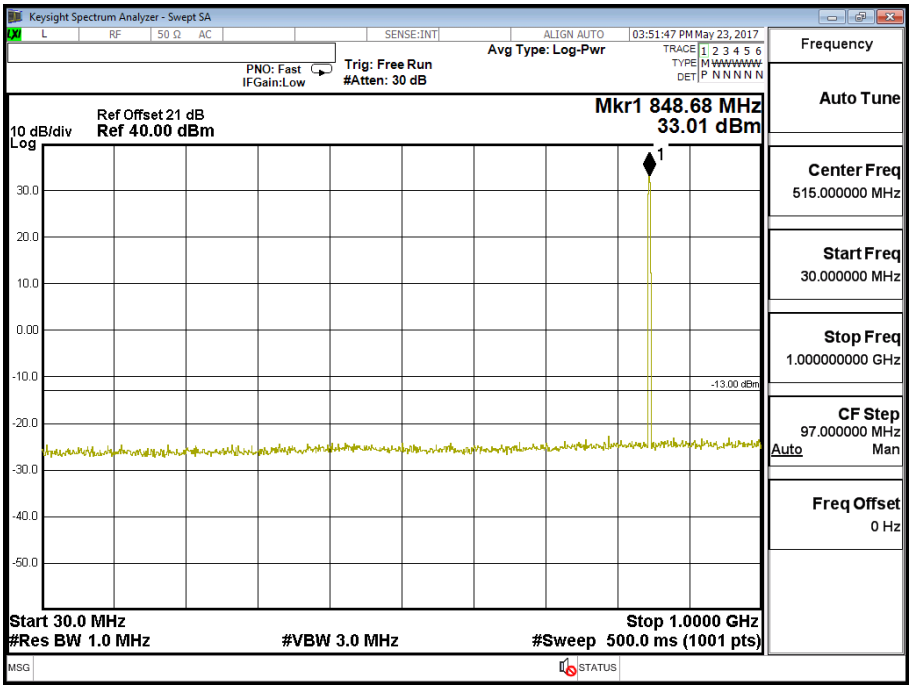
Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to TIA/EIA 603-D on radiated measurement.

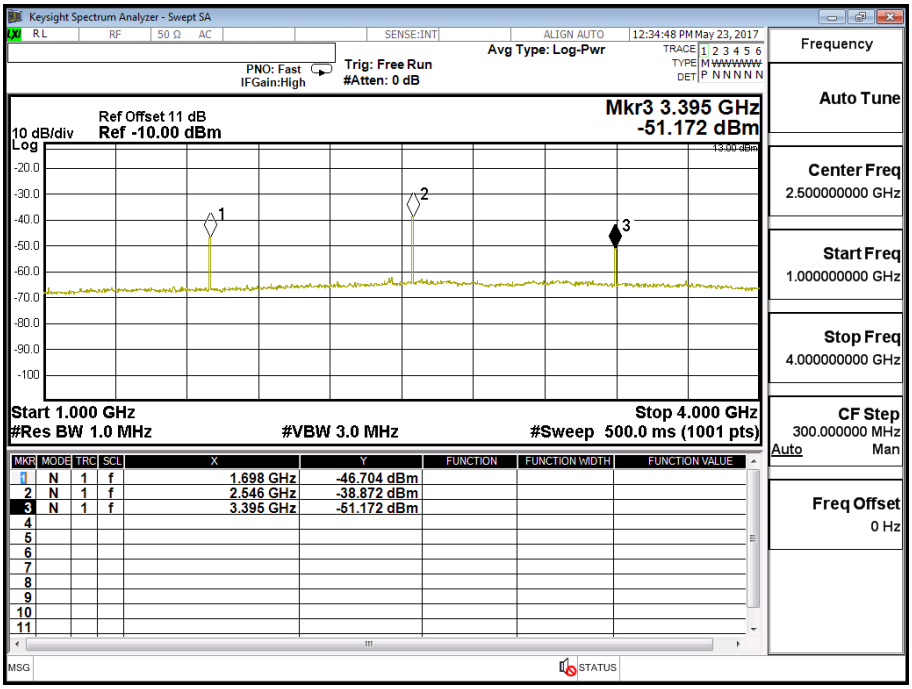
6.10Test Result of Spurious Emission

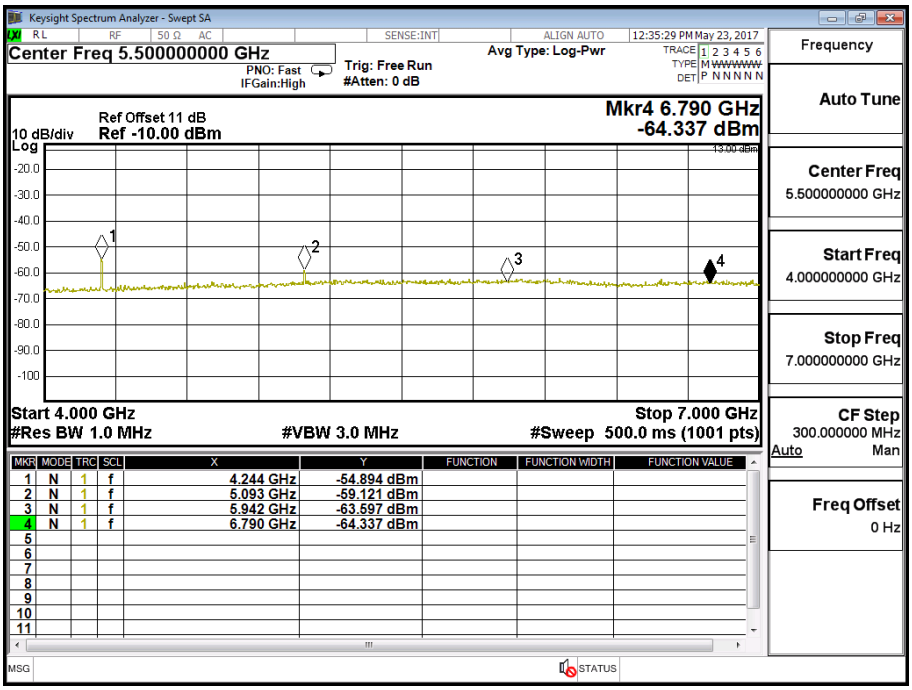
Product	Logistic Monitoring Gateway		
Test Mode	Spurious Emission (Conducted)		
Date of Test	2017/05/23	Test Site	CTR
Test Condition	GSM 850 GPRS	Test Range	30MHz~10GHz

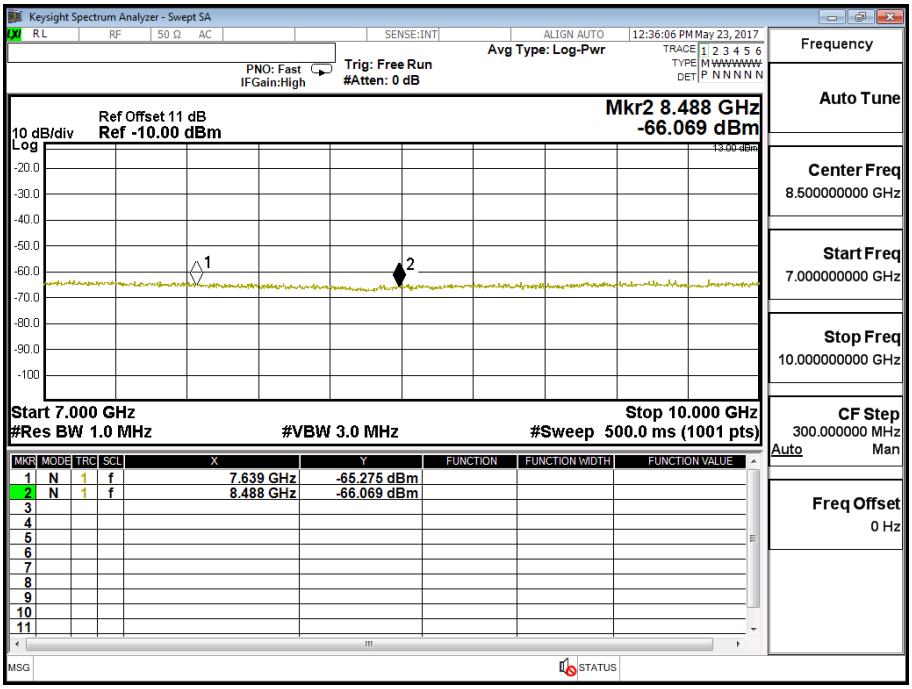
GSM 850 GPRS

Frequency (MHz)	Reading Level (dBm)	Path Loss (dB)	Emission Level (dBm)	Limit (dBm)
1698	-46.704	0.58	-46.124	-13
2546	-38.872	0.70	-38.172	-13
3395	-51.172	1.01	-50.162	-13
4244	-54.894	1.18	-53.714	-13
5093	-59.121	1.23	-57.891	-13
5942	-63.597	1.45	-62.147	-13
6790	-64.337	1.56	-62.777	-13
7639	-65.275	1.59	-63.685	-13
8488	-66.069	1.82	-64.249	-13




Keysight Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
12:34:48 PM May 23, 2017
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Ref Offset 11 dB
10 dB/div
Ref -10.00 dBm
Mkr3 3.395 GHz
-51.172 dBm
Log
13.00 dBm
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100
Start 1.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 4.000 GHz
#Sweep 500.0 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 1.698 GHz -46.704 dBm
2 N 1 f 2.546 GHz -38.872 dBm
3 N 1 f 3.395 GHz -51.172 dBm
Frequency
Auto Tune
Center Freq
2.500000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
4.000000000 GHz
CF Step
300.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

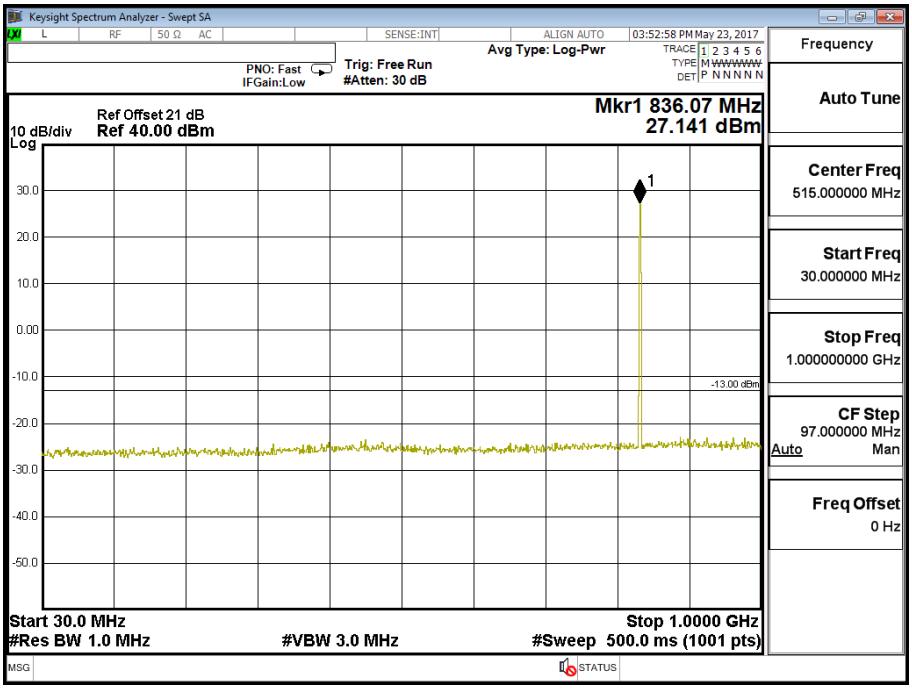

Keysight Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
12:35:29 PM May 23, 2017
Center Freq 5.500000000 GHz
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
Ref Offset 11 dB
10 dB/div
Ref -10.00 dBm
Mkr4 6.790 GHz
-64.337 dBm
Log
13.00 dBm
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100
Start 4.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 7.000 GHz
#Sweep 500.0 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 4.244 GHz -54.894 dBm
2 N 1 f 5.093 GHz -59.121 dBm
3 N 1 f 5.942 GHz -63.597 dBm
4 N 1 f 6.790 GHz -64.337 dBm
Frequency
Auto Tune
Center Freq
5.500000000 GHz
Start Freq
4.000000000 GHz
Stop Freq
7.000000000 GHz
CF Step
300.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

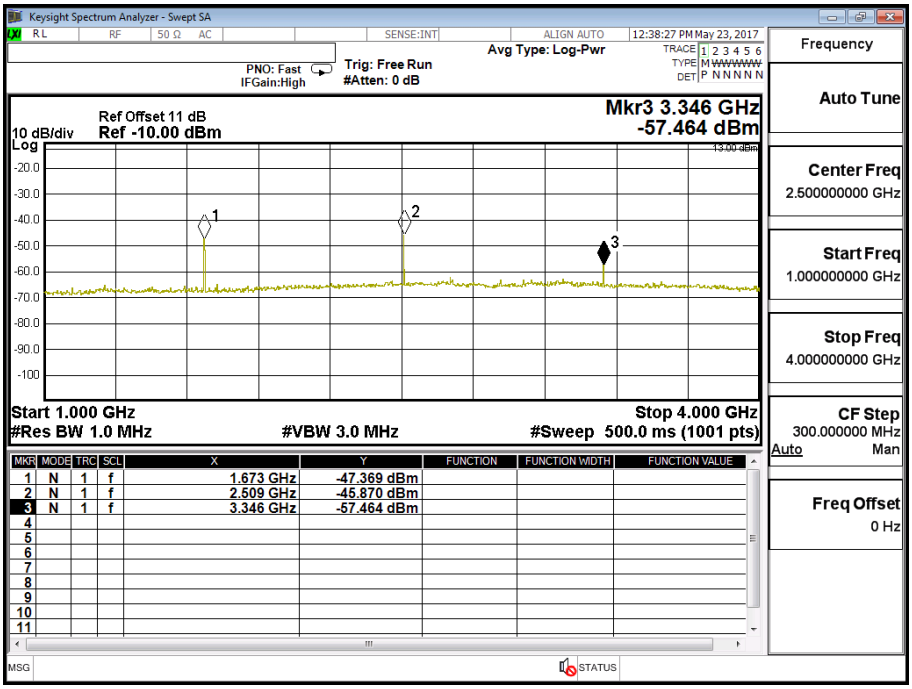

Keysight Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
12:36:06 PM May 23, 2017
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Ref Offset 11 dB
10 dB/div
Ref -10.00 dBm
Mkr2 8.488 GHz
-66.069 dBm
Log
13.00 dBm
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100
1
2
Start 7.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 10.000 GHz
#Sweep 500.0 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 7.639 GHz -65.275 dBm
2 N 1 f 8.488 GHz -66.069 dBm
3
4
5
6
7
8
9
10
11
MSG
STATUS
Frequency
Auto Tune
Center Freq
8.500000000 GHz
Start Freq
7.000000000 GHz
Stop Freq
10.000000000 GHz
CF Step
300.000000 MHz
Auto
Man
Freq Offset
0 Hz

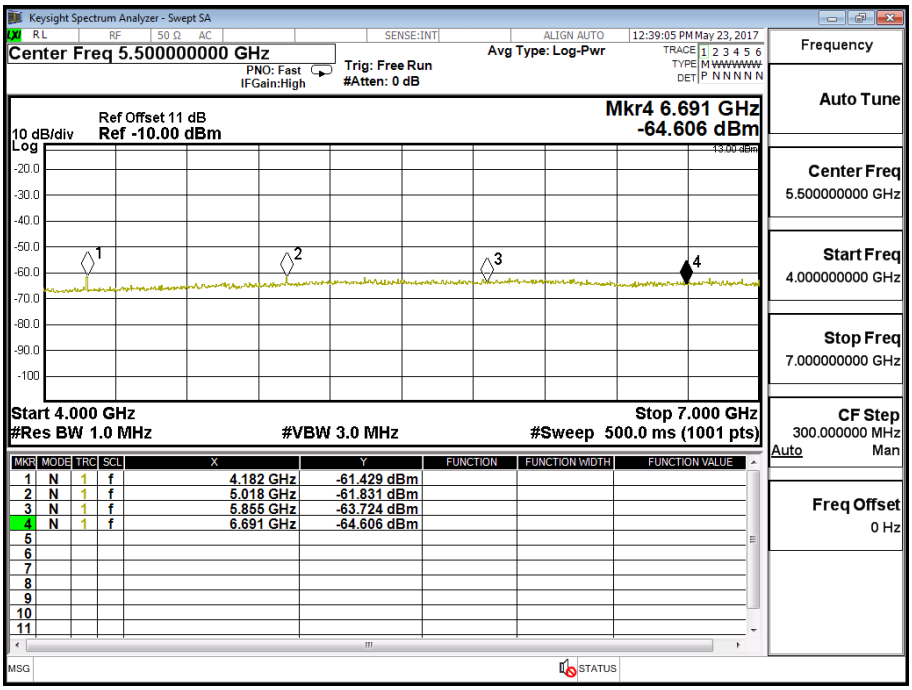
Product	Logistic Monitoring Gateway		
Test Mode	Spurious Emission (Conducted)		
Date of Test	2017/05/23	Test Site	CTR
Test Condition	GSM 850 EGPRS	Test Range	30MHz~10GHz

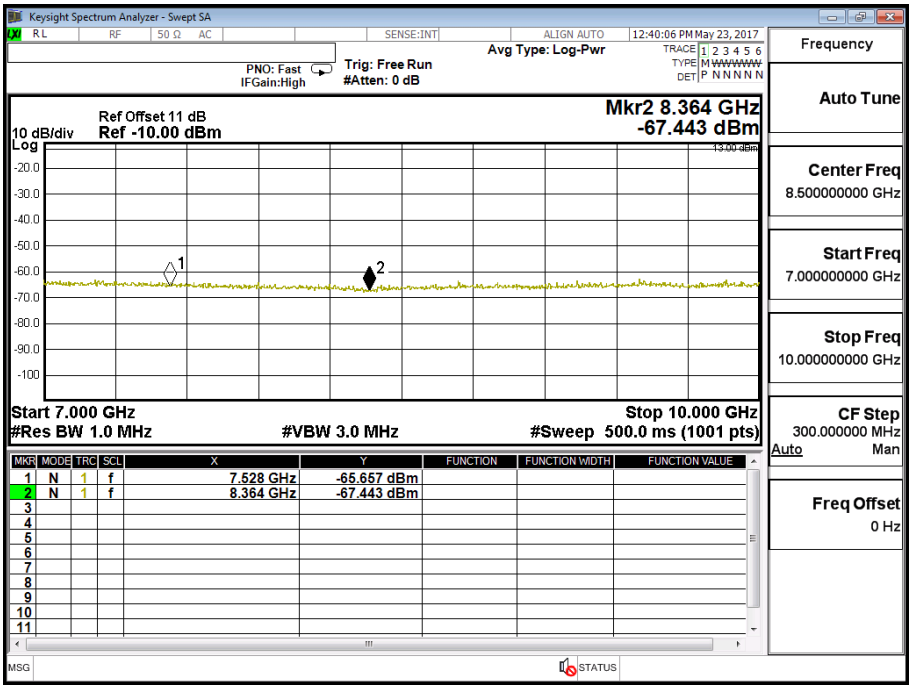
GSM 850 EGPRS

Frequency (MHz)	Reading Level (dBm)	Path Loss (dB)	Emission Level (dBm)	Limit (dBm)
1673	-47.369	0.58	-46.789	-13
2509	-45.870	0.70	-45.170	-13
3346	-57.464	1.01	-56.454	-13
4182	-61.429	1.18	-60.249	-13
5018	-61.831	1.23	-60.601	-13
5855	-63.724	1.45	-62.274	-13
6691	-64.606	1.56	-63.046	-13
7528	-65.657	1.59	-64.067	-13
8364	-67.443	1.82	-65.623	-13




Keysight Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
12:38:27 PM May 23, 2017
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Ref Offset 11 dB
10 dB/div
Ref -10.00 dBm
Mkr3 3.346 GHz
-57.464 dBm
Log
13.00 dBm
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100
Start 1.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 4.000 GHz
#Sweep 500.0 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 1.673 GHz -47.369 dBm
2 N 1 f 2.509 GHz -45.870 dBm
3 N 1 f 3.346 GHz -57.464 dBm
4
5
6
7
8
9
10
11
MSG
STATUS
Frequency
Auto Tune
Center Freq
2.500000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
4.000000000 GHz
CF Step
300.000000 MHz
Auto
Man
Freq Offset
0 Hz

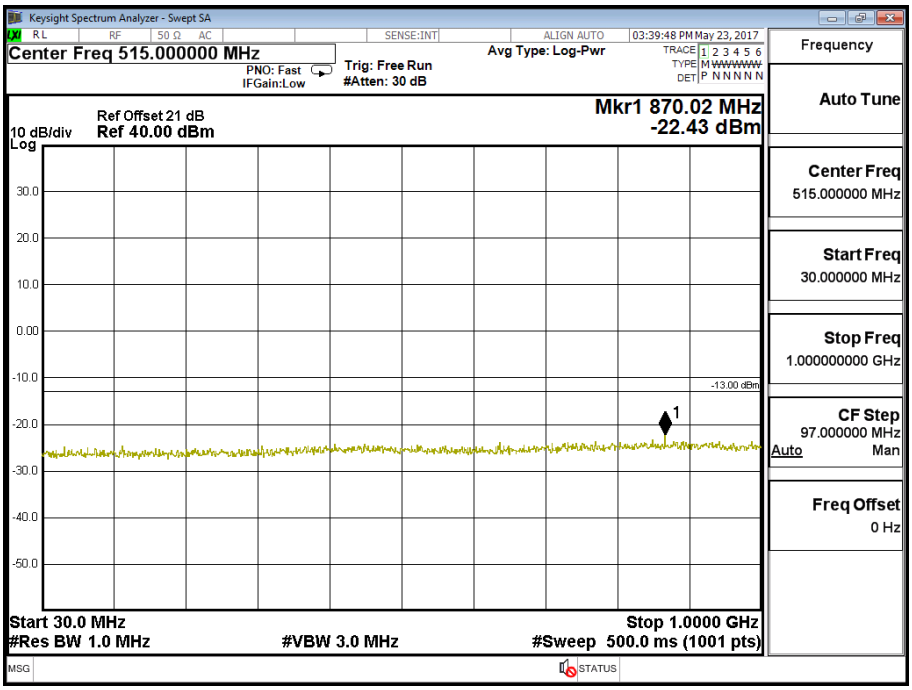

Keysight Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
12:39:05 PM May 23, 2017
Center Freq 5.500000000 GHz
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Ref Offset 11 dB
10 dB/div
Ref -10.00 dBm
Mkr4 6.691 GHz
-64.606 dBm
Log
13.00 dBm
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100
Start 4.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 7.000 GHz
#Sweep 500.0 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 4.182 GHz -61.429 dBm
2 N 1 f 5.018 GHz -61.831 dBm
3 N 1 f 5.855 GHz -63.724 dBm
4 N 1 f 6.691 GHz -64.606 dBm
5
6
7
8
9
10
11
MSG
STATUS
Frequency
Auto Tune
Center Freq
5.500000000 GHz
Start Freq
4.000000000 GHz
Stop Freq
7.000000000 GHz
CF Step
300.000000 MHz
Auto
Man
Freq Offset
0 Hz

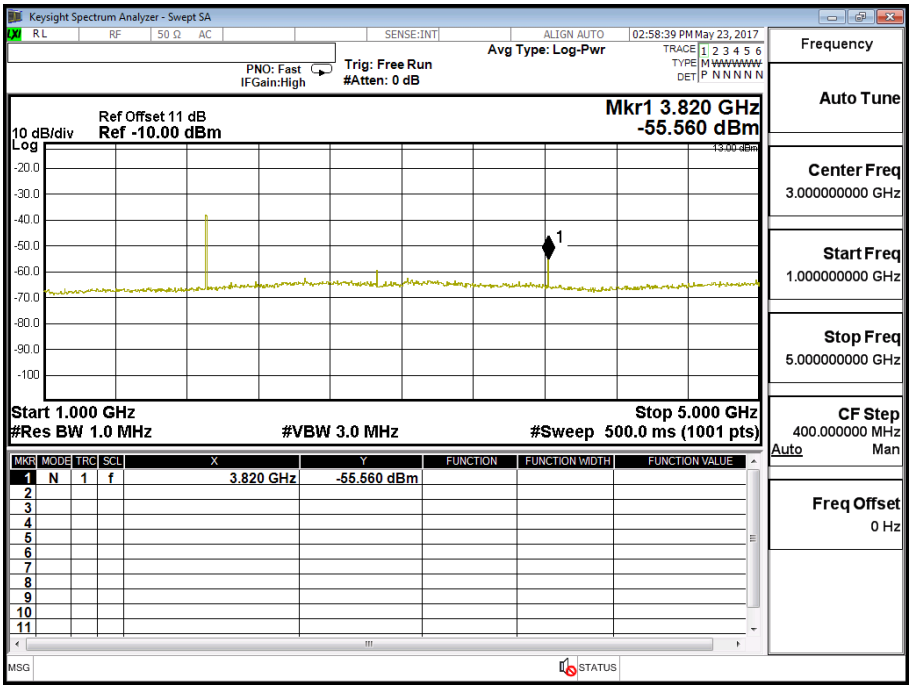

Keysight Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
12:40:06 PM May 23, 2017
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Mkr2 8.364 GHz
-67.443 dBm
Ref Offset 11 dB
10 dB/div
Ref -10.00 dBm
Log
13.00 dBm
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100
Start 7.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 10.000 GHz
#Sweep 500.0 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 7.528 GHz -65.657 dBm
2 N 1 f 8.364 GHz -67.443 dBm
3
4
5
6
7
8
9
10
11
MSG
STATUS
Frequency
Auto Tune
Center Freq
8.500000000 GHz
Start Freq
7.000000000 GHz
Stop Freq
10.000000000 GHz
CF Step
300.000000 MHz
Auto
Man
Freq Offset
0 Hz

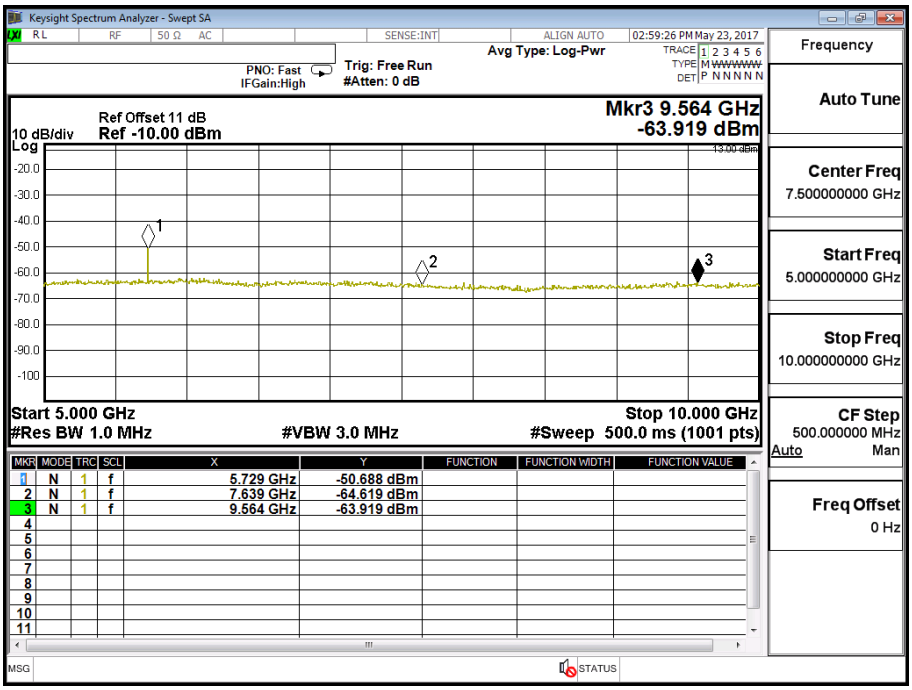
Product	Logistic Monitoring Gateway		
Test Mode	Spurious Emission (Conducted)		
Date of Test	2017/05/23	Test Site	CTR
Test Condition	PCS 1900 GPRS	Test Range	30MHz~20GHz

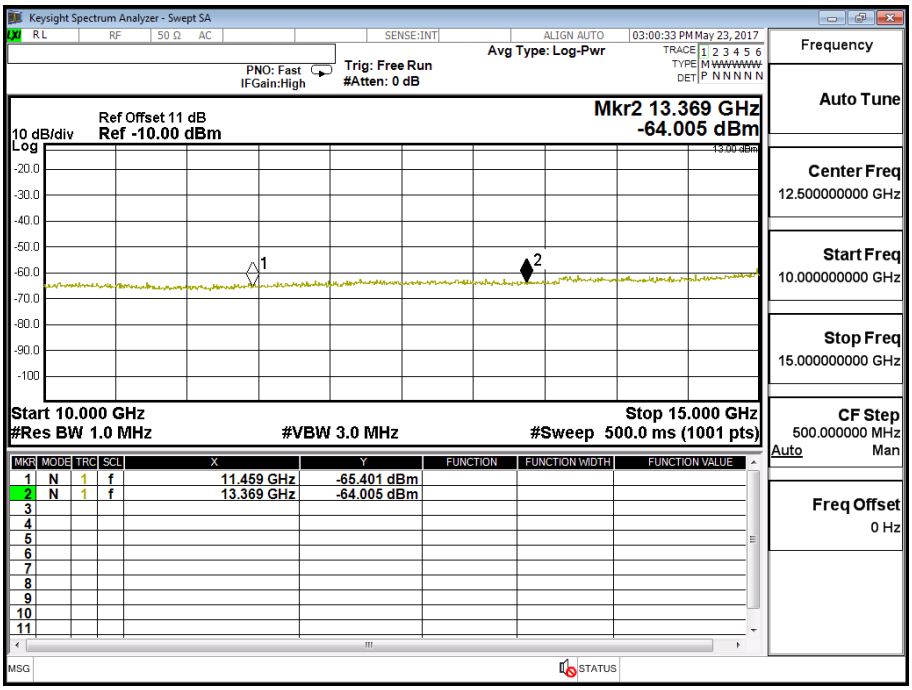
PCS 1900 GPRS

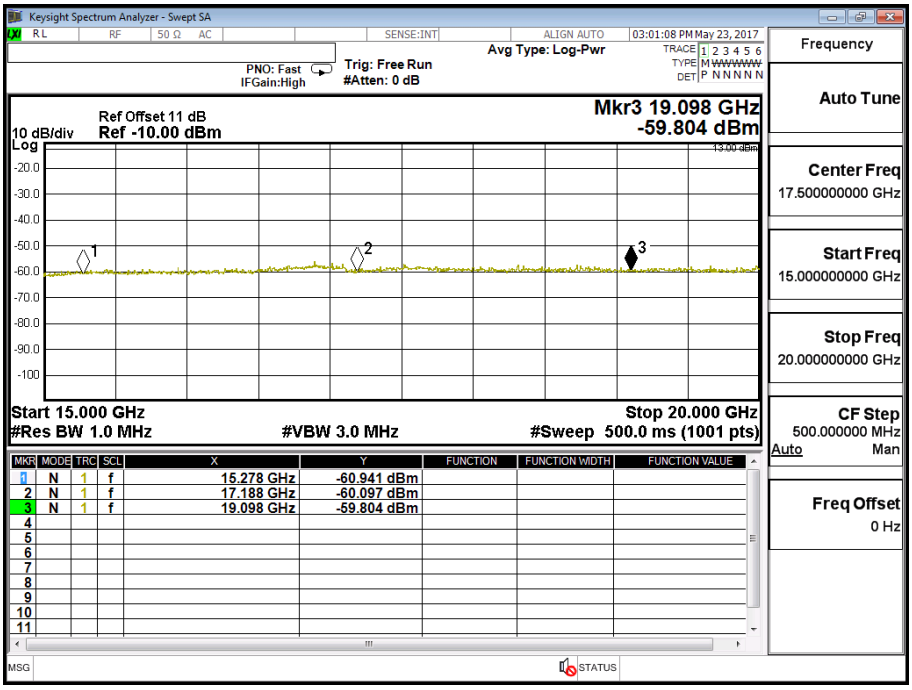
Frequency (MHz)	Reading Level (dBm)	Path Loss (dB)	Emission Level (dBm)	Limit (dBm)
3820	-55.560	1.1	-54.460	-13
5729	-50.688	1.23	-49.458	-13
7639	-64.619	1.59	-63.029	-13
9564	-63.919	1.89	-62.029	-13
11459	-65.401	2.07	-63.331	-13
13369	-64.005	2.26	-61.745	-13
15278	-60.941	2.64	-58.301	-13
17188	-60.097	3.5	-56.597	-13
19098	-59.804	3.7	-56.104	-13




Keysight Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
02:58:39 PM May 23, 2017
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Ref Offset 11 dB
10 dB/div
Ref -10.00 dBm
Log
Mkr1 3.820 GHz
-55.560 dBm
13.00 dBm
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100
Start 1.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 5.000 GHz
#Sweep 500.0 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 3.820 GHz -55.560 dBm
MSG
STATUS
Frequency
Auto Tune
Center Freq
3.000000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
5.000000000 GHz
CF Step
400.000000 MHz
Auto
Man
Freq Offset
0 Hz


Keysight Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
02:59:26 PM May 23, 2017
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Ref Offset 11 dB
10 dB/div
Ref -10.00 dBm
Log
Mkr3 9.564 GHz
-63.919 dBm
13.00 dBm
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100
Start 5.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 10.000 GHz
#Sweep 500.0 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 5.729 GHz -50.688 dBm
2 N 1 f 7.639 GHz -64.619 dBm
3 N 1 f 9.564 GHz -63.919 dBm
MSG
STATUS
Frequency
Auto Tune
Center Freq
7.500000000 GHz
Start Freq
5.000000000 GHz
Stop Freq
10.000000000 GHz
CF Step
500.000000 MHz
Auto
Man
Freq Offset
0 Hz

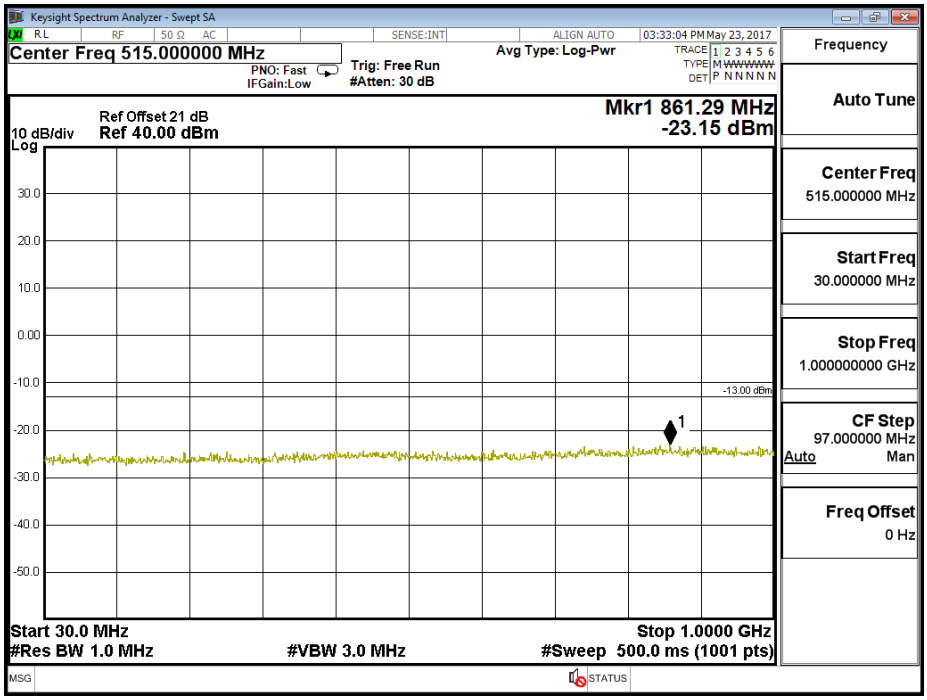

Keysight Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
03:00:33 PM May 23, 2017
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Ref Offset 11 dB
10 dB/div
Ref -10.00 dBm
Log
Mkr2 13.369 GHz
-64.005 dBm
13.00 dBm
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100
Start 10.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 15.000 GHz
#Sweep 500.0 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 11.459 GHz -65.401 dBm
2 N 1 f 13.369 GHz -64.005 dBm
Frequency
Auto Tune
Center Freq
12.500000000 GHz
Start Freq
10.000000000 GHz
Stop Freq
15.000000000 GHz
CF Step
500.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

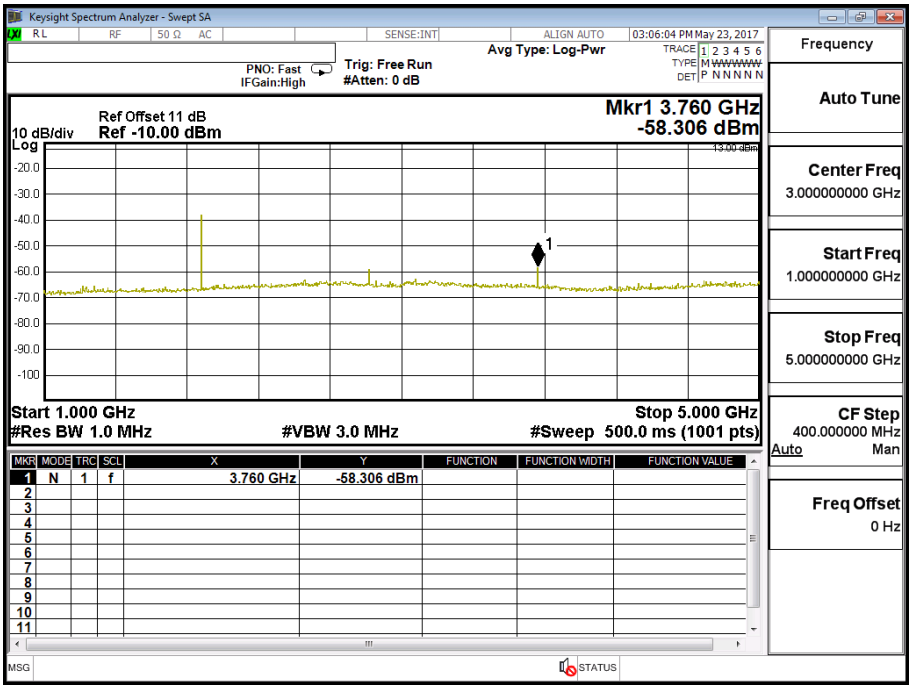

Keysight Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
03:01:08 PM May 23, 2017
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Ref Offset 11 dB
10 dB/div
Ref -10.00 dBm
Log
Mkr3 19.098 GHz
-59.804 dBm
13.00 dBm
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100
Start 15.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 20.000 GHz
#Sweep 500.0 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 15.278 GHz -60.941 dBm
2 N 1 f 17.188 GHz -60.097 dBm
3 N 1 f 19.098 GHz -59.804 dBm
Frequency
Auto Tune
Center Freq
17.500000000 GHz
Start Freq
15.000000000 GHz
Stop Freq
20.000000000 GHz
CF Step
500.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

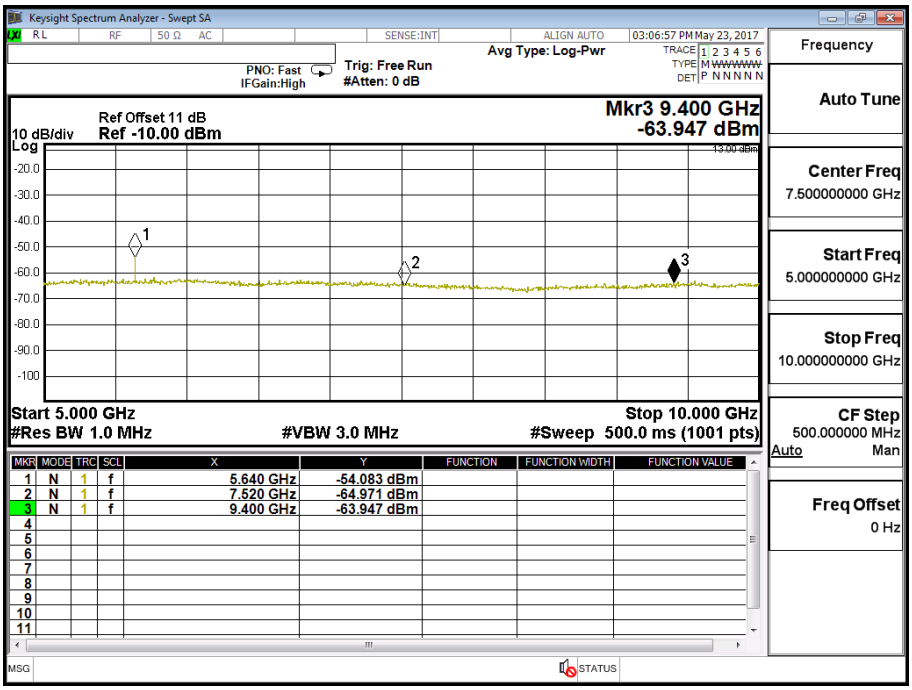
Product	Logistic Monitoring Gateway		
Test Mode	Spurious Emission (Conducted)		
Date of Test	2017/05/23	Test Site	CTR
Test Condition	PCS 1900 EGPRS	Test Range	30MHz~20GHz

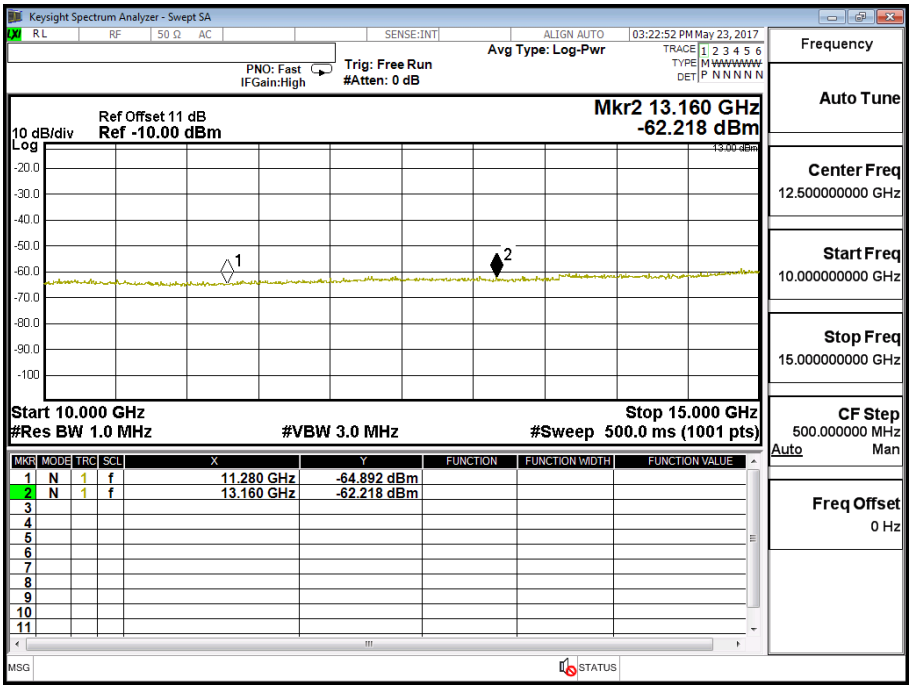
PCS 1900 EGPRS

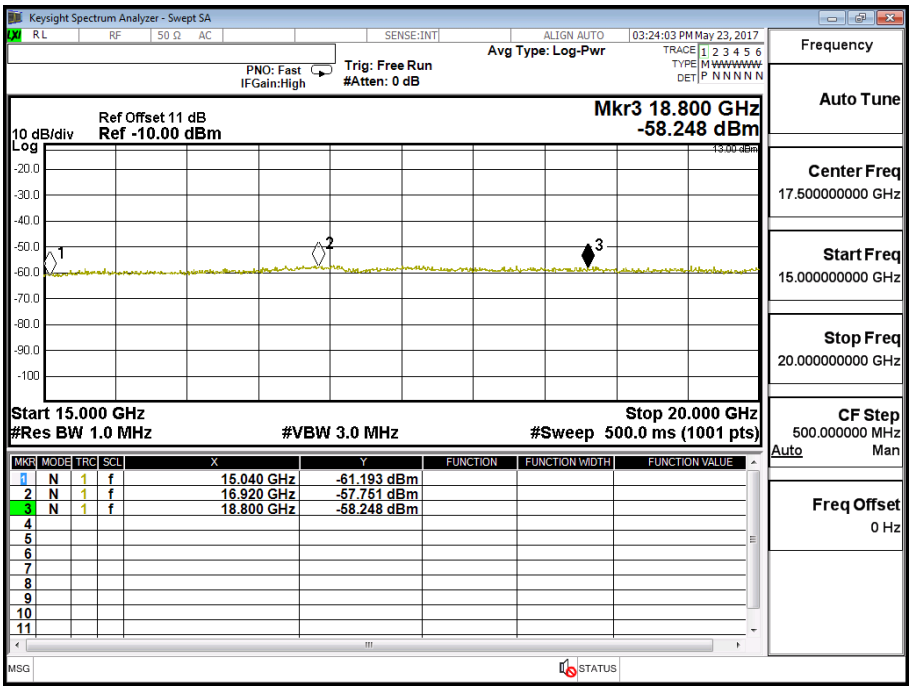
Frequency (MHz)	Reading Level (dBm)	Path Loss (dB)	Emission Level (dBm)	Limit (dBm)
3760	-58.306	1.1	-57.206	-13
5640	-54.083	1.23	-52.853	-13
7520	-64.971	1.59	-63.381	-13
9400	-63.947	1.89	-62.057	-13
11280	-64.892	2.07	-62.822	-13
13160	-62.218	2.26	-59.958	-13
15040	-61.193	2.64	-58.553	-13
16920	-57.751	3.5	-54.251	-13
18800	-58.248	3.7	-54.548	-13




Keysight Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
03:06:04 PM May 23, 2017
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Ref Offset 11 dB
10 dB/div
Ref -10.00 dBm
Mkr1 3.760 GHz
-58.306 dBm
Log
13.00 dBm
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100
Start 1.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 5.000 GHz
#Sweep 500.0 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 3.760 GHz -58.306 dBm
MSG
STATUS
Frequency
Auto Tune
Center Freq
3.000000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
5.000000000 GHz
CF Step
400.000000 MHz
Auto
Man
Freq Offset
0 Hz


Keysight Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
03:06:57 PM May 23, 2017
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Ref Offset 11 dB
10 dB/div
Ref -10.00 dBm
Mkr3 9.400 GHz
-63.947 dBm
Log
13.00 dBm
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100
Start 5.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 10.000 GHz
#Sweep 500.0 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 5.640 GHz -54.083 dBm
2 N 1 f 7.520 GHz -64.971 dBm
3 N 1 f 9.400 GHz -63.947 dBm
MSG
STATUS
Frequency
Auto Tune
Center Freq
7.500000000 GHz
Start Freq
5.000000000 GHz
Stop Freq
10.000000000 GHz
CF Step
500.000000 MHz
Auto
Man
Freq Offset
0 Hz

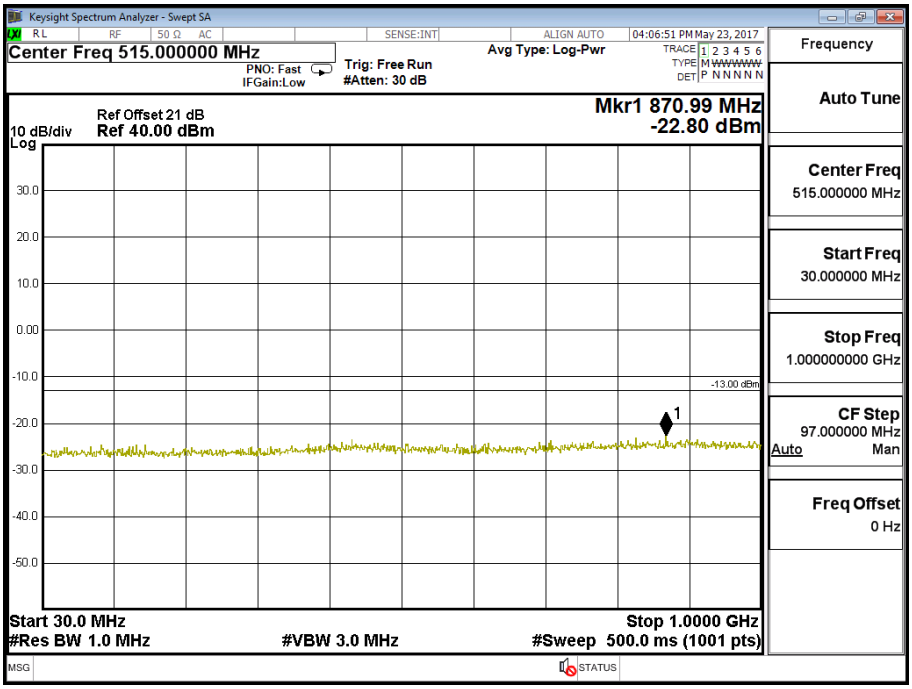

Keysight Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
03:22:52 PM May 23, 2017
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Ref Offset 11 dB
10 dB/div
Ref -10.00 dBm
Mkr2 13.160 GHz
-62.218 dBm
Log
13.00 dBm
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100
Start 10.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 15.000 GHz
#Sweep 500.0 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 11.280 GHz -64.892 dBm
2 N 1 f 13.160 GHz -62.218 dBm
MSG
STATUS
Frequency
Auto Tune
Center Freq
12.500000000 GHz
Start Freq
10.000000000 GHz
Stop Freq
15.000000000 GHz
CF Step
500.000000 MHz
Auto
Man
Freq Offset
0 Hz

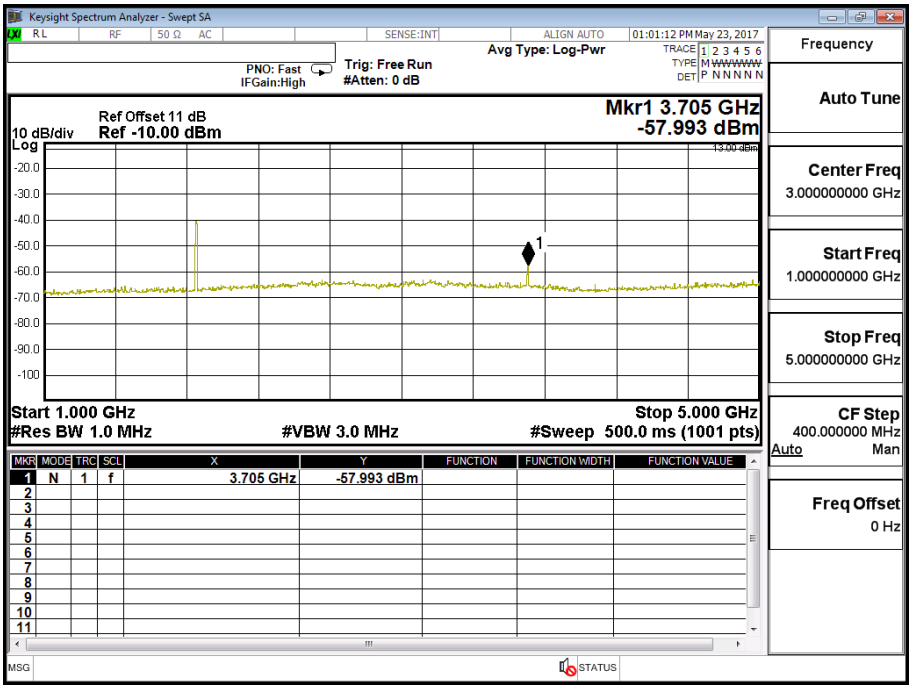

Keysight Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
03:24:03 PM May 23, 2017
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Ref Offset 11 dB
10 dB/div
Ref -10.00 dBm
Mkr3 18.800 GHz
-58.248 dBm
Log
13.00 dBm
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100
Start 15.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 20.000 GHz
#Sweep 500.0 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 15.040 GHz -61.193 dBm
2 N 1 f 16.920 GHz -57.751 dBm
3 N 1 f 18.800 GHz -58.248 dBm
MSG
STATUS
Frequency
Auto Tune
Center Freq
17.500000000 GHz
Start Freq
15.000000000 GHz
Stop Freq
20.000000000 GHz
CF Step
500.000000 MHz
Auto
Man
Freq Offset
0 Hz

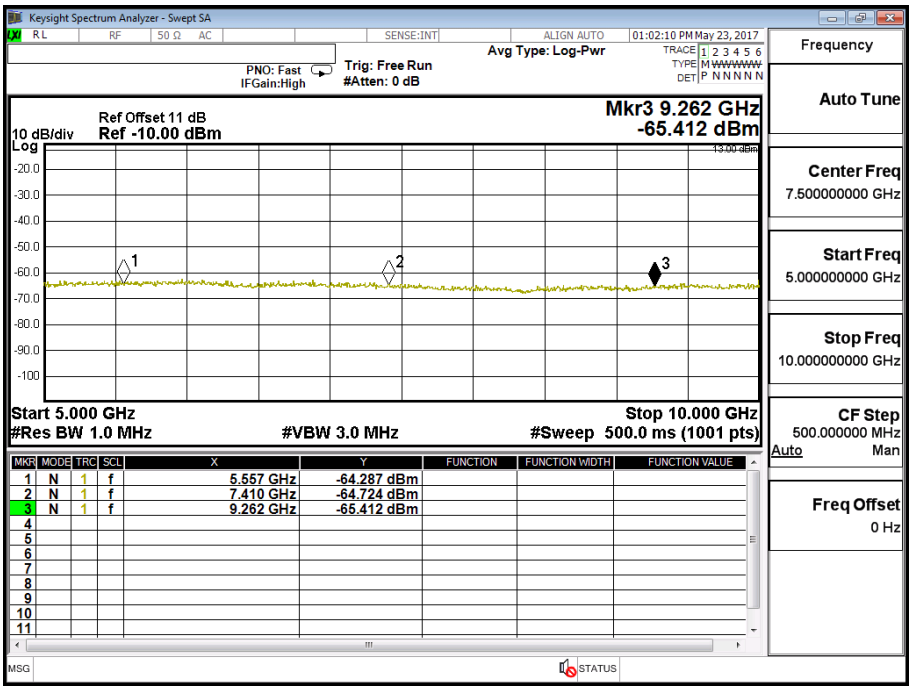
Product	Logistic Monitoring Gateway		
Test Mode	Spurious Emission (Conducted)		
Date of Test	2017/05/23	Test Site	CTR
Test Condition	WCDMA BAND 2	Test Range	30MHz~20GHz

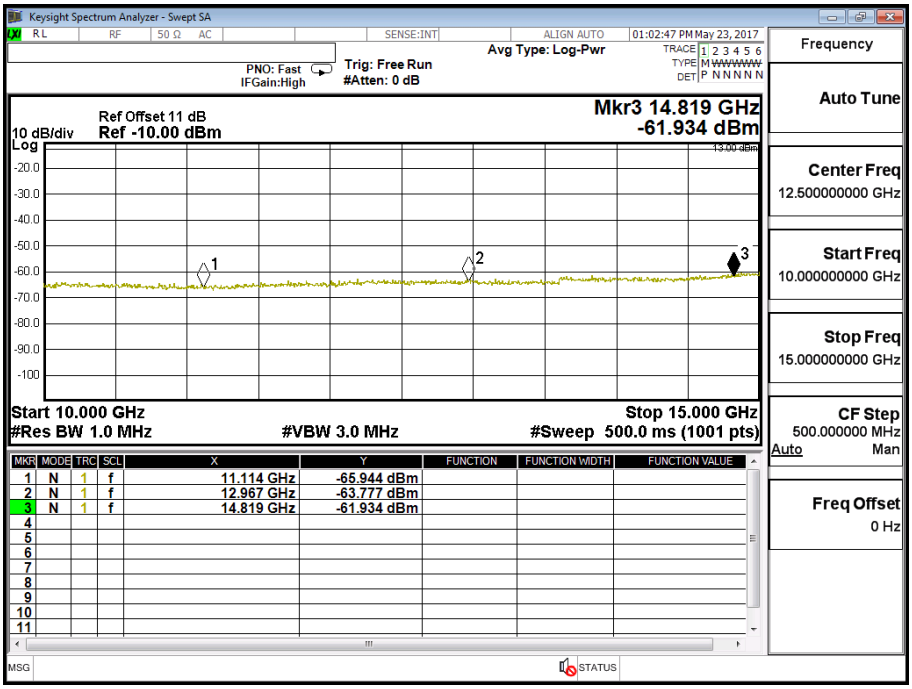
WCDMA BAND 2

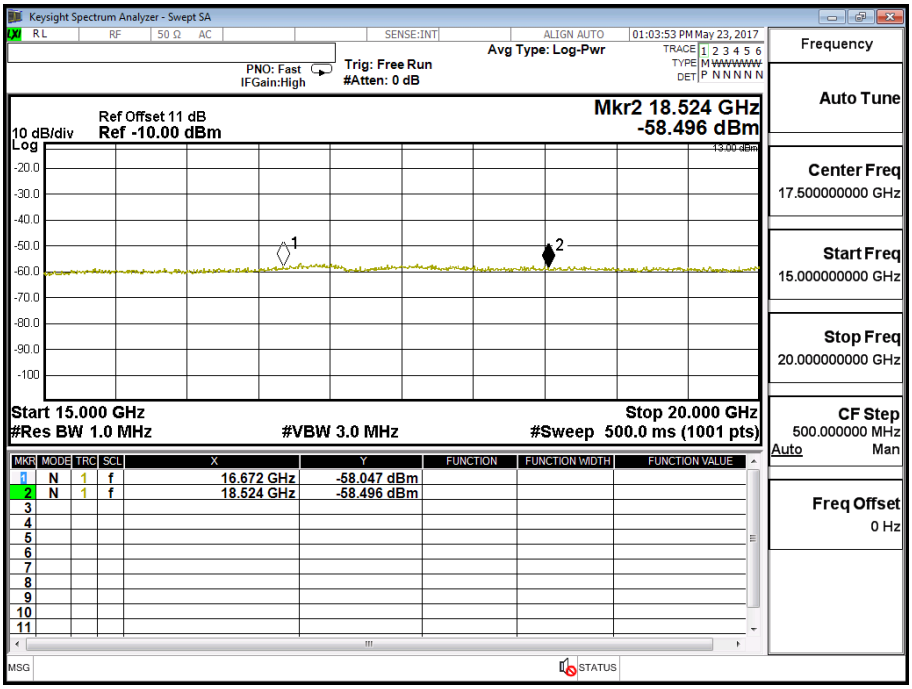
Frequency (MHz)	Reading Level (dBm)	Path Loss (dB)	Emission Level (dBm)	Limit (dBm)
3705	-57.993	1.1	-56.893	-13
5557	-64.287	1.23	-63.057	-13
7410	-64.724	1.59	-63.134	-13
9262	-65.412	1.89	-63.522	-13
11114	-65.944	2.07	-63.874	-13
12967	-63.777	2.26	-61.517	-13
14819	-61.934	2.64	-59.294	-13
16672	-58.047	3.5	-54.547	-13
18524	-58.496	3.7	-54.796	-13




Keysight Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
01:01:12 PM May 23, 2017
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Mkr1 3.705 GHz
-57.993 dBm
Ref Offset 11 dB
10 dB/div
Ref -10.00 dBm
Log
13.00 dBm
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100
Start 1.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 5.000 GHz
#Sweep 500.0 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 3.705 GHz -57.993 dBm
MSG
STATUS
Frequency
Auto Tune
Center Freq
3.000000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
5.000000000 GHz
CF Step
400.000000 MHz
Auto
Man
Freq Offset
0 Hz


Keysight Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
01:02:10 PM May 23, 2017
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Mkr3 9.262 GHz
-65.412 dBm
Ref Offset 11 dB
10 dB/div
Ref -10.00 dBm
Log
13.00 dBm
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100
Start 5.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 10.000 GHz
#Sweep 500.0 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 5.557 GHz -64.287 dBm
2 N 1 f 7.410 GHz -64.724 dBm
3 N 1 f 9.262 GHz -65.412 dBm
MSG
STATUS
Frequency
Auto Tune
Center Freq
7.500000000 GHz
Start Freq
5.000000000 GHz
Stop Freq
10.000000000 GHz
CF Step
500.000000 MHz
Auto
Man
Freq Offset
0 Hz

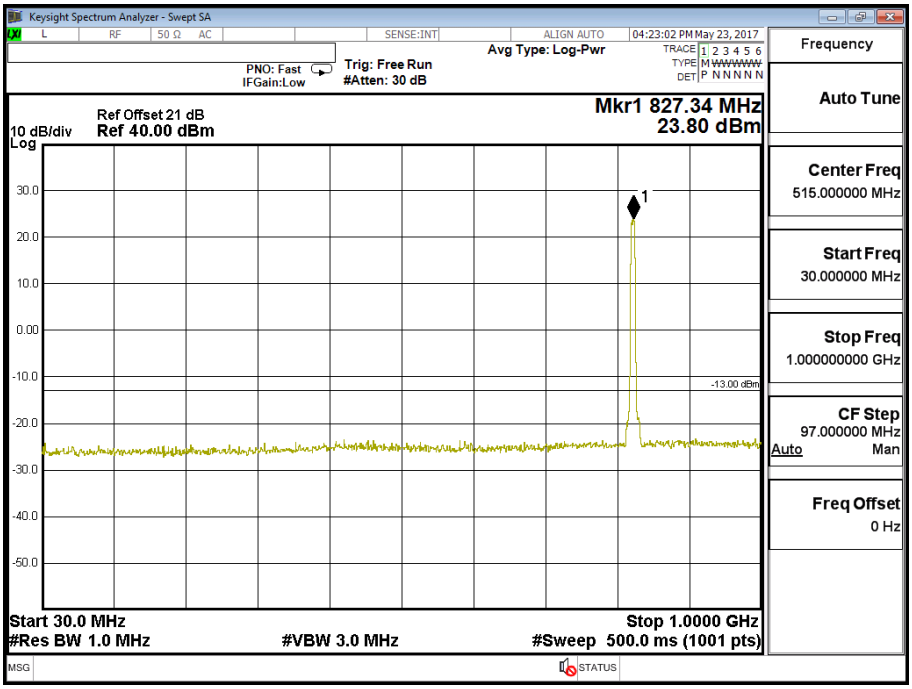

Keysight Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
01:02:47 PM May 23, 2017
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Ref Offset 11 dB
10 dB/div
Ref -10.00 dBm
Mkr3 14.819 GHz
-61.934 dBm
Log
13.00 dBm
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100
Start 10.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 15.000 GHz
#Sweep 500.0 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 11.114 GHz -65.944 dBm
2 N 1 f 12.967 GHz -63.777 dBm
3 N 1 f 14.819 GHz -61.934 dBm
Frequency
Auto Tune
Center Freq
12.500000000 GHz
Start Freq
10.000000000 GHz
Stop Freq
15.000000000 GHz
CF Step
500.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

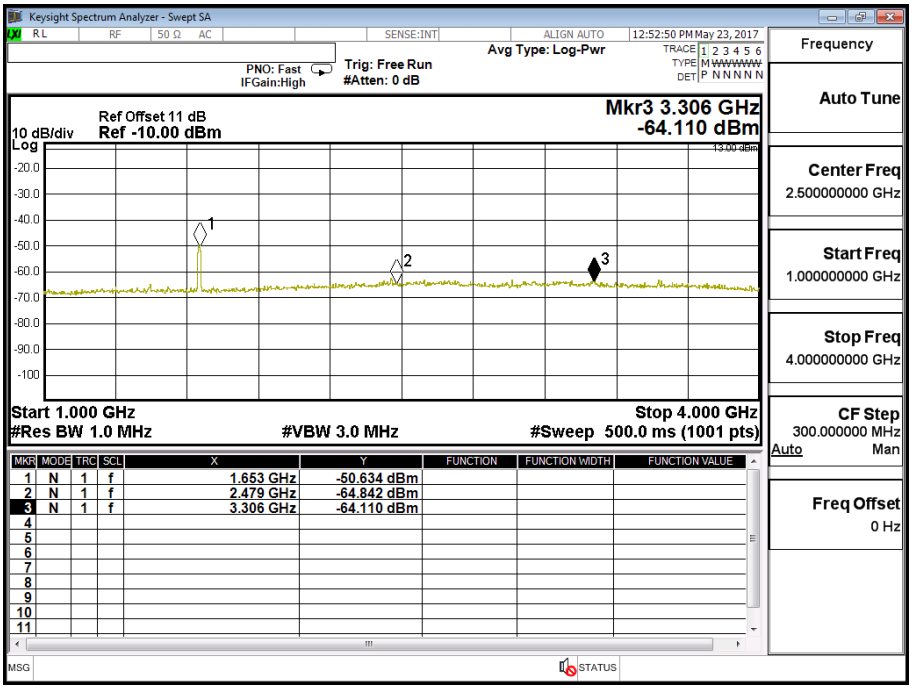

Keysight Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
01:03:53 PM May 23, 2017
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Ref Offset 11 dB
10 dB/div
Ref -10.00 dBm
Mkr2 18.524 GHz
-58.496 dBm
Log
13.00 dBm
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100
Start 15.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 20.000 GHz
#Sweep 500.0 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 16.672 GHz -58.047 dBm
2 N 1 f 18.524 GHz -58.496 dBm
Frequency
Auto Tune
Center Freq
17.500000000 GHz
Start Freq
15.000000000 GHz
Stop Freq
20.000000000 GHz
CF Step
500.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

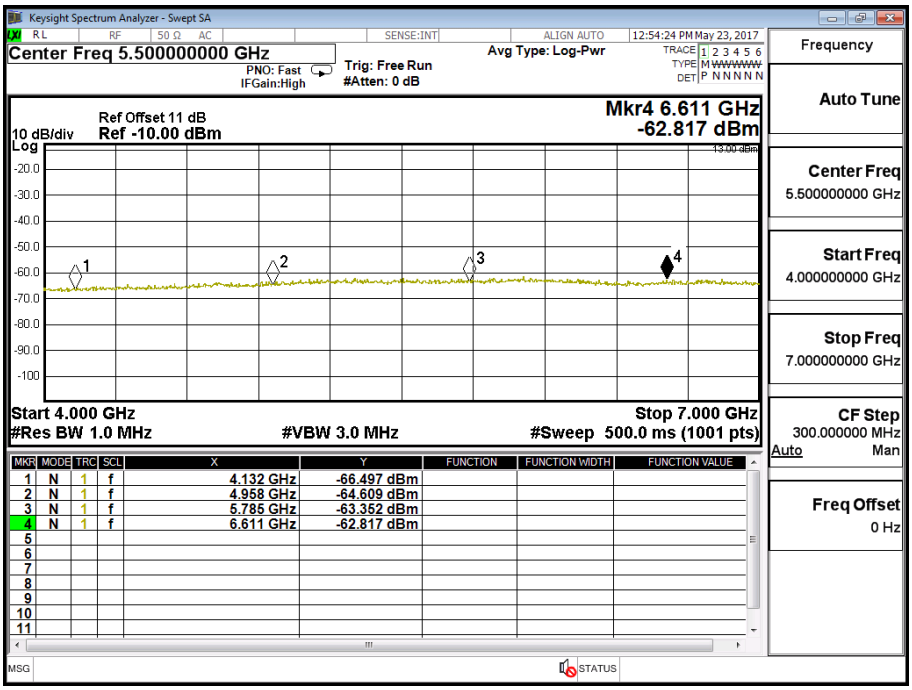
Product	Logistic Monitoring Gateway		
Test Mode	Spurious Emission (Conducted)		
Date of Test	2017/05/23	Test Site	CTR
Test Condition	WCDMA BAND 5	Test Range	30MHz~10GHz

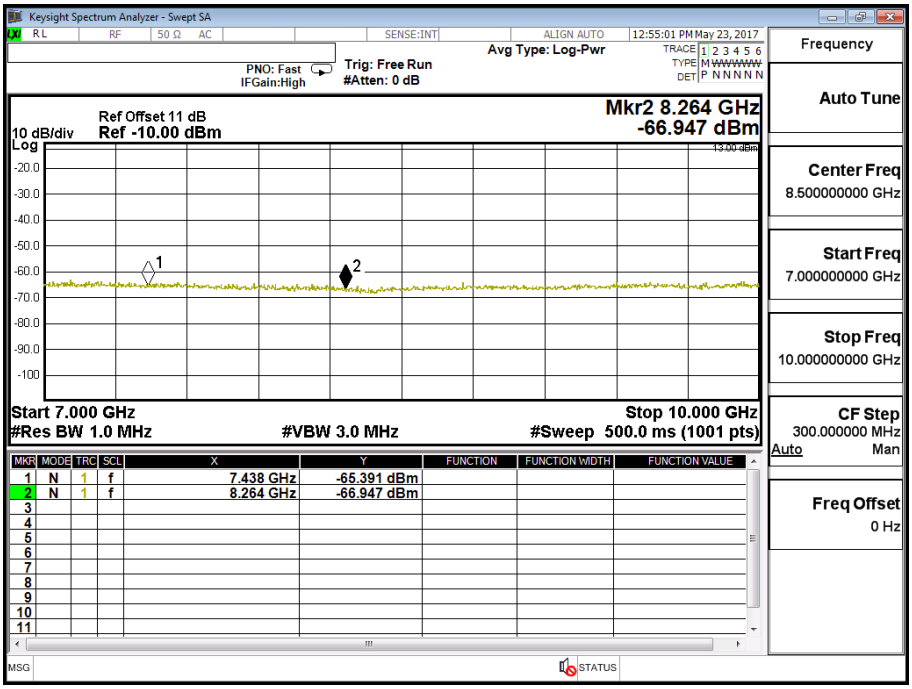
WCDMA BAND 5

Frequency (MHz)	Reading Level (dBm)	Path Loss (dB)	Emission Level (dBm)	Limit (dBm)
1653	-50.634	0.58	-50.054	-13
2479	-64.842	0.7	-64.142	-13
3306	-64.110	1.01	-63.100	-13
4132	-66.497	1.18	-65.317	-13
4958	-64.609	1.23	-63.379	-13
5785	-63.352	1.45	-61.902	-13
6611	-62.817	1.56	-61.257	-13
7438	-65.391	1.59	-63.801	-13
8264	-66.947	1.82	-65.127	-13




Keysight Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
12:52:50 PM May 23, 2017
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Ref Offset 11 dB
10 dB/div
Ref -10.00 dBm
Mkr3 3.306 GHz
-64.110 dBm
Log
13.00 dBm
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100
Start 1.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 4.000 GHz
#Sweep 500.0 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 1.653 GHz -50.634 dBm
2 N 1 f 2.479 GHz -64.842 dBm
3 N 1 f 3.306 GHz -64.110 dBm
4
5
6
7
8
9
10
11
MSG
STATUS
Frequency
Auto Tune
Center Freq
2.500000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
4.000000000 GHz
CF Step
300.000000 MHz
Auto
Man
Freq Offset
0 Hz


Keysight Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
12:54:24 PM May 23, 2017
Center Freq 5.500000000 GHz
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Ref Offset 11 dB
10 dB/div
Ref -10.00 dBm
Mkr4 6.611 GHz
-62.817 dBm
Log
13.00 dBm
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100
Start 4.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 7.000 GHz
#Sweep 500.0 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 4.132 GHz -66.497 dBm
2 N 1 f 4.958 GHz -64.609 dBm
3 N 1 f 5.785 GHz -63.352 dBm
4 N 1 f 6.611 GHz -62.817 dBm
5
6
7
8
9
10
11
MSG
STATUS
Frequency
Auto Tune
Center Freq
5.500000000 GHz
Start Freq
4.000000000 GHz
Stop Freq
7.000000000 GHz
CF Step
300.000000 MHz
Auto
Man
Freq Offset
0 Hz


Keysight Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
12:55:01 PM May 23, 2017
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Ref Offset 11 dB
10 dB/div
Ref -10.00 dBm
Mkr2 8.264 GHz
-66.947 dBm
Log
13.00 dBm
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100
Start 7.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 10.000 GHz
#Sweep 500.0 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 7.438 GHz -65.391 dBm
2 N 1 f 8.264 GHz -66.947 dBm
3
4
5
6
7
8
9
10
11
MSG
STATUS
Frequency
Auto Tune
Center Freq
8.500000000 GHz
Start Freq
7.000000000 GHz
Stop Freq
10.000000000 GHz
CF Step
300.000000 MHz
Auto
Man
Freq Offset
0 Hz

Product	Logistic Monitoring Gateway		
Test Mode	Spurious Emission (Radiated)		
Date of Test	2017/05/23	Test Site	OATS 3
Test Condition	Channel 251(GSM 850 GPRS)	Test Range	9kHz ~10GHz

Frequency	Reading Level	Signal Generator Level	Cable Loss	Antenna Gain	EIRP Value	Limit
(GHz)	(dBm)	(dBm)	(dB)	(dBi)	(dBm)	(dBm)

Horizontal Emissions

1696	-48.221	-50.977	1.630	9.800	-42.807	-13
2548	-40.070	-40.923	2.100	10.600	-32.423	-13
3394	-51.728	-53.223	2.350	12.300	-43.273	-13
4240	-56.929	-55.275	2.700	12.600	-45.375	-13
5092	-62.110	-57.544	2.830	12.700	-47.674	-13
5950	-62.653	-58.356	3.200	13.000	-48.556	-13

Vertical Emissions

1696	-45.658	-47.990	1.630	9.800	-39.820	-13
2548	-41.497	-41.485	2.100	10.600	-32.985	-13
3394	-47.913	-48.300	2.350	12.300	-38.350	-13
4240	-55.766	-52.952	2.700	12.600	-43.052	-13
5092	-62.034	-57.187	2.830	12.700	-47.317	-13
5944	-63.442	-59.158	3.200	13.000	-49.358	-13

Note:

1. Receiver setting (Peak Detector) : RBW:1MHz; VBW:3MHz
2. EIRP Value = Signal Generator Level + Antenna Gain - Cable Loss
3. Spurious emissions past 6 GHz are not shown, due to the magnitude of spurious emissions attenuated more than 20 dB below the limit.

Product	Logistic Monitoring Gateway		
Test Mode	Spurious Emission (Radiated)		
Date of Test	2017/05/23	Test Site	OATS 3
Test Condition	Channel 251 (GSM 850 EGPRS)	Test Range	9kHz ~10GHz

Frequency	Reading Level	Signal Generator Level	Cable Loss	Antenna Gain	EIRP Value	Limit
(GHz)	(dBm)	(dBm)	(dB)	(dBi)	(dBm)	(dBm)

Horizontal Emissions

1672	-48.822	-51.864	1.630	9.800	-43.694	-13
2512	-48.070	-48.628	2.100	10.600	-40.128	-13
3346	-58.798	-60.450	2.350	12.300	-50.500	-13
4180	-61.276	-60.480	2.700	12.600	-50.580	-13
5020	-62.999	-58.641	2.830	12.700	-48.771	-13
5854	-63.828	-60.729	3.200	13.000	-50.929	-13

Vertical Emissions

1672	-45.969	-48.679	1.630	9.800	-40.509	-13
2512	-48.717	-48.759	2.100	10.600	-40.259	-13
3346	-55.111	-55.638	2.350	12.300	-45.688	-13
4180	-59.683	-57.273	2.700	12.600	-47.373	-13
5020	-62.394	-57.395	2.830	12.700	-47.525	-13
5854	-64.096	-61.049	3.200	13.000	-51.249	-13

Note:

1. Receiver setting (Peak Detector) : RBW:1MHz; VBW:3MHz
2. EIRP Value = Signal Generator Level + Antenna Gain - Cable Loss
3. Spurious emissions past 6 GHz are not shown, due to the magnitude of spurious emissions attenuated more than 20 dB below the limit.

Product	Logistic Monitoring Gateway		
Test Mode	Spurious Emission (Radiated)		
Date of Test	2017/05/23	Test Site	OATS 3
Test Condition	Channel 512 (PCS1900 GPRS)	Test Range	9kHz ~20GHz

Frequency	Reading Level	Signal Generator Level	Cable Loss	Antenna Gain	EIRP Value	Limit
(GHz)	(dBm)	(dBm)	(dB)	(dBi)	(dBm)	(dBm)

Horizontal Emissions

3824	-57.139	-57.563	2.530	12.600	-47.493	-13
5730	-49.175	-47.122	3.050	13.100	-37.072	-13
7630	-63.408	-49.549	3.650	11.500	-41.699	-13
9530	-62.596	-47.981	3.850	12.000	-39.831	-13
11480	-63.430	-44.409	4.580	12.000	-36.989	-13
13380	-62.187	-41.563	4.800	13.300	-33.063	-13

Vertical Emissions

3824	-51.737	-49.639	2.530	12.600	-39.569	-13
5730	-54.471	-52.308	3.050	13.100	-42.258	-13
7650	-62.463	-48.158	3.650	11.500	-40.308	-13
9560	-63.014	-48.116	3.850	12.000	-39.966	-13
11460	-63.254	-44.654	4.580	12.000	-37.234	-13
13390	-62.641	-42.172	4.800	13.300	-33.672	-13

Note:

1. Receiver setting (Peak Detector) : RBW:1MHz; VBW:3MHz
2. EIRP Value = Signal Generator Level + Antenna Gain - Cable Loss
3. Spurious emissions past 14GHz are not shown, due to the magnitude of spurious emissions attenuated more than 20 dB below the limit.

Product	Logistic Monitoring Gateway		
Test Mode	Spurious Emission (Radiated)		
Date of Test	2017/05/23	Test Site	OATS 3
Test Condition	Channel 512 (PCS1900 EGPRS)	Test Range	9kHz ~20GHz

Frequency	Reading Level	Signal Generator Level	Cable Loss	Antenna Gain	EIRP Value	Limit
(GHz)	(dBm)	(dBm)	(dB)	(dBi)	(dBm)	(dBm)

Horizontal Emissions

3760	-58.414	-58.762	2.530	12.600	-48.692	-13
5640	-54.241	-51.561	3.050	13.100	-41.511	-13
7510	-63.233	-48.843	3.650	11.500	-40.993	-13
9430	-62.129	-46.868	3.850	12.000	-38.718	-13
11260	-64.027	-47.460	4.580	12.000	-40.040	-13
13160	-63.164	-43.323	4.800	13.300	-34.823	-13

Vertical Emissions

3760	-54.493	-52.511	2.530	12.600	-42.441	-13
5640	-57.241	-54.091	3.050	13.100	-44.041	-13
7520	-63.094	-48.112	3.650	11.500	-40.262	-13
9370	-62.251	-46.456	3.850	12.000	-38.306	-13
11290	-64.529	-47.881	4.580	12.000	-40.461	-13
13160	-63.030	-43.045	4.800	13.300	-34.545	-13

Note:

1. Receiver setting (Peak Detector) : RBW:1MHz; VBW:3MHz
2. EIRP Value = Signal Generator Level + Antenna Gain - Cable Loss
3. Spurious emissions past 14GHz are not shown, due to the magnitude of spurious emissions attenuated more than 20 dB below the limit.

Product	Logistic Monitoring Gateway		
Test Mode	Spurious Emission (Radiated)		
Date of Test	2017/05/23	Test Site	OATS 3
Test Condition	Channel 9262 (WCDMA BAND 2)	Test Range	9kHz ~20GHz

Frequency	Reading Level	Signal Generator Level	Cable Loss	Antenna Gain	EIRP Value	Limit
(GHz)	(dBm)	(dBm)	(dB)	(dBi)	(dBm)	(dBm)

Horizontal Emissions

3704	-47.891	-48.502	2.530	12.600	-38.432	-13
5560	-63.321	-60.017	3.050	13.100	-49.967	-13
7390	-63.215	-48.517	3.650	11.500	-40.667	-13
9270	-62.152	-47.237	3.850	12.000	-39.087	-13
11110	-63.937	-46.447	4.580	12.000	-39.027	-13
12970	-64.405	-44.374	4.800	13.300	-35.874	-13

Vertical Emissions

3712	-39.967	-38.282	2.530	12.600	-28.212	-13
5540	-61.418	-57.374	3.050	13.100	-47.324	-13
7410	-61.957	-46.871	3.650	11.500	-39.021	-13
9290	-61.805	-46.169	3.850	12.000	-38.019	-13
11110	-64.662	-47.000	4.580	12.000	-39.580	-13
12970	-63.889	-44.196	4.800	13.300	-35.696	-13

Note:

1. Receiver setting (Peak Detector) : RBW:1MHz; VBW:3MHz
2. EIRP Value = Signal Generator Level + Antenna Gain - Cable Loss
3. Spurious emissions past 13GHz are not shown, due to the magnitude of spurious emissions attenuated more than 20 dB below the limit.

Product	Logistic Monitoring Gateway		
Test Mode	Spurious Emission (Radiated)		
Date of Test	2017/05/23	Test Site	OATS 3
Test Condition	Channel 4132 (WCDMA BAND 5)	Test Range	9kHz ~10GHz

Frequency	Reading Level	Signal Generator Level	Cable Loss	Antenna Gain	EIRP Value	Limit
(GHz)	(dBm)	(dBm)	(dB)	(dBi)	(dBm)	(dBm)

Horizontal Emissions

1648	-56.261	-59.656	1.630	9.800	-51.486	-13
2482	-61.869	-62.219	2.100	10.600	-53.719	-13
3310	-59.111	-60.785	2.350	12.300	-50.835	-13
4120	-60.322	-59.312	2.700	12.600	-49.412	-13
4972	-62.740	-58.563	2.830	12.700	-48.693	-13
5782	-64.210	-62.161	3.200	13.000	-52.361	-13

Vertical Emissions

1654	-60.488	-63.480	1.630	9.800	-55.310	-13
2482	-61.251	-61.324	2.100	10.600	-52.824	-13
3304	-57.532	-58.159	2.350	12.300	-48.209	-13
4132	-61.157	-58.507	2.700	12.600	-48.607	-13
4960	-63.113	-58.365	2.830	12.700	-48.495	-13
5770	-63.779	-61.602	3.200	13.000	-51.802	-13

Note:

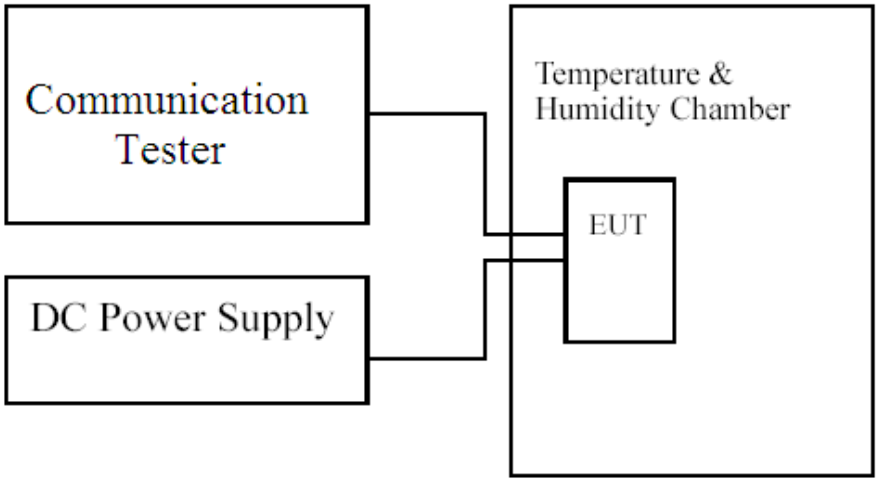
1. Receiver setting (Peak Detector) : RBW:1MHz; VBW:3MHz
2. EIRP Value = Signal Generator Level + Antenna Gain - Cable Loss
3. Spurious emissions past 6 GHz are not shown, due to the magnitude of spurious emissions attenuated more than 20 dB below the limit.

7 Frequency Stability Under Temperature & Voltage Variations

7.6 Test Specification

According to Part 2.1055, 22.355, 24.235

7.7 Test Setup



7.8 Limits

Limit	**<±2.5ppm**

7.9 Test Procedure

The frequency stability of transmitter is measured by:

(a) Temperature: The temperature is varied from -30°C to 50°C in 10°C increment using a standard temperature & Humidity chamber.

(b) Primary Supply Voltage: The primary supply voltage is varied 85% to 115% of the nominal value for non hand-carried equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating endpoint which shall be specified by the manufacturer.

The EUT was connected via the base station simulator. Universal Radio Communication Tester, was used to measure The Frequency Error. The maximum result of measurements was recorded.

7.10 Test Result of Frequency Stability Under Temperature Variations

Product	Logistic Monitoring Gateway		
Test Mode	Frequency Stability Under Temperature Variations & Voltage Variations		
Date of Test	2017/05/31	Test Site	CTR
Test Condition	GSM 850 GPRS / Channel 189	Test Range	0℃~+35℃

Frequency Stability Under Temperature Variations

Temperature Interval(℃)	Test Frequency (GHz)	Deviation (kHz)	Limit (kHz)
-30	0.8364	-0.062	±2.09
-20	0.8364	-0.079	±2.09
-10	0.8364	-0.077	±2.09
0	0.8364	-0.068	±2.09
10	0.8364	-0.075	±2.09
20	0.8364	-0.085	±2.09
35	0.8364	-0.073	±2.09
40	0.8364	-0.056	±2.09
50	0.8364	-0.068	±2.09

Note : Test Temperature specified by the manufacturer .

Voltage Variations

DC Voltage (V)	Test Frequency (GHz)	Deviation (KHz)	Limit (KHz)
4.4	0.8364	-0.069	±2.09
4.2	0.8364	-0.085	±2.09
3.75	0.8364	-0.074	±2.09

Product	Logistic Monitoring Gateway		
Test Mode	Frequency Stability Under Temperature Variations & Voltage Variations		
Date of Test	2017/05/31	Test Site	CTR
Test Condition	GSM 850 EGPRS / Channel 189	Test Range	0℃~+35℃

Frequency Stability Under Temperature Variations

Temperature Interval(℃)	Test Frequency (GHz)	Deviation (kHz)	Limit (kHz)
-30	0.8364	-0.130	±2.09
-20	0.8364	0.182	±2.09
-10	0.8364	0.170	±2.09
0	0.8364	0.154	±2.09
10	0.8364	0.151	±2.09
20	0.8364	0.116	±2.09
30	0.8364	0.130	±2.09
40	0.8364	0.123	±2.09
50	0.8364	0.138	±2.09

Note : Test Temperature specified by the manufacturer .

Voltage Variations

DC Voltage (V)	Test Frequency (GHz)	Deviation (KHz)	Limit (KHz)
4.4	0.8364	-0.101	±2.09
4.2	0.8364	0.116	±2.09
3.75	0.8364	-0.119	±2.09

Product	Logistic Monitoring Gateway		
Test Mode	Frequency Stability Under Temperature Variations & Voltage Variations		
Date of Test	2017/05/31	Test Site	CTR
Test Condition	PCS 1900 GPRS / Channel 661	Test Range	0℃~+35℃

Frequency Stability Under Temperature Variations

Temperature Interval(℃)	Test Frequency (GHz)	Deviation (kHz)	Limit (kHz)
-30	1.88	0.047	±4.70
-20	1.88	0.046	±4.70
-10	1.88	-0.033	±4.70
0	1.88	0.028	±4.70
10	1.88	0.036	±4.70
20	1.88	-0.036	±4.70
30	1.88	-0.037	±4.70
40	1.88	-0.033	±4.70
50	1.88	-0.038	±4.70

Note : Test Temperature specified by the manufacturer .

Voltage Variations

DC Voltage (V)	Test Frequency (GHz)	Deviation (KHz)	Limit (KHz)
4.4	1.88	0.032	±4.70
4.2	1.88	-0.036	±4.70
3.75	1.88	0.033	±4.70

Product	Logistic Monitoring Gateway		
Test Mode	Frequency Stability Under Temperature Variations & Voltage Variations		
Date of Test	2017/05/31	Test Site	CTR
Test Condition	PCS 1900 EGPRS / Channel 661	Test Range	0℃~+35℃

Frequency Stability Under Temperature Variations

Temperature Interval(℃)	Test Frequency (GHz)	Deviation (kHz)	Limit (kHz)
-30	1.88	-0.114	±4.70
-20	1.88	0.191	±4.70
-10	1.88	0.078	±4.70
0	1.88	-0.061	±4.70
10	1.88	0.186	±4.70
20	1.88	-0.107	±4.70
30	1.88	-0.121	±4.70
40	1.88	0.137	±4.70
50	1.88	0.158	±4.70

Note : Test Temperature specified by the manufacturer .

Voltage Variations

DC Voltage (V)	Test Frequency (GHz)	Deviation (Hz)	Limit (kHz)
4.4	1.88	-0.128	±4.70
4.2	1.88	-0.107	±4.70
3.75	1.88	-0.096	±4.70

Product	Logistic Monitoring Gateway		
Test Mode	Frequency Stability Under Temperature Variations & Voltage Variations		
Date of Test	2017/05/31	Test Site	CTR
Test Condition	WCDMA BAND 2 / Channel 9400	Test Range	0℃~+35℃

Frequency Stability Under Temperature Variations

Temperature Interval(℃)	Test Frequency (GHz)	Deviation (kHz)	Limit (kHz)
-30	1.88	0.058	±4.70
-20	1.88	0.050	±4.70
-10	1.88	0.053	±4.70
0	1.88	0.056	±4.70
10	1.88	-0.043	±4.70
20	1.88	-0.028	±4.70
30	1.88	-0.040	±4.70
40	1.88	-0.051	±4.70
50	1.88	-0.043	±4.70

Note : Test Temperature specified by the manufacturer .

Voltage Variations

AC Voltage (V)	Test Frequency (GHz)	Deviation (Hz)	Limit (kHz)
4.4	1.88	0.014	±4.70
4.2	1.88	-0.028	±4.70
3.75	1.88	0.042	±4.70

Product	Logistic Monitoring Gateway		
Test Mode	Frequency Stability Under Temperature Variations & Voltage Variations		
Date of Test	2017/05/31	Test Site	CTR
Test Condition	WCDMA BAND 5 / Channel 4183	Test Range	0℃~+35℃

Frequency Stability Under Temperature Variations

Temperature Interval(℃)	Test Frequency (GHz)	Deviation (kHz)	Limit (kHz)
-30	0.8366	0.031	±2.09
-20	0.8366	0.029	±2.09
-10	0.8366	0.028	±2.09
0	0.8366	-0.025	±2.09
10	0.8366	-0.028	±2.09
20	0.8366	-0.027	±2.09
30	0.8366	0.030	±2.09
40	0.8366	-0.021	±2.09
50	0.8366	0.030	±2.09

Note : Test Temperature specified by the manufacturer .

Voltage Variations

AC Voltage (V)	Test Frequency (GHz)	Deviation (Hz)	Limit (kHz)
4.4	0.8366	0.011	±2.09
4.2	0.8366	-0.027	±2.09
3.75	0.8366	0.027	±2.09

8 EMI Reduction Method During Compliance Testing

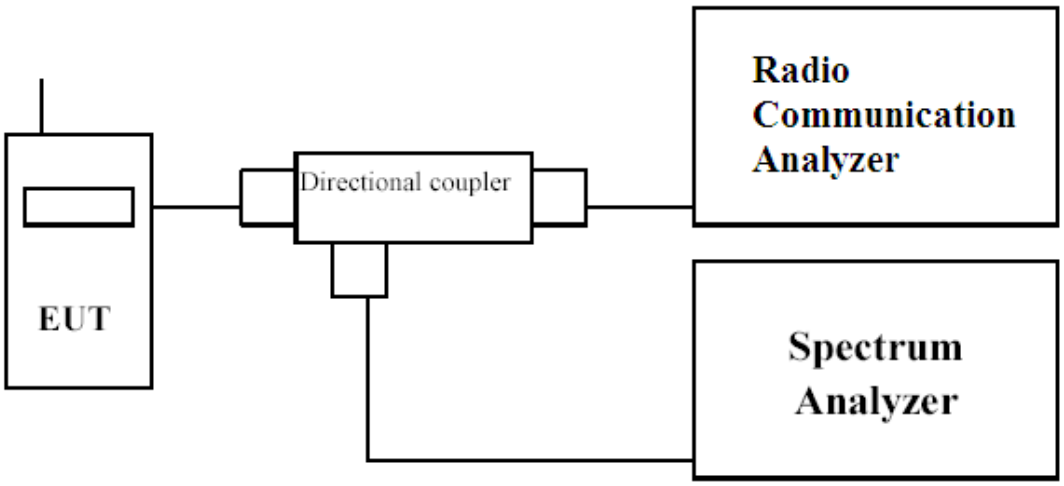
No modification was made during testing.

9 Peak to Average Ratio

9.6 Test Specification

According to Part 24.232.

9.7 Test Setup



9.8 Limits

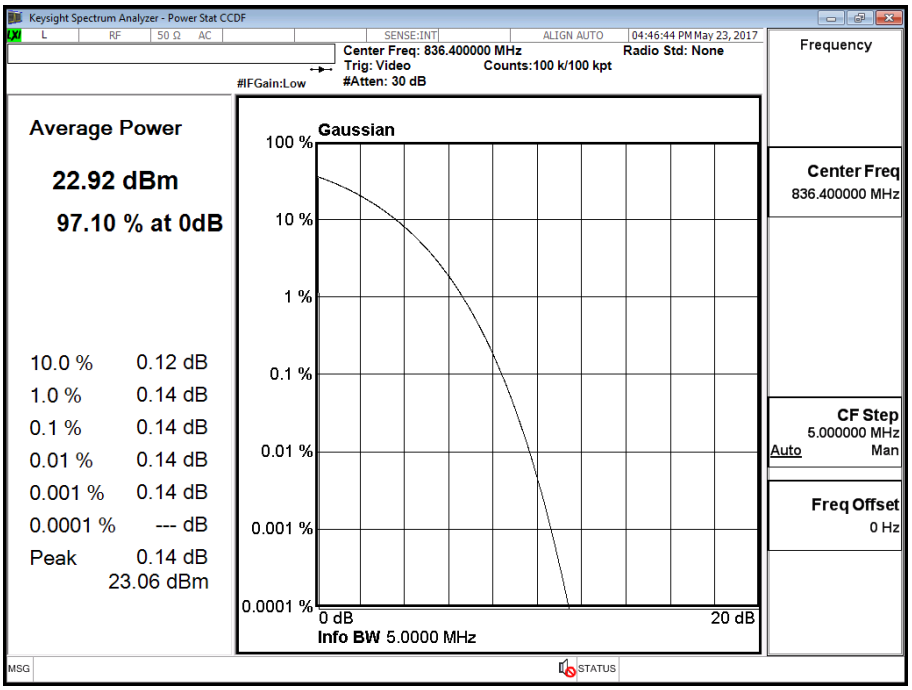
The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB. The PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities to determine that PAPR will not exceed 13 dB for more than 0.1 percent of the time or other Commission approved procedure.

9.9 Test Procedure

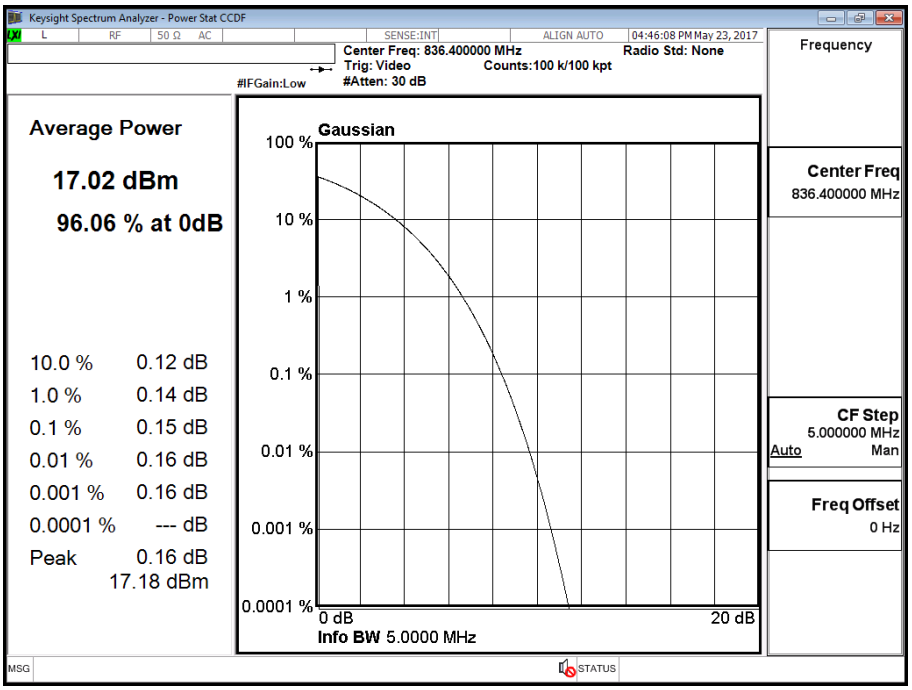
a) Refer to instrument's analyzer instruction manual for details on how to use the power statistics/CCDF function;
b) Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
c) Set the number of counts to a value that stabilizes the measured CCDF curve;
d) Set the measurement interval as follows:
1) for continuous transmissions, set to 1 ms,
2) for burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize and set the measurement interval to a time that is less than or equal to the burst duration.
e) Record the maximum PAPR level associated with a probability of 0.1%.

Product	Logistic Monitoring Gateway		
Test Mode	Peak to Average Ratio		
Date of Test	2017/05/23	Test Site	CTR
Test Condition	GSM 850		

GSM 850 GPRS

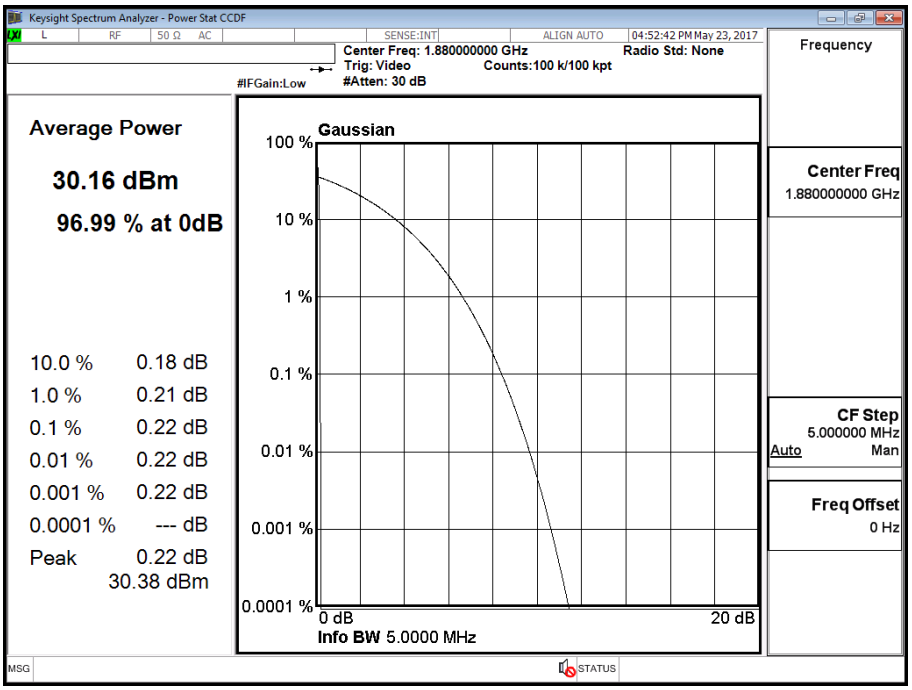


GSM 850 EGPRS

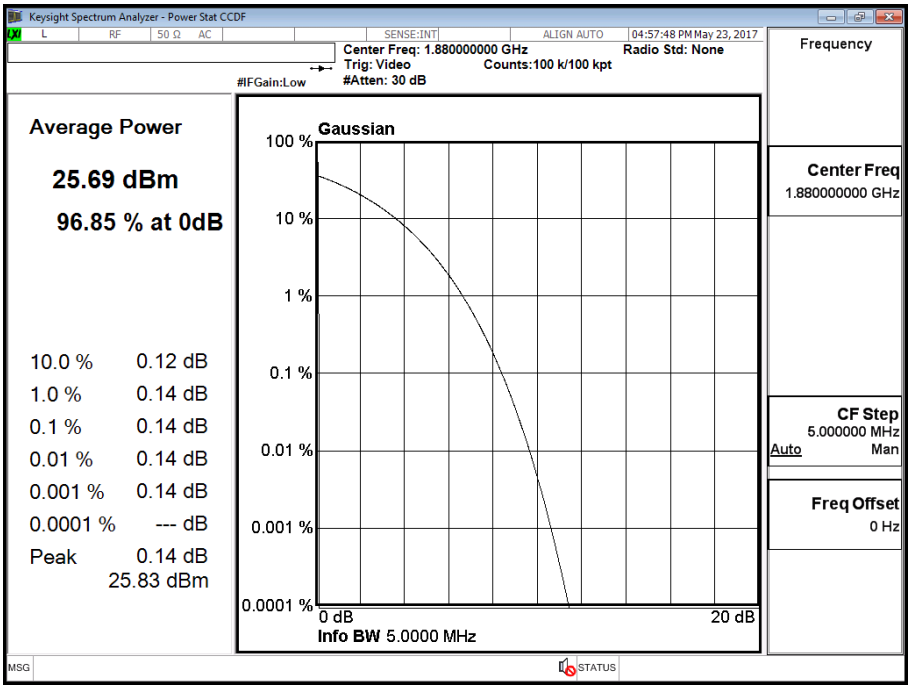


Product	Logistic Monitoring Gateway		
Test Mode	Peak to Average Ratio		
Date of Test	2017/05/23	Test Site	CTR
Test Condition	PCS 1900		

PCS 1900 GPRS

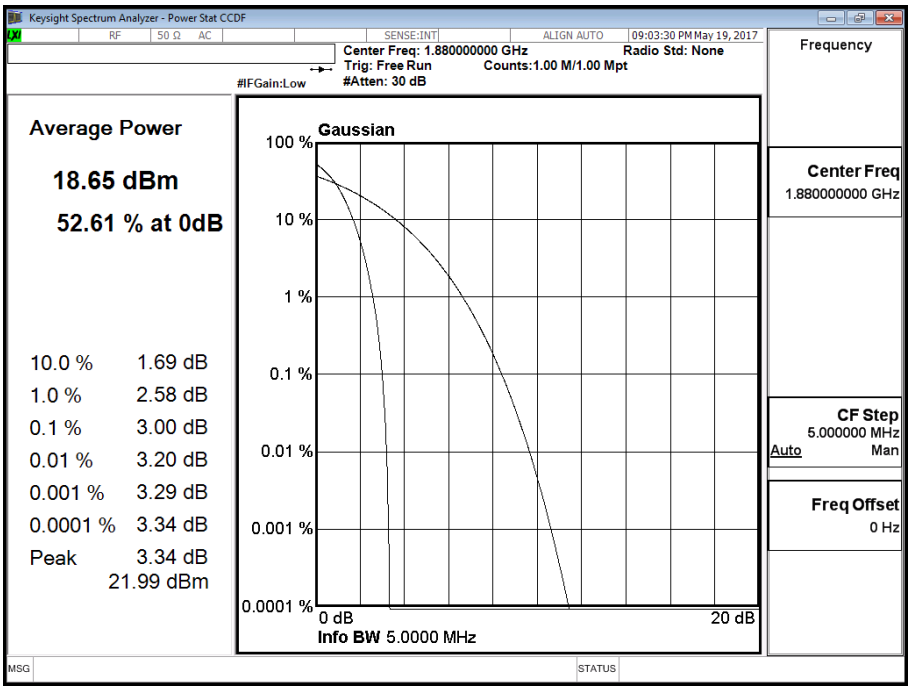


PCS 1900 EGPRS



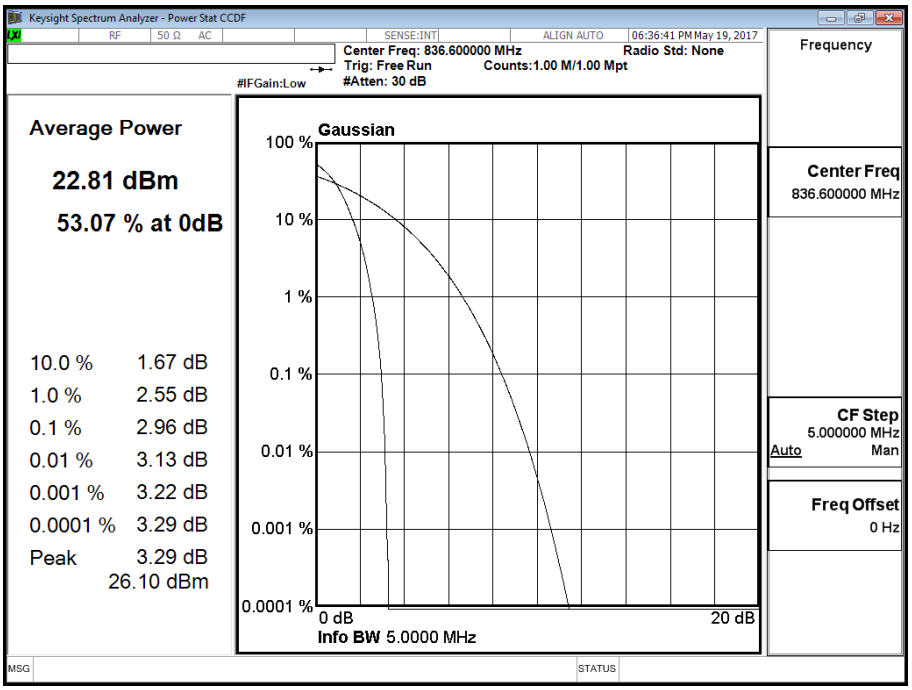
Product	Logistic Monitoring Gateway		
Test Mode	Peak to Average Ratio		
Date of Test	2017/02/08	Test Site	CTR
Test Condition	WCDMA BAND 2		

WCDMA BAND 2



Product	Logistic Monitoring Gateway		
Test Mode	Peak to Average Ratio		
Date of Test	2017/02/08	Test Site	CTR
Test Condition	WCDMA BAND 5		

WCDMA BAND 5



Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs