



# **TEST REPORT**

APPLICANT	: iTrax, Inc.
PRODUCT NAME	: GPS Asset Tracker
MODEL NAME	: SVR4
BRAND NAME	: N/A
FCC ID	: 2AH3LSVR4
STANDARD(S)	47 CFR Part 22 Subpart H 47 CFR Part 24 Subpart E
TEST DATE	: 2018-08-20 to 2018-08-23
ISSUE DATE	: 2018-08-27

Tested by:

Approved by:

Gao Ming zhou Gao Mingzhou (Test Engineer)

Peng Huarui (Supervisor)

NOTE: This document is issued by MORLAB, the test report shall not be r eproduced except in full without prior written permission of the company. The test results apply only to the particular sample(s) tested and to the specific tests carried out which is available on request for validation and information confirmed at our website.



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Change History					
Issue	Issue Date Reason for change				
1.0 2018-08-27		First edition			



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# **1.** Technical Information

Note: Provide by applicant.

# 1.1. Applicant and Manufacturer Information

Applicant:	iTrax, Inc.	
Applicant Address:	963 Topsy Lane,Suite 306 - 359,Carson City, Nevada, 89705,	
	United States	
Manufacturer:	Shenzhen Concox Information Technology Co.,Ltd	
Manufacturer Address:	Floor 4th, Building B, Gaoxinqi Industrial Park, Liuxian 1st Road,	
	District 67, Bao'an, Shenzhen, China	

# **1.2. Equipment Under Test (EUT) Description**

Product Name:	GPS Asset Tracker	
Serial No:	(N/A, marked #1 by test site)	
Hardware Version:	NFC109-V3.0	
Software Version:	GT720S_20_S1A1_D23_R0_V06_WM_20180515_0928	
	GPRS Mode with GMSK Modulation	
Modulation Type:	EDGE Mode with 8PSK Modulation	
	WCDMA Mode with QPSK Modulation	
	GSM 850MHz:	
	Tx: 824.20 - 848.80MHz (at intervals of 200kHz);	
	Rx: 869.20 - 893.80MHz (at intervals of 200kHz)	
	GSM 1900MHz:	
	Tx: 1850.20 - 1909.80MHz (at intervals of 200kHz);	
Operating Frequency Benger	Rx: 1930.20 - 1989.80MHz (at intervals of 200kHz)	
Operating Frequency Range:	WCDMA 850MHz	
	Tx: 826.4 - 846.6MHz (at intervals of 200kHz);	
	Rx: 871.4 - 891.6MHz (at intervals of 200kHz)	
	WCDMA 1900MHz	
	Tx: 1852.4 - 1907.6MHz (at intervals of 200kHz);	
	Rx: 1932.4 - 1987.6MHz (at intervals of 200kHz)	
Multi-slot Class:	GPRS: Multislot Class12; EGPRS: Multislot Class12	
	GPRS 850:261KGXW, GPRS 1900:251KGXW	
Emission Designators:	EGPRS850:250KG7W, EGPRS1900:248KG7W,	
	WCDMA 850:4M10F9W , WCDMA1900:4M11F9W	



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Antenna Type:	Monople Antenna	Monople Antenna		
Antenna Gain:	GSM850	-2.5 dBi		
	GSM1900	-2.5 dBi		
	WCDMA850	-2.5 dBi		
	WCDMA1900	-2.5 dBi		
Operating voltage:	Normal(NV):	3.60 V		

- Note 1: The transmitter (Tx) frequency arrangement of the C ellular 850M Hz band us ed by the EUT can be represented with the formula F(n)=824.2+0.2\*(n-128), 128<=n<=251; the lowest, middle, highest channel numbers (ARFCHs) us ed and tes ted in this report are separately 128 (824.2MHz), 190 (836.6MHz) and 251 (848.8MHz).
- *Note 2:* The transmitter (Tx) frequency arrangement of the PCS 1900MHz band used by the EUT can be represented with the formula F(n)=1850.2+0.2\*(n-512), 512<=n<=810; the lowest, middle and highest channel numbers (ARFCHs) used and tested in this report are separately 512 (1850.2MHz), 661 (1880.0MHz) and 810 (1909.8MHz).
- *Note 3:* The transmitter (Tx) frequency arrangement of the WCDMA 850MHz band used by the EUT can be represented with the formula F(n)=826.4+0.2\*(n-4132), 4132<=n<=4233; the lowest, middle and highest channel numbers (ARFCHs) used and tested in this report are separately 4132 (826.4MHz), 4175(835MHz) and 4233 (846.6MHz).
- *Note 4:* The transmitter (Tx) frequency arrangement of the WCDMA 1900MHz band used by the EUT c an be r epresented with the for mula F(n)=1852.4+0.2\*(n-9262), 9262<=n<=9538; the lowest, middle and highest channel numbers (ARFCHs) used and tested in this report are separately 9262 (1852.4MHz), 9400 (1880MHz) and 9538 (1907.6MHz).
- *Note 5:* For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.





# **1.3. Test Standards and Results**

The objective of the report is to perform testing according to 47 CFR Part 2, Part 22, Part 24 for the EUT FCC ID Certification:

No	o Identity Document Title				
1 47 CFR Part 2 (10-1-12 Edition)		Frequency Allocations and Radio Treaty Matters			
	47 GFR Fait 2 (10-1-12 Edition)	General Rules and Regulations			
2	47 CFR Part 22 (10-1-12 Edition)	Public Mobile Services			
3	47 CFR Part 24 (10-1-12 Edition)	Personal Communications Services			

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Test Date	Test Engineer	Result	
1	2.1046	Conducted RF Output Power	Aug 20, 2018	Gao Mingzhou	PASS	
2	24.232(d)	Peak - Average Radio	Aug 20, 2018	Gao Mingzhou	PASS	
3	2.1049	99% Occupied Bandwidth	Aug 20, 2018	Gao Mingzhou	PASS	
4	2.1055,22.355, 24.235	Frequency Stability	Aug 20, 2018	Gao Mingzhou	PASS	
5	2.1051, 22.917(a), 24.238(a)	Conducted Out of Band Emissions	Aug 20, 2018	Gao Mingzhou	PASS	
6	2.1051, 22.917(a), 24.238(a)	Band Edge	Aug 20, 2018	Gao Mingzhou	PASS	
7	22.913(a), 24.232(a)	Transmitter Radiated Power (EIPR/ERP)	Aug 22, 2018	Wang Dalong	PASS	
8	2.1051, 22.917(a), 24.238(a)	Radiated Out of Band Emissions	Aug 21&22, 2018	Wang Dalong	PASS	
	Note: The tests were performed according to the method of measurements prescribed in					
KDB	KDB971168 D01 v03 (Oct 27, 2017) and ANSI/TIA-603-E-2016.					

# **1.4. Environmental Conditions**

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15 - 35
Relative Humidity (%):	30 -60
Atmospheric Pressure (kPa):	86-106





# 2. 47 CFR Part 2, Part 22H & 24E Requirements

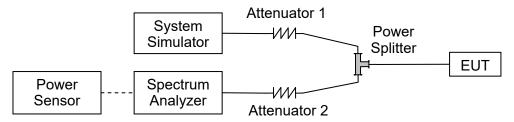
### 2.1. Conducted RF Output Power

#### 2.1.1. Requirement

According to FC C s ection 2.1046(a), for transmitters other than s ingle s ideband, i ndependent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune -up procedure to give the values of current and voltage on the circuit elements specified in FCC section 2.1033(c)(8).

#### 2.1.2. Test Description

Test Setup:



The E UT is c oupled t o the S pectrum A nalyzer (SA) and the S ystem S imulator (SS) with Attenuators through the P ower S plitter; the R F I oad attached to the E UT anten na terminal is 500hm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to o perate at the maximum output power i.e. Power Control Level (PCL) = 5 and P ower Class = 4. A call is established between the EUT and the SS.





#### 2.1.3. Test Results

The lowest, middle and highest channels are selected to perform testing to verify the conducted RF output power of the EUT.

#### **GSM Test Verdict:**

GSM850	Average Power (dBm)			
TX Channel	128	190	251	Verdict
Frequency (MHz)	824.2	836.6	848.8	
GPRS 1 Tx slot	32.54	32.60	32.76	PASS
GPRS 2 Tx slots	30.45	30.55	30.76	PASS
GPRS 3 Tx slots	28.56	28.68	28.91	PASS
GPRS 4 Tx slots	26.53	26.56	26.78	PASS
EDGE 1 Tx slot	32.55	32.60	32.77	PASS
EDGE 2 Tx slots	30.42	30.51	30.71	PASS
EDGE 3 Tx slots	28.53	28.64	28.74	PASS
EDGE 4 Tx slots	26.54	26.62	26.80	PASS

GSM1900	Average Power (dBm)			
TX Channel	512	661	810	Verdict
Frequency (MHz)	1850.2	1880	1909.8	
GPRS 1 Tx slot	28.47	28.39	28.96	PASS
GPRS 2 Tx slots	27.78	27.71	27.54	PASS
GPRS 3 Tx slots	26.02	25.94	25.91	PASS
GPRS 4 Tx slots	23.94	23.97	23.93	PASS
EDGE 1 Tx slot	30.03	29.95	30.44	PASS
EDGE 2 Tx slots	27.69	27.63	27.45	PASS
EDGE 3 Tx slots	26.01	25.92	25.75	PASS
EDGE 4 Tx slots	24.04	23.91	23.67	PASS





#### WCDMA Test Verdict:

WCDN	/A 850	Average Power (dBm)			
TX Cł	nannel	4132	4175	4233	Verdict
Frequency (MHz)		826.4	835.0	846.6	
3GPP Rel 99	RMC 2.2Kbps	25.60	23.62	24.59	PASS

WCDMA 1900		Av			
TX Cł	nannel	9262	9400	9538	Verdict
Frequen	cy (MHz)	1852.4	1880	1907.6	
3GPP Rel 99	RMC 2.2Kbps	23.18	23.34	23.05	PASS



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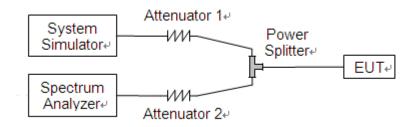
### 2.2. Peak to Average Radio

#### 2.2.1. Requirement

According to FCC 24.232(d) the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

#### 2.2.2. Test Description

Test Setup:



The E UT is c oupled t o the S pectrum A nalyzer (SA) and the S ystem S imulator (SS) with Attenuators through the P ower S plitter; the R F I oad attached to the E UT anten na terminal is 500hm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to o perate at the maximum output power i.e. Power Control Level (PCL) = 5 and P ower Class = 4. A call is established between the EUT and the SS.

#### 2.2.3. Test procedure

1 .For GSM/EGPRS operating mode:

- a. Set RBW=1MHz, VBW=3MHz, peak detector in spectrum analyzer.
- b. Set EUT in maximum output power, and triggered the bust signal.
- c. Measured respectively the peak level and mean level, and the deviation was recorded as Peak to Average radio.
- 2. For UMTS operating mode:
- a. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
- b. The highest RF powers were measured and r ecorded the maximum PAPR level associated with a probability of 0.1%.





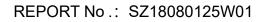
#### 2.2.4. Test Result

The lowest, middle and highest channels are selected to perform testing to verify the conducted RF output peak power of the Module.

#### A. Test Verdict:

Band	Channel	Frequency	Peak to Ave	erage radio	Limit	Verdict
Danu	Channel	(MHz)	dB	Refer to Plot	dB	verdici
GPRS	512	1850.2	0.006			PASS
1900MHz	661	1880.0	0.004	Plot A1 to A3	13	PASS
190010172	810	1909.8	0.004			PASS
EGPRS	512	1850.2	0.002			PASS
1900MHz	661	1880.0	0.003	Plot B1 to B3	13	PASS
190010172	810	1909.8	0.010			PASS
WCDMA	9262	1852.4	4.03			PASS
1900MHz	9400	1880.0	3.82	Plot C1 to C3	13	PASS
	9538	1907.6	3.40			PASS





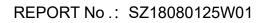


#### B. Test Plots:

ctrum Analyzer - Swept SA 10:42:11 AM Aug 20, 2018 Peak Search TRACE TYPE DET Marker 1 473.000 µs Avg Type: RMS Avg|Hold:>100/100 PNO: Fast 🖵 IFGain:Low Trig: Free Run #Atten: 24 dB Next Peak Mkr1 473.0 μs 30.134 dBm Ref Offset 27 dB Ref 40.00 dBm (div 1 Next Pk Right Next Pk Left Marker Delta Mkr→CF Mkr→RefLvl More 1 of 2 Center 1.850200000 GHz Res BW 1.0 MHz Span 0 Hz Sweep 1.000 ms (1001 pts) #VBW 3.0 MHz\* Alignment Completed 10:41:53 AM Aug 20, 2018 Frequency Center Freq 1.850200000 GHz Avg Type: Log-Pwr Avg|Hold:>100/100 TYPE MUMMANA DET P N N N N PNO: Fast Trig: Free Run IFGain:Low #Atten: 24 dB Auto Tune Mkr1 16.00 µs 30.140 dBm Ref Offset 27 dB Ref 40.00 dBm 0 dB/div 1 **Center Freq** 1.850200000 GHz Start Freq 1.850200000 GHz Stop Freq 1.850200000 GHz **CF Step** 1.000000 MHz Man Auto **Freq Offset** 0 Hz Center 1.850200000 GHz Res BW 1.0 MHz Span 0 Hz Sweep 1.000 ms (1001 pts) #VBW 3.0 MHz MSG

(Plot A1, GSM 1900 MHz, Channel = 512)







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		Hz	#VBW	3.0 MHz*			Sweep 1		Span 0 Hz (1001 pts)	
es BW 1		Hz	#VBW	3.0 MHz*			Sweep 1	.000 ms (	5pan 0 Hz (1001 pts)	
es BW 1 G ilent Spectr	.0 MHz um Analyzer - Swe RF 50 Q	pt SA	#VBW	3.0 MHz*	E:INT		STATUS ALIGN AUTO	.000 ms (	(1001 pts)	Peak Search
es BW 1 G ilent Spectr	.0 MHz um Analyzer - Swe	pt SA AC	#VBW PNO: Fast Gain:Low	SENS	Run		STATUS	.000 ms ( 10:42:41A TRA TY D	MAug20,2018 CE 123456 PE MWWWWW ET P NNNNN	
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(Plot A2, GSM 1900 MHz, Channel = 661)

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Agilent Spectrum <mark>XI</mark>	Analyzer - Swept SA           RF         50 Ω         AC		SENSE:INT	ALIGNAUTO	10:44:04 AM Aug 20, 2018	
larker 1 34		PNO: Fast 🖵 IFGain:Low		Avg Type: RMS Avg Hold:>100/100	TRACE <b>1 2 3 4 5 6</b> TYPE M <del>W///////</del> DET A N N N N N	Peak Search
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og		<b>♦</b> <sup>1</sup>				Next Pk Rig
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es BW 1.0 <sup>G</sup> ilent Spectrum	MHz Analyzer - Swept SA RF 50 Ω AC		SENSE:INT	STATU: ALIGNAUTO Avg Type: Log-Pwr	.000 ms (1001 pts)	Peak Search
es BW 1.0	MHz Analyzer - Swept SA RF 50 Q AC 9.0000 µS		SENSE:INT	ALIGN AUTO	10:43:45 AM Aug 20, 2018 TRACE 12:3 4 5 6 TRACE 12:3 4 5 6 TYPE MUNICIPAL	Peak Search
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es BW 1.0	MHz Analyzer - Swept SA RF 50 Ω AC 9 9.0000 μS Ref Offset 27 dB	PNO: Fast 😱	SENSE:INT	STATU: ALIGNAUTO Avg Type: Log-Pwr	10:43:45 AM Aug 20, 2018 10:43:45 AM Aug 20, 2018 TRACE D 23 4 5 6 TYPE M MAAGE AND AUG DET P NINNIN Mkr1 49.00 us	Peak Search Next Pea Next Pk Rig Next Pk Lu
es BW 1.0	MHz Analyzer - Swept SA RF 50 Ω AC 9 9.0000 μS Ref Offset 27 dB	PNO: Fast 😱	SENSE:INT	STATU: ALIGNAUTO Avg Type: Log-Pwr	10:43:45 AM Aug 20, 2018 10:43:45 AM Aug 20, 2018 TRACE D 23 4 5 6 TYPE M MAAGE AND AUG DET P NINNIN Mkr1 49.00 us	Peak Search Next Per Next Pk Rig Next Pk Lu Marker De
es BW 1.0 glient Spectrum larker 1 49 0 dB/div F 9 1 10 0 0 0 0 0 0 0 0 0 0 0 0 0	MHz Analyzer - Swept SA RF 50 Ω AC 9 9.0000 μS Ref Offset 27 dB	PNO: Fast 😱	SENSE:INT	STATU: ALIGNAUTO Avg Type: Log-Pwr	10:43:45 AM Aug 20, 2018 10:43:45 AM Aug 20, 2018 TRACE D 23 4 5 6 TYPE M MAAGE AND AUG DET P NINNIN Mkr1 49.00 us	Peak Search Next Pea Next Pk Rig Next Pk Lo Marker De Mkr0
es BW 1.0	MHz Analyzer - Swept SA RF 50 Ω AC 9 9.0000 μS Ref Offset 27 dB	PNO: Fast 😱	SENSE:INT	STATU: ALIGNAUTO Avg Type: Log-Pwr	10:43:45 AM Aug 20, 2018 10:43:45 AM Aug 20, 2018 TRACE D 23 4 5 6 TYPE M MAAGE AND AUG DET P NINNIN Mkr1 49.00 us	Peak Search Next Pea Next Pk Rig Next Pk Lo Marker De
es BW 1.0	MHz  Analyzer - Swept SA  RF 50 Q AC  9.0000 µS  Ref Offset 27 dB Ref 40.00 dBm	PNO: Fast 😱	SENSE:INT	STATU: ALIGNAUTO Avg Type: Log-Pwr	.000 ms (1001 pts)	Peak Search Next Pea Next Pk Rig Next Pk Lu Marker De Mkr-A Mkr-Ref L
es BW 1.0 a 1.0 glient Spectrum larker 1 49 o dB/div F o dB/div F 1 20.0 0.0	MHz  Analyzer - Swept SA RF 50 Ω AC   9.0000 μs  Ref 40.00 dBm	PNO: Fast IFGain:Low	SENSE:INT	STATU: ALIGNAUTO Avg Type: Log-Pwr AvgHold>100/100	10:43:45 AM Aug 20, 2018 10:43:45 AM Aug 20, 2018 TRACE D 23 4 5 6 TYPE M MAAGE AND AUG DET P NINNIN Mkr1 49.00 us	

(Plot A3, GSM 1900MHz, Channel = 810)

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1	rum Analyzer - Swept SA RF 50 Ω AC		SENSE:INT	ALIGNAUTO	01:40:58 PM Aug 20, 2018	Peak Search
arker 1	924.000 µs	PNO: Fast 📮 IFGain:Low	Trig: Free Run Atten: 24 dB	Avg Type: RMS Avg Hold:>100/100	TRACE <b>1 2 3 4 5 6</b> TYPE M <del>WWWWW</del> DET A N N N N N	Peak Search
) dB/div	Ref Offset 27 dB Ref 40.00 dBm	IFGam.Low	FRICH. 24 GB		Mkr1 924.0 µs 30.142 dBm	Next Pe
					1	
30.0						Next Pk Rig
20.0						Next Pk Le
0.0						
						Marker De
0.0						
0.0						Mkr→0
0.0						
0.0						Mkr→RefL
0.0						Ма
	850200000 GHz				Span 0 Hz	1 0
es BW '		#VBN	/ 3.0 MHz*		.000 ms (1001 pts)	10
es BW ′ <sup>sg</sup>	1.0 MHz		/ 3.0 MHz*	Sweep 1	.000 ms (1001 pts)	1 o
es BW ' G gilent Spect			SENSE:INT	STATUS ALIGNAUTO Avg Type: Log-Pwr	.000 ms (1001 pts)	1 o Peak Search
es BW ' sg gilent Spect	1.0 MHz rum Analyzer - Swept SA RF 50 Ω AC		SENSE:INT	ALIGNAUTO	0000 ms (1001 pts)	Peak Search
es BW / g ilent Spect arker 1	1.0 MHz rum Analyzer - Swept SA RF 50 Ω AC	PNO: Fast 🔾	SENSE:INT	STATUS ALIGNAUTO Avg Type: Log-Pwr	.000 ms (1001 pts)	Peak Search
es BW / gilent Spect larker 1	1.0 MHz rum Analyzer - Swept SA RF   50 Ω AC I 361.000 μS Ref Offset 27 dB	PNO: Fast 🔾	SENSE:INT	STATUS ALIGNAUTO Avg Type: Log-Pwr	0000 ms (1001 pts)	Peak Search Next Pea
es BW <sup>/</sup> iiient Spect larker 1 0 dB/div	1.0 MHz rum Analyzer - Swept SA RF   50 Ω AC I 361.000 μS Ref Offset 27 dB	PNO: Fast IFGain:Low	SENSE:INT	STATUS ALIGNAUTO Avg Type: Log-Pwr	0000 ms (1001 pts)	Peak Search Next Pea
es BW <sup>/</sup> <sup>(G)</sup> ilent Spect arker 1 0 dB/div 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.0 MHz rum Analyzer - Swept SA RF   50 Ω AC I 361.000 μS Ref Offset 27 dB	PNO: Fast IFGain:Low	SENSE:INT	STATUS ALIGNAUTO Avg Type: Log-Pwr	0000 ms (1001 pts)	Peak Search Next Pe Next Pk Rig
es BW <sup>2</sup> gjlent Spect larker 1 0 dB/div 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.0 MHz rum Analyzer - Swept SA RF   50 Ω AC I 361.000 μS Ref Offset 27 dB	PNO: Fast IFGain:Low	SENSE:INT	STATUS ALIGNAUTO Avg Type: Log-Pwr	0000 ms (1001 pts)	Peak Search Next Pe Next Pk Rig
es BW <sup>2</sup> glent Spect larker 1 0 dB/div 0 0 0.00	1.0 MHz rum Analyzer - Swept SA RF   50 Ω AC I 361.000 μS Ref Offset 27 dB	PNO: Fast IFGain:Low	SENSE:INT	STATUS ALIGNAUTO Avg Type: Log-Pwr	0000 ms (1001 pts)	Peak Search Next Pea Next Pk Rig Next Pk Lo
es BW <sup>7</sup> glient Spect larker 1 0 dB/div 9 0.0 0.0 0.0 0.0	1.0 MHz rum Analyzer - Swept SA RF   50 Ω AC I 361.000 μS Ref Offset 27 dB	PNO: Fast IFGain:Low	SENSE:INT	STATUS ALIGNAUTO Avg Type: Log-Pwr	0000 ms (1001 pts)	Peak Search Next Pea Next Pk Rig Next Pk Lo
es BW <sup>2</sup> <sup>30</sup> <sup>30</sup> <sup>30</sup> <sup>30</sup> <sup>30</sup> <sup>30</sup> <sup>30</sup> <sup>30</sup>	1.0 MHz rum Analyzer - Swept SA RF   50 Ω AC I 361.000 μS Ref Offset 27 dB	PNO: Fast IFGain:Low	SENSE:INT	STATUS ALIGNAUTO Avg Type: Log-Pwr	0000 ms (1001 pts)	
es BW / a glient Spect larker 1	1.0 MHz rum Analyzer - Swept SA RF   50 Ω AC I 361.000 μS Ref Offset 27 dB	PNO: Fast IFGain:Low	SENSE:INT	STATUS ALIGNAUTO Avg Type: Log-Pwr	0000 ms (1001 pts)	Peak Search Next Pea Next Pk Rig Next Pk Lo Marker De
es BW <sup>2</sup> a a a a a a b a a b a b a b a b a b a	1.0 MHz rum Analyzer - Swept SA RF   50 Ω AC I 361.000 μS Ref Offset 27 dB	PNO: Fast IFGain:Low	SENSE:INT	STATUS ALIGNAUTO Avg Type: Log-Pwr	0000 ms (1001 pts)	Peak Search Next Pea Next Pk Rig Next Pk Lo Marker De
es BW <sup>2</sup> <sup>III</sup> <sup>IIII</sup> <sup>III</sup> <sup>IIII</sup> <sup>III</sup> <sup>III</sup> <sup>III</sup> <sup>III</sup> <sup>III</sup> <sup>III</sup> <sup>III</sup> <sup>III</sup> <sup>III</sup> <sup></sup>	1.0 MHz rum Analyzer - Swept SA RF   50 Ω AC I 361.000 μS Ref Offset 27 dB	PNO: Fast IFGain:Low	SENSE:INT	STATUS ALIGNAUTO Avg Type: Log-Pwr	0000 ms (1001 pts)	Peak Search Next Pea Next Pk Rig Next Pk Lu Marker De Mkr-A Mkr-Ref L
es BW <sup>2</sup> igent Spect ifent Spect Spect ifent Spect ifent Spect ifent Spect ifent Spect ifent Spect Spect ifent Spect Spect ifent Spect Sp	1.0 MHz rum Analyzer - Swept SA RF   50 Ω AC I 361.000 μS Ref Offset 27 dB	PNO: Fast IFGain:Low	SENSE:INT	ALIGNAUTO Avg Type: Log-Pwr Avg Hold>100/100	0000 ms (1001 pts)	Peak Search Next Pea Next Pk Rig Next Pk Lu Marker De

(Plot B1, EGPRS 1900 MHz, Channel = 512)





	rum Analyzer - Swept SA RF 50 Ω AC		SENSE:INT	ALIGN AUTO	01:42:21 PM Aug 20, 2018	
larker 1	99.0000 µs	PNO: Fast 🖵	Trig: Free Run	Avg Type: RMS Avg Hold:>100/100	TRACE 123456 TYPE MWWWWW DET A N N N N N	Peak Search
) dB/div	Ref Offset 27 dB Ref 40.00 dBm	IFGain:Low	Atten: 24 dB		Mkr1 99.00 µs 30.173 dBm	Next Pe
	1					Novt Bk Big
30.0						Next Pk Rig
20.0						Next Pk L
0.0						
						Marker De
0.0						
0.0						Mkr→
0.0						Mkr. Defi
0.0						Mkr→RefL
0.0						Mo
	.880000000 GHz 1.0 MHz	#VBW	3.0 MHz*	Sweep 1	Span 0 Hz .000 ms (1001 pts)	1 o
		#VBW	3.0 MHz*	Sweep 1	.000 ms (1001 pts)	1 0
es BW ' G jilent Spect	1.0 MHz rum Analyzer - Swept SA			STATUS	.000 ms (1001 pts)	1 0
es BW ' G jilent Spect	1.0 MHz		SENSE:INT		.000 ms (1001 pts)	1 o Peak Search
es BW <sup>-</sup> g ilent Spect arker 1	1.0 MHz rum Analyzer - Swept SA RF 50 Ω AC 448.000 μs Ref Offset 27 dB		SENSE:INT	STATU: ALIGNAUTO Avg Type: Log-Pwr	0000 ms (1001 pts)	Peak Search
es BW / g jilent Spect arker 1	1.0 MHz rum Analyzer - Swept SA RF 50 Ω AC 448.000 μs	PNO: Fast 😱	SENSE:INT Trig: Free Run Atten: 24 dB	STATU: ALIGNAUTO Avg Type: Log-Pwr	01:42:01PM Aug 20, 2018 TRACE 12:3:4:5:6 TRACE 12:3:4:5:6 TYPE MUNUMPERING DET PINNINN	Peak Search
es BW <sup>4</sup> g ilent Spect arker 1 0 dB/div	1.0 MHz rum Analyzer - Swept SA RF 50 Ω AC 448.000 μs Ref Offset 27 dB	PNO: Fast 😱	SENSE:INT	STATU: ALIGNAUTO Avg Type: Log-Pwr	0000 ms (1001 pts)	Peak Search Next Pe
es BW / g gilent Spect arker 1 0 dB/div	1.0 MHz rum Analyzer - Swept SA RF 50 Ω AC 448.000 μs Ref Offset 27 dB	PNO: Fast 😱	SENSE:INT Trig: Free Run Atten: 24 dB	STATU: ALIGNAUTO Avg Type: Log-Pwr	0000 ms (1001 pts)	Peak Search Next Pe Next Pk Rig
es BW <sup>/</sup> <sup>(G)</sup> ilent Spect arker 1 0 dB/div 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.0 MHz rum Analyzer - Swept SA RF 50 Ω AC 448.000 μs Ref Offset 27 dB	PNO: Fast 😱	SENSE:INT Trig: Free Run Atten: 24 dB	STATU: ALIGNAUTO Avg Type: Log-Pwr	0000 ms (1001 pts)	Peak Search Next Pe Next Pk Rig
es BW <sup>2</sup> gjlent Spect larker 1 0 dB/div 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.0 MHz rum Analyzer - Swept SA RF 50 Ω AC 448.000 μs Ref Offset 27 dB	PNO: Fast 😱	SENSE:INT Trig: Free Run Atten: 24 dB	STATU: ALIGNAUTO Avg Type: Log-Pwr	0000 ms (1001 pts)	Peak Search Next Pe Next Pk Rig Next Pk L
es BW <sup>2</sup> g g g g g g g g g g g g g	1.0 MHz rum Analyzer - Swept SA RF 50 Ω AC 448.000 μs Ref Offset 27 dB	PNO: Fast 😱	SENSE:INT Trig: Free Run Atten: 24 dB	STATU: ALIGNAUTO Avg Type: Log-Pwr	0000 ms (1001 pts)	Peak Search Next Pe Next Pk Rig Next Pk L
es BW ' G gilent Spect	1.0 MHz rum Analyzer - Swept SA RF 50 Ω AC 448.000 μs Ref Offset 27 dB	PNO: Fast 😱	SENSE:INT Trig: Free Run Atten: 24 dB	STATU: ALIGNAUTO Avg Type: Log-Pwr	0000 ms (1001 pts)	Peak Search Next Per Next Pk Rig Next Pk Lu Marker De
es BW <sup>7</sup> glent Spect larker 1 0 dB/div 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.0 MHz rum Analyzer - Swept SA RF 50 Ω AC 448.000 μs Ref Offset 27 dB	PNO: Fast 😱	SENSE:INT Trig: Free Run Atten: 24 dB	STATU: ALIGNAUTO Avg Type: Log-Pwr	0000 ms (1001 pts)	Peak Search Next Pe Next Pk Rig Next Pk Lu Marker De
es BW <sup>2</sup> <sup>rg</sup> <sup>rg</sup> <sup>rg</sup> <sup>rg</sup> <sup>rg</sup> <sup>rg</sup> <sup>rg</sup> <sup>rg</sup>	1.0 MHz rum Analyzer - Swept SA RF 50 Ω AC 448.000 μs Ref Offset 27 dB	PNO: Fast 😱	SENSE:INT Trig: Free Run Atten: 24 dB	STATU: ALIGNAUTO Avg Type: Log-Pwr	0000 ms (1001 pts)	Peak Search Next Pe Next Pk Rig Next Pk Lu Marker De
es BW <sup>2</sup> a jilent Spect arker 1 0 dB/div 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.0 MHz rum Analyzer - Swept SA RF 50 Ω AC 448.000 μs Ref Offset 27 dB	PNO: Fast 😱	SENSE:INT Trig: Free Run Atten: 24 dB	STATU: ALIGNAUTO Avg Type: Log-Pwr	0000 ms (1001 pts)	Peak Search Next Pe Next Pk Rig Next Pk Li Marker De Mkr→Ref L
es BW <sup>2</sup> g glent Spect arker 1 0 dB/div 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.0 MHz rum Analyzer - Swept SA RF 50 Ω AC 448.000 μs Ref Offset 27 dB	PNO: Fast	SENSE:INT Trig: Free Run Atten: 24 dB	ALIGNAUTO Avg Type: Log-Pwr Avg Hold>100/100	0000 ms (1001 pts)	

(Plot B2, EGPRS 1900 MHz, Channel = 661)



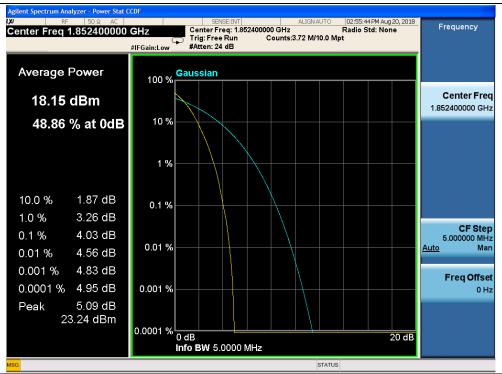


KI	rum Analyzer - Swept SA RF 50 Ω AC		SENSE:INT	ALIGNAUTO		Peak Search
larker 1	802.000 µs	PNO: Fast 🗔 IFGain:Low	⊃ Trig: Free Run Atten: 24 dB	Avg Type: RMS Avg Hold:>100/100	TRACE 123456 TYPE MWWWWW DET A N N N N N	
0 dB/div	Ref Offset 27 dB Ref 40.00 dBm				Mkr1 802.0 µs 30.636 dBm	NextPea
.og					1	New Pk Pie
30.0						Next Pk Rig
20.0						Next Divis
10.0						Next Pk Lo
						MarkerDe
0.0						Marker De
:0.0						Mkr→0
0.0						
0.0						Mkr→RefL
50.0						Miki →Kei L
.0						Ma
	909800000 GHz	#\/B\/	(30 MHz*	Sween	Span 0 Hz 1 000 ms (1001 pts)	1 0
enter 1.9 es BW 1 se		#VBM	/ 3.0 MHz*	Sweep /	1.000 ms (1001 pts)	10
es BW 1 G gilent Spectr	1.0 MHz rum Analyzer - Swept SA			STATU	1.000 ms (1001 pts) <sup>IS</sup>	1 o
es BW 1 <sup>3G</sup> gilent Spectr	I.0 MHz	0 GHz	SENSE:INT		1.000 ms (1001 pts)	1 o
es BW 1 ig gilent Spectr	I.0 MHz rum Analyzer - Swept SA RF 50 Ω AC req 1.909800000		SENSE:INT	ALIGNAUTO Avg Type: Log-Pwr	1.000 ms (1001 pts) Is 01:43:18PM Aug 20, 2018 TRACE 1 2 3 4 5 6 TYPE MWWW DET P. NNNNN	Frequency
es BW 1 gilent Spectr enter F	I.O MHz rum Analyzer - Swept SA RF 50 Ω AC	0 GHz PNO: Fast G	SENSE:INT	ALIGNAUTO Avg Type: Log-Pwr	1.000 ms (1001 pts)	Frequency
es BW 1 gilent Spectr enter F	I.0 MHz rum Analyzer - Swept SA RF 50 Ω AC req 1.909800000 Ref Offset 27 dB	0 GHz PNO: Fast G	SENSE:INT	ALIGNAUTO Avg Type: Log-Pwr	1.000 ms (1001 pts) Is 01:43:18PM Aug 20, 2018 TRACE 1 2 3 4 5 6 TYPE MWWW DET P. NNNNN	Frequency Auto Tu Center Fre
es BW 1 is gilent Spectr enter F 0 dB/div 0 g	1.0 MHz rum Analyzer - Swept SA RF 50 Ω AC req 1.909800000 Ref Offset 27 dB Ref 40.00 dBm	0 GHz PNO: Fast G	SENSE:INT	ALIGNAUTO Avg Type: Log-Pwr	1.000 ms (1001 pts) Is 01:43:18PM Aug 20, 2018 TRACE 1 2 3 4 5 6 TYPE MWWW DET P. NNNNN	Frequency Auto Tu Center Fr
es BW 1 rs gilent Spectr enter F o dB/div og	1.0 MHz rum Analyzer - Swept SA RF 50 Ω AC req 1.909800000 Ref Offset 27 dB Ref 40.00 dBm	0 GHz PNO: Fast G	SENSE:INT	ALIGNAUTO Avg Type: Log-Pwr	1.000 ms (1001 pts) Is 01:43:18PM Aug 20, 2018 TRACE 1 2 3 4 5 6 TYPE MWWW DET P. NNNNN	Frequency Auto Tur Center Fr 1.909800000 G Start Fro
es BW 1 glient Spectr enter F o dB/div o g	1.0 MHz rum Analyzer - Swept SA RF 50 Ω AC req 1.909800000 Ref Offset 27 dB Ref 40.00 dBm	0 GHz PNO: Fast G	SENSE:INT	ALIGNAUTO Avg Type: Log-Pwr	1.000 ms (1001 pts) Is 01:43:18PM Aug 20, 2018 TRACE 1 2 3 4 5 6 TYPE MWWW DET P. NNNNN	Frequency Auto Tur Center Fr 1.909800000 G Start Fro
es BW 1 reg enter F o dB/div o 0 o 0 o 0 o 0 o 0 o 0 o 0 o 0	1.0 MHz rum Analyzer - Swept SA RF 50 Ω AC req 1.909800000 Ref Offset 27 dB Ref 40.00 dBm	0 GHz PNO: Fast G	SENSE:INT	ALIGNAUTO Avg Type: Log-Pwr	1.000 ms (1001 pts) Is 01:43:18PM Aug 20, 2018 TRACE 1 2 3 4 5 6 TYPE MWWW DET P. NNNNN	Frequency Auto Tu Center Fr 1.909800000 G Start Fr 1.909800000 G Stop Fr
es BW 1 glent Spectr enter F o dB/div o g 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.0 MHz rum Analyzer - Swept SA RF 50 Ω AC req 1.909800000 Ref Offset 27 dB Ref 40.00 dBm	0 GHz PNO: Fast G	SENSE:INT	ALIGNAUTO Avg Type: Log-Pwr	1.000 ms (1001 pts) Is 01:43:18PM Aug 20, 2018 TRACE 1 2 3 4 5 6 TYPE MWWW DET P. NNNNN	Frequency Auto Tur Center Fro 1.909800000 G Start Fro 1.909800000 G Stop Fro 1.909800000 G
es BW 1 glent Spectr enter F 0 dB/div 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.0 MHz rum Analyzer - Swept SA RF 50 Ω AC req 1.909800000 Ref Offset 27 dB Ref 40.00 dBm	0 GHz PNO: Fast G	SENSE:INT	ALIGNAUTO Avg Type: Log-Pwr	1.000 ms (1001 pts) Is 01:43:18PM Aug 20, 2018 TRACE 1 2 3 4 5 6 TYPE MWWW DET P. NNNNN	Frequency           Auto Tui           Center Fr           1.909800000 G           Start Fr           1.909800000 G           Stop Fr           1.909800000 G           CF Ste           1.000000 M
es BW 1 gilent Spectr enter F 0 dB/div 0 d 0 dB/div 0 d 0 d 0 d 0 d 0 d 0 d 0 d 0 d	1.0 MHz rum Analyzer - Swept SA RF 50 Ω AC req 1.909800000 Ref Offset 27 dB Ref 40.00 dBm	0 GHz PNO: Fast G	SENSE:INT	ALIGNAUTO Avg Type: Log-Pwr	1.000 ms (1001 pts) Is 01:43:18PM Aug 20, 2018 TRACE 1 2 3 4 5 6 TYPE MWWW DET P. NNNNN	Frequency           Auto Tun           Center Fr           1.909800000 G           Start Fr           1.909800000 G           Stop Fr           1.909800000 G           CF Sta           1.000000 M
es BW 1	1.0 MHz rum Analyzer - Swept SA RF 50 Ω AC req 1.909800000 Ref Offset 27 dB Ref 40.00 dBm	0 GHz PNO: Fast G	SENSE:INT	ALIGNAUTO Avg Type: Log-Pwr	1.000 ms (1001 pts) Is 01:43:18PM Aug 20, 2018 TRACE 1 2 3 4 5 6 TYPE MWWW DET P. NNNNN	Frequency Auto Tur Center Fr 1.909800000 G Start Fr 1.909800000 G Stop Fr 1.909800000 G CF Sta 1.000000 M Auto M
es BW 1	1.0 MHz rum Analyzer - Swept SA RF 50 Ω AC req 1.909800000 Ref Offset 27 dB Ref 40.00 dBm	0 GHz PNO: Fast G	SENSE:INT	ALIGNAUTO Avg Type: Log-Pwr	1.000 ms (1001 pts) Is 01:43:18PM Aug 20, 2018 TRACE 1 2 3 4 5 6 TYPE MWWW DET P. NNNNN	Frequency Auto Tur Center Fr 1.909800000 G Start Fr 1.909800000 G Stop Fr 1.909800000 G CF Sta 1.000000 M Auto M
es BW 1	I.0 MHz  rum Analyzer - Swept SA  RF 50 2 AC  req 1.90980000  Ref Offset 27 dB Ref 40.00 dBm  1	0 GHz PNO: Fast G	SENSE:INT	ALIGNAUTO Avg Type: Log-Pwr	1.000 ms (1001 pts) IIS IRACE 123455 TRACE 12345 TYPE MANNON Mkr1 50.00 µs 30.646 dBm	Frequency Auto Tur Center Fr 1.909800000 G Start Fr 1.909800000 G Stop Fr 1.909800000 G CF Ste 1.000000 M Auto M
es BW 1	I.0 MHz  Tum Analyzer - Swept SA  RF 150 20 AC  Ref Offset 27 dB Ref 40.00 dBm  1  909800000 GHz	D GHZ PNO: Fast IFGain:Low	SENSE:INT	STATU ALIGNAUTO Avg Type: Log-Pwr Avg Hold>100/100	1.000 ms (1001 pts) Is 01:43:18PM Aug 20, 2018 TRACE 1 2 3 4 5 6 TYPE MWWW DET P. NNNNN	Frequency           Auto Tun           Center Fr           1.909800000 Gi           Start Fr           1.909800000 Gi           Stop Fr           1.909800000 Gi           CF Ste           1.000000 Mi

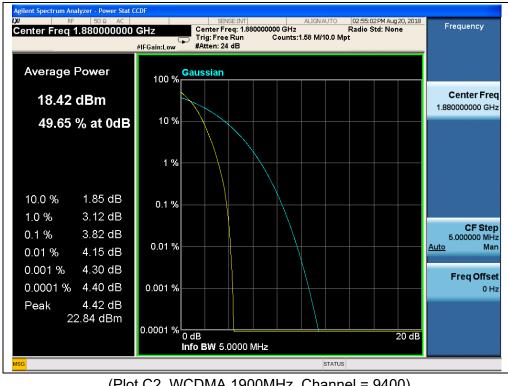
(Plot B3, EGPRS 1900MHz, Channel = 810)







(Plot C1, WCDMA 1900MHz, Channel = 9262)



(Plot C2, WCDMA 1900MHz, Channel = 9400)

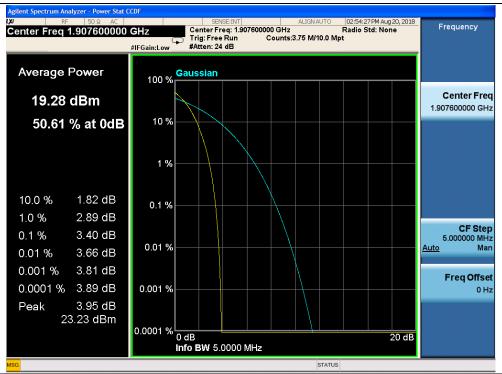
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E-mail: service@morlab.cn







(Plot C3, WCDMA 1900MHz, Channel = 9538)



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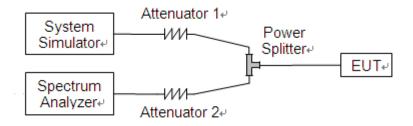
### 2.3.99% Occupied Bandwidth

#### 2.3.1. Requirement

According to FCCs ection 2.1049 and FCC § 22.917 & 24.238, the oc cupied ban dwidth is the frequency bandwidth such that, b elow its lower and above its upper frequency limits, the mean powers r adiated are each equal to 0.5 per cent of the tot al mean power r adiated by a gi ven emission. Occupied bandwidth is also known as the 99% emission bandwidth.

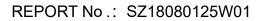
#### 2.3.2. Test Description

Test Setup:



The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 500hm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power i.e. Power Control Level (PCL) = 5 and Power Class = 4. A call is established between the EUT and the SS.







#### 2.3.3. Test Result

The lowest, middle and highest channels are selected to perform testing to record the 99% occupied bandwidth.

#### **GSM Test Verdict:**

Band	Channel	Frequency	26dB bandwidth	99% Occupied	Refer to
Danu	Channel	(MHz)	(kHz)	Bandwidth (kHz)	Plot
GPRS	128	824.2	312.2	245.95	Dist
850MHz	190	836.6	320.5	260.73	Plot A1 to A3
ODUNITZ	251	848.8	315.7	242.12	AT IU AS
CDDS	512	1850.2	311.9	243.85	Diet
GPRS 1900MHz	661	1880.0	317.3	251.25	Plot B1 to B3
	810	1909.8	321.2	244.17	
	128	824.2	318.8	247.17	Diet
EGPRS 850MHz	190	836.6	320.4	249.90	Plot C1 to C3
ODUNITZ	251	848.8	317.7	246.37	
	512	1850.2	319.3	243.32	Diet
EGPRS 1900MHz	661	1880.0	316.9	248.14	Plot D1 to D3
	810	1909.8	317.9	242.66	50 03 10

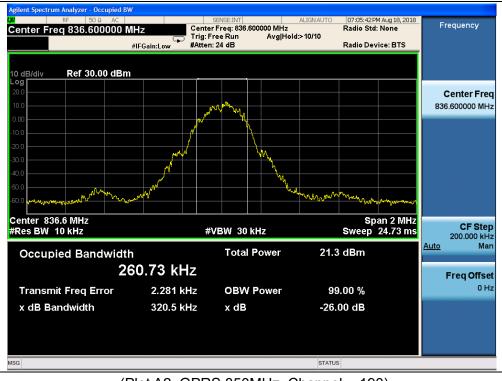




#### **Test Plots:**

t Spectrum Analyzer - Occupied BW 10:59:07 AM Aug 20, 2018 Radio Std: None Center Freq: 824.200000 MHz Trig: Free Run Avg|Hold:>10/10 #Atten: 24 dB Frequency Center Freq 824.200000 MHz #IFGain:Low Radio Device: BTS Ref 35.00 dBm 10 dB/div **Center Freq** 824.200000 MHz Span 2 MHz Sweep 24.73 ms Center 824.2 MHz #Res BW 10 kHz CF Step 200.000 kHz #VBW 30 kHz Man Auto Total Power 38.0 dBm **Occupied Bandwidth** 245.95 kHz Freq Offset Transmit Freq Error 467 Hz **OBW Power** 99.00 % 0 Hz x dB Bandwidth 312.2 kHz x dB -26.00 dB STATUS MSG





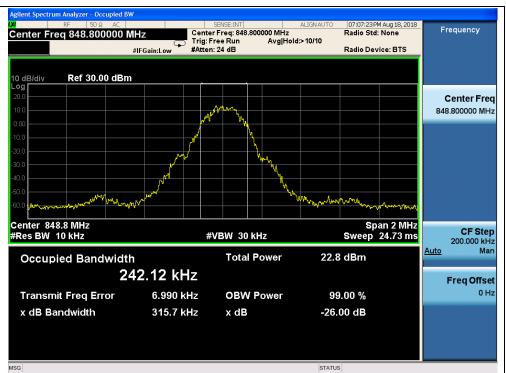
(Plot A2, GPRS 850MHz, Channel = 190)



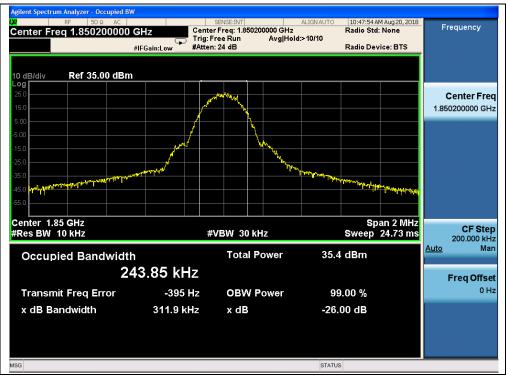
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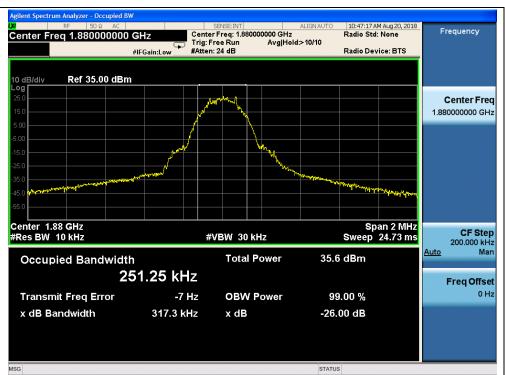


#### (Plot B1, GPRS1900MHz, Channel = 512)

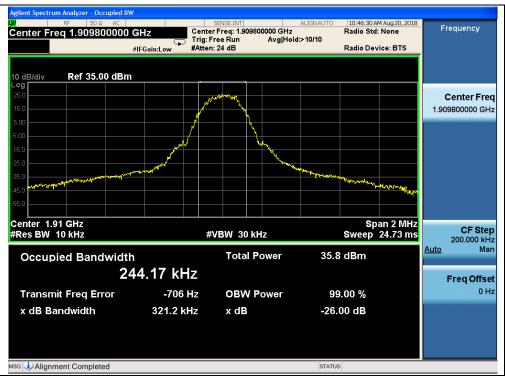
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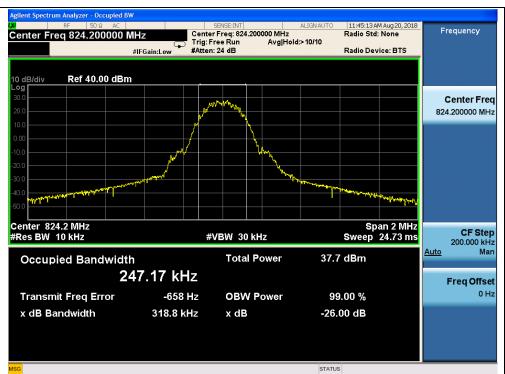


(Plot B3, GPRS 1900MHz, Channel = 810)



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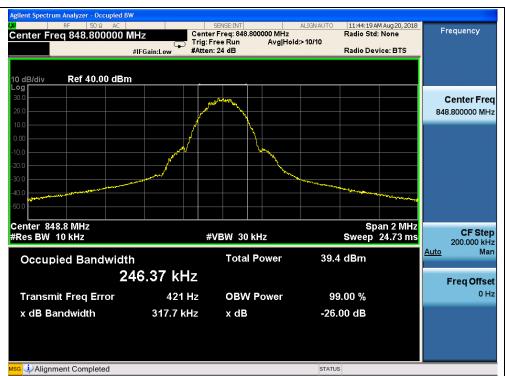


(Plot C2, EGPRS 850MHz, Channel = 190)

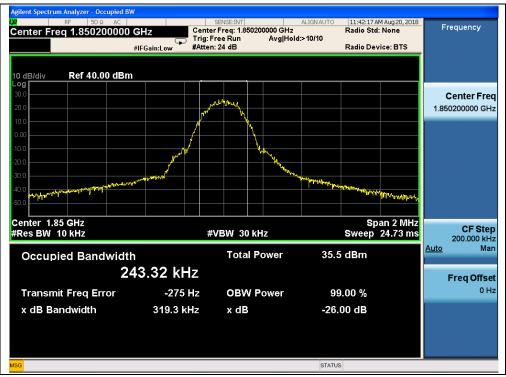


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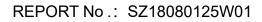




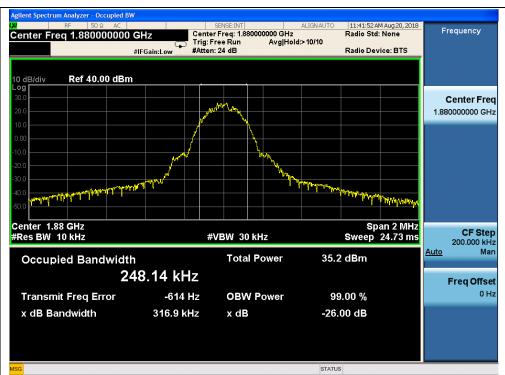
#### (Plot D1, EGPRS1900MHz, Channel = 512)

**MORLAB** 

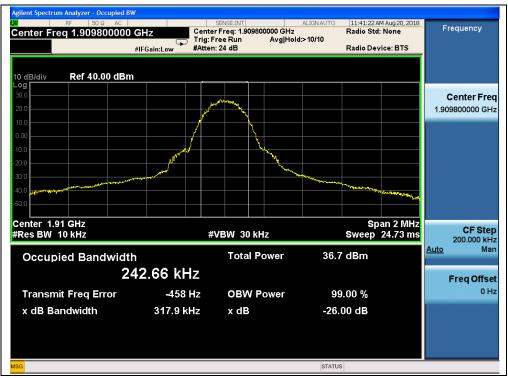
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(Plot D3, EGPRS 1900MHz, Channel = 810)



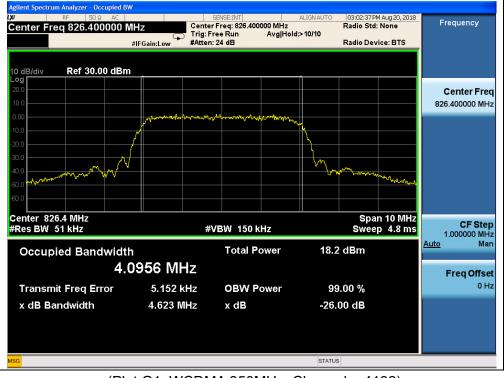
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#### WCDMA Test Verdict:

Band	Channel	Frequency	26dB bandwidth	99% Occupied	Refer to
Danu	Channel	(MHz)	(MHz)	Bandwidth (MHz)	Plot
WCDMA	4132	826.4	4.623	4.0956	Plot
850MHz	4175	835.0	4.622	4.0943	G1 to G3
OSOIVITZ	4233	846.6	4.631	4.0878	61 10 65
	9262	1852.4	4.633	4.1121	Diet
WCDMA 1900MHz	9400	1880.0	4.633	4.0965	Plot
	9538	1907.6	4.629	4.0796	11 to 13

#### **Test Plots:**



(Plot G1, WCDMA 850MHz, Channel = 4132)



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#### (Plot G2, WCDMA 850 MHz, Channel = 4175)

STATUS



#### (Plot G3, WCDMA 850MHz, Channel = 4233)



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#### (Plot I1, WCDMA 1900MHz, Channel = 9262)

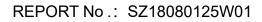
STATUS



#### (Plot I2, WCDMA 1900 MHz, Channel = 9400)

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(Plot I3, WCDMA1900MHz, Channel = 9538)



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# 2.4. Frequency Stability

#### 2.4.1. Requirement

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

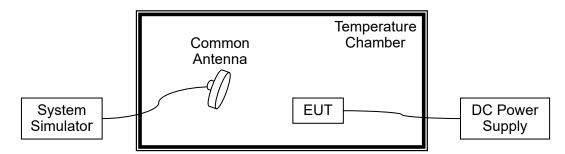
According to FCC section 2.1055, the test conditions are:

(a) The temperature is varied from -30°C to +50°C at intervals of not more than 10°C.

(b) For hand carried battery powered equipment, the pr imary supply voltage is reduced to the battery operating end point which shall be specified by the manufacture. The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

#### 2.4.2. Test Description

Test Setup:



The EUT, which is powered by the DC Power Supply directly, is located in the Temperature Chamber. The EUT is commanded by the System Simulator (SS) to operate at the maximum output power i.e. Power Control Level (PCL) = 5 and Power Class = 4. A call is established between the EUT and the SS via a Common Antenna.





#### 2.4.3. Test Result

The nominal, highest and lowest extreme voltages are separately 3.60V, 4.14V and 3.06V, the nominal voltage 3.60V which is specified by the applicant; the normal temperature here used is 25°C.

	GPI	RS 850MHz, CI	hannel 190, Frequenc	cy 836.6MHz				
Limit =±2.5ppm								
Voltage (%)	Power (VDC)	Temp (°C)	Fre. Dev. (Hz)	Deviation (ppm)	Result			
100		+20(Ref)	24.05	1.14				
100		-30	26.94	1.28				
100		-20	2.35	0.11				
100		-10	-4.93	-0.24				
100	3.60	0	15.94	0.76				
100		+10	31.66	1.51	PASS			
100		+20	18.87	0.90	PA33			
100		+30	14.58	0.69				
100		+40	-22.52	-1.08				
100		+50	-9.85	-0.47				
115	4.14	+20	10.97	0.52				
85	3.06	+20	22.15	1.06				

	GPRS 1900MHz, Channel 661, Frequency 1880.0MHz								
	Limit =Within Authorized Band								
Voltage (%)	Power (VDC)	Temp (°C)	Fre. Dev. (Hz)	Deviation (ppm)	Result				
100		+20(Ref)	32.54	1.73					
100		-30	32.86	1.90					
100		-20	41.42	2.20					
100		-10	24.51	1.30					
100	3.60	0	7.82	0.42					
100		+10	5.03	0.26	PASS				
100		+20	8.45	0.44	PA33				
100		+30	7.05	0.38					
100		+40	-4.42	-0.24					
100		+50	23.43	1.24					
115	4.14	+20	6.65	0.35					
85	3.06	+20	30.52	1.62					



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	EGPRS 850MHz, Channel 190, Frequency 836.6MHz								
Limit =±2.5ppm									
Voltage (%)	Power (VDC)	Temp (°C)	Fre. Dev. (Hz)	Deviation (ppm)	Result				
100		+20(Ref)	4.26	0.20					
100		-30	7.52	0.36					
100		-20	6.42	0.31					
100		-10	6.48	0.31					
100	3.60	0	10.62	0.51					
100		+10	3.65	0.17	PASS				
100		+20	9.94	0.48	PASS				
100		+30	-2.35	-0.11					
100		+40	-0.26	-0.01					
100		+50	11.42	0.55					
115	4.14	+20	13.64	0.65					
85	3.06	+20	14.06	0.67					

	EGPRS 1900MHz, Channel 661, Frequency 1880.0MHz								
Limit =Within Authorized Band									
Voltage (%)	Power (VDC)	Temp (°C)	Fre. Dev. (Hz)	Deviation (ppm)	Result				
100	3.60	+20(Ref)	7.43	0.39					
100		-30	17.21	0.92					
100		-20	-19.15	-1.02					
100		-10	-17.76	-0.94					
100		0	31.42	1.67					
100		+10	-12.15	-0.65	PASS				
100		+20	-17.73	-0.94	PA33				
100		+30	10.62	0.56					
100		+40	17.73	0.94					
100		+50	-28.15	-1.49					
115	4.14	+20	7.25	0.39					
85	3.06	+20	17.31	0.92					



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WCDMA 850MHz, Channel 4400, Frequency 835.0MHz									
Limit =±2.5ppm									
Voltage (%)	Power (VDC)	Temp (°C)	Fre. Dev. (Hz)	Deviation (ppm)	Result				
100		+20(Ref)	-15.02	-0.72					
100	3.60	-30	18.04	0.86	]				
100		-20	21.07	1.01					
100		-10	-3.43	-0.16					
100		0	-6.35	-0.30					
100		+10	4.79	0.23	PASS				
100		+20	5.88	0.28	FA33				
100		+30	4.05	0.19					
100		+40	-2.06	-0.09					
100		+50	-13.07	-0.63					
115	4.14	+20	-20.24	-0.97					
85	3.06	+20	-5.22	-0.25					

WCDMA 1900MHz, Channel 9800, Frequency 1880.0MHz Limit =Within Authorized Band								
Voltage (%)	Power (VDC)	Temp (°C)	Fre. Dev. (Hz)	Deviation (ppm)	Result			
100	3.60	+20(Ref)	8.74	0.46				
100		-30	13.67	0.73				
100		-20	-20.95	-1.11				
100		-10	-13.24	-0.70				
100		0	8.58	0.46				
100		+10	7.35	0.39	DACC			
100		+20	9.46	0.50	- PASS			
100		+30	12.85	0.68				
100		+40	18.58	0.99				
100		+50	-4.76	-0.25				
115	4.14	+20	9.53	0.51				
85	3.06	+20	13.45	0.72				



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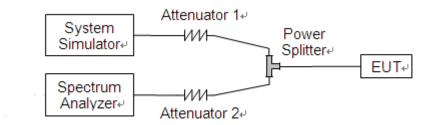
# 2.5. Conducted Out of Band Emissions

#### 2.5.1. Requirement

According to FCC section 22.917(a) and FCC section 24.238(a) 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. This calculated to be -13dBm.

#### 2.5.2. Test Description

Test Setup:



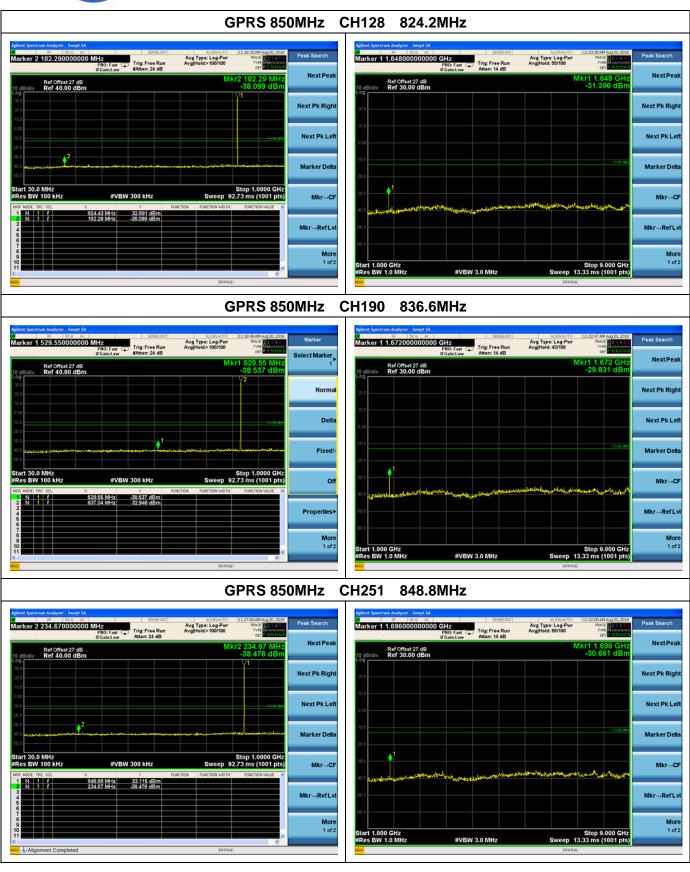
The E UT is c oupled t o the S pectrum A nalyzer (SA) and the S ystem S imulator (SS) w ith Attenuators through the P ower S plitter; the R F I oad attached to the E UT anten na terminal is 500hm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to o perate at the maximum output power i.e. Power Control Level (PCL) = 5 and P ower Class = 4. A call is established between the EUT and the SS.

#### 2.5.3. Test Result

The m easurement fr equency r ange i s fr om 3 0MHz to th e 10<sup>th</sup> harmonic of the fundam ental frequency. The lowest, middle and highest channels are tested to verify the out of band emissions.



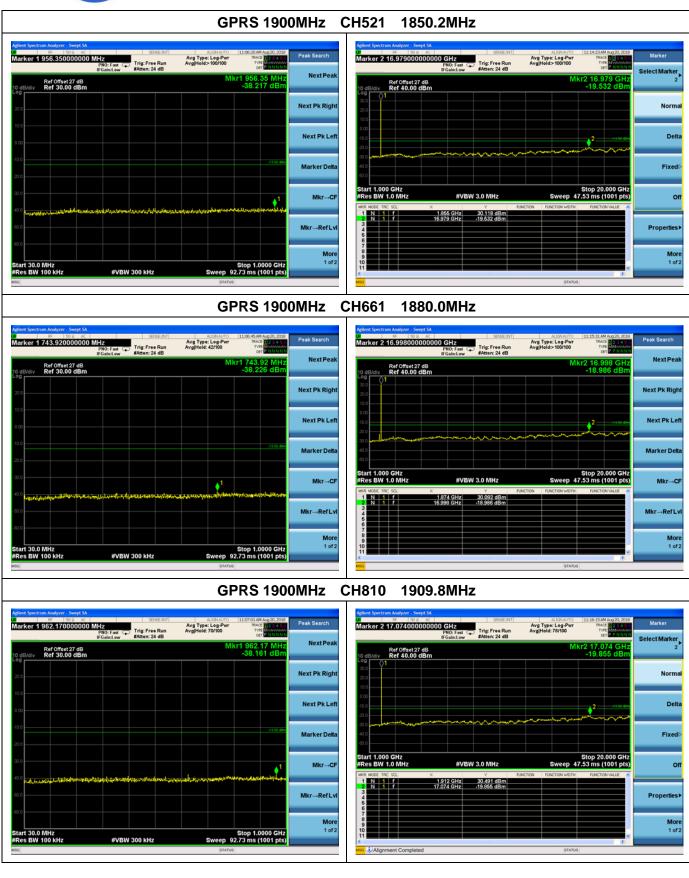






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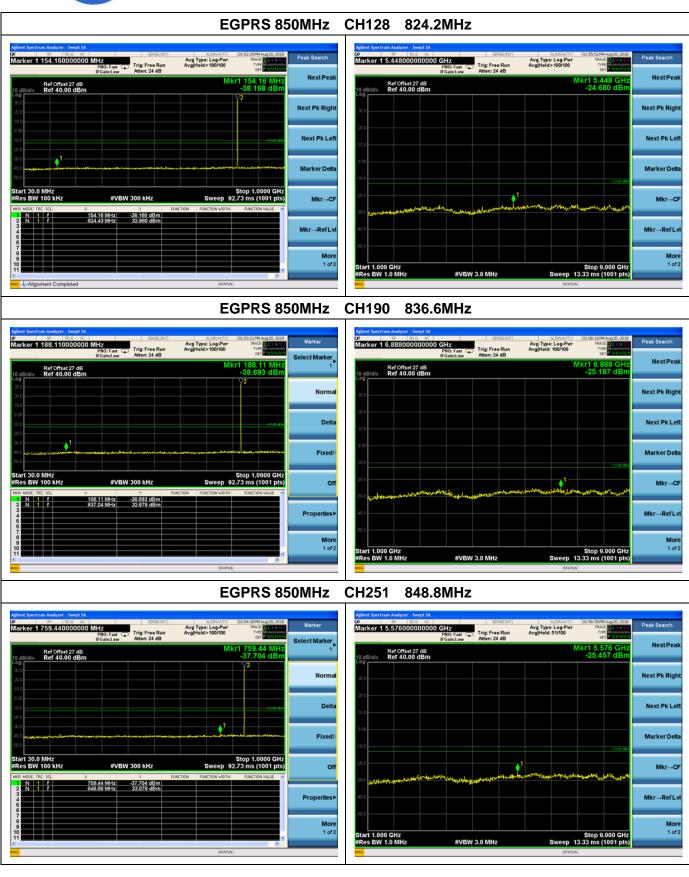




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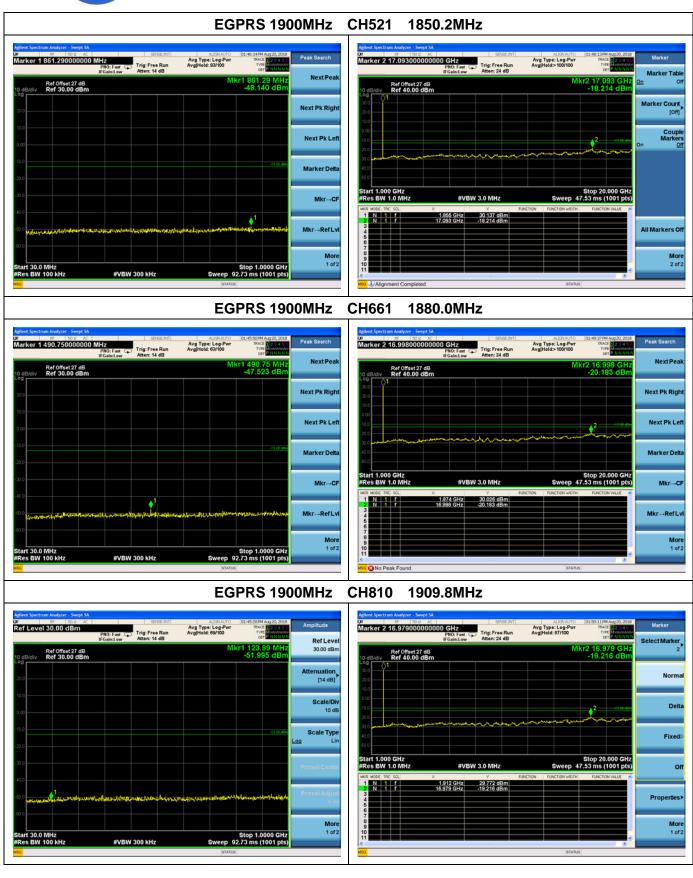
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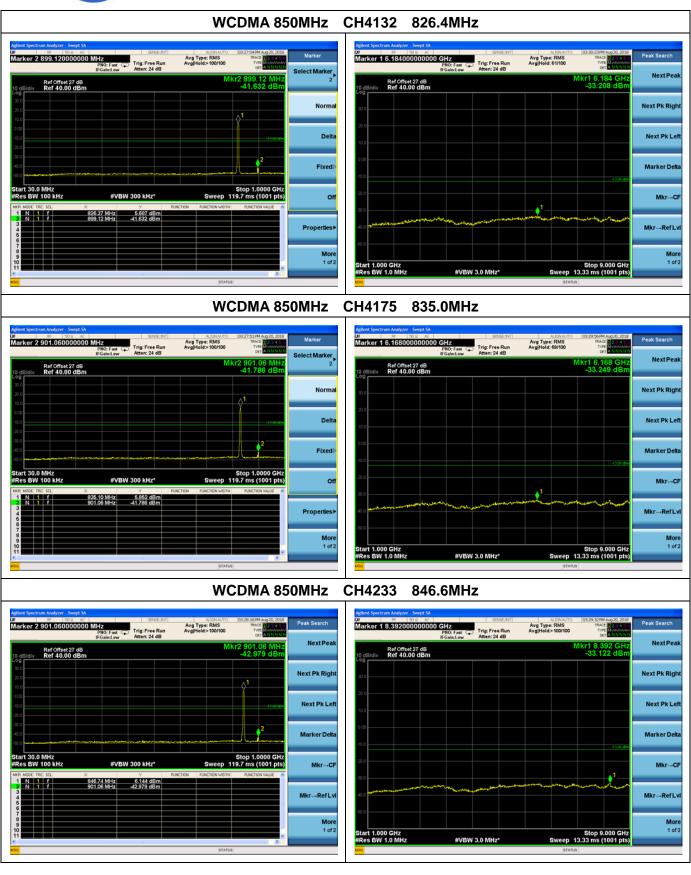




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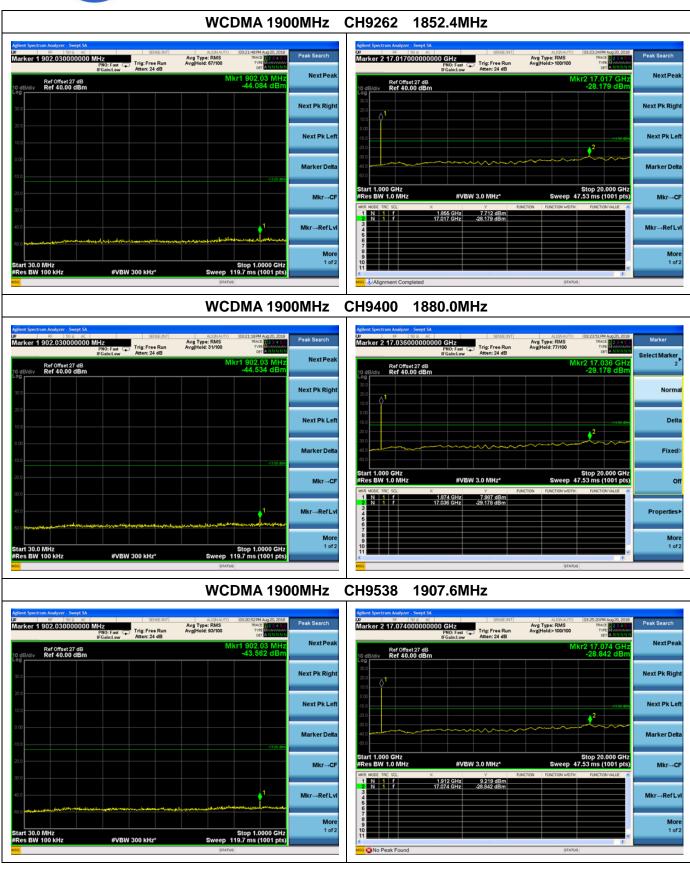
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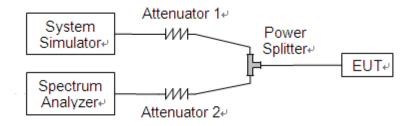


#### 2.6.1. Requirement

According to FCC section 22.917(b) and FCC section 24.238(b) in the 1M Hz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth (26dB emission bandwidth) of the fun damental emission of t he transmitter may be employed.

#### 2.6.2. Test Description

Test Setup:



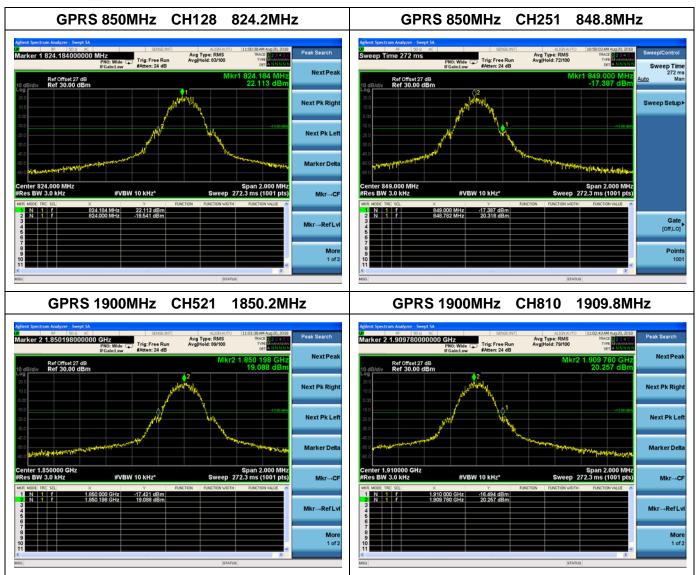
The E UT is c oupled t o the S pectrum A nalyzer (SA) and the S ystem S imulator (SS) with Attenuators through the P ower Splitter; the R F I oad attached to the E UT anten na terminal is 500hm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to o perate at the maximum output pow er i.e. Power Control Level (PCL) = 5 and P ower Class = 4. A call is established between the EUT and the SS.

#### 2.6.3. Test Result

The lowest and highest channels are tested to verify the band edge emissions.



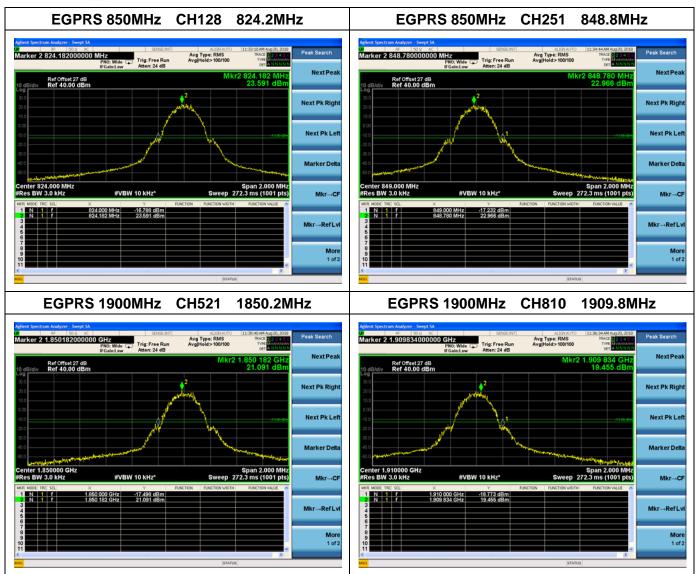






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