

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

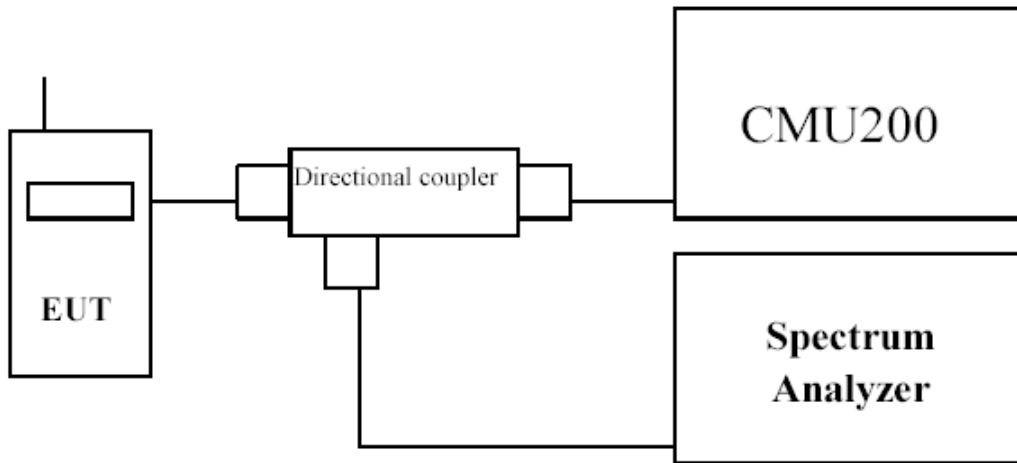
4.1. Test Equipment

The following test equipments are used during the spurious emission test

Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Spectrum Analyzer	Agilent	N9020A/ MY48010570	May., 2010
Universal Radio Communication Tester	R & S	CMU200 / 104846	May., 2010
Directional coupler	Agilent	87300C / MY44300353	Sep., 2010
Directional coupler	Agilent	778D-012/ 50550	Sep., 2010

Note: All equipments upon which need to be calibrated are with calibration period of 1 year.

4.2. Setup



4.3. Limits

Cellular Band Transmitter limits for narrowband spurious emission

Lower Block Edge Test Frequencies	Upper Block Edge Test Frequencies
Block A Channel : 128 Frequency : 824.2 MHz	Block B Channel : 251 Frequency : 848.8 MHz

PCS Band Transmitter limits for narrowband spurious emission

Lower Block Edge Test Channels/Frequencies	Upper Block Edge Test Channels/Frequencies
Block A Channel : 512 Frequency : 1850.2 MHz	Block C Channel : 810 Frequency : 1909.8 MHz

4.4. Test Procedure

In accordance with Part 22.917 and 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 increased to 1MHz.

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

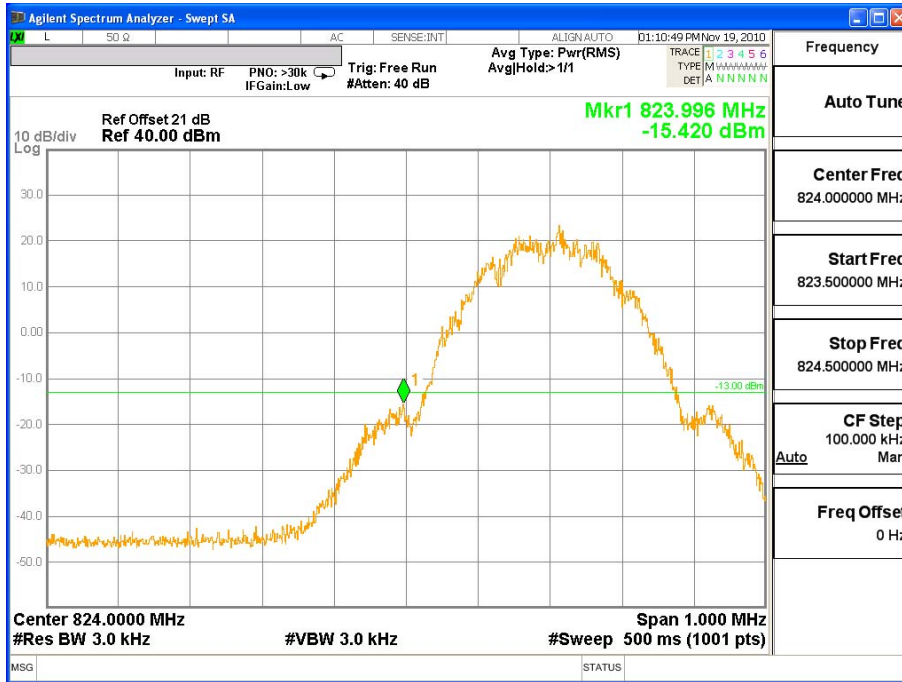
4.5. Test Specification

According to Part 2.1049, 22.917,24.238.

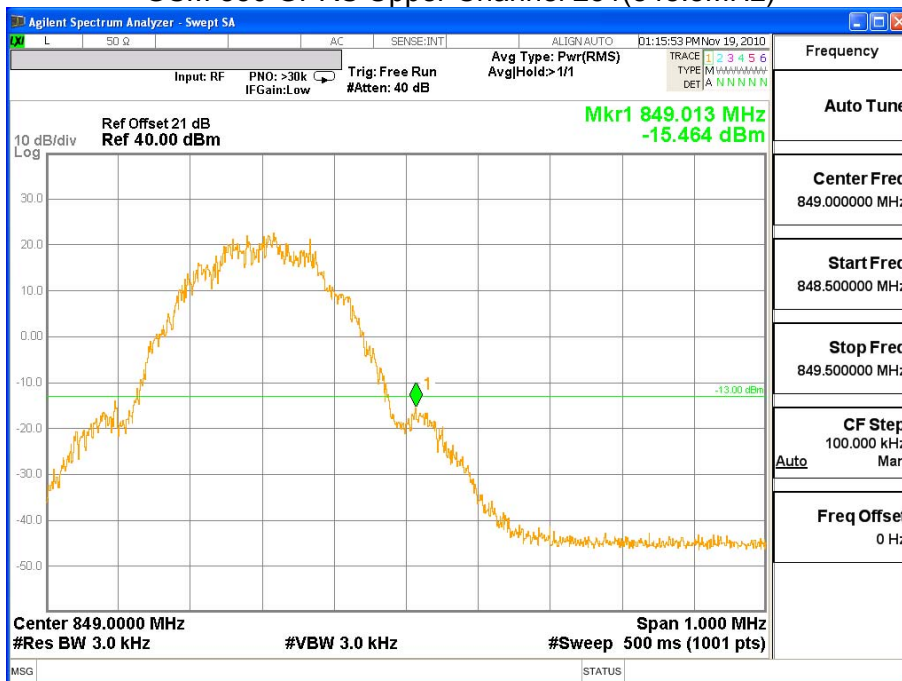
4.6. Test Result of Spurious Emission At Antenna Terminals (+/-1MHz)

Product	HE863-NAD		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2010/11/19	Test Site	CTR
Test Condition	Block Edge Test (GSM 850 GPRS)		

GSM 850 GPRS Lower Channel 128 (824.2MHz)

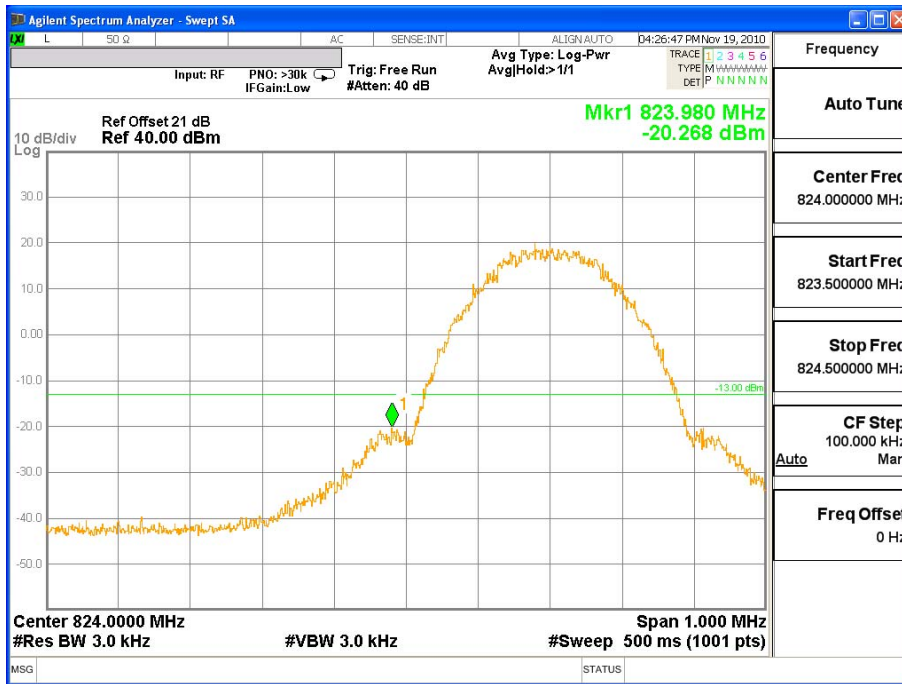


GSM 850 GPRS Upper Channel 251(848.8MHz)

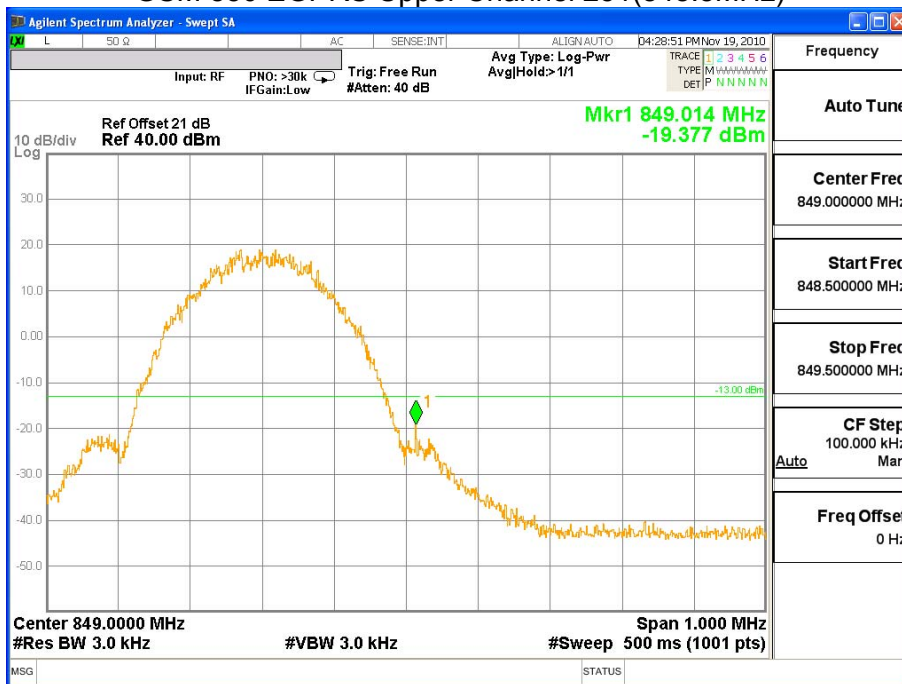


Product	HE863-NAD		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2010/11/19	Test Site	CTR
Test Condition	Block Edge Test (GSM 850 EGPRS)		

GSM 850 EGPRS Lower Channel 128 (824.2MHz)

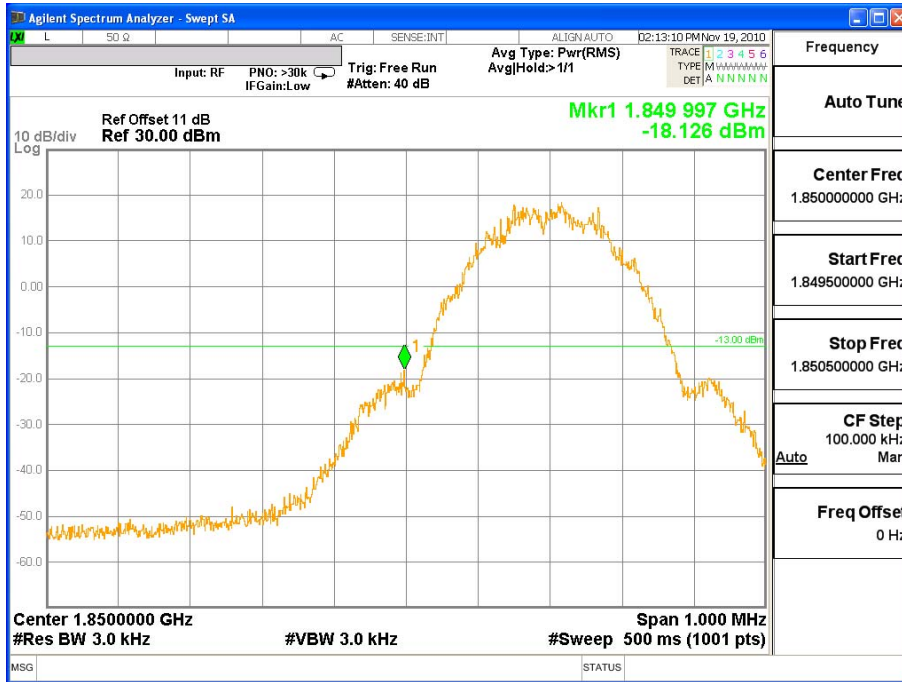


GSM 850 EGPRS Upper Channel 251(848.8MHz)

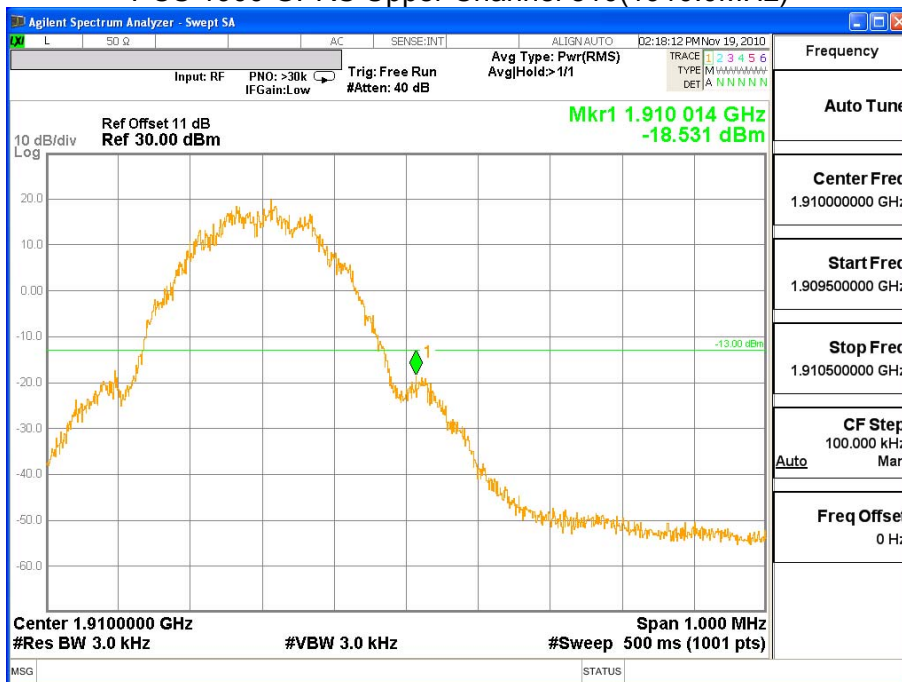


Product	HE863-NAD		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2010/11/19	Test Site	CTR
Test Condition	Block Edge Test (PCS 1900 GPRS)		

PCS 1900 GPRS Lower Channel 512 (1850.2MHz)

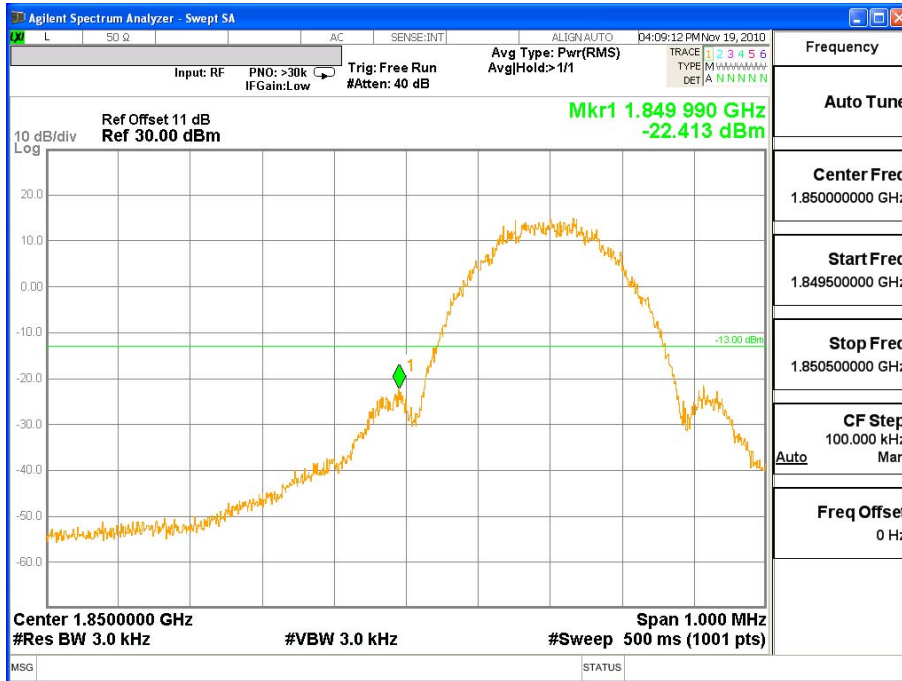


PCS 1900 GPRS Upper Channel 810(1910.0MHz)

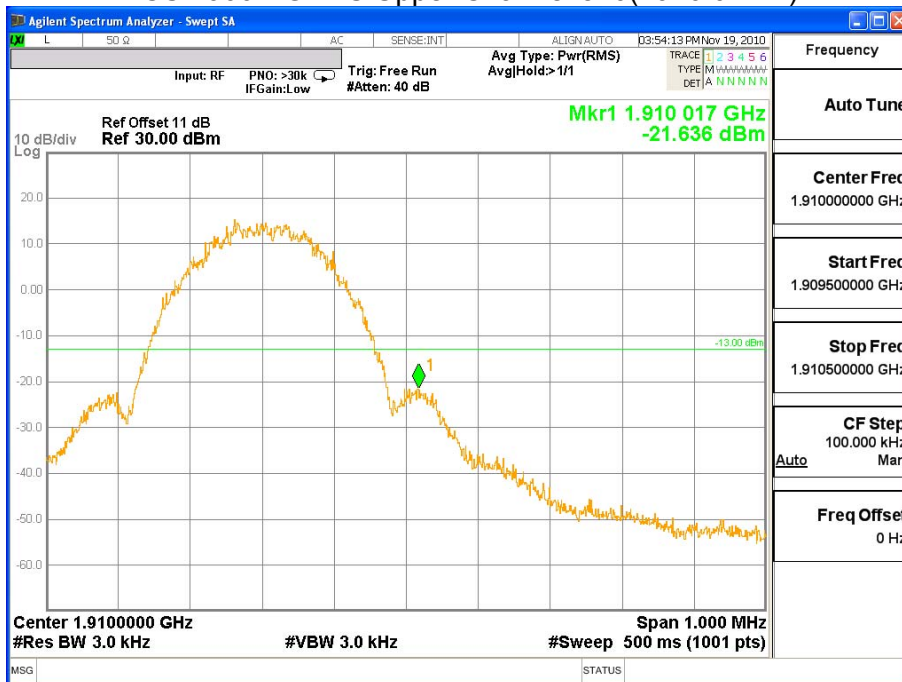


Product	HE863-NAD		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2010/11/19	Test Site	CTR
Test Condition	Block Edge Test (PCS 1900 EGPRS)		

PCS 1900 EGPRS Lower Channel 512 (1850.2MHz)



PCS 1900 EGPRS Upper Channel 810(1910.0MHz)



Product	HE863-NAD		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2010/12/20	Test Site	CTR
Test Condition	Block Edge Test (WCDMA BAND V RMC)		

WCDMA BAND V RMC Lower Channel 4132 (826.4MHz)



WCDMA BAND V RMC Upper Channel 4233 (846.6MHz)



Product	HE863-NAD		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2010/12/20	Test Site	CTR
Test Condition	Block Edge Test (WCDMA BAND V HSDPA)		

WCDMA BAND V HSDPA Lower Channel 4132 (826.4MHz)



WCDMA BAND V HSDPA Upper Channel 4233 (846.6MHz)



Product	HE863-NAD		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2010/12/20	Test Site	CTR
Test Condition	Block Edge Test (WCDMA BAND V HSUPA)		

WCDMA BAND V HSUPA Lower Channel 4132 (826.4MHz)



WCDMA BAND V HSUPA Upper Channel 4233 (846.6MHz)



Product	HE863-NAD		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2010/12/20	Test Site	CTR
Test Condition	Block Edge Test (WCDMA BAND II RMC)		

WCDMA BAND II RMC Lower Channel 9262 (1852.4MHz)



WCDMA BAND II RMC Upper Channel 9538 (1907.6 MHz)



Product	HE863-NAD		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2010/12/20	Test Site	CTR
Test Condition	Block Edge Test (WCDMA BAND II HSDPA)		

WCDMA BAND II HSDPA Lower Channel 9262 (1852.4MHz)



WCDMA BAND II HSDPA Upper Channel 9538 (1907.6 MHz)



Product	HE863-NAD		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2010/12/20	Test Site	CTR
Test Condition	Block Edge Test (WCDMA BAND II HSUPA)		

WCDMA BAND II HSUPA Lower Channel 9262 (1852.4MHz)



WCDMA BAND II HSUPA Upper Channel 9538 (1907.6 MHz)



5. Spurious Emission

5.1. Test Equipment

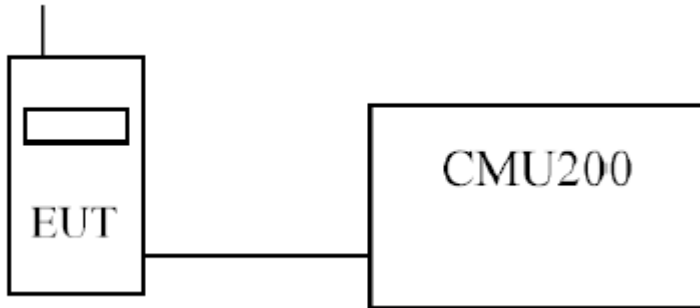
The following test equipments are used during the radiated emission test:

Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☒CTR	Spectrum Analyzer	Agilent	N9020A/ MY48010570	May., 2010
	Dual Directional couple	Agilent	778D-012/50550	Sep., 2010
	Directional coupler	Agilent	87300C/ MY44300353	Sep., 2010
☒SITE1	Test Receiver	R & S	ESCS 30 / 100122	Feb., 2010
	Universal Radio Communication Tester	R & S	CMU200 / 104846	May., 2010
	Spectrum Analyzer	Agilent	E4408B/ MY45102743	Aug., 2010
	Pre-Amplifier	QTK	AP-180C	Sep., 2010
	Bilog Antenna	SCHAFFNER	CBL6112B / 2697	May., 2010
	Horn Antenna	Schwarzbeck	BBHA9120D / D305	Oct., 2010
	Pre-Amplifier	QTK	QTK-AMP-01 / 0001	Jul., 2010

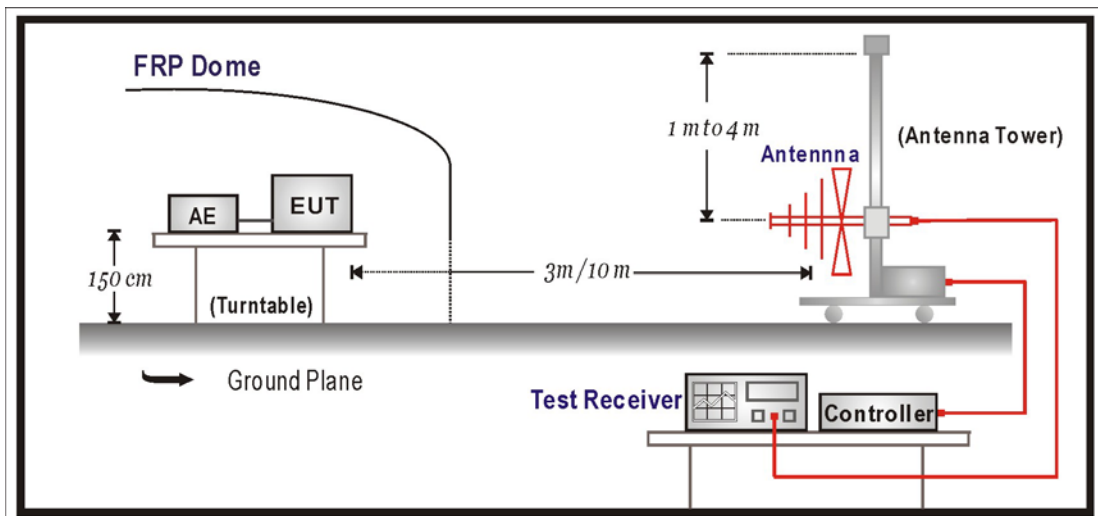
Note: 1. All equipments that need to be calibrated are with calibration period of 1 year.

5.2. Test Setup

5.2.1.1 Spurious emissions at antenna terminals.



5.2.1.2 Field strength of spurious radiation.



5.3. Limits

Limit	$<-13\text{dBm}$
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$43 + 10\text{Log}(P)$ down on the carrier where P is the power in Watts.

5.4. Test Procedure

In accordance with Part 2.1051, the spurious emissions from the antenna terminal 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 EUT was tested on Low, middle and High channels for both power levels. The resolution and video bandwidth was set to 3MHz 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 10th harmonic of the fundamental.

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-C on radiated measurement.

5.5. Test Specification

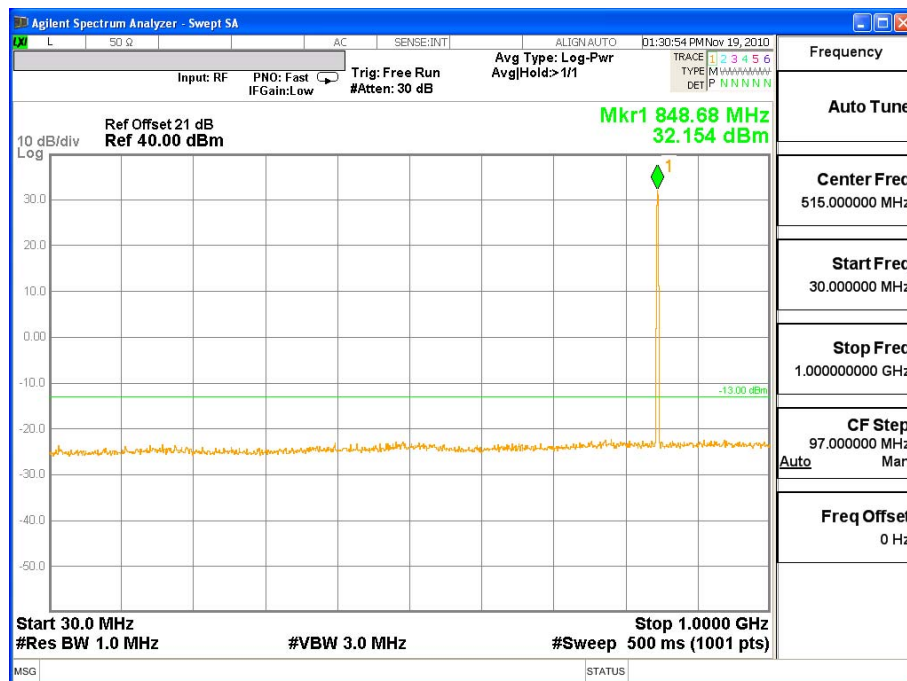
According to Part 2.1051, 2.1053, 22.917(a), 24.238(b).

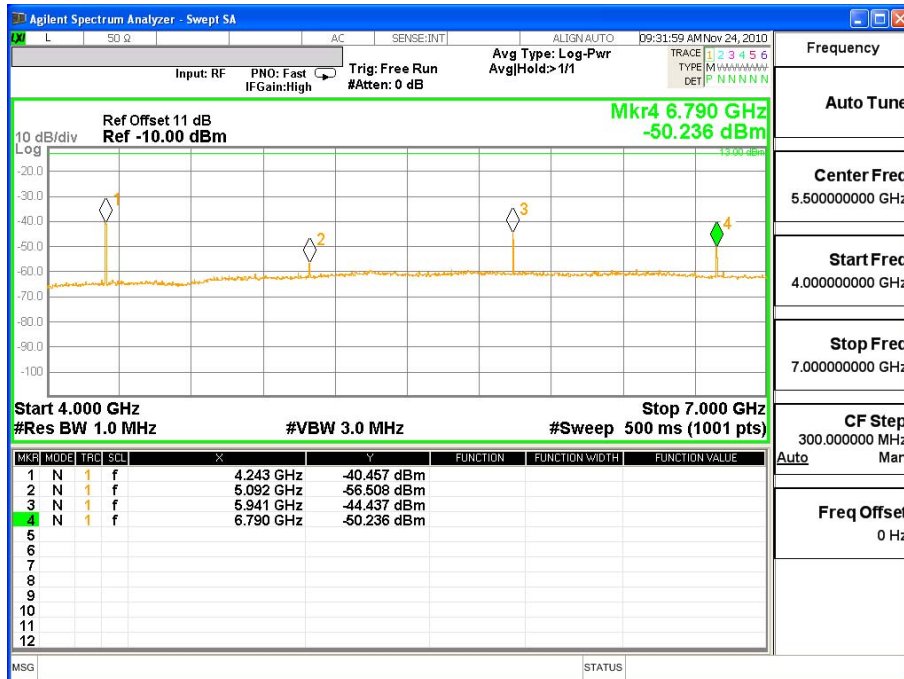
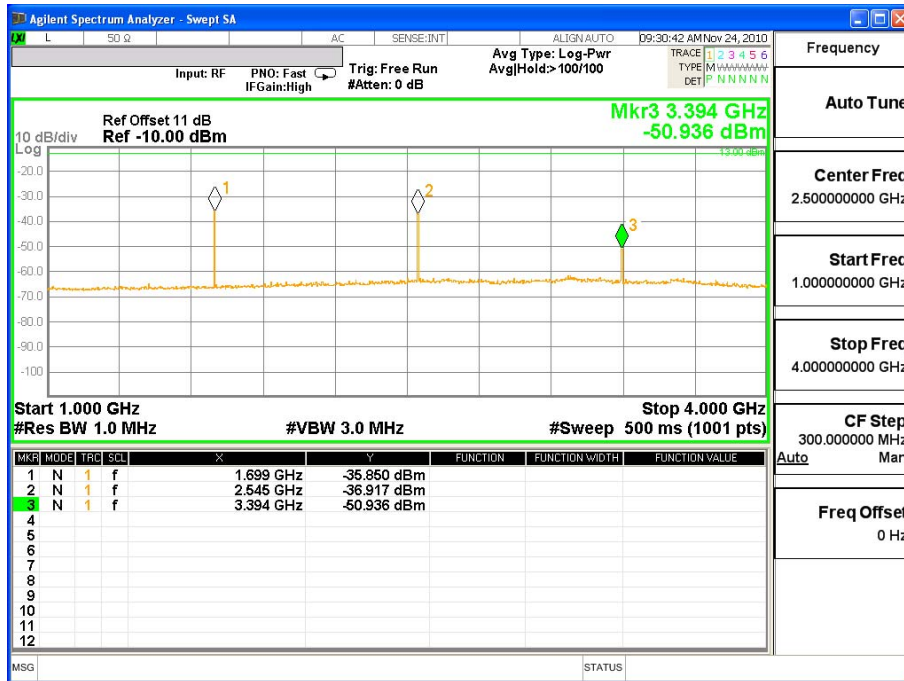
5.6. Test Result of Spurious Emission

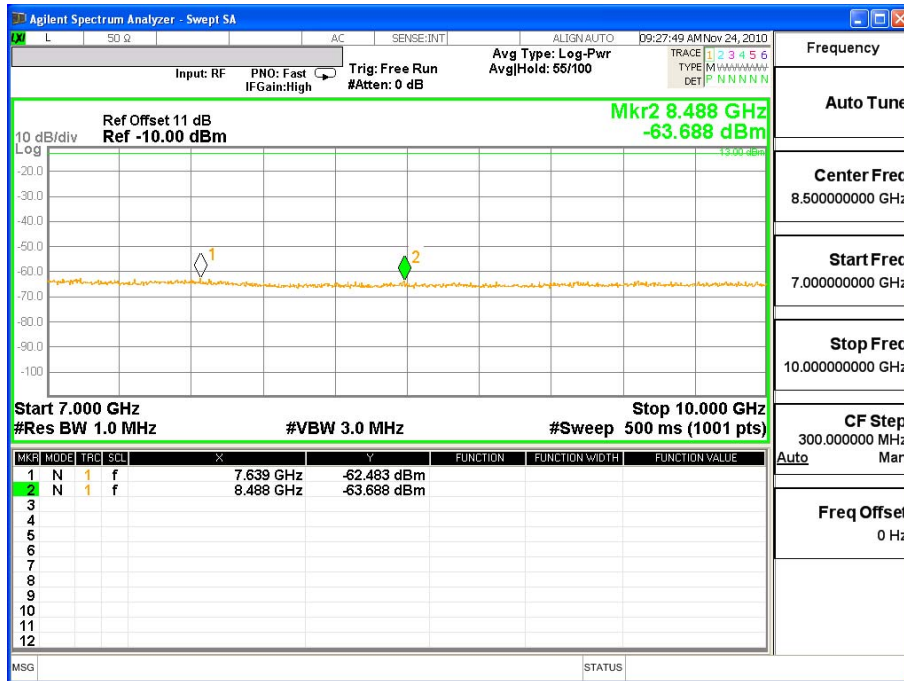
Product	HE863-NAD		
Test Mode	Spurious Emission (Conducted)		
Date of Test	2010/11/23	Test Site	CTR
Test Condition	GSM 850 GPRS	Test Range	30MHz~10GHz

GSM 850 GPRS High-Channel 251

Frequency (MHz)	Reading Level (dBm)	Path Loss (dB)	Emission Level (dBm)	Limit (dBm)
1699	-35.850	0.58	-35.270	-13
2545	-36.917	0.7	-36.217	-13
3394	-50.936	1.01	-49.926	-13
4243	-40.457	1.18	-39.277	-13
5092	-56.508	1.23	-55.278	-13
5941	-44.437	1.45	-42.987	-13
6790.4	-50.236	1.56	-48.676	-13
7639.2	-62.483	1.59	-60.893	-13
8488	-63.688	1.82	-61.868	-13



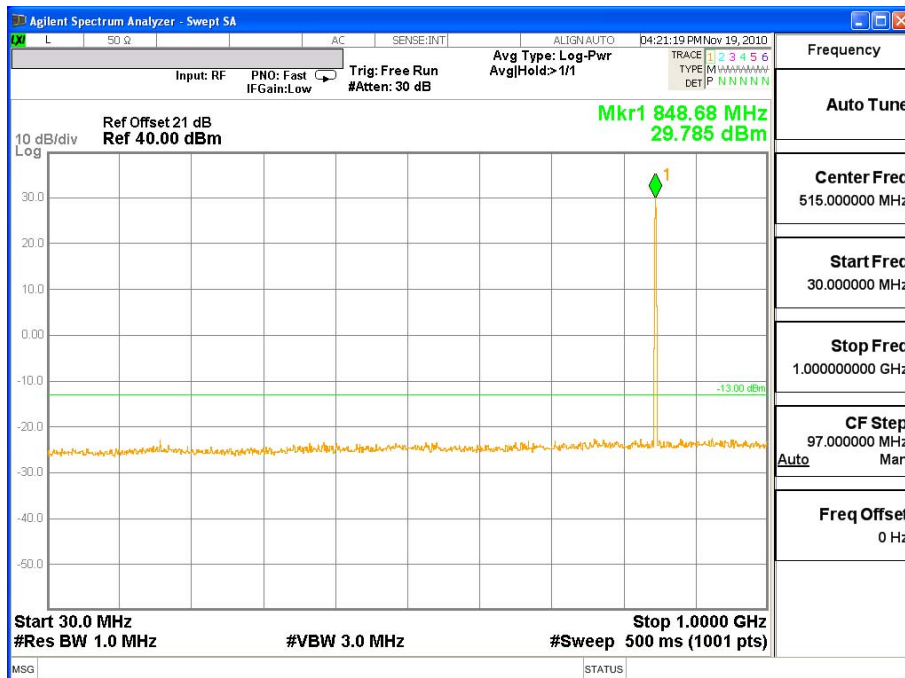


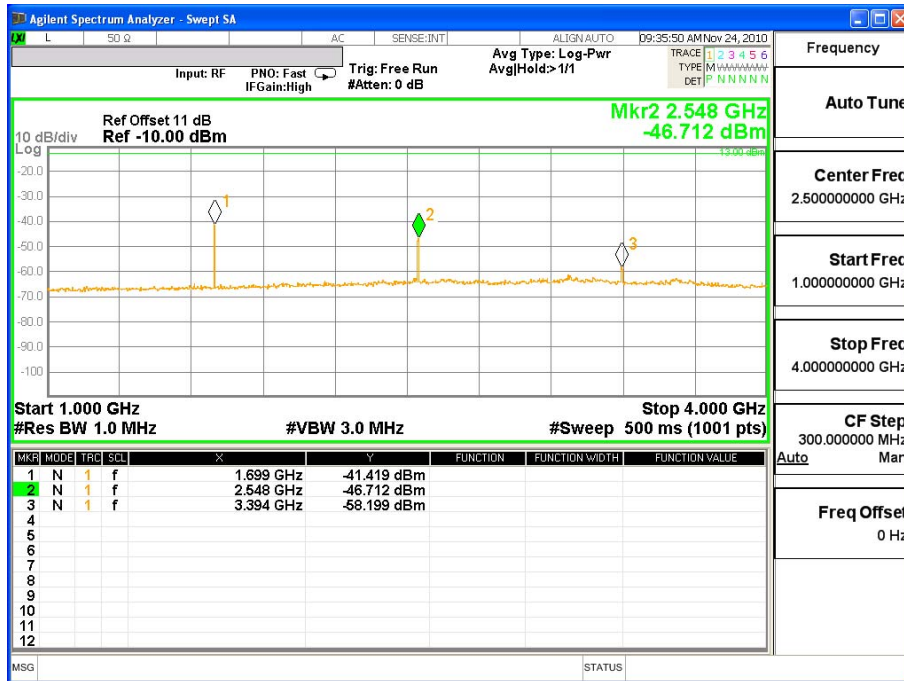


Product	HE863-NAD		
Test Mode	Spurious Emission (Conducted)		
Date of Test	2010/11/23	Test Site	CTR
Test Condition	GSM 850 EGPRS	Test Range	30MHz~10GHz

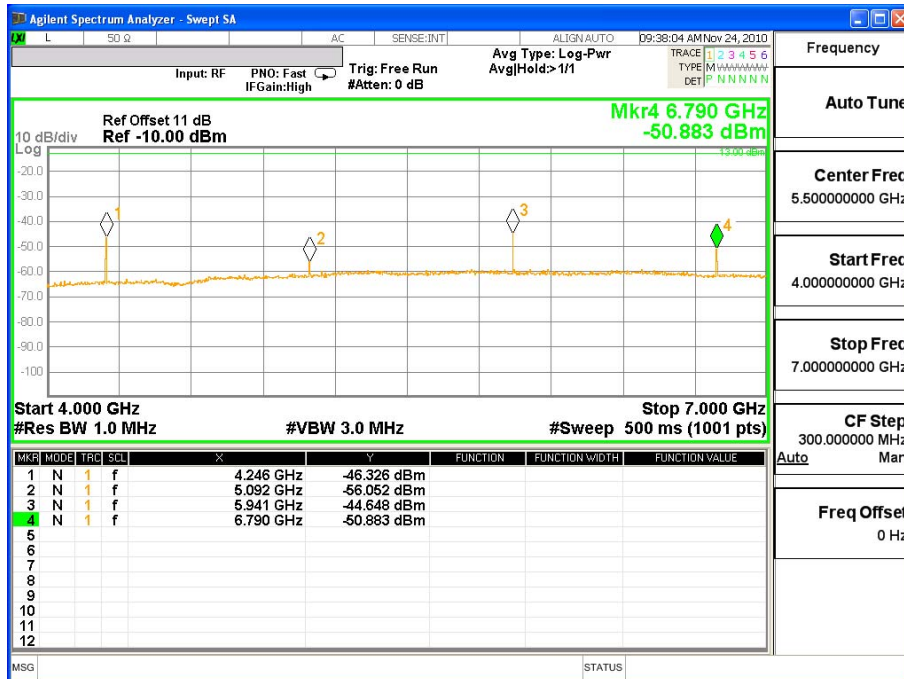
GSM 850 EGPRS High-Channel 251

Frequency (MHz)	Reading Level (dBm)	Path Loss (dB)	Emission Level (dBm)	Limit (dBm)
1699	-41.419	0.58	-40.839	-13
2548	-46.712	0.7	-46.012	-13
3394	-58.199	1.01	-57.189	-13
4246	-46.326	1.18	-45.146	-13
5092	-56.052	1.23	-54.822	-13
5941	-44.648	1.45	-43.198	-13
6790.4	-50.883	1.56	-49.323	-13
7639.2	-64.280	1.59	-62.690	-13
8488	-65.106	1.82	-63.286	-13

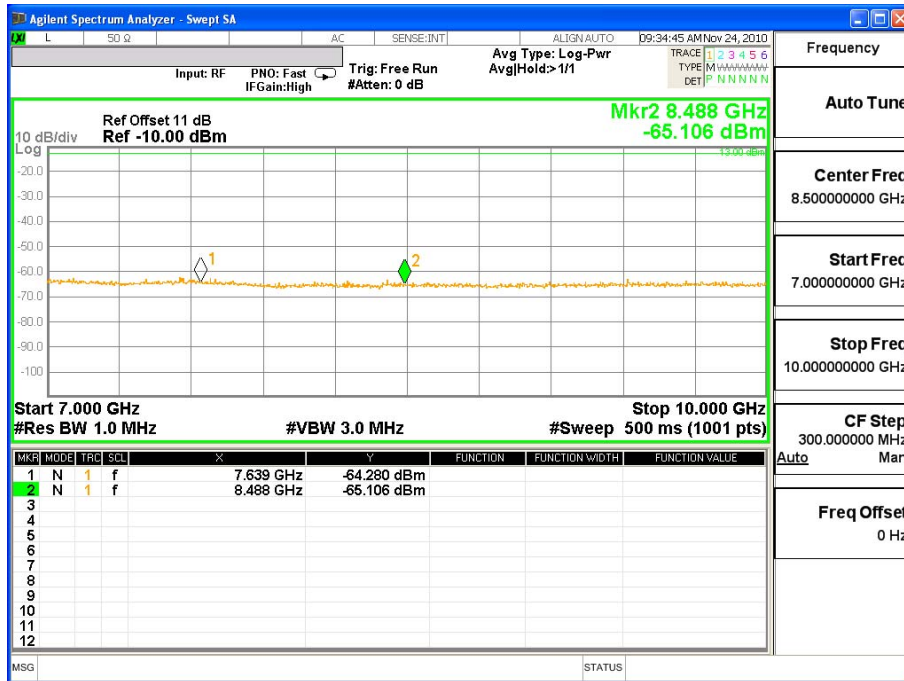




Frequency
Auto Tune
Center Freq 2.500000000 GHz
Start Freq 1.000000000 GHz
Stop Freq 4.000000000 GHz
CF Step 300.0000000 MHz
Auto Man
Freq Offset 0 Hz



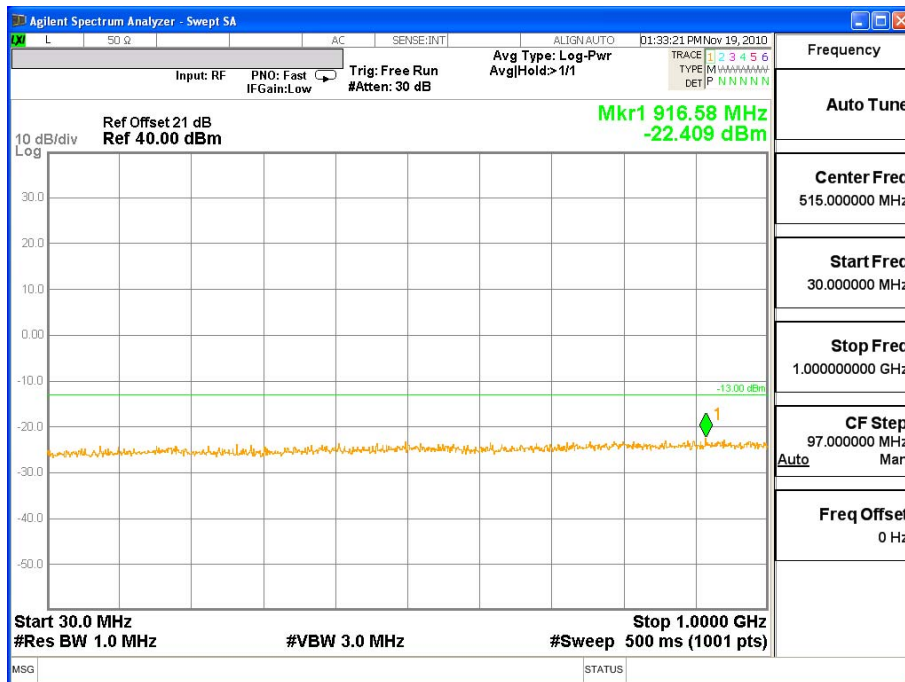
Frequency
Auto Tune
Center Freq 5.500000000 GHz
Start Freq 4.000000000 GHz
Stop Freq 7.000000000 GHz
CF Step 300.0000000 MHz
Auto Man
Freq Offset 0 Hz

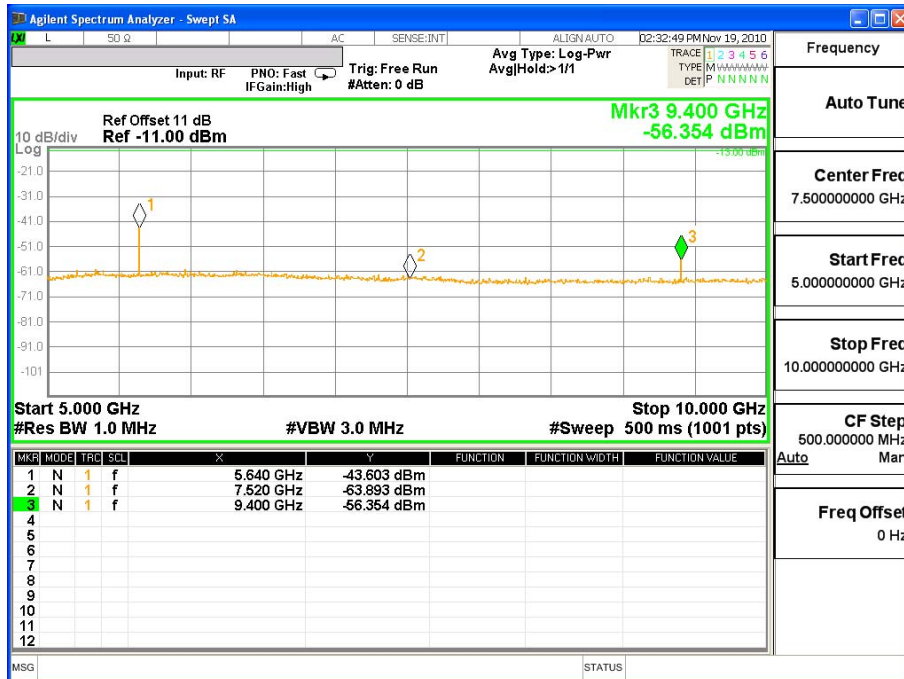
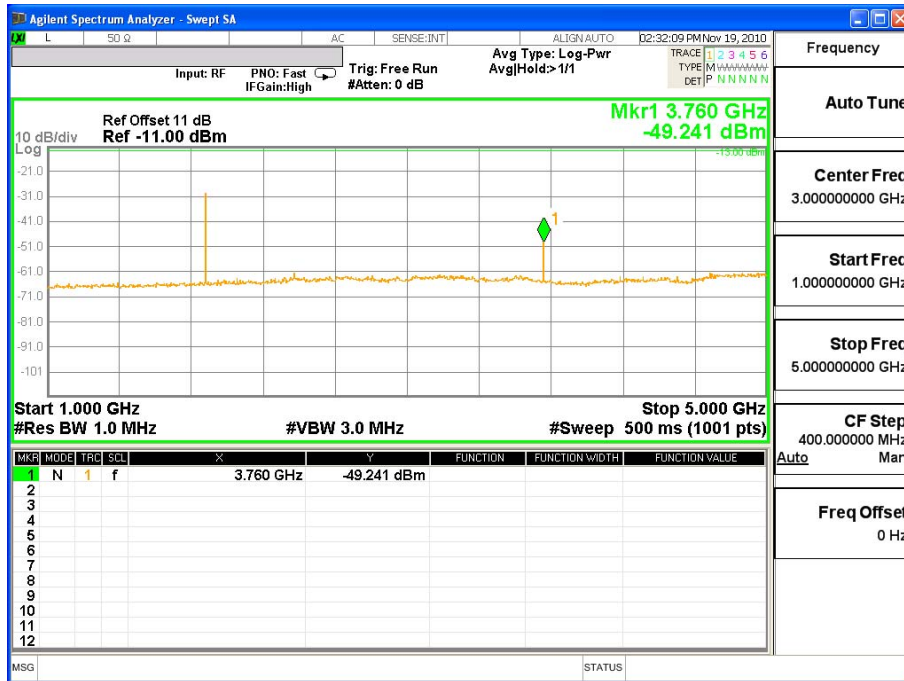


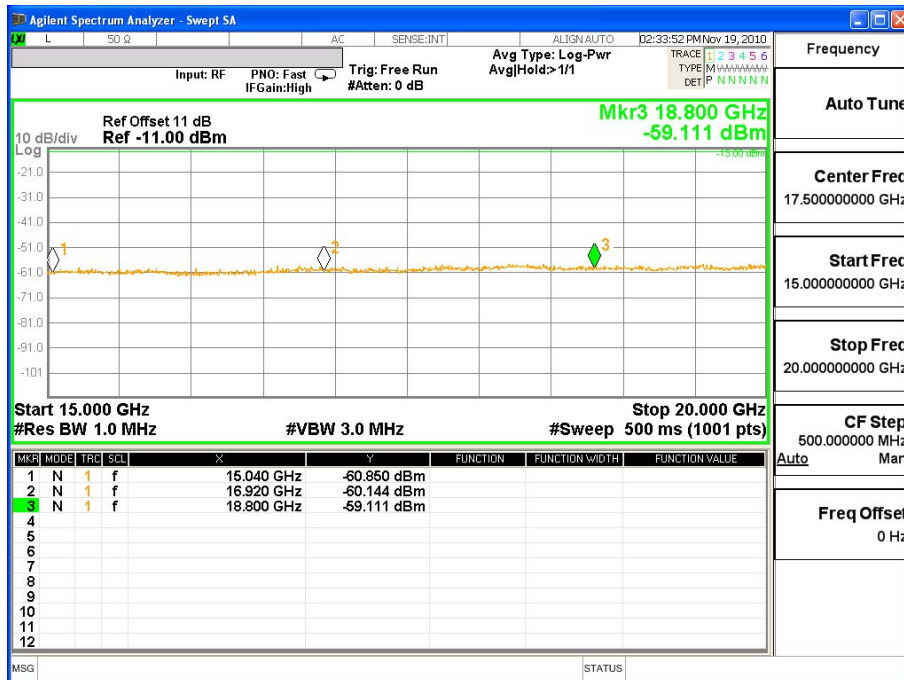
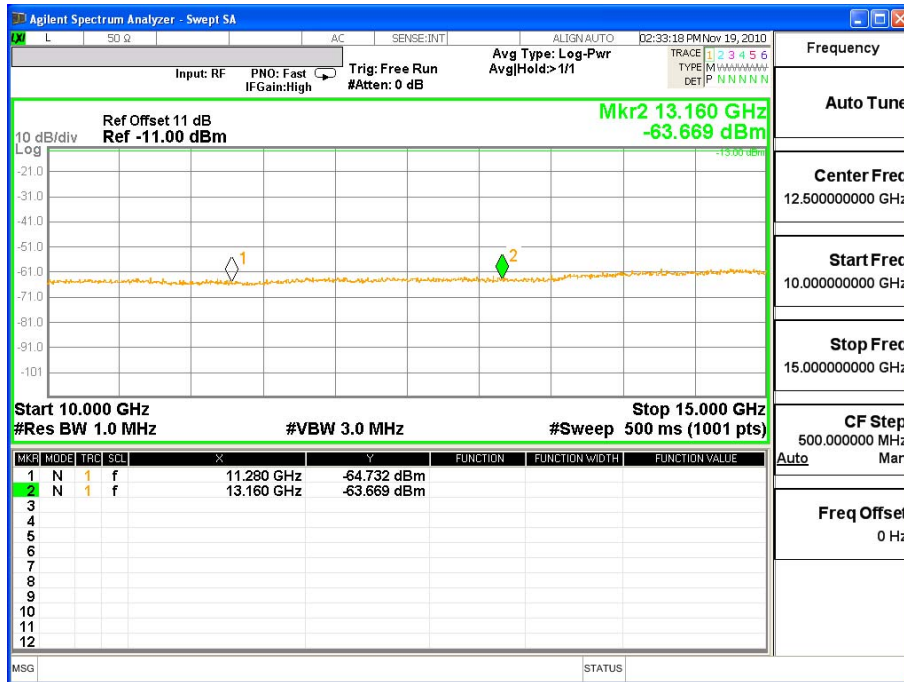
Product	HE863-NAD		
Test Mode	Spurious Emission (Conducted)		
Date of Test	2010/11/23	Test Site	CTR
Test Condition	PCS 1900 GPRS	Test Range	30MHz~20GHz

PCS 1900 GPRS Mid-Channel 698

Frequency (MHz)	Reading Level (dBm)	Path Loss (dB)	Emission Level (dBm)	Limit (dBm)
3760	-49.241	1.1	-48.141	-13
5640	-43.603	1.23	-42.373	-13
7520	-63.893	1.59	-62.303	-13
9400	-56.354	1.89	-54.464	-13
11280	-64.732	2.07	-62.662	-13
13160	-63.669	2.26	-61.409	-13
15040	-60.850	2.64	-58.210	-13
16920	-60.144	3.5	-56.644	-13
18800	-59.111	3.7	-55.411	-13







Product	HE863-NAD		
Test Mode	Spurious Emission (Conducted)		
Date of Test	2010/11/23	Test Site	CTR
Test Condition	PCS 1900 EGPRS	Test Range	30MHz~20GHz

PCS 1900 EGPRS High-Channel 885

Frequency (MHz)	Reading Level (dBm)	Path Loss (dB)	Emission Level (dBm)	Limit (dBm)
3819.6	-55.734	1.1	-54.634	-13
5729.4	-49.410	1.23	-48.180	-13
7639.2	-57.453	1.59	-55.863	-13
9549	-64.186	1.89	-62.296	-13
11458.8	-64.108	2.07	-62.038	-13
13368.6	-63.308	2.26	-61.048	-13
15278.4	-60.746	2.64	-58.106	-13
17188.2	-60.224	3.5	-56.724	-13
19098	-59.308	3.7	-55.608	-13

