



Test Report

Product Name : HE863-EUD
Model No : HE863-EUD
FCC ID : RI7HE863EU

Applicant : Telit Communications S.p.A.
Address : Viale Stazione di Prosecco 5/b

Date of Receipt : 2010/11/17
Issued Date : 2011/02/18
Report No. : 10B334R-HPUSP07V01
Report Version : V 2.0

The test results relate only to the samples tested.
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This report must not be used to claim product endorsement by NVLAP any agency of the U.S. Government

Test Report Certification

Issued Date : 2011/02/18

Report No.: 10B334R-HPUSP07V01



Accredited by NIST (NVLAP)

NVLAP Lab Code: 200533-0

Product Name : HE863-EUD
Applicant : Telit Communications S.p.A.
Address : Viale Stazione di Prosecco 5/b
Manufacturer : TELIT COMMUNICATIONS S.P.A.
Trade Name : Telit
Model No. : HE863-EUD
EUT Rated Voltage : DC 3.4V~4.2V
EUT Test Voltage : DC 3.8V
Measurement Standard : FCC CFR Title 47 Part 2 22 24
Measurement : TIA/EIA 603-C
Reference :
Test Result : Complied

Test results relate only to the samples tested.

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(Manager / Vincent Lin)

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	HE863-EUD
Model No.	HE863-EUD
Trade Name	Telit
IMEI No.	354508-xx-xxxxxx-x
FCC ID.	RI7HE863EU
Antenna Type	Dipole
Antenna Kit	M/N: UC864 - G ;Gain: 4.2dBi
TX Frequency	824MHz~849MHz(GSM 850) 1850MHz ~1910MHz(PCS 1900)
Rx Frequency	869MHz~894MHz(GSM 850) 1930MHz ~1990MHz(PCS 1900)
Function	GPRS/EGPRS
HW Version	1.00
SW version	11.00.100-A016

1.2. Operational Description

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

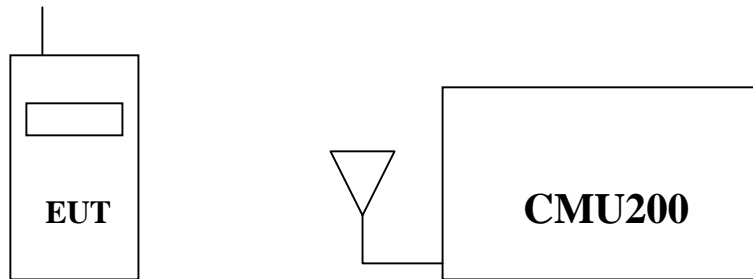
The EUT provide all functions described as above. The EUT is tested with maximum rated TX power via the Base Station simulator.

Quietek 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:

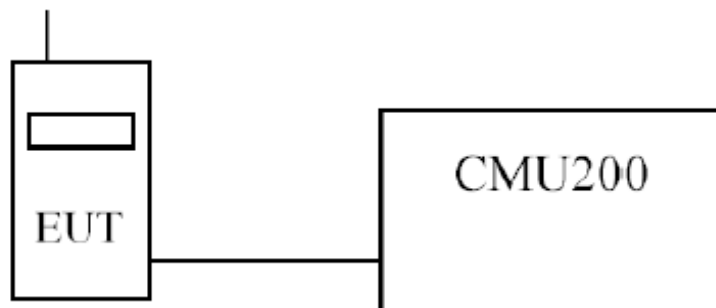
Test Mode:	GSM 850 GPRS
	GSM 850 EGPRS
	PCS 1900 GPRS
	PCS 1900 EGPRS

1.3. Configuration of tested System

(a) Configuration of Radiated measurement



(b) Configuration of Conducted measurement



1.4. 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 CMU200.
- (4) Repeat the above procedure (3).

1.5. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	21
Humidity (%RH)	25-75	53
Barometric pressure (mbar)	860-1060	982

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



July 03, 2001 Accreditation on NVLAP
 NVLAP Lab Code: 200533-0



Site Name: Quietek Corporation

Linkou Testing Laboratory:
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 New Taipei City 24451,
 Taiwan. R.O.C.
 TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789
 E-Mail : service@quietek.com

FCC Accreditation Number: TW1014



1.6. Type of Emission

GPRS: 300KGXW
 EGPRS: 300KG7W

1.7. DC voltages and DC currents

GSM 850 GPRS	
EUT Transmitting (in maximum power) :	DC voltage : 3.8V , DC current : 0.22A
EUT Standby :	DC voltage : 3.8V , DC current : 0.03A
GSM 850 EGPRS	
EUT Transmitting (in maximum power) :	DC voltage : 3.8V , DC current : 0.18A
EUT Standby :	DC voltage : 3.8V , DC current : 0.03A
PCS 1900 GPRS	
EUT Transmitting (in maximum power) :	DC voltage : 3.8V , DC current : 0.18A
EUT Standby :	DC voltage : 3.8V , DC current : 0.03A
PCS 1900 EGPRS	
EUT Transmitting (in maximum power) :	DC voltage : 3.8V , DC current : 0.15A
EUT Standby :	DC voltage : 3.8V , DC current : 0.03A

2. Peak Power Output

2.1. Test Equipment

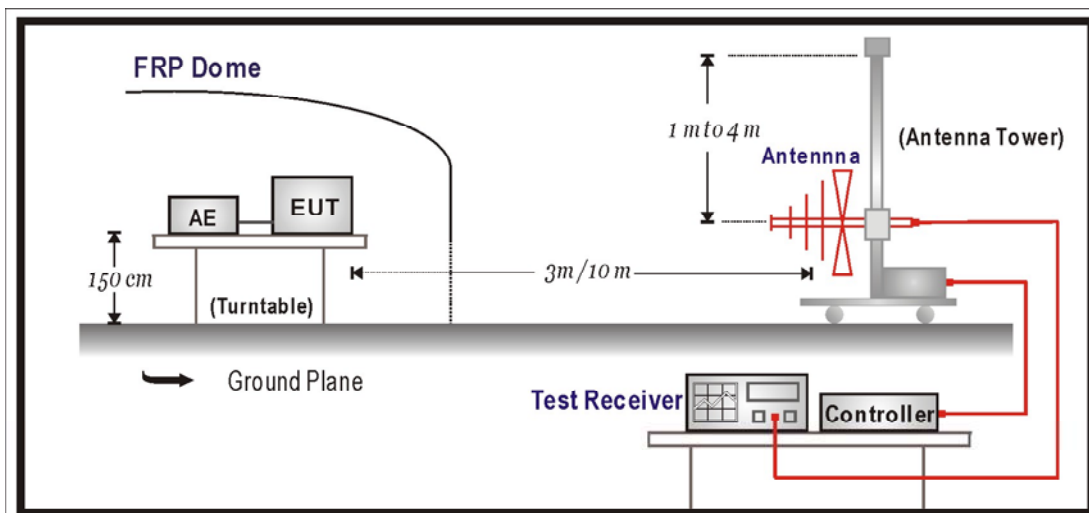
The following test equipments are used during the radiated emission test:

Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☒OATS 1	Test Receiver	R & S	ESCS 30 / 100122	Feb., 2011
	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

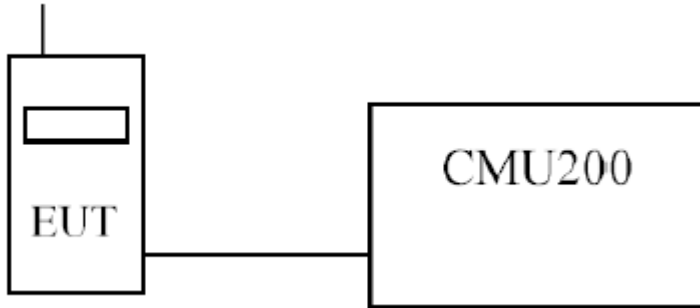
Note: 1. All equipments that need to be calibrated are with calibration period of 1 year.

2.2. Test Setup

Radiated Power Measurement



Conducted Power Measurement



2.3. Limits

Cellular Band 850	<7W
PCS Band 1900	<2W or +33dBm

2.4. Test Procedure

➤RF Out Power (Radiated)

The Spectrum Analyzer was tuned to the test frequency. 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.

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

➤RF Out Power (Conducted)

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.

2.5. Test Specification

According to Part 2.1046, 22.913,24.232.

2.6. Test Result of Peak Power Output

Product	HE863-EUD		
Test Mode	RF Output Power (Conducted)		
Date of Test	2010/11/24	Test Site	CTR

GPRS 850 (↑)				
Frequency (MHz)	Output Power (dBm)	Path Loss (dB)	Result (dBm)	Result (W)
824.2	32.34	0.2	32.54	1.79
836.4	32.34	0.2	32.54	1.79
848.8	32.40	0.2	32.60	1.82
GPRS 1900 (↑)				
Frequency (MHz)	Output Power (dBm)	Path Loss (dB)	Result (dBm)	Result (W)
1850.2	28.69	0.4	29.09	0.81
1880	28.73	0.4	29.13	0.82
1909.8	28.68	0.4	29.08	0.81

EGPRS 850 (↑)				
Frequency (MHz)	Output Power (dBm)	Path Loss (dB)	Result (dBm)	Result (W)
824.2	27.17	0.2	27.37	0.55
836.4	27.13	0.2	27.33	0.54
848.8	27.22	0.2	27.42	0.55
EGPRS 1900 (↑)				
Frequency (MHz)	Output Power (dBm)	Path Loss (dB)	Result (dBm)	Result (W)
1850.2	25.49	0.4	25.89	0.39
1880	25.51	0.4	25.91	0.39
1909.8	25.53	0.4	25.93	0.39

GPRS 850 (↑ ↑)				
Frequency (MHz)	Output Power (dBm)	Path Loss (dB)	Result (dBm)	Result (W)
824.2	32.07	0.2	32.27	1.69
836.4	32.11	0.2	32.31	1.70
848.8	32.07	0.2	32.27	1.69
GPRS 1900 (↑ ↑)				
Frequency (MHz)	Output Power (dBm)	Path Loss (dB)	Result (dBm)	Result (W)
1850.2	28.59	0.4	28.99	0.79
1880	28.57	0.4	28.97	0.79
1909.8	28.52	0.4	28.92	0.78

EGPRS 850 (↑ ↑)				
Frequency (MHz)	Output Power (dBm)	Path Loss (dB)	Result (dBm)	Result (W)
824.2	26.76	0.2	26.96	0.50
836.4	26.86	0.2	27.06	0.51
848.8	26.83	0.2	27.03	0.50
EGPRS 1900 (↑ ↑)				
Frequency (MHz)	Output Power (dBm)	Path Loss (dB)	Result (dBm)	Result (W)
1850.2	25.38	0.4	25.78	0.38
1880	25.39	0.4	25.79	0.38
1909.8	25.41	0.4	25.81	0.38

GPRS 850 (↑ ↑ ↑)				
Frequency (MHz)	Output Power (dBm)	Path Loss (dB)	Result (dBm)	Result (W)
824.2	31.80	0.2	32.00	1.58
836.4	31.84	0.2	32.04	1.60
848.8	31.84	0.2	32.04	1.60
GPRS 1900 (↑ ↑ ↑)				
Frequency (MHz)	Output Power (dBm)	Path Loss (dB)	Result (dBm)	Result (W)
1850.2	28.40	0.4	28.80	0.76
1880	28.37	0.4	28.77	0.75
1909.8	28.33	0.4	28.73	0.75

EGPRS 850 (↑ ↑ ↑)				
Frequency (MHz)	Output Power (dBm)	Path Loss (dB)	Result (dBm)	Result (W)
824.2	25.86	0.2	26.06	0.40
836.4	25.97	0.2	26.17	0.41
848.8	25.93	0.2	26.13	0.41
EGPRS 1900 (↑ ↑ ↑)				
Frequency (MHz)	Output Power (dBm)	Path Loss (dB)	Result (dBm)	Result (W)
1850.2	25.24	0.4	25.64	0.37
1880	25.11	0.4	25.51	0.36
1909.8	25.13	0.4	25.53	0.36

GPRS 850 (↑ ↑ ↑ ↑)				
Frequency (MHz)	Output Power (dBm)	Path Loss (dB)	Result (dBm)	Result (W)
824.2	30.69	0.2	30.89	1.23
836.4	30.76	0.2	30.96	1.25
848.8	30.75	0.2	30.95	1.24
GPRS 1900 (↑ ↑ ↑ ↑)				
Frequency (MHz)	Output Power (dBm)	Path Loss (dB)	Result (dBm)	Result (W)
1850.2	28.05	0.4	28.45	0.70
1880	27.94	0.4	28.34	0.68
1909.8	28.04	0.4	28.44	0.70

EGPRS 850 (↑ ↑ ↑ ↑)				
Frequency (MHz)	Output Power (dBm)	Path Loss (dB)	Result (dBm)	Result (W)
824.2	24.86	0.2	25.06	0.32
836.4	24.83	0.2	25.03	0.32
848.8	24.85	0.2	25.05	0.32
EGPRS 1900 (↑ ↑ ↑ ↑)				
Frequency (MHz)	Output Power (dBm)	Path Loss (dB)	Result (dBm)	Result (W)
1850.2	24.28	0.4	24.68	0.29
1880	24.25	0.4	24.65	0.29
1909.8	24.22	0.4	24.62	0.29

Product	HE863-EUD		
Test Mode	RF Output Power (Radiated)		
Date of Test	2010/11/23	Test Site	OATS 1
Test Condition	GSM 850 GPRS		

Maximum Power-GSM 850 GPRS

Frequency (MHz)	Reading Level (dBm)	Substitution Level (dBm)	Substitution Antenna Gain (dBd)	Cable Loss (dB)	Result ERP (dBm)	Result ERP (W)
824.2	16.58	25.16	1.85	0.6	26.41	0.44
836.4	16.24	24.83	1.85	0.6	26.08	0.41
848.8	15.78	24.40	1.85	0.6	25.65	0.37

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	HE863-EUD		
Test Mode	RF Output Power (Radiated)		
Date of Test	2010/11/23	Test Site	OATS 1
Test Condition	GSM 850 EGPRS		

Maximum Power-GSM 850 EGPRS

Frequency (MHz)	Reading Level (dBm)	Substitution Level (dBm)	Substitution Antenna Gain (dBd)	Cable Loss (dB)	Result ERP (dBm)	Result ERP (W)
824.2	14.32	23.04	1.85	0.6	24.29	0.27
836.4	14.21	22.94	1.85	0.6	24.19	0.26
848.8	13.7	22.47	1.85	0.6	23.72	0.24

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	HE863-EUD		
Test Mode	RF Output Power (Radiated)		
Date of Test	2010/11/23	Test Site	OATS 1
Test Condition	PCS 1900 GPRS		

Maximum Power-PCS 1900 GPRS

Frequency (MHz)	Reading Level (dBm)	Substitution Level (dBm)	Substitution Antenna Gain (dBi)	Cable Loss (dB)	Result EIRP (dBm)	Result EIRP (W)
1850.2	-10.270	21.917	10.4	1.02	31.297	1.35
1880.0	-12.100	20.302	10.4	1.02	29.682	0.93
1909.8	-12.980	19.461	10.4	1.02	28.841	0.77

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	HE863-EUD		
Test Mode	RF Output Power (Radiated)		
Date of Test	2010/11/23	Test Site	OATS 1
Test Condition	PCS 1900 EGPRS		

Maximum Power-PCS 1900 EGPRS

Frequency (MHz)	Reading Level (dBm)	Substitution Level (dBm)	Substitution Antenna Gain (dBi)	Cable Loss (dB)	Result EIRP (dBm)	Result EIRP (W)
1850.2	-10.670	21.517	10.4	1.02	30.897	1.23
1880.0	-12.430	19.972	10.4	1.02	29.352	0.86
1909.8	-13.100	19.341	10.4	1.02	28.721	0.74

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

3. Occupied Bandwidth

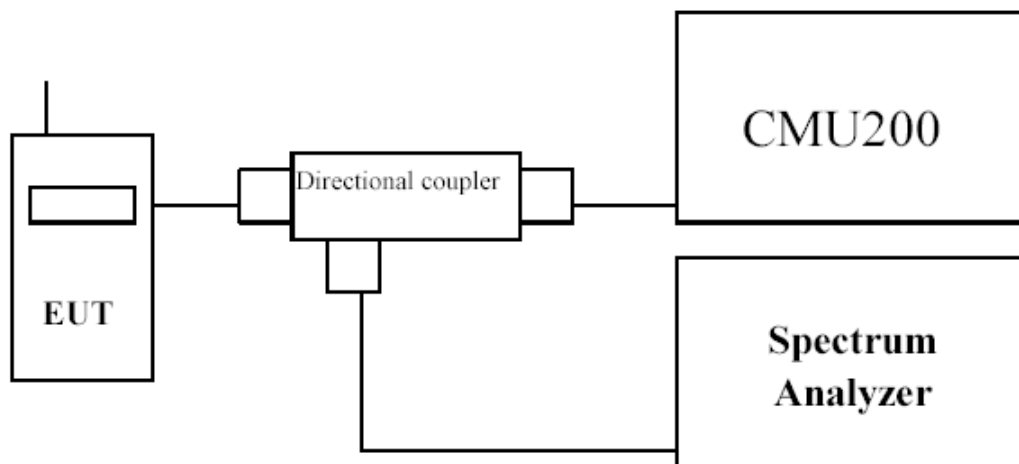
3.1. Test Equipment

The following test equipments are used during the occupied bandwidth tests:

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.

3.2. Test Setup



3.3. 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 Analyzer.

3.4. Test Specification

According to Part 2.1049, 22.917(b), 24.238(b).

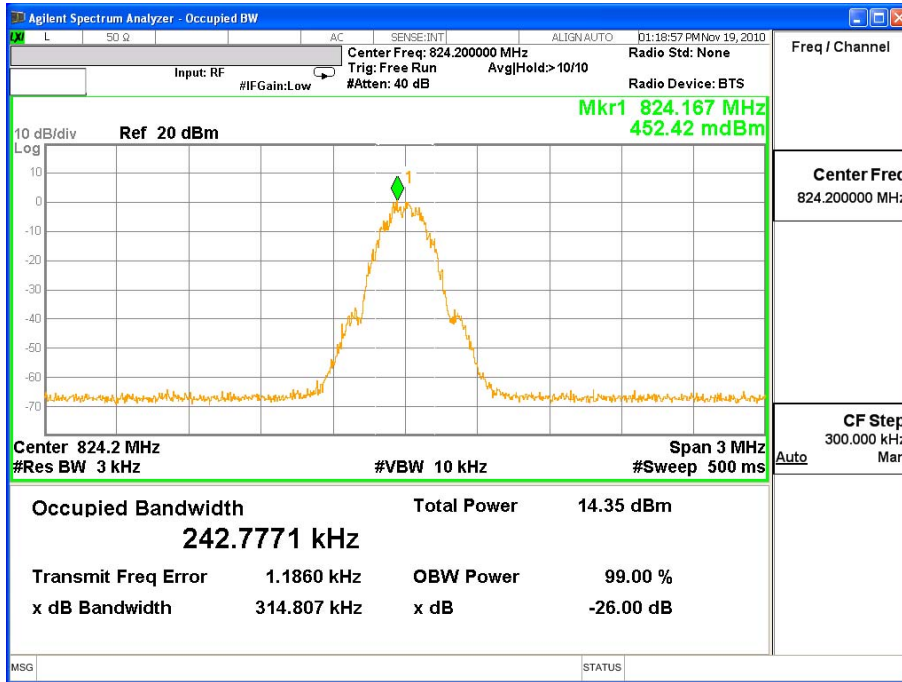
3.5. Test Result of Occupied Bandwidth

Product	HE863-EUD
Test Mode	Occupied Bandwidth
Test Site	CTR

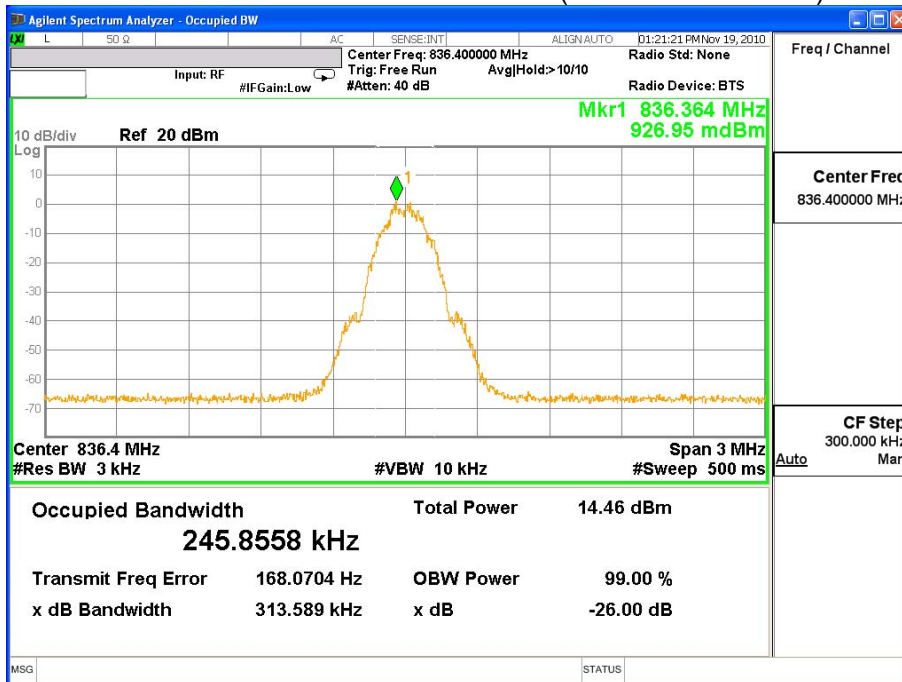
Test Mode	Channel & TX Frequency (MHz)	99% Occupied Bandwidth (KHz)	26 dB bandwidth (KHz)	Required Limit (MHz)	Result
GSM 850 GPRS	128(824.2)	242.777	314.807	N/A	Pass
	189(836.4)	245.856	313.589	N/A	Pass
	251(848.8)	242.216	311.297	N/A	Pass
GSM 850 EGPRS	128(824.2)	248.283	312.127	N/A	Pass
	189(836.4)	251.164	313.682	N/A	Pass
	251(848.8)	251.156	313.739	N/A	Pass
PCS 1900 GPRS	512(1850.2)	241.666	314.681	N/A	Pass
	661(1880)	243.410	313.358	N/A	Pass
	810(1909.8)	245.316	314.085	N/A	Pass
PCS 1900 EGPRS	512(1850.2)	242.707	303.301	N/A	Pass
	661(1880)	243.805	306.144	N/A	Pass
	810(1909.8)	243.090	313.927	N/A	Pass

Product	HE863-EUD		
Test Mode	Occupied Bandwidth		
Date of Test	2010/11/19	Test Site	CTR
Test Condition	GSM 850 GPRS		

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

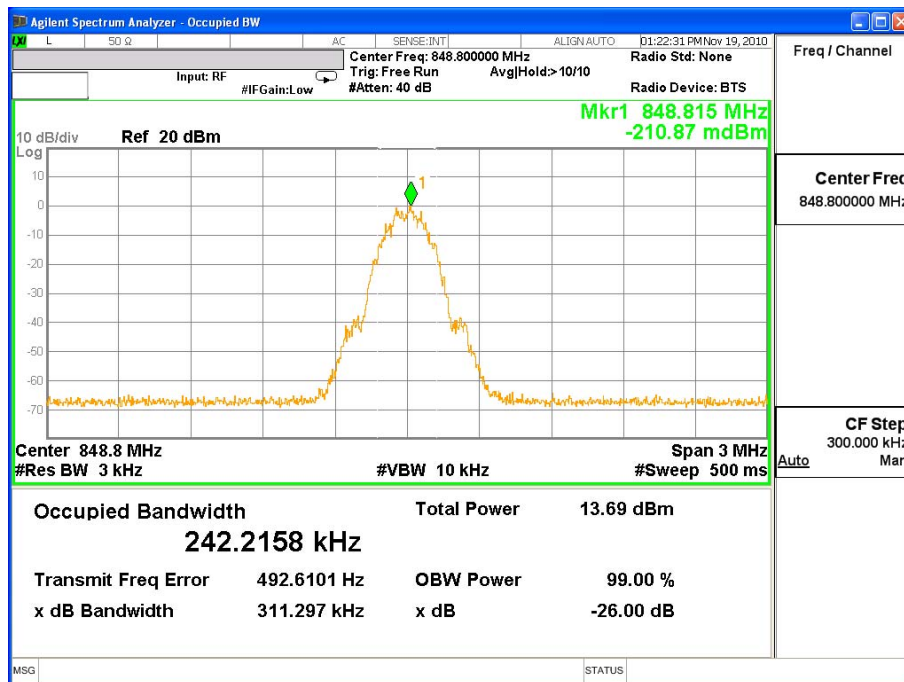


GSM 850 GPRS - Packet Switched (GSM Mode CH189)



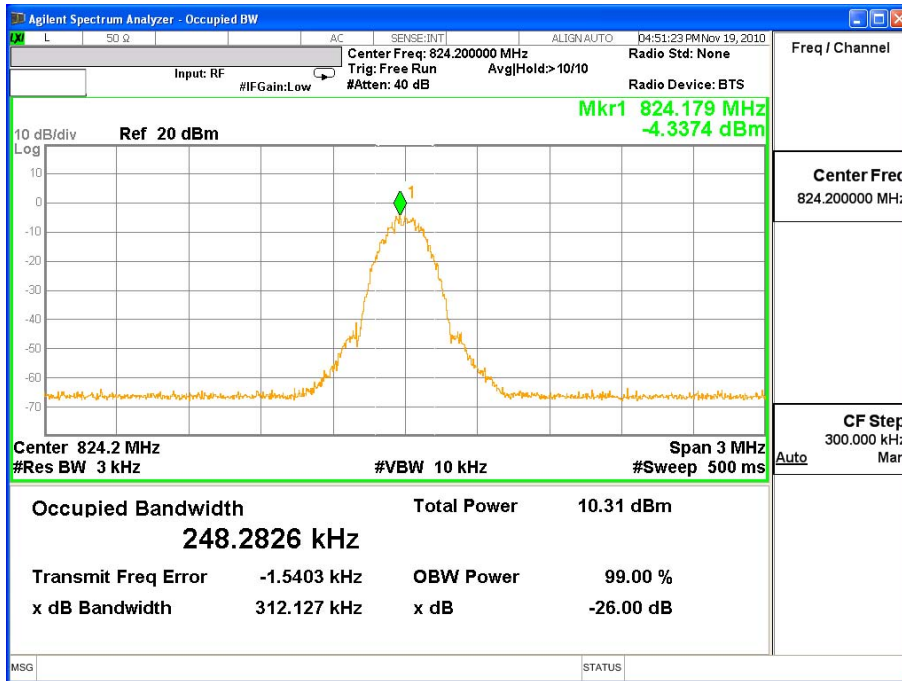
Product	HE863-EUD		
Test Mode	Occupied Bandwidth		
Date of Test	2010/11/19	Test Site	CTR
Test Condition	GSM 850 GPRS		

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

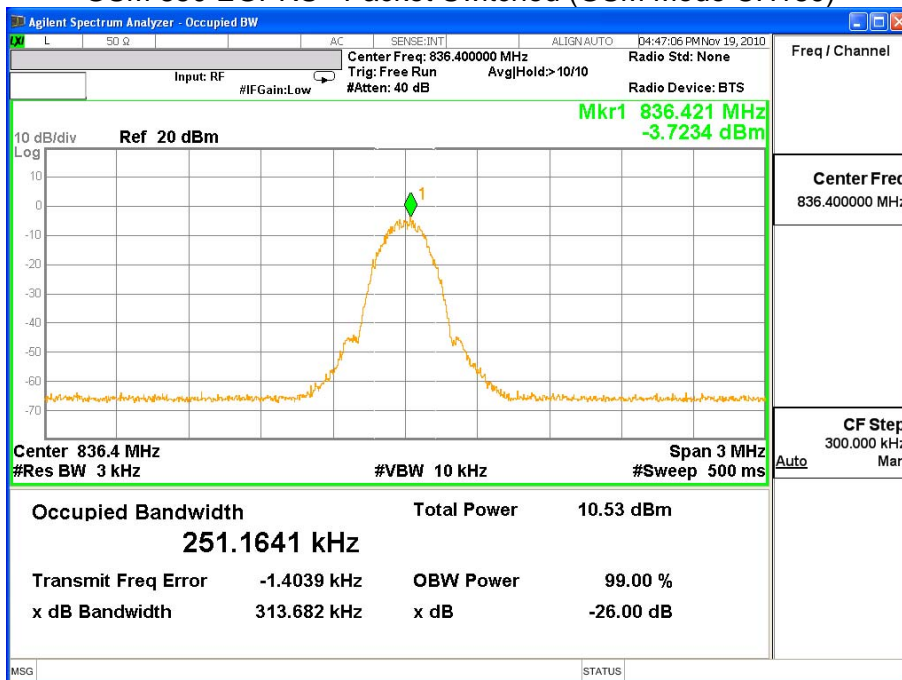


Product	HE863-EUD		
Test Mode	Occupied Bandwidth		
Date of Test	2010/11/19	Test Site	CTR
Test Condition	GSM 850 EGPRS		

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

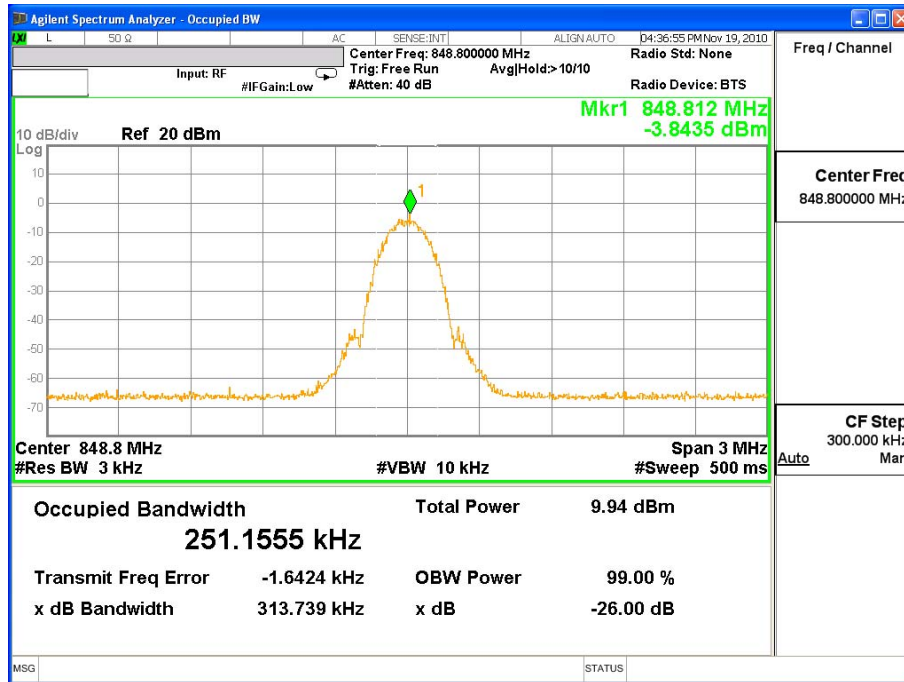


GSM 850 EGPRS - Packet Switched (GSM Mode CH189)



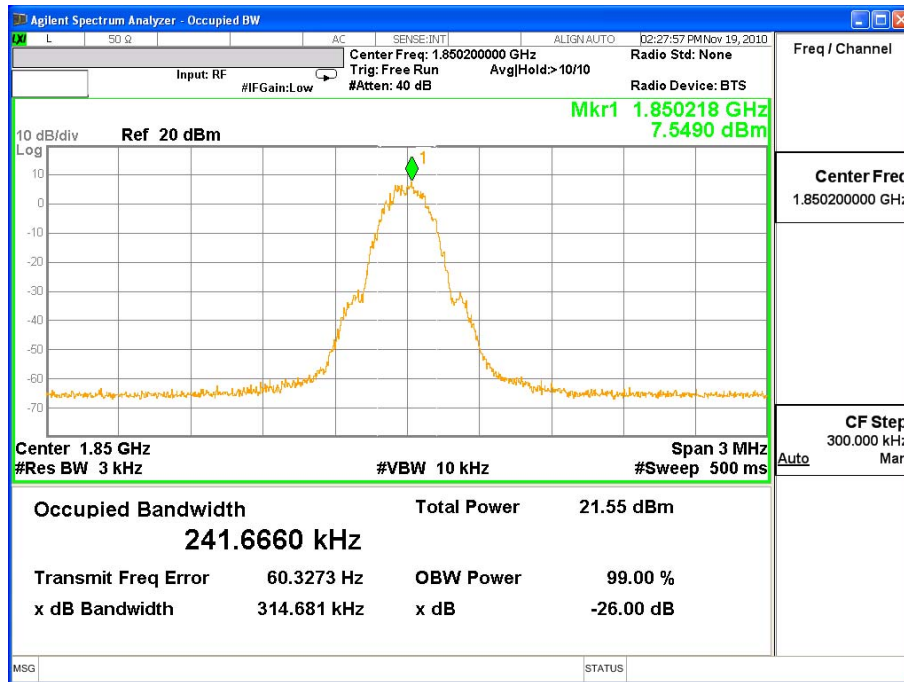
Product	HE863-EUD		
Test Mode	Occupied Bandwidth		
Date of Test	2010/11/19	Test Site	CTR
Test Condition	GSM 850 EGPRS		

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

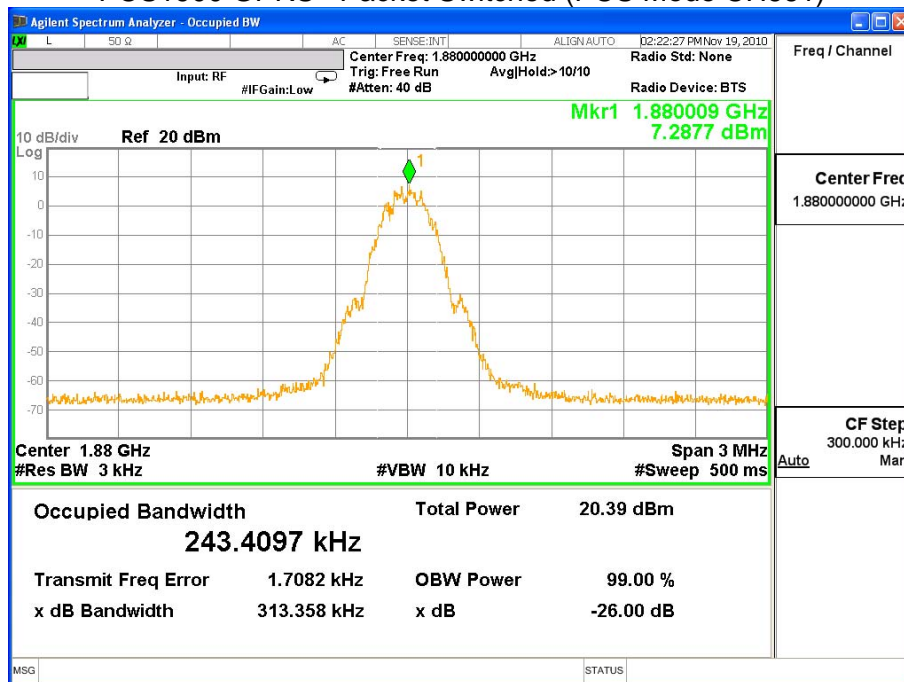


Product	HE863-EUD		
Test Mode	Occupied Bandwidth		
Date of Test	2010/11/19	Test Site	CTR
Test Condition	PCS1900 GPRS		

PCS1900 GPRS - Packet Switched (PCS Mode CH 512)

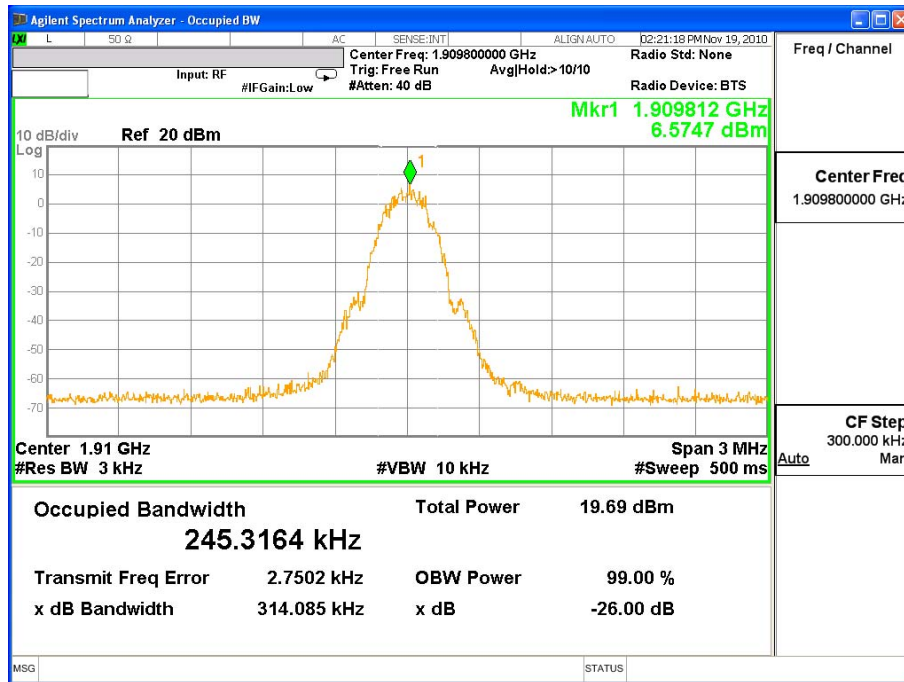


PCS1900 GPRS - Packet Switched (PCS Mode CH661)



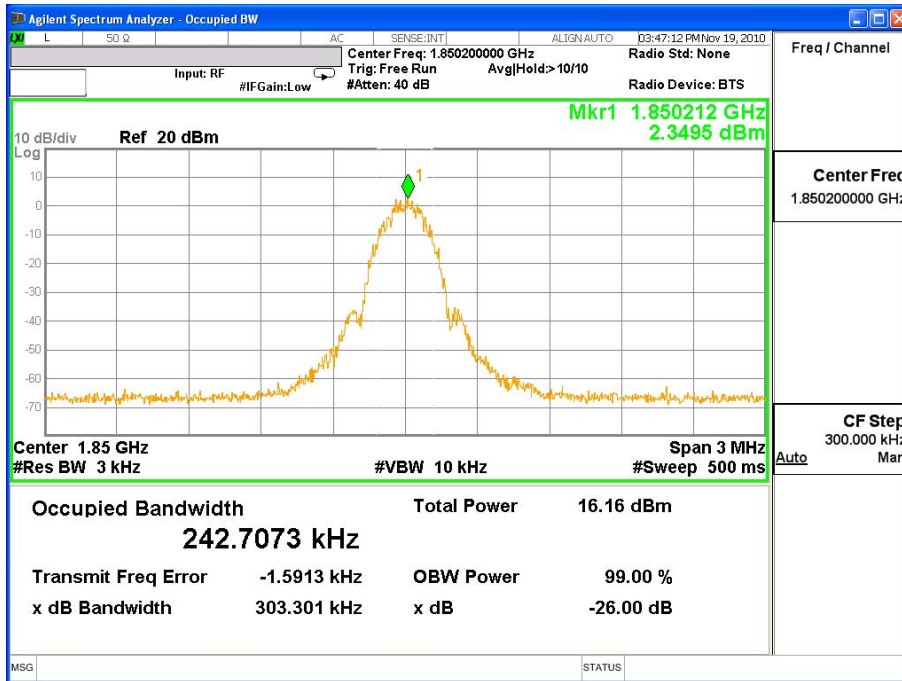
Product	HE863-EUD		
Test Mode	Occupied Bandwidth		
Date of Test	2010/11/19	Test Site	CTR
Test Condition	PCS1900 GPRS		

PCS1900 GPRS - Packet Switched (PCS Mode CH 810)

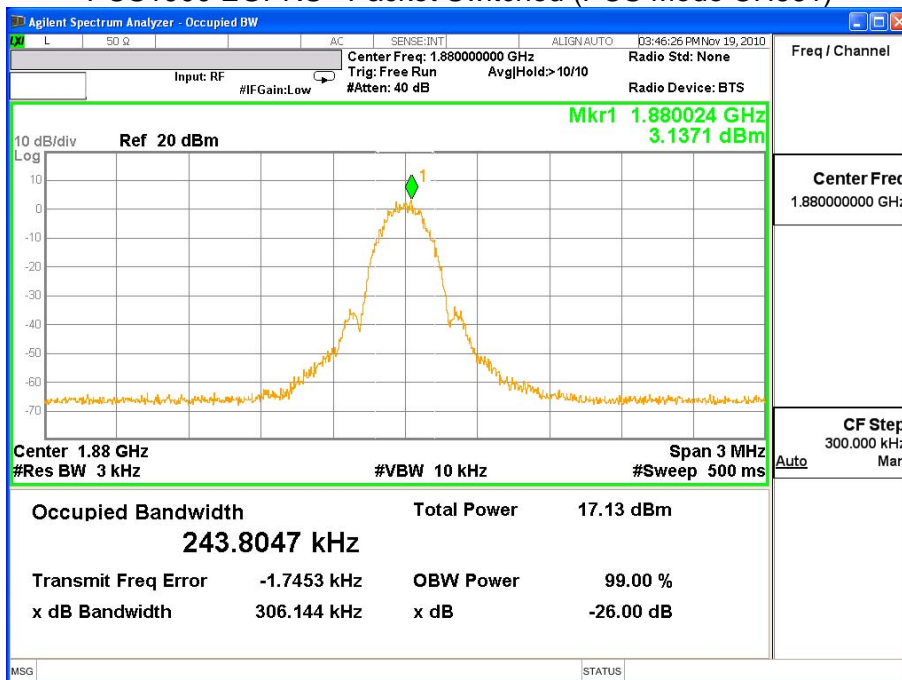


Product	HE863-EUD		
Test Mode	Occupied Bandwidth		
Date of Test	2010/11/19	Test Site	CTR
Test Condition	PCS1900 EGPRS		

PCS1900 EGPRS - Packet Switched (PCS Mode CH 512)

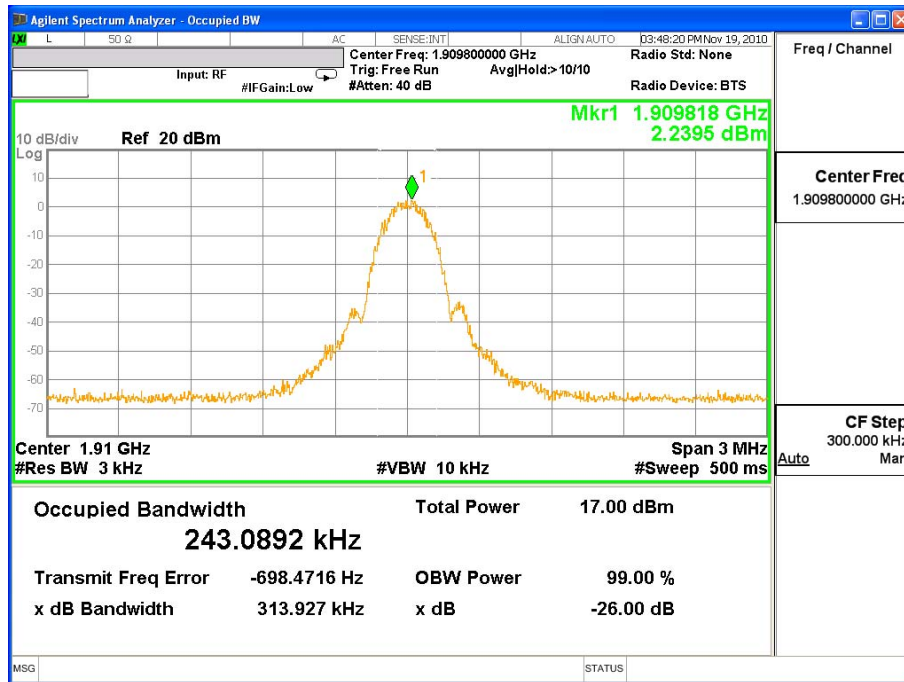


PCS1900 EGPRS - Packet Switched (PCS Mode CH661)



Product	HE863-EUD		
Test Mode	Occupied Bandwidth		
Date of Test	2010/11/19	Test Site	CTR
Test Condition	PCS1900 EGPRS		

PCS1900 EGPRS - Packet Switched (PCS Mode CH 810)



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

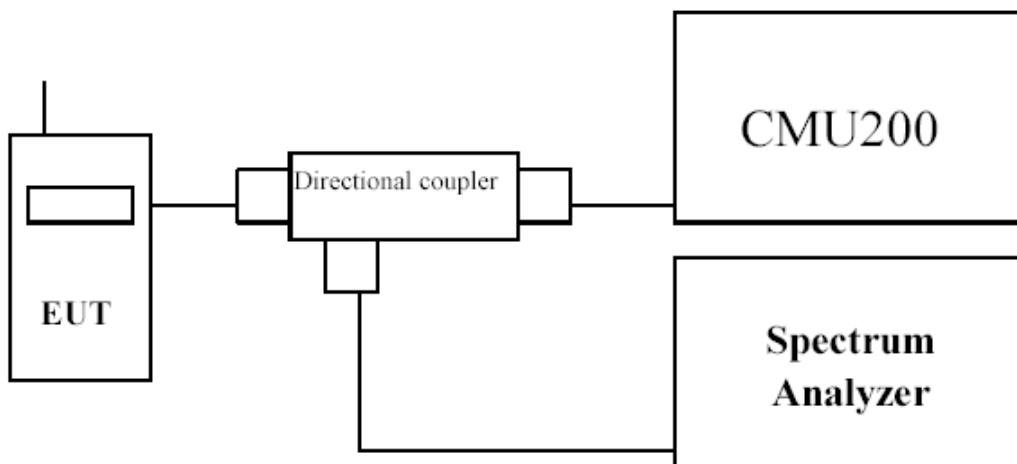
4.1. Test Equipment

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.

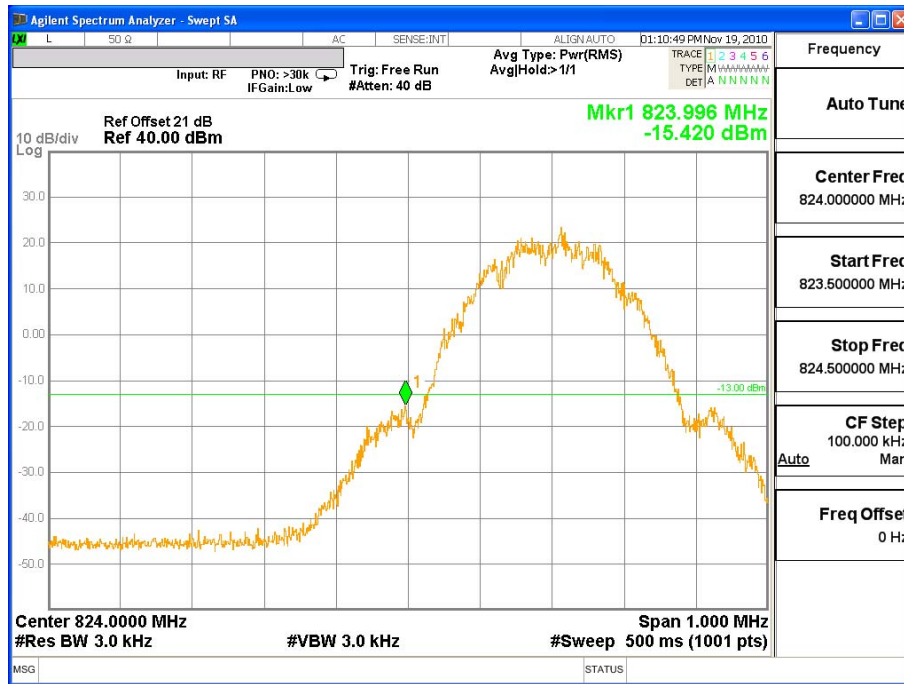
4.5. Test Specification

According to Part 2.1049, 22.917,24.238.

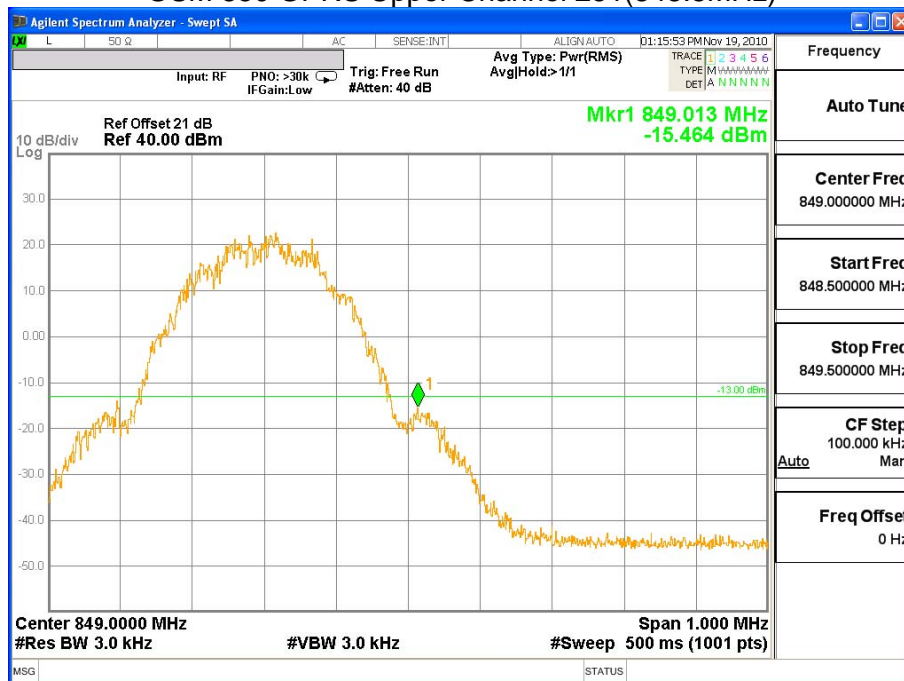
4.6. Test Result of Spurious Emission At Antenna Terminals (+/-1MHz)

Product	HE863-EUD		
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)

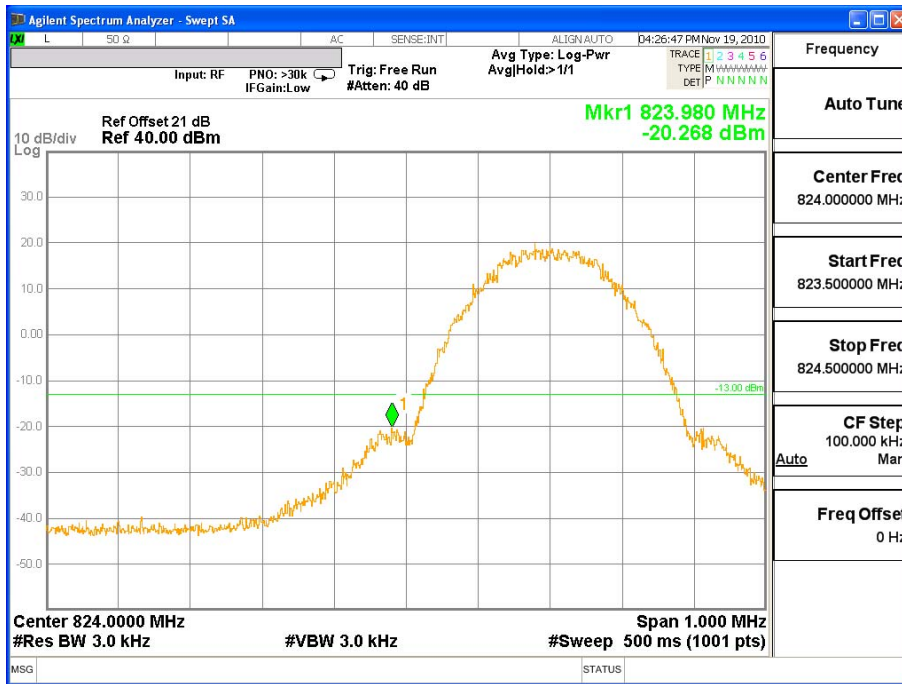


GSM 850 GPRS Upper Channel 251(848.8MHz)

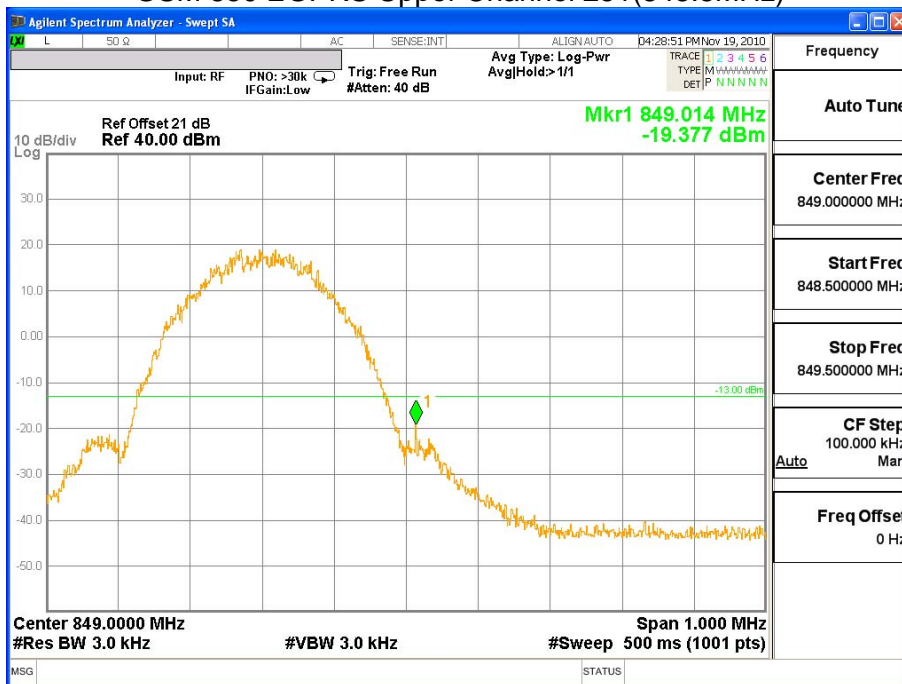


Product	HE863-EUD		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2010/11/19	Test Site	CTR
Test Condition	Block Edge Test (GSM 850 EGPRS)		

GSM 850 EGPRS Lower Channel 128 (824.2MHz)

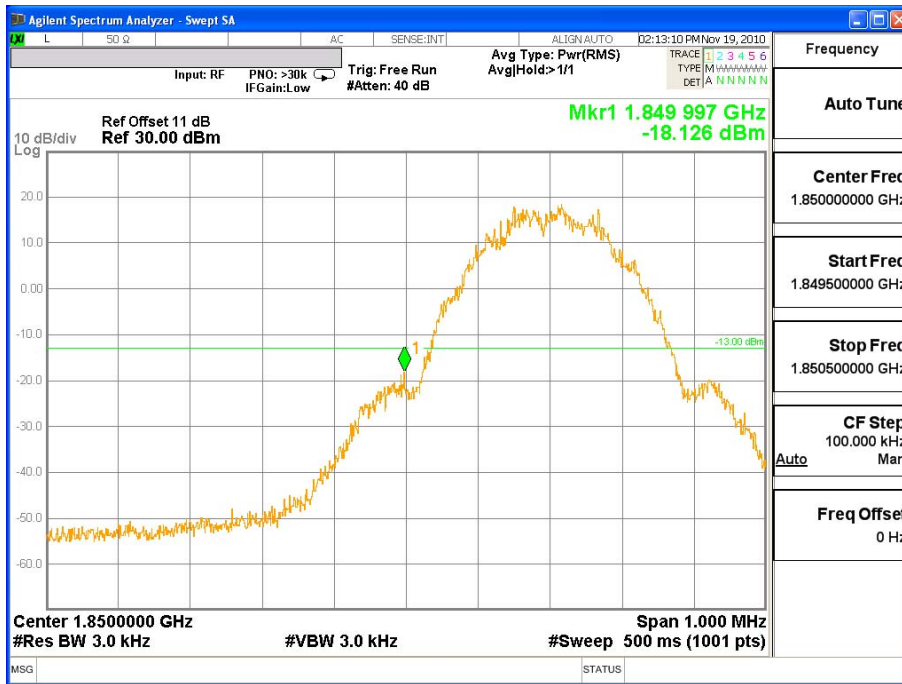


GSM 850 EGPRS Upper Channel 251(848.8MHz)

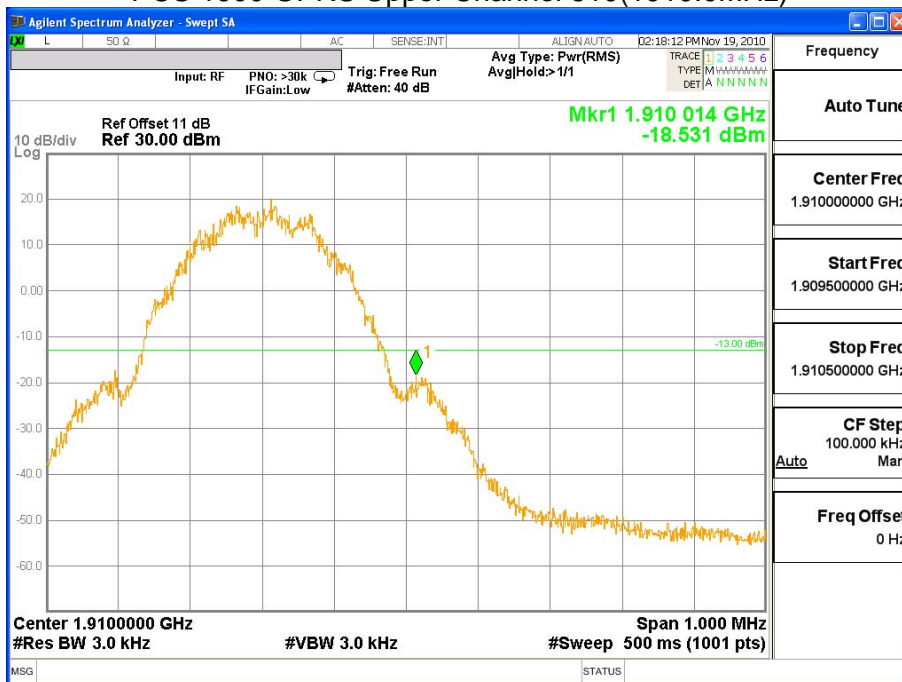


Product	HE863-EUD		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2010/11/19	Test Site	CTR
Test Condition	Block Edge Test (PCS 1900 GPRS)		

PCS 1900 GPRS Lower Channel 512 (1850.2MHz)

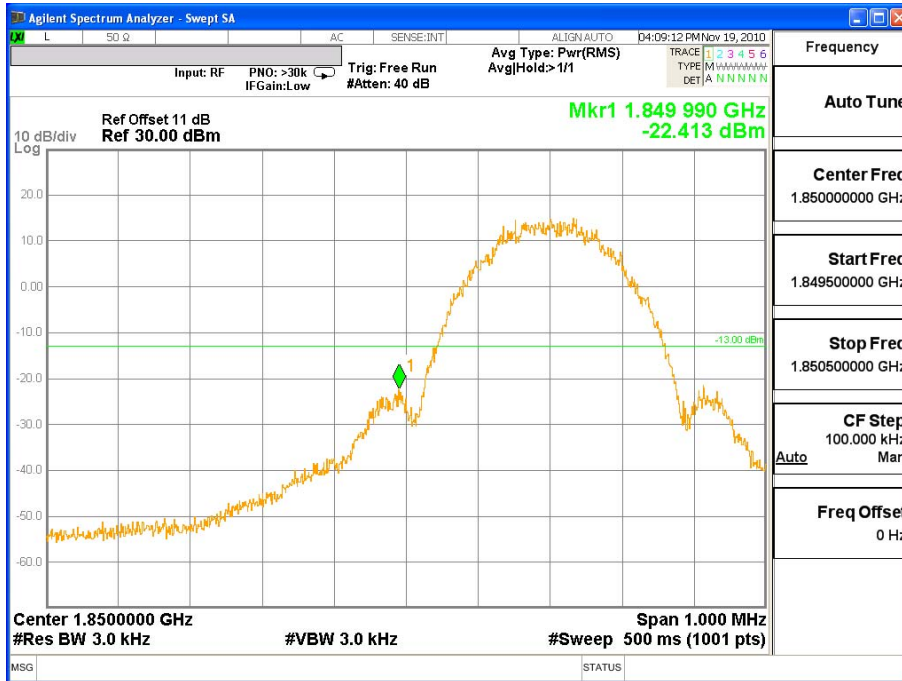


PCS 1900 GPRS Upper Channel 810(1910.0MHz)

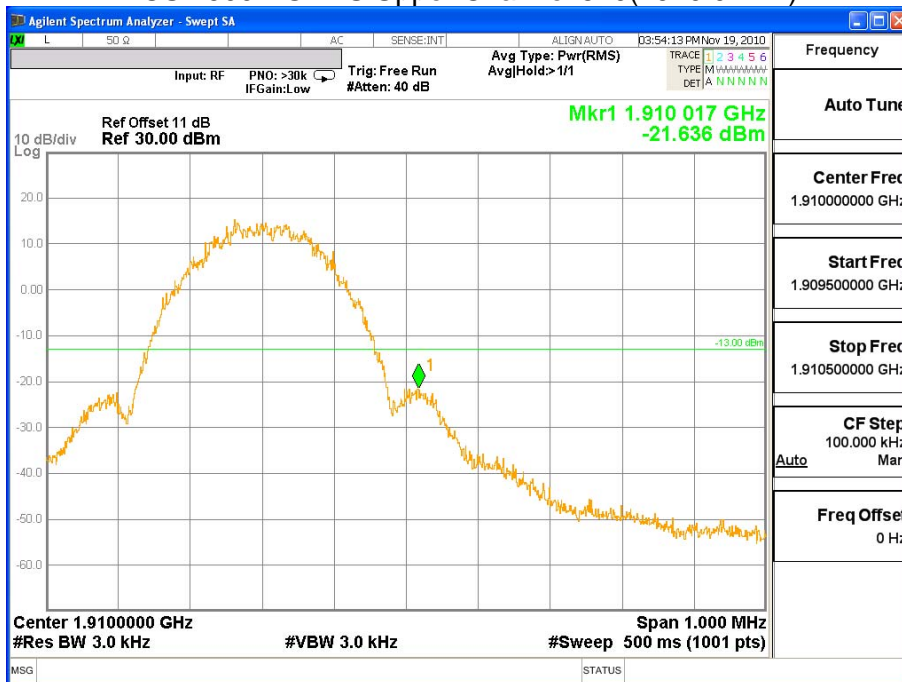


Product	HE863-EUD		
Test Mode	Spurious Emission At Antenna Terminals (+/-1MHz)		
Date of Test	2010/11/19	Test Site	CTR
Test Condition	Block Edge Test (PCS 1900 EGPRS)		

PCS 1900 EGPRS Lower Channel 512 (1850.2MHz)



PCS 1900 EGPRS Upper Channel 810(1910.0MHz)



5. Spurious Emission

5.1. Test Equipment

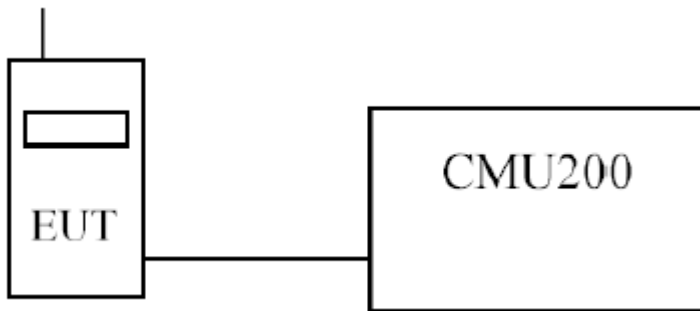
The following test equipments are used during the radiated emission test:

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., 2011
	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

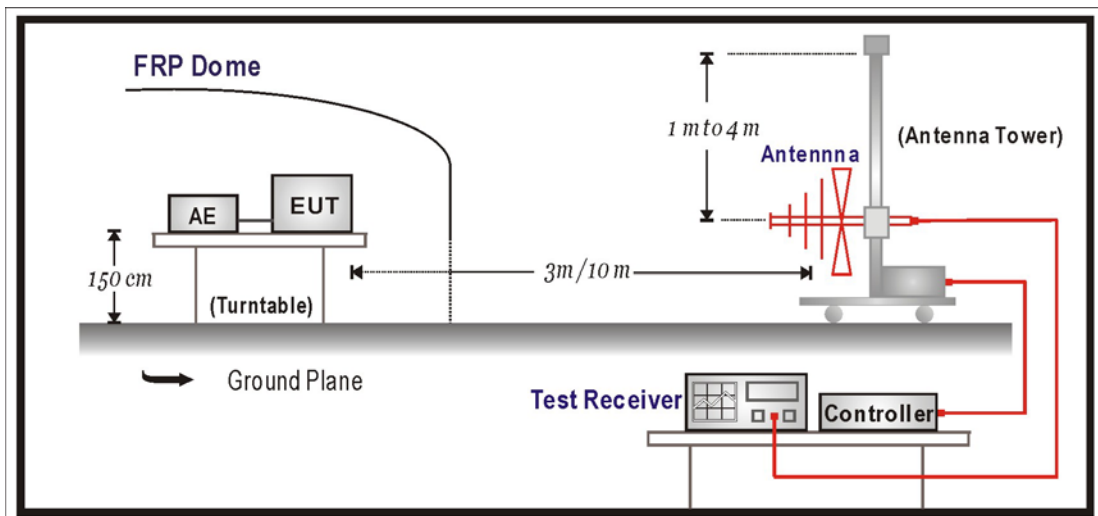
Note: 1. All equipments that need to be calibrated are with calibration period of 1 year.

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

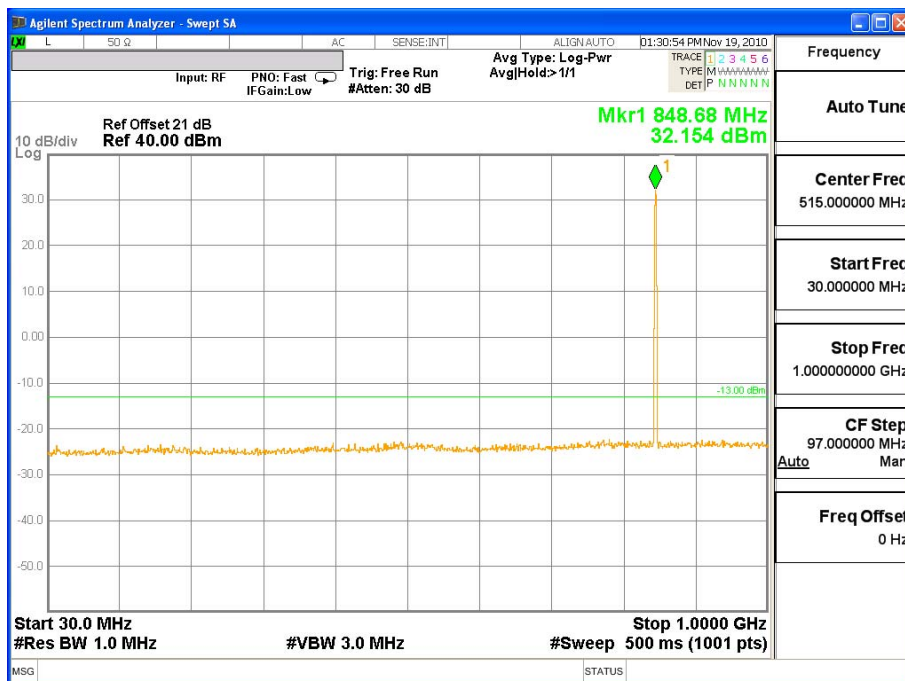
According to Part 2.1051, 2.1053, 22.917(a), 24.238(b).

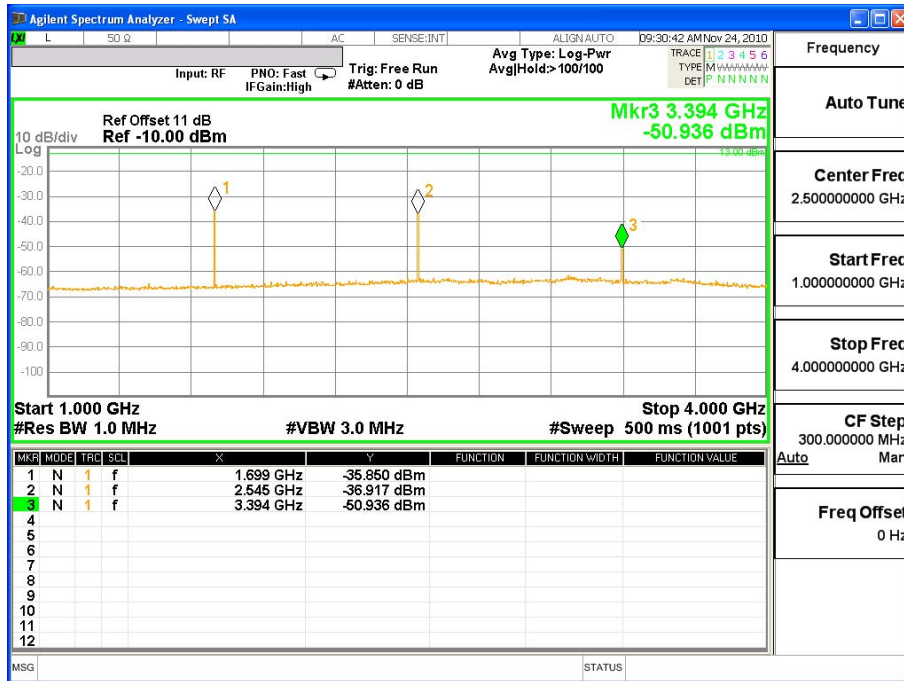
5.6. Test Result of Spurious Emission

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

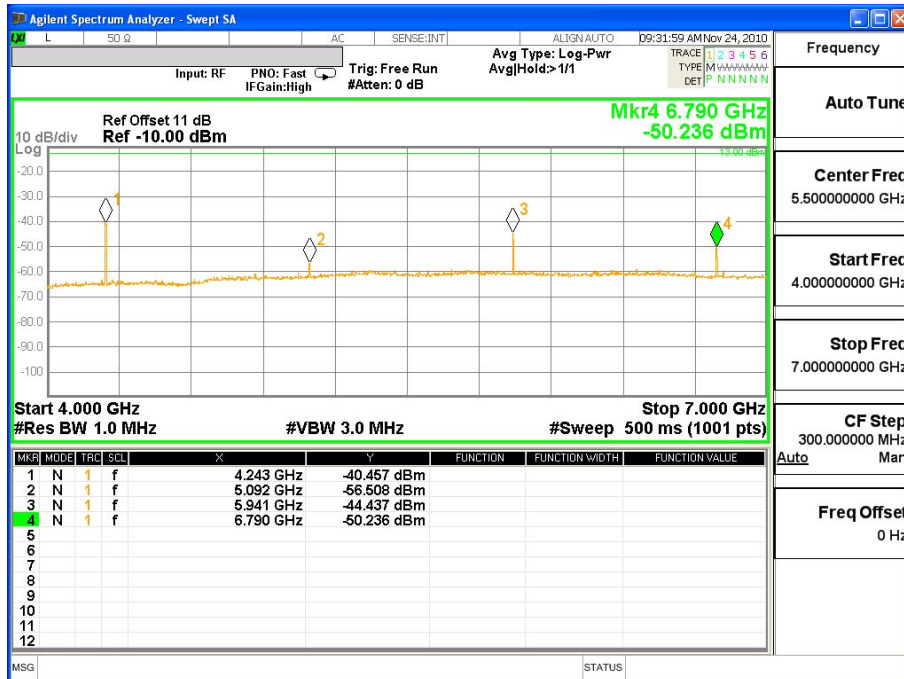
GSM 850 GPRS High-Channel 251

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

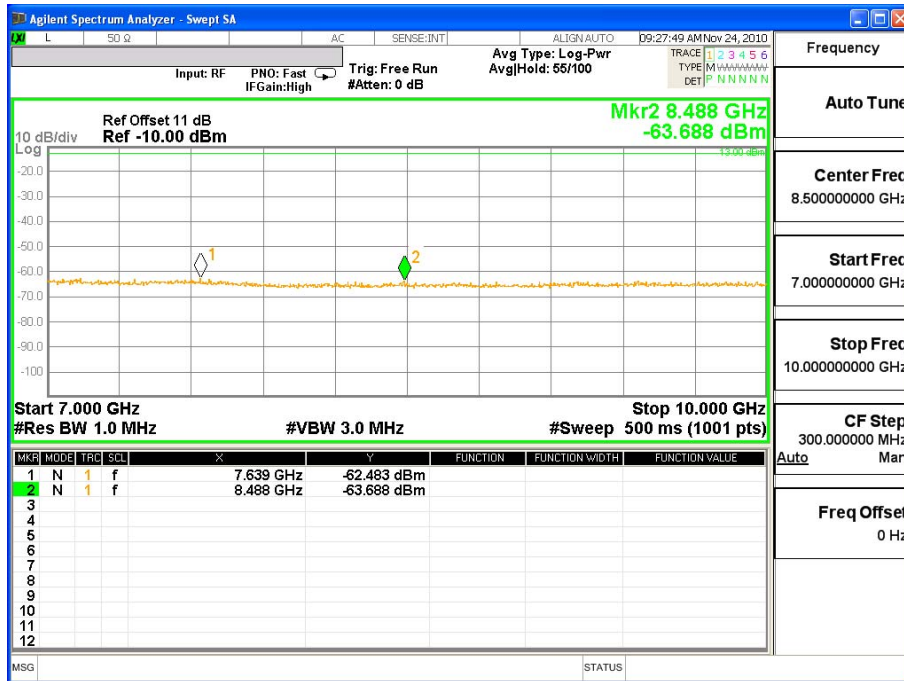




Frequency
Auto Tune
Center Freq 2.500000000 GHz
Start Freq 1.000000000 GHz
Stop Freq 4.000000000 GHz
CF Step 300.0000000 MHz
Auto Man
Freq Offset 0 Hz



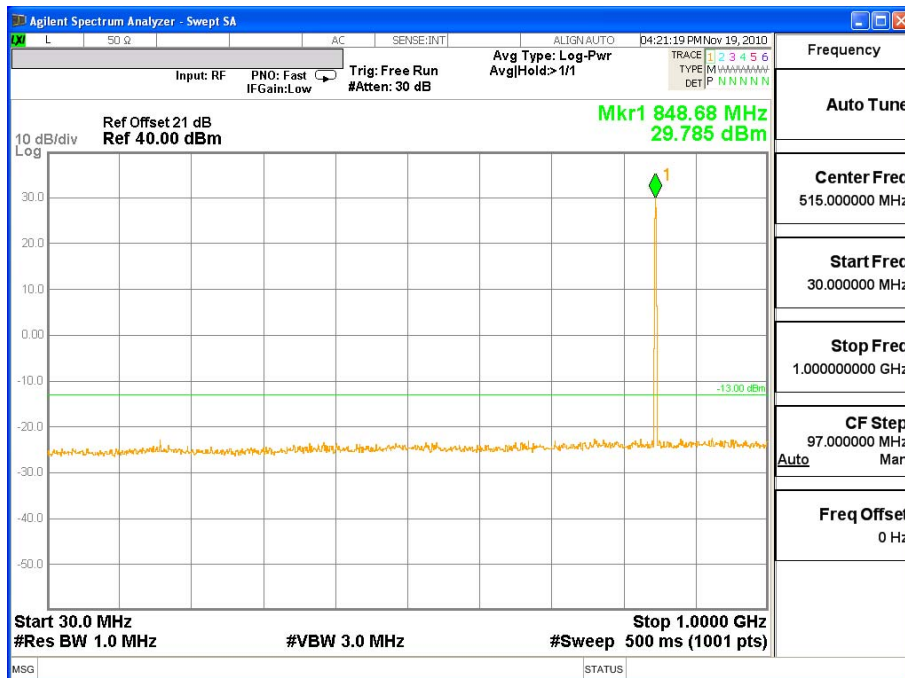
Frequency
Auto Tune
Center Freq 5.500000000 GHz
Start Freq 4.000000000 GHz
Stop Freq 7.000000000 GHz
CF Step 300.0000000 MHz
Auto Man
Freq Offset 0 Hz

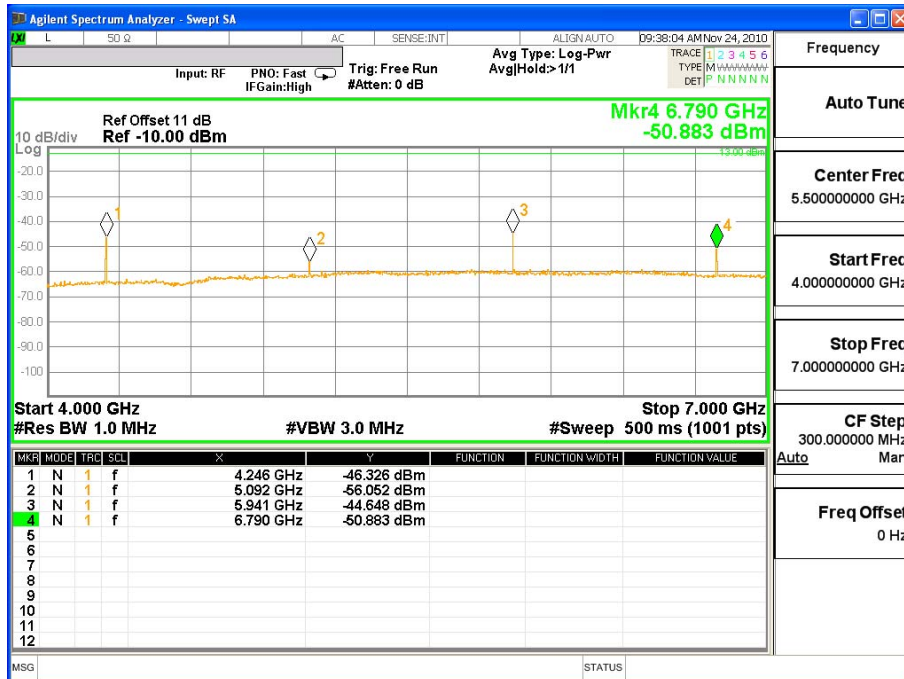
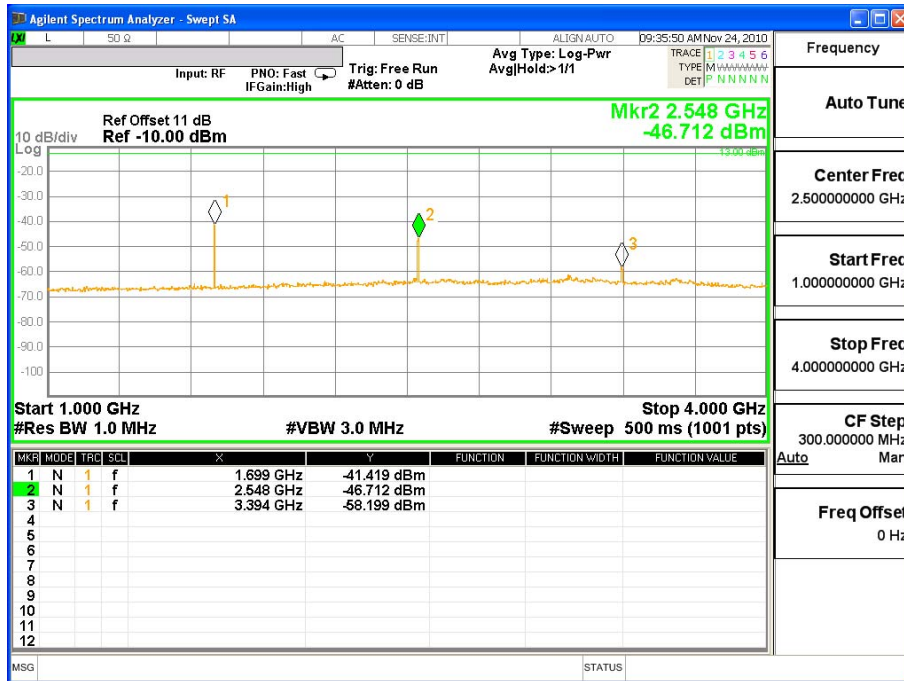


Product	HE863-EUD		
Test Mode	Spurious Emission (Conducted)		
Date of Test	2010/11/23	Test Site	CTR
Test Condition	GSM 850 EGPRS	Test Range	30MHz~10GHz

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



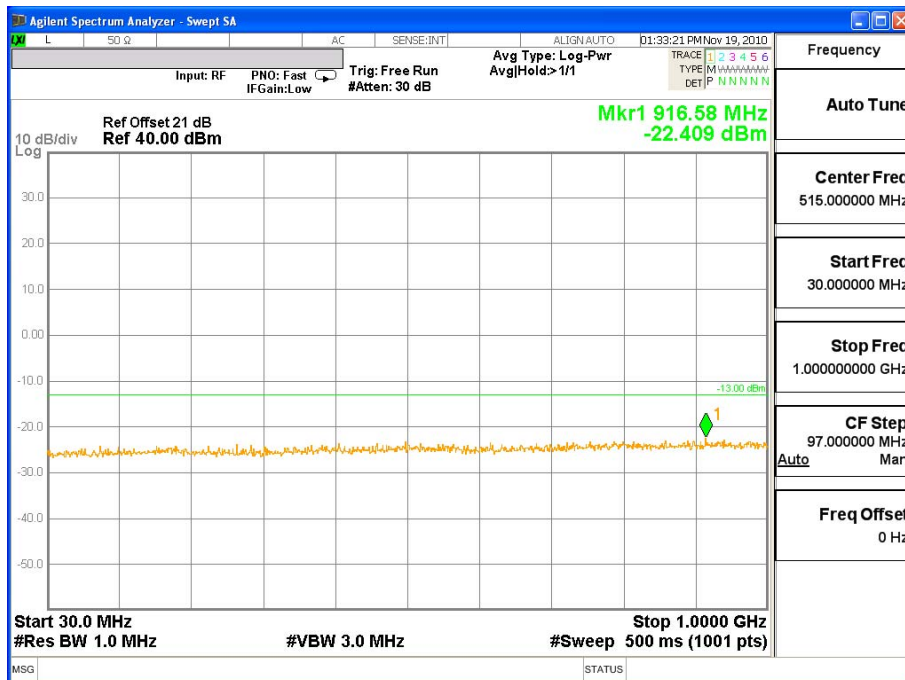


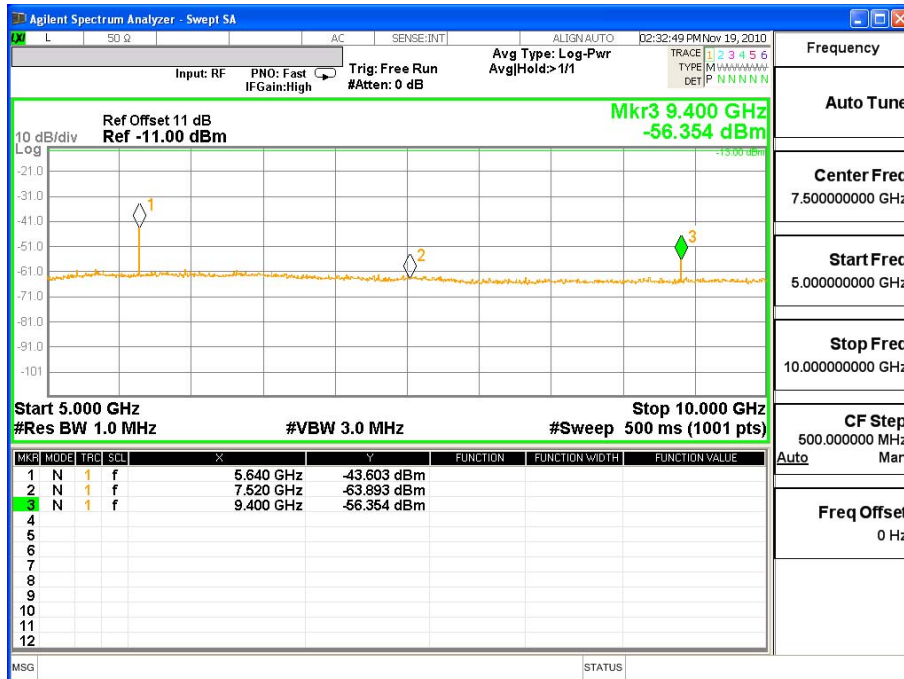
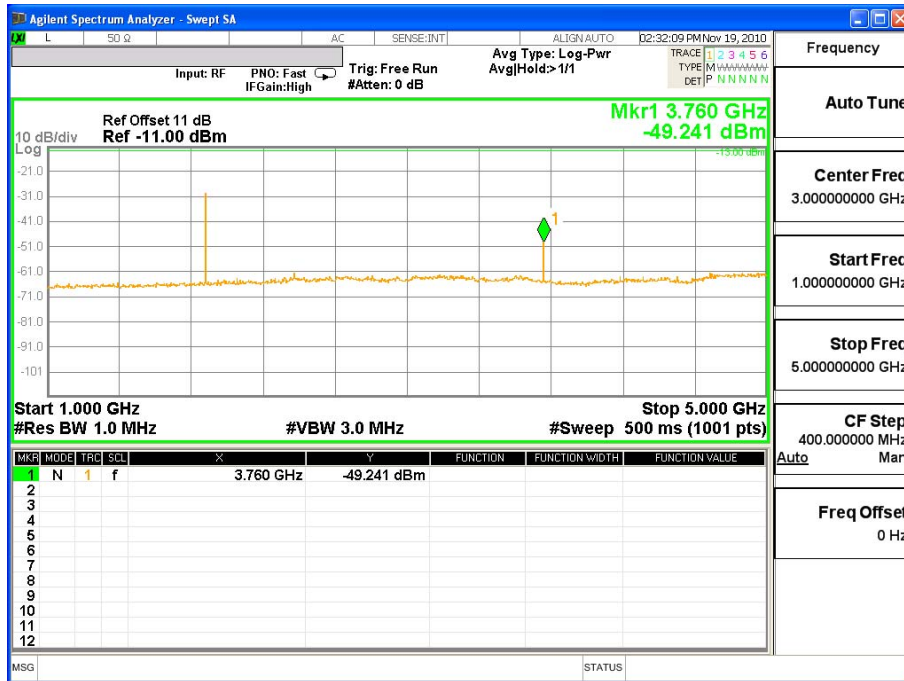


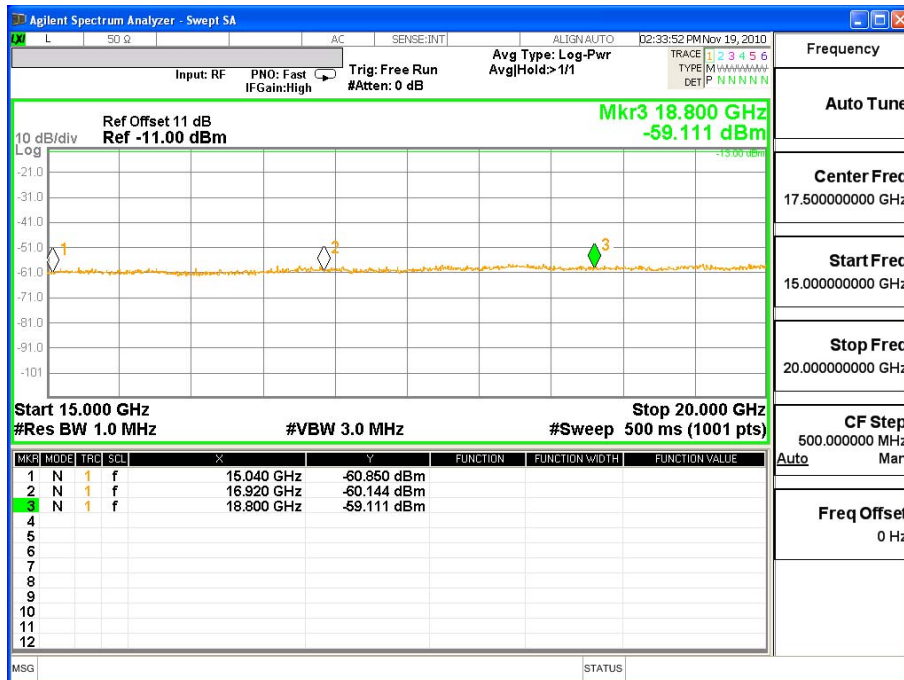
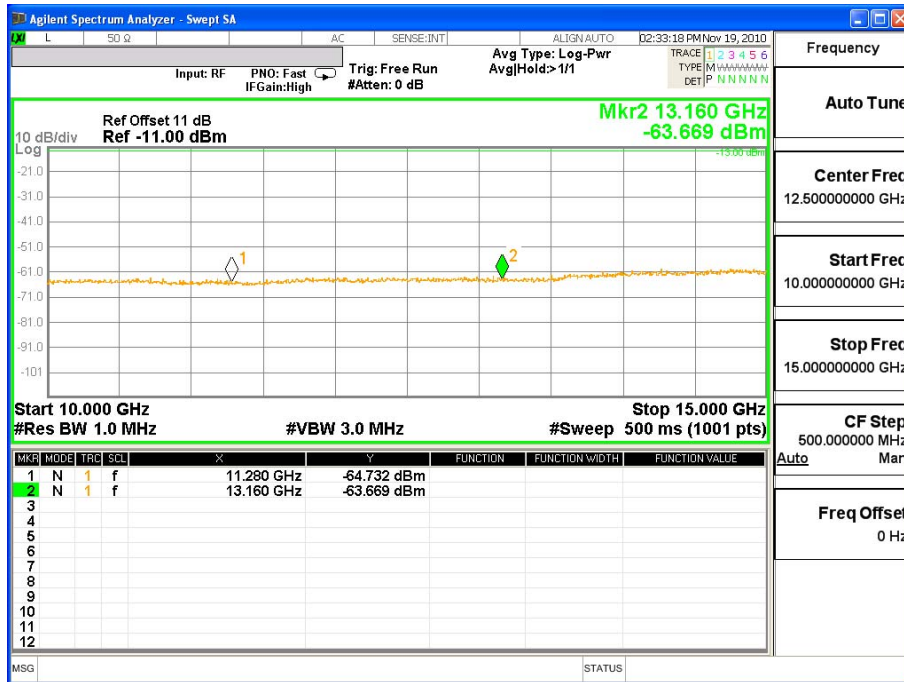
Product	HE863-EUD		
Test Mode	Spurious Emission (Conducted)		
Date of Test	2010/11/23	Test Site	CTR
Test Condition	PCS 1900 GPRS	Test Range	30MHz~20GHz

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



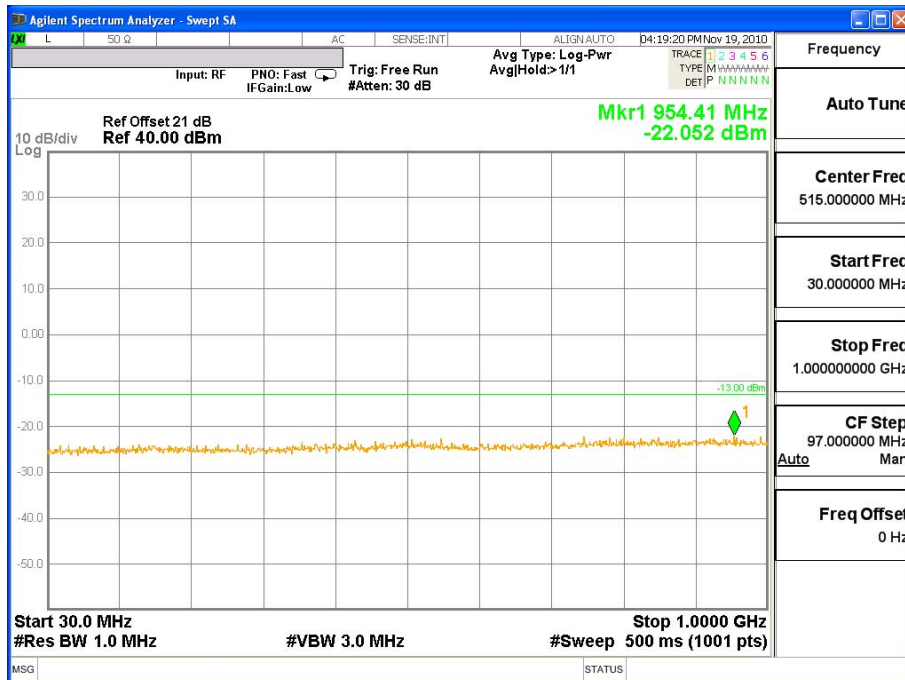


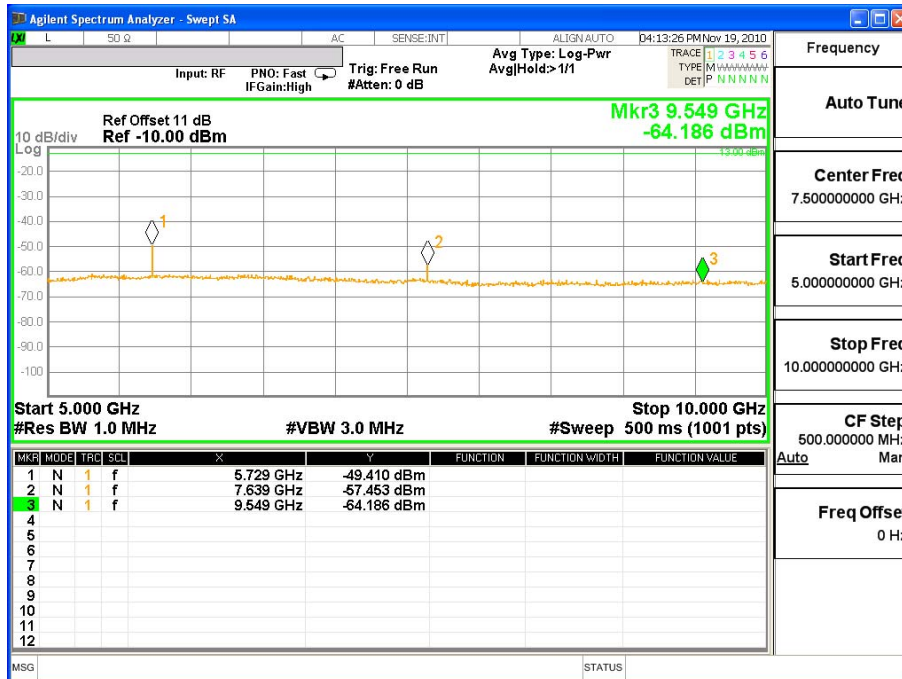


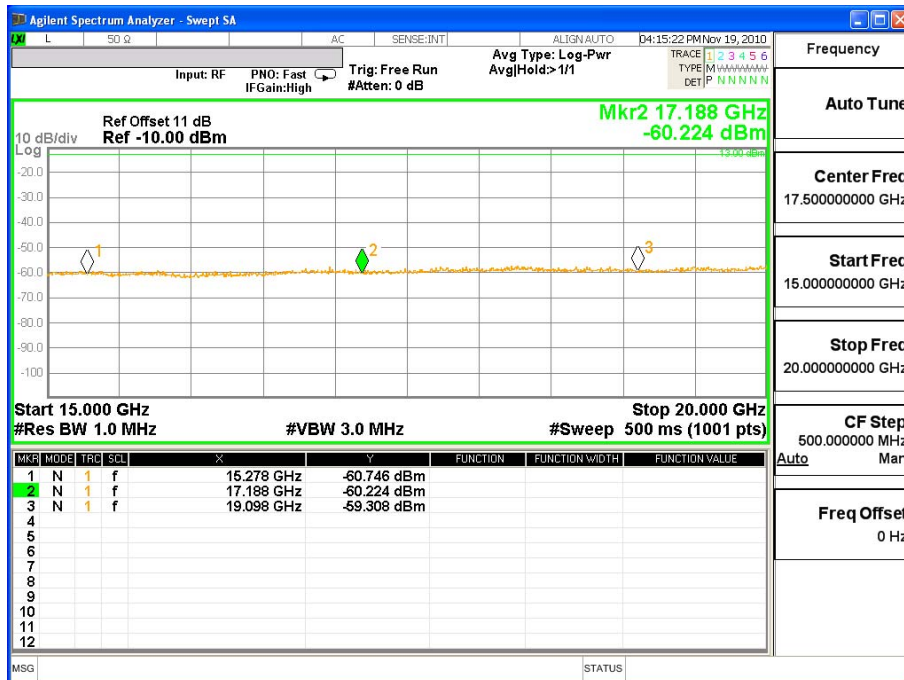
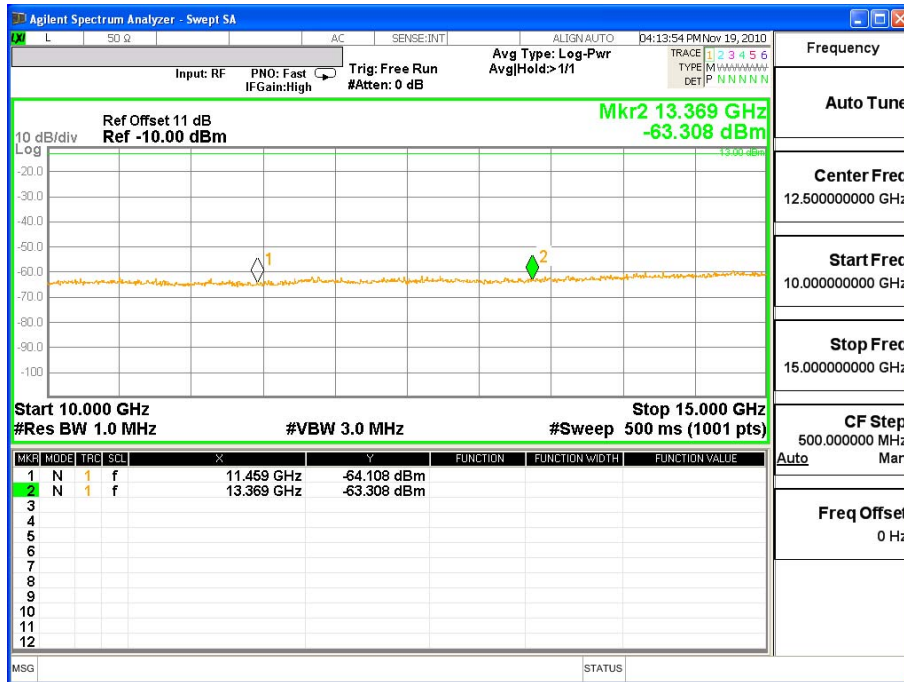
Product	HE863-EUD		
Test Mode	Spurious Emission (Conducted)		
Date of Test	2010/11/23	Test Site	CTR
Test Condition	PCS 1900 EGPRS	Test Range	30MHz~20GHz

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







Product	HE863-EUD		
Test Mode	Spurious Emission (Radiated)		
Date of Test	2010/11/23	Test Site	OATS 1
Test Condition	Channel 128 (GSM 850 GPRS)	Test Range	30MHz~10GHz

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

Horizontal Emissions

1648.400	-44.050	-47.439	1.630	9.800	-39.269	-13
2472.600	-53.490	-53.846	2.100	10.600	-45.346	-13
3296.800	-57.770	-59.452	2.350	12.300	-49.502	-13
4127.000	-58.260	-57.277	2.700	12.600	-47.377	-13
4945.200	-60.290	-56.193	2.830	12.700	-46.323	-13
5757.400	-59.490	-57.359	3.200	13.000	-47.559	-13

Vertical Emissions

1648.400	-45.050	-48.130	1.630	9.800	-39.960	-13
2472.600	-49.710	-49.790	2.100	10.600	-41.290	-13
3296.800	-57.960	-58.588	2.350	12.300	-48.638	-13
4115.000	-58.230	-55.495	2.700	12.600	-45.595	-13
4945.200	-60.570	-55.930	2.830	12.700	-46.060	-13
5769.400	-60.440	-58.259	3.200	13.000	-48.459	-13

Note:

1. Receiver setting (Peak Detector) : RBW:3MHz; 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	HE863-EUD		
Test Mode	Spurious Emission (Radiated)		
Date of Test	2010/11/23	Test Site	OATS 1
Test Condition	Channel 128 (GSM 850 EGPRS)	Test Range	30MHz~10GHz

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

Horizontal Emissions

1648.400	-53.550	-56.939	1.630	9.800	-48.769	-13
2478.600	-59.010	-59.345	2.100	10.600	-50.845	-13
3290.800	-57.280	-58.955	2.350	12.300	-49.005	-13
4121.000	-58.610	-57.604	2.700	12.600	-47.704	-13
4945.200	-60.250	-56.153	2.830	12.700	-46.283	-13
5769.400	-60.150	-58.094	3.200	13.000	-48.294	-13

Vertical Emissions

1648.400	-55.830	-58.910	1.630	9.800	-50.740	-13
2472.600	-58.120	-58.200	2.100	10.600	-49.700	-13
3296.800	-57.720	-58.348	2.350	12.300	-48.398	-13
4121.000	-58.460	-55.755	2.700	12.600	-45.855	-13
4957.200	-58.280	-53.553	2.830	12.700	-43.683	-13
5757.400	-59.310	-57.059	3.200	13.000	-47.259	-13

Note:

1. Receiver setting (Peak Detector) : RBW:3MHz; 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	HE863-EUD		
Test Mode	Spurious Emission (Radiated)		
Date of Test	2010/11/23	Test Site	OATS 1
Test Condition	Channel 512 (PCS1900 GPRS)	Test Range	30MHz~20GHz

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

Horizontal Emissions

3704.000	-48.280	-48.891	2.530	12.600	-38.821	-13
5550.600	-57.070	-53.691	3.050	13.100	-43.641	-13
7400.800	-60.580	-45.900	3.650	11.500	-38.050	-13
9251.000	-58.690	-43.855	3.850	12.000	-35.705	-13
11101.200	-60.400	-42.805	4.580	12.000	-35.385	-13

Vertical Emissions

3704.000	-52.990	-51.355	2.530	12.600	-41.285	-13
5550.600	-56.300	-52.318	3.050	13.100	-42.268	-13
7400.800	-60.180	-45.108	3.650	11.500	-37.258	-13
9251.000	-58.680	-43.417	3.850	12.000	-35.267	-13
11101.200	-60.880	-43.140	4.580	12.000	-35.720	-13

Note:

1. Receiver setting (Peak Detector) : RBW:3MHz; VBW:3MHz
2. EIRP Value = Signal Generator Level + Antenna Gain - Cable Loss
3. Spurious emissions past 12GHz are not shown, due to the magnitude of spurious emissions attenuated more than 20 dB below the limit.

Product	HE863-EUD		
Test Mode	Spurious Emission (Radiated)		
Date of Test	2010/11/23	Test Site	OATS 1
Test Condition	Channel 512 (PCS1900 EGPRS)	Test Range	30MHz~20GHz

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

Horizontal Emissions

3704.000	-52.900	-53.511	2.530	12.600	-43.441	-13
5550.600	-59.690	-56.311	3.050	13.100	-46.261	-13
7400.800	-60.620	-45.919	3.650	11.500	-38.069	-13
9251.000	-58.320	-43.527	3.850	12.000	-35.377	-13
11101.200	-61.290	-43.748	4.580	12.000	-36.328	-13

Vertical Emissions

3704.000	-56.270	-54.647	2.530	12.600	-44.577	-13
5550.600	-59.640	-55.658	3.050	13.100	-45.608	-13
7400.800	-60.090	-45.009	3.650	11.500	-37.159	-13
9251.000	-59.880	-44.455	3.850	12.000	-36.305	-13
11101.200	-60.270	-42.517	4.580	12.000	-35.097	-13

Note:

1. Receiver setting (Peak Detector) : RBW:3MHz; VBW:3MHz
2. EIRP Value = Signal Generator Level + Antenna Gain - Cable Loss
3. Spurious emissions past 12GHz are not shown, due to the magnitude of spurious emissions attenuated more than 20 dB below the limit.

6. Frequency Stability Under Temperature & Voltage Variations

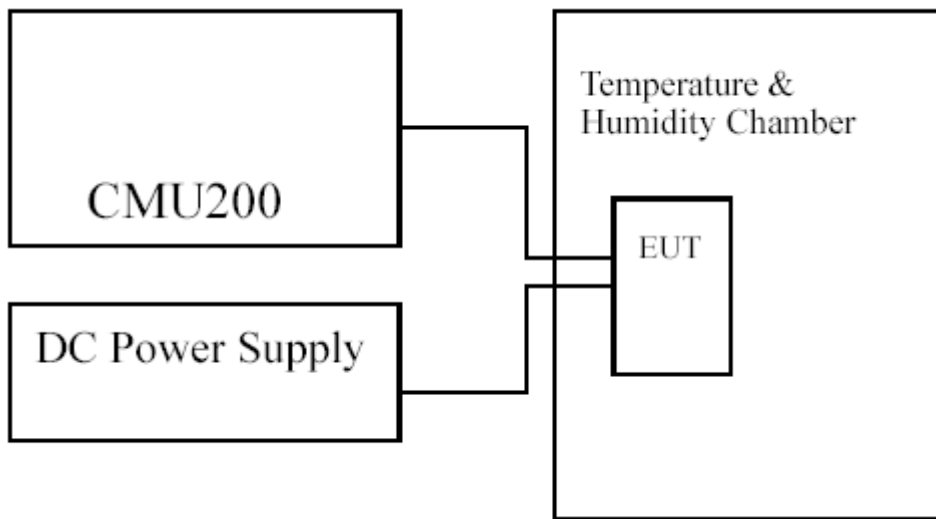
6.1. Test Equipment

The following test equipments are used during the frequency stability test:

Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Universal Radio Communication Tester	R & S	CMU200 / 104846	May., 2010
Standard Temperature & Humidity Chamber	WIT	TH-1S-B / 108210	Sep., 2010
DC Power Supply	Agilent	87421A / MY44350304	Apr., 2010

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

6.2. Test Setup



6.3. Limits

Limit	$<\pm 2.5\text{ppm}$
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6.4. 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, (CMU200), was used to measure The Frequency Error. The maximum result of measurements was recorded.

6.5. Test Specification

According to Part 2.1055,22.355,24.235

6.6. Test Result of Frequency Stability Under Temperature Variations

Product	HE863-EUD		
Test Mode	Frequency Stability Under Temperature Variations & Voltage Variations		
Date of Test	2010/11/25	Test Site	CTR
Test Condition	GSM 850 GPRS / Channel 189	Test Range	-30°C ~+50°C

Frequency Stability Under Temperature Variations

Temperature Interval(°C)	Test Frequency (GHz)	Deviation (Hz)	Limit (KHz)
-30	0.836	-29	±2.09
-20	0.836	-25	±2.09
-10	0.836	-16	±2.09
0	0.836	-18	±2.09
10	0.836	-21	±2.09
20	0.836	-17	±2.09
30	0.836	-19	±2.09
40	0.836	-43	±2.09
50	0.836	-51	±2.09

Voltage Variations

DC Voltage (V)	Test Frequency (GHz)	Deviation (Hz)	Limit (KHz)
4.2	0.836	-23	±2.09
3.8	0.836	-17	±2.09
3.4	0.836	-18	±2.09

Product	HE863-EUD		
Test Mode	Frequency Stability Under Temperature Variations & Voltage Variations		
Date of Test	2010/11/25	Test Site	CTR
Test Condition	GSM 850 EGPRS / Channel 189	Test Range	-30°C ~+50°C

Frequency Stability Under Temperature Variations

Temperature Interval(°C)	Test Frequency (GHz)	Deviation (Hz)	Limit (KHz)
-30	0.836	-48	±2.09
-20	0.836	-54	±2.09
-10	0.836	-44	±2.09
0	0.836	-46	±2.09
10	0.836	-43	±2.09
20	0.836	-45	±2.09
30	0.836	-42	±2.09
40	0.836	-50	±2.09
50	0.836	-43	±2.09

Voltage Variations

DC Voltage (V)	Test Frequency (GHz)	Deviation (Hz)	Limit (KHz)
4.2	0.836	-39	±2.09
3.8	0.836	-45	±2.09
3.4	0.836	-47	±2.09

Product	HE863-EUD		
Test Mode	Frequency Stability Under Temperature Variations & Voltage Variations		
Date of Test	2010/11/25	Test Site	CTR
Test Condition	PCS 1900 GPRS / Channel 698	Test Range	-30°C ~+50°C

Frequency Stability Under Temperature Variations

Temperature Interval(°C)	Test Frequency (GHz)	Deviation (Hz)	Limit (KHz)
-30	1.88	-16	±4.7
-20	1.88	29	±4.7
-10	1.88	-38	±4.7
0	1.88	46	±4.7
10	1.88	-34	±4.7
20	1.88	-26	±4.7
30	1.88	-39	±4.7
40	1.88	-48	±4.7
50	1.88	-41	±4.7

Voltage Variations

DC Voltage (V)	Test Frequency (GHz)	Deviation (Hz)	Limit (KHz)
4.2	1.88	-36	±4.7
3.8	1.88	-26	±4.7
3.4	1.88	-29	±4.7

Product	HE863-EUD		
Test Mode	Frequency Stability Under Temperature Variations & Voltage Variations		
Date of Test	2010/11/25	Test Site	CTR
Test Condition	PCS 1900 EGPRS / Channel 698	Test Range	-30°C ~+50°C

Frequency Stability Under Temperature Variations

Temperature Interval(°C)	Test Frequency (GHz)	Deviation (Hz)	Limit (KHz)
-30	1.88	-38	±4.7
-20	1.88	41	±4.7
-10	1.88	-47	±4.7
0	1.88	-59	±4.7
10	1.88	-51	±4.7
20	1.88	-56	±4.7
30	1.88	-55	±4.7
40	1.88	-67	±4.7
50	1.88	-58	±4.7

Voltage Variations

DC Voltage (V)	Test Frequency (GHz)	Deviation (Hz)	Limit (KHz)
4.2	1.88	-54	±4.7
3.8	1.88	-56	±4.7
3.4	1.88	-58	±4.7

7. EMI Reduction Method During Compliance Testing

No modification was made during testing.

Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs