FCC/IC Test Report

FOR:

Manufacturer: 3SI Security Systems

Model Name: GT83000, GT83000VP, GT83000R2, & GT83100
Product Description: Asset Tracking and Alert Device

FCC ID: Q6KGT83000A
IC ID: 5043A-GT83000A

47 CFR Part 2, 22, 24

RSS-132 Issue 3

RSS-133 Issue 6

TEST REPORT #: EMC_3SISE-020-12001_WWAN
DATE: 2013-04-04

ACCREDITED
TESTING LABORATORY
Certificate #2135.01

CTIA Authorized Test Lab
LAB CODE 20020328-00

FCC:
Accredited

IC recognized #
3462B-1

***CETECOM* Inc.**
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CETECOM Inc. is a Delaware Corporation with Corporation number: 2905571

Table of Contents

1 Assessment

The following device was tested against the applicable criteria specified in FCC rules Parts 2, 22 and 24 of Title 47 of the Code of Federal Regulations and Industry Canada Standards RSS 132 and RSS 133 and no deviations were ascertained during the course of the tests performed.

Company	Description	Model #
3SI Security Systems	Asset Tracking and Alert Device	GT83000, GT83000VP, GT83000R2, GT83100

Responsible for Testing Laboratory:

Date	Section	Name	Signature
2013-04-04	Compliance	Sajay Jose (Test Lab Manager)	

Responsible for the Report:

Date	Section	Name	Signature
2013-04-04	Compliance	Daniel Salinas (EMC Engineer)	Digitally signed by Daniel Salinas DN: cn=Daniel Salinas, c=US, o=Cetecom, Inc., ou=Compliance, email=daniel.salinas@cetecom.com Date: 2013.04.04 14:34:12 -07'00'

The test results of this test report relate exclusively to the test item specified in Section3.
CETECOM Inc. USA does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of CETECOM Inc. USA.

2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the Test Report

Company Name:	CETECOM Inc.
Department:	Compliance
Address:	411 Dixon Landing Road Milpitas, CA 95035 U.S.A.
Telephone:	+1 (408) 586 6200
Fax:	+1 (408) 586 6299
Test Lab Manager:	Sajay Jose
Responsible Project Leader:	Daniel Salinas

2.2 Identification of the Client

Applicant's Name:	3SI Security Systems
Street Address:	486 Thomas Jones Way
City/Zip Code	Exton, PA 19341
Country	USA
Contact Person:	Latha Ravi
Phone No.	478-718-5791
e-mail:	latha_ravi@3SISecurity.com

2.3 Identification of the Manufacturer

Same as client

2.4 Environmental conditions during Test:

The following environmental conditions were maintained during the course of testing:
Ambient Temperature: 20-25^{o}C
Relative humidity: 40-60%

2.5 Dates of Testing:

Aug 27, 2012 - Feb 25, 2013

3 Equipment under Test (EUT)

3.1 Specification of the Equipment under Test

Marketing Name:	Cash Tracker
Model No:	Base Model: GT83000 Variant Models: GT83000VP, GT83000R2, GT83100
Product Type:	Asset Tracking and Alert Device
FCC-ID:	Q6KGT83000A
IC-ID :	5043A-GT83000A
Supported frequency bands of operation:	GSM/GPRS: 850/900/1800/1900 MHz
Frequency range of test:	GSM 850: 824.2-848.8MHz PCS 1900: 1850.2-1909.8MHz
Type(s) of Modulation:	GSM: GMSK
Number of channels:	GSM850: 125 PCS 1900: 300
Antenna Info:	Inverted F antenna Manufacturer stated antenna Gain: 1 – 3 dBi
Other radios in the device:	Beacon Transmitter: 219.6 MHz GPS Receiver: 1575.42 MHz
Rated Operating Voltage Range(DC):	Internal Battery Operated 3.3V (Low) / 3.7V (Nominal) / 4.2V (Max)
Rated Operating Temperature Range:	**GT83000/GT83000VP/GT83100:** -20^{o}C to + 40^{o}C **GT83000R2:** -20^{o}C to +60^{o}C
Test Sample status:	Production

3.2 Identification of the Equipment under Test (EUT)

EUT #	SN/ IMEI:	HW Version	SW Version	Model	Note
1	35259904476333703	1.0.0	9.09.07	GT83000	-
2	3529605186885003	1.0.5	9.09.07	GT83000	Radiated Sample
3	35466004458020003	1.0.5	9.13.03	GT83000VP	Radiated Sample
4	3525990414093103	1.0.1	9.13.03	GT83000R2	Radiated Sample
5	35259904606520203	1.0.1	9.13.03	GT83100	Radiated Sample
6	35466004711704203	1.0.1	9.13.03	GT83100 Folded	Radiated Sample

4 Subject of Investigation

The objective of the measurements done by Cetecom Inc. was to measure the performance of the EUT as specified by requirements listed in the following test standards:

- 47 CFR Part 2: Title 47 of the Code of Federal Regulations: Chapter I-Federal Communications Commission Frequency allocations and radio treaty matters; general rules and regulations.
- 47 CFR Part 22: Title 47 of the Code of Federal Regulations: Chapter I-Federal Communications Commission subchapter B- common carrier services; Part 22- Public mobile services
- 47 CFR Part 24: Title 47 of the Code of Federal Regulations: Chapter I-Federal Communications Commission subchapter B- common carrier services; Part 24- Personal communication services
- RSS 132- Issue 3: Spectrum management and telecommunication policy- Radio Standards Specifications Cellular telephones operating in the bands 824-849MHz and 869-894MHz
- RSS 133- Issue 6: Spectrum management and telecommunication policy- Radio Standards Specifications- 2GHz personal communication services

This report is to support a request for a Class 2 Permissive Change under the FCC ID: Q6KGT83000A and IC ID: 5043A-GT83000A; as well as IC Family approval of the additional models GT83000VP, GT83000R2 and GT83100.

The EUT incorporates a pre-certified module Telit GE865-QUAD.
Based on verification that the module's conducted output power is within documented production tolerances and following guidance from FCC KDB 996369 this test report covers the radiated test portion of the above listed FCC/IC rule parts.

This test report contains radiated test data as per FCC 22H/24E and conducted power verification required per KDB 996369 on model GT83000.

Based on the manufacturer's product equality declaration that models GT83000VP, GT83000R2, & GT83100 incorporate the same WWAN portion (Telit GE865-QUAD module radio, antenna and associated circuitry) as in GT83000, only Radiated Spurious Emissions testing, in mid channel of operation , is performed on these additional models to prove compliance against all the above listed FCC/IC rule parts.

5 Summary of Measurement Results

850MHz Band:

Test Specification	Test Case	Temperature and Voltage Conditions	Mode	Pass	Fail	NA	NP	Models Tested	Result
§2.1046 §22.913 (a) RSS132 4.4	RF Output Power	Nominal	GSM 850	■	☐	☐	☐	GT83000	Complies
§2.1055 §22.355 RSS132 4.3	Frequency Stability	Nominal	GSM 850	☐	☐	☐	■	GT83000	Complies*
§2.1049 §22.917(b) RSS132 4.2	Occupied Bandwidth	Nominal	GSM 850	☐	☐	☐	■	GT83000	Complies*
§2.1051 §22.917 RSS132 4.5	Band Edge Compliance	Nominal	GSM 850	☐	☐	☐	■	GT83000	Complies*
§2.1051 §22.917 RSS132 4.5	Conducted Spurious Emissions	Nominal	GSM 850	☐	☐	☐	■	GT83000	Complies*
§2.1053 §22.917 RSS132 4.5	Radiated Spurious Emissions	Nominal	GSM 850	■	☐	☐	☐	GT83000, GT83000VP, GT83000R2, GT83100	Complies

Note: NA= Not Applicable; NP= Not Performed

* Compliance data referenced from module test report #RFI/RPT2/RP76937JD03B issued by RFI Global LTD. on 2010-09-20

1900MHz Band:

Test Specification	Test Case	Temperature and Voltage Conditions	Mode	Pass	Fail	NA	NP	Models Tested	Result
§2.1046 §24.232 (a) RSS133 6.4	RF Output Power	Nominal	GSM 1900	■	☐	☐	☐	GT83000	Complies
§2.1055 §24.235 RSS133 6.3	Frequency Stability	Nominal	GSM 1900	☐	☐	■	☐	GT83000	Complies*
§2.1049 §24.238(b) RSS133 6.2	Occupied Bandwidth	Nominal	GSM 1900	☐	☐	■	☐	GT83000	Complies*
§2.1051 §24.238 RSS133 6.5	Band Edge Compliance	Nominal	GSM 1900	☐	☐	■	☐	GT83000	Complies*
§2.1051 §24.238 RSS133 6.5	Conducted Spurious Emissions	Nominal	GSM 1900	☐	☐	■	☐	GT83000	Complies*
§2.1053 §24.238 RSS133 6.5	Radiated Spurious Emissions	Nominal	GSM 1900	■	☐	☐	☐	GT83000, GT83000VP, GT83000R2, GT83100	Complies

Note: NA= Not Applicable; NP= Not Performed

* Compliance data referenced from module test report #RFI/RPT2/RP76937JD03A #RFI/RPT2/RP76937JD03B issued by RFI Global LTD. on 2010-09-20

6 Measurements

6.1 RF Power Output

6.1.1 References

FCC: CFR Part 2.1046, CFR Part 22.913, CFR Part 24.232
IC: RSS-Gen Section 4.8; RSS 132 Section 5.4; RSS 133 Section 6.4

6.1.2 Measurement requirements:

6.1.2.1 FCC 2.1046: RF power output.

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 circuit elements as specified. The electrical characteristics of the radio frequency load attached to the output terminals when this test is made shall be stated.

6.1.2.2 RSS-Gen 4.8: RF power output.

Transmitter output power measurements shall be carried out before the unwanted emissions test. The transmitter output power value, obtained from this test, serves as the reference level used to determine the unwanted emissions.

6.1.3 Limits:

6.1.3.1 FCC 22.913 (a) Effective radiated power limits.

The effective radiated power (ERP) of mobile transmitters must not exceed 7 Watts.

6.1.3.2 FCC 24.232 (b)(c) Power limits.

(b) Mobile/portable stations are limited to 2 Watts effective isotropic radiated power (EIRP).
(c) Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms equivalent voltage. The measurement results shall be properly adjusted for any limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, sensitivity, etc., so as to obtain a true peak measurement over the full bandwidth of the channel.

6.1.3.3 RSS-132 Section 5.4

The transmitter output power shall be measured in terms of average power. The equivalent isotropically radiated power (e.i.r.p.) for mobile equipment shall not exceed 11.5 watts.In addition, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time using a signal corresponding to the highest PAPR during periods of continuous transmission.

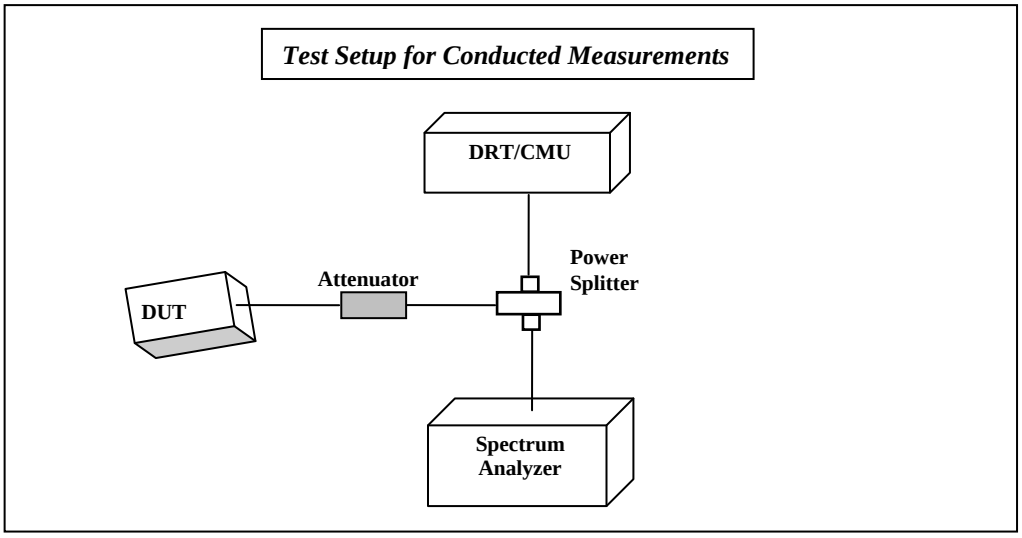
6.1.3.4 RSS-133 Section 6.4

The average equivalent isotropically radiated power (e.i.r.p.) for transmitters shall not exceed the limits given in SRSP-510.
SRSP-510: Mobile stations and hand-held portables are limited to 2 watts maximum e.i.r.p.
In addition, the transmitter's peak-to-average power ratio (PAPR) shall not exceed 13 dB for more than 0.1% of the time using a signal corresponding to the highest PAPR during periods of continuous transmission.

6.1.4 Conducted Output Power Verification:

6.1.4.1 Measurement Procedure:

Ref: TIA-603C 2004 2.2.1



1. Connect the equipment as shown in the above diagram. A Digital Radio Communication Tester (DRT: R&S CMU200 here) is used to enable the EUT to transmit and to measure the output power.
2. Adjust the settings of the CMU200 to set the EUT to its maximum power at the required channel.
3. Record the Peak and Average Output power levels measured by the CMU200.
4. Correct the measured level for all losses in the RF path.
5. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band and for all types of modulation schemes.
6. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band and for all types of modulation schemes.
    a. GMSK mode measurements are performed in circuit switched configuration.

6.1.4.2 Measurement Uncertainty

+/- 0.5 dB

6.1.4.3 Test Conditions:

Tnom: 20^{o}C; Vnom: 3.7 V

6.1.4.4 Measurement Results- Peak Output Power:

GSM Cellular 850 (GMSK Mode)		
Frequency (MHz)	**Conducted Output Power from module certification (Peak)**	**Conducted Output Power from the EUT (Peak)**
	(dBm)	**(dBm)**
824.2	31.8	32.5
836.6	31.6	32.6
848.8	31.6	32.5

GSM PCS 1900 (GMSK Mode)		
Frequency (MHz)	**Conducted Output Power from module certification (Peak)**	**Conducted Output Power from the EUT (Peak)**
	(dBm)	**(dBm)**
1850.2	29.4	28.1
1880	29.0	28.3
1909.8	28.9	27.8

6.1.4.4.1 Verification Result

All measured results remain within the tolerance specified from the module manufacturer .

6.1.4.5 Measurement Results- Peak to Average Ratio:

6.1.4.5.1 Limits

RSS-132 and RSS-133

Peak to Average Ratio shall not exceed 13dB.

GSM Cellular 850 (GMSK Mode)			
Frequency (MHz)	**Measured Peak Power**	**Measured Average Power**	**Peak to Average Ratio**
	(dBm)	**(dBm)**	
824.2	32.5	32.0	0.5
836.6	32.6	32.0	0.6
848.8	32.5	32.0	0.5

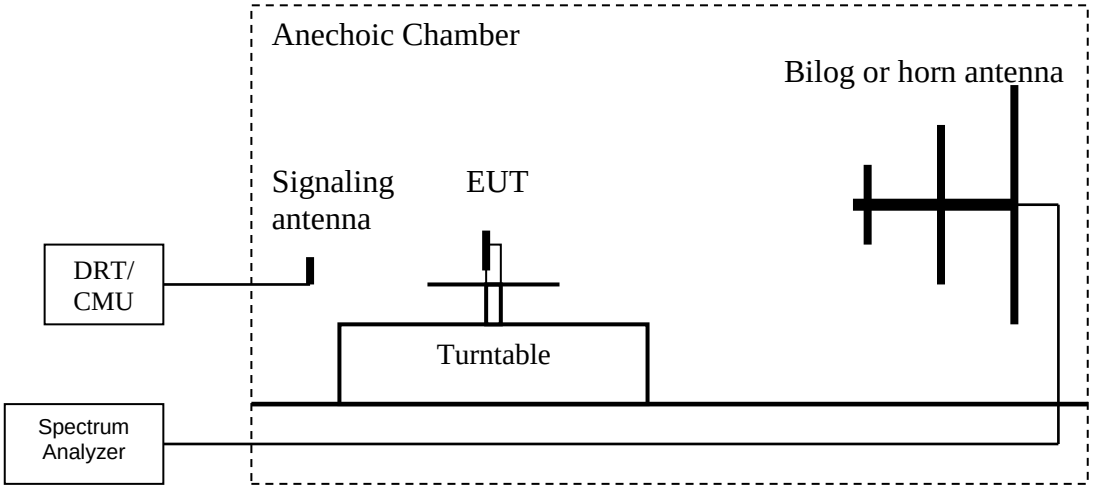
GSM Cellular 1900 (GMSK Mode)			
Frequency (MHz)	**Measured Peak Power**	**Measured Average Power**	**Peak to Average Ratio**
	(dBm)	**(dBm)**	
1850.2	28.1	27.9	0.2
1880.0	28.3	28.1	0.2
1909.8	27.8	27.5	0.3

6.1.4.5.2 Measurement Verdict:

Pass.

6.1.5 Radiated Output Power Measurement procedure

Ref: TIA-603C 2004 -2.2.17.2 Effective Radiated Power (ERP) or Effective Isotropic Radiated Power (EIRP)



1. Connect the equipment as shown in the above diagram with the EUT's antenna in center of the turn table.
2. Adjust the settings of the Digital Radio Communication Tester (DRT) to set the EUT to its maximum power at the required channel.
3. Set the spectrum analyzer to the channel frequency. Set the analyzer to measure peak hold with the required settings.
4. Rotate the EUT 360°. Record the peak level in dBm (**LVL**).
5. Replace the EUT with a vertically polarized half wave dipole or known gain antenna. The center of the antenna should be at the same location as the center of the EUT's antenna.
6. Connect the antenna to a signal generator with known output power and record the path loss in dB (**LOSS)**. **LOSS** = Generator Output Power (dBm) – Analyzer reading (dBm).
7. Determine the ERP using the following equation:
   ERP (dBm) = **LVL** (dBm) + **LOSS** (dB)
8. Determine the EIRP using the following equation:
   EIRP (dBm) = **ERP** (dBm) + 2.14 (dB)
9. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band.

6.1.5.1 Measurement Uncertainty

+/- 3 dB

6.1.5.2 Test Conditions:

Tnom: 23^{o}C; Vnom: 3.7 V

6.1.6 RF Power Output 850MHz band

Limit: FCC: Nominal Peak Output Power < 38.45 dBm (7W)
IC: Nominal Peak Output Power < 40.60 dBm (11.5W)

GSM 850: GMSK Mode	
Frequency (MHz)	**Radiated Power**
	ERP (dBm)
824.2	28.6
836.6	29.9
848.8	31.2

6.1.6.1 Measurement Verdict:

Pass.

6.1.7 RF Power Output 1900MHz band

Limit: Nominal Peak Output Power < 33 dBm (2W)

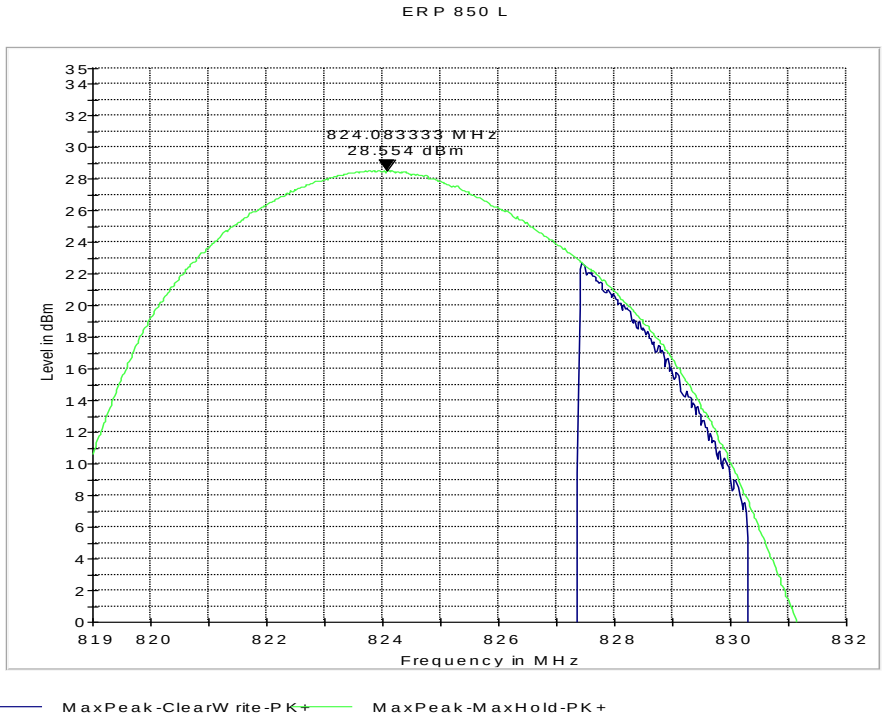
GSM 1900: GMSK Mode	
Frequency (MHz)	**Radiated Power**
	EIRP (dBm)
1850.2	30.3
1880.0	30.3
1909.8	29.1

6.1.7.1 Measurement Verdict:

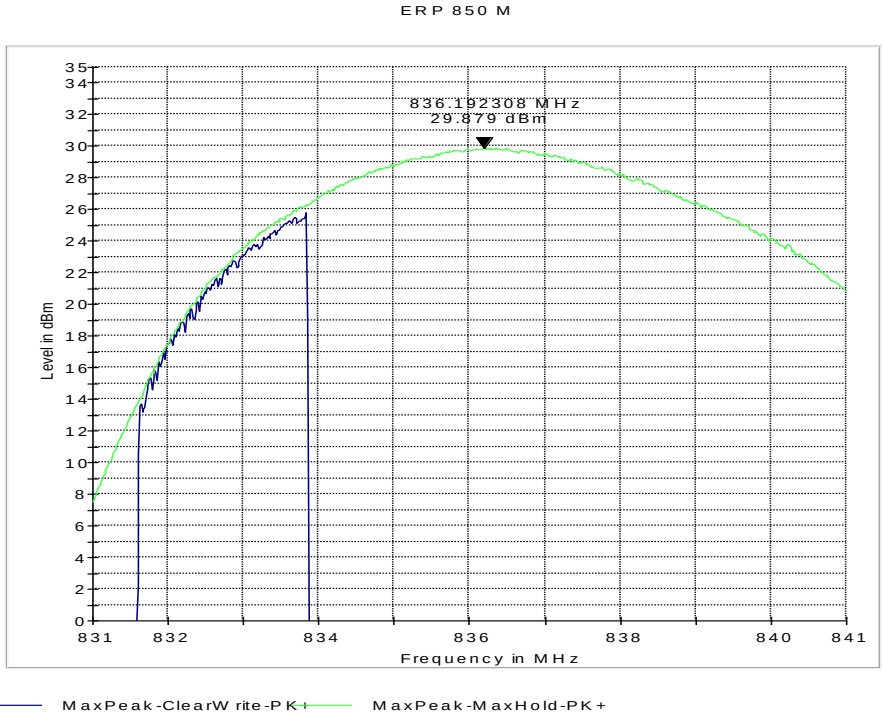
Pass.

6.1.8 Results

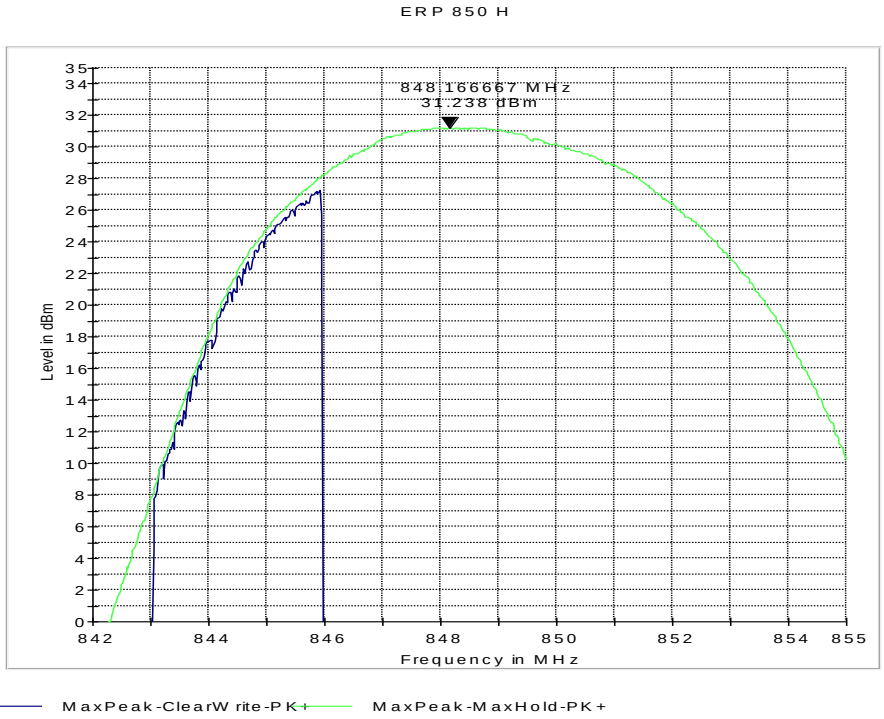
ERP (GSM 850) CHANNEL 128



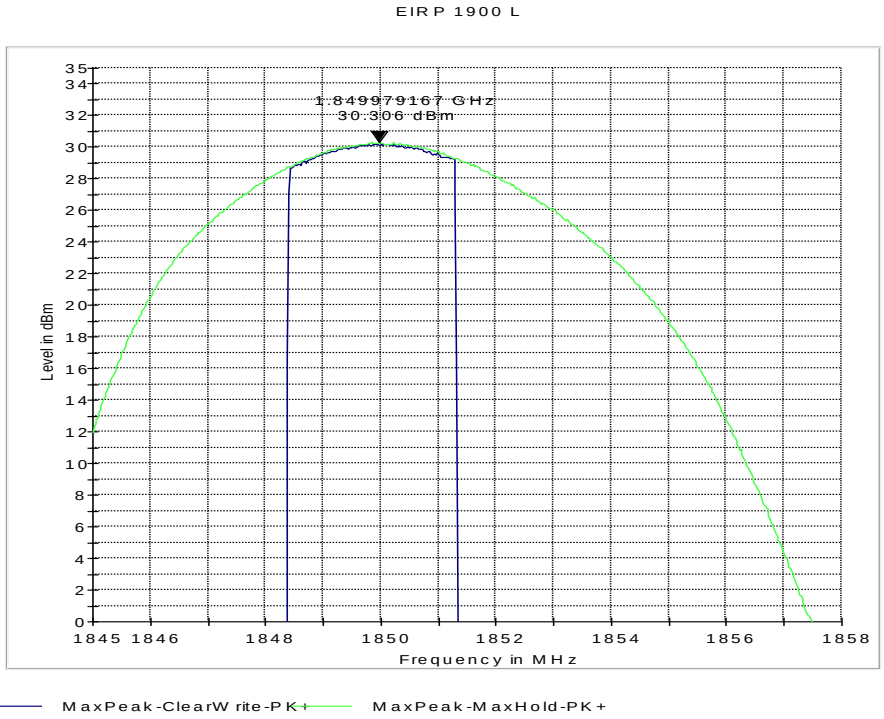
ERP (GSM 850) CHANNEL 190



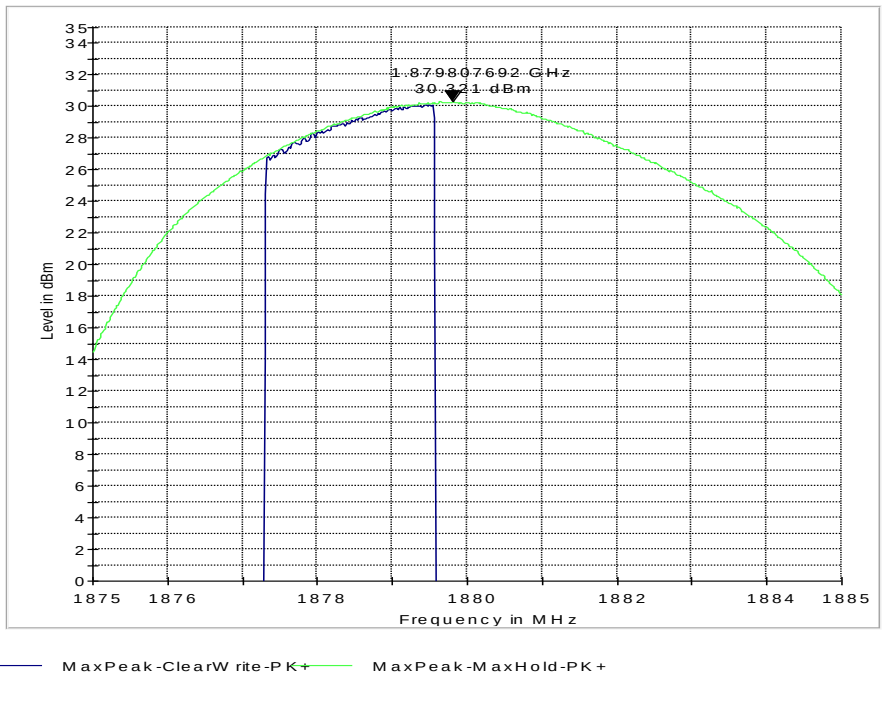
ERP (GSM 850) CHANNEL 251



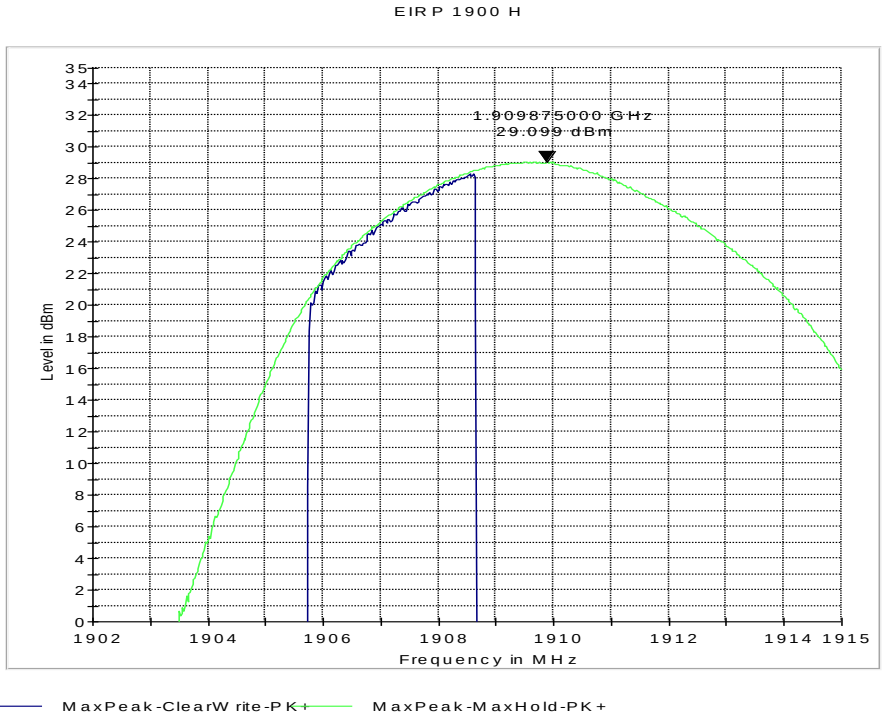
EIRP (PCS-1900) CHANNEL 512



EIRP (PCS-1900) CHANNEL 661



EIRP (PCS-1900) CHANNEL 810



6.2 Spurious Emissions Radiated

6.2.1 References

FCC: CFR Part 2.1053, CFR Part 22.917, CFR Part 24.238
IC: RSS-Gen Section 4.9; RSS 132 Section 4.5; RSS 133 Section 6.5

6.2.2 Measurement requirements:

6.2.2.1 FCC 2.1053: Field strength of spurious radiation.

Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission.

6.2.2.2 RSS-Gen 4.9: Transmitter unwanted spurious emissions

The same parameter, peak power or average power, used for the transmitter output power measurement shall be used for unwanted emission measurements.
The search for unwanted emissions shall be from the lowest frequency internally generated or used in the device (local oscillator, intermediate or carrier frequency), or from 30 MHz, whichever is the lower, to the 5th harmonic of the highest frequency generated without exceeding 40 GHz.

6.2.3 Limits:

(a) *Out of band emissions*. 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.
For all power levels +30dBm to 0dBm, this becomes a constant specification of -13dBm.

6.2.3.1 FCC 22.917 Emission limitations for cellular equipment.

The rules in this section govern the spectral characteristics of emissions in the Cellular Radiotelephone Service.
(b) *Measurement procedure.* Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (*i.e.* 100 kHz of 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

6.2.3.2 FCC 24.238 Emission limitations for Broadband PCS equipment.

The rules in this section govern the spectral characteristics of emissions in the Broadband Personal Communications Service.
(b) Measurement procedure. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to

improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (*i.e.* 100 kHz of 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

6.2.3.3 RSS-132 Section 5.5

i. In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified inSection 5.1, the power of emissions per any 1% of the occupied bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10p (watts).

ii. After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any 100 kHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10 p (watts). If the measurement is performed using 1% of the occupied bandwidth, power integration over 100 kHz is required.

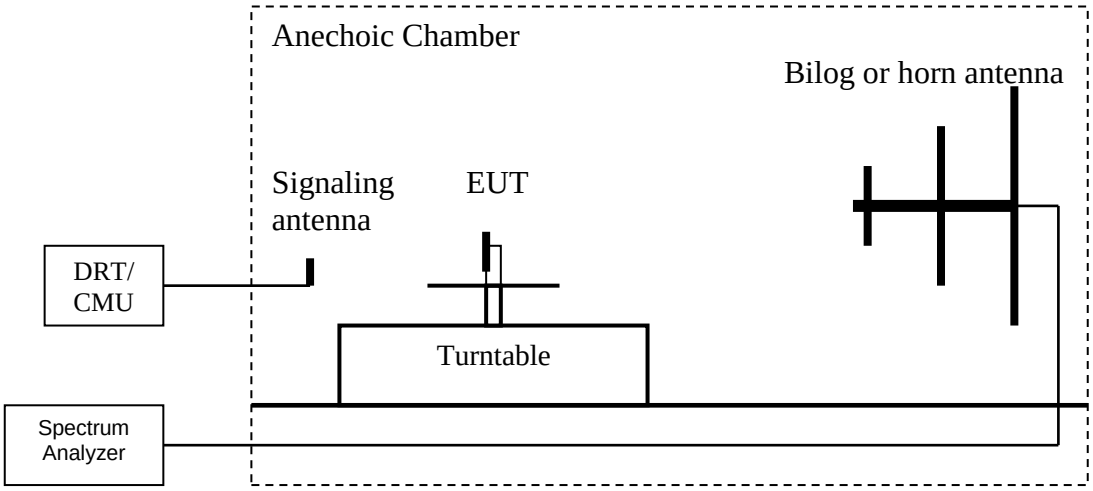
6.2.3.4 RSS-133 Section 6.5.1

i. In the 1.0 MHz bands immediately outside and adjacent to the equipment's operating frequency block, the emission power per any 1% of the emission bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10p(watts).

ii. After the first 1.0 MHz, the emission power in any 1 MHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10p(watts). If the measurement is performed using 1% of the emission bandwidth, power integration over 1.0 MHz is required.

6.2.4 Radiated out of band measurement procedure:

Ref: TIA-603C 2004- 2.2.12 Unwanted emissions: Radiated Spurious



1. Connect the equipment as shown in the above diagram with the EUT's antenna in a horizontal orientation.
2. Adjust the settings of the Digital RadioCommunication Tester (DRT) to set the EUT to its maximum power at the required channel.
3. Set the spectrum analyzer to measure peak hold with the required settings.
4. Place the measurement antenna in a horizontal orientation. Rotate the EUT 360°. Raise the measurement antenna up to 4 meters in 0.5 meters increments and rotate the EUT 360° at each height to maximize all emissions. Measure and record all spurious emissions (**LVL**) up to the tenth harmonic of the carrier frequency.
5. Replace the EUT with a horizontally polarized half wave dipole or known gain antenna. The center of the antenna should be at the same location as the center of the EUT's antenna.
6. Connect the antenna to a signal generator with known output power and record the path loss in dB (**LOSS)**. **LOSS** = Generator Output Power (dBm) – Analyzer reading (dBm).
7. Determine the level of spurious emissions using the following equation:
   Spurious (dBm) = **LVL** (dBm) + **LOSS** (dB):
8. Repeat steps 4, 5 and 6 with all antennas vertically polarized.
9. Determine the level of spurious emissions using the following equation:
   Spurious (dBm) = **LVL** (dBm) + **LOSS** (dB):
10. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band.
    (N**ote:** Steps 5 and 6 above are performed prior to testing and **LOSS** is recorded by test software. Steps 3, 4 and 7 above are performed with test software.)

6.2.5 Sample Calculations for Radiated Measurements

6.2.5.1 Power Measurements using Substitution Procedure:

The measurement on the Spectrum Analyzer is used as a basis for the Substitution procedure.
The EUT is replaced with a Signal Generator and an antenna. The setting on the Signal Generator is varied until the Spectrum Analyzer displays the original reading. EIRP is calculated as-

EIRP (dBm)= Signal Generator setting (dBm)- Cable Loss (dB)+ Antenna Gain (dBi)
Eg:

Frequency (MHz)	Measured SA (dBµV)	Signal Generator setting (dBm)	Antenna Gain (dBi)	Dipole Gain (dBd)	Cable Loss (dB)	EIRP (dBm)
1000	95.5	24.5	6.5	0	3.5	27.5

Measurement Survey:

The site is constructed in accordance with ANSI C63.4 requirements and is recognized by the FCC to be in compliance for a 3m site. The spectrum is scanned from 30MHz to the 10th harmonic of the highest frequency generated by the EUT.
Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the GSM-850 & PCS-1900 bands. It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of the GSM-850 & PCS-1900 band into any of the other blocks respectively. The equipment must still, however, meet emissions requirements with the carrier at all frequencies over which it is capable of operating and it is the manufacturer's responsibility to verify this.

Radiated emission measurements were made in Circuit Switched mode.

For radiated measurements, all data in this report shows the worst case emissions data between H/V antenna polarizations and for all 3 orthogonal orientations of the EUT.

Unless mentioned otherwise, the emission signals above the limit line in the plots are from the transmit carrier.

Measurement Uncertainty= +/- 3.0 dB.

6.2.6 Test Conditions:

Tnom: 20^{o}C; Vnom: 3.7 V

6.2.7 Radiated out of band emissions results on EUT- Transmit Mode:

6.2.7.1 Test Results Transmitter Spurious Emission GSM850 – GT83000:

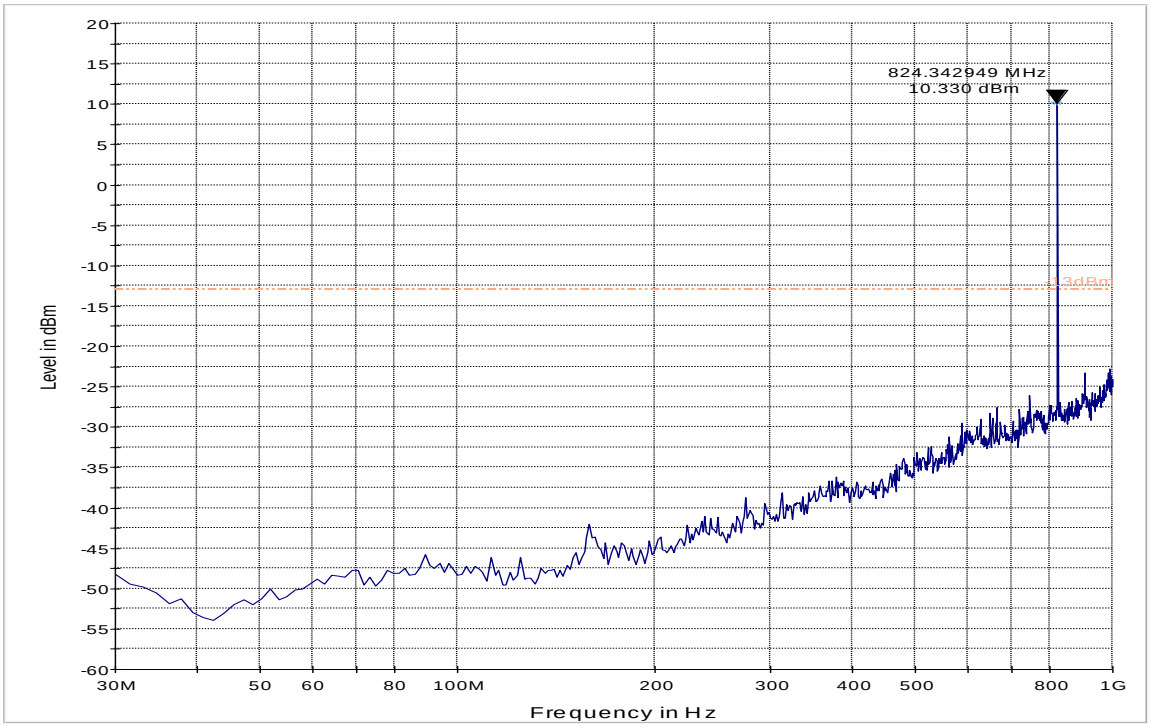
Harmonic	Tx ch-128 Freq. (MHz)	Level (dBm)	Tx ch-190 Freq. (MHz)	Level (dBm)	Tx ch-251 Freq. (MHz)	Level (dBm)
2	**1648.4**	-48	**1673.2**	-52.4	**1697.6**	-48
3	**2472.6**	-40.8	**2509.8**	-21.6	**2546.4**	-50
4	**3296.8**	-52.3	**3346.4**	-52.5	**3395.2**	-49.9
5	**4121**	NF	**4183**	NF	**4244**	NF
6	**4945.2**	-47.8	**5019.6**	-41.9	**5092.8**	-47.5
7	**5769.4**	NF	**5856.2**	-45	**5941.6**	-45
8	**6593.6**	NF	**6692.8**	-45	**6790.4**	-45
9	**7417.8**	NF	**7529.4**	NF	**7639.2**	-40.2
10	**8242**	NF	**8366**	NF	**8488**	NF
NF = Noise Floor Measurement Uncertainty: ±3dB						

6.2.7.2 Measurement Result

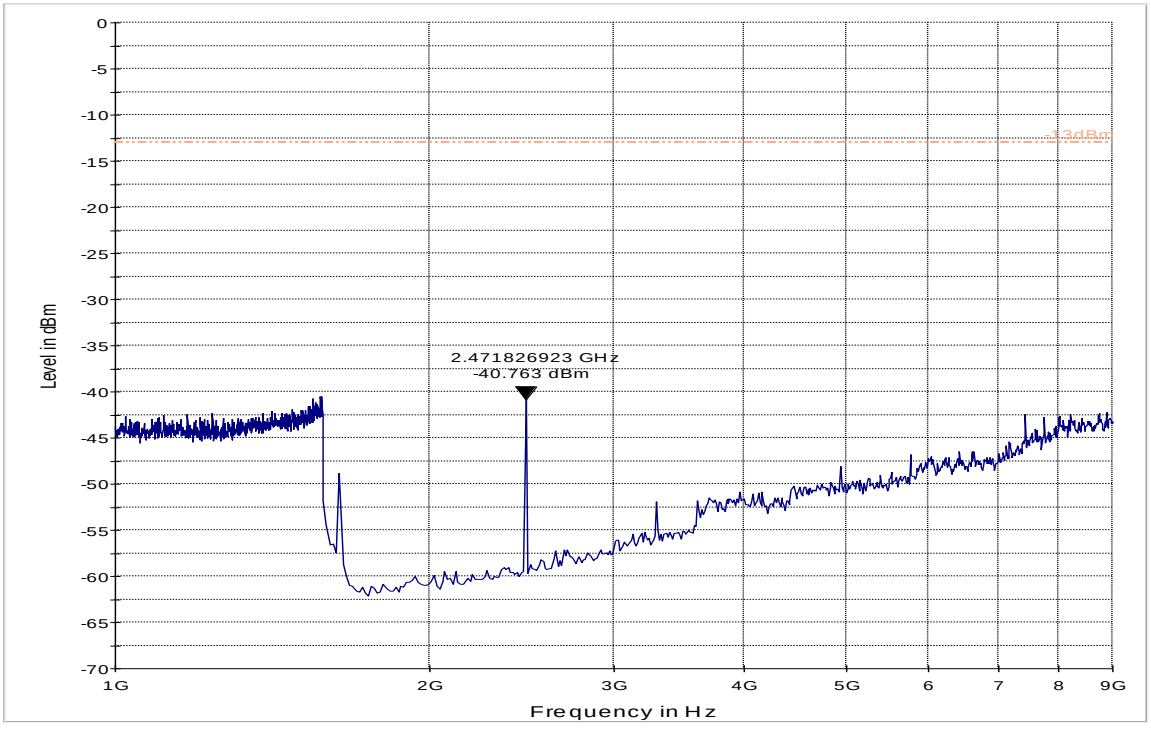
Pass.

Radiated Spurious Emissions (GSM-850) Tx: Low Channel – GT83000

Test results 30M-1GHz

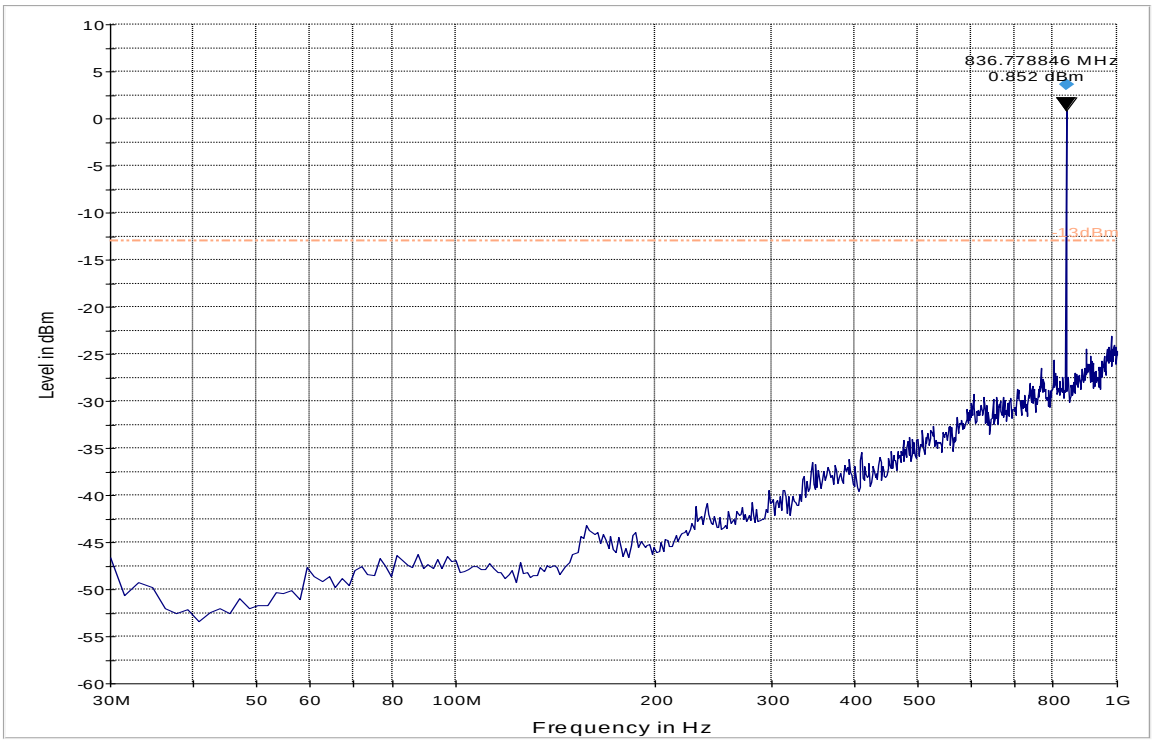


Test results 1GHz-9GHz – GT83000

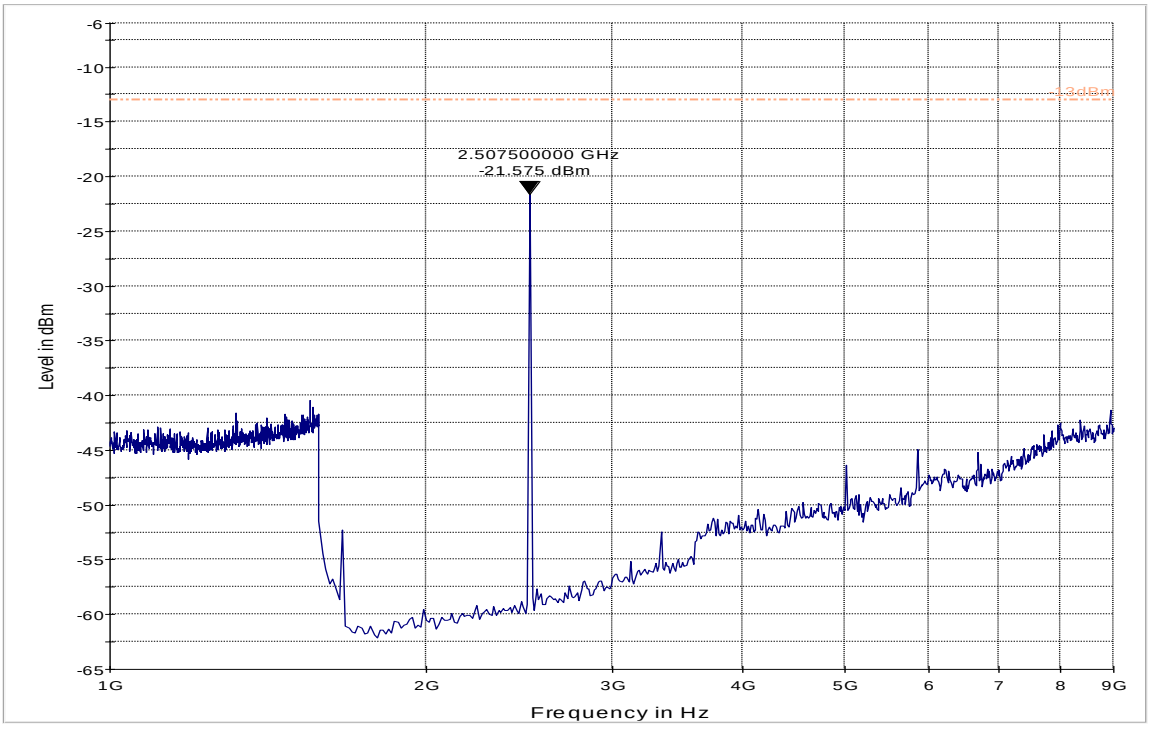


Radiated Spurious Emissions (GSM-850) Tx: Mid Channel – GT83000

Test results 30M-1GHz

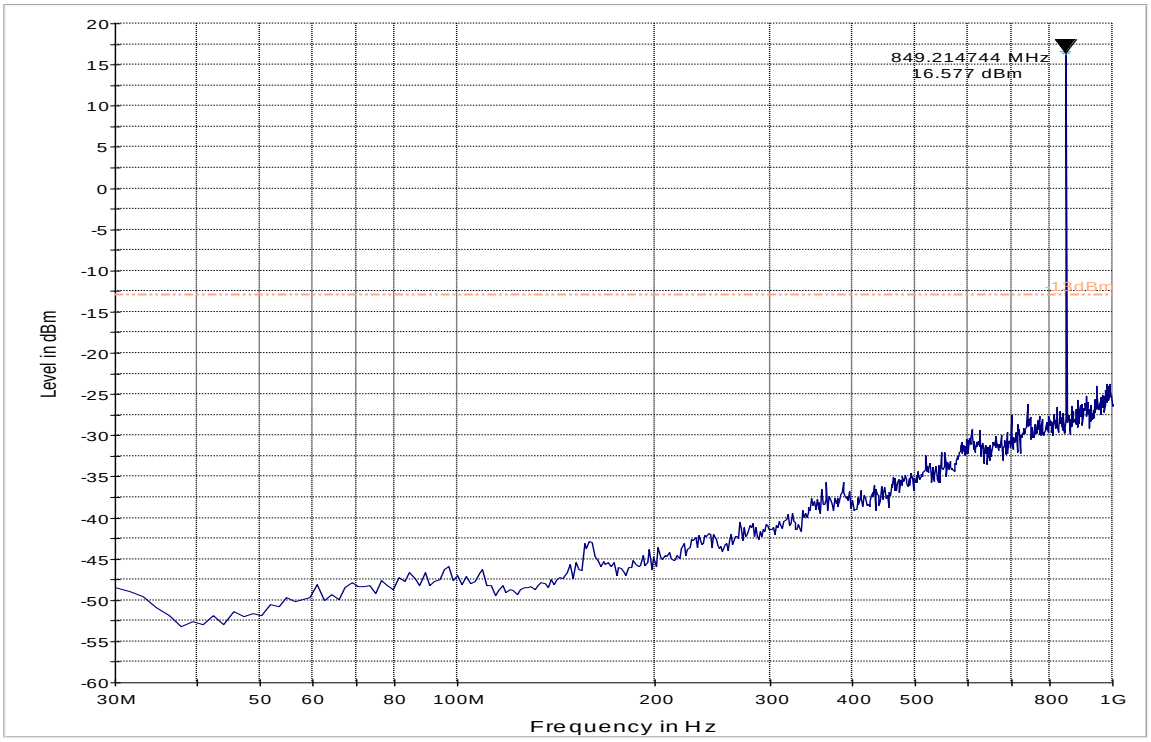


Test results 1GHz-9GHz – GT83000

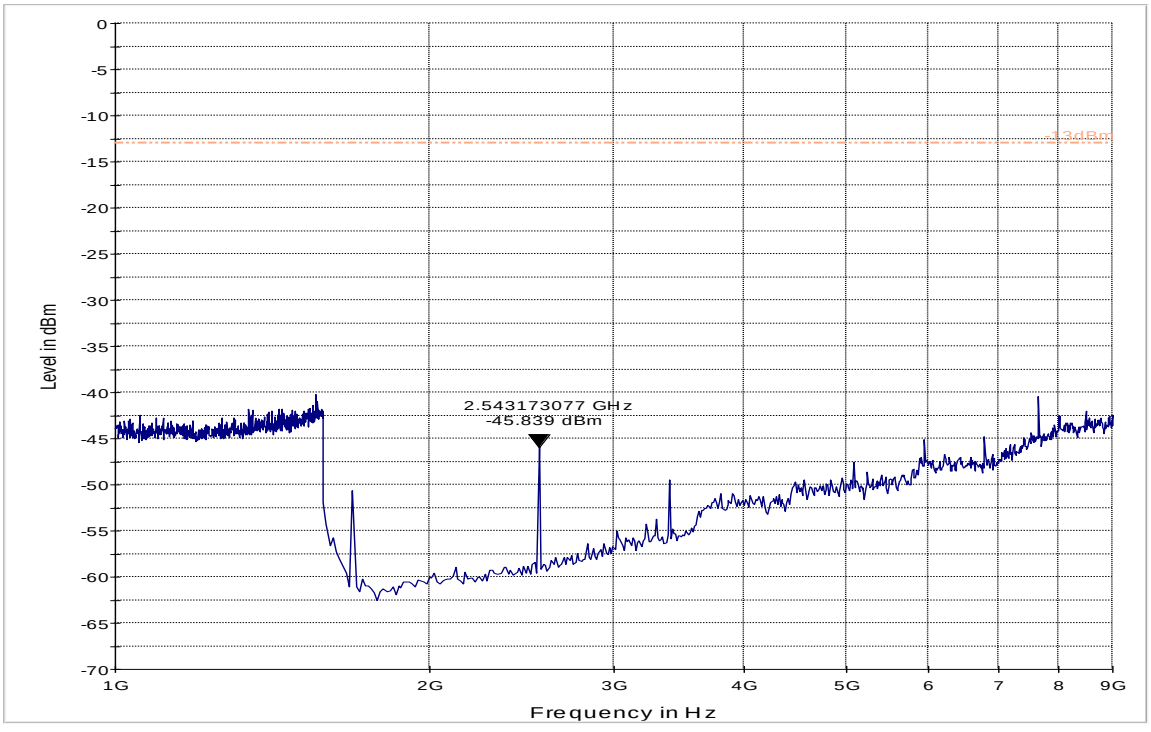


Radiated Spurious Emissions (GSM-850) Tx: High Channel – GT83000

Test results 30M-1GHz



Test results 1GHz-9GHz – GT83000



6.2.7.3 Test Results Transmitter Spurious Emission GSM850 – Variant Models:

Harmonic	GT83000VP Tx ch-190 Freq. (MHz)	Level (dBm)	GT83000R2 Tx ch-190 Freq. (MHz)	Level (dBm)	GT83100 Tx ch-190 Freq. (MHz)	Level (dBm)
2	**1673.2**	-57	**1673.2**	-46	**1673.2**	-49
3	**2509.8**	-46.67	**2509.8**	-47.7	**2509.8**	-43
4	**3346.4**	-51	**3346.4**	NF	**3346.4**	-52.3
5	**4183**	NF	**4183**	NF	**4183**	NF
6	**5019.6**	NF	**5019.6**	NF	**5019.6**	NF
7	**5856.2**	NF	**5856.2**	NF	**5856.2**	NF
8	**6692.8**	NF	**6692.8**	NF	**6692.8**	NF
9	**7529.4**	NF	**7529.4**	NF	**7529.4**	NF
10	**8366**	NF	**8366**	NF	**8366**	NF
NF = Noise Floor Measurement Uncertainty: ±3dB						

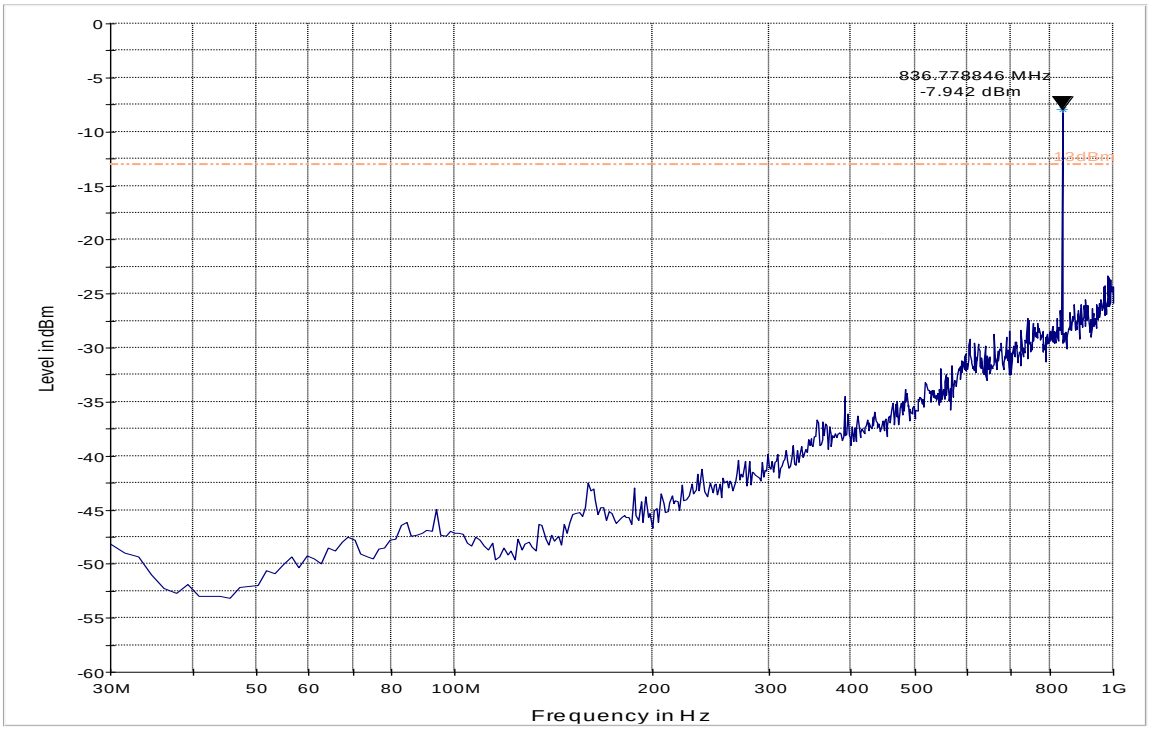
Note: Spurious Emissions were measured on Mid Channels only

6.2.7.4 Measurement Result

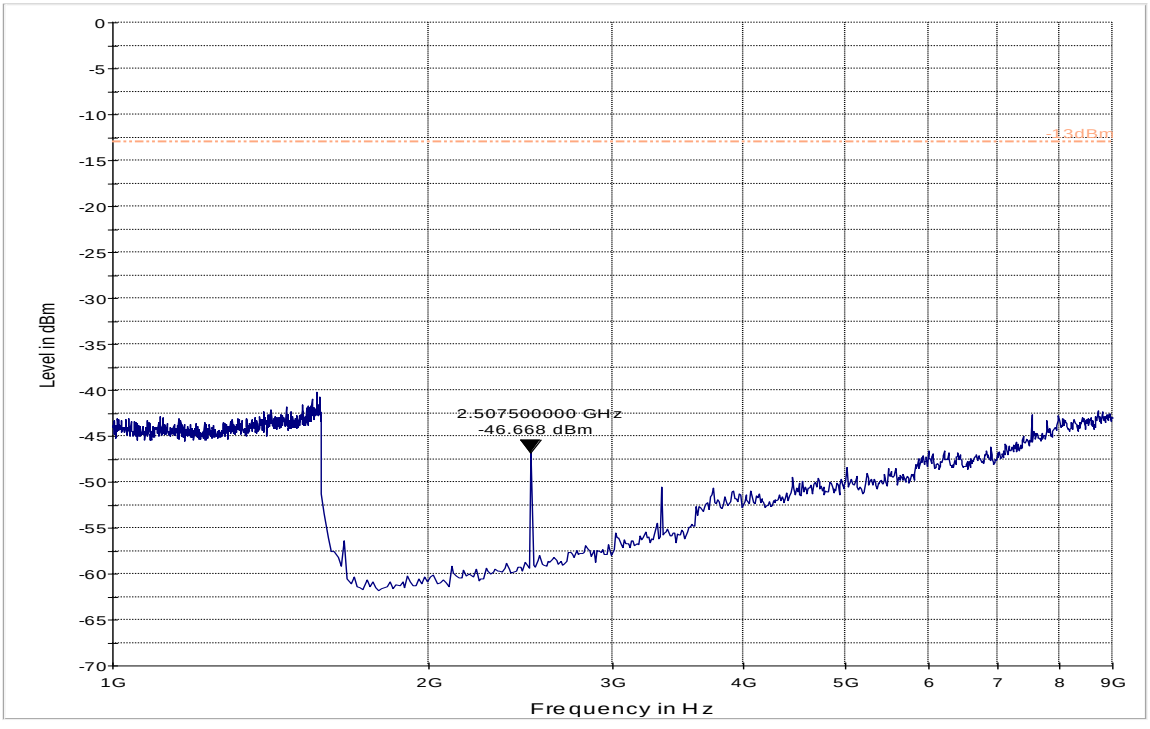
Pass.

Radiated Spurious Emissions (GSM-850) Tx: Mid Channel – GT83000VP

Test results 30M-1GHz

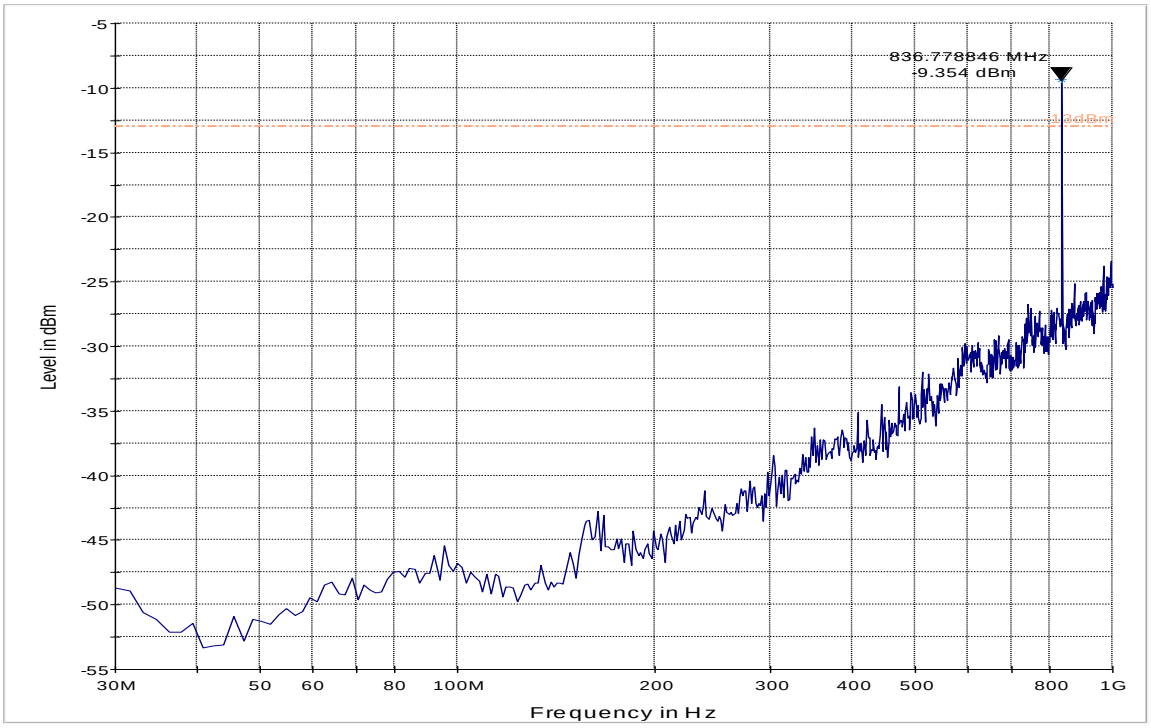


Test results 1GHz-9GHz – GT83000VP

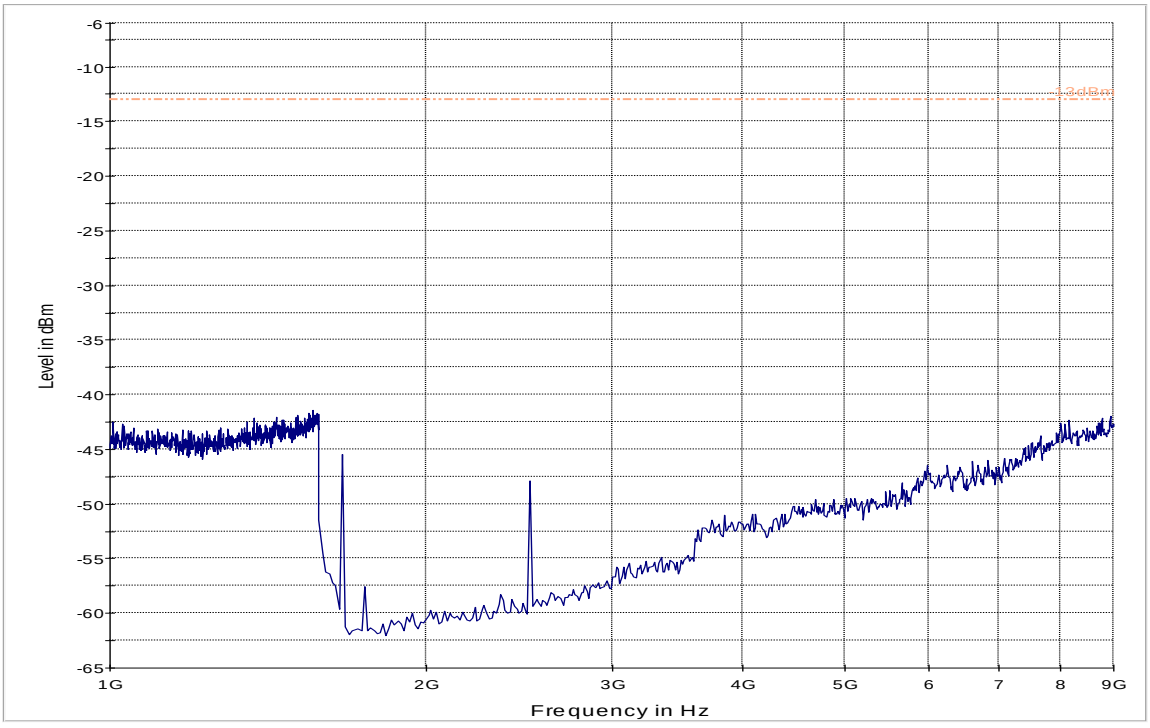


Radiated Spurious Emissions (GSM-850) Tx: Mid Channel – GT83000R2

Test results 30M-1GHz



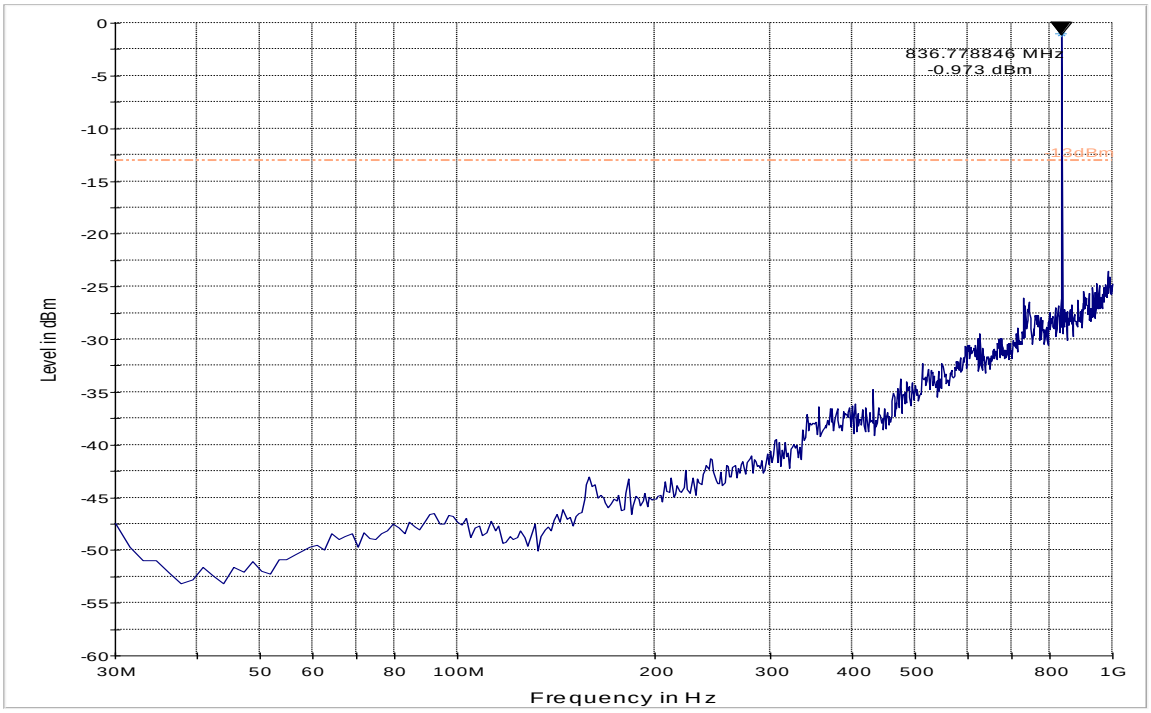
Test results 1GHz-9GHz – GT83000R2



Radiated Spurious Emissions (GSM-850) Tx: Mid Channel – GT83100

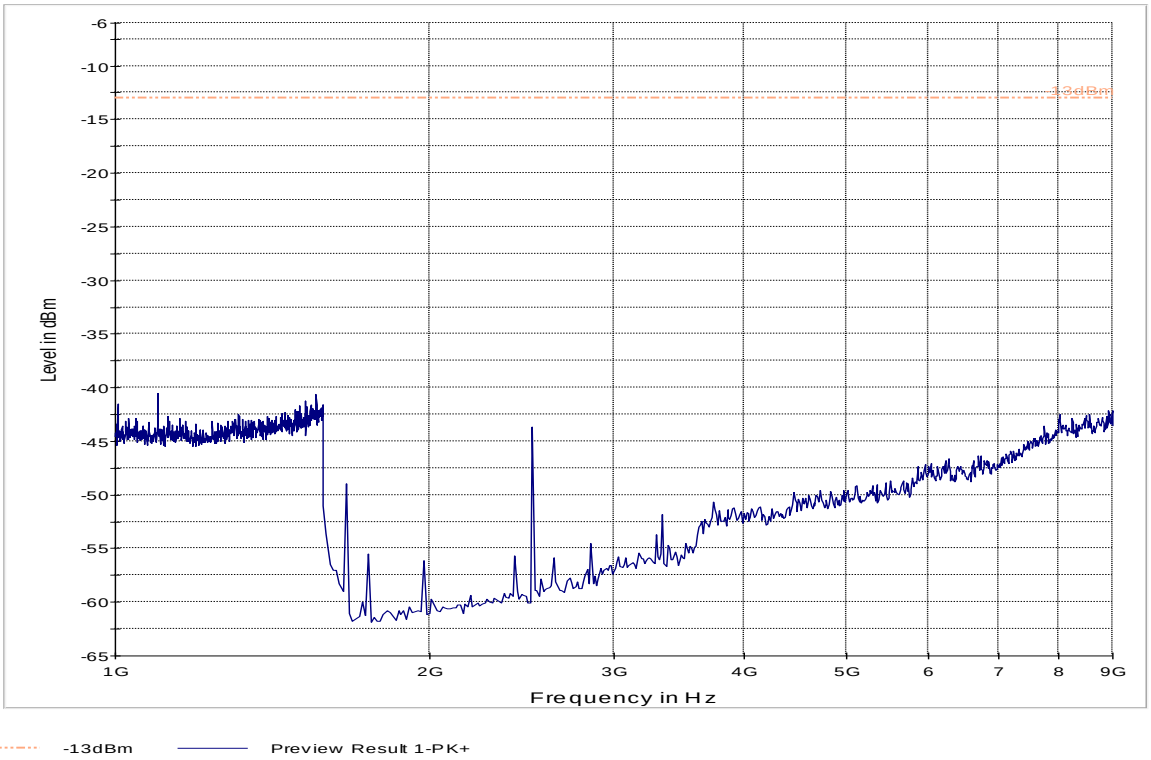
Test results 30M-1GHz

Emissions measured represent worst case of folded and unfolded unit



Test results 1GHz-9GHz – GT83100

Emissions measured represent worst case of folded and unfolded unit



6.2.7.5 Test Results Transmitter Spurious Emission GSM1900 – GT83000:

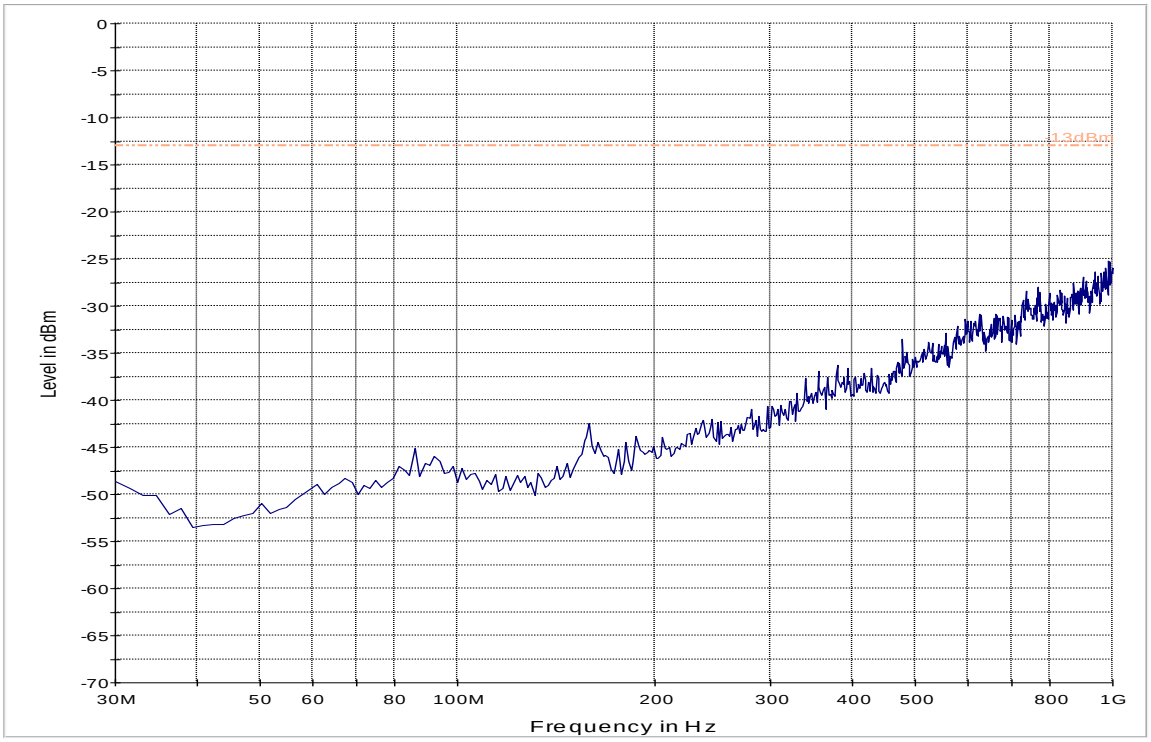
Harmonic	Tx ch-512 Freq.(MHz)	Level (dBm)	Tx ch-661 Freq. (MHz)	Level (dBm)	Tx ch-810 Freq. (MHz)	Level (dBm)
2	**3700.4**	-33	**3760**	-33	**3819.6**	-40.72
3	**5550.6**	-45	**5640**	-45	**5729.4**	-43
4	**7400.8**	NF	**7520**	NF	**7639.2**	NF
5	**9251**	-32	**9400**	-32	**9549**	-34.16
6	**11101.2**	NF	**11280**	NF	**11458.8**	NF
7	**12951.4**	NF	**13160**	NF	**13368.6**	NF
8	**14801.6**	NF	**15040**	NF	**15278.4**	NF
9	**16651.8**	NF	**16920**	NF	**17188.2**	NF
10	**18502**	NF	**18800**	NF	**19098**	NF
NF = Noise Floor Measurement Uncertainty: ±3dB						

6.2.7.6 Measurement Result

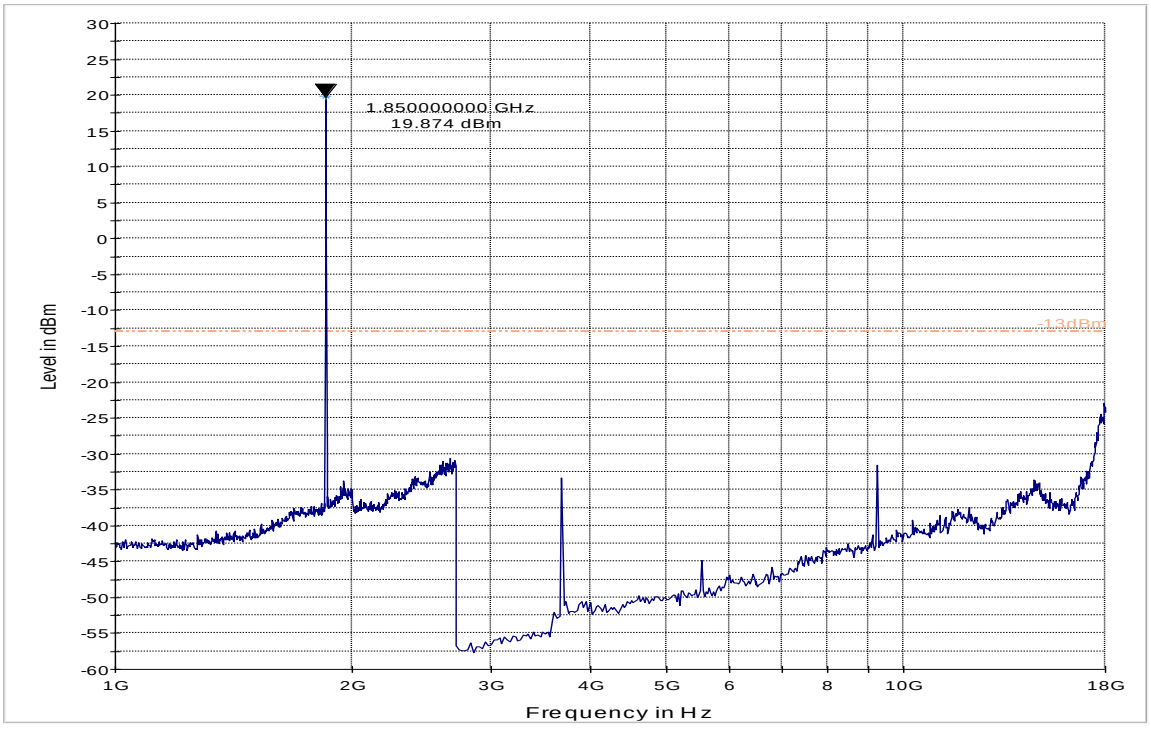
Pass.

Radiated Spurious Emissions (GSM-1900) Tx: Low Channel – GT83000

Test results 30M-1GHz

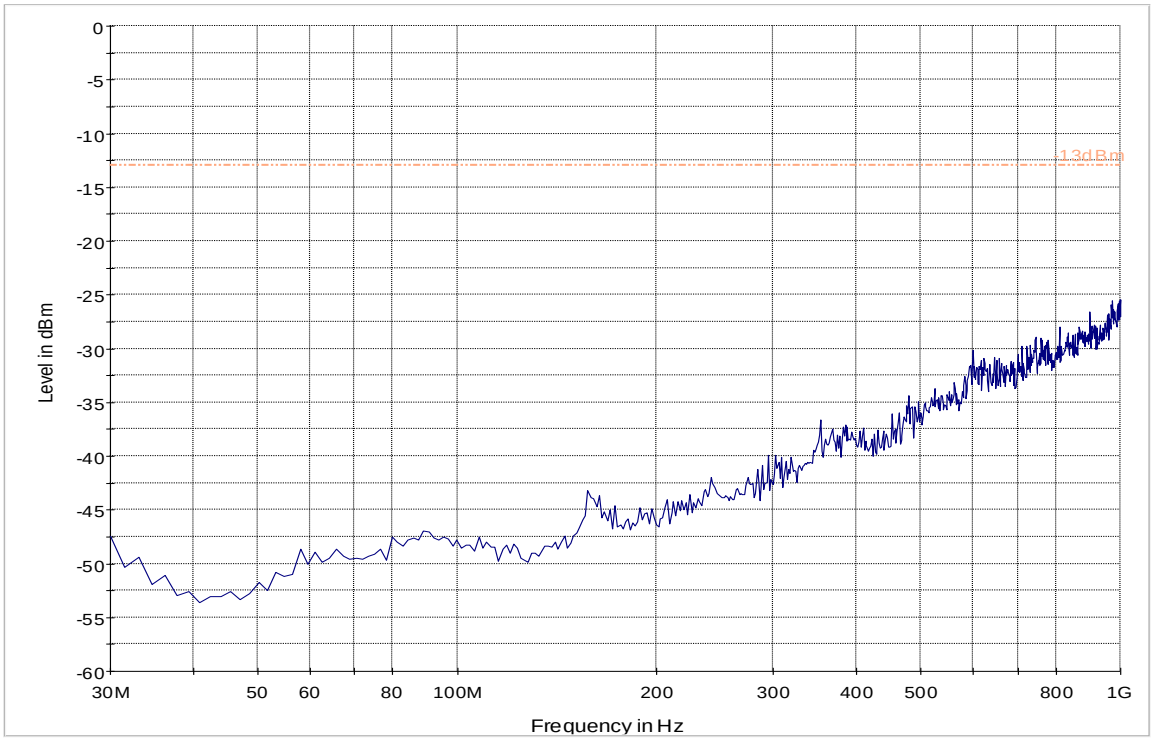


Test results 1GHz-18GHz – GT83000

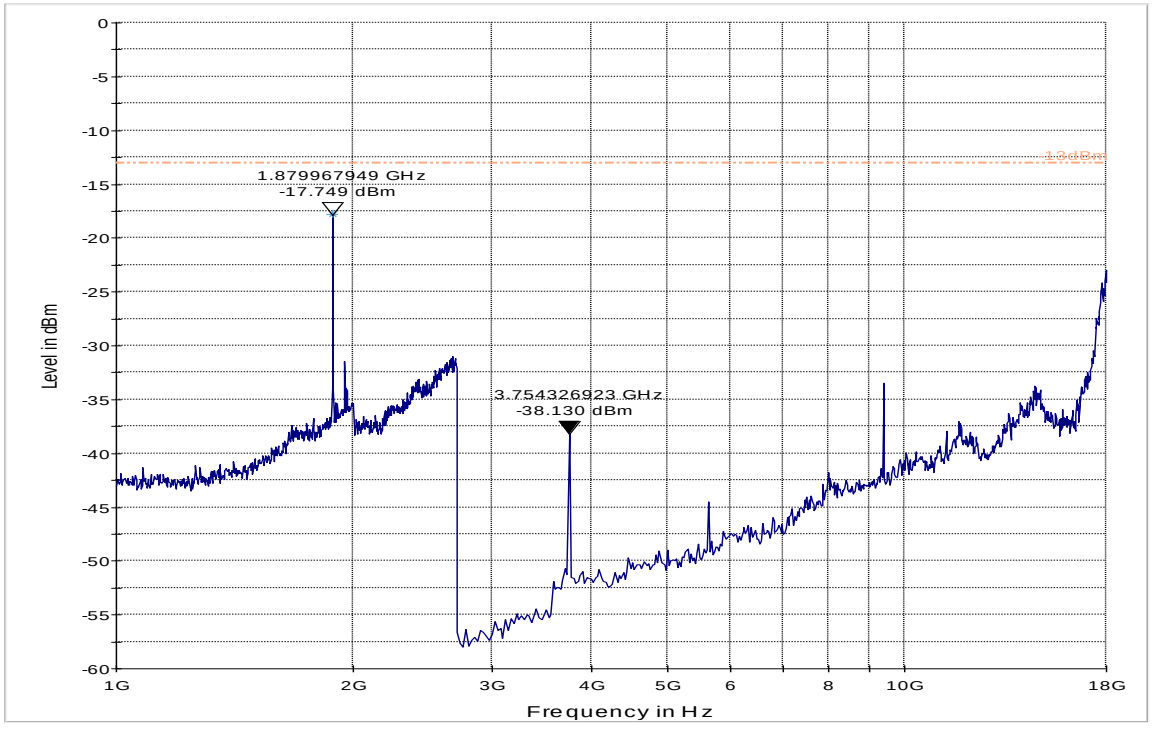


Radiated Spurious Emissions (GSM-1900) Tx: Mid Channel – GT83000

Test results 30M-1GHz

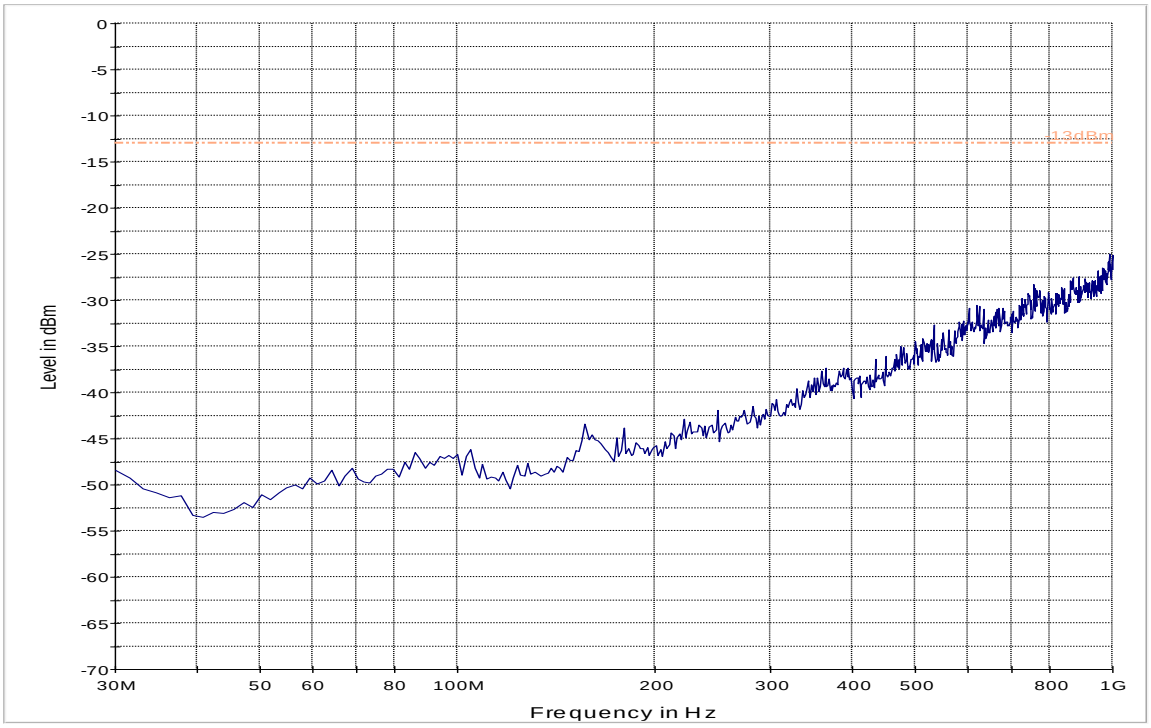


Test results 1GHz-18GHz – GT83000

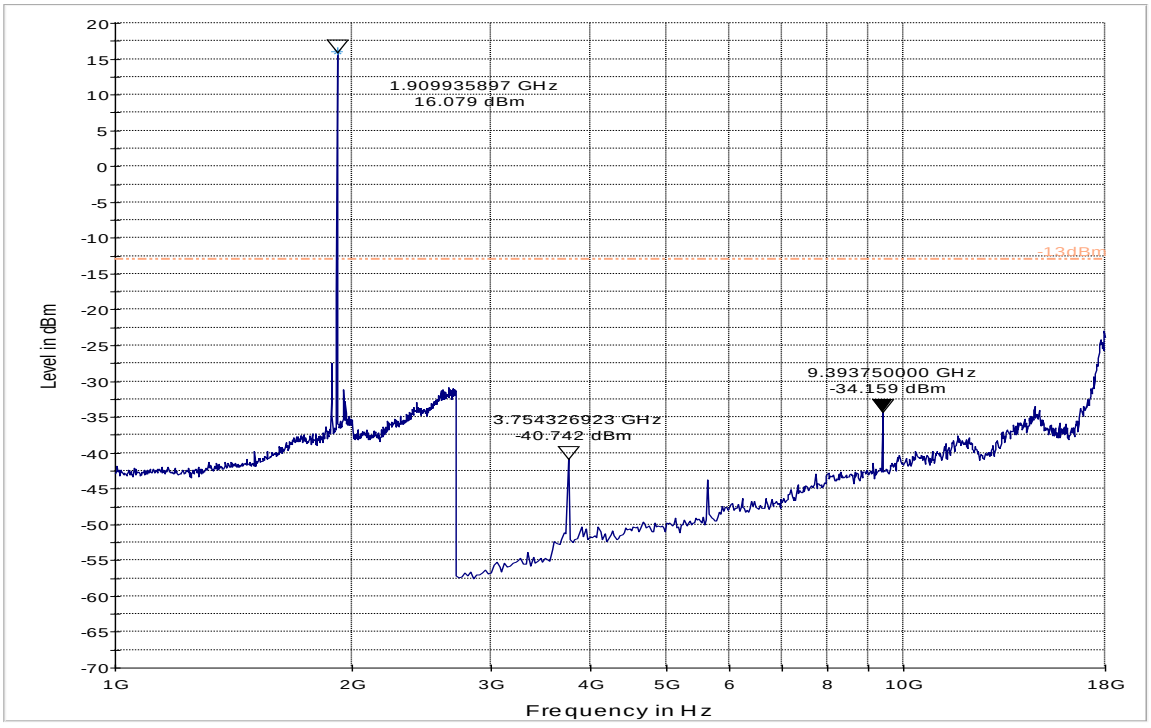


Radiated Spurious Emissions (GSM-1900) Tx: High Channel – GT83000

Test results 30M-1GHz

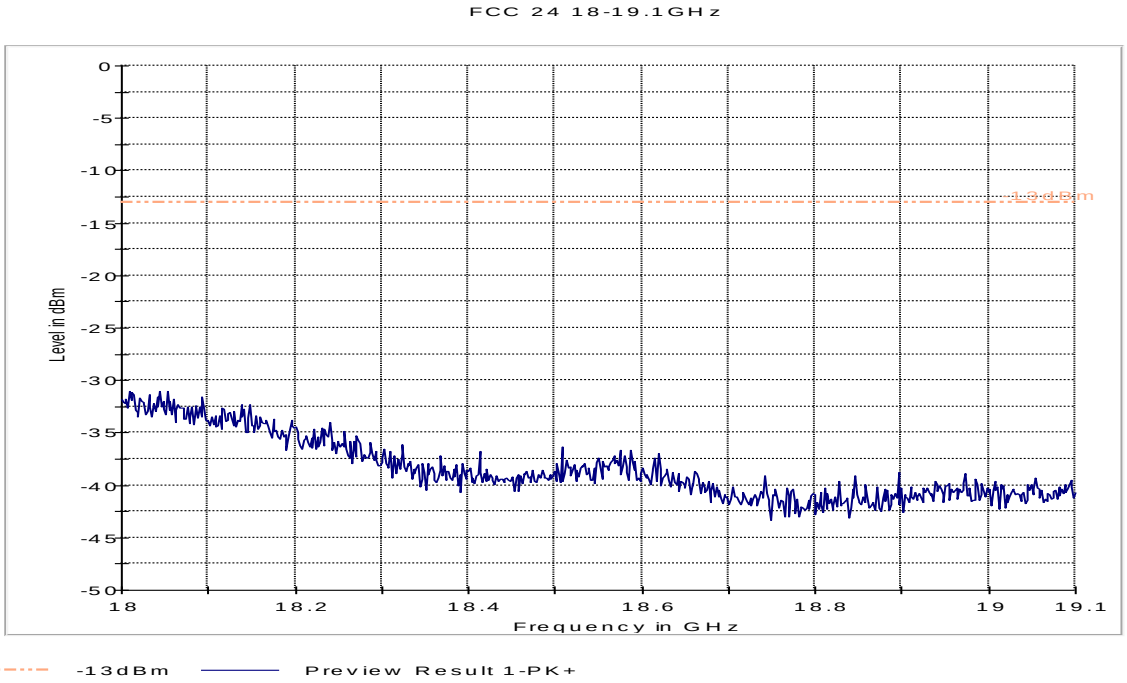


Test results 1GHz-18GHz – GT83000



Test results 18GHz-19.1GHz – GT83000

Note: Worst case representation for all channels in this band of operation.



6.2.7.7 Test Results Transmitter Spurious Emission GSM1900 – Variant Models:

Harmonic	GT83000VP Tx ch-661 Freq. (MHz)	Level (dBm)	GT83000R2 Tx ch-661 Freq. (MHz)	Level (dBm)	GT83100 Tx ch-661 Freq. (MHz)	Level (dBm)
2	**3760**	-47	**3760**	-43	**3760**	-45.7
3	**5640**	NF	**5640**	-43.5	**5640**	NF
4	**7520**	NF	**7520**	NF	**7520**	NF
5	**9400**	-35	**9400**	-35	**9400**	-33
6	**11280**	NF	**11280**	NF	**11280**	NF
7	**13160**	NF	**13160**	NF	**13160**	NF
8	**15040**	NF	**15040**	NF	**15040**	NF
9	**16920**	NF	**16920**	NF	**16920**	NF
10	**18800**	NF	**18800**	NF	**18800**	NF
NF = Noise Floor Measurement Uncertainty: ±3dB						

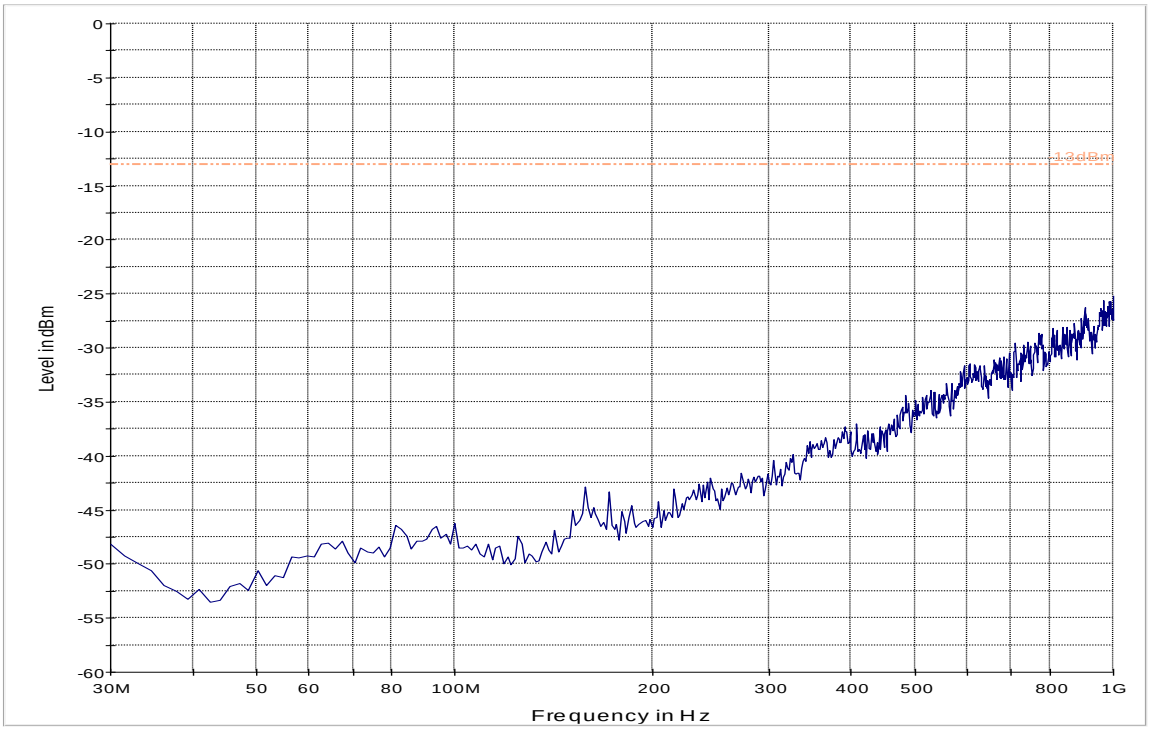
Note: Spurious Emissions were measured on Mid Channels only

6.2.7.8 Measurement Result

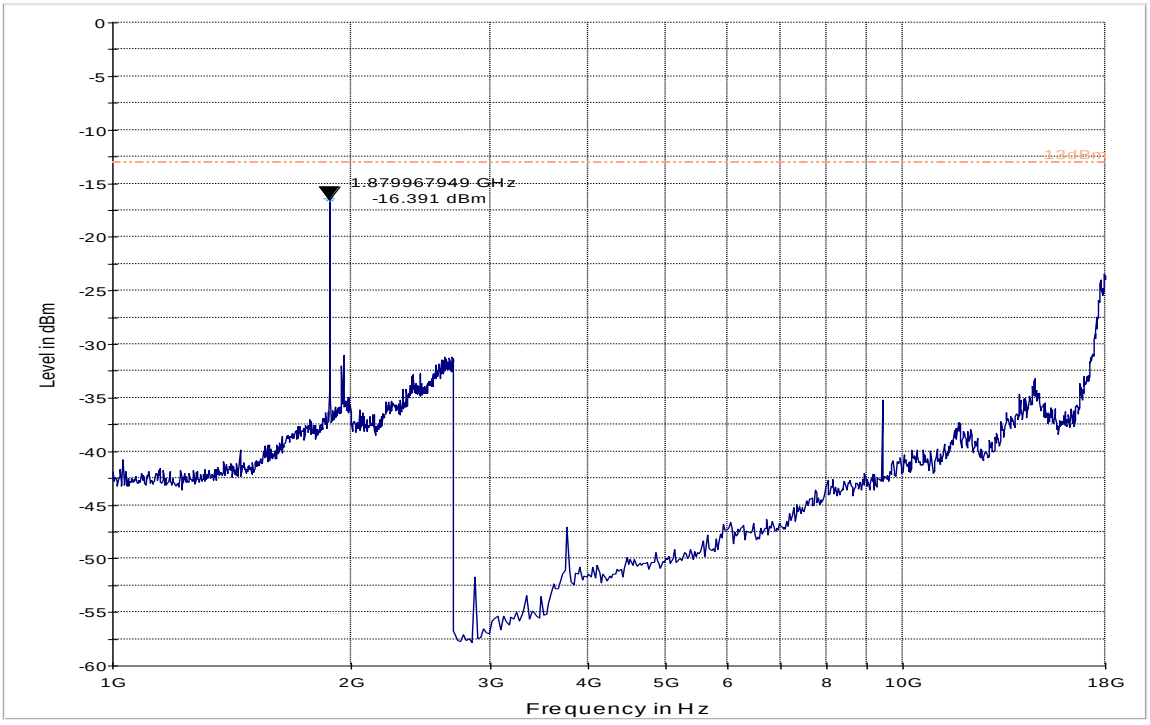
Pass.

Radiated Spurious Emissions (GSM-1900) Tx: Mid Channel – GT83000VP

Test results 30M-1GHz

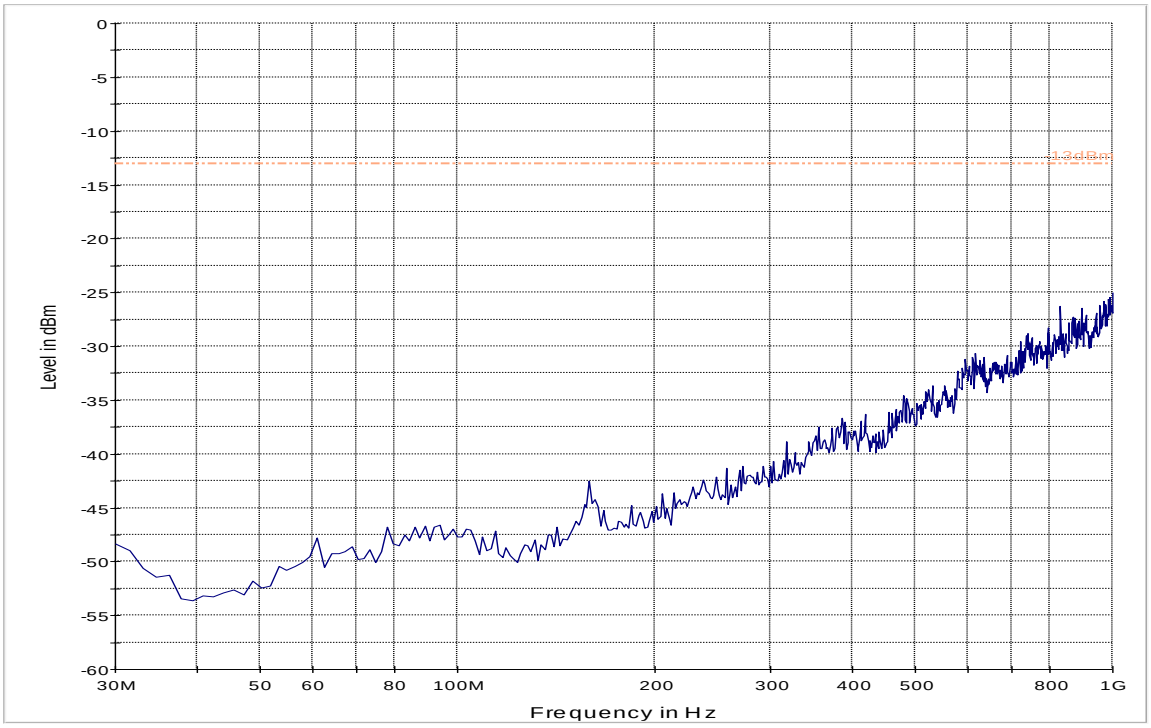


Test results 1GHz-18GHz – GT83000VP

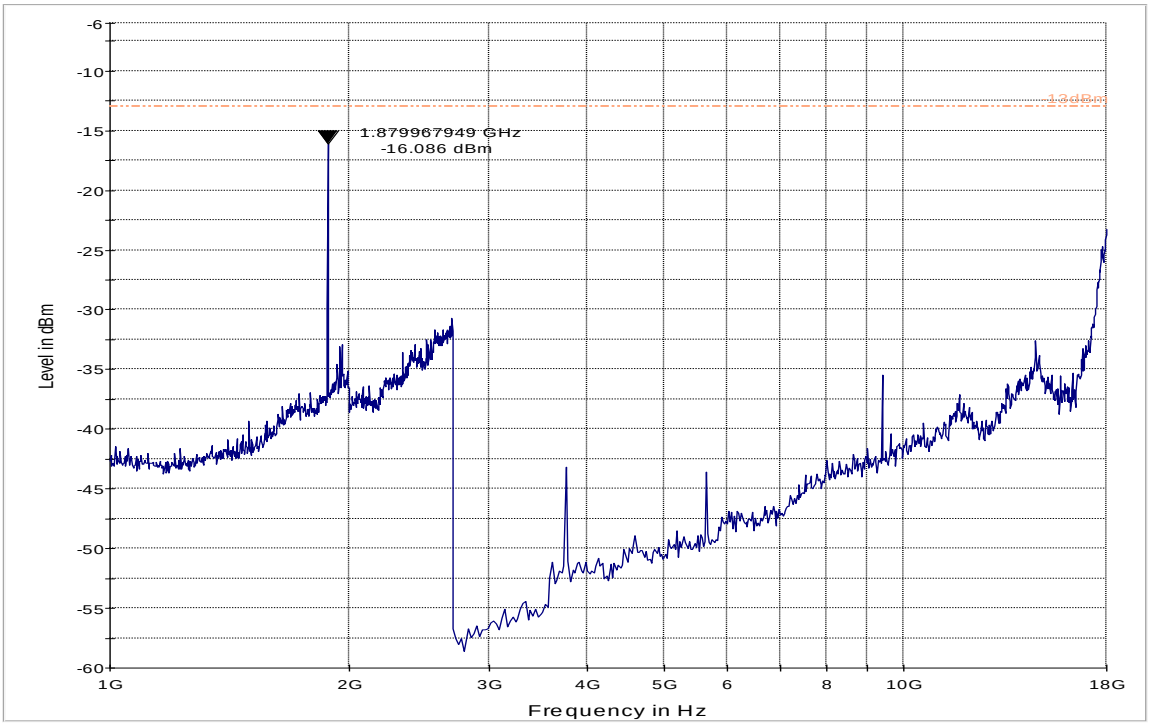


Radiated Spurious Emissions (GSM-1900) Tx: Mid Channel – GT83000R2

Test results 30M-1GHz



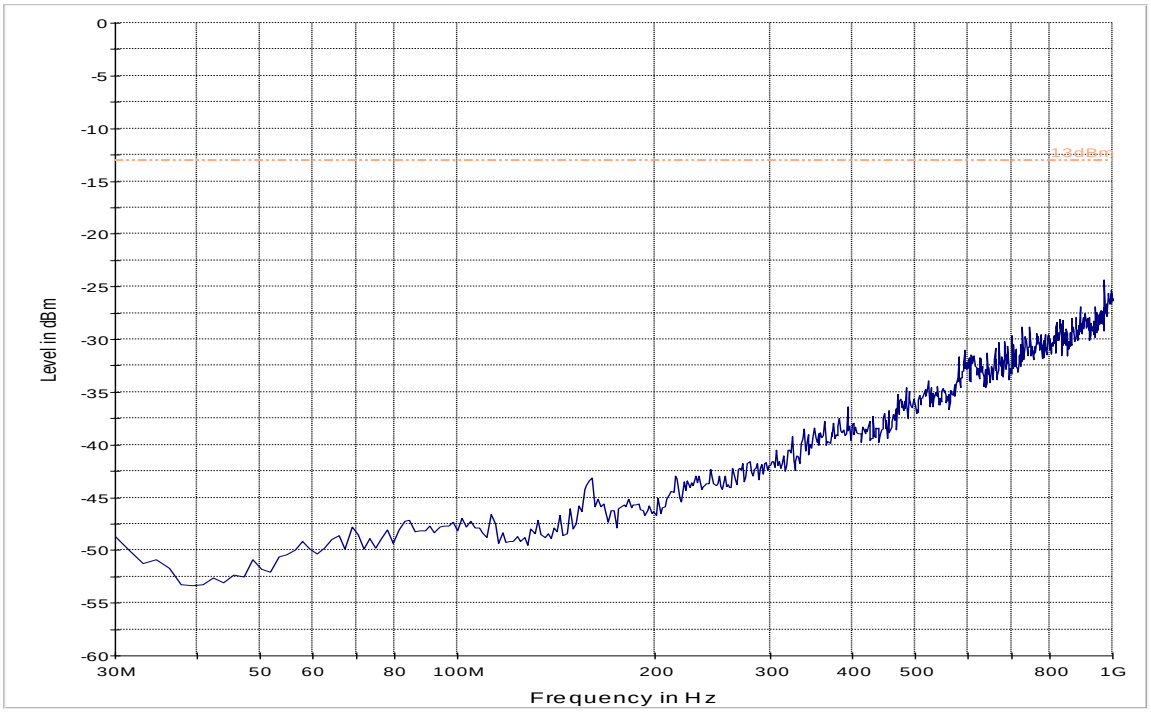
Test results 1GHz-18GHz – GT83000R2



Radiated Spurious Emissions (GSM-1900) Tx: Mid Channel – GT83100

Test results 30M-1GHz

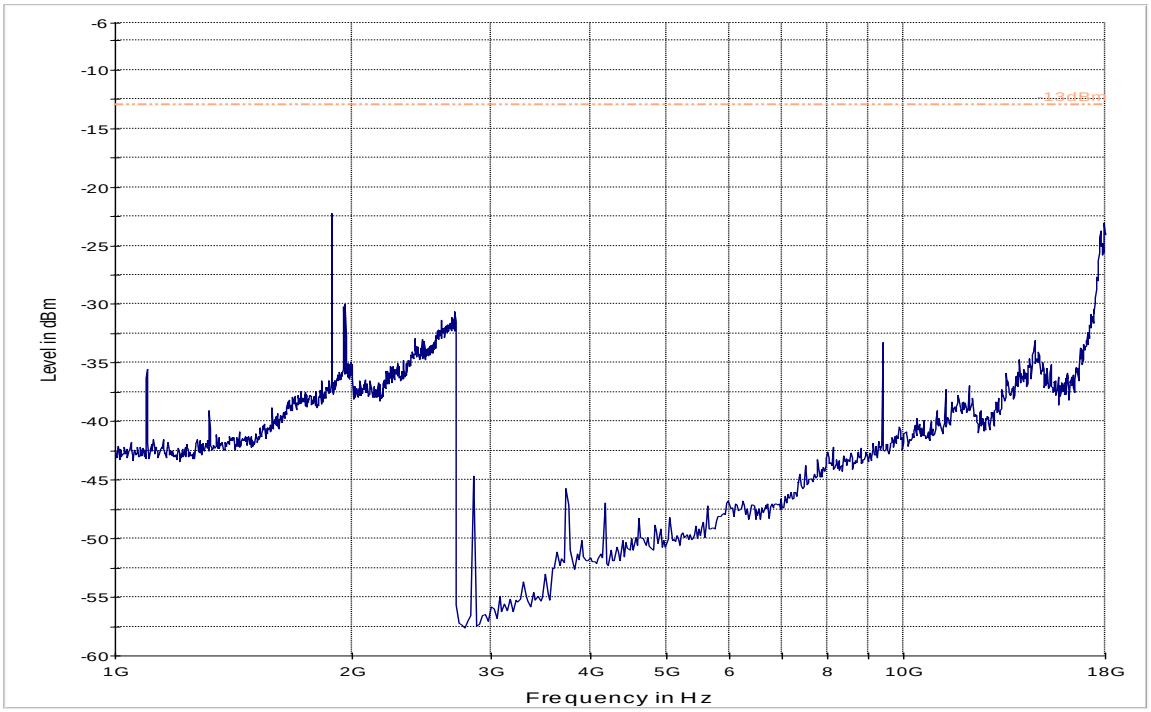
Emissions measured represent worst case of folded and unfolded units.



-13dBm Preview Result 1-PK+

Test results 1GHz-18GHz – GT83100

Emissions measured represent worst case of unfolded and folded units.

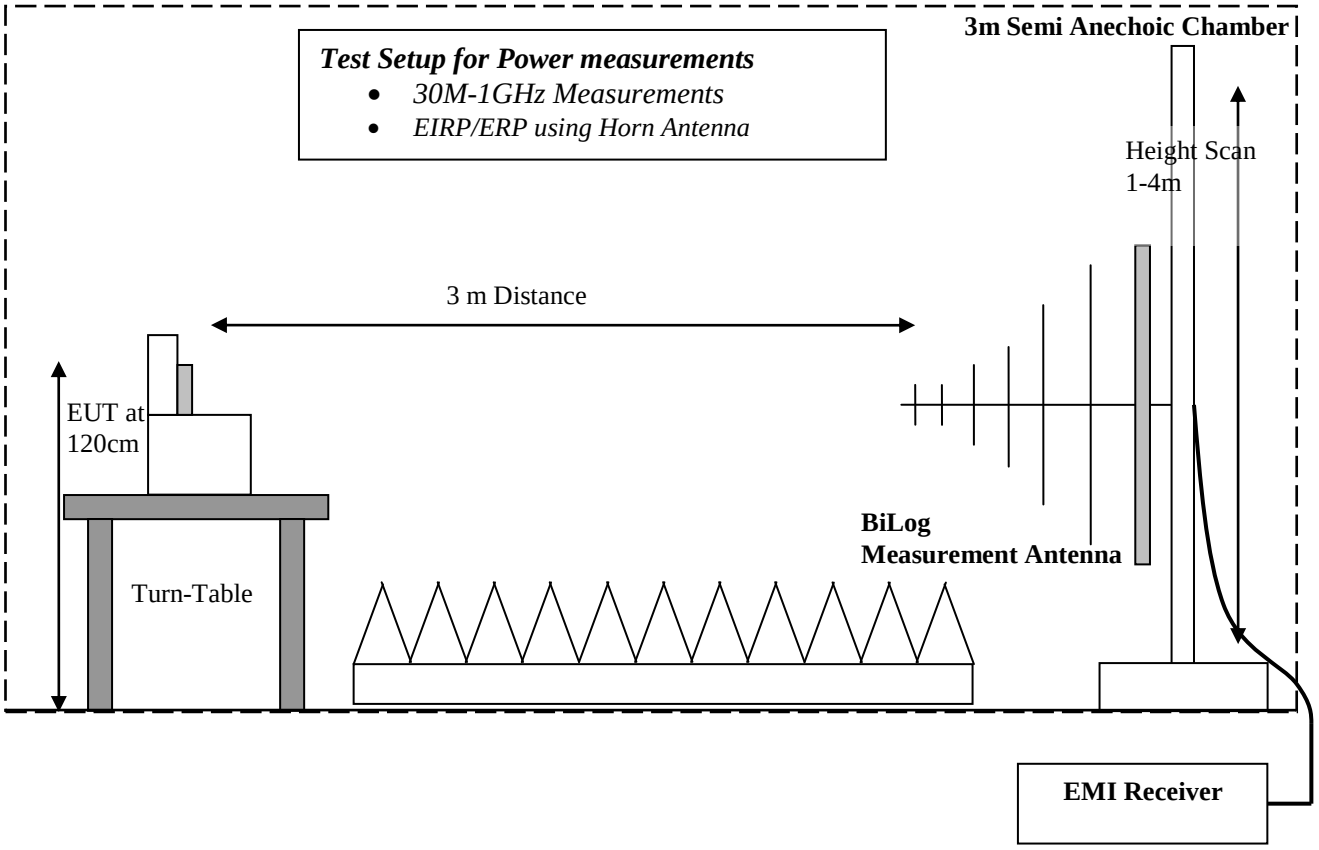


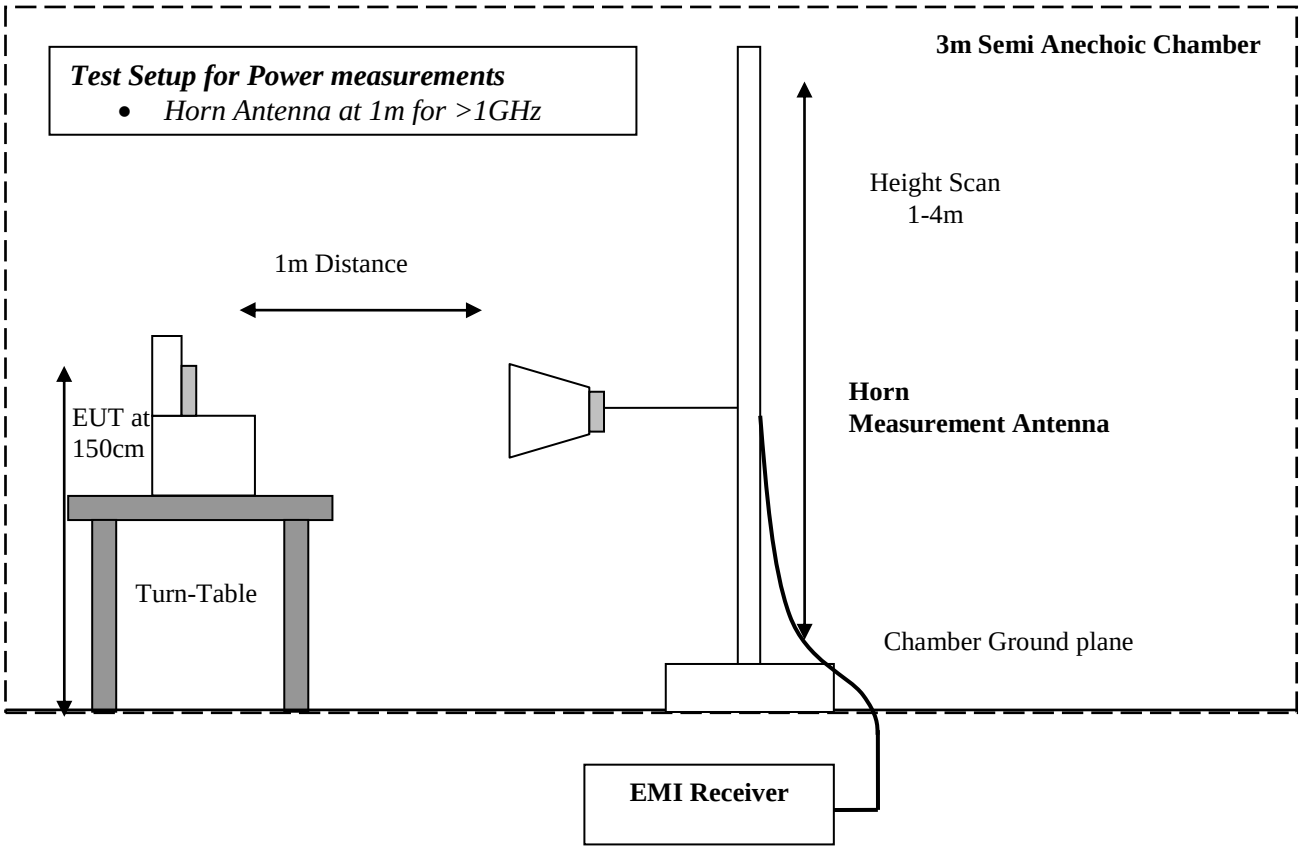
-13dBm Preview Result 1-PK+

7 Test Equipment and Ancillaries used for tests

Instrument/Ancillary	Model	Manufacturer	Serial No.	Cal Date	Cal Interval
Radio Communication Tester	CMU 200	Rohde & Schwarz	101821	May 2011	2 Years
Radio Communication Tester	CMU 200	Rohde & Schwarz	109879	May 2011	2 Years
Radio Communication Tester	CMU 200	Rohde & Schwarz	110759	May 2011	2 Years
EMI Receiver/Analyzer	ESU 40	Rohde & Schwarz	100251	Aug 2012	2 Years
Spectrum Analyzer	FSU	Rohde & Schwarz	200302	May 2011	2 Years
Loop Antenna	6512	EMCO	00049838	Apr 2012	3 years
Biconilog Antenna	3141	EMCO	0005-1186	Mar 2012	3 years
Horn Antenna (1-18GHz)	3115	ETS	00035111	Mar 2012	3 years
Horn Antenna (1-18GHz)	3115	ETS	00035114	Apr 2012	3 years
Horn Antenna (18-40GHz)	3116	ETS	00070497	Aug 2011	3 years
Communication Antenna	IBP5-900/1940	Kathrein	n/a	n/a	n/a
High Pass Filter	5HC2700	Trilithic Inc.	9926013	Part of system calibration	
High Pass Filter	4HC1600	Trilithic Inc.	9922307	Part of system calibration	
6GHz High Pass Filter	HPM50106	Microtronics	001	Part of system calibration	
Pre-Amplifier	JS4-00102600	Miteq	00616	Part of system calibration	
LISN	50-25-2-08	FCC	08014	Jan 2012	1 year
Power Smart Sensor	R&S	NRP-Z81	100161	May 2011	2 Years
DC Power Supply	6655A	Hewlett Packard	3403A-00487	n/a	n/a
Multimeter	MM200	Klein	N/A	Apr 2011	2 Years
Temp Hum Logger	TM320	Dickson	03280063	Feb 2012	1 Year
Temp Hum Logger	TM325	Dickson	5285354	Feb 2012	1 Year

8 Block Diagrams





9 Revision History

Date	Report Name	Changes to report	Report prepared by
2013-04-04	EMC_3SISE-020-12001_WWAN	First Version	Daniel Salinas