Shenzhen Huatongwei International Inspection Co., Ltd.
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CNASL1225

TEST REPORT

ETSI EN 301 511 V9.0.2: 2003-03

Report Reference No.....:	**TRE1303013502 R/C: 59940**
Compiled by (position+printed name+signature)..:	File administrators Tim Zhang
Supervised by (position+printed name+signature)..:	Test Engineer Eric Zhang
Approved by (position+printed name+signature)..:	Manager Wenliang Li
Date of issue.....:	May 22, 2013
Testing Laboratory Name .....:	**Shenzhen Huatongwei International Inspection Co., Ltd**
Address.....:	Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China
Applicant's name.....:	**RICON TECHNOLOGIES FZE**
Address.....:	Ras Al Khaimah,UAE P.O. Box 16111
Test specification:	
Standard .....:	**ETSI EN 301 511 V9.0.2: 2003-03**
TRF Originator.....:	Shenzhen Huatongwei International Inspection CO., Ltd
Master TRF.....:	Dated 2006-06

Test item description .....:	Cellular Router
Trade Mark .....:	RICON
Manufacturer .....:	**RICON TECHNOLOGIES FZE**
Model/Type reference.....:	S9922
List Model .....:	/
Modulation .....:	GMSK
Multislot Class	GPRS: Multi-slot Class 10/EGPRS Multi-slot Class 10
Frequency Band	GPRS900/GPRS1800
Operation Frequency.....	GPRS900:880MHz-915MHz/GPRS1800:1710MHz-1785MHz
Power Class .....:	GPRS900:Power Class 4/GPRS1800:Power Class 1
Ratings.....:	DC12.0V adapter from AC 230V/50Hz
Result.....:	**Positive**

T E S T R E P O R T

Test Report No. :	**TRE1303013502**	May 22, 2013 Date of issue

Equipment under Test	:	Cellular Router
Model /Type	:	S9922
Listed Models	:	/
Applicant	:	**RICON TECHNOLOGIES FZE**
Address	:	Ras Al Khaimah,UAE P.O. Box 16111
Manufacturer	:	**RICON TECHNOLOGIES FZE**
Address	:	Ras Al Khaimah,UAE P.O. Box 16111

Test Result according to the standards on page 4:	**Positive**

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Contents

1. TEST STANDARDS

The tests were performed according to following standards:

ETSI EN 301 511 V9.0.2 (2003-03)–Global System for Mobile communications (GSM);Harmonized EN for mobile stationsin the GSM 900 and GSM 1800 bandscovering essential requirements underarticle 3.2 of the R&TTE directive (1999/5/EC)
ETSI TS 151 010-1 V10.2.0 (2012-10)–Digital cellular telecommunications system (Phase 2+); Mobile Station (MS) conformance specification; Part 1: Conformance specification (3GPP TS 51.010-1 version 10.2.0 Release 10)
3GPP TS 51.010-1 version 10.2.0 Release 10–Digital cellular telecommunications system (Phase 2+);Mobile Station (MS) conformance specification; Part 1: Conformance specification(3GPP TS 51.010-1 version 10.0.0 Release 10

2. SUMMARY

2.1. General Remarks

Date of receipt of test sample	:	Mar 26, 2013
Testing commenced on	:	Mar 26, 2013
Testing concluded on	:	May 22, 2013

2.2. Product Description

The **RICON TECHNOLOGIES FZE**.'s Model: S9922 or the "EUT" as referred to in this report; more general information as follows, for more details, refer to the user's manual of the EUT.

Name of EUT	Cellular Router
Model Number	S9922
Power Class	GPRS900:Power Class 4/GPRS1800:Power Class 1
Multislot Class	GPRS: Multi-slot Class 10 EGPRS Multi-slot Class 10
Operation Frequency	GPRS900:880MHz-915MHz/GPRS1800:1710MHz-1785MHz
Modilation Type	GMSK
Antenna Type	Internal
Operation Frequency Band	GPRS900/GPRS1800
GSM Release Version	R97

2.3. Equipment under Test

Power supply system utilised

Power supply voltage	:	○	230V / 50 Hz	○	115V / 60Hz
		○	12 V DC	○	24 V DC
		●	Other (specified in blank below)		

DC 12.0 V Adapter from AC 230V/50Hz

Test frequency list

Frequency Band	Test Channel	Test Frequency
GPRS900	Low (980)	881.20 MHz
	Middle (62)	902.40 MHz
	High (120)	914.00 MHz
GPRS1800	Low (520)	1711.80 MHz
	Middle (698)	1747.40 MHz
	High (880)	1783.80 MHz

Type of Mobile Station and Additional Information

Table 1: Type of Mobile Station (Re. ETSI EN 301 511 Annex A.1)

Item	Type of Mobile Station	Support	Mnemonic
1	HSCSD Multislot MS	NO	Type_HSCSD_Multislot
2	R-GSM MS	NO	Type_R-GSM
3	Support of GPRS Multislot class on the uplink	YES	Type_GPRS_Multislot_uplink
4	EGPRS	YES	Type_EGPRS
5	EGPRS capable of 8PSK in Uplink, of all Multislot classes	YES	Type_EGPRS_8PSK_uplink

Table 2: Additional information (Re. ETSI EN 301 511 Annex A.2)

Item	Additional Information	Support	Mnemonic
1	Telephony.	NO	TSPC_Serv_TS11
2	Permanent Antenna Connector	YES	TSPC_AddInfo_PermAntenna

2.4. EUT operation mode

The EUT and test equipment were configured for testing according to ETSI EN 301 511 V9.0.2 (2003-03), where refer to ETSI TS 151 010-1 V10.2.0 (2012-10) for details.

2.5. Configuration of Tested System

Fig. 2-1 Configuration of Tested System

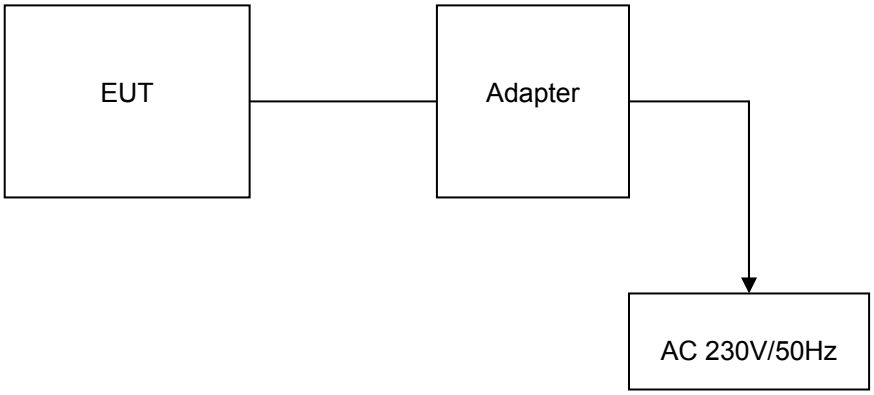


Table 2-1 Equipment Used in Tested System

Adapter:

Model: KW300-120E20
Input:100-240V～50/60Hz 0.8A
Output: +12V DC 2.0A
Power Cable: 120cm
◇ Shielded ◆ Unshielded

2.6. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

● - supplied by the manufacturer

○ - Supplied by the lab

○	Power Cable	Length (m) :	/
		Shield :	/
		Detachable :	/
○	Multimeter	Manufacturer :	/
		Model No. :	/

2.7. Modifications

No modifications were implemented to meet testing criteria.

2.8. NOTE

1. The EUT including GPRS,EGPRS, WCDMA and WLAN function,The functions of the EUT listed as below:

	Test Standards	Reference Report
Radio-WCDMA	ETSI EN 301 908-1 V5.2.1: 2011-05 ETSI EN 301 908-2 V4.2.1: 2010-03	TRE1303013501
Radio-GSM	ETSI EN 301 511 V9.0.2: 2003-03	TRE1303013502
Radio-WLAN	ETSI EN 300 328 V1.7.1: 2006-10	TRE1303013503
EMC-GSM	ETSI EN 301 489-1 V1.9.2: 2011-09 ETSI EN 301 489-7 V1.3.1: 2005-11	TRE1303013504
EMC-WCDMA	ETSI EN 301 489-1 V1.9.2: 2011-09 ETSI EN 301 489-24 V1.5.1: 2010-10	TRE1303013505
EMC-WLAN	ETSI EN 301 489-1 V1.9.2: 2011-09 ETSI EN 301 489-17 V2.2.1: 2012-09	TRE1303013506
EMC	EN 55022:2010 EN 55024:2010	TRE1303013507
EMF	EN62311:2008	TRE1303013508

2. The frequency bands used in this EUT are listed as follows:

Frequency Band(MHz)	2400-2483.5	5150-5350	5470-5725	5725-5850
802.11b	√	—	—	—
802.11g	√	—	—	—
802.11n(20MHz)	√	—	—	—
802.11n(40MHz)	√	—	—	—

3. The EUT incorporates a SISO function, Physically, the EUT provides one transmitter and one receiver.

Modulation Mode	TX Function
802.11b	1TX
802.11g	1TX
802.11n (20MHz)	1TX
802.11n (40MHz)	1TX

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Shenzhen Huatongwei International Inspection Co., Ltd
Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China
Phone: 86-755-26715686 Fax: 86-755-26748089

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 (2009) and CISPR Publication 22.

3.2. Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L1225

Shenzhen Huatongwei International Inspection Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories, Date of Registration: Mar. 29, 2012. Valid time is until Feb. 28, 2015.

A2LA-Lab Cert. No. 2243.01

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing. Valid time is until Sept. 30, 2013.

FCC-Registration No.: 662850

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 662850, Renewal date June. 01, 2012, valid time is until Jun. 01, 2015.

IC-Registration No.: 5377A

The 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 5377A on Jan. 25, 2011, valid time is until Jan. 24, 2014.

ACA

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

NEMKO-Aut. No.: ELA125

Shenzhen Huatongwei International Inspection Co., Ltd has been assessed the quality assurance system, the testing facilities, qualifications and testing practices of the relevant parts of the organization. The quality assurance system of the Laboratory has been validated against ISO/IEC 17025 or equivalent. The laboratory also fulfils the conditions described in Nemko Document NLA-10, the authorization is valid through July 07, 2013

VCCI

The 3m Semi-anechoic chamber (12.2m×7.95m×6.7m) and Shielded Room (8m×4m×3m) of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-292. Date of Registration: Dec. 24, 2010. Valid time is until Dec. 23, 2013.

Main Ports Conducted Interference Measurement of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: C-2726. Date of Registration: Dec. 20, 2012. Valid time is until Dec. 19, 2015.

Telecommunication Ports Conducted Interference Measurement of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: T-1837. Date of Registration: May 07, 2010. Valid time is until May 06, 2013.

DNV

Shenzhen Huatongwei International Inspection Co., Ltd. has been found to comply with the requirements of DNV towards subcontractor of EMC and safety testing services in conjunction with the EMC and Low voltage Directives and in the voluntary field. The acceptance is based on a formal quality Audit and follow-ups according to relevant parts of ISO/IEC Guide 17025 (2005), in accordance with the requirements of the DNV Laboratory Quality Manual towards subcontractors. Valid time is until Aug. 24, 2013.

3.3. Environmental conditions

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

Normal Temperature: 25 °C
High Temperature: 55 °C
Low Temperature: -20 °C
Normal Voltage : AC 230V/50Hz
High Voltage:AC 253V/50Hz
Low Voltage:AC 203V/50Hz
Relative Humidity: 55 %
Air Pressure: 989 hPa

3.4. Test Description

ESTI EN 301 511	ETSI TS 151 010-1	EN-R (note): Test Descriptions & Test Conditions	Verdict		Note
			GSM	DCS	
Section 4.2.1	Clause 13.1	Transmitter - Frequency error and phase error			---
		NT/NV	N/A	N/A	
		LT/LV	N/A	N/A	
		LT/HV	N/A	N/A	
		HT/LV	N/A	N/A	
		HT/HV	N/A	N/A	
		Vibrated X/Y/Z	N/A	N/A	
Section 4.2.2	Clause 13.2	Transmitter - Frequency error under multipath and interference conditions			---
		NT/NV	N/A	N/A	
		LT/LV	N/A	N/A	
		LT/HV	N/A	N/A	
		HT/LV	N/A	N/A	
		HT/HV	N/A	N/A	
Section 4.2.3	Clause 13.6	Transmitter - Frequency error and phase error in HSCSD multislot configuration			---
		NT/NV	N/A	N/A	
		LT/LV	N/A	N/A	
		LT/HV	N/A	N/A	
		HT/LV	N/A	N/A	
		HT/HV	N/A	N/A	
Section 4.2.4	Clause 13.16.1	Frequency error and phase error in GPRS multislot configuration			---
		NT/NV	PASS	PASS	
		LT/LV	PASS	PASS	
		LT/HV	PASS	PASS	
		HT/LV	PASS	PASS	
		HT/HV	PASS	PASS	
		Vibrated X/Y/Z	PASS	PASS	
Section 4.2.5	Clause 13.3	Transmitter output power and burst timing			
		NT/NV	N/A	N/A	
		LT/LV	N/A	N/A	

		LT/HV HT/LV HT/HV	N/A N/A N/A	N/A N/A N/A	
Section 4.2.6	Clause 13.4	Transmitter - Output RF spectrum NT/NV LT/LV LT/HV HT/LV HT/HV	 N/A N/A N/A N/A N/A	 N/A N/A N/A N/A N/A	---
Section 4.2.7	Clause 13.7	Transmitter output power and burst timing in HSCSD multislot configurations NT/NV LT/LV LT/HV HT/LV HT/HV	 N/A N/A N/A N/A N/A	 N/A N/A N/A N/A N/A	---
Section 4.2.8	Clause 13.8	Transmitter - Output RF spectrum in HSCSD multislot configuration NT/NV LT/LV LT/HV HT/LV HT/HV	 N/A N/A N/A N/A N/A	 N/A N/A N/A N/A N/A	---
Section 4.2.9	Clause 13.9	Transmitter - Output RF spectrum for MS supporting the R-GSM frequency band NT/NV LT/LV LT/HV HT/LV HT/HV	 N/A N/A N/A N/A N/A	 N/A N/A N/A N/A N/A	---
Section 4.2.10	Clause 13.16.2	Transmitter output power in GPRS multislot configuration NT/NV LT/LV LT/HV HT/LV HT/HV	 PASS PASS PASS PASS PASS	 PASS PASS PASS PASS PASS	Remark 2
Section 4.2.11	Clause 13.16.3	Output RF spectrum in GPRS multislot configuration NT/NV LT/LV LT/HV HT/LV HT/HV	 PASS PASS PASS PASS PASS	 PASS PASS PASS PASS PASS	---
Section 4.2.12	Clause 12.1.1	Conducted spurious emissions - MS allocated a channel NT/NV NT/LV NT/HV	 PASS PASS PASS	 PASS PASS PASS	---
Section 4.2.13	Clause 12.1.2	Conducted spurious emissions - MS in idle mode NT/NV NT/LV NT/HV	 PASS PASS PASS	 PASS PASS PASS	---
Section 4.2.14	Clause 12.3.1	Conducted spurious emissions for MS supporting the R-GSM frequency band - MS allocated a channel NT/NV NT/LV	 N/A N/A	 N/A N/A	---

		NT/HV	N/A	N/A	
Section 4.2.15	Clause 12.3.2	Conducted spurious emissions for MS supporting the R-GSM frequency band - MS in idle mode			---
		NT/NV	N/A	N/A	
		NT/LV	N/A	N/A	
		NT/HV	N/A	N/A	
Section 4.2.16	Clause 12.2.1	Radiated spurious emissions - MS allocated a channel			Remark 4
		NT/NV	PASS	PASS	
		NT/LV	PASS	PASS	
		NT/HV	PASS	PASS	
Section 4.2.17	Clause 12.2.2	Radiated spurious emissions - MS in idle mode			Remark 5
		NT/NV	PASS	PASS	
		NT/LV	PASS	PASS	
		NT/HV	PASS	PASS	
Section 4.2.18	Clause 12.4.1	Radiated spurious emissions for MS supporting the R-GSM frequency band - MS allocated a channel			---
		NT/NV	N/A	N/A	
		NT/LV	N/A	N/A	
		NT/HV	N/A	N/A	
Section 4.2.19	Clause 12.4.2	Radiated spurious emissions for MS supporting the R-GSM frequency band - MS in idle mode			---
		NT/NV	N/A	N/A	
		NT/LV	N/A	N/A	
		NT/HV	N/A	N/A	
Section 4.2.20	Clause 14.7.1	Receiver Blocking and spurious response - speech channels			---
		NT/NV	PASS	PASS	
Section 4.2.21	Clause 14.7.3	Receiver Blocking and spurious response - speech channels for MS supporting the R-GSM frequency band			---
		NT/NV	N/A	N/A	
Section 4.2.22	Clause 13.17.1	Frequency error and Modulation accuracy in EGPRS Configuration			---
		NT/NV	PASS	PASS	
		LT/LV	PASS	PASS	
		LT/HV	PASS	PASS	
		HT/LV	PASS	PASS	
		HT/HV	PASS	PASS	
Section 4.2.23	Clause 13.17.2	Frequency error under multipath and interference conditions in EGPRS Configuration			---
		NT/NV	PASS	PASS	
		LT/LV	PASS	PASS	
		LT/HV	PASS	PASS	
		HT/LV	PASS	PASS	
		HT/HV	PASS	PASS	
Section 4.2.24	Clause 13.17.3	EGPRS Transmitter output power			Remark 3
		NT/NV	PASS	PASS	
		LT/LV	PASS	PASS	
		LT/HV	PASS	PASS	
		HT/LV	PASS	PASS	
		HT/HV	PASS	PASS	
Section 4.2.25	Clause 13.17.4	Output RF spectrum in EGPRS configuration			---
		NT/NV	PASS	PASS	
		LT/LV	PASS	PASS	

		LT/HV HT/LV HT/HV	PASS PASS PASS	PASS PASS PASS	
Section 4.2.26	Clause 14.18.5	Blocking and spurious response in EGPRS configuration NT / NV	 PASS	 PASS	---

Remark: 1. The measurement uncertainty is not included in the test result;
2. See Section 4.1.1 for more details;
3. See Scetion 4.1.2 for more details;
4. See Section 4.1.3 for more details;
5. See Scetion 4.1.3 for more details.

3.5. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01" Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics;Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics;Part 2 " and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen Huatongwei laboratory is reported:

3GPP TS 51.010-1	Test Description	Uncertainty
12.1.1	Conducted spurious emissions-MS Allocated a Channel Emissions@100kHz<f<2GHz Emissions@2GHz <f<12.75GHz	 0.593dB 1.123 dB
12.1.2	Conducted spurious emissions- MS in Idle Mode Emissions@100kHz<f<2GHz Emissions@2GHz <f<12.75GHz	 0.649 dB 1.123 dB
12.2.1 12.2.2	Radiated spurious emissions	2.2dB
13.1 13.2 13.16.1 13.17.1 13.17.2	Frequency error and phase error Frequency error under multipath and interference conditions Frequency error and phase error in GPRS multislot configuration Frequency error and Modulation accuracy in EGPRS Configuration Frequency error under multipath and interference conditions in EGPRS Configuration	Freq Err<11.5Hz RMS Phase Err 1.0degrees Peak Phase Error 4.0degrees
13.3.4.1 13.16.2.4.1 13.17.3.4.1	Transmitter output power and burst timing Transmitter output power in GPRS multislot configuration EGPRS Transmitter output power	0.593dB
13.4 13.16.3 13.17.4	Output RF spectrum Transmitter output power in GPRS(or EGPRS)multislot configuration	0.593dB
14.7.1 14.18.5	Receiver Blocking and spurious response - speech channels Blocking and spurious response in EGPRS Configuration Wanted Signal@f<2GHz Blocking Signal@100kHz<f<2GHz Blocking Signal@2GHz<f<12.75GHz	 0.649 dB 0.593 dB 1.035 dB

3.6. Equipments Used during the Test

Details for TS8950

No.	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	GSM/WCDMA Signaling Unit	Rohde&Schwarz	CRTU-MS	11511.2500.02	2012/10/27
2	Power Sensor	Rohde&Schwarz	NRP-Z21	102638	2012/10/27
3	Power Sensor	Rohde&Schwarz	NRP-Z21	102639	2012/10/27
4	Spectrum Analyzer	Rohde&Schwarz	FSU26	201141	2012/10/27
5	Signal Generator	Rohde&Schwarz	SMF100A	101932	2012/10/27
6	Vector signal genertor	Rohde&Schwarz	SMU200A	104329	2012/10/27
7	Vector signal genertor	Rohde&Schwarz	SMU200A	104332	2012/10/27
8	UNIVERSAL RADIO COMMUNICATION	Rohde&Schwarz	CMU200	122206	2012/10/27

Vibrated

No.	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	electromagnetic vibration generator system	BERIER	BF-LD-F	200909281309	2012/10/27

Details for Radiated emissions test equipment

No.	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Ultra-Broadband Antenna	ShwarzBeck	VULB9163	538	2012/10/27
2	Ultra-Broadband Antenna	ShwarzBeck	VULB9163	539	2012/10/27
3	HORN ANTENNA	ShwarzBeck	9120D	1011	2012/10/27
4	HORN ANTENNA	ShwarzBeck	9120D	1012	2012/10/27
5	TURNTABLE	MATURO	TT2.0	----	2012/10/27
6	ANTENNA MAST	MATURO	TAM-4.0-P	----	2012/10/27
7	UNIVERSAL RADIO COMMUNICATION	Rohde&Schwarz	CMU200	112012	2012/10/27
8	High pass filter	Compliance Direction systems	BSU-6	34202	2012/10/27
9	EMI TEST SOFTWARE	Rohde&Schwarz	ESK1	N/A	2012/10/27
10	EMI TEST RECEIVER	Rohde&Schwarz	ESI 26	100009	2012/10/27
11	RF TEST PANEL	Rohde&Schwarz	TS / RSP	335015/ 0017	2012/10/27
12	Broadband Preamplifier	ShwarzBeck	BBV743	9743-0079	2012/10/27
13	JS amplifer	Rohde&Schwarz	JS4-00101800-28-5A	F201504	2012/10/27
14	Amplifer	Compliance Direction systems	PAP1-4060	120	2012/10/27

The Cal. Interval was one year

4. TEST CONDITIONS AND RESULTS

4.1. ETSI EN 301 511 REQUIREMENTS

4.1.1. Transmitter output power in GPRS multislot configuration

LIMIT

ETSI TS 51.010-1 (V.10.2.0) Sub-clause 13.16.2.5

The transmitter output power is the average value of the power delivered to an artificial antenna or radiated by the MS and its integral antenna, over the time that the useful information bits of one burst are transmitted. The transmitter output power, under every combination of normal and extreme test conditions, for normal bursts and access bursts, at each frequency and for each power control level applicable to the MS power class, shall be at the relevant level shown in table 13.16.2-1, table 13.16.2-2 or table 13.16.2-3 within the tolerances also shown in table 13.16.2-1, table 13.16.2-2 or table 13.16.2-3.

Table 13.16.2-1: Bands other than DCS 1800 and PCS 1900 transmitter output power for different power classes

Power class				Power control level (note 4)	GAMMA_TN (Γ_{CH})	Transmitter output power (note 2.3)	Tolerances	
2	3	4	5			dBm	normal	extreme
•				2	0	39	±2 dB	±2.5 dB
•	•			3	1	37	±3 dB (note 1)	±4 dB (note 1)
•	•			4	2	35	±3 dB	±4 dB
•	•	•		5	3	33	±3 dB (note 1)	±4 dB (note 1)
•	•	•		6	4	31	±3 dB	±4 dB
•	•	•	•	7	5	29	±3 dB (note 1)	±4 dB (note 1)
•	•	•	•	8	6	27	±3 dB	±4 dB
•	•	•	•	9	7	25	±3 dB	±4 dB
				10	8	23	±3 dB	±4 dB
				11	9	21	±3 dB	±4 dB
				12	10	19	±3 dB	±4 dB
				13	11	17	±3 dB	±4 dB
				14	12	15	±3 dB	±4 dB
				15	13	13	±3 dB	±4 dB
				16	14	11	±5 dB	±6 dB
				17	15	9	±5 dB	±6 dB
				18	16	7	±5 dB	±6 dB
				19	17	5	±5 dB	±6 dB

NOTE1: When the power control level corresponds to the power class of the MS, then the tolerances shall be 2.0 dB under normal test conditions and 2.5 dB under extreme test conditions.

NOTE 2: For R99 and Rel-4, the maximum output power in a multislot configuration must be lower within the limits defined in table 13.16.2-1a. From Rel-5 onwards, the maximum output power in a multislot configuration may be lower within the limits defined in table 13.16.2-1b.

NOTE 3: For a MS using reduced interslot dynamic range in multislot configurations, the MS may restrict the interslot output power control range to a 10 dB window, on a TDMA frame basis. On those timeslots where the ordered power level is more than 10 dB lower than the applied power level of the highest power timeslot, the MS shall transmit at a lowest possible power level within 10 dB range from the highest applied power level, if not transmitting at the actual ordered power level.

NOTE 4: There is no requirement to test power control levels 20-31.

Table 13.16.2-2: DCS 1 800 transmitter output power for different power classes

Power class			Power control level (note 4)	GAMMA_TN (Γ_{CH})	Transmitter output power (note 2.3)	Tolerances	
1	2	3			dBm	Normal	extreme
		•	29	0	36	±2.0 dB	±2.5 dB

		•	30	1	34	±3.0 dB	±4.0 dB
		•	31	2	32	±3.0 dB	±4.0 dB
•		•	0	3	30	±3.0 dB(note_1)	±4 dB(note_1)
•		•	1	4	28	±3 dB	±4 dB
•		•	2	5	26	±3 dB	±4 dB
•	•	•	3	6	24	±3 dB(note_1)	±4 dB(note_1)
•	•	•	4	7	22	±3 dB	±4 dB
•	•	•	5	8	20	±3 dB	±4 dB
•	•	•	6	9	18	±3 dB	±4 dB
•	•	•	7	10	16	±3 dB	±4 dB
•	•	•	8	11	14	±3 dB	±4 dB
•	•	•	9	12	12	±3 dB	±4 dB
•	•	•	10	13	10	±3 dB	±4 dB
•	•	•	11	14	8	±3 dB	±4 dB
•	•	•	12	15	6	±3 dB	±4 dB
•	•	•	13	16	4	±3 dB	±4 dB
•	•	•	14	17	2	±3 dB	±4 dB
•	•	•	15	18	0	±3 dB	±4 dB

NOTE1: When the power control level corresponds to the power class of the MS, then the tolerances shall be 2.0 dB under normal test conditions and 2,5 dB under extreme test conditions.
NOTE 2: For R99 and Rel-4, the maximum output power in a multislot configuration must be lower within the limits defined in table 13.16.2-2a. From Rel-5 onwards, the maximum output power in a multislot configuration may be lower within the limits defined in table 13.16.2-2b.
NOTE 3: For a MS using reduced interslot dynamic range in multislot configurations, the MS may restrict the interslot output power control range to a 10 dB window, on a TDMA frame basis. On those timeslots where the ordered power level is more than 10 dB lower than the applied power level of the highest power timeslot, the MS shall transmit at a lowest possible power level within 10 dB range from the highest applied power level, if not transmitting at the actual ordered power level.
NOTE 4: There is no requirement to test power control levels 16-28.

GSM 400, GSM 700, GSM 850 and GSM 900 allowed maximum output power reduction in a multislot configuration

Number of timeslots in uplink assignment	Permissible nominal reduction of maximum output power, (dB)
1	0
2	3.0
3	4.8
4	6.0
5	7.0
6	7.8
7	8.5
8	9.0

DCS 1 800 allowed maximum output power reduction in a multislot configuration

Number of timeslots in uplink assignment	Permissible nominal reduction of maximum output power, (dB)
1	0
2	3.0
3	4.8
4	6.0
5	7.0
6	7.8
7	8.5
8	9.0

TEST PROCEDURE

1. Measurement of normal burst transmitter output power.
The SS takes power measurement samples evenly distributed over the duration of one burst with a sampling rate of at least 2/T, where T is the bit duration. The samples are identified in time with respect to the modulation on the burst. The SS identifies the centre of the useful 147 transmitted bits, i.e. the transition from bit 13 to bit 14 of the midamble, as the timing reference.

The transmitter output power is calculated as the average of the samples over the 147 useful bits. This is also used as the 0 dB reference for the power/time template.

2. Measurement of normal burst power/time relationship
   The array of power samples measured in a) are referenced in time to the centre of the useful transmitted bits and in power to the 0 dB reference, both identified in 1.
3. Steps 1 to 2 are repeated on each timeslot within the multislot configuration with the MS commanded to operate on each of the nominal output power levels defined in tables 13.16.2-1, 13.16.2-2 and 13.16.2-3, and in step a) only on one nominal output power higher than supported by the MS.
   NOTE: Power control levels 0 and 1 are excluded for bands other than DCS 1800 and PCS 1900 since these power control levels can not be set by GAMMA_TN.
4. The SS commands the MS to the maximum power control level supported by the MS and steps a) to b) are repeated on each timeslot within the multislot configuration for ARFCN in the Low and High ranges.
5. The SS commands the MS to the maximum power control level in the first timeslot allocated within the multislot configuration and to the minimum power control level in the second timeslot allocated. Any further timeslots allocated are to be set to the maximum power control level. Steps 1 to 2 and corresponding measurements on each timeslot within the multislot configuration are repeated.
6. Measurement of access burst transmitter output power
   The SS causes the MS to generate an Access Burst on an ARFCN in the Mid ARFCN range, this could be either by a cell re-selection or a new request for radio resource. In the case of a cell re-selection procedure the Power Level indicated in the PSI3 message is the maximum power control level supported by the MS. In the case of an Access Burst the MS shall use the Power Level indicated in the GPRS_MS_TXPWR_MAX_CCH parameter. If the power class of the MS is DCS 1 800 Class 3 and the Power Level is indicated by the MS_TXPWR_MAX_CCH parameter, the MS shall also use the POWER_OFFSET parameter.
   The SS takes power measurement samples evenly distributed over the duration of the access burst as described in a). However, in this case the SS identifies the centre of the useful bits of the burst by identifying the transition from the last bit of the synch sequence. The centre of the burst is then five data bits prior to this point and is used as the timing reference. The transmitter output power is calculated as the average of the samples over the 87 useful bits of the burst. This is also used as the 0 dB reference for the power/time template.
7. Measurement of access burst power/time relationship
   The array of power samples measured in f) is referenced in time to the centre of the useful transmitted bits and in power to the 0 dB reference, both identified in 5.
8. Depending on the method used in step f) to cause the MS to send an Access Burst, the SS sends either a PACKET CELL CHANGE ORDER along with power control level set to 10 in PSI3 parameter GPRS_MS_TXPWR_MAX_CCH or it changes the (Packet) System Information elements (GPRS_)MS_TXPWR_MAX_CCH and for DCS 1 800 the POWER_OFFSET on the serving cell PBCCH/BCCH in order to limit the MS transmit power on the Access Burst to power control level 10 (+23 dBm for bands other than DCS 1800 and PCS 1900 or +10 dBm for DCS 1 800 and PCS 1 900) and then steps 5 to 6 are repeated.
9. Steps a) to h) are repeated under extreme test conditions (annex 1, TC2.2) except that the repeats at step 3 are only performed for power control level 10 and the minimum nominal output power level supported by the MS.

TEST RESULTS

GPRS900								
SLOT: 1DOWN4UP			Coding scheme: CS-4					
Test environment		Power control Level	Transmitter Output power Meas Results					
Temperature (℃)	Voltage (V)		ARFCN	Results	ARFCN	Results	ARFCN	Results
25	230	5	980	28.12	62	28.54	120	28.10
		12	980	17.24	62	17.20	120	17.68
		19	980	4.33	62	4.27	120	4.30
-20	253	5	980	28.25	62	28.67	120	28.23
		12	980	17.40	62	17.25	120	17.63
		19	980	4.30	62	4.26	120	4.31
	207	5	980	28.20	62	28.54	120	28.23
		12	980	17.31	62	17.25	120	17.60
		19	980	4.38	62	4.33	120	4.35
+55	253	5	980	28.15	62	28.60	120	28.15
		12	980	17.28	62	17.28	120	17.72
		19	980	4.28	62	4.29	120	4.38
	207	5	980	28.17	62	28.60	120	28.19
		12	980	17.22	62	17.28	120	17.68
		19	980	4.22	62	4.24	120	4.38
Test Results			PASS					

GPRS1800								
SLOT: 1DOWN4UP			Coding scheme: CS-4					
Test environment		Power control Level	Transmitter Output power Meas Results					
Temperature (℃)	Voltage (V)		ARFCN	Results	ARFCN	Results	ARFCN	Results
25	230	0	520	24.11	698	24.38	880	24.07
		8	520	13.85	698	13.87	880	13.70
		15	520	-0.56	698	-0.23	880	-0.86
-20	253	0	520	24.27	698	24.31	880	24.15
		8	520	13.80	698	13.86	880	13.76
		15	520	-0.40	698	-0.18	880	-0.80
	207	0	520	24.20	698	24.30	880	24.12
		8	520	13.83	698	13.82	880	13.71
		15	520	-0.44	698	-0.18	880	-0.79
+55	253	0	520	24.16	698	24.35	880	24.12
		8	520	13.76	698	13.84	880	13.75
		15	520	-0.52	698	-0.26	880	-0.82
	207	0	520	24.19	698	24.30	880	24.10
		8	520	13.79	698	13.84	880	13.75
		15	520	-0.56	698	-0.26	880	-0.82
Test Results			PASS					

GPRS900								
SLOT: 2DOWN2UP			Coding scheme: CS-4					
Test environment		Power control Level	Transmitter Output power Meas Results					
Temperature (℃)	Voltage (V)		ARFCN	Results	ARFCN	Results	ARFCN	Results
25	230	5	980	31.38	62	31.50	120	31.76
		12	980	17.74	62	17.82	120	17.97
		19	980	3.85	62	3.90	120	4.02
-20	253	5	980	31.45	62	31.56	120	31.80
		12	980	17.79	62	17.85	120	18.03
		19	980	3.87	62	3.92	120	4.06
	207	5	980	31.49	62	31.56	120	31.80
		12	980	17.82	62	17.89	120	18.00
		19	980	3.90	62	3.96	120	4.00
+55	253	5	980	31.42	62	31.52	120	17.99
		12	980	17.82	62	17.80	120	31.82
		19	980	3.94	62	3.92	120	4.05
	207	5	980	31.42	62	31.65	120	31.78
		12	980	17.84	62	17.88	120	18.02
		19	980	3.93	62	3.92	120	4.02
Test Results			PASS					

GPRS1800								
SLOT: 2DOWN2UP			Coding scheme: CS-4					
Test environment		Power control Level	Transmitter Output power Meas Results					
Temperature (℃)	Voltage (V)		ARFCN	Results	ARFCN	Results	ARFCN	Results
25	230	0	520	29.01	698	29.14	880	29.00
		8	520	13.56	698	13.42	880	13.38
		15	520	-0.12	698	-0.02	880	-0.56
-20	253	0	520	29.10	698	29.23	880	29.06
		8	520	13.40	698	13.49	880	13.45
		15	520	-0.09	698	-0.05	880	-0.50
	207	0	520	29.10	698	23.20	880	29.00
		8	520	13.37	698	13.52	880	13.41
		15	520	-0.12	698	-0.05	880	-0.56
+55	253	0	520	29.05	698	29.17	880	29.05
		8	520	13.58	698	13.46	880	13.41
		15	520	-0.08	698	-0.07	880	-0.54
	207	0	520	29.08	698	29.17	880	29.02
		8	520	13.56	698	13.45	880	13.38
		15	520	-0.07	698	-0.09	880	-0.52
Test Results			PASS					

4.1.2. EGPRS Transmitter output power

LIMIT

ETSI TS 51.010-1 (V.10.2.0) Sub-clause 13.17.3.4.1

The transmitter output power is the average value of the power delivered to an artificial antenna or radiated by the MS and its integral antenna, over the time that the useful information bits of one burst are transmitted. Since the conformance requirement, test procedure and test requirement of GSMK modulated signal's output power are defined in subclause 13.16.2 for GPRS MS, being thereby defined also for all EGPRS MS in that section, only 8PSK modulated signal's output power conformance requirement, test procedure and test requirements are defined in this subclause.
The transmitter output power for the 8-PSK modulated signals, under every combination of normal and extreme test conditions, for normal bursts, at each frequency and for each power control level applicable to the MS power class, shall be at the relevant level shown in table 13.17.3-1 or table 13.17.3-2 within the tolerances also shown in table 13.17.3-1 or table 13.17.3-2.

Table 13.17.3-1: Bands other than DCS 1800 and PCS 1900 transmitter output power for different power classes 8PSK Modulated Signals

Power class			Power control level (note 3)	GAMMA_TN (Γ_{CH})	Transmitter output power (note 1,2)	Tolerances	
E1	E2	E3					
•			2-5	0-3	33	±2 dB	±2.5dB
			6	4	31	±3 dB	±4 dB
			7	5	29	±3 dB	±4 dB
	•		8	6	27	±3 dB	±4 dB
	•		9	7	25	±3 dB	±4 dB
	•	•	10	8	23	±3 dB	±4 dB
	•	•	11	9	21	±3 dB	±4 dB
	•	•	12	10	19	±3 dB	±4 dB
	•	•	13	11	17	±3 dB	±4 dB
	•	•	14	12	15	±3 dB	±4 dB
	•	•	15	13	13	±3 dB	±4 dB
	•	•	16	14	11	±5 dB	±6 dB
	•	•	17	15	9	±5 dB	±6 dB
	•	•	18	16	7	±5 dB	±6 dB
	•	•	19	17	5	±5 dB	±6 dB

NOTE 1: For R99 and Rel-4, the maximum output power in a multislot configuration must be lower within the limits defined in table 13.17.3-1a. From Rel-5 onwards, the maximum output power in a multislot configuration may be lower within the limits defined in table 13.17.3-1b.
NOTE 2: For a MS using reduced interslot dynamic range in multislot configurations, the MS may restrict the interslot output power control range to a 10 dB window, on a TDMA frame basis. On those timeslots where the ordered power level is more than 10 dB lower than the applied power level of the highest power timeslot, the MS shall transmit at a lowest possible power level within 10 dB range from the highest applied power level, if not transmitting at the actual ordered power level.
NOTE 3: There is no requirement to test power control levels 20-31.

Table 13.17.3-1a: R99 and Rel-4: Bands other than DCS 1800 and PCS 1900 allowed maximum output power reduction in a multislot configuration

Number of timeslots in uplink assignment	Permissible nominal reduction of maximum output power, (dB)
1	0
2	0 to 3.0
3	1.8 to 4.8
4	3.0 to 6.0

Table 13.17.3-1b: From Rel-5 onwards: Bands other than DCS 1800 and PCS 1900 allowed maximum output power reduction in a multislot configuration

Number of timeslots in uplink assignment	Permissible nominal reduction of maximum output power, (dB)
1	0
2	3.0
3	4.8
4	6.0

5	7.0
6	7.8
7	8.5
8	9.0

Table 13.17.3-2: DCS 1 800 and PCS 1 900 transmitter output power for different power classes 8-PSK Modulated Signals

Power class			Power control level (note 3)	GAMMA_TN (Γ_{CH})	Transmitter output power (note 1,2)	Tolerances	
E1	E2	E3				NORMAL	EXTREME
•			29.0 *)	0-3 **)	30	±3 dB(note 4)	±4dB(note 4)
			1	4	28	±3 dB	±4 dB
	•		2	5	26	±3 dB(note 4)	±4dB(note 4)
	•		3	6	24	±3 dB	±4 dB
	•	•	4	7	22	±3 dB	±4 dB
	•	•	5	8	20	±3 dB	±4 dB
	•	•	6	9	18	±3 dB	±4 dB
	•	•	7	10	16	±3 dB	±4 dB
	•	•	8	11	14	±4 dB	±4 dB
	•	•	9	12	12	±4 dB	±5 dB
	•	•	10	13	10	±4 dB	±5 dB
	•	•	11	14	8	±4 dB	±5 dB
	•	•	12	15	6	±4 dB	±5 dB
	•	•	13	16	4	±5 dB	±5 dB
	•	•	14	17	2	±5 dB	±6 dB
	•	•	15	18	0	±5 dB	±6 dB

*) 30-0 for PCS 1900 **) 1-3 for PCS 1900

NOTE 1: For R99 and Rel-4, the maximum output power in a multislot configuration must be lower within the limits defined in table 13.17.3-2a. From Rel-5 onwards, the maximum output power in a multislot configuration may be lower within the limits defined in table 13.17.3-2b.

NOTE 2: For a MS using reduced interslot dynamic range in multislot configurations, the MS may restrict the interslot output power control range to a 10 dB window, on a TDMA frame basis. On those timeslots where the ordered power level is more than 10 dB lower than the applied power level of the highest power timeslot, the MS shall transmit at a lowest possible power level within 10 dB range from the highest applied power level, if not transmitting at the actual ordered power level.

NOTE 3: There is no requirement to test power control levels 16-28.

NOTE 4: When the power control level corresponds to the power class of the MS, then the tolerances shall be ±2,0 dB under normal test conditions and ±2,5 dB under extreme test conditions for a class E1 mobile. For a class E2 mobile the tolerances shall be -4/+3 under normal test conditions and -4,5/+4 dB under extreme test conditions.

TEST PROCEDURE

1. Measurement of normal burst transmitter output power
   For 8PSK, power may be determined by applying the technique described for GMSK in subclause 13.16.2.4.1.2; step a) and then averaging over multiple bursts to achieve sufficient accuracy (see annex 5). Alternatively, an estimation technique based on a single burst which can be demonstrated to yield the same result as the long term average may be used. The long term average or the estimate of long term average is used as the 0dB reference for the power/time template.
2. Measurement of normal burst power/time relationship. The array of power samples measured in a) are referenced in time to the centre of the useful transmitted symbols and in power to the 0 dB reference, both identified in 1.
3. Steps 1 to 2 are repeated on each timeslot within the multislot configuration with the MS commanded to operate on each of the nominal output power levels defined in tables 13.17.3-1, 13.17.3-2 and 13.17.3-3. NOTE: Power control levels 0 and 1 are excluded for bands other than DCS 1800 and PCS 1900 since these power control levels can not be set by GAMMA_TN.
4. The SS commands the MS to the maximum power control level supported by the MS and steps a) to b) are repeated on each timeslot within the multislot configuration for ARFCN in the Low and High ranges.
5. The SS commands the MS to the maximum power control level in the first timeslot allocated within the multislot configuration and to the minimum power control level in the second timeslot allocated. Any further timeslots allocated are to be set to the maximum power control level. Steps a) to b) and

corresponding measurements on each timeslot within the multislot configuration are repeated. This step is only applicable to MS which support more than one uplink time slot.

6. Steps 1 to 5 are repeated under extreme test conditions (annex 1, TC2.2) except that the repeats at step c) are only performed for power control level 10 and the minimum nominal output power level supported by the MS.

Table 13.17.3-2a: R99 and Rel-4: DCS 1 800 and PCS 1 900 allowed maximum output power reduction in a multislot configuration

Number of timeslots in uplink assignment	Permissible nominal reduction of maximum output power, (dB)
1	0
2	0 to 3.0
3	1.8 to 4.8
4	3.0 to 6.0

Table 13.17.3-2b: From Rel-5 onwards: DCS 1 800 and PCS 1 900 allowed maximum output power reduction in a multislot configuration

Number of timeslots in uplink assignment	Permissible nominal reduction of maximum output power, (dB)
1	0
2	3.0
3	4.8
4	6.0
5	7.0
6	7.8
7	8.5
8	9.0

TEST RESULTS

EGPRS900								
SLOT: 1DOWN4UP			Coding scheme: CS-4					
Test environment		Power control Level	Transmitter Output power Meas Results					
Temperature (℃)	Voltage (V)		ARFCN	Results	ARFCN	Results	ARFCN	Results
25	230	8	980	25.32	62	25.15	120	25.03
		10	980	22.01	62	22.34	120	22.14
		12	980	18.96	62	18.77	120	18.52
		14	980	14.24	62	14.11	120	14.03
		16	980	10.69	62	10.52	120	10.22
		19	980	4.24	62	4.36	120	4.13
-20	253	8	980	25.38	62	25.33	120	25.10
		10	980	22.08	62	22.47	120	22.27
		12	980	18.82	62	18.82	120	18.69
		14	980	14.16	62	14.37	120	14.21
		16	980	10.82	62	10.66	120	10.22
		19	980	4.40	62	4.45	120	4.21
	207	8	980	25.38	62	25.27	120	25.15
		10	980	22.04	62	22.42	120	22.27
		12	980	18.89	62	18.82	120	18.66
		14	980	14.20	62	14.29	120	14.17
		16	980	10.74	62	10.60	120	10.22
		19	980	4.40	62	4.41	120	4.18
+55	253	8	980	25.35	62	25.15	120	25.12
		10	980	22.01	62	22.41	120	22.17
		12	980	18.82	62	18.82	120	18.60
		14	980	14.26	62	14.33	120	14.10
		16	980	10.75	62	10.58	120	10.22
		19	980	4.35	62	4.38	120	4.18
	207	8	980	25.32	62	25.20	120	25.09
		10	980	22.05	62	22.41	120	22.15
		12	980	18.85	62	18.78	120	18.55
		14	980	14.20	62	14.38	120	14.10
		16	980	10.69	62	10.50	120	10.22
		19	980	4.29	62	4.34	120	4.13
Test Results			PASS					

EGPRS1800								
SLOT: 1DOWN4UP			Coding scheme: CS-4					
Test environment		Power control Level	Transmitter Output power Meas Results					
Temperature (℃)	Voltage (V)		ARFCN	Results	ARFCN	Results	ARFCN	Results
25	230	2	520	24.10	698	24.15	880	24.22
		5	520	19.81	698	19.77	880	19.64
		8	520	13.40	698	13.51	880	13.53
		11	520	7.52	698	7.54	880	7.37
		15	520	-0.55	698	-0.42	880	-0.50
-20	253	2	520	24.16	698	24.23	880	24.35
		5	520	19.74	698	19.80	880	19.78
		8	520	13.52	698	13.66	880	13.60
		11	520	7.59	698	7.67	880	7.42
		15	520	-0.48	698	-0.36	880	-0.41
	207	2	520	24.16	698	24.20	880	24.31
		5	520	19.78	698	19.77	880	19.73
		8	520	13.55	698	13.63	880	13.58
		11	520	7.62	698	7.60	880	7.40
		15	520	-0.52	698	-0.39	880	-0.45
+55	253	2	520	24.12	698	24.17	880	24.27
		5	520	19.77	698	19.74	880	19.68
		8	520	13.48	698	13.60	880	13.53
		11	520	7.59	698	7.63	880	7.40
		15	520	-0.55	698	-0.40	880	-0.45
	207	2	520	24.12	698	24.17	880	24.25
		5	520	19.80	698	19.81	880	19.68
		8	520	13.50	698	13.56	880	13.53
		11	520	7.59	698	7.54	880	7.39
		15	520	-0.52	698	-0.40	880	-0.49
Test Results			PASS					

EGPRS900								
SLOT: 2DOWN2UP			Coding scheme: CS-4					
Test environment		Power control Level	Transmitter Output power Meas Results					
Temperature (℃)	Voltage (V)		ARFCN	Results	ARFCN	Results	ARFCN	Results
25	230	8	980	26.10	62	25.98	120	25.77
		10	980	22.35	62	22.31	120	22.14
		12	980	18.74	62	18.66	120	18.50
		14	980	14.59	62	14.54	120	14.23
		16	980	10.66	62	10.72	120	10.55
		19	980	4.52	62	4.47	120	4.36
-20	253	8	980	26.22	62	26.10	120	25.90
		10	980	22.44	62	22.42	120	22.25
		12	980	18.71	62	18.66	120	18.46
		14	980	14.60	62	14.62	120	14.37
		16	980	10.72	62	10.70	120	10.55
		19	980	4.59	62	4.55	120	4.48
	207	8	980	26.22	62	26.10	120	22.87
		10	980	22.40	62	22.40	120	22.20
		12	980	18.71	62	18.63	120	18.50
		14	980	14.63	62	14.62	120	14.35
		16	980	10.69	62	10.72	120	10.52
		19	980	4.59	62	4.50	120	4.45
+55	253	8	980	26.18	62	26.05	120	22.85
		10	980	22.40	62	22.38	120	22.20
		12	980	18.74	62	18.60	120	18.46
		14	980	14.61	62	14.57	120	14.28
		16	980	10.69	62	10.68	120	10.50
		19	980	4.55	62	4.53	120	4.40
	207	8	980	26.15	62	26.02	120	22.82
		10	980	22.37	62	22.35	120	22.17
		12	980	18.70	62	18.60	120	10.46
		14	980	14.60	62	14.54	120	14.30
		16	980	10.67	62	10.72	120	10.50
		19	980	4.55	62	4.55	120	4.43
Test Results			PASS					

EGPRS1800								
SLOT: 1DOWN2UP			Coding scheme: CS-4					
Test environment		Power control Level	Transmitter Output power Meas Results					
Temperature (℃)	Voltage (V)		ARFCN	Results	ARFCN	Results	ARFCN	Results
25	230	2	520	24.95	698	24.71	880	24.55
		5	520	19.44	698	19.55	880	19.48
		8	520	13.60	698	13.63	880	13.60
		11	520	7.77	698	7.69	880	7.64
		15	520	-0.35	698	-0.40	880	-0.48
-20	253	2	520	25.13	698	24.86	880	24.63
		5	520	19.58	698	19.55	880	19.42
		8	520	13.67	698	13.69	880	13.68
		11	520	7.70	698	7.62	880	7.66
		15	520	-0.42	698	-0.36	880	-0.41
	207	2	520	23.10	698	24.86	880	23.60
		5	520	19.55	698	19.50	880	19.48
		8	520	13.62	698	13.66	880	13.66
		11	520	7.75	698	7.62	880	7.66
		15	520	-0.42	698	-0.40	880	-0.45
+55	253	2	520	23.06	698	24.78	880	24.58
		5	520	19.50	698	19.50	880	19.48
		8	520	13.62	698	13.65	880	13.64
		11	520	7.72	698	7.66	880	7.66
		15	520	-0.35	698	-0.40	880	-0.50
	207	2	520	23.00	698	24.75	880	24.55
		5	520	19.54	698	19.50	880	19.42
		8	520	13.60	698	13.66	880	13.62
		11	520	7.72	698	7.66	880	7.66
		15	520	-0.35	698	-0.36	880	-0.48
Test Results			PASS					

4.1.3. Radiated spurious emissions

LIMIT

ETSI TS 51.010-1 (V.10.2.0) Sub-clause 12.1.1.5 and 12.2.2.5

MS allocated a channel

Radiated spurious emissions, when the MS has been allocated a channel, are any emissions radiated by the cabinet and structure of the mobile station, including all interconnecting cables.
This is also known as "cabinet radiation".
The test applies to all types of MS with the exception of the test at extreme voltages for an MS where a practical connection, to an external power supply, is not possible.
NOTE: A "practical connection" shall be interpreted to mean it is possible to connect extreme voltages to the MS without interfering with the configuration of the MS in a way which could invalidate the test.
The radiated spurious power emitted by the MS, when allocated a channel, shall be no more than the levels in table 12.7 under extreme voltage conditions; 3GPP TS 05.05, subclauses 4.3 and 4.3.3, and clause D.2.

Table 12.7

Frequency range		Power level in dBm		
		GSM 400, GSM 700, T-GSM 810, GSM 850, GSM 900	DCS 1 800	PCS 1 900
100 kHz to	1 GHz	-36	-36	-36
1 GHz to	12.75 GHz	-30		-30
1 GHz to	1710 MHz		-30	
1 710 MHz to	1 785 MHz		-36	
1 785 MHz to	4 GHz		-30	

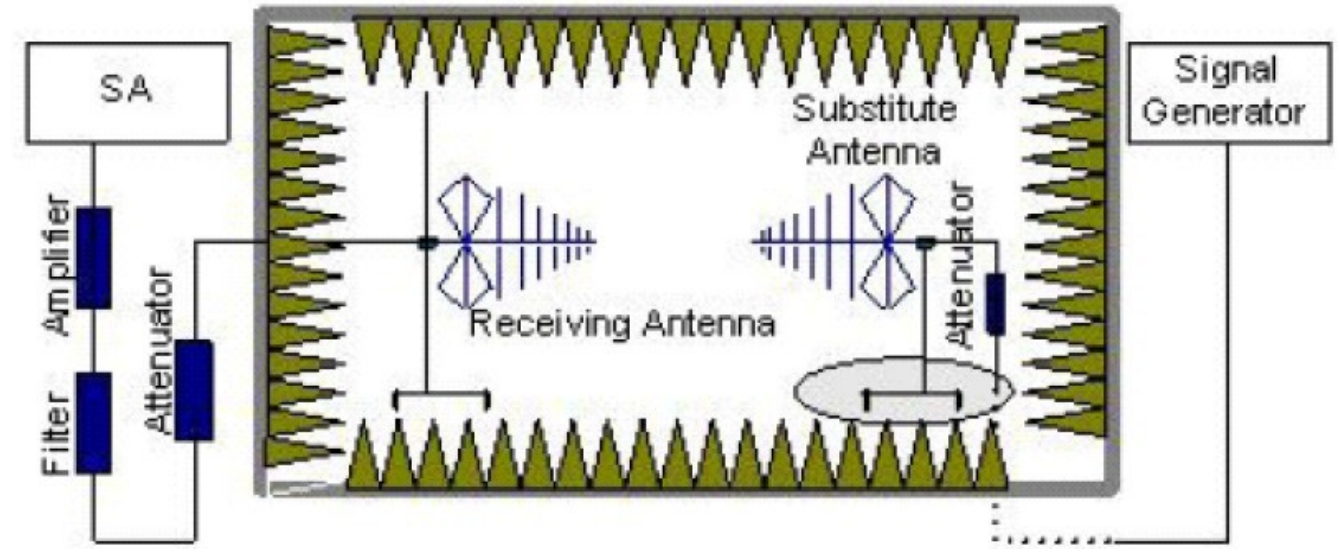
MS in idle mode

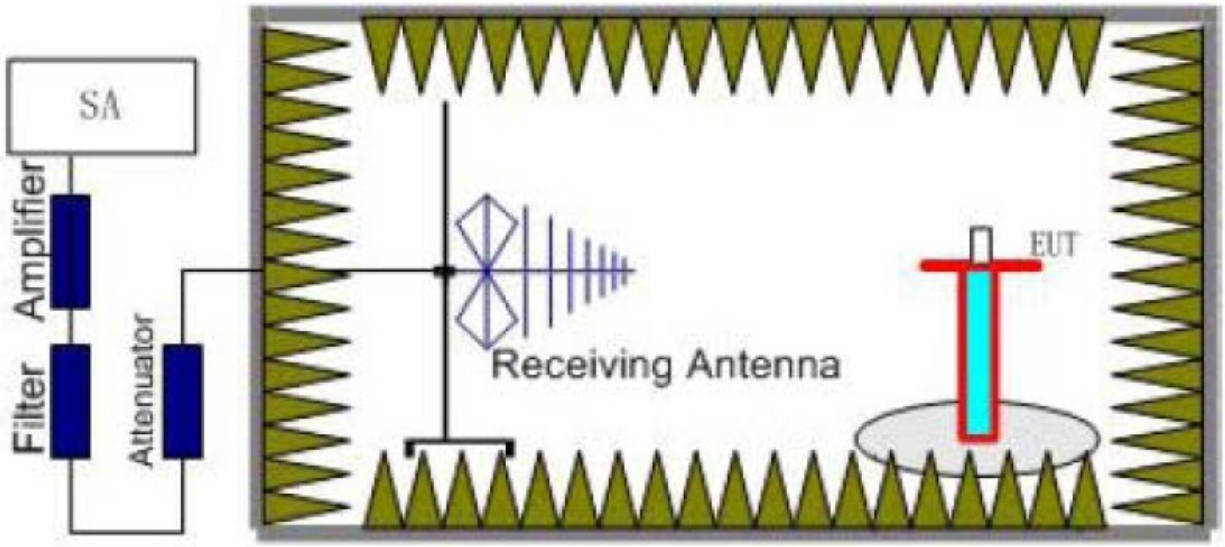
Radiated spurious emissions, when the MS is in idle mode, are any emissions radiated by the cabinet and structure of the mobile station, including all interconnecting cables.
This is also known as "cabinet radiation".
The test applies to all types of MS with the exception of the test at extreme voltages for an MS where a practical connection, to an external power supply, is not possible.
NOTE: A "practical connection" shall be interpreted to mean it is possible to connect extreme voltages to the MS without interfering with the configuration of the MS in a way which could invalidate the test.
The radiated spurious power emitted by the MS, when in idle mode, shall be no more than the levels in table 12.9. under extreme voltage conditions; 3GPP TS 05.05, subclauses 4.3 and 4.3.3, and clause D.2.

Table 12.9

Frequency range		Power level in dBm	
		GSM 400, T-GSM 810 GSM 900, DCS 1 800	GSM 700, GSM 850, PCS 1 900
100 kHz to	880 MHz	-57	-57
880 MHz to	915 MHz	-59	-57
915 MHz to	1 000 MHz	-57	-57
1 GHz to	1 710 MHz	-47	
1 710 MHz to	1 785 MHz	-53	
1 785 MHz to	12.75 GHz	-47	
1 GHz to	1 850 MHz		-47
1 850 MHz to 1	1 910 MHz		-53
1 910 MHz to	12.75 GHz		-47

TEST CONFIGURATION





TEST PROCEDURE

Step 1:
The measurement is carried out in the fully anechoic chamber. EUT was placed on a 1.50 meter high non-conductive table at a 3 meter test distance from the test receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT. The height of receiving antenna is 1.50 m and varies in certain range to find the maximum power value. Connect the EUT to the BTS simulator via the air interface. The measurement is carried out using a spectrum analyzer or receiver. Then the antenna height and turn table rotation is adjusted till the maximum power value is founded on spectrum analyzer or receiver. A filter is necessary in the band near to the carrier frequency. A filter is needed to avoid the distortion of the testing equipment in the band above the carrier frequency.

Step 2:
A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.

Calculation procedure:
The data of cable loss, antenna gain and air loss has been calibrated in full testing frequency range before the testing.
The power of the Radiated Spurious Emissions is calculated by adding the cable loss, antenna gain and air loss. The basic equation with a sample calculation is as followed:
$P=P_R+L_C+L_A-G$
Where
P: Power of the Radiated Spurious Emissions (dBm)
P_R: reading of the receiver (dBm)

L_C: Cable Lose and power amilifer gain and filter cable loss (dB)
L_A: Air loss (dB)
G: Antenna Gain (dBi)
Assumed the reading of the receiver is -60dBm. A cable lose of 10dB, an air lose of 30dB and an antenna gain of 11dBi are added.
$P=P_R+L_C+L_A-G=-60+10+30-11=-31dBm$

TEST RESULTS

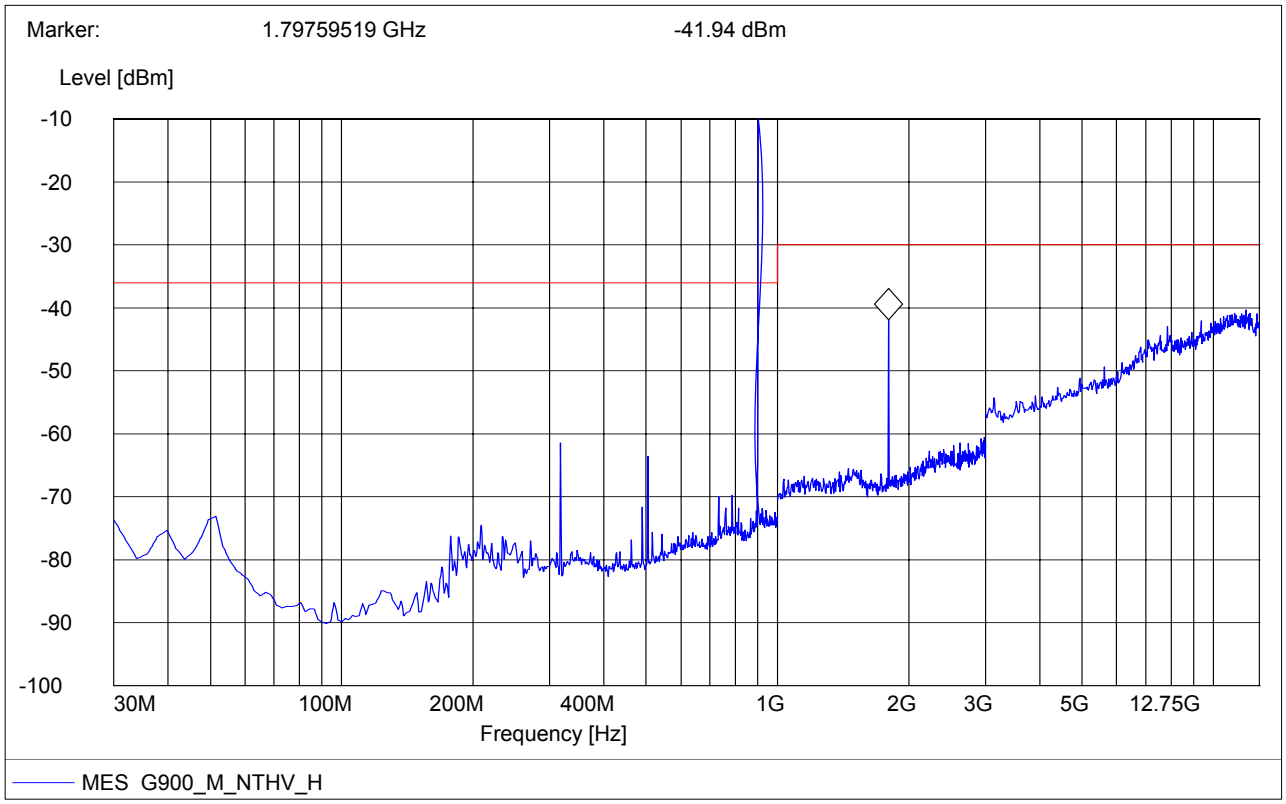
This test was carried out in all the test modes, here only the worst test result was shown.

The EUT has met the requirements of 3GPP2 C.S0011-A's requirement.

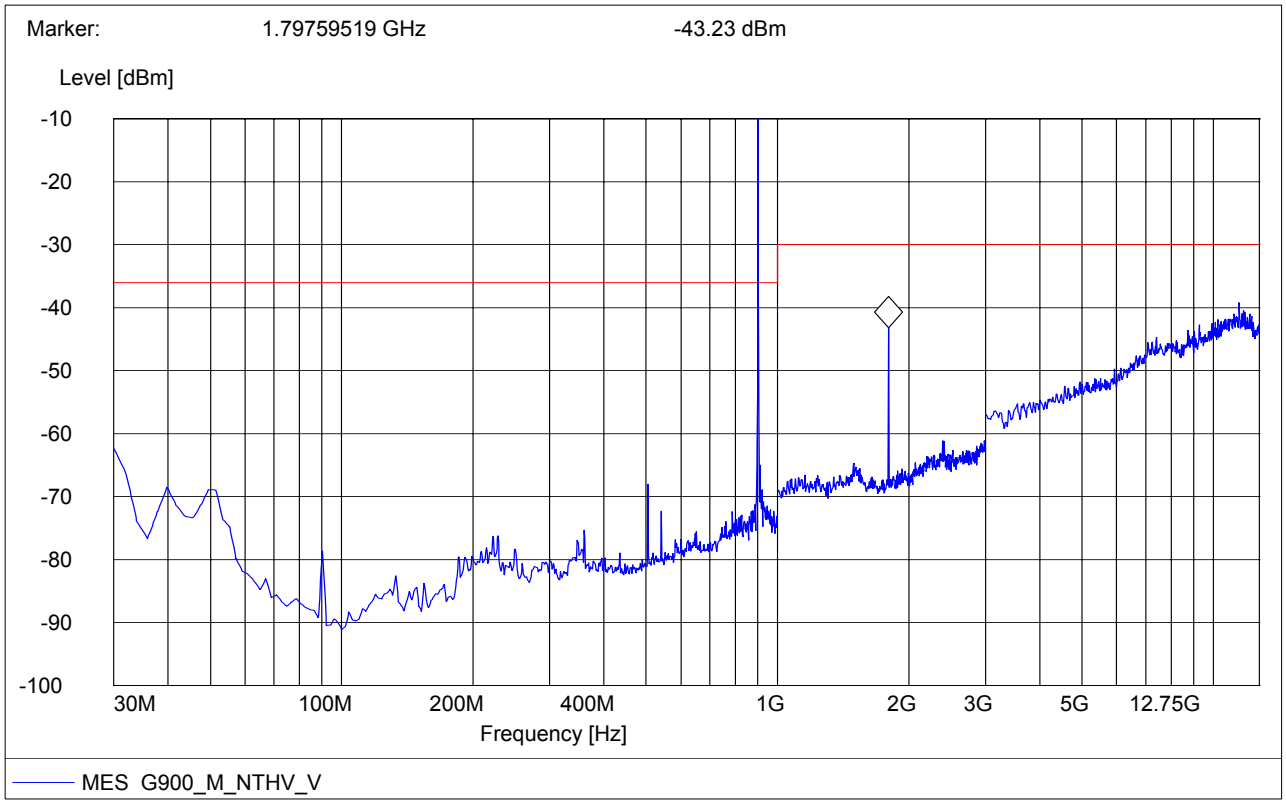
For GPRS900

Traffic Mode (30MHz~4GHz)

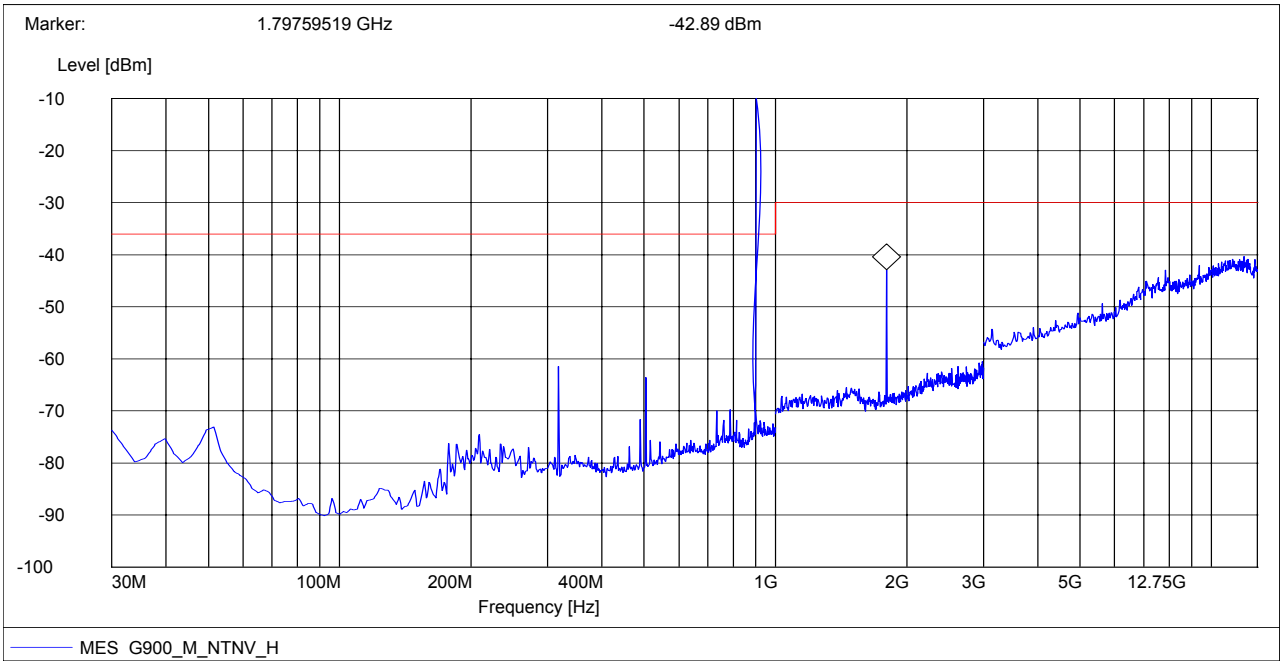
The Middle Channel @Horizontal @ High Voltage



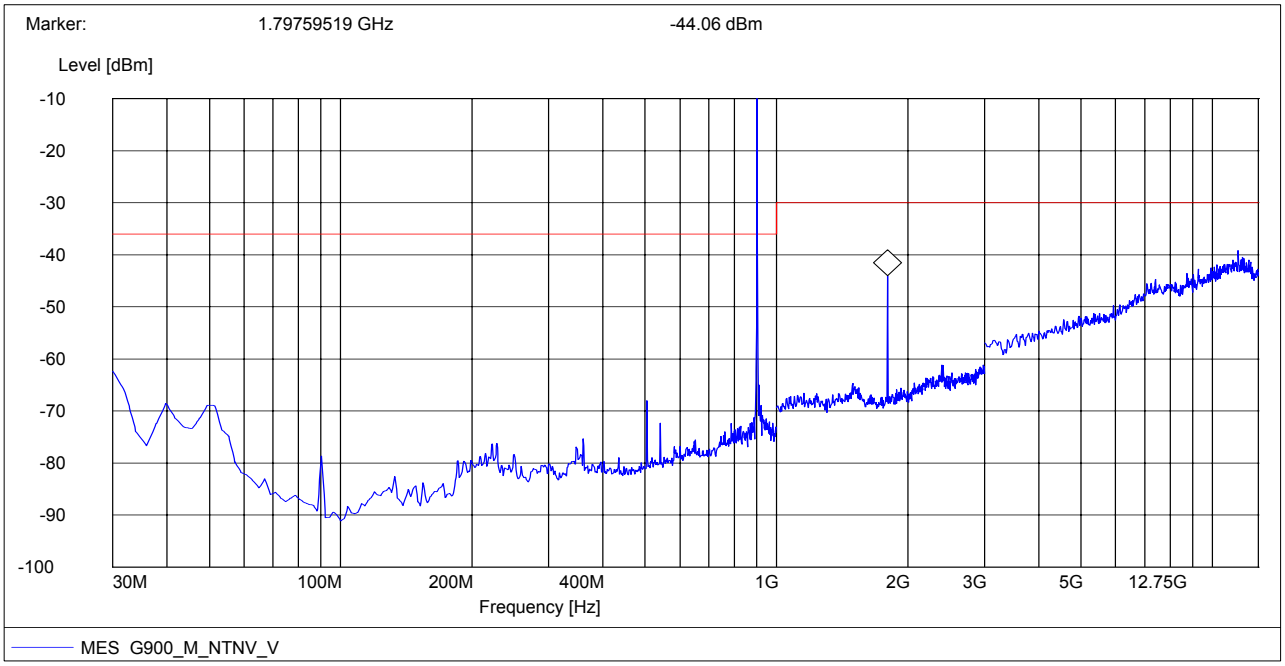
The Middle Channel @Vertical @ High Voltage



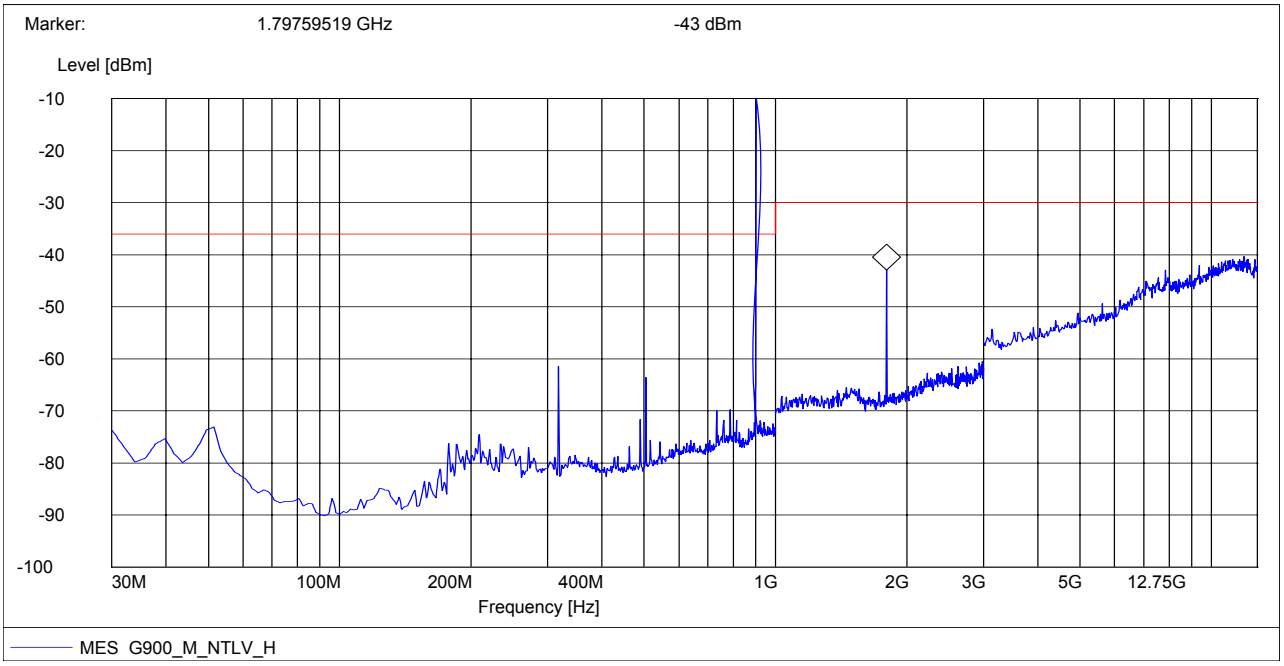
The Middle Channel @Horizontal @ Nor Voltage



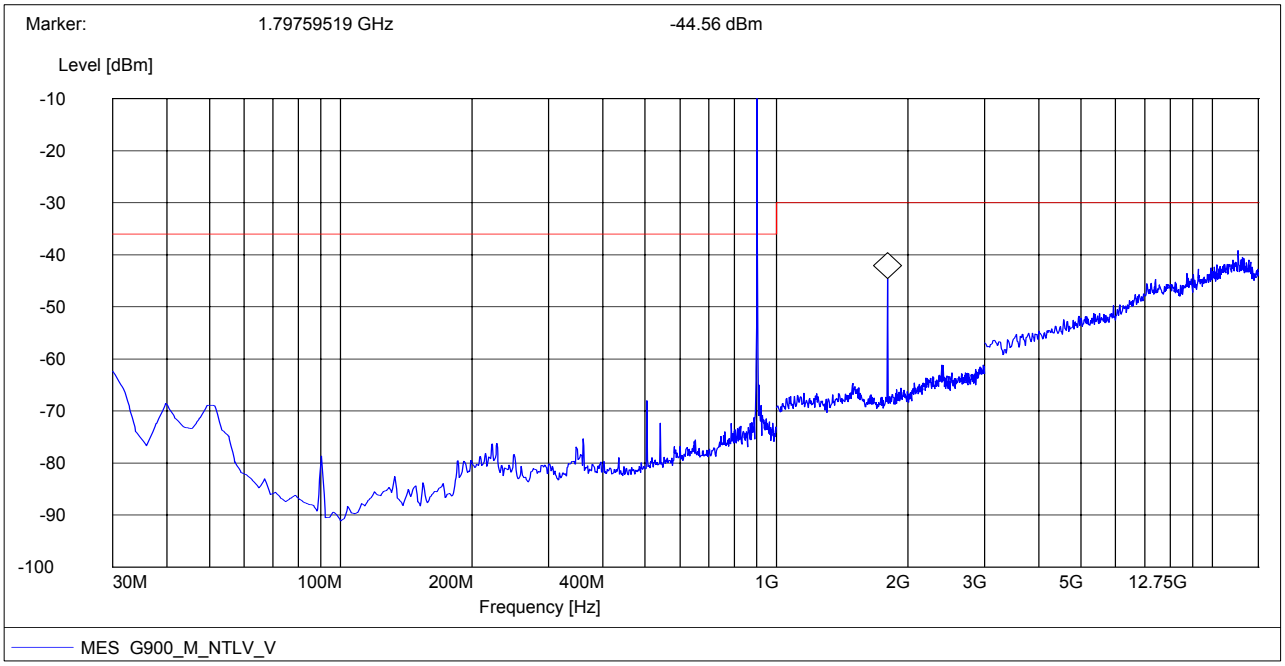
The Middle Channel @Vertical @ Nor Voltage



The Middle Channel @Horizontal @ Low Voltage

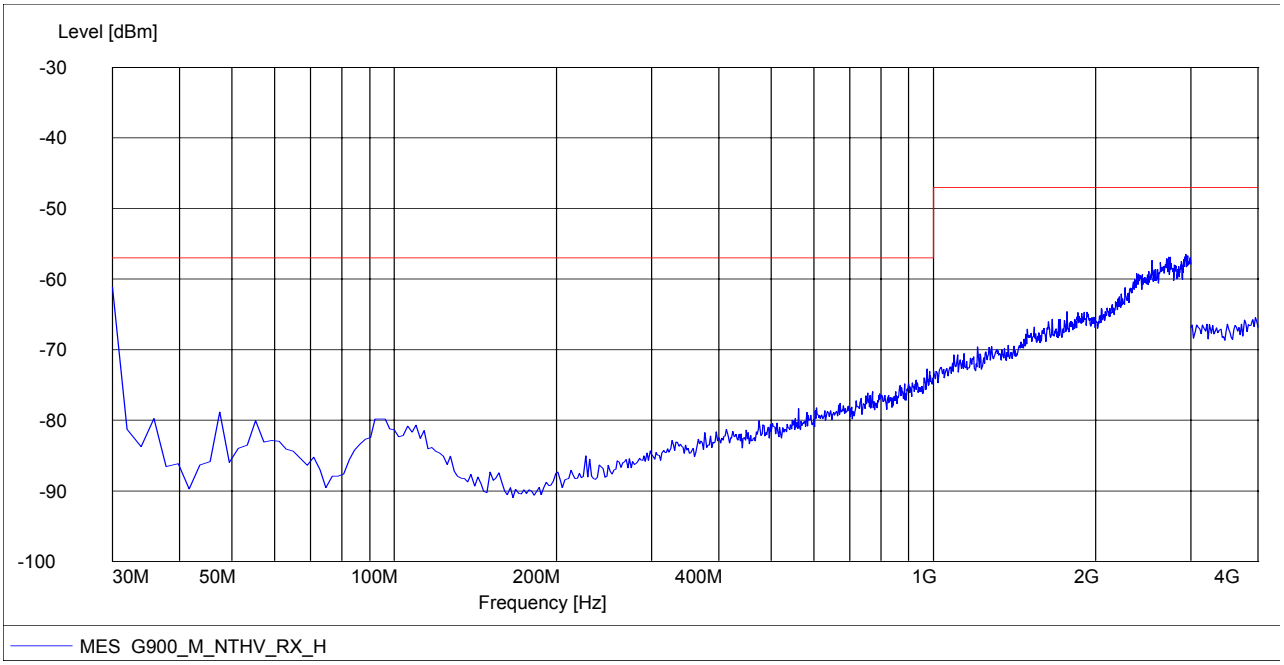


The Middle Channel @Vertical @ Low Voltage

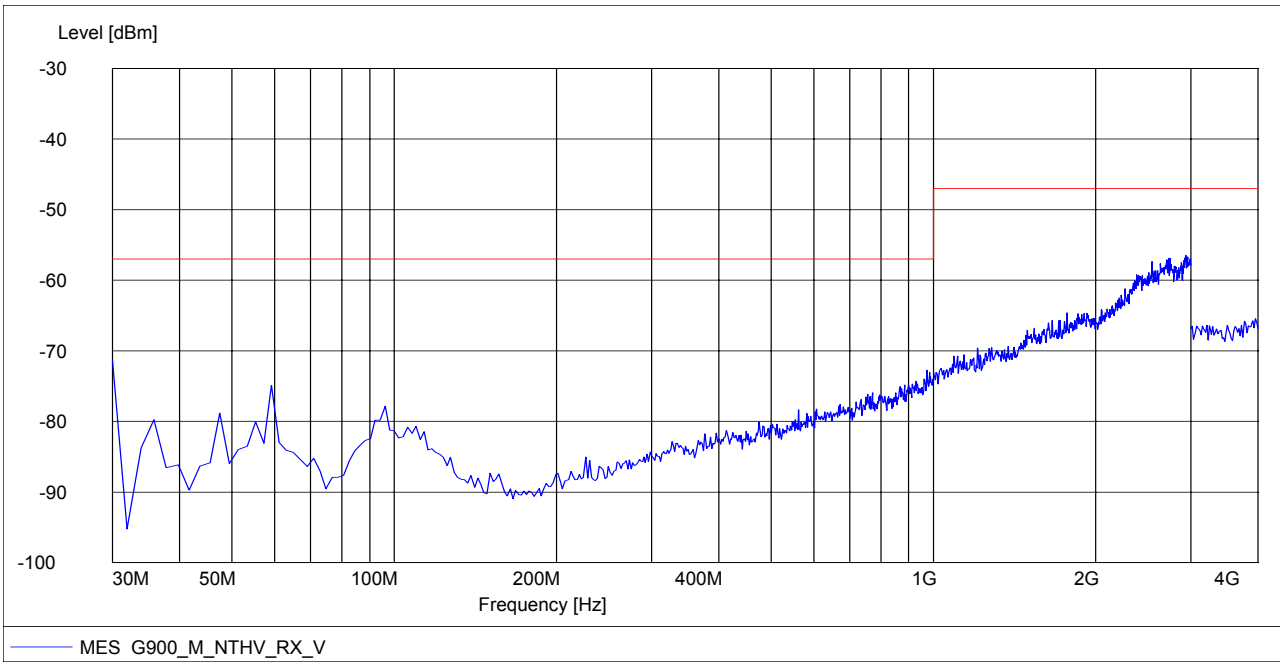


Idle Mode (30MHz~4GHz)

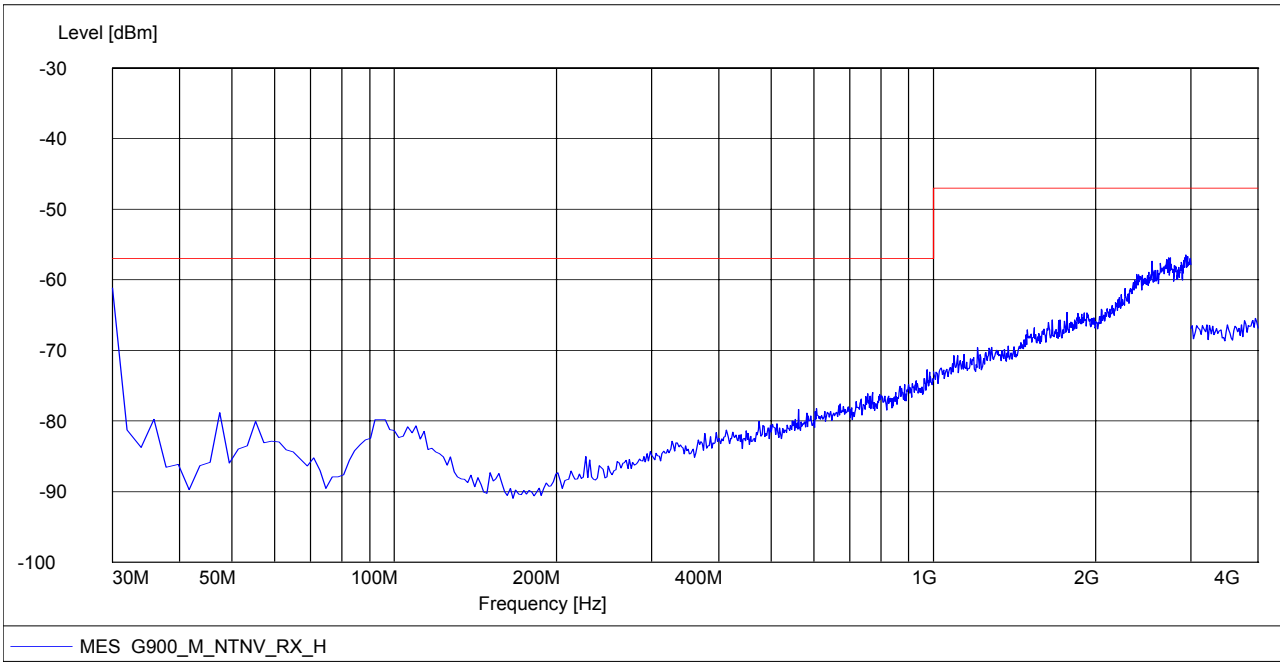
The Middle Channel @Horizontal @ High Voltage



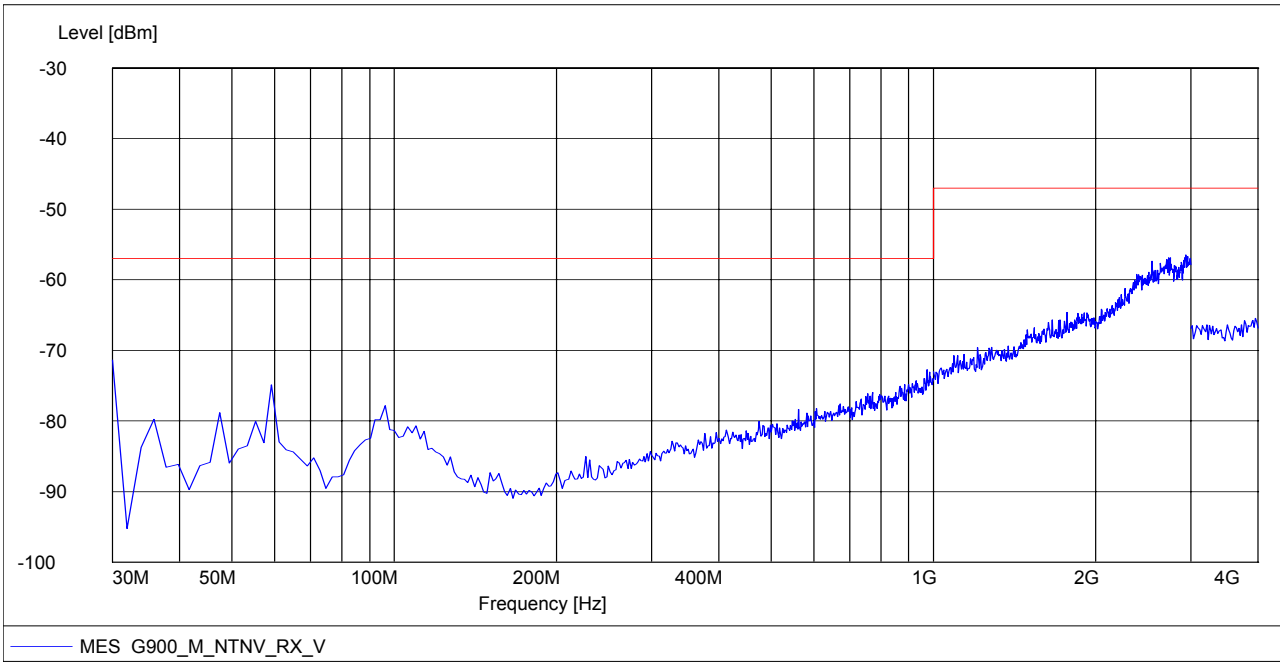
The Middle Channel @Vertical @ High Voltage



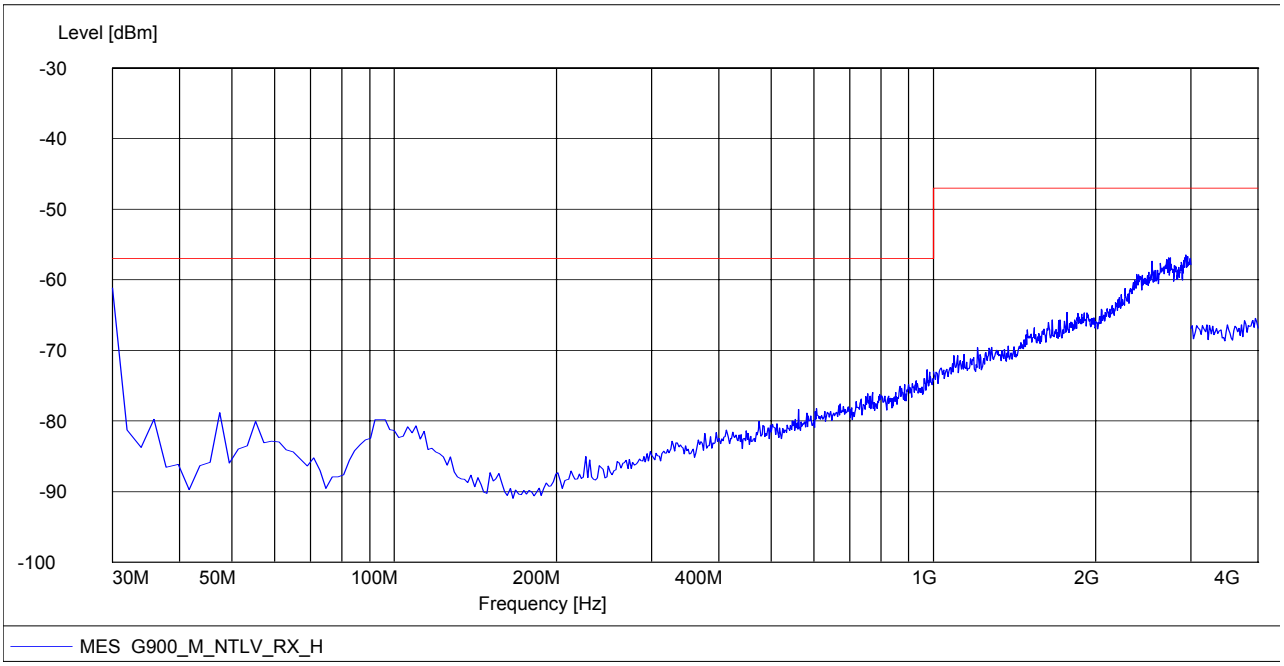
The Middle Channel @Horizontal @ Nor Voltage



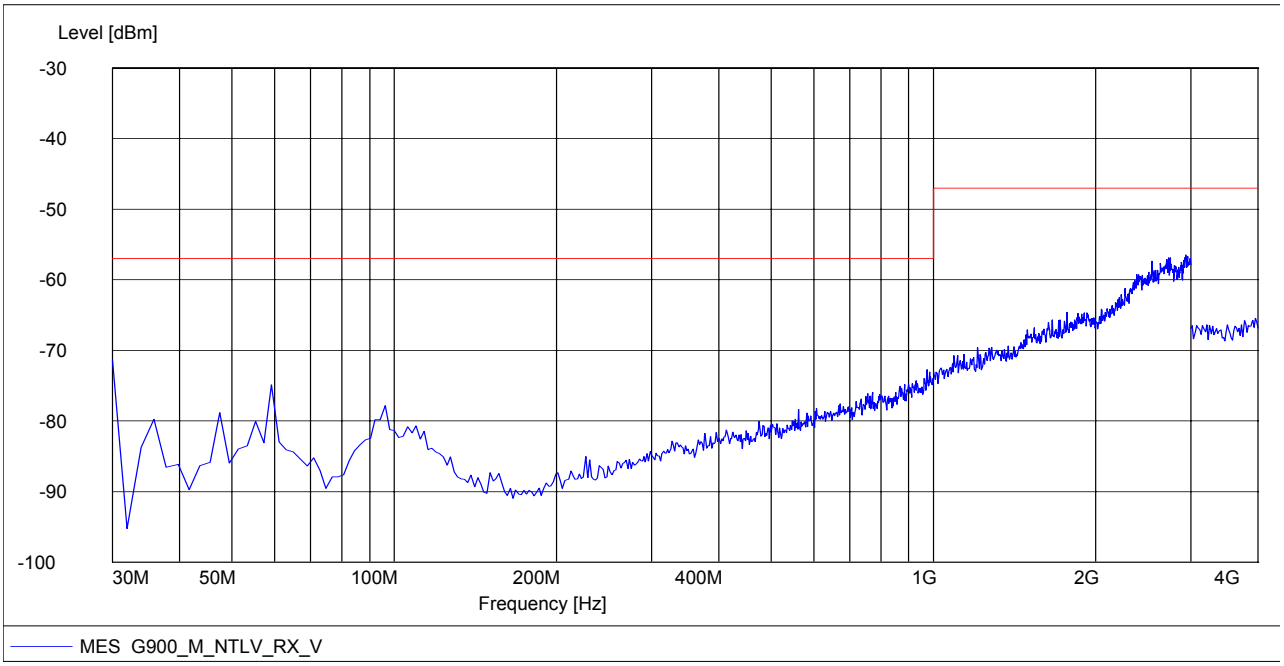
The Middle Channel @Vertical @ Nor Voltage



The Middle Channel @Horizontal @ Low Voltage



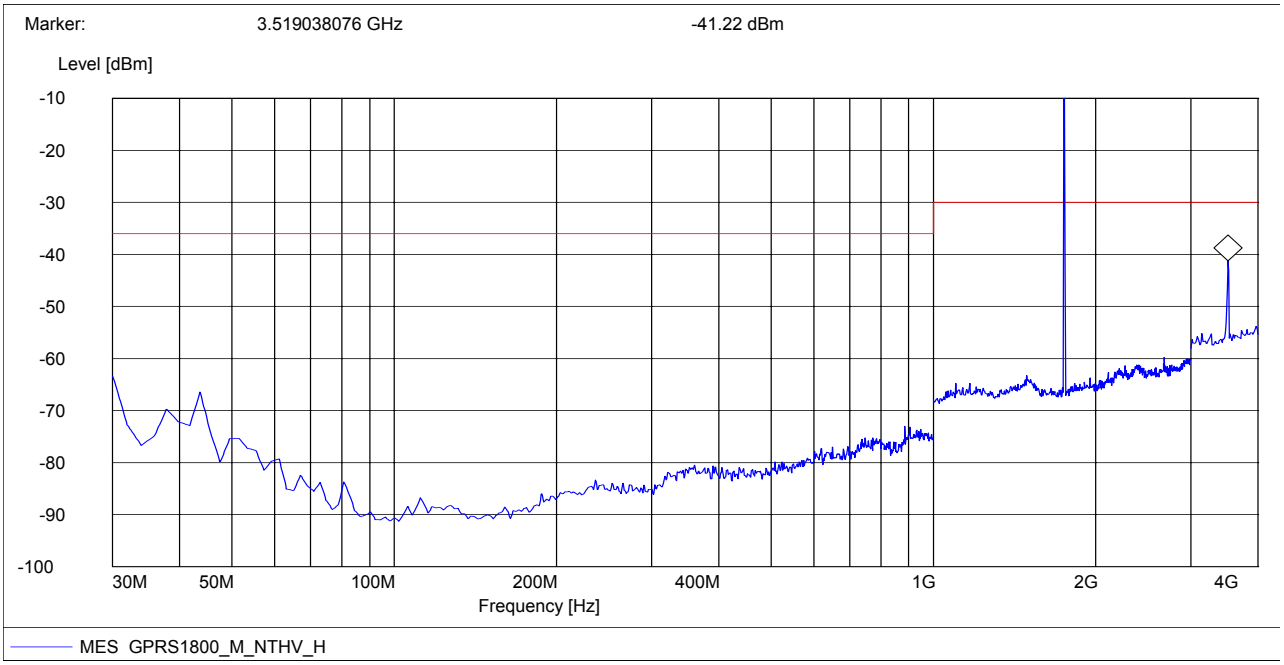
The Middle Channel @Vertical @ Low Voltage



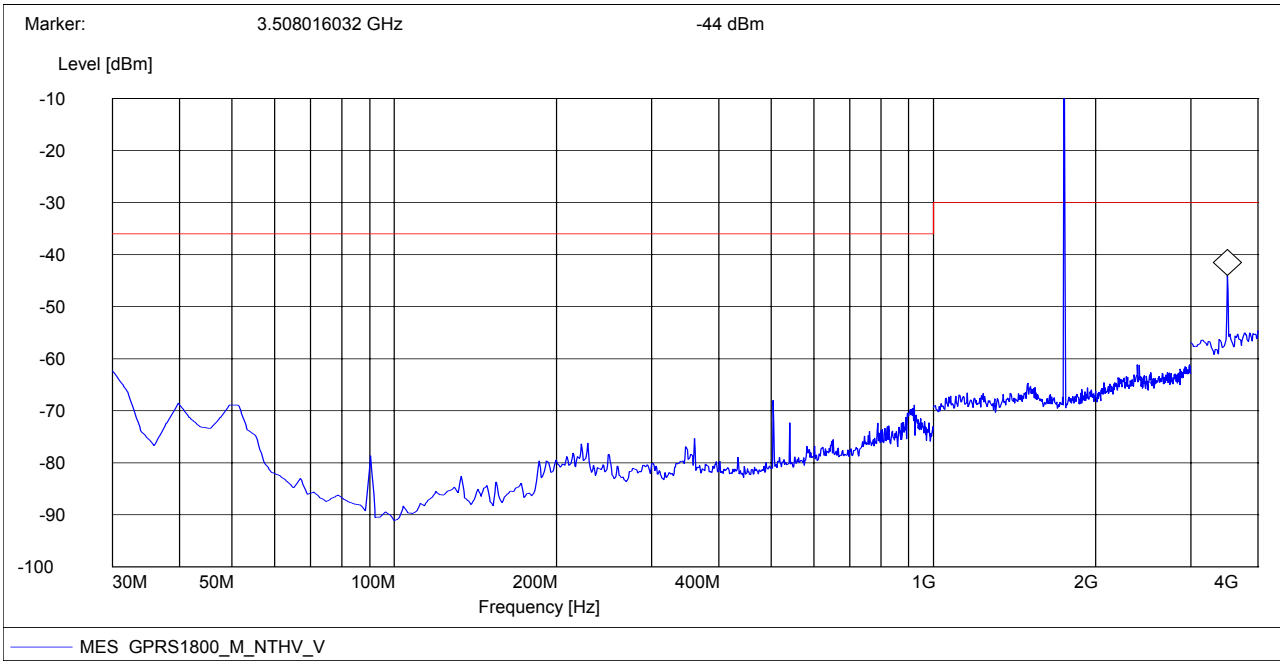
For GPRS1800

Traffic Mode (30MHz~4GHz)

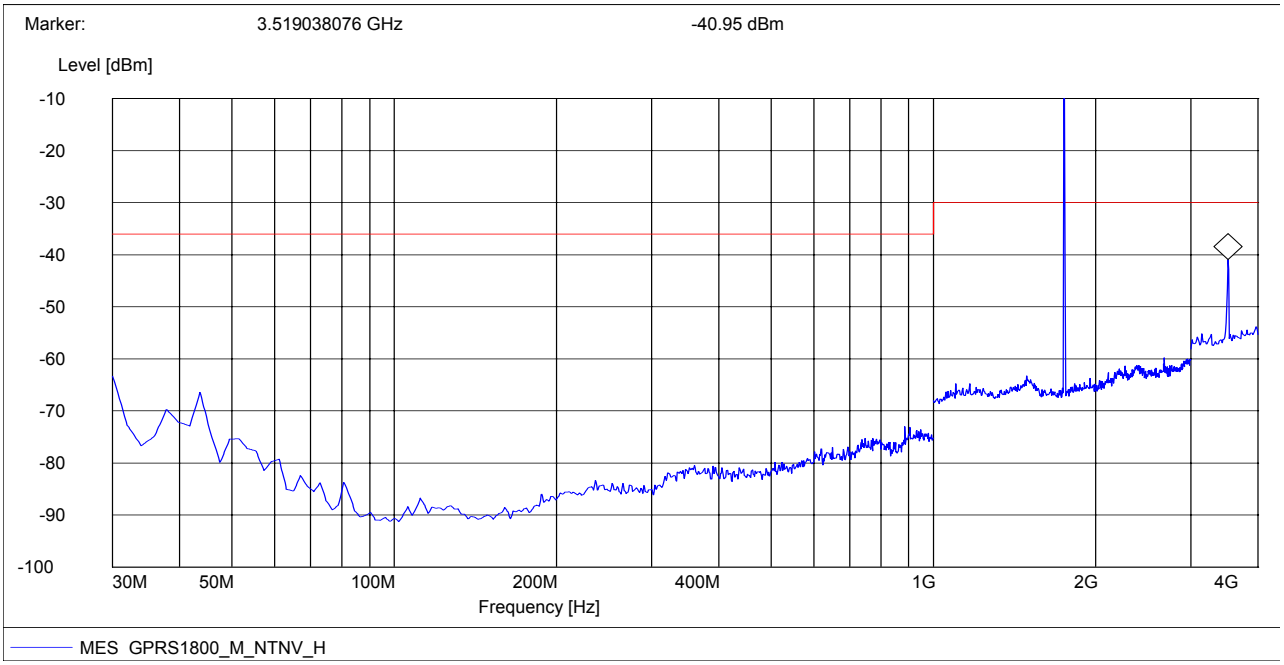
The Middle Channel @Horizontal @ High Voltage



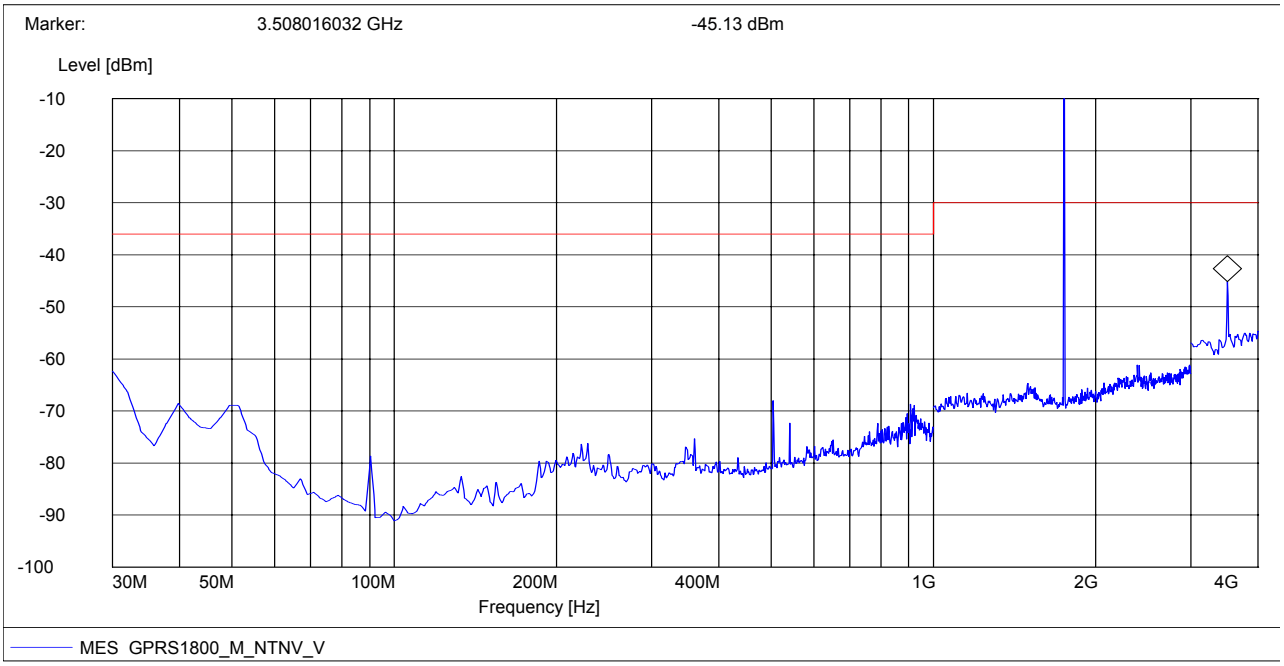
The Middle Channel @Vertical @ High Voltage



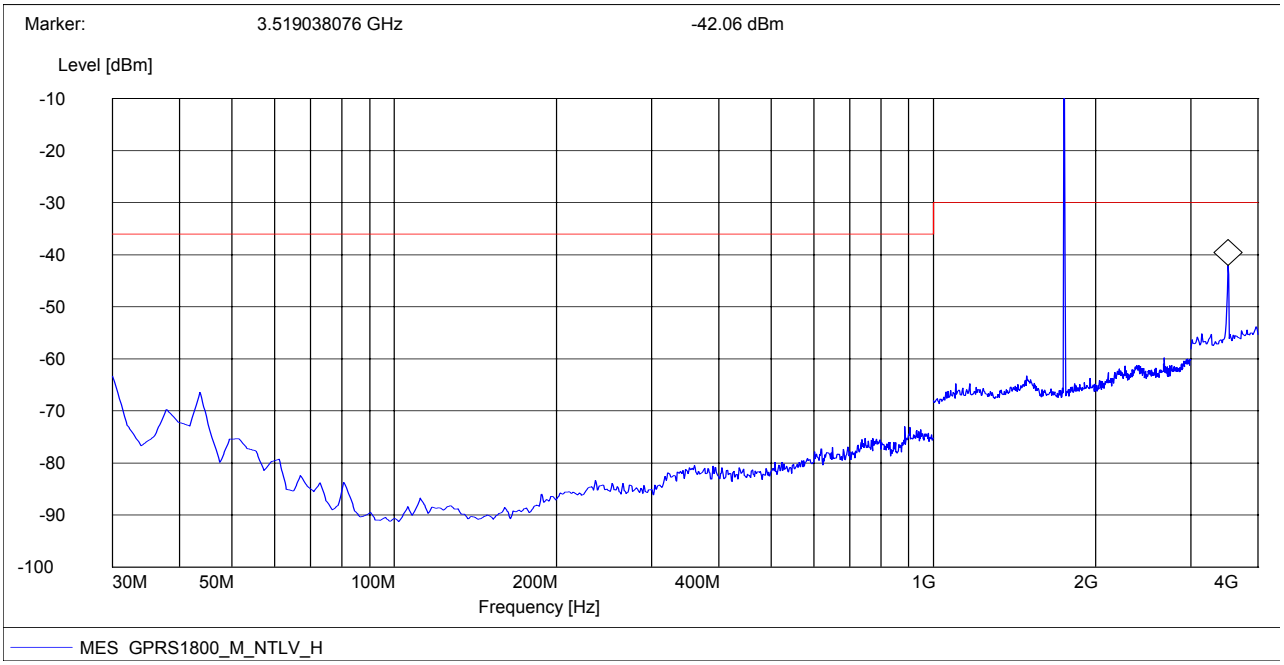
The Middle Channel @Horizontal @ Nor Voltage



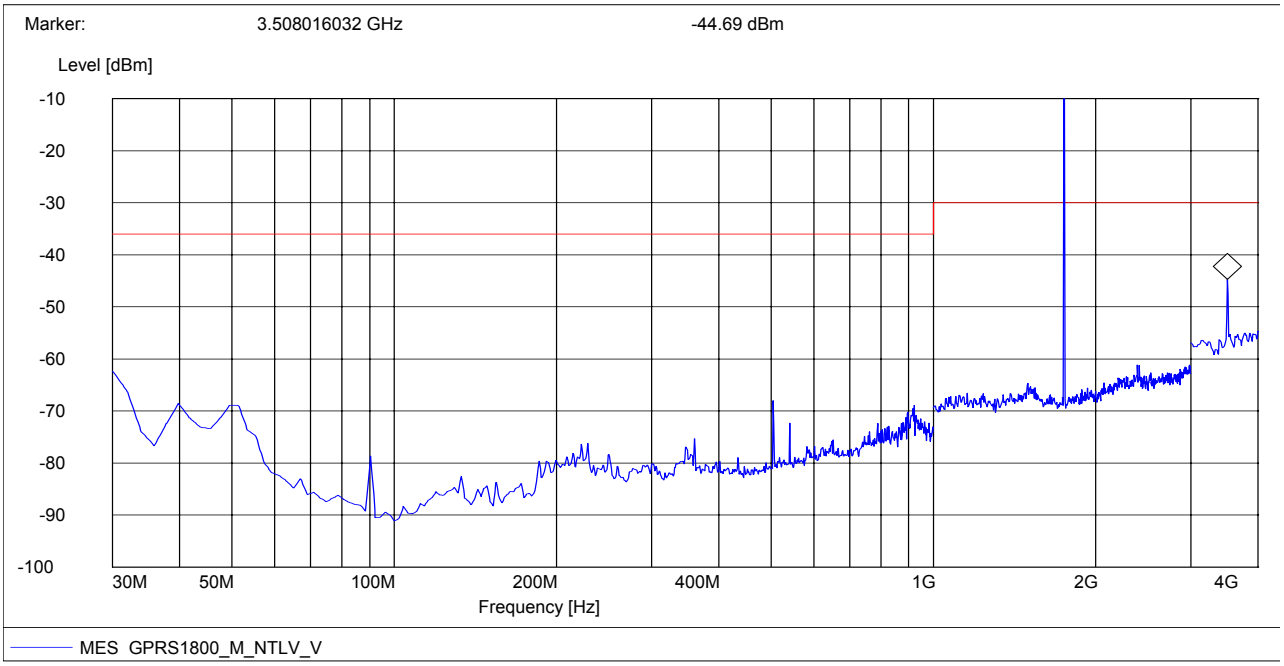
The Middle Channel @Vertical @ Nor Voltage



The Middle Channel @Horizontal @ Low Voltage

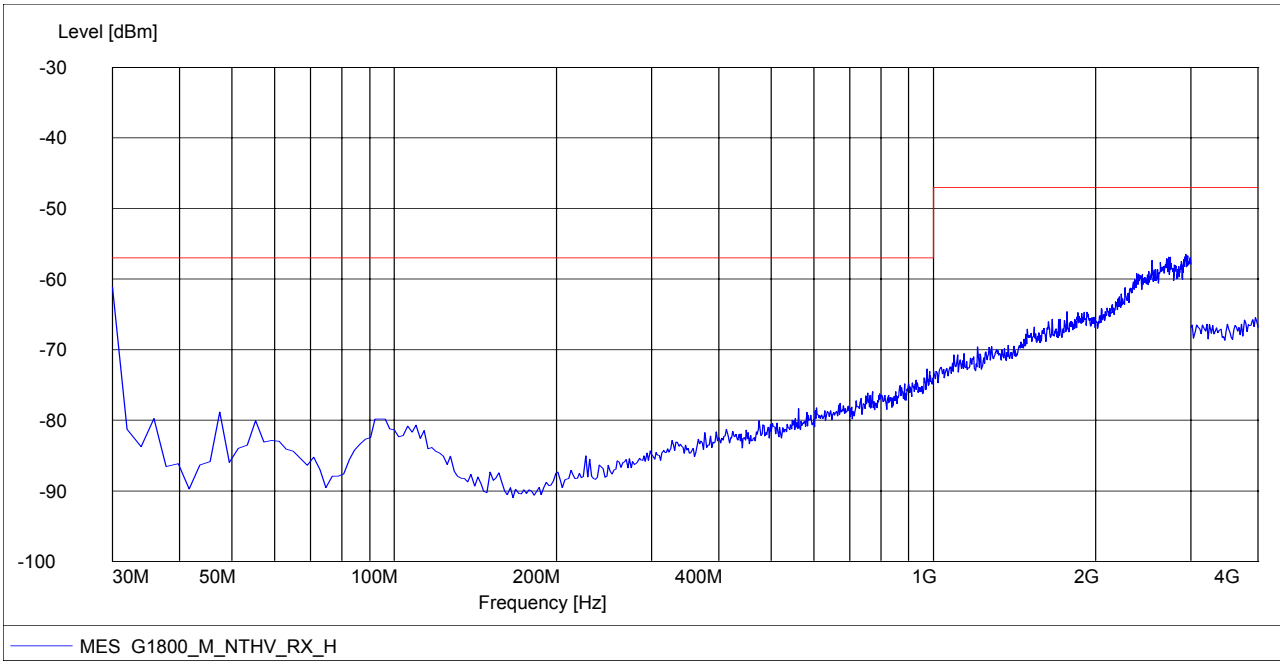


The Middle Channel @Vertical @ Low Voltage

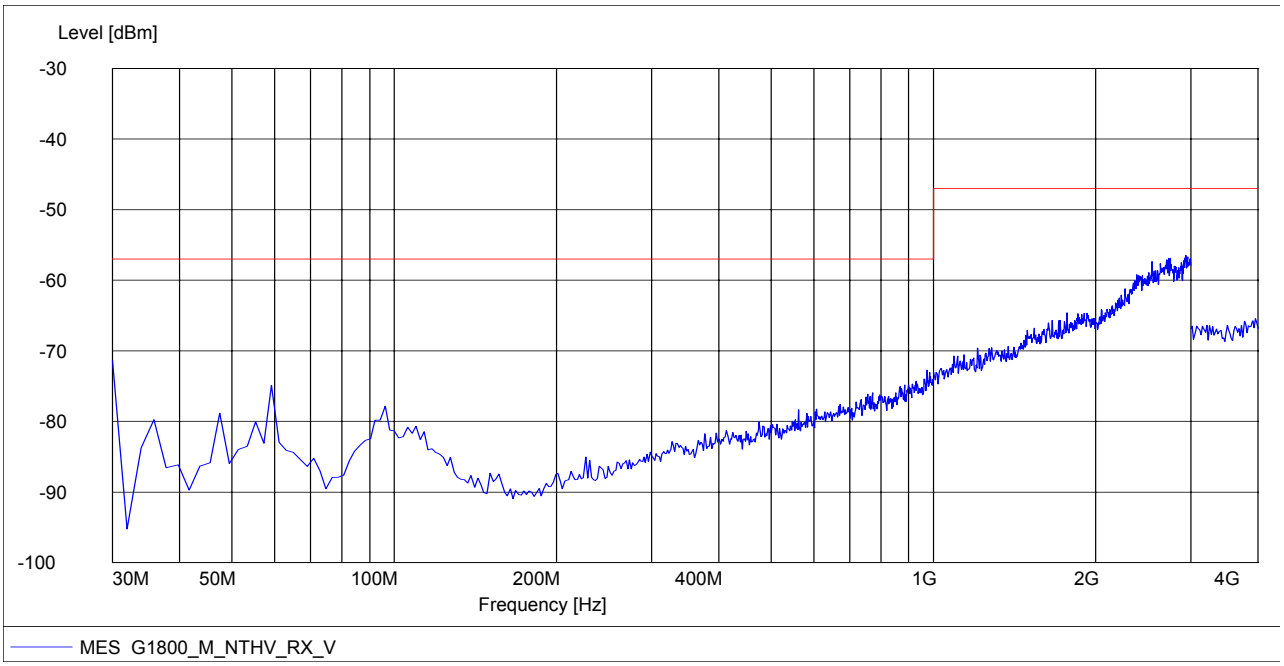


Idle Mode (30MHz~4GHz)

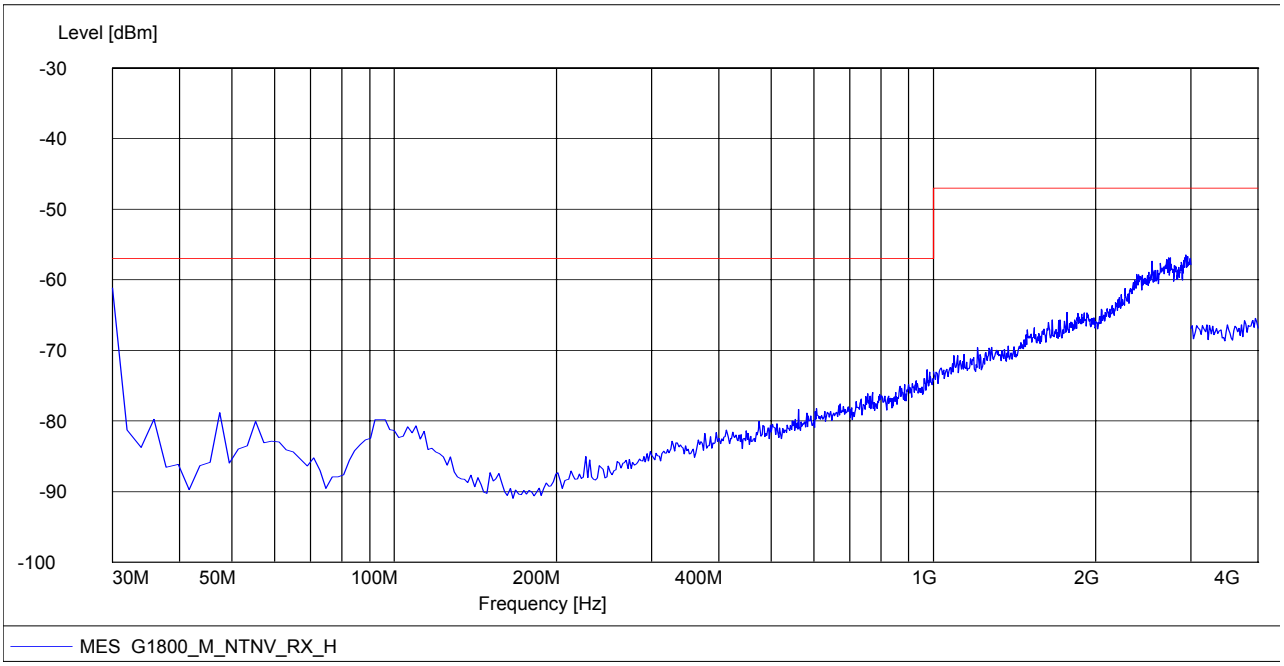
The Middle Channel @Horizontal @ High Voltage



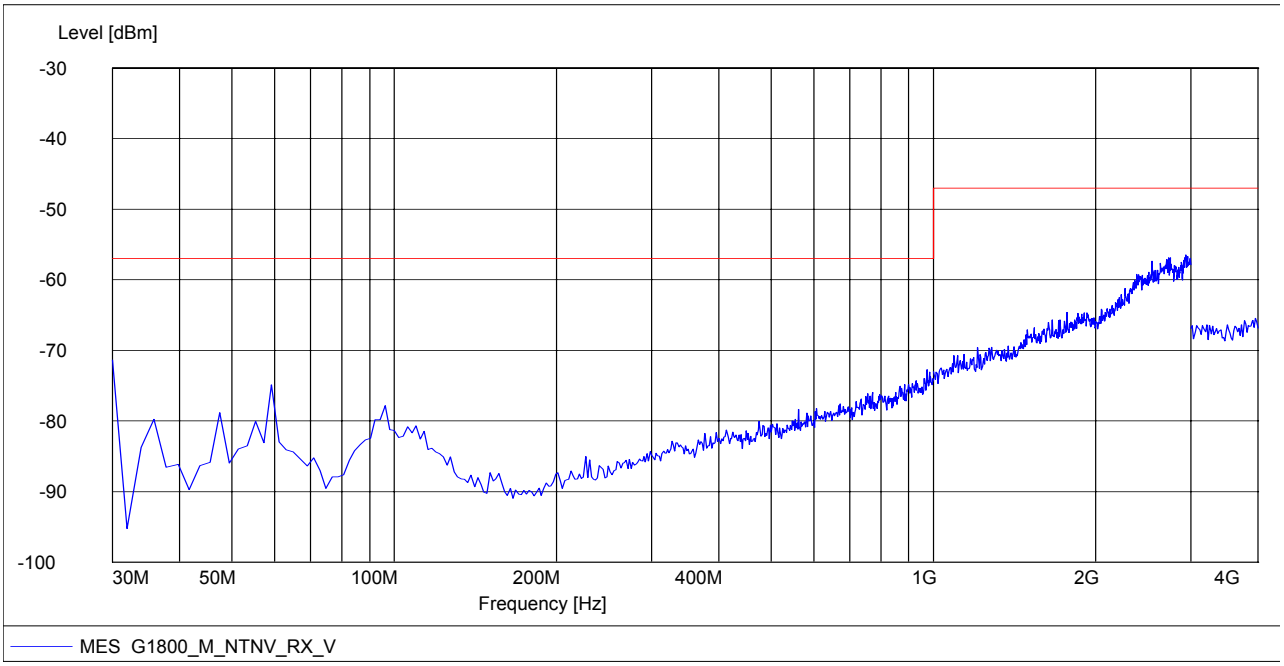
The Middle Channel @Vertical @ High Voltage



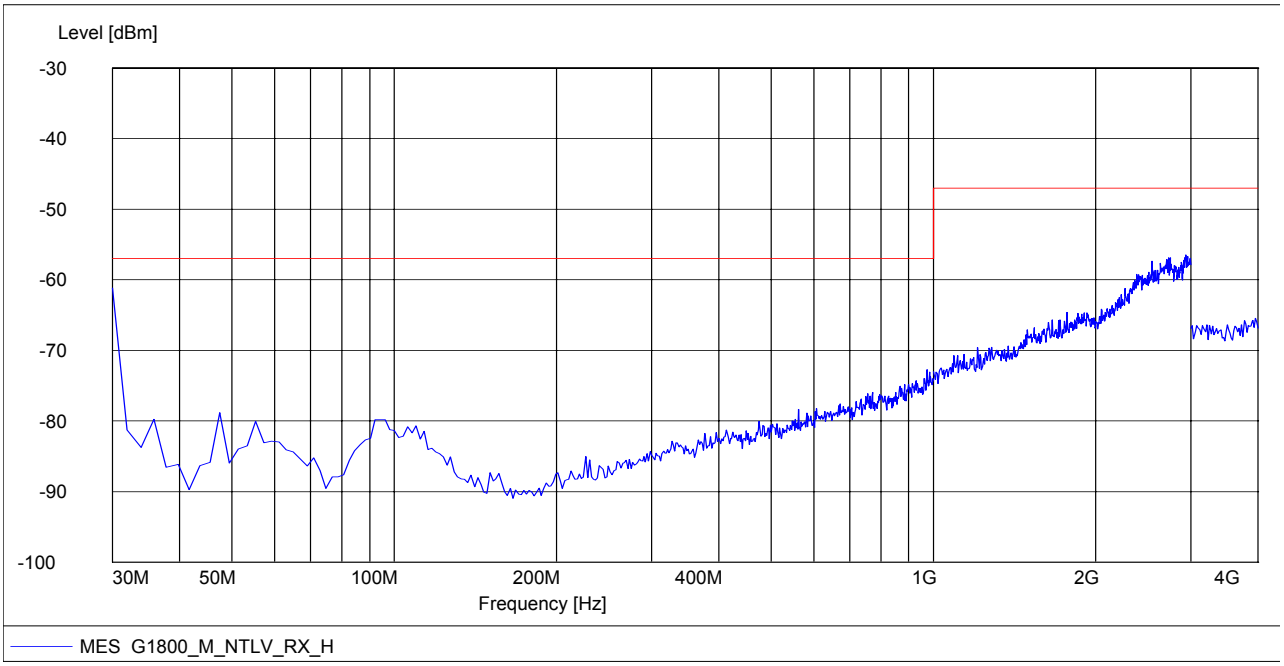
The Middle Channel @Horizontal @ Nor Voltage



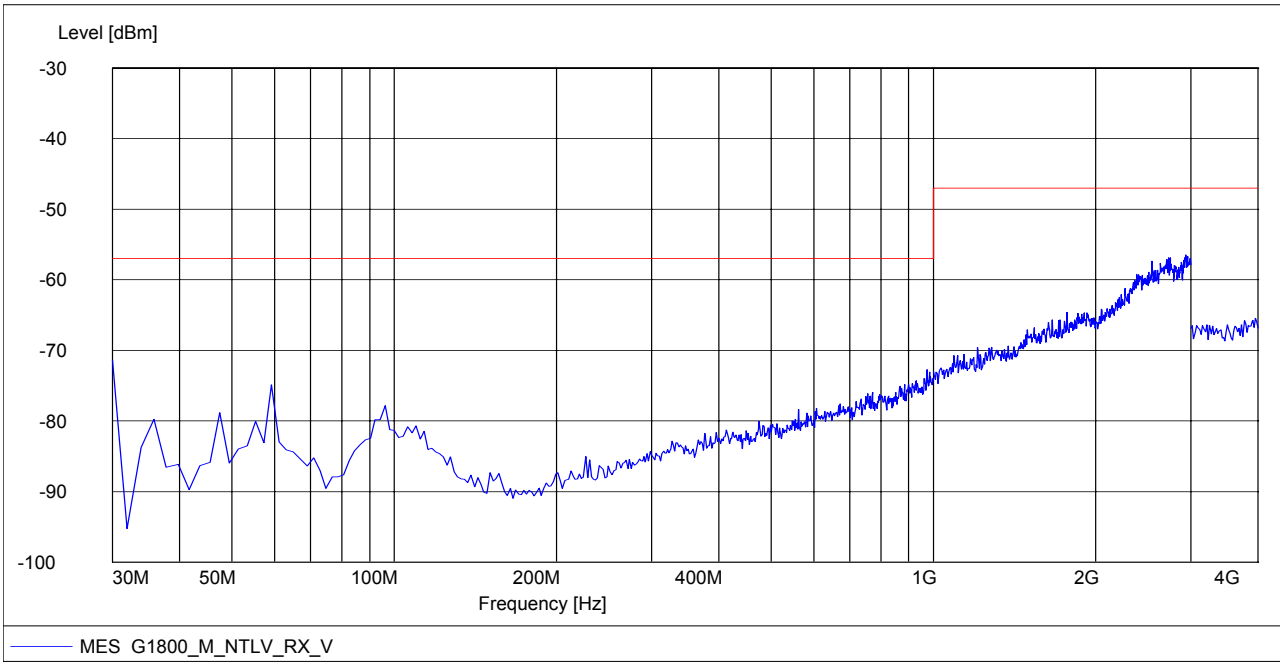
The Middle Channel @Vertical @ Nor Voltage



The Middle Channel @Horizontal @ Low Voltage



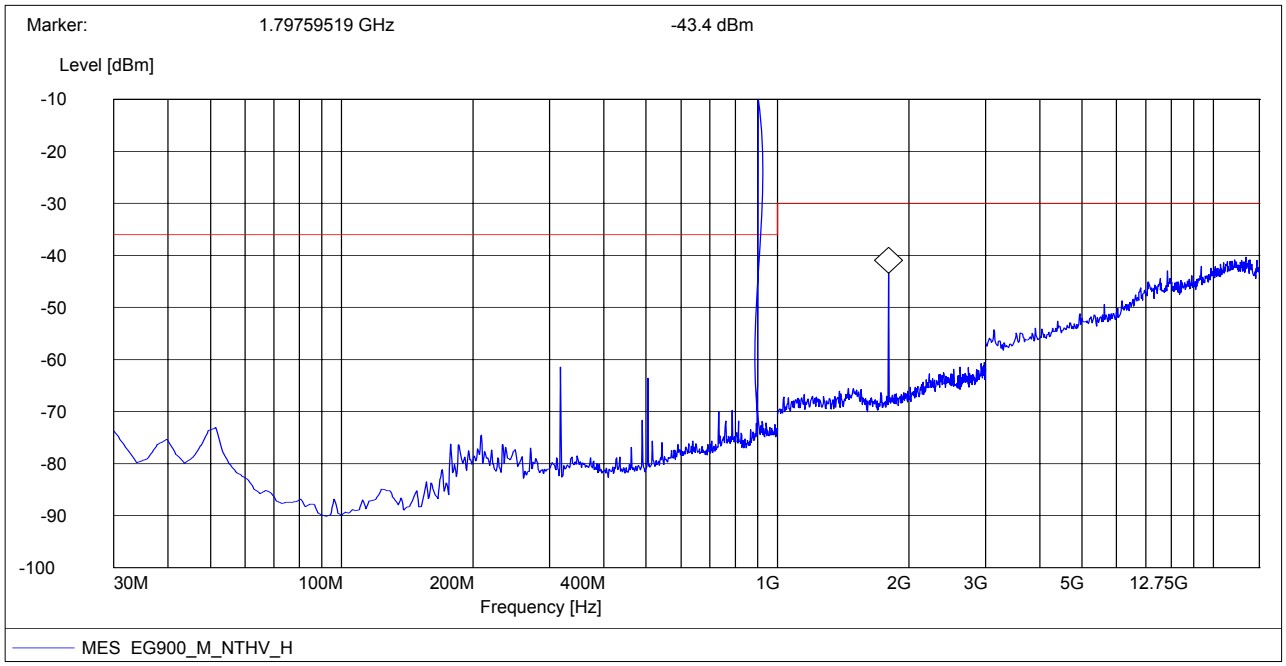
The Middle Channel @Vertical @ Low Voltage



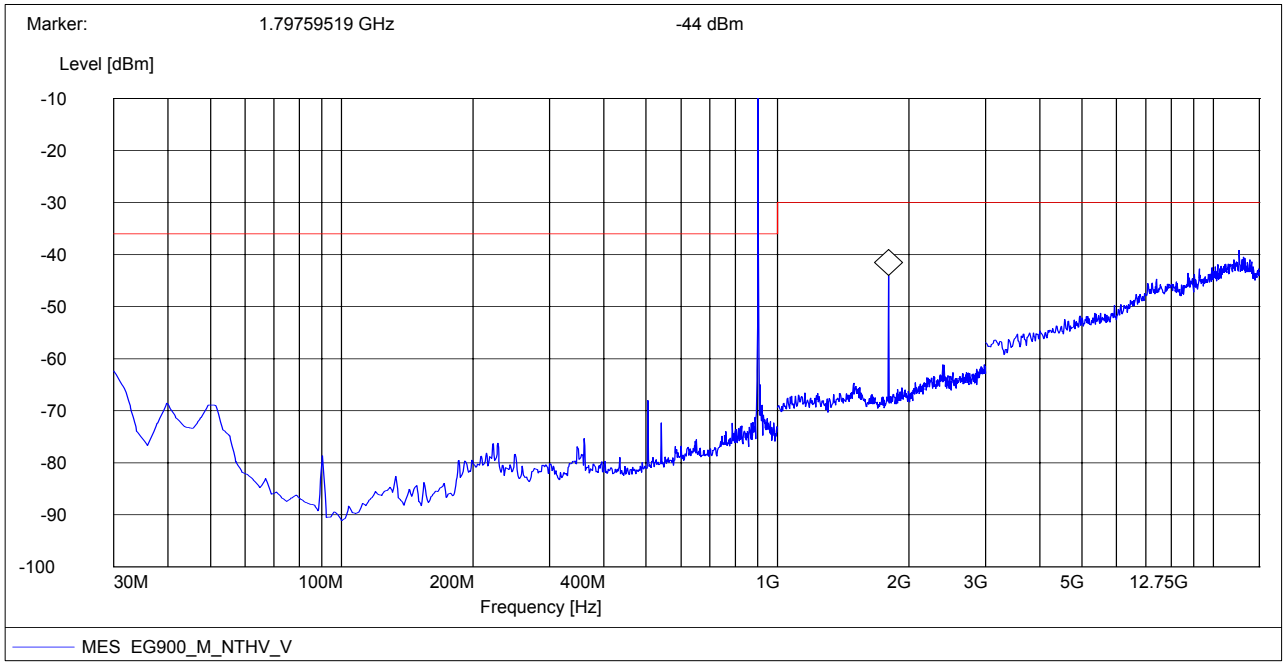
For EGPRS900

Traffic Mode (30MHz~4GHz)

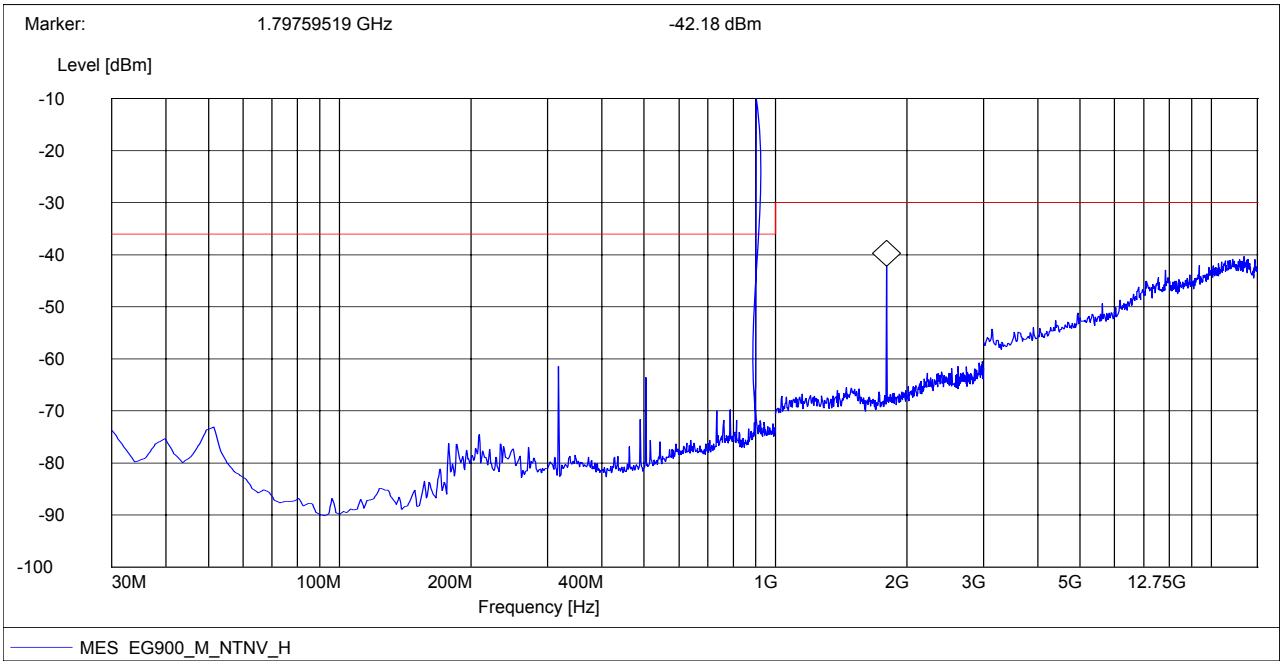
The Middle Channel @Horizontal @ High Voltage



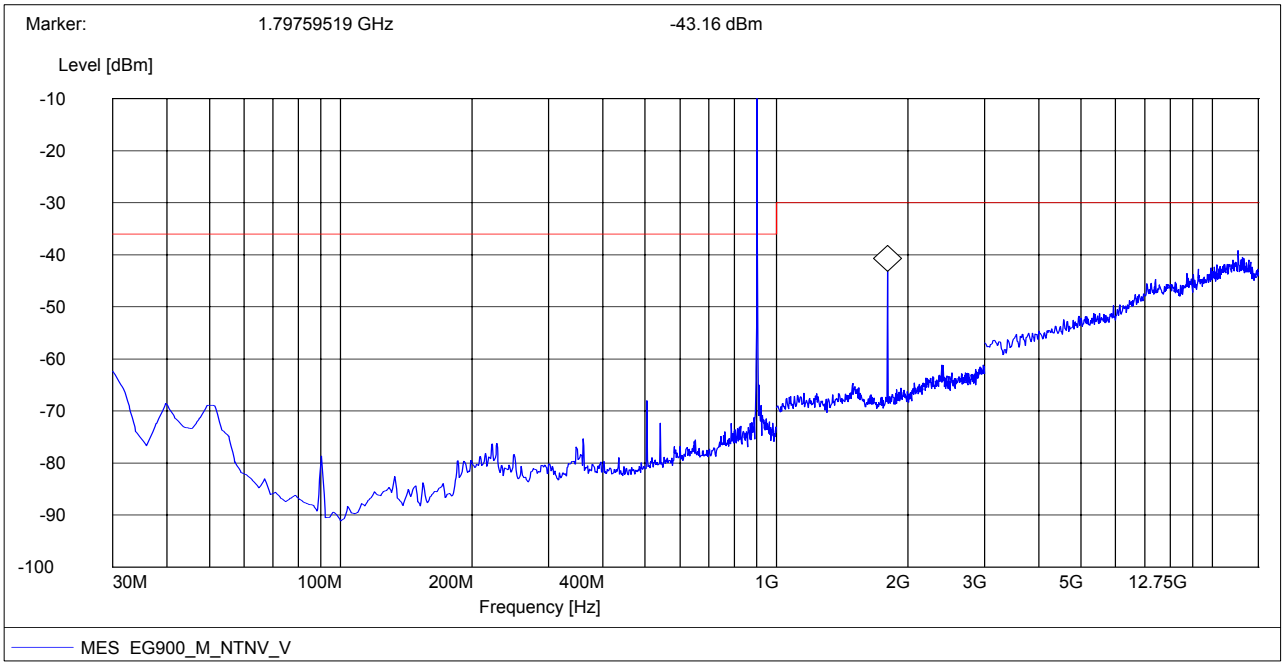
The Middle Channel @Vertical @ High Voltage



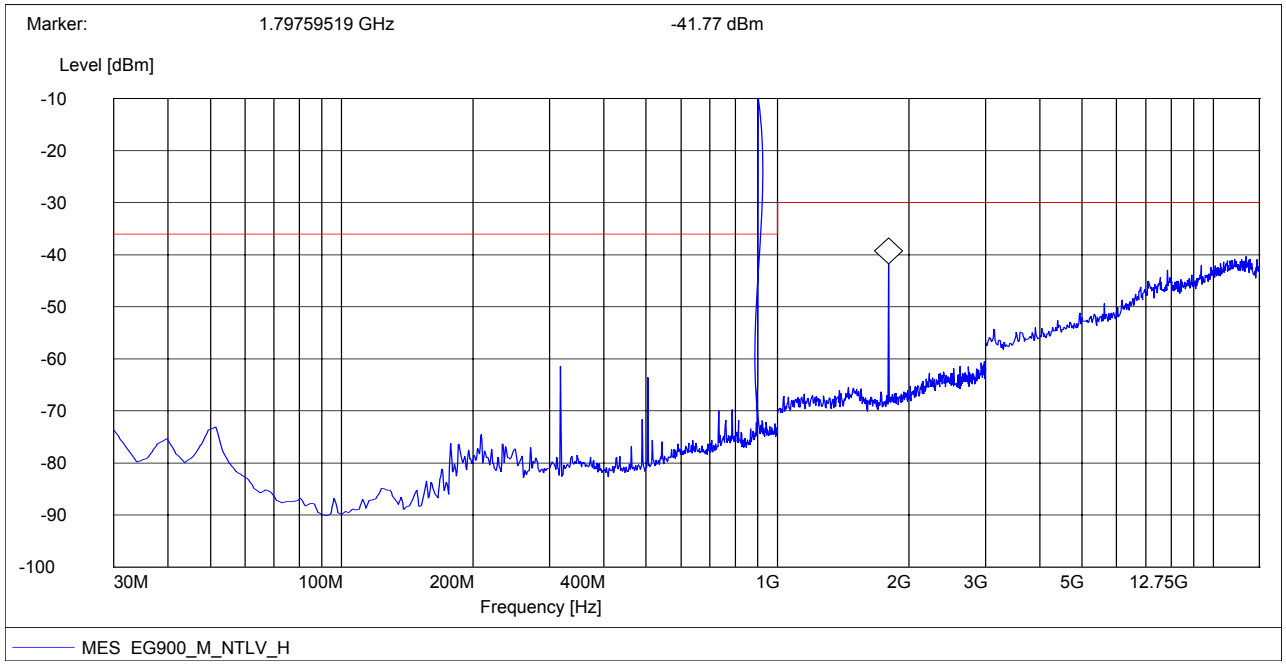
The Middle Channel @Horizontal @ Nor Voltage



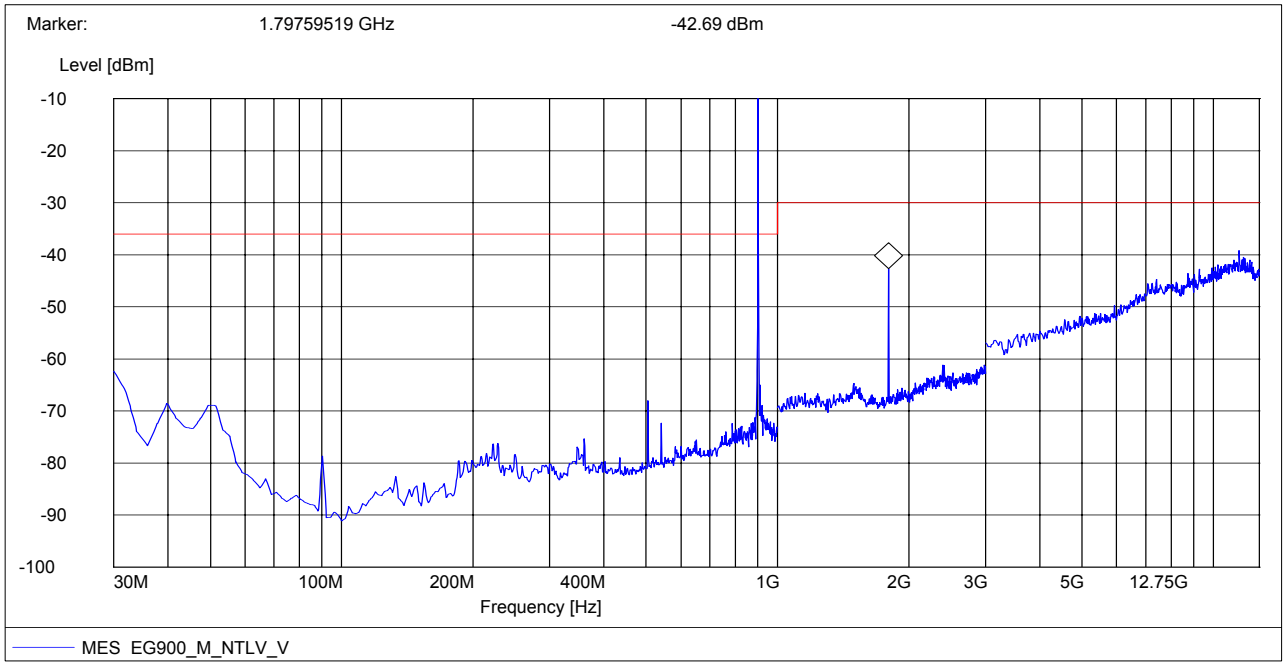
The Middle Channel @Vertical @ Nor Voltage



The Middle Channel @Horizontal @ Low Voltage

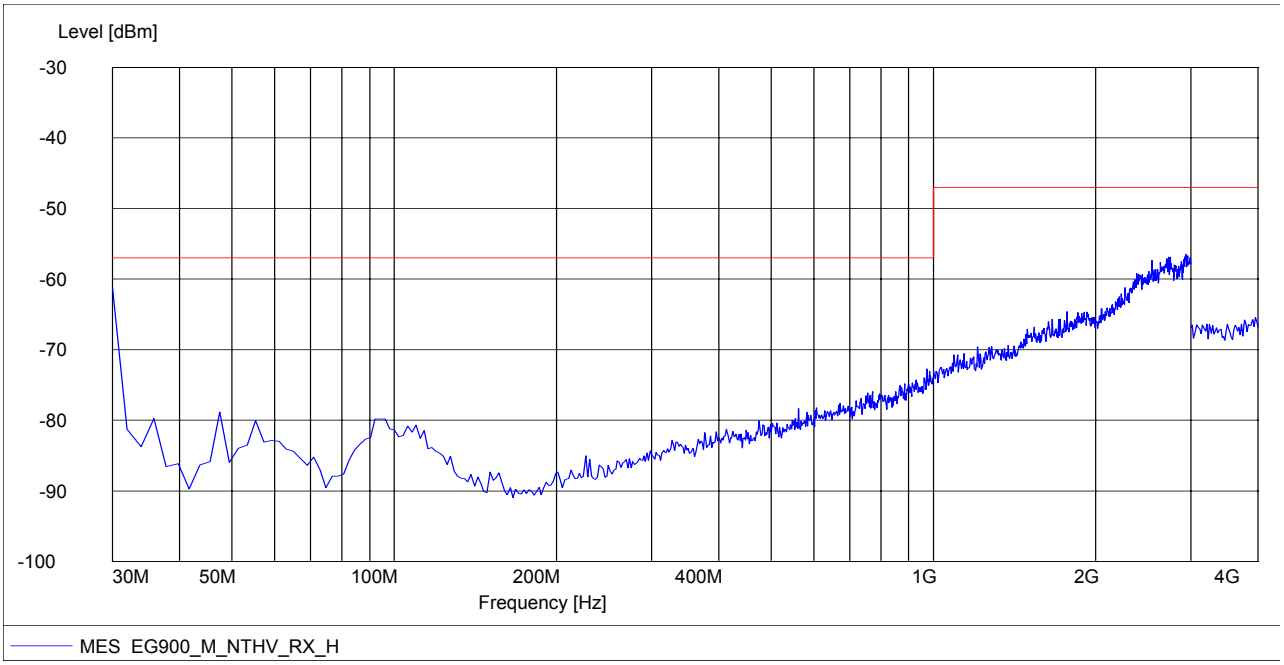


The Middle Channel @Vertical @ Low Voltage

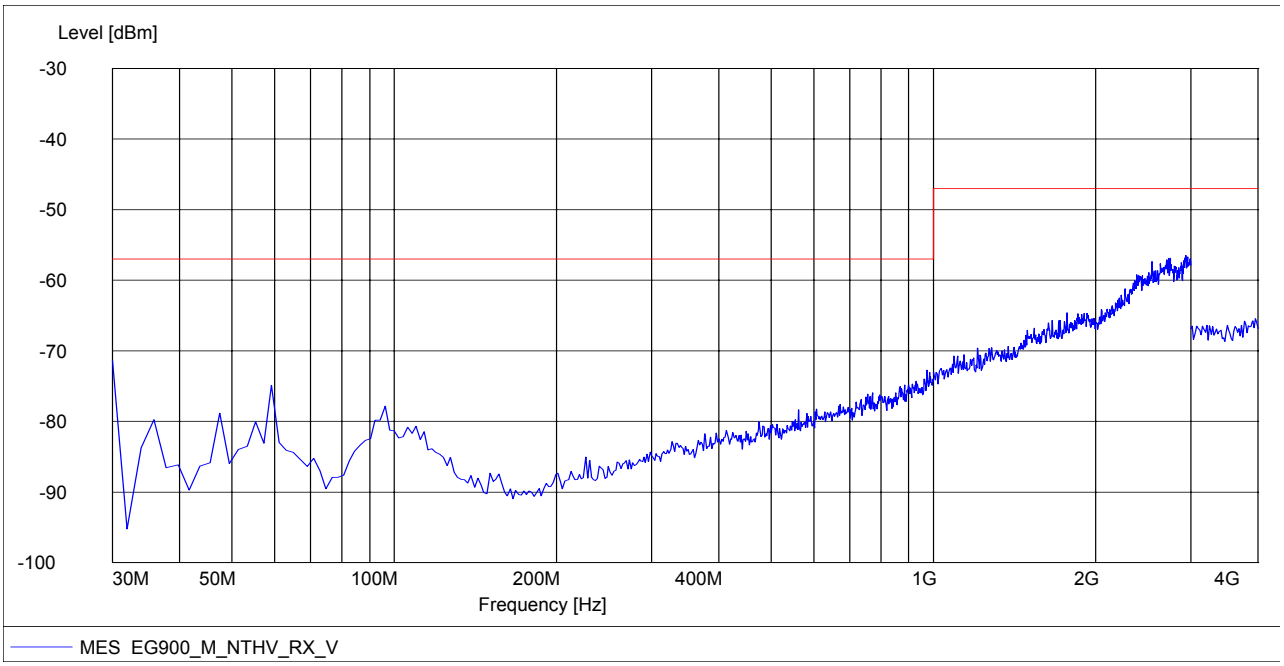


Idle Mode (30MHz~4GHz)

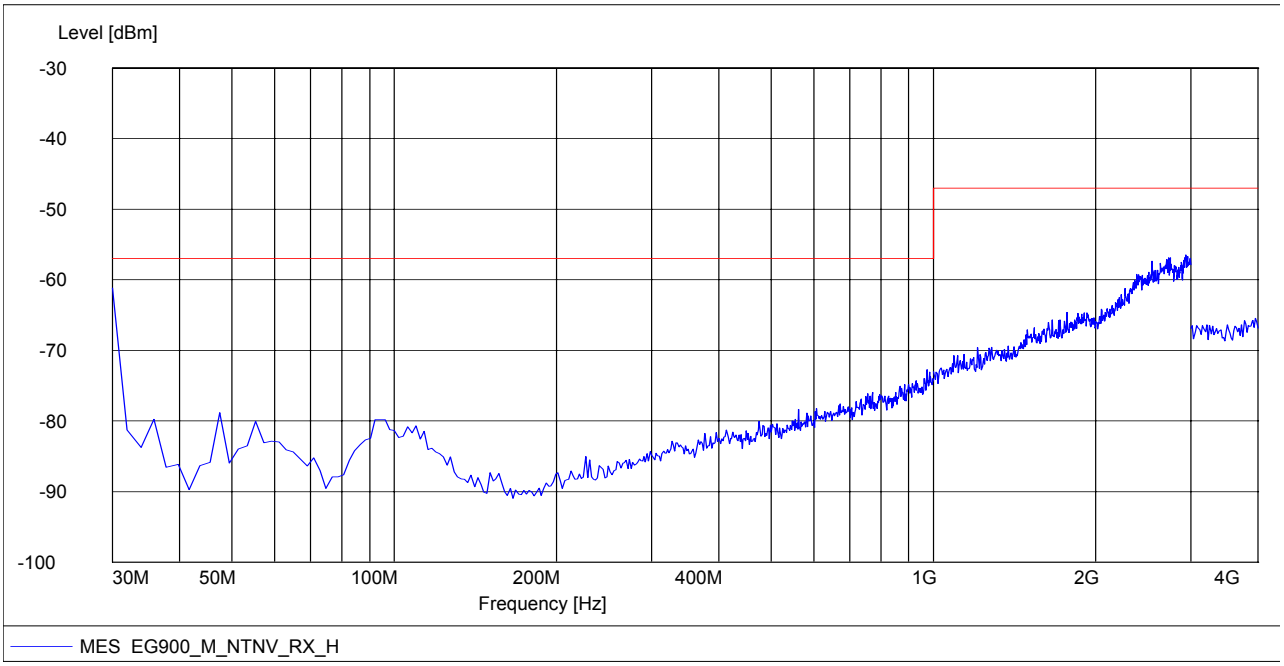
The Middle Channel @Horizontal @ High Voltage



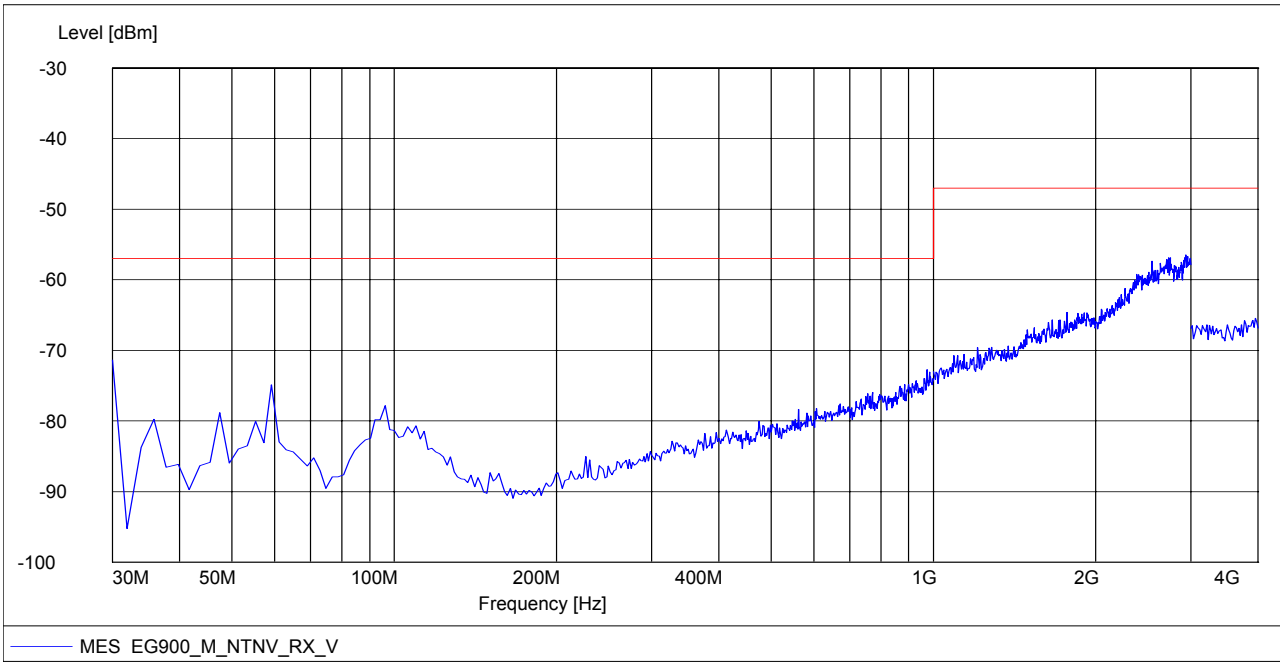
The Middle Channel @Vertical @ High Voltage



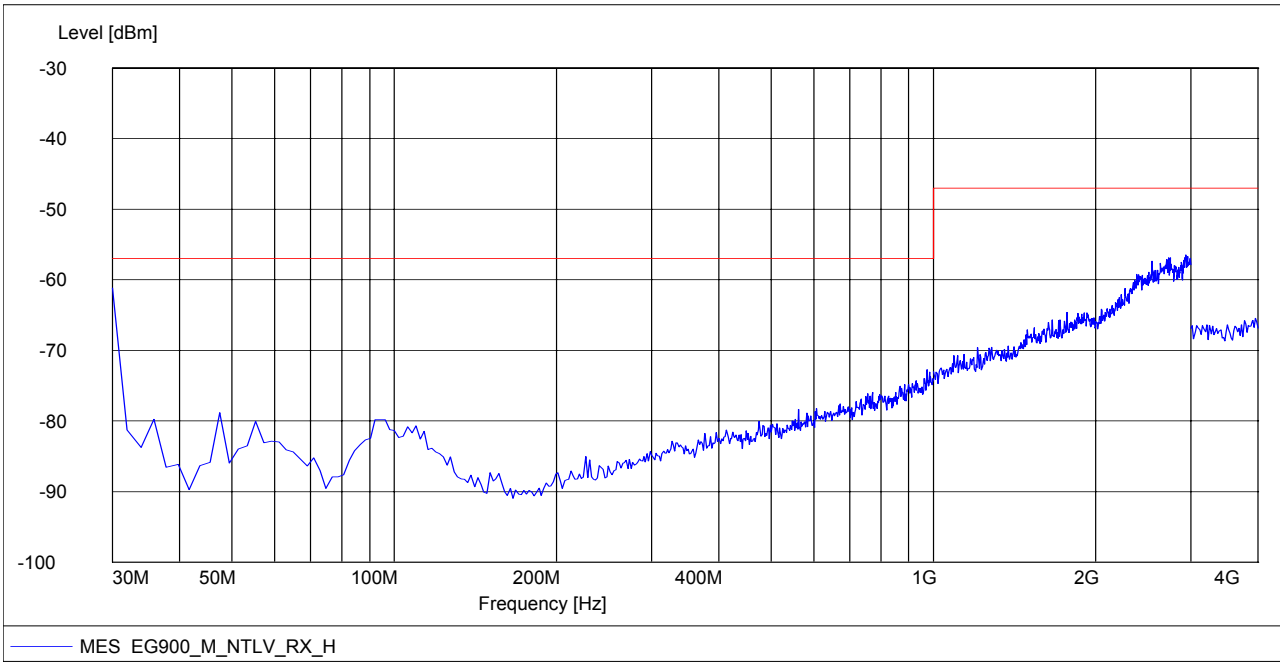
The Middle Channel @Horizontal @ Nor Voltage



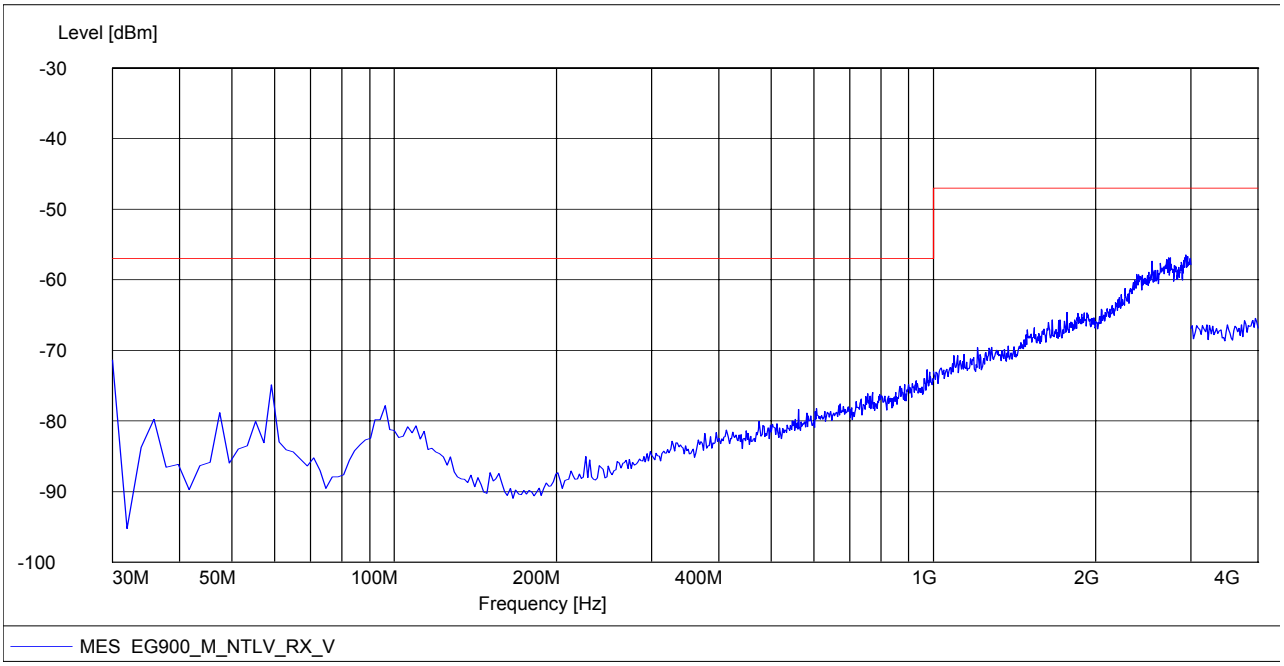
The Middle Channel @Vertical @ Nor Voltage



The Middle Channel @Horizontal @ Low Voltage



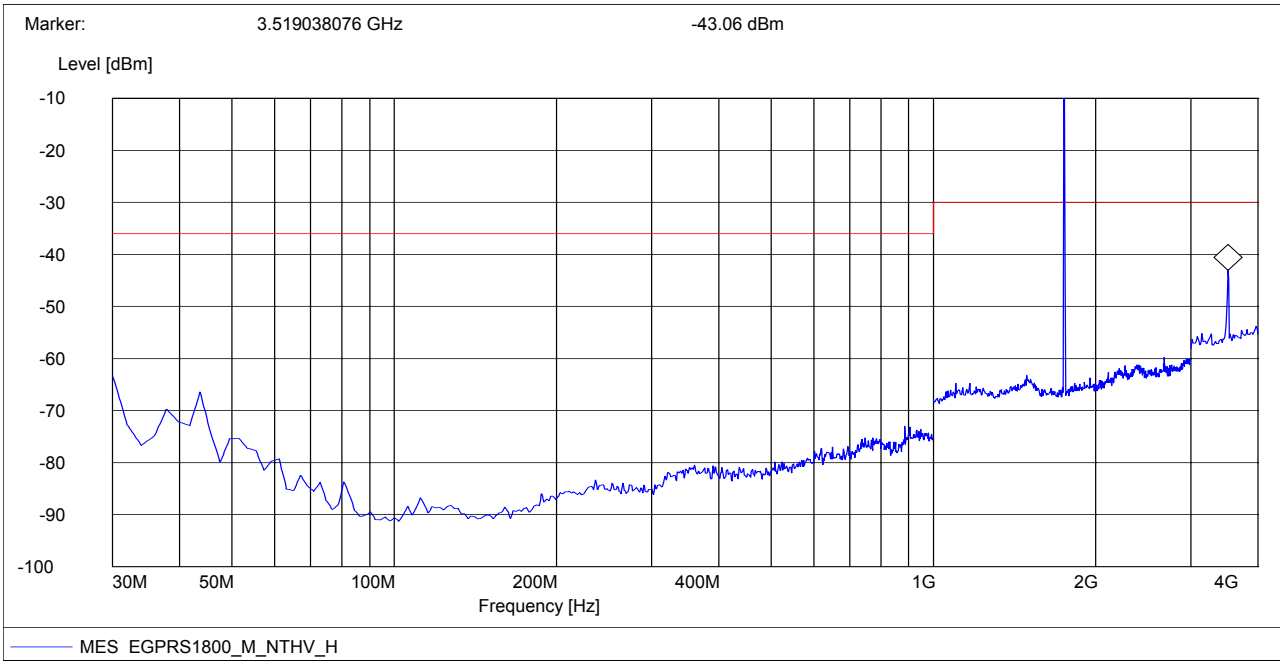
The Middle Channel @Vertical @ Low Voltage



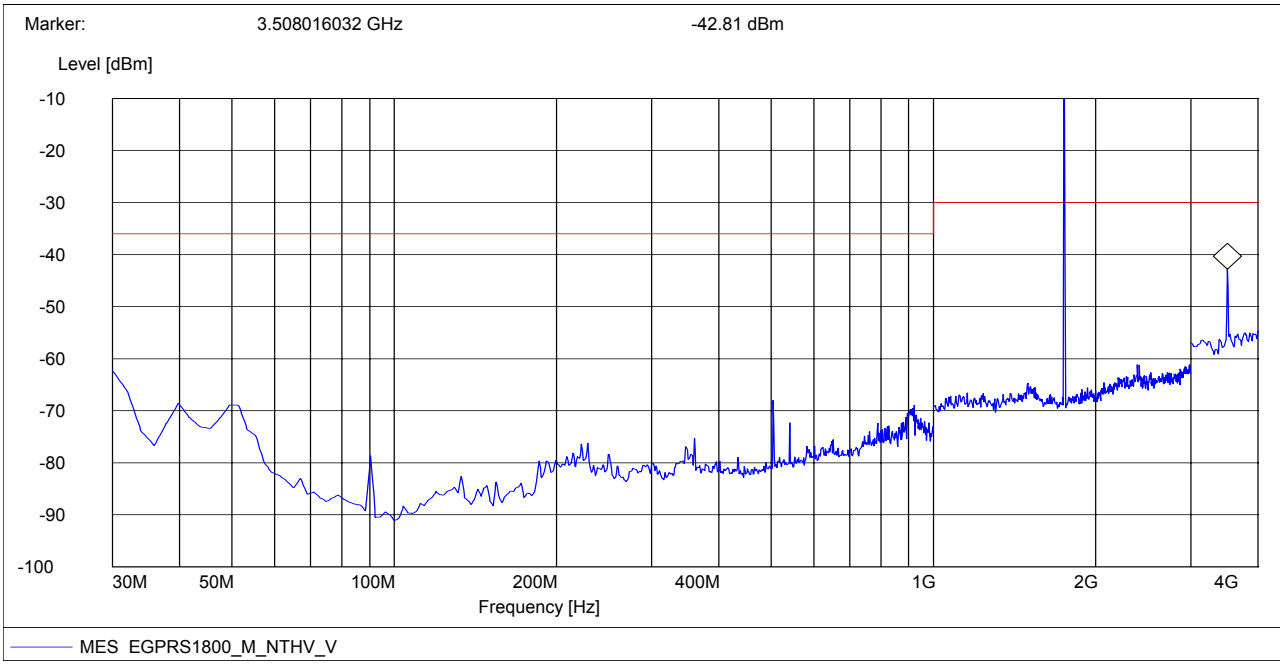
For EGPRS1800

Traffic Mode (30MHz~4GHz)

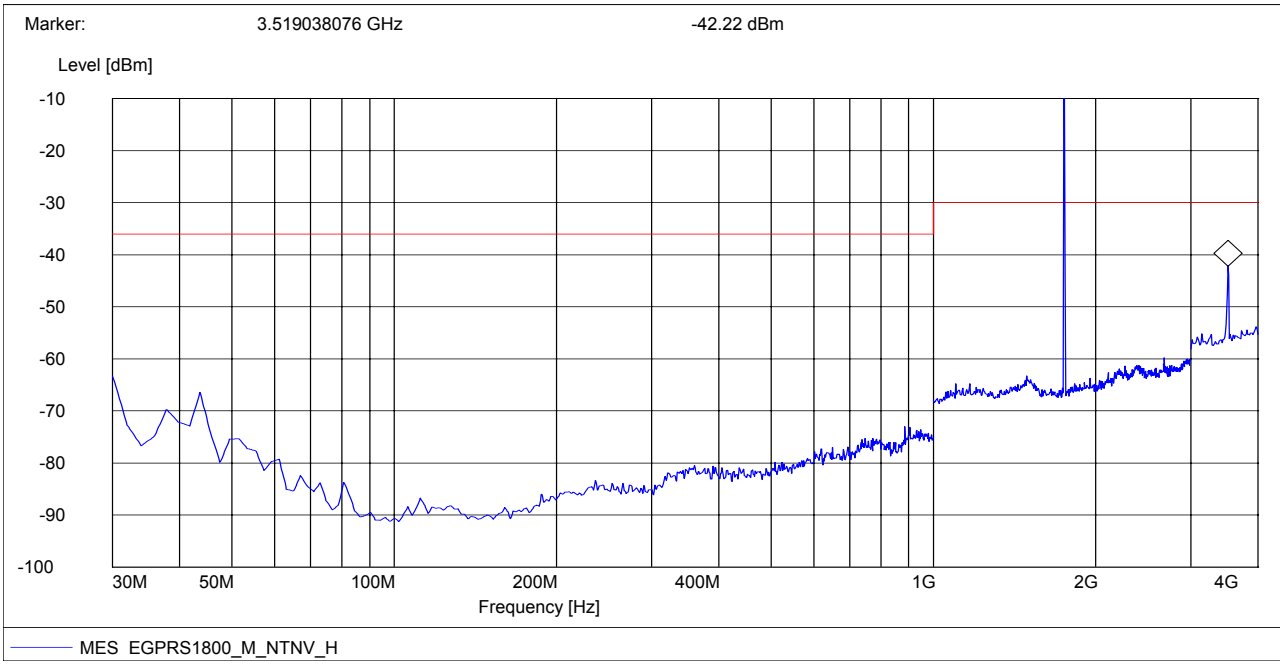
The Middle Channel @Horizontal @ High Voltage



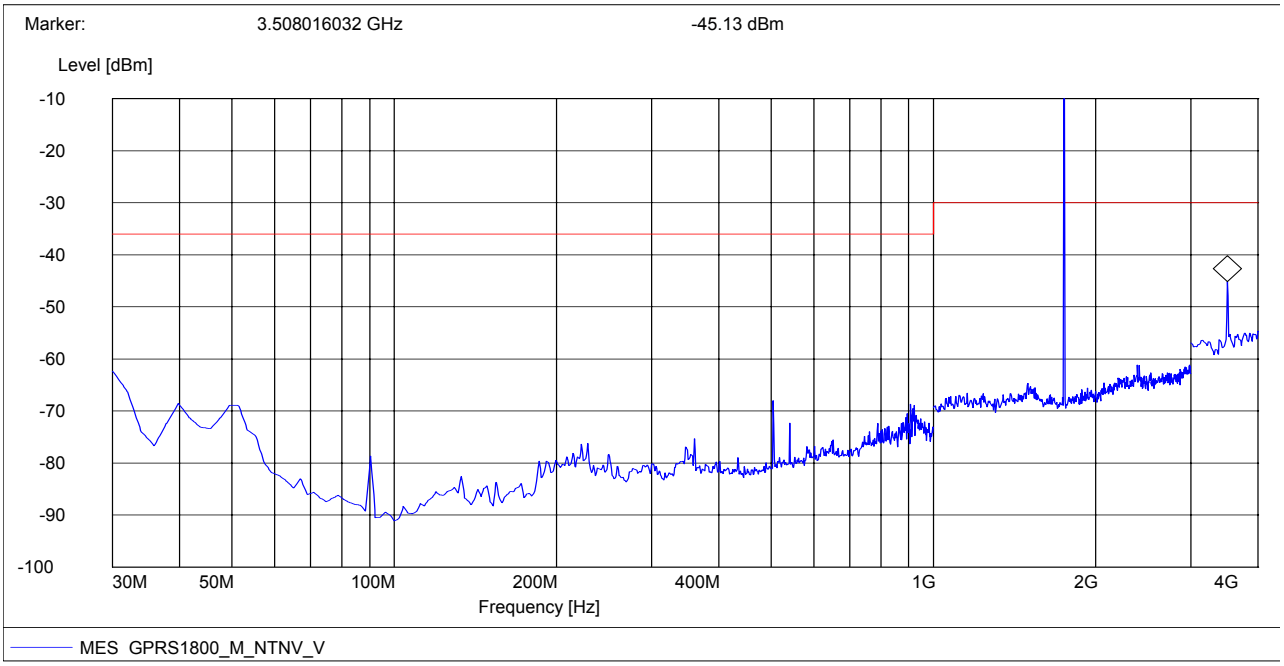
The Middle Channel @Vertical @ High Voltage



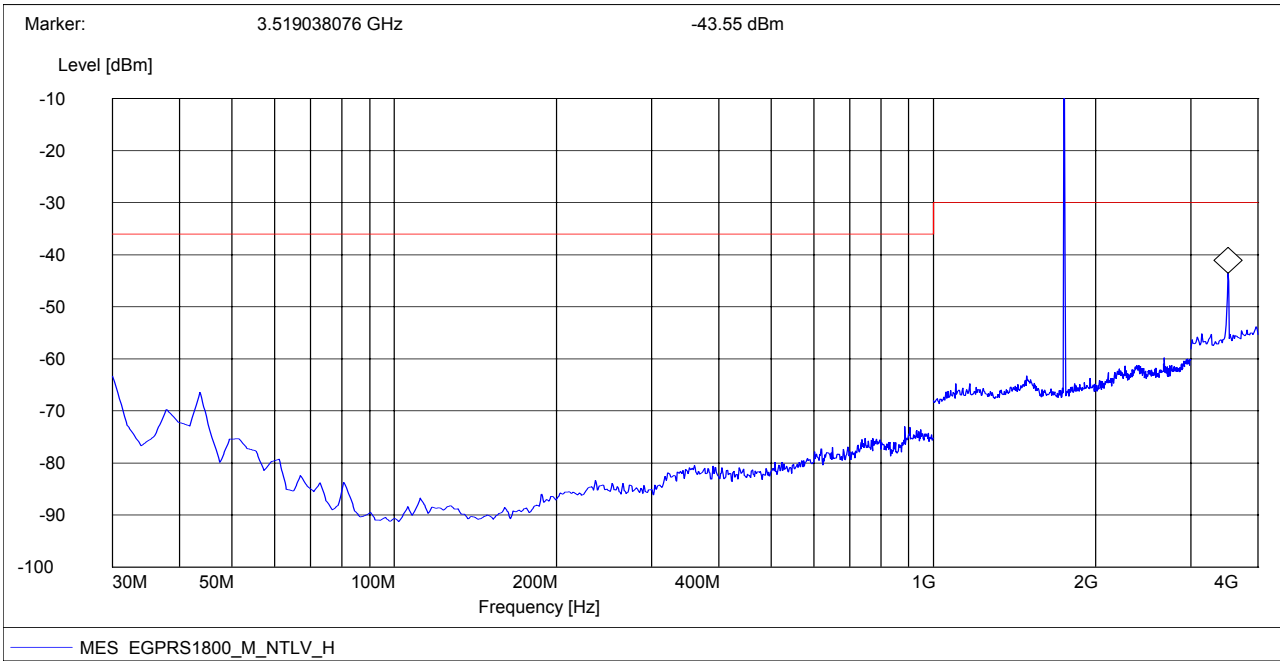
The Middle Channel @Horizontal @ Nor Voltage



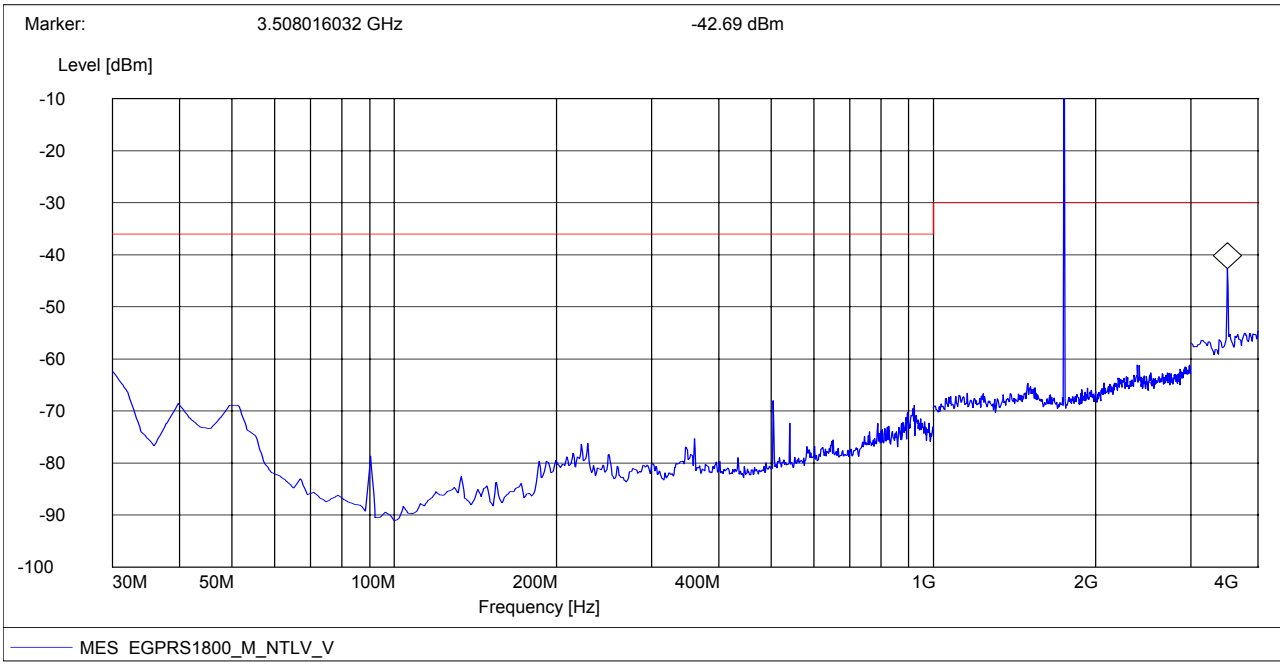
The Middle Channel @Vertical @ Nor Voltage



The Middle Channel @Horizontal @ Low Voltage

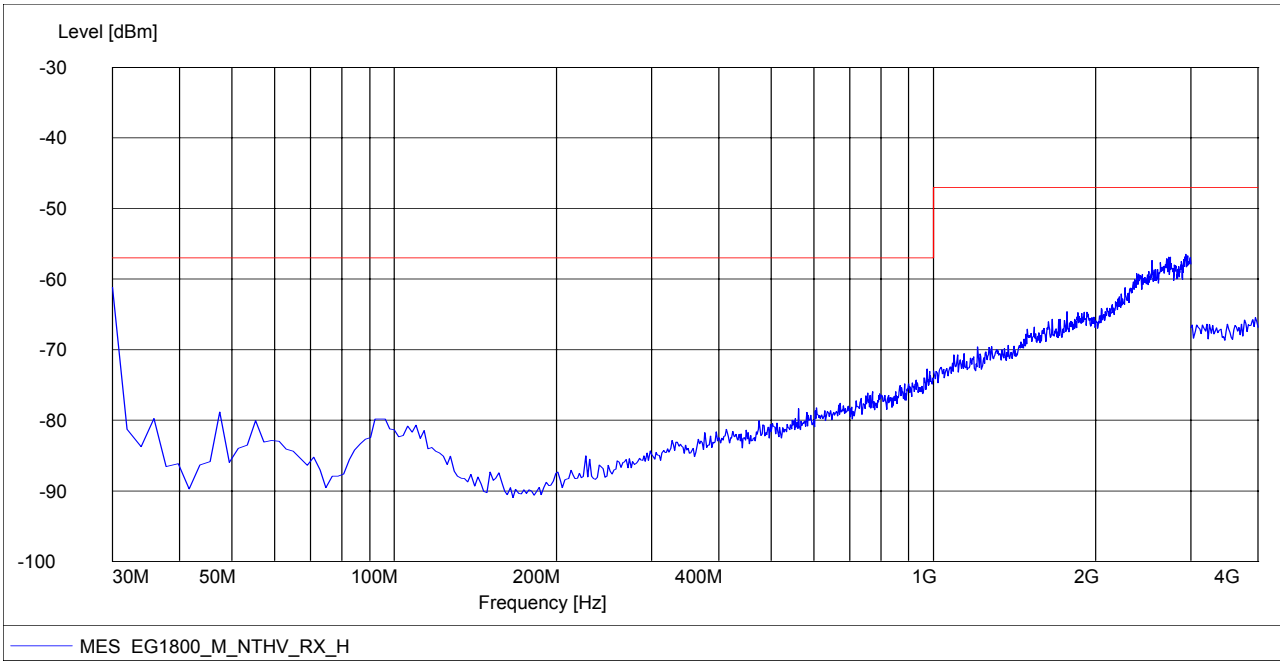


The Middle Channel @Vertical @ Low Voltage

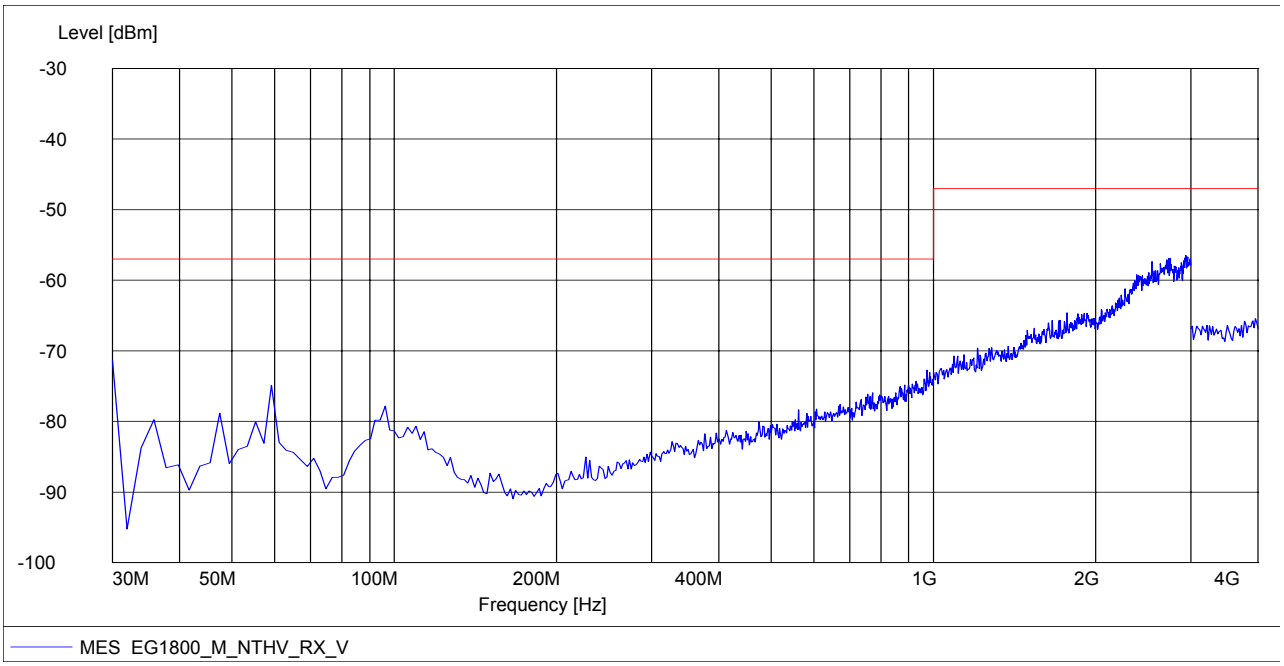


Idle Mode (30MHz~4GHz)

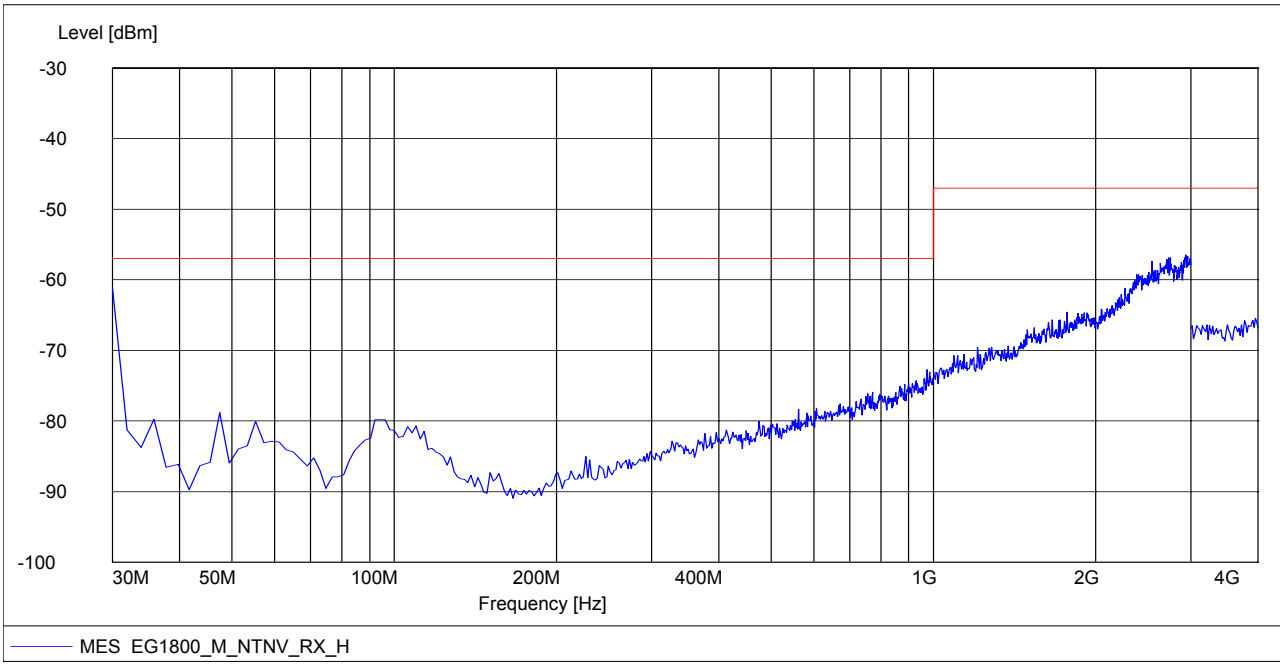
The Middle Channel @Horizontal @ High Voltage



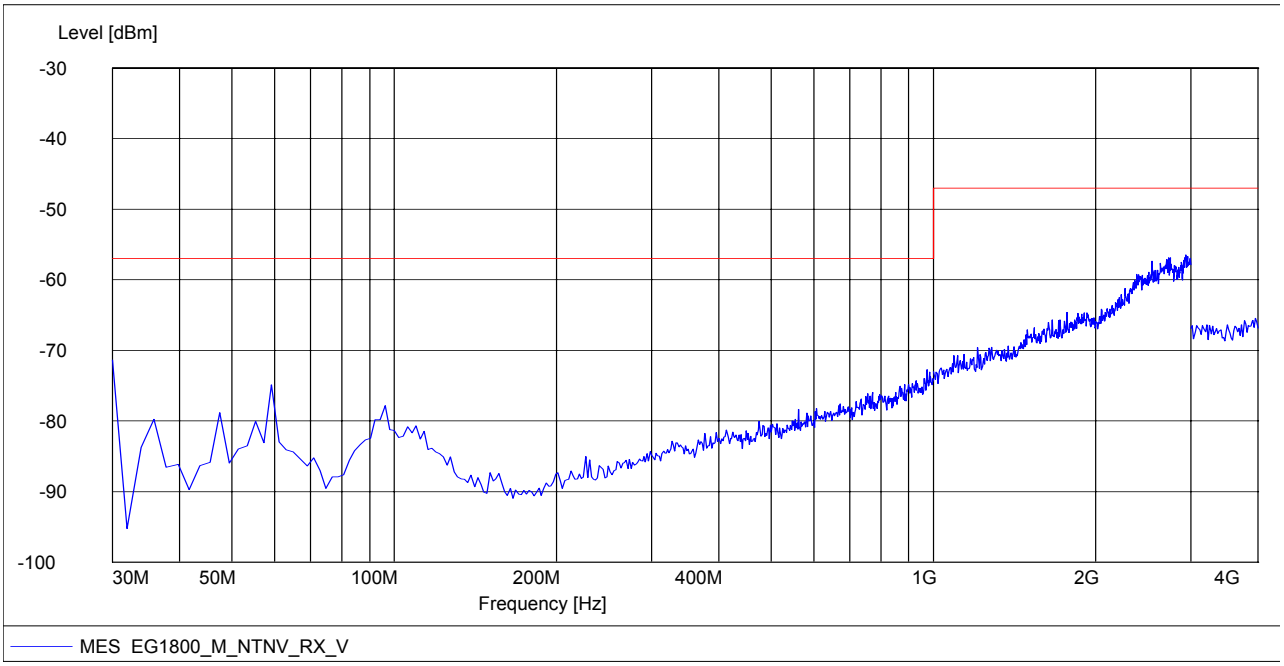
The Middle Channel @Vertical @ High Voltage



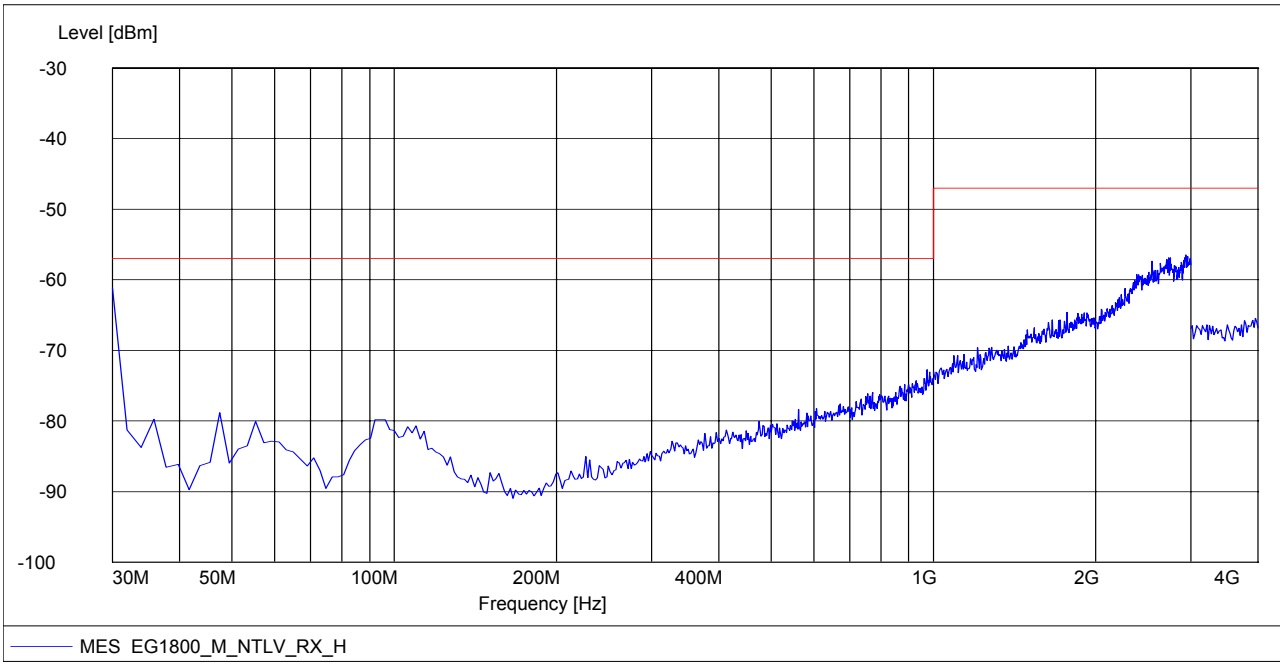
The Middle Channel @Horizontal @ Nor Voltage



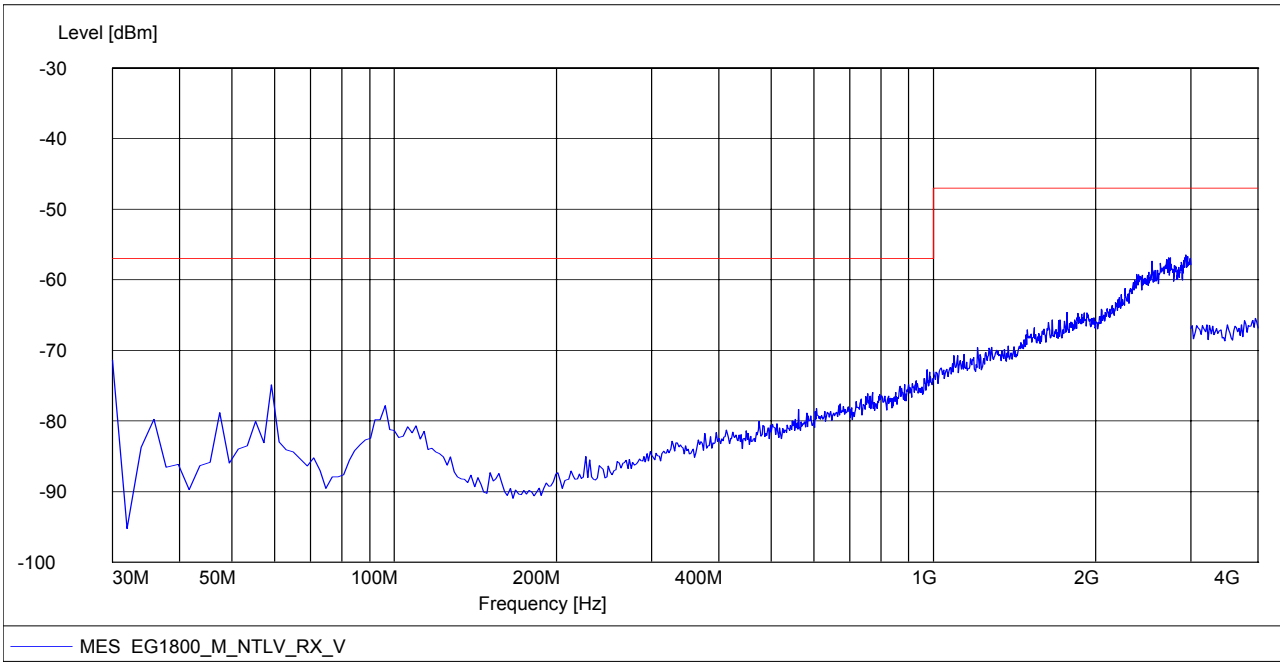
The Middle Channel @Vertical @ Nor Voltage



The Middle Channel @Horizontal @ Low Voltage



The Middle Channel @Vertical @ Low Voltage



5. Test Set-up Photos of the EUT

.....End of Report.....