

Prima Ricerca & Sviluppo Srl soggetta a direzione e coordinamento da parte della Giovanni Maspero & C. S.p.A. – C.I. 02634780130
Sede legale : 22100 Tavernola (CO) Via Conciliazione, 1 Cod. FISC. e N. R.I. CO 02635860139
Sede operativa : Laboratori Via Campagna, 92 22020 Faloppio fraz. Gaggino (CO) Tel. +39 03135000.11 Fax +39 031991309

EQUIPMENT UNDER TEST :
APPARECCHIO IN PROVA :

Telematics Platform Accessory TPA
TPA Gen2

REFERENCE STANDARDS:
NORME DI RIFERIMENTO :

FCC RULES PART 22 and 24

Customer:

RICHIEDENTE:

- Dept. / Firm : **META SYSTEM S.p.A.**
Ente / Società:
- Mr.: **Maldini**
Sig.:
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Telefono : Fax :

Site of test execution: Via Campagna, 92 - 22020 Gaggino Faloppio (CO) - Italy
Località esecuzione prove:

Date of test samples receipt: **31/08/09** **Date of start test:** **30/09/2009**
Data ricevimento campioni: Data inizio prove:

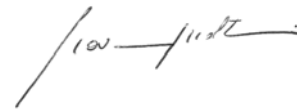
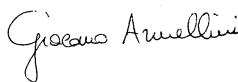
Date of end test: **16/03/2010**
Data fine prove:

Witness to the test:
Presenti alle prove:

Signature of the engineers:
Firma esecutore prove:

Approvato da:
Approved by:

Nobody / Nessuno



.....
Giacomo Armellini

.....
Giovanni Molteni

The test results recorded in this Test Report are exclusively referred to the tested samples.

I risultati del presente rapporto di prova si riferiscono esclusivamente al campione sottoposto a prova.

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1. TECHNICAL INFORMATION OF EQUIPMENT UNDER TEST (EUT)

1.1 Identification

Brand name: META SYSTEM S.P.A.
Manufacturer: META SYSTEM S.P.A.
Equipment : GSM-GPS CONTROL UNIT
Model name : TPA Gen2
Country of manufacturer: ITALY

1.2 Technical data

FCC class:	FCC RULES PART 22 and 24
FCC ID:	P3O96902
Supply voltage:	12 Vdc
EUT standing:	Car power supply
EUT single or system:	Single
EUT dimensions :	See photographic documentation
GSM module manufacturer	Telit Communications SpA
Module type :	GE864 QUAD
Type of antenna :	☐ Integral ☒ External ☒ Dedicated
Frequency range TX - GSM 850	824.2 – 848.80 MHz
Frequency range TX - PCS	1850.2 – 1909.8 MHz
Frequency range RX – GSM 850	869.2 – 893.8 MHz
Frequency range RX – PCS	1930.2 – 1989.8 MHz
External Antenna gain	810 - 960 MHz → -2.1dBi 1710 – 1990 MHz → -2.1dBi
Dedicated Antenna gain	880-960 MHz → 1dBi 1710 – 1990 MHz → 1dBi
Power supply	3.22 – 4.5 Vdc (3,8 Vdc recommended)
Operating mode	Duplex
Type of modulation	GMSK (GSM modulation)
Emission	GXW
Software	Fully GSM software Stack
Temperature range	Operating: -40°C to +85°C Storage: -40°C to +85°C

1.3 Modifications incorporated in E.U.T.

The following items are the modifications introduced in the equipment under test :

- None

1.4 Ports identification

This section contains descriptions of all signal ports and AC/DC power input/output ports, the length and the type of the cable provided by manufacturer needed for the tests.

Moreover it is specified if the ports are ever or optionally connected.

Port		Description	Connection
1	Enclosure	Plastic	Screw
2	AC power input/output ports	Port not present	----
3	DC power input/output ports	12Vdc	Cable
4	Signals ports	CanBus Auxiliary NA/C/NC contact	Cable
<i>Note: During the tests all cables must be what provided the manufacturer or the same that used in the real employment of the EUT.</i>			

1.5 Auxiliary equipment

- No auxiliary equipment

2. TEST CONDITIONS

2.1 Operating test modes and test conditions

The equipment has been tested according to the operative conditions described in the user/installation manual provided by the manufacturer and by following reference standards :

Reference Standard:

FCC Part 22, 24, 2

In the following table there are the operating conditions adopted during tests identified by an indicator (#..) at which has been referred the item “Operating condition of the equipment under test” of all technical sheets of the tests (see Section 4)

Operating condition	Description
#1	<i>Continuous transmission at 850 frequency band</i>
#2	<i>Continuous transmission at 1900 frequency band</i>

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3. Summary of test results

3.1 Tests

Name of test	Paragraph	Result
Field Strength of Spurious Radiation	FCC 2.1053	Test passed
Effective Radiated Power	FCC 22.913	Test passed
Equivalent isotropic radiated Power	FCC 24.232	Test passed

4. TEST RESULTS

FIELD STRENGTH OF SPURIOUS RADIATION	8
FIELD STRENGTH OF SPURIOUS RADIATION	21
RF POWER OUTPUT	34

**TEST
1.****FIELD STRENGTH OF SPURIOUS RADIATION****EXTERNAL ANTENNA**

FCC Part. 2.1053

**REFERENCE
DOCUMENT****5.1 Test procedure**

The EUT was positioned on a non-conductive turntable, 0.8m above the ground plane. The radiated emission at the fundamental frequency was measured at 3m distance with a test antenna and spectrum analyzer. Worst case emission was recorded with the rotation of the turntable and the raising and lowering of the test antenna. ERP was measured using a substitution method. The EUT was replaced by horn antenna connected to a signal generator. The frequency range up to tenth harmonic was investigated.

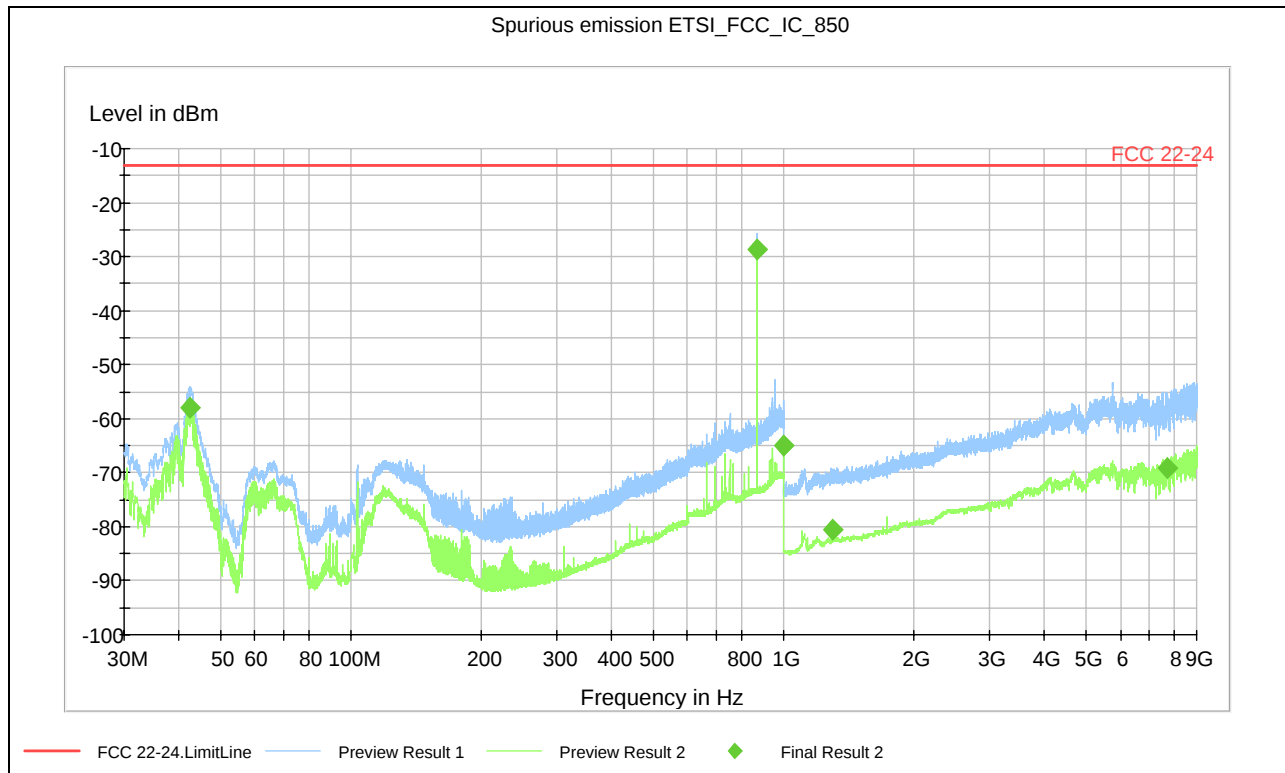
5.2 Test Results**5.2.1 GSM 850**

The radiated spurious emissions were measured for channel 128, channel 188 and channel 251, respectively the upper, center, and lower frequencies of the US GSM band (824,2MHz, 836,5MHz and 848,8 MHz). The measurement diagrams show that all significant spurs are well below the limit line. The measurements of the spurious emissions at the equipment output terminals were performed pursuant to § 2.1053 in order to verify that any emissions are below the limits given by § 22.917.

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GSM 850 (Channel 128)

Vertical polarization

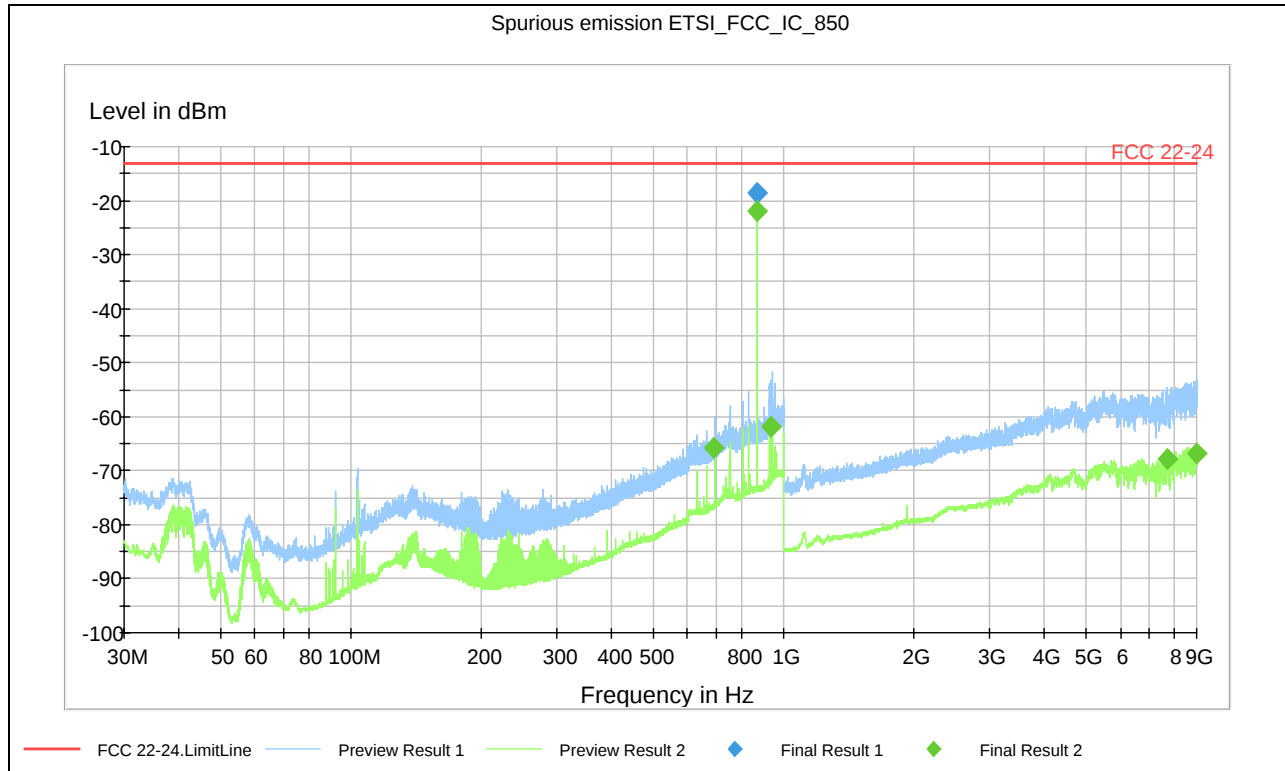


Final Result 2

Frequency (MHz)	Average (dBm)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Comment
42.525000	-58.0	1000.000	100.000	100.0	V	180.0	-81.2	
869.225000	-28.6	1000.000	100.000	100.0	V	2.0	-65.8	
999.975000	-64.9	1000.000	100.000	100.0	V	180.0	-63.3	
1300.000000	-80.5	1000.000	1000.000	100.0	V	180.0	-111.7	
7704.500000	-69.2	1000.000	1000.000	100.0	V	180.0	-91.9	

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Horizontal Polarization



Final Result 1

Frequency (MHz)	MaxPeak (dBm)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBm)
869.200000	-18.7	1000.000	100.000	100.0	H	180.0	-65.8	4.40	-13.00

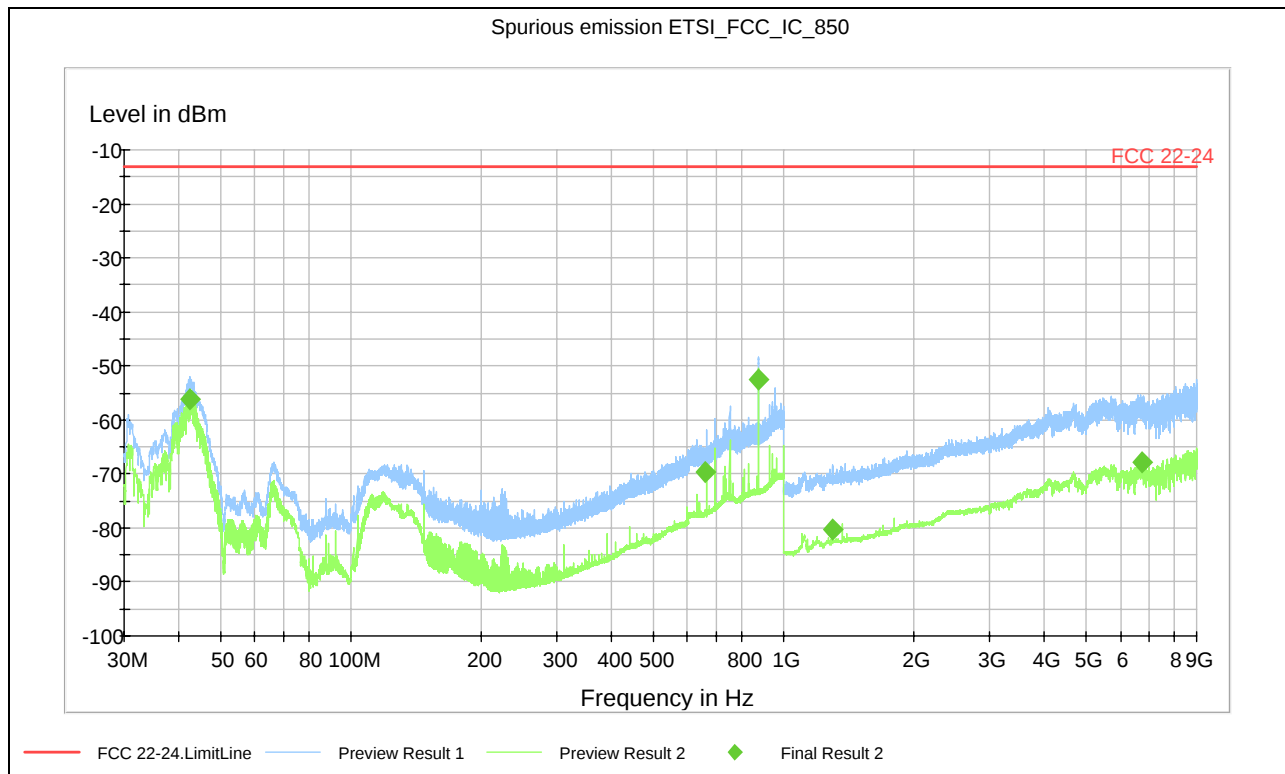
Final Result 2

Frequency (MHz)	Average (dBm)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Comment
691.670000	-65.8	1000.000	100.000	100.0	H	180.0	-66.3	
869.200000	-22.0	1000.000	100.000	100.0	H	180.0	-65.8	
935.400000	-61.9	1000.000	100.000	100.0	H	180.0	-64.3	
7692.500000	-67.8	1000.000	1000.000	100.0	H	180.0	-91.9	
8976.750000	-66.8	1000.000	1000.000	100.0	H	180.0	-89.3	

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GSM 850 (Channel 188)

Vertical polarization



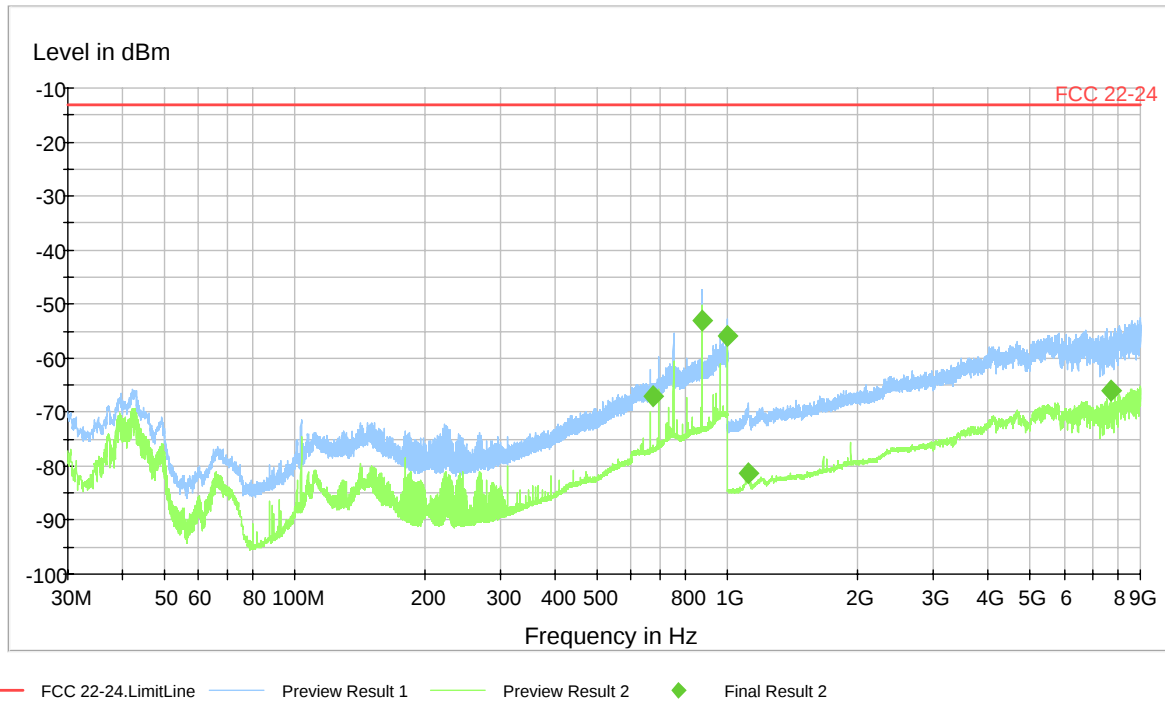
Final Result 2

Frequency (MHz)	Average (dBm)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Comment
42.650000	-56.2	1000.000	100.000	100.0	V	180.0	-81.2	
661.320000	-69.5	1000.000	100.000	100.0	V	90.0	-67.1	
873.600000	-52.4	1000.000	100.000	100.0	V	90.0	-65.7	
1300.000000	-80.2	1000.000	1000.000	100.0	V	180.0	-111.7	
6750.750000	-67.9	1000.000	1000.000	100.0	V	90.0	-93.6	

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Horizontal polarization

Spurious emission ETSI_FCC_IC_850



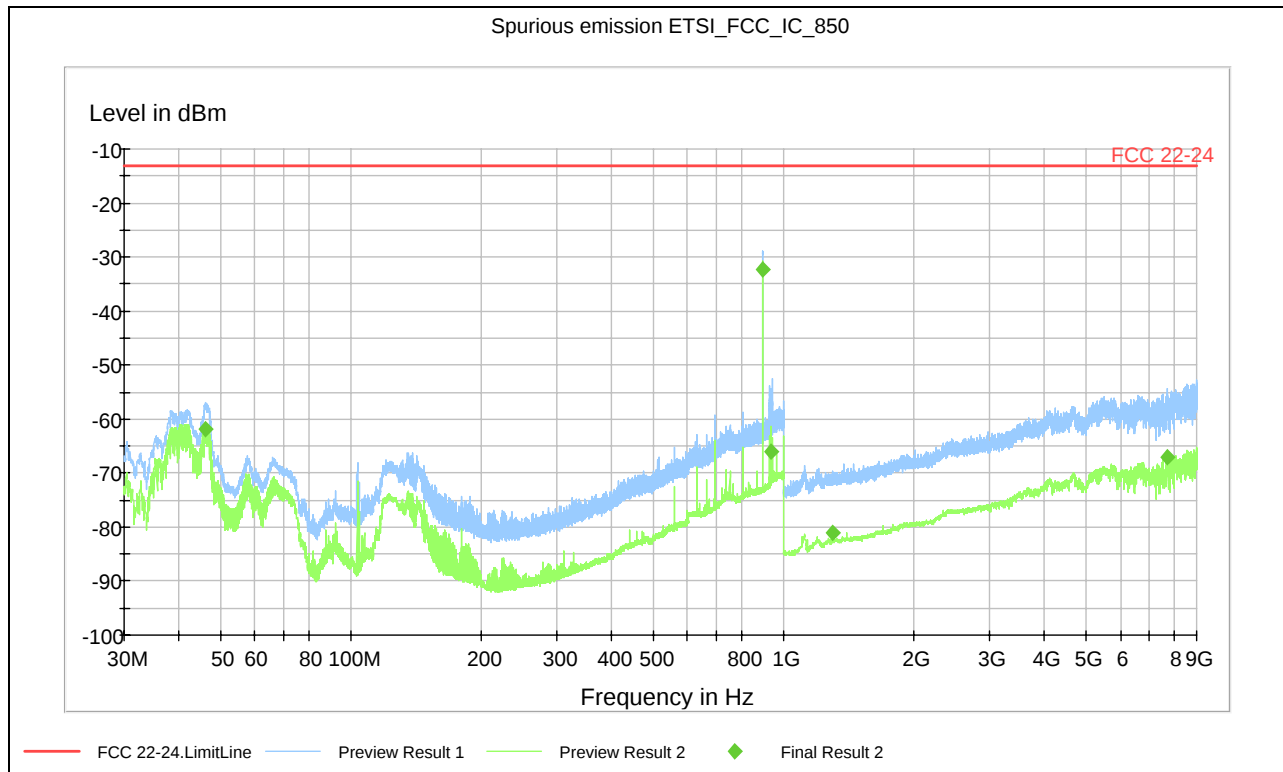
Final Result 2

Frequency (MHz)	Average (dBm)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Comment
673.925000	-67.1	1000.000	100.000	100.0	H	179.0	-67.1	
873.625000	-53.1	1000.000	100.000	100.0	H	92.0	-65.7	
999.975000	-55.9	1000.000	100.000	100.0	H	92.0	-63.3	
1118.750000	-81.4	1000.000	1000.000	100.0	H	1.0	-110.8	
7704.750000	-66.1	1000.000	1000.000	250.0	H	1.0	-91.9	

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GSM 850 (Channel 251)

Vertical polarization

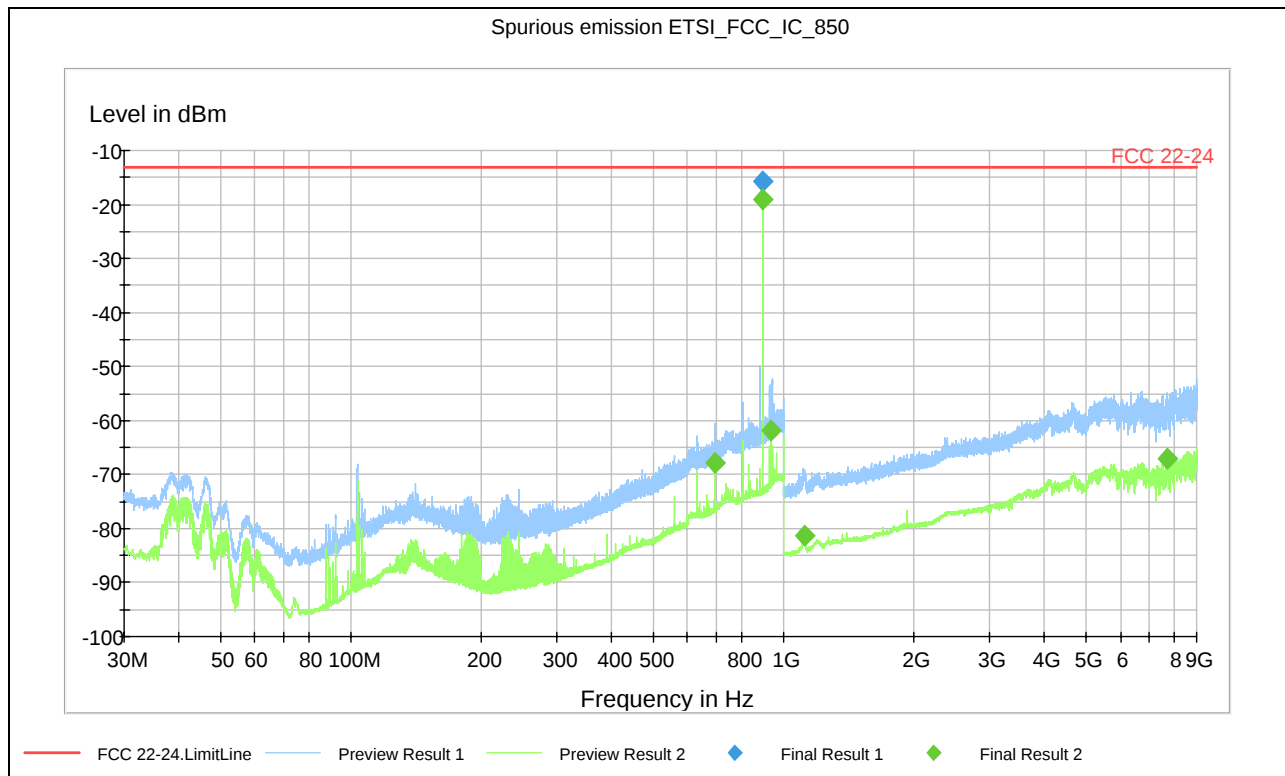


Final Result 2

Frequency (MHz)	Average (dBm)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Comment
46.250000	-61.8	1000.000	100.000	100.0	V	180.0	-83.6	
893.800000	-32.4	1000.000	100.000	100.0	V	180.0	-65.6	
935.425000	-65.9	1000.000	100.000	100.0	V	180.0	-64.3	
1300.000000	-81.2	1000.000	1000.000	100.0	V	180.0	-111.7	
7704.500000	-67.0	1000.000	1000.000	100.0	V	180.0	-91.9	

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Horizontal polarization



Final Result 1

Frequency (MHz)	MaxPeak (dBm)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBm)
893.875000	-15.7	1000.000	100.000	100.0	H	180.0	-65.6	0.80	-13.00

Final Result 2

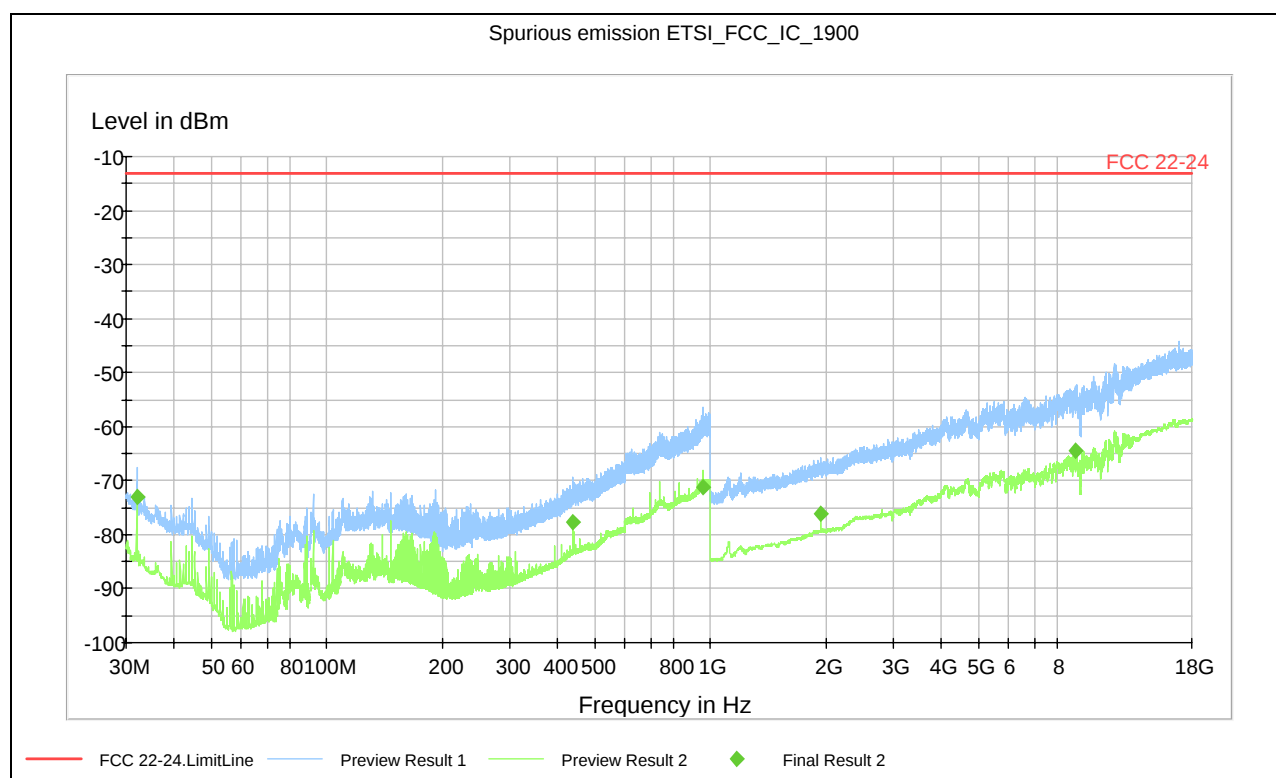
Frequency (MHz)	Average (dBm)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Comment
695.450000	-67.8	1000.000	100.000	100.0	H	180.0	-66.9	
893.800000	-19.2	1000.000	100.000	100.0	H	180.0	-65.6	
935.400000	-61.8	1000.000	100.000	100.0	H	180.0	-64.3	
1118.750000	-81.4	1000.000	1000.000	100.0	H	180.0	-110.8	
7704.500000	-67.0	1000.000	1000.000	100.0	H	180.0	-91.9	

PCS 1900

The radiated spurious emissions were measured for channel 512, channel 661 and channel 810, respectively the upper, center, and lower frequencies of the US PCS band (1850.2 MHz, 1880.0 MHz and 1909.8 MHz). The measurement show that all significant spurs are well below the limit line. The measurements of the spurious emissions at the equipment output terminals were performed pursuant to § 2.1053 in order to verify that any emissions are below the limits given by § 24.238.

PCS 1900 (Channel 512)

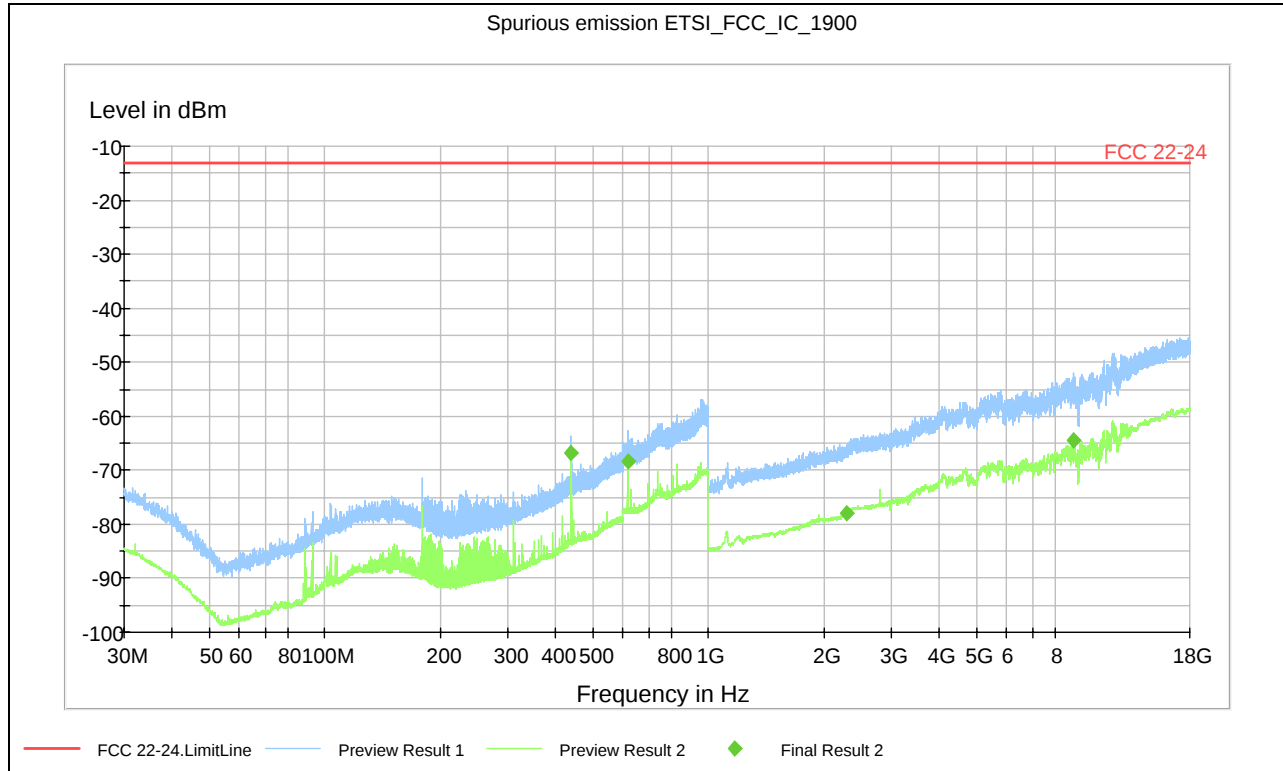
Vertical polarization



Final Result 2

Frequency (MHz)	Average (dBm)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Comment
32.000000	-73.1	5.000	100.000	100.0	V	180.0	-75.9	
440.000000	-77.7	5.000	100.000	100.0	V	180.0	-74.2	
958.520000	-71.1	5.000	100.000	100.0	V	180.0	-63.5	
1944.000000	-76.2	5.000	1000.000	100.0	V	180.0	-108.0	
8984.400000	-64.5	5.000	1000.000	100.0	V	180.0	-89.3	

Horizontal polarization



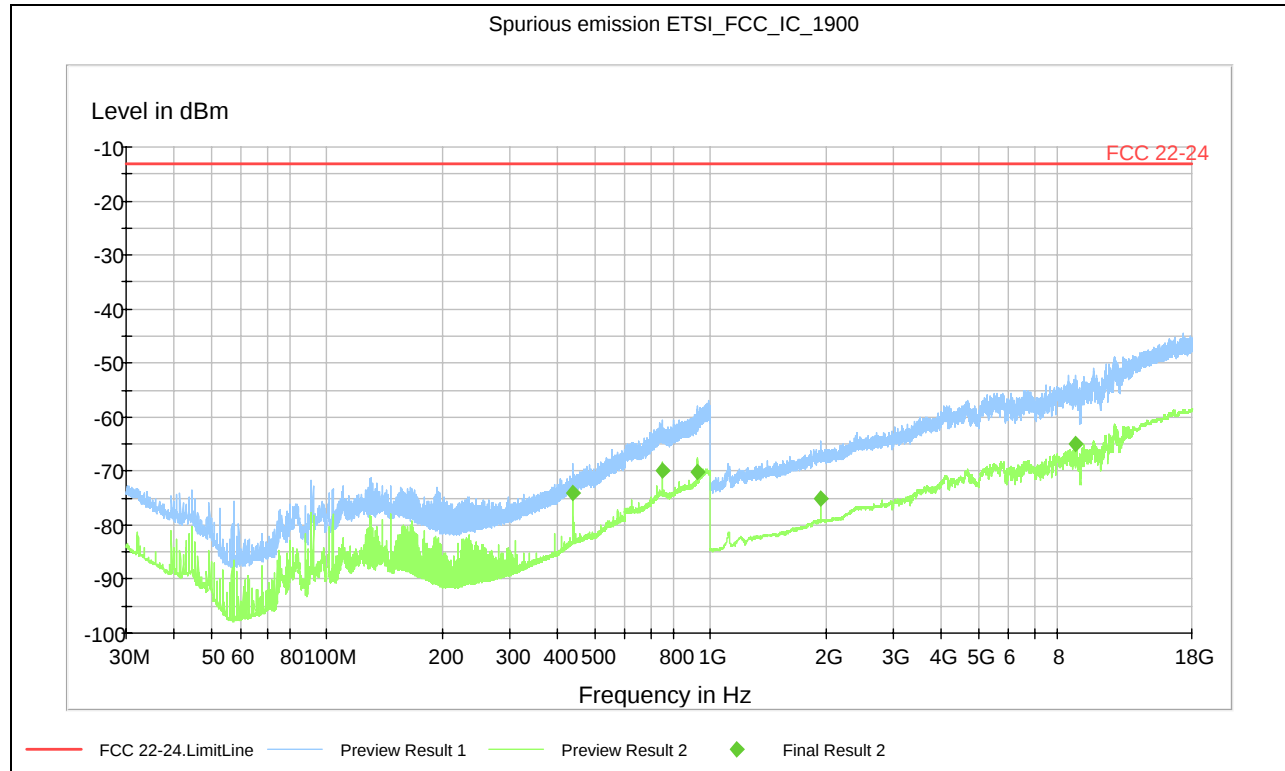
Final Result 2

Frequency (MHz)	Average (dBm)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Comment
440.000000	-66.7	5.000	100.000	100.0	H	0.0	-74.2	
616.000000	-68.3	5.000	100.000	100.0	H	0.0	-70.4	
2294.400000	-77.9	5.000	1000.000	100.0	H	-1.0	-106.4	
8984.400000	-64.5	5.000	1000.000	100.0	H	180.0	-89.3	

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PCS 1900 (Channel 661)

Vertical polarization

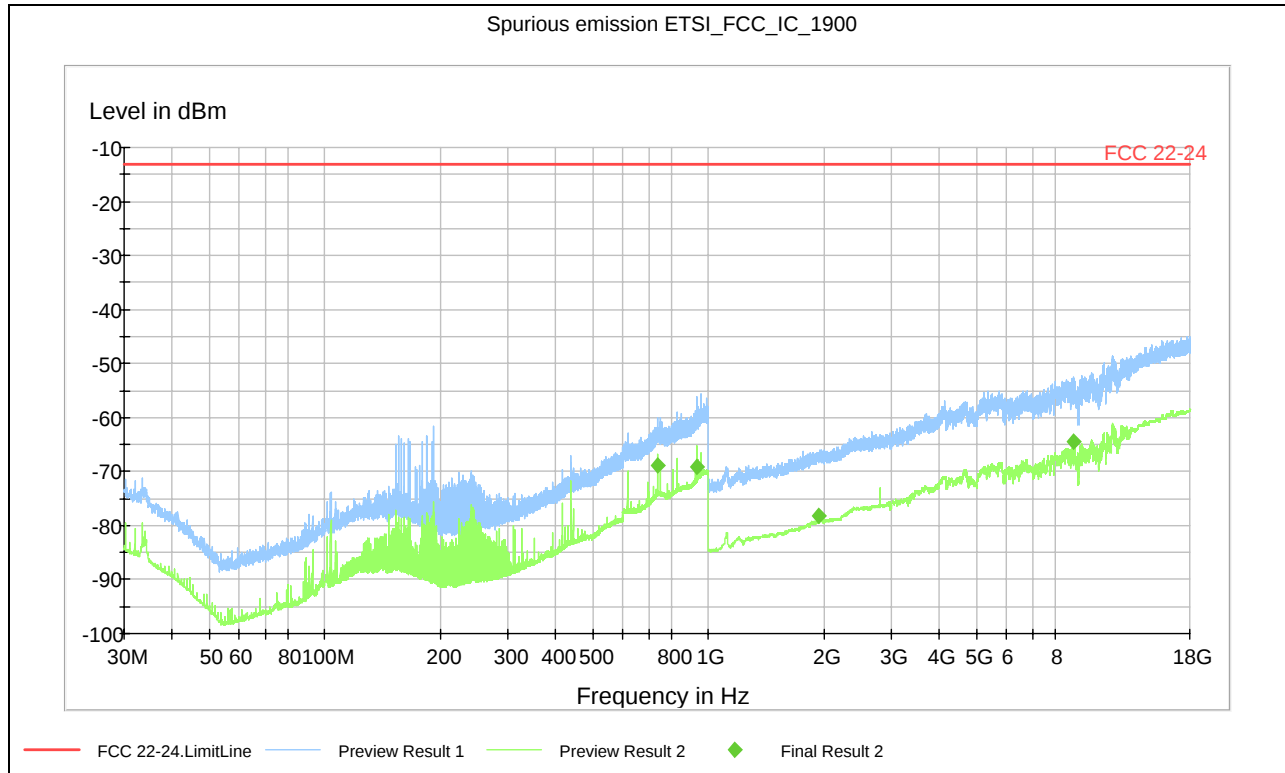


Final Result 2

Frequency (MHz)	Average (dBm)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Comment
440.000000	-73.9	5.000	100.000	101.0	V	180.0	-74.2	
751.240000	-69.9	5.000	100.000	101.0	V	1.0	-67.1	
929.000000	-70.2	5.000	100.000	101.0	V	180.0	-64.6	
1943.600000	-75.1	5.000	1000.000	100.0	V	180.0	-108.0	
8978.400000	-65.0	5.000	1000.000	100.0	V	180.0	-89.3	

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Horizontal polarization

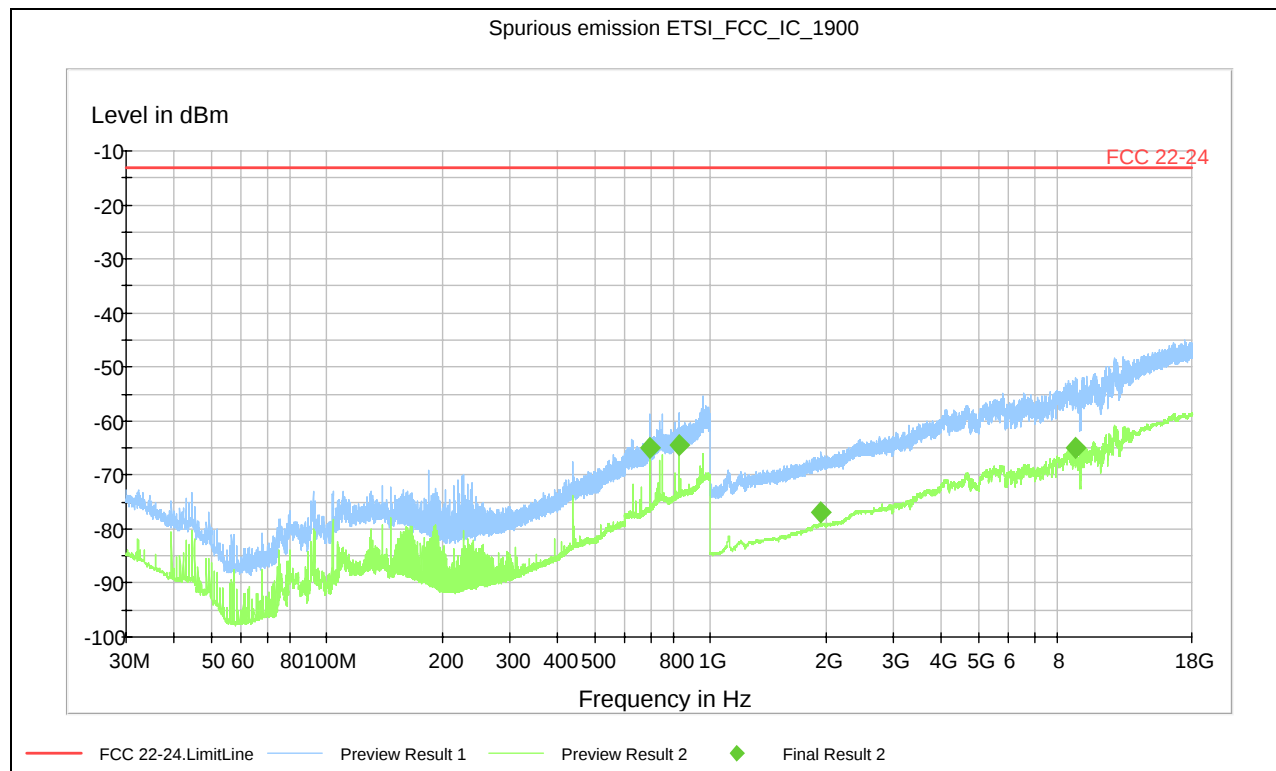


Final Result 2

Frequency (MHz)	Average (dBm)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Comment
735.240000	-68.9	5.000	100.000	100.0	H	180.0	-67.0	
935.440000	-69.1	5.000	100.000	100.0	H	1.0	-64.3	
1943.600000	-78.2	5.000	1000.000	100.0	H	180.0	-108.0	
8984.000000	-64.5	5.000	1000.000	100.0	H	0.0	-89.3	

PCS 1900 (Channel 810)

Vertical polarization

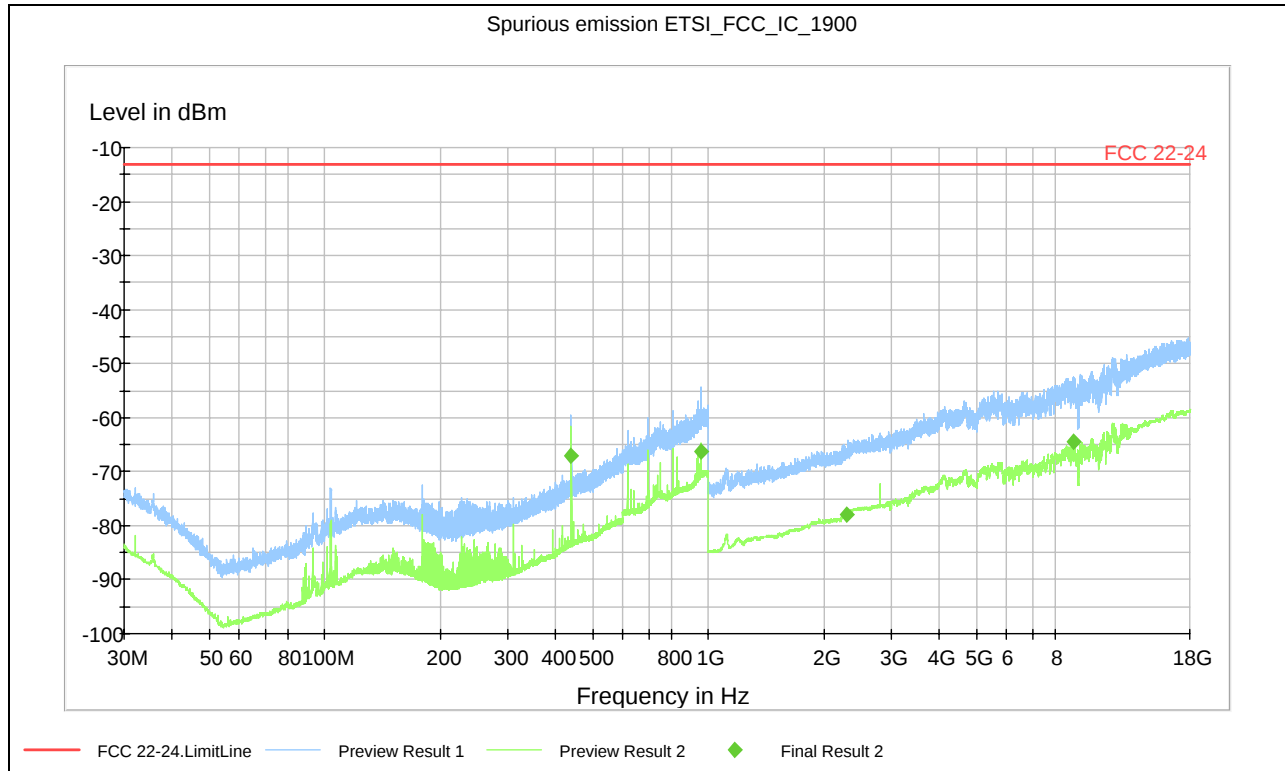


Final Result 2

Frequency (MHz)	Average (dBm)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Comment
695.240000	-64.9	5.000	100.000	100.0	V	180.0	-68.9	
831.280000	-64.6	5.000	100.000	100.0	V	180.0	-66.3	
1944.000000	-76.9	5.000	1000.000	100.0	V	180.0	-108.0	
8978.400000	-65.0	5.000	1000.000	100.0	V	180.0	-89.3	

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Horizontal polarization



Final Result 2

Frequency (MHz)	Average (dBm)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Comment
440.000000	-67.1	5.000	100.000	100.0	H	180.0	-74.2	
958.640000	-66.2	5.000	100.000	100.0	H	180.0	-63.5	
2300.000000	-78.0	5.000	1000.000	100.0	H	180.0	-106.3	
8978.800000	-64.5	5.000	1000.000	100.0	H	180.0	-89.3	

**TEST
2.****FIELD STRENGTH OF SPURIOUS RADIATION****INTERNAL ANTENNA**

FCC Part. 2.1053

**REFERENCE
DOCUMENT****5.3 Test procedure**

The EUT was positioned on a non-conductive turntable, 0.8m above the ground plane. The radiated emission at the fundamental frequency was measured at 3m distance with a test antenna and spectrum analyzer. Worst case emission was recorded with the rotation of the turntable and the raising and lowering of the test antenna. ERP was measured using a substitution method. The EUT was replaced by horn antenna connected to a signal generator. The frequency range up to tenth harmonic was investigated.

5.4 Test Results**5.2.2 GSM 850**

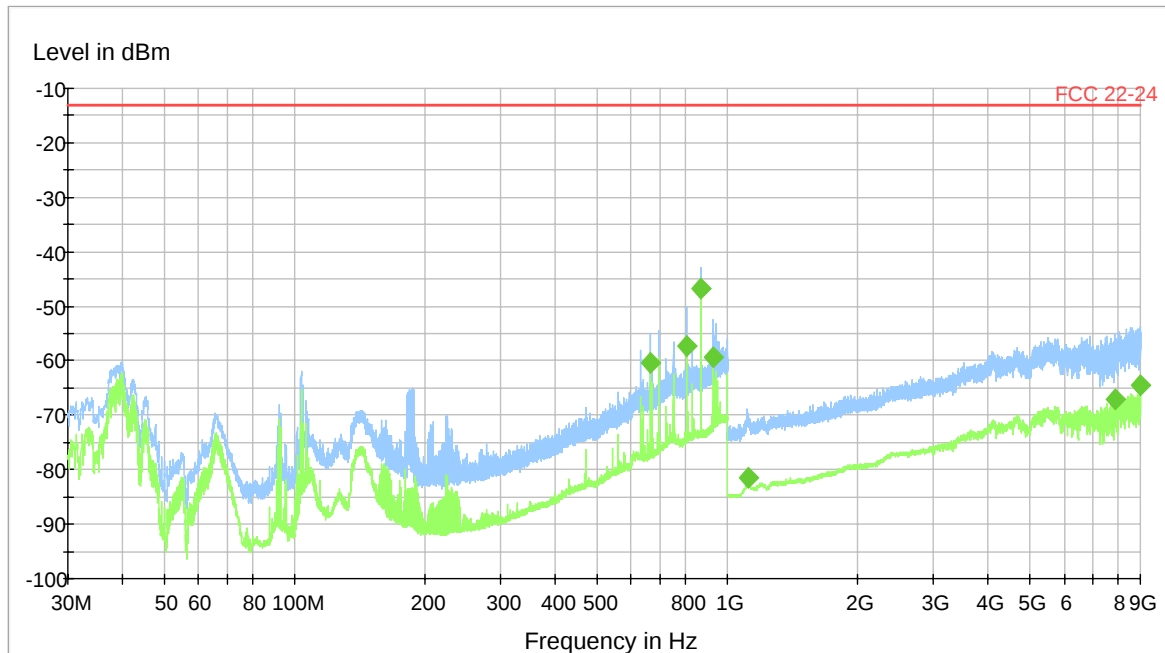
The radiated spurious emissions were measured for channel 128, channel 188 and channel 251, respectively the upper, center, and lower frequencies of the US GSM band (824,2MHz, 836,5MHz and 848,8 MHz). The measurement diagrams show that all significant spurs are well below the limit line. The measurements of the spurious emissions at the equipment output terminals were performed pursuant to § 2.1053 in order to verify that any emissions are below the limits given by § 22.917

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GSM 850 (Channel 128)

Vertical polarization

Spurious emission ETSI_FCC_IC_850



— FCC 22-24.LimitLine — Preview Result 1 — Preview Result 2 ◆ Final Result 2

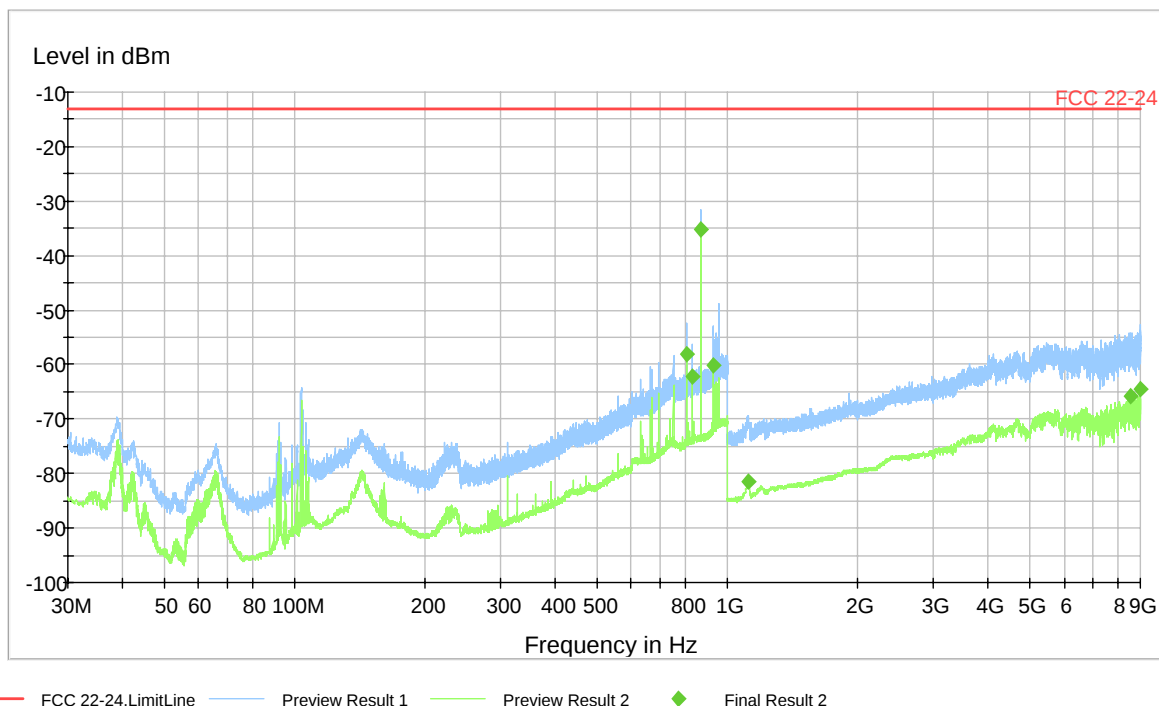
Final Result 2

Frequency (MHz)	Average (dBm)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Comment
663.250000	-60.4	1000.000	100.000	100.0	V	-1.0	-70.0	
807.250000	-57.4	1000.000	100.000	100.0	V	-1.0	-66.9	
869.200000	-46.7	1000.000	100.000	100.0	V	-1.0	-65.8	
925.800000	-59.3	1000.000	100.000	100.0	V	-1.0	-64.7	
1119.750000	-81.6	1000.000	1000.000	100.0	V	-1.0	-111.0	
7872.750000	-67.1	1000.000	1000.000	100.0	V	-1.0	-92.3	
8976.500000	-64.6	1000.000	1000.000	100.0	V	-1.0	-89.3	

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Horizontal Polarization

Spurious emission ETSI_FCC_IC_850



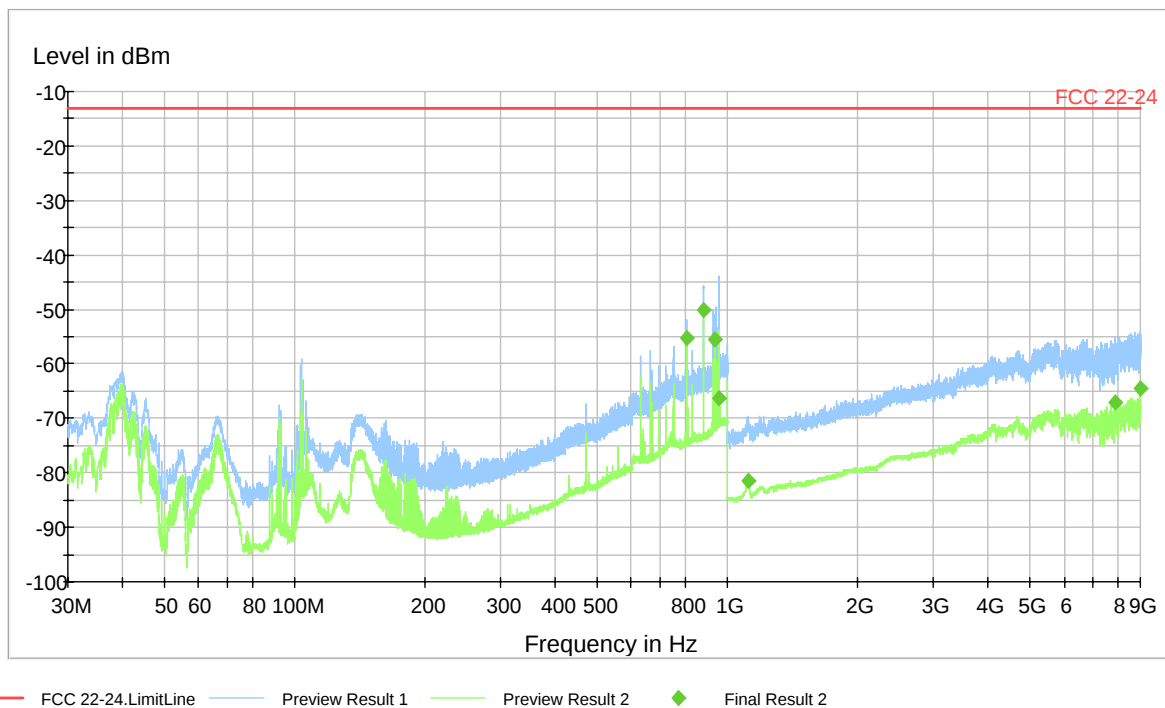
Final Result 2

Frequency (MHz)	Average (dBm)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Comment
807.250000	-58.1	1000.000	100.000	100.0	H	-1.0	-66.9	
831.250000	-62.3	1000.000	100.000	100.0	H	-1.0	-66.3	
869.200000	-35.1	1000.000	100.000	100.0	H	-1.0	-65.8	
925.800000	-60.1	1000.000	100.000	100.0	H	-1.0	-64.7	
1119.000000	-81.5	1000.000	1000.000	100.0	H	-1.0	-110.9	
8574.500000	-65.8	1000.000	1000.000	100.0	H	-1.0	-90.1	
8976.500000	-64.5	1000.000	1000.000	100.0	H	-1.0	-89.3	

GSM 850 (Channel 188)

Vertical polarization

Spurious emission ETSI_FCC_IC_850



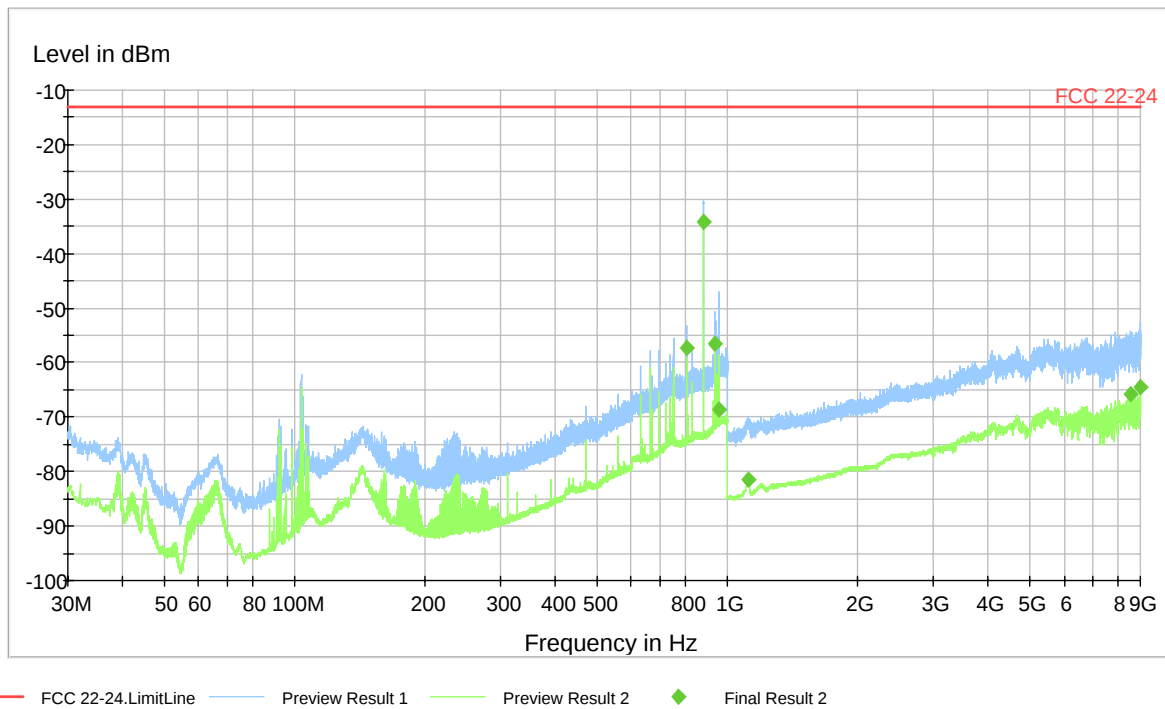
Final Result 2

Frequency (MHz)	Average (dBm)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Comment
807.250000	-55.2	1000.000	100.000	100.0	V	-1.0	-66.9	
881.225000	-50.1	1000.000	100.000	100.0	V	-1.0	-65.7	
935.400000	-55.5	1000.000	100.000	100.0	V	-1.0	-64.3	
959.800000	-66.4	1000.000	100.000	100.0	V	-1.0	-63.4	
1118.750000	-81.6	1000.000	1000.000	100.0	V	-1.0	-110.8	
7867.000000	-67.2	1000.000	1000.000	100.0	V	-1.0	-92.3	
8976.500000	-64.6	1000.000	1000.000	100.0	V	-1.0	-89.3	

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Horizontal polarization

Spurious emission ETSI_FCC_IC_850



Final Result 2

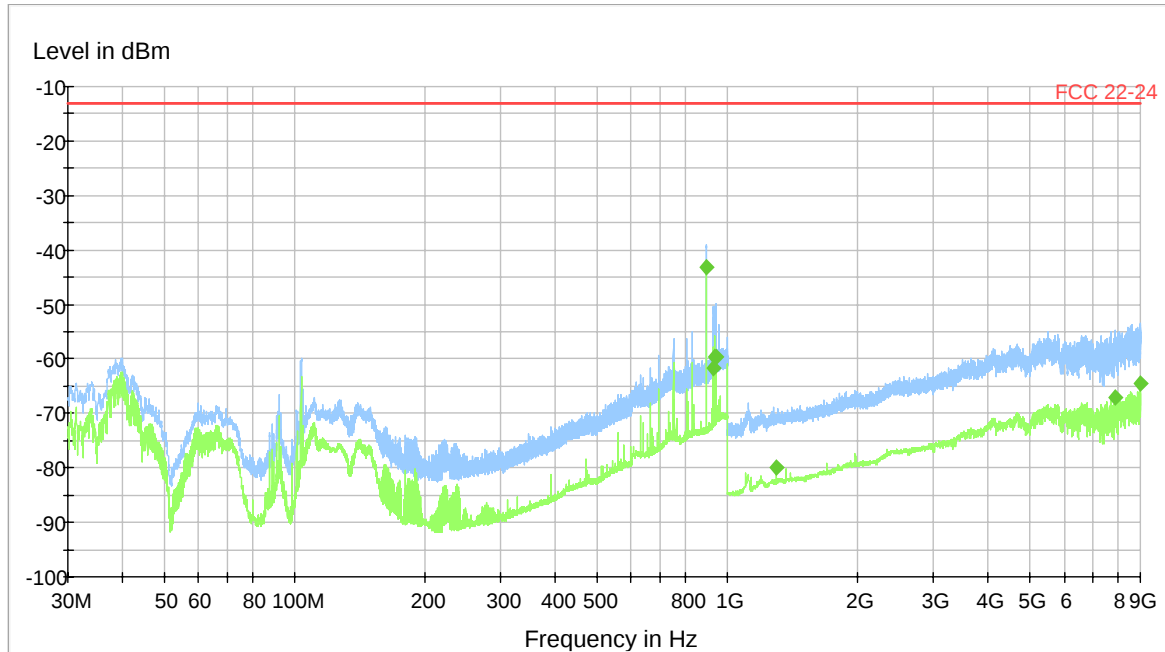
Frequency (MHz)	Average (dBm)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Comment
807.250000	-57.4	1000.000	100.000	100.0	H	-1.0	-66.9	
881.200000	-34.2	1000.000	100.000	100.0	H	-1.0	-65.7	
935.400000	-56.6	1000.000	100.000	100.0	H	-1.0	-64.3	
959.825000	-68.7	1000.000	100.000	100.0	H	-1.0	-63.4	
1118.750000	-81.5	1000.000	1000.000	100.0	H	-1.0	-110.8	
8574.750000	-65.9	1000.000	1000.000	100.0	H	-1.0	-90.1	
8976.500000	-64.5	1000.000	1000.000	100.0	H	-1.0	-89.3	

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GSM 850 (Channel 251)

Vertical polarization

Spurious emission ETSI_FCC_IC_850



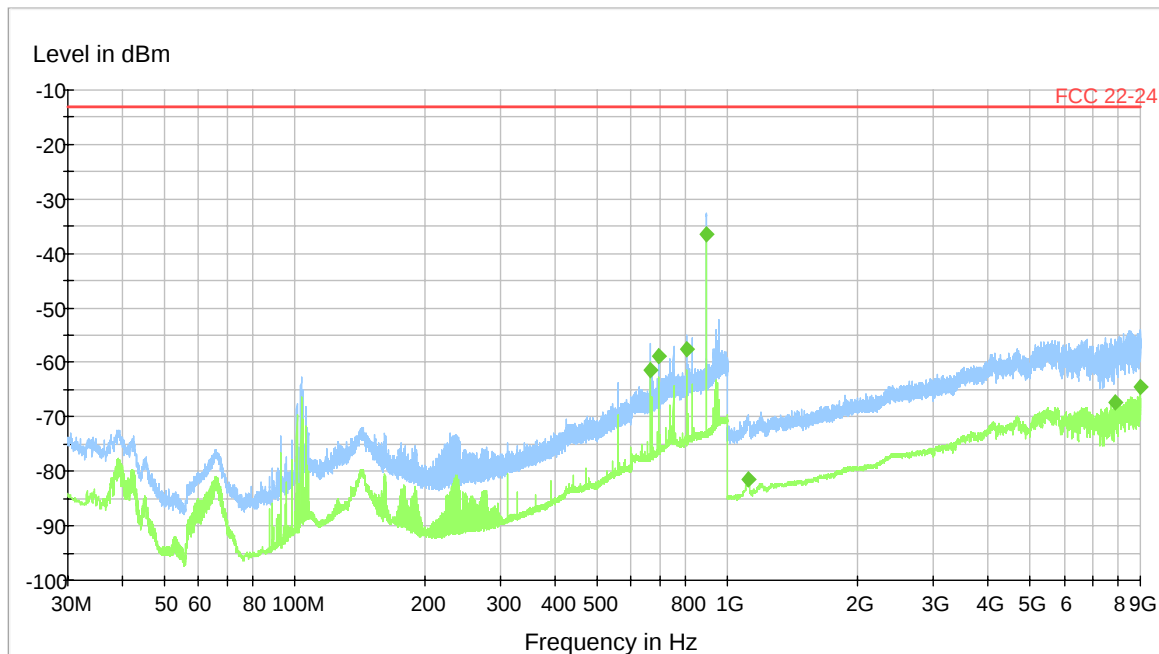
— FCC 22-24.LimitLine — Preview Result 1 — Preview Result 2 ◆ Final Result 2

Final Result 2

Frequency (MHz)	Average (dBm)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Comment
893.800000	-43.2	1000.000	100.000	100.0	V	180.0	-65.6	
925.825000	-61.6	1000.000	100.000	100.0	V	180.0	-64.7	
935.400000	-59.5	1000.000	100.000	100.0	V	180.0	-64.3	
940.600000	-59.6	1000.000	100.000	100.0	V	180.0	-64.1	
1300.000000	-79.9	1000.000	1000.000	100.0	V	180.0	-111.7	
7866.750000	-67.0	1000.000	1000.000	100.0	V	-1.0	-92.3	
8976.500000	-64.4	1000.000	1000.000	100.0	V	-1.0	-89.3	

Horizontal polarization

Spurious emission ETSI_FCC_IC_850



— FCC 22-24.LimitLine — Preview Result 1 — Preview Result 2 ◆ Final Result 2

Final Result 2

Frequency (MHz)	Average (dBm)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Comment
663.250000	-61.5	1000.000	100.000	100.0	H	-1.0	-70.0	
695.250000	-58.9	1000.000	100.000	100.0	H	-1.0	-68.9	
807.250000	-57.7	1000.000	100.000	100.0	H	-1.0	-66.9	
893.800000	-36.4	1000.000	100.000	100.0	H	-1.0	-65.6	
1119.000000	-81.5	1000.000	1000.000	100.0	H	-1.0	-110.9	
7866.500000	-67.2	1000.000	1000.000	100.0	H	-1.0	-92.3	
8976.500000	-64.6	1000.000	1000.000	100.0	H	-1.0	-89.3	

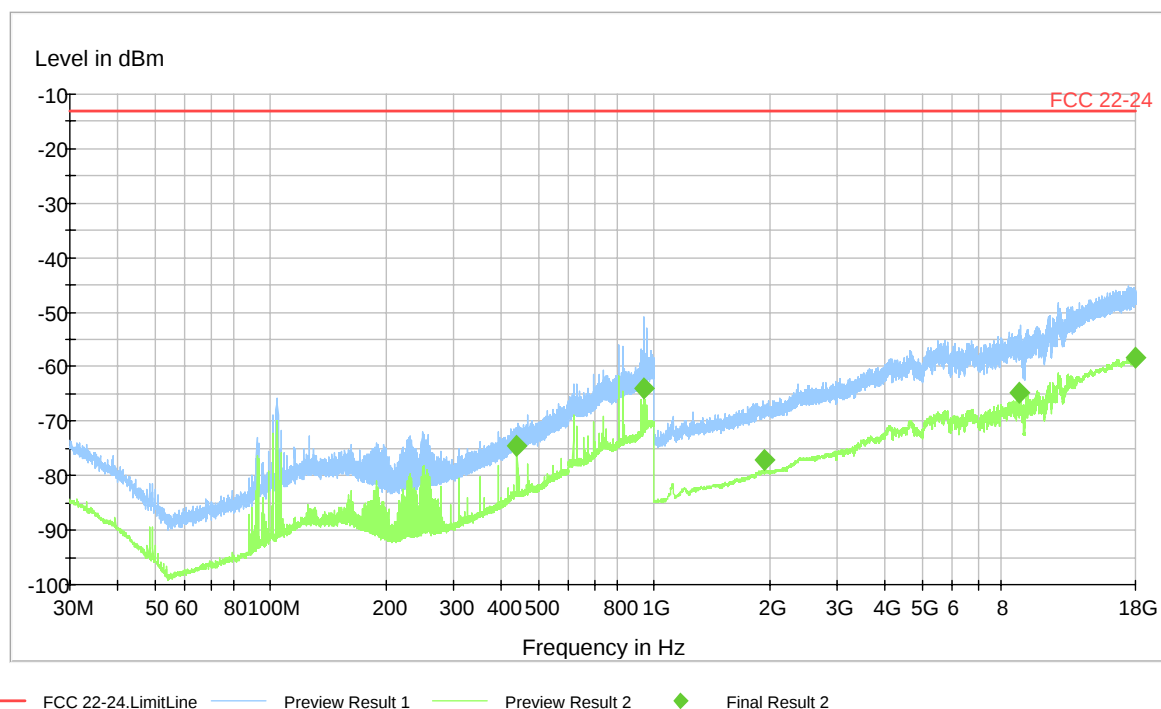
PCS 1900

The radiated spurious emissions were measured for channel 512, channel 661 and channel 810, respectively the upper, center, and lower frequencies of the US PCS band (1850.2 MHz, 1880.0 MHz and 1909.8 MHz). The measurement show that all significant spurs are well below the limit line. The measurements of the spurious emissions at the equipment output terminals were performed pursuant to § 2.1053 in order to verify that any emissions are below the limits given by § 24.238.

PCS 1900 (Channel 512)

Vertical polarization

Spurious emission ETSI_FCC_IC_1900

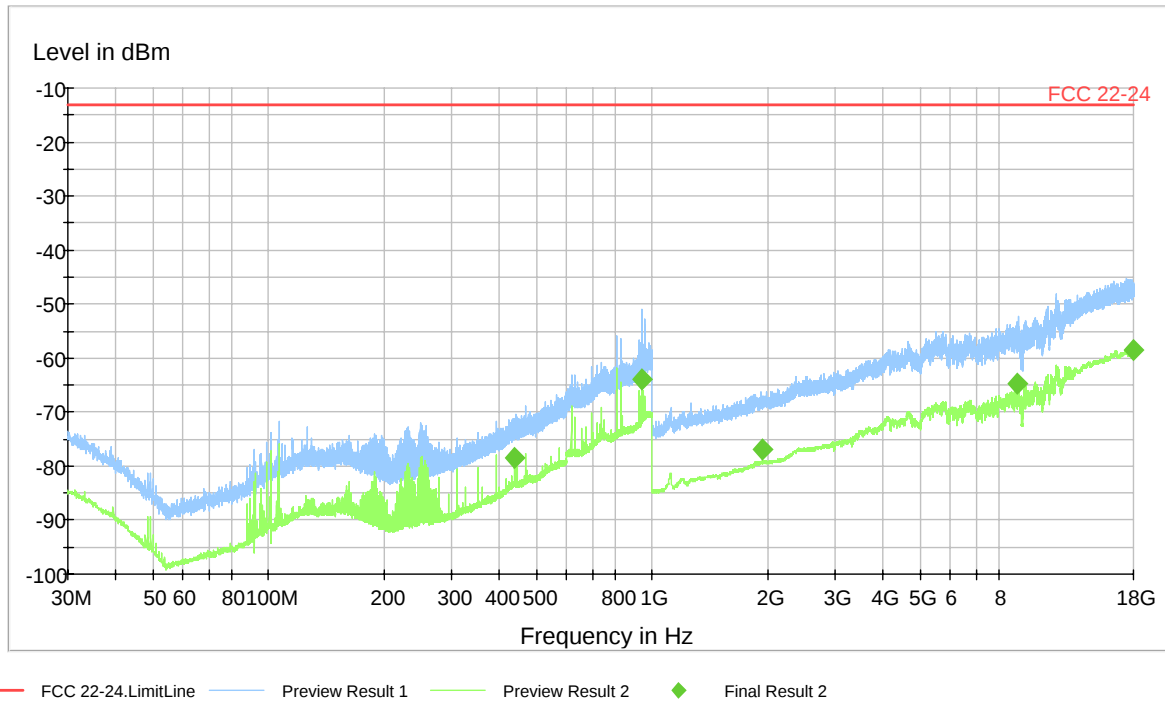


Final Result 2

Frequency (MHz)	Average (dBm)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Comment
440.000000	-74.5	5.000	100.000	100.0	H	0.0	-74.2	
940.600000	-64.0	5.000	100.000	100.0	H	0.0	-64.1	
1943.600000	-77.0	5.000	1000.000	100.0	H	0.0	-106.3	
8978.400000	-64.7	5.000	1000.000	100.0	H	0.0	-89.3	
17999.600000	-58.4	5.000	1000.000	100.0	H	0.0	-76.0	

Horizontal polarization

Spurious emission ETSI_FCC_IC_1900



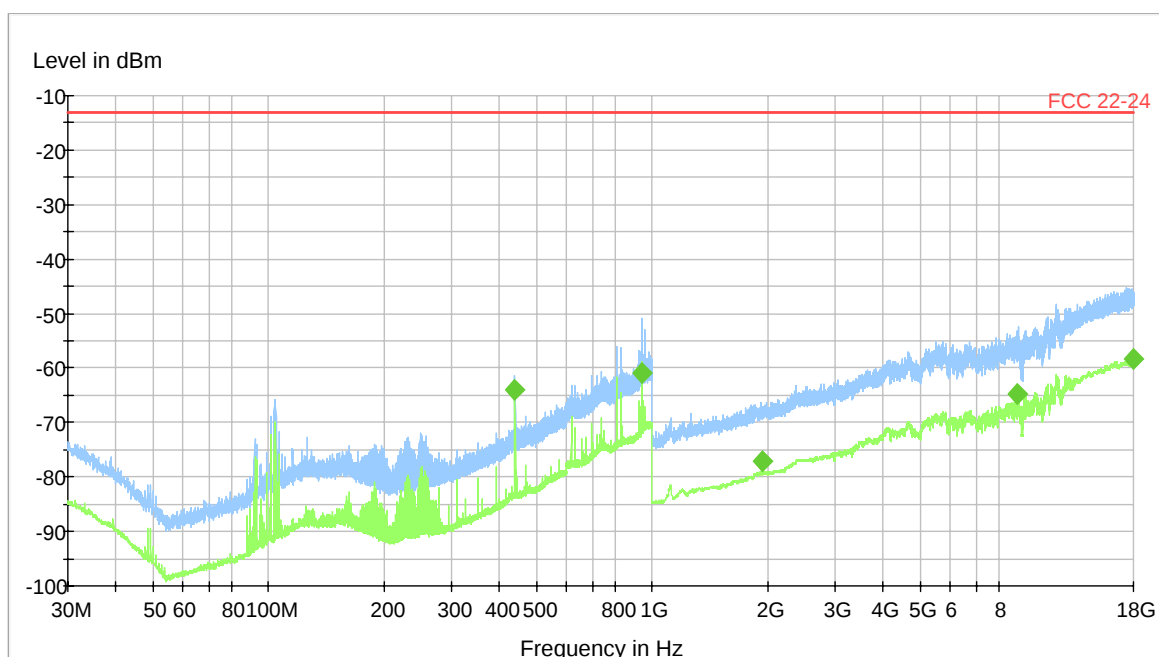
Final Result 2

Frequency (MHz)	Average (dBm)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Comment
440.000000	-78.5	5.000	100.000	100.0	H	0.0	-74.2	
940.600000	-64.0	5.000	100.000	100.0	H	0.0	-64.1	
1943.600000	-77.0	5.000	1000.000	100.0	H	0.0	-106.3	
8978.400000	-64.7	5.000	1000.000	100.0	H	0.0	-89.3	
17999.600000	-58.4	5.000	1000.000	100.0	H	0.0	-76.0	

PCS 1900 (Channel 661)

Vertical polarization

Spurious emission ETSI_FCC_IC_1900



— FCC 22-24.LimitLine — Preview Result 1 — Preview Result 2 ◆ Final Result 2

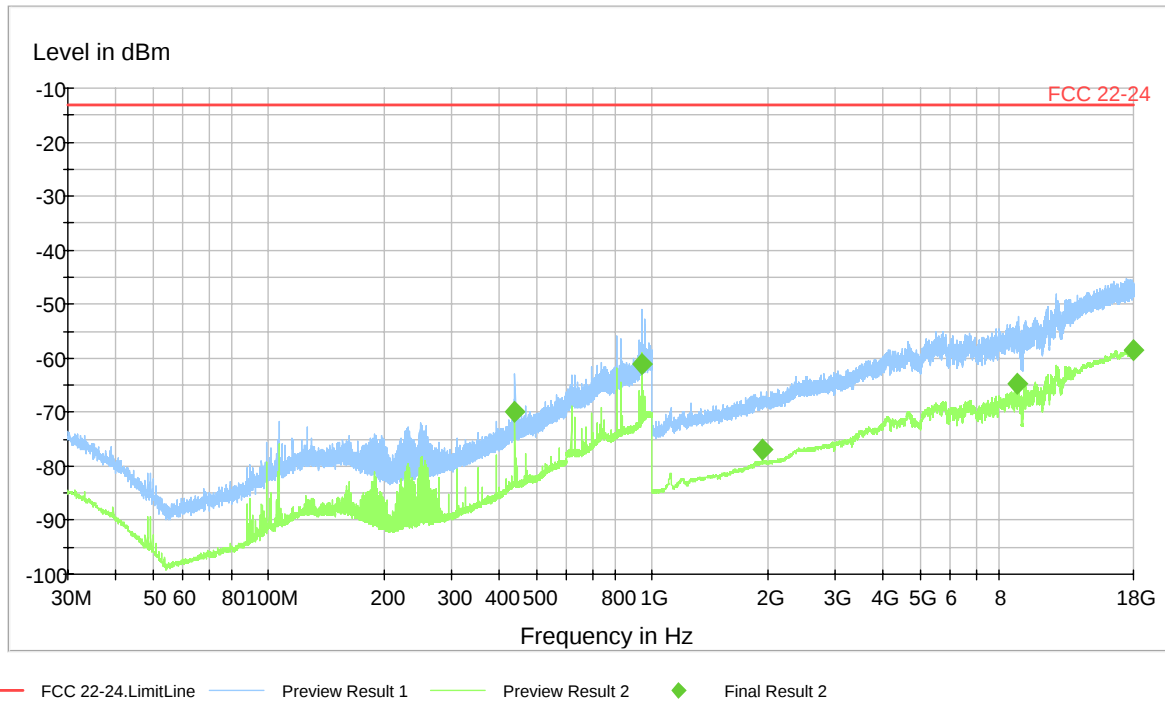
Final Result 2

Frequency (MHz)	Average (dBm)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Comment
440.000000	-64.0	5.000	100.000	100.0	H	0.0	-74.2	
940.600000	-61.0	5.000	100.000	100.0	H	0.0	-64.1	
1943.600000	-77.0	5.000	1000.000	100.0	H	0.0	-106.3	
8978.400000	-64.7	5.000	1000.000	100.0	H	0.0	-89.3	
17999.600000	-58.4	5.000	1000.000	100.0	H	0.0	-76.0	

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Horizontal polarization

Spurious emission ETSI_FCC_IC_1900



Final Result 2

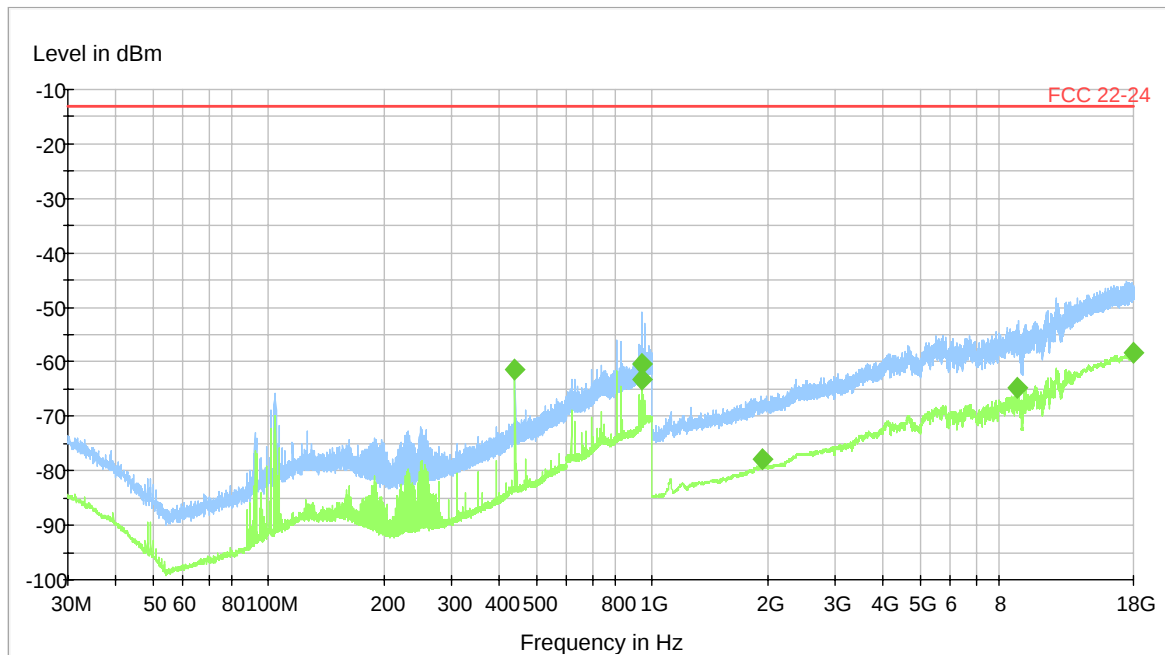
Frequency (MHz)	Average (dBm)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Comment
440.000000	-70.0	5.000	100.000	100.0	H	0.0	-74.2	
940.600000	-61.0	5.000	100.000	100.0	H	0.0	-64.1	
1943.600000	-77.0	5.000	1000.000	100.0	H	0.0	-106.3	
8978.400000	-64.7	5.000	1000.000	100.0	H	0.0	-89.3	
17999.600000	-58.4	5.000	1000.000	100.0	H	0.0	-76.0	

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PCS 1900 (Channel 810)

Vertical polarization

Spurious emission ETSI_FCC_IC_1900



— FCC 22-24.LimitLine — Preview Result 1 — Preview Result 2 ◆ Final Result 2

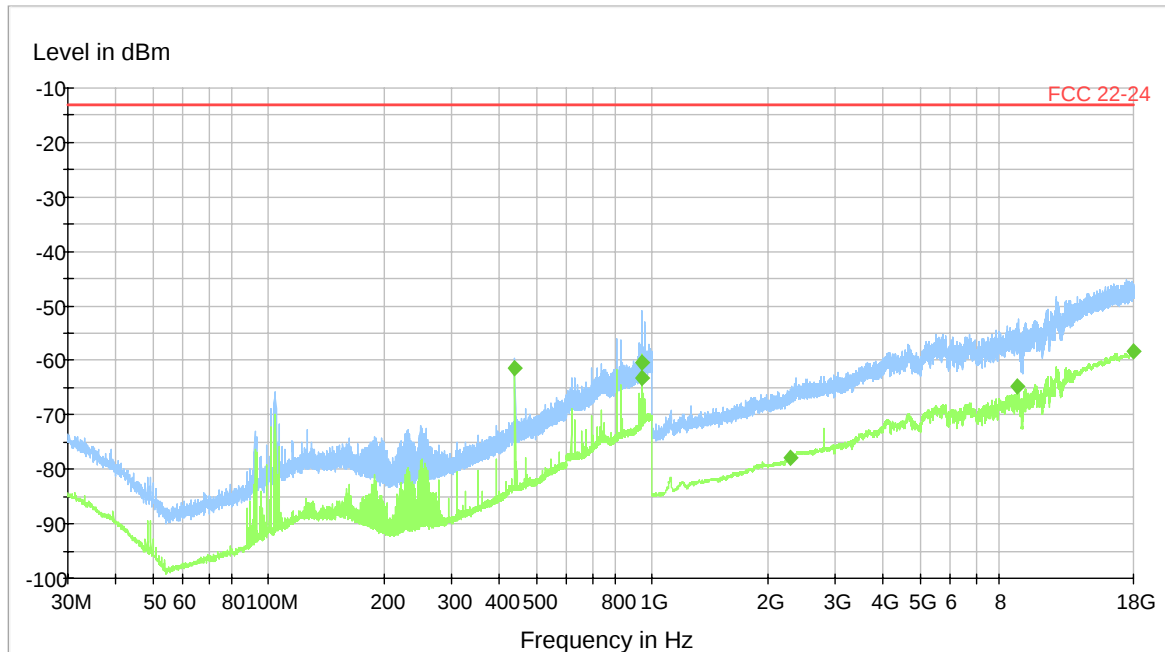
Final Result 2

Frequency (MHz)	Average (dBm)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Comment
440.000000	-61.3	5.000	100.000	100.0	H	0.0	-74.2	
940.600000	-60.5	5.000	100.000	100.0	H	0.0	-64.1	
942.400000	-63.3	5.000	100.000	100.0	H	0.0	-64.0	
1944.000000	-78.0	5.000	1000.000	100.0	H	0.0	-106.3	
8978.400000	-64.7	5.000	1000.000	100.0	H	0.0	-89.3	
17999.600000	-58.4	5.000	1000.000	100.0	H	0.0	-76.0	

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Horizontal polarization

Spurious emission ETSI_FCC_IC_1900



— FCC 22-24.LimitLine — Preview Result 1 — Preview Result 2 ◆ Final Result 2

Final Result 2

Frequency (MHz)	Average (dBm)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Comment
440.000000	-61.4	5.000	100.000	100.0	H	0.0	-74.2	
940.600000	-60.5	5.000	100.000	100.0	H	0.0	-64.1	
942.400000	-63.3	5.000	100.000	100.0	H	0.0	-64.0	
2300.000000	-78.0	5.000	1000.000	100.0	H	0.0	-106.3	
8978.400000	-64.7	5.000	1000.000	100.0	H	0.0	-89.3	
17999.600000	-58.4	5.000	1000.000	100.0	H	0.0	-76.0	

**TEST
3.****REFERENCE
DOCUMENT****RF POWER OUTPUT**

FCC 2.1046 Measurements required: 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.

FCC 22.913

The Effective Radiated Power (ERP) of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

FCC 24.232

The equivalent Isotropic Radiated Power (EIRP) must not exceed 2 Watts.

2.1 Test procedure

The EUT was positioned on a non-conductive turntable, 0.8m above the ground plane on Semianechoic chamber. The radiated emission at the fundamental frequency was measured at 3m distance with a test antenna and spectrum analyzer. Worst case emission was recorded with the rotation of the turntable and the raising and lowering of the test antenna. ERP in frequency band 824.2-848.8 MHz, and EIRP in frequency band 1850.2-1909.8 MHz were measured using a substitution method. The EUT was replaced by half-wave dipole (824.2-848.8 MHz) or horn antenna (1850.2-1909.8 MHz) connected to a signal generator.

2.1.1 Substitution RF power measurement:

The applied substitution method follows ANSI/TIA/EIA-603, ANSI/TIA/EIA-102.CAAA or the appropriate ETSI rules respectively. The actual signal generated by the EUT can be determined by means of a substitution measurement in which a known signal source replaces the device to be measured.

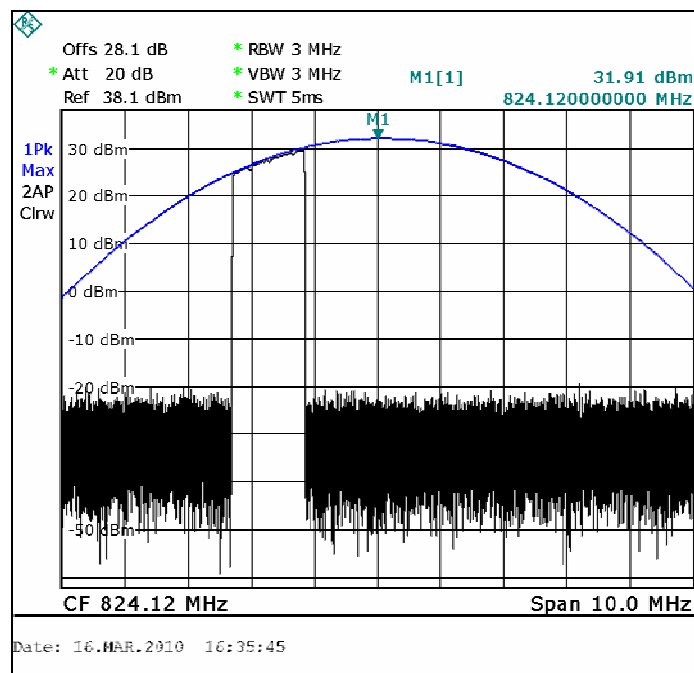
The substitution antenna replaces the transmitter antenna at the same position and in vertical polarisation. The frequency of the signal generator shall be adjusted to the measurement frequency. The test antenna shall be raised or lowered, if necessary, to ensure that the maximum signal is still received. The input signal to the substitution antenna shall be adjusted in level until an equal or a known related level to that detected from the transmitter is obtained in the measurement receiver. If a fully anechoic chamber is used as test site in order to provide free space conditions there is no need to change the height of the antenna. The measurement will be repeated in horizontal position.

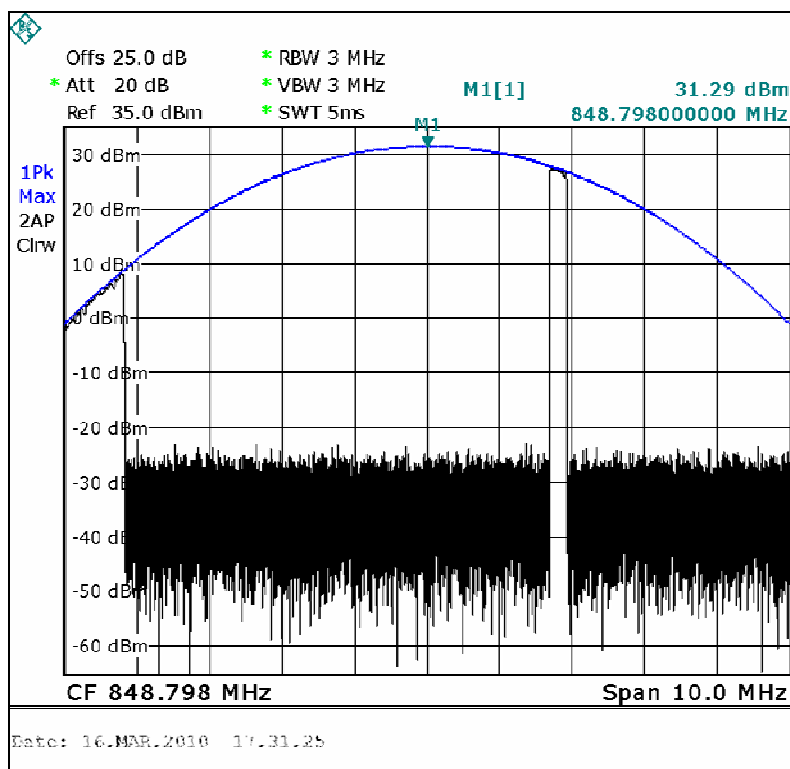
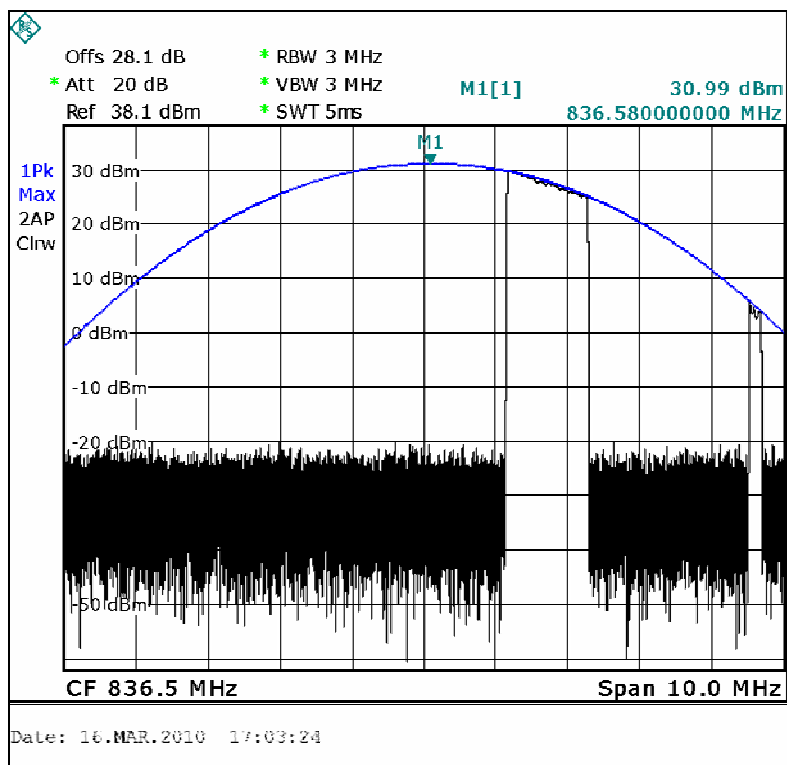
In order to make this kind of measurement more effective and to avoid subjective measurement faults ETS has installed automatic computer controlled measurement procedures. With the above described substitution method a test site is calibrated over the full frequency range which is used in suitable frequency steps. For a certain power level on the substitution antenna the received power over the whole frequency range is documented. All necessary antenna gains, cable losses, filter losses and amplifications of preamplifiers are taken in consideration. The summary of this calibration measurement performs a transducer factor that is related to the considered test site and a certain measurement distance. Differences of the radiated power levels of different test samples are determined by internal attenuation of the measurement receiver. The proper function of such test site will be maintained by short term plausibility checks and periodical re-calibration. Now the test sample will be putted on the table at the defined position and the radiated power will be received and documented by the measurement receiver. On test sites with ground plane the measurement antenna will be lowered and raised to maximum values at significant frequencies. For peak power measurements the sample is turned by the turntable over 360 degree in order to find the direction with the maximum radiation or to document the max reading with the MAXHOLD function during the rotation.

2.2 Test Result

External Antenna

GSM 850		Power Control Level = 5
Channel	Frequency (MHz)	ERP Output Power(dBm)
128	824,12	31.91
188	836,58	30.99
251	848,798	31.29

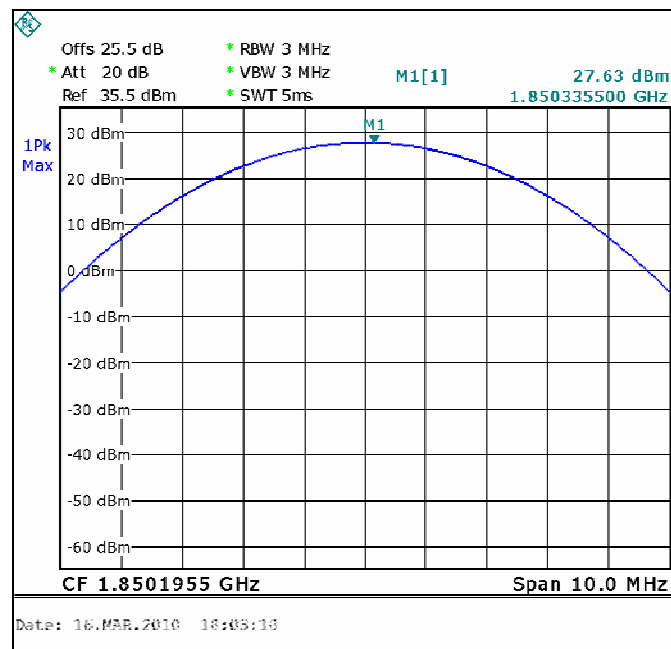




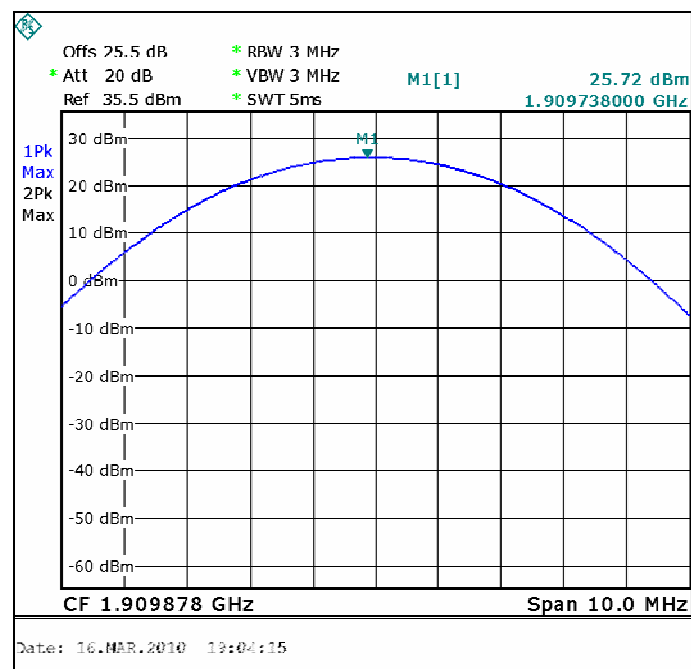
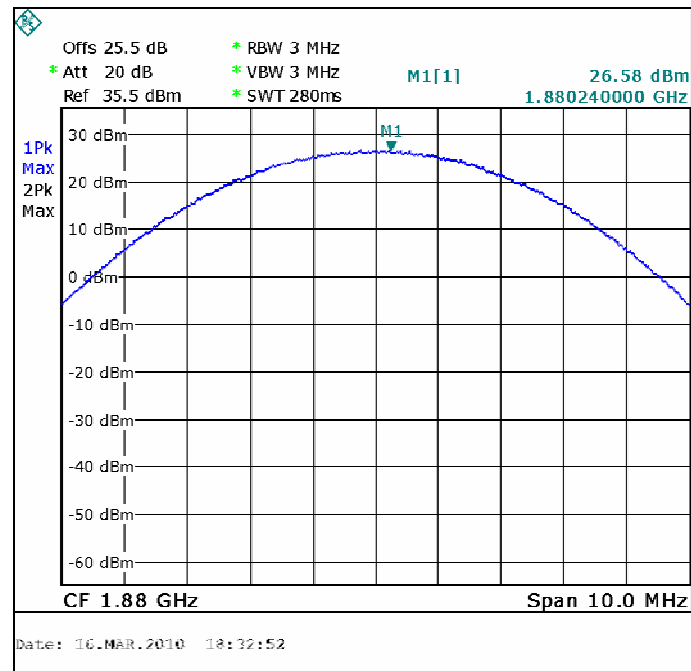
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Internal Antenna

PCS 1900		Power Control Level = 0	
Channel	Frequency (MHz)	EIRP Output Power(dBm)	
512	1850,335	27.63	
661	1880,24	26.58	
810	1909,738	25,72	



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5. LIST OF EQUIPMENT USED

EQUIPMENT	MANUFACTURER	MODEL	SERIAL N.	CAL. DUE
EMI TEST RECEIVER 20HZ 40GHZ	ROHDE & SCHWARZ	ESU40	100111	AUG.2010
ARTIFICIAL MAINS NETWORK	ROHDE & SCHWARZ	ESH 2 - Z5	841887/011	SEPT.2010
ABSORBING CLAMP	ROHDE & SCHWARZ	MDS21	840031/005	JUL.2010
RF SEMI-ANECHOIC CHAMBER (CSSA)	SIEMENS	B83117-D6019-T232	003-005-134/94C	APR.2010
BILOG ANTENNA	CHASE	CBL6111A	1798	JUL.2010
BILOG ANTENNA	CHASE	CBL6111C	2717	JUL.2010
LOG PERIODIC ANTENNA BROAD BAND 1-26 GHZ	ROHDE & SCHWARZ	HL050	350380/007	DEC.2010
NOCH FILTER	WAINWRIGHT	WRCD 1700/2000	32	OCT 2010
NOCH FILTER	WAINWRIGHT	WRCA 800/960	15	OCT 2010
HIGH PASS FILTER	WAINWRIGHT	WHK 1,3/15G	9	OCT 2010
HIGH PASS FILTER	WAINWRIGHT	WHK 2,8/18G	1	OCT 2010
WIRELESS COMMUNICATIONS TEST SET	AGILENT	8960 SERIES 10	E5515C	JUN 2010
LOW NOISE PREAMPLIFIER 18-40 GHZ	BONN ELEKTRONIK	BLMA 1840-1A	087084B	AGO.2010
LOW NOISE PREAMPLIFIER 1-18GHz	BONN ELEKTRONIK	BLMA 0118-M	087084A	AGO.2010

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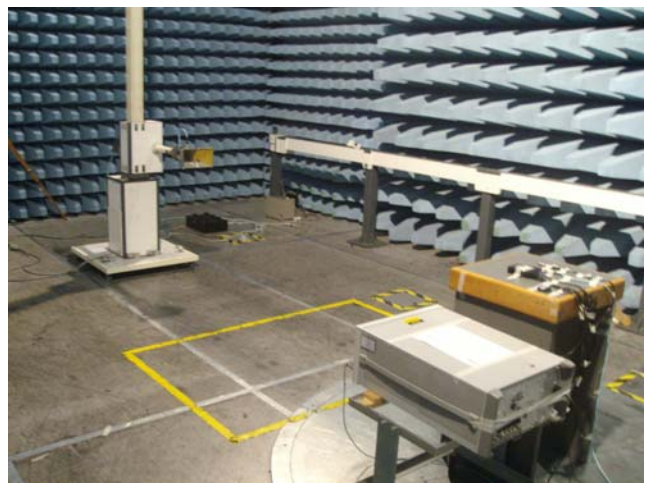
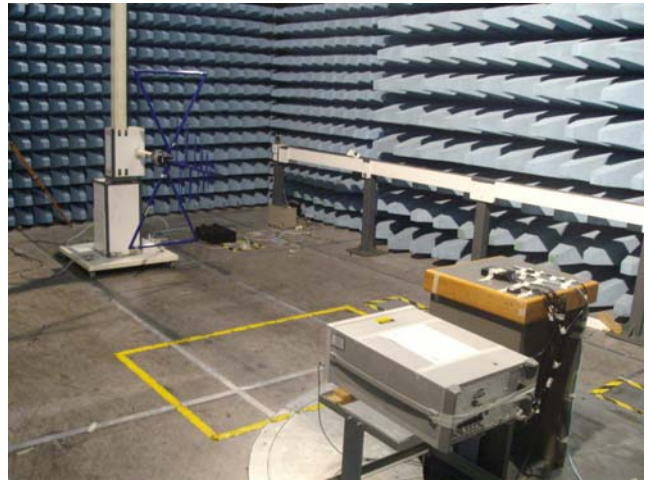
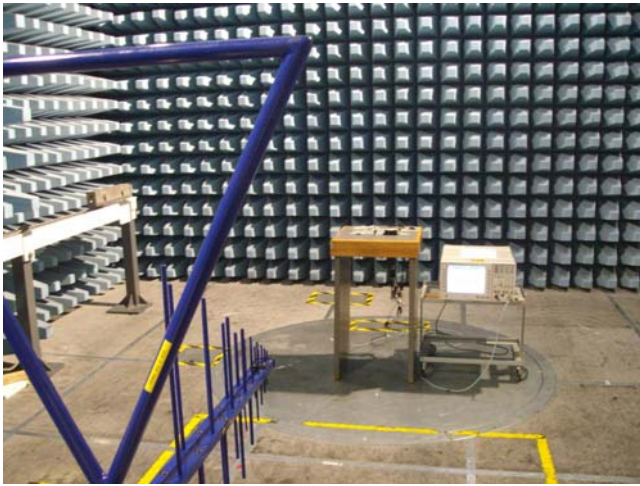
6 .PHOTOGRAPHIC DOCUMENTATION

PHOTO N° 1 –EUT IDENTIFICATION



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PHOTO N° 2 –SETUP FIELD STRENGTH OF SPURIOUS RADIATION GSM 850



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PHOTO N° 3 –SETUP FIELD STRENGTH OF SPURIOUS RADIATION PCS 1900

