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FCC PART 90 & RSS-119 TEST REPORT

FCC Part 90 and RSS-119

Report Reference No.: TRE1203004601

FCC ID.: X24-MOBILE-U

IC.: 10337A-MOBILEU

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Date of issue: May 02, 2012

Testing Laboratory Name: Shenzhen Huatongwei International Inspection Co., Ltd

Address: Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China

Applicant's name: Quanzhou TYT Electronics Co., Ltd.

Address: Bldg.22, Daxiamei Industrial Area,Nan'an,Quanzhou,Fujian 362300,China

Test specification:

Standard: FCC Part 90/FCC Part 2

RSS-119/RSS-Gen/RSS-102

TRF Originator: Shenzhen Huatongwei International Inspection CO., Ltd

Master TRF: Dated 2006-06

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Test item description: Mobile Radio

Trade Mark: 

Model/Type reference: TH-9000UHF

Listed Models: TH-8900UHF/TH-9800UHF/TH-9900UHF

Ratings: DC 13.60 V

Rated Output Power: 45 Watt(46.53 dBm)/25 Watt(43.98 dBm)/10 Watt(40.00 dBm)

Modulation: FM

Channel Separation: 12.5KHz only for FCC&both 12.5KHz and 25KHz only for IC

Frequency Range: From 406.1MHz to 430MHz and 450MHz to 470MHz for IC

From 400MHz to 490MHz for FCC

Result: Positive

TEST REPORT

Test Report No. :	TRE1203004601	May 02, 2012 Date of issue
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Equipment under Test : Mobile Radio

Model /Type : TH-9000UHF

Listed Models : TH-8900UHF/TH-9800UHF/TH-9900UHF

Applicant : **Quanzhou TYT Electronics Co., Ltd.**

Address : Bldg.22, Daxiamei Industrial Area,Nan'an,Quanzhou,Fujian 362300,China

Manufacturer : **Quanzhou TYT Electronics Co., Ltd.**

Address : Bldg.22, Daxiamei Industrial Area,Nan'an,Quanzhou,Fujian 362300,China

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

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1. TEST STANDARDS

The tests were performed according to following standards:

FCC Rules Part 90: PRIVATE LAND MOBILE RADIO SERVICES.

TIA/EIA 603: Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

FCC Rules Part 15 Subpart B: RADIO FREQUENCY DEVICES-Unintentional Radiators

FCC Part 2: FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

RSS-119 Issue 11 June 2011: Radio Transmitters and Receivers Operating in the Land Mobile and Fixed Services in the Frequency Range 27.41-960 MHz

RSS-Gen Issue 3 December 2010: General Requirements and Information for the Certification of Radio Apparatus

2. SUMMARY

2.1. General Remarks

Date of receipt of test sample	:	Apr 02, 2012
Testing commenced on	:	Apr 02, 2012
Testing concluded on	:	May 02, 2012

2.2. Product Description

The **Quanzhou TYT Electronics Co., Ltd.**'s Model:TH-9000UHF/TH-8900UHF/TH-9800UHF/TH-9900UHF or the "EUT" as referred to in this report; more general information as follows:

Name of EUT	Mobile Radio	
Model Number	TH-9000UHF/TH-8900UHF/TH-9800UHF/TH-9900UHF	
Rated Output Power	45 Watt(46.53 dBm)/25 Watt(43.98 dBm)/10 Watt(40.00 dBm)	
Modulation Type	FM for Analog Voice	
Emission Designator	Analog	16K0F3E for 25KHz Channel Separation
		11K50F3E for 12.5KHz Channel Separation
Channel Separation	Analog Voice	12.5KHz&25KHz only for IC
		12.5KHz only for FCC
Antenna Type	External	
Frequency Range	From 406.1MHz to 430MHz and 450MHz to 470MHz for IC	
	From 400MHz to 490MHz for FCC	
Maximum Transmitter Power	Analog/FCC	46.67 W for 12.5 KHz Channel Separation
	Analog/IC	45.71 W for 25 KHz Channel Separation 45.60 W for 12.5 KHz Channel Separation

2.3. Equipment under Test

Power supply system utilised

Power supply voltage	:	<input type="radio"/>	120V / 60 Hz	<input type="radio"/>	115V / 60Hz
		<input type="radio"/>	12 V DC	<input type="radio"/>	24 V DC
		<input checked="" type="radio"/>	Other (specified in blank below)		

DC 13.60V

Test frequency list

Modulation Type	Channel Separation	Test Channel	Test Frequency	Remark
Analog/FM	12.5 KHz	Low	406.5000 MHz	Only for FCC Review
		Middle	450.5000 MHz	
		High	489.5000 MHz	
	25 KHz	Low	406.5000 MHz	Only for IC Review (Not for FCC Review)
		Middle	429.5000 MHz	
		Middle	450.5000 MHz	
		High	469.0000 MHz	
	12.5 KHz	Low	406.5000 MHz	
		Middle	429.5000 MHz	
		Middle	450.5000 MHz	
		High	469.0000 MHz	

2.4. Short description of the Equipment under Test (EUT)

400-490MHz U frequency band Mobile Radio (TH-9000UHF/TH-8900UHF/TH-9800UHF/TH-9900UHF).

For more details, refer to the user's manual of the EUT.

Serial number: Prototype

2.5. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.6. EUT operation mode

The EUT has been tested under typical operating condition and The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

2.7. EUT configuration

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

- supplied by the manufacturer

- supplied by the lab

<input type="radio"/>	Power Cable	Length (m) :	3
		Shield :	Unshield
		Detachable :	Undetachable
<input type="radio"/>	Multimeter	Manufacturer :	/
		Model No. :	/

2.8. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **X24-MOBILE-U** and IC: **10337A-MOBILEU** filing to comply with FCC Part 90&FCC Part 2&FCC Part 15B Rules and RSS-119&RSS-Gen.

2.9. Modifications

No modifications were implemented to meet testing criteria.

2.10. Note

1. The EUT is a 400-490 MHz frequency band Mobile Radio (TH-9000UHF/TH-8900UHF/TH-9800UHF/TH-9900UHF),The functions of the EUT listed as below:

	Test Standards	Reference Report	Remark
Radio	FCC Part 90&RSS-119	TRE1203004601	For both FCC and IC Review
Health	Oet 65&RSS-102	TRE1203004602	
Health	Oet 65	TRE1203004603	Only for FCC Review

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 Jul. 01, 2009, valid time is until Jun. 30, 2012.

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, 2009. Valid time is until Dec. 19, 2012.

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.

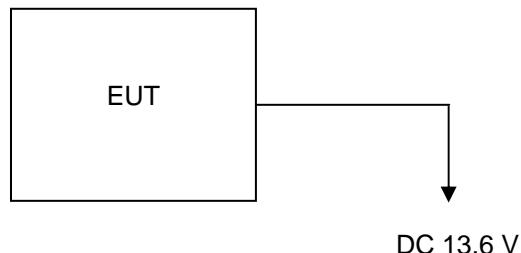
3.3. Environmental conditions

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

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	950-1050mbar

3.4. Configuration of Tested System

Fig. 2-1 Configuration of Tested System



3.5. Description of Tested Modes

The EUT (Mobile Radio) has been tested under normal operating condition. Three channels (the high, the middle and the low) are chosen for testing at each channel separation (12.5 KHz/ 25KHz).

3.6. 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 CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ 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:

Test Items	Measurement Uncertainty	Notes
Frequency stability	150 Hz	(1)
Transmitter power conducted	0.30 dB	(1)
Transmitter power Radiated	2.20 dB	(1)
Conducted spurious emission 9KHz-12.75 GHz	1.60 dB	(1)
Radiated spurious emission 9KHz-12.75 GHz	2.20 dB	(1)
Conducted Emission 9KHz-30MHz	3.39 dB	(1)
Radiated Emission 30~1000MHz	4.24 dB	(1)
Radiated Emissio 1~18GHz	5.16 dB	(1)
Radiated Emissio 18-40GHz	5.54 dB	(1)
Occupied Bandwidth	-----	(1)
Emission Mask	-----	(1)
Modulation Characteristic	-----	(1)
Transmitter Frequency Behavior	-----	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3.7. Test Description

FCC Rules	RSS-119	Description of Test	Test Result
§ 15.107	RSS-Gen	Conducted Emission	Complies
§ 15.109	RSS-Gen	Receiver Radiated Spurious Emssion	Complies
§ 15.109	RSS-Gen	Receiver Conducted Spurious Emssion	Complies
§ 90.205	§ 5.4	Maximum Transmitter Power	Complies
§ 90.207	§ 5.13	Modulation Characteristic	Complies
§ 90.209	§ 5.5	Occupied Bandwidth	Complies
§ 90.210	§ 5.8	Emission Mask	Complies
§ 90.213	§ 5.3	Frequency Stability	Complies
§ 90.214	§ 5.9	Transmitter Frequency Behavior	Complies
§ 90.210	§ 5.8	Transmitter Radiated Spurious Emssion	Complies
§ 90.210	§ 5.8	Spurious Emssion On Antenna Port	Complies
§ 2.1091	RSS-102	RF Exposure Evaluation	Complies

3.8. Equipments Used during the Test

DC Power Conducted Emission				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	Rohde&Schwarz	ESCS 30	100038	10/23/2012
Artificial Mains	Rohde&Schwarz	ESH3-Z6	100210	10/23/2012
Artificial Mains	Rohde&Schwarz	ESH3-Z6	100211	10/23/2012
Pulse Limiter	Rohde&Schwarz	ESHSZ2	100044	10/23/2012
EMI Test Software	Rohde&Schwarz	ES-K1 V1.71	N/A	10/23/2012
RF COMMUNICATION TEST SET	HP	8920A	3813A10206	10/23/2012

Modulation Characteristic				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
RF COMMUNICATION TEST SET	HP	8920A	3813A10206	23/10/2012

Transmitter Radiated Spurious Emssion & Receiver Radiated Spurious Emssion				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Ultra-Broadband Antenna	Rohde&Schwarz	HL562	100015	23/10/2012
EMI Test Receiver	Rohde&Schwarz	ESI 26	100009	23/10/2012
RF Test Panel	Rohde&Schwarz	TS / RSP	335015/ 0017	N/A
HORN ANTENNA	Rohde&Schwarz	HF906	100039	23/10/2012
Turntable	ETS	2088	2149	N/A
Antenna Mast	ETS	2075	2346	N/A
EMI Test Software	Rohde&Schwarz	ES-K1 V1.71	N/A	23/10/2012
RF COMMUNICATION TEST SET	HP	8920A	3813A10206	23/10/2012

Frequency Stability				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Climate Chamber	ESPEC	EL-10KA	05107008	10/23/2012
Receiver	Rohde&Schwarz	ESI 26	100009	10/23/2012

Maximum Transmitter Power & Spurious Emssion On Antenna Port				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Receiver	Rohde&Schwarz	ESI 26	100009	10/23/2012
Attenuator	R&S	ESH3-22	100449	10/23/2012
RF COMMUNICATION TEST SET	HP	8920A	3813A10206	10/23/2012
High-Pass Filter	Anritsu	MP526B	6220875256	10/23/2012
High-Pass Filter	Anritsu	MP526D	6220878392	10/23/2012
Spectrum Analyzer	Agilent	E4407B	MY44210775	23/10/2012
Spectrum Analyzer	Rohde&Schwarz	FSP40	1164.4391.40	23/10/2012

Transient Frequency Behavior				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Storage Oscilloscope	Tektronix	TDS3054B	B033027	10/23/2012
RF COMMUNICATION TEST SET	HP	8920A	3813A10206	10/23/2012

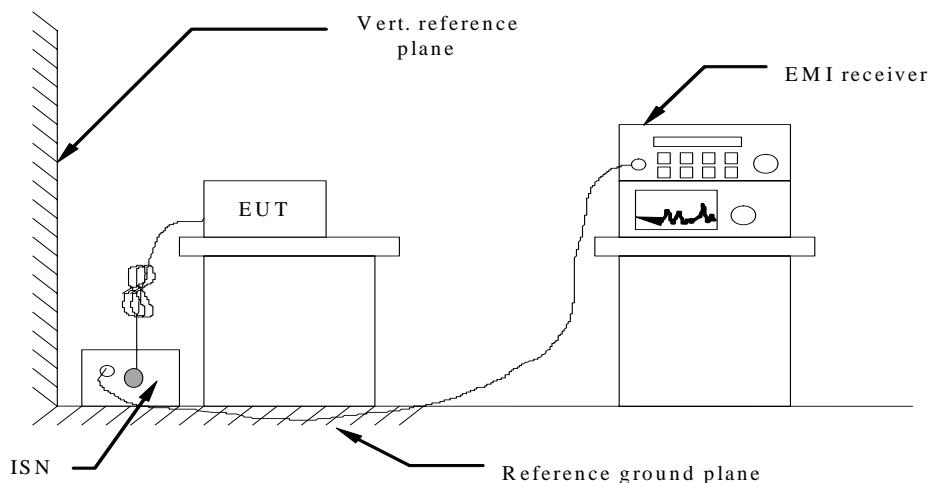
4. TEST CONDITIONS AND RESULTS

4.1. Conducted Emissions

TEST APPLICABLE

The EUT was tested according to ANSI C63.4 - 2009. The frequency spectrum from 0.15 MHz to 30 MHz was investigated. The LISN used was 50 ohm / 50 u Henry as specified by section 5.1 of ANSI C63.4 - 2009. Cables and peripherals were moved to find the maximum emission levels for each frequency.

TEST CONFIGURATION



TEST PROCEDURE

- 1 The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system; a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4-2009.
- 2 Support equipment, if needed, was placed as per ANSI C63.4-2009.
- 3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4-2009.
- 4 If a EUT received DC power from the adapter, the adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
- 5 All support equipments received AC power from a second LISN, if any.
- 6 The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7 Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
- 8 During the above scans, the emissions were maximized by cable manipulation.

Conducted Power Line Emission Limit

For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following :

Frequency (MHz)	Maximum RF Line Voltage (dB μ V)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15 - 0.50	79	66	66-56*	56-46*
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

* Decreasing linearly with the logarithm of the frequency

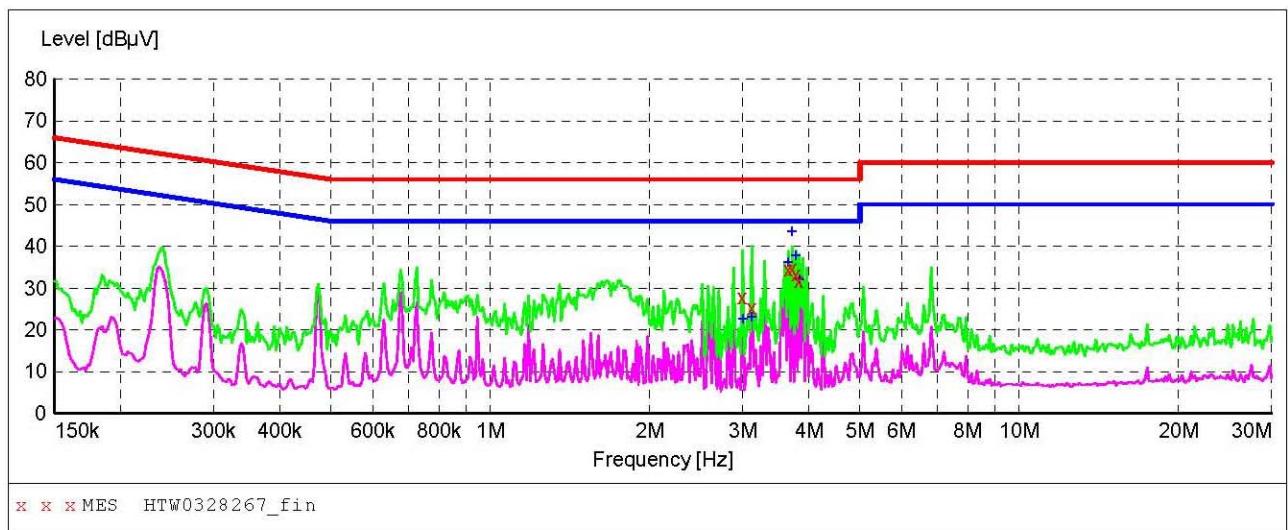
For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

TEST RESULTS

Only for IC Review (Not For FCC Review)

For FM Modulation @ 25 KHz TX Mode

SCAN TABLE: "Voltage (9K-30M) FIN"
Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "HTW0328267_fin"

3/28/2012 3:49PM

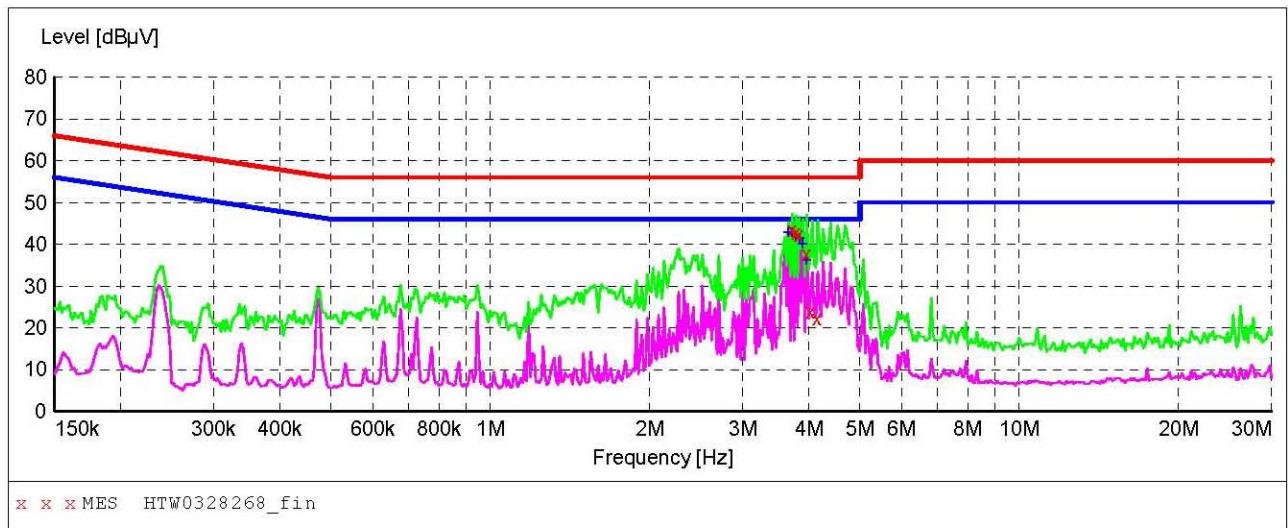
Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
3.000897	27.80	10.2	56	28.2	QP	+	GND
3.122865	25.30	10.2	56	30.7	QP	+	GND
3.662387	34.60	10.2	56	21.4	QP	+	GND
3.721213	34.70	10.2	56	21.3	QP	+	GND
3.780998	33.30	10.2	56	22.7	QP	+	GND
3.841730	31.70	10.2	56	24.3	QP	+	GND

MEASUREMENT RESULT: "HTW0328267_fin2"

3/28/2012 3:49PM

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
3.000897	22.60	10.2	46	23.4	AV	+	GND
3.122865	23.10	10.2	46	22.9	AV	+	GND
3.662387	36.20	10.2	46	9.8	AV	+	GND
3.721213	43.50	10.2	46	2.5	AV	+	GND
3.780998	37.80	10.2	46	8.2	AV	+	GND
3.841730	32.00	10.2	46	14.0	AV	+	GND

SCAN TABLE: "Voltage (9K-30M) FIN"
 Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "HTW0328268_fin"

3/28/2012 3:56PM

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
3.721213	43.40	10.2	56	12.6	QP	???	GND
3.780998	42.70	10.2	56	13.3	QP	???	GND
3.841730	42.20	10.2	56	13.8	QP	???	GND
3.966157	37.60	10.2	56	18.4	QP	???	GND
4.029860	23.90	10.2	56	32.1	QP	???	GND
4.160379	22.30	10.2	56	33.7	QP	???	GND

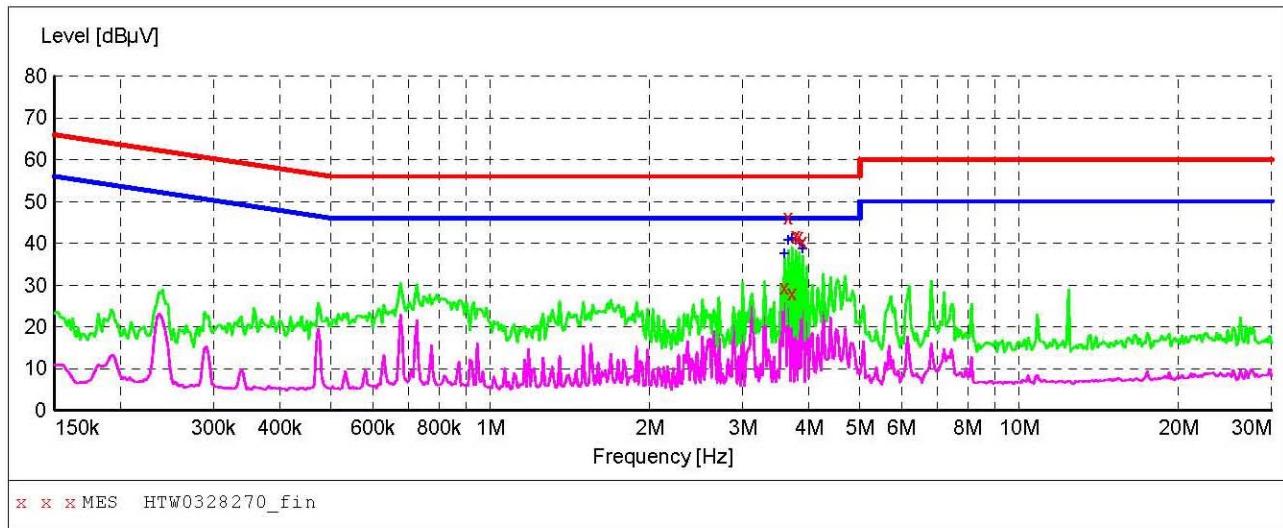
MEASUREMENT RESULT: "HTW0328268_fin2"

3/28/2012 3:56PM

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
3.662387	42.80	10.2	46	3.2	AV	???	GND
3.721213	42.70	10.2	46	3.3	AV	???	GND
3.780998	41.90	10.2	46	4.1	AV	???	GND
3.841730	41.40	10.2	46	4.6	AV	???	GND
3.903450	40.00	10.2	46	6.0	AV	???	GND
3.966157	36.20	10.2	46	9.8	AV	???	GND

For both FCC and IC Review**For FM Modulation @ 12.5 KHz TX Mode**

SCAN TABLE: "Voltage (9K-30M) FIN"
Short Description: 150K-30M Voltage

**MEASUREMENT RESULT: "HTW0328270_fin"**

3/28/2012 4:04PM

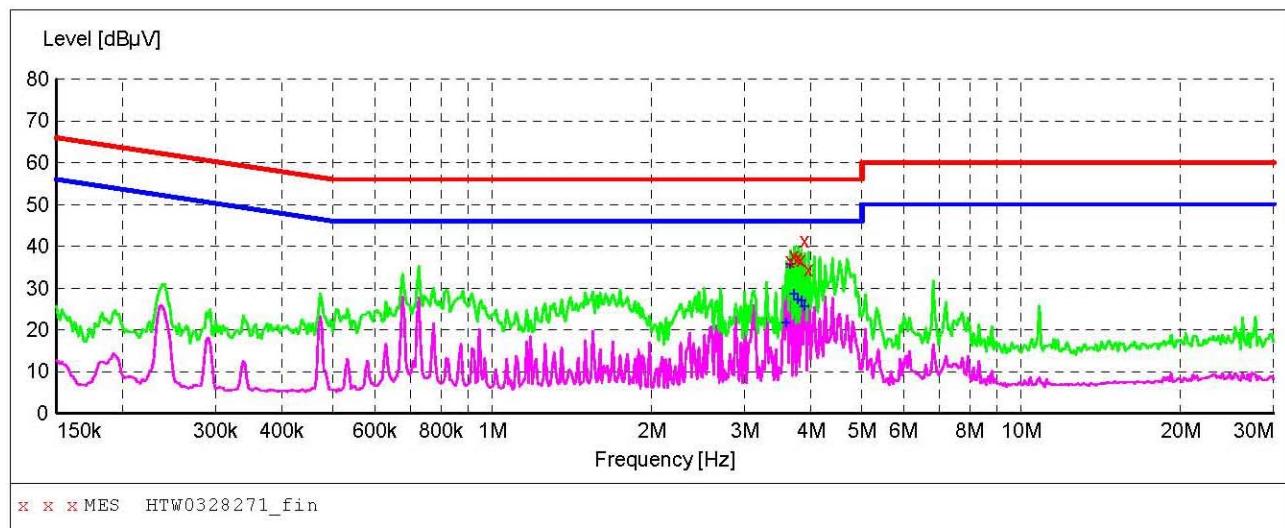
Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
3.604487	29.40	10.2	56	26.6	QP	+	GND
3.662387	46.10	10.2	56	9.9	QP	+	GND
3.721213	28.10	10.2	56	27.9	QP	+	GND
3.780998	41.90	10.2	56	14.1	QP	+	GND
3.841730	41.60	10.2	56	14.4	QP	+	GND
3.903450	40.50	10.2	56	15.5	QP	+	GND

MEASUREMENT RESULT: "HTW0328270_fin2"

3/28/2012 4:04PM

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
3.604487	37.50	10.2	46	8.5	AV	+	GND
3.662387	40.60	10.2	46	5.4	AV	+	GND
3.721213	41.20	10.2	46	4.8	AV	+	GND
3.780998	40.70	10.2	46	5.3	AV	+	GND
3.841730	40.50	10.2	46	5.5	AV	+	GND
3.903450	38.50	10.2	46	7.5	AV	+	GND

SCAN TABLE: "Voltage (9K-30M) FIN"
 Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "HTW0328271_fin"

3/28/2012 4:11PM

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
3.662387	36.60	10.2	56	19.4	QP	-	GND
3.721213	37.60	10.2	56	18.4	QP	-	GND
3.780998	37.30	10.2	56	18.7	QP	-	GND
3.841730	36.90	10.2	56	19.1	QP	-	GND
3.903450	41.50	10.2	56	14.5	QP	-	GND
3.966157	34.50	10.2	56	21.5	QP	-	GND

MEASUREMENT RESULT: "HTW0328271_fin2"

3/28/2012 4:11PM

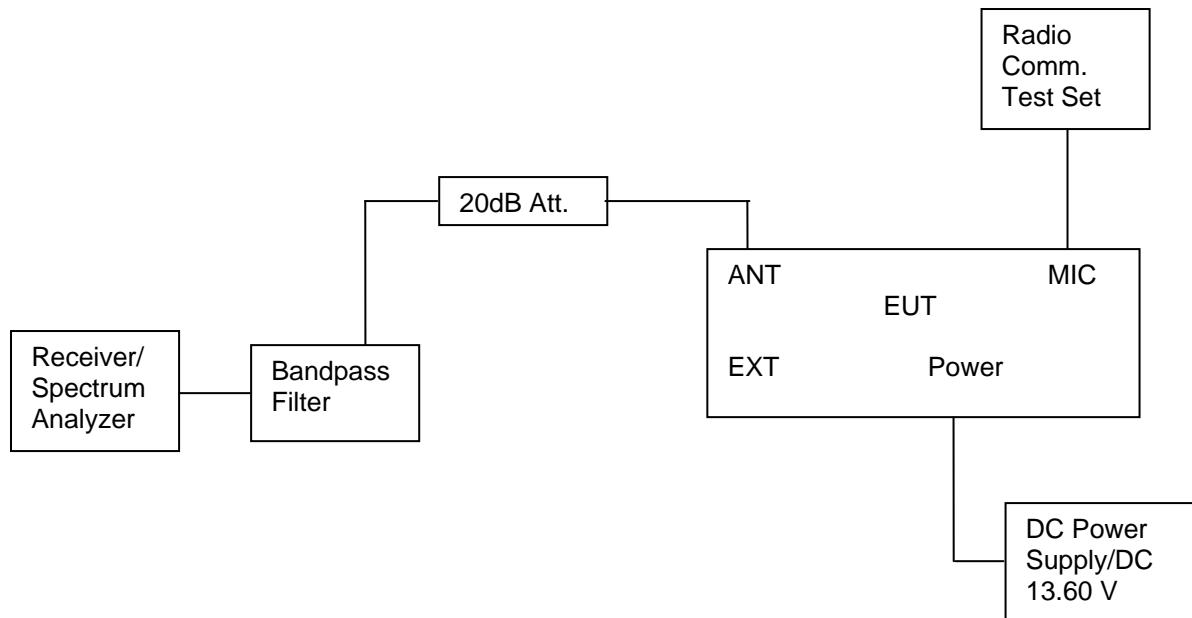
Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
3.604487	21.50	10.2	46	24.5	AV	-	GND
3.662387	35.70	10.2	46	10.3	AV	-	GND
3.721213	28.50	10.2	46	17.5	AV	-	GND
3.780998	27.20	10.2	46	18.8	AV	-	GND
3.841730	26.80	10.2	46	19.2	AV	-	GND
3.903450	25.50	10.2	46	20.5	AV	-	GND

4.2. Occupied Bandwidth & Emission Mask

TEST APPLICABLE

- (a). Occupied Bandwidth: The EUT was connected to the audio signal generator and the spectrum analyzer via the main RF connector, and through an appropriate attenuator. The EUT was controlled to transmit its maximum power. Then the bandwidth of 99% power can be measured by the spectrum analyzer.
- (b). Emission Mask B: For transmitters that are equipped with an audio low-pass filter pursuant to §90.211(a) and RSS-119 Section 5.8, the power of any emission must be below the unmodulated carrier power (P) as follows:
 - (1) On any frequency removed from the assigned frequency by more than 50 percent, but not more than 100 percent of the authorized bandwidth: At least 25 dB.
 - (2) On any frequency removed from the assigned frequency by more than 100 percent, but not more than 250 percent of the authorized bandwidth: At least 35 dB.
 - (3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least $43 + 10 \log (P)$ dB.
- (c). Emission Mask D, 12.5 kHz channel bandwidth equipment: For transmitters designed to operate with a 12.5 kHz channel bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:
 - (1) On any frequency from the center of the authorized bandwidth f_0 to 5.625 kHz removed from f_0 : Zero dB.
 - (2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 5.625 kHz but no more than 12.5 kHz: At least $7.27(f_d - 2.88 \text{ kHz})$ dB.
 - (3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 12.5 kHz: At least $50 + 10 \log (P)$ dB or 70 dB, whichever is the lesser attenuation.

TEST CONFIGURATION



TEST PROCEDURE

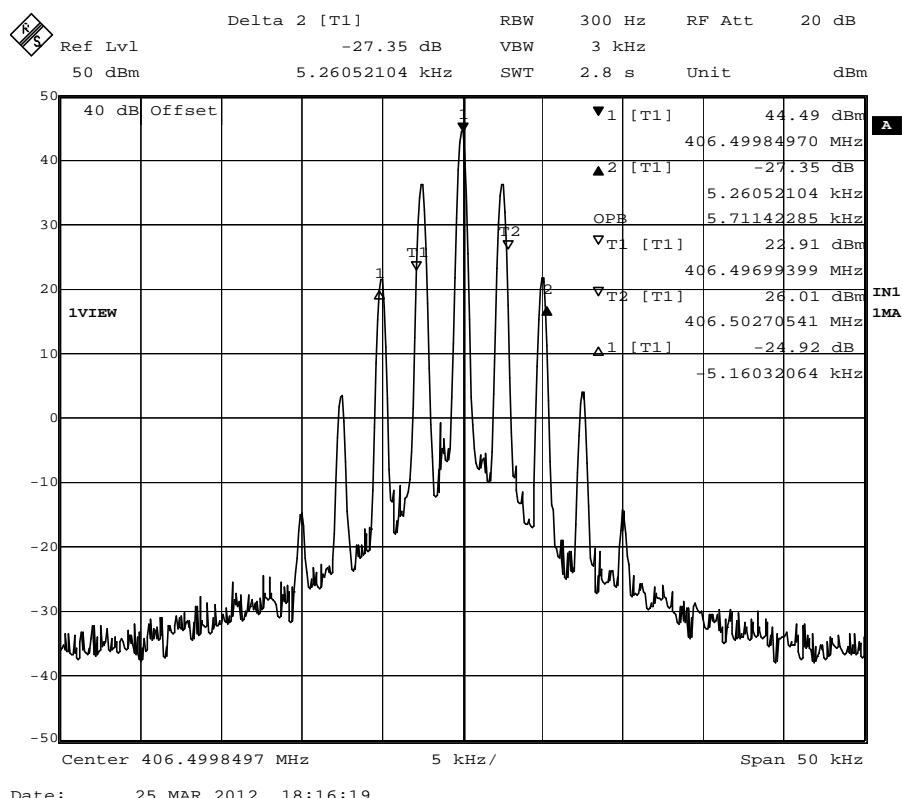
- 1 The EUT was placed on a turn table which is 0.8m above ground plane.
- 2 The EUT was modulated by 2.5 KHz Sine wave audio signal, The level of the audio signal employed is 16 dB greater than that necessary to produce 50% of rated system deviation. Rated system deviation is 2.5 kHz (12.5 kHz channel spacing) and 5 kHz (25 kHz channel spacing).
- 3 Set EUT as normal operation.
- 4 Set SPA Center Frequency = fundamental frequency, RBW=300Hz, VBW= 3 KHz, span =50 KHz.
- 5 Set SPA Max hold. Mark peak, Set 99% Occupied Bandwidth and 26dB Occupied Bandwidth.

TEST RESULTS**4.2.1 Occupied Bandwidth**

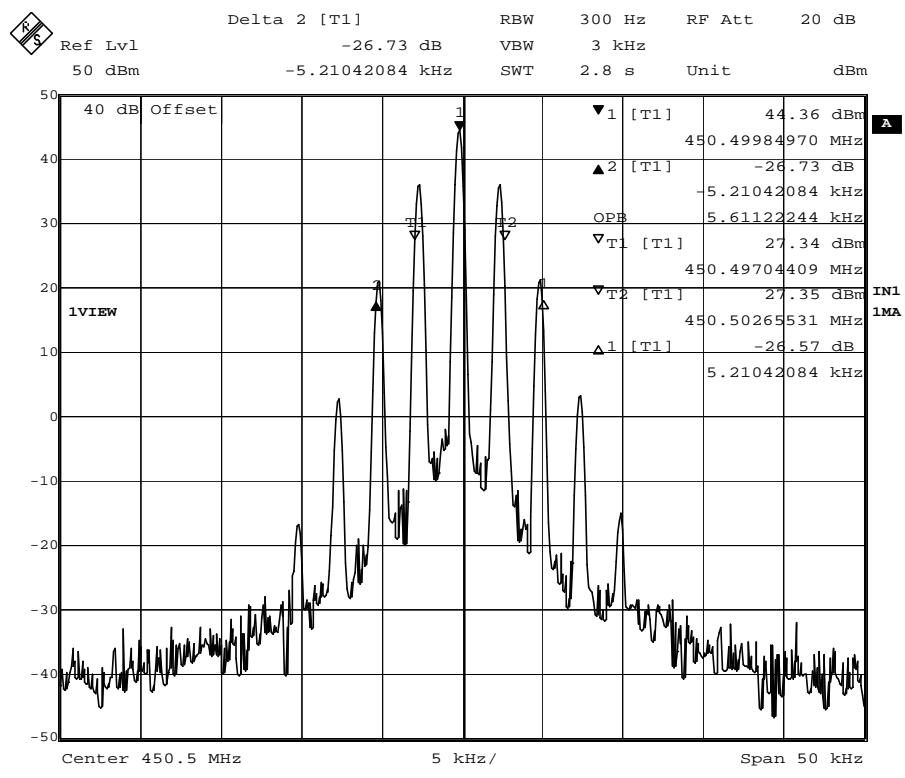
Modulation Type	Channel Separation	Test Channel	Test Frequency (MHz)	Occupied Bandwidth (KHz)		Remark		
				99%	26dB			
FM/Analog	12.5KHz	Low	406.5000	5.71	10.42	Only for FCC Review		
		Middle	450.5000	5.61	10.42			
		High	489.5000	5.61	10.42			
	25KHz	Low	406.5000	10.52	15.52	Only for IC Review (Not for FCC Review)		
		Middle	429.5000	10.42	15.43			
		Middle	450.5000	10.42	15.43			
		High	469.0000	10.42	15.43			
	12.5KHz	Low	406.5000	5.71	10.42			
		Middle	429.5000	5.61	10.42			
		Middle	450.5000	5.61	10.42			
		High	469.0000	5.61	10.42			
Limit		20kHz for 25KHz Channel Separation(Only for IC, Not for FCC Review)						
		11.25KHz for 12.5KHz Channel Separation						
Test Results		Compliance						

Plots of 99% and 26dB Bandwidth Measurement**Only For FCC Review**

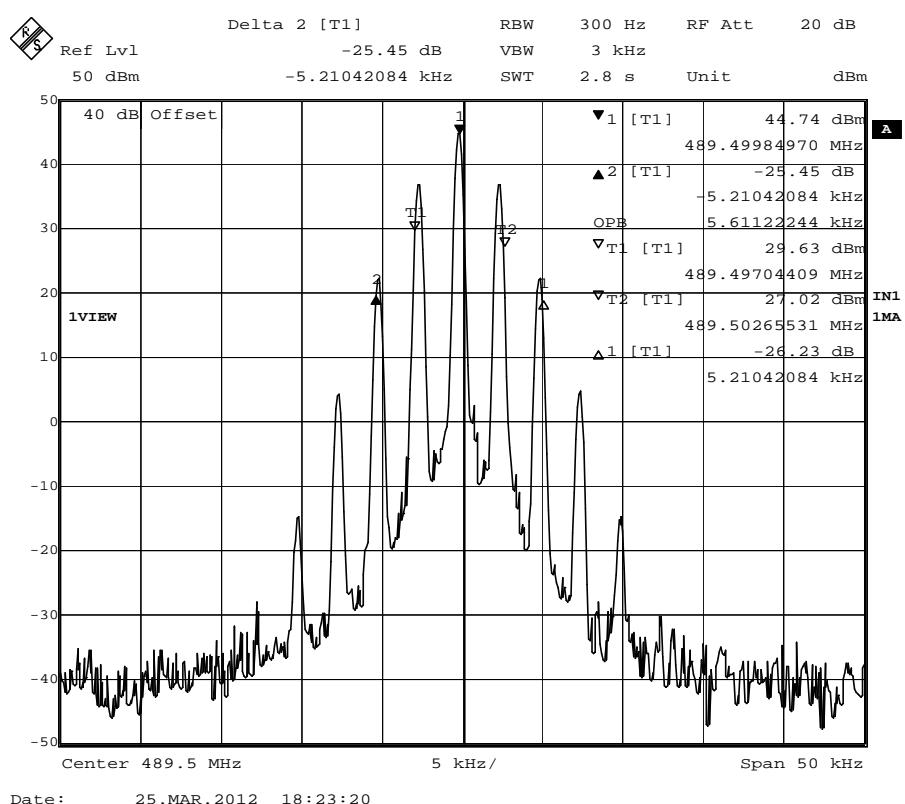
Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	12.5 KHz	406.5000	5.71	10.42	11.25	Compliance



Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	12.5 KHz	450.5000	5.61	10.42	11.25	Compliance

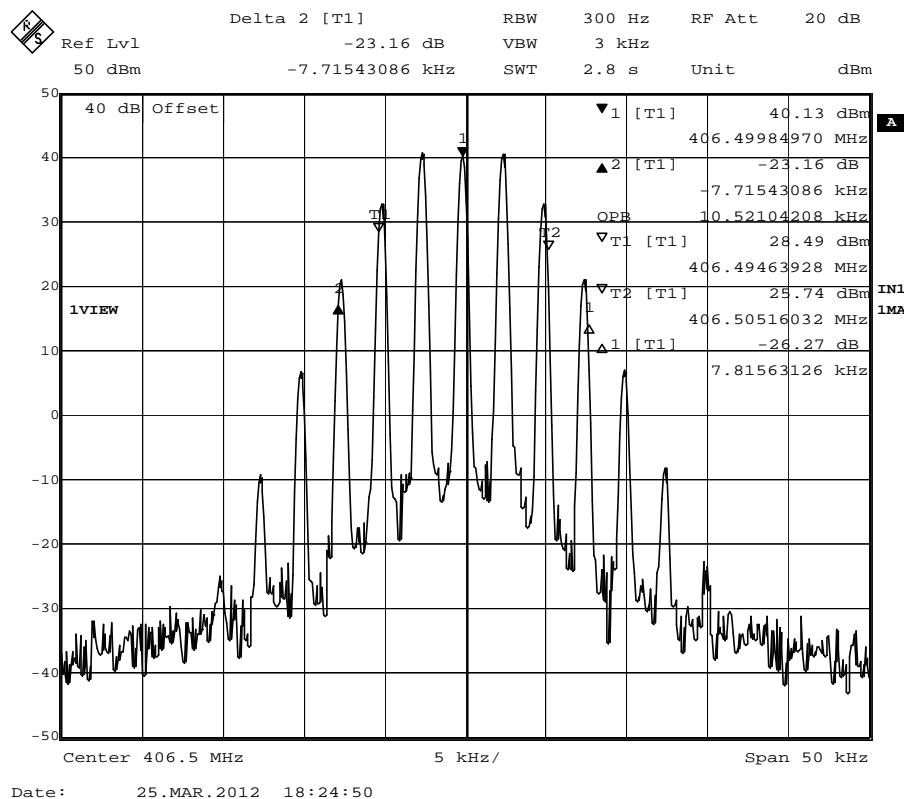


Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	12.5 KHz	489.5000	5.61	10.42	11.25	Compliance

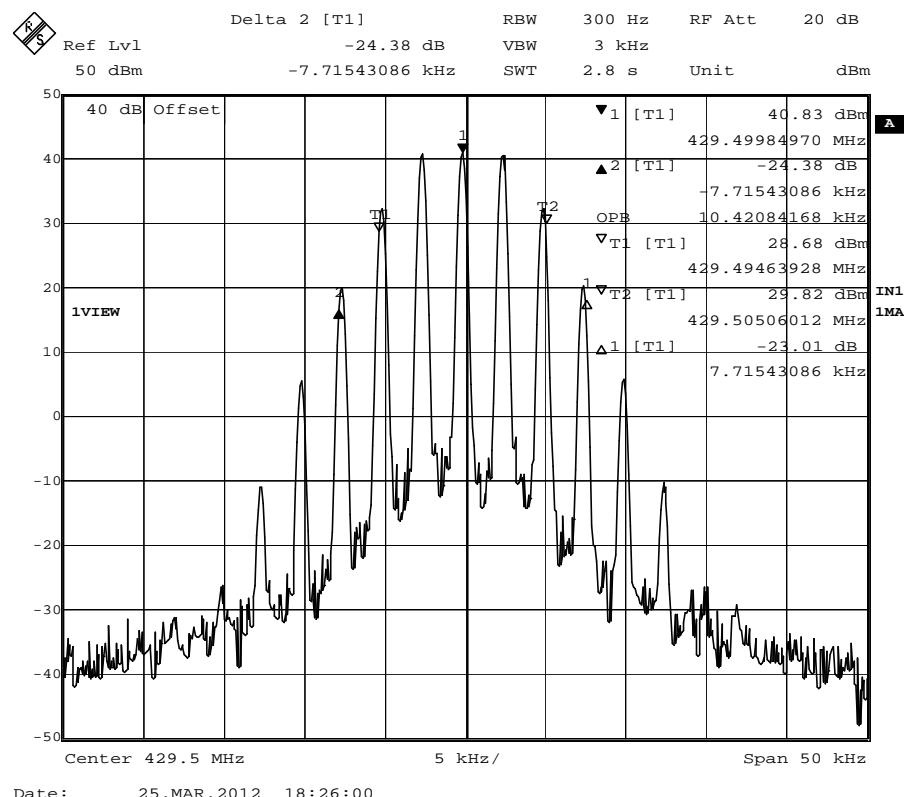


Only For IC Review (Not For FCC Review)

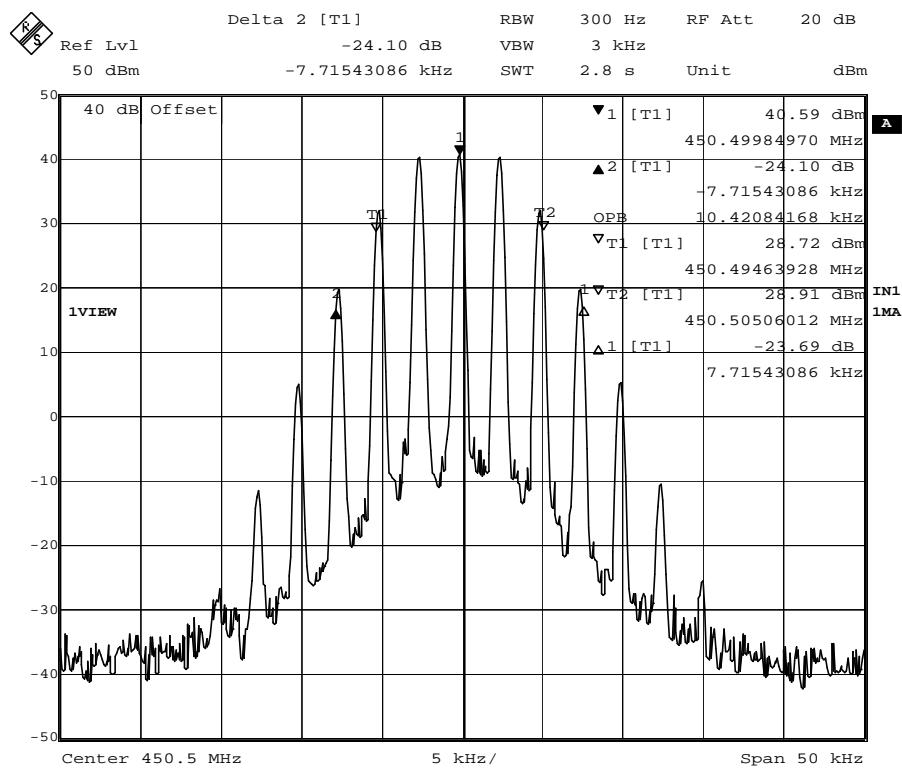
Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	IC Limit (KHz)	Results
FM	25 KHz	406.5000	10.52	15.52	20	Compliance



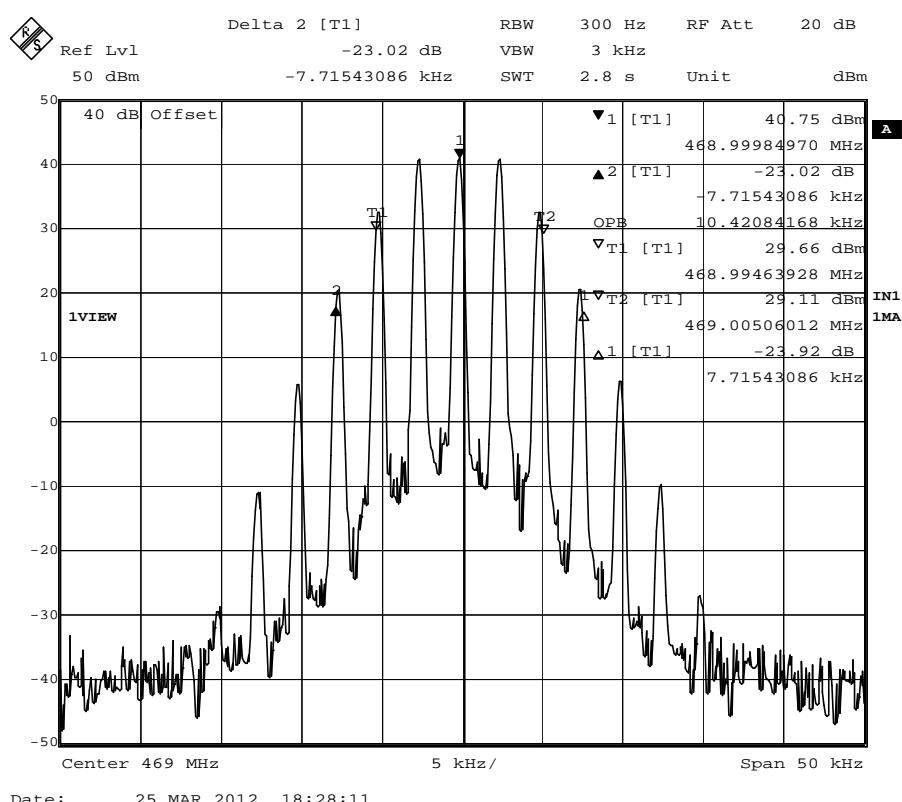
Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	IC Limit (KHz)	Results
FM	25 KHz	429.5000	10.42	15.43	20	Compliance



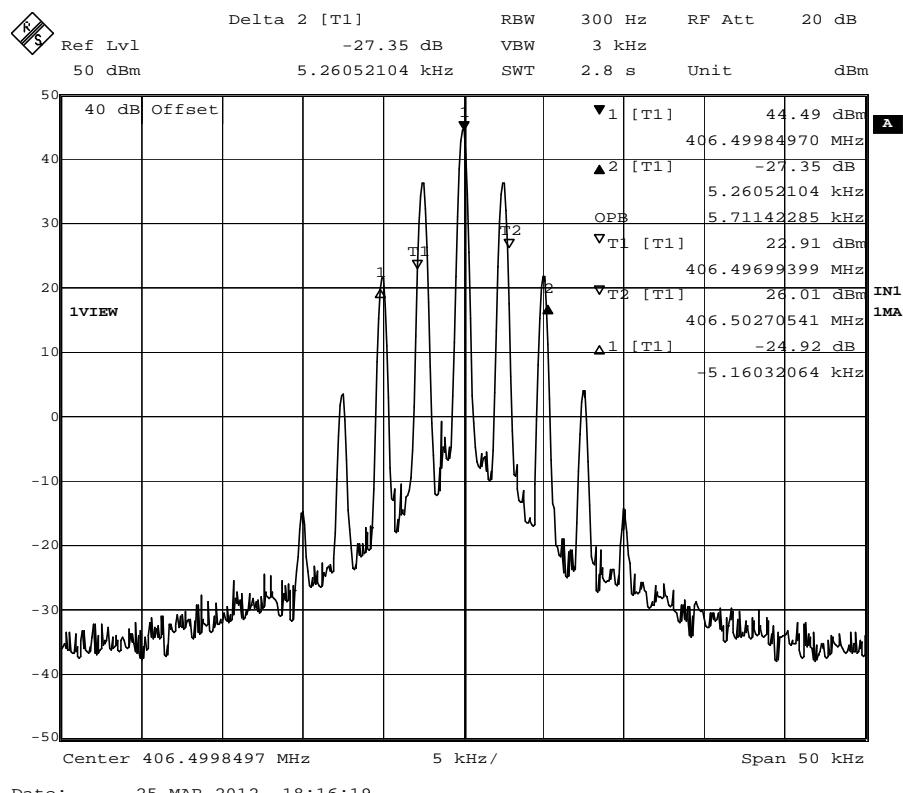
Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	IC Limit (KHz)	Results
FM	25 KHz	450.5000	10.42	15.43	20	Compliance



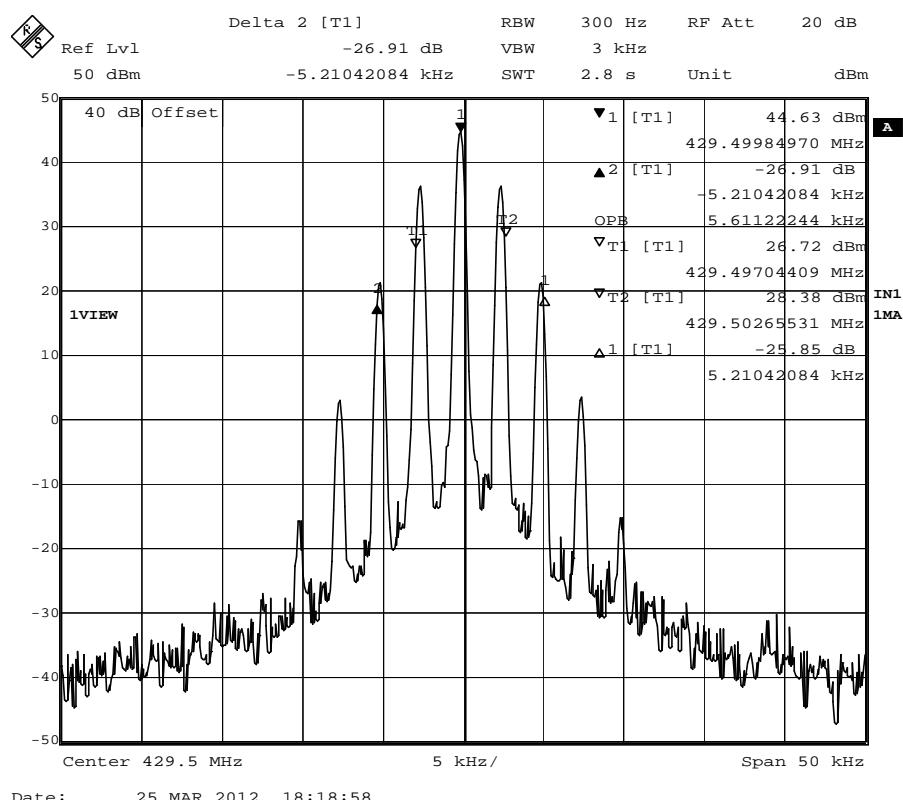
Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	IC Limit (KHz)	Results
FM	25 KHz	469.5000	10.42	15.43	20	Compliance



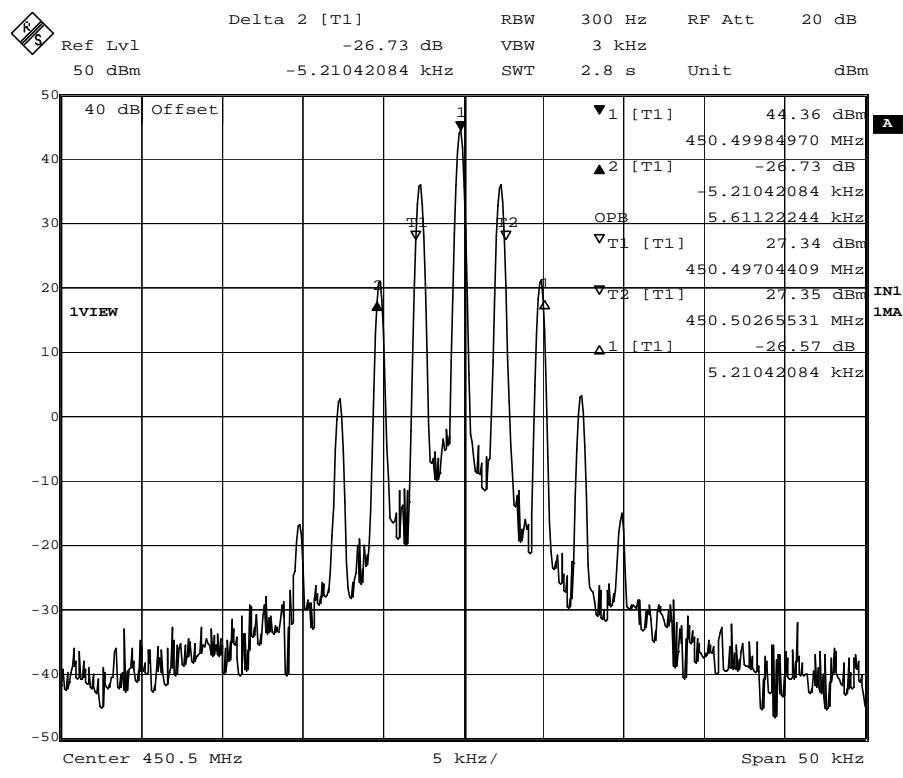
Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	IC Limit (KHz)	Results
FM	12.5 KHz	406.5000	5.71	10.42	11.25	Compliance



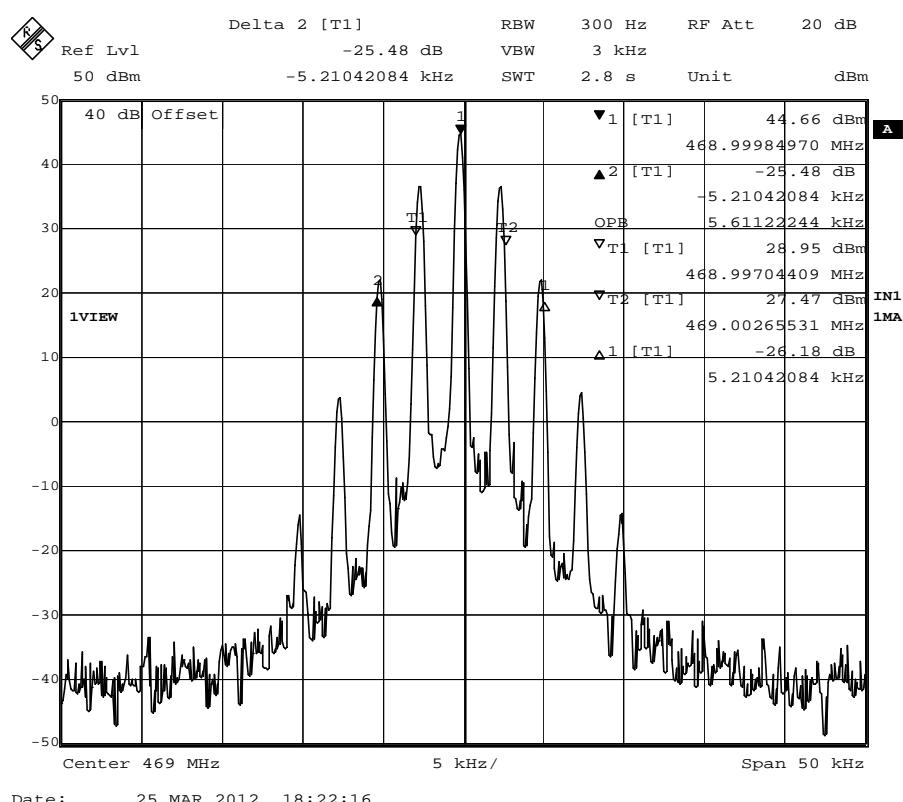
Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	IC Limit (KHz)	Results
FM	12.5 KHz	429.5000	5.61	10.42	11.25	Compliance



Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	12.5 KHz	450.5000	5.61	10.42	11.25	Compliance



Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	IC Limit (KHz)	Results
FM	12.5 KHz	469.5000	5.61	10.42	11.25	Compliance



4.2.2 Emission Mask

Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Applicable Mask	RBW (Hz)	Remark
FM/Analog	12.5KHz	Low	406.5000	D	100	Only for FCC Review
		Middle	450.5000	D	100	
		High	489.5000	D	100	
	25KHz	Low	406.5000	B	300	Only for IC Review (Not For FCC Review)
		Middle	429.5000	B	300	
		Middle	450.5000	B	300	
		High	469.0000	B	300	
	12.5KHz	Low	406.5000	D	100	
		Middle	429.5000	D	100	
		Middle	450.5000	D	100	
		High	469.0000	D	100	
Test Results		Compliance				

Plots of Emission Mask Measurement

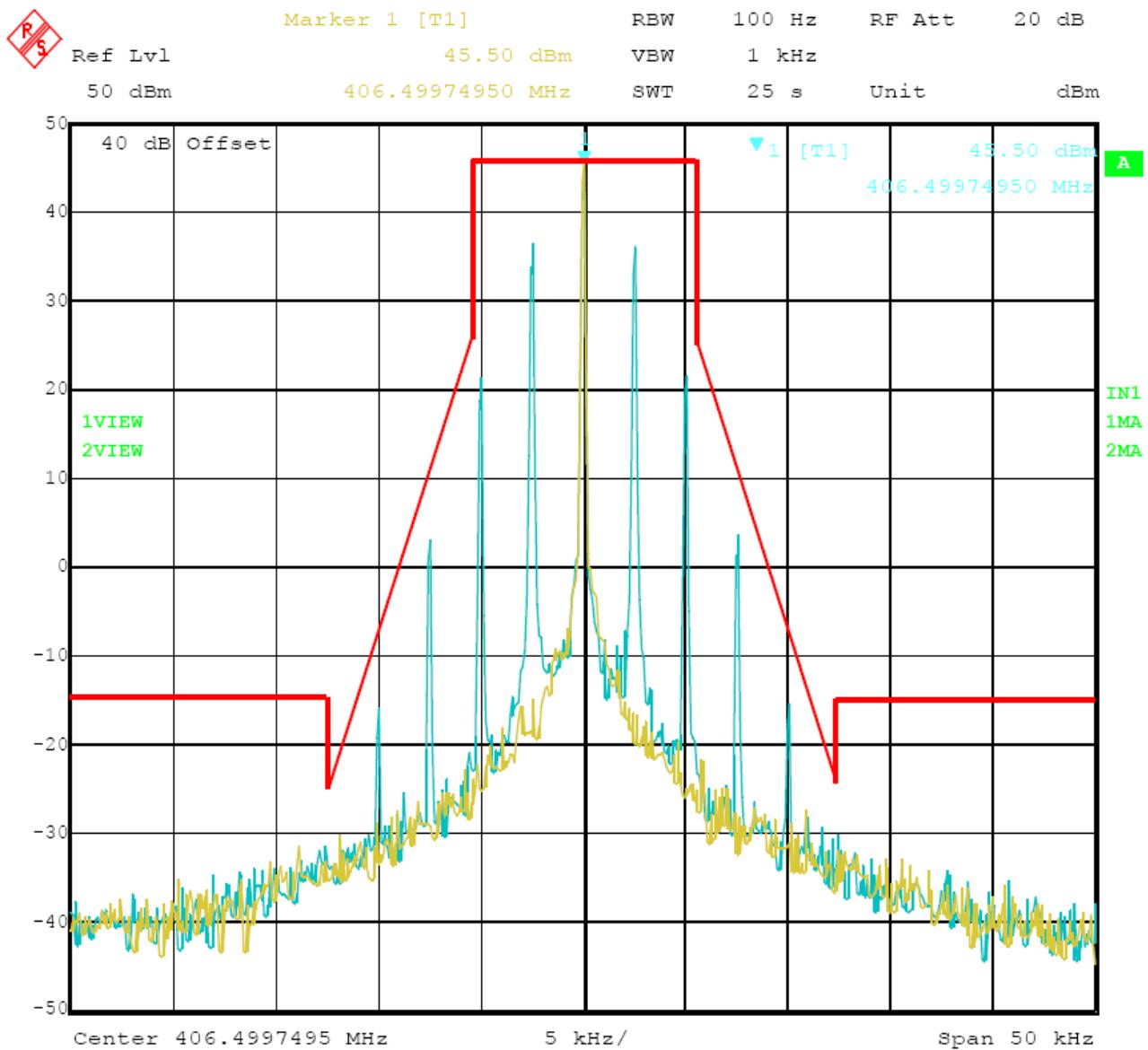
Referred as the attached plot hereinafter

Note: The yellow curve represents unmodulated signal.

The green curve represents modulated signal.

Only For FCC Review

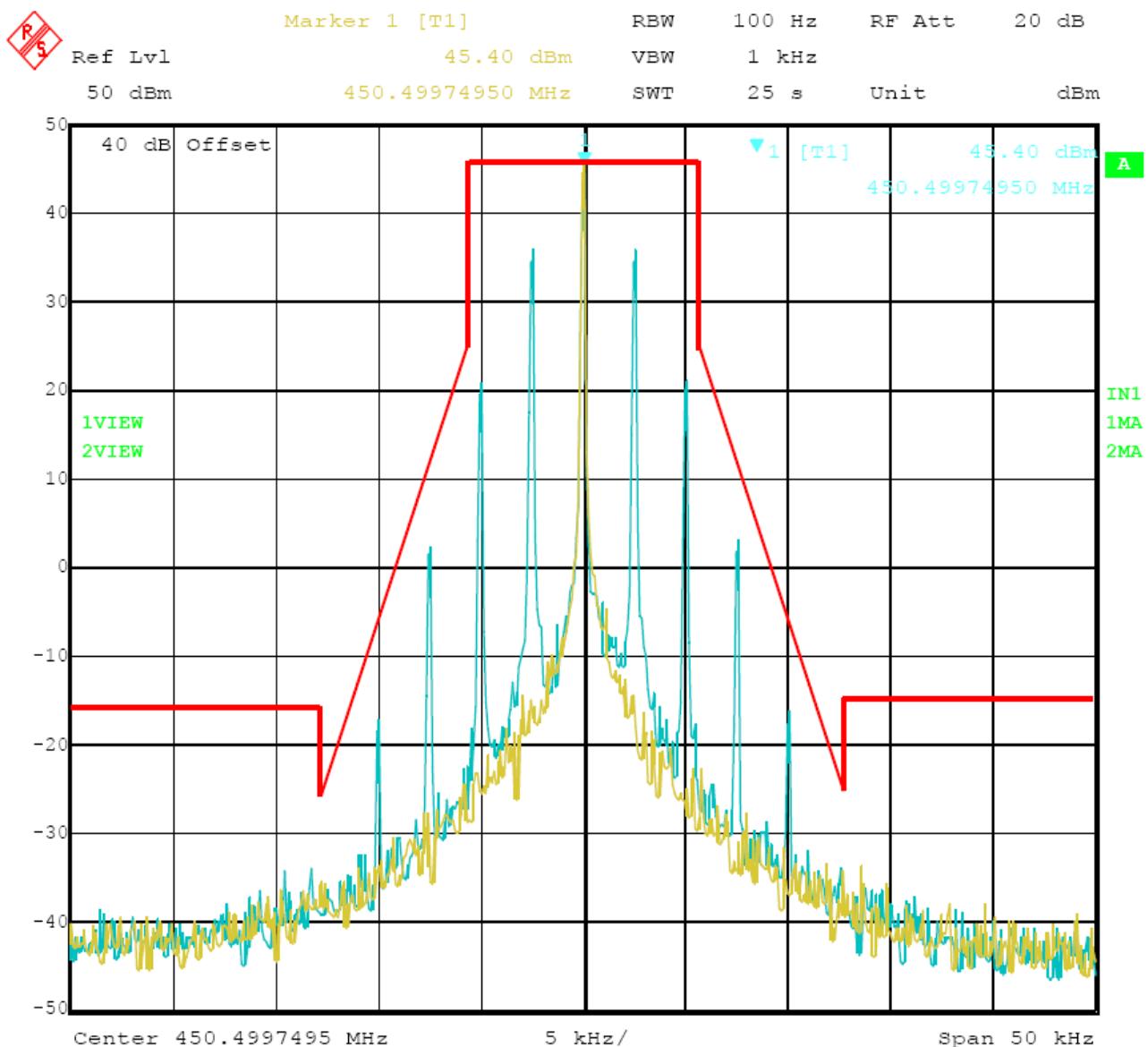
Modulation Type	Channel Separation	Freq.(MHz)	FCC Applicable Mask	RBW	Audio Freq. (KHz)	Results
FM	12.5 KHz	406.5000	D	100Hz	2.5	Compliance



Date: 25.MAR.2012 18:46:51

12.5 kHz Channel Spacing, 406.5000 MHz, 2500 Hz Audio Modulation Only

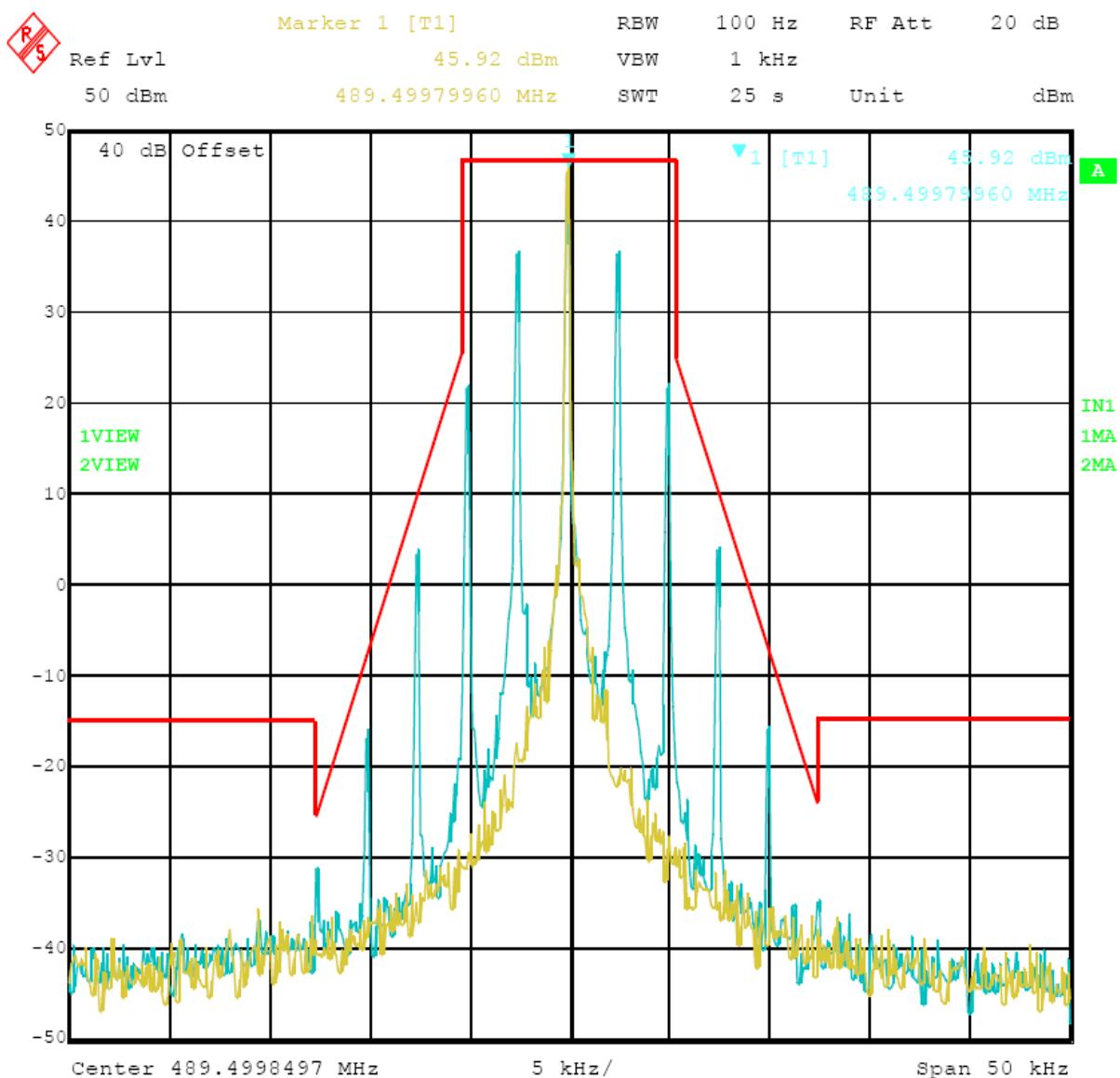
Modulation Type	Channel Separation	Freq.(MHz)	FCC Applicable Mask	RBW	Audio Freq. (KHz)	Results
FM	12.5 KHz	450.5000	D	100Hz	2.5	Compliance



Date: 25.MAR.2012 18:42:05

12.5 kHz Channel Spacing, 450.5000 MHz, 2500 Hz Audio Modulation Only

Modulation Type	Channel Separation	Freq.(MHz)	FCC Applicable Mask	RBW	Audio Freq. (KHz)	Results
FM	12.5 KHz	489.5000	D	100Hz	2.5	Compliance

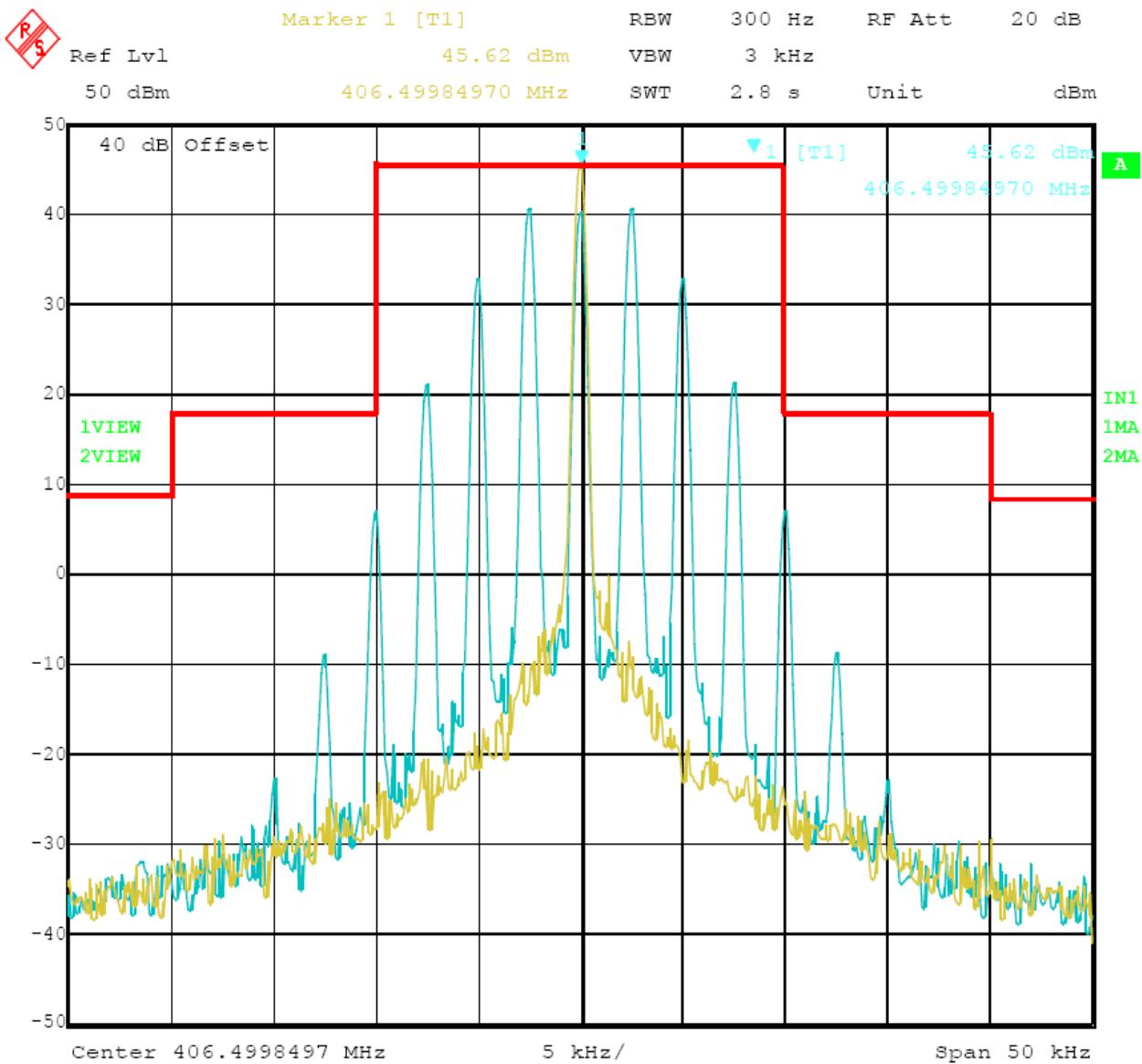


Date: 25.MAR.2012 18:37:41

12.5 kHz Channel Spacing, 489.5000 MHz, 2500 Hz Audio Modulation Only

Only for IC Review (Not For FCC Review)

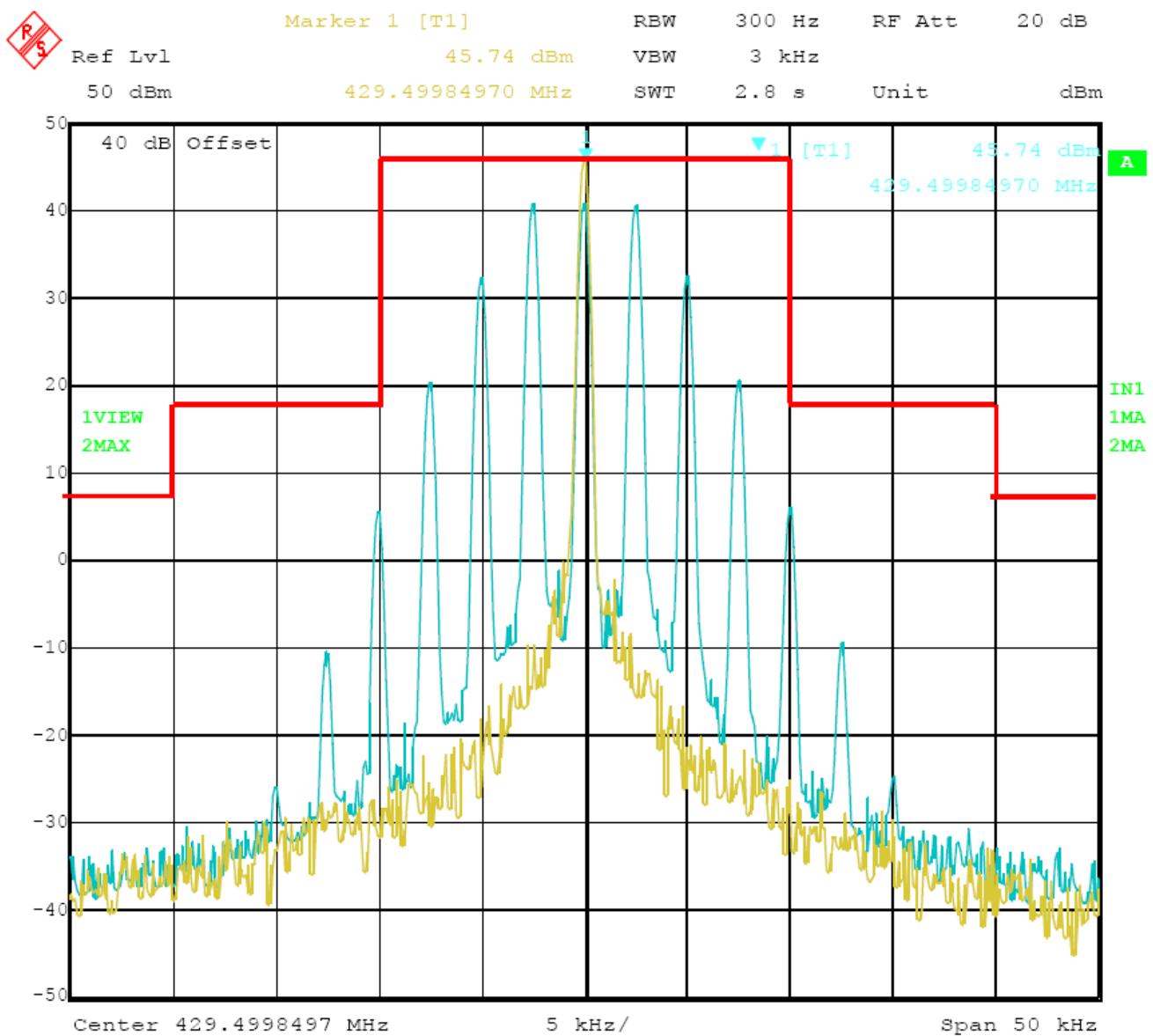
Modulation Type	Channel Separation	Freq.(MHz)	IC Applicable Mask	RBW	Audio Freq. (KHz)	Results
FM	25 KHz	406.5000	B	300Hz	2.5	Compliance



Date: 25.MAR.2012 18:34:03

25 kHz Channel Spacing, 406.5000 MHz, 2500 Hz Audio Modulation Only

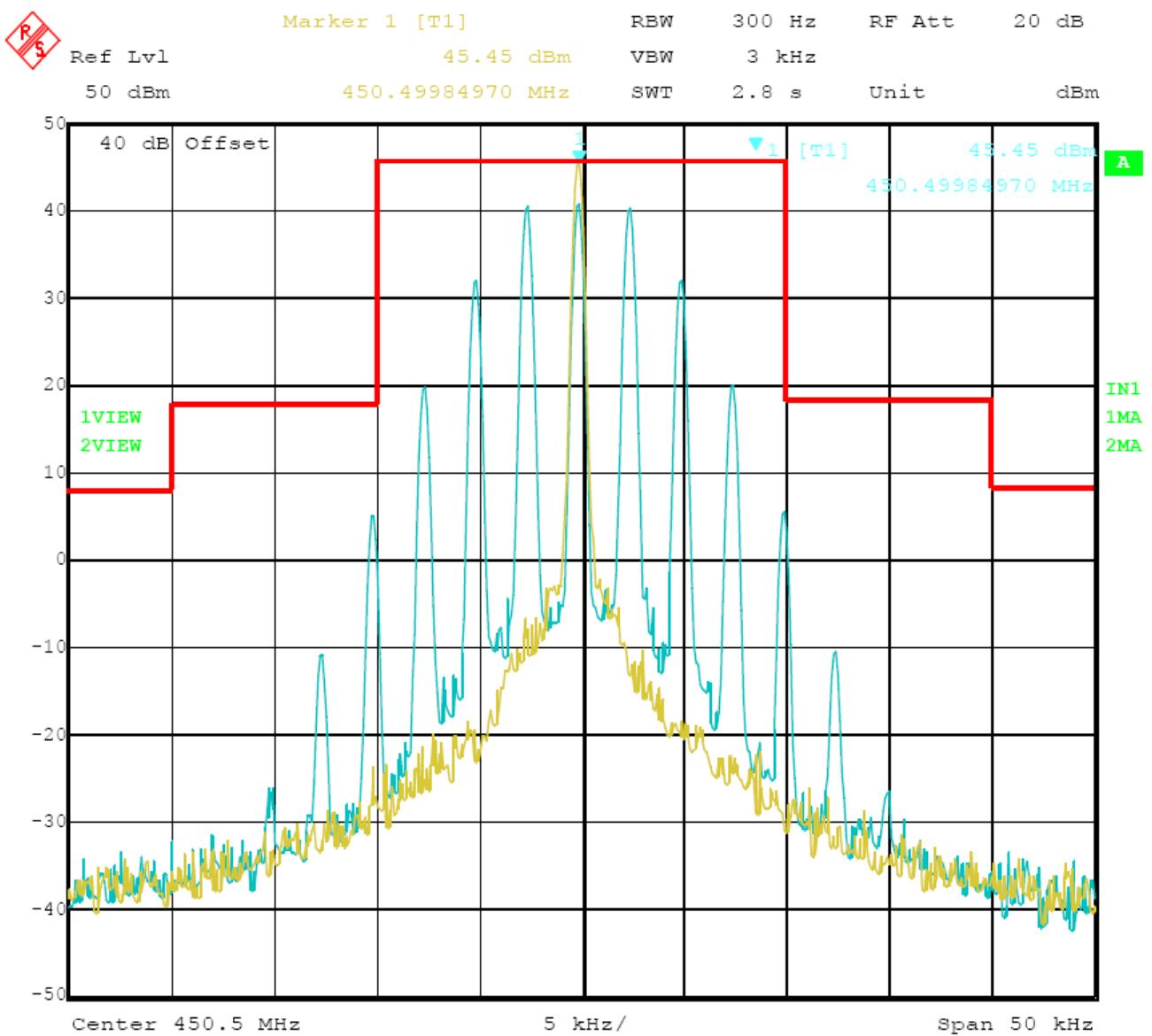
Modulation Type	Channel Separation	Freq.(MHz)	IC Applicable Mask	RBW	Audio Freq. (KHz)	Results
FM	25 KHz	429.5000	B	300Hz	2.5	Compliance



Date: 25.MAR.2012 18:31:57

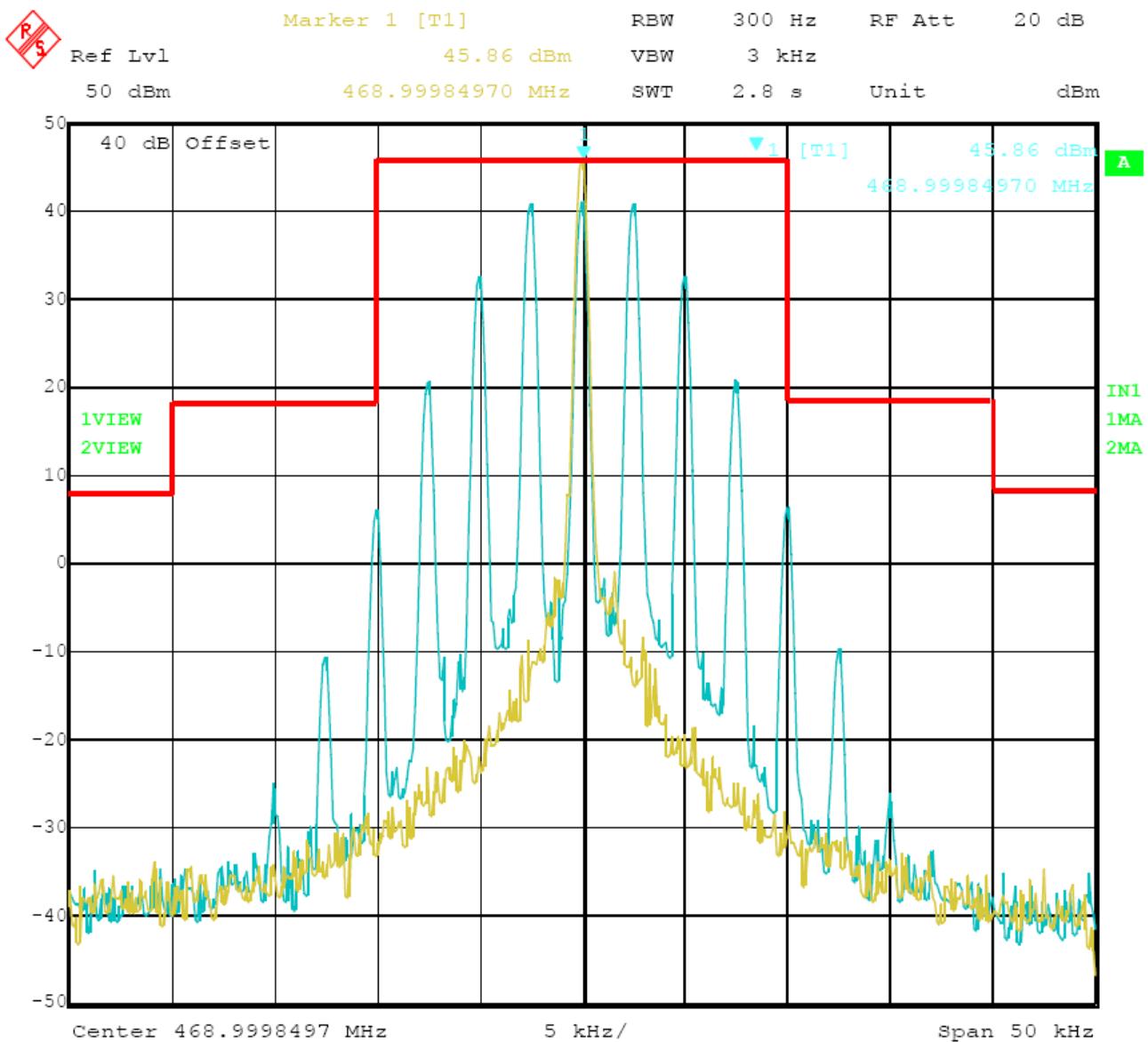
25 kHz Channel Spacing, 429.5000 MHz, 2500 Hz Audio Modulation Only

Modulation Type	Channel Separation	Freq.(MHz)	IC Applicable Mask	RBW	Audio Freq. (KHz)	Results
FM	25 KHz	450.5000	B	300Hz	2.5	Compliance



25 kHz Channel Spacing, 450.5000 MHz, 2500 Hz Audio Modulation Only

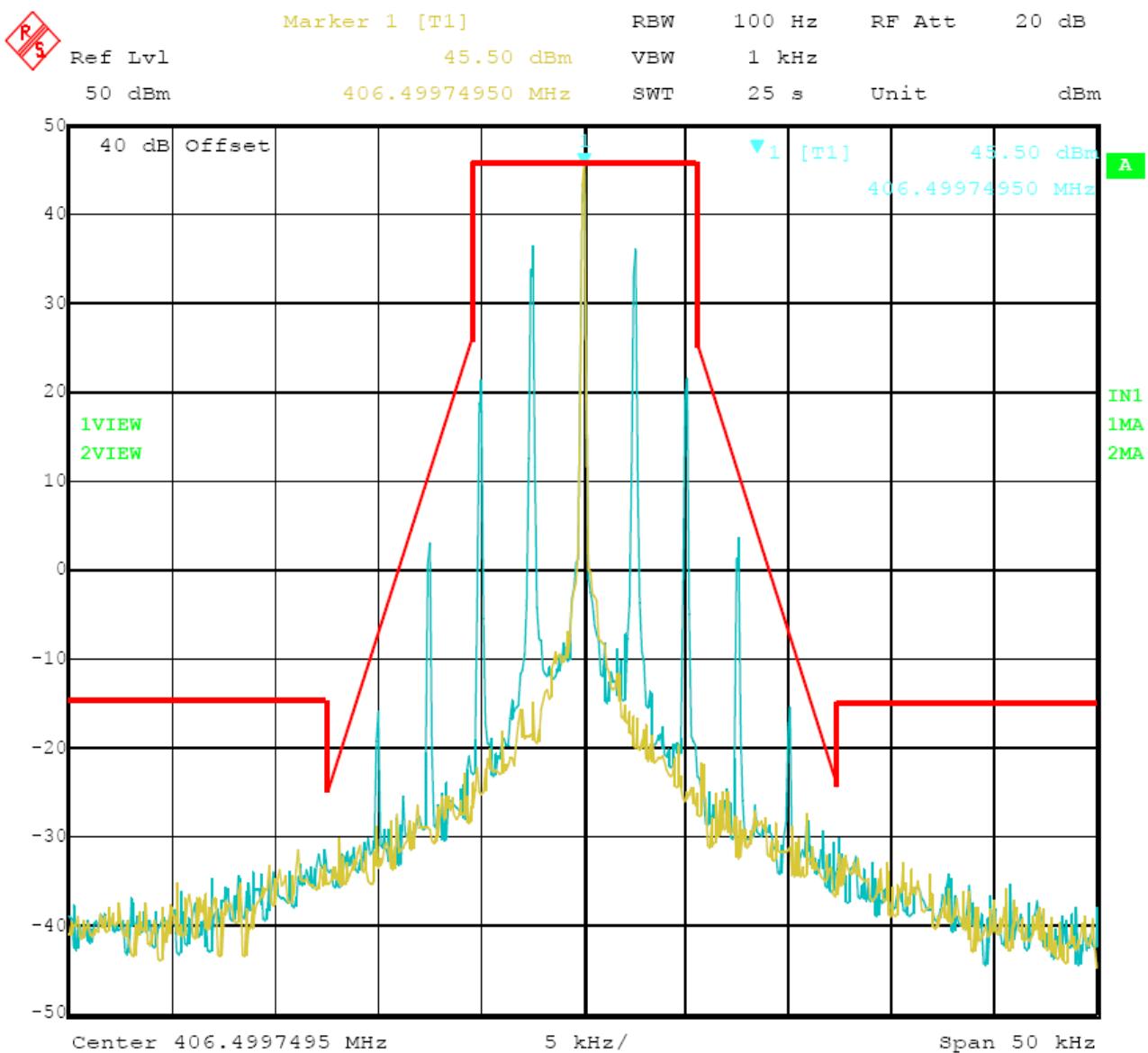
Modulation Type	Channel Separation	Freq.(MHz)	IC Applicable Mask	RBW	Audio Freq. (KHz)	Results
FM	25 KHz	469.0000	B	300Hz	2.5	Compliance



Date: 25.MAR.2012 18:29:18

25 kHz Channel Spacing, 469.0000 MHz, 2500 Hz Audio Modulation Only

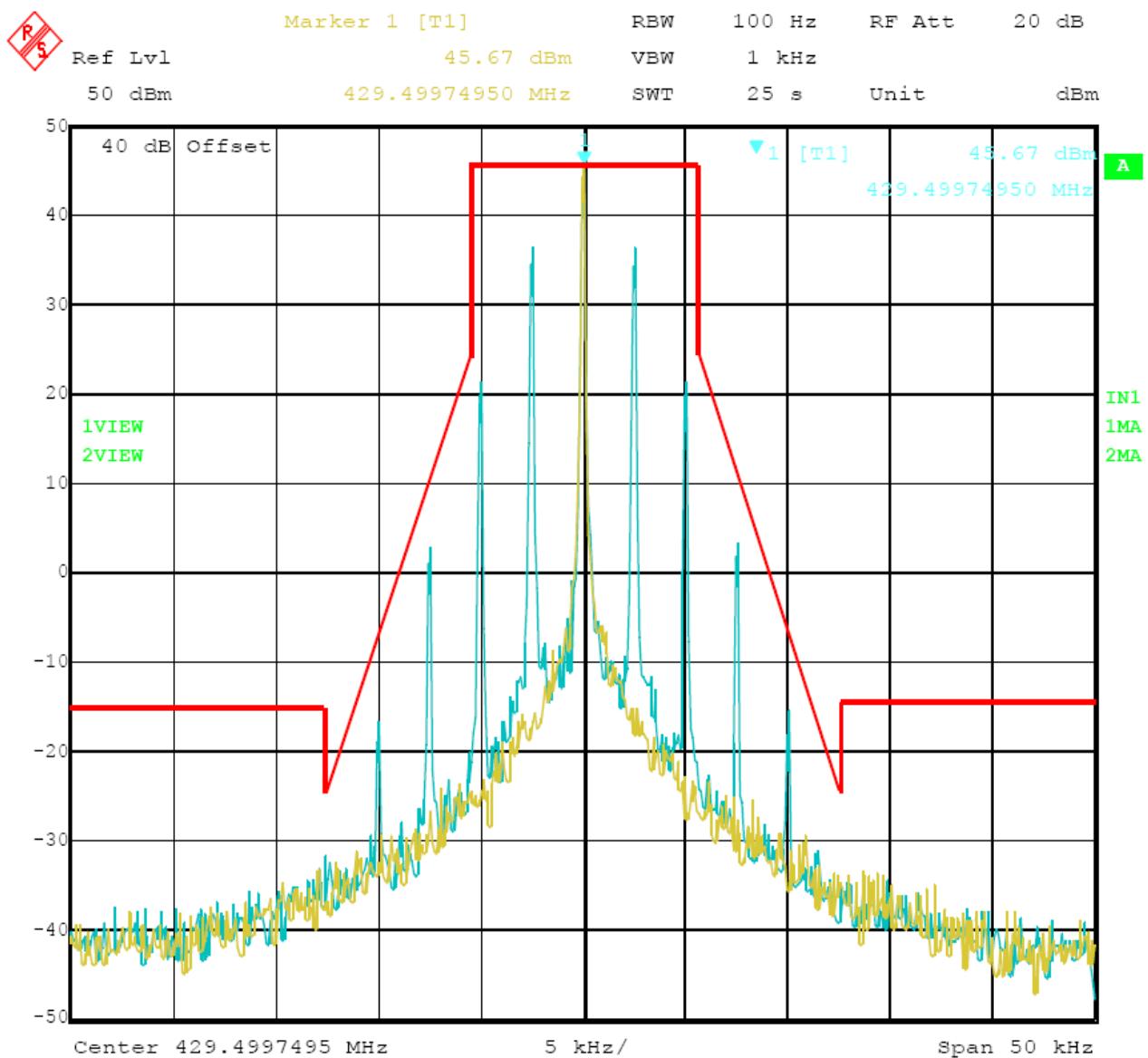
Modulation Type	Channel Separation	Freq.(MHz)	IC Applicable Mask	RBW	Audio Freq. (KHz)	Results
FM	12.5 KHz	406.5000	D	100Hz	2.5	Compliance



Date: 25.MAR.2012 18:46:51

12.5 kHz Channel Spacing, 406.5000 MHz, 2500 Hz Audio Modulation Only

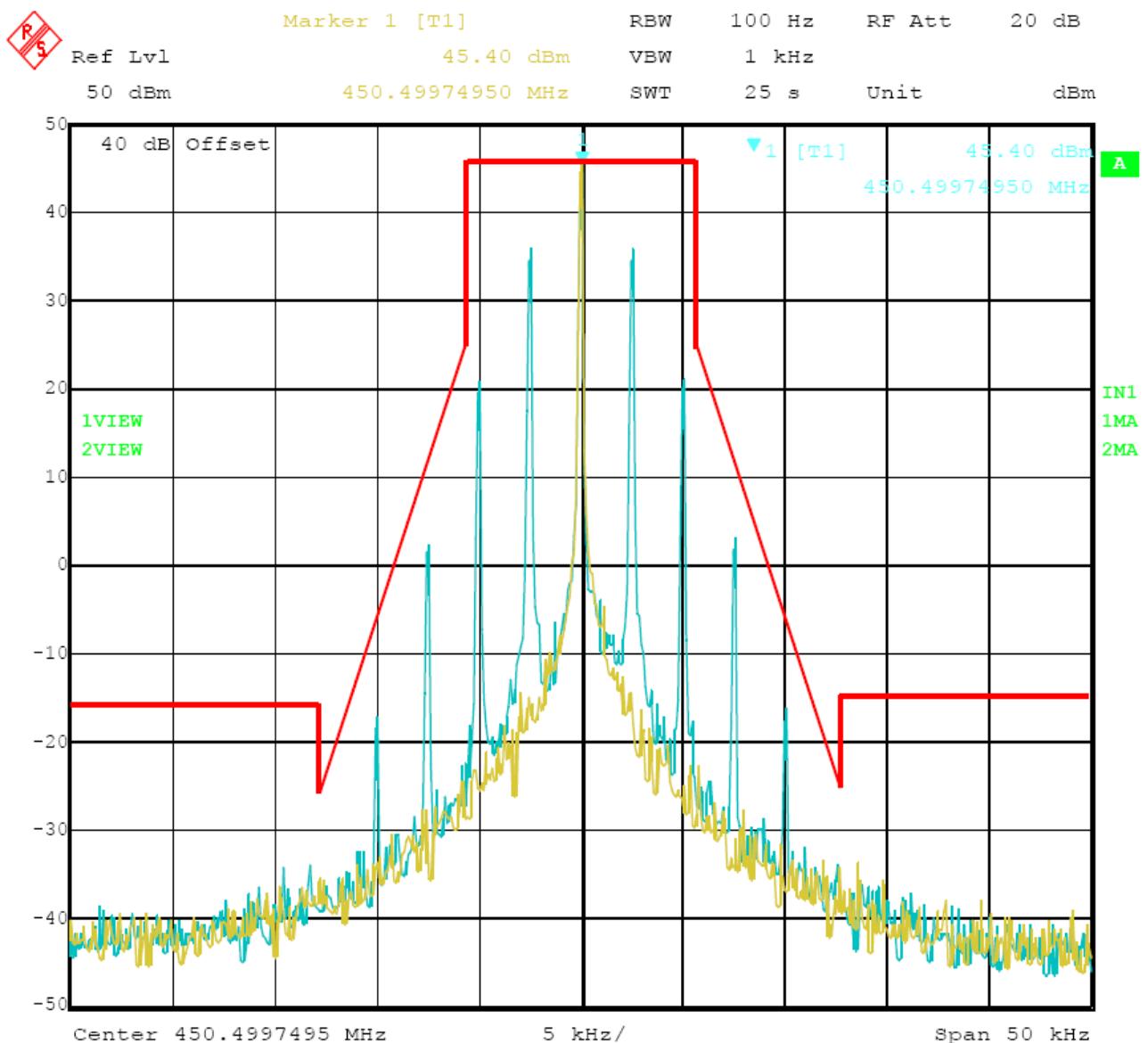
Modulation Type	Channel Separation	Freq.(MHz)	IC Applicable Mask	RBW	Audio Freq. (KHz)	Results
FM	12.5 KHz	429.5000	D	100Hz	2.5	Compliance



Date: 25.MAR.2012 18:45:12

12.5 kHz Channel Spacing, 429.5000 MHz, 2500 Hz Audio Modulation Only

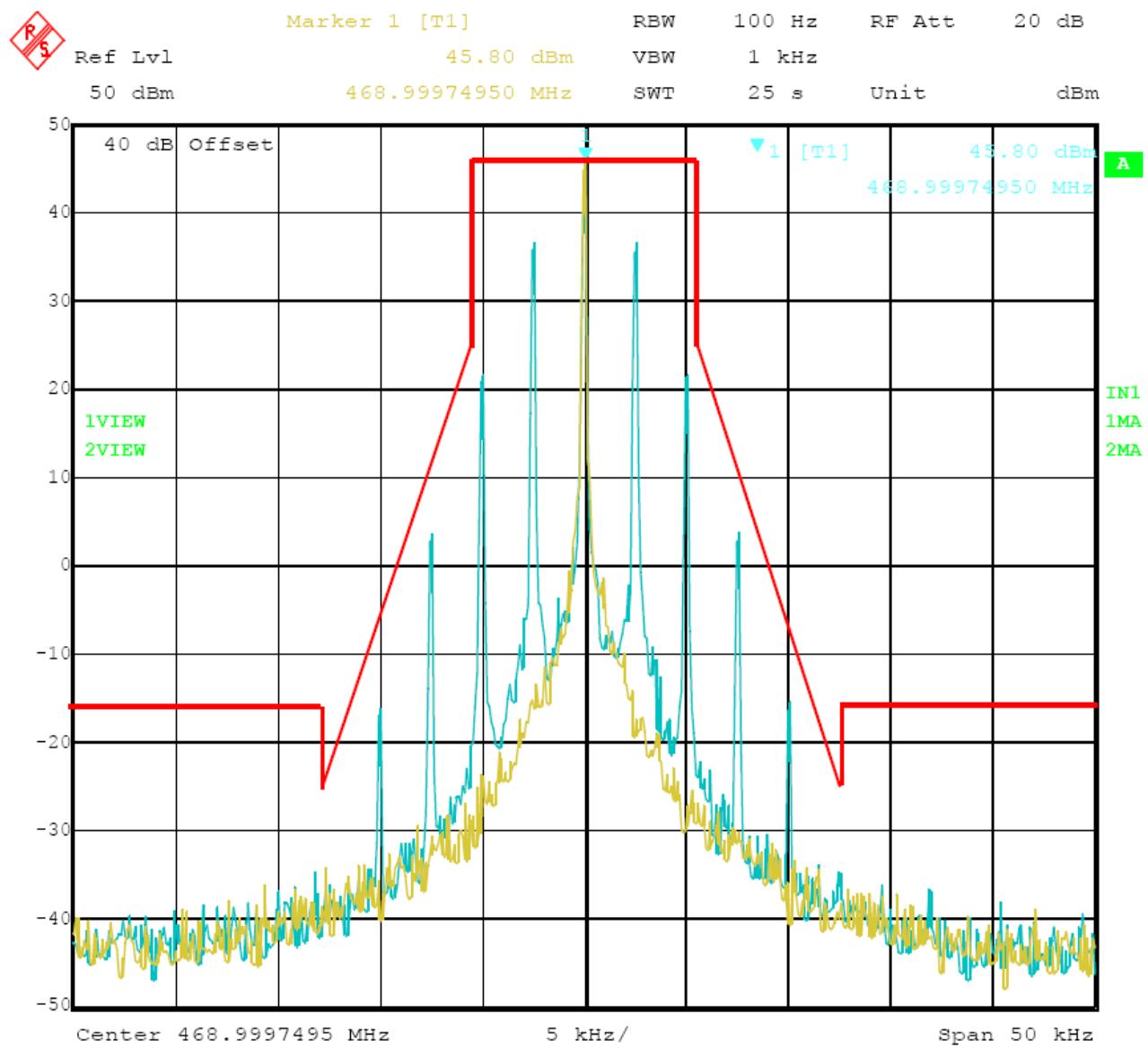
Modulation Type	Channel Separation	Freq.(MHz)	IC Applicable Mask	RBW	Audio Freq. (KHz)	Results
FM	12.5 KHz	450.5000	D	100Hz	2.5	Compliance



Date: 25.MAR.2012 18:42:05

12.5 kHz Channel Spacing, 450.5000 MHz, 2500 Hz Audio Modulation Only

Modulation Type	Channel Separation	Freq.(MHz)	IC Applicable Mask	RBW	Audio Freq. (KHz)	Results
FM	12.5 KHz	469.0000	D	100Hz	2.5	Compliance



Date: 25.MAR.2012 18:39:30

12.5 kHz Channel Spacing, 469.0000 MHz, 2500 Hz Audio Modulation Only

4.3. Transmitter Radiated Spurious Emission

TEST APPLICABLE

According to the TIA/EIA 603 test method, and according to Section 90.210 and RSS-119 Section 5.8, the power of each unwanted emission shall be less than Transmitted Power as specified below for transmitters designed to operate with 12.5 KHz channel bandwidth:

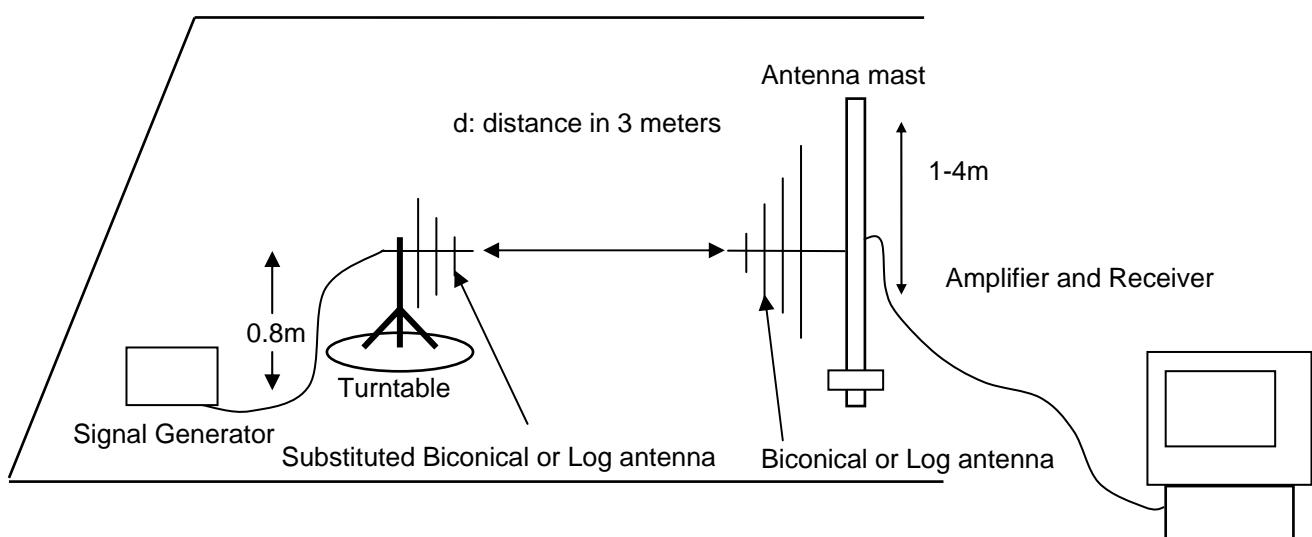
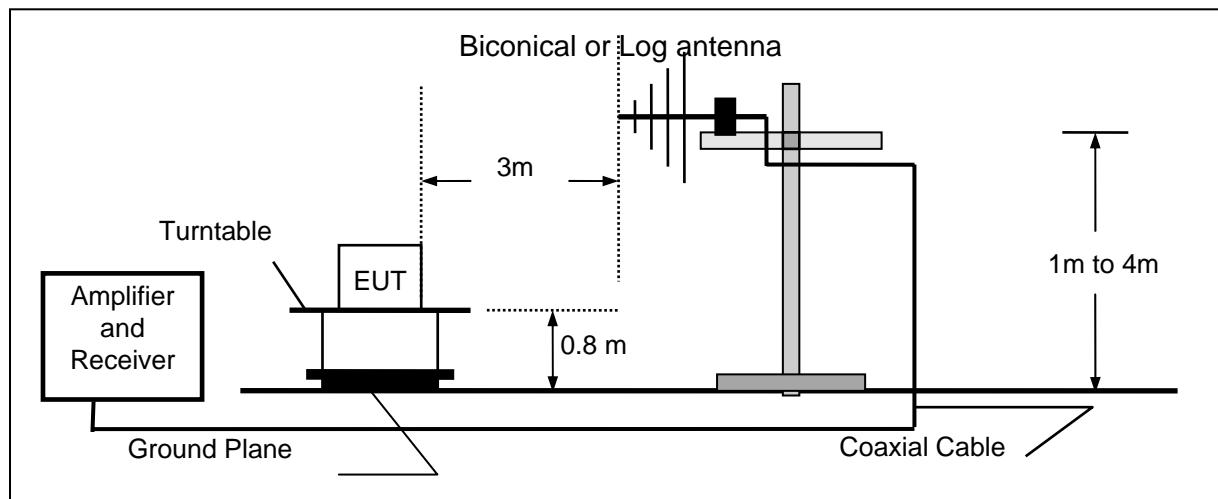
- 1 On any frequency removed from the center of the authorized bandwidth fo to 5.625 KHz removed from fo: Zero dB
- 2 On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in KHz) fo of more than 5.625 KHz but no more than 12.5 KHz: At least 7.27dB
- 3 On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in KHz) fo of more than 12.5 KHz: At least $50 + 10 \log(P)$ dB or 70 dB, which ever is lesser attenuation.

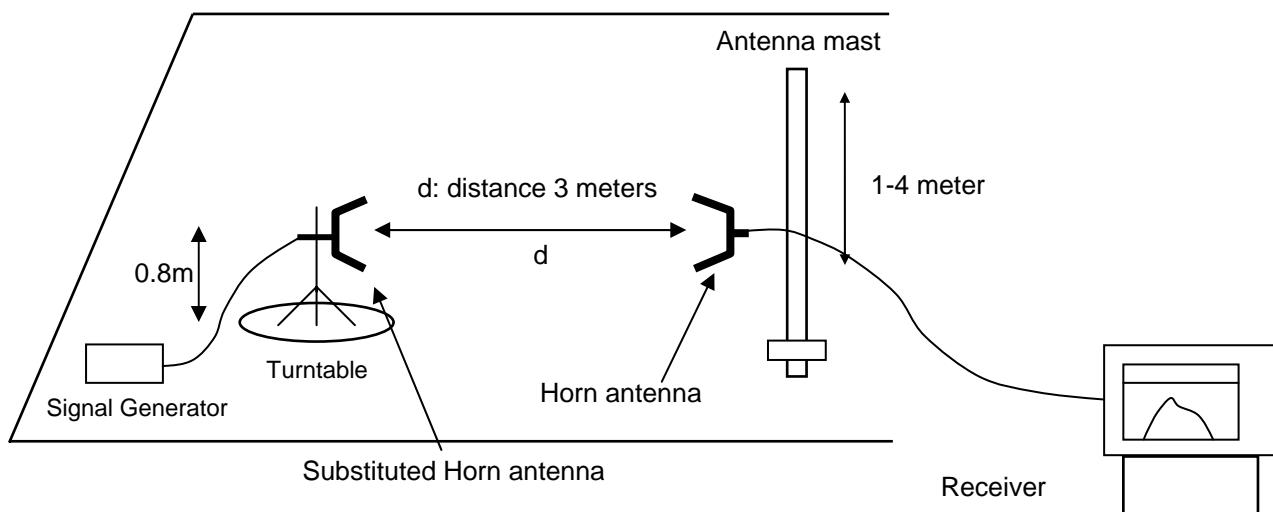
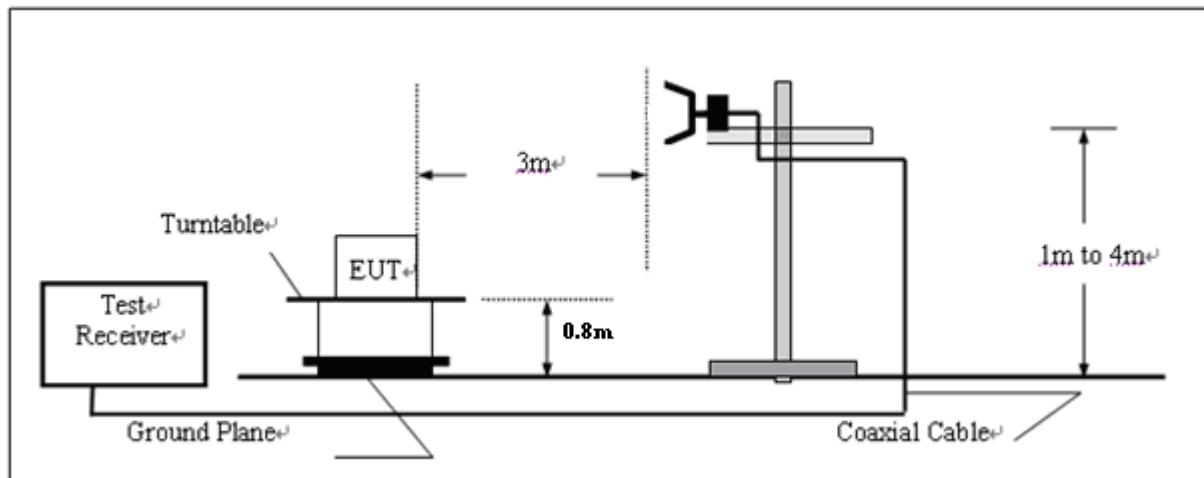
For transmitters designed to transmit with 25 KHz channel separation and equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier power (P) as following:

- 1 On any frequency removed from the assigned frequency by more than 50 percent, but no more than 100 percent of the authorized bandwidth: At least 25 dB.
- 2 On any frequency removed from the assigned frequency by more than 100 percent, but no more than 250 percent of the authorized bandwidth: At least 35 dB.
- 3 On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least $43 + 10\log(P)$ dB.

TEST CONFIGURATION

Below 1GHz



Above 1GHz**TEST PROCEDURE**

- 1 On a test site, the EUT shall be placed on a turntable and in the position closest to the normal use as declared by the user.
- 2 The test antenna shall be oriented initially for vertical polarization located 3m from the EUT to correspond to the transmitter.
- 3 The output of the antenna shall be connected to the measuring receiver and either a peak or quasi-peak detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.
- 4 The transmitter shall be switched on; if possible, without the modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.
- 5 The test antenna shall be raised and lowered through the specified range of height until the measuring receiver detects a maximum signal level.
- 6 The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
- 7 The test antenna shall be raised and lowered again through the specified range of height until the measuring receiver detects a maximum signal level.
- 8 The maximum signal level detected by the measuring receiver shall be noted.
- 9 The measurement shall be repeated with the test antenna set to horizontal polarization.
- 10 Replace the antenna with a proper Antenna (substitution antenna).
- 11 The substitution antenna shall be oriented for vertical polarization and, if necessary, the length of the substitution antenna shall be adjusted to correspond to the frequency of transmitting.
- 12 The substitution antenna shall be connected to a calibrated signal generator.
- 13 If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- 14 The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.

- 15 The input signal to substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.
- 16 The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
- 17 The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization

TEST RESULTS

The Transmitter Radiated Spurious Emission was performed to the Rated high power (45Watt) Rated medium power (25Watt) and Rated low power (10Watt) the datum that reported below is the worst case (Rated high power) of the three rated power conditions.

Modulation Type: FM

FCC Part 22.359, 74.462, 80.211 and 90.210 and RSS Gen, RSS 119 Issue 11 (25 kHz bandwidth only):

On any frequency removed from the center of the assigned channel by more than 250 percent at least:

Low: $43 + 10 \log (P_{\text{watts}}) = 43 + 10 \log (42.85) = 59.32 \text{ dB}$

High: $43 + 10 \log (P_{\text{watts}}) = 43 + 10 \log (45.60) = 59.59 \text{ dB}$

Note: In general, the worse case attenuation requirement shown above was applied.

Calculation: Limit (dBm) = $\text{EL} - 43 - 10 \log_{10} (\text{TP})$

Notes: EL is the emission level of the Output Power expressed in dBm,

In this application, the EL is 46.53 dBm.

Limit (dBm) = $46.53 - 43 - 10 \log_{10} (45.60) = -13 \text{ dBm}$

FCC Part 22.359, 74.462, 80.211 and 90.210 and RSS Gen, RSS 119 Issue 9 (12.5 kHz bandwidth only): On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f d in kHz) of more than 12.5 kHz at least:

Low: $50 + 10 \log (P_{\text{watts}}) = 50 + 10 \log (43.15) = 66.35 \text{ dB}$

High: $50 + 10 \log (P_{\text{watts}}) = 50 + 10 \log (46.67) = 66.69 \text{ dB}$

Note: In general, the worse case attenuation requirement shown above was applied.

Calculation: Limit (dBm) = $\text{EL} - 50 - 10 \log_{10} (\text{TP})$

Notes: EL is the emission level of the Output Power expressed in dBm,

In this application, the EL is 46.53 dBm.

Limit (dBm) = $46.53 - 50 - 10 \log_{10} (46.67) = -20 \text{ dBm}$

Note: 1. In general, the worse case attenuation requirement shown above was applied.

2. The measurement frequency range from 30MHz to 5GHz.

3. *** means that the emission level is too low to be measured or at least 20 dB down than the limit.

Only For FCC Review

Modulation		FM		Channel Separation		12.5KHz		
Test Channel		Low Channel		Test Frequency		406.5000 MHz		
Frequency (MHz)	E-Field Level (dB _{UV} /m)	EMI Detector (Peak/QP)	Antenna Polarization	Antenna Height (cm)	Table Angle (Degree)	ERP measured by Substitution Method (dBm)	Limit (dBm)	Margin (dB)
813.000	73.76	Peak	H	352	0	-21.11	-20	1.11
1219.500	66.55	Peak	H	154	245	-26.99	-20	6.99
1626.000	63.56	Peak	H	258	157	-29.58	-20	9.58
...			H					
813.000	72.66	Peak	V	100	178	-22.58	-20	2.58
1219.500	65.68	Peak	V	124	56	-28.84	-20	8.84
1626.000	63.92	Peak	V	108	355	-30.23	-20	10.23
...	...		V					

Modulation		FM		Channel Separation		12.5KHz		
Test Channel		Middle Channel		Test Frequency		450.5000 MHz		
Frequency (MHz)	E-Field Level (dBuv/m)	EMI Detector (Peak/QP)	Antenna Polarization	Antenna Height (cm)	Table Angle (Degree)	ERP measured by Substitution Method (dBm)	Limit (dBm)	Margin (dB)
901.00	73.32	Peak	H	135	282	-21.55	-20	1.55
1351.50	68.72	Peak	H	300	51	-24.82	-20	4.82
1802.00	66.56	Peak	H	150	350	-26.58	-20	6.58
...			H					
901.00	72.35	Peak	V	100	258	-22.89	-20	2.89
1351.50	68.64	Peak	V	120	45	-25.88	-20	5.88
1802.00	68.53	Peak	V	150	214	-25.62	-20	5.62
...	...		V					

Modulation		FM		Channel Separation		12.5KHz		
Test Channel		High Channel		Test Frequency		489.5000 MHz		
Frequency (MHz)	E-Field Level (dBuv/m)	EMI Detector (Peak/QP)	Antenna Polarization	Antenna Height (cm)	Table Angle (Degree)	ERP measured by Substitution Method (dBm)	Limit (dBm)	Margin (dB)
979.000	75.22	Peak	H	155	8	-21.82	-20	1.82
1468.5000	73.44	Peak	H	100	274	-24.00	-20	4.00
2447.5000	69.17	Peak	H	340	56	-27.38	-20	7.38
...			H					
979.000	75.64	Peak	V	100	265	-21.37	-20	1.37
1468.5000	73.19	Peak	V	128	157	-23.58	-20	3.58
2447.5000	70.16	Peak	V	148	302	-26.66	-20	6.66
...	...		V					

Only for IC Review (Not For FCC Review)

Modulation		FM		Channel Separation		25KHz		
Test Channel		Low Channel		Test Frequency		406.5000 MHz		
Frequency (MHz)	E-Field Level (dBuv/m)	EMI Detector (Peak/QP)	Antenna Polarization	Antenna Height (cm)	Table Angle (Degree)	ERP measured by Substitution Method (dBm)	Limit (dBm)	Margin (dB)
813.000	77.62	Peak	H	100	47	-17.25	-13	4.25
1219.500	70.02	Peak	H	298	331	-23.52	-13	10.52
1626.000	68.89	Peak	H	300	247	-24.25	-13	11.25
...			H					
813.000	77.03	Peak	V	150	220	-18.21	-13	5.21
1219.500	69.00	Peak	V	100	358	-25.52	-13	12.52
1626.000	67.53	Peak	V	100	279	-26.62	-13	13.62
...	...		V					

Modulation		FM		Channel Separation		25KHz		
Test Channel		Middle Channel		Test Frequency		429.5000 MHz		
Frequency (MHz)	E-Field Level (dBuv/m)	EMI Detector (Peak/QP)	Antenna Polarization	Antenna Height (cm)	Table Angle (Degree)	ERP measured by Substitution Method (dBm)	Limit (dBm)	Margin (dB)
859.000	78.62	Peak	H	254	233	-16.25	-13	3.25
1288.500	70.40	Peak	H	300	300	-23.14	-13	10.14
1718.000	67.56	Peak	H	150	144	-25.58	-13	12.58
...			H					
859.000	75.70	Peak	V	150	125	-19.54	-13	6.54
1288.500	69.97	Peak	V	108	12	-24.55	-13	11.55
1718.000	67.31	Peak	V	100	345	-26.84	-13	13.84
...	...		V					

Modulation		FM		Channel Separation		25KHz		
Test Channel		High Channel		Test Frequency		450.5000 MHz		
Frequency (MHz)	E-Field Level (dBuv/m)	EMI Detector (Peak/QP)	Antenna Polarization	Antenna Height (cm)	Table Angle (Degree)	ERP measured by Substitution Method (dBm)	Limit (dBm)	Margin (dB)
901.000	78.73	Peak	H	200	244	-16.14	-13	3.14
1351.500	68.43	Peak	H	288	56	-25.11	-13	12.11
1802.000	66.62	Peak	H	100	137	-26.52	-13	13.52
...			H					
901.000	75.70	Peak	V	100	355	-19.54	-13	6.54
1351.500	70.00	Peak	V	100	300	-24.52	-13	11.52
1802.000	67.57	Peak	V	145	256	-26.58	-13	13.58
...	...		V					

Modulation		FM		Channel Separation		25KHz		
Test Channel		High Channel		Test Frequency		469.0000 MHz		
Frequency (MHz)	E-Field Level (dBuv/m)	EMI Detector (Peak/QP)	Antenna Polarization	Antenna Height (cm)	Table Angle (Degree)	ERP measured by Substitution Method (dBm)	Limit (dBm)	Margin (dB)
938.000	78.39	Peak	H	300	122	-16.48	-13	3.48
1407.000	67.96	Peak	H	100	345	-25.58	-13	12.58
1876.000	66.26	Peak	H	148	298	-26.88	-13	13.88
...			H					
938.000	76.40	Peak	V	108	244	-18.84	-13	5.84
1407.000	67.97	Peak	V	100	36	-26.55	-13	13.55
1876.000	65.27	Peak	V	100	134	-28.88	-13	15.88
...	...		V					

Modulation		FM		Channel Separation		12.5KHz		
Test Channel		Low Channel		Test Frequency		406.5000 MHz		
Frequency (MHz)	E-Field Level (dBuv/m)	EMI Detector (Peak/QP)	Antenna Polarization	Antenna Height (cm)	Table Angle (Degree)	ERP measured by Substitution Method (dBm)	Limit (dBm)	Margin (dB)
813.000	73.76	Peak	H	352	0	-21.11	-20	1.11
1219.500	66.55	Peak	H	154	245	-26.99	-20	6.99
1626.000	63.56	Peak	H	258	157	-29.58	-20	9.58
...			H					
813.000	72.66	Peak	V	100	178	-22.58	-20	2.58
1219.500	65.68	Peak	V	124	56	-28.84	-20	8.84
1626.000	63.92	Peak	V	108	355	-30.23	-20	10.23
...	...		V					

Modulation		FM		Channel Separation		12.5KHz		
Test Channel		Middle Channel		Test Frequency		429.5000 MHz		
Frequency (MHz)	E-Field Level (dBuv/m)	EMI Detector (Peak/QP)	Antenna Polarization	Antenna Height (cm)	Table Angle (Degree)	ERP measured by Substitution Method (dBm)	Limit (dBm)	Margin (dB)
859.000	72.29	Peak	H	125	341	-22.58	-20	2.58
1288.500	66.10	Peak	H	355	129	-27.44	-20	7.44
1718.000	63.60	Peak	H	100	255	-29.54	-20	9.54
...			H					
859.000	72.03	Peak	V	100	18	-23.21	-20	3.21
1288.500	65.97	Peak	V	108	126	-28.55	-20	8.55
1718.000	64.90	Peak	V	150	150	-29.25	-20	9.25
...	...		V					

Modulation		FM		Channel Separation		12.5KHz		
Test Channel		High Channel		Test Frequency		450.5000 MHz		
Frequency (MHz)	E-Field Level (dBuv/m)	EMI Detector (Peak/QP)	Antenna Polarization	Antenna Height (cm)	Table Angle (Degree)	ERP measured by Substitution Method (dBm)	Limit (dBm)	Margin (dB)
901.000	73.32	Peak	H	135	282	-21.55	-20	1.55
1351.500	68.72	Peak	H	300	51	-24.82	-20	4.82
1802.000	66.56	Peak	H	150	350	-26.58	-20	6.58
...			H					
901.000	72.35	Peak	V	100	258	-22.89	-20	2.89
1351.500	68.64	Peak	V	120	45	-25.88	-20	5.88
1802.000	68.53	Peak	V	150	214	-25.62	-20	5.62
...	...		V					

Modulation		FM		Channel Separation		12.5KHz		
Test Channel		High Channel		Test Frequency		469.0000 MHz		
Frequency (MHz)	E-Field Level (dBuv/m)	EMI Detector (Peak/QP)	Antenna Polarization	Antenna Height (cm)	Table Angle (Degree)	ERP measured by Substitution Method (dBm)	Limit (dBm)	Margin (dB)
938.000	72.73	Peak	H	150	88	-22.14	-20	2.14
1407.000	68.10	Peak	H	300	347	-25.44	-20	5.44
1876.000	67.96	Peak	H	128	223	-25.18	-20	5.18
...			H					
938.000	71.83	Peak	V	108	300	-23.41	-20	3.41
1407.000	68.37	Peak	V	124	156	-26.15	-20	6.15
1876.000	66.30	Peak	V	108	87	-27.85	-20	7.85
...	...		V					

4.4. Spurious Emission on Antenna Port

TEST APPLICABLE

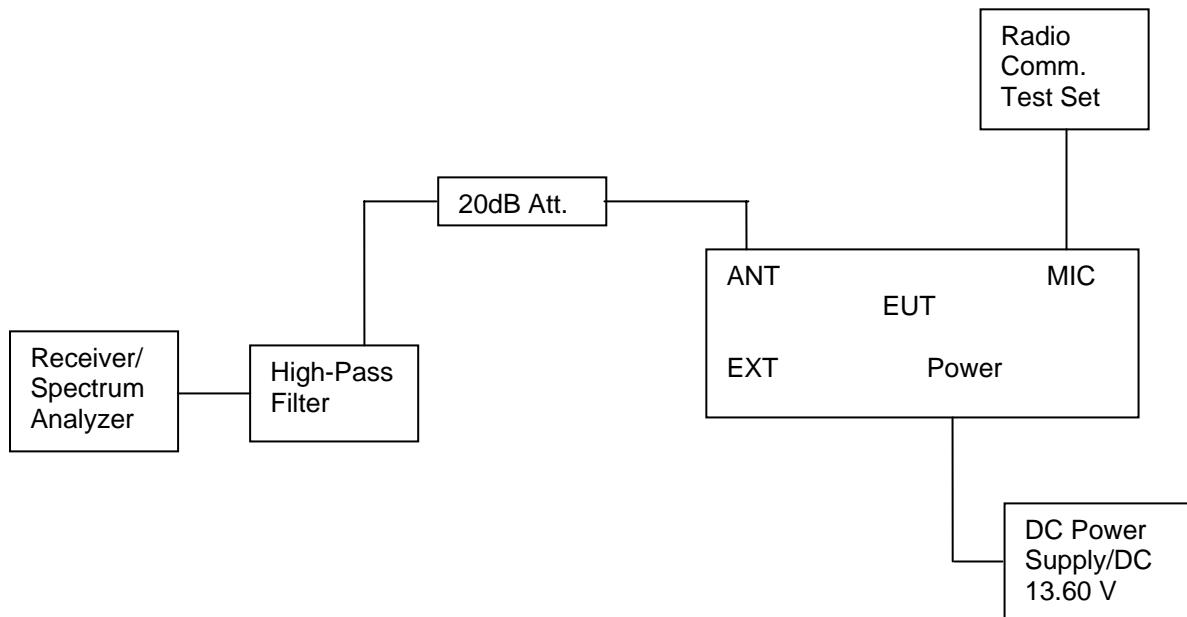
The same as Section 4.3

TEST PROCEDURE

The RF output of the EUT was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set to 100 kHz. Sufficient scans were taken to show any out of band emission up to 10th. Harmonic for the lower and the highest frequency range.RBW 100 kHz, VBW 300 kHz,

The audio input was set to 0 to get the unmodulated carrier, the resulting picture is print out for each channel separation.

TEST CONFIGURATION



TEST RESULTS

Modulation Type: FM

FCC Part 22.359, 74.462, 80.211 and 90.210 and RSS Gen, RSS 119 Issue 11 (25 kHz bandwidth only): On any frequency removed from the center of the assigned channel by more than 250 percent at least:

Low: $43 + 10 \log (P_{\text{watts}}) = 43 + 10 \log (42.85) = 59.32 \text{ dB}$

High: $43 + 10 \log (P_{\text{watts}}) = 43 + 10 \log (45.60) = 59.59 \text{ dB}$

Note: In general, the worse case attenuation requirement shown above was applied.

Calculation: Limit (dBm) = $EL - 43 - 10\log_{10} (TP)$

Notes: EL is the emission level of the Output Power expressed in dBm,

In this application, the EL is 46.53 dBm.

Limit (dBm) = $46.53 - 43 - 10\log_{10} (45.60) = -13 \text{ dBm}$

FCC Part 22.359, 74.462, 80.211 and 90.210 and RSS Gen, RSS 119 Issue 9 (12.5 kHz bandwidth only): On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f d in kHz) of more than 12.5 kHz at least:

Low: $50 + 10 \log (P_{\text{watts}}) = 50 + 10 \log (43.15) = 66.35 \text{ dB}$

High: $50 + 10 \log (P_{\text{watts}}) = 50 + 10 \log (46.67) = 66.69 \text{ dB}$

Note: In general, the worse case attenuation requirement shown above was applied.

Calculation: Limit (dBm) = $EL - 50 - 10\log_{10} (TP)$

Notes: EL is the emission level of the Output Power expressed in dBm,

In this application, the EL is 46.53 dBm.

Limit (dBm) = $46.53 - 50 - 10\log_{10} (46.67) = -20 \text{ dBm}$

Note: 1. In general, the worse case attenuation requirement shown above was applied.

2. The measurement frequency range from 30MHz to 5 GHz.

Only For FCC Review

For Rated High Power (45Watt)

Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM/Analog	12.5KHz	Low	406.5000	680.96	-26.39	4414.82	-36.24	
		Middle	450.5000	972.74	-24.77	1625.25	-37.13	
		High	489.5000	979.16	-22.31	2843.69	-21.54	
Limit		-20dBm for 12.5KHz Channel Separation						
Test Results		Compliance						

For Rated Middle Power (25Watt)

Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM/Analog	12.5KHz	Low	406.5000	513.38	-23.88	2843.65	-27.91	
		Middle	450.5000	972.74	-24.77	1625.25	-37.13	
		High	489.5000	980.56	-23.24	1400.80	-30.38	
Limit		-20dBm for 12.5KHz Channel Separation						
Test Results		Compliance						

For Rated Low Power (10Watt)

Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM/Analog	12.5KHz	Low	406.5000	823.10	-26.22	2432.86	-34.45	
		Middle	450.5000	694.81	-26.23	2252.50	-29.18	
		High	489.5000	980.56	-23.76	2442.89	-23.53	
Limit		-20dBm for 12.5KHz Channel Separation						
Test Results		Compliance						

Only For IC Review (Not For FCC Review)

For Rated High Power (45Watt)

Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM/Analog	25KHz	Low	406.5000	814.02	-25.03	3509.01	-37.02	
		Middle	429.5000	858.91	-25.12	3933.86	-36.82	
		Middle	450.5000	901.40	-23.93	4671.34	-36.13	
		High	469.0000	938.27	-22.23	2923.84	-36.98	
	12.5KHz	Low	406.5000	680.96	-26.39	4414.82	-36.24	
		Middle	429.5000	558.91	-24.10	3933.86	-37.03	
		Middle	450.5000	972.74	-24.77	1625.25	-37.13	
		High	469.0000	938.27	-23.27	3837.67	-36.81	
Limit		-13dBm for 25KHz Channel Separation						
		-20dBm for 12.5KHz Channel Separation						
Test Results		Compliance						

For Rated Middle Power (25Watt)

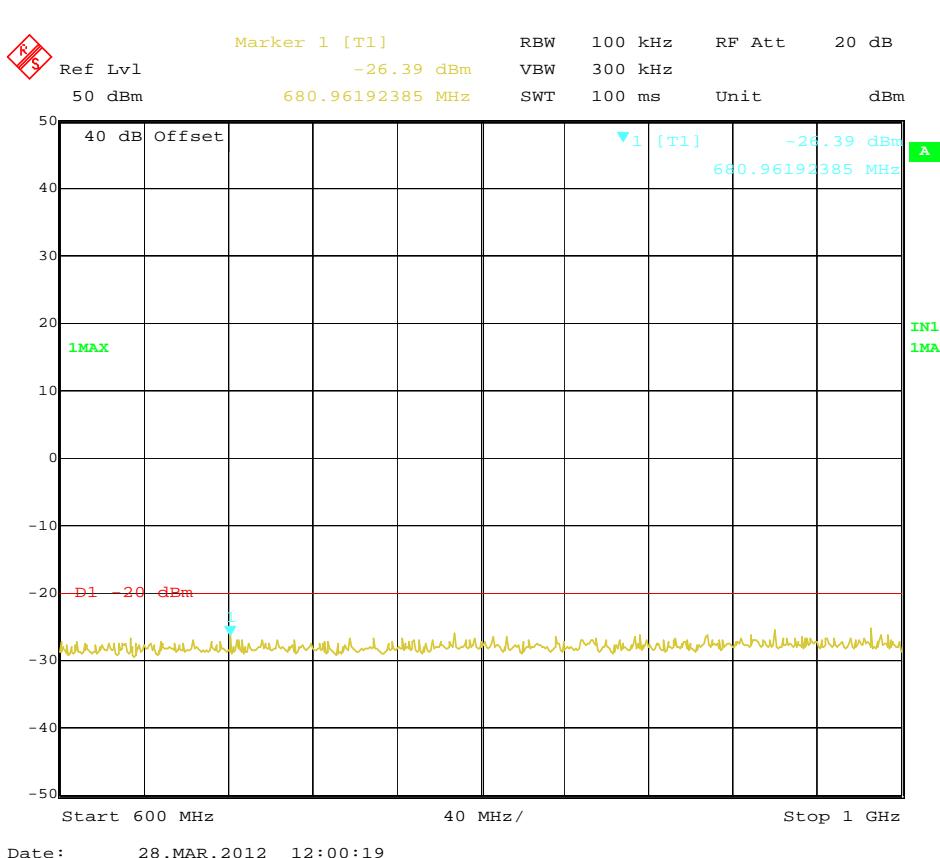
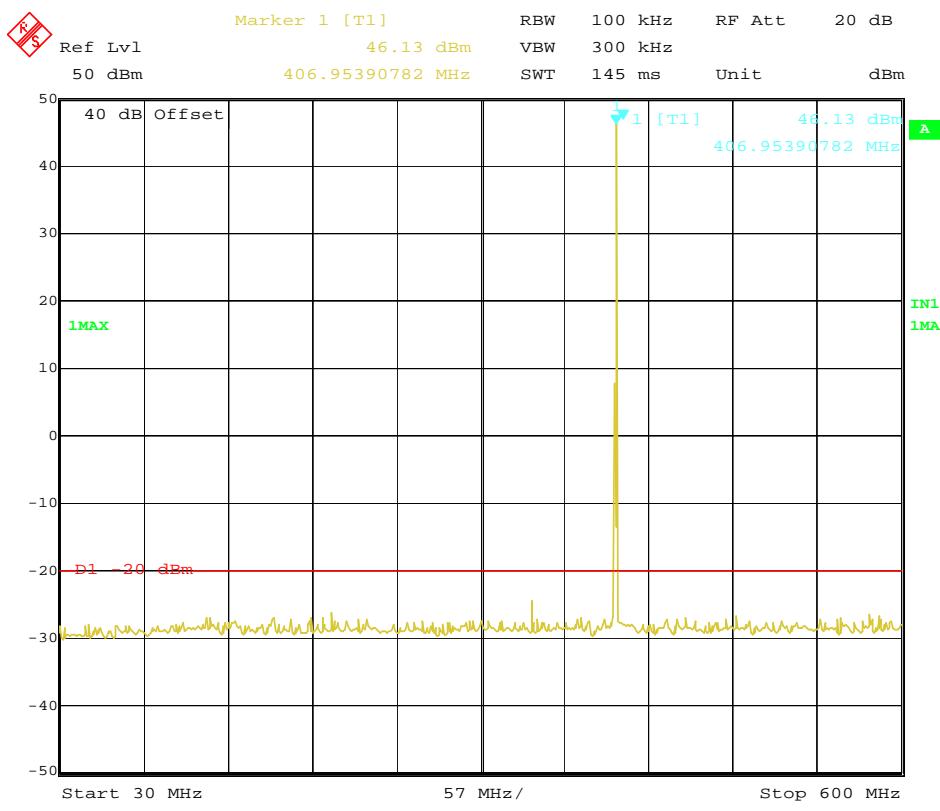
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM/Analog	25KHz	Low	406.5000	626.77	-25.63	1220.44	-27.97	
		Middle	429.5000	860.04	-22.23	1280.56	-17.03	
		Middle	450.5000	900.86	-16.59	2252.5	-24.31	
		High	469.0000	939.73	-17.38	2813.62	-31.90	
	12.5KHz	Low	406.5000	513.38	-23.88	2843.65	-27.91	
		Middle	429.5000	860.04	-21.75	2252.50	-23.90	
		Middle	450.5000	902.80	-21.46	2252.50	-24.37	
		High	469.0000	939.73	-21.32	2813.62	-31.43	
Limit		-13dBm for 25KHz Channel Separation -20dBm for 12.5KHz Channel Separation						
Test Results		Compliance						

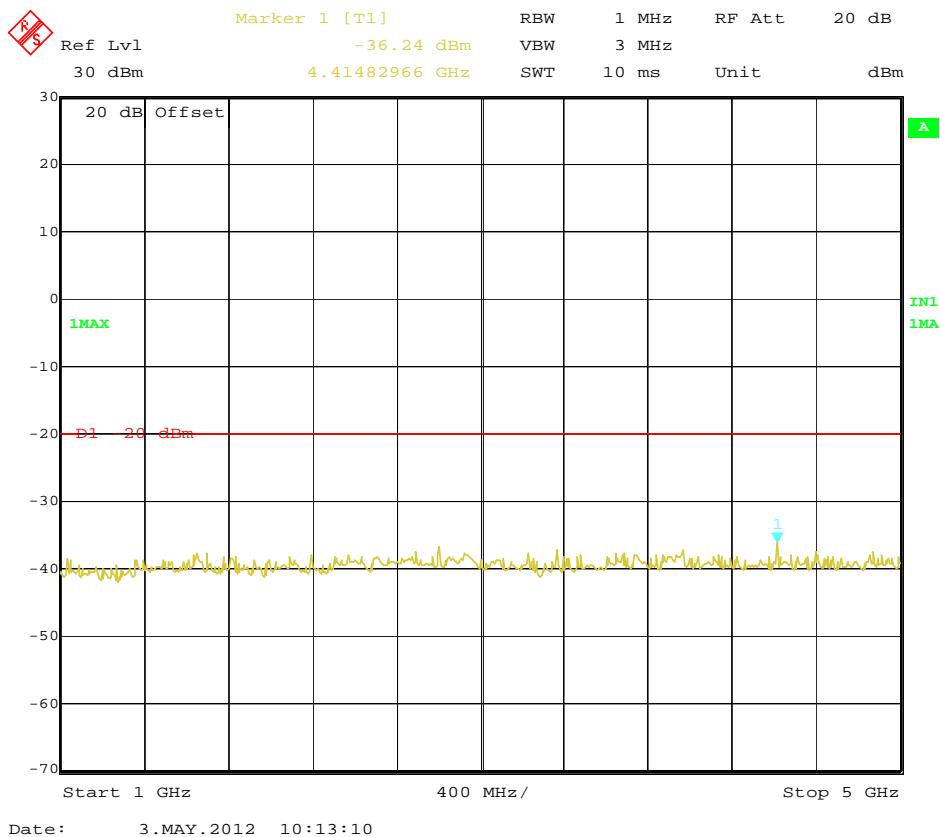
For Rated Low Power (10Watt)

Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM/Analog	25KHz	Low	406.5000	212.72	-26.10	2843.68	-23.98	
		Middle	429.5000	237.99	-26.47	1280.56	-27.61	
		Middle	450.5000	134.96	-26.18	2252.50	-29.01	
		High	469.0000	131.08	-25.57	2813.62	-34.49	
	12.5KHz	Low	406.5000	823.10	-26.22	2432.86	-34.45	
		Middle	429.5000	644.26	-25.70	1280.56	-27.39	
		Middle	450.5000	694.81	-26.23	2252.50	-29.18	
		High	469.0000	580.12	-25.90	2513.62	-33.34	
Limit		-13dBm for 25KHz Channel Separation -20dBm for 12.5KHz Channel Separation						
Test Results		Compliance						

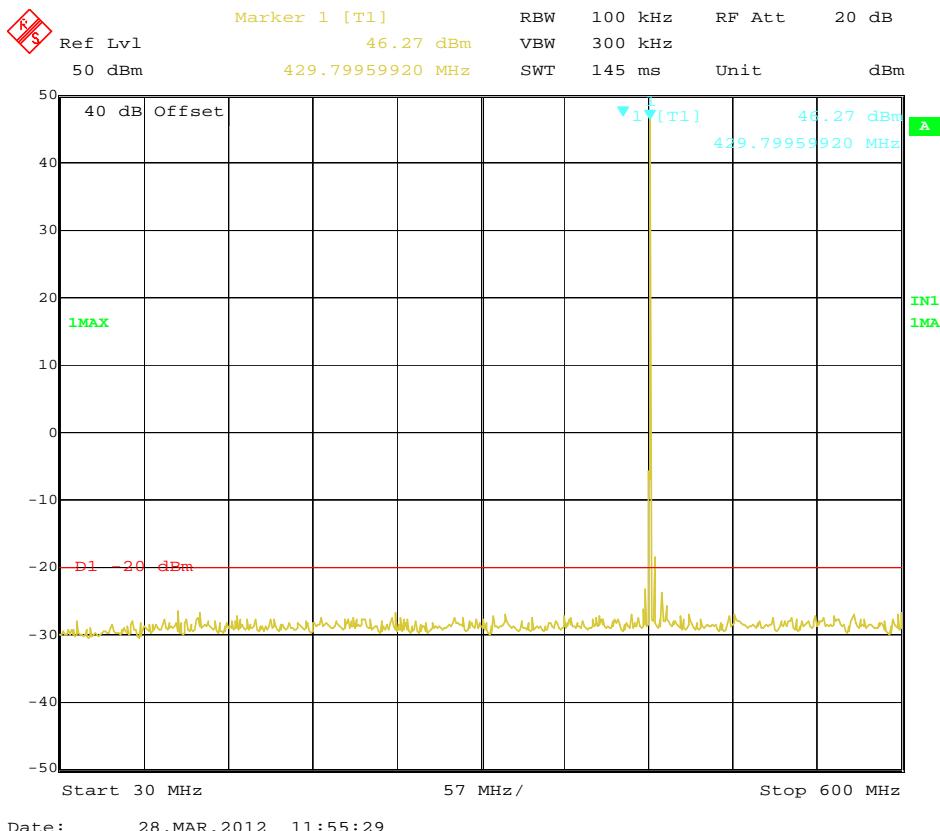
Plots of Spurious Emission on Antenna Port Measurement**Only for FCC Review****For Rated High Power (45Watt)**

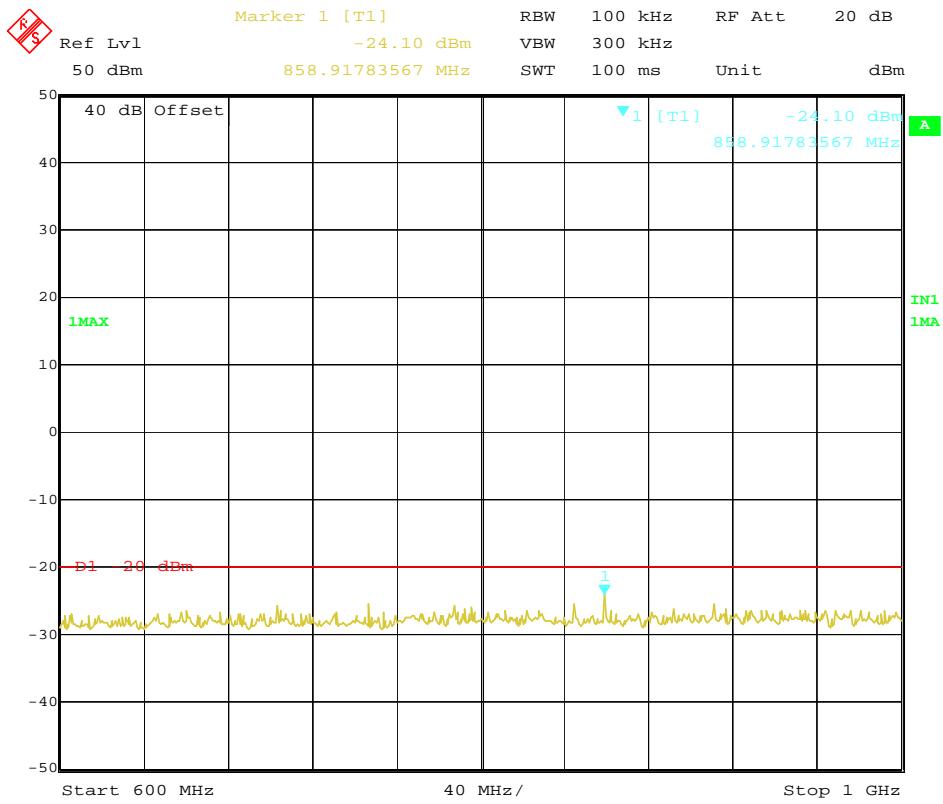
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	Low	406.5000	680.96	-26.39	4414.82	-36.24	-20dBm
Test Results				Compliance				



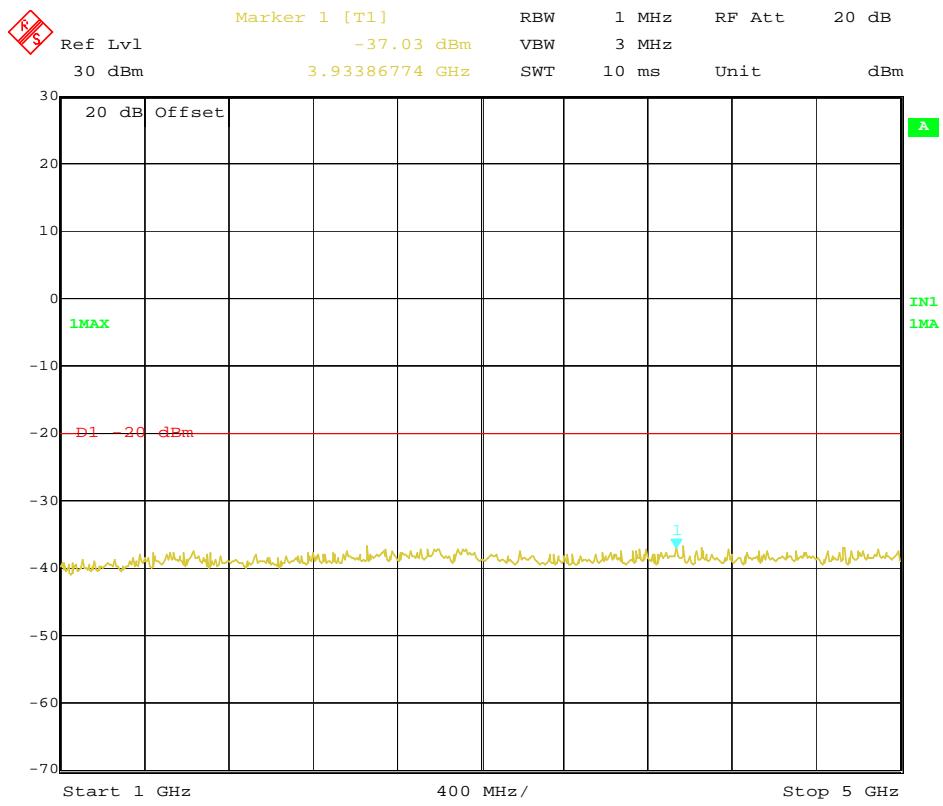


Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	Middle	450.5000	972.74	-24.77	1625.25	-37.13	-20dBm
Test Results				Compliance				



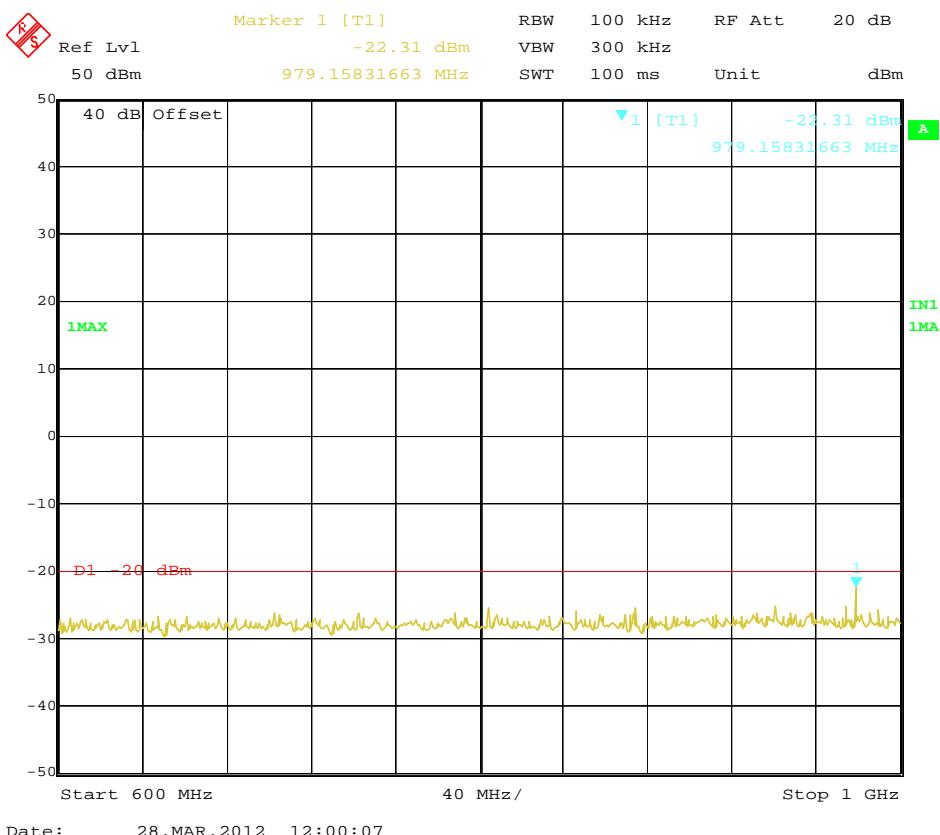
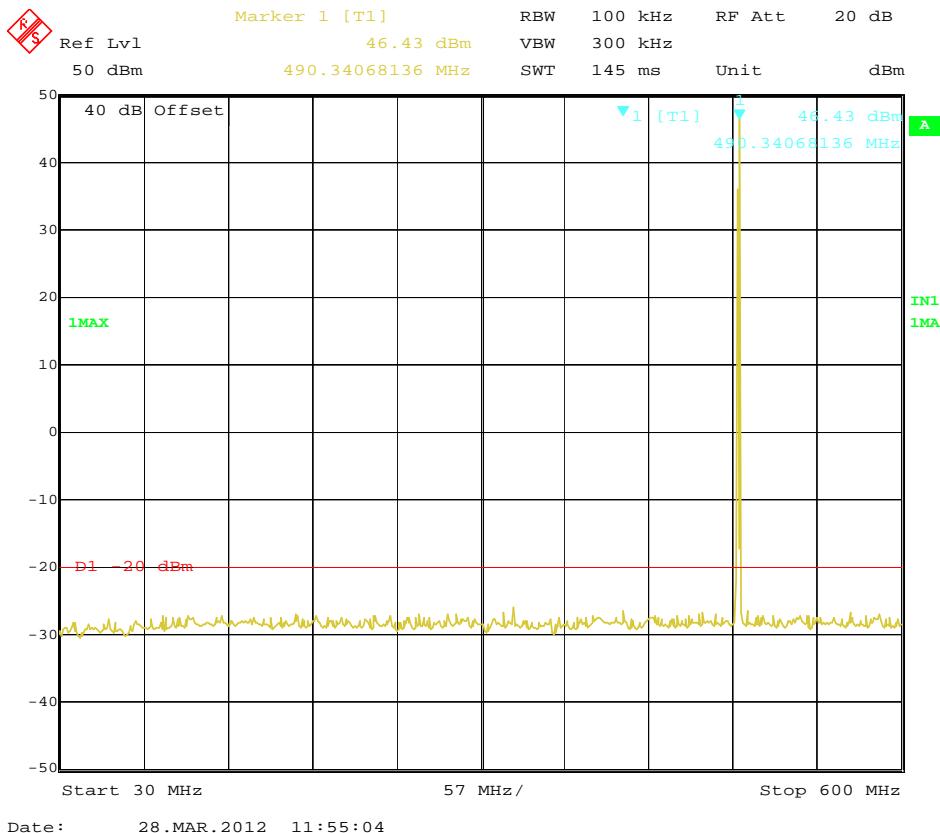


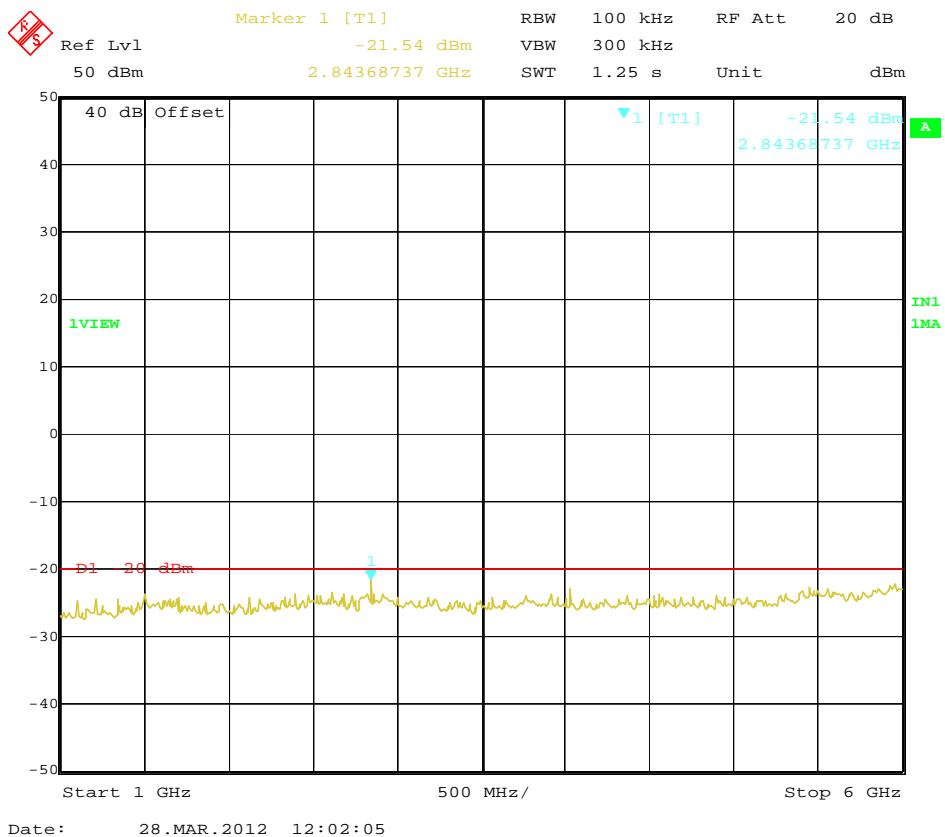
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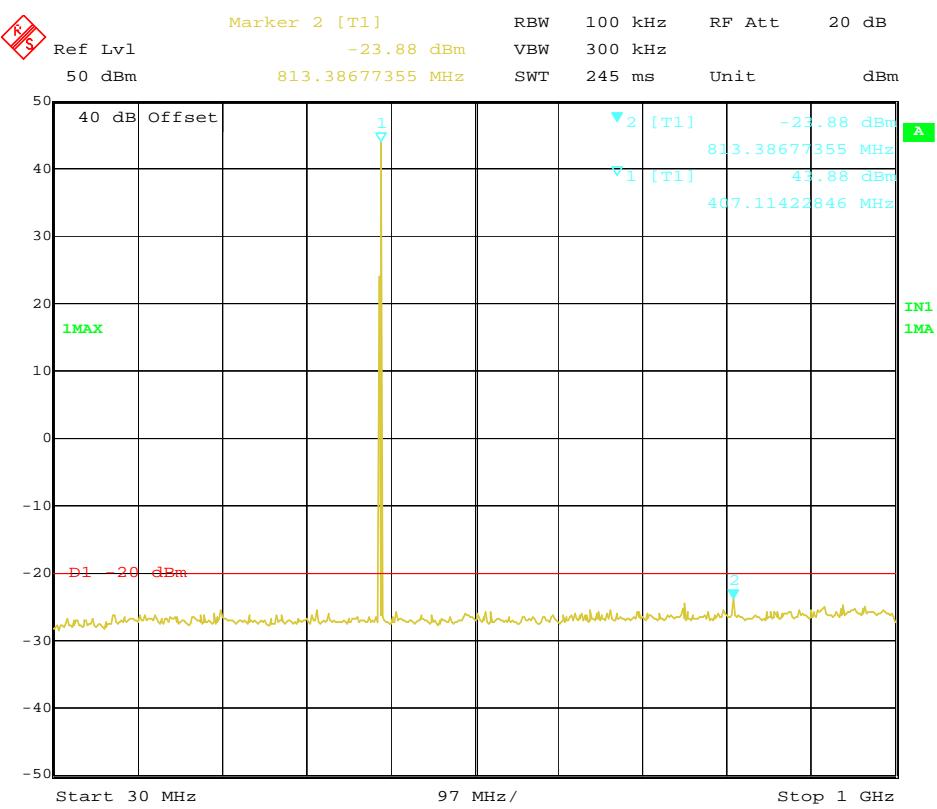
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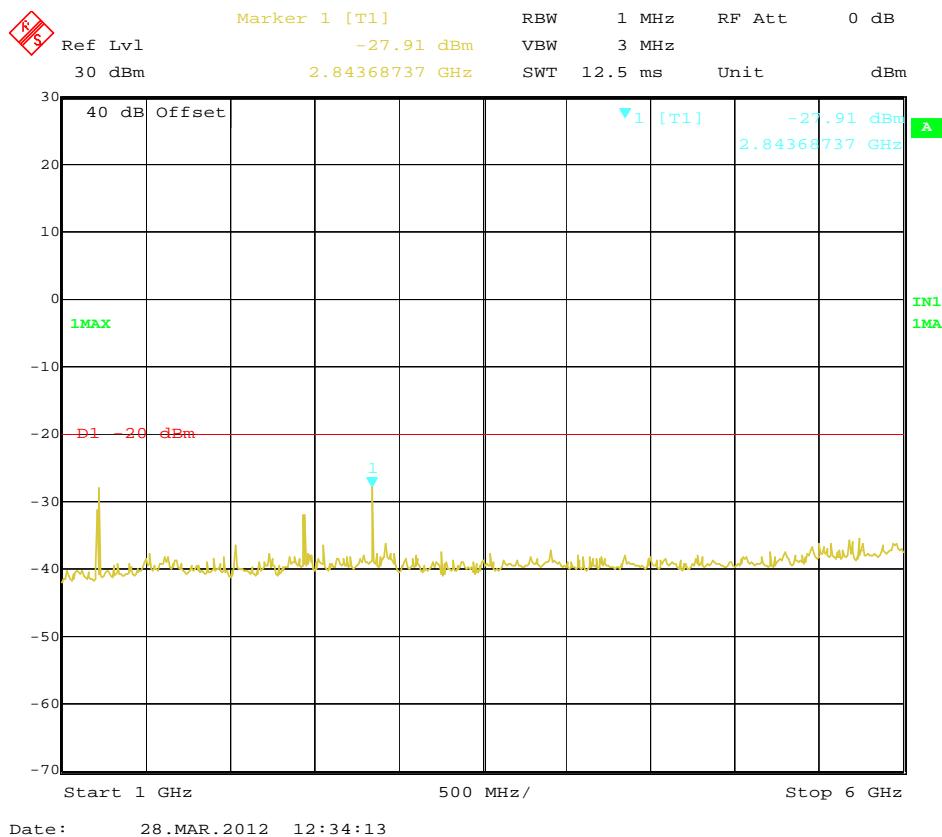
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	High	489.5000	979.16	-22.31	2843.69	-21.54	-20dBm
Test Results				Compliance				



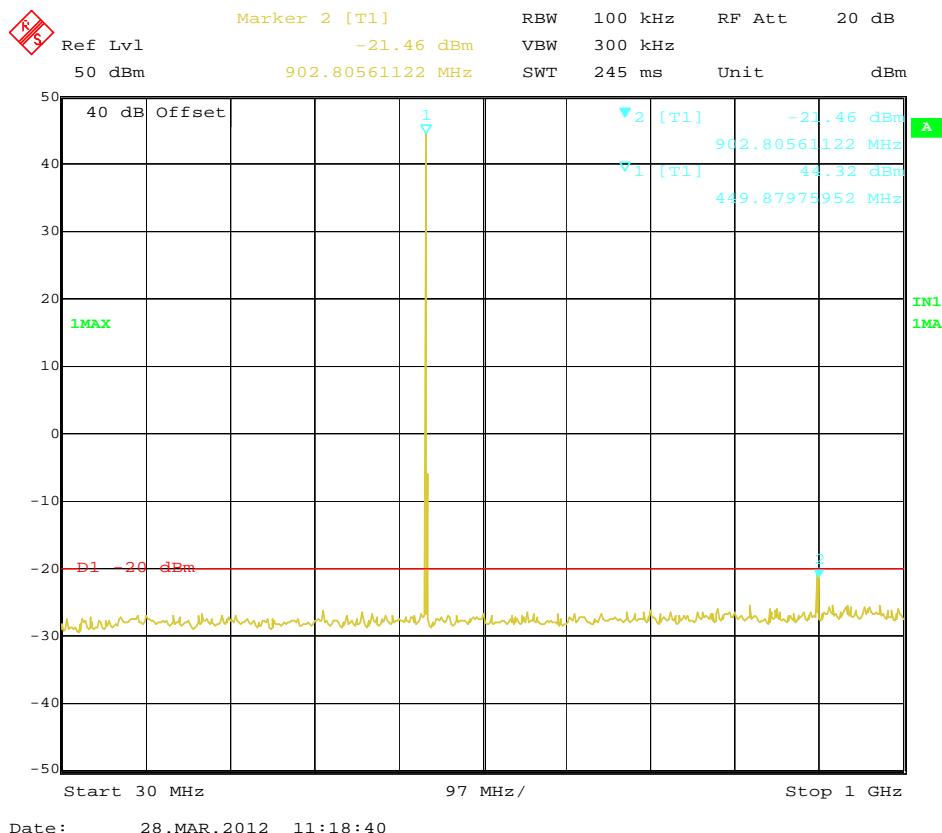
**For Rated Middle Power (25Watt)**

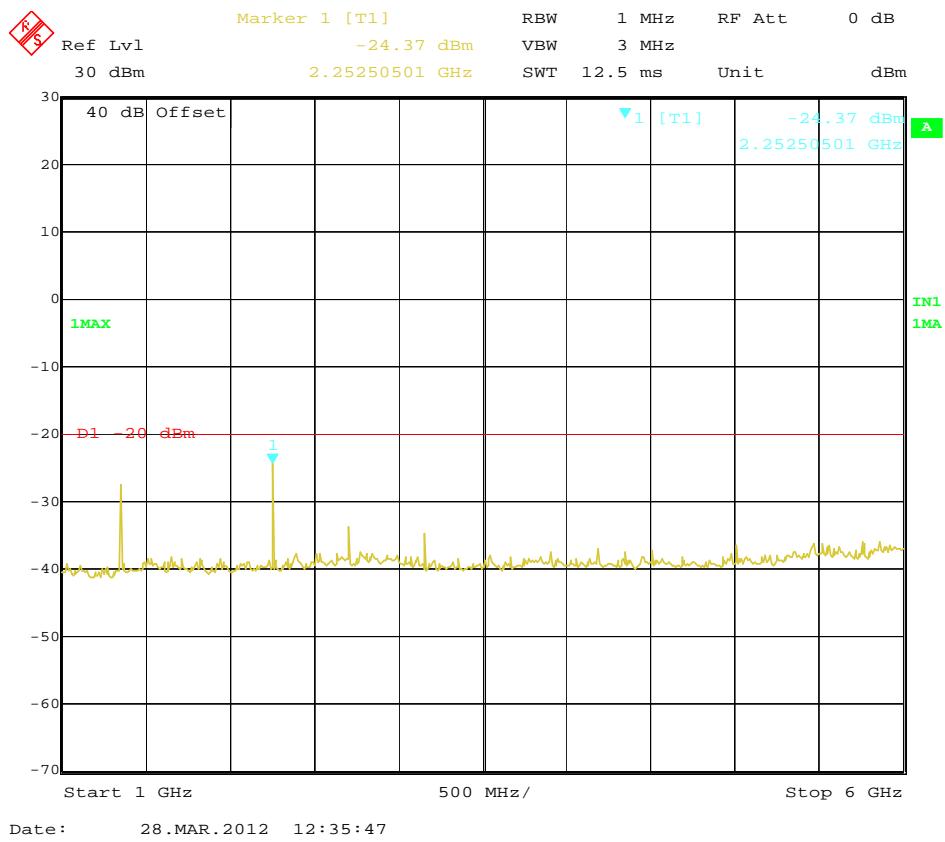
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	Low	406.5000	513.38	-23.88	2843.65	-27.91	-20dBm
Test Results				Compliance				



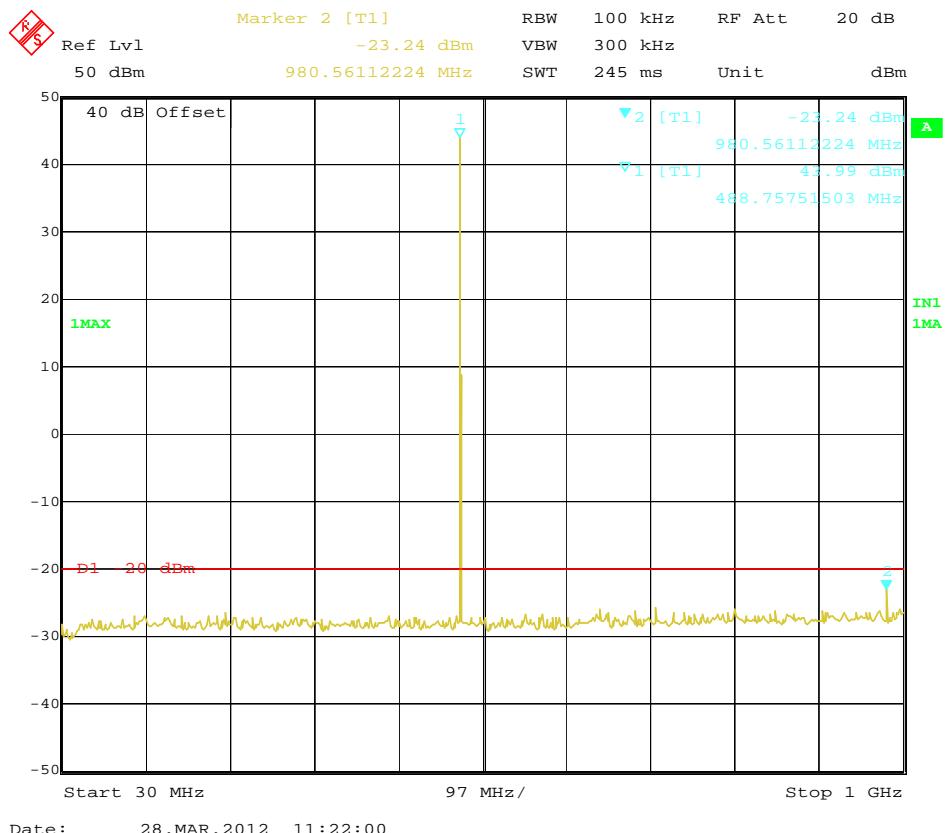


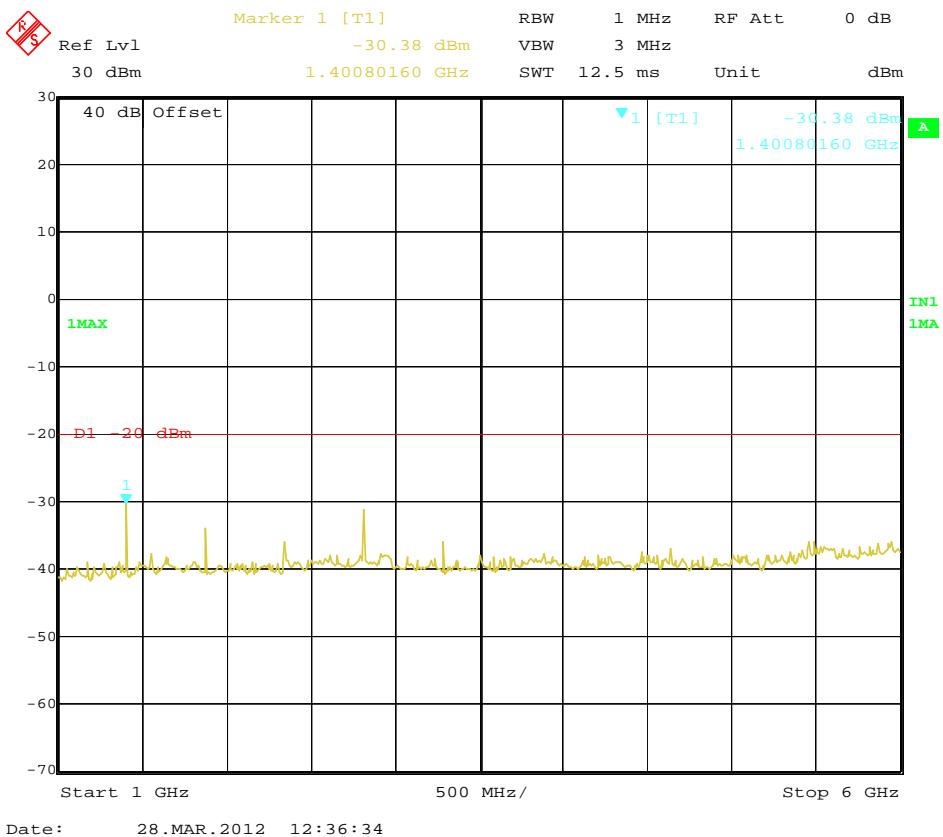
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	Middle	450.5000	902.80	-21.46	2252.50	-24.37	-20dBm
Test Results				Compliance				



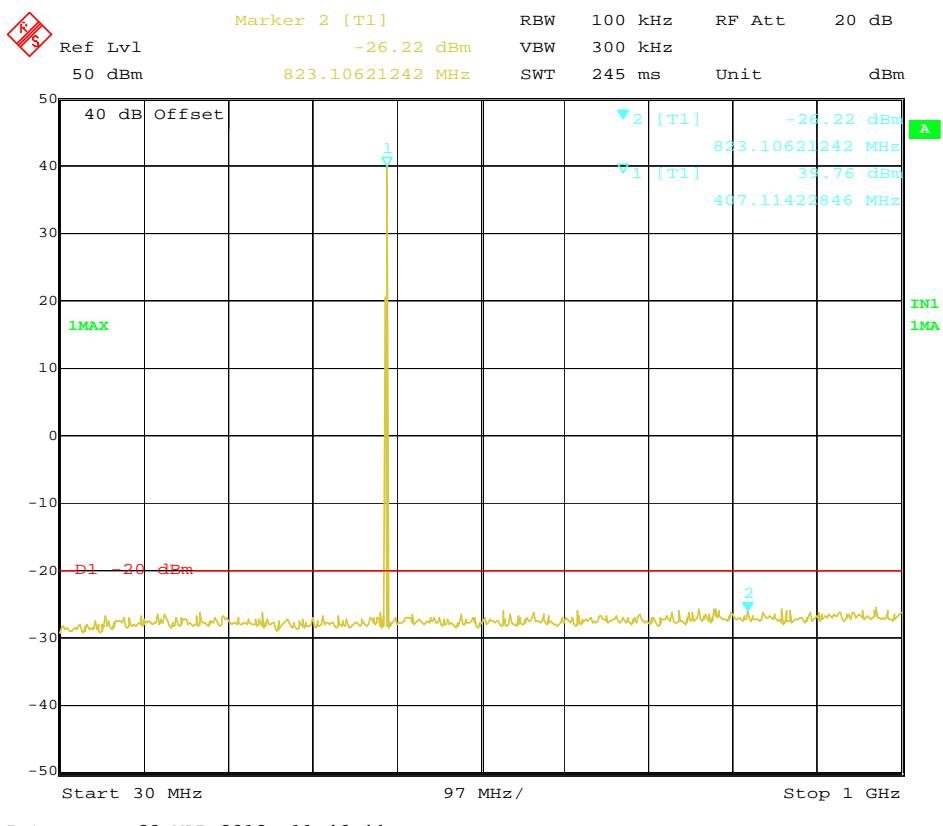


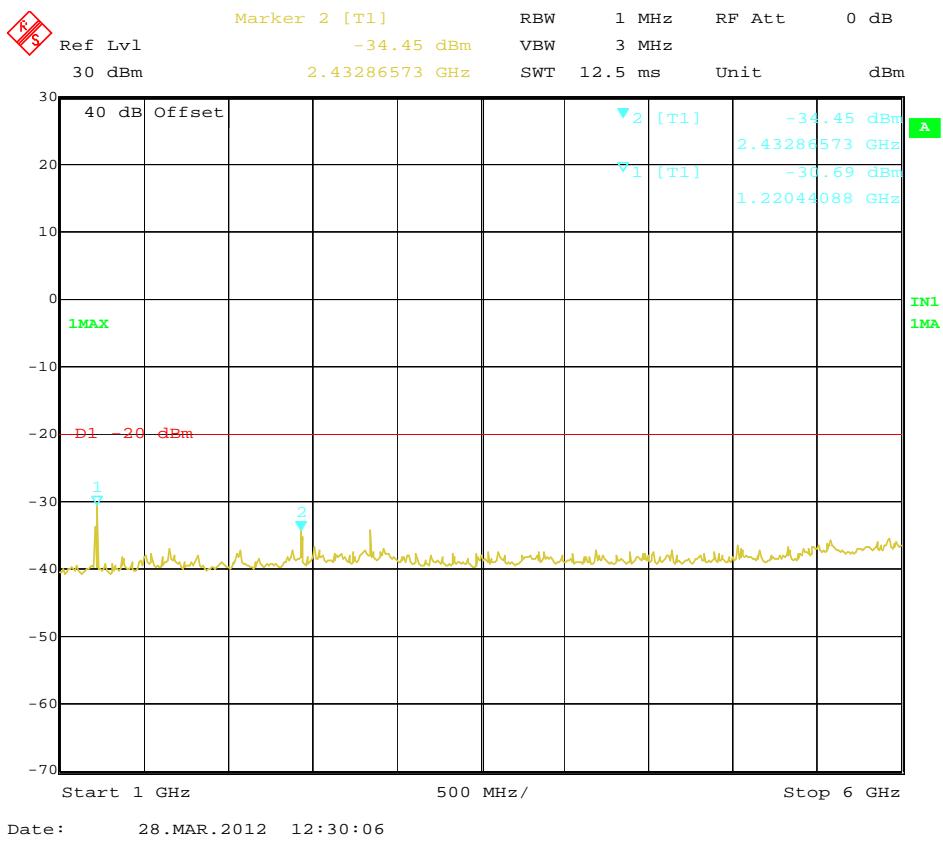
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	High	489.5000	980.56	-23.24	1400.80	-30.38	-20dBm
Test Results				Compliance				



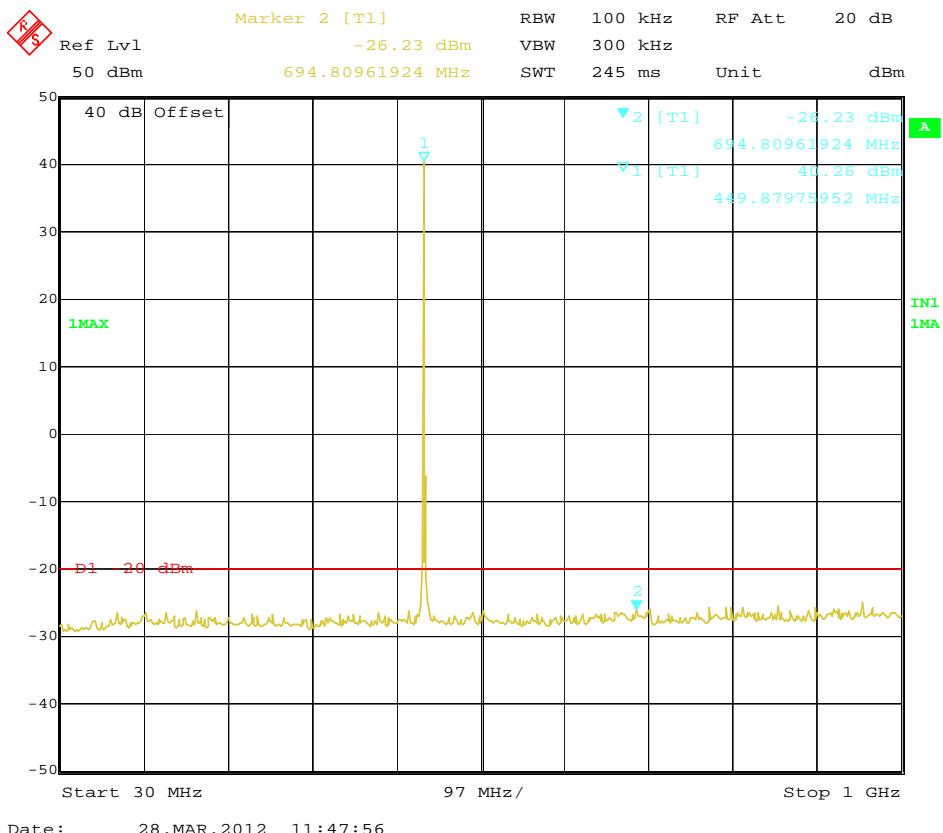
**For Rated Low Power (10Watt)**

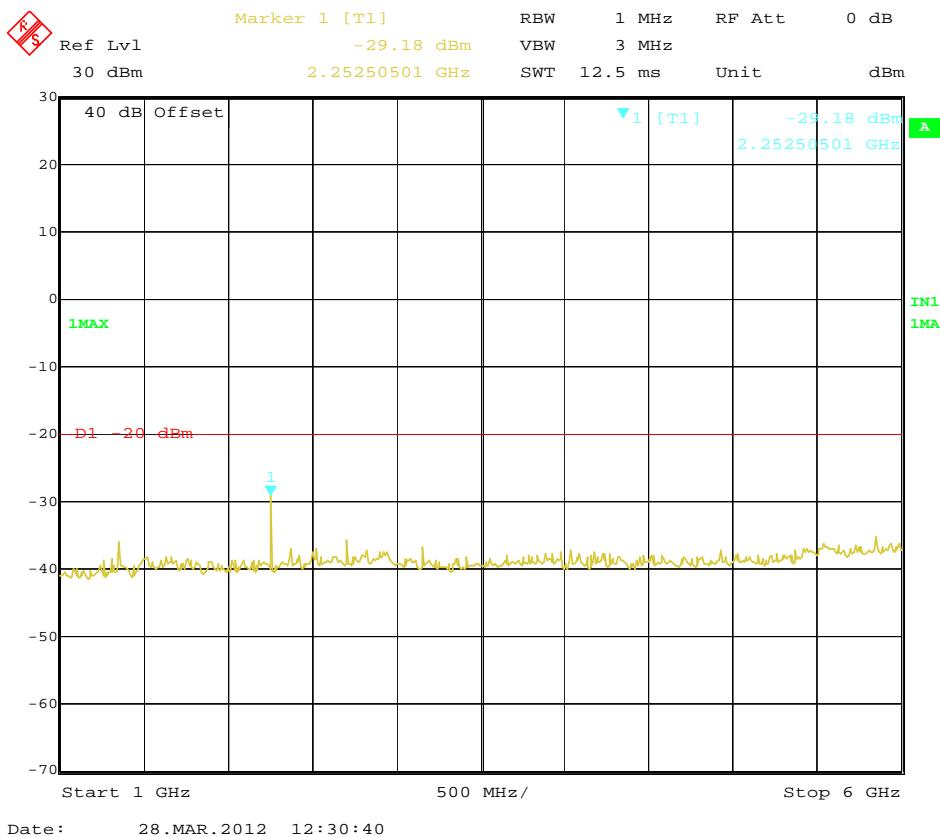
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	Low	406.5000	823.10	-26.22	2432.86	-34.45	-20dBm
Test Results				Compliance				



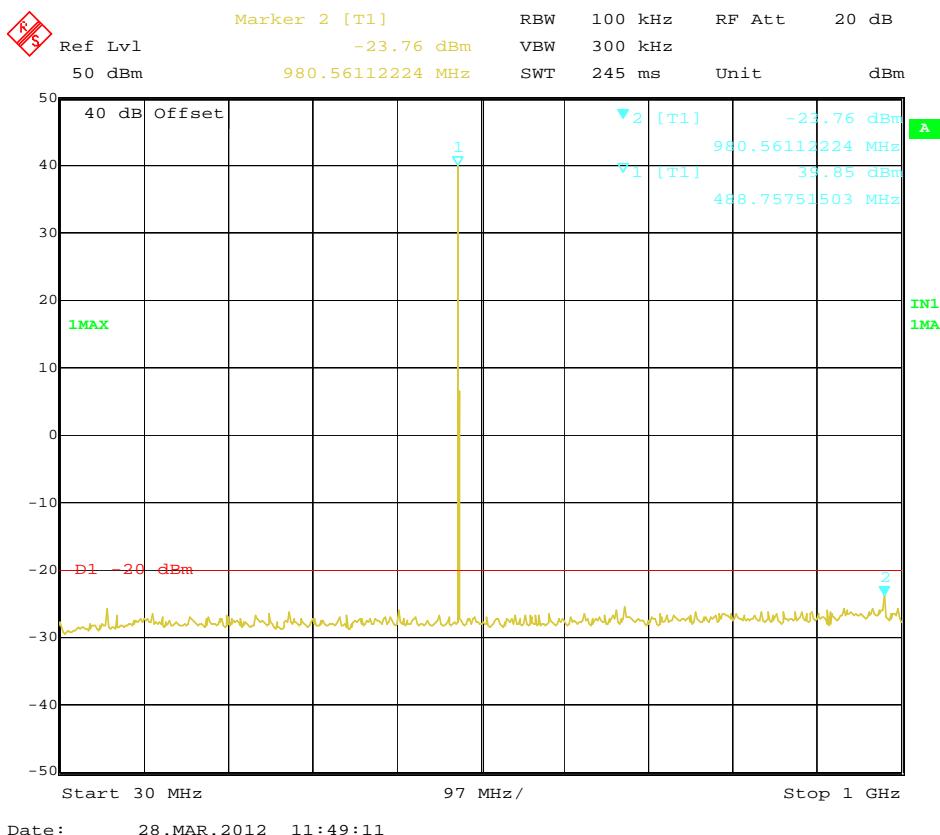


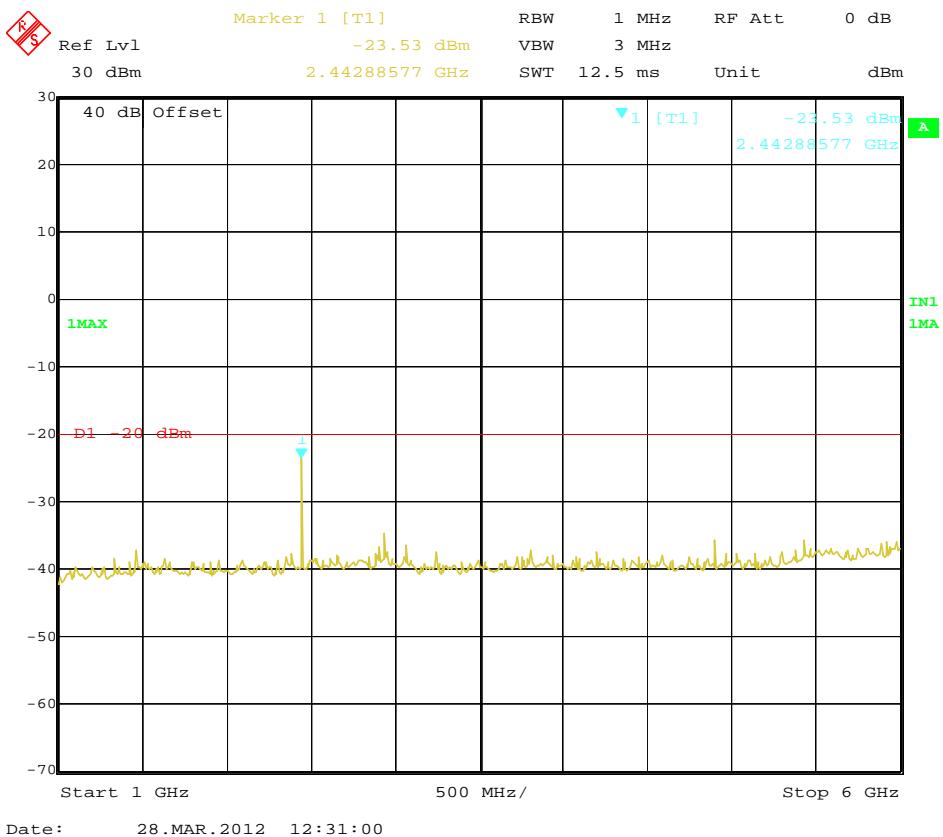
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	Middle	450.5000	694.81	-26.23	2252.50	-29.18	-20dBm
Test Results				Compliance				



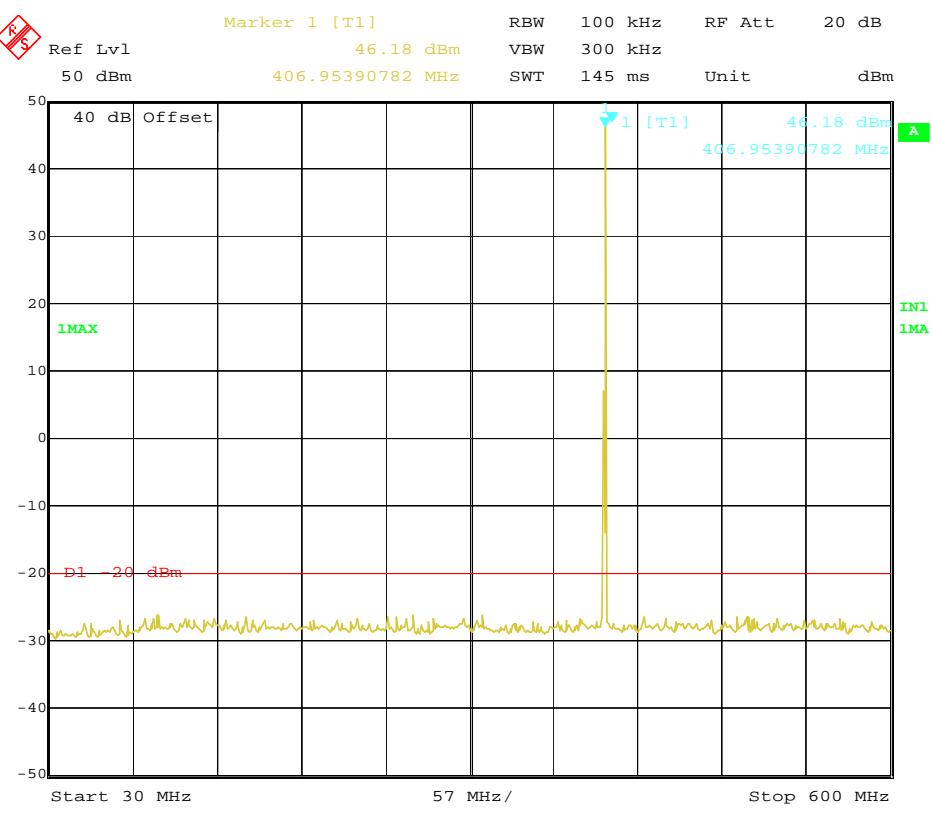


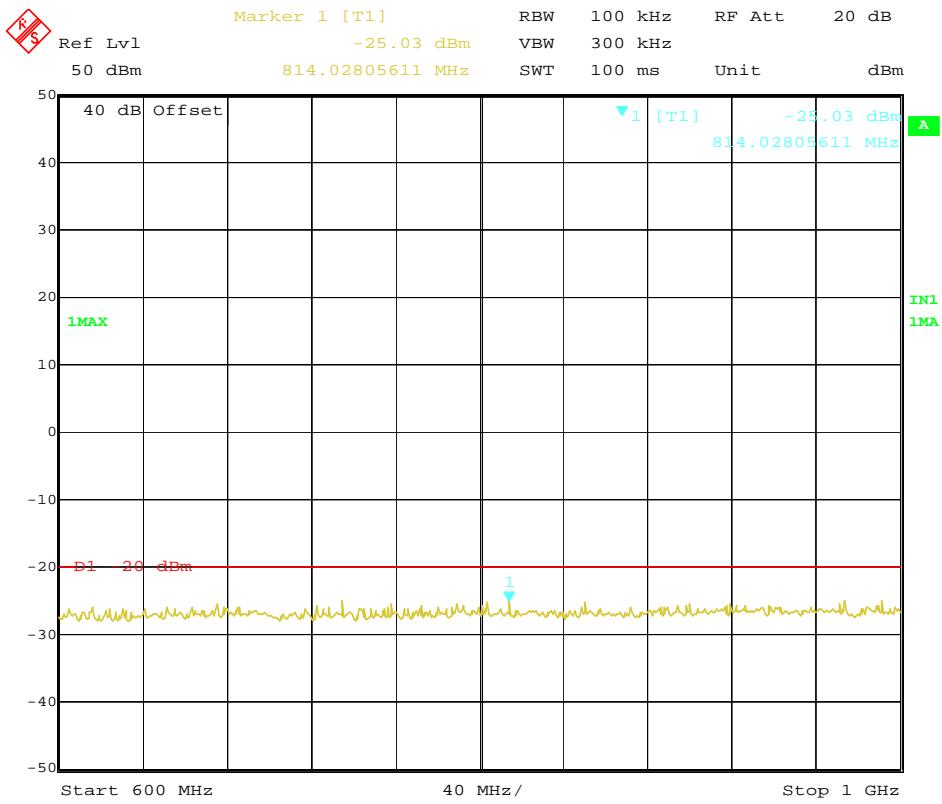
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	Middle	489.5000	980.56	-23.76	2442.89	-23.53	-20dBm
Test Results				Compliance				



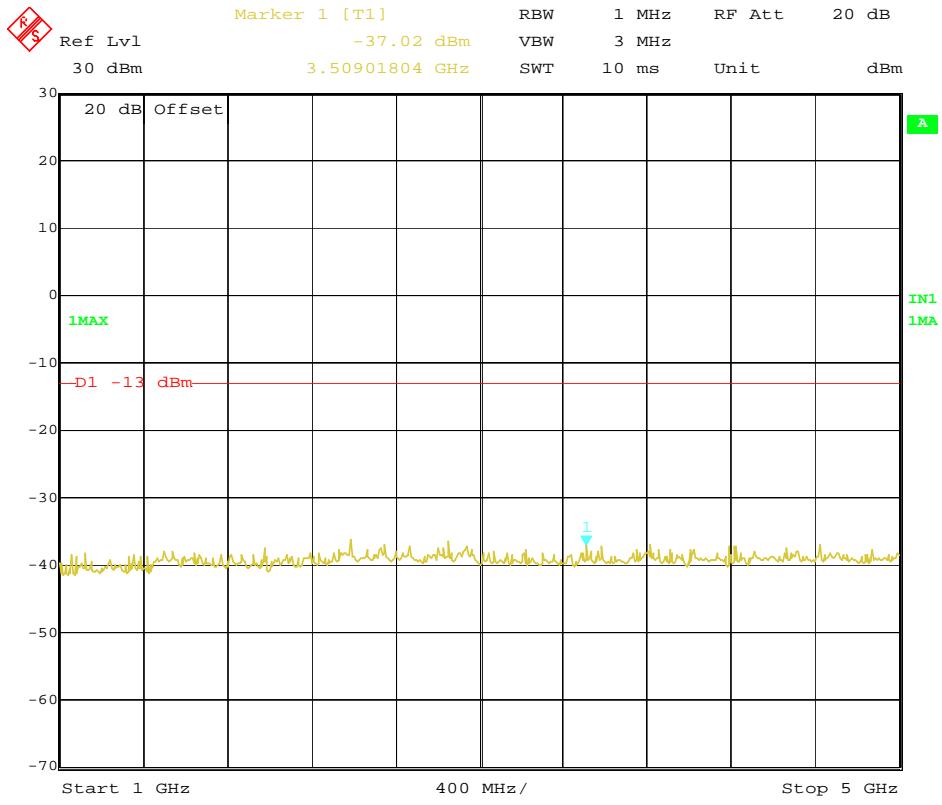
**Only for IC Review (Not For FCC Review)**

Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		IC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	25KHz	Low	406.5000	814.02	-25.03	3509.01	-37.02	-13dBm
Test Results				Compliance				



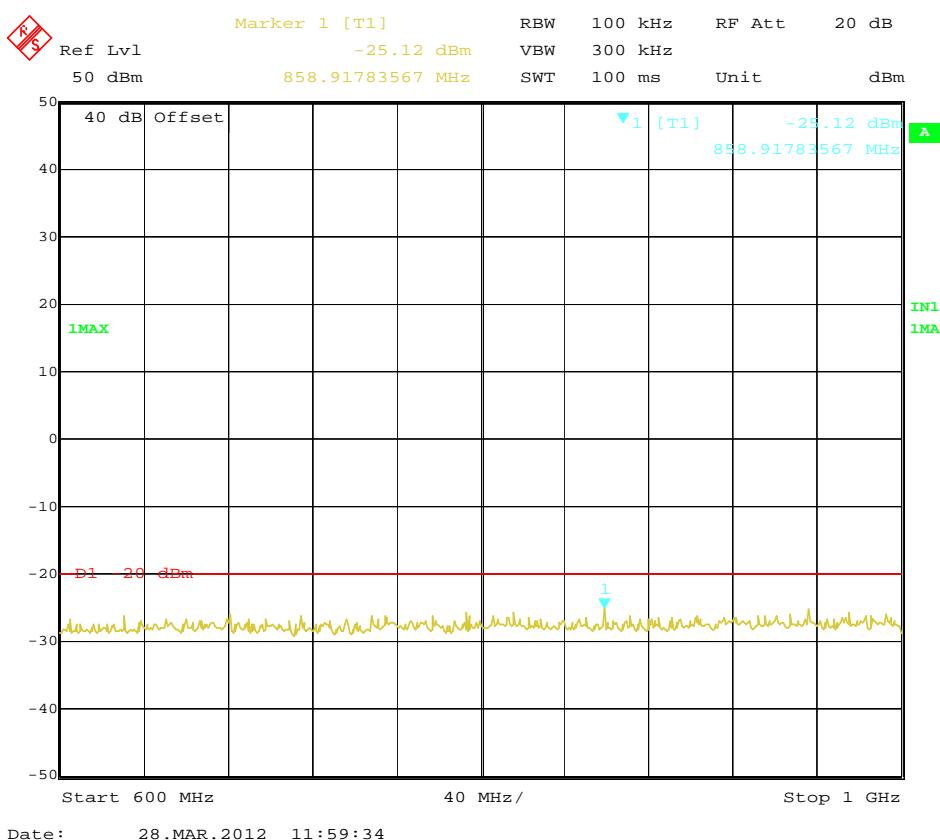
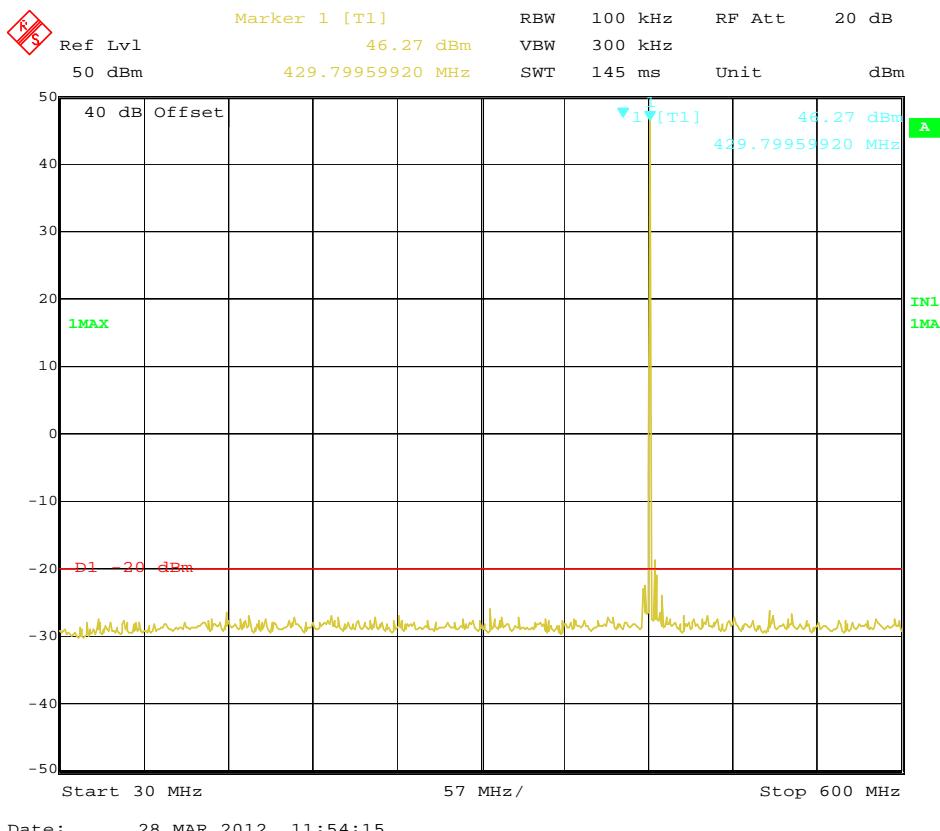


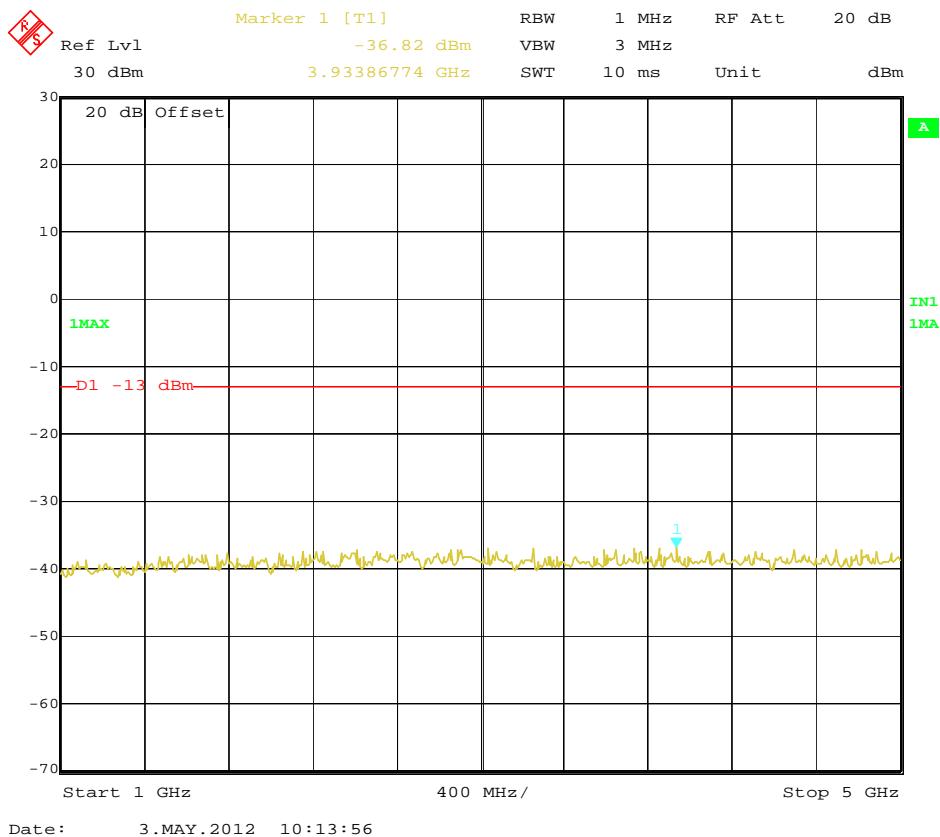
Date: 28.MAR.2012 11:59:21



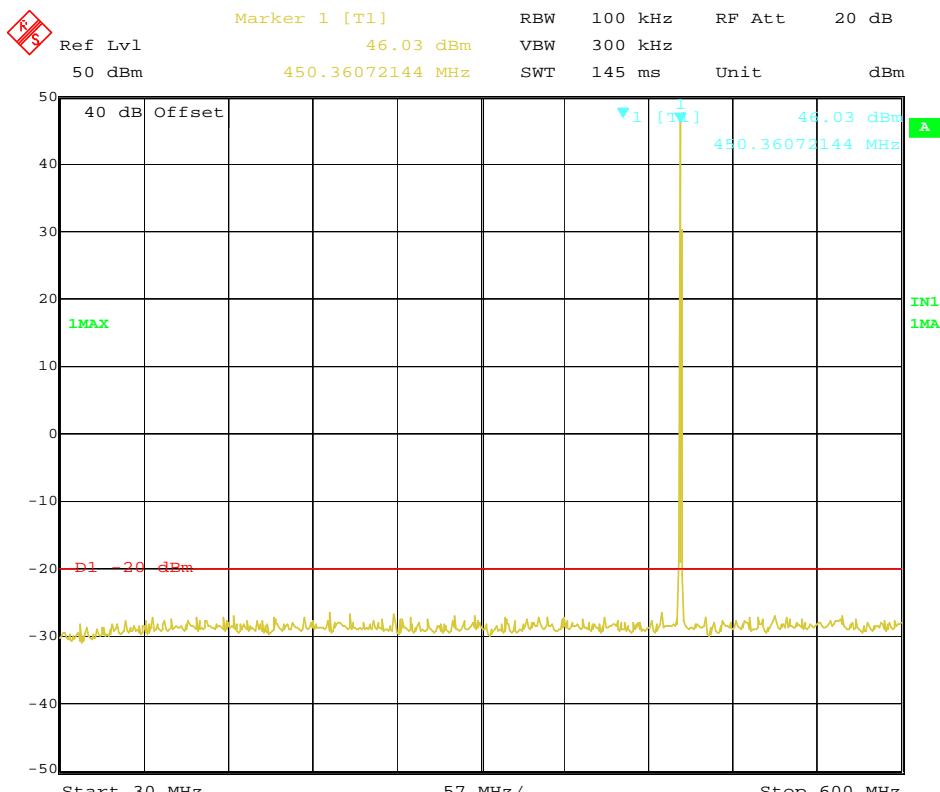
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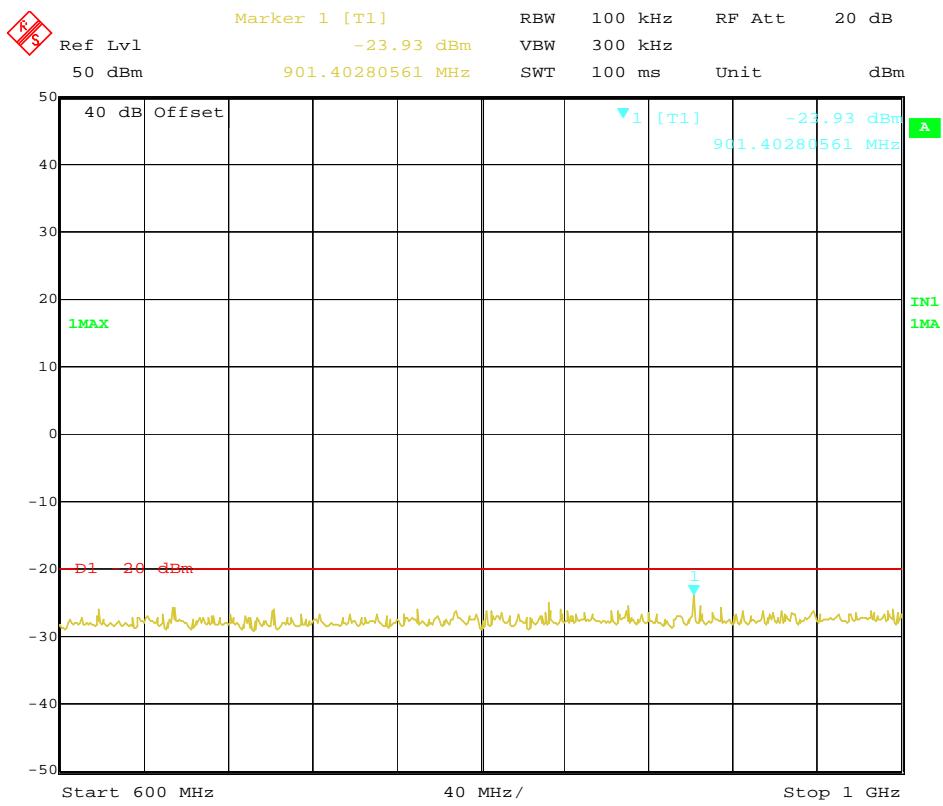
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above1GHz		IC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	25KHz	Middle	429.5000	858.91	-25.12	3933.86	-36.82	-13dBm
Test Results				Compliance				



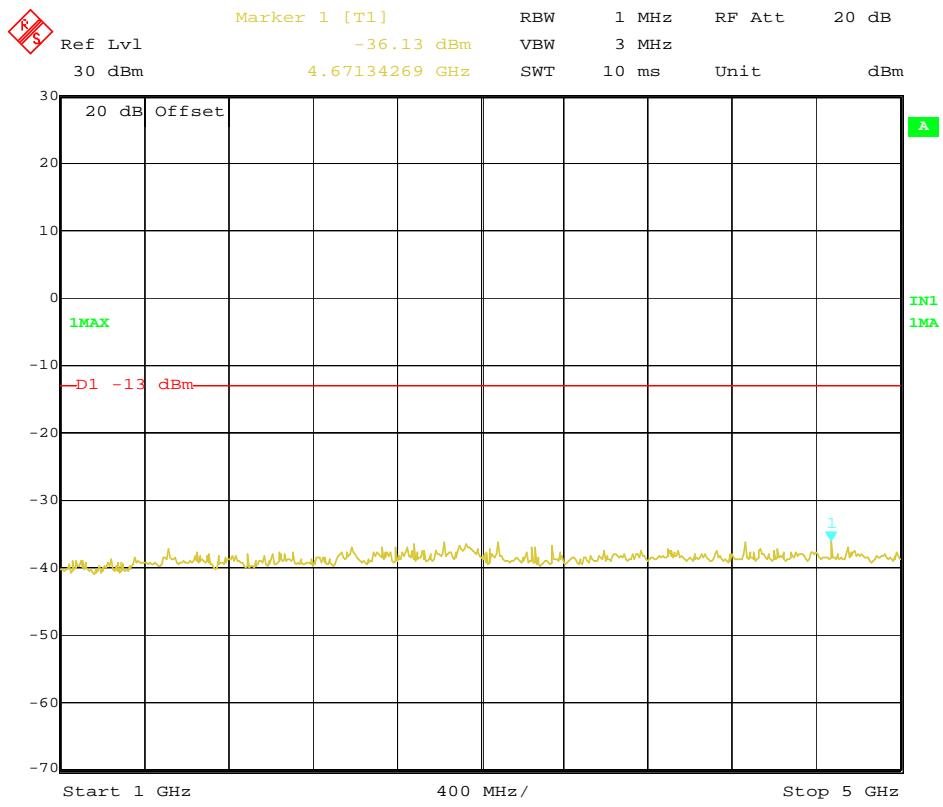


Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above1GHz		IC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	25KHz	Middle	450.5000	901.40	-23.93	4671.34	-36.13	-13dBm
Test Results				Compliance				



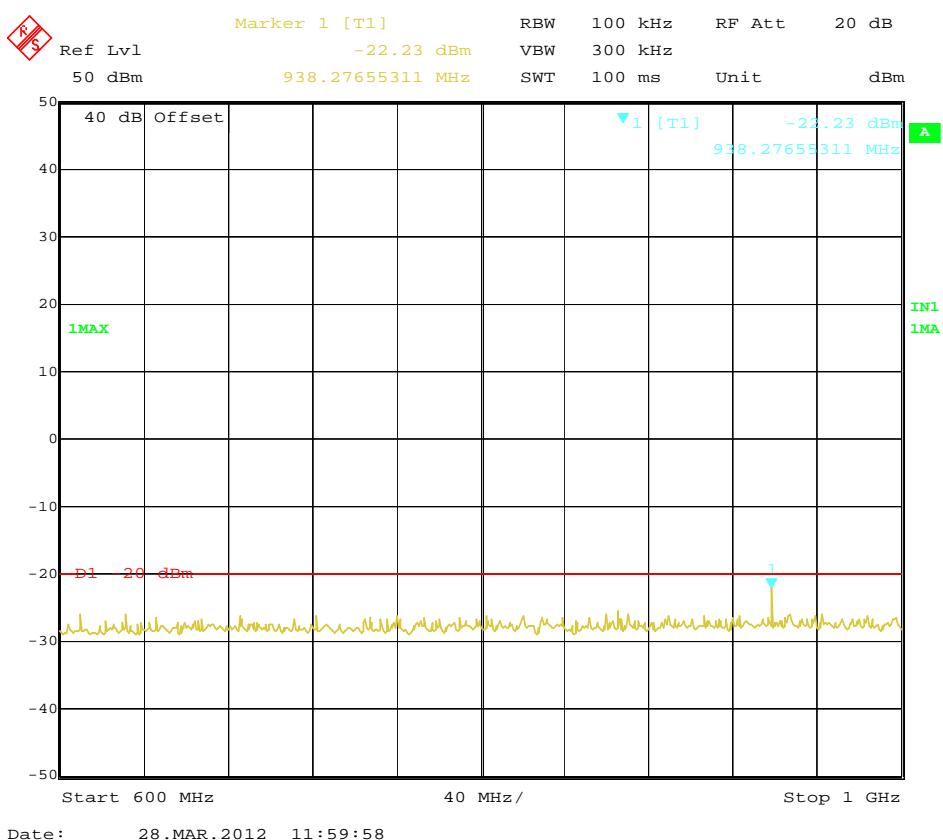
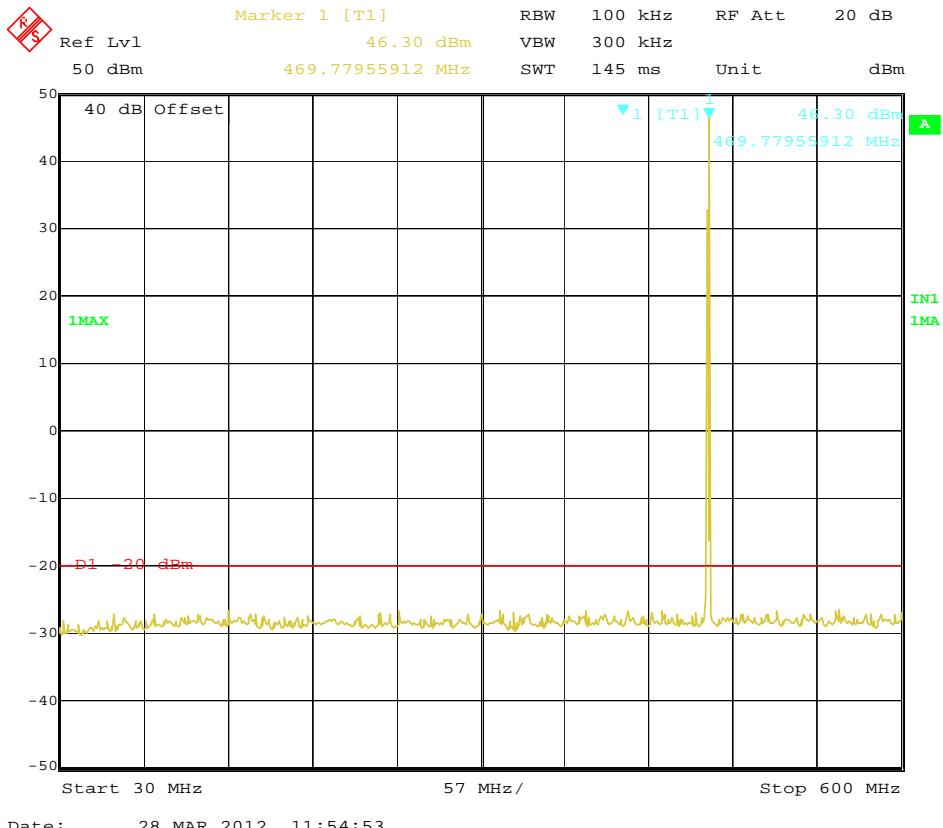


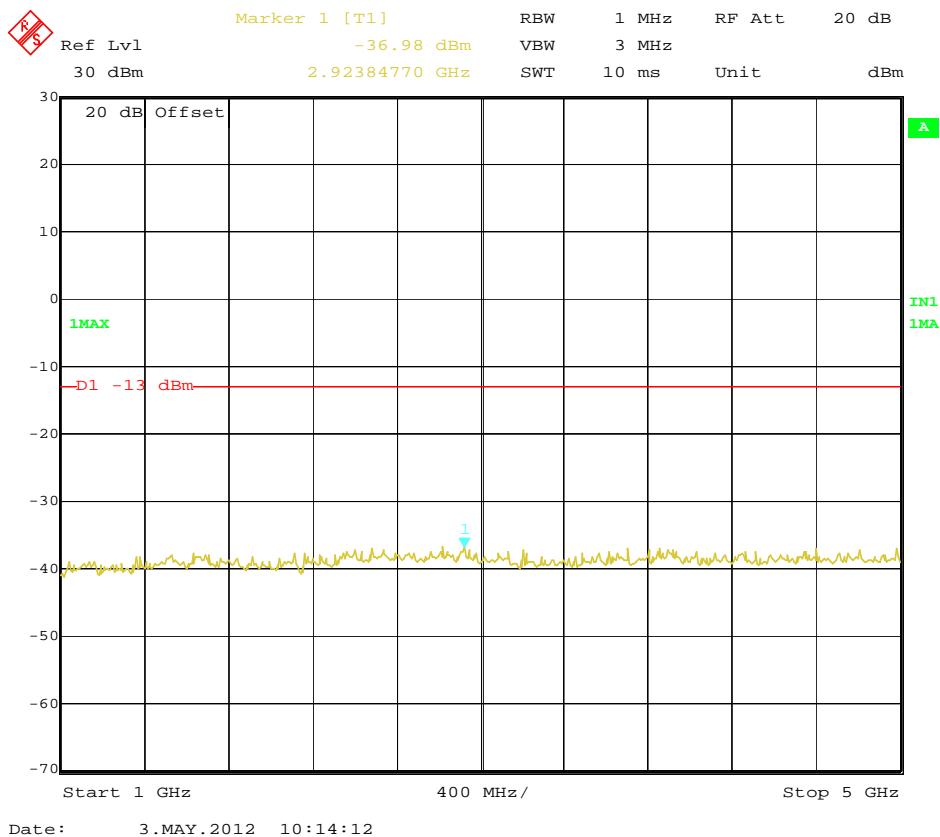
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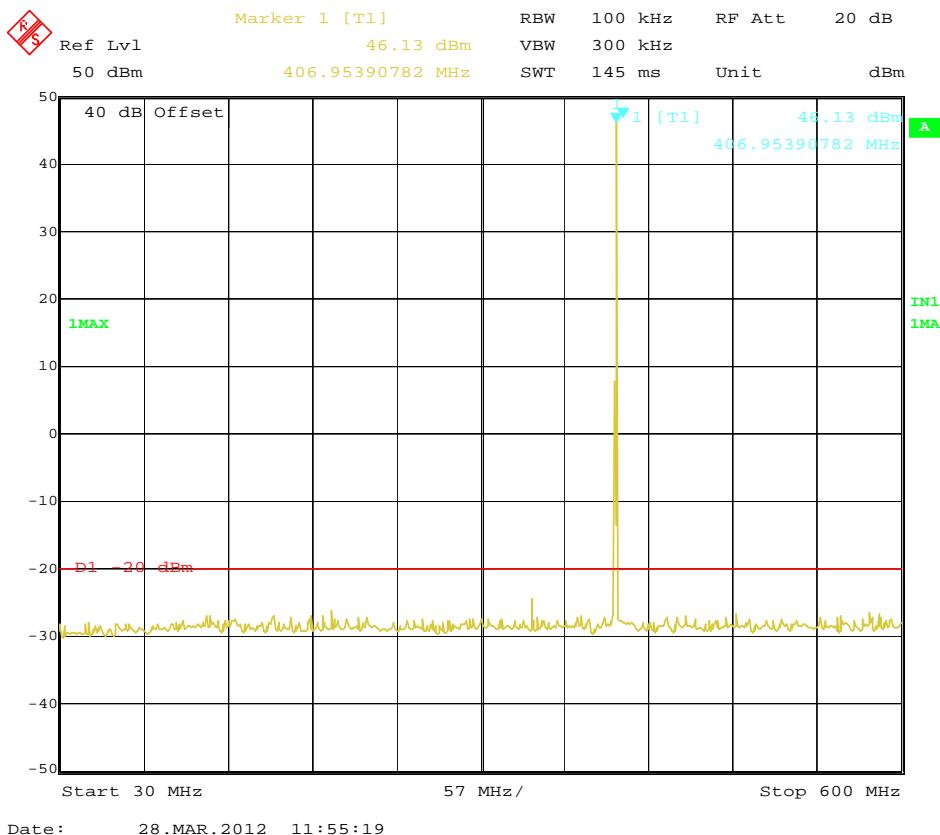
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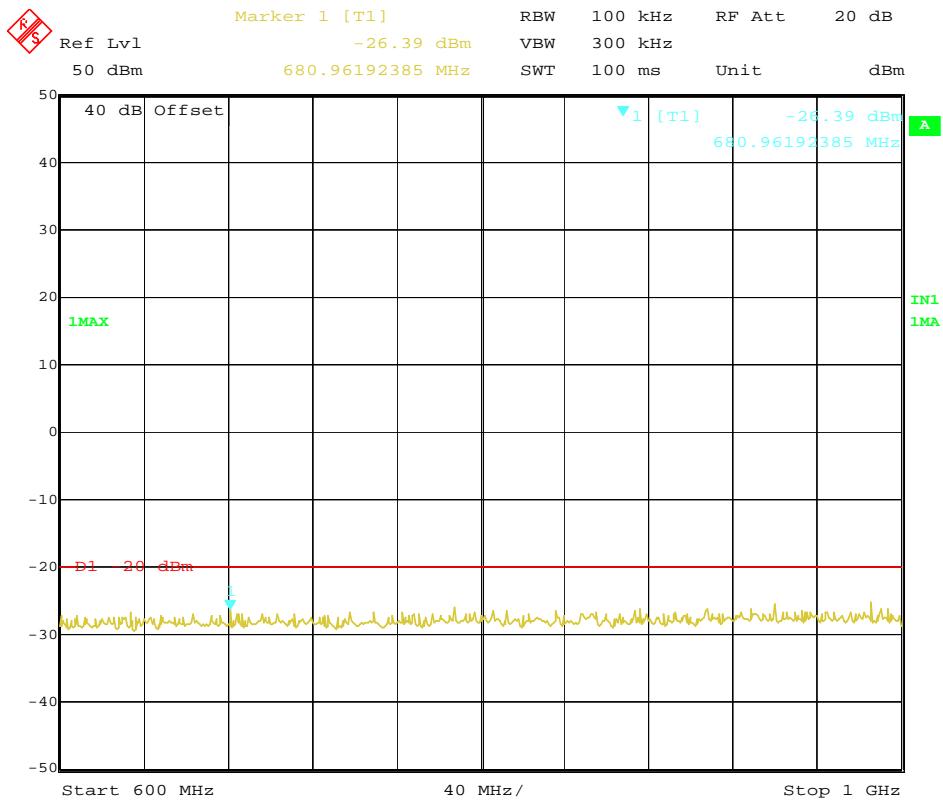
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above1GHz		IC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	25KHz	High	469.0000	938.27	-22.23	2923.84	-36.98	-13dBm
Test Results				Compliance				



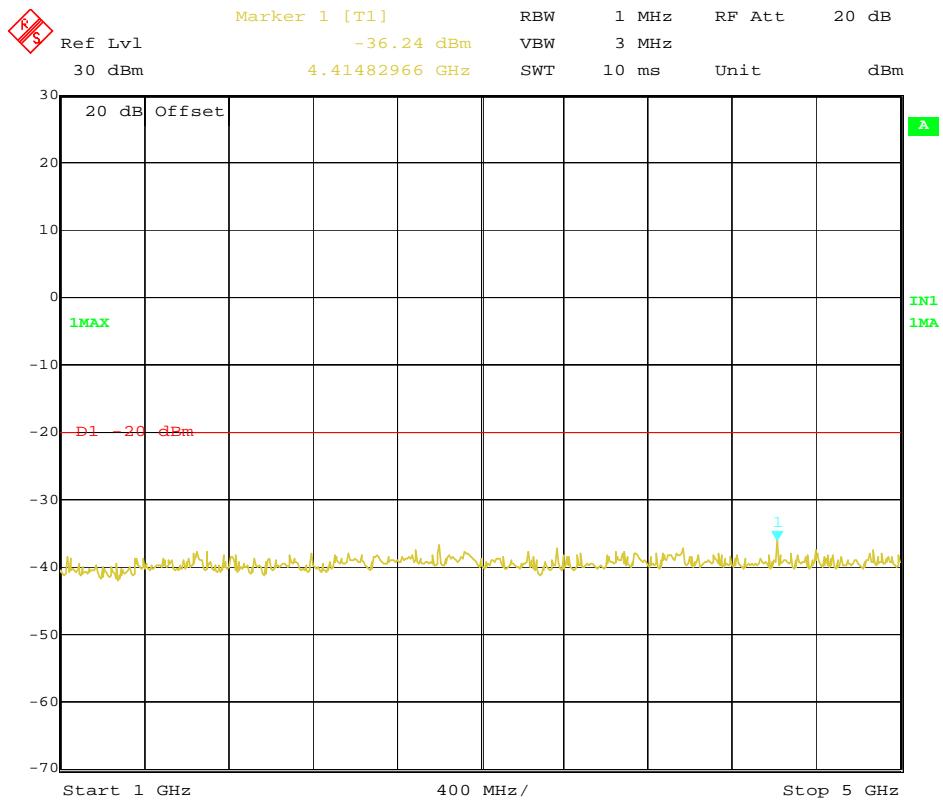


Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		IC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	Low	406.5000	680.96	-26.39	4414.82	-36.24	-20dBm
Test Results				Compliance				



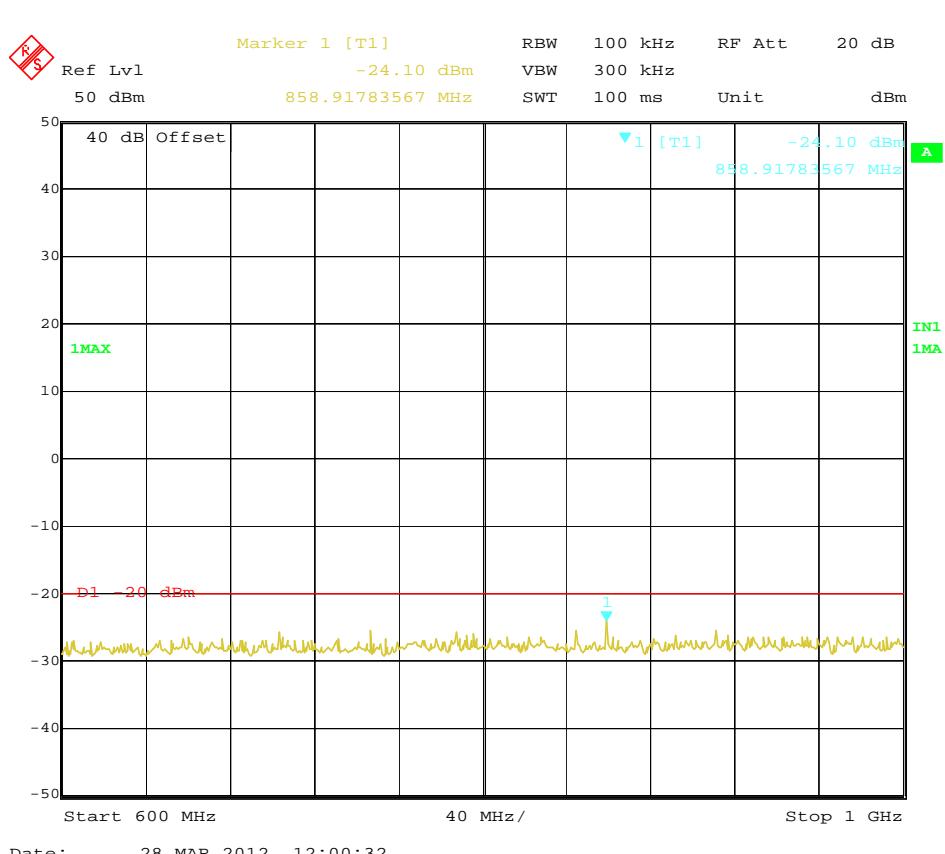
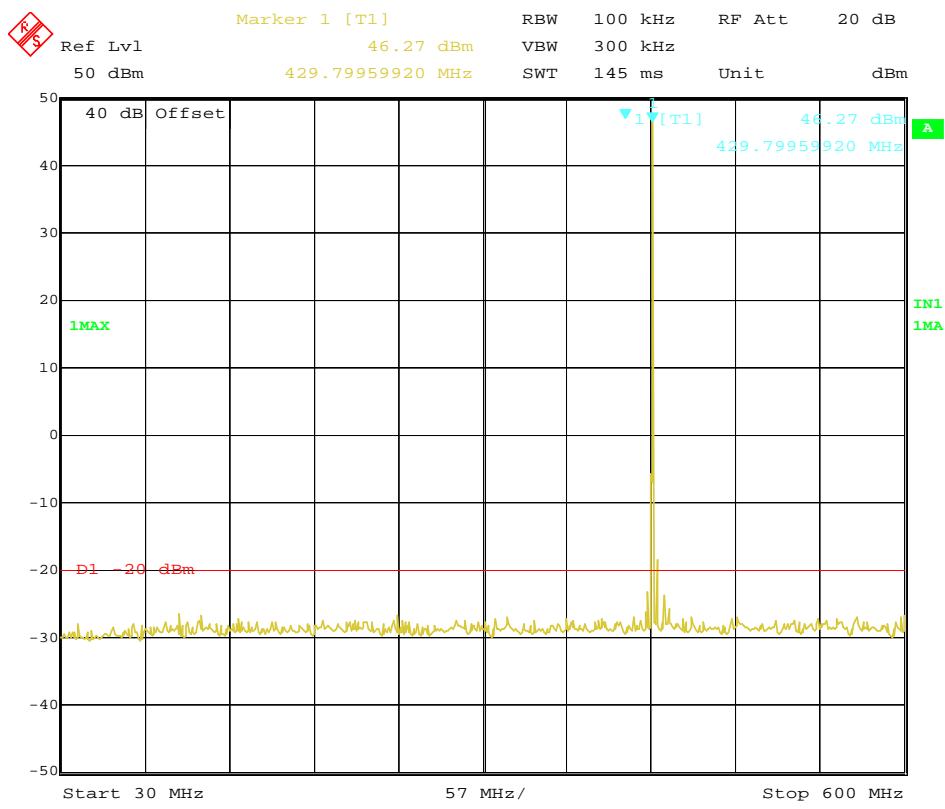


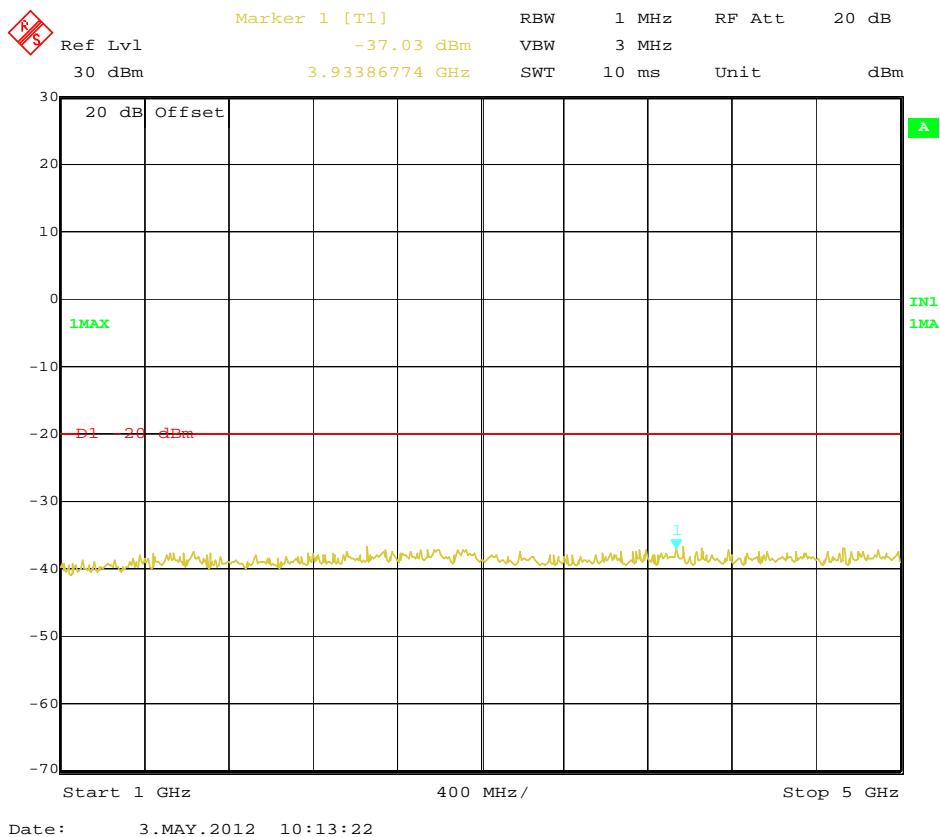
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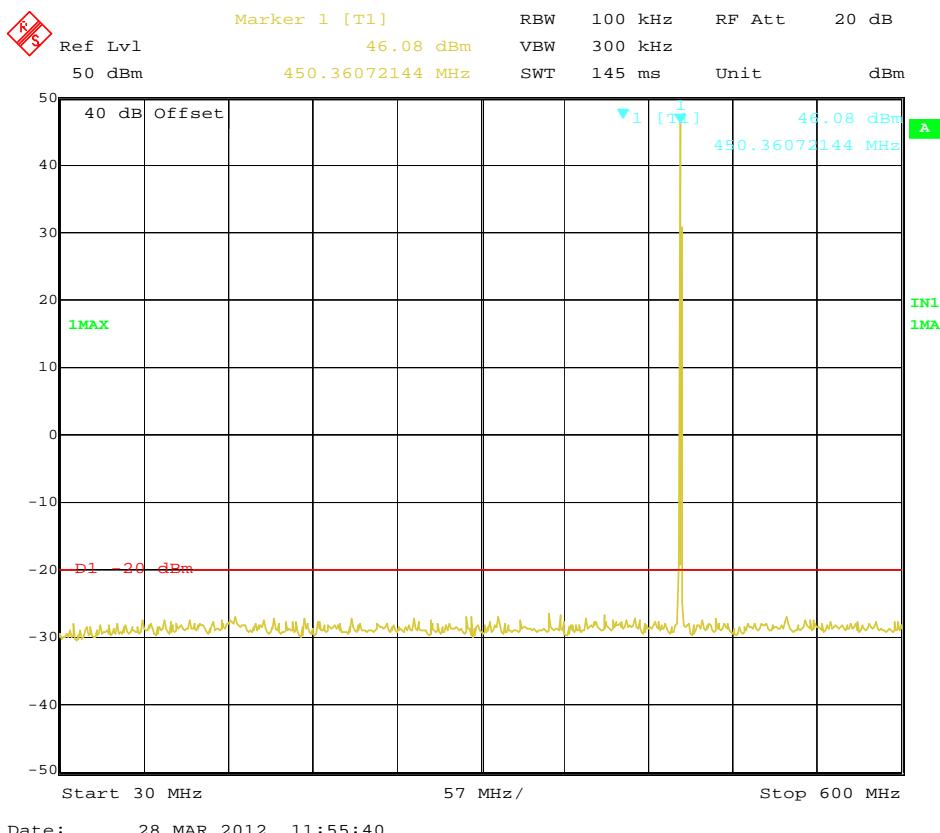
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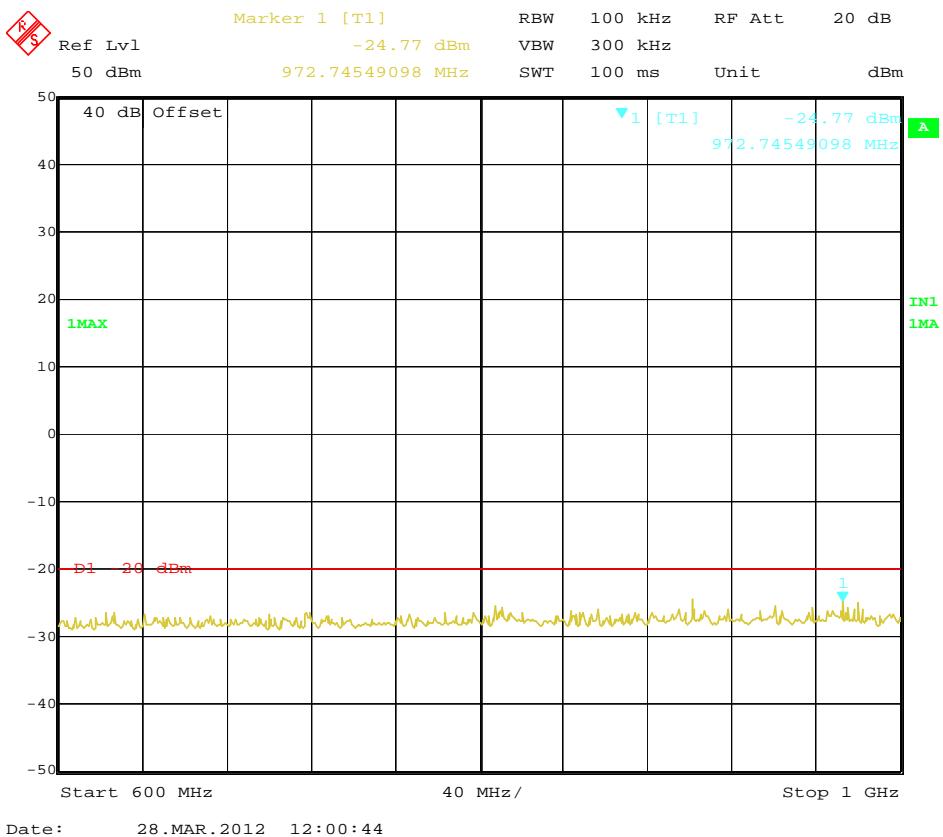
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above1GHz		IC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	Middle	429.5000	558.91	-24.10	3933.86	-37.03	-20dBm
Test Results				Compliance				



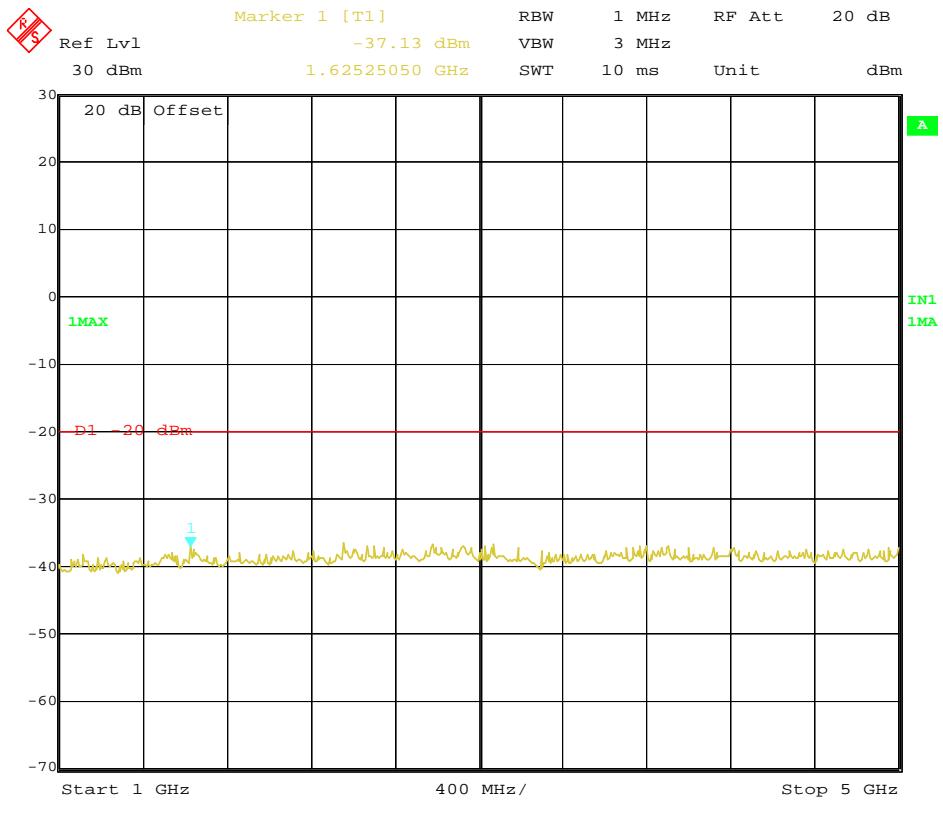


Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		IC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	Middle	450.5000	972.74	-24.77	1625.25	-37.13	-20dBm
Test Results				Compliance				



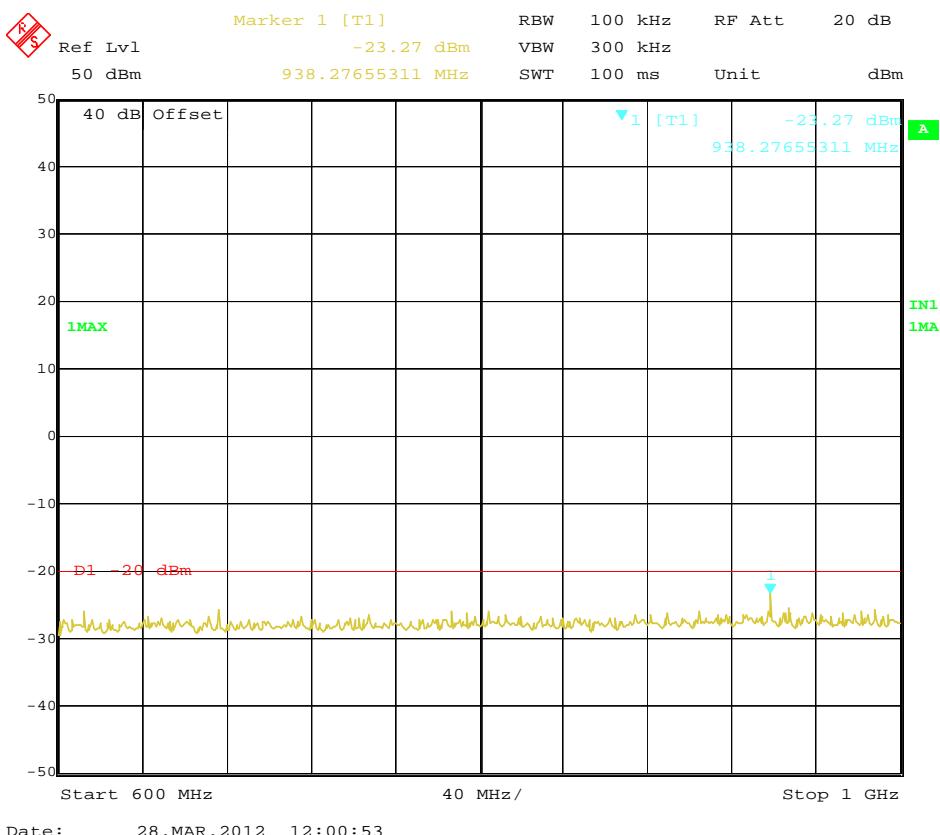
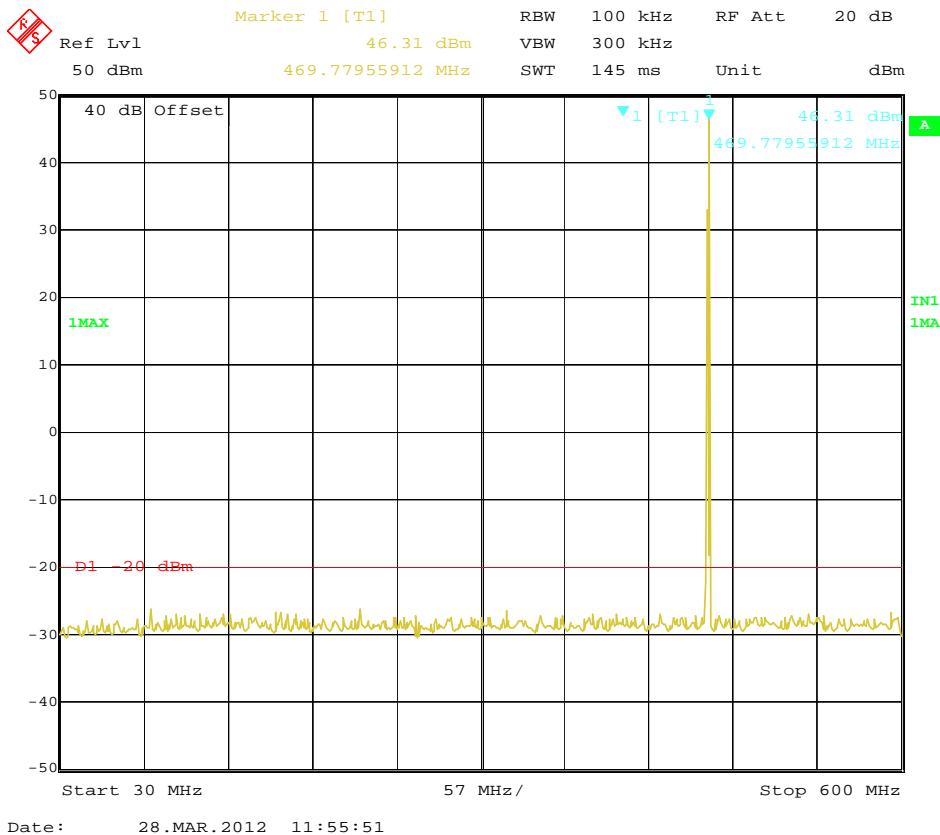


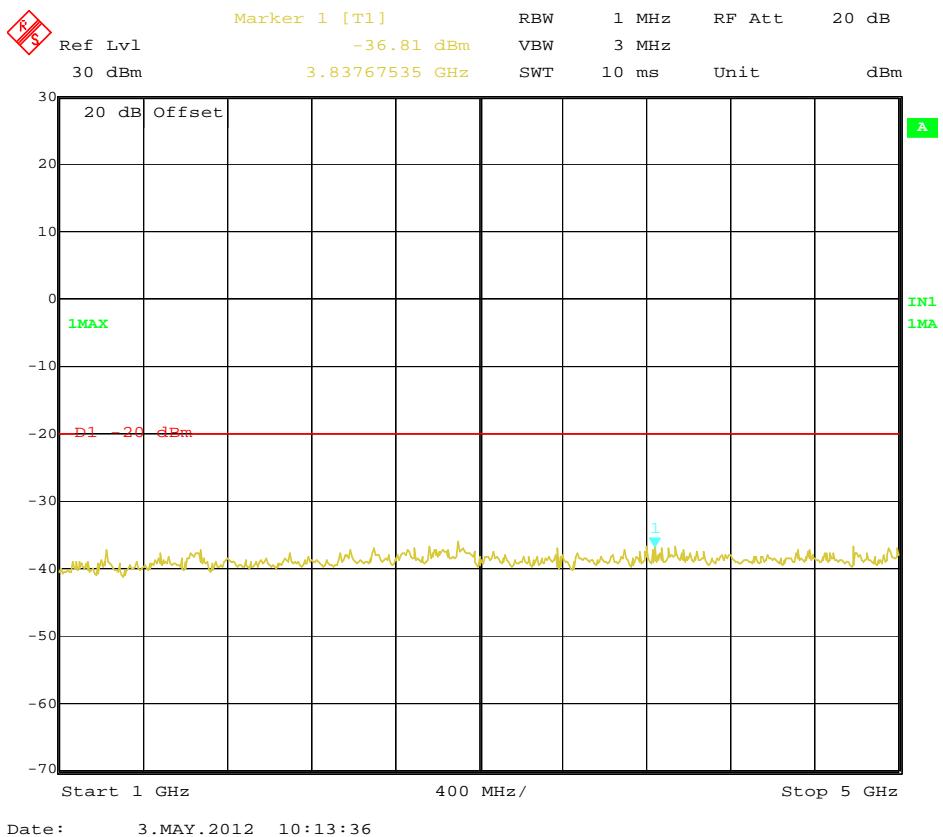
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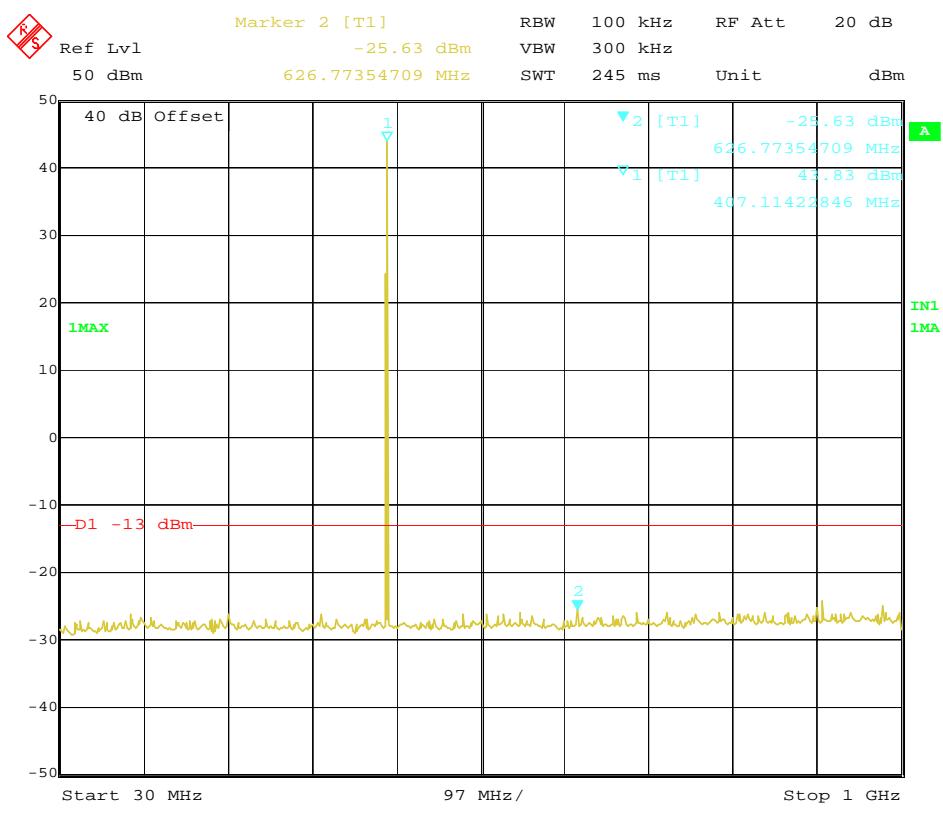
Date: 3.MAY.2012 10:13:29

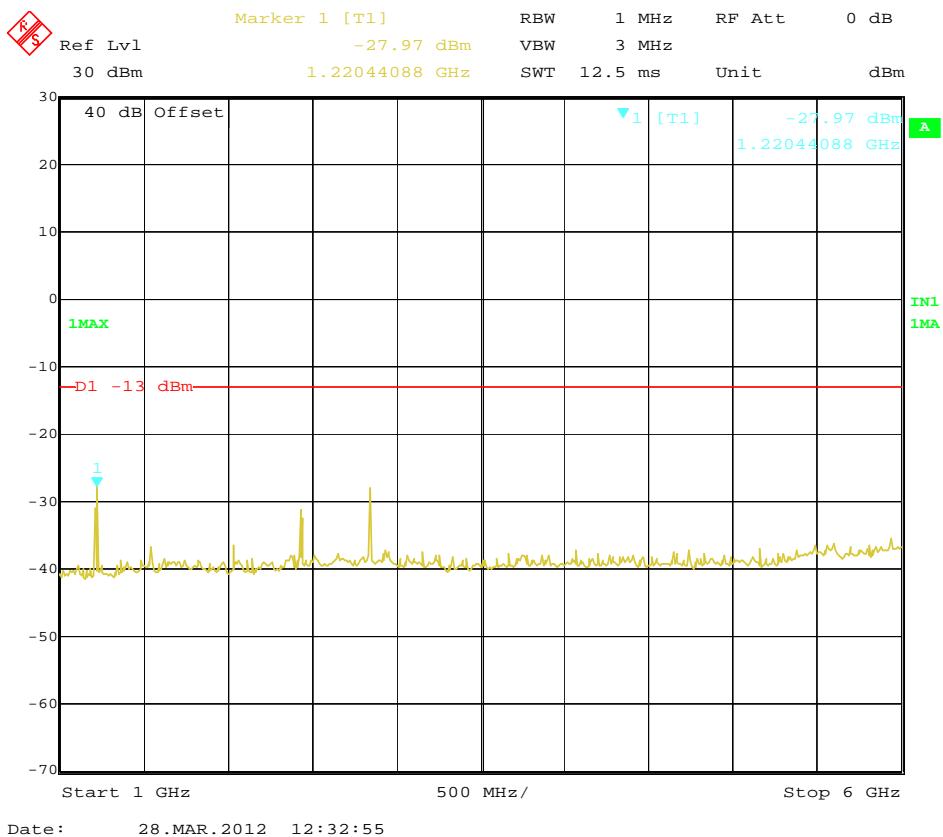
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above1GHz		IC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	High	469.0000	938.27	-23.27	3837.67	-36.81	-20dBm
Test Results				Compliance				



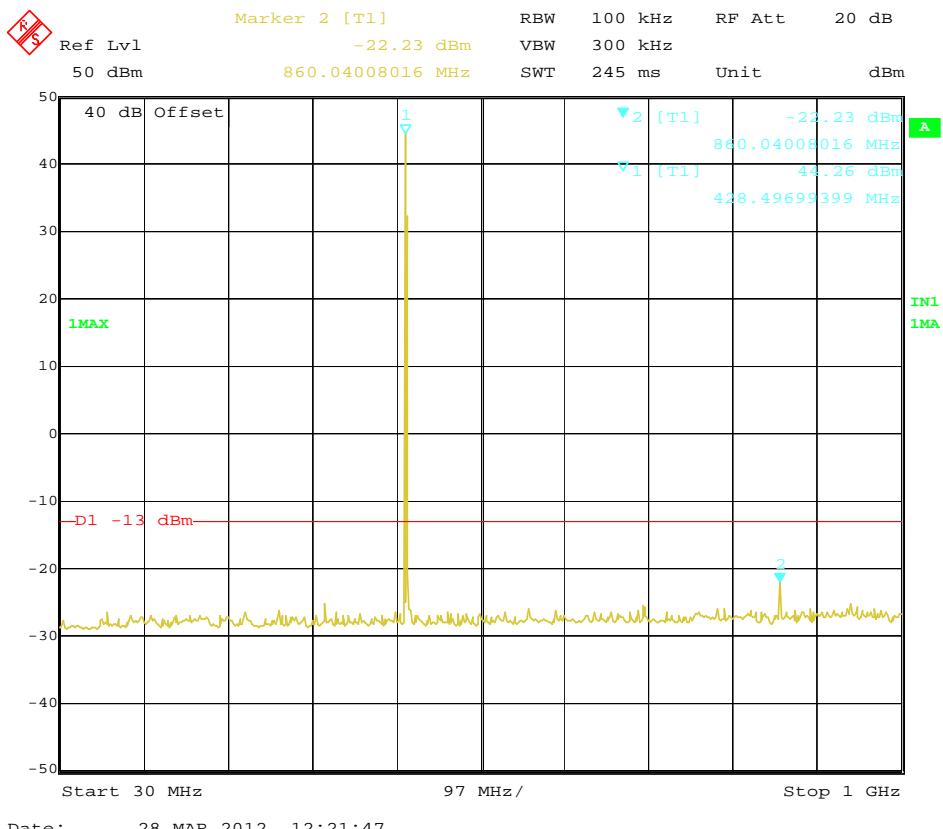
**For Rated Middle Power (25Watt)**

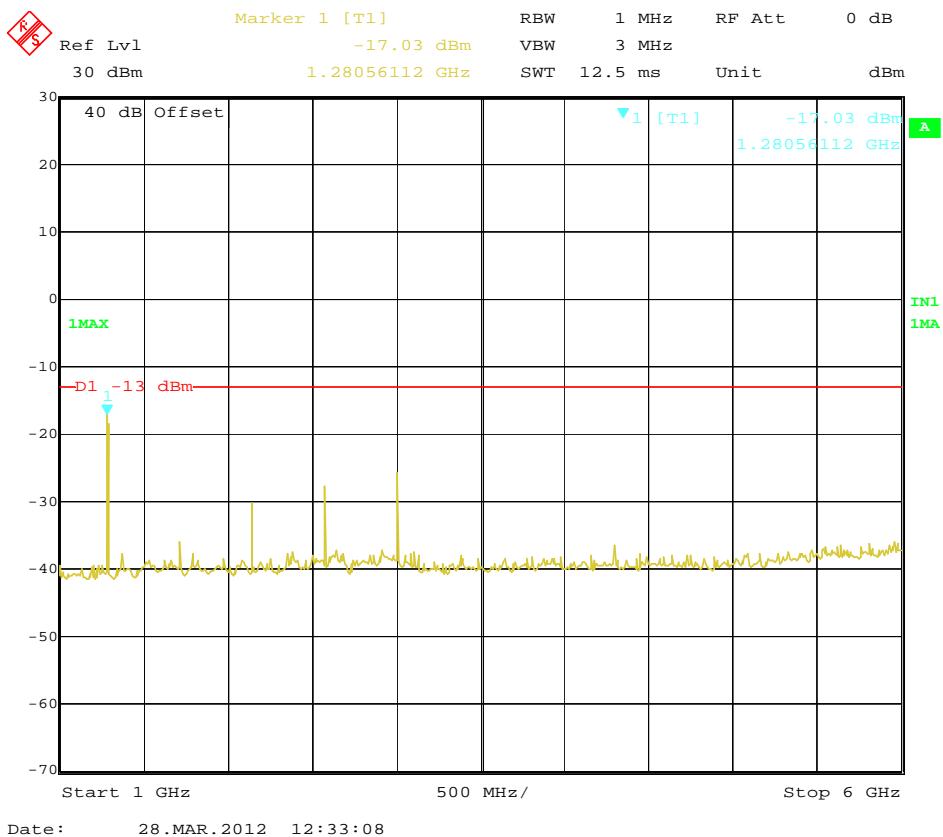
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		IC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	25KHz	Low	406.5000	626.77	-25.63	1220.44	-27.97	-13dBm
Test Results				Compliance				



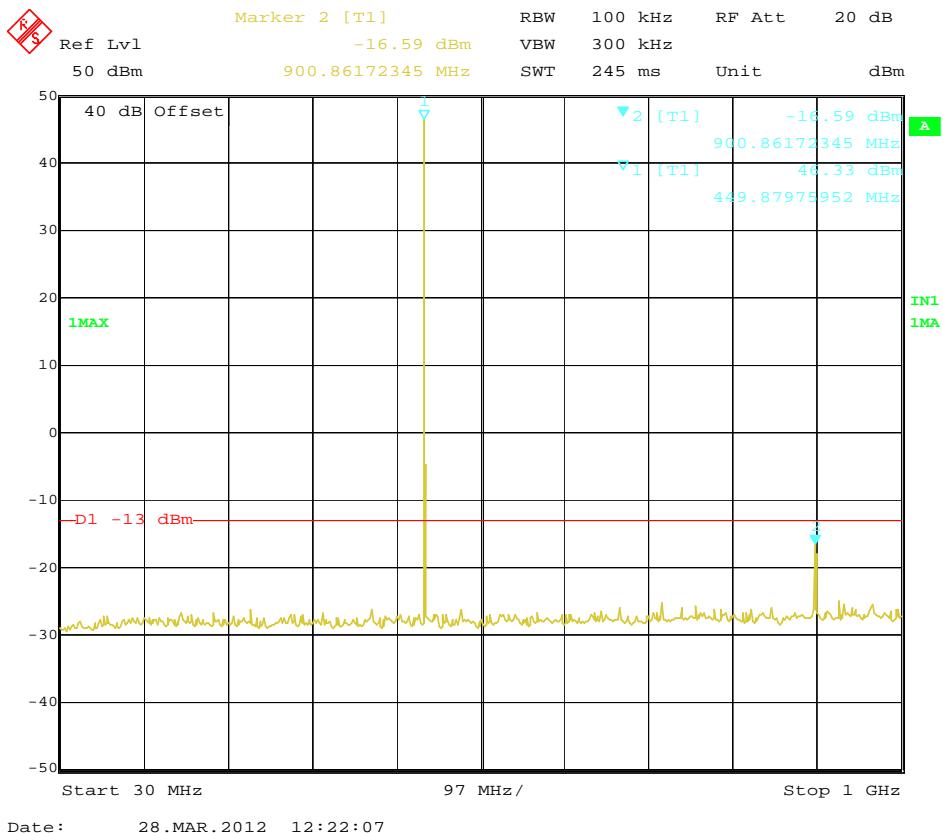


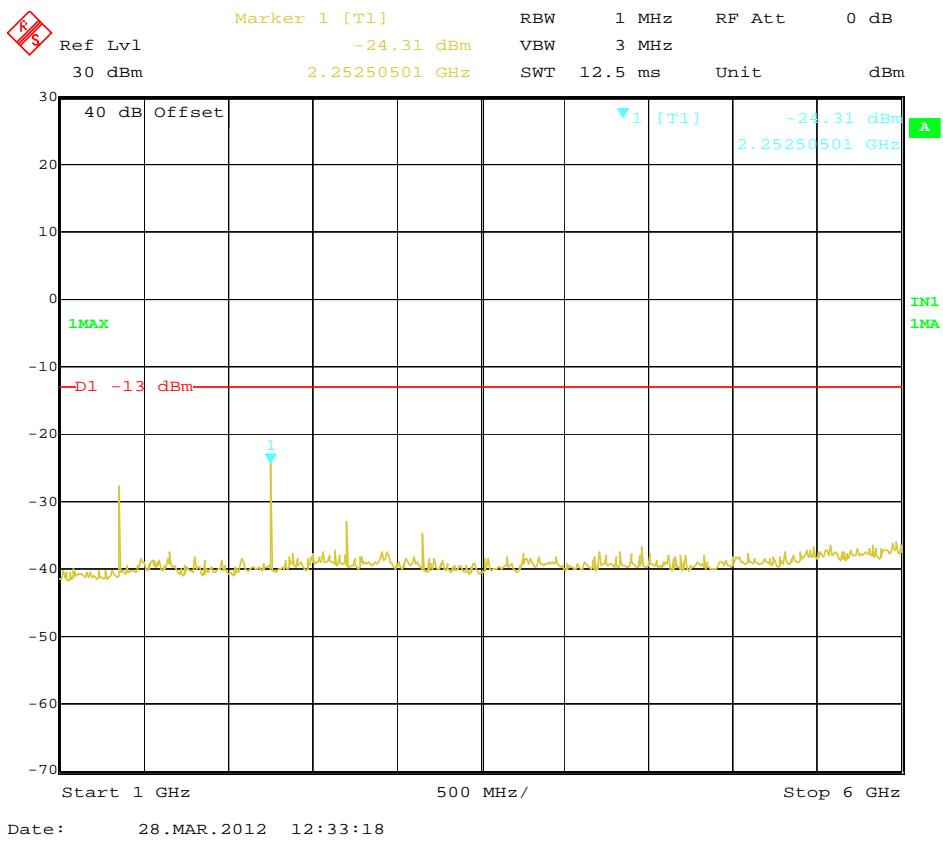
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		IC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	25KHz	Middle	429.5000	860.04	-22.23	1280.56	-17.03	-13dBm
Test Results				Compliance				



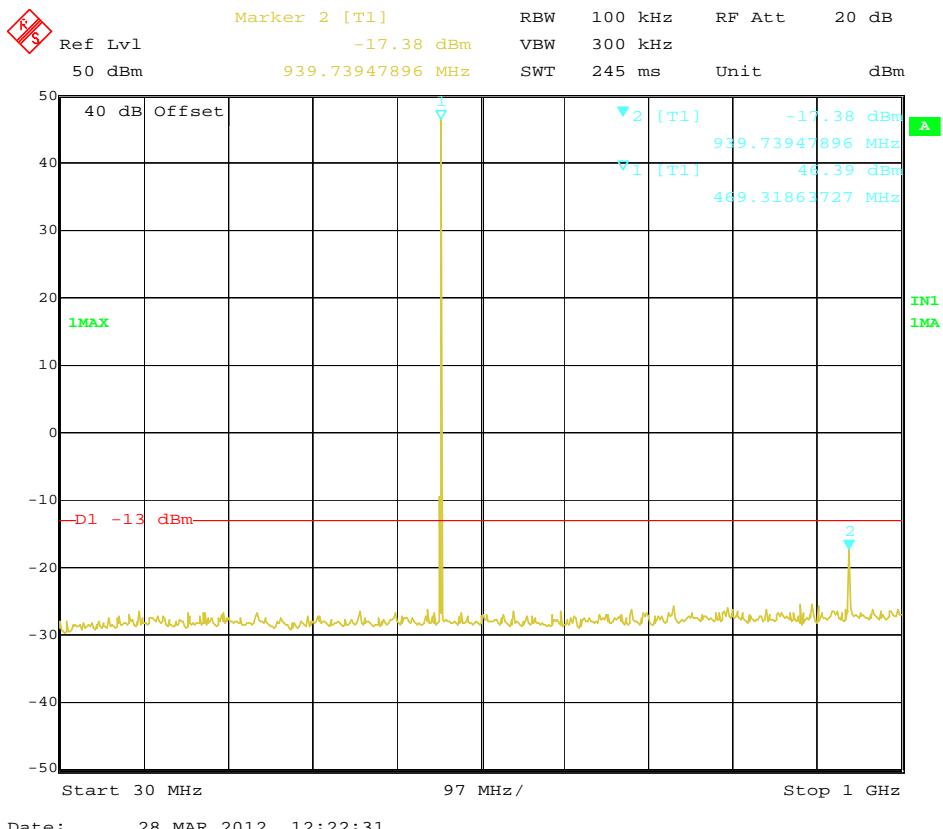


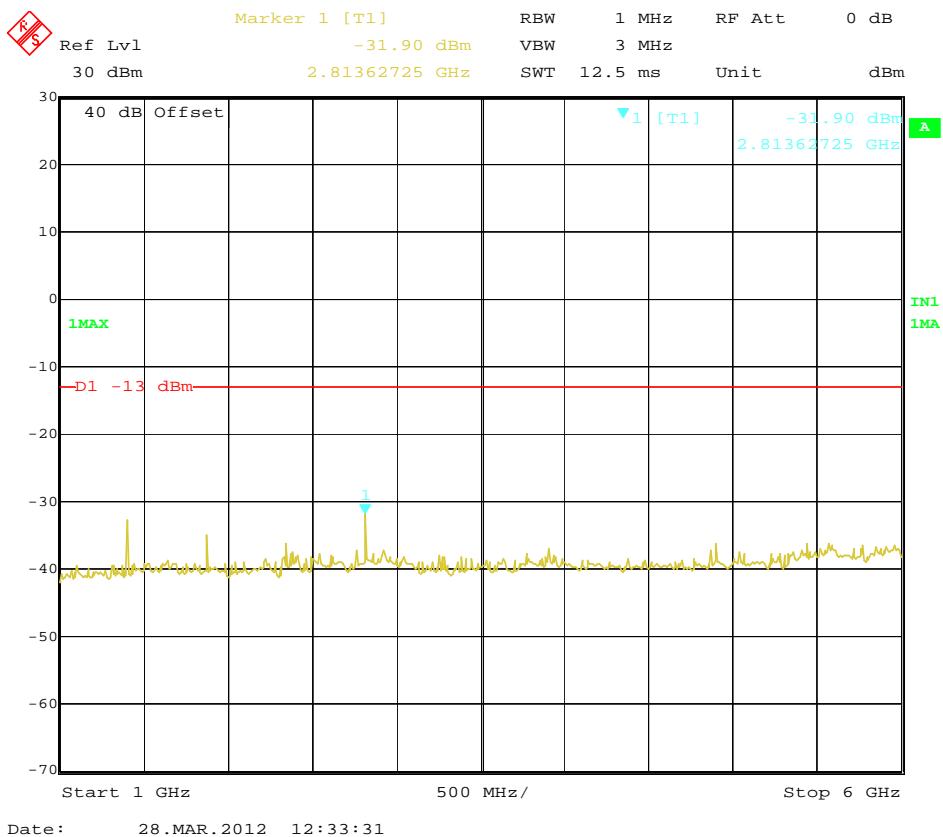
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		IC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	25KHz	Middle	450.5000	900.86	-16.59	2252.50	-24.31	-13dBm
Test Results				Compliance				



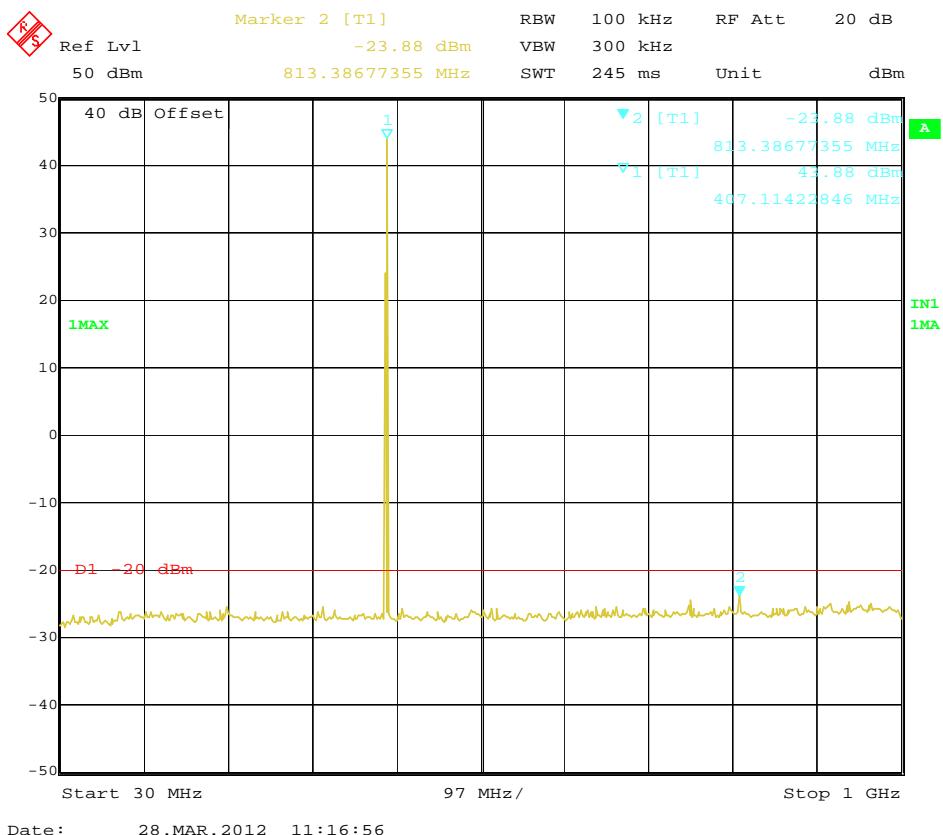


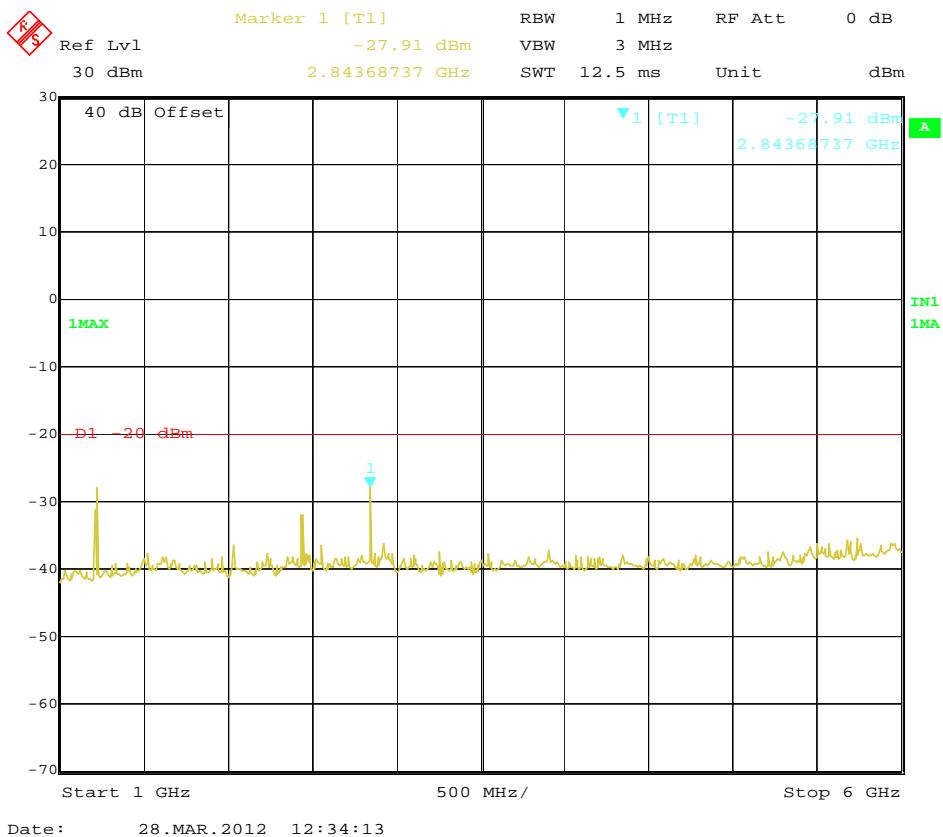
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		IC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	25KHz	High	469.0000	939.73	-17.38	2813.62	-31.90	-13dBm
Test Results				Compliance				



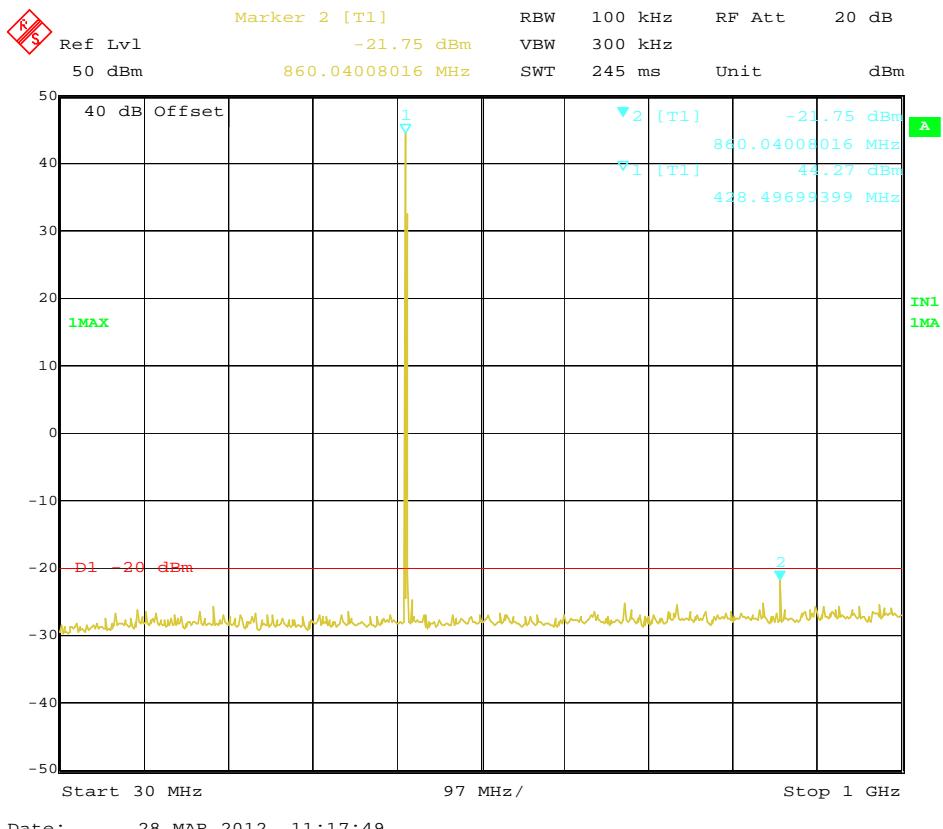


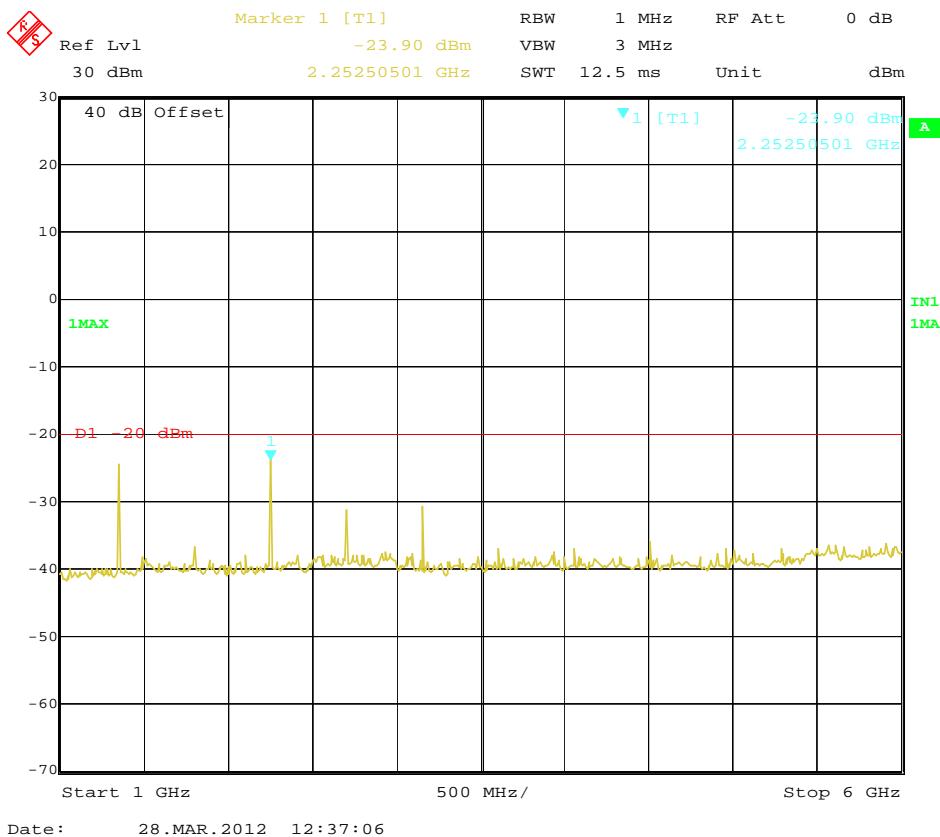
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	Low	406.5000	513.38	-23.88	2843.65	-27.91	-20dBm
Test Results				Compliance				



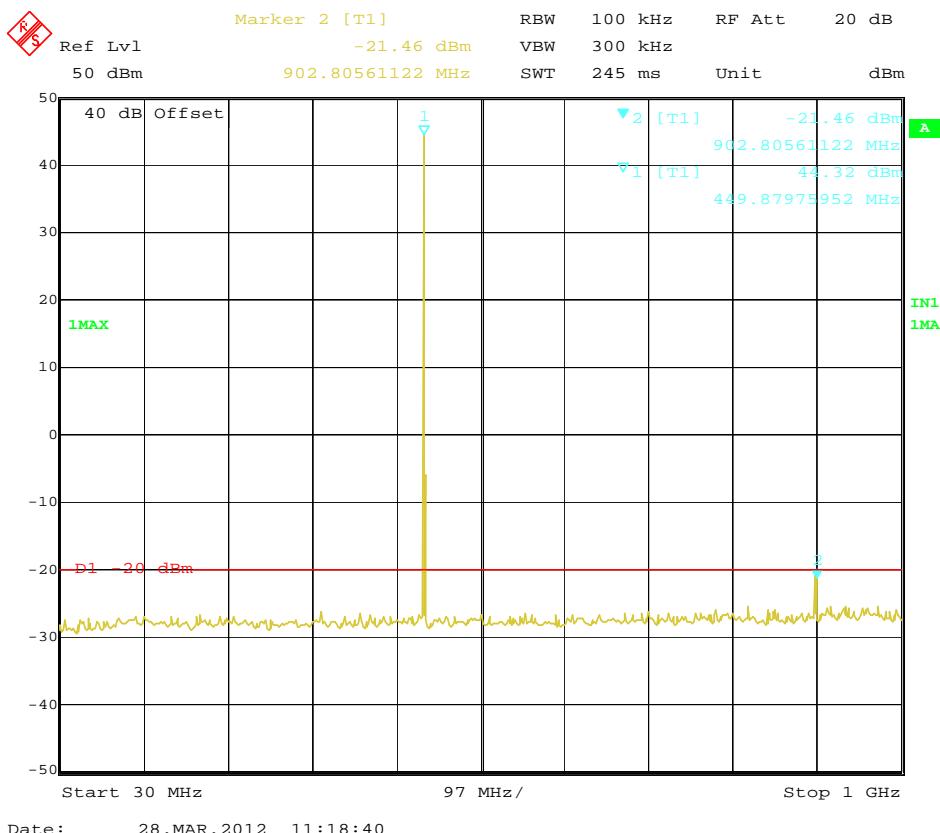


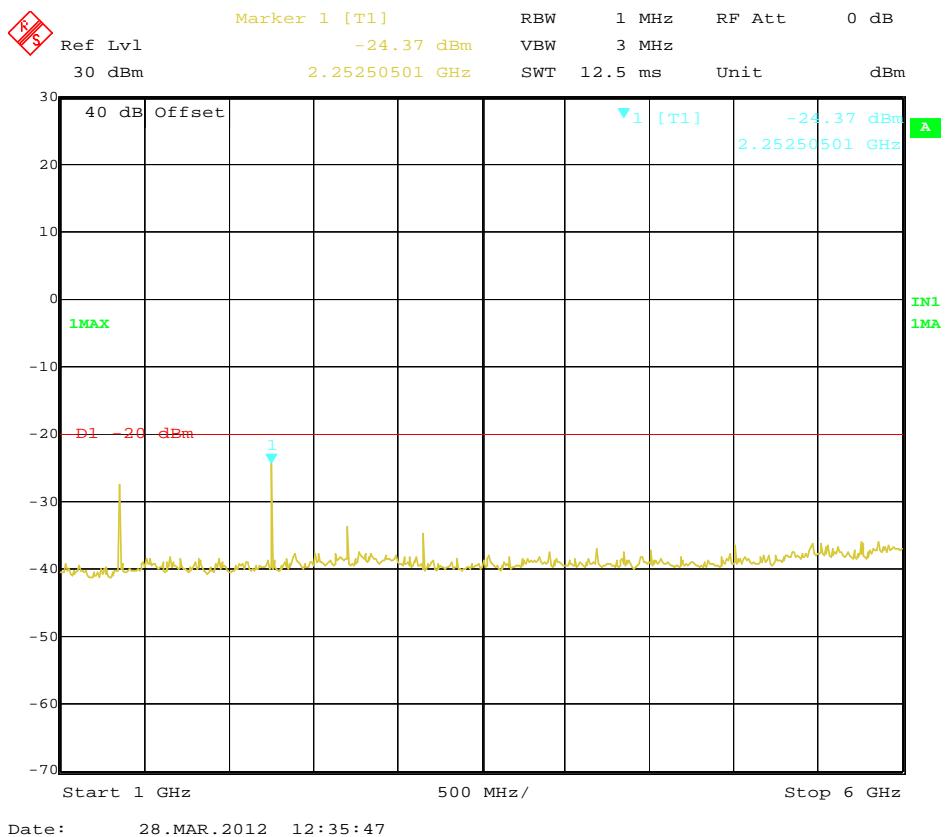
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	Middle	429.5000	860.04	-21.75	2252.50	-23.90	-20dBm
Test Results				Compliance				



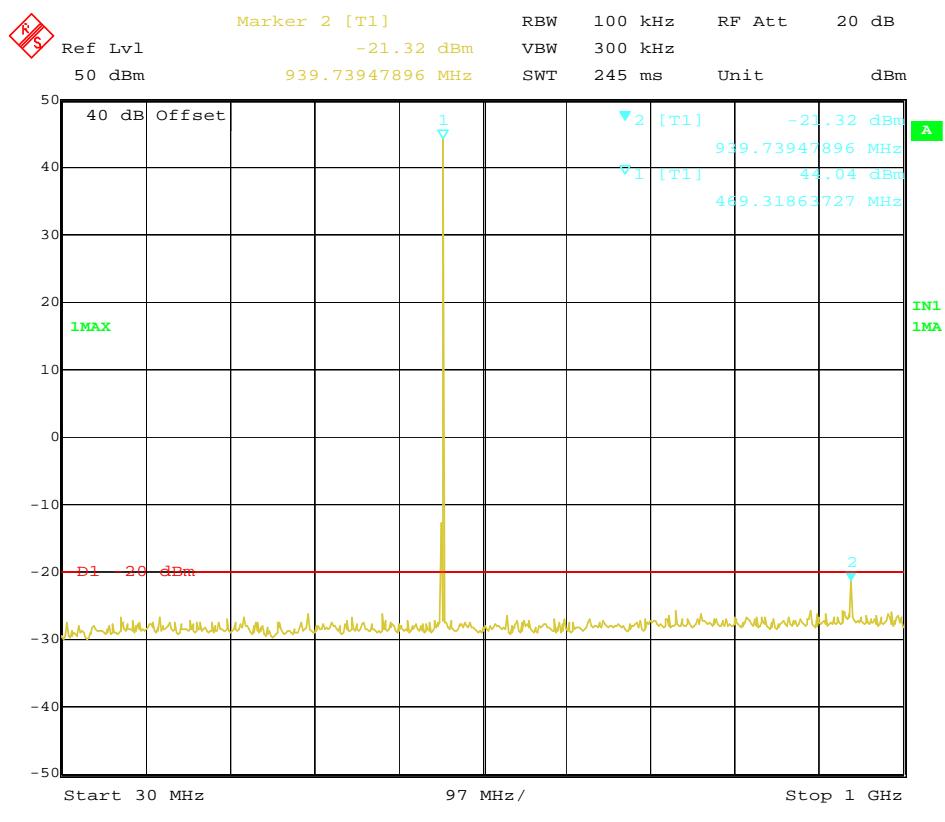


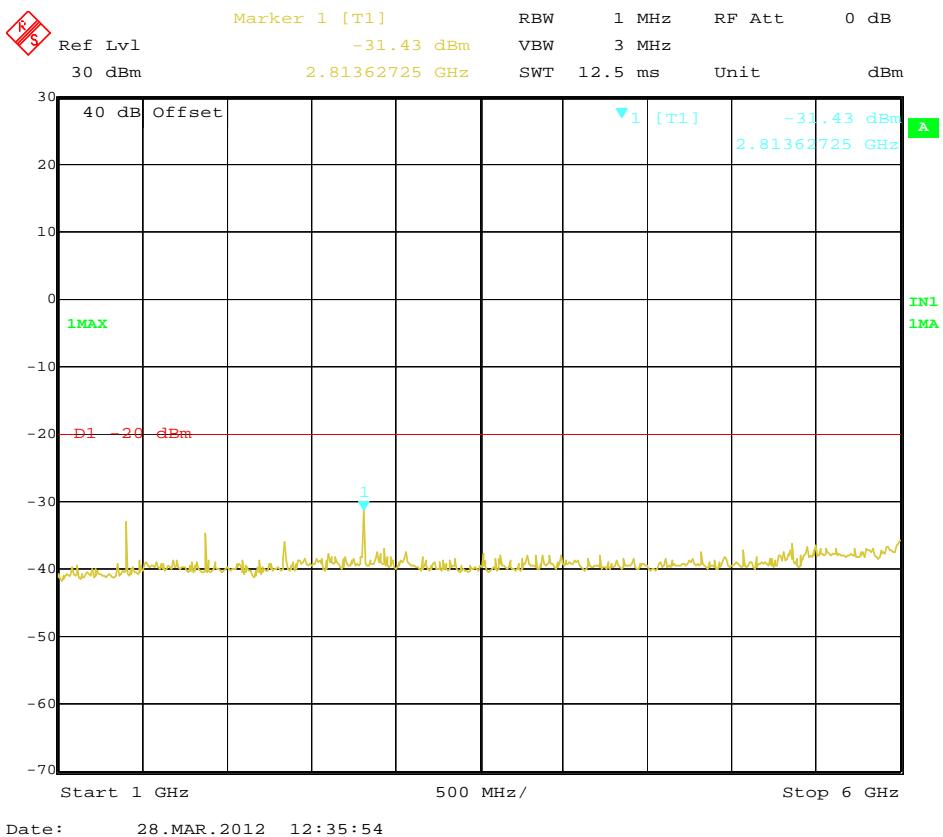
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	High	450.5000	902.80	-21.46	2252.50	-24.37	-20dBm
Test Results				Compliance				



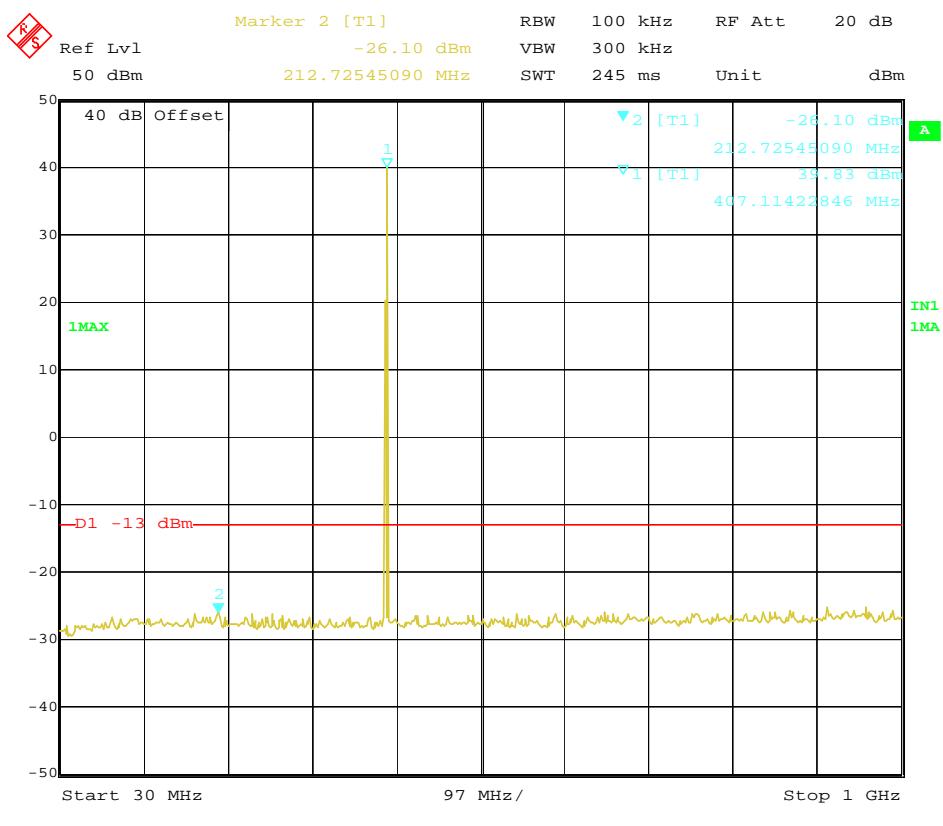


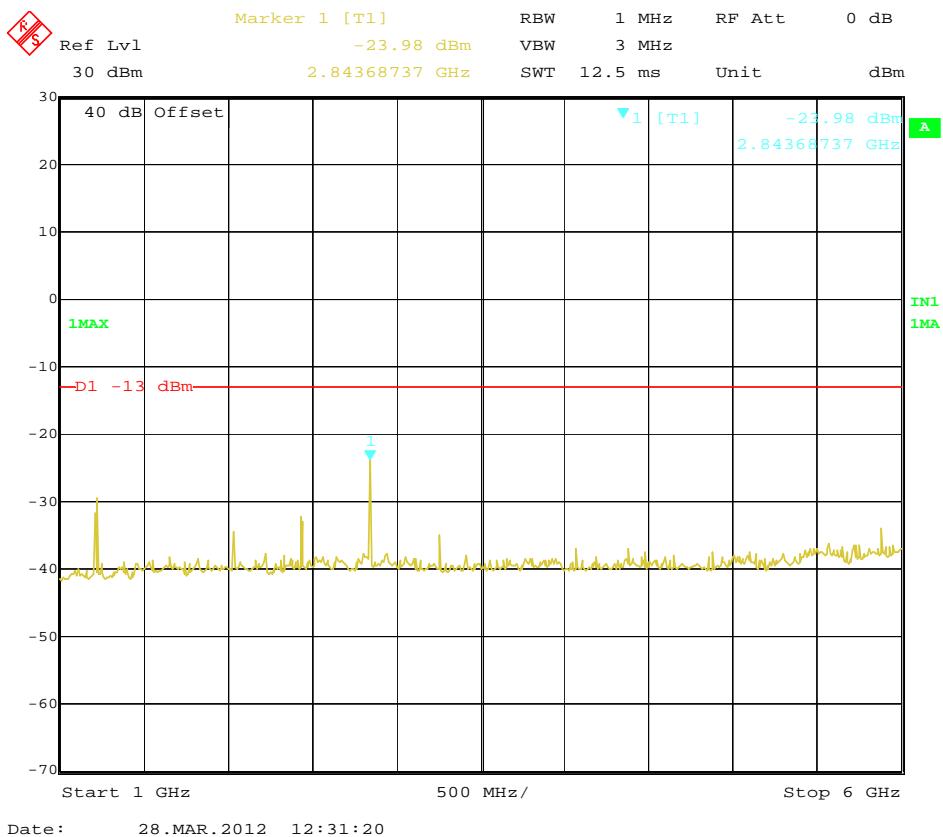
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	High	469.0000	939.73	-21.32	2813.62	-31.43	-20dBm
Test Results					Compliance			



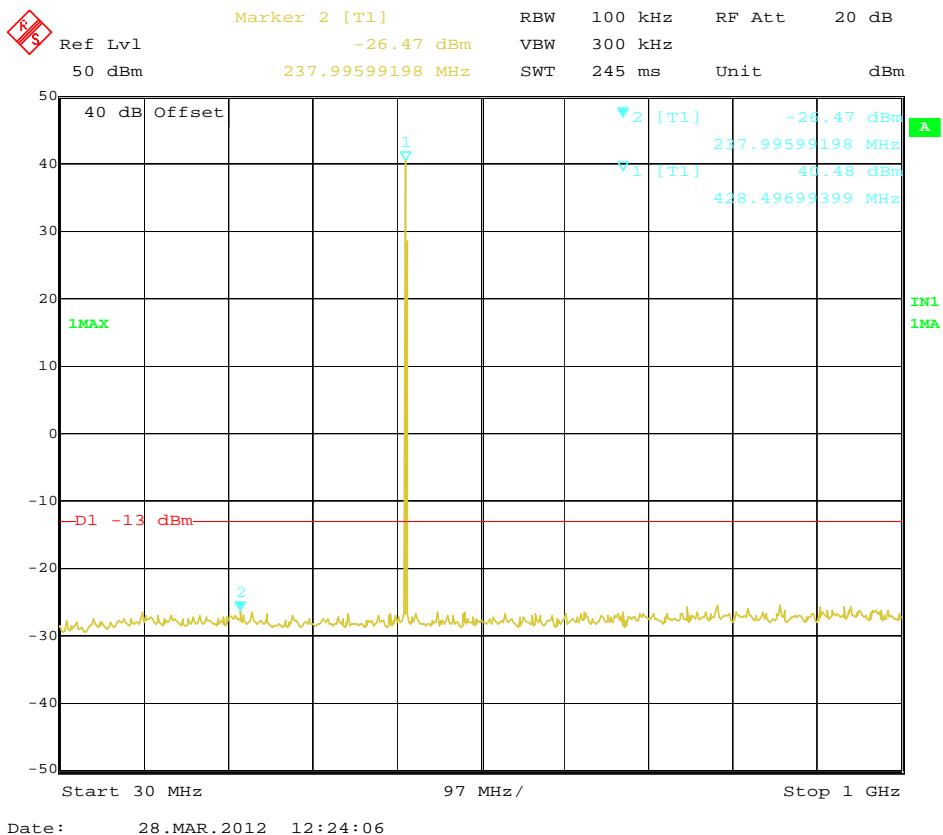
**For Rated Low Power (10Watt)**

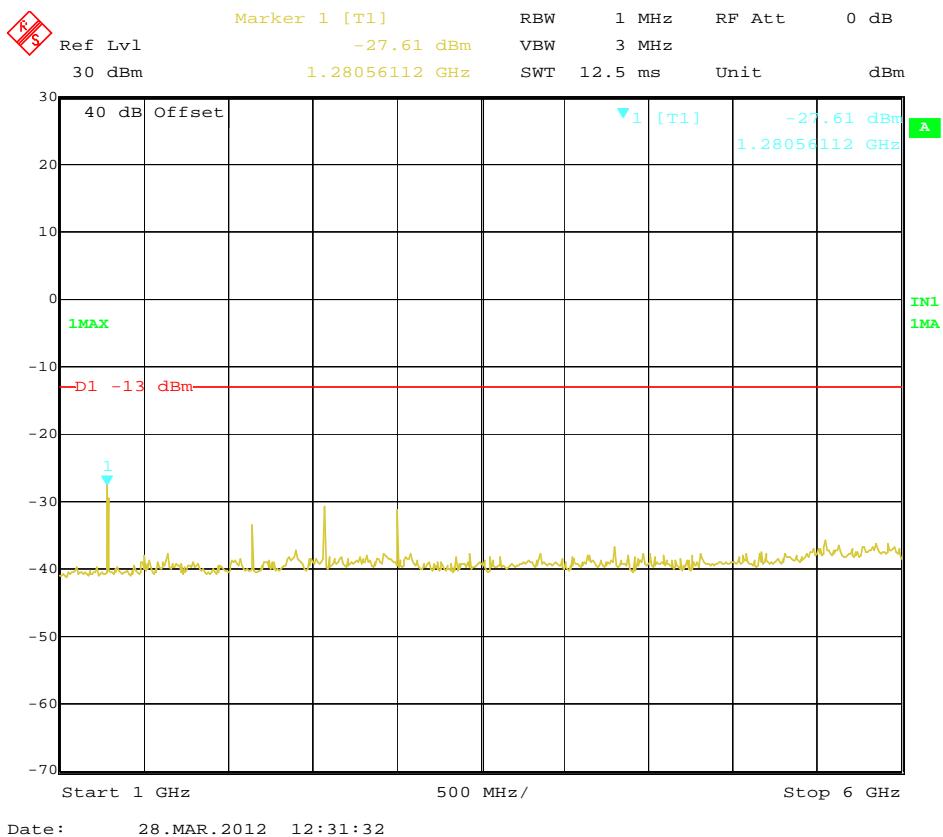
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		IC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	25KHz	Low	406.5000	212.72	-26.10	2843.68	-23.98	-13dBm
Test Results				Compliance				



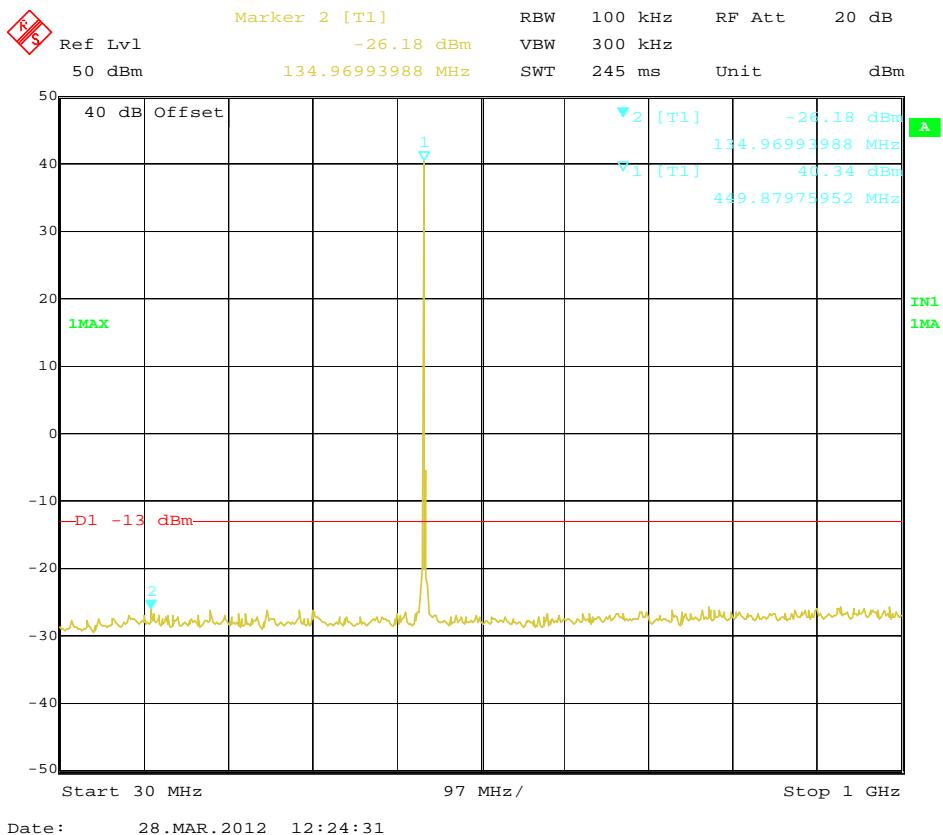


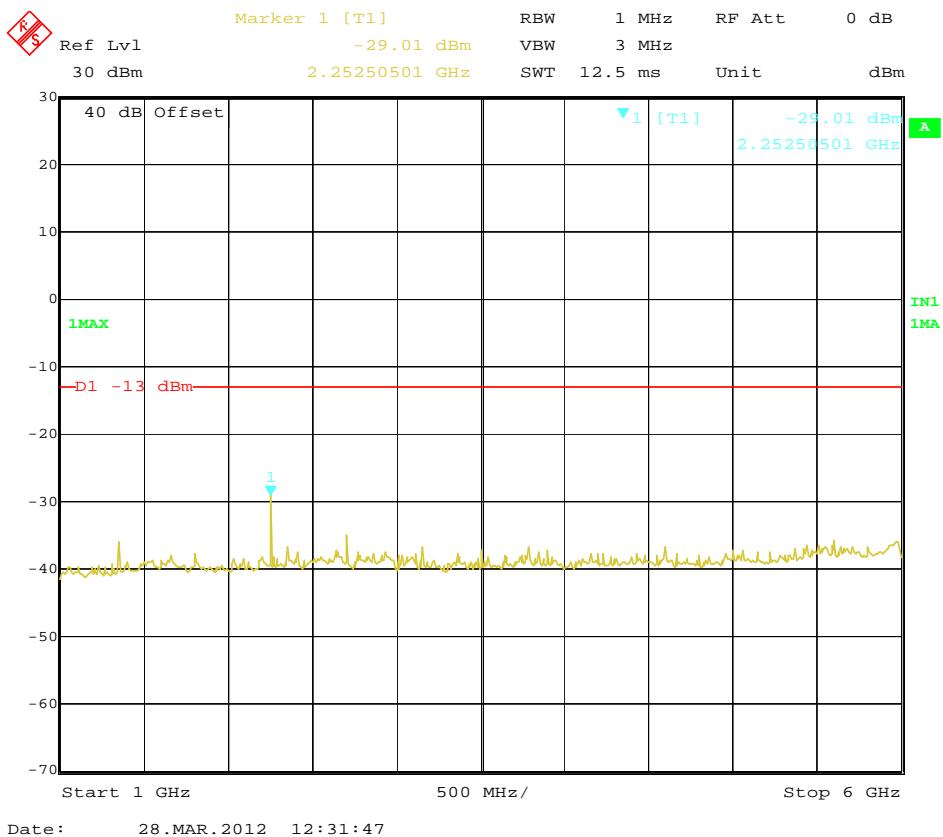
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		IC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	25KHz	Middle	429.5000	237.99	-26.47	1280.56	-27.61	-13dBm
Test Results				Compliance				



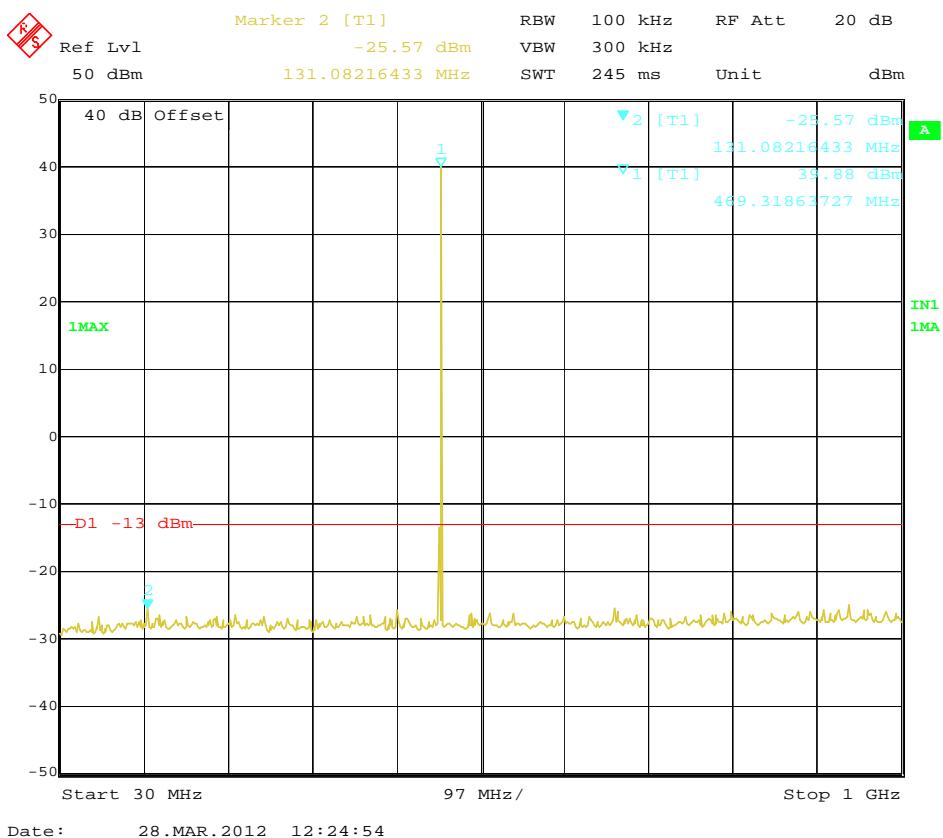


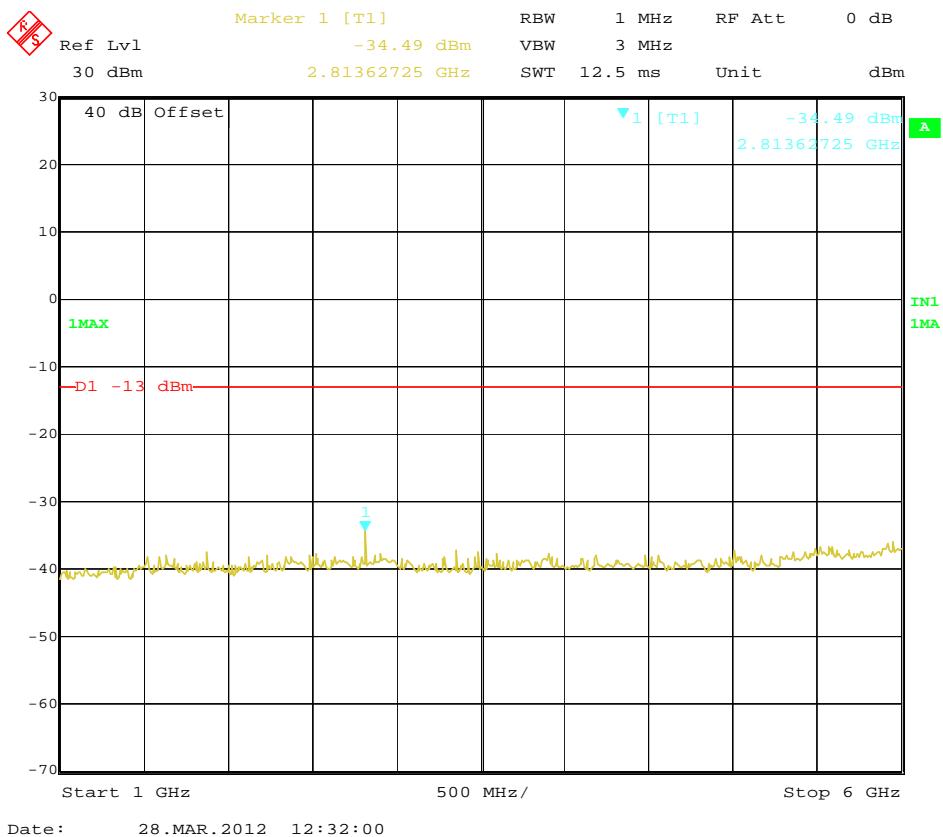
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		IC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	25KHz	Middle	450.5000	134.96	-26.18	2252.50	-29.01	-13dBm
Test Results				Compliance				



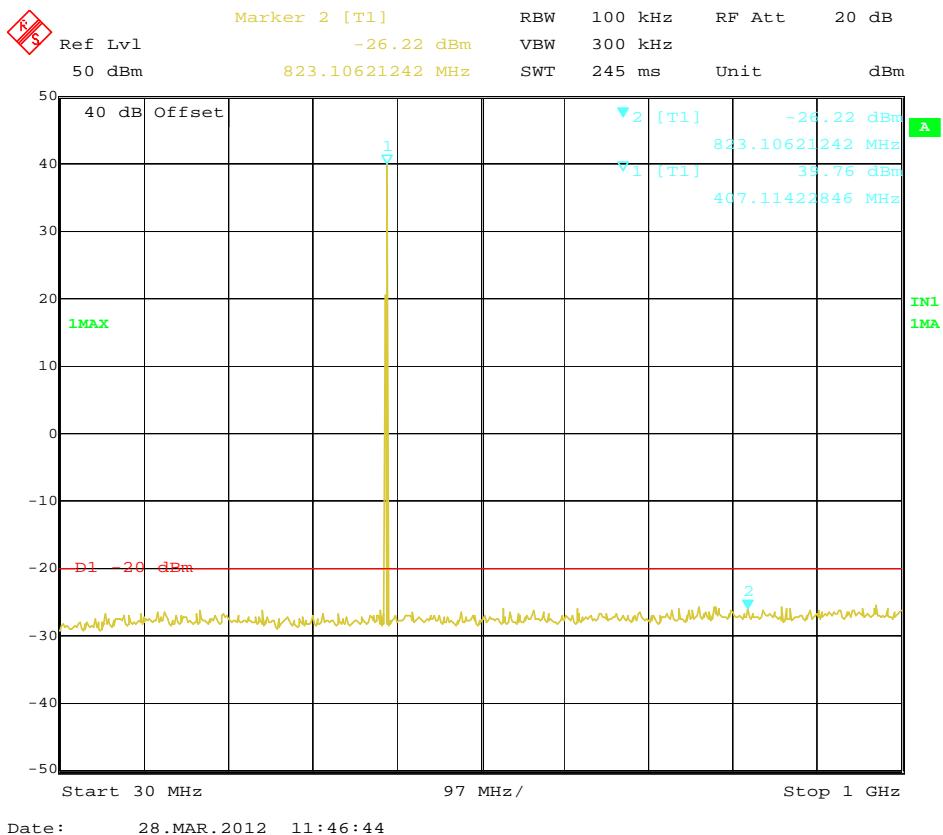


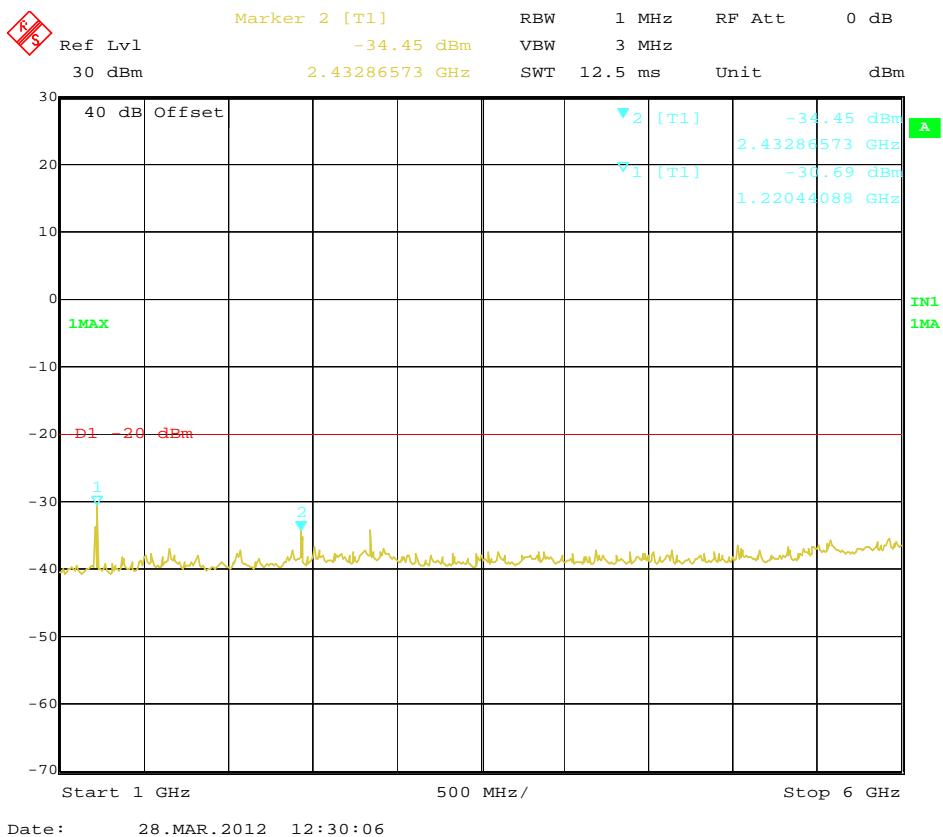
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		IC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	25KHz	High	469.0000	131.08	-25.57	2813.62	-34.49	-13dBm
Test Results				Compliance				



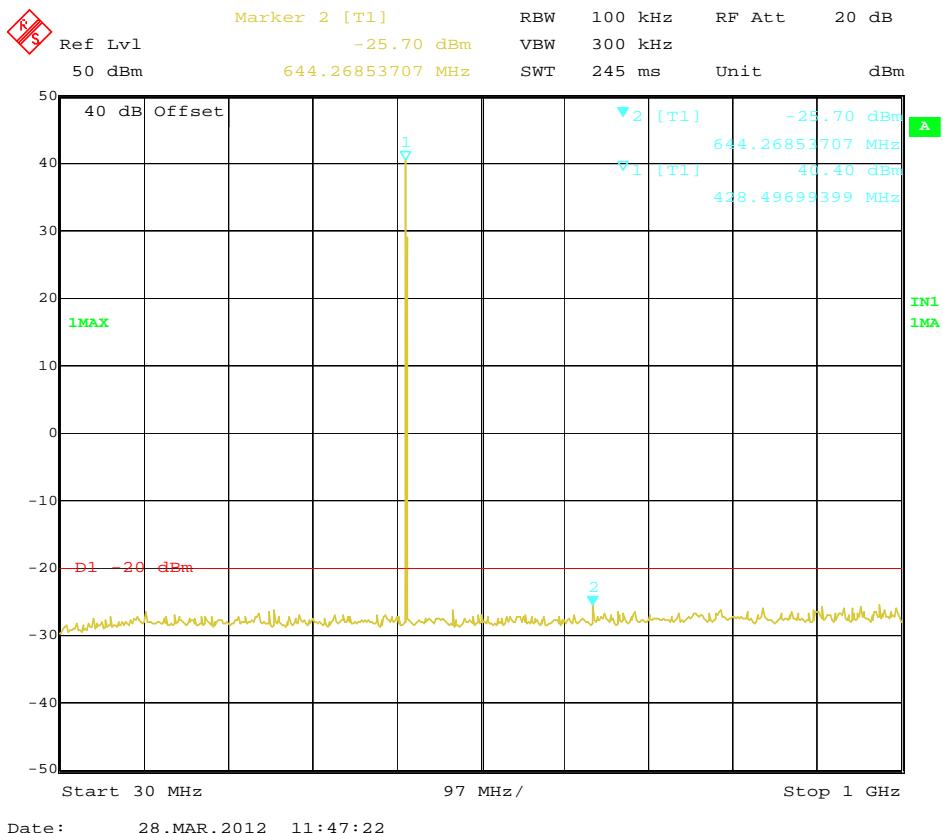


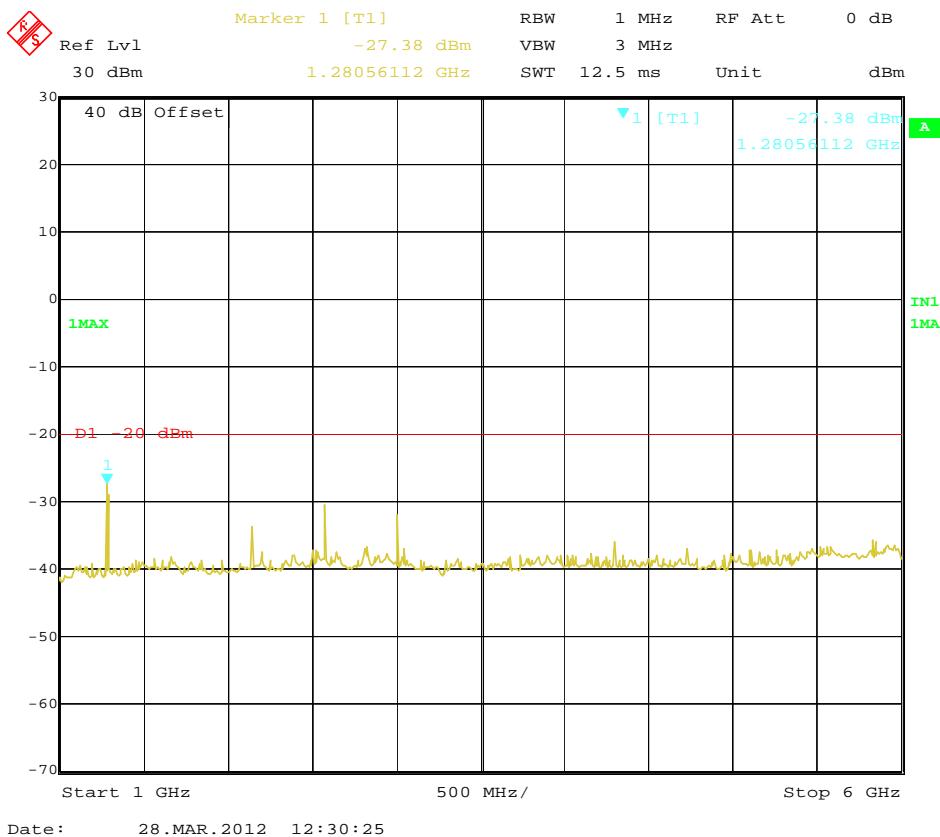
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	Low	406.5000	823.10	-26.22	2432.86	-34.45	-20dBm
Test Results				Compliance				



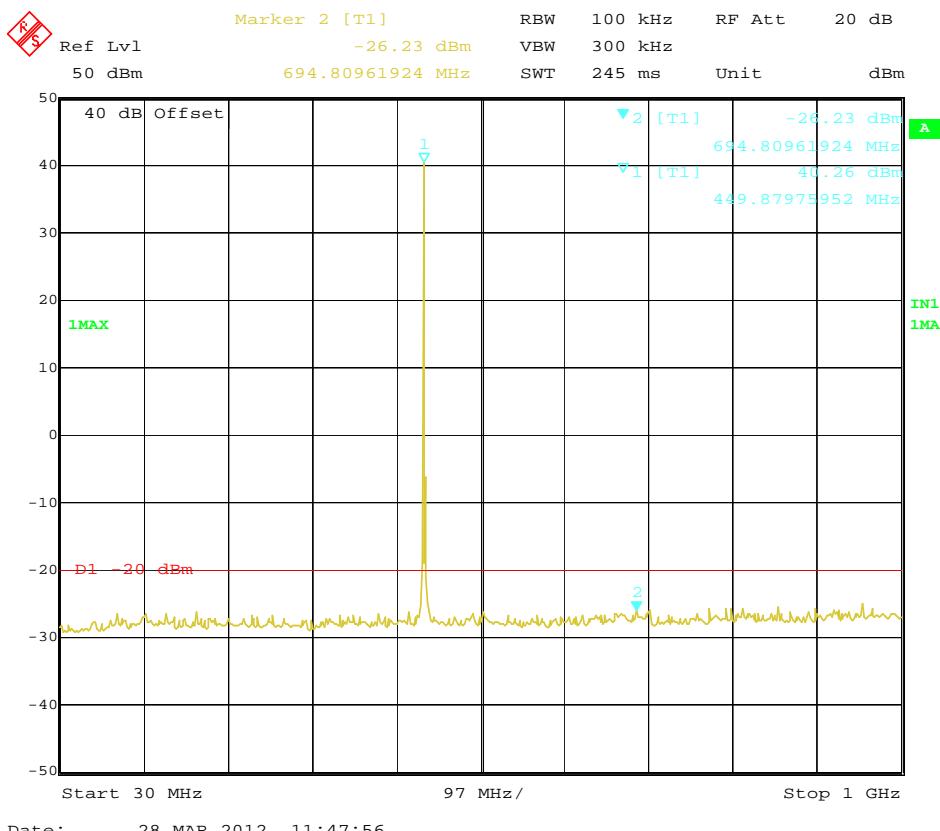


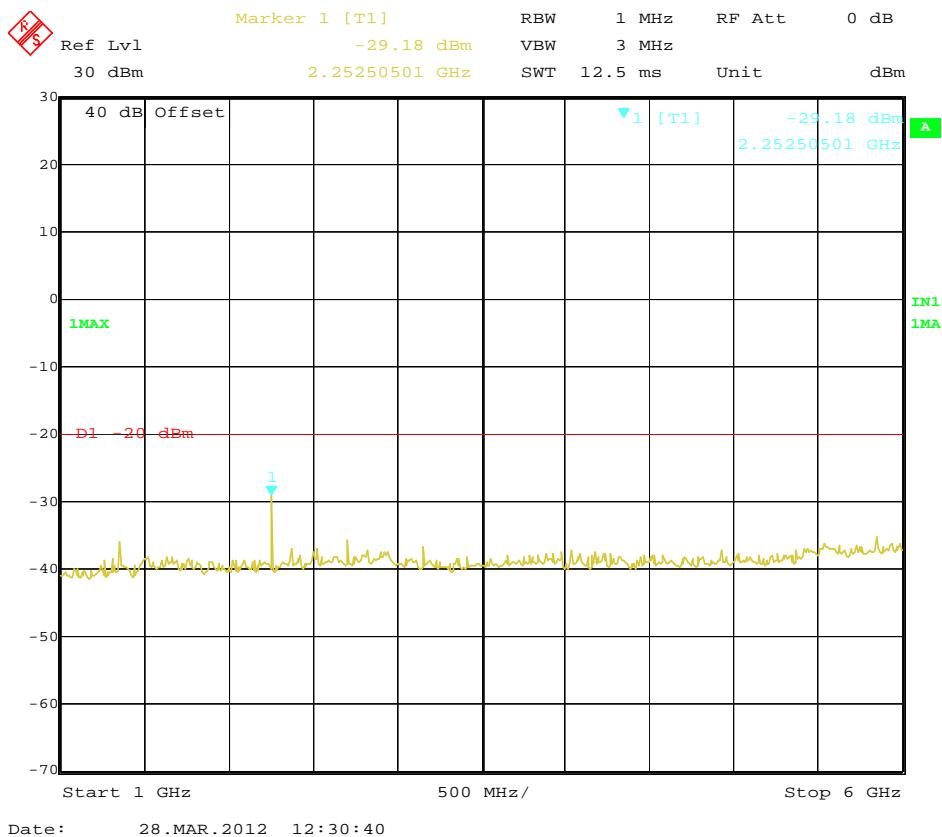
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	Middle	429.5000	644.26	-25.70	1280.56	-27.39	-20dBm
Test Results				Compliance				



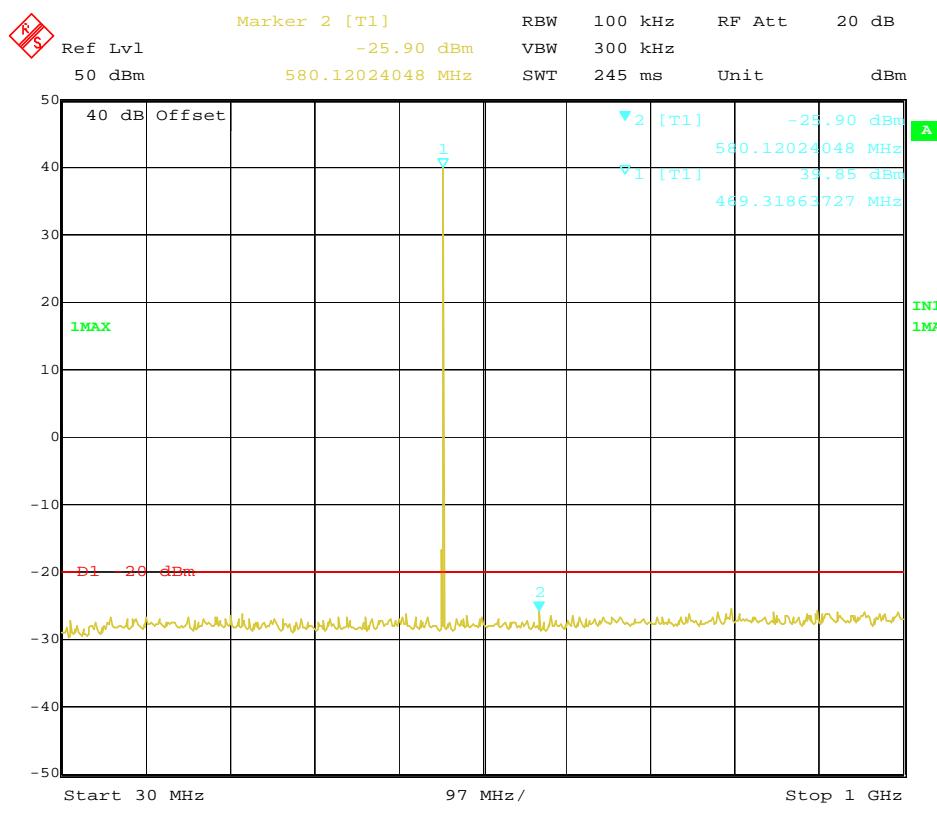


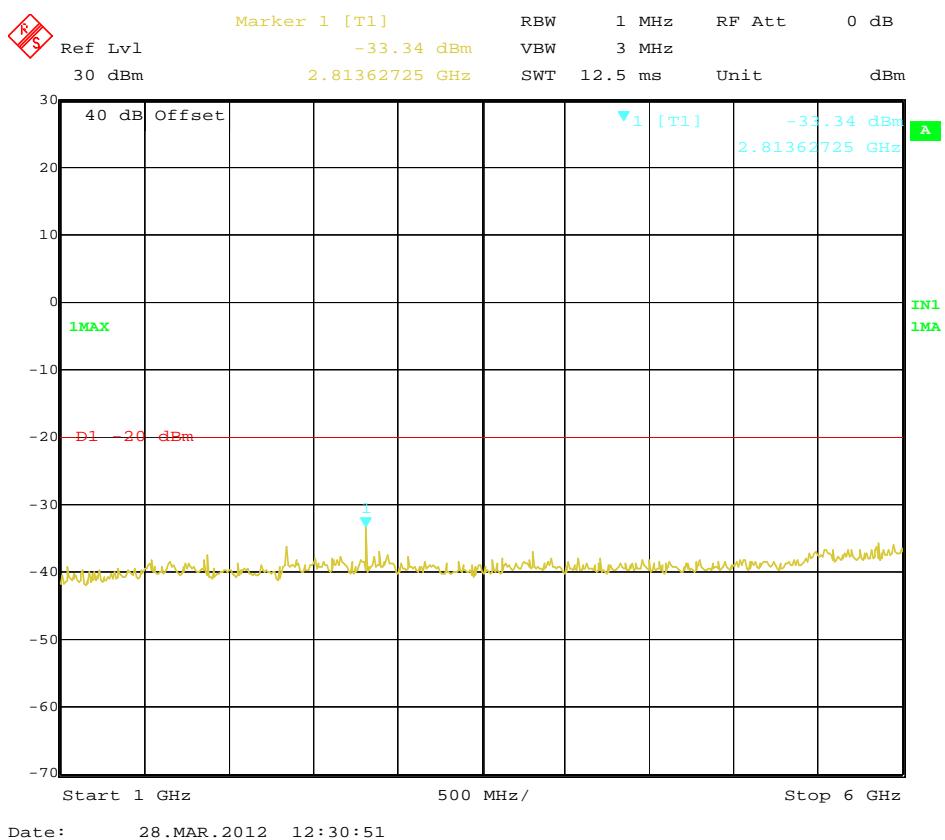
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	Middle	450.5000	694.81	-26.23	2252.50	-29.18	-20dBm
Test Results				Compliance				





Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	High	469.0000	580.12	-25.90	2513.62	-33.34	-20dBm
Test Results				Compliance				





4.5. Modulation Characteristics

TEST APPLICABLE

According to CFR47 section 2.1047(a), for Voice Modulation Communication Equipment, the frequency response of the audio modulation circuit over a range of 100 to 5000Hz shall be measured.

TEST PROCEDURE

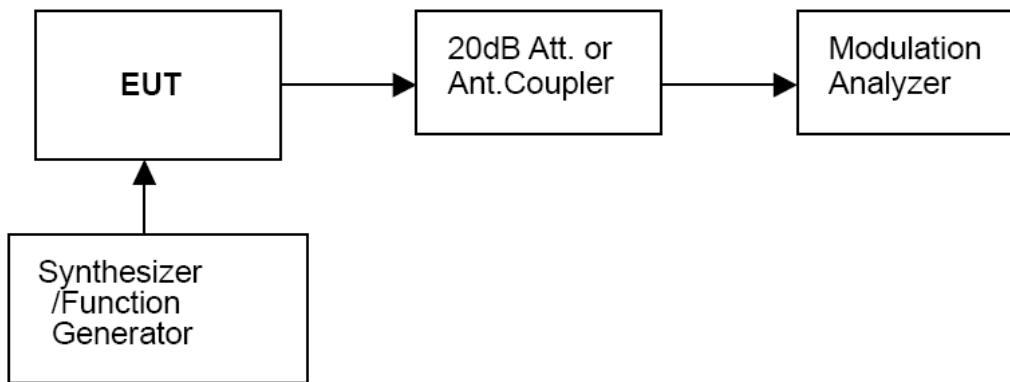
Modulation Limit

- 1 Configure the EUT as shown in figure 1, adjust the audio input for 60% of rated system deviation at 1 KHz using this level as a reference (0dB) and vary the input level from -20 to +20dB. Record the frequency deviation obtained as a function of the input level.
- 2 Repeat step 1 with input frequency changing to 300, 1004, and 2500Hz in sequence.

Audio Frequency Response

- 1 Configure the EUT as shown in figure 1.
- 2 Adjust the audio input for 20% of rated system deviation at 1 KHz using this level as a reference (0dB).
- 3 Vary the Audio frequency from 100 Hz to 10 KHz and record the frequency deviation.
- 4 Audio Frequency Response = $20\log_{10}(\text{Deviation of test frequency}/\text{Deviation of 1 KHz reference})$.

TEST CONFIGURATION

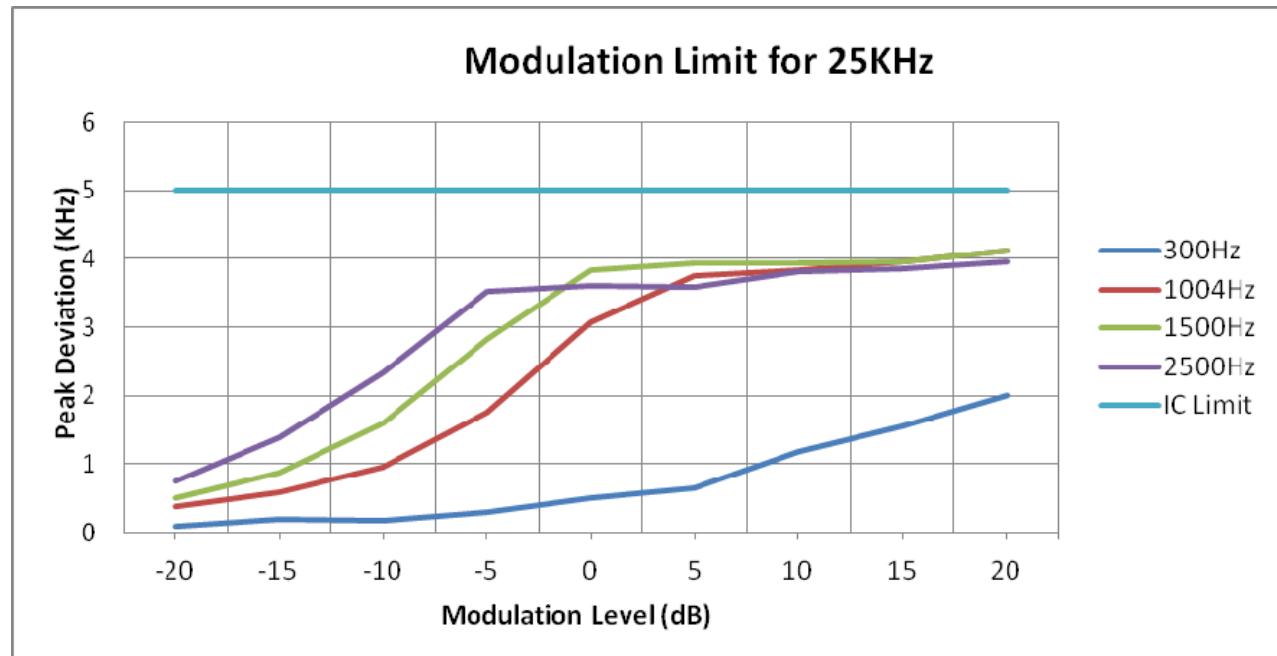


TEST RESULTS

Only for IC Review (Not For FCC Review)

25 KHz Channel Separation

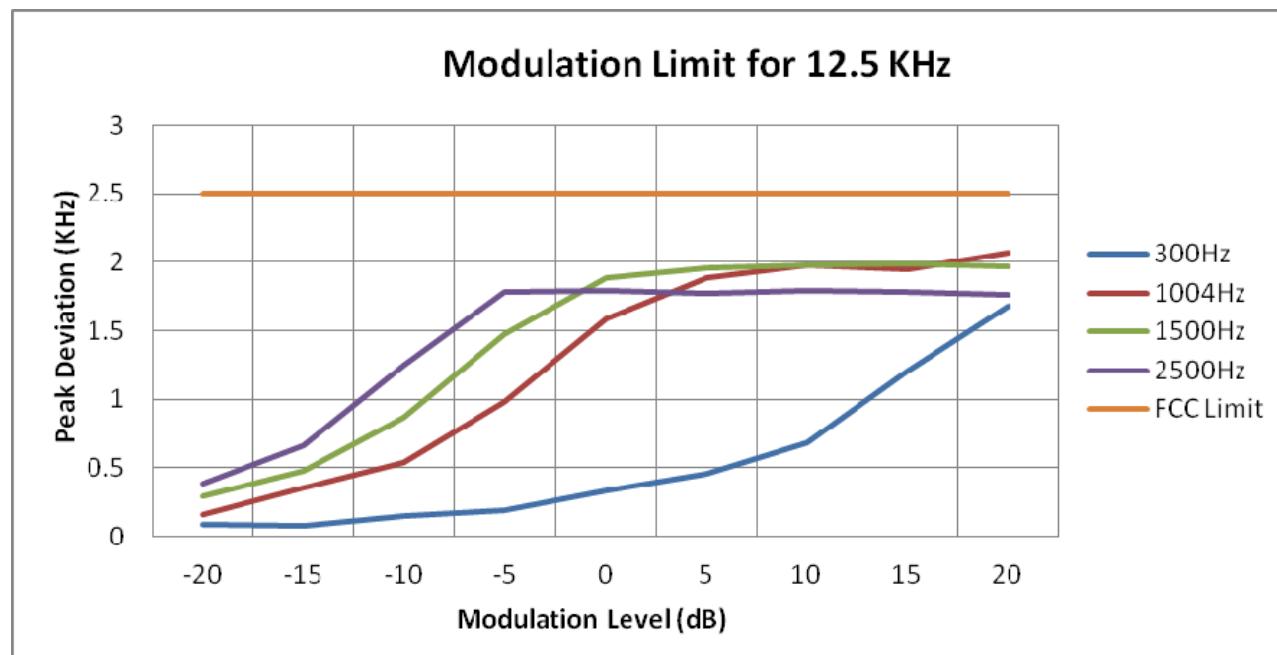
Modulation Level(dB)	Peak Freq. Deviation At 300 Hz(KHz)	Peak Freq. Deviation At 1004 Hz(KHz)	Peak Freq. Deviation At 1500 Hz(KHz)	Peak Freq. Deviation At 2500 Hz(KHz)
-20	0.09	0.38	0.51	0.75
-15	0.19	0.59	0.88	1.38
-10	0.18	0.95	1.59	2.33
-5	0.29	1.75	2.82	3.52
0	0.50	3.08	3.83	3.61
+5	0.65	3.75	3.94	3.58
+10	1.18	3.84	3.94	3.82
+15	1.56	3.96	3.96	3.86
+20	2.01	4.12	4.13	3.95



For both FCC and IC Review

12.5 KHz Channel Separation

Modulation Level(dB)	Peak Freq. Deviation At 300 Hz(KHz)	Peak Freq. Deviation At 1004 H(KHz)	Peak Freq. Deviation At 1500 Hz(KHz)	Peak Freq. Deviation At 2500 Hz(KHz)
-20	0.09	0.16	0.29	0.38
-15	0.08	0.35	0.48	0.66
-10	0.15	0.54	0.87	1.25
-5	0.19	0.98	1.48	1.78
0	0.33	1.59	1.89	1.79
+5	0.46	1.89	1.96	1.77
+10	0.68	1.98	1.98	1.79
+15	1.21	1.95	1.99	1.78
+20	1.68	2.07	1.97	1.76



b). Audio Frequency Response:**Rule Part No.: Part 2.1407(a) (b)****Method of Measurement:**

The audio frequency response was measured in accordance with TIA/EIA Specification 603 with no exception. A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 300-3000Hz shall be submitted and Audio Post Limiter Low Pass Filter Response from 3.0 KHz to 50KHz.However, the audio frequency response should test from 100Hz to 5.0 KHz according to FCC Part 90.

Modulation Type: FM

The audio frequency response curve is show below.and

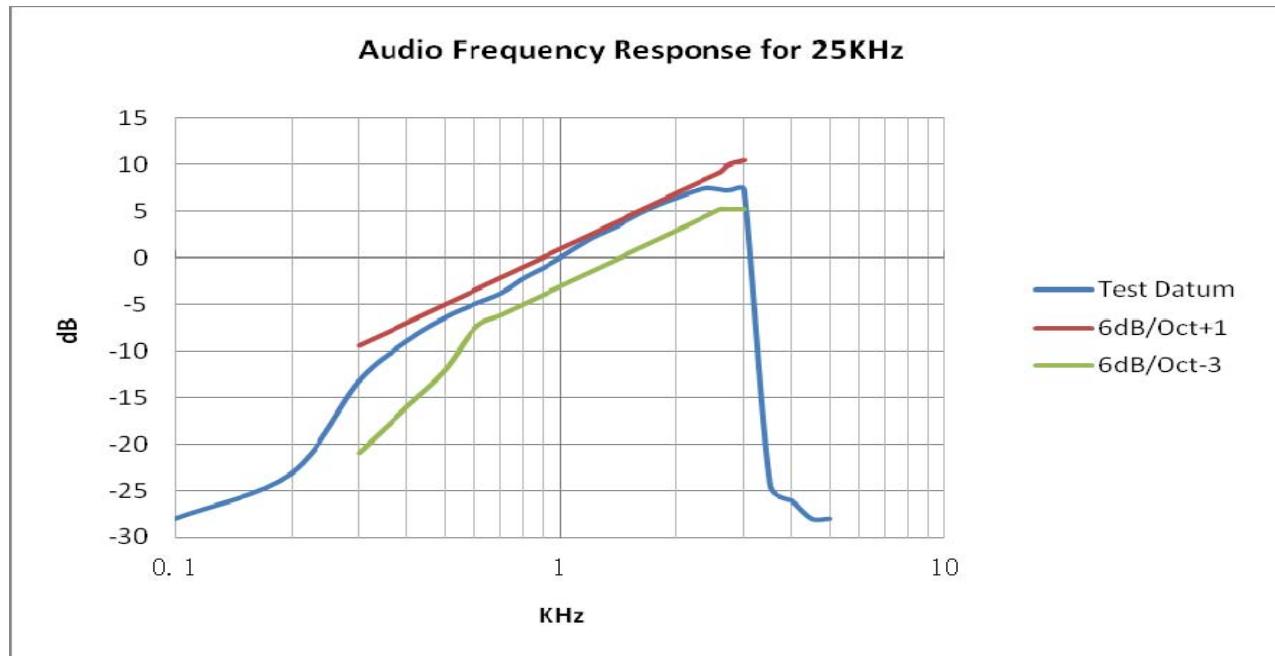
Test Audio Level (1 KHz and 20% maximum deviation) for 25 KHz channel separation is 4.20mv and 4.40mv for 12.5 KHz channel separation.

Note:

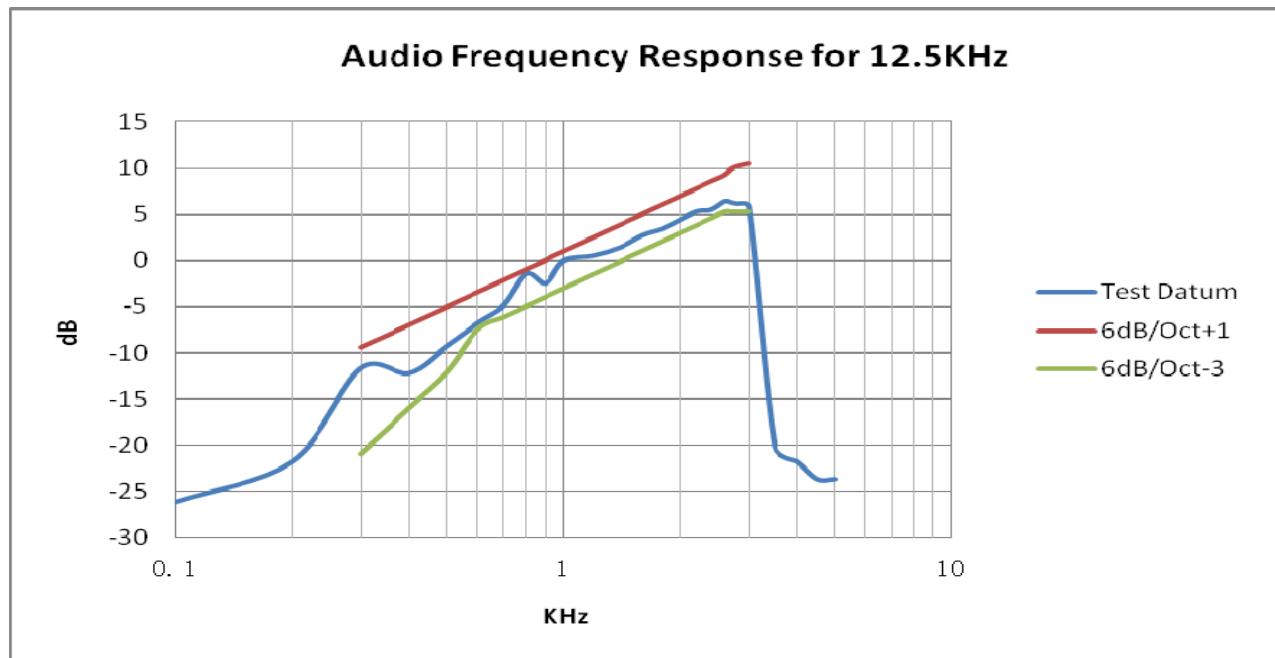
- 1 Not applicable to new standard. However, tests are conducted under FCC's recommendation.
- 2 The Audio Frequency Response is identical for 12.5 KHz and 25 KHz channel separation

Only for IC Review (Not For FCC Review)**For 25 KHz**

Frequency (KHz)	Frequency Deviation (KHz)	1KHz Reference Deviation (KHz)	Audio Frequency Response (dB)
0.1	0.04	1.01	-28.05
0.2	0.07	1.01	-23.18
0.3	0.22	1.01	-13.24
0.4	0.36	1.01	-8.96
0.5	0.48	1.01	-6.46
0.6	0.57	1.01	-4.97
0.7	0.65	1.01	-3.83
0.8	0.78	1.01	-2.24
0.9	0.89	1.01	-1.10
1.0	1.01	1.01	0.00
1.2	1.28	1.01	2.06
1.4	1.49	1.01	3.38
1.6	1.74	1.01	4.72
1.8	1.95	1.01	5.71
2.0	2.12	1.01	6.44
2.2	2.28	1.01	7.07
2.4	2.39	1.01	7.48
2.6	2.35	1.01	7.33
2.7	2.32	1.01	7.22
2.8	2.34	1.01	7.30
3.0	2.35	1.01	7.33
3.5	0.06	1.01	-24.52
4.0	0.05	1.01	-26.11
4.5	0.04	1.01	-28.05
5.0	0.04	1.01	-28.05

**For both FCC and IC Review****For 12.5 KHz**

Frequency (KHz)	Frequency Deviation (KHz)	1KHz Refenerce Deviation (KHz)	Audio Frequency Response (dB)
0.1	0.03	0.61	-26.16
0.2	0.05	0.61	-21.73
0.3	0.16	0.61	-11.62
0.4	0.15	0.61	-12.18
0.5	0.21	0.61	-9.26
0.6	0.28	0.61	-6.76
0.7	0.35	0.61	-4.83
0.8	0.52	0.61	-1.39
0.9	0.46	0.61	-2.45
1.0	0.61	0.61	0.00
1.2	0.65	0.61	0.55
1.4	0.72	0.61	1.44
1.6	0.84	0.61	2.78
1.8	0.91	0.61	3.47
2.0	1.02	0.61	4.47
2.2	1.13	0.61	5.35
2.4	1.15	0.61	5.51
2.6	1.28	0.61	6.44
2.7	1.26	0.61	6.30
2.8	1.24	0.61	6.16
3.0	1.20	0.61	5.88
3.5	0.06	0.61	-20.14
4.0	0.05	0.61	-21.73
4.5	0.04	0.61	-23.67
5.0	0.04	0.61	-23.67



4.6. Frequency Stability

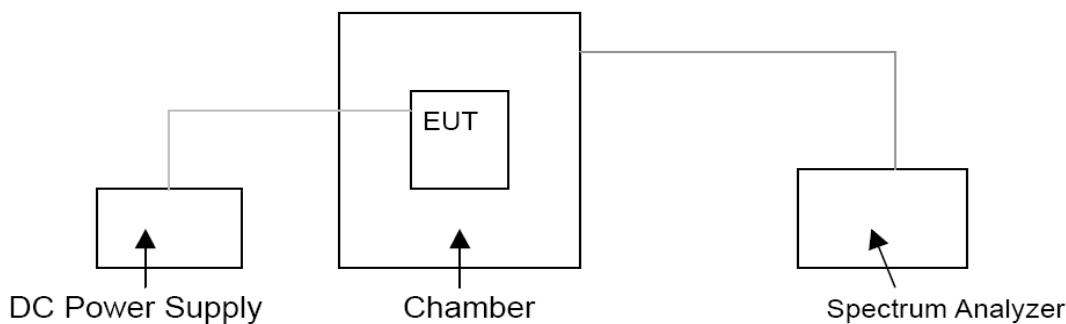
TEST APPLICABLE

- 1 According to FCC Part 2 Section 2.1055 (a) (1) and RSS-119 Section 5.3, the frequency stability shall be measured with variation of ambient temperature from -30°C to +60°C centigrade.
- 2 According to FCC Part 2 Section 2.1055 (a) (2) and RSS-119 Section 5.3, for battery powered equipment, the frequency stability shall be measured with reducing primary supply voltage to the battery operating end point, which is specified by the manufacturer.
- 3 Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.
- 4 According to §90.213 and RSS-119 Section 5.3, the frequency stability limit is 2.5 ppm for 12.5KHz channel separation and 5 ppm for 25KHz channel separation.

TEST PROCEDURE

The EUT was set in the climate chamber and connected to an external DC power supply. The RF output was directly connected to Spectrum Analyzer ESI 26. The coupling loss of the additional cables was recorded and taken in account for all the measurements. After temperature stabilization (approx. 20 min for each stage), the frequency for the lower, the middle and the highest frequency range was recorded. For Frequency stability Vs. Voltage the EUT was connected to a DC power supply and the voltage was adjusted in the required ranges. The result was recorded.

TEST CONFIGURATION



TEST LIMITS

According to 90.213, Transmitters used must have minimum frequency stability as specified in the following table.

Frequency Range (MHz)	Channel Bandwidth (KHz)	Frequency Tolerance (ppm)		
		Fixed and Base Stations	Mobile Stations	
			> 2 W	≤ 2 W
150-174 MHz	6.25	1.0	2.0	2.0
	12.5	2.5	5.0	5.0
	25	5.0	5.0	50.0*
421-512 MHz	6.25	0.5	1.0	1.0
	12.5	1.5	2.5	2.5
	25	2.5	5.0	5.0

- Stations operating in the 154.45 to 154.49 MHz or the 173.2 to 173.4 MHz bands must have a frequency stability of 5 ppm.
- Paging transmitters operating on paging-only frequencies must operate with frequency stability of 5 ppm in the 150-174 MHz band and 2.5 ppm in the 421-512 MHz band.

TEST RESULTS**Only for FCC Review**

Modulation Type	Channel Separation	Test conditions		Frequency error (ppm)			
		Voltage(V)	Temp(°C)	Low Channel	Middle Channel	High Channel	
Analog/FM	12.5KHz	13.60	-30	-1.88	-1.56	-1.47	
			-20	-1.77	-1.97	-1.52	
			-10	-1.64	-1.55	-1.45	
			0	-1.45	-1.59	-1.45	
			10	-1.39	-1.59	-1.33	
			20	-1.06	-1.49	-1.24	
			30	-1.41	-1.47	-1.36	
			40	-1.89	-1.40	-1.49	
			50	-1.99	-1.98	-1.78	
			11.56 (85% Rated)	20	-1.68	-1.83	
			15.64 (115% Rated)	20	-2.02	-1.93	
Limit		2.5 ppm					
Conclusion		Complies					

Only for IC Review (Not For FCC Review)

Modulation Type	Channel Separation	Test conditions		Frequency error (ppm)				
		Voltage(V)	Temp(°C)	Low Channel	Middle Channel	Middle Channel	High Channel	
Analog/FM	25KHz	13.60	-30	-1.85	-1.95	-1.98	-1.85	
			-20	-1.78	-1.74	-1.74	-1.95	
			-10	-1.69	-1.55	-1.54	-1.68	
			0	-1.45	-1.49	-1.47	-1.96	
			10	-1.34	-1.35	-1.45	-1.56	
			20	-1.01	-1.45	-1.56	-1.15	
			30	-1.11	-1.65	-1.48	-1.18	
			40	-1.41	-1.85	-1.95	-1.69	
			50	-1.58	-1.95	-1.84	-1.99	
			11.56 (85% Rated)	20	-1.96	-2.12	-1.59	
			15.64 (115% Rated)	20	-1.48	-2.12	-1.96	
Limit		5.0 ppm						
Conclusion		Complies						

Modulation Type	Channel Separation	Test conditions		Frequency error (ppm)				
		Voltage(V)	Temp(°C)	Low Channel	Middle Channel	Middle Channel	High Channel	
Analog/FM	12.5KHz	13.60	-30	-1.88	-1.95	-1.56	-1.99	
			-20	-1.77	-1.79	-1.97	-1.89	
			-10	-1.64	-1.57	-1.55	-1.78	
			0	-1.45	-1.44	-1.59	-1.57	
			10	-1.39	-1.37	-1.59	-1.44	
			20	-1.06	-1.65	-1.49	-1.15	
			30	-1.41	-1.89	-1.47	-1.19	
			40	-1.89	-1.58	-1.40	-1.78	
			50	-1.99	-1.78	-1.98	-1.84	
			11.56 (85% Rated)	20	-1.68	-1.96	-1.83	
			15.64 (115% Rated)	20	-2.02	-2.20	-1.93	
Limit		2.5 ppm						
Conclusion		Complies						

4.7. Maximum Transmitter Power

TEST APPLICABLE

Per FCC «2.1046 and «90.205 and RSS-119 Section 5.4: Maximum ERP is dependent upon the station's antenna HAAT and required service area.

Per RSS-119 Section 5.4 and 5.4.1: The output power shall be within ± 1.0 dB of the manufacturer's rated power. Typical transmitter output powers are 110 watts for base and/or fixed stations (paging transmitters excepted), and 30 watts for mobile stations. Higher powers may be certified, but it should be noted that mobile stations are normally only licensed up to 30 watts. See the SRSP relevant to the operating frequency for equipment power limits.

TEST PROCEDURE

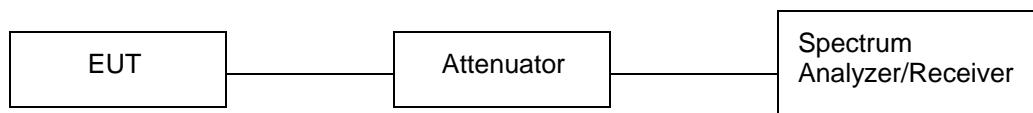
Measurements shall be made to establish the radio frequency power delivered by the transmitter the standard output termination. The power output shall be monitored and recorded and no adjustment shall be made to the transmitter after the test has begun, except as noted below:

If the power output is adjustable, measurements shall be made for the highest and lowest power levels.

The EUT connect to the Receiver through 40 dB attenuator.

Measurement with Spectrum Analyzer ESI 26 conducted, external power supply with 13.60V stabilized supply voltage.

TEST CONFIGURATION



The EUT was directly connected to a RF Communication
Test set by a 40 dB attenuator

TEST RESULTS

Only for FCC Review

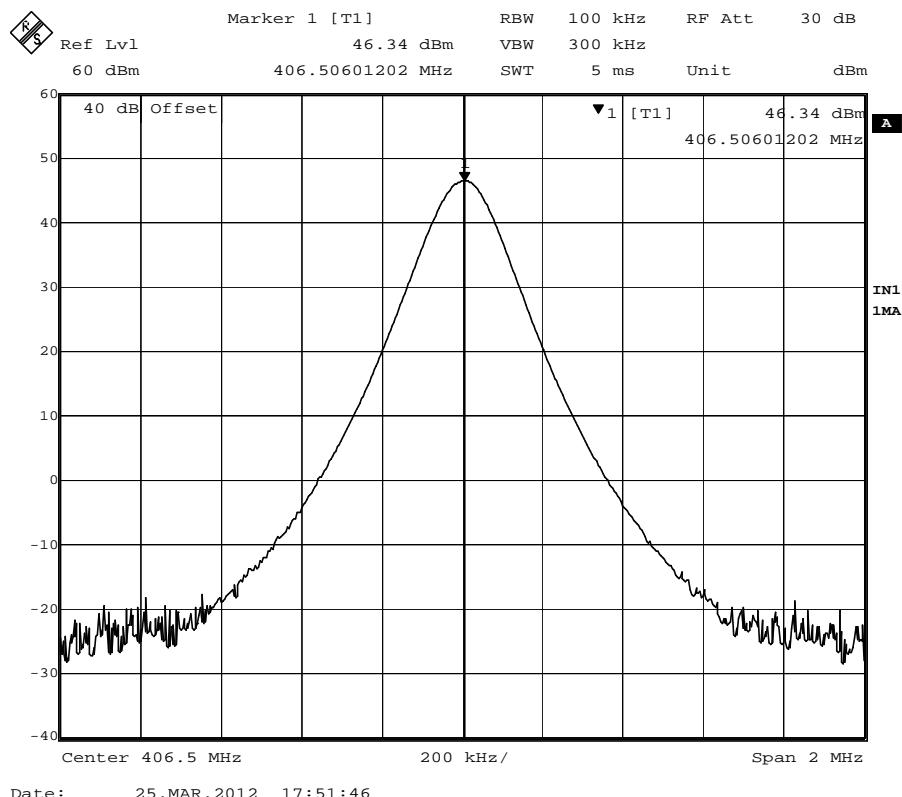
Modulation Type	Channel Separation	Test Channel	Test Frequency (MHz)	Maximum Transmitter Power (dBm)			
				High Power Level	Middle Power Level	Low Power Level	
Analog/FM	12.5KHz	Low	406.5000	46.34	43.95	39.88	
		Middle	450.5000	46.32	43.55	40.51	
		High	489.5000	46.69	43.90	40.03	
Limit		The limit is dependent upon the station's antenna HAAT and required service area.					
Test Results		Compliance					

Only for IC Review (Not For FCC Review)

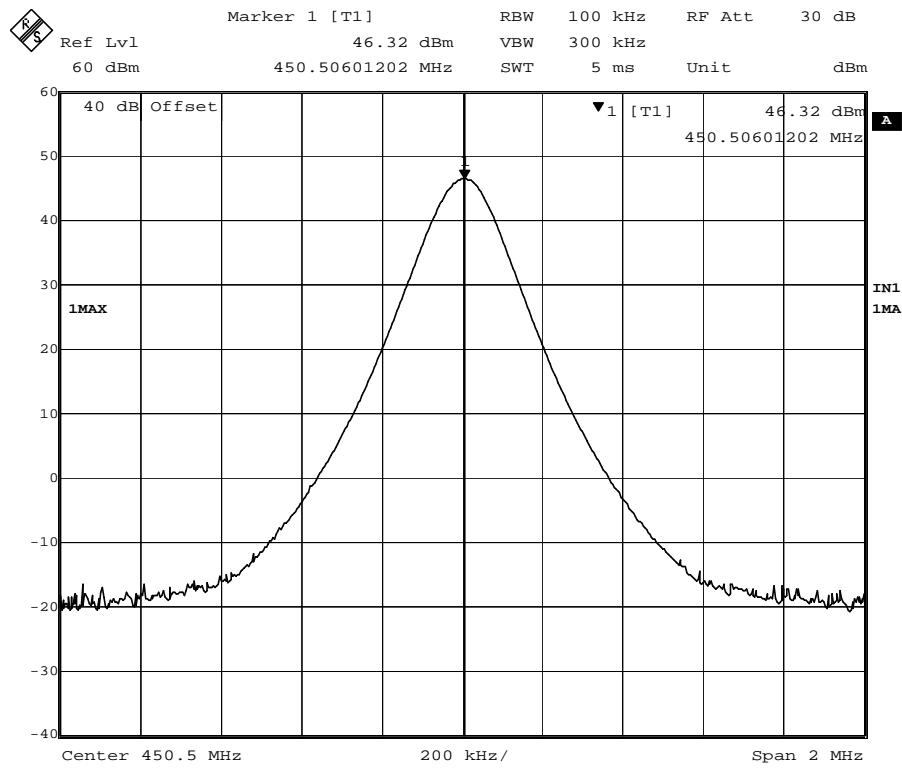
Modulation Type	Channel Separation	Test Channel	Test Frequency (MHz)	Maximum Transmitter Power (dBm)			
				High Power Level	Middle Power Level	Low Power Level	
Analog/FM	25KHz	Low	406.5000	46.35	43.95	39.88	
		Middle	429.5000	46.60	43.92	40.62	
		Middle	450.5000	46.35	43.55	40.51	
		High	469.0000	46.58	43.87	40.05	
	12.5KHz	Low	406.5000	46.34	43.95	39.88	
		Middle	429.5000	46.59	43.92	40.62	
		Middle	450.5000	46.32	43.55	40.51	
		High	469.0000	46.57	43.87	40.05	
Limit		The output power shall be within ± 1.0 dB of the manufacturer's rated power.					
Test Results		Compliance					

Plots of Maximum Transmitter Power MeasurementOnly for FCC Review

Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	12.5 KHz	406.5000	45	46.34	Varies	Compliance

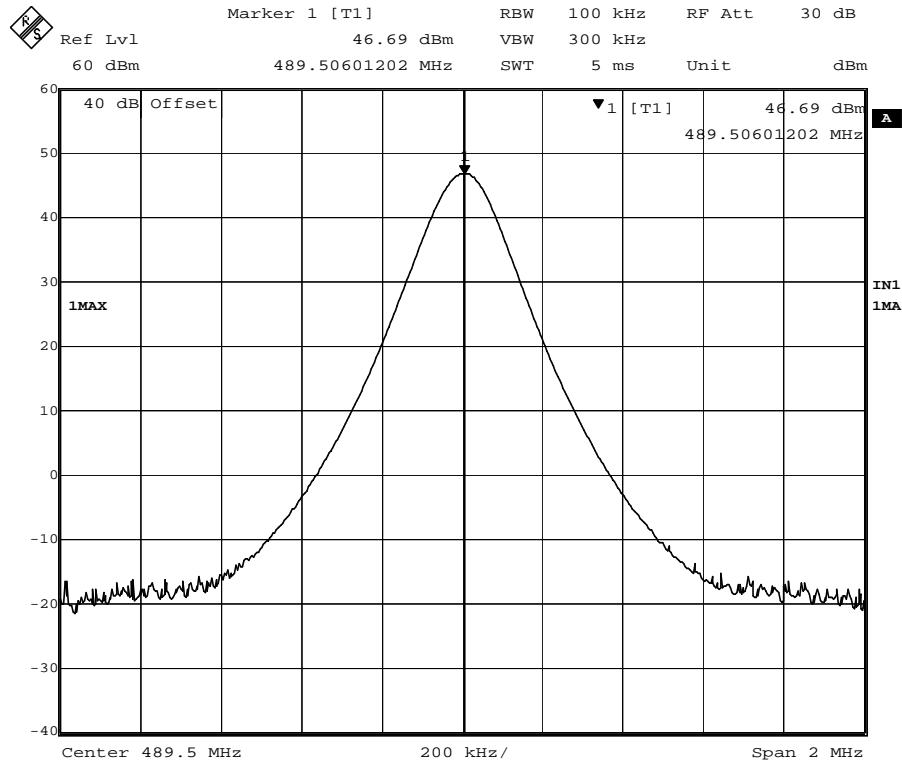


Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	12.5 KHz	450.5000	45	46.32	Varies	Compliance



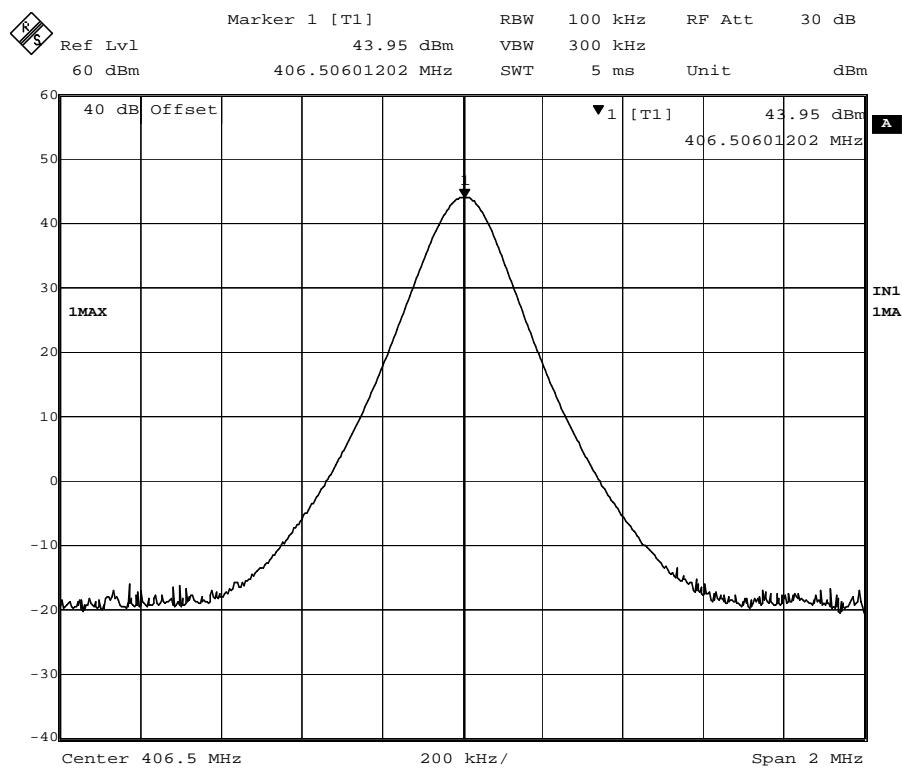
Date: 25.MAR.2012 17:52:53

Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	12.5 KHz	489.5000	45	46.69	Varies	Compliance

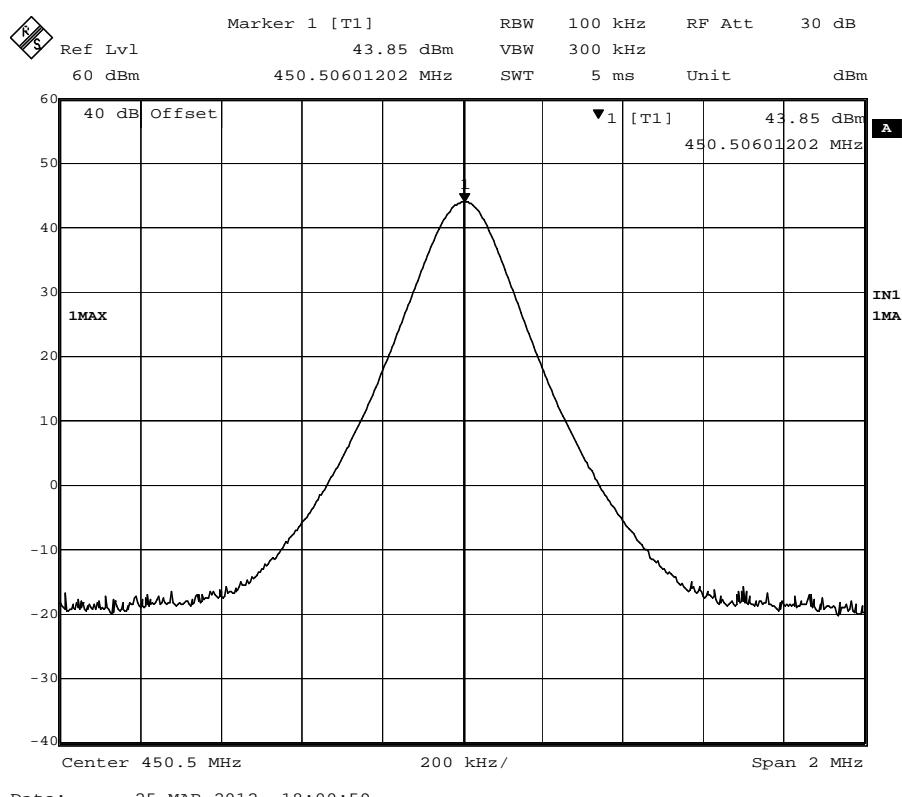


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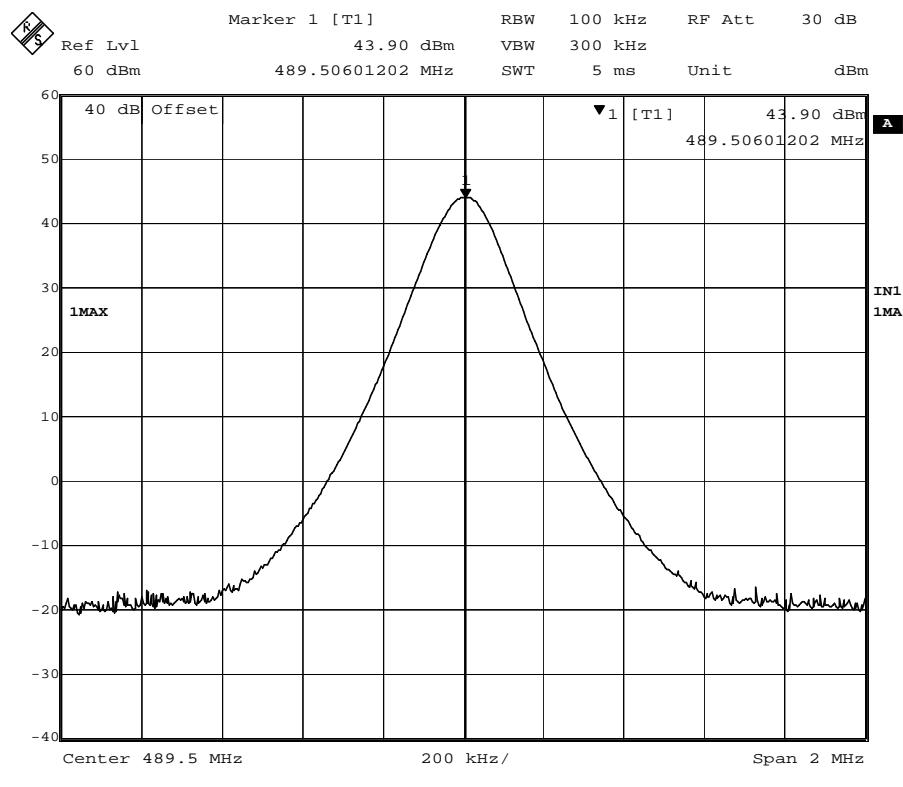
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	12.5 KHz	406.5000	25	43.95	Varies	Compliance



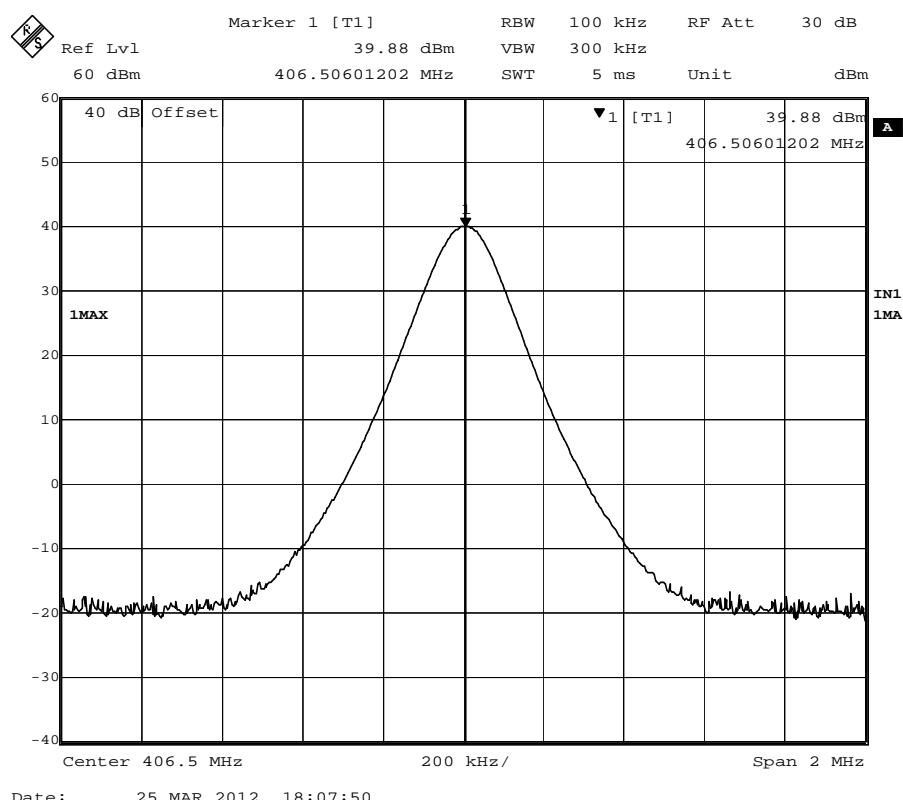
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	12.5 KHz	450.5000	25	43.55	Varies	Compliance



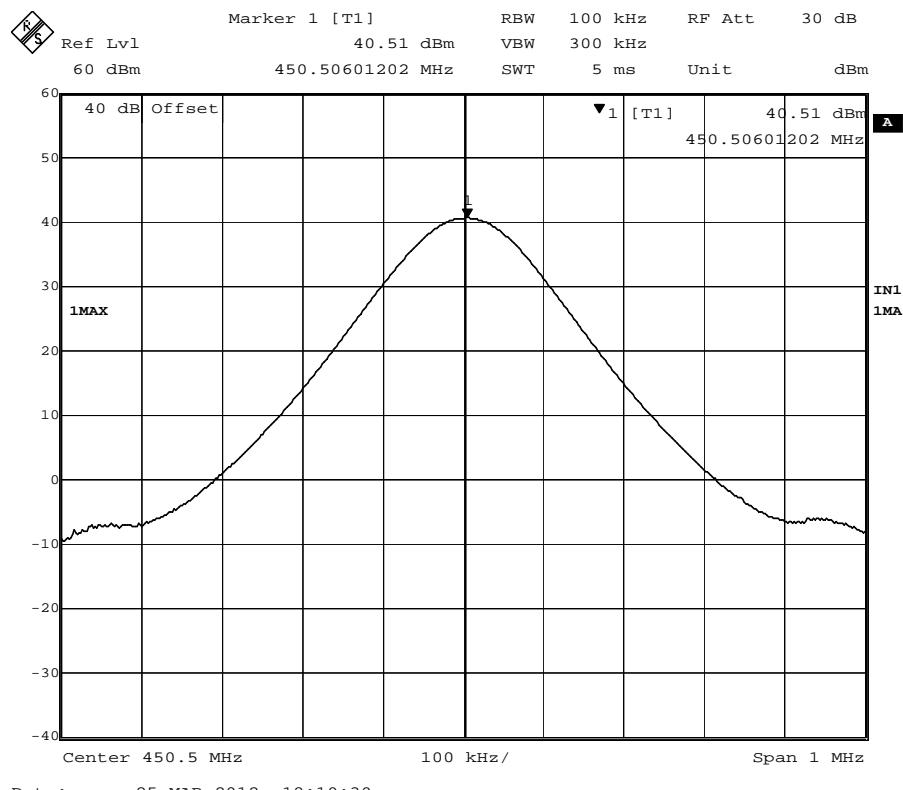
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	12.5 KHz	489.5000	25	43.90	Varies	Compliance



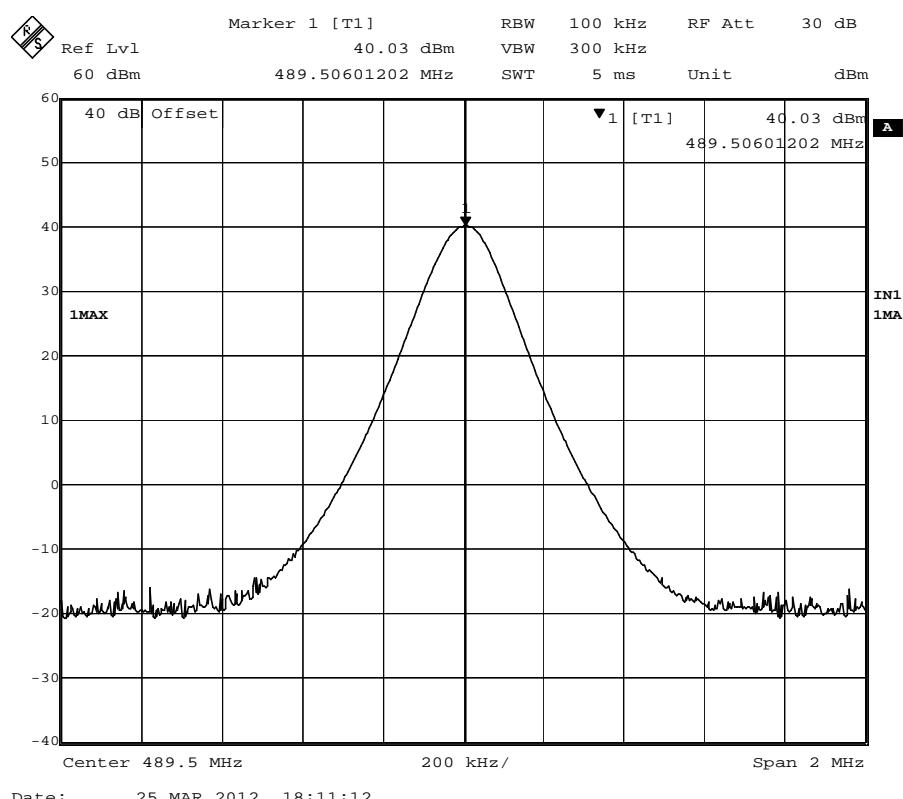
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	12.5 KHz	406.5000	10	39.88	Varies	Compliance



Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	12.5 KHz	450.5000	10	40.51	Varies	Compliance

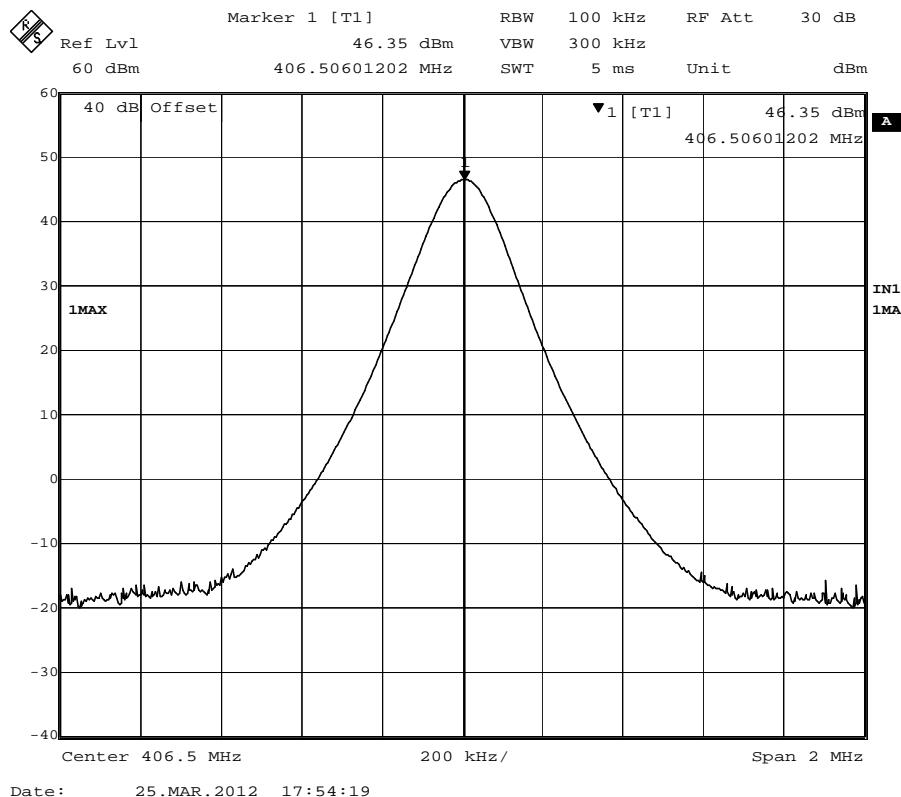


Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	12.5 KHz	489.5000	10	40.03	Varies	Compliance

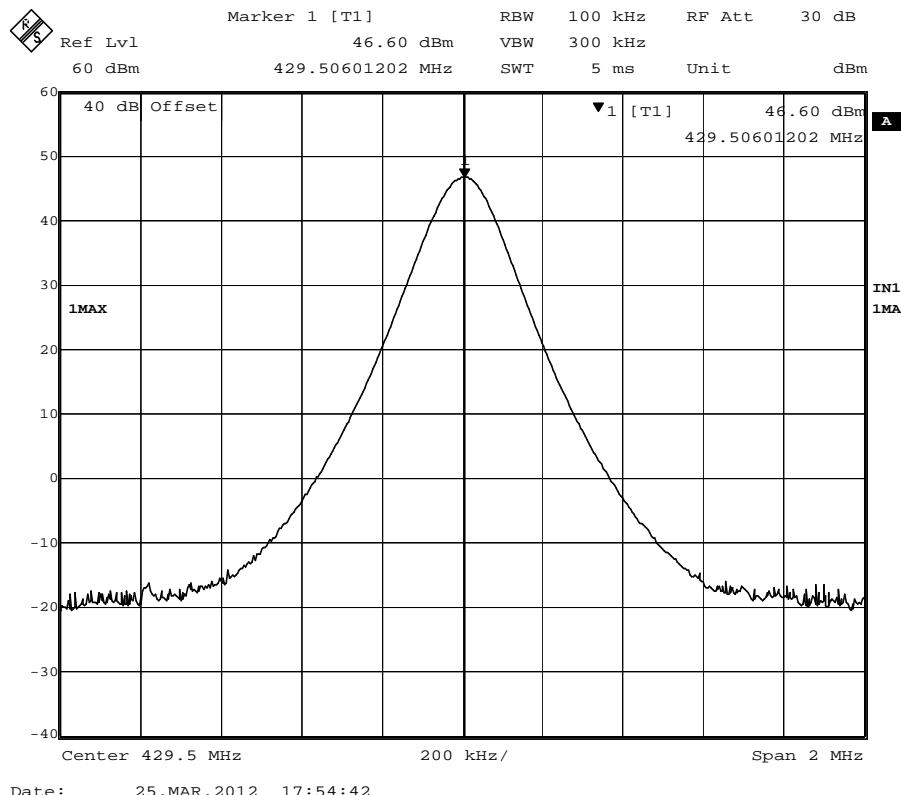


Only for IC Review (Not For FCC Review)

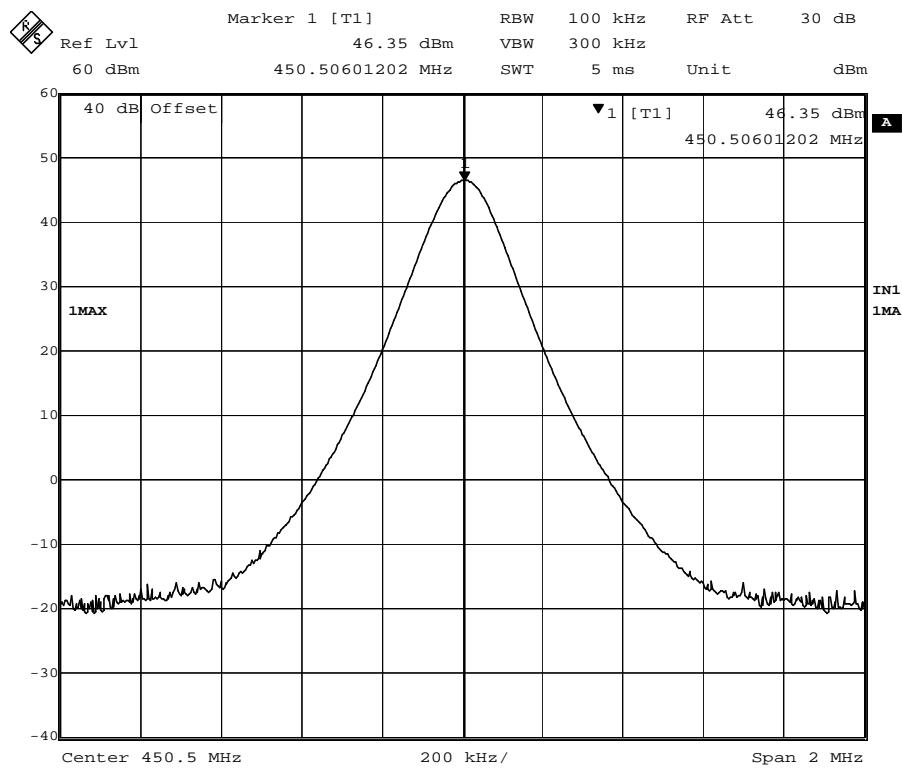
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	IC Limit (dBm)	Results
FM	25 KHz	406.5000	45	46.35	46.53±1	Compliance



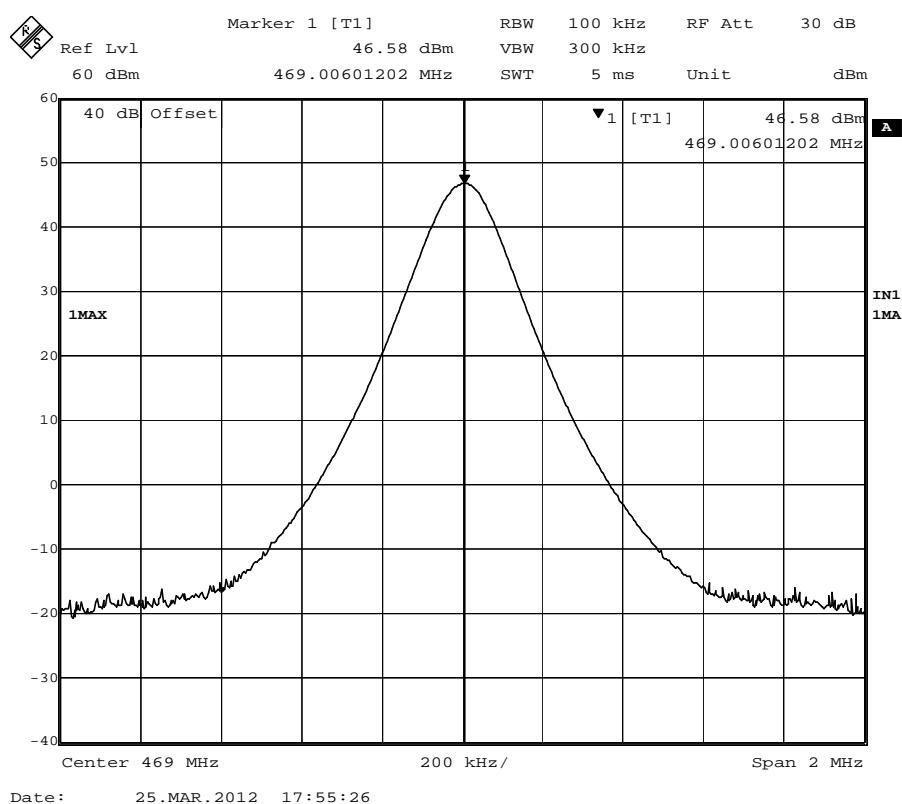
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	IC Limit (dBm)	Results
FM	25 KHz	429.5000	45	46.60	46.53±1	Compliance



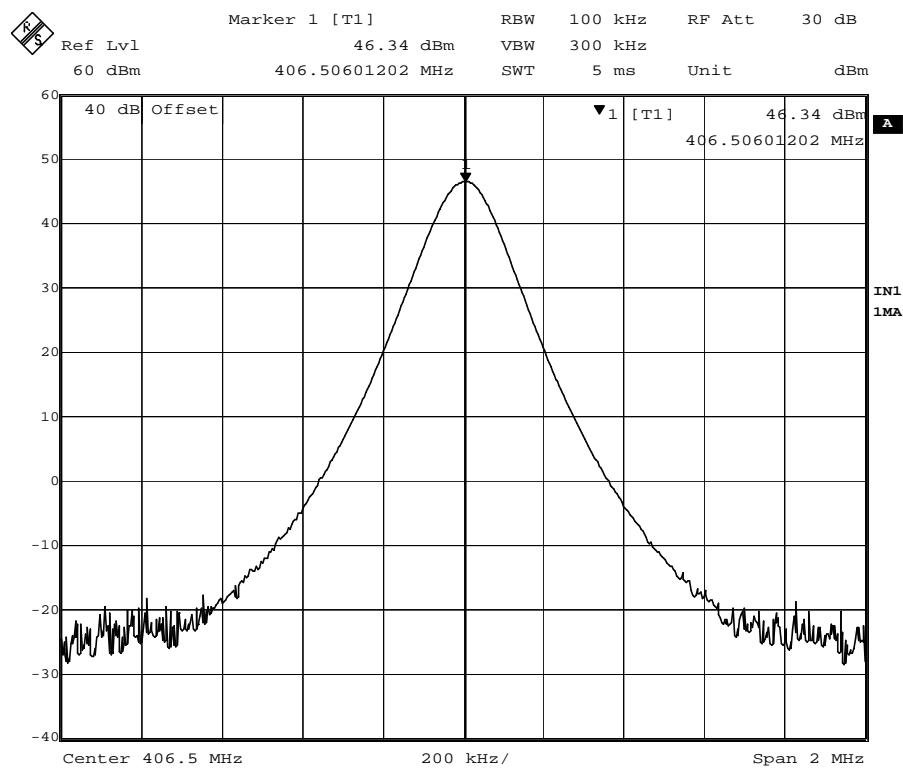
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	IC Limit (dBm)	Results
FM	25 KHz	450.5000	45	46.35	46.53±1	Compliance



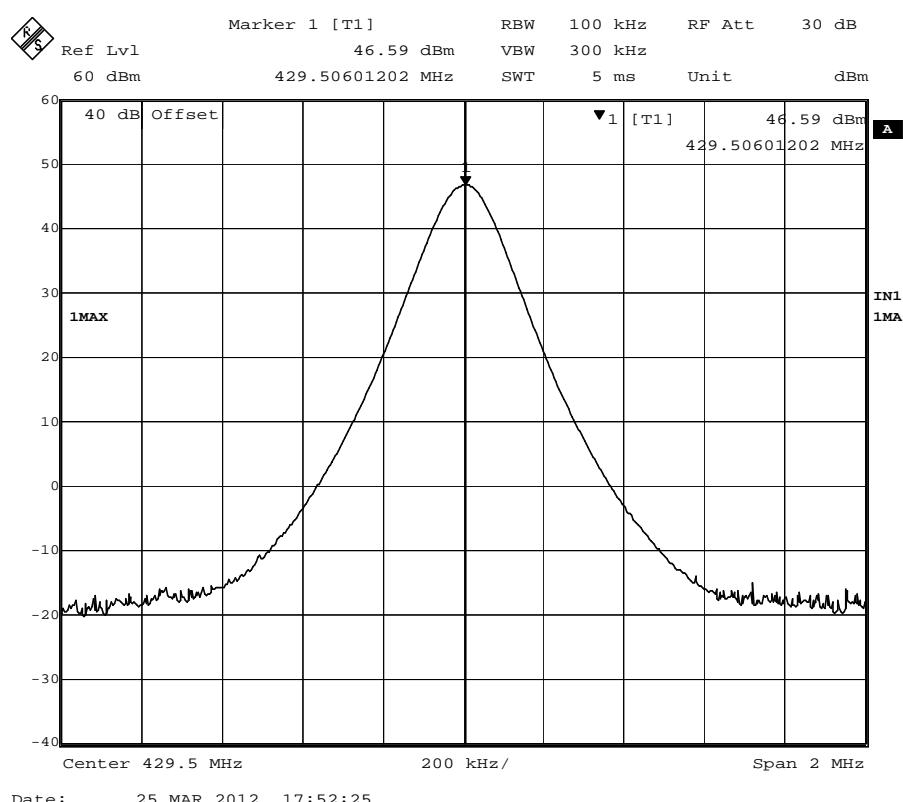
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	IC Limit (dBm)	Results
FM	25 KHz	469.0000	45	46.58	46.53±1	Compliance



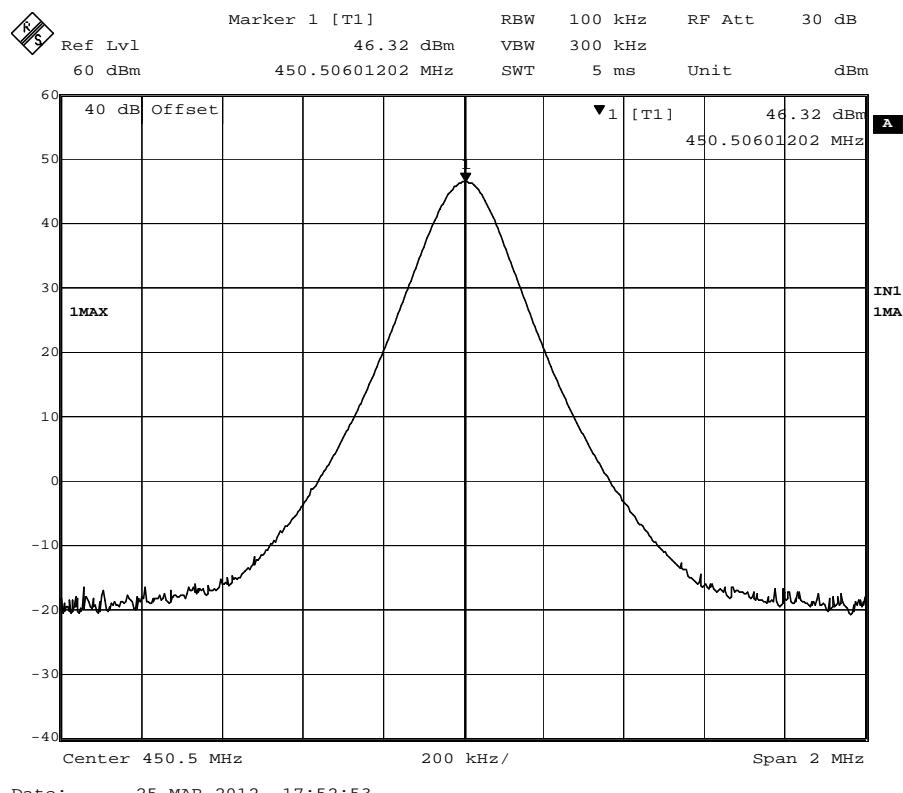
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	IC Limit (dBm)	Results
FM	12.5 KHz	406.5000	45	46.34	46.53±1	Compliance



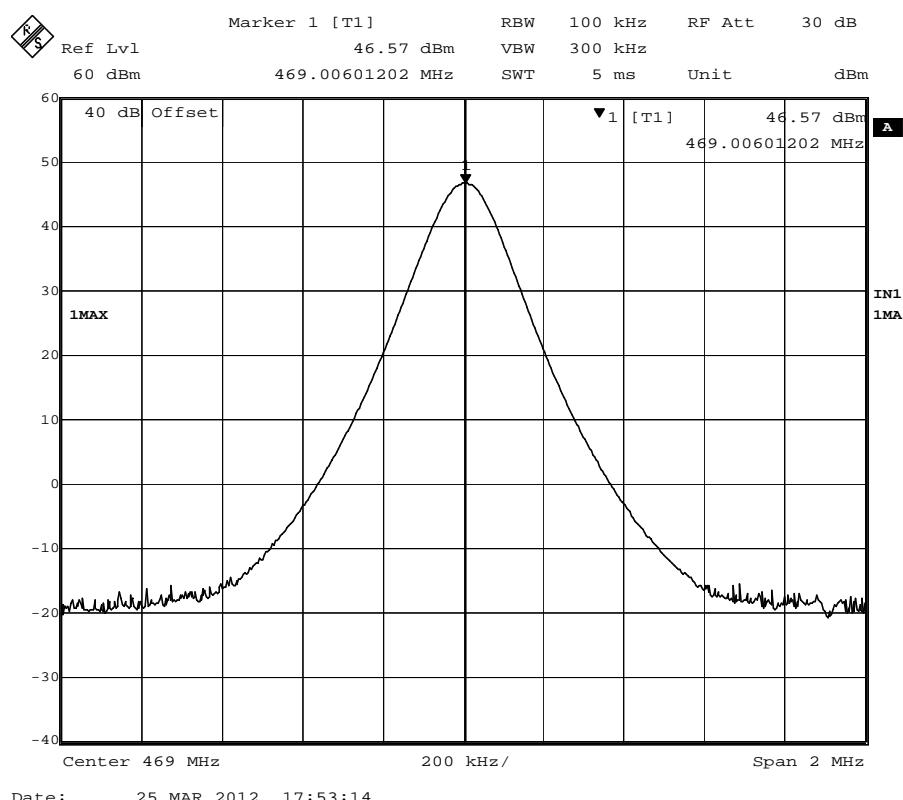
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	IC Limit (dBm)	Results
FM	12.5 KHz	429.5000	45	46.59	46.53±1	Compliance



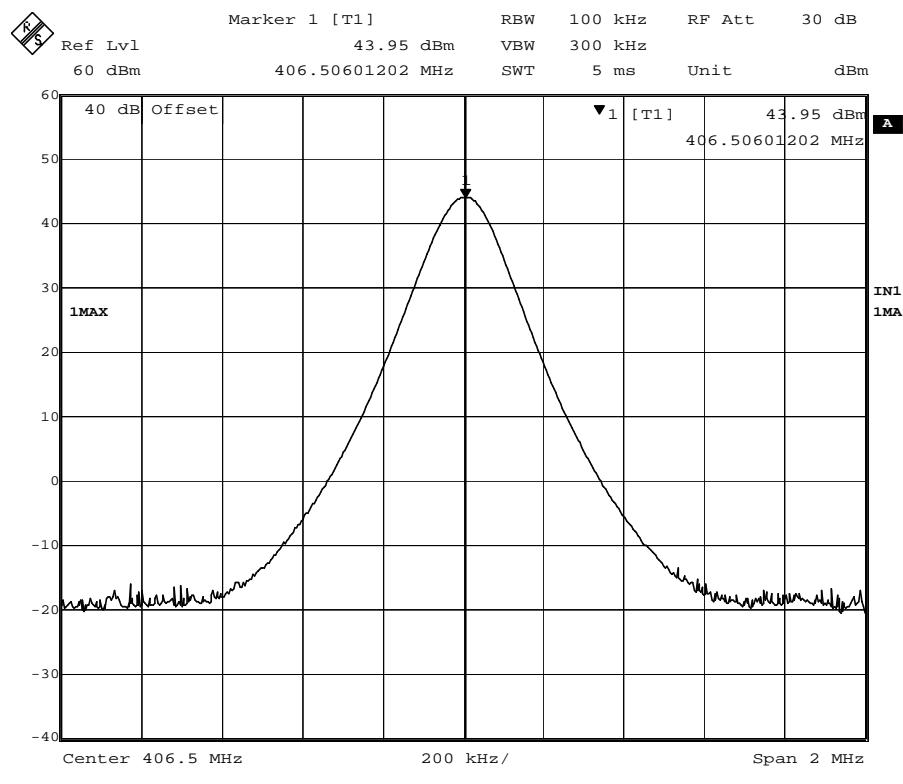
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	IC Limit (dBm)	Results
FM	12.5 KHz	450.5000	45	46.32	46.53±1	Compliance



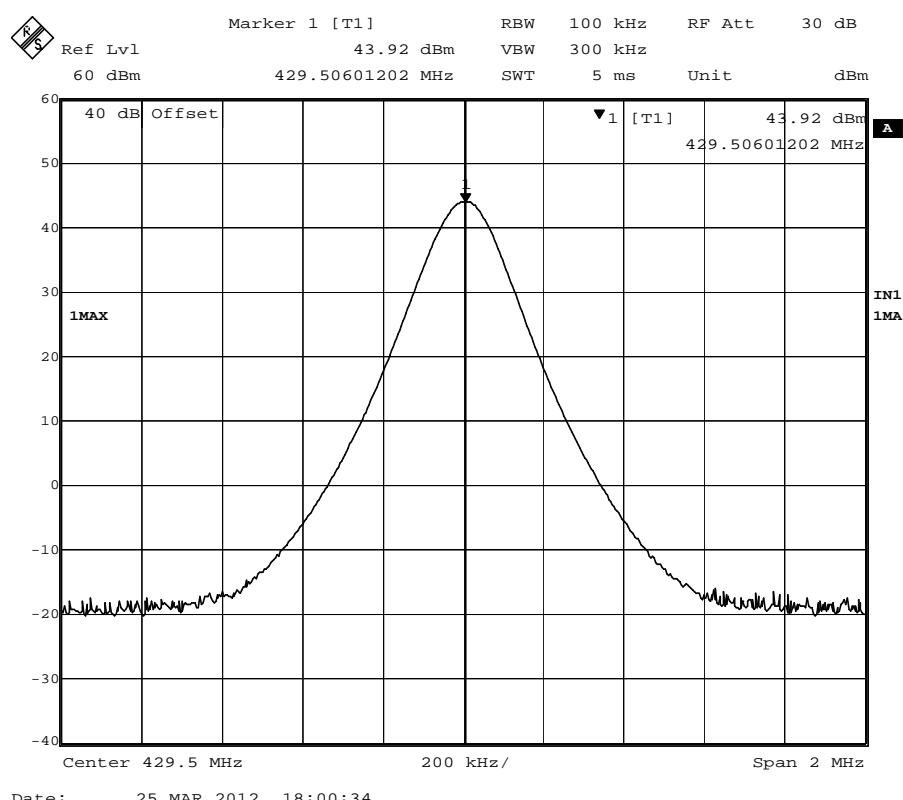
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	IC Limit (dBm)	Results
FM	12.5 KHz	469.0000	45	46.57	46.53±1	Compliance



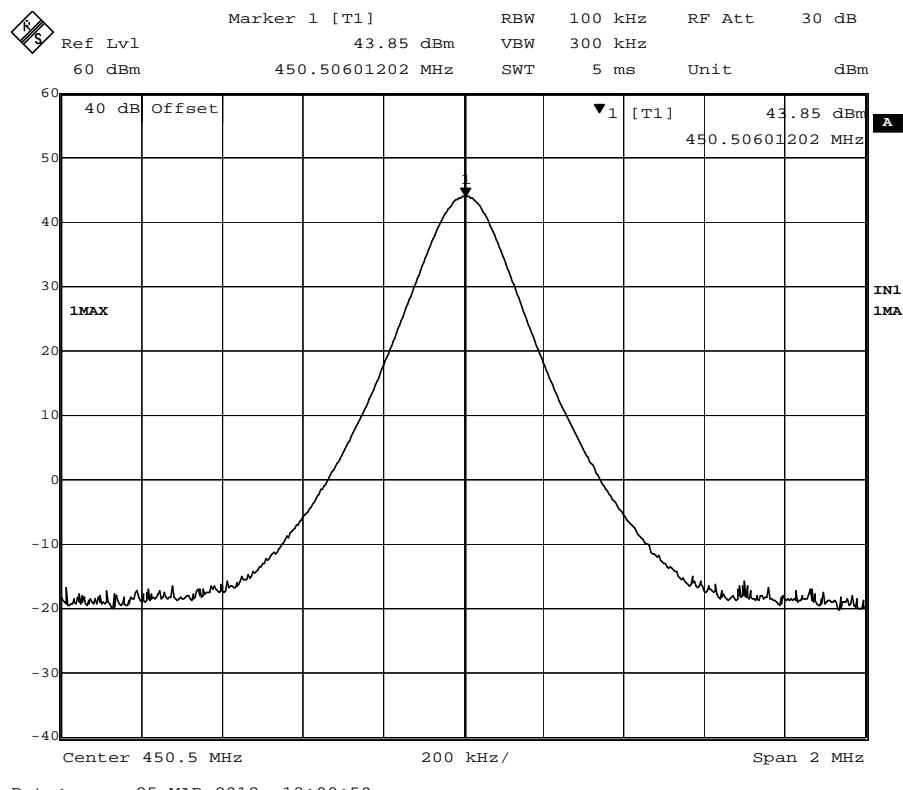
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	IC Limit (dBm)	Results
FM	12.5 KHz	406.5000	25	43.95	43.98±1	Compliance



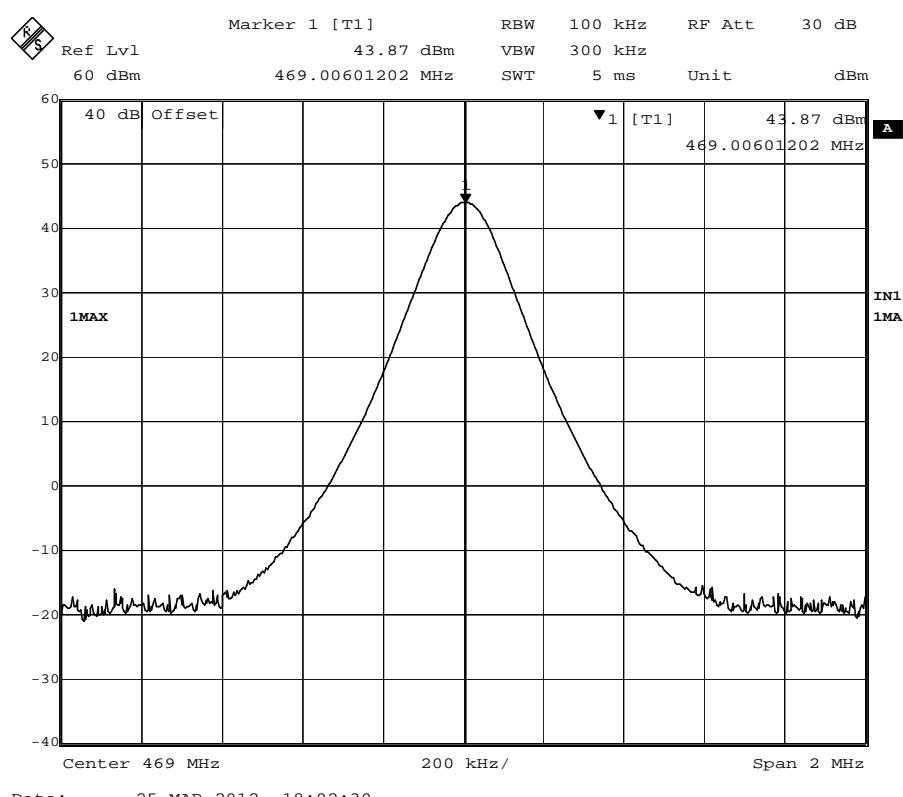
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	IC Limit (dBm)	Results
FM	12.5KHz	429.5000	25	43.92	43.98±1	Compliance



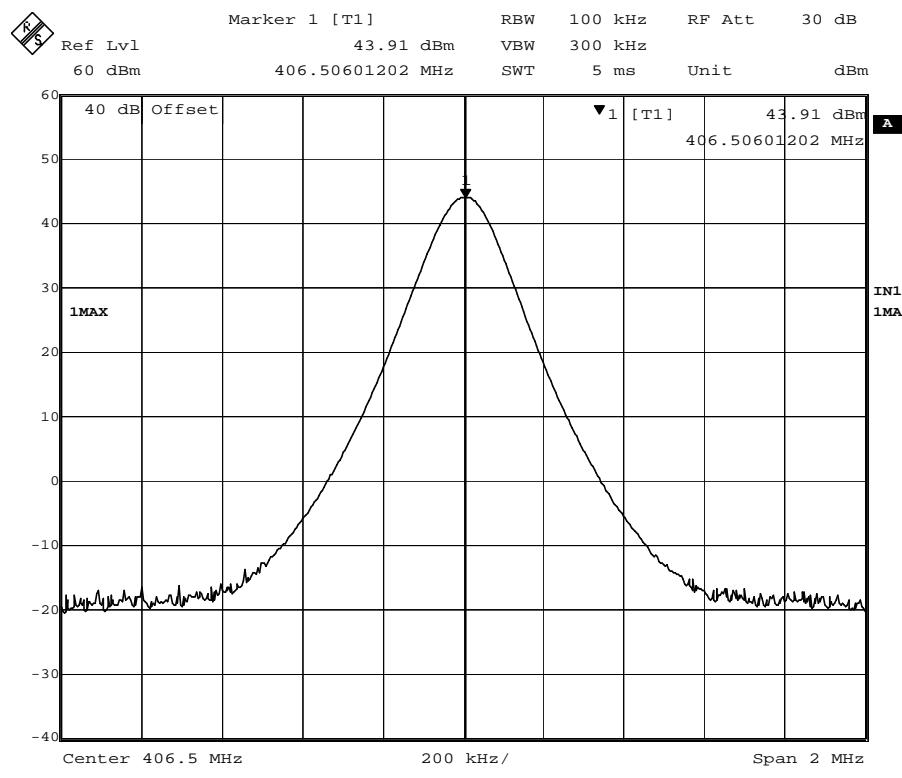
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	IC Limit (dBm)	Results
FM	12.5 KHz	450.5000	25	43.55	43.98±1	Compliance



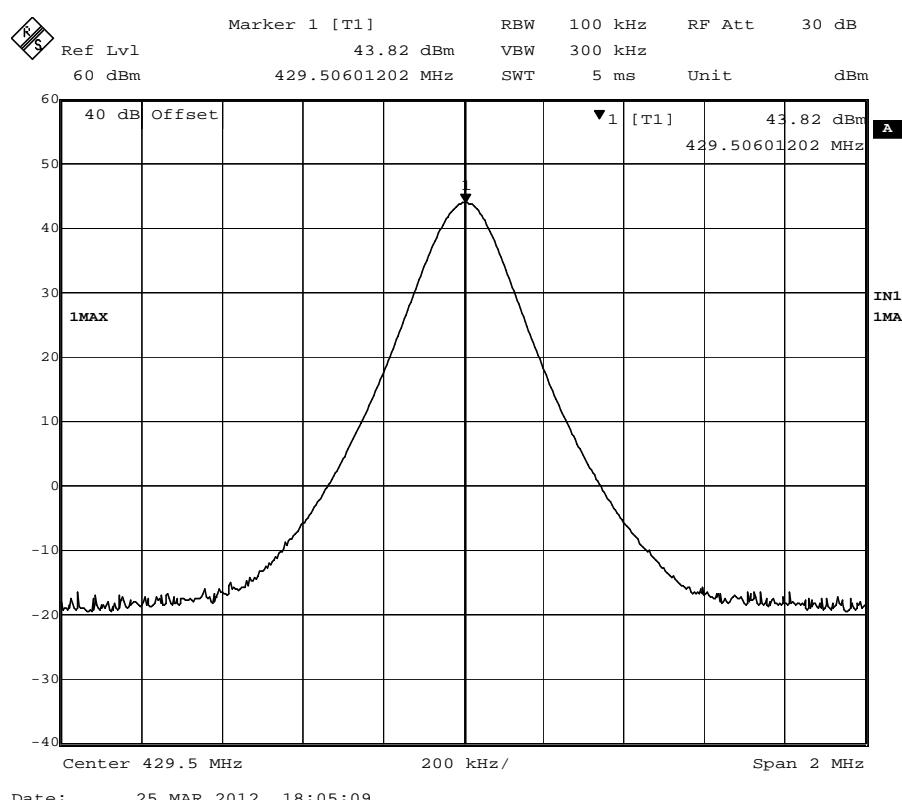
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	IC Limit (dBm)	Results
FM	12.5 KHz	469.000	25	43.87	43.98±1	Compliance



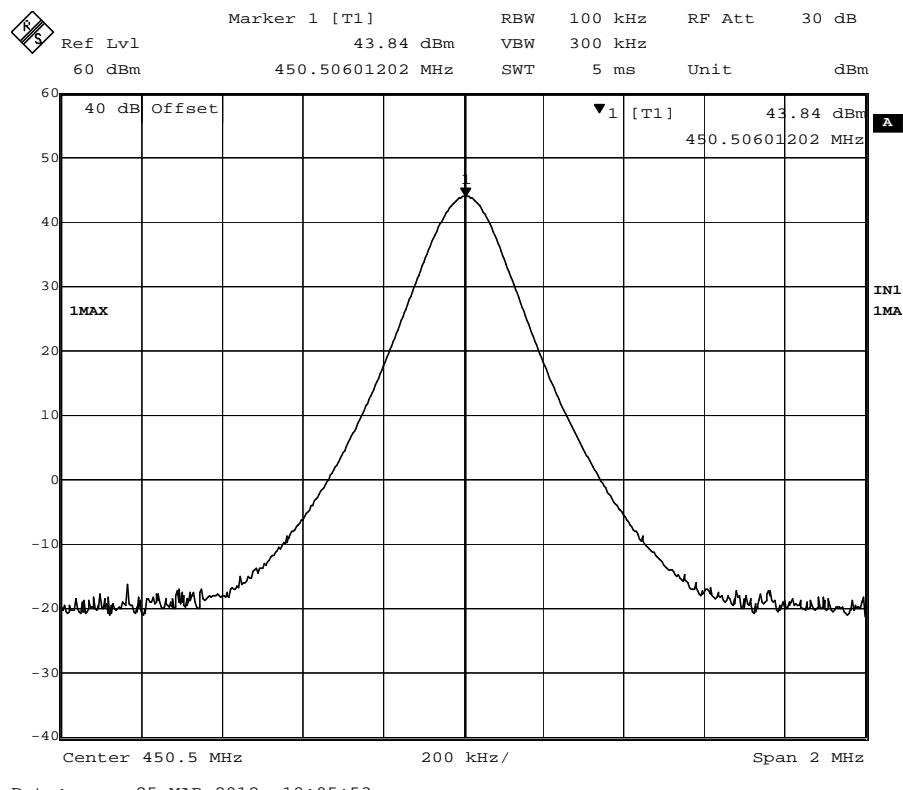
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	IC Limit (dBm)	Results
FM	25KHz	406.5000	25	43.91	43.98±1	Compliance



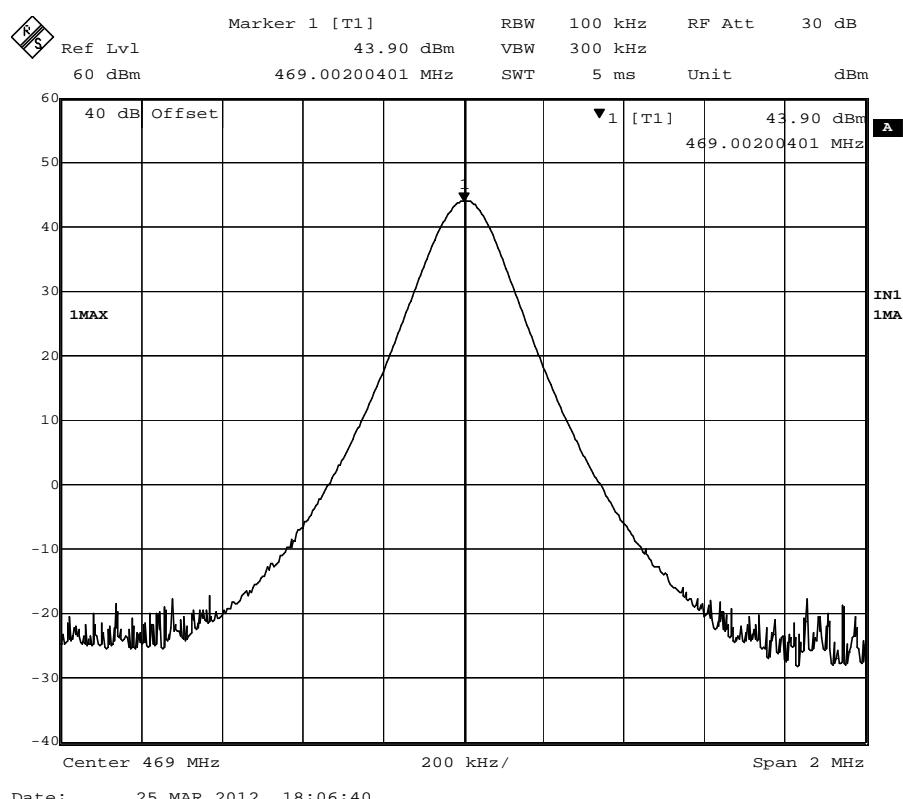
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	IC Limit (dBm)	Results
FM	25 KHz	429.5000	25	43.82	43.98±1	Compliance



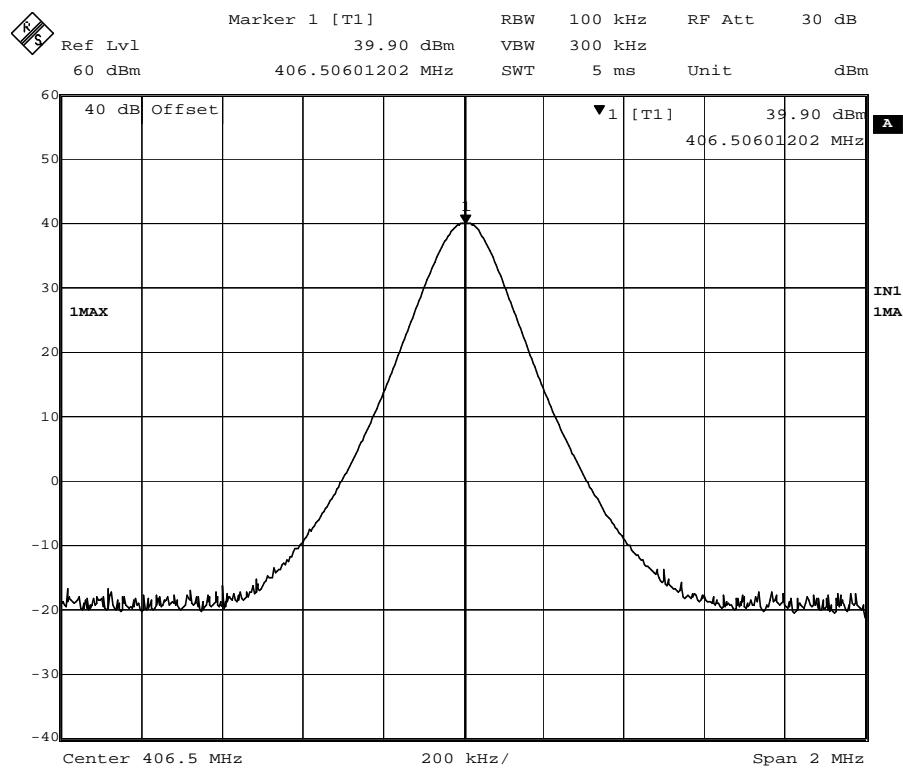
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	IC Limit (dBm)	Results
FM	25 KHz	450.5000	25	43.54	43.98±1	Compliance



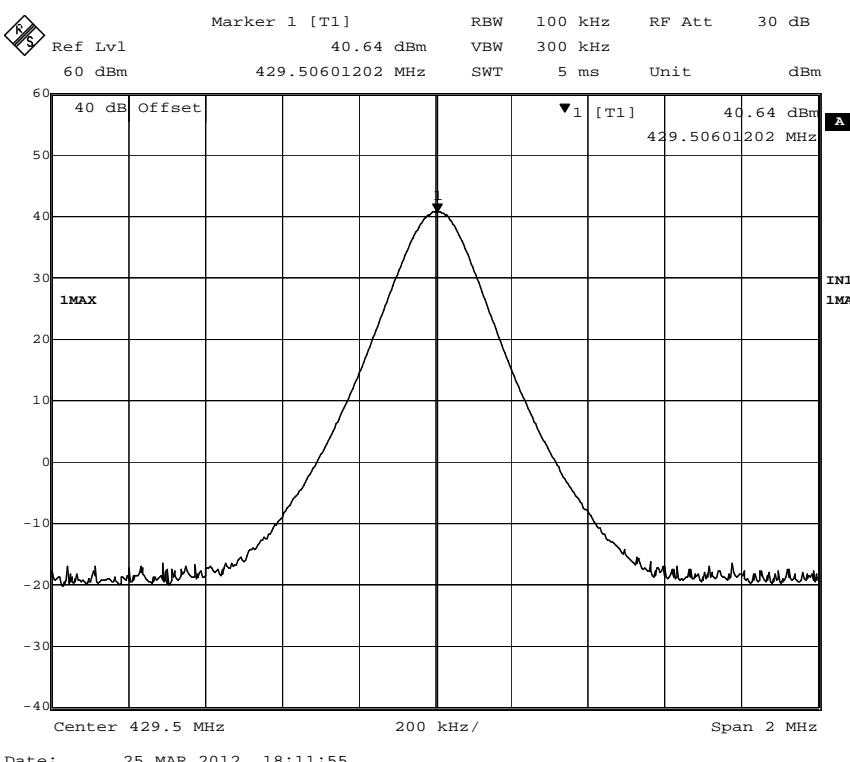
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	IC Limit (dBm)	Results
FM	25 KHz	469.0000	25	43.90	43.98±1	Compliance



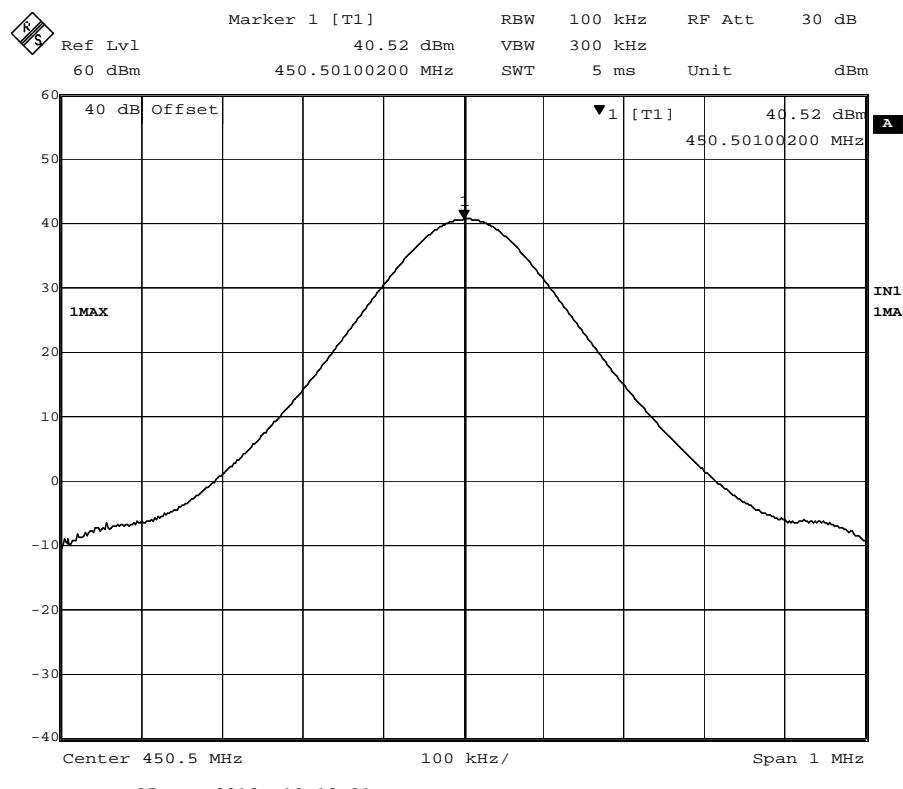
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	IC Limit (dBm)	Results
FM	25 KHz	406.5000	10	39.90	40.00±1	Compliance



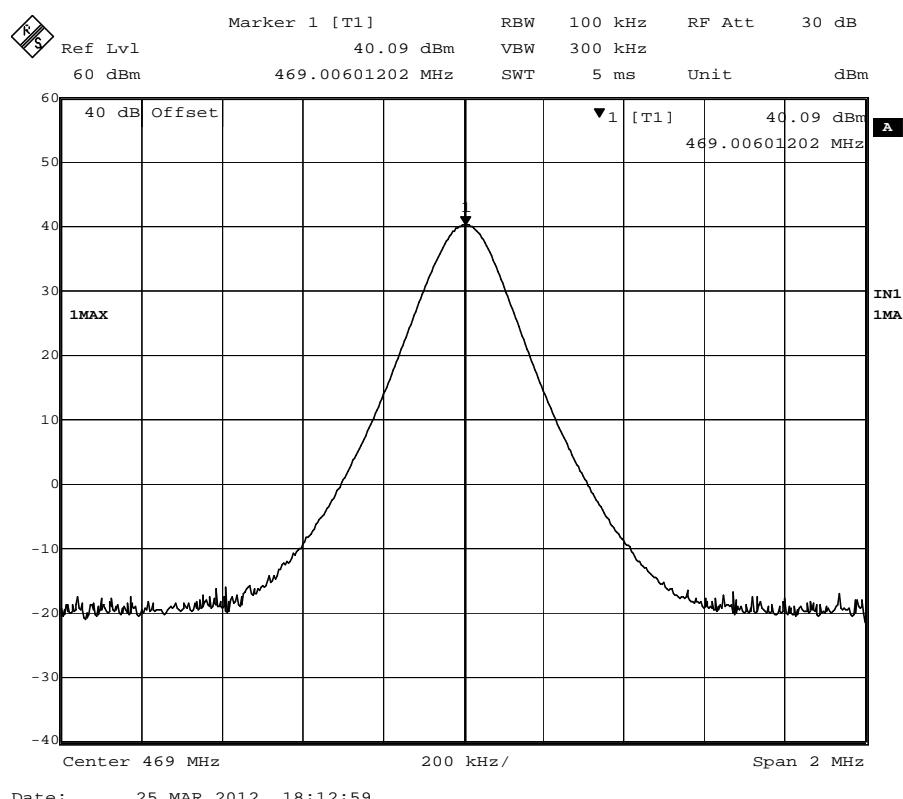
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	IC Limit (dBm)	Results
FM	25 KHz	429.5000	10	40.64	40.00±1	Compliance



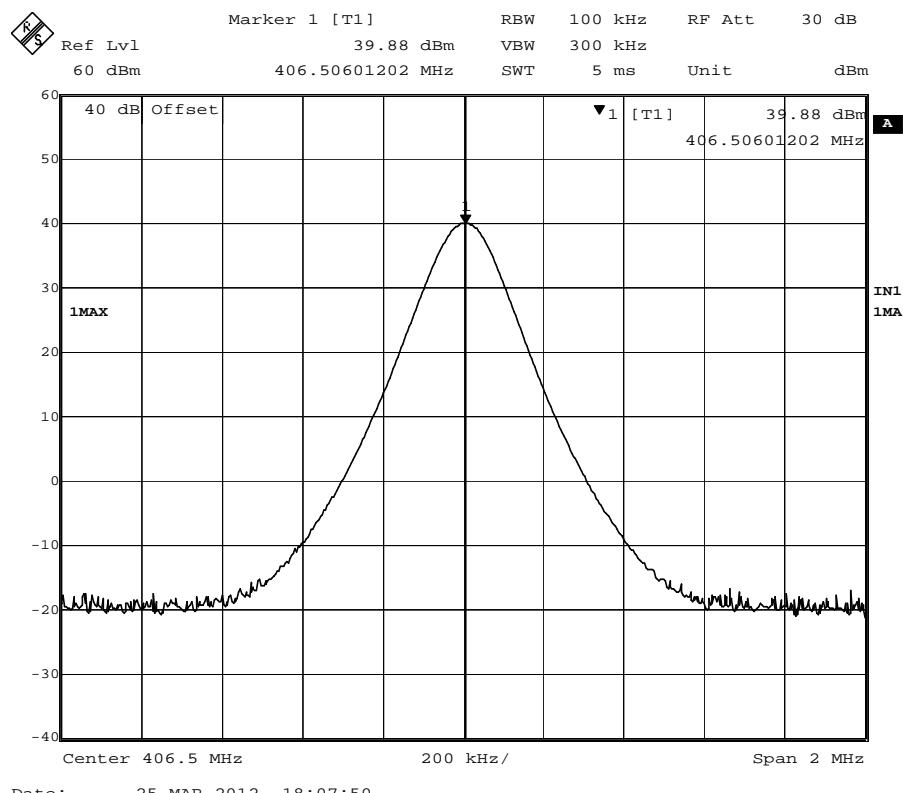
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	IC Limit (dBm)	Results
FM	25 KHz	450.5000	10	40.52	40.00±1	Compliance



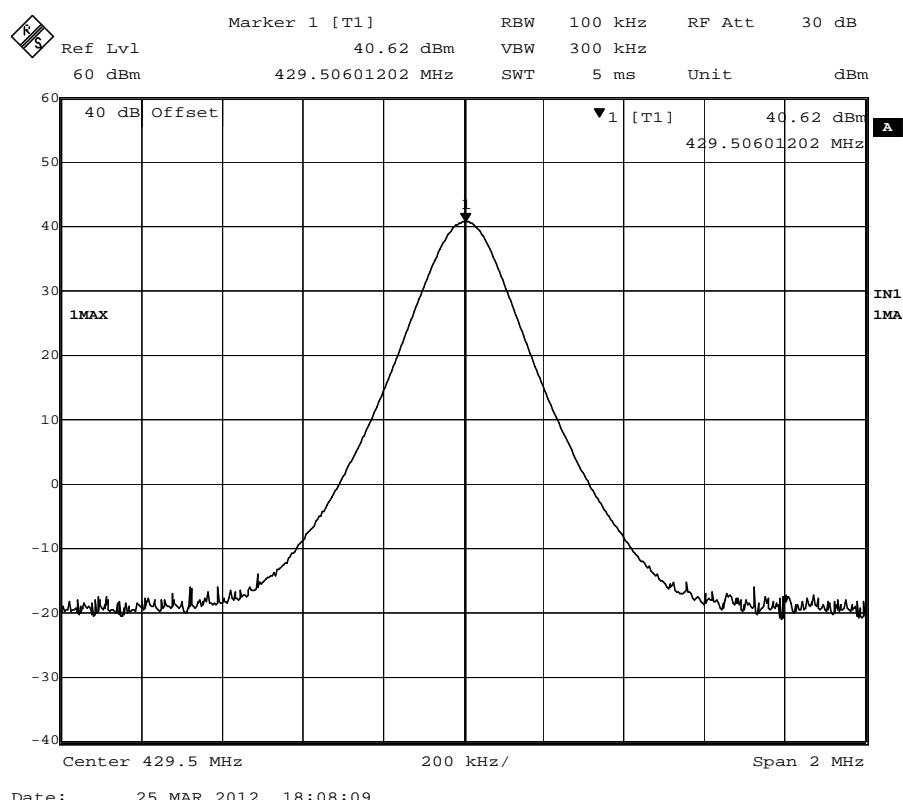
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	IC Limit (dBm)	Results
FM	25 KHz	469.0000	10	40.09	40.00±1	Compliance



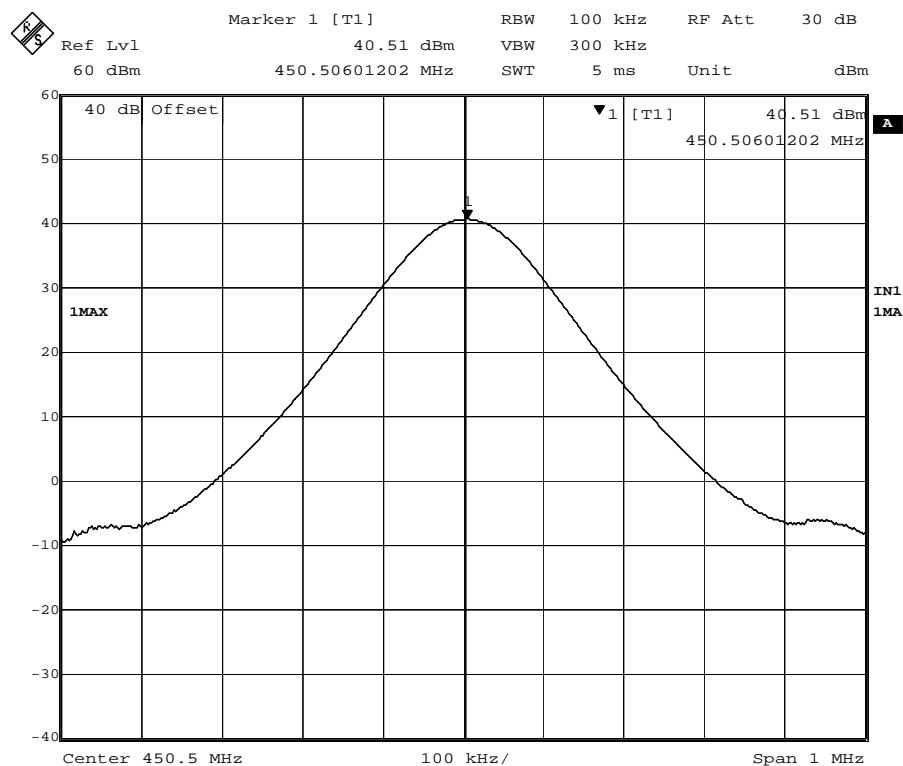
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	IC Limit (dBm)	Results
FM	12.5 KHz	406.5000	10	39.88	40.00±1	Compliance



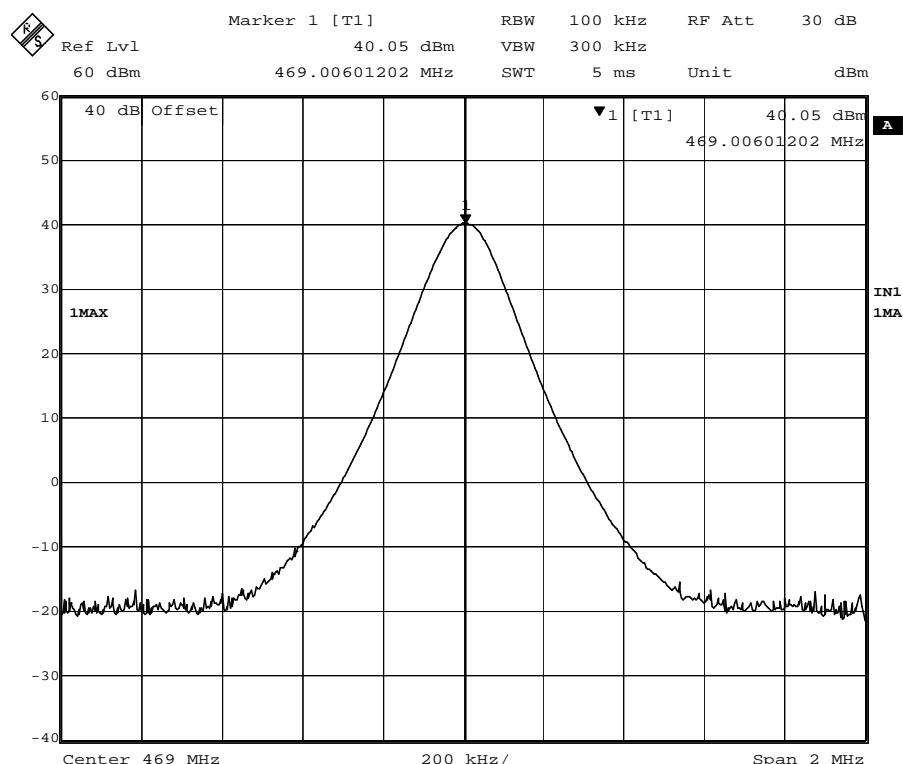
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	IC Limit (dBm)	Results
FM	12.5 KHz	429.5000	10	40.62	40.00±1	Compliance



Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	IC Limit (dBm)	Results
FM	12.5 KHz	450.5000	10	40.51	40.00±1	Compliance



Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	IC Limit (dBm)	Results
FM	12.5 KHz	469.000	10	40.05	40.00±1	Compliance



4.8. Transmitter Frequency Behavior

TEST APPLICABLE

Section 90.214 and ESS-119 Section 5.9

Transient frequencies must be within the maximum frequency difference limits during the time intervals indicated:

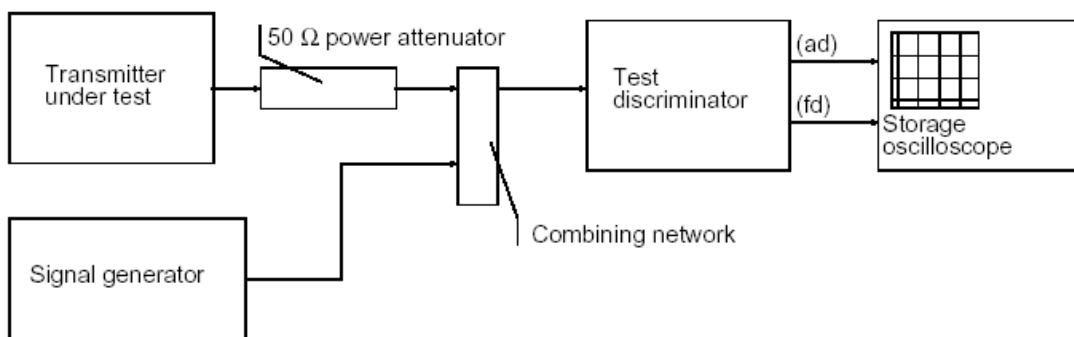
Time intervals ^{1, 2}	Maximum frequency difference ³	All equipment	
		150 to 174 MHz	421 to 512MHz
Transient Frequency Behavior for Equipment Designed to Operate on 25 KHz Channels			
t ₁ ⁴	± 25.0 KHz	5.0 ms	10.0 ms
t ₂	± 12.5 KHz	20.0 ms	25.0 ms
t ₃ ⁴	± 25.0 KHz	5.0 ms	10.0 ms
Transient Frequency Behavior for Equipment Designed to Operate on 12.5 KHz Channels			
t ₁ ⁴	± 12.5 KHz	5.0 ms	10.0 ms
t ₂	± 6.25 KHz	20.0 ms	25.0 ms
t ₃ ⁴	± 12.5 KHz	5.0 ms	10.0 ms
Transient Frequency Behavior for Equipment Designed to Operate on 6.25 KHz Channels			
t ₁ ⁴	±6.25 KHz	5.0 ms	10.0 ms
t ₂	±3.125 KHz	20.0 ms	25.0 ms
..... t ₃ ⁴	±6.25 KHz	5.0 ms	10.0 ms

1. t_{on} is the instant when a 1 KHz test signal is completely suppressed, including any capture time due to phasing.
 t₁ is the time period immediately following t_{on}.
 t₂ is the time period immediately following t₁.
 t₃ is the time period from the instant when the transmitter is turned off until t_{off}.
 t_{off} is the instant when the 1 KHz test signal starts to rise.
2. During the time from the end of t₂ to the beginning of t₃, the frequency difference must not exceed the limits specified in § 90.213.
3. Difference between the actual transmitter frequency and the assigned transmitter frequency.
4. If the transmitter carrier output power rating is 6 watts or less, the frequency difference during this time period may exceed the maximum frequency difference for this time period.

TEST PROCEDURE

TIA/EIA-603 2.2.19

TEST CONFIGURATION

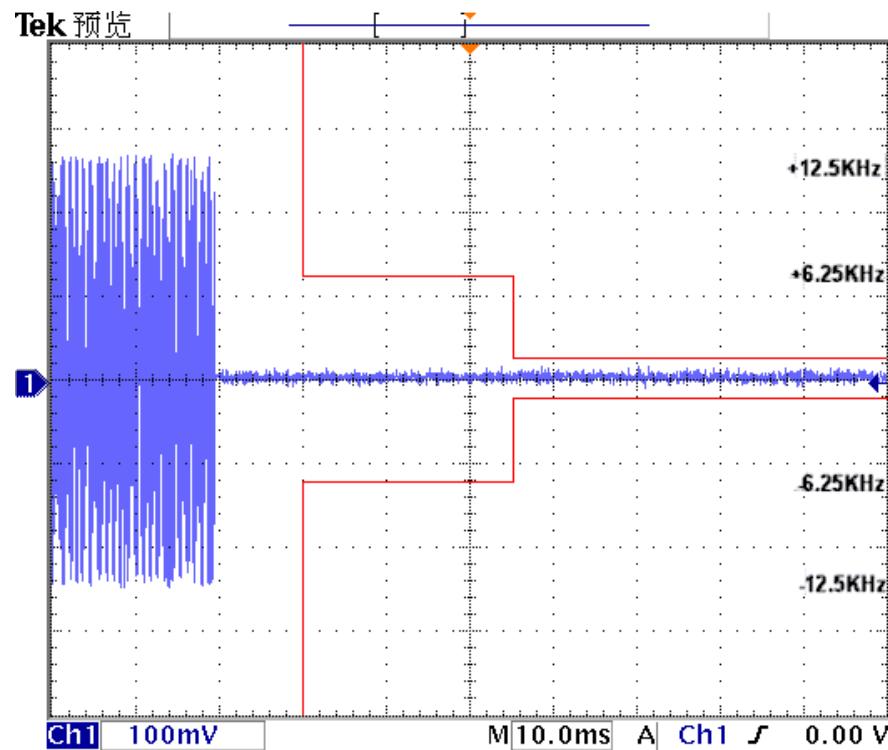


TEST RESULTS

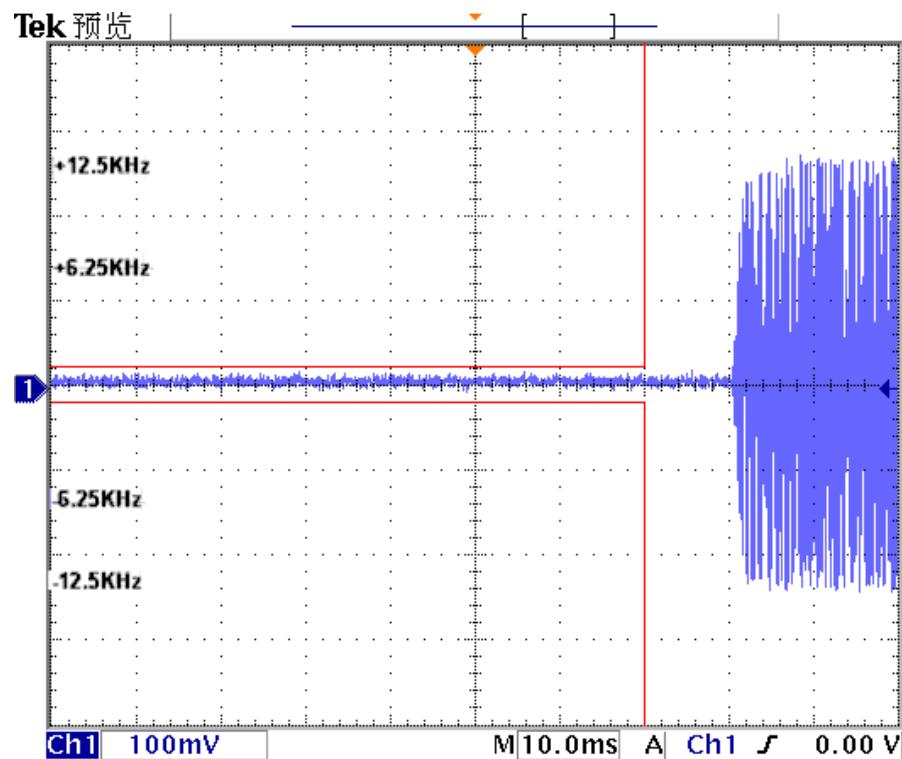
Both for FCC and IC Review

Please refer to the following plots.

Transmitter Frequency Behaviour @ 12.5 KHz Channel Separation-----Off – On

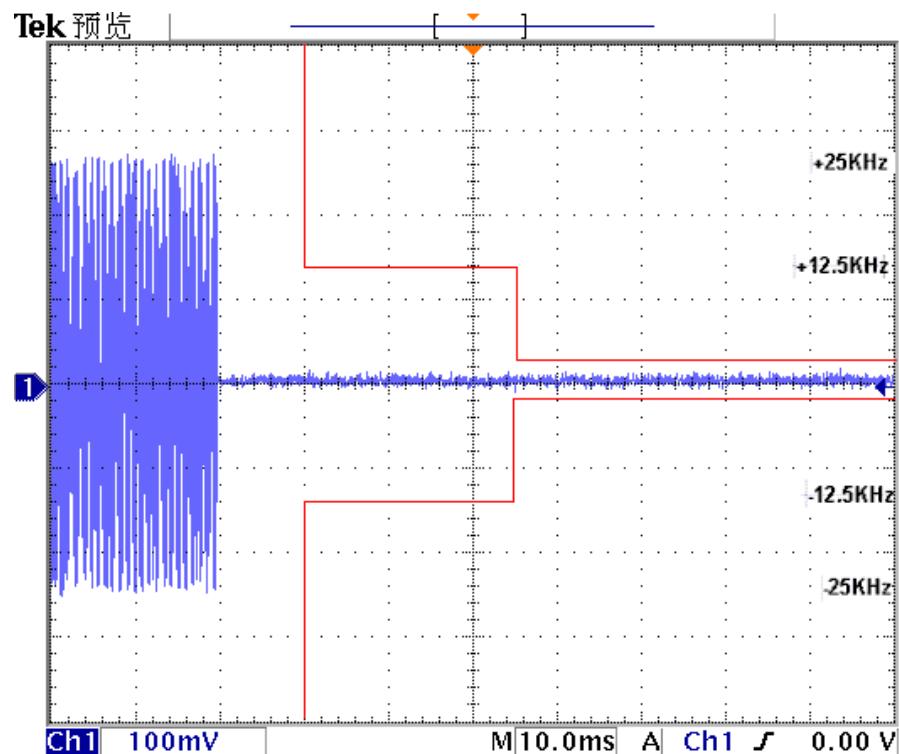


Transmitter Frequency Behaviour @ 12.5 KHz Channel Separation-----On - Off

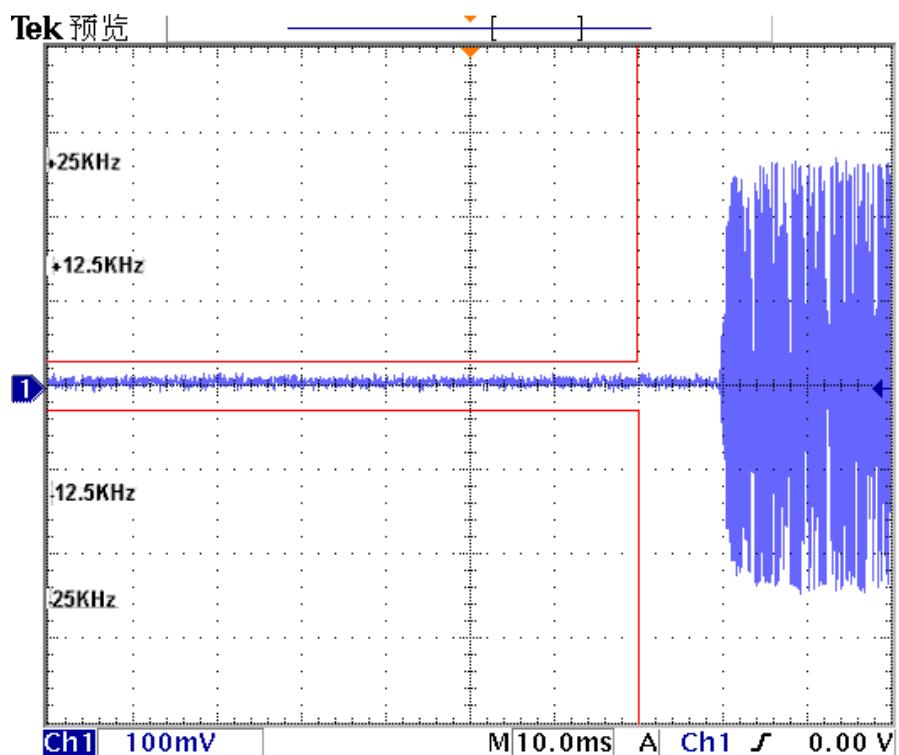


Only for IC Review (Not For FCC Review)

Transmitter Frequency Behaviour @ 25 KHz Channel Separation-----Off – On



Transmitter Frequency Behaviour @ 25 KHz Channel Separations-----On – Off



4.9. Receiver Radiated Spurious Emission

TEST APPLICABLE

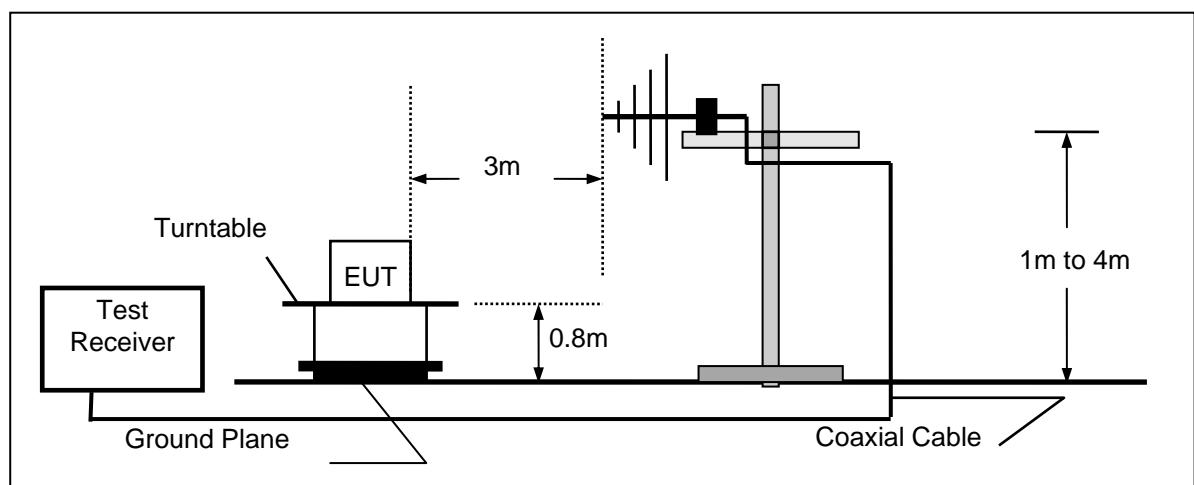
The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

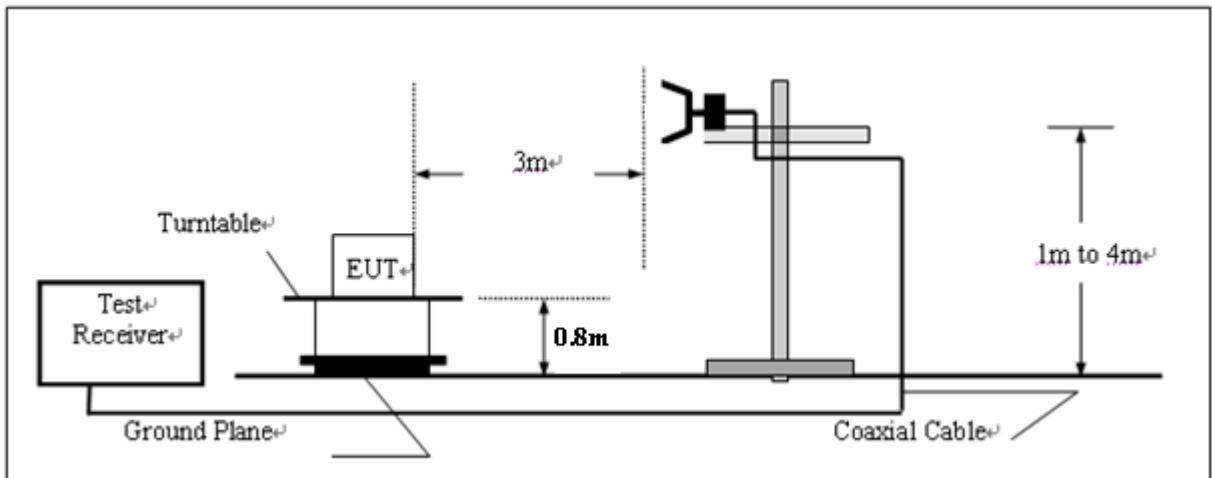
Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

TEST CONFIGURATION

(A) Radiated Emission Test Set-Up, Frequency below 1000MHz



(B) Radiated Emission Test Set-Up, Frequency above 1000MHz



TEST PROCEDURE

- 1 The EUT was placed on a turn table which is 0.8m above ground plane.
- 2 Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0°C to 360°C to acquire the highest emissions from EUT
- 3 And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 4 Repeat above procedures until all frequency measurements have been completed.

RECEIVER RADIATED SPOUSIOUS LIMIT

For unintentional device, according to § 15.109(a) and RSS-Gen, except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Distance (Meters)	Radiated (dB μ V/m)	Radiated (μ V/m)
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

TEST RESULTS

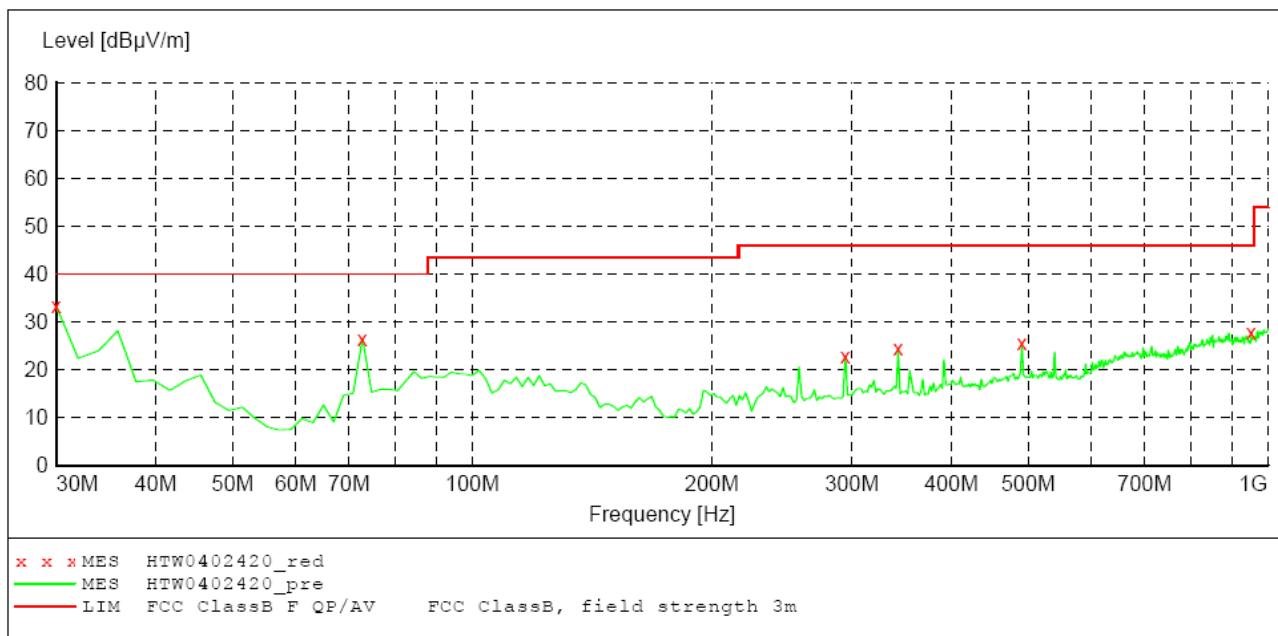
The Radiated Measurement are performed to the three channels (the top channel, the middle channel and the bottom channel), the datum recorded below is the worst case for each channel separation;and the EUT shall be scanned from 30 MHz to the 5th harmonic of the highest oscillator frequency in the digital devices or 1 GHz whichever is higher.

Only for IC Review (Not For FCC Review)

Modulation Type	Channel Separation	Test Frequency (MHz)	Polar.	Maximum Radiated Emissions		IC Limit (dBuV/m)
				Frequency (MHz)	Datum (dBuV/m)	
FM	25 KHz	450.5000	H	31.94	35.20	40
			V	30.00	33.20	40
Test Results				Compliance		

SWEET TABLE: "test (30M-1G)"

Short Description: Field Strength
 Start Stop Detector Meas. IF Transducer
 Frequency Frequency Time Bandw.
 30.0 MHz 1.0 GHz MaxPeak Coupled 120 kHz HL562 2010

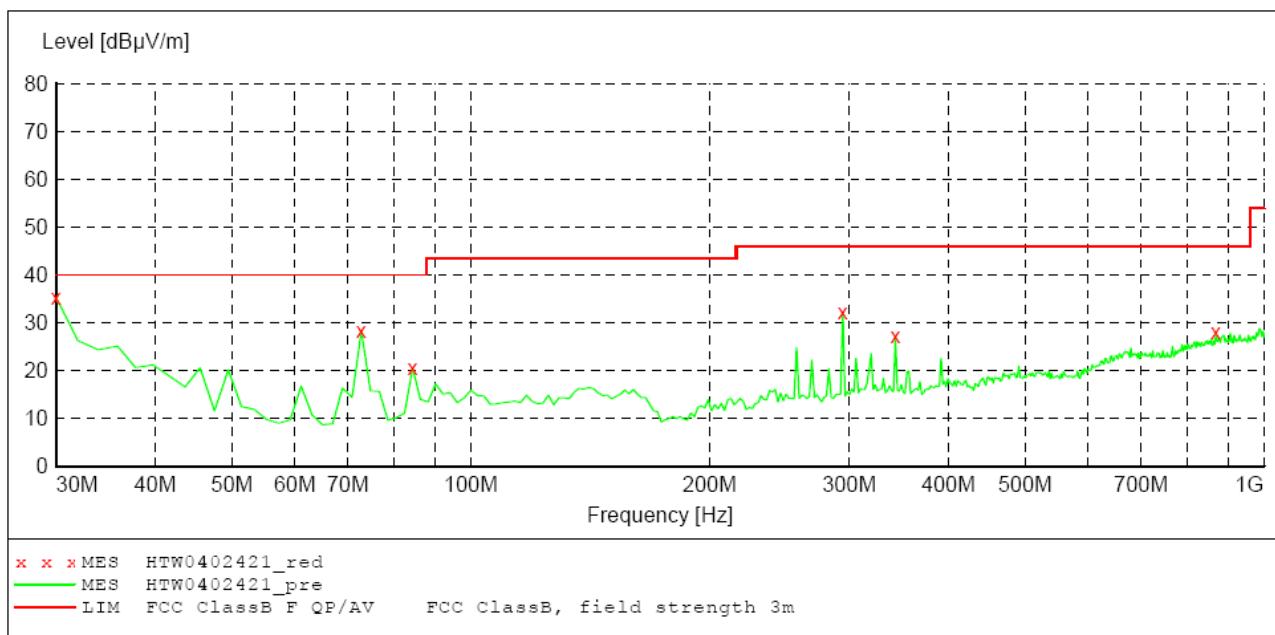
**MEASUREMENT RESULT: "HTW0402420_red"**

4/2/2012 1:34PM

Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det. PK	Height cm	Azimuth deg	Polarization
30.000000	33.20	-11.3	40.0	6.8	PK	100.0	338.00	VERTICAL
72.765531	26.50	-22.7	40.0	13.5	PK	100.0	252.00	VERTICAL
294.368737	22.80	-17.4	46.0	23.2	PK	100.0	125.00	VERTICAL
342.965932	24.40	-16.4	46.0	21.6	PK	100.0	204.00	VERTICAL
490.701403	25.60	-13.6	46.0	20.4	PK	100.0	198.00	VERTICAL
953.346693	27.80	-7.2	46.0	18.2	PK	100.0	198.00	VERTICAL

SWEET TABLE: "test (30M-1G)"

Short Description:		Field Strength		
Start Frequency	Stop Frequency	Detector	Meas.	IF
30.0 MHz	1.0 GHz	MaxPeak	Time Coupled	Bandw.
			120 kHz	HL562 2010

***MEASUREMENT RESULT: "HTW0402421_red"***

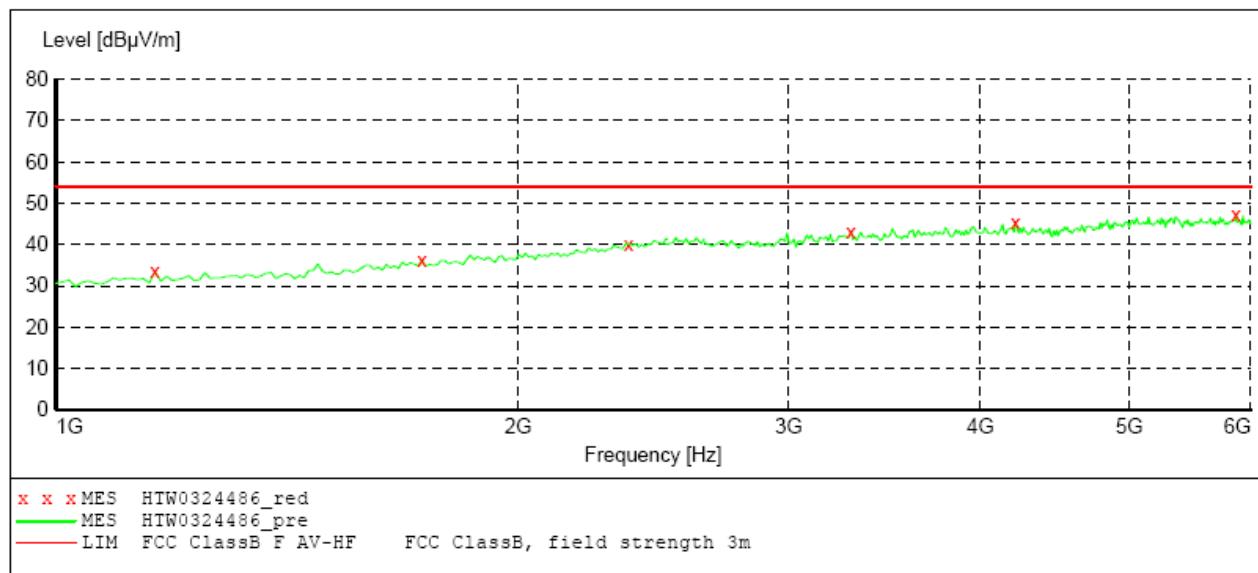
4/2/2012 1:36PM

Frequency MHz	Level dB μ V/m	Transd dB	Limit dB μ V/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	35.20	-11.3	40.0	4.8	PK	300.0	294.00	HORIZONTAL
72.765531	28.30	-22.7	40.0	11.7	PK	300.0	167.00	HORIZONTAL
84.428858	20.50	-21.2	40.0	19.5	PK	300.0	158.00	HORIZONTAL
294.368737	32.10	-17.4	46.0	13.9	PK	100.0	185.00	HORIZONTAL
342.965932	27.30	-16.4	46.0	18.7	PK	100.0	0.00	HORIZONTAL
869.7759519	28.00	-6.9	46.0	18.0	PK	300.0	111.00	HORIZONTAL

Modulation Type	Channel Separation	Test Frequency (MHz)	Polar.	Maximum Radiated Emissions		IC Limit (dBuV/m)
				Frequency (MHz)	Datum (dBuV/m)	
FM	25 KHz	450.5000	H	5849.69	47.20	54.00
			V	5869.74	45.30	54.00
Test Results				Compliance		

SWEET TABLE: "test (30M-1G)"

Short Description: Field Strength
 Start Stop Detector Meas. IF Transducer
 Frequency Frequency Time Bandw.
 30.0 MHz 1.0 GHz MaxPeak Coupled 120 kHz HL562

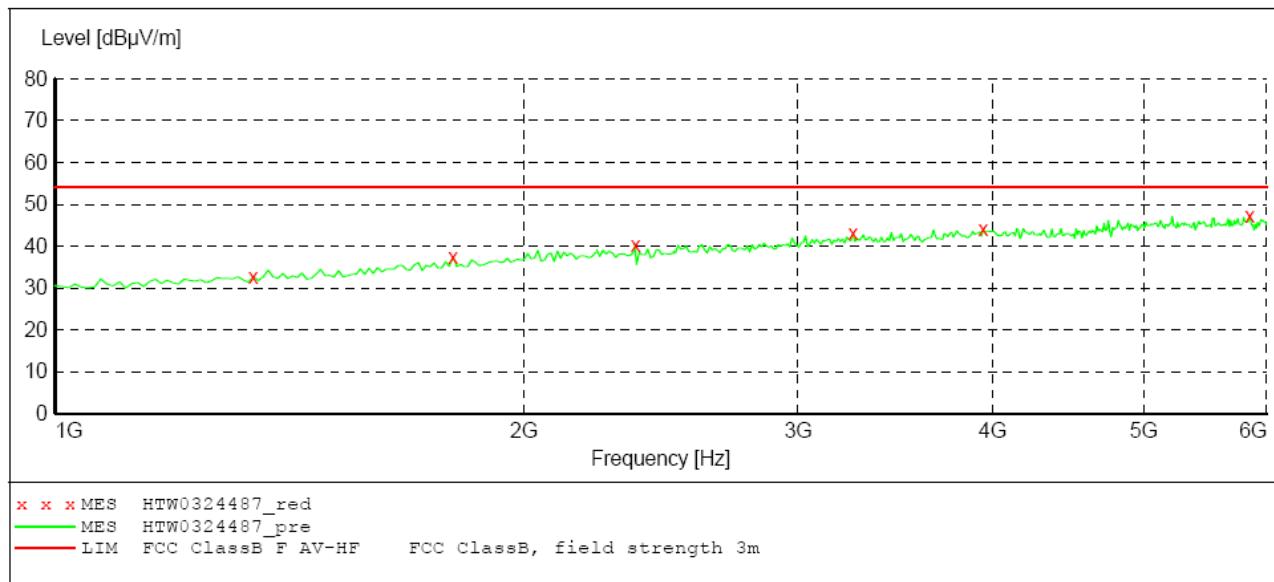
***MEASUREMENT RESULT: "HTW0324486_red"***

3/25/2012 6:58PM

Frequency	Level	Transd	Limit	Margin	Det.	Height	Azimuth	Polarization
MHz	dB μ V/m	dB	dB μ V/m	dB		cm	deg	
1160.320641	33.50	-25.7	54.0	20.5	PK	100.0	126.00	VERTICAL
1731.462926	36.20	-21.7	54.0	17.8	PK	100.0	183.00	VERTICAL
2332.665331	36.90	-18.0	54.0	17.1	PK	100.0	210.00	VERTICAL
3294.589178	43.10	-14.7	54.0	10.9	PK	100.0	259.00	VERTICAL
4216.432866	45.30	-13.7	54.0	8.7	PK	100.0	177.00	VERTICAL
5869.739479	47.40	-12.0	54.0	6.6	PK	100.0	345.00	VERTICAL

SWEET TABLE: "test (30M-1G)"

Short Description:		Field Strength		
Start Frequency	Stop Frequency	Detector	Meas.	IF Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	120 kHz HL562

***MEASUREMENT RESULT: "HTW0324487_red"***

3/25/2012 7:01PM

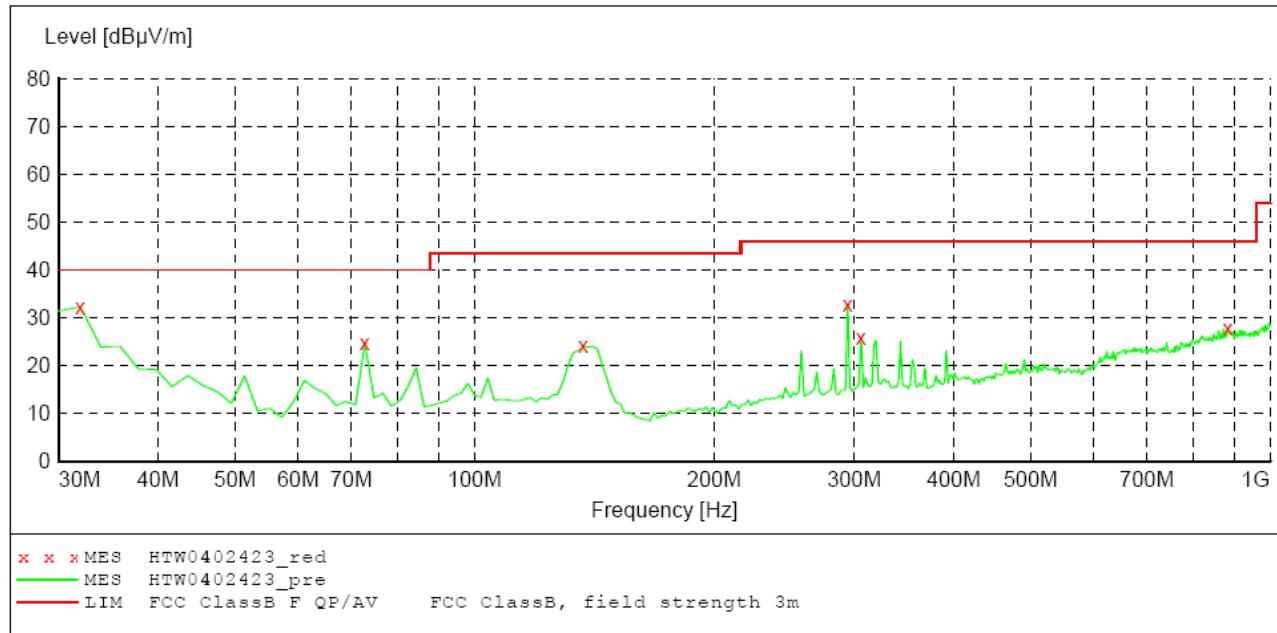
Frequency MHz	Level dB μ V/m	Transd dB	Limit dB μ V/m	Margin dB	Det. PK	Height cm	Azimuth deg	Polarization
1340.681363	32.70	-24.6	54.0	21.3	PK	100.0	323.00	HORIZONTAL
1801.603206	37.40	-21.2	54.0	16.6	PK	100.0	101.00	HORIZONTAL
2332.665331	37.90	-18.0	54.0	16.1	PK	100.0	226.00	HORIZONTAL
3254.509018	43.00	-14.8	54.0	11.0	PK	100.0	78.00	HORIZONTAL
3945.891784	44.20	-13.5	54.0	9.8	PK	100.0	238.00	HORIZONTAL
5849.699399	47.20	-12.0	54.0	6.8	PK	100.0	174.00	HORIZONTAL

Both for FCC and IC Review

Modulation Type	Channel Separation	Test Frequency (MHz)	Polar.	Maximum Radiated Emissions		FCC Limit (dBuV/m)
				Frequency (MHz)	Datum (dBuV/m)	
FM	12.5 KHz	450.5000	H	31.94	32.30	40
			V	45.55	32.20	40
Test Results				Compliance		

SWEET TABLE: "test (30M-1G)"

Short Description: Field Strength
 Start Stop Detector Meas. IF Transducer
 Frequency Frequency Time Bandw.
 30.0 MHz 1.0 GHz MaxPeak Coupled 120 kHz HL562 2010

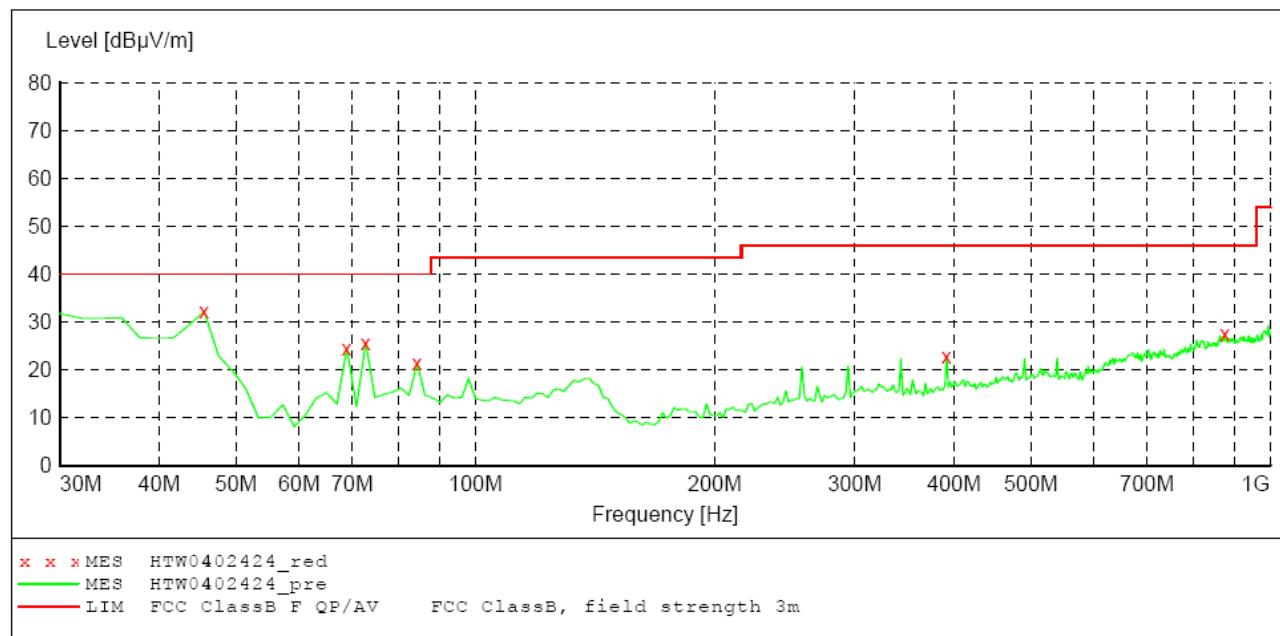
**MEASUREMENT RESULT: "HTW0402423_red"**

4/2/2012 1:43PM

Frequency MHz	Level dB μ V/m	Transd dB	Limit dB μ V/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
31.943888	32.30	-12.3	40.0	7.7	PK	100.0	344.00	HORIZONTAL
72.765531	24.70	-22.7	40.0	15.3	PK	300.0	182.00	HORIZONTAL
136.913828	24.10	-21.1	43.5	19.4	PK	300.0	346.00	HORIZONTAL
294.368737	32.80	-17.4	46.0	13.2	PK	100.0	181.00	HORIZONTAL
306.032064	25.90	-16.6	46.0	20.1	PK	100.0	160.00	HORIZONTAL
885.310621	27.70	-6.8	46.0	18.3	PK	100.0	83.00	HORIZONTAL

SWEET TABLE: "test (30M-1G)"

Short Description:		Field Strength			
Start Frequency	Stop Frequency	Detector	Meas.	IF Time	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	120 kHz	HL562

***MEASUREMENT RESULT: "HTW0402424_red"***

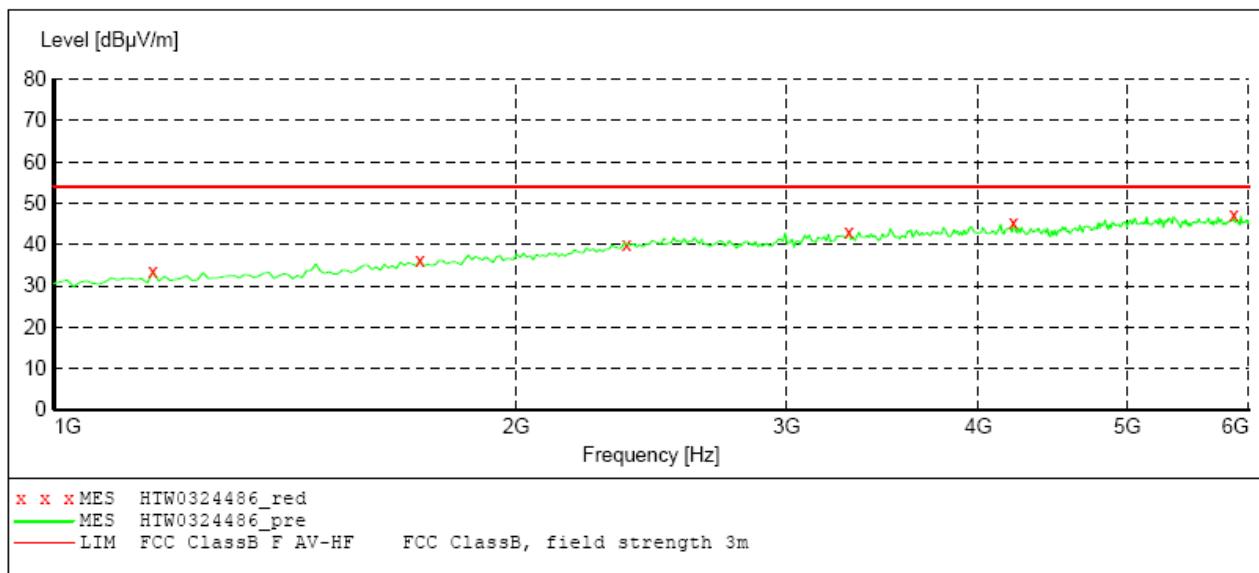
4/2/2012 1:45PM

Frequency MHz	Level dB μ V/m	Transd dB	Limit dB μ V/m	Margin dB	Det. PK	Height cm	Azimuth deg	Polarization
45.551102	32.20	-19.8	40.0	7.8	PK	100.0	65.00	VERTICAL
68.877756	24.50	-23.3	40.0	15.5	PK	100.0	133.00	VERTICAL
72.765531	25.70	-22.7	40.0	14.3	PK	100.0	249.00	VERTICAL
84.428858	21.40	-21.2	40.0	18.6	PK	100.0	216.00	VERTICAL
391.563126	22.70	-15.5	46.0	23.3	PK	100.0	160.00	VERTICAL
877.535070	27.40	-7.0	46.0	18.6	PK	100.0	187.00	VERTICAL

Modulation Type	Channel Separation	Test Frequency (MHz)	Polar.	Maximum Radiated Emissions		FCC Limit (dBuV/m)
				Frequency (MHz)	Datum (dBuV/m)	
FM	25 KHz	450.5000	H	5849.69	47.20	54.00
			V	5869.74	45.30	54.00
Test Results				Compliance		

SWEET TABLE: "test (30M-1G)"

Short Description: Field Strength
 Start Stop Detector Meas. IF Transducer
 Frequency Frequency Time Bandw.
 30.0 MHz 1.0 GHz MaxPeak Coupled 120 kHz HL562

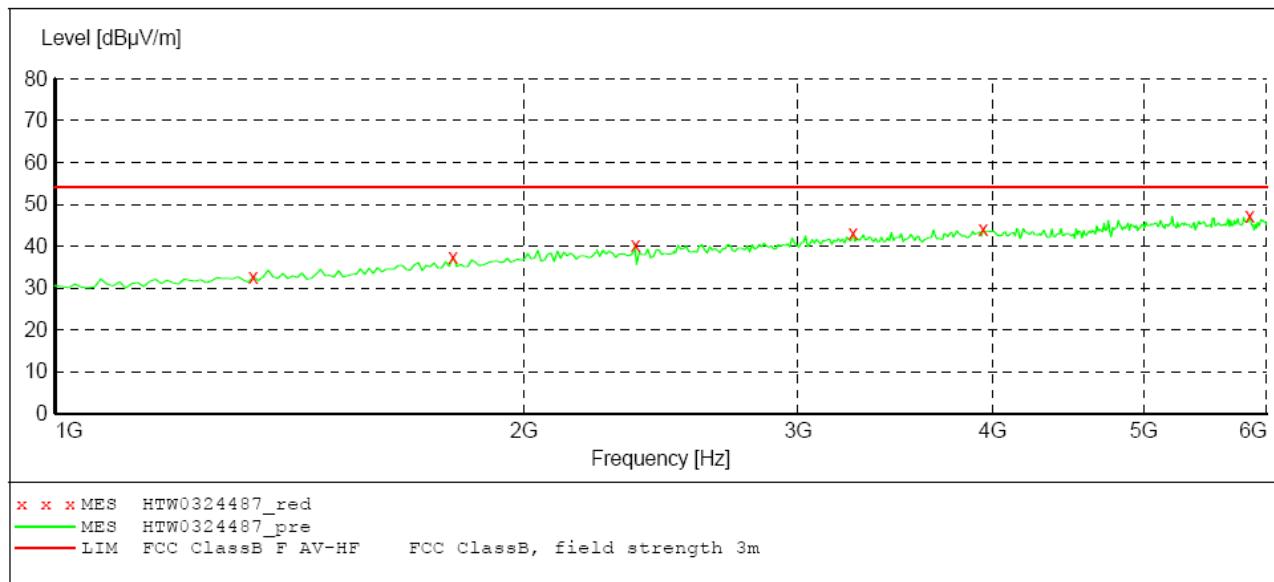
***MEASUREMENT RESULT: "HTW0324486_red"***

3/25/2012 6:58PM

Frequency	Level	Transd	Limit	Margin	Det.	Height	Azimuth	Polarization
MHz	dB μ V/m	dB	dB μ V/m	dB		cm	deg	
1160.320641	33.50	-25.7	54.0	20.5	PK	100.0	126.00	VERTICAL
1731.462926	36.20	-21.7	54.0	17.8	PK	100.0	183.00	VERTICAL
2332.665331	36.90	-18.0	54.0	17.1	PK	100.0	210.00	VERTICAL
3294.589178	43.10	-14.7	54.0	10.9	PK	100.0	259.00	VERTICAL
4216.432866	45.30	-13.7	54.0	8.7	PK	100.0	177.00	VERTICAL
5869.739479	47.40	-12.0	54.0	6.6	PK	100.0	345.00	VERTICAL

SWEET TABLE: "test (30M-1G)"

Short Description:		Field Strength		
Start Frequency	Stop Frequency	Detector	Meas.	IF Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	120 kHz HL562

***MEASUREMENT RESULT: "HTW0324487_red"***

3/25/2012 7:01PM

Frequency MHz	Level dB μ V/m	Transd dB	Limit dB μ V/m	Margin dB	Det. PK	Height cm	Azimuth deg	Polarization
1340.681363	32.70	-24.6	54.0	21.3	PK	100.0	323.00	HORIZONTAL
1801.603206	37.40	-21.2	54.0	16.6	PK	100.0	101.00	HORIZONTAL
2332.665331	37.90	-18.0	54.0	16.1	PK	100.0	226.00	HORIZONTAL
3254.509018	43.00	-14.8	54.0	11.0	PK	100.0	78.00	HORIZONTAL
3945.891784	44.20	-13.5	54.0	9.8	PK	100.0	238.00	HORIZONTAL
5849.699399	47.20	-12.0	54.0	6.8	PK	100.0	174.00	HORIZONTAL

4.10. Receiver Conducted Spurious Emssion

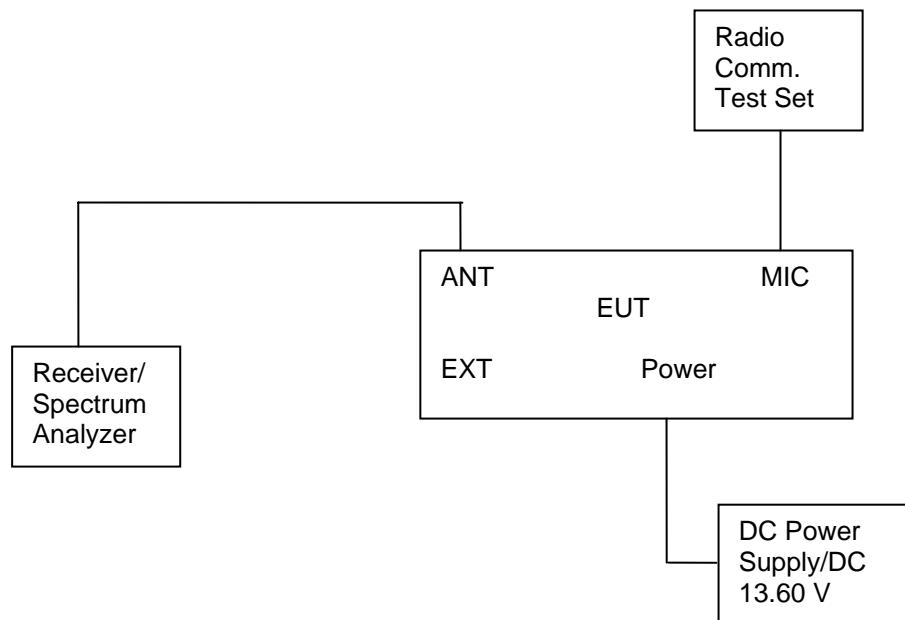
TEST APPLICABLE

The same as Section 4.3

TEST PROCEDURE

The spectrum analyzer was connected to the RF output power of the EUT, the EUT was setup in receiving mode; The RBW of the spectrum analyzer was set to 100 kHz and the VBW set to 300 KHz below the test frequency 1GHz. While the RBW of the spectrum analyzer was set to the 1MHz and VBW set to the 3MHz from 1GHz to the 10th harmonic.

TEST CONFIGURATION



LIMIT

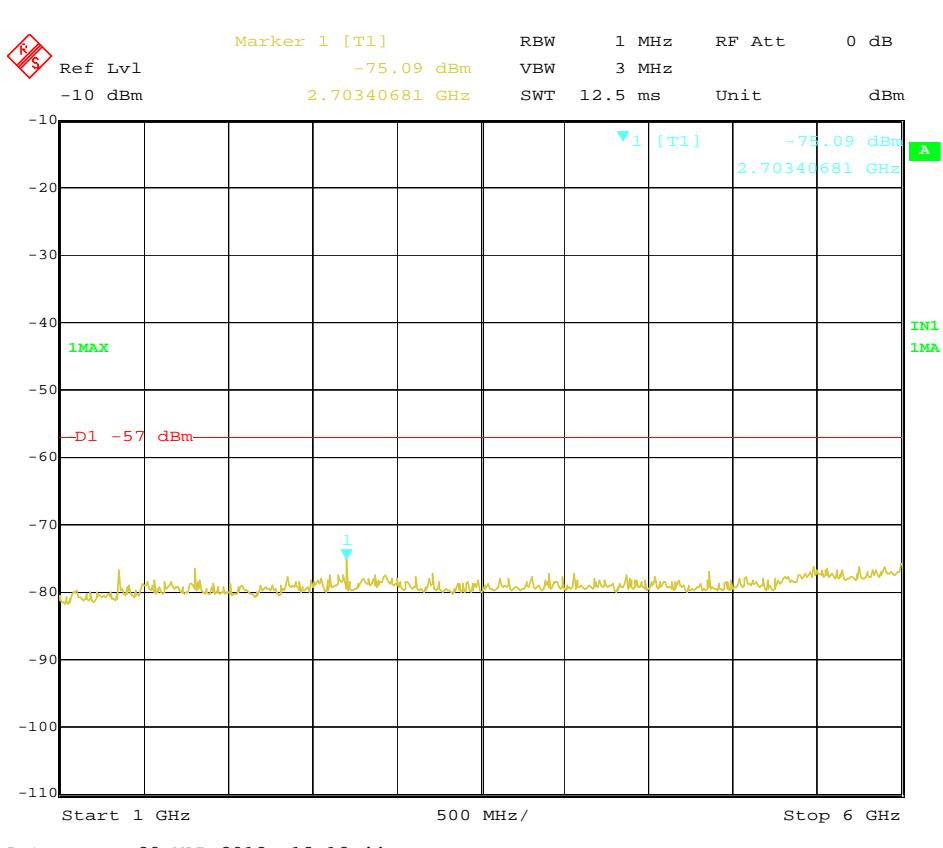
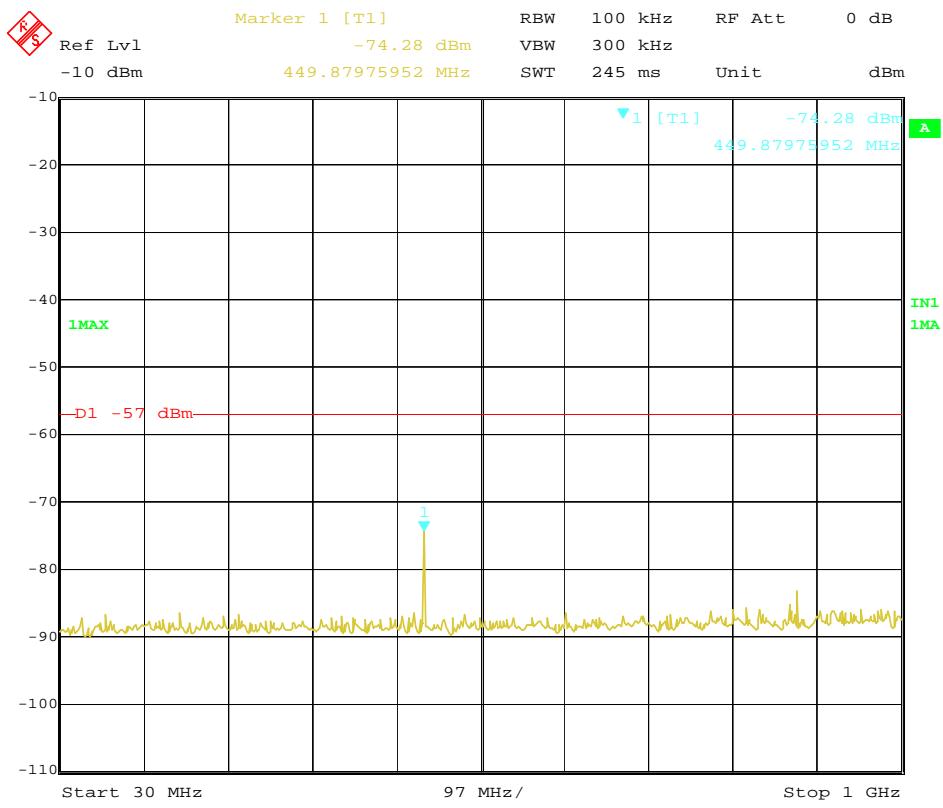
The power at the antenna terminal shall not exceed 2.0 nanowatts (-57dBm).

TEST RESULTS

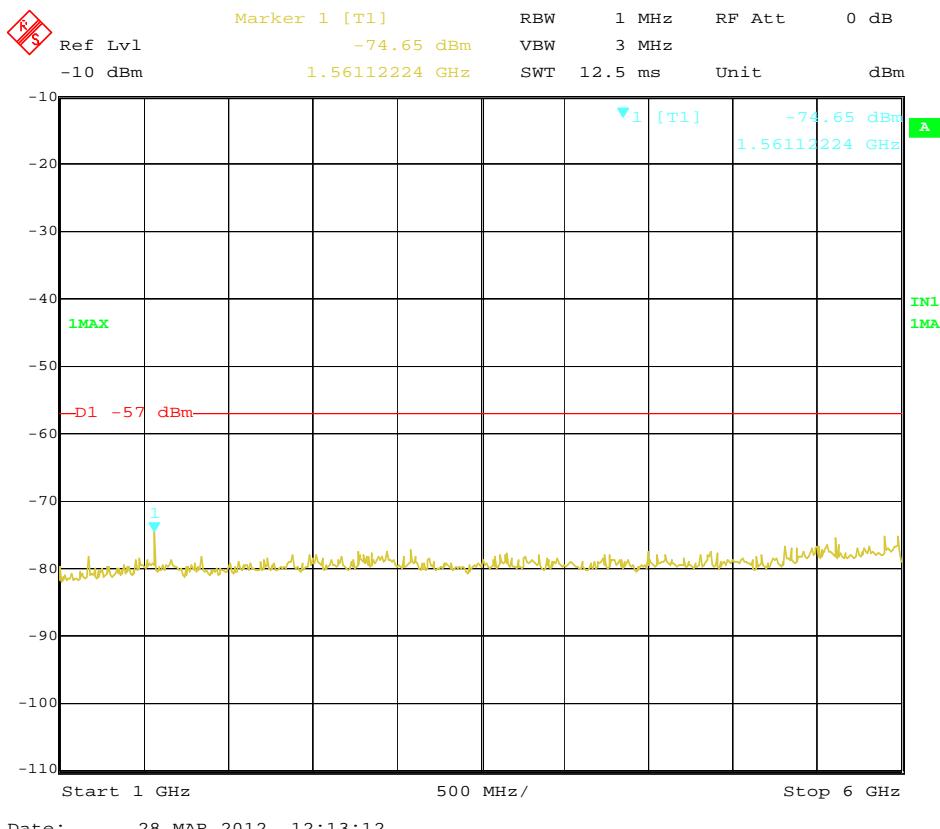
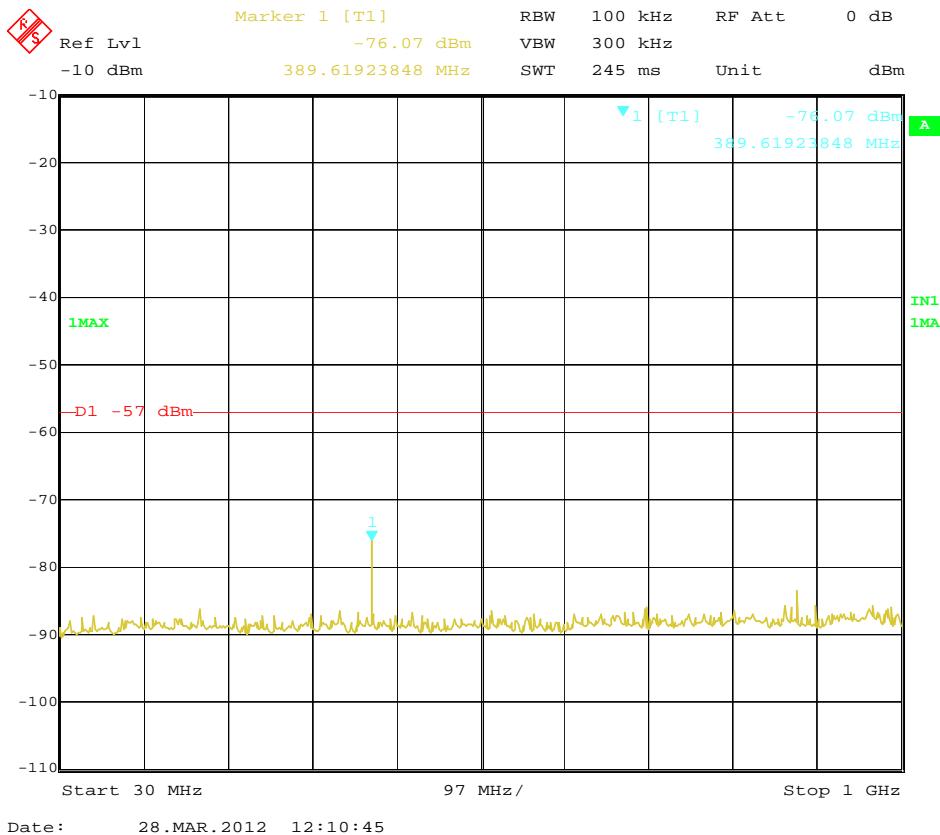
The Receiver Conducted Spurious Emssions Measurement is performed to the three channels (the high channel, the middle channel and the low channel), the datums recorded below were for the three channels; and the EUT shall be scanned from 30 MHz to the 5 GHz.

Only for FCC Review

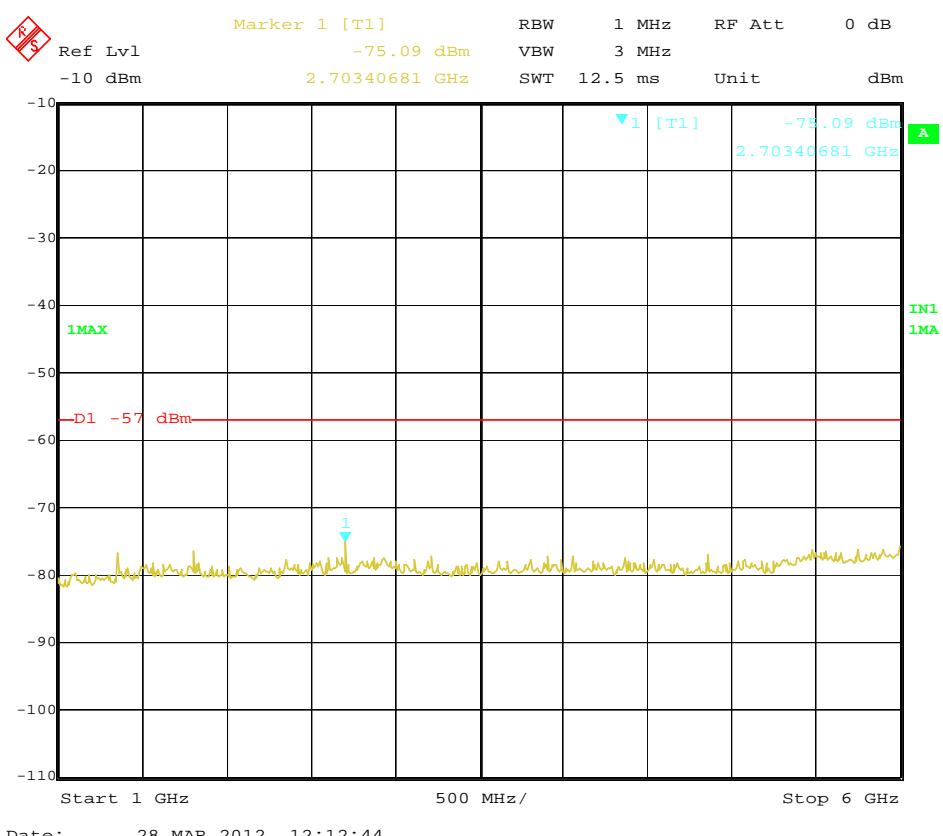
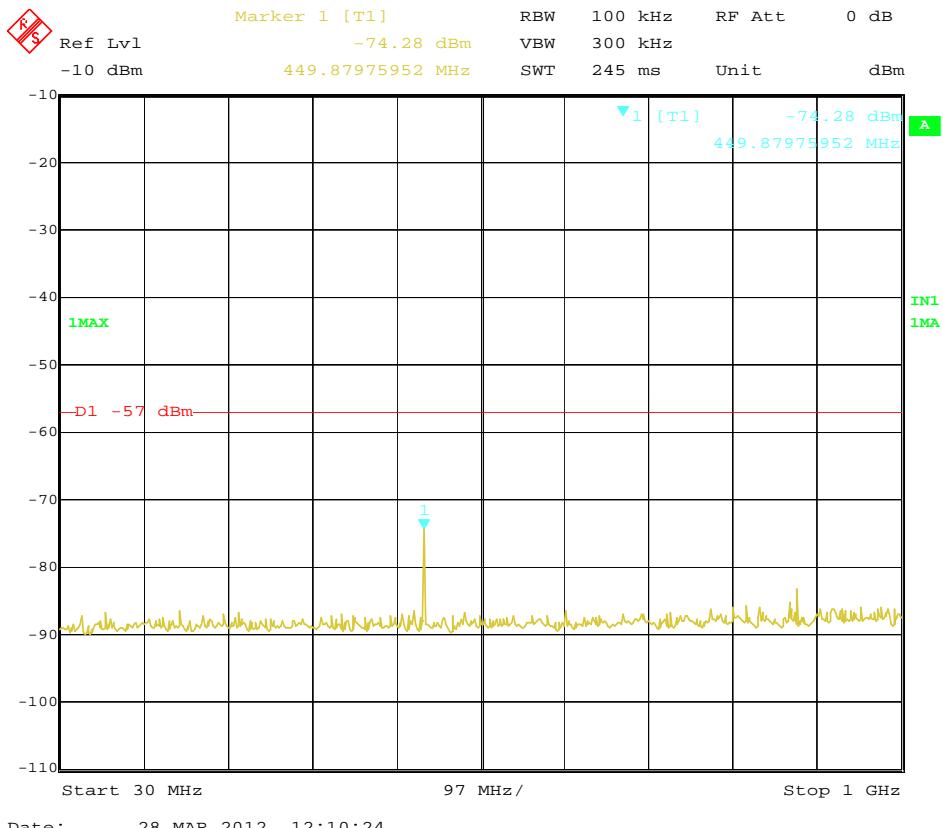
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	Low	406.5000	449.88	-74.28	2703.41	-75.09	-57dBm
Test Results				Compliance				



Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	Middle	450.5000	389.62	-76.07	1561.12	-74.65	-57dBm
Test Results				Compliance				

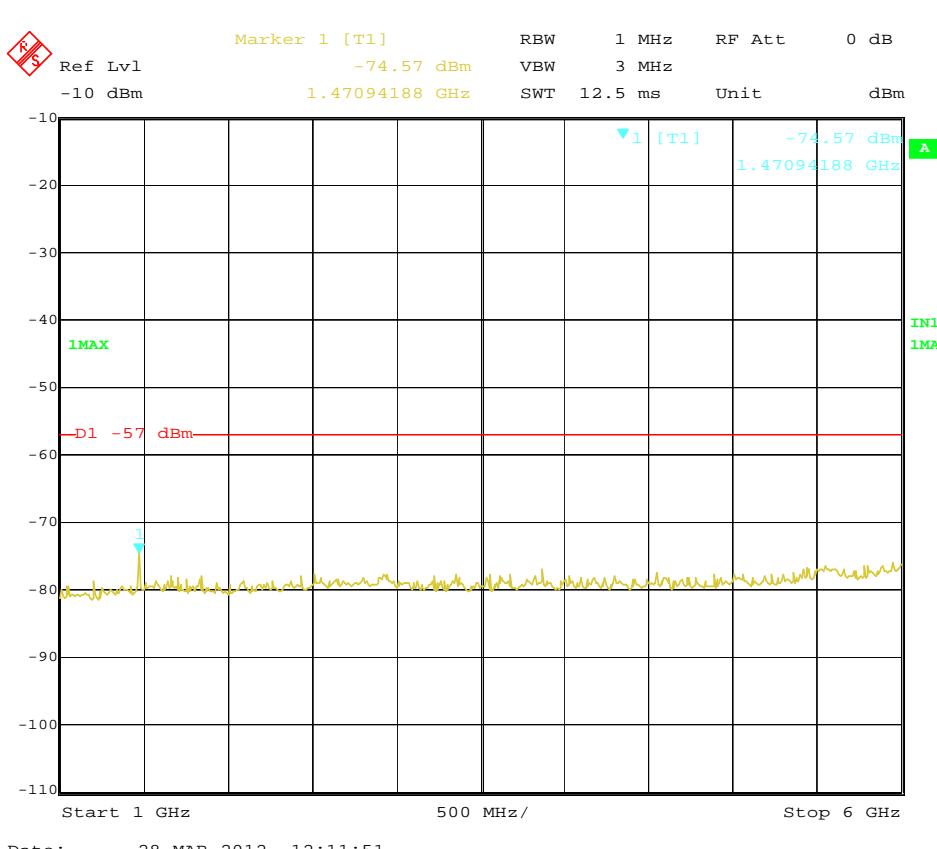
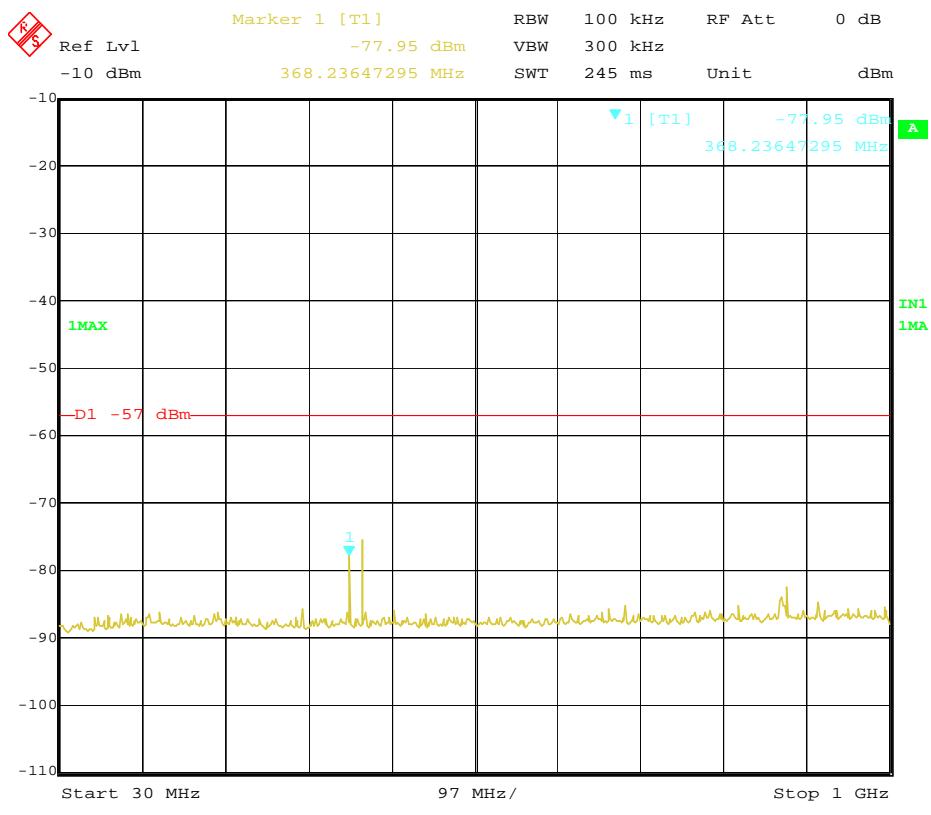


Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	High	489.5000	449.88	-74.28	2703.41	-78.09	-57dBm
Test Results				Compliance				

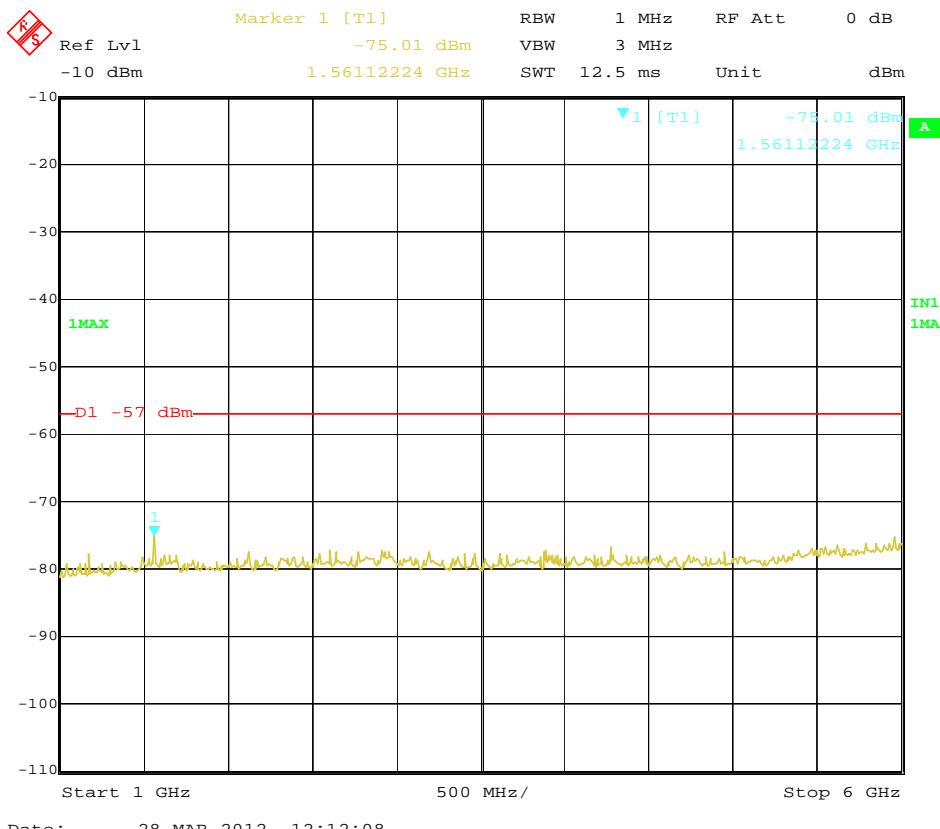
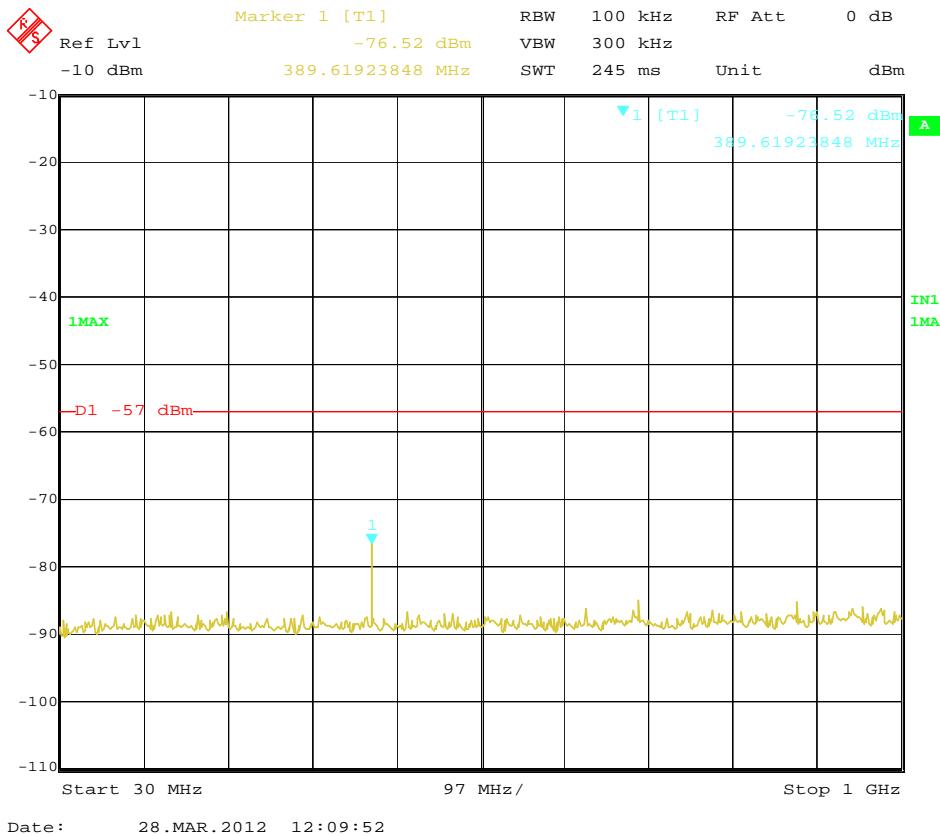


Only for IC Review (Not For FCC Review)

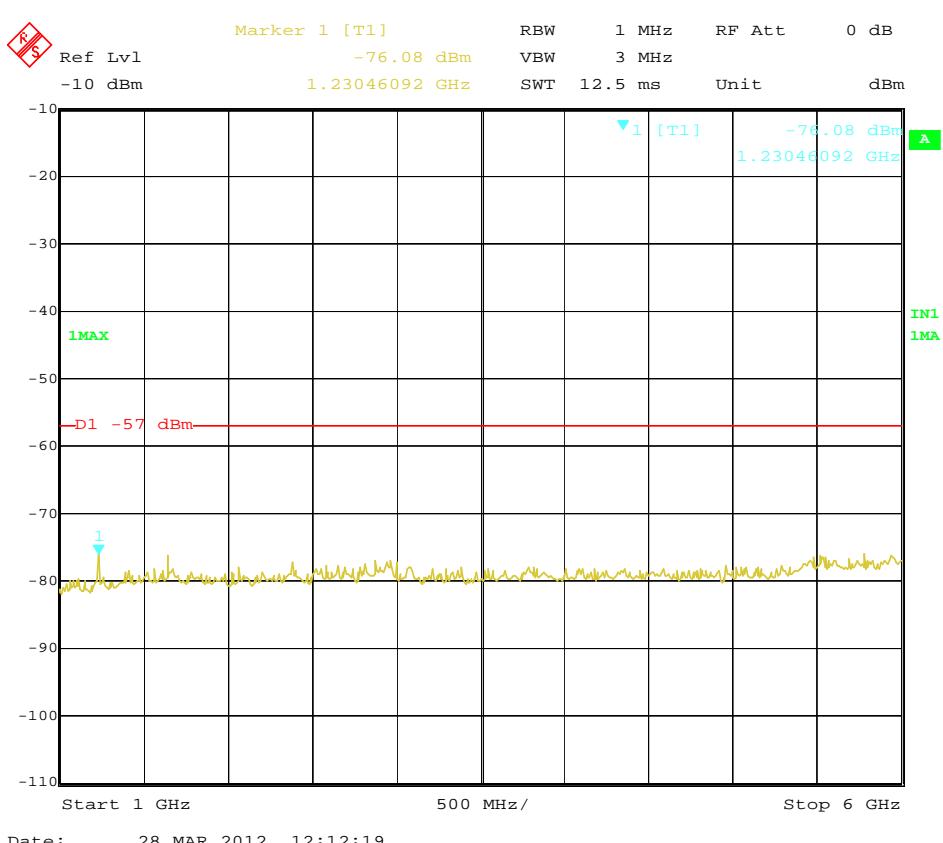
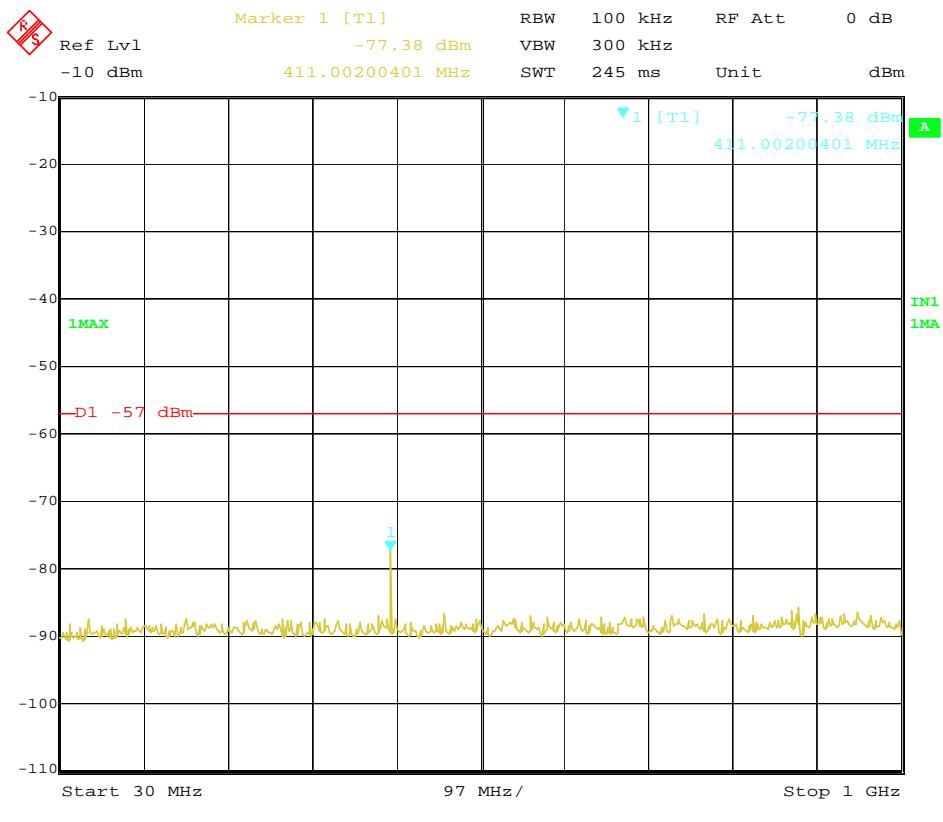
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above1GHz		IC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	25KHz	Low	406.5000	368.24	-77.95	1470.94	-74.57	-57dBm
Test Results				Compliance				



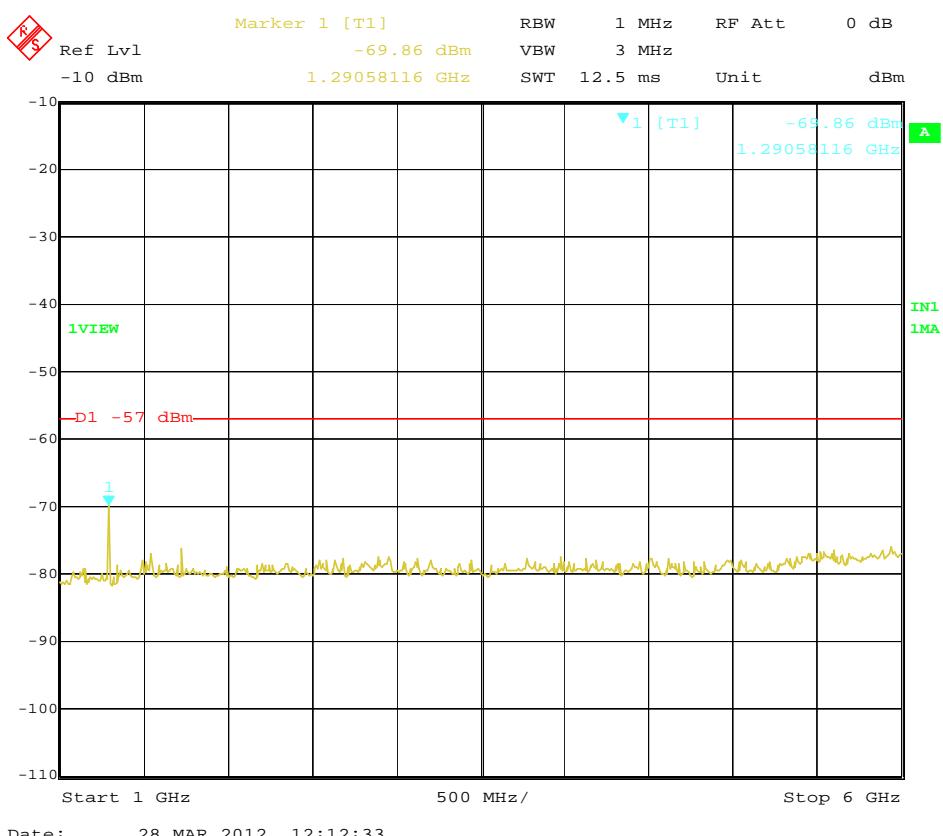
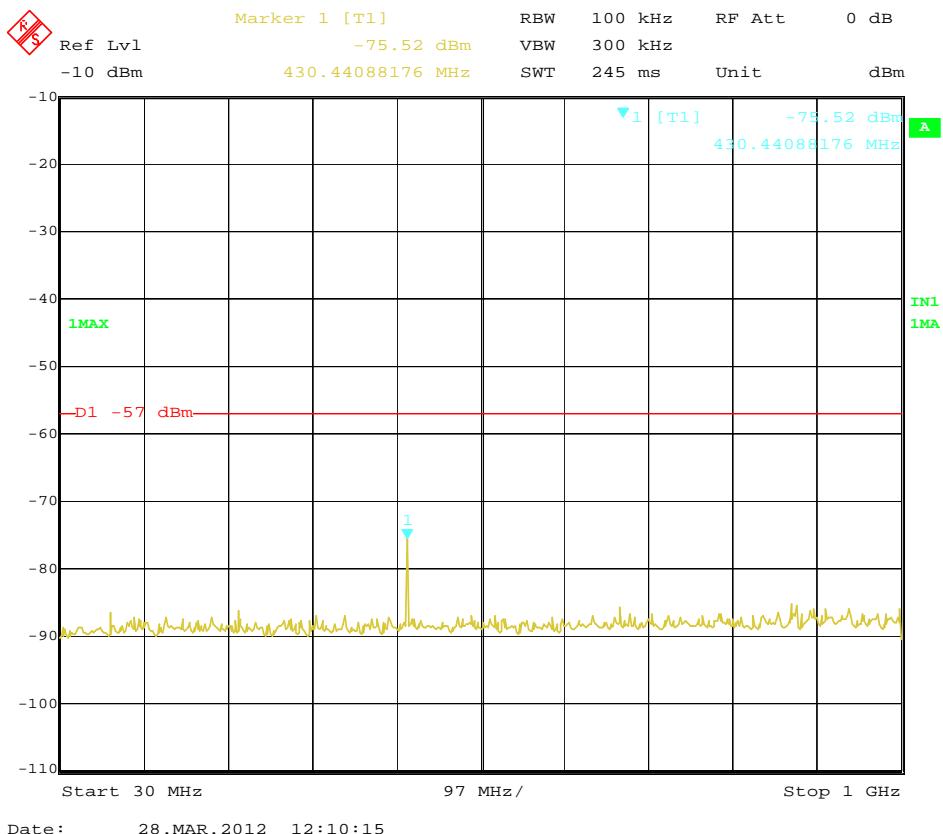
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above1GHz		IC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	25KHz	Middle	429.5000	389.62	-76.52	1561.62	-75.01	-57dBm
Test Results				Compliance				



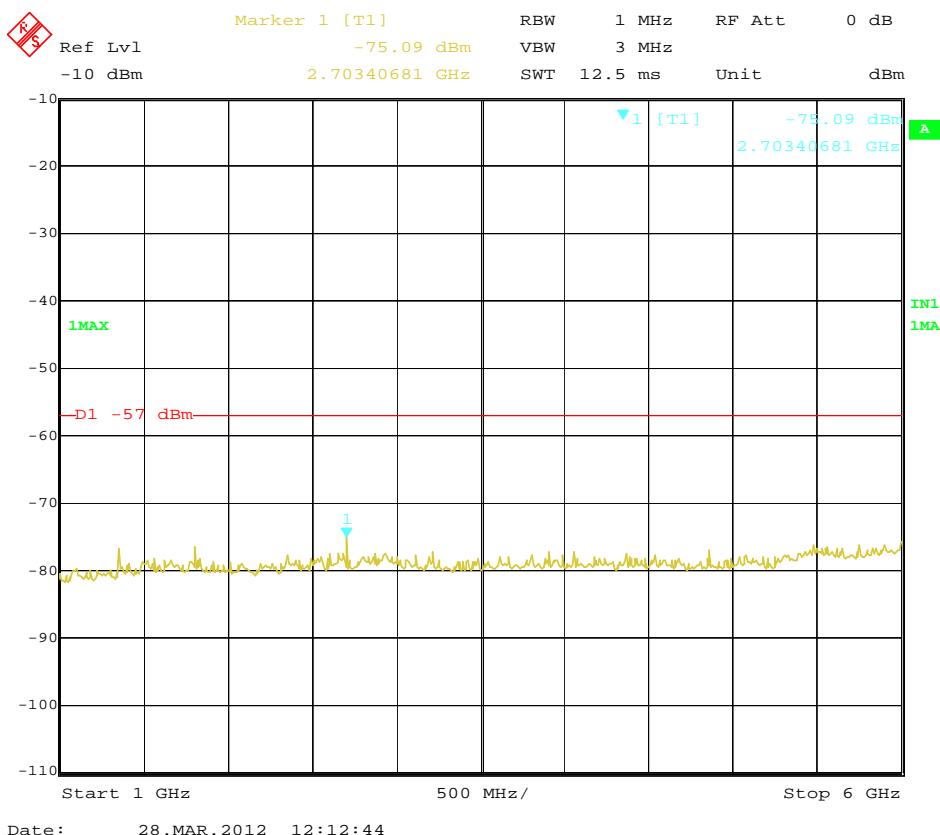
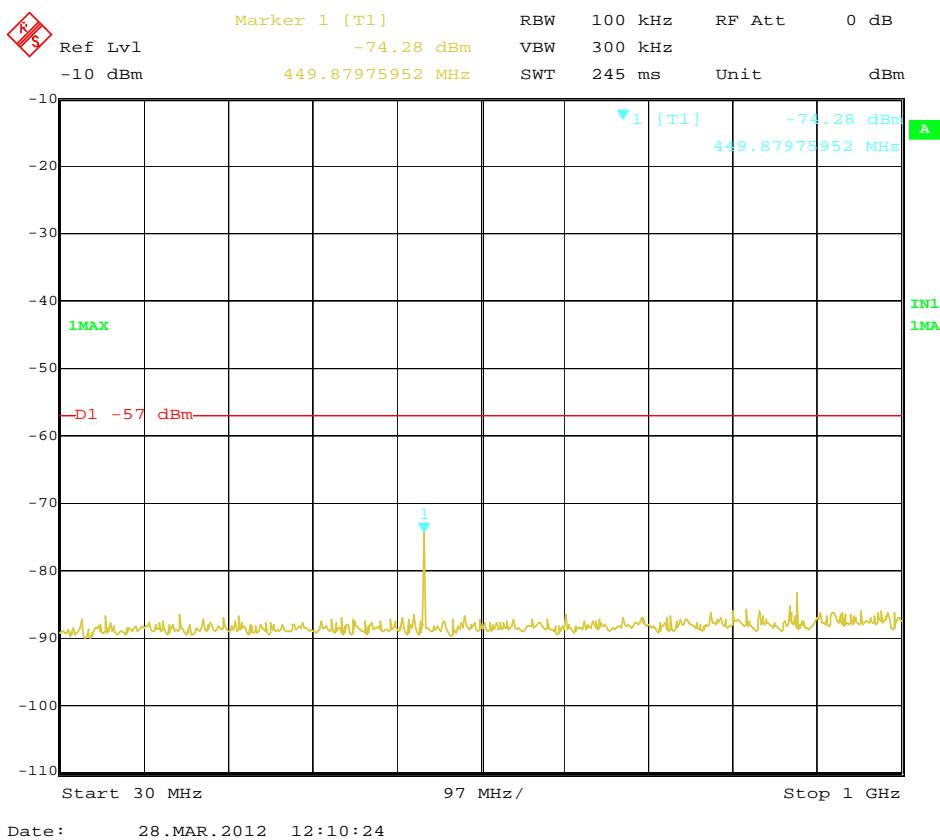
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above1GHz		IC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	25KHz	High	450.5000	411.00	-77.38	1230.46	-76.08	-57dBm
Test Results				Compliance				



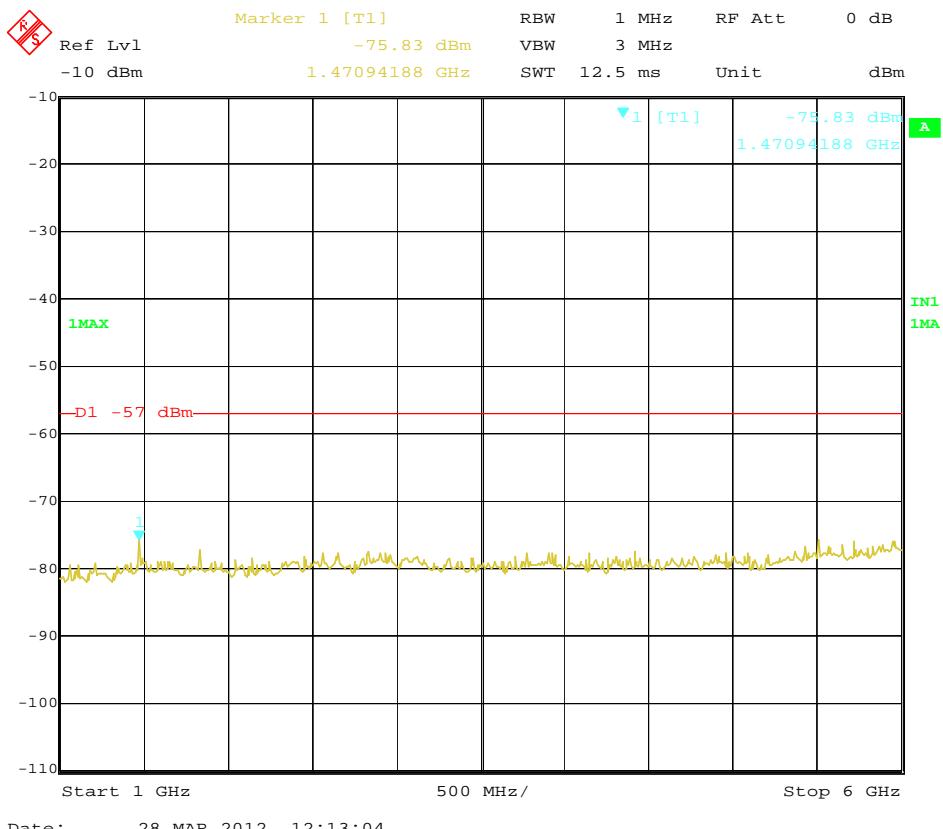
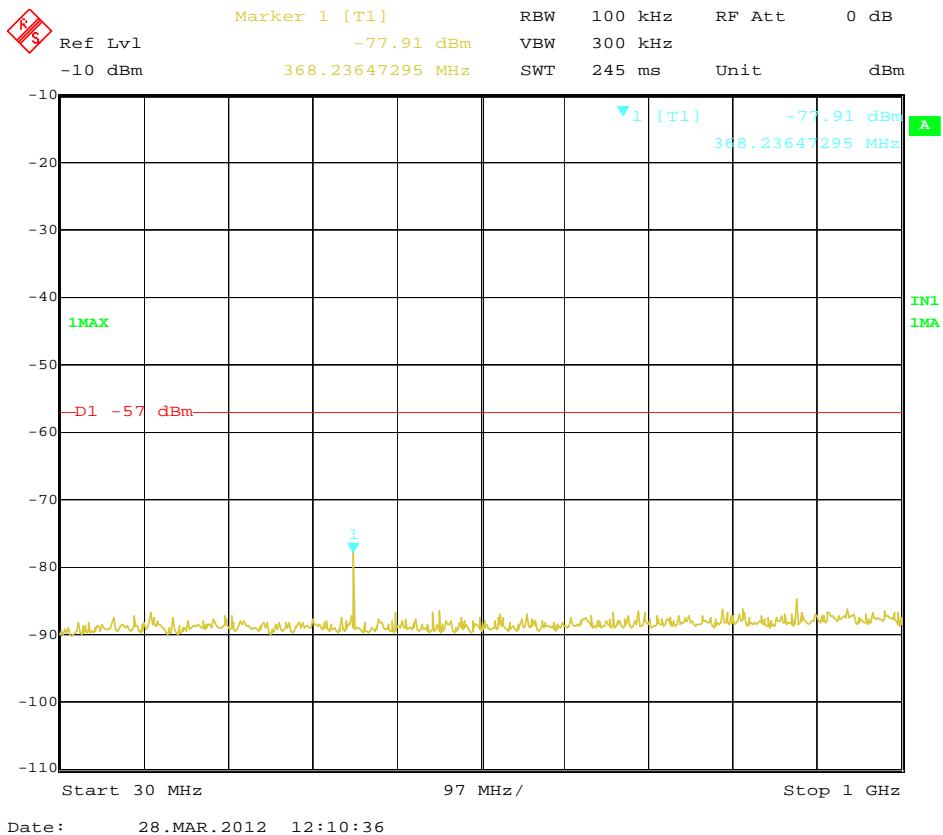
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above1GHz		IC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	25KHz	High	469.0000	430.44	-75.52	1290.68	-69.86	-57dBm
Test Results				Compliance				



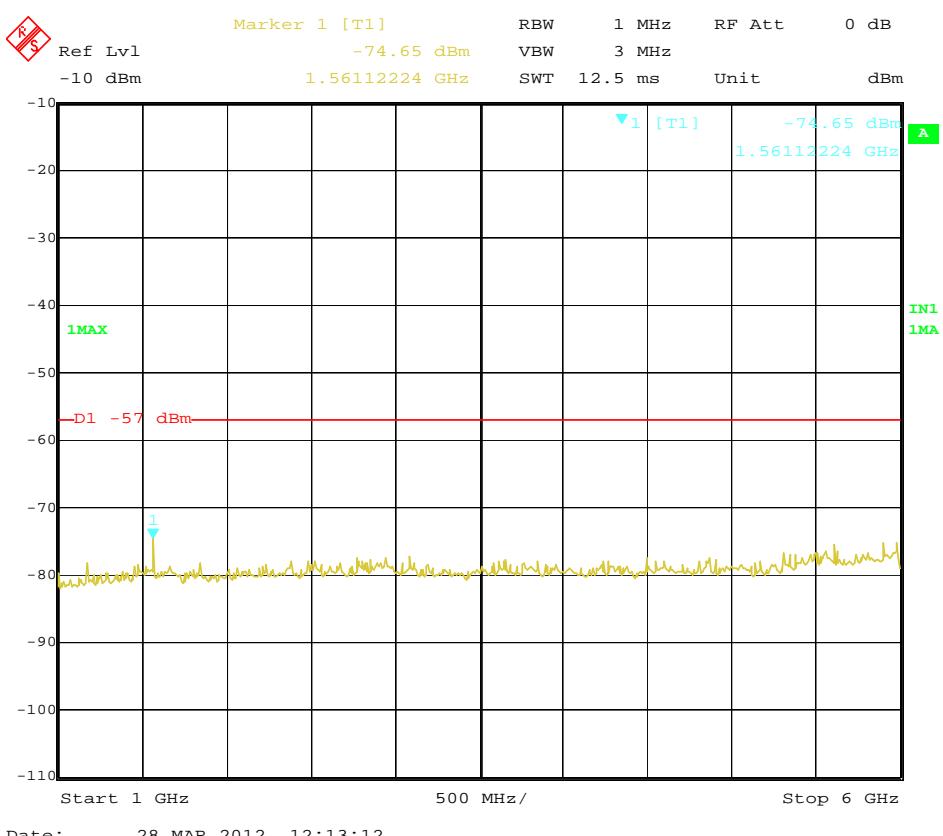
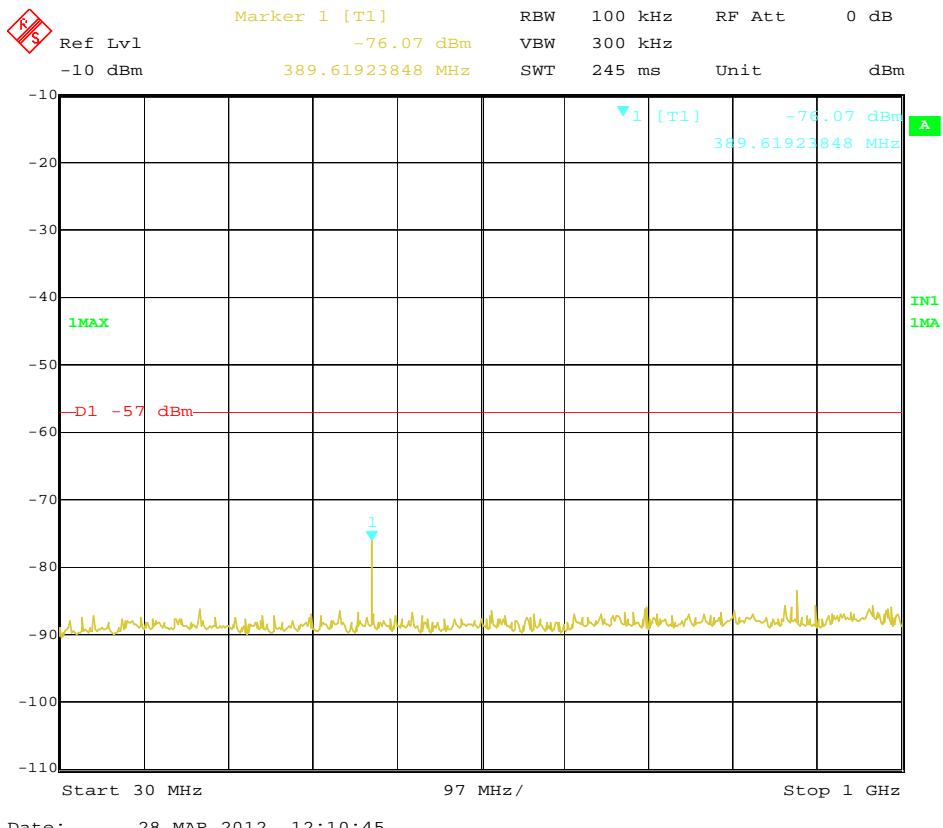
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above1GHz		IC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	Low	406.5000	449.88	-74.28	2703.41	-75.09	-57dBm
Test Results				Compliance				



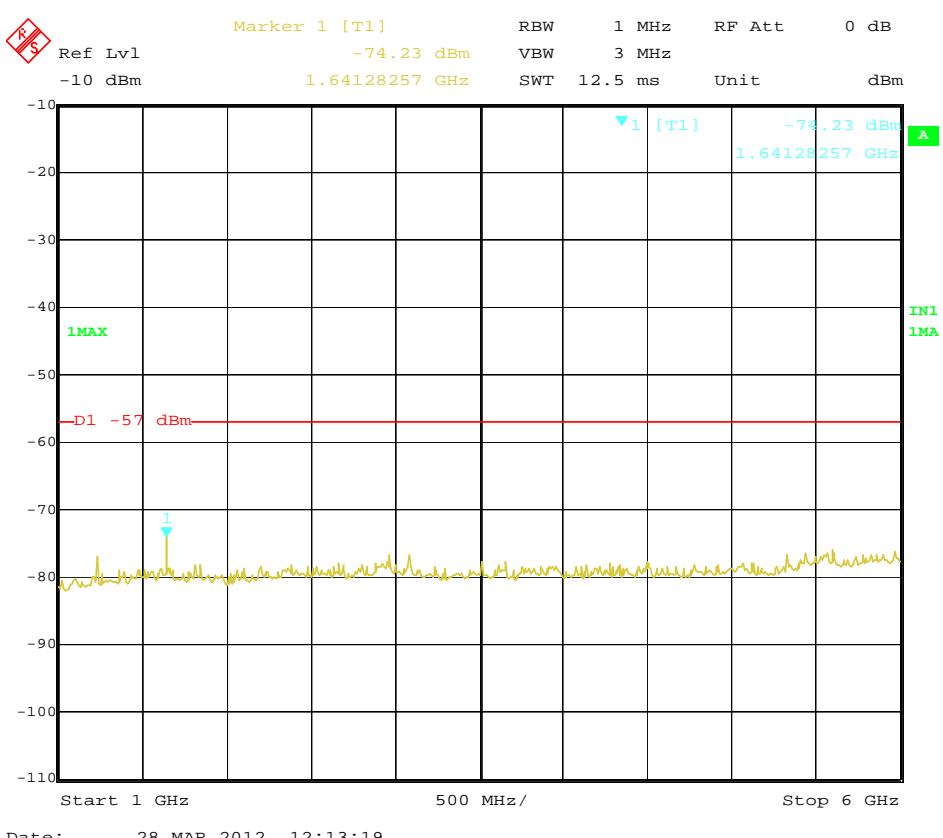
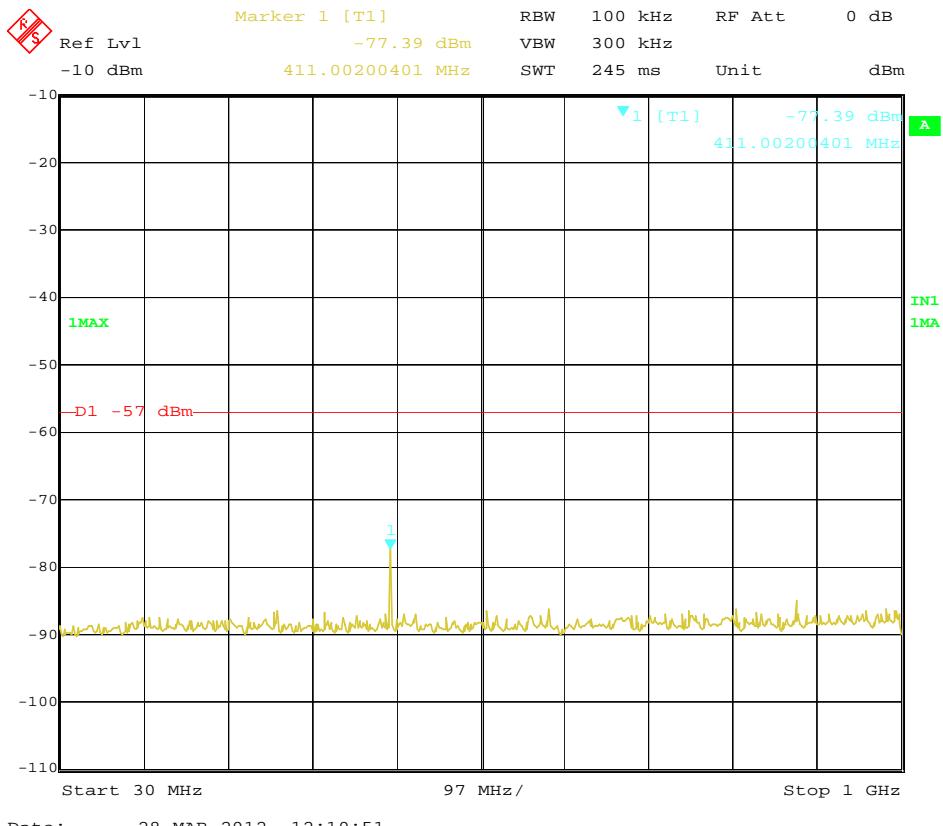
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above1GHz		IC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	Middle	429.5000	368.24	-77.91	1470.94	-70.83	-57dBm
Test Results				Compliance				



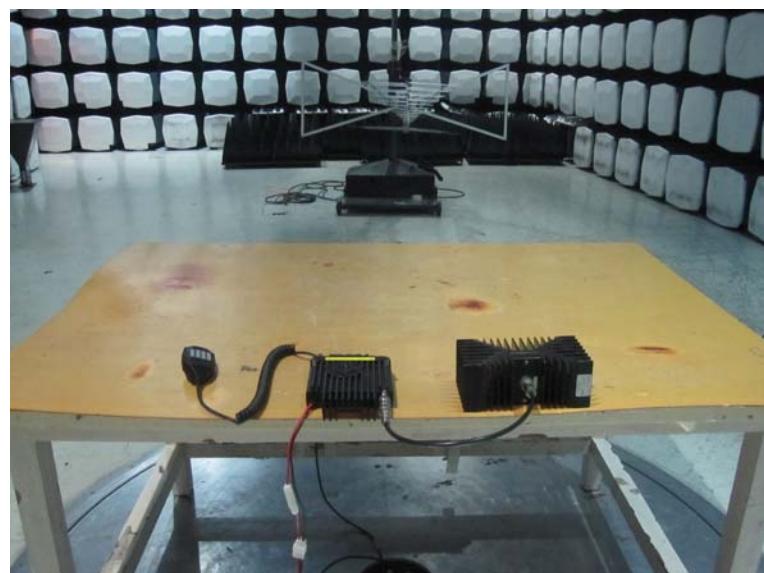
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above1GHz		IC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	High	450.5000	389.62	-76.07	1561.12	-74.65	-57dBm
Test Results				Compliance				



Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above1GHz		IC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	High	469.0000	411.00	-77.39	1641.45	-74.23	-57dBm
Test Results				Compliance				



5. Test Setup Photos of the EUT



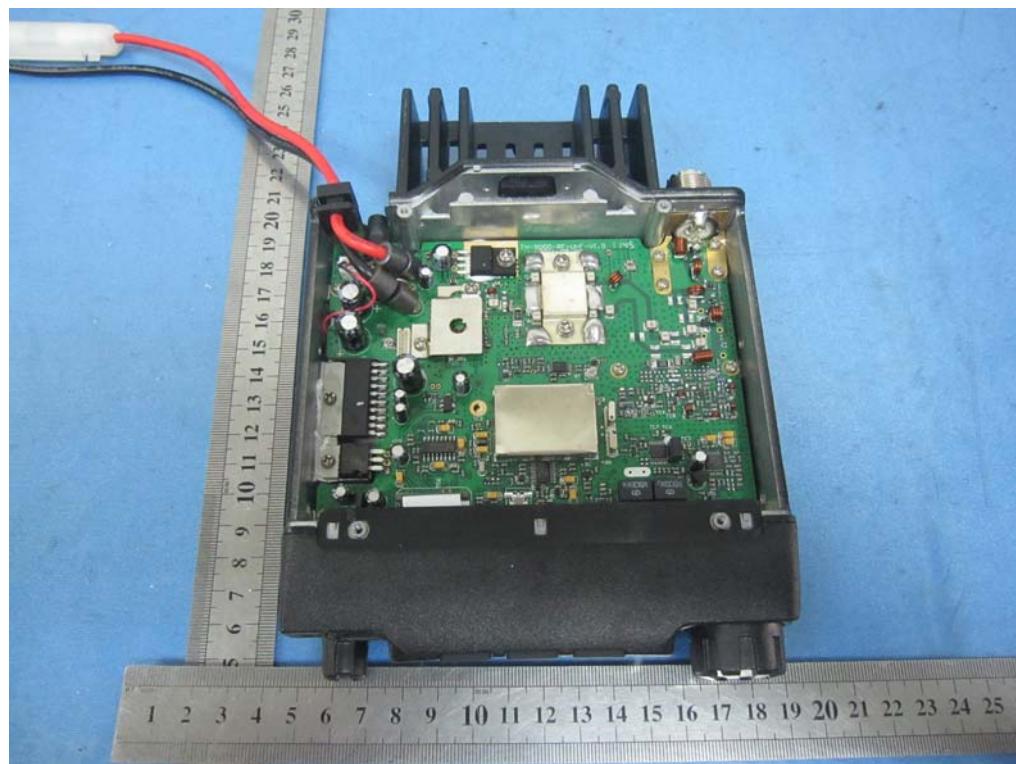
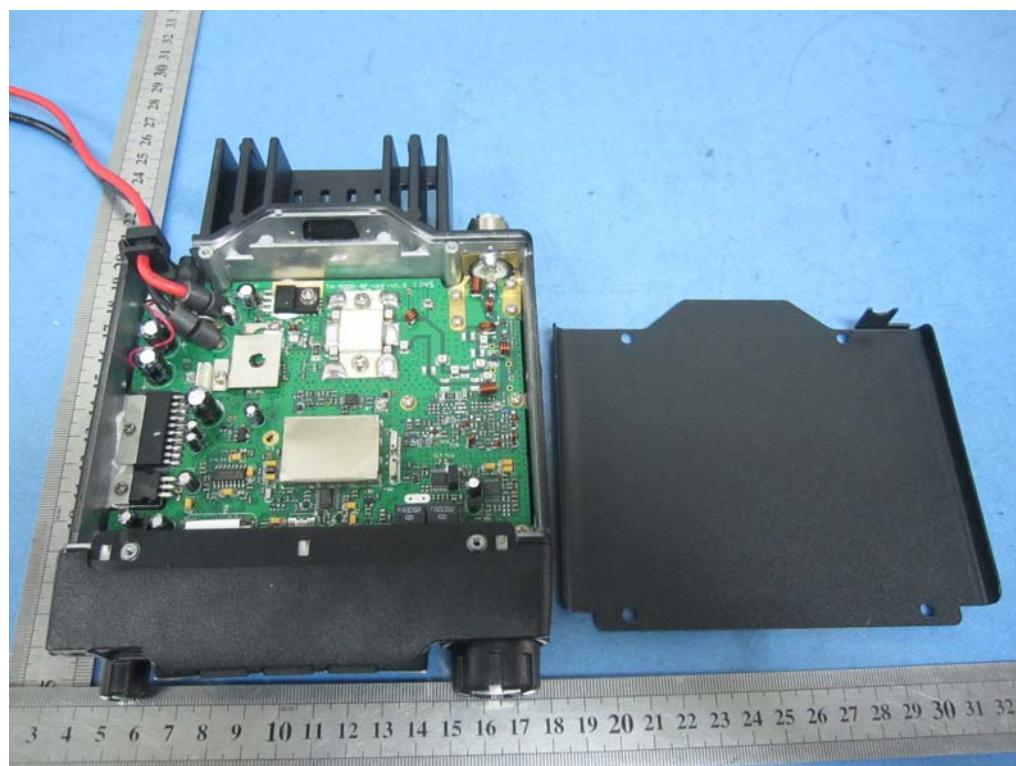


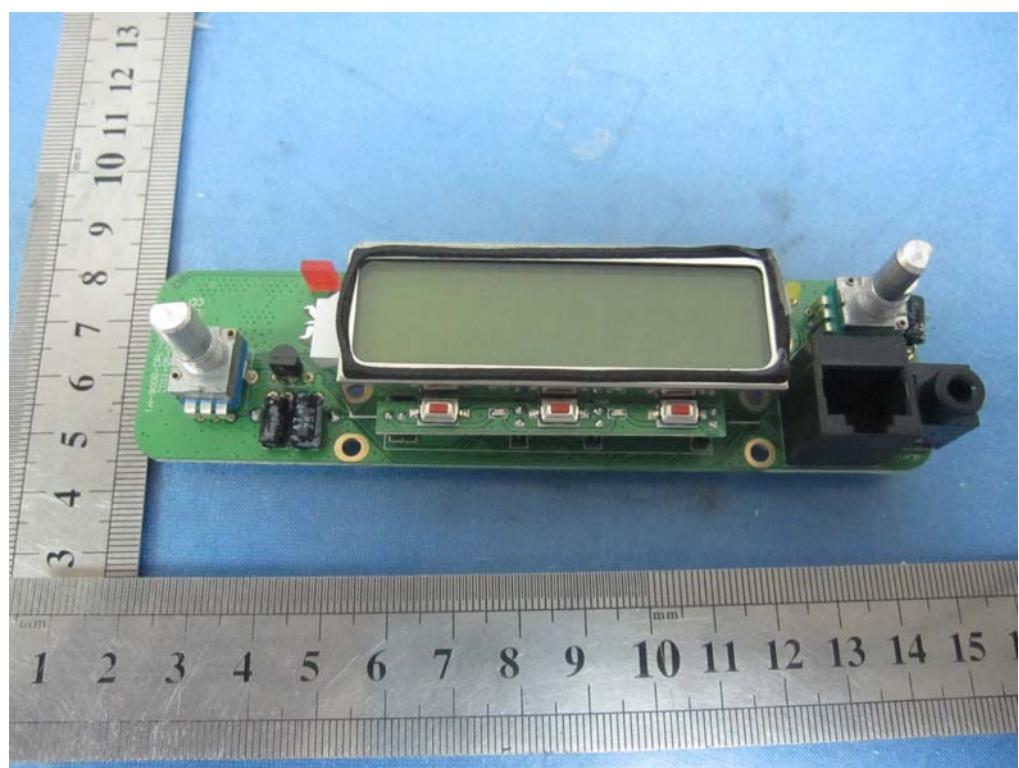
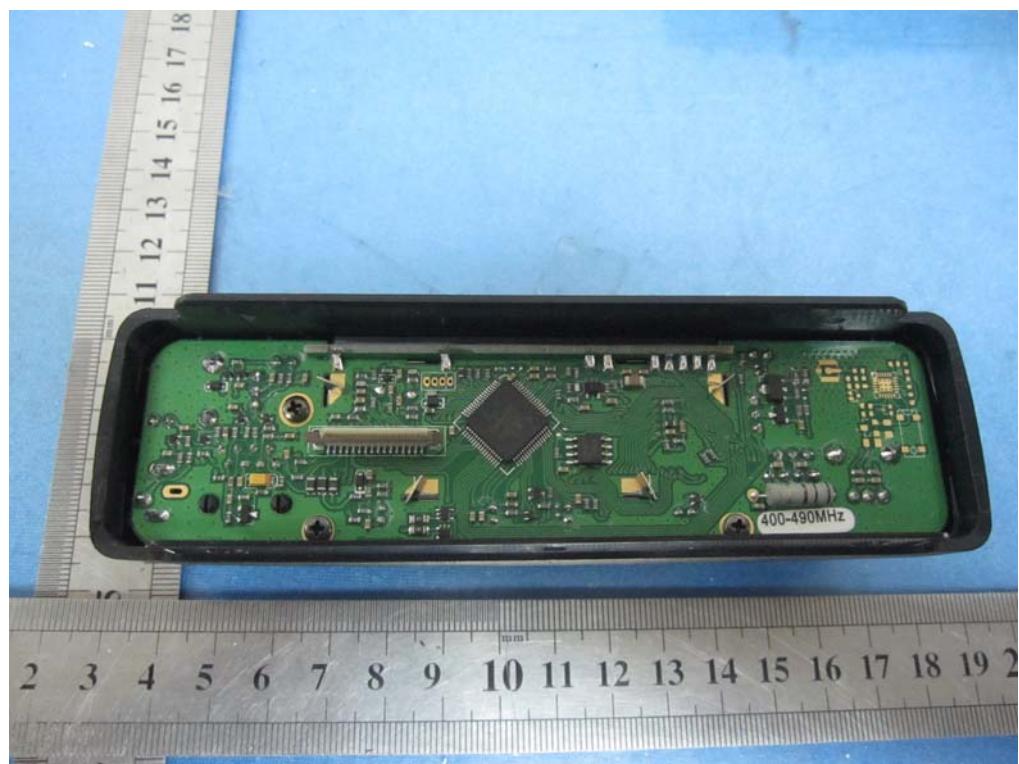
6. External and Internal Photos of the EUT

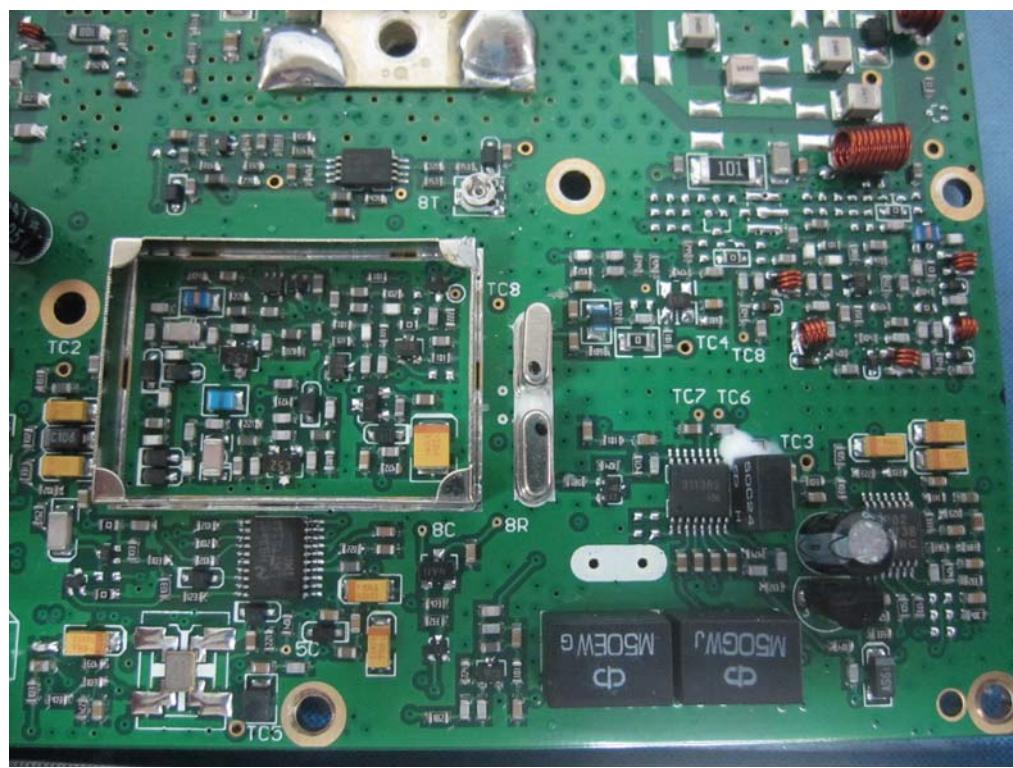
External Photos





Internal Photos







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