FCC PART 90 TEST REPORT

FCC Part 90

Report Reference No.....:	**WE10090019**
FCC ID.....:	**YAMMD78XVHF**
Compiled by (position+printed name+signature)..:	File administrators Xiankun Ding
Supervised by (position+printed name+signature)..:	Test Engineer Wenliang Li
Approved by (position+printed name+signature)..:	Manager Jimmy Li
Date of issue.....:	Oct 10, 2010
Testing Laboratory Name.....:	**Shenzhen Huatongwei International Inspection Co., Ltd**
Address .....:	Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China
Applicant's name.....:	**Hytera Communications Corporation Ltd.**
Address .....:	HYT Tower,Hi-Tech Industrial Park North,Nanshan District,Shenzhen China.518057
Test specification:	
Standard .....:	**FCC Part 90: PRIVATE LAND MOBILE RADIO SERVICES**
TRF Originator.....:	Shenzhen Huatongwei International Inspection CO., Ltd
Master TRF.....:	Dated 2006-06

Test item description .....:	Digital Mobile Radio
Trade Mark .....:	Hytera
Manufacturer .....:	**Hytera Communications Corporation Ltd.**
Model/Type reference.....:	MD782 VHF/ MD785 VHF/ MD786 VHF/ MD788 VHF
Listed Models .....:	/
Modulation .....:	FM&4FSK
Channel Separation.....	12.5KHz&25KHz
Rated Power .....:	50 Watts(46.99 dBm)/5 Watts(36.99 dBm)
Operation Frequency.....	From 136 MHz to 174 MHz
Ratings .....:	DC 13.60 V
Result.....:	**Positive**

TEST REPORT

Test Report No. :	WE10090019	Oct 10, 2010 Date of issue

Equipment under Test	:	Digital Mobile Radio
Model /Type	:	MD782 VHF/ MD785 VHF/ MD786 VHF/ MD788 VHF
Listed Models	:	/
Applicant	:	**Hytera Communications Corporation Ltd.**
Address	:	HYT Tower,Hi-Tech Industrial Park North,Nanshan District,Shenzhen China.518057
Manufacturer	:	**Hytera Communications Corporation Ltd.**
Address	:	HYT Tower,Hi-Tech Industrial Park North,Nanshan District,Shenzhen China.518057

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

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

Contents

1. TEST STANDARDS

The tests were performed according to following standards:

FCC Rules Part 90: PRIVATE LAND MOBILE RADIO SERVICES.

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

ANSI C63.4-2009: American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

2 . SUMMARY

2.1. General Remarks

Date of receipt of test sample	:	Sep 14, 2010
Testing commenced on	:	Sep 14, 2010
Testing concluded on	:	Oct 10, 2010

2.2. Product Description

The Hytera Communications Corporation Ltd.'s Model: MD782 VHF/ MD785 VHF/ MD786 VHF/ MD788 VHF or the "EUT" as referred to in this report; more general information as follows, for more details, refer to the user's manual of the EUT.

Name of EUT	Digital Mobile Radio	
Model Number	MD782 VHF/ MD785 VHF/ MD786 VHF/ MD788 VHF	
FCC ID	YAMMD78XVHF	
Rated Output Power	50 Watts(46.99 dBm)/5 Watts(36.99 dBm)	
Modilation Type	FM for Analog Voice	
	4FSK for Digital Voice/Digital Data	
	4FSK for Digital Data	
Emission Designator	Analog	16K0F3E for 25KHz Channel Separation
		11K0F3E for 12.5KHz Channel Separation
	Digital	7K60FXD for Digital Data only
		7K60FXW for Digital Data & Digital Voice
Channel Separation	Analog Voice	12.5KHz&25KHz
	Digital Voice/Data	12.5KHz
	Digital Data	12.5KHz
Antenna Type	External	
Frequency Range	From 136 MHz to 174 MHz	
Maximum Transmitter Power	Analog	54.83 W for 25 KHz Channel Separation
		54.58 W for 12.5 KHz Channel Separation
	Digital	55.59 W for 12.5 KHz Channel Separation

Note: The product has the same digital working characters when operating in both two digitized voice/data mode (7K60FXD and 7K60FXW). So only one set of test results for digital modulation modes are provided in this test report.

2.3. Equipment under Test

Power supply system utilised

Power supply voltage	:	○	120V / 60 Hz	○	115V / 60Hz
		○	12 V DC	○	24 V DC
		●	Other (specified in blank below)		

DC 13.60 V

Test frequency list

Modulation Type	Test Channel	Test Frequency
Analog/FM	Low Channel	136.1250 MHz
	Middle Channel	156.1250 MHz
	High Channel	173.9875 MHz
Digital/4FSK	Low Channel	136.1250 MHz
	Middle Channel	156.1250 MHz
	High Channel	173.9875 MHz

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

136-174 MHz V frequency band Digital Mobile Radio (MD782 VHF/ MD785 VHF/ MD786 VHF/ MD788 VHF).

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

●	Power Cable	Length (m) :	3
		Shield :	Unshield
		Detachable :	Detachable
○	Multimeter	Manufacturer :	/
		Model No. :	/

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

This submittal(s) (test report) is intended for FCC ID: **YAMMD78XVHF** filing to comply with FCC Part 90 Rules

2.9. Modifications

No modifications were implemented to meet testing criteria.

2.10. Note

1. The EUT is a V frequency band (136-174MHz) Digital Mobile Radio,The functions of the EUT listed as below:

	Test Standards	Reference Report
Radio	FCC Part 90	WE10090019

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: August 02, 2007. Valid time is until March 29, 2012.

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 to Sep 30, 2011.

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 July 01, 2009.

IC-Registration No.: 5377

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. 5377 on February 13th, 2009.

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 17025:2005 or equivalent. The laboratory also fulfils the conditions described in Nemko Document NLA-10; the Authorization is valid through July 07, 2011.

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.: R-2484. Date of Registration: December 20, 2009. Valid time is until December 19, 2012.

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: December 20, 2009. Valid time is until December 19, 2012.

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 24 Augest, 2013.

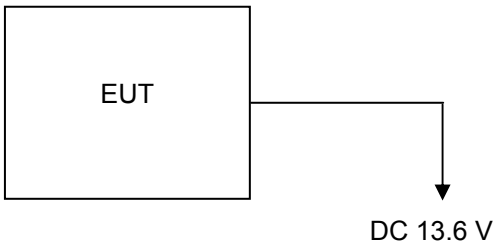
3.3. Environmental conditions

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. Discription of Tested Modes

The EUT (Digital 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	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.24 dB	(1)
Radiated Emission	1~18GHz	5.16 dB	(1)
Radiated Emission	18-40GHz	5.54 dB	(1)
Conducted Disturbance	0.15~30MHz	3.39 dB	(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	Description of Test	Test Result
§ 15.107	Conducted Emission	Complies
§ 15.109	Receiver Radiated Spurious Emssion	Complies
§ 15.109	Receiver Conducted Spurious Emssion	Complies
§ 90.205	Maximum Transmitter Power	Complies
§ 90.207	Modulation Characteristic	Complies
§ 90.209	Occupied Bandwidth	Complies
§ 90.210	Emission Mask	Complies
§ 90.213	Frequency Stability	Complies
§ 90.214	Transmitter Frequency Behavior	Complies
§ 90.210	Transmitter Radiated Spurious Emssion	Complies
§ 90.210	Spurious Emssion On Antenna Port	Complies
§ 2.1091	RF Exposure Evaluation	Complies

3.8. Equipments Used during the Test

DC Power Conducted Emission				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Artificial Mains	Rohde&Schwarz	ESH2-Z5	100028	11/2010
EMI Test Receiver	Rohde&Schwarz	ESCS 30	100038	11/2010
Pulse Limiter	Rohde&Schwarz	ESHSZ2	100044	11/2010
EMI Test Software	Rohde&Schwarz	ES-K1 V1.71	N/A	11/2010

Modulation Characteristic				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Modulation Analyzer	HP	8901B	3104A03367	11/2010
Signal Generator	Rohde&Schwarz	SMT03	100059	11/2010
RF COMMUNICATION TEST SET	HP	8920A	3813A10206	11/2010

Transient Frequency Behavior				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Signal Generator	Rohde&Schwarz	SMT03	100059	11/2010
Storage Oscilloscope	Tektronix	TDS3054B	B033027	11/2010
RF COMMUNICATION TEST SET	HP	8920A	3813A10206	11/2010

Transmitter Radiated Spurious Emssion & Occupied Bandwidth & Emission Mask & Receiver Radiated Spurious Emssion				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Ultra-Broadband Antenna	Rohde&Schwarz	HL562	100015	11/2010
EMI Test Receiver	Rohde&Schwarz	ESI 26	100009	11/2010
RF Test Panel	Rohde&Schwarz	TS / RSP	335015/ 0017	N/A
HORN ANTENNA	Rohde&Schwarz	HF906	100039	11/2010
Turntable	ETS	2088	2149	N/A
Antenna Mast	ETS	2075	2346	N/A
High-Pass Filter	Anritsu	MP526B	6220875256	11/2010
High-Pass Filter	Anritsu	MP526D	6220878392	11/2010
EMI Test Software	Rohde&Schwarz	ES-K1 V1.71	N/A	11/2010
RF COMMUNICATION TEST SET	HP	8920A	3813A10206	11/2010

Frequency Stability				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Communication Test Set	HP	HP8920B	US35010135	11/2010
Signal Generator	Rohde&Schwarz	SMT03	100059	11/2010
Climate Chamber	ESPEC	EL-10KA	05107008	11/2010

Maximum Transmitter Power & Spurious Emssion On Antenna Port				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Receiver	Rohde&Schwarz	ESI 26	100009	11/2010
Attenuator	R&S	ESH3-22	100449	11/2010
RF COMMUNICATION TEST SET	HP	8920A	3813A10206	11/2010
High-Pass Filter	Anritsu	MP526B	6220875256	11/2010
High-Pass Filter	Anritsu	MP526D	6220878392	11/2010

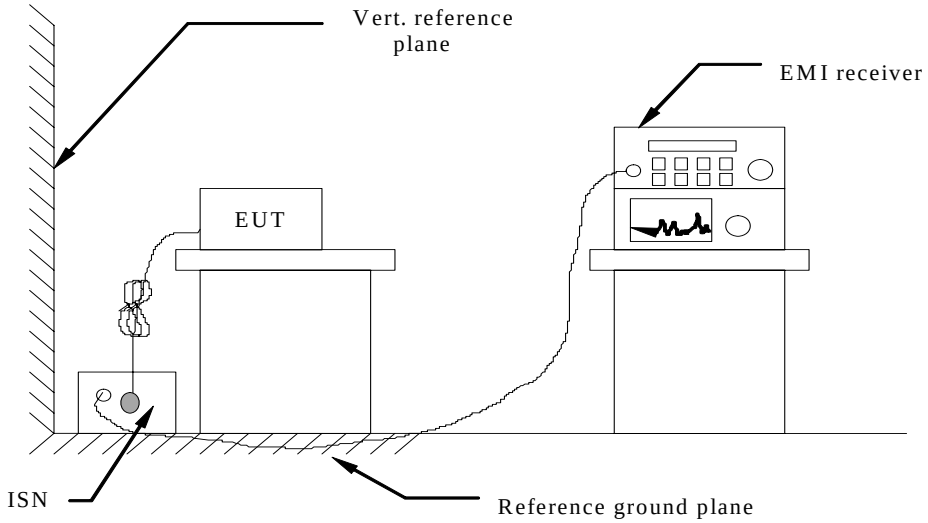
4. TEST CONDITIONS AND RESULTS

4.1. Conducted Emissions Test

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 (dBμV)			
	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

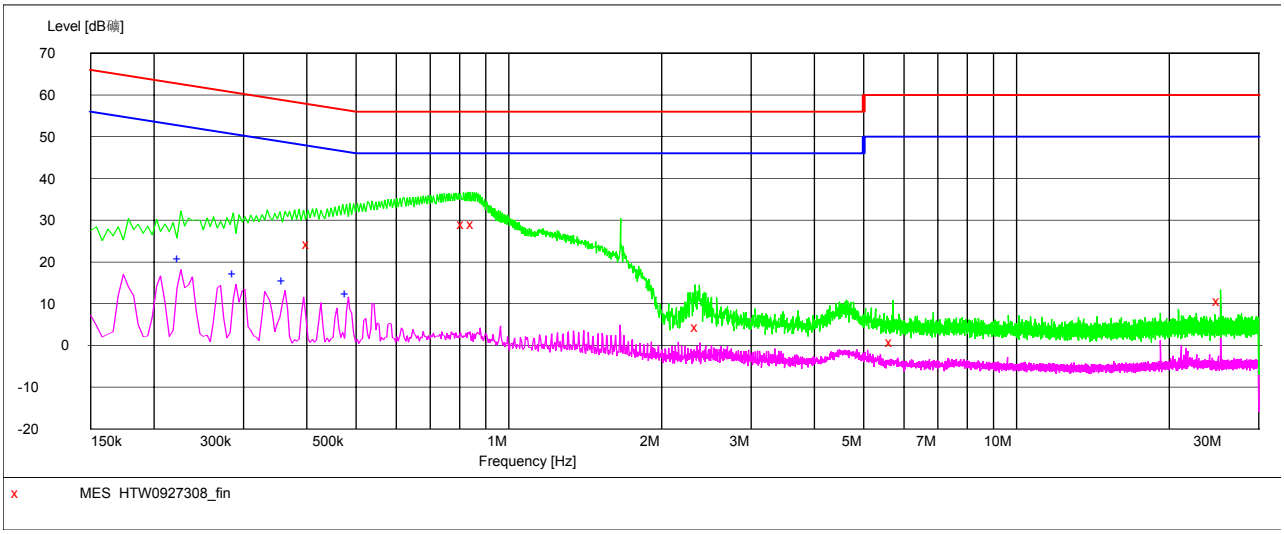
For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

TEST RESULTS

For FM Mudolation @ 25 KHz TX Mode

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

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "HTW0927308_fin"

9/27/2010 10:30AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.406000	24.20	10.5	58	33.5	QP	+	GND
0.818000	29.00	10.4	56	27.0	QP	+	GND
0.854000	29.00	10.4	56	27.0	QP	+	GND
2.366000	4.50	10.5	56	51.5	QP	+	GND
5.718000	0.90	10.5	60	59.1	QP	+	GND
25.202000	10.80	11.1	60	49.2	QP	+	GND

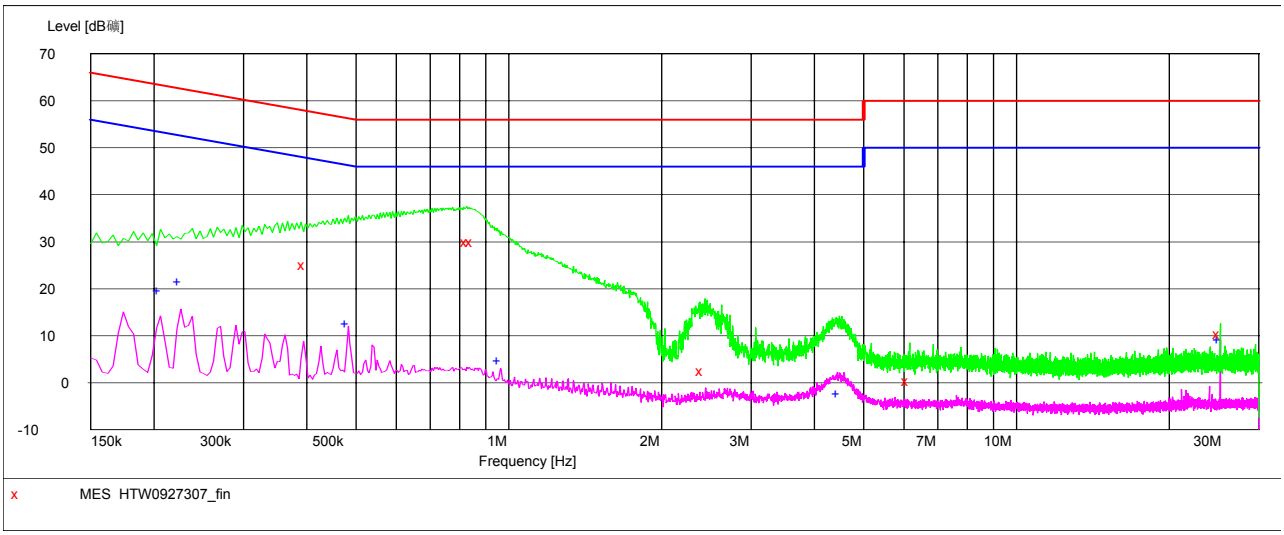
MEASUREMENT RESULT: "HTW0927308_fin2"

9/27/2010 10:30AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.226000	20.80	10.5	53	31.8	AV	+	GND
0.290000	17.10	10.5	51	33.4	AV	+	GND
0.362000	15.40	10.5	49	33.3	AV	+	GND
0.482000	12.20	10.4	46	34.1	AV	+	GND

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

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "HTW0927307_fin"

9/27/2010 10:26AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.398000	25.10	10.5	58	32.8	QP	-	GND
0.830000	30.00	10.4	56	26.0	QP	-	GND
0.850000	29.90	10.4	56	26.1	QP	-	GND
2.414000	2.50	10.5	56	53.5	QP	-	GND
6.134000	0.40	10.5	60	59.6	QP	-	GND
25.202000	10.30	11.1	60	49.7	QP	-	GND

MEASUREMENT RESULT: "HTW0927307_fin2"

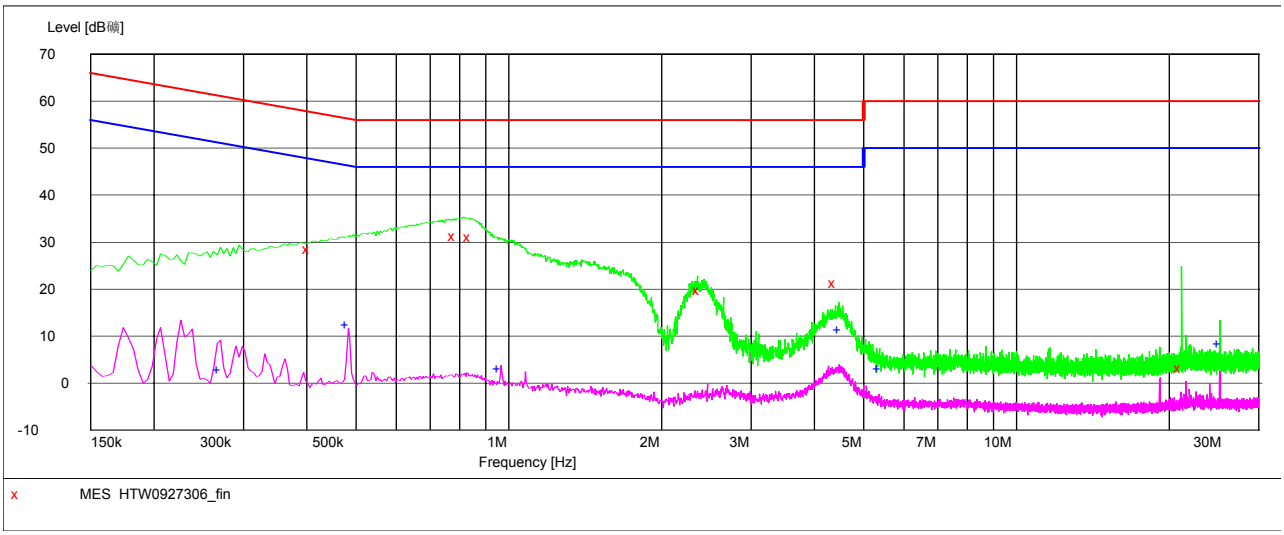
9/27/2010 10:26AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.206000	19.50	10.5	53	33.9	AV	-	GND
0.226000	21.30	10.5	53	31.3	AV	-	GND
0.482000	12.40	10.4	46	33.9	AV	-	GND
0.962000	4.60	10.5	46	41.4	AV	-	GND
4.474000	-2.40	10.5	46	48.4	AV	-	GND
25.202000	9.10	11.1	50	40.9	AV	-	GND

For FM Mudolation @ 12.5 KHz TX Mode

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

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "HTW0927306_fin"

9/27/2010 10:22AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.406000	28.60	10.5	58	29.1	QP	-	GND
0.786000	31.40	10.4	56	24.6	QP	-	GND
0.842000	31.00	10.4	56	25.0	QP	-	GND
2.382000	19.90	10.5	56	36.1	QP	-	GND
4.418000	21.20	10.5	56	34.8	QP	-	GND
21.122000	3.20	11.0	60	56.8	QP	-	GND

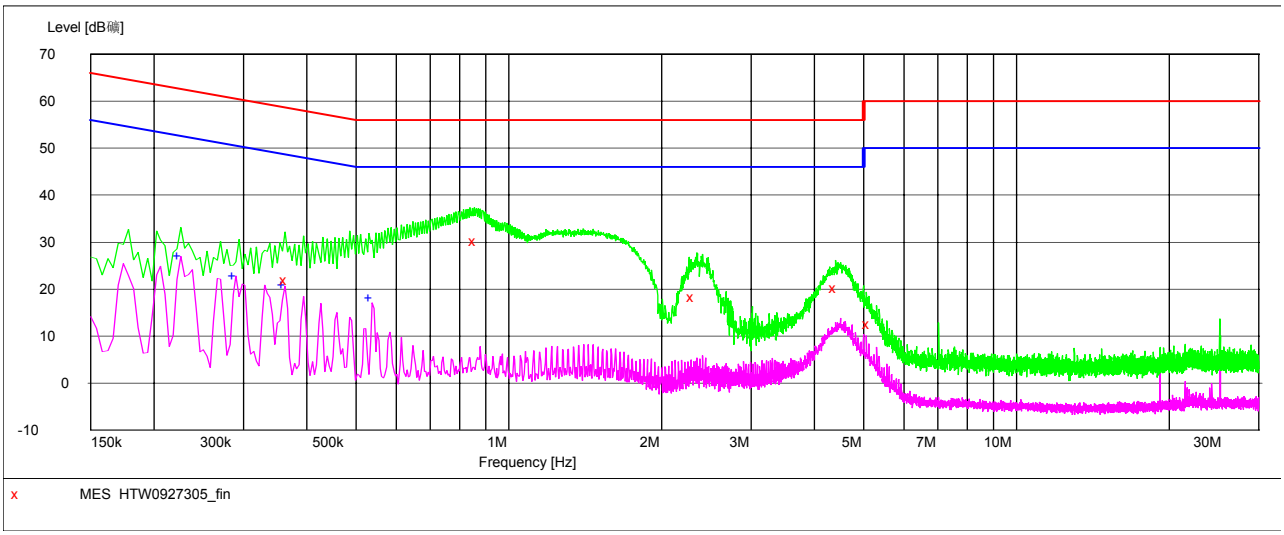
MEASUREMENT RESULT: "HTW0927306_fin2"

9/27/2010 10:22AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.270000	2.90	10.5	51	48.2	AV	-	GND
0.482000	12.40	10.4	46	33.9	AV	-	GND
0.962000	3.00	10.5	46	43.0	AV	-	GND
4.498000	11.40	10.5	46	34.6	AV	-	GND
5.394000	3.10	10.5	50	46.9	AV	-	GND
25.202000	8.30	11.1	50	41.7	AV	-	GND

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

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "HTW0927305_fin"

9/27/2010 10:18AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.366000	22.00	10.5	59	36.6	QP	+	GND
0.862000	30.10	10.4	56	25.9	QP	+	GND
2.318000	18.30	10.5	56	37.7	QP	+	GND
4.422000	20.30	10.5	56	35.7	QP	+	GND
5.146000	12.60	10.5	60	47.4	QP	+	GND

MEASUREMENT RESULT: "HTW0927305_fin2"

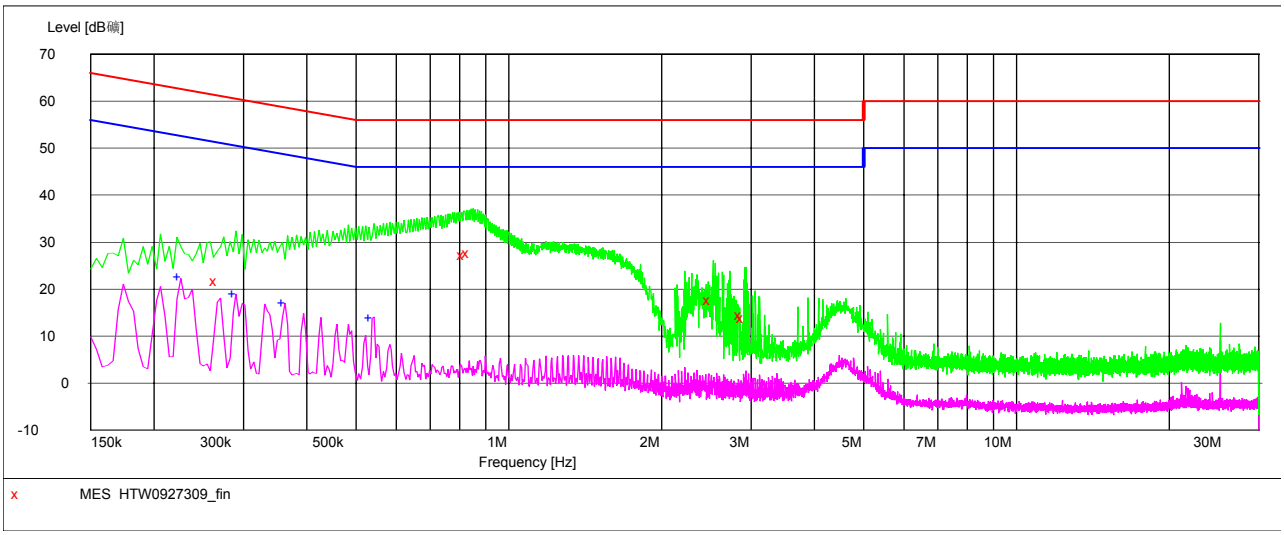
9/27/2010 10:18AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.226000	27.00	10.5	53	25.6	AV	+	GND
0.290000	22.70	10.5	51	27.8	AV	+	GND
0.362000	20.80	10.5	49	27.9	AV	+	GND
0.538000	18.00	10.4	46	28.0	AV	+	GND

For 4FSK Mudolation @ 12.5 KHz TX Mode

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

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "HTW0927309_fin"

9/27/2010 10:34AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.266000	21.70	10.5	61	39.5	QP	+	GND
0.818000	27.30	10.4	56	28.7	QP	+	GND
0.838000	27.70	10.4	56	28.3	QP	+	GND
2.502000	17.60	10.5	56	38.4	QP	+	GND
2.878000	14.40	10.5	56	41.6	QP	+	GND
2.902000	13.80	10.5	56	42.2	QP	+	GND

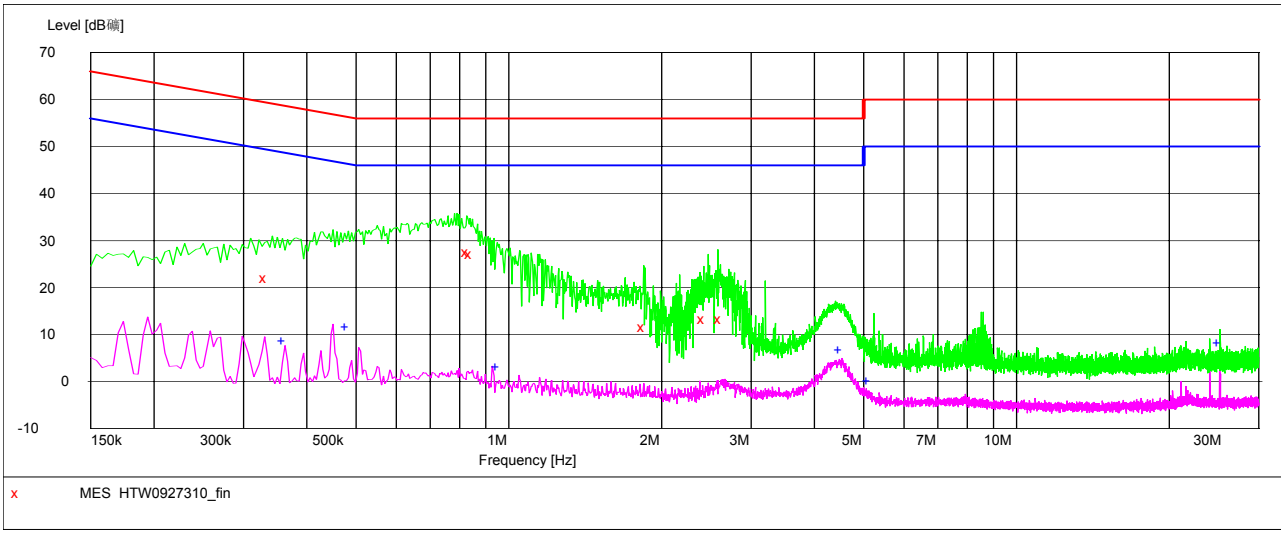
MEASUREMENT RESULT: "HTW0927309_fin2"

9/27/2010 10:34AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.226000	22.60	10.5	53	30.0	AV	+	GND
0.290000	18.90	10.5	51	31.6	AV	+	GND
0.362000	17.10	10.5	49	31.6	AV	+	GND
0.538000	13.80	10.4	46	32.2	AV	+	GND

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

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "HTW0927310_fin"

9/27/2010 10:38AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.334000	21.90	10.5	59	37.5	QP	-	GND
0.834000	27.50	10.4	56	28.5	QP	-	GND
0.846000	27.10	10.4	56	28.9	QP	-	GND
1.854000	11.50	10.5	56	44.5	QP	-	GND
2.434000	13.30	10.5	56	42.7	QP	-	GND
2.626000	13.20	10.5	56	42.8	QP	-	GND

MEASUREMENT RESULT: "HTW0927310_fin2"

9/27/2010 10:38AM

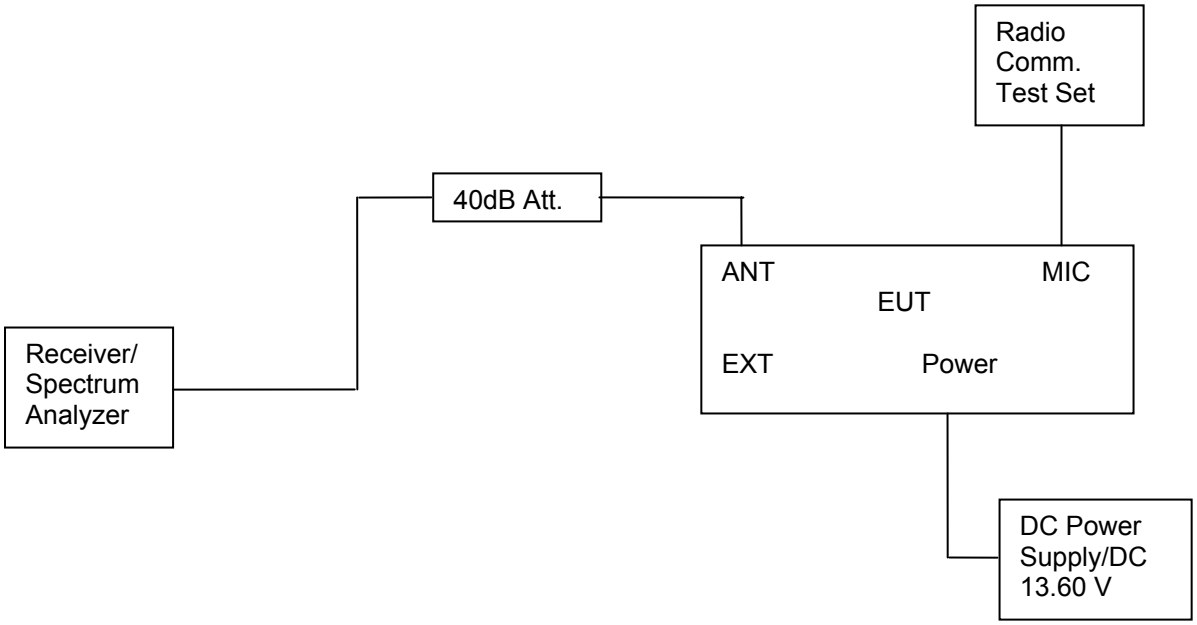
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.362000	8.70	10.5	49	40.0	AV	-	GND
0.482000	11.60	10.4	46	34.7	AV	-	GND
0.958000	3.10	10.5	46	42.9	AV	-	GND
4.534000	6.70	10.5	46	39.3	AV	-	GND
5.146000	0.00	10.5	50	50.0	AV	-	GND
25.202000	8.10	11.1	50	41.9	AV	-	GND

4.2. Occupied Bandwidth and Emission Mask Test

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), 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 f0 to 5.625 kHz removed from f0: Zero dB.
(2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 5.625 kHz but no more than 12.5 kHz: At least 7.27(fd -2.88 kHz) dB.
(3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd 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.
6 Set SPA Center Frequency=fundamental frequency, RBW=300Hz, VBW=3 KHz span=50 KHz for 25 KHz channel spacing, while RBW=100Hz, VBW=300Hz, span=50 KHz for 12.5 channel spacing.

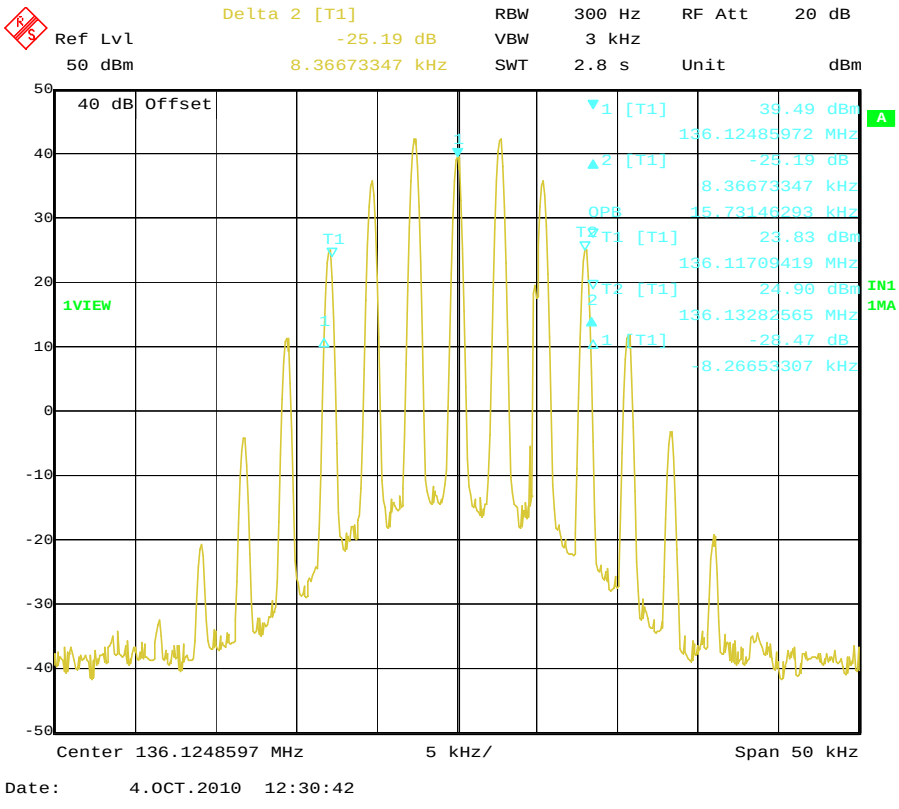
TEST RESULTS

4.2.1 Occupied Bandwidth

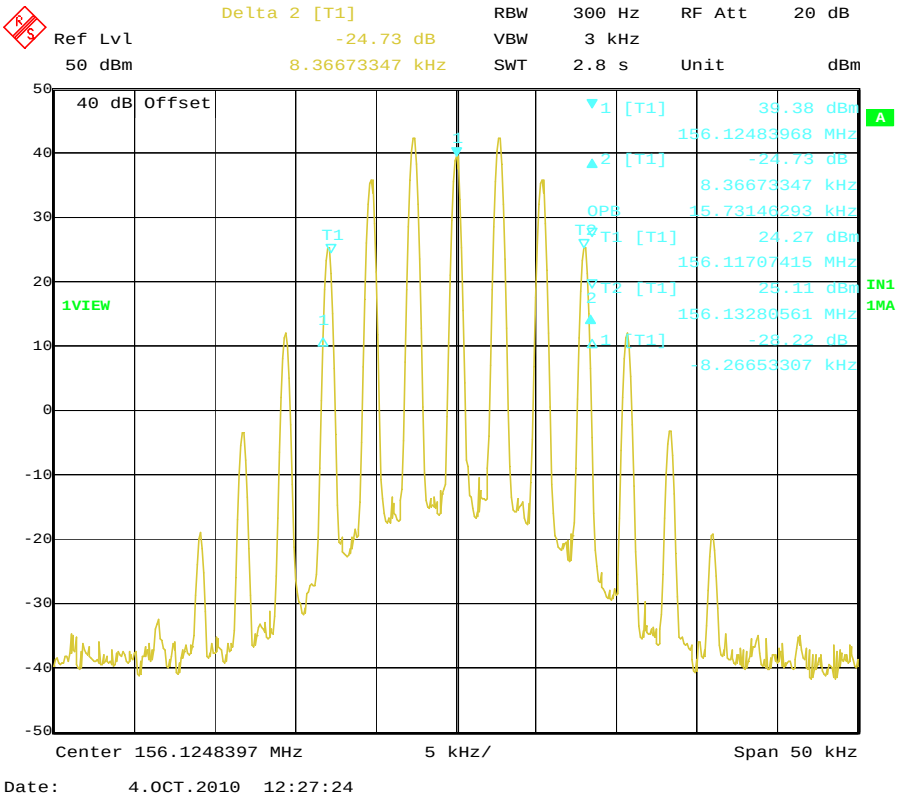
Modulation Type	Channel Sparation	Test Channel	Test Frequency	99% Occupied Bandwidth	26dB Occupied Band width
FM	25KHz	Low	136.1250 MHz	15.73 KHz	16.63 KHz
		Middle	156.1250 MHz	15.73 KHz	16.63 KHz
		High	173.9875 MHz	15.73 KHz	16.53 KHz
	12.5KHz	Low	136.1250 MHz	10.02 KHz	10.62 KHz
		Middle	156.1250 MHz	10.02 KHz	10.62 KHz
		High	173.9875 MHz	9.92 KHz	10.52 KHz
4FSK	12.5KHz	Low	136.1250 MHz	7.31 KHz	9.42 KHz
		Middle	156.1250 MHz	7.21 KHz	10.02 KHz
		High	173.9875 MHz	7.52 KHz	9.72 KHz
Limit		20kHz for 25KHz Channel Separtion			
		11.25KHz for 12.5KHz Channel Separtion			
Test Results		Compliance			

Plots of 99% and 26dB Bandwidth Measurement

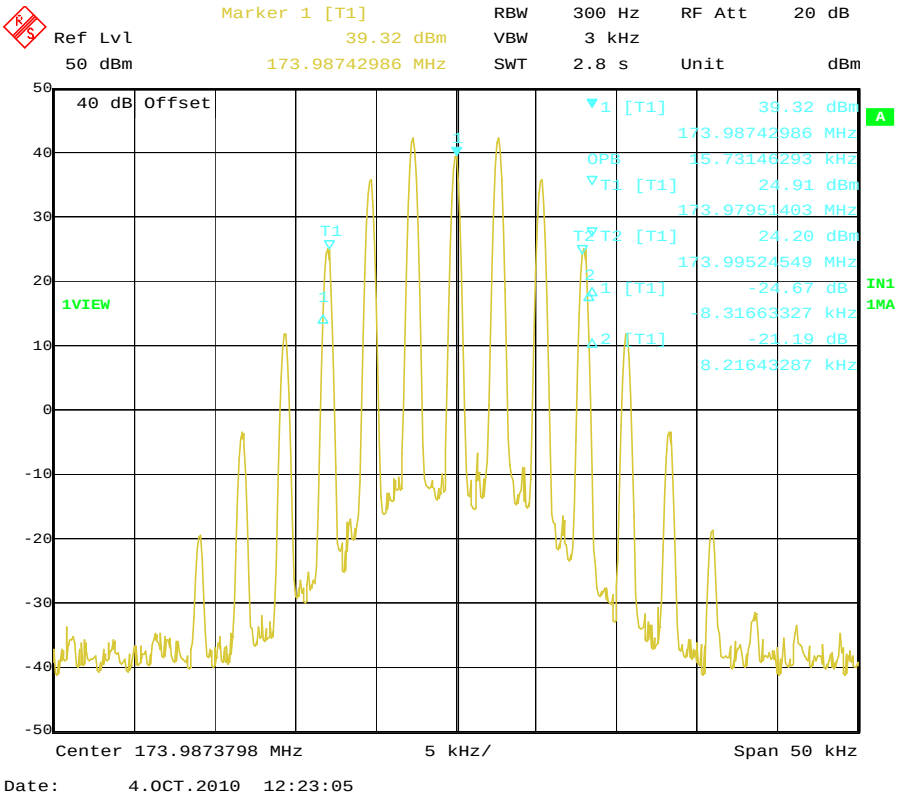
Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	25 KHz	136.1250	15.73	16.63	20	Complicance



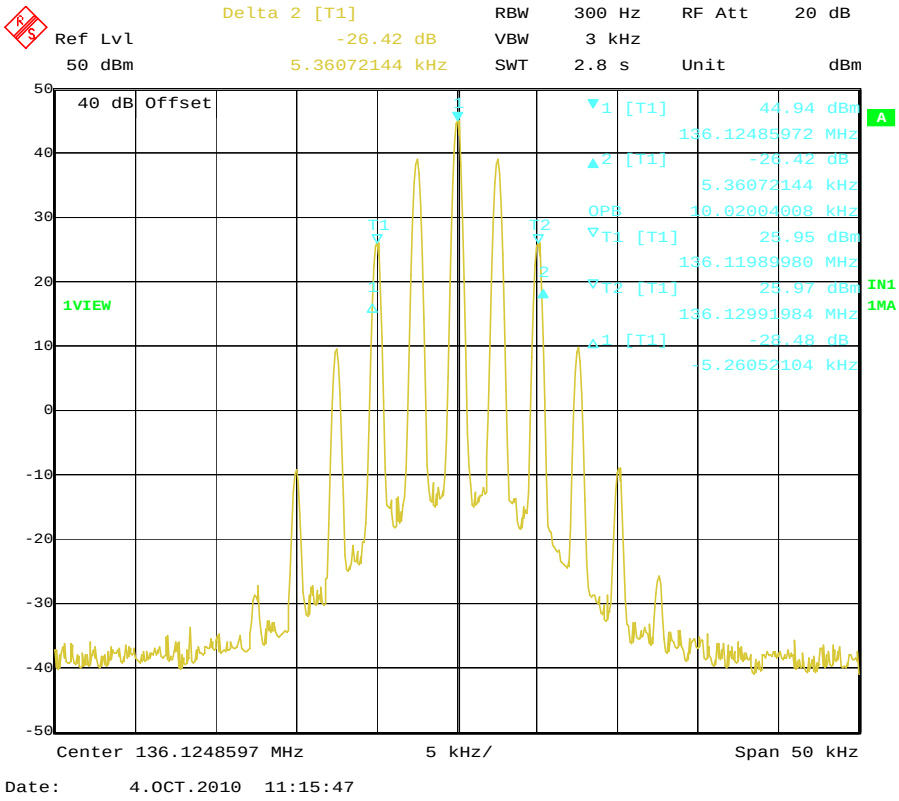
Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	25 KHz	156.1250	15.73	16.63	20	Complicance



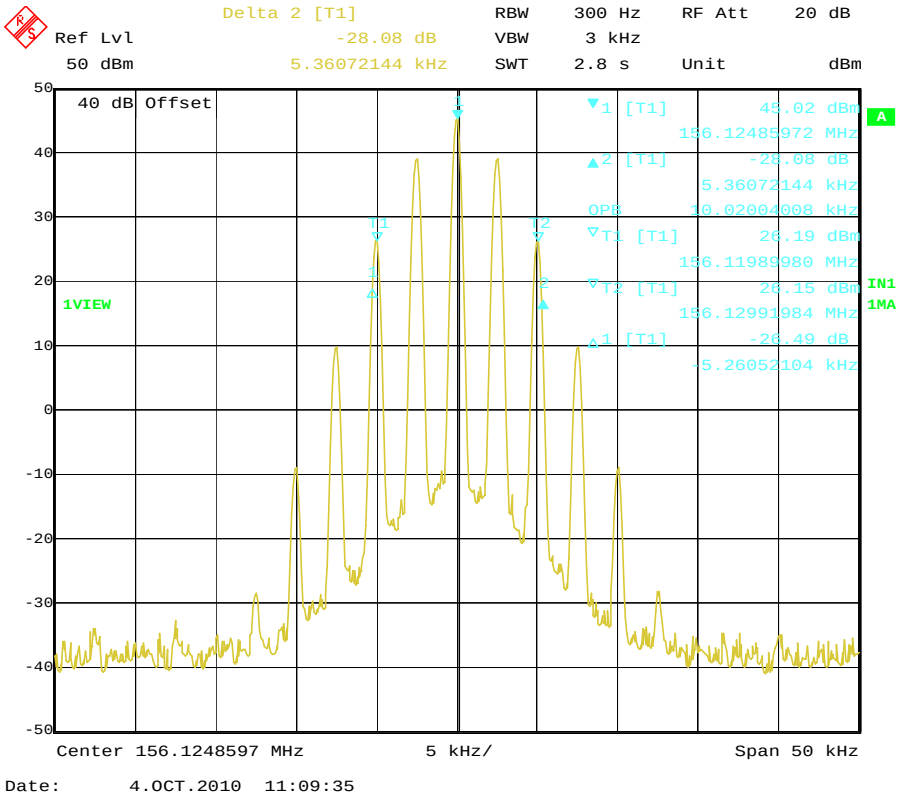
Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	25 KHz	173.9875	15.73	16.53	20	Complicance



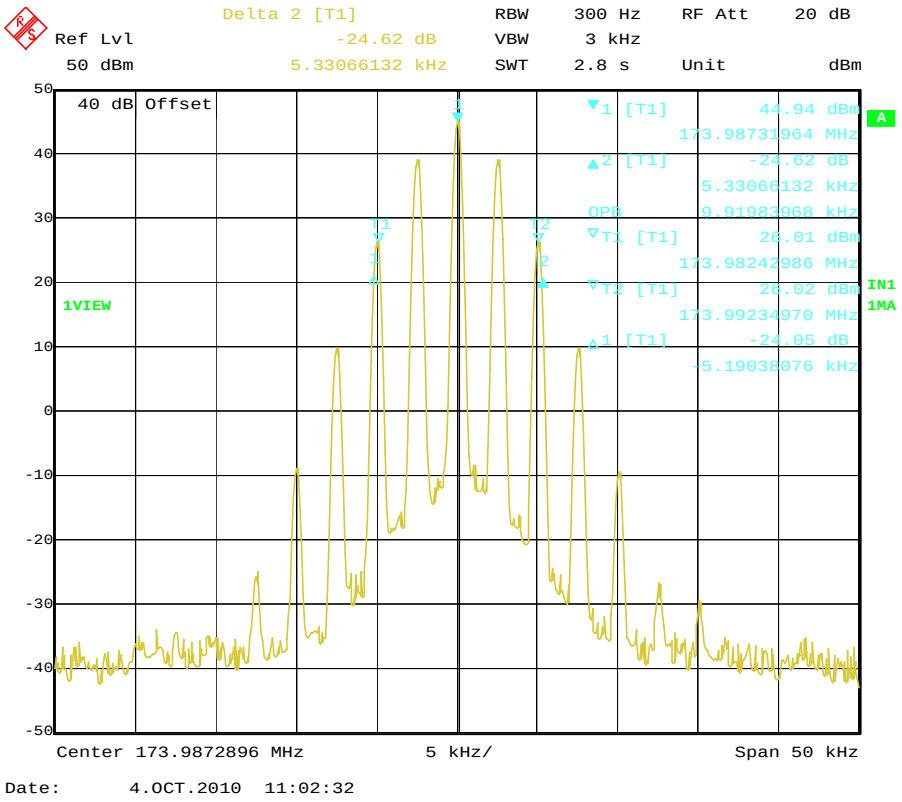
Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	12.5 KHz	136.1250	10.02	10.62	11.25	Complicance



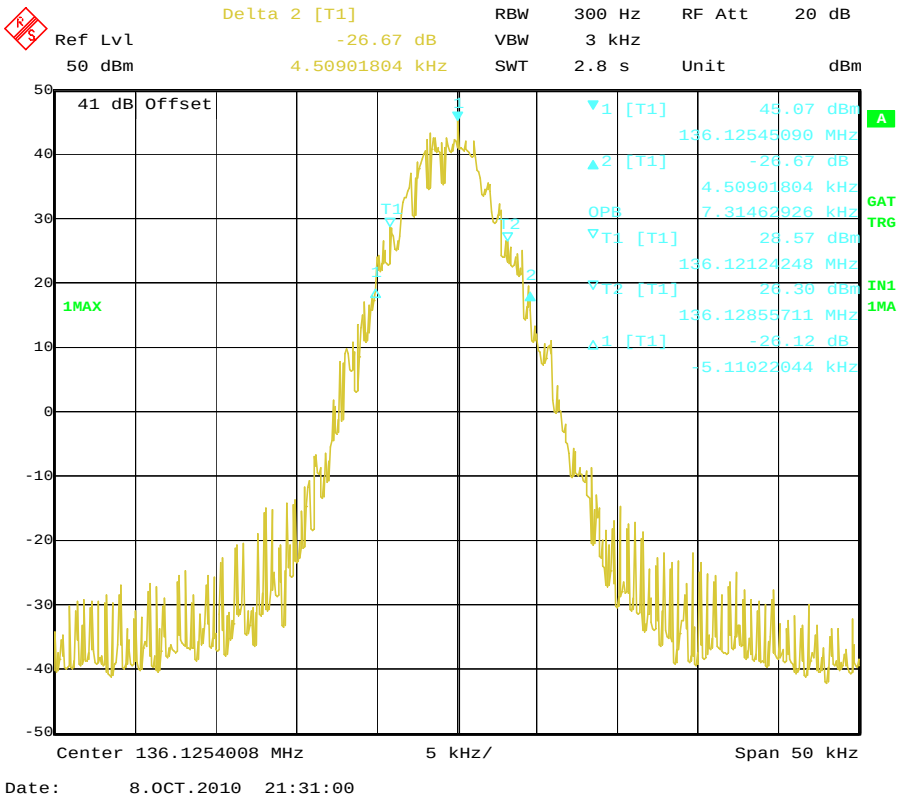
Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	12.5 KHz	156.1250	10.02	10.62	11.25	Complicance



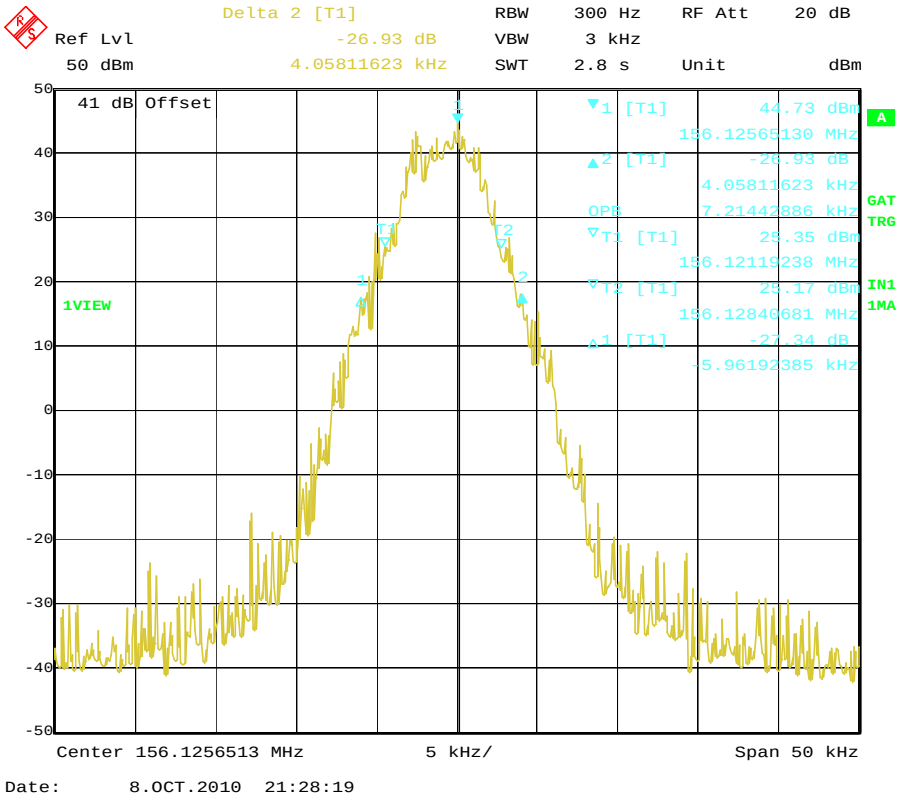
Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	12.5 KHz	173.9875	9.92	10.52	11.25	Complicance



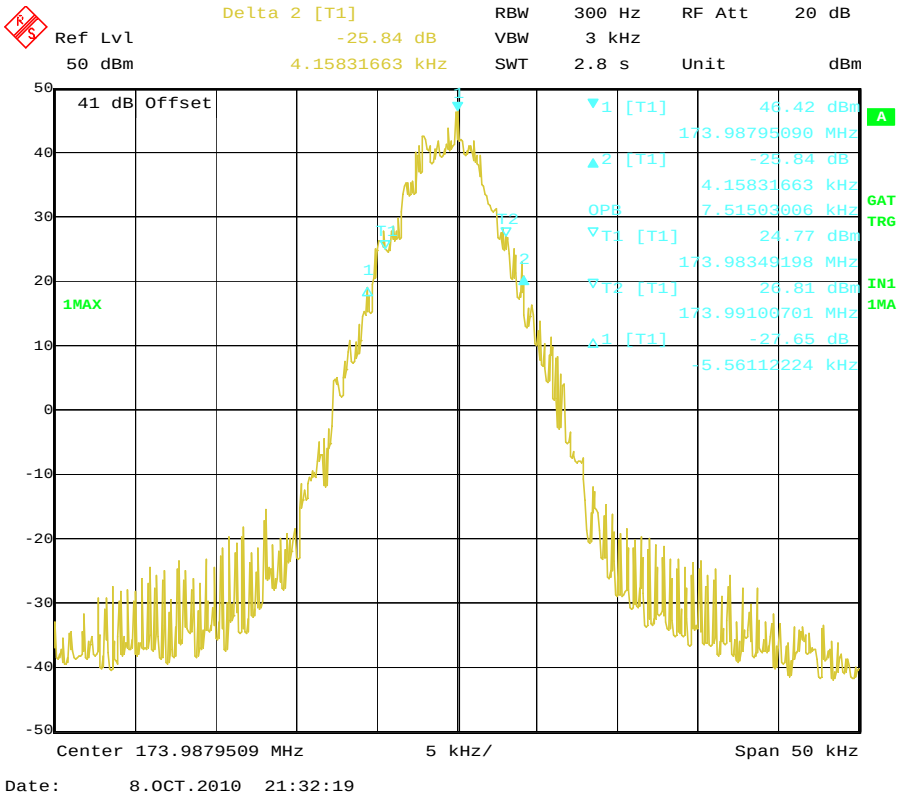
Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
4FSK	12.5 KHz	136.1250	7.31	9.62	11.25	Complicance



Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
4FSK	12.5 KHz	156.1250	7.21	10.02	11.25	Complicance



Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
4FSK	12.5 KHz	173.9875	7.52	9.72	11.25	Complicance



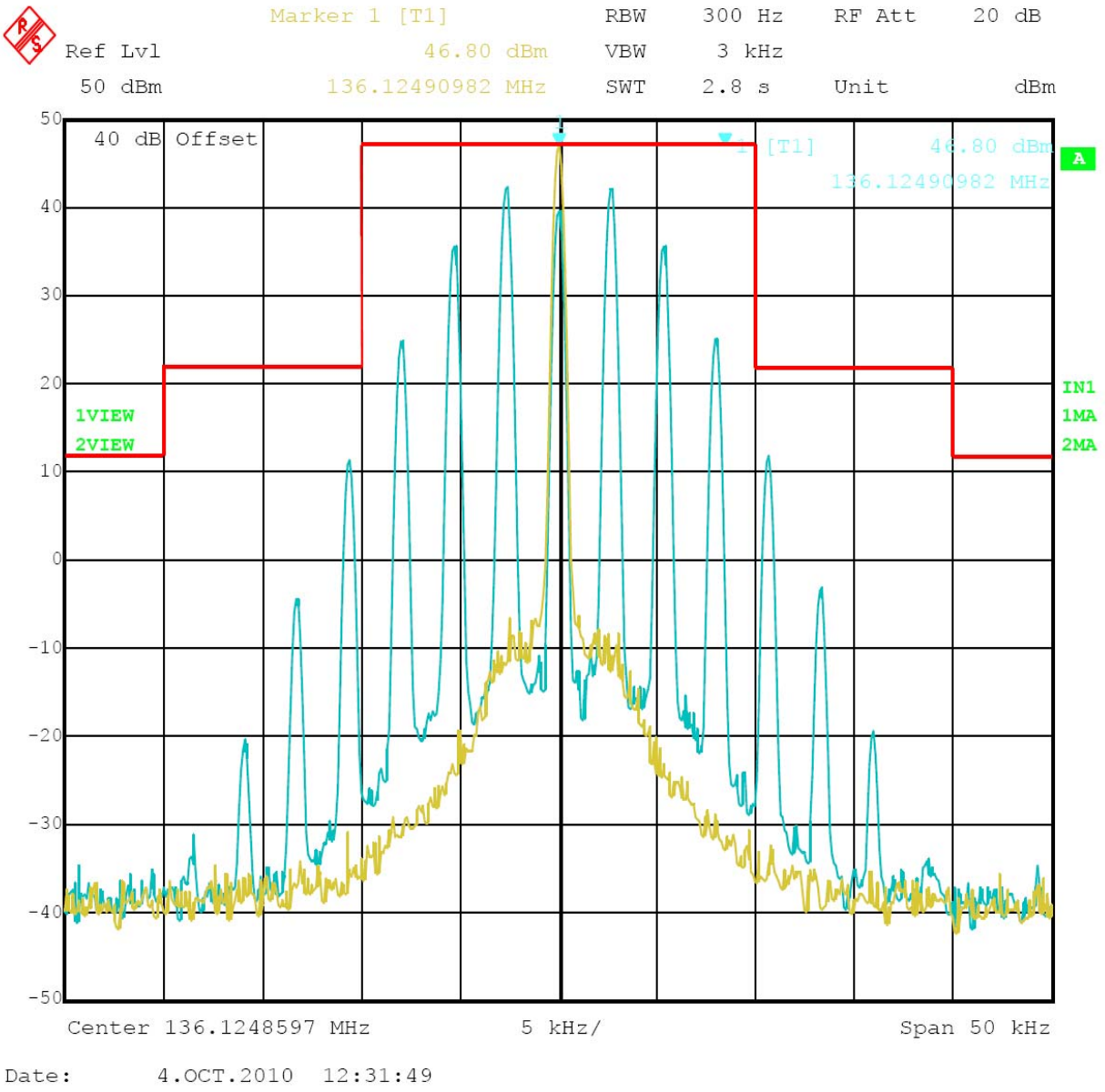
4.2.2 Emission Mask

Modulation Type	Channel Sparation	Test Channel	Test Frequency	FCC Applicable Mask	RBW
FM	25KHz	Low	136.1250 MHz	B	300 Hz
		Middle	156.1250 MHz	B	300 Hz
		High	173.9875 MHz	B	300 Hz
	12.5KHz	Low	136.1250 MHz	D	100 Hz
		Middle	156.1250 MHz	D	100 Hz
		High	173.9875 MHz	D	100 Hz
4FSK	12.5KHz	Low	136.1250 MHz	D	100 Hz
		Middle	156.1250 MHz	D	100 Hz
		High	173.9875 MHz	D	100 Hz
Test Results		Compliance			

Plots of Emission Mask Measurement

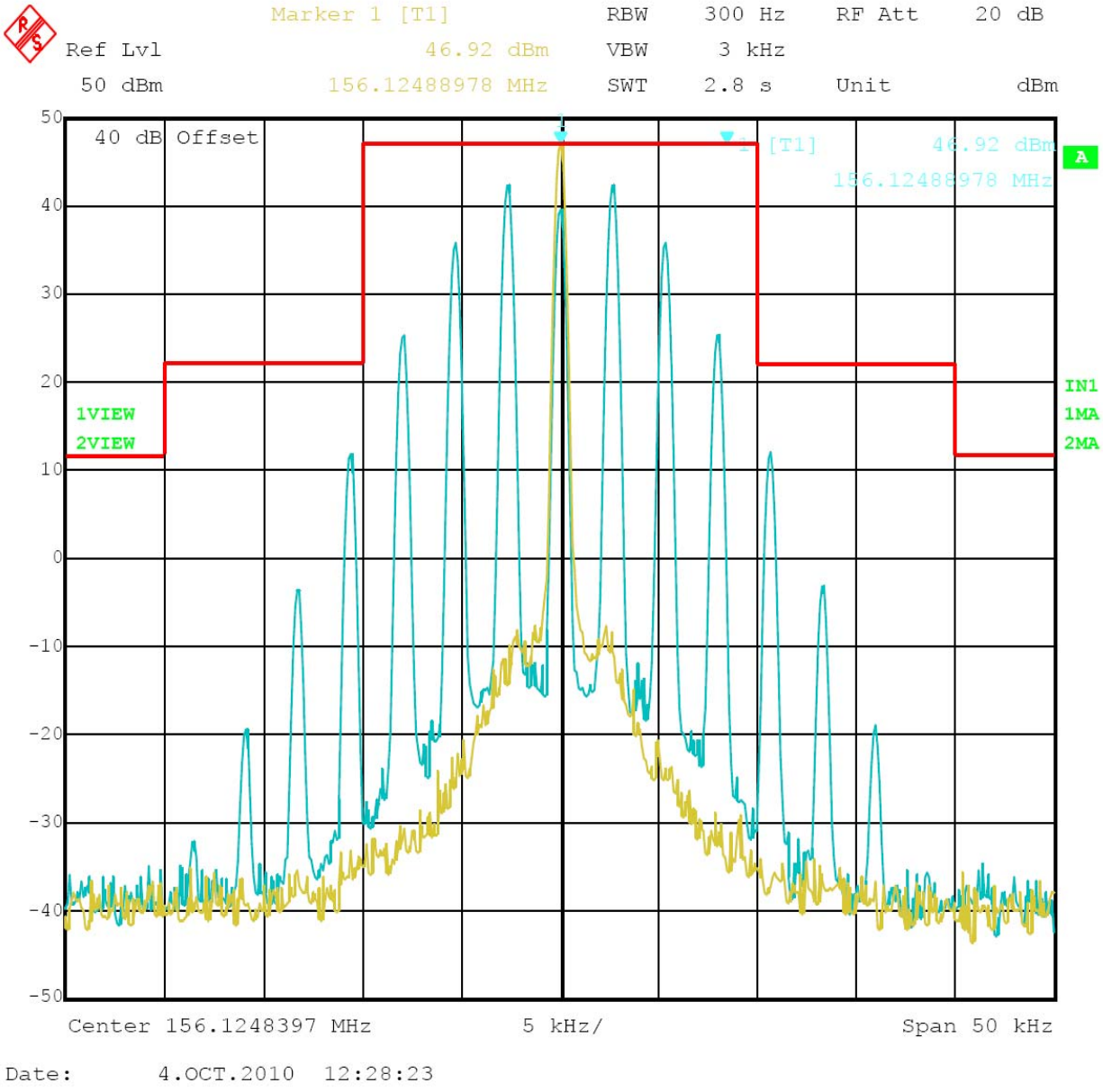
Referred as the attached plot hereinafter
Note: The yellow curve represents unmodulated signal.
The green curve represents modulated signal.

Modulation Type	Channel Separation	Freq.(MHz)	FCC Applicable Mask	RBW	Audio Freq. (KHz)	Results
FM	25 KHz	136.1250	B	300Hz	2.5	Complicance



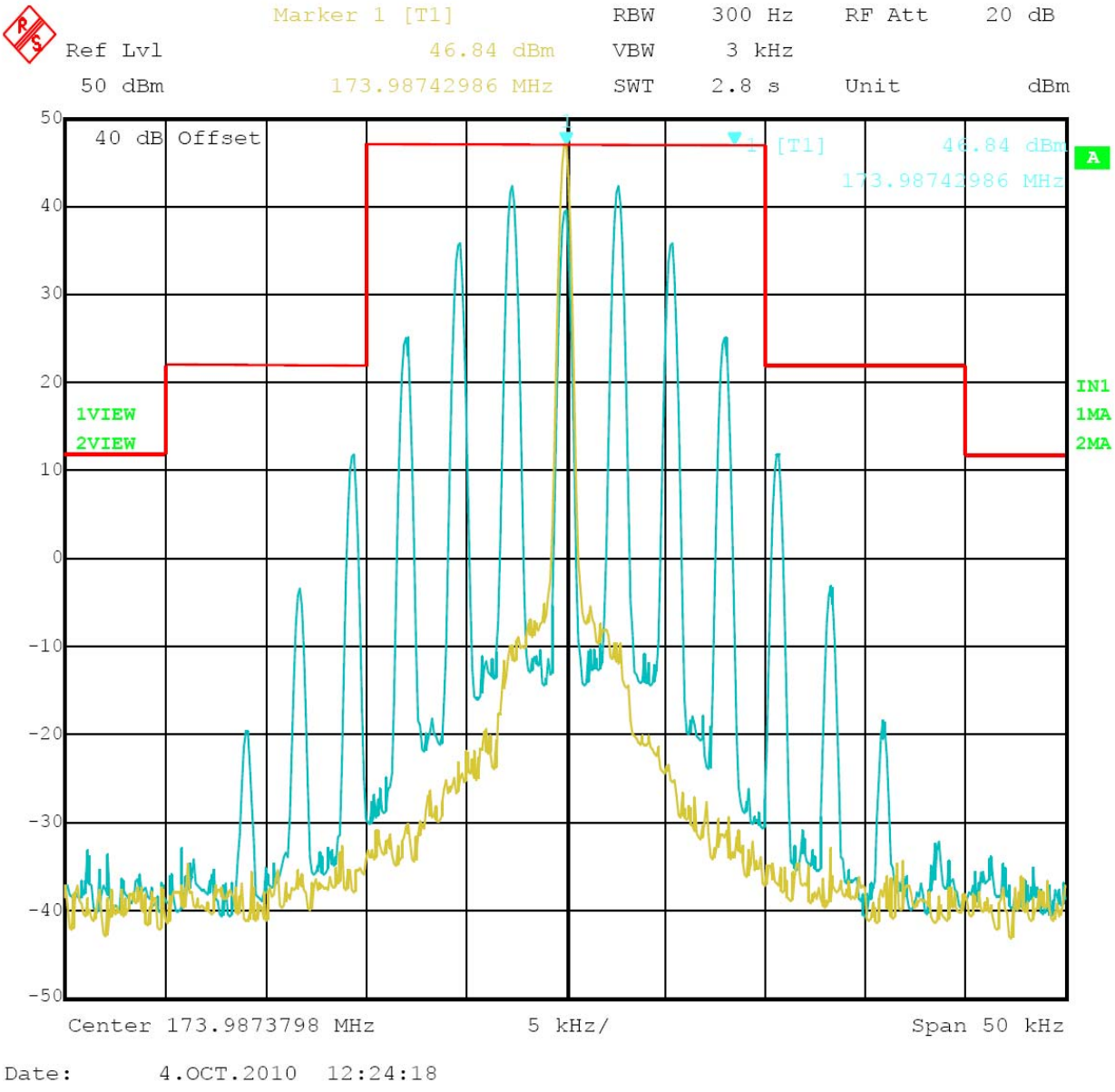
25 kHz Channel Spacing, 136.1250 MHz, 2500 Hz Audio Modulation Only

Modulation Type	Channel Separation	Freq.(MHz)	FCC Applicable Mask	RBW	Audio Freq. (KHz)	Results
FM	25 KHz	156.1250	B	300Hz	2.5	Complicance



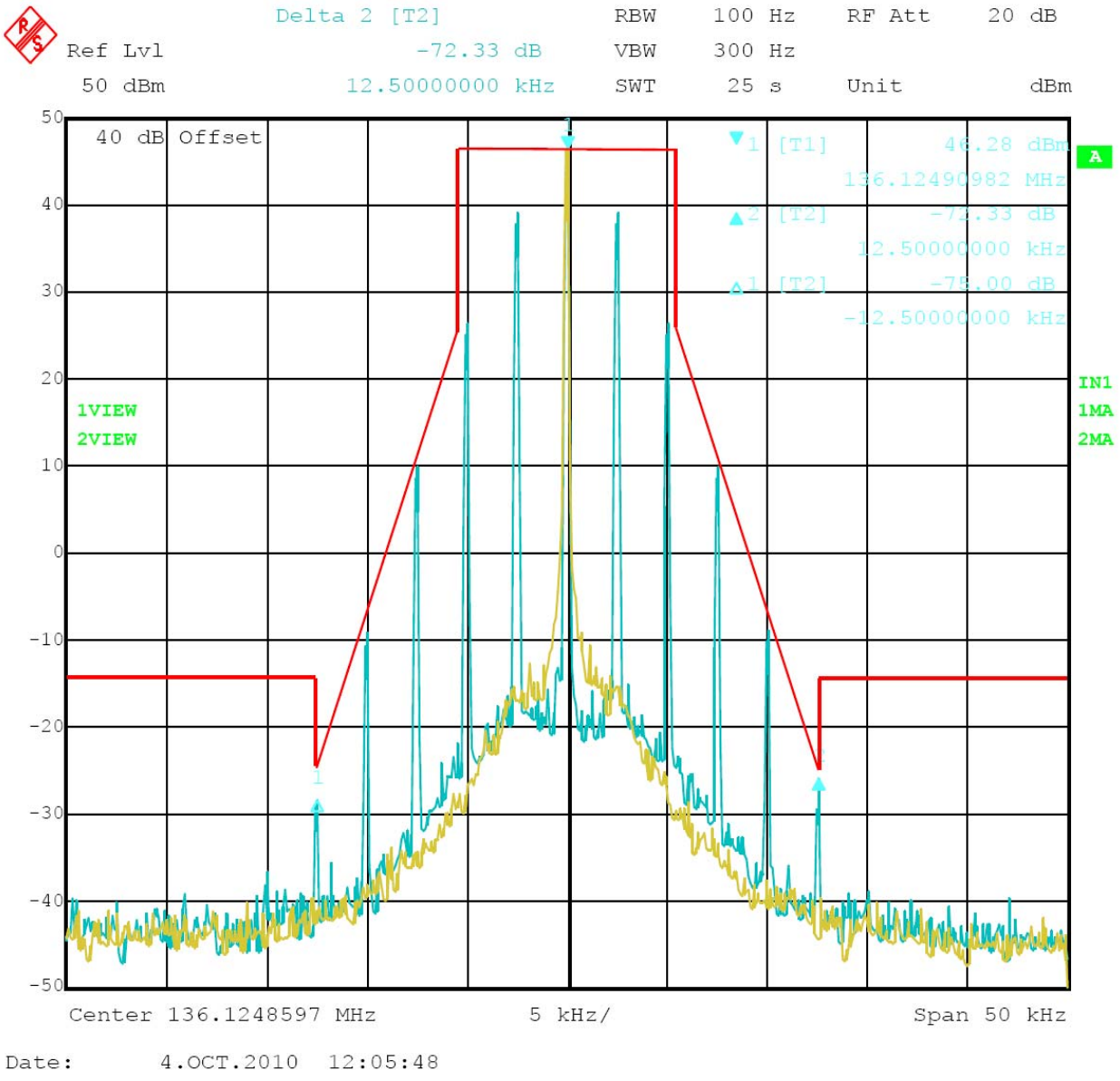
25 kHz Channel Spacing, 156.1250 MHz, 2500 Hz Audio Modulation Only

Modulation Type	Channel Separation	Freq.(MHz)	FCC Applicable Mask	RBW	Audio Freq. (KHz)	Results
FM	25 KHz	173.9875	B	300Hz	2.5	Complicance



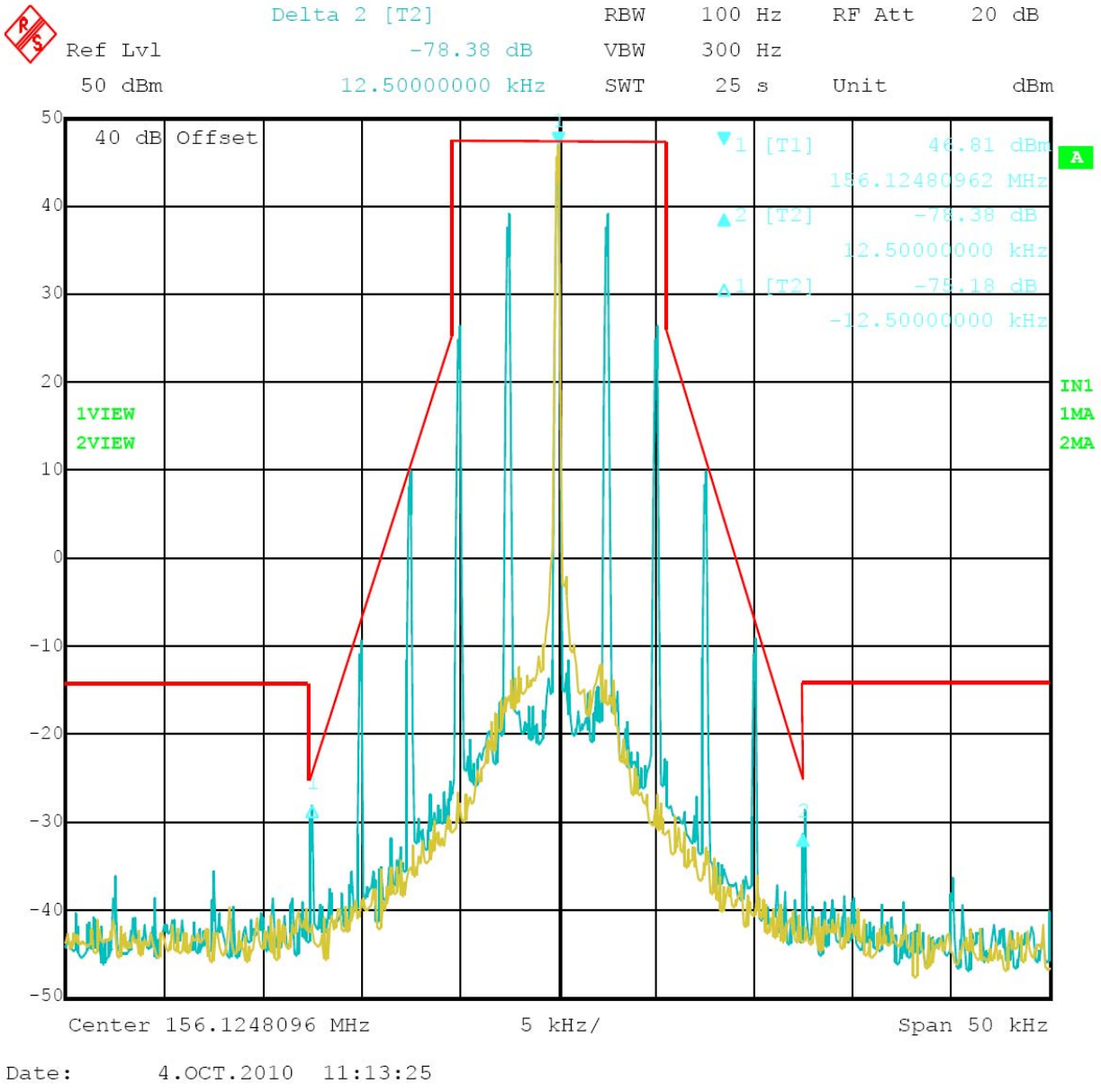
25 kHz Channel Spacing, 173.9875 MHz, 2500 Hz Audio Modulation Only

Modulation Type	Channel Separation	Freq.(MHz)	FCC Applicable Mask	RBW	Audio Freq. (KHz)	Results
FM	12.5 KHz	136.1250	D	100Hz	2.5	Complicance



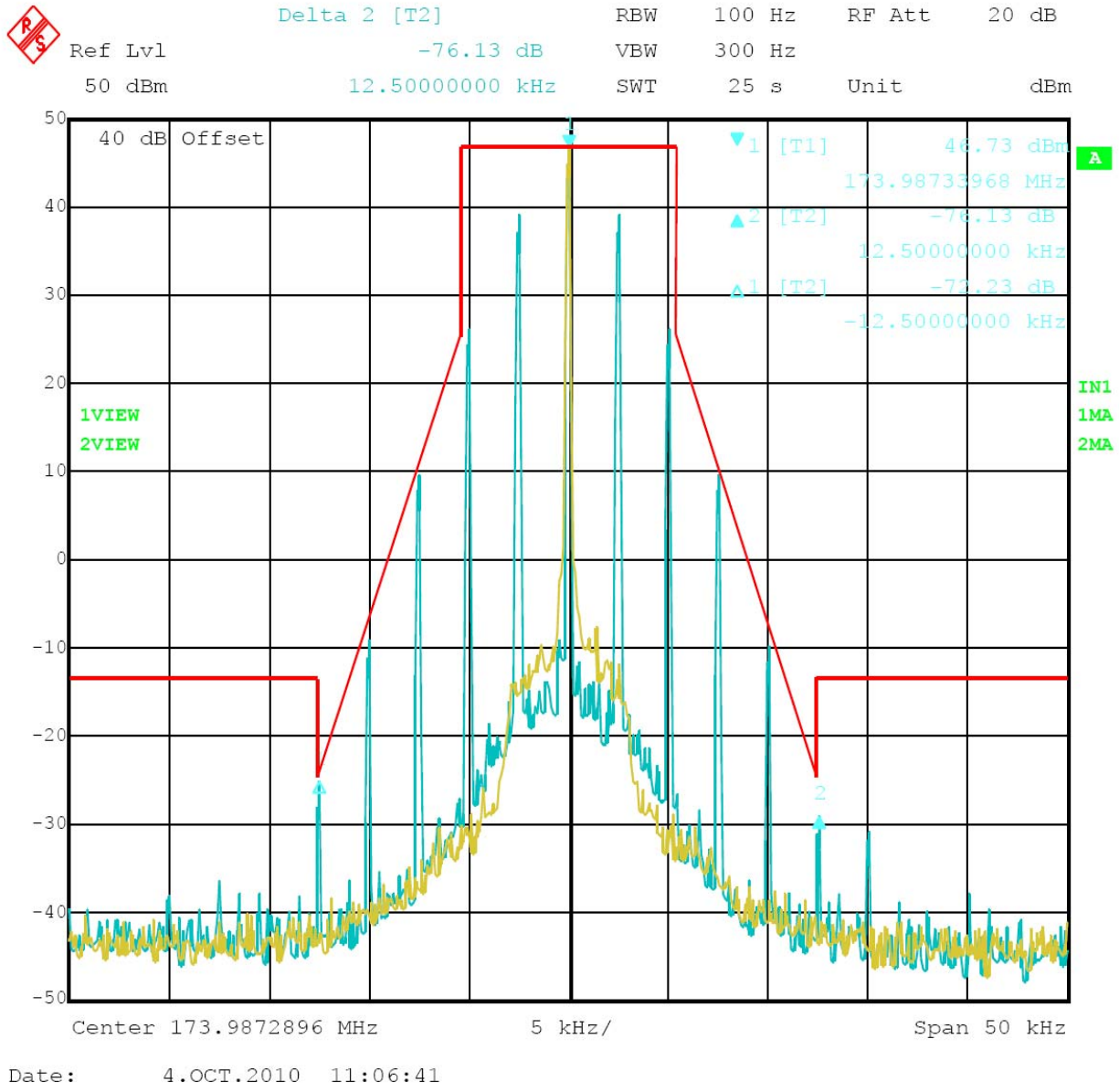
12.5 kHz Channel Spacing, 136.1250 MHz, 2500 Hz Audio Modulation Only

Modulation Type	Channel Separation	Freq.(MHz)	FCC Applicable Mask	RBW	Audio Freq. (KHz)	Results
FM	12.5 KHz	156.1250	D	100Hz	2.5	Complicance



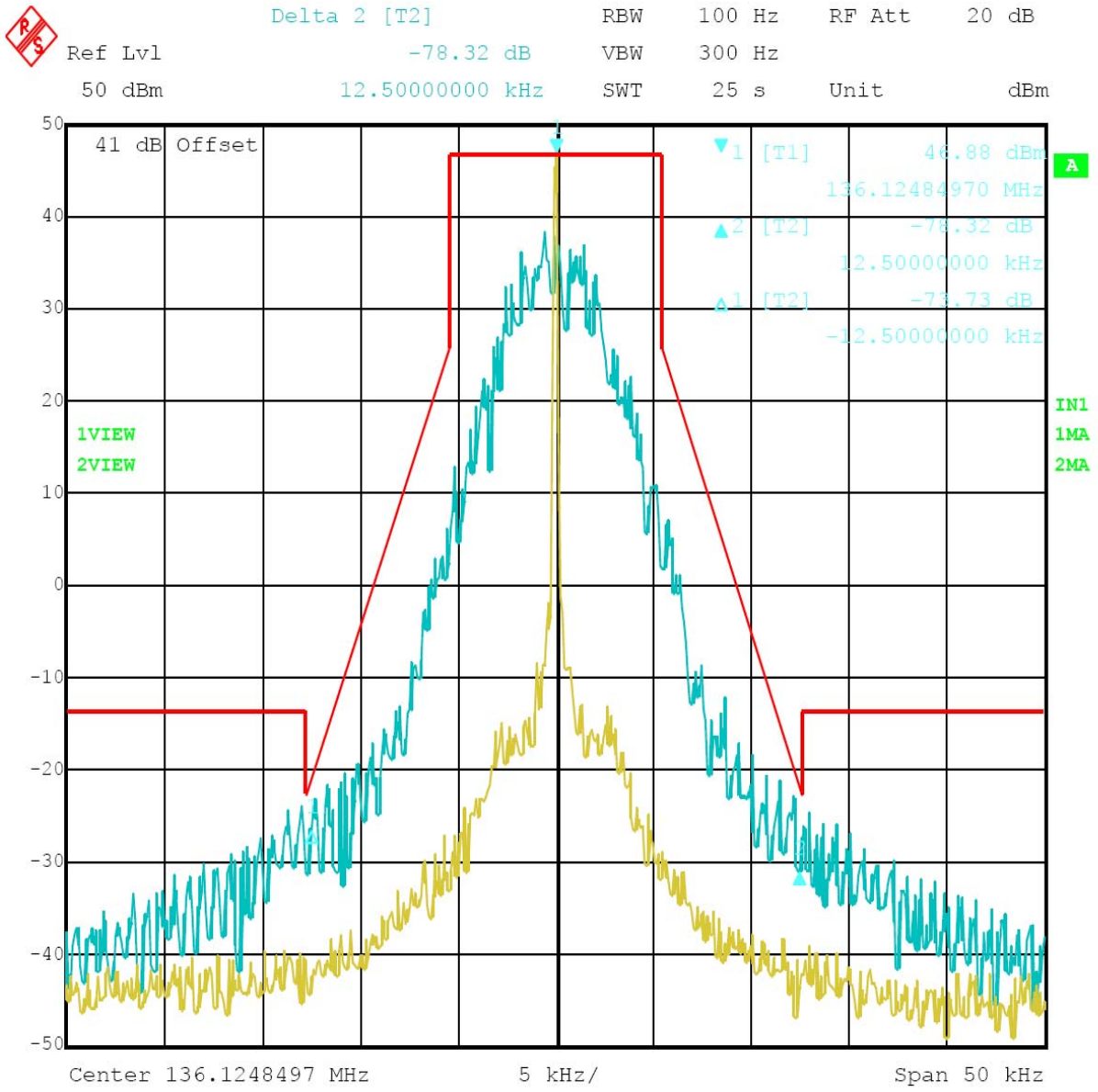
12.5 kHz Channel Spacing, 156.1250 MHz, 2500 Hz Audio Modulation Only

Modulation Type	Channel Separation	Freq.(MHz)	FCC Applicable Mask	RBW	Audio Freq. (KHz)	Results
FM	12.5 KHz	173.9875	D	100Hz	2.5	Complicance



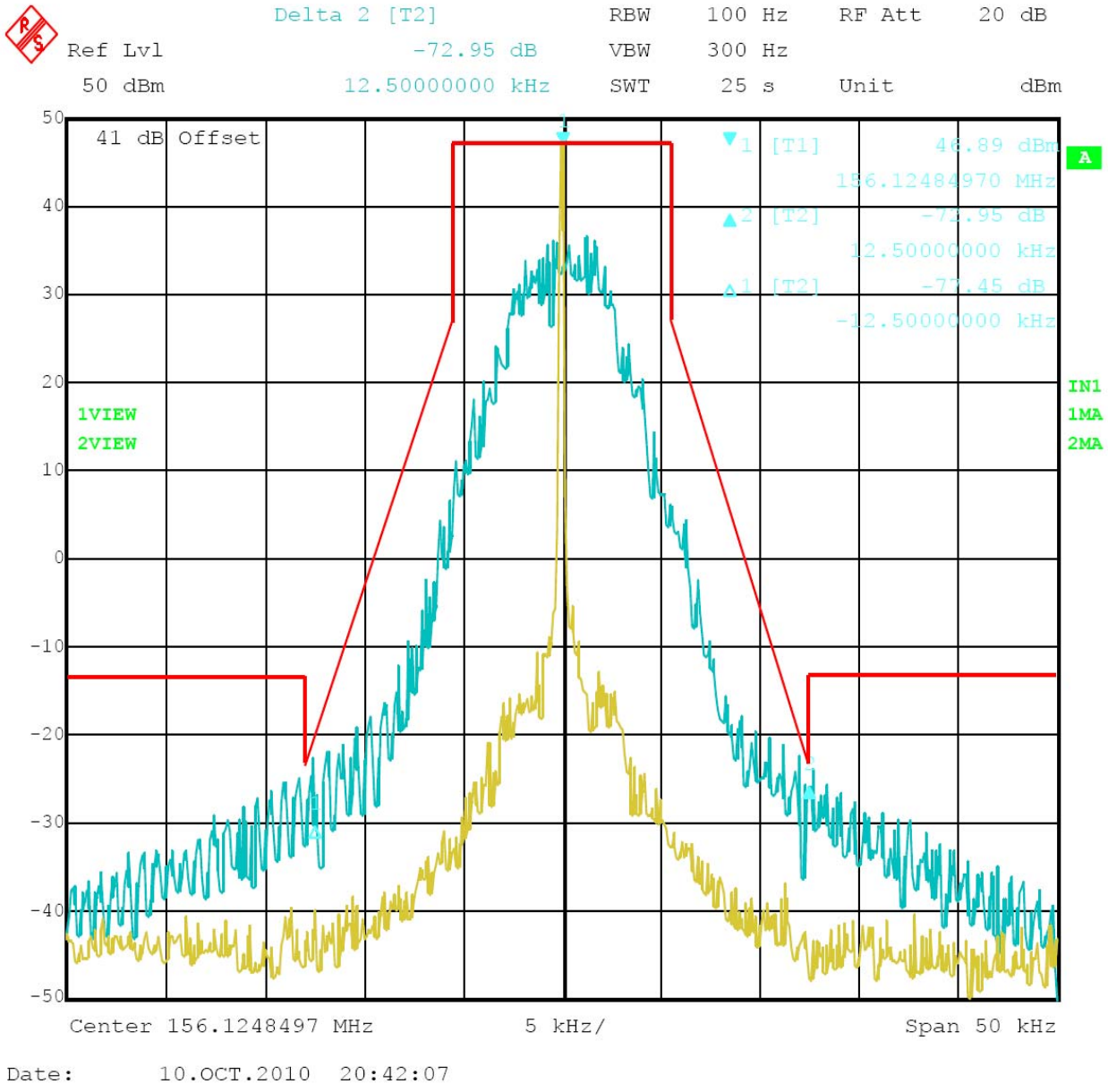
12.5 kHz Channel Spacing, 173.9875 MHz, 2500 Hz Audio Modulation Only

Modulation Type	Channel Separation	Freq.(MHz)	FCC Applicable Mask	RBW	Audio Freq. (KHz)	Results
4FSK	12.5 KHz	136.1250	D	100Hz	/	Complicance



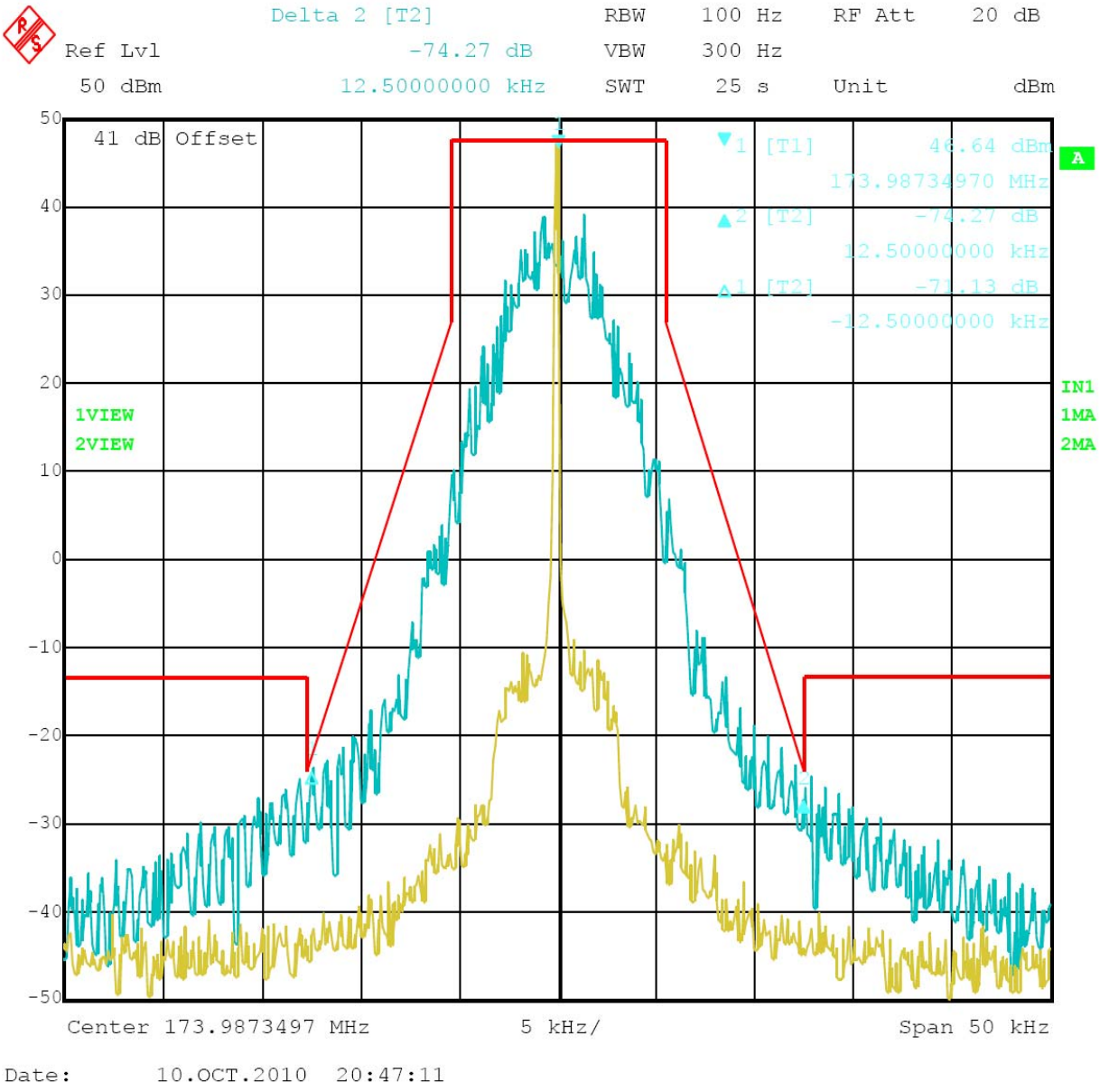
12.5 kHz Channel Spacing, 136.1250 MHz, 4FSK Modulation Only

Modulation Type	Channel Separation	Freq.(MHz)	FCC Applicable Mask	RBW	Audio Freq. (KHz)	Results
4FSK	12.5 KHz	156.1250	D	100Hz	/	Complicance



12.5 kHz Channel Spacing, 156.1250 MHz, 4FSK Modulation Only

Modulation Type	Channel Separation	Freq.(MHz)	FCC Applicable Mask	RBW	Audio Freq. (KHz)	Results
4FSK	12.5 KHz	173.9875	D	100Hz	/	Complicance



12.5 kHz Channel Spacing, 173.9875 MHz, 4FSK Modulation Only

4.3. Transmitter Radiated Spurious Emssion

TEST APPLICABLE

According to the TIA/EIA 603 test method, and according to Section 90.210, 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:

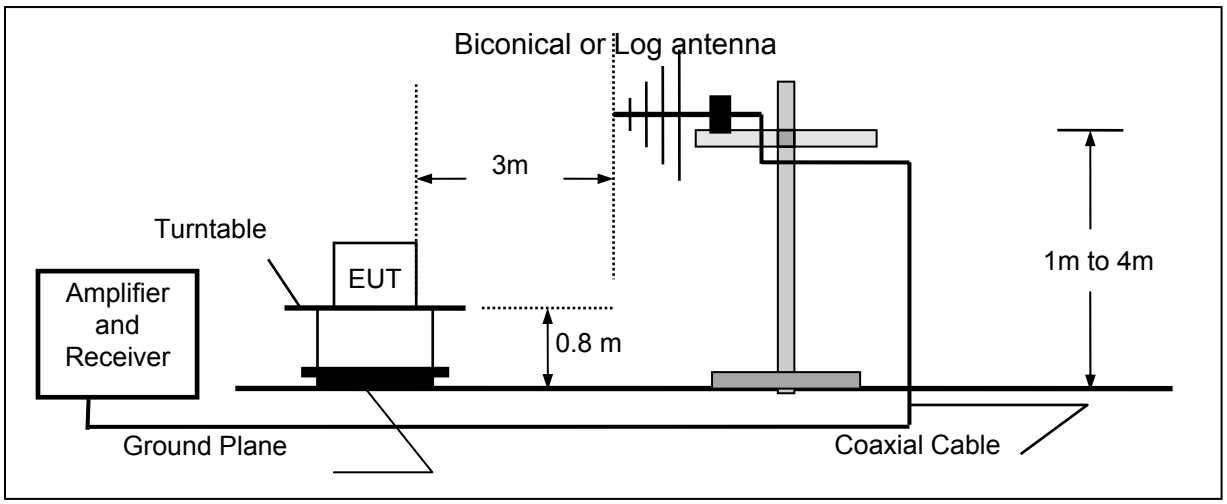
1 On any frequency removed from the center of the authorized bandwidth fo to 5.625 KHz removed from fo: Zero dB
2 On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in KHz) fo of more than 5.625 KHz but no more than 12.5 KHz: At least 7.27dB
3 On any 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.

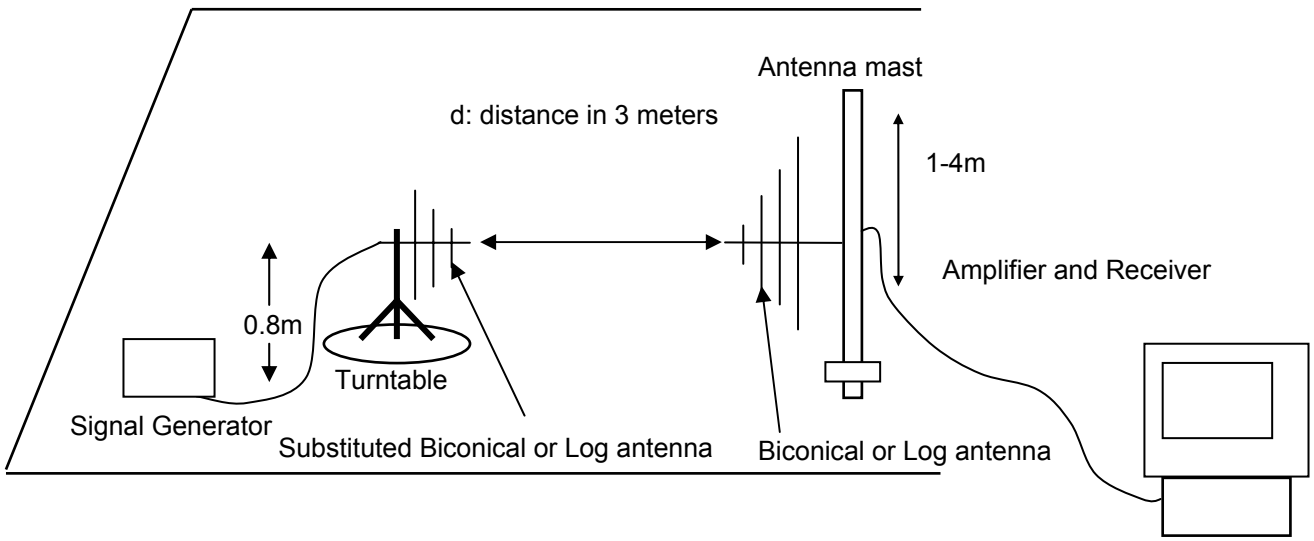
For transmitters designed to transmit with 25 KHz channel separation and equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier power (P) as following:

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+10Log (P) dB.

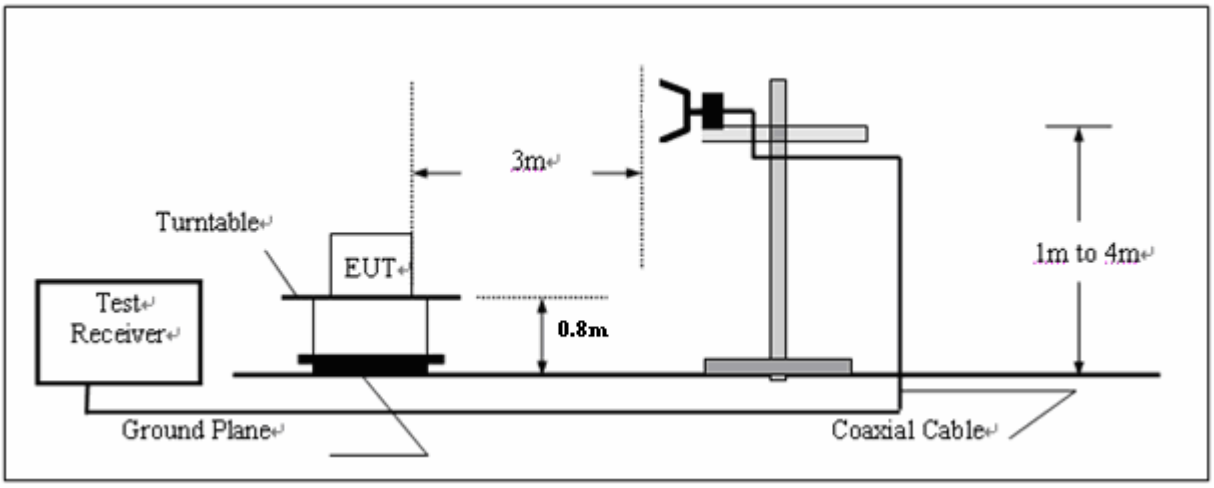
TEST CONFIGURATION

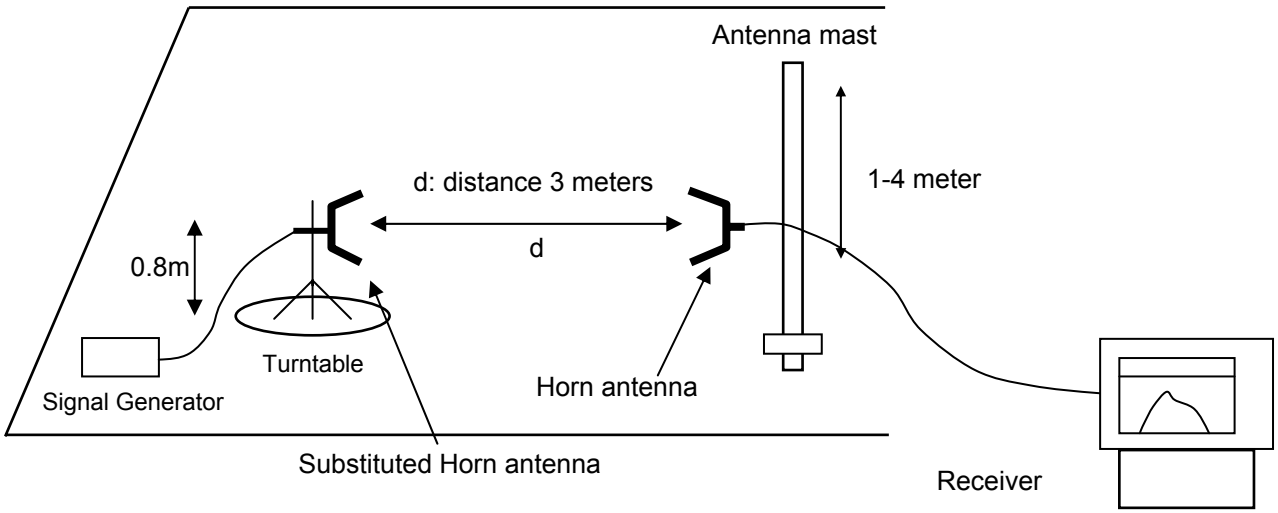
Below 1GHz





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 in dicated 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 than 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 Emssion was performed to the Rated high power (50Watt) and Rated low power (5Watt) the datum that reported below is the worst case (Rated high power) of the two rated power conditions.

Modulation Type: FM

FCC Part 22.359, 74.462, 80.211 and 90.210 and RSS Gen, RSS 119 Issue 9 (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 (Pwatts) = 43 + 10 log (52.72) =60.22 dB
High: 43 + 10 log (Pwatts) = 43 + 10 log (54.83) =60.39 dB
Calculation: Limit (dBm) =EL-43-10log10 (TP)
Notes: EL is the emission level of the Output Power expressed in dBm,
In this application, the EL is 46.99 dBm.
Limit (dBm) =46.99-43-10log10 (54.83) = -13 dBm

FCC Part 22.359, 74.462, 80.211 and 90.210 and RSS Gen, RSS 119 Issue 9 (25 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 (Pwatts) = 50 + 10 log (52.72) =67.22 dB
High: 50 + 10 log (Pwatts) = 50 + 10 log (54.58) =67.37 dB
Note: In general, the worse case attenuation requirement shown above was applied.
Calculation: Limit (dBm) =EL-50-10log10 (TP)
Notes: EL is the emission level of the Output Power expressed in dBm,
In this application, the EL is 46.99 dBm.
Limit (dBm) =46.99-50-10log10 (54.58) = -20 dBm

Modulation Type: 4FSK

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 (Pwatts) = 50 + 10 log (54.45) =67.36 dB
High: 50 + 10 log (Pwatts) = 50 + 10 log (55.59) =67.45 dB
Note: In general, the worse case attenuation requirement shown above was applied.
Calculation: Limit (dBm) =EL-50-10log10 (TP)
Notes: EL is the emission level of the Output Power expressed in dBm,
In this application, the EL is 46.99 dBm.
Limit (dBm) =46.99-50-10log10 (55.59) = -20 dBm

Note: 1. In general, the worse case attenuation requirement shown above was applied.
2. The measurement frequency range from 30 MHz to 4 GHz.
3. ******* means that the emission level is too low to be measured or at least 20 dB down than the limit.

Modulation Type	Channel Sparation	Test Channel	Polar	Maximum Radiated Spurious Emissions Below 1GHz		Maximum Radiated Spurious Emissions Above1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	25KHz	Low	H	347.975	-31.16	1217.913	-47.29	-13dBm
			V	347.975	-30.93	1217.913	-47.69	
Test Results				Compliance				

Frequency (MHz)	Reading Level (dBm)	Antenna Polarization	Transd (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
347.975	-56.30	H	25.14	-31.16	-13	18.16
521.963	-70.12	H	28.12	-42.00	-13	29.00
1217.913	-50.09	H	2.80	-47.29	-13	34.29
…	…	H		…		
347.975	-56.07	V	25.14	-30.93	-13	17.93
521.963	-65.68	V	28.12	-37.56	-13	24.56
1217.913	-50.49	V	2.80	-47.69	-13	34.69
…	…	V		…		

Modulation Type	Channel Sparation	Test Channel	Polar	Maximum Radiated Spurious Emissions Below 1GHz		Maximum Radiated Spurious Emissions Above1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	25KHz	Middle	H	312.250	-29.68	1092.875	-49.06	-13dBm
			V	312.250	-32.46	1092.875	-49.13	
Test Results				Compliance				

Frequency (MHz)	Reading Level (dBm)	Antenna Polarization	Transd (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
312.250	-53.56	H	23.88	-29.68	-13	16.68
468.375	-63.06	H	27.40	-35.66	-13	22.66
1092.875	-51.56	H	2.50	-49.06	-13	36.06
…	…	H		…		
312.250	-56.34	V	23.88	-32.46	-13	19.46
468.375	-65.07	V	27.40	-37.67	-13	24.67
1092.875	-51.63	V	2.50	-49.13	-13	36.13
…	…	V		…		

Modulation Type	Channel Sparation	Test Channel	Polar	Maximum Radiated Spurious Emissions Below 1GHz		Maximum Radiated Spurious Emissions Above1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	25KHz	High	H	408.375	-26.79	1225.125	-42.85	-13dBm
			V	408.375	-29.70	1225.125	-43.38	
Test Results				Compliance				

Frequency (MHz)	Reading Level (dBm)	Antenna Polarization	Transd (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
408.375	-53.39	H	26.60	-26.79	-13	13.79
544.500	-63.97	H	28.45	-35.52	-13	22.52
1225.125	-45.83	H	2.98	-42.85	-13	29.85
…	…	H		…		
408.375	-56.30	V	26.60	-29.70	-13	16.70
544.500	-62.92	V	28.45	-34.47	-13	21.47
1225.125	-46.36	V	2.98	-43.38	-13	30.38
…	…	V		…		

Modulation Type	Channel Sparation	Test Channel	Polar	Maximum Radiated Spurious Emissions Below 1GHz		Maximum Radiated Spurious Emissions Above1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	Low	H	347.975	-37.25	1217.913	-48.67	-20dBm
			V	347.975	-32.66	1217.913	-48.53	
Test Results				Compliance				

Frequency (MHz)	Reading Level (dBm)	Antenna Polarization	Transd (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
347.975	-62.39	H	25.14	-37.25	-20	17.25
521.963	-68.94	H	28.12	-40.82	-20	20.82
1217.913	-51.47	H	2.80	-48.67	-20	28.67
…	…	H		…		
347.975	-57.80	V	25.14	-32.66	-20	12.66
521.963	-66.23	V	28.12	-38.11	-20	18.11
1217.913	-51.33	V	2.80	-48.53	-20	28.53
…	…	V		…		

Modulation Type	Channel Sparation	Test Channel	Polar	Maximum Radiated Spurious Emissions Below 1GHz		Maximum Radiated Spurious Emissions Above1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	Middle	H	312.250	-32.54	1092.875	-49.44	-20dBm
			V	312.250	-33.54	1092.875	-49.02	
Test Results				Compliance				

Frequency (MHz)	Reading Level (dBm)	Antenna Polarization	Transd (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
312.250	-56.42	H	23.88	-32.54	-20	12.54
468.375	-63.48	H	27.40	-36.08	-20	16.08
1092.875	-51.94	H	2.50	-49.44	-20	19.44
…	…	H		…		
312.250	-57.42	V	23.88	-33.54	-20	13.54
468.375	-64.53	V	27.40	-37.13	-20	17.13
1092.875	-51.52	V	2.50	-49.02	-20	19.02
…	…	V		…		

Modulation Type	Channel Sparation	Test Channel	Polar	Maximum Radiated Spurious Emissions Below 1GHz		Maximum Radiated Spurious Emissions Above1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	Top	H	408.375	-27.80	1225.125	-48.55	-20dBm
			V	408.375	-30.05	1225.125	-44.00	
Test Results				Compliance				

Frequency (MHz)	Reading Level (dBm)	Antenna Polarization	Transd (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
408.375	-54.40	H	26.60	-27.80	-20	7.80
544.500	-63.61	H	28.45	-35.16	-20	15.16
1225.125	-51.53	H	2.98	-48.55	-20	28.55
…	…	H		…		
408.375	-56.65	V	26.60	-30.05	-20	10.05
544.500	-62.49	V	28.45	-34.04	-20	14.04
1225.125	-46.98	V	2.98	-44.00	-20	24.00
…	…	V		…		

Modulation Type	Channel Sparation	Test Channel	Polar	Maximum Radiated Spurious Emissions Below 1GHz		Maximum Radiated Spurious Emissions Above1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
4FSK	12.5KHz	Low	H	272.250	-36.52	1225.125	-46.67	-20dBm
			V	272.250	-37.28	1225.125	-48.51	
Test Results				Compliance				

Frequency (MHz)	Reading Level (dBm)	Antenna Polarization	Transd (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
272.250	-59.24	H	22.72	-36.52	-20	16.52
408.375	-69.01	H	26.60	-42.41	-20	22.41
1225.125	-49.65	H	2.98	-46.67	-20	26.67
…	…	H		…		
272.250	-60.00	V	22.72	-37.28	-20	17.28
408.375	-67.14	V	26.60	-40.54	-20	20.54
1225.125	-51.49	V	2.98	-48.51	-20	28.51
…	…	V		…		

Modulation Type	Channel Sparation	Test Channel	Polar	Maximum Radiated Spurious Emissions Below 1GHz		Maximum Radiated Spurious Emissions Above1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
4FSK	12.5KHz	Middle	H	312.250	-33.99	1092.875	-50.98	-20dBm
			V	312.250	-38.52	1092.875	-52.57	
Test Results				Compliance				

Frequency (MHz)	Reading Level (dBm)	Antenna Polarization	Transd (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
312.250	-57.87	H	23.88	-33.99	-20	13.99
468.375	-70.87	H	27.40	-43.47	-20	23.47
1092.875	-53.48	H	2.50	-50.98	-20	30.98
…	…	H		…		
312.250	-62.40	V	23.88	-38.52	-20	18.52
468.375	-70.36	V	27.40	-42.96	-20	22.96
1092.875	-55.07	V	2.50	-52.57	-20	32.57
…	…	V		…		

Modulation Type	Channel Sparation	Test Channel	Polar	Maximum Radiated Spurious Emissions Below 1GHz		Maximum Radiated Spurious Emissions Above1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
4FSK	12.5KHz	Top	H	347.975	-34.53	1217.913	-48.39	-20dBm
			V	347.975	-32.79	1217.913	-47.09	
Test Results				Compliance				

Frequency (MHz)	Reading Level (dBm)	Antenna Polarization	Transd (dB)	Emission level (dBm)	Limit (dBm)	Margin (dB)
347.975	-59.67	H	25.14	-34.53	-20	14.53
521.963	-71.20	H	28.12	-43.08	-20	23.08
1217.913	-51.19	H	2.80	-48.39	-20	28.39
…	…	H		…		
347.975	-57.93	V	25.14	-32.79	-20	12.79
521.963	-71.20	V	28.12	-43.08	-20	23.08
1217.913	-49.89	V	2.80	-47.09	-20	27.09
…	…	V		…		

4.4. Spurious Emssion on Antenna Port

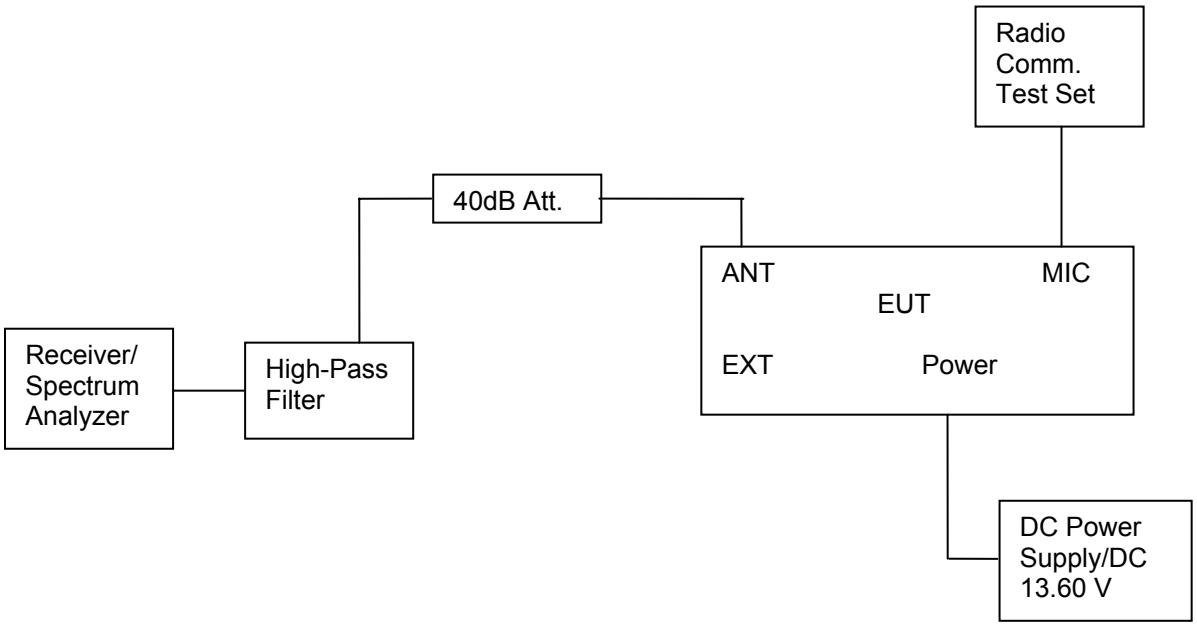
TEST APPLICABLE

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. Set RBW 100 kHz, VBW 300 kHz in the frequency band 30MHz to 1GHz,while set RBW=1MHz.VBW=3MHz from the 1GHz to 10^{th} Harmonic.
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 9 (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 (Pwatts) = 43 + 10 log (52.72) =60.22 dB
High: 43 + 10 log (Pwatts) = 43 + 10 log (54.83) =60.39 dB
Calculation: Limit (dBm) =EL-43-10log10 (TP)
Notes: EL is the emission level of the Output Power expressed in dBm,
In this application, the EL is 46.99 dBm.
Limit (dBm) =46.99-43-10log10 (54.83) = -13 dBm

FCC Part 22.359, 74.462, 80.211 and 90.210 and RSS Gen, RSS 119 Issue 9 (25 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 (Pwatts) = 50 + 10 log (52.72) =67.22 dB
High: 50 + 10 log (Pwatts) = 50 + 10 log (54.58) =67.37 dB
Note: In general, the worse case attenuation requirement shown above was applied.
Calculation: Limit (dBm) =EL-50-10log10 (TP)
Notes: EL is the emission level of the Output Power expressed in dBm,
In this application, the EL is 46.99 dBm.
Limit (dBm) =46.99-50-10log10 (54.58) = -20 dBm

Modulation Type: 4FSK

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 (Pwatts) = 50 + 10 log (54.45) =67.36 dB
High: 50 + 10 log (Pwatts) = 50 + 10 log (55.59) =67.45 dB
Note: In general, the worse case attenuation requirement shown above was applied.
Calculation: Limit (dBm) =EL-50-10log10 (TP)

Notes: EL is the emission level of the Output Power expressed in dBm,
In this application, the EL is 46.99 dBm.
Limit (dBm) =46.99-50-10log10 (55.59) = -20 dBm

Note: 1. In general, the worse case attenuation requirement shown above was applied.
2. The measurement frequency range from 30 MHz to 4 GHz.

For Rated High Power (50Watt)

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	25KHz	Low	136.1250	137.32	-25.85	2683.37	-27.59
		Middle	156.1250	954.61	-26.42	2647.29	-27.70
		High	173.9875	662.71	-26.31	2881.76	-27.28
	12.5KHz	Low	136.1250	960.41	-26.05	2947.90	-27.29
		Middle	156.1250	571.32	-26.62	2665.33	-26.52
		High	173.9875	638.03	-26.23	2635.27	-27.64
4FSK	12.5KHz	Low	136.1250	161.78	-26.07	3224.45	-27.44
		Middle	156.1250	734.38	-25.45	1673.35	-26.49
		High	173.9875	970.38	-24.69	1655.31	-27.23
Limit		-13dBm for 25KHz Channel Separtion					
		-20dBm for 12.5KHz Channel Separtion					
Test Results		Compliance					

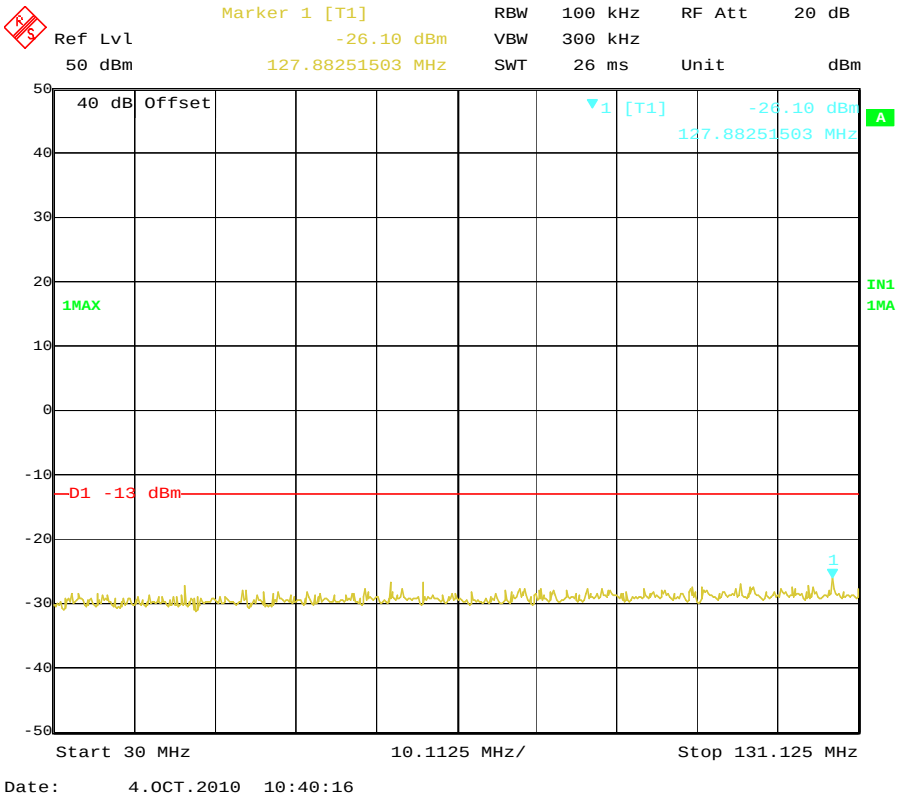
For Rated Low Power (5Watt)

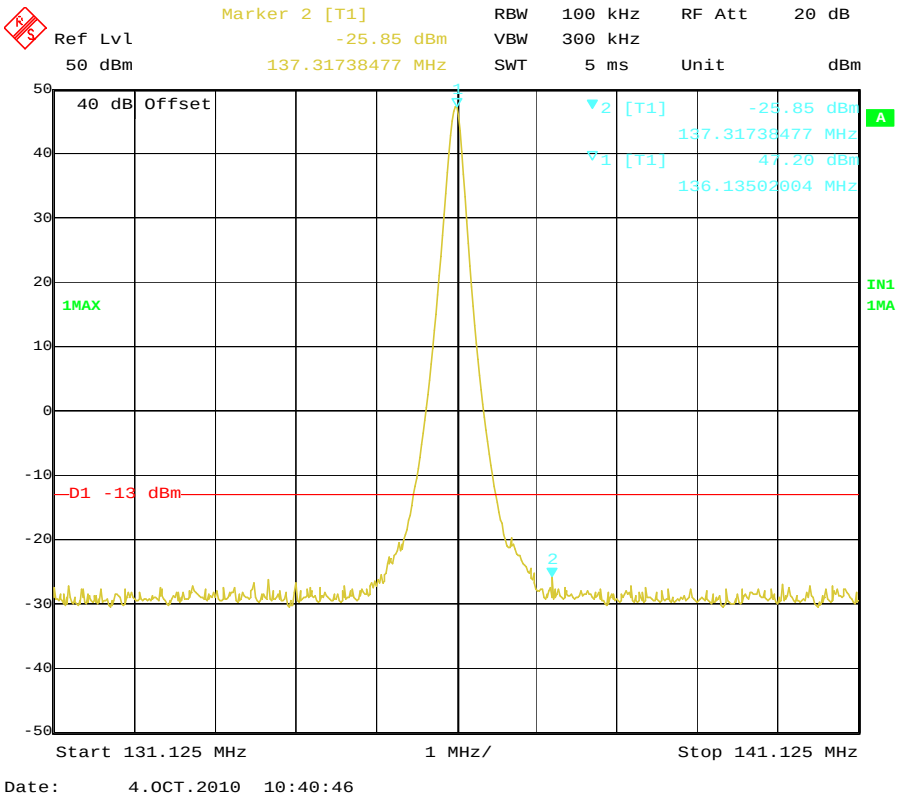
Modulation Type	Channel Sparation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz	
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)
FM	25KHz	Low	136.1250	790.01	-25.31	3771.54	-27.72
		Middle	156.1250	843.66	-25.89	3038.08	-27.43
		High	173.9875	669.29	-26.03	2881.76	-27.67
	12.5KHz	Low	136.1250	814.11	-25.76	2935.87	-27.00
		Middle	156.1250	826.85	-26.33	1348.70	-28.06
		High	173.9875	981.90	-26.11	2370.74	-26.95
4FSK	12.5KHz	Low	136.1250	931.15	-26.26	3651.30	-27.28
		Middle	156.1250	984.87	-25.86	3621.24	-27.33
		High	173.9875	967.09	-26.55	2911.82	-27.68
Limit		-13dBm for 25KHz Channel Separtion					
		-20dBm for 12.5KHz Channel Separtion					
Test Results		Compliance					

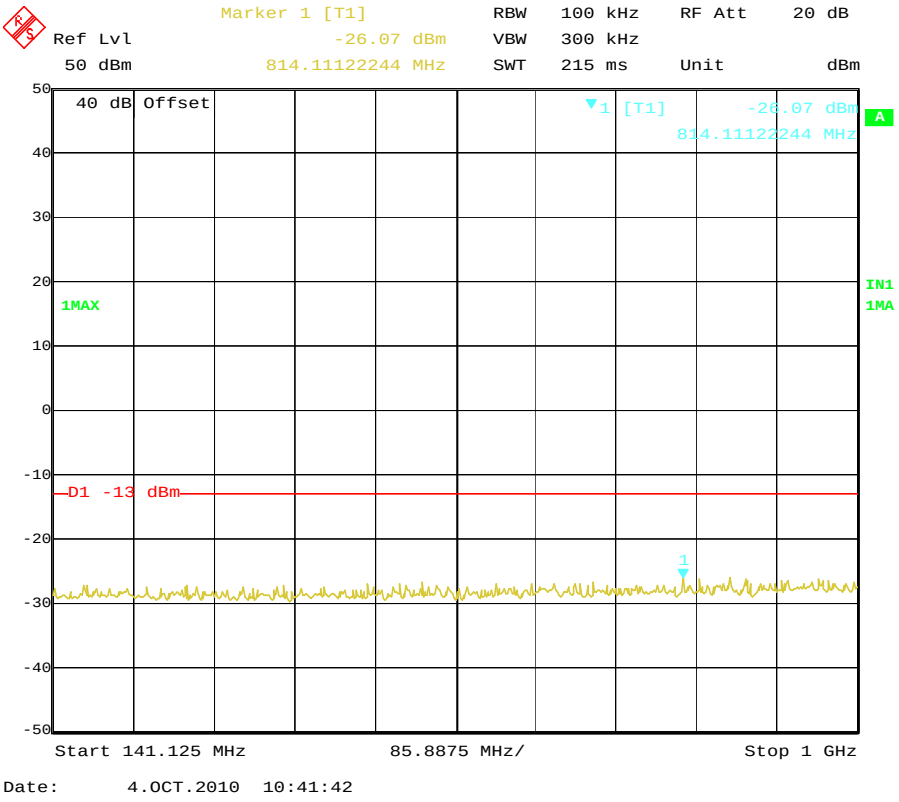
Plots of Spurious Emission on Antenna Port Measurement

For Rated High Power (50Watt)

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	25KHz	Low	136.1250	137.32	-25.85	2683.37	-27.59	-13dBm
Test Results				Compliance				



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RBW 100 kHz
RF Att 20 dB
Ref Lvl
-26.07 dBm
VBW 300 kHz
50 dBm
814.11122244 MHz
SWT 215 ms
Unit dBm
40 dB Offset
1 [T1]
-26.07 dBm
814.11122244 MHz
A
1MAX
IN1
1MA
D1 -13 dBm
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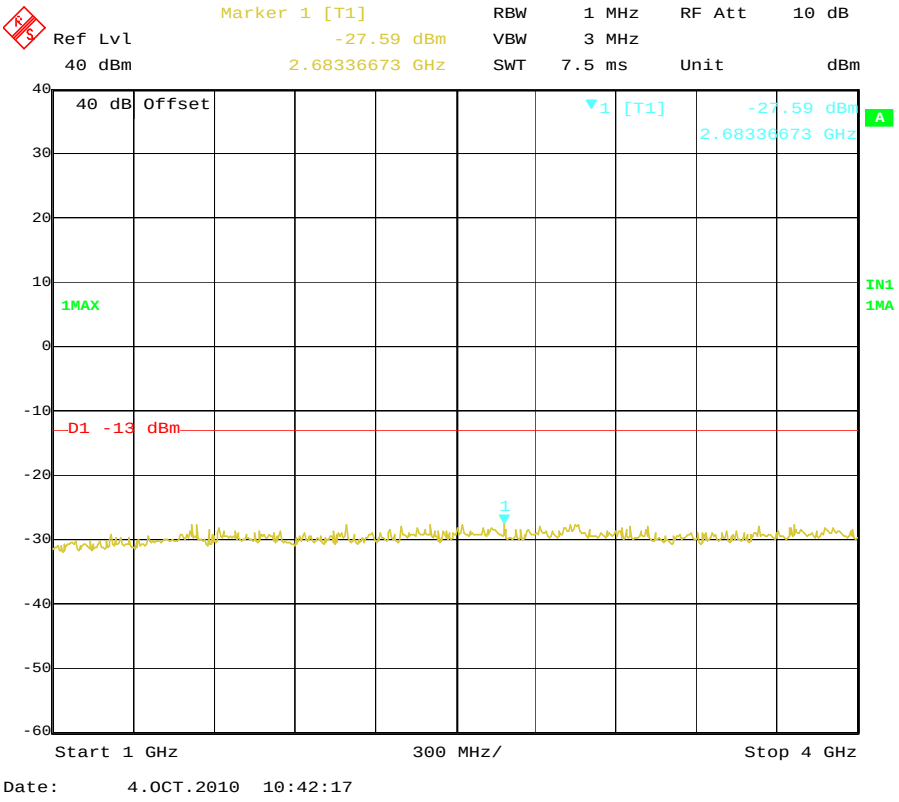
85.8875 MHz/
Stop 1 GHz
Date: 4.OCT.2010 10:41:42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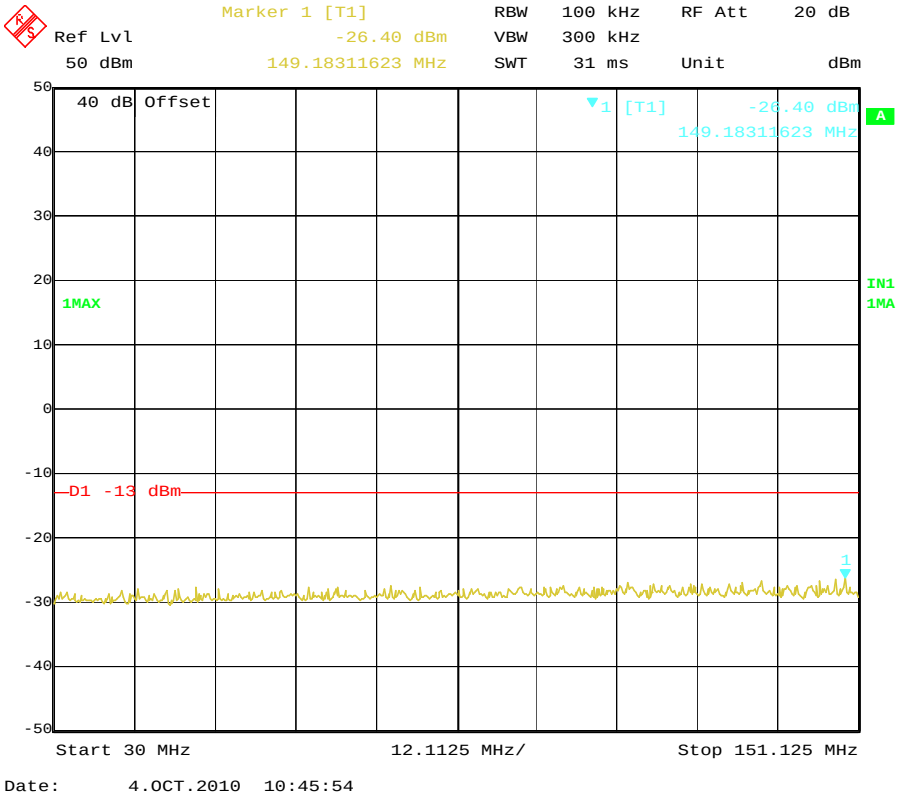
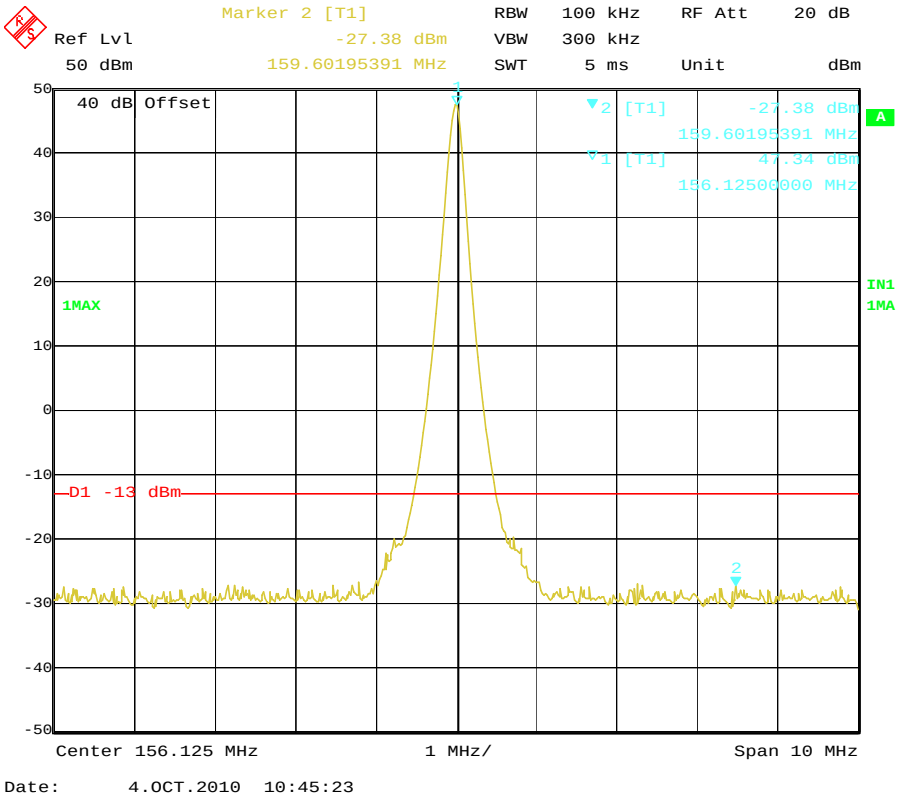
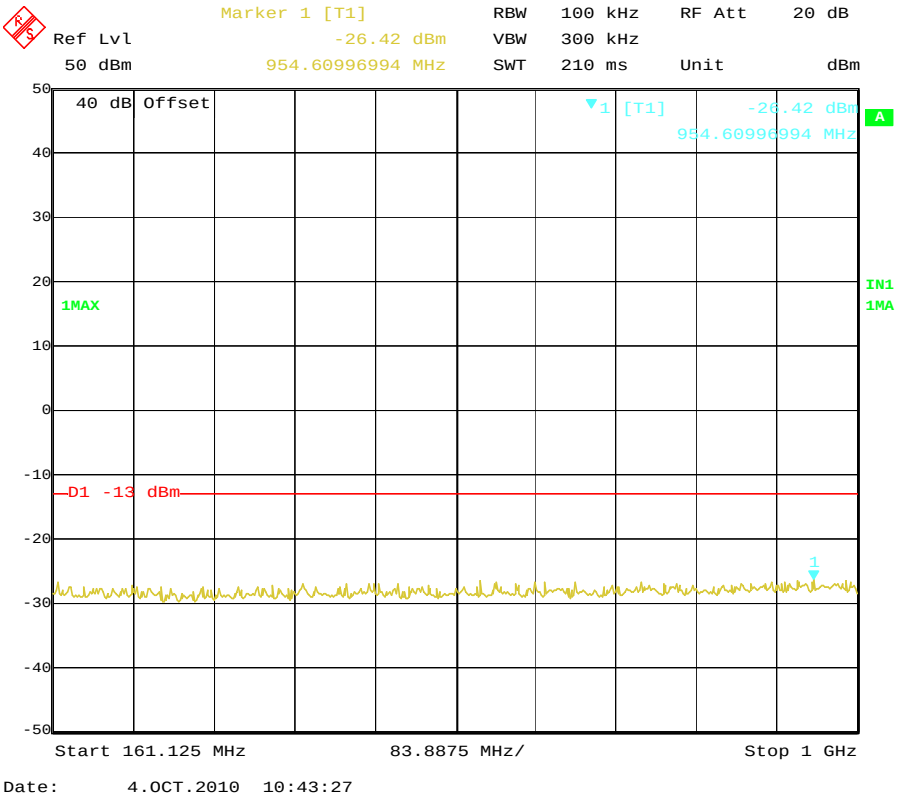
RBW 1 MHz
RF Att 10 dB
Ref Lvl
-27.59 dBm
VBW 3 MHz
40 dBm
2.68336673 GHz
SWT 7.5 ms
Unit dBm
40 dB Offset
1 [T1]
-27.59 dBm
2.68336673 GHz
A
1MAX
IN1
1MA
D1 -13 dBm
Start 1 GHz
300 MHz/
Stop 4 GHz
Date: 4.OCT.2010 10:42:17

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	25KHz	Middle	156.1250	954.61	-26.42	2647.29	-27.70	-13dBm
Test Results				Compliance				



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RBW 100 kHz
RF Att 20 dB
Ref Lvl
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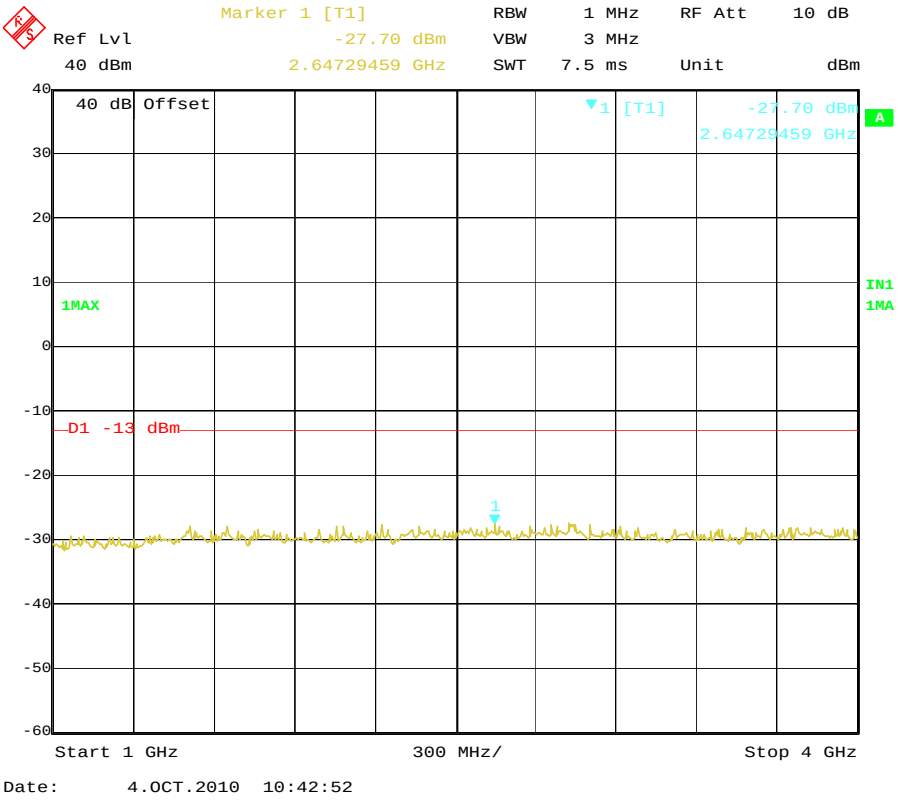
VBW 300 kHz
50 dBm
954.60996994 MHz
SWT 210 ms
Unit dBm
40 dB Offset
1 [T1]
-26.42 dBm
954.60996994 MHz
A
1MAX
IN1
1MA
D1 -13 dBm
Start 161.125 MHz
83.8875 MHz/
Stop 1 GHz
Date: 4.OCT.2010 10:43:27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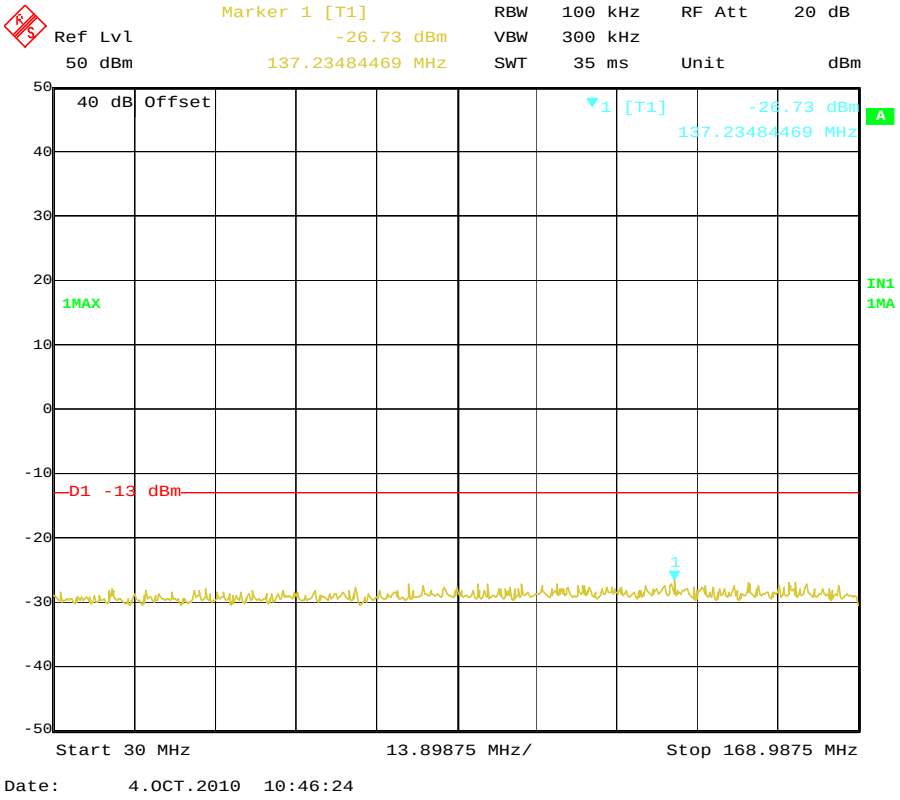
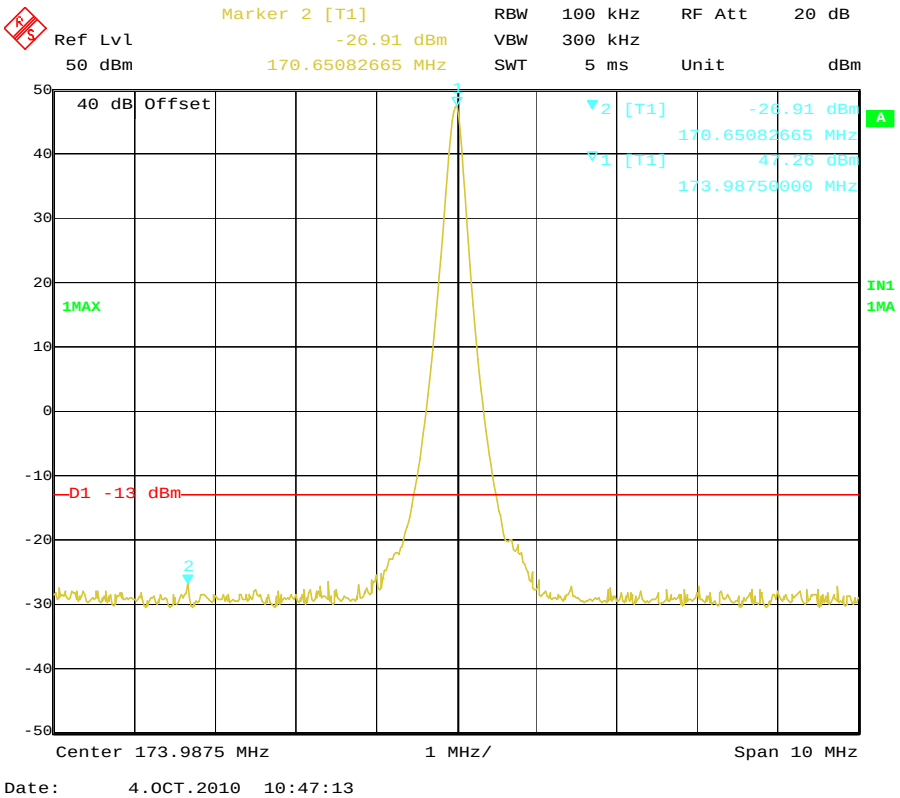
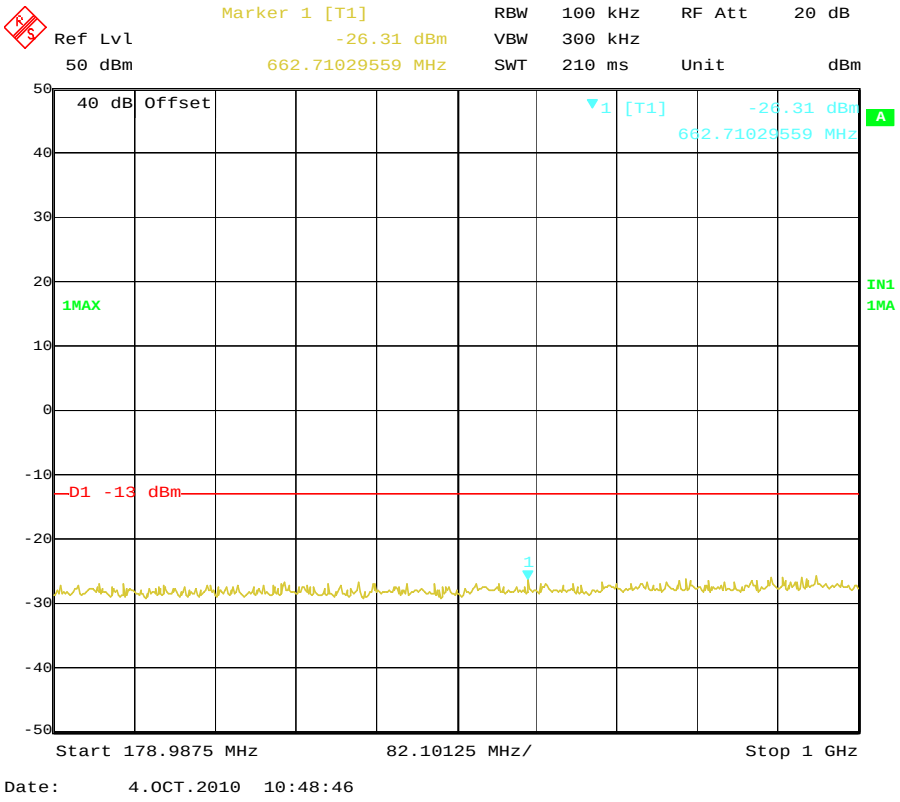
RBW 1 MHz
RF Att 10 dB
Ref Lvl
-27.70 dBm
VBW 3 MHz
40 dBm
2.64729459 GHz
SWT 7.5 ms
Unit dBm
40 dB Offset
1 [T1]
-27.70 dBm
2.64729459 GHz
A
1MAX
IN1
1MA
D1 -13 dBm
Start 1 GHz
300 MHz/
Stop 4 GHz
Date: 4.OCT.2010 10:42:52

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	25KHz	High	173.9875	662.71	-26.31	2881.76	-27.28	-13dBm
Test Results				Compliance				



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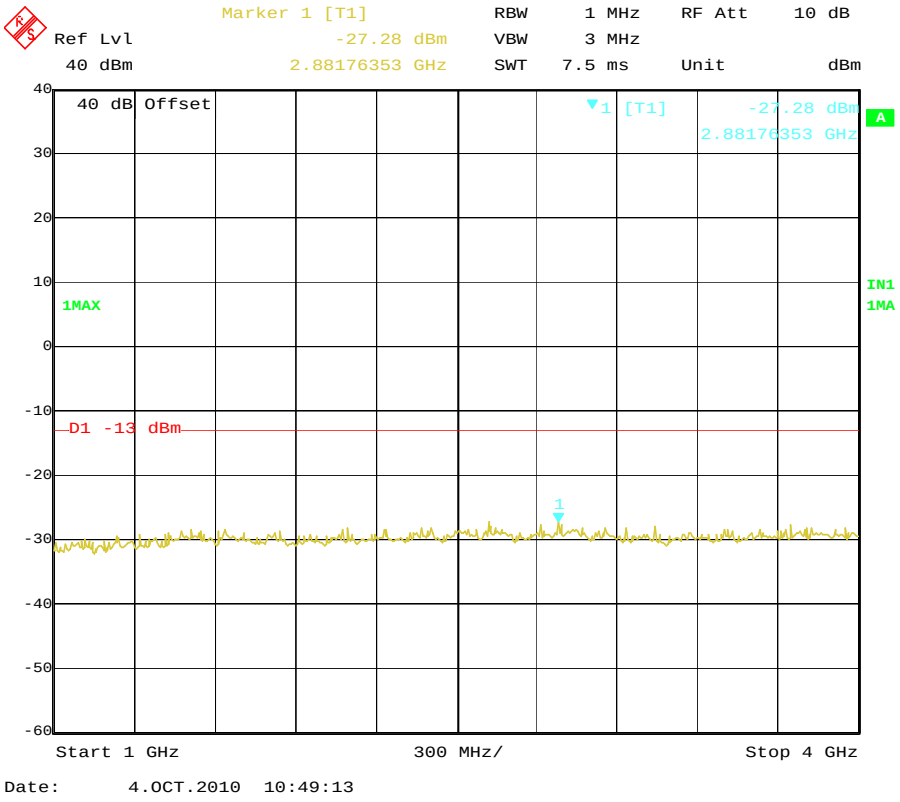
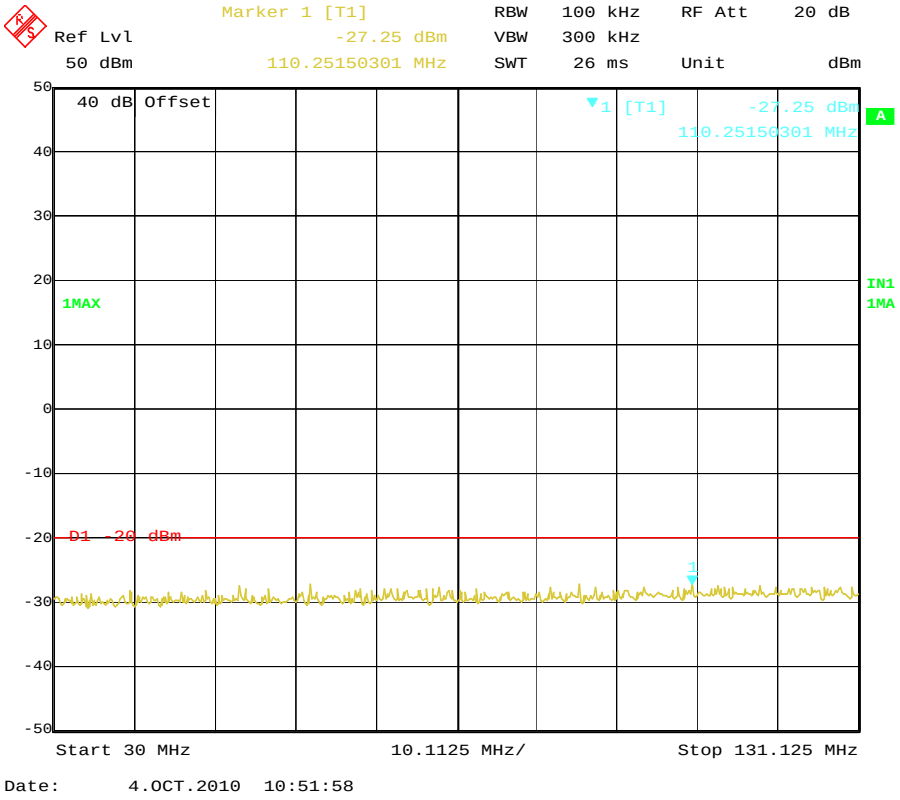
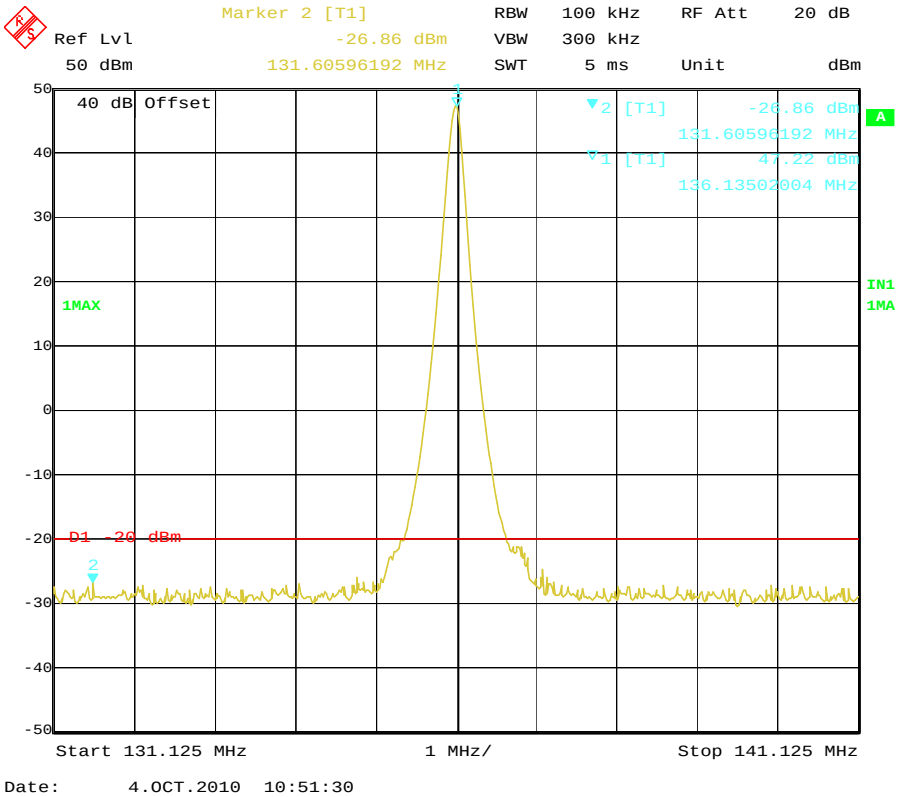
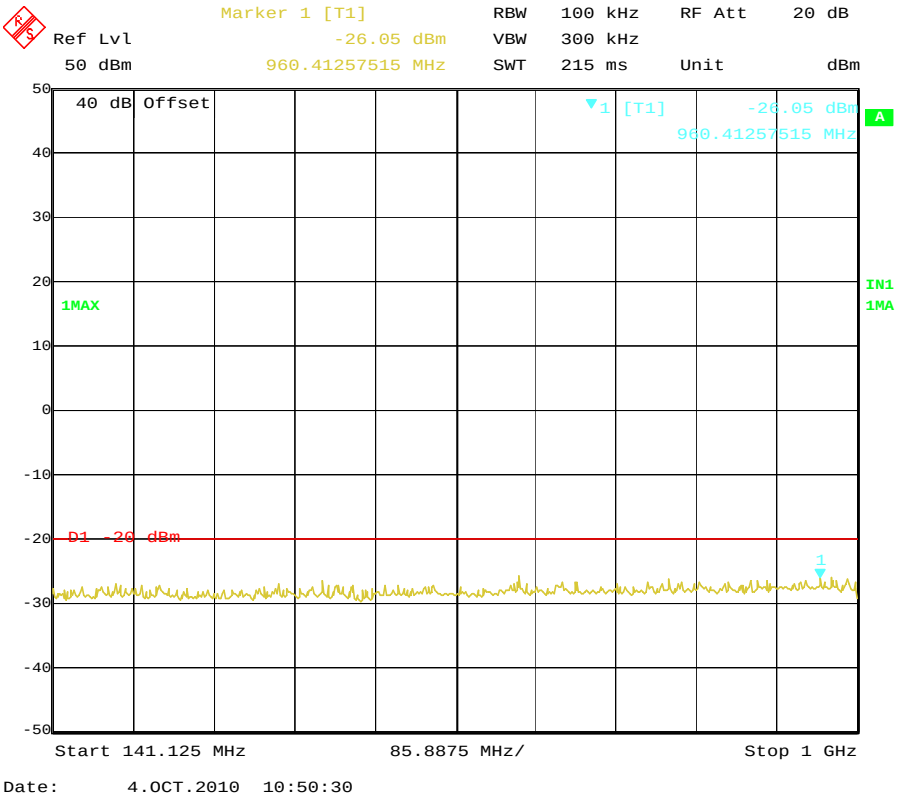
RBW 100 kHz
RF Att 20 dB
Ref Lvl
-26.31 dBm
VBW 300 kHz
50 dBm
662.71029559 MHz
SWT 210 ms
Unit dBm
40 dB Offset
1 [T1]
-26.31 dBm
662.71029559 MHz
A
1MAX
IN1
1MA
D1 -13 dBm
Start 178.9875 MHz
82.10125 MHz/
Stop 1 GHz
Date: 4.OCT.2010 10:48:46

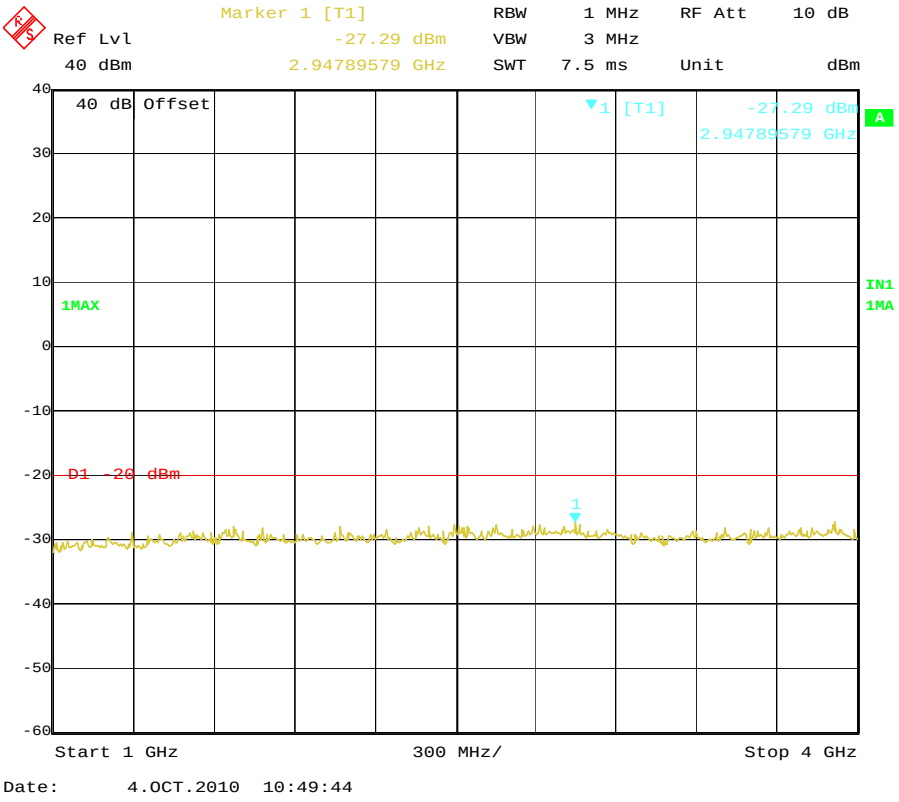

Marker 1 [T1]
RBW 1 MHz
RF Att 10 dB
Ref Lvl
-27.28 dBm
VBW 3 MHz
40 dBm
2.88176353 GHz
SWT 7.5 ms
Unit dBm
40 dB Offset
1 [T1]
-27.28 dBm
2.88176353 GHz
A
1MAX
IN1
1MA
D1 -13 dBm
Start 1 GHz
300 MHz/
Stop 4 GHz
Date: 4.OCT.2010 10:49:13

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	136.1250	960.41	-26.05	2947.90	-27.29	-20dBm
Test Results				Compliance				

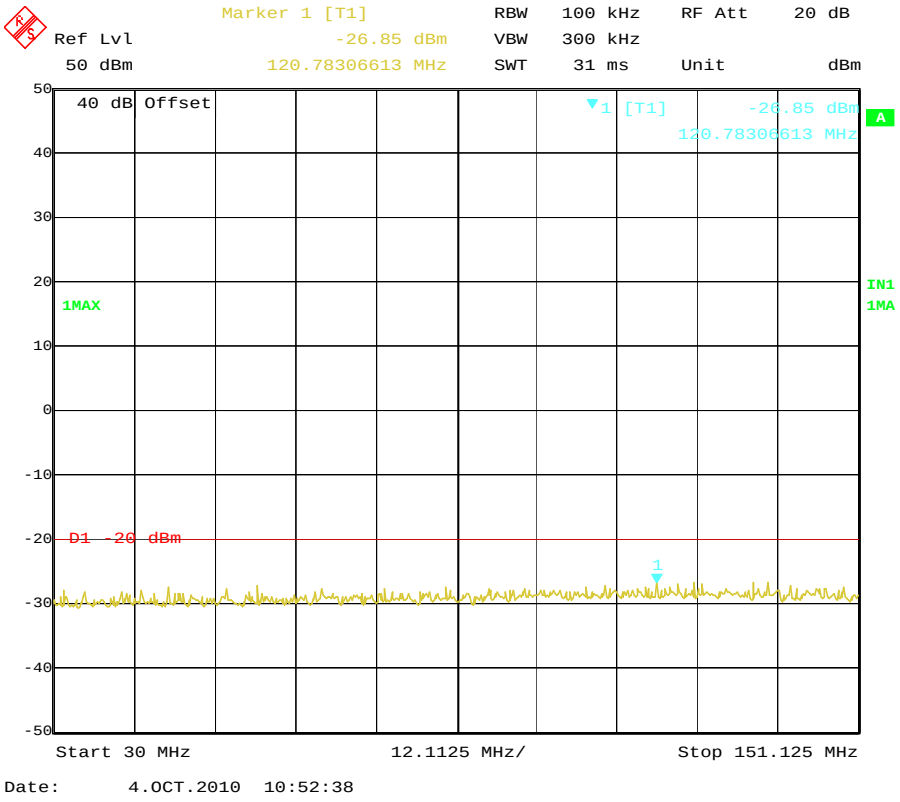


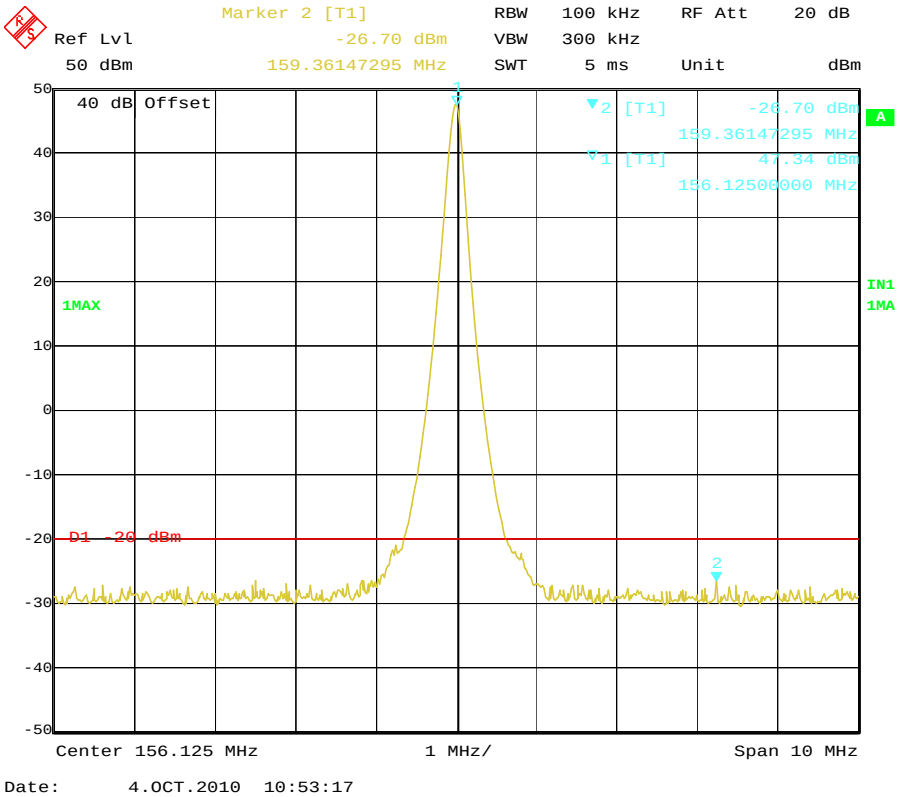


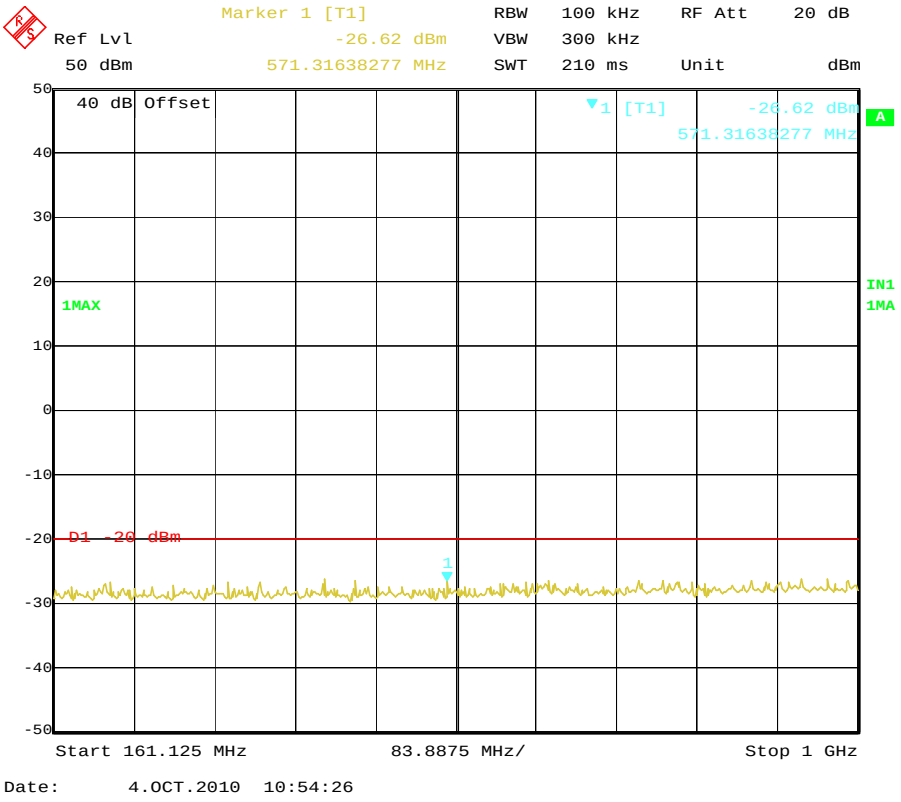

Marker 1 [T1]
Ref Lvl
50 dBm
-26.05 dBm
960.41257515 MHz
RBW 100 kHz
VBW 300 kHz
SWT 215 ms
RF Att 20 dB
Unit dBm
40 dB Offset
1 [T1] -26.05 dBm
960.41257515 MHz
A
IN1
1MA
1MAX
D1 -20 dBm
Start 141.125 MHz
85.8875 MHz/
Stop 1 GHz
Date: 4.OCT.2010 10:50:30

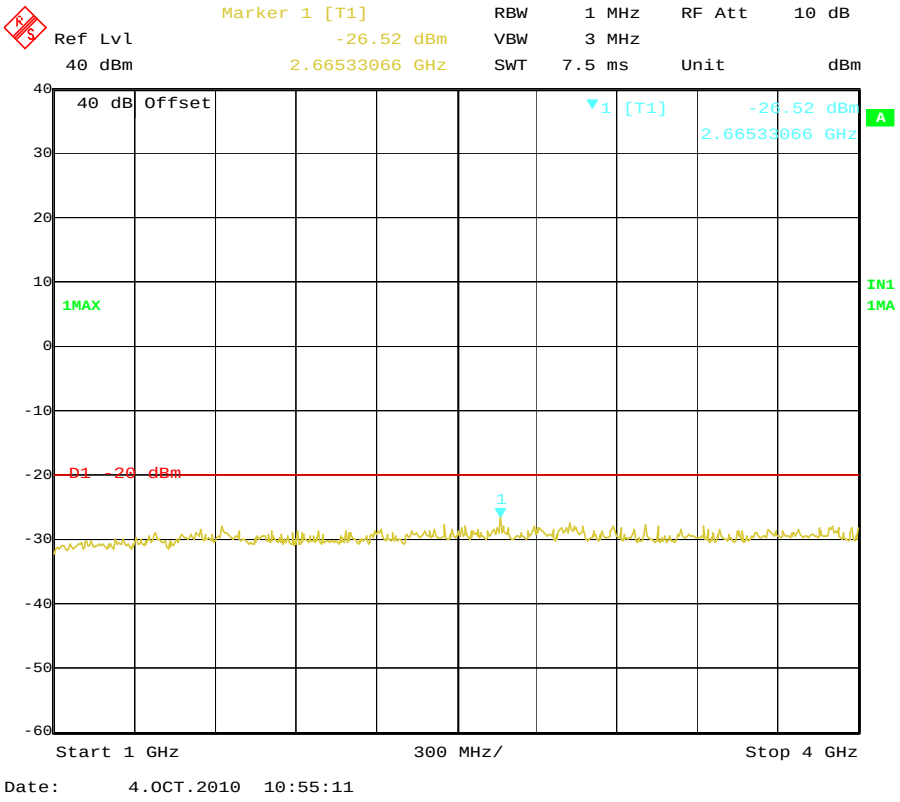

Marker 1 [T1]
Ref Lvl
40 dBm
-27.29 dBm
2.94789579 GHz
RBW 1 MHz
VBW 3 MHz
SWT 7.5 ms
RF Att 10 dB
Unit dBm
40 dB Offset
1 [T1] -27.29 dBm
2.94789579 GHz
A
IN1
1MA
1MAX
D1 -20 dBm
Start 1 GHz
300 MHz/
Stop 4 GHz
Date: 4.OCT.2010 10:49:44

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	156.1250	571.32	-26.62	2665.33	-26.52	-20dBm
Test Results				Compliance				

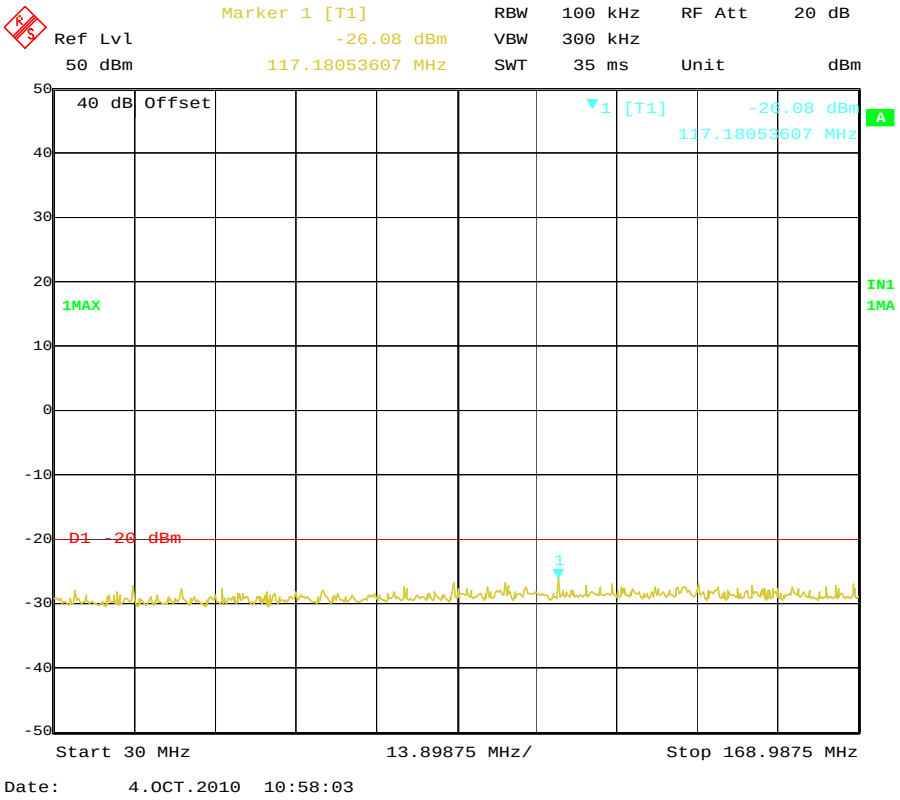


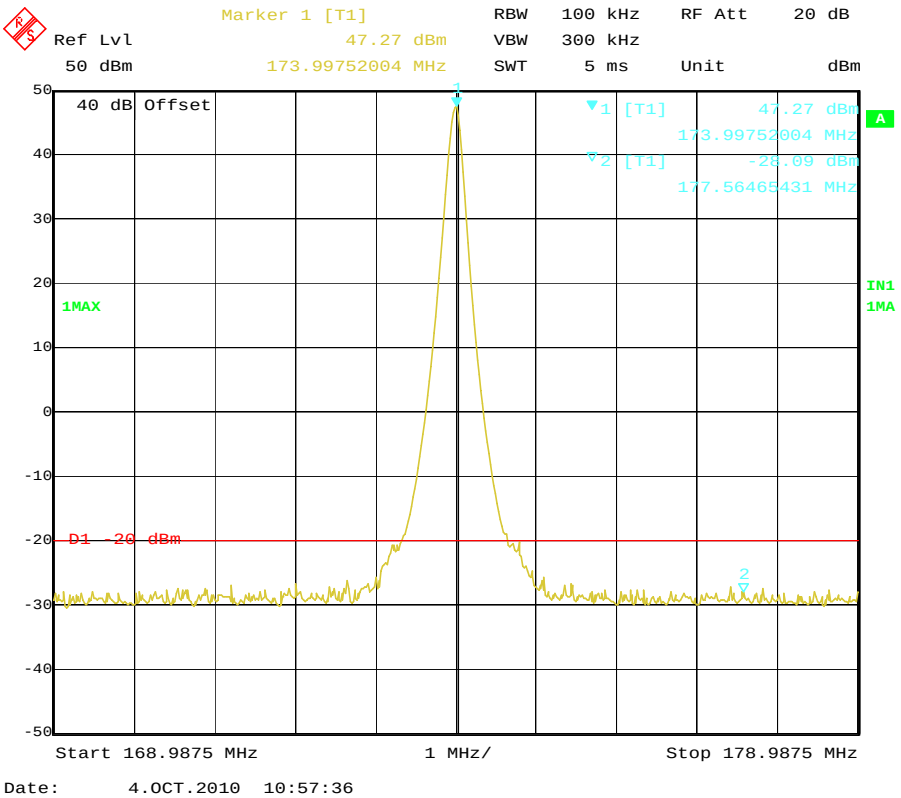


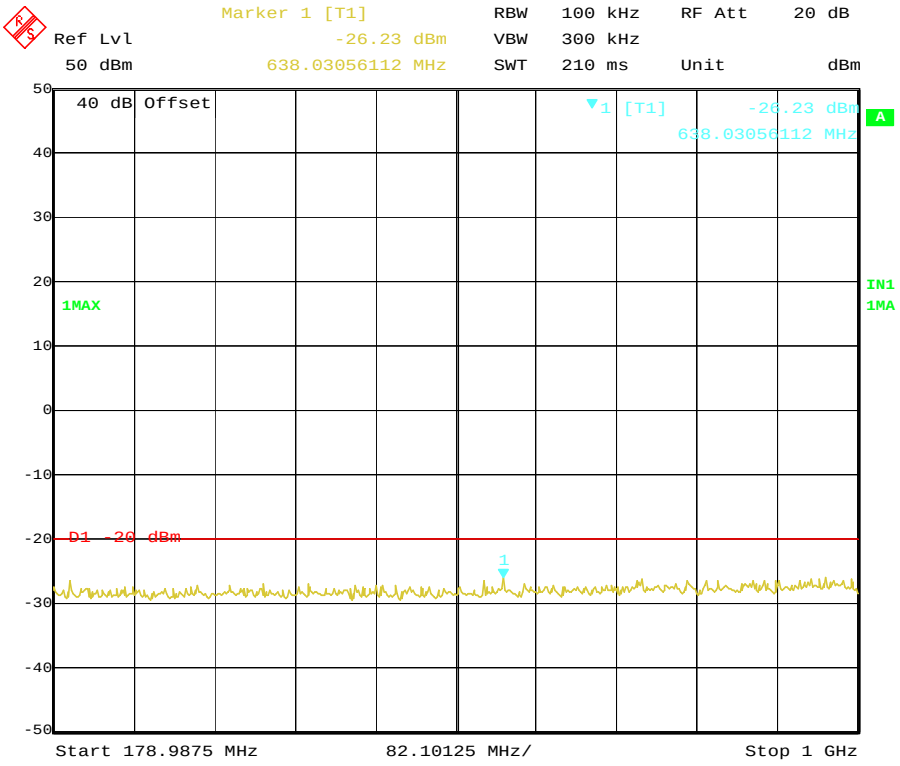

Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
-26.62 dBm
VBW 300 kHz
50 dBm
571.31638277 MHz
SWT 210 ms
Unit dBm
40 dB Offset
1 [T1]
-26.62 dBm
571.31638277 MHz
A
IN1
1MA
1MAX
D1 -20 dBm
Start 161.125 MHz
83.8875 MHz/
Stop 1 GHz
Date: 4.OCT.2010 10:54:26

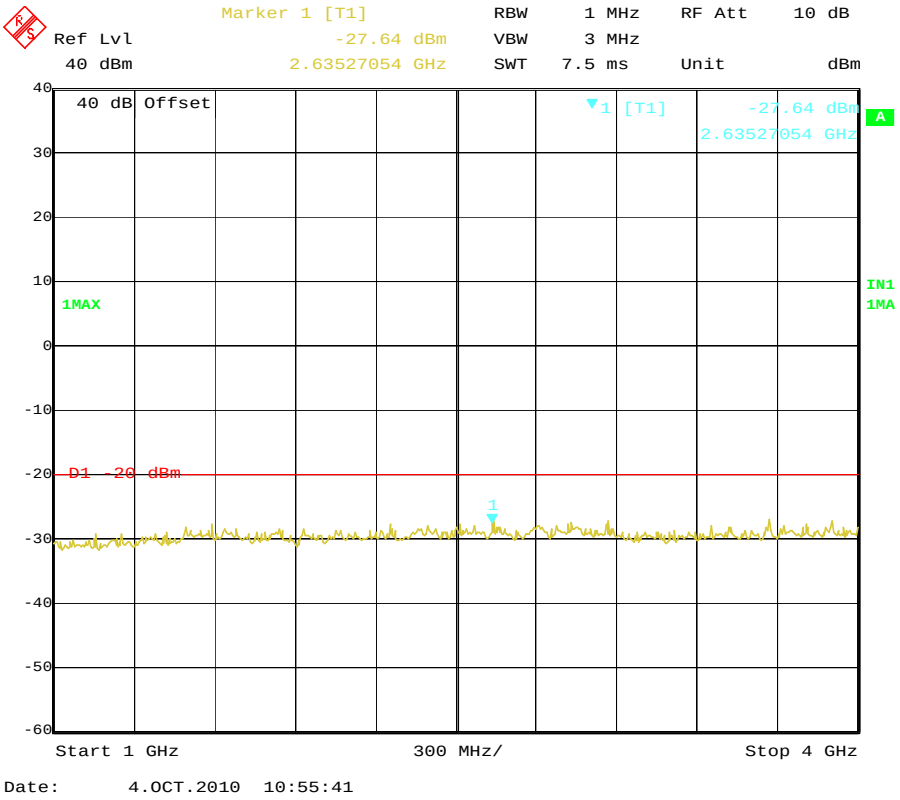

Marker 1 [T1]
RBW 1 MHz
RF Att 10 dB
Ref Lvl
-26.52 dBm
VBW 3 MHz
40 dBm
2.66533066 GHz
SWT 7.5 ms
Unit dBm
40 dB Offset
1 [T1]
-26.52 dBm
2.66533066 GHz
A
IN1
1MA
1MAX
D1 -20 dBm
Start 1 GHz
300 MHz/
Stop 4 GHz
Date: 4.OCT.2010 10:55:11

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	173.9875	638.03	-26.23	2635.27	-27.64	-20dBm
Test Results				Compliance				

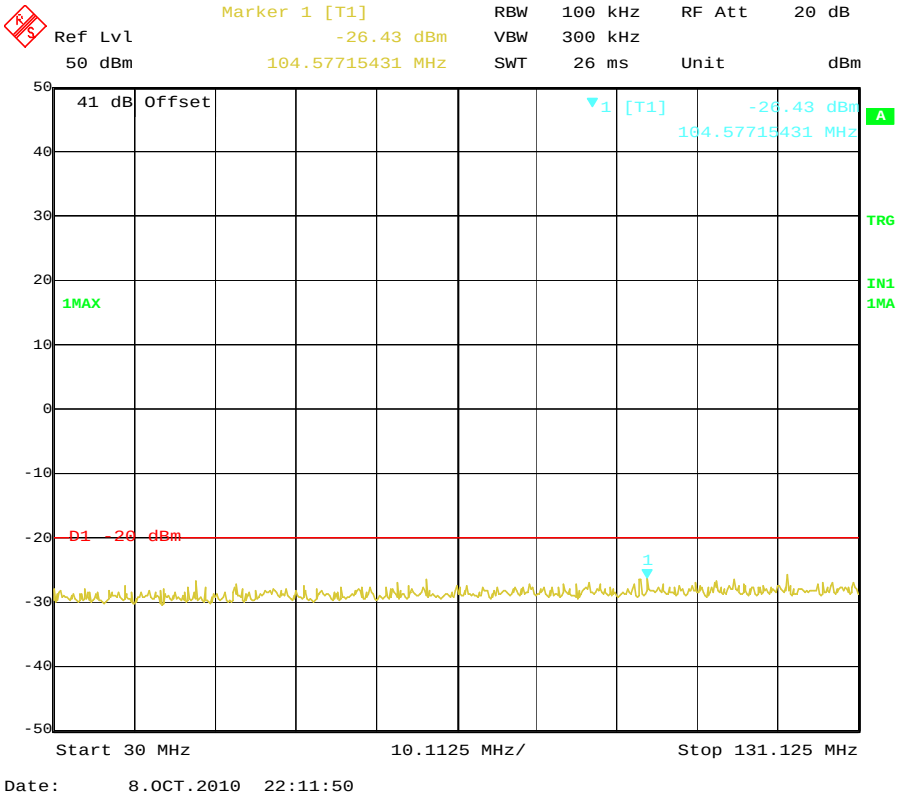


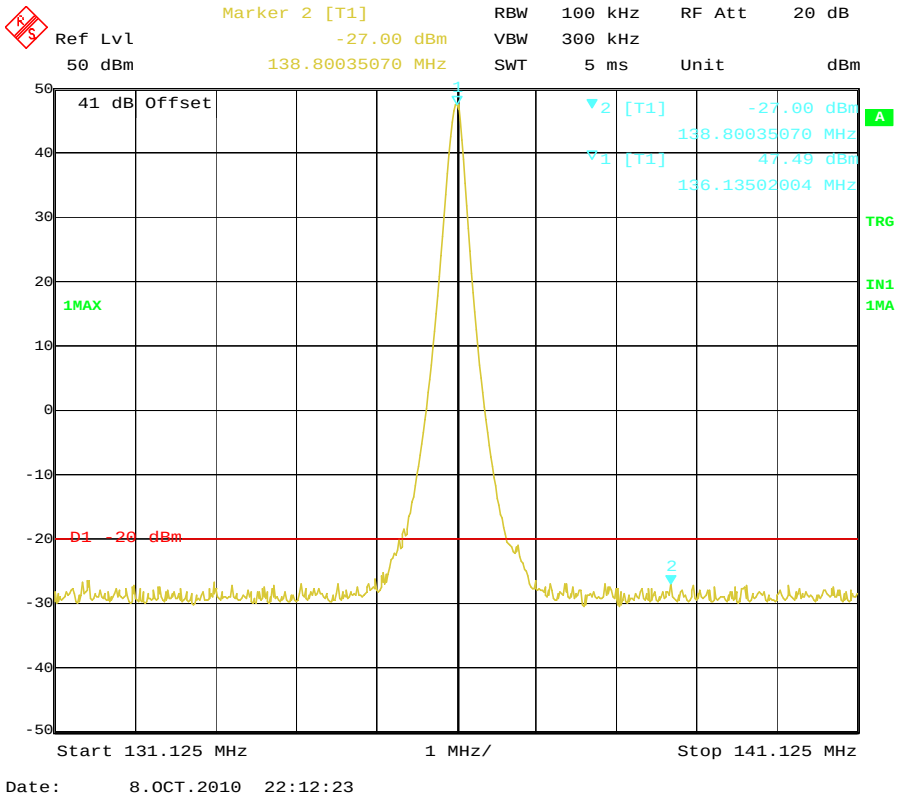


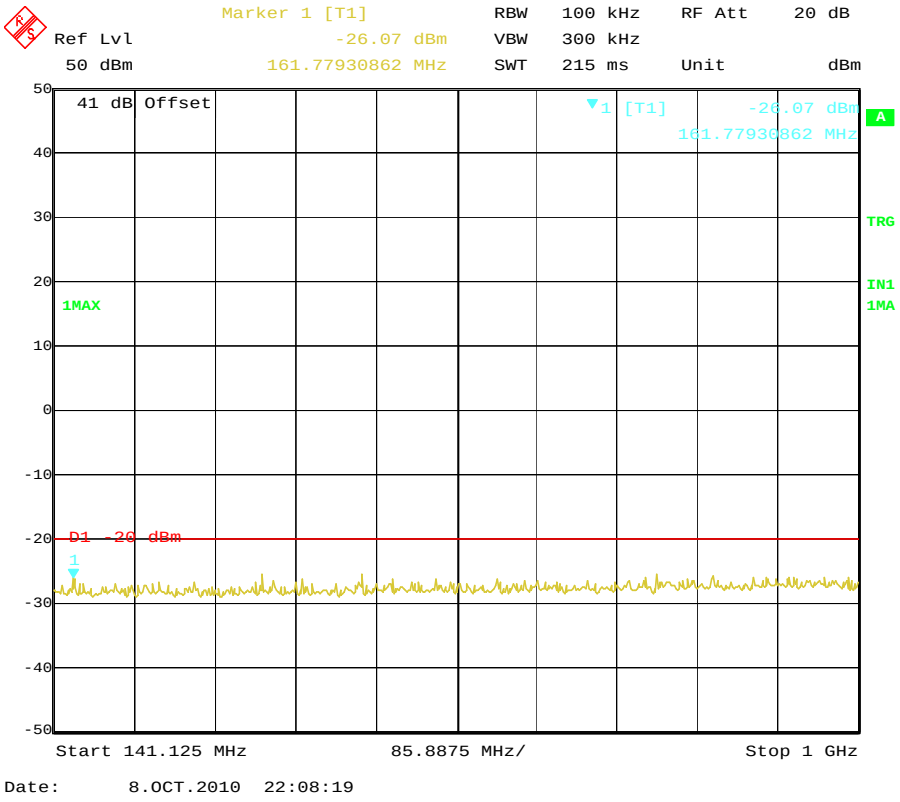

Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
-26.23 dBm
VBW 300 kHz
50 dBm
638.03056112 MHz
SWT 210 ms
Unit dBm
40 dB Offset
1 [T1]
-26.23 dBm
638.03056112 MHz
A
IN1
1MA
1MAX
D1 -20 dBm
Start 178.9875 MHz
82.10125 MHz/
Stop 1 GHz
Date: 4.OCT.2010 10:56:31

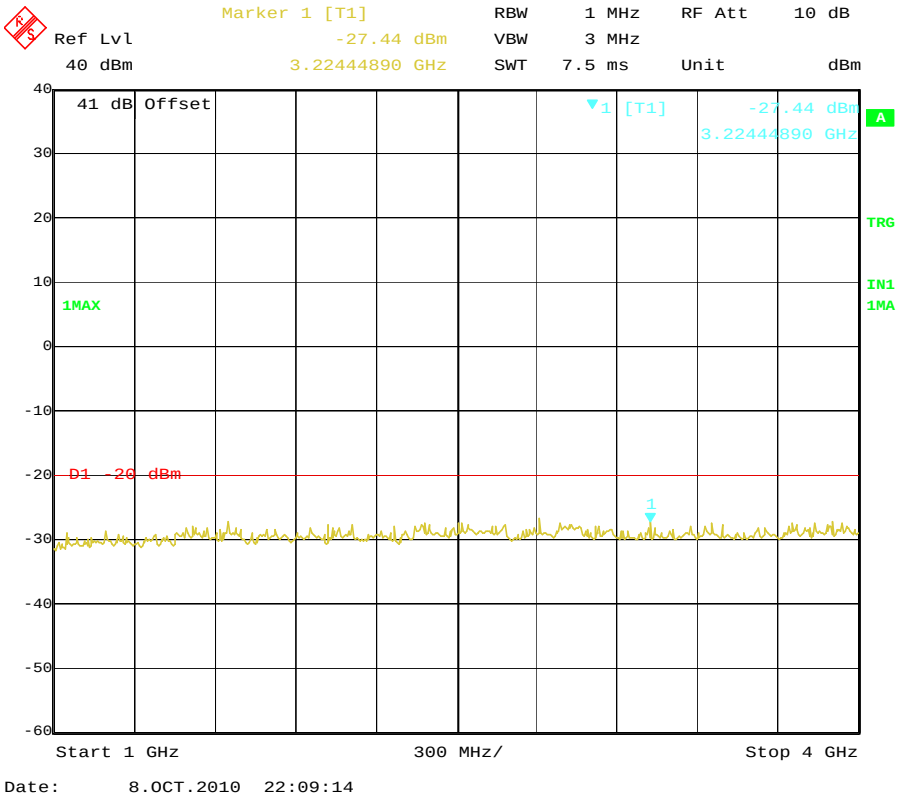

Marker 1 [T1]
RBW 1 MHz
RF Att 10 dB
Ref Lvl
-27.64 dBm
VBW 3 MHz
40 dBm
2.63527054 GHz
SWT 7.5 ms
Unit dBm
40 dB Offset
1 [T1]
-27.64 dBm
2.63527054 GHz
A
IN1
1MA
1MAX
D1 -20 dBm
Start 1 GHz
300 MHz/
Stop 4 GHz
Date: 4.OCT.2010 10:55:41

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)	
4FSK	12.5KHz	Low	136.1250	161.78	-26.07	3224.45	-27.44	-20dBm
Test Results				Compliance				

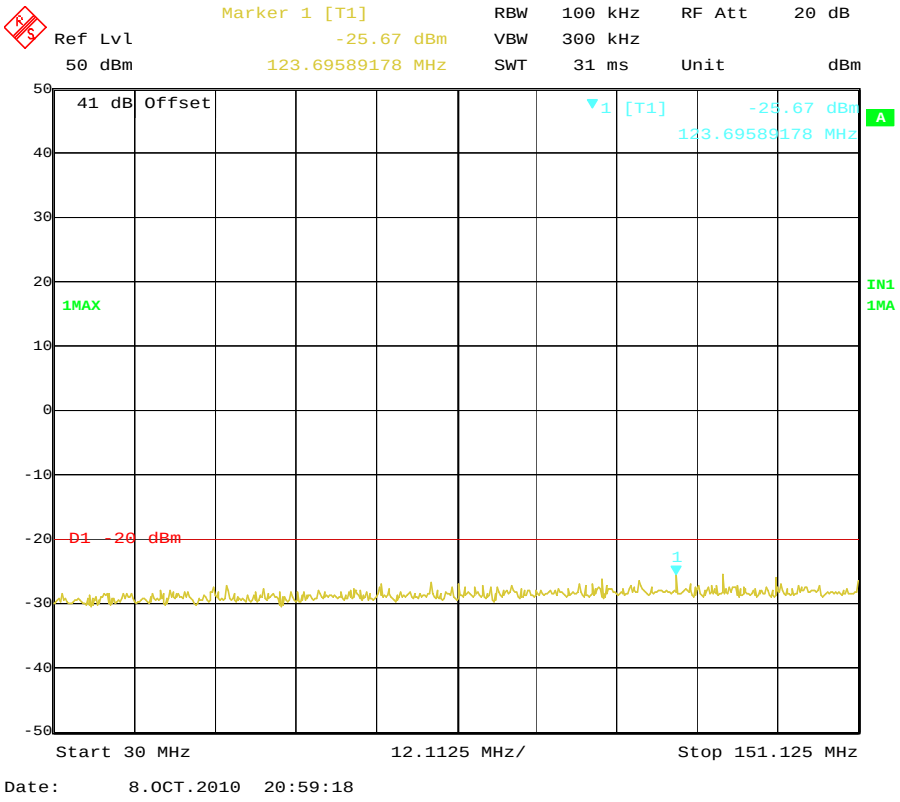


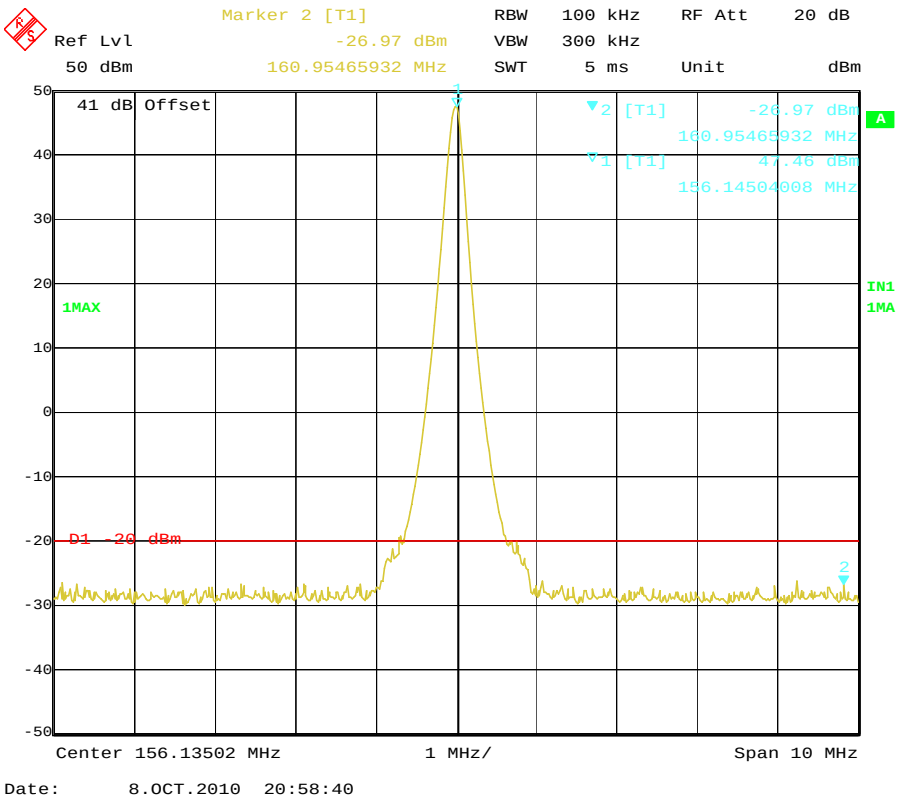


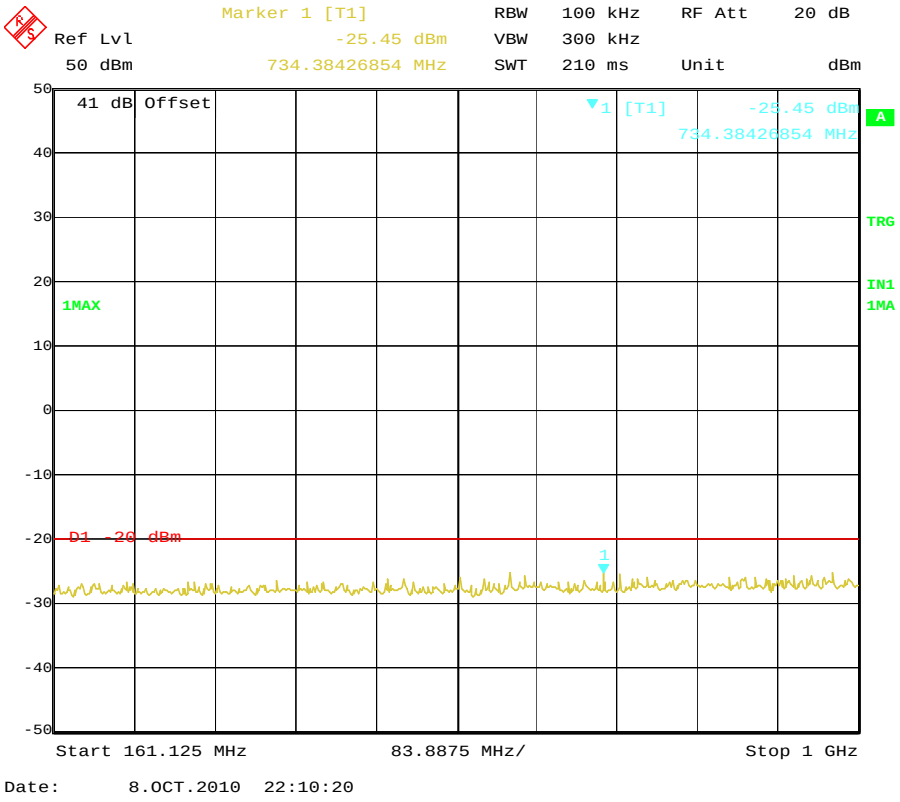

Marker 1 [T1]
Ref Lvl
50 dBm
-26.07 dBm
161.77930862 MHz
RBW 100 kHz
VBW 300 kHz
SWT 215 ms
RF Att 20 dB
Unit dBm
41 dB Offset
1 [T1] -26.07 dBm
161.77930862 MHz
A
TRG
IN1
1MA
1MAX
D1 -20 dBm
Start 141.125 MHz
85.8875 MHz/
Stop 1 GHz
Date: 8.OCT.2010 22:08:19

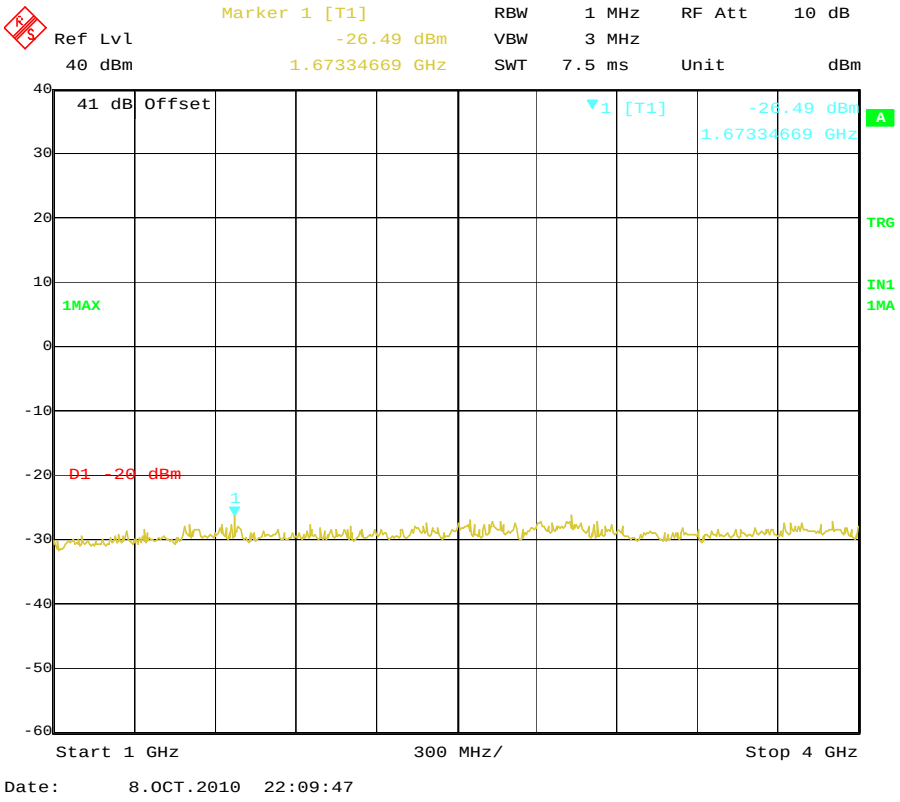

Marker 1 [T1]
Ref Lvl
40 dBm
-27.44 dBm
3.22444890 GHz
RBW 1 MHz
VBW 3 MHz
SWT 7.5 ms
RF Att 10 dB
Unit dBm
41 dB Offset
1 [T1] -27.44 dBm
3.22444890 GHz
A
TRG
IN1
1MA
1MAX
D1 -20 dBm
Start 1 GHz
300 MHz/
Stop 4 GHz
Date: 8.OCT.2010 22:09:14

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)	
4FSK	12.5KHz	Middle	156.1250	734.38	-25.45	1673.35	-26.49	-20dBm
Test Results				Compliance				

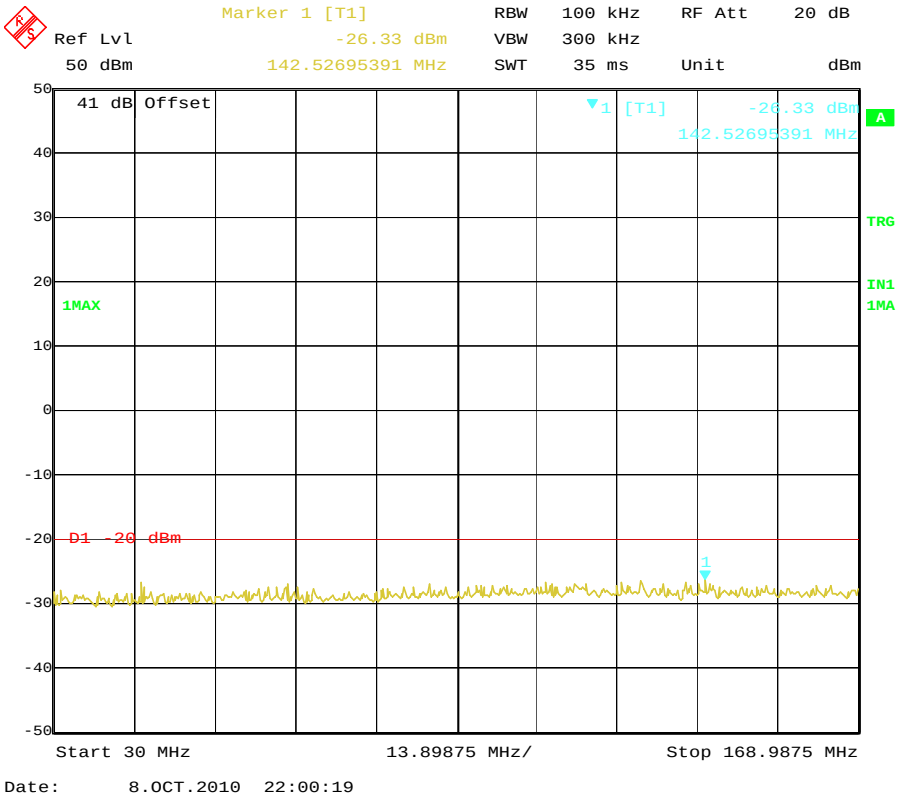


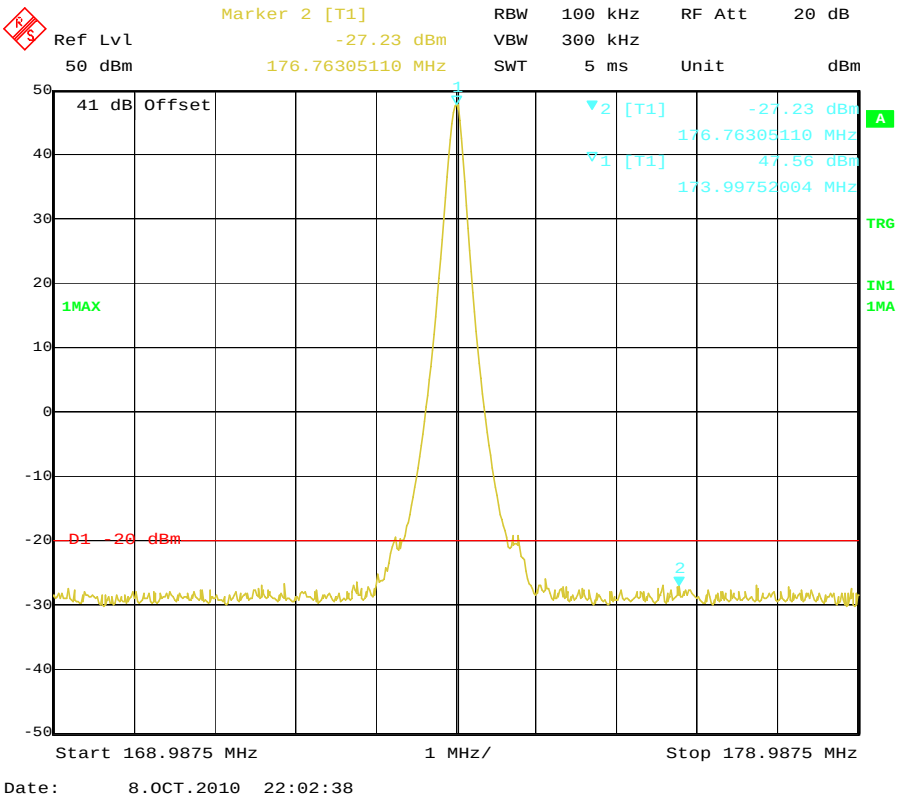


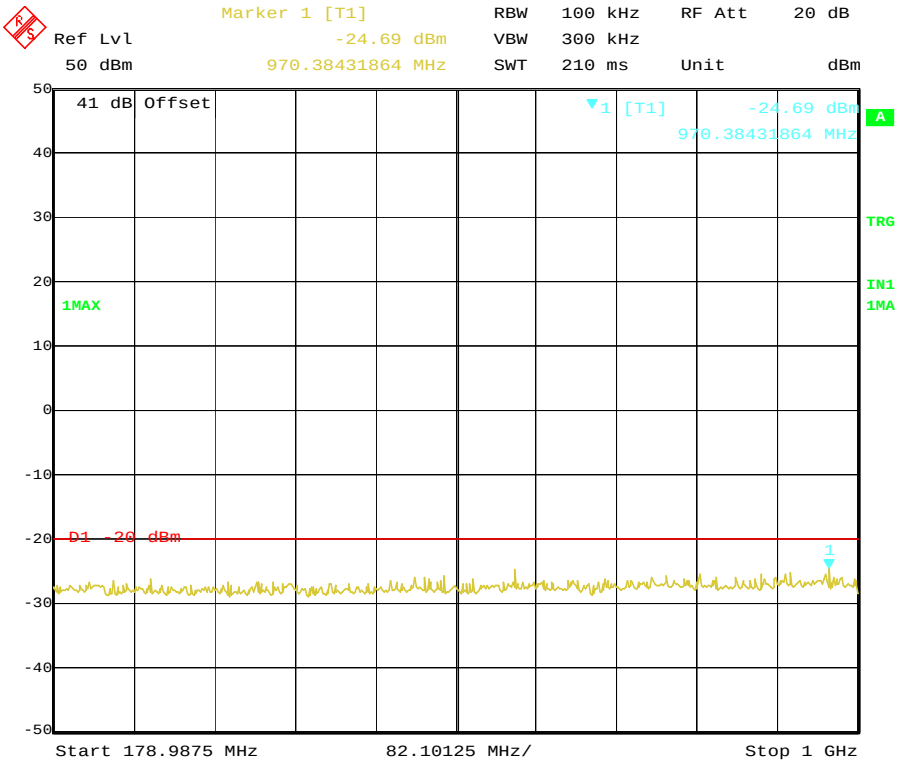

Marker 1 [T1]
Ref Lvl
50 dBm
-25.45 dBm
734.38426854 MHz
RBW 100 kHz
VBW 300 kHz
SWT 210 ms
RF Att 20 dB
Unit dBm
41 dB Offset
1 [T1] -25.45 dBm
734.38426854 MHz
A
TRG
IN1
1MA
1MAX
D1 -20 dBm
Start 161.125 MHz
83.8875 MHz/
Stop 1 GHz
Date: 8.OCT.2010 22:10:20

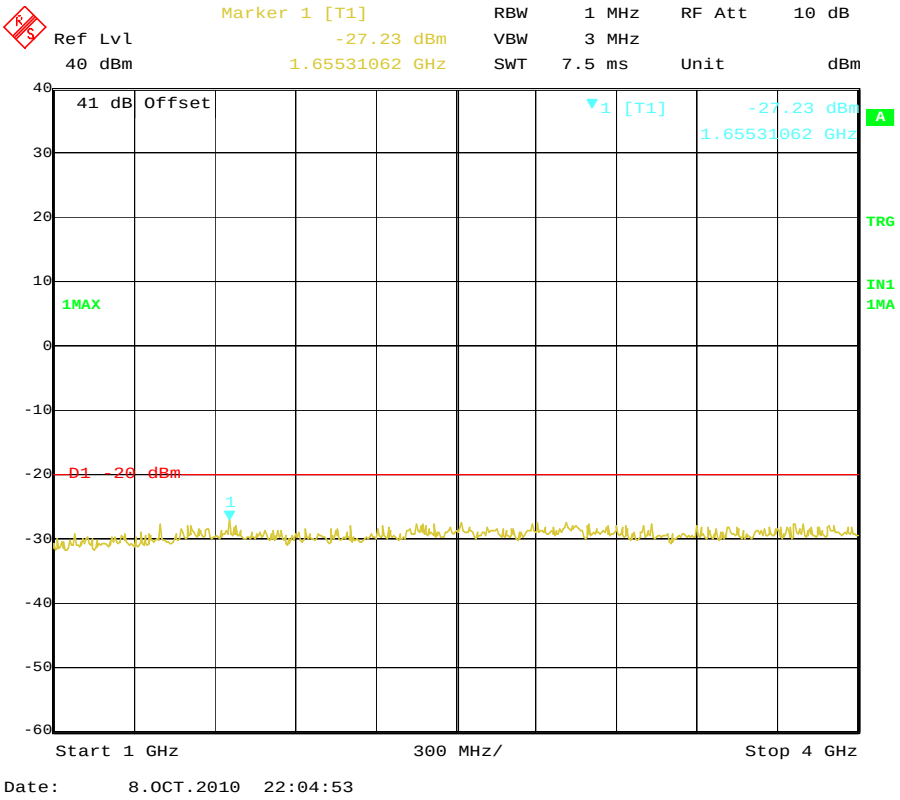

Marker 1 [T1]
Ref Lvl
40 dBm
-26.49 dBm
1.67334669 GHz
RBW 1 MHz
VBW 3 MHz
SWT 7.5 ms
RF Att 10 dB
Unit dBm
41 dB Offset
1 [T1] -26.49 dBm
1.67334669 GHz
A
TRG
IN1
1MA
1MAX
D1 -20 dBm
Start 1 GHz
300 MHz/
Stop 4 GHz
Date: 8.OCT.2010 22:09:47

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)	
4FSK	12.5KHz	High	173.9875	970.38	-24.69	1655.31	-27.23	-20dBm
Test Results				Compliance				



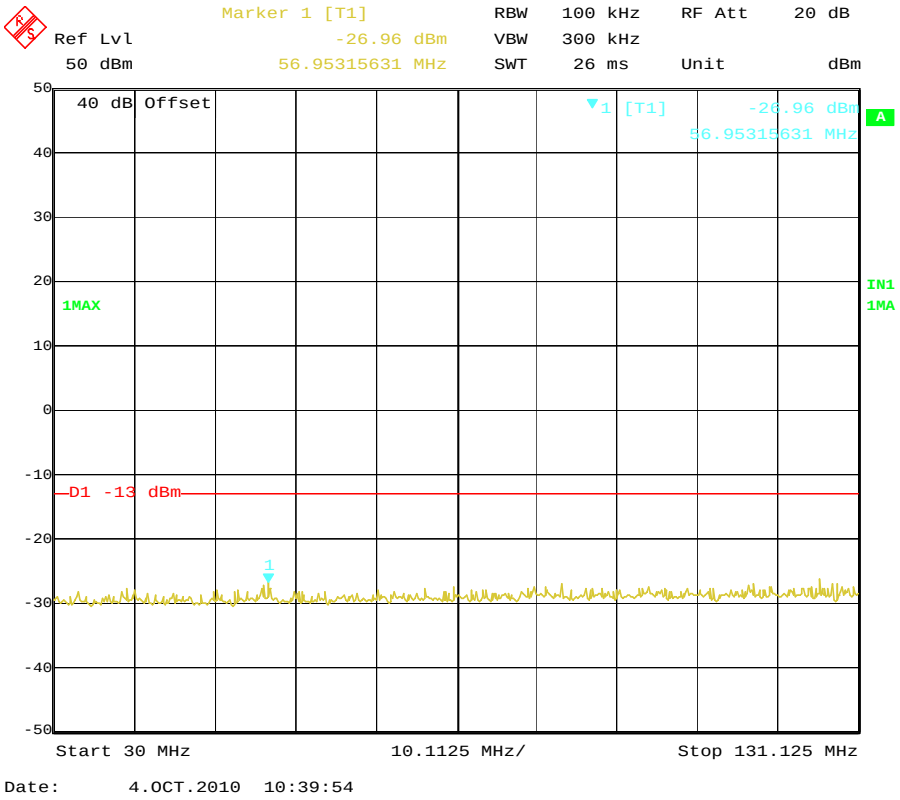


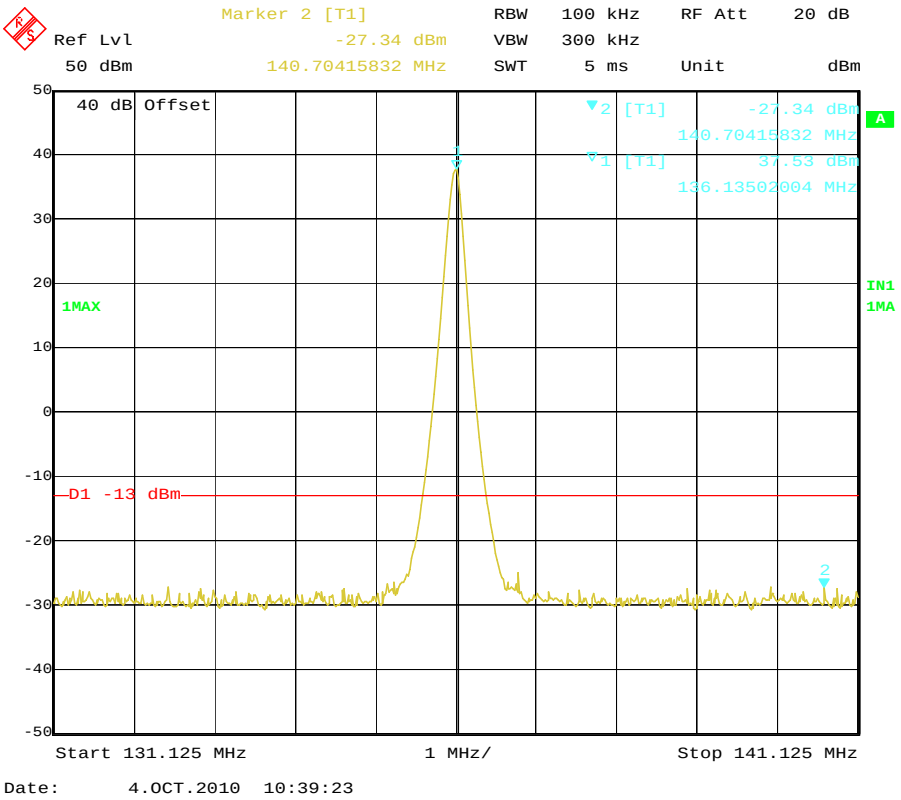

Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
-24.69 dBm
VBW 300 kHz
50 dBm
970.38431864 MHz
SWT 210 ms
Unit dBm
41 dB Offset
1 [T1]
-24.69 dBm
970.38431864 MHz
A
TRG
IN1
1MA
1MAX
D1 -20 dBm
Start 178.9875 MHz
82.10125 MHz/
Stop 1 GHz
Date: 8.OCT.2010 22:04:19

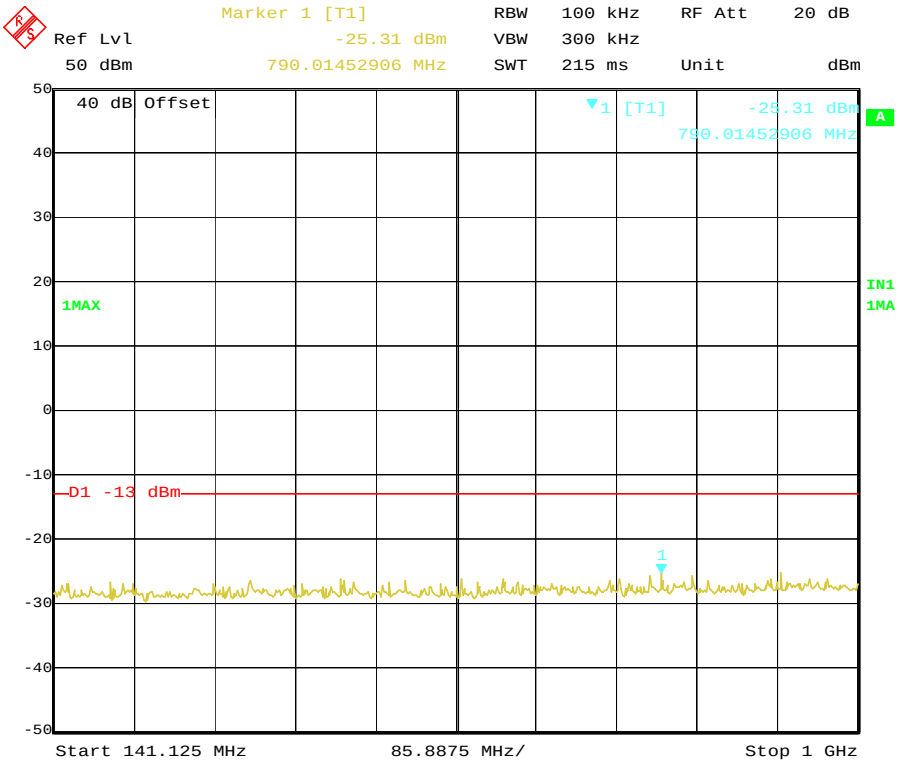

Marker 1 [T1]
RBW 1 MHz
RF Att 10 dB
Ref Lvl
-27.23 dBm
VBW 3 MHz
40 dBm
1.65531062 GHz
SWT 7.5 ms
Unit dBm
41 dB Offset
1 [T1]
-27.23 dBm
1.65531062 GHz
A
TRG
IN1
1MA
1MAX
D1 -20 dBm
Start 1 GHz
300 MHz/
Stop 4 GHz
Date: 8.OCT.2010 22:04:53

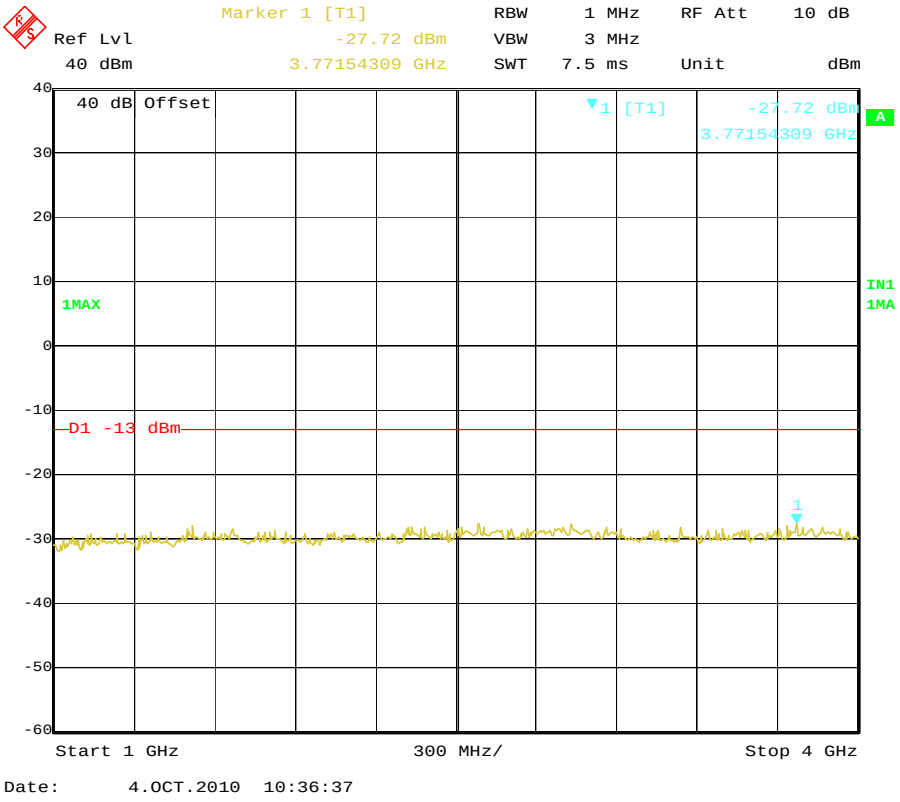
For Rated Low Power (5Watt)

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	25KHz	Low	136.1250	790.01	-25.31	3771.54	-27.72	-13dBm
Test Results				Compliance				

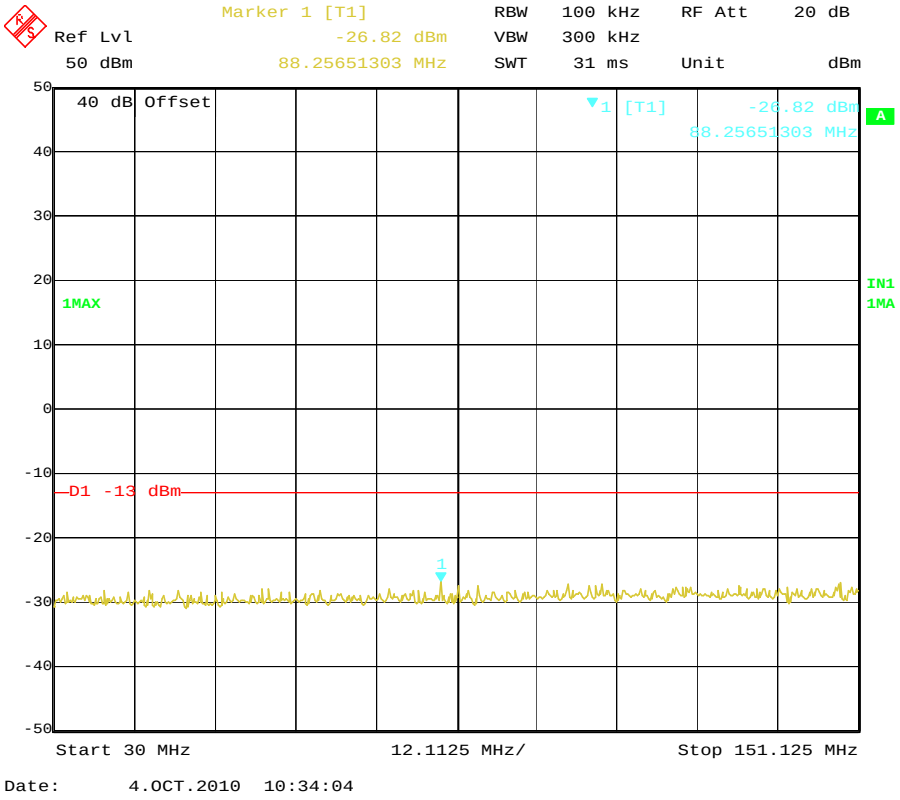


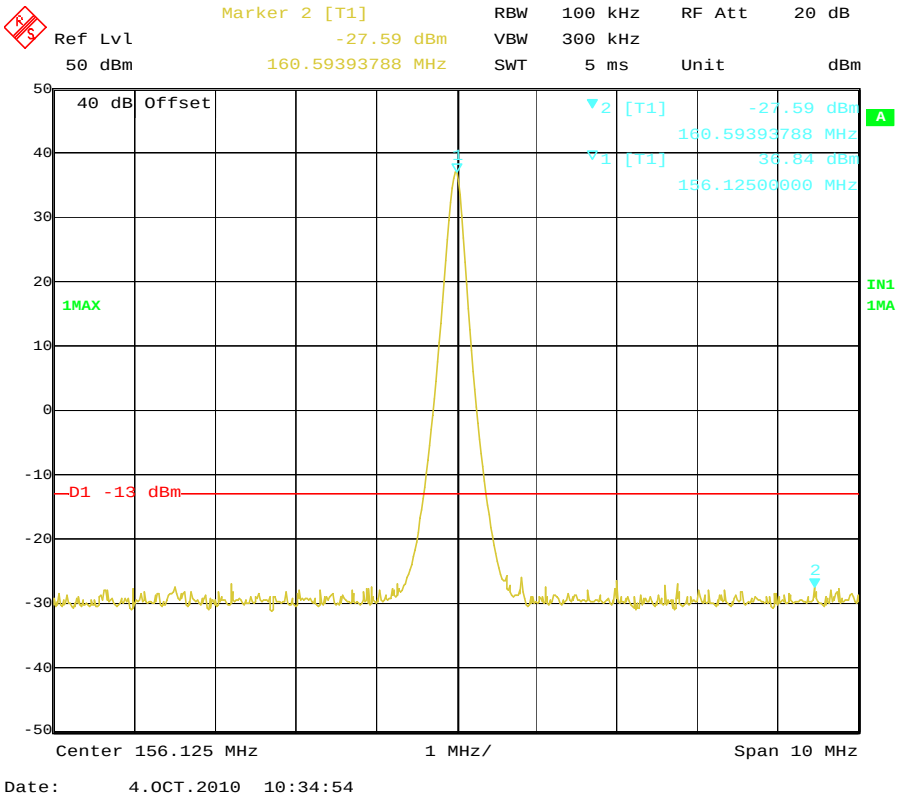


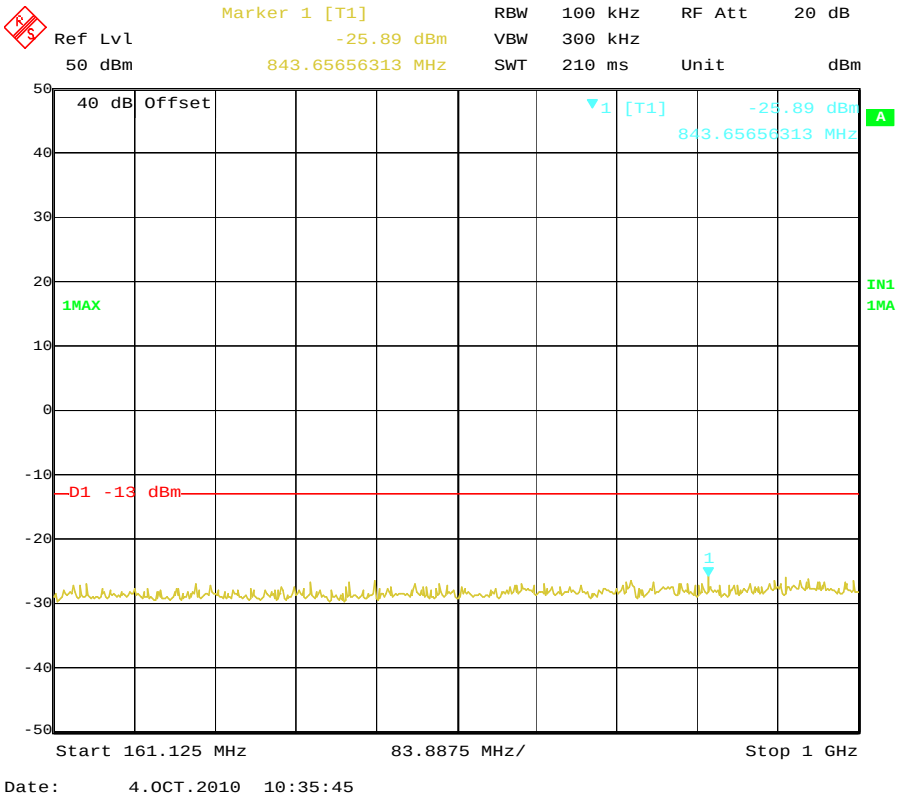

Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
-25.31 dBm
VBW 300 kHz
50 dBm
790.01452906 MHz
SWT 215 ms
Unit dBm
40 dB Offset
1 [T1]
-28.31 dBm
790.01452906 MHz
A
IN1
1MA
1MAX
D1 -13 dBm
Start 141.125 MHz
85.8875 MHz/
Stop 1 GHz
Date: 4.OCT.2010 10:38:14

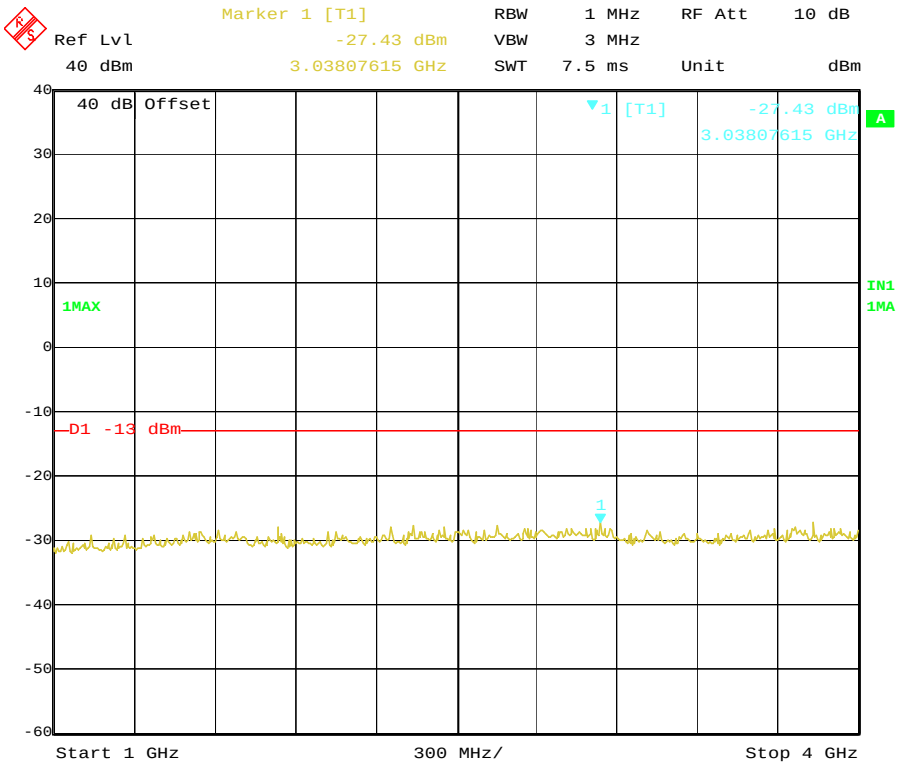

Marker 1 [T1]
RBW 1 MHz
RF Att 10 dB
Ref Lvl
-27.72 dBm
VBW 3 MHz
40 dBm
3.77154309 GHz
SWT 7.5 ms
Unit dBm
40 dB Offset
1 [T1]
-27.72 dBm
3.77154309 GHz
A
IN1
1MA
1MAX
D1 -13 dBm
Start 1 GHz
300 MHz/
Stop 4 GHz
Date: 4.OCT.2010 10:36:37

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	25KHz	Middle	156.1250	843.66	-25.89	3038.08	-27.43	-13dBm
Test Results				Compliance				

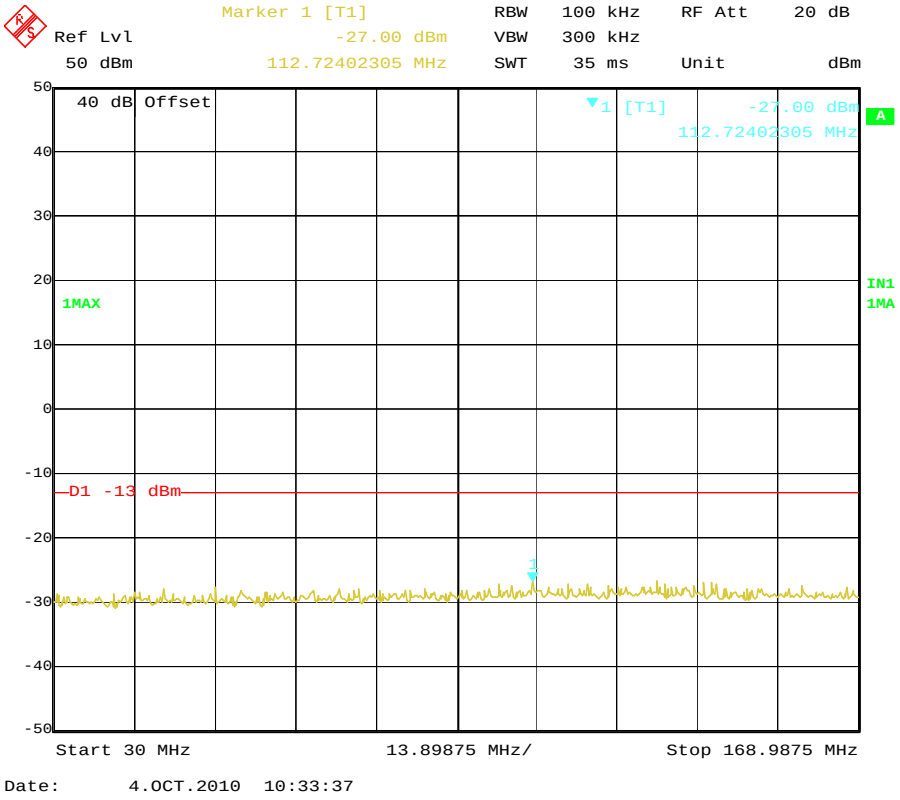


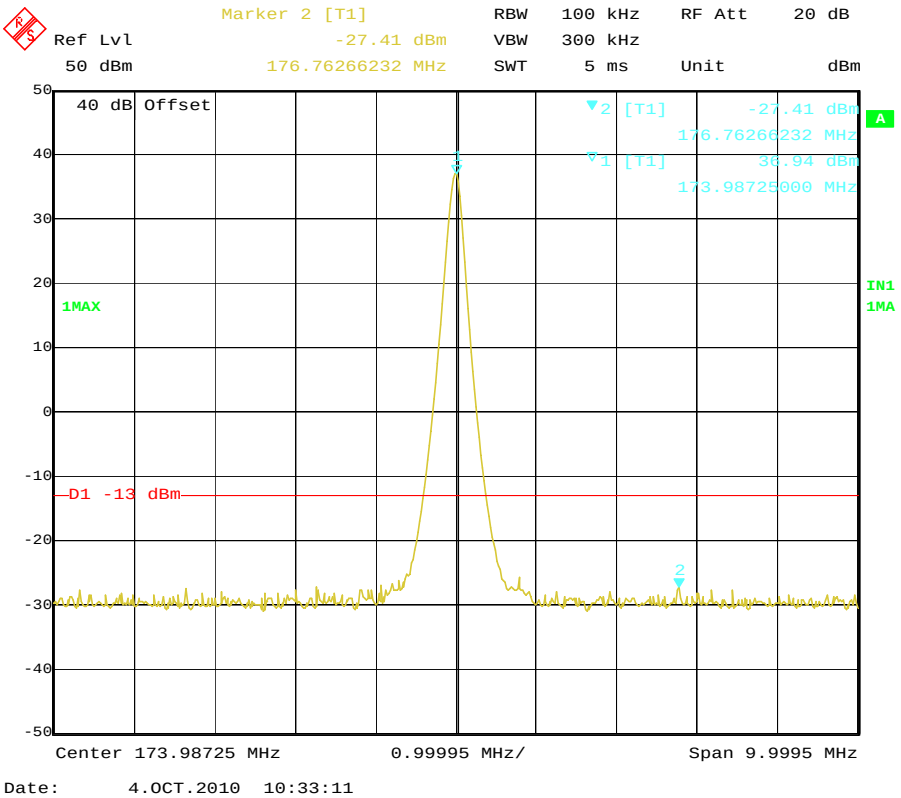


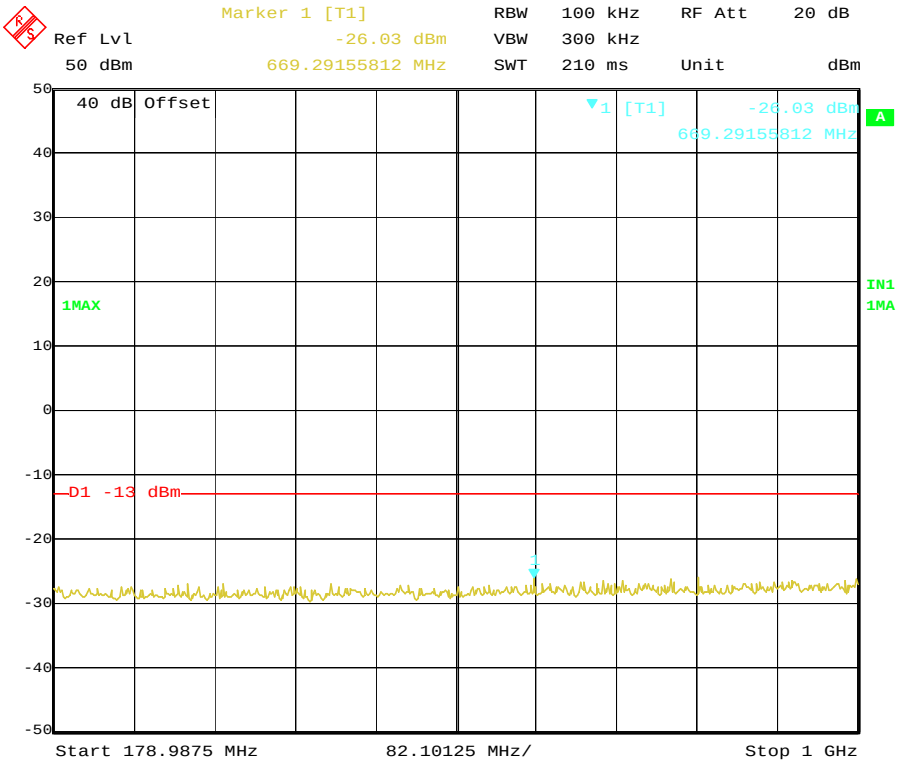

Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
-25.89 dBm
VBW 300 kHz
50 dBm
843.65656313 MHz
SWT 210 ms
Unit dBm
40 dB Offset
1 [T1]
-25.89 dBm
843.65656313 MHz
A
IN1
1MA
1MAX
D1 -13 dBm
Start 161.125 MHz
83.8875 MHz/
Stop 1 GHz
Date: 4.OCT.2010 10:35:45

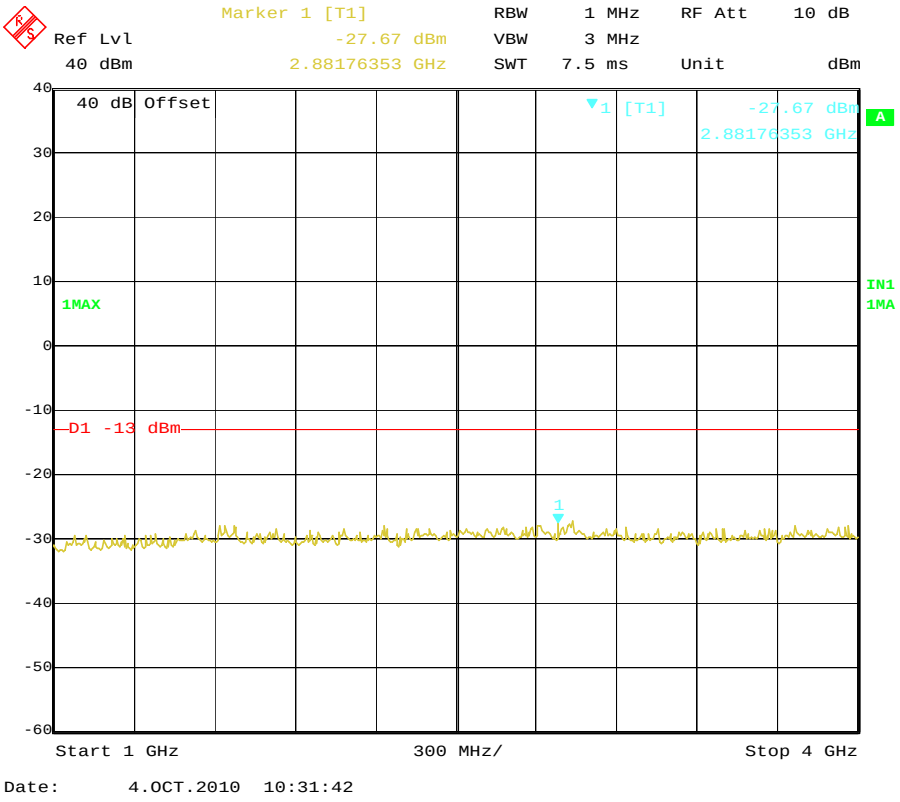

Marker 1 [T1]
RBW 1 MHz
RF Att 10 dB
Ref Lvl
-27.43 dBm
VBW 3 MHz
40 dBm
3.03807615 GHz
SWT 7.5 ms
Unit dBm
40 dB Offset
1 [T1]
-27.43 dBm
3.03807615 GHz
A
IN1
1MA
1MAX
D1 -13 dBm
Start 1 GHz
300 MHz/
Stop 4 GHz
Date: 4.OCT.2010 10:36:14

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	25KHz	High	173.9875	669.29	-26.03	2881.76	-27.67	-13dBm
Test Results				Compliance				

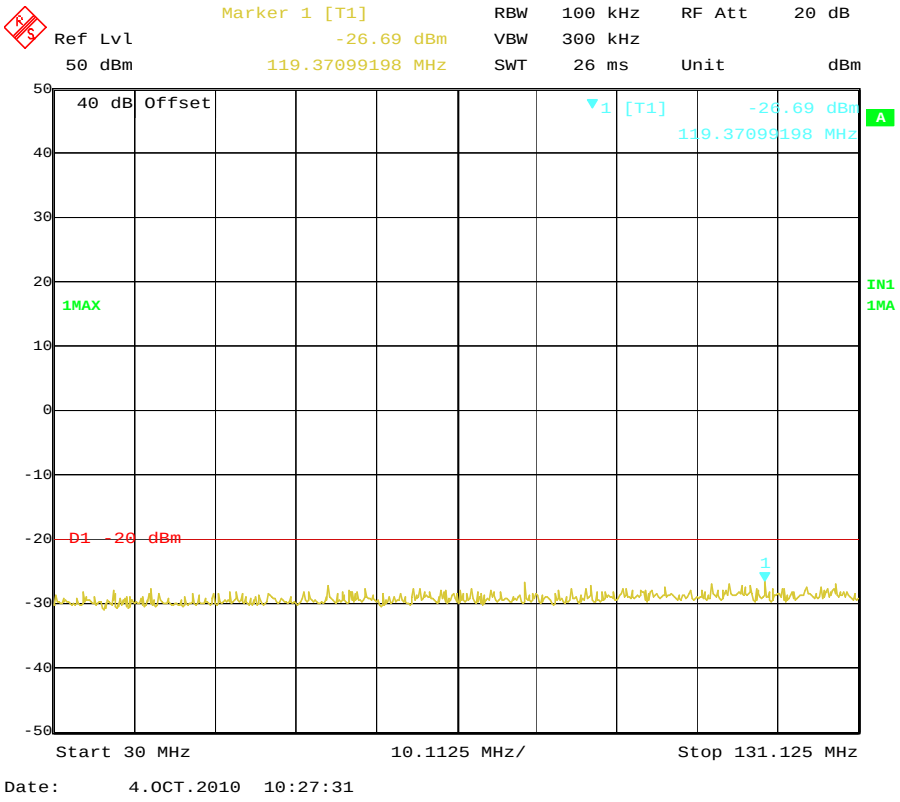


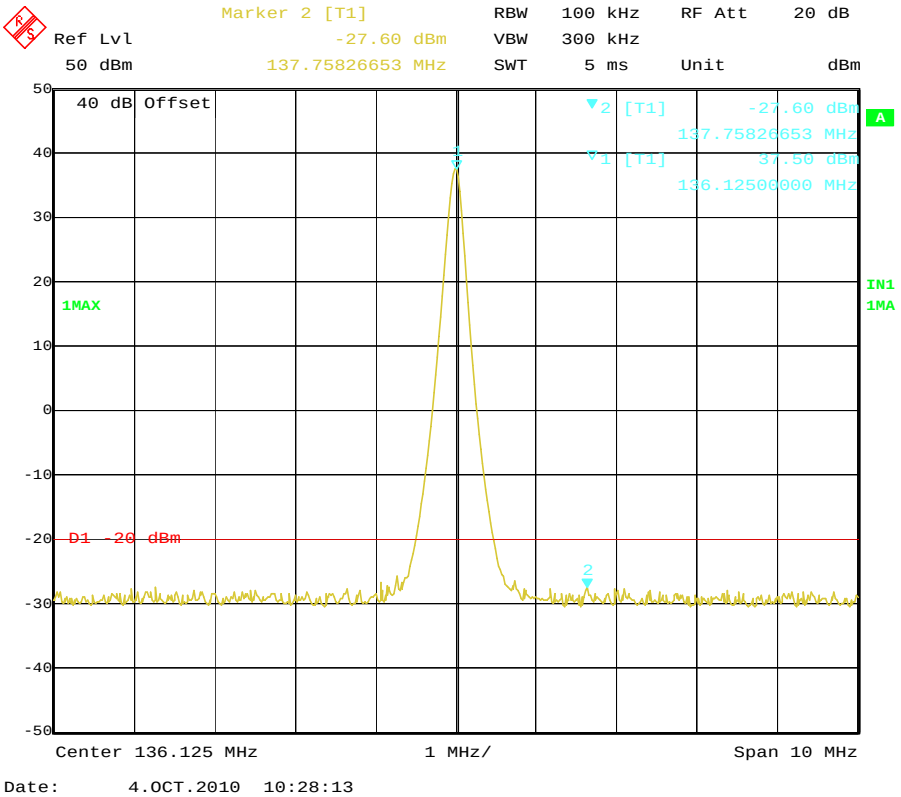


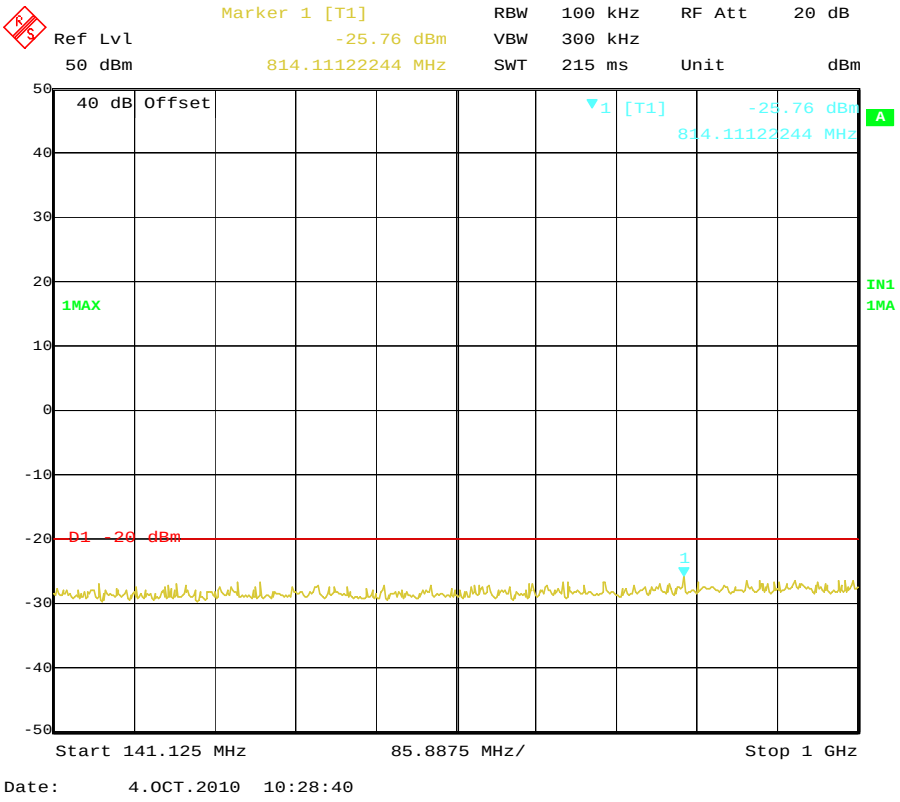

Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
-26.03 dBm
VBW 300 kHz
50 dBm
669.29155812 MHz
SWT 210 ms
Unit dBm
40 dB Offset
1 [T1]
-26.03 dBm
669.29155812 MHz
A
1MAX
IN1
1MA
D1 -13 dBm
Start 178.9875 MHz
82.10125 MHz/
Stop 1 GHz
Date: 4.OCT.2010 10:32:25

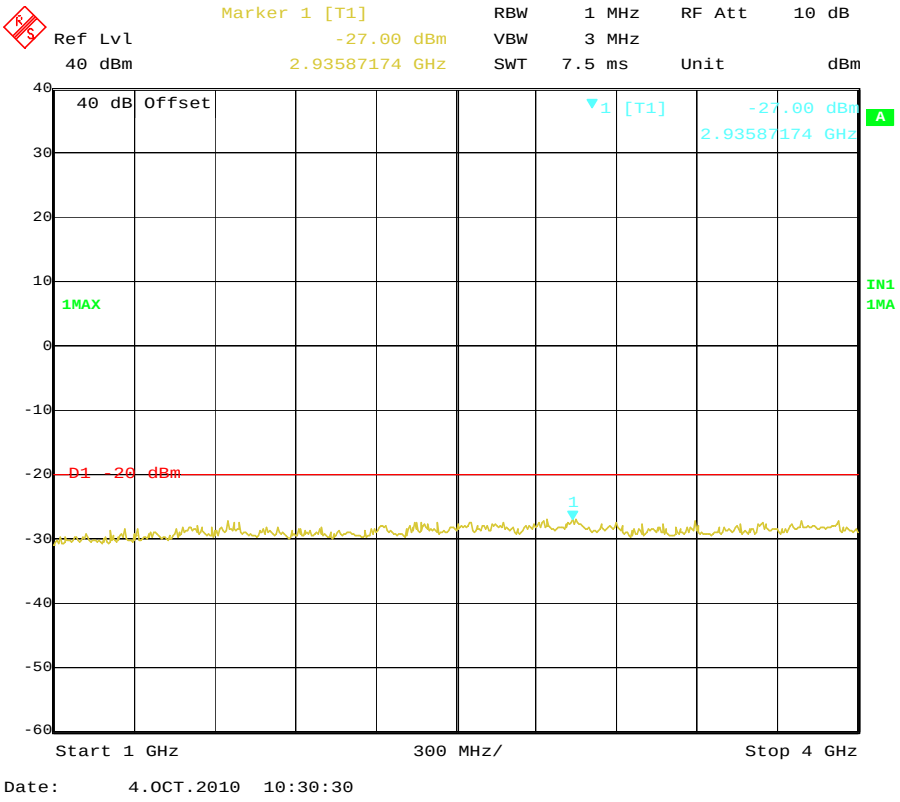

Marker 1 [T1]
RBW 1 MHz
RF Att 10 dB
Ref Lvl
-27.67 dBm
VBW 3 MHz
40 dBm
2.88176353 GHz
SWT 7.5 ms
Unit dBm
40 dB Offset
1 [T1]
-27.67 dBm
2.88176353 GHz
A
1MAX
IN1
1MA
D1 -13 dBm
Start 1 GHz
300 MHz/
Stop 4 GHz
Date: 4.OCT.2010 10:31:42

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	136.1250	814.11	-25.76	2935.87	-27.00	-20dBm
Test Results				Compliance				

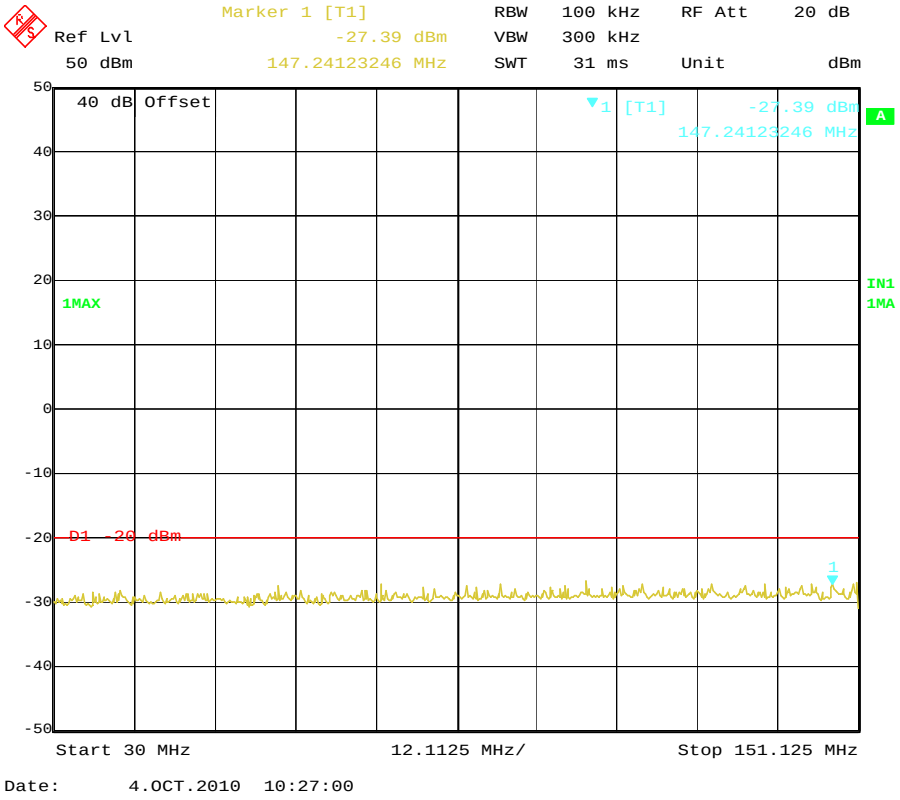


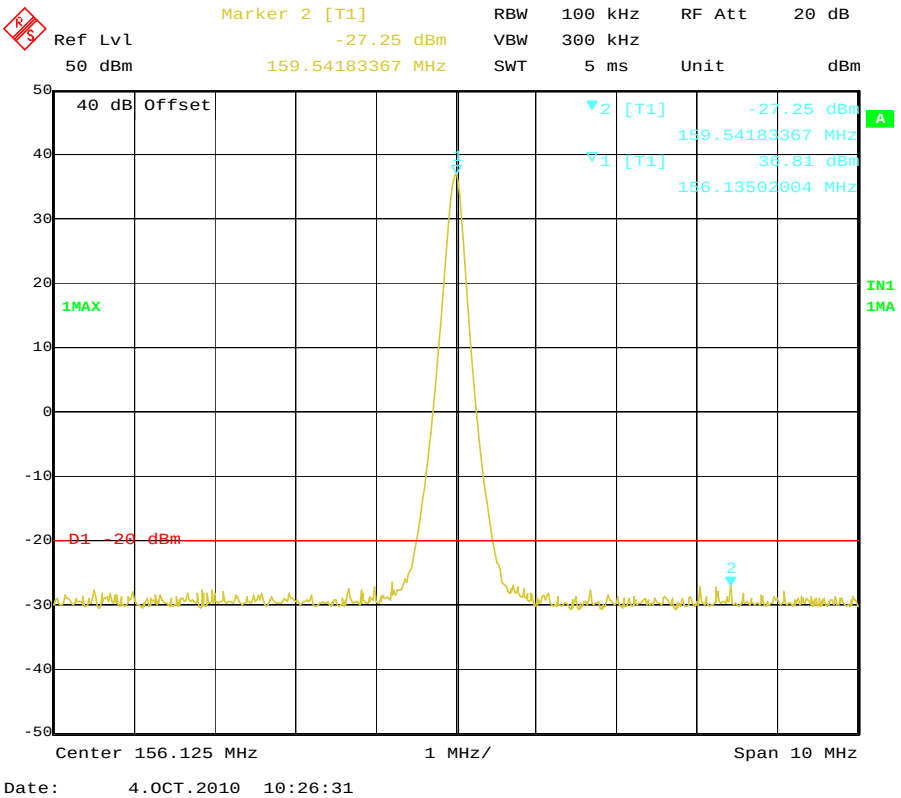


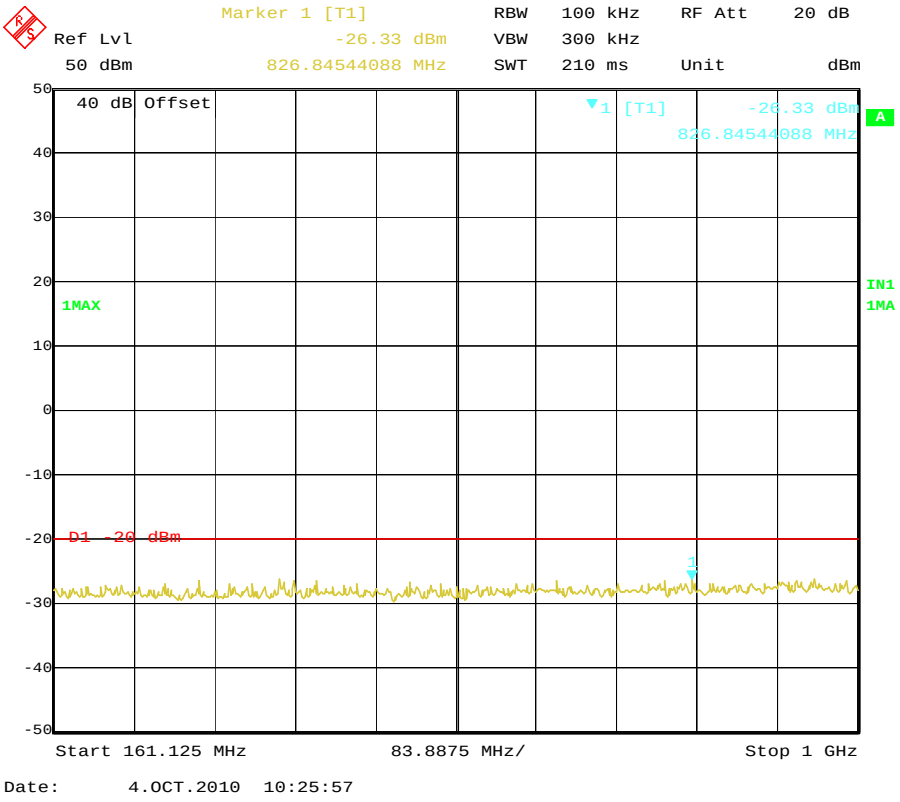

Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
-25.76 dBm
VBW 300 kHz
50 dBm
814.11122244 MHz
SWT 215 ms
Unit dBm
40 dB Offset
1 [T1]
-28.76 dBm
814.11122244 MHz
A
1MAX
IN1
1MA
D1 -20 dBm
Start 141.125 MHz
85.8875 MHz/
Stop 1 GHz
Date: 4.OCT.2010 10:28:40

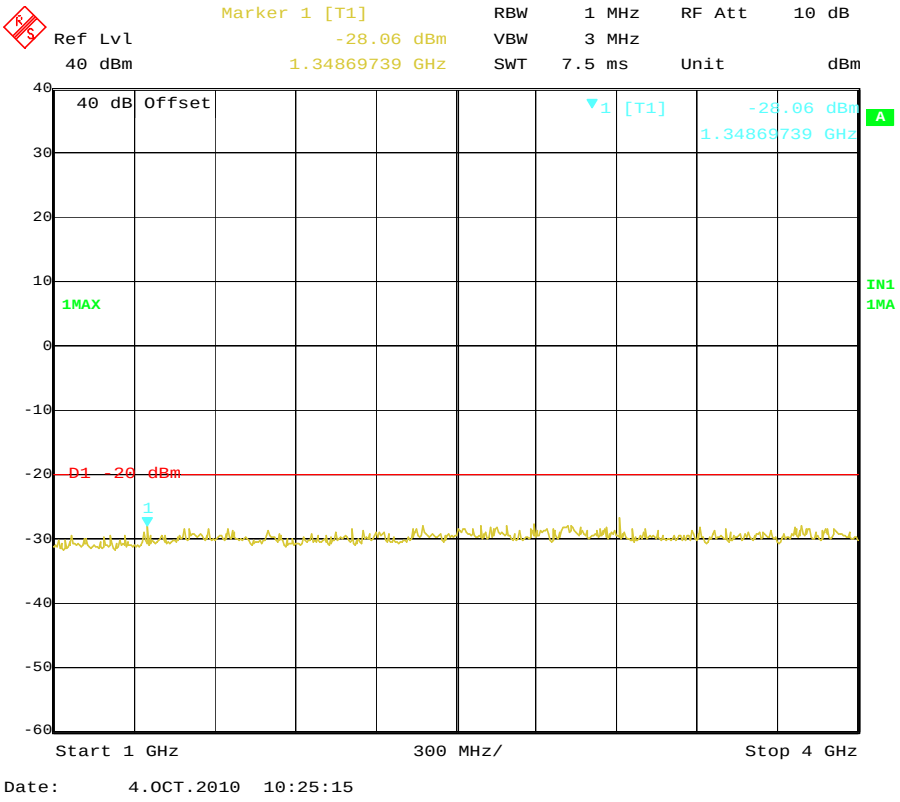

Marker 1 [T1]
RBW 1 MHz
RF Att 10 dB
Ref Lvl
-27.00 dBm
VBW 3 MHz
40 dBm
2.93587174 GHz
SWT 7.5 ms
Unit dBm
40 dB Offset
1 [T1]
-27.00 dBm
2.93587174 GHz
A
1MAX
IN1
1MA
D1 -20 dBm
Start 1 GHz
300 MHz/
Stop 4 GHz
Date: 4.OCT.2010 10:30:30

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	156.1250	826.85	-26.33	1348.70	-28.06	-20dBm
Test Results				Compliance				

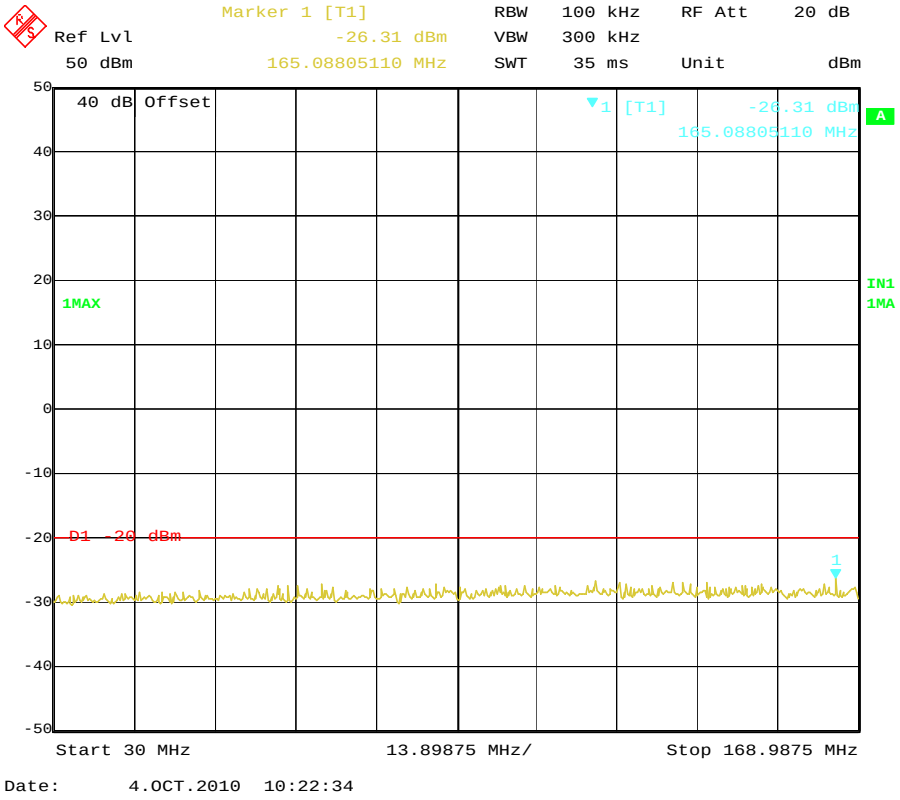


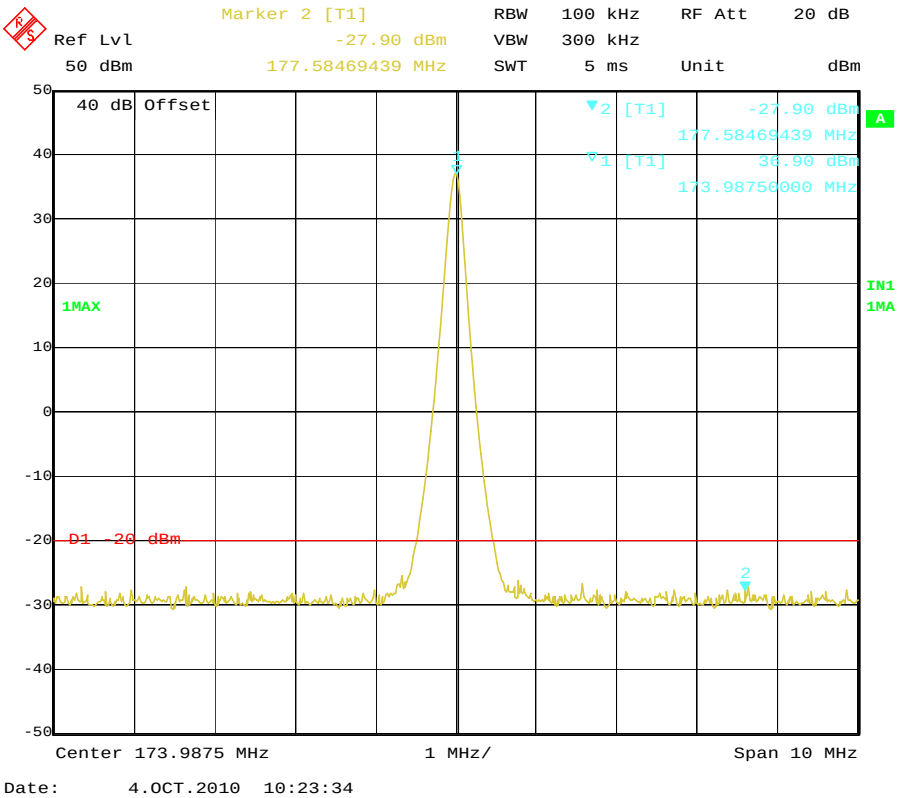


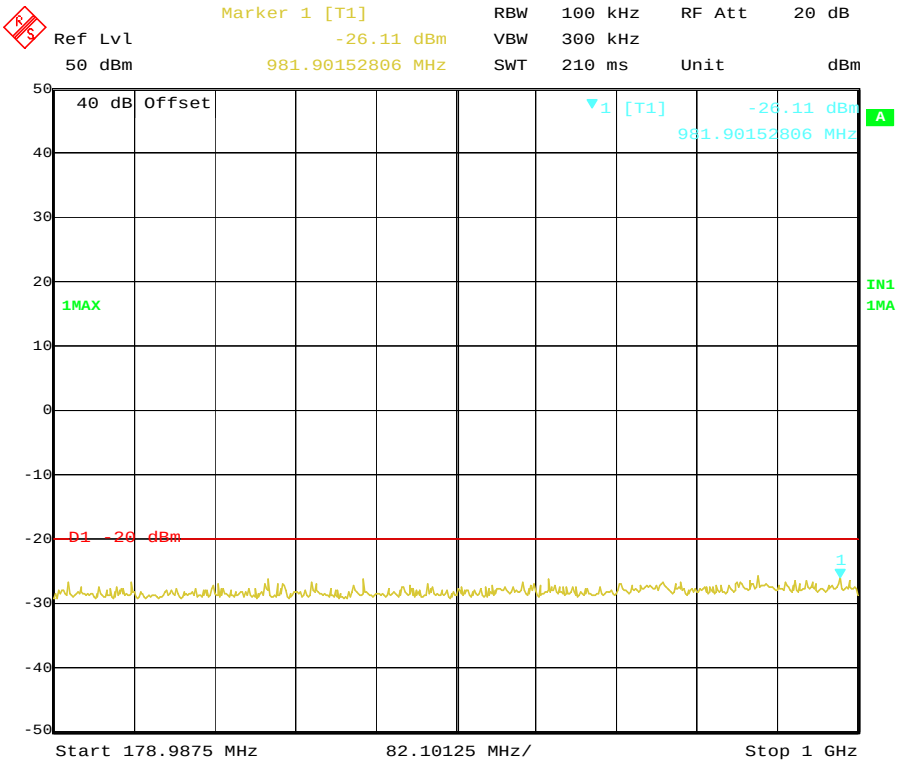

Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
-26.33 dBm
VBW 300 kHz
50 dBm
826.84544088 MHz
SWT 210 ms
Unit dBm
40 dB Offset
1 [T1]
-26.33 dBm
826.84544088 MHz
A
1MAX
IN1
1MA
D1 -20 dBm
Start 161.125 MHz
83.8875 MHz/
Stop 1 GHz
Date: 4.OCT.2010 10:25:57

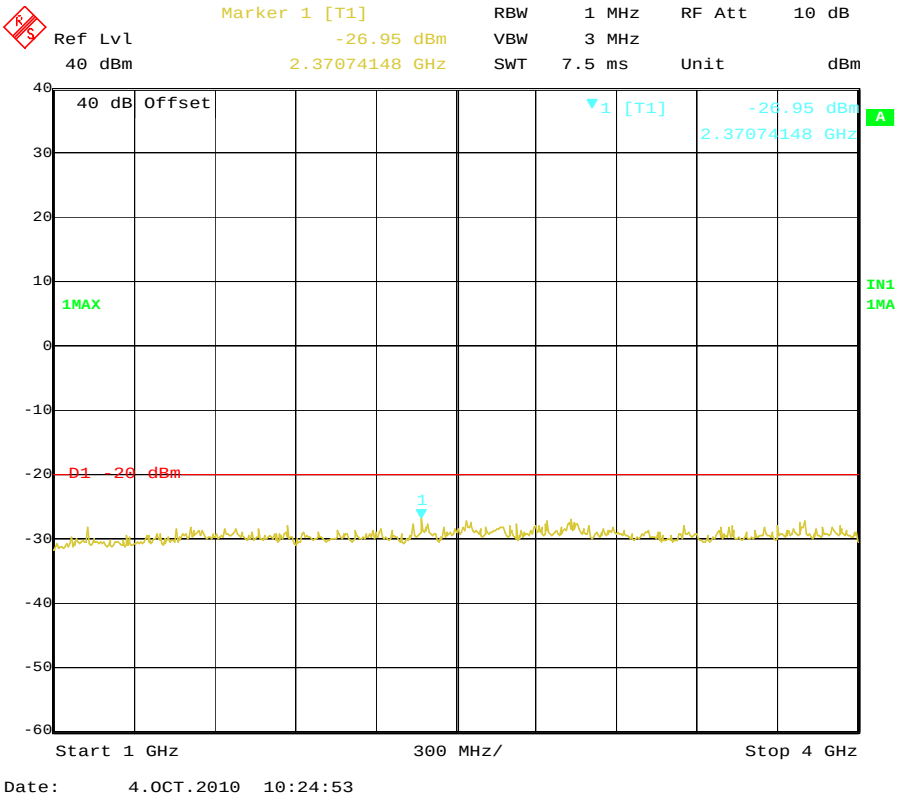

Marker 1 [T1]
RBW 1 MHz
RF Att 10 dB
Ref Lvl
-28.06 dBm
VBW 3 MHz
40 dBm
1.34869739 GHz
SWT 7.5 ms
Unit dBm
40 dB Offset
1 [T1]
-28.06 dBm
1.34869739 GHz
A
1MAX
IN1
1MA
D1 -20 dBm
Start 1 GHz
300 MHz/
Stop 4 GHz
Date: 4.OCT.2010 10:25:15

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	173.9875	981.90	-26.11	2370.74	-26.95	-20dBm
Test Results				Compliance				

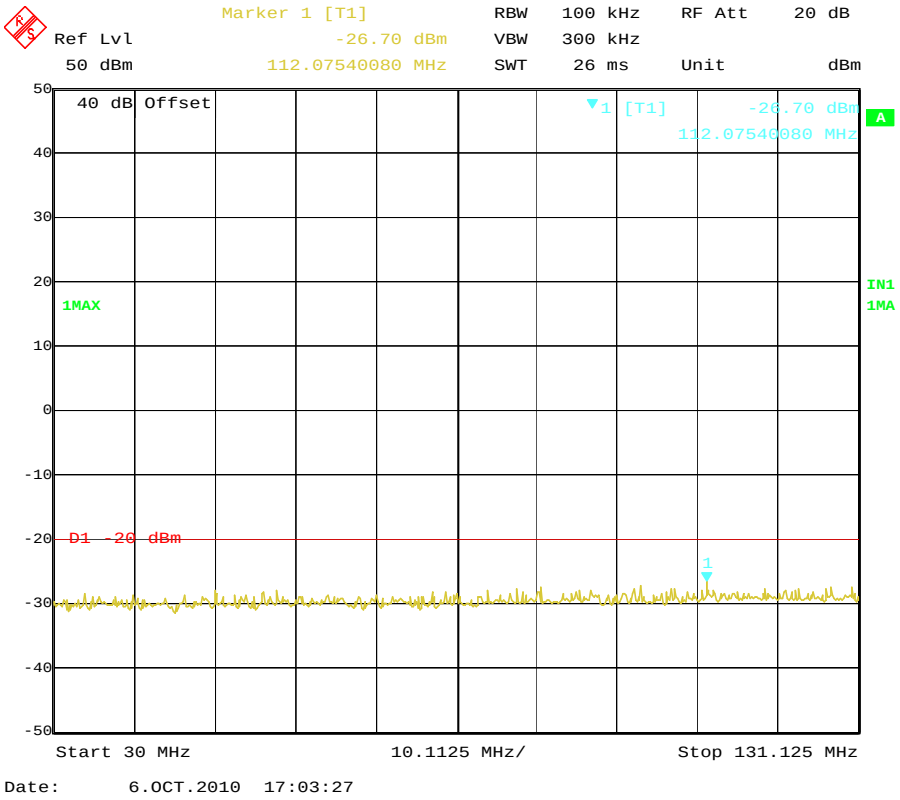


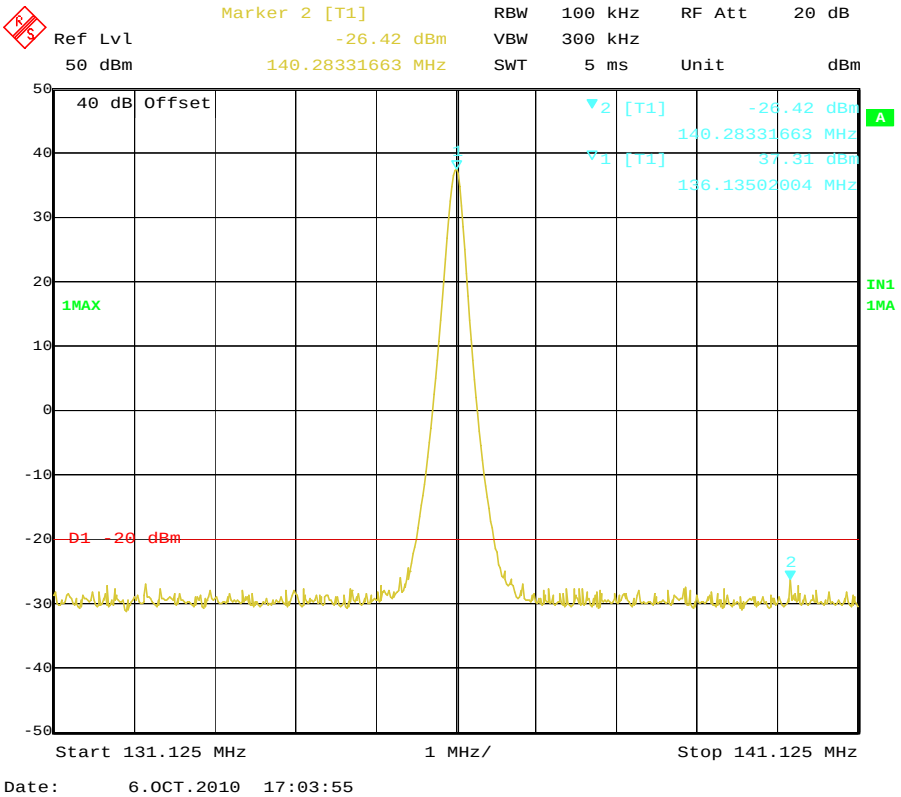


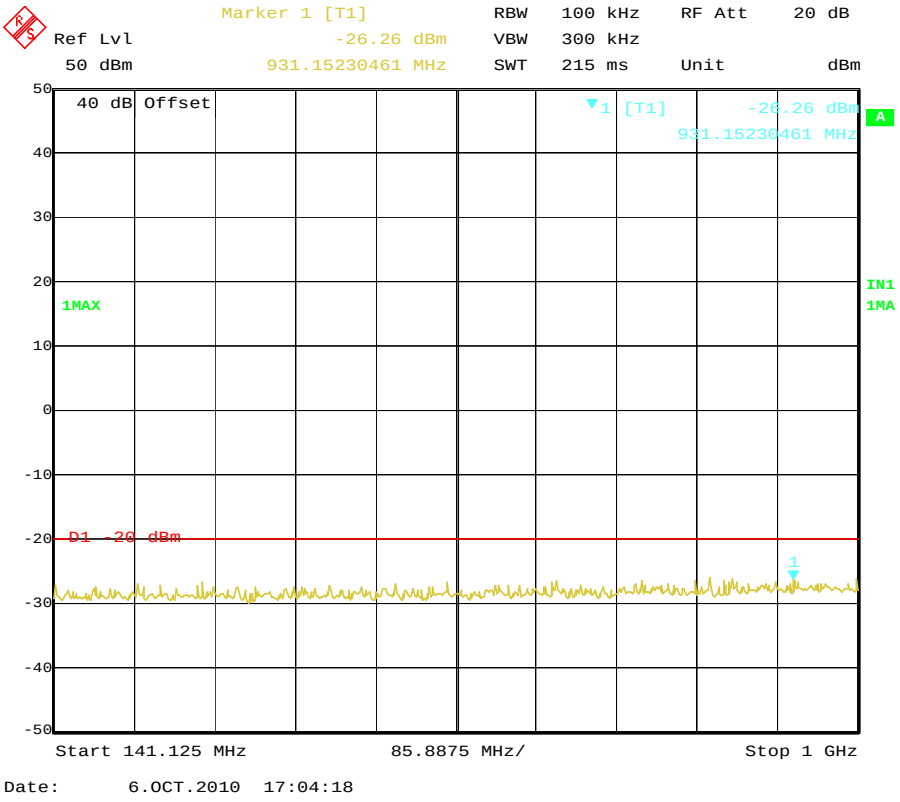

Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
-26.11 dBm
VBW 300 kHz
50 dBm
981.90152806 MHz
SWT 210 ms
Unit dBm
40 dB Offset
1 [T1]
-26.11 dBm
981.90152806 MHz
A
IN1
1MA
1MAX
D1 -20 dBm
Start 178.9875 MHz
82.10125 MHz/
Stop 1 GHz
Date: 4.OCT.2010 10:24:11

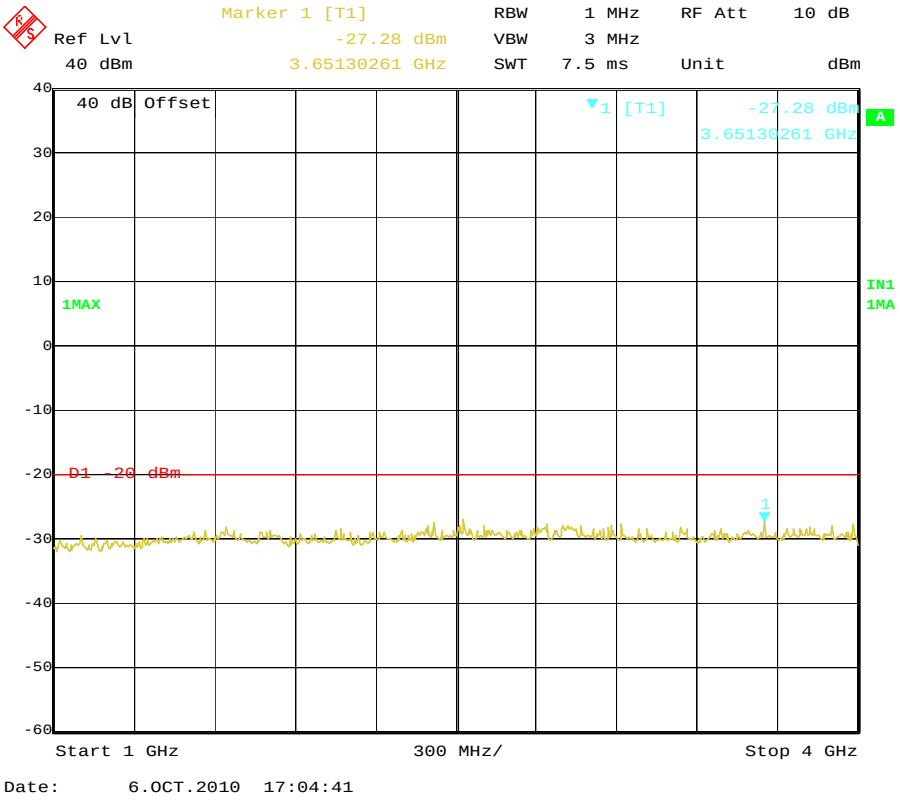

Marker 1 [T1]
RBW 1 MHz
RF Att 10 dB
Ref Lvl
-26.95 dBm
VBW 3 MHz
40 dBm
2.37074148 GHz
SWT 7.5 ms
Unit dBm
40 dB Offset
1 [T1]
-26.95 dBm
2.37074148 GHz
A
IN1
1MA
1MAX
D1 -20 dBm
Start 1 GHz
300 MHz/
Stop 4 GHz
Date: 4.OCT.2010 10:24:53

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)	
4FSK	12.5KHz	Low	136.1250	931.15	-26.26	3651.30	-27.28	-20dBm
Test Results				Compliance				

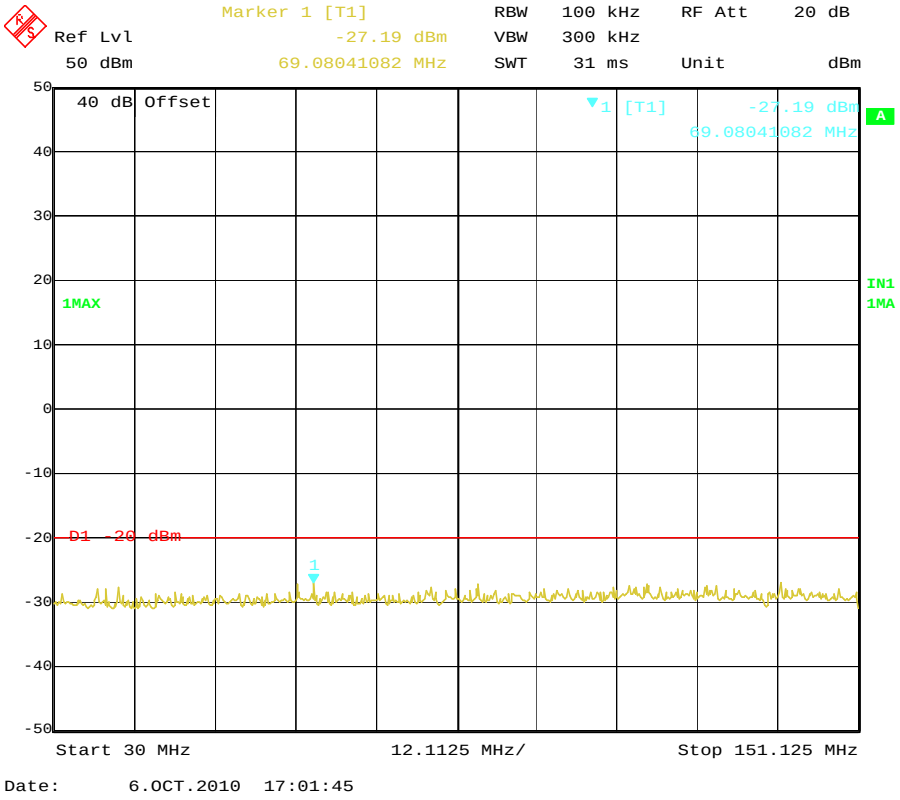


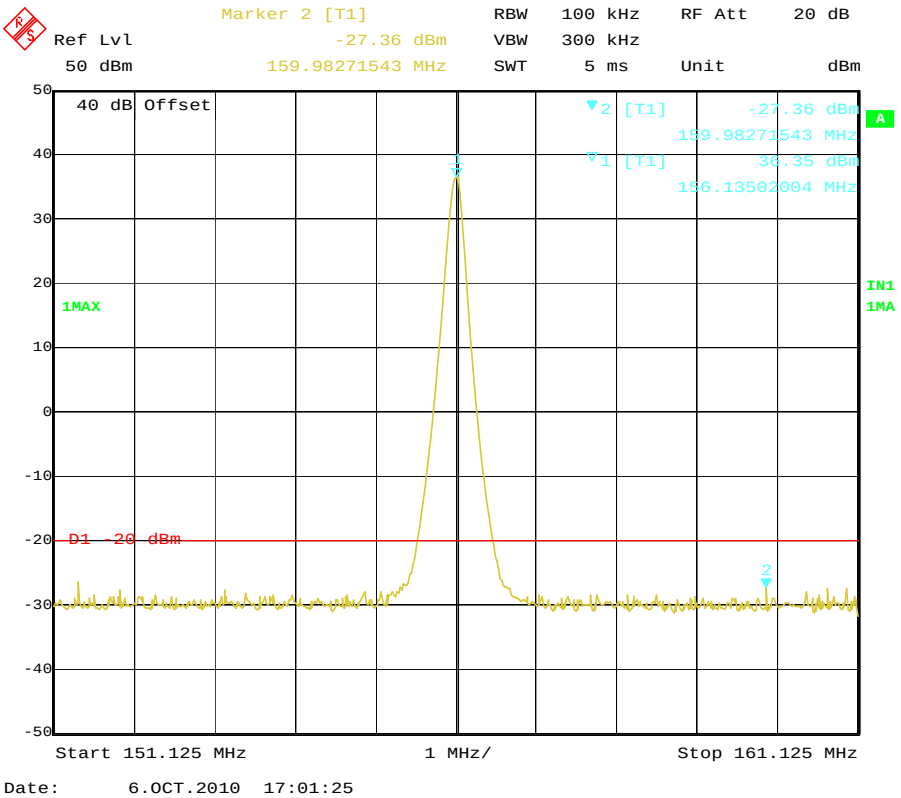


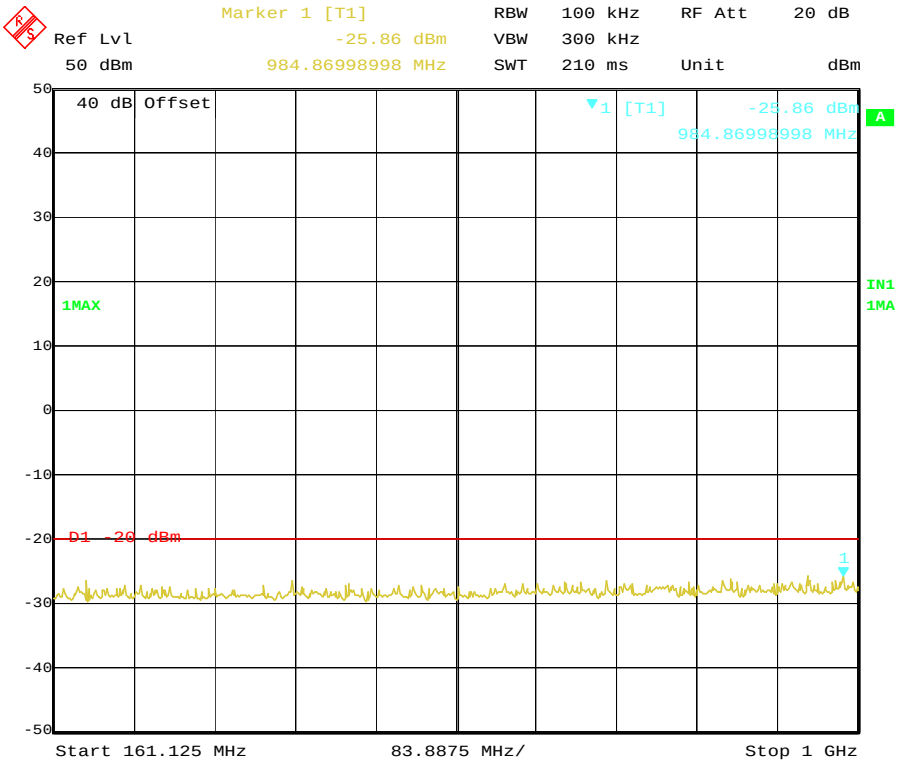

Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
-26.26 dBm
VBW 300 kHz
50 dBm
931.15230461 MHz
SWT 215 ms
Unit dBm
40 dB Offset
1 [T1]
-26.26 dBm
931.15230461 MHz
A
1MAX
IN1
1MA
D1 -20 dBm
Start 141.125 MHz
85.8875 MHz/
Stop 1 GHz
Date: 6.OCT.2010 17:04:18

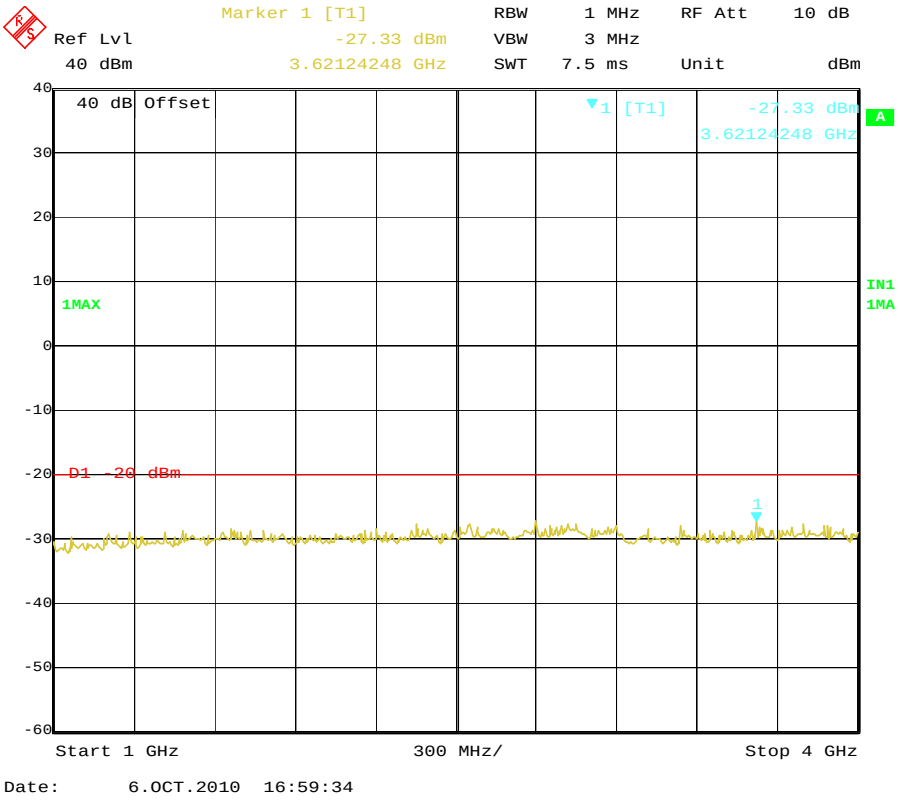

Marker 1 [T1]
RBW 1 MHz
RF Att 10 dB
Ref Lvl
-27.28 dBm
VBW 3 MHz
40 dBm
3.65130261 GHz
SWT 7.5 ms
Unit dBm
40 dB Offset
1 [T1]
-27.28 dBm
3.65130261 GHz
A
1MAX
IN1
1MA
D1 -20 dBm
Start 1 GHz
300 MHz/
Stop 4 GHz
Date: 6.OCT.2010 17:04:41

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)	
4FSK	12.5KHz	Middle	156.1250	984.87	-25.86	3621.24	-27.33	-20dBm
Test Results				Compliance				

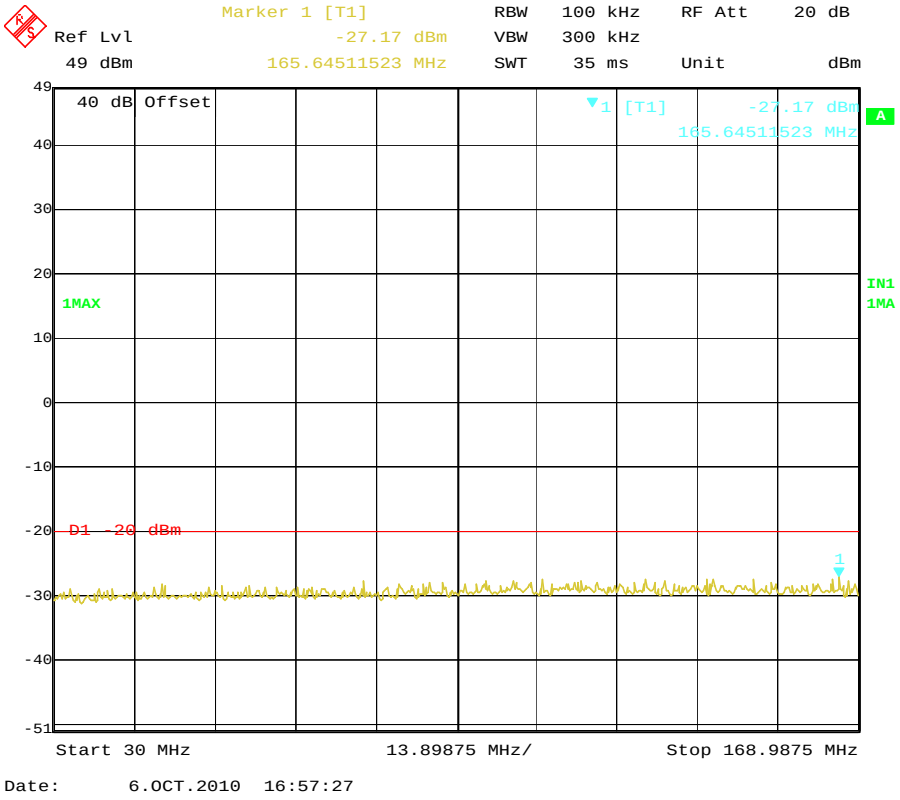


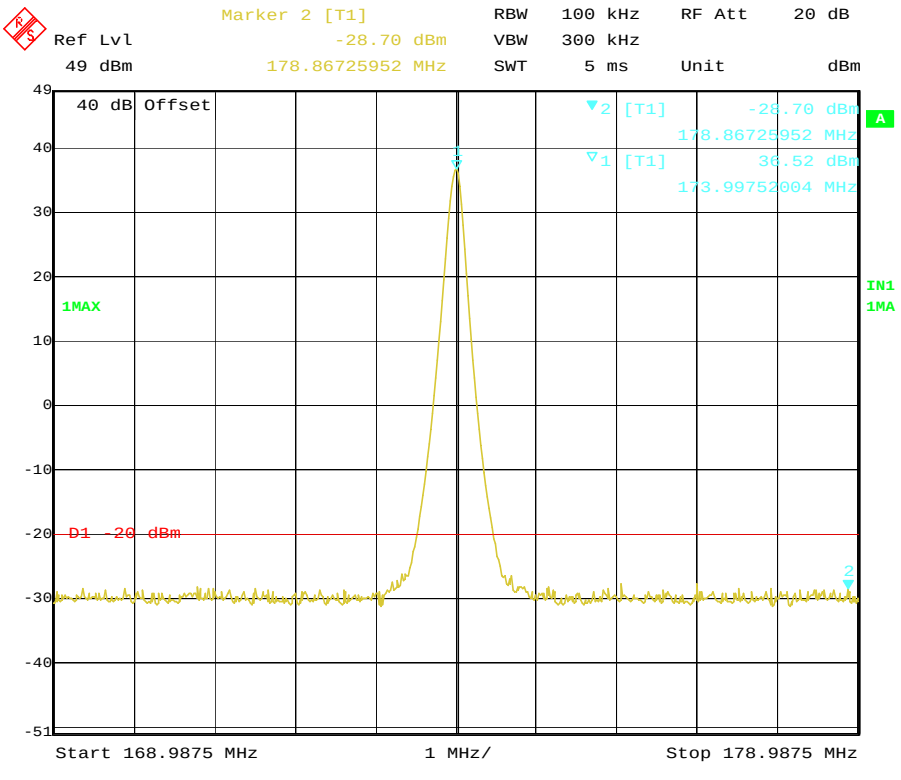


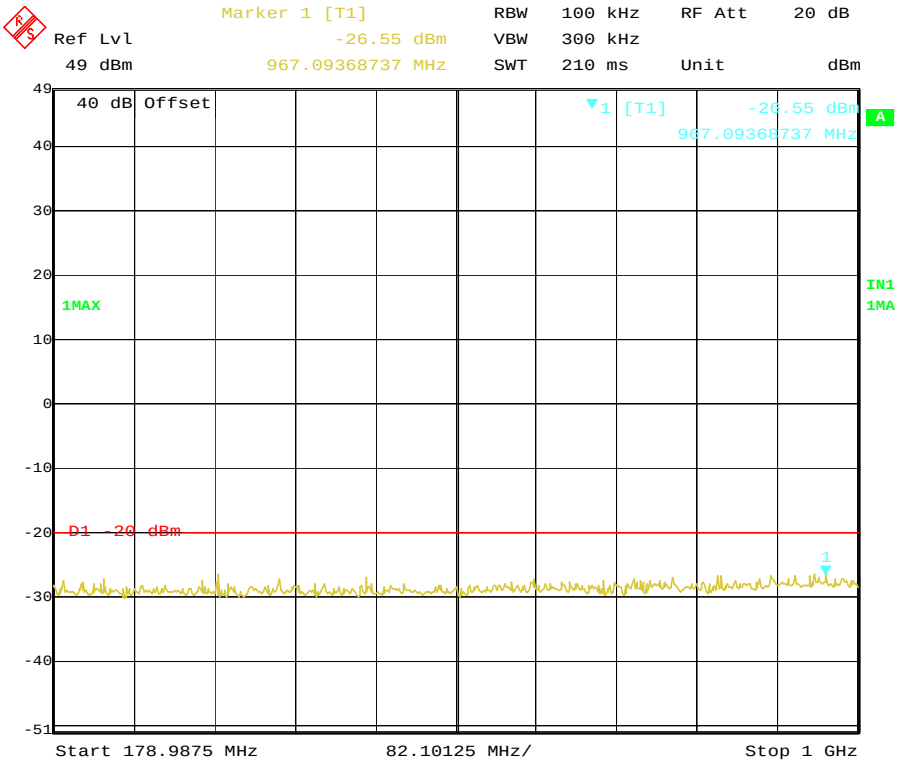

Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
-25.86 dBm
VBW 300 kHz
50 dBm
984.86998998 MHz
SWT 210 ms
Unit dBm
40 dB Offset
1 [T1]
-25.86 dBm
984.86998998 MHz
A
1MAX
IN1
1MA
D1 -20 dBm
Start 161.125 MHz
83.8875 MHz/
Stop 1 GHz
Date: 6.OCT.2010 17:00:53

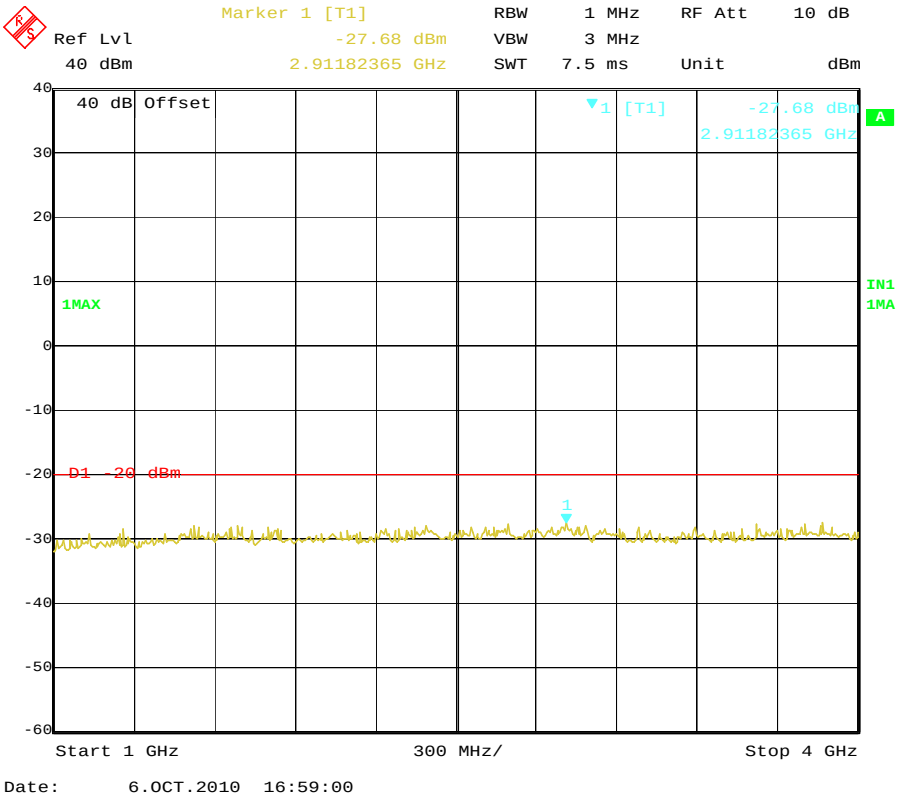

Marker 1 [T1]
RBW 1 MHz
RF Att 10 dB
Ref Lvl
-27.33 dBm
VBW 3 MHz
40 dBm
3.62124248 GHz
SWT 7.5 ms
Unit dBm
40 dB Offset
1 [T1]
-27.33 dBm
3.62124248 GHz
A
1MAX
IN1
1MA
D1 -20 dBm
Start 1 GHz
300 MHz/
Stop 4 GHz
Date: 6.OCT.2010 16:59:34

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)	
4FSK	12.5KHz	High	173.9875	967.09	-26.55	2911.82	-27.68	-20dBm
Test Results				Compliance				






Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
-26.55 dBm
VBW 300 kHz
49 dBm
967.09368737 MHz
SWT 210 ms
Unit dBm
40 dB Offset
1 [T1]
-26.55 dBm
967.09368737 MHz
A
1MAX
IN1
1MA
D1 -20 dBm
Start 178.9875 MHz
82.10125 MHz/
Stop 1 GHz
Date: 6.OCT.2010 16:58:32


Marker 1 [T1]
RBW 1 MHz
RF Att 10 dB
Ref Lvl
-27.68 dBm
VBW 3 MHz
40 dBm
2.91182365 GHz
SWT 7.5 ms
Unit dBm
40 dB Offset
1 [T1]
-27.68 dBm
2.91182365 GHz
A
1MAX
IN1
1MA
D1 -20 dBm
Start 1 GHz
300 MHz/
Stop 4 GHz
Date: 6.OCT.2010 16:59:00

4.5. Modulation Charcateristics

TEST APPLICABLE

According toCFR47 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

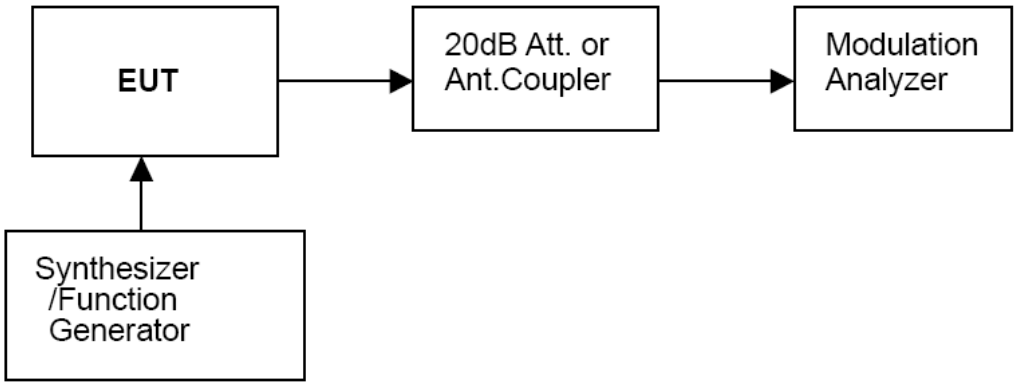
Modulation Limit

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, 1500 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 3 KHz and record the frequency deviation.
4 Audio Frequency Response =20log10 (Deviation of test frequency/Deviation of 1 KHz reference).

TEST CONFIGURATION

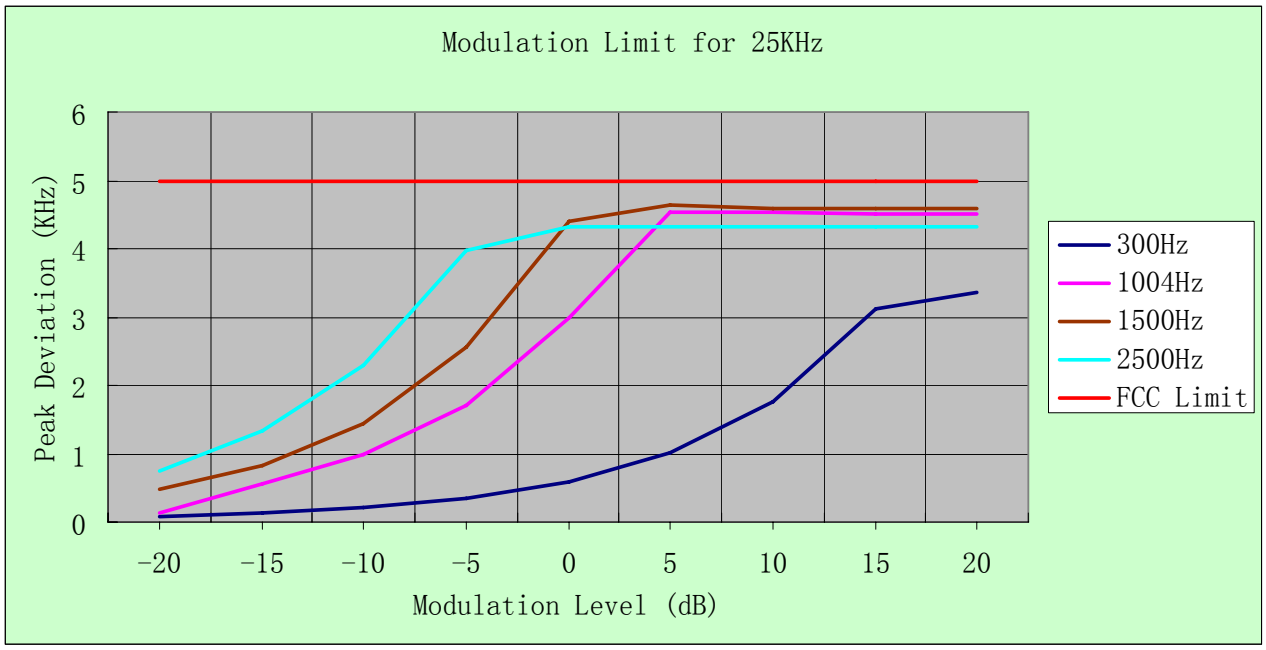


TEST RESULTS

Modulation Type: FM

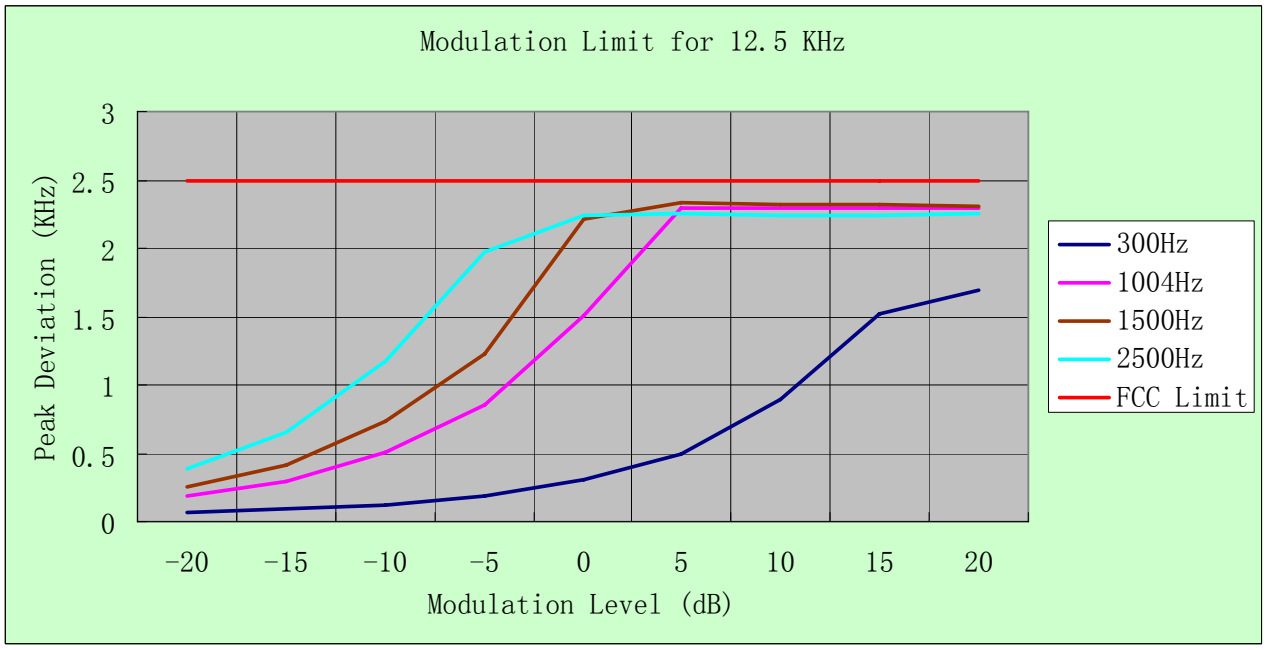
25 KHz Channel Separation

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	0.13	0.47	0.75
-15	0.14	0.57	0.84	1.33
-10	0.21	0.98	1.43	2.30
-5	0.36	1.72	2.55	3.98
0	0.58	2.98	4.40	4.33
+5	1.01	4.54	4.63	4.33
+10	1.76	4.54	4.60	4.33
+15	3.12	4.52	4.60	4.33
+20	3.36	4.52	4.60	4.33



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	0.07	0.19	0.26	0.39
-15	0.09	0.29	0.41	0.65
-10	0.12	0.51	0.73	1.17
-5	0.19	0.85	1.23	1.97
0	0.31	1.51	2.21	2.24
+5	0.50	2.30	2.33	2.25
+10	0.89	2.30	2.32	2.24
+15	1.52	2.30	2.32	2.24
+20	1.70	2.30	2.31	2.25



Modulation type: 4FSK

Channel bandwidth: 12.5 kHz

It is not applicable for devices which operate with the digitized voice/data modulation type.

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

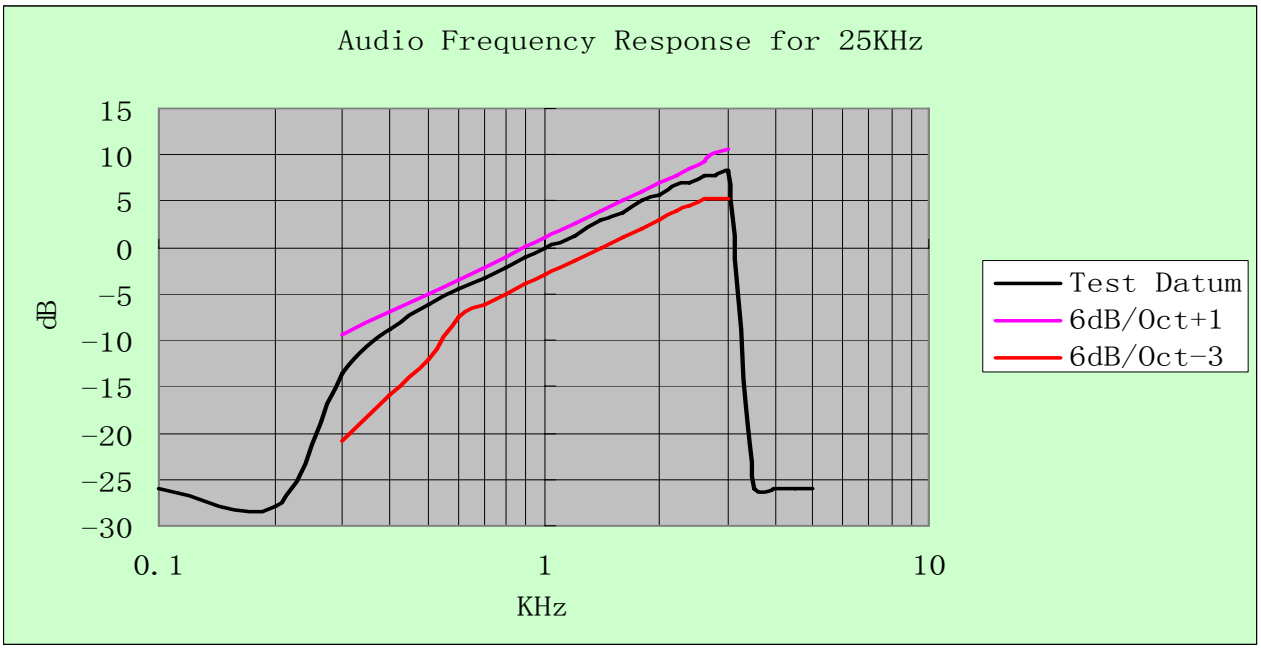
Test Audio Level (1 KHz and 20% maximum deviation) for 25 KHz channel separation is 27mv and 26mv for 12.5 KHz channel separation.

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

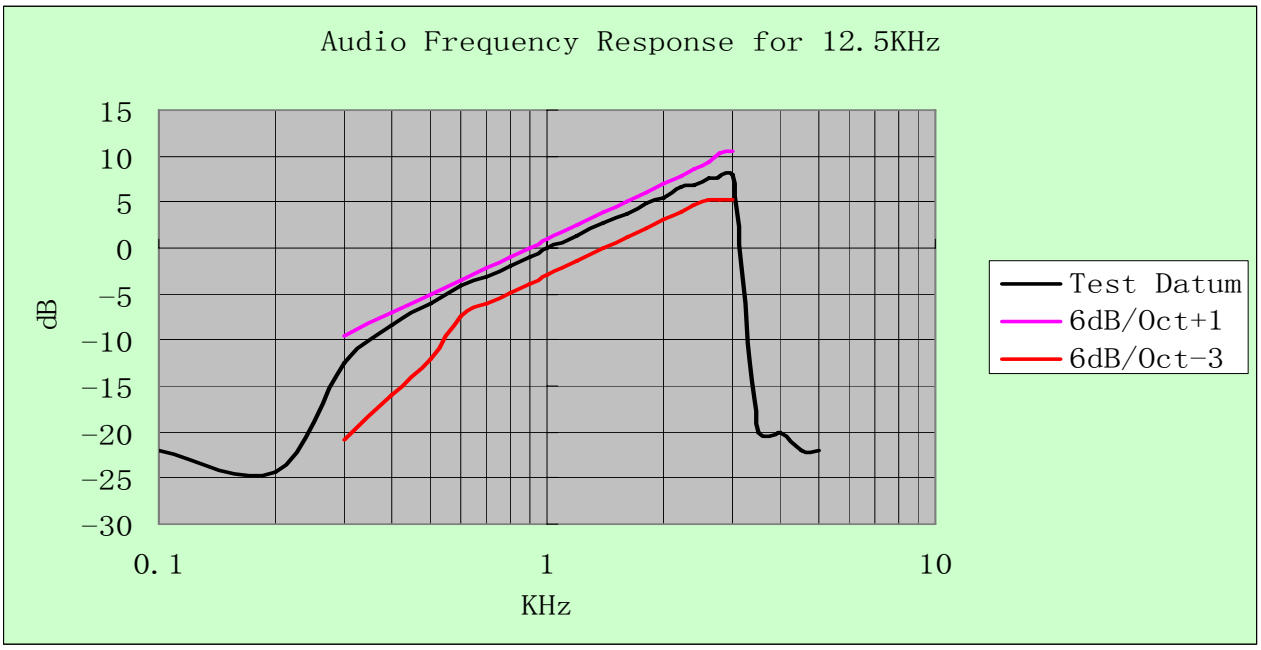
For 25 KHz

Frequency (KHz)	Frequency Deviation (KHz)	1KHz Reference Deviation (KHz)	Audio Frequency Response (dB)
0.1	0.05	1.00	-26.02
0.2	0.04	1.00	-27.96
0.3	0.21	1.00	-13.56
0.4	0.36	1.00	-8.87
0.5	0.49	1.00	-6.20
0.6	0.60	1.00	-4.44
0.7	0.69	1.00	-3.22
0.8	0.78	1.00	-2.16
0.9	0.89	1.00	-1.01
1.0	1.00	1.00	0
1.2	1.16	1.00	1.29
1.4	1.40	1.00	2.92
1.6	1.54	1.00	3.75
1.8	1.78	1.00	5.01
2.0	1.92	1.00	5.67
2.2	2.17	1.00	6.73
2.4	2.25	1.00	7.04
2.6	2.43	1.00	7.71
2.7	2.43	1.00	7.71
2.8	2.46	1.00	7.82
3.0	2.53	1.00	8.06
3.5	0.05	1.00	-26.02
4.0	0.05	1.00	-26.02
4.5	0.05	1.00	-26.02
5.0	0.05	1.00	-26.02



For 12.5 KHz

Frequency (KHz)	Frequency Deviation (KHz)	1KHz Refenerce Deviation (KHz)	Audio Frequency Response (dB)
0.1	0.04	0.50	-21.94
0.2	0.03	0.50	-24.44
0.3	0.12	0.50	-12.40
0.4	0.19	0.50	-8.40
0.5	0.25	0.50	-6.02
0.6	0.31	0.50	-4.15
0.7	0.35	0.50	-3.10
0.8	0.40	0.50	-1.94
0.9	0.45	0.50	-0.92
1.0	0.50	0.50	0
1.2	0.58	0.50	1.29
1.4	0.69	0.50	2.80
1.6	0.76	0.50	3.64
1.8	0.88	0.50	4.91
2.0	0.94	0.50	5.48
2.2	1.06	0.50	6.53
2.4	1.10	0.50	6.85
2.6	1.21	0.50	7.68
2.7	1.21	0.50	7.68
2.8	1.22	0.50	7.75
3.0	1.26	0.50	8.03
3.5	0.05	0.50	-20.00
4.0	0.05	0.50	-20.00
4.5	0.04	0.50	-21.94
5.0	0.04	0.50	-21.94



Modulation type: 4FSK

Channel bandwidth: 12.5 kHz

It is not applicable for devices which operate with the digitized voice/data modulation type.

4.6. Frequency Stability Test

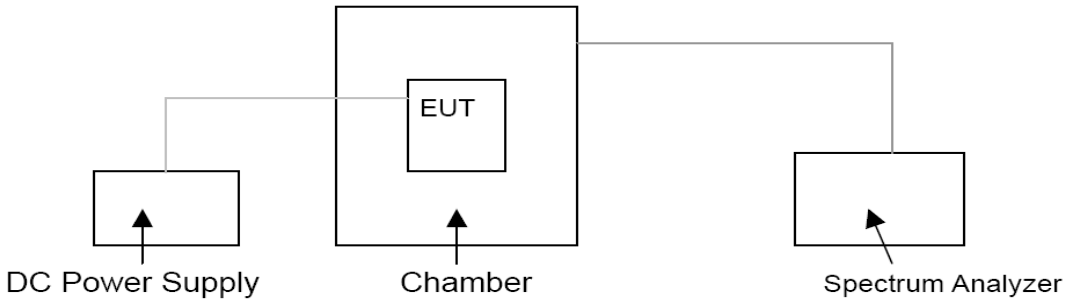
TEST APPLICABLE

1 According to FCC Part 2 Section 2.1055 (a)(1), the frequency stability shall be measured with variation of ambient temperature from -30℃ to +60℃ centigrade.
2 According to FCC Part 2 Section 2.1055 (a) (2), 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 manufacture.
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, the frequency stability limit is 5.0 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

Modulation Type	Channel Separation	Test conditions		Frequency error (ppm)		
		Voltage(V)	Temp(℃)	Low Channel	Middle Channel	High Channel
Analog/FM	25KHz	13.60	-30	-1.38	-1.33	-1.56
			-20	-1.05	-1.10	-1.34
			-10	-0.93	-0.95	-1.13
			0	-0.88	-0.86	-1.05
			10	-0.74	-0.79	-0.96
			20	-0.74	-0.77	-0.92
			30	-0.82	-0.86	-0.92
			40	-0.89	-0.91	-1.08
			50	-0.95	-0.97	-1.17
		11.0 (85% Rated)	20	-1.03	-0.90	-0.92
		15.6 (115% Rated)	20	-0.88	-1.03	-0.81
Limit			5.0 ppm			
Conclusion			Complies			

Modulation Type	Channel Separation	Test conditions		Frequency error (ppm)		
		Voltage(V)	Temp(℃)	Low Channel	Middle Channel	High Channel
Analog/FM	12.5KHz	13.60	-30	-1.38	-1.31	-1.58
			-20	-1.00	-1.10	-1.34
			-10	-0.95	-0.97	-1.16
			0	-0.88	-0.88	-1.00
			10	-0.76	-0.77	-0.92
			20	-0.74	-0.77	-0.92
			30	-0.81	-0.86	-1.08
			40	-0.89	-0.93	-1.14
			50	-0.92	-0.95	-1.14
		11.0 (85% Rated)	20	-0.88	-0.90	-0.92
		15.6 (115% Rated)	20	-0.88	-1.03	-0.92
Limit			5.0 ppm			
Conclusion			Complies			

Modulation Type	Channel Separation	Test conditions		Frequency error (ppm)		
		Voltage(V)	Temp(℃)	Low Channel	Middle Channel	High Channel
Digital/4FSK	12.5KHz	13.60	-30	-1.33	-1.35	-1.58
			-20	-1.05	-1.11	-1.34
			-10	-0.97	-0.97	-1.12
			0	-0.82	-0.89	-1.02
			10	-0.77	-0.78	-0.93
			20	-0.74	-0.77	-0.93
			30	-0.81	-0.77	-1.00
			40	-0.92	-0.89	-1.15
			50	-0.92	-0.93	-1.18
		11.0 (85% Rated)	20	-0.88	-0.90	-0.92
		15.6 (115% Rated)	20	-1.05	-1.03	-0.81
Limit			5.0 ppm			
Conclusion			Complies			

4.7. Maximum Transmitter Power

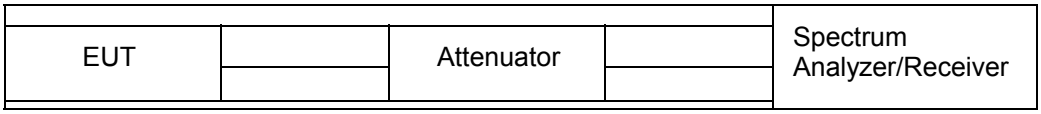
TEST APPLICABLE

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

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 bellow:
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 13.60 V stabilized supply voltage.

TEST CONFIGURATION



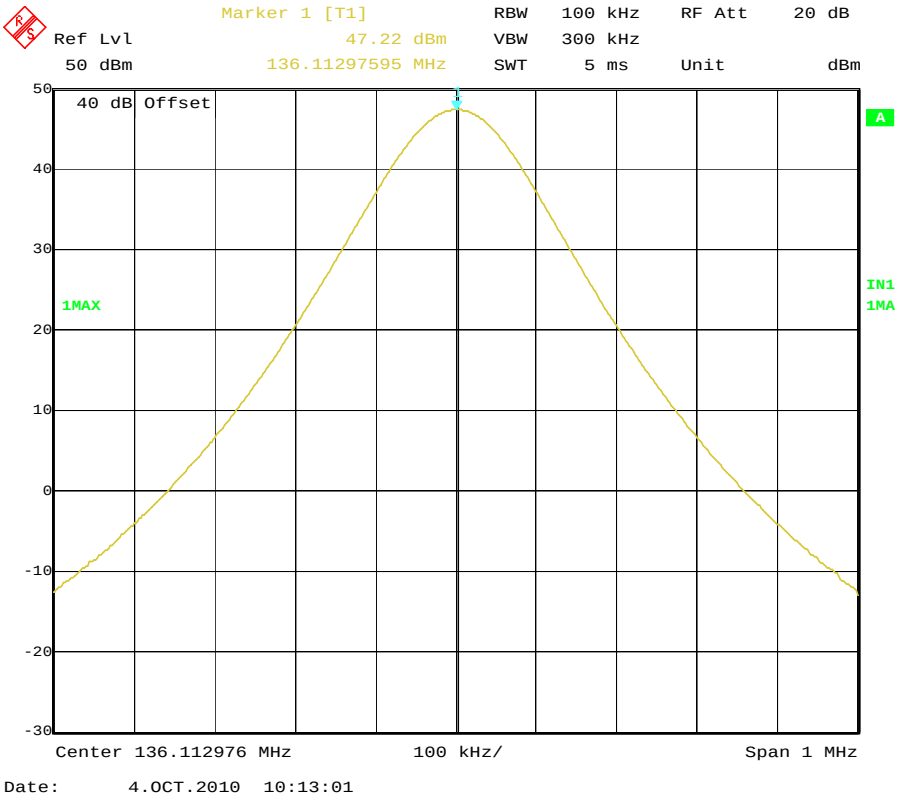
The EUT was directly connected to a RF Communication Test set by a 40 dB attenuator

TEST RESULTS

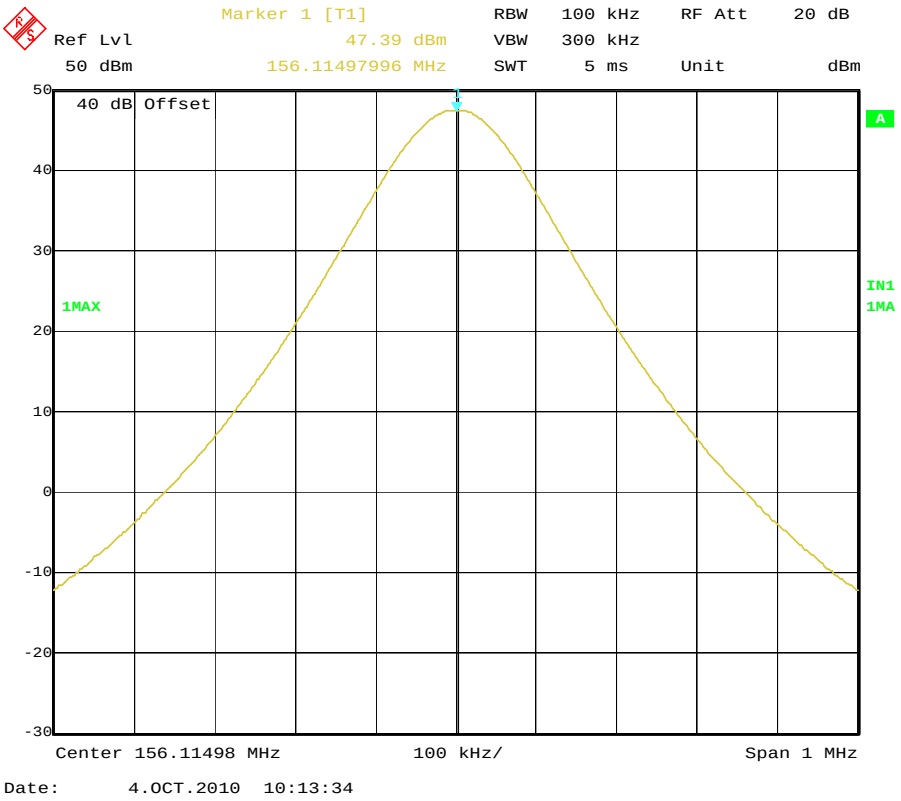
Modulation Type	Channel Separation	Test Channel	Test Frequency	Maximum Transmitter Power at Rated High Power Level(dBm)	Maximum Transmitter Power at Rated Low Power Level(dBm)
Analog/FM	25KHz	Low Channel	136.1250 MHz	47.22	37.51
		Middle Channel	156.1250 MHz	47.39	36.82
		High Channel	173.9875 MHz	47.32	36.95
	12.5KHz	Low Channel	136.1250 MHz	47.22	37.49
		Middle Channel	156.1250 MHz	47.37	36.81
		High Channel	173.9875 MHz	47.30	36.93
Digital/4FSK	12.5KHz	Low Channel	136.1250 MHz	47.36	37.31
		Middle Channel	156.1250 MHz	47.45	36.40
		High Channel	173.9875 MHz	47.39	36.53
Limit		The limit is dependent upon the station's antenna HAAT and required service area.			
Test Results		Complicance			

Plots of Maximum Transmitter Power Measurement

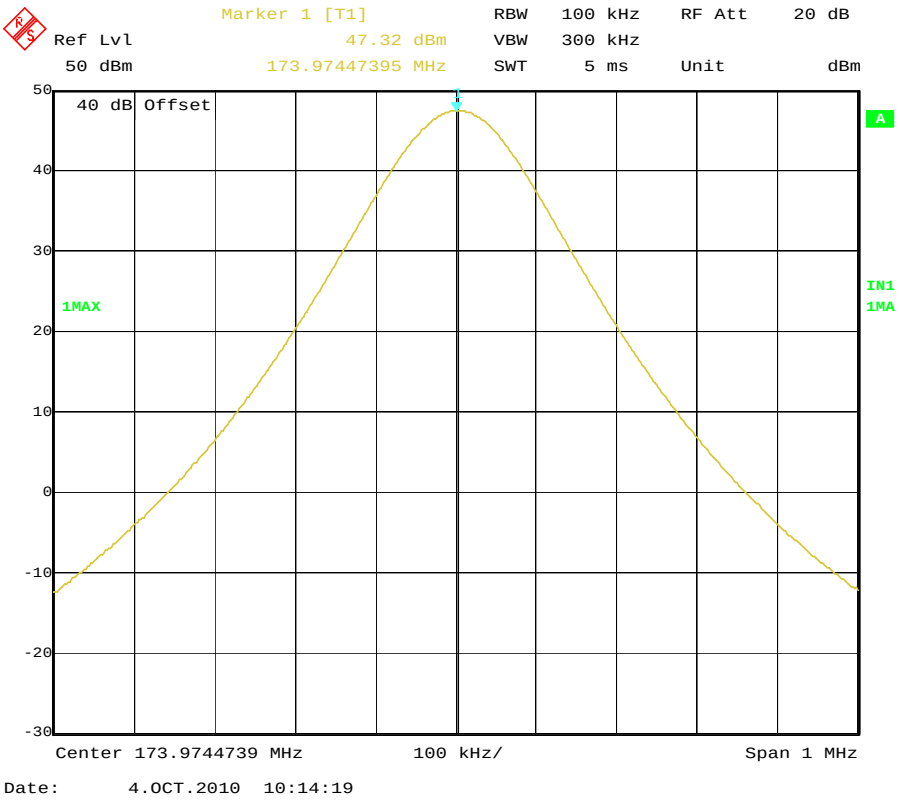
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	25 KHz	136.1250	50	47.22	Varies	Complicance



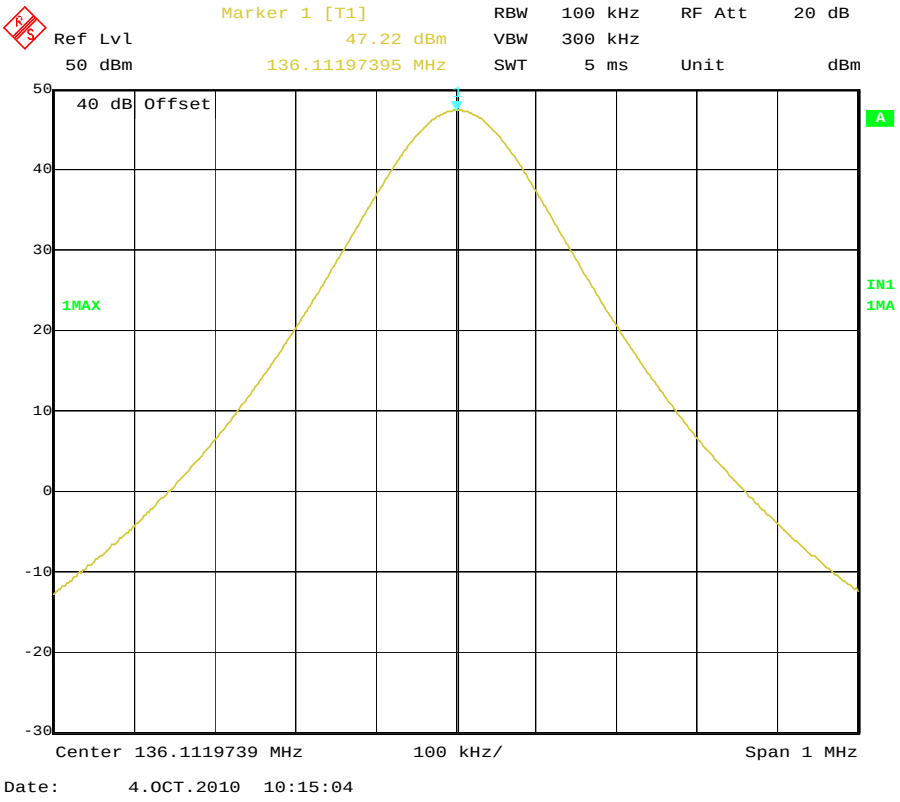
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	25 KHz	156.1250	50	47.39	Varies	Complicance



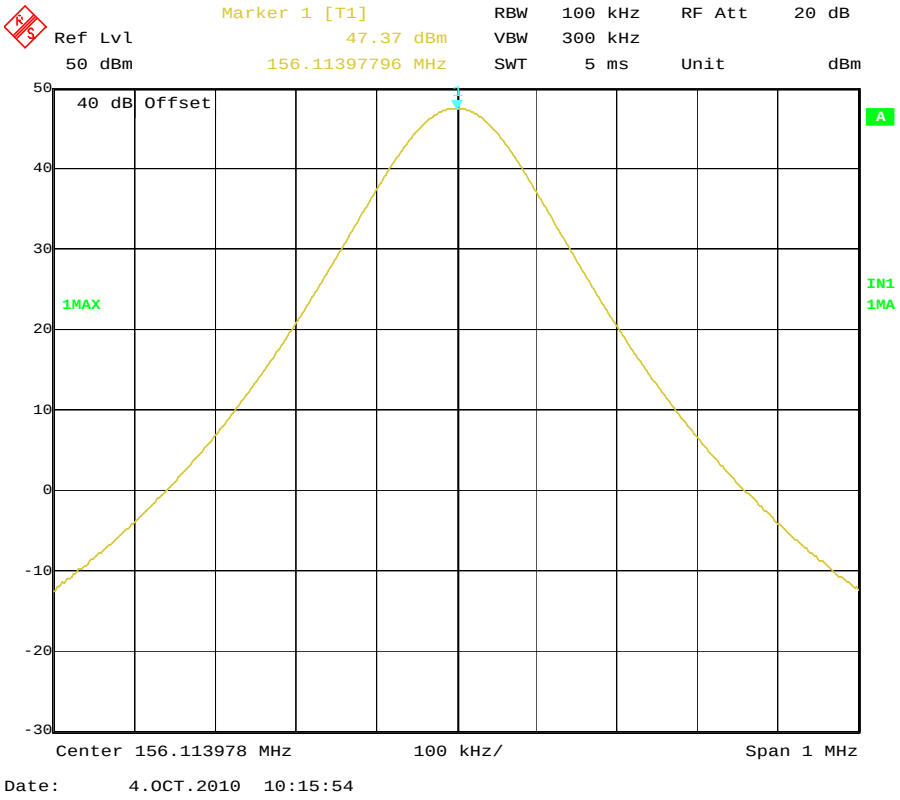
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	25 KHz	173.9875	50	47.32	Varies	Complicance



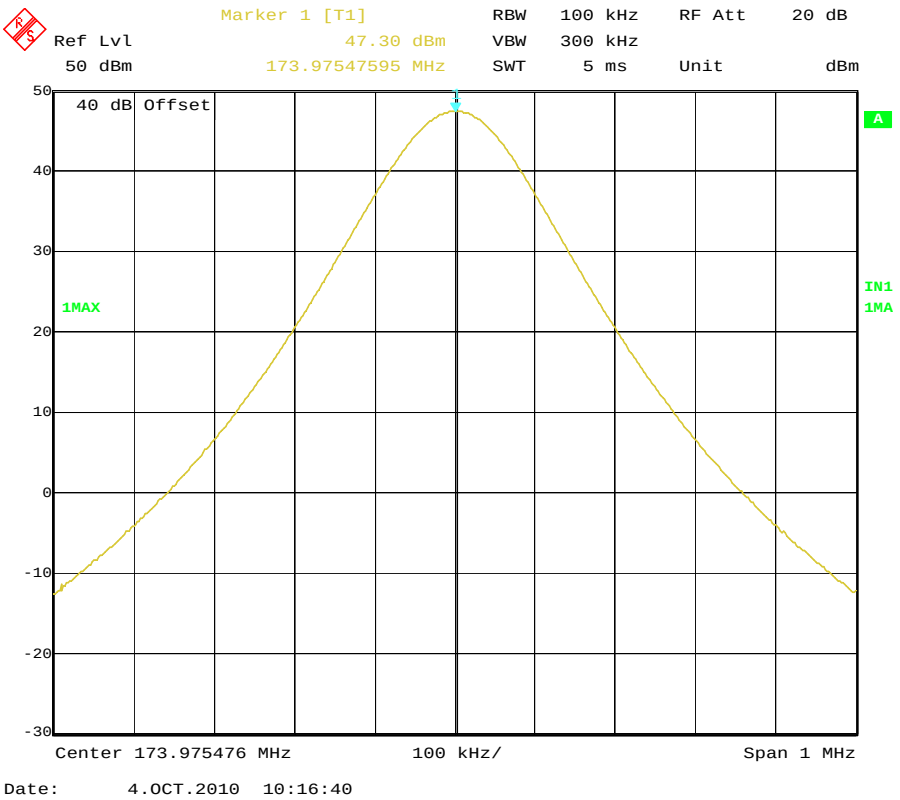
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	12.5 KHz	136.1250	50	47.22	Varies	Complicance



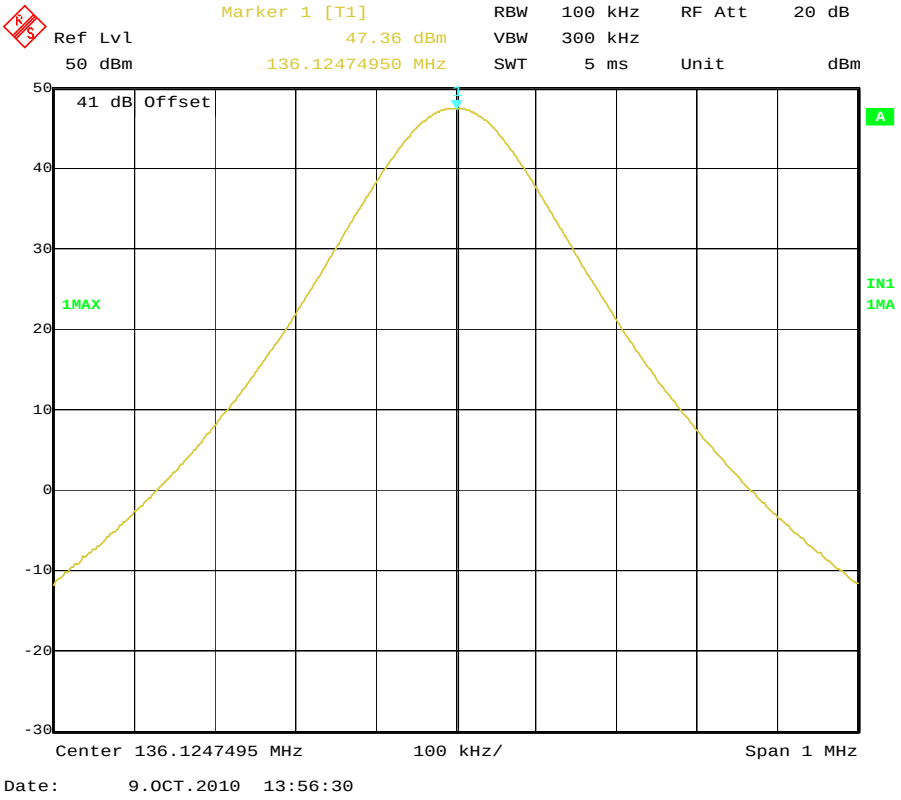
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	12.5 KHz	156.1250	50	47.37	Varies	Complicance



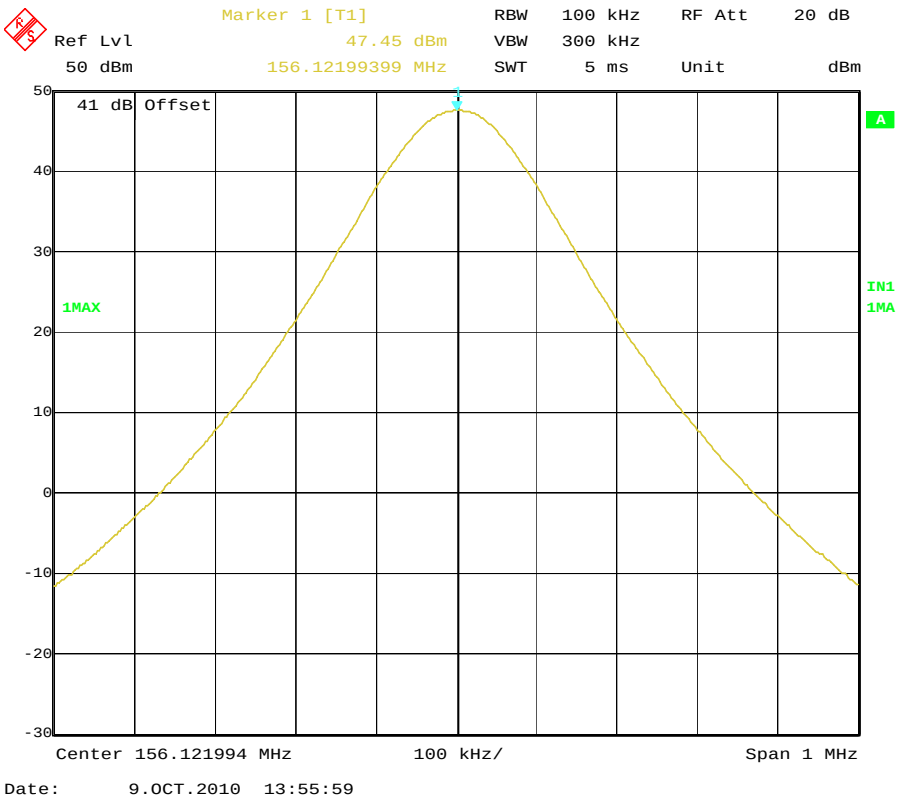
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	12.5 KHz	173.9875	50	47.30	Varies	Complicance



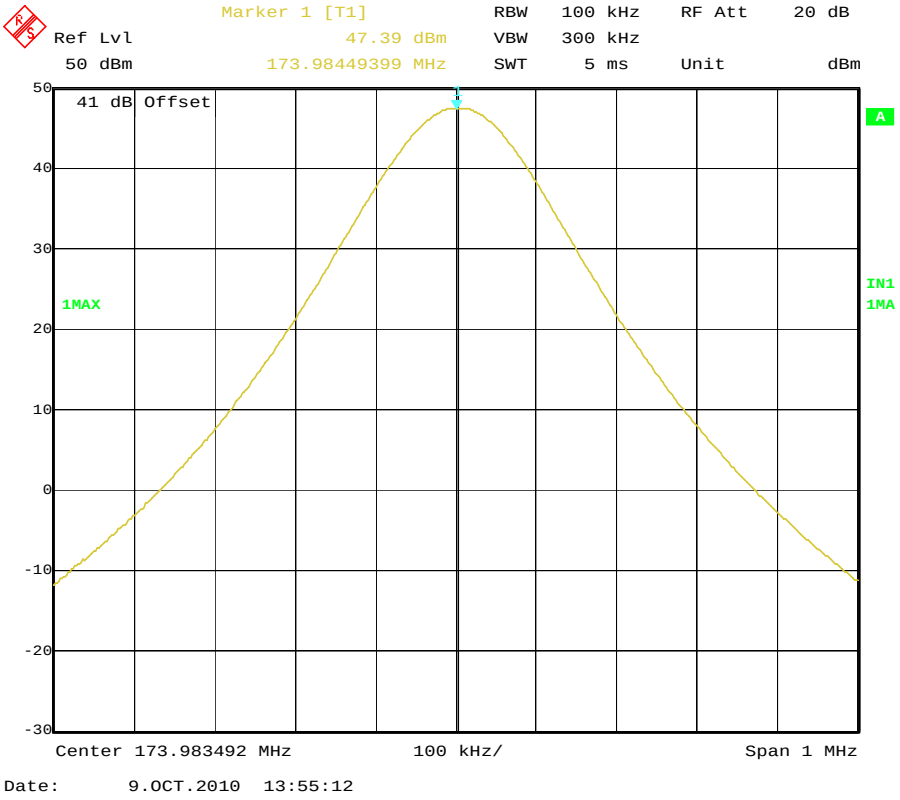
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
4FSK	12.5 KHz	136.1250	50	47.36	Varies	Complicance



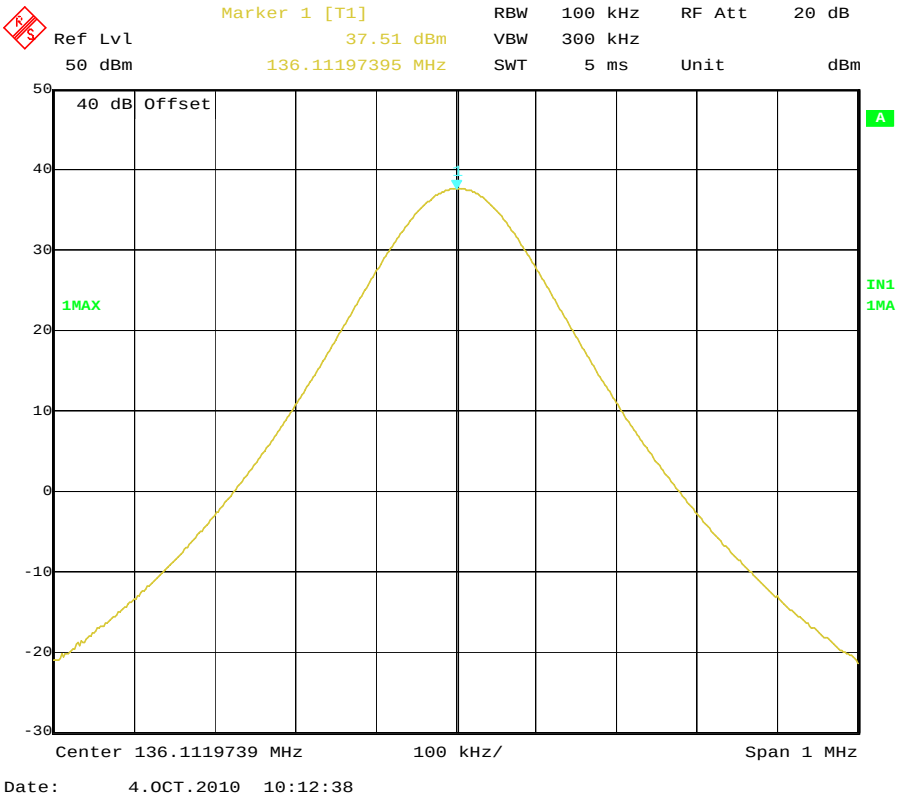
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
4FSK	12.5 KHz	156.1250	50	47.45	Varies	Complicance



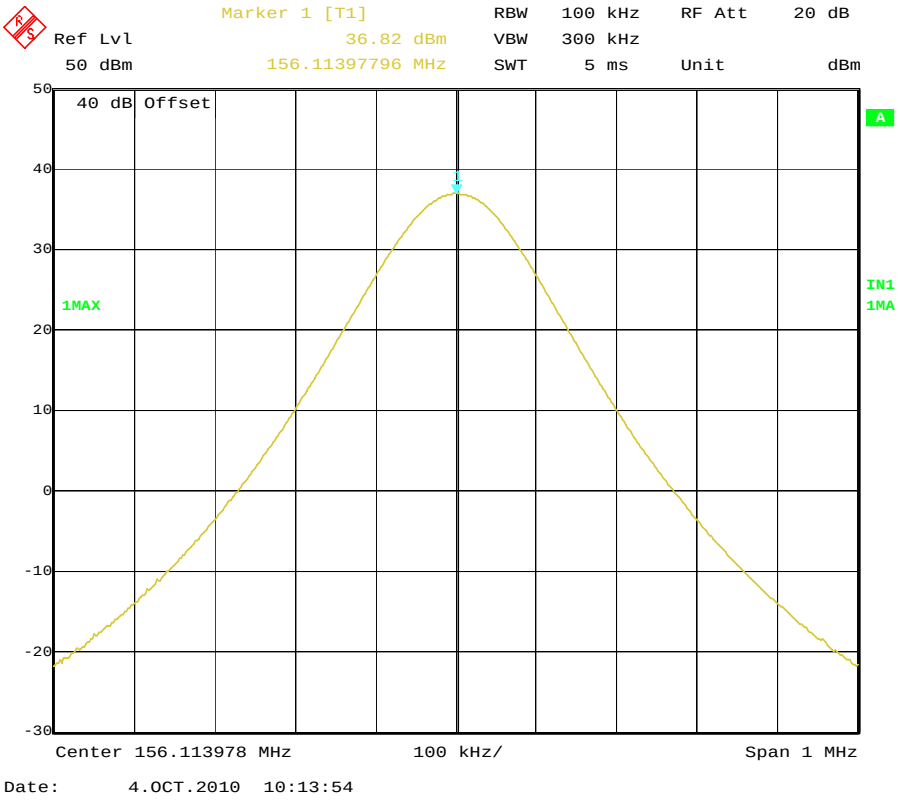
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
4FSK	12.5 KHz	173.9875	50	47.39	Varies	Complicance



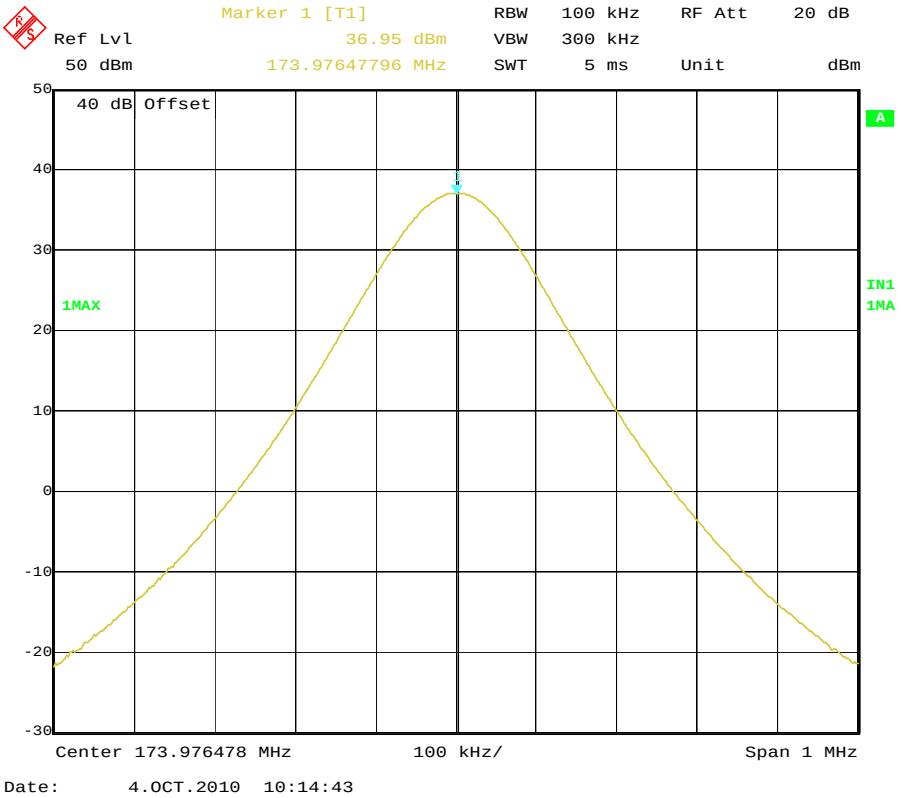
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	25 KHz	136.1250	5	37.51	Varies	Complicance



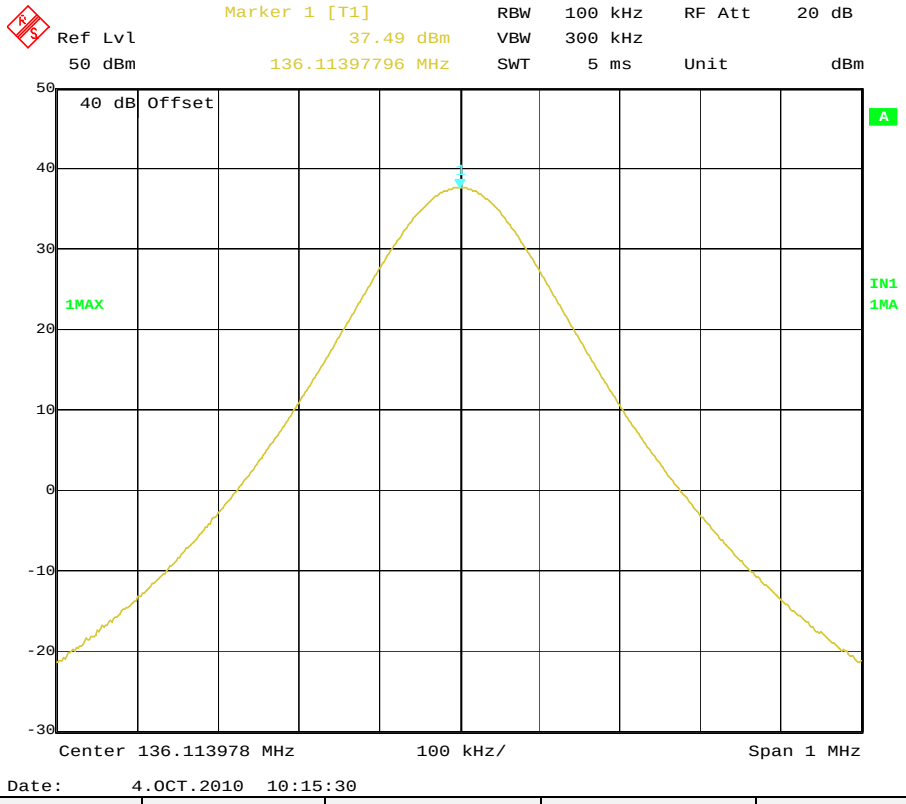
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	25 KHz	156.1250	5	36.82	Varies	Complicance



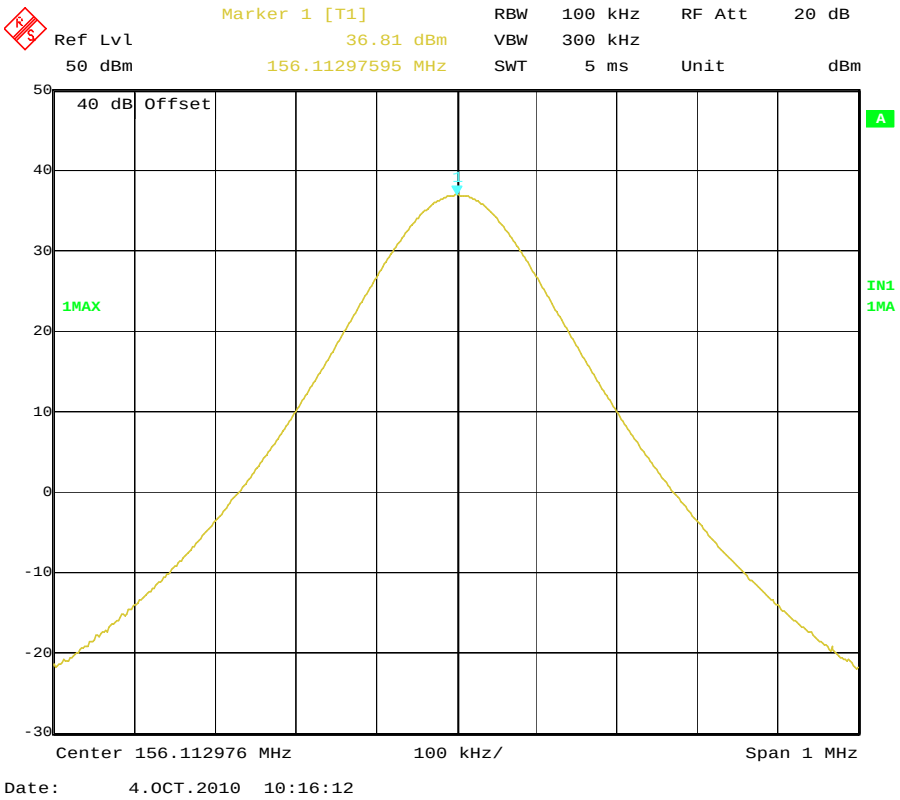
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	25 KHz	173.9875	5	36.95	Varies	Complicance



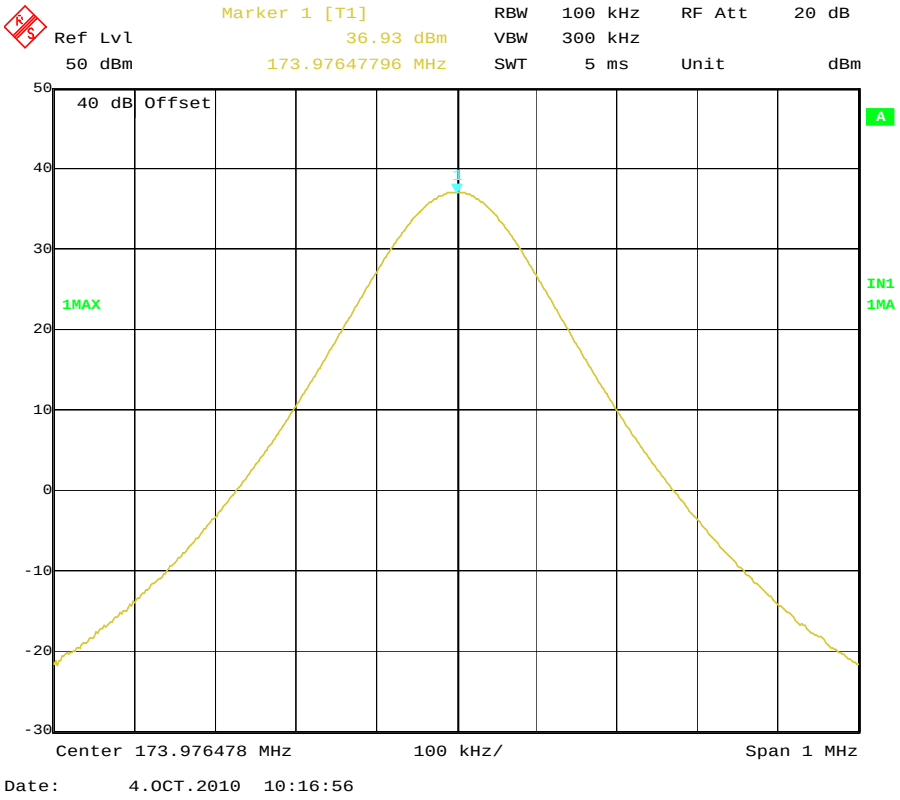
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	12.5 KHz	136.1250	5	37.49	Varies	Complicance



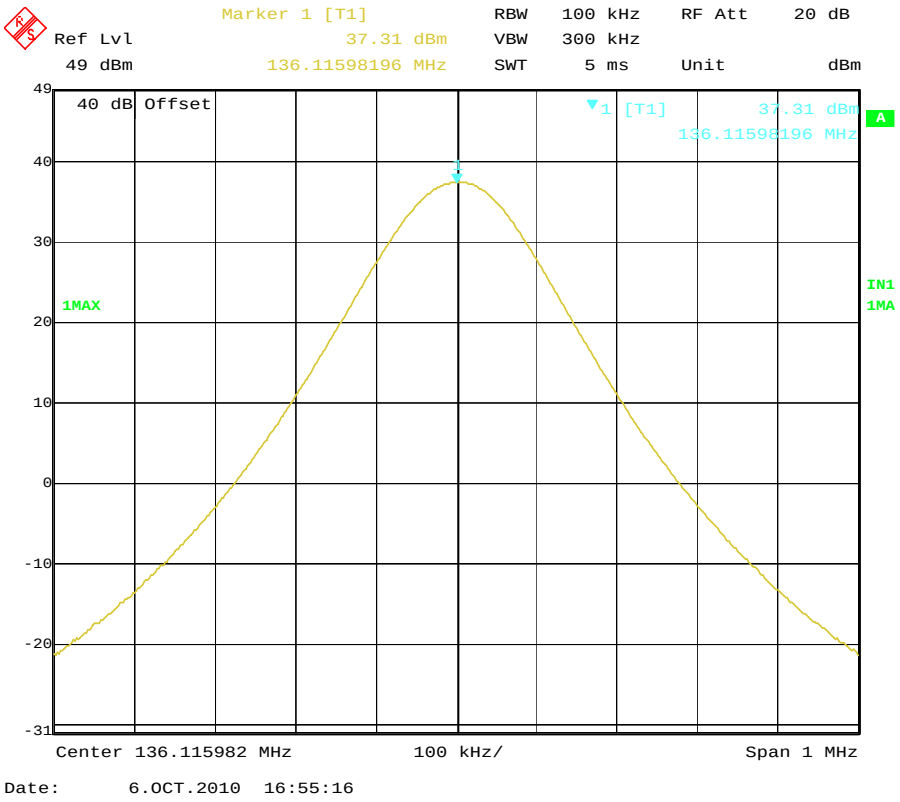
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	12.5 KHz	156.1250	5	36.81	Varies	Complicance



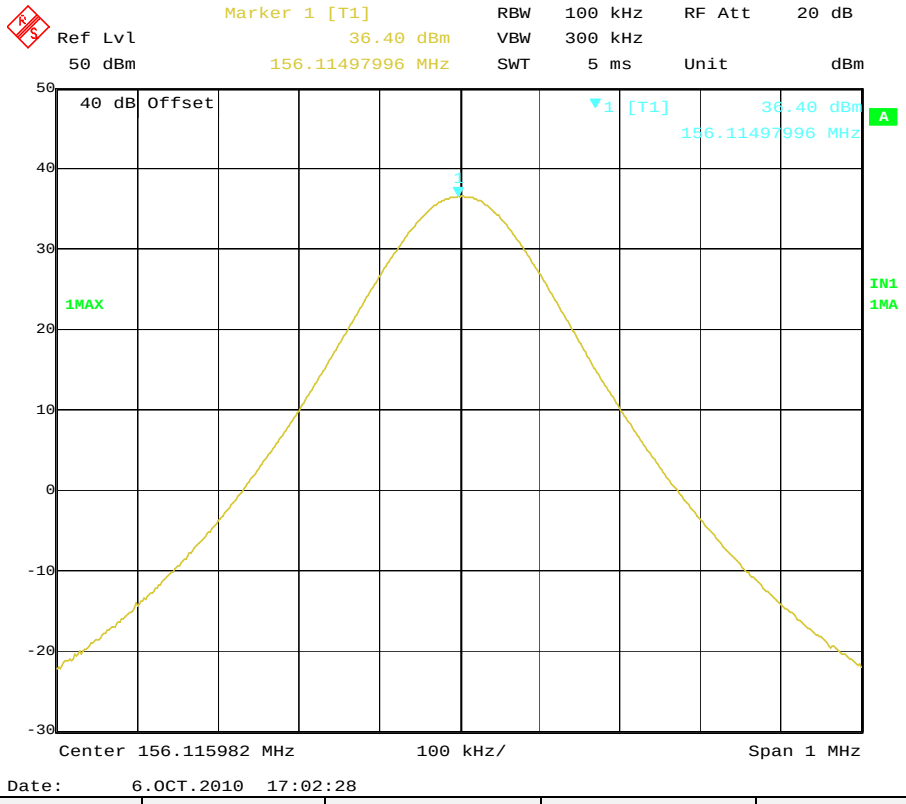
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	12.5 KHz	173.9875	5	36.93	Varies	Complicance



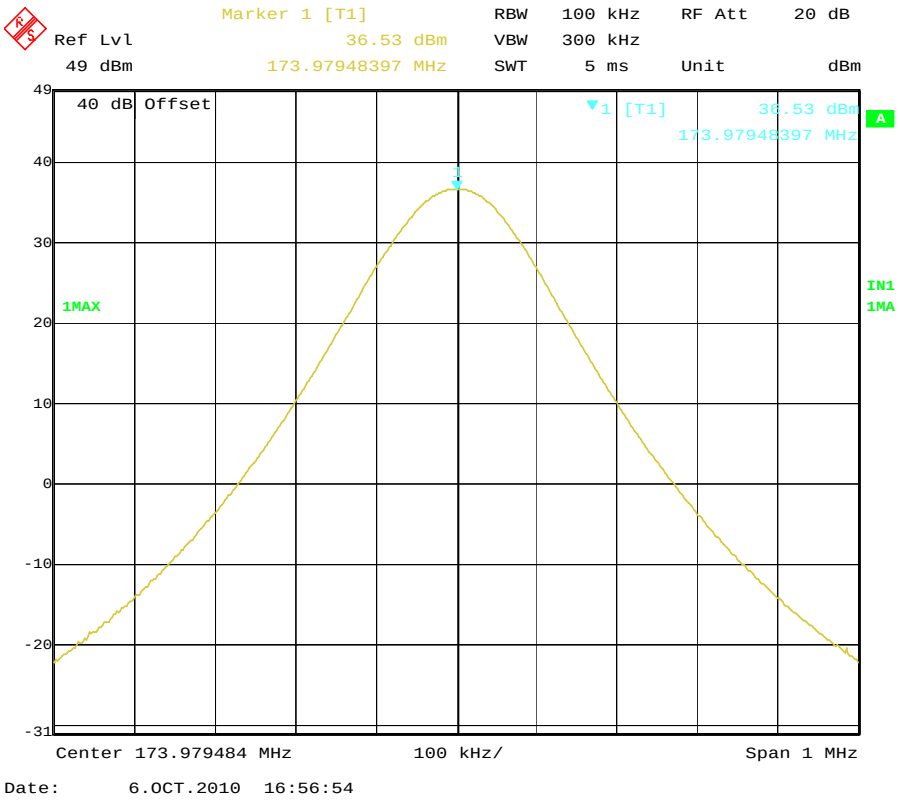
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
4FSK	12.5 KHz	136.1250	5	37.31	Varies	Complicance



Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
4FSK	12.5 KHz	156.1250	5	36.40	Varies	Complicance



Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
4FSK	12.5 KHz	173.9875	5	36.53	Varies	Complicance



4.8. Transmitter Frequency Behavior

TEST APPLICABLE

Section 90.214
Transient frequencies must be within the maximum frequency difference limits during the time intervals indicated:

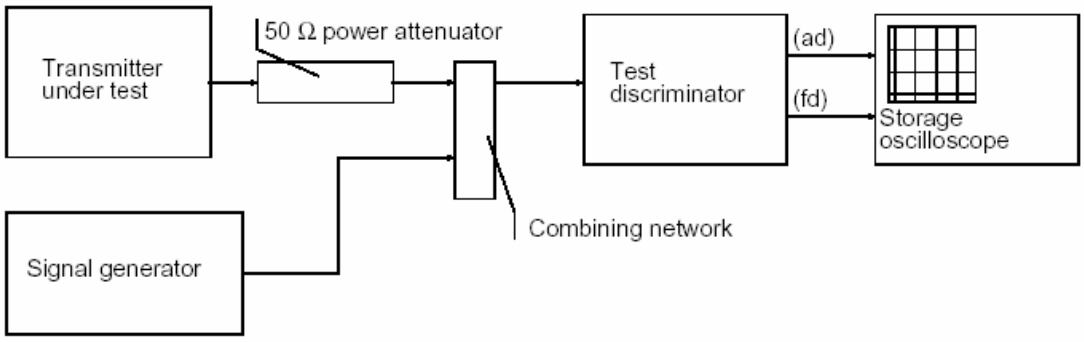
Time intervals [1, 2]	Maximum frequency difference [3]	All equipment	
		150 to 174 MHz	421 to 512MHz
Transient Frequency Behavior for Equipment Designed to Operate on 25 KHz Channels			
t_1 [4]	± 25.0 KHz	5.0 ms	10.0 ms
t_2	± 12.5 KHz	20.0 ms	25.0 ms
t_3 [4]	± 25.0 KHz	5.0 ms	10.0 ms
Transient Frequency 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.
   t_1 is the time period immediately following t_{on}.
   t_2 is the time period immediately following t_1.
   t_3 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 t_2 to the beginning of t_3, 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

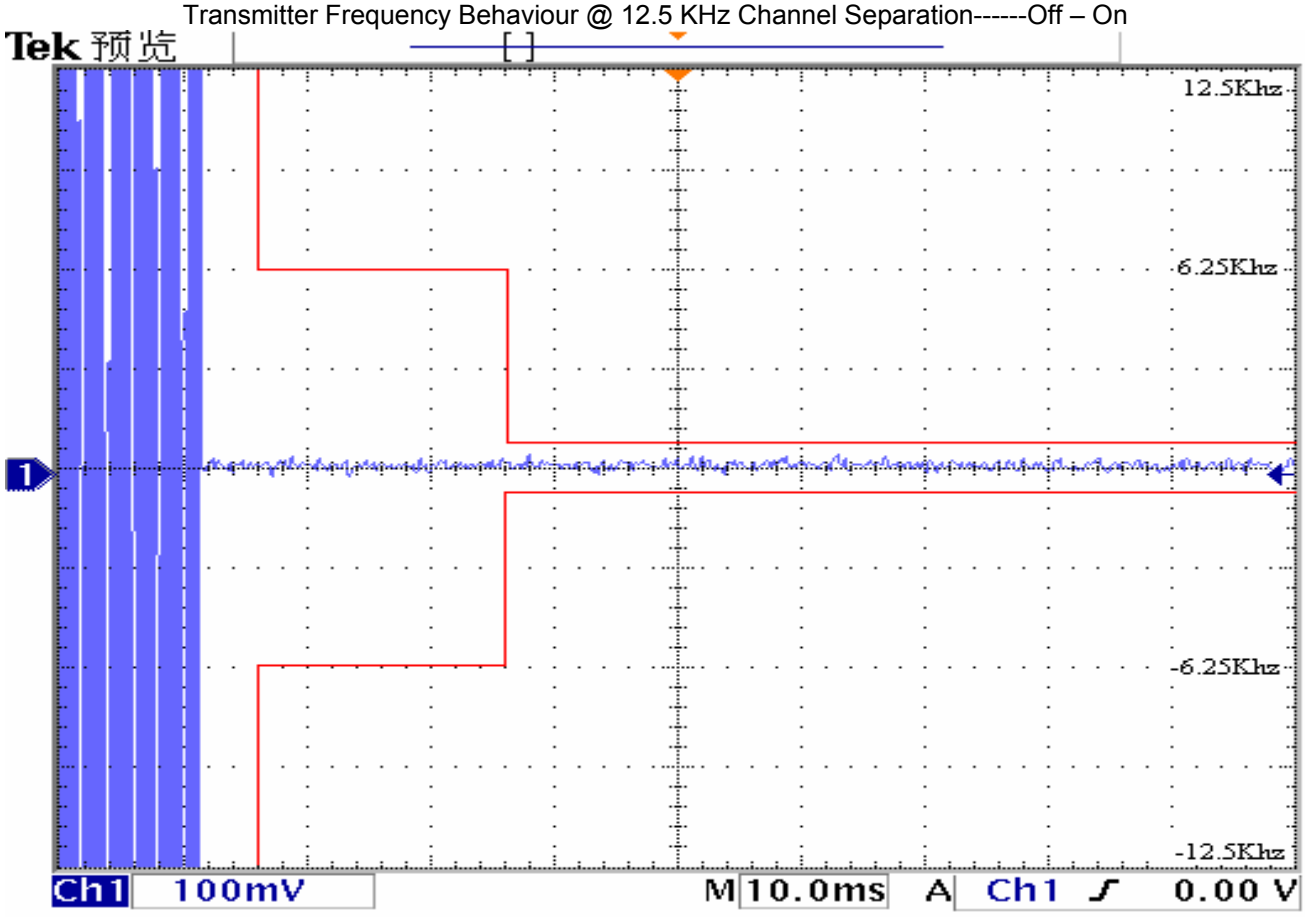


TEST RESULTS

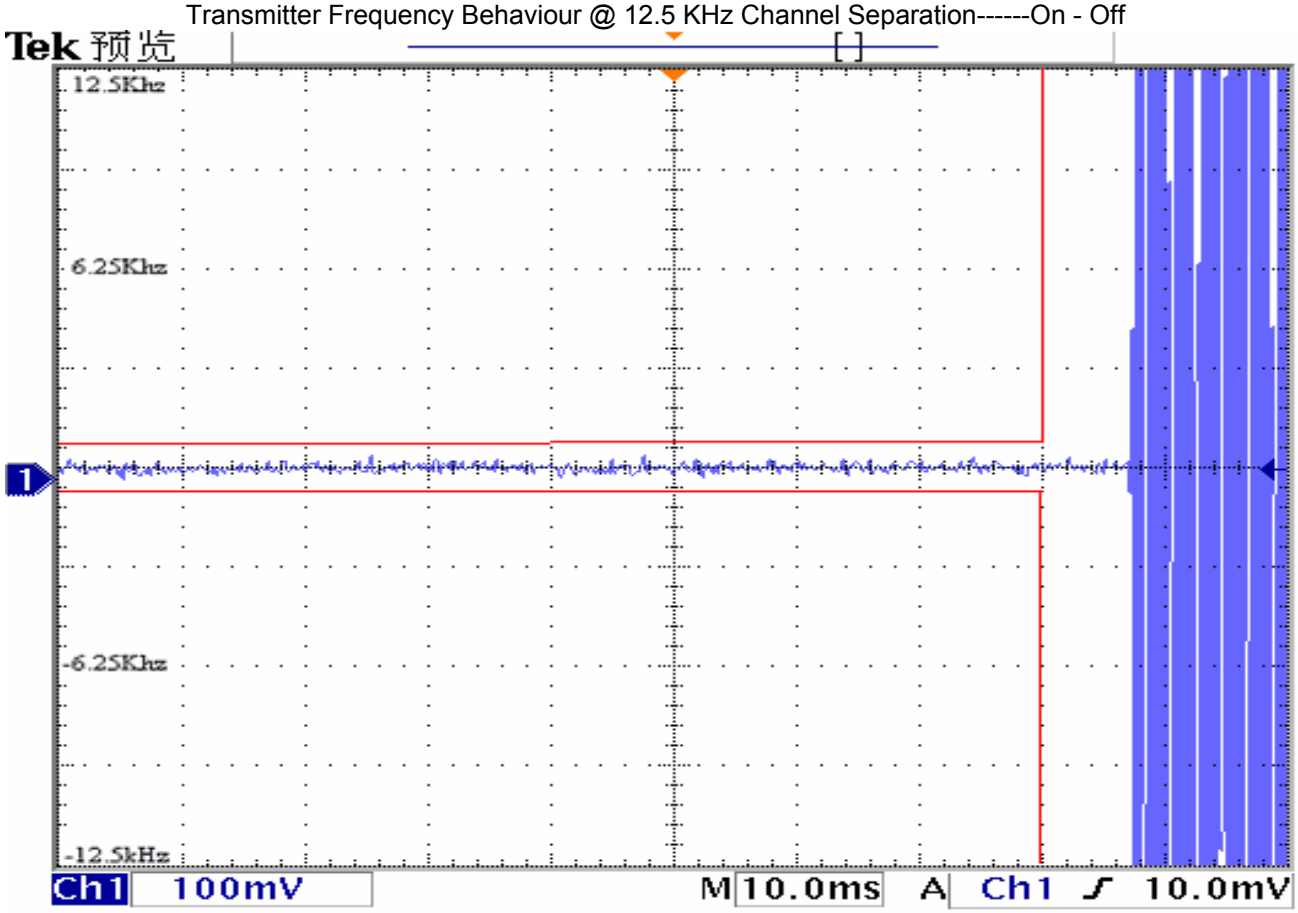
Please refer to the following plots.

Modulation Type: FM

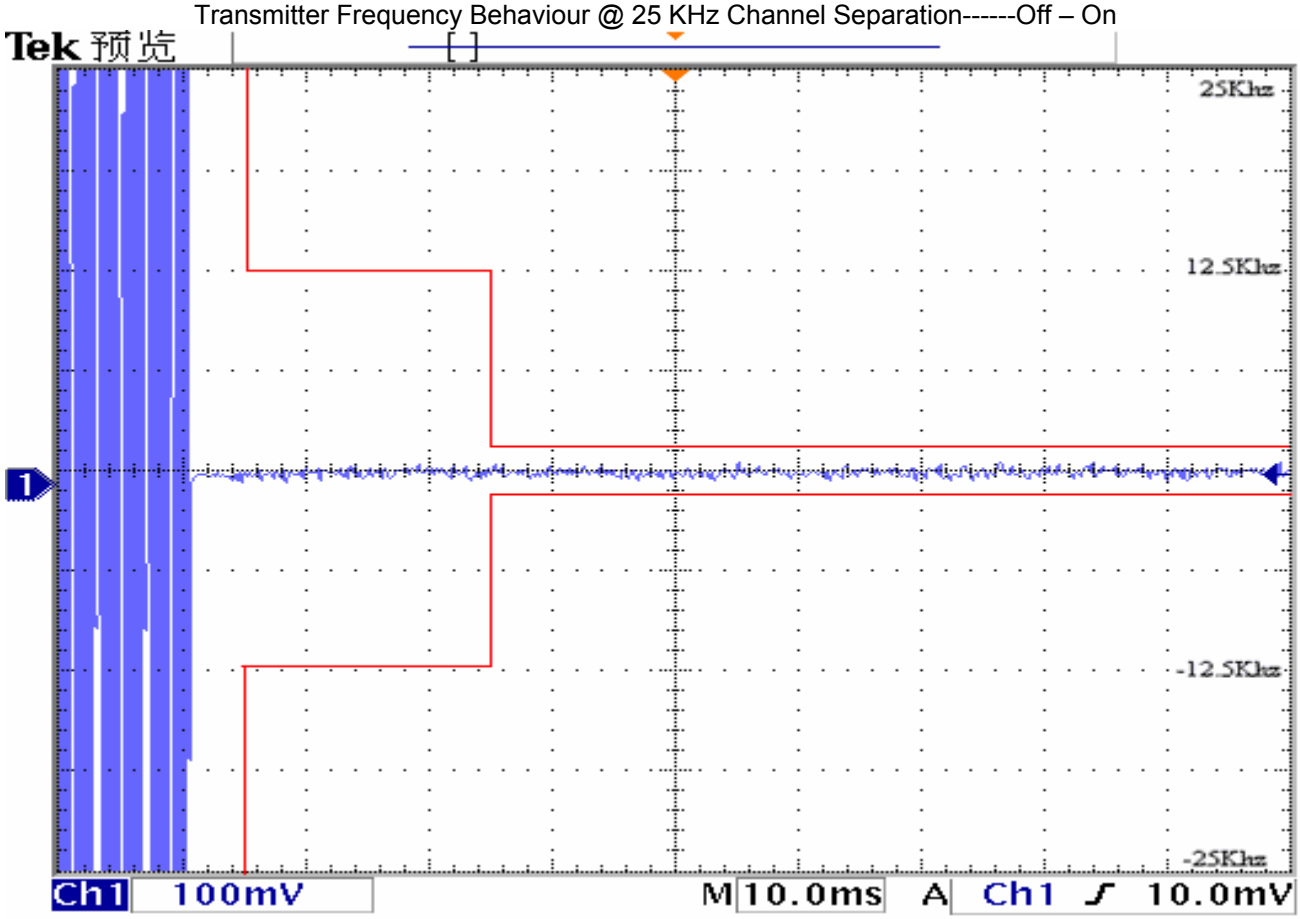
Transmitter Frequency Behaviour @ 12.5 KHz Channel Separation------Off – On



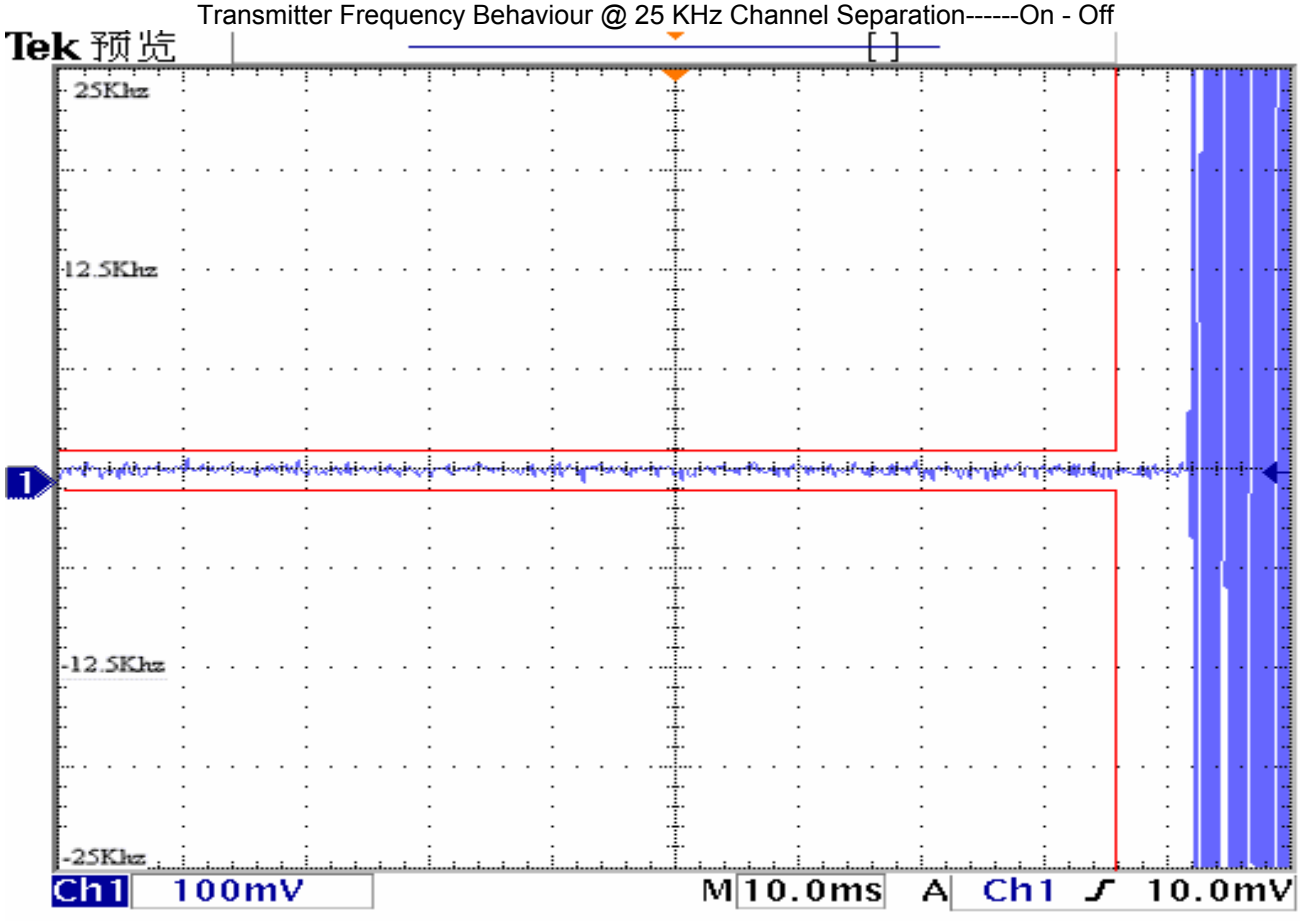
Transmitter Frequency Behaviour @ 12.5 KHz Channel Separation------On - Off



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

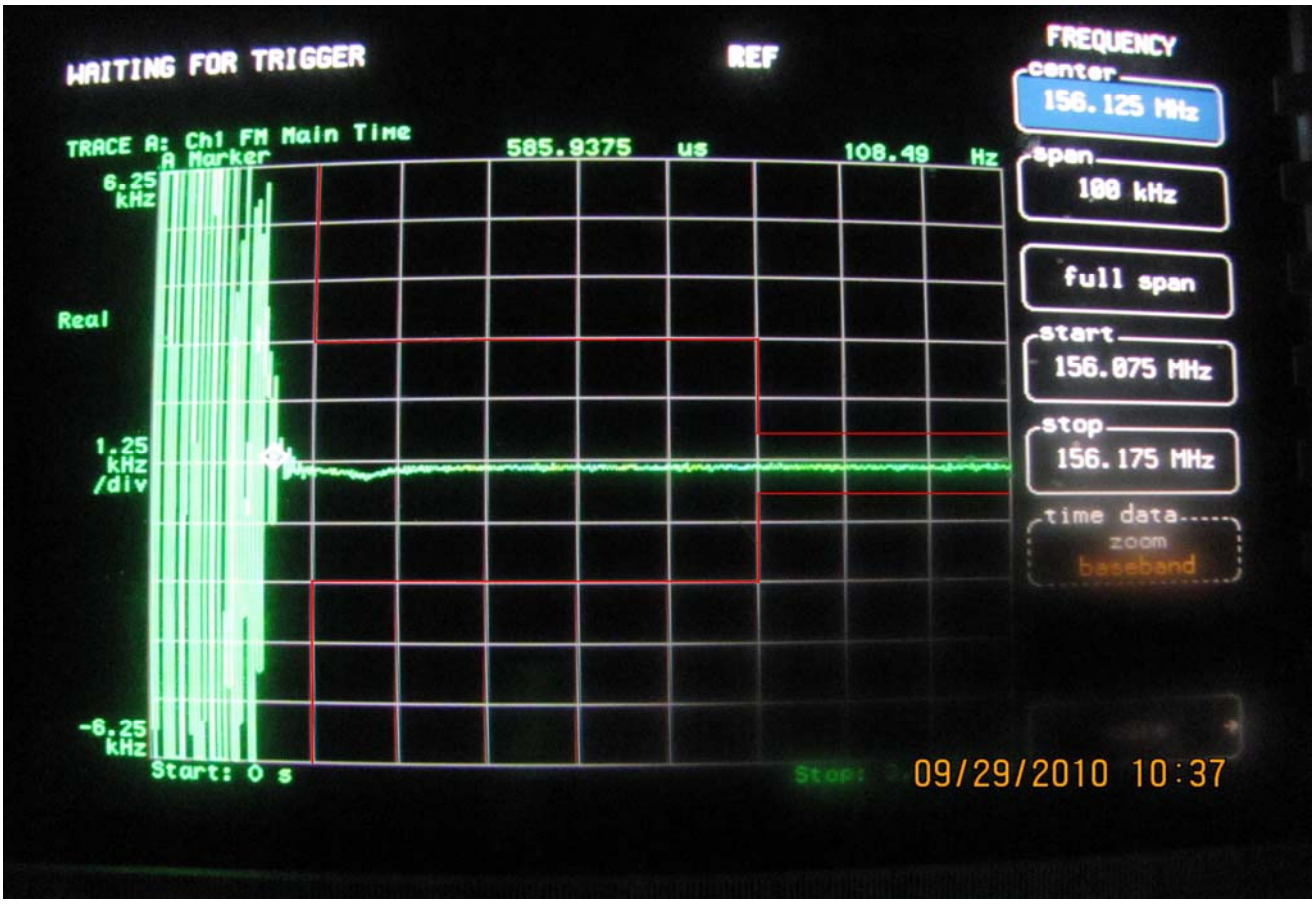


Transmitter Frequency Behaviour @ 25 KHz Channel Separation------On - Off



Modulation Type: 4FSK

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



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