



FCC PART 90 TEST REPORT

FCC Part 90

Report Reference No.	WE10100006
FCC ID	YAMRD98XVHF
Compiled by (position+printed name+signature)...	File administrators Xiankun Ding 
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Date of issue.....	Oct 30, 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 TWO-WAY RADIO SERVICES
TRF Originator	Shenzhen Huatongwei International Inspection CO., Ltd
Master TRF	Dated 2006-06
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Test item description	Digital Base Station Repeater
Trade Mark	
Manufacturer	Hytera Communications Corporation Ltd.
Model/Type reference.....	RD982 VHF/ RD985 VHF/ RD986 VHF/ RD988 VHF
Listed Models	/
Modulation	FM&4FSK
Channel Separation.....	12.5KHz&25KHz
Operation Frequency.....	From 136 MHz to 174 MHz
Ratings	DC 13.60 V
Rated Power	5Watt(36.99dBm)-50Watt(46.99dBm) Continuous
Result.....	Positive

TEST REPORT

Test Report No. :	WE10100006	Oct 30, 2010
		Date of issue

Equipment under Test : Digital Base Station Repeater

Model /Type : RD982 VHF/ RD985 VHF/ RD986 VHF/ RD988 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
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The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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1. TEST STANDARDS

The tests were performed according to following standards:

[FCC Rules Part 90](#): PRIVATE LAND TWO-WAY 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 30, 2010
Testing commenced on	:	Sep 30, 2010
Testing concluded on	:	Oct 30, 2010

2.2. Product Description

The Hytera Communications Corporation Ltd.'s Model: RD982 VHF/ RD985 VHF/ RD986 VHF/ RD988 VHF or the "EUT" as referred to in this report; more general information as follows:

Name of EUT	Digital Base Station Repeater	
Model Number	RD982 VHF/ RD985 VHF/ RD986 VHF/ RD988 VHF	
FCC ID	YAMRD98XVHF	
Rated Output Power	5Watt(36.99dBm)-50Watt(46.99dBm) Continuous	
Operation Type	The repeater cannot operate on multi-channels	
Support data rate	9.6kbps	
Modulation Type	FM for Analog Voice	
	4FSK for Digital Voice/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
Antenna Type	External	
Frequency Range	From 136 MHz to 174 MHz	
Maximum Transmitter Power	Analog	61.94 W for 25 KHz Channel Separation
		61.94 W for 12.5 KHz Channel Separation
	Digital	61.38 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	:	<input type="radio"/> 120V / 60 Hz	<input type="radio"/> 115V / 60Hz
		<input type="radio"/> 12 V DC	<input type="radio"/> 24 V DC
		<input checked="" type="radio"/> Other (specified in blank below)	

DC 13.60 V

Test frequency list

Modulation Type	Test Channel	Test Frequency
Analog/FM	Low Channel	136.1250 MHz
	Middle Channel	155.1250 MHz
	High Channel	173.9750 MHz
Digital/4FSK	Low Channel	136.1250 MHz
	Middle Channel	155.1250 MHz
	High Channel	173.9750 MHz

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

136-174 MHz V frequency band Digital Base Station Repeater (RD982 VHF/ RD985 VHF/ RD986 VHF/ RD988 VHF).

The Digital Base Station Repeater (RD982 VHF/ RD985 VHF/ RD986 VHF/ RD988 VHF) can only operate on one signal channel.

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. Using software provided by the client to control the EUT for staying in transmitting and receiving mode for testing.

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: **YAMRD98XVHF** 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 Base Station Repeater, The functions of the EUT listed as below:

	Test Standards	Reference Report
Radio	FCC Part 90	WE10100006
MPE	FCC Oet 65	WE10100007

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 August, 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

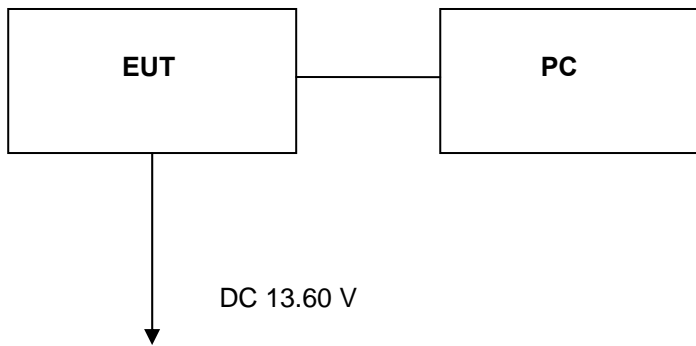


Table 2-1 Equipment Used in Tested System

No.	Product	Manufacturer	Model No.	Serial No.	FCC ID
1	Notebook PC	HP	ProBook 4413	CNU9282KYH	FCC DoC

3.5. Discription of Tested Modes

The EUT (Digital Base Station Repeater) 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

AC 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

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

Transmitter Radiated Spurious Emission & Occupied Bandwidth & Emission Mask & Receiver Radiated Spurious Emission				
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
Turntable	ETS	2088	2149	N/A
Antenna Mast	ETS	2075	2346	N/A
EMI Test Software	Rohde&Schwarz	ES-K1 V1.71	N/A	11/2010
RF COMMUNICATION TEST SET	HP	8920A	3813A10206	11/2010
Verctor Signal Genertor	ROHDE &SCHWARZ	SMU200A	1141.2205.02	11/2010
ESG Verctor Signal Genertor	Agilent	E4438C	MY4271533	11/2010

Maximum Transmitter Power & Spurious Emission 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

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

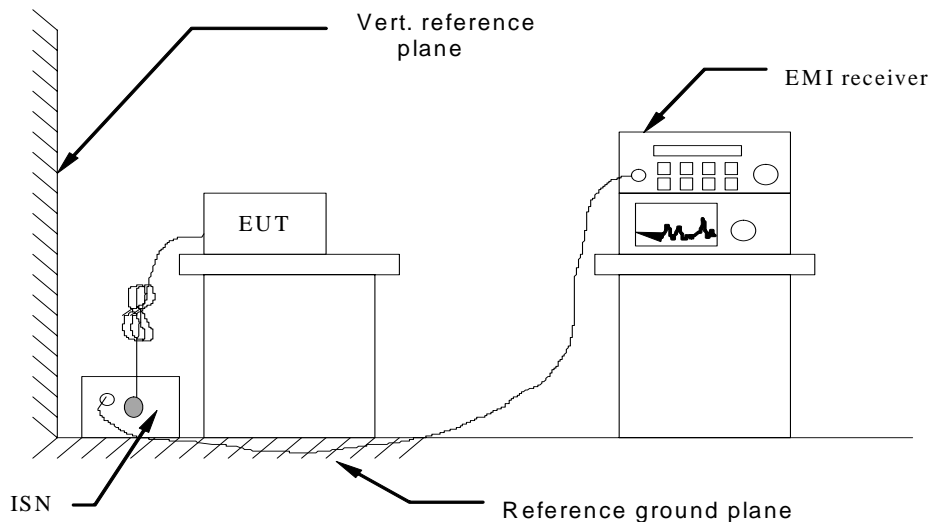
4. TEST CONDITIONS AND RESULTS

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

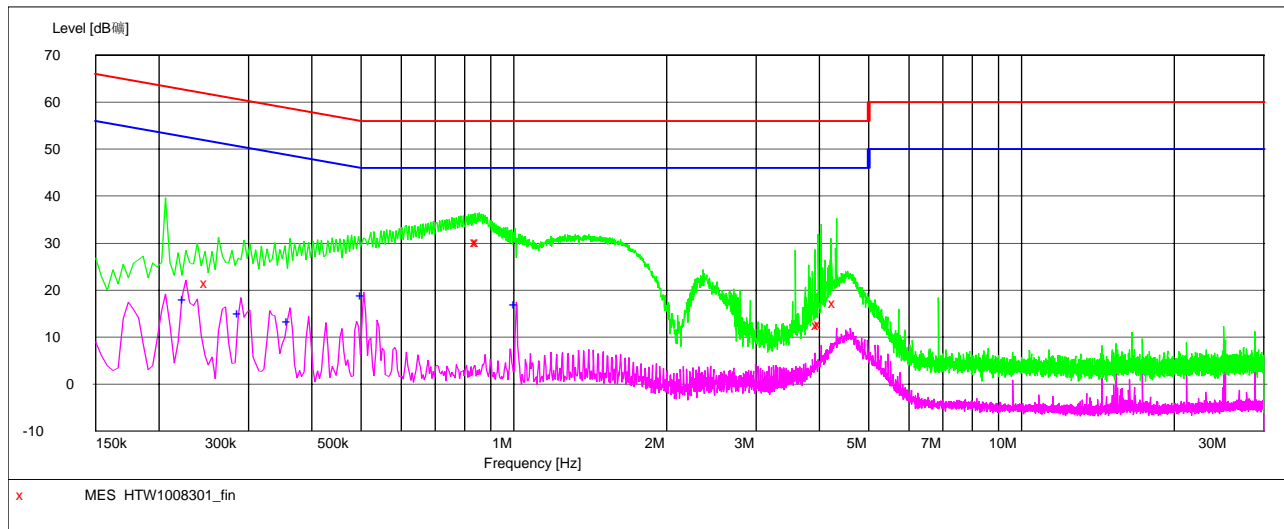
For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

TEST RESULTS

For FM Modulation @ 25 KHz TX Mode

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

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "HTW1008301_fin"

10/8/2010 9:15AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.250000	21.60	10.5	62	40.2	QP	+	GND
0.850000	30.30	10.4	56	25.7	QP	+	GND
0.854000	30.20	10.4	56	25.8	QP	+	GND
4.002000	12.60	10.5	56	43.4	QP	+	GND
4.050000	12.80	10.5	56	43.2	QP	+	GND
4.310000	17.20	10.5	56	38.8	QP	+	GND

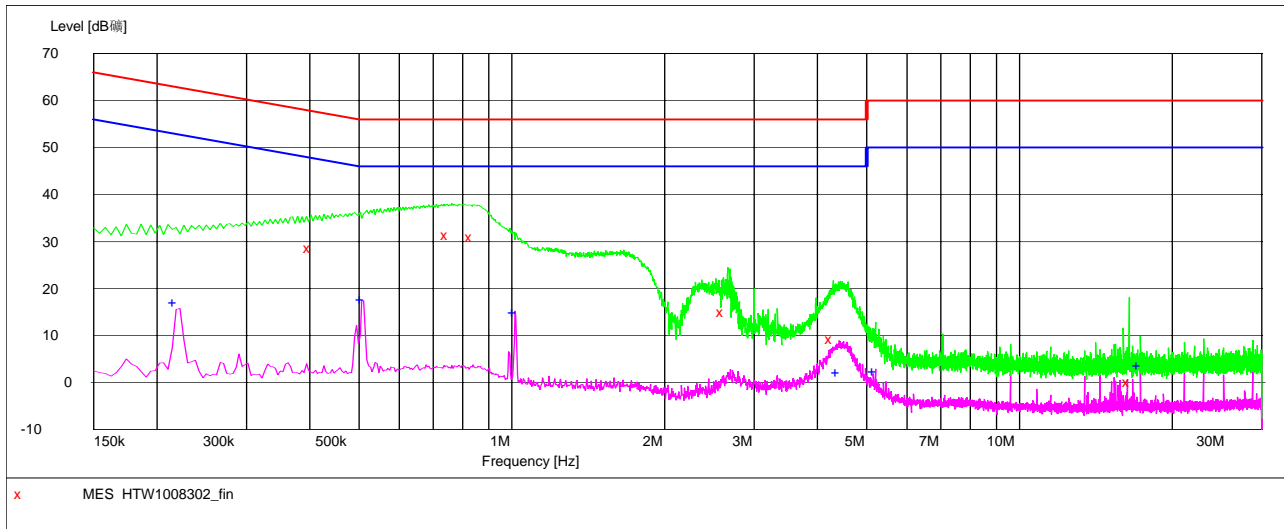
MEASUREMENT RESULT: "HTW1008301_fin2"

10/8/2010 9:15AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.226000	18.00	10.5	53	34.6	AV	+	GND
0.290000	15.20	10.5	51	35.3	AV	+	GND
0.362000	13.50	10.5	49	35.2	AV	+	GND
0.506000	19.00	10.4	46	27.0	AV	+	GND
1.014000	17.10	10.5	46	28.9	AV	+	GND

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

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "HTW1008302_fin"

10/8/2010 9:19AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.402000	28.70	10.5	58	29.1	QP	-	GND
0.750000	31.40	10.4	56	24.6	QP	-	GND
0.838000	30.90	10.4	56	25.1	QP	-	GND
2.618000	14.90	10.5	56	41.1	QP	-	GND
4.290000	9.20	10.5	56	46.8	QP	-	GND
16.494000	0.20	11.0	60	59.8	QP	-	GND

MEASUREMENT RESULT: "HTW1008302_fin2"

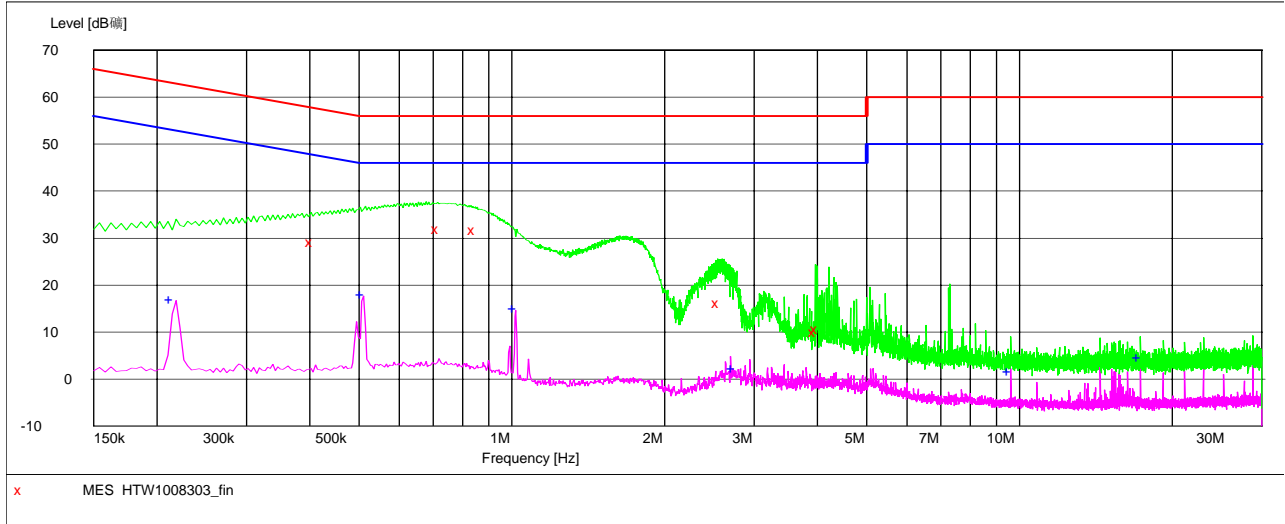
10/8/2010 9:19AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.218000	17.10	10.5	53	35.8	AV	-	GND
0.510000	17.80	10.4	46	28.2	AV	-	GND
1.018000	14.90	10.5	46	31.1	AV	-	GND
4.414000	2.20	10.5	46	43.8	AV	-	GND
5.210000	2.40	10.5	50	47.6	AV	-	GND
17.282000	3.60	11.0	50	46.4	AV	-	GND

For FM Modulation @ 12.5 KHz TX Mode

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

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "HTW1008303_fin"

10/8/2010 9:23AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.406000	29.10	10.5	58	28.6	QP	-	GND
0.718000	32.00	10.4	56	24.0	QP	-	GND
0.846000	31.70	10.4	56	24.3	QP	-	GND
2.566000	16.10	10.5	56	39.9	QP	-	GND
3.970000	10.00	10.5	56	46.0	QP	-	GND
4.010000	10.60	10.5	56	45.4	QP	-	GND

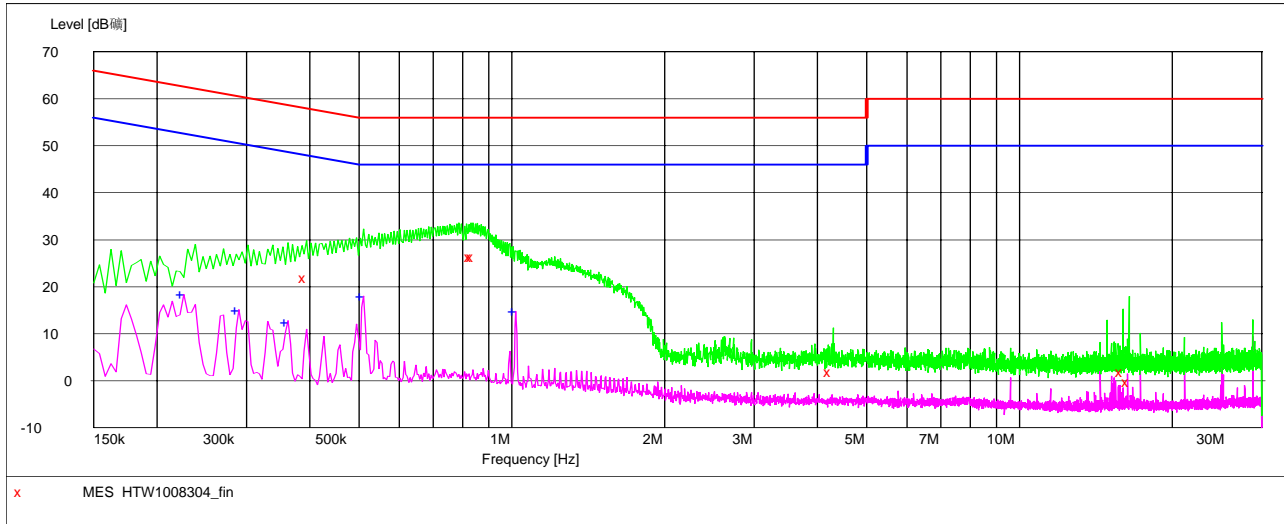
MEASUREMENT RESULT: "HTW1008303_fin2"

10/8/2010 9:23AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.214000	17.00	10.5	53	36.0	AV	-	GND
0.510000	18.00	10.4	46	28.0	AV	-	GND
1.018000	15.10	10.5	46	30.9	AV	-	GND
2.742000	2.40	10.5	46	43.6	AV	-	GND
9.602000	1.70	10.9	50	48.3	AV	-	GND
17.282000	4.60	11.0	50	45.4	AV	-	GND

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

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "HTW1008304_fin"

10/8/2010 9:26AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.394000	21.80	10.5	58	36.2	QP	+	GND
0.834000	26.40	10.4	56	29.6	QP	+	GND
0.842000	26.40	10.4	56	29.6	QP	+	GND
4.258000	1.90	10.5	56	54.1	QP	+	GND
16.002000	1.90	11.0	60	58.1	QP	+	GND
16.474000	-0.20	11.0	60	60.2	QP	+	GND

MEASUREMENT RESULT: "HTW1008304_fin2"

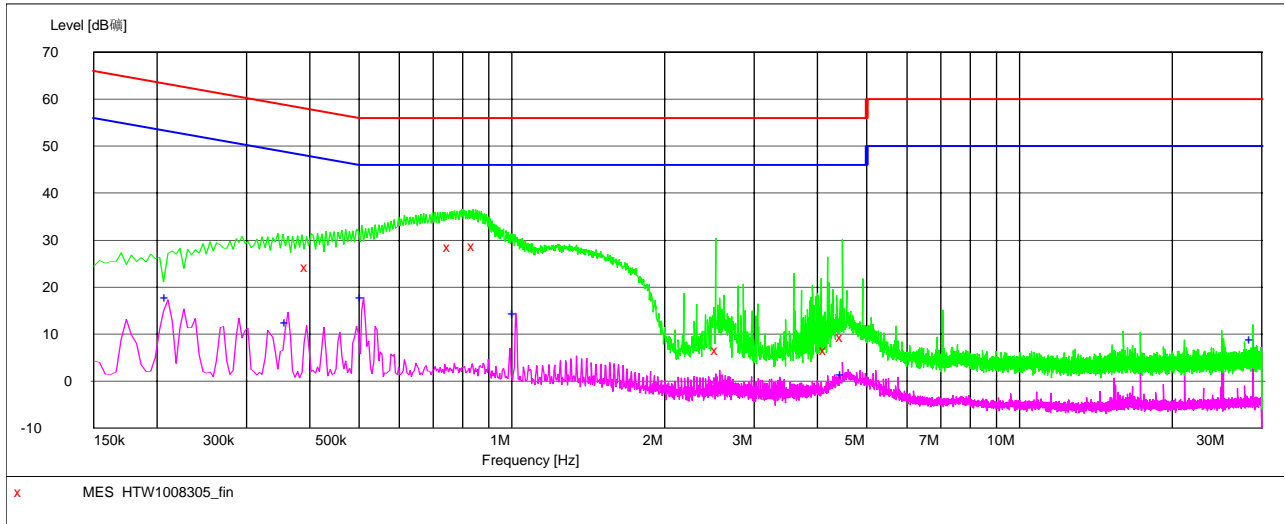
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Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.226000	18.50	10.5	53	34.1	AV	+	GND
0.290000	15.00	10.5	51	35.5	AV	+	GND
0.362000	12.40	10.5	49	36.3	AV	+	GND
0.510000	18.10	10.4	46	27.9	AV	+	GND
1.018000	14.90	10.5	46	31.1	AV	+	GND

For 4FSK Modulation @ 12.5 KHz TX Mode

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

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "HTW1008305_fin"

10/8/2010 9:30AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.398000	24.30	10.5	58	33.6	QP	+	GND
0.758000	28.40	10.4	56	27.6	QP	+	GND
0.846000	28.70	10.4	56	27.3	QP	+	GND
2.554000	6.50	10.5	56	49.5	QP	+	GND
4.178000	6.50	10.5	56	49.5	QP	+	GND
4.502000	9.40	10.5	56	46.6	QP	+	GND

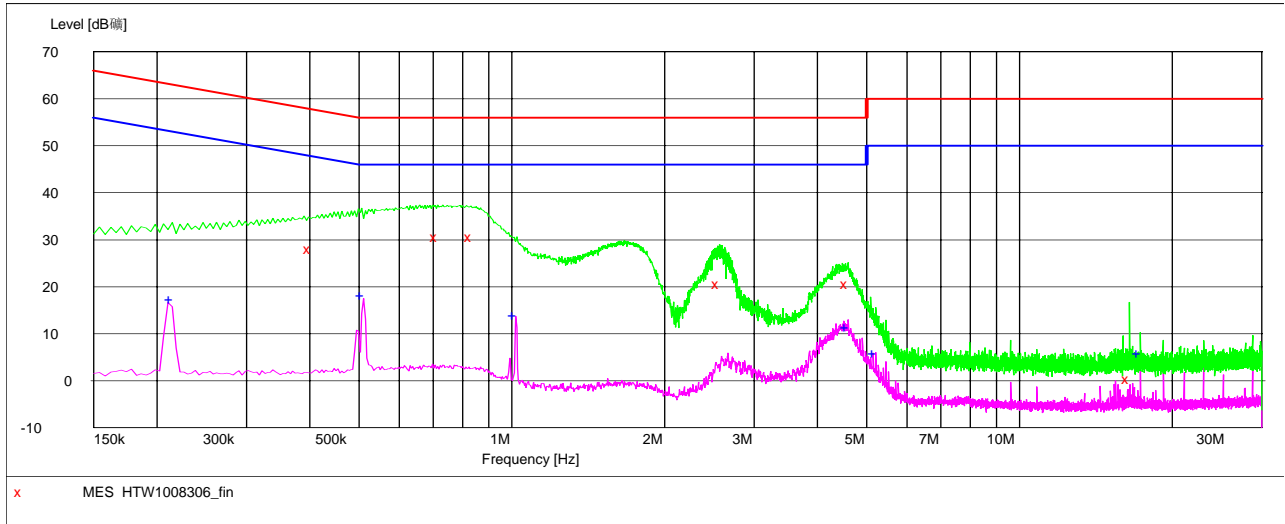
MEASUREMENT RESULT: "HTW1008305_fin2"

10/8/2010 9:30AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.210000	17.90	10.5	53	35.3	AV	+	GND
0.362000	12.50	10.5	49	36.2	AV	+	GND
0.510000	17.90	10.4	46	28.1	AV	+	GND
1.018000	14.40	10.5	46	31.6	AV	+	GND
4.506000	1.50	10.5	46	44.5	AV	+	GND
28.802000	8.90	11.3	50	41.1	AV	+	GND

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

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "HTW1008306_fin"

10/8/2010 9:34AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.402000	28.10	10.5	58	29.7	QP	-	GND
0.714000	30.50	10.4	56	25.5	QP	-	GND
0.834000	30.50	10.4	56	25.5	QP	-	GND
2.566000	20.60	10.5	56	35.4	QP	-	GND
4.594000	20.60	10.5	56	35.4	QP	-	GND
16.446000	0.40	11.0	60	59.6	QP	-	GND

MEASUREMENT RESULT: "HTW1008306_fin2"

10/8/2010 9:34AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.214000	17.50	10.5	53	35.5	AV	-	GND
0.510000	18.20	10.4	46	27.8	AV	-	GND
1.018000	13.90	10.5	46	32.1	AV	-	GND
4.594000	11.30	10.5	46	34.7	AV	-	GND
5.206000	5.90	10.5	50	44.1	AV	-	GND
17.282000	5.80	11.0	50	44.2	AV	-	GND

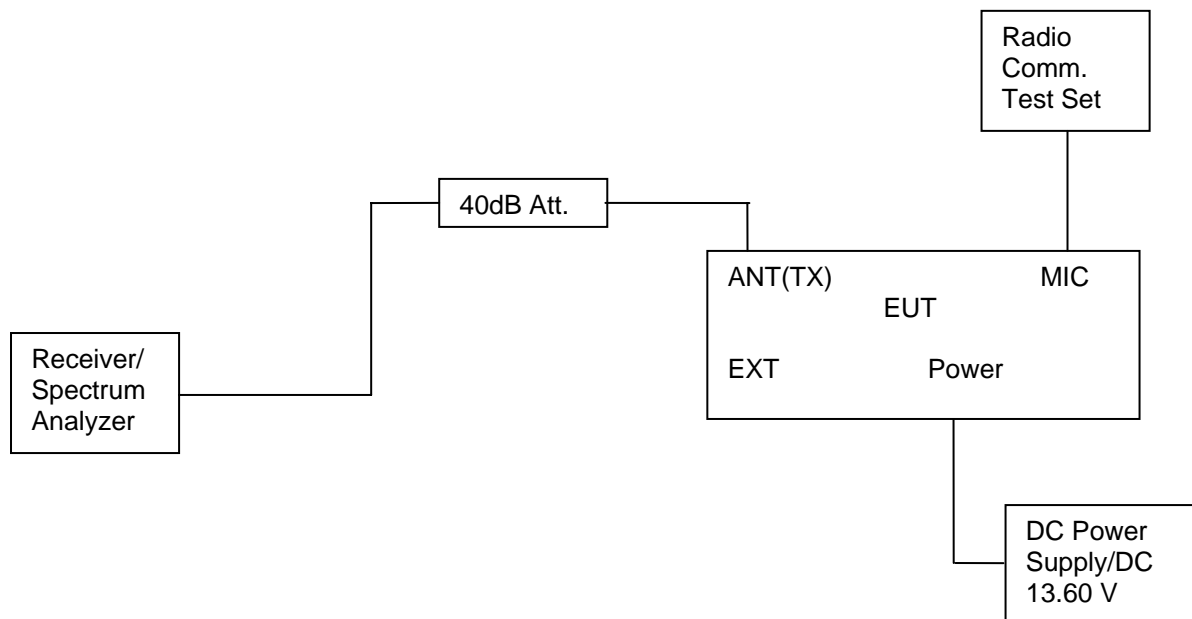
4.2. Occupied Bandwidth and Emission Mask Test

4.2.1 Occupied Bandwidth and Emission Mask at PPT function

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 f_0 to 5.625 kHz removed from f_0 : Zero dB.
 - (2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 5.625 kHz but no more than 12.5 kHz: At least $7.27(f_d - 2.88 \text{ kHz})$ dB.
 - (3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 12.5 kHz: At least $50 + 10 \log (P)$ dB or 70 dB, whichever is the lesser attenuation.

TEST CONFIGURATION



TEST PROCEDURE

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

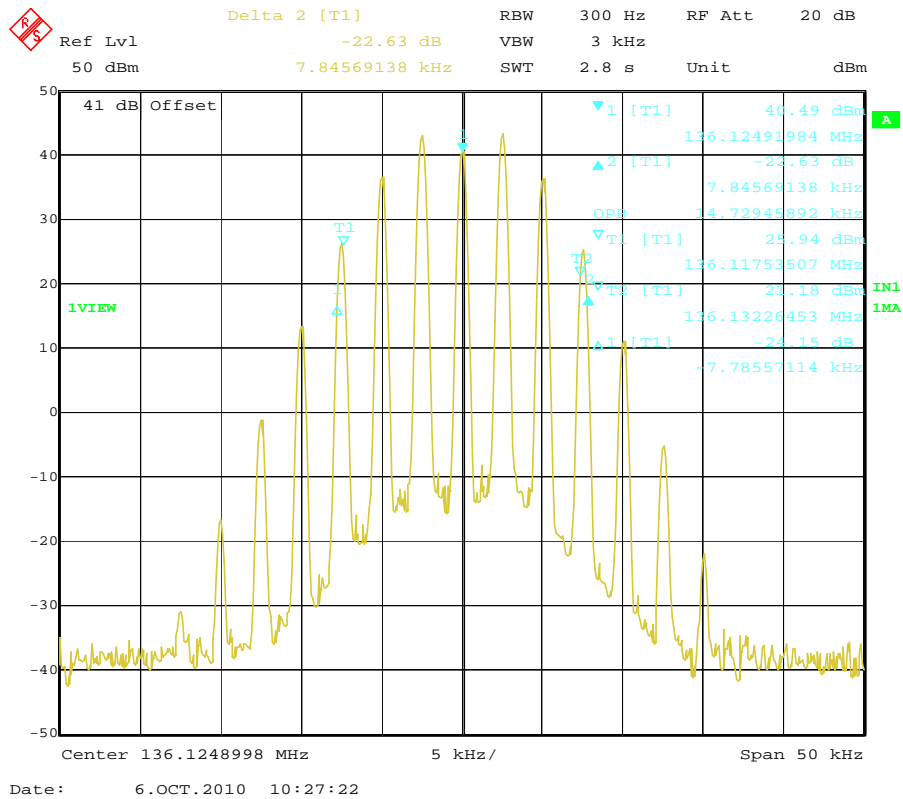
TEST RESULTS

4.2.1.1 Occupied Bandwidth

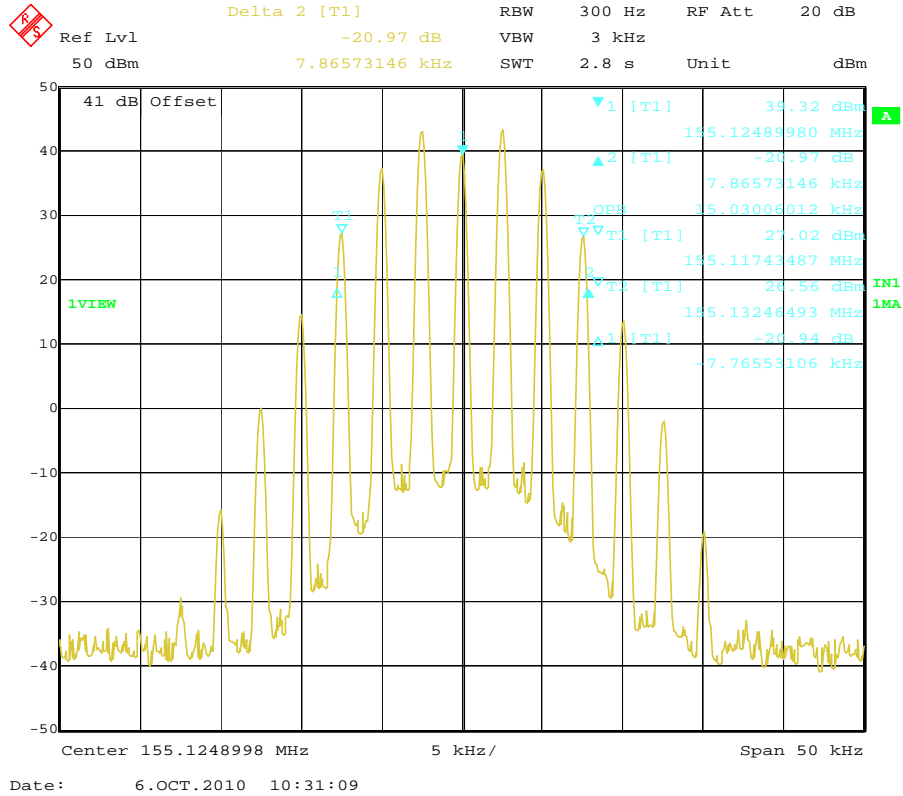
Modulation Type	Channel Separation	Test Channel	Test Frequency	99% Occupied Bandwidth	26dB Occupied Bandwidth
FM	25KHz	Low	136.1250 MHz	14.73 KHz	15.63 KHz
		Middle	155.1250 MHz	15.03 KHz	15.63 KHz
		High	173.9750 MHz	15.03 KHz	15.63 KHz
	12.5KHz	Low	136.1250 MHz	5.36 KHz	10.52 KHz
		Middle	155.1250 MHz	9.82 KHz	10.52 KHz
		High	173.9750 MHz	9.82 KHz	10.62 KHz
4FSK	12.5KHz	Low	136.1250 MHz	7.62 KHz	9.92 KHz
		Middle	155.1250 MHz	7.31 KHz	9.52 KHz
		High	173.9750 MHz	7.62 KHz	9.92 KHz
Limit		20kHz for 25kHz Channel Separation			
Limit		11.25kHz for 12.5kHz Channel Separation			
Test Results		Compliance			

Plots of 99% and 26dB Bandwidth Measurement

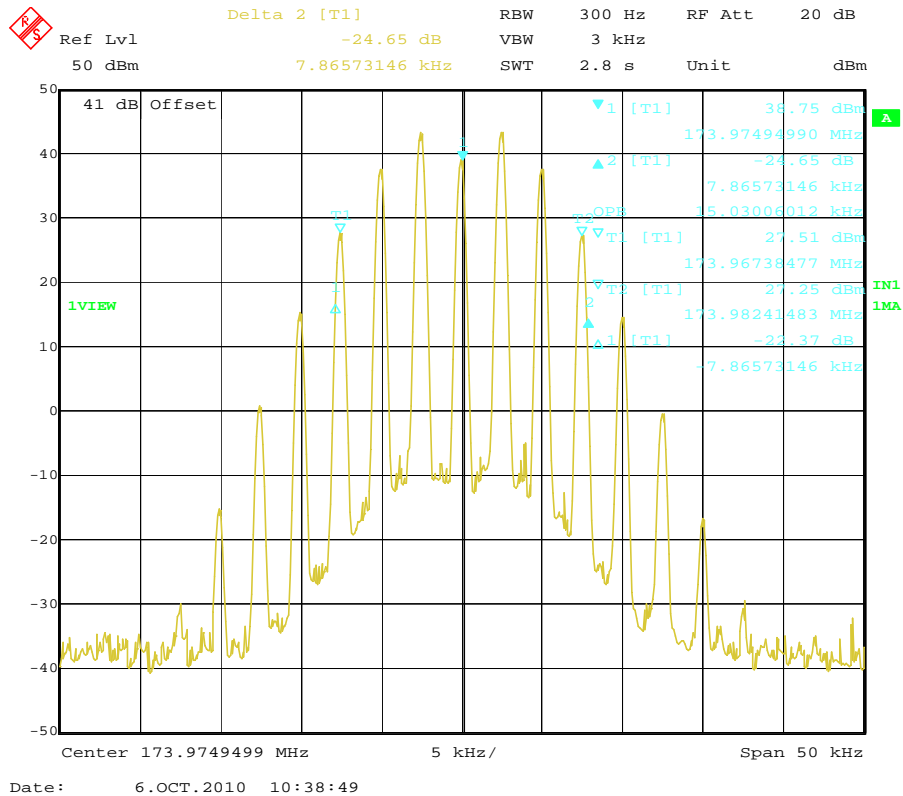
Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	25 KHz	136.1250	14.73	15.63	20	Compliance



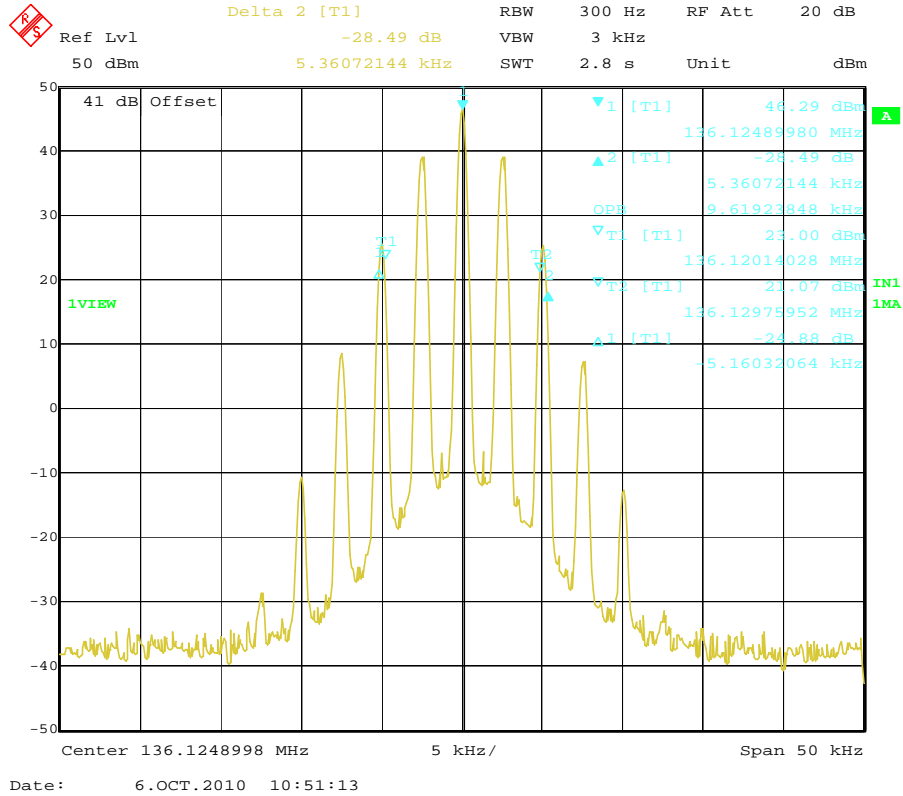
Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	25 KHz	155.1250	15.03	15.63	20	Compliance



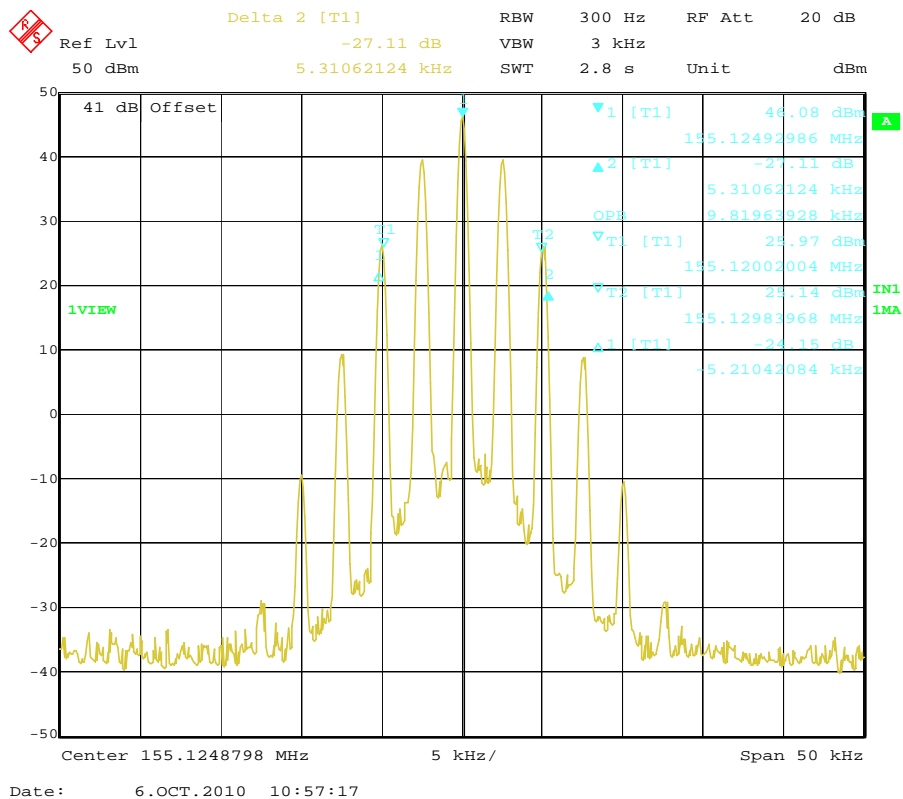
Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	25 KHz	173.9750	15.03	15.63	20	Compliance



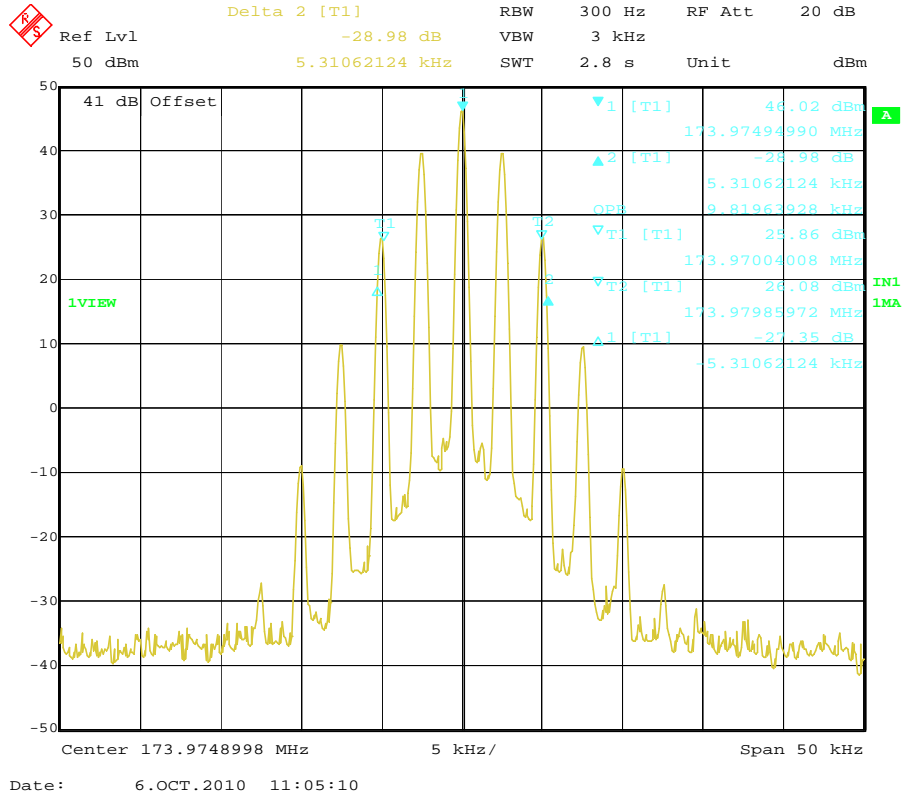
Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	12.5 KHz	136.1250	5.36	10.52	11.25	Compliance



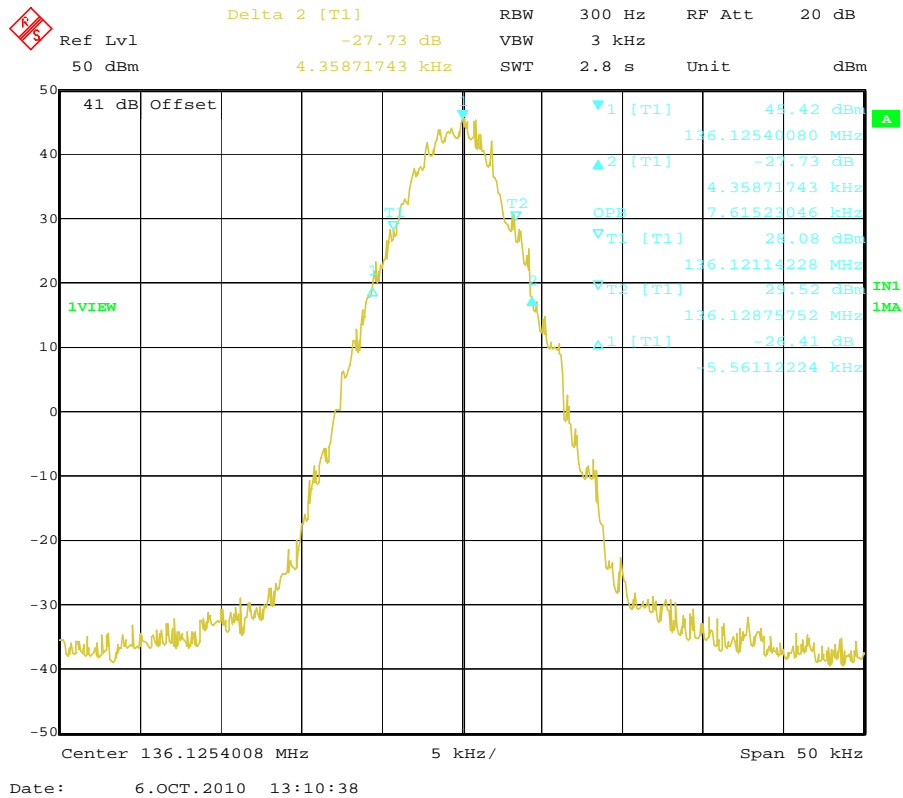
Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	12.5 KHz	155.1250	9.82	10.52	11.25	Compliance



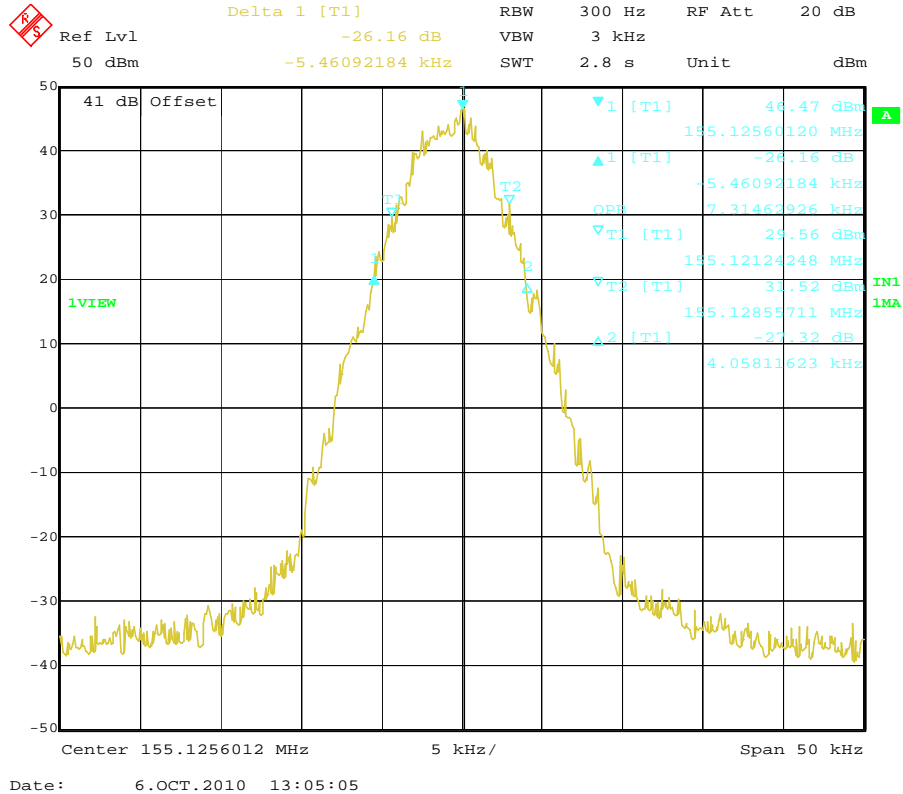
Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	12.5 KHz	173.9750	9.82	10.62	11.25	Compliance



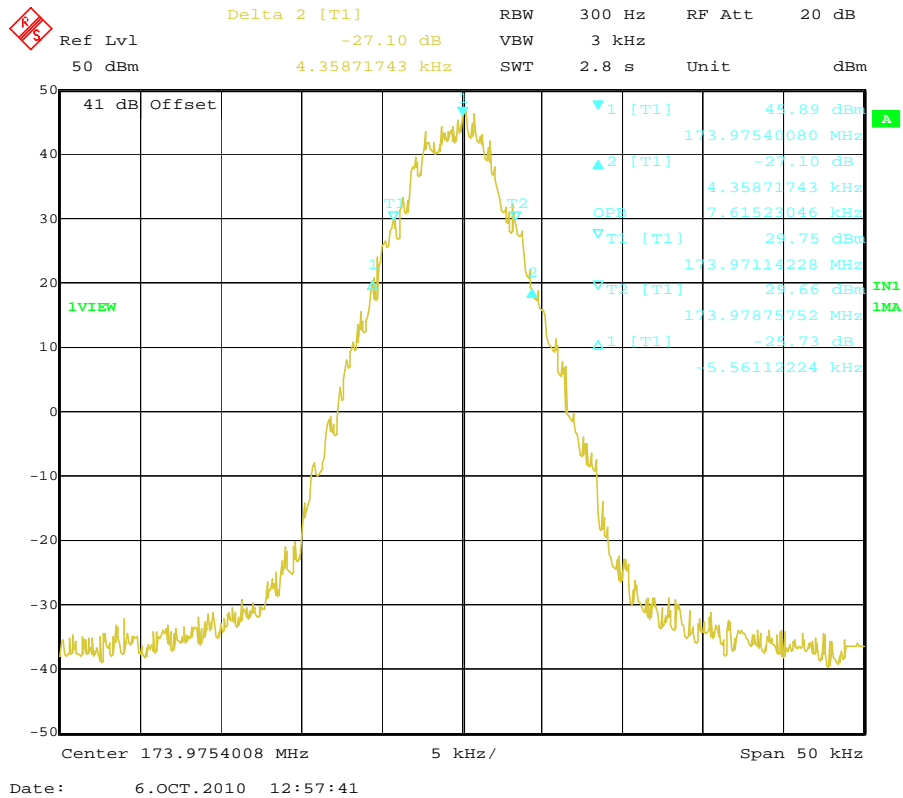
Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
4FSK	12.5 KHz	136.1250	7.62	9.92	11.25	Compliance



Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
4FSK	12.5 KHz	155.1250	7.31	9.52	11.25	Compliance



Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
4FSK	12.5 KHz	173.9750	7.62	9.92	11.25	Compliance



4.2.1.2 Emission Mask

Modulation Type	Channel Separation	Test Channel	Test Frequency	FCC Applicable Mask	RBW
FM	25KHz	Low	136.1250 MHz	B	300Hz
		Middle	155.1250 MHz	B	300Hz
		High	173.9750 MHz	B	300Hz
	12.5KHz	Low	136.1250 MHz	D	100Hz
		Middle	155.1250 MHz	D	100Hz
		High	173.9750 MHz	D	100Hz
4FSK	12.5KHz	Low	136.1250 MHz	D	100Hz
		Middle	155.1250 MHz	D	100Hz
		High	173.9750 MHz	D	100Hz
Test Results		Compliance			

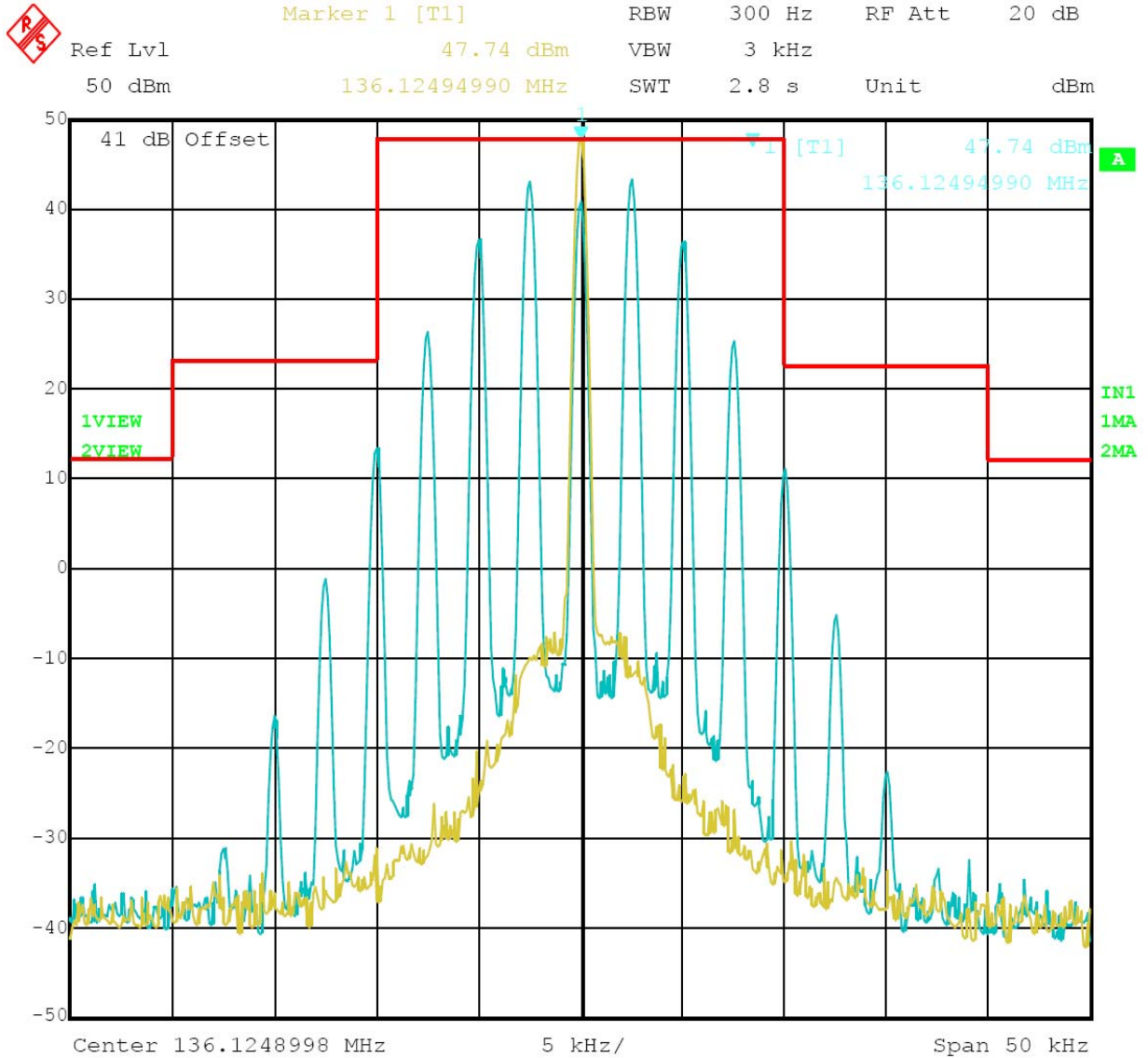
Plots of Emission Mask Measurement

Referred as the attached plot hereinafter

Note: The yellow curve represents unmodulated signal.

The green curve represents modulated signal.

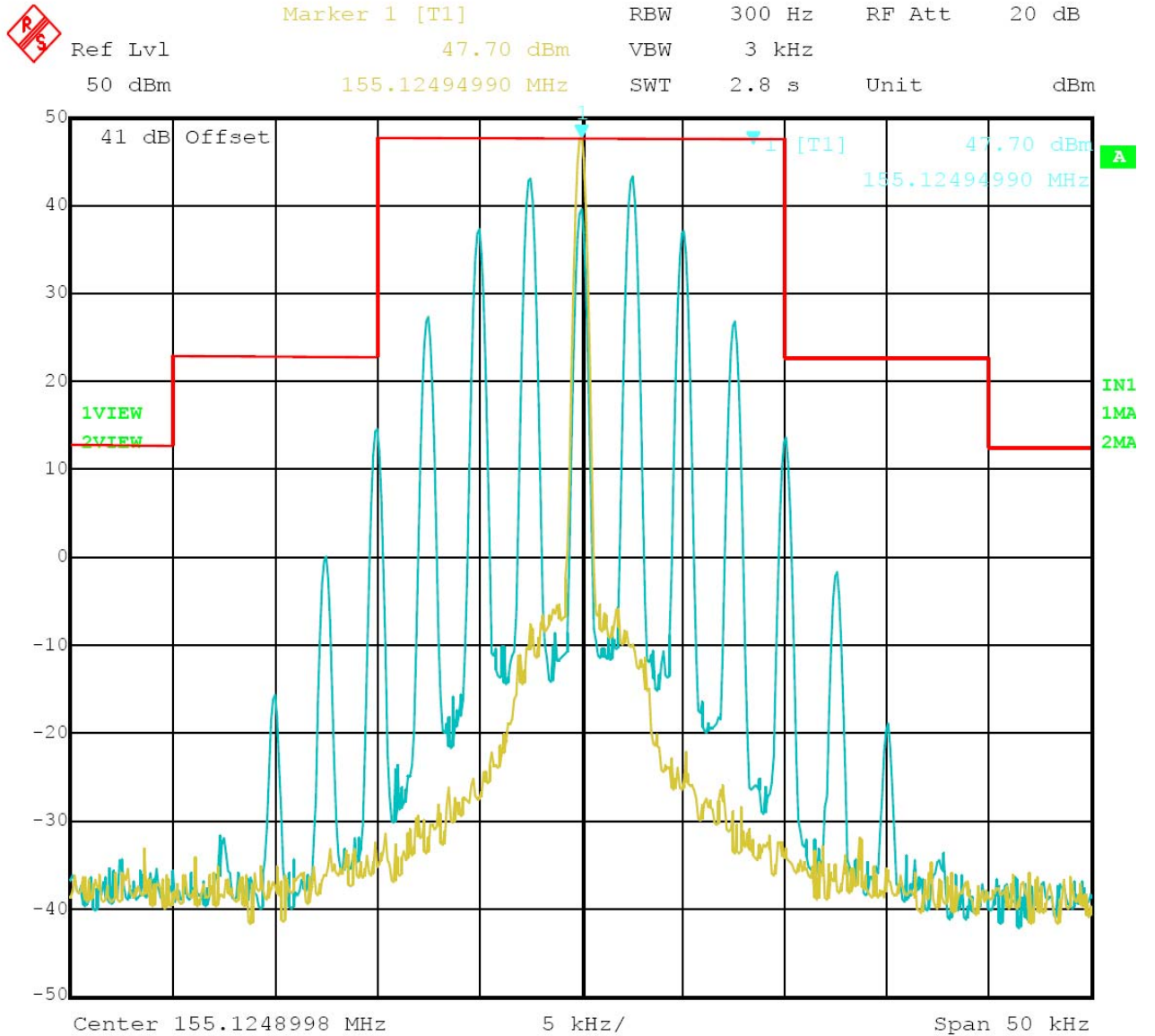
Modulation Type	Channel Separation	Freq.(MHz)	FCC Applicable Mask	RBW	Audio Freq. (KHz)	Results
FM	25 KHz	136.1250	B	300Hz	2.5	Compliance



Date: 6.OCT.2010 10:29:08

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

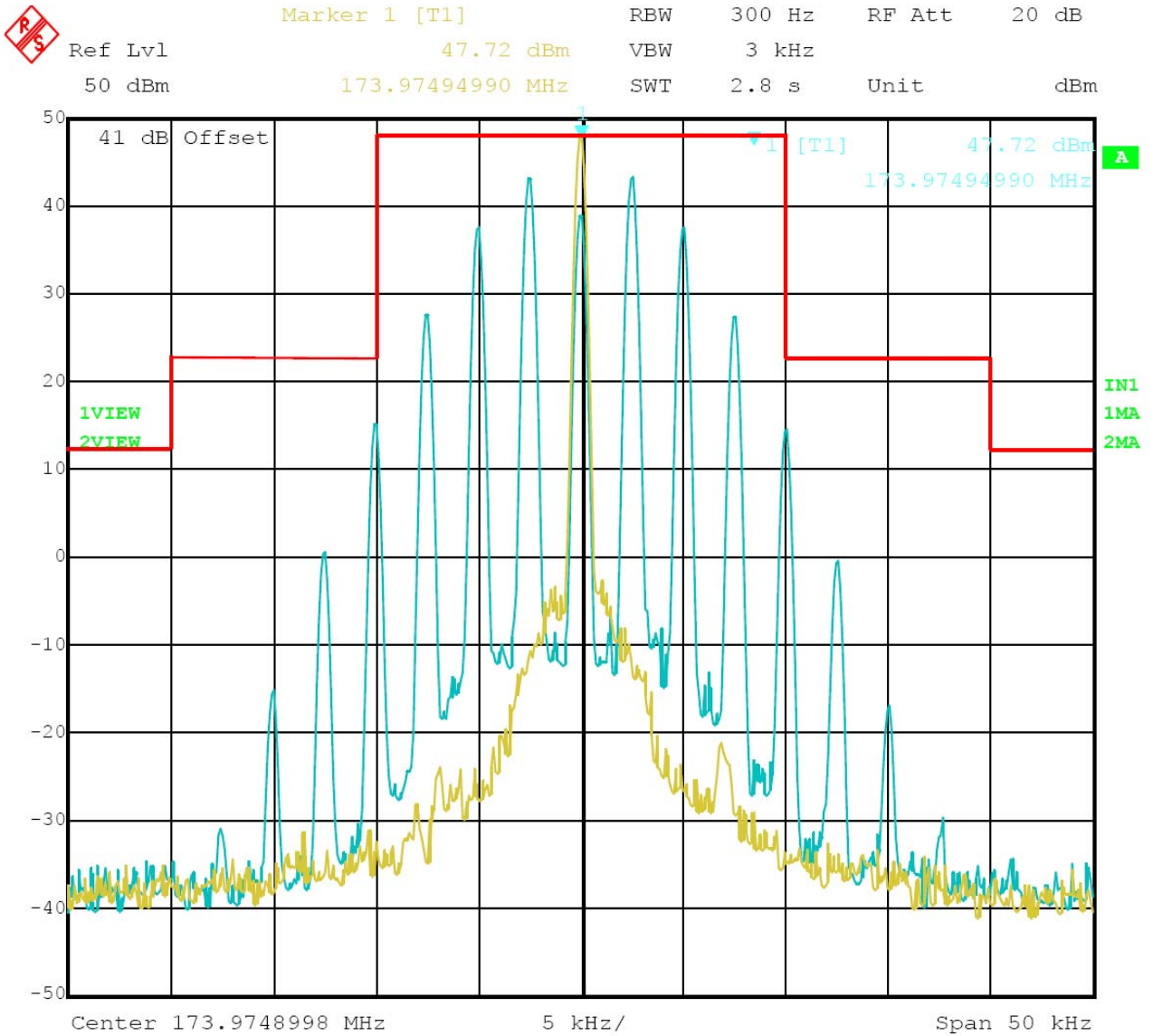
Modulation Type	Channel Separation	Freq.(MHz)	FCC Applicable Mask	RBW	Audio Freq. (KHz)	Results
FM	25 KHz	155.1250	B	300Hz	2.5	Compliance



Date: 6.OCT.2010 10:32:15

25 kHz Channel Spacing, 155.1250 MHz, 2500 Hz Audio Modulation Only

Modulation Type	Channel Separation	Freq.(MHz)	FCC Applicable Mask	RBW	Audio Freq. (KHz)	Results
FM	25 KHz	173.9750	B	300Hz	2.5	Compliance



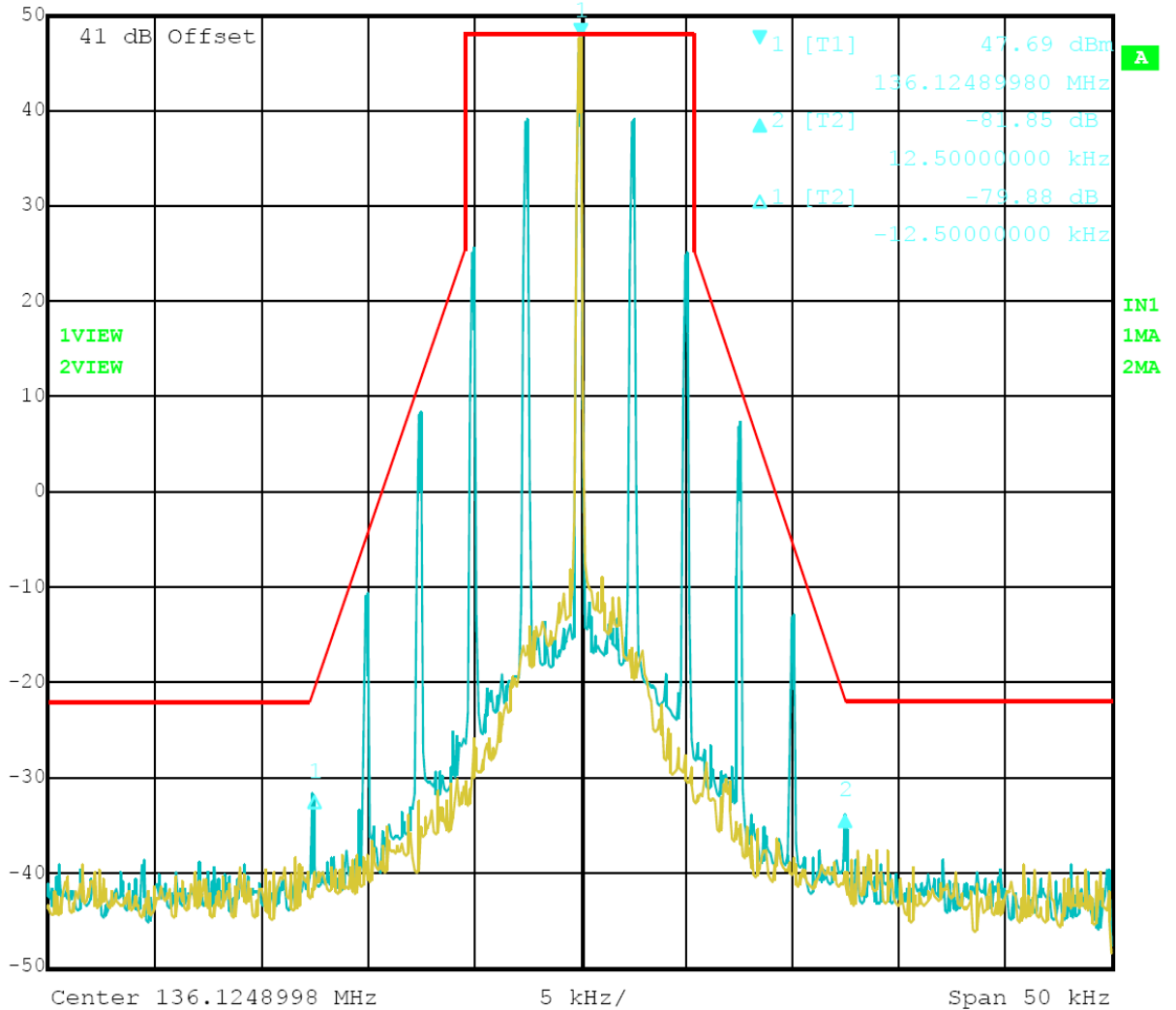
Date: 6.OCT.2010 10:45:27

25 kHz Channel Spacing, 173.9750 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	Compliance



Delta 2 [T2] RBW 100 Hz RF Att 20 dB
 Ref Lvl -81.85 dB VBW 300 Hz
 50 dBm 12.5000000 kHz SWT 25 s Unit dBm



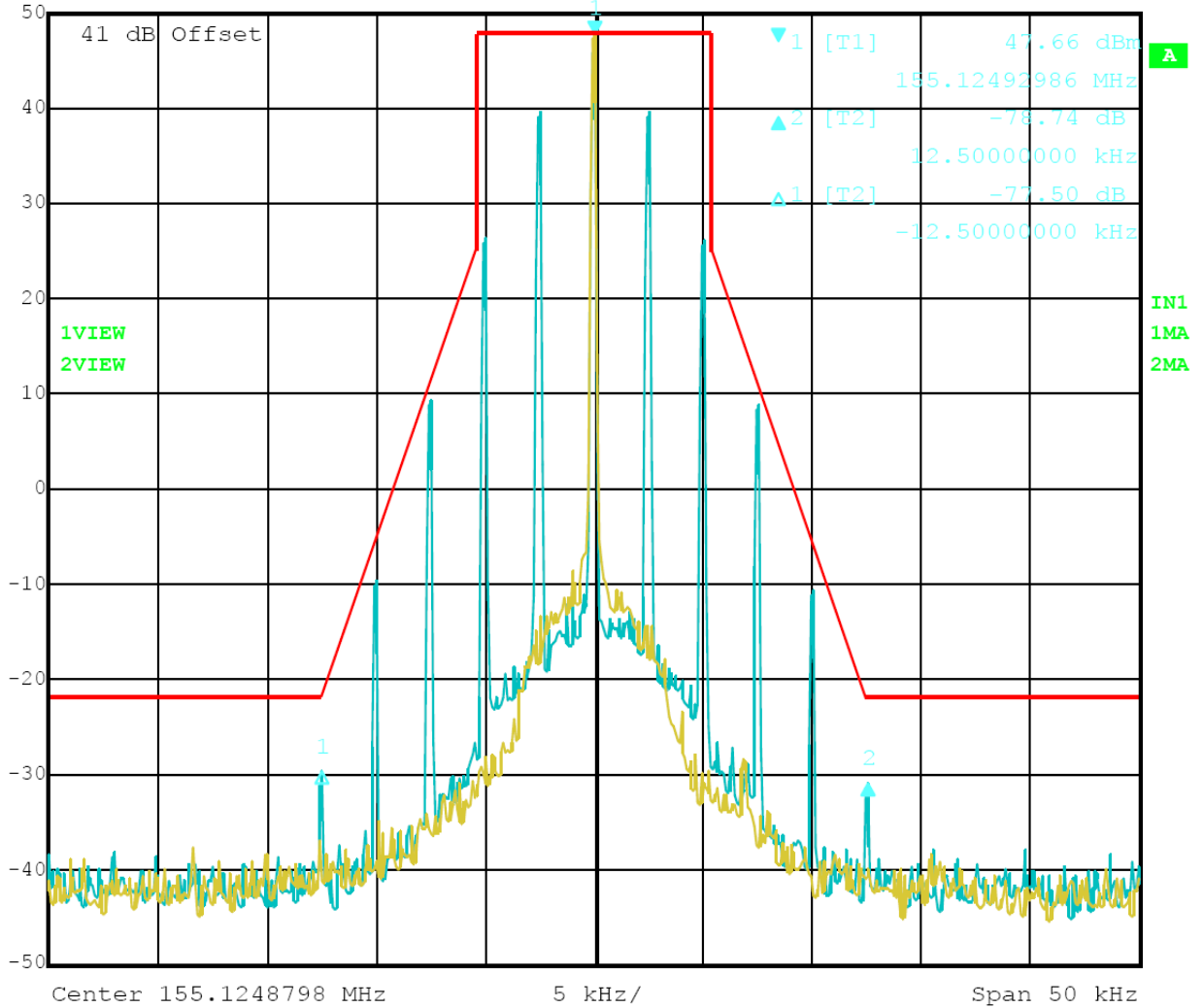
Date: 6.OCT.2010 10:49:38

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	155.1250	D	100Hz	2.5	Compliance



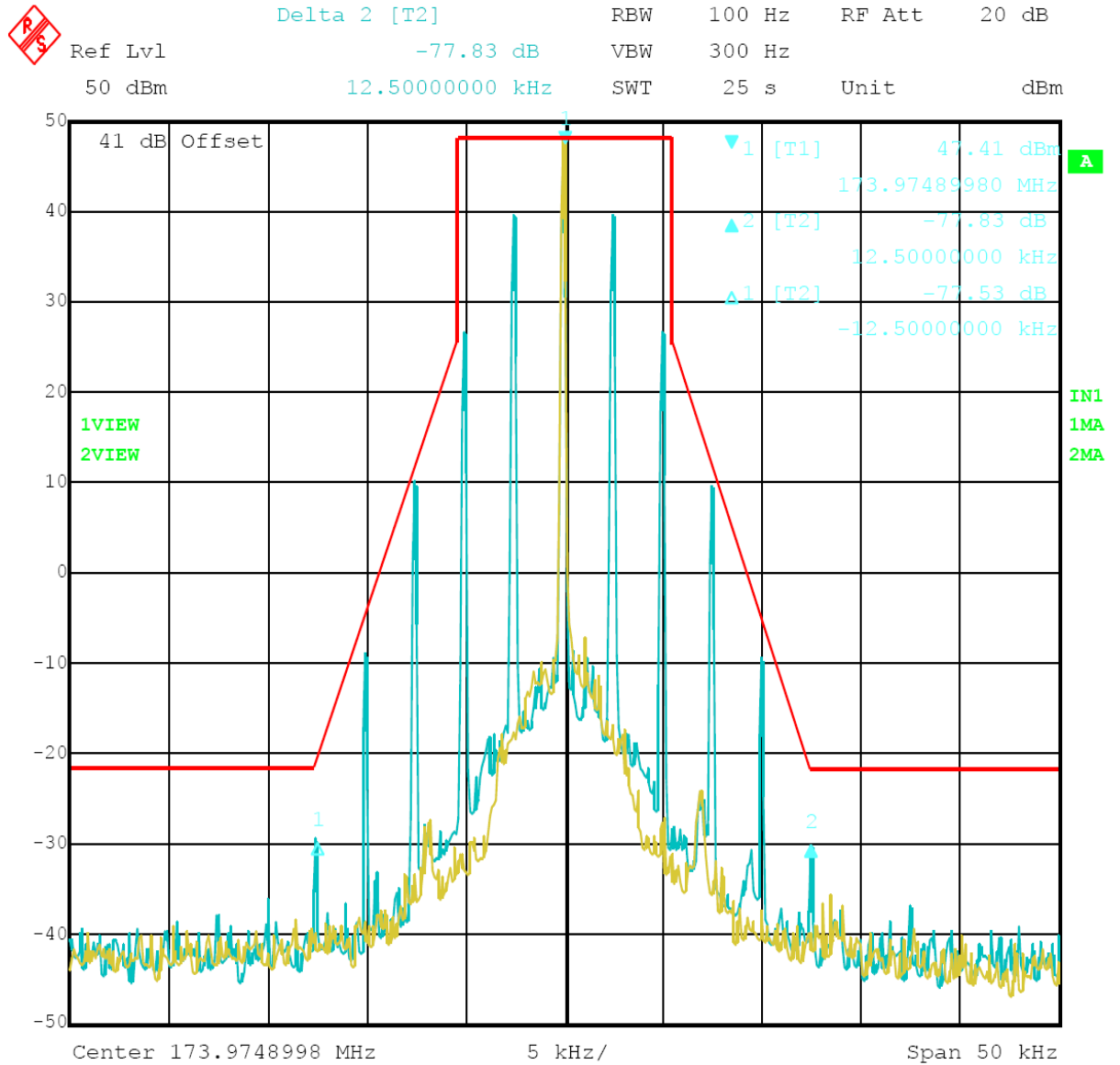
Delta 2 [T2] RBW 100 Hz RF Att 20 dB
Ref Lvl -78.74 dB VBW 300 Hz
50 dBm 12.5000000 kHz SWT 25 s Unit dBm



Date: 6.OCT.2010 10:55:57

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	173.9750	D	100Hz	2.5	Compliance



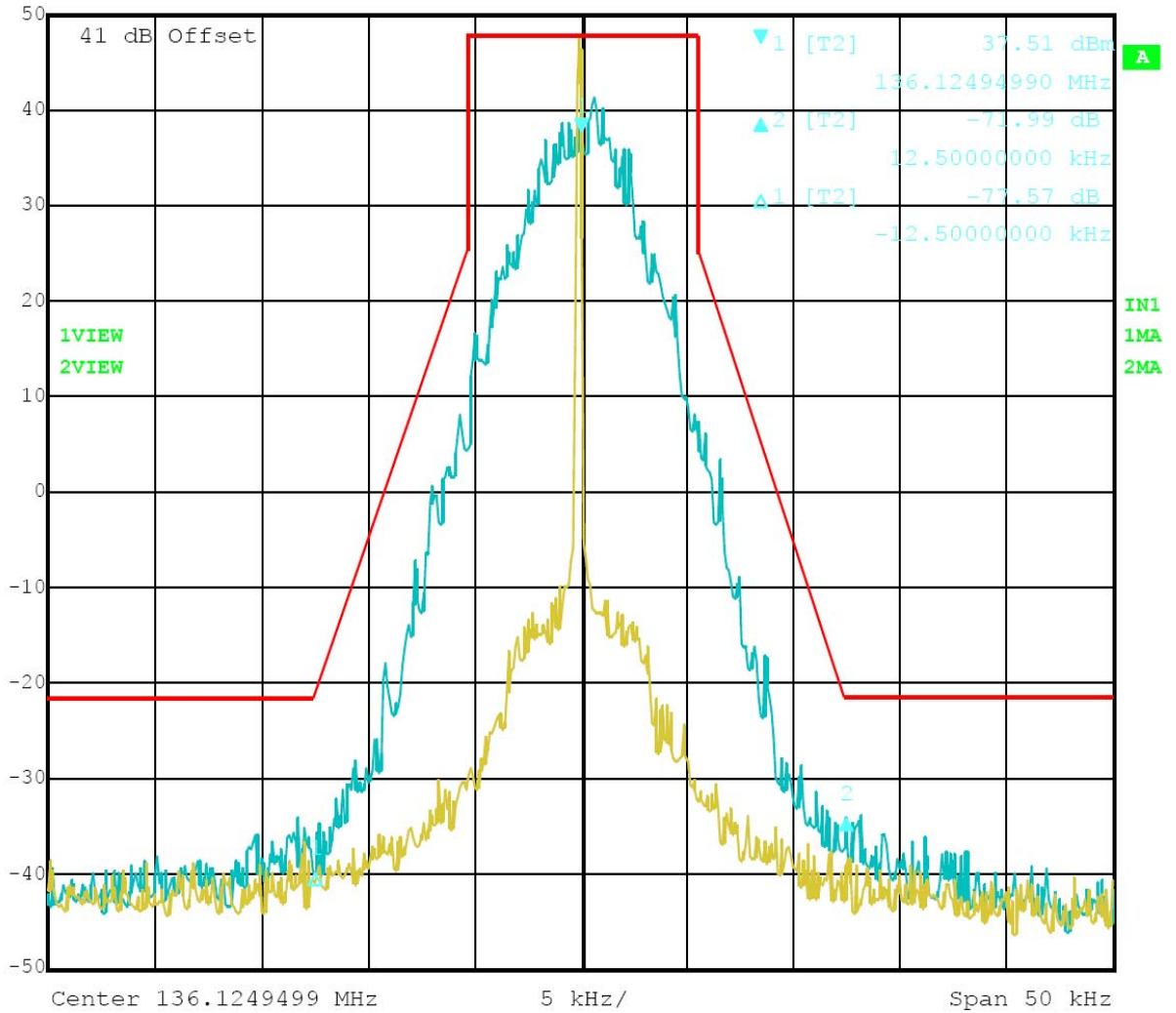
Date: 6.OCT.2010 11:03:45

12.5 kHz Channel Spacing, 173.9750 MHz, 2500 Hz Audio Modulation Only

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



Delta 2 [T2] RBW 100 Hz RF Att 20 dB
 Ref Lvl -71.99 dB VBW 300 Hz
 50 dBm 12.50000000 kHz SWT 25 s Unit dBm



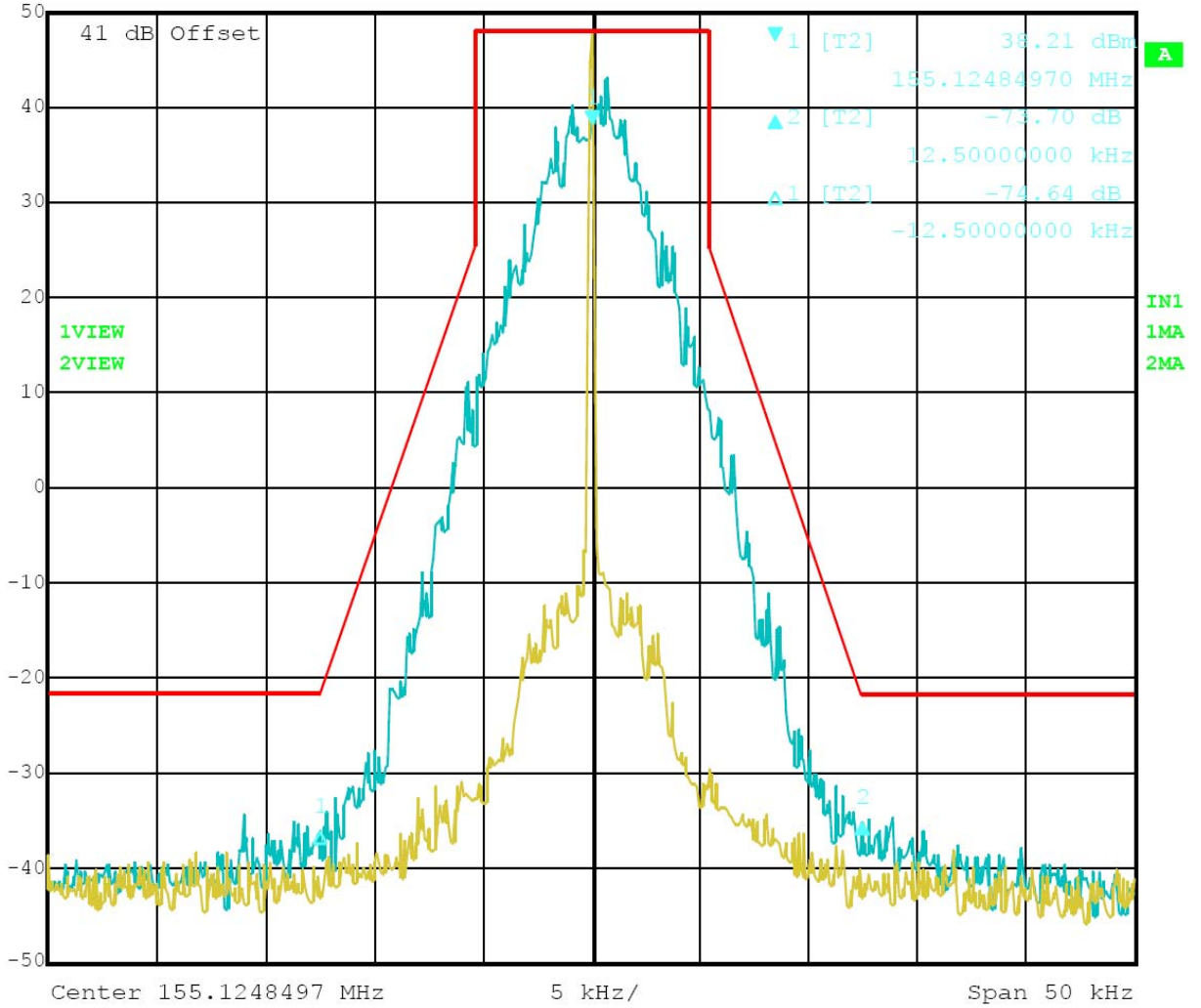
Date: 6.OCT.2010 13:14:29

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

Modulation Type	Channel Separation	Freq.(MHz)	FCC Applicable Mask	RBW	Results
4FSK	12.5 KHz	155.1250	D	100Hz	Compliance



Delta 2 [T2] RBW 100 Hz RF Att 20 dB
Ref Lvl -73.70 dB VBW 300 Hz
50 dBm 12.50000000 kHz SWT 25 s Unit dBm



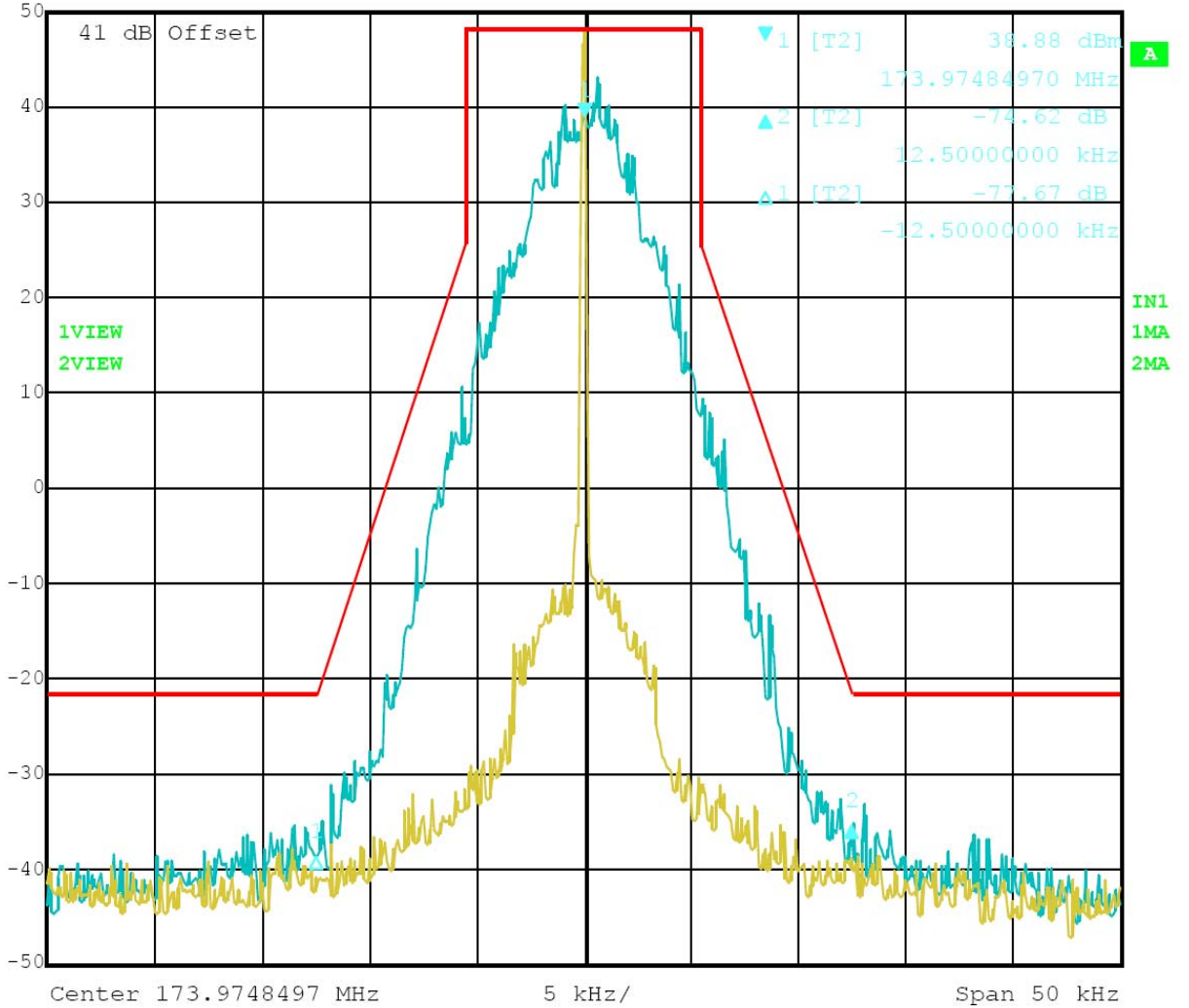
Date: 6.OCT.2010 13:08:49

12.5 kHz Channel Spacing, 155.1250 MHz, 4FSK Modulation Only

Modulation Type	Channel Separation	Freq.(MHz)	FCC Applicable Mask	RBW	Results
4FSK	12.5 KHz	173.9750	D	100Hz	Compliance



Delta 2 [T2] RBW 100 Hz RF Att 20 dB
Ref Lvl -74.62 dB VBW 300 Hz
50 dBm 12.5000000 kHz SWT 25 s Unit dBm



Date: 6.OCT.2010 13:03:02

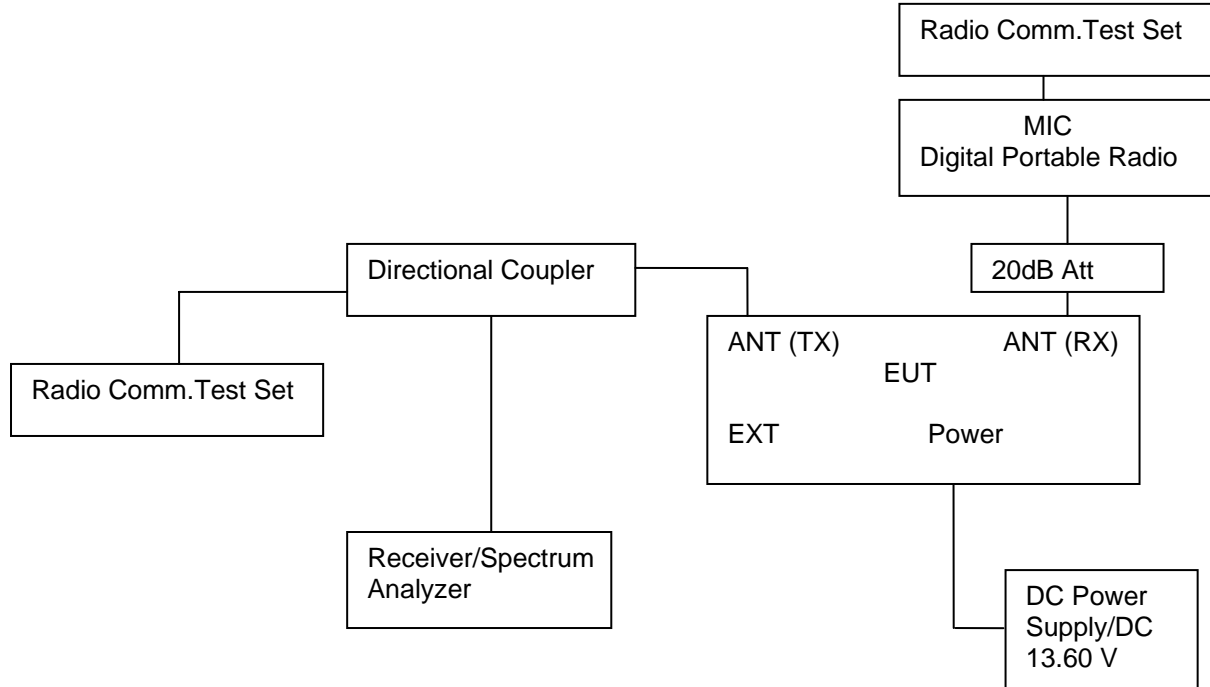
12.5 kHz Channel Spacing, 173.9750 MHz, 4FSK Modulation Only

4.2.2 Occupied Bandwidth at Repeater function

TEST APPLICABLE

(a). Occupied Bandwidth: The spectral shape of outpyt should look similar to input for all modulations.

TEST CONFIGURATION



TEST PROCEDURE

- 1 The EUT was placed on a turn table which is 0.8m above ground plane.
- 2 The Digital Portable Radio was modulated by 2.5 KHz Sine wave audio signal or Digital 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.

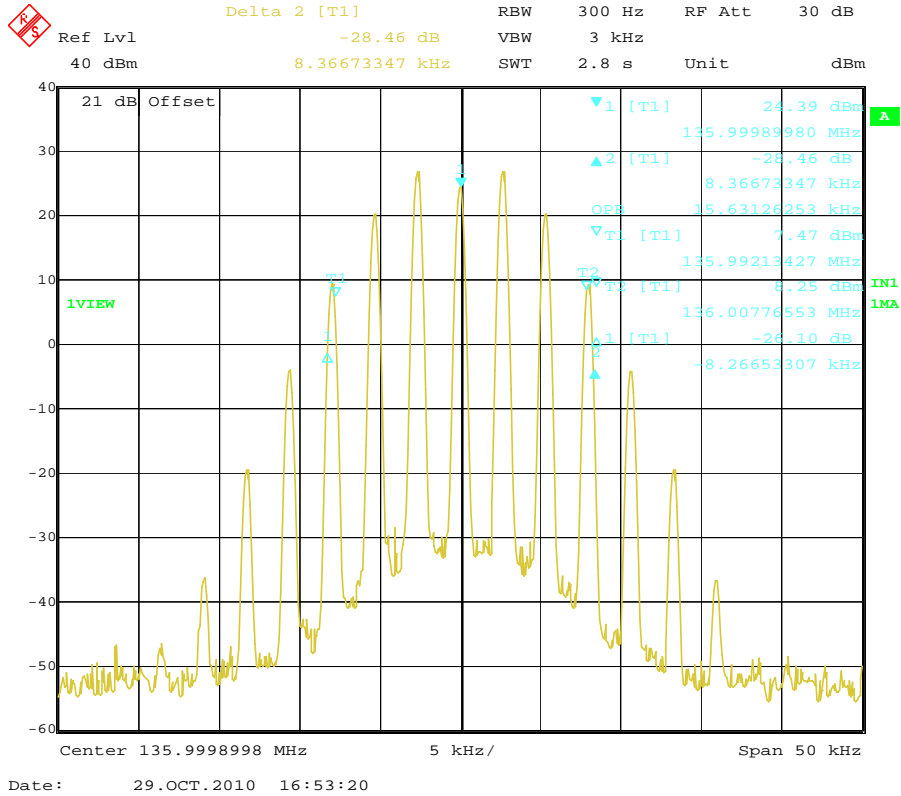
TEST RESULTS

4.2.2.1 Occupied Bandwidth of Digital Portable Radio

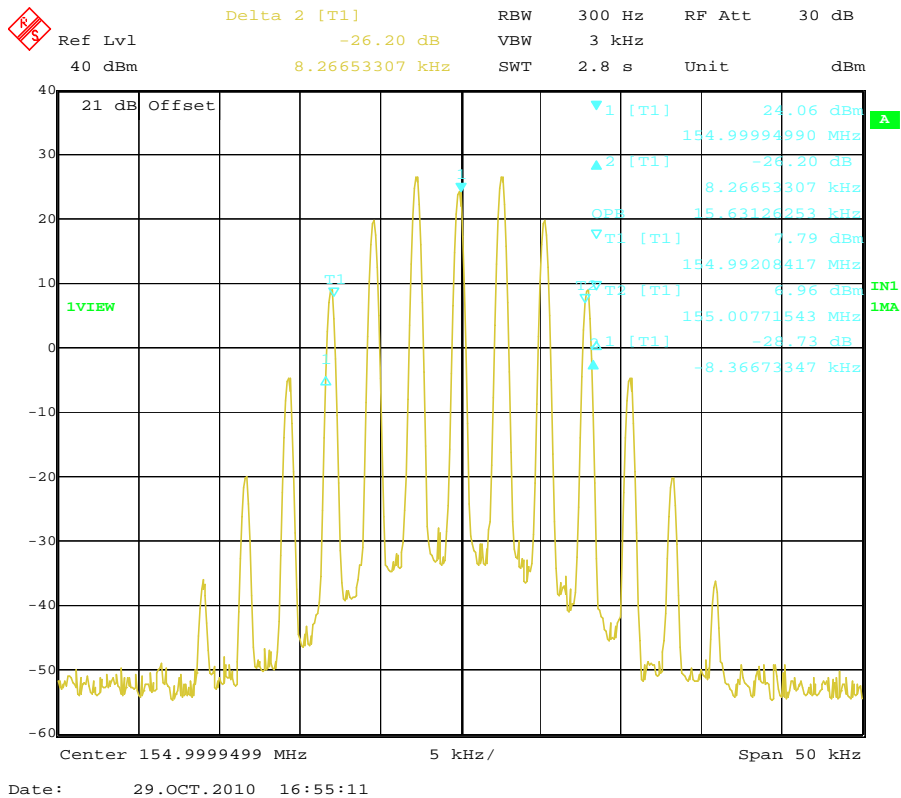
Modulation Type	Channel Sparation	Test Channel	Test Frequency	99% Occupied Bandwidth	26dB Occupied Bandwidth
FM	25KHz	Low	136.0000 MHz	15.63 KHz	16.63 KHz
		Middle	155.0000 MHz	15.63 KHz	16.63 KHz
		High	174.0000 MHz	15.63 KHz	16.63 KHz
	12.5KHz	Low	136.0000 MHz	9.92 KHz	10.52 KHz
		Middle	155.0000 MHz	9.92 KHz	10.52 KHz
		High	174.0000 MHz	9.82 KHz	10.62 KHz
4FSK	12.5KHz	Low	136.0000 MHz	7.71 KHz	10.52 KHz
		Middle	155.0000 MHz	7.62 KHz	9.92 KHz
		High	174.0000 MHz	7.72 KHz	10.52 KHz
Limit		20kHz for 25KHz Channel Separation			
Test Results		11.25KHz for 12.5KHz Channel Separation			
		Compliance			

Plots of 99% and 26dB Bandwidth Measurement

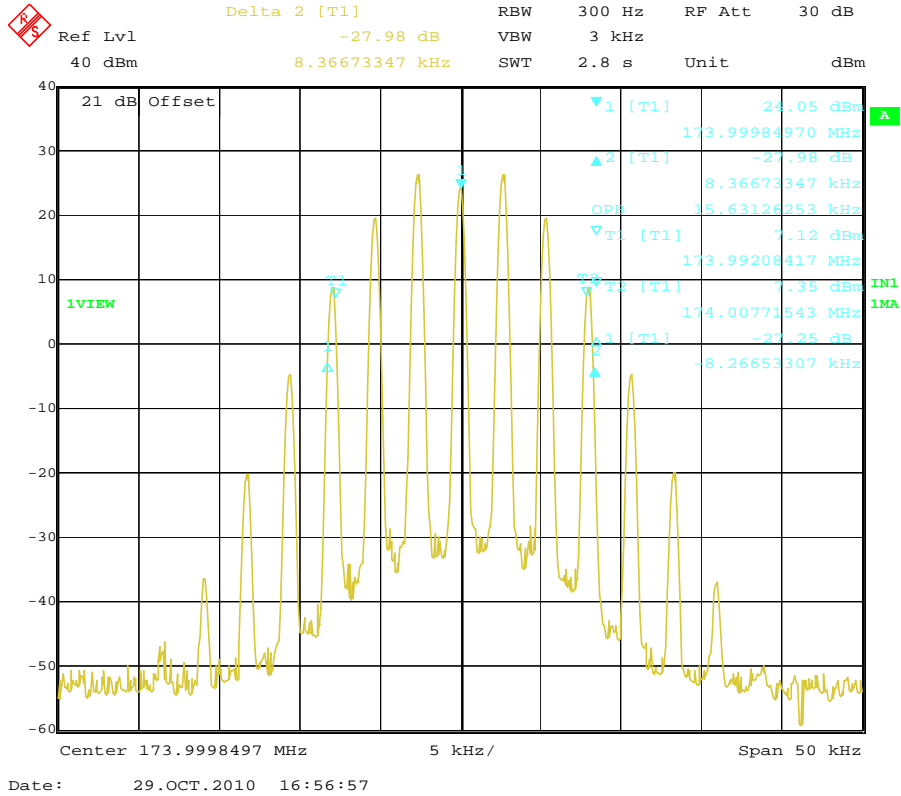
Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	25 KHz	136.0000	15.63	16.53	20	Compliance



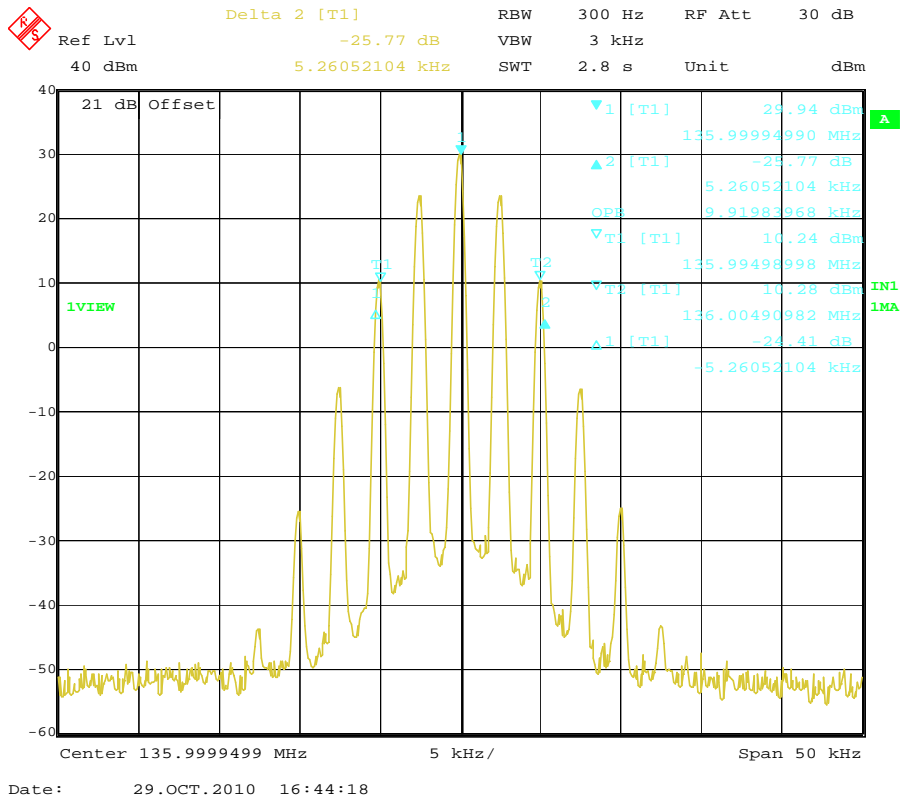
Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	25 KHz	155.0000	15.63	16.63	20	Compliance



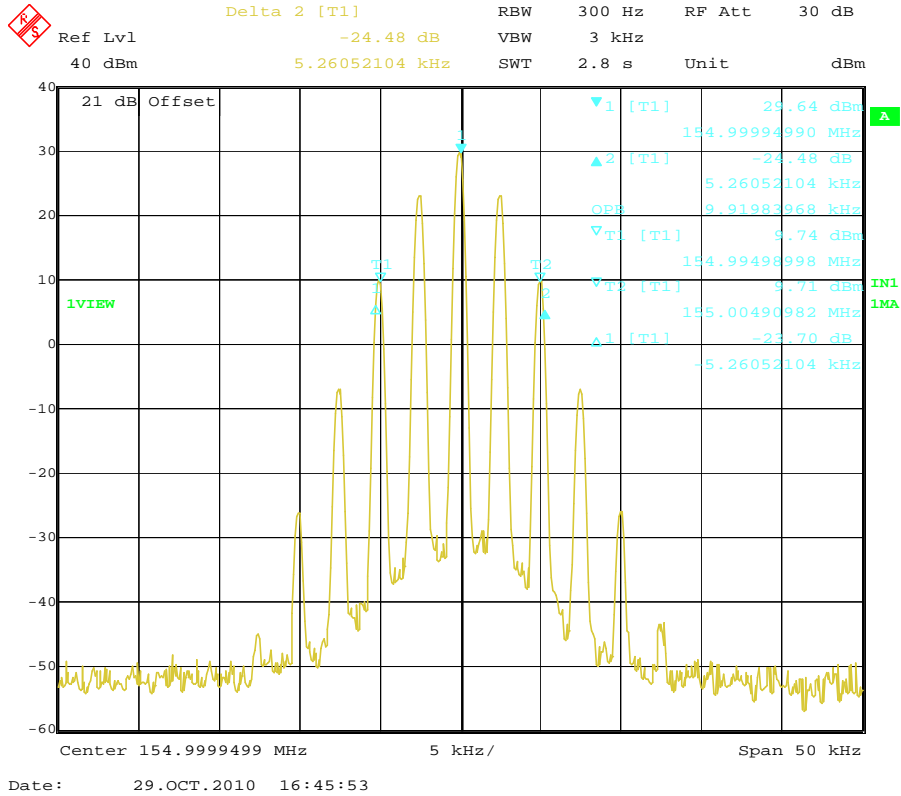
Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	25 KHz	174.0000	15.63	16.63	20	Compliance



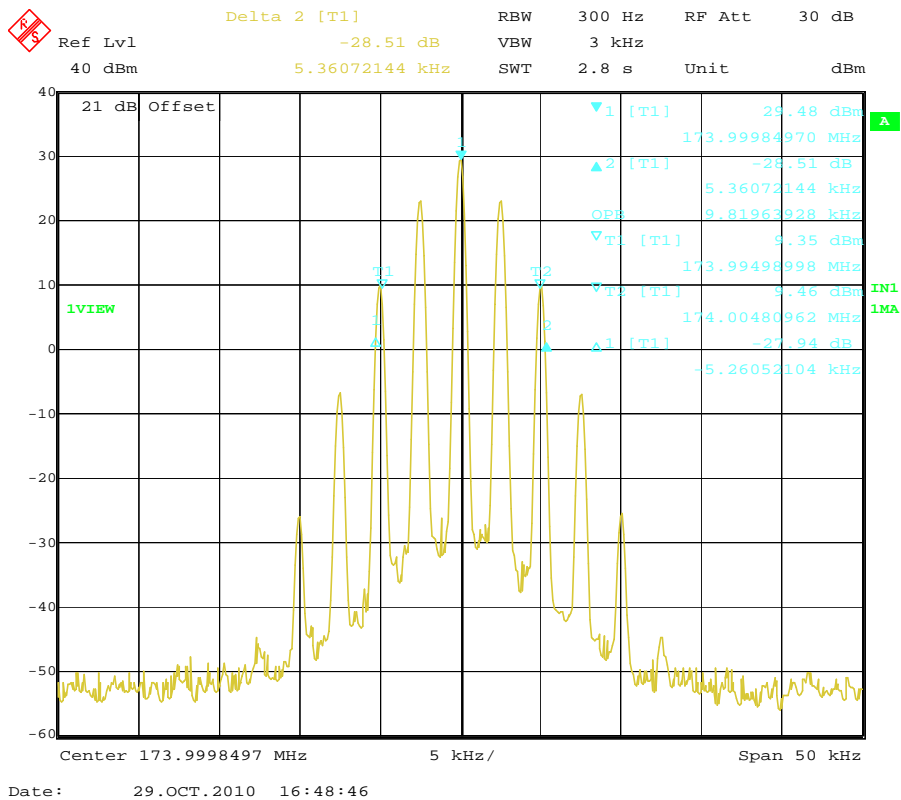
Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	12.5 KHz	136.0000	9.92	10.52	11.25	Compliance




Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	12.5 KHz	155.0000	9.92	10.52	11.25	Compliance

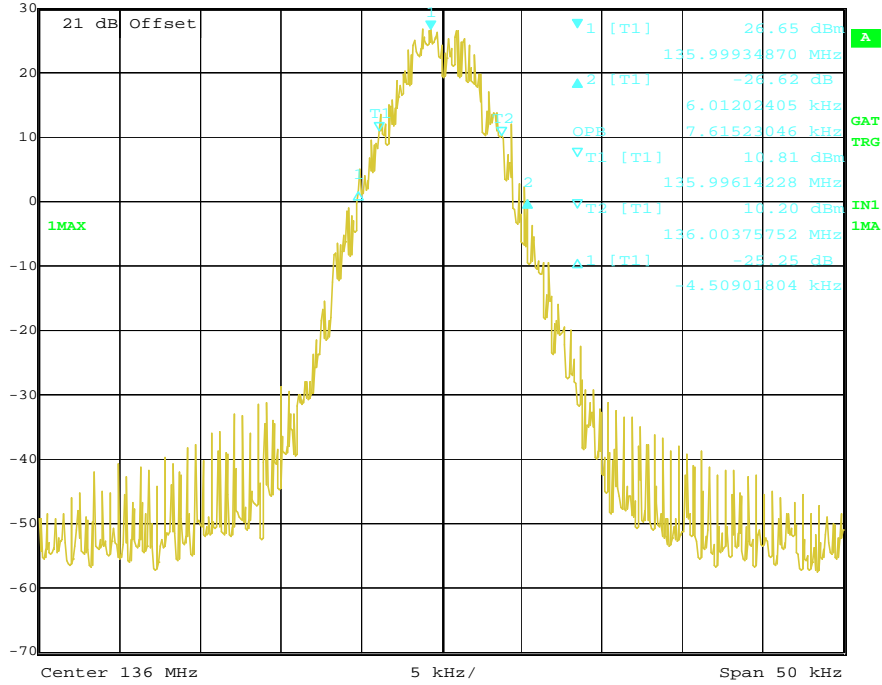


Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	12.5 KHz	174.0000	9.82	10.62	11.25	Compliance




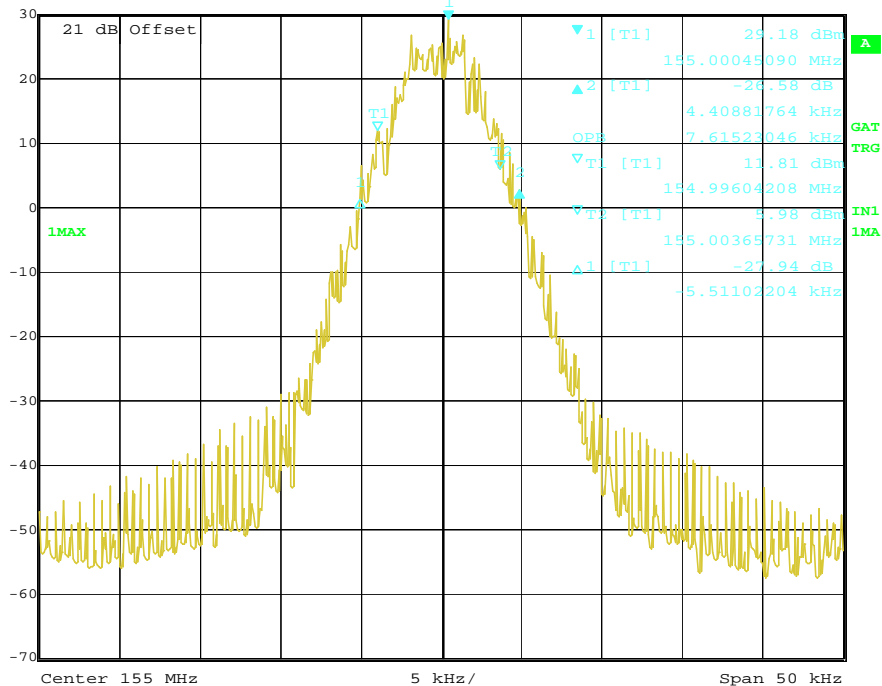
Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
4FSK	12.5 KHz	136.0000	7.62	10.52	11.25	Compliance


Delta 2 [T1]
RBW 300 Hz
RF Att 20 dB
Ref Lvl -26.62 dB
VBW 3 kHz
30 dBm
6.01202405 kHz
SWT 2.8 s
Unit dBm

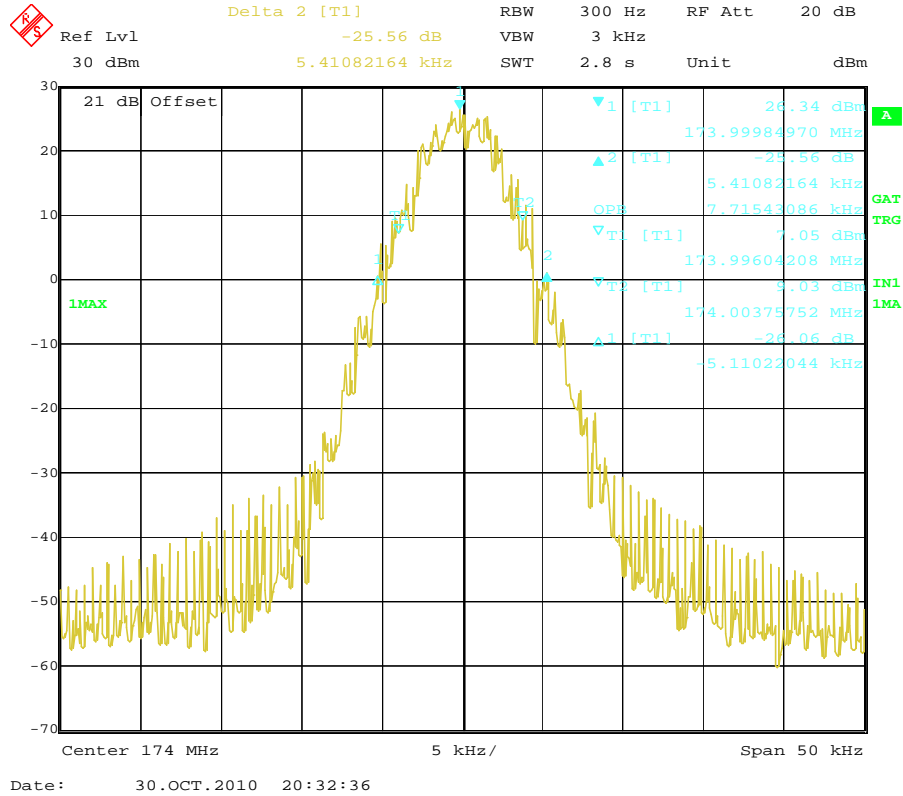


Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
4FSK	12.5 KHz	155.0000	7.52	9.92	11.25	Compliance


Delta 2 [T1]
RBW 300 Hz
RF Att 20 dB
Ref Lvl -26.58 dB
VBW 3 kHz
30 dBm
4.40881764 kHz
SWT 2.8 s
Unit dBm



Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
4FSK	12.5 KHz	174.0000	7.72	10.52	11.25	Compliance

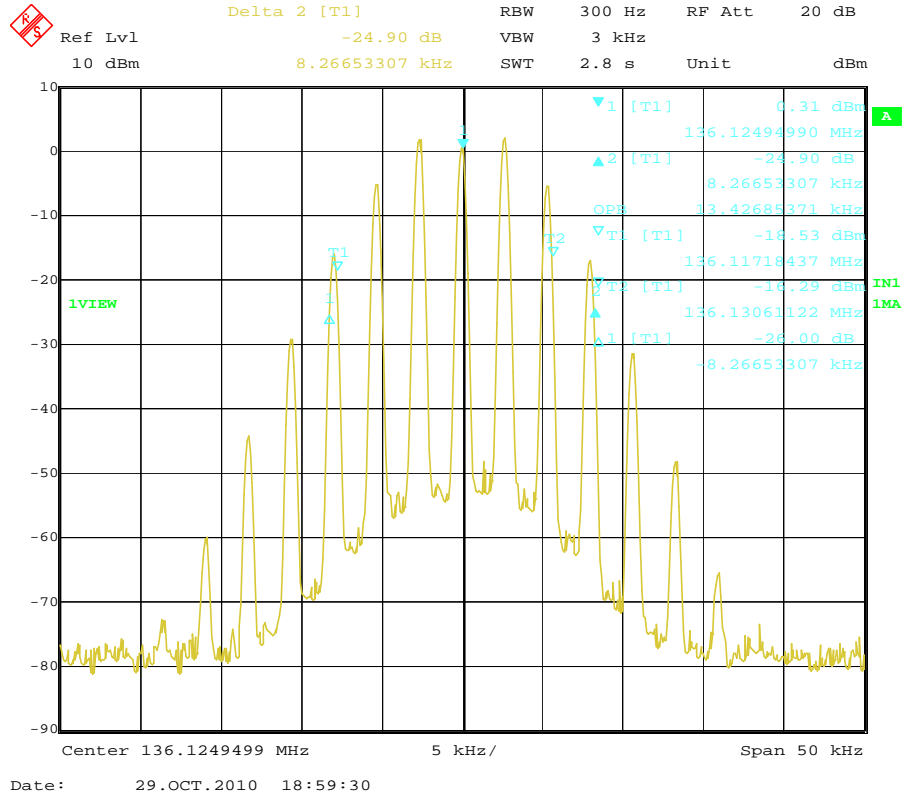


4.2.2.2 Occupied Bandwidth of EUT

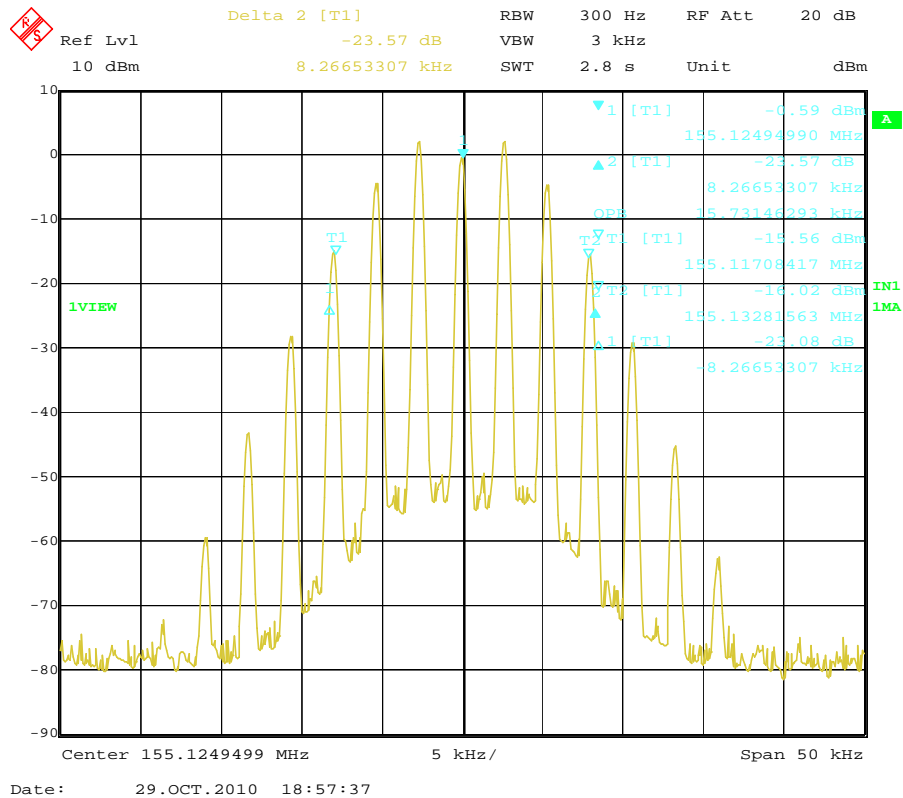
Modulation Type	Channel Separation	Test Channel	Test Frequency	99% Occupied Bandwidth	26dB Occupied Bandwidth
FM	25KHz	Low	136.1250 MHz	13.43 KHz	16.63 KHz
		Middle	155.1250 MHz	15.73 KHz	16.63 KHz
		High	173.9750 MHz	15.73 KHz	16.63 KHz
	12.5KHz	Low	136.1250 MHz	9.72 KHz	10.52 KHz
		Middle	155.1250 MHz	9.82 KHz	10.62 KHz
		High	173.9750 MHz	9.82 KHz	10.62 KHz
4FSK	12.5KHz	Low	136.1250 MHz	7.62 KHz	10.52 KHz
		Middle	155.1250 MHz	7.92 KHz	10.02 KHz
		High	173.9750 MHz	8.02 KHz	10.72 KHz
Limit		20kHz for 25KHz Channel Separation			
Limit		11.25KHz for 12.5KHz Channel Separation			
Test Results		Compliance			

Plots of 99% and 26dB Bandwidth Measurement

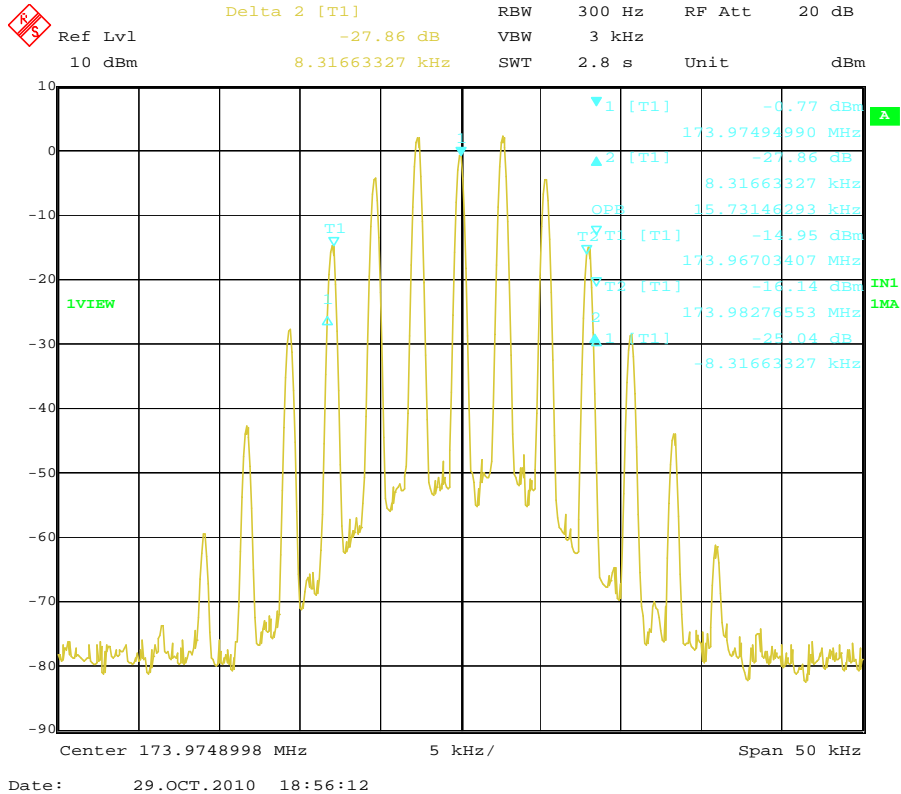
Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	25 KHz	136.1250	13.43	16.63	20	Compliance



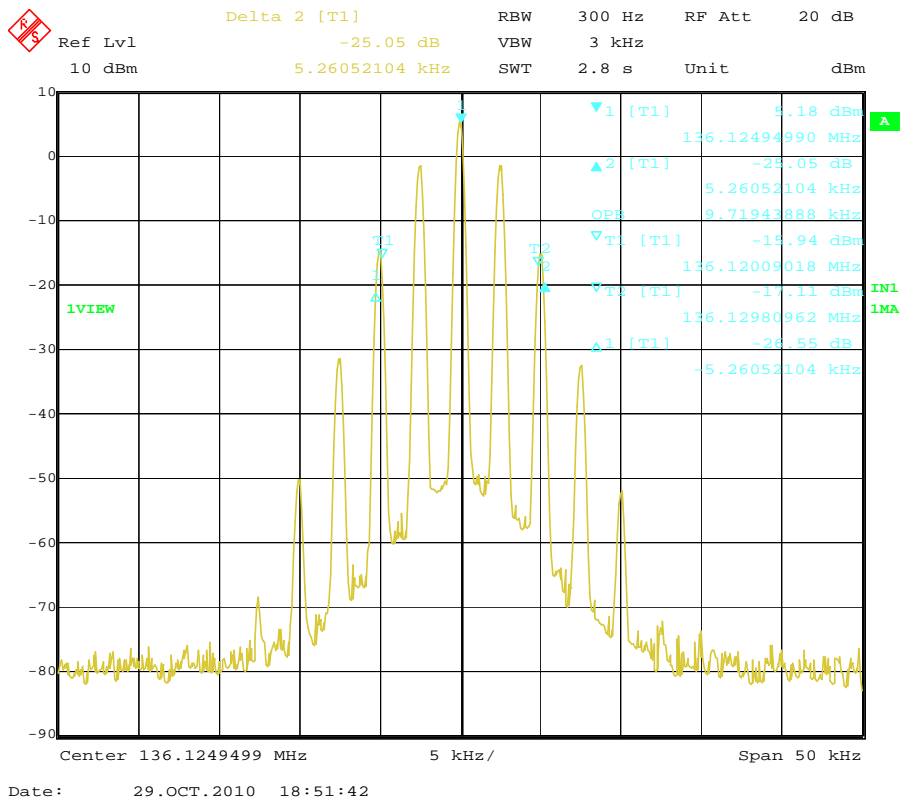
Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	25 KHz	155.1250	15.73	16.63	20	Compliance



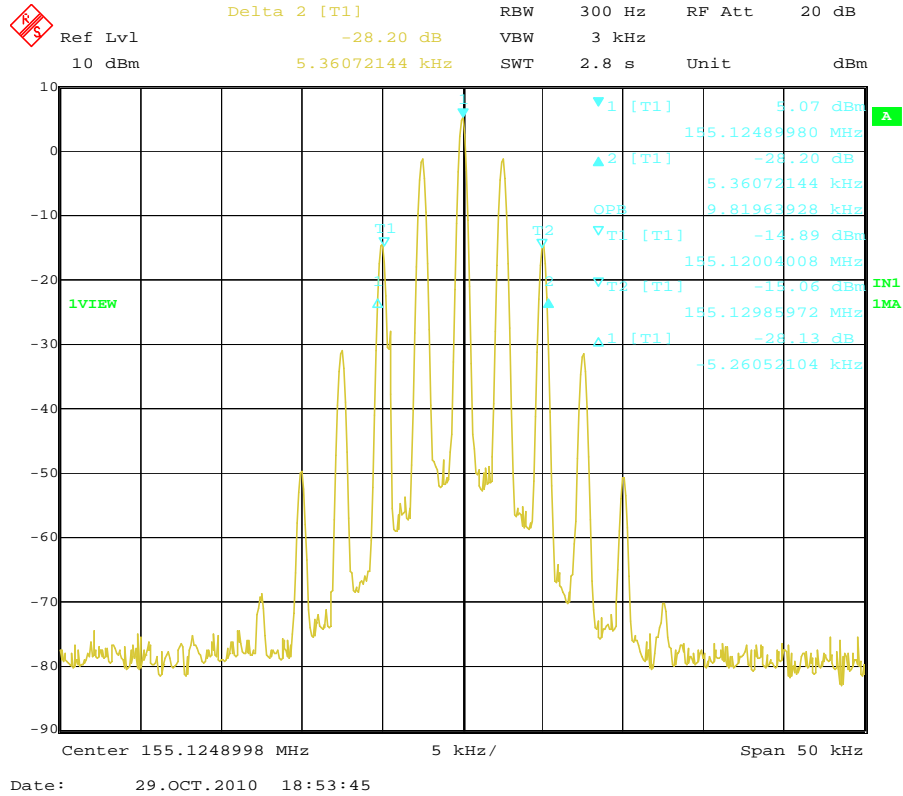
Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	25 KHz	173.9750	15.73	16.63	20	Compliance



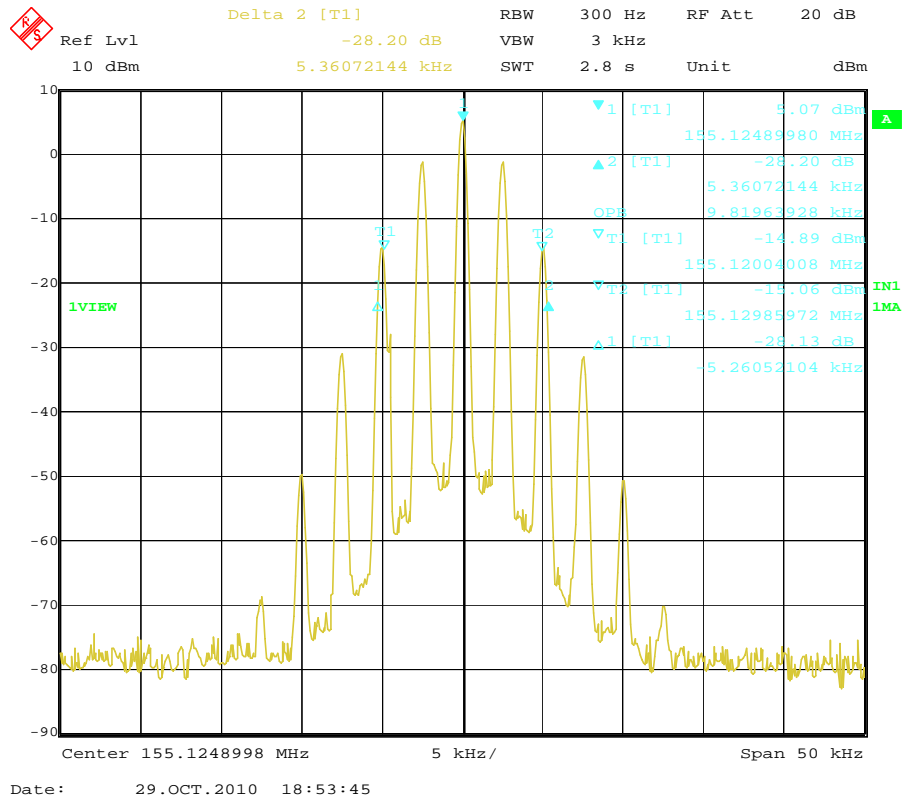
Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	12.5 KHz	136.1250	9.72	10.52	11.25	Compliance




Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	12.5 KHz	155.1250	9.82	10.62	11.25	Compliance

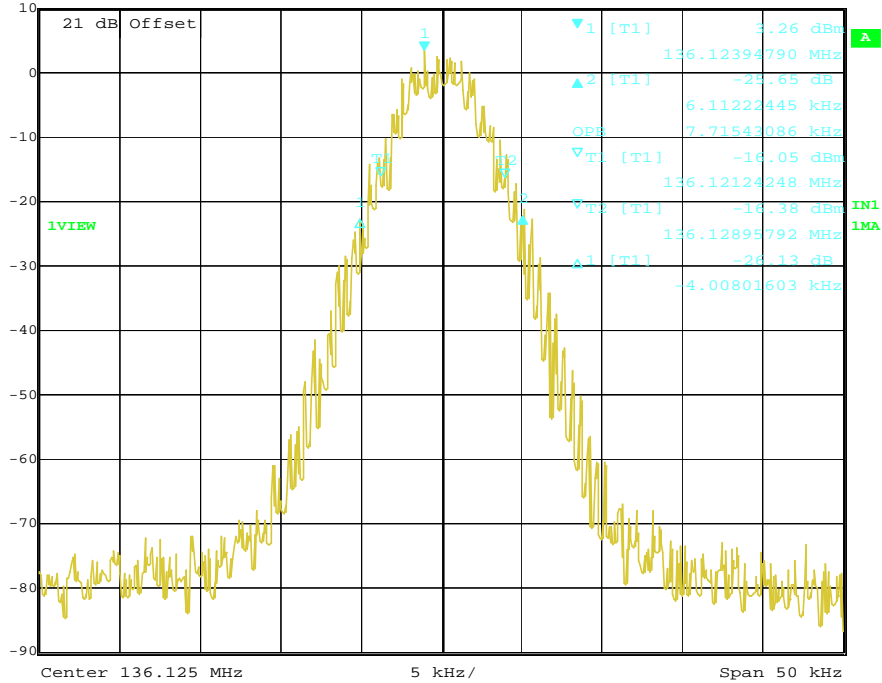


Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	12.5 KHz	173.9750	9.82	10.62	11.25	Compliance




Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
4FSK	12.5 KHz	136.1250	7.71	10.12	11.25	Compliance

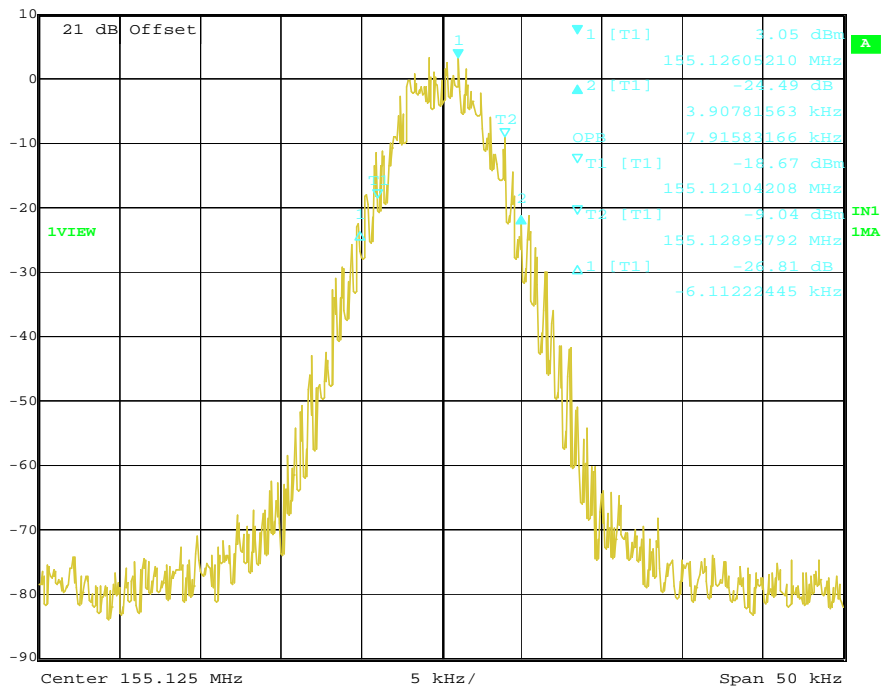

Delta 2 [T1]
RBW 300 Hz RF Att 0 dB
Ref Lvl -25.65 dB
VBW 3 kHz
10 dBm
6.11222445 kHz
SWT 2.8 s Unit dBm



Date: 29.OCT.2010 17:26:28

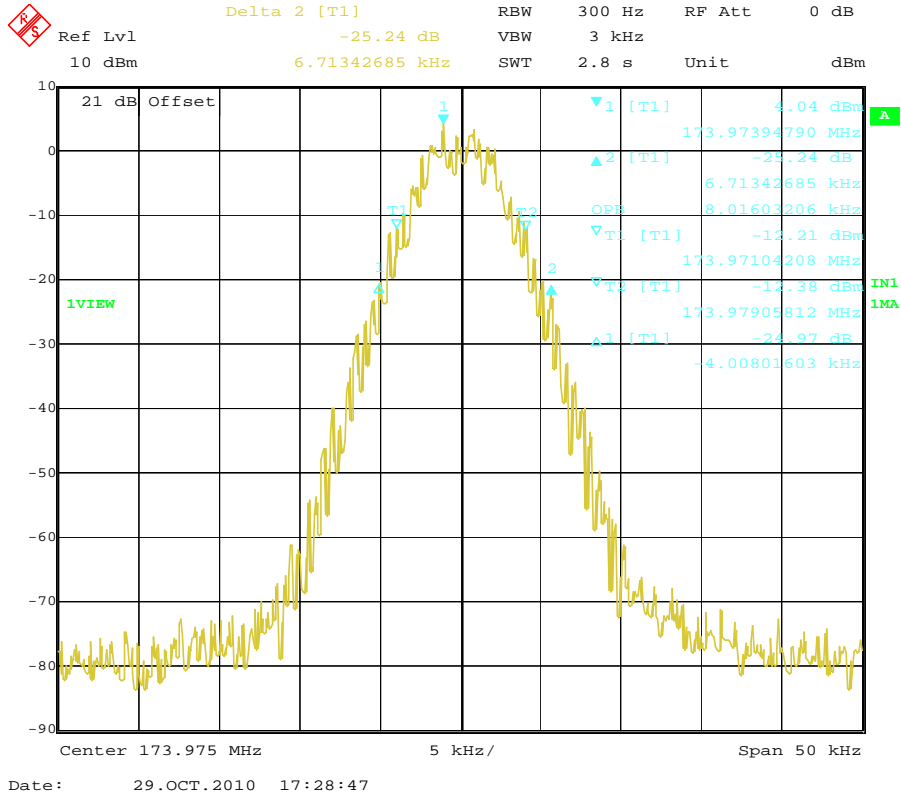
Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
4FSK	12.5 KHz	155.1250	7.92	10.02	11.25	Compliance


Delta 2 [T1]
RBW 300 Hz RF Att 0 dB
Ref Lvl -24.49 dB
VBW 3 kHz
10 dBm
3.90781563 kHz
SWT 2.8 s Unit dBm



Date: 29.OCT.2010 17:27:36

Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
4FSK	12.5 KHz	173.975	8.02	10.72	11.25	Compliance



4.3. Transmitter Radiated Spurious Emission

TEST APPLICABLE

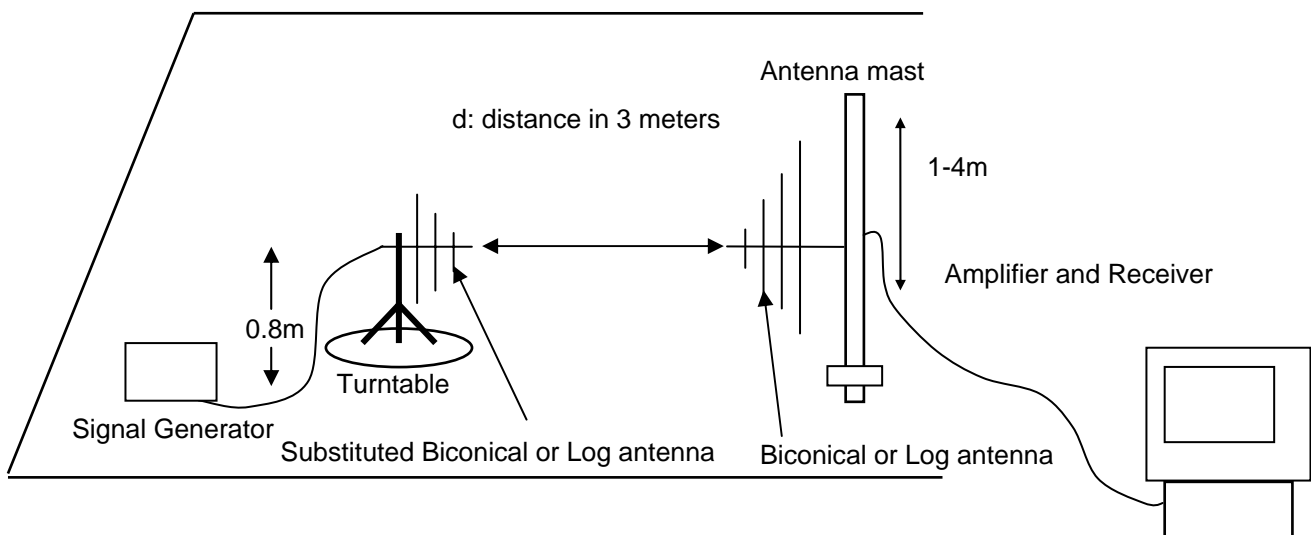
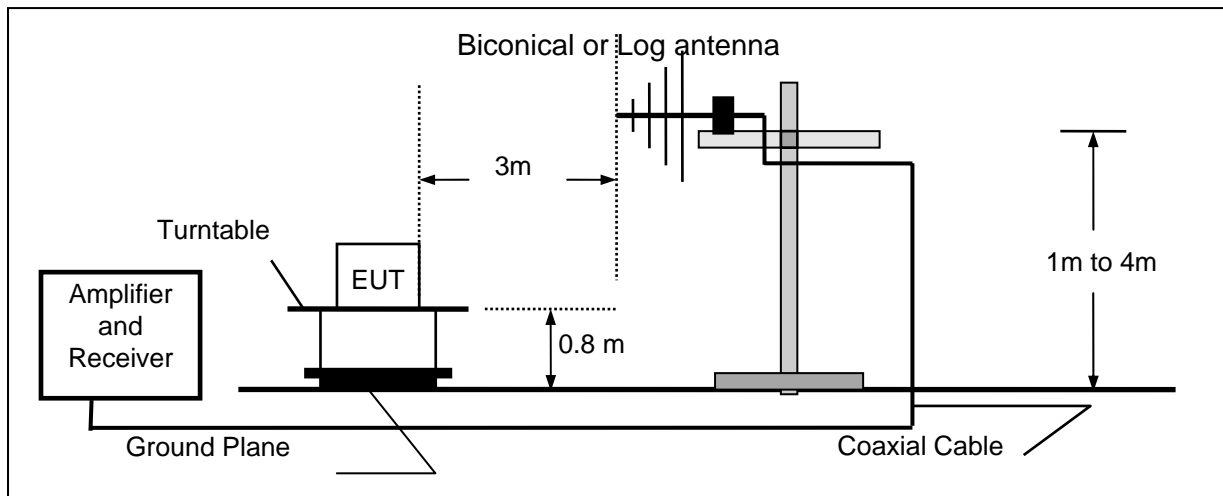
According to the TIA/EIA 603 test method, and according to Section 90.210, the power of each unwanted emission shall be less than Transmitted Power as specified below for transmitters designed to operate with 12.5 KHz channel bandwidth:

- 1 On any frequency removed from the center of the authorized bandwidth f_0 to 5.625 KHz removed from f_0 : Zero dB
 - 2 On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in KHz) f_0 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 (f_d in KHz) f_0 of more than 12.5 KHz: At least $50+10 \log (P)$ dB or 70 dB, which ever is lesser attenuation.
- For transmitters designed to transmit with 25 KHz channel separation and equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier power (P) as following:

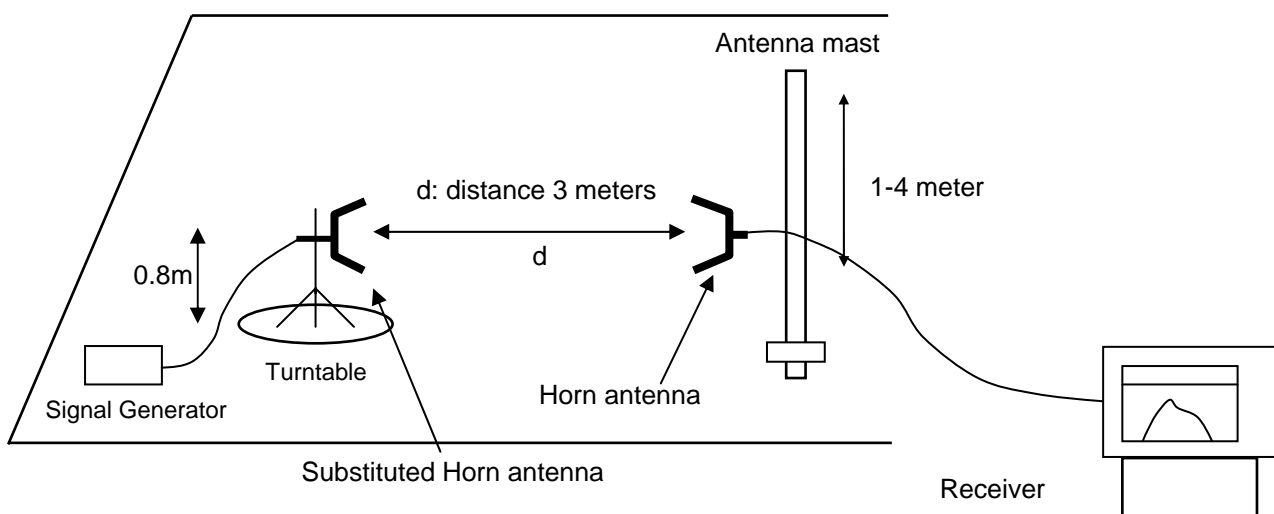
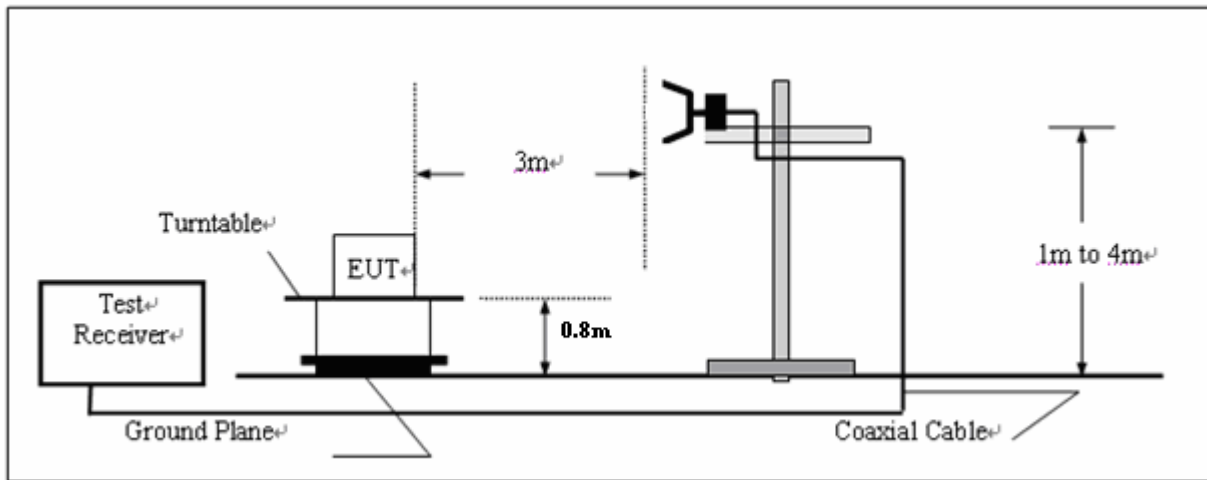
- 1 On any frequency removed from the assigned frequency by more than 50 percent, but no more than 100 percent of the authorized bandwidth: At least 25 dB.
- 2 On any frequency removed from the assigned frequency by more than 100 percent, but no more than 250 percent of the authorized bandwidth: At least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

TEST CONFIGURATION

Below 1GHz



Above 1GHz

**TEST PROCEDURE**

- 1 On a test site, the EUT shall be placed on a turntable and in the position closest to the normal use as declared by the user.
- 2 The test antenna shall be oriented initially for vertical polarization located 3m from the EUT to correspond to the transmitter.
- 3 The output of the antenna shall be connected to the measuring receiver and either a peak or quasi-peak detector was used for the measurement as 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: $43 + 10 \log (P_{\text{watts}}) = 43 + 10 \log (60.53) = 60.82 \text{ dB}$

High: $43 + 10 \log (P_{\text{watts}}) = 43 + 10 \log (61.94) = 60.92 \text{ dB}$

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

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

In this application, the EL is 46.99 dBm.

Limit (dBm) = $46.99 - 43 - 10 \log_{10} (61.94) = -13 \text{ dBm}$

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: $50 + 10 \log (P_{\text{watts}}) = 50 + 10 \log (60.39) = 67.81 \text{ dB}$

High: $50 + 10 \log (P_{\text{watts}}) = 50 + 10 \log (61.94) = 67.92 \text{ dB}$

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

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

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

In this application, the EL is 46.99 dBm.

Limit (dBm) = $46.99 - 50 - 10 \log_{10} (61.94) = -20 \text{ dBm}$

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: $50 + 10 \log (P_{\text{watts}}) = 50 + 10 \log (60.12) = 67.79 \text{ dB}$

High: $50 + 10 \log (P_{\text{watts}}) = 50 + 10 \log (61.38) = 67.88 \text{ dB}$

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

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

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

In this application, the EL is 46.99 dBm.

Limit (dBm) = $46.99 - 50 - 10 \log_{10} (61.38) = -20 \text{ dBm}$

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

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

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

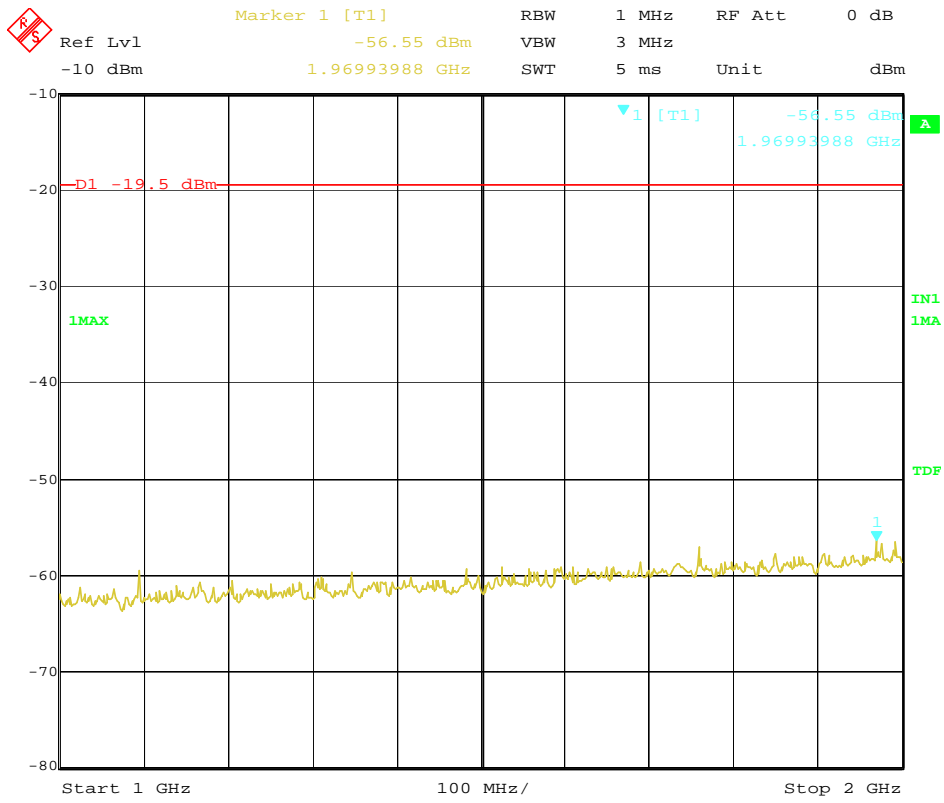
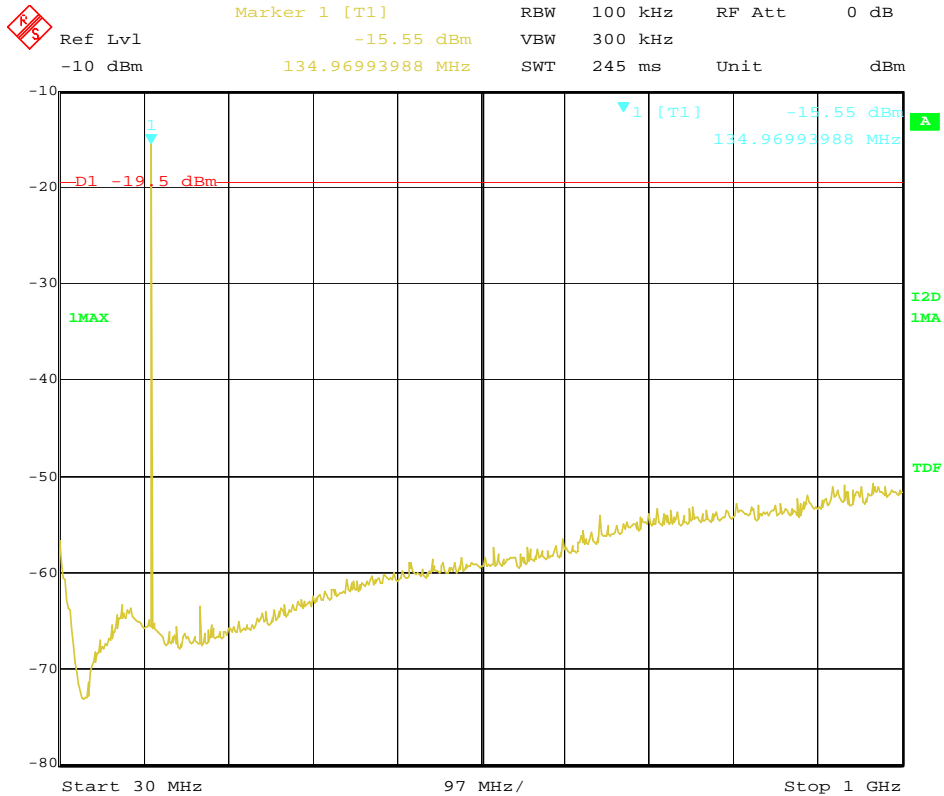
4. Corrected Power (dBm) = SG O/P-Cable + Ant Gain

5. The red line is the 6.5dB margin line.

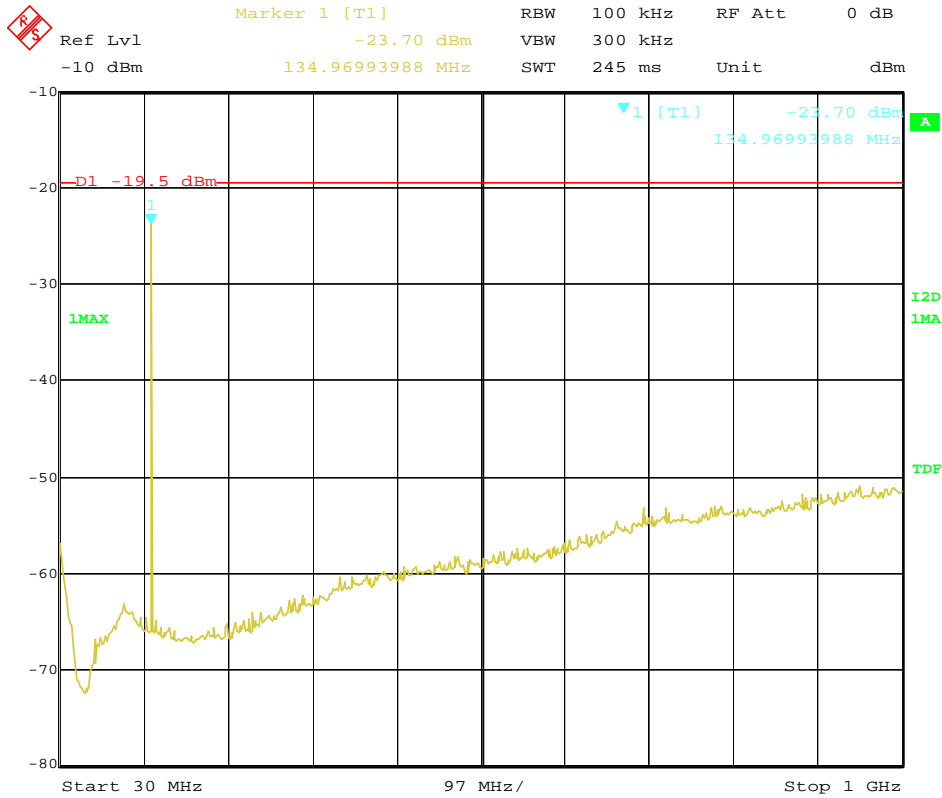
Plots of Transmitter Radiated Spurious Emission Measurement

Modulation Type: FM

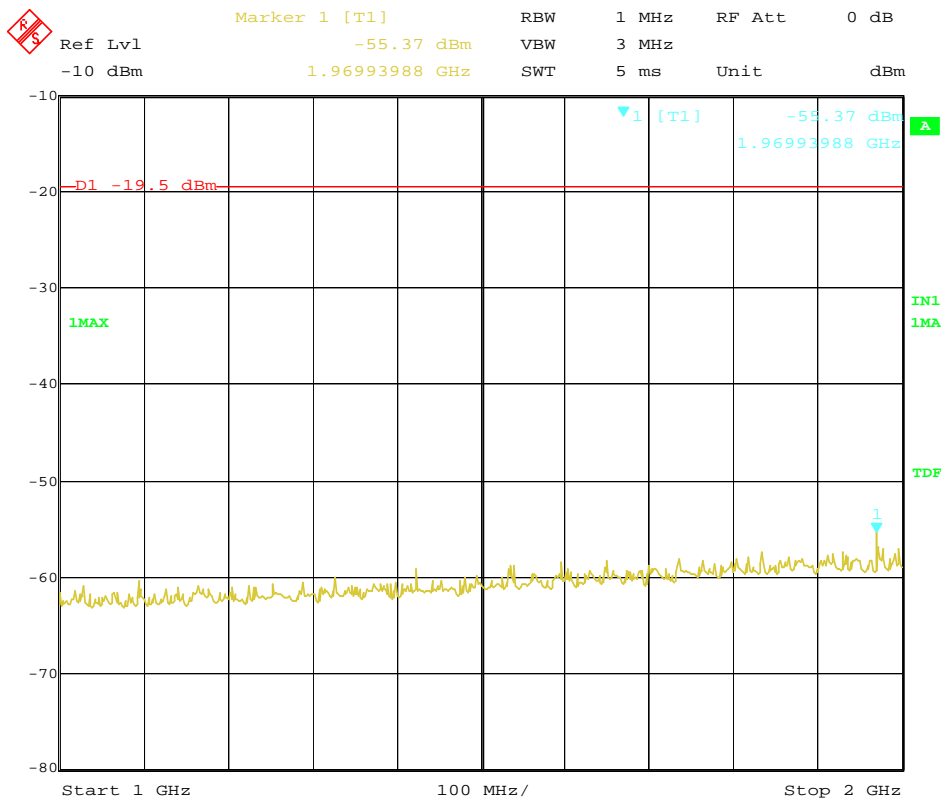
The Low channel for 25 KHz Channel Separation @ Horizontal



The Low channel for 25 KHz Channel Separation@ Vertical

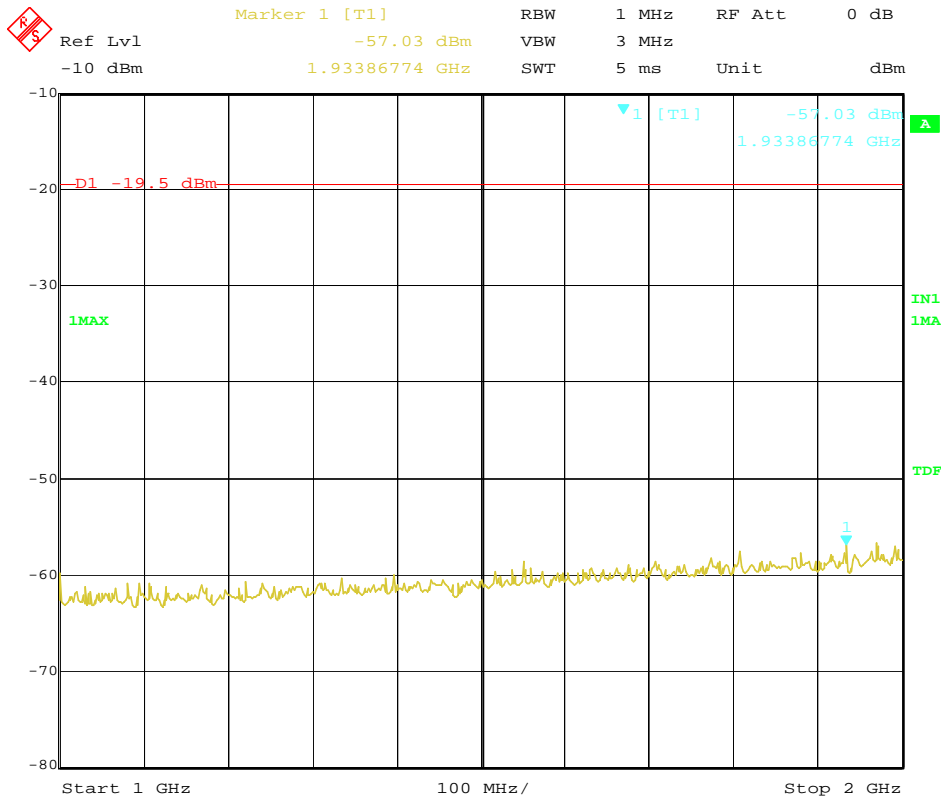
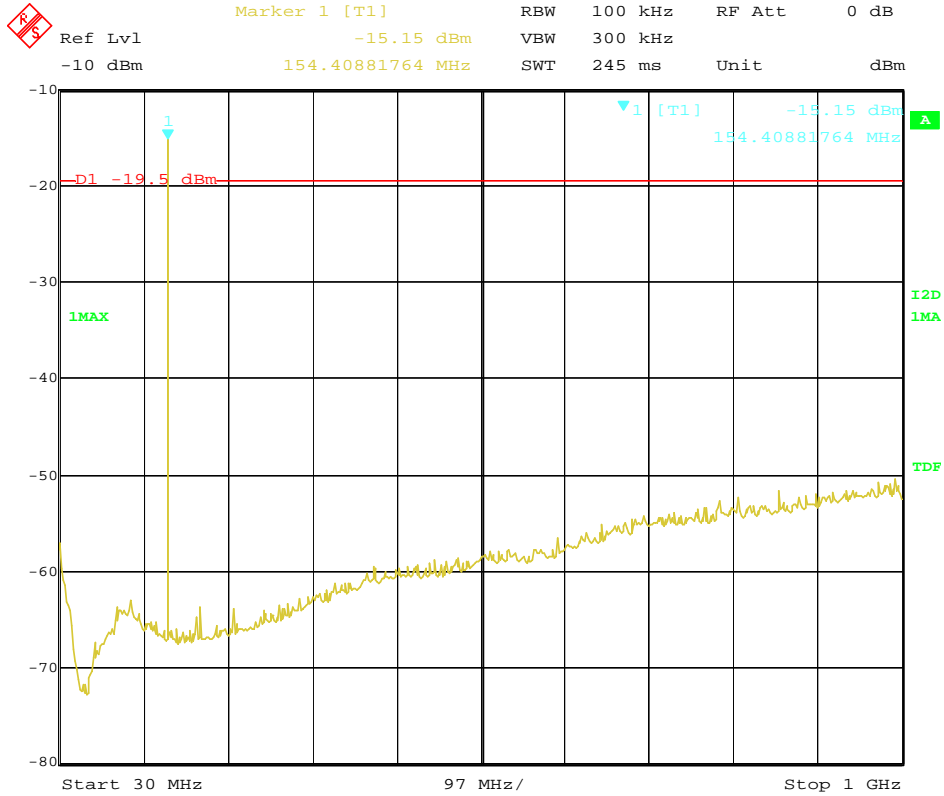


Date: 7.OCT.2010 00:15:52

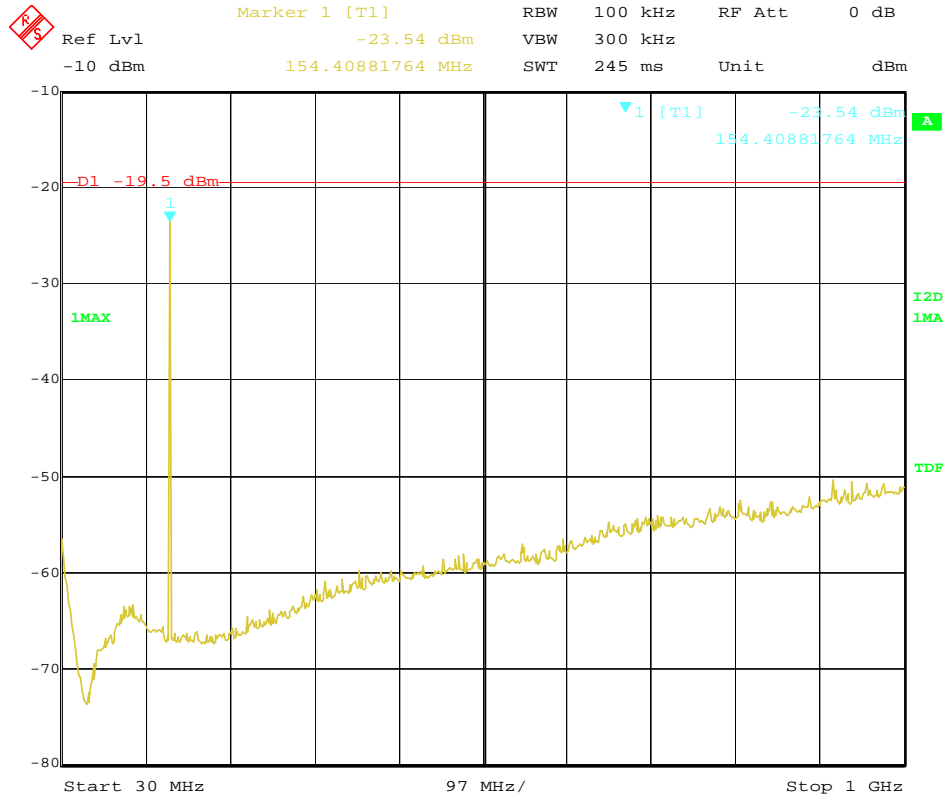


Date: 6.OCT.2010 23:21:19

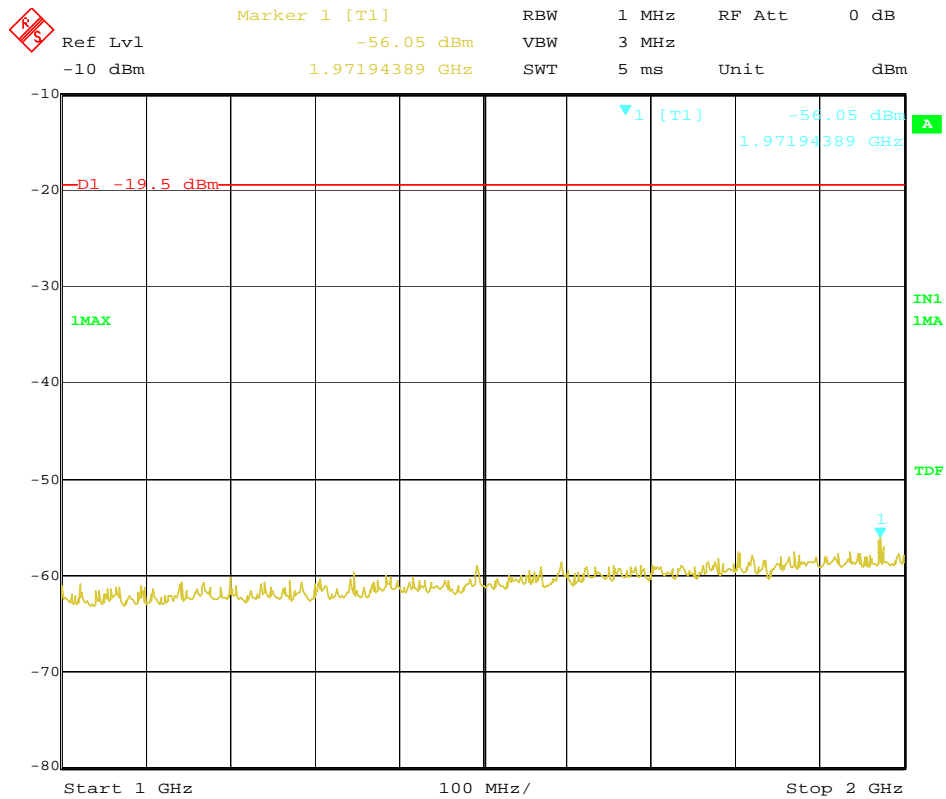
The Middle channel for 25 KHz Channel Separation @ Horizontal



The Middle channel for 25 KHz Channel Separation@ Vertical

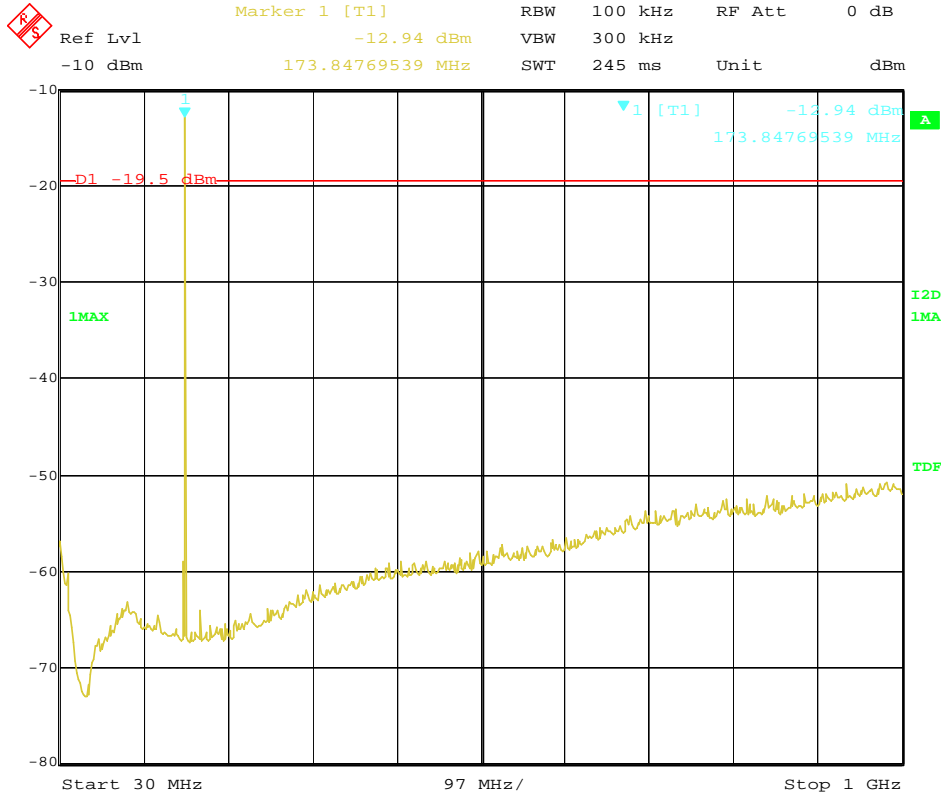


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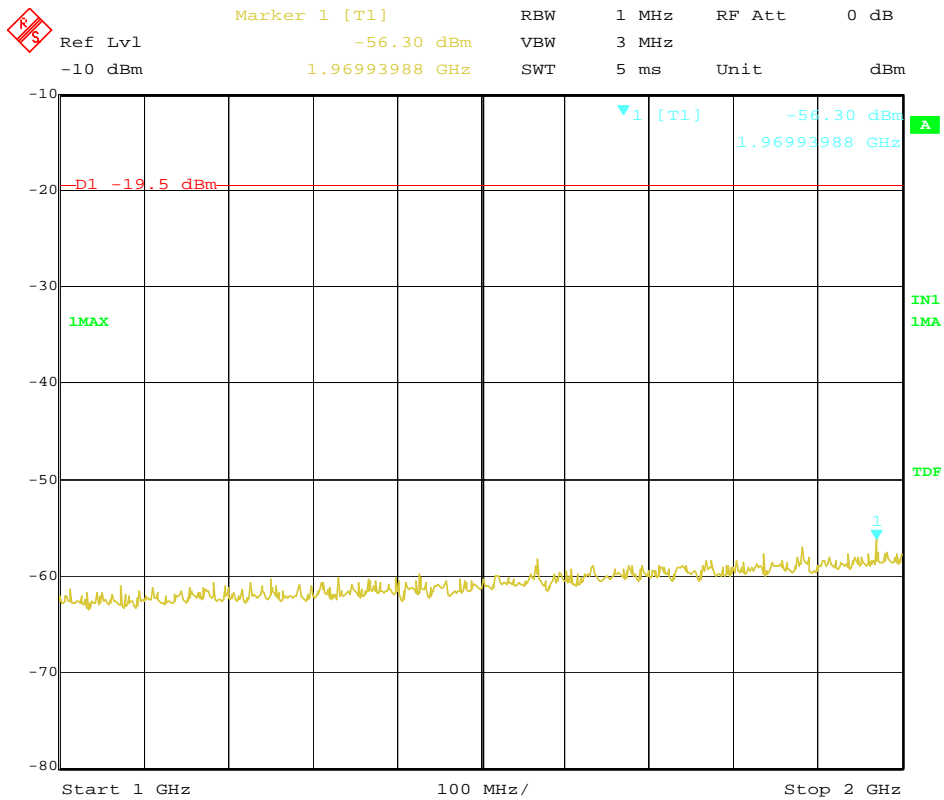


Date: 6.OCT.2010 23:23:02

The High channel for 25 KHz Channel Separation @ Horizontal

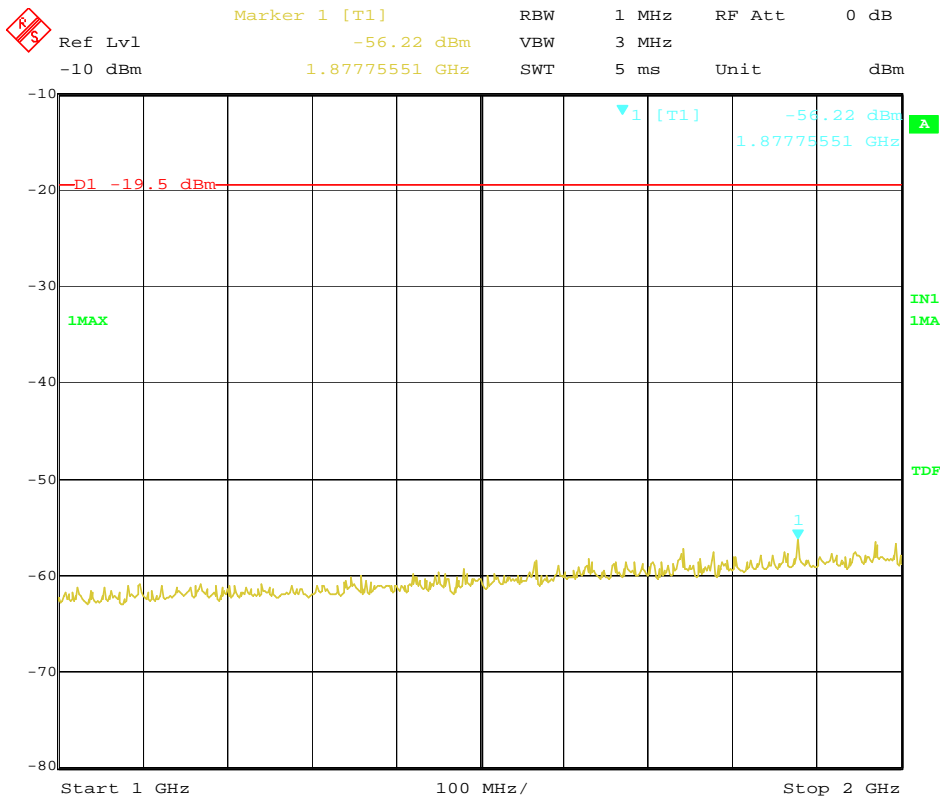
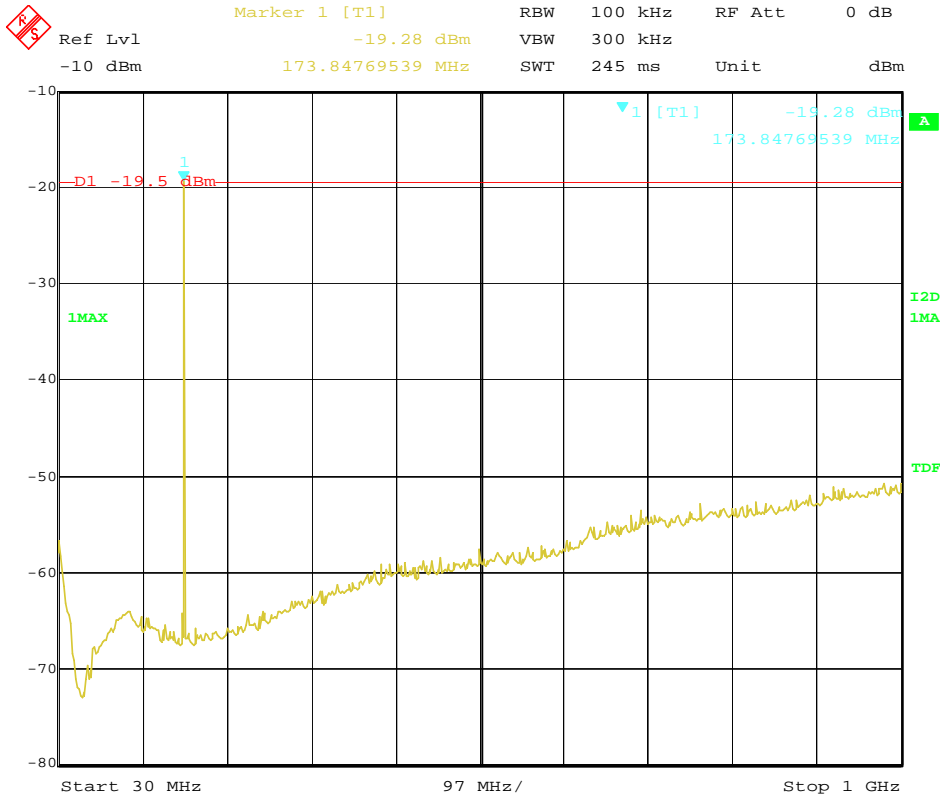


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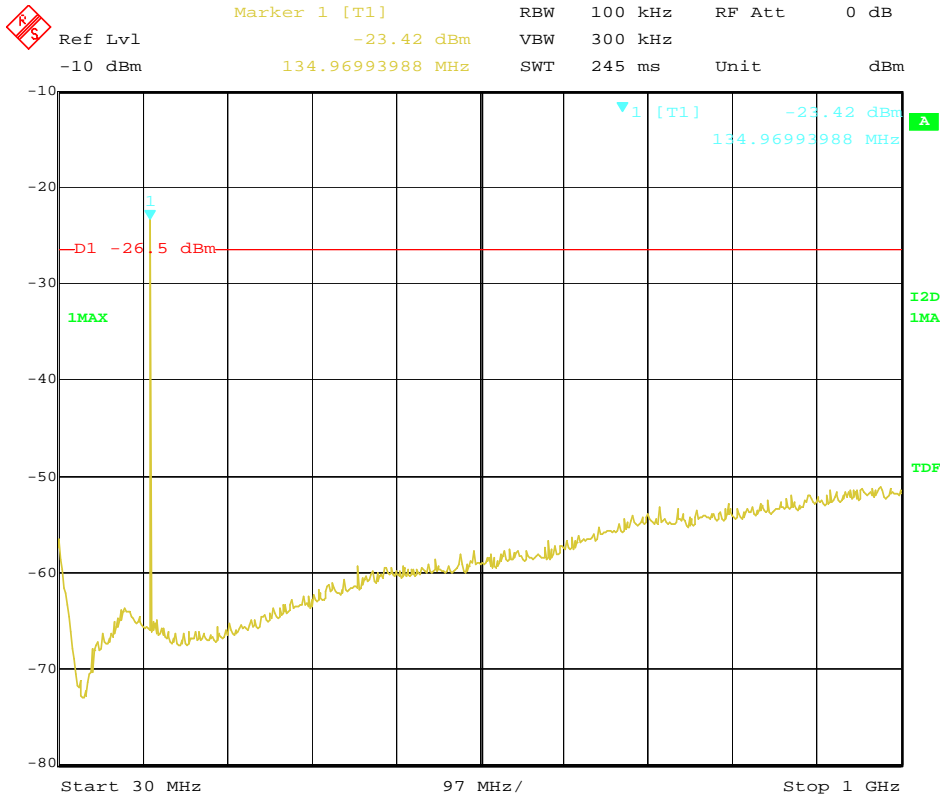


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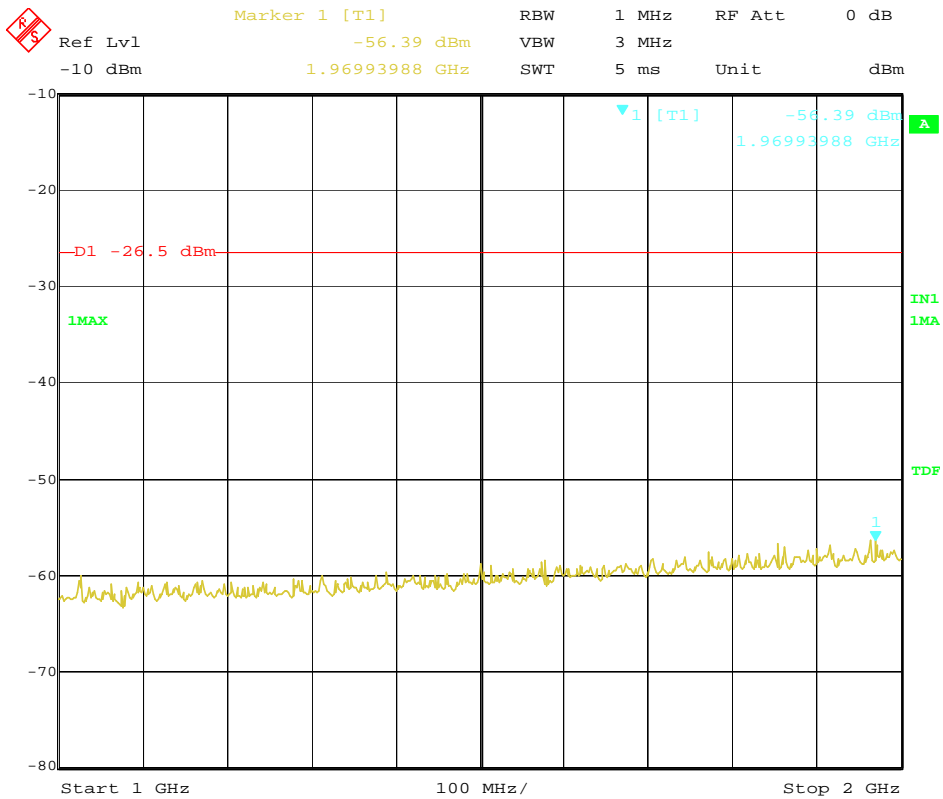
The High channel for 25 KHz Channel Separation@ Vertical



The Low channel for 12.5 KHz Channel Separation@ Vertical

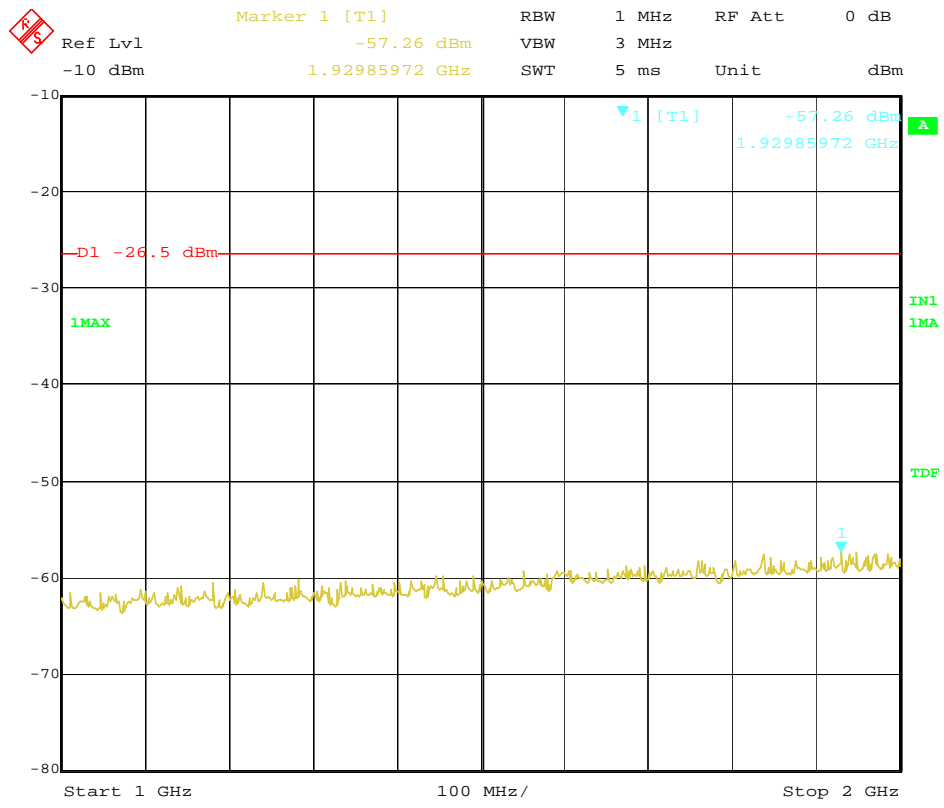
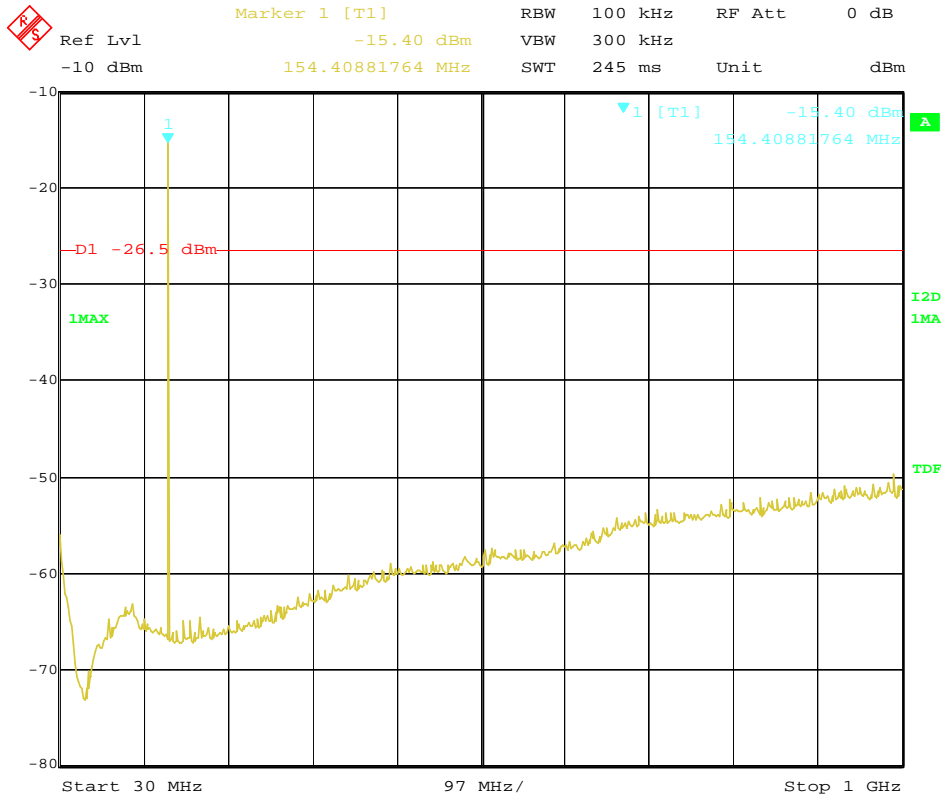


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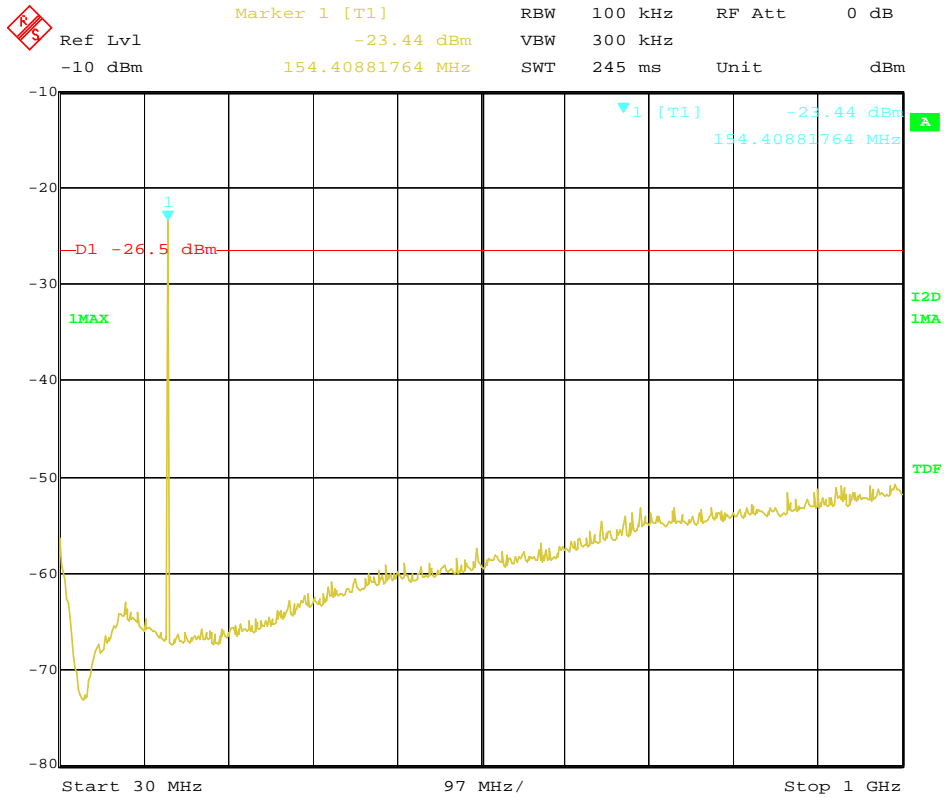


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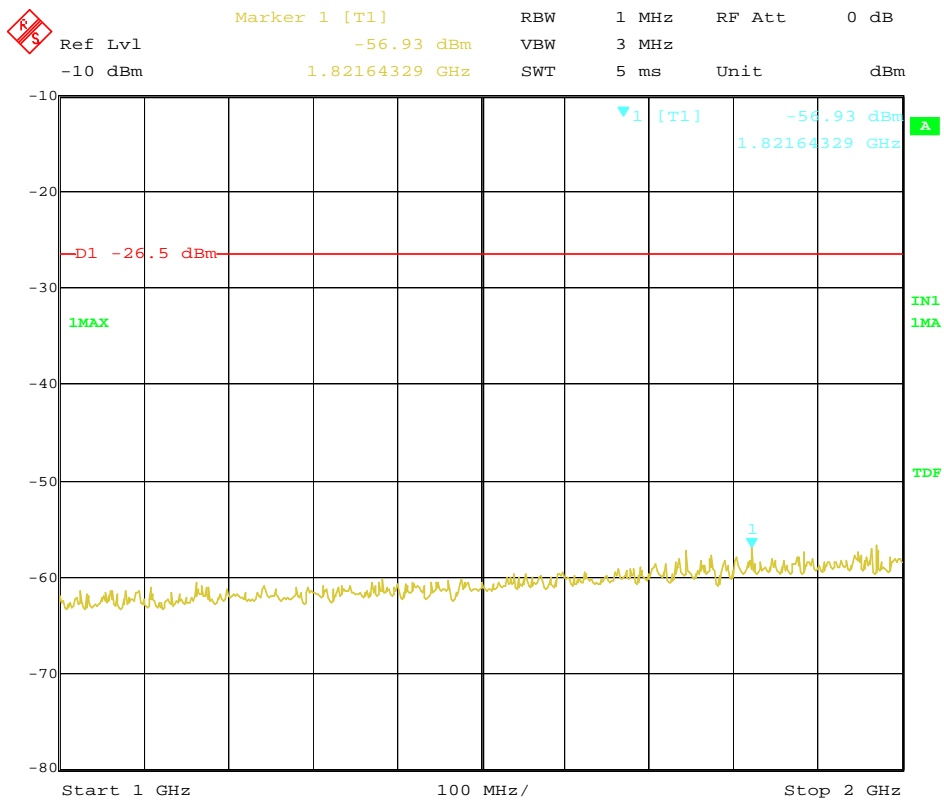
The Middle channel for 12.5 KHz Channel Separation @ Horizontal



The Middle channel for 12.5 KHz Channel Separation@ Vertical

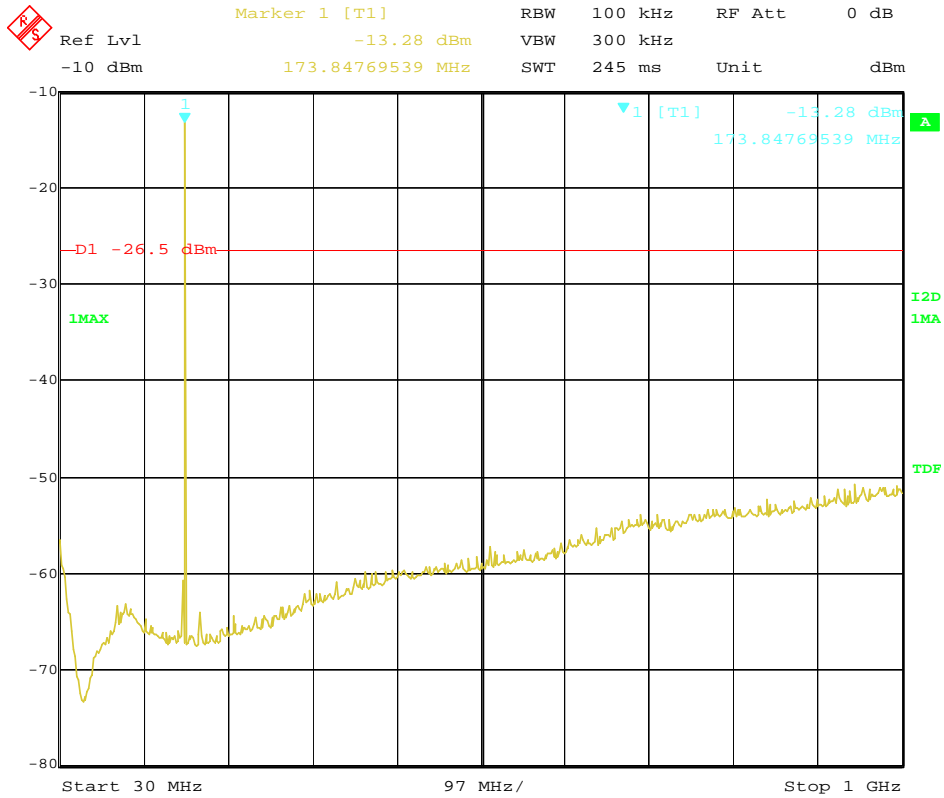


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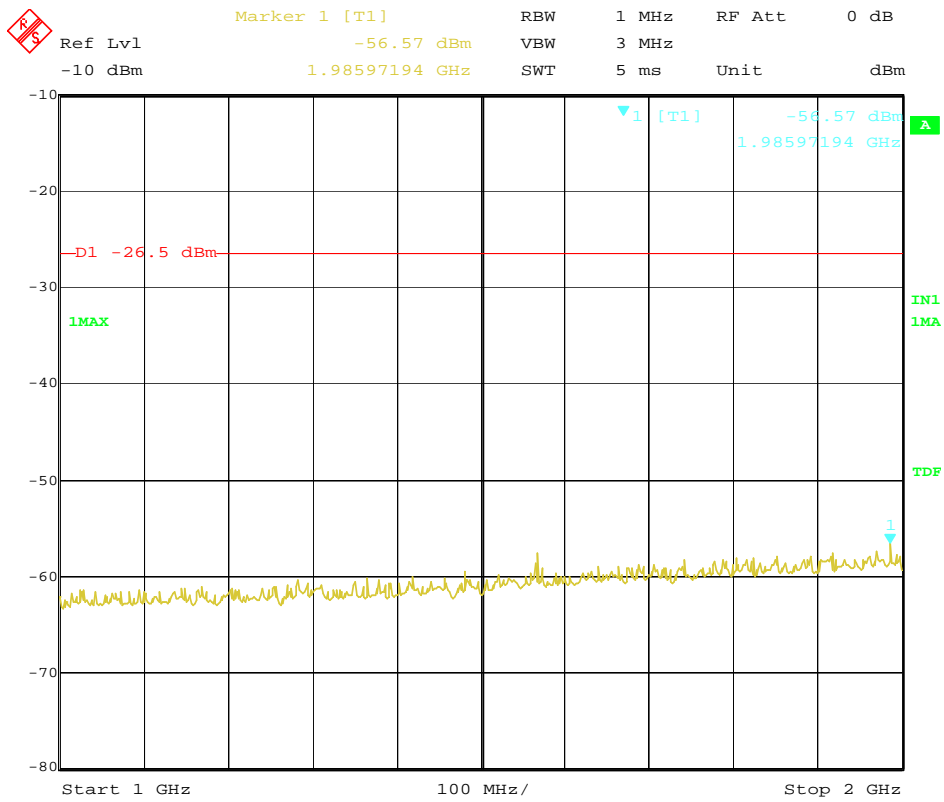


Date: 6.OCT.2010 23:37:39

The High channel for 12.5 KHz Channel Separation @ Horizontal

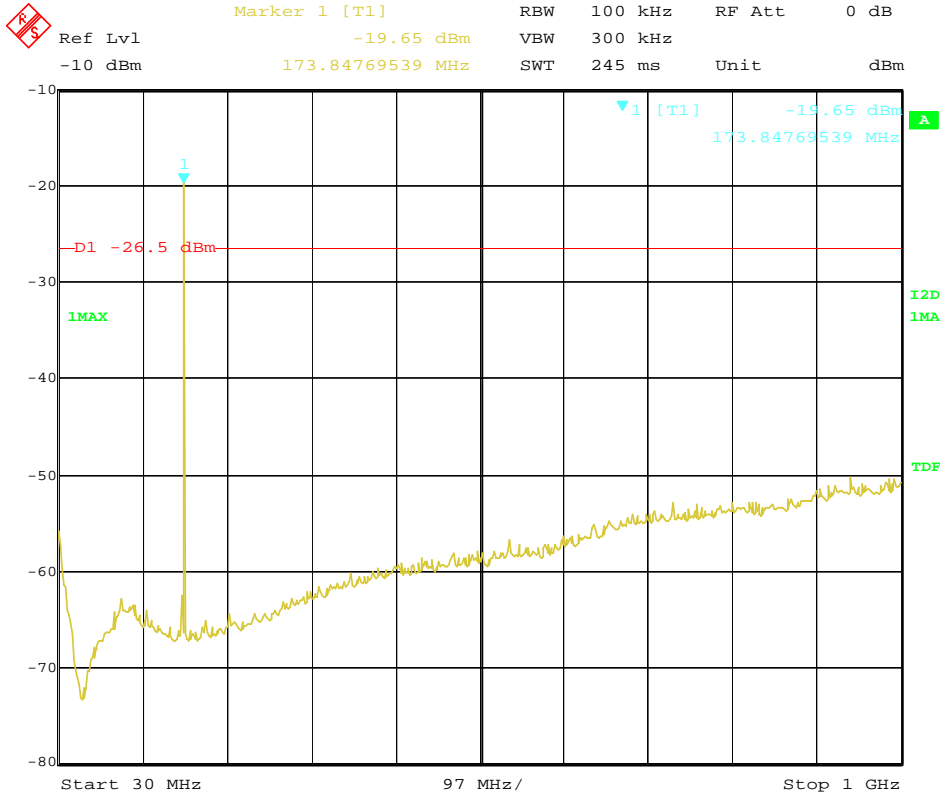


Date: 7.OCT.2010 00:31:23

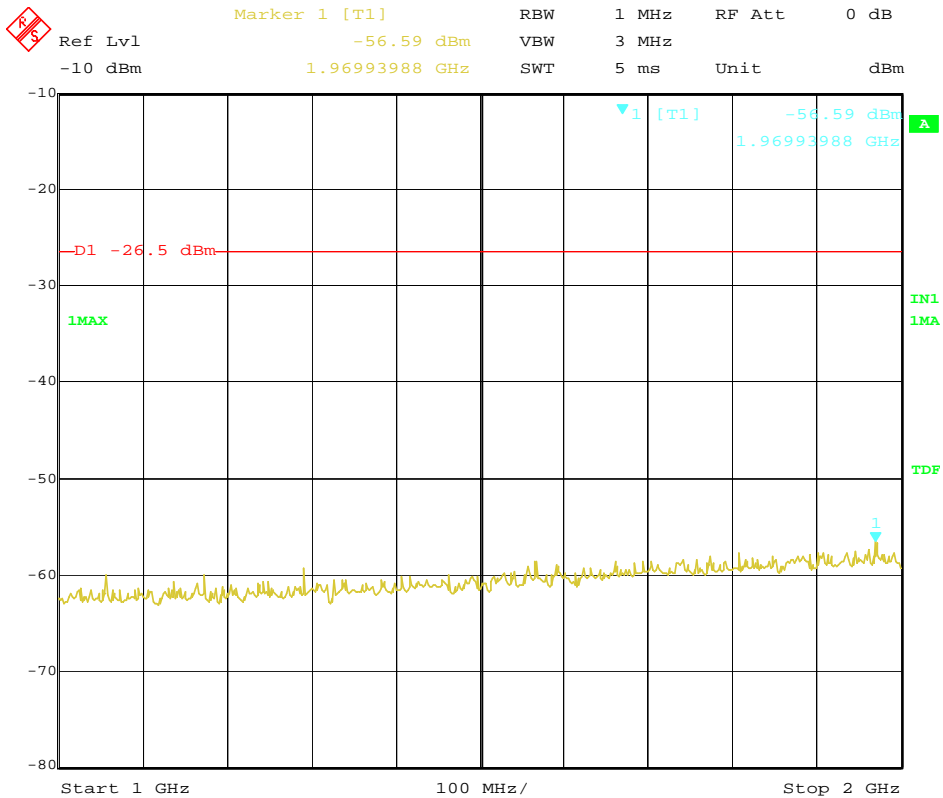


Date: 6.OCT.2010 23:41:01

The High channel for 12.5 KHz Channel Separation @ Vertical



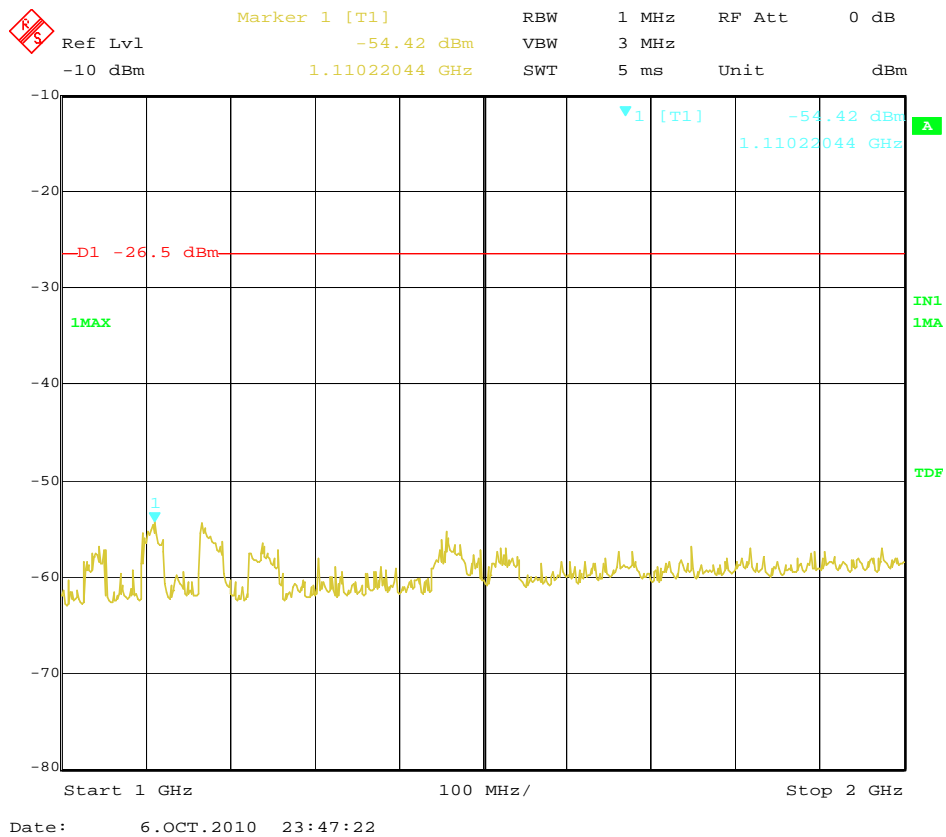
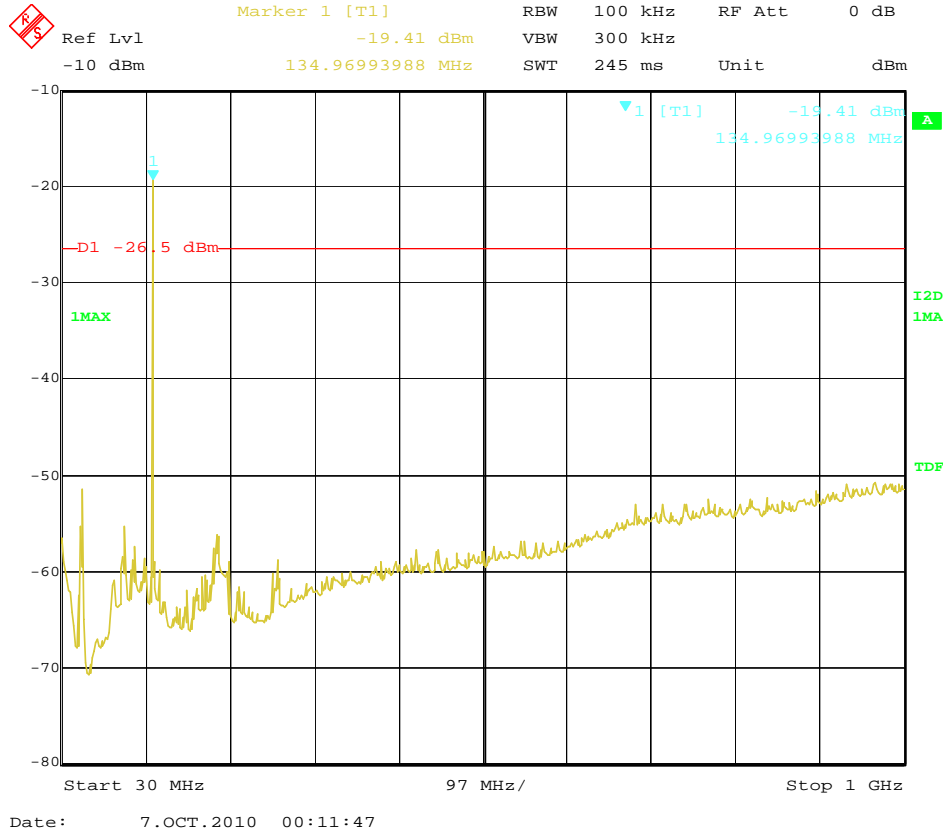
Date: 7.OCT.2010 00:33:45



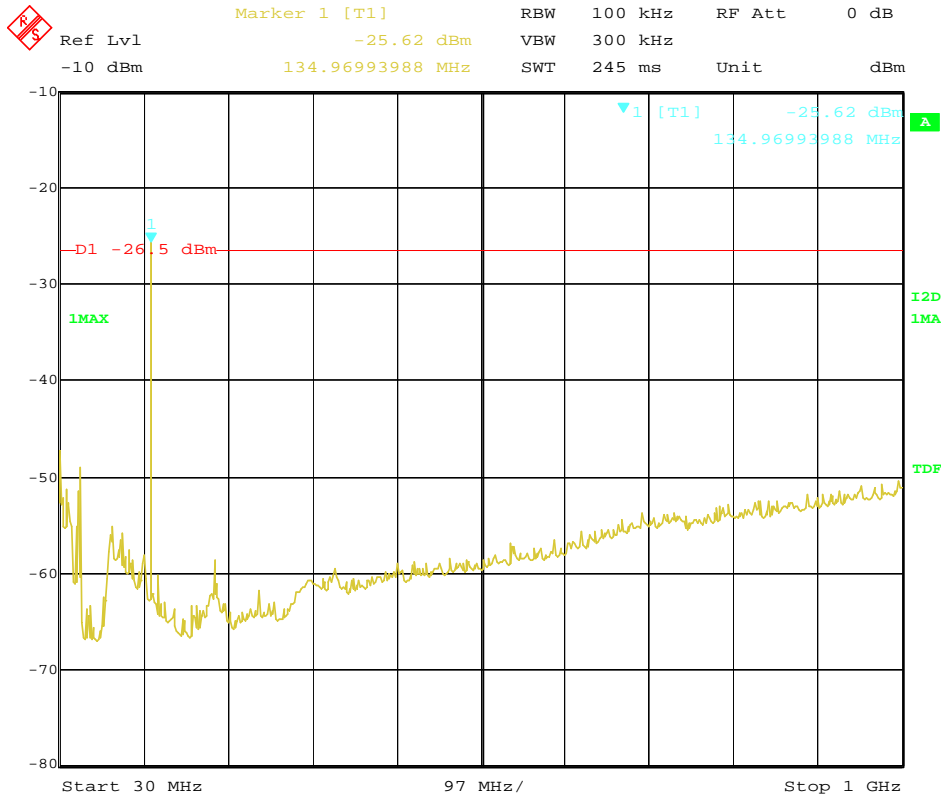
Date: 6.OCT.2010 23:39:25

Modulation Type: 4FSK

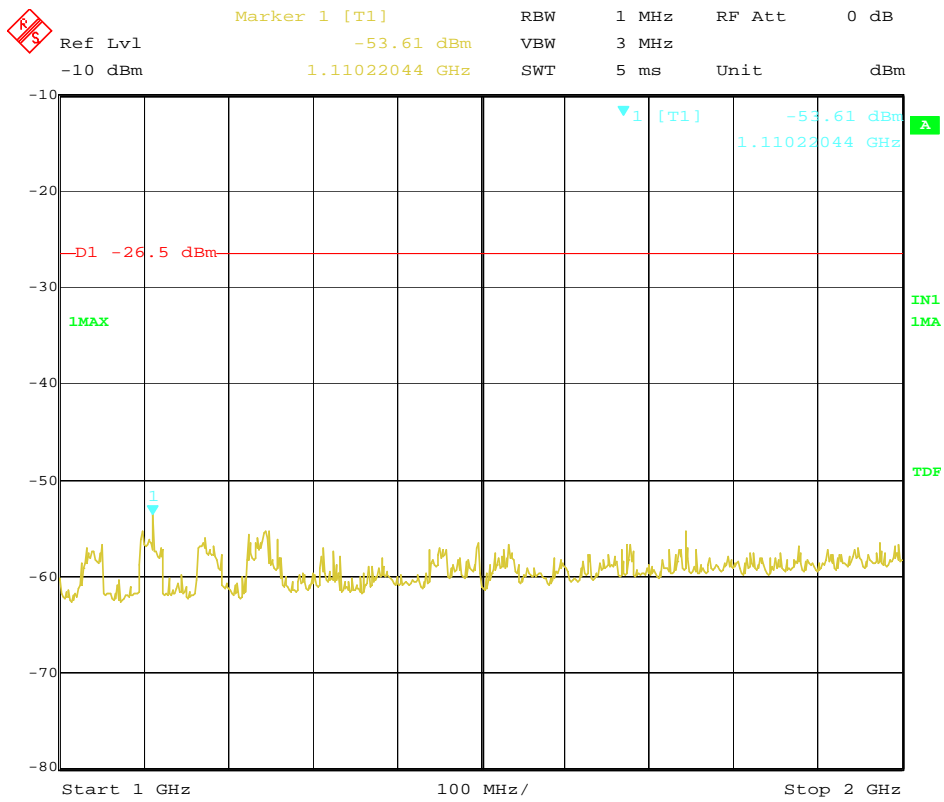
The Low channel for 12.5 KHz Channel Separation @ Horizontal



The Low channel for 12.5 KHz Channel Separation@ Vertical

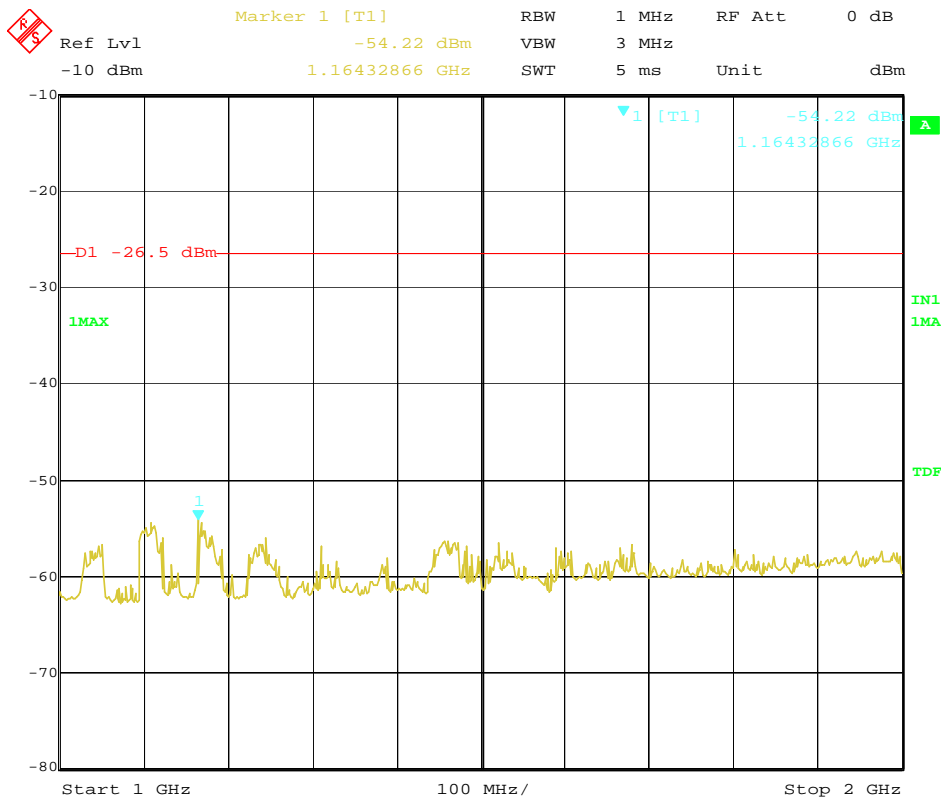
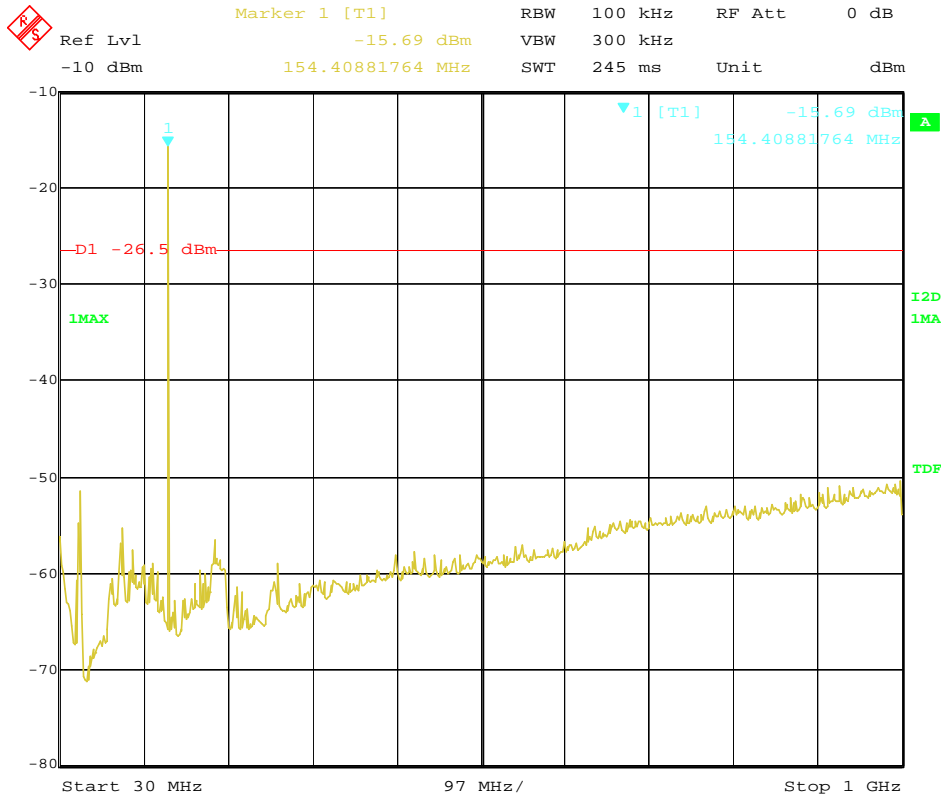


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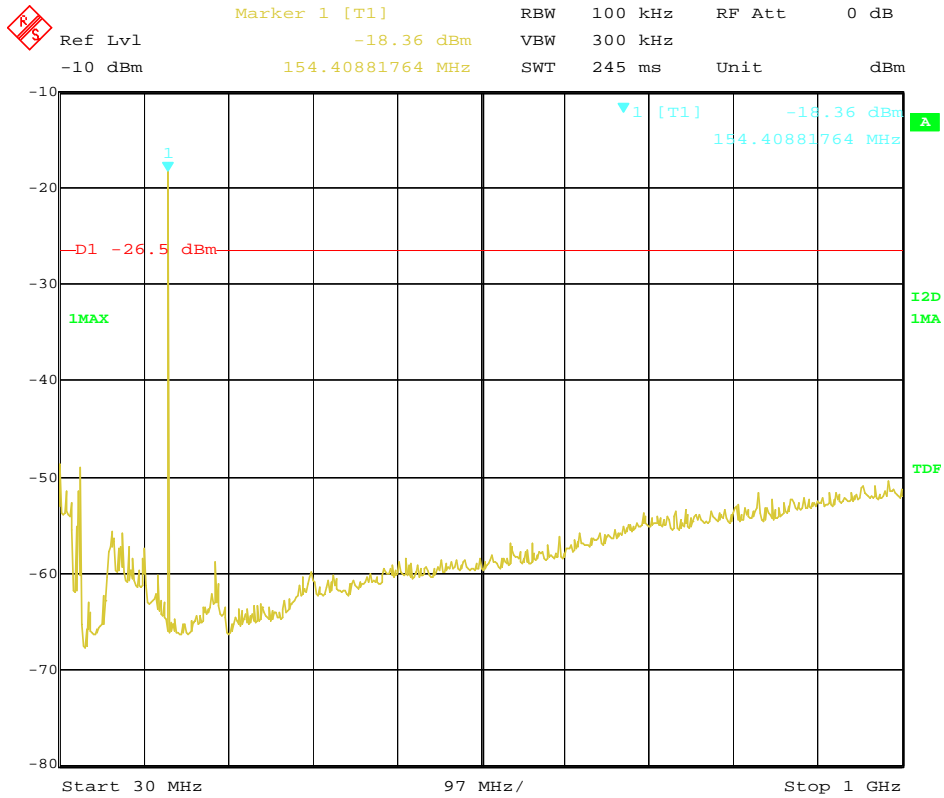


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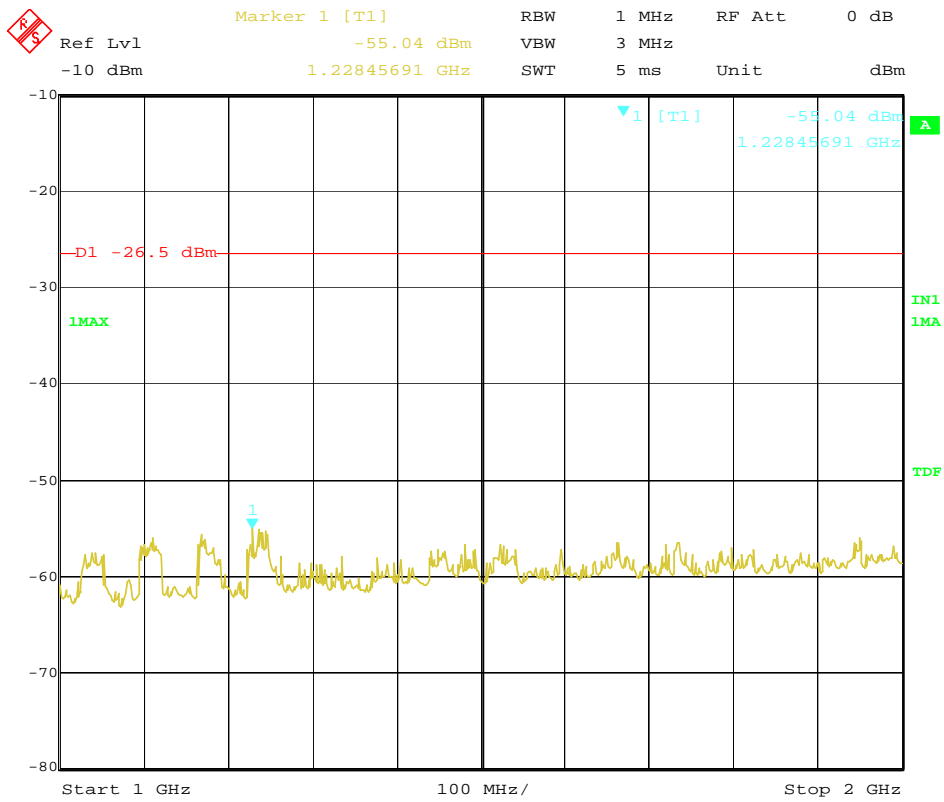
The Middle channel for 12.5 KHz Channel Separation @ Horizontal



The Middle channel for 12.5 KHz Channel Separation@ Vertical

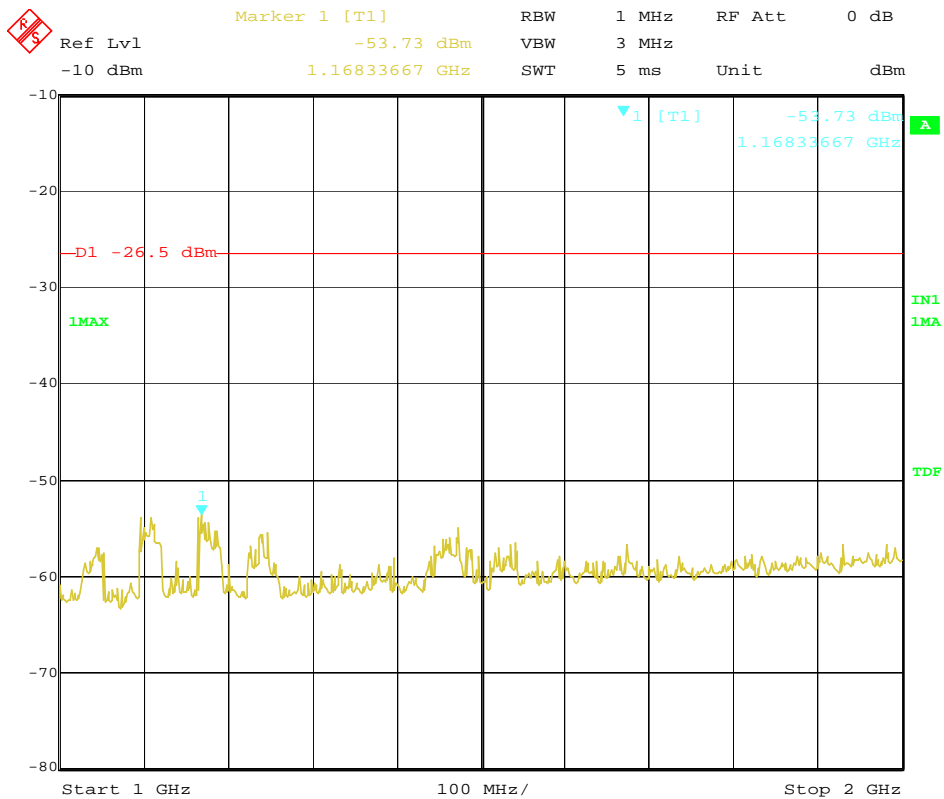
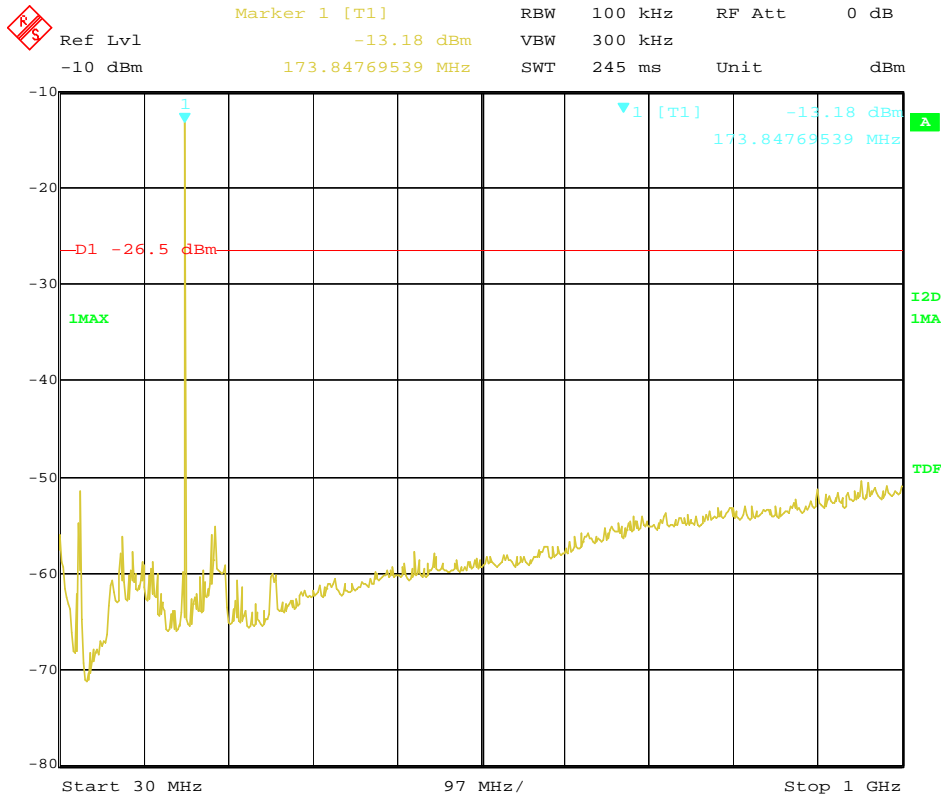


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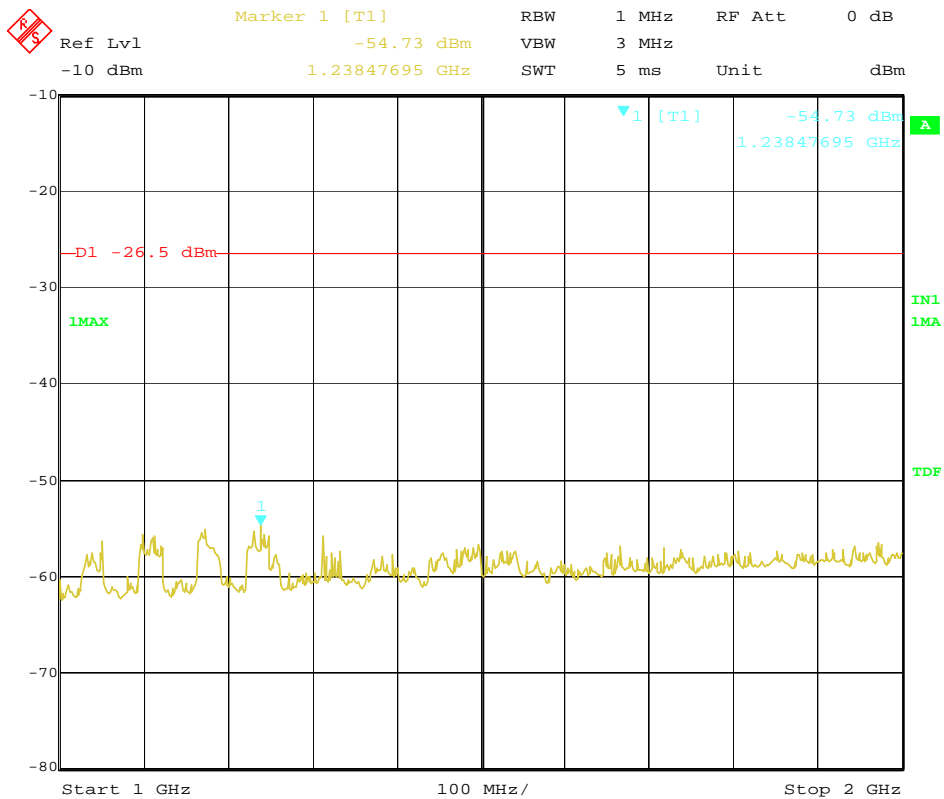
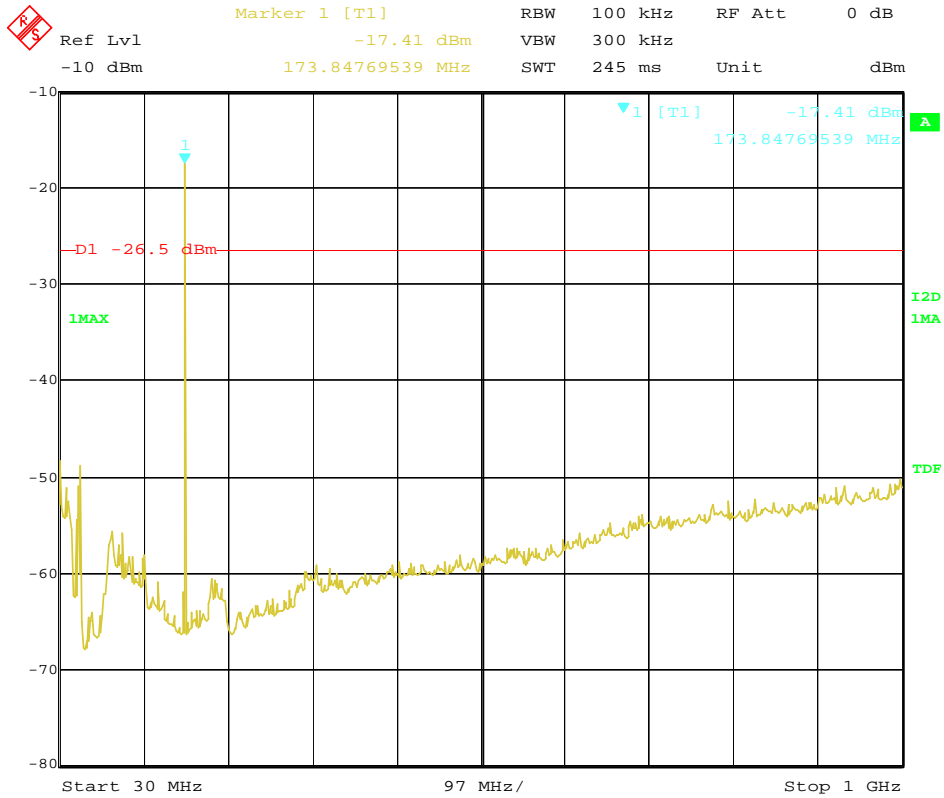


Date: 6.OCT.2010 23:51:01

The High channel for 12.5 KHz Channel Separation @ Horizontal



The High channel for 12.5 KHz Channel Separation@Vertical



4.4. Spurious Emission on Antenna Port

TEST APPLICABLE

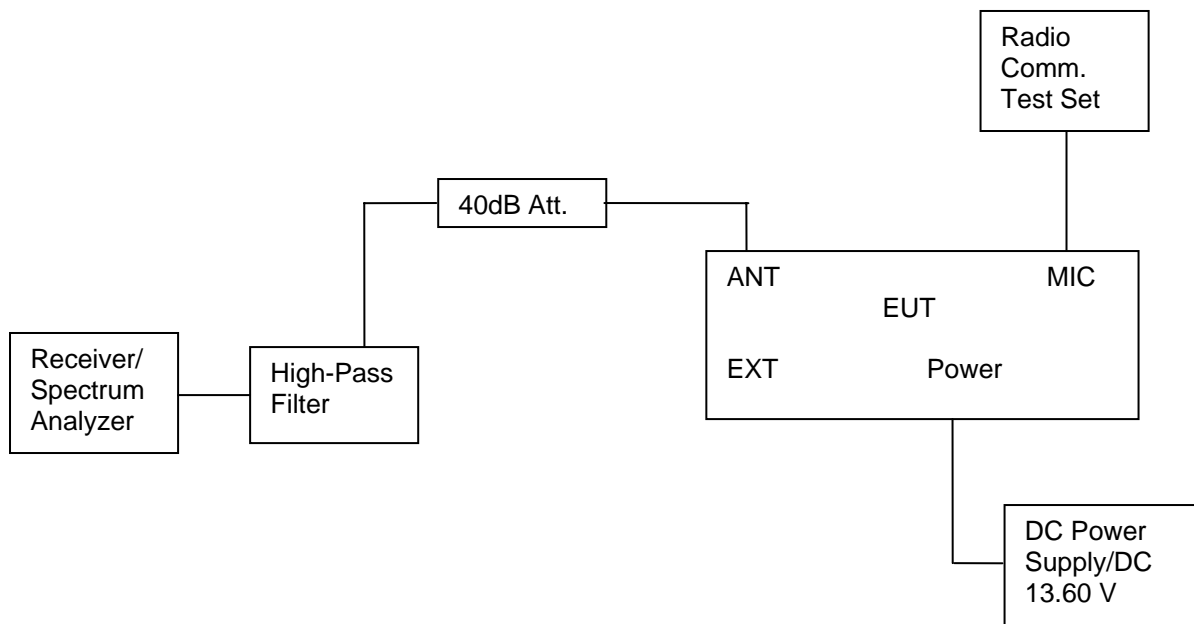
The same as Section 4.3

TEST PROCEDURE

The RF output of the EUT was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set to 100 kHz. Sufficient scans were taken to show any out of band emission up to 10th. Harmonic for the lower and the highest frequency range. Set RBW 100 kHz, VBW 300 kHz in the frequency band 30MHz to 1GHz, while set RBW=1MHz. VBW=3MHz from the 1GHz to 10th 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: $43 + 10 \log (P_{watts}) = 43 + 10 \log (60.53) = 60.82 \text{ dB}$

High: $43 + 10 \log (P_{watts}) = 43 + 10 \log (61.94) = 60.92 \text{ dB}$

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) = $46.99 - 43 - 10 \log_{10} (61.94) = -13 \text{ dBm}$

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: $50 + 10 \log (P_{watts}) = 50 + 10 \log (60.39) = 67.81 \text{ dB}$

High: $50 + 10 \log (P_{watts}) = 50 + 10 \log (61.94) = 67.92 \text{ dB}$

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) = $46.99 - 50 - 10 \log_{10} (61.94) = -20 \text{ dBm}$

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: $50 + 10 \log(P_{\text{watts}}) = 50 + 10 \log(60.12) = 67.79 \text{ dB}$

High: $50 + 10 \log(P_{\text{watts}}) = 50 + 10 \log(61.38) = 67.88 \text{ dB}$

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 (61.38) = -20 dBm

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

2. The measurement frequency range from 30MHz to 4 GHz.

For Rated High Power (50Watt)

Modulation Type	Channel Separation	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	901.89	-25.36	2941.88	-26.14
		Middle	155.1250	978.80	-25.08	2484.97	-22.44
		High	173.9750	881.54	-25.34	2785.57	-22.94
	12.5KHz	Low	136.1250	839.93	-25.65	3789.58	-26.37
		Middle	155.1250	947.82	-25.36	2484.97	-22.92
		High	173.9750	929.25	-25.74	2785.57	-23.76
4FSK	12.5KHz	Low	136.1250	703.95	-25.94	3939.88	-26.50
		Middle	155.1250	749.22	-24.89	2984.97	-22.40
		High	173.9750	124.69	-25.58	2785.57	-23.04
Limit		-13dBm for 25KHz Channel Separation					
		-20dBm for 12.5KHz Channel Separation					
Test Results		Compliance					

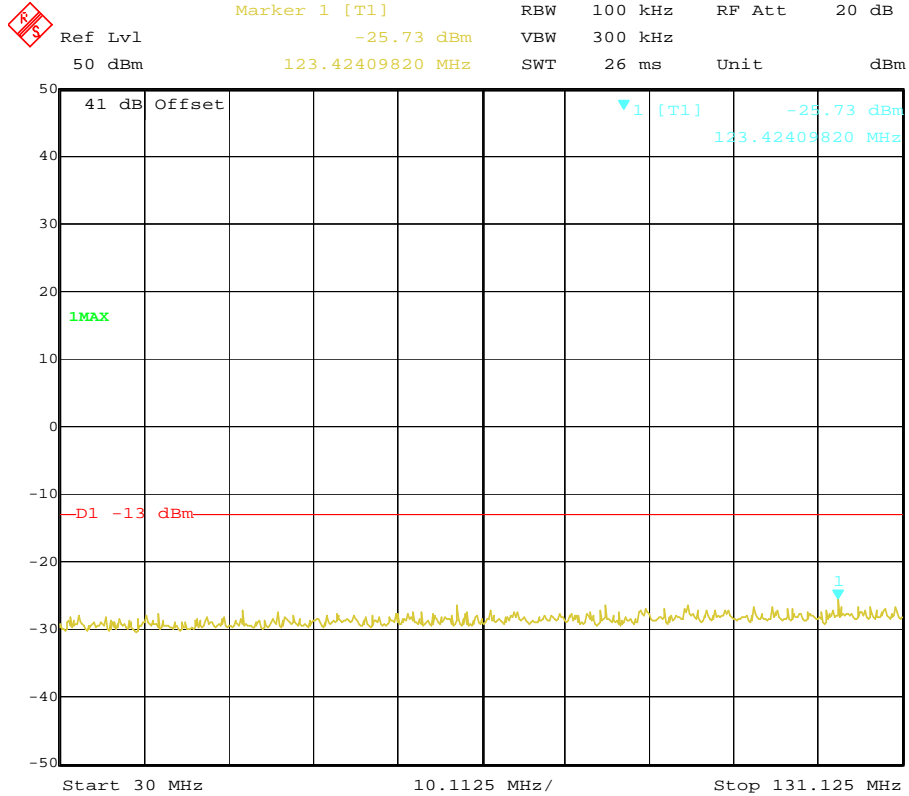
For Rated Low Power (5Watt)

Modulation Type	Channel Separation	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	271.94	-23.92	1727.45	-26.49
		Middle	155.1250	835.05	-25.69	3945.89	-26.95
		High	173.9750	883.18	-25.78	1673.34	-25.92
	12.5KHz	Low	136.1250	271.94	-24.31	2965.93	-26.26
		Middle	155.1250	961.29	-25.40	1661.32	-26.28
		High	173.9750	935.83	-25.46	2671.34	-26.09
4FSK	12.5KHz	Low	136.1250	271.93	-23.59	2977.96	-26.78
		Middle	155.1250	309.92	-24.88	2370.74	-27.09
		High	173.9750	912.80	-25.30	2941.88	-26.31
Limit		-13dBm for 25KHz Channel Separation					
		-20dBm for 12.5KHz Channel Separation					
Test Results		Compliance					

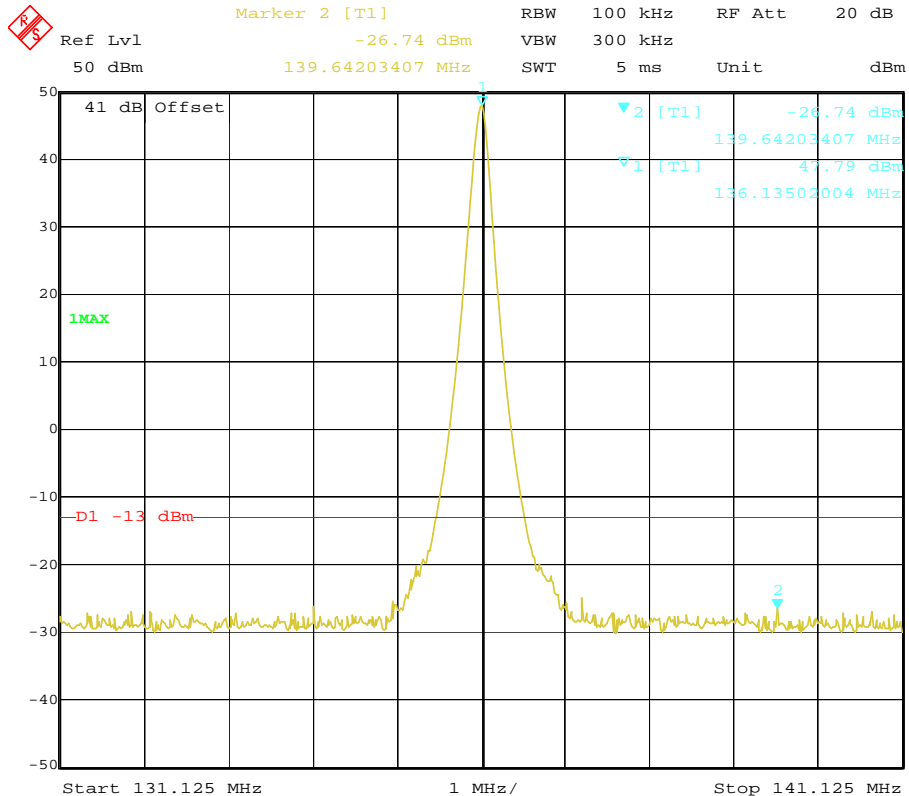
Plots of Spurious Emission on Antenna Port Measurement

For Rated High Power (50Watt)

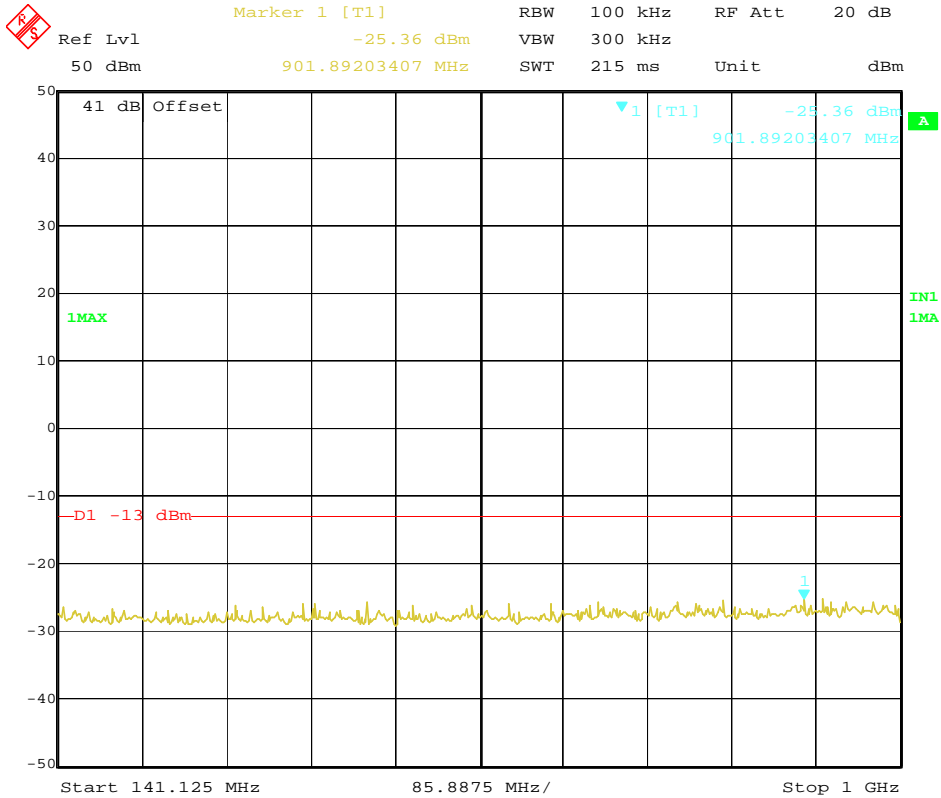
Modulation Type	Channel SpARATION	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	25KHz	Low	136.1250	901.89	-25.36	2941.88	-26.14	-13dBm
Test Results				Compliance				



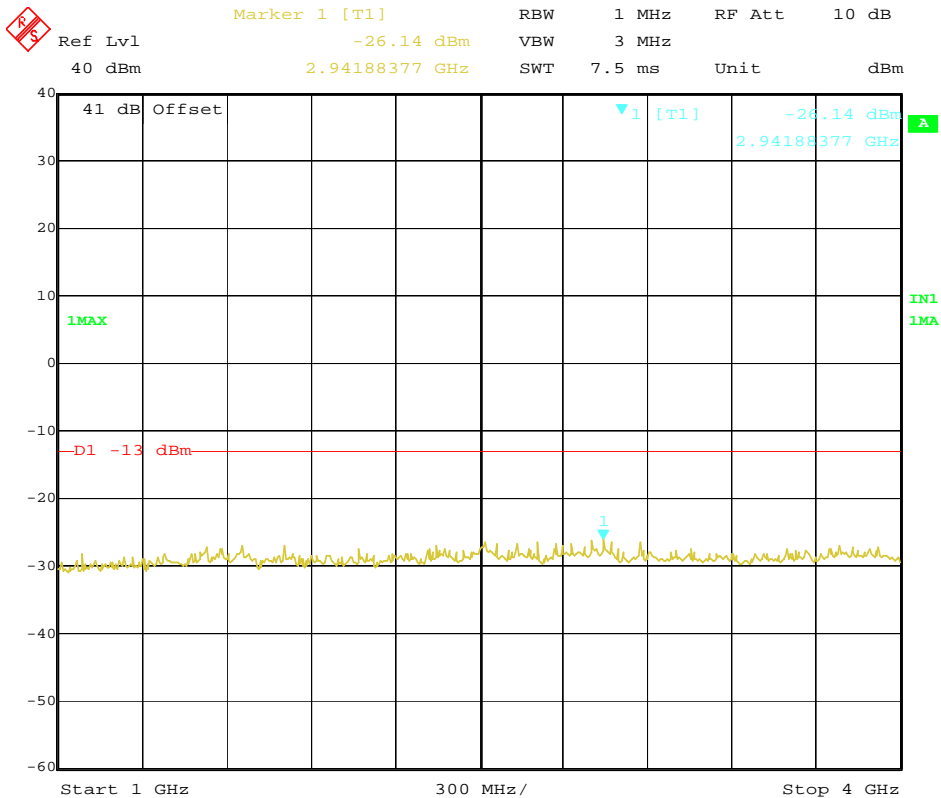
Date: 6.OCT.2010 10:21:49



Date: 6.OCT.2010 10:21:20

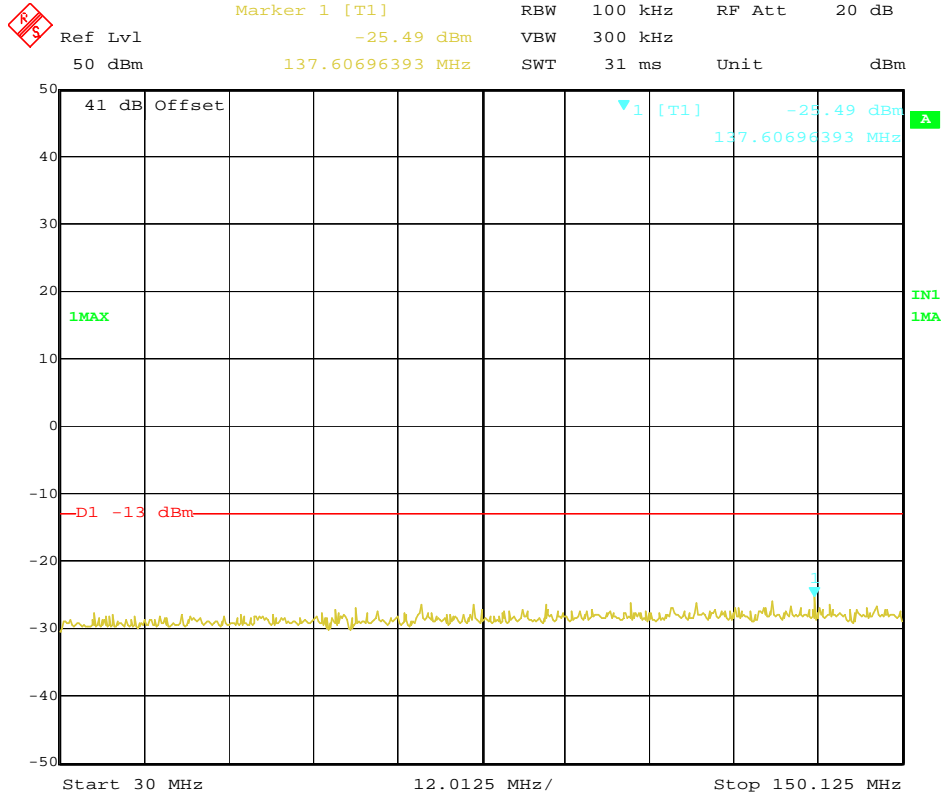


Date: 6.OCT.2010 10:20:19

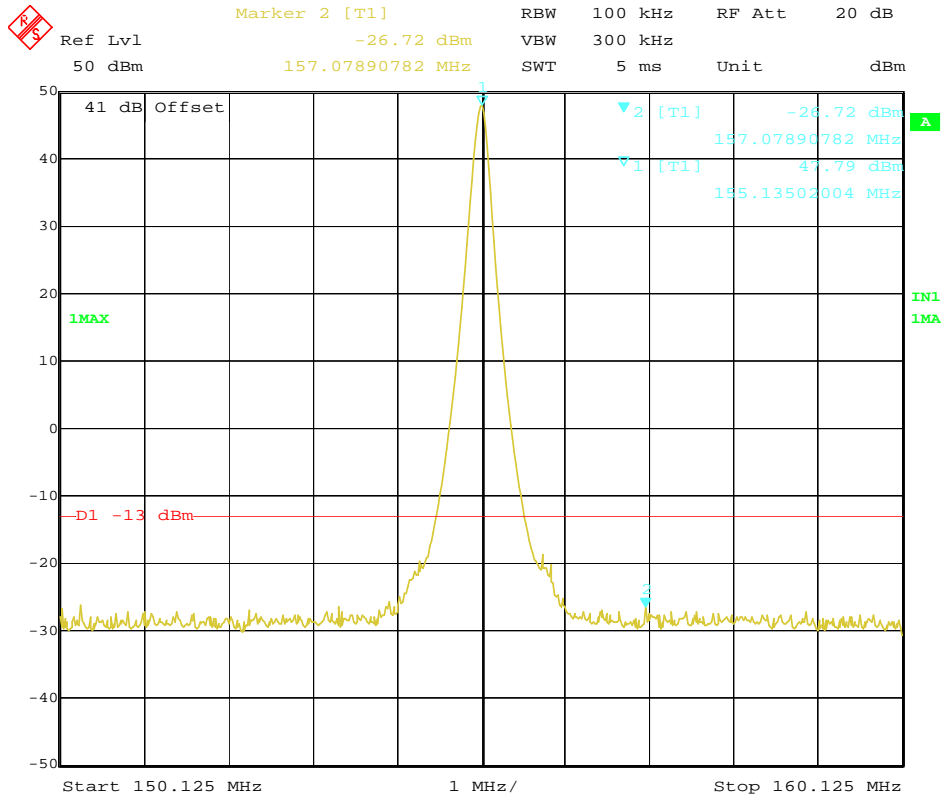


Date: 6.OCT.2010 10:19:38

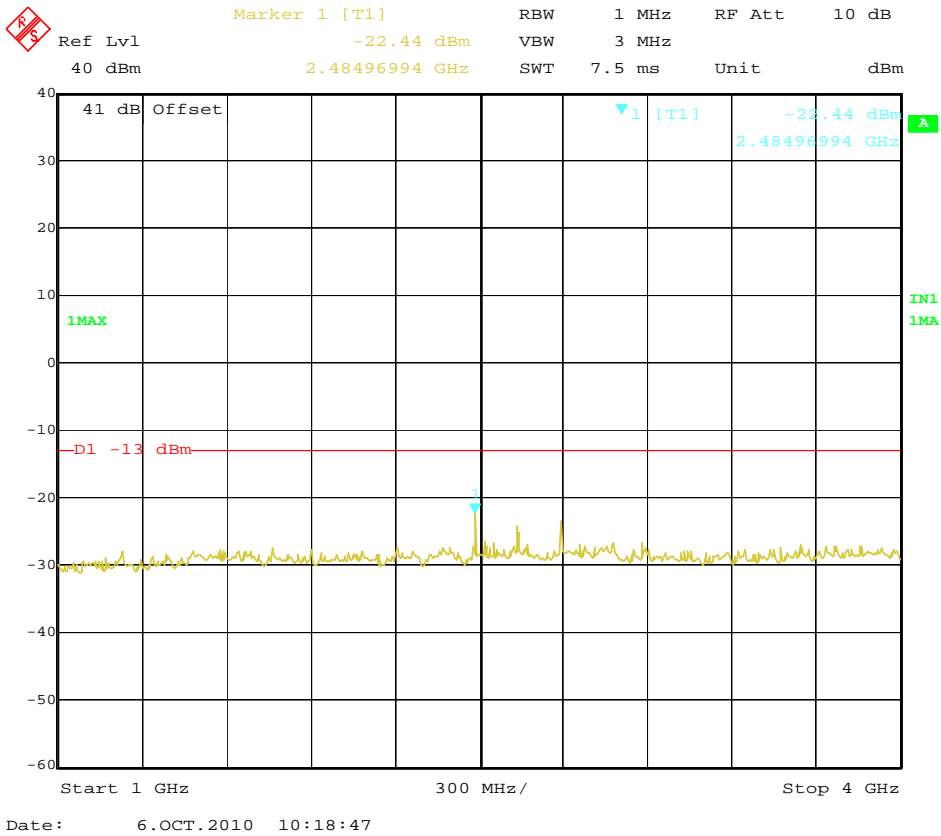
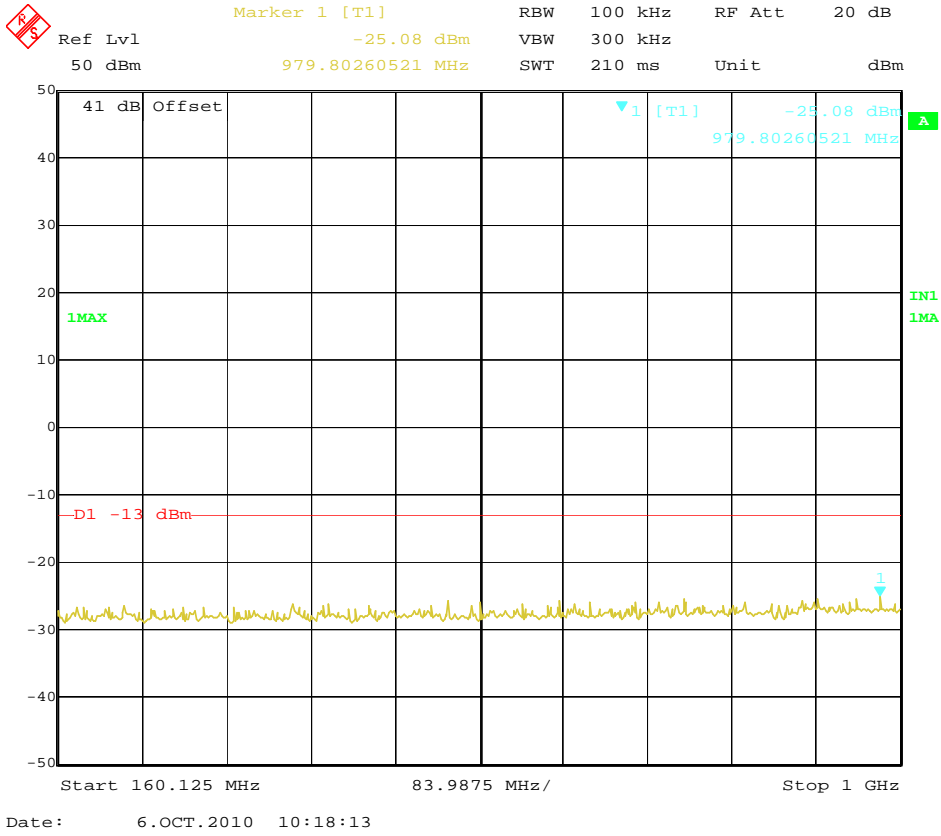
Modulation Type	Channel Separation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	25KHz	Middle	155.1250	978.80	-25.08	2484.97	-22.44	-13dBm
Test Results				Compliance				



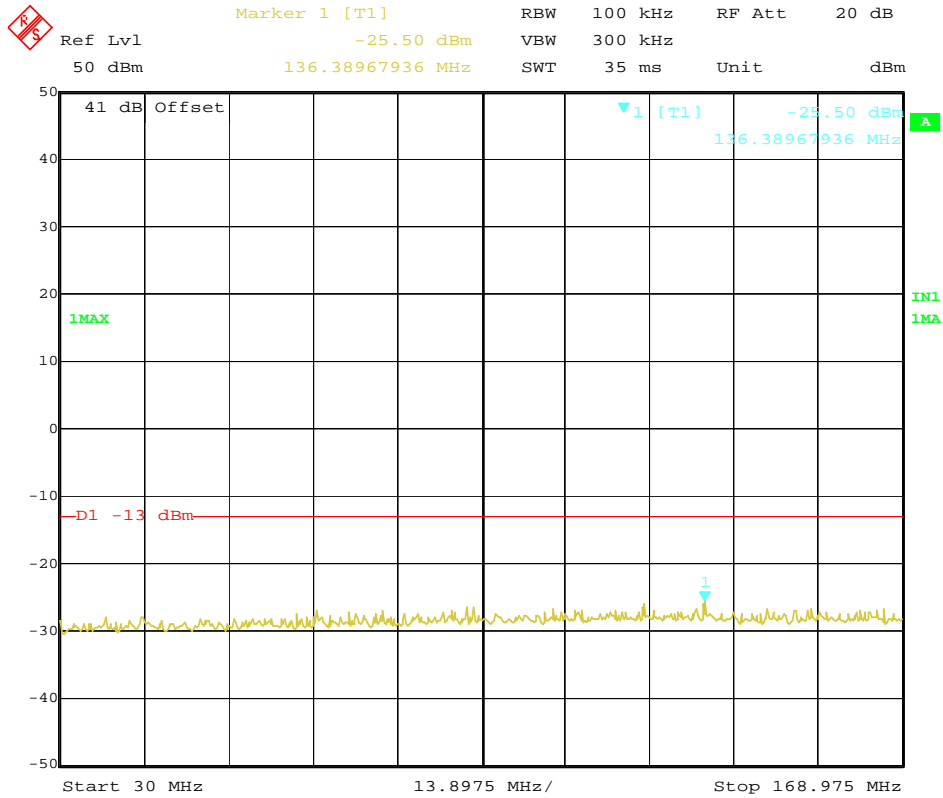
Date: 6.OCT.2010 10:16:15



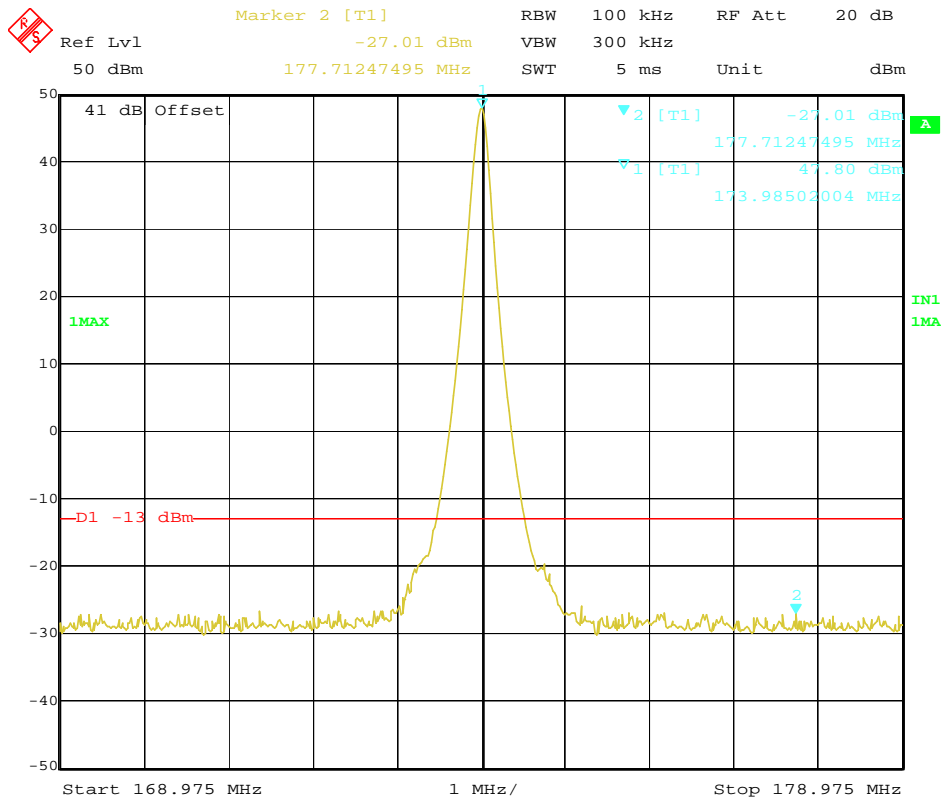
Date: 6.OCT.2010 10:16:49



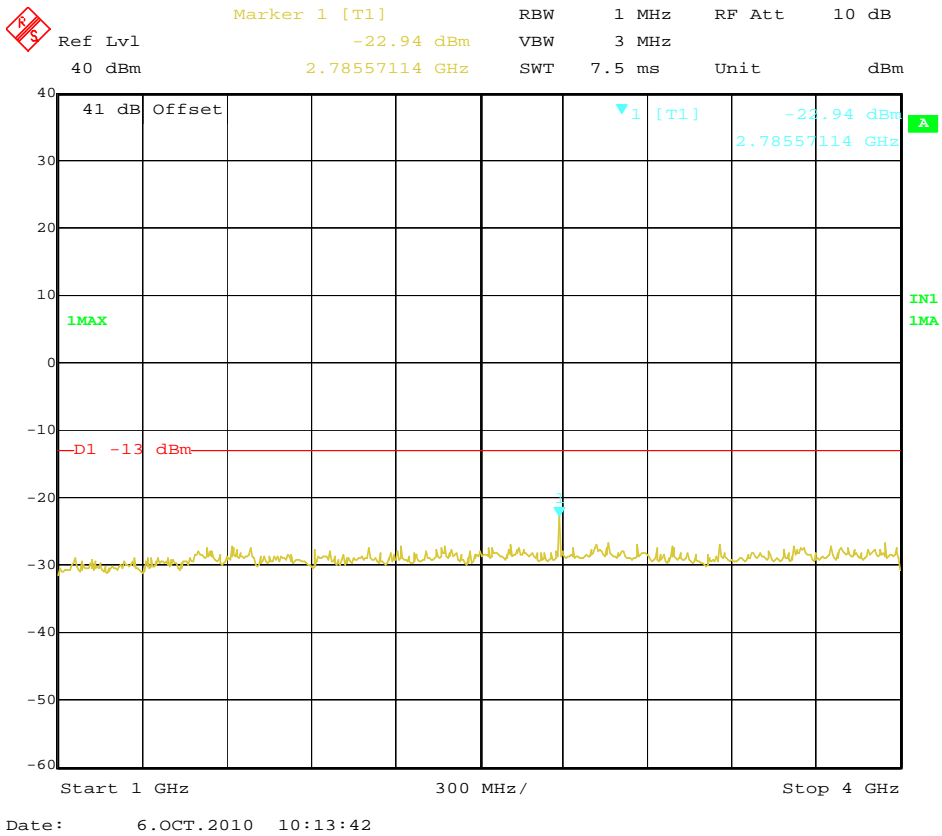
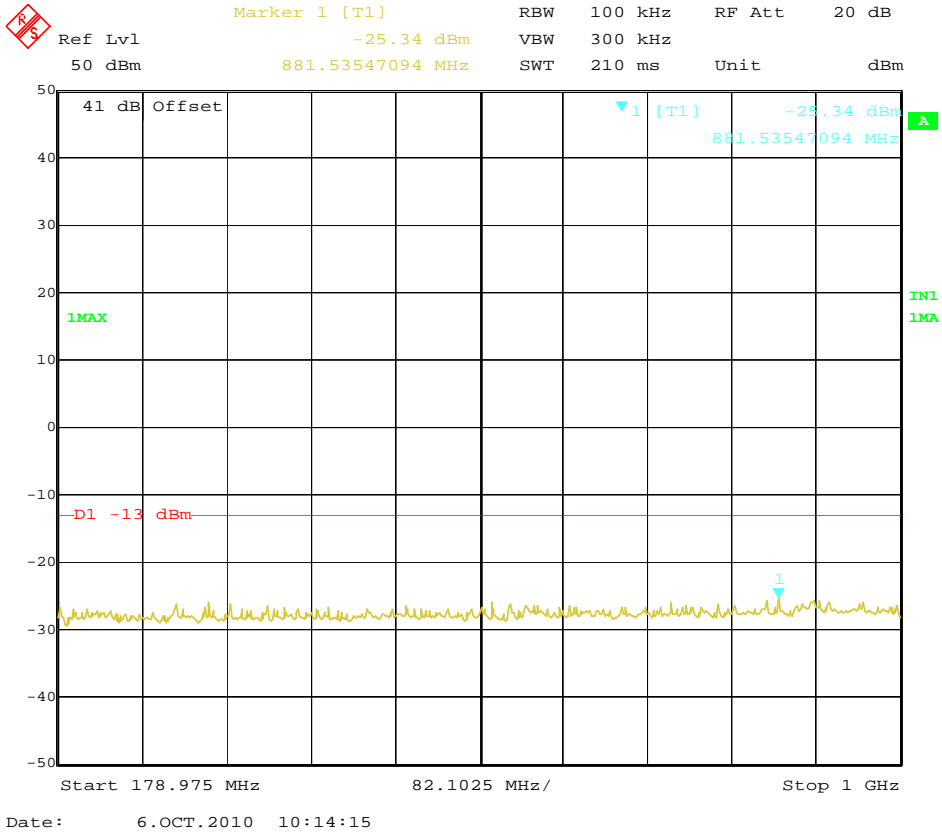
Modulation Type	Channel Separation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	25KHz	High	173.9750	881.54	-25.34	2785.57	-22.94	-13dBm
Test Results				Compliance				



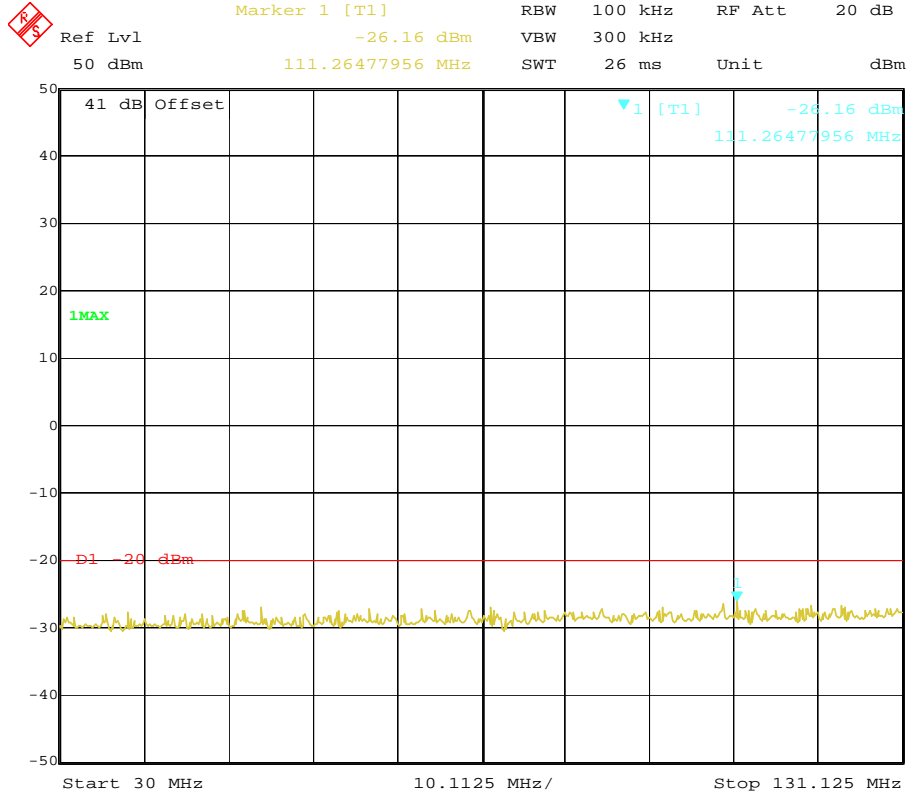
Date: 6.OCT.2010 10:15:49



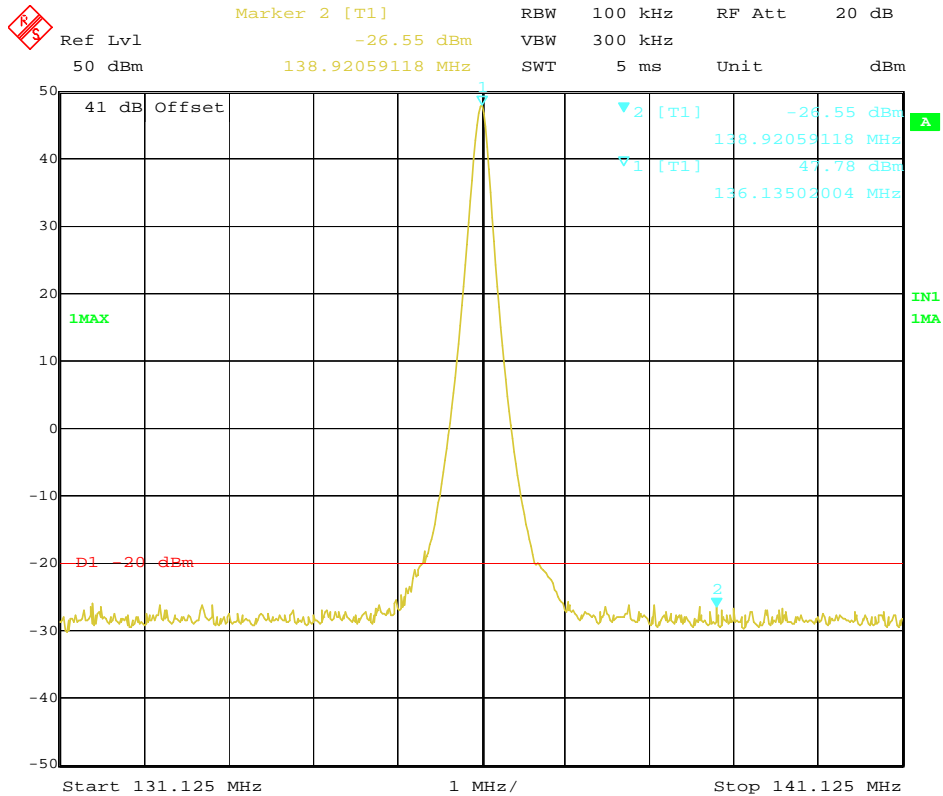
Date: 6.OCT.2010 10:15:19



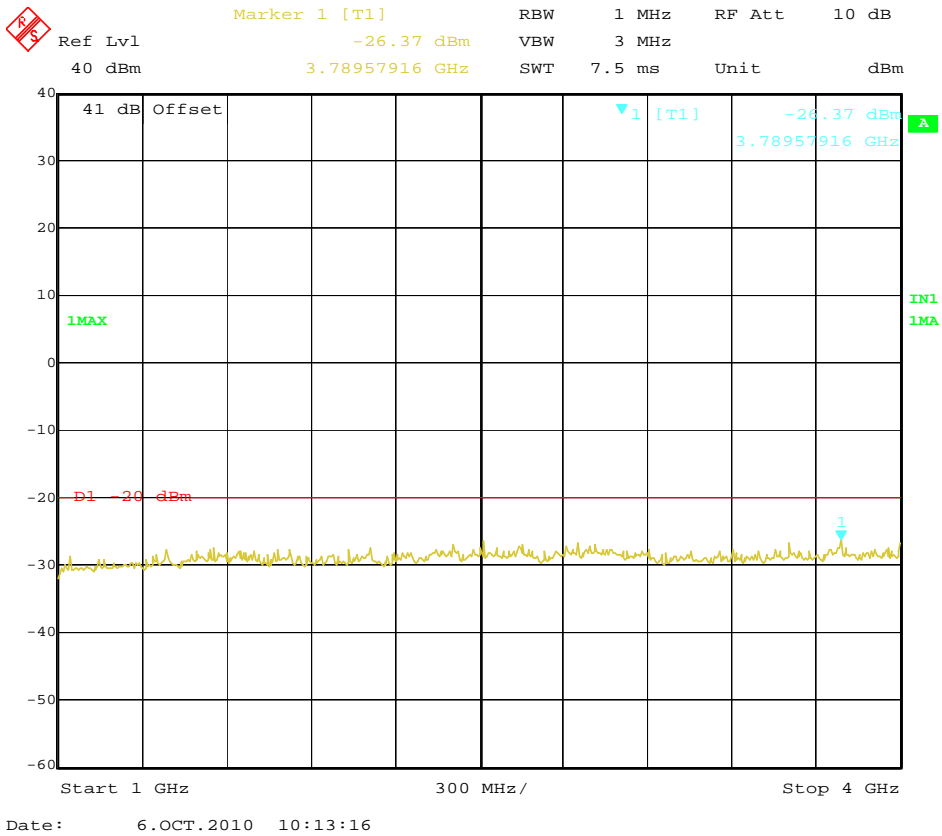
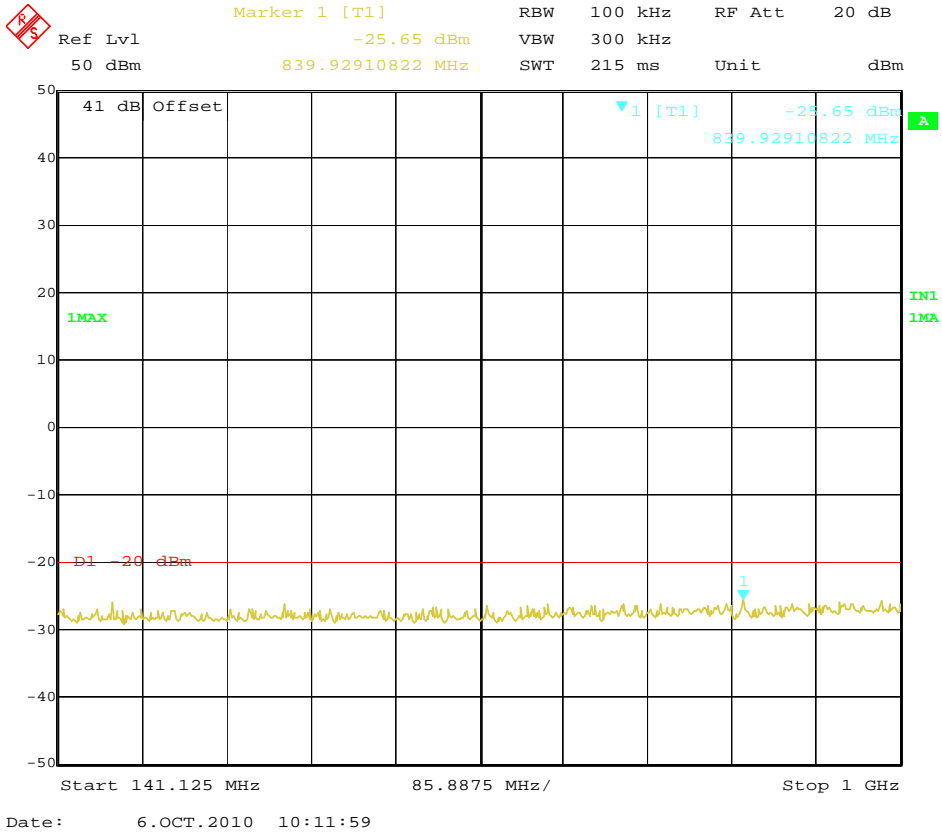
Modulation Type	Channel Separation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	Low	136.1250	839.93	-25.65	3789.58	-26.37	-20dBm
Test Results				Compliance				



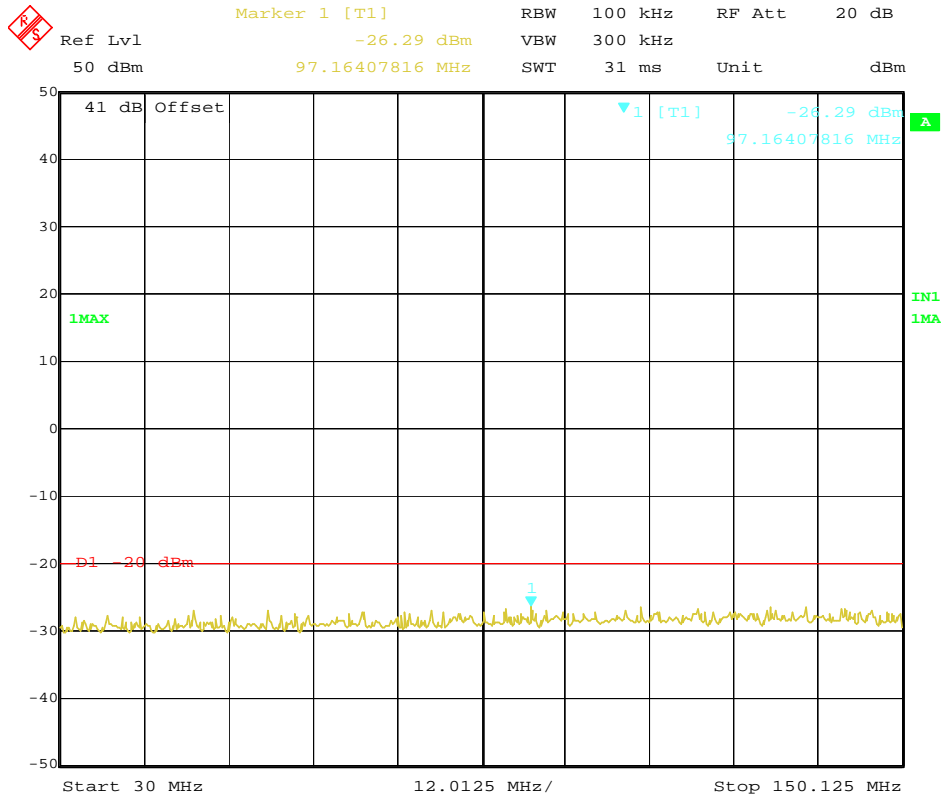
Date: 6.OCT.2010 10:10:20



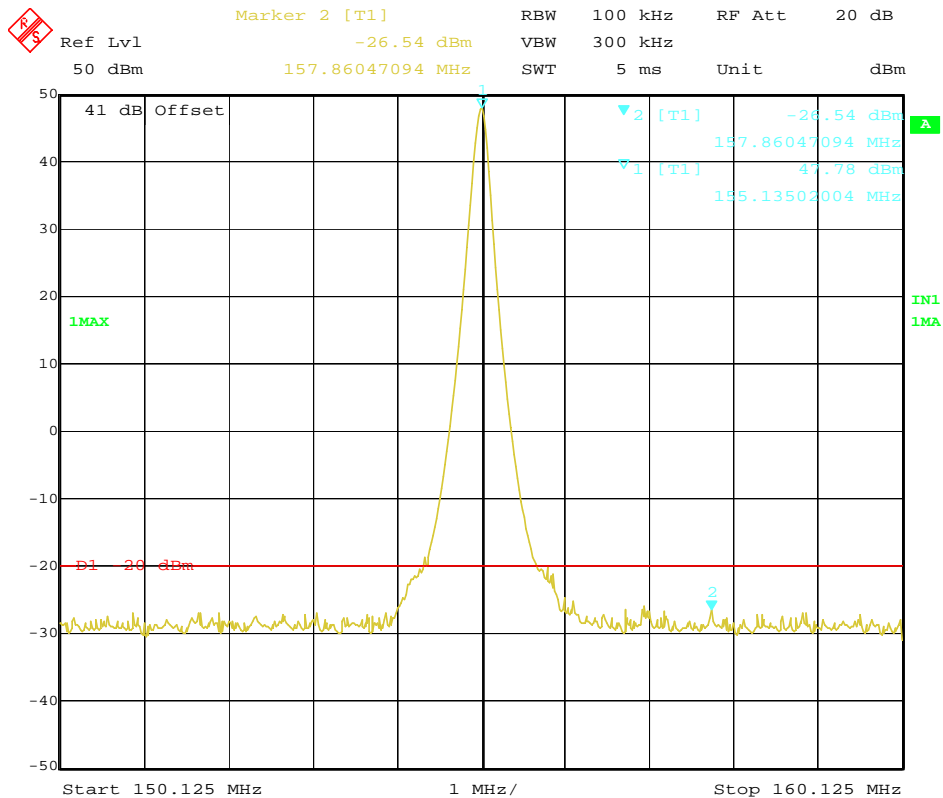
Date: 6.OCT.2010 10:10:59



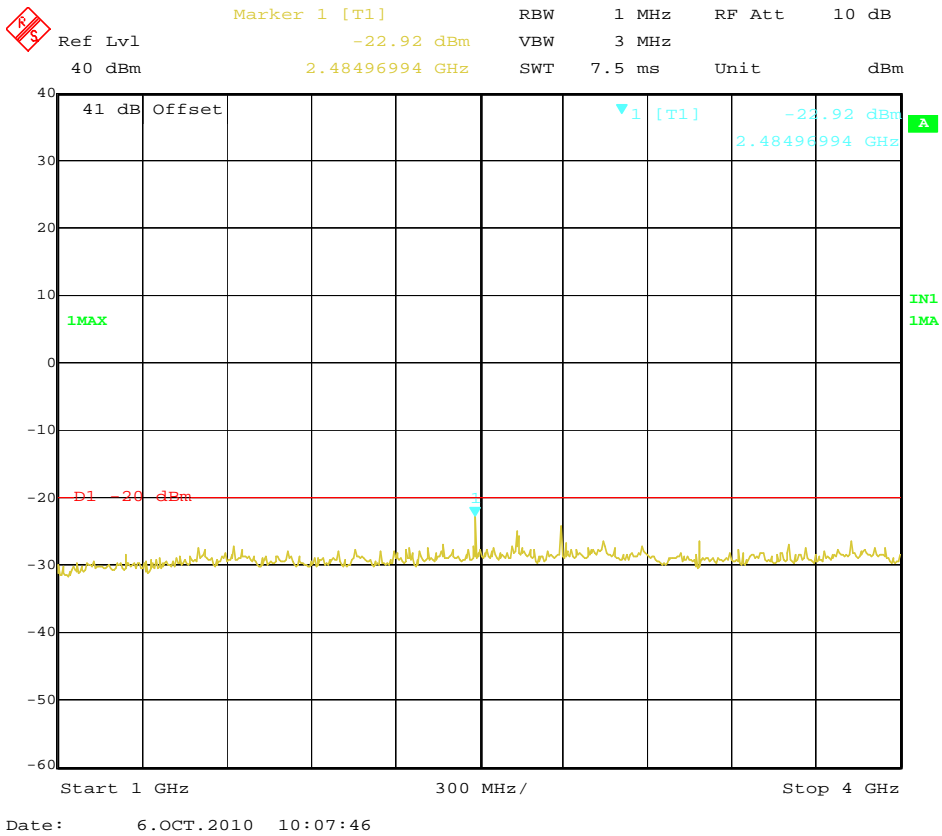
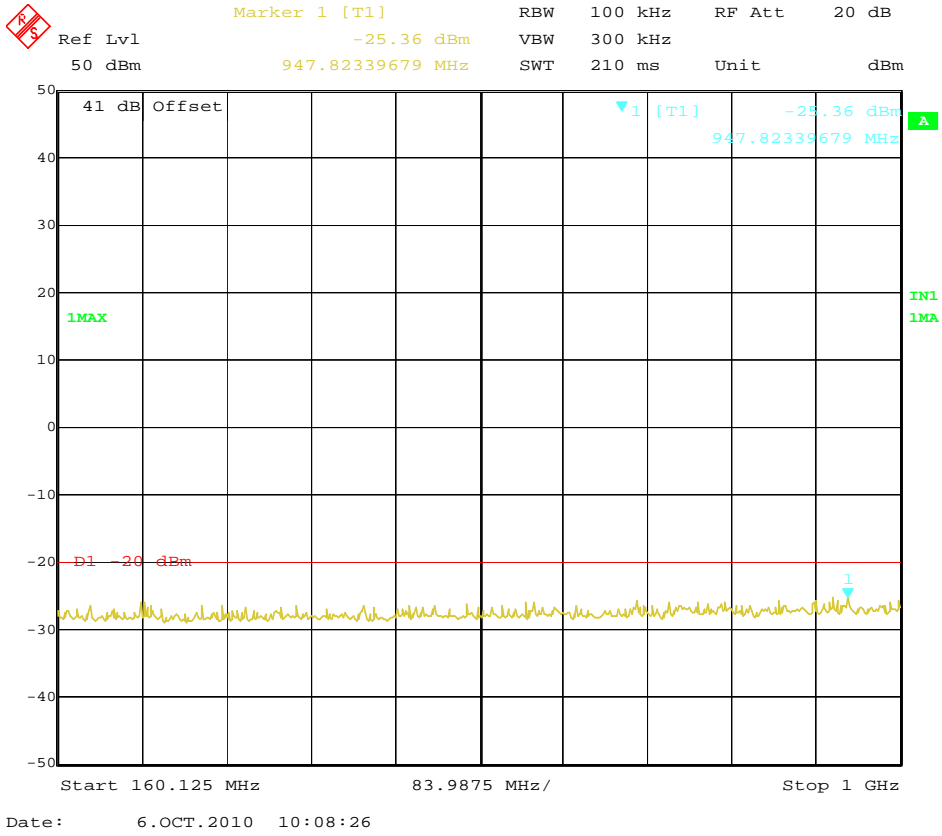
Modulation Type	Channel SpARATION	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	Middle	155.1250	947.82	-25.36	2484.97	-22.92	-20dBm
Test Results				Compliance				



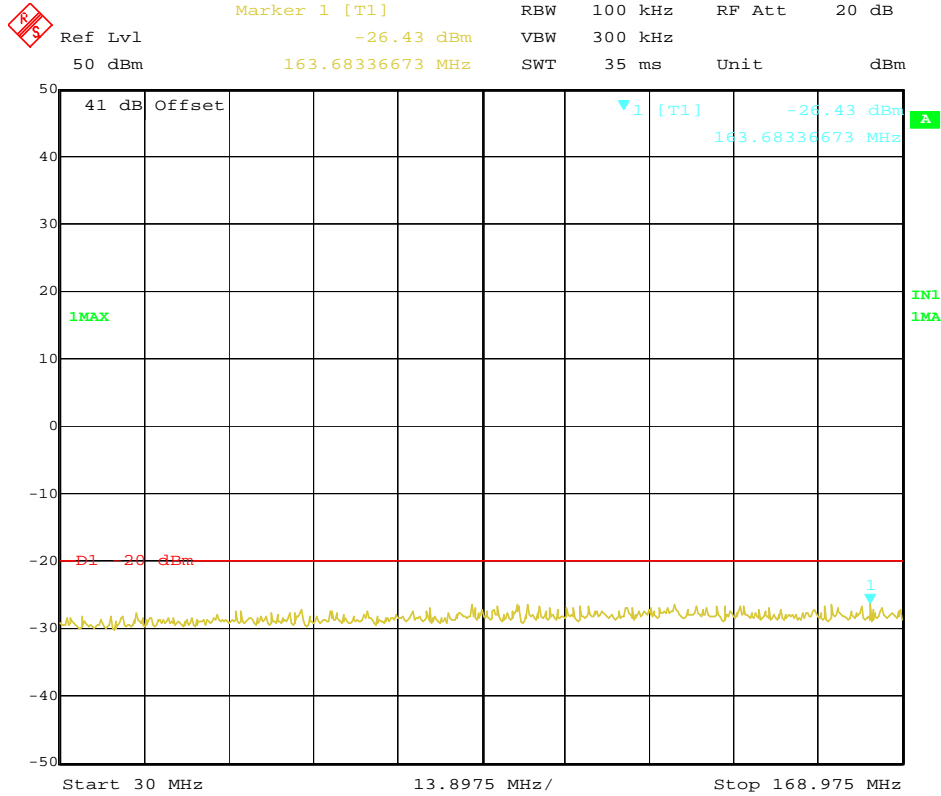
Date: 6.OCT.2010 10:09:50



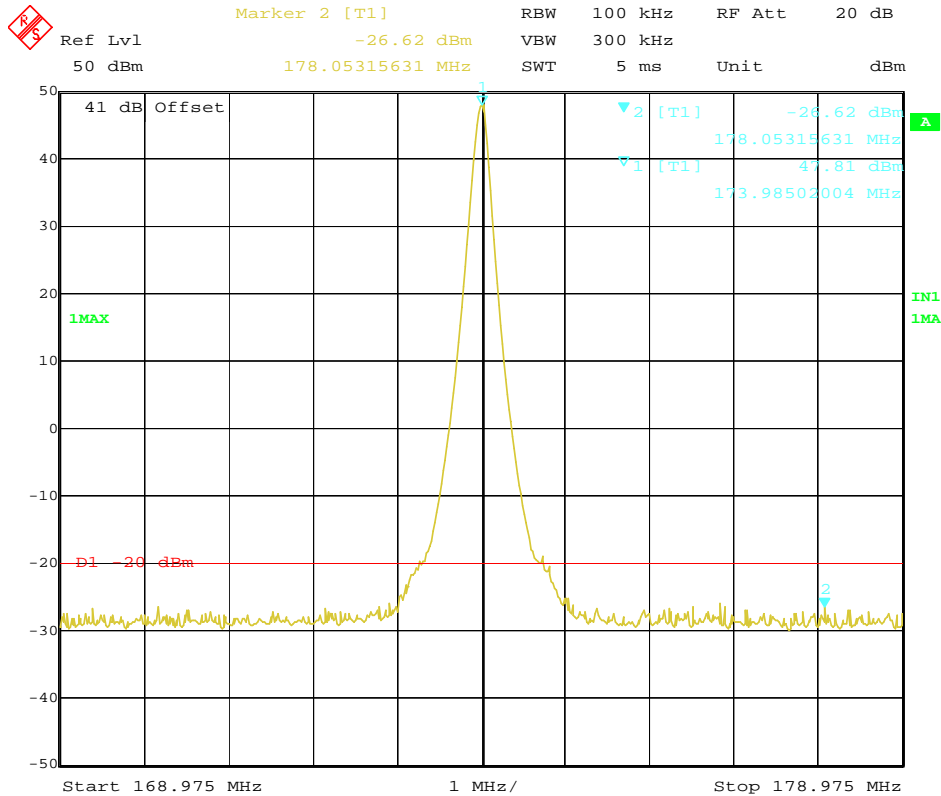
Date: 6.OCT.2010 10:09:24



Modulation Type	Channel Separation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	High	173.9750	929.25	-25.74	2785.57	-23.76	-20dBm
Test Results				Compliance				

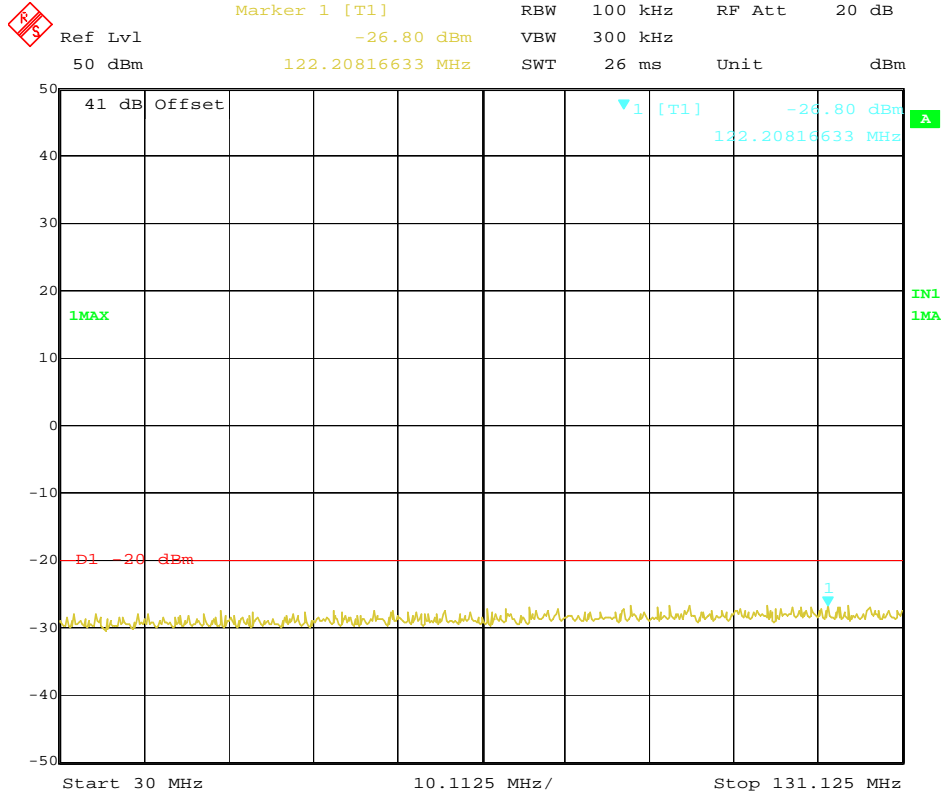


Date: 6.OCT.2010 10:03:56

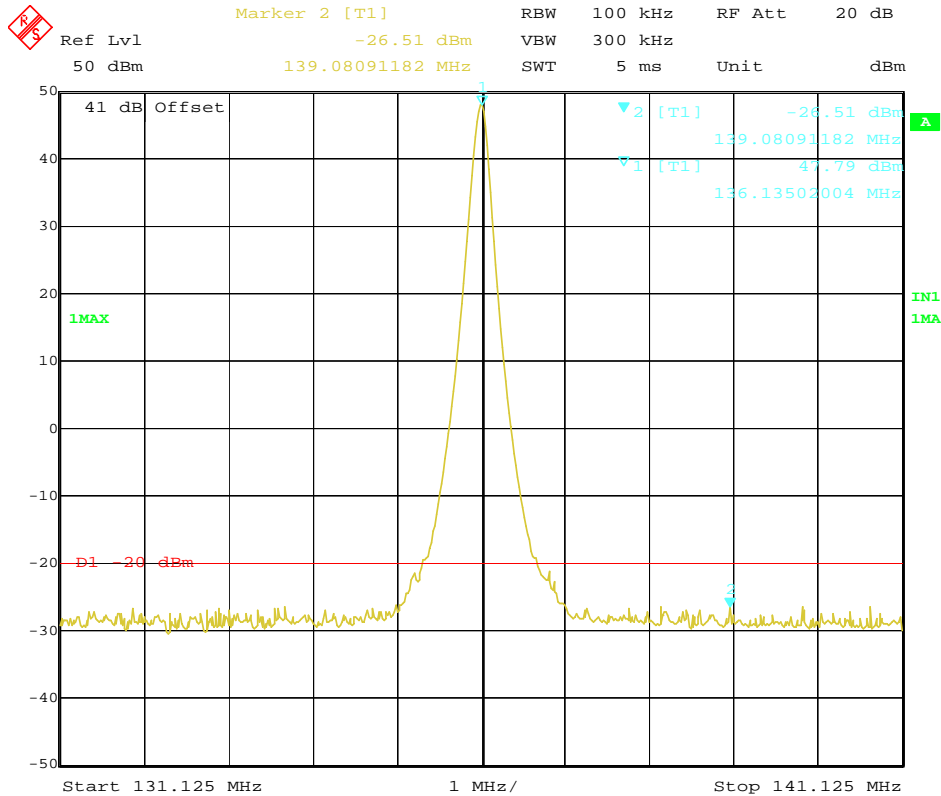


Date: 6.OCT.2010 10:04:32

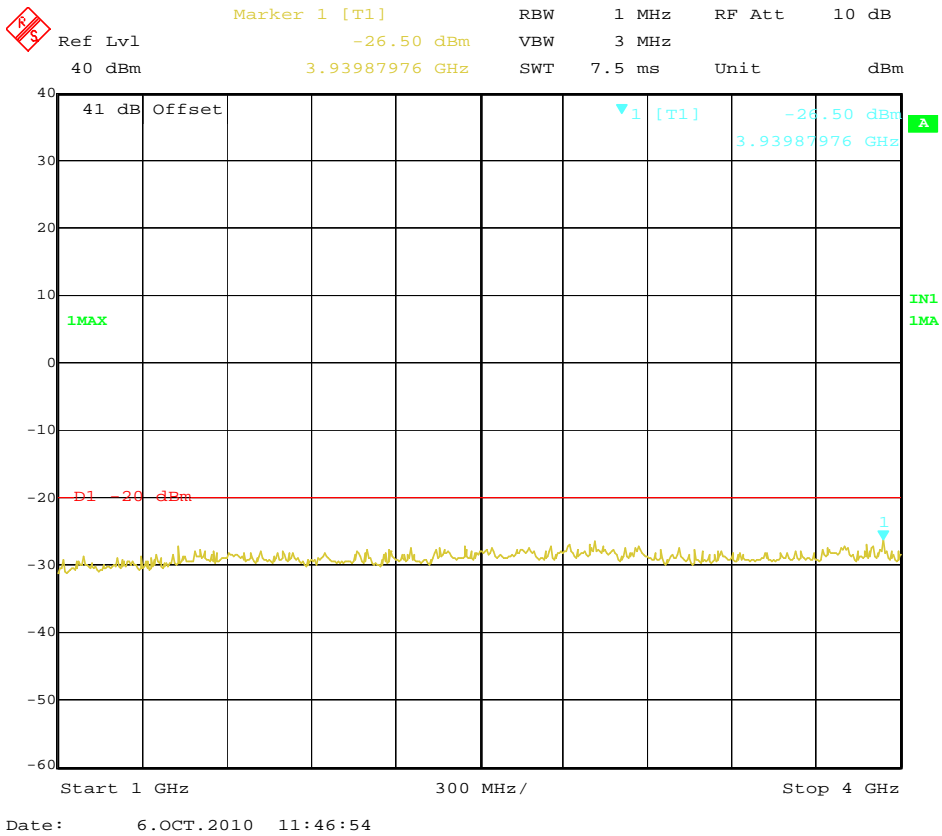
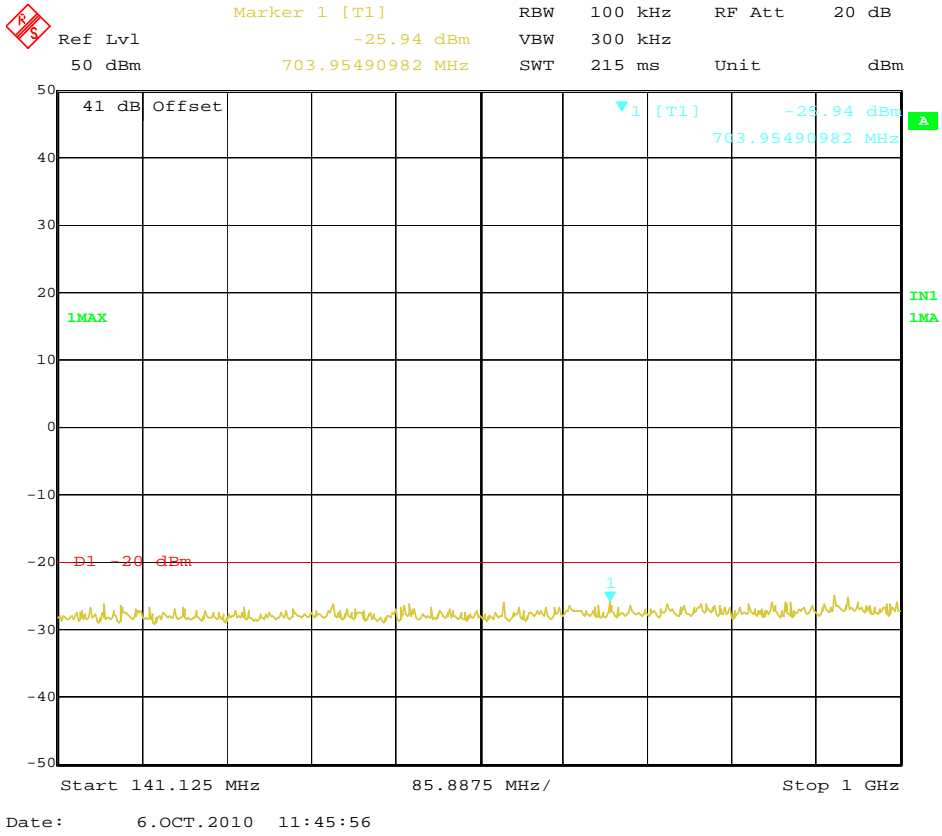
Modulation Type	Channel Separation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
4FSK	12.5KHz	Low	136.1250	703.95	-25.94	3939.88	-26.50	-20dBm
Test Results				Compliance				



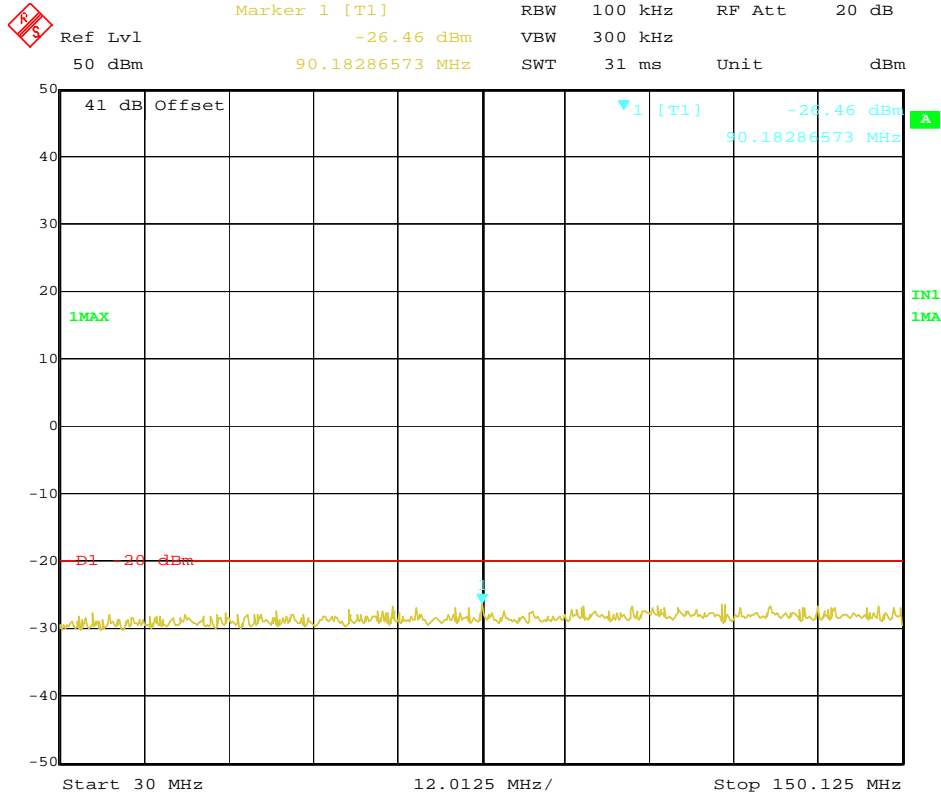
Date: 6.OCT.2010 11:44:09



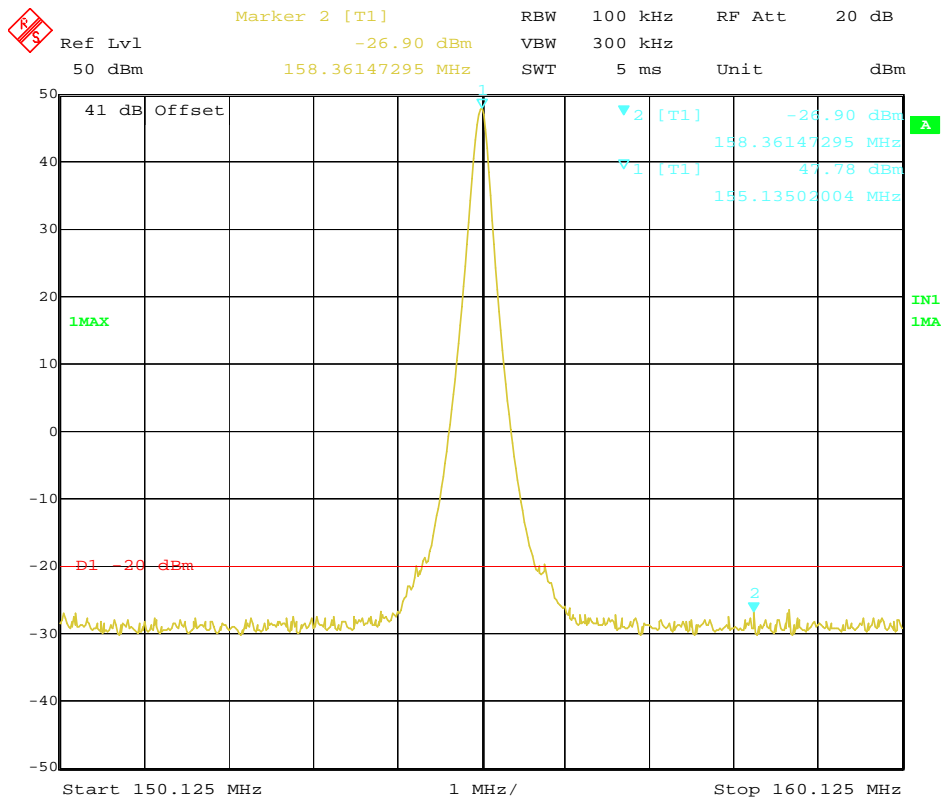
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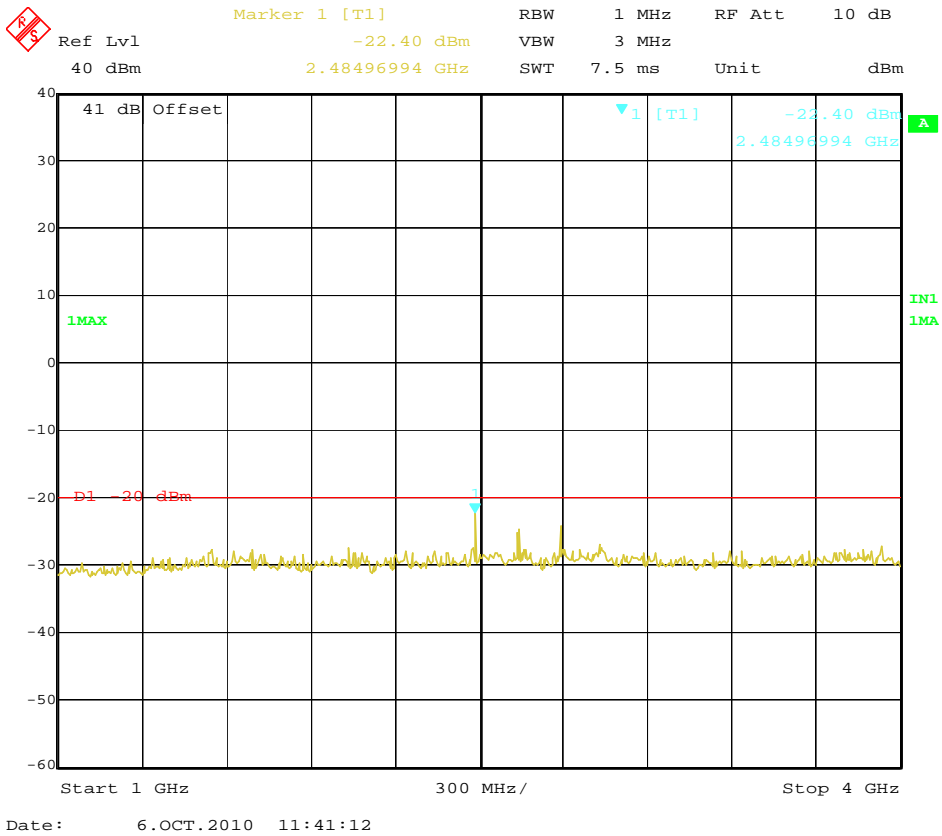
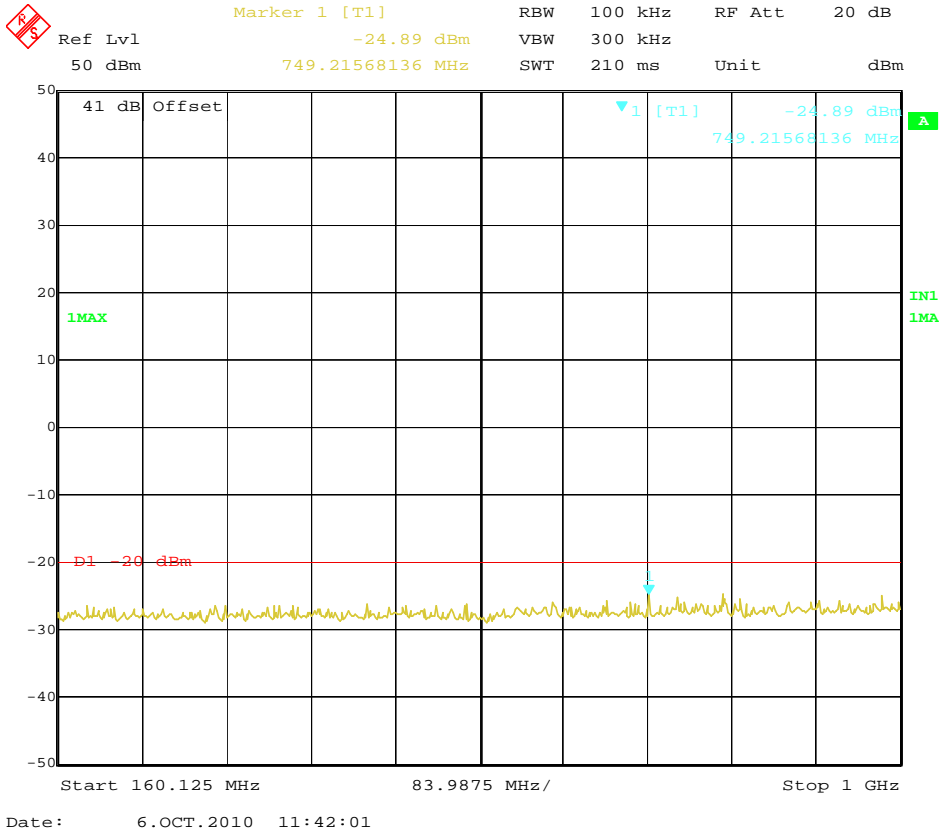
Modulation Type	Channel Separation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
4FSK	12.5KHz	Middle	155.1250	749.22	-24.89	2984.97	-22.40	-20dBm
Test Results				Compliance				



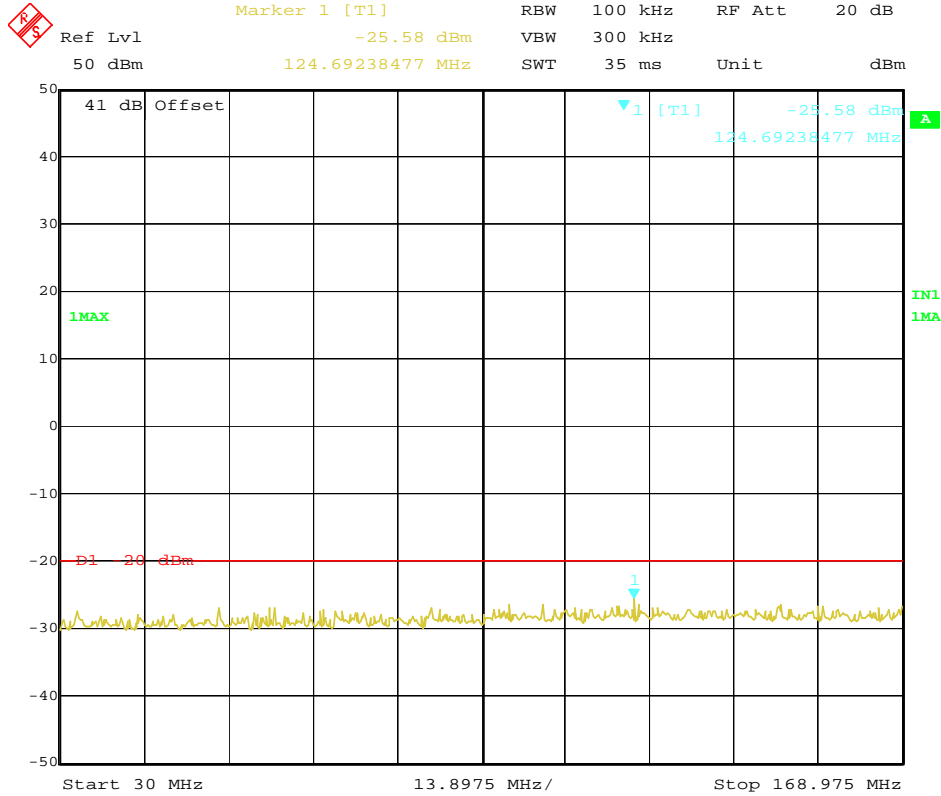
Date: 6.OCT.2010 11:43:31



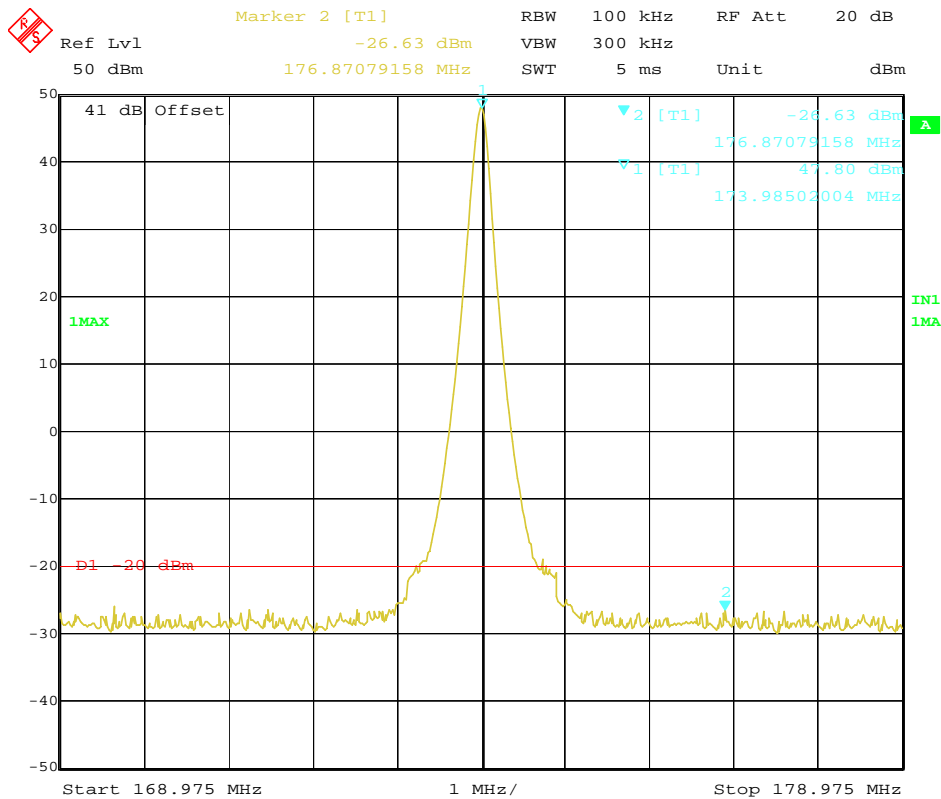
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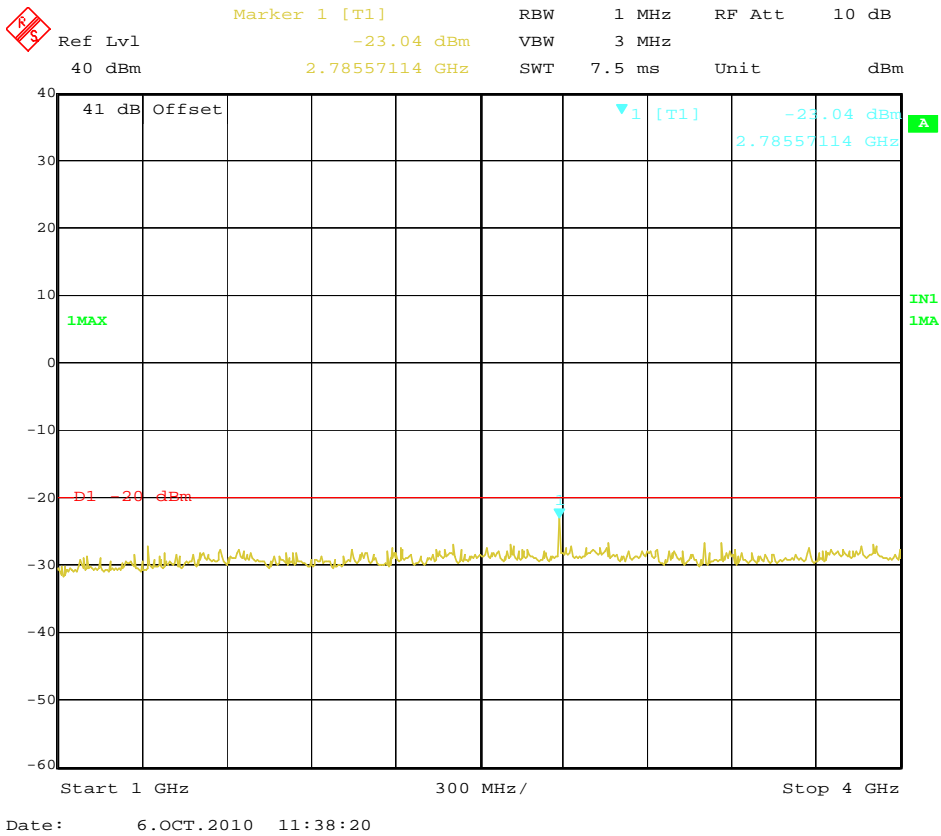
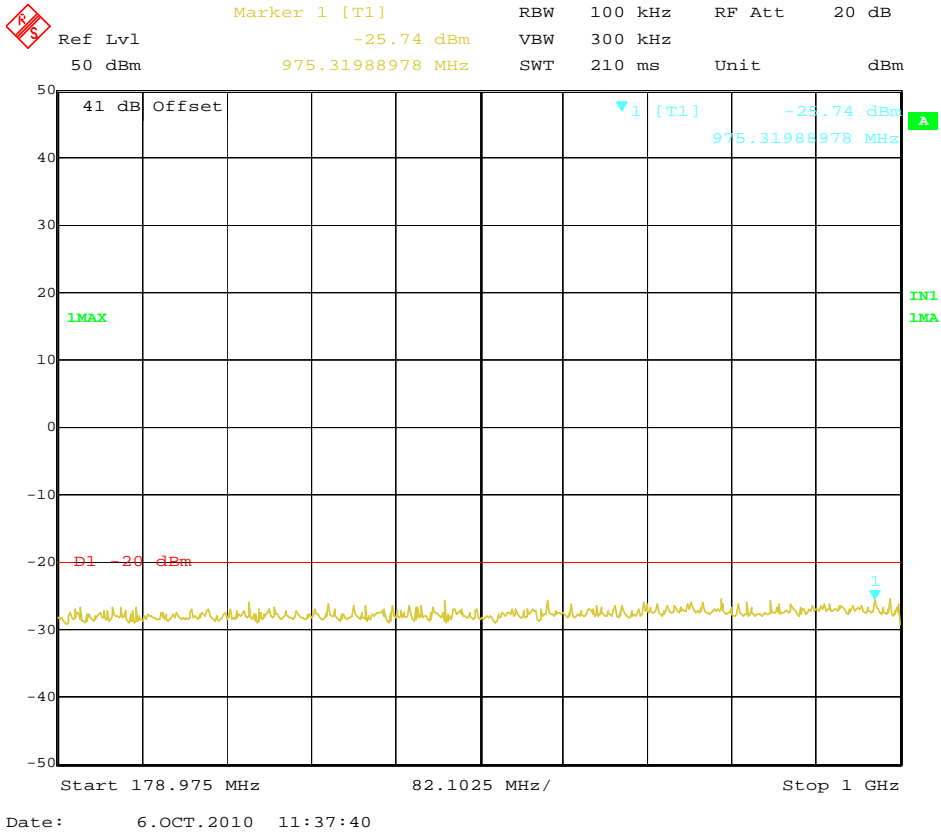
Modulation Type	Channel Separation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
4FSK	12.5KHz	High	173.9750	124.69	-25.58	2785.57	-23.04	-20dBm
Test Results				Compliance				



Date: 6.OCT.2010 11:35:56

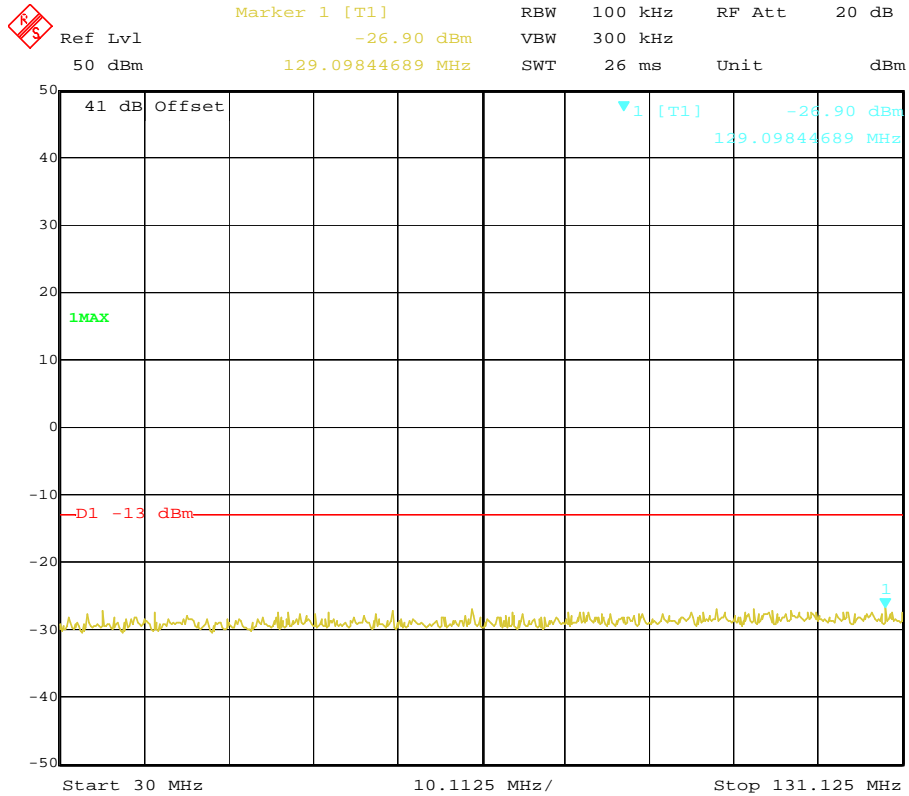


Date: 6.OCT.2010 11:36:28

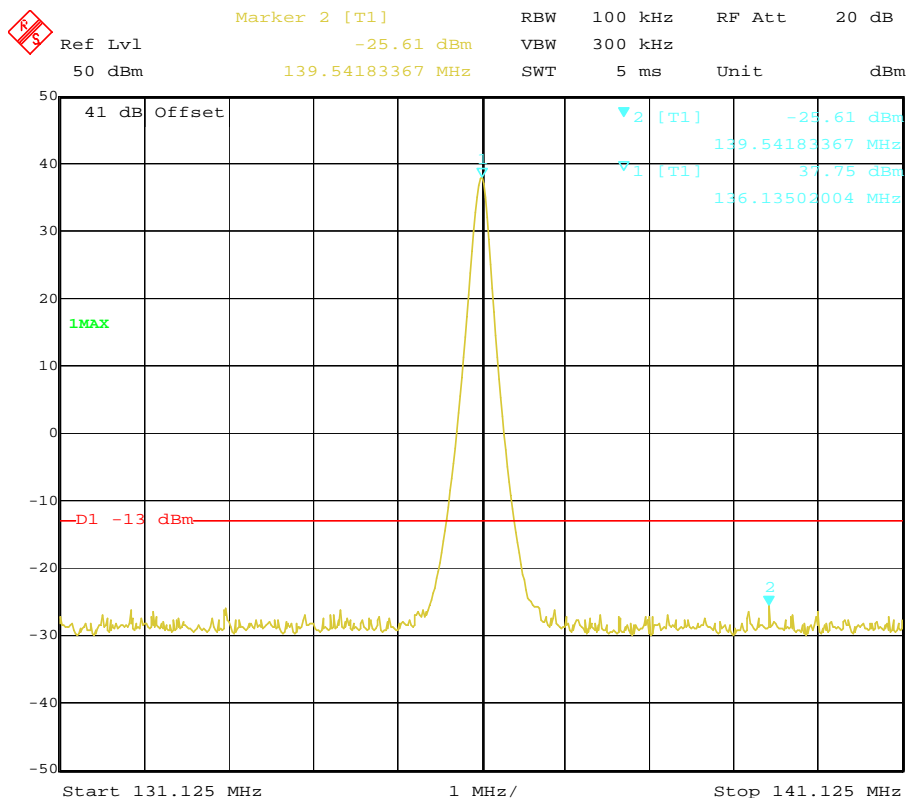


For Rated Low Power (5Watt)

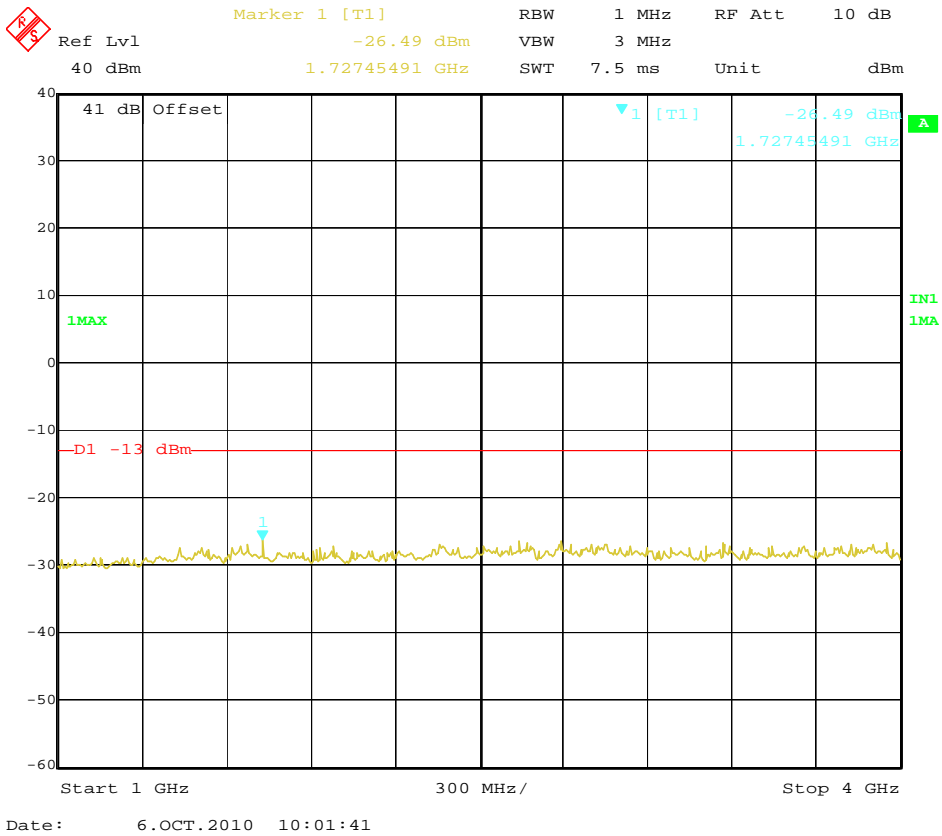
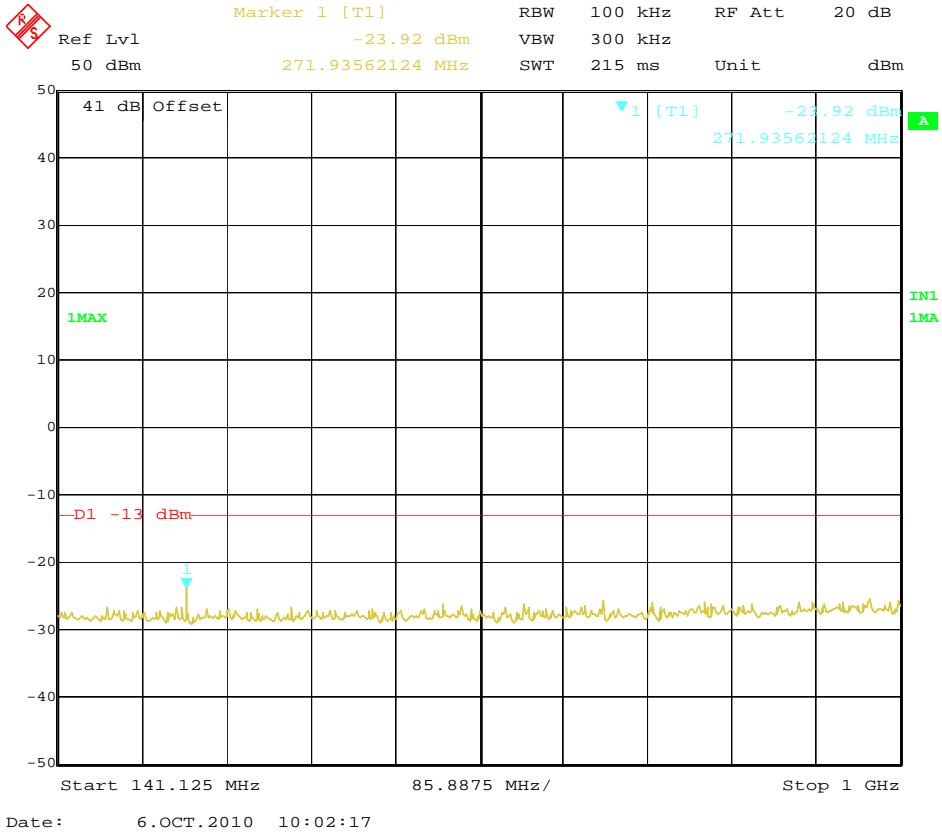
Modulation Type	Channel Separation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	25KHz	Low	136.1250	271.94	-23.92	1727.45	-26.49	-13dBm
Test Results				Compliance				



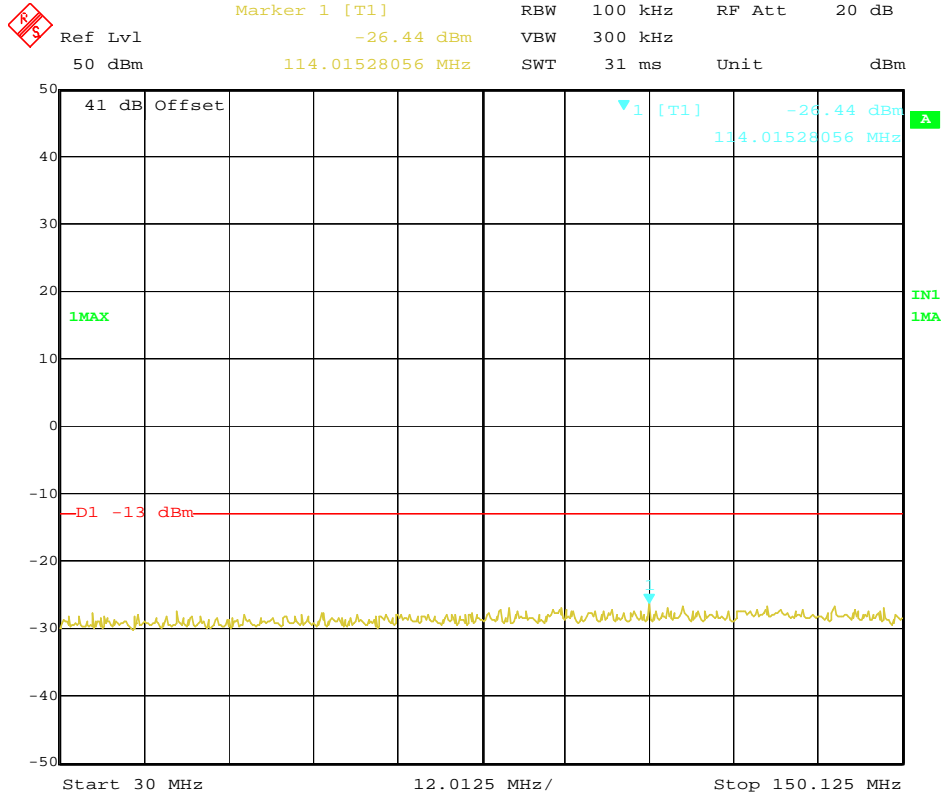
Date: 6.OCT.2010 10:03:19



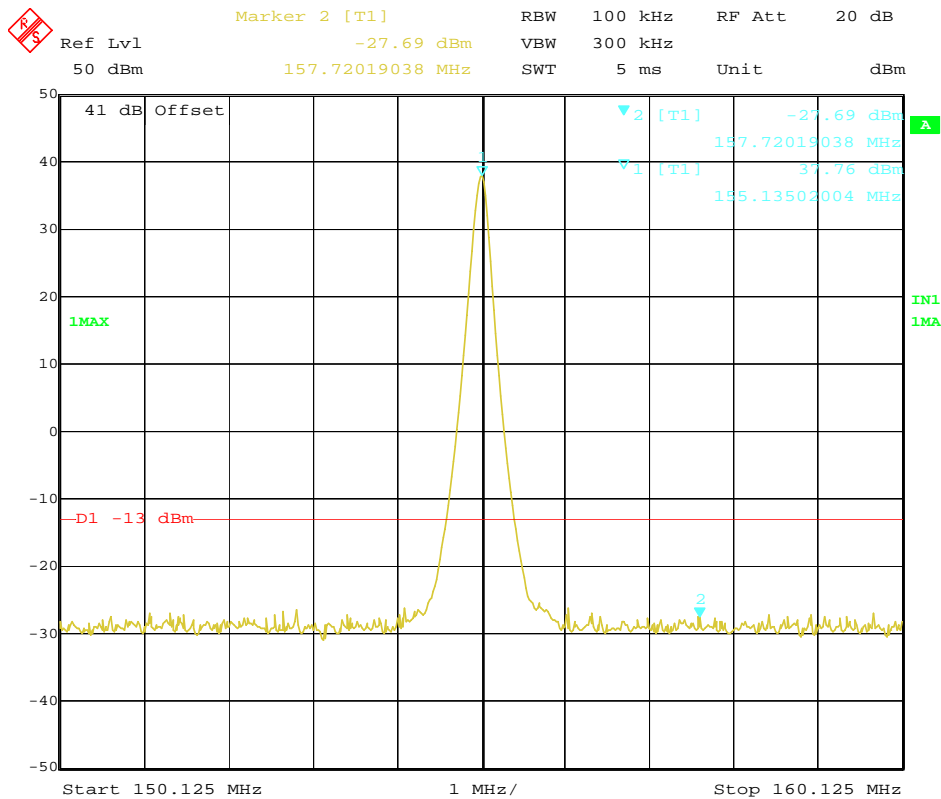
Date: 6.OCT.2010 10:02:57



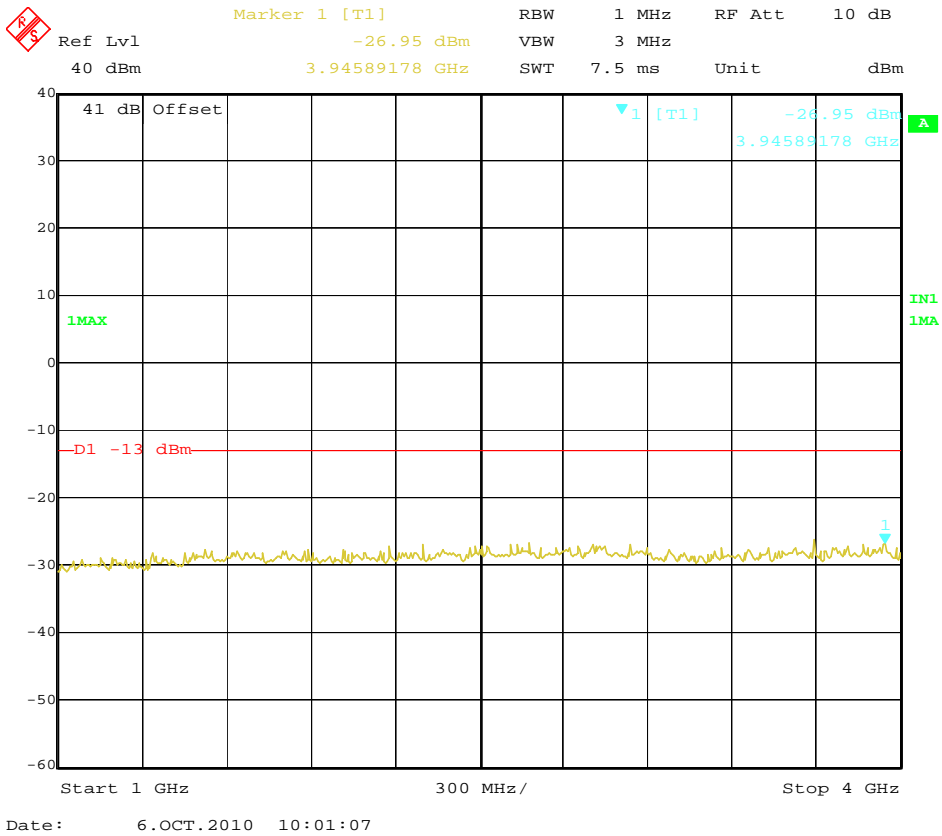
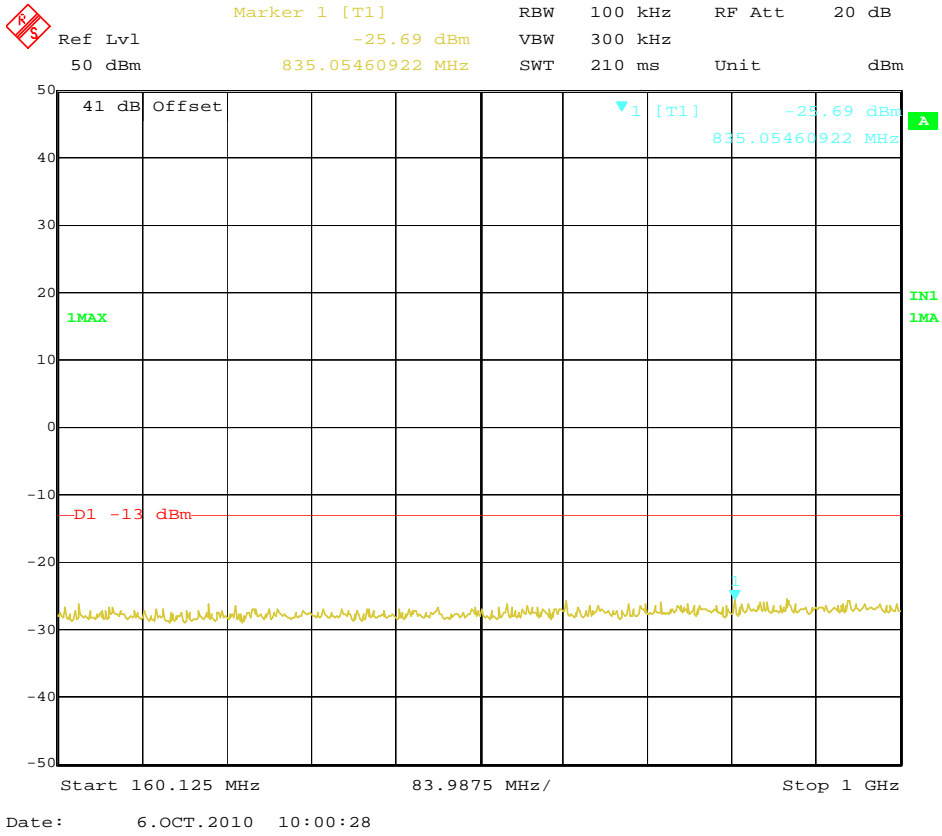
Modulation Type	Channel Separation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	25KHz	Middle	155.1250	835.05	-25.69	3945.89	-26.95	-13dBm
Test Results				Compliance				



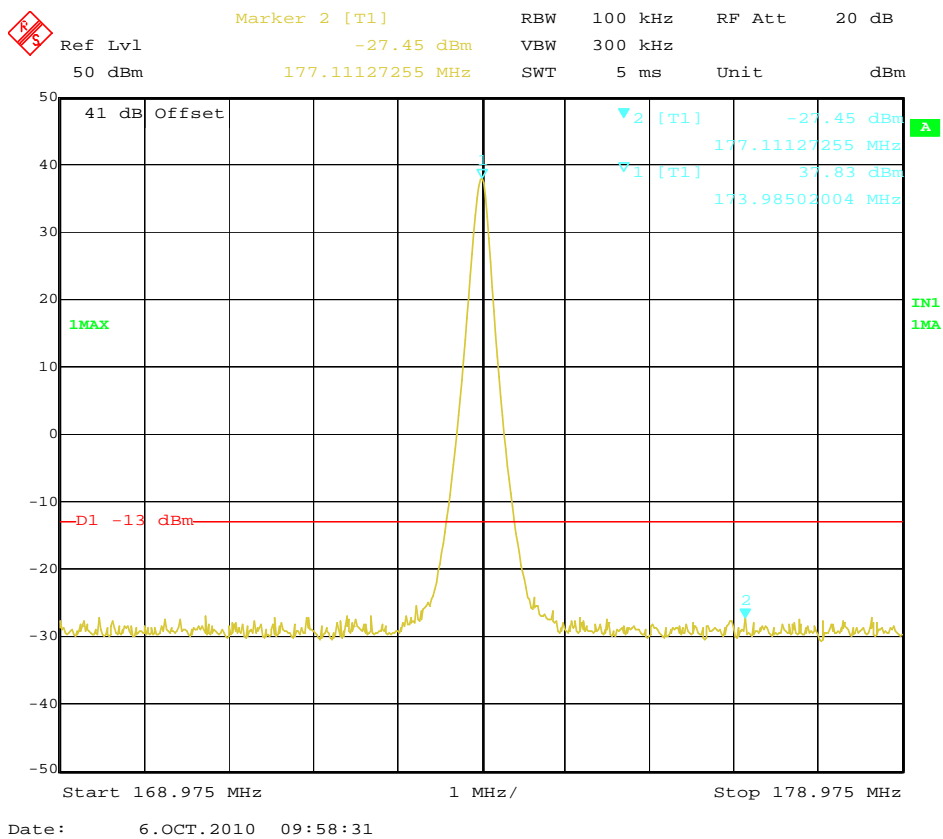
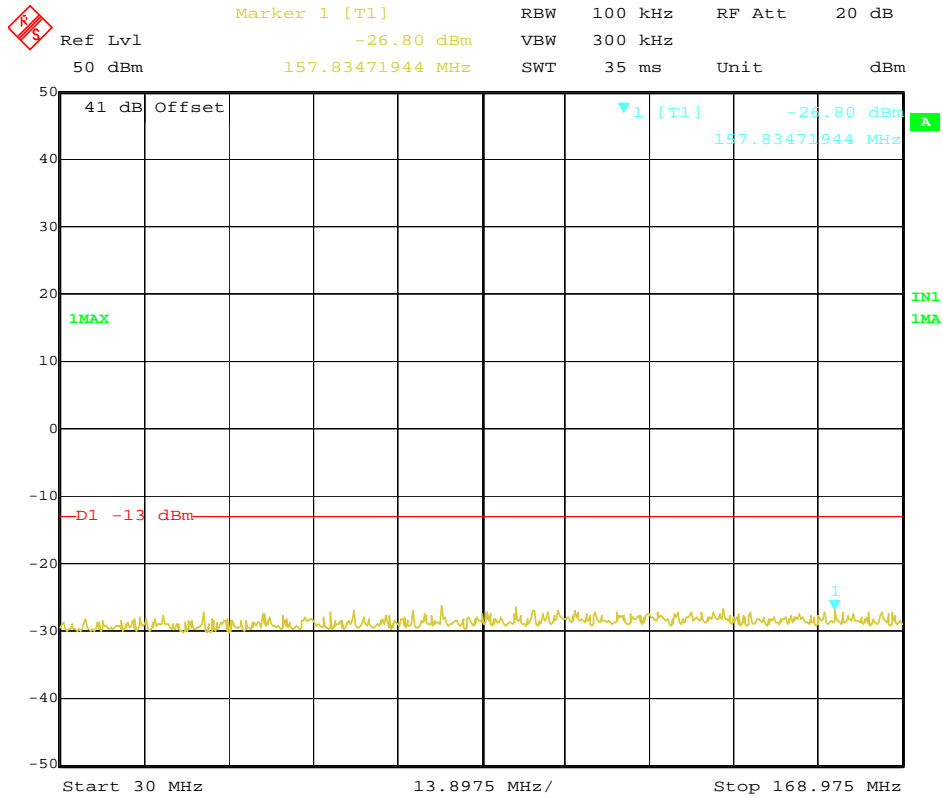
Date: 6.OCT.2010 09:59:26

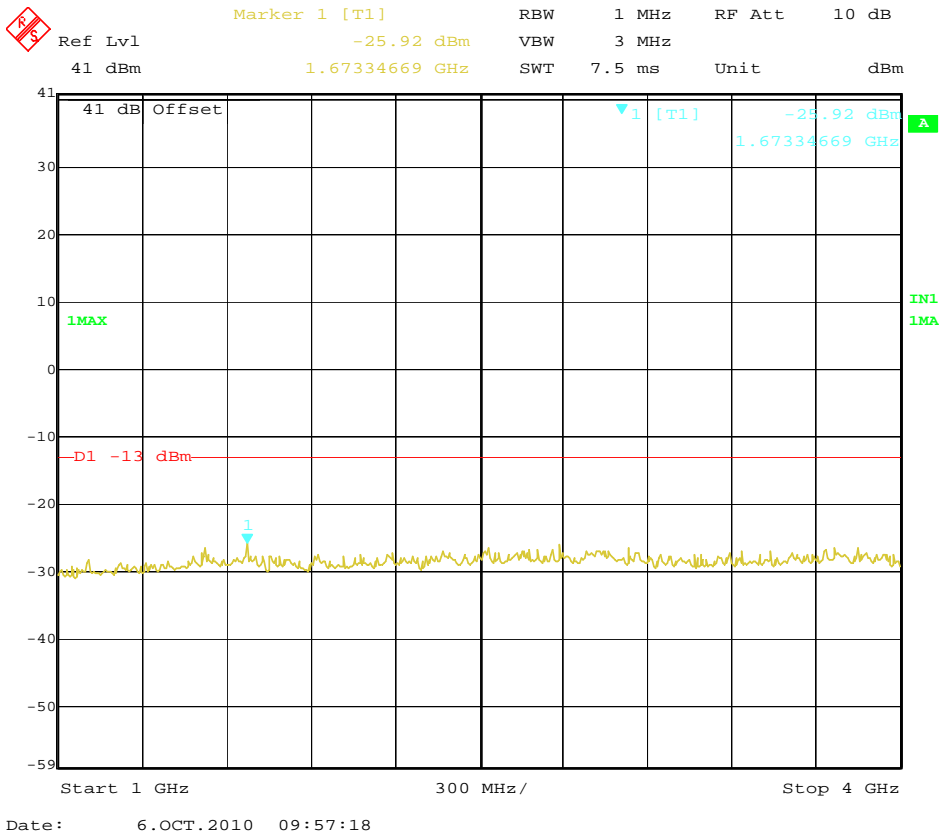
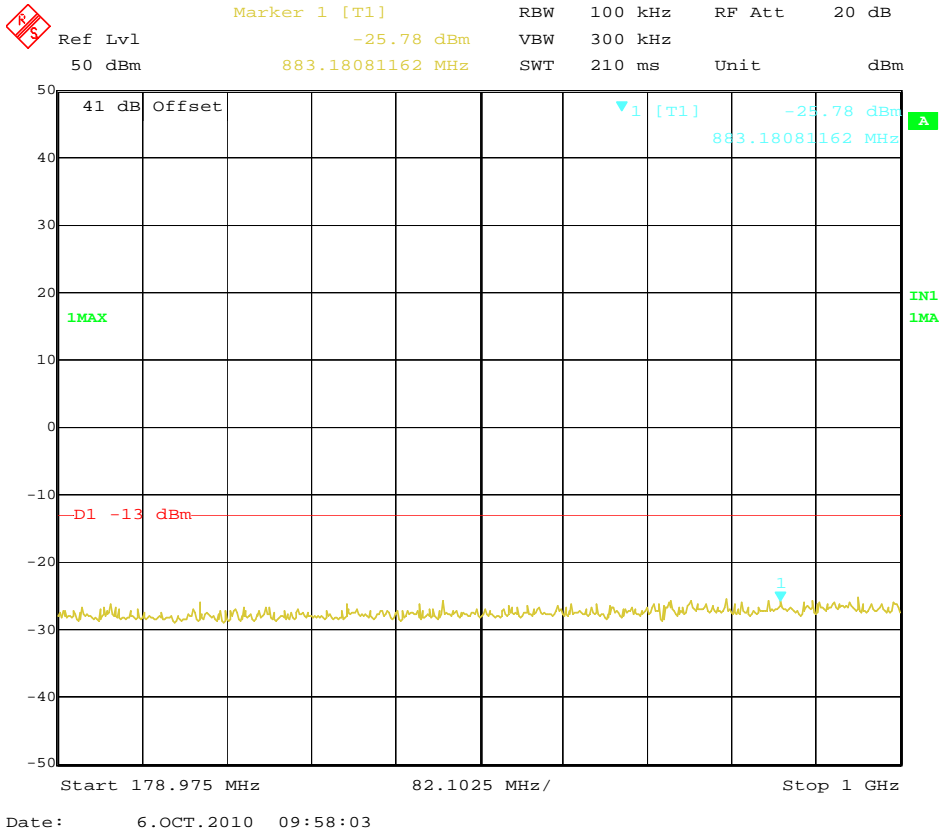


Date: 6.OCT.2010 09:59:58

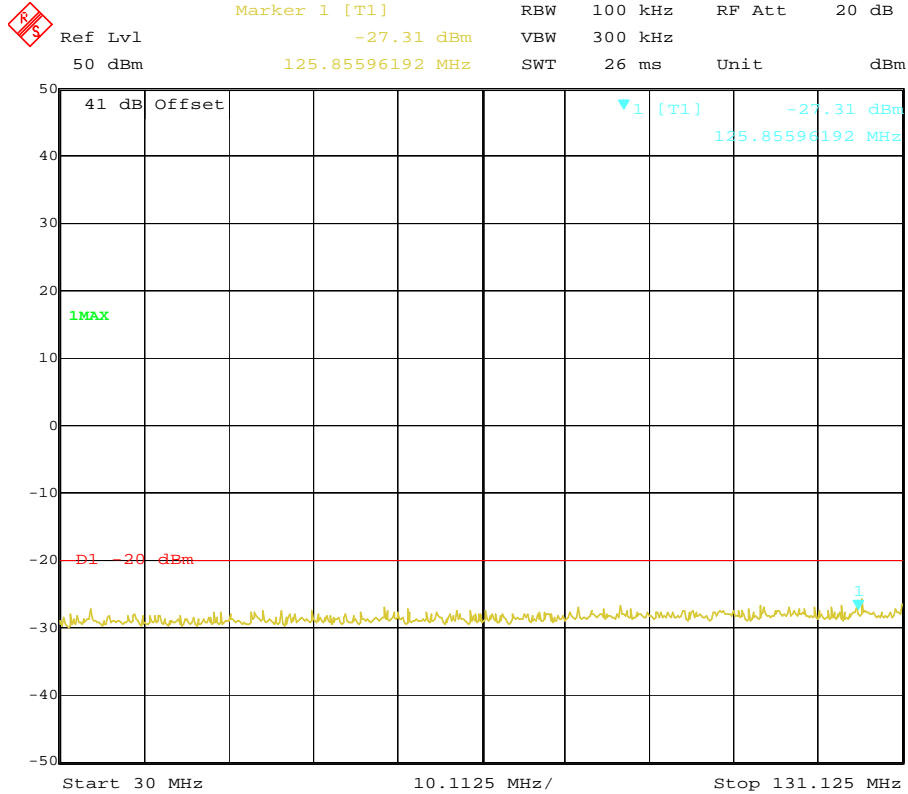


Modulation Type	Channel Separation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	25KHz	High	173.9750	883.18	-25.78	1673.34	-25.92	-13dBm
Test Results				Compliance				

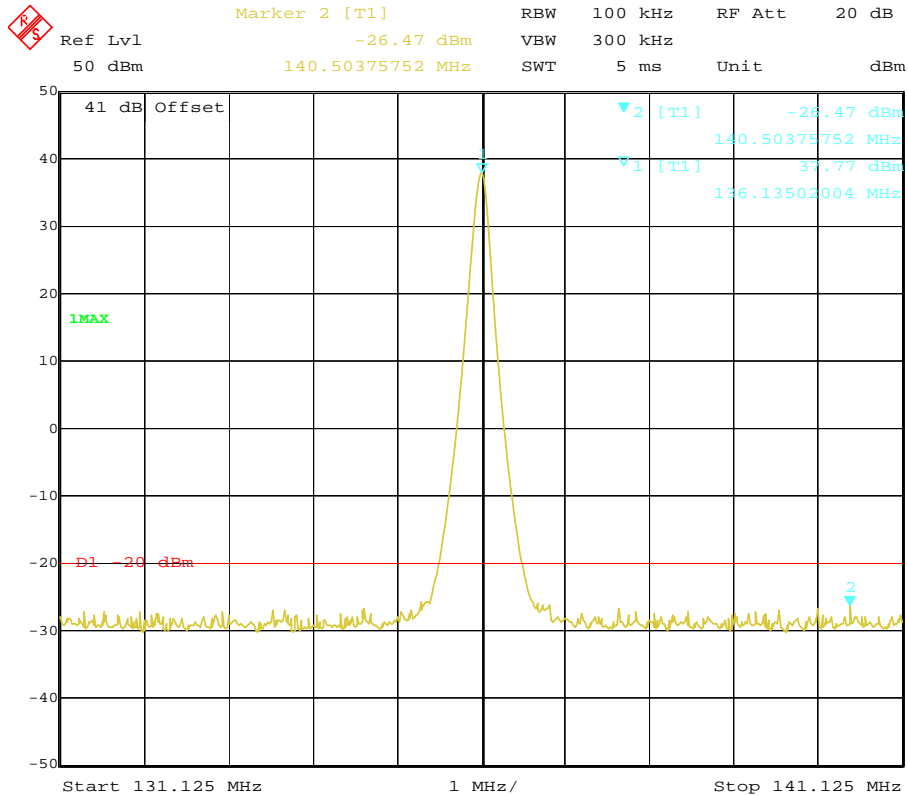




Modulation Type	Channel Separation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	Low	136.1250	271.94	-24.31	2965.93	-26.26	-20dBm
Test Results				Compliance				

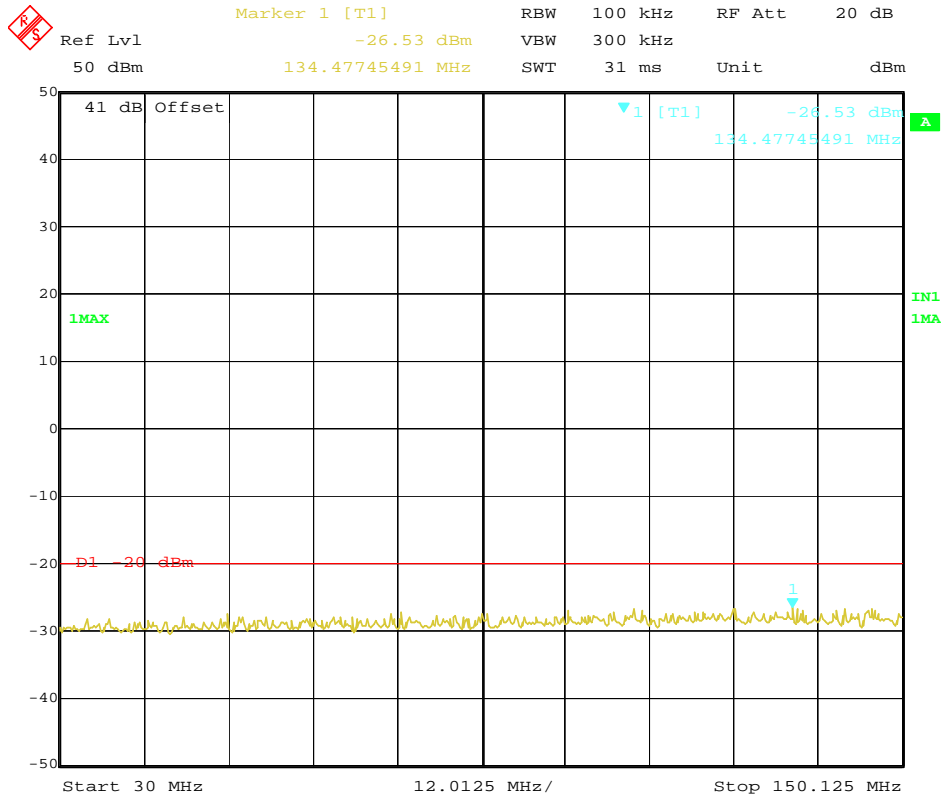


Date: 6.OCT.2010 09:55:18

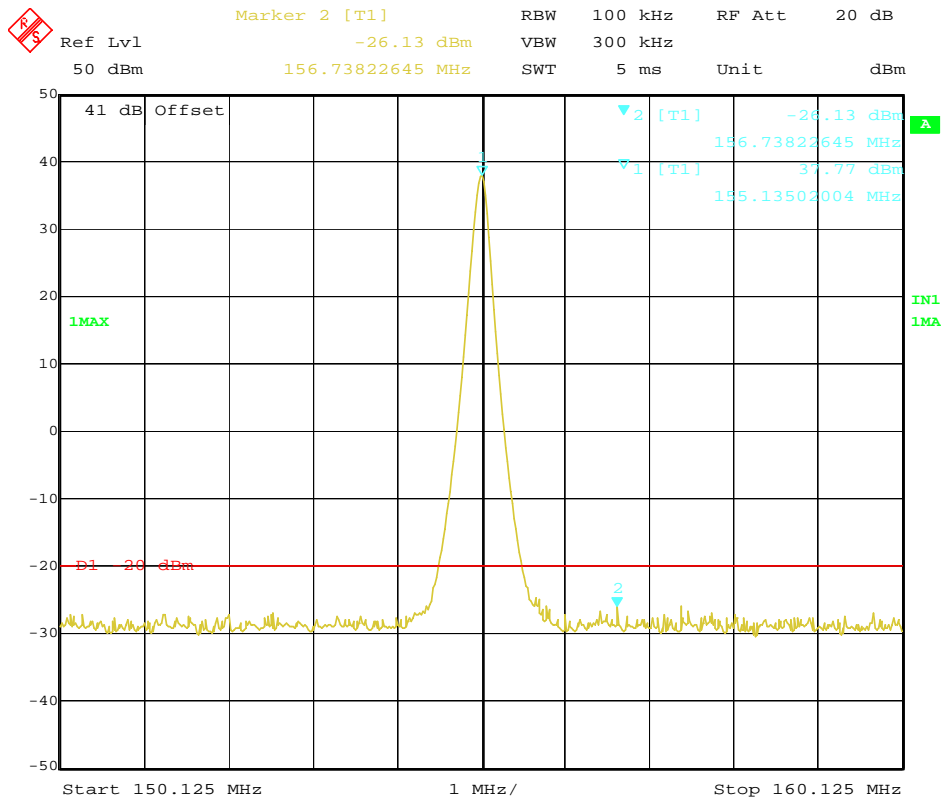


Date: 6.OCT.2010 09:55:53

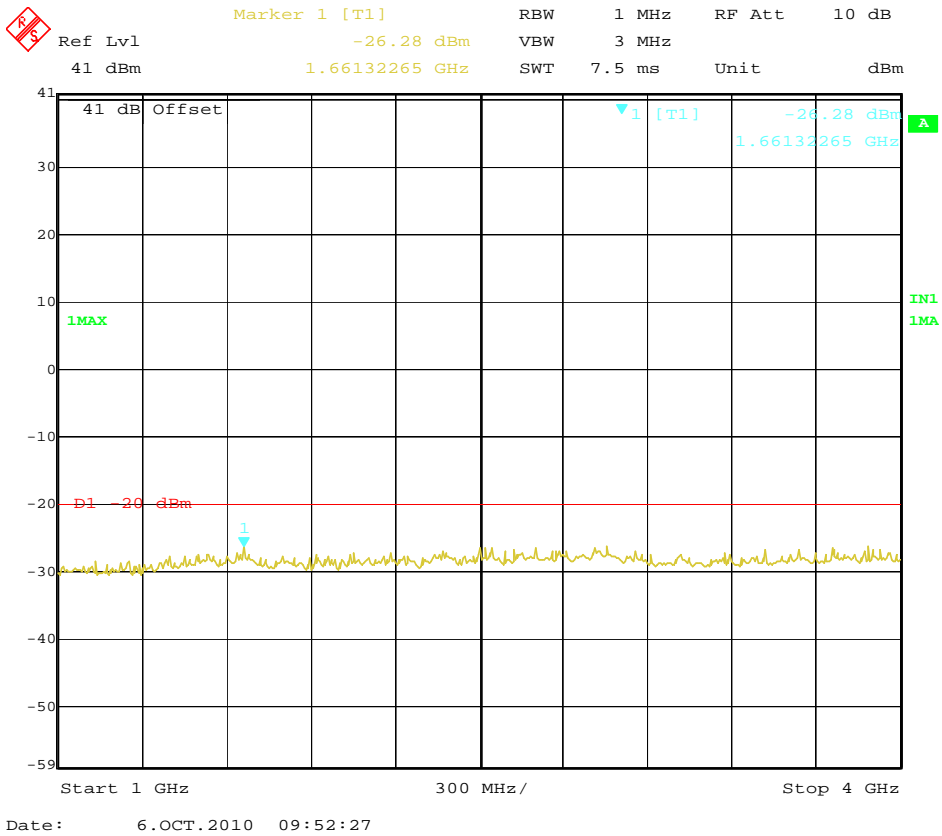
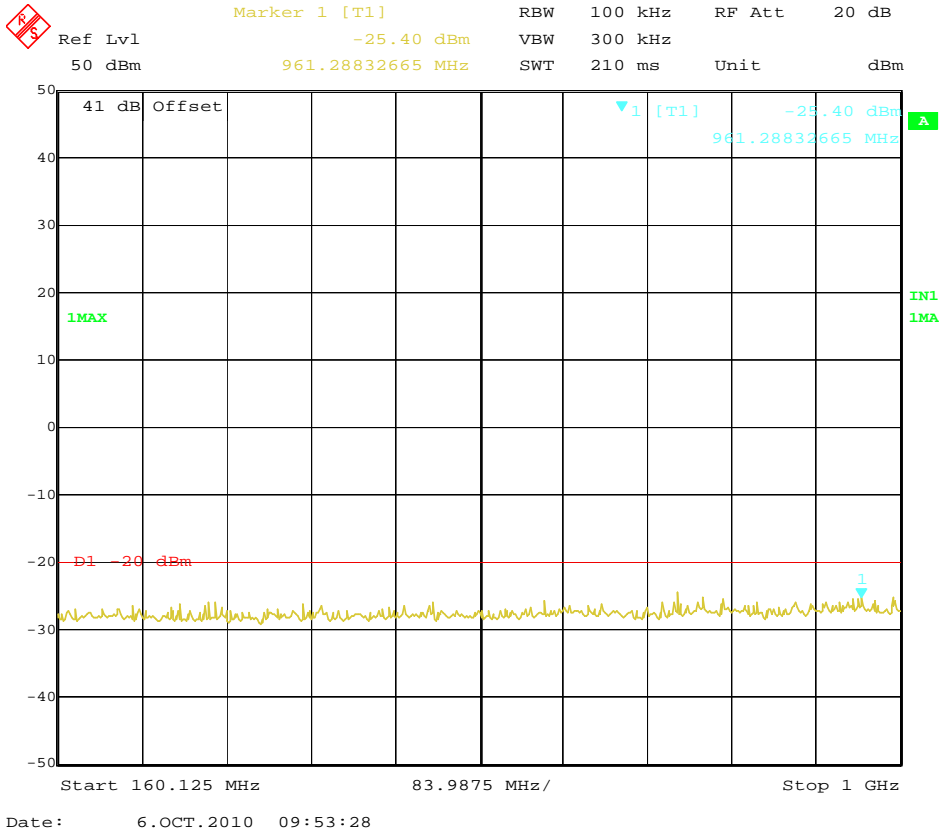
Modulation Type	Channel SpARATION	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	Middle	155.1250	961.29	-25.40	1661.32	-26.28	-20dBm
Test Results				Compliance				



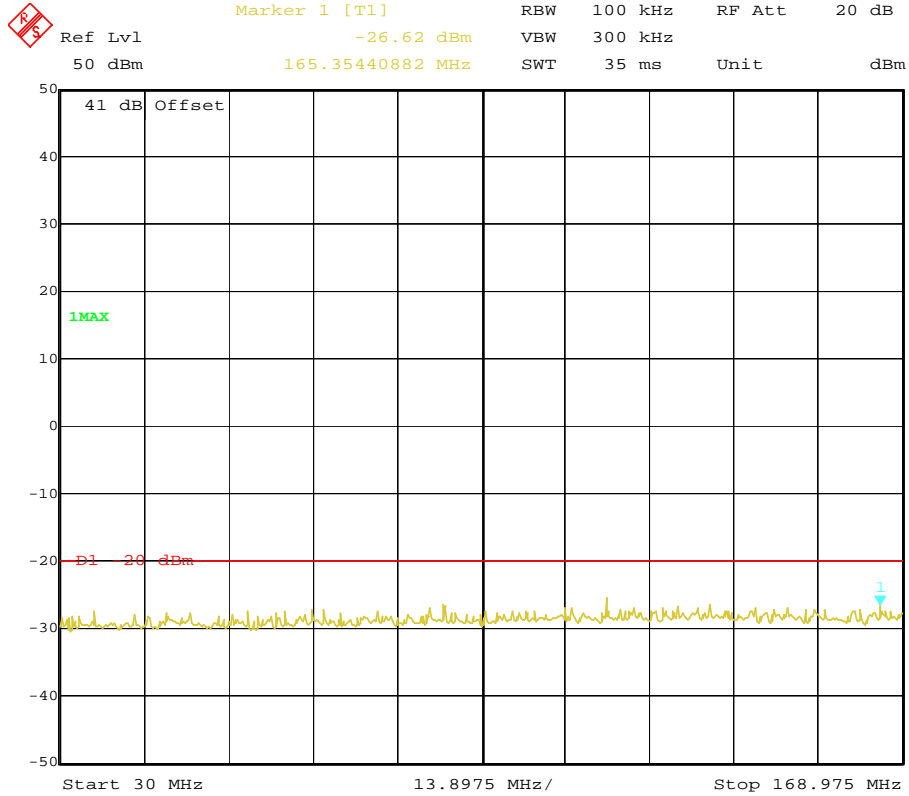
Date: 6.OCT.2010 09:54:35



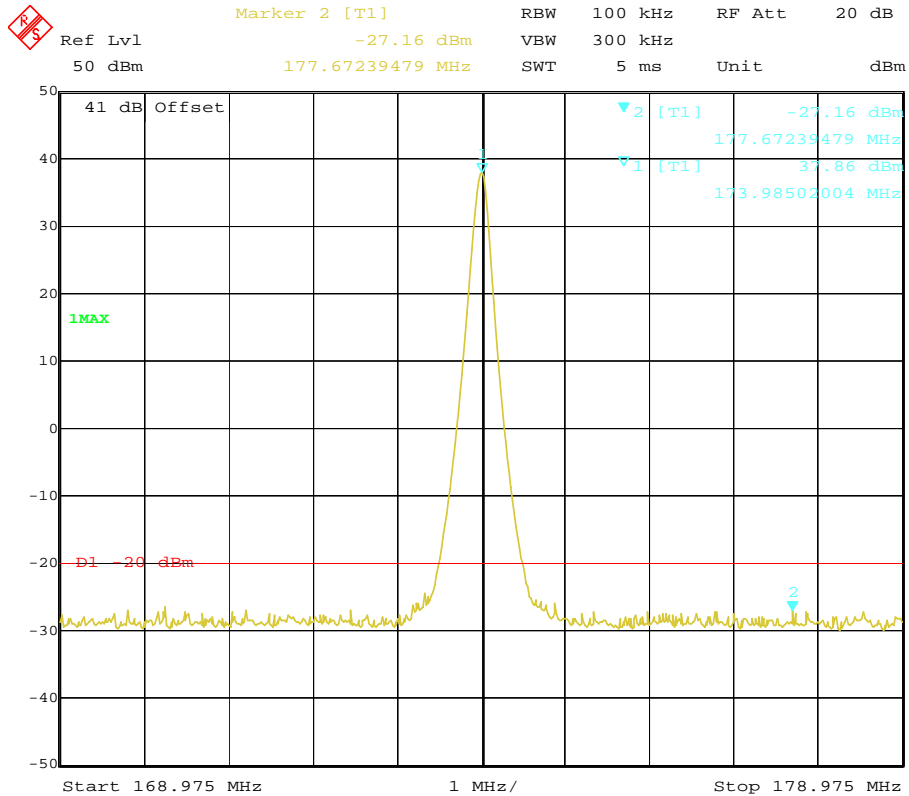
Date: 6.OCT.2010 09:54:03



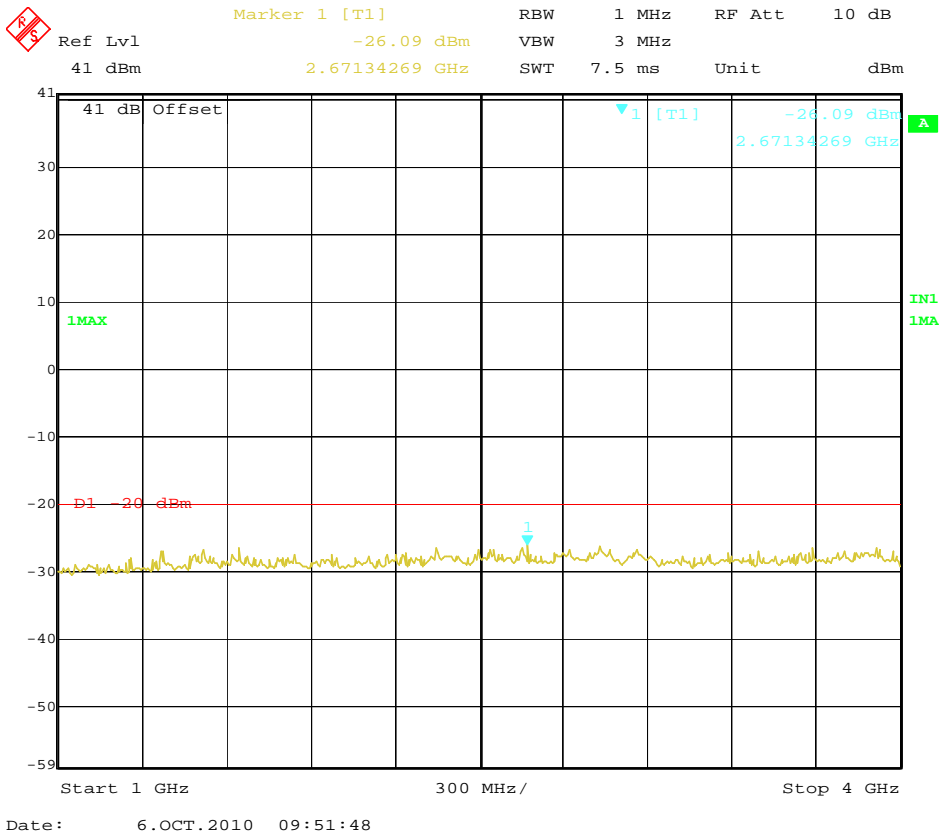
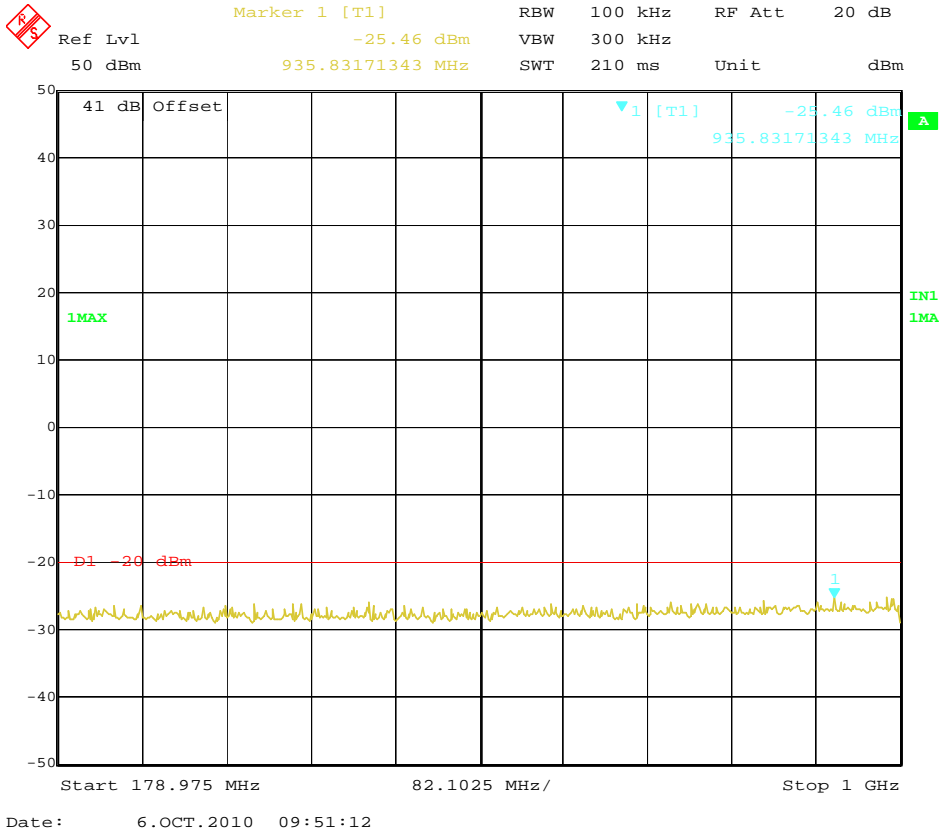
Modulation Type	Channel Separation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	High	173.9750	935.83	-25.46	2671.34	-26.09	-20dBm
Test Results				Compliance				



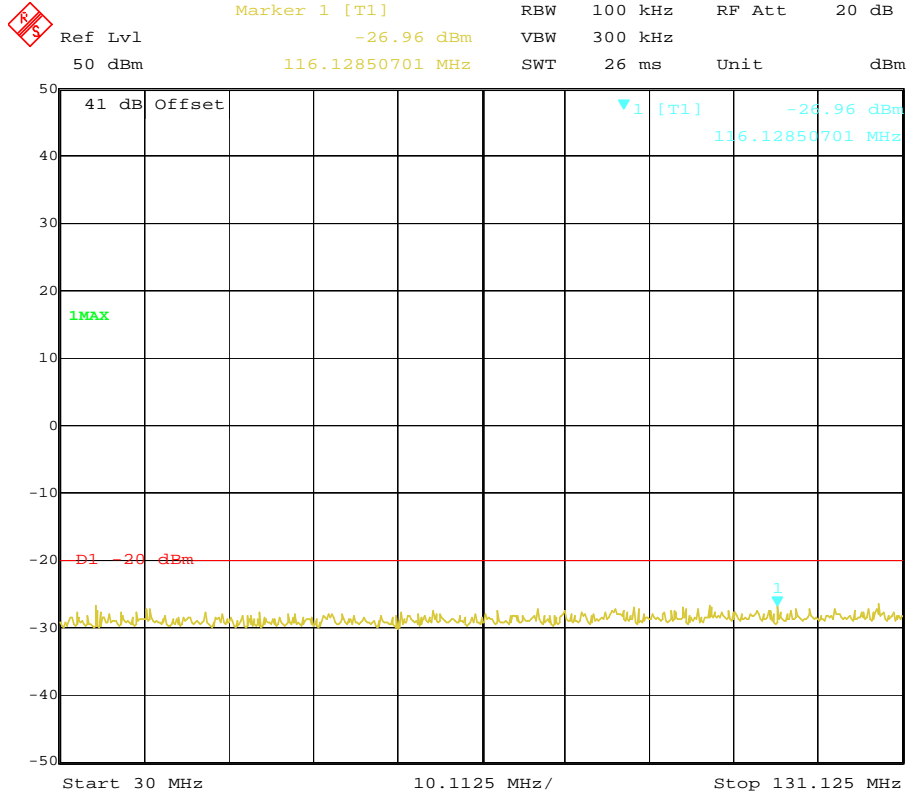
Date: 6.OCT.2010 09:49:54



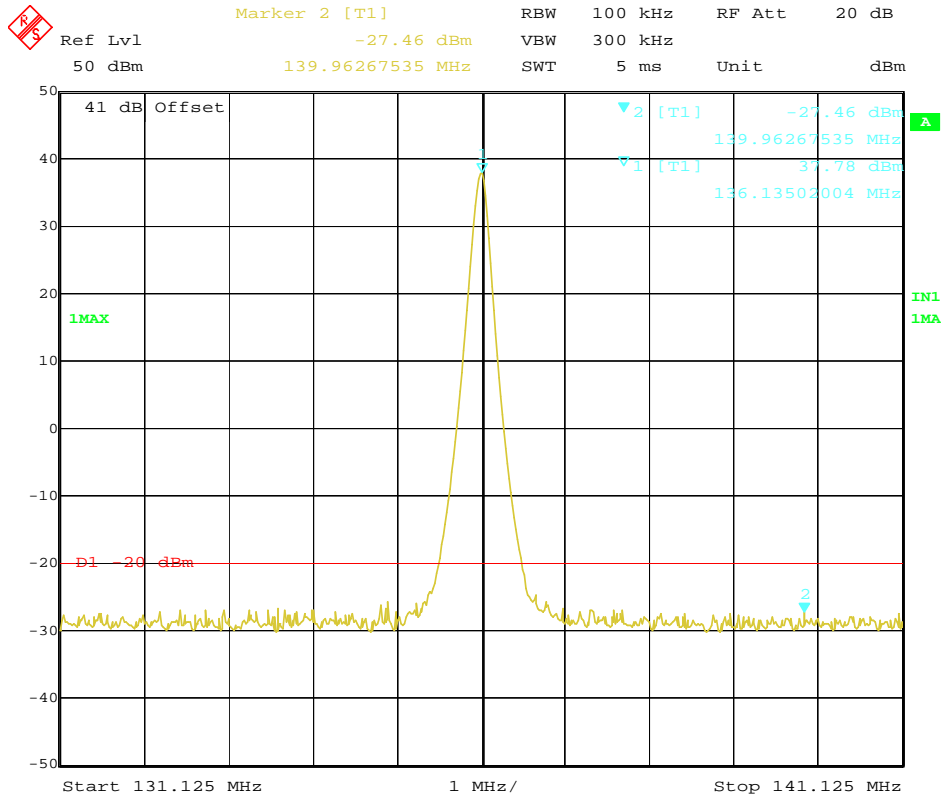
Date: 6.OCT.2010 09:50:38



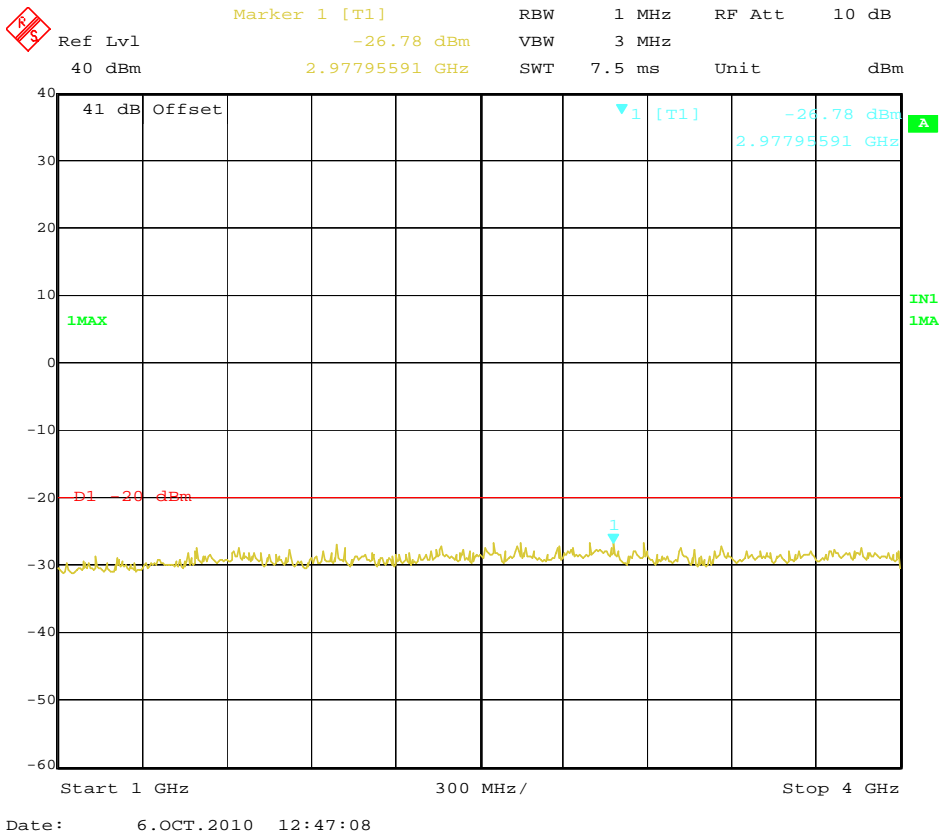
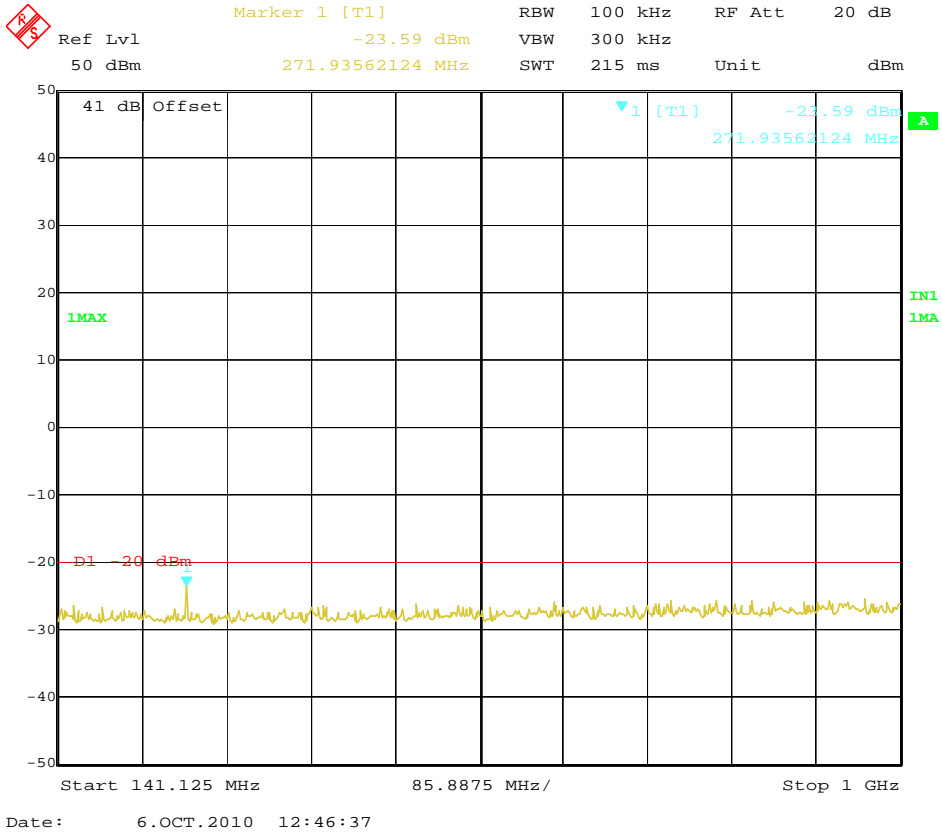
Modulation Type	Channel Separation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
4FSK	12.5KHz	Low	136.1250	271.93	-23.59	2977.96	-26.78	-20dBm
Test Results				Compliance				



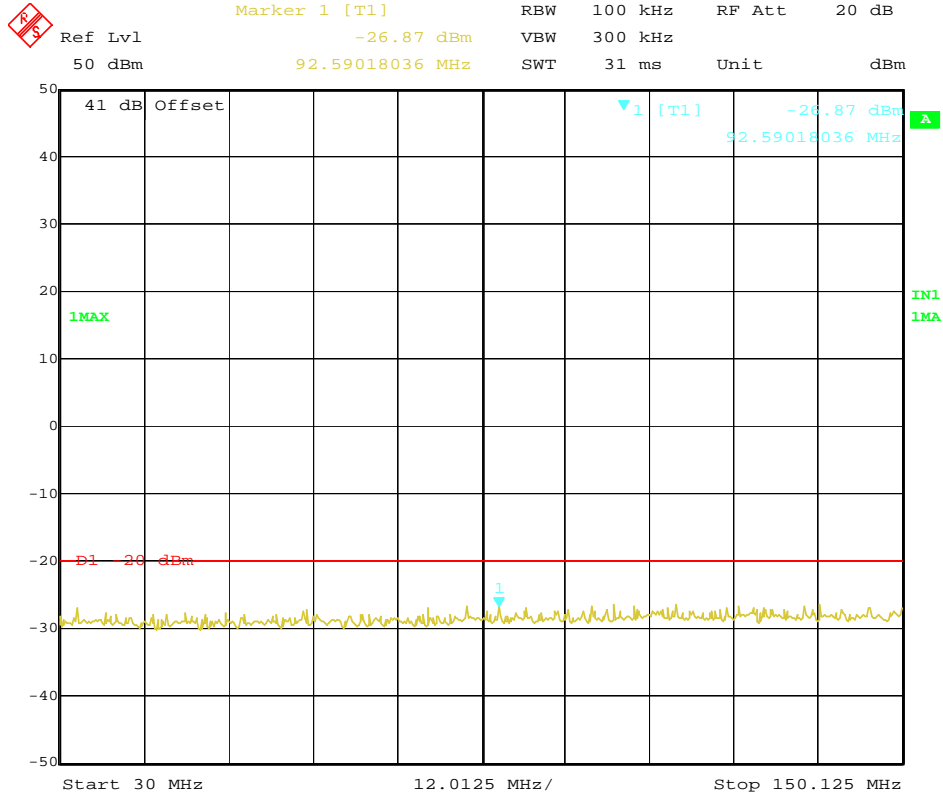
Date: 6.OCT.2010 12:45:41



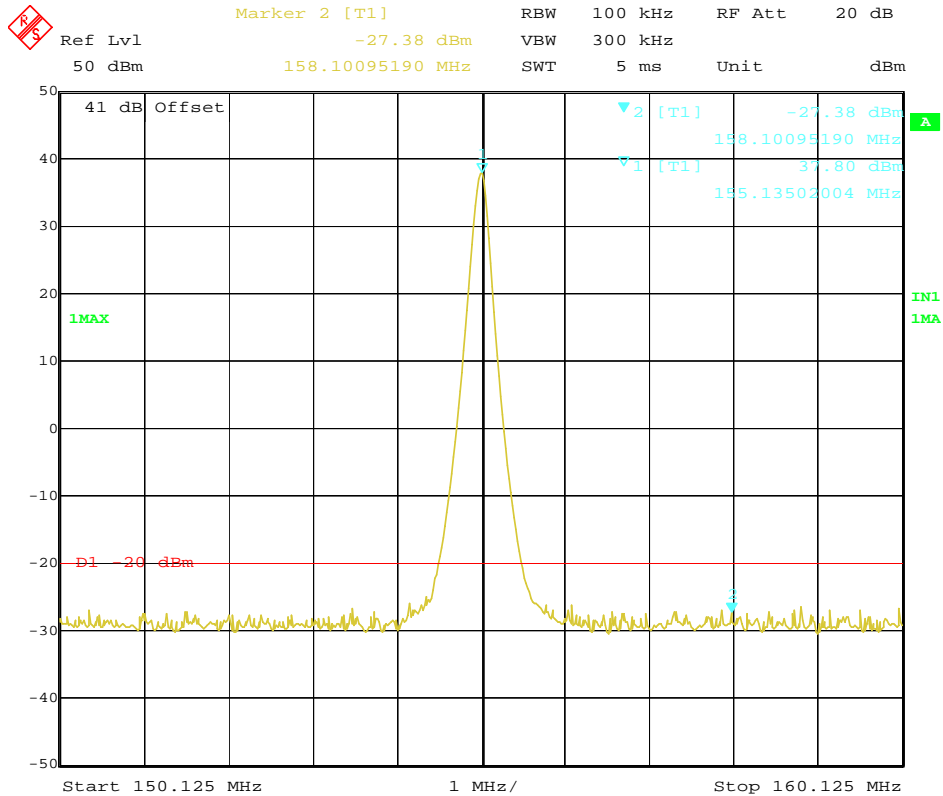
Date: 6.OCT.2010 12:46:11



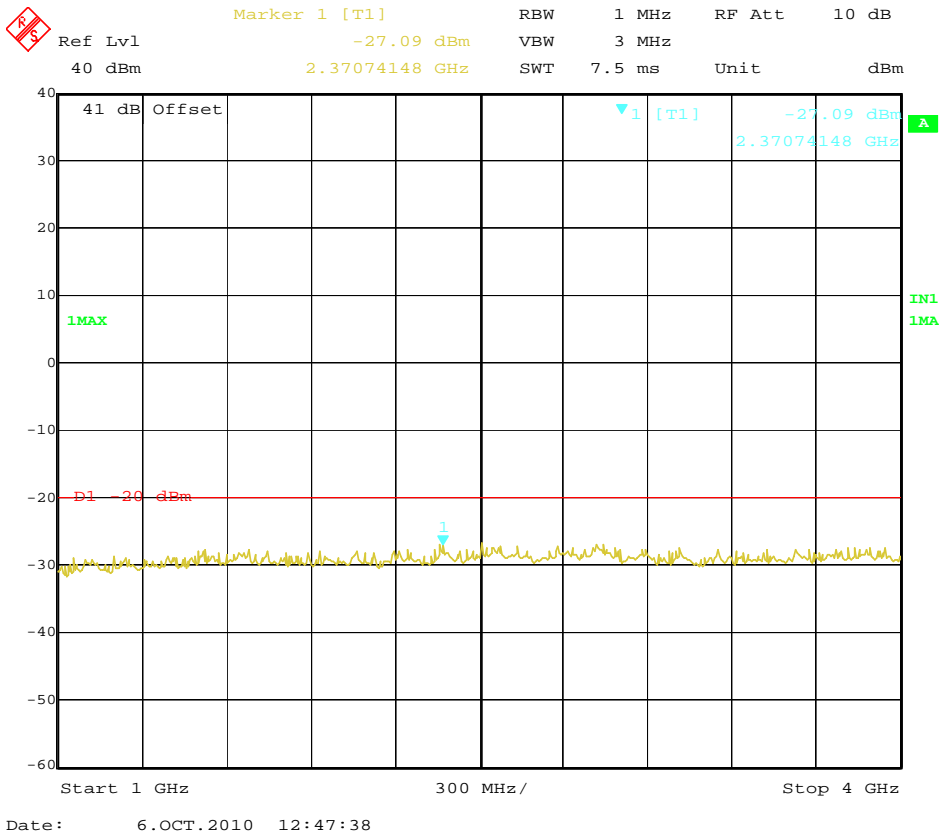
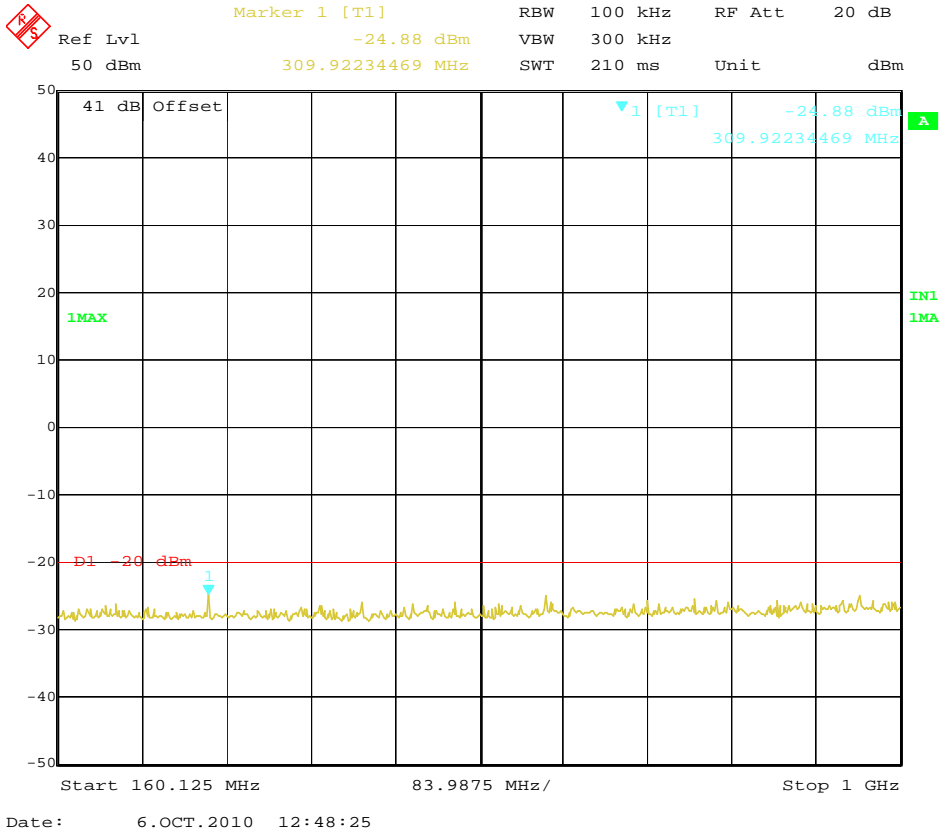
Modulation Type	Channel SpARATION	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
4FSK	12.5KHz	Middle	155.1250	309.92	-24.88	2370.74	-27.09	-20dBm
Test Results				Compliance				



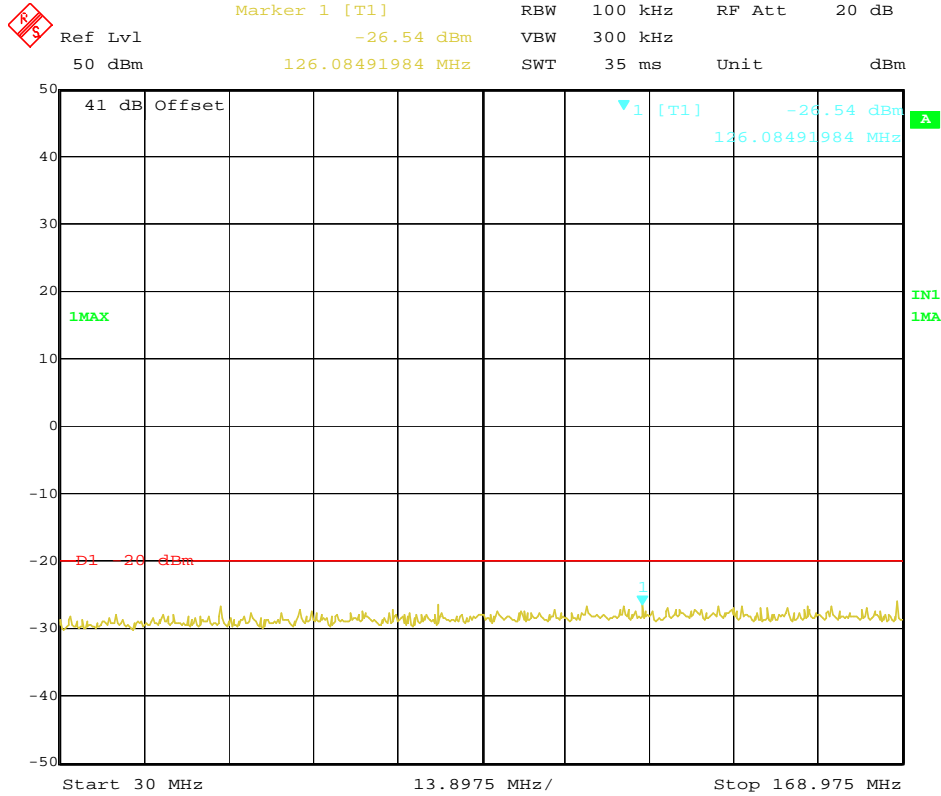
Date: 6.OCT.2010 12:49:26



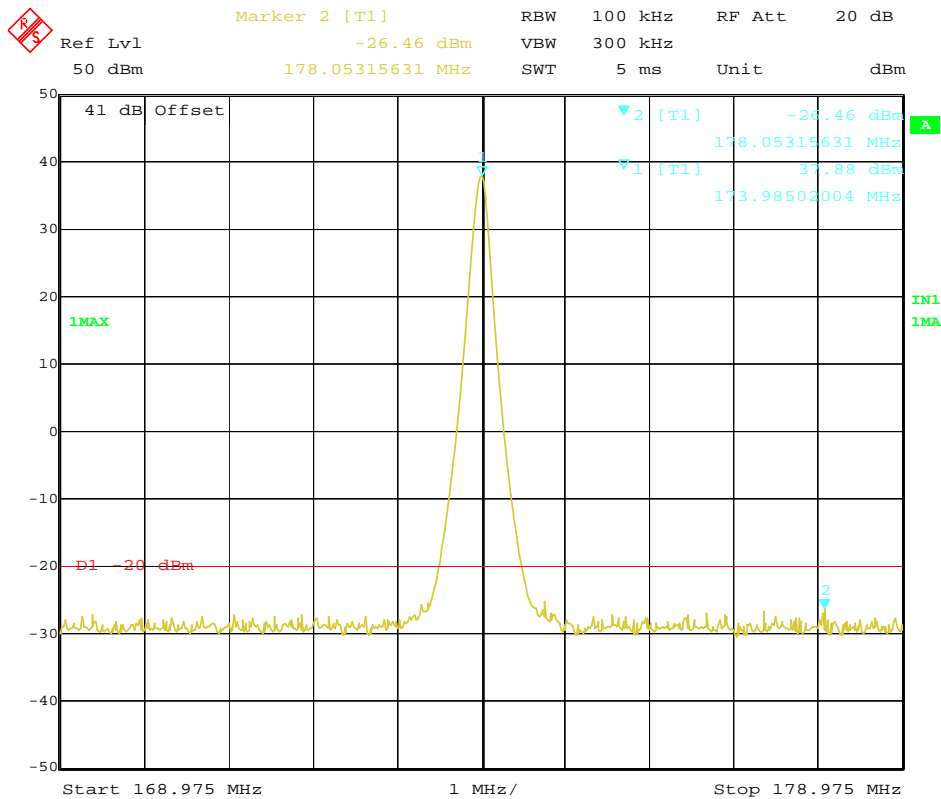
Date: 6.OCT.2010 12:49:02



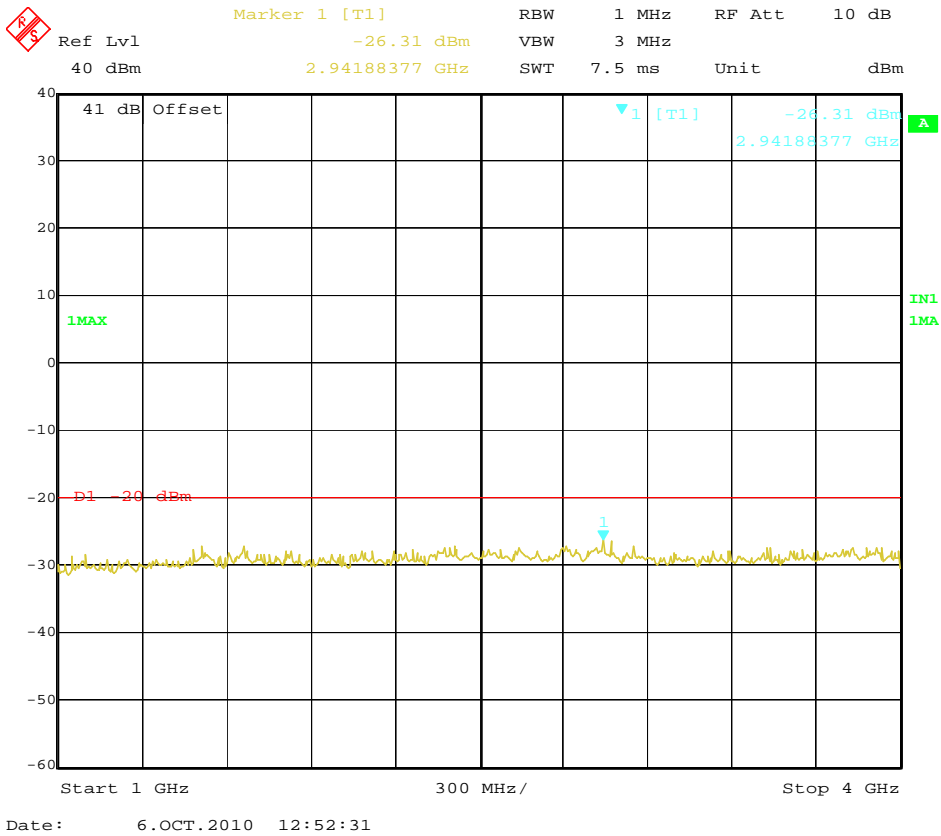
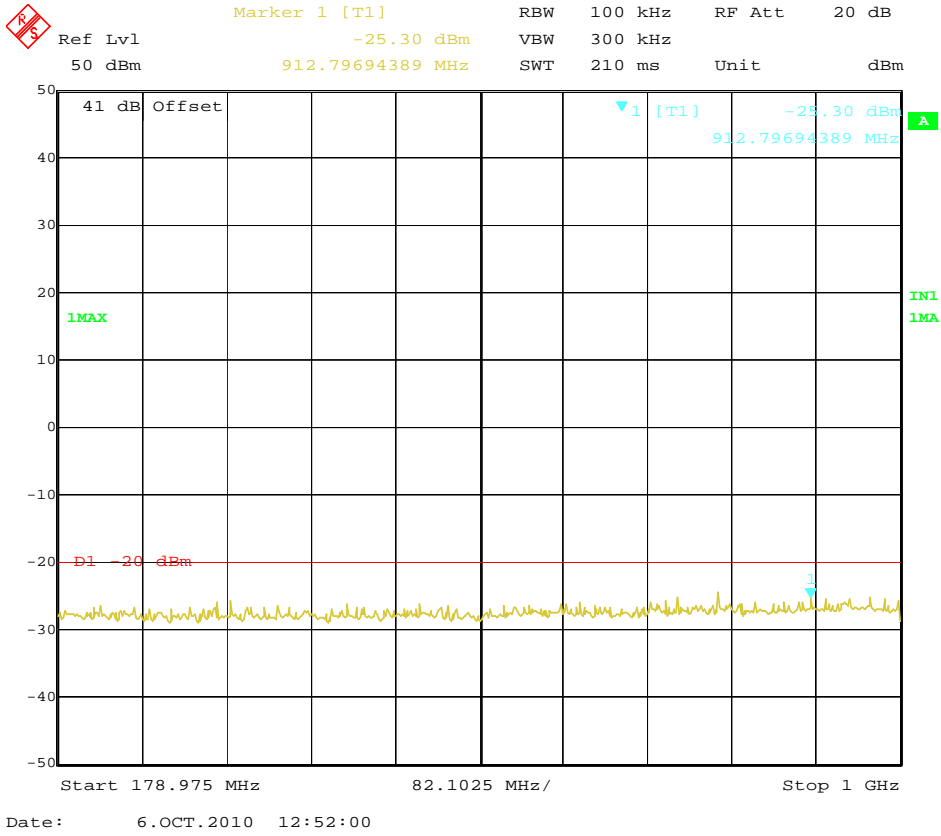
Modulation Type	Channel Separation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
4FSK	12.5KHz	High	173.9750	912.80	-25.30	2941.88	-26.31	-20dBm
Test Results				Compliance				



Date: 6.OCT.2010 12:51:06



Date: 6.OCT.2010 12:51:32



4.5. Modulation Characteristics

TEST APPLICABLE

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

TEST PROCEDURE

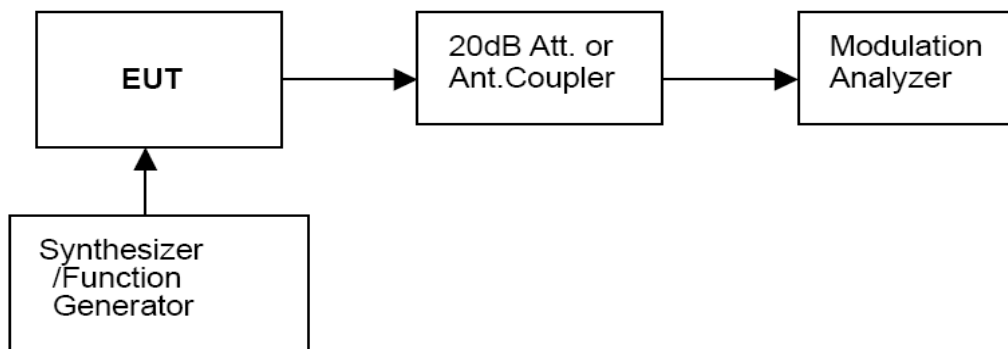
Modulation Limit

- 1 Configure the EUT as shown in figure 1, adjust the audio input for 60% of rated system deviation at 1 KHz using this level as a reference (0dB) and vary the input level from -20 to +20dB. Record the frequency deviation obtained as a function of the input level.
- 2 Repeat step 1 with input frequency changing to 300, 1004, 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 10 KHz and record the frequency deviation.
- 4 Audio Frequency Response = $20 \log_{10} (\text{Deviation of test frequency} / \text{Deviation of 1 KHz reference})$.

TEST CONFIGURATION

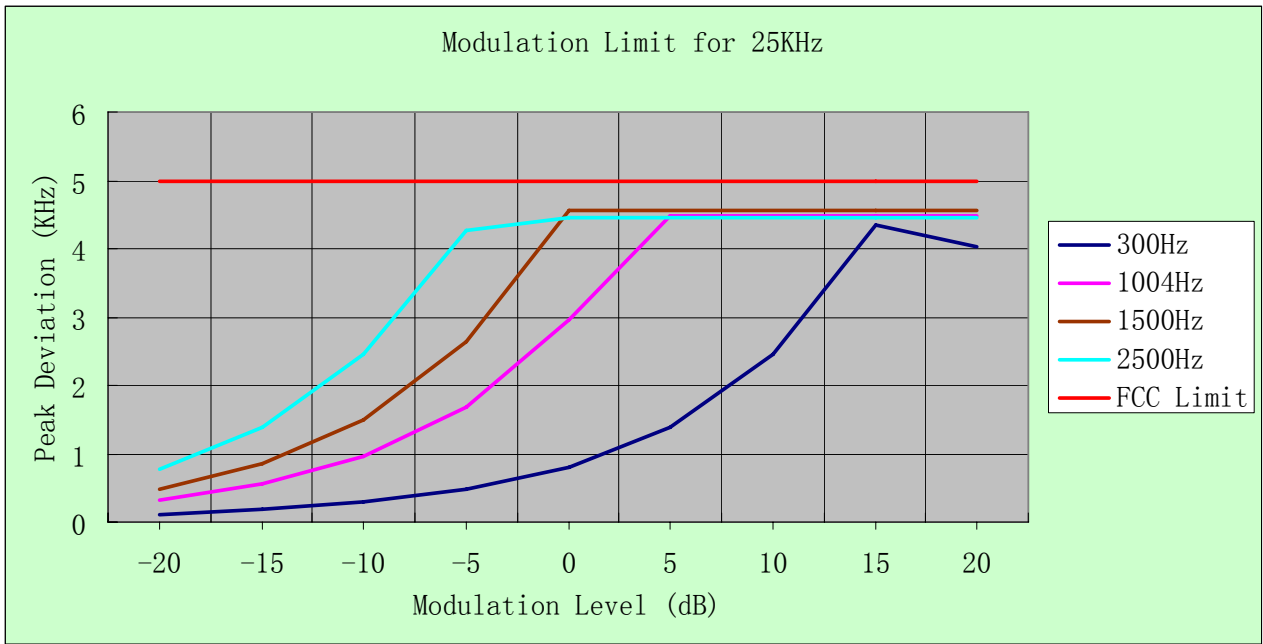


TEST RESULTS

Modulation Type: FM

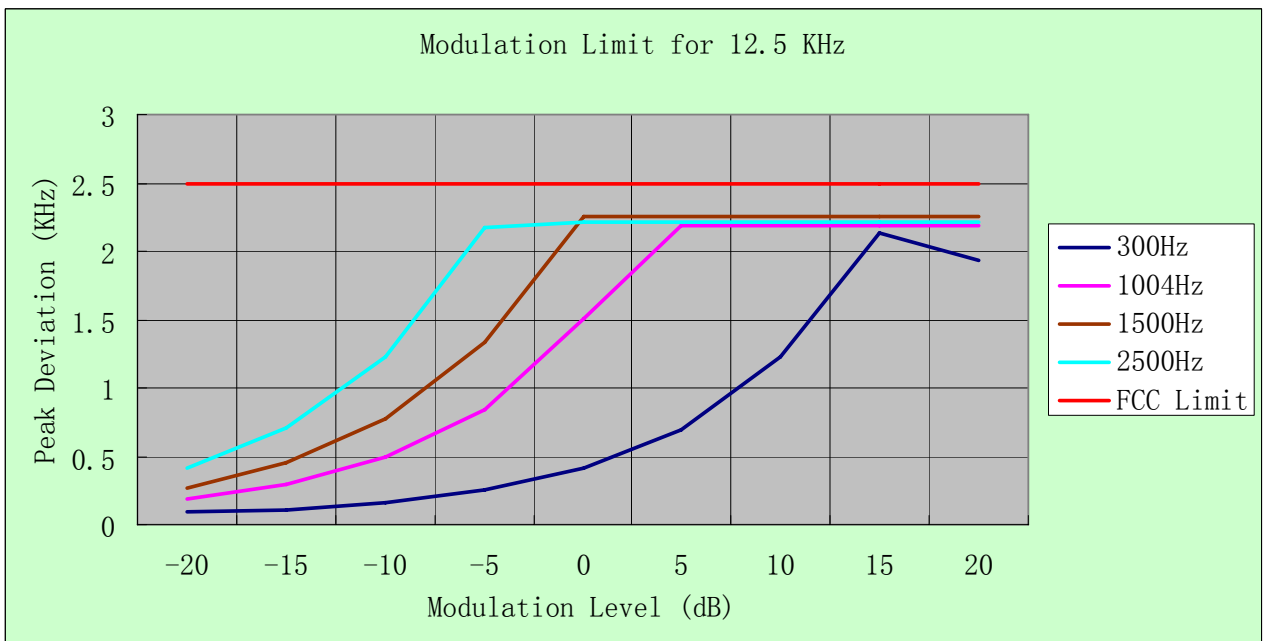
25 KHz Channel Separation

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	0.12	0.32	0.48	0.78
-15	0.18	0.56	0.85	1.40
-10	0.28	0.96	1.50	2.45
-5	0.48	1.69	2.65	4.28
0	0.79	2.95	4.57	4.44
+5	1.40	4.47	4.57	4.44
+10	2.46	4.47	4.57	4.44
+15	4.35	4.47	4.57	4.44
+20	4.04	4.47	4.57	4.44



12.5 KHz Channel Separation

Modulation Level(dB)	Peak Freq. Deviation At 300 Hz(KHz)	Peak Freq. Deviation At 1004 H(KHz)	Peak Freq. Deviation At 1500 Hz(KHz)	Peak Freq. Deviation At 2500 Hz(KHz)
-20	0.09	0.19	0.27	0.42
-15	0.11	0.30	0.45	0.71
-10	0.16	0.49	0.77	1.23
-5	0.25	0.84	1.33	2.17
0	0.41	1.51	2.26	2.21
+5	0.70	2.19	2.26	2.21
+10	1.23	2.19	2.26	2.21
+15	2.14	2.19	2.26	2.21
+20	1.94	2.19	2.26	2.21



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

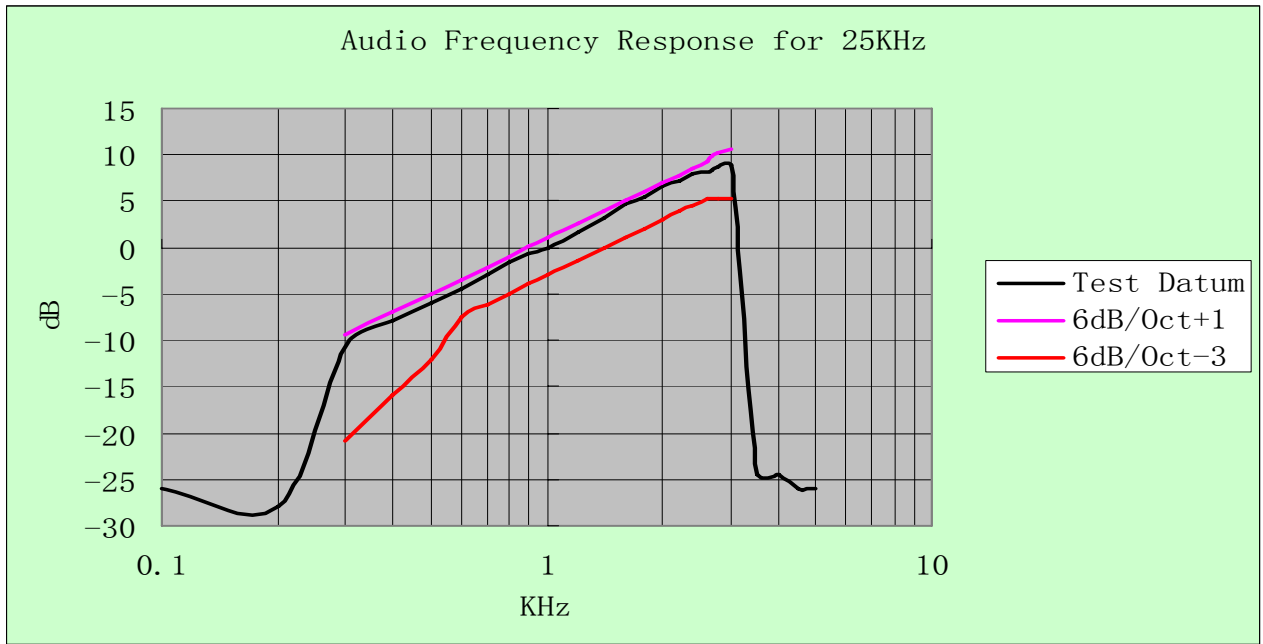
Test Audio Level (1 KHz and 20% maximum deviation) for 25 KHz channel separation is 28mv and19mv for 12.5 KHz channel separation.

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

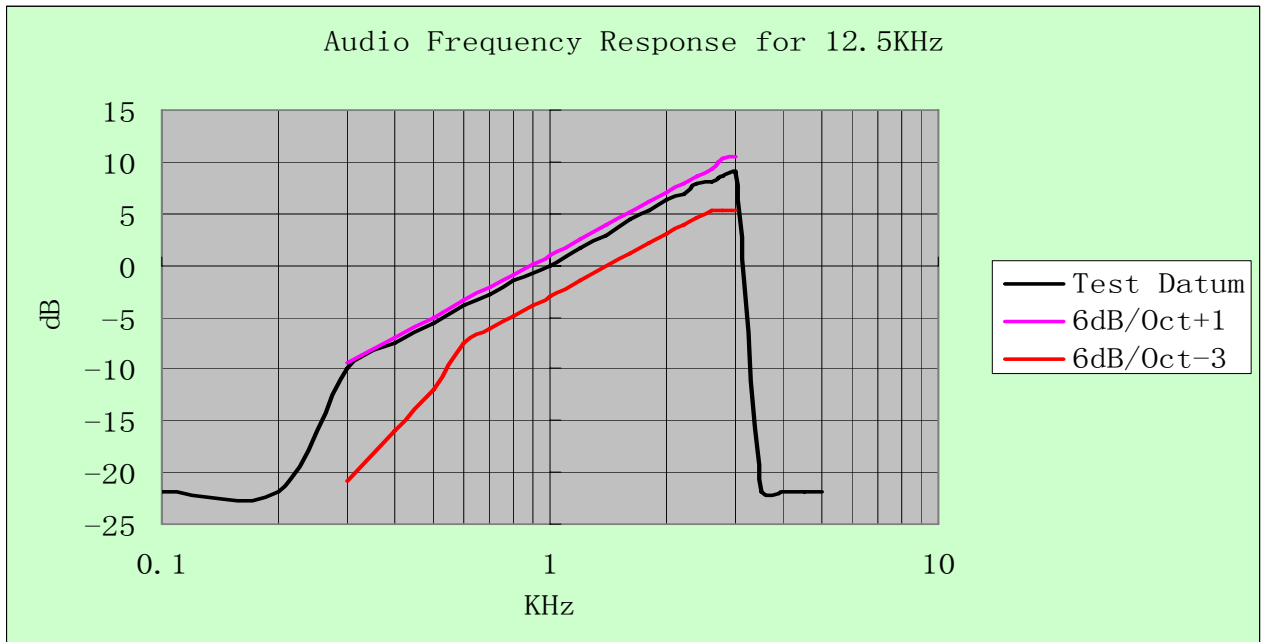
For 25 KHz

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	0.29	1.00	-10.75
0.4	0.40	1.00	-7.96
0.5	0.50	1.00	-6.02
0.6	0.60	1.00	-4.44
0.7	0.71	1.00	-2.97
0.8	0.83	1.00	-1.62
0.9	0.93	1.00	-0.63
1.0	1.00	1.00	0.00
1.2	1.22	1.00	1.73
1.4	1.43	1.00	3.11
1.6	1.71	1.00	4.66
1.8	1.86	1.00	5.39
2.0	2.12	1.00	6.53
2.2	2.28	1.00	7.16
2.4	2.52	1.00	8.03
2.6	2.56	1.00	8.16
2.7	2.63	1.00	8.40
2.8	2.72	1.00	8.69
3.0	2.76	1.00	8.82
3.5	0.06	1.00	-24.44
4.0	0.06	1.00	-24.44
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 Reference Deviation (KHz)	Audio Frequency Response (dB)
0.1	0.04	0.50	-21.94
0.2	0.04	0.50	-21.94
0.3	0.16	0.50	-9.90
0.4	0.21	0.50	-7.54
0.5	0.26	0.50	-5.68
0.6	0.32	0.50	-3.88
0.7	0.36	0.50	-2.85
0.8	0.42	0.50	-1.51
0.9	0.46	0.50	-0.72
1.0	0.50	0.50	0.00
1.2	0.61	0.50	1.73
1.4	0.70	0.50	2.92
1.6	0.84	0.50	4.51
1.8	0.92	0.50	5.30
2.0	1.04	0.50	6.36
2.2	1.11	0.50	6.93
2.4	1.24	0.50	7.89
2.6	1.27	0.50	8.10
2.7	1.31	0.50	8.37
2.8	1.35	0.50	8.63
3.0	1.40	0.50	8.94
3.5	0.04	0.50	-21.94
4.0	0.04	0.50	-21.94
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

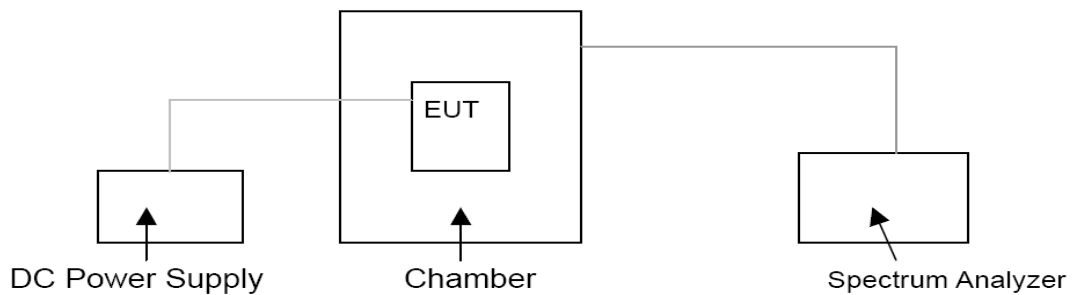
TEST APPLICABLE

- 1 According to FCC Part 2 Section 2.1055 (a)(1), the frequency stability shall be measured with variation of ambient temperature from -30°C to +60°C 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 2.5 ppm for 12.5KHz channel separation and 5 ppm for 25KHz channel separation.

TEST PROCEDURE

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

TEST CONFIGURATION



TEST LIMITS

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

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

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

TEST RESULTS

Modulation Type	Channel Separation	Test conditions		Frequency error (ppm)		
		Voltage(V)	Temp(°C)	Low Channel	Middle Channel	High Channel
Analog/FM	25KHz	13.60	-30	-1.54	-1.90	-1.72
			-20	-1.39	-1.61	-1.50
			-10	-1.25	-1.42	-1.33
			0	-1.13	-1.28	-1.17
			10	-1.13	-1.00	-0.95
			20	-0.88	-0.82	-0.72
			30	-0.59	-0.65	-0.58
			40	-0.59	-0.82	-0.78
			50	-1.17	-1.25	-1.13
		11.0 (85% Rated)	20	-0.59	-0.52	-0.69
		15.6 (115% Rated)	20	-0.74	-0.66	-0.69
Limit			5.0 ppm			
Conclusion			Complies			

Modulation Type	Channel Separation	Test conditions		Frequency error (ppm)		
		Voltage(V)	Temp(°C)	Low Channel	Middle Channel	High Channel
Analog/FM	12.5KHz	13.60	-30	-1.54	-1.93	-1.72
			-20	-1.35	-1.61	-1.55
			-10	-1.23	-1.42	-1.36
			0	-1.23	-1.23	-1.17
			10	-1.12	-0.99	-0.91
			20	-0.88	-0.82	-0.69
			30	-0.88	-0.66	-0.69
			40	-0.88	-0.66	-0.78
			50	-1.17	-1.25	-1.02
		11.0 (85% Rated)	20	-0.74	-0.52	-0.69
		15.6 (115% Rated)	20	-0.59	-0.66	-0.69
Limit			2.5 ppm			
Conclusion			Complies			

Modulation Type	Channel Separation	Test conditions		Frequency error (ppm)		
		Voltage(V)	Temp(°C)	Low Channel	Middle Channel	High Channel
Digital/4FSK	12.5KHz	13.60	-30	-1.51	-1.93	-1.70
			-20	-1.30	-1.56	-1.55
			-10	-1.21	-1.42	-1.39
			0	-1.11	-1.20	-1.21
			10	-1.11	-0.99	-1.00
			20	-1.00	-0.66	-0.82
			30	-0.88	-0.66	-0.69
			40	-0.88	-0.66	-0.85
			50	-1.17	-1.25	-1.02
		11.0 (85% Rated)	20	-0.74	-0.66	-0.69
		15.6 (115% Rated)	20	-0.74	-0.66	-0.69
Limit			2.5 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

EUT		Attenuator		Spectrum Analyzer/Receiver
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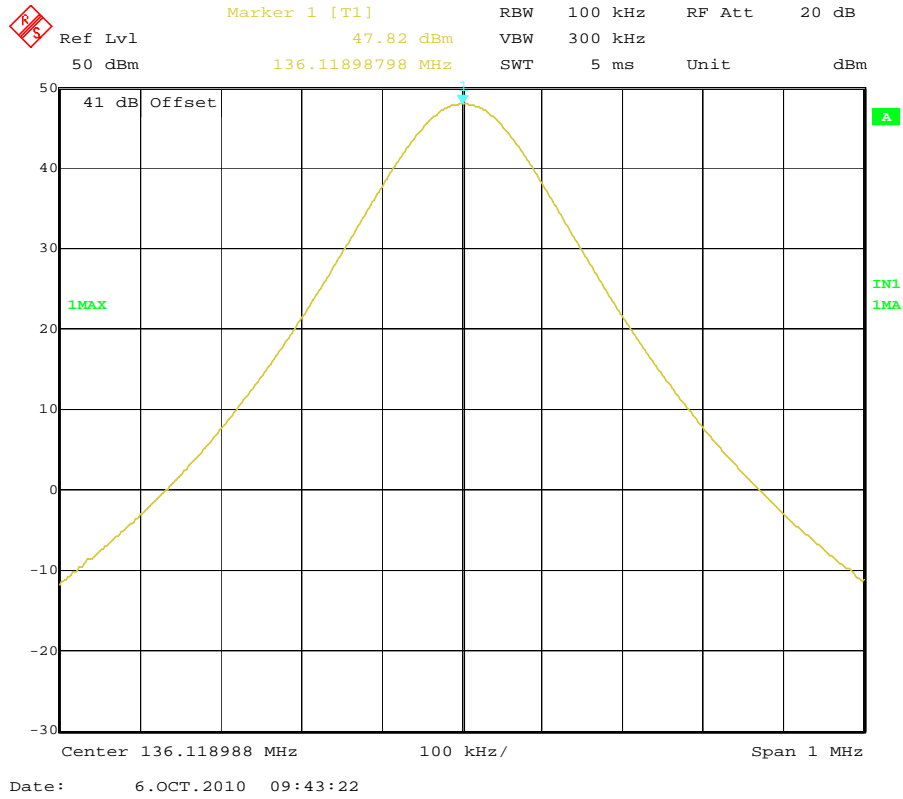
The EUT was directly connected to a RF Communication Test set by a 40 dB attenuator

TEST RESULTS

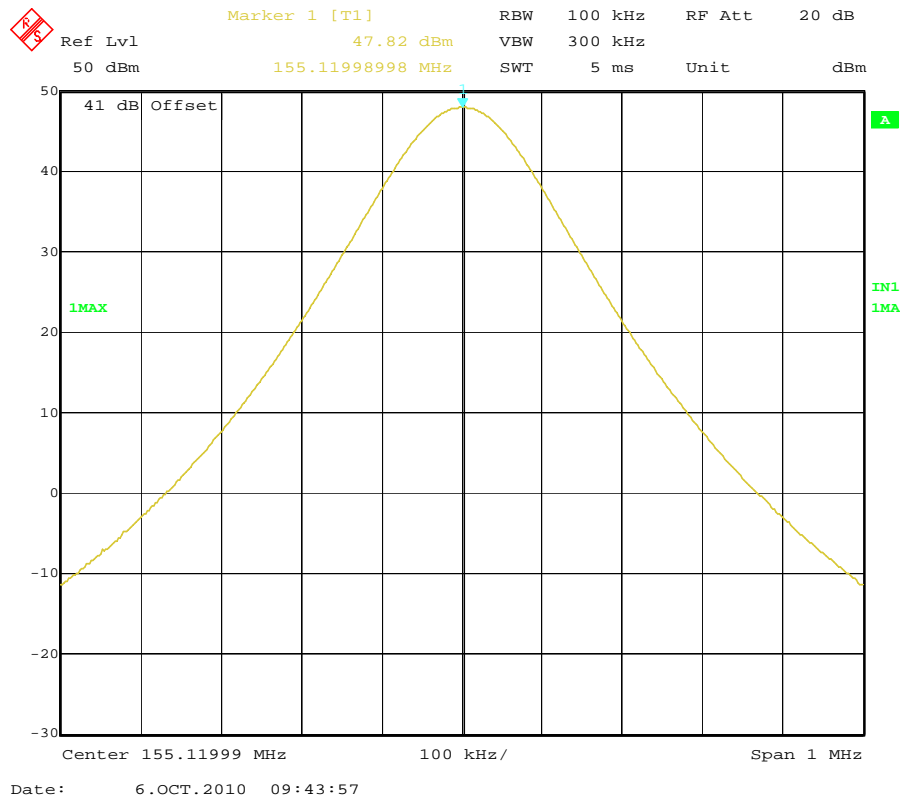
Modulation Type	Channel Separation	Test Channel	Test Frequency	Maximum Transmitter Power at Rated High Power Level(dBm)	Maximum Transmitter Power at Rated Low Power Level(dBm)
Analog/FM	25KHz	Low	136.1250 MHz	47.82	37.82
		Middle	155.1250 MHz	47.82	37.83
		High	173.9750 MHz	47.92	37.90
	12.5KHz	Low	136.1250 MHz	47.82	37.81
		Middle	155.1250 MHz	47.81	37.82
		High	173.9750 MHz	47.92	37.80
Digital/4FSK	12.5KHz	Low	136.1250 MHz	47.79	37.84
		Middle	155.1250 MHz	47.79	37.85
		High	173.9750 MHz	47.88	37.91
Limit	The limit is dependent upon the station’s antenna HAAT and required service area.				
Test Results	Complicance				

Plots of Maximum Transmitter Power Measurement

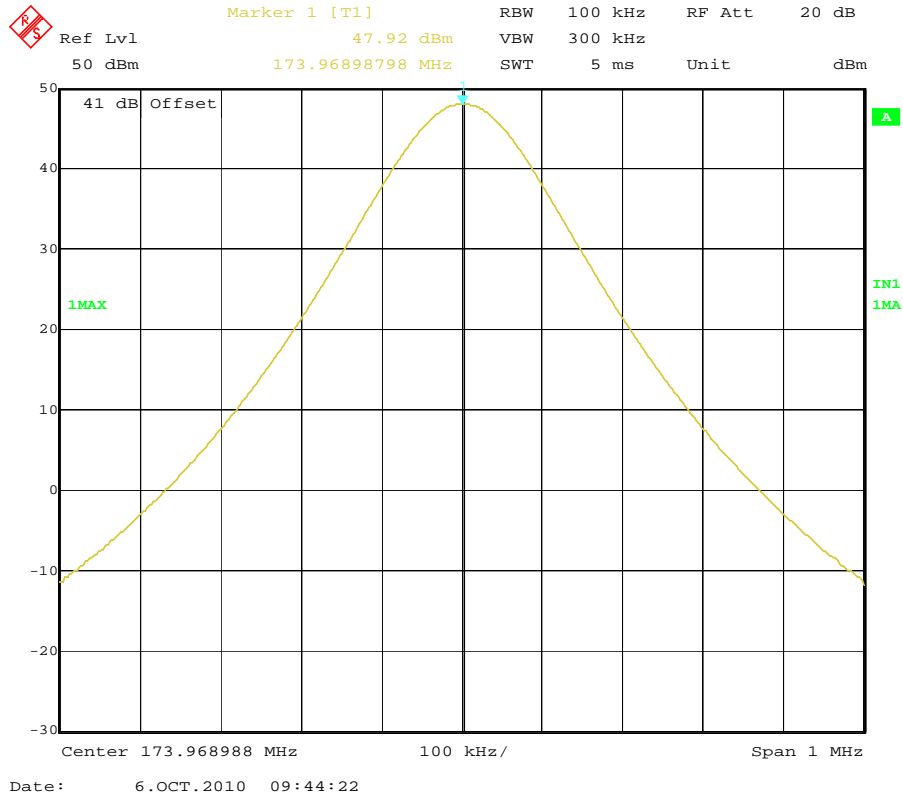
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	25 KHz	136.1250	50	47.82	Varies	Complicance



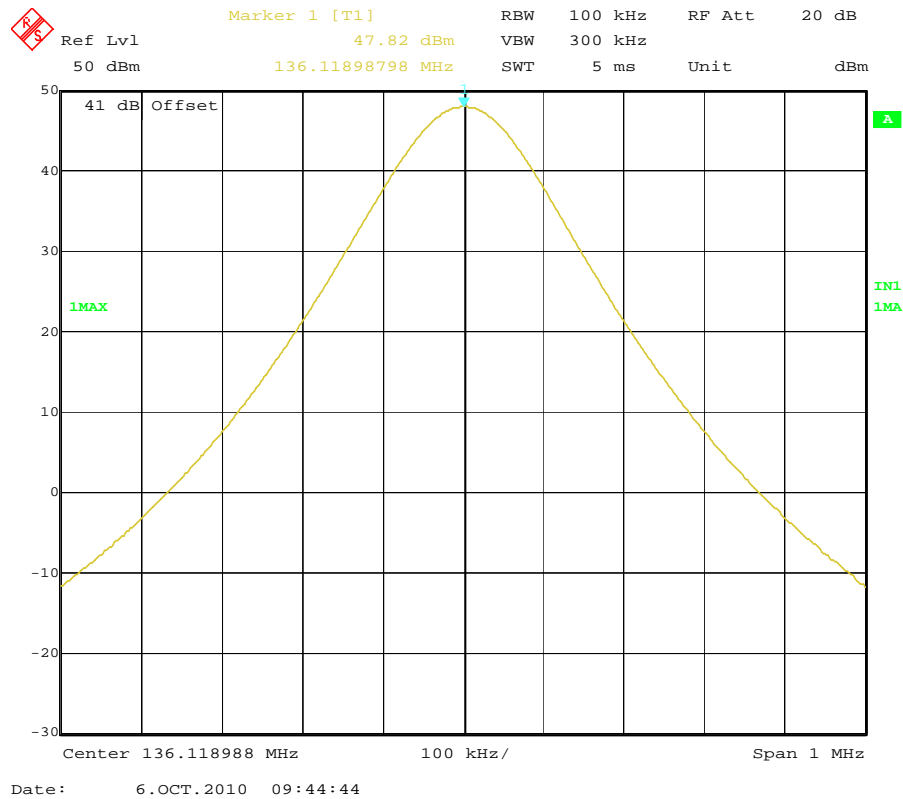
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	25 KHz	155.1250	50	47.82	Varies	Complicance



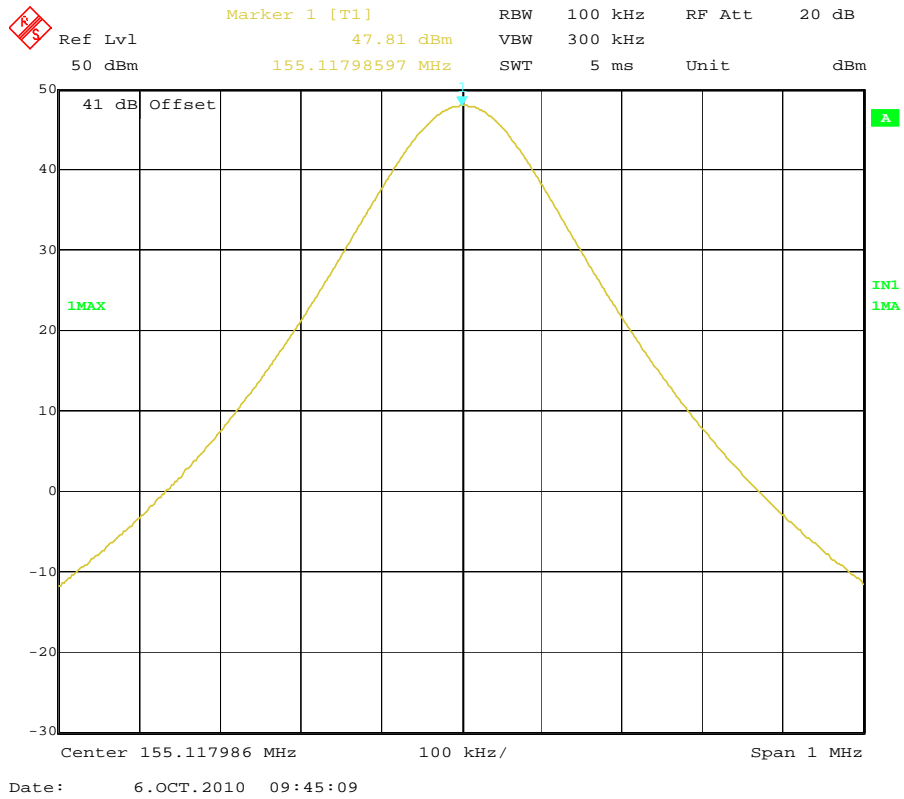
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	25 KHz	173.9750	50	47.92	Varies	Complicance



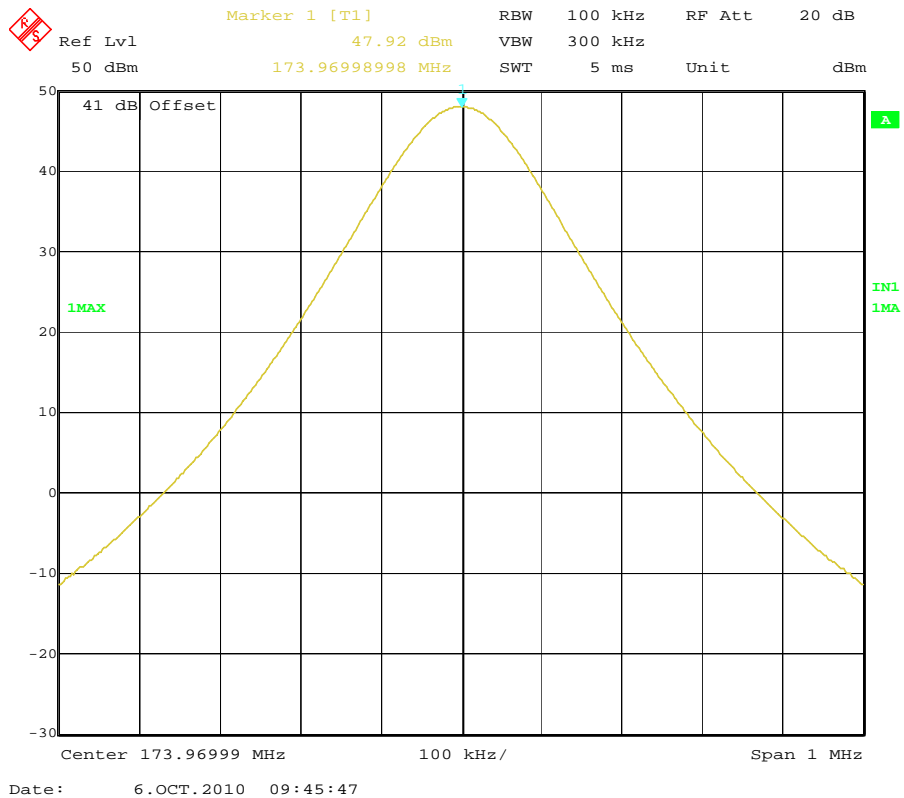
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	12.5 KHz	136.1250	50	47.82	Varies	Complicance



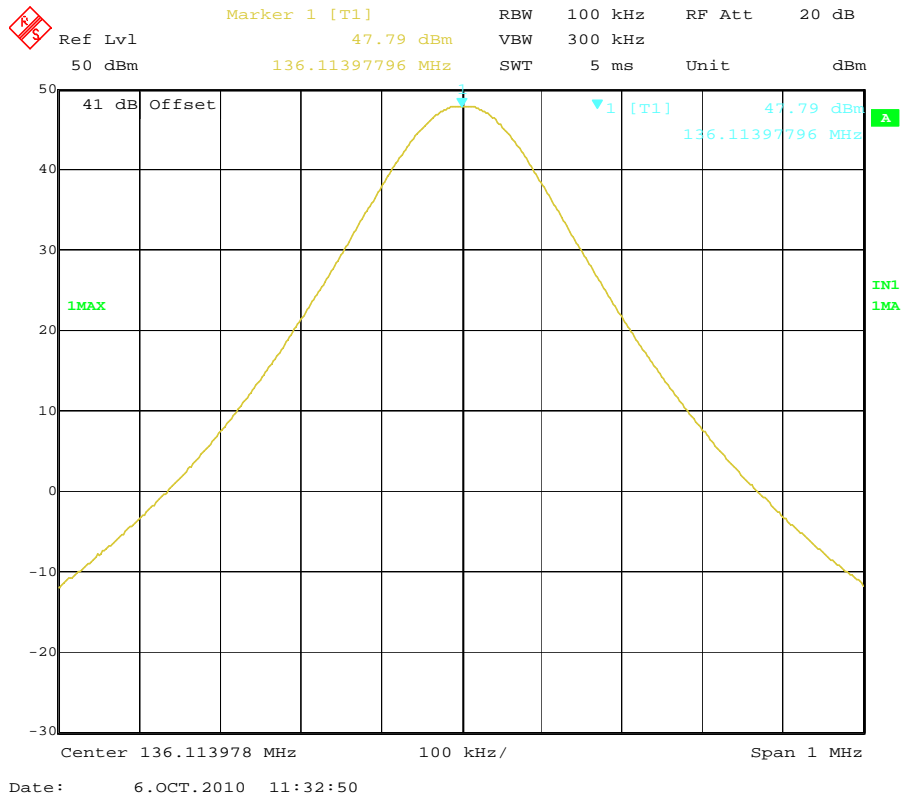
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	12.5 KHz	155.1250	50	47.81	Varies	Complicance



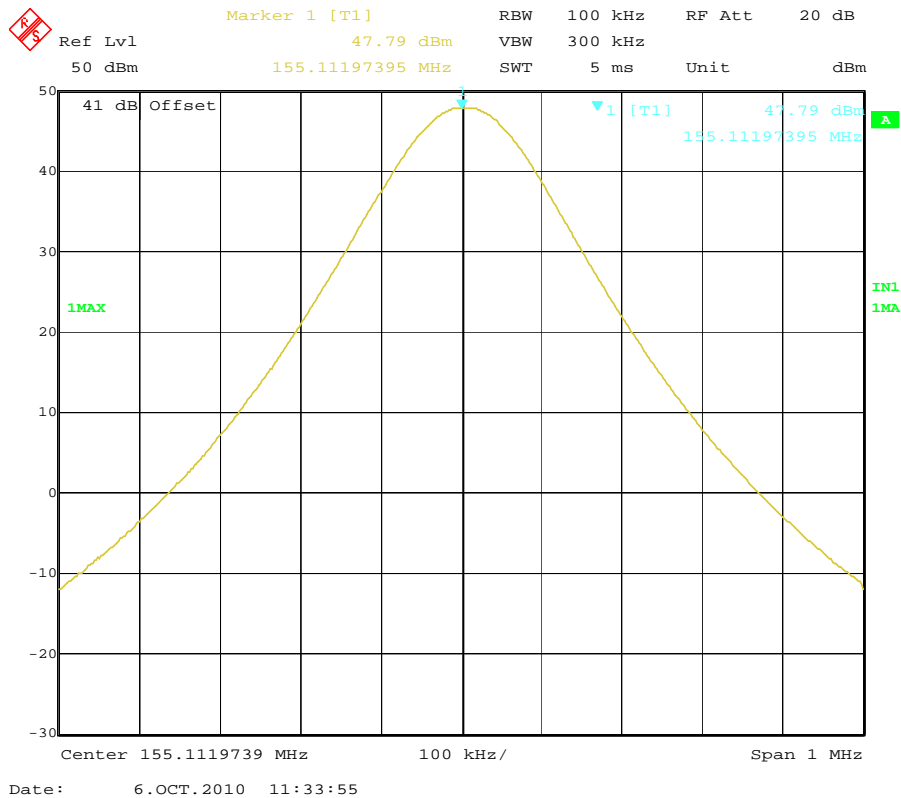
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	12.5 KHz	173.9750	50	47.92	Varies	Complicance



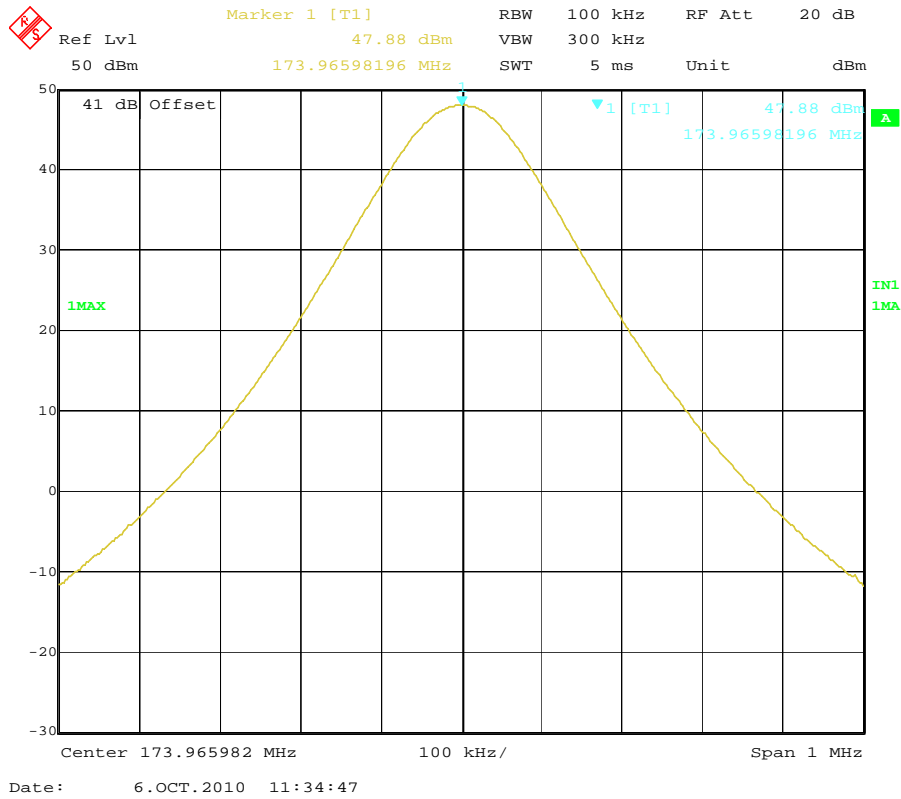
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
4FSK	12.5 KHz	136.1250	50	47.79	Varies	Complicance



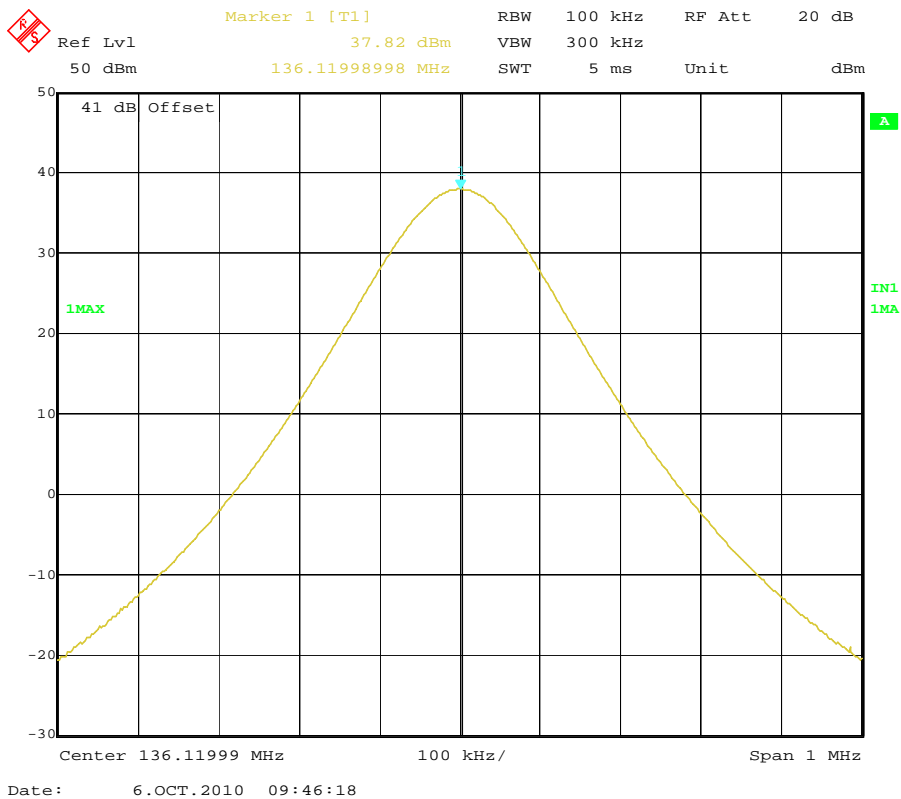
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
4FSK	12.5 KHz	155.1250	50	47.79	Varies	Complicance



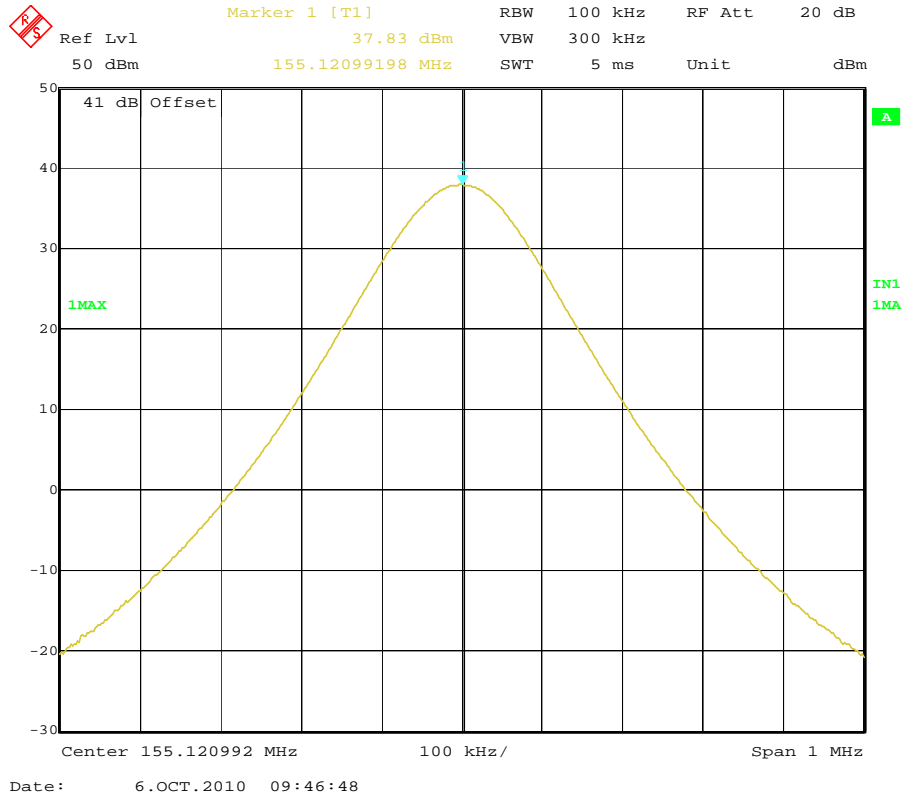
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
4FSK	12.5 KHz	173.9750	50	47.88	Varies	Complicance



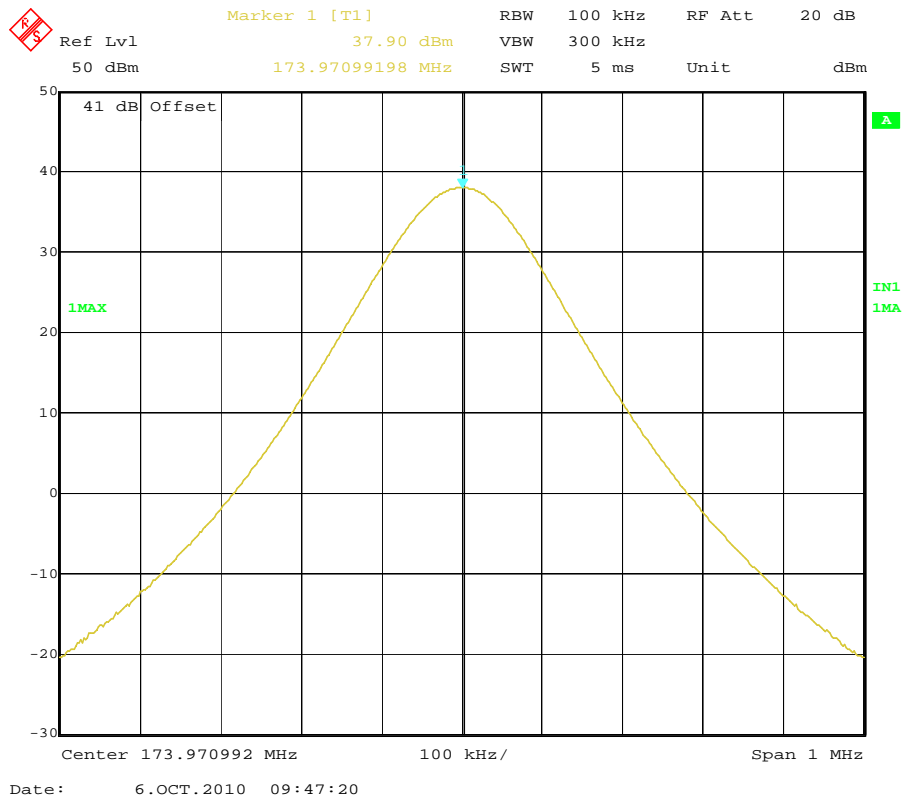
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	25 KHz	136.1250	5	37.82	Varies	Complicance



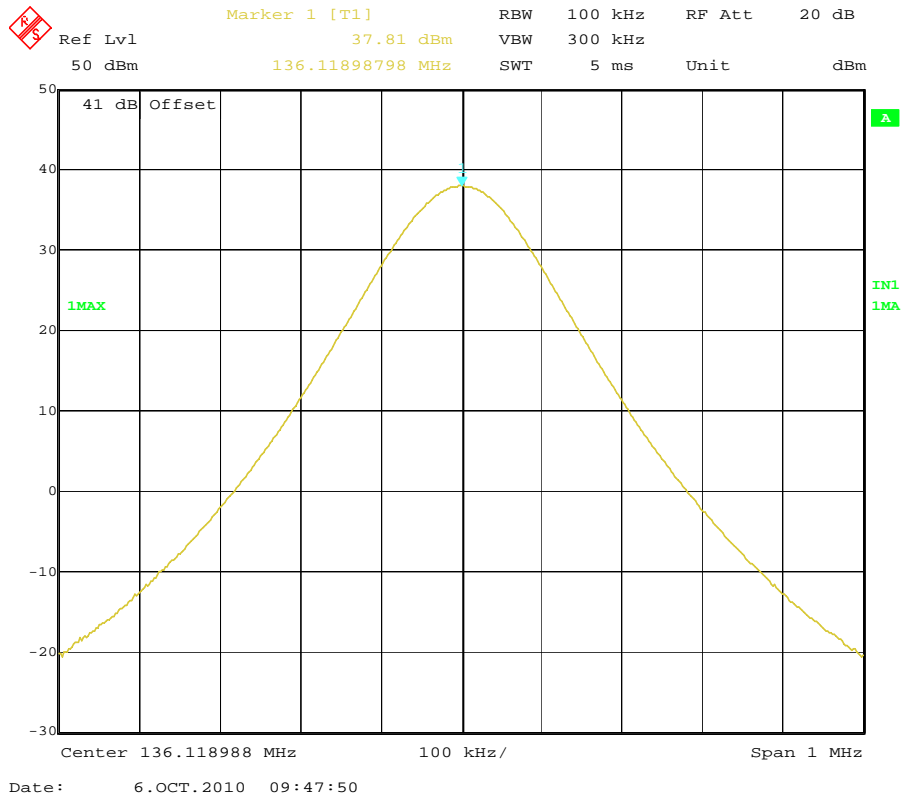
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	25 KHz	155.1250	5	37.83	Varies	Complicance



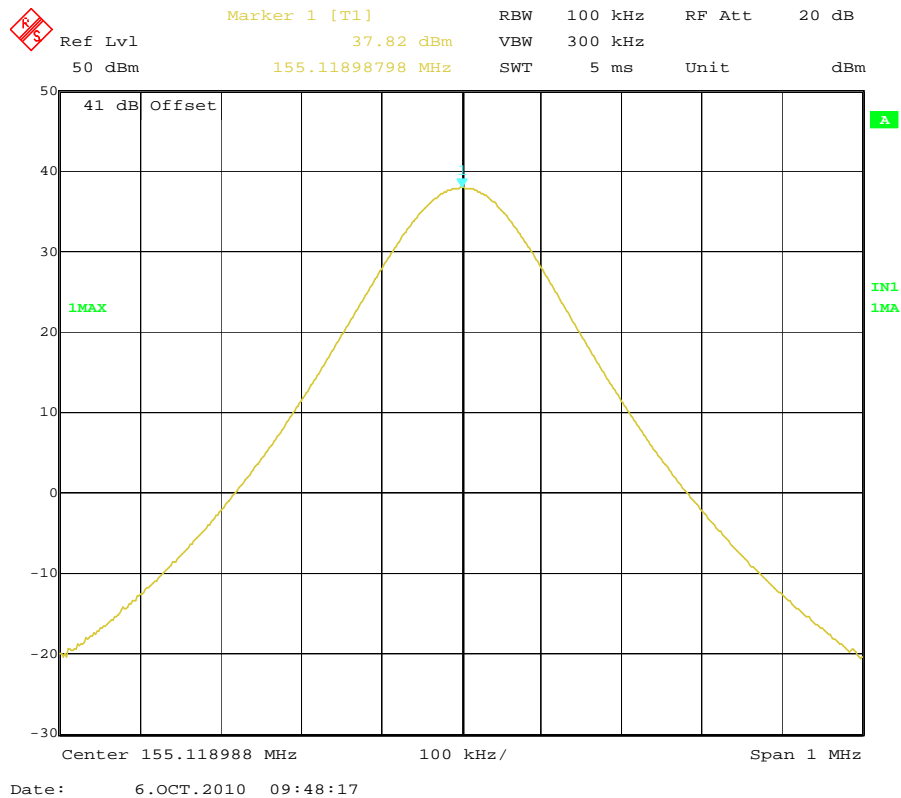
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	25 KHz	173.9750	5	37.90	Varies	Complicance



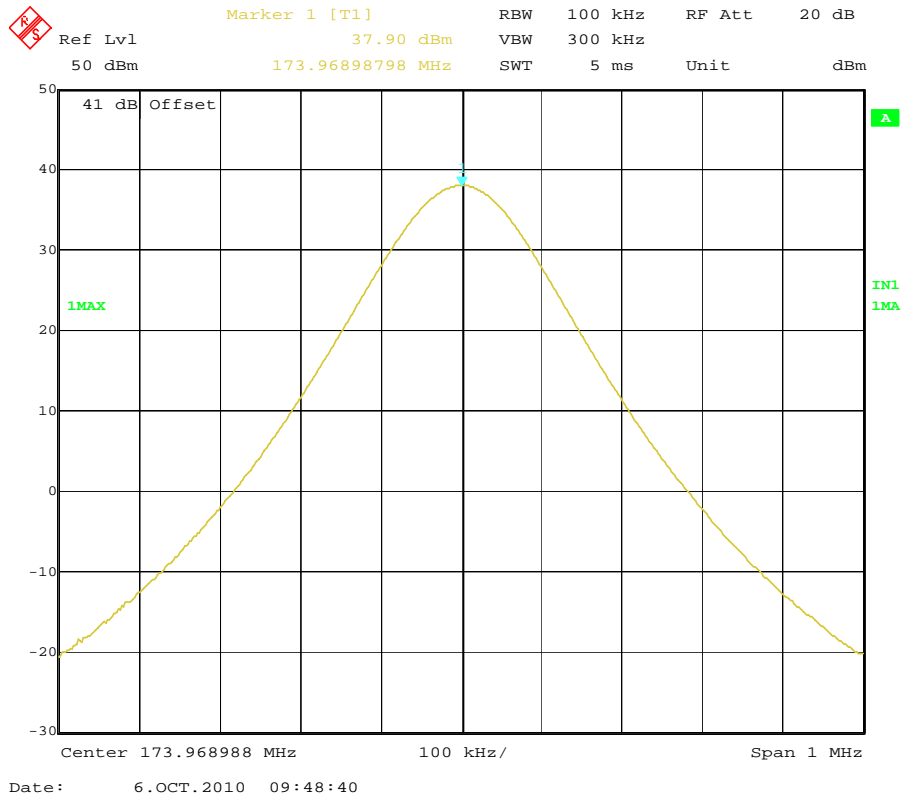
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	12.5 KHz	136.1250	5	37.81	Varies	Complicance



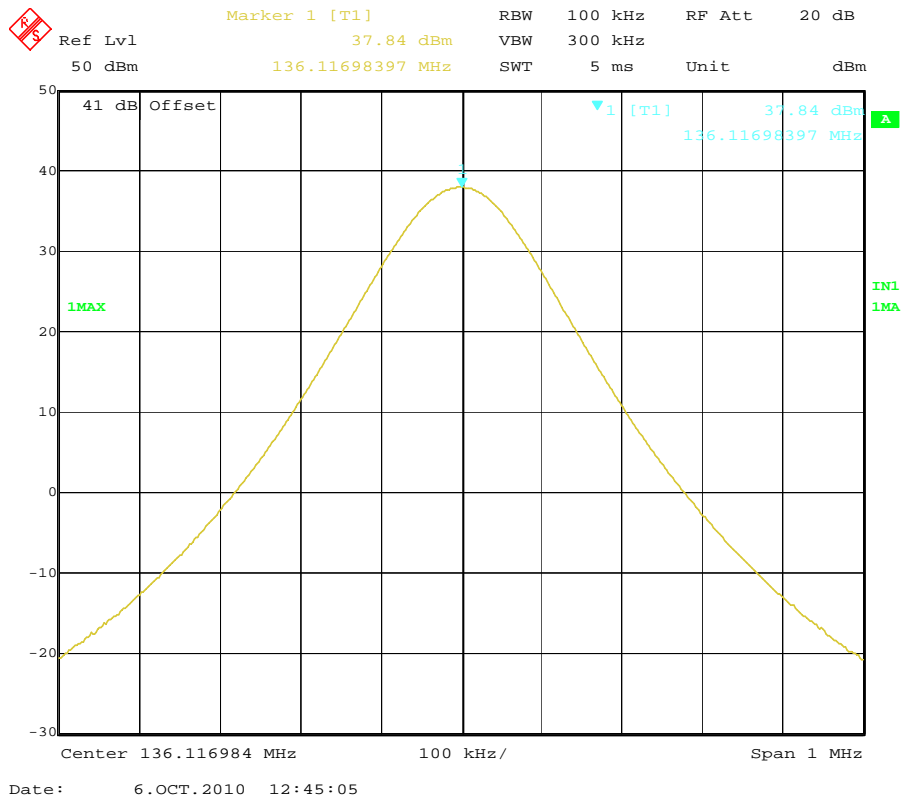
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	12.5 KHz	155.1250	5	37.82	Varies	Complicance



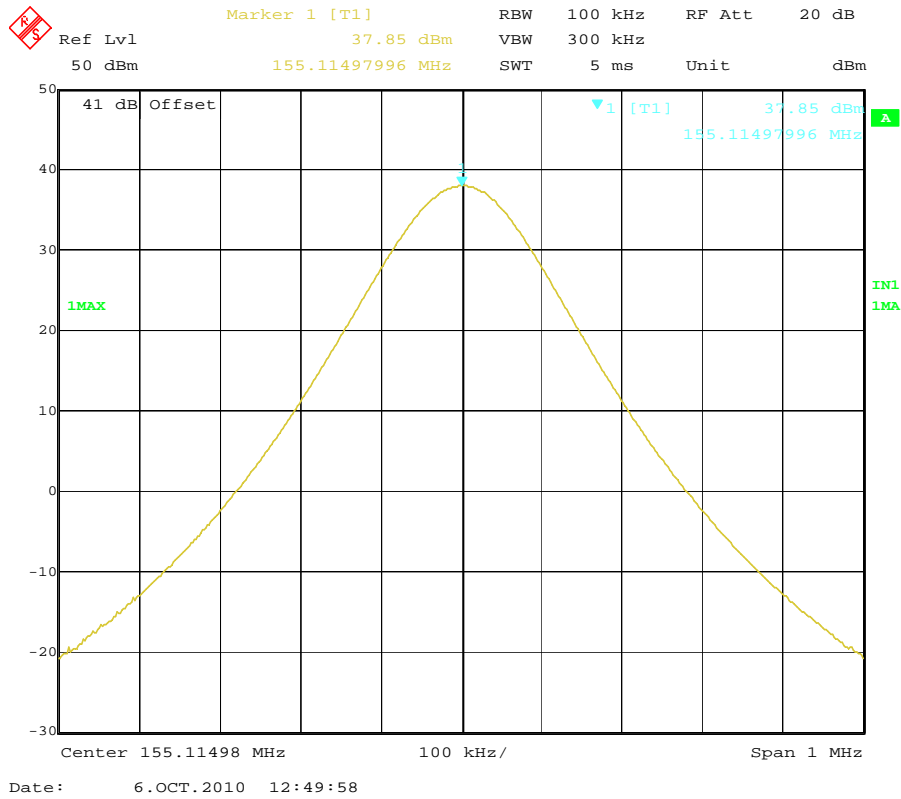
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
FM	12.5 KHz	173.9750	5	37.90	Varies	Complicance



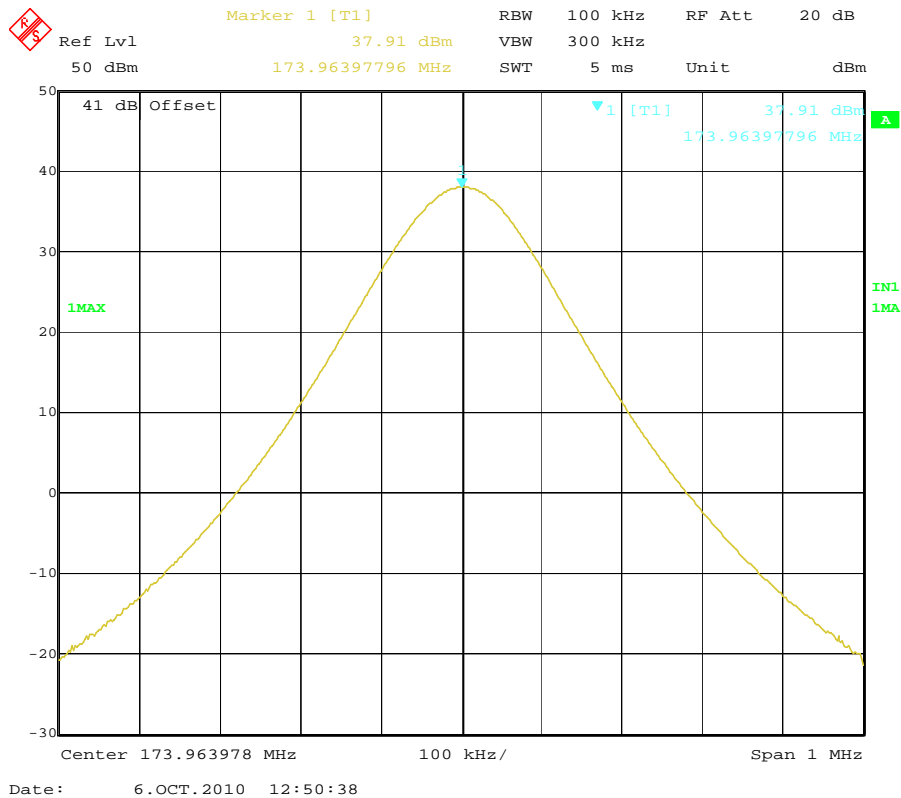
Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
4FSK	12.5 KHz	136.1250	5	37.84	Varies	Complicance



Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
4FSK	12.5 KHz	155.1250	5	37.85	Varies	Complicance



Modulation Type	Channel Separation	Freq.(MHz)	Rated Power (Watt)	Measurement (dBm)	FCC Limit	Results
4FSK	12.5 KHz	173.9750	5	37.91	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:

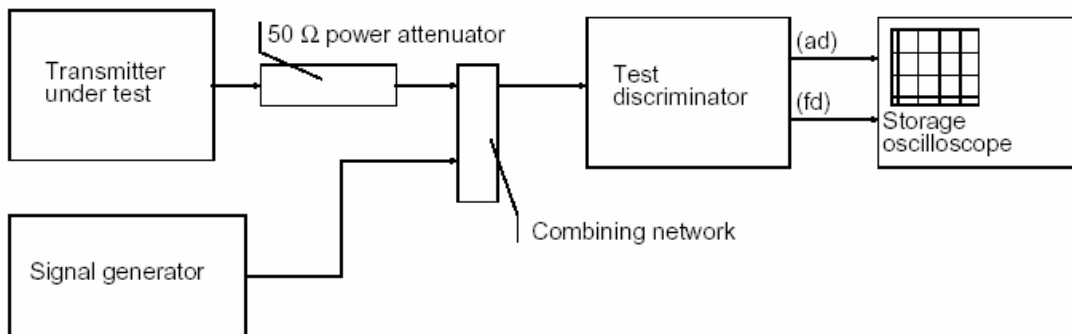
Time intervals ^{1, 2}	Maximum frequency difference ³	All equipment	
		150 to 174 MHz	421 to 512MHz
Transient Frequency Behavior for Equipment Designed to Operate on 25 KHz Channels			
t ₁ ⁴	± 25.0 KHz	5.0 ms	10.0 ms
t ₂ ⁴	± 12.5 KHz	20.0 ms	25.0 ms
t ₃ ⁴	± 25.0 KHz	5.0 ms	10.0 ms
Transient Frequency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

- t_{on} is the instant when a 1 KHz test signal is completely suppressed, including any capture time due to phasing.
t₁ is the time period immediately following t_{on}.
t₂ is the time period immediately following t₁.
t₃ is the time period from the instant when the transmitter is turned off until t_{off}.
t_{off} is the instant when the 1 KHz test signal starts to rise.
- During the time from the end of t₂ to the beginning of t₃, the frequency difference must not exceed the limits specified in § 90.213.
- Difference between the actual transmitter frequency and the assigned transmitter frequency.
- 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

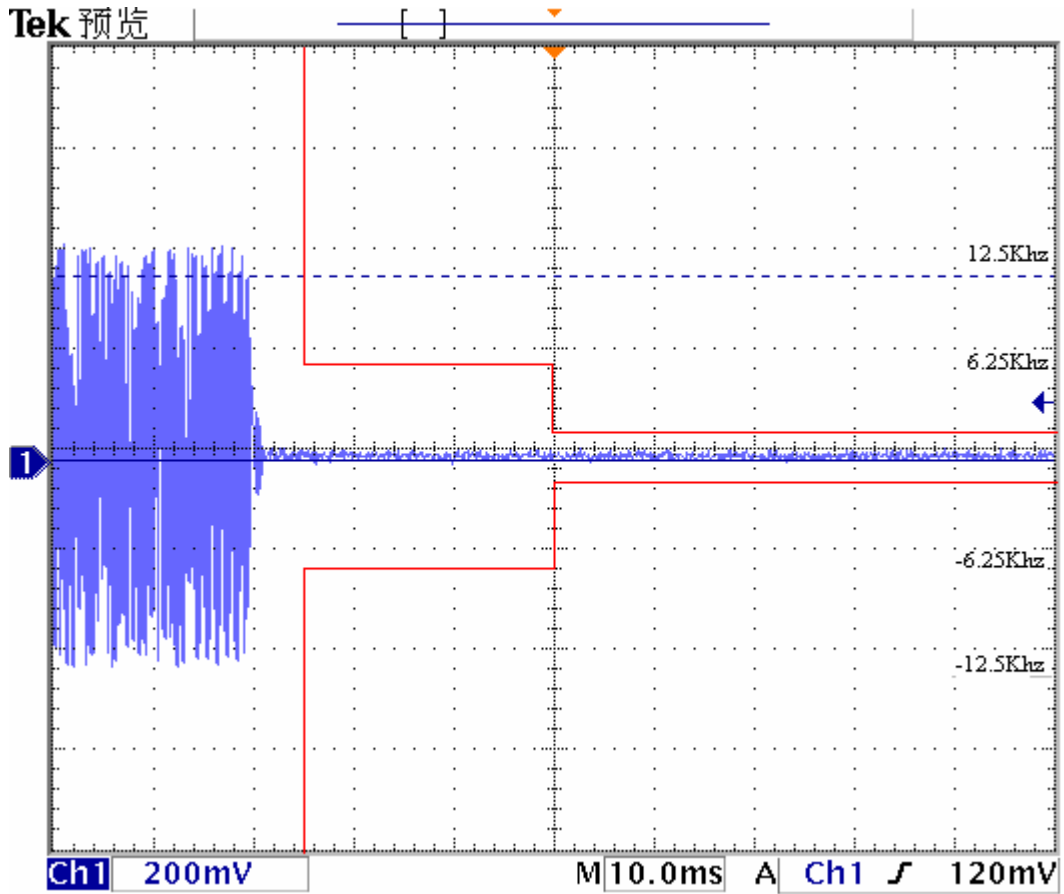


TEST RESULTS

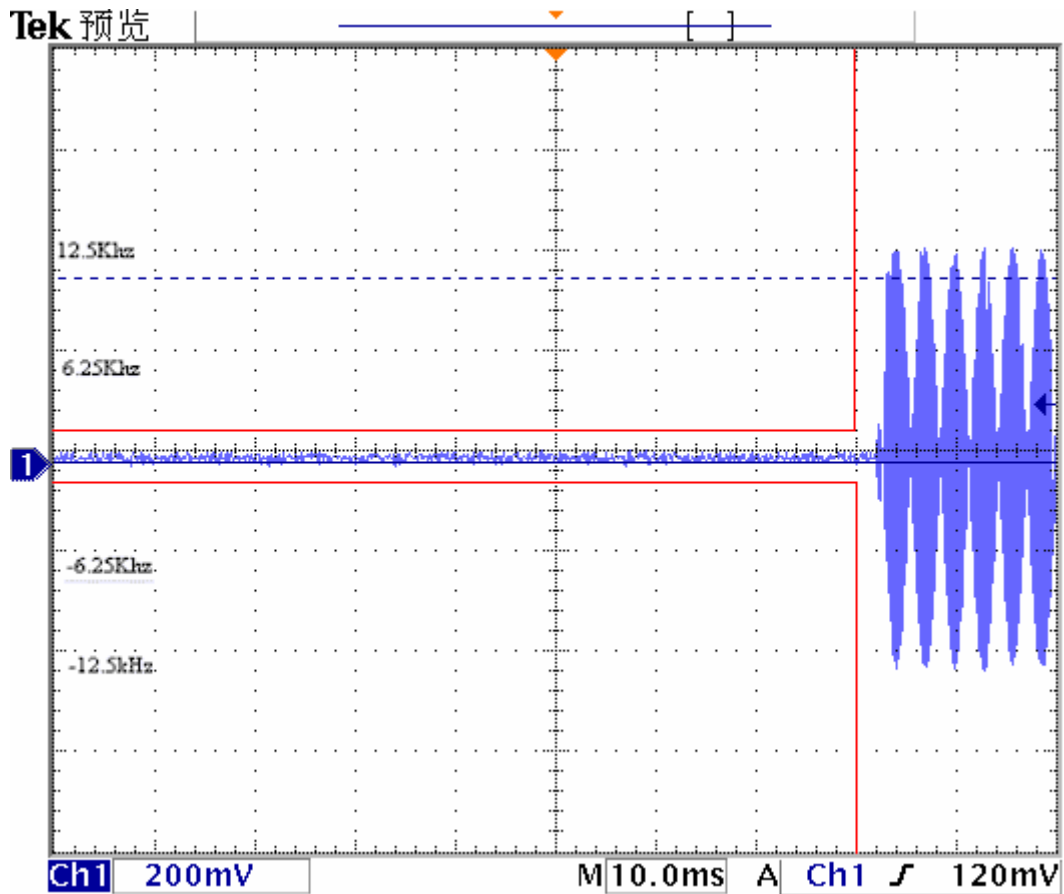
Please refer to the following plots.

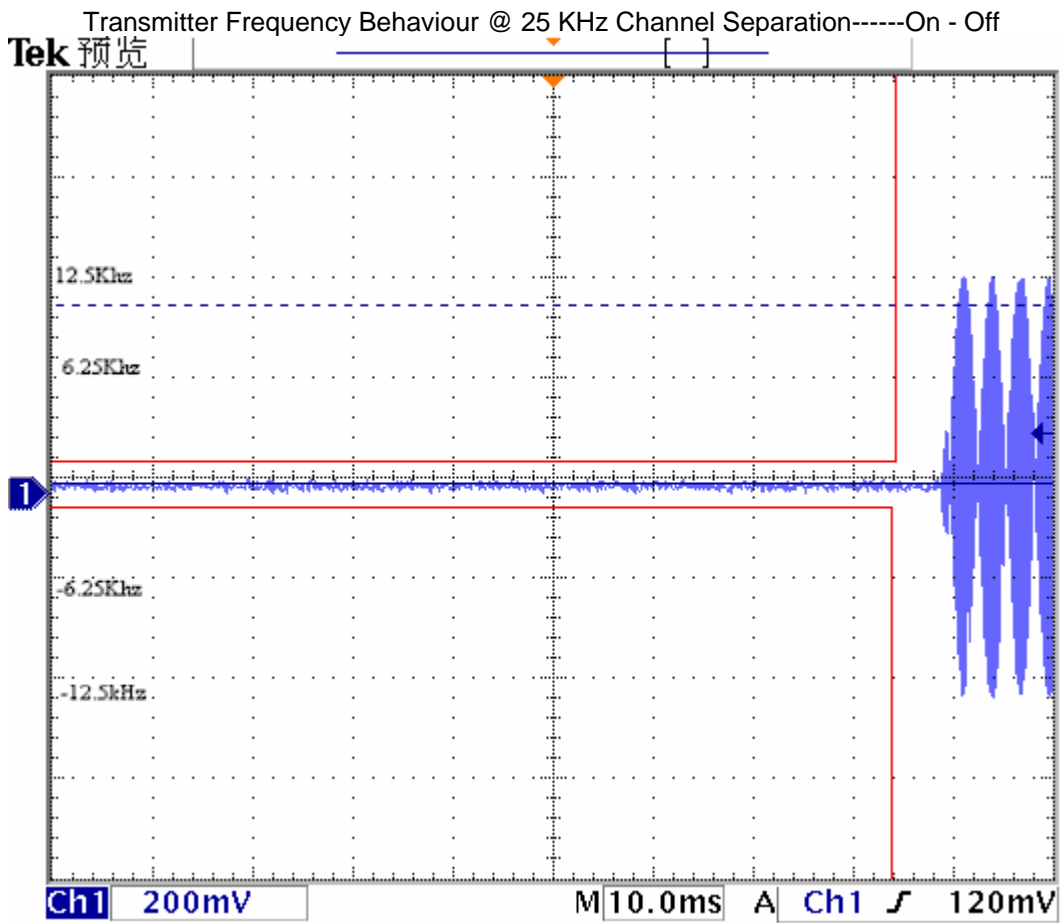
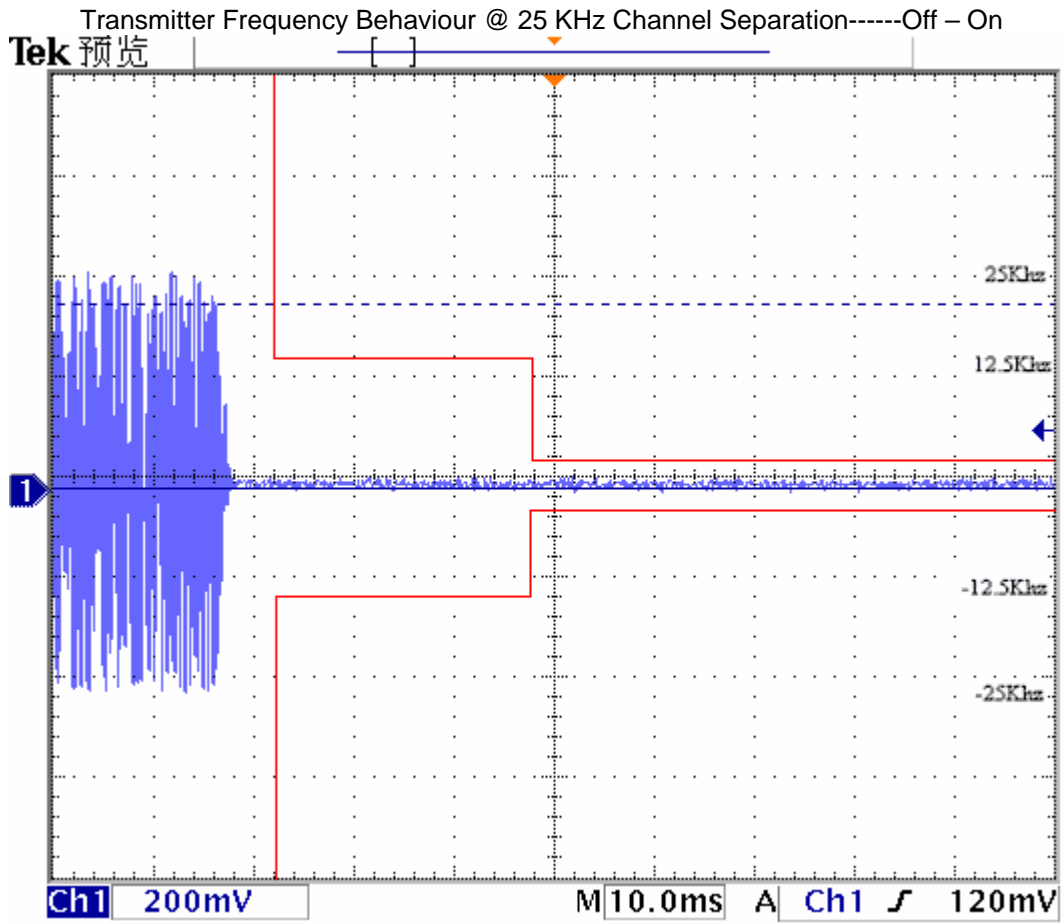
Modulation Type: FM

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



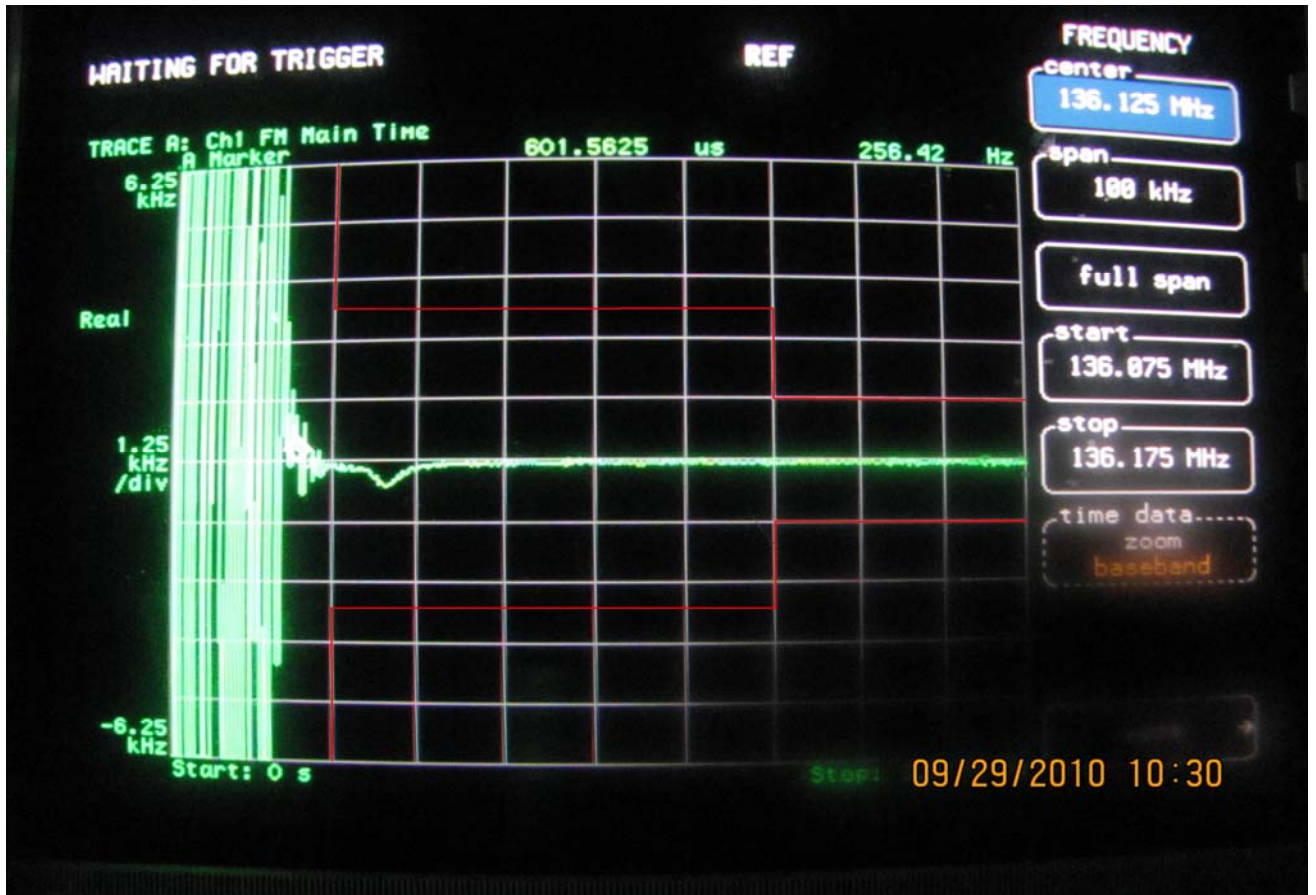
Transmitter Frequency Behaviour @ 12.5 KHz Channel Separation-----On - Off





Modulation Type: 4FSK

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



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



4.9. Receiver Radiated Spurious Emission

TEST APPLICABLE

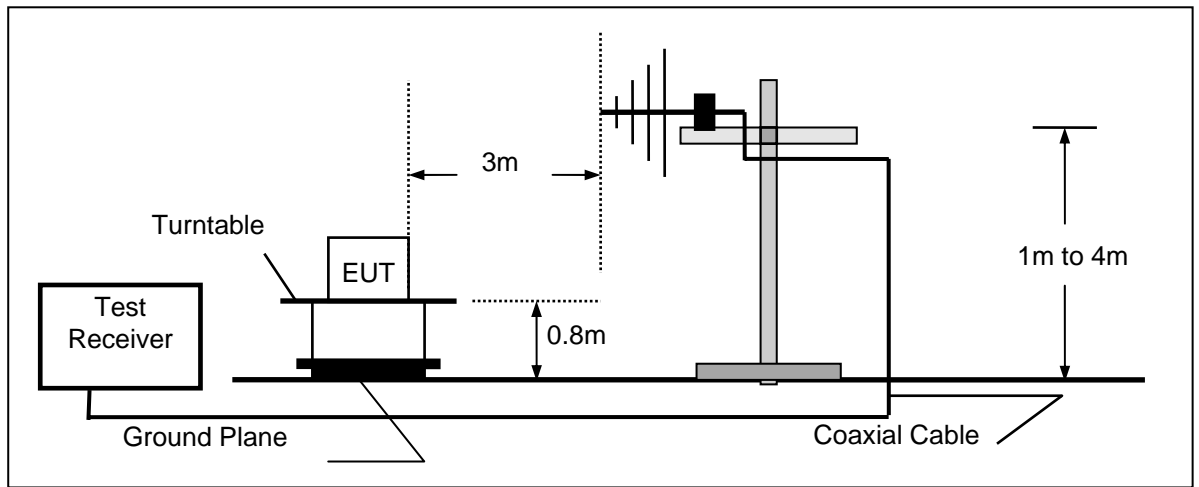
The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

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

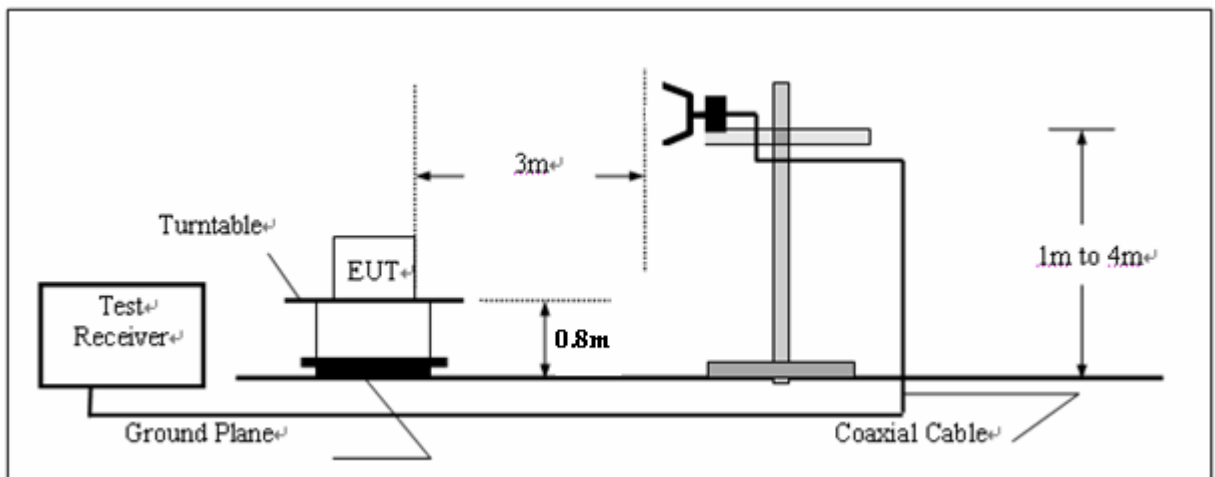
Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

TEST CONFIGURATION

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



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



TEST PROCEDURE

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

RECEIVER RADIATED SPOUIOUS LIMIT

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

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

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

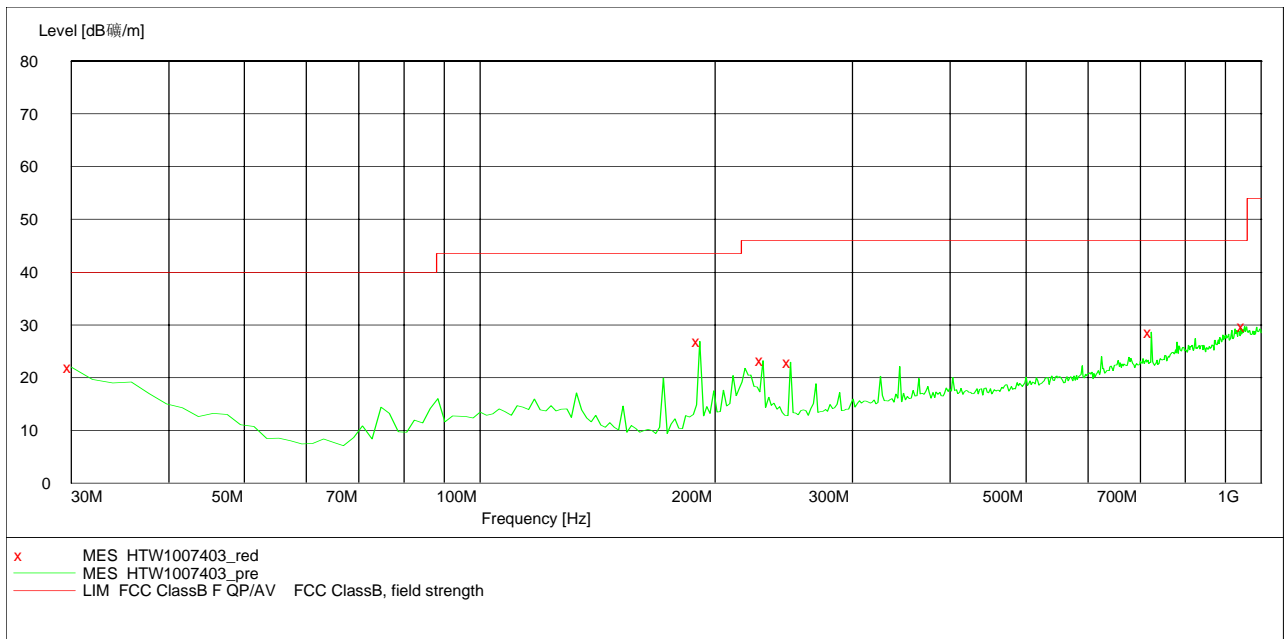
TEST RESULTS

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

Modulation Type	Channel Separation	Test Frequency (MHz)	Polar.	Maximum Radiated Emissions		FCC Limit (dBuV/m)
				Frequency (MHz)	Datum (dBuV/m)	
FM	25 KHz	173.9750	H	951.40	29.70	46
			V	935.85	29.60	46
Test Results			Compliance			

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

Short Description: Field Strength
 Start Stop Detector Meas. IF Transducer
 Frequency Frequency Time Bandw.
 30.0 MHz 1.0 GHz MaxPeak Coupled 120 kHz HL562 10



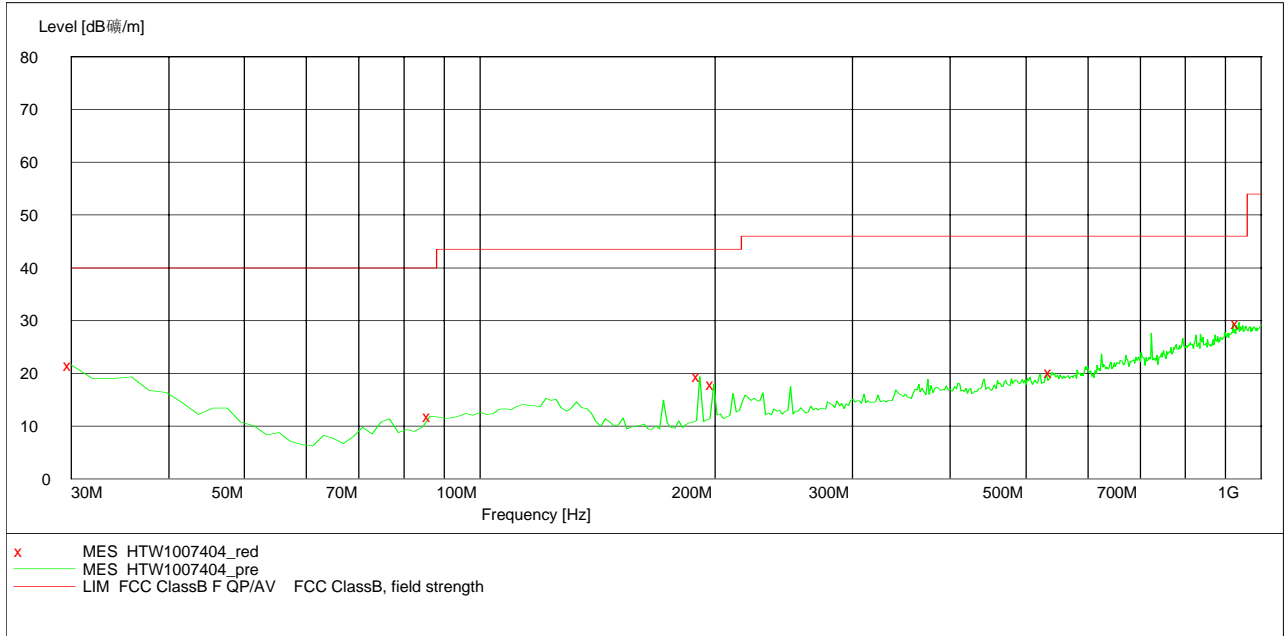
MEASUREMENT RESULT: "HTW1007403_red"

10/7/2010 12:51AM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	22.00	-10.1	40.0	18.0	Peak	300.0	203.00	HORIZONTAL
191.342685	26.90	-21.8	43.5	16.6	Peak	100.0	77.00	HORIZONTAL
230.220441	23.20	-20.3	46.0	22.8	Peak	100.0	77.00	HORIZONTAL
249.659319	22.90	-19.8	46.0	23.1	Peak	100.0	65.00	HORIZONTAL
723.967936	28.60	-10.4	46.0	17.4	Peak	100.0	154.00	HORIZONTAL
951.402806	29.70	-4.8	46.0	16.3	Peak	100.0	136.00	HORIZONTAL

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

Short Description:		Field Strength			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
30.0 MHz	1.0 GHz	MaxPeak	Coupled	120 kHz	HL562 10



MEASUREMENT RESULT: "HTW1007404_red"

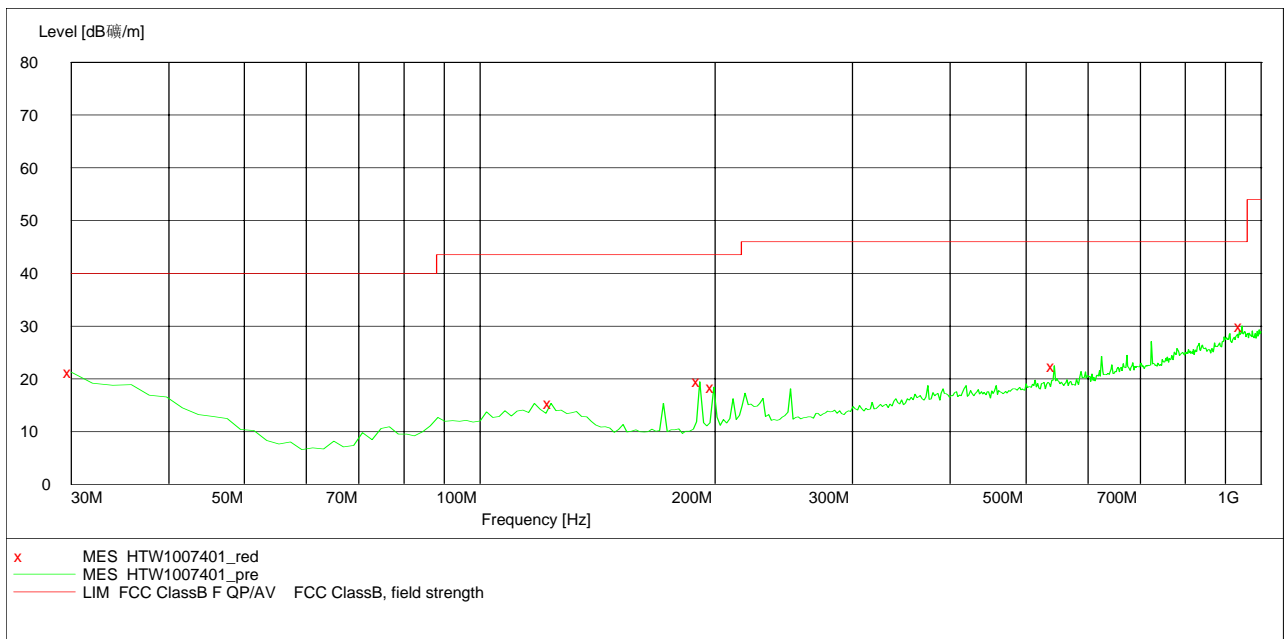
10/7/2010 12:53AM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	21.60	-10.1	40.0	18.4	Peak	100.0	142.00	VERTICAL
86.372745	11.90	-21.5	40.0	28.1	Peak	100.0	359.00	VERTICAL
191.342685	19.40	-21.8	43.5	24.1	Peak	100.0	134.00	VERTICAL
199.118236	17.90	-21.2	43.5	25.6	Peak	100.0	134.00	VERTICAL
539.298597	20.20	-12.8	46.0	25.8	Peak	100.0	258.00	VERTICAL
935.851703	29.60	-5.4	46.0	16.4	Peak	100.0	320.00	VERTICAL

Modulation Type	Channel Separation	Test Frequency (MHz)	Polar.	Maximum Radiated Emissions		FCC Limit (dBuV/m)
				Frequency (MHz)	Datum (dBuV/m)	
FM	12.5 KHz	173.9750	H	953.35	29.40	46
			V	945.57	30.00	46
Test Results			Compliance			

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

Short Description: Field Strength
 Start Stop Detector Meas. IF Transducer
 Frequency Frequency Time Bandw.
 30.0 MHz 1.0 GHz MaxPeak Coupled 120 kHz HL562 10



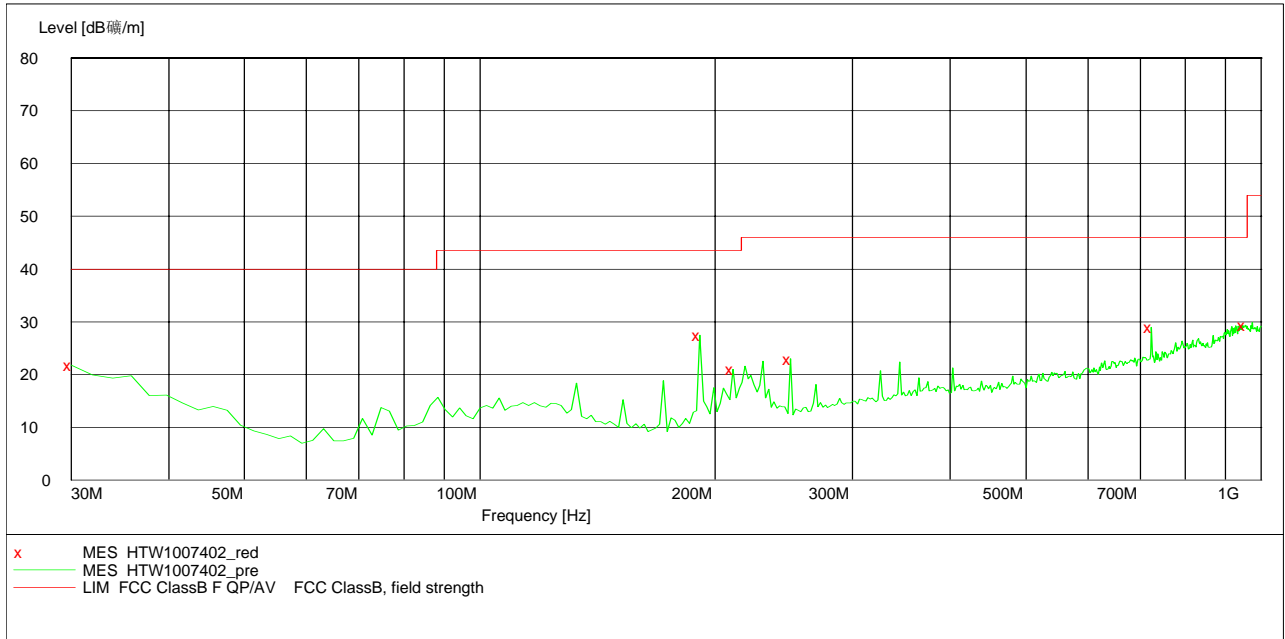
MEASUREMENT RESULT: "HTW1007401_red"

10/7/2010 12:44AM

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	21.30	-10.1	40.0	18.7	Peak	100.0	149.00	VERTICAL
123.306613	15.40	-18.4	43.5	28.1	Peak	100.0	58.00	VERTICAL
191.342685	19.50	-21.8	43.5	24.0	Peak	100.0	295.00	VERTICAL
199.118236	18.40	-21.2	43.5	25.1	Peak	100.0	117.00	VERTICAL
543.186373	22.40	-12.8	46.0	23.6	Peak	100.0	260.00	VERTICAL
945.571142	30.00	-5.0	46.0	16.0	Peak	100.0	96.00	VERTICAL

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

Short Description:		Field Strength			
Start	Stop	Detector	Meas. Time	IF Bandw.	Transducer
Frequency	Frequency				
30.0 MHz	1.0 GHz	MaxPeak	Coupled	120 kHz	HL562 10



MEASUREMENT RESULT: "HTW1007402_red"

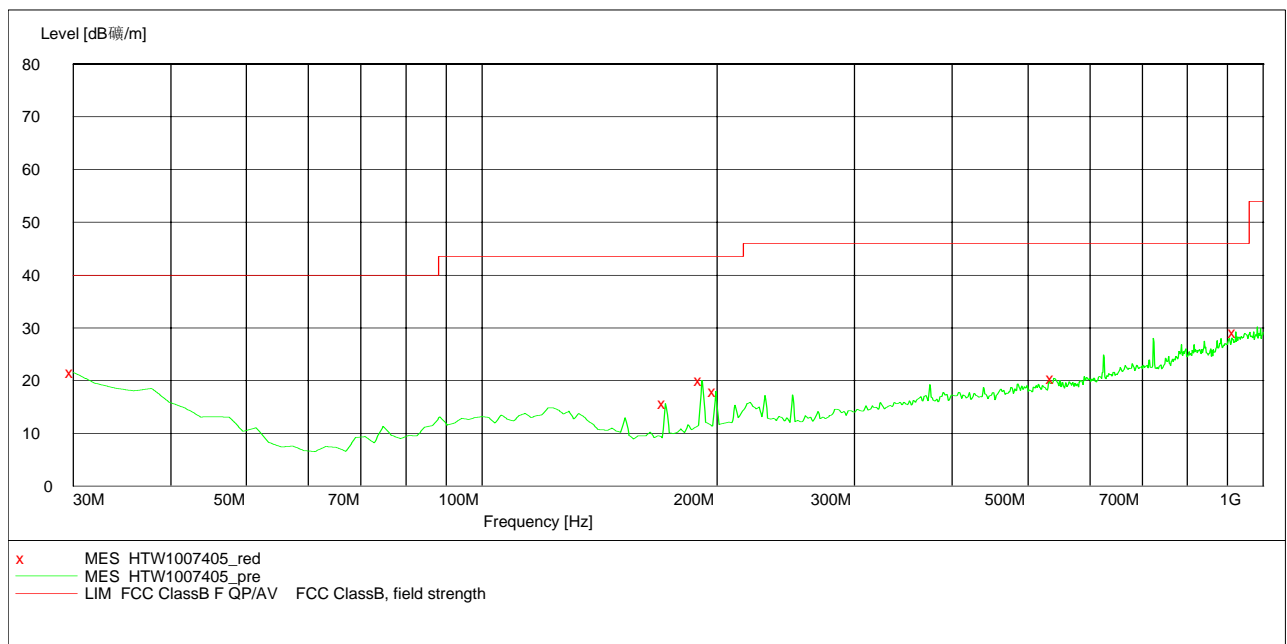
10/7/2010 12:47AM

Frequency	Level	Transd	Limit	Margin	Det.	Height	Azimuth	Polarization
MHz	dBμV/m	dB	dBμV/m	dB		cm	deg	
30.000000	21.80	-10.1	40.0	18.2	Peak	300.0	353.00	HORIZONTAL
191.342685	27.50	-21.8	43.5	16.0	Peak	100.0	77.00	HORIZONTAL
210.781563	21.00	-21.0	43.5	22.5	Peak	100.0	50.00	HORIZONTAL
249.659319	23.00	-19.8	46.0	23.0	Peak	100.0	77.00	HORIZONTAL
723.967936	29.00	-10.4	46.0	17.0	Peak	100.0	192.00	HORIZONTAL
953.346693	29.40	-4.9	46.0	16.6	Peak	100.0	109.00	HORIZONTAL

Modulation Type	Channel Separation	Test Frequency (MHz)	Polar.	Maximum Radiated Emissions		FCC Limit (dBuV/m)
				Frequency (MHz)	Datum (dBuV/m)	
4FSK	12.5 KHz	155.1250	H	941.68	29.50	46
			V	922.24	29.20	46
Test Results			Compliance			

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

Short Description: Field Strength
 Start Stop Detector Meas. IF Transducer
 Frequency Frequency Time Bandw.
 30.0 MHz 1.0 GHz MaxPeak Coupled 120 kHz HL562 10



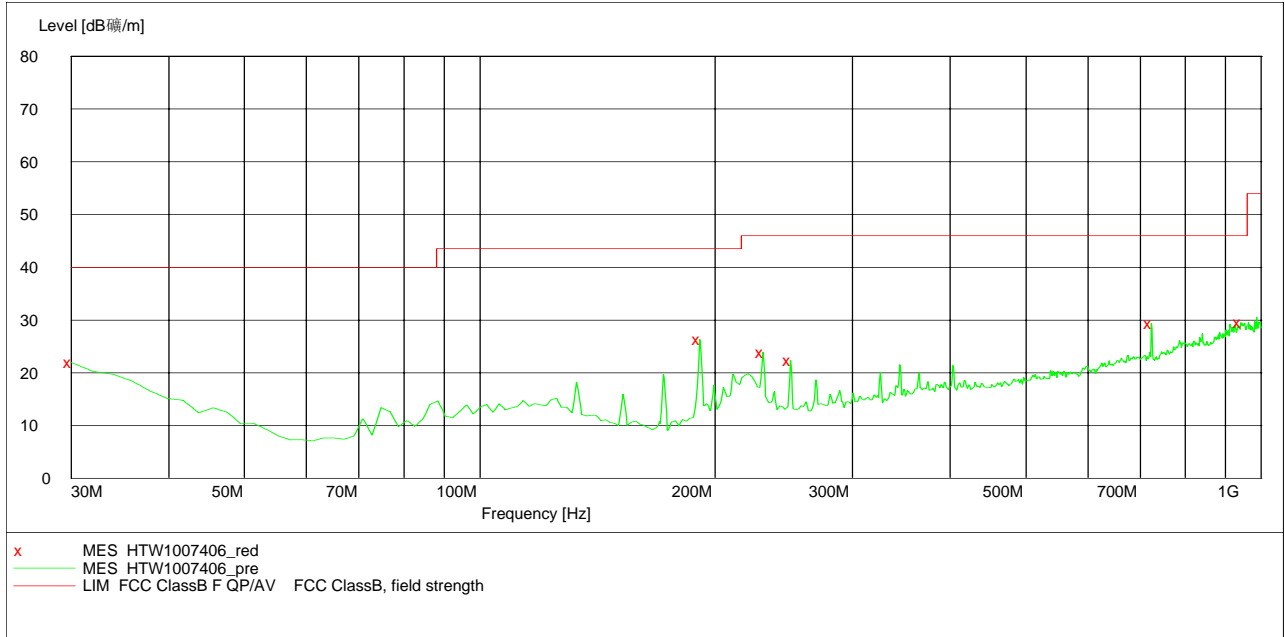
MEASUREMENT RESULT: "HTW1007405_red"

10/7/2010 12:56AM

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	21.50	-10.1	40.0	18.5	Peak	100.0	47.00	VERTICAL
171.903808	15.60	-23.1	43.5	27.9	Peak	100.0	137.00	VERTICAL
191.342685	20.10	-21.8	43.5	23.4	Peak	100.0	129.00	VERTICAL
199.118236	18.00	-21.2	43.5	25.5	Peak	100.0	134.00	VERTICAL
539.298597	20.40	-12.8	46.0	25.6	Peak	100.0	239.00	VERTICAL
922.244489	29.20	-5.9	46.0	16.8	Peak	100.0	297.00	VERTICAL

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

Short Description:		Field Strength			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
30.0 MHz	1.0 GHz	MaxPeak	Coupled	120 kHz	HL562 10



MEASUREMENT RESULT: "HTW1007406_red"

10/7/2010 12:59AM

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	21.90	-10.1	40.0	18.1	Peak	100.0	288.00	HORIZONTAL
191.342685	26.30	-21.8	43.5	17.2	Peak	100.0	86.00	HORIZONTAL
230.220441	23.90	-20.3	46.0	22.1	Peak	100.0	74.00	HORIZONTAL
249.659319	22.40	-19.8	46.0	23.6	Peak	100.0	78.00	HORIZONTAL
723.967936	29.40	-10.4	46.0	16.6	Peak	100.0	162.00	HORIZONTAL
941.683367	29.50	-5.2	46.0	16.5	Peak	100.0	235.00	HORIZONTAL

4.10. Receiver Conducted Spurious Emission

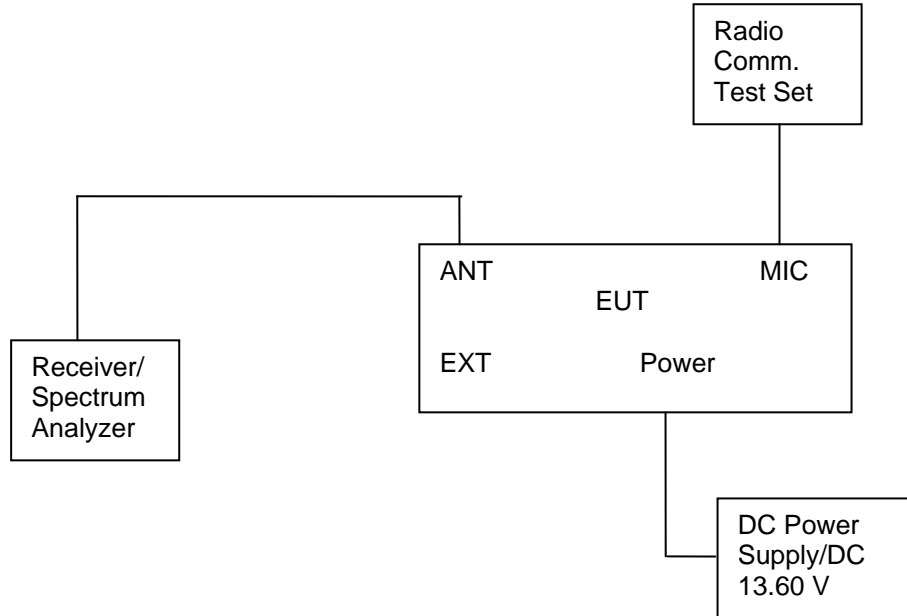
TEST APPLICABLE

The same as Section 4.3

TEST PROCEDURE

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

TEST CONFIGURATION



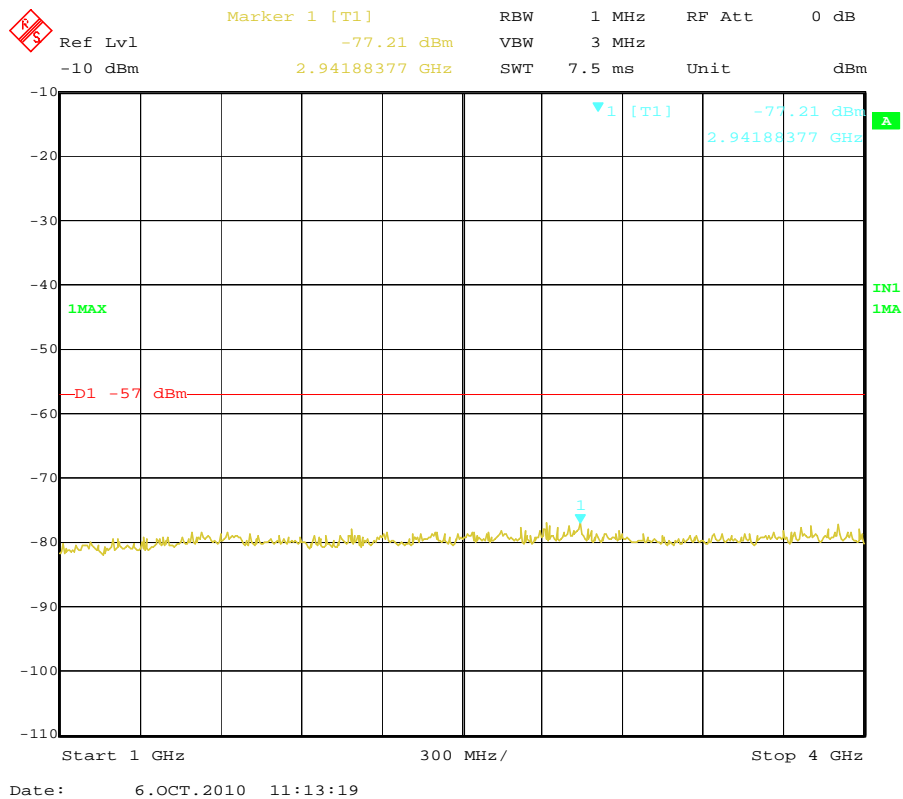
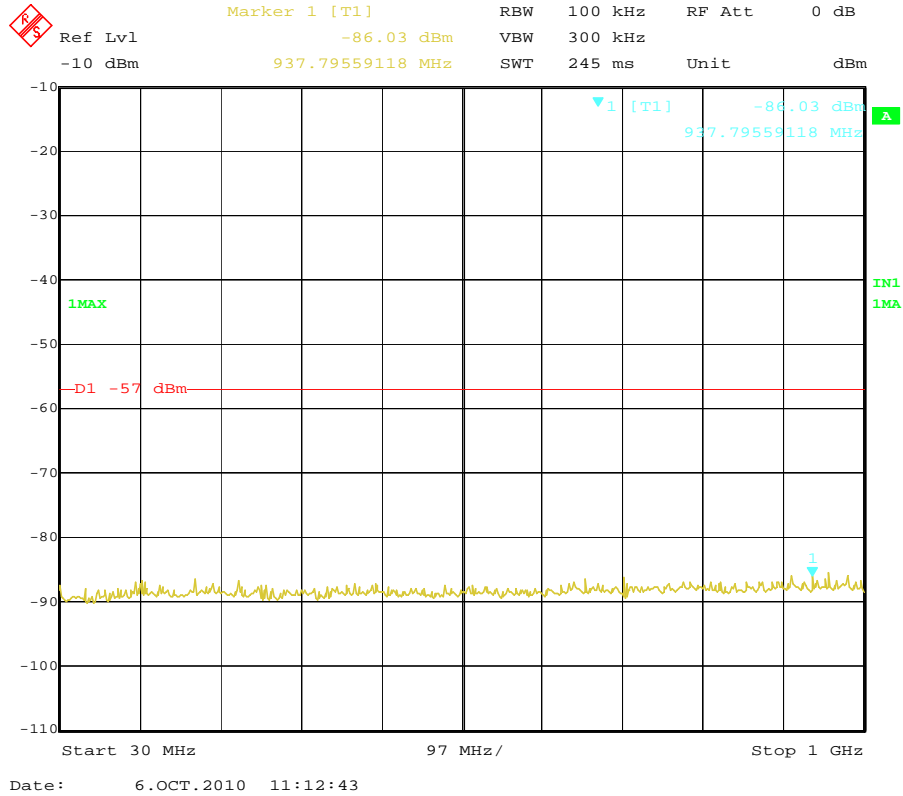
LIMIT

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

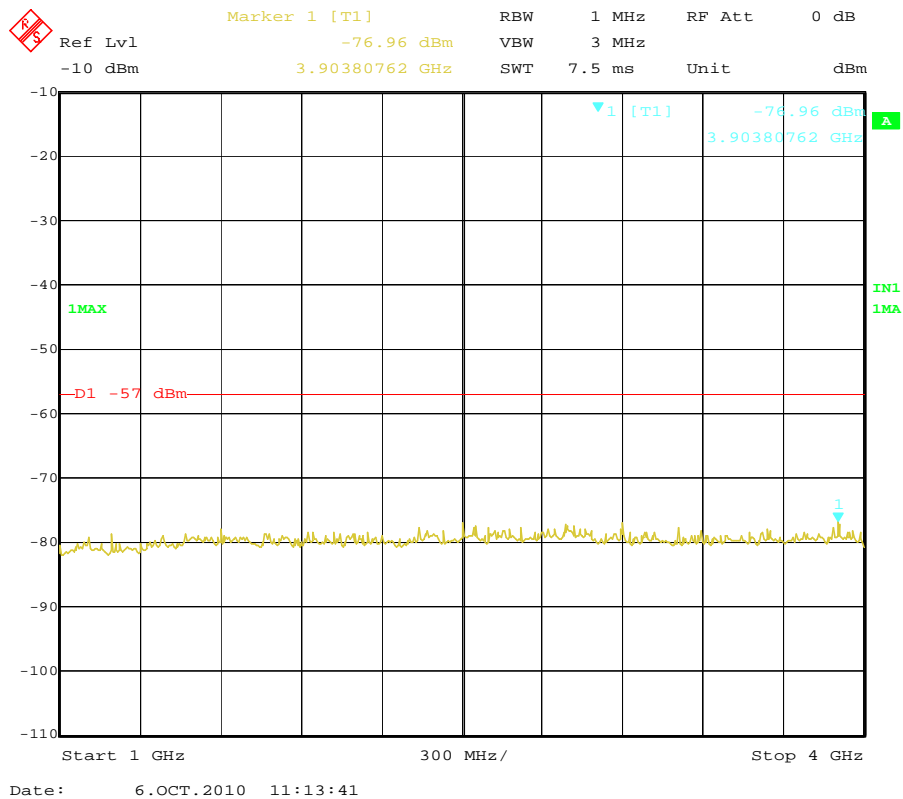
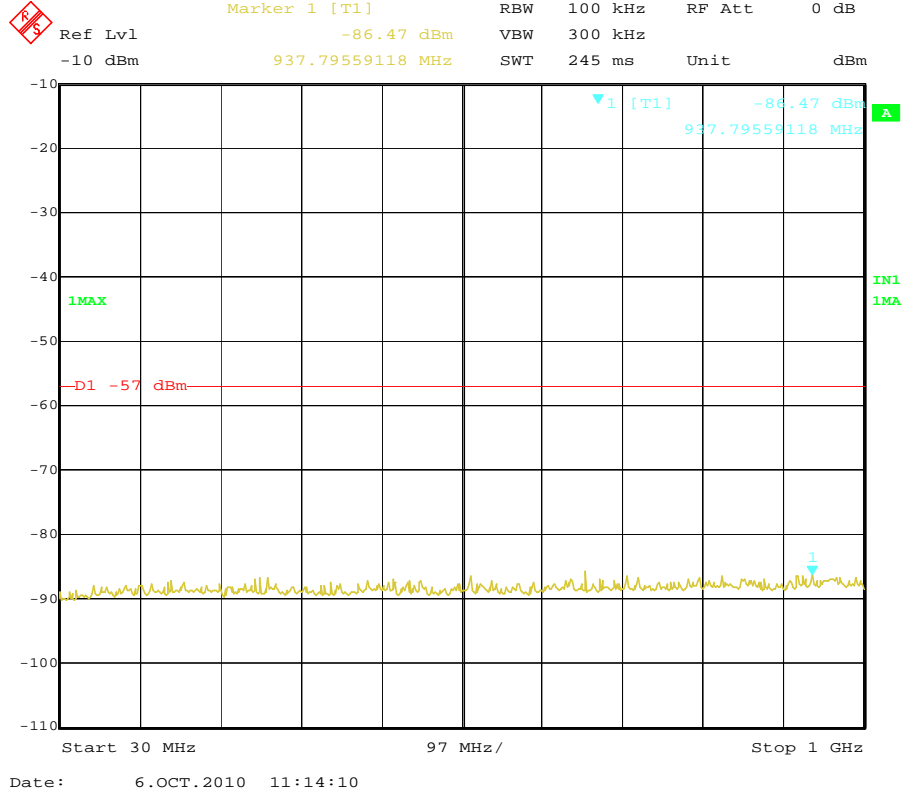
TEST RESULTS

The Receiver Conducted Spurious Emissions Measurement is performed to the three channels (the top channel, the middle channel and the bottom channel), the datums recorded below were for the three channels; and the EUT shall be scanned from 30 MHz to the 6GHz.

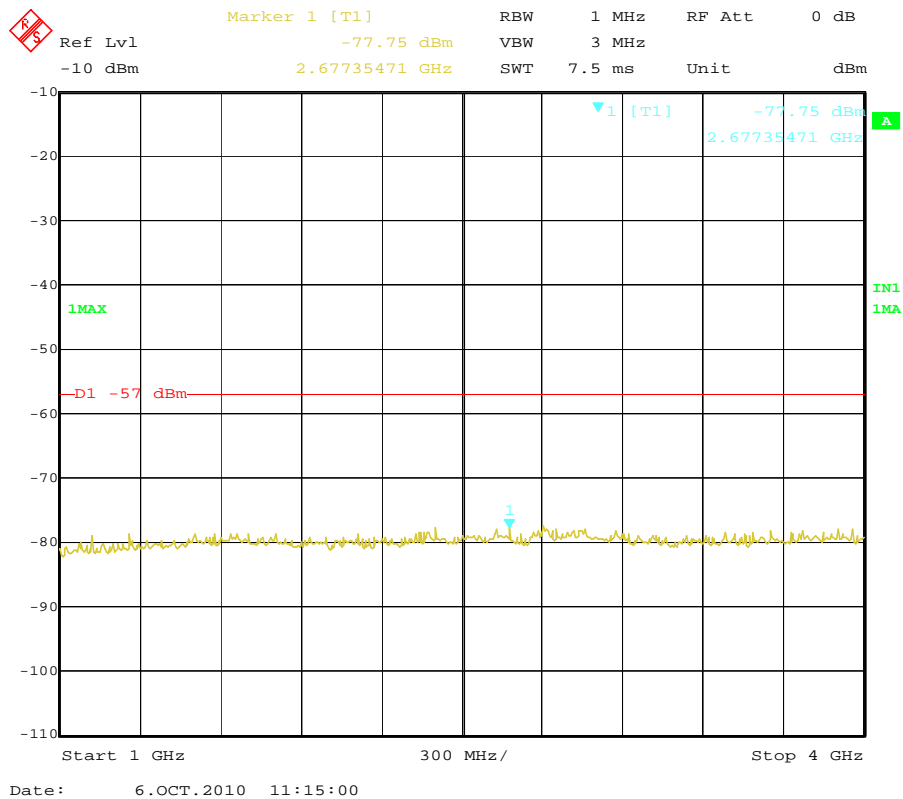
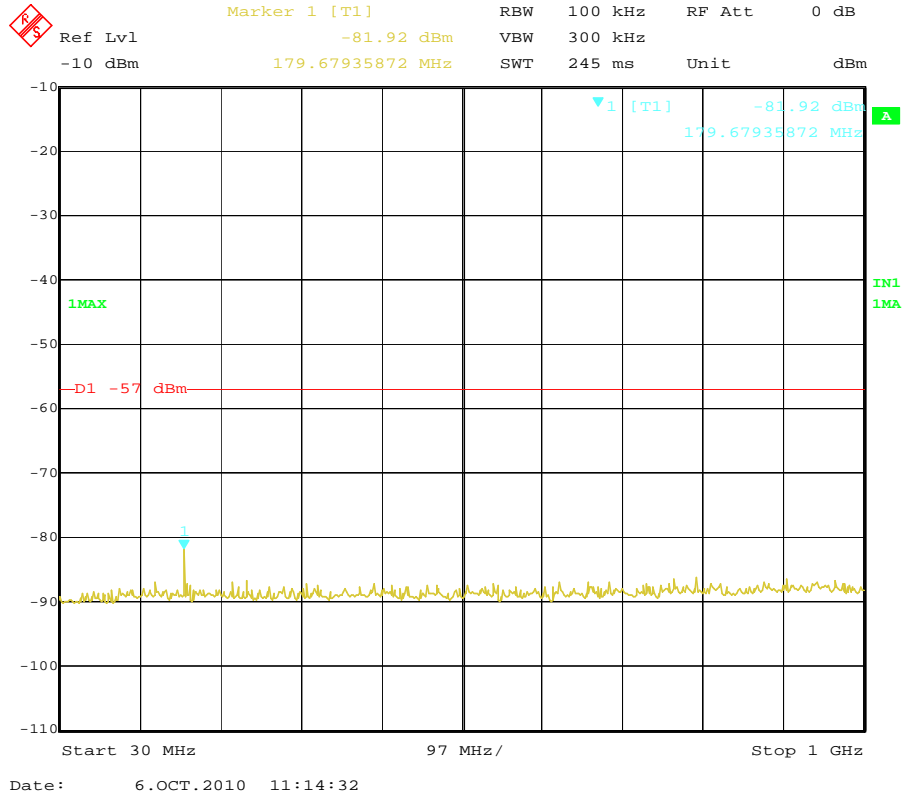
Modulation Type	Channel Separation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	25KHz	Low	136.1250	937.80	-86.03	2941.88	-77.21	-57dBm
Test Results				Compliance				



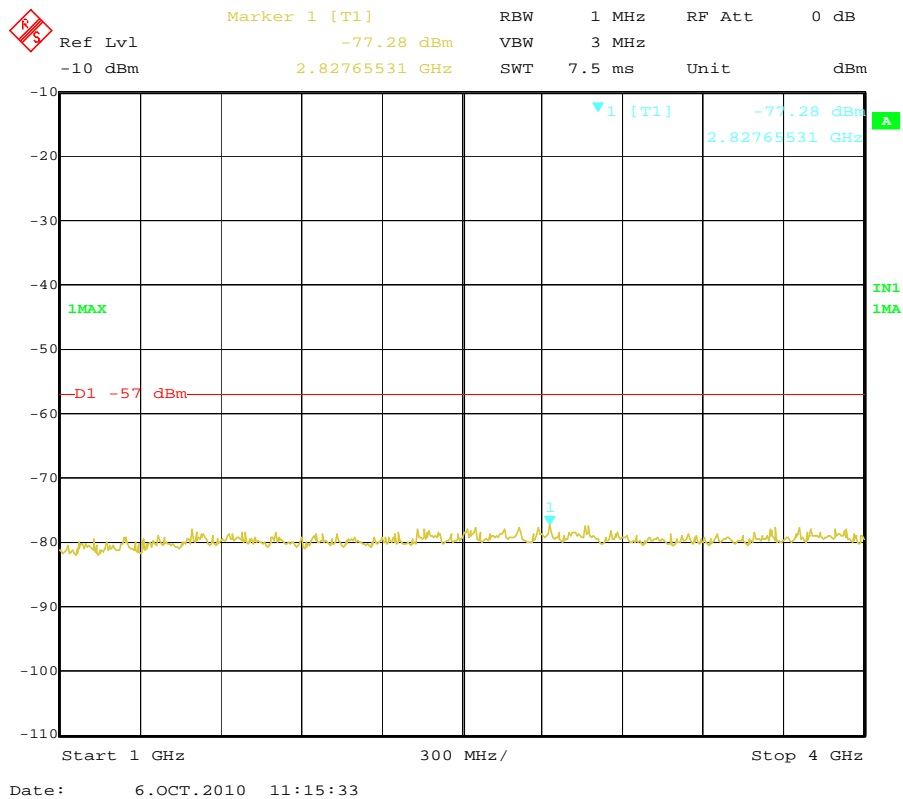
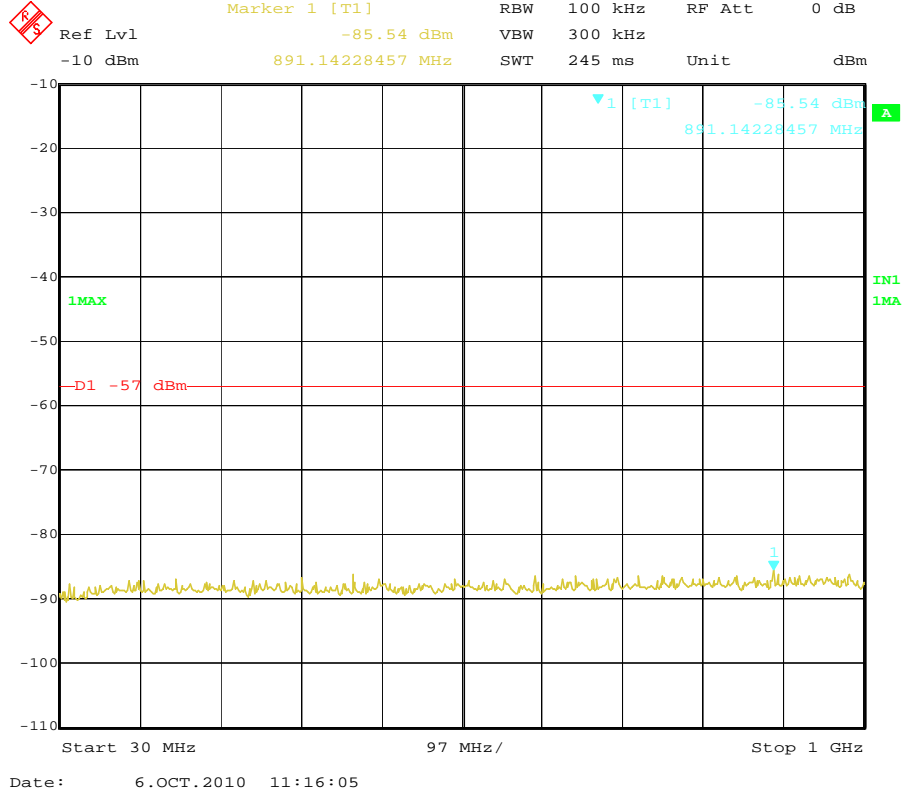
Modulation Type	Channel Separation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	25KHz	Middle	155.1250	937.80	-86.47	3903.81	-76.98	-57dBm
Test Results				Compliance				



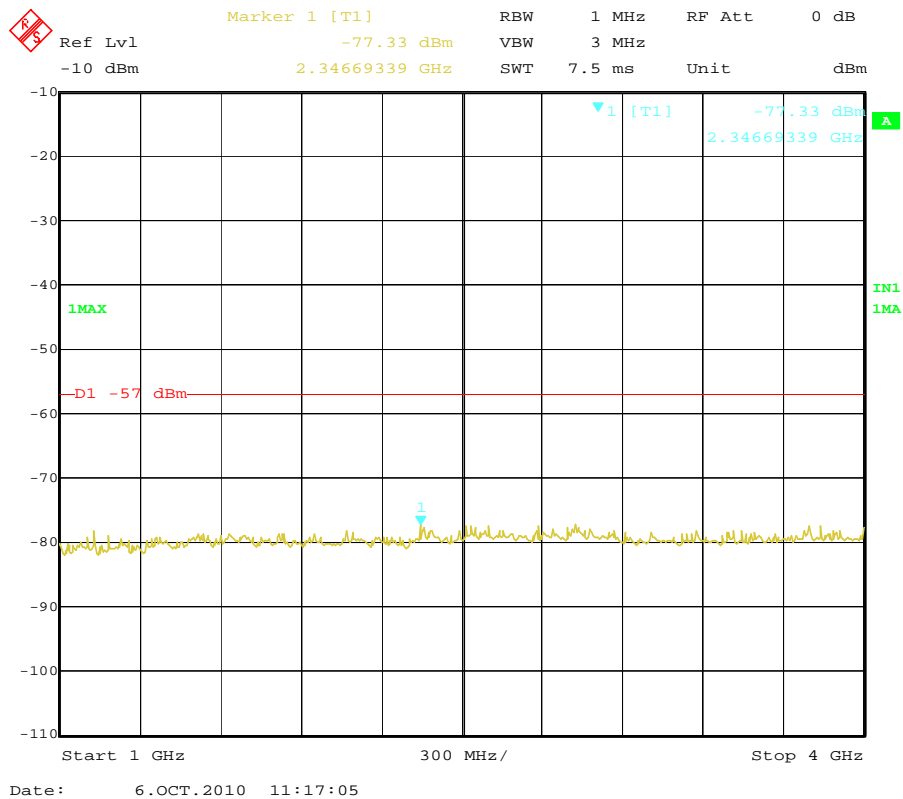
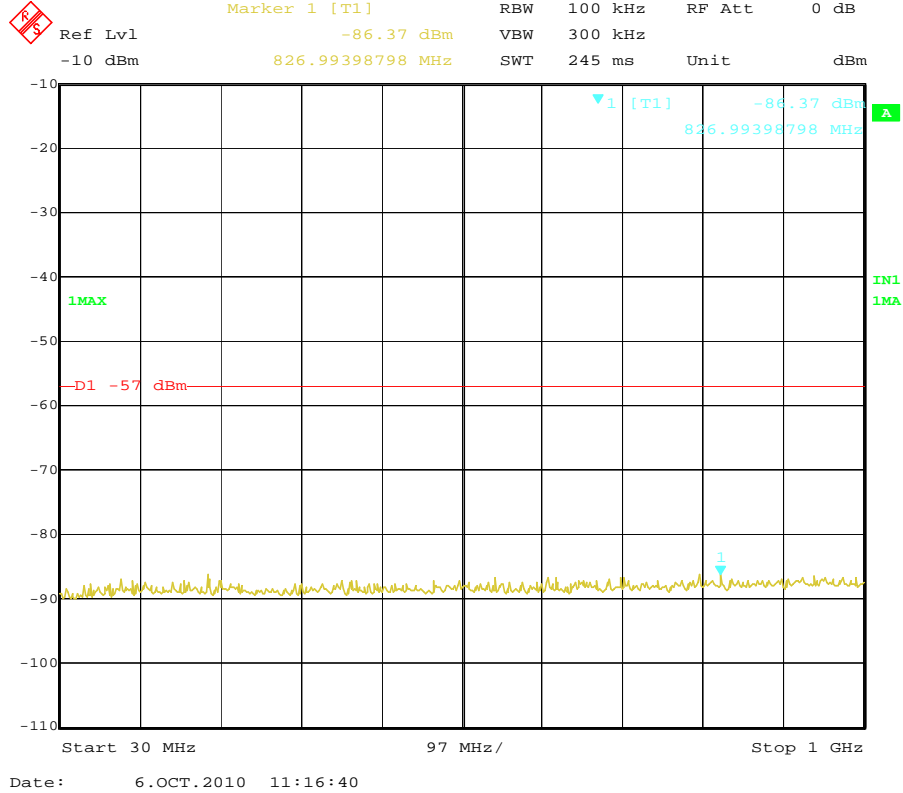
Modulation Type	Channel Separation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	25KHz	High	173.9750	179.68	-81.92	2677.35	-77.75	-57dBm
Test Results				Compliance				



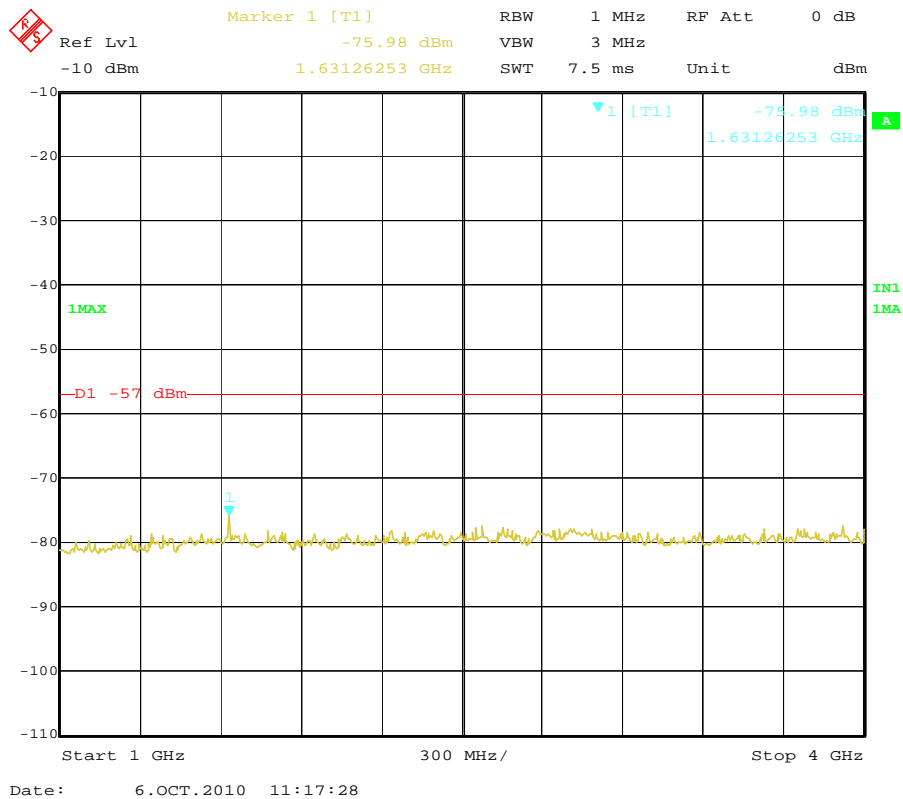
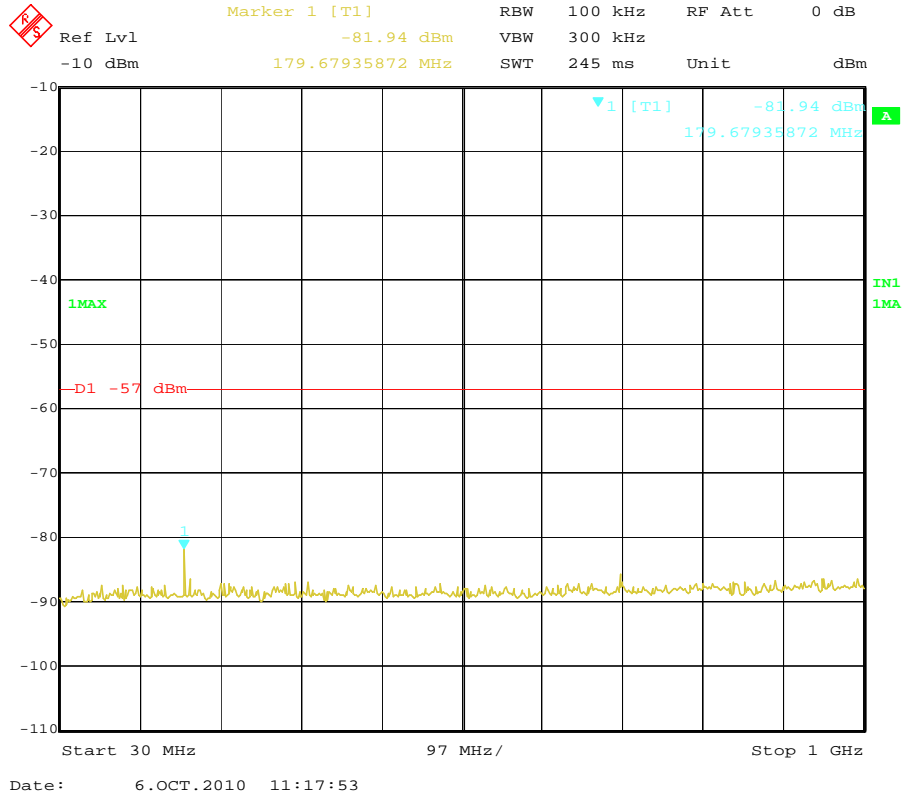
Modulation Type	Channel Separation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	Low	136.1250	891.84	-85.54	2827.66	-77.28	-57dBm
Test Results				Compliance				



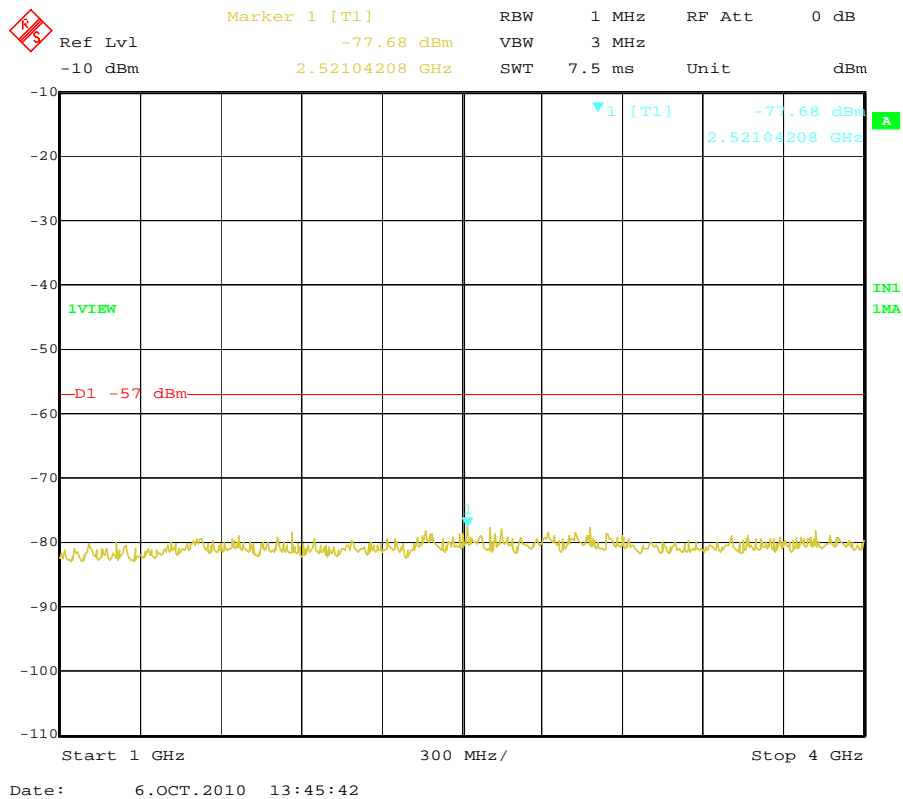
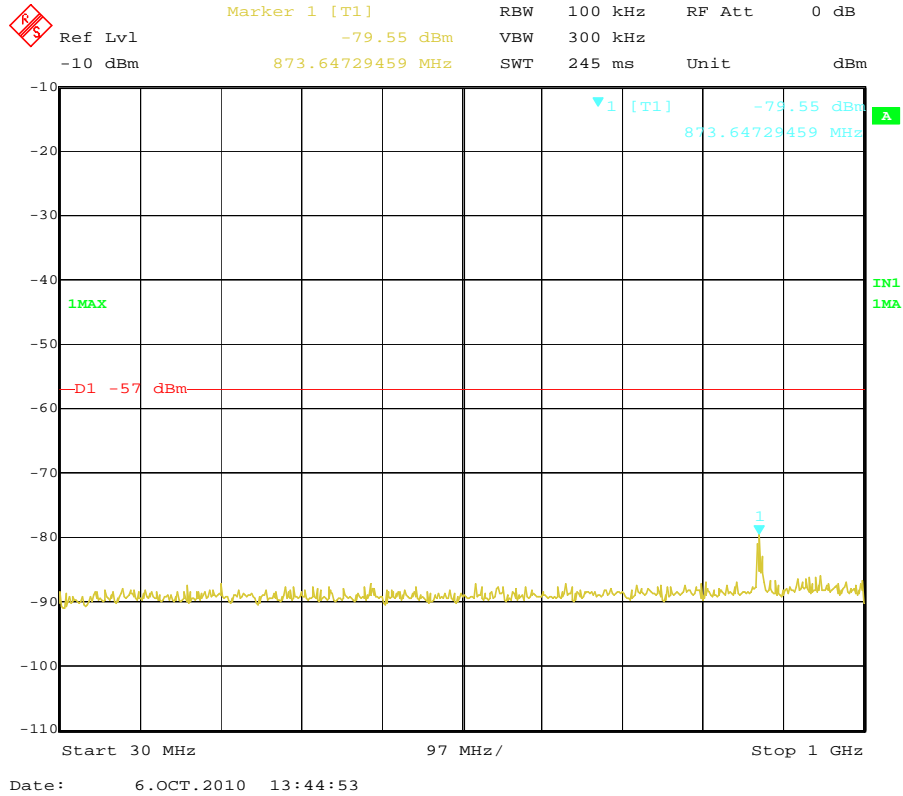
Modulation Type	Channel Separation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	Middle	155.1250	826.99	-86.37	2346.69	-77.33	-57dBm
Test Results				Compliance				



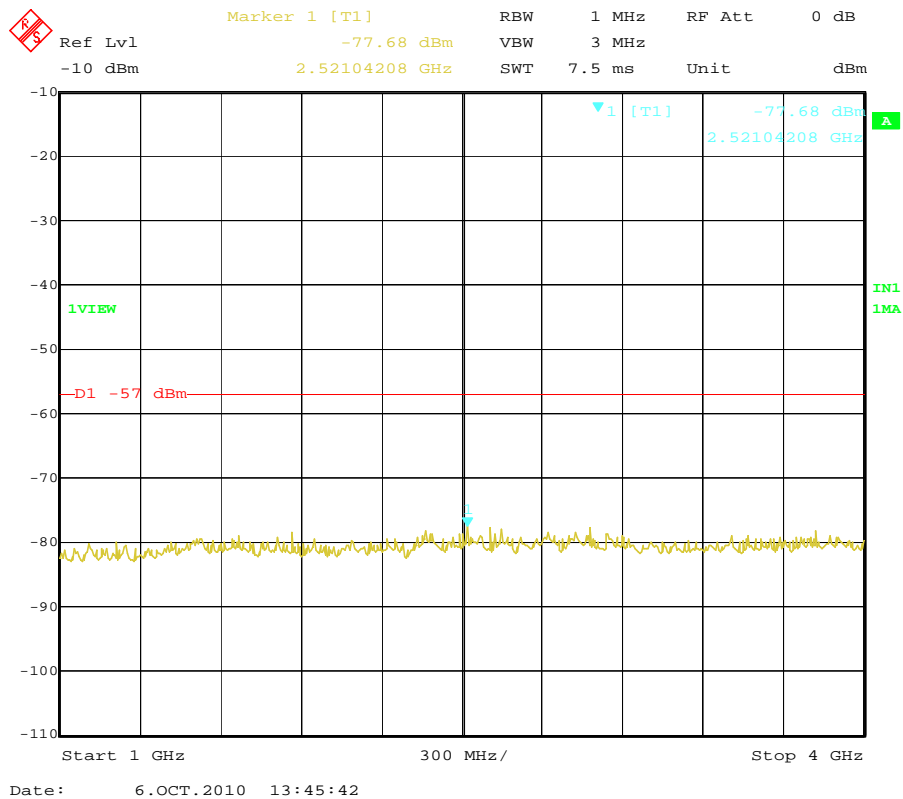
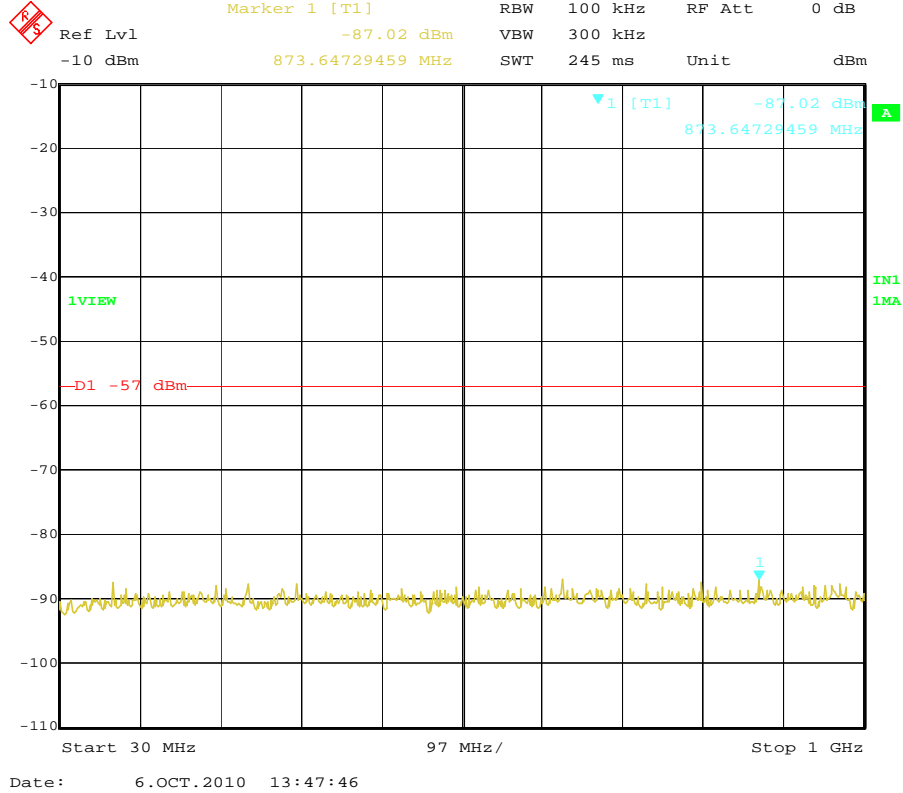
Modulation Type	Channel Separation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
FM	12.5KHz	High	173.9750	179.68	-81.94	1631.26	-75.98	-57dBm
Test Results				Compliance				



Modulation Type	Channel Separation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
4FSK	12.5KHz	Low	136.1250	873.65	-79.55	2521.04	-77.68	-57dBm
Test Results				Compliance				



Modulation Type	Channel Separation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
4FSK	12.5KHz	Middle	155.1250	873.65	-87.02	3819.64	-78.09	-57dBm
Test Results				Compliance				



Modulation Type	Channel Separation	Test Channel	Test Frequency (MHz)	Maximum Conducted Spurious Emissions Below 1GHz		Maximum Conducted Spurious Emissions Above 1GHz		FCC Limit
				Frequency (MHz)	Datum (dBm)	Frequency (MHz)	Datum (dBm)	
4FSK	12.5KHz	High	173.9750	179.68	-81.28	3927.86	-77.95	-57dBm
Test Results				Compliance				

