

FCC PART 90 TEST REPORT

FCC Part 90

Report Reference No......: **TRE12040044**

FCC ID.....: **YAMPD70XGU5**

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Date of issue.....: Apr 16, 2012

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

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

Applicant's name: **Hytera Communications Corporation Ltd.**

Address.....: HYT Tower,Hi-Tech Industrial Park North,Nanshan District,Shenzhen China.518057

Test specification:

Standard: **FCC Part 90: PRIVATE LAND MOBILE RADIO SERVICES**


TRF Originator.....: Shenzhen Huatongwei International Inspection CO., Ltd

Master TRF: Dated 2006-06

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Test item description: Digital Portable Radio

Trade Mark: 

Manufacturer: **Hytera Communications Corporation Ltd.**

Model/Type reference.....: PD702G U(5)/ PD705G U(5)/PD706G U(5)/PD708G U(5)/HD705G U(5)

Listed Models: /

Ratings.....: DC 7.40 V

Modulation: FM&4FSK

Channel Separation.....: 25KHz&12.5KHz

Rated Power: 2.5 Watts(33.98dBm)/1 Watts(30.00dBm)

Operation Frequency Range: 806-825MHz/851-870MHz/896-902MHz/935-941MHz

Result.....: **Positive**

TEST REPORT

Test Report No. :	TRE12040044	Apr 16, 2012
		Date of issue

Equipment under Test : Digital Portable Radio

Model /Type : PD702G U(5)/ PD705G U(5)/PD706G U(5)/PD708G U(5)/HD705G U(5)

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 MOBILE RADIO SERVICES.

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

47 CFR FCC Part 15 Subpart B - Unintentional Radiators

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

2. SUMMARY

2.1. General Remarks

Date of receipt of test sample	:	Apr 01, 2012
Testing commenced on	:	Apr 01, 2012
Testing concluded on	:	Apr 16, 2012

2.2. Product Description

The Hytera Communications Corporation Ltd.'s Model: PD702G U(5)/ PD705G U(5)/PD706G U(5)/PD708G U(5)/HD705G U(5) or the "EUT" as referred to in this report; more general information as follows, for more details, refer to the user's manual of the EUT.

Name of EUT	Digital Portable Radio	
Model Number	PD702G U(5)/ PD705G U(5)/PD706G U(5)/PD708G U(5)/HD705G U(5)	
FCC ID	YAMPD70XGU5	
Rated Output Power	2.5 Watts(33.98dBm)/1 Watts(30.00dBm)	
Support data rate	9.6kbps	
Modulation Type	FM for Analog Voice	
	4FSK for Digital Voice/Digital Data	
	4FSK for Digital Data	
	Analog	16K0F3E for 25KHz Channel Separation 11K0F3E for 12.5KHz Channel Separation
	Digital	7K60FXD for Digital Data only 7K60FXW for Digital Data & Digital Voice
Channel Separation	Analog Voice	12.5KHz&25KHz
	Digital Voice/Data	12.5KHz
	Digital Data	12.5KHz
Antenna Type	External	
Frequency Range	806-825MHz/851-870MHz/896-902MHz/935-941MHz	
Maximum Output Power	Analog	2.99 W for 25 KHz Channel Separation 3.00 W for 12.5 KHz Channel Separation
	Digital	2.98 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 7.40V from battery

Test frequency list

Frequency Range (MHz)	Modulation Type	Channel Separation (KHz)	Test Channel	Test Frequency (MHz)	
				TX	RX
806-825	Analog/FM	25	Low Channel	806.5000	851.5000
			Middle Channel	817.0000	860.0000
			High Channel	823.5000	868.5000
		12.5	Low Channel	806.5000	851.5000
			Middle Channel	817.0000	860.0000
			High Channel	823.5000	868.5000
	Digital/4FSK	12.5	Low Channel	806.5000	851.5000
			Middle Channel	817.0000	860.0000
			High Channel	823.5000	868.5000
851-870	Analog/FM	25	Low Channel	851.5000	851.5000
			Middle Channel	860.0000	860.0000
			High Channel	868.5000	868.5000
		12.5	Low Channel	851.5000	851.5000
			Middle Channel	860.0000	860.0000
			High Channel	868.5000	868.5000
	Digital/4FSK	12.5	Low Channel	851.5000	851.5000
			Middle Channel	860.0000	860.0000
			High Channel	868.5000	868.5000
896-902	Analog/FM	12.5	Low Channel	896.5000	935.5000
			High Channel	900.5000	939.5000
	Digital/4FSK		Low Channel	896.5000	935.5000
			High Channel	900.5000	939.5000
935-941	Analog/FM	12.5	Low Channel	935.5000	935.5000
			High Channel	939.5000	939.5000
	Digital/4FSK		Low Channel	935.5000	935.5000
			High Channel	939.5000	939.5000

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

806-825MHz/851-870MHz/896-902MHz/935-941MHz U frequency band Digital Portable Radio with GPS function(PD702G U(5)/ PD705G U(5)/PD706G U(5)/PD708G U(5)/HD705G U(5)).

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

Serial number: Prototype

2.5. EUT Configuration

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

2.6. EUT operation mode

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

2.7. EUT configuration

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

● - supplied by the manufacturer

○ - supplied by the lab

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

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

This submittal(s) (test report) is intended for FCC ID: **YAMPD70XGU5** filing to comply with FCC Part 90 Rules.

2.9. Modifications

No modifications were implemented to meet testing criteria.

2.10. Note

The EUT is is a U frequency band (806-825MHz/851-870MHz/896-902MHz/935-941MHz) Digital Portable Radio with GPS function, The functions of the EUT listed as below:

	Test Standards	Reference Report
Radio	FCC Part 90	TRE12040044

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 Feb 28, 2015.

A2LA-Lab Cert. No. 2243.01

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

FCC-Registration No.: 662850

Shenzhen Huatongwei International Inspection Co., Ltd, EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 662850, Renewal date 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 Jan 25, 2011. Valid time is until Jan 24, 2014

ACA

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

NEMKO-Aut. No.: ELA125

Shenzhen Huatongwei International Inspection Co., Ltd has been assessed the quality assurance system, the testing facilities, qualifications and testing practices of the relevant parts of the organization. The quality assurance system of the Laboratory has been validated against ISO/IEC 17025:2005 or equivalent. The laboratory also fulfils the conditions described in Nemko Document NLA-10; the Authorization is valid through July 07, 2013.

VCCI

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

3.3. Environmental conditions

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

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

3.4. Configuration of Tested System

Fig. 2-1 Configuration of Tested System

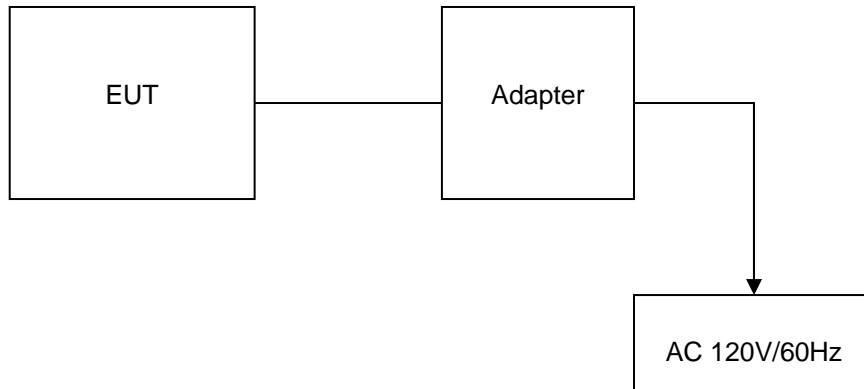


Table 2-1 Equipment Used in Tested System

Adapter: P/N: PS1014
 Model: DSA-15P-12 US 120120
 Input:100-240V~50/60Hz 0.5A
 Output: +12V DC 1A
 Power Cable: 180cm
 ◇ Shielded ◆ Unshielded

3.5. Discription of Tested Modes

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

3.6. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

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

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

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

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	N/A
§ 90.210	Transmitter Radiated Spurious Emssion	Complies
§ 90.210	Spurious Emssion On Antenna Port	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	10/23/2012
EMI Test Receiver	Rohde&Schwarz	ESCS 30	100038	10/23/2012
Pulse Limiter	Rohde&Schwarz	ESHSZ2	100044	10/23/2012
EMI Test Software	Rohde&Schwarz	ES-K1 V1.71	N/A	10/23/2012

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

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	10/23/2012
EMI Test Receiver	Rohde&Schwarz	ESI 26	100009	10/23/2012
RF Test Panel	Rohde&Schwarz	TS / RSP	335015/ 0017	N/A
HORN ANTENNA	Rohde&Schwarz	HF906	100039	10/23/2012
Turntable	ETS	2088	2149	N/A
Antenna Mast	ETS	2075	2346	N/A
EMI Test Software	Rohde&Schwarz	ES-K1 V1.71	N/A	10/23/2012
RF COMMUNICATION TEST SET	HP	8920A	3813A10206	10/23/2012
Spectrum Analyzer	Aglient	E4407B	MY44210775	23/10/2012
Spectrum Analyzer	Rohde&Schwarz	FSP40	1164.4391.40	23/10/2012
High pass filter	Compliance Direction systems	BSU-6	34202	23/10/2012

Frequency Stability				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Communication Test Set	HP	HP8920B	US35010135	10/23/2012
Signal Generator	Rohde&Schwarz	SMT03	100059	10/23/2012
Climate Chamber	ESPEC	EL-10KA	05107008	10/23/2012

Maximum Transmitter Power & Spurious Emission On Antenna Port				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Receiver	Rohde&Schwarz	ESI 26	100009	10/23/2012
Attenuator	R&S	ESH3-22	100449	10/23/2012
RF COMMUNICATION TEST SET	HP	8920A	3813A10206	10/23/2012
High-Pass Filter	Anritsu	MP526B	6220875256	10/23/2012
High-Pass Filter	Anritsu	MP526D	6220878392	10/23/2012
High pass filter	Compliance Direction systems	BSU-6	34202	23/10/2012
Spectrum Analyzer	Rohde&Schwarz	FSP40	1164.4391.40	23/10/2012

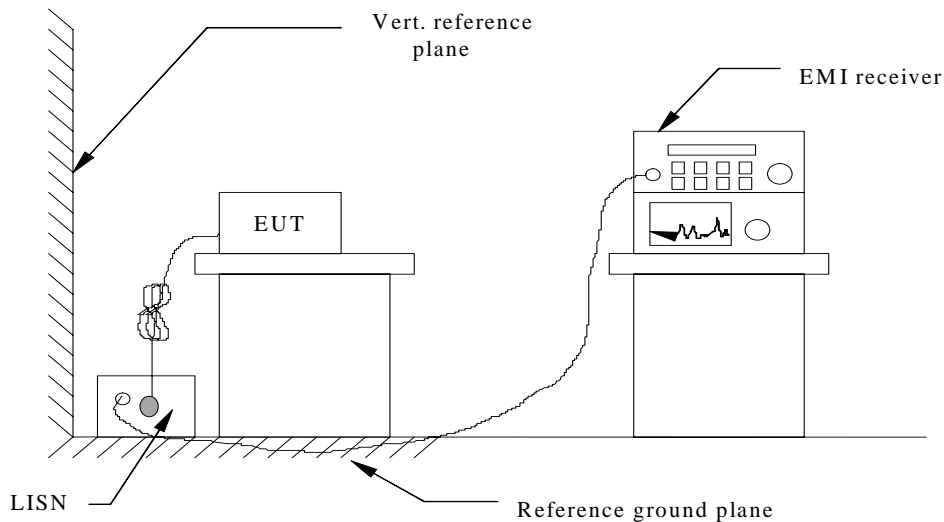
4. TEST CONDITIONS AND RESULTS

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

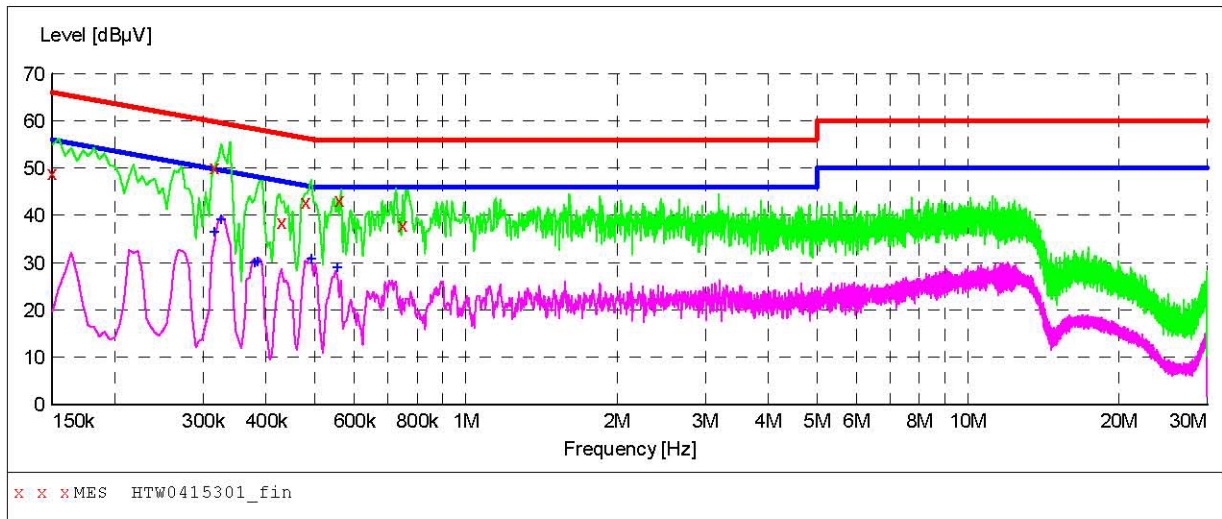
For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

TEST RESULTS

For FM Modulation @ 25 KHz

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

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "HTW0415301_fin"

4/15/2012 3:54PM

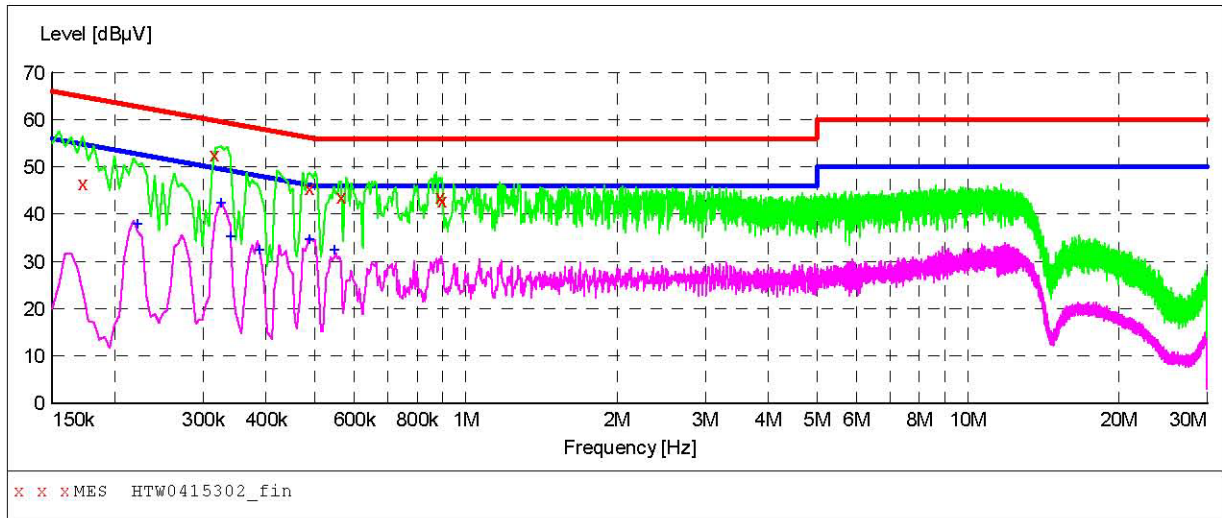
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	48.90	10.1	66	17.1	QP	N	GND
0.316500	50.30	10.1	60	9.5	QP	N	GND
0.429000	38.60	10.1	57	18.7	QP	N	GND
0.478500	43.00	10.1	56	13.4	QP	N	GND
0.559500	43.30	10.1	56	12.7	QP	N	GND
0.748500	38.10	10.1	56	17.9	QP	N	GND

MEASUREMENT RESULT: "HTW0415301_fin2"

4/15/2012 3:54PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.316500	36.70	10.1	50	13.1	AV	N	GND
0.325500	39.30	10.1	50	10.3	AV	N	GND
0.379500	30.20	10.1	48	18.1	AV	N	GND
0.384000	30.30	10.1	48	17.9	AV	N	GND
0.492000	30.90	10.1	46	15.2	AV	N	GND
0.555000	29.10	10.1	46	16.9	AV	N	GND

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



MEASUREMENT RESULT: "HTW0415302_fin"

4/15/2012 3:57PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.172500	46.50	10.1	65	18.3	QP	L1	GND
0.316500	52.60	10.1	60	7.2	QP	L1	GND
0.487500	45.60	10.1	56	10.6	QP	L1	GND
0.564000	43.80	10.1	56	12.2	QP	L1	GND
0.888000	43.70	10.1	56	12.3	QP	L1	GND
0.897000	42.90	10.1	56	13.1	QP	L1	GND

MEASUREMENT RESULT: "HTW0415302_fin2"

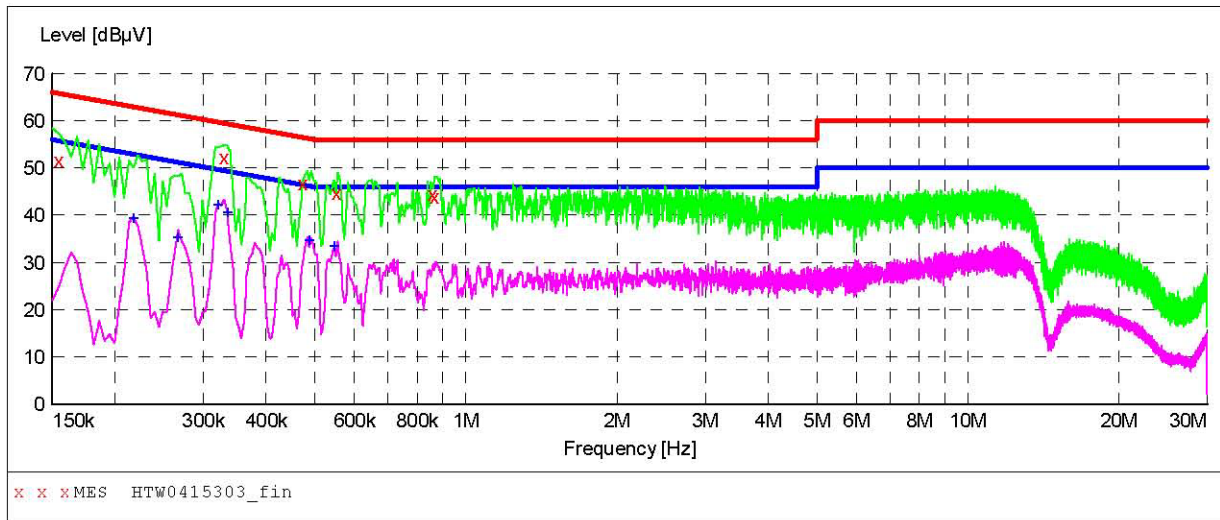
4/15/2012 3:57PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.222000	38.10	10.1	53	14.6	AV	L1	GND
0.325500	42.50	10.1	50	7.1	AV	L1	GND
0.339000	35.50	10.1	49	13.7	AV	L1	GND
0.388500	32.60	10.1	48	15.5	AV	L1	GND
0.487500	34.70	10.1	46	11.5	AV	L1	GND
0.546000	32.60	10.1	46	13.4	AV	L1	GND

For FM Modulation @ 25 KHz

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

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "HTW0415303_fin"

4/15/2012 4:00PM

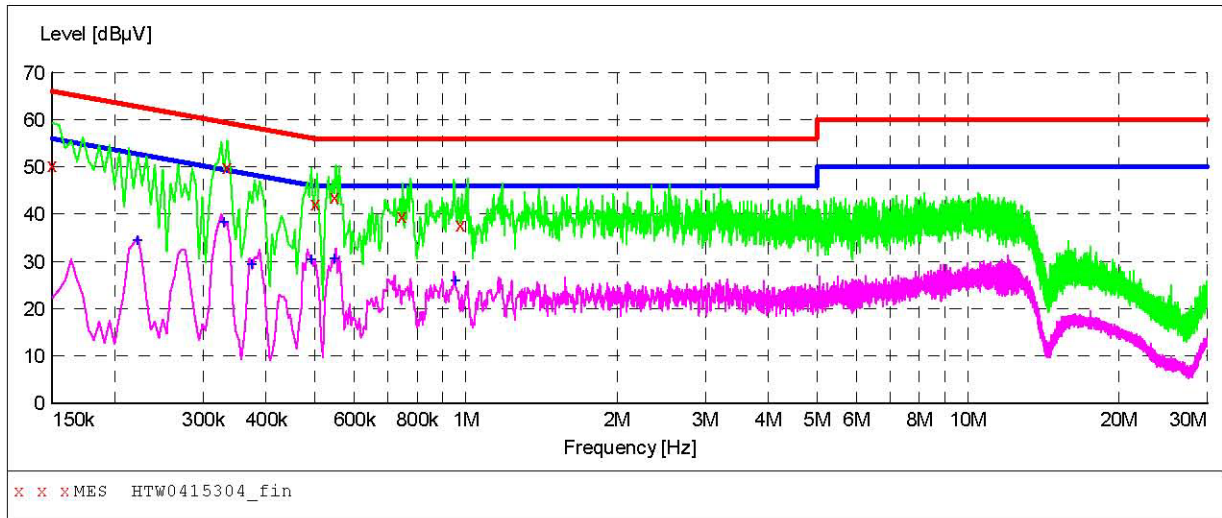
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.154500	51.60	10.1	66	14.2	QP	L1	GND
0.330000	52.20	10.1	60	7.3	QP	L1	GND
0.474000	46.80	10.1	56	9.6	QP	L1	GND
0.550500	44.70	10.1	56	11.3	QP	L1	GND
0.856500	44.60	10.1	56	11.4	QP	L1	GND
0.865500	44.00	10.1	56	12.0	QP	L1	GND

MEASUREMENT RESULT: "HTW0415303_fin2"

4/15/2012 4:00PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.217500	39.40	10.1	53	13.5	AV	L1	GND
0.267000	35.50	10.1	51	15.7	AV	L1	GND
0.321000	42.30	10.1	50	7.4	AV	L1	GND
0.334500	40.70	10.1	49	8.6	AV	L1	GND
0.487500	34.80	10.1	46	11.4	AV	L1	GND
0.546000	33.60	10.1	46	12.4	AV	L1	GND

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



MEASUREMENT RESULT: "HTW0415304_fin"

4/15/2012 4:03PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	50.40	10.1	66	15.6	QP	N	GND
0.334500	50.10	10.1	59	9.2	QP	N	GND
0.501000	42.30	10.1	56	13.7	QP	N	GND
0.546000	43.70	10.1	56	12.3	QP	N	GND
0.744000	39.70	10.1	56	16.3	QP	N	GND
0.973500	37.80	10.2	56	18.2	QP	N	GND

MEASUREMENT RESULT: "HTW0415304_fin2"

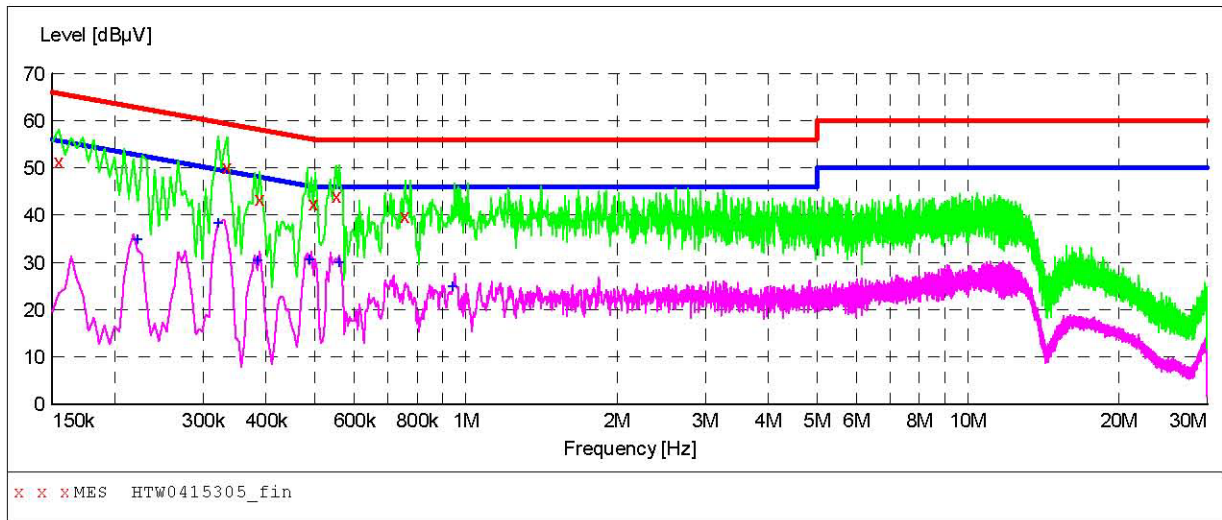
4/15/2012 4:03PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.222000	34.50	10.1	53	18.2	AV	N	GND
0.330000	38.50	10.1	50	11.0	AV	N	GND
0.375000	29.60	10.1	48	18.8	AV	N	GND
0.492000	30.50	10.1	46	15.6	AV	N	GND
0.546000	30.70	10.1	46	15.3	AV	N	GND
0.955500	26.00	10.2	46	20.0	AV	N	GND

For FSK Modulation @ 12.5 KHz

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

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "HTW0415305_fin"

4/15/2012 4:05PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.154500	51.50	10.1	66	14.3	QP	N	GND
0.334500	50.20	10.1	59	9.1	QP	N	GND
0.388500	43.50	10.1	58	14.6	QP	N	GND
0.496500	42.50	10.1	56	13.6	QP	N	GND
0.550500	44.10	10.1	56	11.9	QP	N	GND
0.753000	39.90	10.1	56	16.1	QP	N	GND

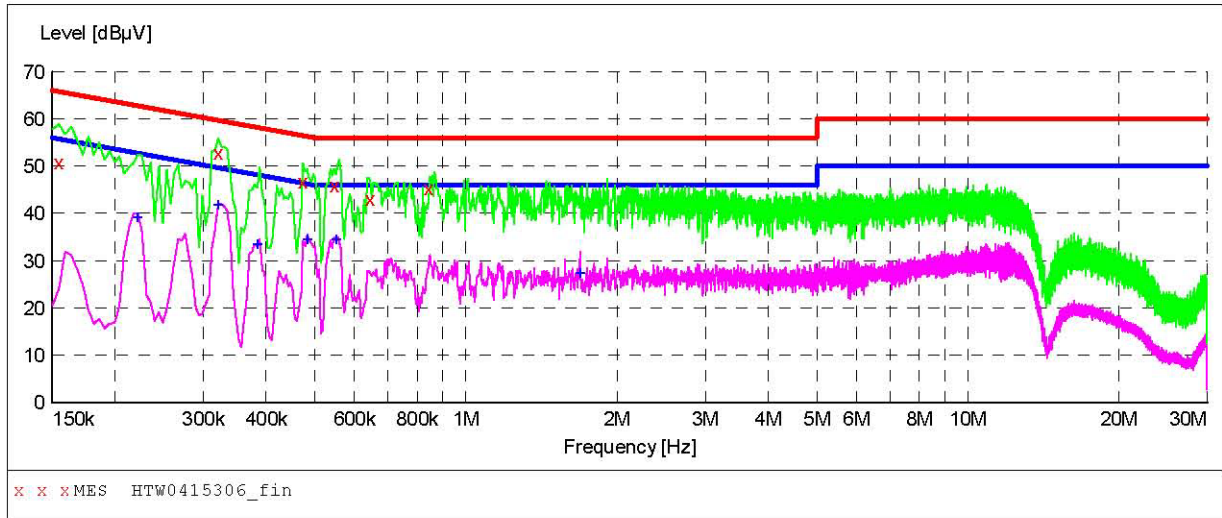
MEASUREMENT RESULT: "HTW0415305_fin2"

4/15/2012 4:05PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.222000	34.90	10.1	53	17.8	AV	N	GND
0.321000	38.50	10.1	50	11.2	AV	N	GND
0.384000	30.60	10.1	48	17.6	AV	N	GND
0.487500	30.80	10.1	46	15.4	AV	N	GND
0.559500	30.10	10.1	46	15.9	AV	N	GND
0.942000	25.10	10.1	46	20.9	AV	N	GND

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

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "HTW0415306_fin"

4/15/2012 4:08PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.154500	50.90	10.1	66	14.9	QP	L1	GND
0.321000	52.80	10.1	60	6.9	QP	L1	GND
0.474000	46.80	10.1	56	9.6	QP	L1	GND
0.546000	46.00	10.1	56	10.0	QP	L1	GND
0.645000	43.20	10.1	56	12.8	QP	L1	GND
0.843000	45.30	10.1	56	10.7	QP	L1	GND

MEASUREMENT RESULT: "HTW0415306_fin2"

4/15/2012 4:08PM

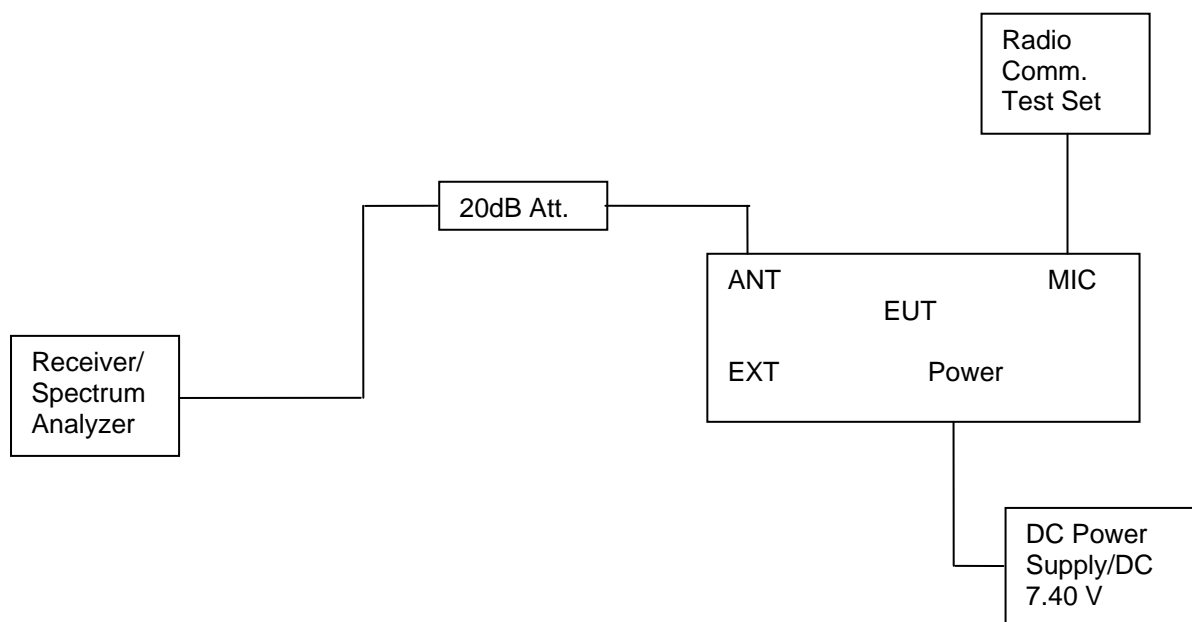
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.222000	39.20	10.1	53	13.5	AV	L1	GND
0.321000	42.00	10.1	50	7.7	AV	L1	GND
0.384000	33.50	10.1	48	14.7	AV	L1	GND
0.483000	34.60	10.1	46	11.7	AV	L1	GND
0.550500	34.50	10.1	46	11.5	AV	L1	GND
1.693500	27.40	10.2	46	18.6	AV	L1	GND

4.2. Occupied Bandwidth and Emission Mask Test

TEST APPLICABLE

- (a). Occupied Bandwidth: The EUT was connected to the audio signal generator and the spectrum analyzer via the main RF connector, and through an appropriate attenuator. The EUT was controlled to transmit its maximum power. Then the bandwidth of 99% power can be measured by the spectrum analyzer.
- (b). Emission Mask B: For transmitters that are equipped with an audio low-pass filter pursuant to §90.211(a), the power of any emission must be below the unmodulated carrier power (P) as follows:
- (1) On any frequency removed from the assigned frequency by more than 50 percent, but not more than 100 percent of the authorized bandwidth: At least 25 dB.
 - (2) On any frequency removed from the assigned frequency by more than 100 percent, but not more than 250 percent of the authorized bandwidth: At least 35 dB.
 - (3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least $43 + 10 \log (P)$ dB.
- (c). Emission Mask D, 12.5 kHz channel bandwidth equipment: For transmitters designed to operate with a 12.5 kHz channel bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:
- (1) On any frequency from the center of the authorized bandwidth 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.
- (d). Emission Mask I: 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 center of the authorized bandwidth by a displacement frequency of more than 6.8 kHz, but no more than 9.0 kHz: At least 25 dB;
 - (2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency of more than 9.0 kHz, but no more than 15 kHz: At least 35 dB;
 - (3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency of more than 15 kHz: At least $43 + 10 \log (P)$ 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, set =100Hz, VBW=1 KHz, span=50 KHz for 12.5 channel spacing.

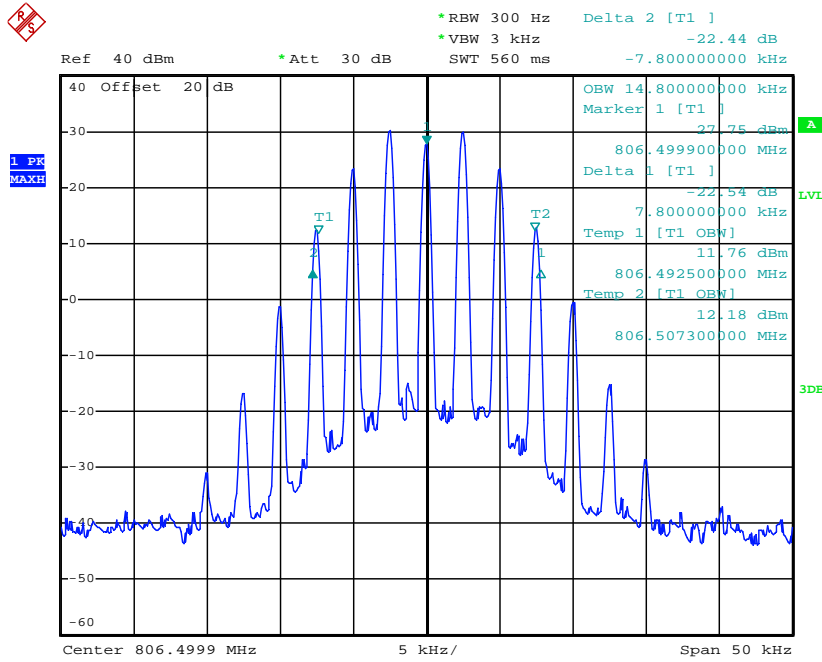
TEST RESULTS

4.2.1 Occupied Bandwidth

Frequency Range (MHz)	Modulation Type	Channel Separation (KHz)	Test Channel	Occupied Bandwidth (KHz)	
				99%	26dB
806-825	Analog/FM	25	Low Channel	14.80	15.60
			Middle Channel	14.80	15.70
			High Channel	14.80	15.70
		12.5	Low Channel	9.80	10.40
			Middle Channel	9.80	10.60
			High Channel	9.80	10.60
	Digital/4FSK	12.5	Low Channel	7.50	9.80
			Middle Channel	7.60	10.00
			High Channel	7.30	10.20
851-870	Analog/FM	25	Low Channel	14.90	15.70
			Middle Channel	14.80	15.80
			High Channel	14.80	15.70
		12.5	Low Channel	9.80	10.50
			Middle Channel	9.80	10.50
			High Channel	9.80	10.50
	Digital/4FSK	12.5	Low Channel	7.50	9.90
			Middle Channel	7.40	9.90
			High Channel	7.50	9.40
896-902	Analog/FM	12.5	Low Channel	9.90	10.50
			High Channel	9.90	10.50
	Digital/4FSK		Low Channel	9.90	10.50
			High Channel	9.90	10.50
935-941	Analog/FM	12.5	Low Channel	7.40	9.50
			High Channel	7.70	10.10
	Digital/4FSK		Low Channel	7.60	9.70
			High Channel	7.60	10.10
Limit	806-825MHz/851-870MHz		11.25KHz for 12.5KHz Channel Separation 20KHz for 25KHz Channel Separation		
	896-902MHz/935-941MHz		13.6KHz for 12.5KHz Channel Separation		
Test Results	Compliance				

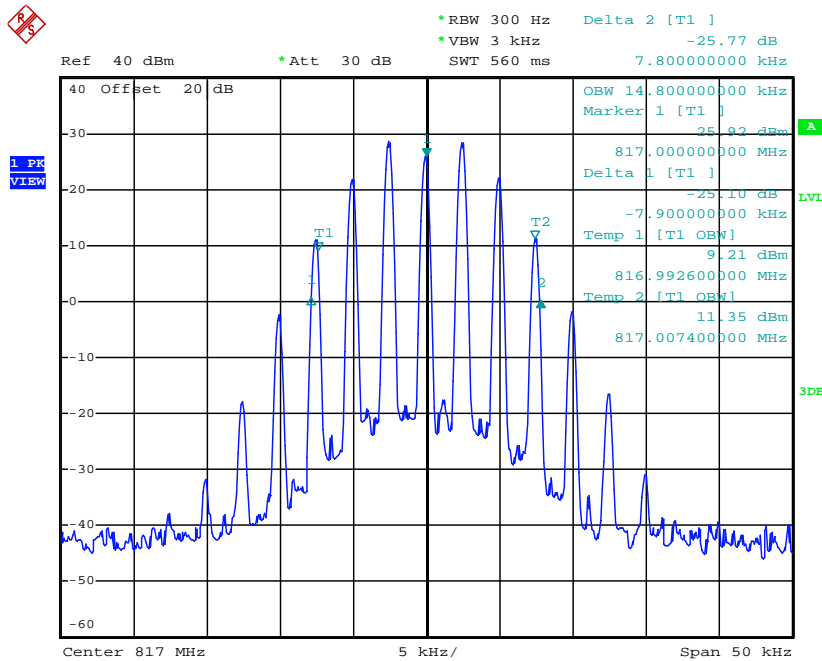
Plots of 99% and 26dB Bandwidth Measurement

Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	25 KHz	806.5000	14.80	15.60	20.00	Compliance



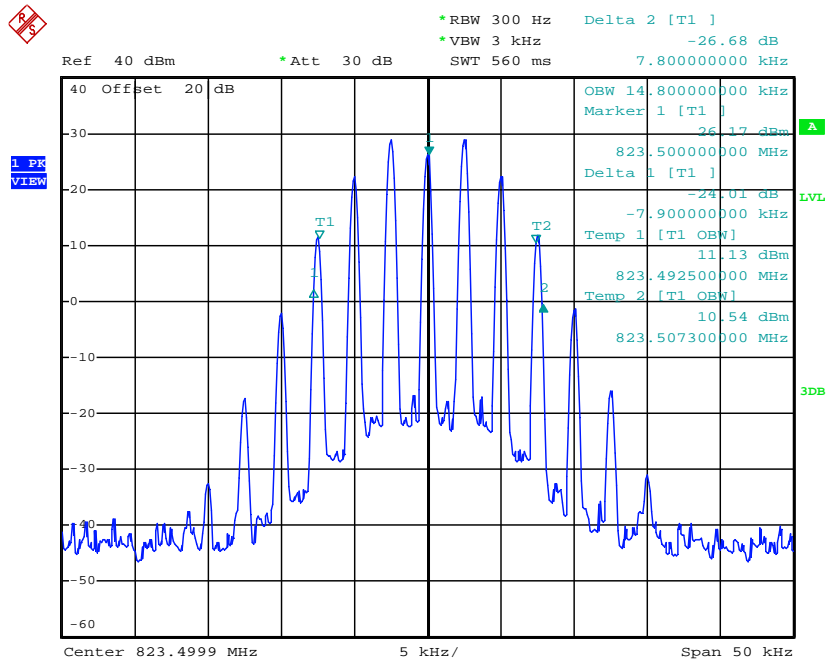
Date: 12.APR.2012 09:23:21

Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	25 KHz	817.0000	14.80	15.70	20.00	Compliance



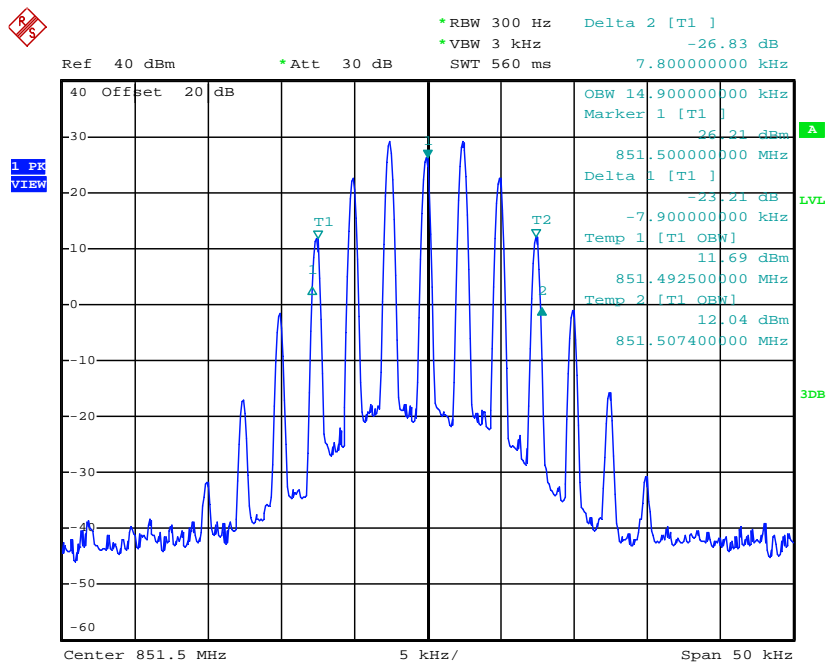
Date: 12.APR.2012 10:31:29

Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	25 KHz	823.5000	14.80	15.70	20.00	Complicance



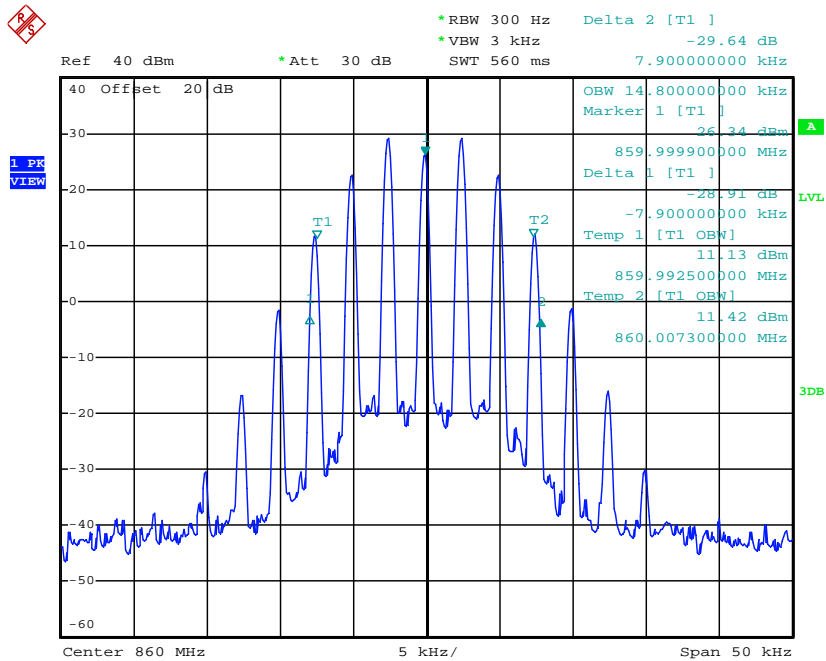
Date: 12.APR.2012 10:39:26

Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	25 KHz	851.5000	14.90	15.70	20.00	Complicance



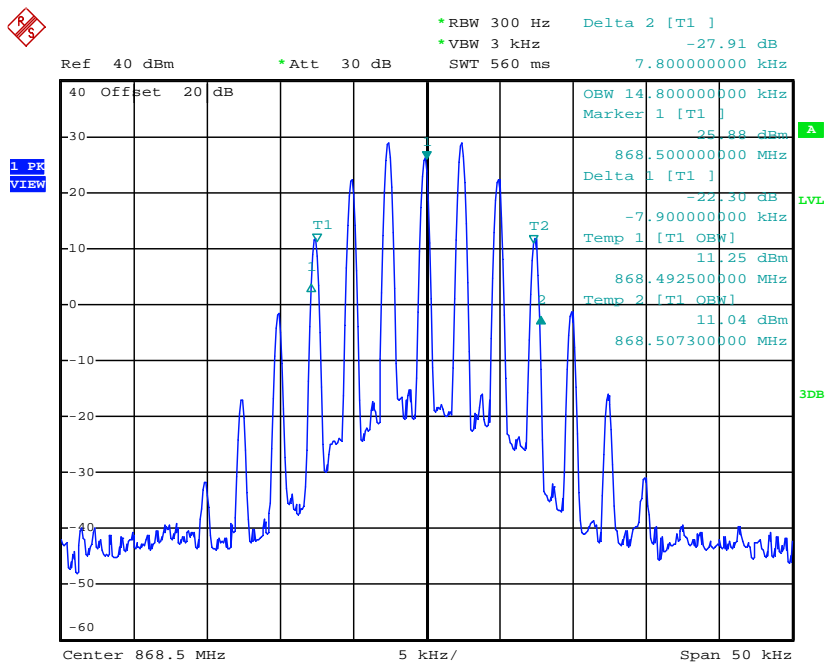
Date: 12.APR.2012 10:40:43

Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	25 KHz	860.0000	14.80	15.80	20.00	Compliance



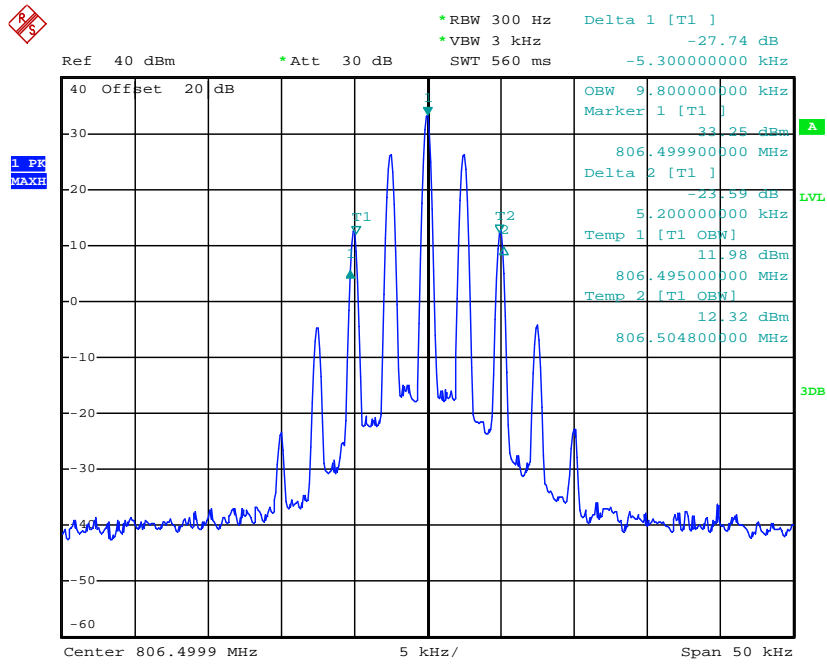
Date: 12.APR.2012 11:02:48

Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	25 KHz	868.5000	14.80	15.70	20.00	Compliance



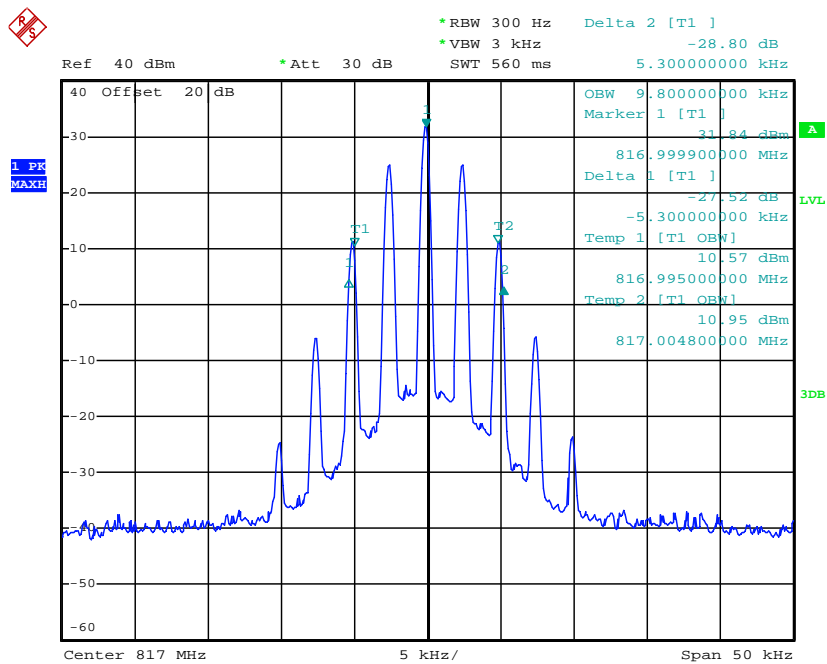
Date: 12.APR.2012 11:04:55

Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	12.5 KHz	806.5000	9.80	10.40	11.25	Compliance



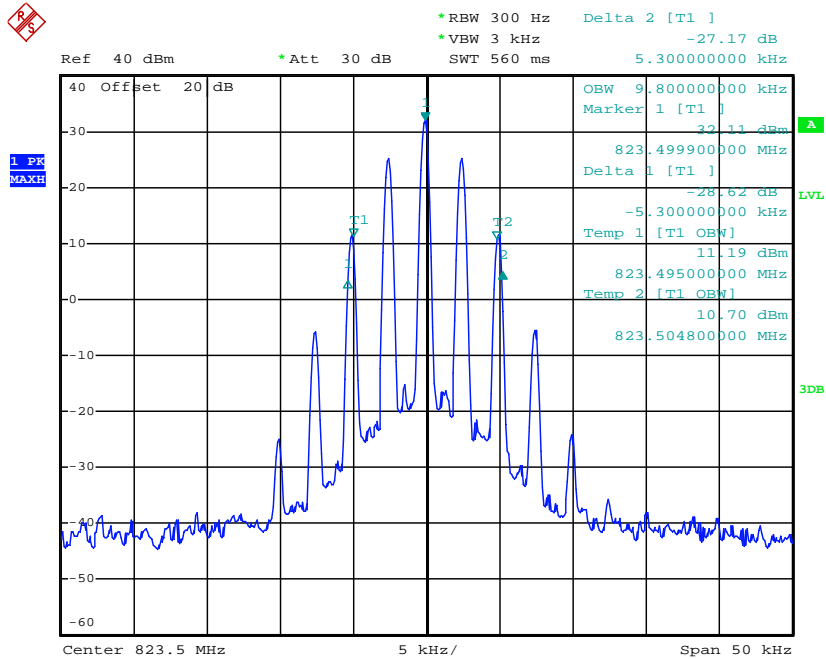
Date: 12.APR.2012 11:18:49

Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	12.5 KHz	817.0000	9.80	10.60	11.25	Compliance



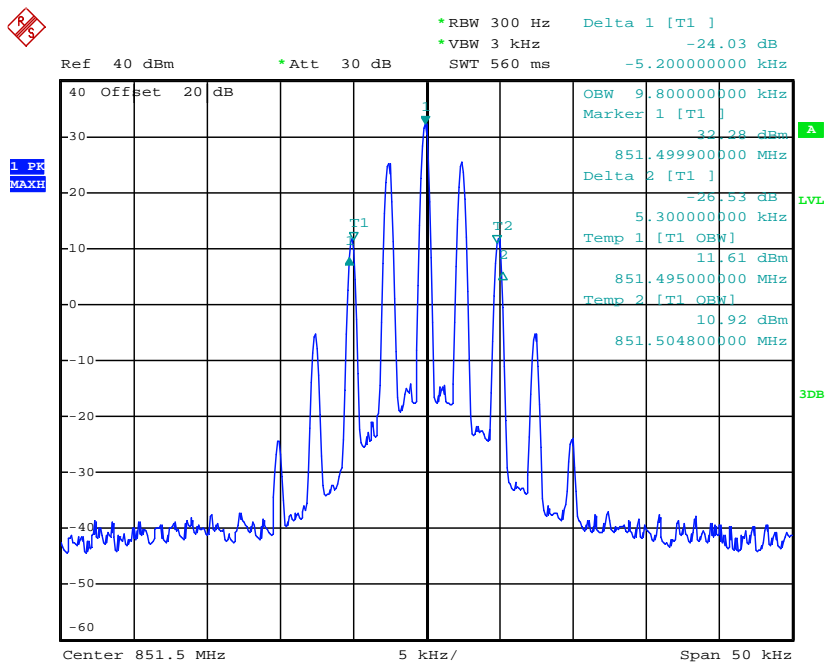
Date: 12.APR.2012 11:21:24

Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	12.5 KHz	823.5000	9.80	10.60	11.25	Compliance



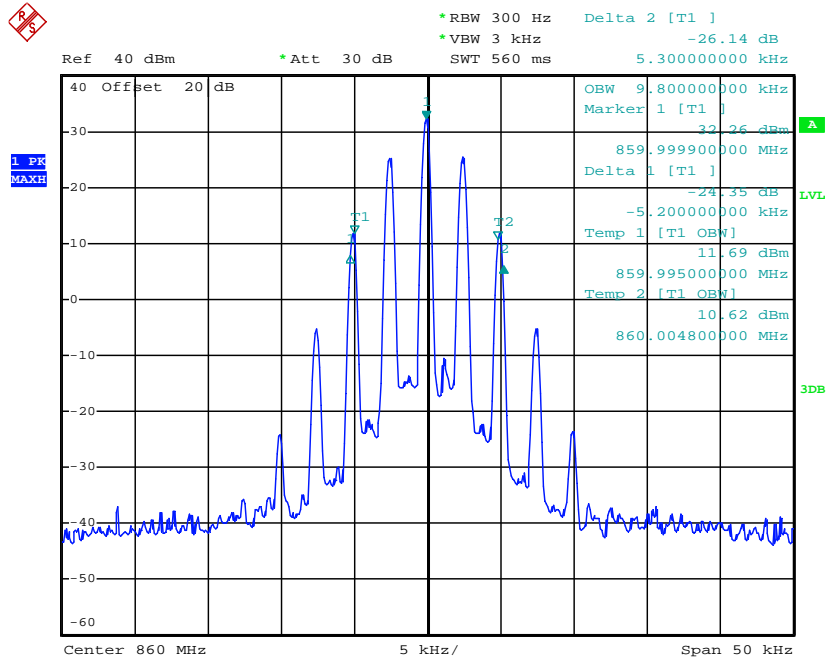
Date: 12.APR.2012 11:22:35

Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	12.5 KHz	851.5000	9.80	10.50	11.25	Compliance



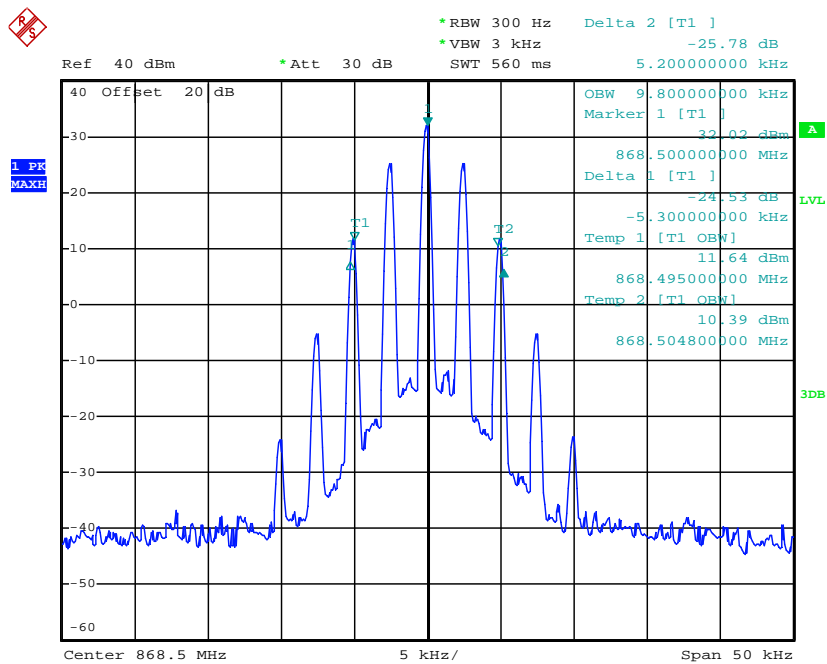
Date: 12.APR.2012 11:23:13

Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	12.5 KHz	860.0000	9.80	10.50	11.25	Compliance



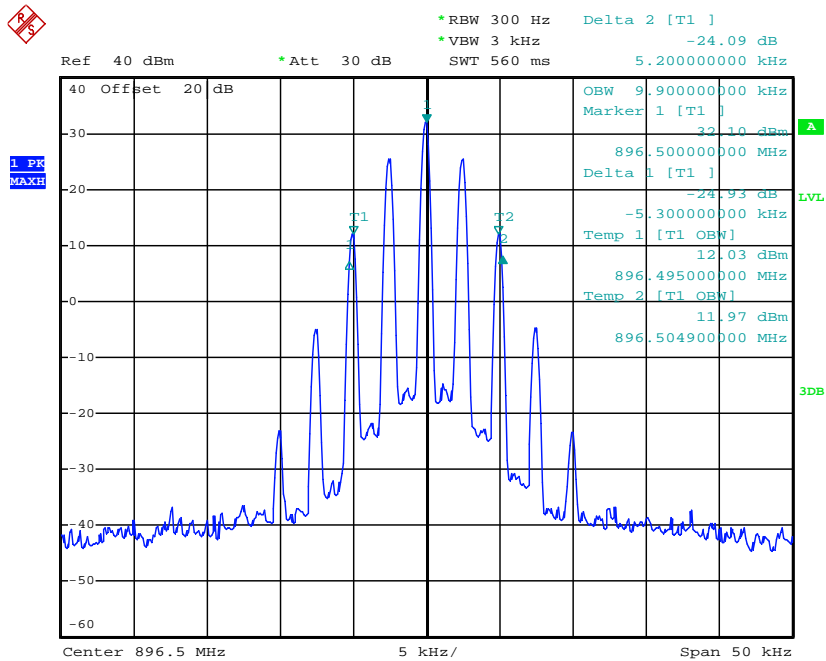
Date: 12.APR.2012 11:23:49

Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	12.5 KHz	868.5000	9.80	10.50	11.25	Compliance



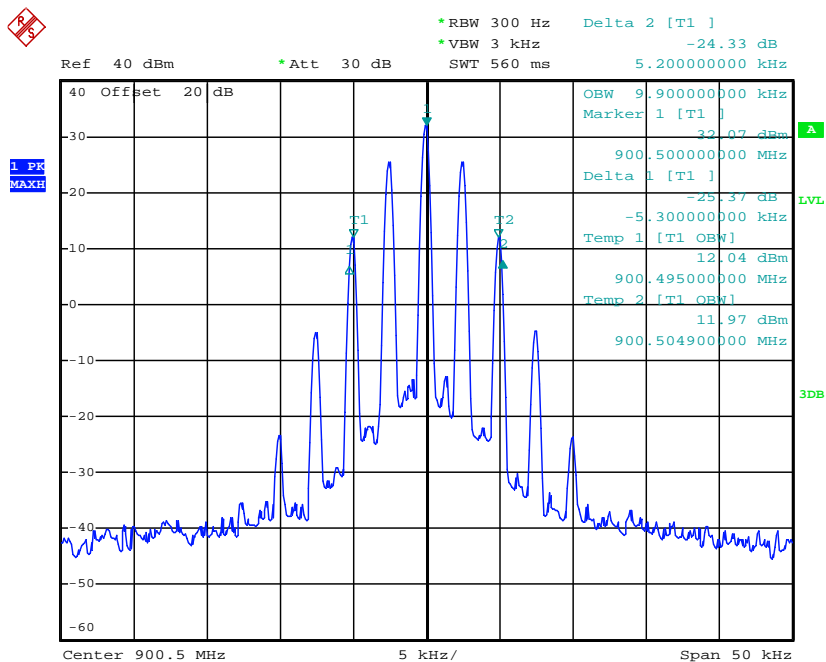
Date: 12.APR.2012 11:24:52

Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	12.5 KHz	896.5000	9.90	10.50	13.60	Compliance



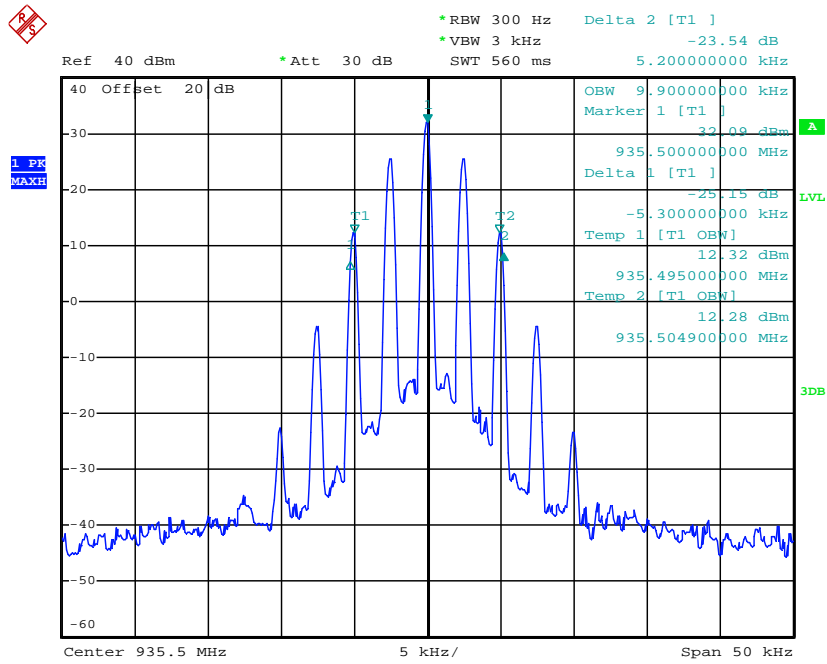
Date: 12.APR.2012 11:25:50

Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	12.5 KHz	900.5000	9.90	10.50	13.60	Compliance



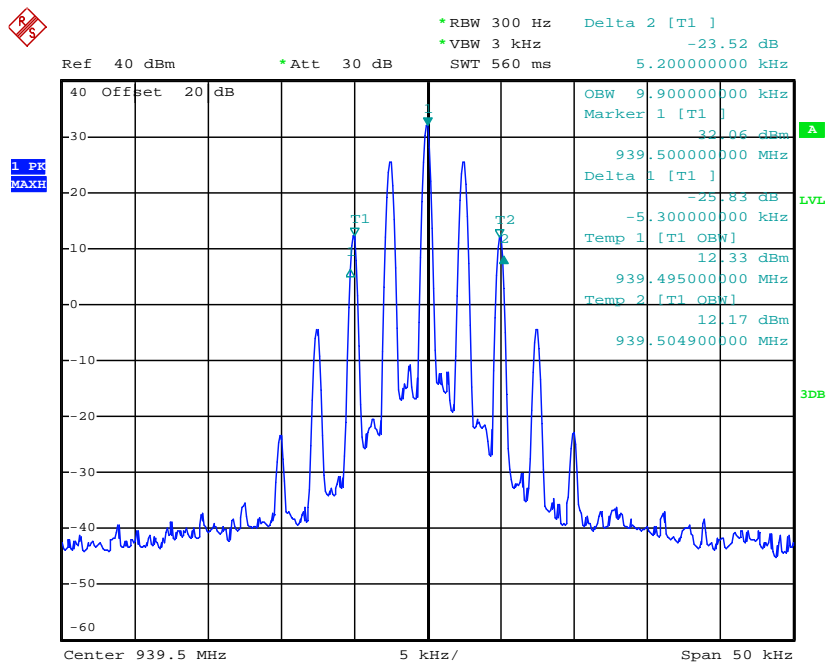
Date: 12.APR.2012 11:26:27

Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	12.5 KHz	935.5000	9.90	10.50	13.60	Complicance



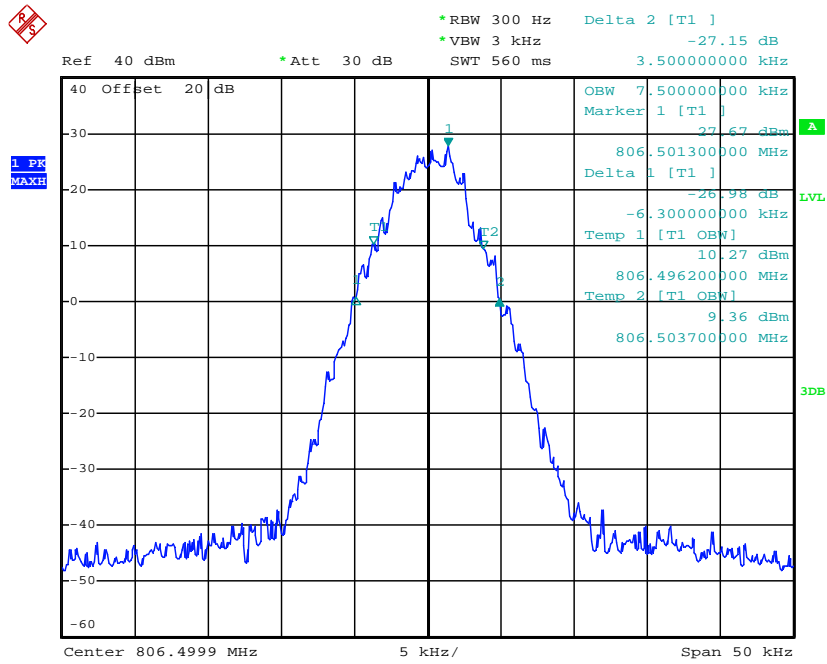
Date: 12.APR.2012 11:27:26

Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
FM	12.5 KHz	939.5000	9.90	10.50	13.60	Complicance



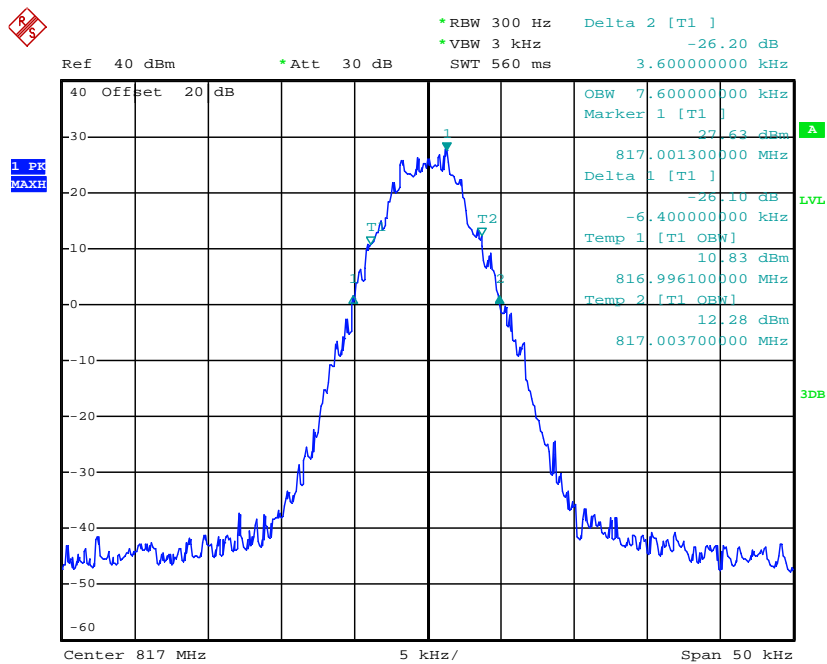
Date: 12.APR.2012 11:28:28

Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
4FSK	12.5 KHz	806.5000	7.50	9.80	11.25	Compliance



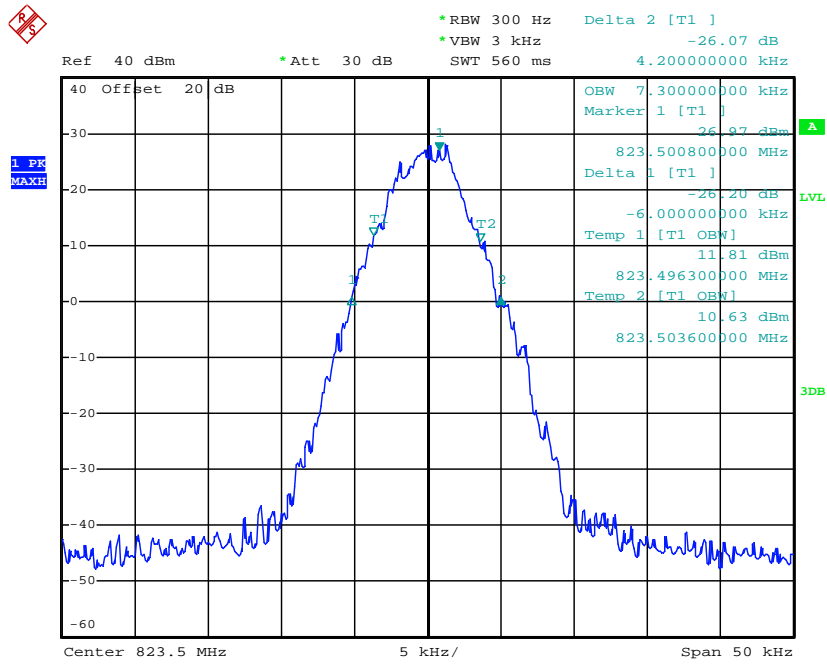
Date: 12.APR.2012 07:20:22

Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
4FSK	12.5 KHz	817.0000	7.60	10.00	11.25	Compliance



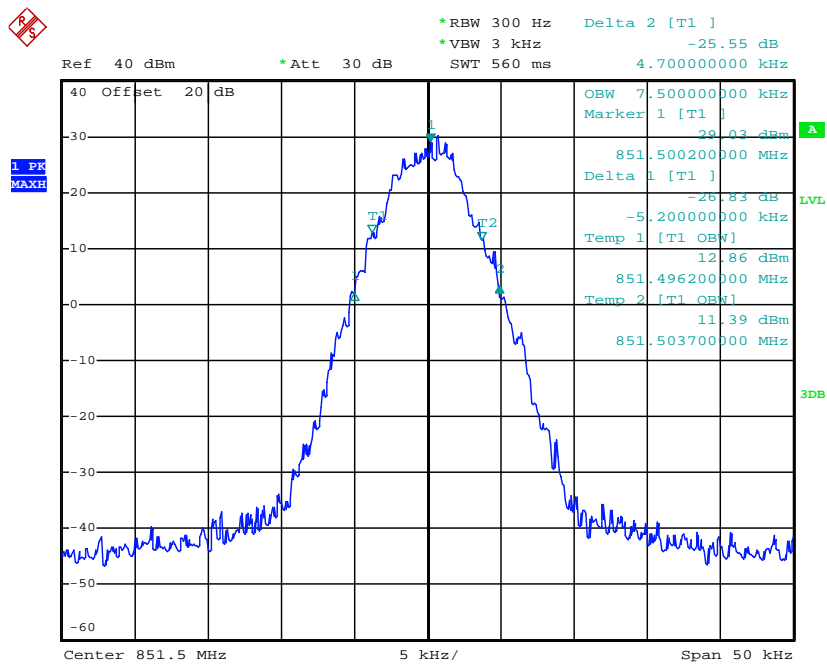
Date: 12.APR.2012 07:21:18

Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
4FSK	12.5 KHz	823.5000	7.30	10.20	11.25	Compliance



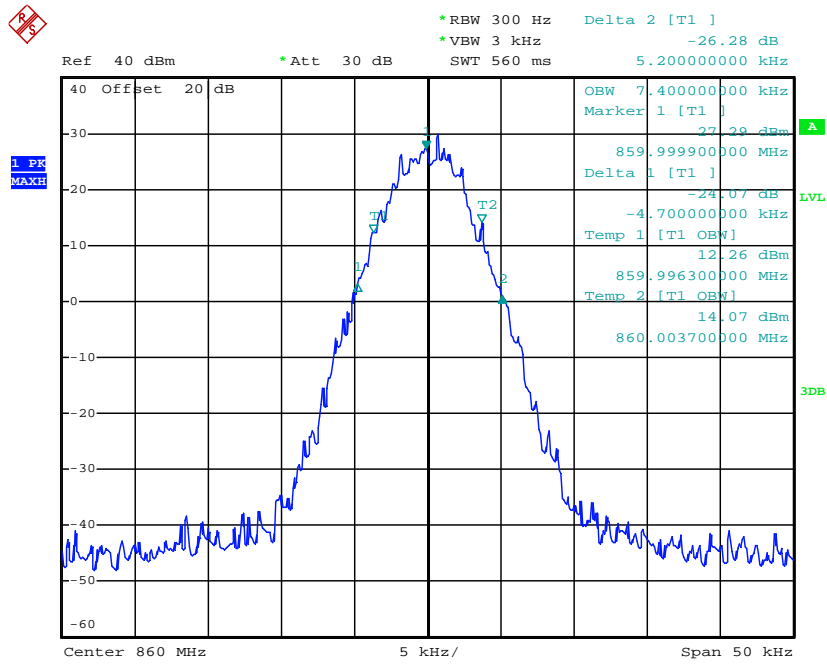
Date: 12.APR.2012 07:22:23

Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
4FSK	12.5 KHz	851.5000	7.50	9.90	11.25	Compliance



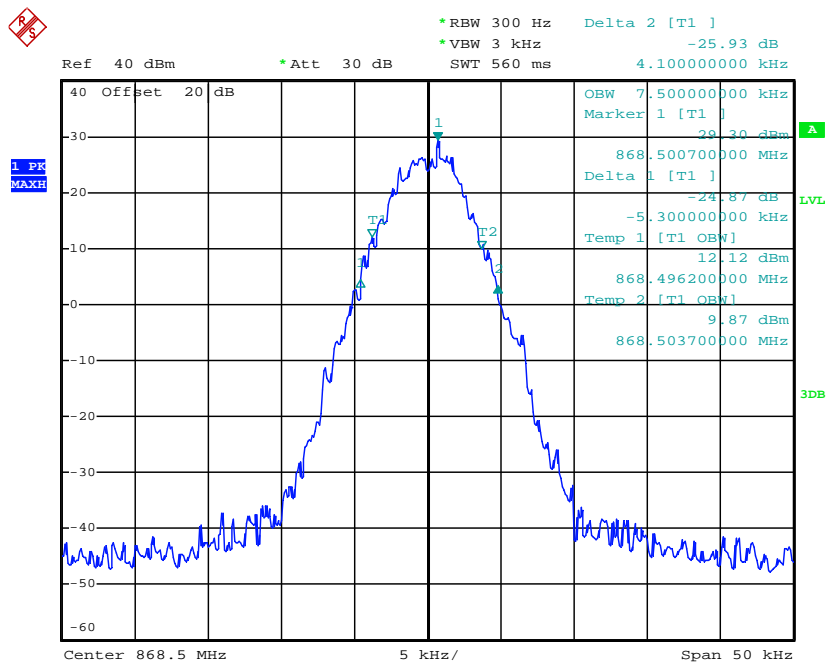
Date: 12.APR.2012 07:25:00

Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
4FSK	12.5 KHz	860.0000	7.40	9.90	11.25	Complicance



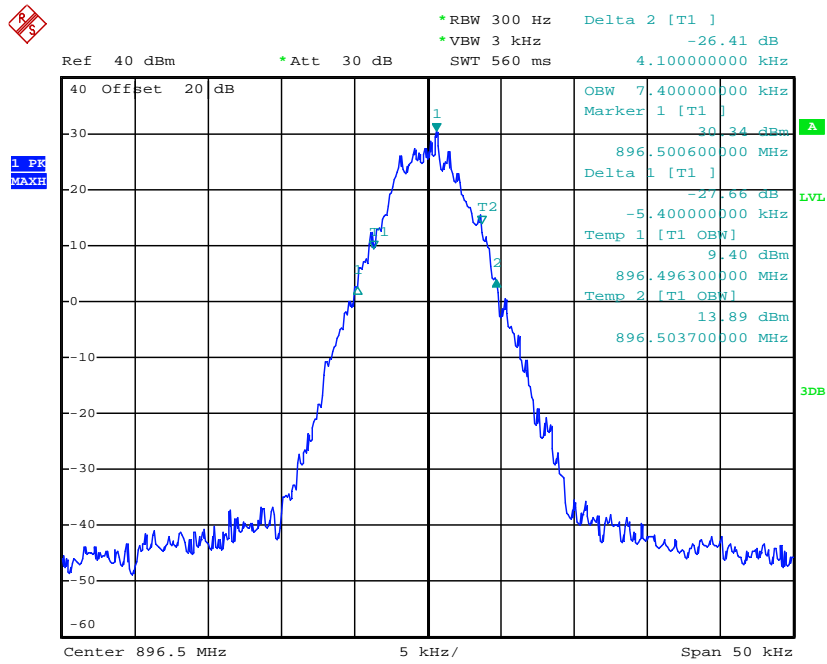
Date: 12.APR.2012 07:26:02

Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
4FSK	12.5 KHz	868.5000	7.50	9.40	11.25	Complicance



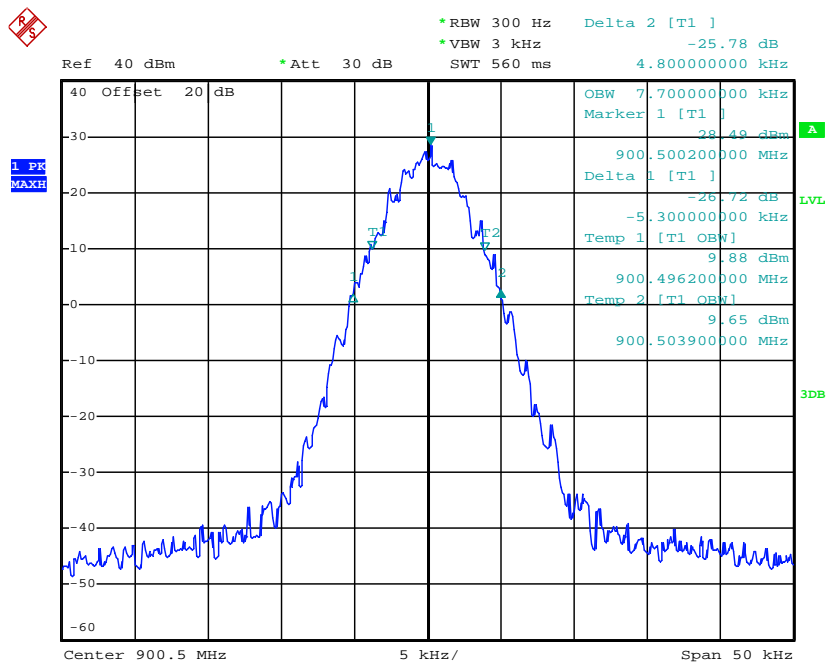
Date: 12.APR.2012 07:26:53

Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
4FSK	12.5 KHz	896.5000	7.40	9.50	13.60	Compliance



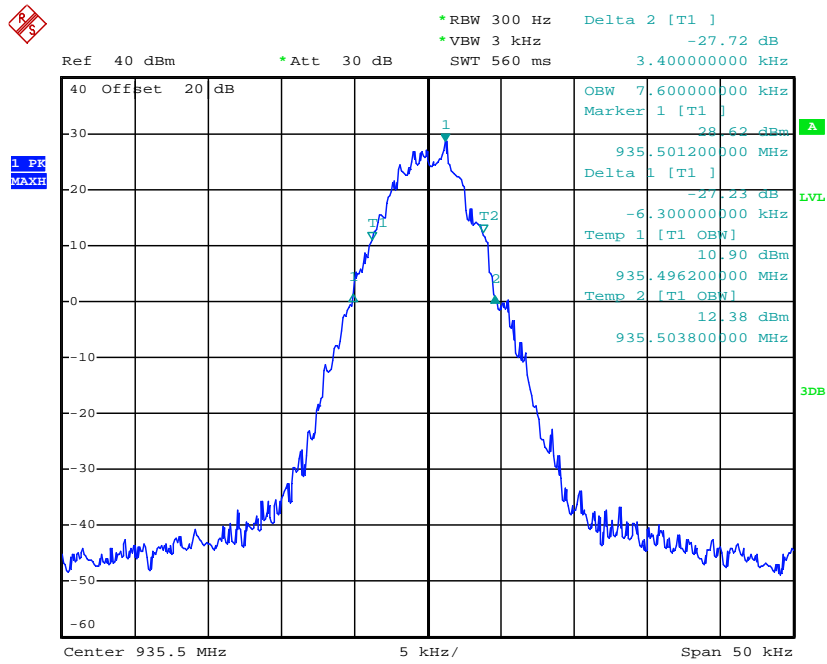
Date: 12.APR.2012 07:27:45

Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
4FSK	12.5 KHz	900.5000	7.70	10.10	13.60	Compliance



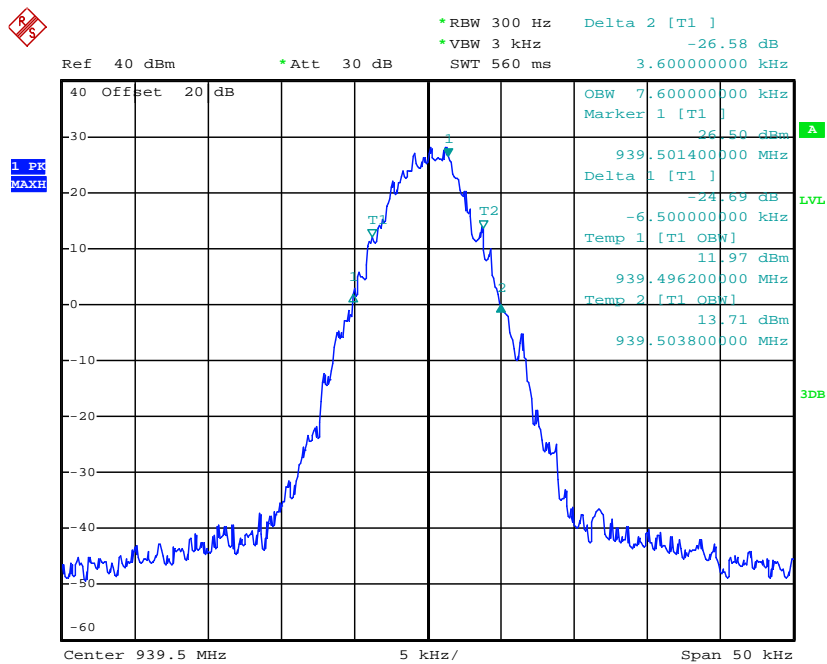
Date: 12.APR.2012 07:28:34

Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
4FSK	12.5 KHz	935.5000	7.60	9.70	13.60	Compliance



Date: 12.APR.2012 07:29:29

Modulation Type	Channel Separation	Freq.(MHz)	99% Bandwidth (KHz)	26dB Bandwidth (KHz)	FCC Limit (KHz)	Results
4FSK	12.5 KHz	939.5000	7.60	10.10	13.60	Compliance



Date: 12.APR.2012 07:30:19