Excellence in Compliance Testing

Certification Test Report

FCC ID: SDBIDTB004
IC: 2220A-IDTB004
FCC Rule Part: CFR 47 Part 24 Subpart D, Part 101 Subpart C
IC Radio Standards Specification: RSS 119, RSS 134

ACS Report Number: 16-3020.W06.1A

Applicant: Sensus Metering Systems, Inc.
Model: IDTB004

Test Begin Date: March 29, 2016
Test End Date: March 30, 2016

Report Issue Date: May 12, 2016

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY

For The Scope of Accreditation Under Certificate Number AT-1921
This report must not be used by the client to claim product certification, approval, or endorsement by ANAB, ANSI, or any agency of the Federal Government.

Project Manager:

M. R de Aranzeta

Mario de Aranzeta
Lab Manager Durham (RTP)
Advanced Compliance Solutions, Inc.

Reviewed by:

Kirby Munroe
Director, Wireless Certifications
Advanced Compliance Solutions, Inc.

This report contains 73 pages

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1.0 GENERAL

1.1 Purpose

The purpose of this report is to demonstrate continued compliance with Part 2 Subpart J, Part 24 Subpart D and Part 101 Subpart C of the FCC's Code of Federal Regulations, and Innovation, Science and Economic Development, Canada Radio Standards Specifications RSS-119 and RSS-134.

This class II change report adds eight new modulations types to the product. This was done with no electronic circuit changes the product.

1.2 Product Description

The Sensus Integrated Display Transceiver Board, Model IDTB004, is a wireless module with meter display circuitry. The device mounts into the Sensus iCon and Stratus electric meters. The device acts as the "Integrated Communications Device" and provides the RF functionality for the meter.

The IDTB monitors meter reading and diagnostic information which is transmitted via the Sensus fixed wireless telemetry network to the utility provider.

Manufacturer Information:
Sensus Metering Systems, Inc.
639 Davis Drive
Morrisville, NC 27560

Test Sample Condition: The EUT was in good functional condition with no physical damage.

Test software provided by the manufacturer was used to exercise the EUT.

The evaluation for unintentional emission is documented separately in a verification report.

1.3 Test Methodology

1.3.1 Configurations and Justification

The EUT's additional modulations formats was evaluated using the RF conducted measurements: spurious emissions at the antenna port and compliance to the emissions masks. Since there are no changes to the electronic circuitry of the product, radiated spurious emissions and other unaffected parameters were not measured. RF power output is provided for reference.

1.3.2 In-Band Testing Methodology

The EUT is designed to operate in multiple bands under the requirements of CFR 47 Parts 24 and 101. The following is a list of the frequency bands of operation sorted based on the FCC rule parts in which the band is associated.

CFR Title 47 Rule Part	Frequency Band of Operation (MHz)
24D	901.0 - 902.0
24D	930.0 - 931.0
24D	940.0 - 941.0
101	928.85 - 929.0
101	932.0 - 932.5
101	941.0 - 941.5
101	952.0 – 953.0
101	959.85 - 960.0

Based on the requirements set forth in accordance 47 CFR 2.1046-2.1057 as stated above, the methodology in selecting the places to test in the available bands of operation is outlined in the following table.

CFR Title 47 Rule Part	Frequency Band of Operation (MHz)	Location in the Range of Operation	Approx. Test Freq. MHz
24D	901.0 - 902.0	Middle	901.5000
101	928.85 - 929.0	Middle	928.9250
24D	930.0 - 931.0	Middle	930.5000
101	932.0 - 932.5	Middle	932.2500
24D	940.0 - 941.0	1 near top and 1 near bottom	940.0125
101	941.0 - 941.5		941.4875
101	952.0 – 953.0	Middle	952.5000
101	959.85 – 960.0	Middle	959.9250

1.4 Emission Designators

The IDTB004 transmitter produces 14 additional distinct modulation formats. The emission designators for the modulation types used by the IDTB004 transmitter were calculated using the baud rate defined in the Theory of Operation and are as follows.

Mode	Emission Designator	Modulation Type
2SFSK (Half Baud)	5K00F1D	2-SFSK
4SFSK (Half Baud)	5K60F1D	4-SFSK
8SFSK (Half Baud)	5K90F1D	8-SFSK
2SFSK	10K0F1D	2-SFSK
4SFSK	11K3F1D	4-SFSK
8SFSK	11K9F1D	8-SFSK
m4Pass 10k	4K70F1D	4-GFSK
m4Pass 20k	9K30F1D	4-GFSK
C&I	4K80F2D	7-FSK
Double Density	9K60F2D	13-FSK
Normal	9K60F2D	7-FSK
Priority	4K80F2D	13-FSK
mPass5k	5K90F1D	2-GFSK
mPass10k	11K8F1D	2-GFSK

2.0 TEST FACILITIES

2.1 Location

The radiated and conducted emissions test sites are located at the following address:

Advanced Compliance Solutions, Inc.
2320 Presidential Dr. Suite 101
Durham NC 27703
Phone: (919) 381-4235
www.acstestlab.com

FCC Test Firm Registration #: 637011
Industry Canada Lab Code: 20446

2.2 Laboratory Accreditations/Recognitions/Certifications

ACS (Durham) is accredited to ISO/IEC 17025 by ANSI-ASQ National Accreditation Board/ANAB accreditation program, and has been issued certificate number AT-1921 in recognition of this accreditation. Unless otherwise specified, all tests methods described within this report are covered under the ISO/IEC 17025 scope of accreditation.

2.3 Radiated & Conducted Emissions Test Site Description

2.3.1 Semi-Anechoic Chamber Test Site

The Semi-Anechoic Chamber Test Site consists of an 18' x 28' x 18' shielded enclosure. The chamber is lined with Samwha Electronics Co. LTD Ferrite Absorber, model number SFA300 (HSN-1). The ferrite tile is 10cm x 10 cm and weighs approximately 1.4lbs. These tiles are mounted on steel panels and installed directly on the inner walls of the chamber. On top of the ferrite tiles is DMAS HT-45 (Dutch Microwave Absorber Solutions) hybrid absorber on all walls except the wall behind the antenna mast which has a shorter DMAS HT-25 absorber.

The turntable is 1.50m in diameter and is located 150cm from the back wall of the chamber. The chamber is grounded via 1 - 8' copper ground rod, installed at the center of the back wall, it is bound to the ground plane using short #6 copper wire. The turntable is an aluminum, flush mounted table installed in an all steel frame. The table is remotely operated from inside the control room located 25' from the turntable. The turntable is electrically bonded to the surrounding ground plane via steel fingers installed on the edge of the turntable. The steel fingers make constant contact with the ground plane.

Behind the turntable is a 2' x 6' x 1.5' deep shielded pit used for support equipment if necessary. The pit is equipped with 2 - 4" PVC chase from the turntable to the pit that allow for cabling to the EUT if necessary. The underside of the turntable can be accessed from the pit so cables can be supplied to the EUT from the pit.

A diagram of the Semi-Anechoic Chamber Test Site is shown in Figure 2.3.1-1 below:

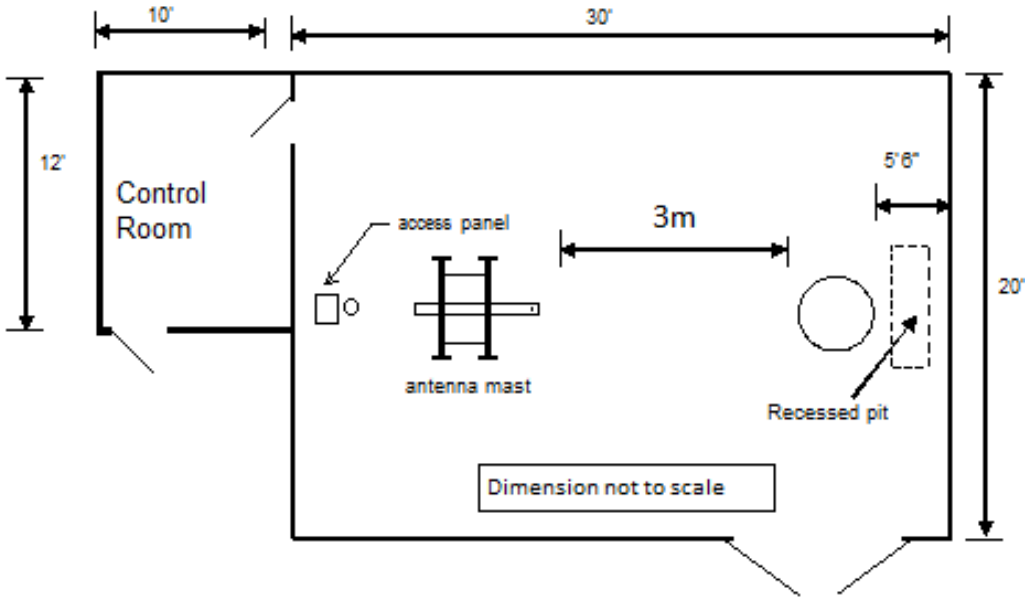

Figure 2.3.1-1: Semi-Anechoic Chamber Test Site

2.3.2 Conducted Emissions Test Site Description

The AC mains conducted EMI site is located in the main EMC lab. It consists of an 8' x 10' sheet galvanized steel horizontal ground reference plane (GRP) bonded every 6" to an 8' X 8' aluminum vertical ground plane.

A diagram of the room is shown below in figure 2.3.2-1:

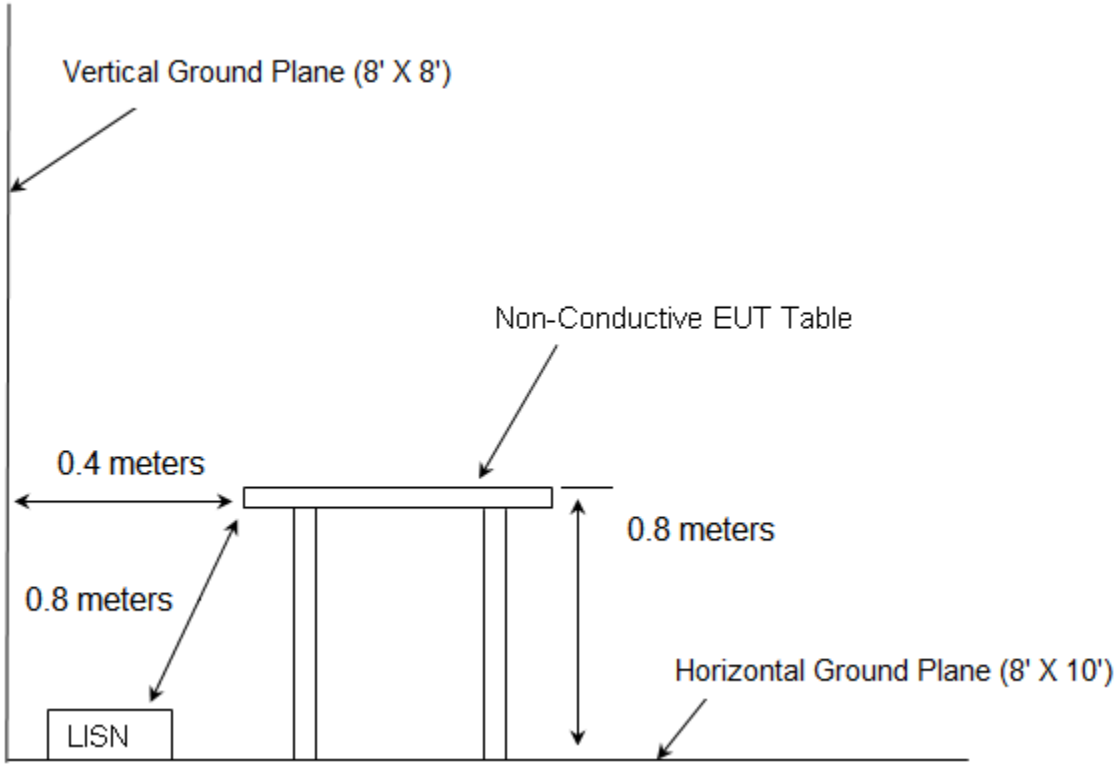

Figure 2.3.2-1: AC Mains Conducted EMI Site

3.0 APPLICABLE STANDARD REFERENCES

The following standards were used:

1 - ANSI C63.4-2014: Method of Measurements of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the 9 kHz to 40GHz - 2014
2 - US Code of Federal Regulations (CFR): Title 47, Part 2, Subpart J: Equipment Authorization Procedures - 2016
3 - US Code of Federal Regulations (CFR): Title 47, Part 24, Subpart D: Personal Communications Services – 2016
4 - US Code of Federal Regulations (CFR): Title 47, Part 101, Subpart C: Fixed Microwave Services - 2016
5 – TIA-603-D: Land Mobile FM or PM - Communications Equipment - Measurement and Performance Standards – 2010
6 – Industry Canada Radio Standards Specification: RSS-119 - Radio Transmitters and Receivers Operating in the Land Mobile and Fixed Services in the Frequency Range 27.41-960 MHz, Issue 12, May 2015
7 – Industry Canada Radio Standards Specification: RSS-134 - 900 MHz Narrow Band Personal Communication Service, Issue 2, February 2016
8 – Industry Canada Radio Standards Specification: RSS-GEN – General Requirements for Compliance of Radio Apparatus, Issue 4, November 2014.

4.0 LIST OF TEST EQUIPMENT

The calibration interval of test equipment is annually or the manufacturer's recommendations. Where the calibration interval deviates from the annual cycle based on the instrument manufacturer's recommendations, it shall be stated below.

Table 4-1: Test Equipment

AssetID	Manufacturer	Model #	Equipment Type	Serial #	Last Calibration Date	Calibration Due Date
3002	Rohde & Schwarz	ESU40	Receiver	100346	7/6/2015	7/6/2016
3033	Hasco, Inc.	HLL142-S1-S1-36	Cables	1435	1/7/2016	1/7/2017
3034	Hasco, Inc.	HLL142-S1-S-12	Cables	3076	12/30/2015	12/30/2016
3055	Rohde & Schwarz	3005	Cables	3055	12/30/2015	12/30/2016
3029	Micro-Tronics	HPM50108	Filter	134	12/21/2015	12/21/2016
3041	Aeroflex Inmet	18N10W-30	Attenuator	1447	1/8/2016	1/8/2017
3042	Aeroflex Inmet	18N10W-10	Attenuator	1444	1/8/2016	1/8/2017

NCR = No Calibration Required
Firmware Version: ESU40 is 4.73 SP4
Software Version: EMC32-B is 9.15

5.0 SUPPORT EQUIPMENT

Table 5-1: EUT and Support Equipment

Item #	Type Device	Manufacturer	Model/Part #	Serial #
1	EUT	Sensus	IDTB004	7848
2	Power Supply	B & K	1694	258C12210

Table 5-2: Cable Description

Cable #	Cable Type	Length	Shield	Termination
A	EUT	80 cm	No	Power supply
B	Power Supply	180 cm	No	AC mains

6.0 EQUIPMENT UNDER TEST SETUP BLOCK DIAGRAM

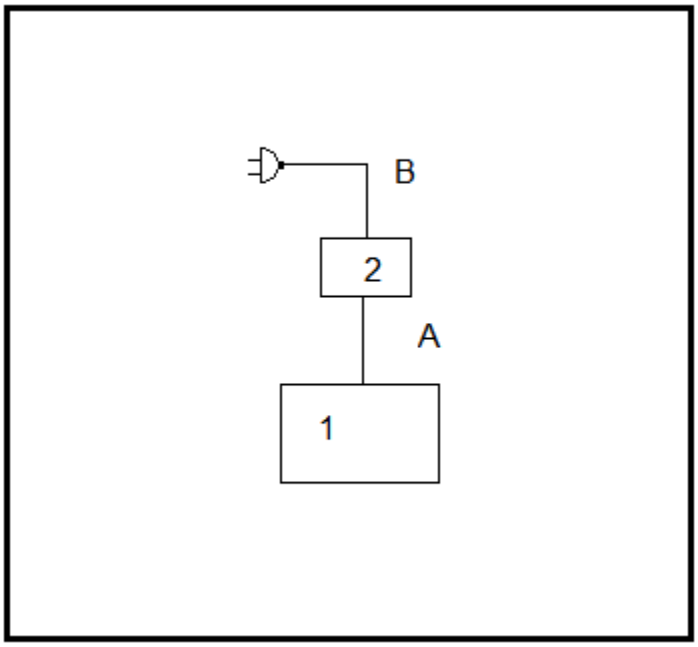

Figure 6-1: EUT Test Setup

7.0 SUMMARY OF TESTS

Along with the tabular data shown below, plots were taken of all signals deemed important enough to document.

7.1 RF Power Output

7.1.1 Measurement Procedure

The RF output of the equipment under test was directly connected to the input of the spectrum analyzer through 40.5 dB of passive attenuation. The internal correction factors of the spectrum analyzer were employed to correct for any cable or attenuator losses. The spectrum analyzer resolution bandwidth was set to 100 kHz.

7.1.2 Measurement Results

Power output is as previously reported in the original filing.

7.2 Occupied Bandwidth

7.2.1 Measurement Procedure

The RF output of the equipment under test was directly connected to the input of the spectrum analyzer through 40.5 dB of passive attenuation for the FCC plots and the IC plots. The spectrum analyzer resolution and video bandwidths were set to 300 Hz and 10 kHz respectively. The internal correction factors of the spectrum analyzer were employed to correct for the cable and attenuator losses. Results of the test are shown below for all modes of operation.

7.2.2 Measurement Results – Emission Masks

Part 24.133 a(1), a(2), IC RSS-134 4.4.1, 4.4.2 – Emission Limits

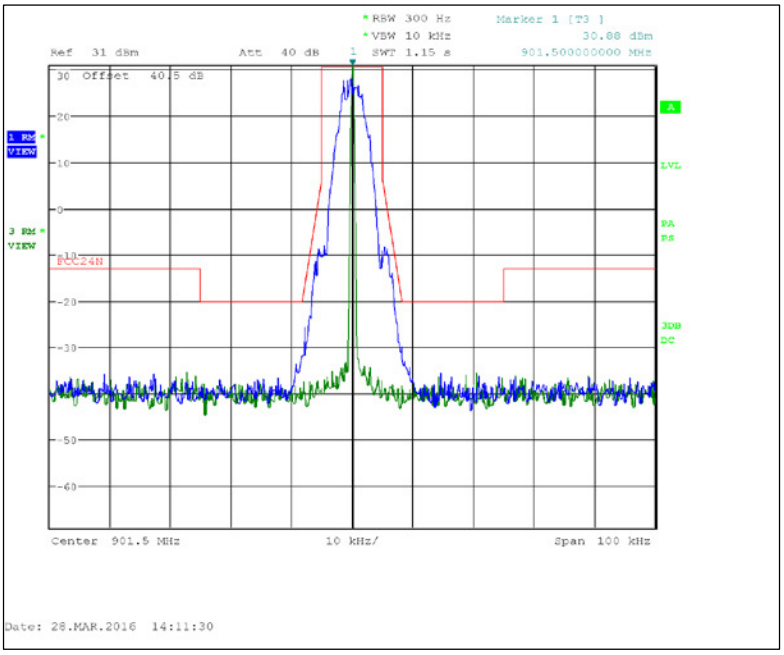

Figure 7.2.2-1: 901.5 MHz – 12.5 kHz Channel Spacing – 2SFSK (Half Baud)

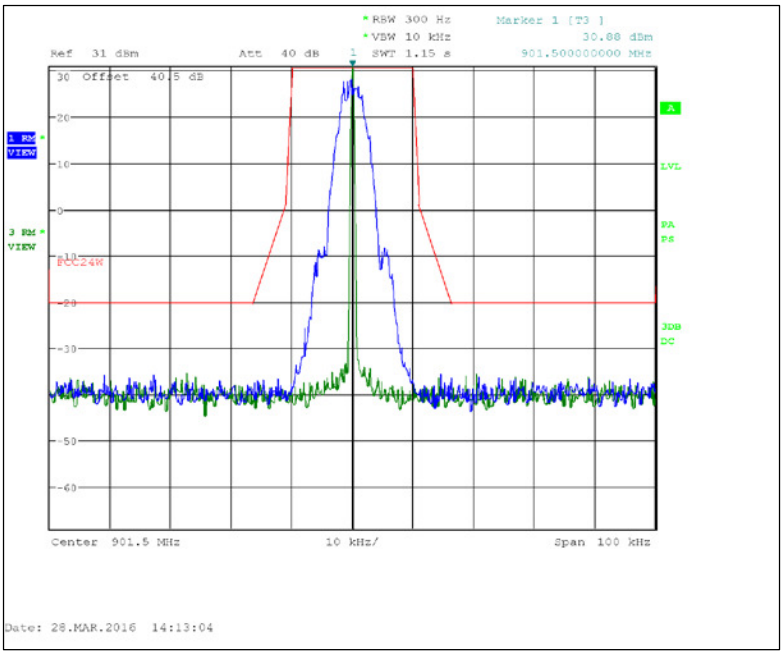

Figure 7.2.2-2: 901.5 MHz – 25 kHz Channel Spacing – 2SFSK (Half Baud)

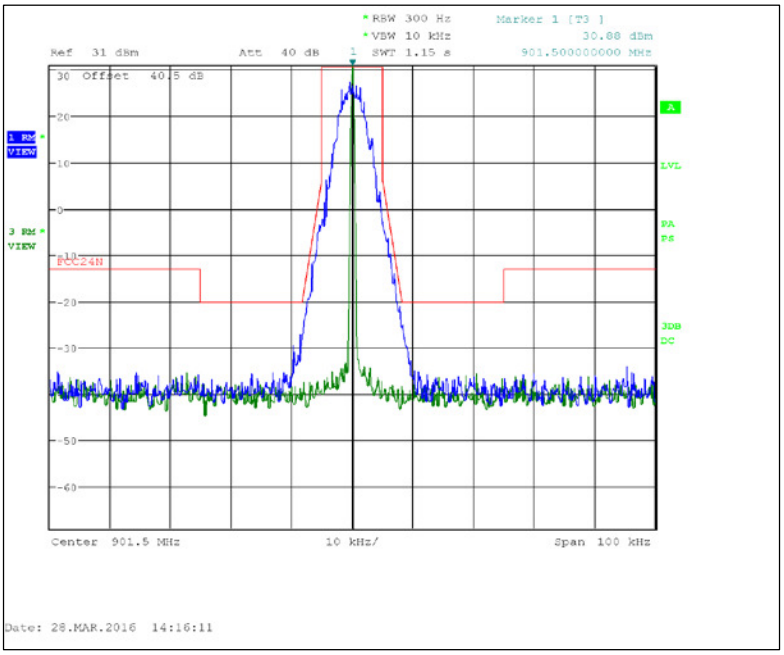

Figure 7.2.2-3: 901.5 MHz – 12.5 kHz Channel Spacing – 4SFSK (Half Baud)

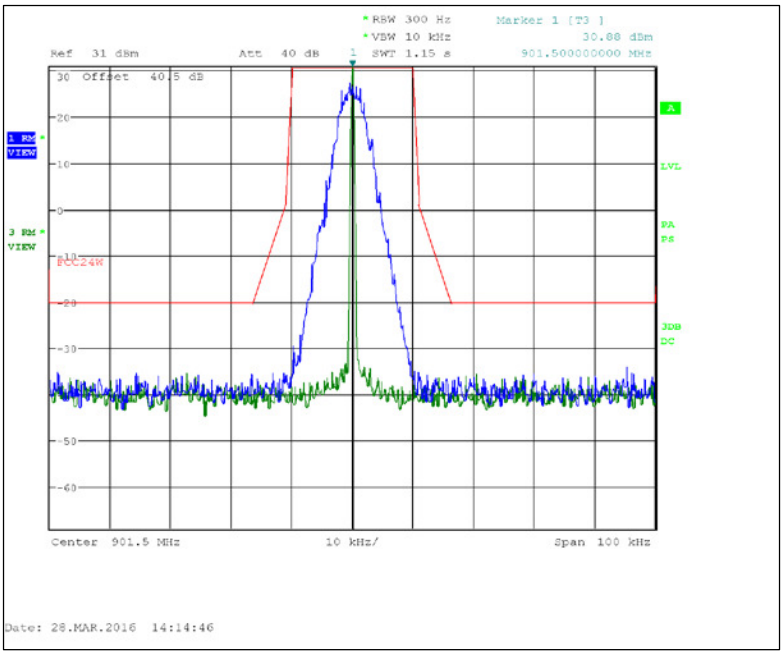

Figure 7.2.2-4: 901.5 MHz – 25 kHz Channel Spacing – 4SFSK (Half Baud)

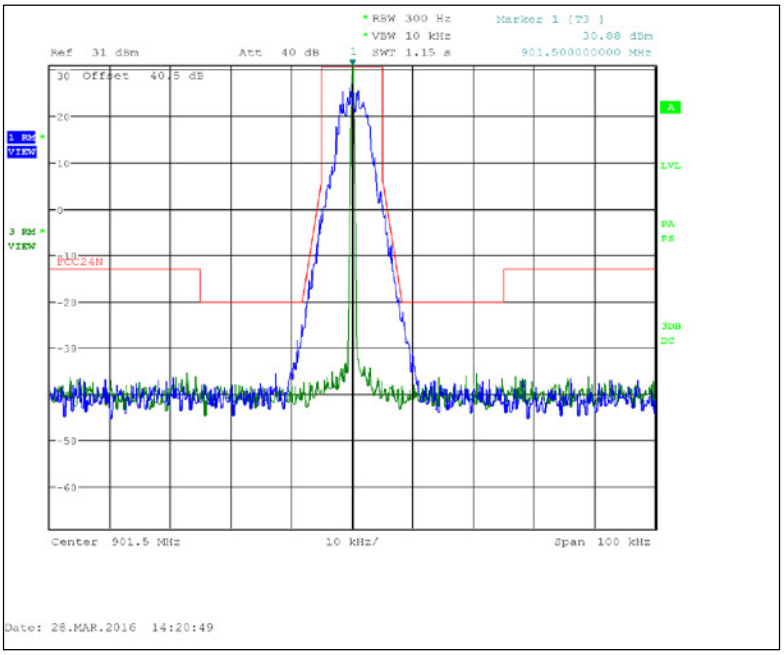

Figure 7.2.2-5: 901.5 MHz – 12.5 kHz Channel Spacing – 8SFSK (Half Baud)

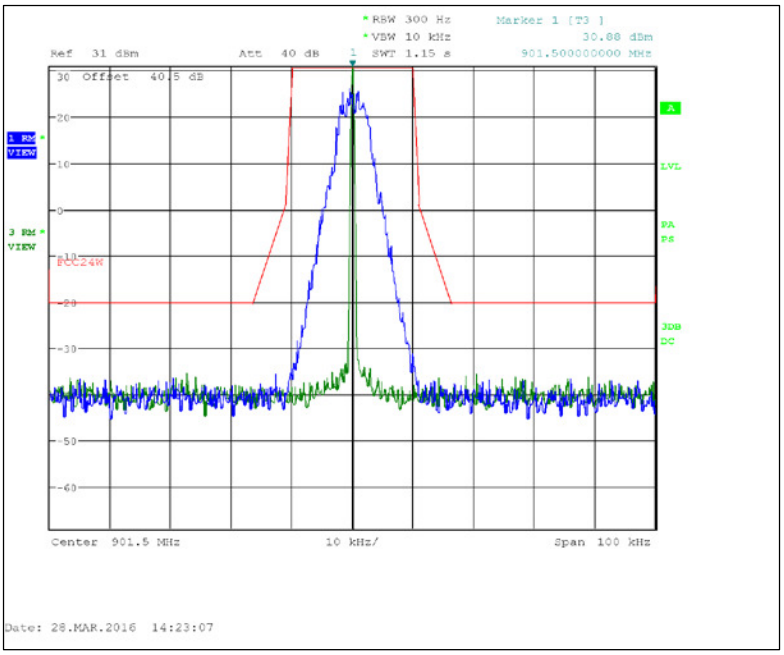

Figure 7.2.2-6: 901.5 MHz – 25 kHz Channel Spacing – 8SFSK (Half Baud)

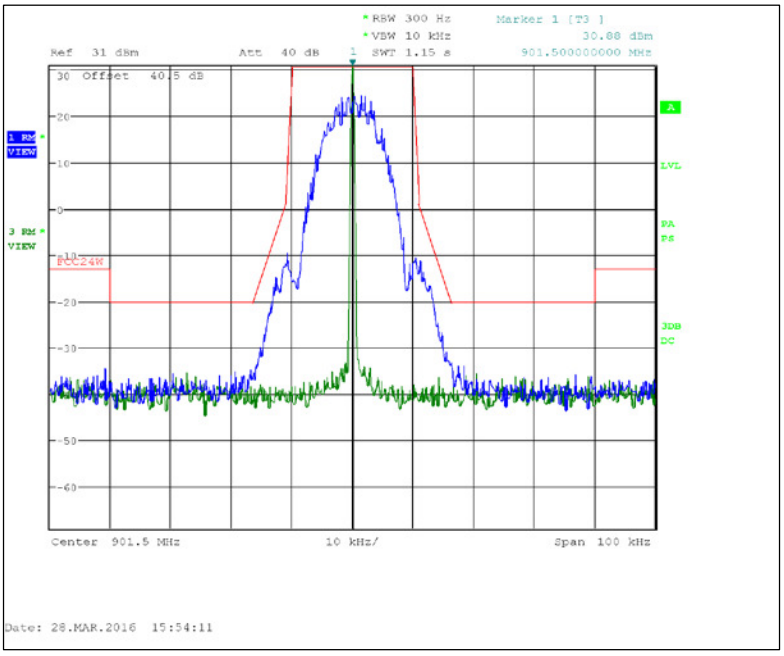

Figure 7.2.2-7: 901.5 MHz – 25 kHz Channel Spacing – 2SFSK

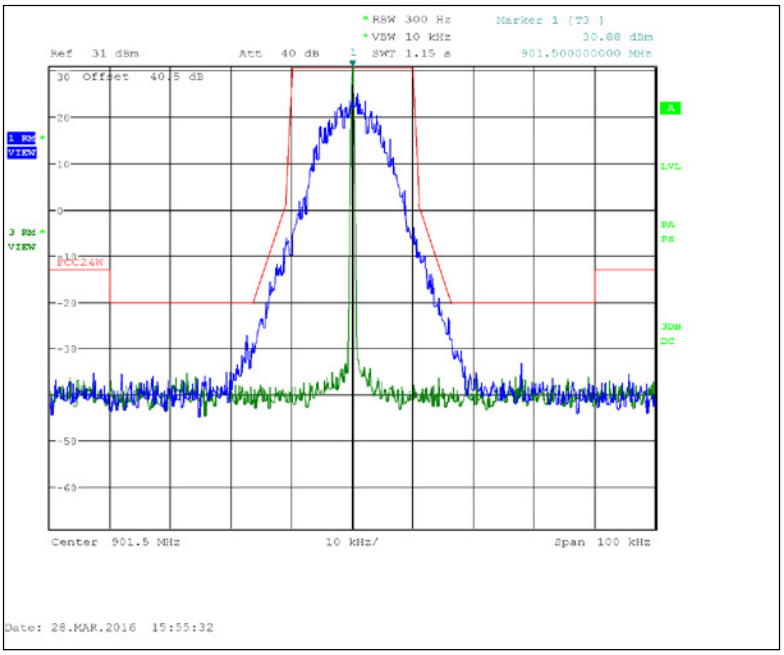

Figure 7.2.2-8: 901.5 MHz – 25 kHz Channel Spacing – 4SFSK

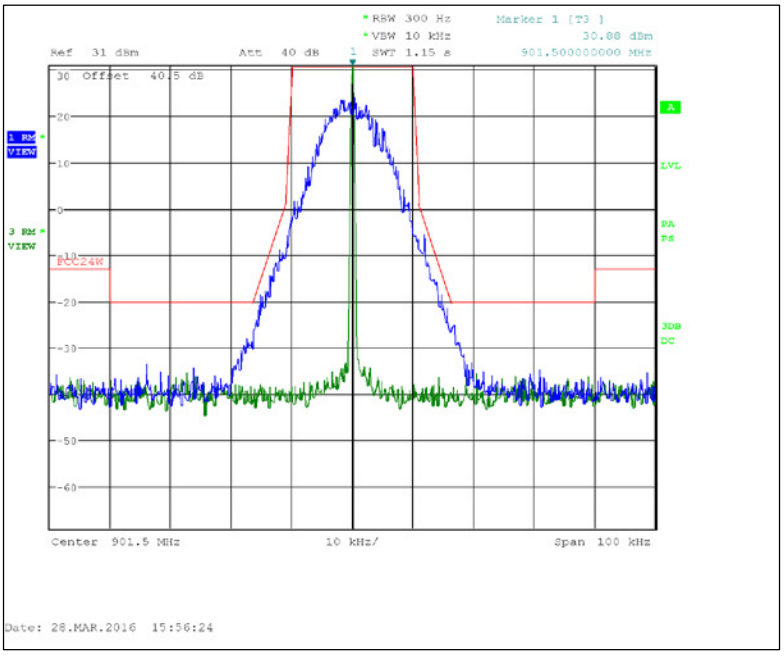

Figure 7.2.2-9: 901.5 MHz – 25 kHz Channel Spacing – 8SFSK

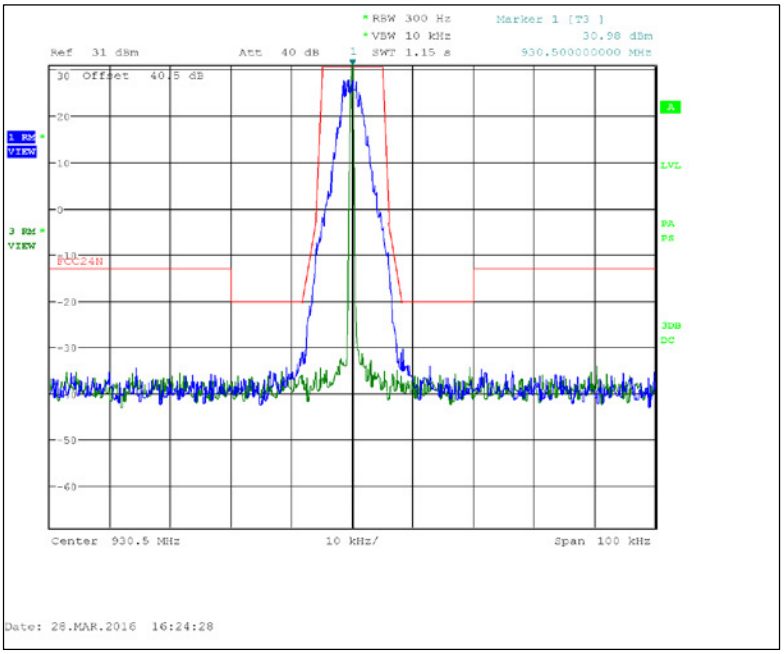

Figure 7.2.2-10: 930.5 MHz – 12.5 kHz Channel Spacing – m4Pass 10k Mode

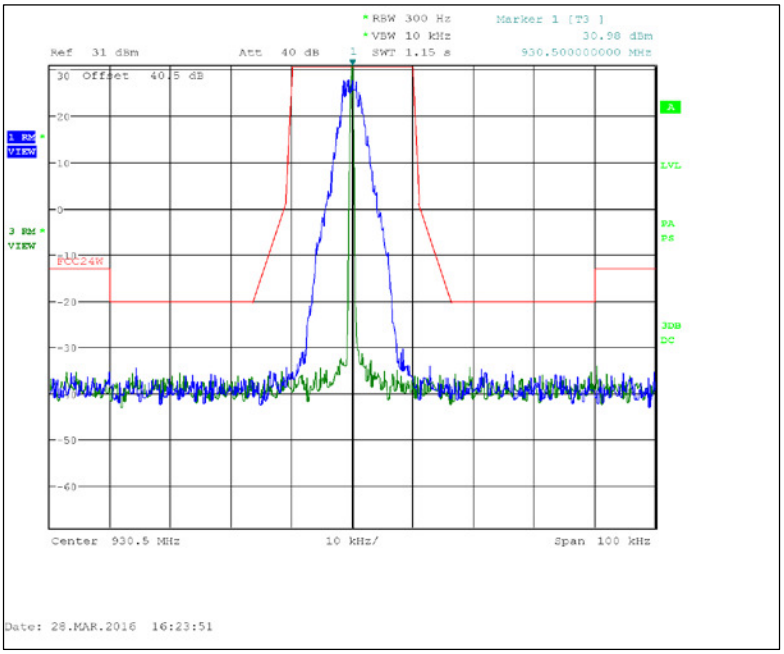

Figure 7.2.2-11: 930.5 MHz – 25 kHz Channel Spacing – m4Pass 10k Mode

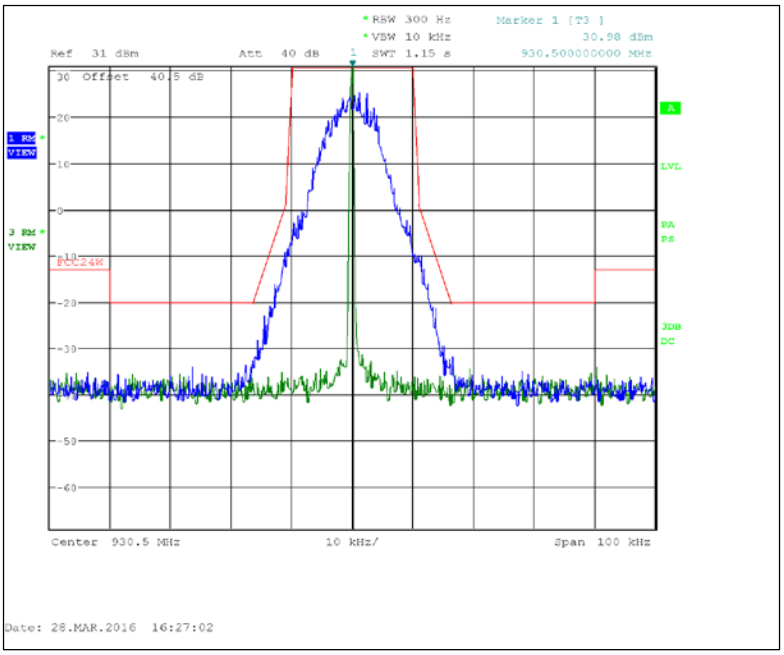

Figure 7.2.2-12: 930.5 MHz – 25 kHz Channel Spacing – m4Pass 20k Mode

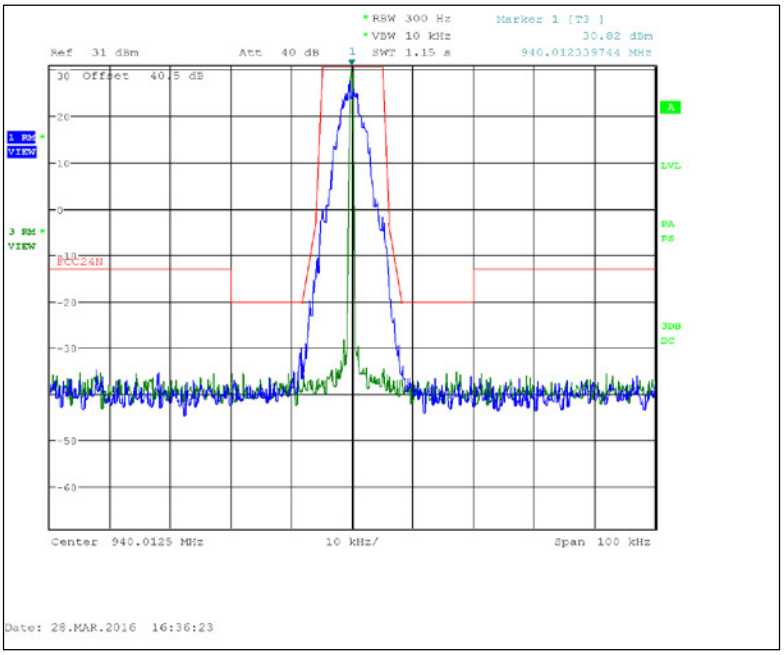

Figure 7.2.2-13: 940.0125 MHz – 12.5 kHz Channel Spacing – m4Pass 10k Mode

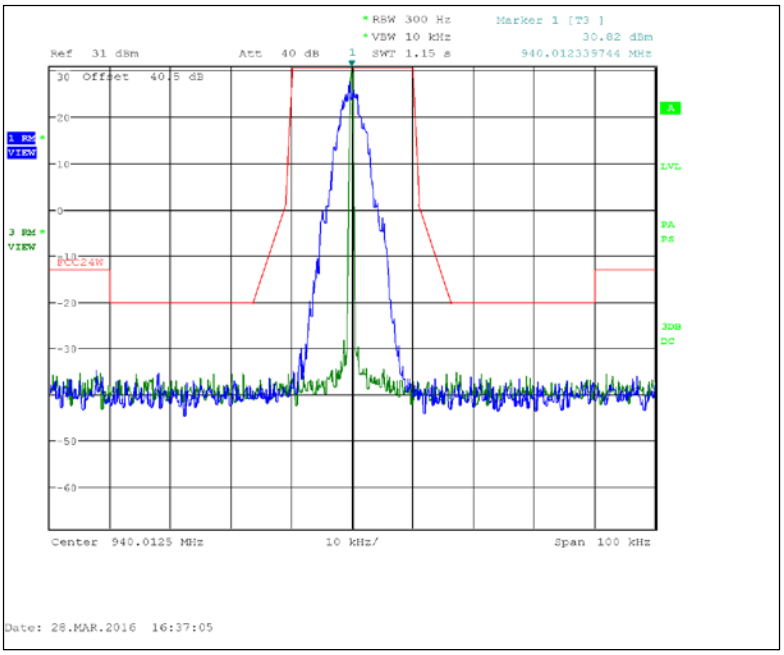

Figure 7.2.2-14: 940.0125 MHz – 25 kHz Channel Spacing – m4Pass 10k Mode

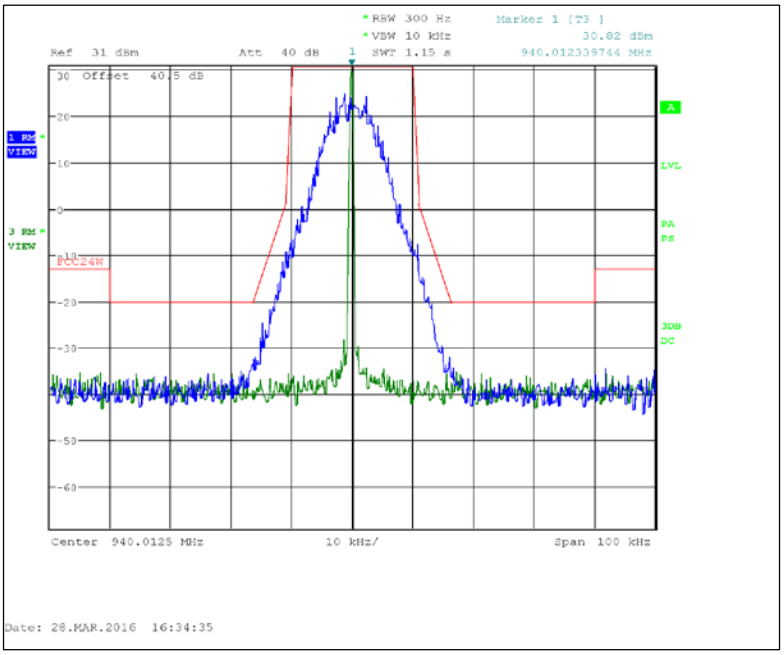

Figure 7.2.2-15: 940.0125 MHz – 25 kHz Channel Spacing – m4Pass 20k Mode

Part 101.111 a(6), RSS-119 5.8.6 (FCC Part 101.111a(6) provides worst case)

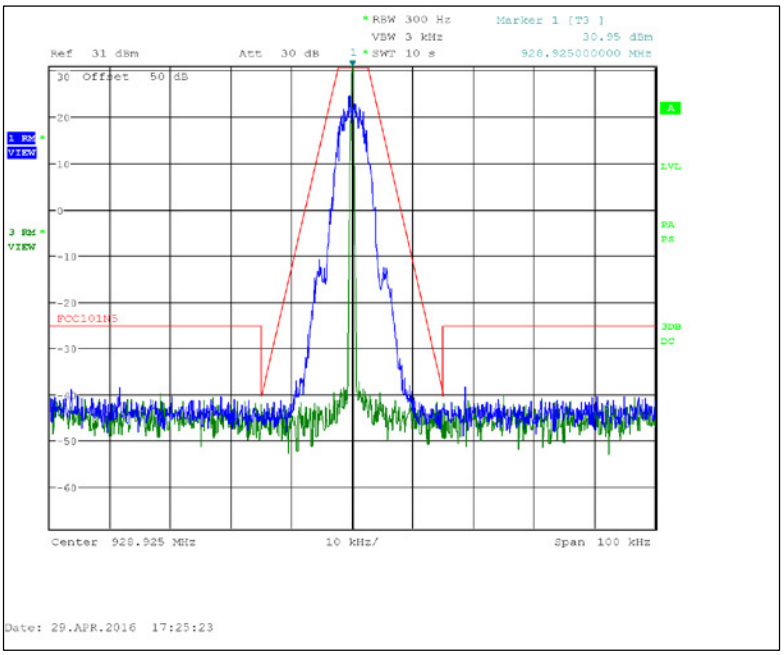

Figure 7.2.2-16: 928.925 MHz – 12.5 kHz Channel Spacing – 2SFSK (Half Baud)

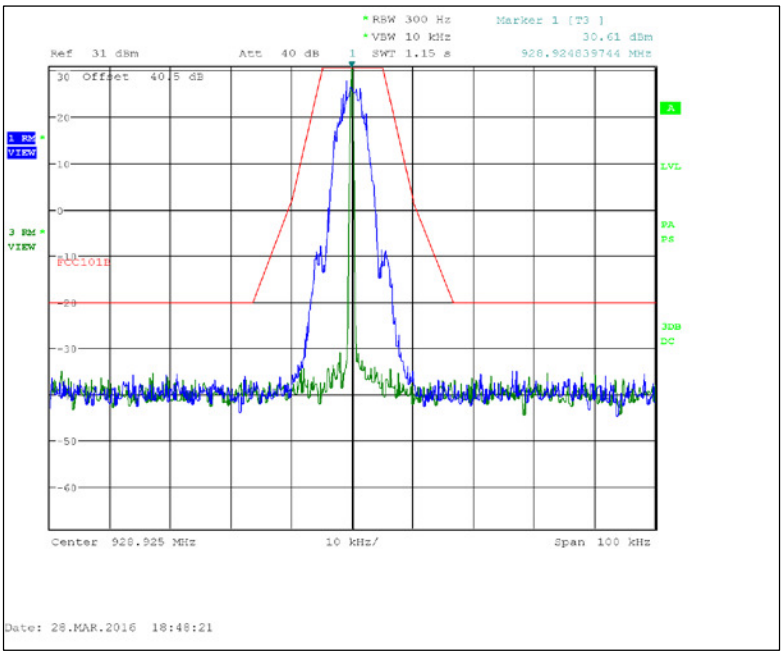

Figure 7.2.2-17: 928.925 MHz – 25 kHz Channel Spacing – 2SFSK (Half Baud)

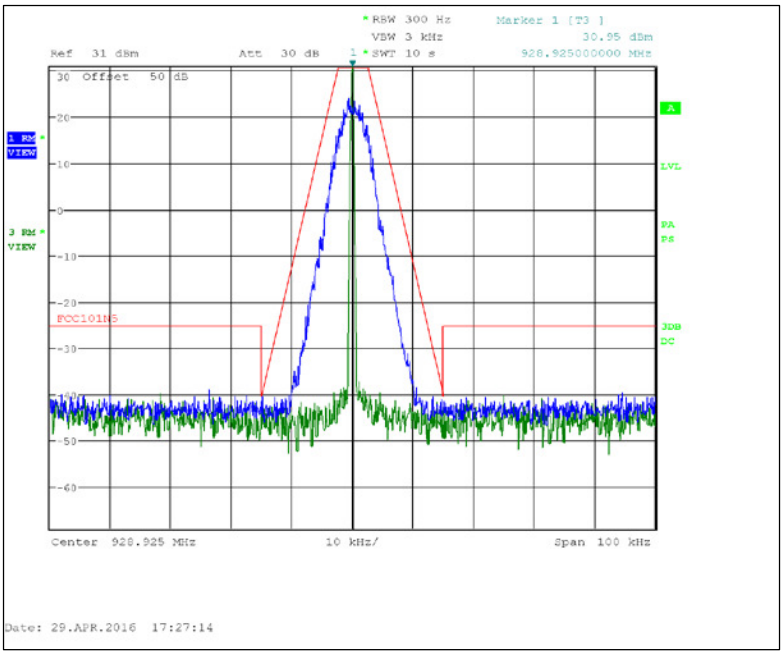

Figure 7.2.2-18: 928.925 MHz – 12.5 kHz Channel Spacing – 4SFSK (Half Baud)

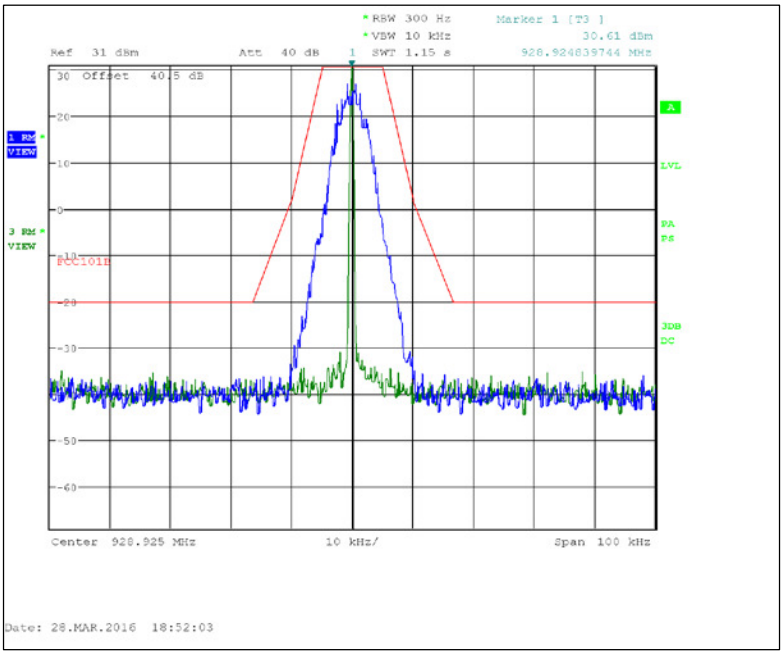

Figure 7.2.2-19: 928.925 MHz – 25 kHz Channel Spacing – 4SFSK (Half Baud)

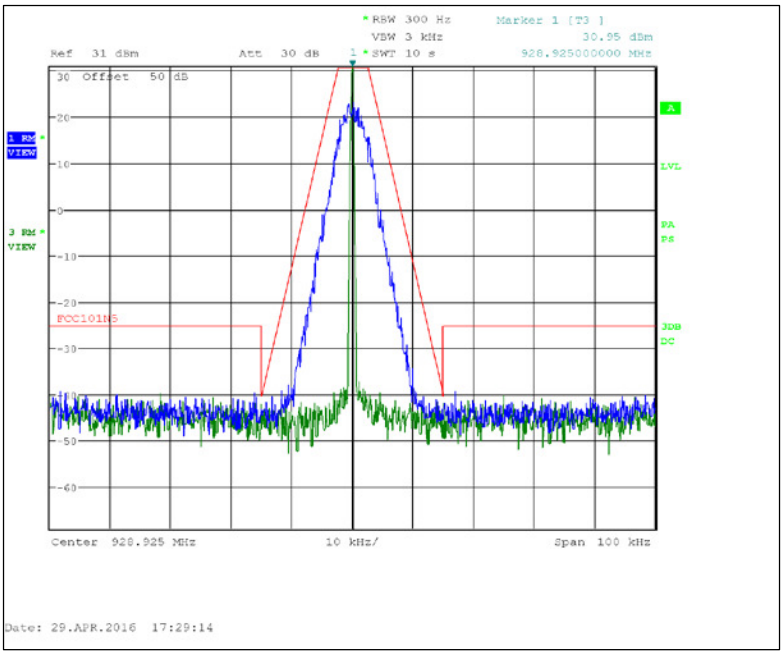

Figure 7.2.2-20: 928.925 MHz – 12.5 kHz Channel Spacing – 8SFSK (Half Baud)

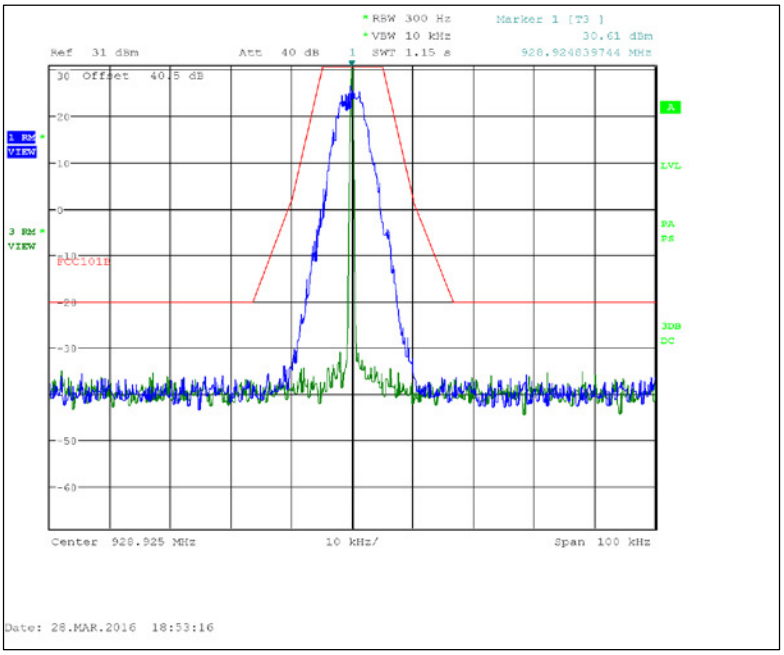

Figure 7.2.2-21: 928.925 MHz – 25 kHz Channel Spacing – 8SFSK (Half Baud)

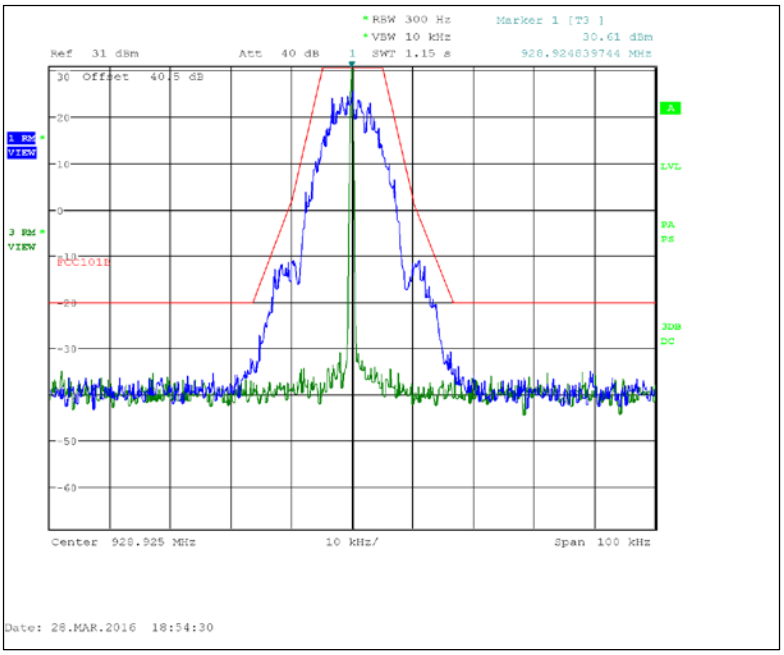

Figure 7.2.2-22: 928.925 MHz – 25 kHz Channel Spacing – 2SFSK

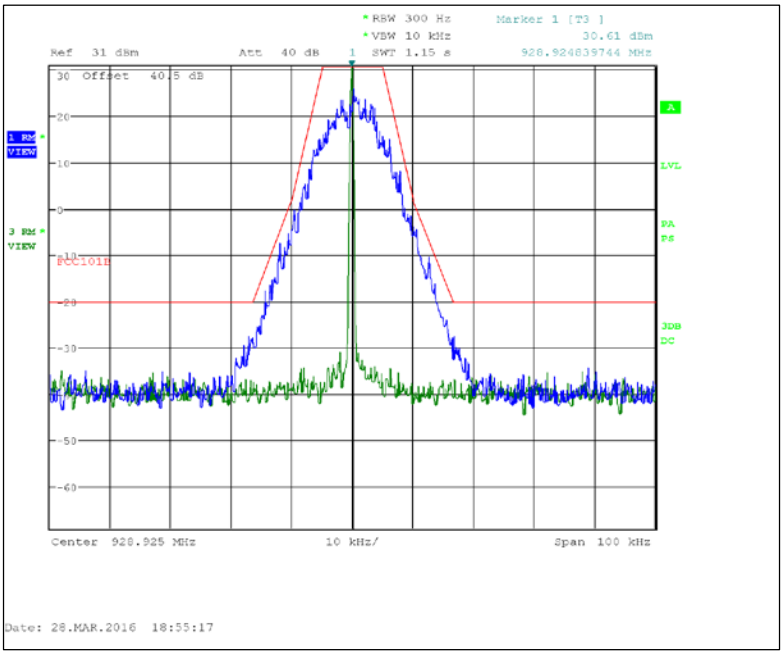

Figure 7.2.2-23-: 928.925 MHz – 25 kHz Channel Spacing – 4SFSK

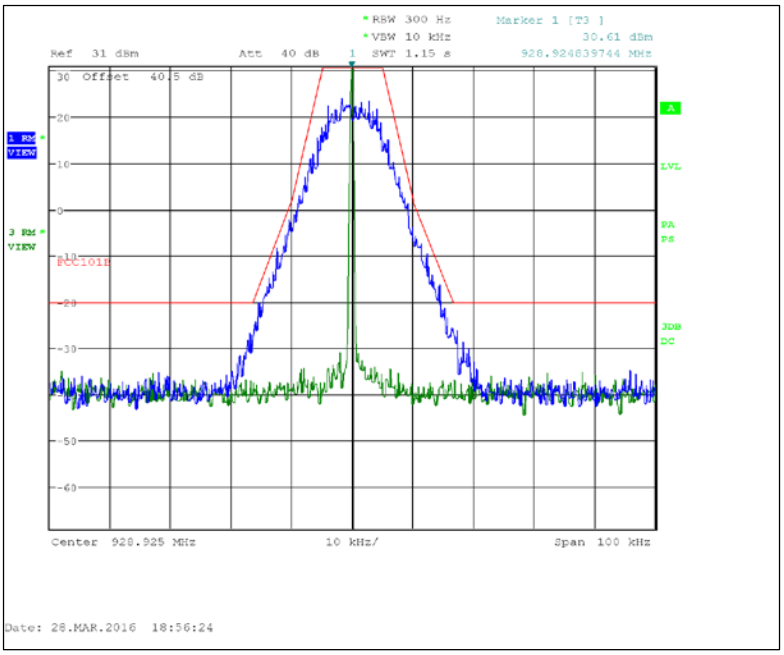

Figure 7.2.2-24: 928.925 MHz – 25 kHz Channel Spacing – 8SFSK

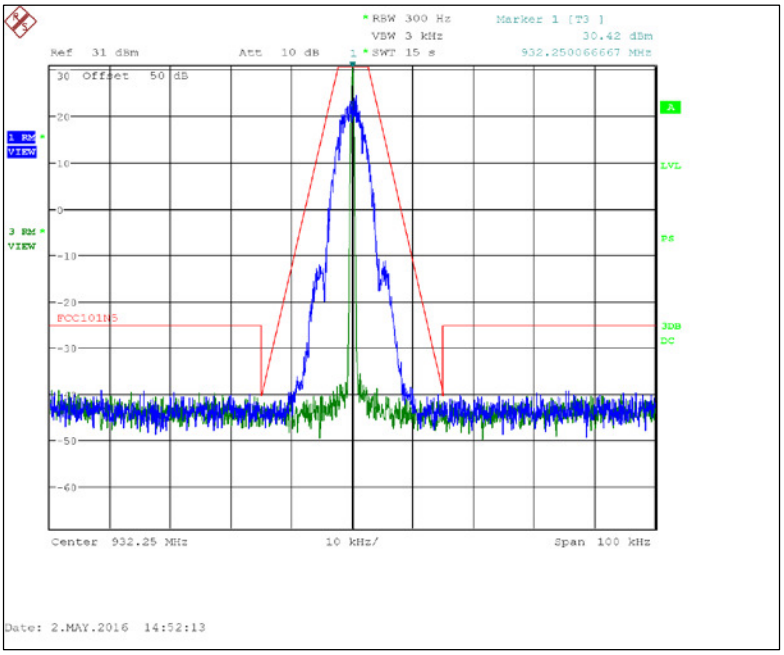

Figure 7.2.2-25: 932.25 MHz – 12.5 kHz Channel Spacing – 2SFSK (Half Baud)

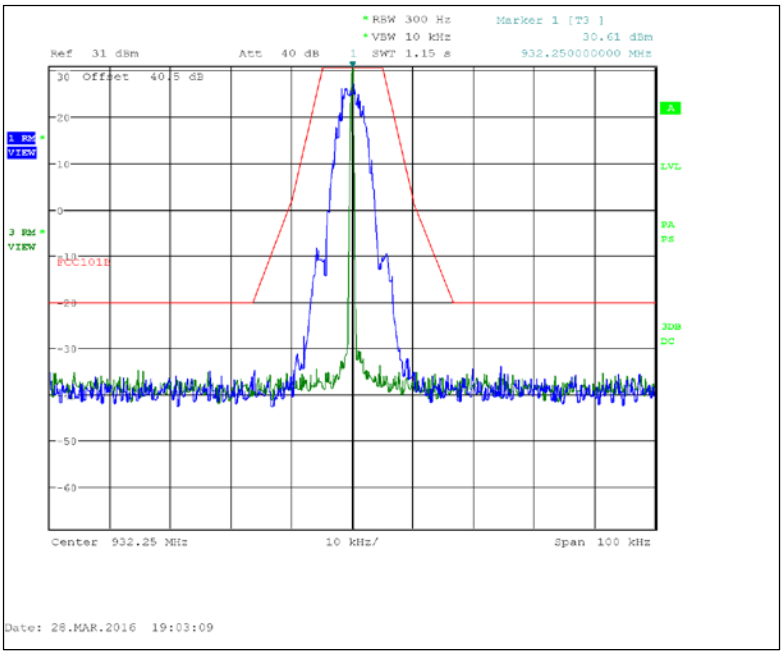

Figure 7.2.2-26: 932.25 MHz – 25 kHz Channel Spacing – 2SFSK (Half Baud)

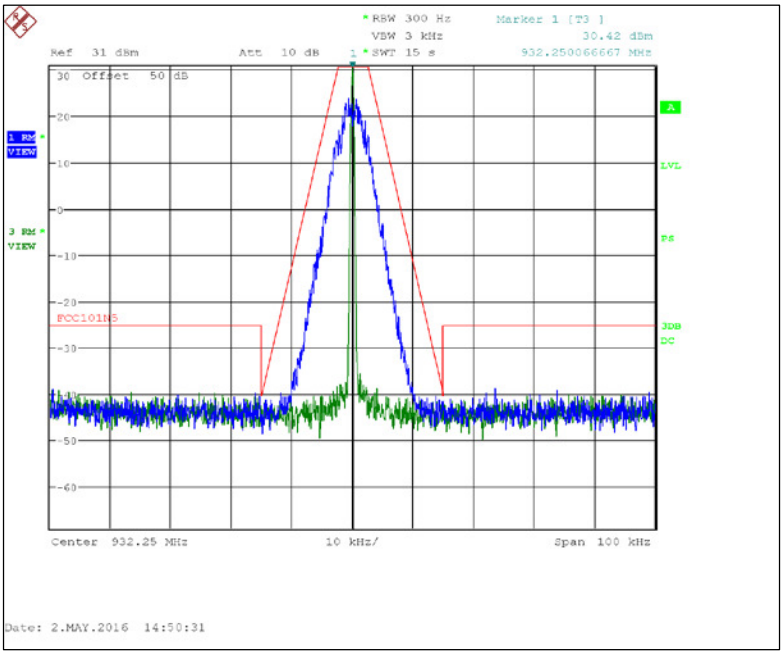

Figure 7.2.2-27: 932.25 MHz – 12.5 kHz Channel Spacing – 4SFSK (Half Baud)

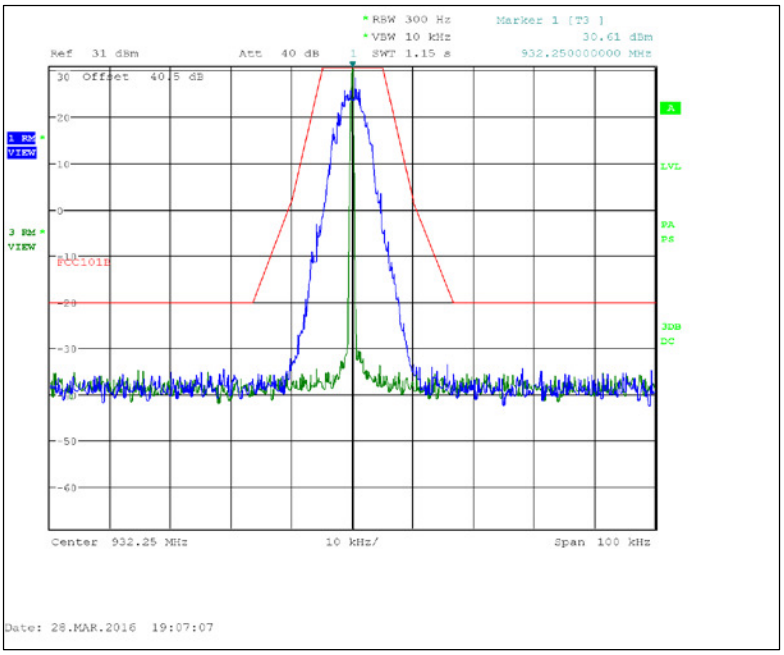

Figure 7.2.2-28: 932.25 MHz – 25 kHz Channel Spacing – 4SFSK (Half Baud)

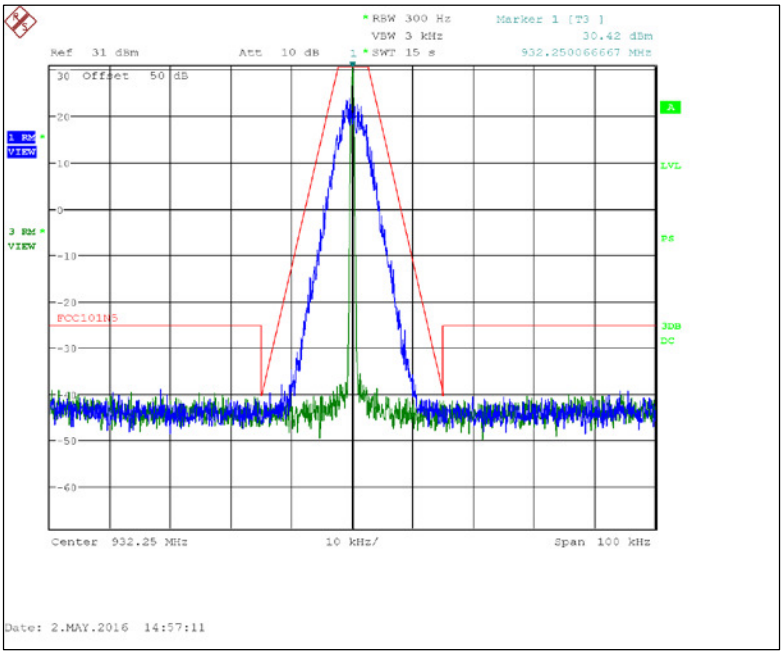

Figure 7.2.2-29: 932.25 MHz – 12.5 kHz Channel Spacing – 8SFSK (Half Baud)

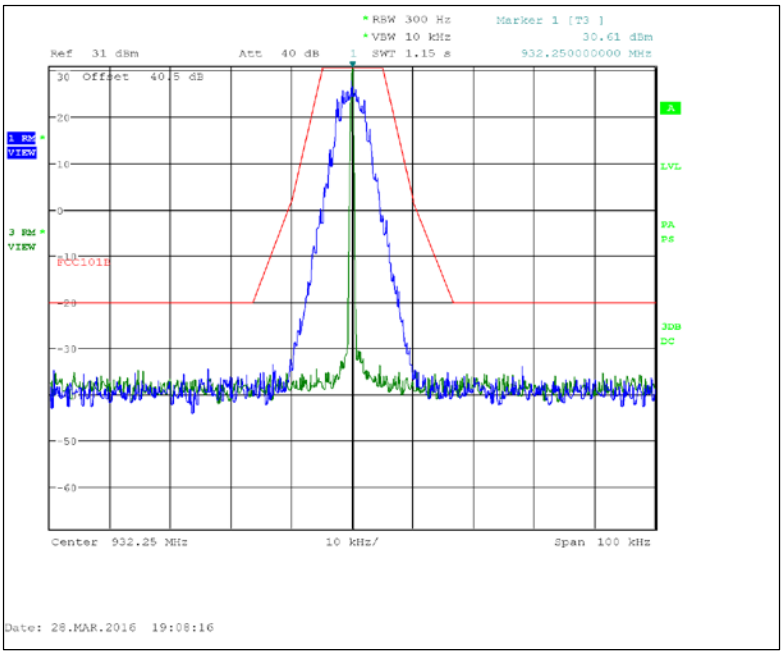

Figure 7.2.2-30: 932.25 MHz – 25 kHz Channel Spacing – 8SFSK (Half Baud)

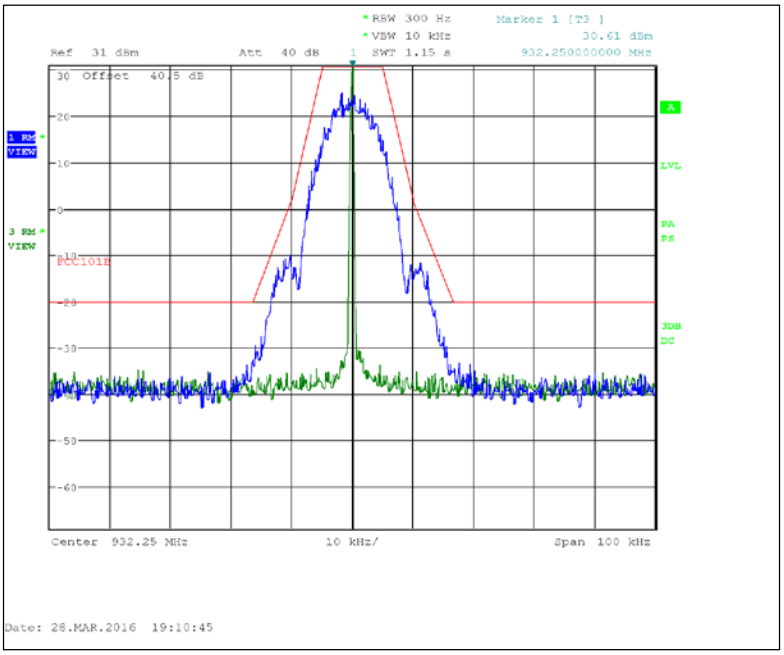

Figure 7.2.2-31: 932.25 MHz – 25 kHz Channel Spacing – 2SFSK

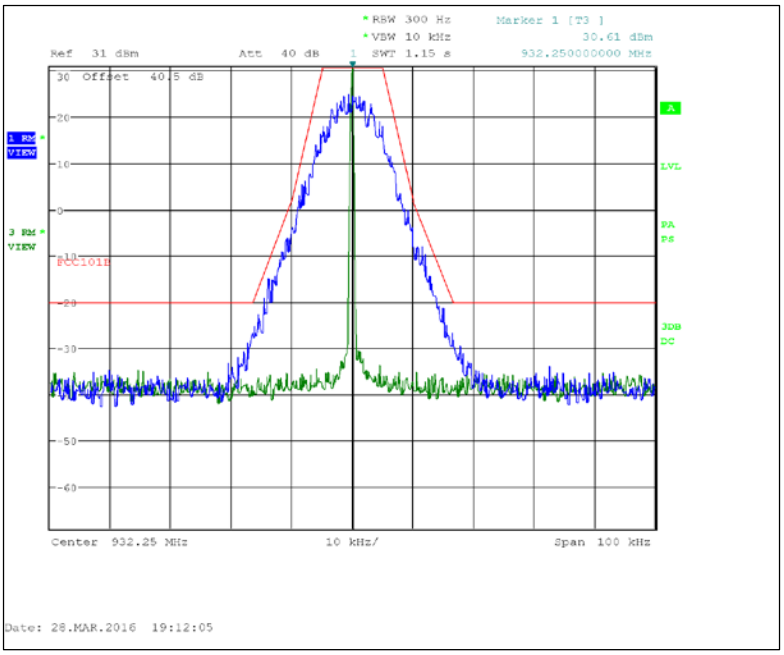

Figure 7.2.2-32: 932.25 MHz – 25 kHz Channel Spacing – 4SFSK

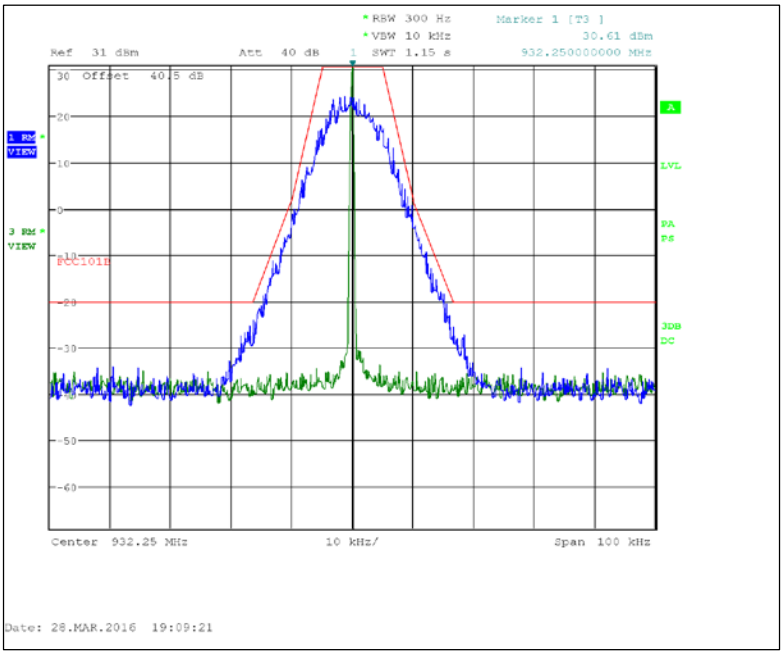

Figure 7.2.2-33: 932.25 MHz – 25 kHz Channel Spacing – 8SFSK

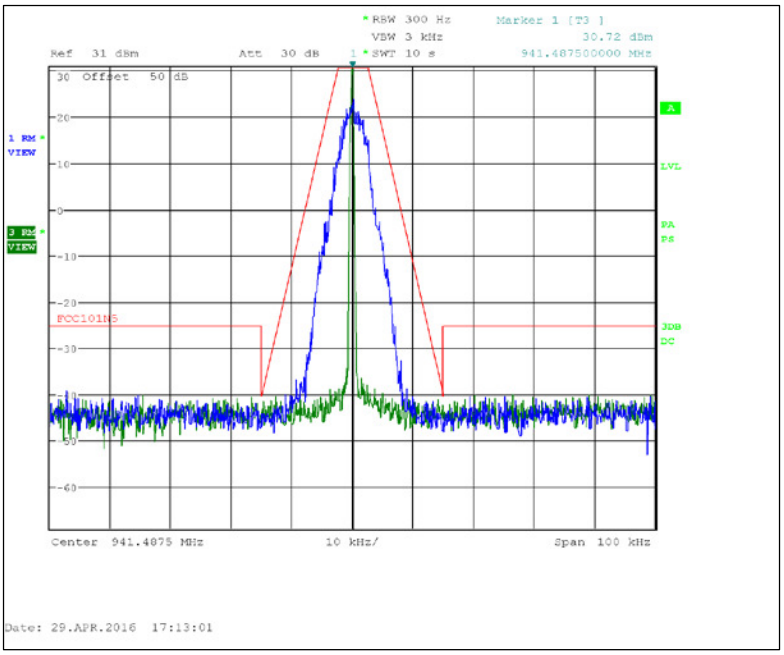

Figure 7.2.2-34: 941.4875 MHz – 12.5 kHz Channel Spacing - m4Pass 10k Mode

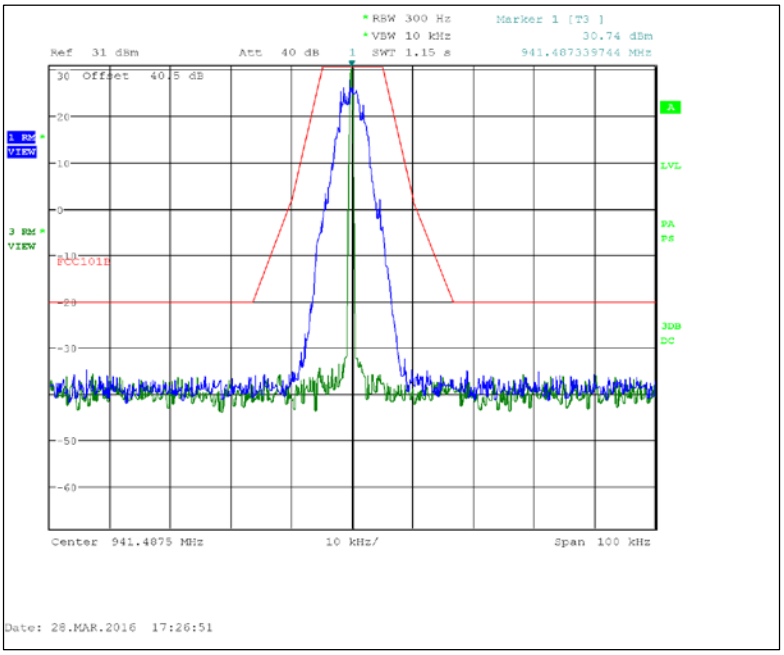

Figure 7.2.2-35: 941.4875 MHz – 25 kHz Channel Spacing - m4Pass 10k Mode

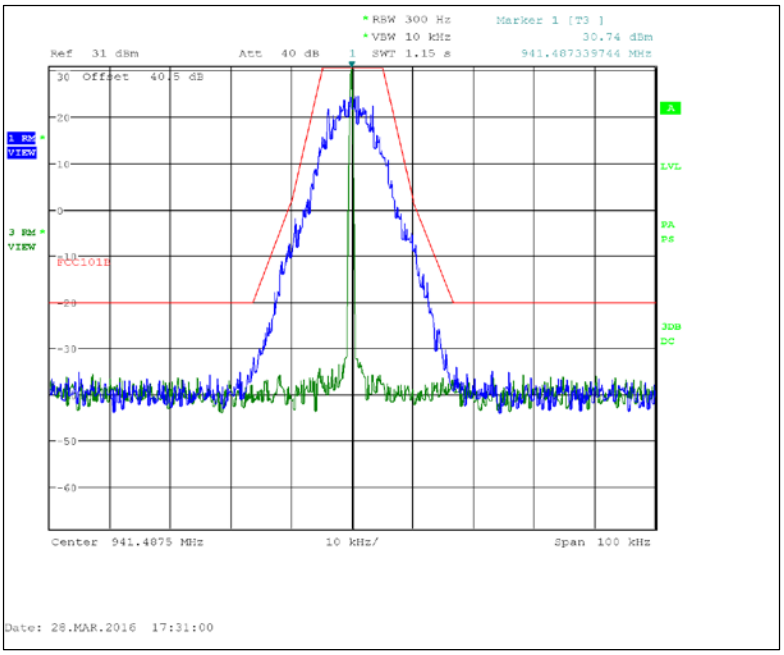

Figure 7.2.2-36: 941.4875 MHz – 25 kHz Channel Spacing - m4Pass 20k Mode

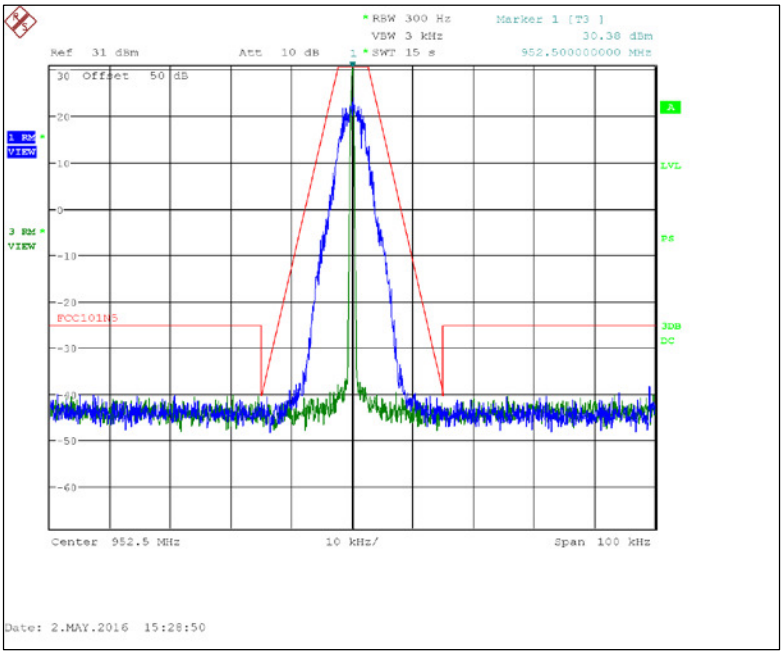

Figure 7.2.2-37: 952.5 MHz – 12.5 kHz Channel Spacing - m4Pass 10k

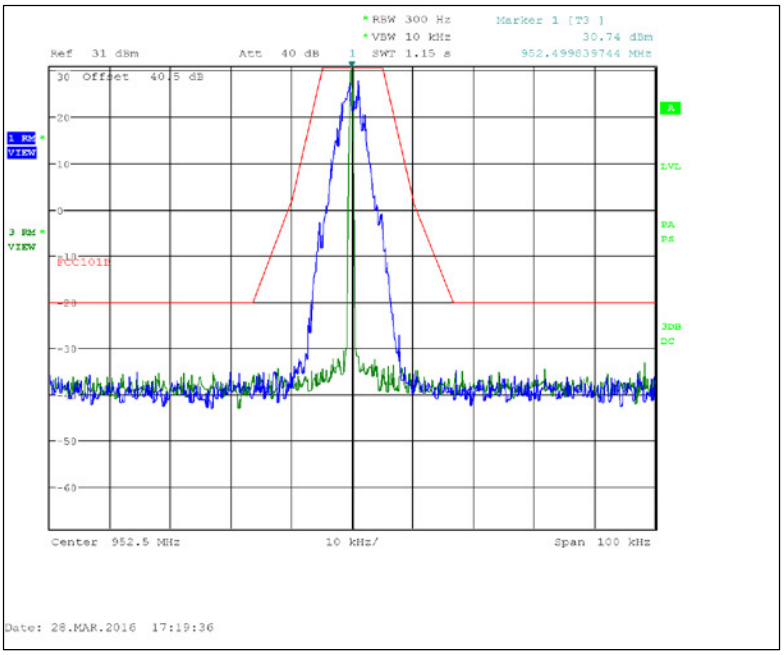

Figure 7.2.2-38: 952.5 MHz – 25 kHz Channel Spacing - m4Pass 10k Mode

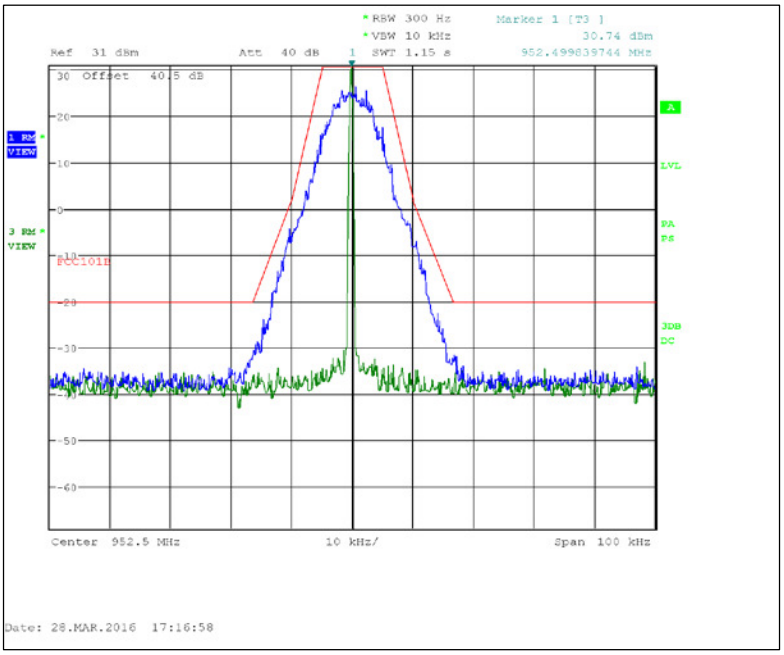

Figure 7.2.2-39: 952.5 MHz – 25 kHz Channel Spacing - m4Pass 20k Mode

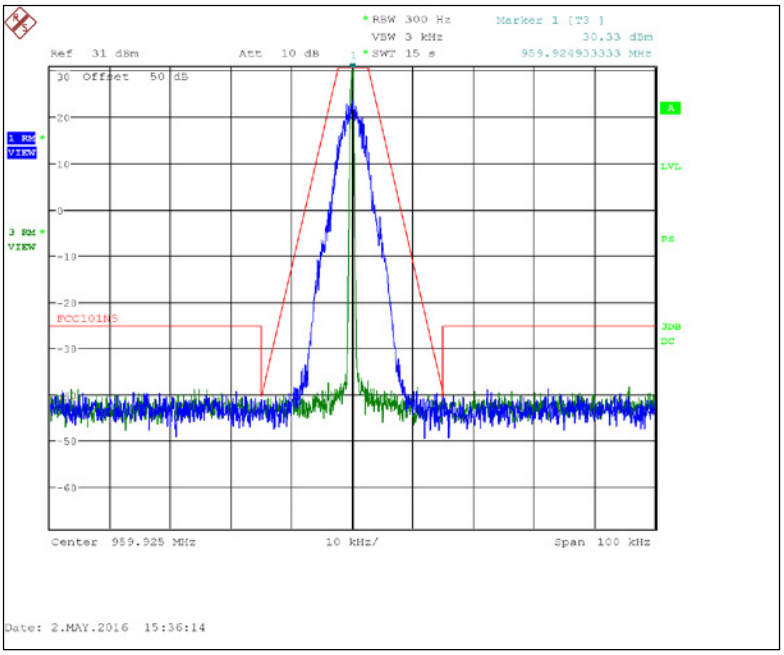

Figure 7.2.2-40: 959.925 MHz – 12.5 kHz Channel Spacing - m4Pass 10k Mode

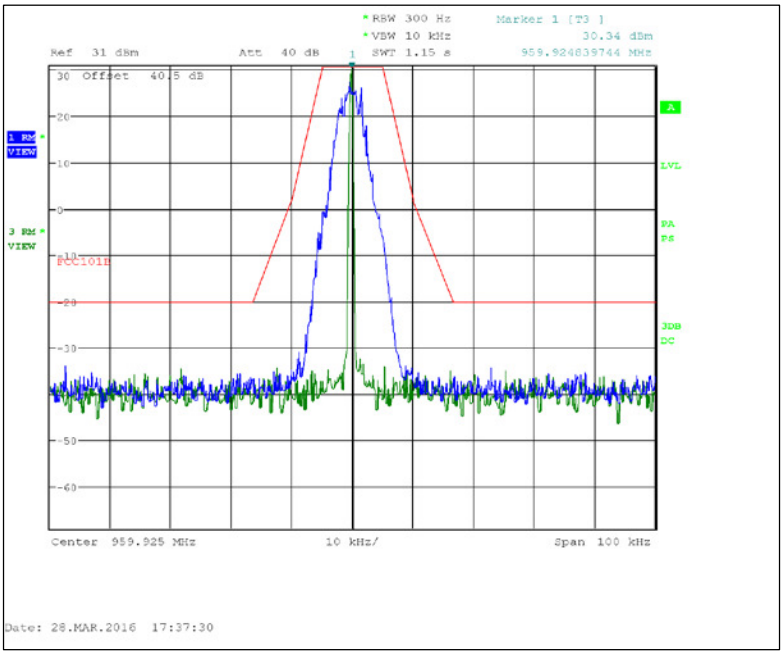

Figure 7.2.2-41: 959.925 MHz – 25 kHz Channel Spacing - m4Pass 10k Mode

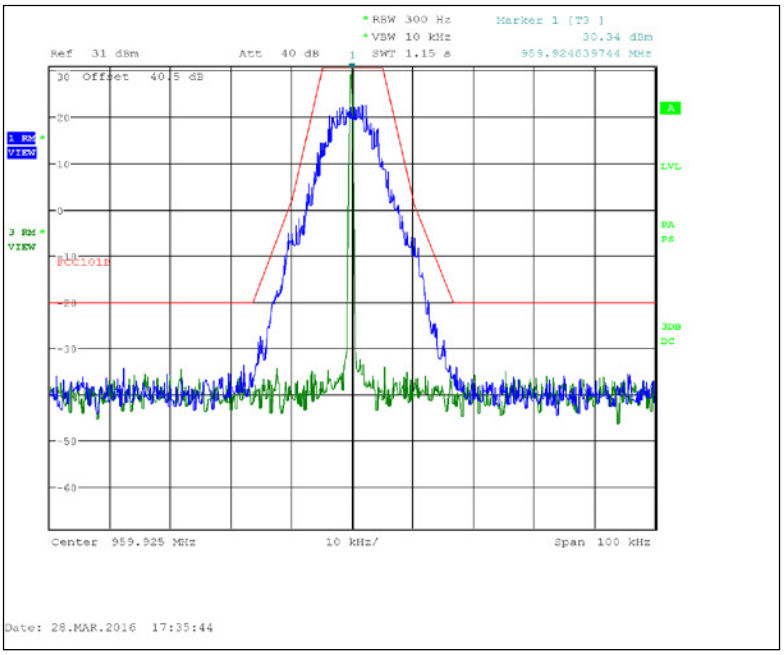

Figure 7.2.2-42: 959.925 MHz – 25 kHz Channel Spacing - m4Pass 20k Mode

7.2.3 Measurement Results – 99% Bandwidth

The bandwidth was measured in accordance with RSS-Gen 6.6. The occupied bandwidth measurement function of the spectrum analyzer was used to measure the 99% bandwidth. The span of the analyzer was set to capture all products of the modulation process, including the emission sidebands. The resolution bandwidth was set to 1% to 5% of the occupied bandwidth. The video bandwidth was set to 3 times the resolution bandwidth.

Frequency (MHz)	IC Rule Part	Mode of Operation	99% Bandwidth (kHz)
901.5000	RSS-134	2SFSK (Half Baud)	5.8974
901.5000	RSS-134	4SFSK (Half Baud)	7.1474
901.5000	RSS-134	8SFSK (Half Baud)	7.1474
901.5000	RSS-134	2SFSK	11.9391
901.5000	RSS-134	4SFSK	13.7820
901.5000	RSS-134	8SFSK	14.5032
901.5000	RSS-134	C&I	5.9760
901.5000	RSS-134	Double Density	13.6000
901.5000	RSS-134	Normal	11.5800
901.5000	RSS-134	Priority	6.4000
930.5000	RSS-134	m4Pass 10k	6.0256
930.5000	RSS-134	m4Pass 20k	12.0192
930.5000	RSS-134	mPass 5k	5.9200
930.5000	RSS-134	mPass 10k	11.7200
940.0125	RSS-134	m4Pass 10k	6.0577
940.0125	RSS-134	m4Pass 20k	12.0192
940.0125	RSS-134	mPass 5k	5.8000
940.0125	RSS-134	mPass 10k	11.7800
928.9250	RSS-119	2SFSK (Half Baud)	6.0256
928.9250	RSS-119	4SFSK (Half Baud)	6.8910
928.9250	RSS-119	8SFSK (Half Baud)	7.3077
928.9250	RSS-119	2SFSK	11.9391
928.9250	RSS-119	4SFSK	13.6218
928.9250	RSS-119	8SFSK	14.6634
928.9250	RSS-119	C&I	5.8600
928.9250	RSS-119	Double Density	12.9800
928.9250	RSS-119	Normal	11.4200
928.9250	RSS-119	Priority	6.5960
932.2500	RSS-119	2SFSK (Half Baud)	6.0577
932.2500	RSS-119	4SFSK (Half Baud)	6.9551
932.2500	RSS-119	8SFSK (Half Baud)	7.1474
932.2500	RSS-119	2SFSK	12.0192

Frequency (MHz)	IC Rule Part	Mode of Operation	99% Bandwidth (kHz)
932.2500	RSS-119	4SFSK	14.0224
932.2500	RSS-119	8SFSK	14.4231
932.2500	RSS-119	C&I	5.9200
932.2500	RSS-119	Double Density	12.8000
932.2500	RSS-119	Normal	11.6000
932.2500	RSS-119	Priority	6.4960
941.4875	RSS-119	m4Pass 10k	6.0256
941.4875	RSS-119	m4Pass 20k	12.3397
941.4875	RSS-119	mPass 5k	5.9000
941.4875	RSS-119	mPass 10k	12.0400
952.5000	RSS-119	m4Pass 10k	6.0577
952.5000	RSS-119	m4Pass 20k	11.9391
952.5000	RSS-119	mPass 5k	5.8600
952.5000	RSS-119	mPass 10k	11.7000

IC RSS-GEN 6.6, IC RSS-134

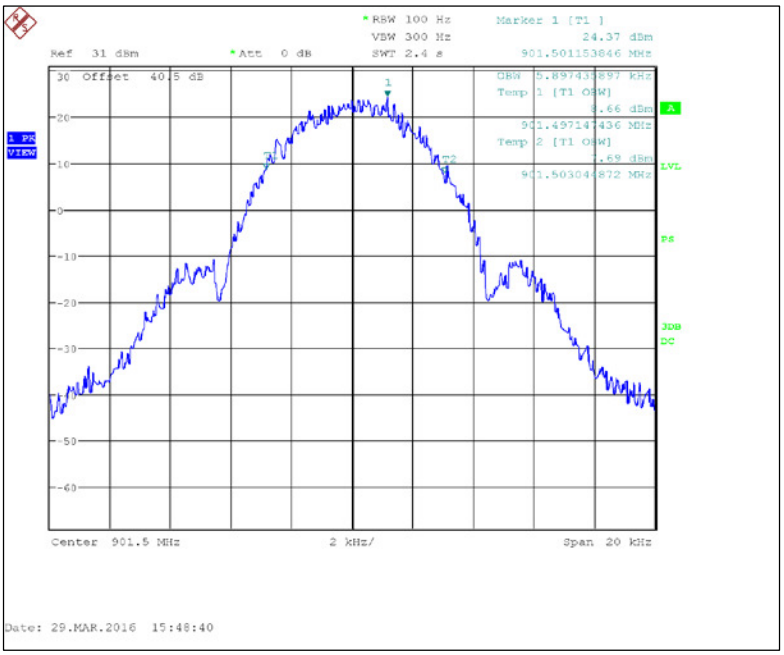

Figure 7.2.3-1: 901.5 MHz – 2SFSK (Half Baud)

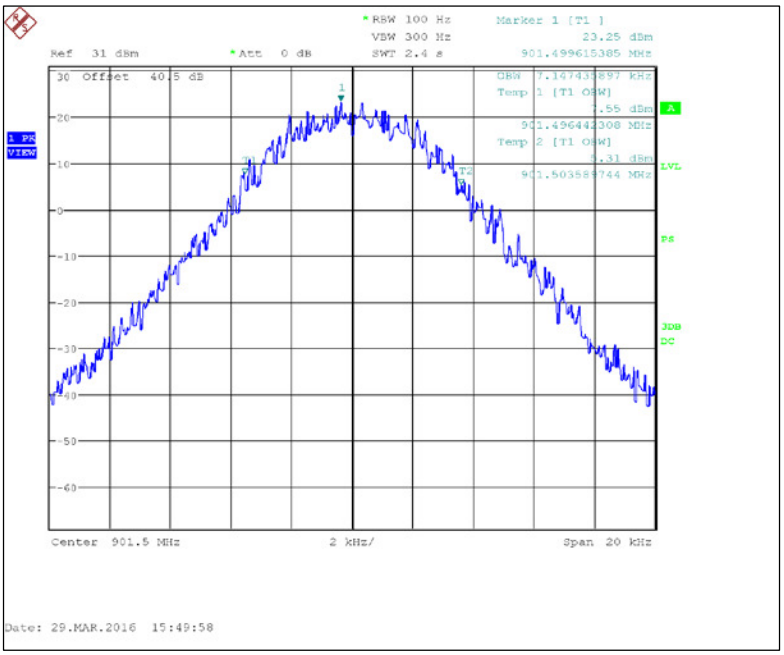

Figure 7.2.3-2: 901.5 MHz – 4SFSK (Half Baud)

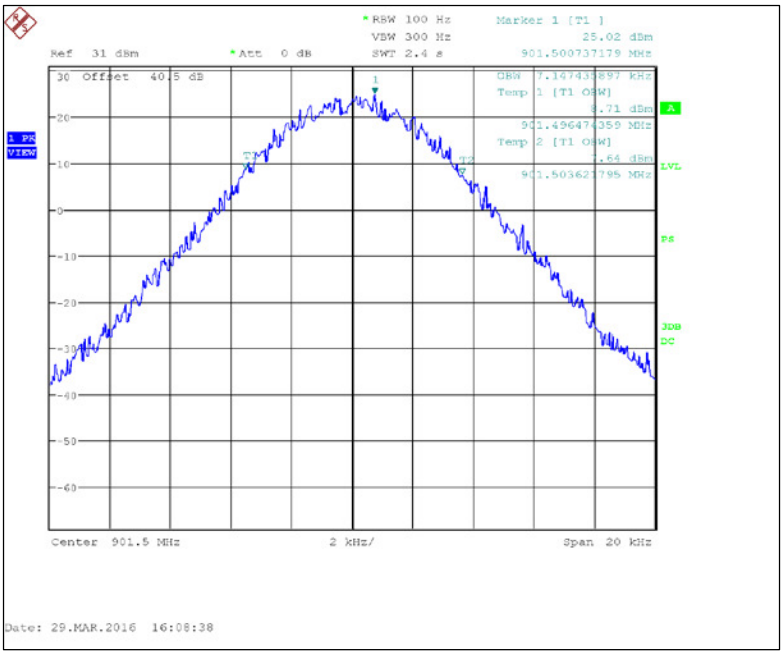

Figure 7.2.3-3: 901.5 MHz – 8SFSK (Half Baud)

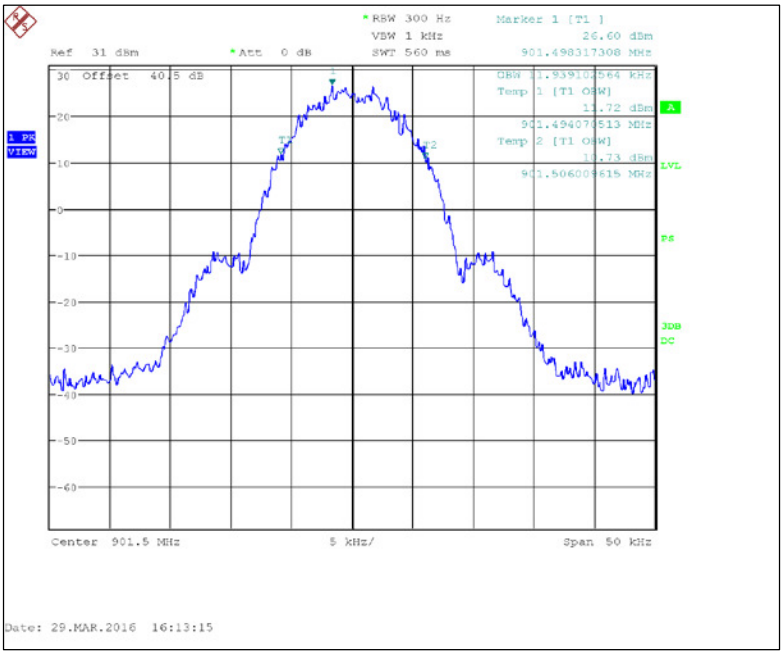

Figure 7.2.3-4: 901.5 MHz – 2SFSK

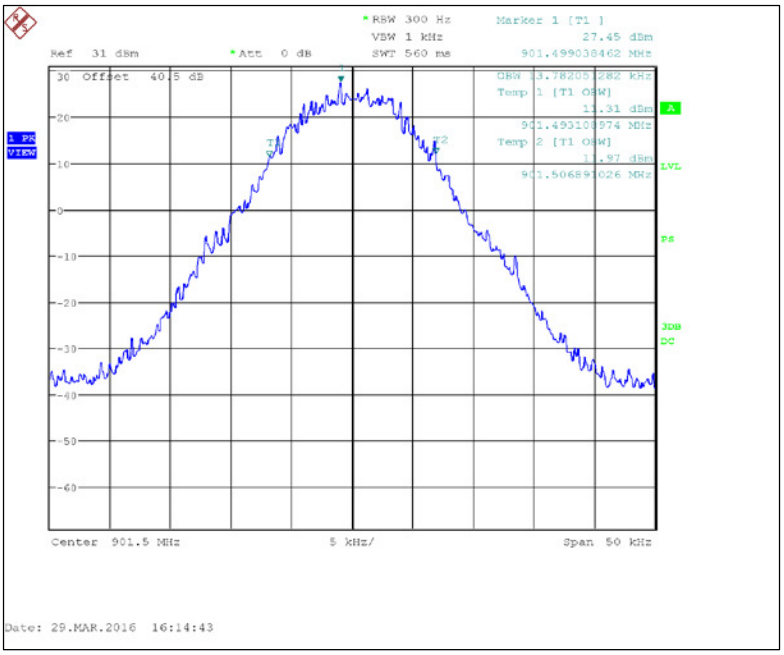

Figure 7.2.3-5: 901.5 MHz – 4SFSK

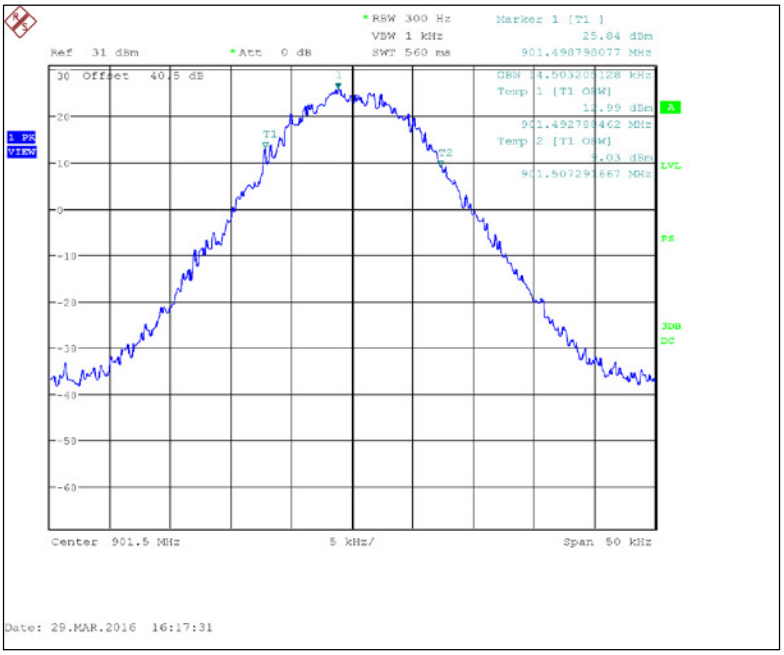

Figure 7.2.3-6: 901.5 MHz – 8SFSK

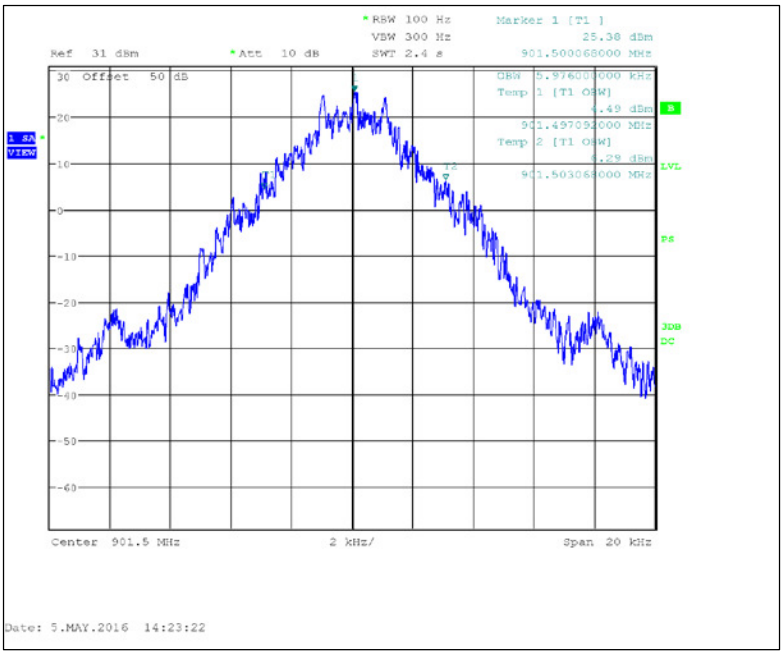

Figure 7.2.3-7: 901.5 MHz – C&I

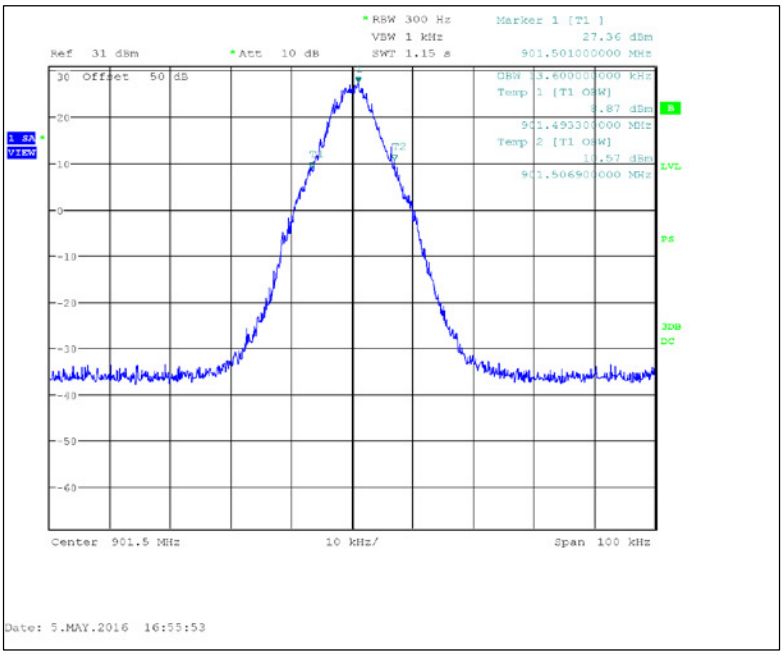

Figure 7.2.3-8: 901.5 MHz – Double Density

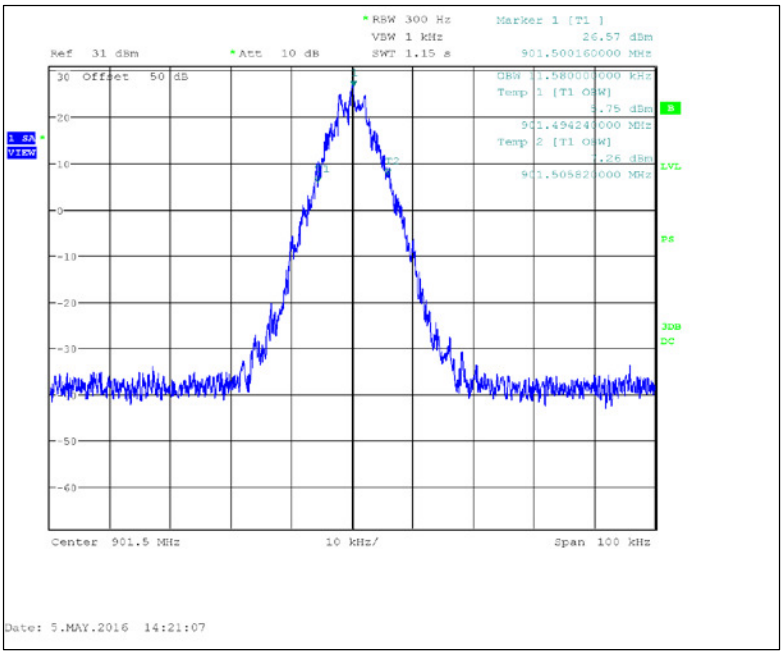

Figure 7.2.3-9: 901.5 MHz – Normal

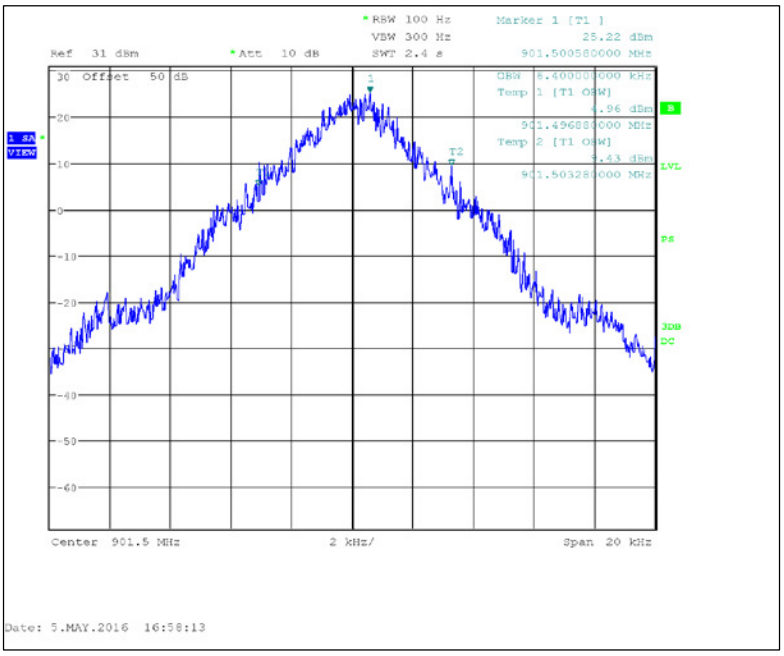

Figure 7.2.3-10: 901.5 MHz – Priority

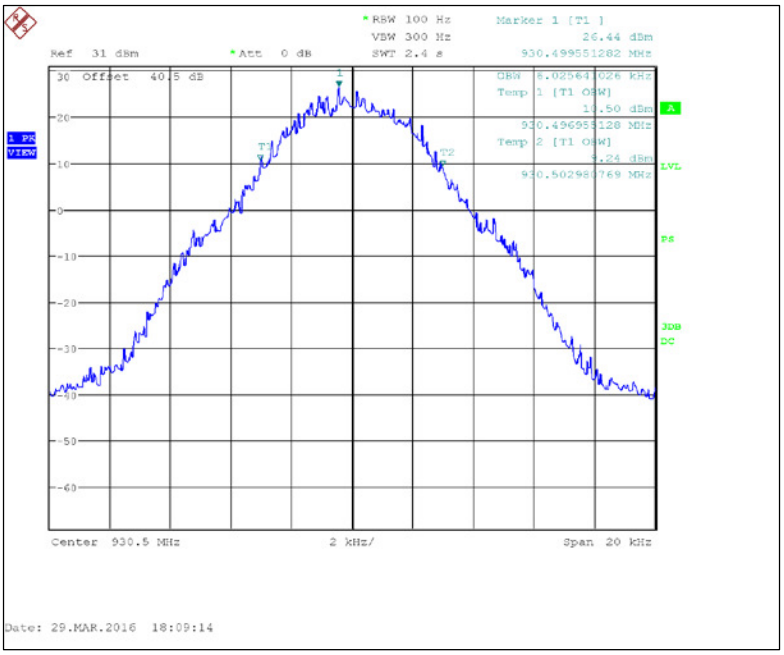

Figure 7.2.3-11: 930.5 MHz – m4Pass 10k Mode

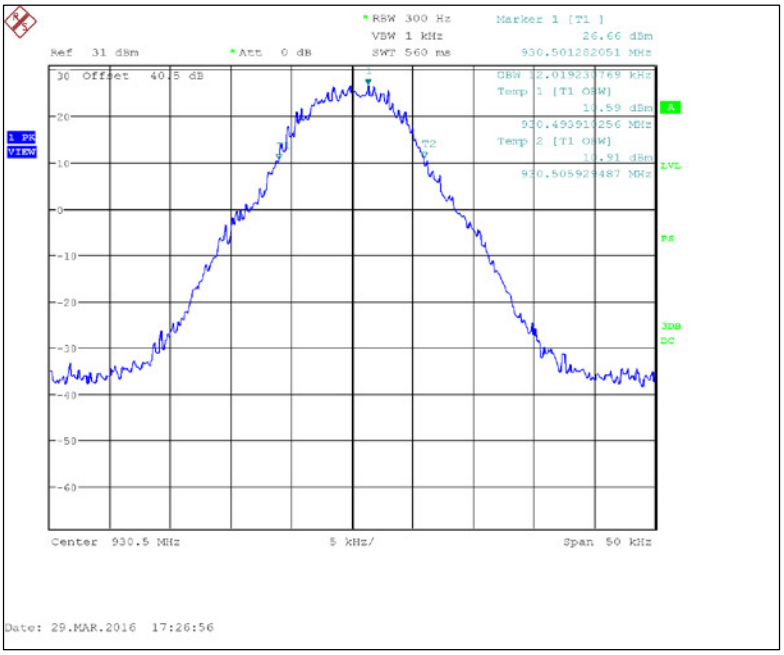

Figure 7.2.3-12: 930.5 MHz – m4Pass 20k Mode

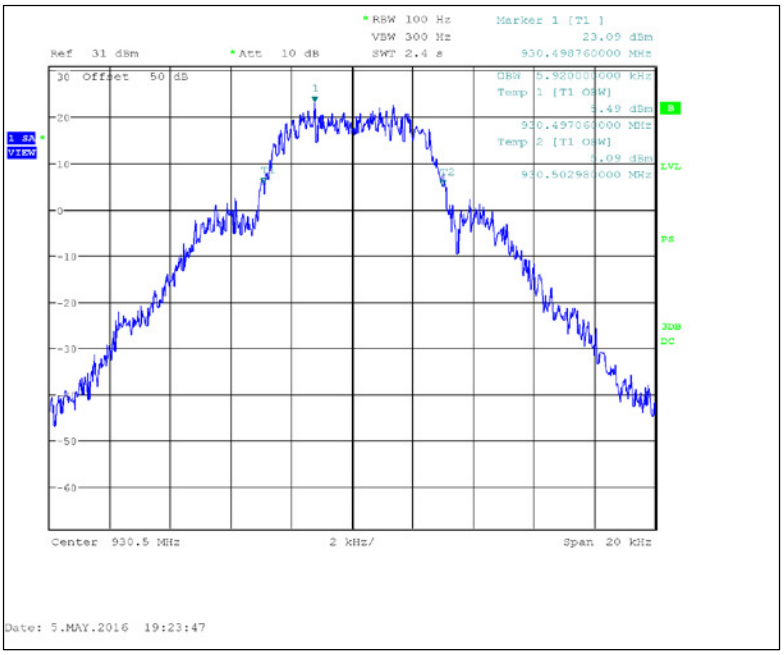

Figure 7.2.3-13: 930.5 MHz – mPass 5k Mode

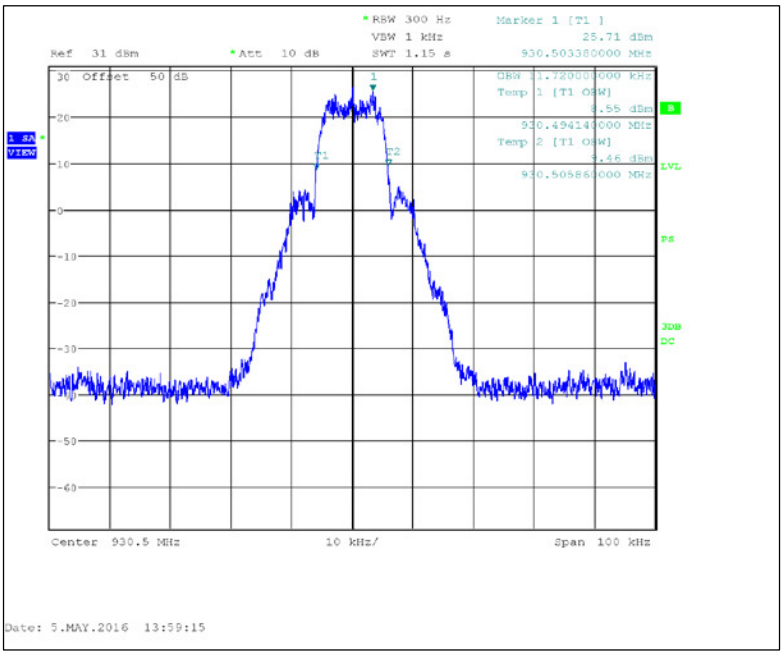

Figure 7.2.3-14: 930.5 MHz – mPass 10k Mode

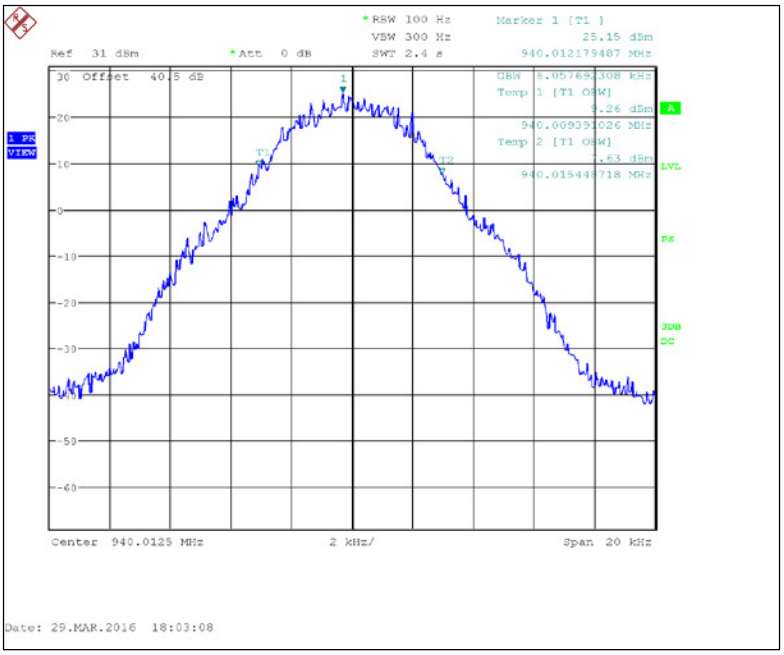

Figure 7.2.3-15: 940.0125 MHz – m4Pass 10k Mode

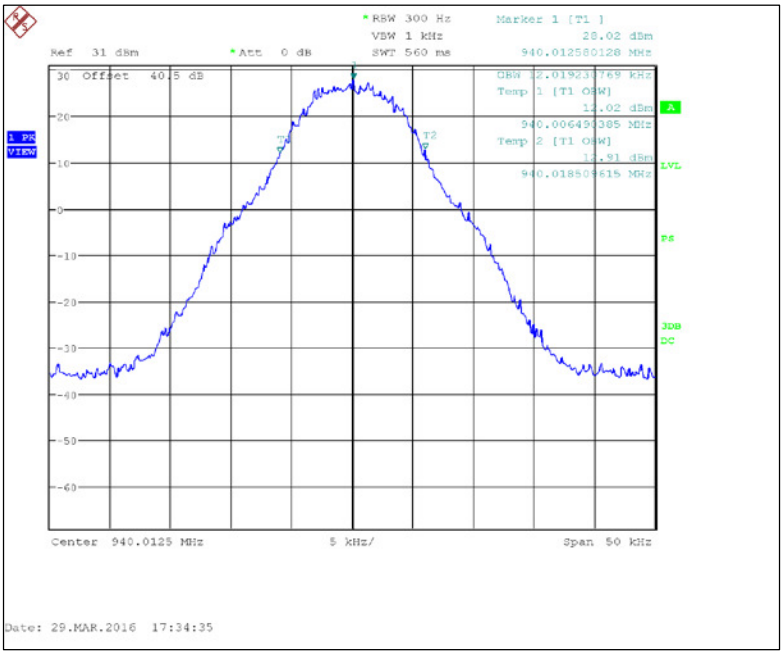

Figure 7.2.3-16: 940.0125 MHz – m4Pass 20k Mode

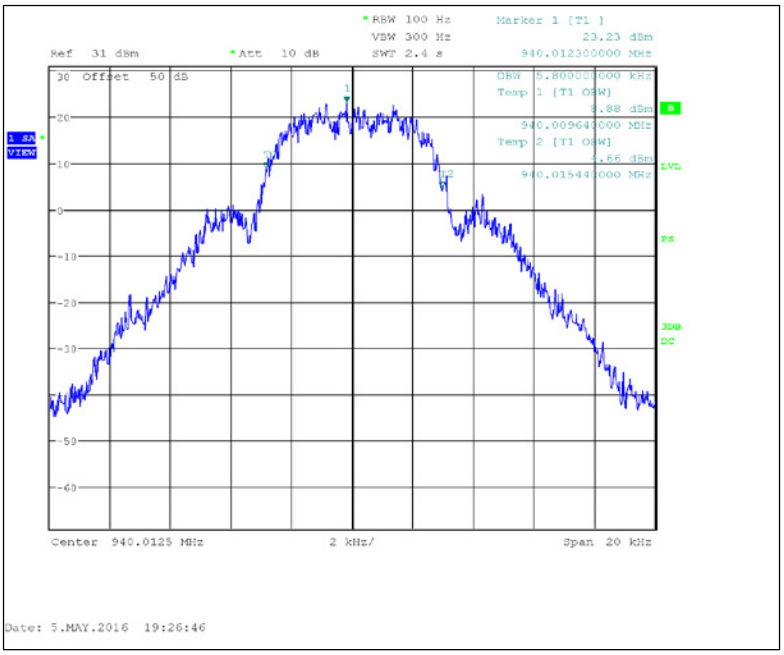

Figure 7.2.3-17: 940.0125 MHz – mPass 5k Mode

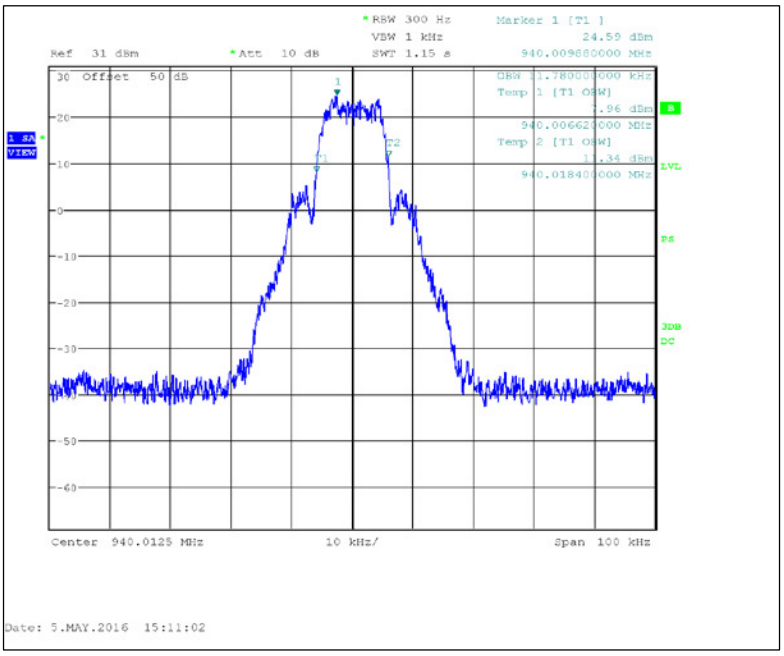

Figure 7.2.3-18: 940.0125 MHz – mPass 10k Mode

RSS-Gen 6.6, RSS-119

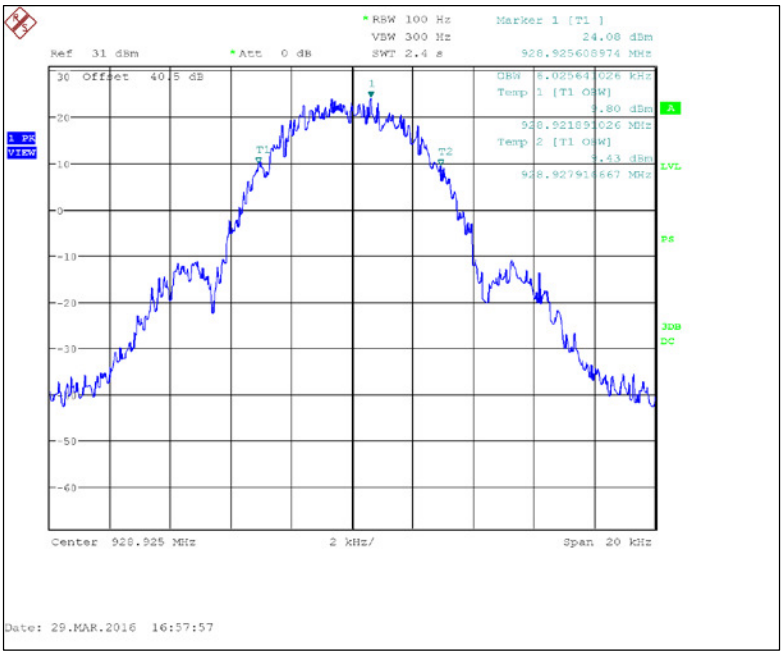

Figure 7.2.3-19: 928.925 MHz – 2SFSK (Half Baud)

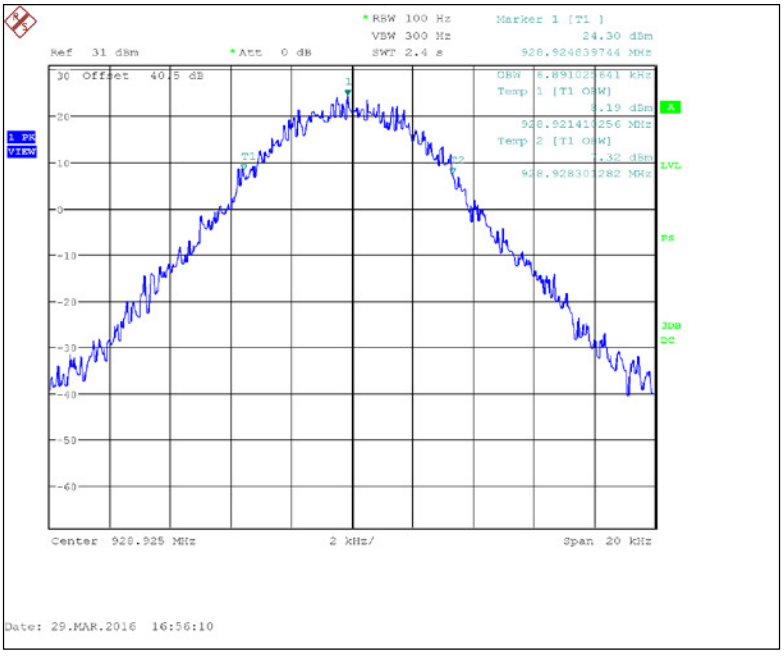

Figure 7.2.3-20: 928.925 MHz – 4SFSK (Half Baud)

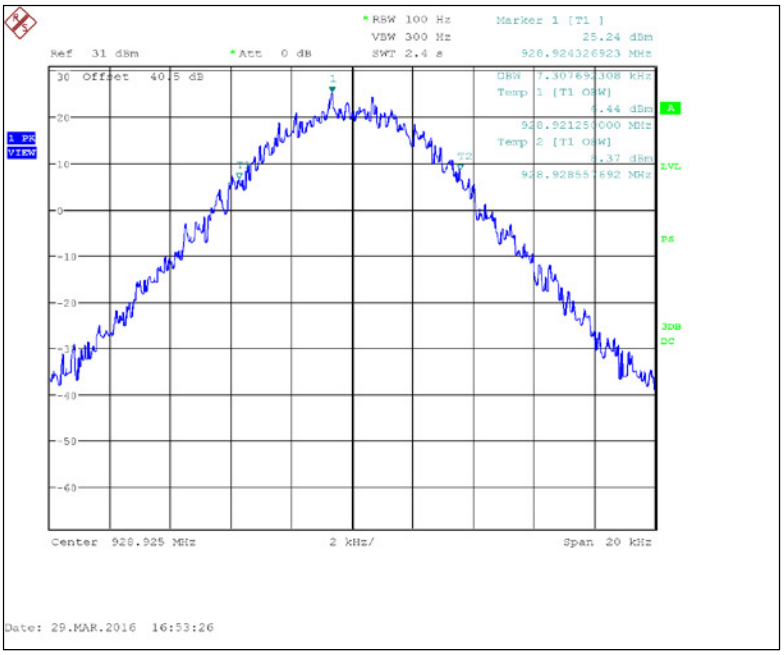

Figure 7.2.3-21: 928.925 MHz – 8SFSK (Half Baud)

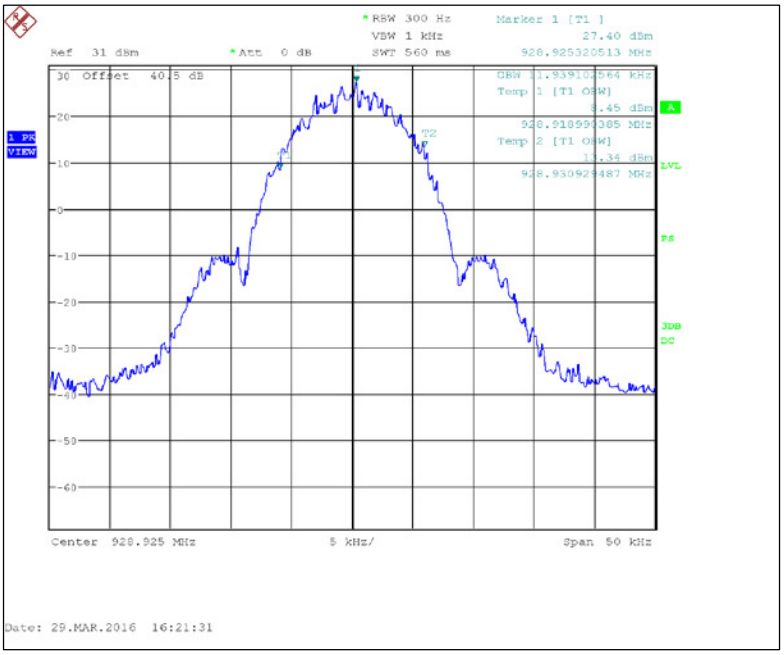

Figure 7.2.3-22: 928.925 MHz — 2SFSK

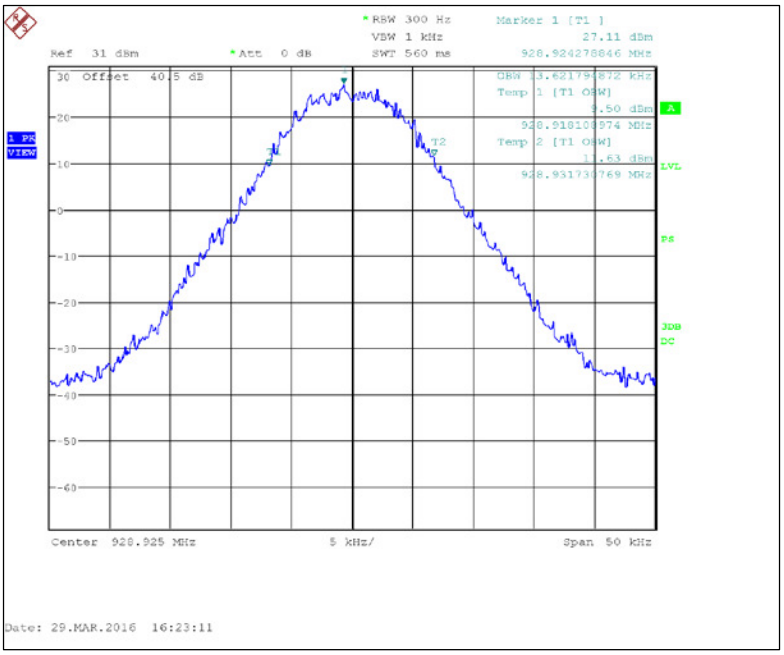

Figure 7.2.3-23: 928.925 MHz — 4SFSK

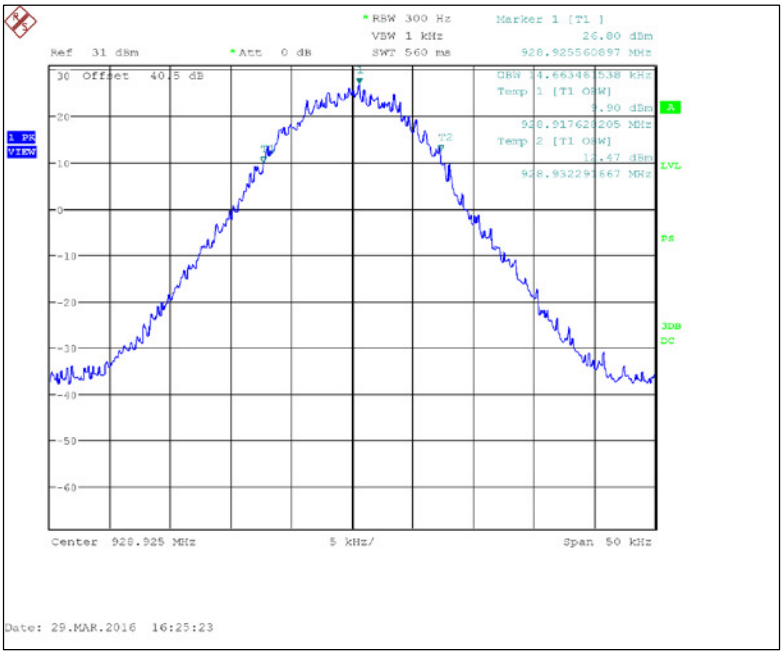

Figure 7.2.3-24: 928.925 MHz — 8SFSK

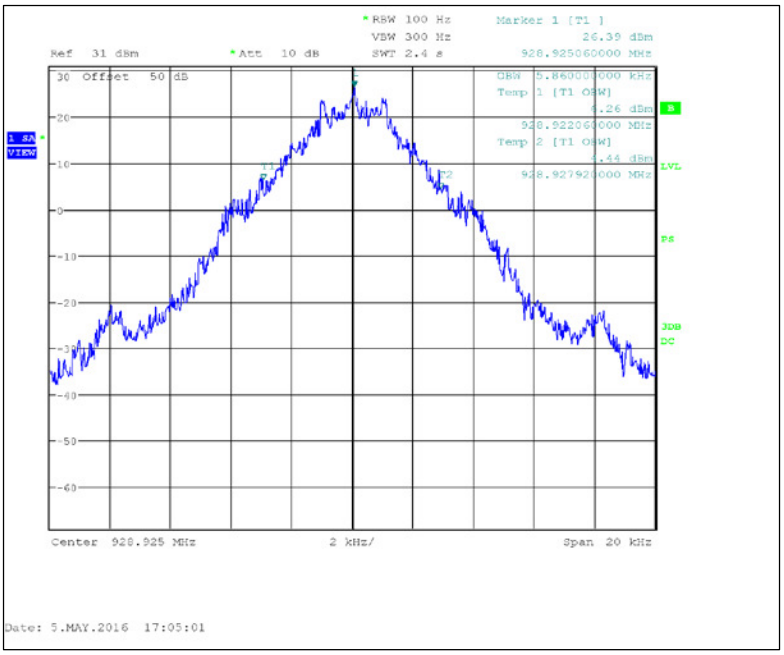

Figure 7.2.3-25: 928.925 MHz — C&I

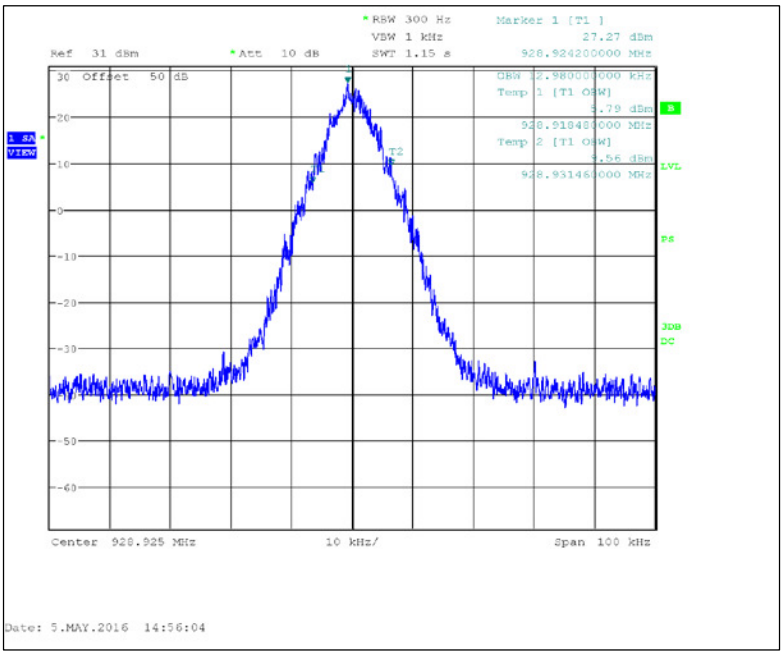

Figure 7.2.3-26: 928.925 MHz — Double Density

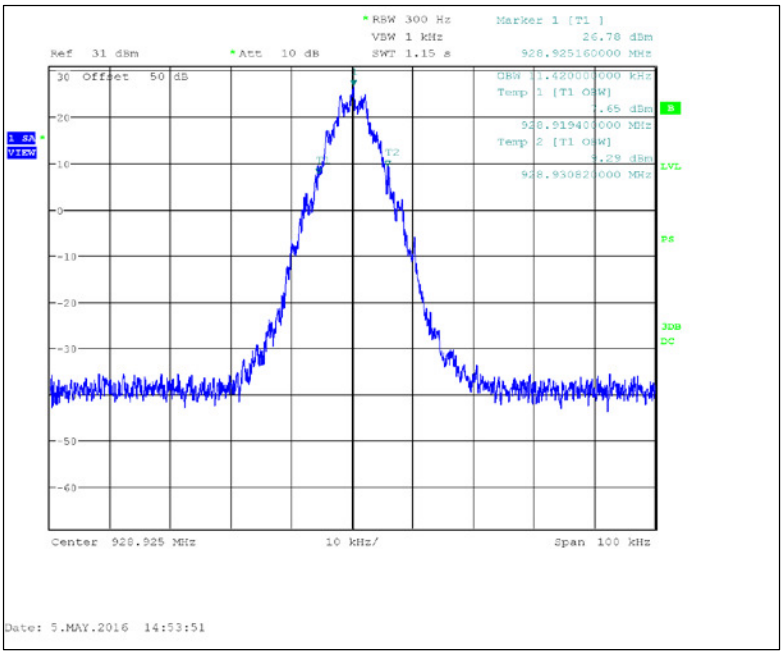

Figure 7.2.3-27: 928.925 MHz — Normal

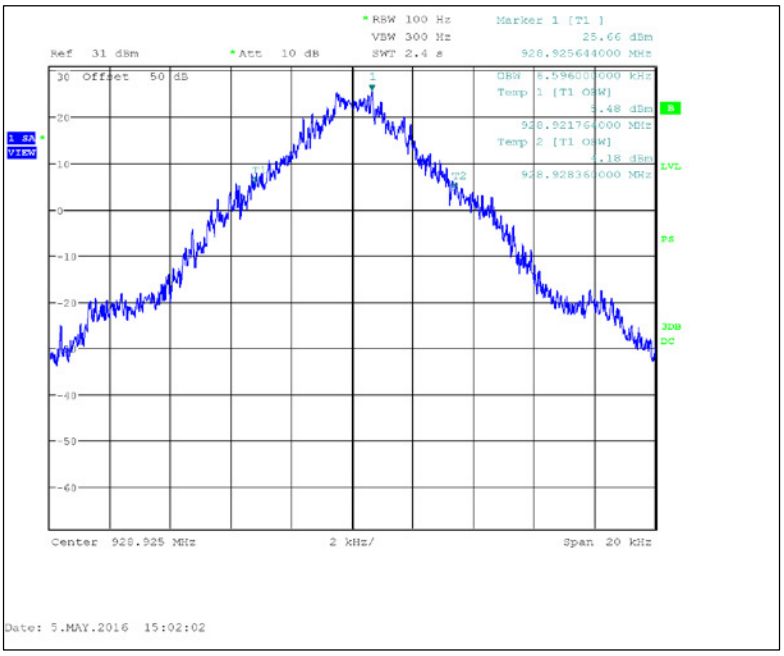

Figure 7.2.3-28: 928.925 MHz — Priority

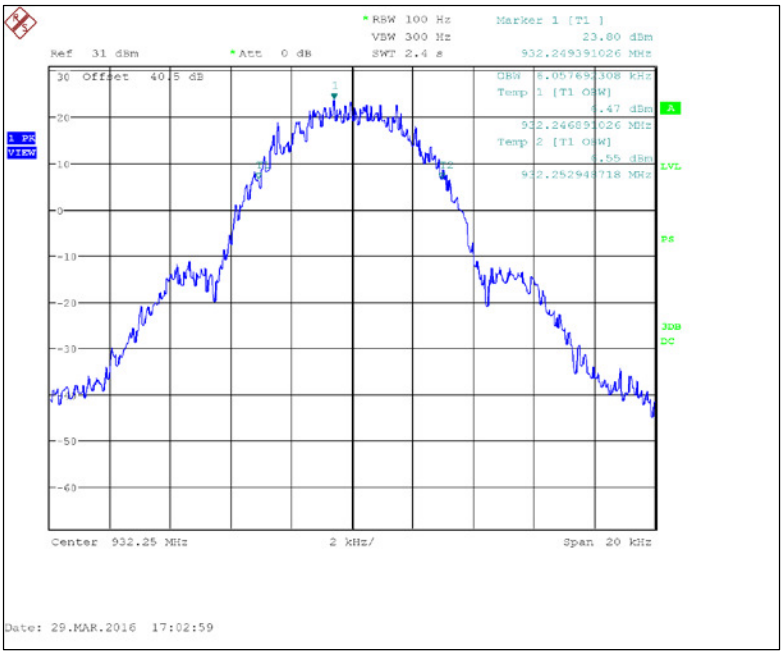

Figure 7.2.3-29: 932.25 MHz – 2SFSK (Half Baud)

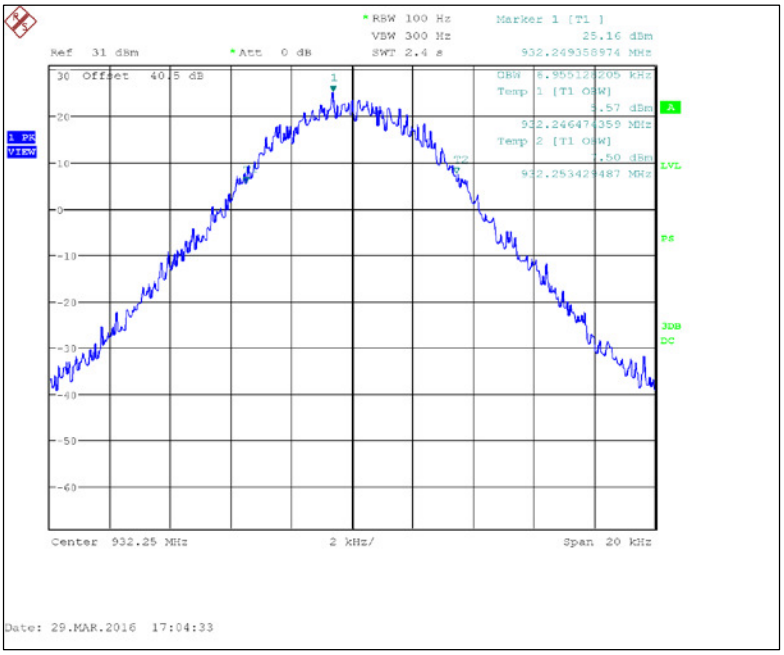

Figure 7.2.3-30: 932.25 MHz – 4SFSK (Half Baud)

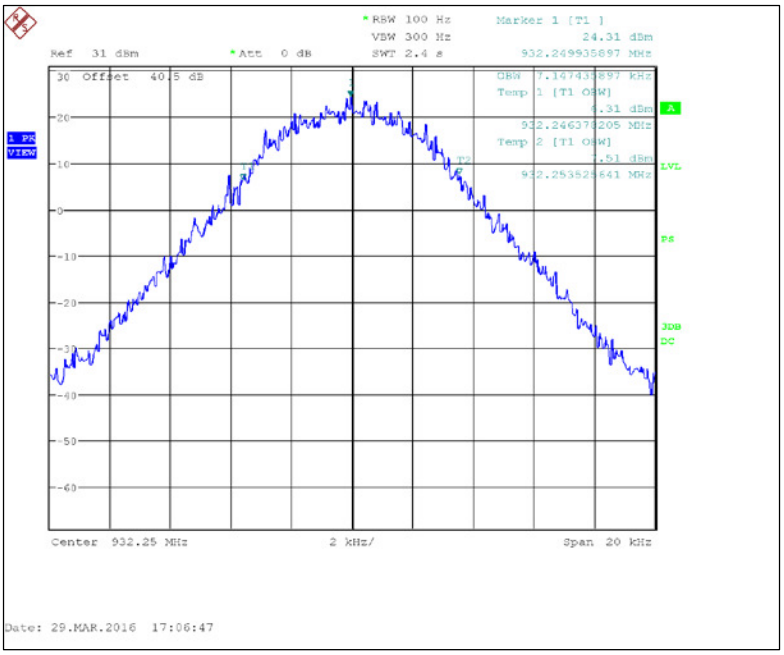

Figure 7.2.3-31: 932.25 MHz – 8SFSK (Half Baud)

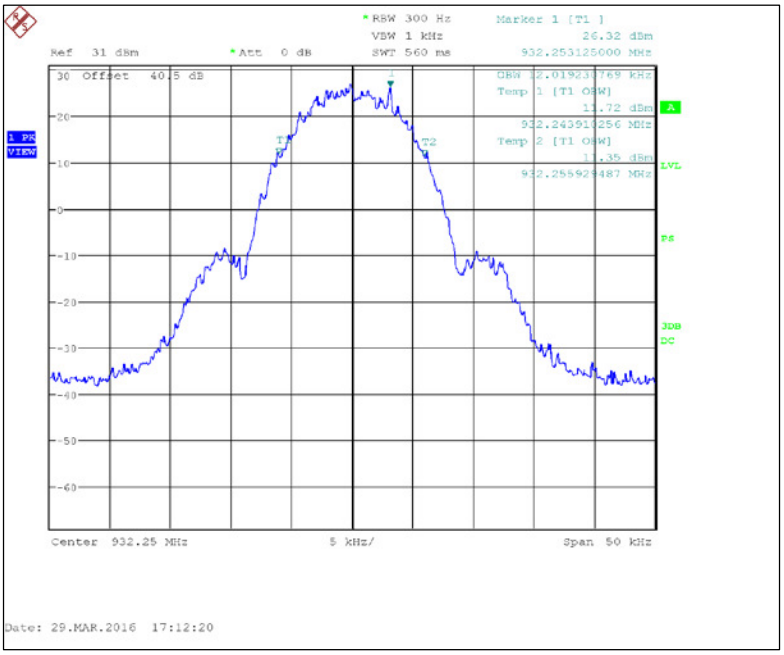

Figure 7.2.3-32: 932.25 MHz — 2SFSK

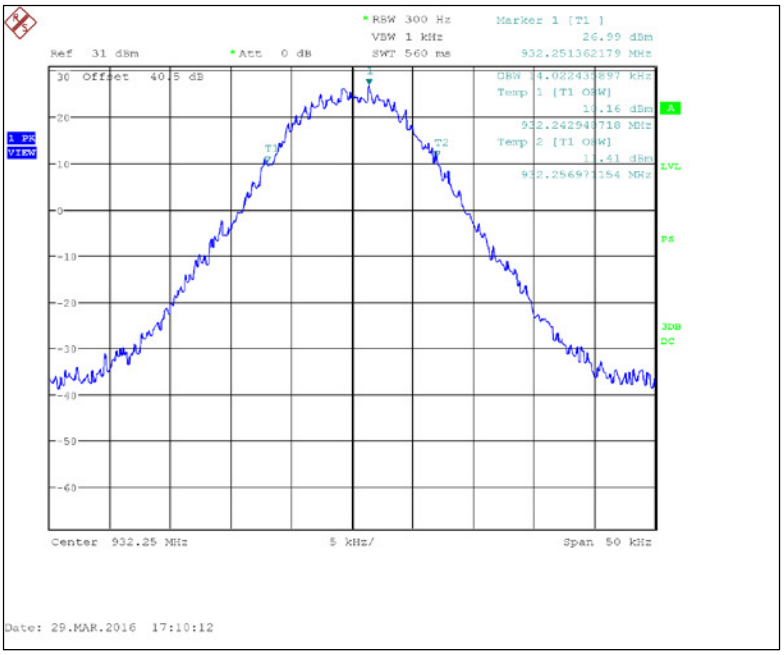

Figure 7.2.3-33: 932.25 MHz — 4SFSK

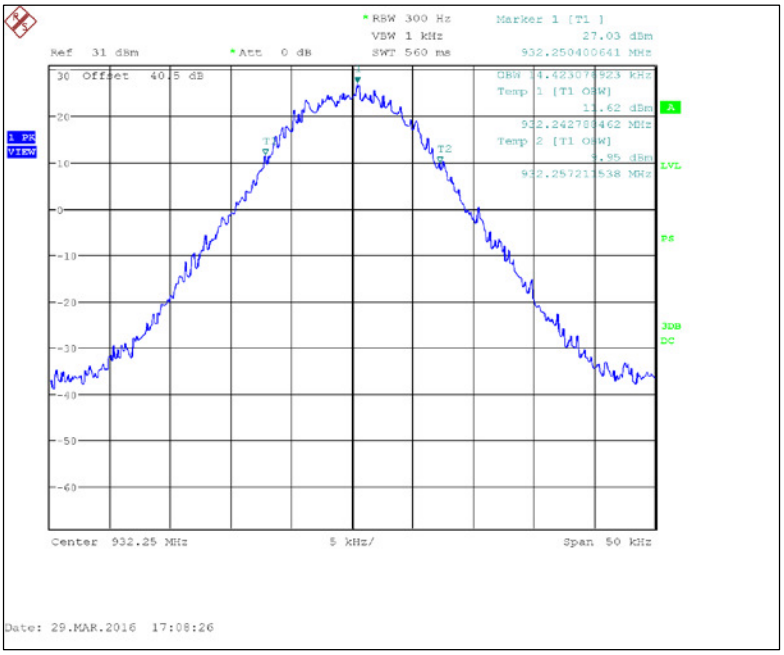

Figure 7.2.3-34: 932.25 MHz — 8SFSK

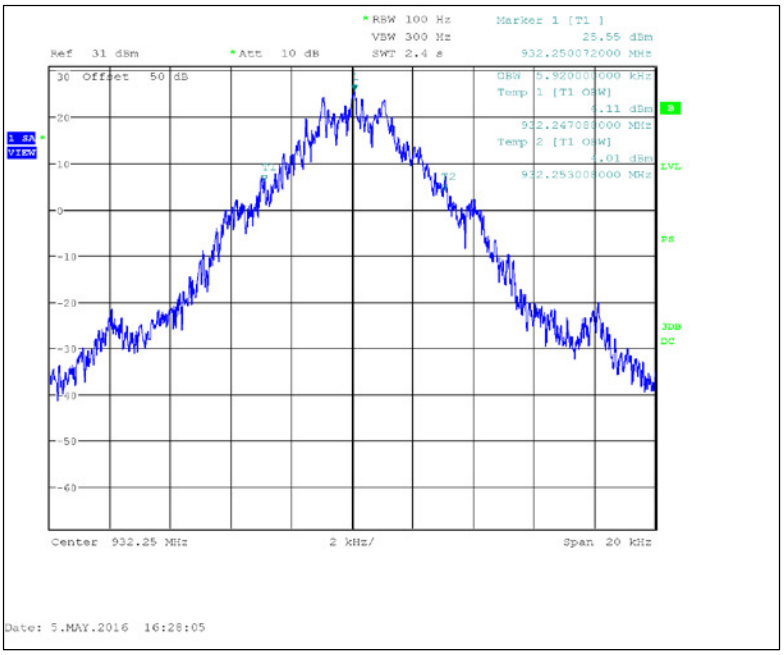

Figure 7.2.3-35: 932.25 MHz — C&I

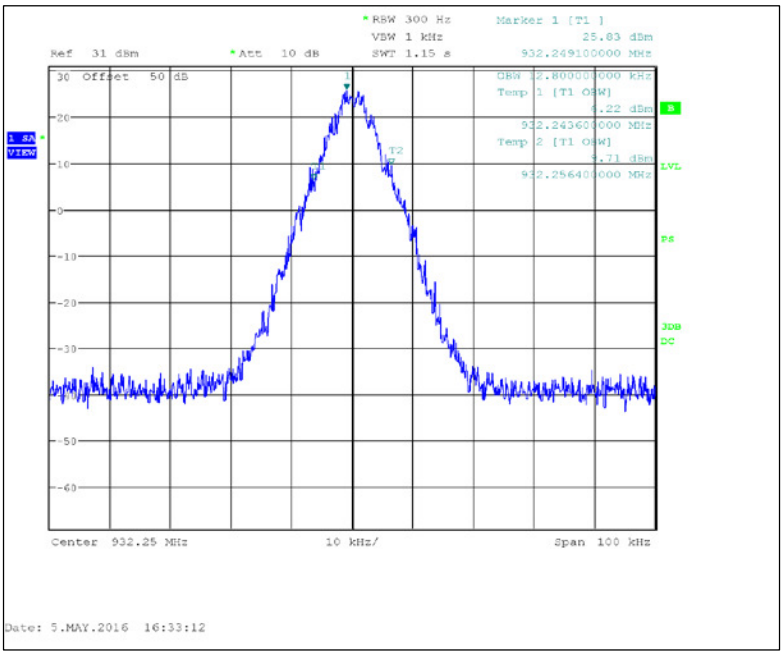

Figure 7.2.3-36: 932.25 MHz — Double Density

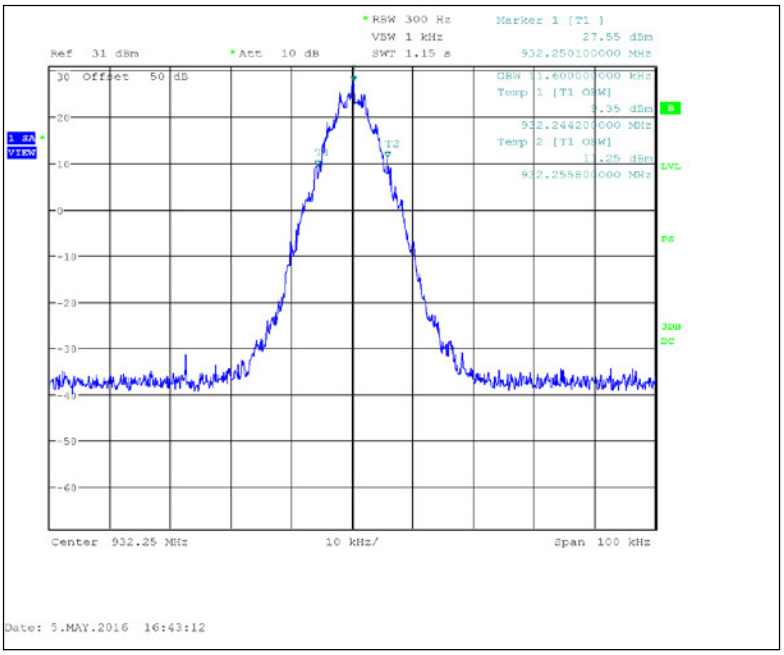

Figure 7.2.3-37: 932.25 MHz — Normal

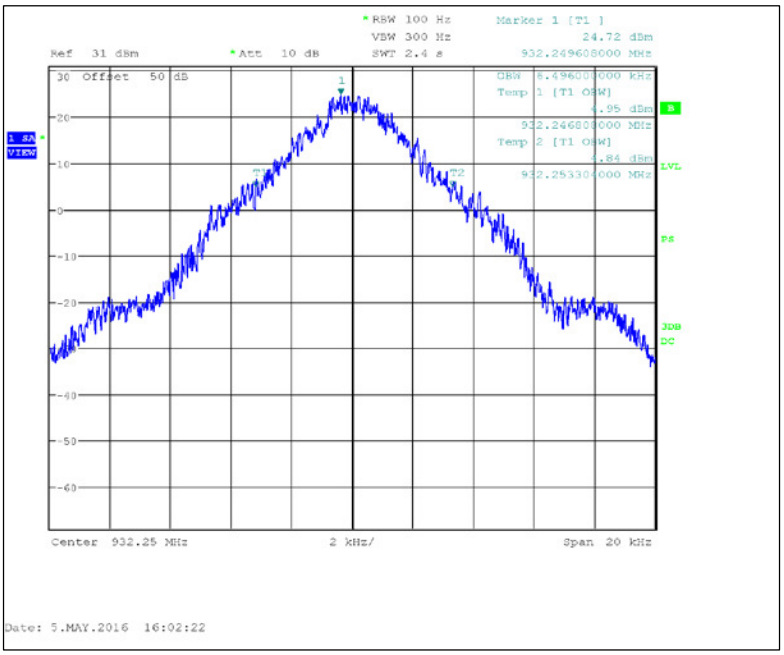

Figure 7.2.3-38: 932.25 MHz — Priority

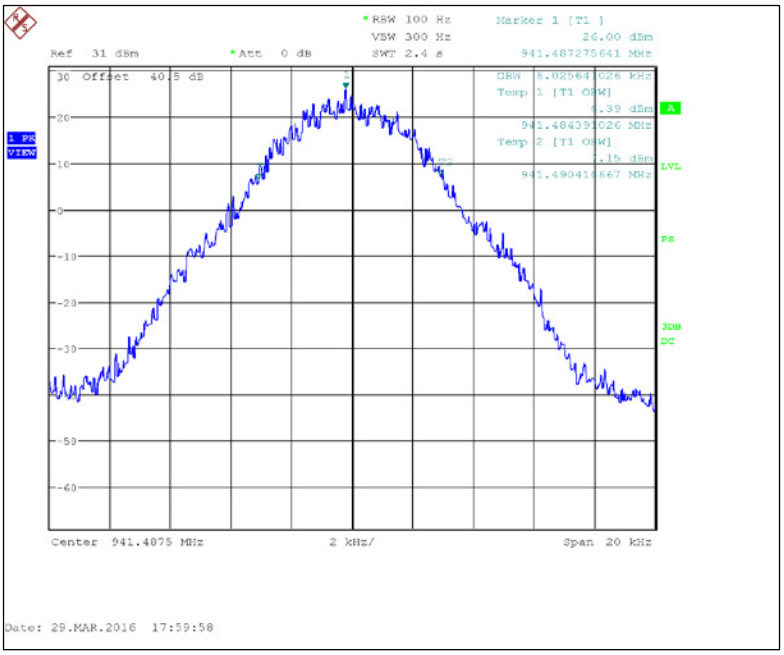

Figure 7.2.3-39: 941.4875 MHz – m4Pass 10k Mode

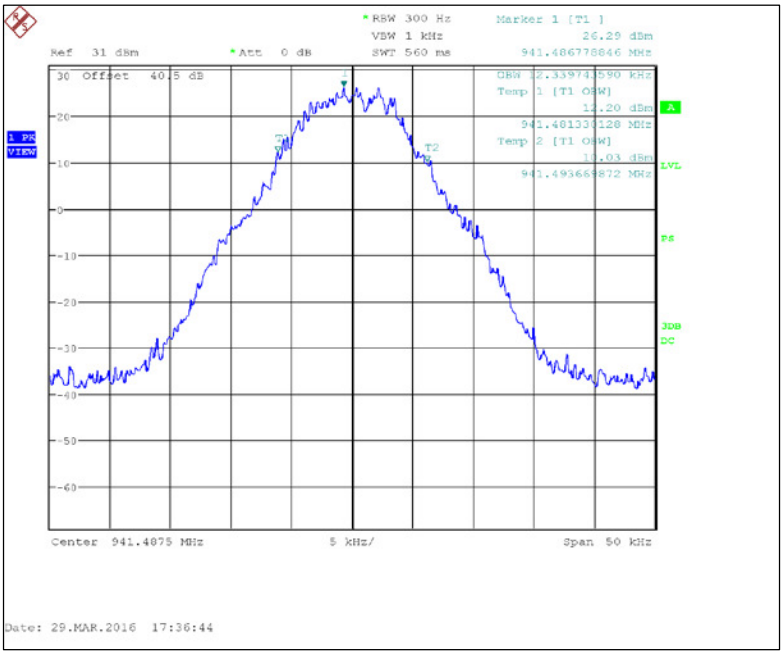

Figure 7.2.3-40: 941.4875 MHz – m4Pass 20k Mode

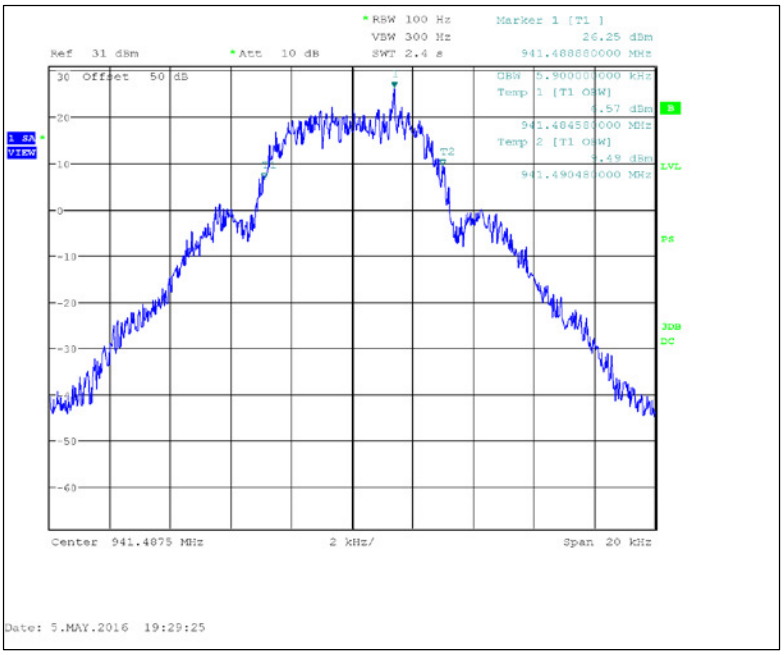

Figure 7.2.3-41: 941.4875 MHz – mPass 5k Mode

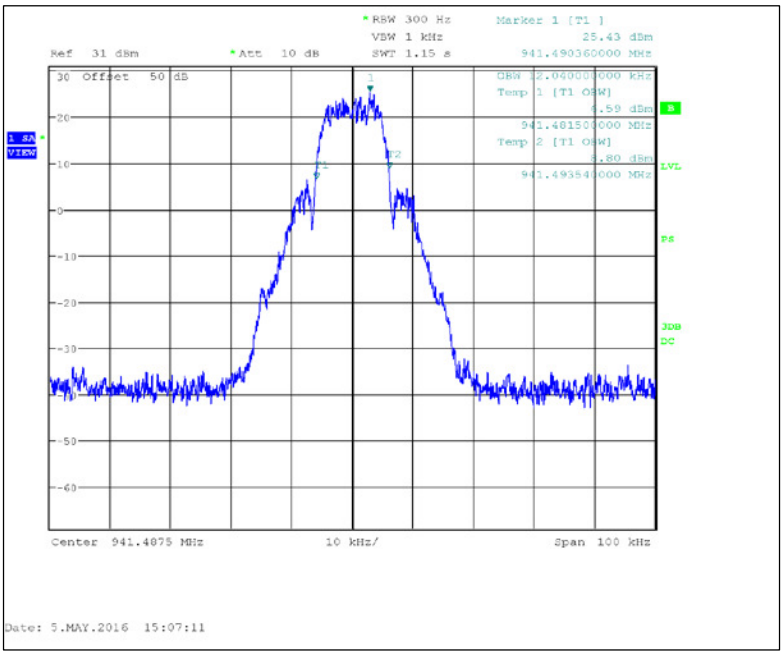

Figure 7.2.3-42: 941.4875 MHz – mPass 10k Mode

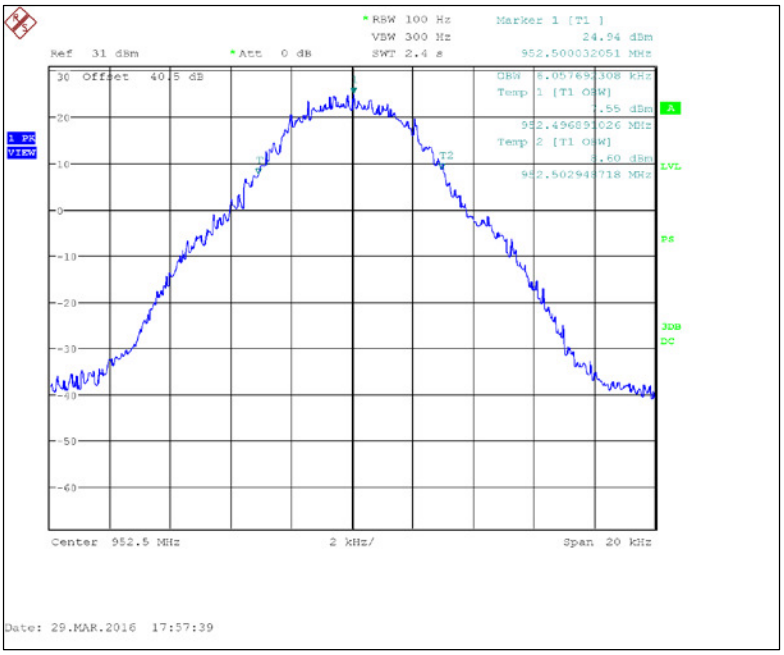

Figure 7.2.3-43: 952.5 MHz – m4Pass 10k Mode

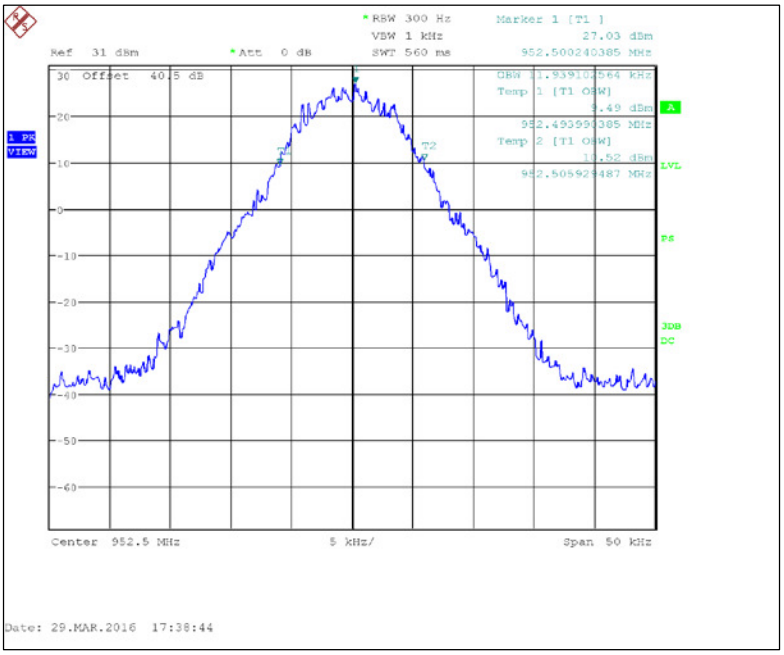

Figure 7.2.3-44: 952.5 MHz – m4Pass 20k Mode

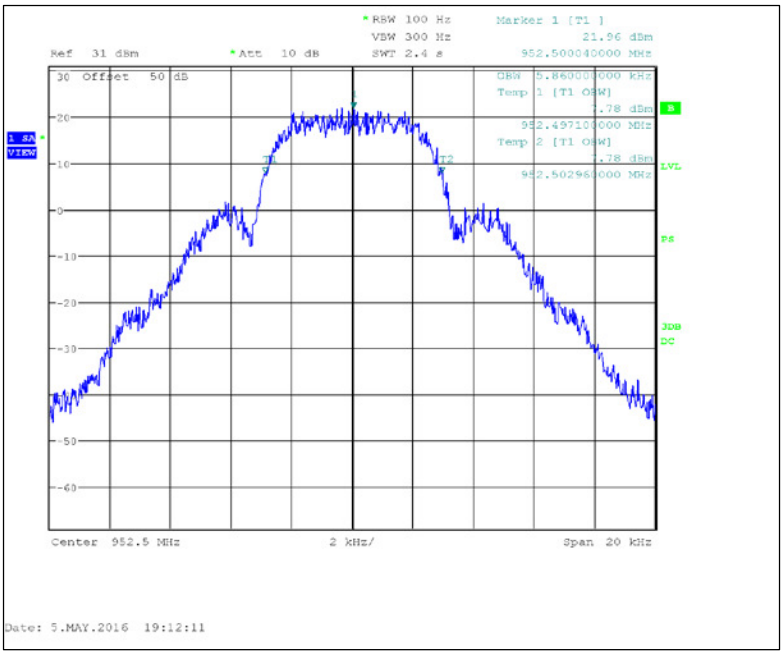

Figure 7.2.3-45: 952.5 MHz – mPass 5k Mode

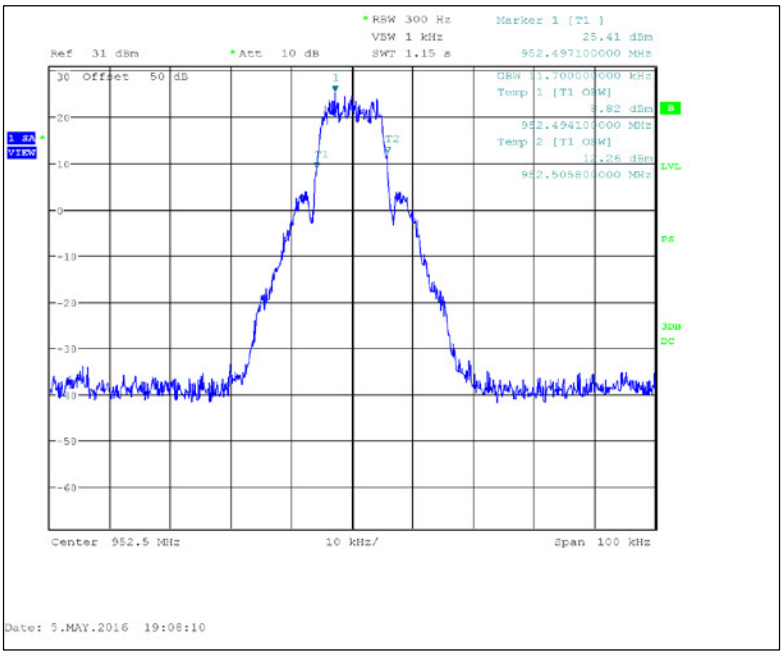

Figure 7.2.3-46: 952.5 MHz – mPass 10k Mode

7.3 Spurious Emissions at Antenna Terminals

7.3.1 Measurement Procedure

The RF output of the equipment under test was directly connected to the input of the spectrum analyzer through 40.5 dB of passive attenuation. The spectrum analyzer resolution bandwidth was set to 100 kHz and the VBW>RBW. The internal correction factors of the spectrum analyzer were employed to correct for any cable, attenuator or filter losses. The spectrum was investigated in accordance to CFR 47 Part 2.1057. Results are shown below.

7.3.2 Measurement Results

Part 24.133 a(1), a(2), IC RSS-134 4.4.1, 4.4.2

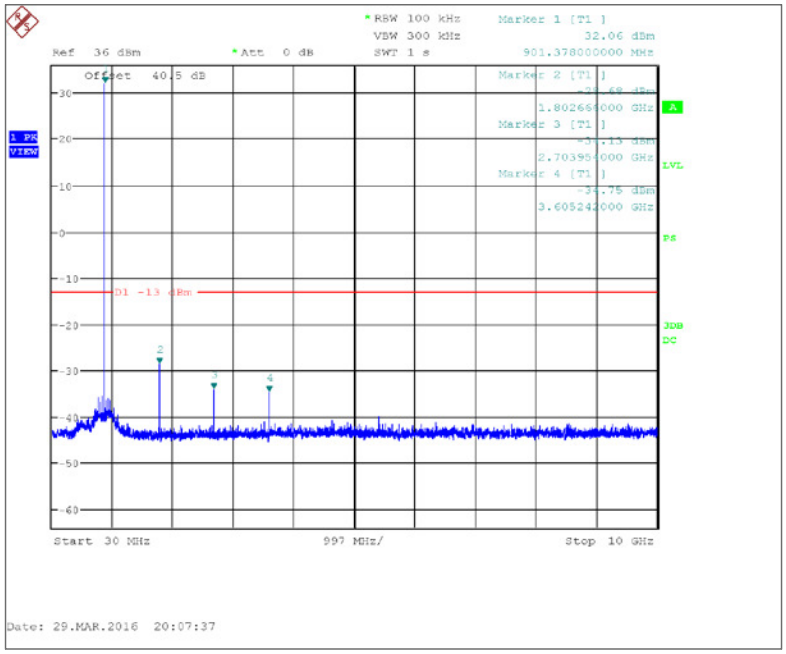

Figure 7.3.2-1: 901.5 MHz – 30 MHz to 10 GHz – 2SFSK (Half Baud)

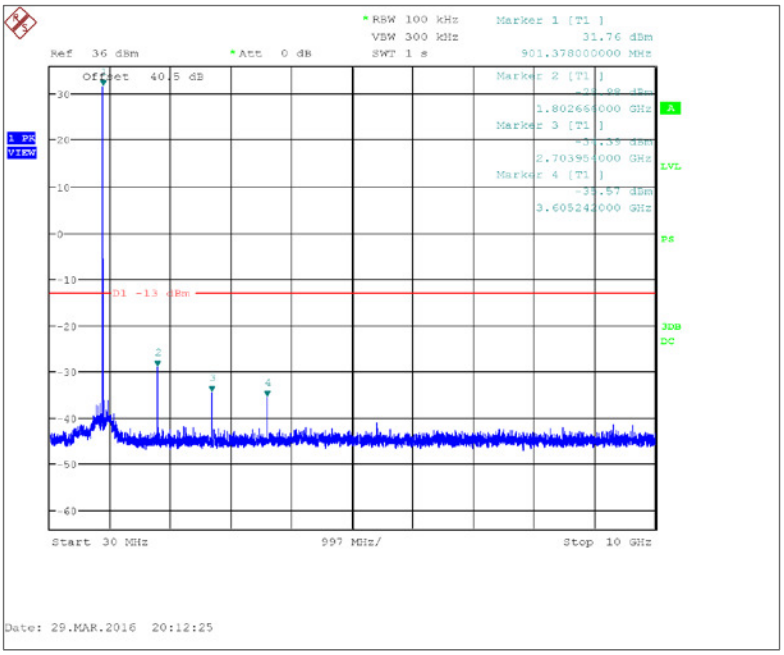

Figure 7.3.2-2: 901.5 MHz – 30 MHz to 10 GHz – 4SFSK (Half Baud)

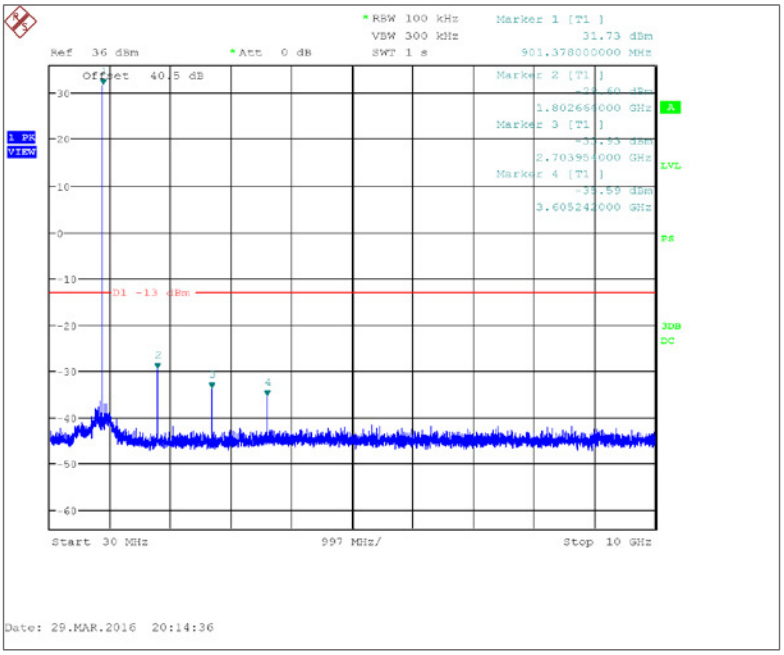

Figure 7.3.2-3: 901.5 MHz – 30 MHz to 10 GHz – 8SFSK (Half Baud)

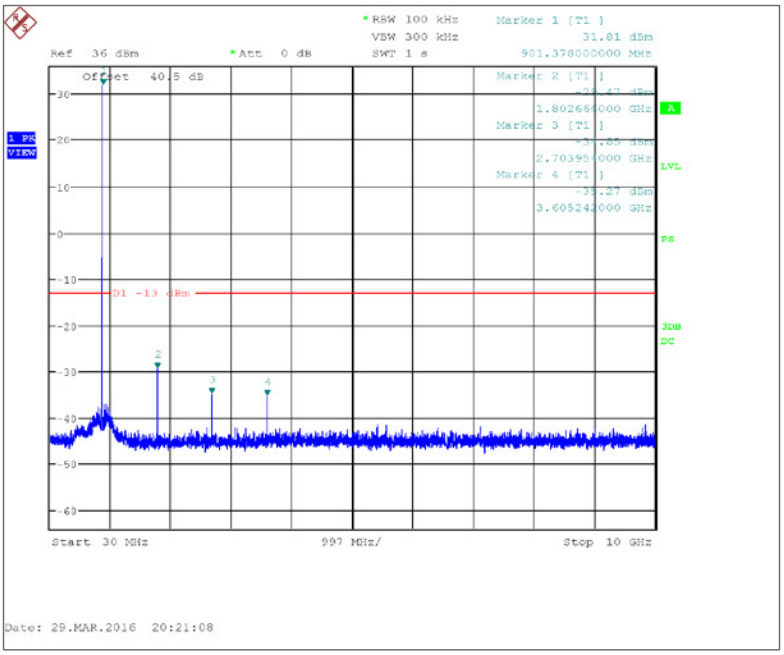

Figure 7.3.2-4: 901.5 MHz – 30 MHz to 10 GHz – 2SFSK

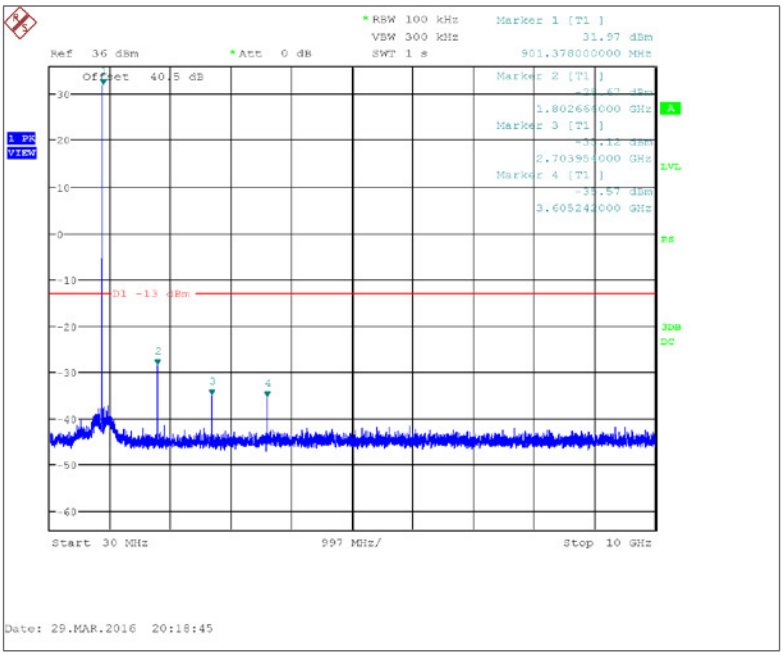

Figure 7.3.2-5: 901.5 MHz – 30 MHz to 10 GHz – 4SFSK

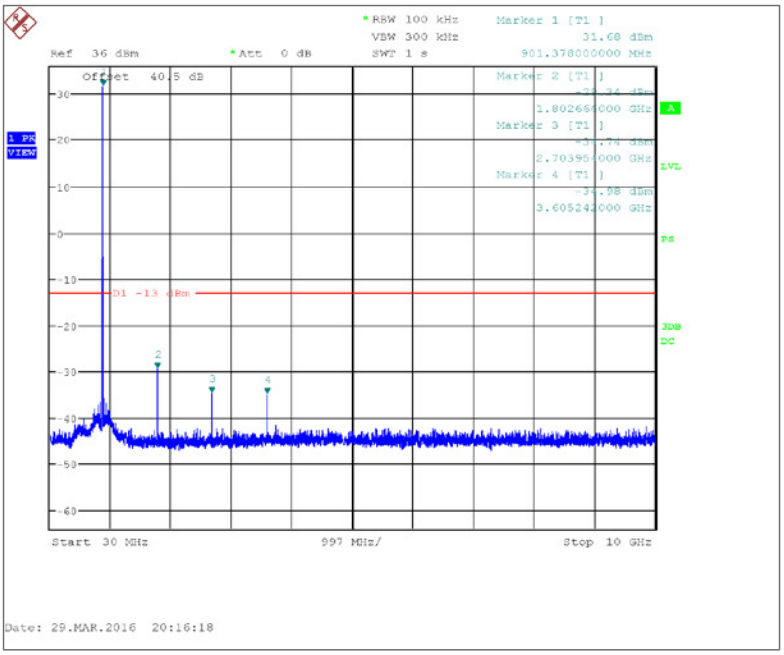

Figure 7.3.2-6: 901.5 MHz – 30 MHz to 10 GHz – 8SFSK

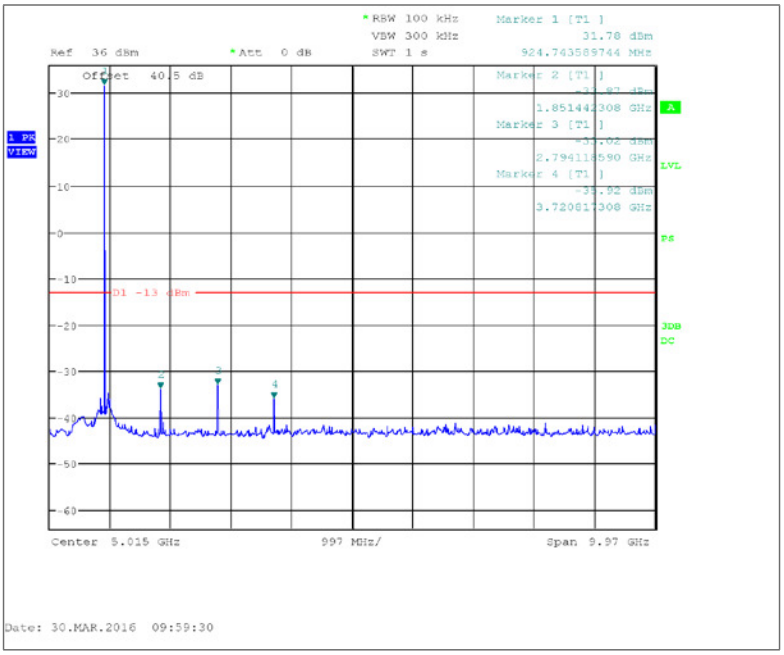

Figure 7.3.2-7: 930.5 MHz – 30 MHz to 10 GHz – m4Pass 10k

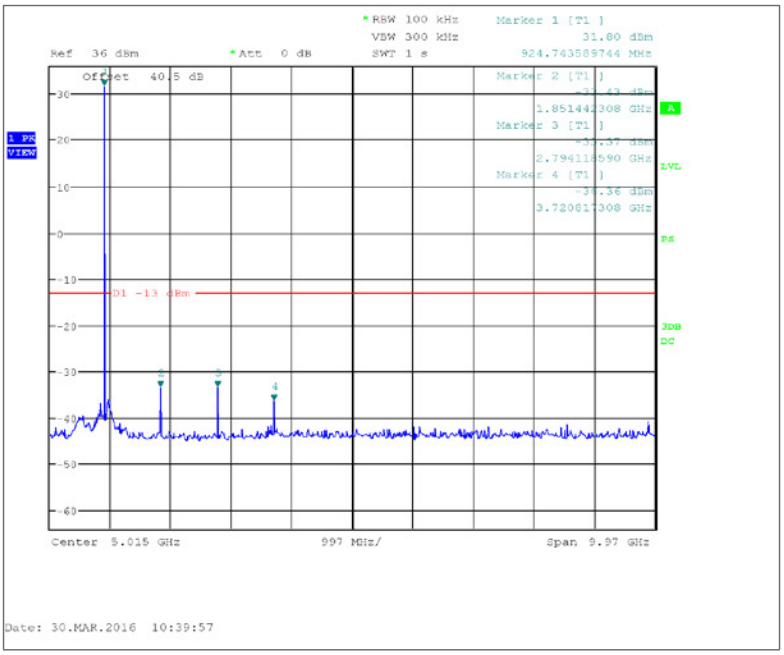

Figure 7.3.2-8: 930.5 MHz – 30 MHz to 10 GHz – m4Pass 20k

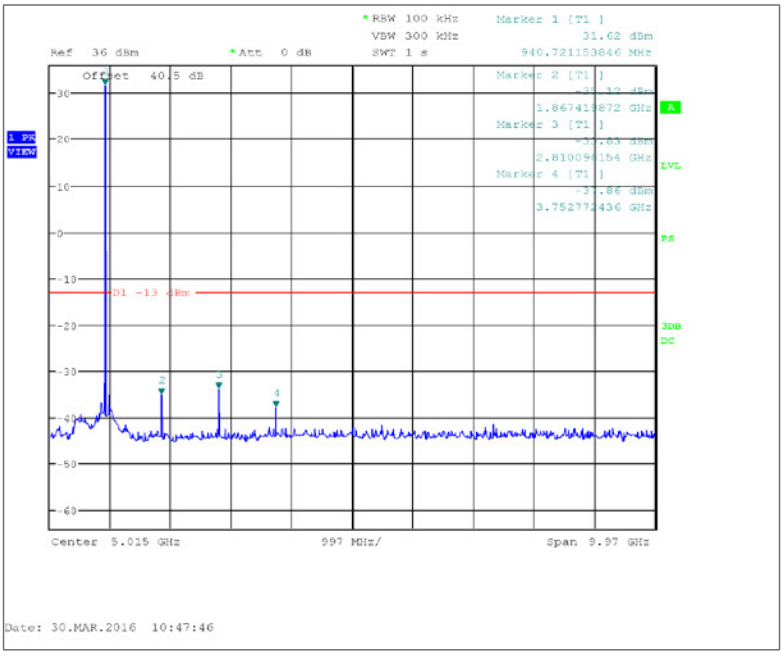

Figure 7.3.2-9: 940.0125 MHz – 30 MHz to 10 GHz – m4Pass 10k

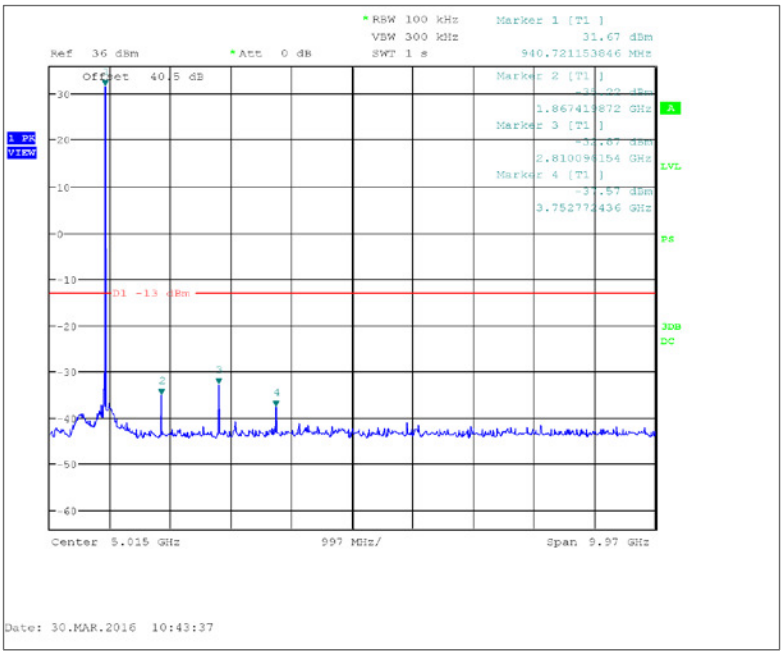

Figure 7.3.2-10: 940.0125 MHz – 30 MHz to 10 GHz – m4Pass 20k

Part 101.111 a(6), RSS-119 5.8.6

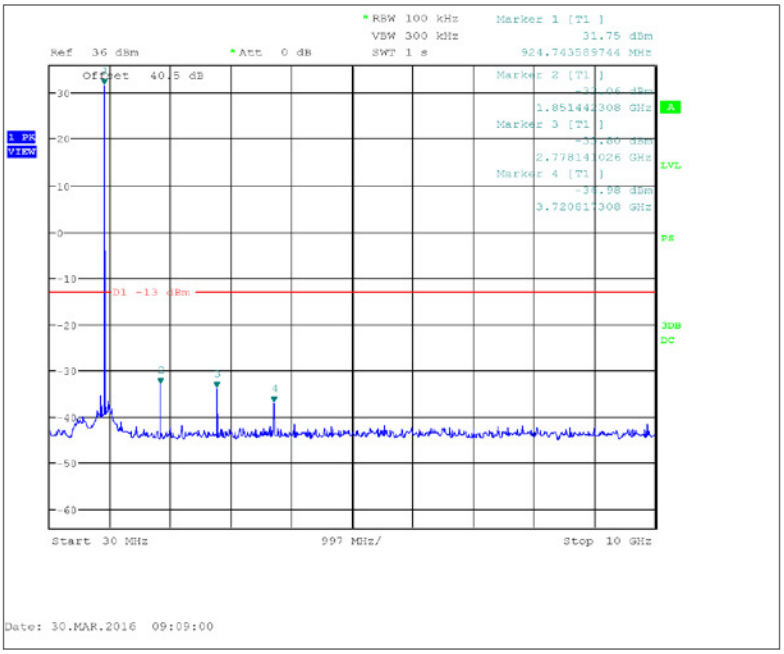

Figure 7.3.2-11: 928.925 MHz – 30 MHz to 10 GHz – 2SFSK (Half Baud)

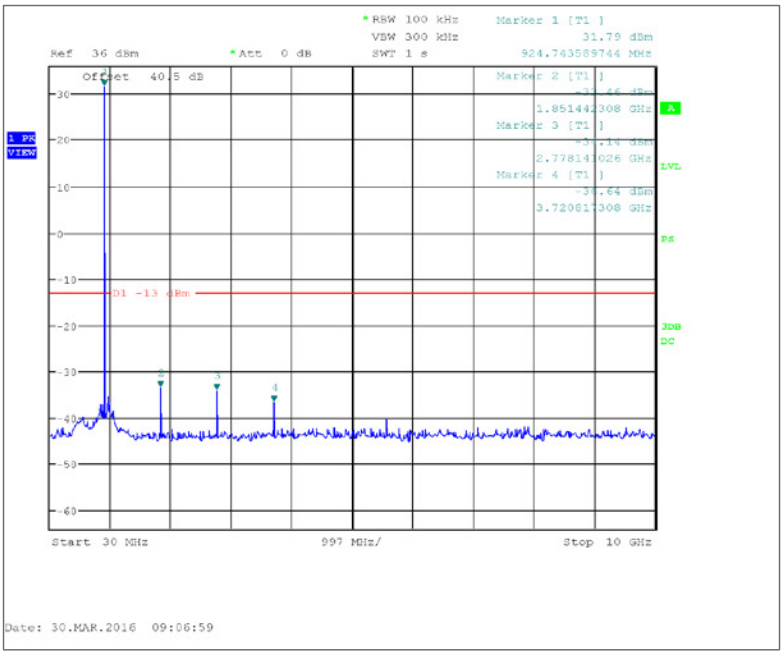

Figure 7.3.2-12: 928.925 MHz – 30 MHz to 10 GHz – 4SFSK (Half Baud)

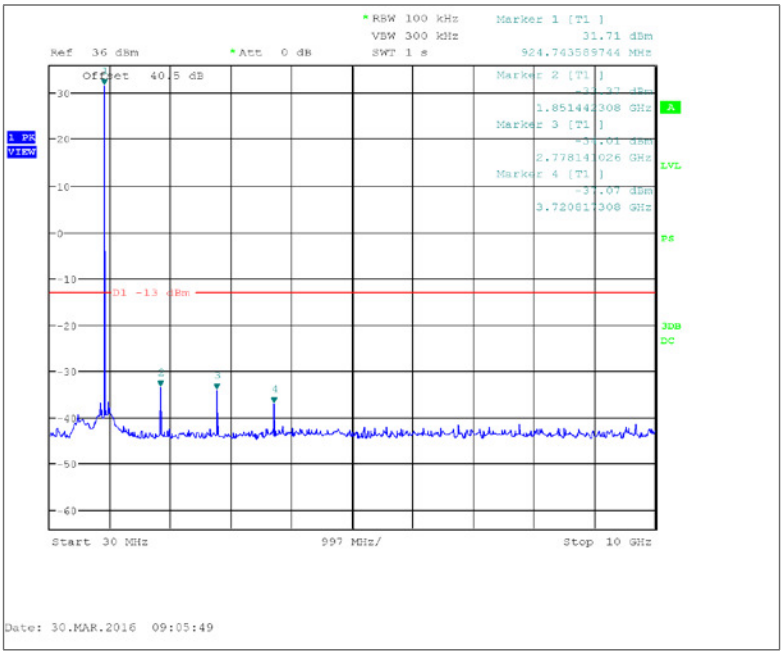

Figure 7.3.2-13: 928.925 MHz – 30 MHz to 10 GHz – 8SFSK (Half Baud)

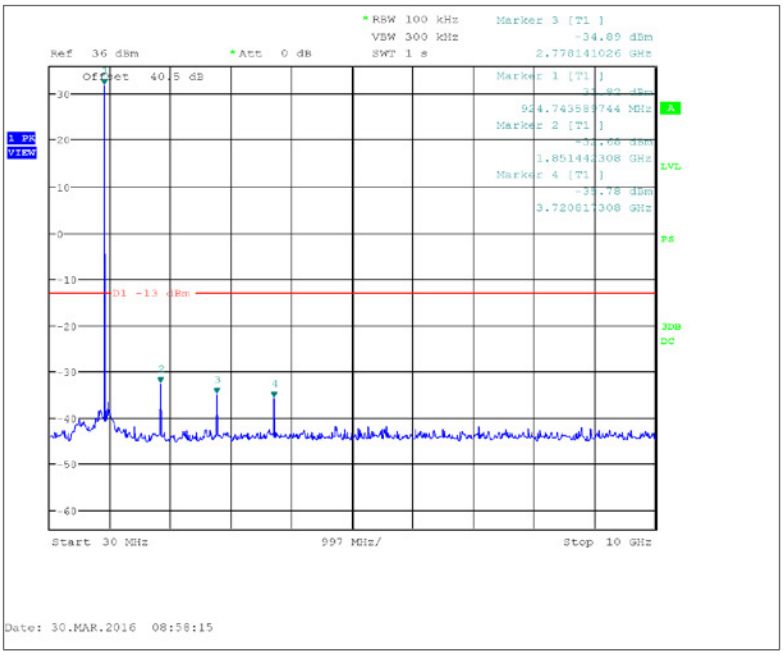

Figure 7.3.2-14: 928.925 MHz – 30 MHz to 10 GHz – 2SFSK

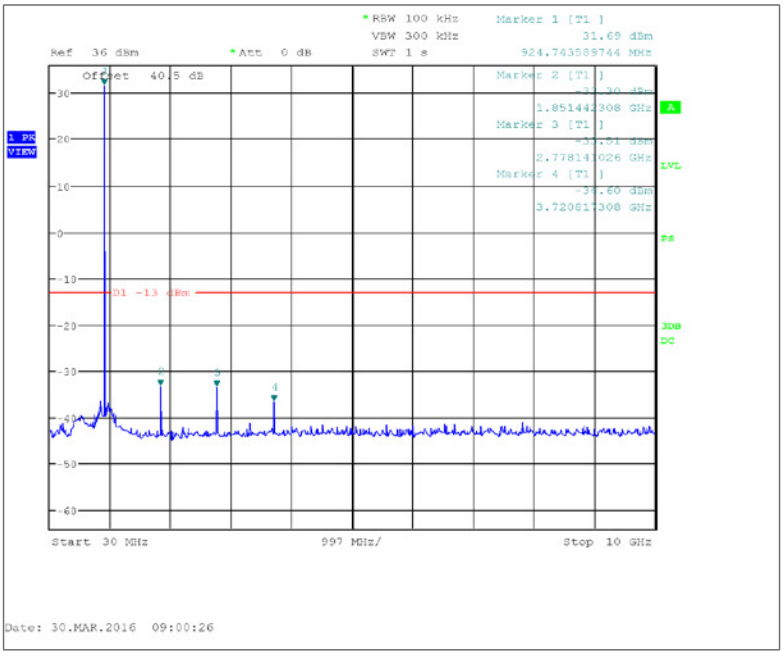

Figure 7.3.2-15: 928.925 MHz – 30 MHz to 10 GHz – 4SFSK

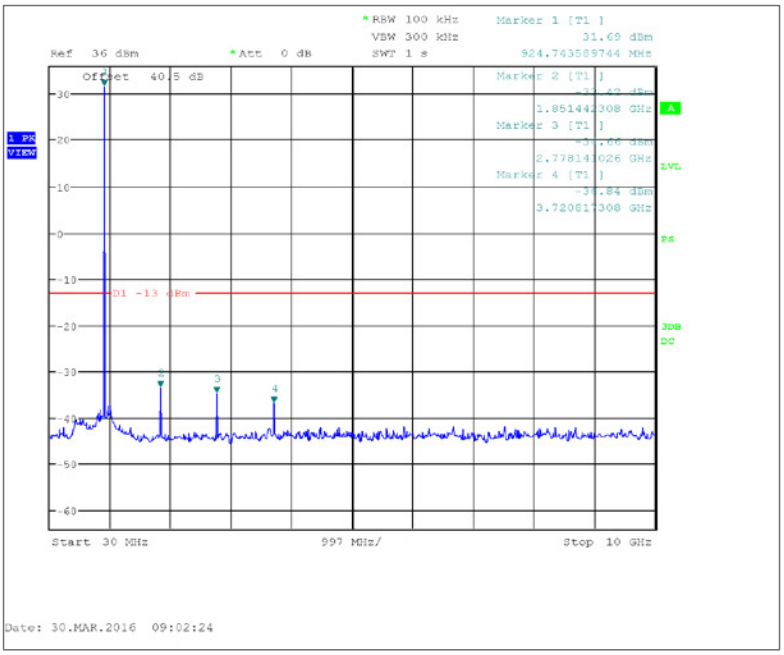

Figure 7.3.2-16: 928.925 MHz – 30 MHz to 10 GHz – 8SFSK

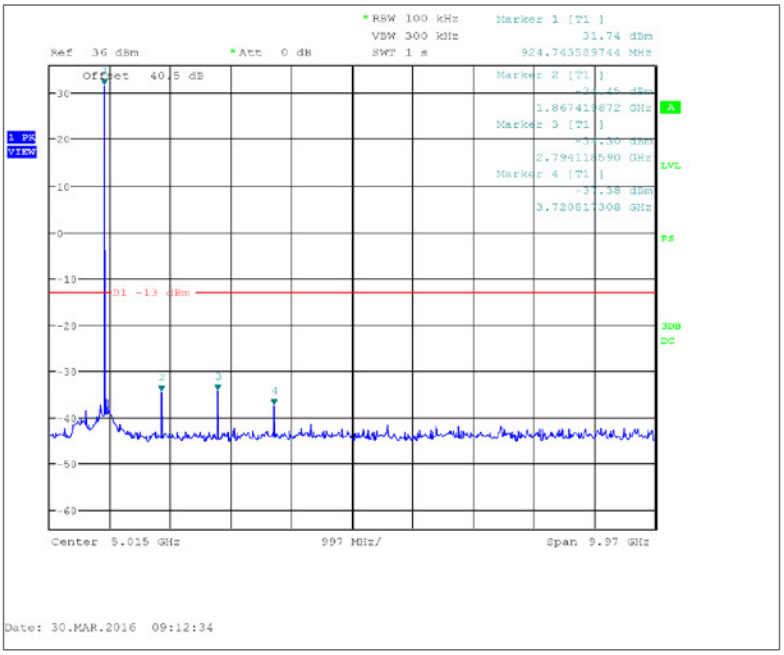

Figure 7.3.2-17: 932.25 MHz – 30 MHz to 10 GHz – 2SFSK (Half Baud)

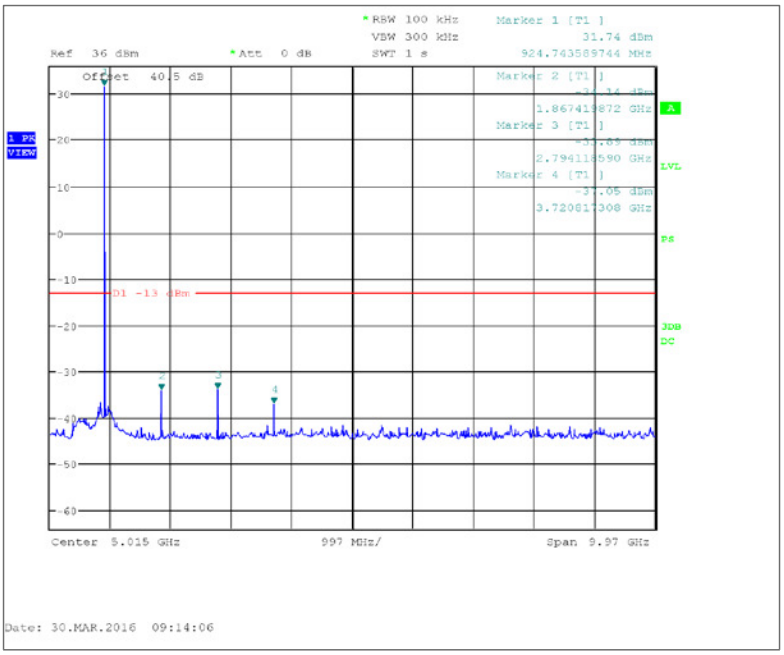

Figure 7.3.2-18: 932.25 MHz – 30 MHz to 10 GHz – 4SFSK (Half Baud)

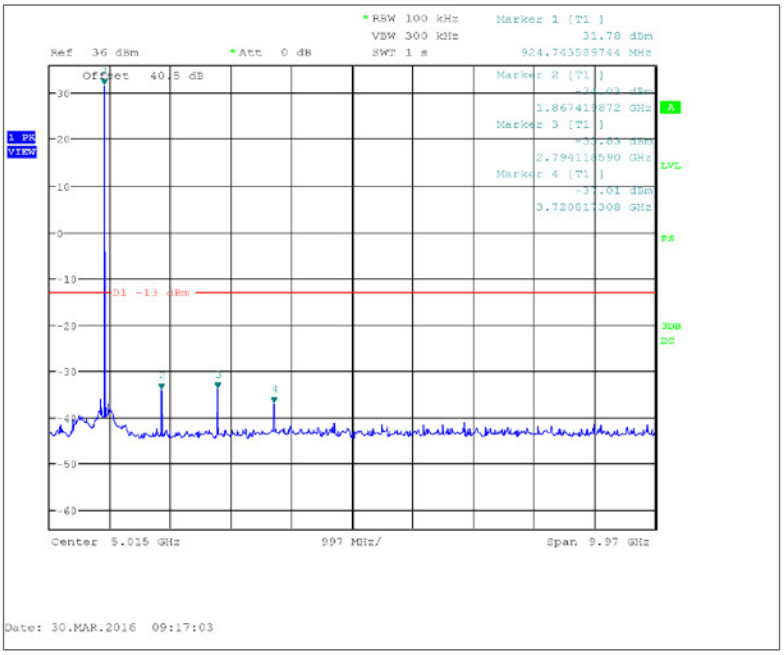

Figure 7.3.2-19: 932.25 MHz – 30 MHz to 10 GHz – 8SFSK (Half Baud)

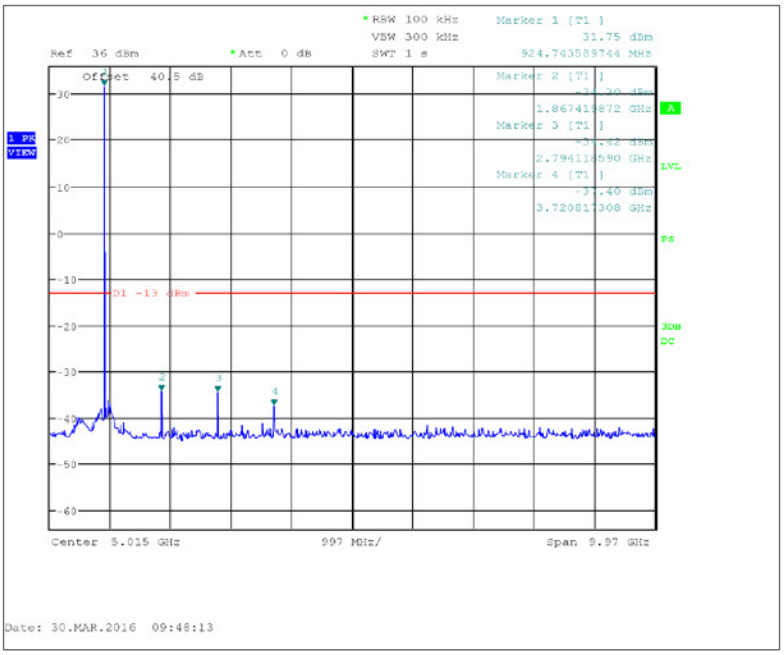

Figure 7.3.2-20: 932.25 MHz – 30 MHz to 10 GHz – 2SFSK

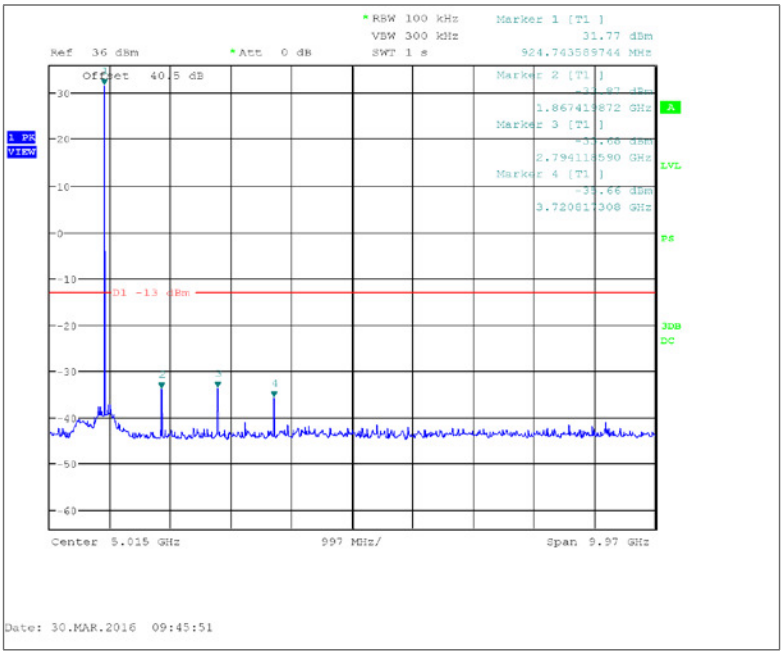

Figure 7.3.2-21: 932.25 MHz – 30 MHz to 10 GHz – 4SFSK

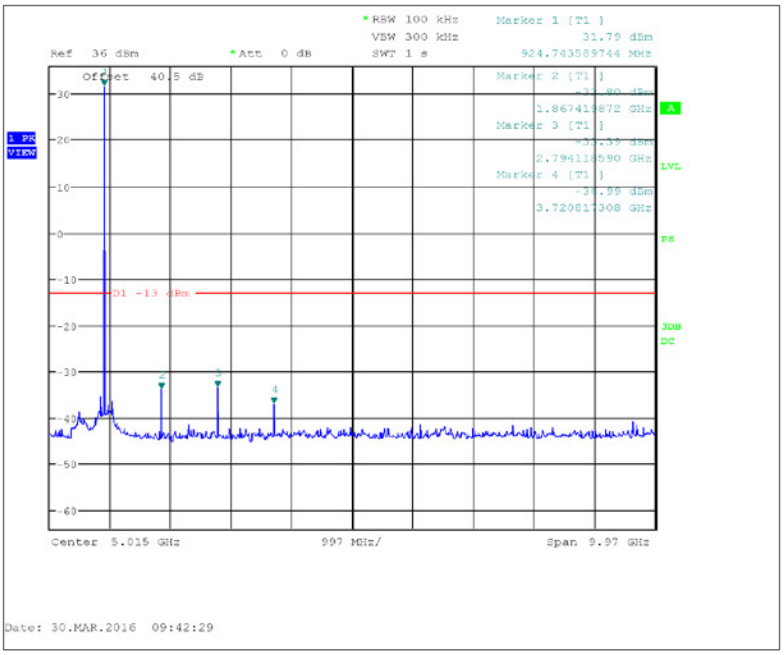

Figure 7.3.2-22: 932.25 MHz – 30 MHz to 10 GHz – 8SFSK

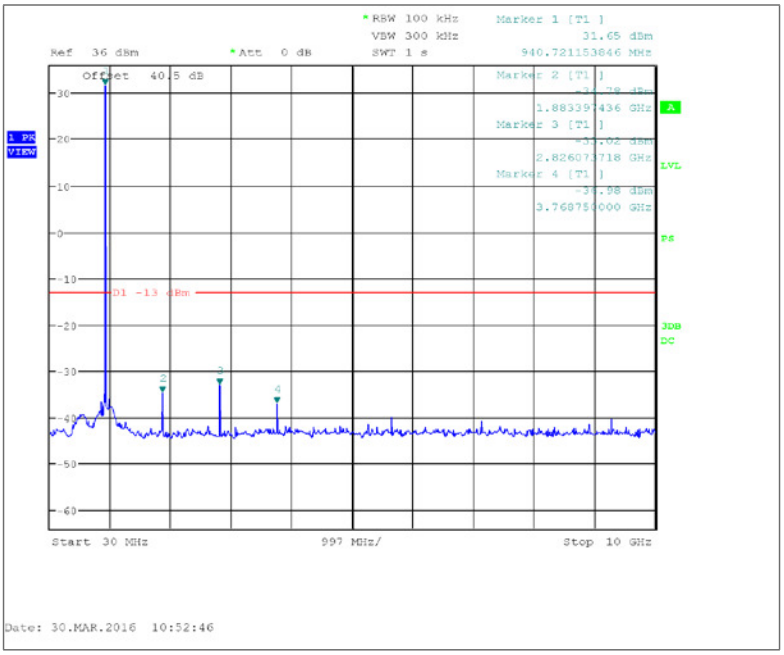

Figure 7.3.2-23: 941.4875 MHz – 30 MHz to 10 GHz – m4Pass 10k

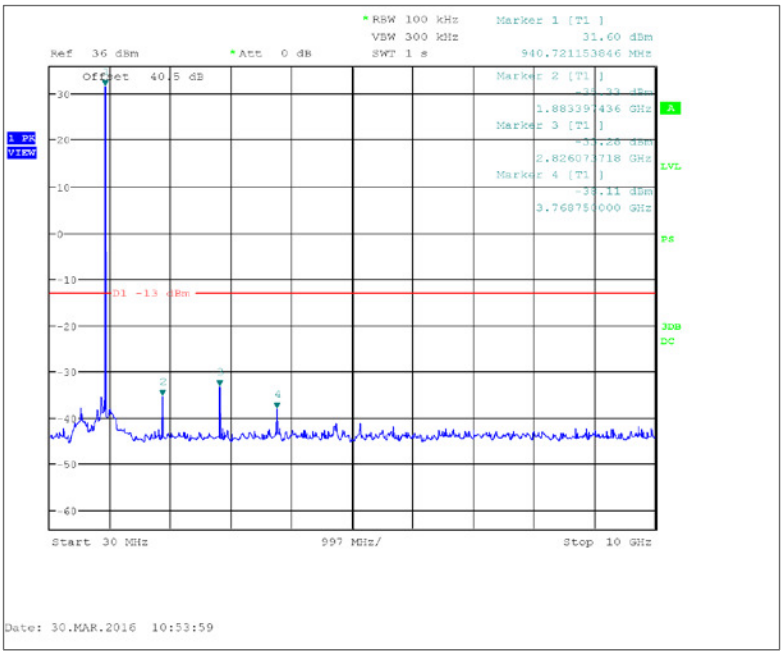

Figure 7.3.2-24: 941.4875 MHz – 30 MHz to 10 GHz – m4Pass 20k

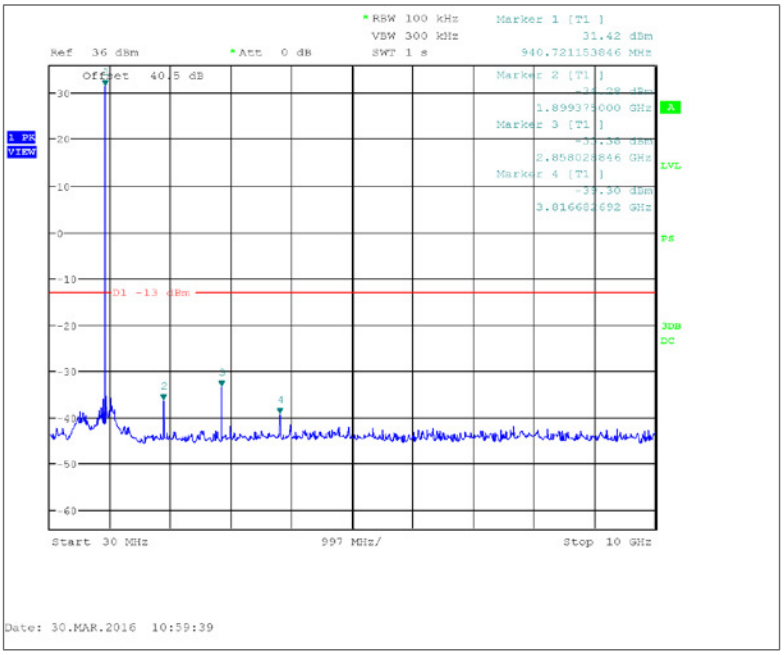

Figure 7.3.2-25: 952.5 MHz – 30 MHz to 10 GHz – m4Pass 10k

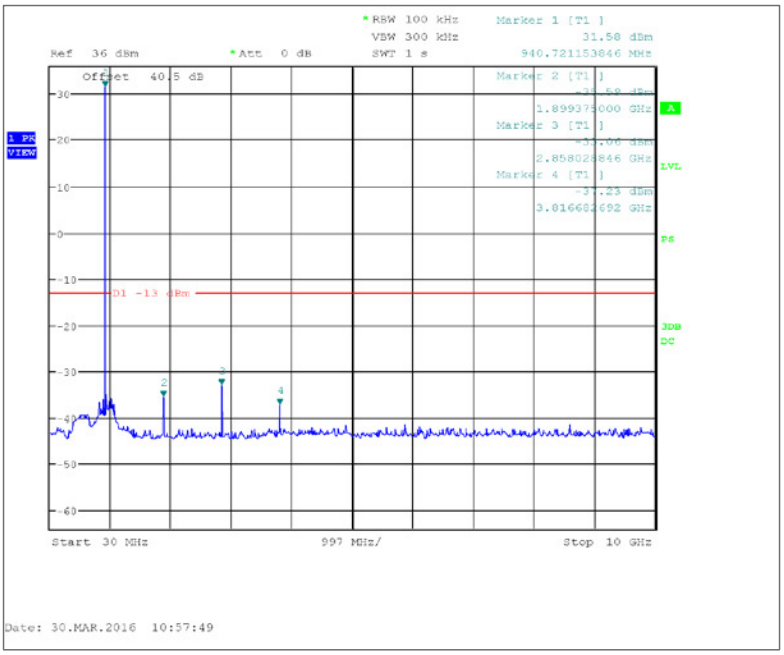

Figure 7.3.2-26: 952.5 MHz – 30 MHz to 10 GHz – m4Pass 20k

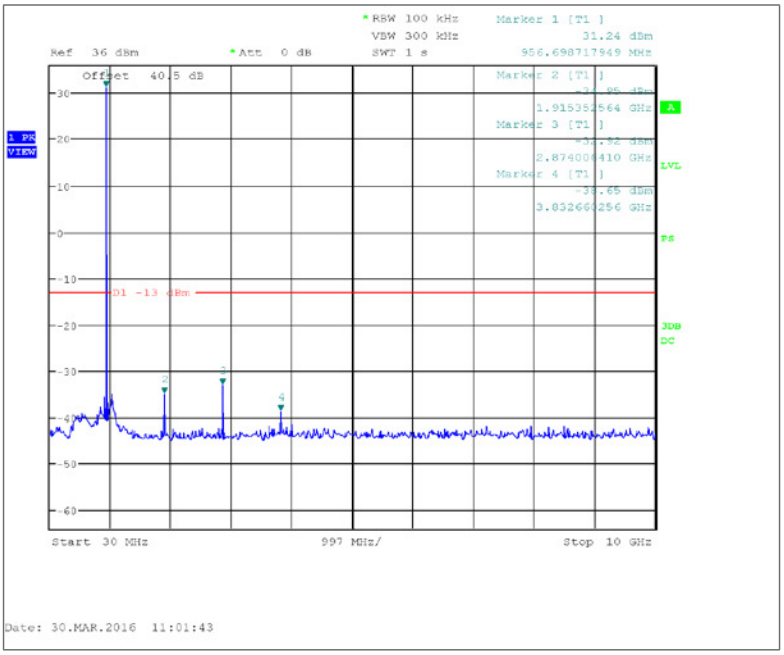

Figure 7.3.2-27: 959.925 MHz – 30 MHz to 10 GHz – m4Pass 10k

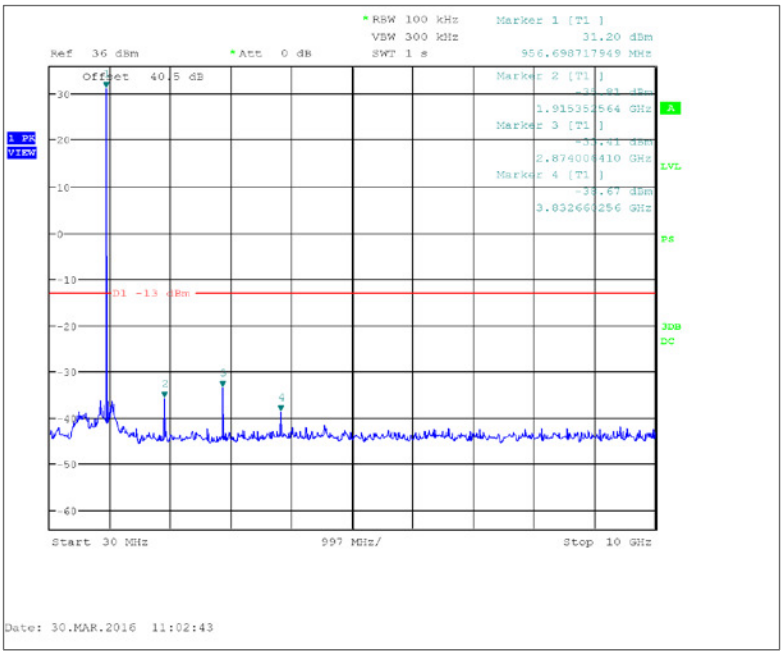

Figure 7.3.2-28: 959.925 MHz – 30 MHz to 10 GHz – m4Pass 20k

8.0 CONCLUSION

In the opinion of ACS, Inc. the model IDTB004, manufactured by Sensus Metering Systems, Inc., meets all the requirements of Part 2 Subpart J, Part 24 Subpart D and Part 101 Subpart C of the FCC's Code of Federal Regulations, and Innovation, Science and Economic Development, Canada Radio Standards Specifications RSS-119 and RSS-134 where applicable.

End of Report