Bluetooth Test Report

Test Report Number: **WR1172.202**

Terminal device: FCC ID: QMNRM-193, Model: 2865i, HWID: 4001, SW: FL100C0003.nep

Originator:	Hai To
Function:	TCC - Dallas – EMC
Version/Status:	1.0 / Approved
Location:	TCC Directories
Date:	28-Aug-06

Change History:

Version	*Date*	*Status*	*Handled By*	*Comments*
0.1	28-Aug-06	Draft	Hai To	
0.2	28-Aug-06	Review	Viet Do	
1.0	28-Aug-06	Approved	Viet Do	

Testing laboratory:

Test & Certification Center (TCC) Dallas
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Fax.

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Date and signatures: **28-Aug-06**

For the contents:

Hai To
Operator Review

Viet Do
Technical Review

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1. GENERAL

1.1 Quality System

The quality system in place for TCC-Dallas conforms to ISO/IEC 17025 and has been audited to the standard by A2LA (American Association of Laboratory Accreditation). TCC - Dallas has also been audited using the ISO 9000 Quality System, as part of Nokia Mobile Phones, Inc., by ABS (American Bureau of Shipping) Quality Evaluations Inc.

TCC-Dallas is a recognized laboratory with the Federal Communications Commission in filing applications for Certification under Parts 15 and 18, Registration Number 100060, and Industry Canada, Registration Number IC 661N.

1.2 Objective

All tests and measurement data shown was performed to determine whether the selected handset was in compliance as specified in FCC: CFR47 Parts 15.207 and 15.247.

1.3 Test Summary

Test Results: *The test result relates only to those tested devices mentioned in Section 4 of this test report.*

Test Performed	CFR 47	RSS-210	Section of Report	Complies / Does not comply / Not Tested
Carrier frequency separation	15.247 (a)(1)	6.2.2 (o), a1	7	Complies
20dB bandwidth	15.247 (a)(1)	6.2.2 (o), a1	8	Complies
Band-edge compliance of RF emissions	15.247 (c)	6.2.2 (o), e1	9	Complies

2. STANDARDS BASIS

Testing has been carried out in accordance with:

REF.	Code of the standard	Name of the standard
1	ANSI C63.4	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz.
2	FCC: CFR 47 Part 15	Code of Federal Regulations (CFR) Title 47, Part 15 – Radio Frequency Devices: Subpart B – Unintentional Radiators and Subpart C – Intentional Radiators
3	CISPR 22 / EN55022	Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement.
4	ICES-003	Digital Apparatus, Industry Canada
5	RSS-210	Low Power License-Exempt Radio communication Devices (All Frequency Bands)
6	RSS-212	Test Facilities and Test Methods for Radio Equipment, Industry Canada (Provisional)
7	RSP-100	Radio Equipment Certification Procedure

Note: Unless otherwise stated, (by reference to a version number and a publication date), the latest version of the above documents applies.

Deviations:

Not Applicable.

3. LIST OF ABBREVIATIONS, ACRONYMS AND TERMS

3.1 Abbreviations

dB - decibel

dBm - decibels per milliwatt (absolute measurement)

dBµV - decibel per microvolt

dBµV/m - decibel of microvolt per meter

GHz - gigahertz or 1000000000 hertz

kHz - kilohertz or 1000 hertz

MHz - megahertz or 1000000 hertz

ms - millisecond or 0.001 second

µs - microsecond or 0.000001 second

3.2 Acronyms

BT - Bluetooth

EMC - Electromagnetic Compatibility

EMI - Electromagnetic Interference

EUT - Equipment under Test

PRBS - Pseudo Random Bit Sequence

RF - Radio Frequency

3.3 Terms

Base Station Simulator (BSS) - simulates all the necessary signals that a phone would experience while on a live network. There are many types of base station simulators catering for all current protocols, i.e., GSM, AMPS, TDMA, and CDMA.

4. EQUIPMENT-UNDER-TEST (EUT)

The results in this report relate only to the items listed below:

4.1 Description of Tested Device(s):

Test Performed	Mode of Operation	Date of Receipt	Condition of Sample	Item	Identifying Information
47CFR15.247	BT/EDR	28-Aug-06	Operational	Phone	ESN: 02603359307 FCC ID: QMNRM-193 Model: 2865i HW: 4001 SW: FL100C000.nep
N/A	N/A	N/A	N/A	Battery	Type: BL-6C Other: 3.7 V

5. TEST EQUIPMENT LIST

The listing below indicates the test equipment utilized for the test (s). Calibration interval on all items listed can be obtained from the Engineering Services Group within NMP, Product Creation - Dallas. Where relevant, measuring equipment is subjected to in-service checks between testing. TCC - Dallas shall notify clients promptly, in writing, of identification of defective measuring equipment that casts doubt on the validity of results given in this report.

Section of Report	NMP#	Test Equipment	Mfr. #	Model #	Calibration Due Date	Calibration Interval
7,8,9	N/A	10dB Attenuator	Weinschel	Model 2	N/A	N/A
7,8,9	02666	Base Station	R&S	CMU 200	6-Sept-06	12 months
7,8,9	N/A	Power Splitter (must have 6 dB insertion loss)	Agilent	33120A	N/A	N/A
7,8,9	N/A	6dB Attenuator	Weinschel	Model 2	N/A	N/A
7,8,9	03463	Spectrum Analyzer	Rhodes & Schwartz	FSP	5-Dec-06	12 months

6. EUT TEST SETUPS

For each test the EUT was exercised to find out the worst case of operation modes and device configuration.

Two different test setups were used: one for conducted measurements, another for radiated measurements. One EUT was equipped with an external antenna connector for conductive measurements.

6.1 EUT test set-up A (conducted measurement)

This setup was used in conducted measurements. The Bluetooth simulator was used to control the following:

- set the EUT channel (0 – 79)

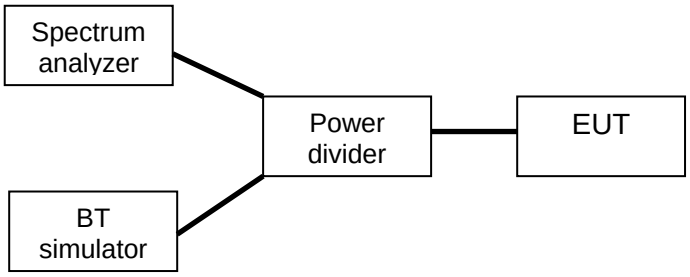
- set the number of EUT TX slots (1, 3, 5)

- set the EUT to TX, RX and TX/RX mode

- enable/disable frequency hopping

- select between several different test modulation patterns

In tests, where absolute level reporting were required, the results were corrected with all applicable factors as detailed in the result section of each measurement.



7. CARRIER FREQUENCY SEPARATION

Specification: FCC Part 15.247(a)(1); RSS-210 6.2.2(o), a1

7.1 Setup

Used test set-up: A (see section 6)

7.2 Test Results

Test Operator	Hai To
Date of Measurement	28-Aug-06
Temperature	22 °C
Humidity	34 %RH
Test Result	**Complies**

7.3 EUT operation mode

EUT operation mode	Connected, DH5, Static PRBS
EUT channel	Hopping mode (Euro/US)
EUT TX power level	Nominal

7.4 Pass/Fail Criteria

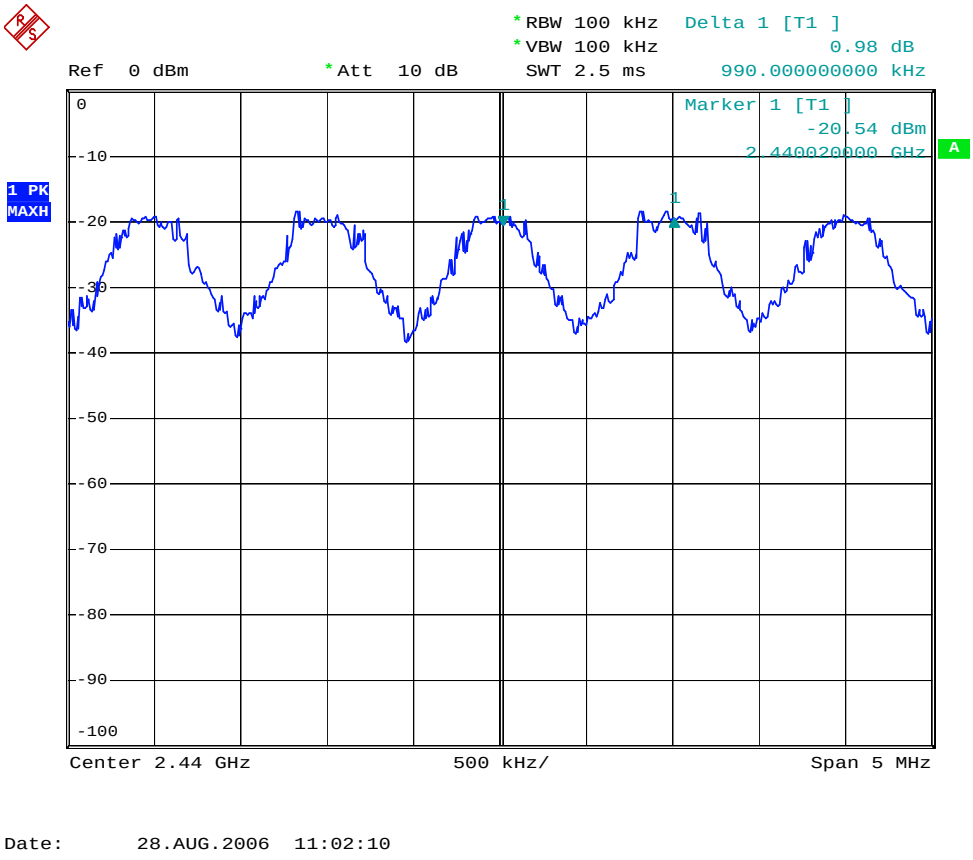
Limit
≥ 25 kHz or 2/3 of 20dB Bandwidth

7.5 Results

GFSK Modulation, PRBS packet type

Hopping on, Carrier Frequency Separation of Channels 39 and 40

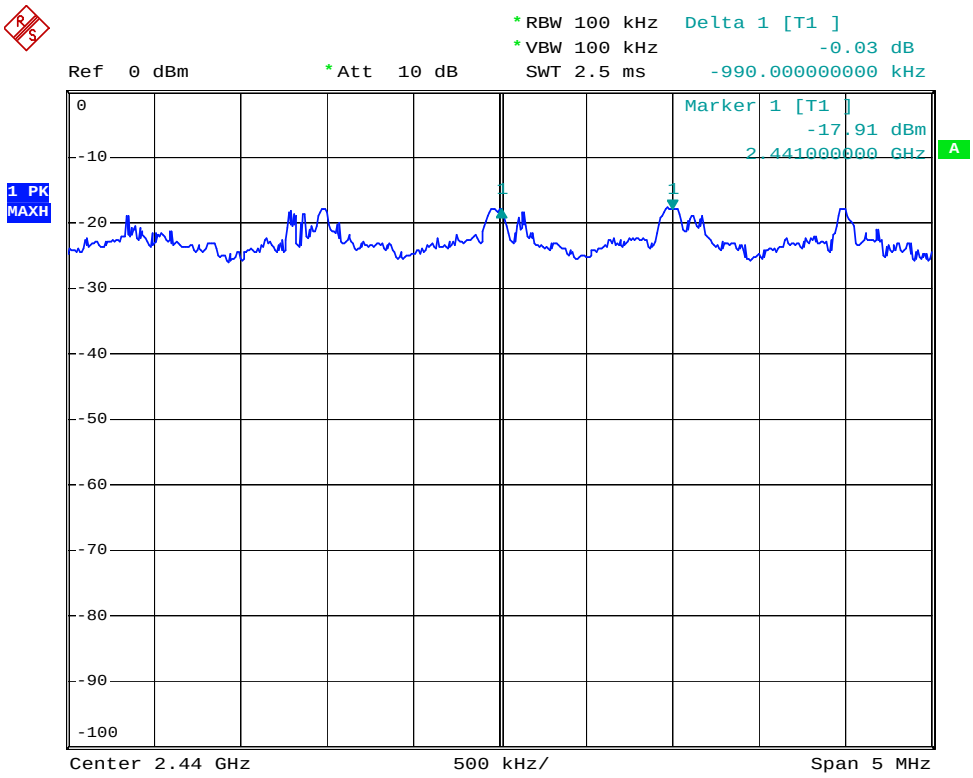
Measured value (MHz)	Result
0.99	Passed



(π/4-DQPSK), Modulation, PRBS packet type

Hopping on, Carrier Frequency Separation of Channels 39 and 40

Measured value (MHz)	Result
0.99	Passed



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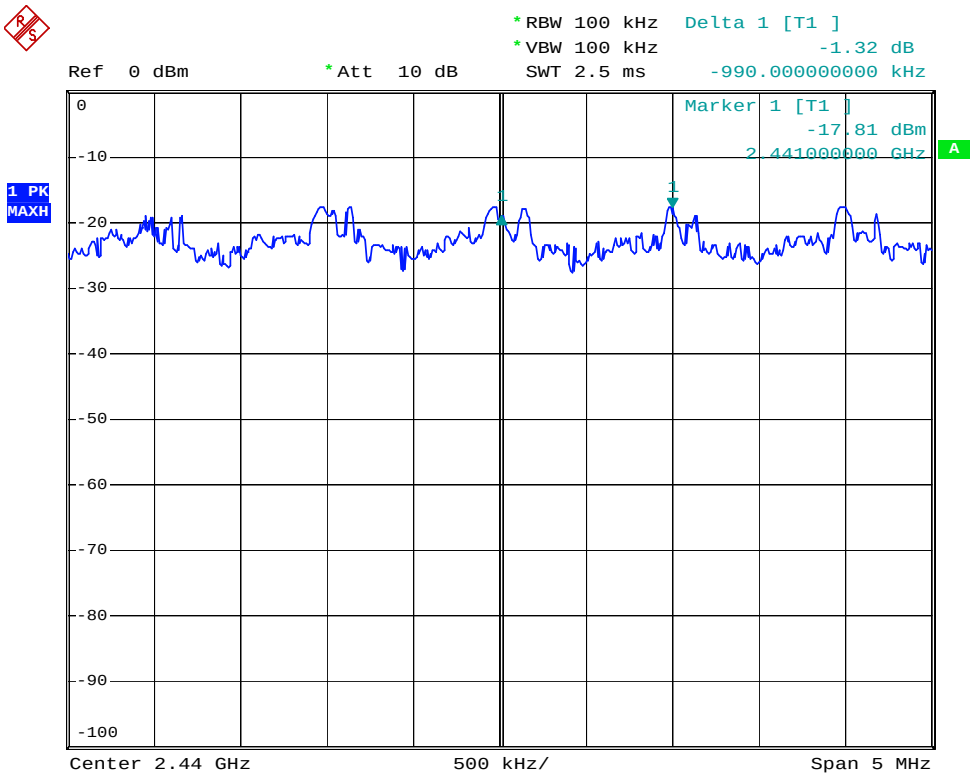
8DPSK Modulation, PRBS packet type

Hopping on, Carrier Frequency Separation of Channels 39 and 40

Measured value (MHz)	Result
1.0	Passed



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8. 20dB BANDWITH

Specification: FCC Part 15.247(a)(1); RSS-210 6.2.2(o), a1

8.1 Setup

Used test set-up: A (see section 6)

8.2 Test Results

Test Operator	Hai To
Date of Measurement	28-Aug-06
Temperature	22 °C
Humidity	34 %RH
Test Result	**Complies**

8.3 EUT operation mode

EUT operation mode	Connected, DH5, Static PRBS
EUT channel	0 (2402 MHz), 40 (2442 MHz), 78 (2480MHz)
EUT TX power level	Nominal

8.4 Pass/Fail Criteria

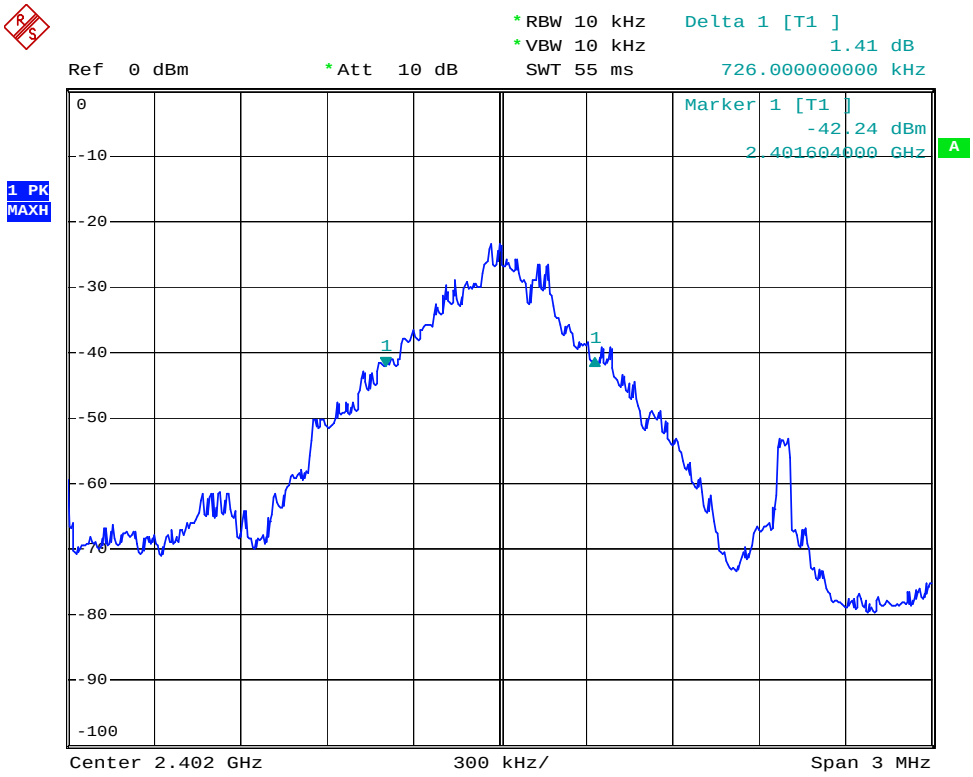
Limit (MHz)
N/A

8.5 Results

GFSK Modulation, PRBS packet type

EUT channel	Measured value (kHz)
0	726
40	726
78	654

20dB bandwidth, channel 0



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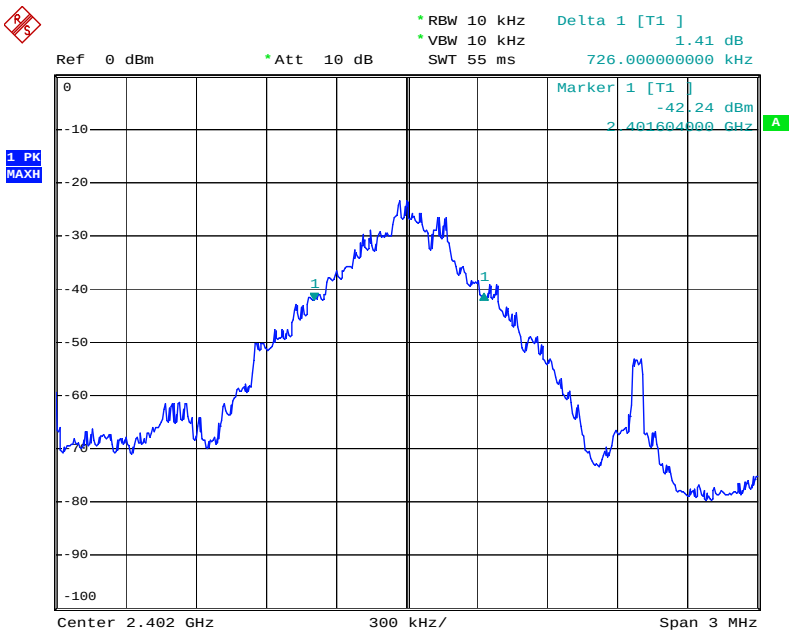
20dB bandwidth, channel 40



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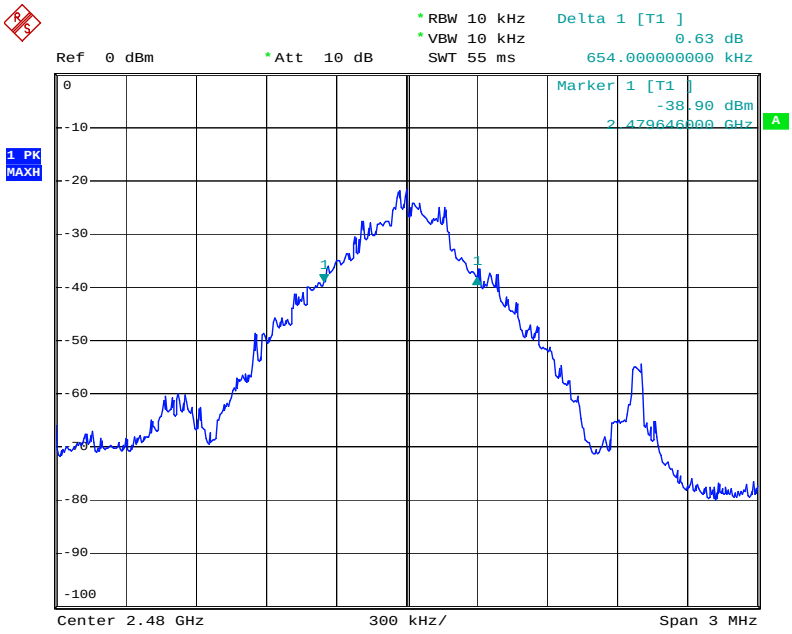
20dB bandwidth, channel 78



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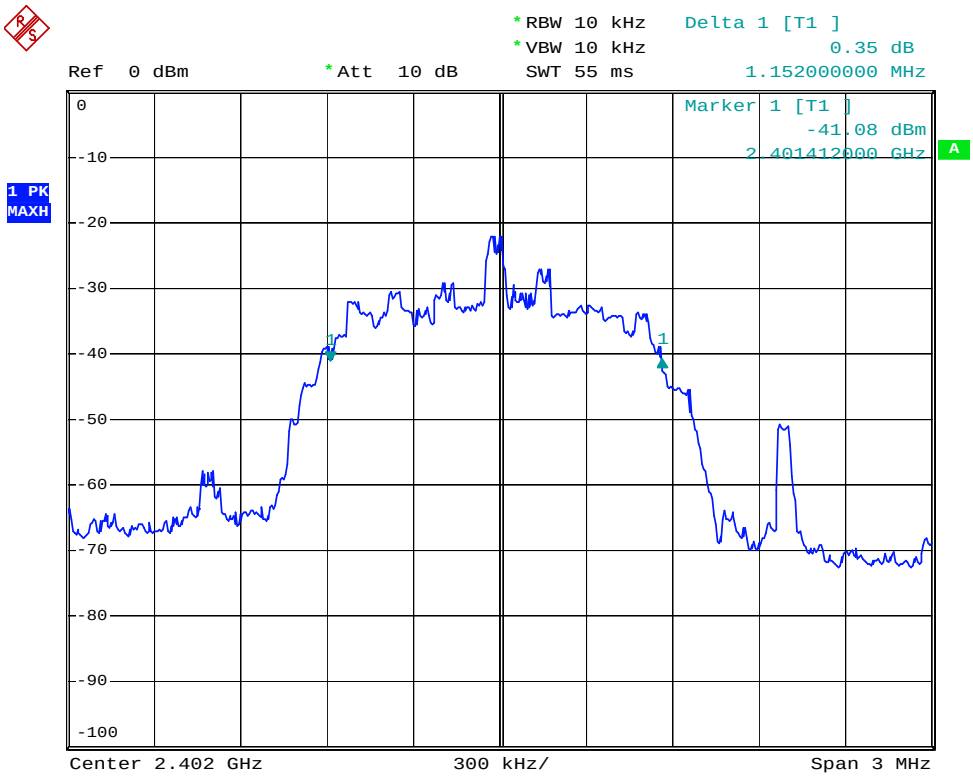
(π/4-DQPSK), Modulation, PRBS packet type

EUT channel	Measured value (kHz)
0	1152
39	1206
78	1188

Channel 0



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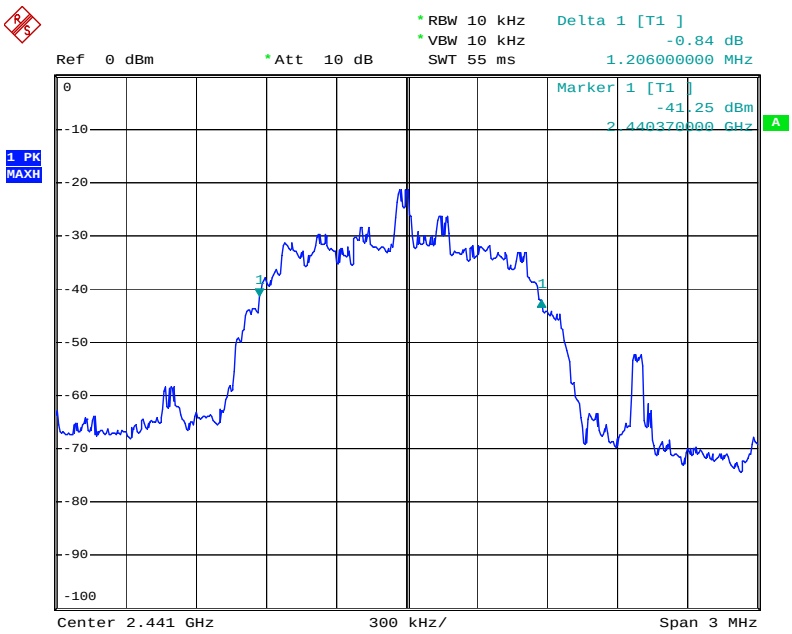
Channel 39



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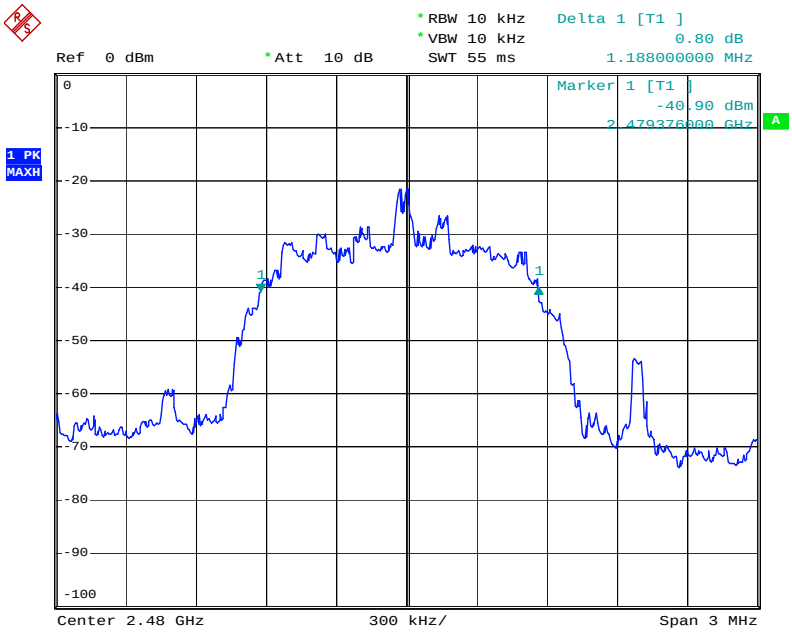
Channel 78



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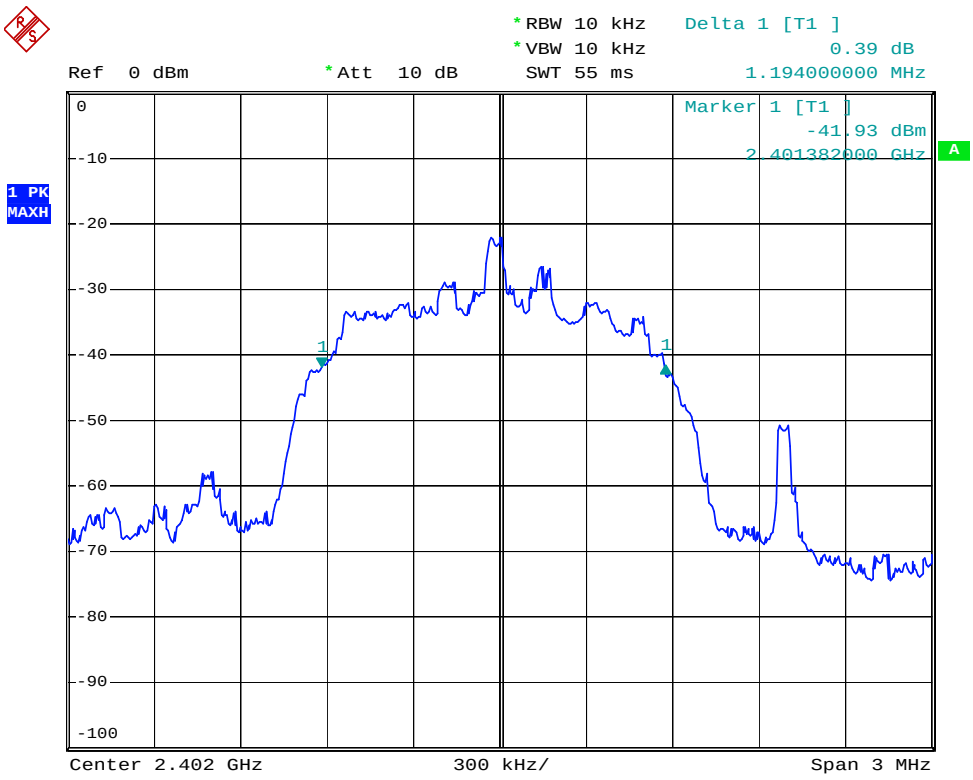
8DPSK Modulation, PRBS packet Type

EUT channel	Measured value (kHz)
0	1194
39	1164
78	1170

Channel 0



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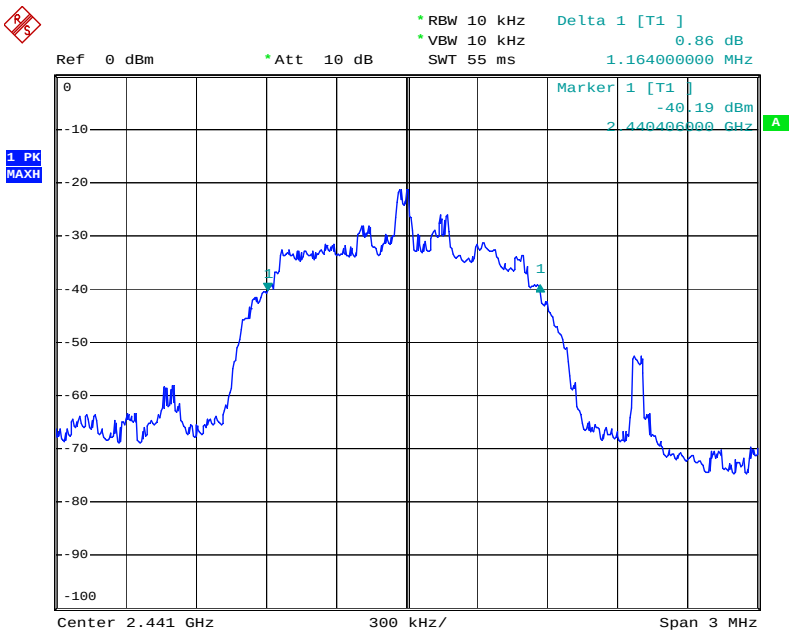
Channel 39



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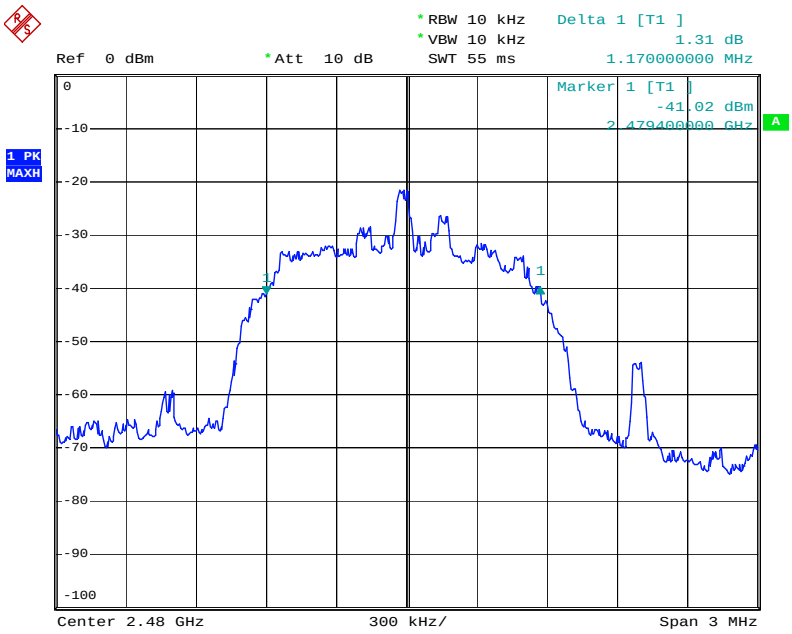

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9. BAND-EDGE COMPLIANCE OF RF CONDUCTED EMISSIONS

Specification: FCC Part 15.247(c); RSS-210 6.2.2(o), e1

9.1 Setup

Used test set-up: A (see section 6)

9.2 Test Results

Test Operator	Hai To
Date of Measurement	28-Aug-06
Temperature	22°C
Humidity	34 %RH
Test Result	**Complies**

9.3 EUT operation mode

EUT operation mode	Connected, DH5, Static PRBS
EUT channel	Hopping mode, 0 (2402 MHz); 78 (2480 MHz)
EUT TX power level	Nominal

9.4 Pass/Fail Criteria

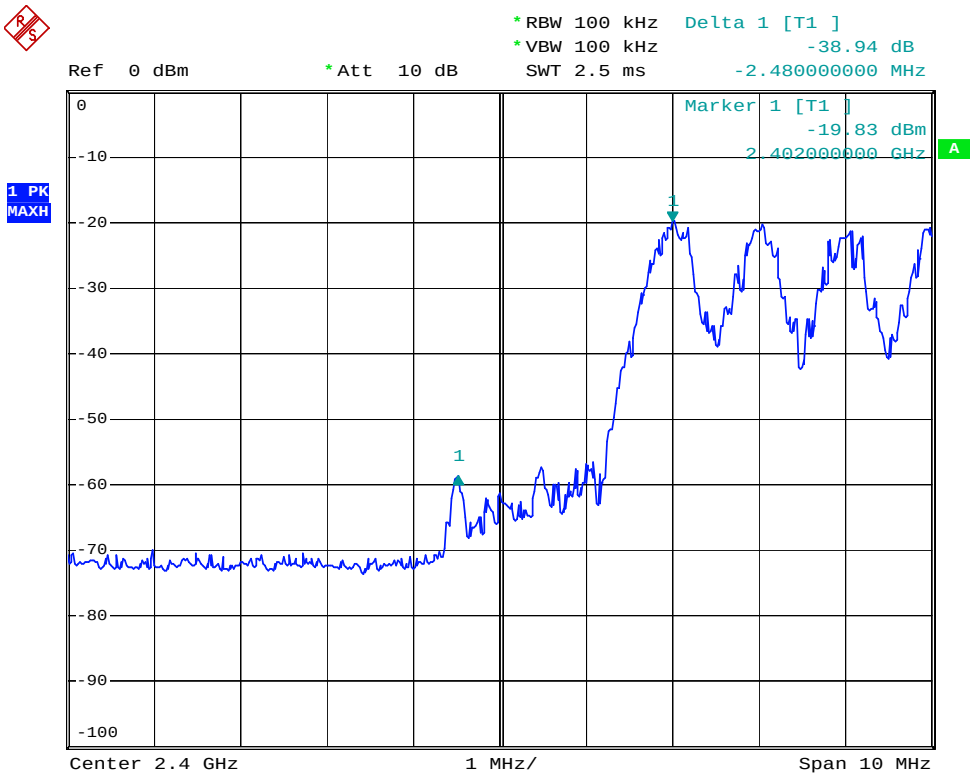
Limit (dBc)
≤ -20

9.5 Results

GFSK Modulation, PRBS packet type

EUT channel	Measured value (dBc)
Low End, Hopping Mode	-38.94
High End, Hopping Mode	-46.63
0	-38.44
78	-47.01

Hopping on, low end



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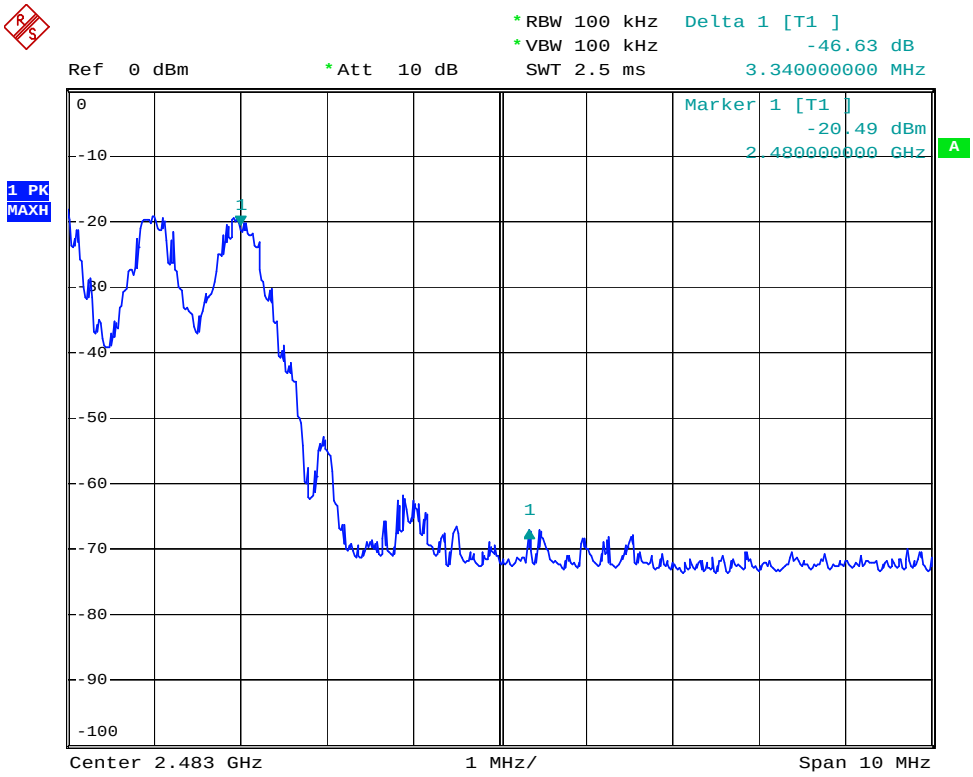
Hopping on, high end



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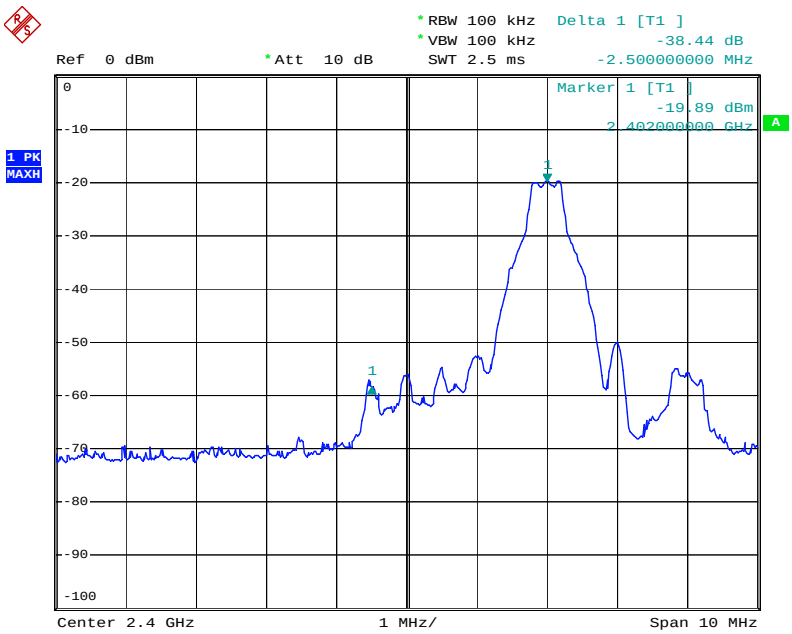
Channel 0



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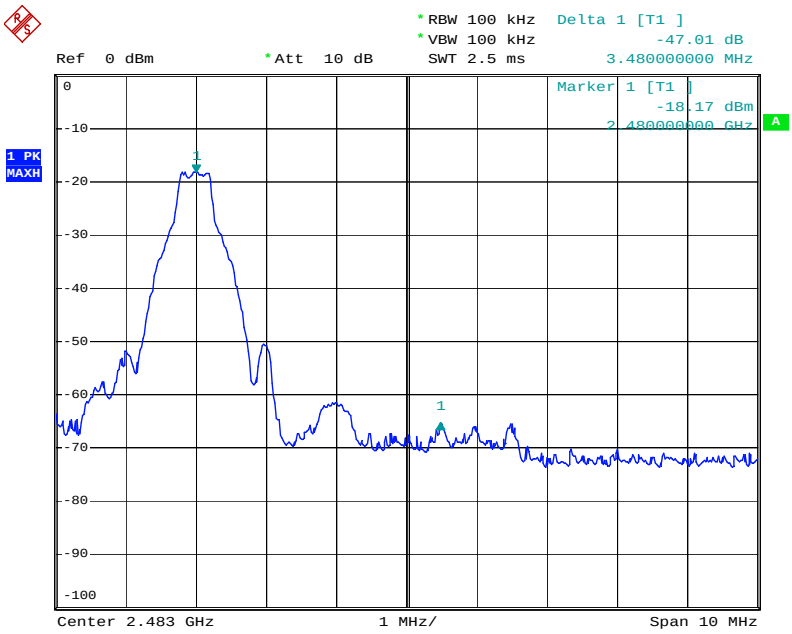
Channel 78



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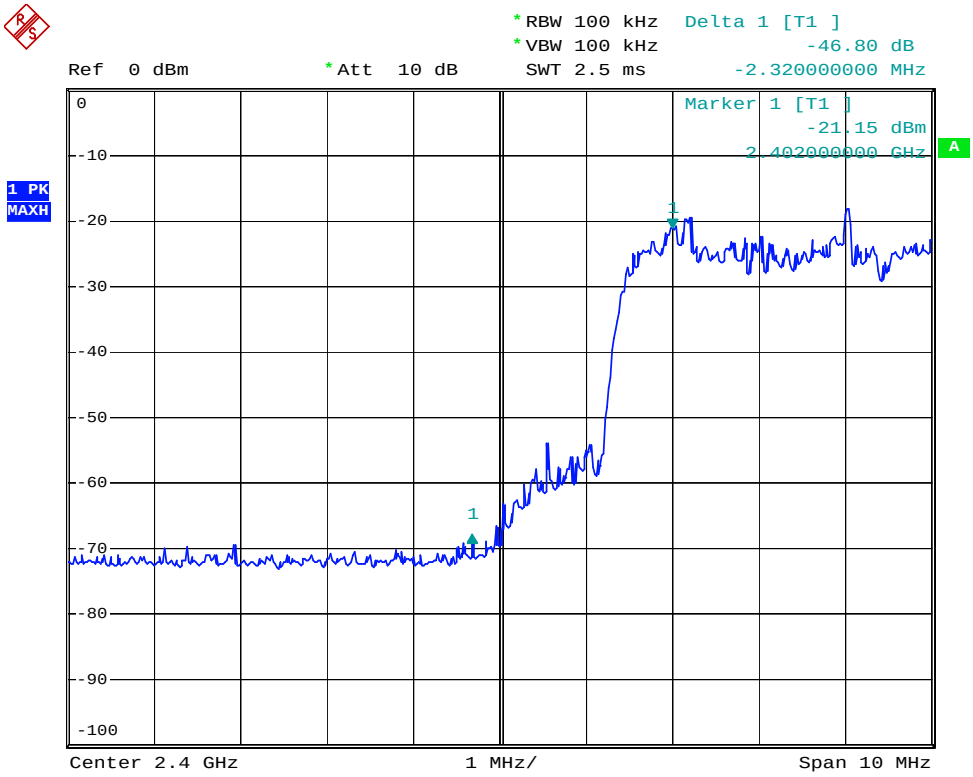
(π/4-DQPSK), Modulation, PRBS packet type

EUT channel	Measured value (dBc)	Results
Low End, Hopping Mode	-46.80	Passed
High End, Hopping Mode	-39.00	Passed
0	-48.07	Passed
78	-43.39	Passed

Hopping on, Low end



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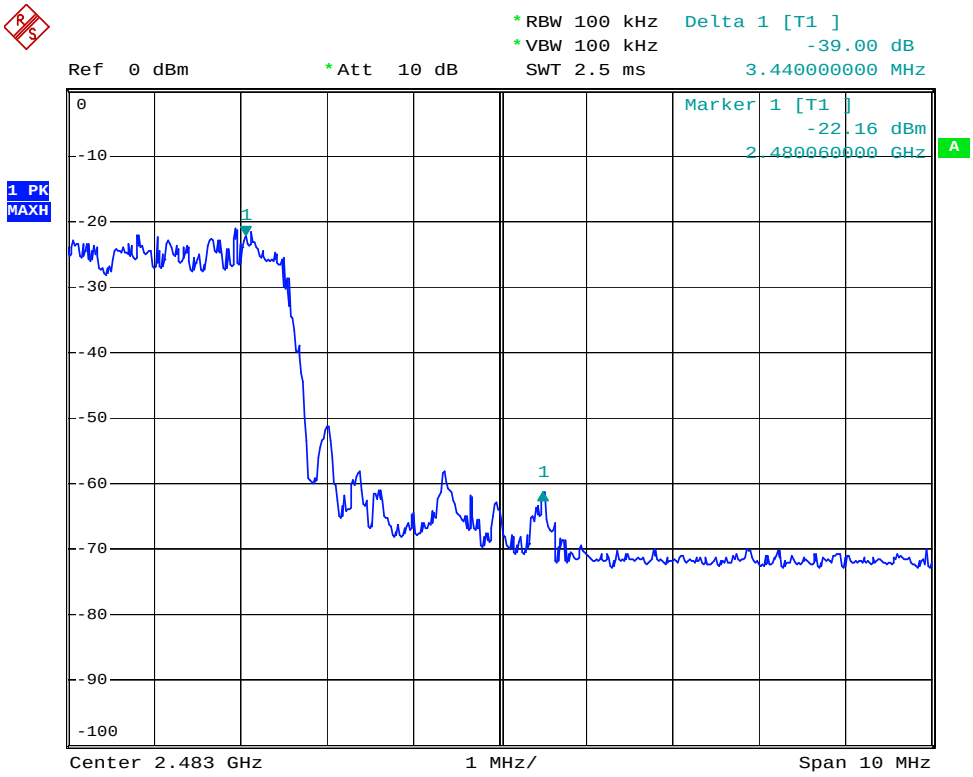
Hopping on, high end



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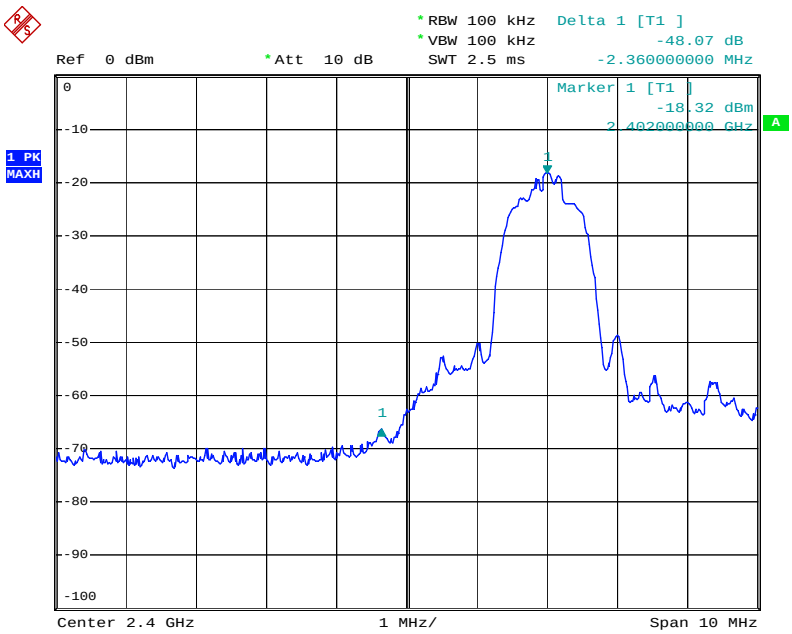
Channel 0



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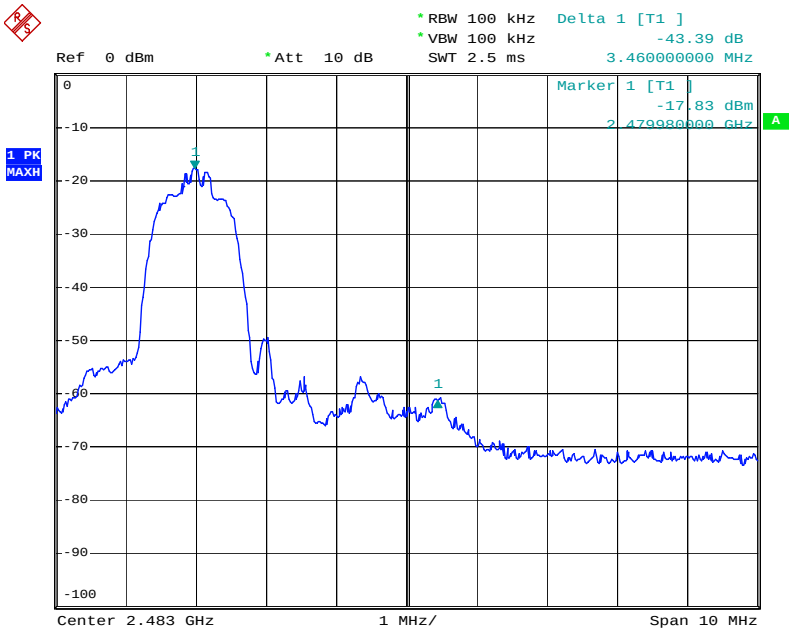

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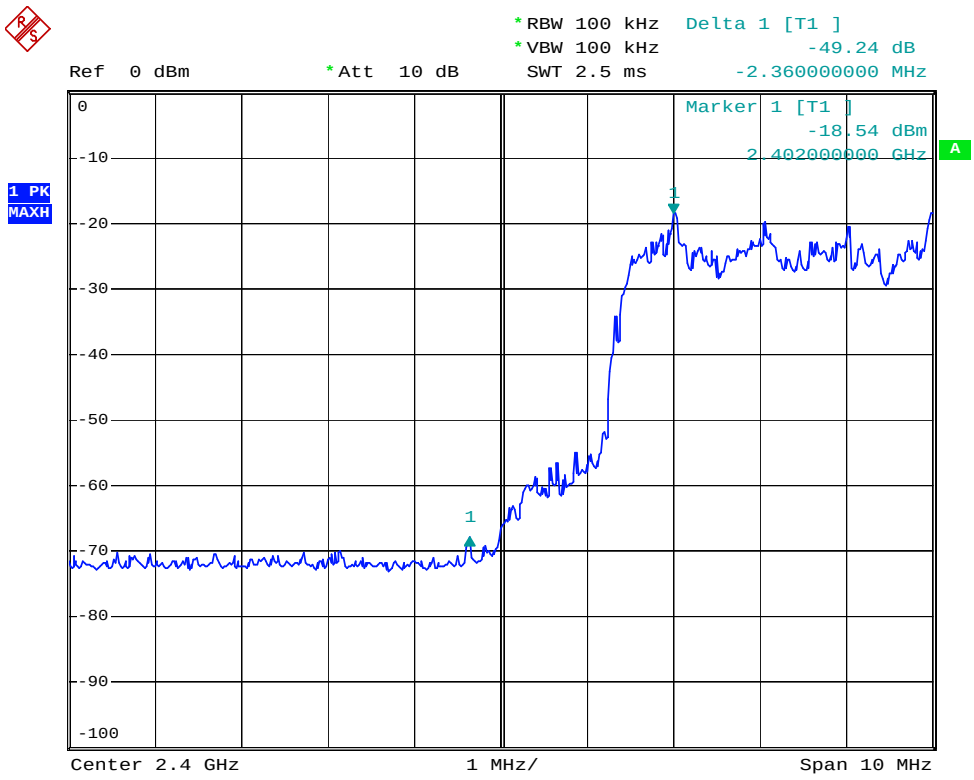
8DPSK Modulation, PRBS packet type

EUT channel	Measured value (dBc)	Results
Low End, Hopping Mode	-49.24	Passed
High End, Hopping Mode	-44.36	Passed
0	-50.07	Passed
78	-42.38	Passed

Hopping on, Low end



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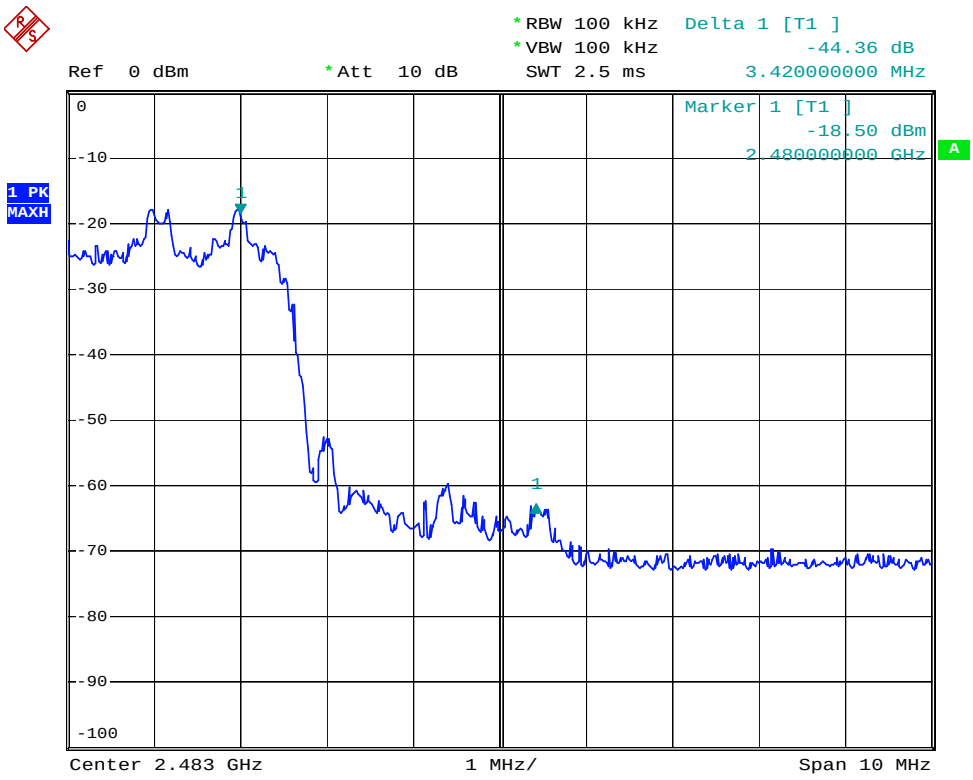
Hopping on, high end



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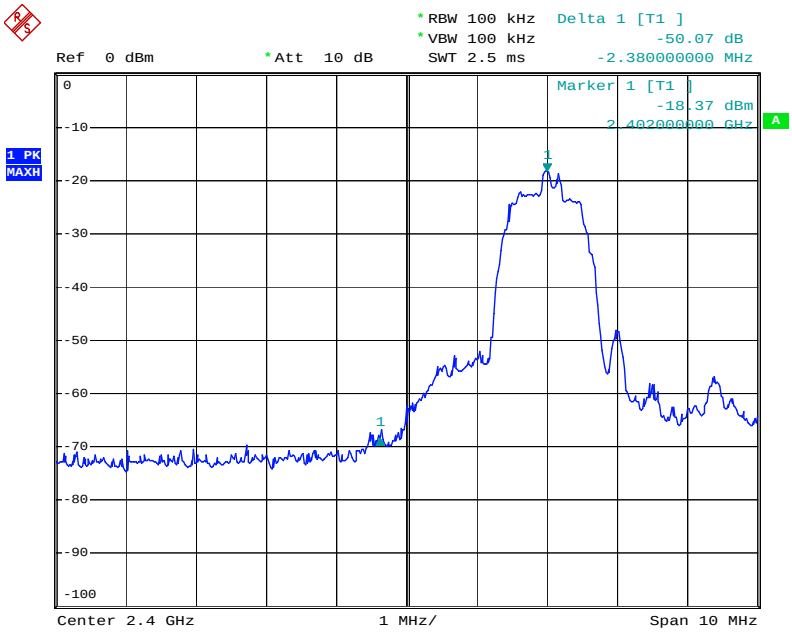

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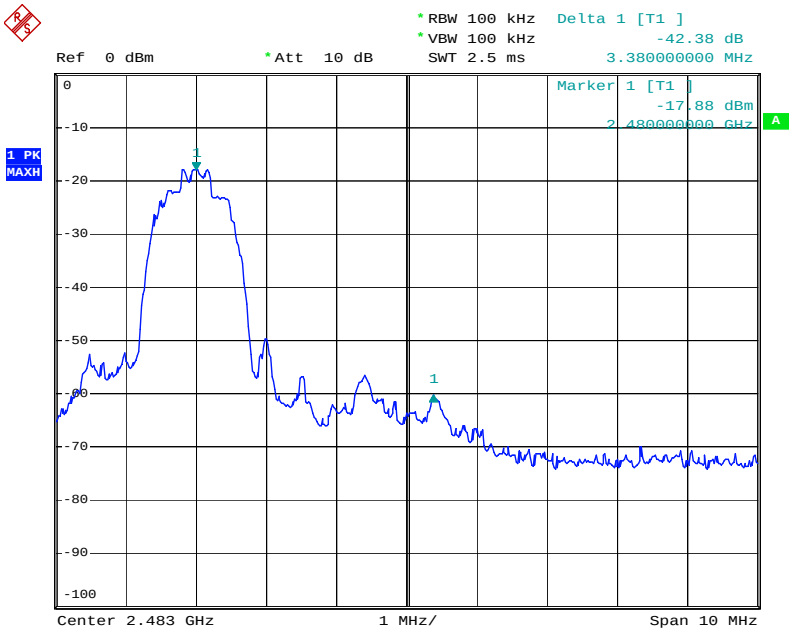

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