

FCC Part 27 Test Report

Product Name : Module
Trade Name : AirPrime
Model No. : HL7718
FCC ID : N7NHL7718

Applicant : Sierra Wireless Inc.
Address : 13811 Wireless Way, Richmond, BC, V6V 3A4 Canada

Date of Receipt : Sep. 20, 2017
Issued Date : Nov. 11, 2017
Report No. : 17A0040R-HPUSP45V00
Report Version : V2.0



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Test Report Certification

Issued Date : Nov. 11, 2017

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Product Name : Module
 Applicant : Sierra Wireless Inc.
 Address : 13811 Wireless Way, Richmond, BC, V6V 3A4 Canada
 Manufacturer : Sierra Wireless Inc.
 Model No. : HL7718
 FCC ID : N7NHL7718
 EUT Voltage : DC 3.7V
 Testing Voltage : DC 3.7V
 Trade Name : AirPrime
 Applicable Standard : FCC CFR Title 47 Part 27 Subpart C & Part 2
 ANSI C63.26-2015
 KDB 971168 D01 Power Meas License Digital Systems v03

Test Lab : Hsin Chu Laboratory
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Test Result : Complied

Documented By :



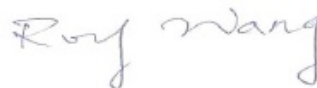
(Demi Chang / Senior Engineering Adm. Specialist)

Tested By :



(Max Chang / Engineer)

Approved By :



(Roy Wang / Director)

Revision History

Report No.	Version	Description	Issued Date
17A0040R-HPUSP45V00	V2.0	Initial issue of report	Nov. 11, 2017

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1. General Information

1.1. EUT Description

Product Name	Module
Model No.	HL7718
Trade Name	AirPrime
Tx Frequency Range/ Channel number	LTE Band 13: 777MHz~787MHz
Rx Frequency Range/ Channel number	LTE Band 13: 746 MHz~756MHz
HW Version	1.0
SW Version	AHL77xx_NQ.01.00.45_0.6.1
IMEI No.	355272080004761

Note:

1. This Module supports LTE Cat-M1 with Band 13
2. Regarding frequency band operation, the lowest, middle and highest frequency of channel were selected to perform the test, and the details were shown on this report.

1.2. Mode of Operation

DEKRA has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

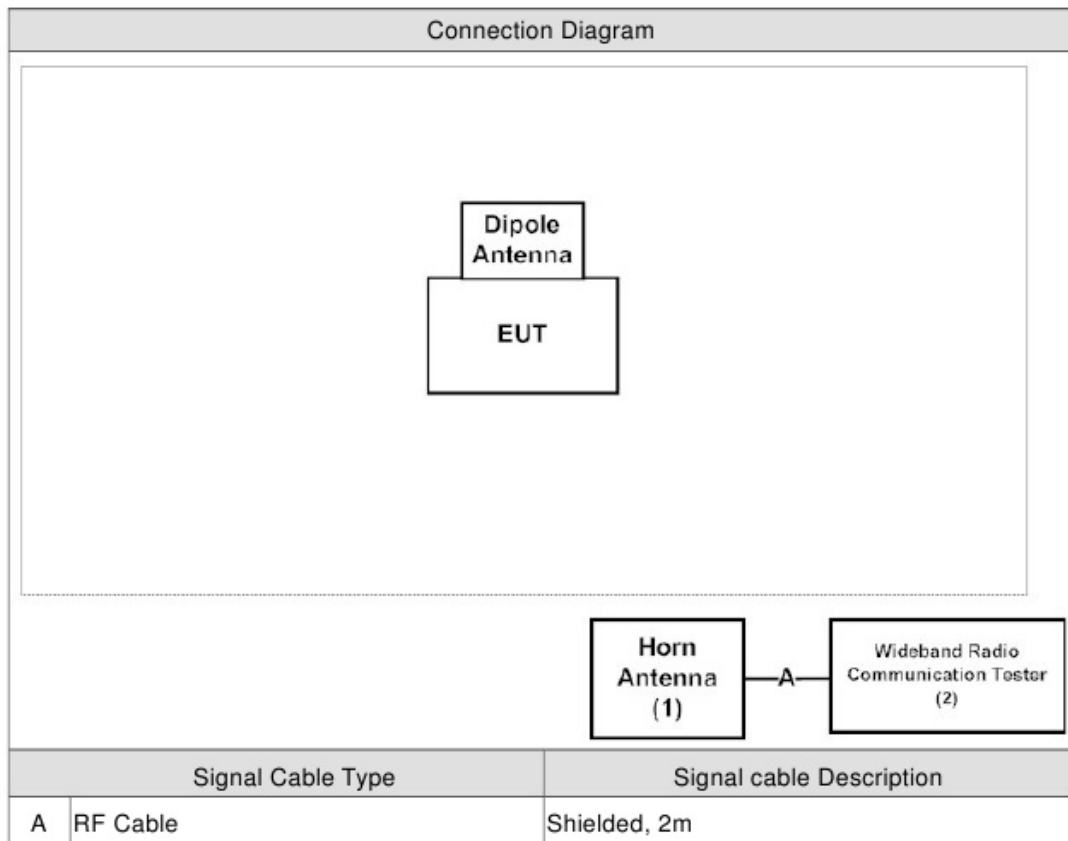
Test Mode
Mode 1: LTE_Cat-M1_Band 13_Link

1.3. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product	Manufacturer	Model No.	Serial No.	Power Cord
1 Horn Antenna	Schwarzbeck	BBHA 9120D	639	--
2 Wideband Radio Communication Tester	R&S	CMW500	150246	--
3 Dipole Antenna (2dBi)	SIERRA	--	--	--

1.4. Configuration of Tested System



1.5. EUT Exercise Software

1	Setup the EUT and simulators as shown on 1.4.
2	Turn on the power of all equipment.
3	The EUT will continue receive the signal from LTE Cat-M1 function.
4	Repeat the above procedure (3)

2. Technical Test

2.1. Summary of Test Result

- No deviations from the test standards
 Deviations from the test standards as below description:

(FCC CFR Title 47 Part 27 Subpart C)

Test Item	FCC Rule	Limit	Result	Test Site
Peak Output Power	FCC PART 2.1046 and PART 27.50(C)(10)	3 Watts ERP	Pass	3
Occupied Bandwidth	FCC PART 2.1049 and PART 27.53(l)(6)	N/A	Pass	3
Spurious Emission At Antenna Terminals (+/- 1MHz)	FCC PART 2.1051 and PART 27.53(l)(4)(6)	-13 dBm	Pass	3
Spurious Emission	FCC PART 2.1051 and PART 27.53(l)(4)(6)	-13 dBm	Pass	2
Frequency Stability Under Temperature & Voltage Variations	FCC PART 2.1055(a)(l) and PART 27.54	2.5 ppm	Pass	3

Note: Test site information refers to Laboratory Information.

2.2. Test Environment

Items	Required (IEC 68-1)	Actual	Test Site
Temperature (°C)	15-35	23	2 & 3
Humidity (%RH)	25-75	52	
Barometric pressure (mbar)	860-1060	950-1000	

Note: Test site information refers to Laboratory Information.

The related certificate for our laboratories about the test site and management system can be downloaded from DEKRA Testing and Certification Co., Ltd. Web Site:

<http://www.dekra.com.tw/english/about/certificates.aspx?bval=5>

The address and introduction of DEKRA Testing and Certification Co., Ltd. laboratories can be founded in our Web site : http://www.dekra.com.tw/index_en.aspx

If you have any comments, Please don't hesitate to contact us. Our test sites as below:

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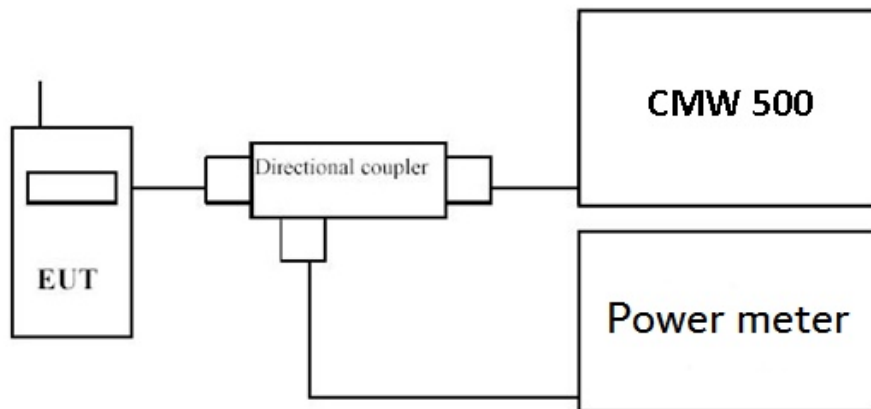
3. RF Output Power

3.1. Test Equipment

RF Output Power / SR10-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
High Speed Peak Power Meter Dual Input	Anritsu	ML2496A	1602004	2017/01/20	2018/01/19
Wideband Radio Communication Tester	R&S	CMW500	150246	2017/04/19	2018/04/18
Directional Coupler	Agilent	778D	20402	2017/10/05	2018/10/04

3.2. Test Setup



3.3. Test Procedure

- a) The RF output of the transmitter was connected to base station simulator.
- b) The RF output of EUT was connected to the power meter by RF cable and attenuator.
The path loss was compensated to the results for each measurement..
- c) Set EUT at maximum average power by base station emulator.
- d) Measure lowest, middle, and highest channels for each bandwidth and different modulation.

Effective Isotropic Radiated Power = Conducted Power(dBm) + Antenna Gain(dBi)

Effective Radiated Power = Conducted Power(dBm) + Antenna Gain(dBi) - 2.15dB

3.4. Test Method

KDB 971168 D01 Power Meas License Digital Systems v03 sub-clause5.2.4
ANSI C63.26-2015 Sub-clause 5.2.4.2

3.5. Uncertainty

The measurement uncertainty is defined as ± 1.27 dB.

3.6. Test Result

Product	Module		
Test Item	RF Output Power		
Test Mode	Mode 1: LTE_Cat-M1_Band 13_Link		
Date of Test	2017/11/10	Test Site	SR10-H

LTE Band13_QPSK					
Frequency (MHz)	Average Power				Limit (W) ERP
	Reading Level (dBm)	Antenna Gain (dBi) <small>(note2)</small>	Measure Level (dBm) ERP	Measure Level (W) ERP	
777.7	24.67	2	24.52	0.28	3
780.3	24.38	2	24.23	0.26	3
786.3	24.89	2	24.74	0.30	3

Note:

1. Measure Level (ERP) = Reading Level (dBm) + Antenna Gain (dBi) - 2.15dB
2. The usable maximum antenna gain is 2dBi.

LTE Band13_16-QAM					
Frequency (MHz)	Average Power				Limit (W) ERP
	Reading Level (dBm)	Antenna Gain (dBi) <small>(note2)</small>	Measure Level (dBm) ERP	Measure Level (W) ERP	
777.7	23.57	2	23.42	0.22	3
780.3	23.14	2	22.99	0.20	3
786.3	23.41	2	23.26	0.21	3

Note:

1. Measure Level (ERP) = Reading Level (dBm) + Antenna Gain (dBi) - 2.15dB
2. The usable maximum antenna gain is 2dBi.

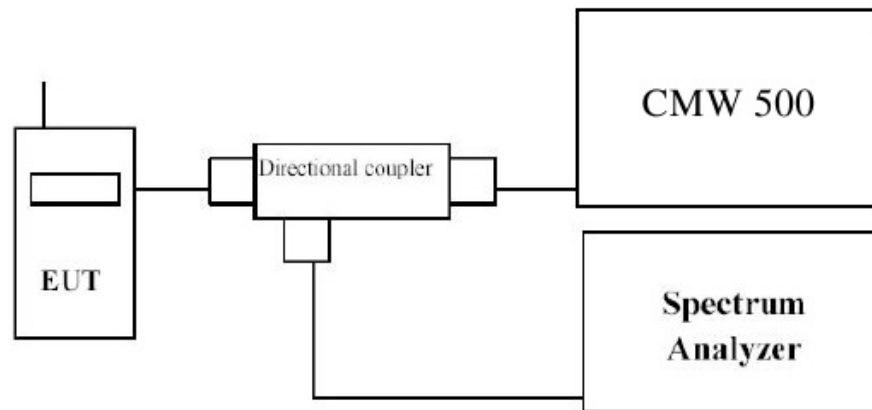
4. Occupied Bandwidth

4.1. Test Equipment

Occupied Bandwidth / SR10-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Spectrum Analyzer	R&S	FSVA40	101455	2016/11/28	2017/11/27
Wideband Radio Communication Tester	R&S	CMW500	150246	2017/04/19	2018/04/18
Directional Coupler	Agilent	778D	20402	2016/10/07	2017/10/06

4.2. Test Setup



4.3. Test Procedure

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The 26 dB bandwidth and 99% occupied bandwidth of the low & middle & high channel for the highest RF powers were measured.

4.4. Test Method

KDB 971168 D01 Power Meas License Digital Systems v03 sub-clause 4.2 & 4.3
ANSI C63.26-2015 Sub-clause 5.4.3 & 5.4.4

4.5. Uncertainty

The measurement uncertainty is defined as ± 10 Hz

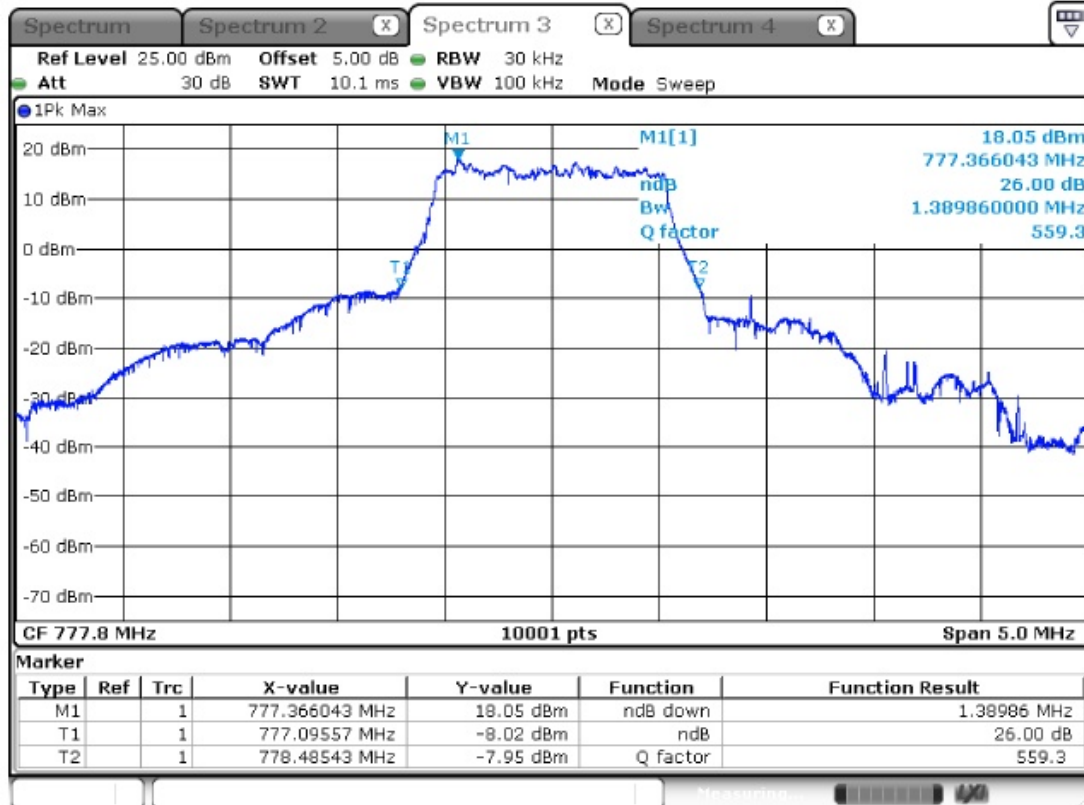
4.6. Test Result

Product	Module		
Test Item	26 dB bandwidth		
Test Mode	Mode 1: LTE_Cat-M1_Band 13_Link		
Date of Test	2017/09/26	Test Site	SR10-H

LTE Band13_QPSK

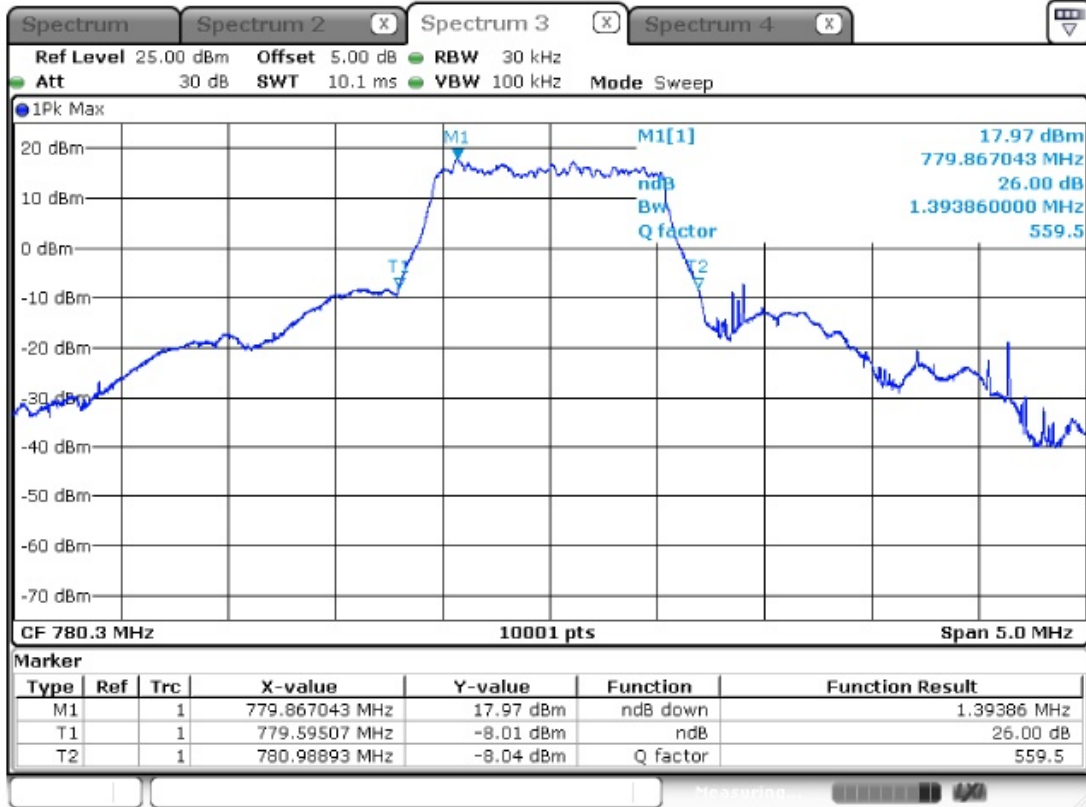
Frequency (MHz)	Measure Level (MHz)	Limit (MHz)
777.7	1.390	N/A
780.3	1.394	N/A
786.3	1.360	N/A

777.7 MHz



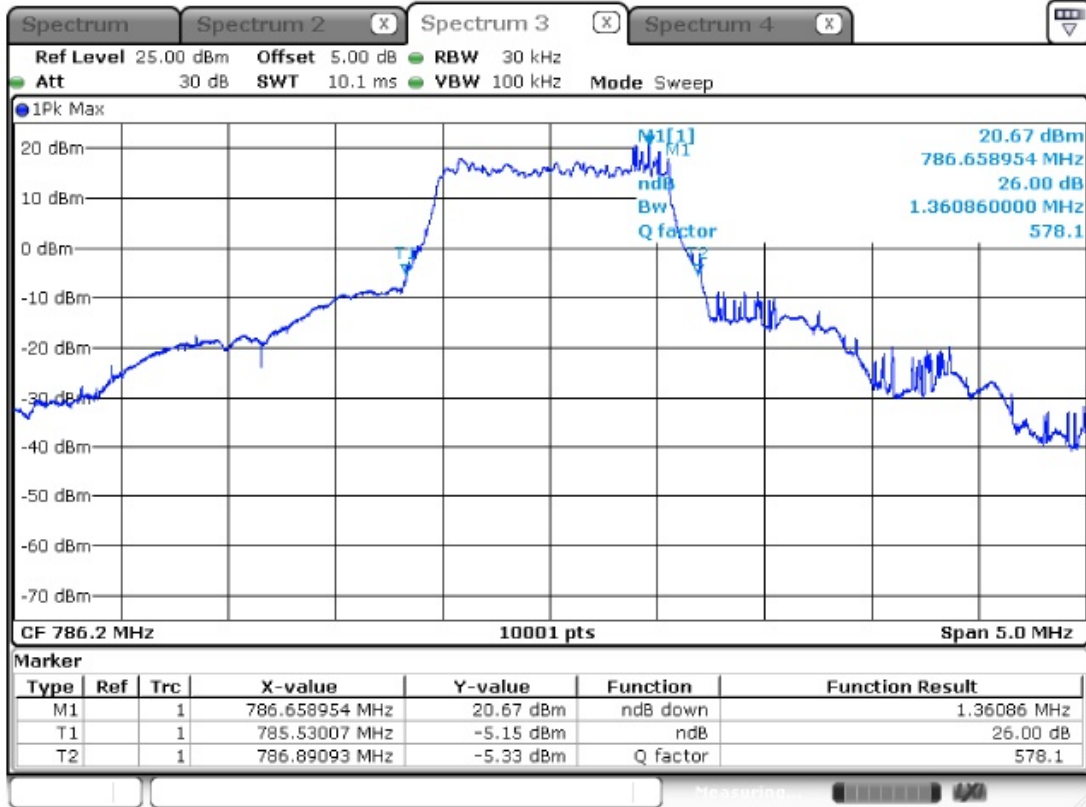
Date: 26.SEP.2017 14:24:36

780.3 MHz



Date: 26.SEP.2017 13:37:07

786.3 MHz



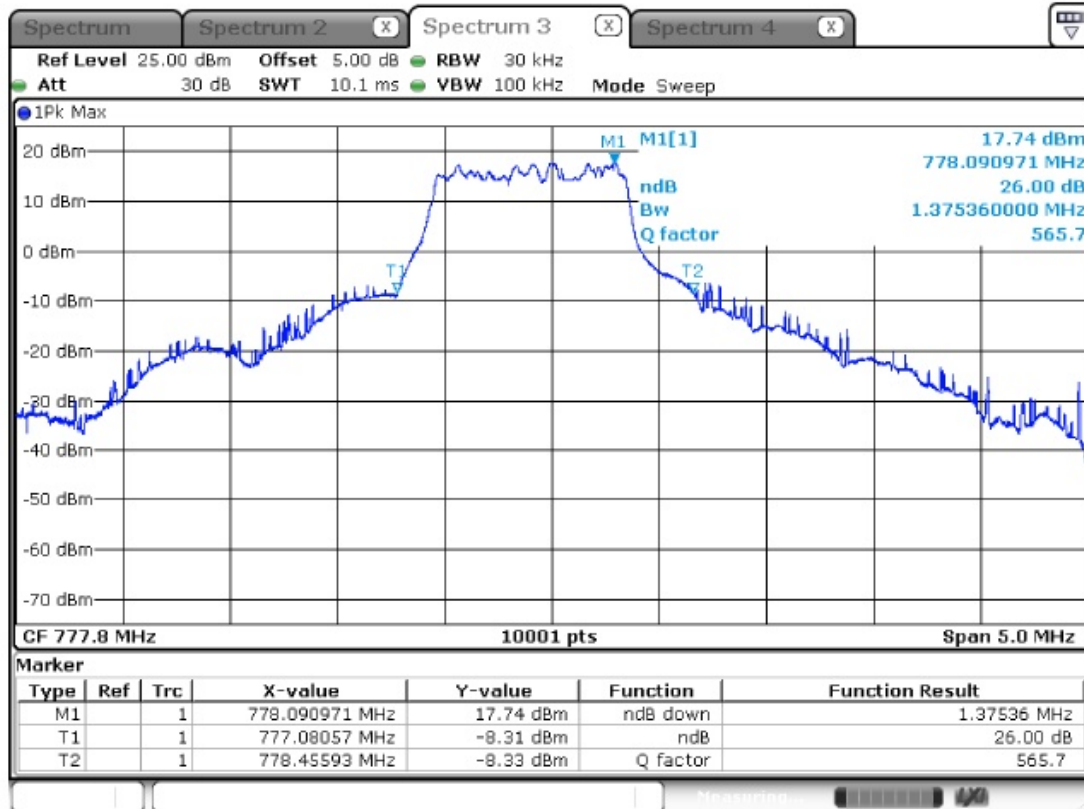
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Product	Module		
Test Item	26 dB bandwidth		
Test Mode	Mode 1: LTE_Cat-M1_Band 13_Link		
Date of Test	2017/09/26	Test Site	SR10-H

LTE Band13_16-QAM

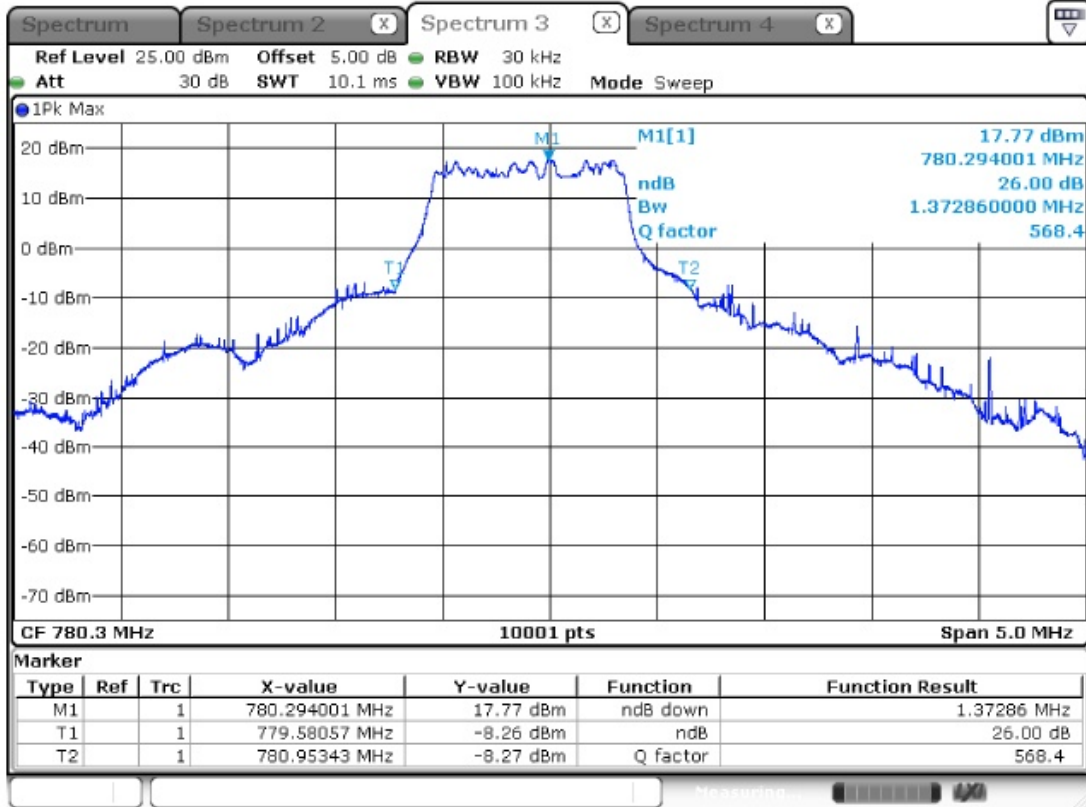
Frequency (MHz)	Measure Level (MHz)	Limit (MHz)
777.7	1.375	N/A
780.3	1.373	N/A
786.3	1.370	N/A

777.7 MHz



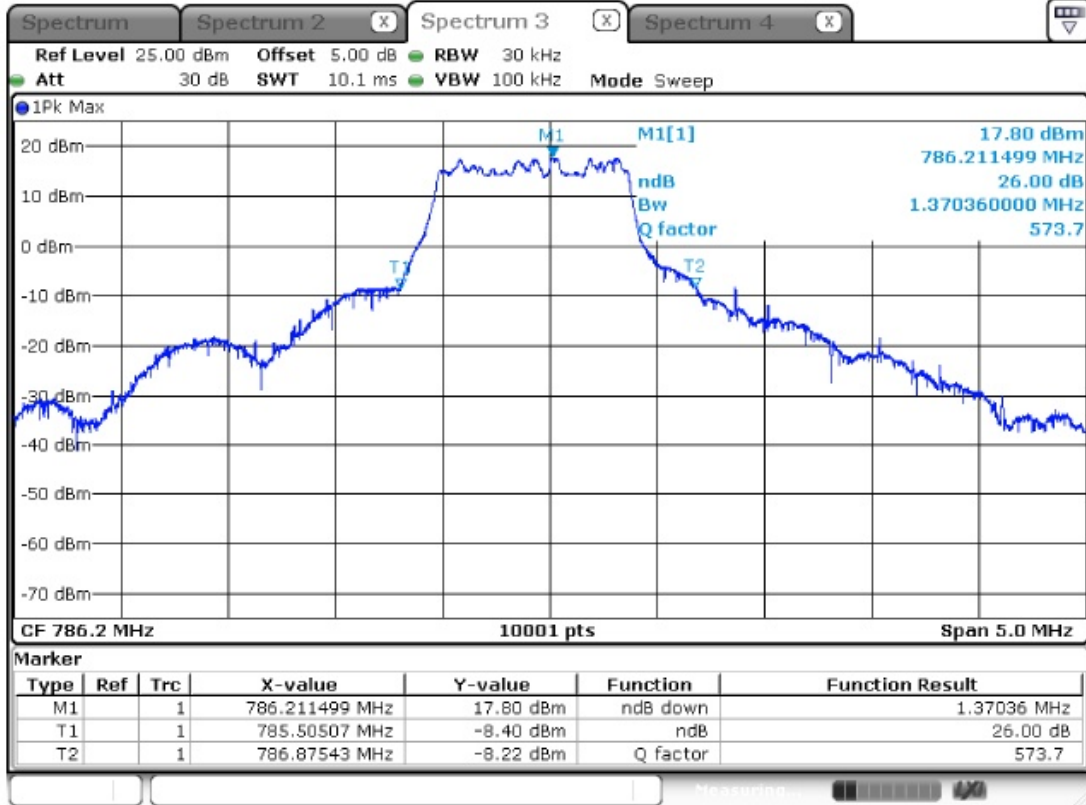
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780.3 MHz



Date: 26.SEP.2017 13:55:12

786.3 MHz



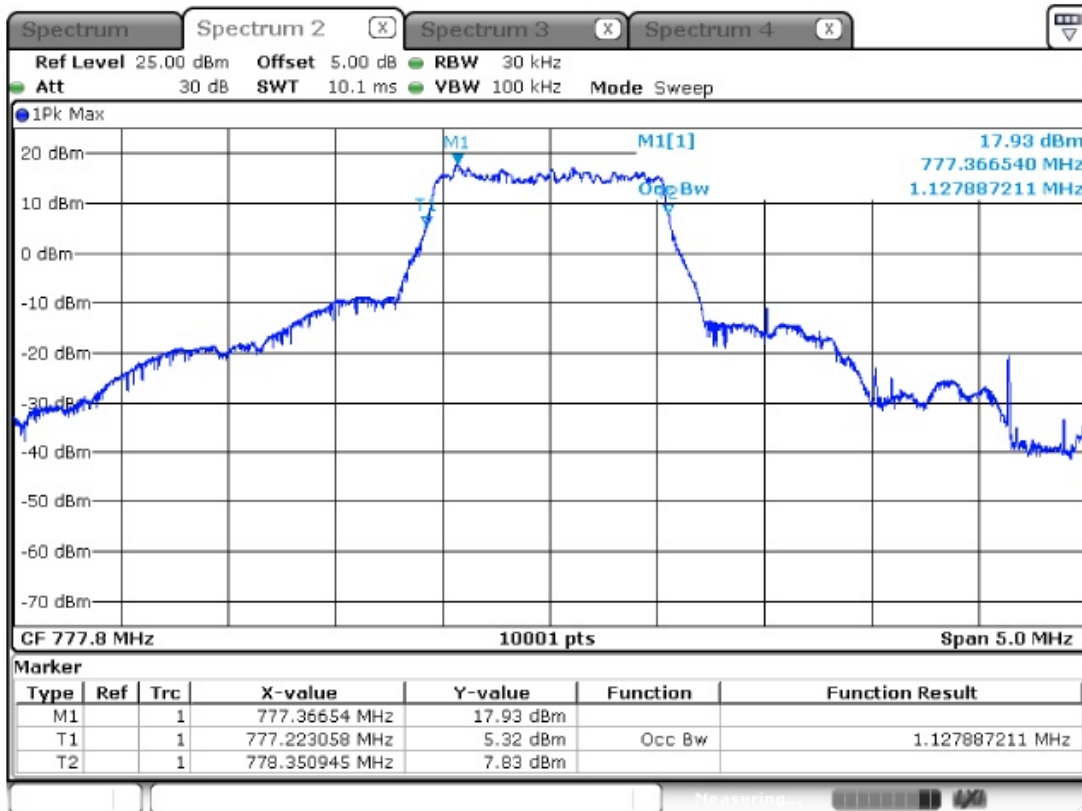
Date: 26.SEP.2017 15:17:01

Product	Module		
Test Item	99% occupied bandwidth		
Test Mode	Mode 1: LTE_Cat-M1_Band 13_Link		
Date of Test	2017/09/26	Test Site	SR10-H

LTE Band13_QPSK

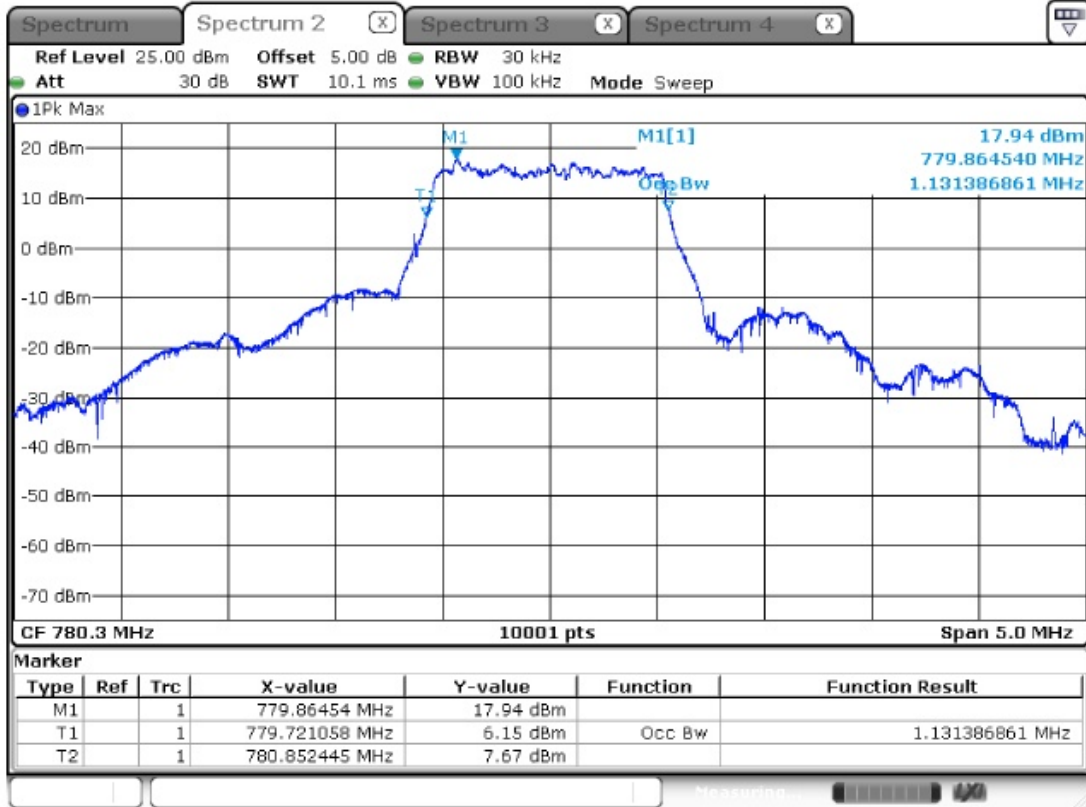
Frequency (MHz)	Measure Level (MHz)	Limit (MHz)
777.7	1.128	N/A
780.3	1.131	N/A
786.3	1.128	N/A

777.7 MHz



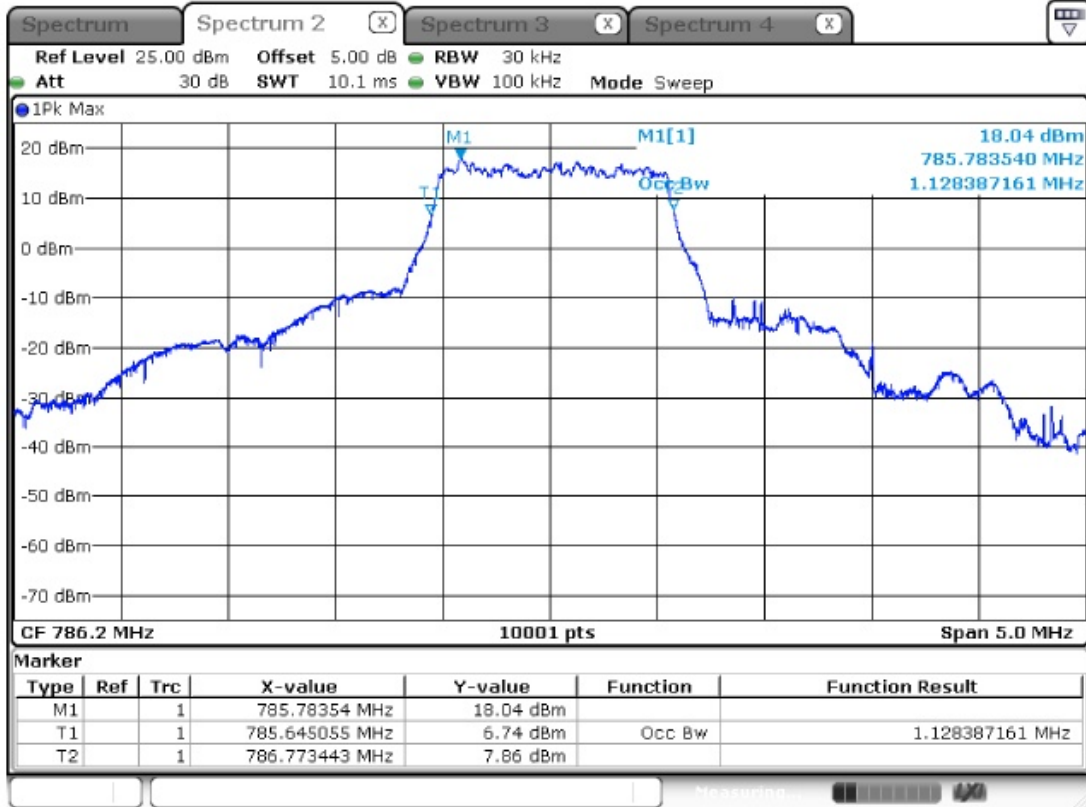
Date: 26.SEP.2017 14:23:07

780.3 MHz



Date: 26 SEP.2017 13:41:26

786.3 MHz



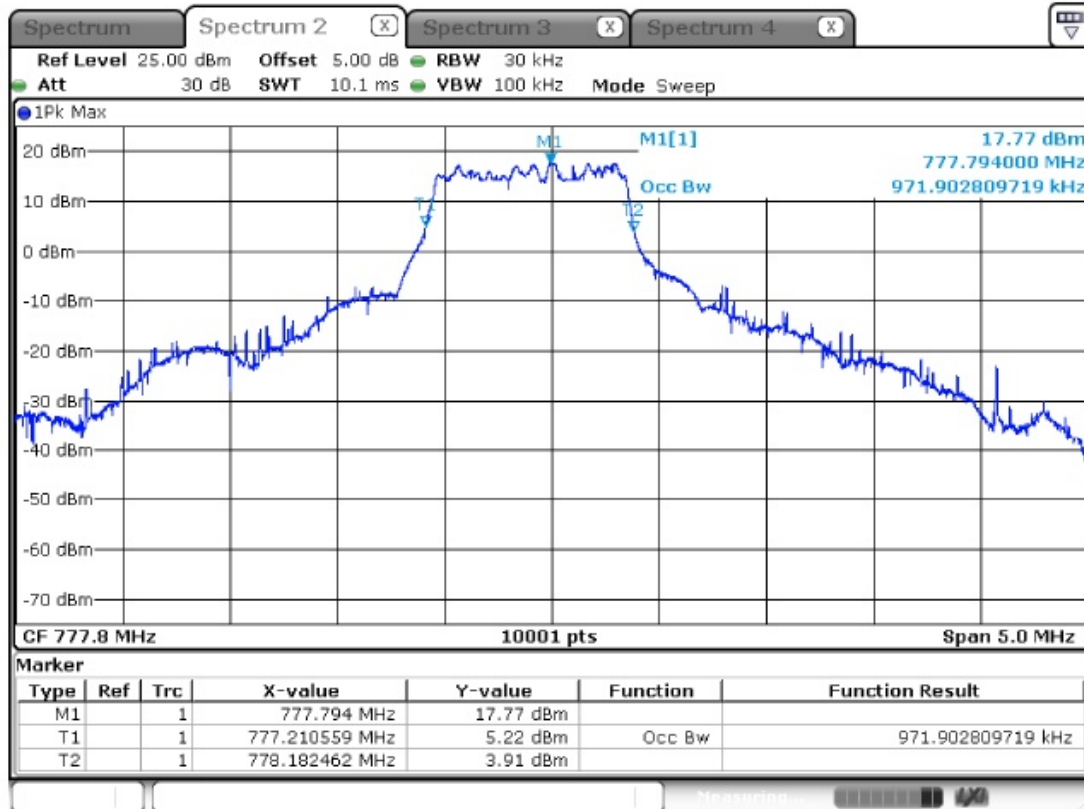
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Product	Module		
Test Item	99% occupied bandwidth		
Test Mode	Mode 1: LTE_Cat-M1_Band 13_Link		
Date of Test	2017/09/26	Test Site	SR10-H

LTE Band13_16-QAM

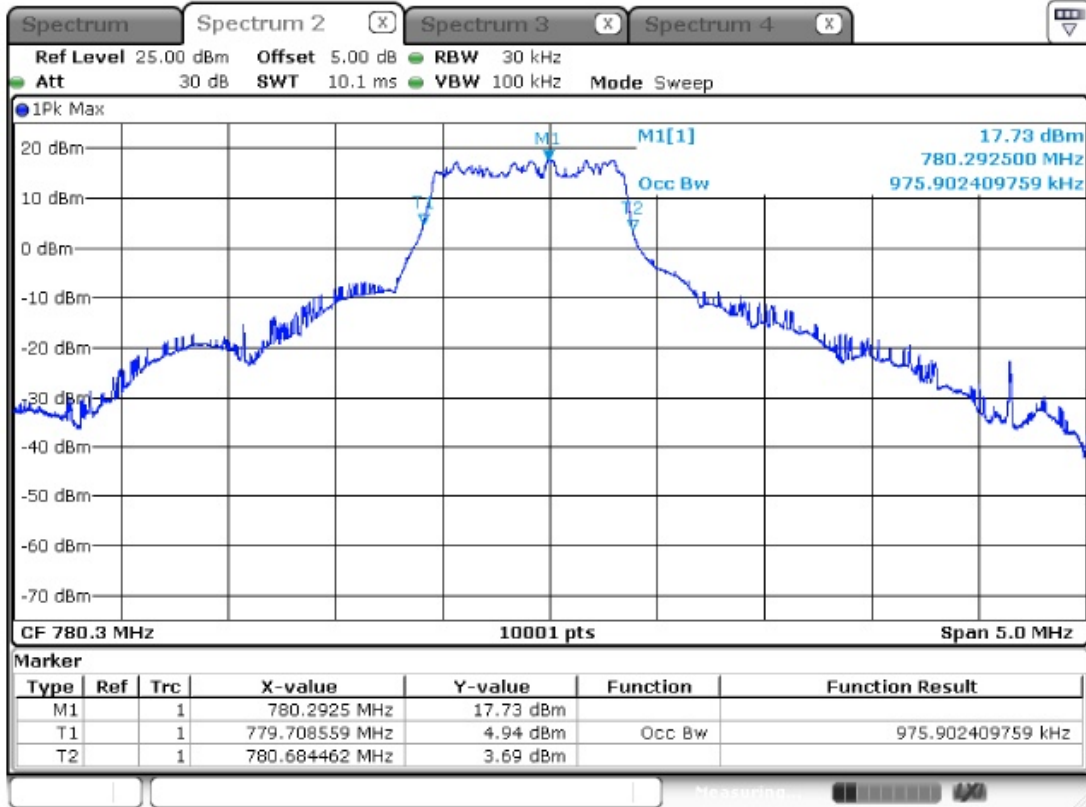
Frequency (MHz)	Measure Level (MHz)	Limit (MHz)
777.7	0.972	N/A
780.3	0.976	N/A
786.3	0.975	N/A

777.7 MHz



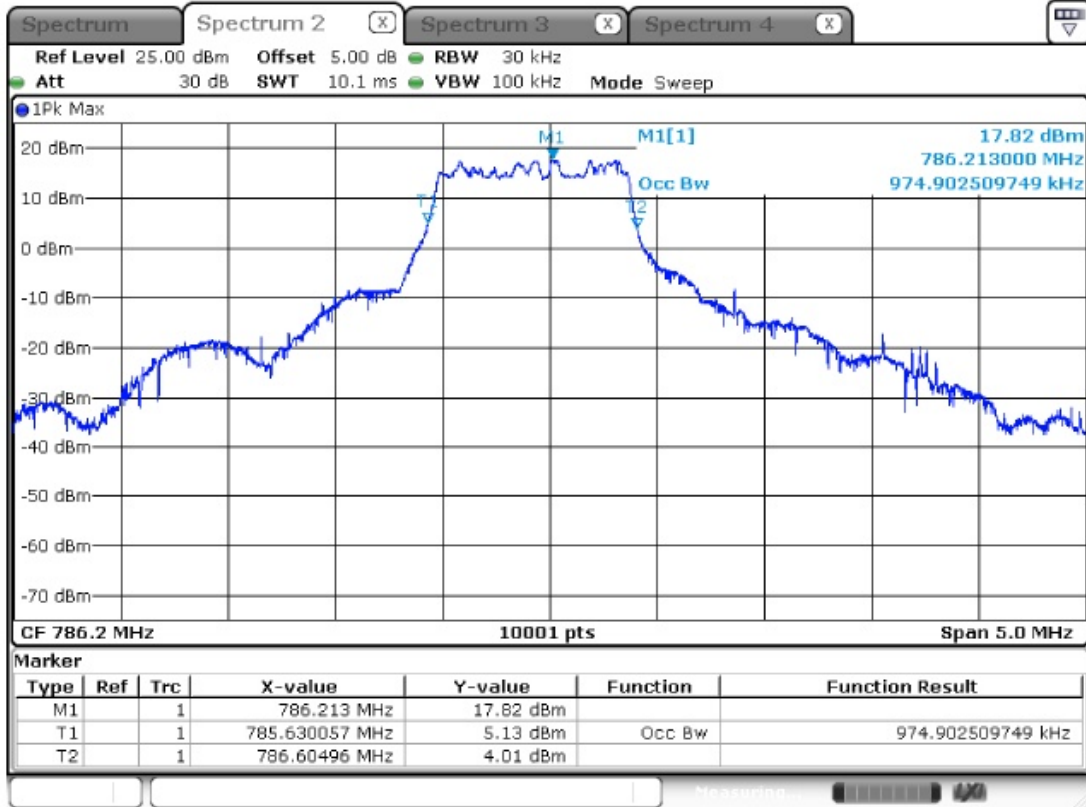
Date: 26.SEP.2017 14:33:48

780.3 MHz



Date: 26.SEP.2017 13:53:23

786.3 MHz



Date: 26.SEP.2017 15:18:07