

FCC Part 22H&24E&27M Test Report

Product Name : Module
Trade Name : 
Model No. : LE910C1-LA
FCC ID : RI7LE910C1LA

Applicant : TELIT WIRELESS SOLUTIONS CO., LTD
Address : 12TH FL., SHINYOUNG SECURITIES BLD.SEOUL.REPUBLIC
OF KOREA

Date of Receipt : Mar. 21, 2019
Issued Date : May. 07, 2019
Report No. : 1930357R-HPUSP28V00
Report Version : V1.0



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Test Report Certification

Issued Date : May. 07, 2019

Report No. : 1930357R-HPUSP28V00



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Applicant : TELIT WIRELESS SOLUTIONS CO., LTD
Address : 12TH FL., SHINYOUNG SECURITIES
BLD.SEOUL.REPUBLIC OF KOREA
Manufacturer : TELIT WIRELESS SOLUTIONS CO., LTD
Address : 12TH FL., SHINYOUNG SECURITIES
BLD.SEOUL.REPUBLIC OF KOREA
Model No. : LE910C1-LA
FCC ID : RI7LE910C1LA
EUT Voltage : DC 3.8V
Testing Voltage : DC 3.8V
Trade Name : 
Applicable Standard : FCC CFR Title 47 Part 2, ANSI/TIA-603-D
FCC Part 22 Subpart H, FCC Part 24 Subpart E,
FCC Part 27 Subpart M
Test Lab : Hsin Chu Laboratory
Address : No.372-2, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu
County 310, Taiwan, R.O.C.
TEL: +886-3-582-8001 / FAX: +886-3-582-8958
Test Result : Complied

Documented By :



(Fonbo Fang / Engineering Adm. Specialist)

Tested By :



(Clemens Fang / Senior Engineer)

Approved By :



(Louis Hsu / Deputy Manager)

Revision History

Report No.	Version	Description	Issued Date
1930357R-HPUSP28V00	V1.0	Initial issue of report	May. 07, 2019

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1. General Information

1.1. EUT Description

Product Name	Module
Trade Name	
Model No.	LE910C1-LA
Tx Frequency Range/ Channel number	WCDMA Band 2: 1852.4-1907.6 MHz WCDMA Band 4: 1712.4-1752.6 MHz WCDMA Band 5: 826.4-846.6 MHz
Rx Frequency Range/ Channel number	WCDMA Band 2: 1932.4-1987.6 MHz WCDMA Band 4: 2112.4-2152.6 MHz WCDMA Band 5: 871.4-891.6 MHz
Type of Modulation	WCDMA: QPSK (Uplink) HSDPA: QPSK (Uplink) HSUPA: QPSK (Uplink)
HW Version	1.0
Firmware Version	25.20.272-B024

Accessories Information	
Antenna	1 pcs

Antenna Information	
MFR. / Model	Hankook / WE14-LF-07
Antenna Type	Dipole Antenna
Antenna Gain	Band 5: 1.5dBi Band 2/4: 3.5dBi

Note:

1. This LE910C1-LA support GSM 850, PCS 1900, WCDMA Band 2/4/5 and LTE Band 2/4/5/7.
2. Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then 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:

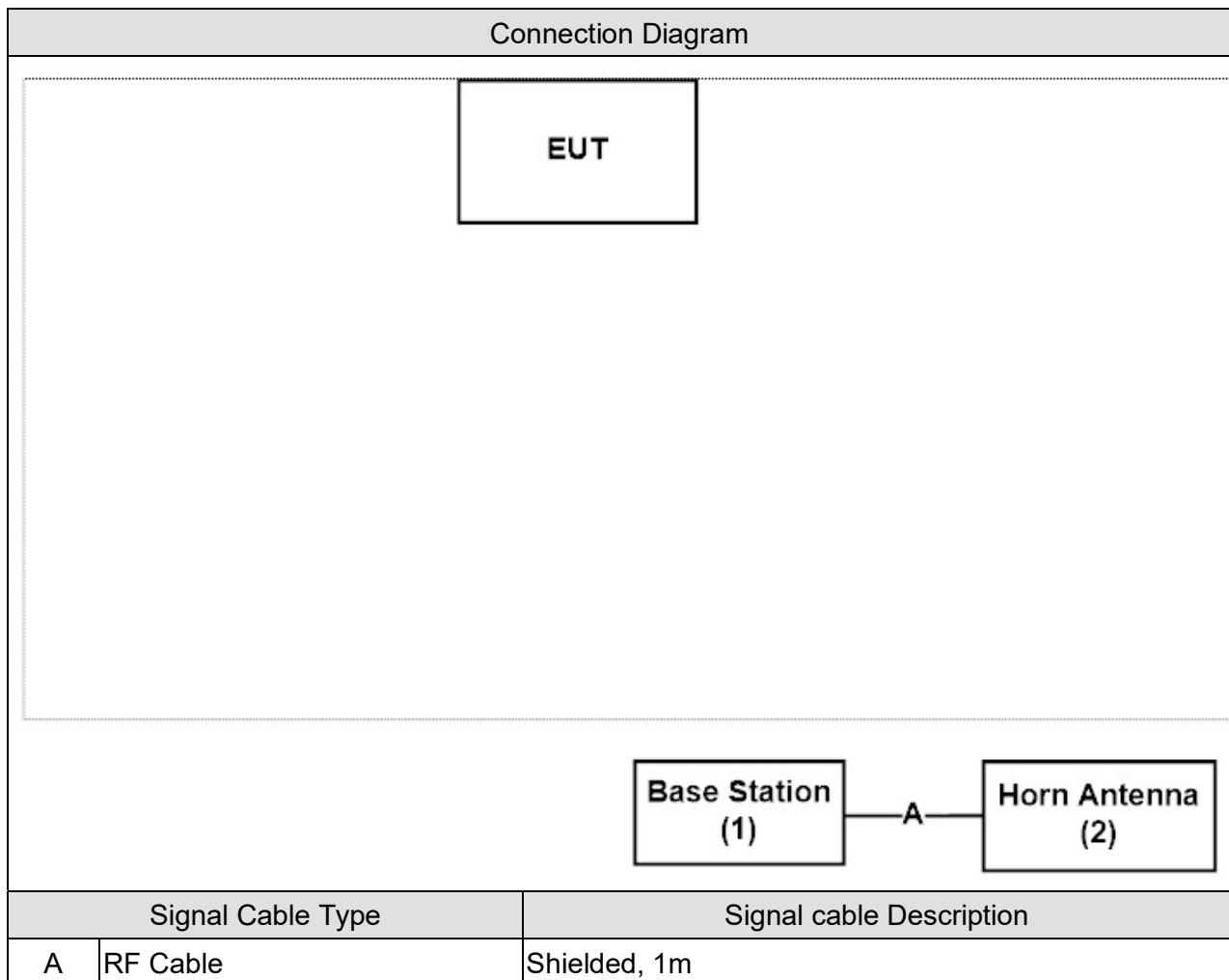
Test Mode
Mode 1: WCDMA_Band 2
Mode 2: WCDMA_Band 4
Mode 3: WCDMA_Band 5

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.	FCC ID	Power Cord
1 Base Station	R&S	CMW500	106071	DoC	Non-Shielded, 2m.
2 Horn Antenna	scnwahzbeck	BBHA9120B	639	DoC	--

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. Horn link with base station.
3	The EUT link with base station and it will continue receive the signal.
4	Repeat the above procedure.

2. Technical Test

2.1. Summary of Test Result

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

For WCDMA Band 2

(FCC Part 24 Subpart E)

Performed Item	FCC Rule	Limit	Result
Maximum Output Power	§2.1033 §2.1046 §24.232	< 2 Watts	Pass
Occupied Bandwidth	§2.1049	N/A	Pass
Peak To Average Ratio	§24.232(d)	$\leq$ 13dB	Pass
Conducted Band Edge	§27.238	< -13dBm	Pass
Spurious Emission	§2.1053 §24.238	< -13dBm	Pass
Frequency Stability	§2.1055 §24.235	< 2.5 ppm	Pass

For WCDMA Band 4
(FCC Part 27 Subpart M)

Performed Item	FCC Rule	Limit	Result
Maximum Output Power	FCC PART 2.1046 and PART 27.50(h)(2)	< 1 Watts EIRP	Pass
Occupied Bandwidth	FCC PART 2.1049 and PART 27.53(l)(6)	N/A	Pass
Peak To Average Ratio	§27.50(b)	≤ 13dB	Pass
Conducted Band Edge	FCC PART 2.1051 and PART 27.53(l)(4)(6)	< -13 dBm	Pass
Spurious Emission	FCC PART 2.1051 and PART 27.53(l)(4)(6)	< -25 dBm	Pass
Frequency Stability	FCC PART 2.1055(a)(l) and PART 27.54	< 2.5 ppm	Pass

For WCDMA Band 5
(FCC Part 22 Subpart H)

Performed Item	FCC Rule	Limit	Result
Maximum Output Power	§2.1033 §2.1046 §22.913	< 7 Watts	Pass
Occupied Bandwidth	§2.1049	N/A	Pass
Peak To Average Ratio	§22.913(d)	≤ 13dB	Pass
Conducted Band Edge	§22.917	< -13dBm	Pass
Spurious Emission	§2.1053 §22.917	< -13dBm	Pass
Frequency Stability	§2.1055 §22.335	< 2.5 ppm	Pass

2.2. Test Environment

Items	Test Item	Required (IEC 68-1)	Actual	Test Site
Temperature (°C)	RF Output Power	15-35	23	3
Humidity (%RH)		25-75	52	
Barometric pressure (mbar)		860-1060	950-1000	
Temperature (°C)	Occupied Bandwidth	15-35	23	3
Humidity (%RH)		25-75	52	
Barometric pressure (mbar)		860-1060	950-1000	
Temperature (°C)	Peak To Average Ratio	15-35	23	3
Humidity (%RH)		25-75	52	
Barometric pressure (mbar)		860-1060	950-1000	
Temperature (°C)	Conducted Band Edge	15-35	23	3
Humidity (%RH)		25-75	52	
Barometric pressure (mbar)		860-1060	950-1000	
Temperature (°C)	Spurious Emission	15-35	23	2/3
Humidity (%RH)		25-75	52	
Barometric pressure (mbar)		860-1060	950-1000	
Temperature (°C)	Frequency Stability	15-35	23	3
Humidity (%RH)		25-75	52	
Barometric pressure (mbar)		860-1060	950-1000	

Note: Test Site information refers to Laboratory Information.

Laboratory Information

USA : FCC Registration Number: TW3024

Canada : IC Registration Number: 22397-1 / 22397-2 / 22397-3

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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- 2 No.372, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 31061, Taiwan, R.O.C.
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TEL: +886-3-582-8001 / FAX: +886-3-582-8958 E-Mail : info.tw@dekra.com

2.3. List of Test Equipment

RF Output Power / SR10-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Signal & Spectrum Analyzer	R&S	FSV40	101049	2018/12/21	2019/12/20
EXA Signal Analyzer	Keysight	N9010A	MY51440132	2019/03/15	2020/03/14
Spectrum Analyzer	Keysight	N9030B	MY57140404	2018/06/26	2019/06/25
Spectrum Analyzer	Keysight	N9010B	MY57110159	2018/05/25	2019/05/24
Wireless Conn. Tseter	R&S	CMW500	157118	2018/08/16	2019/08/15
Wideband Radio Communication Tester	R&S	CMW500	106071	2019/01/16	2020/01/15

Occupied Bandwidth / SR10-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Signal & Spectrum Analyzer	R&S	FSV40	101049	2018/12/21	2019/12/20
EXA Signal Analyzer	Keysight	N9010A	MY51440132	2019/03/15	2020/03/14
Spectrum Analyzer	Keysight	N9030B	MY57140404	2018/06/26	2019/06/25
Spectrum Analyzer	Keysight	N9010B	MY57110159	2018/05/25	2019/05/24
Wireless Conn. Tseter	R&S	CMW500	157118	2018/08/16	2019/08/15
Wideband Radio Communication Tester	R&S	CMW500	106071	2019/01/16	2020/01/15

Peak To Average Ratio / SR10-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Signal & Spectrum Analyzer	R&S	FSV40	101049	2018/12/21	2019/12/20
EXA Signal Analyzer	Keysight	N9010A	MY51440132	2019/03/15	2020/03/14
Spectrum Analyzer	Keysight	N9030B	MY57140404	2018/06/26	2019/06/25
Spectrum Analyzer	Keysight	N9010B	MY57110159	2018/05/25	2019/05/24
Wireless Conn. Tseter	R&S	CMW500	157118	2018/08/16	2019/08/15
Wideband Radio Communication Tester	R&S	CMW500	106071	2019/01/16	2020/01/15

Conducted Band Edge / SR10-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Signal & Spectrum Analyzer	R&S	FSV40	101049	2018/12/21	2019/12/20
EXA Signal Analyzer	Keysight	N9010A	MY51440132	2019/03/15	2020/03/14
Spectrum Analyzer	Keysight	N9030B	MY57140404	2018/06/26	2019/06/25
Spectrum Analyzer	Keysight	N9010B	MY57110159	2018/05/25	2019/05/24
Wireless Conn. Tseter	R&S	CMW500	157118	2018/08/16	2019/08/15
Wideband Radio Communication Tester	R&S	CMW500	106071	2019/01/16	2020/01/15

Conducted Spurious Emissions / SR10-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Signal & Spectrum Analyzer	R&S	FSV40	101049	2018/12/21	2019/12/20
EXA Signal Analyzer	Keysight	N9010A	MY51440132	2019/03/15	2020/03/14
Spectrum Analyzer	Keysight	N9030B	MY57140404	2018/06/26	2019/06/25
Spectrum Analyzer	Keysight	N9010B	MY57110159	2018/05/25	2019/05/24
Wireless Conn. Tseter	R&S	CMW500	157118	2018/08/16	2019/08/15
Wideband Radio Communication Tester	R&S	CMW500	106071	2019/01/16	2020/01/15

Radiated Spurious Emissions / CB2-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Horn Antenna	Schwarzbeck	BBHA 9120D	639	2018/06/01	2019/05/31
Bilog Antenna	Teseq	CBL6112D	23191	2018/06/26	2019/06/25
Signal & Spectrum Analyzer	R&S	FSV40	101049	2018/12/21	2019/12/20
EXA Signal Analyzer	Keysight	N9010A	MY51440132	2019/03/15	2020/03/14
Signal Analyzer	R&S	FSVA40	101455	2018/11/05	2019/11/04
Horn Antenna	Schwarzbeck	BBHA 9170	202	2019/01/16	2020/01/15
Pre-Amplifier	Dekra	AP-400C	201801231	2018/12/05	2019/12/04
Pre-Amplifier	EMCI	EMC11830I	980366	2018/12/21	2019/12/20
Horn Antenna	Schwarzbeck	BBHA 9120D	01656	2018/10/17	2019/10/16
Pre-Amplifier	Dekra	AP-025C	201801236	2019/02/18	2020/02/17
Signal Analyzer	R&S	FSV40	101435	2018/07/19	2019/07/18
Wideband Radio Communication Tester	R&S	CMW500	106071	2019/01/16	2020/01/15
Wireless Conn. Tseter	R&S	CMW500	157118	2018/08/16	2019/08/15
Coaxial Cable	Huber+Suhner	SF104_SF104_SF104_SF104(16.0m)	CB2-H	2018/08/21	2019/08/20

Frequency Stability / SR10-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Signal & Spectrum Analyzer	R&S	FSV40	101049	2018/12/21	2019/12/20
EXA Signal Analyzer	Keysight	N9010A	MY51440132	2019/03/15	2020/03/14
Spectrum Analyzer	Keysight	N9030B	MY57140404	2018/06/26	2019/06/25
Spectrum Analyzer	Keysight	N9010B	MY57110159	2018/05/25	2019/05/24
Wireless Conn. Tseter	R&S	CMW500	157118	2018/08/16	2019/08/15
Wideband Radio Communication Tester	R&S	CMW500	106071	2019/01/16	2020/01/15

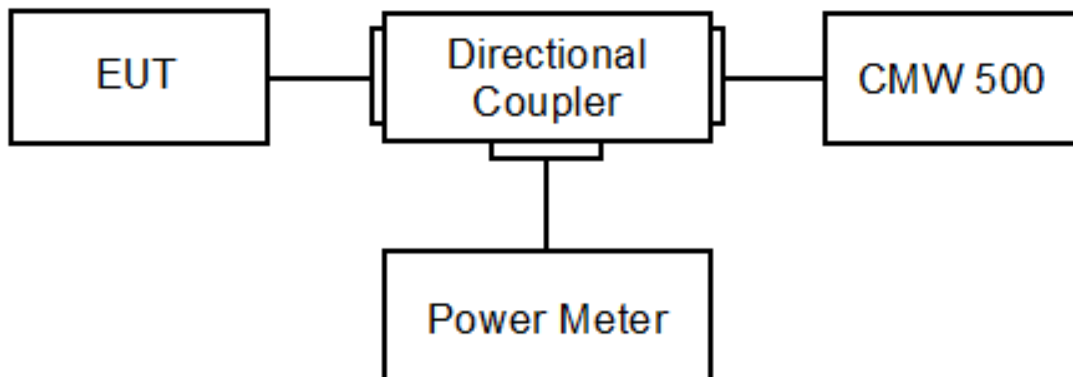
Note: All equipment upon which need to calibrated are with calibration period of 1 year.

2.4. Measurement Uncertainty

Test Item	Uncertainty
RF Output Power	$\pm 1.27\text{dB}$
Occupied Bandwidth	$\pm 10\text{ Hz}$
Peak To Average Ratio	In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13dB.
Conducted Band Edge	$\pm 1.2\text{ dB}$
Spurious Emissions	The measurement uncertainty is defined as $\pm 1.27\text{ dB}$ for Conducted Measurement. The measurement uncertainty is defined as $\pm 3.2\text{ dB}$ for Radiated Measurement.
Frequency Stability	$\pm 10\text{ Hz}$

3. RF Output Power

3.1. Test Setup



3.2. Test Procedure

- The RF output of the transmitter was connected to base station simulator.
- 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.
- Set EUT at maximum average power by base station simulator.
- 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

3.3. Test Method

KDB 971168 D01 Power Meas License Digital Systems v03 sub-clause 5.2.4

ANSI C63.26-2015 Sub-clause 5.2.4.2

3.4. Test Result

Product	Module		
Test Item	RF Output Power (Conducted)		
Test Mode	Mode 1: WCDMA _Band 2		
Date of Test	2019/04/02	Test Site	SR10-H

Test Mode	Frequency (MHz)	Reading Level (dBm)	Antenna Gain (dBi)	Measure Level (dBm)	Measure Level (W)	Limit (W) EIRP
RMC	1852.4	23.15	3.5	26.650	0.462	2
	1880.0	23.01	3.5	26.510	0.448	2
	1907.6	22.86	3.5	26.360	0.433	2
HSUPA	1852.4	20.92	3.5	24.420	0.277	2
	1880.0	20.87	3.5	24.370	0.274	2
	1907.6	20.58	3.5	24.080	0.256	2
HSDPA	1852.4	20.38	3.5	23.880	0.244	2
	1880.0	20.32	3.5	23.820	0.241	2
	1907.6	20.26	3.5	23.760	0.238	2
Voice	1852.4	22.65	3.5	26.150	0.412	2
	1880.0	22.68	3.5	26.180	0.415	2
	1907.6	22.76	3.5	26.260	0.423	2

Note: Measure Level (EIRP) = Reading Level + Antenna Gain

Product	Module		
Test Item	RF Output Power (Conducted)		
Test Mode	Mode 2: WCDMA _Band 4		
Date of Test	2019/04/02	Test Site	SR10-H

Test Mode	Frequency (MHz)	Reading Level (dBm)	Antenna Gain (dBi)	Measure Level (dBm)	Measure Level (W)	Limit (W) EIRP
RMC	1712.4	23.03	3.5	26.530	0.450	1
	1732.6	23.05	3.5	26.550	0.452	1
	1752.6	23.01	3.5	26.510	0.448	1
HSUPA	1712.4	20.63	3.5	24.130	0.259	1
	1732.6	21.06	3.5	24.560	0.286	1
	1752.6	20.71	3.5	24.210	0.264	1
HSDPA	1712.4	20.42	3.5	23.920	0.247	1
	1732.6	20.37	3.5	23.870	0.244	1
	1752.6	20.32	3.5	23.820	0.241	1
Voice	1712.4	22.95	3.5	26.450	0.442	1
	1732.6	22.94	3.5	26.440	0.441	1
	1752.6	22.87	3.5	26.370	0.434	1

Note: Measure Level (EIRP) = Reading Level + Antenna Gain

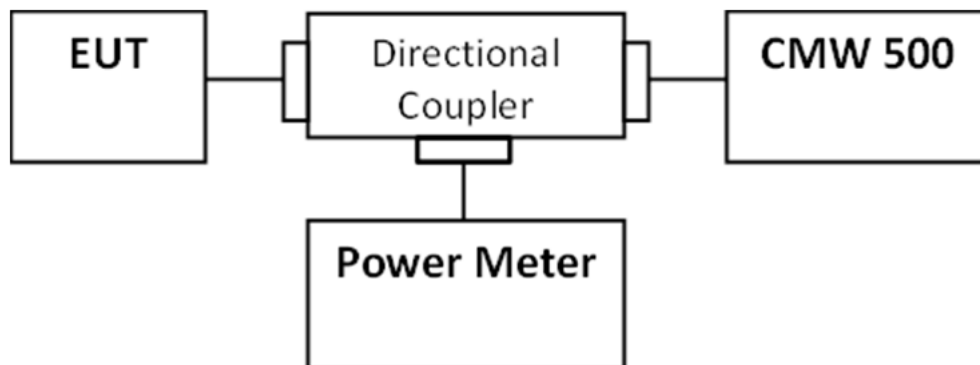
Product	Module		
Test Item	RF Output Power (Conducted)		
Test Mode	Mode 3: WCDMA_Band 5		
Date of Test	2019/04/02	Test Site	SR10-H

Test Mode	Frequency (MHz)	Reading Level (dBm)	Antenna Gain (dBi)	Measure Level (dBm)	Measure Level (W)	Limit (W) ERP
RMC	826.4	23.37	1.5	22.720	0.187	7
	836.6	23.31	1.5	22.660	0.185	7
	846.6	23.29	1.5	22.640	0.184	7
HSUPA	826.4	21.32	1.5	20.670	0.117	7
	836.6	21.42	1.5	20.770	0.119	7
	846.6	21.37	1.5	20.720	0.118	7
HSDPA	826.4	20.92	1.5	20.270	0.106	7
	836.6	21.04	1.5	20.390	0.109	7
	846.6	20.94	1.5	20.290	0.107	7
Voice	826.4	23.21	1.5	22.560	0.180	7
	836.6	23.22	1.5	22.570	0.181	7
	846.6	23.20	1.5	22.550	0.180	7

Note: Measure Level (EIRP) = Reading Level + Antenna Gain - 2.15

4. Occupied Bandwidth

4.1. Test Setup



4.2. 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.

4.3. Test Method

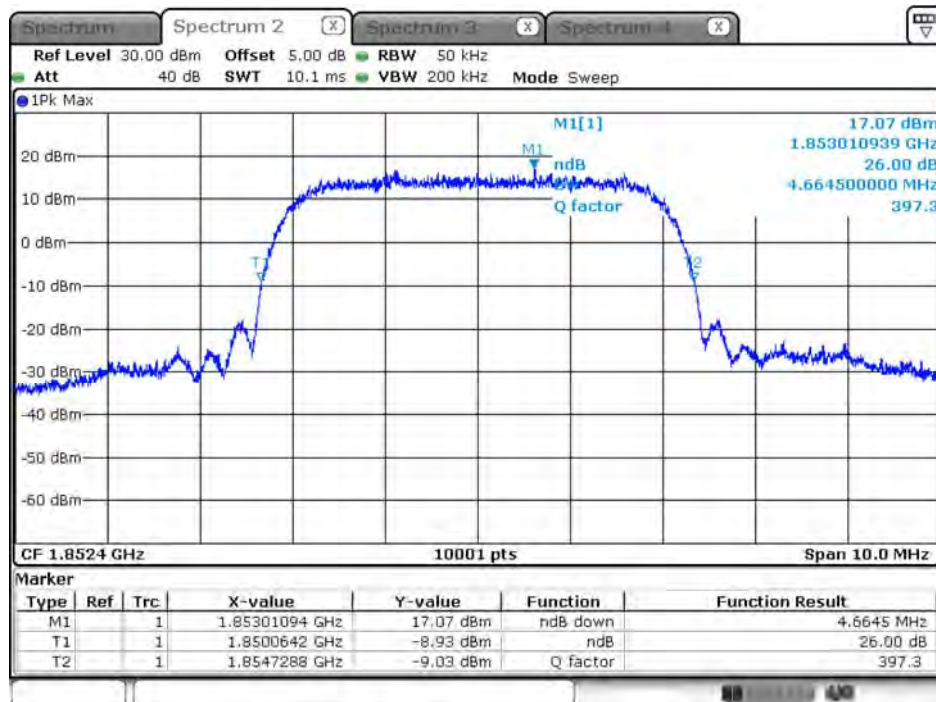
KDB 971168 D01 Power Meas License Digital Systems v03 sub-clause 4.2 & 4.3
ANSI C63.26-2015 Sub-clause 5.4.3 & 5.4.4

4.4. Test Result

Product	Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: WCDMA_Band 2		
Date of Test	2019/04/16	Test Site	SR10-H

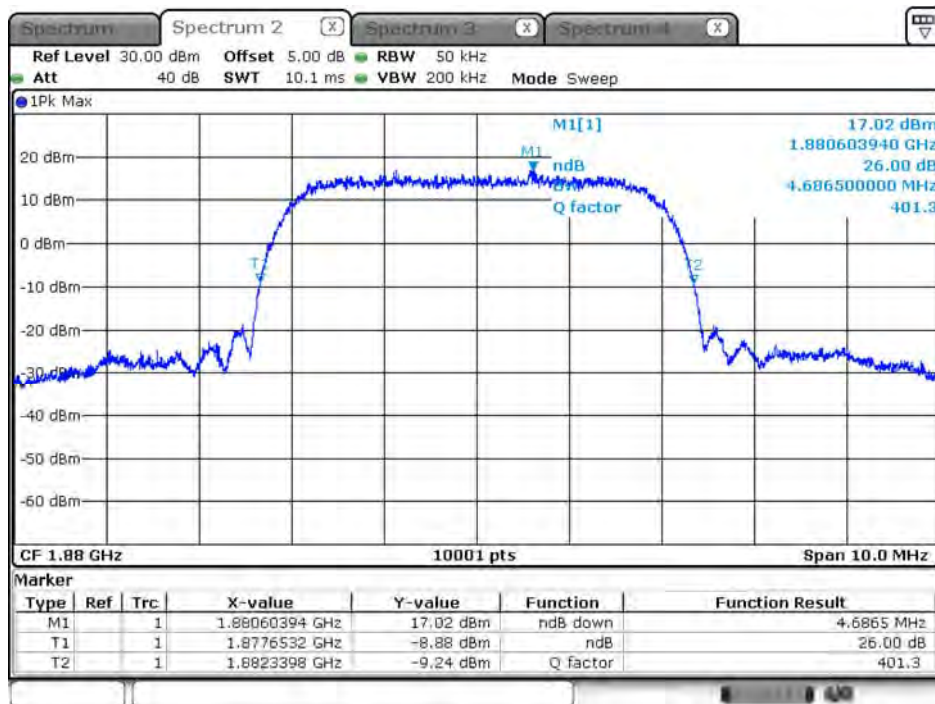
WCDMA_Band 2_RMC			
Frequency (MHz)	Measure Level (MHz)		Limit (MHz)
	26dB BW	99% BW	
1852.4	4.664	4.132	N/A
1880	4.686	4.119	N/A
1907.6	4.680	4.131	N/A

WCDMA_Band 2_RMC_1852.4MHz_26dB BW



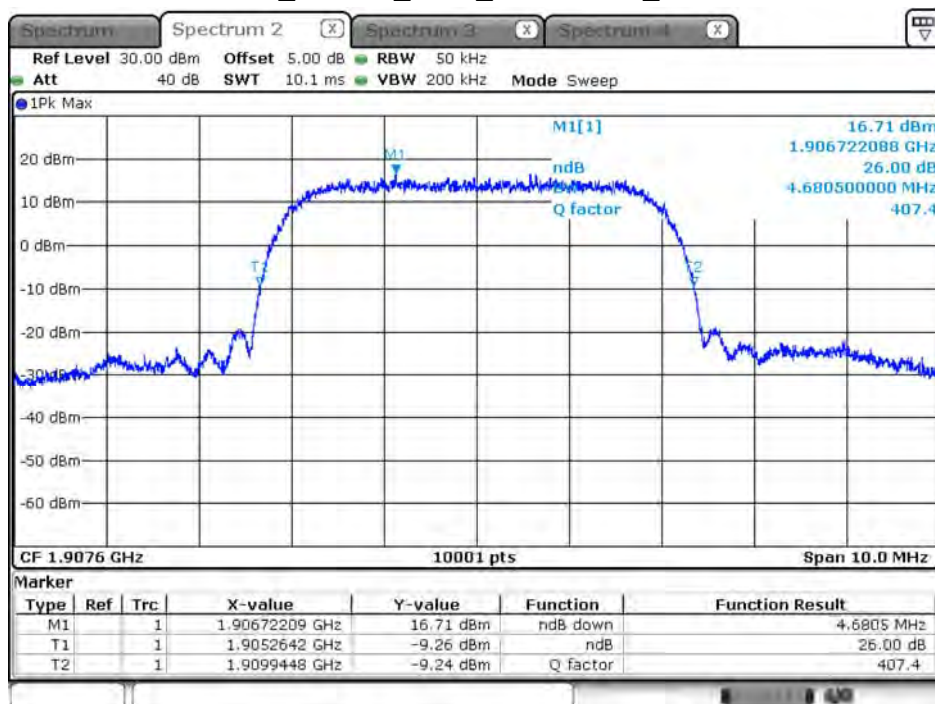
Date: 2.APR 2019 19:29:51

WCDMA_Band 2_RMC_1880.0MHz_26dB BW

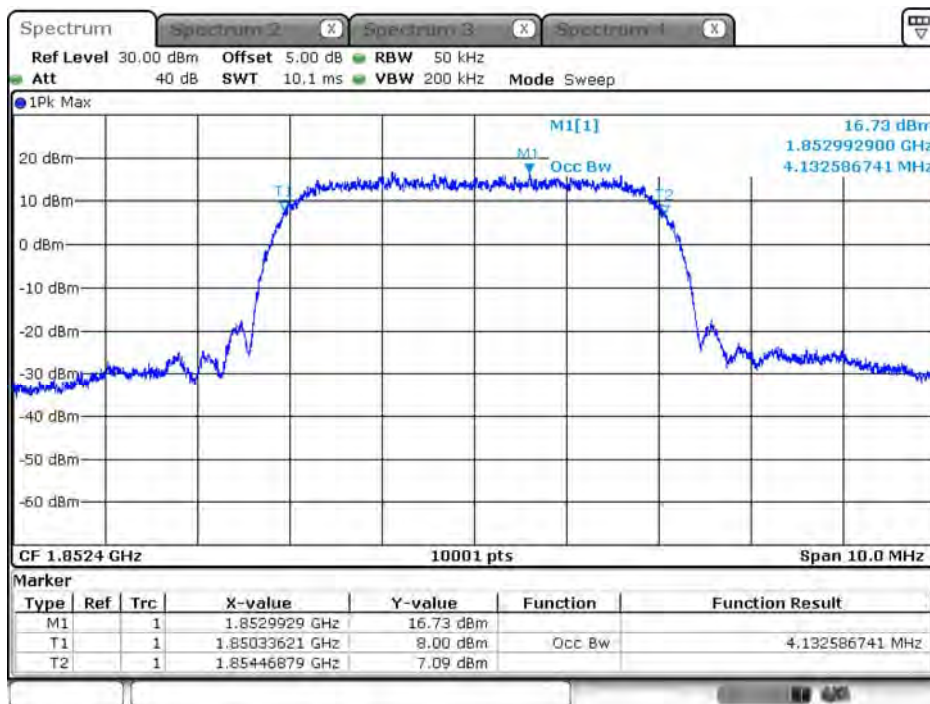


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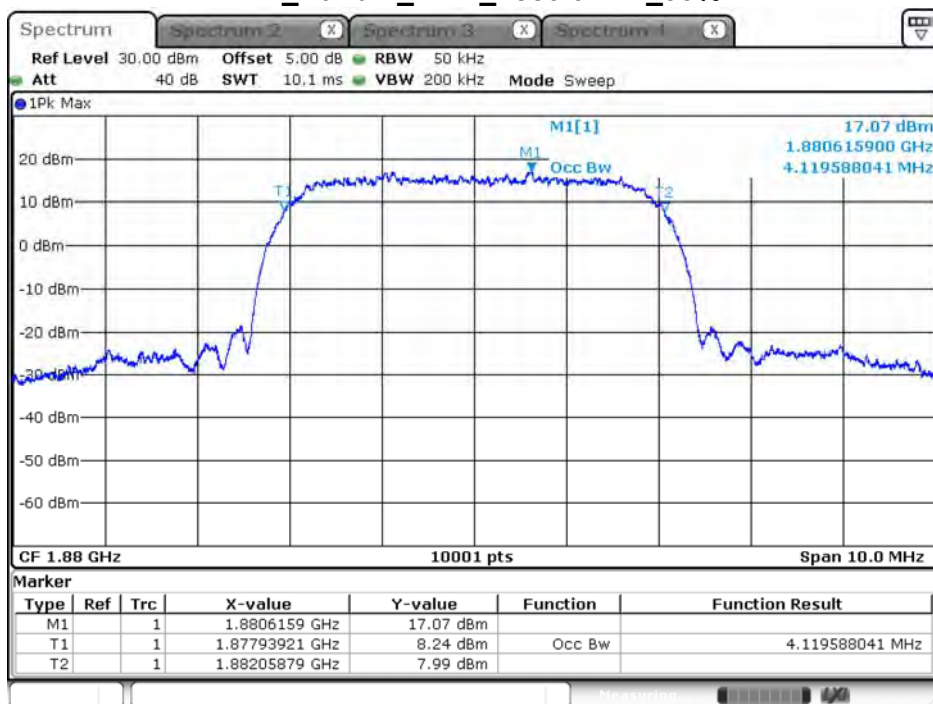
WCDMA_Band 2_RMC_1907.6MHz_26dB BW



Date: 2.APR.2019 19:36:05

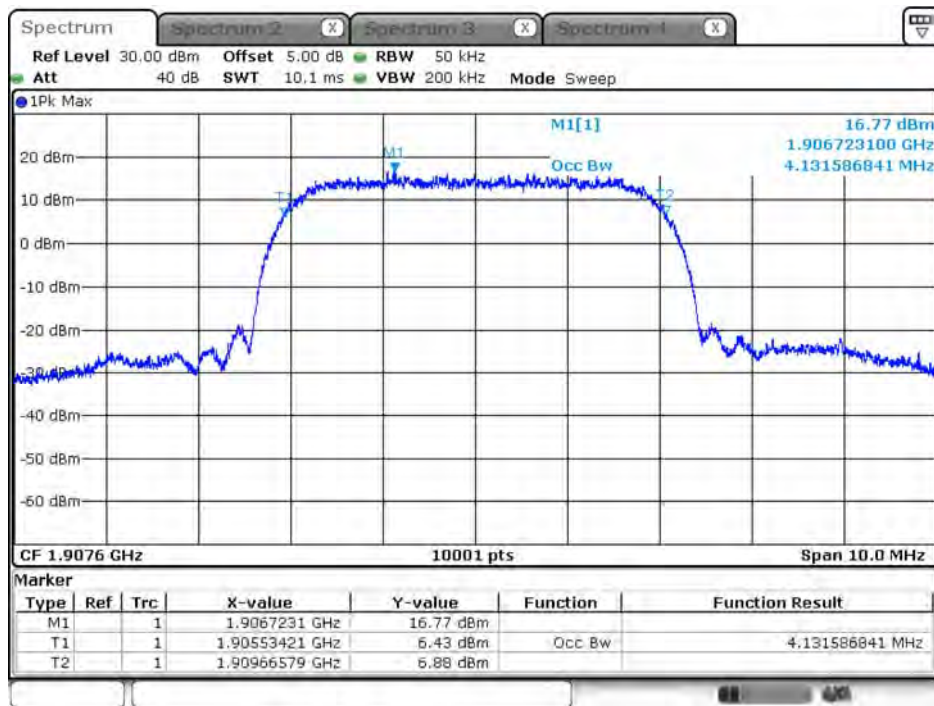
WCDMA_Band 2_RMC_1852.4MHz_99% BW

Date: 2.APR.2019 19:29:19

WCDMA_Band 2_RMC_1880.0MHz_99% BW

Date: 2.APR.2019 19:34:11

WCDMA_Band 2_RMC_1907.6MHz_99% BW

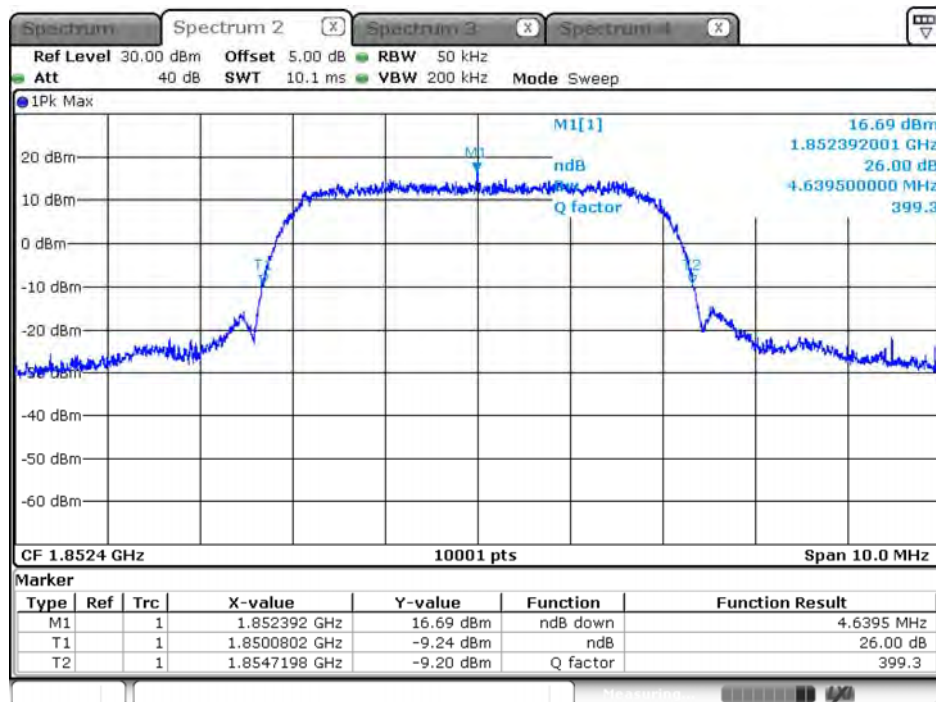


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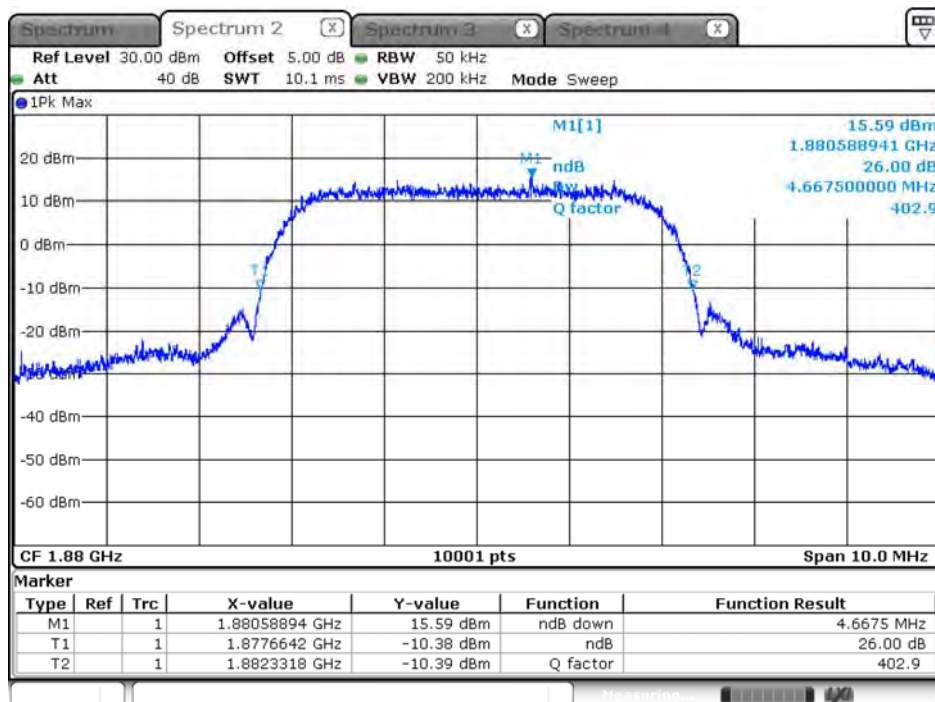
Product	Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: WCDMA_Band 2		
Date of Test	2019/04/16	Test Site	SR10-H

WCDMA_Band 2_HSDPA			
Frequency (MHz)	Measure Level (MHz)		Limit (MHz)
	26dB BW	99% BW	
1852.4	4.639	4.133	N/A
1880	4.667	4.136	N/A
1907.6	4.671	4.135	N/A

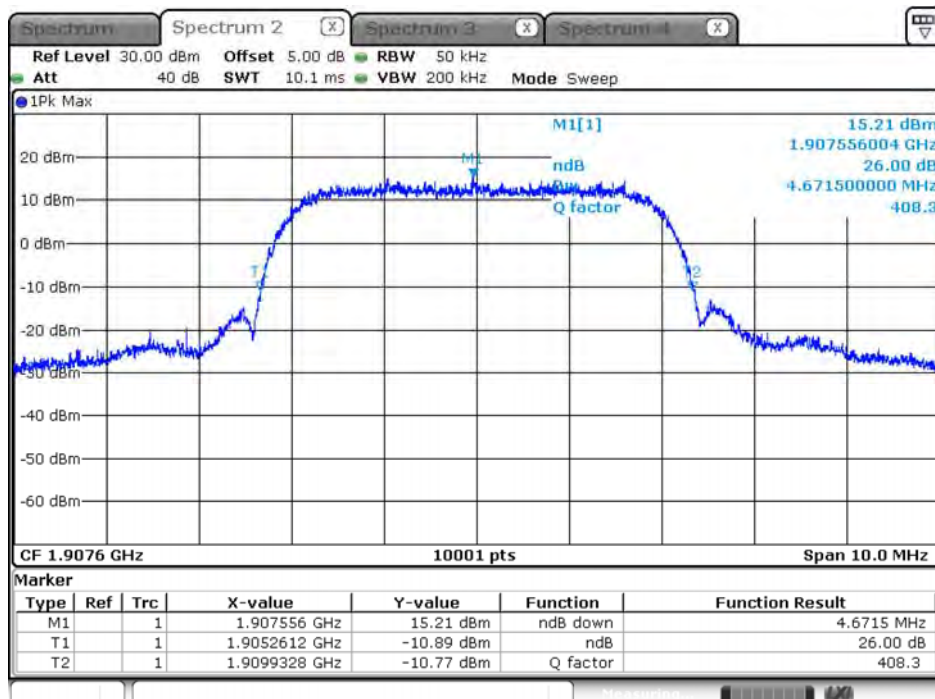
WCDMA_Band 2_HSDPA_1852.4MHz_26dB BW



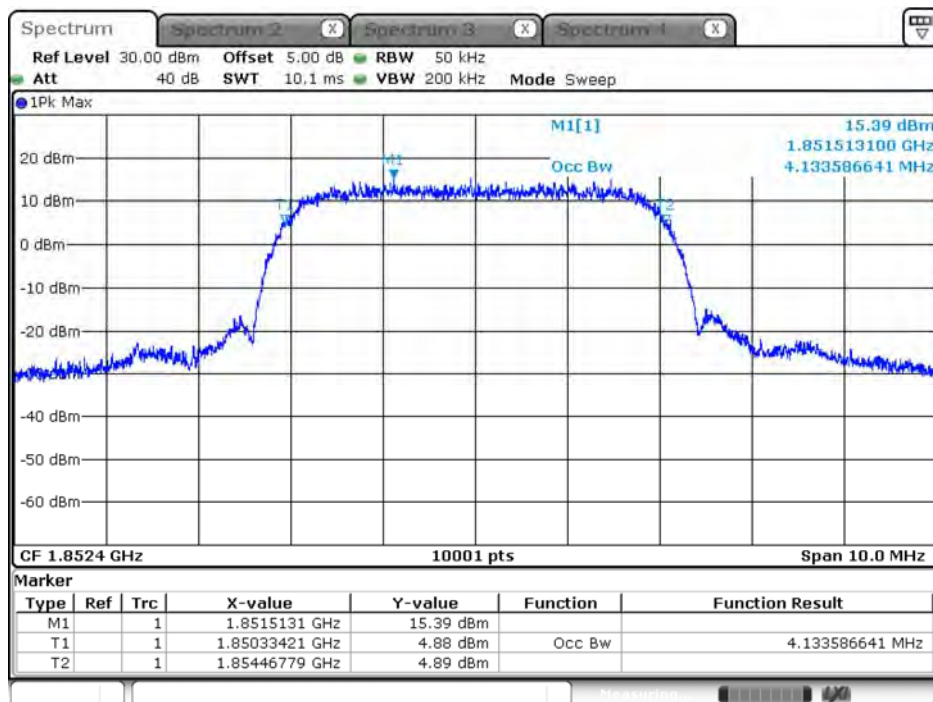
Date: 2.APR.2019 20:29:31

WCDMA_Band 2_HSDPA_1880.0MHz_26dB BW

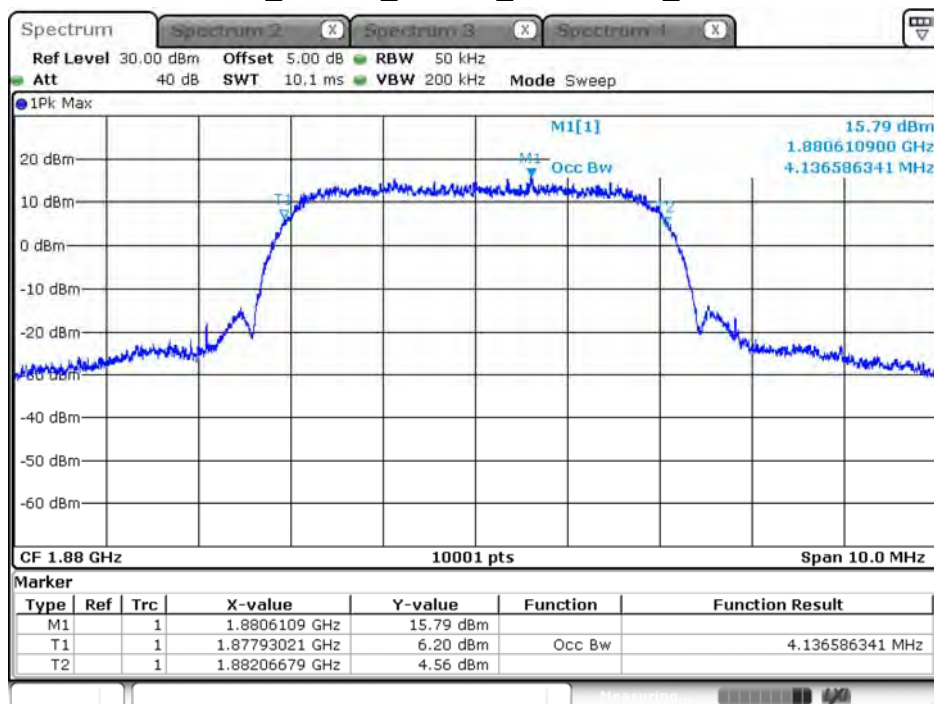
Date: 2.APR.2019 20:27:42

WCDMA_Band 2_HSDPA_1907.6MHz_26dB BW

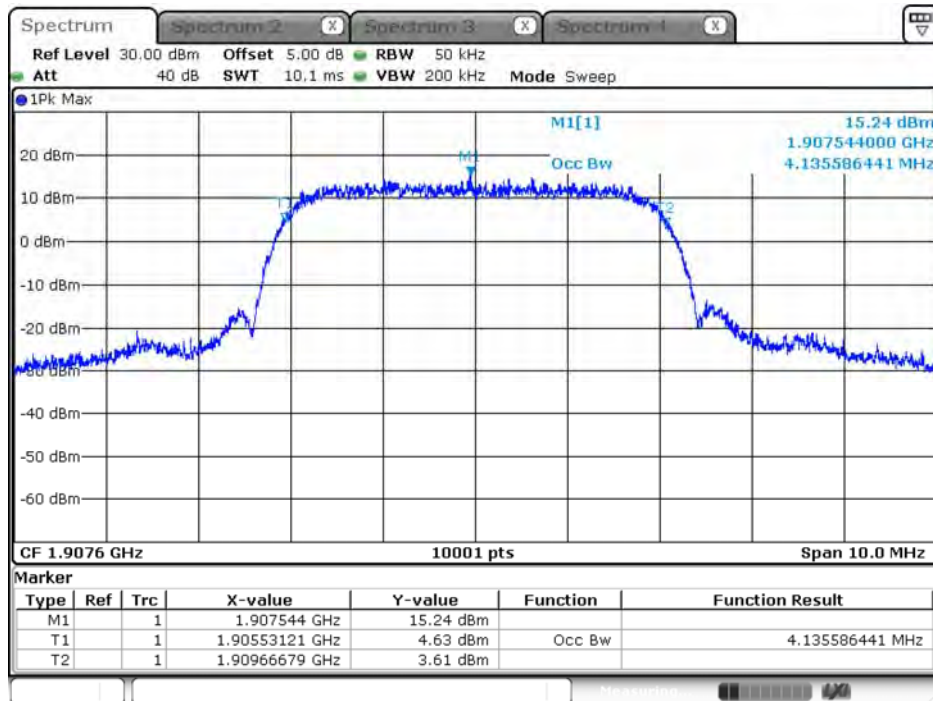
Date: 2.APR.2019 20:26:12

WCDMA_Band 2_HSDPA_1852.4MHz_99% BW

Date: 2.APR.2019 20:28:30

WCDMA_Band 2_HSDPA_1880.0MHz_99% BW

Date: 2.APR.2019 20:27:20

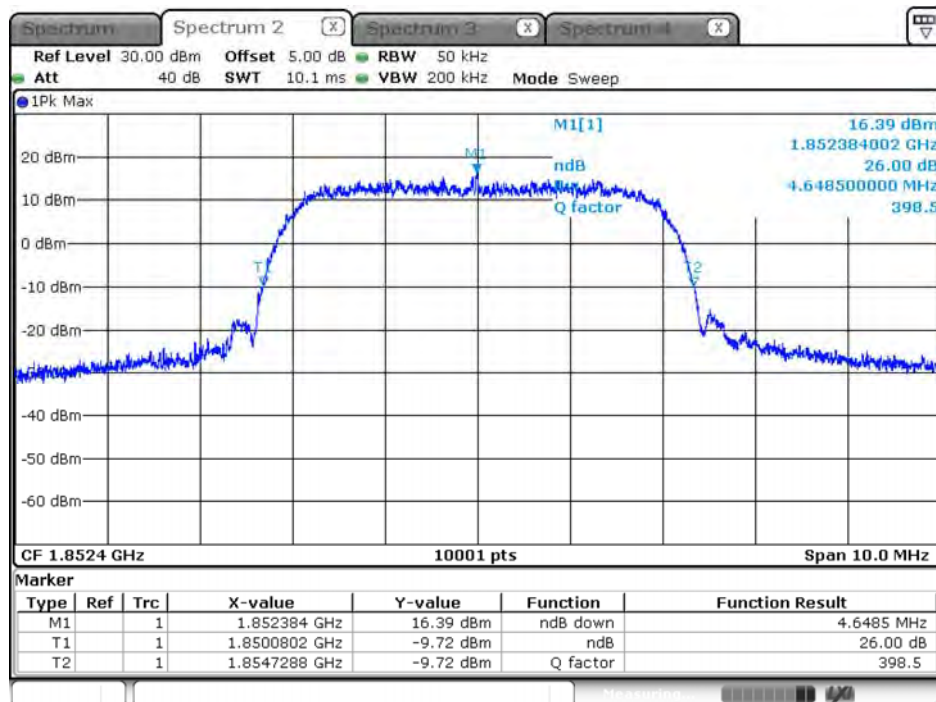
WCDMA_Band 2_HSDPA_1907.6MHz_99% BW

Date: 2.APR.2019 20:25:40

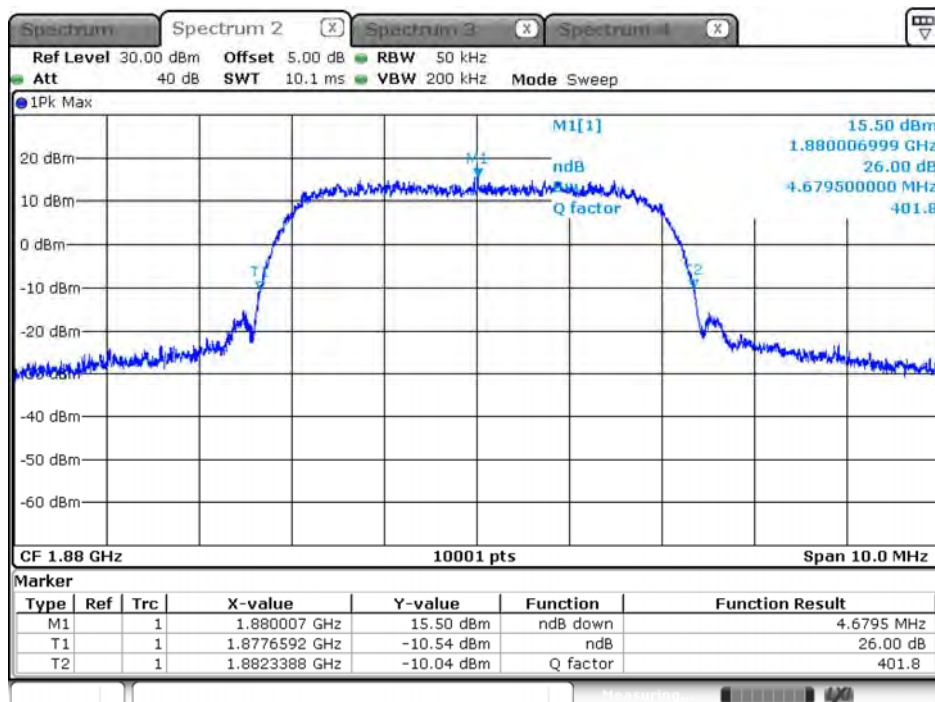
Product	Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: WCDMA_Band 2		
Date of Test	2019/04/16	Test Site	SR10-H

WCDMA_Band 2_HSUPA			
Frequency (MHz)	Measure Level (MHz)		Limit (MHz)
	26dB BW	99% BW	
1852.4	4.648	4.135	N/A
1880	4.679	4.124	N/A
1907.6	4.674	4.130	N/A

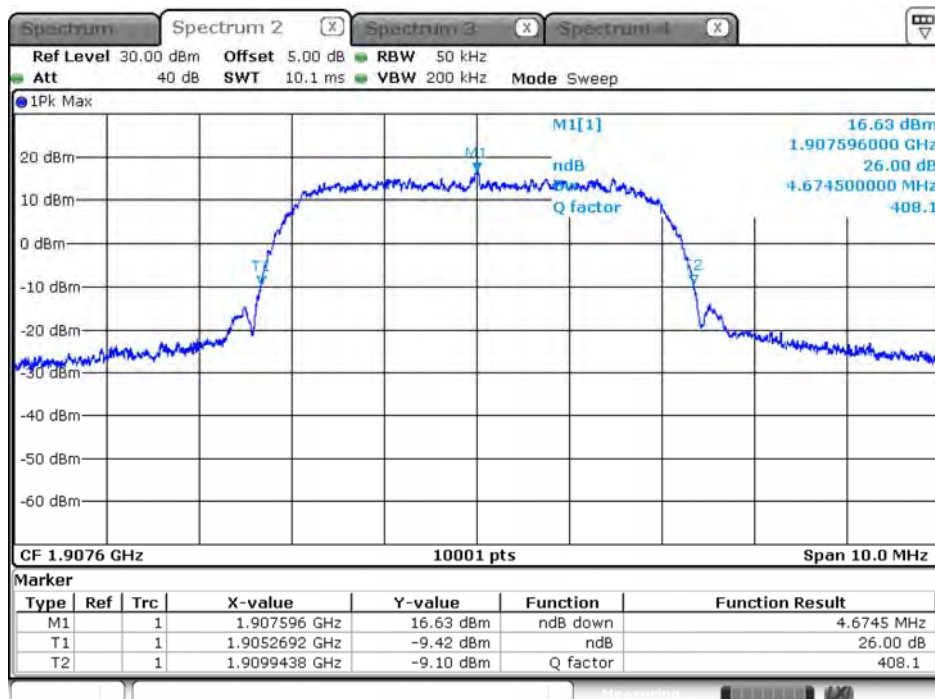
WCDMA_Band 2_HSUPA_1852.4MHz_26dB BW



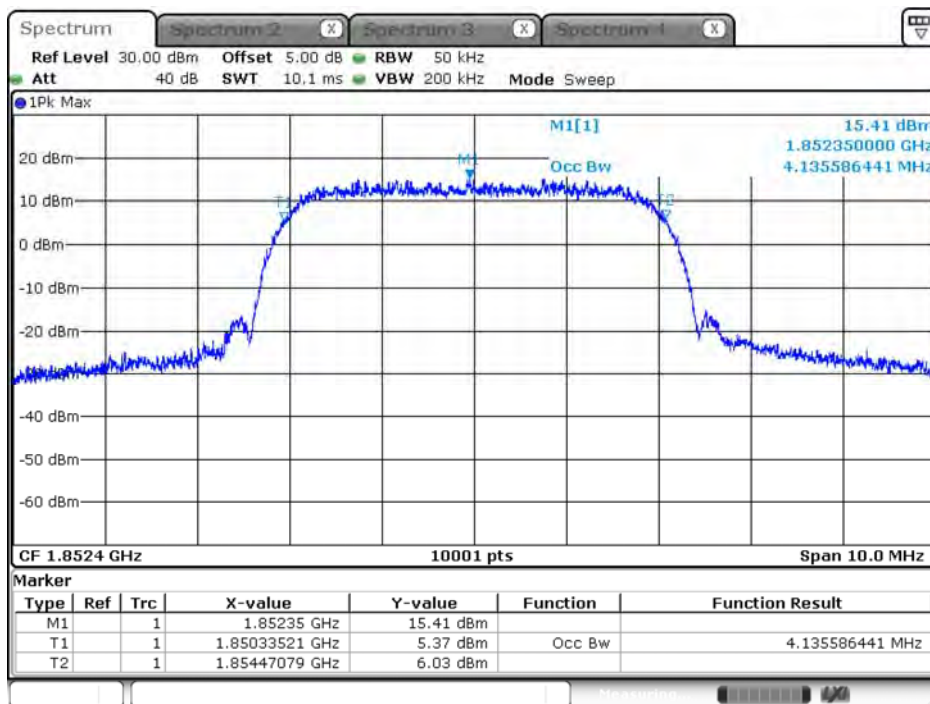
Date: 2.APR.2019 20:31:22

WCDMA_Band 2_HSUPA_1880.0MHz_26dB BW

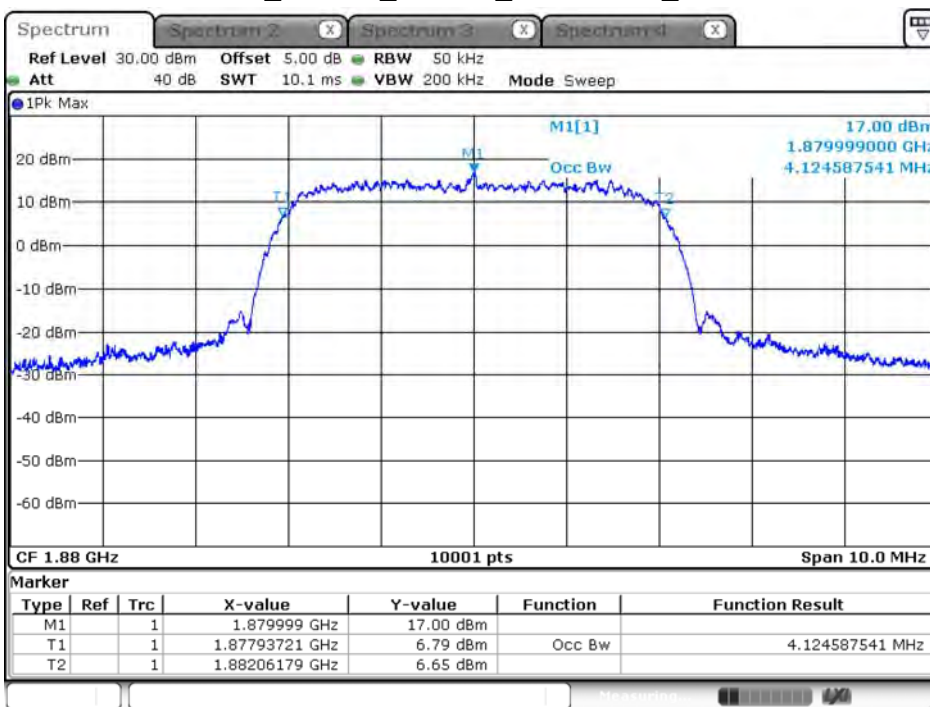
Date: 2.APR.2019 20:37:47

WCDMA_Band 2_HSUPA_1907.6MHz_26dB BW

Date: 2.APR.2019 20:41:54

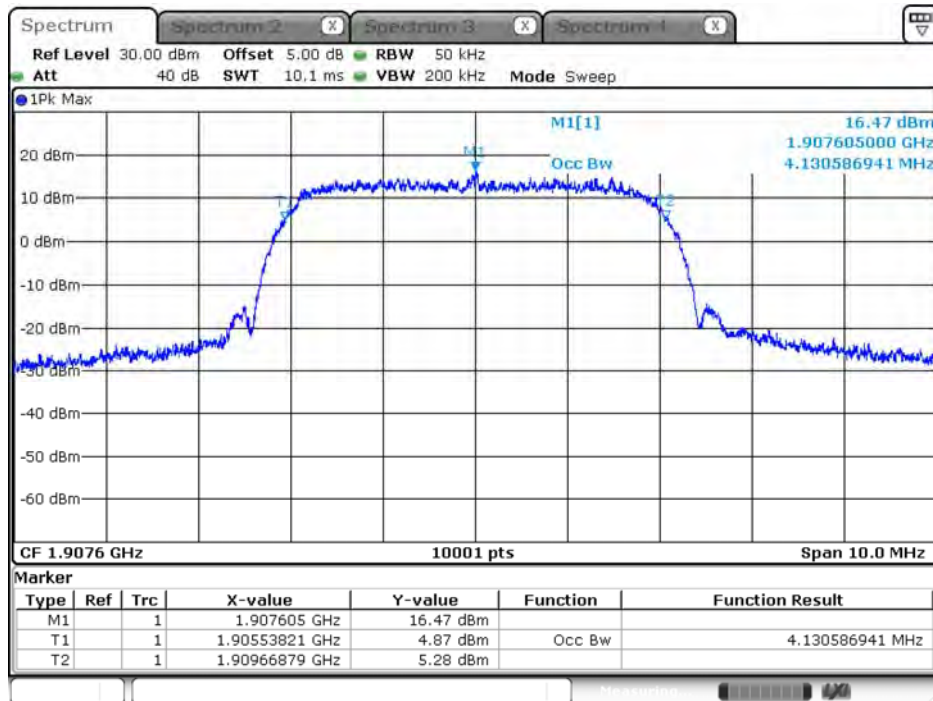
WCDMA_Band 2_HSUPA_1852.4MHz_99% BW

Date: 2.APR.2019 20:30:47

WCDMA_Band 2_HSUPA_1880.0MHz_99% BW

Date: 2.APR.2019 20:37:17

WCDMA_Band 2_HSUPA_1907.6MHz_99% BW

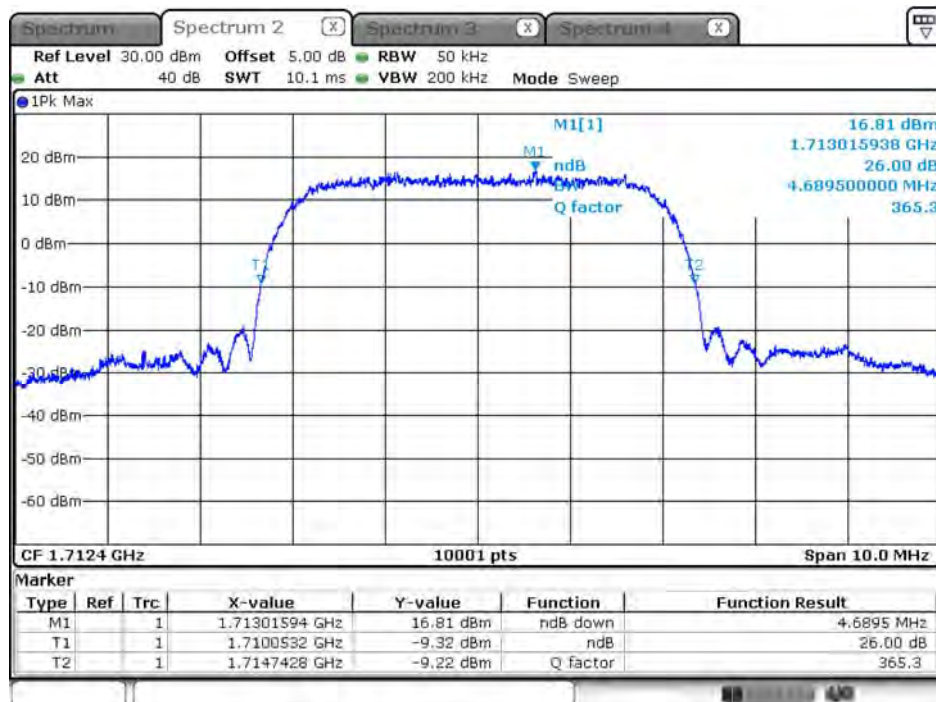


Date: 2.APR.2019 20:39:09

Product	Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 2: WCDMA_Band 4		
Date of Test	2019/04/16	Test Site	SR10-H

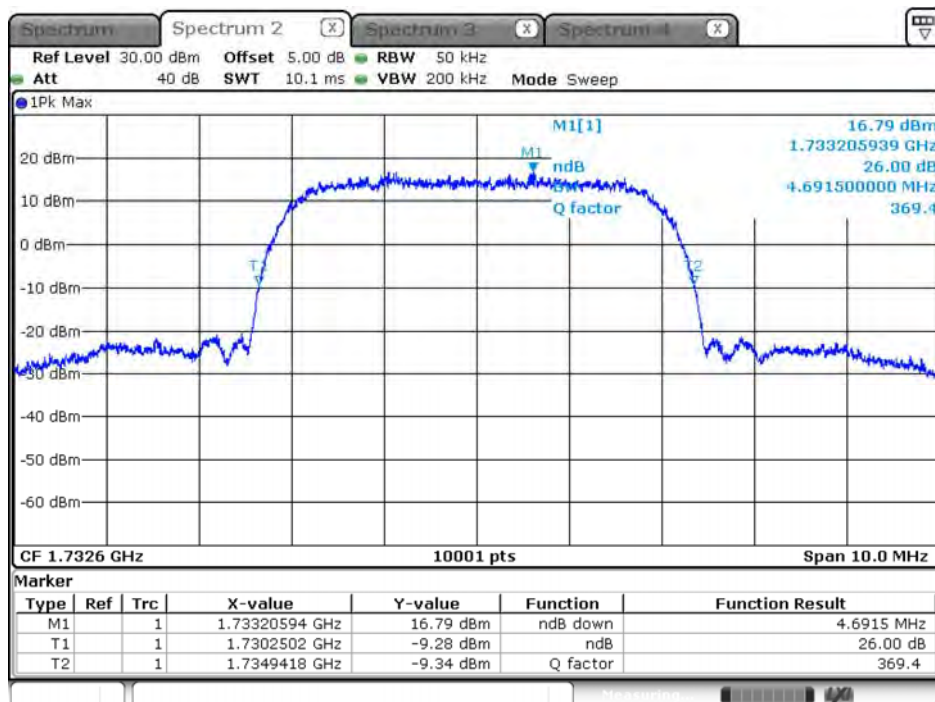
WCDMA_Band 4_RMC			
Frequency (MHz)	Measure Level (MHz)		Limit (MHz)
	26dB BW	99% BW	
1712.4	4.689	4.128	N/A
1732.6	4.691	4.127	N/A
1752.6	4.683	4.121	N/A

WCDMA_Band 4_RMC_1712.4MHz_26dB BW



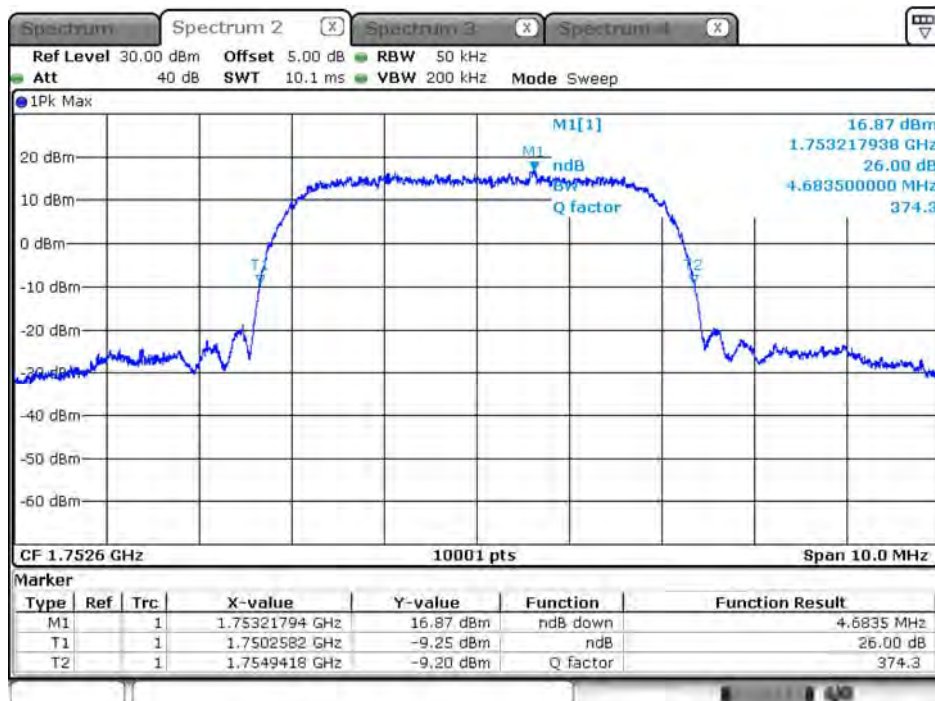
Date: 2.APR 2019 19:42:35

WCDMA_Band 4_RMC_1732.6MHz_26dB BW

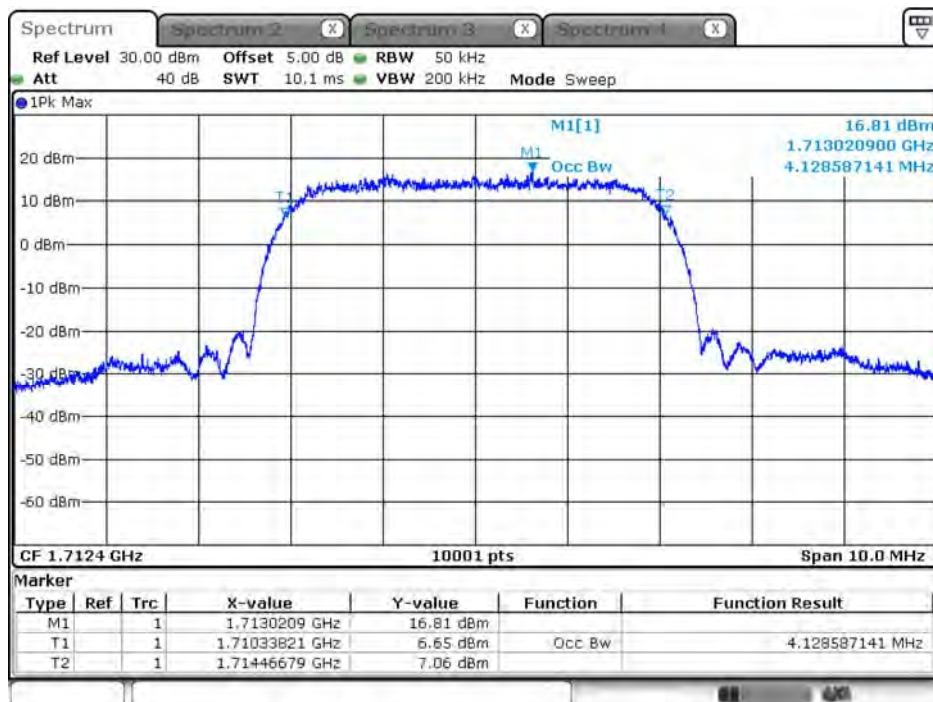


Date: 2.APR.2019 19:43:25

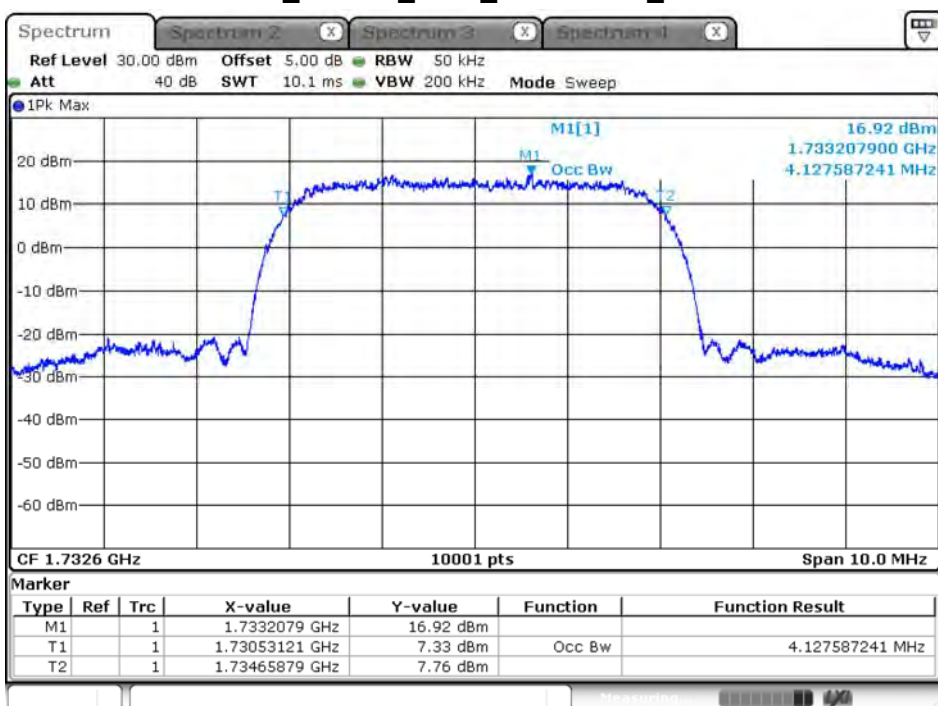
WCDMA_Band 4_RMC_1752.6MHz_26dB BW



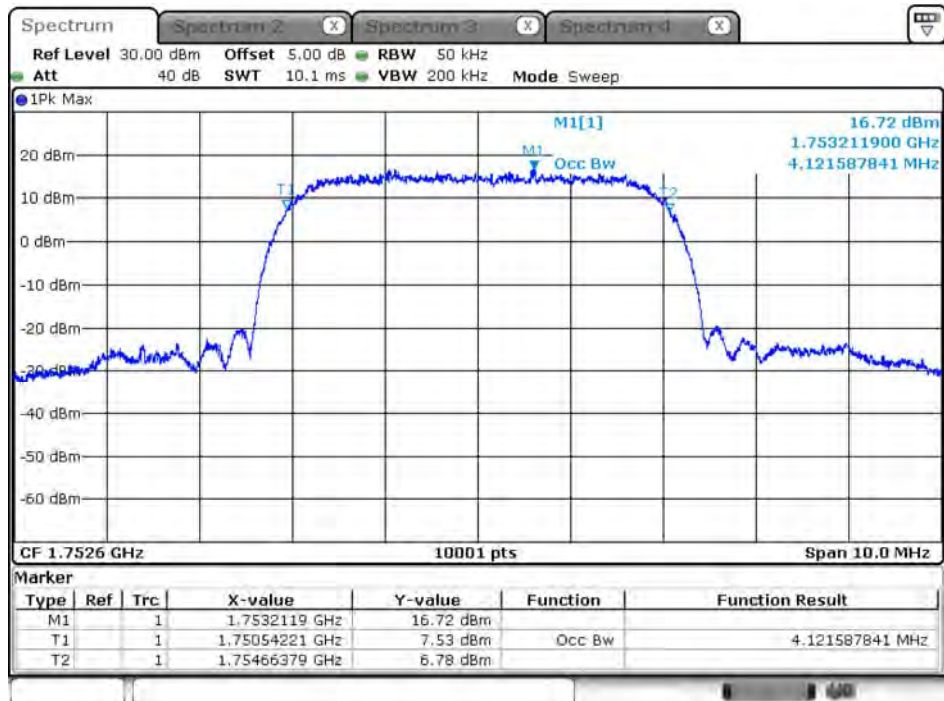
Date: 2.APR.2019 19:51:57

WCDMA_Band 4_RMC_1712.4MHz_99% BW

Date: 2.APR.2019 19:40:56

WCDMA_Band 4_RMC_1732.6MHz_99% BW

Date: 2.APR.2019 19:45:27

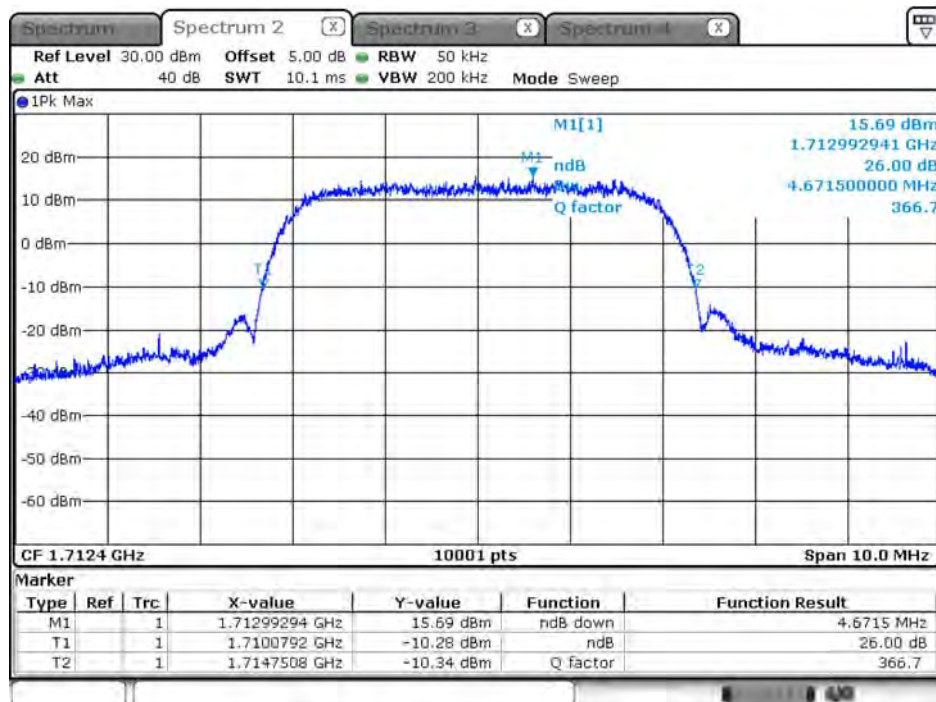
WCDMA_Band 4_RMC_1752.6MHz_99% BW

Date: 2.APR.2019 19:50:38

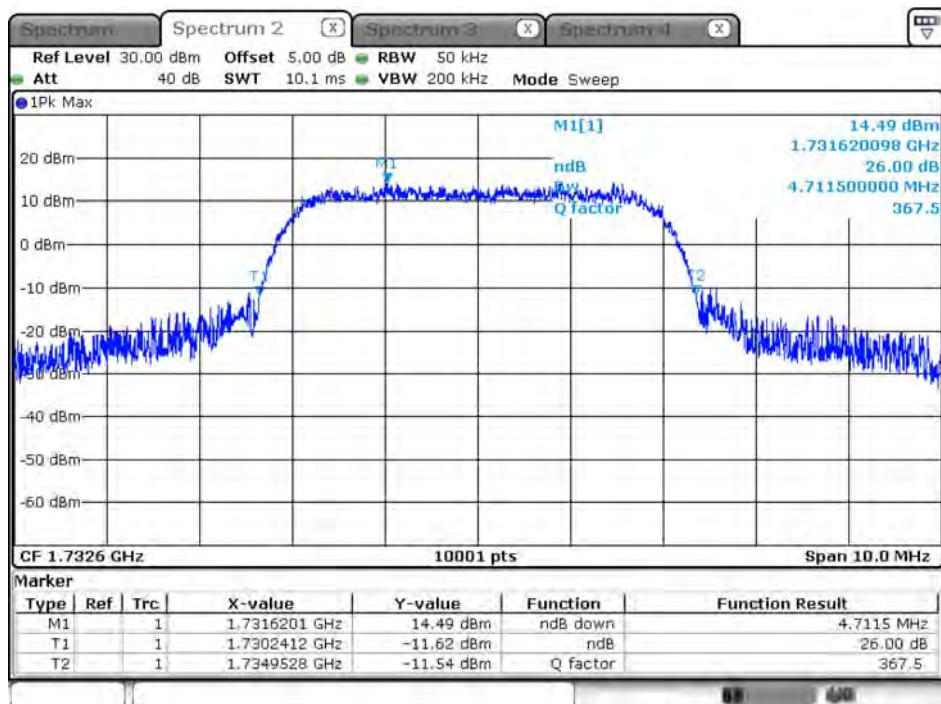
Product	Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 2: WCDMA_Band 4		
Date of Test	2019/04/16	Test Site	SR10-H

WCDMA_Band 4_ HSDPA			
Frequency (MHz)	Measure Level (MHz)		Limit (MHz)
	26dB BW	99% BW	
1712.4	4.671	4.135	N/A
1732.6	4.711	4.147	N/A
1752.6	4.661	4.128	N/A

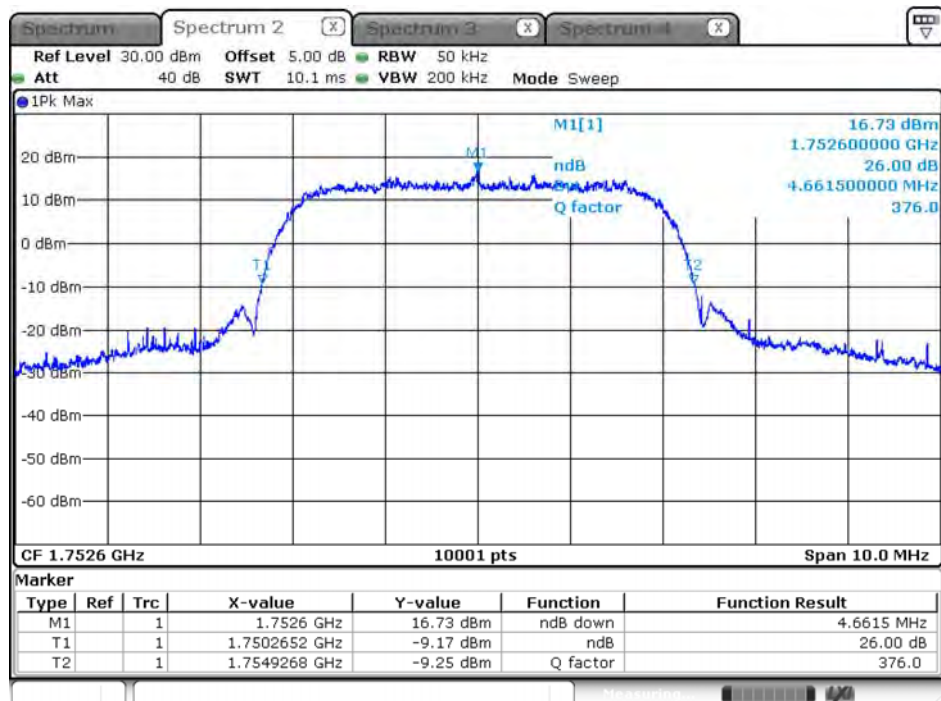
WCDMA_Band 4_HSDPA_1712.4MHz_26dB BW



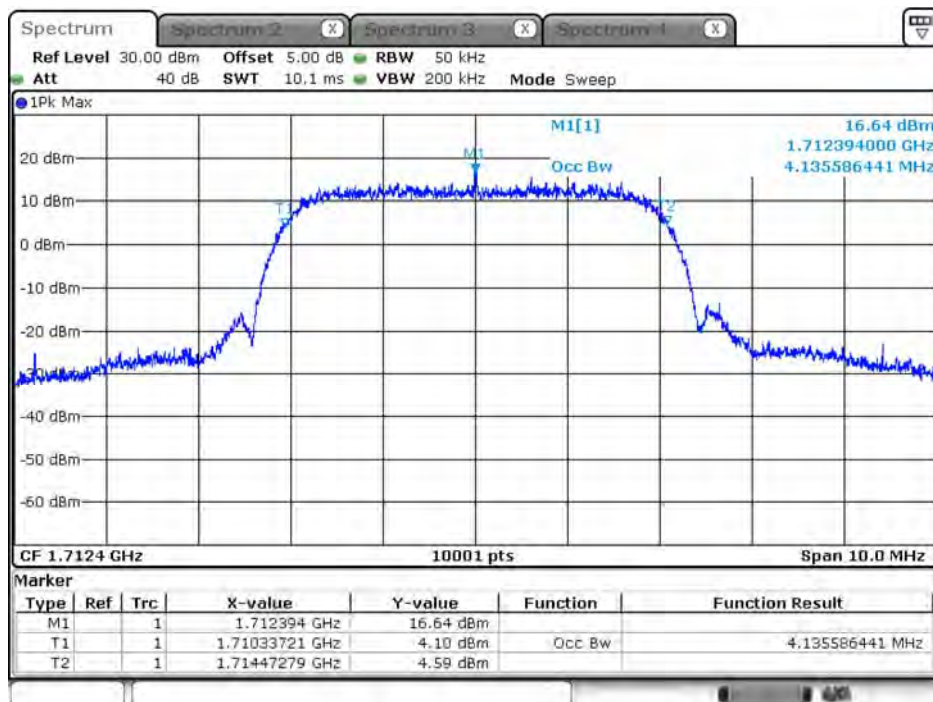
Date: 2.APR 2019 20:24:54

WCDMA_Band 4_HSDPA_1732.6MHz_26dB BW

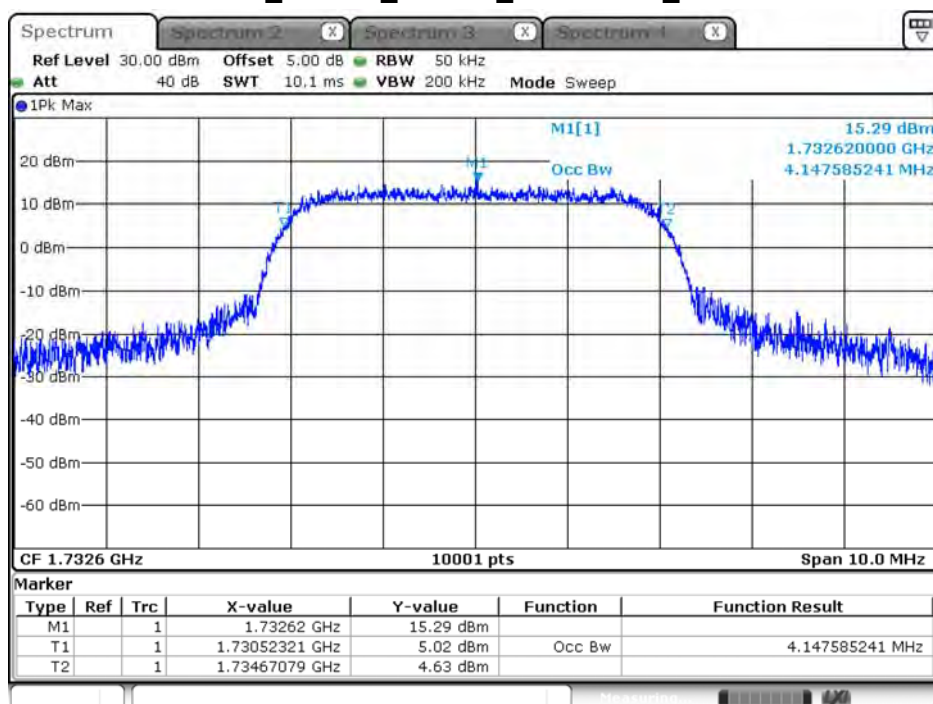
Date: 2.APR.2019 20:22:51

WCDMA_Band 4_HSDPA_1752.6MHz_26dB BW

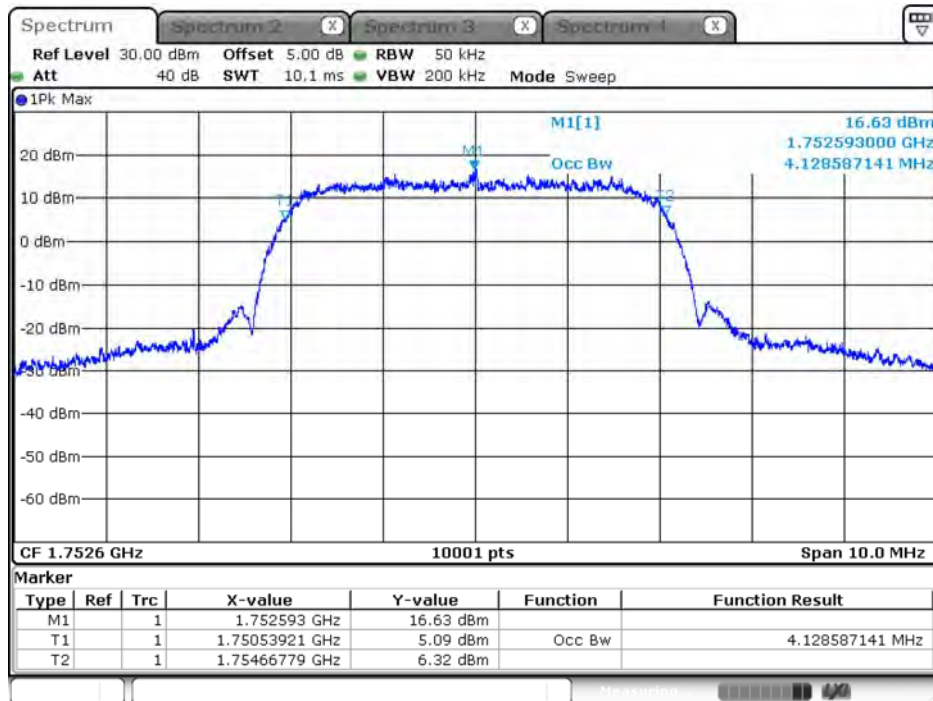
Date: 2.APR.2019 20:18:26

WCDMA_Band 4_HSDPA_1712.4MHz_99% BW

Date: 2.APR.2019 20:24:06

WCDMA_Band 4_HSDPA_1732.6MHz_99% BW

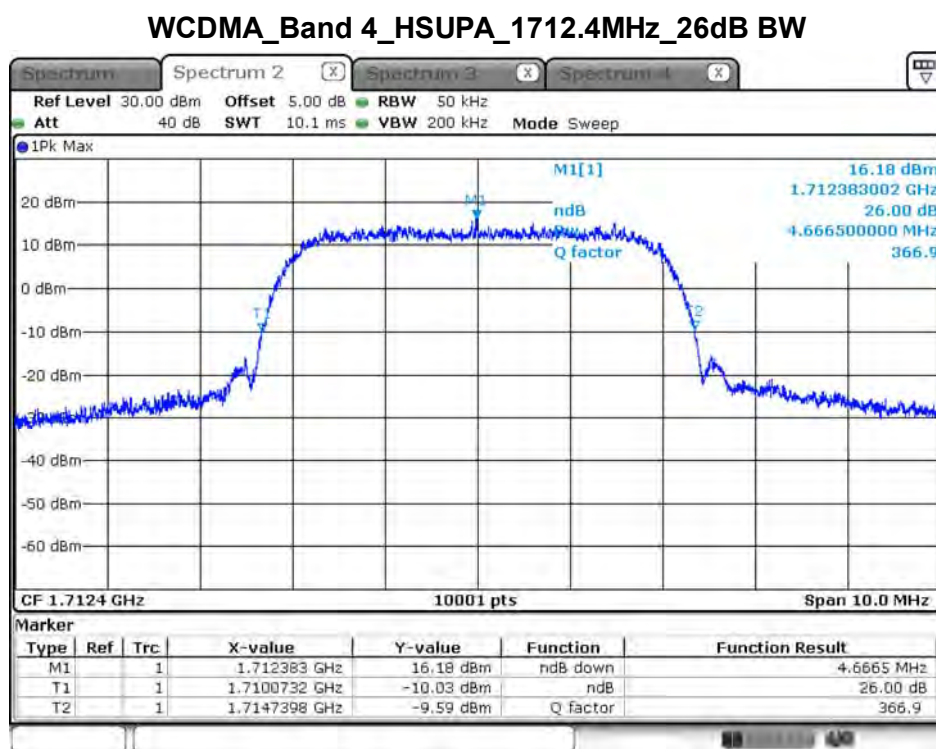
Date: 2.APR.2019 20:22:24

WCDMA_Band 4_HSDPA_1752.6MHz_99% BW

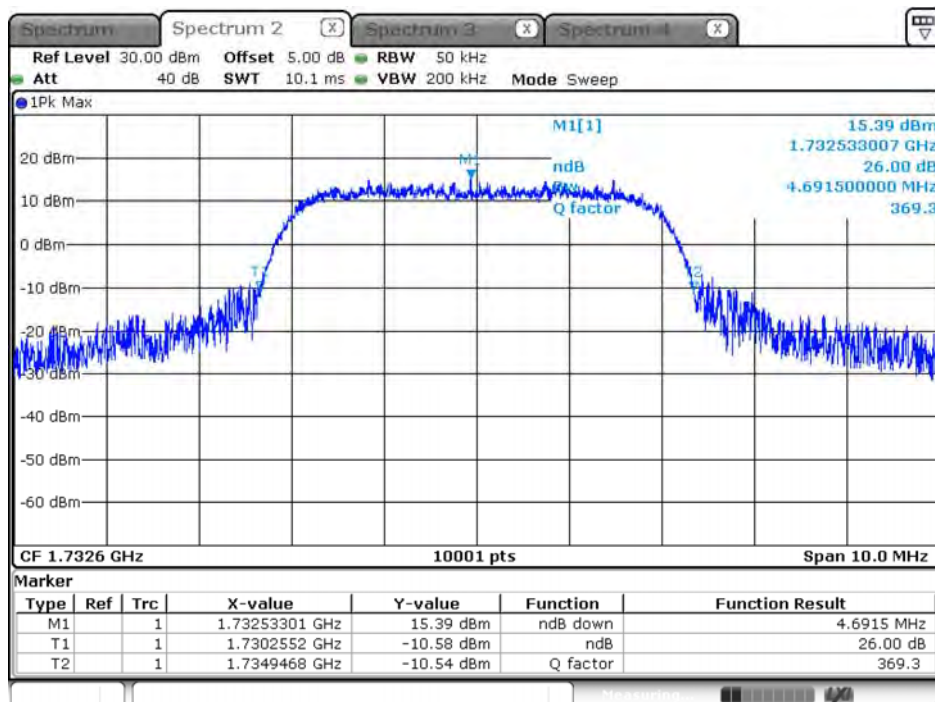
Date: 2.APR.2019 20:15:21

Product	Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 2: WCDMA _Band 4		
Date of Test	2019/04/16	Test Site	SR10-H

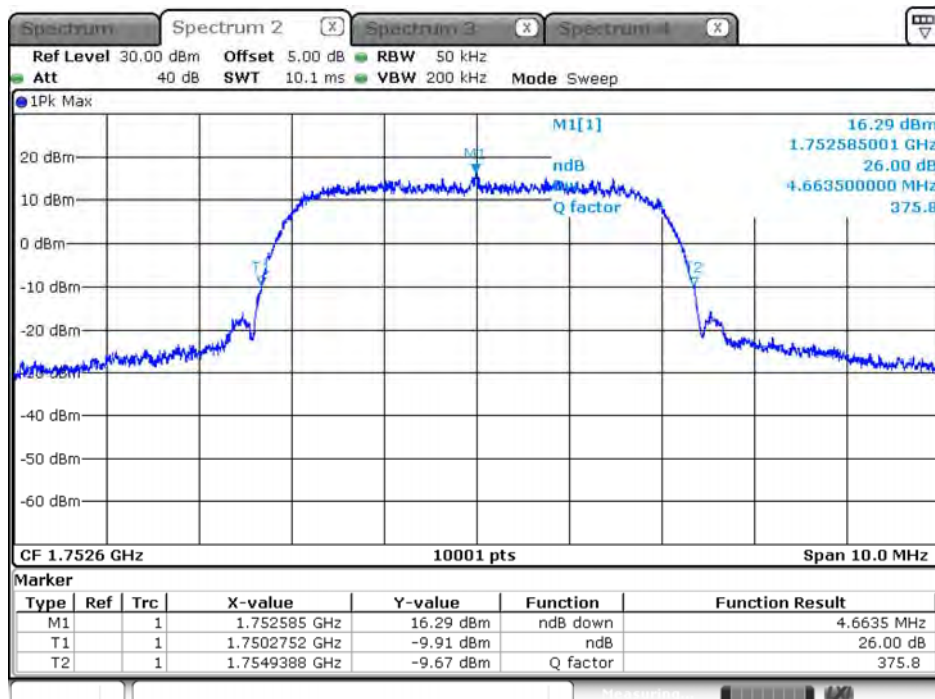
WCDMA_Band 4_HSUPA			
Frequency (MHz)	Measure Level (MHz)		Limit (MHz)
	26dB BW	99% BW	
1712.4	4.666	4.132	N/A
1732.6	4.691	4.160	N/A
1752.6	4.663	4.122	N/A



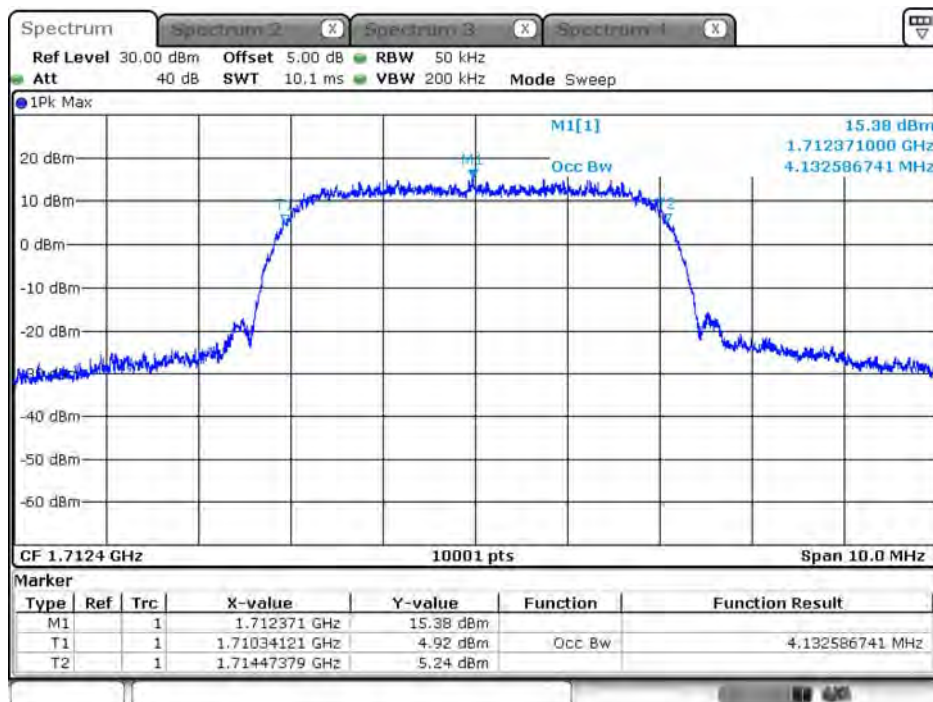
Date: 2 APR 2019 20:43:30

WCDMA_Band 4_HSUPA_1732.6MHz_26dB BW

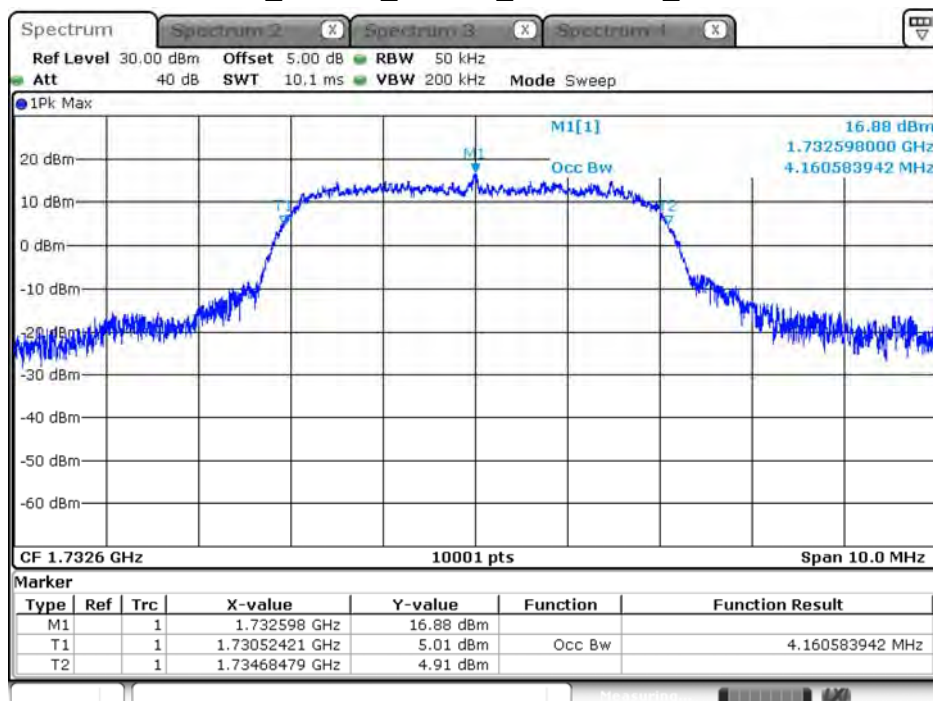
Date: 2.APR.2019 20:47:12

WCDMA_Band 4_HSUPA_1752.6MHz_26dB BW

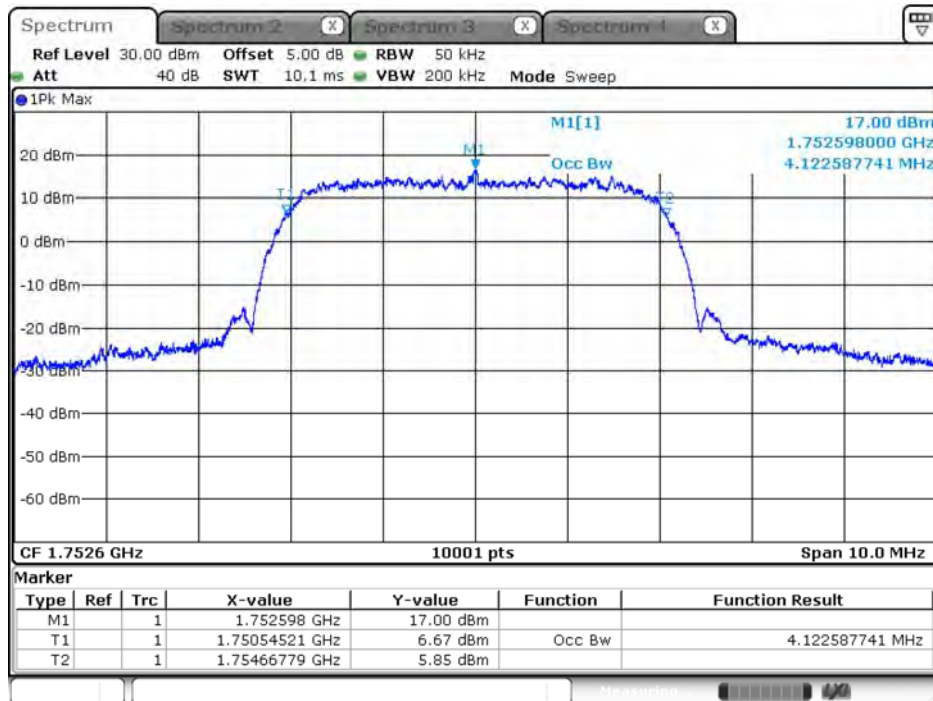
Date: 2.APR.2019 20:51:43

WCDMA_Band 4_HSUPA_1712.4MHz_99% BW

Date: 2.APR.2019 20:42:48

WCDMA_Band 4_HSUPA_1732.6MHz_99% BW

Date: 2.APR.2019 20:46:45

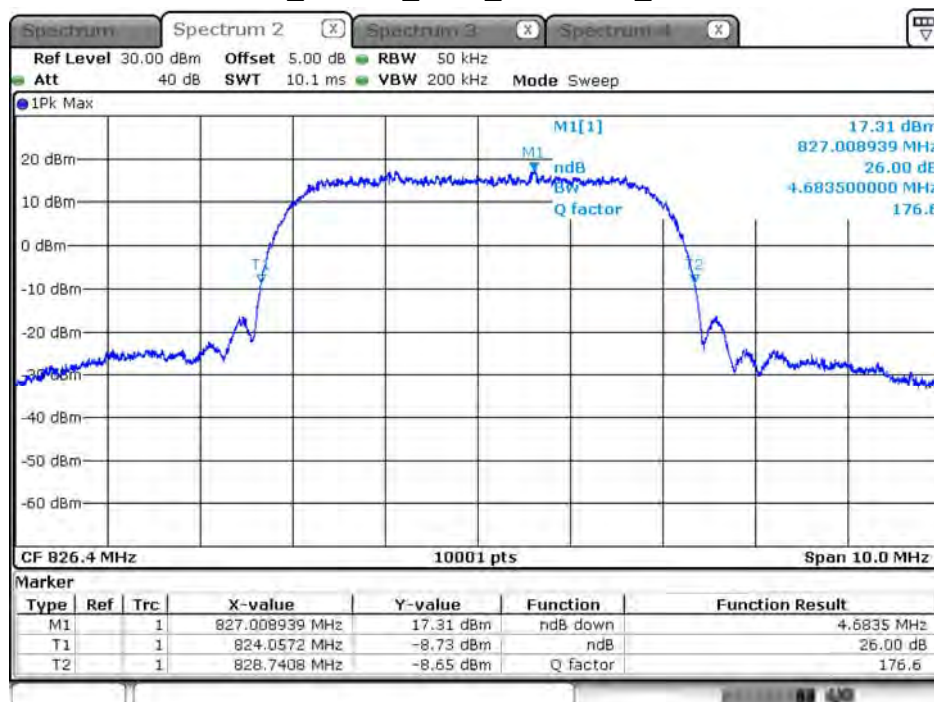
WCDMA_Band 4_HSUPA_1752.6MHz_99% BW

Date: 2.APR.2019 20:50:59

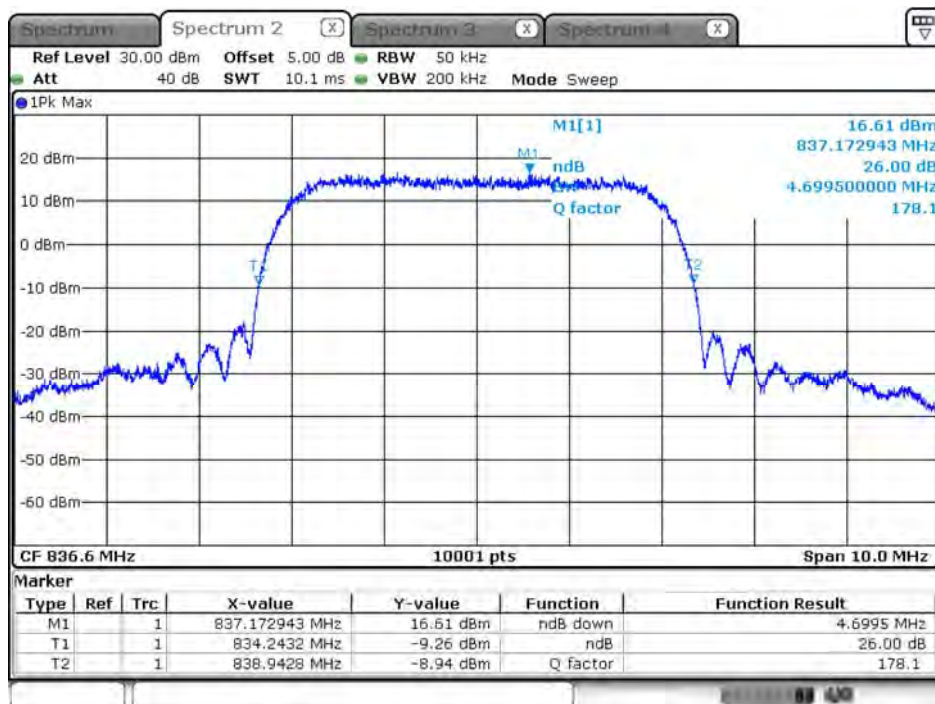
Product	Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 3: WCDMA_Band 5		
Date of Test	2019/04/16	Test Site	SR10-H

WCDMA_Band 5_RMC			
Frequency (MHz)	Measure Level (MHz)		Limit (MHz)
	26dB BW	99% BW	
826.4	4.683	4.128	N/A
836.6	4.699	4.149	N/A
846.6	4.691	4.149	N/A

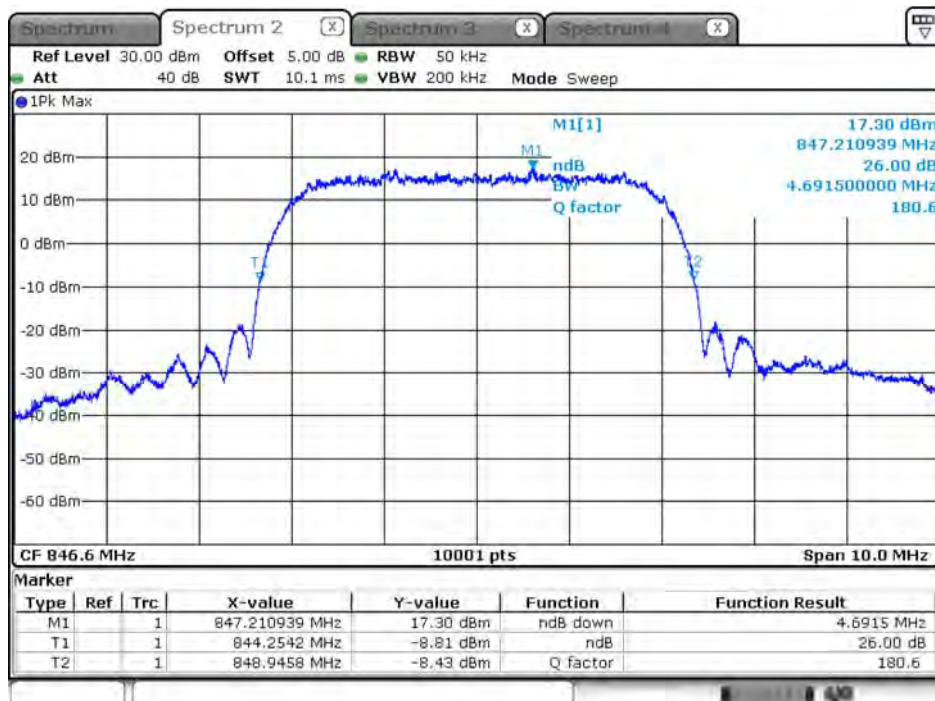
WCDMA_Band 5_RMC_826.4MHz_26dB BW



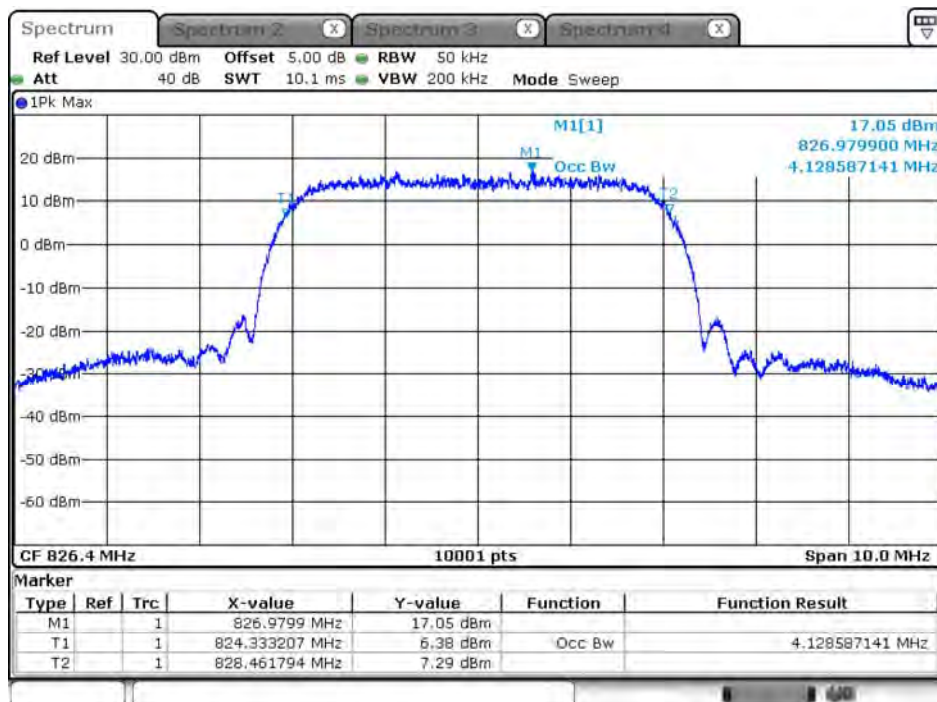
Date: 2.APR 2019 19:57:16

WCDMA_Band 5_RMC_836.6MHz_26dB BW

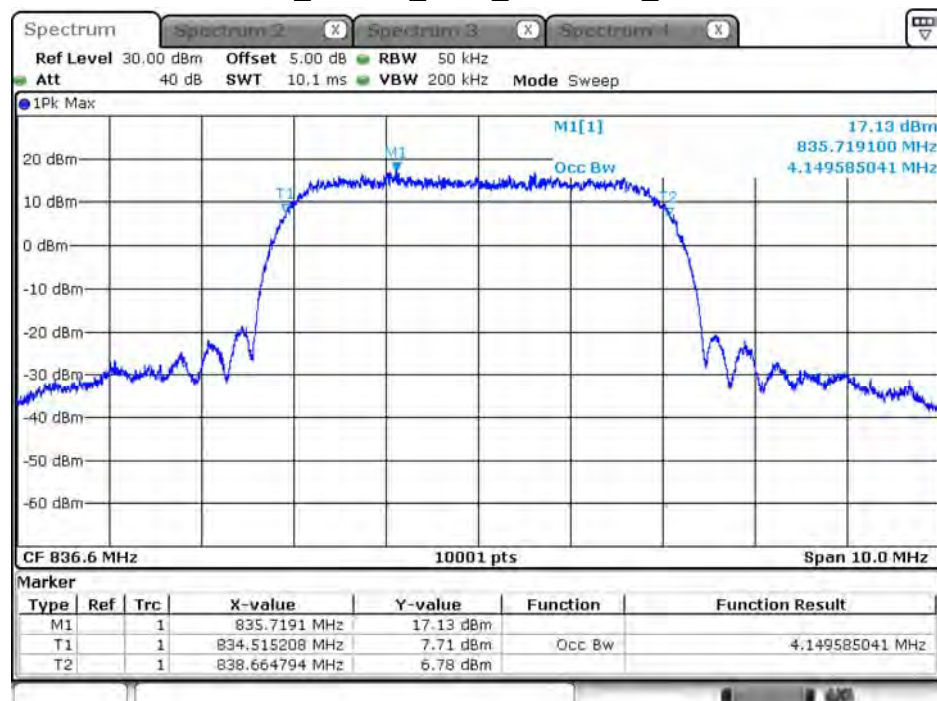
Date: 2.APR.2019 19:59:31

WCDMA_Band 5_RMC_846.6MHz_26dB BW

Date: 2.APR.2019 20:02:47

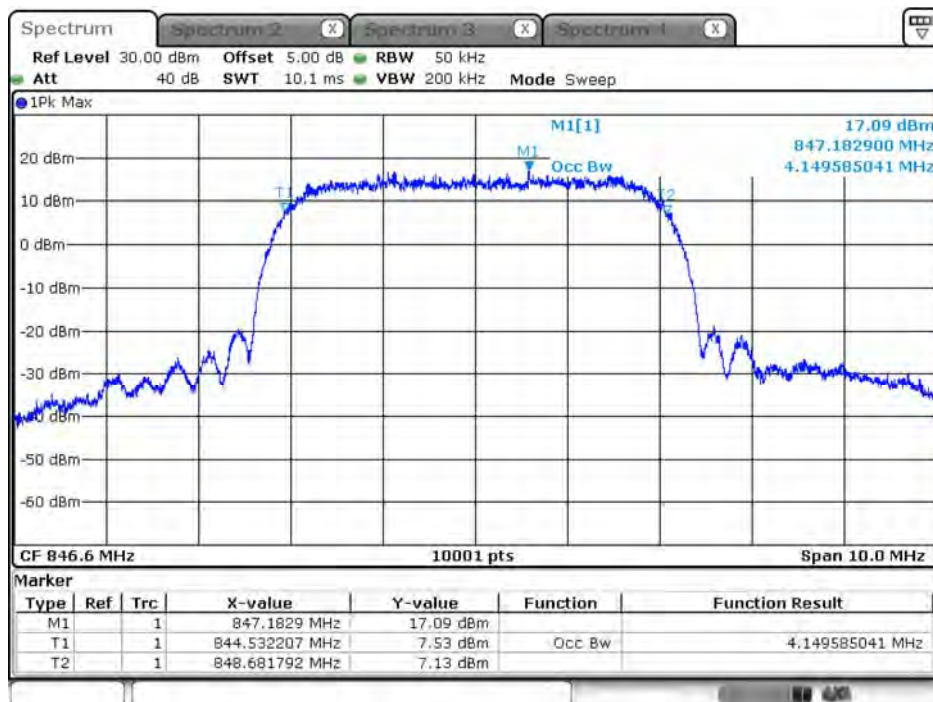
WCDMA_Band 5_RMC_826.4MHz_99% BW

Date: 2.APR.2019 19:55:35

WCDMA_Band 5_RMC_836.6MHz_99% BW

Date: 2.APR.2019 19:58:06

WCDMA_Band 5_RMC_846.6MHz_99% BW

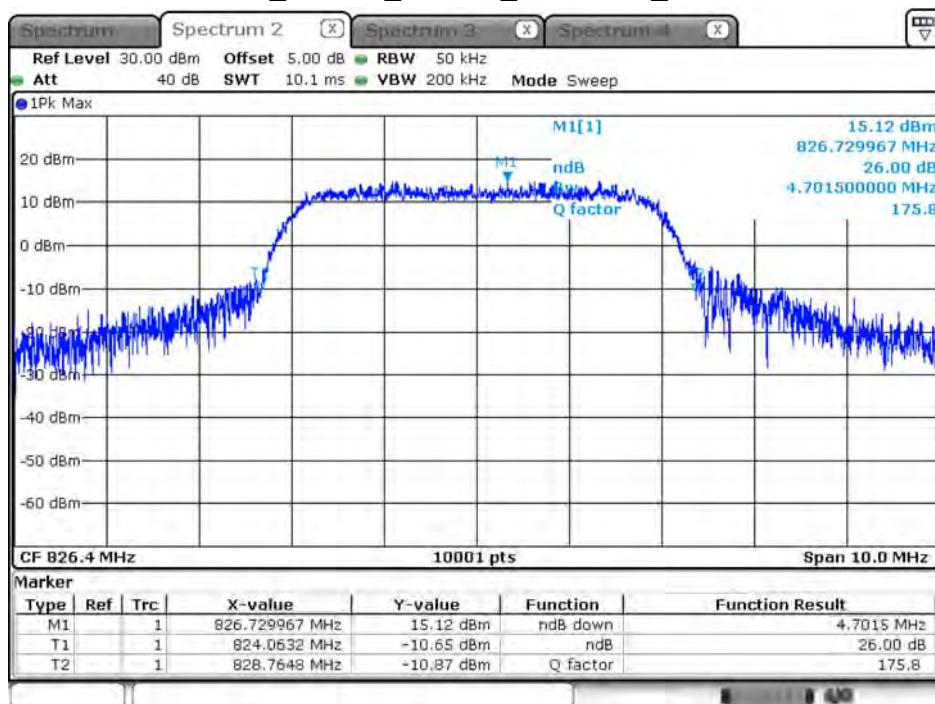


Date: 2 APR 2019 20:01:01

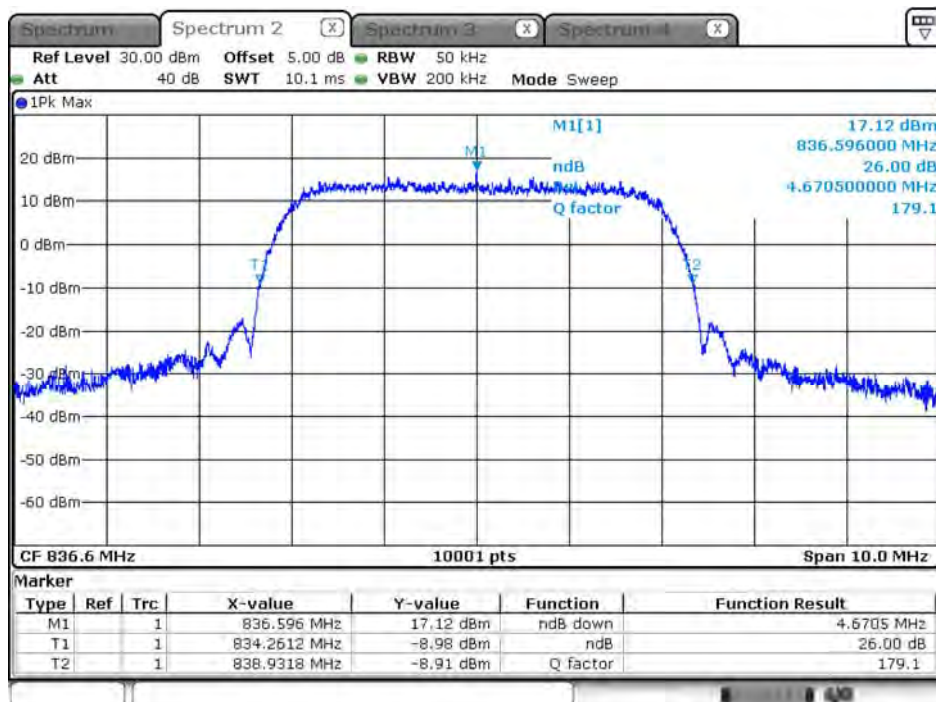
Product	Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 3: WCDMA_Band 5		
Date of Test	2019/04/16	Test Site	SR10-H

WCDMA_Band 5_HSDPA			
Frequency (MHz)	Measure Level (MHz)		Limit (MHz)
	26dB BW	99% BW	
826.4	4.701	4.217	N/A
836.6	4.670	4.157	N/A
846.6	4.682	4.142	N/A

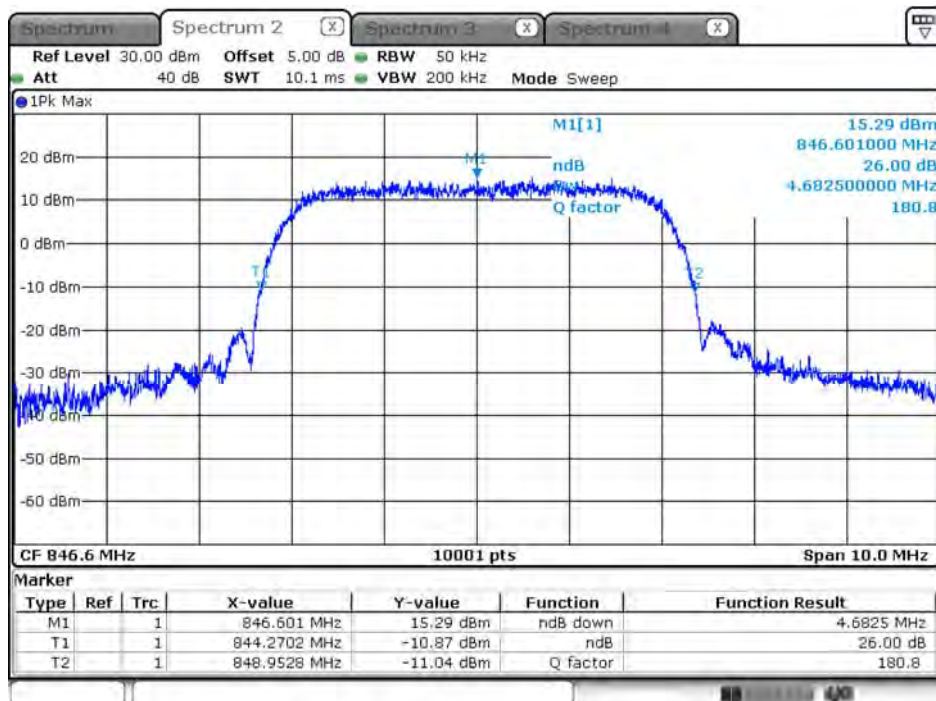
WCDMA_Band 5_HSDPA_826.4MHz_26dB BW



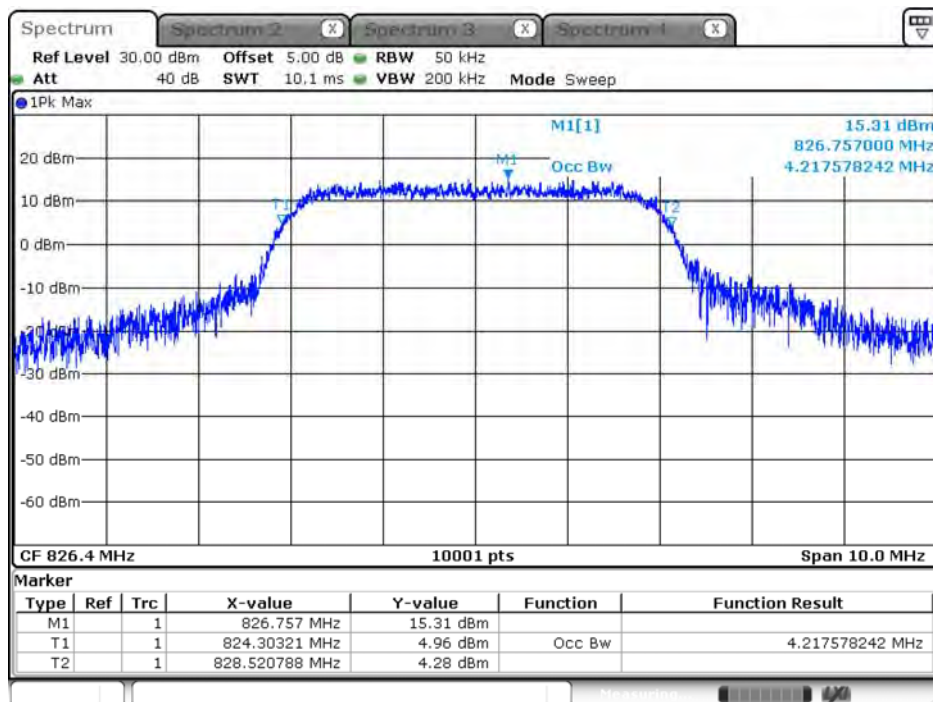
Date: 2.APR 2019 20:12:54

WCDMA_Band 5_HSDPA_836.6MHz_26dB BW

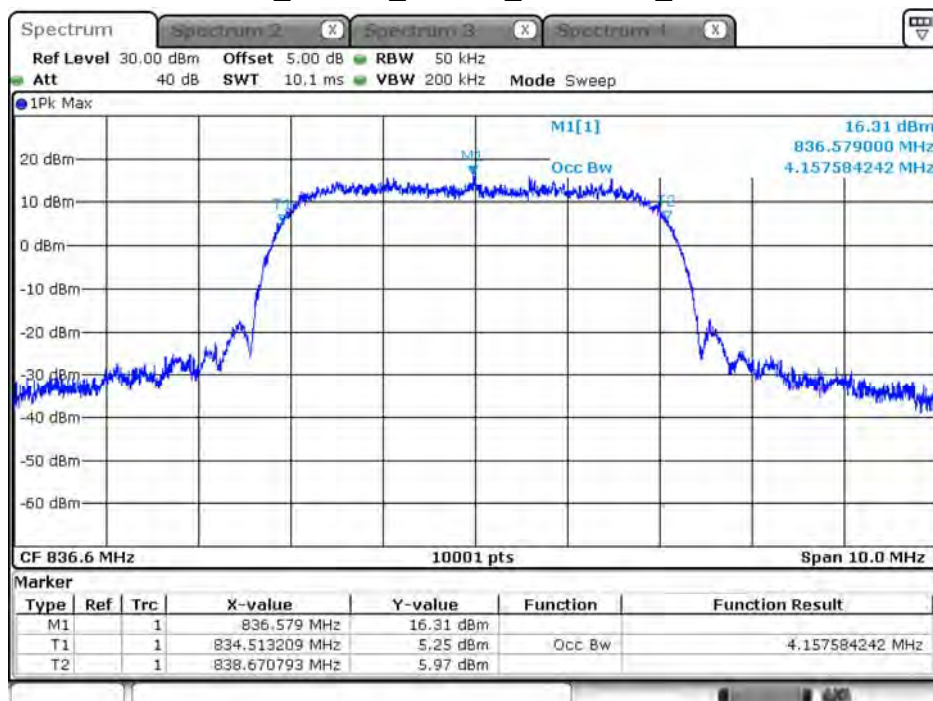
Date: 2.APR.2019 20:07:55

WCDMA_Band 5_HSDPA_846.6MHz_26dB BW

Date: 2.APR.2019 20:05:41

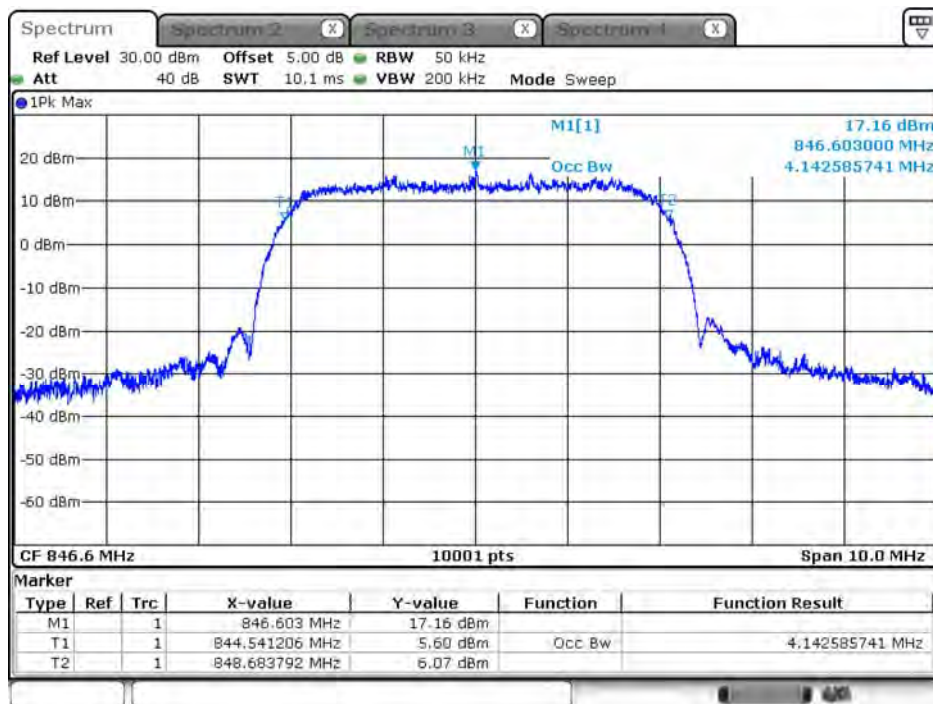
WCDMA_Band 5_HSDPA_826.4MHz_99% BW

Date: 2.APR.2019 20:12:31

WCDMA_Band 5_HSDPA_836.6MHz_99% BW

Date: 2.APR.2019 20:06:57

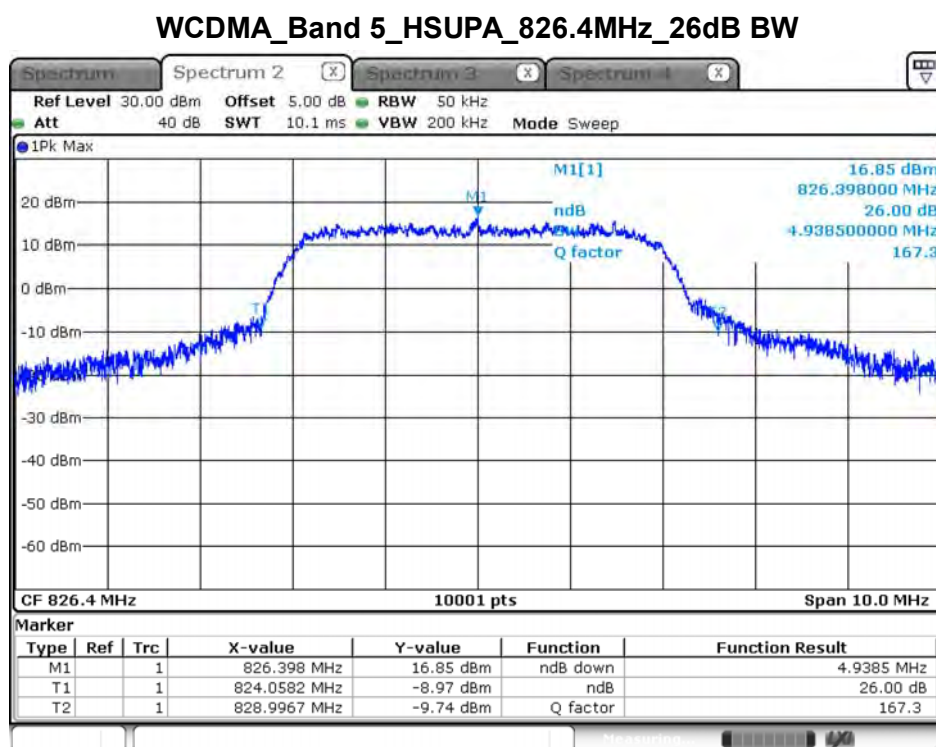
WCDMA_Band 5_HSDPA_846.6MHz_99% BW



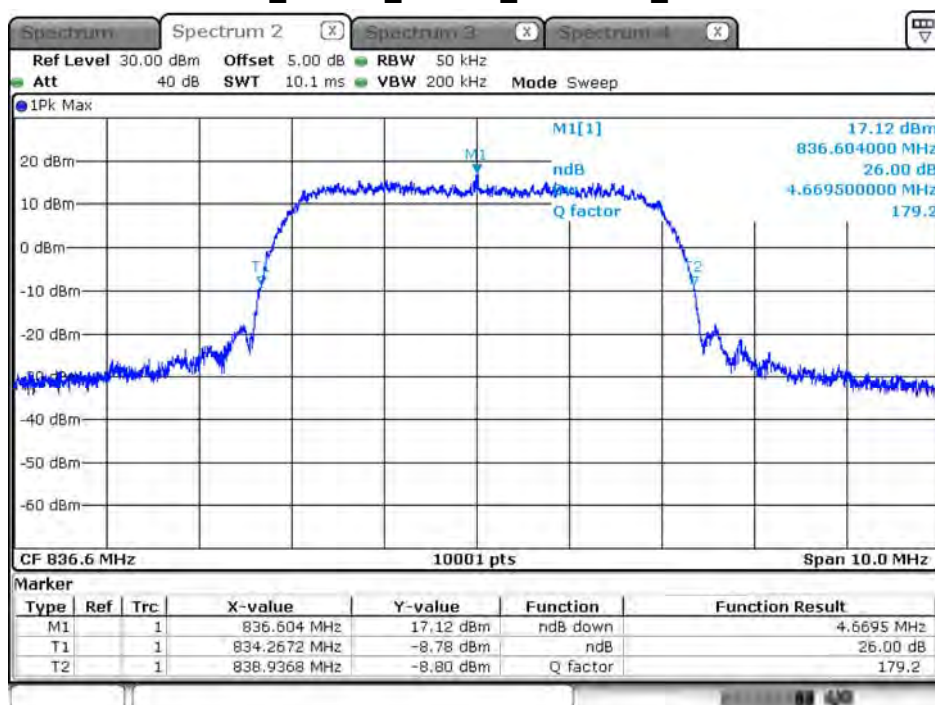
Date: 2 APR 2019 20:05:05

Product	Module		
Test Item	Occupied Bandwidth		
Test Mode	Mode 3: WCDMA_Band 5		
Date of Test	2019/04/16	Test Site	SR10-H

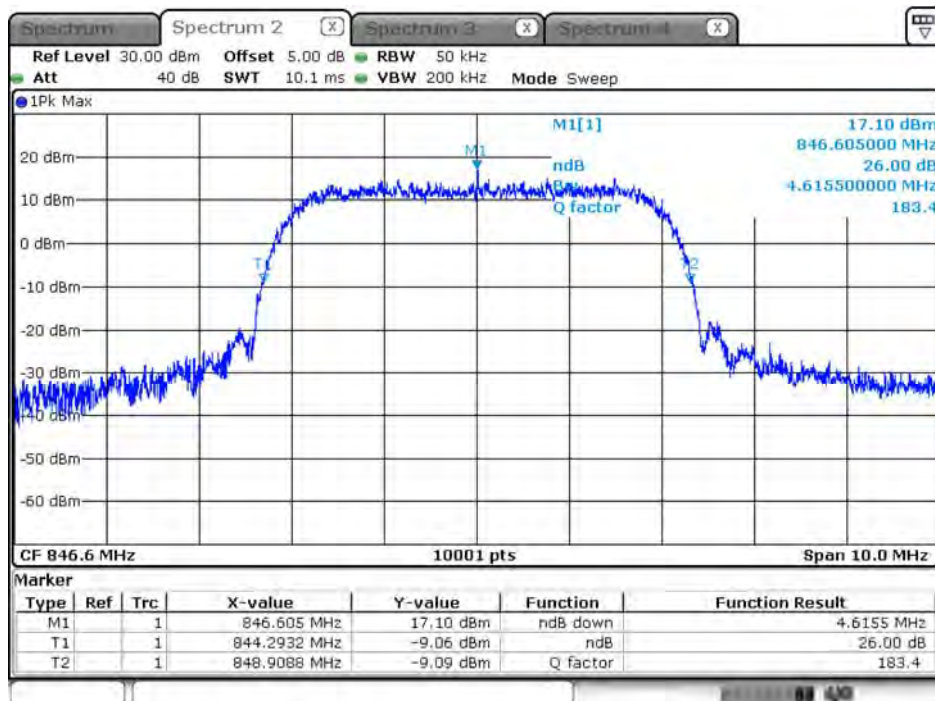
WCDMA_Band 5_HSUPA			
Frequency (MHz)	Measure Level (MHz)		Limit (MHz)
	26dB BW	99% BW	
826.4	4.938	4.249	N/A
836.6	4.669	4.143	N/A
846.6	4.615	4.132	N/A



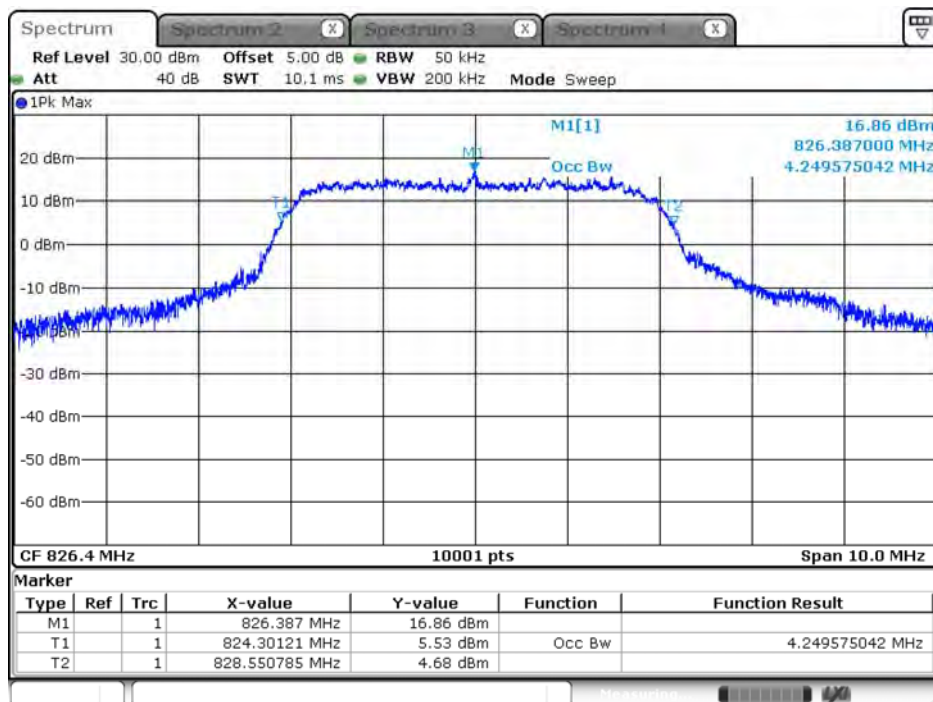
Date: 2.APR.2019 21:02:10

WCDMA_Band 5_HSUPA_836.6MHz_26dB BW

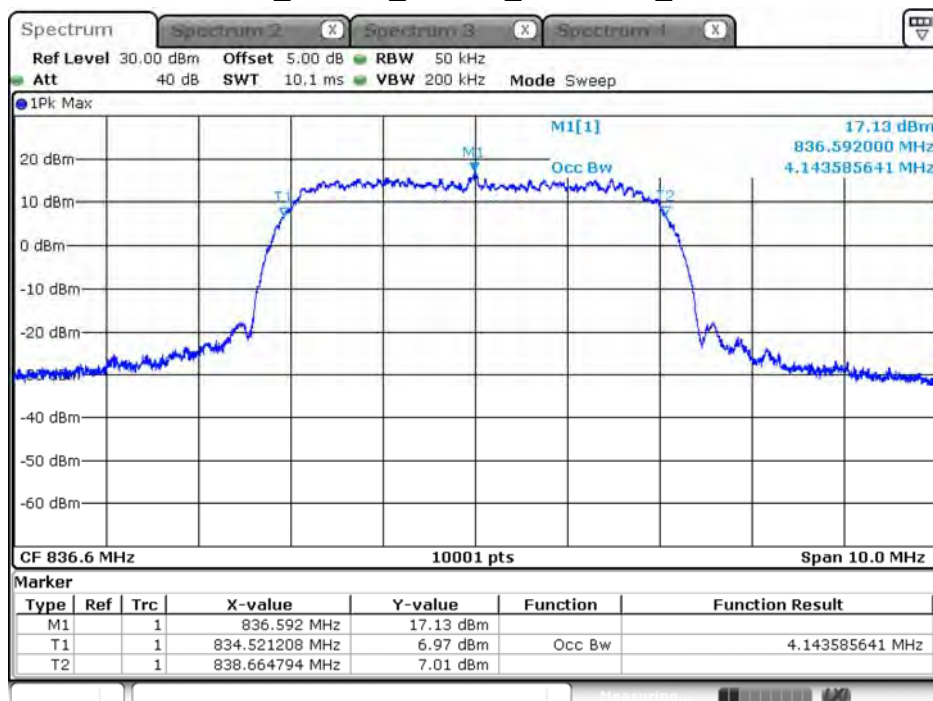
Date: 2.APR.2019 21:10:55

WCDMA_Band 5_HSUPA_846.6MHz_26dB BW

Date: 2.APR.2019 21:13:26

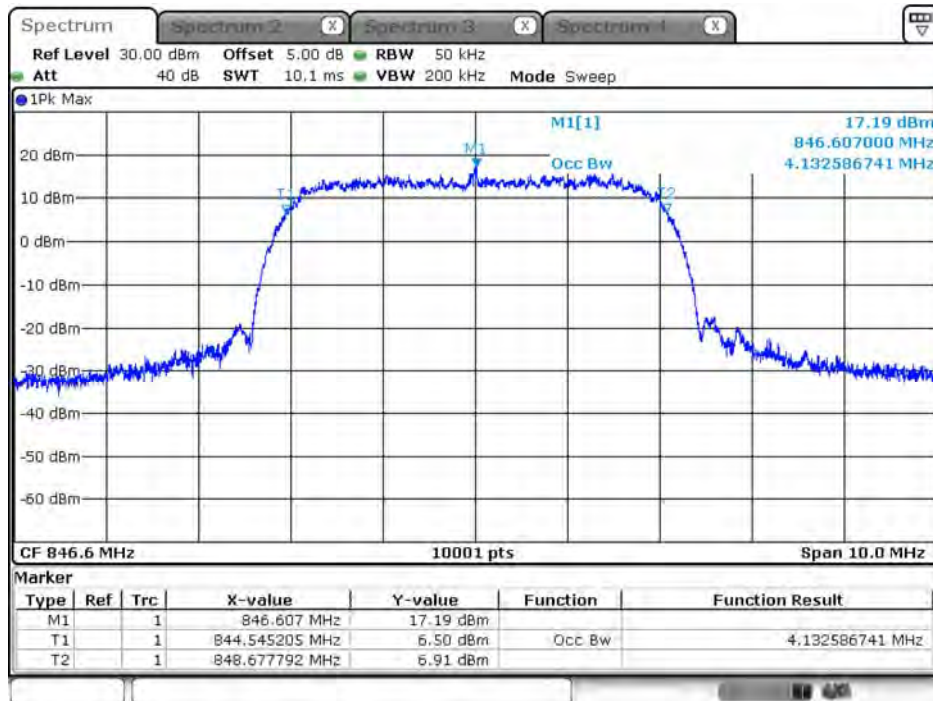
WCDMA_Band 5_HSUPA_826.4MHz_99% BW

Date: 2.APR.2019 20:57:18

WCDMA_Band 5_HSUPA_836.6MHz_99% BW

Date: 2.APR.2019 21:08:55

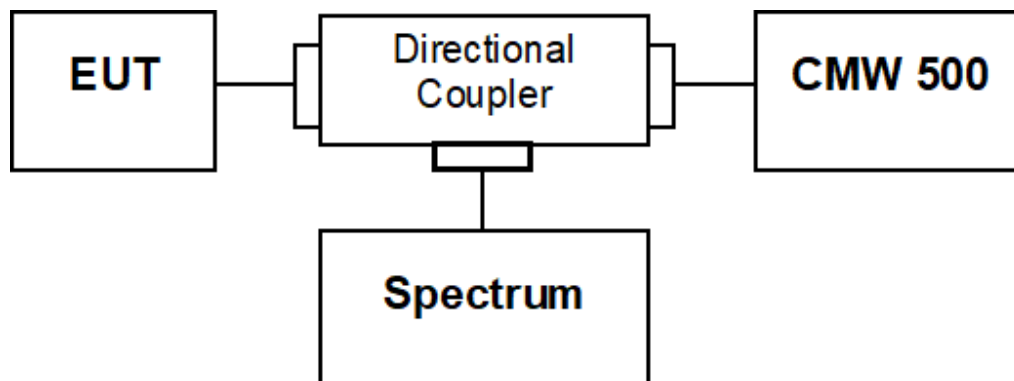
WCDMA_Band 5_HSUPA_846.6MHz_99% BW



Date: 2 APR 2019 21:13:12

5. Peak To Average Ratio

5.1. Test Setup



5.2. Test Procedure

1. Set resolution/measurement bandwidth $\geq$ signal's occupied bandwidth.
2. Set the number of counts to a value that stabilizes the measured CCDF curve.
3. Record the maximum PAPR level associated with a probability of 0.1 %.

5.3. Test Method

KDB 971168 D01 Power Meas License Digital Systems v03 sub-clause 5.7.2
ANSI C63.26-2015 Sub-clause 5.2.3.4

5.4. Test Result

Product	Module		
Test Item	Peak To Average Ratio		
Test Mode	Mode 1: WCDMA_Band 2		
Date of Test	2019/04/10	Test Site	SR10-H

Channel	Frequency (MHz)	Modulation	Peak (dBm)	Average (dBm)	PAPR (dB)
9262	1852.4	RMC	25.94	22.33	3.61
9400	1880		25.80	22.33	3.47
9538	1907.6		25.78	22.26	3.52
9262	1852.4	HSUPA	27.35	20.10	7.25
9400	1880		27.29	20.13	7.16
9538	1907.6		27.08	20.06	7.02
9262	1852.4	HSDPA	25.86	19.49	6.37
9400	1880		25.72	19.34	6.38
9538	1907.6		25.70	19.28	6.42

WCDMA_Band 2_RMC_1852.4MHz



Date: 2.APR.2019 18:34:34

WCDMA_Band 2_RMC_1880.0MHz

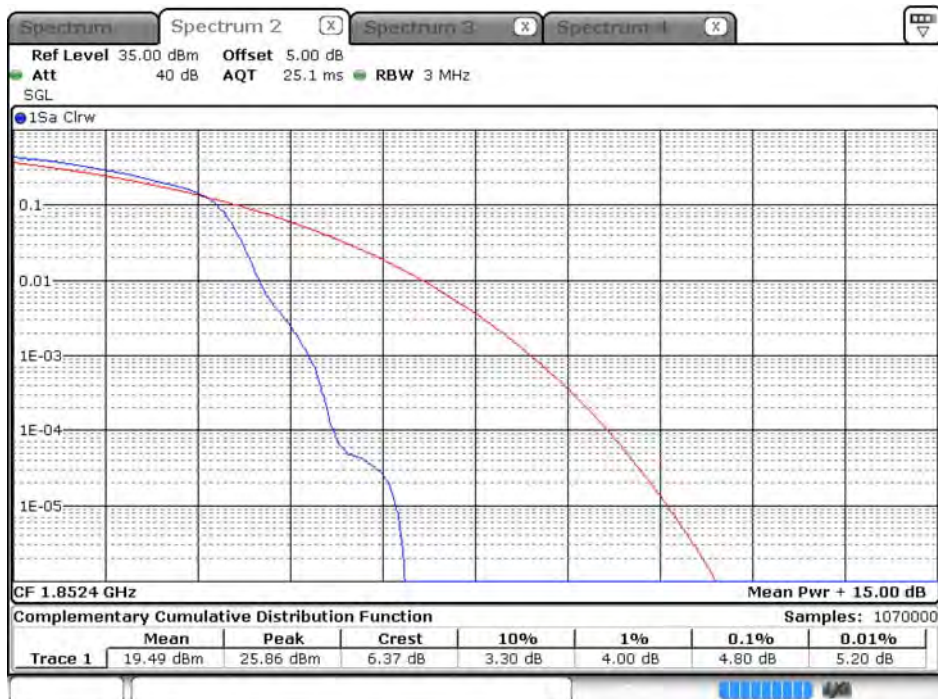


Date: 2.APR.2019 18:32:40

WCDMA_Band 2_RMC_1907.6MHz



Date: 2.APR.2019 18:32:12

WCDMA_Band 2_HSDPA_1852.4MHz

Date: 2.APR.2019 18:05:01

WCDMA_Band 2_HSDPA_1880.0MHz

Date: 2.APR.2019 18:05:46

WCDMA_Band 2_HSDPA_1907.6MHz

Date: 2.APR 2019 18:06:21

WCDMA_Band 2_HSUPA_1852.4MHz

Date: 2.APR.2019 17:58:42

WCDMA_Band 2_HSUPA_1880.0MHz

Date: 2.APR.2019 17:58:13

WCDMA_Band 2_HSUPA_1907.6MHz



Date: 2.APR.2019 17:57:37

Product	Module		
Test Item	Peak To Average Ratio		
Test Mode	Mode 2: WCDMA_Band 4		
Date of Test	2019/04/10	Test Site	SR10-H

Channel	Frequency (MHz)	Modulation	Peak (dBm)	Average (dBm)	PAPR (dB)
1312	1712.4	RMC	25.59	22.05	3.54
1413	1732.6		25.46	22.11	3.35
1513	1752.6		25.54	22.07	3.47
1312	1712.4	HSUPA	27.33	20.04	7.29
1413	1732.6		26.64	20.18	6.46
1513	1752.6		27.11	20.06	7.05
1312	1712.4	HSDPA	25.65	19.34	6.31
1413	1732.6		25.48	19.36	6.12
1513	1752.6		25.79	19.30	6.49

WCDMA_Band 4_RMC_1712.4MHz



Date: 2.APR.2019 18:28:21

WCDMA_Band 4_RMC_1732.6MHz

Date: 2.APR.2019 18:25:22

WCDMA_Band 4_RMC_1752.6MHz

Date: 2.APR.2019 18:24:44

WCDMA_Band 4_HSDPA_1712.4MHz



Date: 2.APR.2019 18:07:34

WCDMA_Band 4_HSDPA_1732.6MHz



Date: 2.APR.2019 18:08:33

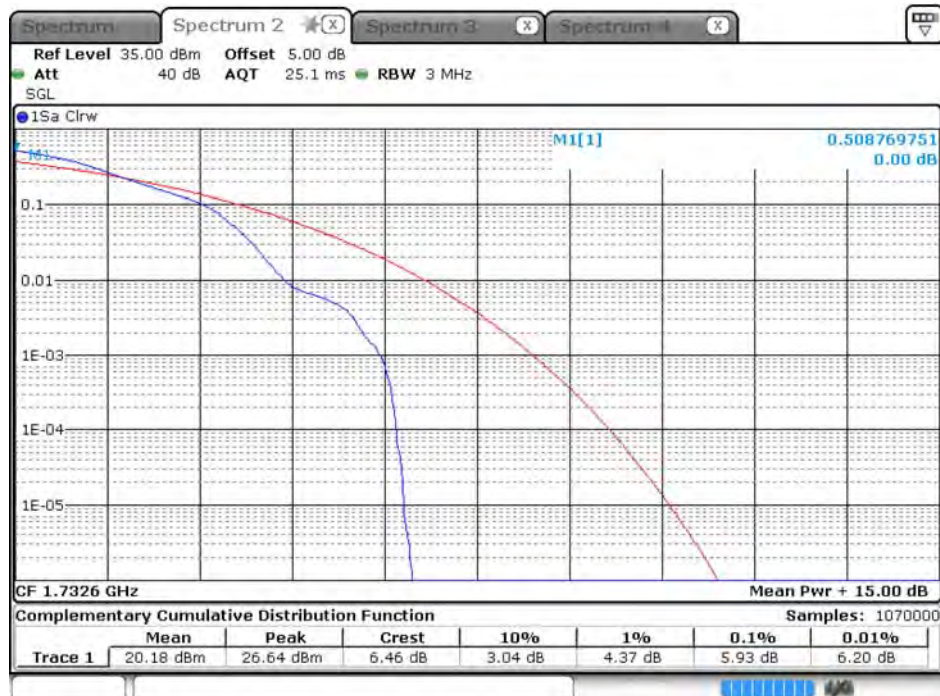
WCDMA_Band 4_HSDPA_1752.6MHz



Date: 2.APR.2019 18:09:05

WCDMA_Band 4_HSUPA_1712.4MHz

Date: 2.APR.2019 17:57:01

WCDMA_Band 4_HSUPA_1732.6MHz

Date: 2.APR.2019 17:56:26

WCDMA_Band 4_HSUPA_1752.6MHz

Date: 2.APR 2019 17:55:20

Product	Module		
Test Item	Peak To Average Ratio		
Test Mode	Mode 3: WCDMA_Band 5		
Date of Test	2019/04/10	Test Site	SR10-H

Channel	Frequency (MHz)	Modulation	Peak (dBm)	Average (dBm)	PAPR (dB)
4132	826.4	RMC	26.18	22.60	3.58
4183	836.6		26.08	22.57	3.51
4233	846.6		26.04	22.57	3.47
4132	826.4	HSUPA	27.65	20.41	7.24
4183	836.6		27.52	20.61	6.91
4233	846.6		27.50	20.55	6.95
4132	826.4	HSDPA	27.53	19.90	7.63
4183	836.6		26.03	19.75	6.28
4233	846.6		26.88	19.98	6.90

WCDMA_Band 5_RMC_826.4MHz



Date: 2 APR 2019 18:24:06

WCDMA_Band 5_RMC_836.6MHz

Date: 2.APR.2019 18:23:40

WCDMA_Band 5_RMC_846.6MHz

Date: 2.APR.2019 18:23:05

WCDMA_Band 5_HSDPA_826.4MHz

Date: 2.APR.2019 18:18:35

WCDMA_Band 5_HSDPA_836.6MHz

Date: 2.APR.2019 18:21:05

WCDMA_Band 5_HSDPA_846.6MHz

Date: 2.APR 2019 18:21:53

WCDMA_Band 5_HSUPA_826.4MHz



Date: 2.APR.2019 17:54:28

WCDMA_Band 5_HSUPA_836.6MHz



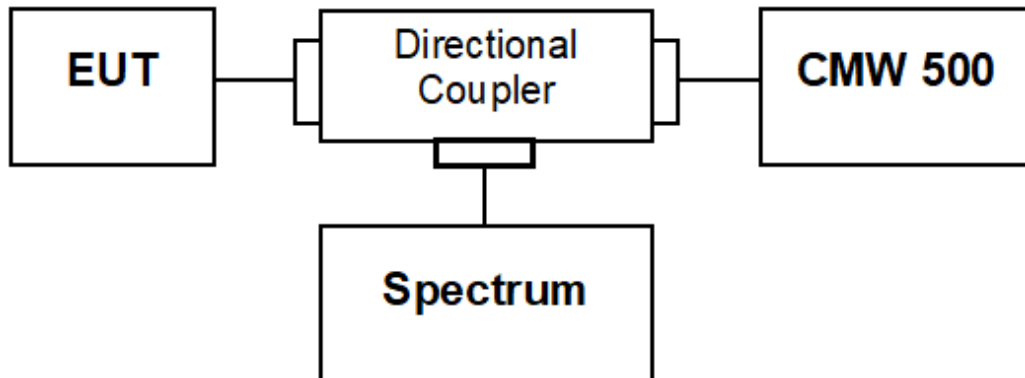
Date: 2.APR.2019 17:52:24

WCDMA_Band 5_HSUPA_846.6MHz

Date: 2.APR 2019 17:37:30

6. Conducted Band Edge

6.1. Test Setup



6.2. Test Procedure

1. The EUT was connected to spectrum analyzer and System Simulator 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 conducted spurious emission for the whole frequency range was taken.
4. In the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions.

6.3. Test Method

Conducted Spurious Measurement:

KDB 971168 D01 Power Meas License Digital Systems v03 sub-clause6.1

ANSI C63.26: 2015 Sub-clause 5.7

Radiated Spurious Measurement:

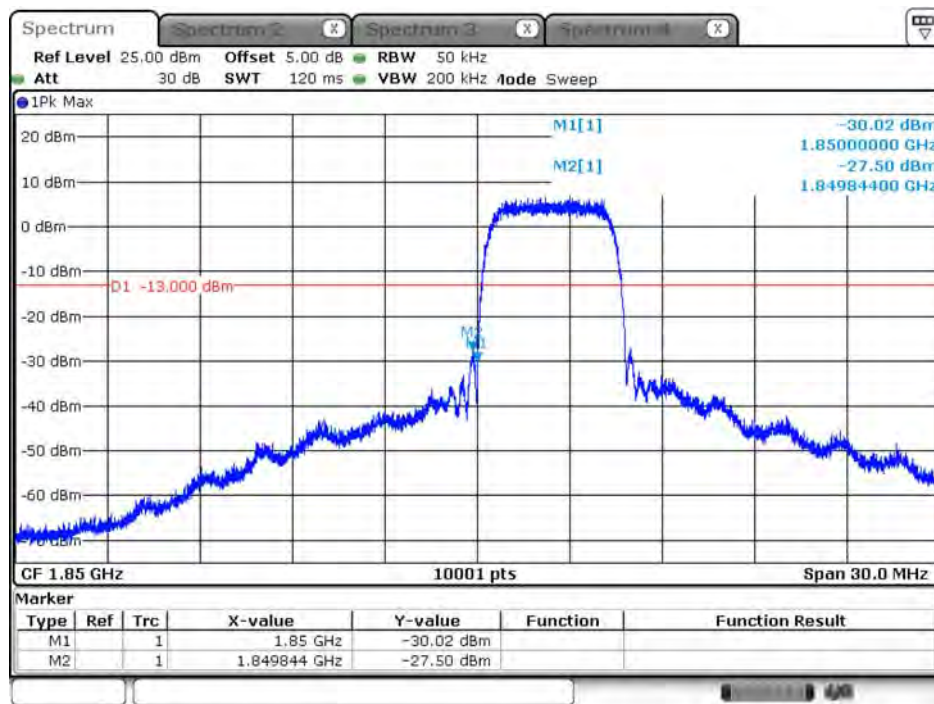
KDB 971168 D01 Power Meas License Digital Systems v03 sub-clause5.8

ANSI C63.26: 2015 Sub-clause 5.5.3.2

6.4. Test Result

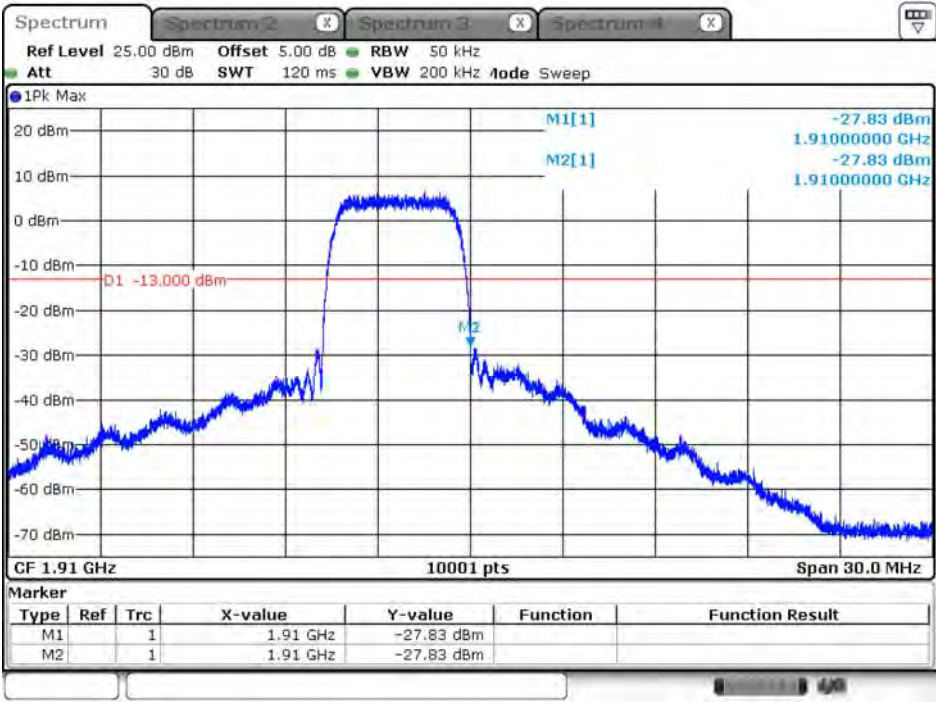
Product	Module		
Test Item	Conducted Band Edge		
Test Mode	Mode 1: WCDMA_Band 2		
Date of Test	2019/04/02	Test Site	SR10-H

WCDMA_Band 2_RMC_1852.4MHz

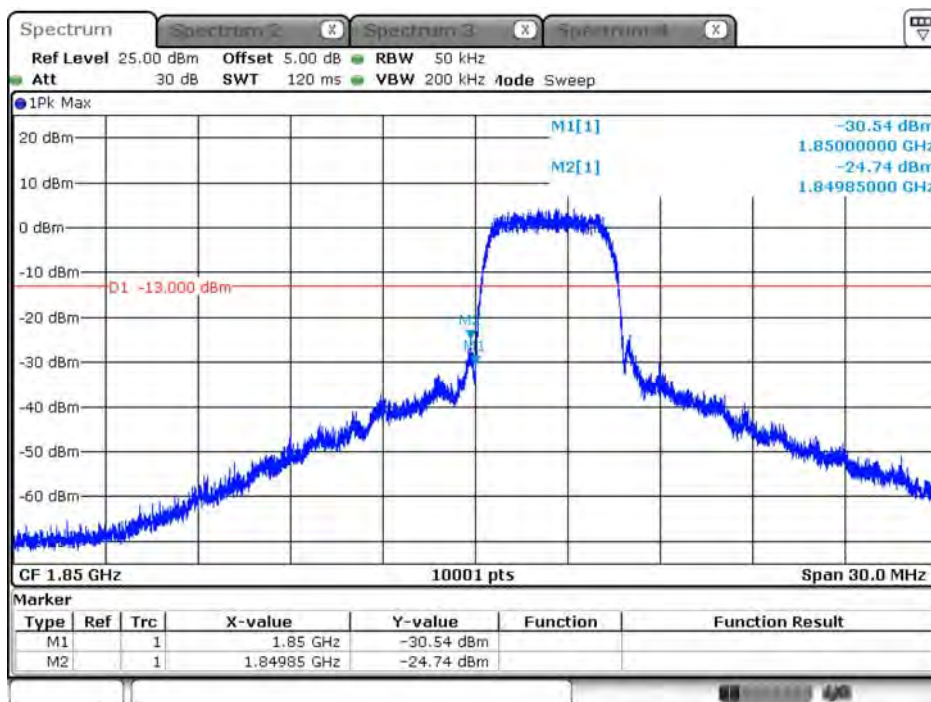


Date: 2.APR.2019 16:42:54

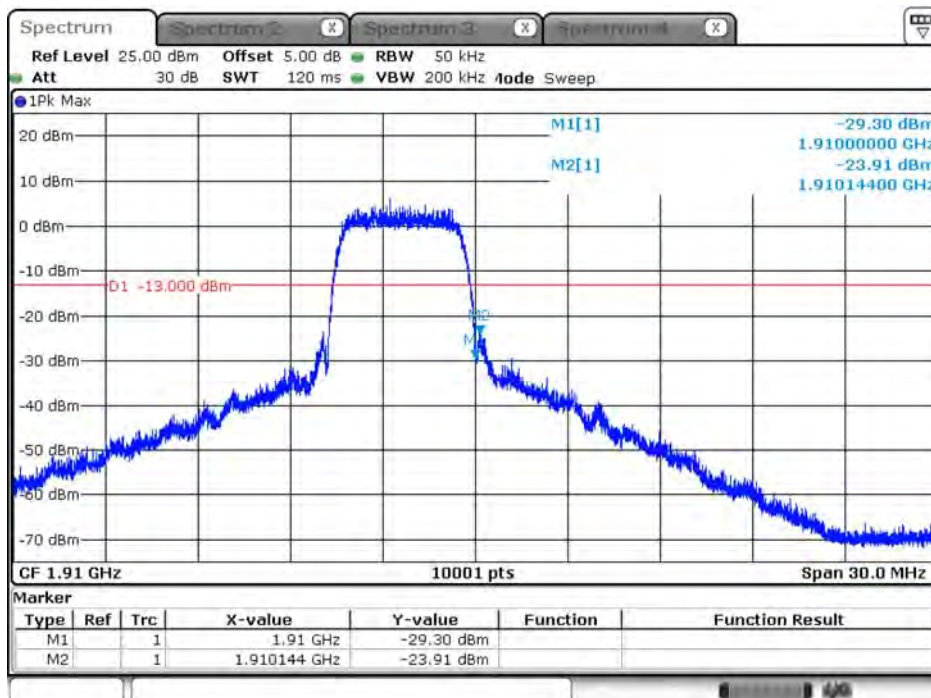
WCDMA_Band 2_RMC_1907.6MHz



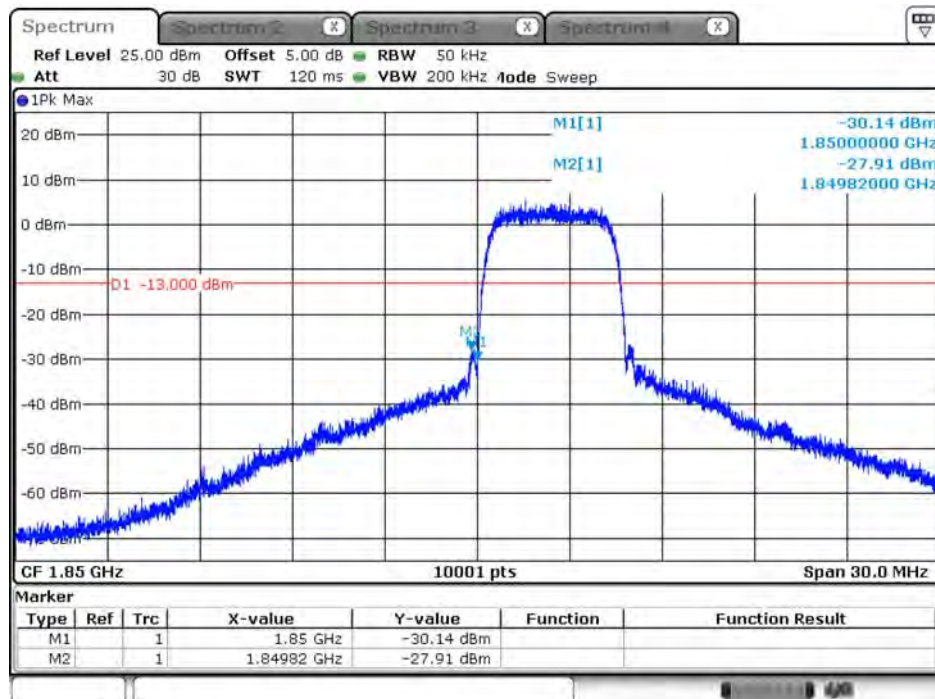
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WCDMA_Band 2_HSDPA_1852.4MHz

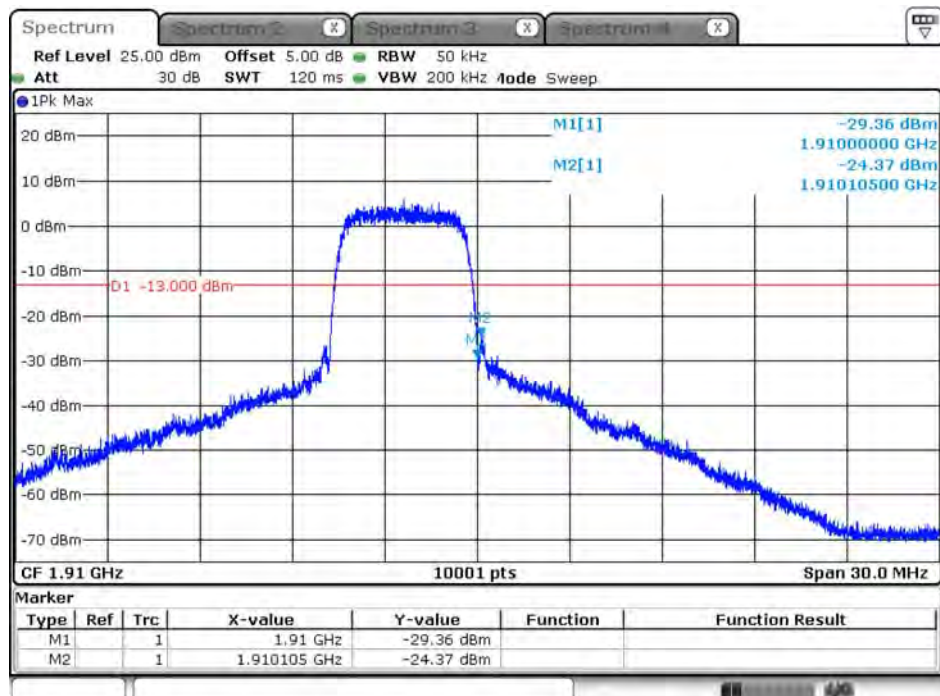
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WCDMA_Band 2_HSDPA_1907.6MHz

Date: 2.APR.2019 17:06:00

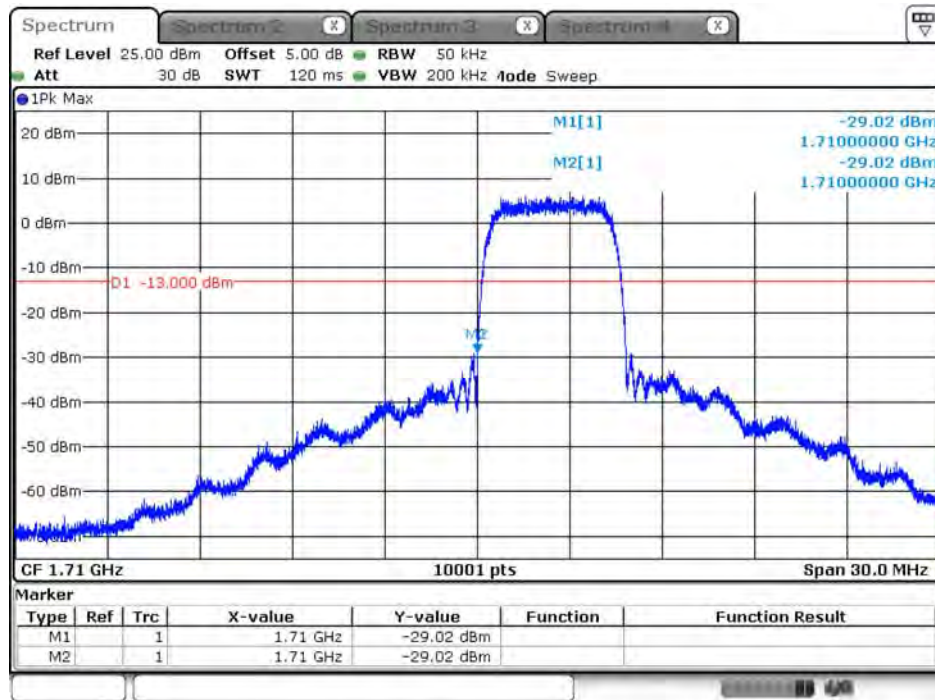
WCDMA_Band 2_HSUPA_1852.4MHz

Date: 2.APR.2019 17:14:00

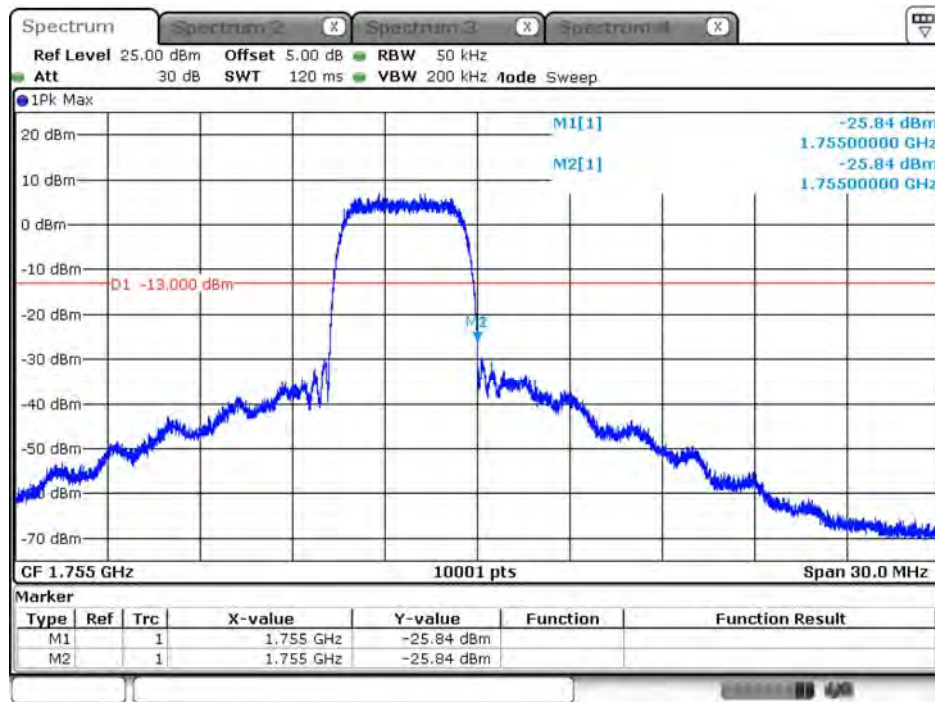
WCDMA_Band 2_HSUPA_1907.6MHz

Date: 2.APR.2019 17:17:06

Product	Module		
Test Item	Conducted Band Edge		
Test Mode	Mode 2: WCDMA_Band 4		
Date of Test	2019/04/02	Test Site	SR10-H

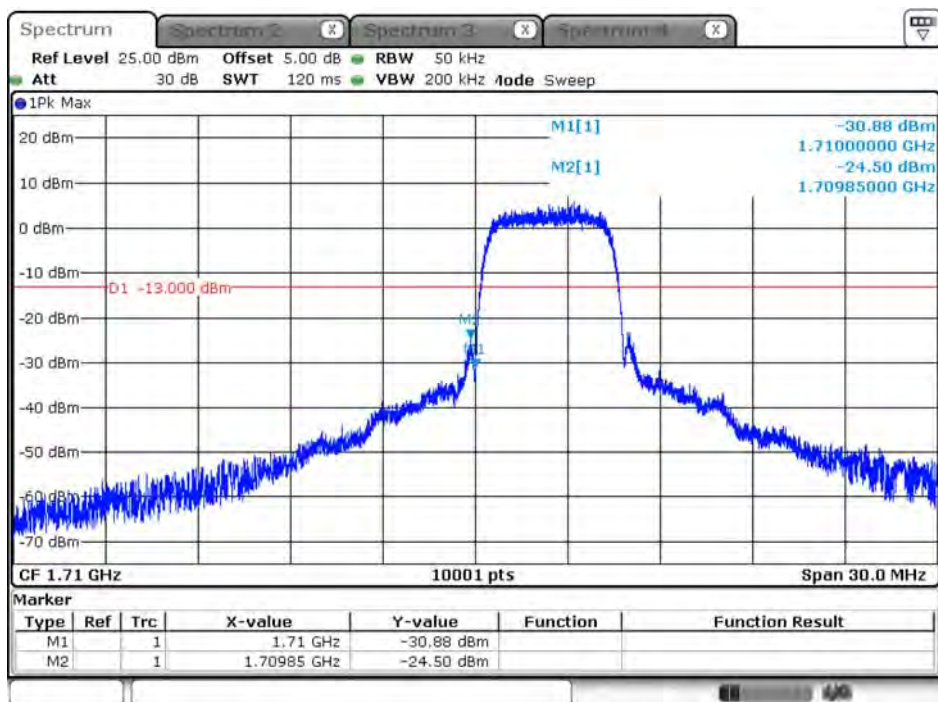
WCDMA_Band 4_RMC_1712.4MHz

Date: 2.APR 2019 16:47:56

WCDMA_Band 4_RMC_1752.6MHz

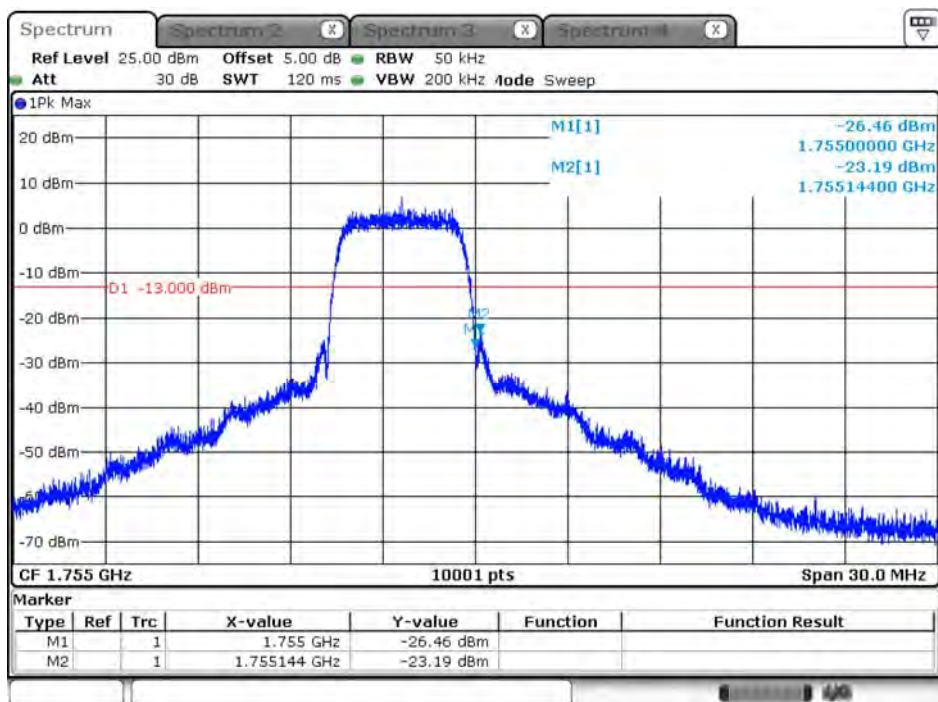
Date: 2.APR.2019 16:50:04

WCDMA_Band 4_HSDPA_1712.4MHz



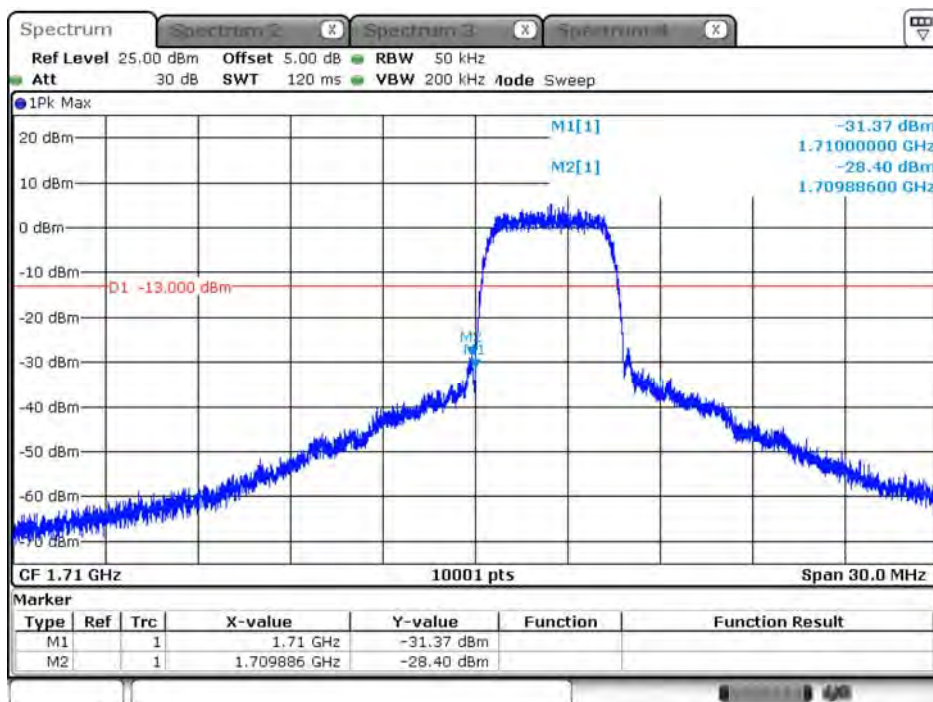
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WCDMA_Band 4_HSDPA_1752.6MHz



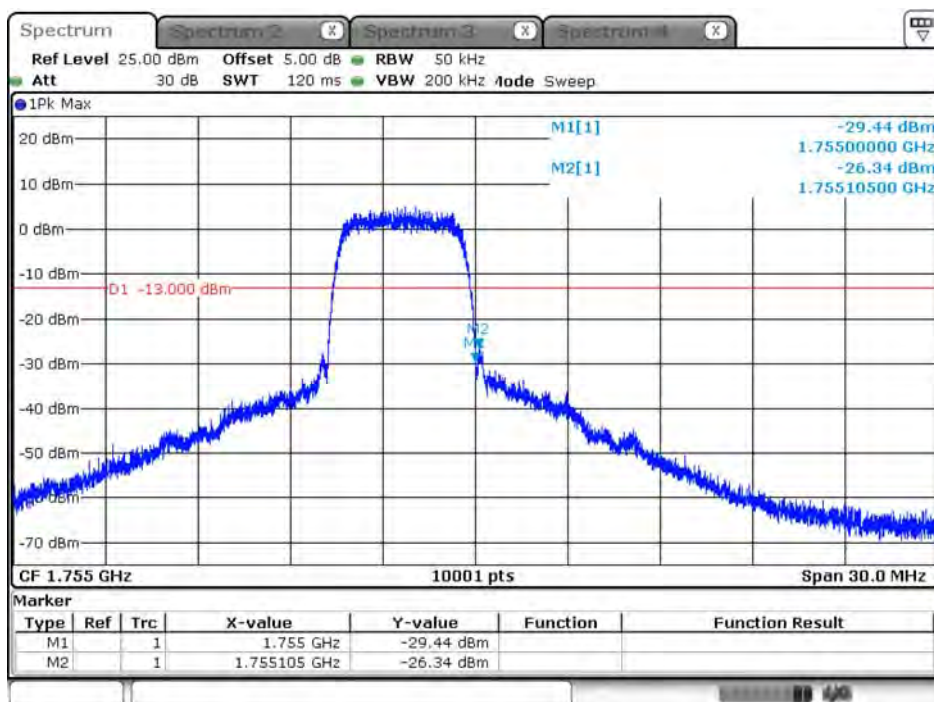
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WCDMA_Band 4_HSUPA_1712.4MHz



Date: 2.APR.2019 17:18:00

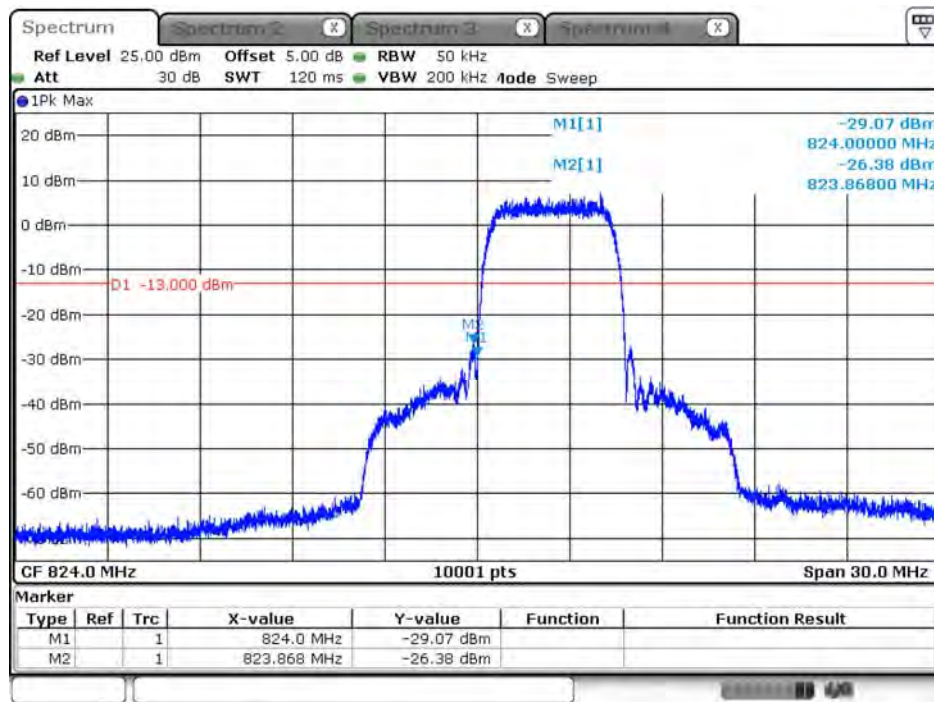
WCDMA_Band 4_HSUPA_1752.6MHz



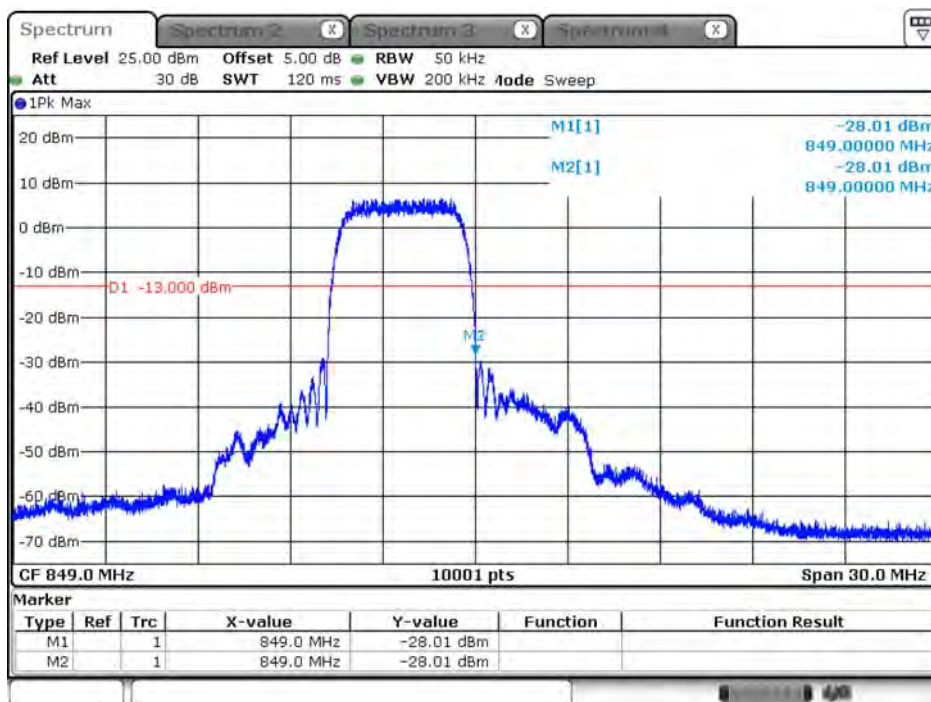
Date: 2.APR.2019 17:19:10

Product	Module		
Test Item	Conducted Band Edge		
Test Mode	Mode 3: WCDMA_Band 5		
Date of Test	2019/04/02	Test Site	SR10-H

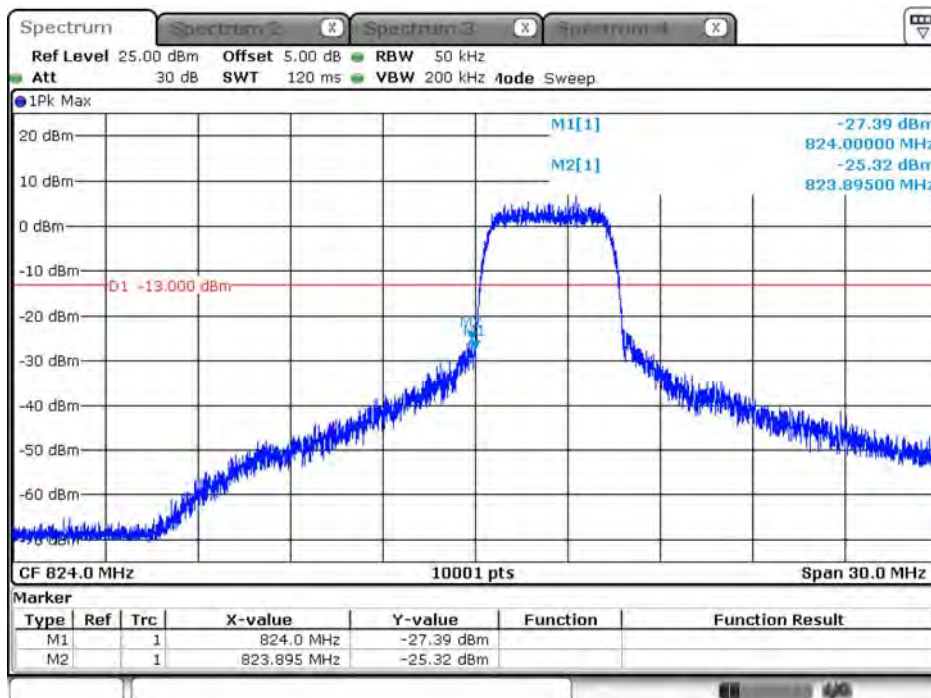
WCDMA_Band 5_RMC_826.4MHz



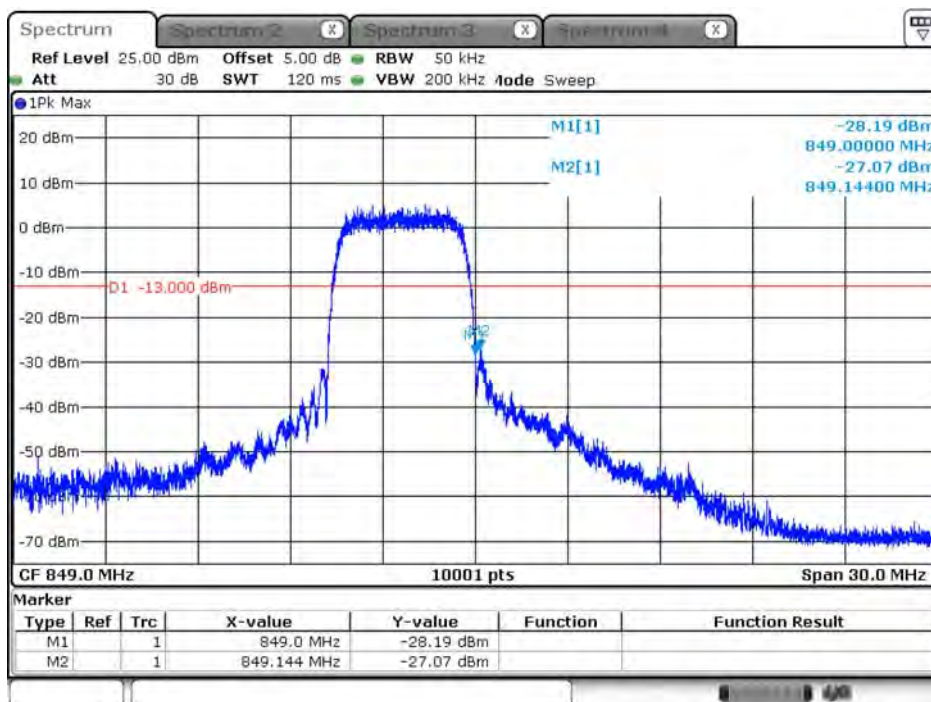
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WCDMA_Band 5_RMC_846.6MHz

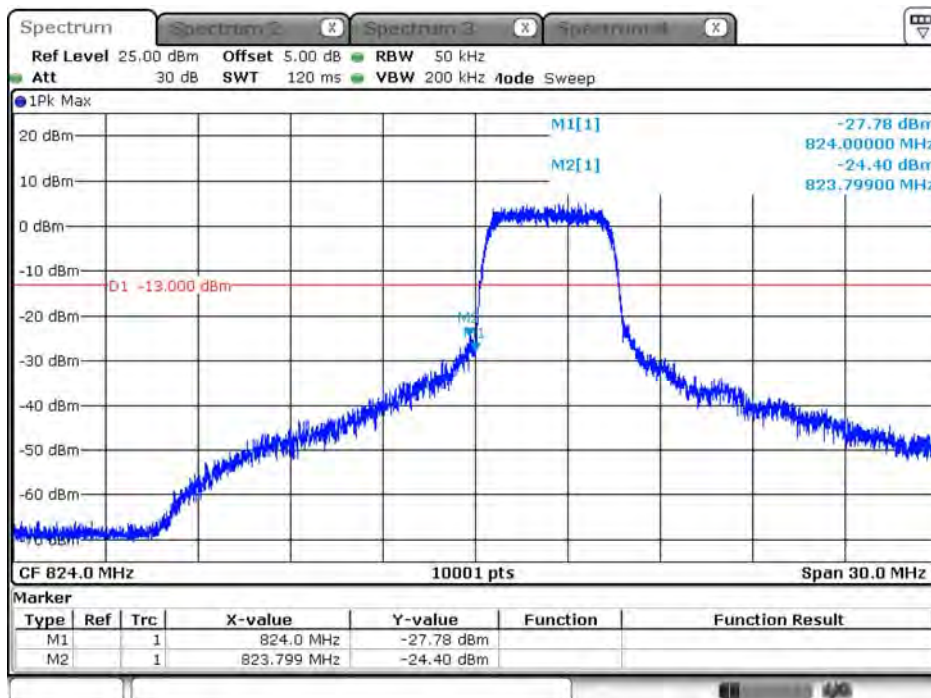
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WCDMA_Band 5_HSDPA_826.4MHz

Date: 2.APR.2019 17:01:02

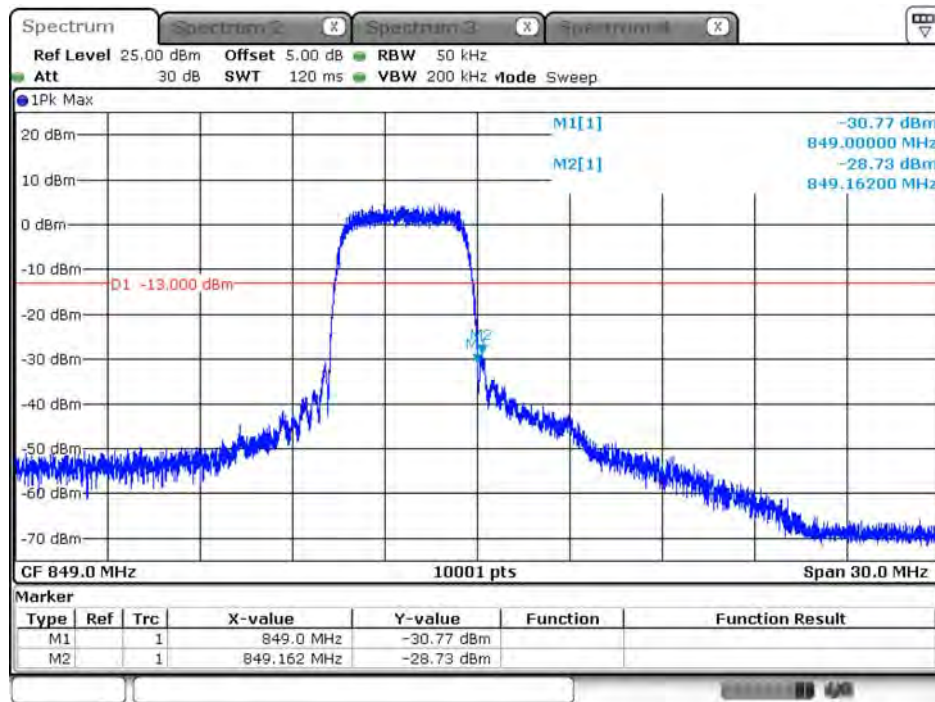
WCDMA_Band 5_HSDPA_846.6MHz

Date: 2.APR.2019 16:59:22

WCDMA_Band 5_HSUPA_826.4MHz

Date: 2.APR.2019 17:20:53

WCDMA_Band 5_HSUPA_846.6MHz

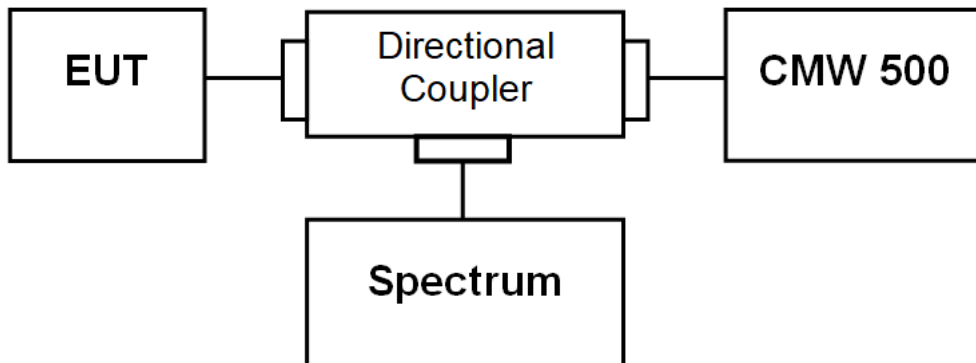


Date: 2.APR 2019 17:21.45

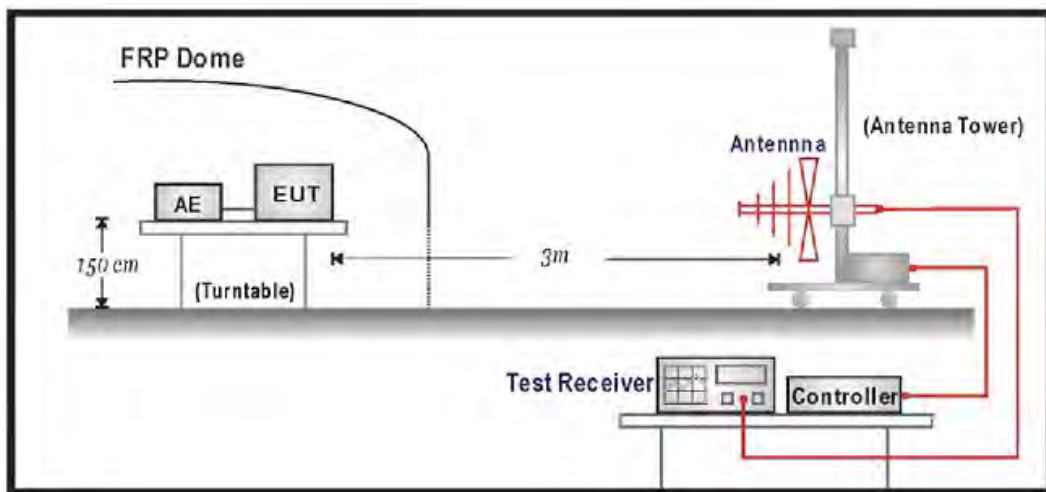
7. Spurious Emission

7.1. Test Setup

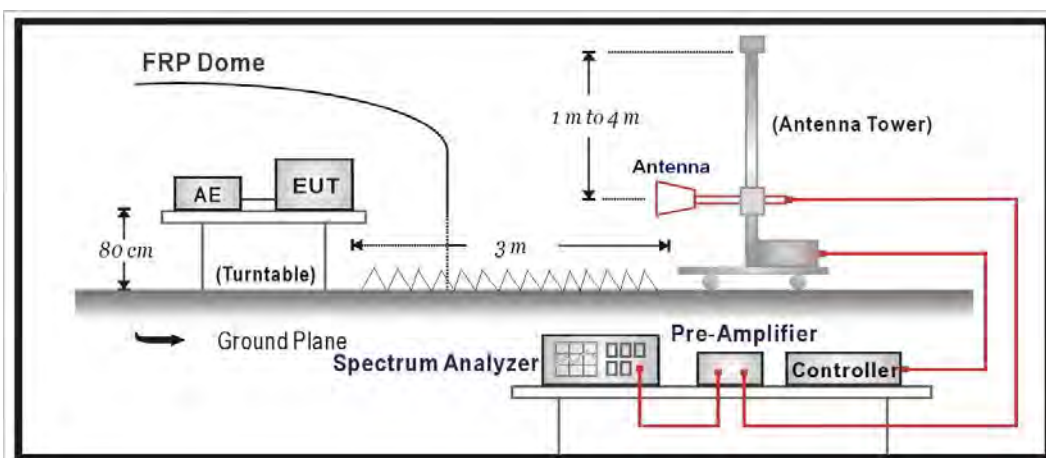
Conducted Spurious Measurement (below 1GHz)



Radiated Spurious Measurement (below 1GHz)



Radiated Spurious Measurement (above 1GHz)



7.2. Test Procedure

Conducted Spurious Measurement:

- a) Place the EUT on a bench and set it in transmitting mode.
- b) Connect a low loss RF cable from the antenna port to a spectrum analyzer and CMU200 by a Directional Couple.
- c) EUT Communicate with CMU200, then select a channel for testing.
- d) Add a correction factor to the display of spectrum, and then test.
- e) The resolution bandwidth of the spectrum analyzer was set at 1 MHz, sufficient scans were taken to show the out of band Emission if any up to 10th harmonic.

Radiated Spurious Measurement:

- a) The EUT was placed on a rotatable wooden table with 1.5 meter above ground.
- b) The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
- c) The table was rotated 360 degrees to determine the position of the highest spurious emission.
- d) The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
- e) Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 1MHz, Sweep 500ms, Taking the record of maximum spurious emission.
- f) A horn antenna was substituted in place of the EUT and was driven by a signal generator.
- g) Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
- h) Taking the record of output power at antenna port
- i) Repeat step 7 to step 8 for another polarization.
- j) $EIRP = SG - \text{Cable loss} + \text{Antenna Gain}$

7.3. Test Method

Conducted Spurious Measurement:

KDB 971168 D01 Power Meas License Digital Systems v03 sub-clause6.1
ANSI C63.26-2015 Sub-clause 5.7

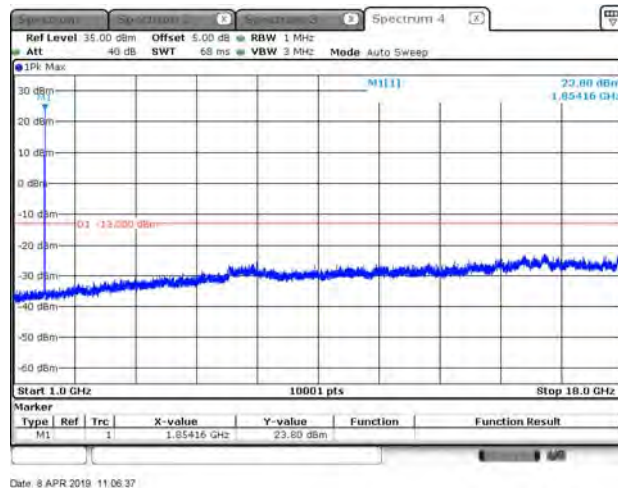
Radiated Spurious Measurement:

KDB 971168 D01 Power Meas License Digital Systems v03 sub-clause5.8
ANSI C63.26-2015 Sub-clause 5.5.3.2

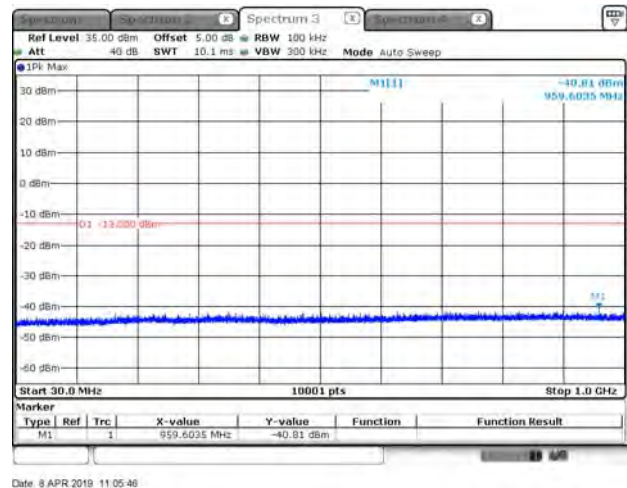
7.4. Test Result

Product	Module		
Test Item	Conducted Spurious Emission		
Test Mode	Mode 1: WCDMA_Band 2		
Date of Test	2019/04/08	Test Site	SR10-H

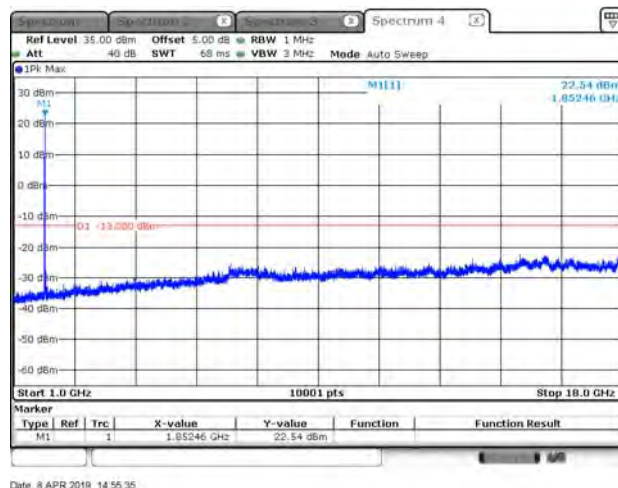
WCDMA_Band2_1852.4MHz_RMC_above 1G



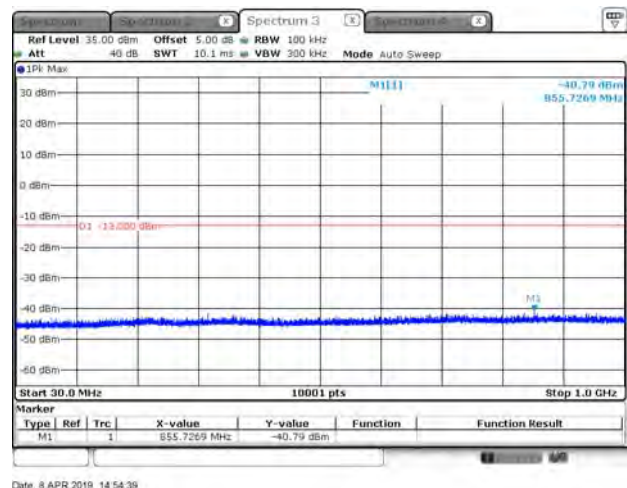
WCDMA_Band2_1852.4MHz_RMC_under 1G



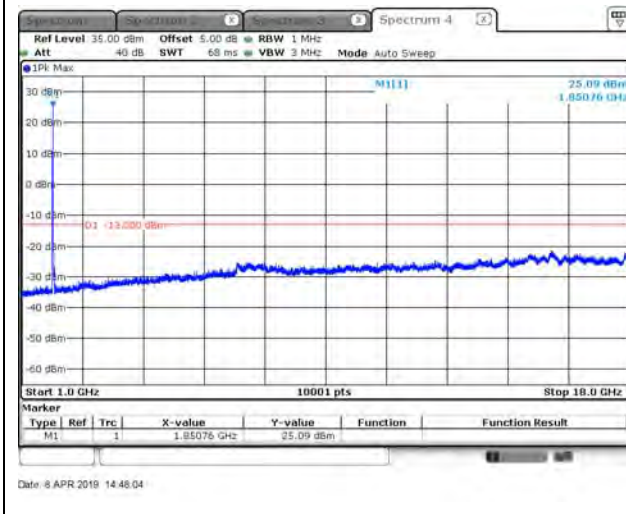
WCDMA_Band2_1852.4MHz_HSDPA_above 1G



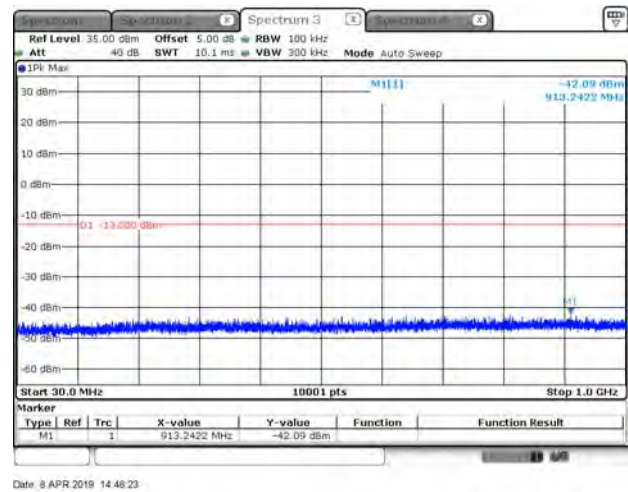
WCDMA_Band2_1852.4MHz_HSDPA_under 1G



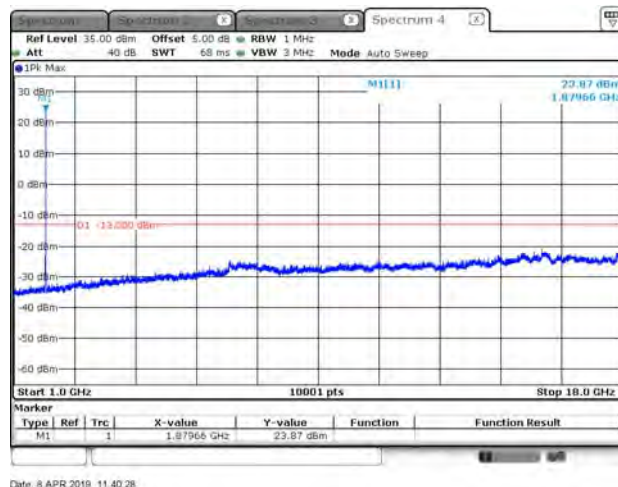
WCDMA_Band2_1852.4MHz_HSUPA_above 1G



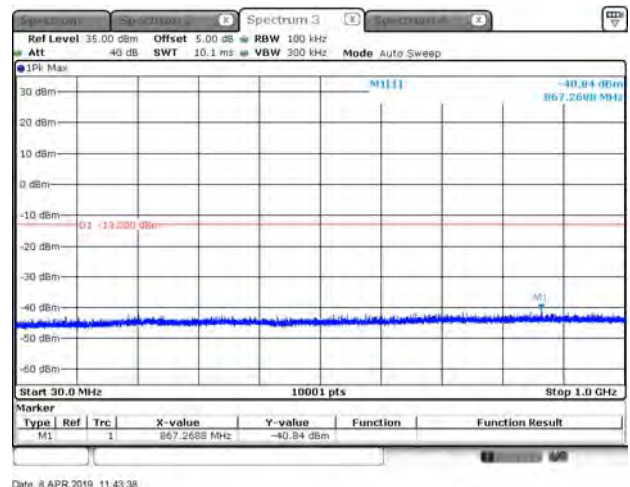
WCDMA_Band2_1852.4MHz_HSUPA_under 1G



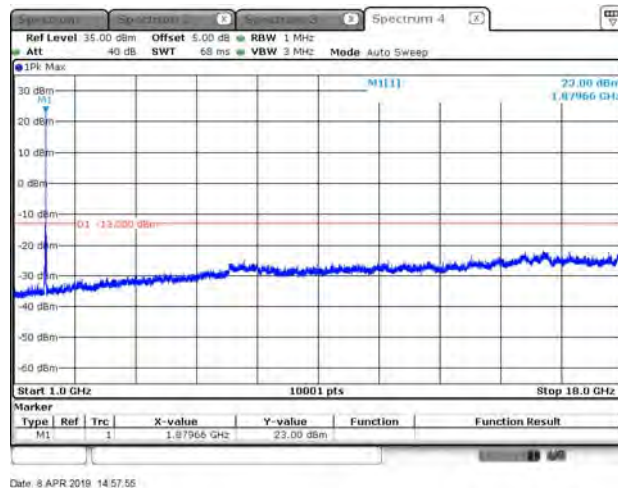
WCDMA_Band2_1880MHz_RMC_above 1G



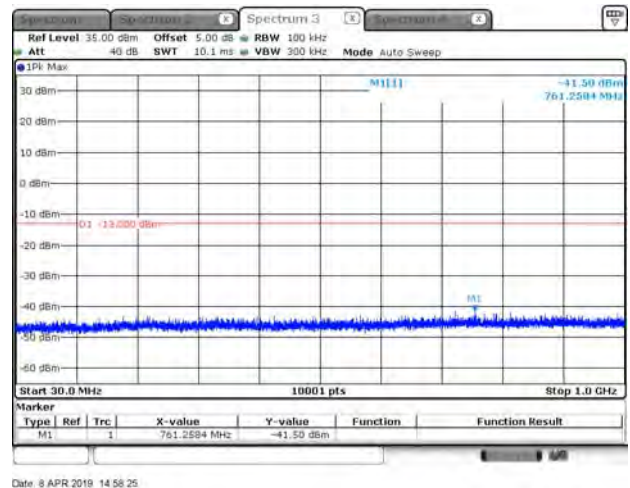
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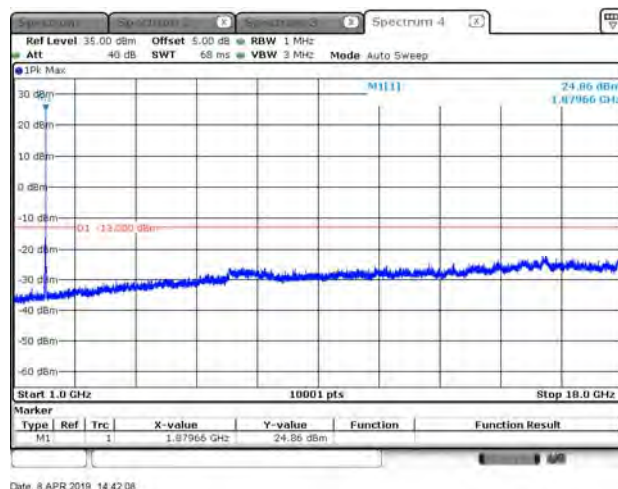
WCDMA_Band2_1880MHz_HSDPA_above 1G



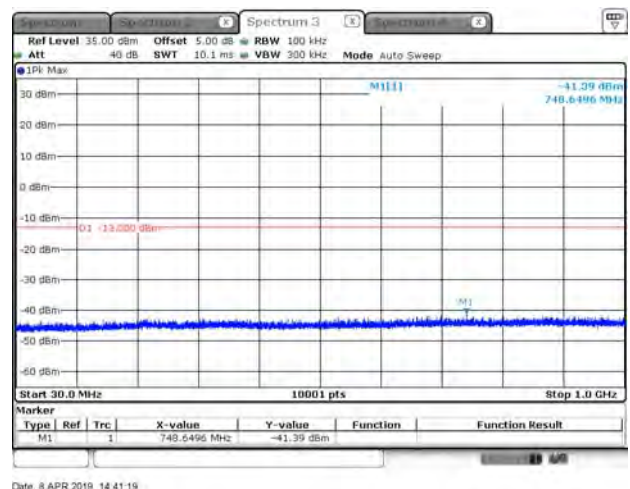
WCDMA_Band2_1880MHz_HSDPA_under 1G



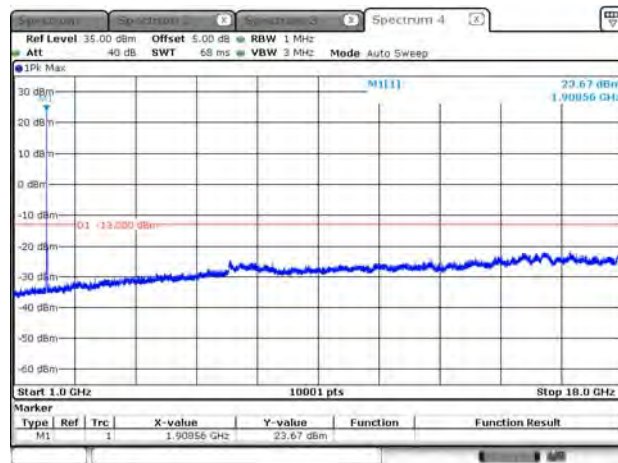
WCDMA_Band2_1880MHz_HSUPA_above 1G



WCDMA_Band2_1880MHz_HSUPA_under 1G

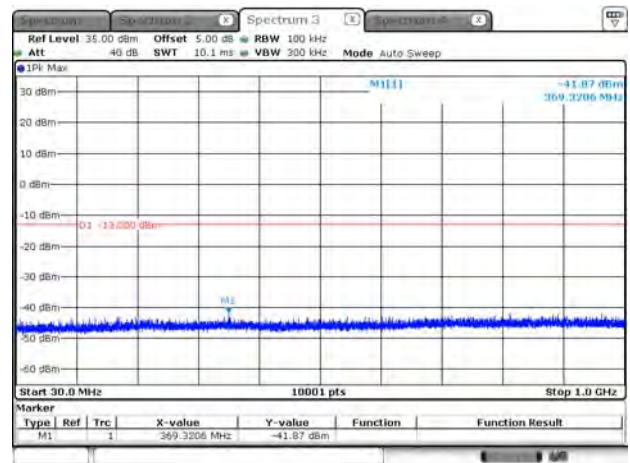


WCDMA_Band2_1907.6MHz_RMC_above 1G



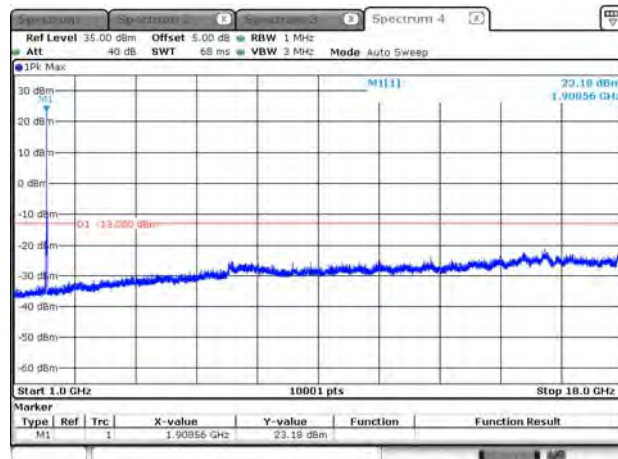
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WCDMA_Band2_1907.6MHz_RMC_under 1G



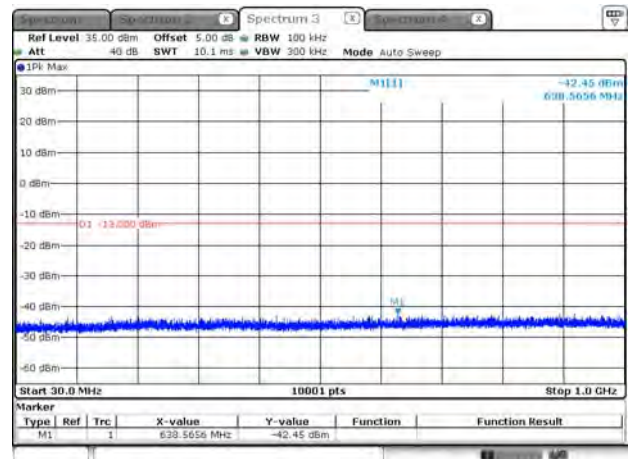
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WCDMA_Band2_1907.6MHz_HSDPA_above 1G



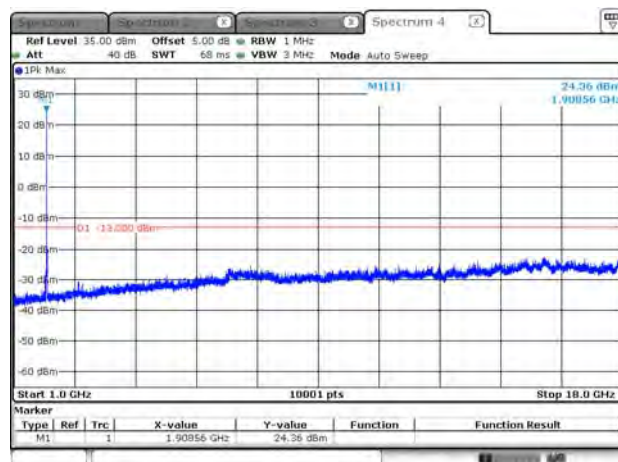
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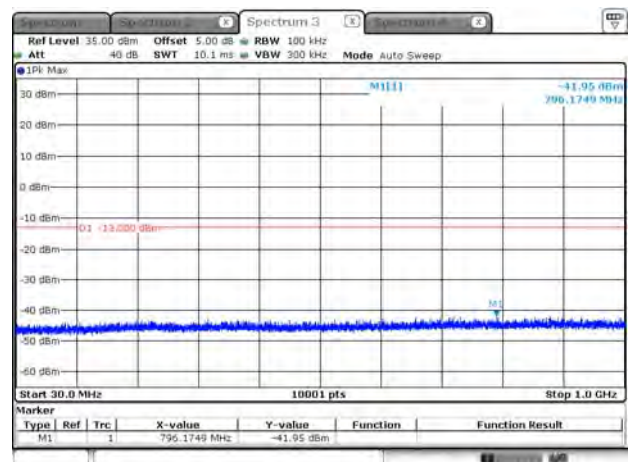
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WCDMA_Band2_1907.6MHz_HSUPA_above 1G



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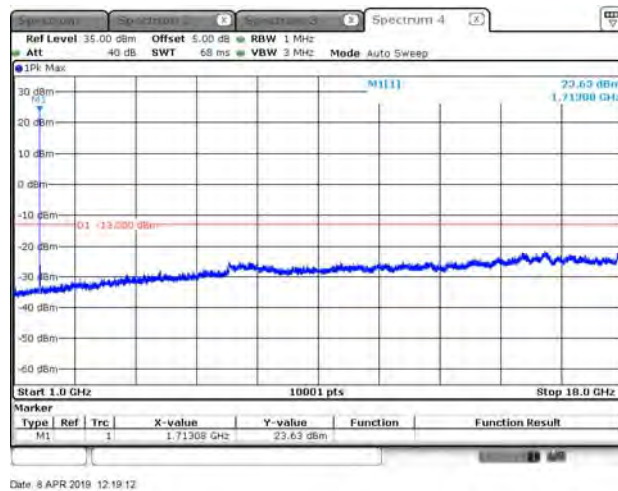
WCDMA_Band2_1907.6MHz_HSUPA_under 1G



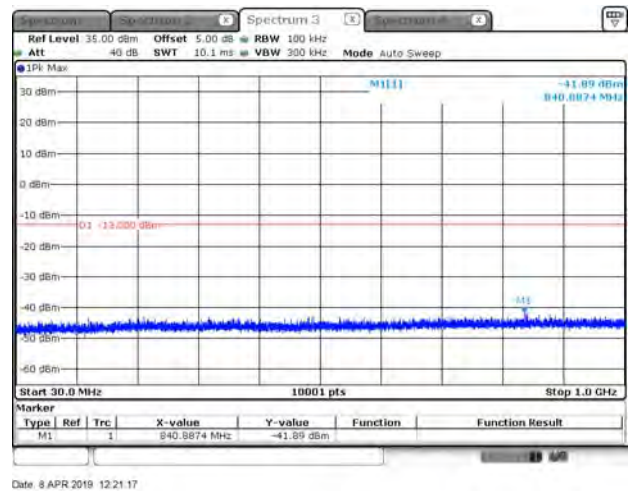
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Product	Module		
Test Item	Conducted Spurious Emission		
Test Mode	Mode 2: WCDMA_Band 4		
Date of Test	2019/04/08	Test Site	SR10-H

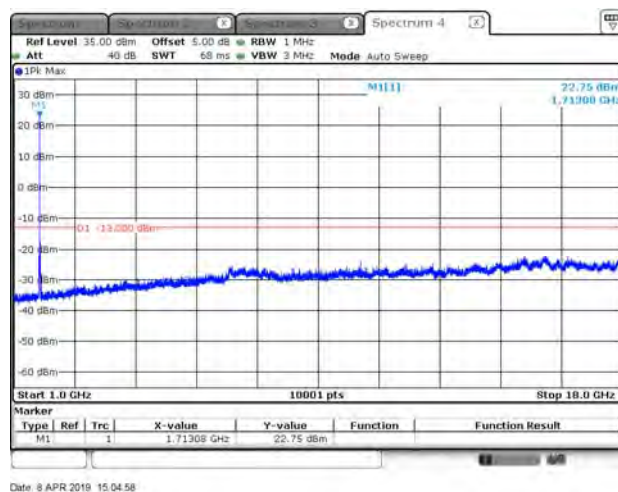
WCDMA_Band4_1712.4MHz_RMC_above 1G



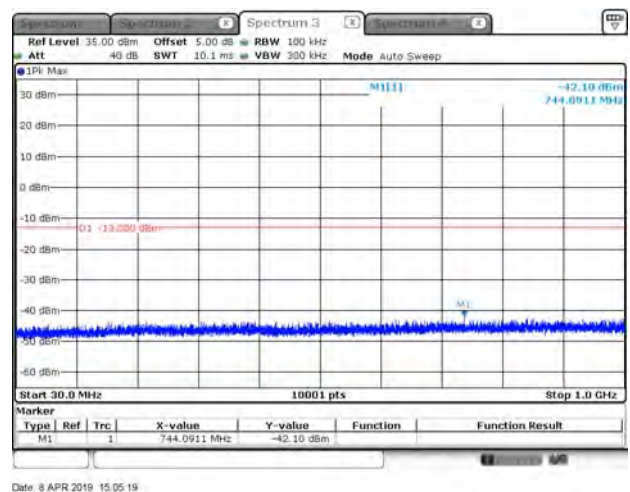
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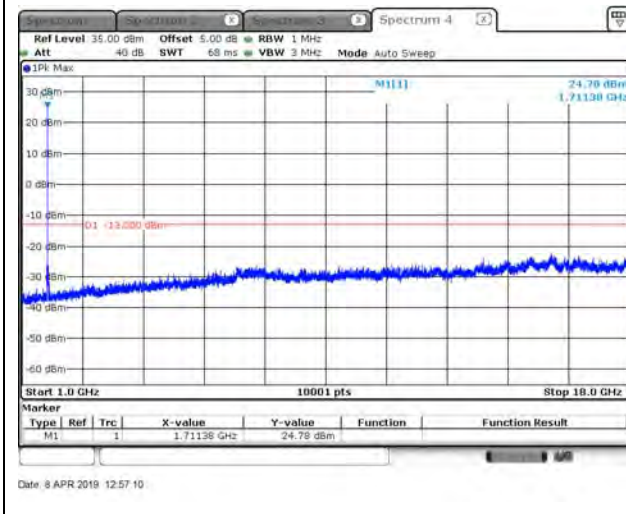
WCDMA_Band4_1712.4MHz_HSDPA_above 1G



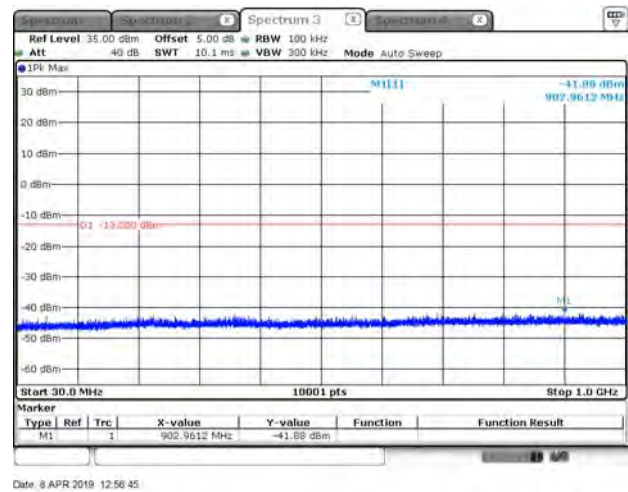
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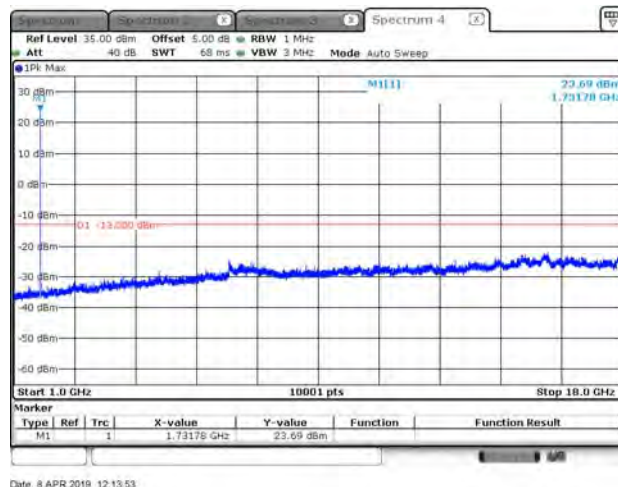
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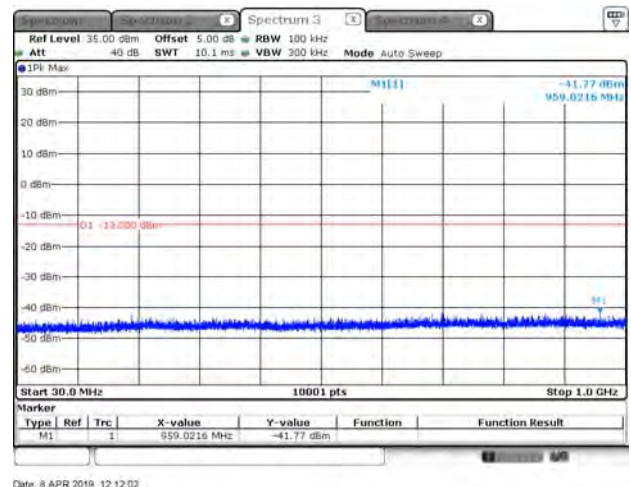
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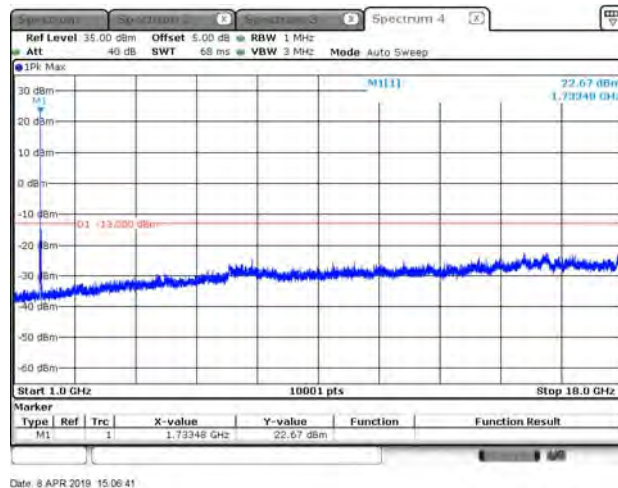
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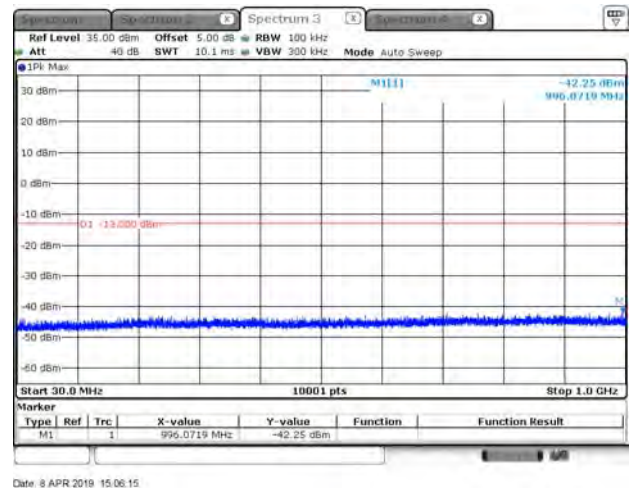
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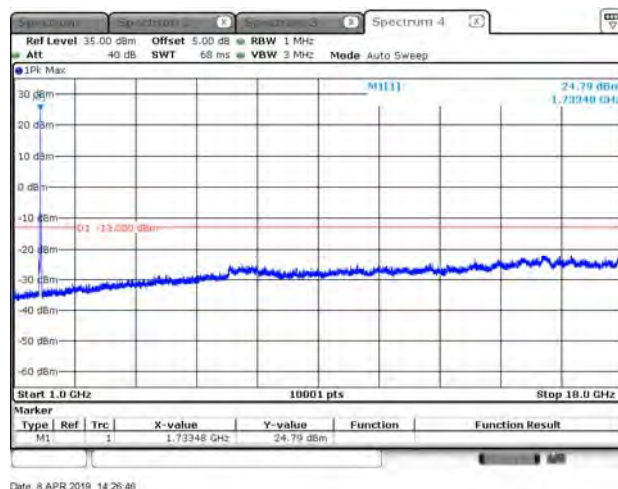
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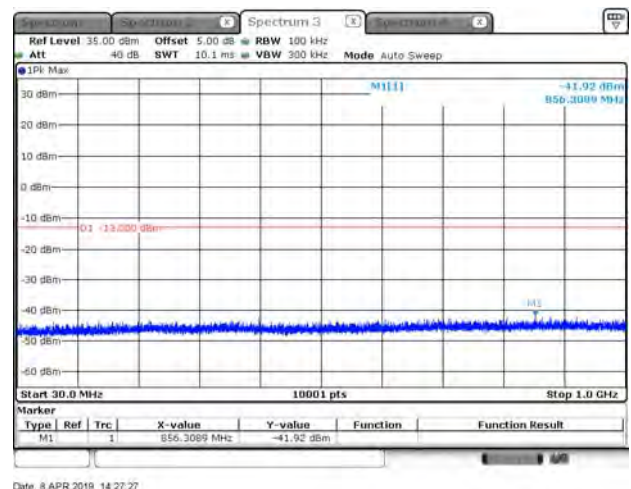
WCDMA_Band4_1732.6MHz_HSDPA_under 1G



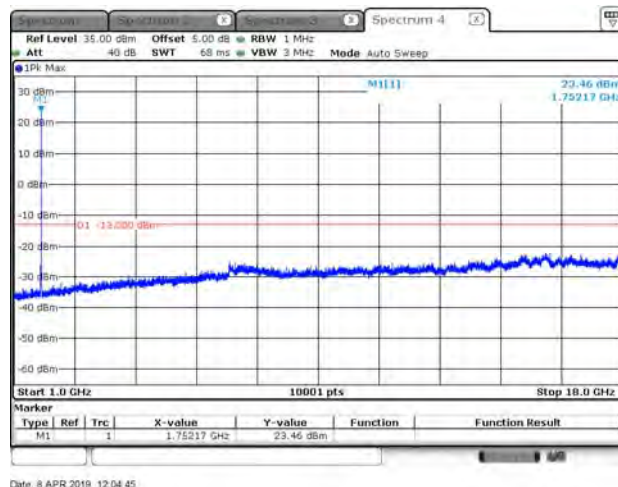
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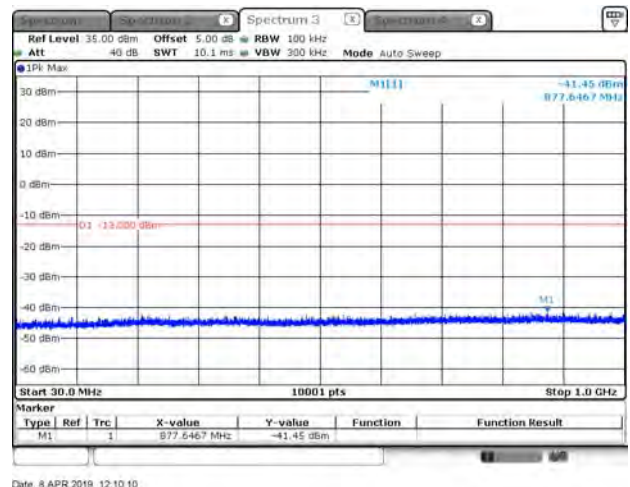
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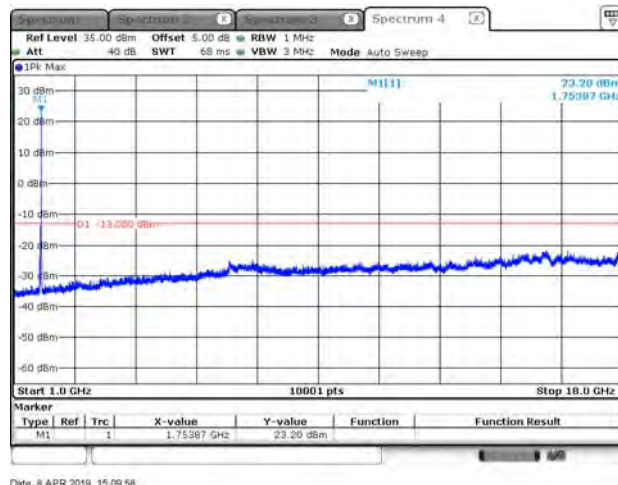
WCDMA_Band4_1752.6MHz_RMC_above 1G



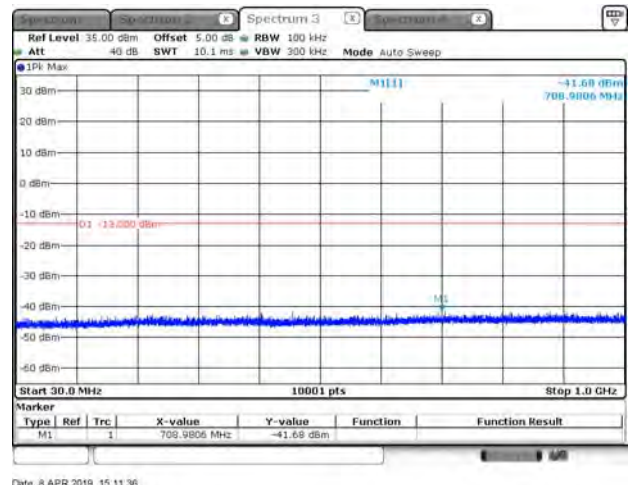
WCDMA_Band4_1752.6MHz_RMC_under 1G



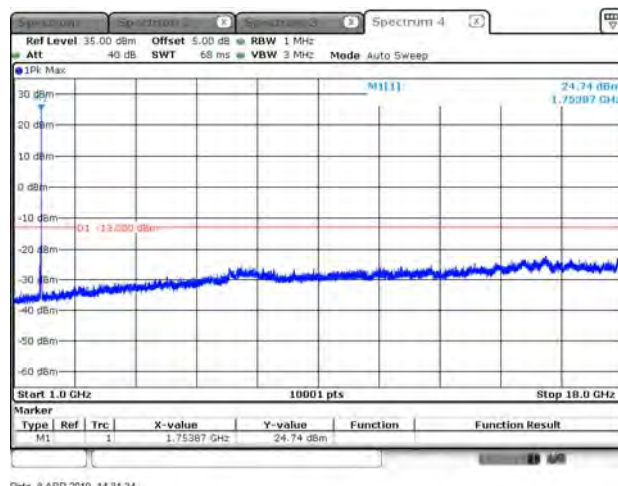
WCDMA_Band4_1752.6MHz_HSDPA_above 1G



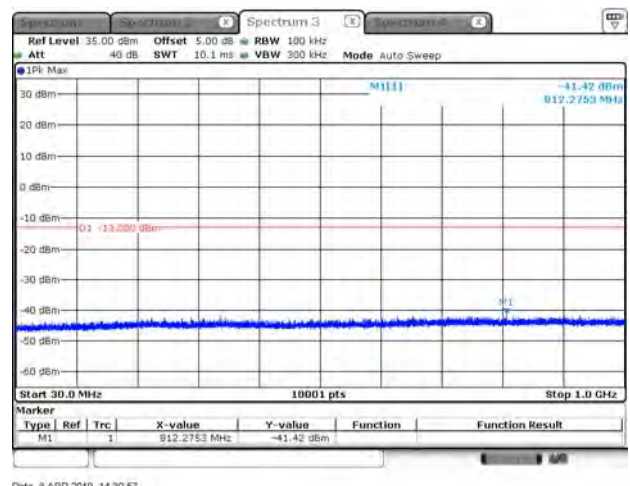
WCDMA_Band4_1752.6MHz_HSDPA_under 1G



WCDMA_Band4_1752.6MHz_HSUPA_above 1G

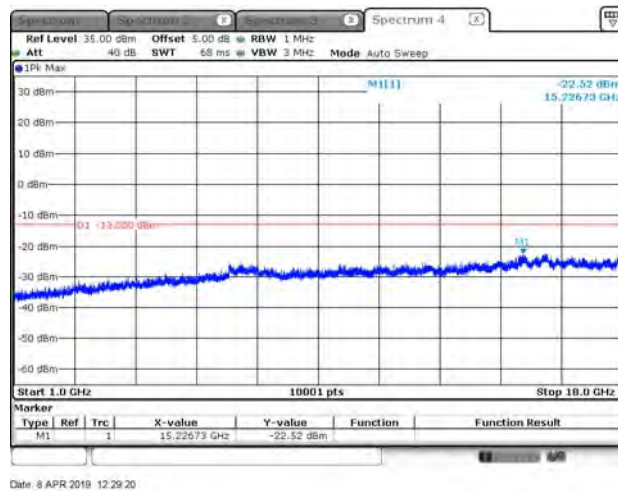


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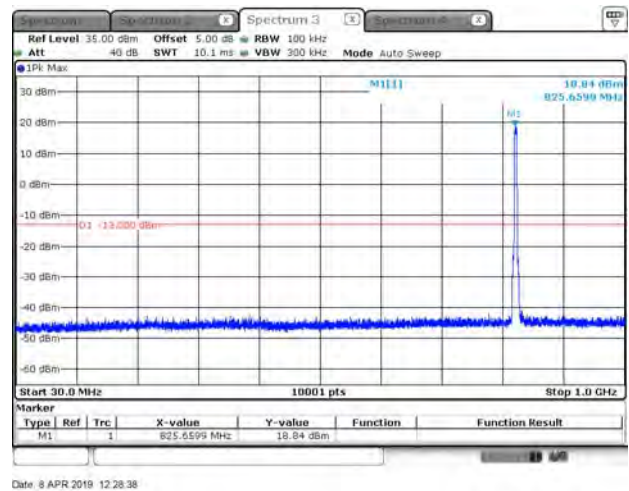


Product	Module		
Test Item	Conducted Spurious Emission		
Test Mode	Mode 3: WCDMA_Band 5		
Date of Test	2019/04/08	Test Site	SR10-H

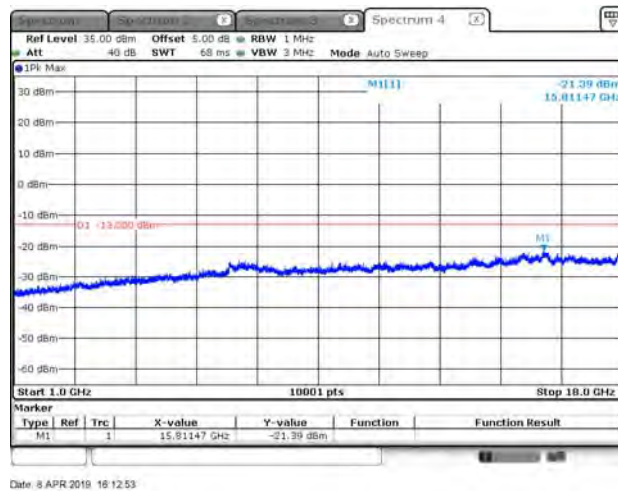
WCDMA_Band5_826.4MHz_RMC_above 1G



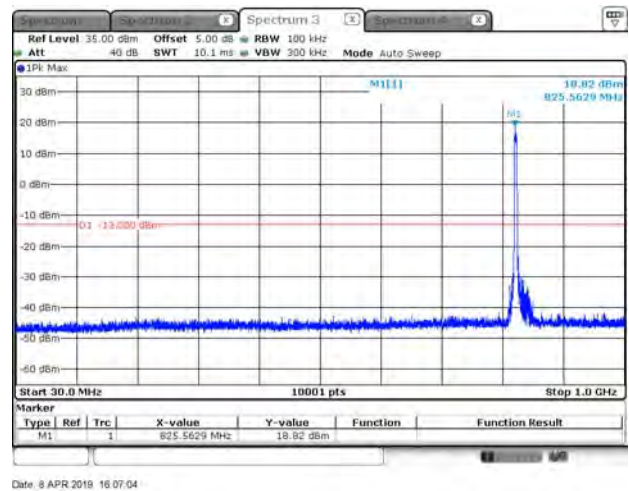
WCDMA_Band5_826.4MHz_RMC_under 1G



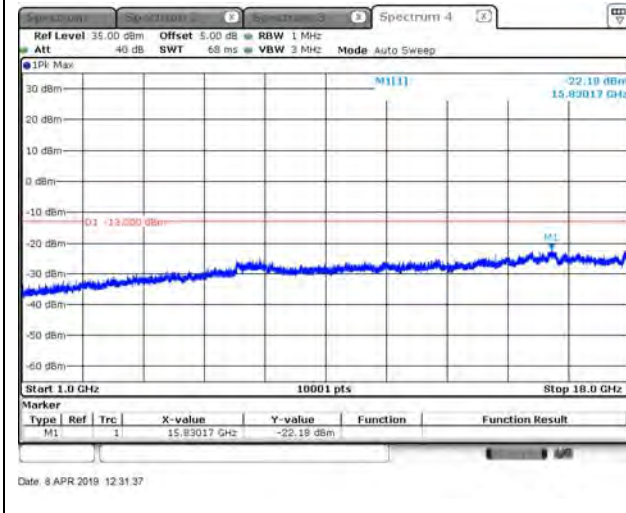
WCDMA_Band5_826.4MHz_HSDPA_above 1G



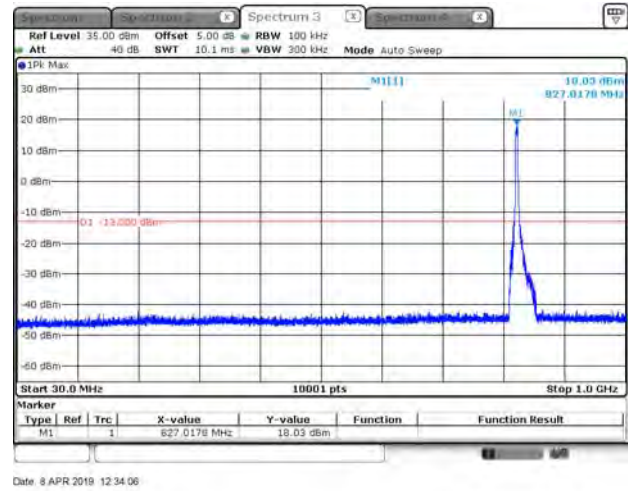
WCDMA_Band5_826.4MHz_HSDPA_under 1G



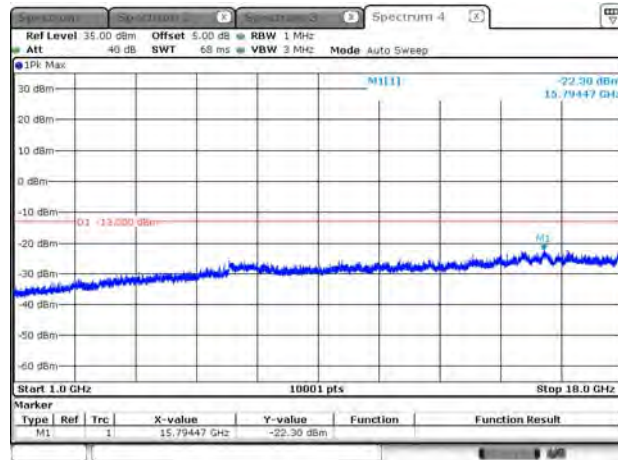
WCDMA_Band5_826.4MHz_HSUPA_above 1G



WCDMA_Band5_826.4MHz_HSUPA_under 1G

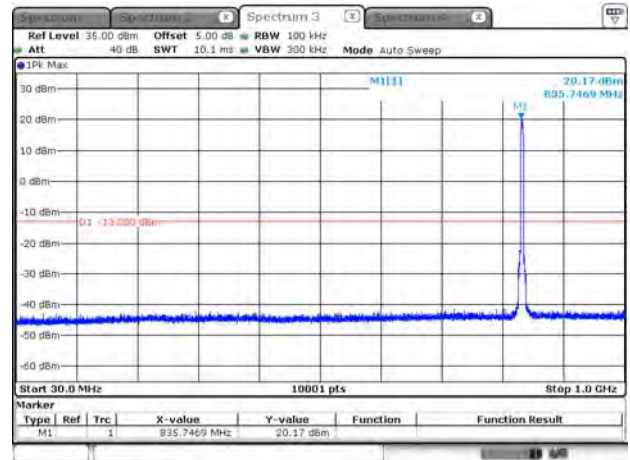


WCDMA_Band5_836.6MHz_RMC_above 1G



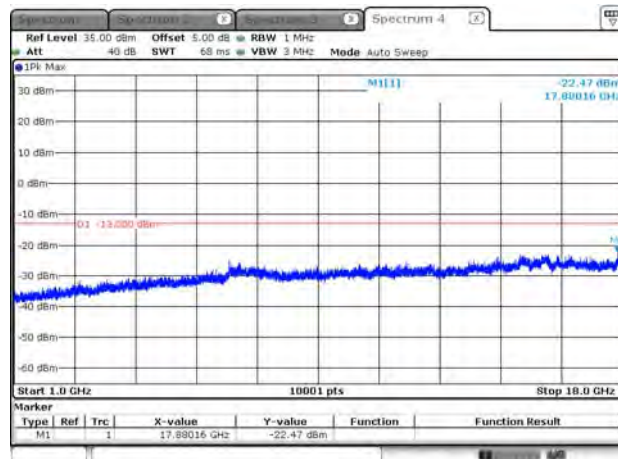
Date: 8 APR 2019 12:24:16

WCDMA_Band5_836.6MHz_RMC_under 1G



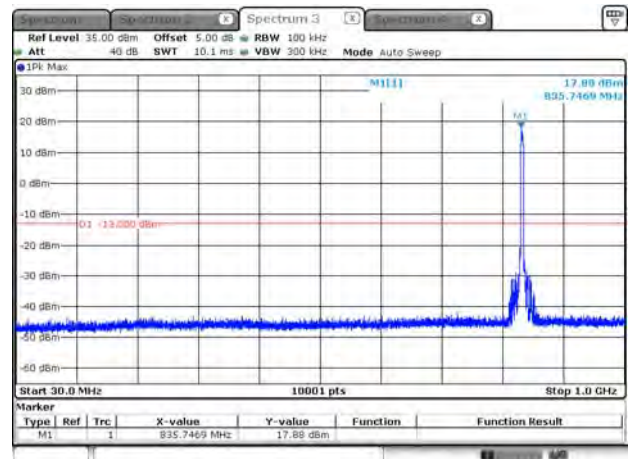
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WCDMA_Band5_836.6MHz_HSDPA_above 1G



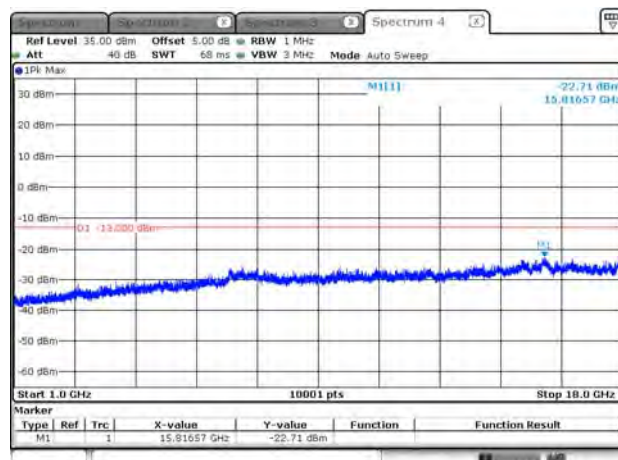
Date: 8 APR 2019 16:38:42

WCDMA_Band5_836.6MHz_HSDPA_under 1G



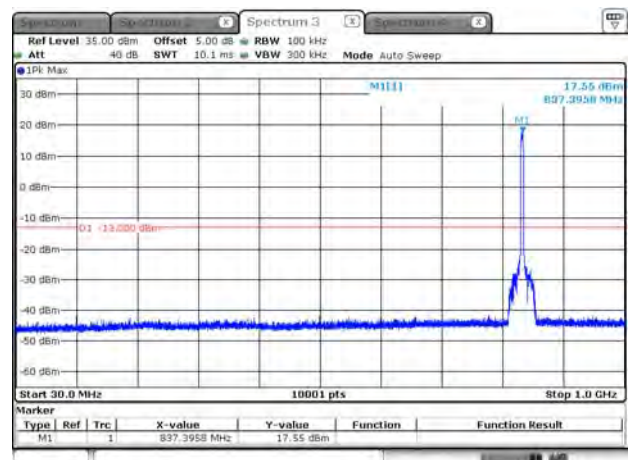
Date: 8 APR 2019 16:37:12

WCDMA_Band5_836.6MHz_HSUPA_above 1G



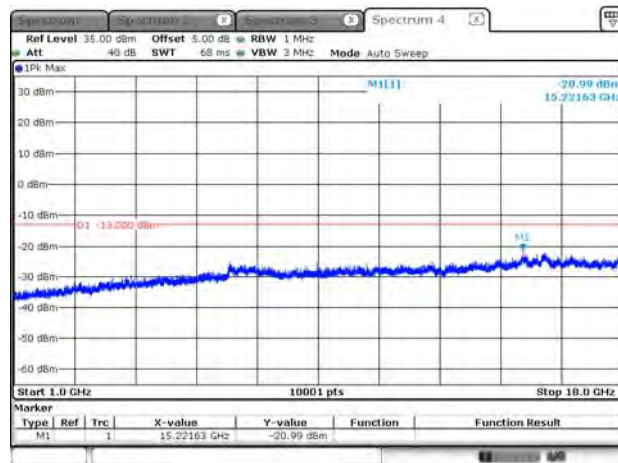
Date: 8 APR 2019 12:40:29

WCDMA_Band5_836.6MHz_HSUPA_under 1G



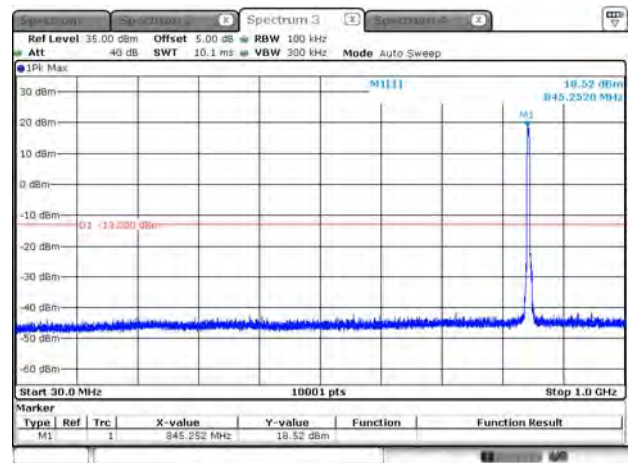
Date: 8 APR 2019 12:38:35

WCDMA_Band5_846.6MHz_RMC_above 1G



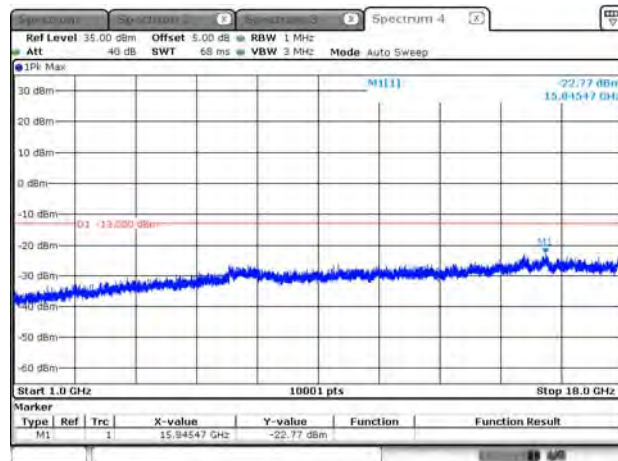
Date: 8 APR 2019 12:23:05

WCDMA_Band5_846.6MHz_RMC_under 1G



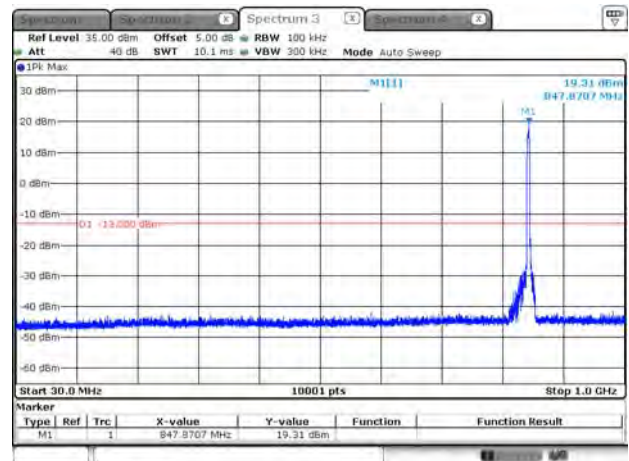
Date: 8 APR 2019 12:22:21

WCDMA_Band5_846.6MHz_HSDPA_above 1G



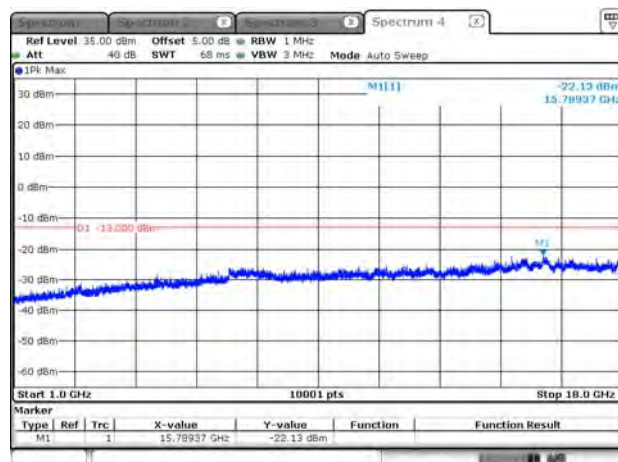
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WCDMA_Band5_846.6MHz_HSDPA_under 1G



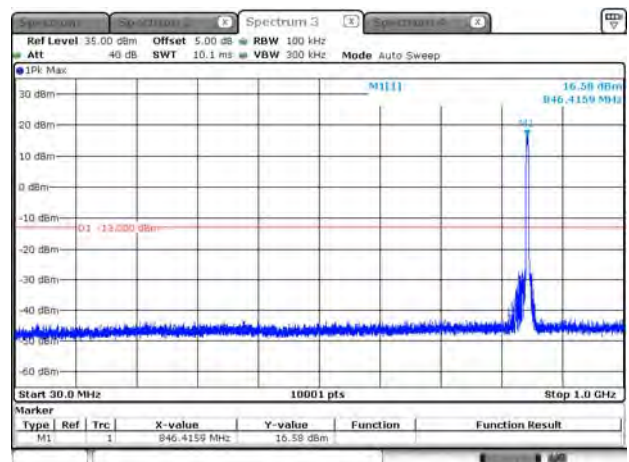
Date: 8 APR 2019 16:38:09

WCDMA_Band5_846.6MHz_HSUPA_above 1G



Date: 8 APR 2019 12:43:57

WCDMA_Band5_846.6MHz_HSUPA_under 1G



Date: 8 APR 2019 12:46:14

Product	Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 1: WCDMA_Band 2		
Date of Test	2019/04/16	Test Site	CB4-H

WCDMA_Band 2_RMC_Link

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 9262 (1852.4MHz)								
3704.80	-63.270	H	-64.684	4.287	11.931	-57.040	-13	-44.040
5557.20	-61.250	H	-55.867	5.203	12.900	-48.170	-13	-35.170
3704.80	-67.030	V	-66.494	4.287	11.931	-58.850	-13	-45.850
5557.20	-53.500	V	-48.217	5.203	12.900	-40.520	-13	-27.520
Middle Channel 9400 (1880MHz)								
3760.00	-65.100	H	-66.577	4.335	11.832	-59.080	-13	-46.080
5640.00	-59.900	H	-54.755	5.235	12.900	-47.090	-13	-34.090
3760.00	-62.410	V	-61.777	4.335	11.832	-54.280	-13	-41.280
5640.00	-52.740	V	-47.865	5.235	12.900	-40.200	-13	-27.200
High Channel 9538 (1907.6MHz)								
3815.20	-65.670	H	-67.231	4.382	11.733	-59.880	-13	-46.880
5722.80	-58.350	H	-53.443	5.267	12.900	-45.810	-13	-32.810
3815.20	-67.240	V	-66.531	4.382	11.733	-59.180	-13	-46.180
5722.80	-48.980	V	-44.503	5.267	12.900	-36.870	-13	-23.870

Test Result (EIRP) = SG Level - Cable Loss + Antenna Gain

Product	Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 1: WCDMA_Band 2		
Date of Test	2019/04/16	Test Site	CB4-H

WCDMA_Band 2_HSDPA_Link

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 9262 (1852.4MHz)								
3704.80	-65.630	H	-67.044	4.287	11.931	-59.400	-13	-46.400
5557.20	-61.590	H	-56.207	5.203	12.900	-48.510	-13	-35.510
3704.80	-65.690	V	-65.154	4.287	11.931	-57.510	-13	-44.510
5557.20	-53.760	V	-48.477	5.203	12.900	-40.780	-13	-27.780
Middle Channel 9400 (1880MHz)								
3760.00	-63.440	H	-64.917	4.335	11.832	-57.420	-13	-44.420
5640.00	-60.900	H	-55.755	5.235	12.900	-48.090	-13	-35.090
3760.00	-62.790	V	-62.157	4.335	11.832	-54.660	-13	-41.660
5640.00	-53.500	V	-48.625	5.235	12.900	-40.960	-13	-27.960
High Channel 9538 (1907.6MHz)								
3815.20	-66.290	H	-67.851	4.382	11.733	-60.500	-13	-47.500
5722.80	-58.470	H	-53.563	5.267	12.900	-45.930	-13	-32.930
3815.20	-67.350	V	-66.641	4.382	11.733	-59.290	-13	-46.290
5722.80	-48.940	V	-44.463	5.267	12.900	-36.830	-13	-23.830

Test Result (EIRP) = SG Level - Cable Loss + Antenna Gain

Product	Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 1: WCDMA_Band 2		
Date of Test	2019/04/16	Test Site	CB4-H

WCDMA_Band 2_HSUPA_Link

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 9262 (1852.4MHz)								
3704.80	-65.210	H	-66.624	4.287	11.931	-58.980	-13	-45.980
5557.20	-61.060	H	-55.677	5.203	12.900	-47.980	-13	-34.980
3704.80	-66.020	V	-65.484	4.287	11.931	-57.840	-13	-44.840
5557.20	-54.810	V	-49.527	5.203	12.900	-41.830	-13	-28.830
Middle Channel 9400 (1880MHz)								
3760.00	-64.960	H	-66.437	4.335	11.832	-58.940	-13	-45.940
5640.00	-58.020	H	-52.875	5.235	12.900	-45.210	-13	-32.210
3760.00	-61.820	V	-61.187	4.335	11.832	-53.690	-13	-40.690
5640.00	-51.080	V	-46.205	5.235	12.900	-38.540	-13	-25.540
High Channel 9538 (1907.6MHz)								
3815.20	-65.160	H	-66.721	4.382	11.733	-59.370	-13	-46.370
5722.80	-58.190	H	-53.283	5.267	12.900	-45.650	-13	-32.650
3815.20	-67.520	V	-66.811	4.382	11.733	-59.460	-13	-46.460
5722.80	-49.390	V	-44.913	5.267	12.900	-37.280	-13	-24.280

Test Result (EIRP) = SG Level - Cable Loss + Antenna Gain

Product	Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 2: WCDMA_Band 4		
Date of Test	2019/04/16	Test Site	CB4-H

WCDMA_Band 4_RMC_Link

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 1312 (1712.4MHz)								
3424.80	-63.510	H	-64.718	4.066	12.104	-56.680	-13	-43.680
5137.20	-58.410	H	-55.880	5.077	12.247	-48.710	-13	-35.710
3424.80	-60.080	V	-60.008	4.066	12.104	-51.970	-13	-38.970
5137.20	-56.810	V	-53.740	5.077	12.247	-46.570	-13	-33.570
Middle Channel 1413 (1732.6MHz)								
3465.20	-65.620	H	-66.539	4.090	12.210	-58.420	-13	-45.420
5197.80	-60.550	H	-57.522	5.094	12.356	-50.260	-13	-37.260
3465.20	-64.180	V	-63.829	4.090	12.210	-55.710	-13	-42.710
5197.80	-56.610	V	-53.142	5.094	12.356	-45.880	-13	-32.880
High Channel 1513 (1752.6MHz)								
3505.20	-62.960	H	-64.115	4.115	12.291	-55.940	-13	-42.940
5257.80	-57.050	H	-53.533	5.111	12.464	-46.180	-13	-33.180
3505.20	-62.740	V	-62.515	4.115	12.291	-54.340	-13	-41.340
5257.80	-51.260	V	-47.393	5.111	12.464	-40.040	-13	-27.040

Test Result (EIRP) = SG Level - Cable Loss + Antenna Gain

Product	Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 2: WCDMA_Band 4		
Date of Test	2019/04/16	Test Site	CB4-H

WCDMA_Band 4_HSDPA_Link

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 1312 (1712.4MHz)								
3424.80	-63.950	H	-65.158	4.066	12.104	-57.120	-13	-44.120
5137.20	-58.440	H	-55.910	5.077	12.247	-48.740	-13	-35.740
3424.80	-60.150	V	-60.078	4.066	12.104	-52.040	-13	-39.040
5137.20	-57.420	V	-54.350	5.077	12.247	-47.180	-13	-34.180
Middle Channel 1413 (1732.6MHz)								
3465.20	-65.570	H	-66.489	4.090	12.210	-58.370	-13	-45.370
5197.80	-61.680	H	-58.652	5.094	12.356	-51.390	-13	-38.390
3465.20	-64.290	V	-63.939	4.090	12.210	-55.820	-13	-42.820
5197.80	-55.490	V	-52.022	5.094	12.356	-44.760	-13	-31.760
High Channel 1513 (1752.6MHz)								
3505.20	-63.070	H	-64.225	4.115	12.291	-56.050	-13	-43.050
5257.80	-57.140	H	-53.623	5.111	12.464	-46.270	-13	-33.270
3505.20	-62.790	V	-62.565	4.115	12.291	-54.390	-13	-41.390
5257.80	-53.370	V	-49.503	5.111	12.464	-42.150	-13	-29.150

Test Result (EIRP) = SG Level - Cable Loss + Antenna Gain

Product	Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 2: WCDMA_Band 4		
Date of Test	2019/04/16	Test Site	CB4-H

WCDMA_Band 4_HSUPA_Link

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 1312 (1712.4MHz)								
3424.80	-63.570	H	-64.778	4.066	12.104	-56.740	-13	-43.740
5137.20	-58.460	H	-55.930	5.077	12.247	-48.760	-13	-35.760
3424.80	-59.980	V	-59.908	4.066	12.104	-51.870	-13	-38.870
5137.20	-56.410	V	-53.340	5.077	12.247	-46.170	-13	-33.170
Middle Channel 1413 (1732.6MHz)								
3465.20	-66.250	H	-67.169	4.090	12.210	-59.050	-13	-46.050
5197.80	-60.770	H	-57.742	5.094	12.356	-50.480	-13	-37.480
3465.20	-64.350	V	-63.999	4.090	12.210	-55.880	-13	-42.880
5197.80	-56.690	V	-53.222	5.094	12.356	-45.960	-13	-32.960
High Channel 1513 (1752.6MHz)								
3505.20	-63.120	H	-64.275	4.115	12.291	-56.100	-13	-43.100
5257.80	-58.580	H	-55.063	5.111	12.464	-47.710	-13	-34.710
3505.20	-60.460	V	-60.235	4.115	12.291	-52.060	-13	-39.060
5257.80	-51.570	V	-47.703	5.111	12.464	-40.350	-13	-27.350

Test Result (EIRP) = SG Level - Cable Loss + Antenna Gain

Product	Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 3: WCDMA_Band 5		
Date of Test	2019/04/16	Test Site	CB4-H

WCDMA_Band 5_RMC_Link

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 4132 (826.4MHz)								
1652.80	-46.730	H	-60.314	2.794	8.758	-54.350	-13	-41.350
2479.20	-65.320	H	-76.705	3.442	10.567	-69.580	-13	-56.580
1652.80	-50.470	V	-63.494	2.794	8.758	-57.530	-13	-44.530
2479.20	-67.650	V	-77.025	3.442	10.567	-69.900	-13	-56.900
Middle Channel 4183 (836.6MHz)								
1673.20	-50.500	H	-64.127	2.813	8.820	-58.120	-13	-45.120
2509.80	-65.290	H	-76.475	3.463	10.608	-69.330	-13	-56.330
1673.20	-53.950	V	-67.057	2.813	8.820	-61.050	-13	-48.050
2509.80	-67.580	V	-76.595	3.463	10.608	-69.450	-13	-56.450
High Channel 4233 (846.6MHz)								
1693.20	-49.110	H	-62.789	2.831	8.880	-56.740	-13	-43.740
2539.80	-65.060	H	-75.947	3.484	10.632	-68.800	-13	-55.800
1693.20	-53.010	V	-66.219	2.831	8.880	-60.170	-13	-47.170
2539.80	-66.960	V	-75.587	3.484	10.632	-68.440	-13	-55.440

Test Result (EIRP) = SG Level - Cable Loss + Antenna Gain

Product	Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 3: WCDMA_Band 5		
Date of Test	2019/04/16	Test Site	CB4-H

WCDMA_Band 5_HSDPA_Link

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 4132 (826.4MHz)								
1652.80	-46.840	H	-60.424	2.794	8.758	-54.460	-13	-41.460
2479.20	-65.290	H	-76.675	3.442	10.567	-69.550	-13	-56.550
1652.80	-50.580	V	-63.604	2.794	8.758	-57.640	-13	-44.640
2479.20	-67.570	V	-76.945	3.442	10.567	-69.820	-13	-56.820
Middle Channel 4183 (836.6MHz)								
1673.20	-50.570	H	-64.197	2.813	8.820	-58.190	-13	-45.190
2509.80	-65.260	H	-76.445	3.463	10.608	-69.300	-13	-56.300
1673.20	-53.640	V	-66.747	2.813	8.820	-60.740	-13	-47.740
2509.80	-66.820	V	-75.835	3.463	10.608	-68.690	-13	-55.690
High Channel 4233 (846.6MHz)								
1693.20	-49.200	H	-62.879	2.831	8.880	-56.830	-13	-43.830
2539.80	-65.050	H	-75.937	3.484	10.632	-68.790	-13	-55.790
1693.20	-53.230	V	-66.439	2.831	8.880	-60.390	-13	-47.390
2539.80	-66.370	V	-74.997	3.484	10.632	-67.850	-13	-54.850

Test Result (EIRP) = SG Level - Cable Loss + Antenna Gain

Product	Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 3: WCDMA_Band 5		
Date of Test	2019/04/16	Test Site	CB4-H

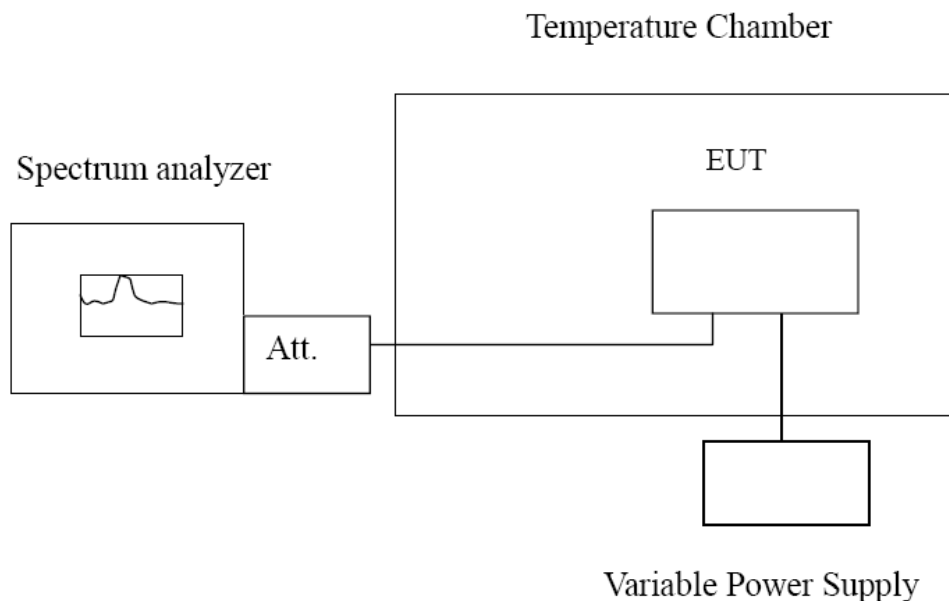
WCDMA_Band 5_HSUPA_Link

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 4132 (826.4MHz)								
1652.80	-47.190	H	-60.774	2.794	8.758	-54.810	-13	-41.810
2479.20	-65.130	H	-76.515	3.442	10.567	-69.390	-13	-56.390
1652.80	-49.810	V	-62.834	2.794	8.758	-56.870	-13	-43.870
2479.20	-66.170	V	-75.545	3.442	10.567	-68.420	-13	-55.420
Middle Channel 4183 (836.6MHz)								
1673.20	-50.720	H	-64.347	2.813	8.820	-58.340	-13	-45.340
2509.80	-64.410	H	-75.595	3.463	10.608	-68.450	-13	-55.450
1673.20	-53.630	V	-66.737	2.813	8.820	-60.730	-13	-47.730
2509.80	-68.560	V	-77.575	3.463	10.608	-70.430	-13	-57.430
High Channel 4233 (846.6MHz)								
1693.20	-49.230	H	-62.909	2.831	8.880	-56.860	-13	-43.860
2539.80	-64.530	H	-75.417	3.484	10.632	-68.270	-13	-55.270
1693.20	-53.230	V	-66.439	2.831	8.880	-60.390	-13	-47.390
2539.80	-66.670	V	-75.297	3.484	10.632	-68.150	-13	-55.150

Test Result (EIRP) = SG Level - Cable Loss + Antenna Gain

8. Frequency Stability

8.1. Test Setup



8.2. Test Procedure

Frequency Stability under Temperature Variations:

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

Frequency Stability under Voltage Variations:

Set chamber temperature to 20°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specify extreme voltage variation ($\pm 15\%$) and endpoint, record the maximum frequency change.

8.3. Test Method

KDB 971168 D01 Power Meas License Digital Systems v03 sub-clause 9

ANSI C63.26-2015 Sub-clause 5.6

8.4. Test Result

Product	Module		
Test Item	Frequency Stability		
Test Mode	Mode 1: WCDMA _Band 2		
Date of Test	2019/04/02	Test Site	SR10-H

WCDMA_Band 2_1852.4MHz

Voltage

DC Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)
4.2	14	-0.0208
3.8	24	-0.0357
3.4	14	-0.0208

Temperature

Temperature	Frequency Error (Hz)	Frequency Error (ppm)
-30	16	-0.0238
-20	11	-0.0163
-10	7	-0.0104
0	-10	0.0149
10	4	-0.0059
20	-1	0.0015
30	8	-0.0119
40	8	-0.0119
50	7	-0.0104

Product	Module		
Test Item	Frequency Stability		
Test Mode	Mode 1: WCDMA_Band 2		
Date of Test	2019/04/02	Test Site	SR10-H

WCDMA_Band 2_1880MHz

Voltage

DC Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)
4.2	-7	0.0103
3.8	-42	0.0617
3.4	-26	0.0382

Temperature

Temperature	Frequency Error (Hz)	Frequency Error (ppm)
-30	-1	0.0015
-20	1	-0.0015
-10	-36	0.0529
0	21	-0.0309
10	20	-0.0294
20	-22	0.0323
30	4	-0.0059
40	-26	0.0382
50	-35	0.0514

Product	Module		
Test Item	Frequency Stability		
Test Mode	Mode 1: WCDMA_Band 2		
Date of Test	2019/04/02	Test Site	SR10-H

WCDMA_Band 2_1907.6MHz

Voltage

DC Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)
4.2	-23	0.0331
3.8	20	-0.0288
3.4	22	-0.0316

Temperature

Temperature	Frequency Error (Hz)	Frequency Error (ppm)
-30	-3	0.0043
-20	-5	0.0072
-10	-21	0.0302
0	-23	0.0331
10	-4	0.0058
20	-15	0.0216
30	-20	0.0288
40	9	-0.0129
50	22	-0.0316

Product	Module		
Test Item	Frequency Stability		
Test Mode	Mode 2: WCDMA_Band 4		
Date of Test	2019/04/02	Test Site	SR10-H

WCDMA_Band 4_1712.4MHz

Voltage

DC Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)
4.2	1	-0.0015
3.8	18	-0.0267
3.4	-4	0.0059

Temperature

Temperature	Frequency Error (Hz)	Frequency Error (ppm)
-30	24	-0.0357
-20	-24	0.0357
-10	3	-0.0045
0	-36	0.0535
10	-4	0.0059
20	4	-0.0059
30	-29	0.0431
40	-35	0.0520
50	-35	0.0520

Product	Module		
Test Item	Frequency Stability		
Test Mode	Mode 2: WCDMA_Band 4		
Date of Test	2019/04/02	Test Site	SR10-H

WCDMA_Band 4_1732.6MHz

Voltage

DC Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)
4.2	-22	0.0323
3.8	-37	0.0544
3.4	-28	0.0411

Temperature

Temperature	Frequency Error (Hz)	Frequency Error (ppm)
-30	-13	0.0191
-20	-28	0.0411
-10	25	-0.0367
0	-32	0.0470
10	16	-0.0235
20	-34	0.0500
30	-28	0.0411
40	-29	0.0426
50	-30	0.0441

Product	Module		
Test Item	Frequency Stability		
Test Mode	Mode 2: WCDMA_Band 4		
Date of Test	2019/04/02	Test Site	SR10-H

WCDMA_Band 4_1752.6MHz

Voltage

DC Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)
4.2	5	-0.0072
3.8	-34	0.0489
3.4	-10	0.0144

Temperature

Temperature	Frequency Error (Hz)	Frequency Error (ppm)
-30	-27	0.0388
-20	24	-0.0345
-10	-29	0.0417
0	-27	0.0388
10	-36	0.0518
20	8	-0.0115
30	1	-0.0014
40	-34	0.0489
50	14	-0.0201

Product	Module		
Test Item	Frequency Stability		
Test Mode	Mode 3: WCDMA_Band 5		
Date of Test	2019/04/02	Test Site	SR10-H

WCDMA_Band 5_826.4MHz

Voltage

DC Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)
4.2	5	-0.0072
3.8	5	-0.0072
3.4	2	-0.0029

Temperature

Temperature	Frequency Error (Hz)	Frequency Error (ppm)
-30	3	-0.0043
-20	-5	0.0072
-10	-24	0.0345
0	-42	0.0604
10	-31	0.0446
20	8	-0.0115
30	-21	0.0302
40	5	-0.0072
50	-36	0.0518

Product	Module		
Test Item	Frequency Stability		
Test Mode	Mode 3: WCDMA_Band 5		
Date of Test	2019/04/02	Test Site	SR10-H

WCDMA_Band 5_836.6MHz

Voltage

DC Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)
4.2	-13	0.0193
3.8	-31	0.0461
3.4	-7	0.0104

Temperature

Temperature	Frequency Error (Hz)	Frequency Error (ppm)
-30	-11	0.0163
-20	-15	0.0223
-10	-31	0.0461
0	-34	0.0505
10	-15	0.0223
20	1	-0.0015
30	7	-0.0104
40	-36	0.0535
50	-20	0.0297

Product	Module		
Test Item	Frequency Stability		
Test Mode	Mode 3: WCDMA_Band 5		
Date of Test	2019/04/02	Test Site	SR10-H

WCDMA_Band 5_846.6MHz

Voltage

DC Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)
4.2	6	-0.0089
3.8	-13	0.0193
3.4	-35	0.0520

Temperature

Temperature	Frequency Error (Hz)	Frequency Error (ppm)
-30	-5	0.0074
-20	-40	0.0594
-10	2	-0.0030
0	12	-0.0178
10	18	-0.0267
20	-42	0.0624
30	-39	0.0579
40	-4	0.0059
50	24	-0.0357