

ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR LICENSED TRANSMITTER

Test Report No. : W165R-D017

AGR No. : A161A-258

Applicant : BLUEBIRD INC.

Address : (Dogok-dong, SEI Tower13,14)39, Eonjuro30-gil, Gangnam-gu, Seoul, South Korea

Manufacturer : BLUEBIRD INC.

Address : (Dogok-dong, SEI Tower13,14)39, Eonjuro30-gil, Gangnam-gu, Seoul, South Korea

Type of Equipment : Premium Tablet

FCC ID. : SS4ST100

Model Name : ST100

Serial number : N/A

Total page of Report : 36 pages (including this page)

Date of Incoming : February 01, 2016

Date of issue : May 12, 2016

SUMMARY

The equipment complies with the regulation; **FCC Part 22 Subpart H**

This test report only contains the result of a single test of the sample supplied for the examination.

It is not a generally valid assessment of the features of the respective products of the mass-production.

Prepared by:



Jae-Ho, Lee / Chief Engineer
ONETECH Corp.

Approved by:



Sung-Ik, Han / Managing Director
ONETECH Corp.

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Revision History

Issued Report No.	Issued Date	Revisions	Effect Section
W165R-D017	May 12, 2016	Initial Issue	All

1. VERIFICATION OF COMPLIANCE

APPLICANT : BLUEBIRD INC.
 ADDRESS : (Dogok-dong, SEI Tower13,14)39, Eonjuro30-gil, Gangnam-gu, Seoul, South Korea
 CONTACT PERSON : Jae-ho, Lee / Assistant Manager
 TELEPHONE NO : +82-70-7730-8210
 HOST MODEL NAME : ST100
 HOST FCC ID : SS4ST100
 MODULE MODEL NAME : MU739
 MODULE FCC ID : QISMU739
 SERIAL NUMBER : N/A
 DATE : May 12, 2016

EQUIPMENT CLASS	PCB-PCS Licensed Transmitter
EQUIPMENT DESCRIPTION	Premium Tablet
THIS REPORT CONCERNS	Original Grant
MEASUREMENT PROCEDURES	ANSI C63.10: 2013
TYPE OF EQUIPMENT TESTED	Pre-Production
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	Certification
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	FCC Part 22 Subpart H
MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE	No
FINAL TEST WAS CONDUCTED ON	3 m, Semi Anechoic Chamber

-. The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

2. TEST SUMMARY

2.1 Test items and results

SECTION	TEST ITEMS	RESULTS
2.1046, 22.913	Conducted Power of Transmitter	Met the Limit / PASS
2.1049	Occupied Bandwidth	Met the Limit / PASS
2.1051, 22.917	Band Edges compliance	Met the Limit / PASS
2.1051, 22.917	Spurious Emission at Antenna Terminal	Met the Limit / PASS

2.2 Additions, deviations, exclusions from standards

No additions, deviations or exclusions have been made from standard.

2.3 Related Submittal(s) / Grant(s)

Original Grant

2.4 Purpose of the test

To determine whether the equipment under test fulfills the requirements of the regulation stated in section 2.1.

2.5 Test Methodology

Radiated testing was performed according to the procedures in ANSI/TIA-603-D was performed at a distance of 3 m from EUT to the antenna.

2.6 Test Facility

The Onetech Corp. has been designated to perform equipment testing in compliance with ISO/IEC 17025.

The Electromagnetic compatibility measurement facilities are located at 301-14, Daessangnyeong-ri, Chowol-eup, Gwangju-si, Gyeonggi-do, 464-862 Korea.

-. Site Filing:

VCCI (Voluntary Control Council for Interference) – Registration No. R-4112/ C-4617/ G-666/ T-1842

IC (Industry Canada) – Registration No. Site# 3736A-3

-. Site Accreditation:

KOLAS (Korea Laboratory Accreditation Scheme) - Accreditation NO. KT085

FCC (Federal Communications Commission) - Accreditation No. KR0013

RRA (Radio Research Agency) – Designation No. KR0013

3. GENERAL INFORMATION

3.1 Product Description

The BLUEBIRD INC., Model ST100 (referred to as the EUT in this report) is a Premium Tablet. The product specification described herein was obtained from product data sheet or user's manual.

DEVICE TYPE	Premium Tablet
LIST OF EACH OSC. or CRY. FREQ.(FREQ. >= 1 MHz)	26 MHz
EMISSION DESIGNATOR	GPRS, HSDPA, HSUPA
OPERATING FREQUENCY	GPRS : 824.2 MHz ~ 848.8 MHz
	HSDPA : 826.4 MHz ~ 846.6 MHz
	HSUPA : 826.4 MHz ~ 846.6 MHz
ANTENNA TYPE	PIFA Antenna
RATED SUPPLY VOLTAGE	DC 3.8 V
EXTERNAL CONNECTOR	Micro SD card slot, USIM card slot, USB, AUX

3.2 Alternative type(s)/model(s); also covered by this test report.

-. None

3.3 Peripheral equipment

Defined as equipment needed for correct operation of the EUT, but not considered as tested:

Model	Manufacturer	Description	Connected to
N/A	N/A	N/A	N/A

3.4 Mode of operation during the test

The EUT was received signal form signal generator and then each modulation was configured for maximum signal gain and bandwidth. The EUT was operated in a manner representative of the typical usage of the equipment. During all testing, system components were manipulated within the confines of typical usage to maximize each emission. The applicant does not supply antenna(s) with the system, so the dummy loads were connected to the RF output ports on the EUT for radiated spurious emission testing.

For the above testing, following frequencies per channel were selected for each modulation.

- Mode

Modulation	Channel	Frequency	Modulation	Channel	Frequency	Modulation	Channel	Frequency
GPRS	Low	824.2	HSDPA	Low	826.4	HSUPA	Low	826.4
	Middle	836.6		Middle	836.6		Middle	836.6
	High	848.8		High	846.6		High	846.6

4. EUT MODIFICATIONS

-. None

5. Conducted Power of Transmitter

5.1 Operating environment

Temperature : 25 °C
Relative humidity : 40 % R.H.

5.2 Test set-up



5.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ -	E5515C	Agilent	WIRELESS COMMUNICATIONS TEST	GB44350208	Oct. 07, 2015 (1Y)

All test equipment used is calibrated on a regular basis.

5.4 Test data

5.4.1 Test data for GSM850

-. Test Date : May 12, 2016

-. Test Result : Pass

CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	824.2	32.54	38.45	5.91
MIDDLE	837.0	32.54	38.45	5.91
HIGH	848.8	32.50	38.45	5.95

Remark. Margin = Limit – Measured Value (=Receiver Reading + Cable Loss)

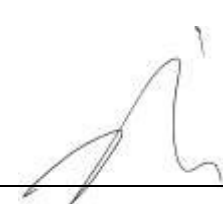
5.4.2 Test data for WCDMA(Band 5)

-. Test Date : May 12, 2016

-. Test Result : Pass

CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	816.4	23.76	38.45	14.69
MIDDLE	836.4	23.63	38.45	14.82
HIGH	846.6	23.63	38.45	14.82

Remark. Margin = Limit – Measured Value (=Receiver Reading + Cable Loss)



Tested by: Jun-Hui, Lee / Senior Engineer

6. Occupied Bandwidth

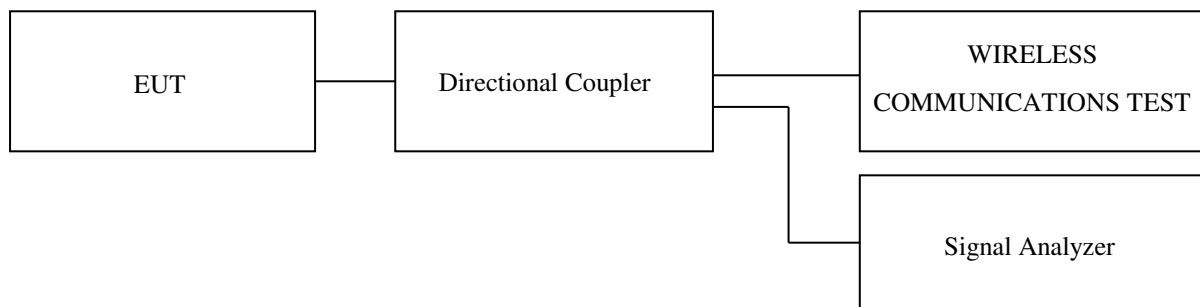
6.1 Operating environment

Temperature : 25 °C
Relative humidity : 40 % R.H.

6.2 Test set-up

The emission bandwidth (×dB) is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated × dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3× the resolution bandwidth. When the occupied bandwidth limit is not stated in the applicable RSS or reference measurement method, the transmitted signal bandwidth shall be reported as the 99% emission bandwidth, as calculated or measured.

- The transmitter shall be operated at its maximum carrier power measured under normal test conditions.
- The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.
- The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) shall be approximately 3×RBW.



6.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ -	FSV40	Rohde & Schwarz	Signal Analyzer	101009	Jul. 22, 2015 (1Y)
■ -	E5515C	Agilent	WIRELESS COMMUNICATIONS TEST	GB44350208	Oct. 07, 2015 (1Y)
■ -	AAMCS-UDC	AA-MCS	Directional Coupler	400	Nov. 10, 2015 (1Y)

All test equipment used is calibrated on a regular basis.

6.4 Test data

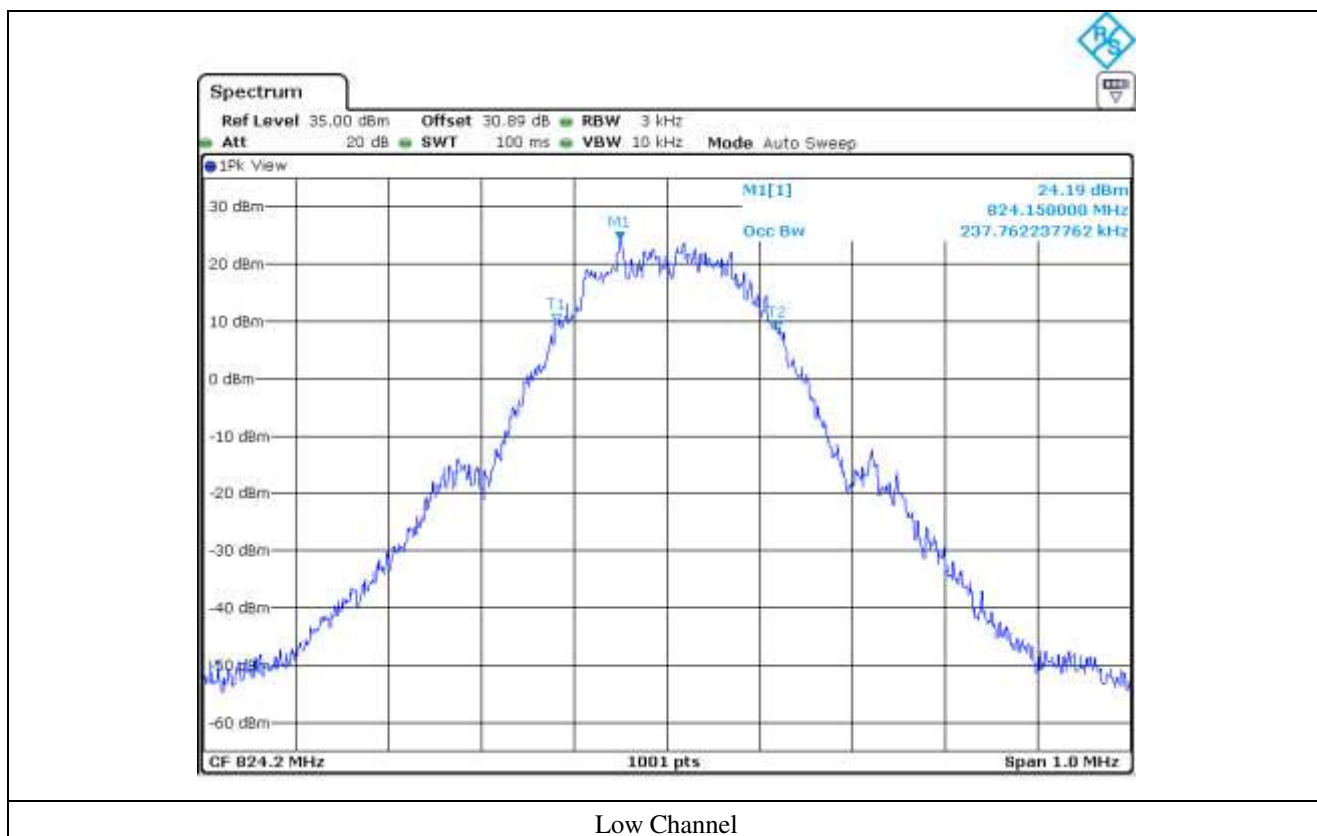
6.4.1 Test data for GSM850

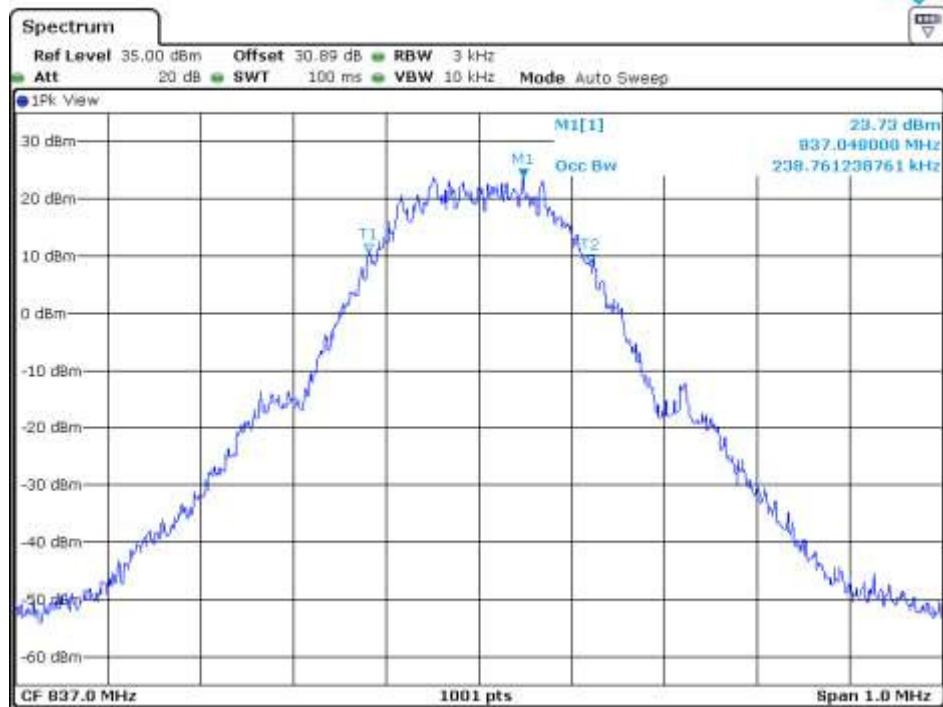
-. Test Date : May 12, 2016

-. Test Result : Pass

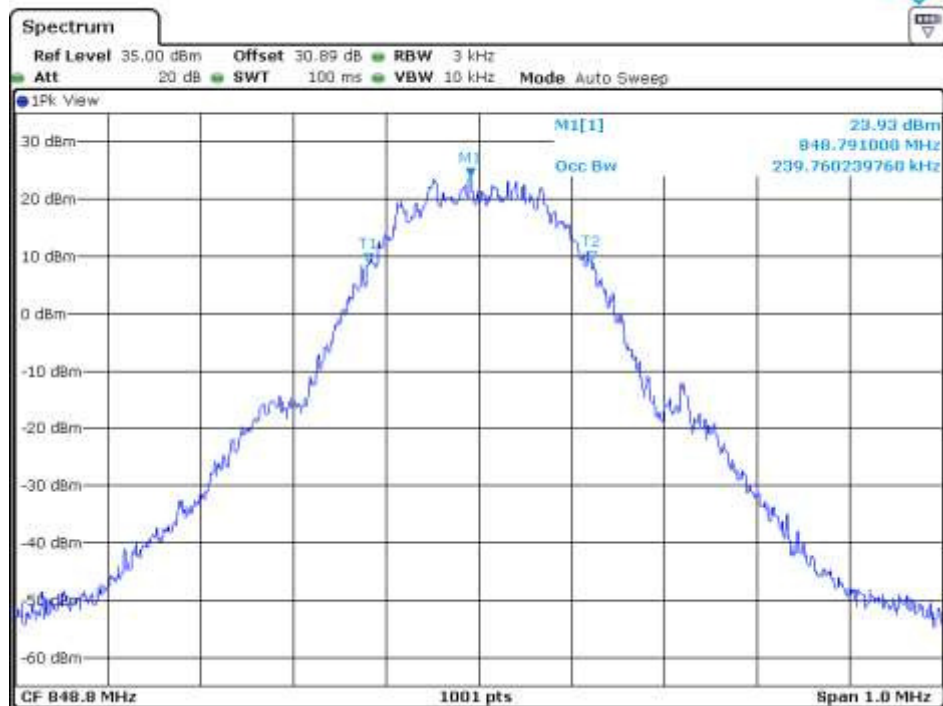
CHANNEL	FREQUENCY(MHz)	99% Occupied Bandwidth(kHz)
Low	824.2	237.76
Middle	837.0	238.76
High	848.8	239.76

Tested by: Jun-Hui, Lee / Senior Engineer





Middle Channel



High Channel

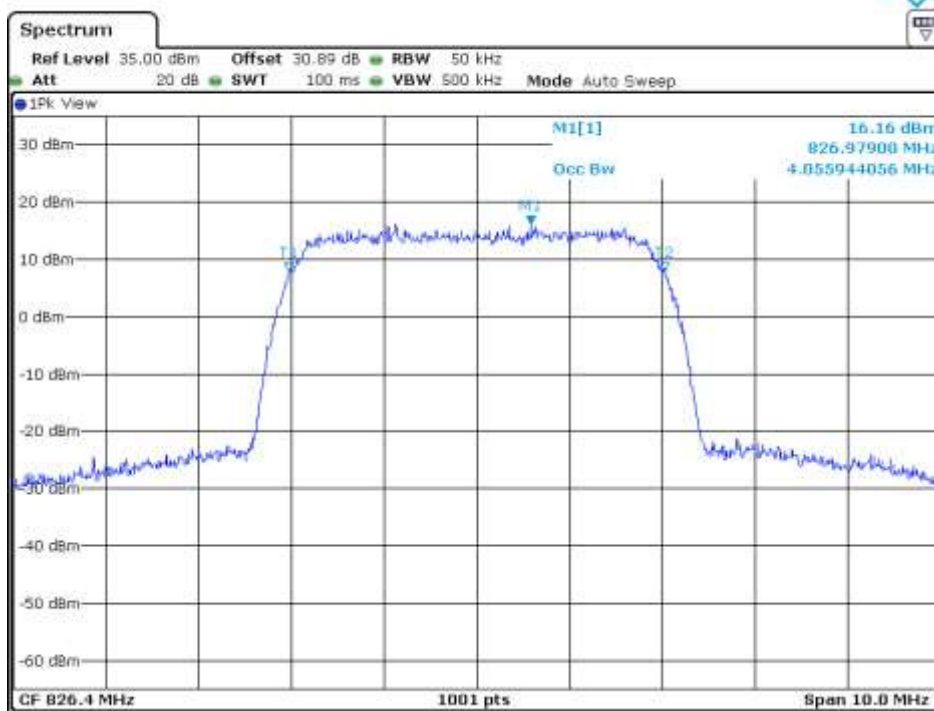
6.4.2 Test data for WCDMA(Band 5)

-. Test Date : May 12, 2016

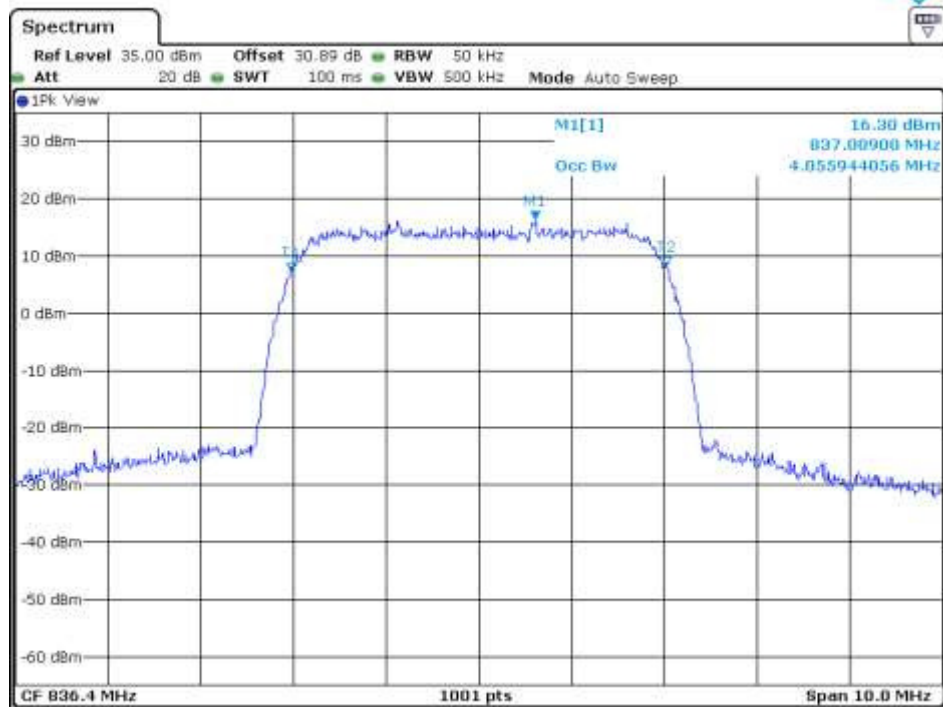
-. Test Result : Pass

CHANNEL	FREQUENCY(MHz)	99% Occupied Bandwidth(MHz)
Low	826.4	4.06
Middle	836.4	4.06
High	846.6	4.06

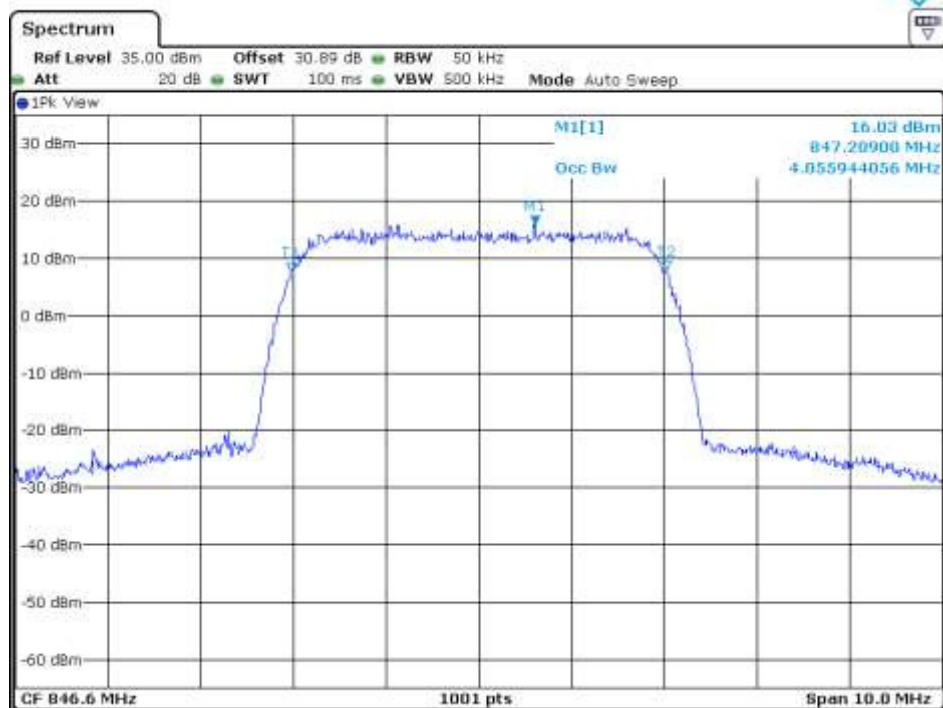
Tested by: Jun-Hui, Lee / Senior Engineer



Low Channel



Middle Channel



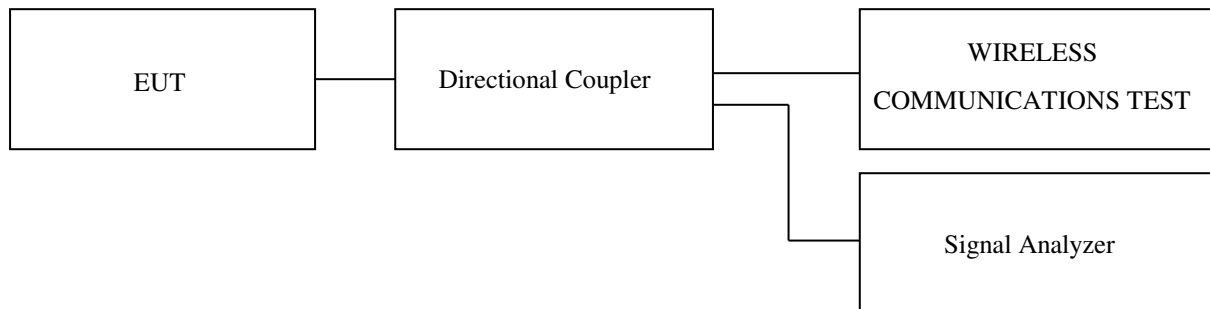
High Channel

7. Band Edges Compliance

7.1 Operating environment

Temperature : 25 °C
Relative humidity : 40 % R.H.

7.2 Test set-up



7.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ -	FSV40	Rohde & Schwarz	Signal Analyzer	101009	Jul. 22, 2015 (1Y)
■ -	E5515C	Agilent	WIRELESS COMMUNICATIONS TEST	GB44350208	Oct. 07, 2015 (1Y)
■ -	AAMCS-UDC	AA-MCS	Directional Coupler	400	Nov. 10, 2015 (1Y)

All test equipment used is calibrated on a regular basis.

7.4 Test data

7.4.1 Test data for GSM850

-. Test Date : May 12, 2016

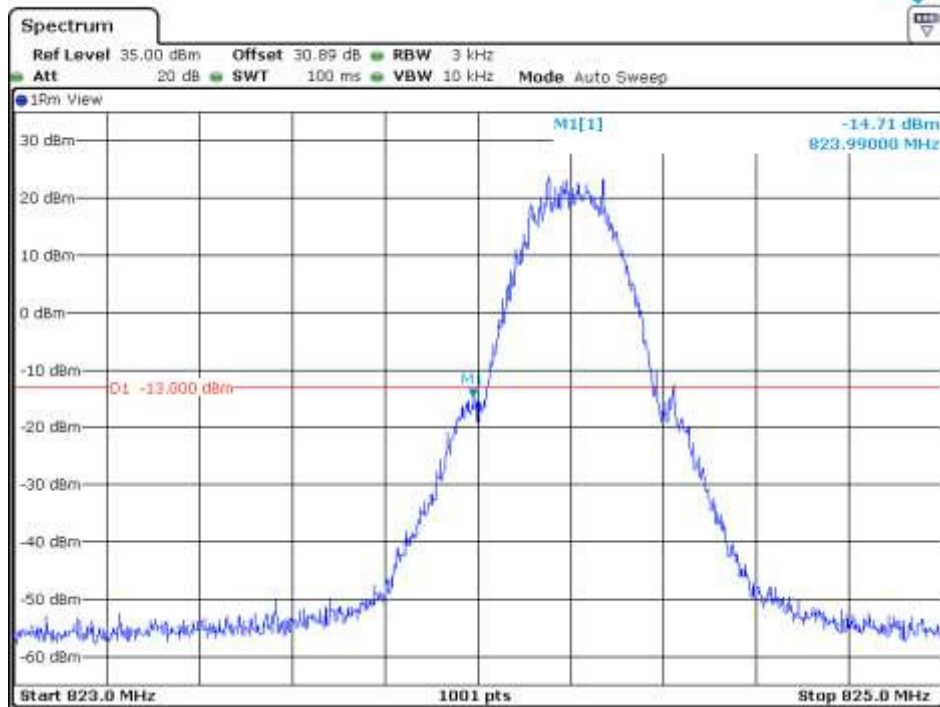
-. Test Result : Pass

CHANNEL	FREQUENCY (MHz)	Measured Value (dBm)	LIMITS (dBm)	MARGIN (dB)
LOW	823.99	-14.71	-13.00	1.71
HIGH	849.02	-14.07	-13.00	1.07

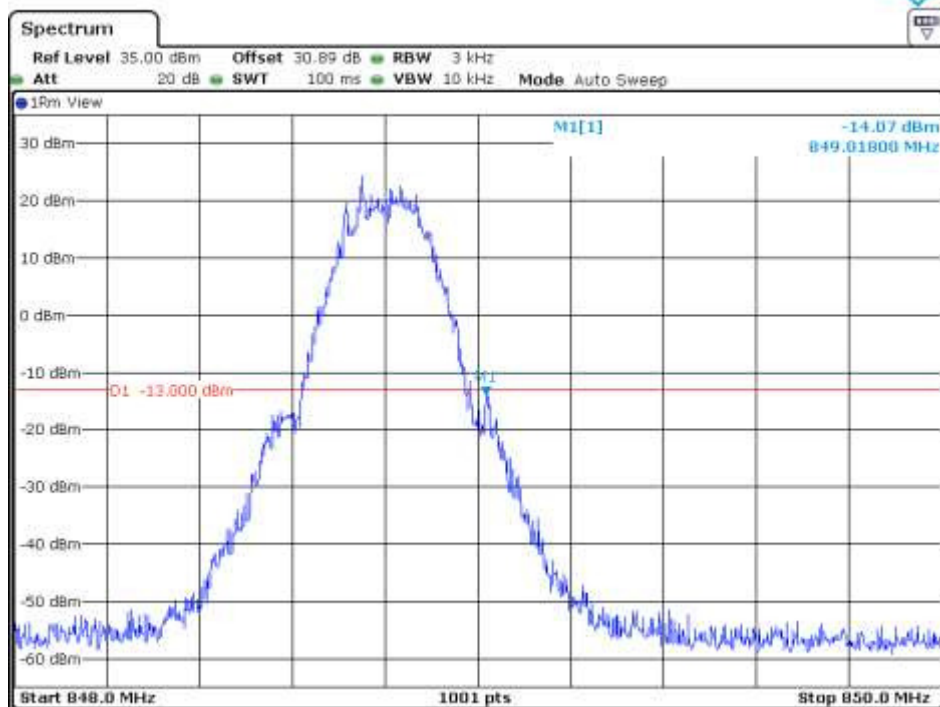
Remark. Margin = Limit – Measured Value (=Receiver Reading + Cable Loss)



Tested by: Jun-Hui, Lee / Senior Engineer



Low Channel



High Channel

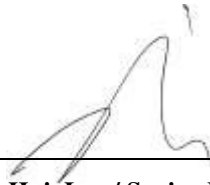
7.4.2 Test data for WCDMA(Band 5)

-. Test Date : May 12, 2016

-. Test Result : Pass

CHANNEL	FREQUENCY (MHz)	Measured Value (dBm)	LIMITS (dBm)	MARGIN (dB)
LOW	824.00	-26.89	-13.00	13.89
HIGH	849.01	-25.19	-13.00	12.19

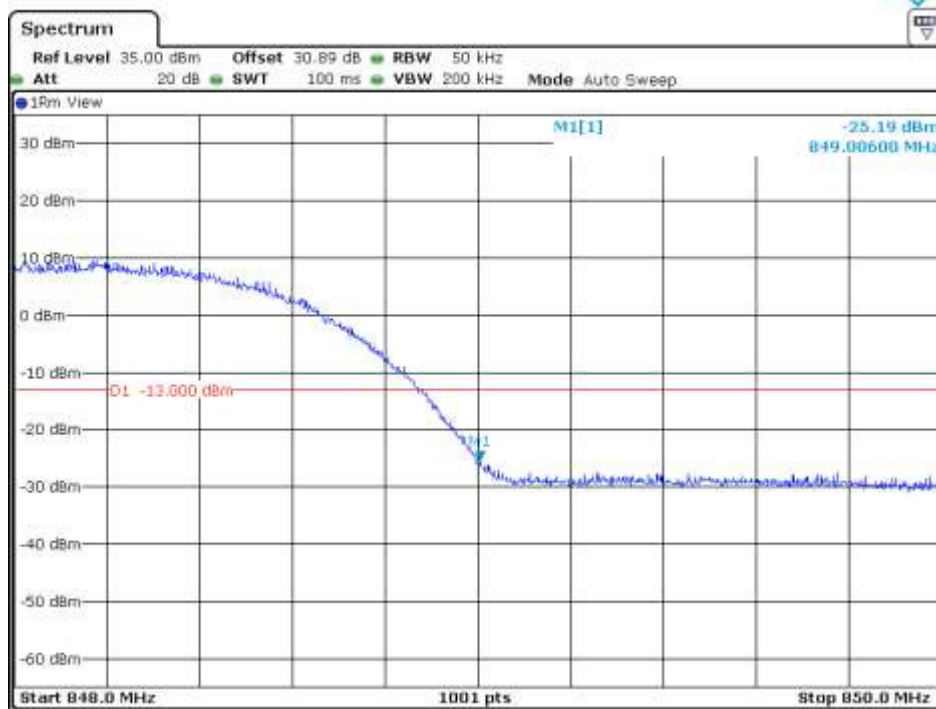
Remark. Margin = Limit – Measured Value (=Receiver Reading + Cable Loss)



Tested by: Jun-Hui, Lee / Senior Engineer



Low Channel



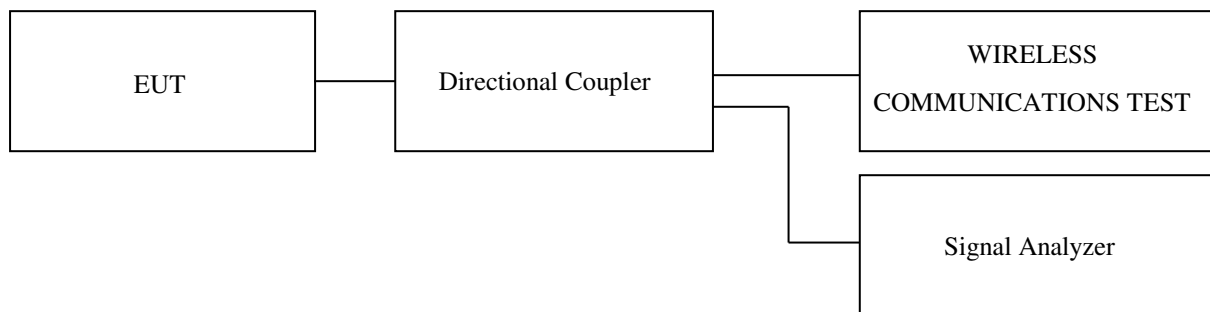
High Channel

8. Spurious Emission at Antenna Terminal

8.1 Operating environment

Temperature : 25 °C
Relative humidity : 40 % R.H.

8.2 Test set-up



8.3 Test equipment used

Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ - FSV40	Rohde & Schwarz	Signal Analyzer	101009	Jul. 22, 2015 (1Y)
■ - E5515C	Agilent	WIRELESS COMMUNICATIONS TEST	GB44350208	Oct. 07, 2015 (1Y)
■ - AAMCS-UDC	AA-MCS	Directional Coupler	400	Nov. 10, 2015 (1Y)

All test equipment used is calibrated on a regular basis.

8.4 Test data

8.4.1 Test data for GSM850

-. Test Date : May 12, 2016

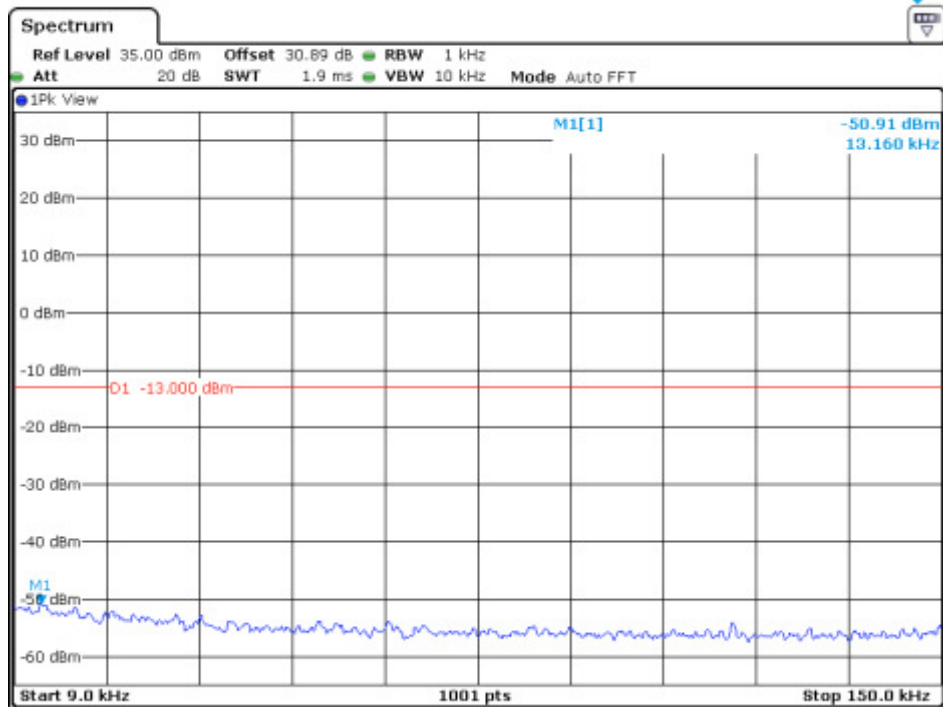
-. Test Result : Pass

CHANNEL	FREQUENCY (MHz)	Measured value (dBm)	LIMITS (dBm)	MARGIN (dB)
LOW	6 863.00	-23.30	-13.00	10.30
MIDDLE	6 945.00	-23.59	-13.00	10.59
HIGH	6 441.00	-22.56	-13.00	9.56

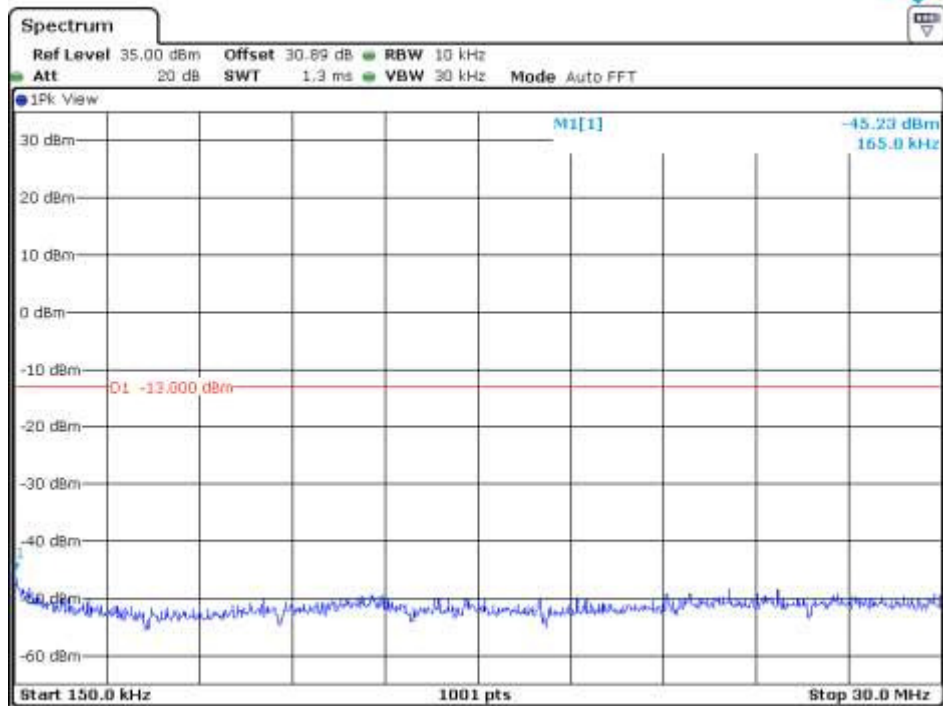
Remark. Margin = Limit – Measured Value (=Receiver Reading + Cable Loss)



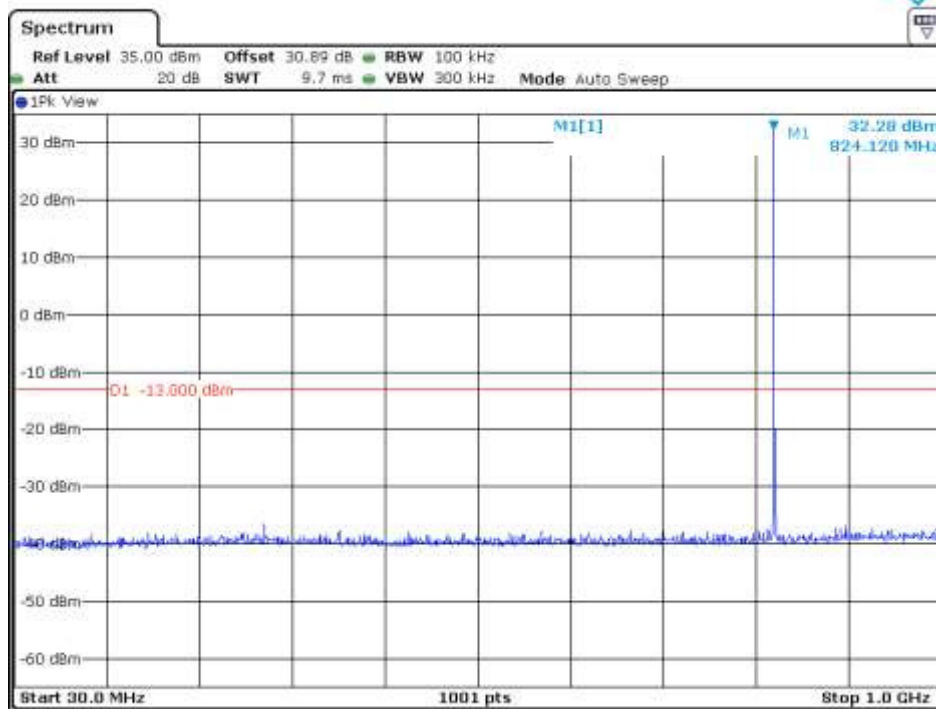
Tested by: Jun-Hui, Lee / Senior Engineer



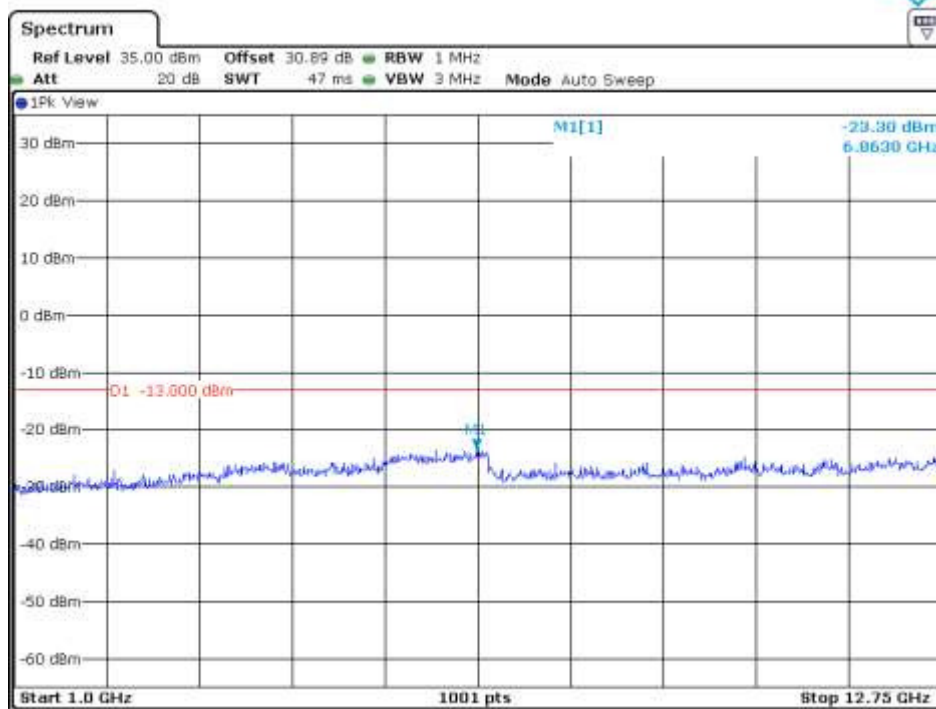
Low Channel



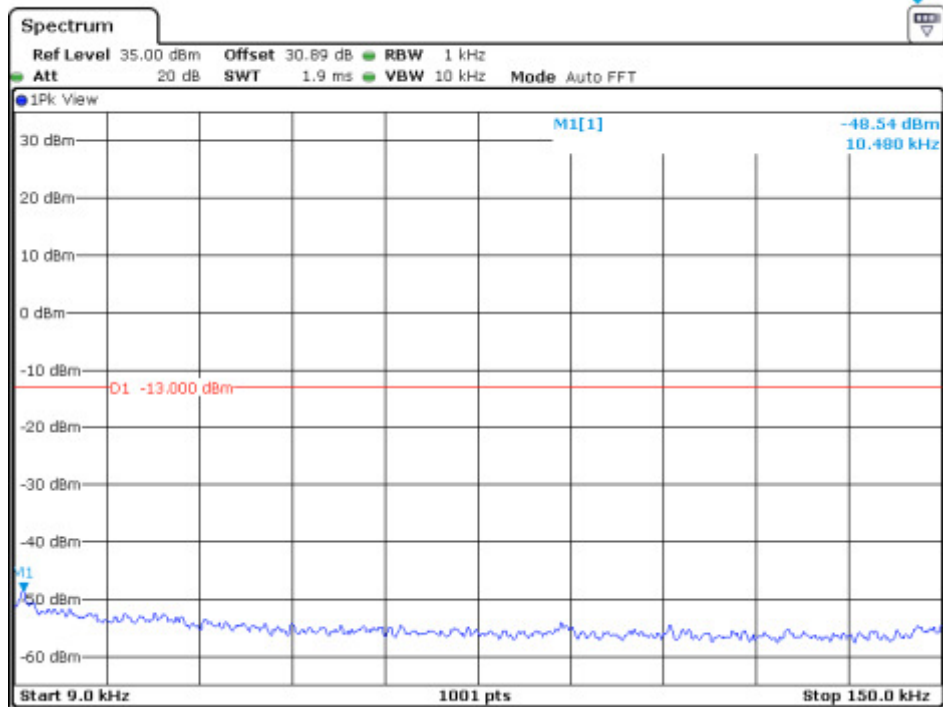
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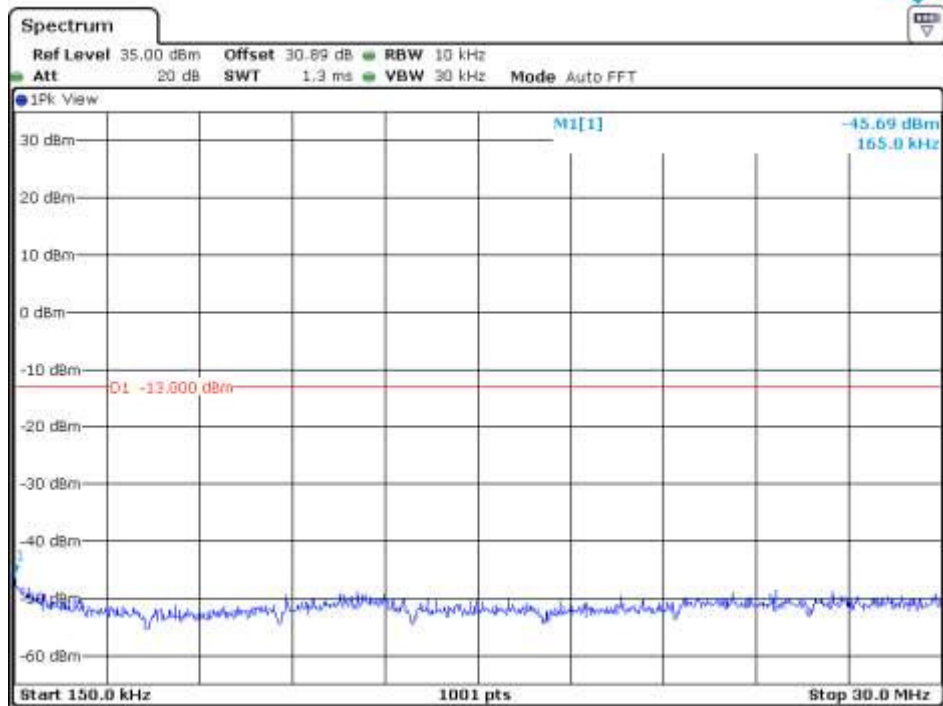
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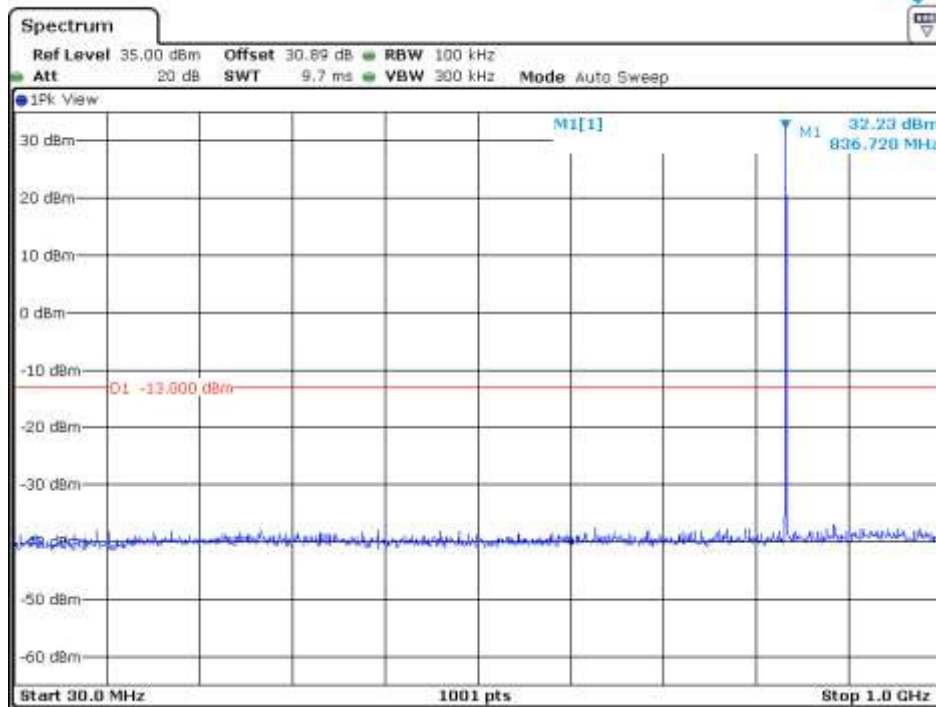
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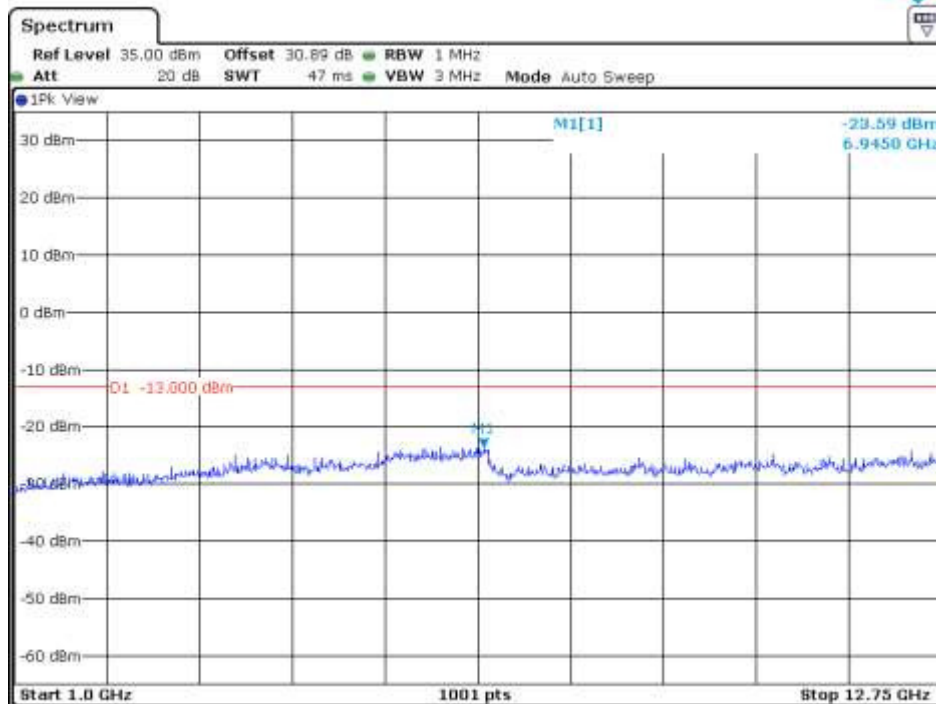
Middle Channel



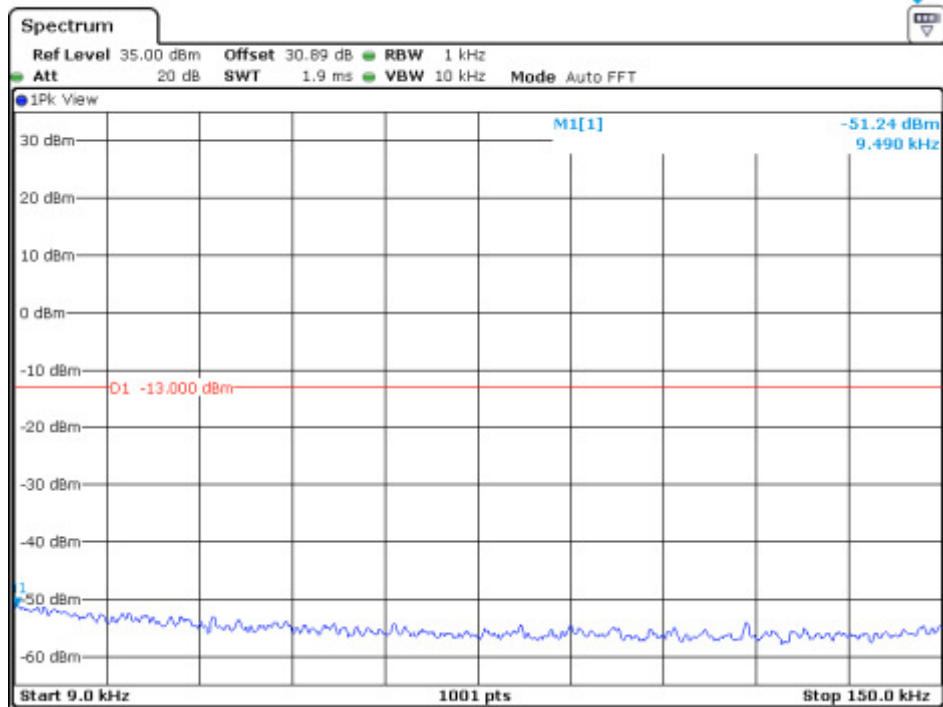
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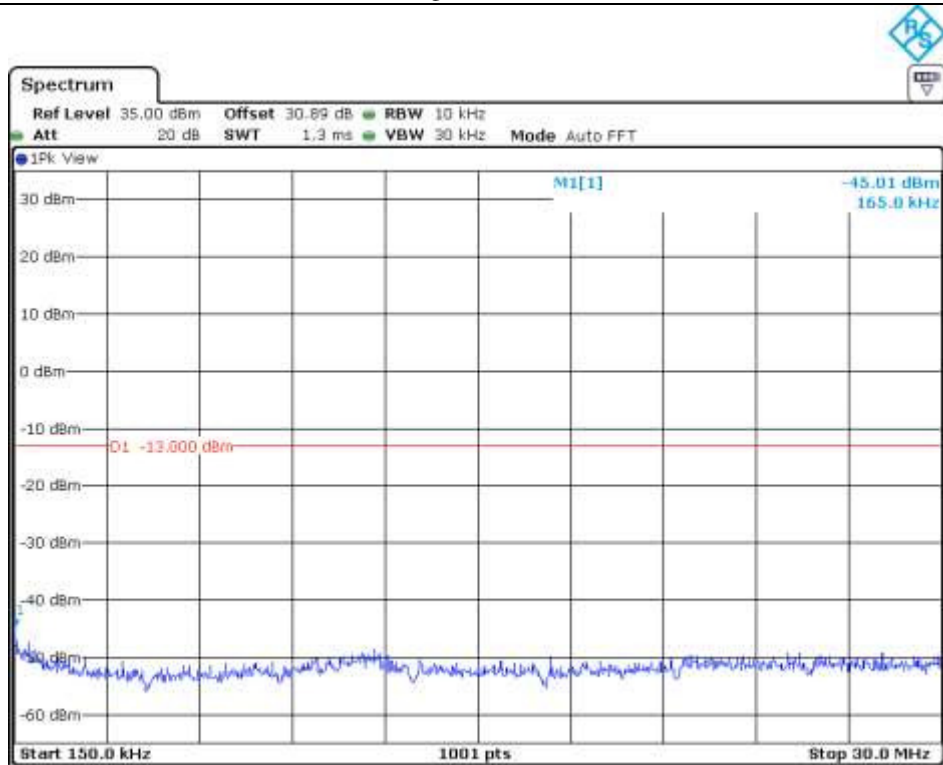
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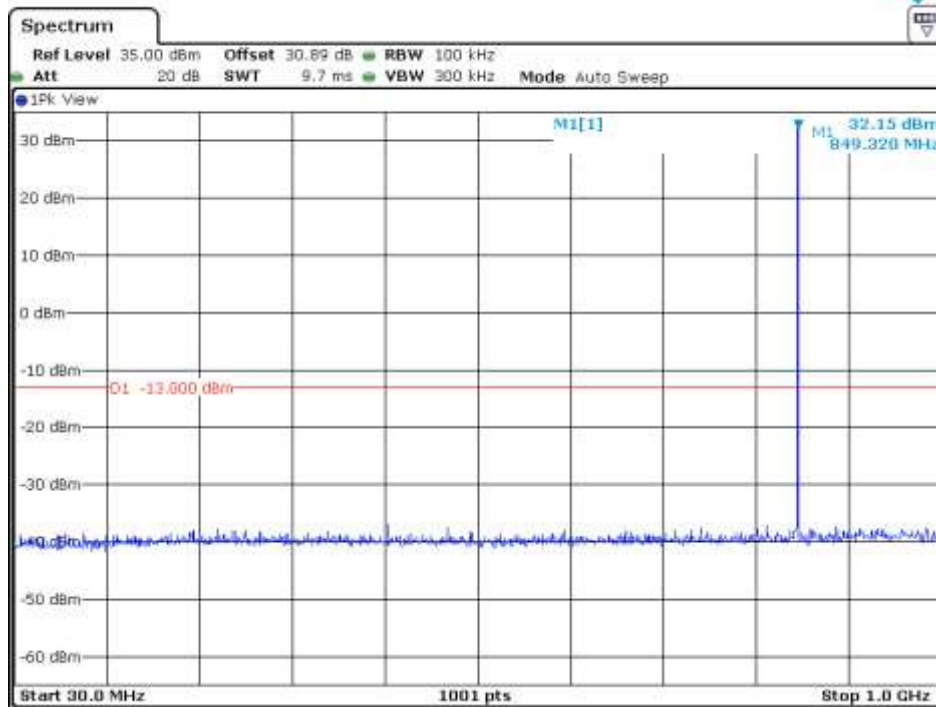
Middle Channel



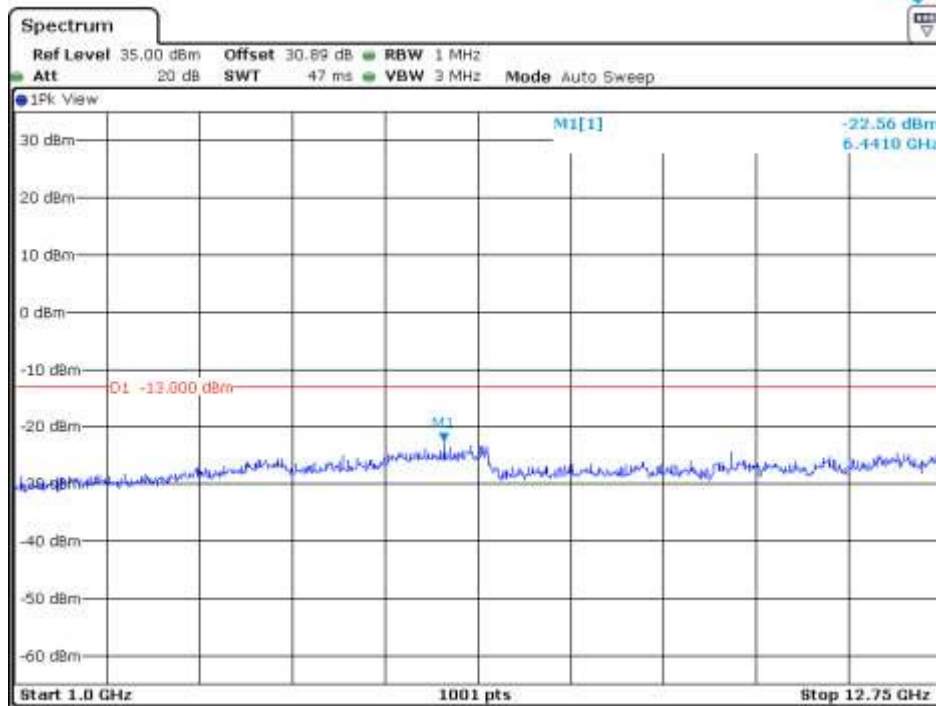
High Channel



High Channel



High Channel



High Channel

8.4.2 Test data for WCDMA(Band 5)

-. Test Date : May 12, 2016

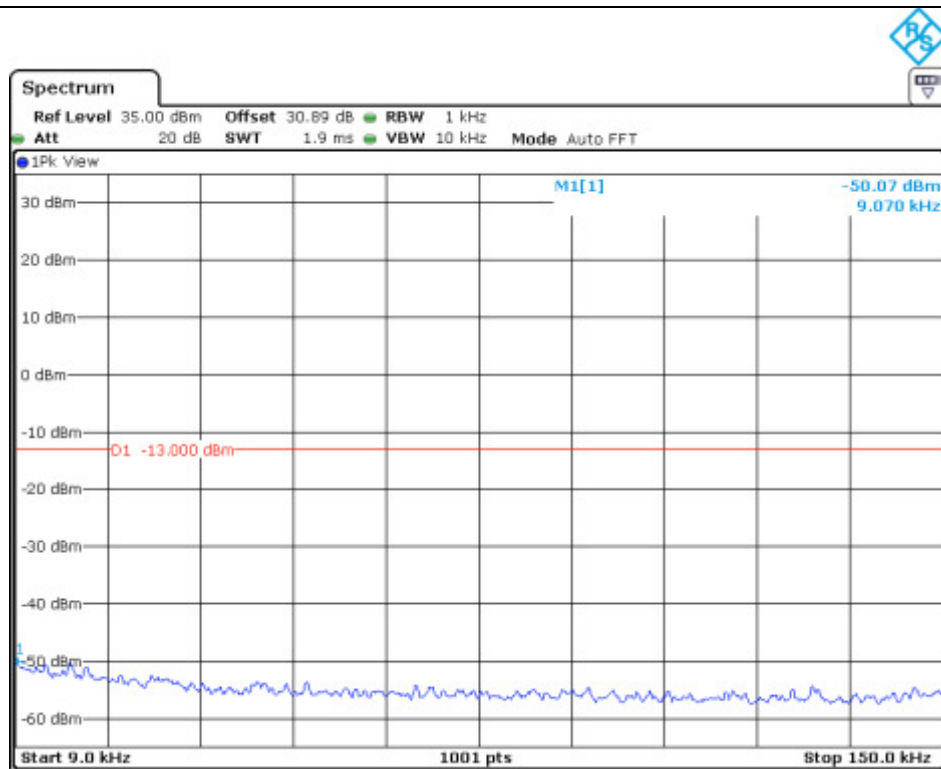
-. Test Result : Pass

CHANNEL	FREQUENCY (MHz)	Measured value (dBm)	LIMITS (dBm)	MARGIN (dB)
LOW	6 640.00	-23.80	-13.00	10.80
MIDDLE	6 570.00	-23.20	-13.00	10.20
HIGH	6 652.00	-22.68	-13.00	9.68

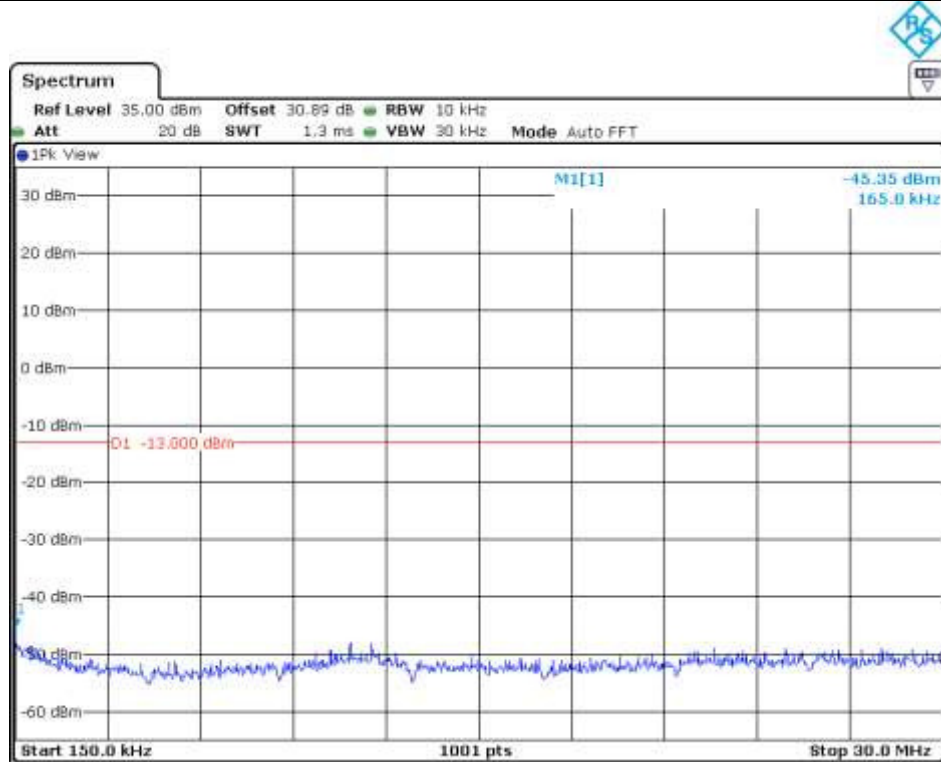
Remark. Margin = Limit – Measured Value (=Receiver Reading + Cable Loss)



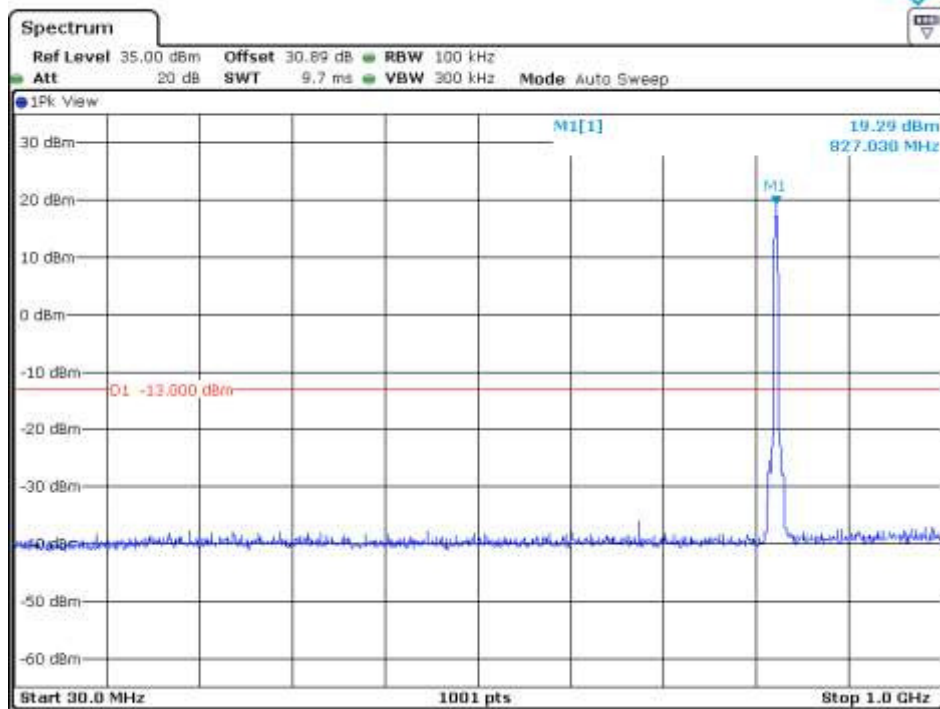
Tested by: Jun-Hui, Lee / Senior Engineer



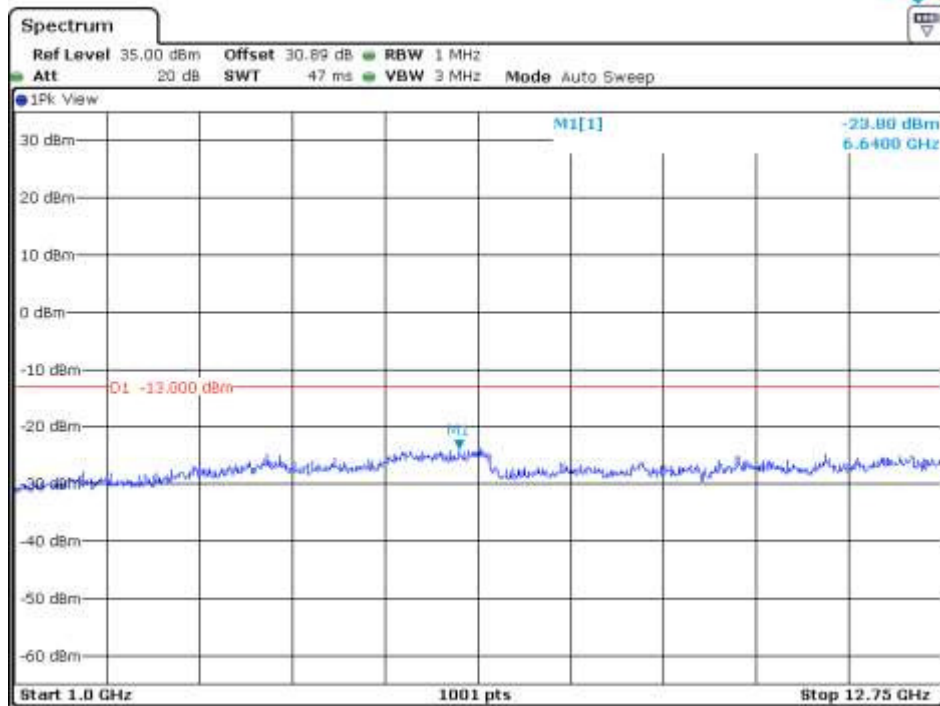
Low Channel



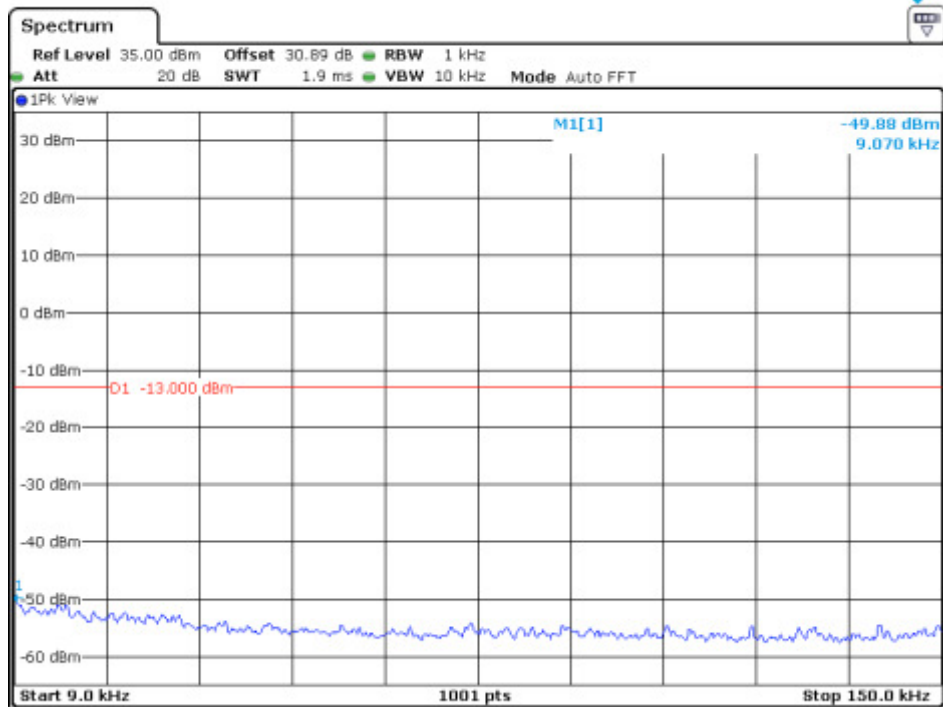
Low Channel



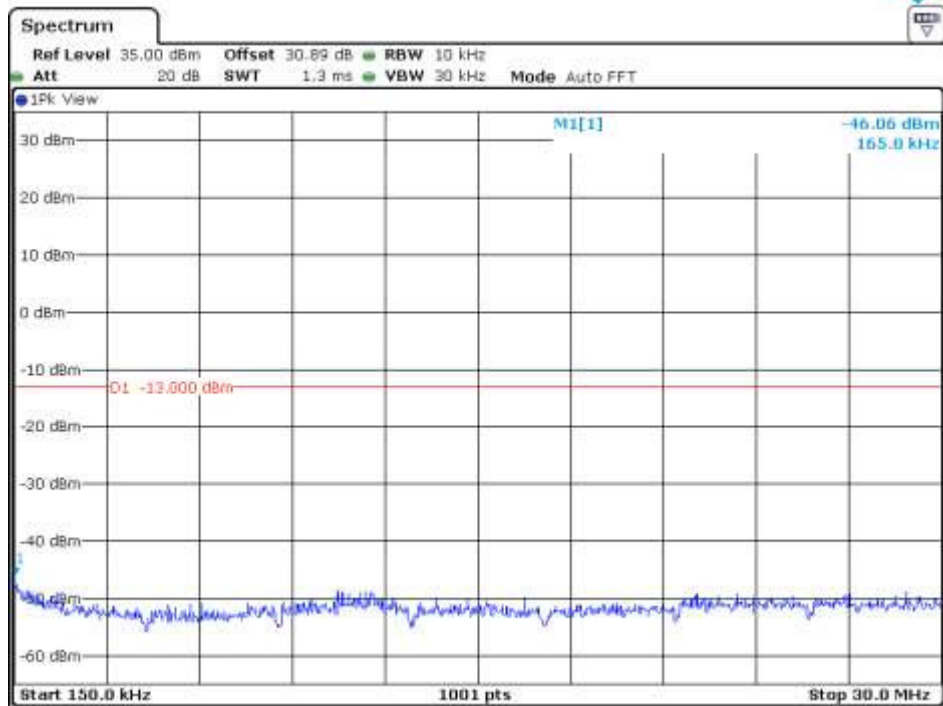
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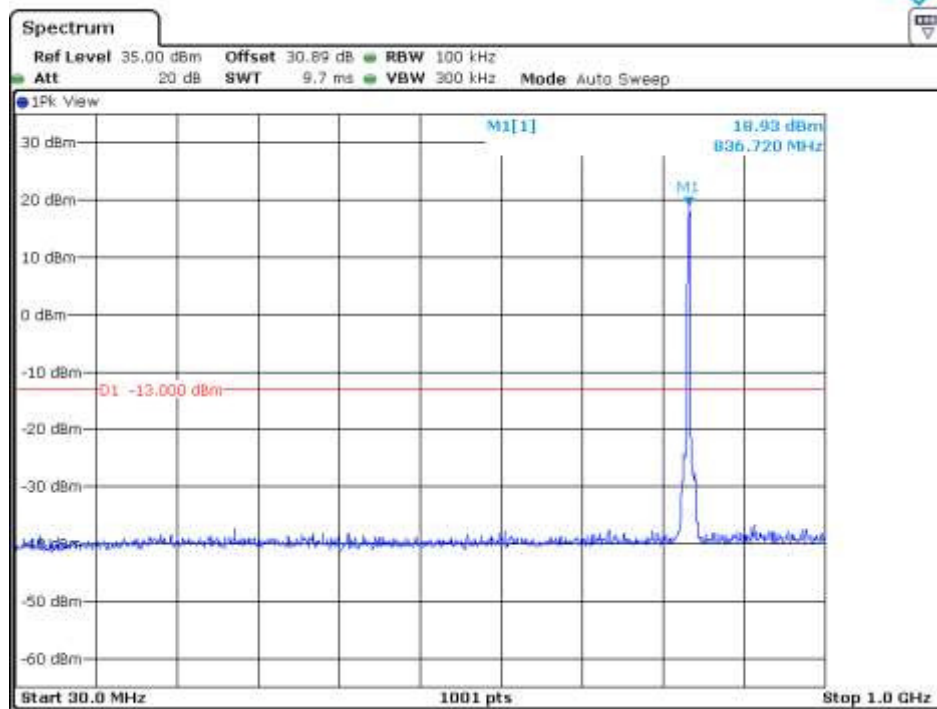
Low Channel



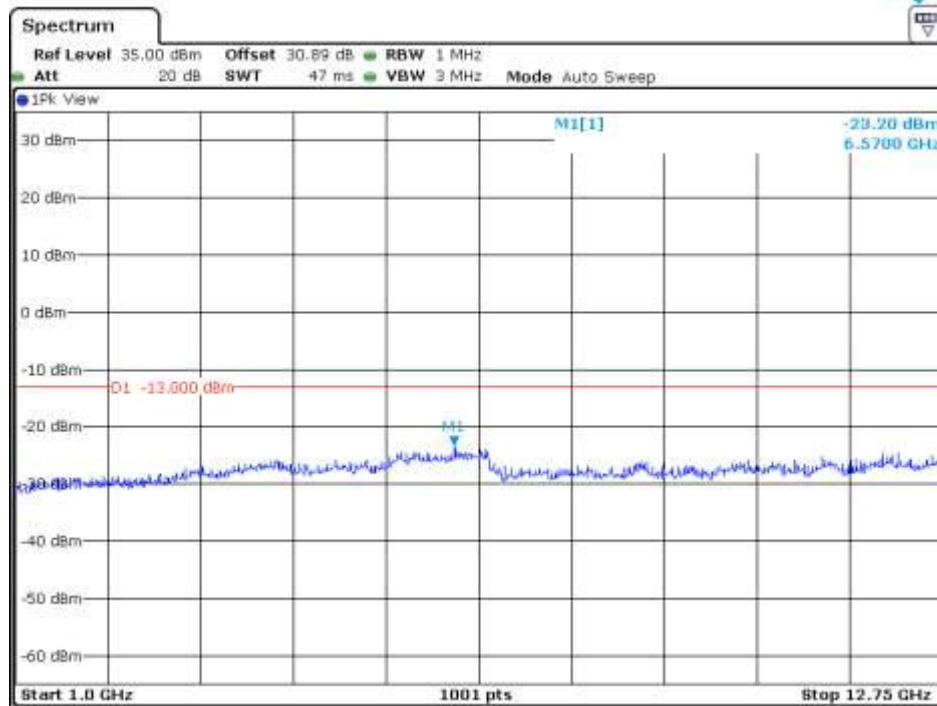
Middle Channel



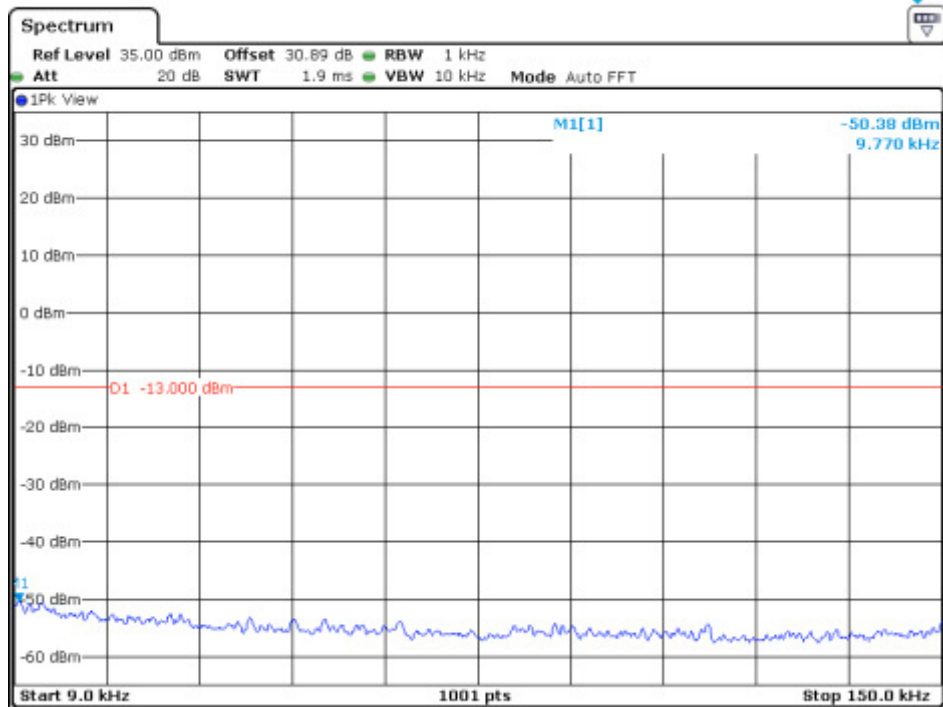
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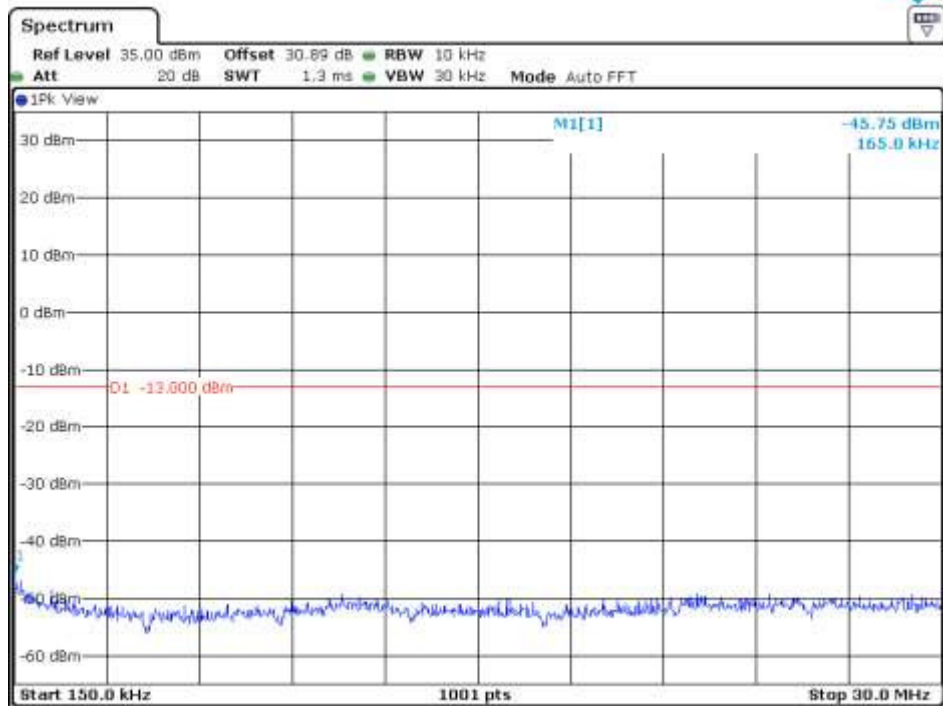
Middle Channel



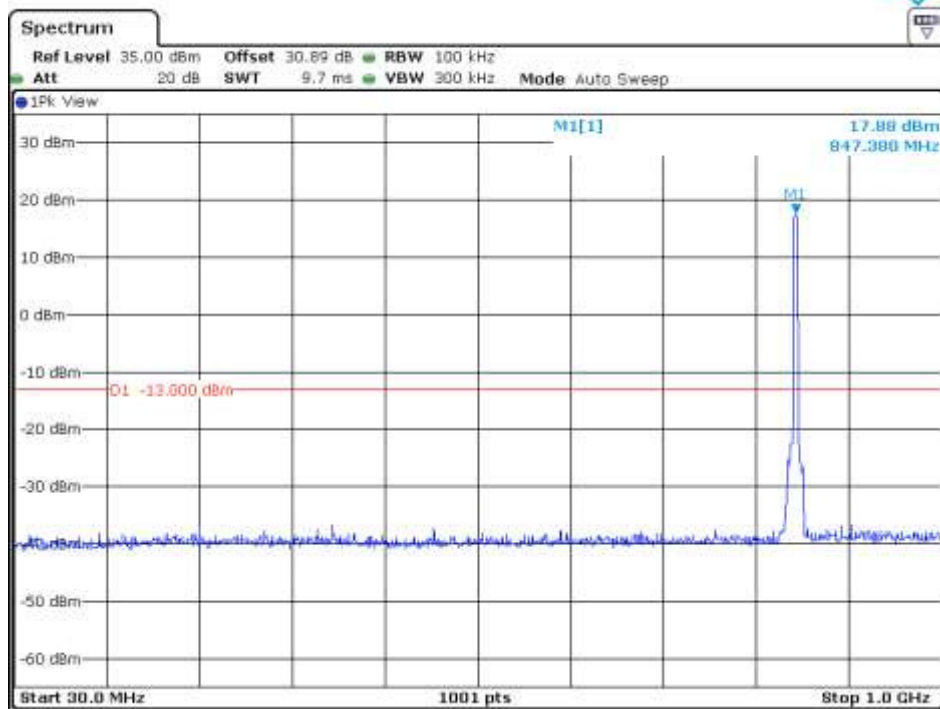
Middle Channel



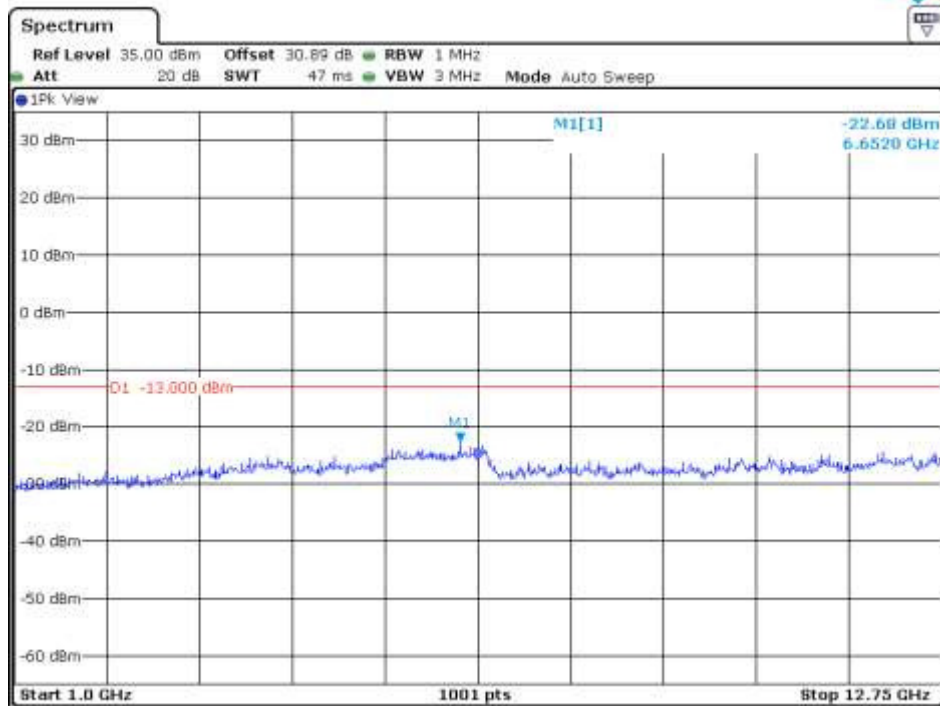
High Channel



High Channel



High Channel



High Channel