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Report On

FCC and Industry Canada Testing of the
Ericsson RRUS 01 B2 / KRC 118 74/2

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FCC ID: TA8AKRC11874-2
IC: 287AB-AS118742

Document 75926460 Report 02 Issue 1 **July 2014**

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REPORT ON FCC and Industry Canada Testing of the Ericsson RRUS 01 B2 / KRC 118 74/2

Document 75926460 Report 02 Issue 1

July 2014

PREPARED FOR

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Test Engineer

APPROVED BY

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Authorised Signatory

DATED 2 July 2014

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate compliance with FCC CFR 47: Part 24 and Industry Canada RSS-133. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

G Zhao X Zhang

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SECTION 1

REPORT SUMMARY

FCC and Industry Canada Testing of the
Ericsson RRUS 01 B2 / KRC 118 74/2

1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Ericsson RRUS 01 B2 / KRC 118 74/2 to the requirements of FCC CFR 47 Part 24 and Industry Canada RSS-133.

Testing was carried out in support of a C2PC application for Grant of RRUS 01 B2 / KRC 118 74/2 to include WCDMA and LTE Multi Standard Radio mode.

Objective	To perform FCC and Industry Canada Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	Ericsson AB
Product Name	RRUS 01 B2
Product Number	KRC 118 74/2
IC Model Number	AS118742
Serial Number(s)	D165426806, CB4S938194
WCDMA Software	CXP9021719 Rev R2JA61
LTE Software	CXP102051/19 Rev R30H
PIS Software	CXP9013268/6 Rev R51MA
Hardware Version	R1F
Number of Samples Tested	2
Test Specification/Issue/Date	FCC CFR 47 Part 24: 2013 Industry Canada RSS-133 Issue 6: 2013
Incoming Release Date	Declaration of Build Status 11 April 2014
Order Number Date	PTP 09 April 2014
Start of Test	11 April 2014
Finish of Test	24 June 2014
Name of Engineer(s)	G Zhao X Zhang
Related Document(s)	ANSI C63.4: 2009 ANSI/TIA-603-C-2004 FCC CFR 47 Part 2: 2013 Industry Canada RSS-GEN Issue 3: 2010 Industry Canada SRSP510 Issue 5: 2009

Product Service

1.2 BRIEF SUMMARY OF RESULTS

A brief summary of results in accordance with FCC CFR 47 Part 24 and Industry Canada RSS-133, is shown below.

Configuration 1 – Remote Radio Equipment							
Section	Spec Clause		Test Description	Mode	Mod State	Result	Comments
	FCC Part 2 and 24	RSS-133 and RSS-GEN					
	24.232 (a)	6.4	Effective Radiated Power	1932.4MHz (W) + 1949.3 MHz (L1.4) / 1932.4 MHz (W) + 1948.5 MHz (L3) 1932.4 MHz (W) + 1947.5 MHz (L5) / 1932.4 MHz (W) + 1945.0 MHz (L10)		N/A	No integral antenna.
				1952.4 MHz (W) + 1969.3 MHz (L1.4) / 1952.4 MHz (W) + 1968.5 MHz (L3) 1952.4 MHz (W) + 1967.5 MHz (L5) / 1952.4 MHz (W) + 1965.0 MHz (L10)		N/A	
				1970.7 MHz (L1.4) + 1987.6 MHz (W) / 1971.5 MHz (L3) + 1987.6 MHz (W) 1972.5 MHz (L5) + 1987.6 MHz (W) / 1975.0 MHz (L10) + 1987.6 MHz (W)		N/A	
				1952.4 MHz (W) + 1957.4 MHz (W) + 1969.3 MHz (L1.4) 1952.4 MHz (W) + 1957.4 MHz (W) + 1968.5 MHz (L3) 1952.4 MHz (W) + 1957.4 MHz (W) + 1967.5 MHz (L5) 1952.4 MHz (W) + 1957.4 MHz (W) + 1965.0 MHz (L10)		N/A	
				1952.4 MHz (W) + 1957.4 MHz (W) + 1967.9 MHz (L1.4) + 1969.3 MHz(L1.4) 1952.4 MHz (W) + 1957.4 MHz (W) + 1965.5 MHz (L3) + 1968.5 MHz (L3) 1952.4 MHz (W) + 1957.4 MHz (W) + 1962.5 MHz (L5) + 1967.5 MHz (L5)		N/A	
2.1	2.1046, 24.232 (a)	6.4	RF Output Power - Conducted	1932.4MHz (W) + 1949.3 MHz (L1.4) / 1932.4 MHz (W) + 1948.5 MHz (L3) 1932.4 MHz (W) + 1947.5 MHz (L5) / 1932.4 MHz (W) + 1945.0 MHz (L10)	0	Pass	-
				1952.4 MHz (W) + 1969.3 MHz (L1.4) / 1952.4 MHz (W) + 1968.5 MHz (L3) 1952.4 MHz (W) + 1967.5 MHz (L5) / 1952.4 MHz (W) + 1965.0 MHz (L10)	0	Pass	
				1970.7 MHz (L1.4) + 1987.6 MHz (W) / 1971.5 MHz (L3) + 1987.6 MHz (W) 1972.5 MHz (L5) + 1987.6 MHz (W) / 1975.0 MHz (L10) + 1987.6 MHz (W)	0	Pass	
				1952.4 MHz (W) + 1957.4 MHz (W) + 1969.3 MHz (L1.4) 1952.4 MHz (W) + 1957.4 MHz (W) + 1968.5 MHz (L3) 1952.4 MHz (W) + 1957.4 MHz (W) + 1967.5 MHz (L5) 1952.4 MHz (W) + 1957.4 MHz (W) + 1965.0 MHz (L10)	0	Pass	
				1952.4 MHz (W) + 1957.4 MHz (W) + 1967.9 MHz (L1.4) + 1969.3 MHz(L1.4) 1952.4 MHz (W) + 1957.4 MHz (W) + 1965.5 MHz (L3) + 1968.5 MHz (L3) 1952.4 MHz (W) + 1957.4 MHz (W) + 1962.5 MHz (L5) + 1967.5 MHz (L5)	0	Pass	

Product Service

Configuration 1 – Remote Radio Equipment							
Section	Spec Clause		Test Description	Mode	Mod State	Result	Comments
	FCC Part 2 and 24	RSS-133 and RSS-GEN					
2.2	24.232 (d)	6.4	Peak – Average Ratio	1932.4MHz (W) + 1949.3 MHz (L1.4) / 1932.4 MHz (W) + 1948.5 MHz (L3) 1932.4 MHz (W) + 1947.5 MHz (L5) / 1932.4 MHz (W) + 1945.0 MHz (L10)	0	Pass	-
				1952.4 MHz (W) + 1969.3 MHz (L1.4) / 1952.4 MHz (W) + 1968.5 MHz (L3) 1952.4 MHz (W) + 1967.5 MHz (L5) / 1952.4 MHz (W) + 1965.0 MHz (L10)	0	Pass	
				1970.7 MHz (L1.4) + 1987.6 MHz (W) / 1971.5 MHz (L3) + 1987.6 MHz (W) 1972.5 MHz (L5) + 1987.6 MHz (W) / 1975.0 MHz (L10) + 1987.6 MHz (W)	0	Pass	
				1952.4 MHz (W) + 1957.4 MHz (W) + 1969.3 MHz (L1.4) 1952.4 MHz (W) + 1957.4 MHz (W) + 1968.5 MHz (L3) 1952.4 MHz (W) + 1957.4 MHz (W) + 1967.5 MHz (L5) 1952.4 MHz (W) + 1957.4 MHz (W) + 1965.0 MHz (L10)	0	Pass	
				1952.4 MHz (W) + 1957.4 MHz (W) + 1967.9 MHz (L1.4) + 1969.3 MHz(L1.4) 1952.4 MHz (W) + 1957.4 MHz (W) + 1965.5 MHz (L3) + 1968.5 MHz (L3) 1952.4 MHz (W) + 1957.4 MHz (W) + 1962.5 MHz (L5) + 1967.5 MHz (L5)	0	Pass	
	2.1047 (d)	6.2	Modulation Characteristics	1932.4MHz (W) + 1949.3 MHz (L1.4) / 1932.4 MHz (W) + 1948.5 MHz (L3) 1932.4 MHz (W) + 1947.5 MHz (L5) / 1932.4 MHz (W) + 1945.0 MHz (L10)		N/A	-
				1952.4 MHz (W) + 1969.3 MHz (L1.4) / 1952.4 MHz (W) + 1968.5 MHz (L3) 1952.4 MHz (W) + 1967.5 MHz (L5) / 1952.4 MHz (W) + 1965.0 MHz (L10)		N/A	
				1970.7 MHz (L1.4) + 1987.6 MHz (W) / 1971.5 MHz (L3) + 1987.6 MHz (W) 1972.5 MHz (L5) + 1987.6 MHz (W) / 1975.0 MHz (L10) + 1987.6 MHz (W)		N/A	
				1952.4 MHz (W) + 1957.4 MHz (W) + 1969.3 MHz (L1.4) 1952.4 MHz (W) + 1957.4 MHz (W) + 1968.5 MHz (L3) 1952.4 MHz (W) + 1957.4 MHz (W) + 1967.5 MHz (L5) 1952.4 MHz (W) + 1957.4 MHz (W) + 1965.0 MHz (L10)		N/A	
				1952.4 MHz (W) + 1957.4 MHz (W) + 1967.9 MHz (L1.4) + 1969.3 MHz(L1.4) 1952.4 MHz (W) + 1957.4 MHz (W) + 1965.5 MHz (L3) + 1968.5 MHz (L3) 1952.4 MHz (W) + 1957.4 MHz (W) + 1962.5 MHz (L5) + 1967.5 MHz (L5)		N/A	

Product Service

Configuration 1 – Remote Radio Equipment							
Section	Spec Clause		Test Description	Mode	Mod State	Result	Comments
	FCC Part 2 and 24	RSS-133 and RSS-GEN					
	2.1049, 24.238 (b)	RSS-Gen 4.6.1	Occupied Bandwidth	1932.4MHz (W) + 1949.3 MHz (L1.4) / 1932.4 MHz (W) + 1948.5 MHz (L3) 1932.4 MHz (W) + 1947.5 MHz (L5) / 1932.4 MHz (W) + 1945.0 MHz (L10)		N/A	-
				1952.4 MHz (W) + 1969.3 MHz (L1.4) / 1952.4 MHz (W) + 1968.5 MHz (L3) 1952.4 MHz (W) + 1967.5 MHz (L5) / 1952.4 MHz (W) + 1965.0 MHz (L10)		N/A	
				1970.7 MHz (L1.4) + 1987.6 MHz (W) / 1971.5 MHz (L3) + 1987.6 MHz (W) 1972.5 MHz (L5) + 1987.6 MHz (W) / 1975.0 MHz (L10) + 1987.6 MHz (W)		N/A	
				1952.4 MHz (W) + 1957.4 MHz (W) + 1969.3 MHz (L1.4) 1952.4 MHz (W) + 1957.4 MHz (W) + 1968.5 MHz (L3) 1952.4 MHz (W) + 1957.4 MHz (W) + 1967.5 MHz (L5) 1952.4 MHz (W) + 1957.4 MHz (W) + 1965.0 MHz (L10)		N/A	
				1952.4 MHz (W) + 1957.4 MHz (W) + 1967.9 MHz (L1.4) + 1969.3 MHz(L1.4) 1952.4 MHz (W) + 1957.4 MHz (W) + 1965.5 MHz (L3) + 1968.5 MHz (L3) 1952.4 MHz (W) + 1957.4 MHz (W) + 1962.5 MHz (L5) + 1967.5 MHz (L5)		N/A	
2.3	2.1051, 24.238 (b)	6.5	Spurious Emissions at Antenna Terminals (±1MHz)	1932.4MHz (W) + 1949.3 MHz (L1.4)	0	Pass	
				1970.7 MHz (L1.4) + 1987.6 MHz (W)	0	Pass	
2.4	2.1053, 24.238 (a)	6.5	Radiated Spurious Emissions	1932.4MHz (W) + 1949.3 MHz (L1.4)	0	Pass	-
				1952.4 MHz (W) + 1969.3 MHz (L1.4) / 1952.4 MHz (W) + 1968.5 MHz (L3) 1952.4 MHz (W) + 1967.5 MHz (L5) / 1952.4 MHz (W) + 1965.0 MHz (L10)	0	Pass	
				1970.7 MHz (L1.4) + 1987.6 MHz (W)	0	Pass	
				1952.4 MHz (W) + 1957.4 MHz (W) + 1969.3 MHz (L1.4)	0	Pass	
				1952.4 MHz (W) + 1957.4 MHz (W) + 1967.9 MHz (L1.4) + 1969.3 MHz(L1.4)	0	Pass	
2.5	2.1051, 24.238 (a)	6.5	Conducted Spurious Emissions	1932.4MHz (W) + 1949.3 MHz (L1.4)	0	Pass	-
				1952.4 MHz (W) + 1969.3 MHz (L1.4) / 1952.4 MHz (W) + 1968.5 MHz (L3) 1952.4 MHz (W) + 1967.5 MHz (L5) / 1952.4 MHz (W) + 1965.0 MHz (L10)	0	Pass	
				1970.7 MHz (L1.4) + 1987.6 MHz (W)	0	Pass	
				1952.4 MHz (W) + 1957.4 MHz (W) + 1969.3 MHz (L1.4)	0	Pass	
				1952.4 MHz (W) + 1957.4 MHz (W) + 1967.9 MHz (L1.4) + 1969.3 MHz(L1.4)	0	Pass	

Configuration 1 – Remote Radio Equipment							
Section	Spec Clause		Test Description	Mode	Mod State	Result	Comments
	FCC Part 2 and 24	RSS-133 and RSS-GEN					
	2.1055, 24.235	6.3	Frequency Stability Under Temperature Variations	1932.4MHz (W) + 1949.3 MHz (L1.4) / 1932.4 MHz (W) + 1948.5 MHz (L3) 1932.4 MHz (W) + 1947.5 MHz (L5) / 1932.4 MHz (W) + 1945.0 MHz (L10)		N/A	-
				1952.4 MHz (W) + 1969.3 MHz (L1.4) / 1952.4 MHz (W) + 1968.5 MHz (L3) 1952.4 MHz (W) + 1967.5 MHz (L5) / 1952.4 MHz (W) + 1965.0 MHz (L10)		N/A	
				1970.7 MHz (L1.4) + 1987.6 MHz (W) / 1971.5 MHz (L3) + 1987.6 MHz (W) 1972.5 MHz (L5) + 1987.6 MHz (W) / 1975.0 MHz (L10) + 1987.6 MHz (W)		N/A	
				1952.4 MHz (W) + 1957.4 MHz (W) + 1969.3 MHz (L1.4) 1952.4 MHz (W) + 1957.4 MHz (W) + 1968.5 MHz (L3) 1952.4 MHz (W) + 1957.4 MHz (W) + 1967.5 MHz (L5) 1952.4 MHz (W) + 1957.4 MHz (W) + 1965.0 MHz (L10)		N/A	
				1952.4 MHz (W) + 1957.4 MHz (W) + 1967.9 MHz (L1.4) + 1969.3 MHz(L1.4) 1952.4 MHz (W) + 1957.4 MHz (W) + 1965.5 MHz (L3) + 1968.5 MHz (L3) 1952.4 MHz (W) + 1957.4 MHz (W) + 1962.5 MHz (L5) + 1967.5 MHz (L5)		N/A	
	2.1055, 24.235	6.3	Frequency Stability Under Voltage Variations	1932.4MHz (W) + 1949.3 MHz (L1.4) / 1932.4 MHz (W) + 1948.5 MHz (L3) 1932.4 MHz (W) + 1947.5 MHz (L5) / 1932.4 MHz (W) + 1945.0 MHz (L10)		N/A	-
				1952.4 MHz (W) + 1969.3 MHz (L1.4) / 1952.4 MHz (W) + 1968.5 MHz (L3) 1952.4 MHz (W) + 1967.5 MHz (L5) / 1952.4 MHz (W) + 1965.0 MHz (L10)		N/A	
				1970.7 MHz (L1.4) + 1987.6 MHz (W) / 1971.5 MHz (L3) + 1987.6 MHz (W) 1972.5 MHz (L5) + 1987.6 MHz (W) / 1975.0 MHz (L10) + 1987.6 MHz (W)		N/A	
				1952.4 MHz (W) + 1957.4 MHz (W) + 1969.3 MHz (L1.4) 1952.4 MHz (W) + 1957.4 MHz (W) + 1968.5 MHz (L3) 1952.4 MHz (W) + 1957.4 MHz (W) + 1967.5 MHz (L5) 1952.4 MHz (W) + 1957.4 MHz (W) + 1965.0 MHz (L10)		N/A	
				1952.4 MHz (W) + 1957.4 MHz (W) + 1967.9 MHz (L1.4) + 1969.3 MHz(L1.4) 1952.4 MHz (W) + 1957.4 MHz (W) + 1965.5 MHz (L3) + 1968.5 MHz (L3) 1952.4 MHz (W) + 1957.4 MHz (W) + 1962.5 MHz (L5) + 1967.5 MHz (L5)		N/A	

L1.4 denotes LTE network with 1.4MHz channel bandwidth.
L3 denotes LTE network with 3MHz channel bandwidth.
L5 denotes LTE network with 5MHz channel bandwidth.
L10 denotes LTE network with 10MHz channel bandwidth.
W denotes WCDMA network
N/A – Not Applicable

Product Service

1.3 DECLARATION OF BUILD STATUS

MAIN EUT	
MANUFACTURING DESCRIPTION	Remote Radio Equipment
MANUFACTURER	Ericsson AB
PRODUCT NUMBER	RRUS 01 B2
PART NUMBER	KRC 118 74/2
IC Model NUMBER	AS118742
SERIAL NUMBER	D165426806, CB4S938194
HARDWARE VERSION	R1F
WCDMA SOFTWARE	CXP9021719 Rev R2JA61
LTE SOFTWARE	CXP102051/19 Rev R30H
PIS SOFTWARE	CXP9013268/6 Rev R51MA
TRANSMITTER OPERATING RANGE	TX: 1930MHz - 1990MHz RX: 1850MHz - 1910MHz
MODULATIONS	WCDMA: QPSK, 16QAM, 64QAM LTE: QPSK, 16QAM, 64QAM
NUMBER OF CARRIERS	Maximum 4 carriers
ITU DESIGNATION OF EMISSION	WCDMA: 5M00F9W LTE: 1M40F9W, 3M00F9W, 5M00F9W, 10M0F9W
OUTPUT POWER (RMS) (W or dBm)	**WCDMA/LTE Mix Carrier (x 2):** 1WCDMA (1 x 40W) + 1LTE (1 x 40W) per port: 49.0dBm per port
	WCDMA/LTE Mix Carrier (x 3): 2WCDMA (2 x 30W) + 1LTE (1 x 20W) per port: 49.0dBm per port
	WCDMA/LTE Mix Carrier (x 4): 2WCDMA (2 x 20W) + 2LTE (2 x 20W) per port: 49.0dBm per port
OUTPUT POWER TOLERANCE	± 1.0dB
INSTANTANEOUS BANDWIDTH	20MHz
CHANNEL BANDWIDTH	WCDMA: 4.2 MHz to 5MHz (configurable in steps of 100/200kHz) LTE: 1.4MHz, 3MHz, 5MHz and 10MHz according to 3GPP TS 36.141
ANTENNA	No dedicated antenna, handled during licensing
NUMBER OF ANTENNA PORTS	Non-MIMO: 1TX/RX port and 1RX port MIMO 2 x 2: 2TX/RX ports and 2RX ports are supported by combining two Radio Units.
SUPPORTED CONFIGURATION	Multi-standard (LTE/WCDMA) configured for Mix Carrier. Both RF chains are identical.
FCC ID	TA8AKRC11874-2
IC ID	287AB-AS118742
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	The equipment is the Radio Part of WCDMA, LTE Base Station.

Signature

Date 15 Aril 2014

D of B S Serial No 75926460/02

No responsibility will be accepted by TÜV SÜD Product Service as to the accuracy of the information declared in this document by the manufacturer.

Product Service

1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) RRUS 01 B2 / KRC 118 74/2 is an Ericsson Remote Radio Equipment working in the public mobile service 1900MHz band which provides communication connections to WCDMA and LTE network. The RRUS 01 B2 / KRC 118 74/2 operates from a -48V DC supply.

The Equipment Under Test (EUT) is shown in the photograph below. A full technical description can be found in the Manufacturers documentation.

Equipment Under Test

Product Service

1.4.2 Test Configuration

Configuration 1: Remote Radio Equipment

The EUT was configured in accordance with FCC CFR 47 Part 24 and Industry Canada RSS-133.

The RRUS 01 B2 / KRC 118 74/2 supports MSR WCDMA/LTE access technology. WCDMA supports TM1 (QPSK), TM5 (16QAM) and TM6 (64QAM) defined in 3GPP TS 25.141, and LTE supports Test Models E-TM1.1 (QPSK), E-TM3.2 (16QAM) and E-TM3.1 (64QAM) defined in 3GPP TS 36.141 at 1900MHz.

By combining two EUTs together, the EUTs were configured to transmit in MIMO mode with two TX/RX ports (RF A1, RF A2) and two RX ports (RF B1, RF B2). MIMO mode was used for measurements as the worst configuration.

The Maximum Output Power was tested on both TX/RX output connector RF A1 and RF A2, all other TX measurements were performed on the combined TX/RX output connector RF A1 of the EUT as the representative port.

The complete testing was performed with the EUT transmitting at maximum RF power unless otherwise stated.

The settings below were found to be representative for all modes when several settings, with different modulations and number of carriers, were tested to find the worst case settings. After the measured results were compared, the following settings were used for all measurements unless otherwise noted:

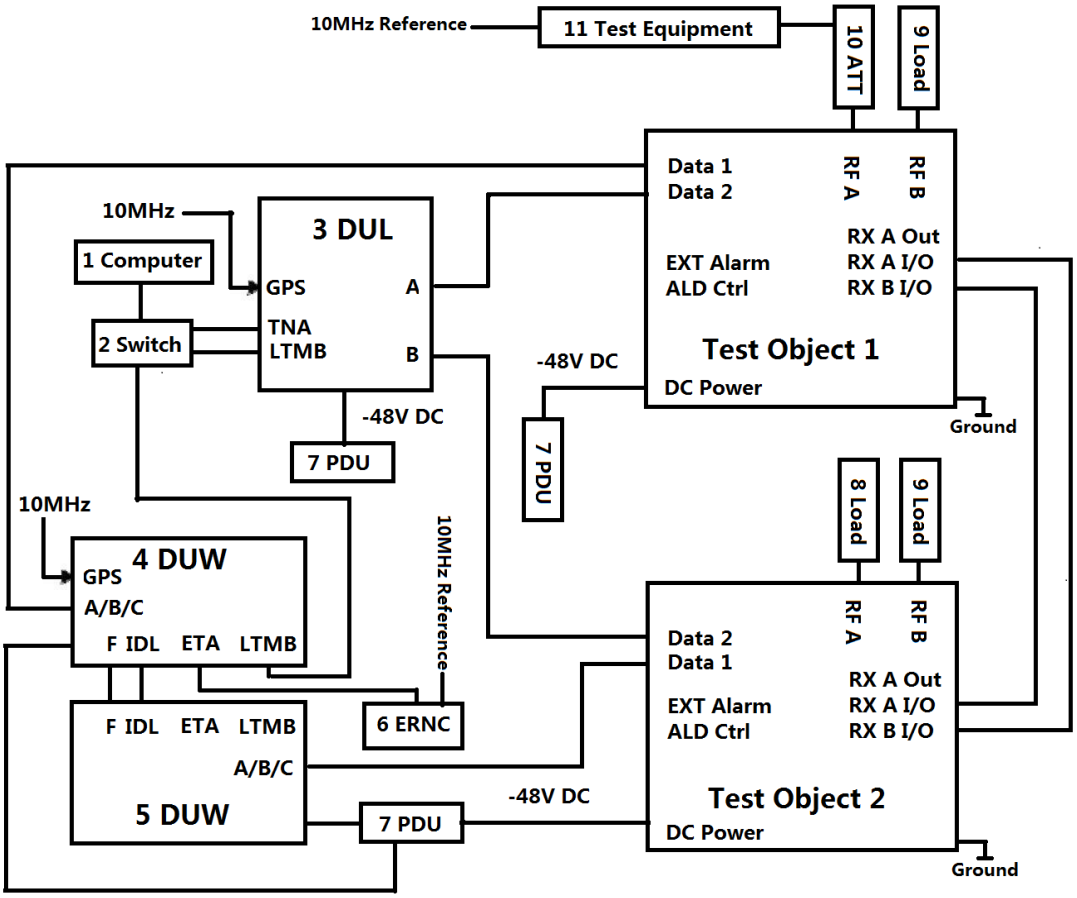
- WCDMA/LTE Mix Carrier:

  WCDMA:
  Single Carrier: Test Model 1 (TM1): 64DPCHs at 30 ksps (SF=128)
  Multi Carrier (1x2): Test Model 1 (TM1): 32 DPCHs at 30 ksps (SF=128)
  Channel Bandwidth: 5MHz
  Modulation: QPSK

  LTE:
  Test Model E-TM1.1 (QPSK) in channel bandwidth 1.4MHz

The EUT was powered by a -48V DC Power supply.

Test Setup, Conducted Measurement:

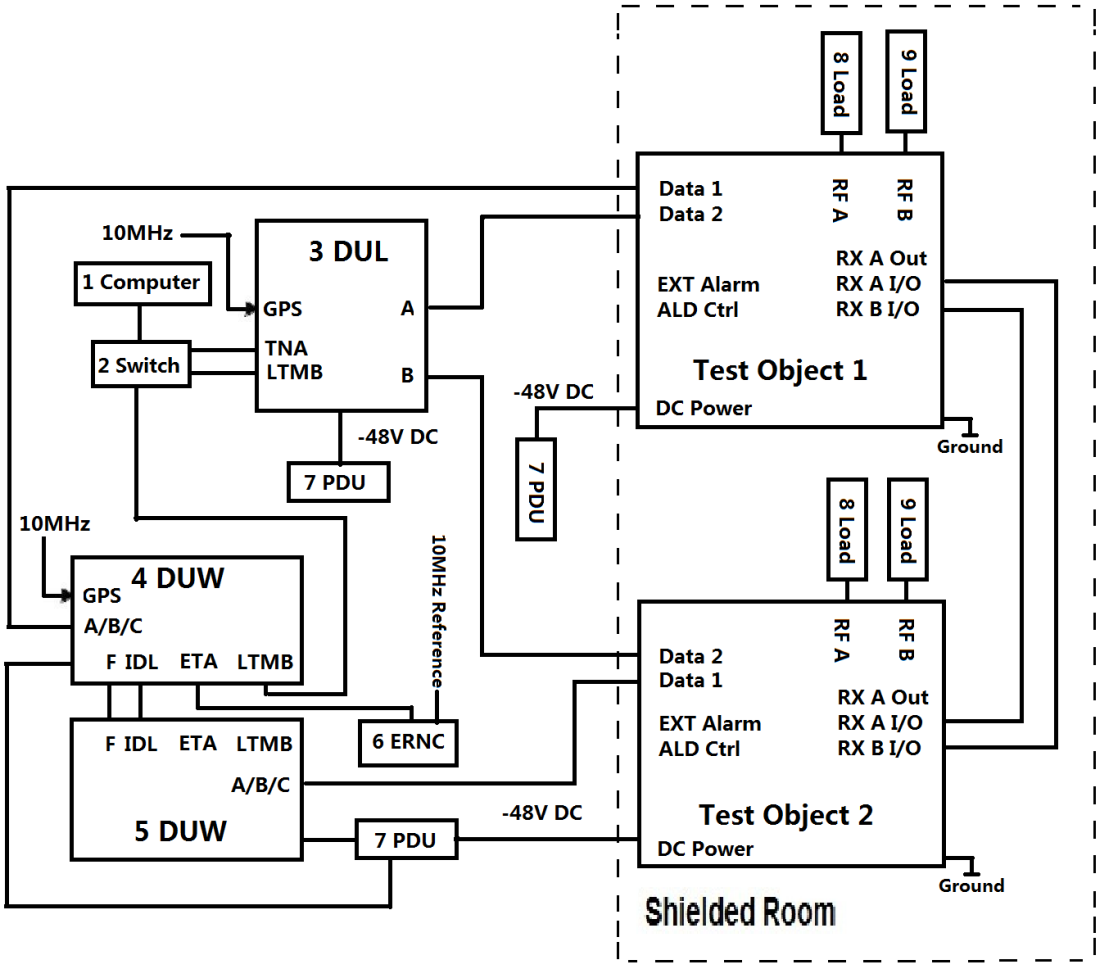


Product Name	Product Number	Version	Serial Number
RRUS 01 B2	KRC 118 74/2	R1F	D165426806
RRUS 01 B2	KRC 118 74/2	R1F	CB4S938194

No.	Auxiliary Equipment	Part Number / Model Type	Version	Serial Number
1	Computer	HP EliteBook 8460p	--	AP523464
	Work Station	Sun A70-XHZB1-9AG-2GDT	--	0826TFC1V9
2	Switch	TL-HP8MU	--	05300902892
	Switch	TL-SF1008+	--	11936826484
3	RBS 6601	BFL 901 009/1	--	--
	DUL 20 01	KDU 137 533/4	R1C	CB4H451296
	SUP 6601	1/BFL 901 009/1	R3B	BR81005675
4	RBS 6601	BFL 901 009/4	--	--
	DUW 30 01	KDU 127 161/3	R4F	TU8X969107
	SUP 6601	1/BFL 901 009/4	R1E	BR81844360
5	RBS 6601	BFL 901 009/1	--	--
	DUW 30 01	KDU 127 161/3	R4F	TU8X960825
	SUP 6601	1/BFL 901 009/1	R3B	BR81477047
6	ERNC SIM	FAB 102 614	--	ETC/L167
7	Power Supply	DH1716-5D	--	2008040031
	Power Supply	DH1716-5D	--	2008040050
	Power Supply	DH1716A-9	--	ETE/L676
8	Load	TF100	--	09121648
9	Load	TFE5-3	--	090323176
	Load	TFE5-3	--	090323220
10	40dB Attenuator	66-40-33	--	CD4019
11	Power Meter	Rohde & Schwarz NRP2	--	101283
	Power Sensor	Rohde & Schwarz NRP-Z51	--	102310
	Spectrum Analyzer	FSQ26	--	100253

Product Service

Test Setup, Radiated Measurement:



Product Name	Product Number	Version	Serial Number
RRUS 01 B2	KRC 118 74/2	R1F	D165426806
RRUS 01 B2	KRC 118 74/2	R1F	CB4S938194

No.	Auxiliary Equipment	Part Number / Model Type	Version	Serial Number
1	Computer	HP EliteBook 8460p	--	AP523464
	Work Station	Sun A70-XHZB1-9AG-2GDT	--	0826TFC1V9
2	Switch	TL-HP8MU	--	05300902892
	Switch	TL-SF1008+	--	11936826484
3	RBS 6601	BFL 901 009/1	--	--
	DUL 20 01	KDU 137 533/4	R1C	CB4H451296
	SUP 6601	1/BFL 901 009/1	R3B	BR81005675
4	RBS 6601	BFL 901 009/4	--	--
	DUW 30 01	KDU 127 161/3	R4F	TU8X969107
	SUP 6601	1/BFL 901 009/4	R1E	BR81844360
5	RBS 6601	BFL 901 009/1	--	--
	DUW 30 01	KDU 127 161/3	R4F	TU8X960825
	SUP 6601	1/BFL 901 009/1	R3B	BR81477047
6	ERNC SIM	FAB 102 614	--	ETC/L167
7	Power Supply	DH1716-5D	--	2008040031
	Power Supply	DH1716-5D	--	2008040050
	Power Supply	DH1716A-9	--	ETE/L676
8	Load	TF100	--	09121648
	Load	TF100	--	09121605
9	Load	TFE5-3	--	090323176
	Load	TFE5-3	--	090323220

Product Service

1.4.3 Modes of Operation

Modes of operation of each EUT during testing were as follows:

L1.4 denotes LTE network with 1.4MHz channel bandwidth.
L3 denotes LTE network with 3MHz channel bandwidth.
L5 denotes LTE network with 5MHz channel bandwidth.
L10 denotes LTE network with 10MHz channel bandwidth.
W denotes WCDMA network

WCDMA/LTE MSR:

Mix Carrier(x2): 1W (1x40W) + 1L (1x40W)

Mode 1 - W&L1.4, W&L3, W&L5, W&L10

MSR	Channel No.	Frequencies (MHz)
W & L1.4	9662(W) & 793(L)	1932.4+1949.3
W & L3	9662(W) & 785(L)	1932.4+1948.5
W & L5	9662(W) & 775(L)	1932.4+1947.5
W & L10	9662(W) & 750(L)	1932.4+1945.0

Mode 2 - W&L1.4, W&L3, W&L5, W&L10

MSR	Channel No.	Frequencies (MHz)
W & L1.4	9762(W) & 993(L)	1952.4+1969.3
W & L3	9762(W) & 985(L)	1952.4+1968.5
W & L5	9762(W) & 975(L)	1952.4+1967.5
W & L10	9762(W) & 950(L)	1952.4+1965.0

Mode 3 - L1.4&W, L3&W, L5&W, L10&W

MSR	Channel No.	Frequencies (MHz)
L1.4 & W	1007(L) & 9938(W)	1970.7+1987.6
L3 & W	1015(L) & 9938(W)	1971.5+1987.6
L5 & W	1025(L) & 9938(W)	1972.5+1987.6
L10 & W	1050(L) & 9938(W)	1975.0+1987.6

Mix Carrier(x3): 2W (2x30W) + 1L (1x20W)

Mode 4 - W&W&L1.4, W&W&L3, W&W&L5, W&W&L10

MSR	Channel No.	Frequencies (MHz)
W&W & L1.4	9762(W) & 9787(W) & 993(L)	1952.4+1957.4+1969.3
W&W & L3	9762(W) & 9787(W) & 985(L)	1952.4+1957.4+1968.5
W&W & L5	9762(W) & 9787(W) & 975(L)	1952.4+1957.4+1967.5
W&W & L10	9762(W) & 9787(W) & 950(L)	1952.4+1957.4+1965.0

Mix Carrier(x4): 2W (2x20W) + 2L (2x20W)

Mode 5 - W&W&L1.4&L1.4, W&W&L3&L3, W&W&L5&L5

MSR	Channel No.	Frequencies (MHz)
W&W & L1.4&L1.4	9762(W) & 9787(W) & 979(L) & 993(L)	1952.4+1957.4+1967.9+1969.3
W&W & L3&L3	9762(W) & 9787(W) & 955(L) & 985(L)	1952.4+1957.4+1965.5+1968.5
W&W & L5&L5	9762(W) & 9787(W) & 925(L) & 975(L)	1952.4+1957.4+1962.5+1967.5

Information on the specific test modes utilised are detailed in the test procedure for each individual test.

1.5 TEST CONDITIONS

For all tests the EUT was set up in accordance with the relevant test standard and to represent typical operating conditions. Tests were applied with the EUT situated in a shielded enclosure, test laboratories or an open test area as appropriate.

The EUT was powered from a -48V DC supply.

1.6 DEVIATIONS FROM THE STANDARD

No deviations from the applicable test standards or test plan were made during testing.

1.7 MODIFICATION RECORD

Mod State 0 - No modifications were made to the EUT during testing.

1.8 ALTERNATIVE TEST SITE

Under our group UKAS Accreditation, TÜV SÜD Product Service conducted the following tests at Ericsson in Beijing, China:

- RF Output Power – Conducted
- Peak - Average Ratio
- Spurious Emissions at Antenna Terminals (±1MHz)
- Conducted Spurious Emissions

Only Radiated Spurious Emissions testing has been performed under the following site registrations:

FCC Accreditation 910917:
The State Radio Monitoring Centre, No.80 Beilishi Road Xicheng District Beijing, China.

Industry Canada Accreditation 7308A-1:
The State Radio Monitoring Centre, No.80 Beilishi Road Xicheng District Beijing, China.

Product Service

SECTION 2

TEST DETAILS

FCC and Industry Canada Testing of the
Ericsson RRUS 01 B2 / KRC 118 74/2

2.1 RF OUTPUT POWER - CONDUCTED

2.1.1 Specification Reference

FCC CFR 47 Part 2.1046
FCC CFR 47 Part 24, Clause 24.232 (a)
Industry Canada RSS-133, Clause 6.4

2.1.2 Equipment Under Test

RRUS 01 B2 / KRC 118 74/2, S/N: D165426806, CB4S938194

2.1.3 Date of Test and Modification State

26 May to 03 June 2014 – Modification State 0

2.1.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.1.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 2 and Part 24 and Industry Canada RSS-133.

Using a power meter and attenuator(s), the output power of the EUT was measured at the antenna terminal.

Since the EUTs transmit on two antennas simultaneously in the same frequency range, i.e, TX MIMO mode, using the Measure-and-Sum approach, the output power at both antennas RF A1 and RF A2 were tested, and the total output power were then summed mathematically in linear power units according to FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

The path loss was measured and entered to the power meter as a reference level offset to get the output power value directly.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 1 - W&L1.4, W&L3, W&L5, W&L10
- Mode 2 - W&L1.4, W&L3, W&L5, W&L10
- Mode 3 - L1.4&W, L3&W, L5&W, L10&W
- Mode 4 - W&W&L1.4, W&W&L3, W&W&L5, W&W&L10
- Mode 5 - W&W&L1.4&L1.4, W&W&L3&L3, W&W&L5&L5

2.1.6 Environmental Conditions

Ambient Temperature	22.0 – 28.5°C
Relative Humidity	41.0 – 65.0%

Product Service

2.1.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 2 and Part 24 and Industry Canada RSS-133 for RF Output Power.

The test results are shown below

Antenna RF A1 and RF A2

Mix Carrier(x2): 1W+1L

Configuration 1 - Mode 1 - W&L1.4, W&L3, W&L5, W&L10

LTE (E-TM1.1) & WCDMA (QPSK)

MSR	Frequency(MHz)	Antenna A1		Antenna A2		*Total (dBm) RMS	*Total (W) RMS
		Result (dBm) RMS	Result (W) RMS	Result (dBm) RMS	Result (W) RMS		
W & L1.4	1932.4+1949.3	48.63	72.95	48.51	70.96	51.58	143.91
W & L3	1932.4+1948.5	48.71	74.30	48.50	70.79	51.62	145.09
W & L5	1932.4+1947.5	48.72	74.47	48.58	72.11	51.66	146.58
W & L10	1932.4+1945.0	48.71	74.30	48.57	71.94	51.65	146.24

LTE (E-TM3.2) & WCDMA (16QAM)

MSR	Frequency(MHz)	Antenna A1		Antenna A2		*Total (dBm) RMS	*Total (W) RMS
		Result (dBm) RMS	Result (W) RMS	Result (dBm) RMS	Result (W) RMS		
W & L1.4	1932.4+1949.3	48.65	73.28	48.42	69.50	51.55	142.78
W & L3	1932.4+1948.5	48.72	74.47	48.51	70.96	51.63	145.43
W & L5	1932.4+1947.5	48.66	73.45	48.51	70.96	51.60	144.41
W & L10	1932.4+1945.0	48.71	74.30	48.59	72.28	51.66	146.58

LTE (E-TM3.1) & WCDMA (64QAM)

MSR	Frequency(MHz)	Antenna A1		Antenna A2		*Total (dBm) RMS	*Total (W) RMS
		Result (dBm) RMS	Result (W) RMS	Result (dBm) RMS	Result (W) RMS		
W & L1.4	1932.4+1949.3	48.51	70.96	48.39	69.02	51.46	139.98
W & L3	1932.4+1948.5	48.62	72.78	48.40	69.18	51.52	141.96
W & L5	1932.4+1947.5	48.58	72.11	48.46	70.15	51.53	142.26
W & L10	1932.4+1945.0	48.63	72.95	48.46	70.15	51.56	143.10

Product Service

Configuration 1 - Mode 2 - W&L1.4, W&L3, W&L5, W&L10

LTE (E-TM1.1) & WCDMA (QPSK)

MSR	Frequency(MHz)	Antenna A1		Antenna A2		*Total (dBm) RMS	*Total (W) RMS
		Result (dBm) RMS	Result (W) RMS	Result (dBm) RMS	Result (W) RMS		
W & L1.4	1952.4+1969.3	48.77	75.34	48.67	73.62	51.73	148.96
W & L3	1952.4+1968.5	48.82	76.21	48.66	73.45	51.75	149.66
W & L5	1952.4+1967.5	48.83	76.38	48.69	73.96	51.77	150.34
W & L10	1952.4+1965.0	48.84	76.56	48.65	73.28	51.76	149.84

LTE (E-TM3.2) & WCDMA (16QAM)

MSR	Frequency(MHz)	Antenna A1		Antenna A2		*Total (dBm) RMS	*Total (W) RMS
		Result (dBm) RMS	Result (W) RMS	Result (dBm) RMS	Result (W) RMS		
W & L1.4	1952.4+1969.3	48.71	74.30	48.63	72.95	51.68	147.25
W & L3	1952.4+1968.5	48.81	76.03	48.66	73.45	51.75	149.48
W & L5	1952.4+1967.5	48.77	75.34	48.62	72.78	51.71	148.12
W & L10	1952.4+1965.0	48.83	76.38	48.69	73.96	51.77	150.34

LTE (E-TM3.1) & WCDMA (64QAM)

MSR	Frequency(MHz)	Antenna A1		Antenna A2		*Total (dBm) RMS	*Total (W) RMS
		Result (dBm) RMS	Result (W) RMS	Result (dBm) RMS	Result (W) RMS		
W & L1.4	1952.4+1969.3	48.66	73.45	48.50	70.79	51.59	144.24
W & L3	1952.4+1968.5	48.67	73.62	48.57	71.94	51.63	145.56
W & L5	1952.4+1967.5	48.69	73.96	48.61	72.61	51.66	146.57
W & L10	1952.4+1965.0	48.72	74.47	48.65	73.28	51.70	147.75

Configuration 1 - Mode 3 - L1.4&W, L3&W, L5&W, L10&W

LTE (E-TM1.1) & WCDMA (QPSK)

MSR	Frequency(MHz)	Antenna A1		Antenna A2		*Total (dBm) RMS	*Total (W) RMS
		Result (dBm) RMS	Result (W) RMS	Result (dBm) RMS	Result (W) RMS		
L1.4 & W	1970.7+1987.6	48.75	74.99	48.62	72.78	51.70	147.77
L3 & W	1971.5+1987.6	48.77	75.34	48.72	74.47	51.76	149.81
L5 & W	1972.5+1987.6	48.88	77.27	48.69	73.96	51.80	151.23
L10 & W	1975.0+1987.6	48.81	76.03	48.71	74.30	51.77	150.33

LTE (E-TM3.2) & WCDMA (16QAM)

MSR	Frequency(MHz)	Antenna A1		Antenna A2		*Total (dBm) RMS	*Total (W) RMS
		Result (dBm) RMS	Result (W) RMS	Result (dBm) RMS	Result (W) RMS		
L1.4 & W	1970.7+1987.6	48.76	75.16	48.70	74.13	51.74	149.29
L3 & W	1971.5+1987.6	48.76	75.16	48.74	74.82	51.76	149.98
L5 & W	1972.5+1987.6	48.80	75.86	48.68	73.79	51.75	149.65
L10 & W	1975.0+1987.6	48.78	75.51	48.71	74.30	51.76	149.81

LTE (E-TM3.1) & WCDMA (64QAM)

MSR	Frequency(MHz)	Antenna A1		Antenna A2		*Total (dBm) RMS	*Total (W) RMS
		Result (dBm) RMS	Result (W) RMS	Result (dBm) RMS	Result (W) RMS		
L1.4 & W	1970.7+1987.6	48.58	72.11	48.57	71.94	51.59	144.05
L3 & W	1971.5+1987.6	48.66	73.45	48.61	72.61	51.65	146.06
L5 & W	1972.5+1987.6	48.70	74.13	48.62	72.78	51.67	146.91
L10 & W	1975.0+1987.6	48.69	73.96	48.64	73.11	51.68	147.07

Mix Carrier(x3): 2W+1L

Configuration 1 - Mode 4 - W&W&L1.4, W&W&L3, W&W&L5, W&W&L10

LTE (E-TM1.1) & WCDMA (QPSK)

MSR	Frequency(MHz)	Antenna A1		Antenna A2		*Total (dBm) RMS	*Total (W) RMS
		Result (dBm) RMS	Result (W) RMS	Result (dBm) RMS	Result (W) RMS		
W&W & L1.4	1952.4+1957.4+1969.3	48.76	75.16	48.66	73.45	51.72	148.61
W&W & L3	1952.4+1957.4+1968.5	48.79	75.68	48.67	73.62	51.74	149.30
W&W & L5	1952.4+1957.4+1967.5	48.78	75.51	48.70	74.13	51.75	149.64
W&W & L10	1952.4+1957.4+1965.0	48.80	75.86	48.69	73.96	51.76	149.82

LTE (E-TM3.2) & WCDMA (16QAM)

MSR	Frequency(MHz)	Antenna A1		Antenna A2		*Total (dBm) RMS	*Total (W) RMS
		Result (dBm) RMS	Result (W) RMS	Result (dBm) RMS	Result (W) RMS		
W&W & L1.4	1952.4+1957.4+1969.3	48.83	76.38	48.77	75.34	51.81	151.72
W&W & L3	1952.4+1957.4+1968.5	48.84	76.56	48.79	75.68	51.83	152.24
W&W & L5	1952.4+1957.4+1967.5	48.86	76.91	48.76	75.16	51.82	152.07
W&W & L10	1952.4+1957.4+1965.0	48.83	76.38	48.74	74.82	51.80	151.20

LTE (E-TM3.1) & WCDMA (64QAM)

MSR	Frequency(MHz)	Antenna A1		Antenna A2		*Total (dBm) RMS	*Total (W) RMS
		Result (dBm) RMS	Result (W) RMS	Result (dBm) RMS	Result (W) RMS		
W&W & L1.4	1952.4+1957.4+1969.3	48.65	73.28	48.61	72.61	51.64	145.89
W&W & L3	1952.4+1957.4+1968.5	48.70	74.13	48.64	73.11	51.68	147.24
W&W & L5	1952.4+1957.4+1967.5	48.79	75.68	48.66	73.45	51.74	149.13
W&W & L10	1952.4+1957.4+1965.0	48.80	75.86	48.65	73.28	51.74	149.14

Mix Carrier(x4): 2W+2L

Configuration 1 - Mode 5 - W&W&L1.4&L1.4, W&W&L3&L3, W&W&L5&L5, W&W&L10&L10

LTE (E-TM1.1) & WCDMA (QPSK)

MSR	Frequency(MHz)	Antenna A1		Antenna A2		*Total (dBm) RMS	*Total (W) RMS
		Result (dBm) RMS	Result (W) RMS	Result (dBm) RMS	Result (W) RMS		
W&W & L1.4&L1.4	1952.4+1957.4+ 1967.9+1969.3	48.70	74.13	48.69	73.96	51.71	148.09
W&W & L3&L3	1952.4+1957.4+ 1965.5+1968.5	48.79	75.68	48.69	73.96	51.75	149.64
W&W & L5&L5	1952.4+1957.4+ 1962.5+1967.5	48.79	75.68	48.73	74.64	51.77	150.32

LTE (E-TM3.2) & WCDMA (16QAM)

MSR	Frequency(MHz)	Antenna A1		Antenna A2		*Total (dBm) RMS	*Total (W) RMS
		Result (dBm) RMS	Result (W) RMS	Result (dBm) RMS	Result (W) RMS		
W&W & L1.4&L1.4	1952.4+1957.4+ 1967.9+1969.3	48.81	76.03	48.65	73.28	51.74	149.31
W&W & L3&L3	1952.4+1957.4+ 1965.5+1968.5	48.79	75.68	48.72	74.47	51.77	150.15
W&W & L5&L5	1952.4+1957.4+ 1962.5+1967.5	48.78	75.51	48.65	73.28	51.73	148.79

LTE (E-TM3.1) & WCDMA (64QAM)

MSR	Frequency(MHz)	Antenna A1		Antenna A2		*Total (dBm) RMS	*Total (W) RMS
		Result (dBm) RMS	Result (W) RMS	Result (dBm) RMS	Result (W) RMS		
W&W & L1.4&L1.4	1952.4+1957.4+ 1967.9+1969.3	48.59	72.28	48.59	72.28	51.60	144.56
W&W & L3&L3	1952.4+1957.4+ 1965.5+1968.5	48.70	74.13	48.63	72.95	51.68	147.08
W&W & L5&L5	1952.4+1957.4+ 1962.5+1967.5	48.69	73.96	48.64	73.11	51.68	147.07

Product Service

Note *:

Two transmitters output power were summed up according to FCC KDB662911 D01 Multiple Transmitter Output v02r01for MIMO mode.

This unit is tested without antenna. ERP/EIRP compliance is addressed at the time of licensing, as required by the responsible FCC/IC Bureau(s).Licensees are required to take into account maximum allowed antenna gain used in combination with above power settings to prevent the radiated output power to exceed the limits.

Limit	FCC: ≤1640W/MHz or ≤+62.15dBm/MHz IC: ≤100W or ≤+50dBm

Remarks

The total output power of the EUT does not exceed 1640W/MHz or 62.15dBm/MHz, and the output power per transmitter does not exceed 100W or 50dBm at the measured frequencies.

2.2 PEAK – AVERAGE RATIO

2.2.1 Specification Reference

FCC CFR 47 Part 24, Clause 24.232 (d)
Industry Canada RSS-133, Clause 6.4

2.2.2 Equipment Under Test

RRUS 01 B2 / KRC 118 74/2, S/N: D165426806, CB4S938194

2.2.3 Date of Test and Modification State

26 May to 03 June 2014 – Modification State 0

2.2.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.2.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 24 and Industry Canada RSS-133.

A peak to average ratio measurement is performed at the conducted port of the EUT. The spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determined the largest deviation between the average and the peak power of the EUT in given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level.

The measurements were performed on the combined output connector RF A1. Limited complementary measurement were done at the output connector RF A2 to verify identical performance for both transmitter chains in MIMO mode.

The EUT was tested at it's maximum power level. The path loss measured and entered as a reference level offset.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1
- Mode 1 - W&L1.4, W&L3, W&L5, W&L10
- Mode 2 - W&L1.4, W&L3, W&L5, W&L10
- Mode 3 - L1.4&W, L3&W, L5&W, L10&W
- Mode 4 - W&W&L1.4, W&W&L3, W&W&L5, W&W&L10
- Mode 5 - W&W&L1.4&L1.4, W&W&L3&L3, W&W&L5&L5

2.2.6 Environmental Conditions

Ambient Temperature	22.0 – 28.5°C
Relative Humidity	41.0 – 65.0%

Product Service

2.2.7 Test Results

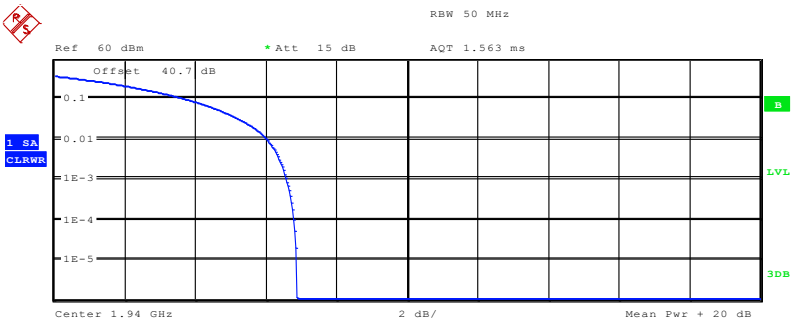
For the period of test the EUT met the requirements of FCC CFR 47 Part 24 and Industry Canada RSS-133 for Peak – Average Ratio.

The test results are shown below.

LTE (E-TM1.1) & WCDMA (QPSK)

Mix Carrier(x2): 1W+1L

Configuration 1 - Mode 1 - W&L1.4



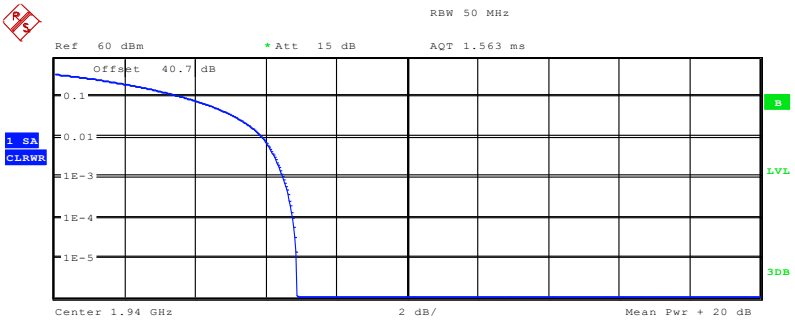
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.58 dBm
Peak	55.45 dBm
Crest	6.87 dB
10 %	3.75 dB
1 %	5.99 dB
.1 %	6.57 dB
.01 %	6.79 dB

Date: 27.MAY.2014 14:43:14

Product Service

Configuration 1 - Mode 1 - W&L3

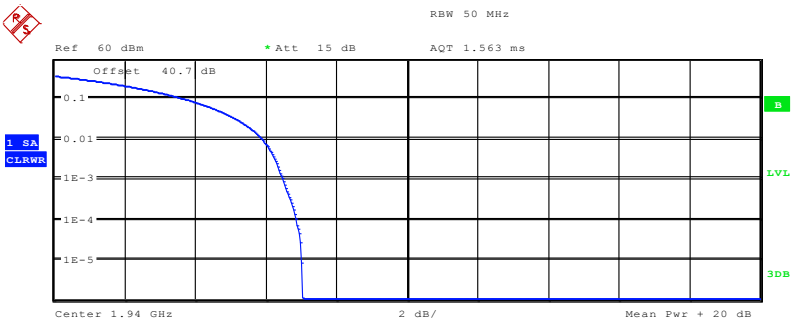


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.86 dBm
Peak	55.73 dBm
Crest	6.87 dB
10 %	3.69 dB
1 %	5.87 dB
.1 %	6.47 dB
.01 %	6.76 dB

Date: 27.MAY.2014 15:50:05

Configuration 1 - Mode 1 - W&L5



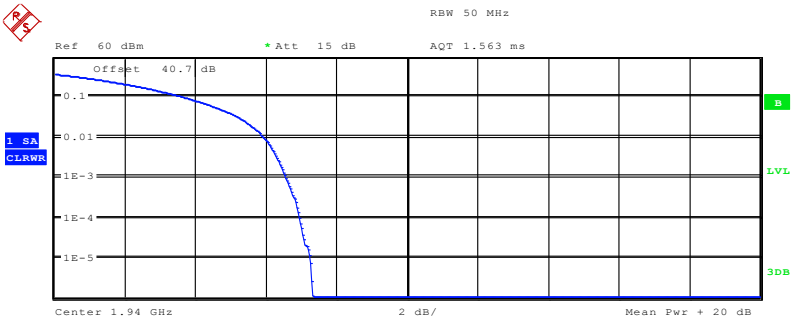
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.85 dBm
Peak	55.87 dBm
Crest	7.02 dB
10 %	3.72 dB
1 %	5.90 dB
.1 %	6.47 dB
.01 %	6.86 dB

Date: 27.MAY.2014 15:44:47

Product Service

Configuration 1 - Mode 1 - W&L10

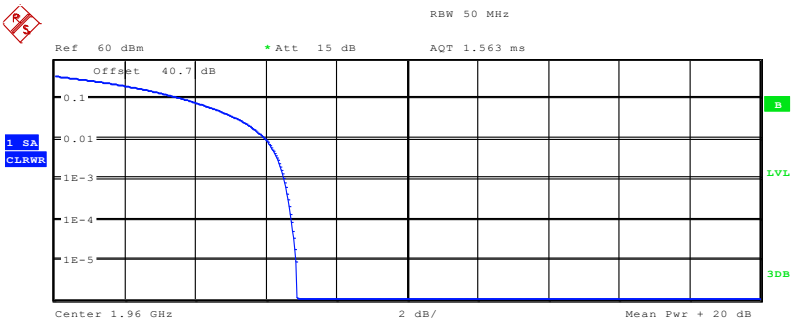


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.77 dBm
Peak	56.09 dBm
Crest	7.31 dB
10 %	3.72 dB
1 %	5.93 dB
.1 %	6.57 dB
.01 %	6.96 dB

Date: 27.MAY.2014 15:12:32

Configuration 1 - Mode 2 - W&L1.4



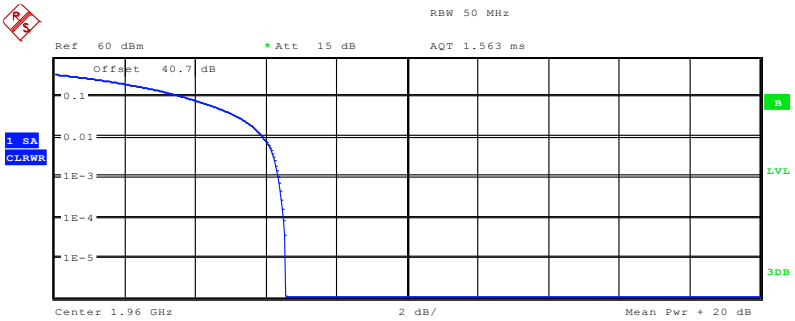
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.86 dBm
Peak	55.73 dBm
Crest	6.88 dB
10 %	3.69 dB
1 %	5.99 dB
.1 %	6.51 dB
.01 %	6.73 dB

Date: 26.MAY.2014 16:55:17

Product Service

Configuration 1 - Mode 2 - W&L3



Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.90 dBm
Peak	55.45 dBm
Crest	6.55 dB
10 %	3.72 dB
1 %	5.90 dB
.1 %	6.35 dB
.01 %	6.51 dB

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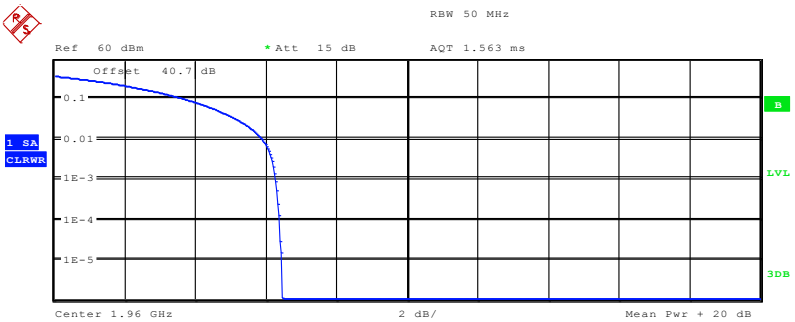
Configuration 1 - Mode 2 - W&L5



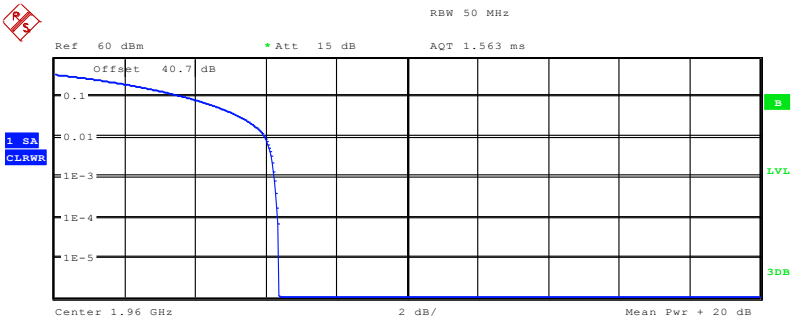
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.92 dBm
Peak	55.38 dBm
Crest	6.47 dB
10 %	3.72 dB
1 %	5.87 dB
.1 %	6.28 dB
.01 %	6.38 dB

Date: 27.MAY.2014 10:23:17

Product Service

Configuration 1 - Mode 2 - W&L10

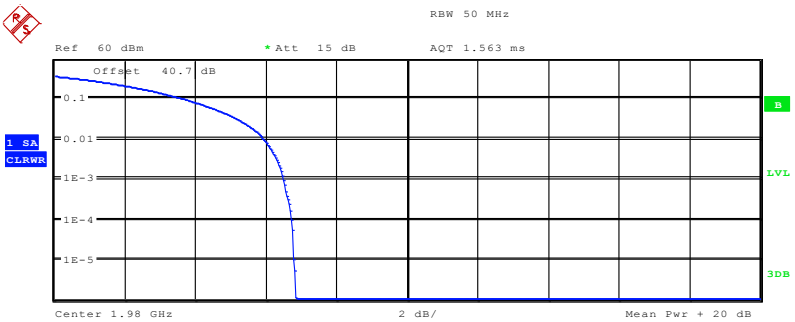


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.88 dBm
Peak	55.24 dBm
Crest	6.36 dB
10 %	3.75 dB
1 %	5.96 dB
.1 %	6.25 dB
.01 %	6.35 dB

Date: 27.MAY.2014 10:35:03

Configuration 1 - Mode 3 - L1.4&W



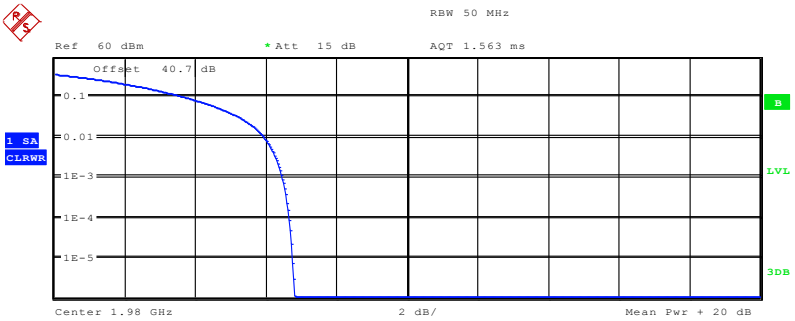
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.85 dBm
Peak	55.70 dBm
Crest	6.85 dB
10 %	3.72 dB
1 %	5.93 dB
.1 %	6.51 dB
.01 %	6.73 dB

Date: 27.MAY.2014 16:36:37

Product Service

Configuration 1 - Mode 3 - L3&W

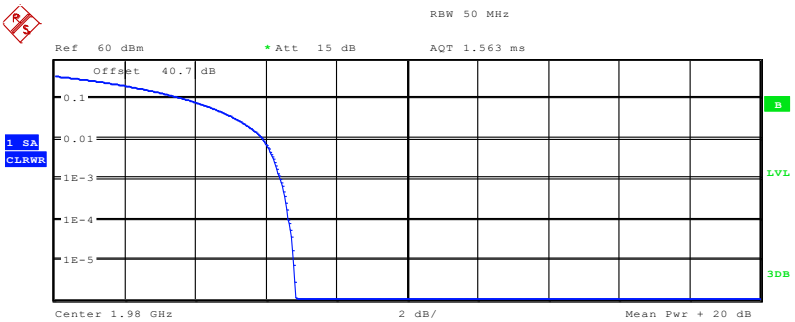


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.83 dBm
Peak	55.63 dBm
Crest	6.80 dB
10 %	3.72 dB
1 %	5.93 dB
.1 %	6.47 dB
.01 %	6.67 dB

Date: 27.MAY.2014 17:07:40

Configuration 1 - Mode 3 - L5&W



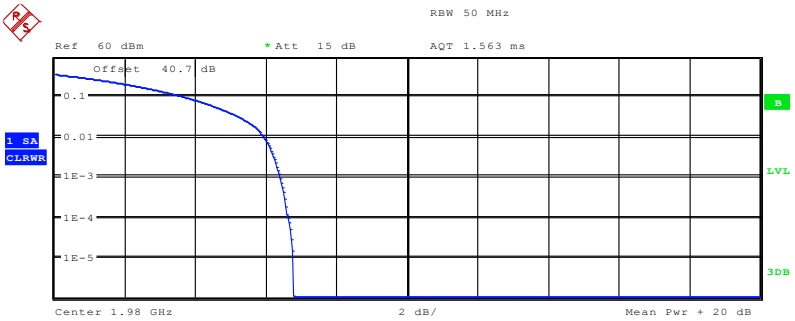
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.94 dBm
Peak	55.78 dBm
Crest	6.84 dB
10 %	3.75 dB
1 %	5.90 dB
.1 %	6.41 dB
.01 %	6.63 dB

Date: 28.MAY.2014 09:42:27

Product Service

Configuration 1 - Mode 3 - L10&W



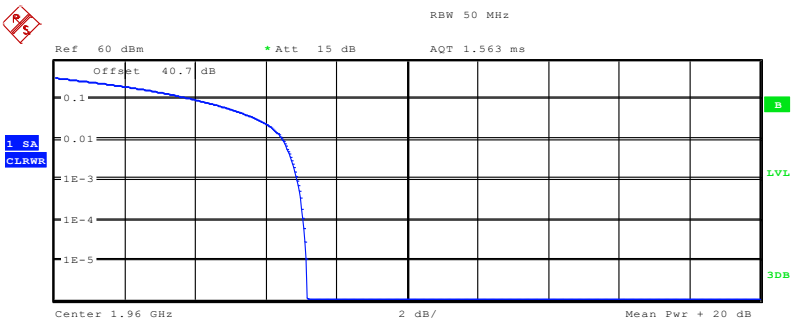
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.92 dBm
Peak	55.70 dBm
Crest	6.79 dB
10 %	3.75 dB
1 %	5.93 dB
.1 %	6.41 dB
.01 %	6.63 dB

Date: 28.MAY.2014 10:42:30

Mix Carrier(x3): 2W+1L

Configuration 1 - Mode 4 - W&W&L1.4



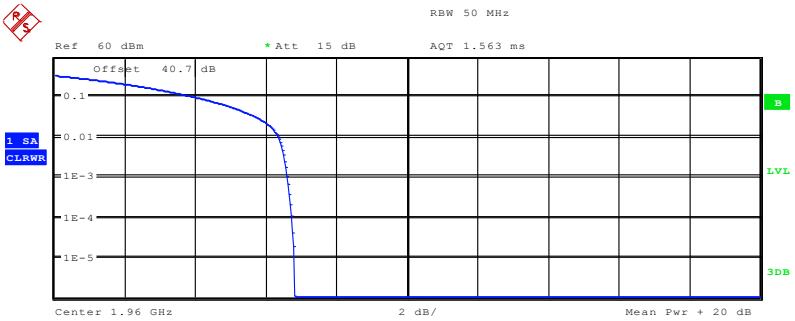
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.86 dBm
Peak	56.02 dBm
Crest	7.16 dB
10 %	4.01 dB
1 %	6.47 dB
.1 %	6.89 dB
.01 %	7.05 dB

Date: 29.MAY.2014 14:49:56

Product Service

Configuration 1 - Mode 4 - W&W&L3

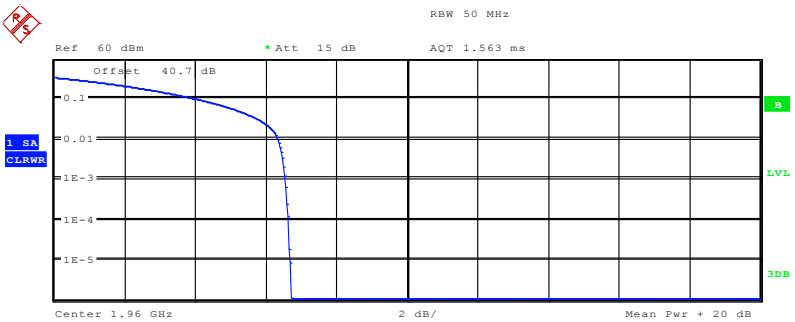


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.85 dBm
Peak	55.66 dBm
Crest	6.81 dB
10 %	4.04 dB
1 %	6.35 dB
.1 %	6.60 dB
.01 %	6.73 dB

Date: 29.MAY.2014 15:03:39

Configuration 1 - Mode 4 - W&W&L5

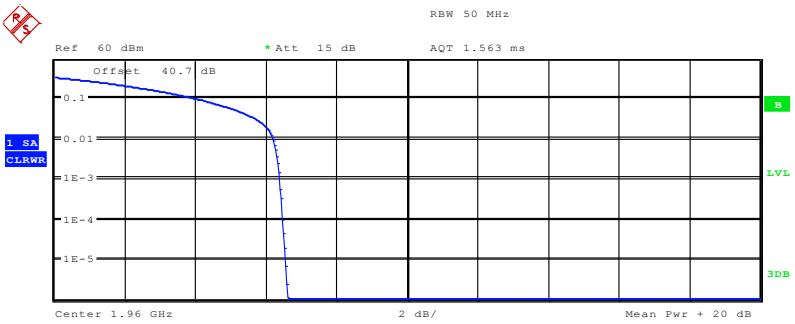


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.88 dBm
Peak	55.59 dBm
Crest	6.72 dB
10 %	4.07 dB
1 %	6.35 dB
.1 %	6.54 dB
.01 %	6.63 dB

Date: 29.MAY.2014 15:06:17

Configuration 1 - Mode 4 - W&W&L10



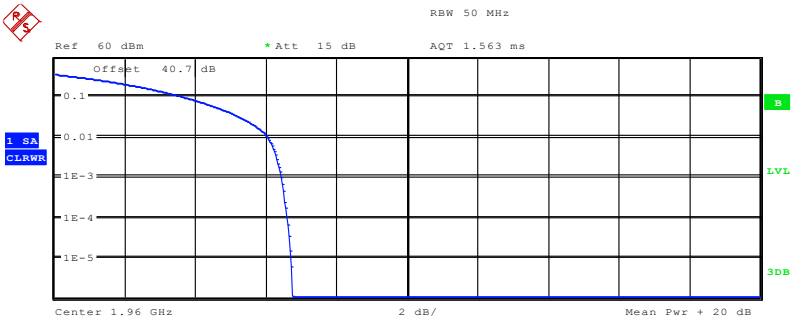
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.91 dBm
Peak	55.52 dBm
Crest	6.61 dB
10 %	4.10 dB
1 %	6.19 dB
.1 %	6.41 dB
.01 %	6.47 dB

Date: 29.MAY.2014 15:21:44

Mix Carrier(x4): 2W+2L

Configuration 1 - Mode 5 - W&W&L1.4&L1.4



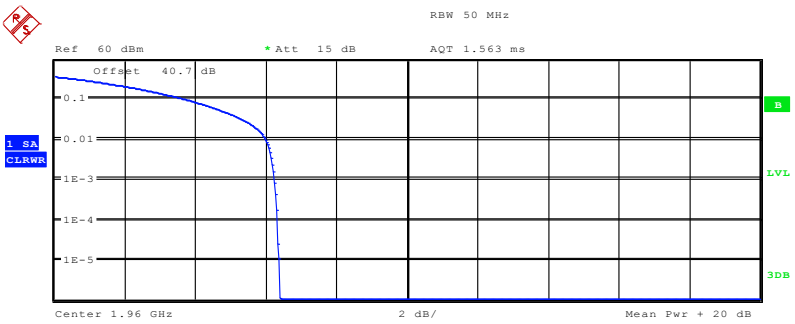
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.78 dBm
Peak	55.52 dBm
Crest	6.74 dB
10 %	3.72 dB
1 %	6.06 dB
.1 %	6.44 dB
.01 %	6.60 dB

Date: 3.JUN.2014 11:48:10

Product Service

Configuration 1 - Mode 5 - W&W&L3&L3

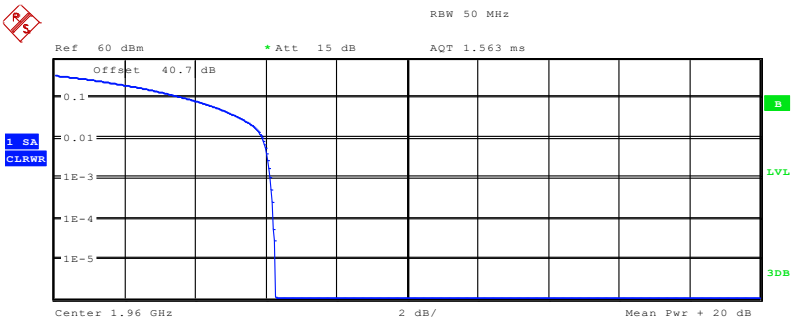


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.78 dBm
Peak	55.17 dBm
Crest	6.39 dB
10 %	3.75 dB
1 %	5.99 dB
.1 %	6.25 dB
.01 %	6.31 dB

Date: 3.JUN.2014 11:37:52

Configuration 1 - Mode 5 - W&W&L5&L5



Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.83 dBm
Peak	55.10 dBm
Crest	6.27 dB
10 %	3.75 dB
1 %	5.90 dB
.1 %	6.12 dB
.01 %	6.22 dB

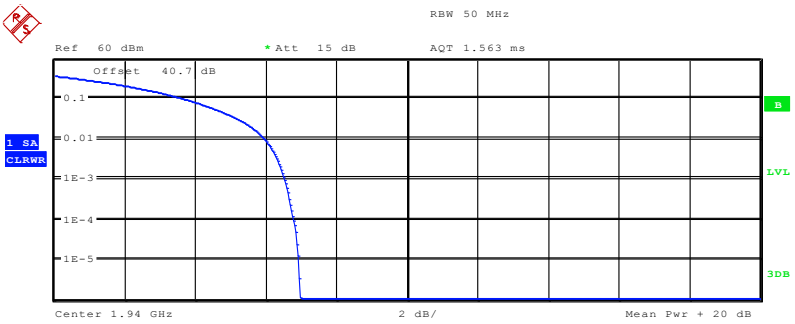
Date: 3.JUN.2014 11:34:52

Product Service

LTE (E-TM3.2) & WCDMA (16QAM)

Mix Carrier(x2): 1W+1L

Configuration 1 - Mode 1 - W&L1.4

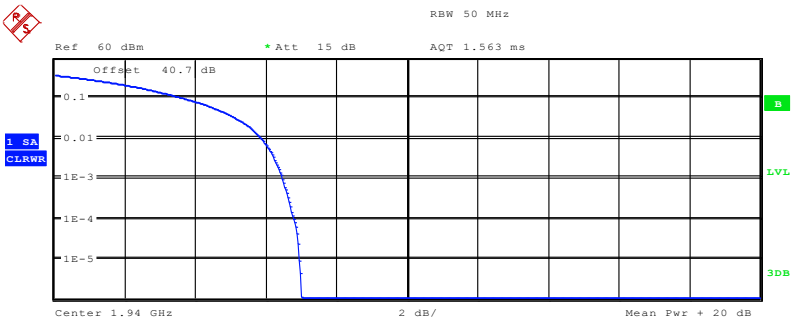


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.78 dBm
Peak	55.73 dBm
Crest	6.96 dB
10 %	3.69 dB
1 %	5.93 dB
.1 %	6.54 dB
.01 %	6.79 dB

Date: 28.MAY.2014 16:53:46

Configuration 1 - Mode 1 - W&L3



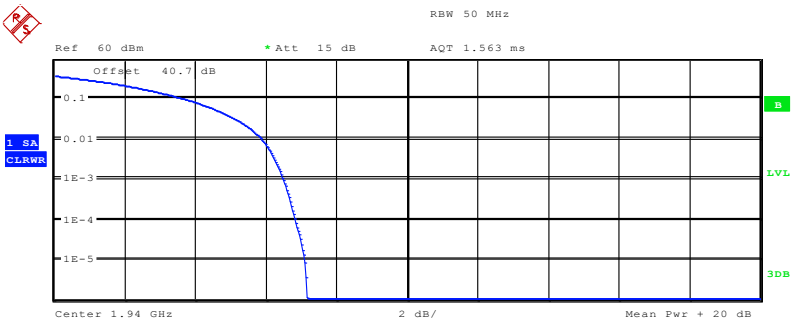
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.87 dBm
Peak	55.87 dBm
Crest	7.01 dB
10 %	3.69 dB
1 %	5.87 dB
.1 %	6.47 dB
.01 %	6.79 dB

Date: 29.MAY.2014 10:08:58

Product Service

Configuration 1 - Mode 1 - W&L5

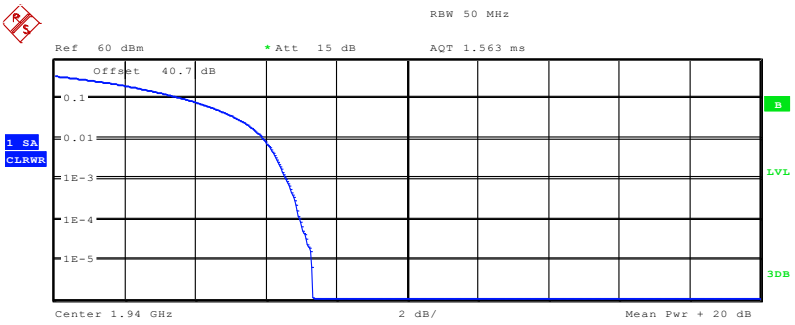


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.78 dBm
Peak	55.94 dBm
Crest	7.16 dB
10 %	3.72 dB
1 %	5.87 dB
.1 %	6.47 dB
.01 %	6.83 dB

Date: 29.MAY.2014 10:26:18

Configuration 1 - Mode 1 - W&L10



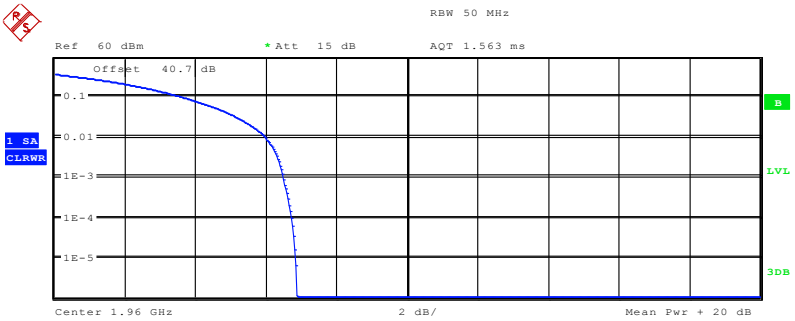
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.77 dBm
Peak	56.09 dBm
Crest	7.32 dB
10 %	3.72 dB
1 %	5.93 dB
.1 %	6.57 dB
.01 %	6.96 dB

Date: 29.MAY.2014 10:44:05

Product Service

Configuration 1 - Mode 2 - W&L1.4

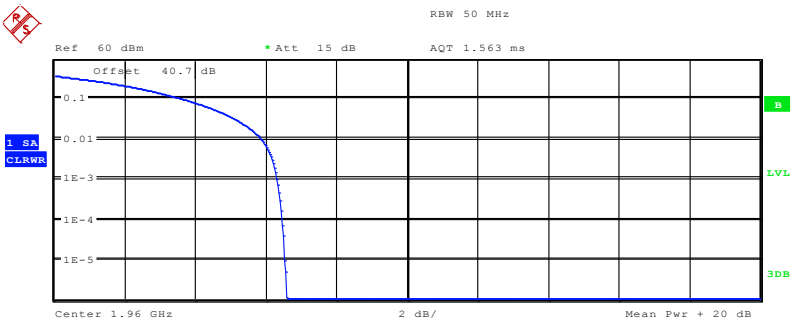


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.79 dBm
Peak	55.66 dBm
Crest	6.87 dB
10 %	3.69 dB
1 %	5.96 dB
.1 %	6.51 dB
.01 %	6.73 dB

Date: 27.MAY.2014 12:23:36

Configuration 1 - Mode 2 - W&L3



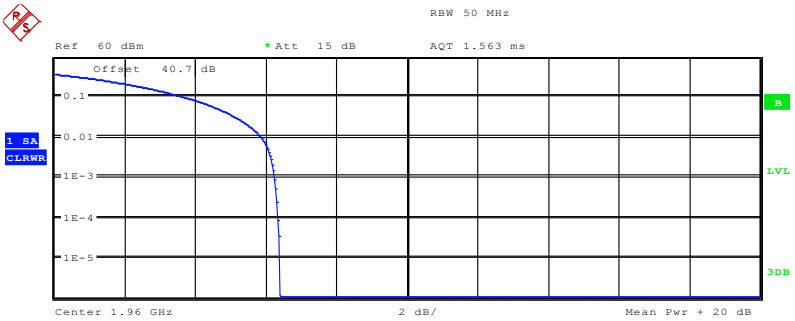
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.86 dBm
Peak	55.45 dBm
Crest	6.60 dB
10 %	3.65 dB
1 %	5.87 dB
.1 %	6.31 dB
.01 %	6.47 dB

Date: 27.MAY.2014 12:08:52

Product Service

Configuration 1 - Mode 2 - W&L5

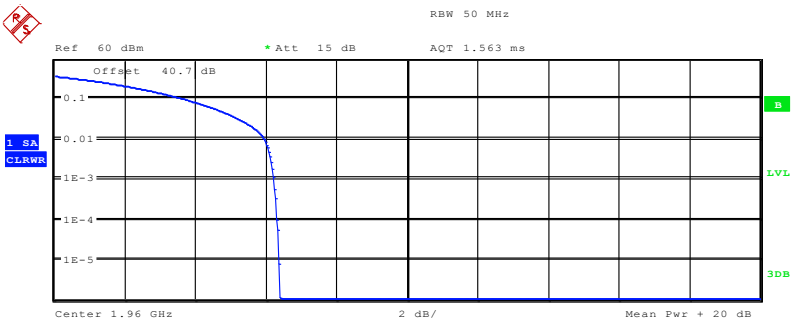


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.92 dBm
Peak	55.31 dBm
Crest	6.39 dB
10 %	3.72 dB
1 %	5.87 dB
.1 %	6.25 dB
.01 %	6.35 dB

Date: 27.MAY.2014 11:34:21

Configuration 1 - Mode 2 - W&L10



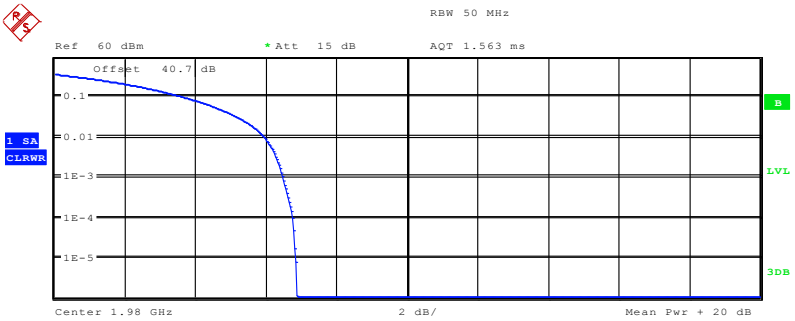
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.87 dBm
Peak	55.24 dBm
Crest	6.37 dB
10 %	3.72 dB
1 %	5.96 dB
.1 %	6.22 dB
.01 %	6.31 dB

Date: 27.MAY.2014 11:20:26

Product Service

Configuration 1 - Mode 3 - L1.4&W

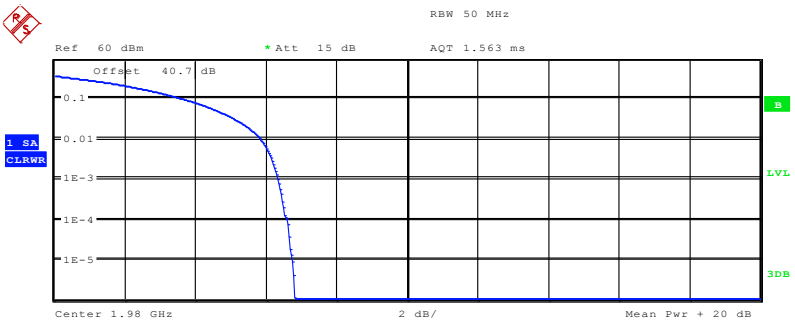


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.83 dBm
Peak	55.70 dBm
Crest	6.87 dB
10 %	3.72 dB
1 %	5.93 dB
.1 %	6.47 dB
.01 %	6.76 dB

Date: 28.MAY.2014 12:45:44

Configuration 1 - Mode 3 - L3&W



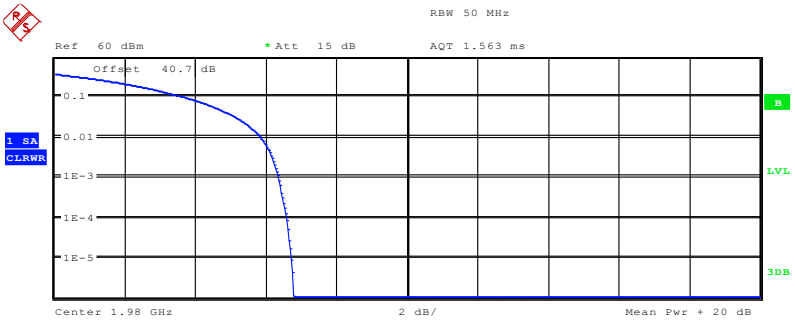
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.89 dBm
Peak	55.70 dBm
Crest	6.81 dB
10 %	3.69 dB
1 %	5.83 dB
.1 %	6.35 dB
.01 %	6.60 dB

Date: 28.MAY.2014 11:33:27

Product Service

Configuration 1 - Mode 3 - L5&W

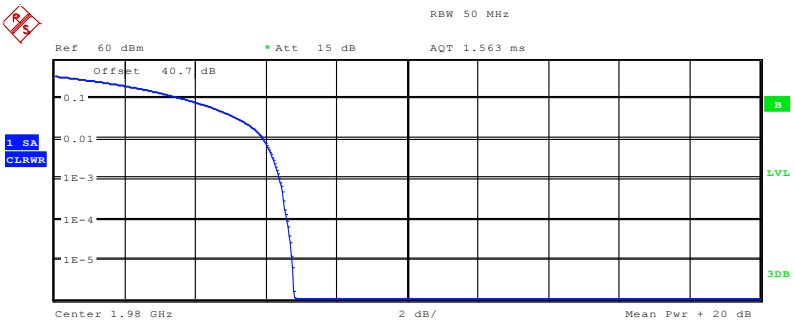


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.92 dBm
Peak	55.70 dBm
Crest	6.78 dB
10 %	3.72 dB
1 %	5.83 dB
.1 %	6.35 dB
.01 %	6.60 dB

Date: 28.MAY.2014 11:11:12

Configuration 1 - Mode 3 - L10&W



Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

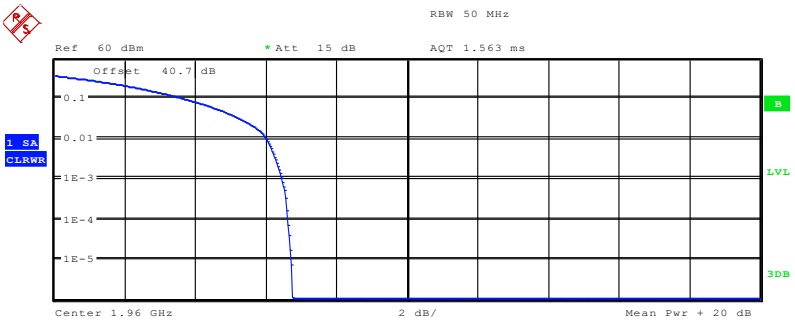
	Trace 1
Mean	48.91 dBm
Peak	55.70 dBm
Crest	6.80 dB
10 %	3.72 dB
1 %	5.93 dB
.1 %	6.38 dB
.01 %	6.60 dB

Date: 28.MAY.2014 11:08:34

Product Service

Mix Carrier(x3): 2W+1L

Configuration 1 - Mode 4 - W&W&L1.4

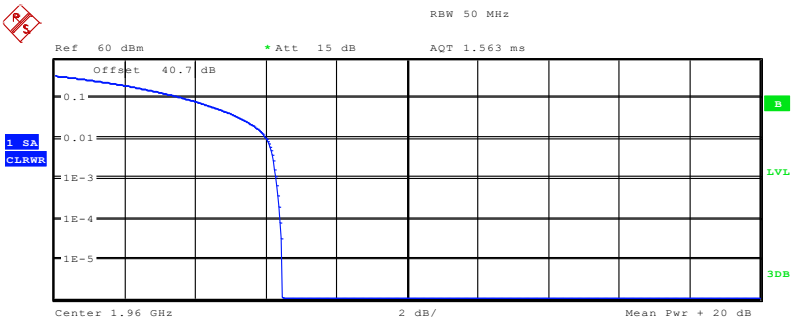


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.99 dBm
Peak	55.73 dBm
Crest	6.75 dB
10 %	3.72 dB
1 %	5.99 dB
.1 %	6.44 dB
.01 %	6.63 dB

Date: 29.MAY.2014 16:45:48

Configuration 1 - Mode 4 - W&W&L3



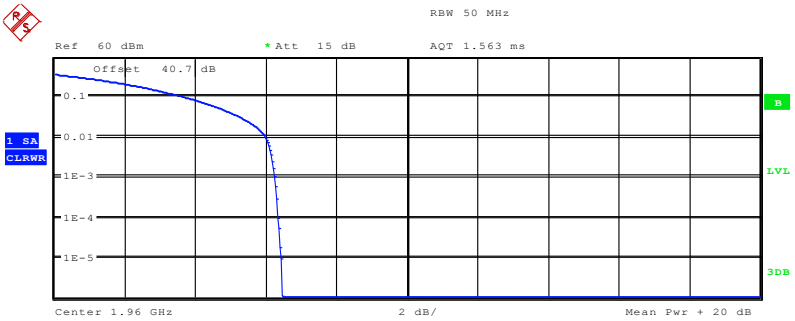
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.93 dBm
Peak	55.38 dBm
Crest	6.45 dB
10 %	3.75 dB
1 %	5.99 dB
.1 %	6.28 dB
.01 %	6.41 dB

Date: 29.MAY.2014 16:43:19

Product Service

Configuration 1 - Mode 4 - W&W&L5

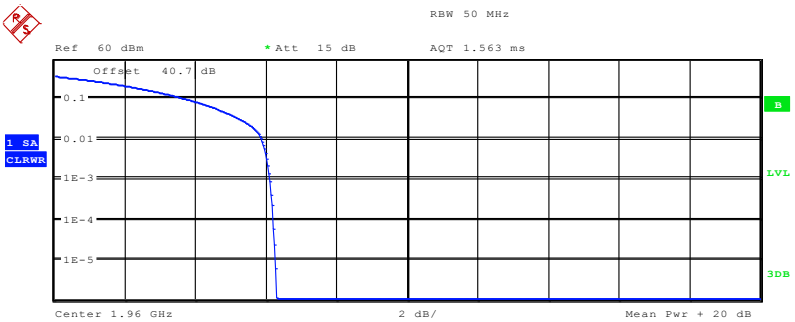


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.92 dBm
Peak	55.38 dBm
Crest	6.46 dB
10 %	3.75 dB
1 %	5.99 dB
.1 %	6.25 dB
.01 %	6.35 dB

Date: 29.MAY.2014 16:31:59

Configuration 1 - Mode 4 - W&W&L10



Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

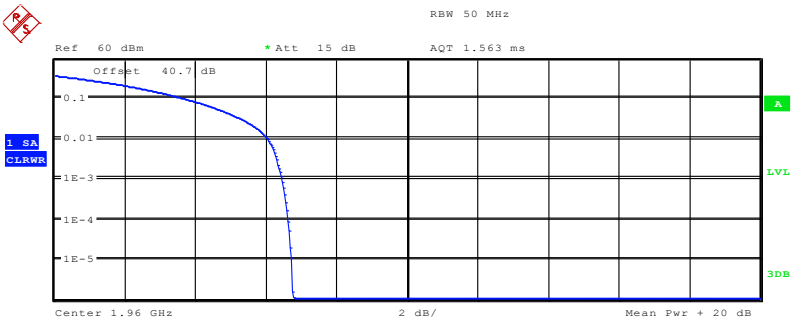
	Trace 1
Mean	48.96 dBm
Peak	55.24 dBm
Crest	6.28 dB
10 %	3.78 dB
1 %	5.87 dB
.1 %	6.12 dB
.01 %	6.22 dB

Date: 29.MAY.2014 16:24:06

Product Service

Mix Carrier(x4): 2W+2L

Configuration 1 - Mode 5 - W&W&L1.4&L1.4

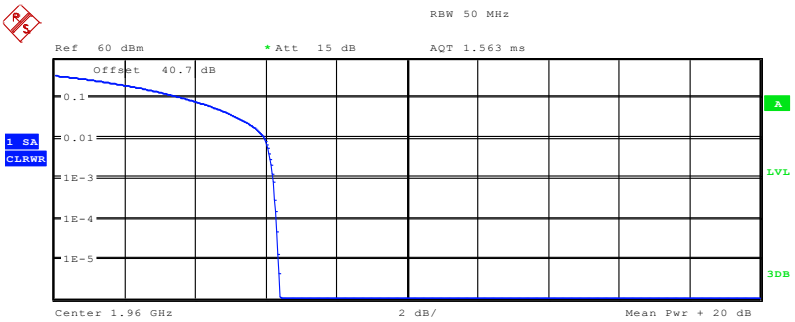


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.77 dBm
Peak	55.52 dBm
Crest	6.76 dB
10 %	3.72 dB
1 %	6.03 dB
.1 %	6.44 dB
.01 %	6.63 dB

Date: 3.JUN.2014 12:47:11

Configuration 1 - Mode 5 - W&W&L3&L3



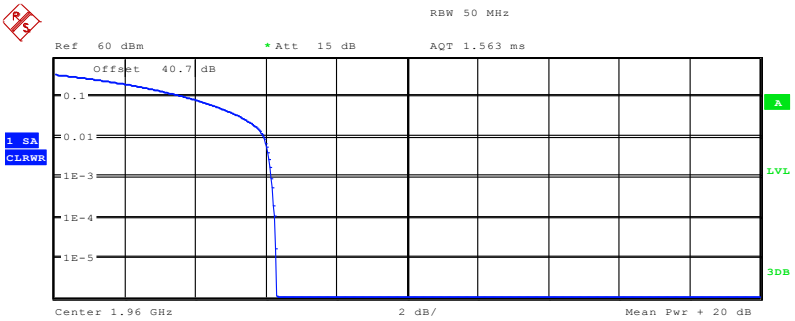
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.86 dBm
Peak	55.24 dBm
Crest	6.38 dB
10 %	3.72 dB
1 %	5.96 dB
.1 %	6.22 dB
.01 %	6.31 dB

Date: 3.JUN.2014 13:50:14

Product Service

Configuration 1 - Mode 5 - W&W&L5&L5



Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

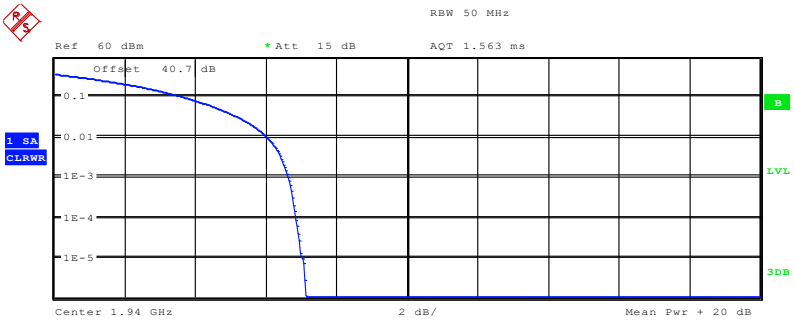
	Trace 1
Mean	48.75 dBm
Peak	55.03 dBm
Crest	6.28 dB
10 %	3.78 dB
1 %	5.93 dB
.1 %	6.15 dB
.01 %	6.25 dB

Date: 3.JUN.2014 13:57:13

LTE (E-TM3.1) & WCDMA (64QAM)

Mix Carrier(x2): 1W+1L

Configuration 1 - Mode 1 - W&L1.4



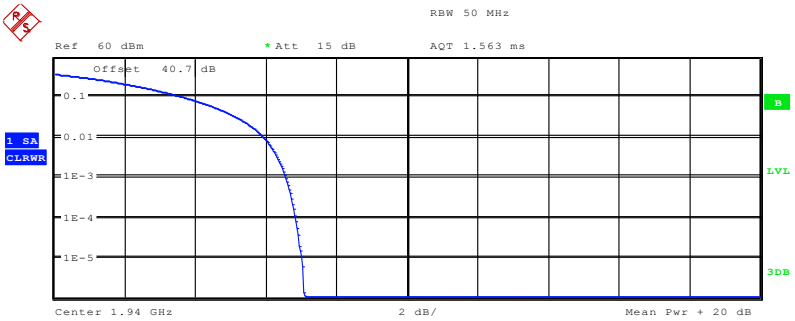
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.61 dBm
Peak	55.73 dBm
Crest	7.12 dB
10 %	3.72 dB
1 %	6.03 dB
.1 %	6.63 dB
.01 %	6.86 dB

Date: 28.MAY.2014 16:33:40

Product Service

Configuration 1 - Mode 1 - W&L3

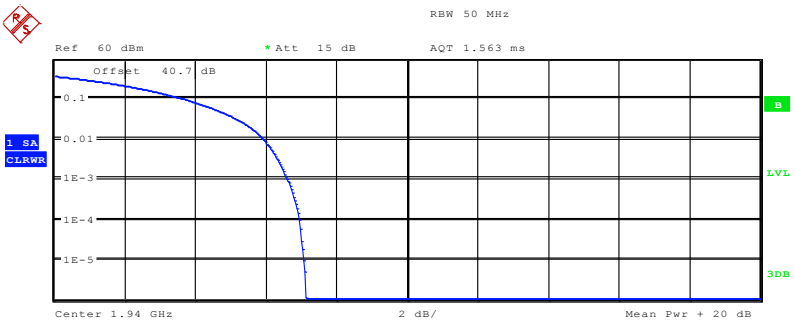


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.72 dBm
Peak	55.80 dBm
Crest	7.08 dB
10 %	3.69 dB
1 %	5.93 dB
.1 %	6.57 dB
.01 %	6.83 dB

Date: 28.MAY.2014 16:15:18

Configuration 1 - Mode 1 - W&L5



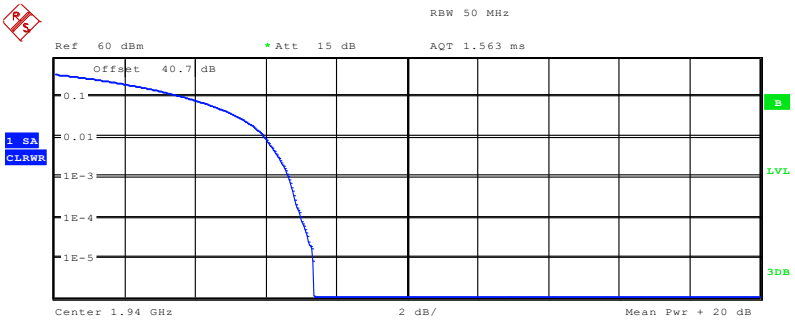
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.73 dBm
Peak	55.87 dBm
Crest	7.14 dB
10 %	3.72 dB
1 %	5.90 dB
.1 %	6.60 dB
.01 %	6.96 dB

Date: 28.MAY.2014 15:30:39

Product Service

Configuration 1 - Mode 1 - W&L10

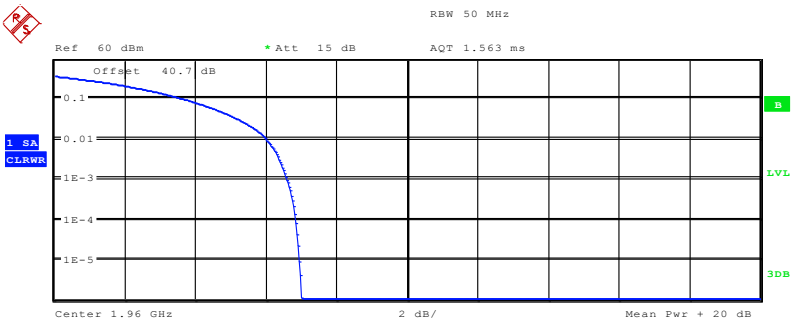


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.73 dBm
Peak	56.09 dBm
Crest	7.36 dB
10 %	3.72 dB
1 %	5.96 dB
.1 %	6.63 dB
.01 %	6.99 dB

Date: 28.MAY.2014 15:23:15

Configuration 1 - Mode 2 - W&L1.4



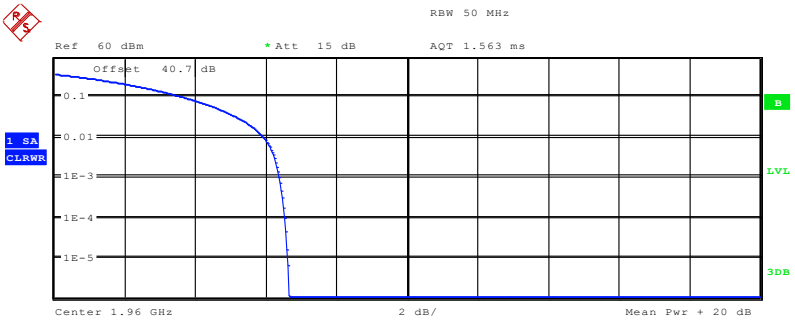
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.66 dBm
Peak	55.66 dBm
Crest	7.00 dB
10 %	3.69 dB
1 %	5.99 dB
.1 %	6.60 dB
.01 %	6.86 dB

Date: 27.MAY.2014 13:43:14

Product Service

Configuration 1 - Mode 2 - W&L3

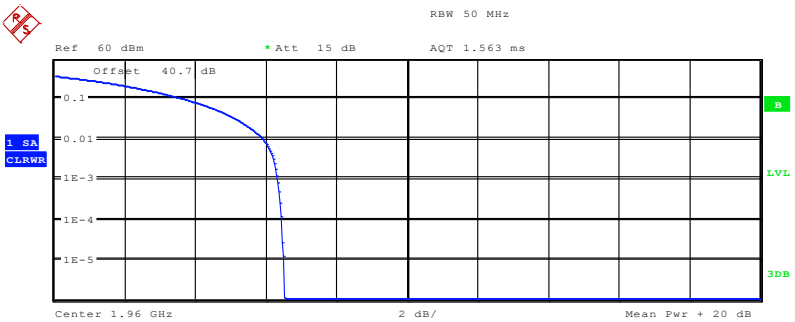


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.81 dBm
Peak	55.45 dBm
Crest	6.65 dB
10 %	3.69 dB
1 %	5.90 dB
.1 %	6.38 dB
.01 %	6.54 dB

Date: 27.MAY.2014 14:00:33

Configuration 1 - Mode 2 - W&L5



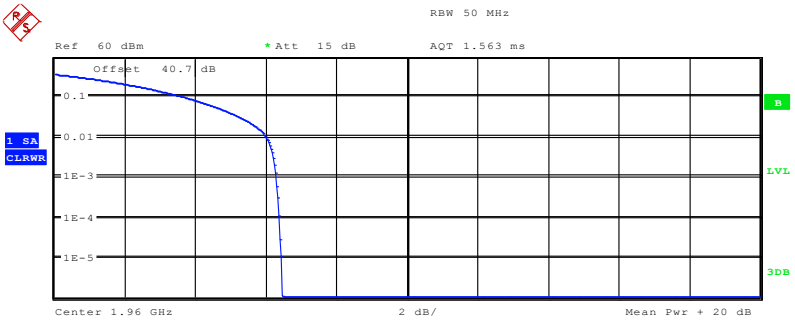
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.79 dBm
Peak	55.31 dBm
Crest	6.52 dB
10 %	3.72 dB
1 %	5.90 dB
.1 %	6.35 dB
.01 %	6.44 dB

Date: 27.MAY.2014 14:04:54

Product Service

Configuration 1 - Mode 2 - W&L10

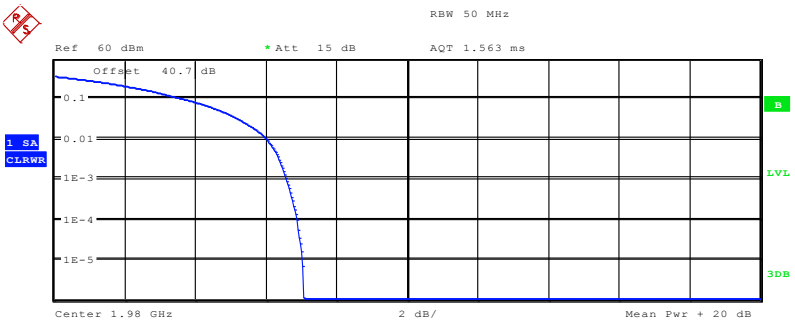


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.79 dBm
Peak	55.24 dBm
Crest	6.45 dB
10 %	3.72 dB
1 %	5.99 dB
.1 %	6.28 dB
.01 %	6.38 dB

Date: 27.MAY.2014 14:21:19

Configuration 1 - Mode 3 - L1.4&W



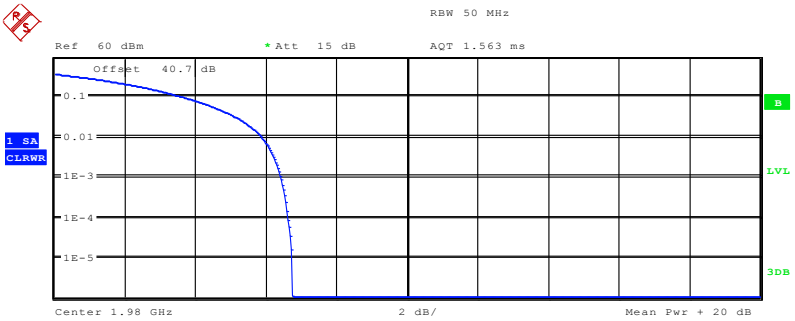
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.71 dBm
Peak	55.78 dBm
Crest	7.06 dB
10 %	3.72 dB
1 %	5.99 dB
.1 %	6.57 dB
.01 %	6.89 dB

Date: 28.MAY.2014 13:50:50

Product Service

Configuration 1 - Mode 3 - L3&W

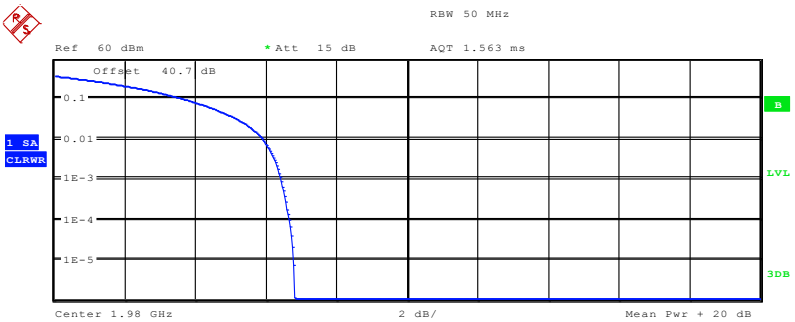


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.82 dBm
Peak	55.56 dBm
Crest	6.75 dB
10 %	3.69 dB
1 %	5.87 dB
.1 %	6.41 dB
.01 %	6.63 dB

Date: 28.MAY.2014 14:12:34

Configuration 1 - Mode 3 - L5&W



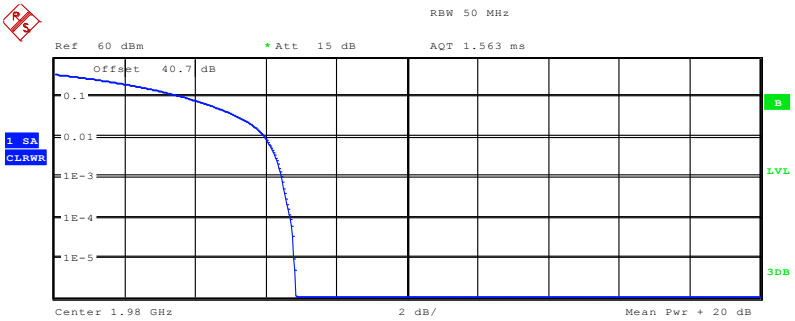
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.83 dBm
Peak	55.63 dBm
Crest	6.80 dB
10 %	3.69 dB
1 %	5.90 dB
.1 %	6.41 dB
.01 %	6.67 dB

Date: 28.MAY.2014 14:39:16

Product Service

Configuration 1 - Mode 3 - L10&W



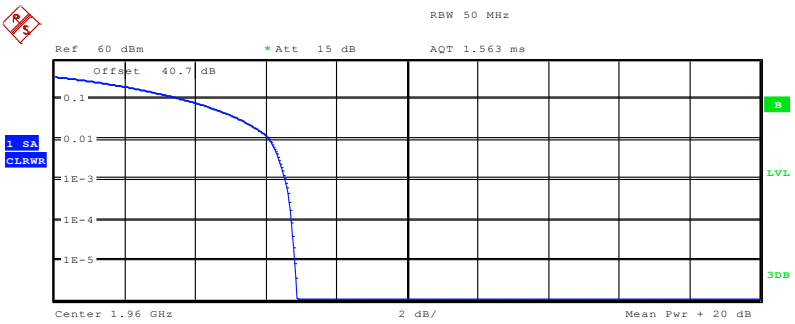
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.85 dBm
Peak	55.70 dBm
Crest	6.85 dB
10 %	3.72 dB
1 %	5.96 dB
.1 %	6.44 dB
.01 %	6.70 dB

Date: 28.MAY.2014 14:57:01

Mix Carrier(x3): 2W+1L

Configuration 1 - Mode 4 - W&W&L1.4



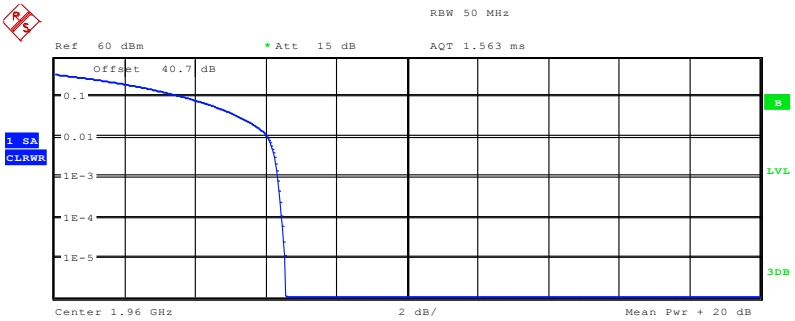
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.79 dBm
Peak	55.66 dBm
Crest	6.87 dB
10 %	3.69 dB
1 %	6.09 dB
.1 %	6.54 dB
.01 %	6.73 dB

Date: 29.MAY.2014 17:01:49

Product Service

Configuration 1 - Mode 4 - W&W&L3

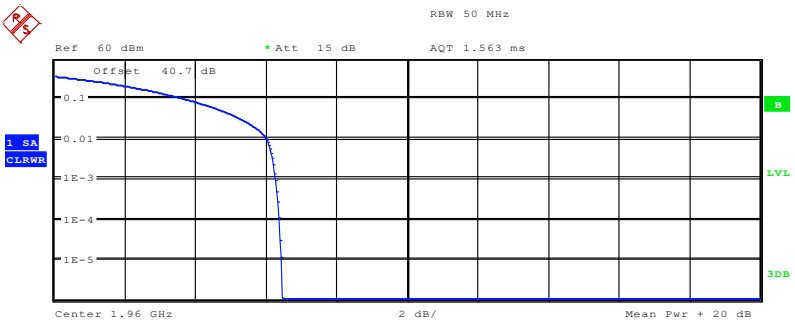


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.83 dBm
Peak	55.38 dBm
Crest	6.55 dB
10 %	3.72 dB
1 %	6.03 dB
.1 %	6.35 dB
.01 %	6.44 dB

Date: 29.MAY.2014 17:14:18

Configuration 1 - Mode 4 - W&W&L5

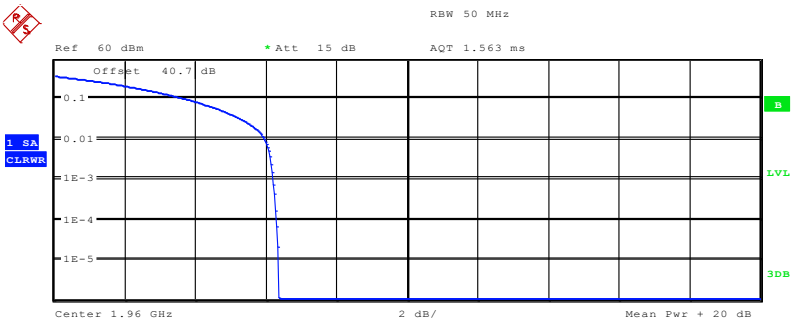


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.79 dBm
Peak	55.24 dBm
Crest	6.45 dB
10 %	3.75 dB
1 %	5.99 dB
.1 %	6.28 dB
.01 %	6.38 dB

Date: 30.MAY.2014 09:45:24

Configuration 1 - Mode 4 - W&W&L10



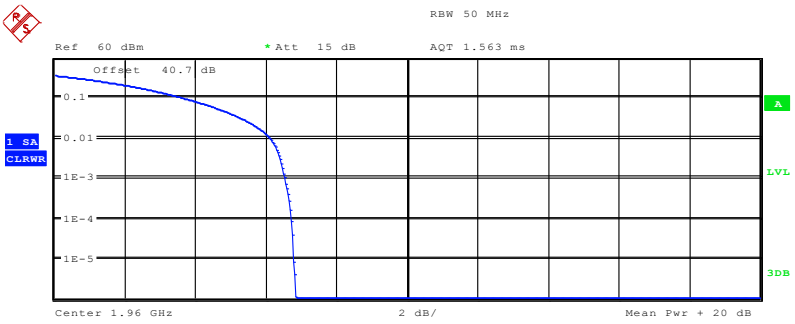
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.75 dBm
Peak	55.10 dBm
Crest	6.35 dB
10 %	3.75 dB
1 %	5.96 dB
.1 %	6.22 dB
.01 %	6.31 dB

Date: 30.MAY.2014 09:58:23

Mix Carrier(x4): 2W+2L

Configuration 1 - Mode 5 - W&W&L1.4&L1.4

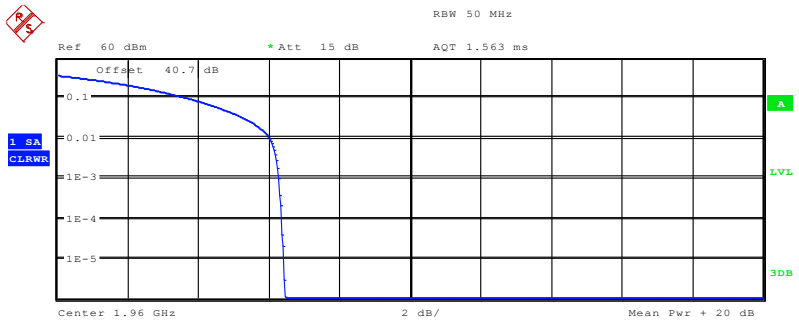


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.68 dBm
Peak	55.52 dBm
Crest	6.84 dB
10 %	3.72 dB
1 %	6.12 dB
.1 %	6.54 dB
.01 %	6.73 dB

Date: 3.JUN.2014 14:42:05

Configuration 1 - Mode 5 - W&W&L3&L3

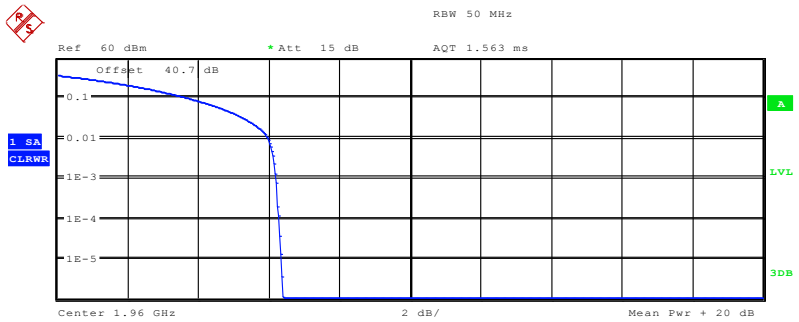


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.73 dBm
Peak	55.17 dBm
Crest	6.44 dB
10 %	3.72 dB
1 %	6.03 dB
.1 %	6.28 dB
.01 %	6.38 dB

Date: 3.JUN.2014 14:33:11

Configuration 1 - Mode 5 - W&W&L5&L5



Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

	Trace 1
Mean	48.72 dBm
Peak	55.10 dBm
Crest	6.38 dB
10 %	3.75 dB
1 %	5.96 dB
.1 %	6.22 dB
.01 %	6.28 dB

Date: 3.JUN.2014 14:24:38

Limit	13dB

Remarks

The Peak – Average ratio does not exceed 13dB at the measured frequencies.

2.3 SPURIOUS EMISSIONS AT ANTENNA TERMINALS (±1MHz)

2.3.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1051
FCC CFR 47 Part 24, Clause 24.238 (b)
Industry Canada RSS-133, Clause 6.5

2.3.2 Equipment Under Test

RRUS 01 B2 / KRC 118 74/2, S/N: D165426806, CB4S938194

2.3.3 Date of Test and Modification State

27 and 28 May 2014 – Modification State 0

2.3.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.3.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 2 and Part 24 and Industry Canada RSS-133.

In accordance with FCC CFR 47 Part 24, 24.238(b), at least 1% of the emission bandwidth should be used for the frequencies offset up to 1MHz away from the block edge. For WCDMA/LTE mix carrier 1W+1L(1.4MHz OBW), with WCDMA signal at the edge, which is selected as the worst case, 30kHz resolution bandwidth was used. As 30kHz is <1% of the Emission Bandwidth (4.7MHz emission Bandwidth setting), the limit was adjusted from -13dBm to -14.95dBm to compensate for the reduced measurement bandwidth. According to the FCC rules, a RBW of 1MHz should be used for measurements of emissions > 1MHz away from the band edges. A resolution bandwidth of 50kHz was used for the measurements of emissions > 1MHz away from the band edges. To compensate for the reduced measurement bandwidth, at the frequency range > 1MHz away from the band edges, the limit was adjusted from -13dBm to -26dBm. Spectrum analyser detector was set as RMS.

The limit was adjusted with a correction of -3dB [10Log(2)] by using the Measure and Add 10Log(N) dB technique according to FCC KDB662911 D01 Multiple Transmitter Output v02r01 accounting for simultaneous transmission from antenna ports RF A1 and RF A2 .

The measurements were performed on the combined output connector RF A1. Limited complementary measurement were done at the output connector RF A2 to verify identical performance for both transmitter chains.

The EUT was tested at it's maximum power level. The path loss measured and entered as a reference level offset.

The test was performed with the EUT in the following configurations and modes of operation as the worst cases:

Configuration 1 - Mode 1 - W&L1.4
- Mode 3 - L1.4&W

Product Service

2.3.6 Environmental Conditions

Ambient Temperature	22.0 – 28.5°C
Relative Humidity	41.0 – 65.0%

2.3.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 2 and Part 24 and Industry Canada RSS-133 for Spurious Emissions Antenna Terminals (±1MHz).

The below frequencies of the EUT were tested against along with the tested channels.

Mix Carrier(x2): 1W+1L

Configuration 1 - Mode 1 - W&L1.4 and 3 - L1.4&W

Band Edge Frequency	Edge Test with WCDMA Channel No./Frequencies	RBW / VBW (kHz)	Limit (dB)
Bottom 1930MHz	Channel: 9667(W)&793(L) Frequency: 1932.4MHz(W)+ 1949.3MHz(L1.4)	30 / 300	-17.95
Top 1990MHz	Channel: 9938(W)&1007(L) Frequency: 1987.6 MHz(W)+ 1970.7MHz(L1.4)	30 / 300	-17.95

The channels shown in the table above are the minimum and maximum channels of WCDMA mode that can be used in the authorised frequency ranges to maintain compliance. Channels used outside of those stated and power levels used beyond those stated in the table exceed the specification limits, thus they cannot be used.

The channels outside of those shown in the table above were not tested at lower power levels to determine a level at which compliance would be achieved. Therefore, to maintain compliance, only the channels shown in the table above shall be used.

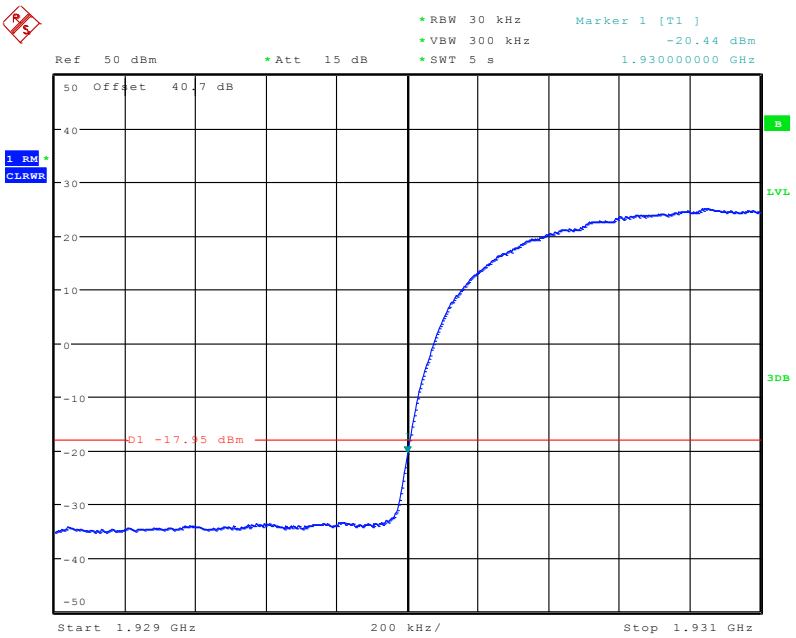
Product Service

The test results are shown below

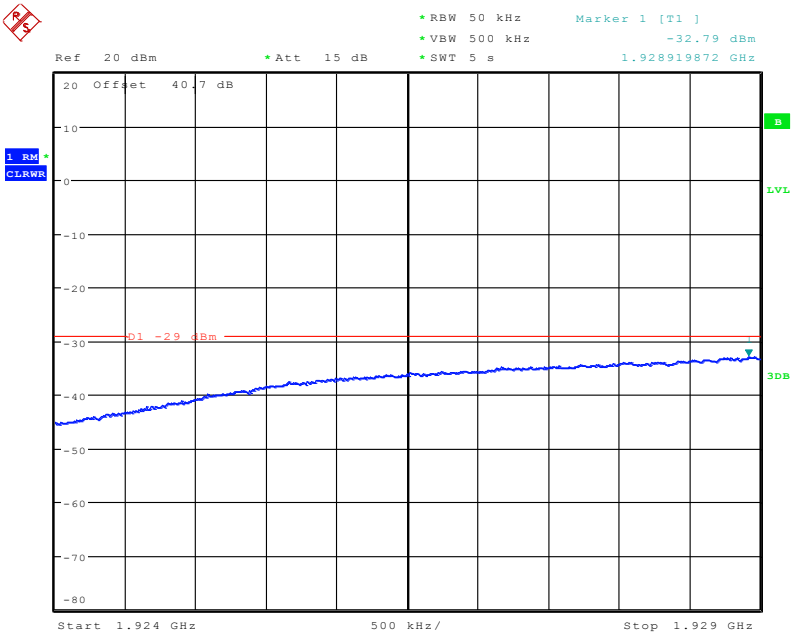
Mix Carrier(x2): 1W+1L

LTE (E-TM1.1) & WCDMA (QPSK)

Configuration 1 - Mode 1 - W&L1.4

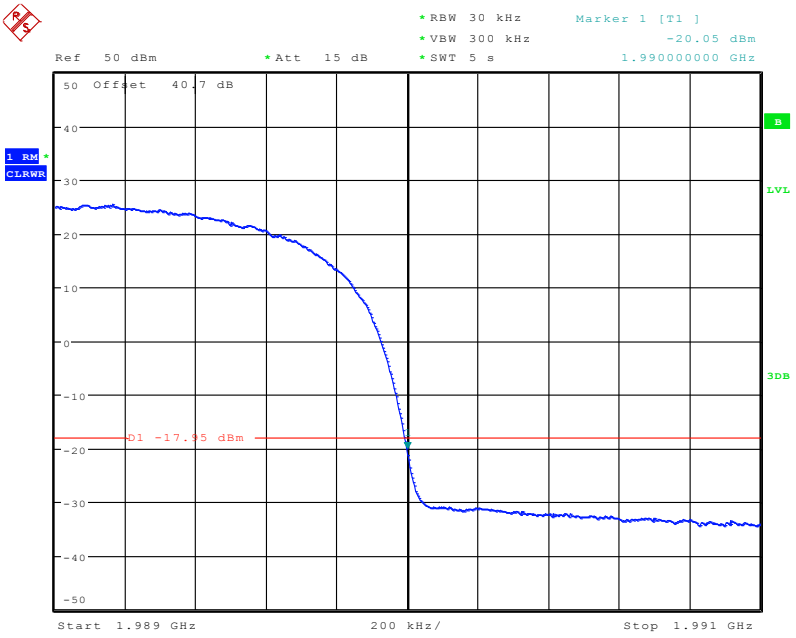


Date: 27.MAY.2014 16:13:32

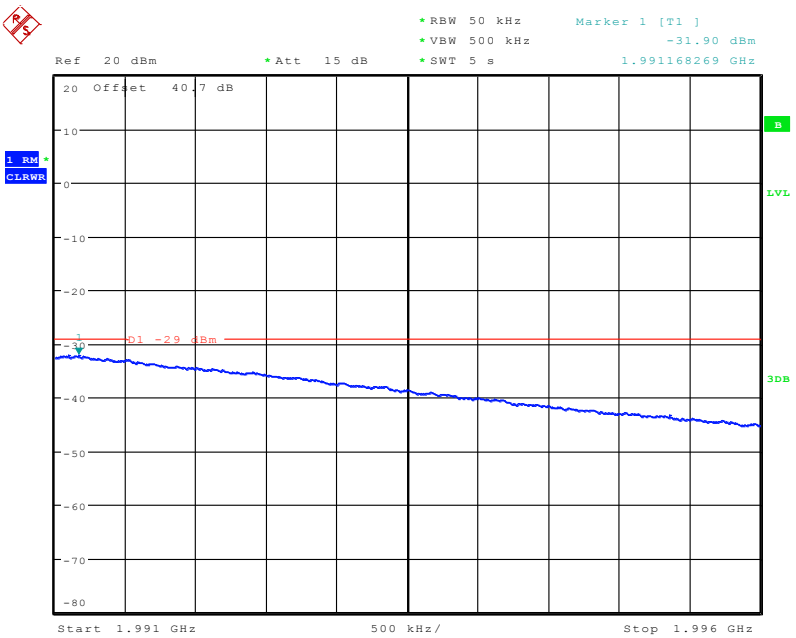


Date: 27.MAY.2014 16:14:33

Configuration 1 - Mode 3 - L1.4&W



Date: 27.MAY.2014 16:38:10

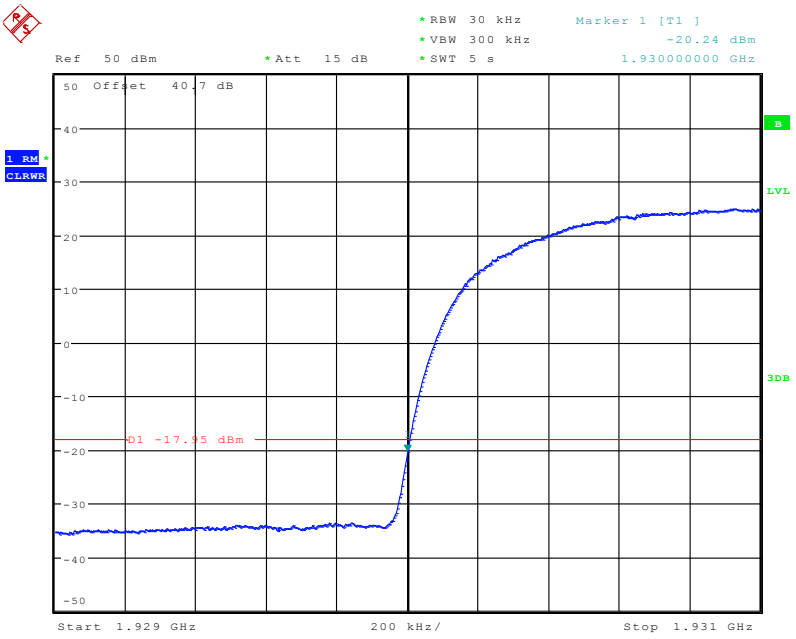


Date: 27.MAY.2014 16:40:31

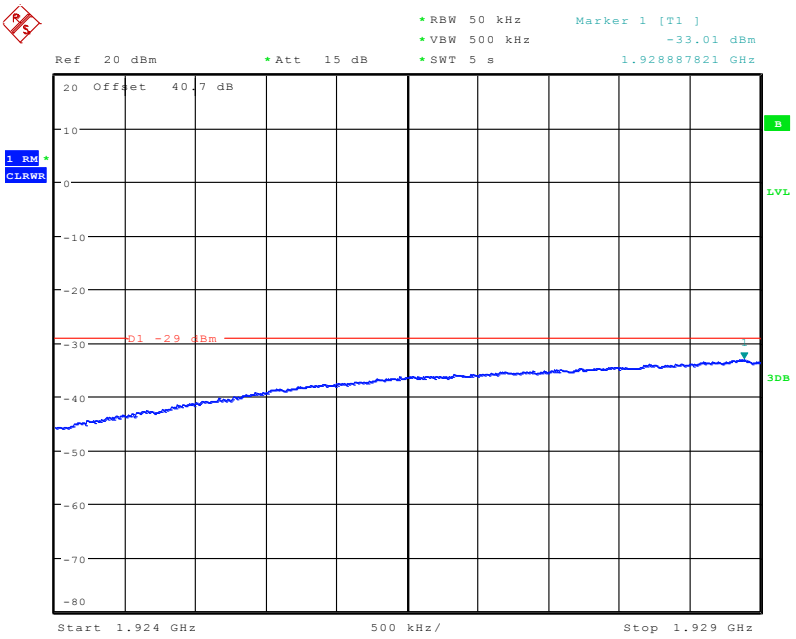
Product Service

LTE (E-TM3.2) & WCDMA (16QAM)

Configuration 1 - Mode 1 - W&L1.4



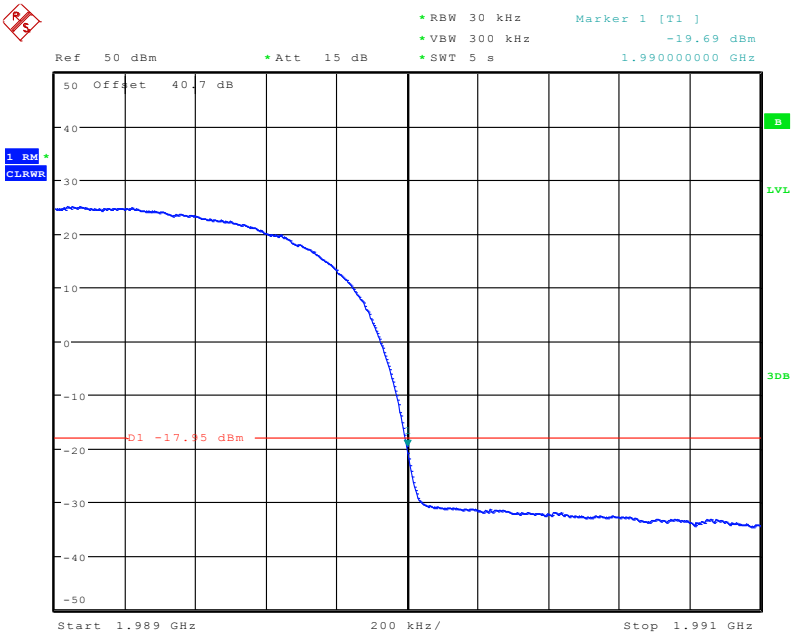
Date: 28.MAY.2014 16:57:54



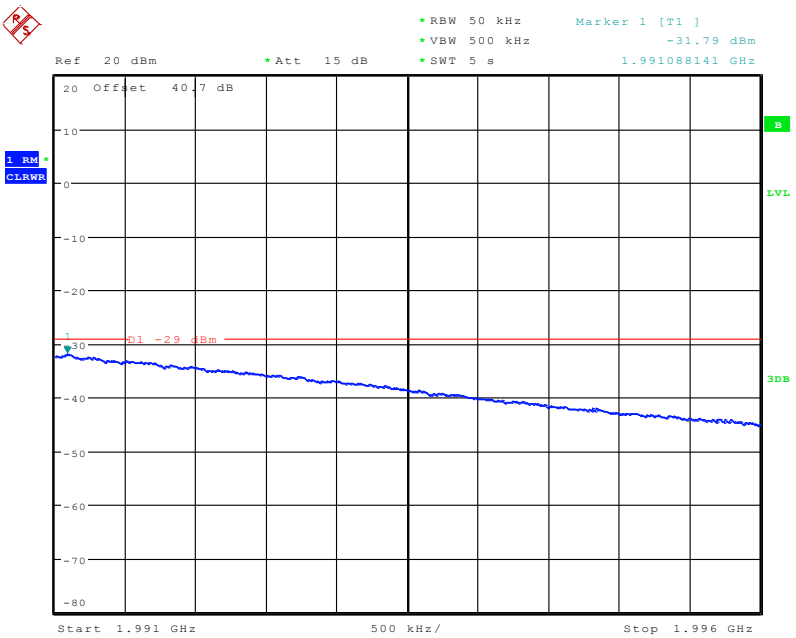
Date: 28.MAY.2014 16:55:22

Product Service

Configuration 1 - Mode 3 - L1.4&W



Date: 28.MAY.2014 12:58:12

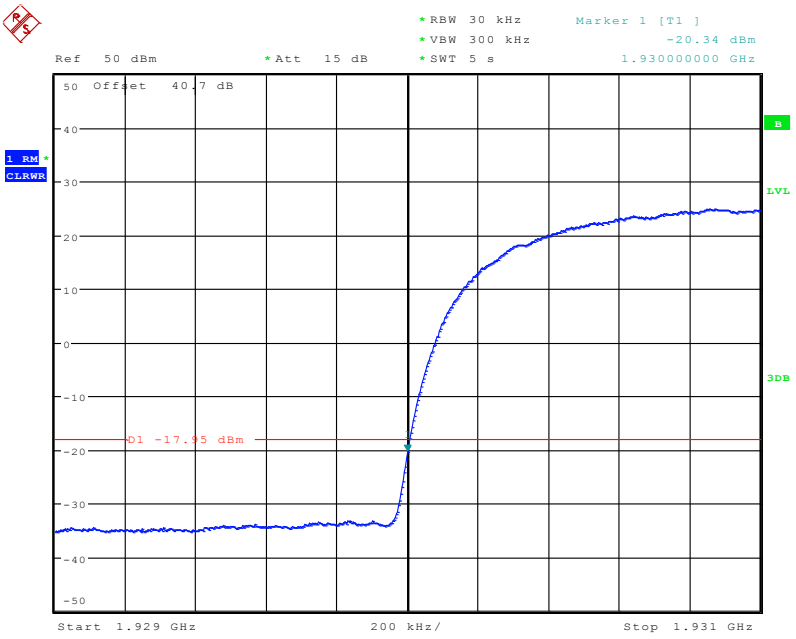


Date: 28.MAY.2014 12:57:14

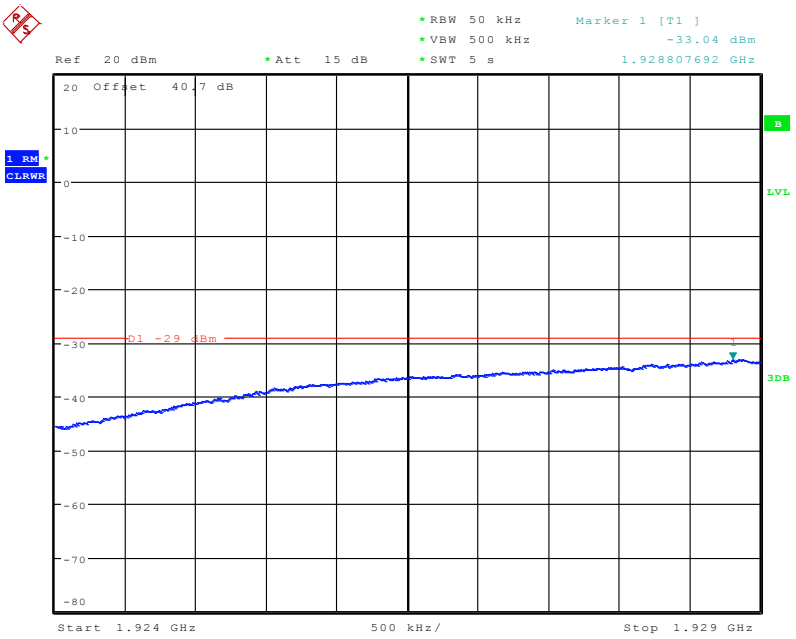
Product Service

LTE (E-TM3.1) & WCDMA (64QAM)

Configuration 1 - Mode 1 - W&L1.4

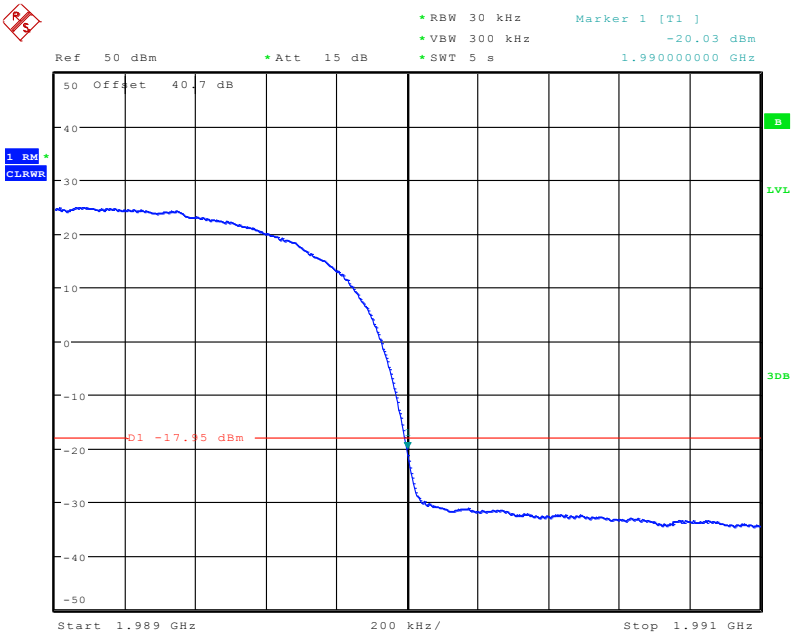


Date: 28.MAY.2014 16:29:10

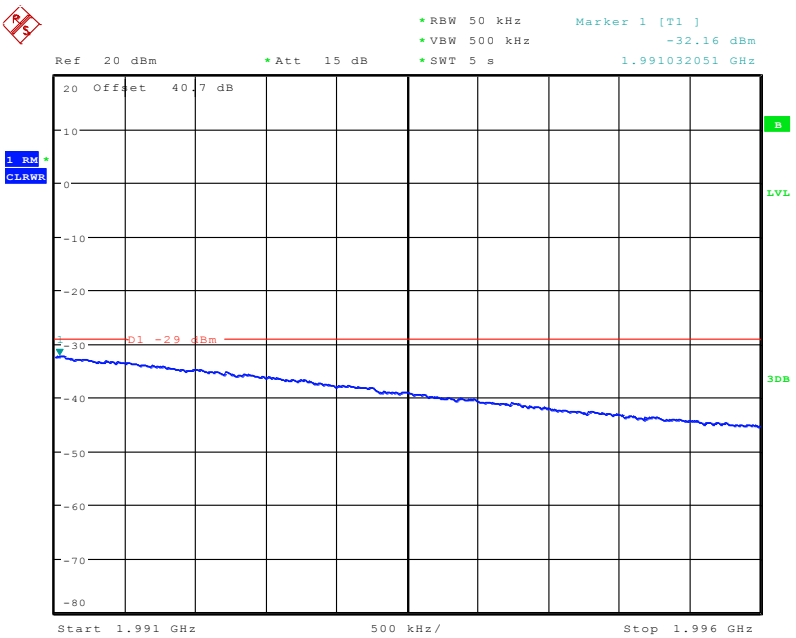


Date: 28.MAY.2014 16:55:40

Configuration 1 - Mode 3 - L1.4&W



Date: 28.MAY.2014 14:03:38



Date: 28.MAY.2014 14:02:37

Limit

The power of any emission outside the frequency band shall be attenuated below the transmitter power (P) by at least 43 + 10logP dB.

2.4 RADIATED SPURIOUS EMISSIONS

2.4.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1053
FCC CFR 47 Part 24, Clause 24.238 (a)
Industry Canada RSS-133, Clause 6.5

2.4.2 Equipment Under Test

RRUS 01 B2 / KRC 118 74/2, S/N: D165426806, CB4S938194

2.4.3 Date of Test and Modification State

18 and 20 June 2014 – Modification State 0

2.4.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.4.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 2 and Part 24 and Industry Canada RSS-133 and ANSI/TIA-603-C-2004.

A preliminary profile of the Spurious Radiated Emissions was obtained by operating the EUTs on a remotely controlled turntable within the chamber. Measurements of emissions from the EUT were obtained with the measurement antenna in both horizontal and vertical polarisations.

The measurement of radiated spurious emissions in the frequency range 30MHz to 20GHz was performed using a peak detector and a resolution bandwidth of 1MHz which satisfied the minimum measurement bandwidth requirement of 1MHz as the worst case.

The EUTs were measured with the antenna height varied between 1 and 4 m with the turntable rotated between 0 and 360 degrees. The emission of any frequencies within 10dB of the limit were measured with the substitution method used according to the standard.

The measurements were performed at a 3m distance unless otherwise stated.

The limits for Spurious Emissions have been calculated, as shown below using the following formula:

Field Strength of Carrier - (43 + 10Log (P)) dB

Where:
Field Strength is measured in dBµV/m
P is measured Transmitter Power in Watts

Product Service

Determination of Spurious Emission Limit

As the EUT does not have an integral antenna, the field strength of the carrier has been calculated assuming that the power is to be fed to a half-wave tuned dipole as per 2.1053 (a).

$E_{(v/m)}=(30 \times G_i \times P_o)^{0.5} / d$

Where G_i is the antenna gain of ideal half-wave dipoles,
P_o is the power out of the transceiver in W,
d is the measurement distance in meters.

Therefore at 3m measurement distance the field strength using the lowest transceiver output power would be:

$E_{(v/m)}=(30 \times 1.64 \times 69.02)^{0.5} / 3 = 19.42 V/m = 145.77 dB\mu V/m$

As per 24.238 (a) the spurious emission must be attenuated by 43 + 10log (P_o) dB this gives:

43 + 10log(69.02) = 61.39dB

Therefore the limit at 3m measurement distance is:

145.77 – 61.39 = 84.4 dBµV/m

This limit has been used to determine Pass or Fail for the harmonics measured and detailed in the following results.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 1 - W&L1.4
- Mode 2 - W&L1.4, W&L3, W&L5, W&L10
- Mode 3 - L1.4&W
- Mode 4 - W&W&L1.4
- Mode 5 - W&W&L1.4&L1.4

2.4.6 Environmental Conditions

Ambient Temperature	22.0 – 28.5°C
Relative Humidity	41.0 – 65.0%

Product Service

2.4.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 2 & Part 24 and Industry Canada RSS-133 for Radiated Spurious Emissions.

The test results are shown below

Note: Only the worst case results plots have been included as all of the emissions are greater than 20dB below the limit. A set of plots have been included to show the measurement system noise floor.

LTE (E-TM1.1) & WCDMA (QPSK)

Mix Carrier(x2): 1W+1L

Configuration 1 - Mode 2 - W&L1.4

No emissions were detected within 20dB of the limit.

Configuration 1 - Mode 2 - W&L3

No emissions were detected within 20dB of the limit.

Configuration 1 - Mode 2 - W&L5

No emissions were detected within 20dB of the limit.

Configuration 1 - Mode 2 - W&L10

No emissions were detected within 20dB of the limit.

LTE (E-TM3.2) & WCDMA (16QAM)

Mix Carrier(x2): 1W+1L

Configuration 1 - Mode 2 - W&L1.4

No emissions were detected within 20dB of the limit.

LTE (E-TM3.1) & WCDMA (64QAM)

Mix Carrier(x2): 1W+1L

Configuration 1 - Mode 1 - W&L1.4

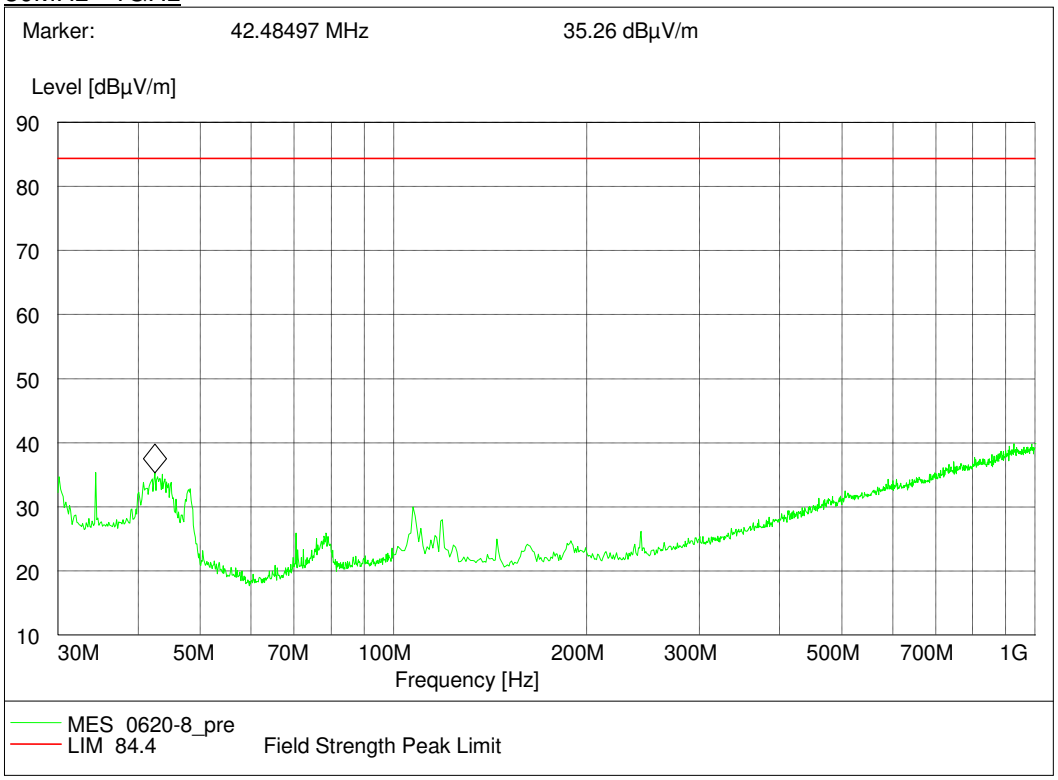
No emissions were detected within 20dB of the limit.

Configuration 1 - Mode 2 - W&L1.4

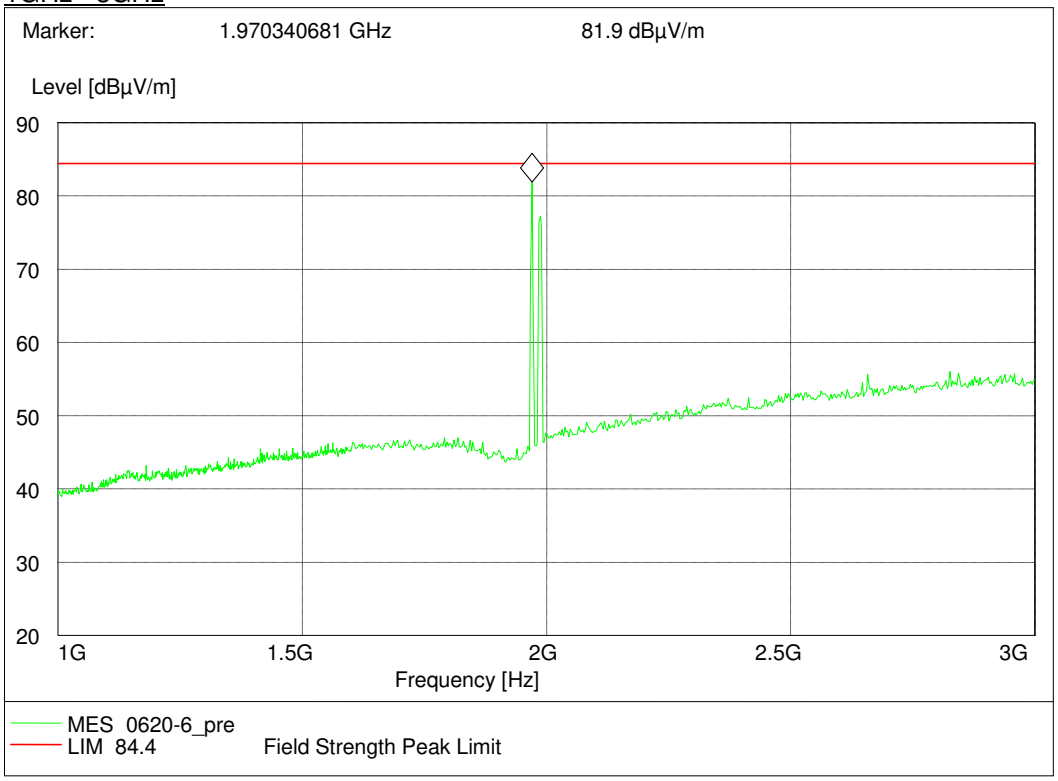
No emissions were detected within 20dB of the limit.

Configuration 1 - Mode 3 - W&L1.4

30MHz - 1GHz



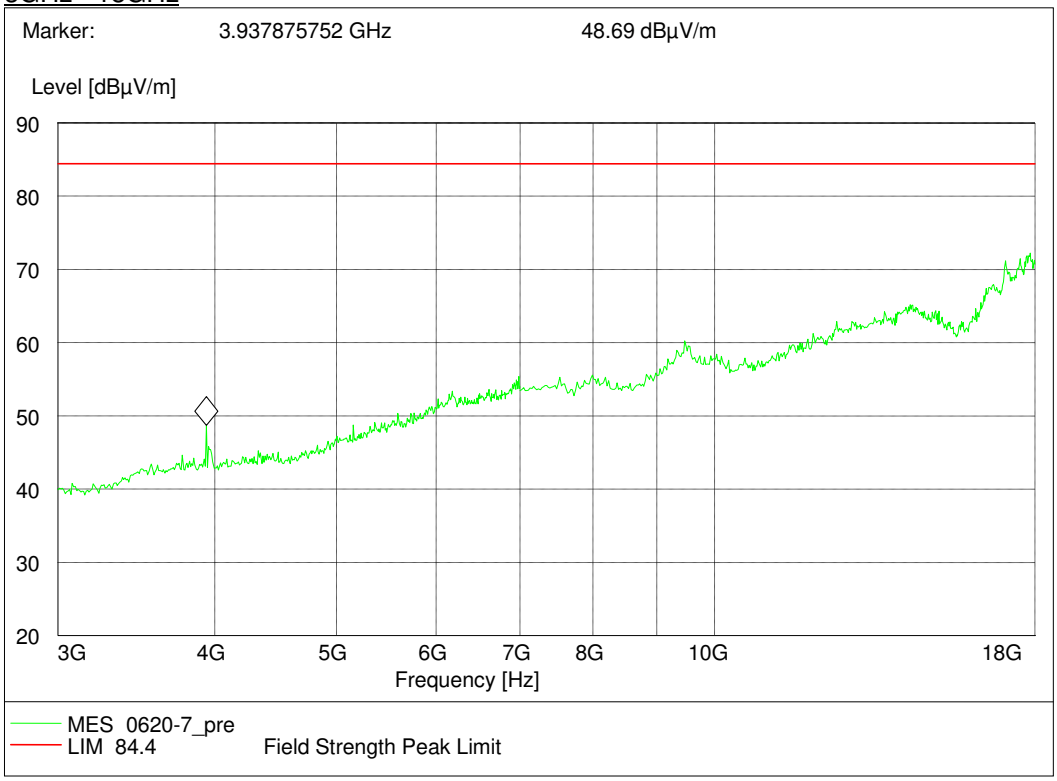
1GHz - 3GHz



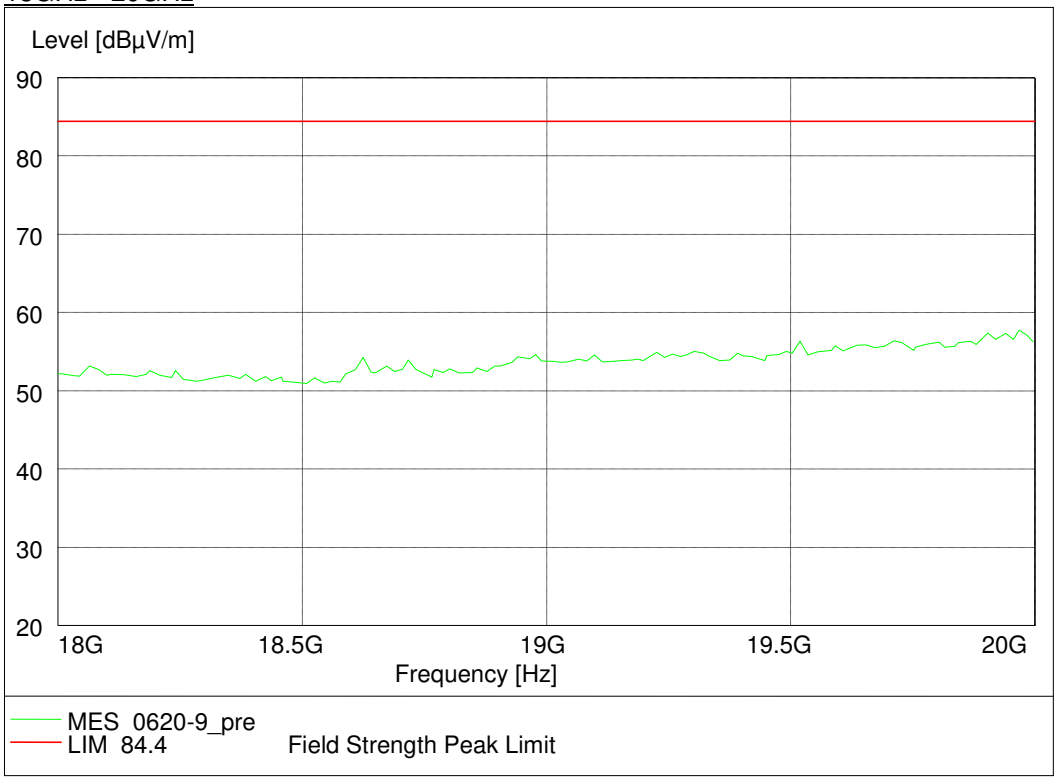
Note: The emissions beyond the limit are the operating frequencies.

Product Service

3GHz - 18GHz



18GHz - 20GHz



LTE (E-TM3.1) & WCDMA (64QAM)

Mix Carrier(x3): 2W+1L

Configuration 1 - Mode 4 - W&W&L1.4

No emissions were detected within 20dB of the limit.

LTE (E-TM3.1) & WCDMA (64QAM)

Mix Carrier(x4): 2W+2L

Configuration 1 - Mode 5 - W&W&L1.4&L1.4

No emissions were detected within 20dB of the limit.

Limit	-13dBm or 84.4dBµV/m

Remarks

The EUT does not exceed -13dBm or 84.4dBµV/m at the measured frequencies.

2.5 CONDUCTED SPURIOUS EMISSIONS

2.5.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1051
FCC CFR 47 Part 24, Clause 24.238 (a)
Industry Canada RSS-133, Clause 6.5

2.5.2 Equipment Under Test

RRUS 01 B2 / KRC 118 74/2, S/N: D165426806, CB4S938194

2.5.3 Date of Test and Modification State

26 May to 03 June 2014 – Modification State 0

2.5.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.5.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 2 and Part 24 and Industry Canada RSS-133.

In accordance with FCC CFR 47 Part 24, Clause 24.238(a), any emissions outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. The transmitter output power was attenuated using an attenuator and the frequency spectrum investigated from 9kHz to 20GHz. The EUT was set to transmit on maximum power. The resolution was set to 1MHz for 9kHz to 20GHz thus meeting the requirements of FCC CFR 47 Part 24, Clause 24.238 (b) and Industry Canada RSS-133, Clause 6.5. The spectrum analyser detector was set to peak and trace was kept on Max Hold.

The limit was adjusted with a correction of -3dB [10Log(2)] by using the Measure and Add 10Log(N) dB technique according to FCC KDB662911 D01 Multiple Transmitter Output v02r01 accounting for simultaneous transmission from antenna ports RF A1 and RF A2. The limit was adjusted from -13dBm to -16dBm.

The maximum path loss across the measurement band was used as the reference level offset to ensure worst case.

Measurements were made up to the 10^{th} harmonics of the highest carrier frequency at least.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 1 - W&L1.4
- Mode 2 - W&L1.4, W&L3, W&L5, W&L10
- Mode 3 - L1.4&W
- Mode 4 - W&W&L1.4
- Mode 5 - W&W&L1.4&L1.4

Product Service

2.5.6 Environmental Conditions

Ambient Temperature	22.0 – 28.5°C
Relative Humidity	41.0 – 65.0%

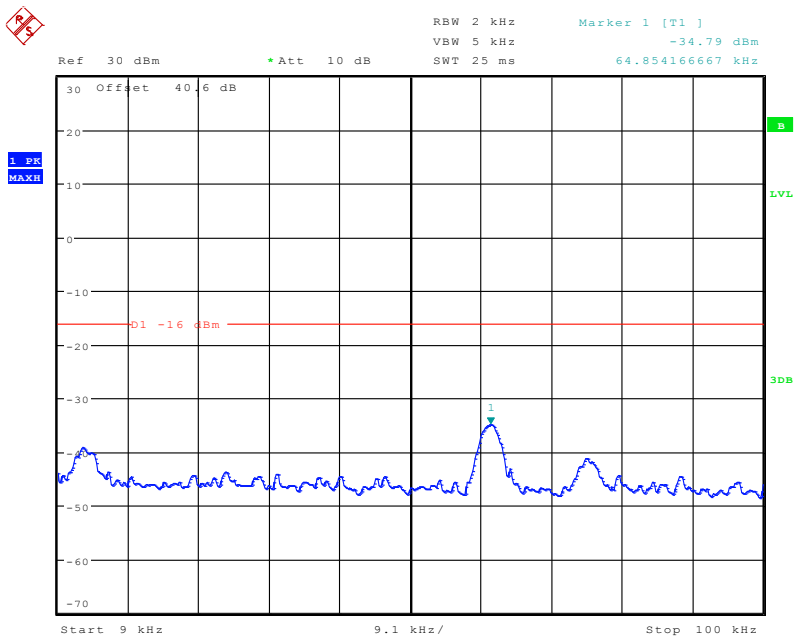
2.5.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 2 and Part 24 and Industry Canada RSS-133 for Conducted Spurious Emissions.

The test results are shown below

Remark:

The emissions at 9kHz on the plots was not generated by the test object. A complementary measurement with a smaller span showed that it was related to the LO feedthrough.

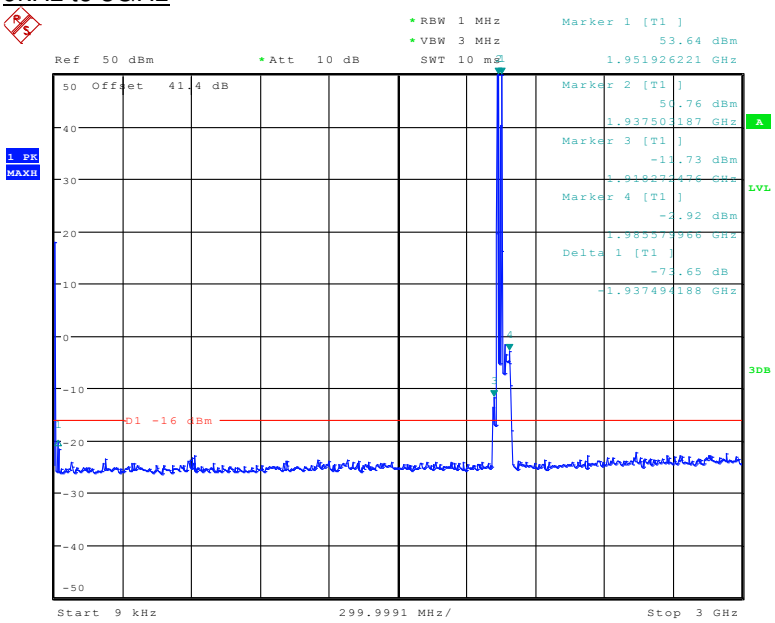


LTE (E-TM1.1) & WCDMA (QPSK)

Mix Carrier(x2): 1W+1L

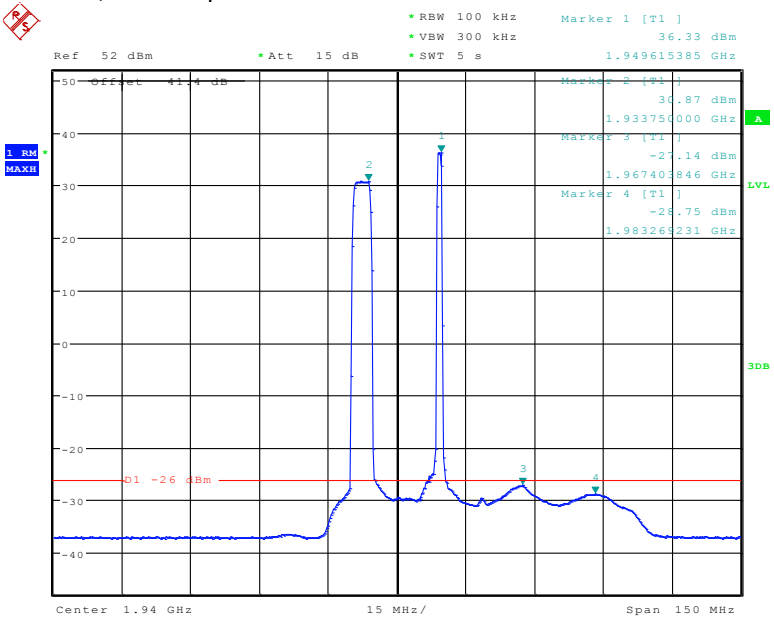
Configuration 1 - Mode 1 - W&L1.4

9kHz to 3GHz



Date: 27.MAY.2014 16:17:21

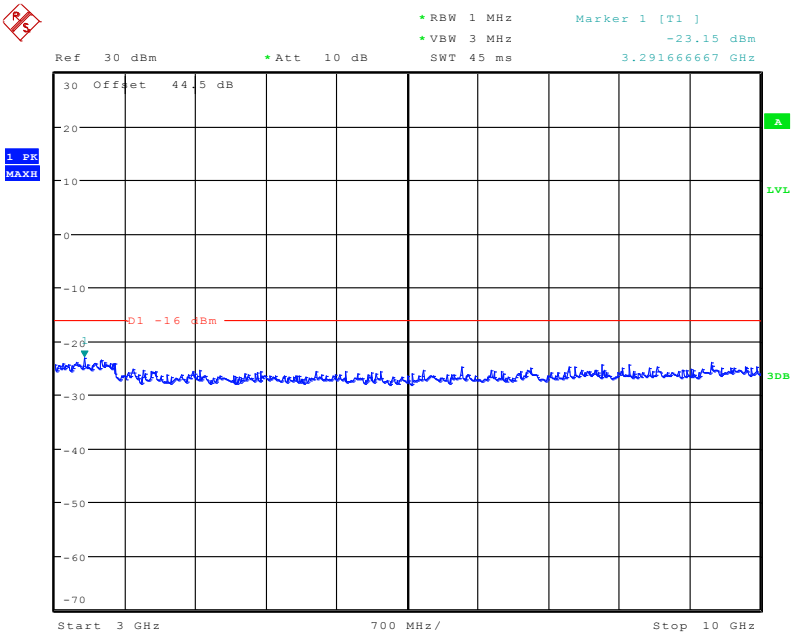
Note: The emissions above the limit are measured in a smaller bandwidth and using a RMS detector, see the plot below.



Date: 27.MAY.2014 16:20:06

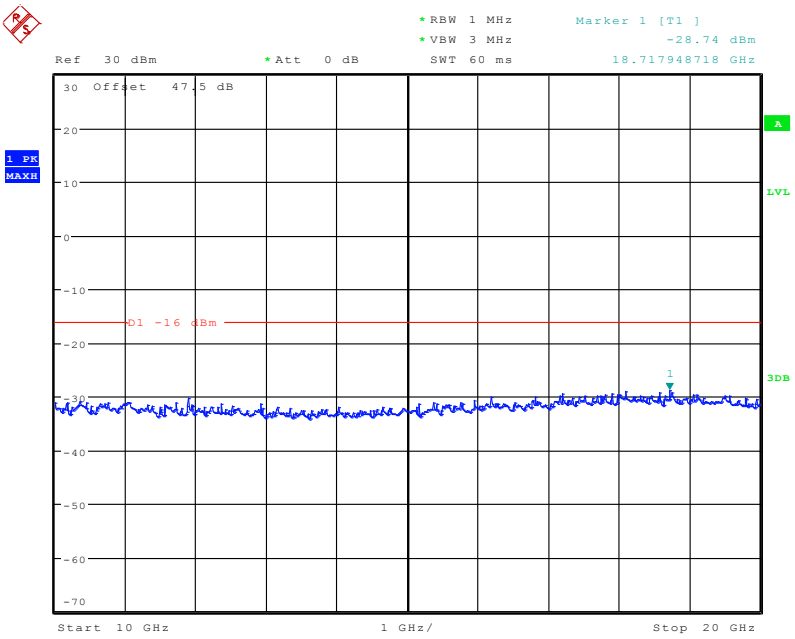
Note: The limit has been tightened by 10dB to account for the reduction in measurement bandwidth.

3GHz to 10GHz



Date: 27.MAY.2014 16:23:17

10GHz to 20GHz

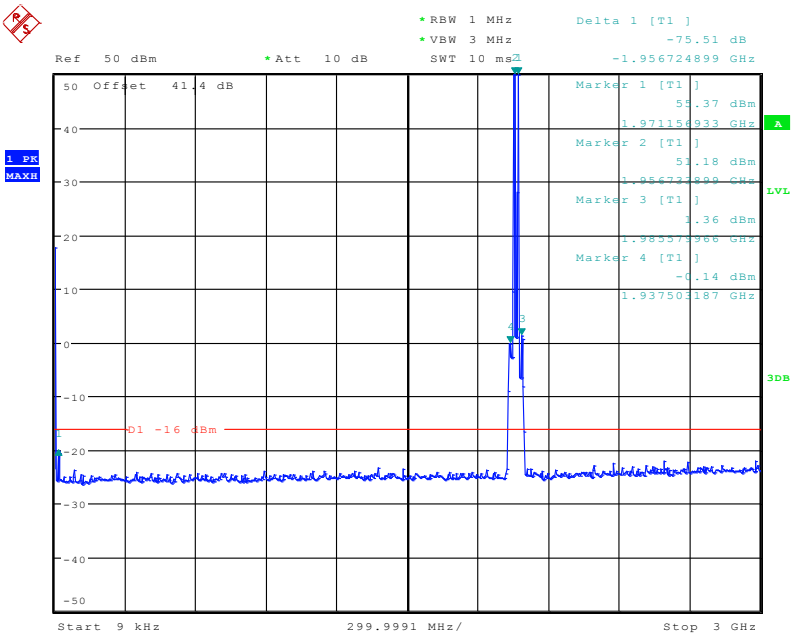


Date: 27.MAY.2014 16:25:01

Product Service

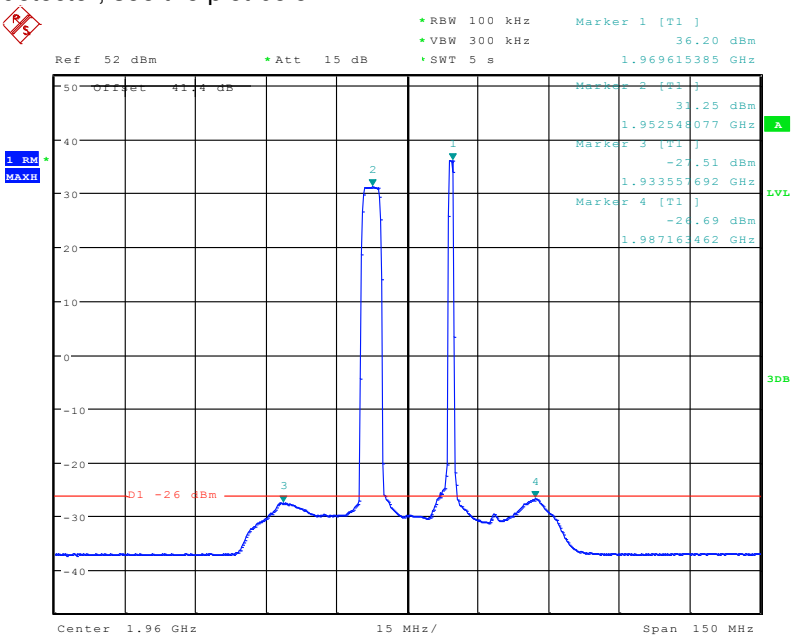
Configuration 1 - Mode 2 - W&L1.4

9kHz to 3GHz



Date: 26.MAY.2014 16:59:04

Note: The emissions above the limit are measured in a smaller bandwidth and using a RMS detector, see the plot below.

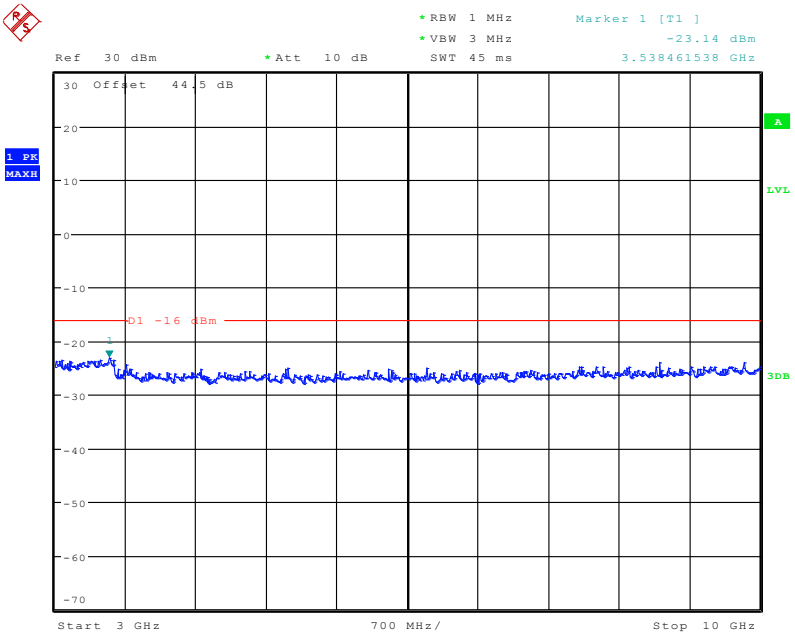


Date: 26.MAY.2014 17:01:30

Note: The limit has been tightened by 10dB to account for the reduction in measurement bandwidth.

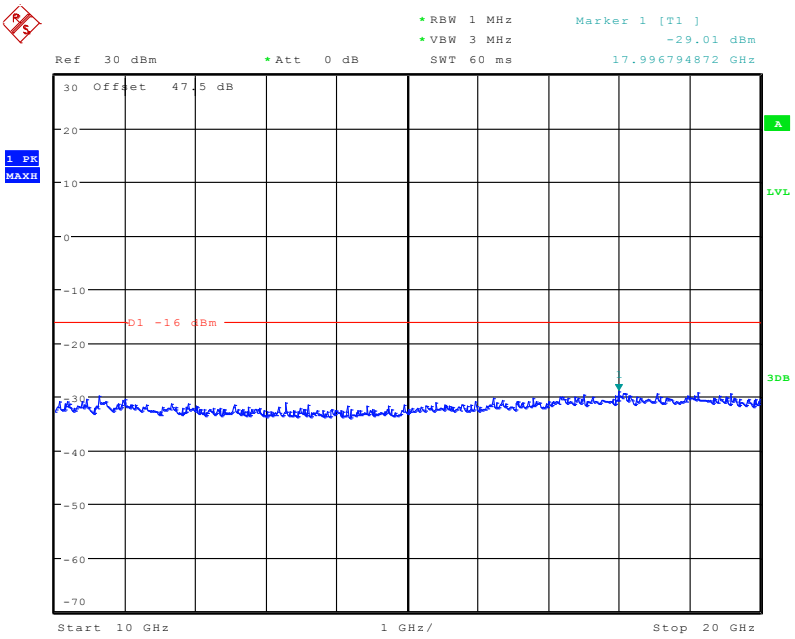
Product Service

3GHz to 10GHz



Date: 26.MAY.2014 16:57:18

10GHz to 20GHz

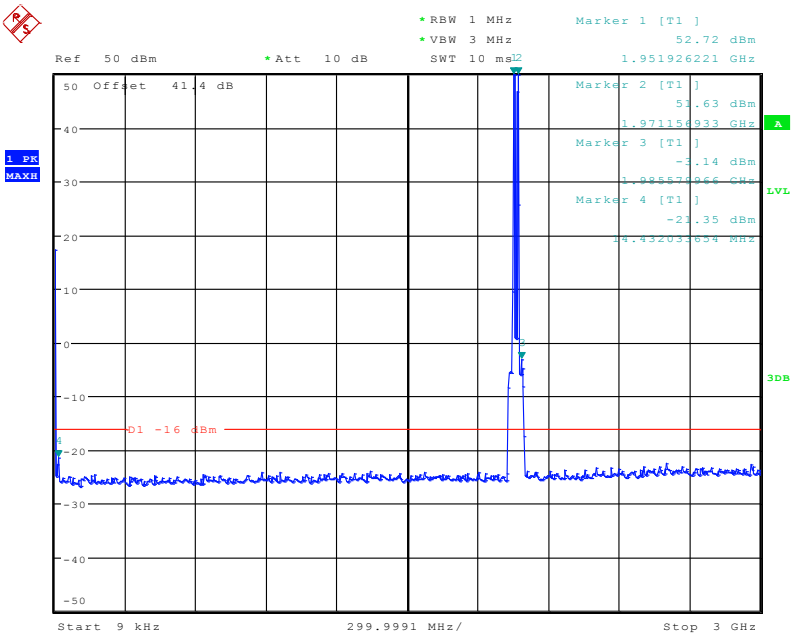


Date: 26.MAY.2014 16:56:09

Product Service

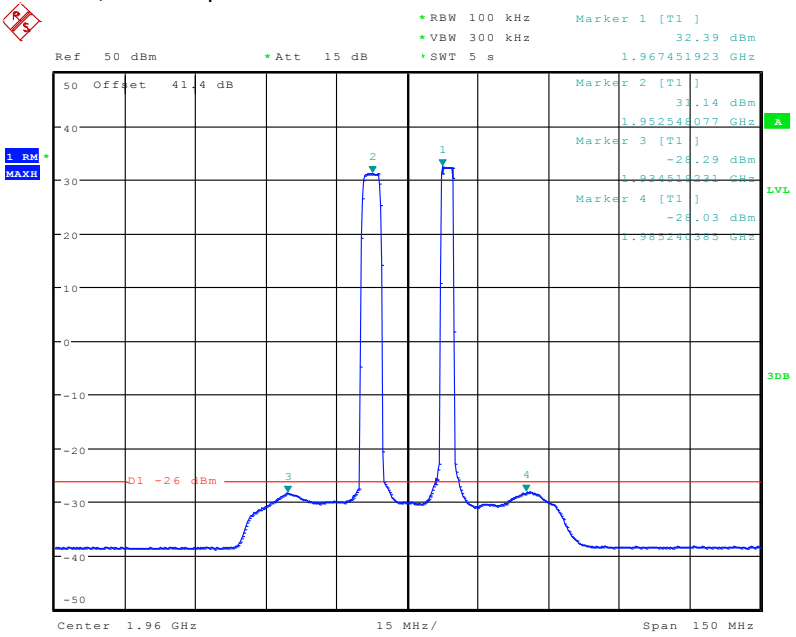
Configuration 1 - Mode 2 - W&L3

9kHz to 3GHz



Date: 27.MAY.2014 10:05:01

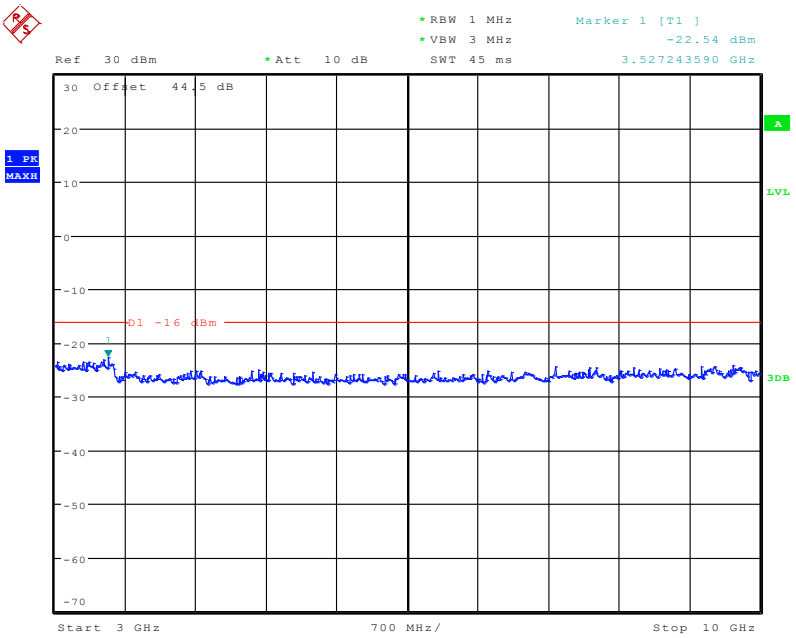
Note: The emissions above the limit are measured in a smaller bandwidth and using a RMS detector, see the plot below.



Date: 27.MAY.2014 10:06:18

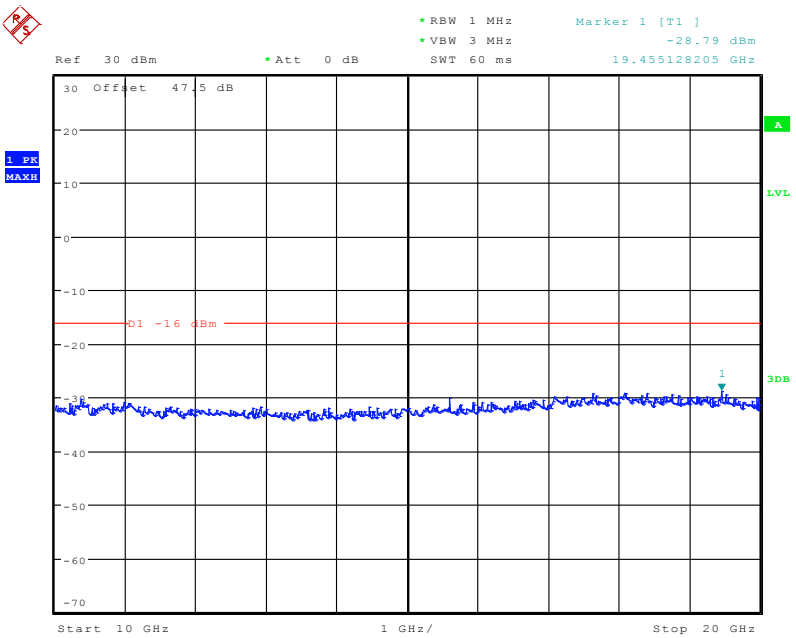
Note: The limit has been tightened by 10dB to account for the reduction in measurement bandwidth.

3GHz to 10GHz



Date: 27.MAY.2014 10:07:37

10GHz to 20GHz

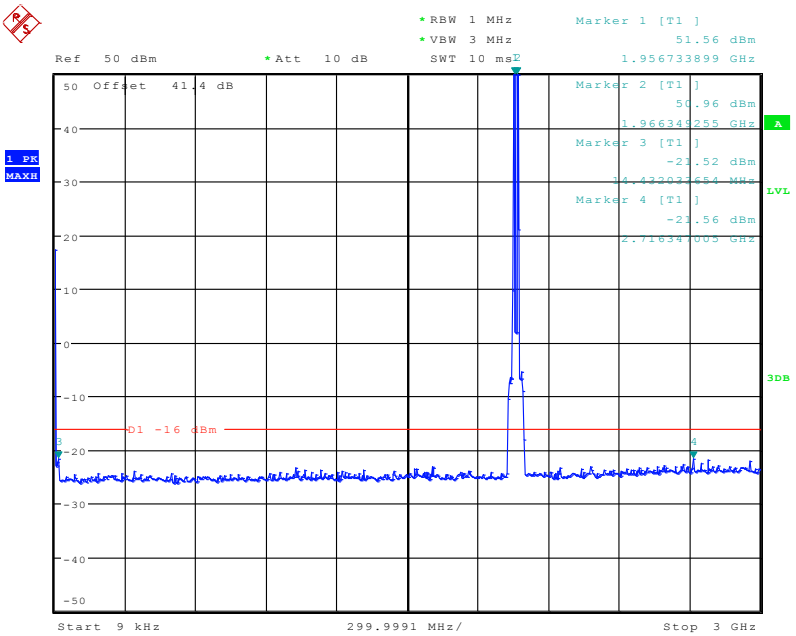


Date: 27.MAY.2014 10:08:30

Product Service

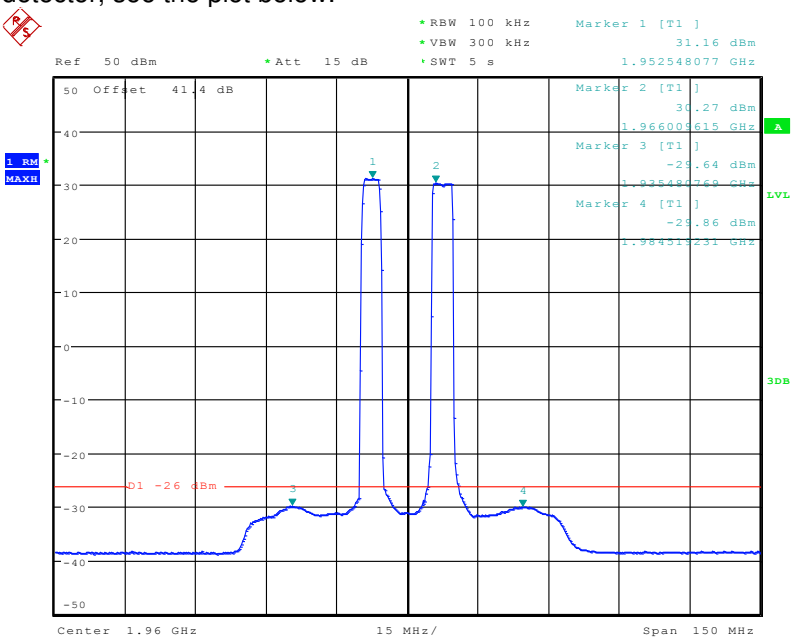
Configuration 1 - Mode 2 - W&L5

9kHz to 3GHz



Date: 27.MAY.2014 10:30:06

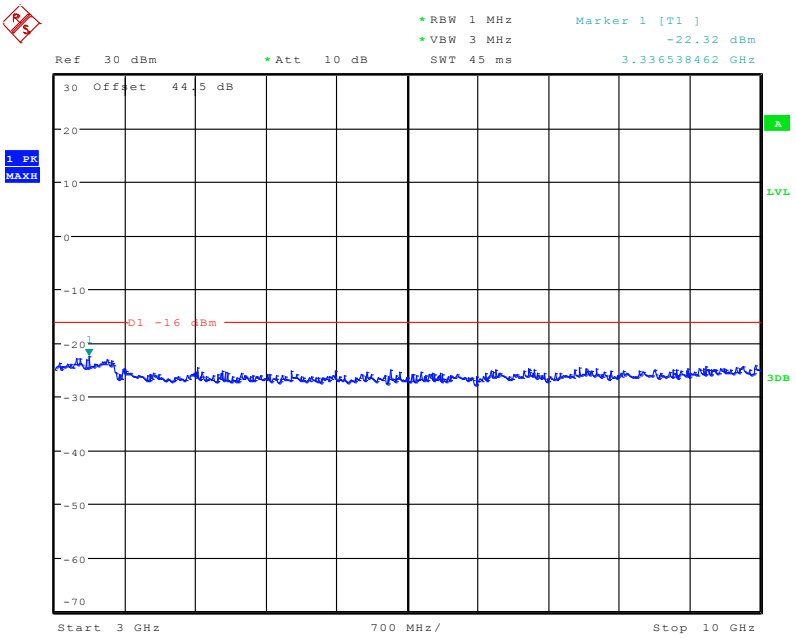
Note: The emissions above the limit are measured in a smaller bandwidth and using a RMS detector, see the plot below.



Date: 27.MAY.2014 10:31:44

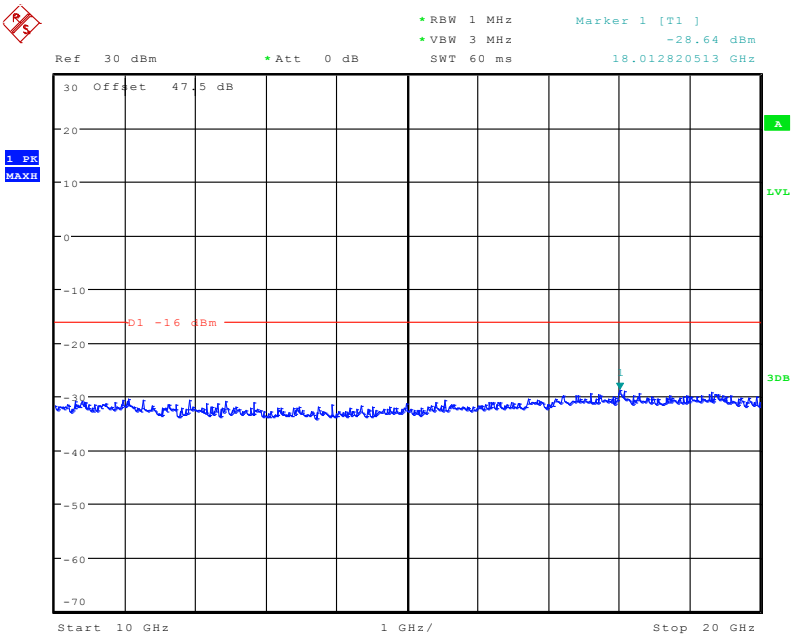
Note: The limit has been tightened by 10dB to account for the reduction in measurement bandwidth.

3GHz to 10GHz



Date: 27.MAY.2014 10:25:09

10GHz to 20GHz

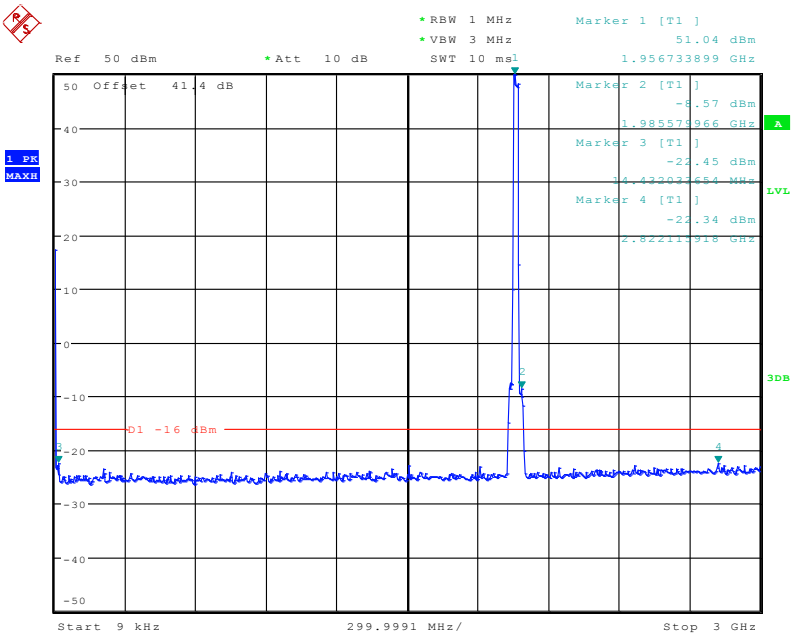


Date: 27.MAY.2014 10:24:01

Product Service

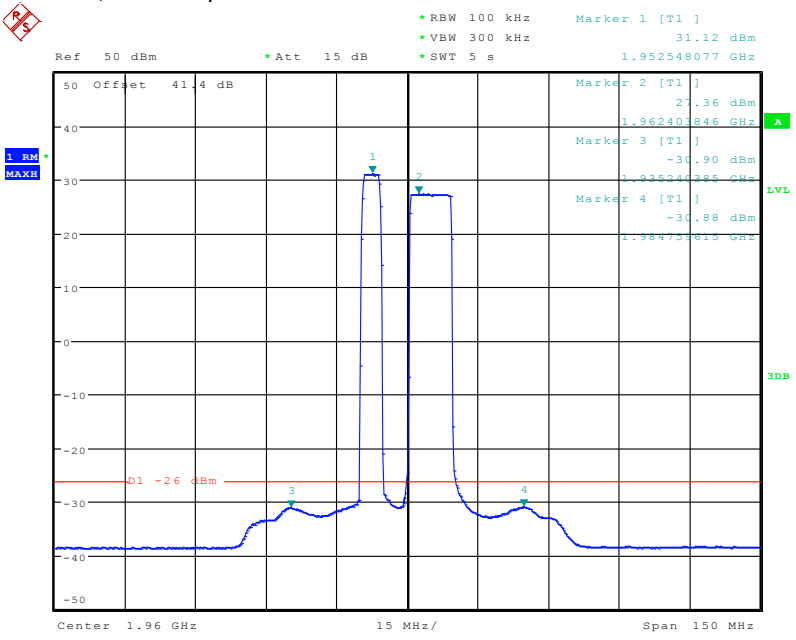
Configuration 1 - Mode 2 - W&L10

9kHz to 3GHz



Date: 27.MAY.2014 10:37:47

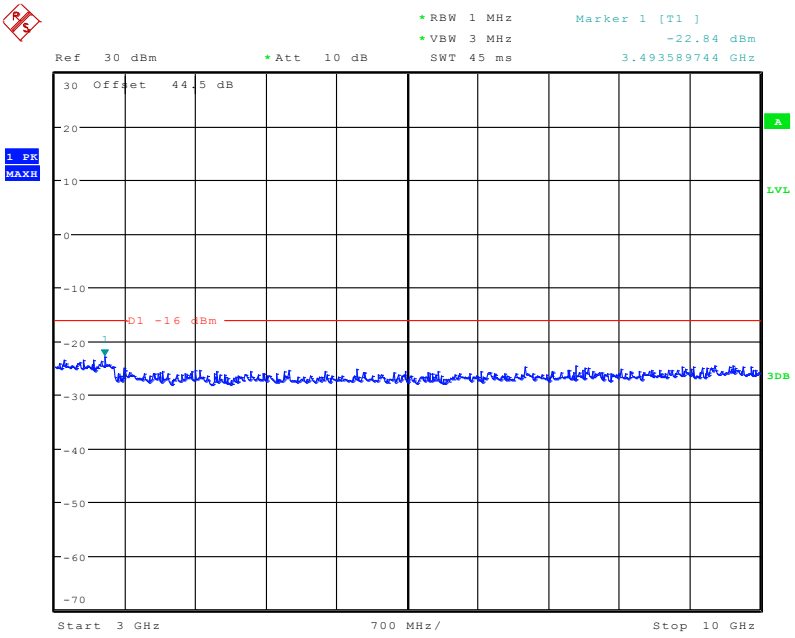
Note: The emissions above the limit are measured in a smaller bandwidth and using a RMS detector, see the plot below.



Date: 27.MAY.2014 10:39:43

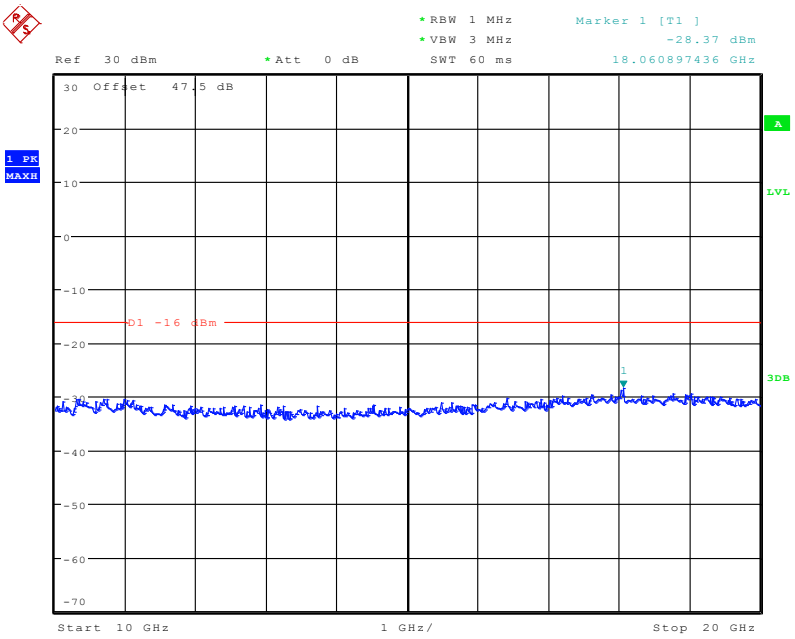
Note: The limit has been tightened by 10dB to account for the reduction in measurement bandwidth.

3GHz to 10GHz



Date: 27.MAY.2014 10:40:24

10GHz to 20GHz

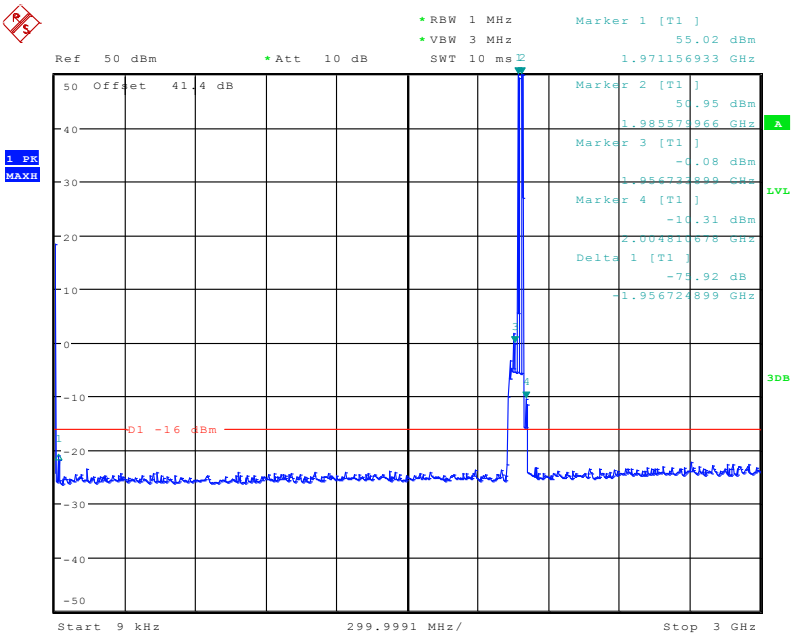


Date: 27.MAY.2014 10:41:10

Product Service

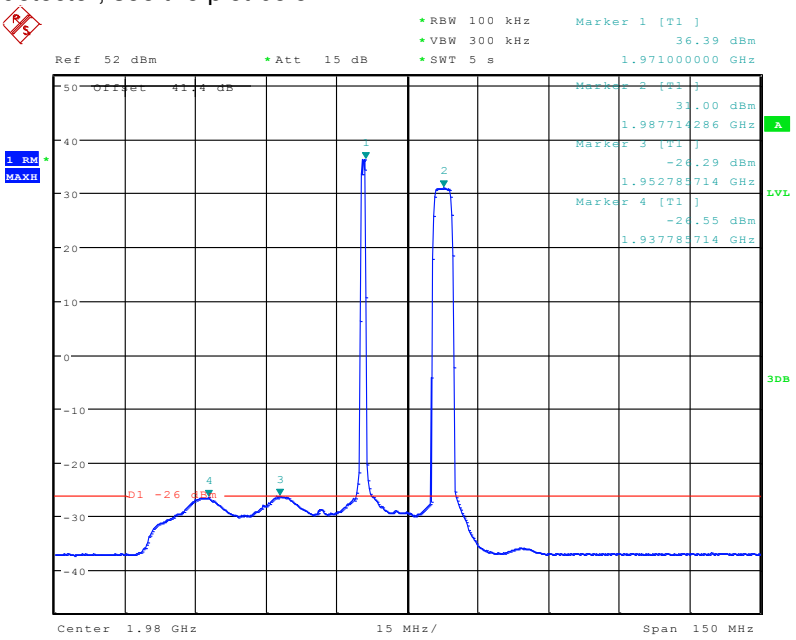
Configuration 1 - Mode 3 - L1.4&W

9kHz to 3GHz



Date: 27.MAY.2014 16:44:15

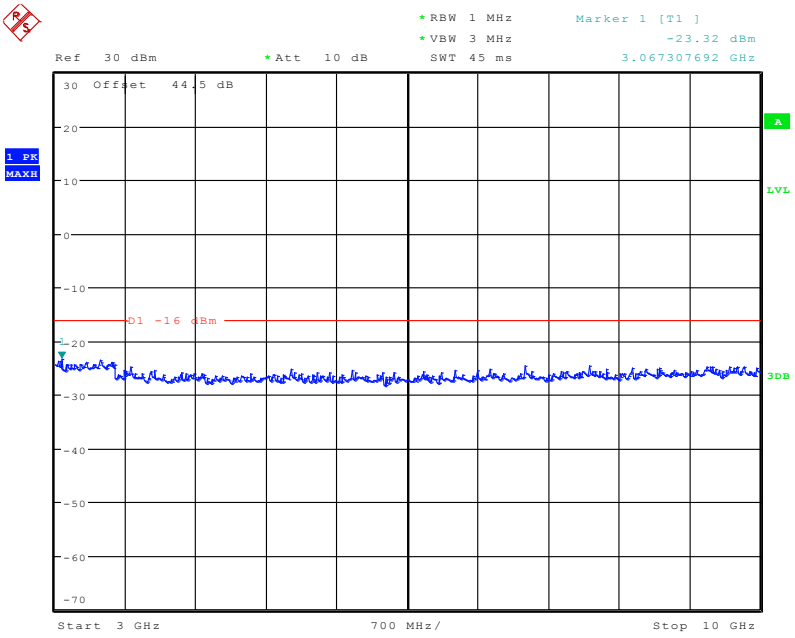
Note: The emissions above the limit are measured in a smaller bandwidth and using a RMS detector, see the plot below.



Date: 27.MAY.2014 16:48:07

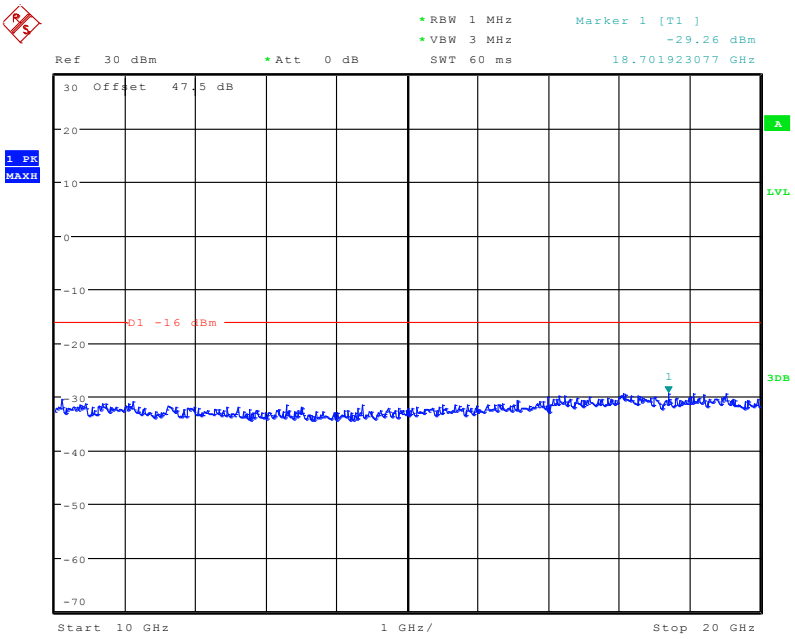
Note: The limit has been tightened by 10dB to account for the reduction in measurement bandwidth.

3GHz to 10GHz



Date: 27.MAY.2014 16:43:05

10GHz to 20GHz

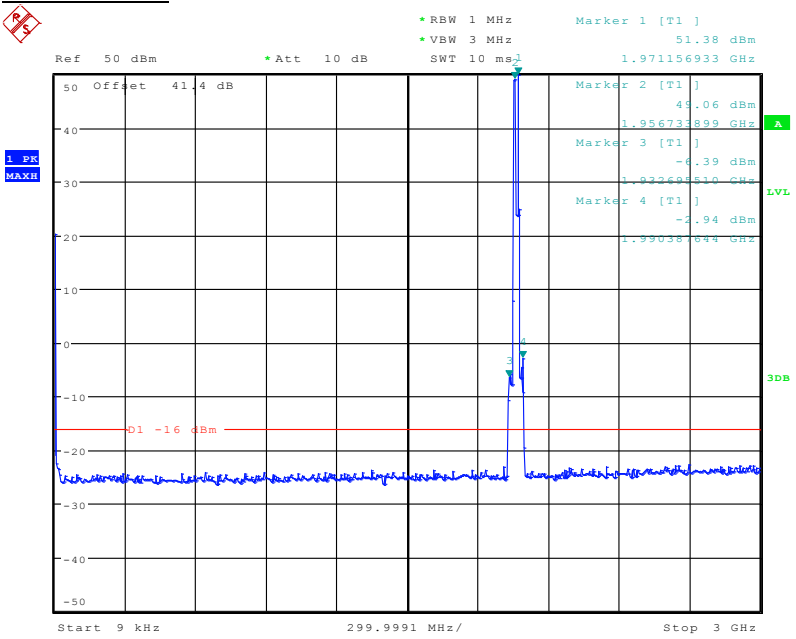


Date: 27.MAY.2014 16:41:24

Mix Carrier(x3): 2W+1L

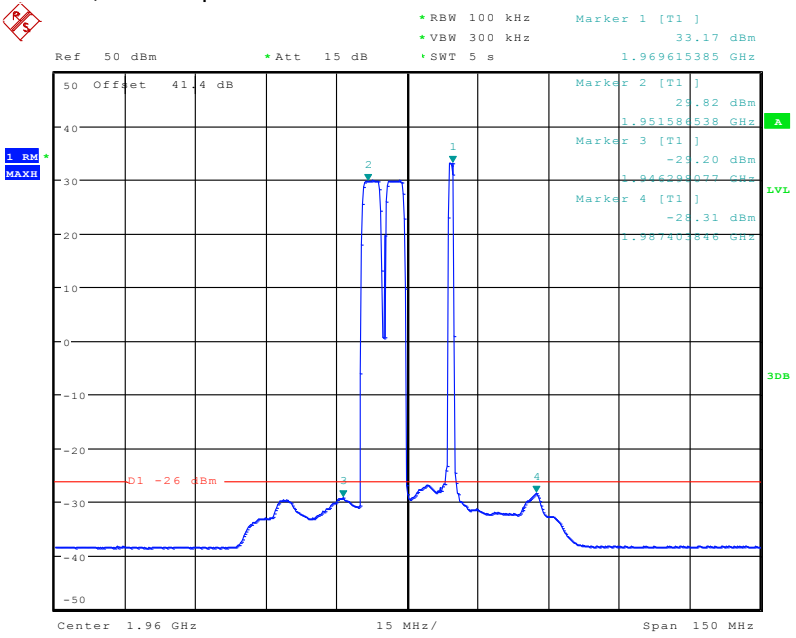
Configuration 1 - Mode 4 - W&W&L1.4

9kHz to 3GHz



Date: 29.MAY.2014 14:51:33

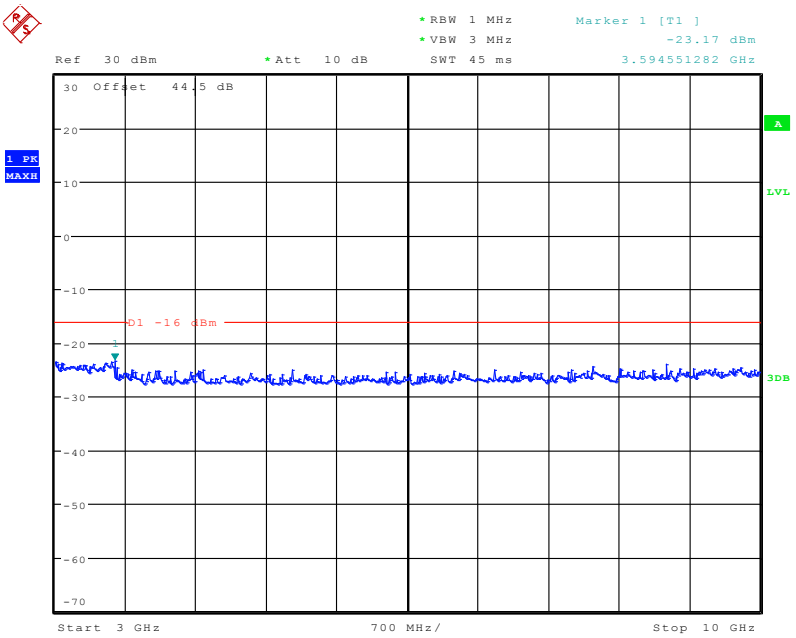
Note: The emissions above the limit are measured in a smaller bandwidth and using a RMS detector, see the plot below.



Date: 29.MAY.2014 14:53:46

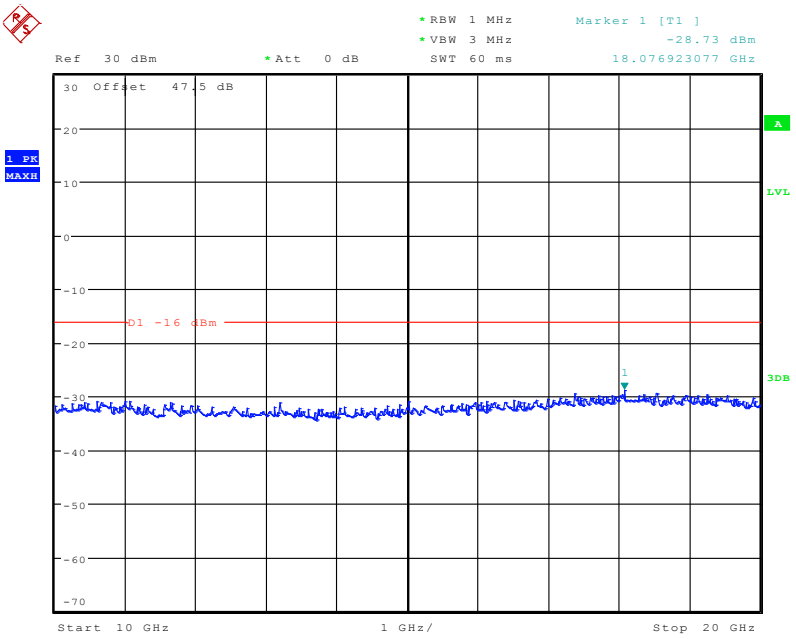
Note: The limit has been tightened by 10dB to account for the reduction in measurement bandwidth.

3GHz to 10GHz



Date: 29.MAY.2014 14:56:27

10GHz to 20GHz

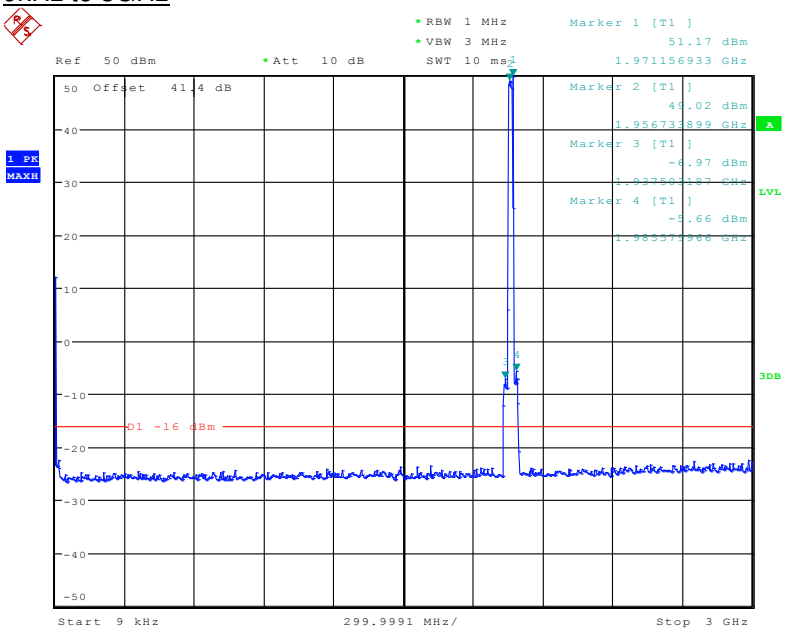


Date: 29.MAY.2014 14:57:00

Mix Carrier(x4): 2W+2L

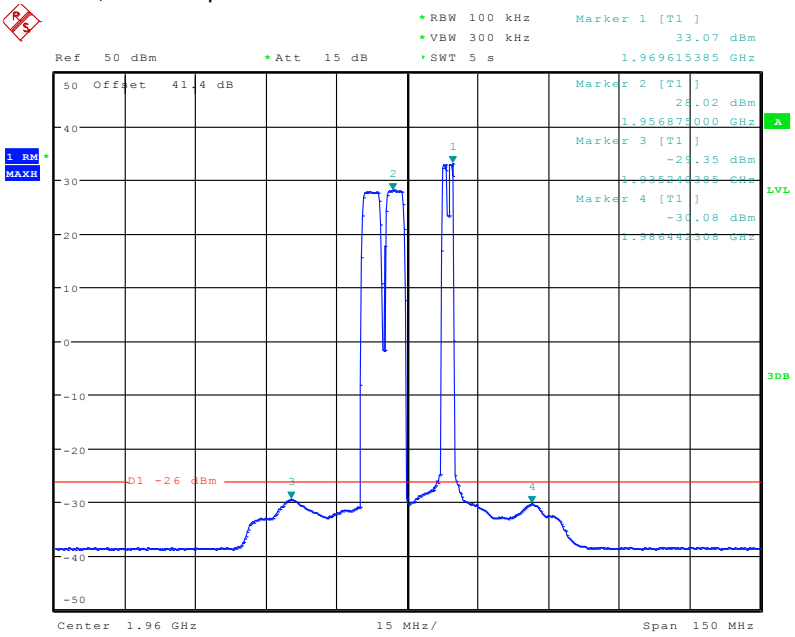
Configuration 1 - Mode 5 - W&W&L1.4&L1.4

9kHz to 3GHz



Date: 3.JUN.2014 10:56:50

Note: The emissions above the limit are measured in a smaller bandwidth and using a RMS detector, see the plot below.

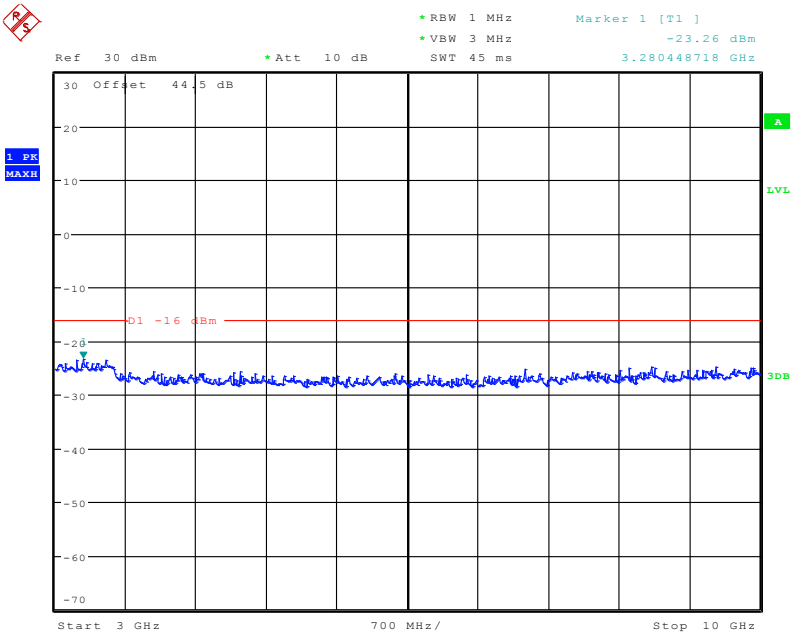


Date: 3.JUN.2014 10:58:27

Note: The limit has been tightened by 10dB to account for the reduction in measurement bandwidth.

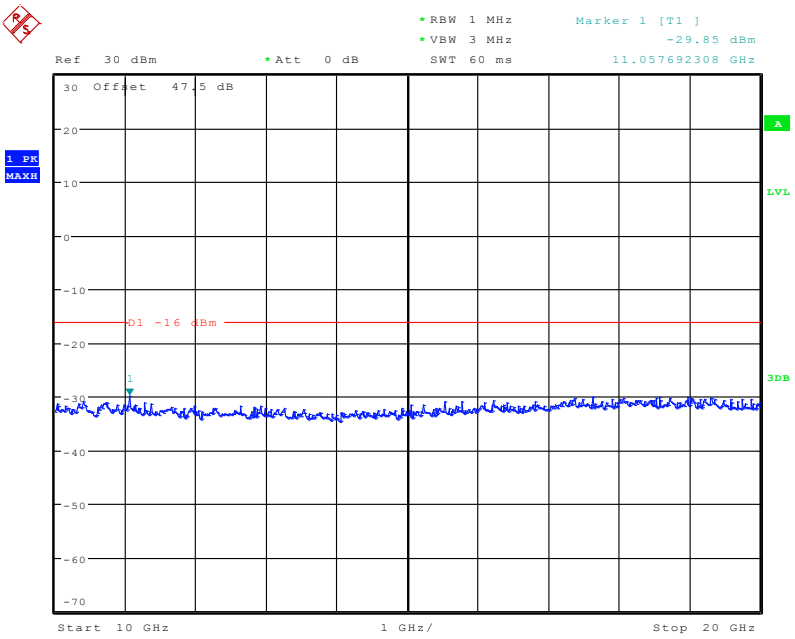
Product Service

3GHz to 10GHz



Date: 3.JUN.2014 10:59:33

10GHz to 20GHz



Date: 3.JUN.2014 11:00:30

Limit

The power of any emission outside the frequency band shall be attenuated below the transmitter power (P) by at least 43 + 10logP dB.

Remarks

The EUT does not exceed -16dBm at the frequency range of 9kHz to 20GHz.

Product Service

SECTION 3

TEST EQUIPMENT USED

Product Service

3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

Instrument	Manufacturer	Type No.	Serial No.	Calibration Period (months)	Calibration Due
Section 2.1, 2.2, 2.3, 2.5 – Maximum Conducted Output Power, Peak – Average Ratio, Spurious Emissions at Antenna Terminals (±1MHz) and Conducted Spurious Emissions.					
Spectrum Analyser	Rohde & Schwarz	FSQ26	100253	12	04-Aug-2014
Power Meter	Rohde & Schwarz	NRP2	101283	12	04-Aug-2014
Power Sensor	Rohde & Schwarz	NRP-Z51	102310	12	04-Aug-2014
Network Analyzer	Agilent	8720D	US36140166	12	26-Sep-2014
40dB Attenuator	Aeroflex / Weinschel	66-40-33	CD4019	-	O/P MON
Pass Filter	K&L	ULK 904 098/2	16	-	O/P MON
Load	Shanghai Huaxiang	TF100	09121648	-	O/P MON
Load	Shanghai Huaxiang	TFE5-3	090323176	-	O/P MON
Load	Shanghai Huaxiang	TFE5-3	090323220	-	O/P MON
Power Supply	Dahua	DH1716-5D	2008040031	-	O/P MON
Power Supply	Dahua	DH1716-5D	2008040050	-	O/P MON
Power Supply	Dahua	DH1716A-9	ETE/L676	-	O/P MON
Digital Multi-meter	FLUKE	179	91820401	12	24-Dec-2014
Thermo-hygrometer	AZ Instruments	8705	9151665	12	12-Dec-2014
Section 2.4 – Radiated Spurious Emissions					
Load	Shanghai Huaxiang	TF100	09121648	-	O/P MON
Load	Shanghai Huaxiang	TF100	09121605	-	O/P MON
Load	Shanghai Huaxiang	TFE5-3	090323176	-	O/P MON
Load	Shanghai Huaxiang	TFE5-3	090323220	-	O/P MON
EMI Receiver	Rohde & Schwarz	ESI 40	100015	12	19-Aug-2014
Ultra log test antenna	Rohde & Schwarz	HL562	100167	12	19-Aug-2014
Double-Ridged Waveguide Horn Antenna	Rohde & Schwarz	HF 906	100029	12	19-Aug-2014
Pyramidal Horn Antenna	EMCO	3160-09	-	-	-
Antenna master	Frankonia	MA 260	-	12	19-Aug-2014
Relay Switch Unit	Rohde & Schwarz	331.1601.31	338965002	-	TU
Semi Anechoic Chamber	Frankonia	23.18m×16.88 m×9.60m	-	12	19-Aug-2014
Power Supply	Dahua	DH1716-5D	2008040031	-	O/P MON
Power Supply	Dahua	DH1716-5D	2008040050	-	O/P MON
Digital Multimeter	FLUKE	179	91820401	12	24-Dec-2014
Thermo-hygrometer	AZ Instruments	8705	9151665	12	12-Dec-2014

TU – Traceability Unscheduled, O/P MON – Output monitored with calibration equipment,

3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:-

Test Discipline	Frequency / Parameter	MU
Conducted RF Output Power	30MHz to 10GHz Amplitude	0.5dB*
Conducted Emissions	30MHz to 40GHz Amplitude	3.0dB*
Radiated Emissions, Bilog Antenna, AOATS	30MHz to 1GHz Amplitude	5.1dB*
Radiated Emissions, Horn Antenna, AOATS	1GHz to 40GHz Amplitude	6.3dB*
Worst case error for both Time and Frequency measurement 12 parts in 10^6		

* In accordance with CISPR 16-4

Product Service

SECTION 4

ACCREDITATION, DISCLAIMERS AND COPYRIGHT

4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT

This report relates only to the actual item/items tested.

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.

Results of tests not covered by our UKAS Accreditation Schedule are marked NUA (Not UKAS Accredited).