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# Report On

FCC and Industry Canada Testing of the
Ericsson AB RUS 01 B2 / KRC 118 66/2

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FCC ID: TA8AKRC11866-2
IC ID: 287AB-AS118662

Document 75921580 Report 05 Issue 1 April 2013

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**REPORT ON** FCC and Industry Canada Testing of the Ericsson RUS 01 B2 / KRC 118 66/2

Document 75921580 Report 05 Issue 1

April 2013

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**DATED** 22 April 2013

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);

Zhao Guiying — G Zhao

Zhang Liuying — X Zhang

UKAS TESTING 0141

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**SECTION 1**

**REPORT SUMMARY**

FCC and Industry Canada Testing of the
Ericsson RUS 01 B2 / KRC 118 66/2

Product Service

## 1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Ericsson RUS 01 B2 / KRC 118 66/2 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 RUS 01 B2 / KRC 118 66/2 for hardware update in LTE/CDMA multi-standard.

| | |
|---|---|
| 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 | RUS 01 B2 |
| Part Number | KRC 118 66/2 |
| IC Model Number | AS118662 |
| Serial Number(s) | D164655167 |
| PIS Software Version | CXP9017316/1 Rev R39UL |
| CDMA Software Version | CXP102051/18 Rev R19N |
| LTE Software Version | CXP9013268/6 Rev R44GX |
| Hardware Version | R1G |
| Number of Samples Tested | 1 |
| Test Specification/Issue/Date | FCC CFR 47 Part 24: 2012<br>Industry Canada RSS-133 issue 6: 2013 |
| Incoming Release<br>Date | Declaration of Build Status<br>8 March 2013 |
| Order Number<br>Date | PTP<br>11 March 2013 |
| Start of Test | 12 March 2013 |
| Finish of Test | 27 March 2013 |
| Name of Engineer(s) | G Zhao<br>X Zhang |
| Related Document(s) | ANSI C63.4: 2009<br>FCC CFR 47 Part 2: 2012<br>Industry Canada RSS-GEN Issue 3: 2010 |

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## 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 – Radio Equipment | | | | | | | |
|---|---|---|---|---|---|---|---|
| Section | Spec Clause | | Test Description | Mode | Mod State | Result | Comments |
| | FCC Part 2 and Part 24 | RSS-133 and RSS-GEN | | | | | |
| | 24.232 (a) | 6.4 | Effective Radiated Power | 1931.5MHz(L3)+1933.65MHz(C) | | N/A | No integral antenna. |
| | | | | 1960.0MHz(L3)+1962.15MHz(C) | | N/A | |
| | | | | 1986.35MHz(C)+1988.5MHz(L3) | | N/A | |
| | | | | 1932.5MHz(L5)+1935.65MHz(C) | | N/A | |
| | | | | 1960.0MHz(L5)+1963.15MHz(C) | | N/A | |
| | | | | 1984.35MHz(C)+1987.5MHz(L5) | | N/A | |
| | | | | 1935.0MHz(L10)+1940.65MHz(C) | | N/A | |
| | | | | 1960.0MHz(L10)+1965.65MHz(C) | | N/A | |
| | | | | 1979.35MHz(C)+1985.0MHz(L10) | | N/A | |
| | | | | 1960.0MHz(L3)+1962.15MHz(C)+1963.40MHz(C) | | N/A | |
| | | | | 1960.0MHz(L5)+1963.15MHz(C)+1964.40MHz(C) | | N/A | |
| | | | | 1960.0MHz(L10)+1965.65MHz(C)+1966.90MHz(C) | | N/A | |
| | | | | 1960.0MHz(L3)+1962.15MHz(C)+1963.40MHz(C)+1964.65MHz(C) | | N/A | |
| | | | | 1960.0MHz(L5)+1963.15MHz(C)+1964.40MHz(C)+1965.65MHz(C) | | N/A | |
| 2.1 | 2.1046, 24.232 (a) | 6.4 | Maximum Peak Output Power - Conducted | 1931.5MHz(L3)+1933.65MHz(C) | 0 | Pass | - |
| | | | | 1960.0MHz(L3)+1962.15MHz(C) | 0 | Pass | |
| | | | | 1986.35MHz(C)+1988.5MHz(L3) | 0 | Pass | |
| | | | | 1932.5MHz(L5)+1935.65MHz(C) | 0 | Pass | |
| | | | | 1960.0MHz(L5)+1963.15MHz(C) | 0 | Pass | |
| | | | | 1984.35MHz(C)+1987.5MHz(L5) | 0 | Pass | |
| | | | | 1935.0MHz(L10)+1940.65MHz(C) | 0 | Pass | |
| | | | | 1960.0MHz(L10)+1965.65MHz(C) | 0 | Pass | |
| | | | | 1979.35MHz(C)+1985.0MHz(L10) | 0 | Pass | |
| | | | | 1960.0MHz(L3)+1962.15MHz(C)+1963.40MHz(C) | 0 | Pass | |
| | | | | 1960.0MHz(L5)+1963.15MHz(C)+1964.40MHz(C) | 0 | Pass | |
| | | | | 1960.0MHz(L10)+1965.65MHz(C)+1966.90MHz(C) | 0 | Pass | |
| | | | | 1960.0MHz(L3)+1962.15MHz(C)+1963.40MHz(C)+1964.65MHz(C) | 0 | Pass | |
| | | | | 1960.0MHz(L5)+1963.15MHz(C)+1964.40MHz(C)+1965.65MHz(C) | 0 | Pass | |

Product Service

| Configuration 1 – Radio Equipment | | | | | | | |
|---|---|---|---|---|---|---|---|
| Section | Spec Clause | | Test Description | Mode | Mod State | Result | Comments |
| | FCC Part 2 and Part 24 | RSS-133 and RSS-GEN | | | | | |
| 2.2 | 24.232 (d) | 6.4 | Peak – Average Ratio | 1931.5MHz(L3)+1933.65MHz(C) | 0 | Pass | - |
| | | | | 1960.0MHz(L3)+1962.15MHz(C) | 0 | Pass | |
| | | | | 1986.35MHz(C)+1988.5MHz(L3) | 0 | Pass | |
| | | | | 1932.5MHz(L5)+1935.65MHz(C) | 0 | Pass | |
| | | | | 1960.0MHz(L5)+1963.15MHz(C) | 0 | Pass | |
| | | | | 1984.35MHz(C)+1987.5MHz(L5) | 0 | Pass | |
| | | | | 1935.0MHz(L10)+1940.65MHz(C) | 0 | Pass | |
| | | | | 1960.0MHz(L10)+1965.65MHz(C) | 0 | Pass | |
| | | | | 1979.35MHz(C)+1985.0MHz(L10) | 0 | Pass | |
| | | | | 1960.0MHz(L3)+1962.15MHz(C)+1963.40MHz(C) | 0 | Pass | |
| | | | | 1960.0MHz(L5)+1963.15MHz(C)+1964.40MHz(C) | 0 | Pass | |
| | | | | 1960.0MHz(L10)+1965.65MHz(C)+1966.90MHz(C) | 0 | Pass | |
| | | | | 1960.0MHz(L3)+1962.15MHz(C)+1963.40MHz(C)+1964.65MHz(C) | 0 | Pass | |
| | | | | 1960.0MHz(L5)+1963.15MHz(C)+1964.40MHz(C)+1965.65MHz(C) | 0 | Pass | |
| | 2.1047 (d) | 6.2 | Modulation Characteristics | 1960.0MHz(L3)+1962.15MHz(C) | | N/A | - |
| | | | | 1960.0MHz(L5)+1963.15MHz(C) | | N/A | |
| | | | | 1960.0MHz(L10)+1965.65MHz(C) | | N/A | |
| | | | | 1960.0MHz(L3)+1962.15MHz(C)+1963.40MHz(C) | | N/A | |
| | | | | 1960.0MHz(L5)+1963.15MHz(C)+1964.40MHz(C) | | N/A | |
| | | | | 1960.0MHz(L10)+1965.65MHz(C)+1966.90MHz(C) | | N/A | |
| | | | | 1960.0MHz(L3)+1962.15MHz(C)+1963.40MHz(C)+1964.65MHz(C) | | N/A | |
| | | | | 1960.0MHz(L5)+1963.15MHz(C)+1964.40MHz(C)+1965.65MHz(C) | | N/A | |
| | 2.1049, 24.238 (b) | RSS-Gen 4.6.1 | Occupied Bandwidth | 1960.0MHz(L3)+1962.15MHz(C) | | N/A | - |
| | | | | 1960.0MHz(L5)+1963.15MHz(C) | | N/A | |
| | | | | 1960.0MHz(L10)+1965.65MHz(C) | | N/A | |
| | | | | 1960.0MHz(L3)+1962.15MHz(C)+1963.40MHz(C) | | N/A | |
| | | | | 1960.0MHz(L5)+1963.15MHz(C)+1964.40MHz(C) | | N/A | |
| | | | | 1960.0MHz(L10)+1965.65MHz(C)+1966.90MHz(C) | | N/A | |
| | | | | 1960.0MHz(L3)+1962.15MHz(C)+1963.40MHz(C)+1964.65MHz(C) | | N/A | |
| | | | | 1960.0MHz(L5)+1963.15MHz(C)+1964.40MHz(C)+1965.65MHz(C) | | N/A | |

Product Service

| Configuration 1 – Radio Equipment | | | | | | | |
|---|---|---|---|---|---|---|---|
| Section | Spec Clause | | Test Description | Mode | Mod State | Result | Comments |
| | FCC Part 2 and Part 24 | RSS-133 and RSS-GEN | | | | | |
| 2.3 | 2.1051, 24.238 (b) | 6.5 | Spurious Emissions at Antenna Terminals (±1MHz) | 1931.5MHz(L3)+1933.65MHz(C) | 0 | Pass | - |
| | | | | 1986.35MHz(C)+1988.5MHz(L3) | 0 | Pass | |
| | | | | 1931.25MHz(C)+1933.4MHz(L3) | 0 | Pass | |
| | | | | 1986.6MHz(L3)+1988.75MHz(C) | 0 | Pass | |
| | | | | 1932.5MHz(L5)+1935.65MHz(C) | 0 | Pass | |
| | | | | 1984.35MHz(C)+1987.5MHz(L5) | 0 | Pass | |
| | | | | 1935.0MHz(L10)+1940.65MHz(C) | 0 | Pass | |
| | | | | 1979.35MHz(C)+1985.0MHz(L10) | 0 | Pass | |
| 2.4 | 2.1053, 24.238 (a) | 6.5 | Radiated Spurious Emissions | 1960.0MHz(L3)+1962.15MHz(C) | 0 | Pass | - |
| | | | | 1932.5MHz(L5)+1935.65MHz(C) | 0 | Pass | |
| | | | | 1960.0MHz(L5)+1963.15MHz(C) | 0 | Pass | |
| | | | | 1984.35MHz(C)+1987.35MHz(L5) | 0 | Pass | |
| | | | | 1960.0MHz(L10)+1965.65MHz(C) | 0 | Pass | |
| | | | | 1960.0MHz(L3)+1962.15MHz(C)+1963.40MHz(C) | | N/A | |
| | | | | 1960.0MHz(L5)+1963.15MHz(C)+1964.40MHz(C) | 0 | Pass | |
| | | | | 1960.0MHz(L10)+1965.65MHz(C)+1966.90MHz(C) | | N/A | |
| | | | | 1960.0MHz(L3)+1962.15MHz(C)+1963.40MHz(C)+1964.65MHz(C) | | N/A | |
| | | | | 1960.0MHz(L5)+1963.15MHz(C)+1964.40MHz(C)+1965.65MHz(C) | 0 | Pass | |
| 2.5 | 2.1051, 24.238 (a) | 6.5 | Conducted Spurious Emissions | 1931.5MHz(L3)+1933.65MHz(C) | 0 | Pass | - |
| | | | | 1960.0MHz(L3)+1962.15MHz(C) | 0 | Pass | |
| | | | | 1986.35MHz(C)+1988.5MHz(L3) | 0 | Pass | |
| | | | | 1960.0MHz(L5)+1963.15MHz(C) | 0 | Pass | |
| | | | | 1960.0MHz(L10)+1965.65MHz(C) | 0 | Pass | |
| | | | | 1960.0MHz(L3)+1962.15MHz(C)+1963.40MHz(C) | 0 | Pass | |
| | | | | 1960.0MHz(L5)+1963.15MHz(C)+1964.40MHz(C) | | N/A | |
| | | | | 1960.0MHz(L10)+1965.65MHz(C)+1966.90MHz(C) | | N/A | |
| | | | | 1960.0MHz(L3)+1962.15MHz(C)+1963.40MHz(C)+1964.65MHz(C) | 0 | Pass | |
| | | | | 1960.0MHz(L5)+1963.15MHz(C)+1964.40MHz(C)+1965.65MHz(C) | | N/A | |

Product Service

| Configuration 1 – Radio Equipment | | | | | | | |
|---|---|---|---|---|---|---|---|
| Section | Spec Clause | | Test Description | Mode | Mod State | Result | Comments |
| | FCC Part 2 and Part 24 | RSS-133 and RSS-GEN | | | | | |
| | 2.1055, 24.235 | 6.3 | Frequency Stability Under Temperature Variations | 1960.0MHz(L3)+1962.15MHz(C) | | N/A | - |
| | | | | 1960.0MHz(L5)+1963.15MHz(C) | | N/A | |
| | | | | 1960.0MHz(L10)+1965.65MHz(C) | | N/A | |
| | | | | 1960.0MHz(L3)+1962.15MHz(C)+1963.40MHz(C) | | N/A | |
| | | | | 1960.0MHz(L5)+1963.15MHz(C)+1964.40MHz(C) | | N/A | |
| | | | | 1960.0MHz(L10)+1965.65MHz(C)+1966.90MHz(C) | | N/A | |
| | | | | 1960.0MHz(L3)+1962.15MHz(C)+1963.40MHz(C)+1964.65MHz(C) | | N/A | |
| | | | | 1960.0MHz(L5)+1963.15MHz(C)+1964.40MHz(C)+1965.65MHz(C) | | N/A | |
| | 2.1055, 24.235 | 6.3 | Frequency Stability Under Voltage Variations | 1960.0MHz(L3)+1962.15MHz(C) | | N/A | - |
| | | | | 1960.0MHz(L5)+1963.15MHz(C) | | N/A | |
| | | | | 1960.0MHz(L10)+1965.65MHz(C) | | N/A | |
| | | | | 1960.0MHz(L3)+1962.15MHz(C)+1963.40MHz(C) | | N/A | |
| | | | | 1960.0MHz(L5)+1963.15MHz(C)+1964.40MHz(C) | | N/A | |
| | | | | 1960.0MHz(L10)+1965.65MHz(C)+1966.90MHz(C) | | N/A | |
| | | | | 1960.0MHz(L3)+1962.15MHz(C)+1963.40MHz(C)+1964.65MHz(C) | | N/A | |
| | | | | 1960.0MHz(L5)+1963.15MHz(C)+1964.40MHz(C)+1965.65MHz(C) | | N/A | |

N/A – Not Applicable

Note: "(L3)" denotes LTE network with 3MHz channel bandwidth.
"(L5)" denotes LTE network with 5MHz channel bandwidth.
"(L10)" denotes LTE network with 10MHz channel bandwidth.
"(C)" denotes CDMA network

## 1.3 DECLARATION OF BUILD STATUS

| MAIN EUT | |
|---|---|
| **MANUFACTURING DESCRIPTION** | Radio Equipment |
| **MANUFACTURER** | Ericsson AB |
| **PRODUCT NAME** | RUS 01 B2 |
| **PART NUMBER** | KRC 118 66/2 |
| **IC Model Number** | AS118662 |
| **SERIAL NUMBER(s)** | D164655167 |
| **HARDWARE VERSION** | R1G |
| **PIS SOFTWARE VERSION** | CXP9017316/1 Rev R39UL |
| **CDMA SOFTWARE VERSION** | CXP102051/18 Rev R19N |
| **LTE SOFTWARE VERSION** | CXP9013268/6 Rev R44GX |
| **TRANSMITTER OPERATING RANGE** | TX: 1931.25MHz - 1988.75MHz<br>RX: 1851.25MHz - 1908.75MHz |
| **MODULATIONS** | LTE: QPSK,16QAM, 64QAM<br>CDMA: QPSK, 8PSK, 16QAM |
| **INTERMEDIATE FREQUENCIES** | -- |
| **ITU DESIGNATION OF EMISSION** | 1M25F9W<br>3M00F9W<br>5M00F9W<br>10M0F9W |
| **SUPPORTED CHANNEL BANDWIDTH CONFIGURATION** | LTE: 3MHz, 5MHz, 10MHz according to 3GPP TS 36.141<br>CDMA: 1.25MHz |
| **OUTPUT POWER (RMS) (W or dBm)** | 80W (or 49dBm) |
| **OUTPTU POWER TOLERANCE** | ± 2.0dB |
| **NUMBER OF ANTENNA PORTS** | 1 TX/RX port, 1 RX port |
| **SUPPORTED CONFIGURATION** | Multi-standard (LTE/CDMA) configured for Mix Carrier. |
| **FCC ID** | TA8AKRC11866-2 |
| **IC ID** | 287AB-AS118662 |
| **TECHNICAL DESCRIPTION (a brief description of the intended use and operation)** | The equipment is the Radio Part of LTE / CDMA Base Station. |

**Signature** 

**Date** 07 April 2013

**D of B S Serial No** 75921580/05

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

## 1.4 PRODUCT INFORMATION

### 1.4.1 Technical Description

The Equipment Under Test (EUT) RUS 01 B2 / KRC 118 66/2 is an Ericsson Radio Equipment working in the public mobile service 1900MHz band which provides communication connections to LTE&CDMA network network. The RUS 01 B2 / KRC 118 66/2 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

### 1.4.2 Test Configuration

Configuration 1: Radio Equipment

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

The RUS 01 B2 / KRC 118 66/2 supports Multi-standard (LTE/CDMA) configured for mix-carrier. LTE supports Test Models E-TM1.1 (QPSK), E-TM3.2 (16QAM) and E-TM3.1 (64QAM) defined in 3GPP TS 36.141 and CDMA supports QPSK, 8PSK and16QAM modulations at 1900MHz. The setting below was found to be representative for all traffic scenarios when several settings with the different modulations, the number of carriers and the output power combinations were tested to find the worst case setting. These settings were used for all measurements if not otherwise noted:

- LTE/CDMA Mix Carrier:

  The Output Power settings as below:

  Mix Carrier (x2): LTE(60W) & CDMA(20W)

  Mix Carrier (x3): LTE(40W) & CDMA(20W) & CDMA(20W)

  Mix Carrier (x4): LTE(20W) & CDMA(20W) & CDMA(20W) & CDMA(20W)

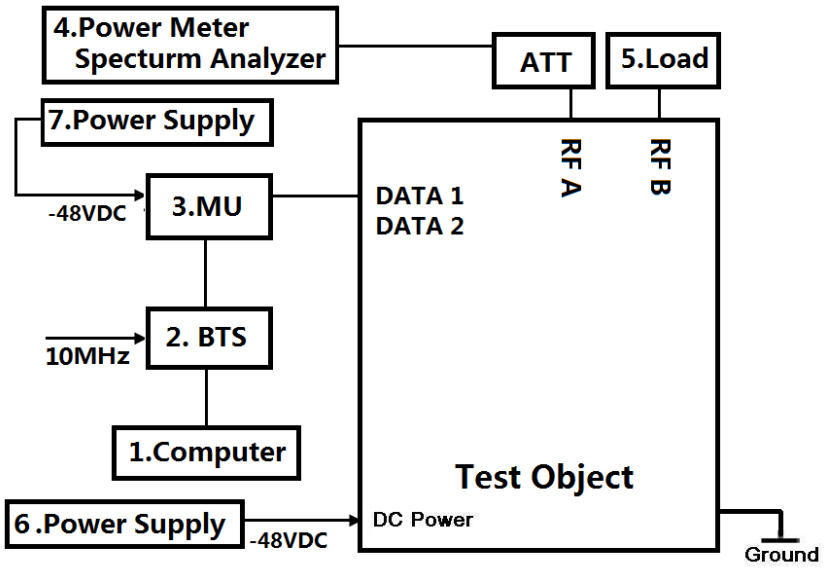
  LTE in test models E-TM1.1, E-TM3.2 and E-TM3.1;

  CDMA with QPSK Modulation
  Forward Traffic Channel using Spreading Rate 1 (1X), Voice
  User Channels: 6
  Channel rate: 9.6kbps
  Channel bandwidth: 1.25MHz

The EUT has only one TX/RX port and one RX port and it can be configured to transmit with 1900MHz mix carrier at RF A output connector. All TX measurements were performed on the TX output connector RF A. The complete testing was performed with the EUT transmitting at maximum RF power unless otherwise stated.

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

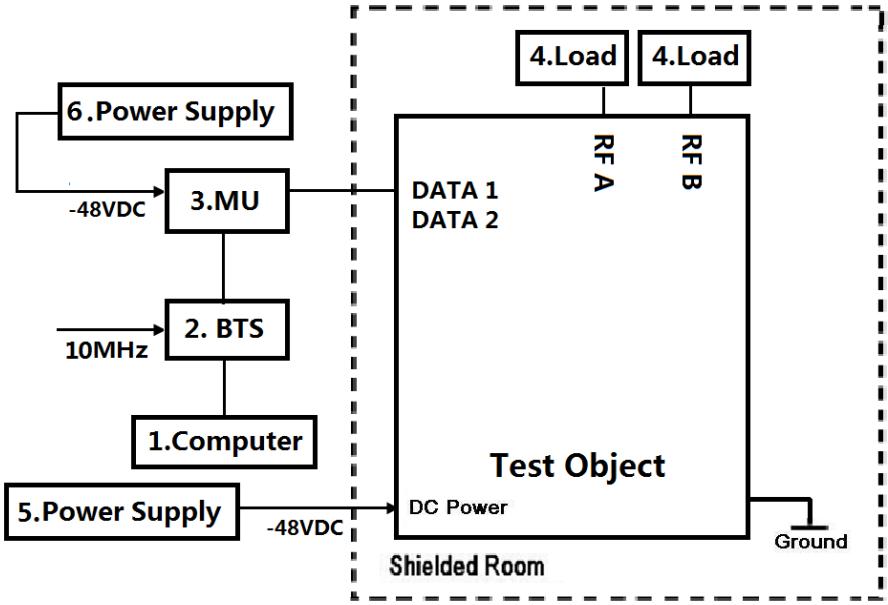
**Test Setup, Conducted Measurement:**




| Test Object | Part Number | Version | Serial Number |
|---|---|---|---|
| Radio Part | RUS 01 B2 / KRC 118 66/2 | R1G | D164655167 |

| No. | Auxiliary Equipment | Part Number / Model Type | Version | Serial Number |
|---|---|---|---|---|
| 1 | Computer | HP 8470P | -- | AP533355 |
| 2 | BTS 602A | -- | -- | -- |
| | DBA | NTLK90AAE5 | 06 | NNTMPX00P6XF |
| | CEEM | NTLK86AAE5 | 02 | NNTMPX00MHPR |
| | AEM1302 | NTLK85GAE5 | 07 | NNTMPX00VJV8 |
| | AEM1302 | NTLK85GAE5 | 07 | NNTMPX00VL8Y |
| 3 | DUL 20 01 | KDU 137 533/4 | R1C | C824321396 |
| | XMU 02 01 | KDU 137 745/1 | R2B | TU8X761275 |
| | SUP 6601 | 1/BFL 901 009/1 | R3B | BR81262548 |
| 4 | Power Meter | NRP | -- | 102438 |
| | Power Sensor | NRP-Z51 | -- | 102434 |
| | Spectrum Analyzer | FSQ26 | -- | 201123 |
| 5 | Load | TFE5-3 | -- | 090715057 |
| 6 | Power Supply | DH1716-5D | -- | 2008040041 |
| 7 | Power Supply | DH1716-5D | -- | 200360003 |

**Test Setup, Radiated Measurement:**




| Test Object | Part Number | Version | Serial Number |
|---|---|---|---|
| Radio Part | RUS 01 B2 / KRC 118 66/2 | R1G | D164655167 |

| No. | Auxiliary Equipment | Part Number / Model Type | Version | Serial Number |
|---|---|---|---|---|
| 1 | Computer | ADVANTECH 610H | -- | ATB5103888 |
| 2 | BTS 602A | -- | -- | -- |
| | DBA | NTLK90AAE5 | 06 | NNTMPX00P6XF |
| | CEEM | NTLK86AAE5 | 02 | NNTMPX00MHPR |
| | AEM1302 | NTLK85GAE5 | 07 | NNTMPX00VJV8 |
| | AEM1302 | NTLK85GAE5 | 07 | NNTMPX00VL8Y |
| 3 | DUL 20 01 | KDU 137 533/4 | R1C | C824321396 |
| | XMU 02 01 | KDU 137 745/1 | R2B | TU8X761275 |
| | SUP 6601 | 1/BFL 901 009/1 | R3B | BR81262548 |
| 4 | Load | TF100 | -- | 09121648 |
| | Load | TF100 | -- | 09121605 |
| 5 | Power Supply | DH1716A-14 | -- | 20080401 |
| 6 | Power Supply | DH1716-5D | -- | 200360003 |

### 1.4.3 Modes of Operation

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

L3 denotes LTE network with 3MHz channel bandwidth.
L5 denotes LTE network with 5MHz channel bandwidth.
L10 denotes LTE network with 10MHz channel bandwidth.
C denotes CDMA network

**Mix Carrier (x2)**

Mode 1 - L3&C, L5&C, L10&C

| **MSR** | Channel No. | Frequency (MHz) |
|---|---|---|
| L3(B)&C | 615 & 73 | 1931.5+1933.65 |
| L5(B)&C | 625 & 113 | 1932.5+1935.65 |
| L10(B)&C | 650 & 213 | 1935.0+1940.65 |

Mode 2 - L3&C, L5&C, L10&C

| **MSR** | Channel No. | Frequency (MHz) |
|---|---|---|
| L3(M)&C | 900 & 643 | 1960.0+1962.15 |
| L5(M)&C | 900 & 663 | 1960.0+1963.15 |
| L10(M)&C | 900 & 713 | 1960.0+1965.65 |

Mode 3 - C&L3, C&L5, C&L10

| **MSR** | Channel No. | Frequency (MHz) |
|---|---|---|
| C&L3(T) | 1127 & 1185 | 1986.35+1988.5 |
| C&L5(T) | 1087 & 1175 | 1984.35+1987.5 |
| C&L10(T) | 987 & 1150 | 1979.35+1985.0 |

Mode 4 - C&L3

| **MSR** | Channel No. | Frequency (MHz) |
|---|---|---|
| C(B)&L3 | 25 & 634 | 1931.25+1933.4 |

Mode 5 - L3&C

| **MSR** | Channel No. | Frequency (MHz) |
|---|---|---|
| L3&C(T) | 1166 & 1175 | 1986.6+1988.75 |

**Mix Carrier (x3)**

Mode 6 - L3&C&C, L5&C&C, L10&C&C

| **MSR** | Channel No. | Frequency (MHz) |
|---|---|---|
| L3(M)&C&C | 900 & 643 & 668 | 1960.0+1962.15+1963.40 |
| L5(M)&C&C | 900 & 663 & 688 | 1960.0+1963.15+1964.40 |
| L10(M)&C&C | 900 & 713 & 738 | 1960.0+1965.65+1966.90 |

**Mix Carrier (x4)**

Mode 7 - L3&C&C&C, L5&C&C&C

| **MSR** | Channel No. | Frequency (MHz) |
|---|---|---|
| L3(M)&C&C&C | 900 & 643 & 668 & 693 | 1960.0+1962.15+1963.40+1964.65 |
| L5(M)&C&C&C | 900 & 663 & 688 & 713 | 1960.0+1963.15+1964.40+1965.65 |

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

No modifications were made to the EUT during testing.

## 1.8 ALTERNATIVE TEST SITE

Only Radiated Spurious Emissions 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.

# SECTION 2

# TEST DETAILS

FCC and Industry Canada Testing of the
Ericsson RUS 01 B2 / KRC 118 66/2

## 2.1 MAXIMUM PEAK OUTPUT POWER - CONDUCTED

### 2.1.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1046
FCC CFR 47 Part 24, Clause 24.232 (a)
Industry Canada RSS-133, Clause 6.4

### 2.1.2 Equipment Under Test

RUS 01 B2 / KRC 118 66/2, S/N: D164655167

### 2.1.3 Date of Test and Modification State

12 to 15 March 2013 – 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.

The path loss was 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 - L3&C, L5&C, L10&C
- Mode 2 - L3&C, L5&C, L10&C
- Mode 3 - C&L3, C&L5, C&L10
- Mode 6 - L3&C&C, L5&C&C, L10&C&C
- Mode 7 - L3&C&C&C, L5&C&C&C

### 2.1.6 Environmental Conditions

| | 12 Mar 2013 | 13 Mar 2013 | 14 Mar 2013 | 15 Mar 2013 |
|---|---|---|---|---|
| Ambient Temperature | 22.0°C | 23.0°C | 22.0°C | 22.5°C |
| Relative Humidity | 47.5% | 34.3% | 37.0% | 40.0% |

### 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 Maximum Peak Output Power.

The test results are shown below

**Mix Carrier (x2)**

**Configuration 1 - Mode 1 - L3&C, L5&C, L10&C**

**LTE (E-TM1.1) & CDMA (QPSK)**

| MSR | Channel No. | Frequency (MHz) | Path Loss (dB) | Result (dBm) RMS | Result (W) RMS |
|---|---|---|---|---|---|
| L3&C | 615 & 73 | 1931.5+1933.65 | 42.6 | 49.02 | 79.80 |
| L5&C | 625 & 113 | 1932.5+1935.65 | 42.6 | 48.60 | 72.44 |
| L10&C | 650 & 213 | 1935.0+1940.65 | 42.6 | 48.61 | 72.61 |

**LTE (E-TM3.2) & CDMA (QPSK)**

| MSR | Channel No. | Frequency (MHz) | Path Loss (dB) | Result (dBm) RMS | Result (W) RMS |
|---|---|---|---|---|---|
| L3&C | 615 & 73 | 1931.5+1933.65 | 42.6 | 48.92 | 77.98 |
| L5&C | 625 & 113 | 1932.5+1935.65 | 42.6 | 48.54 | 71.45 |
| L10&C | 650 & 213 | 1935.0+1940.65 | 42.6 | 48.54 | 71.45 |

**LTE (E-TM3.1) & CDMA (QPSK)**

| MSR | Channel No. | Frequency (MHz) | Path Loss (dB) | Result (dBm) RMS | Result (W) RMS |
|---|---|---|---|---|---|
| L3&C | 615 & 73 | 1931.5+1933.65 | 42.6 | 49.08 | 80.91 |
| L5&C | 625 & 113 | 1932.5+1935.65 | 42.6 | 48.59 | 72.28 |
| L10&C | 650 & 213 | 1935.0+1940.65 | 42.6 | 48.55 | 71.61 |

**Configuration 1 - Mode 2 - L3&C, L5&C, L10&C**

**LTE (E-TM1.1) & CDMA (QPSK)**

| MSR | Channel No. | Frequency (MHz) | Path Loss (dB) | Result (dBm) RMS | Result (W) RMS |
|---|---|---|---|---|---|
| L3&C | 900 & 643 | 1960.0+1962.15 | 42.6 | 49.04 | 80.17 |
| L5&C | 900 & 663 | 1960.0+1963.15 | 42.6 | 48.50 | 70.79 |
| L10&C | 900 & 713 | 1960.0+1965.65 | 42.6 | 48.47 | 70.31 |

**LTE (E-TM3.2) & CDMA (QPSK)**

| MSR | Channel No. | Frequency (MHz) | Path Loss (dB) | Result (dBm) RMS | Result (W) RMS |
|---|---|---|---|---|---|
| L3&C | 900 & 643 | 1960.0+1962.15 | 42.6 | 49.03 | 79.98 |
| L5&C | 900 & 663 | 1960.0+1963.15 | 42.6 | 48.43 | 69.66 |
| L10&C | 900 & 713 | 1960.0+1965.65 | 42.6 | 48.42 | 69.50 |

**LTE (E-TM3.1) & CDMA (QPSK)**

| MSR | Channel No. | Frequency (MHz) | Path Loss (dB) | Result (dBm) RMS | Result (W) RMS |
|---|---|---|---|---|---|
| L3&C | 900 & 643 | 1960.0+1962.15 | 42.6 | 48.97 | 78.89 |
| L5&C | 900 & 663 | 1960.0+1963.15 | 42.6 | 48.49 | 70.63 |
| L10&C | 900 & 713 | 1960.0+1965.65 | 42.6 | 48.43 | 69.66 |

**Configuration 1 - Mode 3 - C&L3, C&L5, C&L10**

**LTE (E-TM1.1) & CDMA (QPSK)**

| MSR | Channel No. | Frequency (MHz) | Path Loss (dB) | Result (dBm) RMS | Result (W) RMS |
|---|---|---|---|---|---|
| C&L3 | 1127 & 1185 | 1986.35+1988.5 | 42.6 | 48.70 | 74.13 |
| C&L5 | 1087 & 1175 | 1984.35+1987.5 | 42.6 | 48.25 | 66.83 |
| C&L10 | 987 & 1150 | 1979.35+1985.0 | 42.6 | 48.35 | 68.39 |

**LTE (E-TM3.2) & CDMA (QPSK)**

| MSR | Channel No. | Frequency (MHz) | Path Loss (dB) | Result (dBm) RMS | Result (W) RMS |
|---|---|---|---|---|---|
| C&L3 | 1127 & 1185 | 1986.35+1988.5 | 42.6 | 48.69 | 73.96 |
| C&L5 | 1087 & 1175 | 1984.35+1987.5 | 42.6 | 48.21 | 66.22 |
| C&L10 | 987 & 1150 | 1979.35+1985.0 | 42.6 | 48.32 | 67.92 |

**LTE (E-TM3.1) & CDMA (QPSK)**

| MSR | Channel No. | Frequency (MHz) | Path Loss (dB) | Result (dBm) RMS | Result (W) RMS |
|---|---|---|---|---|---|
| C&L3 | 1127 & 1185 | 1986.35+1988.5 | 42.6 | 48.65 | 73.28 |
| C&L5 | 1087 & 1175 | 1984.35+1987.5 | 42.6 | 48.23 | 66.53 |
| C&L10 | 987 & 1150 | 1979.35+1985.0 | 42.6 | 48.32 | 67.92 |

**Mix Carrier (x3)**

**Configuration 1 - Mode 6 - L3&C&C, L5&C&C, L10&C&C**

**LTE (E-TM1.1) & CDMA (QPSK)**

| MSR | Channel No. | Frequency (MHz) | Path Loss (dB) | Result (dBm) RMS | Result (W) RMS |
|---|---|---|---|---|---|
| L3&C&C | 900 & 643 & 668 | 1960.0+1962.15+1963.40 | 42.6 | 48.61 | 72.61 |
| L5&C&C | 900 & 663 & 688 | 1960.0+1963.15+1964.40 | 42.6 | 48.53 | 71.29 |
| L10&C&C | 900 & 713 & 738 | 1960.0+1965.65+1966.90 | 42.6 | 48.58 | 72.11 |

**LTE (E-TM3.2) & CDMA (QPSK)**

| MSR | Channel No. | Frequency (MHz) | Path Loss (dB) | Result (dBm) RMS | Result (W) RMS |
|---|---|---|---|---|---|
| L3&C&C | 900 & 643 & 668 | 1960.0+1962.15+1963.40 | 42.6 | 48.56 | 71.78 |
| L5&C&C | 900 & 663 & 688 | 1960.0+1963.15+1964.40 | 42.6 | 48.49 | 70.63 |
| L10&C&C | 900 & 713 & 738 | 1960.0+1965.65+1966.90 | 42.6 | 48.52 | 71.12 |

**LTE (E-TM3.1) & CDMA (QPSK)**

| MSR | Channel No. | Frequency (MHz) | Path Loss (dB) | Result (dBm) RMS | Result (W) RMS |
|---|---|---|---|---|---|
| L3&C&C | 900 & 643 & 668 | 1960.0+1962.15+1963.40 | 42.6 | 48.55 | 71.61 |
| L5&C&C | 900 & 663 & 688 | 1960.0+1963.15+1964.40 | 42.6 | 48.54 | 71.45 |
| L10&C&C | 900 & 713 & 738 | 1960.0+1965.65+1966.90 | 42.6 | 48.54 | 71.45 |

**Mix Carrier (x4)**

**Configuration 1 - Mode 7 - L3&C&C&C, L5&C&C&C**

**LTE (E-TM1.1) & CDMA (QPSK)**

| MSR | Channel No. | Frequency (MHz) | Path Loss (dB) | Result (dBm) RMS | Result (W) RMS |
|---|---|---|---|---|---|
| L3&C&C&C | 900 & 643 & 668 & 693 | 1960.0+1962.15+1963.40+1964.65 | 42.6 | 48.63 | 72.95 |
| L5&C&C&C | 900 & 663 & 688 & 713 | 1960.0+1963.15+1964.40+1965.65 | 42.6 | 48.61 | 72.61 |

**LTE (E-TM3.2) & CDMA (QPSK)**

| MSR | Channel No. | Frequency (MHz) | Path Loss (dB) | Result (dBm) RMS | Result (W) RMS |
|---|---|---|---|---|---|
| L3&C&C&C | 900 & 643 & 668 & 693 | 1960.0+1962.15+1963.40+1964.65 | 42.6 | 48.75 | 74.99 |
| L5&C&C&C | 900 & 663 & 688 & 713 | 1960.0+1963.15+1964.40+1965.65 | 42.6 | 48.59 | 72.28 |

**LTE (E-TM3.1) & CDMA (QPSK)**

| MSR | Channel No. | Frequency (MHz) | Path Loss (dB) | Result (dBm) RMS | Result (W) RMS |
|---|---|---|---|---|---|
| L3&C&C&C | 900 & 643 & 668 & 693 | 1960.0+1962.15+1963.40+1964.65 | 42.6 | 48.65 | 73.28 |
| L5&C&C&C | 900 & 663 & 688 & 713 | 1960.0+1963.15+1964.40+1965.65 | 42.6 | 48.60 | 72.44 |

| | |
|---|---|
| Limit | ≤+50dBm or ≤100W |

Remarks

The EUT does not exceed 50dBm or 100W 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

RUS 01 B2 / KRC 118 66/2, S/N: D164655167

### 2.2.3 Date of Test and Modification State

12 to 15 March 2013 – 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 measurment 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 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 - L3&C, L5&C, L10&C
- Mode 2 - L3&C, L5&C, L10&C
- Mode 3 - C&L3, C&L5, C&L10
- Mode 6 - L3&C&C, L5&C&C, L10&C&C
- Mode 7 - L3&C&C&C, L5&C&C&C

### 2.2.6 Environmental Conditions

| | 12 Mar 2013 | 13 Mar 2013 | 14 Mar 2013 | 15 Mar 2013 |
|---|---|---|---|---|
| Ambient Temperature | 22.0°C | 23.0°C | 22.0°C | 22.5°C |
| Relative Humidity | 47.5% | 34.3% | 37.0% | 40.0% |

### 2.2.7 Test Results

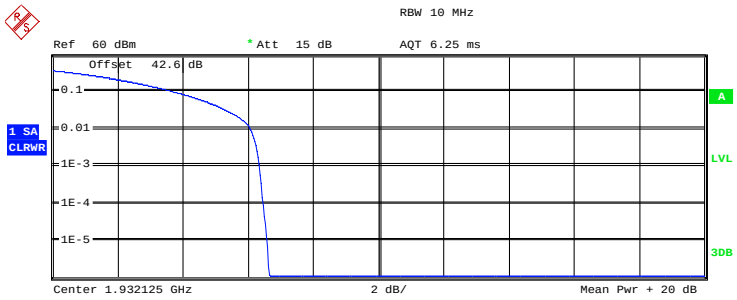
For the period of test the EUT met the requirements of FCC CFR 47 Part 24 and Industry Canada RSS-133 for Peak – Average Ratio.

The test results are shown below.

**Mix Carrier (x2)**

**Configuration 1 - Mode 1 - L3&C**

**LTE (E-TM1.1) & CDMA (QPSK)**

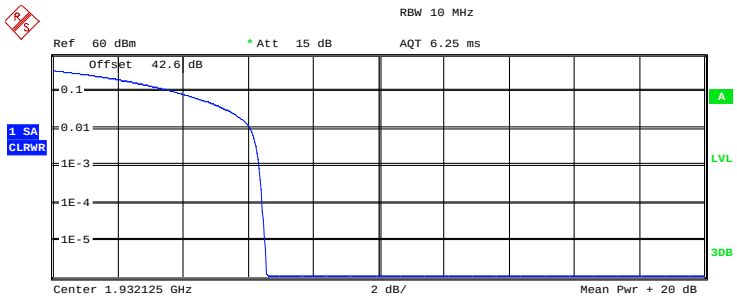



Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

| | Trace 1 |
|---|---|
| Mean | 48.79 dBm |
| Peak | 55.43 dBm |
| Crest | 6.64 dB |
| 10 % | 3.75 dB |
| 1 % | 6.06 dB |
| .1 % | 6.35 dB |
| .01 % | 6.47 dB |

Date: 13.MAR.2013 07:30:54

## LTE (E-TM3.2) & CDMA (QPSK)

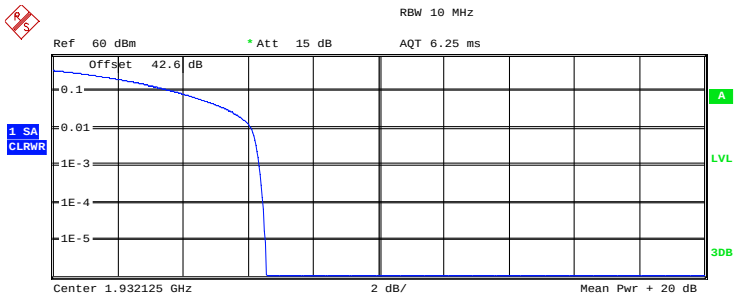



**Complementary Cumulative Distribution Function**
**NOF samples: 100000, Usable BW: 11.2MHz**

| | Trace 1 |
|---|---|
| Mean | 48.72 dBm |
| Peak | 55.29 dBm |
| Crest | 6.57 dB |
| 10 % | 3.75 dB |
| 1 % | 6.06 dB |
| .1 % | 6.35 dB |
| .01 % | 6.44 dB |

Date: 13.MAR.2013 07:58:27

## LTE (E-TM3.1) & CDMA (QPSK)



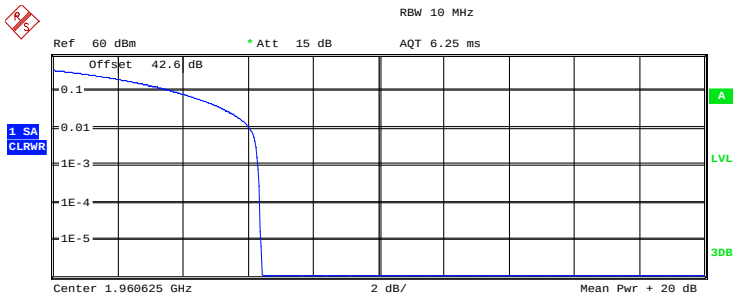

**Complementary Cumulative Distribution Function**
**NOF samples: 100000, Usable BW: 11.2MHz**

| | Trace 1 |
|---|---|
| Mean | 48.73 dBm |
| Peak | 55.29 dBm |
| Crest | 6.56 dB |
| 10 % | 3.75 dB |
| 1 % | 6.09 dB |
| .1 % | 6.35 dB |
| .01 % | 6.47 dB |

Date: 13.MAR.2013 09:06:34

## Configuration 1 - Mode 2 - L3&C

## LTE (E-TM1.1) & CDMA (QPSK)

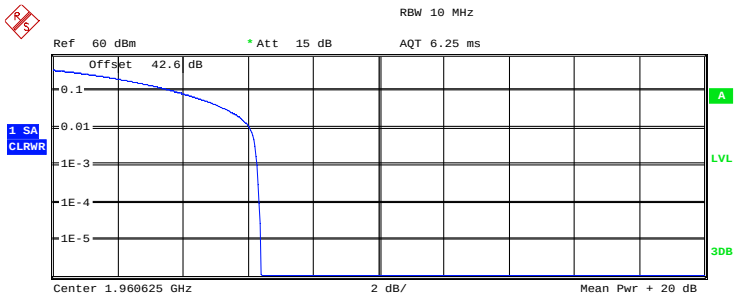



Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

| | Trace 1 |
|---|---|
| Mean | 48.59 dBm |
| Peak | 55.01 dBm |
| Crest | 6.42 dB |
| 10 % | 3.75 dB |
| 1 % | 6.06 dB |
| .1 % | 6.31 dB |
| .01 % | 6.38 dB |

Date: 12.MAR.2013 08:56:33

## LTE (E-TM3.2) & CDMA (QPSK)

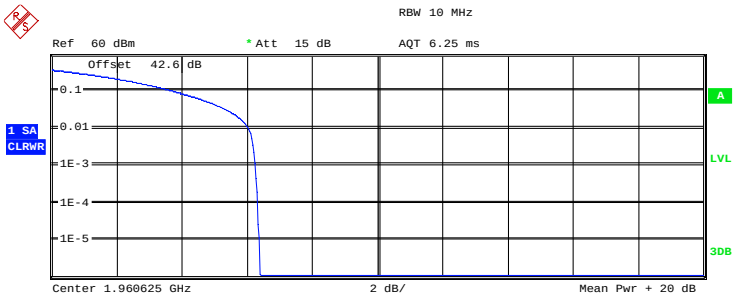



Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

| | Trace 1 |
|---|---|
| Mean | 48.70 dBm |
| Peak | 55.08 dBm |
| Crest | 6.38 dB |
| 10 % | 3.75 dB |
| 1 % | 6.06 dB |
| .1 % | 6.28 dB |
| .01 % | 6.35 dB |

Date: 12.MAR.2013 10:01:49

## LTE (E-TM3.1) & CDMA (QPSK)



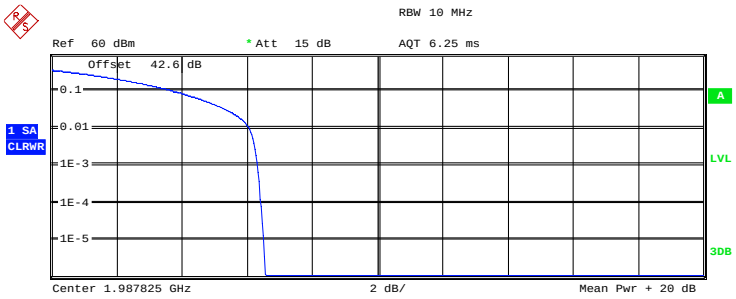

**Complementary Cumulative Distribution Function**
**NOF samples: 100000, Usable BW: 11.2MHz**

| | Trace 1 |
|---|---|
| Mean | 48.83 dBm |
| Peak | 55.23 dBm |
| Crest | 6.39 dB |
| 10 % | 3.75 dB |
| 1 % | 6.03 dB |
| .1 % | 6.25 dB |
| .01 % | 6.35 dB |

Date: 12.MAR.2013 10:25:08

## Configuration 1 - Mode 3 - C&L3

## LTE (E-TM1.1) & CDMA (QPSK)

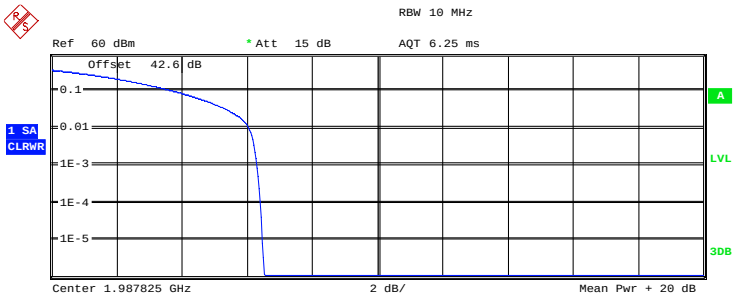



**Complementary Cumulative Distribution Function**
**NOF samples: 100000, Usable BW: 11.2MHz**

| | Trace 1 |
|---|---|
| Mean | 48.62 dBm |
| Peak | 55.16 dBm |
| Crest | 6.54 dB |
| 10 % | 3.78 dB |
| 1 % | 6.06 dB |
| .1 % | 6.31 dB |
| .01 % | 6.41 dB |

Date: 13.MAR.2013 11:09:05

## LTE (E-TM3.2) & CDMA (QPSK)

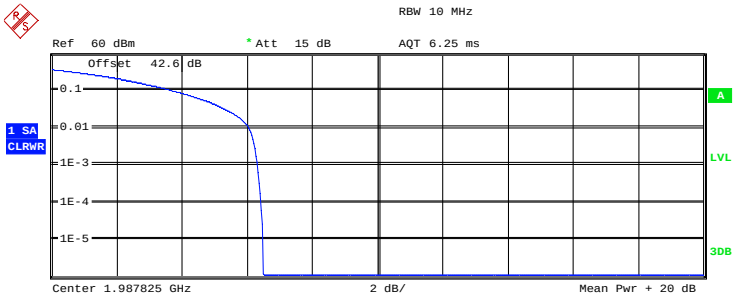



**Complementary Cumulative Distribution Function**
**NOF samples: 100000, Usable BW: 11.2MHz**

| | Trace 1 |
|---|---|
| Mean | 48.71 dBm |
| Peak | 55.23 dBm |
| Crest | 6.52 dB |
| 10 % | 3.78 dB |
| 1 % | 6.06 dB |
| .1 % | 6.31 dB |
| .01 % | 6.41 dB |

Date: 14.MAR.2013 03:38:45

## LTE (E-TM3.1) & CDMA (QPSK)



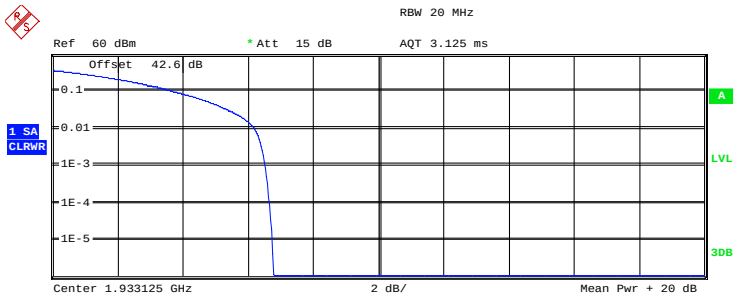

**Complementary Cumulative Distribution Function**
**NOF samples: 100000, Usable BW: 11.2MHz**

| | Trace 1 |
|---|---|
| Mean | 48.67 dBm |
| Peak | 55.16 dBm |
| Crest | 6.49 dB |
| 10 % | 3.75 dB |
| 1 % | 6.06 dB |
| .1 % | 6.31 dB |
| .01 % | 6.44 dB |

Date: 14.MAR.2013 03:40:13

## Configuration 1 - Mode 1 - L5&C

## LTE (E-TM1.1) & CDMA (QPSK)



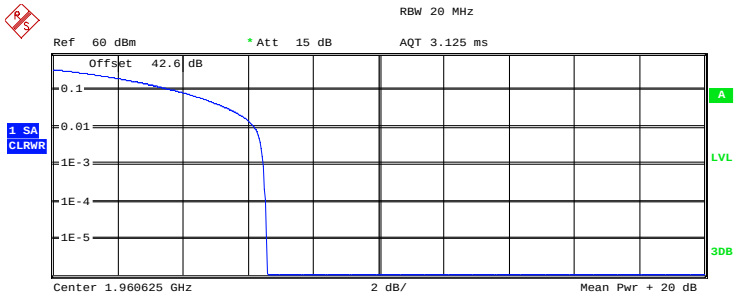

Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

| | Trace 1 |
|---|---|
| Mean | 48.26 dBm |
| Peak | 55.02 dBm |
| Crest | 6.76 dB |
| 10 % | 3.75 dB |
| 1 % | 6.19 dB |
| .1 % | 6.54 dB |
| .01 % | 6.67 dB |

Date: 14.MAR.2013 04:51:48

## Configuration 1 - Mode 2 - L5&C

## LTE (E-TM1.1) & CDMA (QPSK)



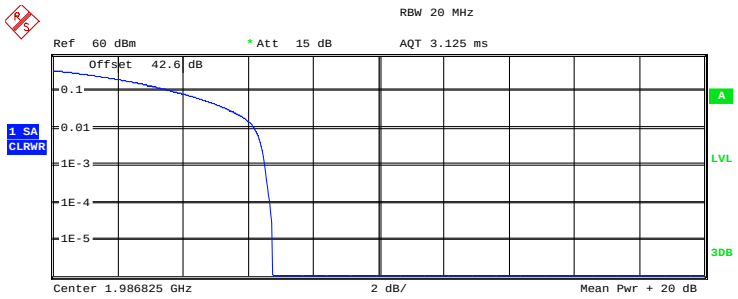

Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

| | Trace 1 |
|---|---|
| Mean | 48.26 dBm |
| Peak | 54.82 dBm |
| Crest | 6.56 dB |
| 10 % | 3.78 dB |
| 1 % | 6.19 dB |
| .1 % | 6.47 dB |
| .01 % | 6.54 dB |

Date: 14.MAR.2013 07:27:17

## Configuration 1 - Mode 3 - C&L5

## LTE (E-TM1.1) & CDMA (QPSK)



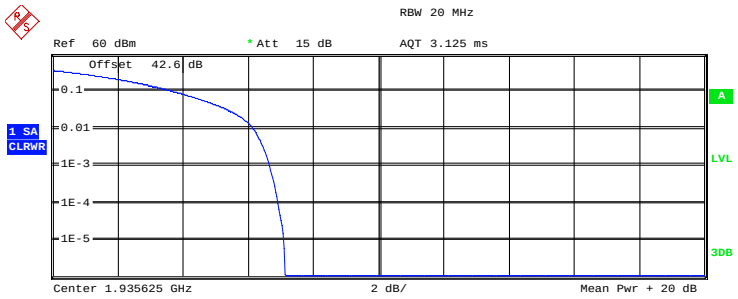

Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

| | Trace 1 |
|---|---|
| Mean | 48.28 dBm |
| Peak | 55.03 dBm |
| Crest | 6.75 dB |
| 10 % | 3.75 dB |
| 1 % | 6.19 dB |
| .1 % | 6.51 dB |
| .01 % | 6.67 dB |

Date: 14.MAR.2013 08:42:47

## Configuration 1 - Mode 1 - L10&C

## LTE (E-TM1.1) & CDMA (QPSK)



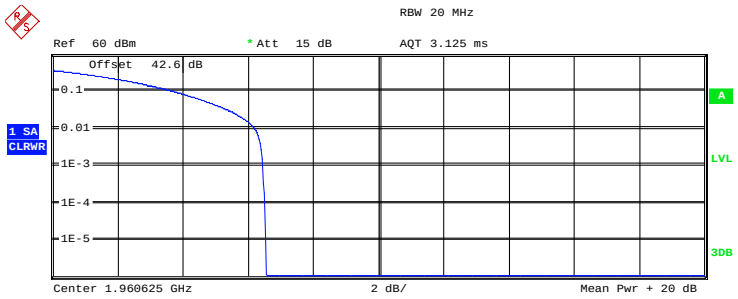

Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

| | Trace 1 |
|---|---|
| Mean | 48.47 dBm |
| Peak | 55.59 dBm |
| Crest | 7.12 dB |
| 10 % | 3.75 dB |
| 1 % | 6.15 dB |
| .1 % | 6.67 dB |
| .01 % | 6.92 dB |

Date: 15.MAR.2013 03:44:53

## Configuration 1 - Mode 2 - L10&C

## LTE (E-TM1.1) & CDMA (QPSK)



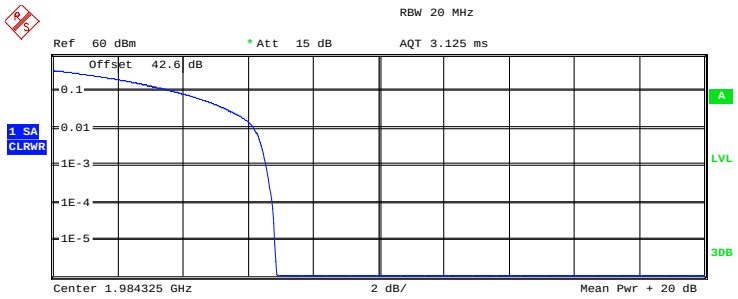

Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

| | Trace 1 |
|---|---|
| Mean | 48.29 dBm |
| Peak | 54.82 dBm |
| Crest | 6.53 dB |
| 10 % | 3.75 dB |
| 1 % | 6.19 dB |
| .1 % | 6.44 dB |
| .01 % | 6.51 dB |

Date: 14.MAR.2013 10:34:14

## Configuration 1 - Mode 3 - C&L10

## LTE (E-TM1.1) & CDMA (QPSK)




Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

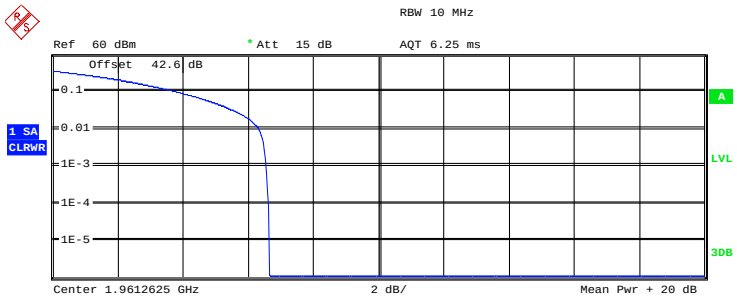
| | Trace 1 |
|---|---|
| Mean | 48.23 dBm |
| Peak | 55.10 dBm |
| Crest | 6.87 dB |
| 10 % | 3.75 dB |
| 1 % | 6.19 dB |
| .1 % | 6.54 dB |
| .01 % | 6.73 dB |

Date: 15.MAR.2013 05:11:28

## Mix Carrier (x3)

## Configuration 1 - Mode 6 - L3&C&C

## LTE (E-TM1.1) & CDMA (QPSK)



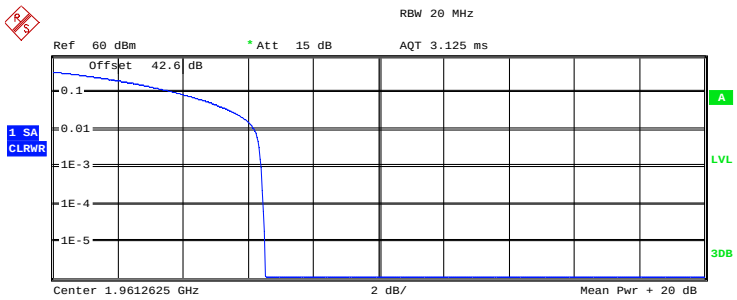

Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

| | Trace 1 |
|---|---|
| Mean | 48.37 dBm |
| Peak | 55.01 dBm |
| Crest | 6.65 dB |
| 10 % | 3.81 dB |
| 1 % | 6.31 dB |
| .1 % | 6.57 dB |
| .01 % | 6.63 dB |

Date: 13.MAR.2013 06:30:21

## Configuration 1 - Mode 6 - L5&C&C

## LTE (E-TM1.1) & CDMA (QPSK)



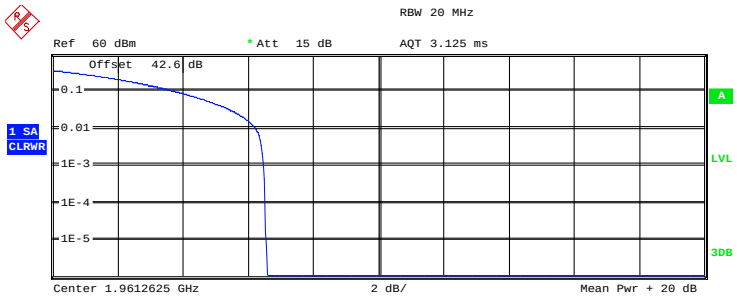

Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

| | Trace 1 |
|---|---|
| Mean | 48.38 dBm |
| Peak | 54.89 dBm |
| Crest | 6.51 dB |
| 10 % | 3.81 dB |
| 1 % | 6.19 dB |
| .1 % | 6.41 dB |
| .01 % | 6.47 dB |

Date: 14.MAR.2013 07:06:30

## Configuration 1 - Mode 6 - L10&C&C

## LTE (E-TM1.1) & CDMA (QPSK)




Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

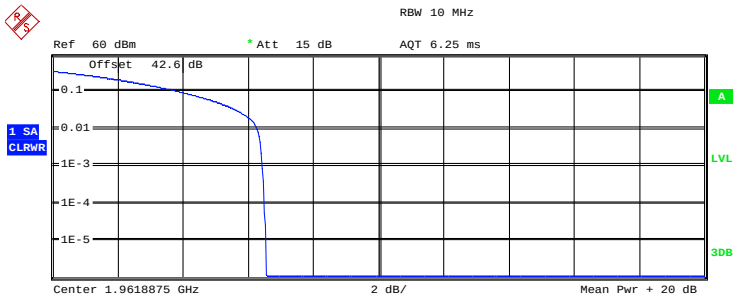
| | Trace 1 |
|---|---|
| Mean | 48.31 dBm |
| Peak | 54.89 dBm |
| Crest | 6.58 dB |
| 10 % | 3.81 dB |
| 1 % | 6.22 dB |
| .1 % | 6.47 dB |
| .01 % | 6.54 dB |

Date: 14.MAR.2013 10:13:00

## Mix Carrier (x4)

## Configuration 1 - Mode 7 - L3&C&C&C

## LTE (E-TM1.1) & CDMA (QPSK)



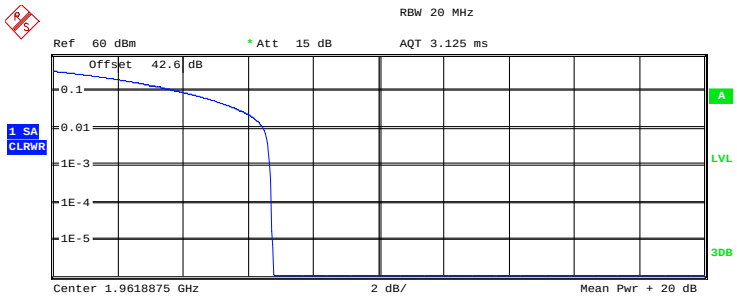

Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

| | Trace 1 |
|---|---|
| Mean | 48.46 dBm |
| Peak | 55.01 dBm |
| Crest | 6.56 dB |
| 10 % | 3.94 dB |
| 1 % | 6.28 dB |
| .1 % | 6.44 dB |
| .01 % | 6.51 dB |

Date: 13.MAR.2013 04:47:07

## Configuration 1 - Mode 7 - L5&C&C&C

## LTE (E-TM1.1) & CDMA (QPSK)




Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

| | Trace 1 |
|---|---|
| Mean | 48.39 dBm |
| Peak | 55.17 dBm |
| Crest | 6.78 dB |
| 10 % | 3.91 dB |
| 1 % | 6.47 dB |
| .1 % | 6.67 dB |
| .01 % | 6.73 dB |

Date: 14.MAR.2013 06:53:01

| | |
|---|---|
| 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 (a)
Industry Canada RSS-133 Clause 6.5

### 2.3.2 Equipment Under Test

RUS 01 B2 / KRC 118 66/2, S/N: D164655167

### 2.3.3 Date of Test and Modification State

13 to 15 March 2013 – 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 24.238(b), at least 1% of the emission bandwith shall be used for the resolution bandwidth up to 1MHz away from the block edge. As the LTE emission bandwidth of the EUT support are 3MHz, 5MHz and 10MHz, the CDMA emission bandwidth is 1.25MHz.So, 30kHz RBW was used up to 1MHz away from the band edges when the mix carrier of LTE bandwidth is 3MHz, 50kHz RBW when the mix carrier of LTE banwidth is 5MHz, and 100kHz RBW when the mix carrier of LTE banwidth is 10MHz. A resolution bandwidth of 50kHz was used between1MHz to 5MHz away from the band edge. As the FCC rules specify a RBW of 1MHz for measurements of emissions > 1MHz away from the band edges, the limit was adjusted with -13dB to -26dBm to compensate for the reduce mesurement bandwidth. Spectrum analyser detector was set as RMS.

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 - L3&C, L5&C, L10&C
- Mode 3 - C&L3, C&L5, C&L10
- Mode 4 - C&L3
- Mode 5 - L3&C

### 2.3.6 Environmental Conditions

| | 13 Mar 2013 | 14 Mar 2013 | 15 Mar 2013 |
|---|---|---|---|
| Ambient Temperature | 23.0°C | 22.0°C | 22.5°C |
| Relative Humidity | 34.3% | 37.0% | 40.0% |

### 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)

Below are the Frequencies the EUT was tested against along with the tested channels

**Mix Carrier (x2)**

**LTE (E-TM1.1) & CDMA (QPSK)**

**Configuration 1 - Mode 1 - L3&C, Mode 3 - C&L3**

| Band Edge Frequency | Edge Test with LTE at the Bottom and Top Channel | RBW / VBW (Hz) |
|---|---|---|
| Bottom<br>1930 MHz | Channel No. 615 & 73<br>Frequencies 1931.5MHz(L3)+1933.65MHz(C) | 30k / 300k |
| Top<br>1990MHz | Channel No. 1127 & 1185<br>Frequencies 1986.35MHz(C)+1988.5MHz(L3) | |

**Configuration 1 - Mode 4 - C&L3, Mode 5 - L3&C**

| Band Edge Frequency | Edge Test with CDMA at the Bottom and Top Channel | RBW / VBW (Hz) |
|---|---|---|
| Bottom<br>1930 MHz | Channel No. 25 & 634<br>Frequencies 1931.25MHz(C)+1933.4MHz(L3) | 30k /300k |
| Top<br>1990MHz | Channel No. 1166 & 1175<br>Frequencies 1986.6MHz(L3)+1988.75MHz(C) | |

**Configuration 1 - Mode 1 - L5&C, Mode 3 - C&L5**

| Band Edge Frequency | Edge Test with LTE at the Bottom and Top Channel | RBW / VBW (Hz) |
|---|---|---|
| Bottom<br>1930 MHz | Channel No. 625 & 113<br>Frequencies 1932.5MHz(L5)+1935.65MHz(C) | 50k / 500k |
| Top<br>1990MHz | Channel No. 1087 & 1175<br>Frequencies 1986.35MHz(C)+1987.5MHz(L5) | |

**Configuration 1 - Mode 1 - L10&C, Mode 3 - C&L10C**

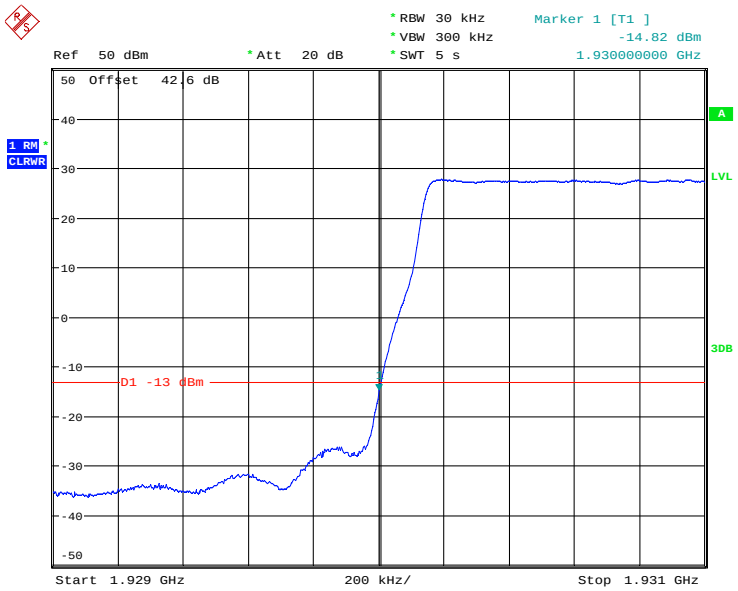
| Band Edge Frequency | Edge Test with LTE at the Bottom and Top Channel | RBW / VBW (Hz) |
|---|---|---|
| Bottom<br>1930 MHz | Channel No. 650 &213<br>Frequencies 1935.0MHz(L10)+1940.65MHz(C) | 100k / 1M |
| Top<br>1990MHz | Channel No. 987 & 1150<br>Frequencies 1979.35MHz(C)+1985.0MHz(L10) | |

The channels shown in the table above are the minimum and maximum channels that can be used in the authorised frequency ranges to maintain compliance. Channels outside of ranges shown in the above tables shall not be made available to the end user.

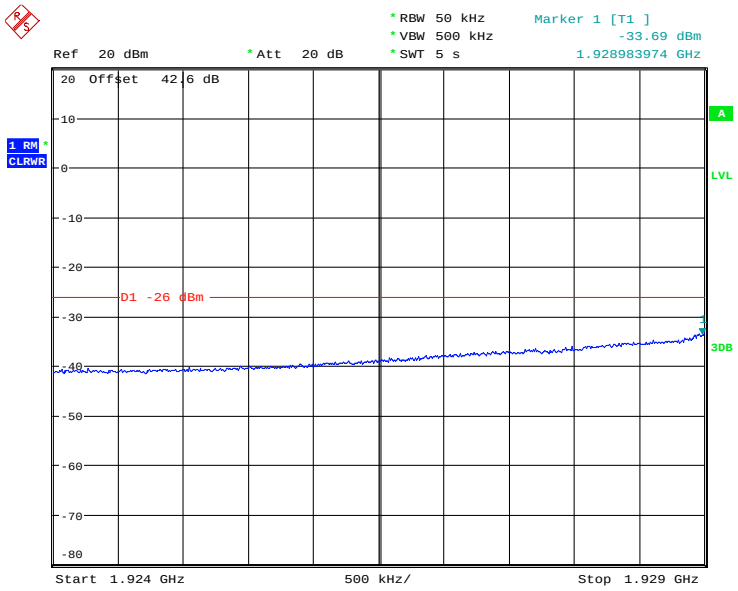
## Mix Carrier (x2)

## LTE (E-TM1.1) & CDMA (QPSK)

## Configuration 1 - Mode 1 - L3&C

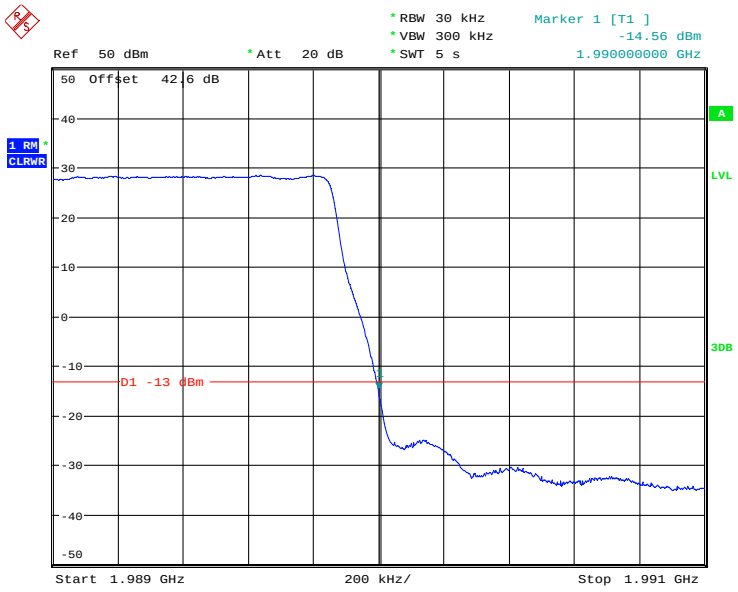



Date: 13.MAR.2013 07:42:08

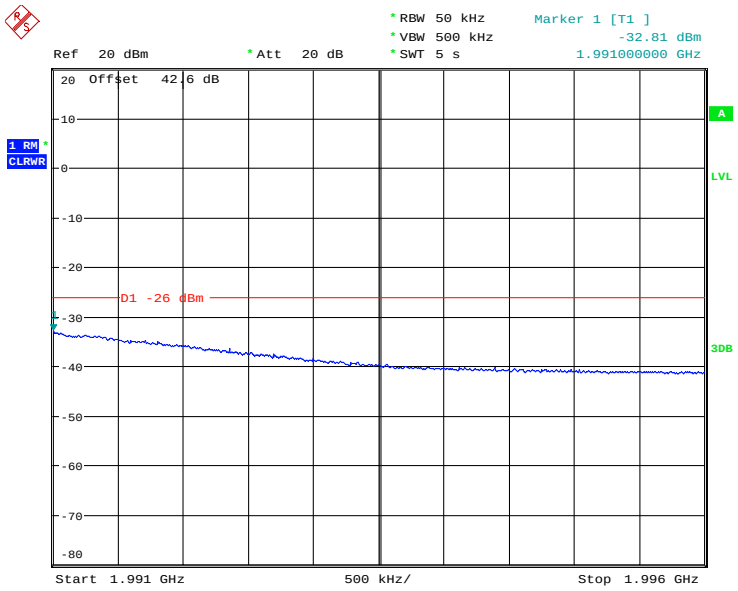



Date: 13.MAR.2013 07:45:03

## Configuration 1 - Mode 3 - C&L3

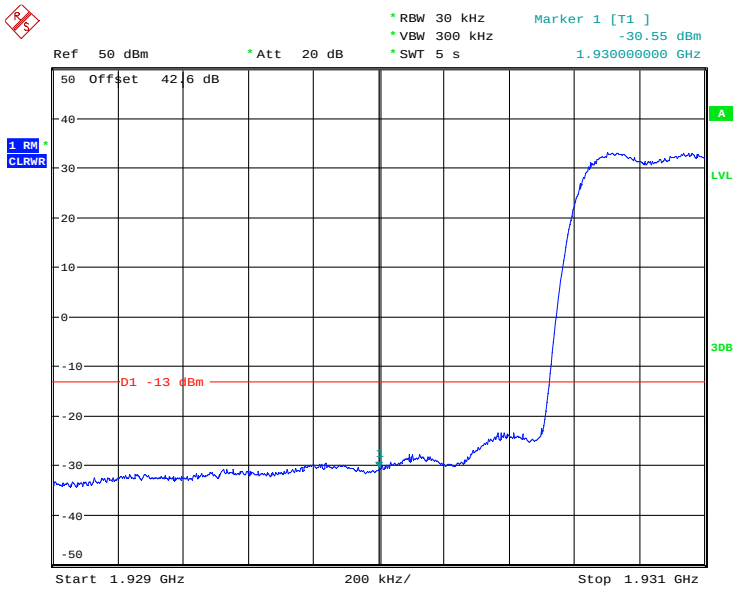



Date: 13.MAR.2013 11:07:51

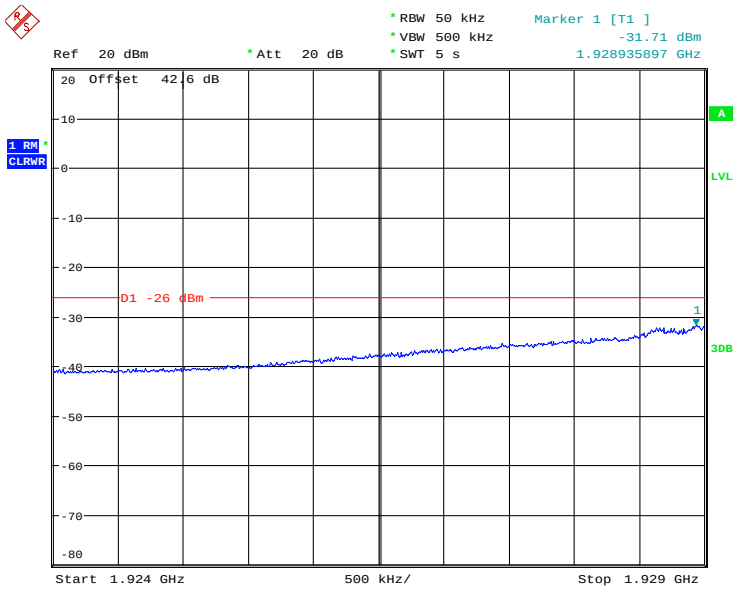



Date: 13.MAR.2013 11:06:17

## Configuration 1 - Mode 4 - C&L3

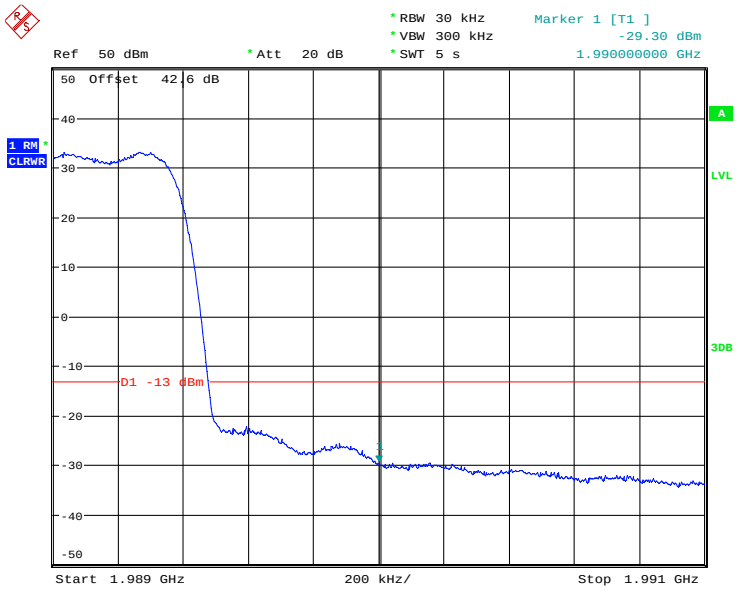



Date: 14.MAR.2013 04:28:56

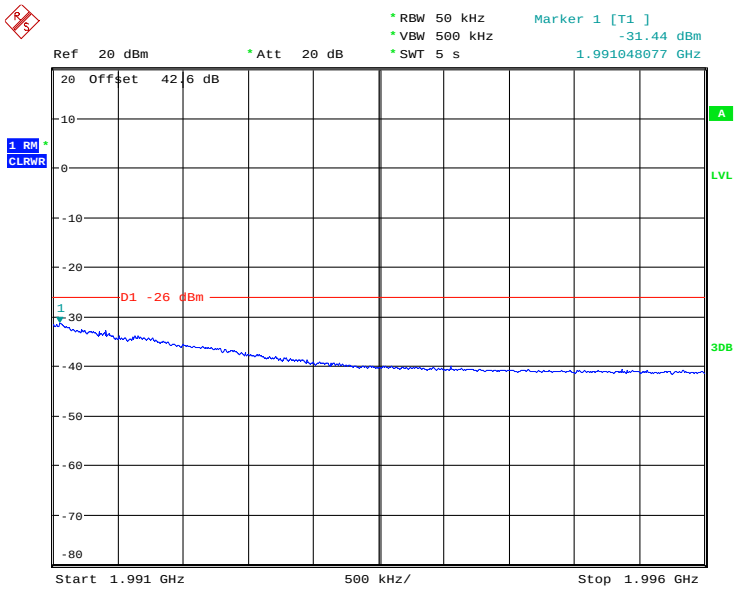



Date: 14.MAR.2013 04:30:07

## Configuration 1 - Mode 5 - L3&C

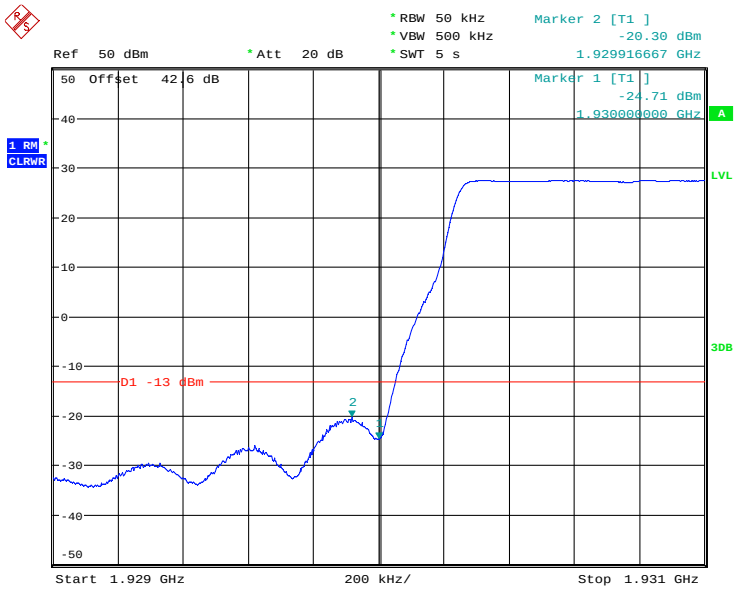



Date: 14.MAR.2013 04:09:43

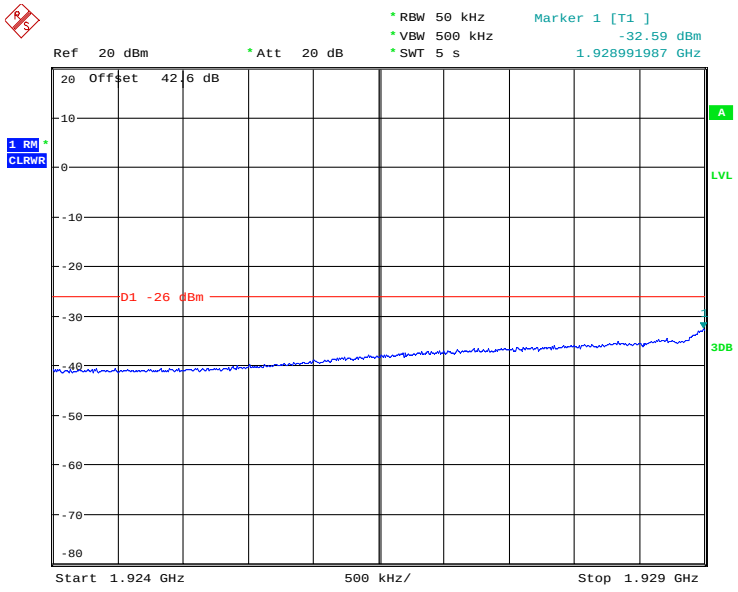



Date: 14.MAR.2013 04:12:30

## Configuration 1 - Mode 1 - L5&C

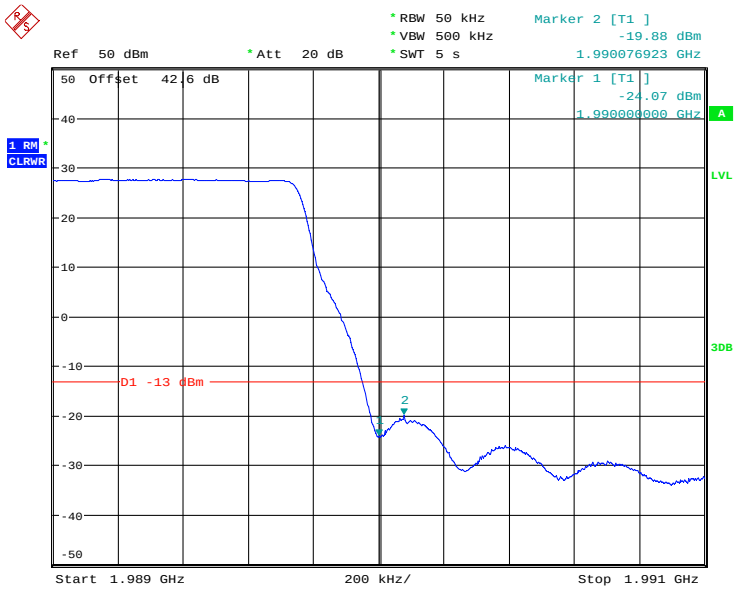



Date: 14.MAR.2013 06:32:21

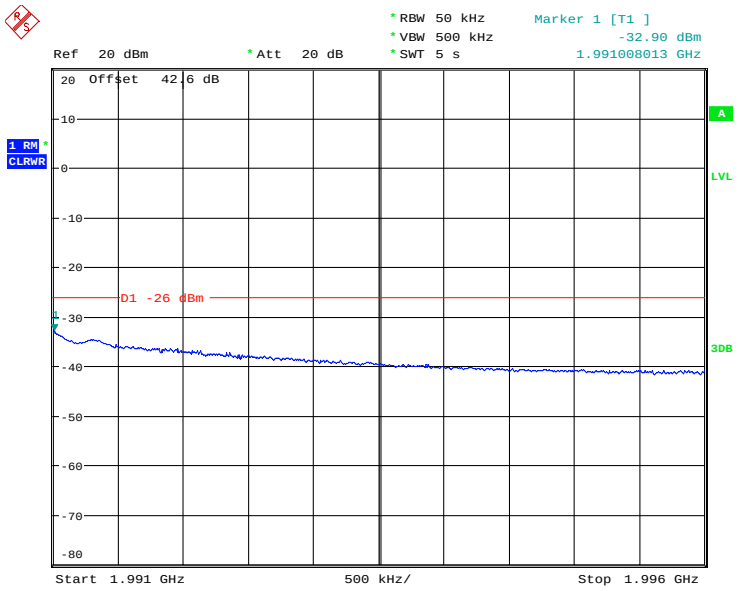



Date: 14.MAR.2013 04:59:10

## Configuration 1 - Mode 3 - C&L5

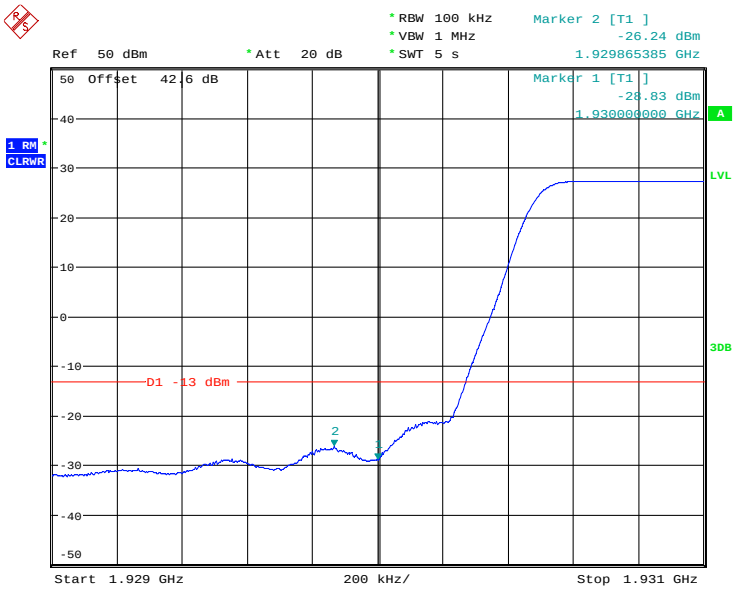



Date: 14.MAR.2013 08:45:46

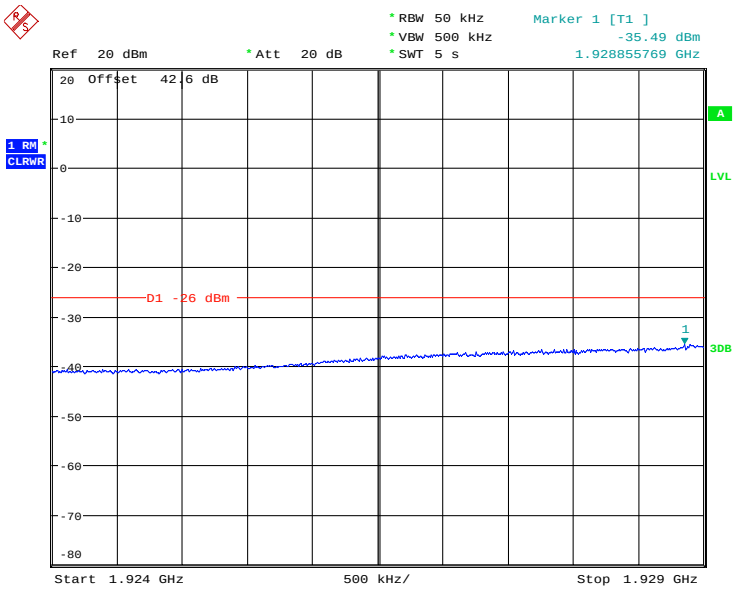



Date: 14.MAR.2013 08:47:21

## Configuration 1 - Mode 1 - L10&C

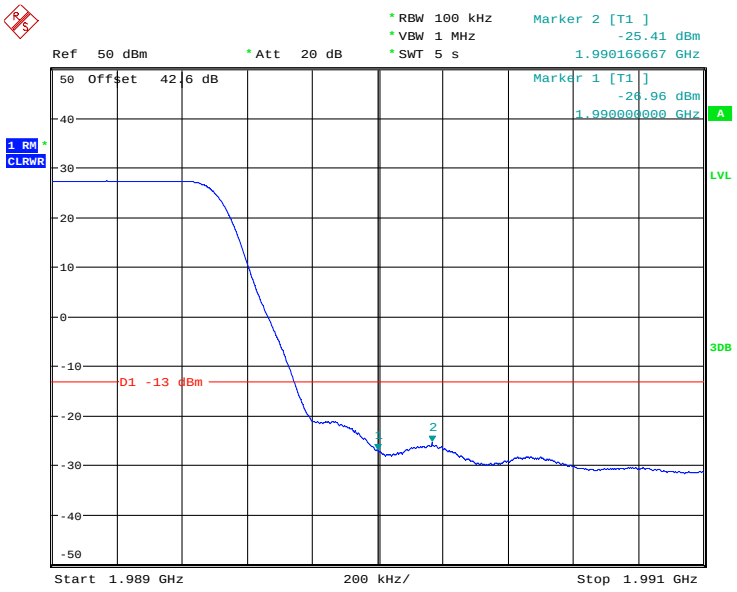



Date: 15.MAR.2013 03:54:13

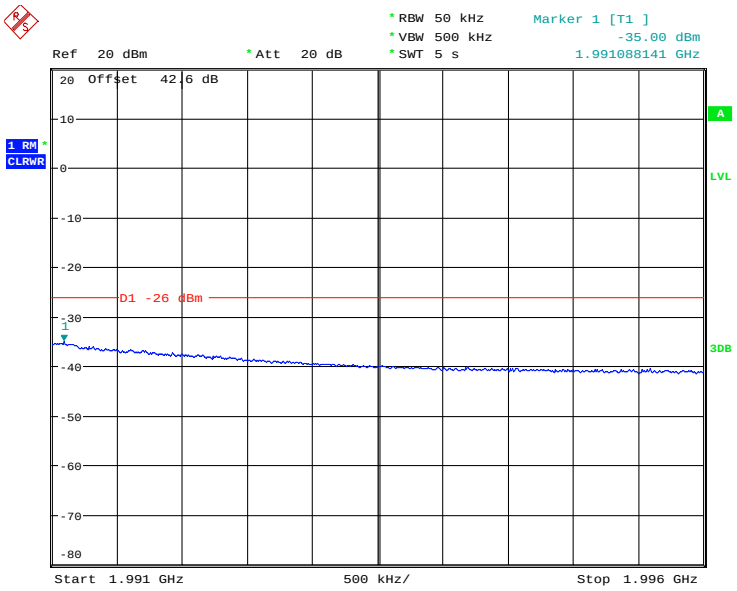



Date: 15.MAR.2013 03:55:50

## Configuration 1 - Mode 3 - C&L10




Date: 15.MAR.2013 05:00:43




Date: 15.MAR.2013 05:02:27

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, 24.238 (a)
Industry Canada RSS-133, Clause 6.5

### 2.4.2 Equipment Under Test

RUS 01 B2 / KRC 118 66/2, S/N: D164655167

### 2.4.3 Date of Test and Modification State

26 and 27 March 2013 – 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.

A preliminary profile of the Spurious Radiated Emissions was obtained by operating the EUT 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.

Emissions identified within the range 30MHz – 25GHz were then formally measured using a Peak detector as the worst case.

In the frequency Range 30MHz – 25GHz, the measurement was performed with a resolution bandwidth of 1MHz.

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

**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 dipoles 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 meter.

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

$E_{(v/m)}=(30 \times 1.64 \times 66.22)^{0.5} / 3 = 19.026V/m = 145.6dB\mu V/m$

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

43 + 10log(66.22) = 61.2dB

Therefore the limit at 3m measurement distance is:

145.6 – 61.2 = 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 operating on all modes in section 1.4.3 and record the result of the following configurations and modes of operation for worst case:

Configuration 1
- Mode 1 - L5&C
- Mode 2 - L3&C, L5&C, L10&C
- Mode 3 - C&L5
- Mode 6 - L5&C&C
- Mode 7 - L5&C&C&C

### 2.4.6 Environmental Conditions

| | 26 Mar 2013 | 27 Mar 2013 |
|---|---|---|
| Ambient Temperature | 23.0°C | 22.0°C |
| Relative Humidity | 30.0% | 29.8% |

### 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

**Mix Carrier (x2)**

**LTE (E-TM1.1) & CDMA (QPSK)**

**Configuration 1 - Mode 2 - L3&C**

No emissions were detected within 20dB of the limit.

**LTE (E-TM3.2) & CDMA (QPSK)**

**Configuration 1 - Mode 2 - L3&C**

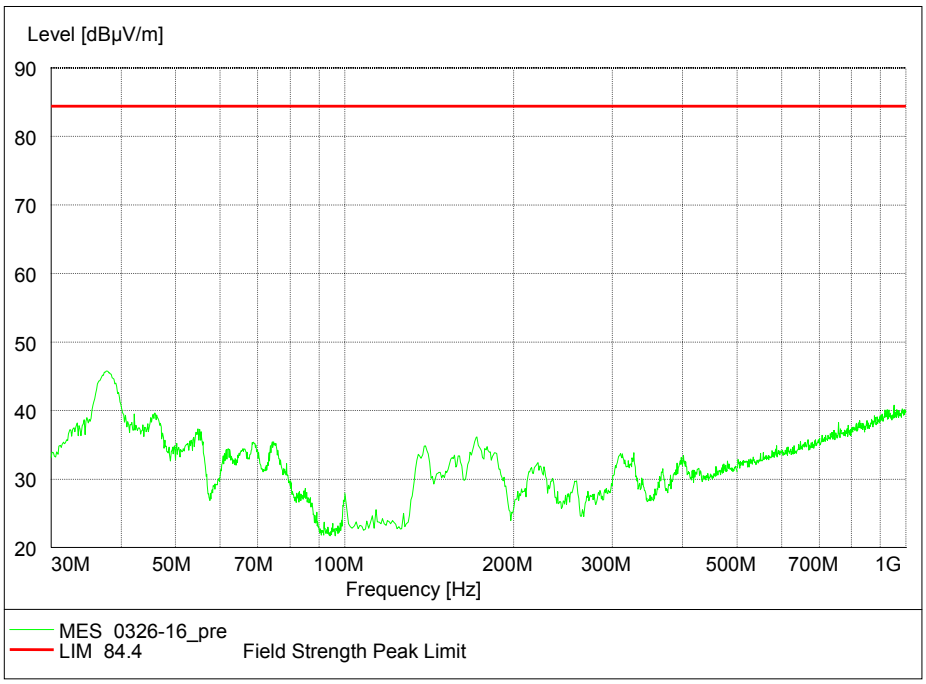
No emissions were detected within 20dB of the limit.

**Configuration 1 - Mode 1 - L5&C**

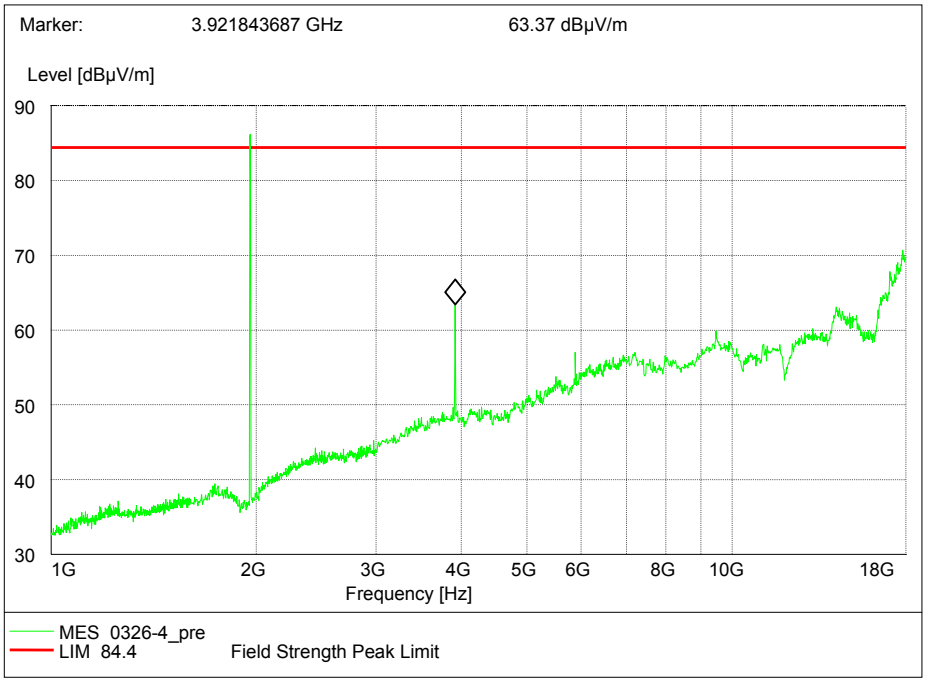
No emissions were detected within 20dB of the limit.

**Configuration 1 - Mode 2 - L5&C**

30MHz to 1GHz

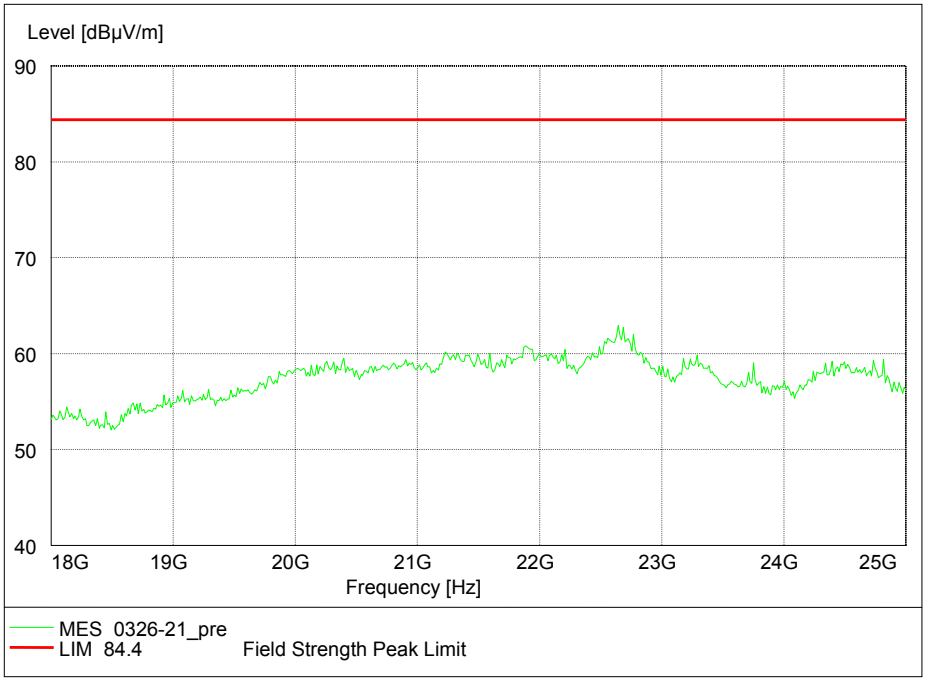


1GHz - 18GHz




Note: The emission beyond the limit is the operating frequency.

18GHz - 25GHz



**Configuration 1 - Mode 3 - C&L5**

No emissions were detected within 20dB of the limit.

**Configuration 1 - Mode 2 - L10&C**

No emissions were detected within 20dB of the limit.

**LTE (E-TM3.1) & CDMA (QPSK)**

**Configuration 1 - Mode 2 - L3&C**

No emissions were detected within 20dB of the limit.

**Mix Carrier (x3)**

**LTE (E-TM3.2) & CDMA (QPSK)**

**Configuration 1 - Mode 6 - L5&C&C**

No emissions were detected within 20dB of the limit.

**MixCarrier (x4)**

**LTE (E-TM3.2) & CDMA (QPSK)**

**Configuration 1 - Mode 7 - L5&C&C&C**

No emissions were detected within 20dB of the limit.

| | |
|---|---|
| Limit | -13dBm / 84.4dBµV/m |

Remarks

The EUT does not exceed -13dBm / 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, 24.238 (a)
Industry Canada RSS-133, Clause 6.5

### 2.5.2 Equipment Under Test

RUS 01 B2 / KRC 118 66/2, S/N: D164655167

### 2.5.3 Date of Test and Modification State

12 to 15 March 2013 – 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 Part 2.1051, the spurious emissions from the antenna terminal were measured. The transmitter output power was attenuated using an attenuator and the frequency spectrum investigated from 9kHz to 25GHz. The EUT was set to transmit on maximum power. The EUT was tested on Bottom, Middle and Top channels. The resolution was set to 1MHz for 9kHz to 25GHz thus meeting the requirements of Part 24.238(b). The spectrum analyser detector was set to peak and trace was kept on Max Hold.

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

In addition, measurements were made up to the $10^{th}$ harmonic of the highest internal frequency.

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

Configuration 1
- Mode 1 - L3&C
- Mode 2 - L3&C, L5&C, L10&C
- Mode 3 - C&L3
- Mode 6 - L3&C&C
- Mode 7 - L3&C&C&C

### 2.5.6 Environmental Conditions

| | 12 Mar 2013 | 13 Mar 2013 | 14 Mar 2013 | 15 Mar 2013 |
|---|---|---|---|---|
| Ambient Temperature | 22.0°C | 23.0°C | 22.0°C | 22.5°C |
| Relative Humidity | 47.5% | 34.3% | 37.0% | 40.0% |

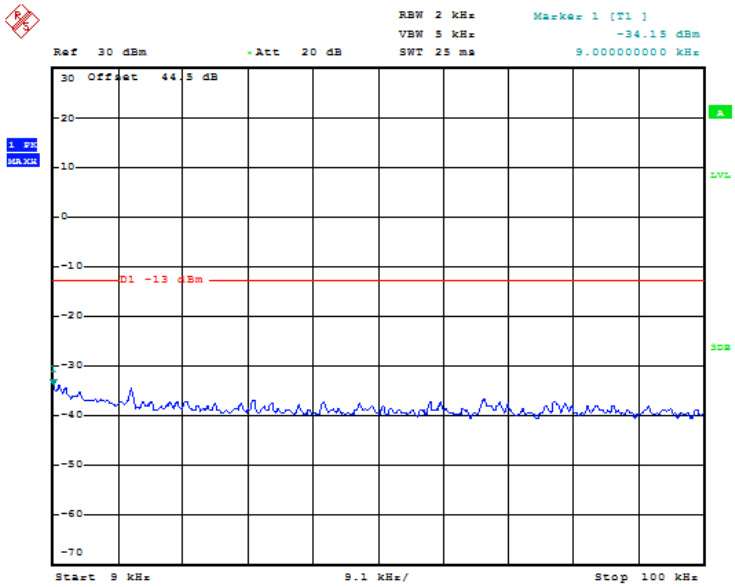
### 2.5.7 Test Results

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 measruement with a smaller Span showed that it was related to the LO feedthrough.

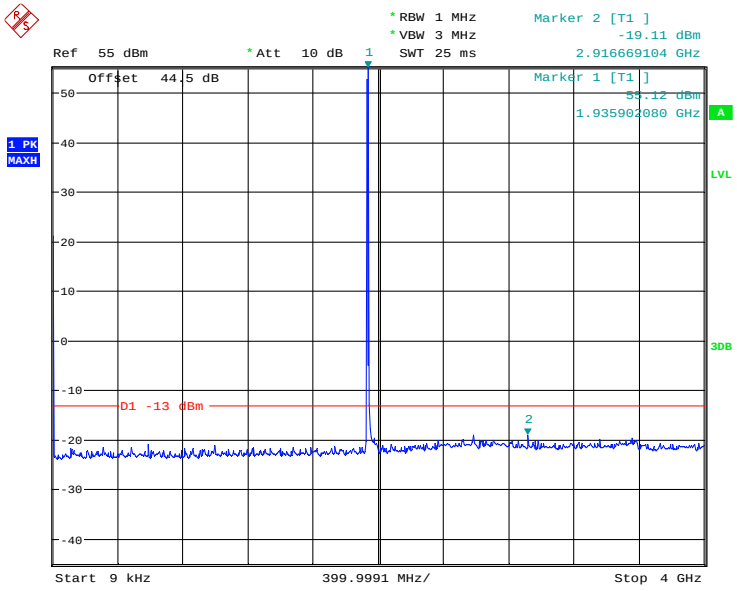


**Mix Carrier (x2)**

**LTE (E-TM1.1) & CDMA (QPSK)**

**Configuration 1 - Mode 1 - L3&C**

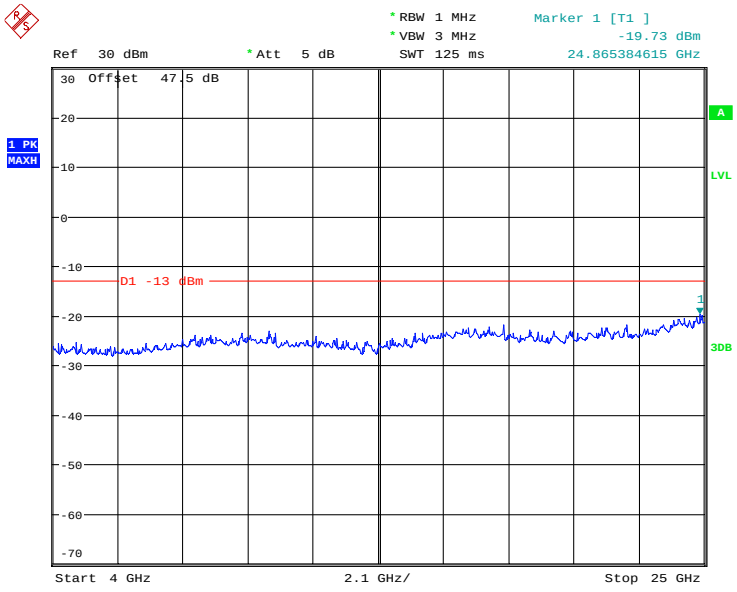
9kHz to 4GHz




Date: 13.MAR.2013 07:33:13

Note: The emission beyond the limit is the operating frequency.

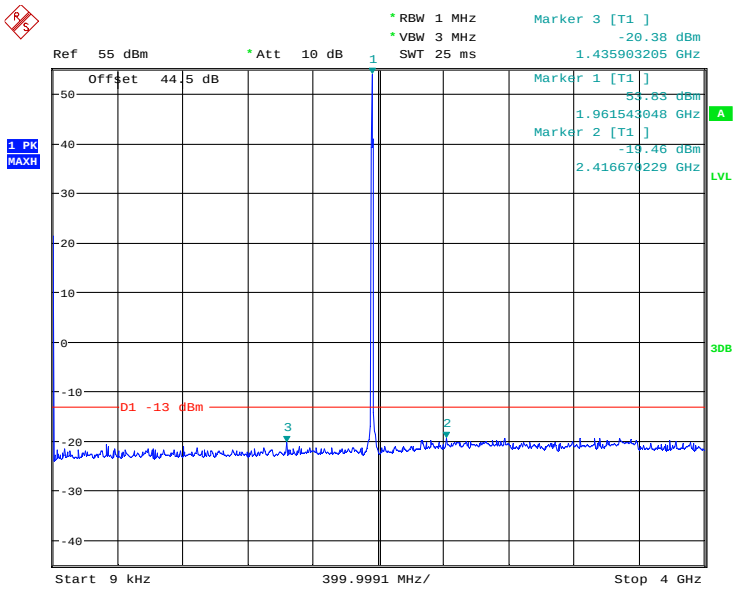
4GHz to 25GHz




Date: 13.MAR.2013 07:34:44

## Configuration 1 - Mode 2 - L3&C

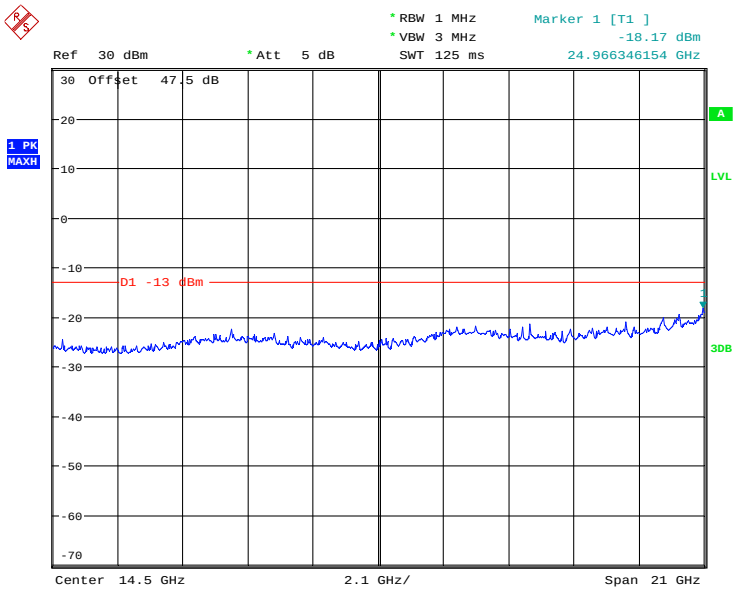
9kHz to 4GHz




Date: 12.MAR.2013 09:07:50

Note: The emission beyond the limit is the operating frequency.

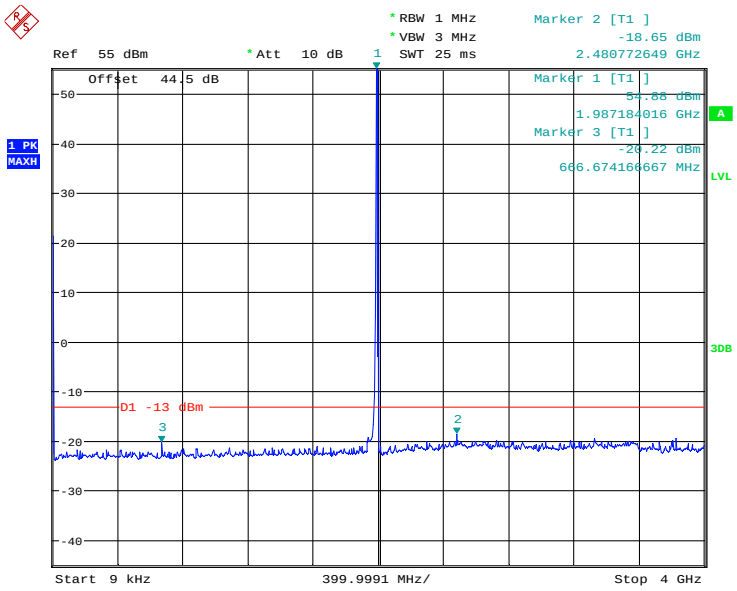
4GHz to 25GHz




Date: 12.MAR.2013 09:16:08

## Configuration 1 - Mode 3 - C&L3

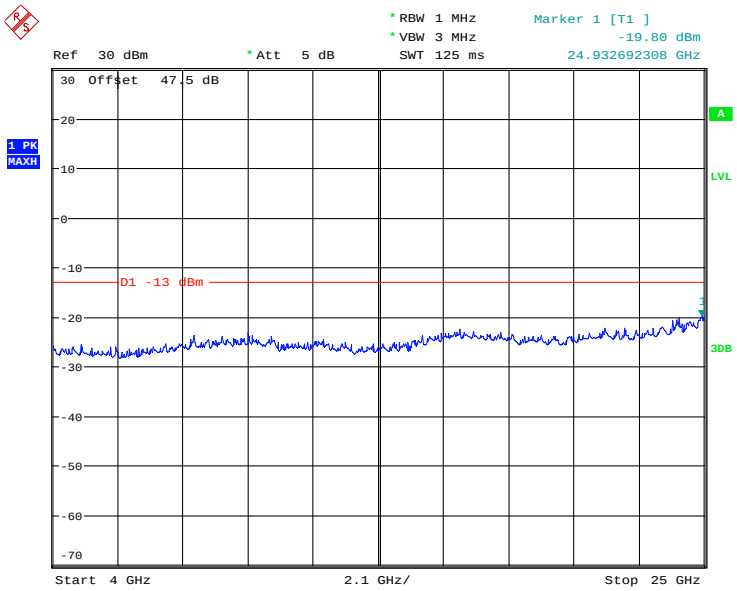
9kHz to 4GHz




Date: 13.MAR.2013 11:11:07

Note: The emission beyond the limit is the operating frequency.

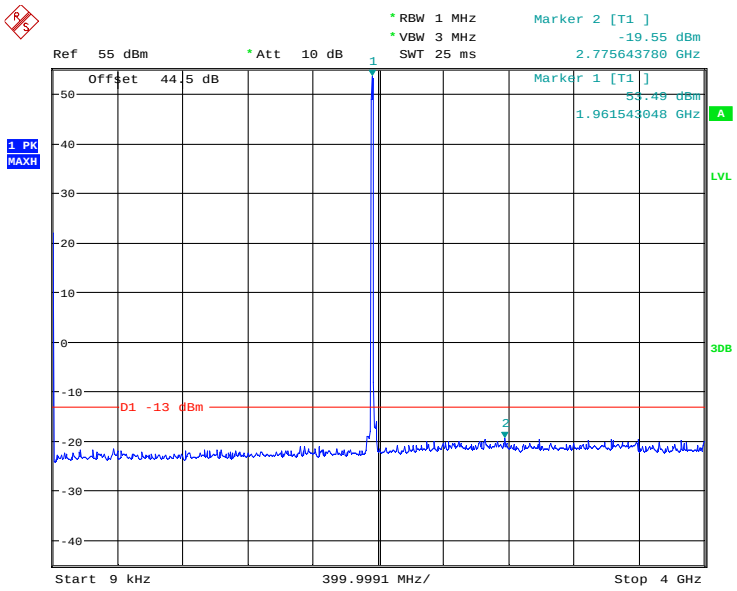
4GHz to 25GHz




Date: 13.MAR.2013 11:12:12

## Configuration 1 - Mode 2 - L5&C

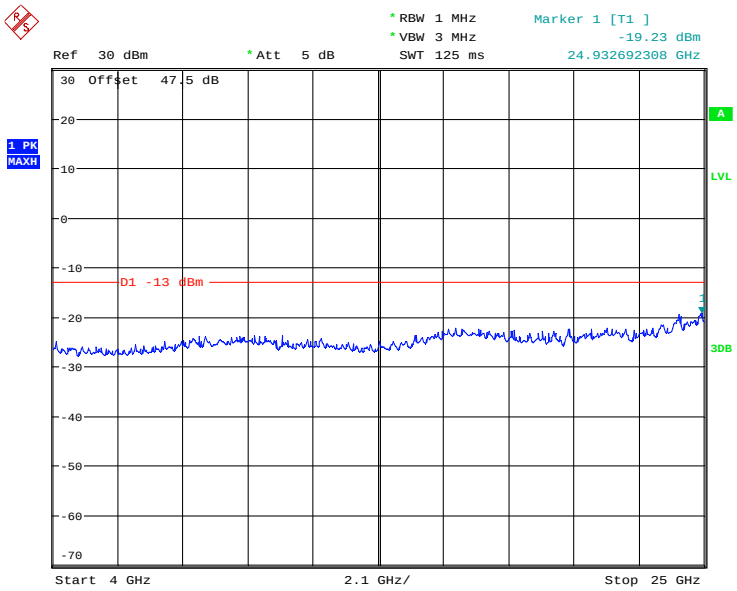
9kHz to 4GHz




Date: 14.MAR.2013 07:29:27

Note: The emission beyond the limit is the operating frequency.

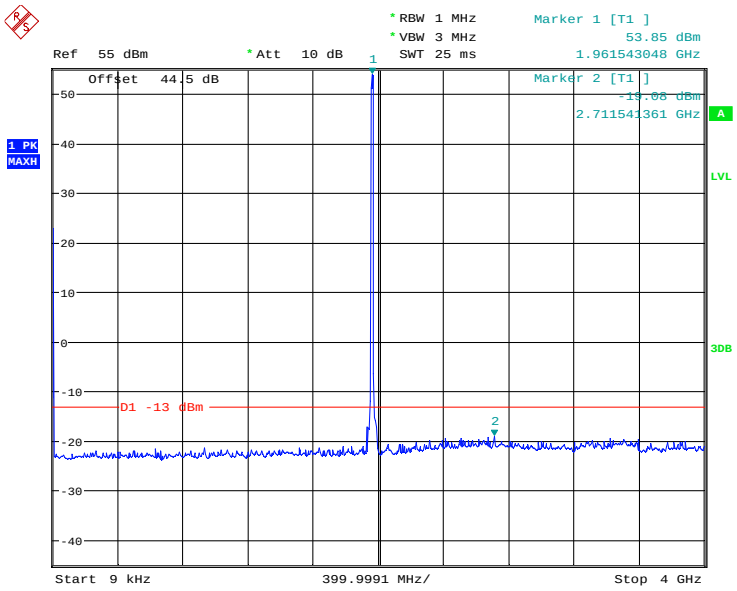
4GHz to 25GHz




Date: 14.MAR.2013 07:30:45

## Configuration 1 - Mode 2 - L10&C

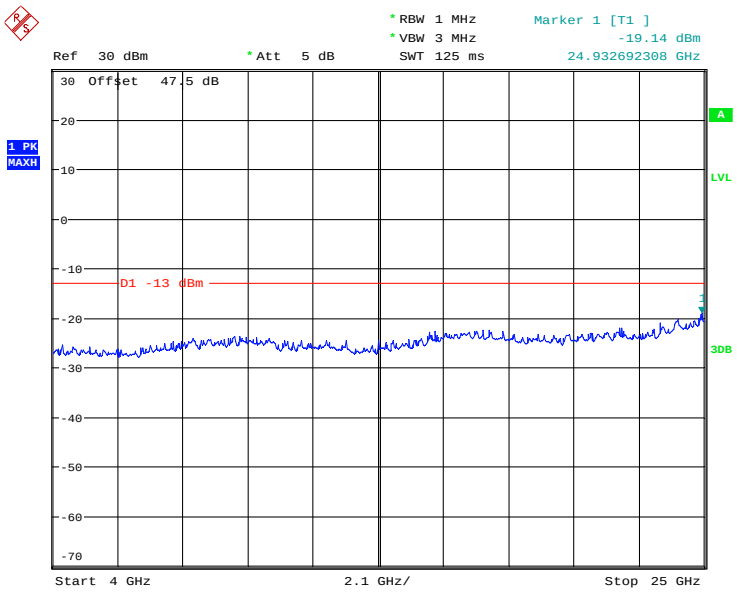
9kHz to 4GHz




Date: 14.MAR.2013 10:36:38

Note: The emission beyond the limit is the operating frequency.

4GHz to 25GHz



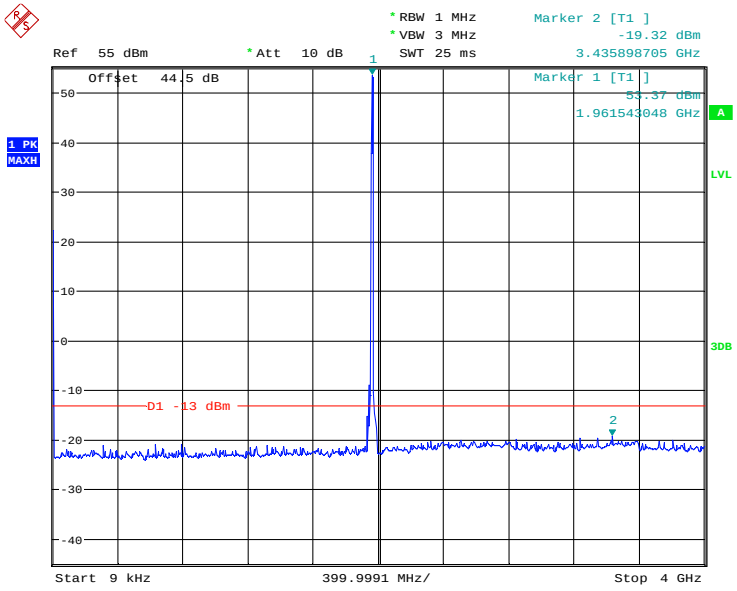

Date: 14.MAR.2013 10:37:56

**Mix Carrier (x3)**

**LTE (E-TM1.1) & CDMA (QPSK)**

**Configuration 1 - Mode 6 - L3&C&C**

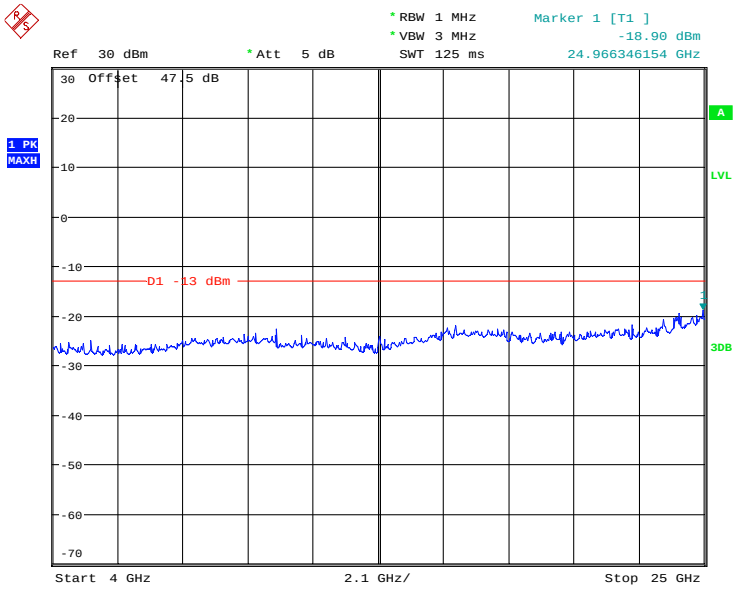
9kHz to 4GHz




Date: 13.MAR.2013 06:31:44

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

4GHz to 25GHz



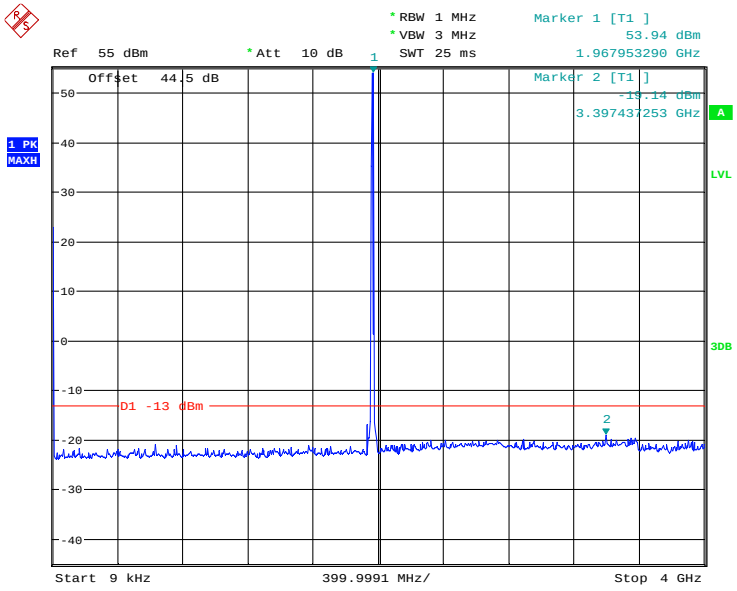

Date: 13.MAR.2013 06:32:40

**Mix Carrier (x4)**

**LTE (E-TM1.1) & CDMA (QPSK)**

**Configuration 1 - Mode 7 - L3&C&C&C**

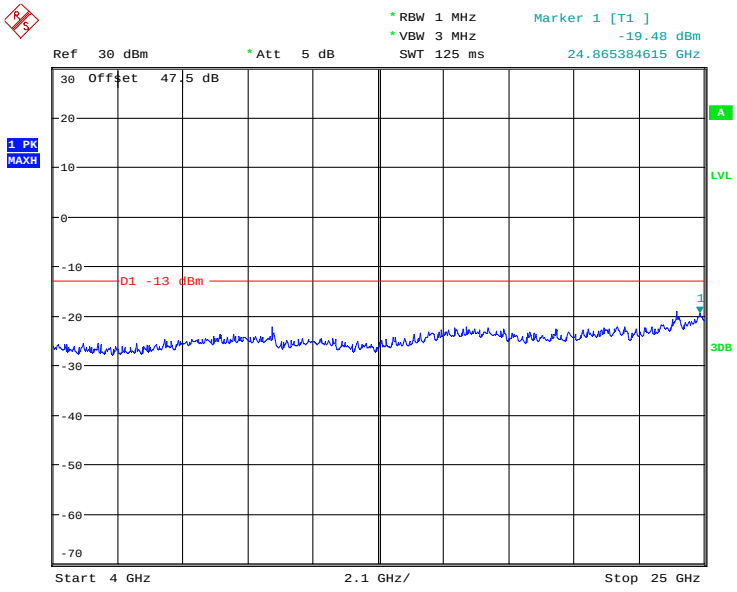
9kHz to 4GHz




Date: 13.MAR.2013 04:48:55

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

4GHz to 25GHz




Date: 13.MAR.2013 04:50:02

| | |
|---|---|
| Limit | -13dBm |

Remarks

The EUT does not exceed -13dBm at the frequency range of 9kHz to 25GHz.

# SECTION 3

# TEST EQUIPMENT USED

## 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 and 2.5– Maximum Conducted Output Power, Peak – Average Ratio, Spurious Emissions at Antenna Terminals (±1MHz) and Conducted Spurious Emissions** | | | | | |
| Spectrum Analyzer | Rohde & Schwarz | FSQ26 | 201123 | 12 | 09-Apr-2013 |
| Power Meter | Rohde & Schwarz | NRP | 102438 | 12 | 12-Apr-2013 |
| Power Sensor | Rohde & Schwarz | NRP-Z51 | 102434 | 12 | 12-Aug-2013 |
| Network Analyzer | Hewlett Packard | 8720D | US36140166 | 12 | 06-Sep-2013 |
| 40 dB Attenuator | Shanghai Huaxiang | DTS 80 | 090722014 | - | O/P MON |
| Load | Shanghai Huaxiang | TFE5 | 090715057 | - | O/P MON |
| Power Supply | Dahua | DH1716-5D | 2008040041 | - | O/P MON |
| Power Supply | Dahua | DH1716-5D | 200360003 | - | O/P MON |
| Digital Multimeter | FLUKE | 179 | 91820401 | 12 | 13-Dec-2013 |
| Thermo-hygrometer | AZ Instruments | 8705 | 9151655 | 12 | 16-Dec-2013 |
| **Section 2.4 – Radiated Spurious Emissions** | | | | | |
| Load | Shanghai Huaxiang | TF100 | 09121648 | - | O/P MON |
| Load | Shanghai Huaxiang | TF100 | 09121605 | - | O/P MON |
| EMI Receiver | Rohde & Schwarz | ESI 40 | 100015 | 12 | 19-Aug-2013 |
| Ultra log test antenna | Rohde & Schwarz | HL562 | 100167 | 12 | 19-Aug-2013 |
| Double-Ridged Wave-guide Horn Antenna | Rohde & Schwarz | HF 906 | 100029 | 12 | 19-Aug-2013 |
| Pyramidal Horn Antenna | EMCO | 3160-09 | - | - | - |
| Antenna master | Frankonia | MA 260 | - | 12 | 19-Aug-2013 |
| Relay Switch Unit | Rohde & Schwarz | 331.1601.31 | 338965002 | - | TU |
| Semi Anechoic Chamber | Frankonia | 23.18m×16.88m×9.60m | - | 12 | 19-Aug-2013 |
| Power Supply | Dahua | DH1716A-14 | 20080401 | - | O/P MON |
| Power Supply | Dahua | DH1716-5D | 200360003 | - | O/P MON |
| Digital Multimeter | FLUKE | 179 | 91820401 | 12 | 13-Dec-2013 |
| Thermo-hygrometer | AZ Instruments | 8705 | 9151655 | 12 | 16-Dec-2013 |

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

## 3.2 MEASUREMENT UNCERTAINTY

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

| Test Discipline | Frequency / Parameter | MU |
|---|---|---|
| Conducted Maximum Peak 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

## 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).