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Report On

FCC and Industry Canada Testing of the
Ericsson AB RUS 01 B5 / KRC 118 64/3

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FCC ID: TA8AKRC11864-3

IC ID: 287AB-AS118643

Document 75926039 Report 01 Issue 1

April 2014



Product Service

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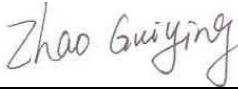
COMMERCIAL-IN-CONFIDENCE

REPORT ON FCC and Industry Canada Testing of the
Ericsson RUS 01 B5 / KRC 118 64/3

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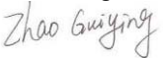
APPROVED BY 
N Forsyth
Authorised Signatory

DATED 1 May 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 22 and Industry Canada RSS-132. 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 RUS 01 B5 / KRC 118 64/3



1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Ericsson RUS 01 B5 / KRC 118 64/3 to the requirements of FCC CFR 47 Part 22 and Industry Canada RSS-132.

Testing was carried out in support of a C2PC application for Grant of RUS 01 B5 / KRC 118 64/3 to include GSM/LTE multi-standard wireless network.

| | |
|-------------------------------|---|
| 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 B5 |
| Product Number | KRC 118 64/3 |
| IC Model Number | AS118643 |
| Serial Number(s) | D168263201 D168263247 |
| GSM Software | CXP1040013 Rev 09R71H |
| LTE Software | CXP102051/18 Rev R25AU |
| PIS Software | CXP9013268/6 Rev R49DV |
| Hardware Version | R1E |
| Number of Samples Tested | 2 |
| Test Specification/Issue/Date | FCC CFR 47 Part 22: 2013 Industry Canada RSS-132 Issue 3: 2013 |
| Incoming Release Date | Declaration of Build Status 03 March 2014 |
| Order Number Date | PTP 03 March 2014 |
| Start of Test | 04 March 2014 |
| Finish of Test | 28 March 2014 |
| Name of Engineer(s) | G Zhao X Zhang |
| Related Document(s) | ANSI C63.4: 2009 FCC CFR 47 Part 2: 2013 Industry Canada RSS-GEN Issue 3: 2010 |



1.2 BRIEF SUMMARY OF RESULTS

A brief summary of results in accordance with FCC CFR 47 Part 22 and Industry Canada RSS-132, is shown below.

| Configuration 1 – Radio Equipment | | | | | | | |
|-----------------------------------|--------------------|---------------------|-----------------------------|---|-----------|--------|----------------------|
| Section | Spec Clause | | Test Description | Mode | Mod State | Result | Comments |
| | FCC Part 2 and 22 | RSS-132 and RSS-GEN | | | | | |
| | 22.913 (a) | 5.4 | Effective Radiated Power | 869.4 MHz* (G) + 877.6 MHz (L1.4, L3, L5, L10, L15) | | N/A | No integral antenna. |
| | | | | 877.0 MHz (G) + 886.0 MHz (L1.4, L3, L5, L10, L15) | | N/A | |
| | | | | 886.6 MHz (L1.4, L3, L5, L10) + 893.6 MHz* (G) / 881.5 MHz (L15) + 893.6 MHz* (G) | | N/A | |
| | | | | 869.4 MHz* (G) + 871.0 MHz (G) + 884.0 MHz (L1.4, L3, L5, L10) | | N/A | |
| | | | | 871.6 MHz (G) + 873.2 MHz (G) + 884.0 MHz (L1.4, L3, L5, L10) | | N/A | |
| | | | | 880.5MHz (L1.4, L3, L5, L10) + 892.0 MHz (G) + 893.6 MHz* (G) | | N/A | |
| | | | | 871.6 MHz (G) + 873.2 MHz (G) + 874.8 MHz (G) + 889.0 MHz (L1.4, L3, L5) | | N/A | |
| | | | | 871.6 MHz (G) + 873.2 MHz (G) + 881.0 MHz (L1.4, L3) + 884.0 MHz (L1.4, L3) / 871.6 MHz (G) + 873.2 MHz (G) + 879.0 MHz (L5) + 884.0 MHz (L5) | | N/A | |
| 2.1 | 2.1046, 22.913 (a) | 5.4 | RF Output Power - Conducted | 869.4 MHz* (G) + 877.6 MHz (L1.4, L3, L5, L10, L15) | 0 | Pass | - |
| | | | | 877.0 MHz (G) + 886.0 MHz (L1.4, L3, L5, L10, L15) | 0 | Pass | |
| | | | | 886.6 MHz (L1.4, L3, L5, L10) + 893.6 MHz* (G) / 881.5 MHz (L15) + 893.6 MHz* (G) | 0 | Pass | |
| | | | | 869.4 MHz* (G) + 871.0 MHz (G) + 884.0 MHz (L1.4, L3, L5, L10) | 0 | Pass | |
| | | | | 871.6 MHz (G) + 873.2 MHz (G) + 884.0 MHz (L1.4, L3, L5, L10) | 0 | Pass | |
| | | | | 880.5MHz (L1.4, L3, L5, L10) + 892.0 MHz (G) + 893.6 MHz* (G) | 0 | Pass | |
| | | | | 871.6 MHz (G) + 873.2 MHz (G) + 874.8 MHz (G) + 889.0 MHz (L1.4, L3, L5) | 0 | Pass | |
| | | | | 871.6 MHz (G) + 873.2 MHz (G) + 881.0 MHz (L1.4, L3) + 884.0 MHz (L1.4, L3) / 871.6 MHz (G) + 873.2 MHz (G) + 879.0 MHz (L5) + 884.0 MHz (L5) | 0 | Pass | |
| 2.2 | 22.913 (a) | 5.4 | Peak – Average Ratio | 869.4 MHz* (G) + 877.6 MHz (L1.4) | 0 | Pass | - |
| | | | | 877.0 MHz (G) + 886.0 MHz (L1.4, L3, L5, L10, L15) | 0 | Pass | |
| | | | | 886.6 MHz (L1.4) + 893.6 MHz* (G) | 0 | Pass | |
| | | | | 869.4 MHz* (G) + 871.0 MHz (G) + 884.0 MHz (L1.4) | 0 | Pass | |
| | | | | 871.6 MHz (G) + 873.2 MHz (G) + 884.0 MHz (L1.4, L3, L5, L10) | 0 | Pass | |
| | | | | 880.5MHz (L1.4) + 892.0 MHz (G) + 893.6 MHz* (G) | 0 | Pass | |
| | | | | 871.6 MHz (G) + 873.2 MHz (G) + 874.8 MHz (G) + 889.0 MHz (L1.4, L3, L5) | 0 | Pass | |
| | | | | 871.6 MHz (G) + 873.2 MHz (G) + 881.0 MHz (L1.4, L3) + 884.0 MHz (L1.4, L3) / 871.6 MHz (G) + 873.2 MHz (G) + 879.0 MHz (L5) + 884.0 MHz (L5) | 0 | Pass | |



| Configuration 1 – Radio Equipment | | | | | | | |
|-----------------------------------|-----------------------|---------------------|--|--|-----------|--------|------------------------|
| Section | Spec Clause | | Test Description | Mode | Mod State | Result | Comments |
| | FCC Part 2, 15 and 22 | RSS-132 and RSS-GEN | | | | | |
| | 2.1047 (d) | 5.2 | Modulation Characteristics | 869.4 MHz* (G) + 877.6 MHz (L1.4) | | NT | Not tested due to C2PC |
| | | | | 877.0 MHz (G) + 886.0 MHz (L1.4, L3, L5, L10, L15) | | NT | |
| | | | | 886.6 MHz (L1.4) + 893.6 MHz* (G) | | NT | |
| | 2.1049, 22.917 (b) | RSS-Gen 4.6.1 | Occupied Bandwidth | 869.4 MHz* (G) + 877.6 MHz (L1.4) | | NT | Not tested due to C2PC |
| | | | | 877.0 MHz (G) + 886.0 MHz (L1.4, L3, L5, L10, L15) | | NT | |
| | | | | 886.6 MHz (L1.4) + 893.6 MHz* (G) | | NT | |
| 2.3 | 2.1051, 22.917 (b) | 5.5 | Spurious Emissions at Antenna Terminals (±1MHz) | 869.4 MHz* (G) + 871.0 MHz (G) + 884.0 MHz (L1.4, L3, L5, L10) | 0 | Pass | |
| | | | | 880.5MHz (L1.4, L3, L5, L10) + 892.0 MHz (G) + 893.6 MHz* (G) | 0 | Pass | |
| 2.4 | 2.1053, 22.917 (a) | 5.5 | Radiated Spurious Emissions | 869.4 MHz* (G) + 877.6 MHz (L1.4) | 0 | Pass | - |
| | | | | 877.0 MHz (G) + 886.0 MHz (L1.4, L3, L5, L10, L15) | 0 | Pass | |
| | | | | 886.6 MHz (L1.4) + 893.6 MHz* (G) | 0 | Pass | |
| | | | | 871.6 MHz (G) + 873.2 MHz (G) + 884.0 MHz (L1.4) | 0 | Pass | |
| | | | | 871.6 MHz (G) + 873.2 MHz (G) + 874.8 MHz (G) + 889.0 MHz (L1.4) | 0 | Pass | |
| 2.5 | 2.1051, 22.917 (a) | 5.5 | Conducted Spurious Emissions | 869.4 MHz* (G) + 877.6 MHz (L1.4) | 0 | Pass | - |
| | | | | 877.0 MHz (G) + 886.0 MHz (L1.4, L3, L5, L10, L15) | 0 | Pass | |
| | | | | 886.6 MHz (L1.4) + 893.6 MHz* (G) | 0 | Pass | |
| | | | | 869.4 MHz* (G) + 871.0 MHz (G) + 884.0 MHz (L1.4) | 0 | Pass | |
| | | | | 871.6 MHz (G) + 873.2 MHz (G) + 884.0 MHz (L1.4, L3, L5, L10) | 0 | Pass | |
| | | | | 880.5MHz (L1.4) + 892.0 MHz (G) + 893.6 MHz* (G) | 0 | Pass | |
| | | | | 871.6 MHz (G) + 873.2 MHz (G) + 874.8 MHz (G) + 889.0 MHz (L1.4) | 0 | Pass | |
| | 2.1055, 22.355 | 5.3 | Frequency Stability Under Temperature Variations | 869.4 MHz* (G) + 877.6 MHz (L1.4) | | NT | Not tested due to C2PC |
| | | | | 877.0 MHz (G) + 886.0 MHz (L1.4, L3, L5, L10, L15) | | NT | |
| | | | | 886.6 MHz (L1.4) + 893.6 MHz* (G) | | NT | |
| | 2.1055, 22.355 | 5.3 | Frequency Stability Under Voltage Variations | 869.4 MHz* (G) + 877.6 MHz (L1.4) | | NT | Not tested due to C2PC |
| | | | | 877.0 MHz (G) + 886.0 MHz (L1.4, L3, L5, L10, L15) | | NT | |
| | | | | 886.6 MHz (L1.4) + 893.6 MHz* (G) | | NT | |



Product Service

| Configuration 1 – Radio Equipment | | | | | | |
|-----------------------------------|-------------|-----------------------------|-----------------------------------|-----------|--------|----------|
| Section | Spec Clause | Test Description | Mode | Mod State | Result | Comments |
| | FCC Part 15 | | | | | |
| 2.6 | 15.111 | Receiver Spurious Emissions | 869.4 MHz* (G) + 877.6 MHz (L1.4) | 0 | Pass | - |
| | | | 877.0 MHz (G) + 886.0 MHz (L1.4) | 0 | Pass | |
| | | | 886.6 MHz (L1.4) + 893.6 MHz* (G) | 0 | Pass | |

Note*: The channel adjacent to the lower and higher band-edge cannot be used. The lowest usable channel is 129 (869.4MHz), and the highest usable channel is 250 (893.6MHz).

- 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.
- L15 denotes LTE network with 15MHz channel bandwidth.
- G denotes GSM network
- N/A – Not Applicable
- NT – Not Tested



1.3 DECLARATION OF BUILD STATUS

| | |
|--|--|
| MAIN EUT | |
| MANUFACTURING DESCRIPTION | Radio Equipment |
| MANUFACTURER | Ericsson AB |
| PRODUCT NUMBER | RUS 01 B5 |
| PART NUMBER | KRC 118 64/3 |
| IC Model NUMBER | AS118643 |
| SERIAL NUMBER | D168263201 D168263247 |
| HARDWARE VERSION | R1E |
| GSM Software | CXP1040013 Rev 09R71H |
| LTE Software | CXP102051/18 Rev R25AU |
| PIS Software | CXP9013268/6 Rev R49DV |
| TRANSMITTER OPERATING RANGE | TX: 869MHz - 894MHz RX: 824MHz - 849MHz |
| MODULATIONS | GSM: GMSK, 8-PSK, 16QAM, 32QAM, AQPSK LTE: QPSK, 16QAM, 64QAM |
| NUMBER OF CARRIERS | Maximum 4carriers (1 - 3 GSM carriers and 1 - 2 LTE carriers) |
| ITU DESIGNATION OF EMISSION | GSM: 250KGXW, 250KG7W LTE: 1M40F9W, 3M00F9W, 5M00F9W, 10M0F9W, 15M0F9W |
| OUTPUT POWER (RMS) (W or dBm) | GSM/LTE Mix Carrier (x2): GSM + LTE: 49.0dBm (80W) |
| | GSM/LTE Mix Carrier (x3): 2 x GSM + LTE: 49.0dBm (80W) |
| | GSM/LTE Mix Carrier (x4): 3 x GSM + LTE: 49.0dBm (80W) 2 x GSM + 2 x LTE: 49.0dBm (80W) |
| OUTPUT POWER TOLERANCE | ± 1.0dB |
| INSTANTANEOUS BANDWIDTH | 20MHz |
| CHANNEL BANDWIDTH | GSM: 250kHz LTE: 1.4MHz, 3MHz, 5MHz, 10MHz and 15MHz according to 3GPP TS 36.141 |
| NUMBER OF ANTENNA PORTS | 1 TX/RX port and 1 RX port |
| FCC ID | TA8AKRC11864-3 |
| IC ID | 287AB-AS118643 |
| TECHNICAL DESCRIPTION (a brief description of the intended use and operation) | The equipment is the Radio Part of GSM, LTE Base Station. |

Signature

Date

20 March 2014

D of B S Serial No

75926039/01

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

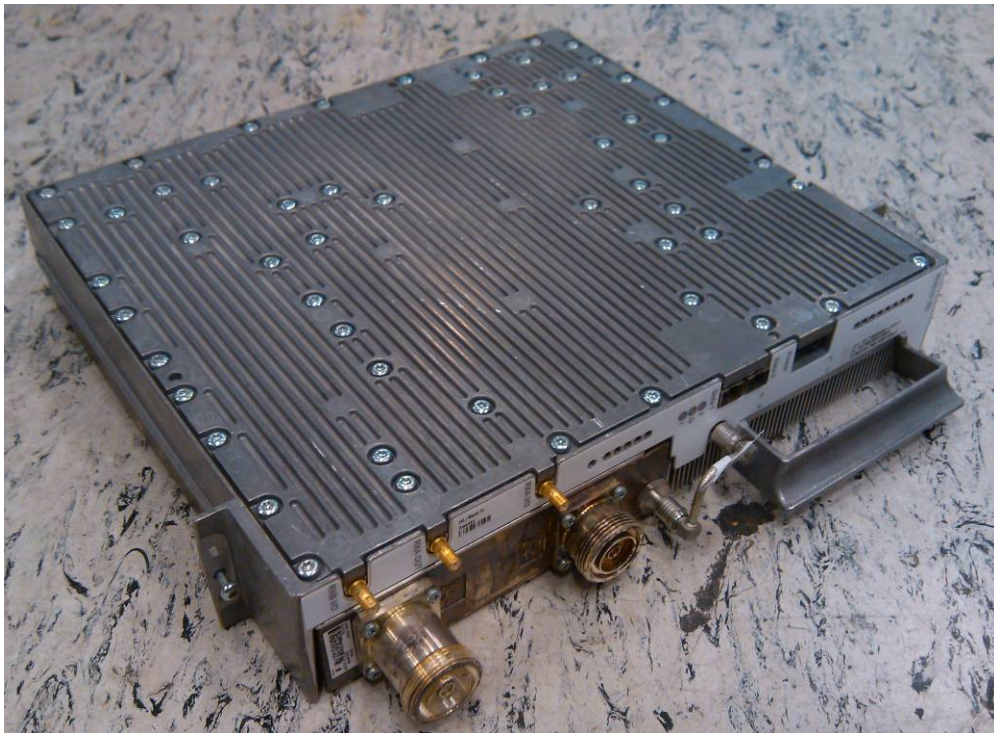


1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) RUS 01 B5 / KRC 118 64/3 is an Ericsson Radio Equipment working in the public mobile service 850MHz band which provides communication connections to GSM and LTE network. The RUS 01 B5 / KRC 118 64/3 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: Radio Equipment

The EUT was configured in accordance with FCC CFR 47 Part 22 and Industry Canada RSS-132.

The RUS 01 B5 / KRC 118 64/3 supports Multi-standard (GSM/LTE) configured for mix-carrier. GSM supports GMSK, 8-PSK, 16QAM, 64QAM and AQPSK defined in 3GPP TS 51.021, 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 869-894MHz.

The EUT has only one TX/RX port. By combining two EUTs together, the EUTs were configured to transmit in LTE MIMO mode with two TX/RX ports (RF A1, RF A2) and two RX ports (RF B1, RF B2) at 850MHz.

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

- GSM/LTE Mix Carrier:

LTE operates in TX MIMO mode with Test Model E-TM1.1 (QPSK).

GSM operates with all GSM timeslots activated, using GMSK modulation.

The Output Power settings as below:

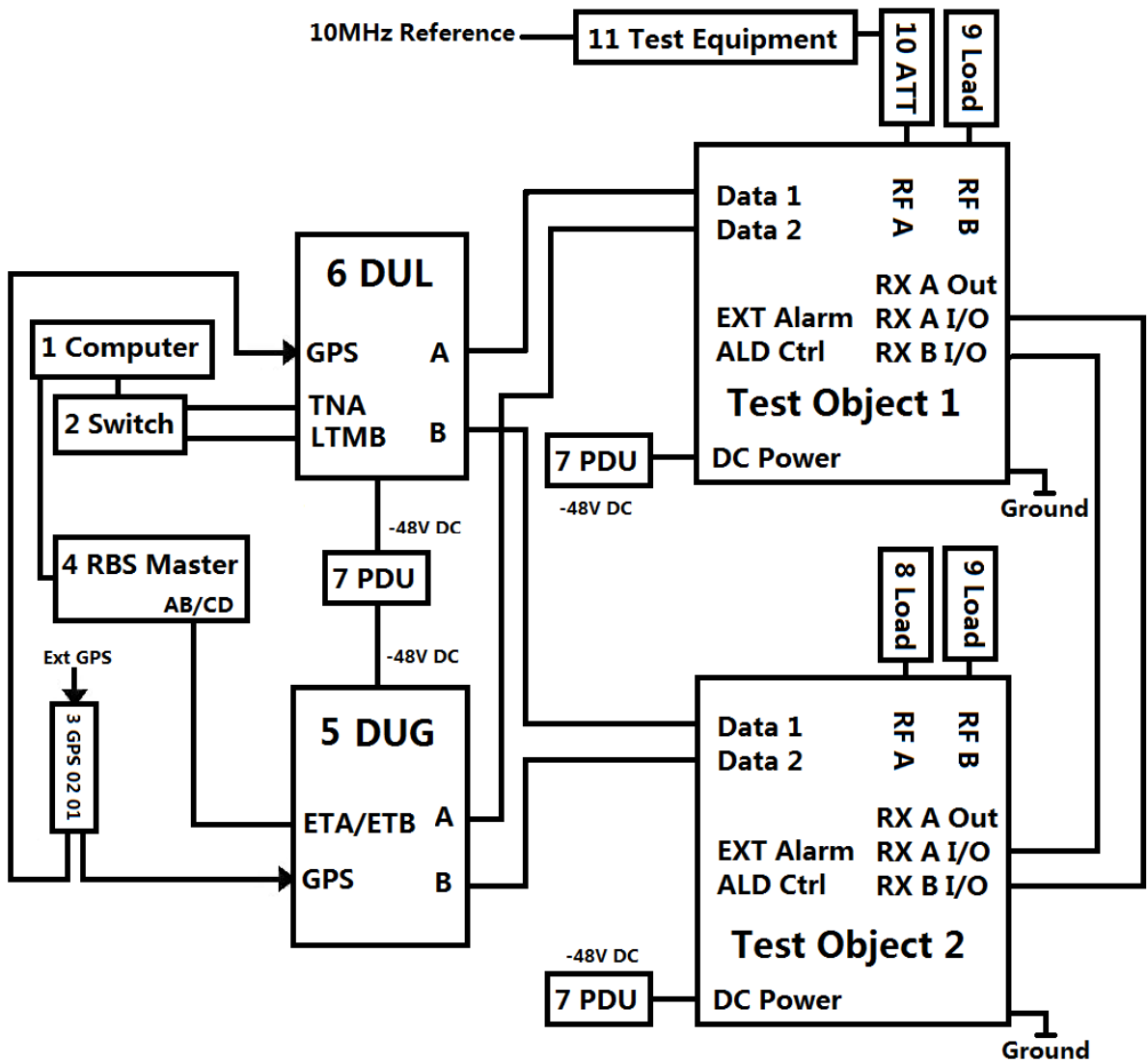
| Mix Carriers | The Output Power Settings | Bandwidth for LTE |
|--------------|-----------------------------------|----------------------------------|
| | Antenna Port A1 / A2 | |
| x2 | 40W(G) & 40W(L) | 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz |
| x3 | 30W(G) & 30W(G) & 20W(L) | 1.4MHz, 3MHz, 5MHz, 10MHz |
| x4 | 20W(G) & 20W(G) & 20W(G) & 20W(L) | 1.4MHz, 3MHz, 5MHz |
| | 20W(G) & 20W(G) & 20W(L) & 20W(L) | 1.4MHz, 3MHz, 5MHz |

All TX measurements were performed on the combined TX/RX output connector RF A1 of the EUTs. RX testing was performed on the RX connector RF B1 of the EUT when the EUT was set as single transmitter. 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:



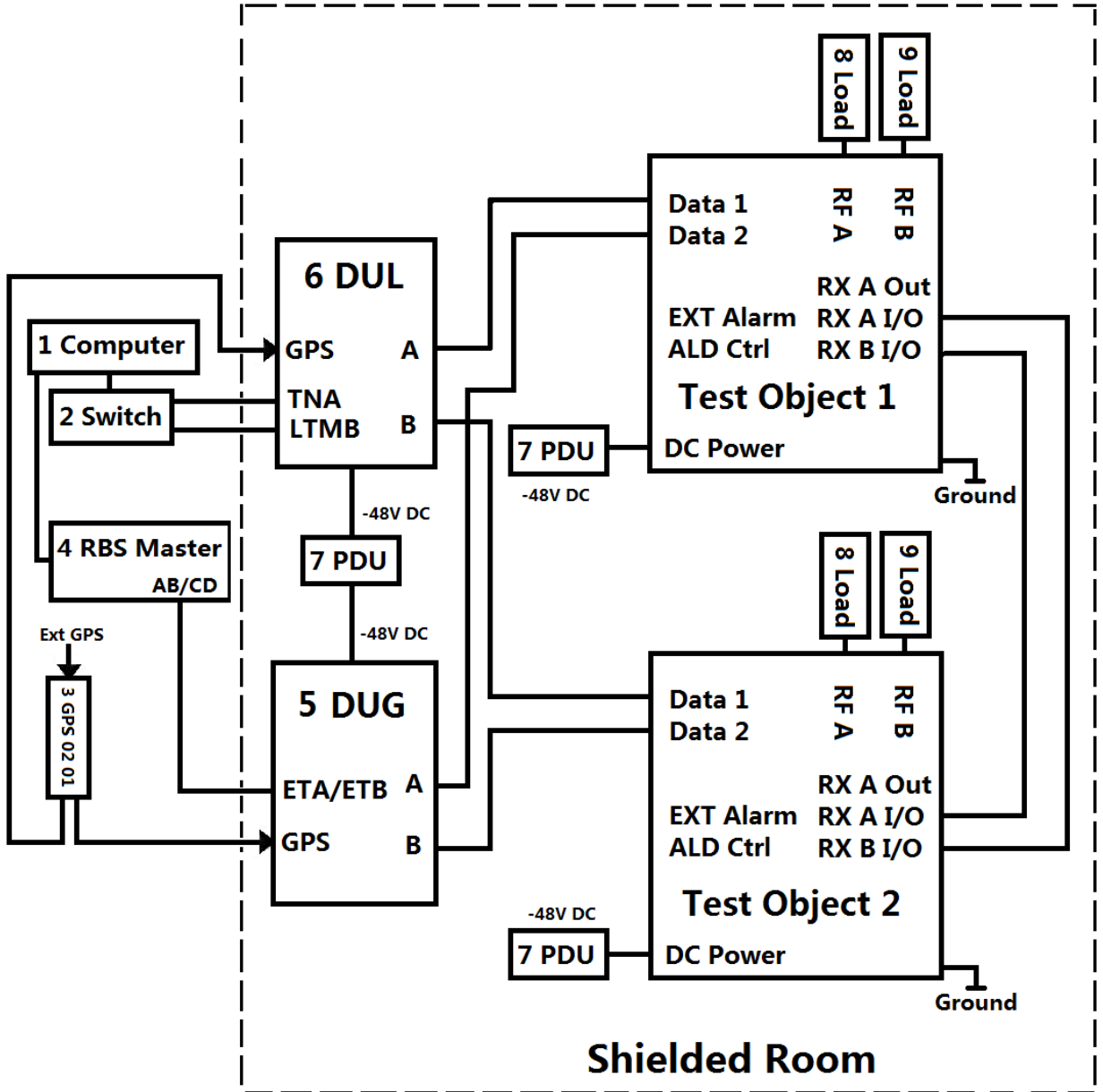


| Product Name | Product Number | Version | Serial Number |
|--------------|----------------|---------|---------------|
| RUS 01 B5 | KRC 118 64/3 | R1E | D168263201 |
| RUS 01 B5 | KRC 118 64/3 | R1E | D168263247 |

| No. | Auxiliary Equipment | Part Number / Model Type | Version | Serial Number |
|-----|---------------------|--------------------------|---------|---------------|
| 1 | Computer | HP EliteBook 8530w | -- | AP103078 |
| 2 | Switch | TL-HP8MU | -- | 05300902892 |
| 3 | GPS 02 01 | NCD 901 41/1 | R1D | TU8K595208 |
| 4 | RBS Master | LPY 107 1007/3 | R1C | T01E050944 |
| 5 | RBS 6601 | BFL 901 009/1 | -- | -- |
| | DUG 20 01 | KDU 137 569/1 | R3C | D166616487 |
| | SUP 6601 | 1/BFL 901 009/1 | R3B | BR81262578 |
| 6 | RBS 6601 | BFL 901 009/1 | -- | -- |
| | DUL 20 01 | KDU 137 533/4 | R2A | D166926358 |
| | SUP 6601 | 1/BFL 901 009/1 | R3B | BR80908065 |
| 7 | Power Supply | DH1716-5D | -- | 2008040041 |
| | Power Supply | DH1716A-10 | -- | ETQ-123 |
| 8 | Load | TF100 | -- | 09121648 |
| 9 | Load | TFE5-3 | -- | 090323194 |
| | Load | TFE5-3 | -- | 090323220 |
| 10 | 40dB Attenuator | 66-40-43 | -- | CE6211 |
| 11 | Power Meter | Rohde & Schwarz NRP | -- | 101283 |
| | Power Sensor | Rohde & Schwarz NRP-Z51 | -- | 102310 |
| | Spectrum Analyzer | FSQ26 | -- | 100253 |



Test Setup, Radiated Measurement:





Product Service

| Product Name | Product Number | Version | Serial Number |
|--------------|----------------|---------|---------------|
| RUS 01 B5 | KRC 118 64/3 | R1E | D168263201 |
| RUS 01 B5 | KRC 118 64/3 | R1E | D168263247 |

| No. | Auxiliary Equipment | Part Number / Model Type | Version | Serial Number |
|-----|---------------------|--------------------------|---------|---------------|
| 1 | Computer | HP EliteBook 8530w | -- | AP103078 |
| 2 | Switch | TL-HP8MU | -- | 05300902892 |
| 3 | GPS 02 01 | NCD 901 41/1 | R1D | TU8K595208 |
| 4 | RBS Master | LPY 107 1007/3 | R1C | T01E050944 |
| 5 | RBS 6601 | BFL 901 009/1 | -- | -- |
| | DUG 20 01 | KDU 137 569/1 | R3C | D166616487 |
| | SUP 6601 | 1/BFL 901 009/1 | R3B | BR81262578 |
| 6 | RBS 6601 | BFL 901 009/1 | -- | -- |
| | DUL 20 01 | KDU 137 533/4 | R2A | D166926358 |
| | SUP 6601 | 1/BFL 901 009/1 | R3B | BR80908065 |
| 7 | Power Supply | DH1716-5D | -- | 2008040041 |
| | Power Supply | DH1716A-10 | -- | ETQ-123 |
| 8 | Load | TF100 | -- | 09121648 |
| | Load | TF100 | -- | 09121605 |
| 9 | Load | TFE5-3 | -- | 090323194 |
| | Load | TFE5-3 | -- | 090323220 |



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.

L15 denotes LTE network with 15MHz channel bandwidth.

G denotes GSM network.

L denotes LTE network.

GSM/LTE MSR:

Mix Carrier(x2): 1G (40W) + 1L (40W)

Mode 1 - G&L1.4, G&L3, G&L5, G&L10, G&L15

| MSR | Channel No. | Frequencies (MHz) |
|-----|------------------|-------------------|
| G&L | 129(G) & 2486(L) | 869.4+877.6 |

Mode 2 - G&L1.4, G&L3, G&L5, G&L10, G&L15

| MSR | Channel No. | Frequencies (MHz) |
|-----|------------------|-------------------|
| G&L | 167(G) & 2570(L) | 877.0+886.0 |

Mode 3 - L1.4&G, L3&G, L5&G, L10&G, L15&G

| MSR | Channel No. | Frequencies (MHz) |
|--------------------|------------------|-------------------|
| L(1.4, 3, 5, 10)&G | 2576(L) & 250(G) | 886.6+893.6 |
| L15&G | 2525(L) & 250(G) | 881.5+893.6 |

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

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

| MSR | Channel No. | Frequencies (MHz) |
|-------|---------------------------|-------------------|
| G&G&L | 129(G) & 137(G) & 2550(L) | 869.4+871.0+884.0 |

Mode 5 - G&G&L1.4, G&G&L3, G&G&L5, G&G&L10

| MSR | Channel No. | Frequencies (MHz) |
|-------|---------------------------|-------------------|
| G&G&L | 140(G) & 148(G) & 2550(L) | 871.6+873.2+884.0 |

Mode 6 - L1.4&G&G, L3&G&G, L5&G&G, L10&G&G

| MSR | Channel No. | Frequencies (MHz) |
|-------|---------------------------|-------------------|
| L&G&G | 2515(L) & 242(G) & 250(G) | 880.5+892.0+893.6 |



Mix Carrier(x4): 3G (3x20W) + 1L (1x20W)

Mode 7 - G&G&G&L1.4, G&G&G&L3, G&G&G&L5

| MSR | Channel No. | Frequencies (MHz) |
|------------|------------------------------------|--------------------------|
| G&G&G&L1.4 | 140(G) & 148(G) & 156(G) & 2600(L) | 871.6+873.2+874.8+889.0 |
| G&G&G&L3 | 140(G) & 148(G) & 156(G) & 2600(L) | 871.6+873.2+874.8+889.0 |
| G&G&G&L5 | 140(G) & 148(G) & 156(G) & 2600(L) | 871.6+873.2+874.8+889.0 |

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

Mode 8 - G&G&L1.4&L1.4, G&G&L3&L3, G&G&L5&L5

| MSR | Channel No. | Frequencies (MHz) |
|---------------|-------------------------------------|--------------------------|
| G&G&L1.4&L1.4 | 140(G) & 148(G) & 2520(L) & 2550(L) | 871.6+873.2+881.0+884.0 |
| G&G&L3&L3 | 140(G) & 148(G) & 2520(L) & 2550(L) | 871.6+873.2+881.0+884.0 |
| G&G&L5&L5 | 140(G) & 148(G) & 2500(L) & 2550(L) | 871.6+873.2+879.0+884.0 |

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



Product Service

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

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 (± 1 MHz)
- Conducted Spurious Emissions
- Receiver Spurious Emissions

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

FCC Accreditation 413514:

TA Beijing Limited, Building B-4, No.1 JingHai 3rd Road, BDA East Park, Beijing, 100176, China

Industry Canada Accreditation 10852A-1:

TA Beijing Limited, Building B-4, No.1 JingHai 3rd Road, BDA East Park, Beijing, 100176, China



Product Service

SECTION 2

TEST DETAILS

FCC and Industry Canada Testing of the
Ericsson RUS 01 B5 / KRC 118 64/3



Product Service

2.1 RF OUTPUT POWER - CONDUCTED

2.1.1 Specification Reference

FCC CFR 47 Part 2.1046
 FCC CFR 47 Part 22, Clause 22.913 (a)
 Industry Canada RSS-132, Clause 5.4

2.1.2 Equipment Under Test

RUS 01 B5 / KRC 118 64/3, S/N: D168263201

2.1.3 Date of Test and Modification State

05 to 18 March 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 22 and Industry Canada RSS-132.

Using a power meter and attenuator(s), the output power of the EUTs was measured at the antenna terminal without antenna.

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

Not all modes and modulations were tested, the modes with LTE modulation E-TM1.1 that produced the worst case intermodulation product level were tested with the other supported modulation schemes.

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

- Configuration 1 - Mode 1 - G&L1.4, G&L3, G&L5, G&L10, G&L15
 - Mode 2 - G&L1.4, G&L3, G&L5, G&L10, G&L15
 - Mode 3 - L1.4&G, L3&G, L5&G, L10&G, L15&G
 - Mode 4 - G&G&L1.4, G&G&L3, G&G&L5, G&G&L10
 - Mode 5 - G&G&L1.4, G&G&L3, G&G&L5, G&G&L10
 - Mode 6 - L1.4&G&G, L3&G&G, L5&G&G, L10&G&G
 - Mode 7 - G&G&G&L1.4, G&G&G&L3, G&G&G&L5
 - Mode 8 - G&G&L1.4&L1.4, G&G&L3&L3, G&G&L5&L5

2.1.6 Environmental Conditions

| | |
|---------------------|---------------|
| Ambient Temperature | 21.8 – 24.6°C |
| Relative Humidity | 25.5 – 31.0% |



2.1.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 2 and Part 22 and Industry Canada RSS-132 for RF Output Power.

The test results are shown below

Antenna RF A1 and RF A2

Mix Carrier(x2): 1G+1L

Declarative Maximum Output Power:

G&L1.4, G&L3, G&L5, G&L10, G&L15 : 49.00dBm

Configuration 1 - Mode 1 - G&L1.4, G&L3, G&L5, G&L10, G&L15

GSM (GMSK) & LTE (E-TM1.1)

| MSR | Channel No. | Frequency (MHz) | Result (dBm) RMS | Result (W) RMS |
|--------|-------------|-----------------|------------------|----------------|
| G&L1.4 | 129 & 2486 | 869.4+877.6 | 48.31 | 67.76 |
| G&L3 | 129 & 2486 | 869.4+877.6 | 48.42 | 69.50 |
| G&L5 | 129 & 2486 | 869.4+877.6 | 48.35 | 68.39 |
| G&L10 | 129 & 2486 | 869.4+877.6 | 48.37 | 68.71 |
| G&L15 | 129 & 2486 | 869.4+877.6 | 48.31 | 67.76 |

Configuration 1 - Mode 2 - G&L1.4, G&L3, G&L5, G&L10, G&L15

GSM (GMSK) & LTE (E-TM1.1)

| MSR | Channel No. | Frequency (MHz) | Result (dBm) RMS | Result (W) RMS |
|--------|-------------|-----------------|------------------|----------------|
| G&L1.4 | 167 & 2570 | 877.0+886.0 | 48.48 | 70.47 |
| G&L3 | 167 & 2570 | 877.0+886.0 | 48.55 | 71.61 |
| G&L5 | 167 & 2570 | 877.0+886.0 | 48.51 | 70.96 |
| G&L10 | 167 & 2570 | 877.0+886.0 | 48.53 | 71.29 |
| G&L15 | 167 & 2570 | 877.0+886.0 | 48.50 | 70.79 |

Configuration 1 - Mode 3 - L1.4&G, L3&G, L5&G, L10&G, L15&G

GSM (GMSK) & LTE (E-TM1.1)

| MSR | Channel No. | Frequency (MHz) | Result (dBm) RMS | Result (W) RMS |
|--------|-------------|-----------------|------------------|----------------|
| L1.4&G | 2576 & 250 | 886.6+893.6 | 48.40 | 69.18 |
| L3&G | 2576 & 250 | 886.6+893.6 | 48.44 | 69.82 |
| L5&G | 2576 & 250 | 886.6+893.6 | 48.44 | 69.82 |
| L10&G | 2576 & 250 | 886.6+893.6 | 48.42 | 69.50 |
| L15&G | 2525 & 250 | 881.5+893.6 | 48.39 | 69.02 |

**Mix Carrier(x3): 2G+1L**Declarative Maximum Output Power:G&G&L1.4, G&G&L3, G&G&L5, G&G&L10: 49.00dBmConfiguration 1 - Mode 4 - G&G&L1.4, G&G&L3, G&G&L5, G&G&L10**GSM (GMSK) & LTE (E-TM1.1)**

| MSR | Channel No. | Frequency (MHz) | Result (dBm) RMS | Result (W) RMS |
|----------|------------------|-------------------|------------------|----------------|
| G&G&L1.4 | 129 & 137 & 2550 | 869.4+871.0+884.0 | 48.27 | 67.14 |
| G&G&L3 | 129 & 137 & 2550 | 869.4+871.0+884.0 | 48.26 | 66.99 |
| G&G&L5 | 129 & 137 & 2550 | 869.4+871.0+884.0 | 48.26 | 66.99 |
| G&G&L10 | 129 & 137 & 2550 | 869.4+871.0+884.0 | 48.28 | 67.30 |

GSM (GMSK) & LTE (E-TM3.2)

| MSR | Channel No. | Frequency (MHz) | Result (dBm) RMS | Result (W) RMS |
|----------|------------------|-------------------|------------------|----------------|
| G&G&L1.4 | 129 & 137 & 2550 | 869.4+871.0+884.0 | 48.26 | 66.99 |

GSM (GMSK) & LTE (E-TM3.1)

| MSR | Channel No. | Frequency (MHz) | Result (dBm) RMS | Result (W) RMS |
|----------|------------------|-------------------|------------------|----------------|
| G&G&L1.4 | 129 & 137 & 2550 | 869.4+871.0+884.0 | 48.24 | 66.68 |

Configuration 1 - Mode 5 - G&G&L1.4, G&G&L3, G&G&L5, G&G&L10**GSM (GMSK) & LTE (E-TM1.1)**

| MSR | Channel No. | Frequency (MHz) | Result (dBm) RMS | Result (W) RMS |
|----------|------------------|-------------------|------------------|----------------|
| G&G&L1.4 | 140 & 148 & 2550 | 871.6+873.2+884.0 | 48.43 | 69.66 |
| G&G&L3 | 140 & 148 & 2550 | 871.6+873.2+884.0 | 48.41 | 69.34 |
| G&G&L5 | 140 & 148 & 2550 | 871.6+873.2+884.0 | 48.41 | 69.34 |
| G&G&L10 | 140 & 148 & 2550 | 871.6+873.2+884.0 | 48.36 | 68.55 |

GSM (GMSK) & LTE (E-TM3.2)

| MSR | Channel No. | Frequency (MHz) | Result (dBm) RMS | Result (W) RMS |
|----------|------------------|-------------------|------------------|----------------|
| G&G&L1.4 | 140 & 148 & 2550 | 871.6+873.2+884.0 | 48.42 | 69.50 |
| G&G&L3 | 140 & 148 & 2550 | 871.6+873.2+884.0 | 48.40 | 69.18 |
| G&G&L5 | 140 & 148 & 2550 | 871.6+873.2+884.0 | 48.35 | 68.39 |
| G&G&L10 | 140 & 148 & 2550 | 871.6+873.2+884.0 | 48.36 | 68.55 |

**GSM (GMSK) & LTE (E-TM3.1)**

| MSR | Channel No. | Frequency (MHz) | Result (dBm) RMS | Result (W) RMS |
|----------|------------------|-------------------|------------------|----------------|
| G&G&L1.4 | 140 & 148 & 2550 | 871.6+873.2+884.0 | 48.40 | 69.18 |
| G&G&L3 | 140 & 148 & 2550 | 871.6+873.2+884.0 | 48.42 | 69.50 |
| G&G&L5 | 140 & 148 & 2550 | 871.6+873.2+884.0 | 48.40 | 69.18 |
| G&G&L10 | 140 & 148 & 2550 | 871.6+873.2+884.0 | 48.35 | 68.39 |

Configuration 1 - Mode 6 - G&G&L1.4, G&G&L3, G&G&L5, G&G&L10

GSM (GMSK) & LTE (E-TM1.1)

| MSR | Channel No. | Frequency (MHz) | Result (dBm) RMS | Result (W) RMS |
|----------|------------------|-------------------|------------------|----------------|
| L1.4&G&G | 2515 & 242 & 250 | 880.5+892.0+893.6 | 48.38 | 68.87 |
| L3&G&G | 2515 & 242 & 250 | 880.5+892.0+893.6 | 48.30 | 67.61 |
| L5&G&G | 2515 & 242 & 250 | 880.5+892.0+893.6 | 48.39 | 69.02 |
| L10&G&G | 2515 & 242 & 250 | 880.5+892.0+893.6 | 48.37 | 68.71 |

GSM (GMSK) & LTE (E-TM3.2)

| MSR | Channel No. | Frequency (MHz) | Result (dBm) RMS | Result (W) RMS |
|----------|------------------|-------------------|------------------|----------------|
| L1.4&G&G | 2515 & 242 & 250 | 880.5+892.0+893.6 | 48.34 | 68.23 |

GSM (GMSK) & LTE (E-TM3.1)

| MSR | Channel No. | Frequency (MHz) | Result (dBm) RMS | Result (W) RMS |
|----------|------------------|-------------------|------------------|----------------|
| L1.4&G&G | 2515 & 242 & 250 | 880.5+892.0+893.6 | 48.36 | 68.55 |

Mix Carrier(x4): 3G+1L

Declarative Maximum Output Power:

G&G&G&L1.4, G&G&G&L3 : 47.20dBm

G&G&G&L5: 49.00dBm

Configuration 1 - Mode 7 - G&G&G&L1.4, G&G&G&L3, G&G&G&L5

GSM (GMSK) & LTE (E-TM1.1)

| MSR | Channel No. | Frequency (MHz) | Result (dBm) RMS | Result (W) RMS |
|------------|------------------------|-------------------------|------------------|----------------|
| G&G&G&L1.4 | 140 & 148 & 156 & 2600 | 871.6+873.2+874.8+889.0 | 47.15 | 51.88 |
| G&G&G&L3 | 140 & 148 & 156 & 2600 | 871.6+873.2+874.8+889.0 | 47.19 | 52.36 |
| G&G&G&L5 | 140 & 148 & 156 & 2600 | 871.6+873.2+874.8+889.0 | 48.32 | 67.92 |



Product Service

Mix Carrier(x4): 2G+2L

Declarative Maximum Output Power:

G&G&L1.4&L1.4, G&G&L3&L3, G&G&L5&L5: 49.00dBm

Configuration 1 - Mode 8 - G&G&L1.4&L1.4, G&G&L3&L3, G&G&L5&L5

GSM (GMSK) & LTE (E-TM1.1)

| MSR | Channel No. | Frequency (MHz) | Result (dBm) RMS | Result (W) RMS |
|---------------|-------------------------|-------------------------|------------------|----------------|
| G&G&L1.4&L1.4 | 140 & 148 & 2520 & 2550 | 871.6+873.2+881.0+884.0 | 48.40 | 69.18 |
| G&G&L3&L3 | 140 & 148 & 2520 & 2550 | 871.6+873.2+881.0+884.0 | 48.45 | 69.98 |
| G&G&L5&L5 | 140 & 148 & 2500 & 2550 | 871.6+873.2+879.0+884.0 | 48.42 | 69.50 |

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

| | |
|-------|--------------------|
| Limit | ≤820W or ≤+59.1dBm |
|-------|--------------------|

Remarks

The EUT does not exceed 820W or 59.1dBm at the measured frequencies.



2.2 PEAK – AVERAGE RATIO

2.2.1 Specification Reference

FCC CFR 47 Part 22, Clause 22.913 (a)
Industry Canada RSS-132, Clause 5.4

2.2.2 Equipment Under Test

RUS 01 B5 / KRC 118 64/3, S/N: D168263201

2.2.3 Date of Test and Modification State

05 to 18 March 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 22.

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 determine 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.

The path loss measured and entered as a reference level offset.

Not all modes and modulation schemes were tested, the worst case results were determined as being with LTE bandwidth of 1.4 MHz. As a minimum, all modes were tested with a 1.4 MHz LTE bandwidth, however other bandwidths were tested for some modes.

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

- Configuration 1 - Mode 1 - G&L1.4
- Mode 2 - G&L1.4, G&L3, G&L5, G&L10, G&L15
- Mode 3 - L1.4&G
- Mode 4 - G&G&L1.4
- Mode 5 - G&G&L1.4, G&G&L3, G&G&L5, G&G&L10
- Mode 6 - L1.4&G&G
- Mode 7 - G&G&G&L1.4, G&G&G&L3, G&G&G&L5
- Mode 8 - G&G&L1.4&L1.4, G&G&L3&L3, G&G&L5&L5



Product Service

2.2.6 Environmental Conditions

Ambient Temperature 21.8 – 24.6°C
 Relative Humidity 25.5 – 31.0%

2.2.7 Test Results

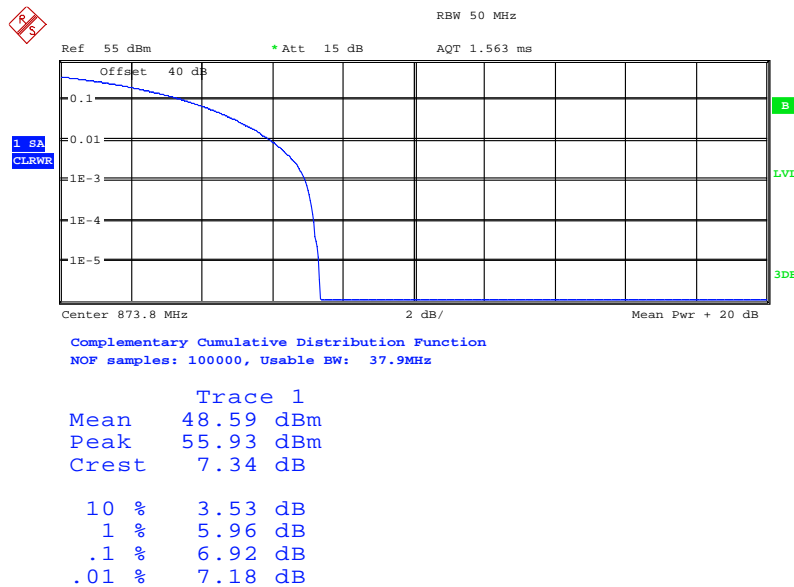
For the period of test the EUT met the requirements of FCC CFR 47 Part 22 Peak – Average Ratio.

The test results are shown below.

Mix Carrier(x2): 1G+1L

GSM (GMSK) & LTE (E-TM1.1)

Configuration 1 - Mode 1 - G&L1.4

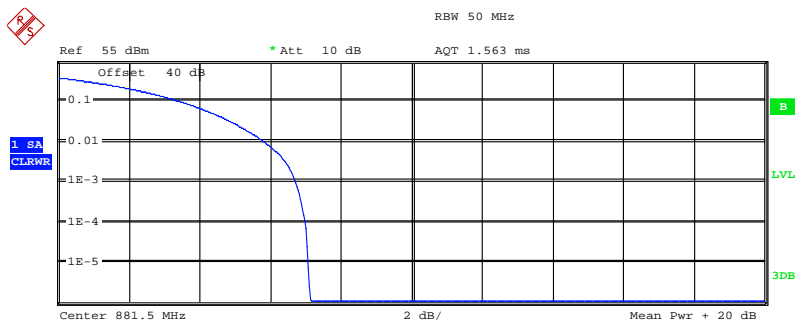


Date: 5.MAR.2014 15:33:54



Product Service

Configuration 1 - Mode 2 - G&L1.4

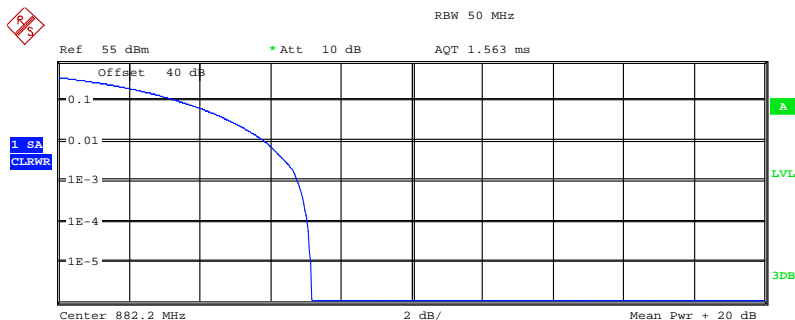


Center 881.5 MHz 2 dB/ Mean Pwr + 20 dB
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

| Trace 1 | |
|---------|-----------|
| Mean | 48.59 dBm |
| Peak | 55.71 dBm |
| Crest | 7.12 dB |
| 10 % | 3.46 dB |
| 1 % | 5.80 dB |
| .1 % | 6.70 dB |
| .01 % | 6.99 dB |

Date: 7.MAR.2014 09:55:10

Configuration 1 - Mode 2 - G&L3



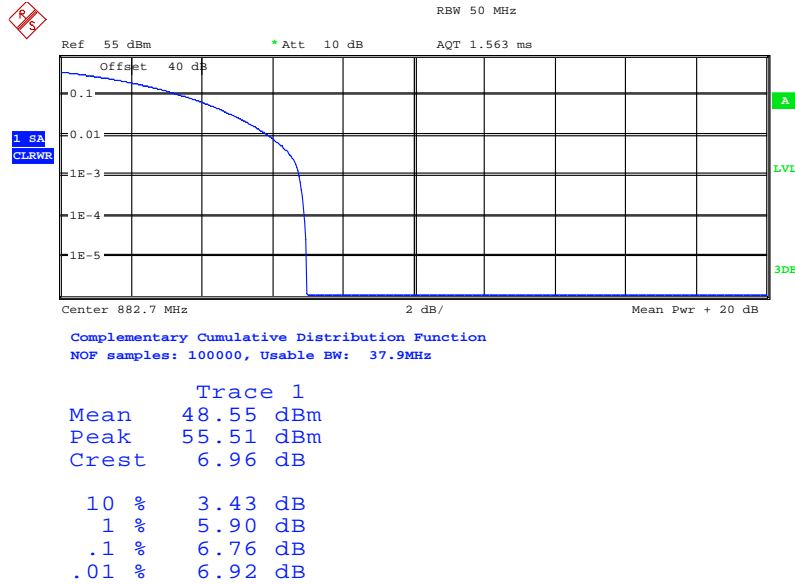
Center 882.2 MHz 2 dB/ Mean Pwr + 20 dB
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

| Trace 1 | |
|---------|-----------|
| Mean | 48.55 dBm |
| Peak | 55.72 dBm |
| Crest | 7.17 dB |
| 10 % | 3.43 dB |
| 1 % | 5.83 dB |
| .1 % | 6.76 dB |
| .01 % | 7.05 dB |

Date: 13.MAR.2014 15:29:45

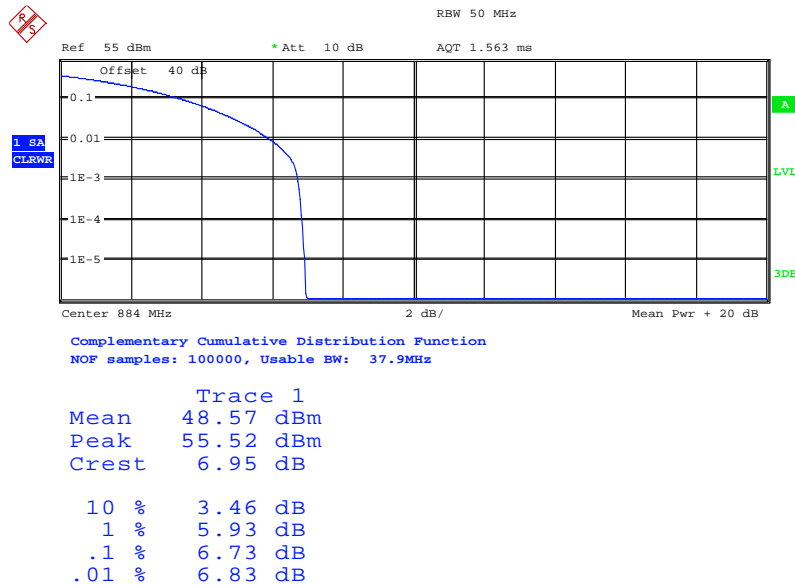


Configuration 1 - Mode 2 - G&L5



Date: 13.MAR.2014 15:35:39

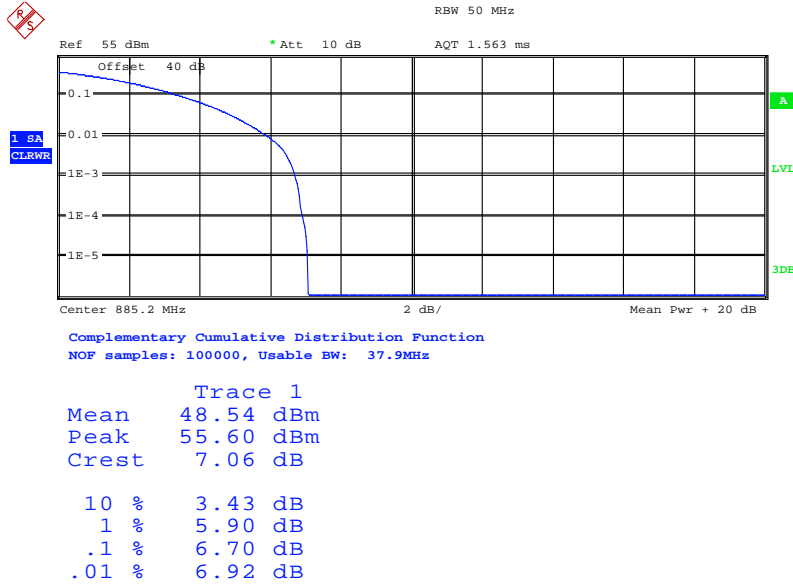
Configuration 1 - Mode 2 - G&L10



Date: 13.MAR.2014 16:21:05

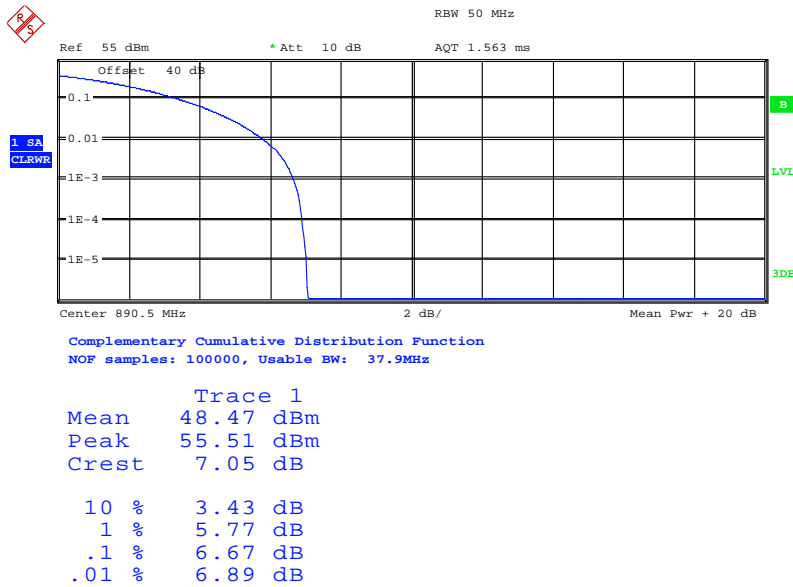


Configuration 1 - Mode 2 - G&L15



Date: 13.MAR.2014 16:24:41

Configuration 1 - Mode 3 - L1.4&G



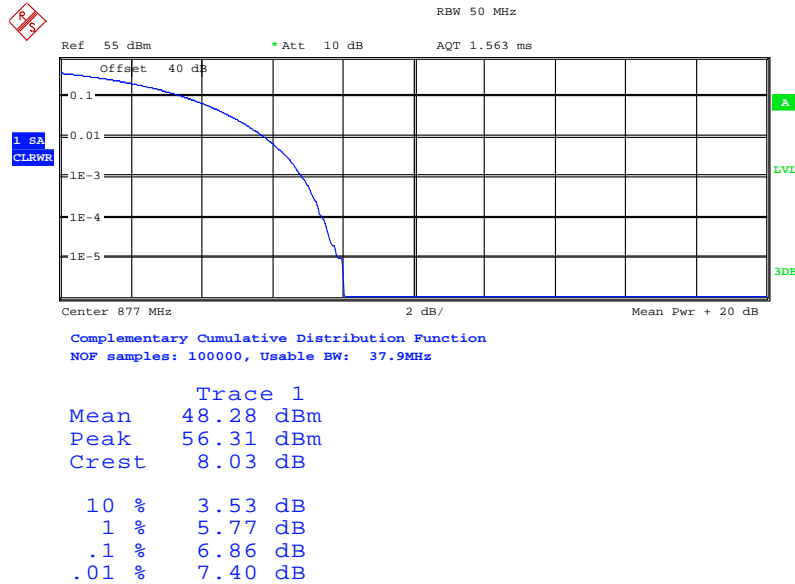
Date: 6.MAR.2014 12:15:18



Mix Carrier (x3): 2G+1L

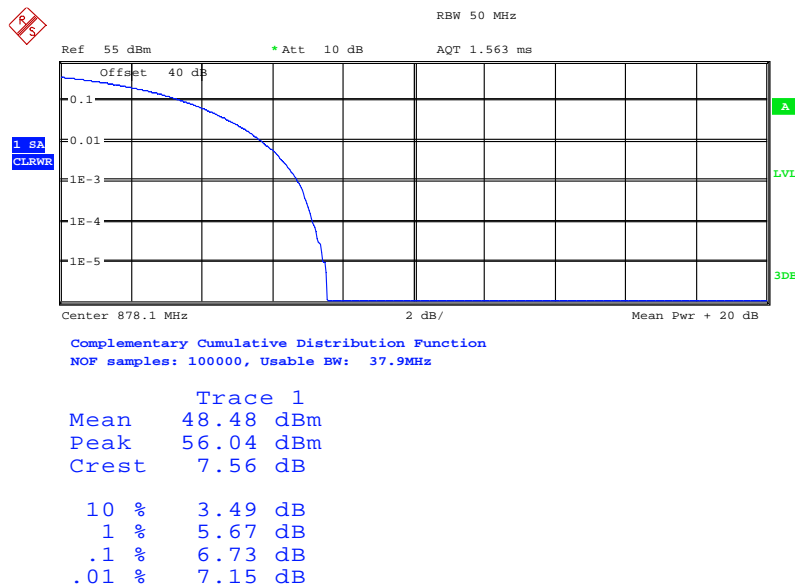
GSM (GMSK) & LTE (E-TM1.1)

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



Date: 10.MAR.2014 10:12:11

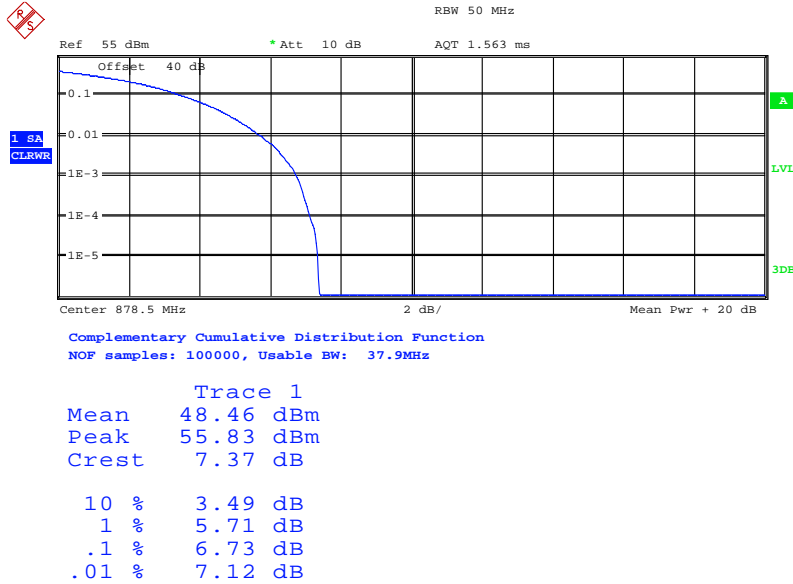
Configuration 1 - Mode 5 - G&G&L1.4



Date: 12.MAR.2014 13:22:56

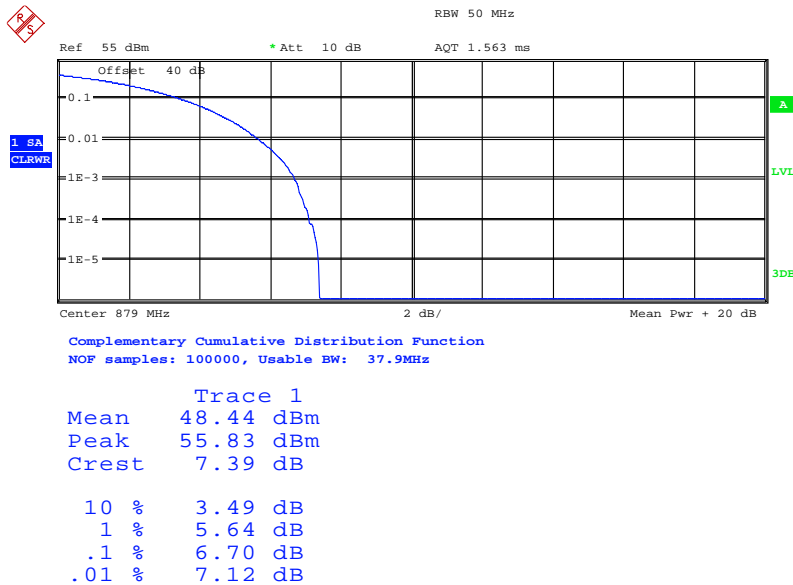


Configuration 1 - Mode 5 - G&G&L3



Date: 12.MAR.2014 13:25:23

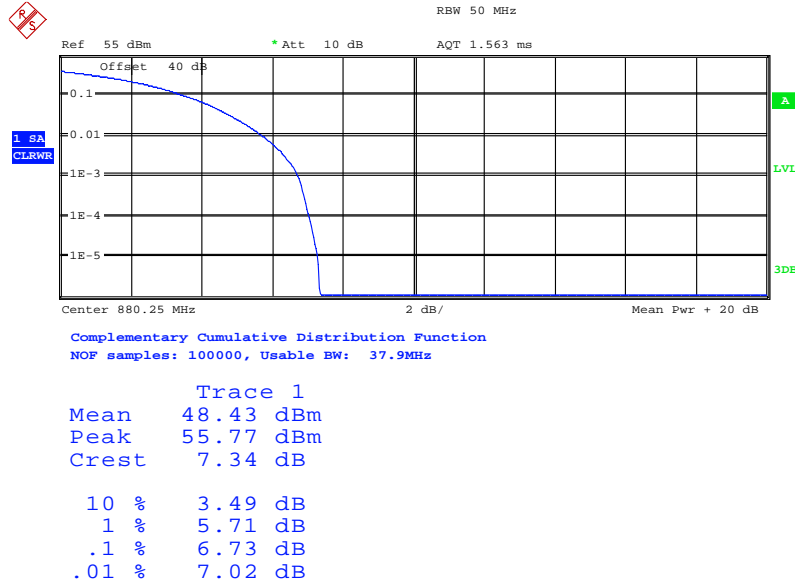
Configuration 1 - Mode 5 - G&G&L5



Date: 12.MAR.2014 13:33:38

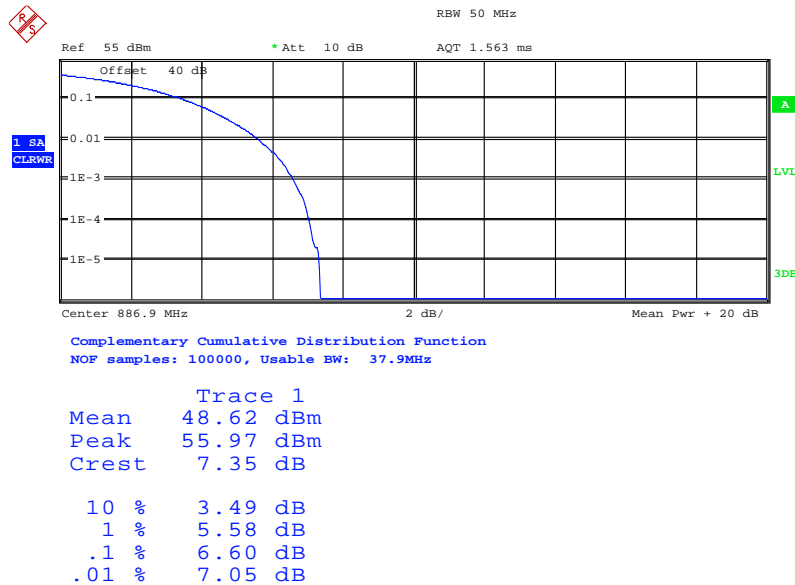


Configuration 1 - Mode 5 - G&G&L10



Date: 12.MAR.2014 13:57:38

Configuration 1 - Mode 6 - L1.4&G&G

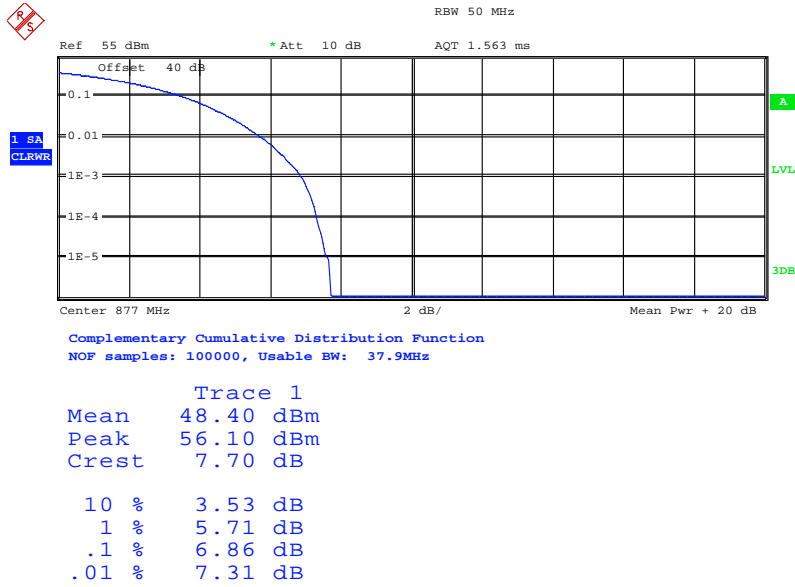


Date: 10.MAR.2014 15:17:35



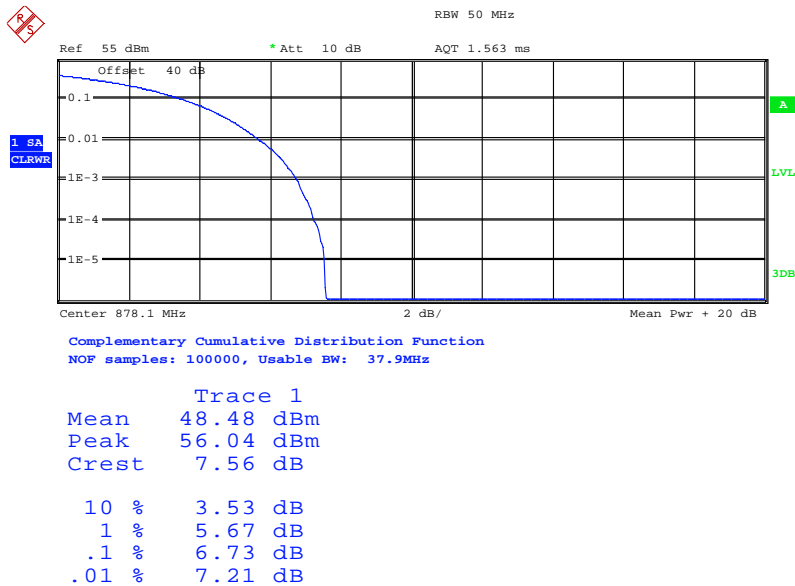
GSM (GMSK) & LTE (E-TM3.2)

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



Date: 13.MAR.2014 14:38:06

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

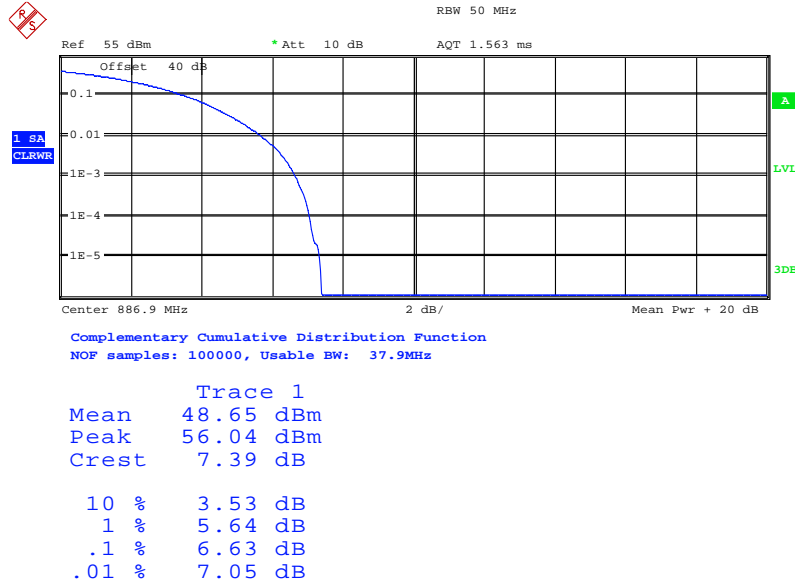


Date: 13.MAR.2014 13:22:34



Product Service

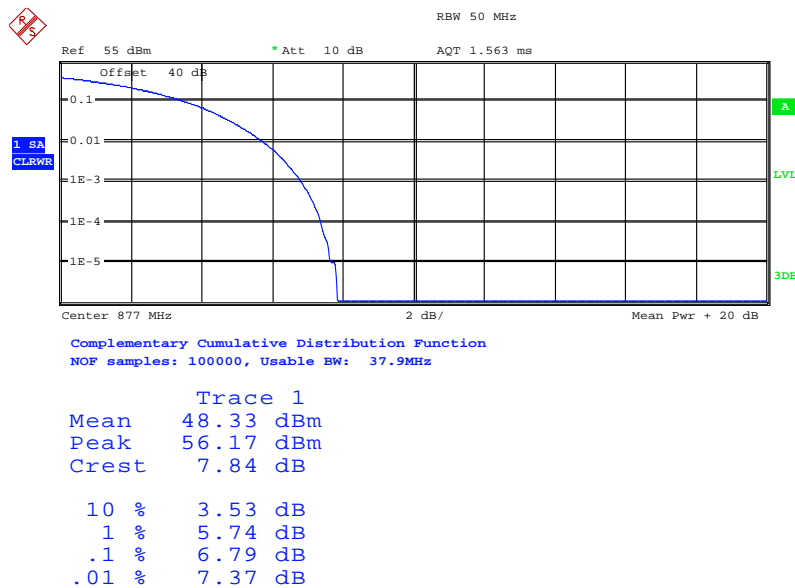
Configuration 1 - Mode 6 - L1.4&G&G



Date: 13.MAR.2014 14:42:19

GSM (GMSK) & LTE (E-TM3.1)

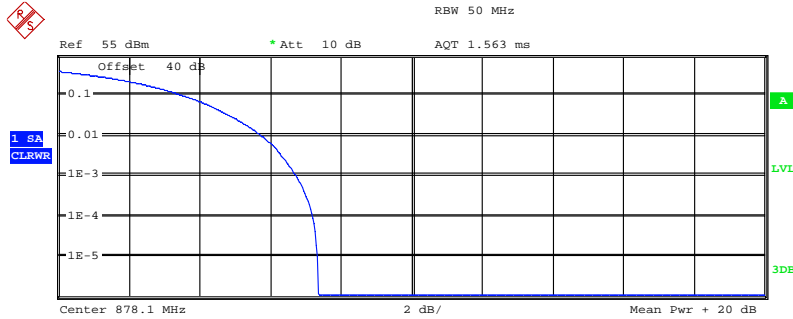
Configuration 1 - Mode 4 - G&G&L1.4



Date: 13.MAR.2014 14:35:47



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



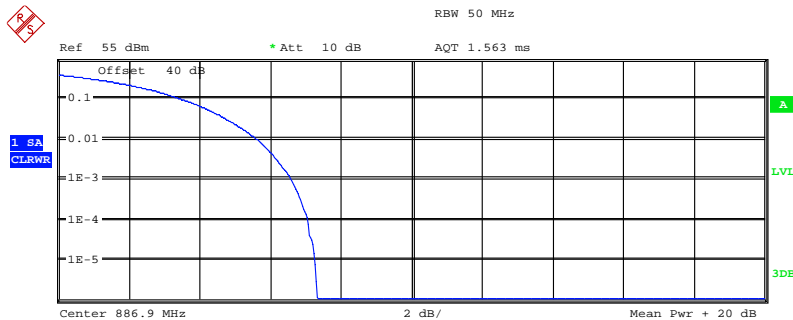
Center 878.1 MHz 2 dB/ Mean Pwr + 20 dB
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

Trace 1

| | |
|-------|-----------|
| Mean | 48.46 dBm |
| Peak | 55.82 dBm |
| Crest | 7.36 dB |
| 10 % | 3.53 dB |
| 1 % | 5.74 dB |
| .1 % | 6.73 dB |
| .01 % | 7.21 dB |

Date: 13.MAR.2014 13:32:29

Configuration 1 - Mode 6 - L1.4&G&G



Center 886.9 MHz 2 dB/ Mean Pwr + 20 dB
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 37.9MHz

Trace 1

| | |
|-------|-----------|
| Mean | 48.59 dBm |
| Peak | 55.90 dBm |
| Crest | 7.32 dB |
| 10 % | 3.49 dB |
| 1 % | 5.61 dB |
| .1 % | 6.60 dB |
| .01 % | 7.05 dB |

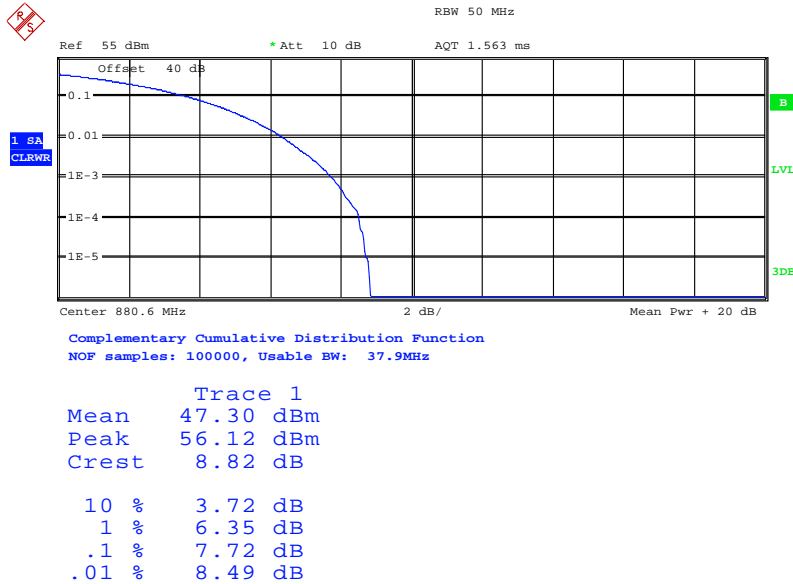
Date: 13.MAR.2014 14:44:34



Mix Carrier (x4): 3G+1L

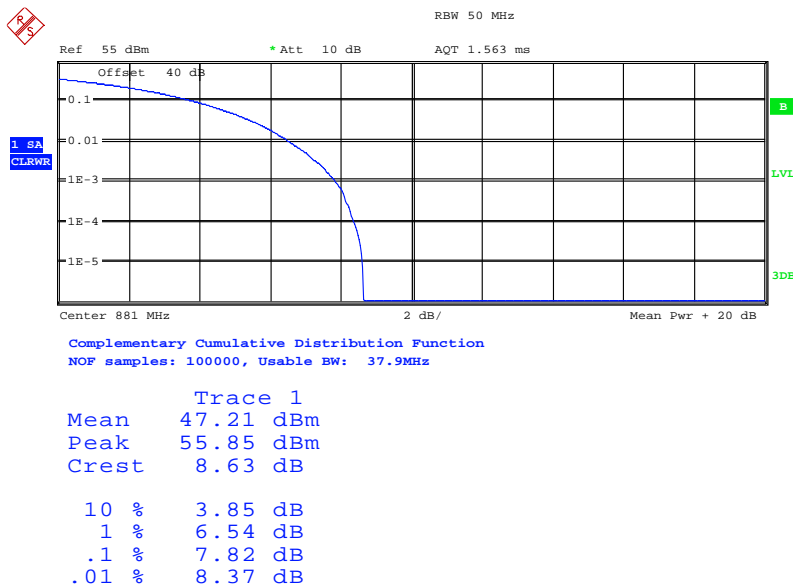
GSM (GMSK) & LTE (E-TM1.1)

Configuration 1 - Mode 7 - G&G&G&L1.4



Date: 18.MAR.2014 15:09:31

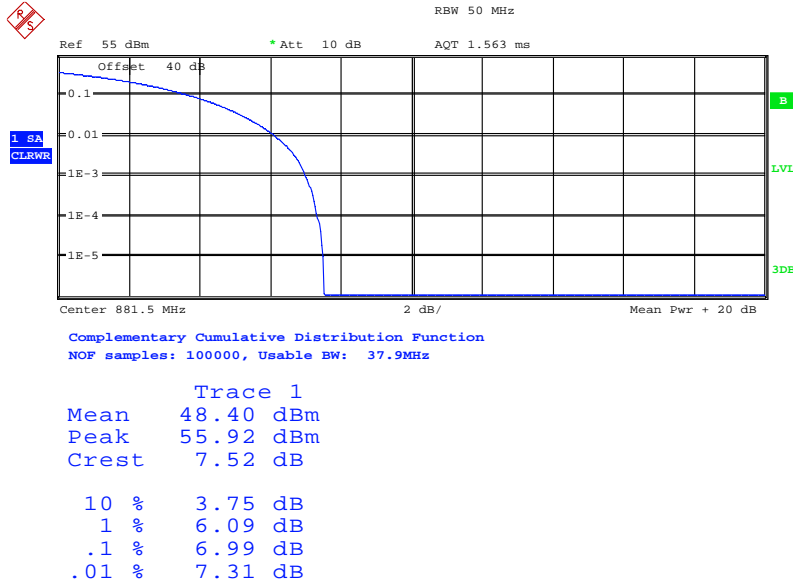
Configuration 1 - Mode 7 - G&G&G&L3



Date: 18.MAR.2014 15:14:10



Configuration 1 - Mode 7 - G&G&G&L5

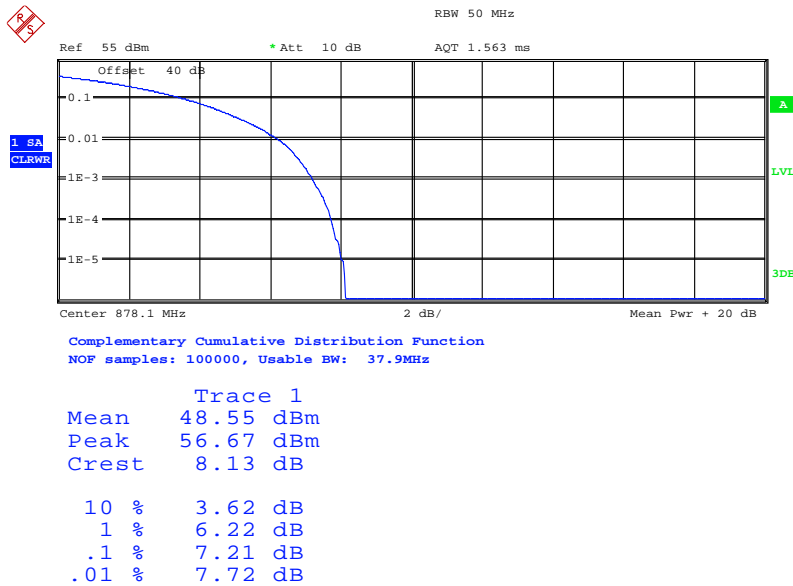


Date: 18.MAR.2014 15:23:05

Mix Carrier (x4): 2G+2L

GSM (GMSK) & LTE (E-TM1.1)

Configuration 1 - Mode 8 - G&G&L1.4&L1.4

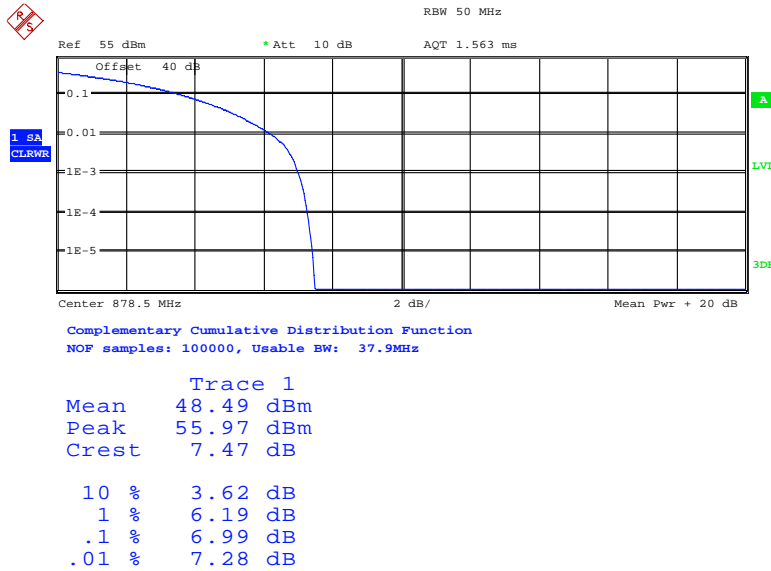


Date: 13.MAR.2014 11:22:32



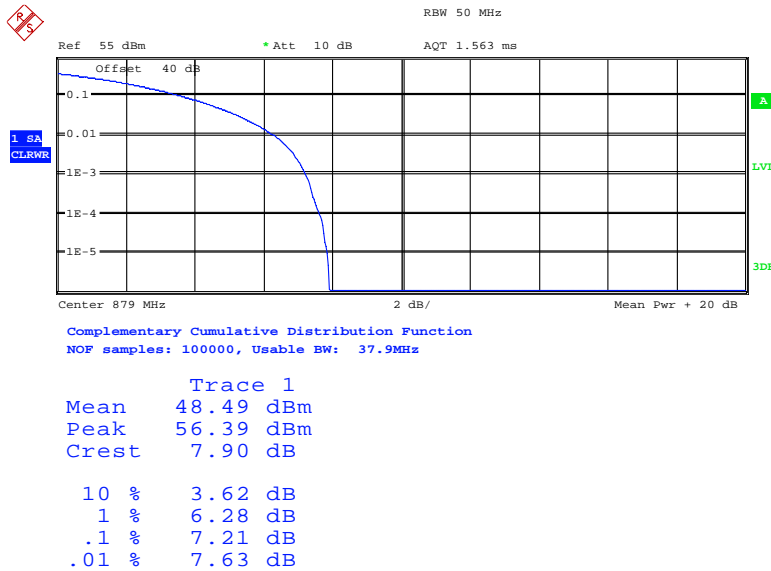
Product Service

Configuration 1 - Mode 8 - G&G&L3&L3



Date: 13.MAR.2014 11:29:35

Configuration 1 - Mode 8 - G&G&L5&L5



Date: 13.MAR.2014 11:37:24

| | |
|-------|------|
| Limit | 13dB |
|-------|------|

Remarks

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



2.3 SPURIOUS EMISSIONS AT ANTENNA TERMINALS (± 1 MHz)

2.3.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1051
FCC CFR 47 Part 22, Clause 22.917(b)
Industry Canada RSS-132 Clause 5.5

2.3.2 Equipment Under Test

RUS 01 B5 / KRC 118 64/3, S/N: D168263201

2.3.3 Date of Test and Modification State

10 March 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 22 and Industry Canada RSS-132.

In accordance with 22.917(b), at least 1% of the emission bandwidth shall be used for the resolution bandwidth up to 1MHz away from the block edge and a RBW of 100kHz for measurements of emissions > 1MHz away from the band edges. The power of any emission outside the frequency band shall be attenuated below the transmitter power (P) by at least $43 + 10\log P$ dB. After calculation, the limit is -13dBm. As the EUT can operate in LTE MIMO mode, according to FCC KDB662911 D01 Multiple Transmitter Output v02r01, the limit should be adjusted with a correction of -3dB $[10\log(2)]$.

For GSM/LTE mix carrier(x2), with GSM signal at the edge, which is selected as the worst case. The RBW of 2kHz was used for frequencies offset up to 1MHz away from the band edge and 1% of the emission bandwidth was 3kHz, so the the correction of $10\log(2/3)$ was added to -13dBm. Due to LTE transmit in TX-MIMO in Mix carrier mode and the EUT has Two transmit ports, the limit was adjusted to -17.8dBm.

The resolution bandwidth of 100kHz was used between 1MHz to 5MHz away from the band edge. Spectrum analyzer detector was set as RMS.

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

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

Configuration 1 - Mode 4 - G&G&L1.4, G&G&L3, G&G&L5, G&G&L10
- Mode 6 - L1.4&G&G, L3&G&G, L5&G&G, L10&G&G



Product Service

2.3.6 Environmental Conditions

Ambient Temperature 23.0°C

Relative Humidity 28.0%

2.3.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 2 and Part 22 and Industry Canada RSS-132 for Spurious Emissions Antenna Terminals (± 1 MHz).

Below are the frequencies the EUT was tested against along with the tested channels.

Mix Carrier(x3): 2G+1L

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

| Band Edge Frequency | Edge Test with GSM Channel No./Frequencies | RBW / VBW (kHz) | Limit (dB) |
|---------------------|--|--------------------|---------------|
| Bottom 869MHz | Channel: 129(G) & 137(G) & 2550(L) Frequency: 869.4+871.0+884.0 | 2 / 20 | -17.8 |

Configuration 1 - Mode 6 - L1.4&G&G, L3&G&G, L5&G&G, L10&G&G

| Band Edge Frequency | Edge Test with GSM Channel No./Frequencies | RBW / VBW (kHz) | Limit (dB) |
|---------------------|--|--------------------|---------------|
| Top 894MHz | Channel: 2515(L) & 242(G) & 250(G) Frequency: 880.5+892.0+893.6 | 2 / 20 | -17.8 |

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 used outside of those stated and power levels used beyond those stated in the table exceed the specification limits, thus they cannot be used.

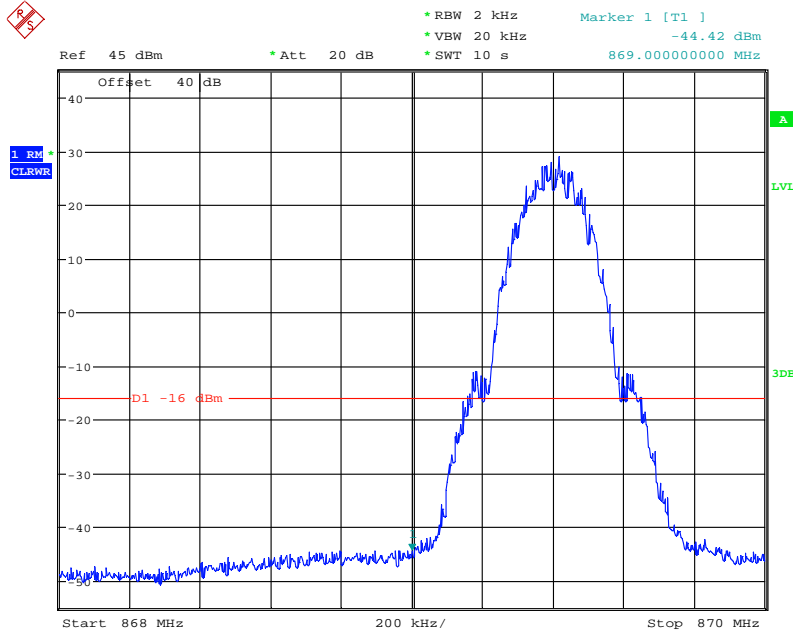
The test results are shown below



Mix Carrier(x3): 2G+1L

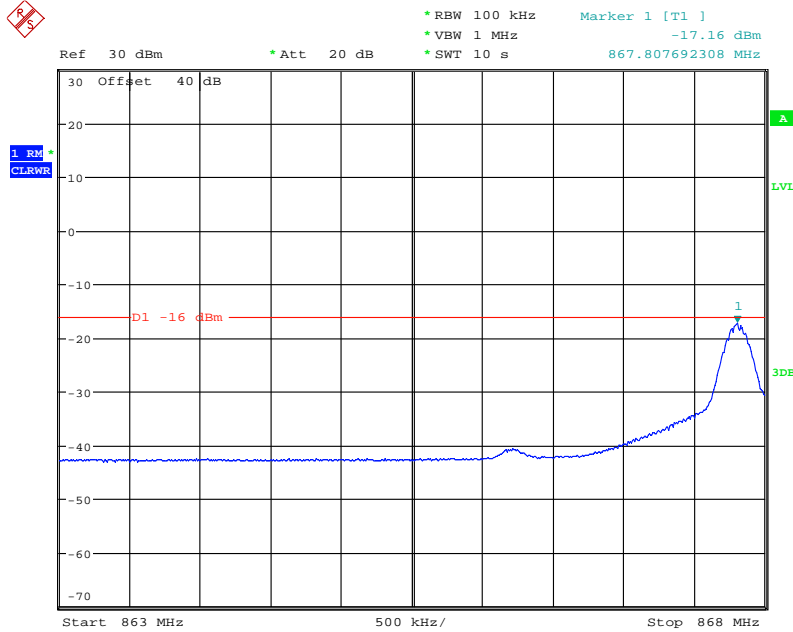
GSM (GMSK) & LTE (E-TM1.1)

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



Date: 10.MAR.2014 10:07:42

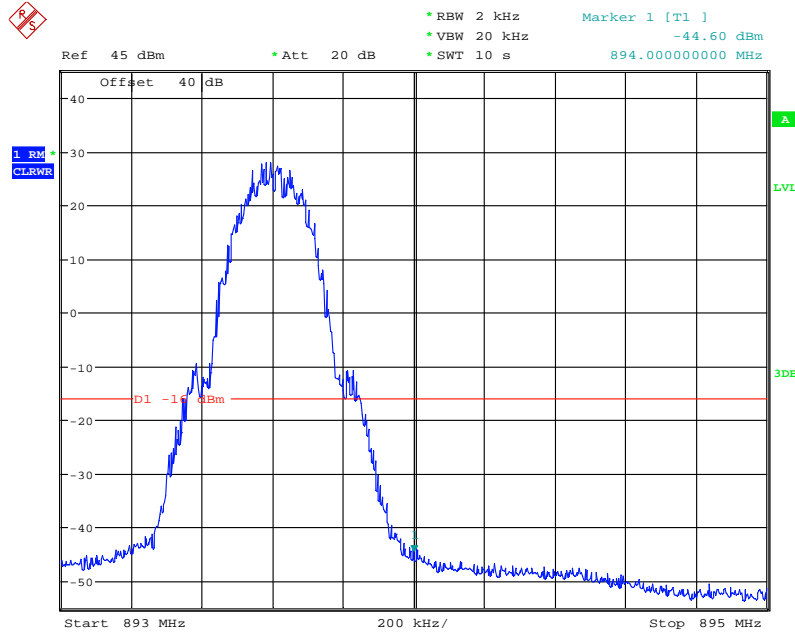
Note: The results for frequencies offset up to 1MHz away from the band edge should be compared to a limit of -17.8dBm.



Date: 10.MAR.2014 13:13:56

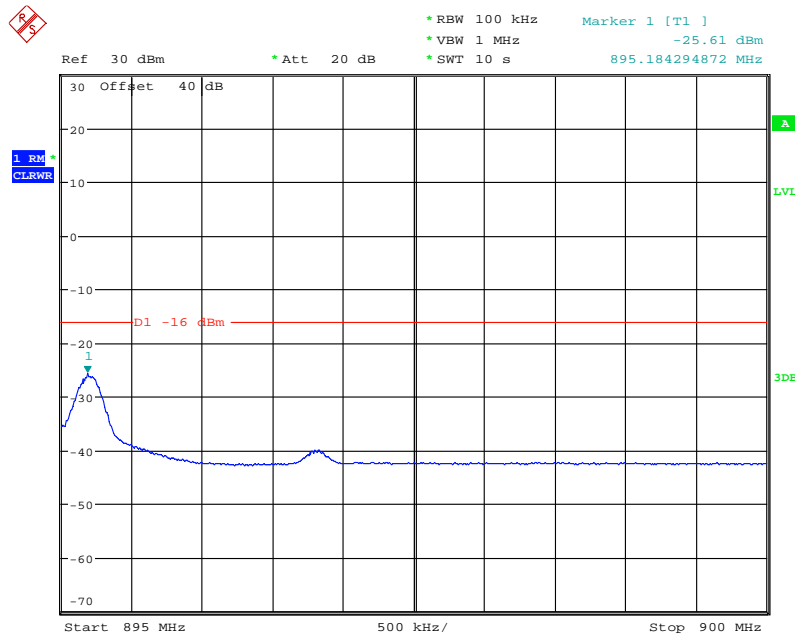


Configuration 1 - Mode 6 - L1.4&G&G



Date: 10.MAR.2014 15:16:03

Note: The results for frequencies offset up to 1MHz away from the band edge should be compared to a limit of -17.8dBm.

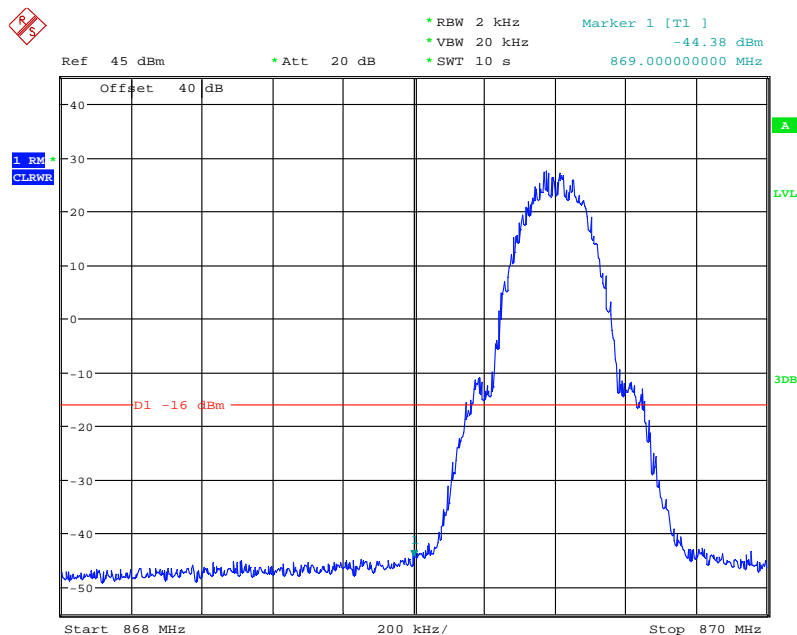


Date: 10.MAR.2014 15:14:43



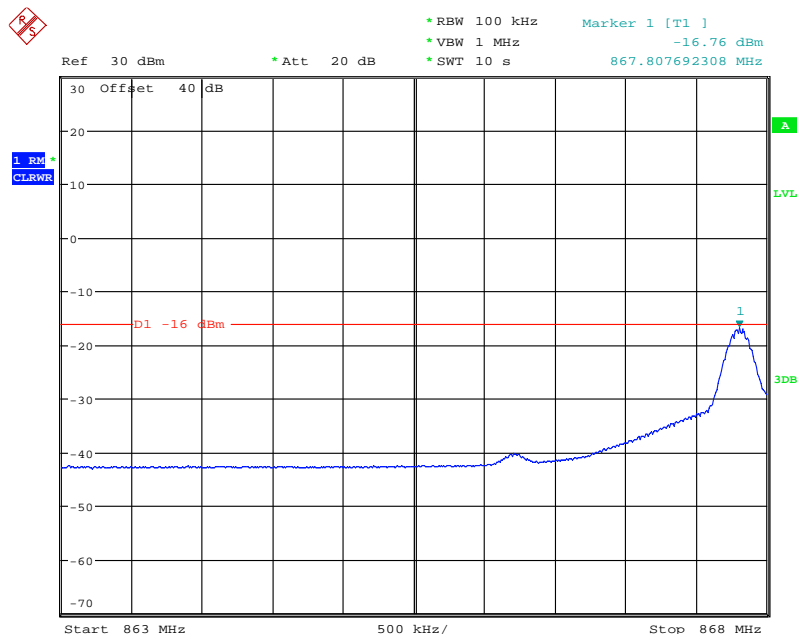
Product Service

Configuration 1 - Mode 4 - G&G&L13



Date: 10.MAR.2014 11:38:19

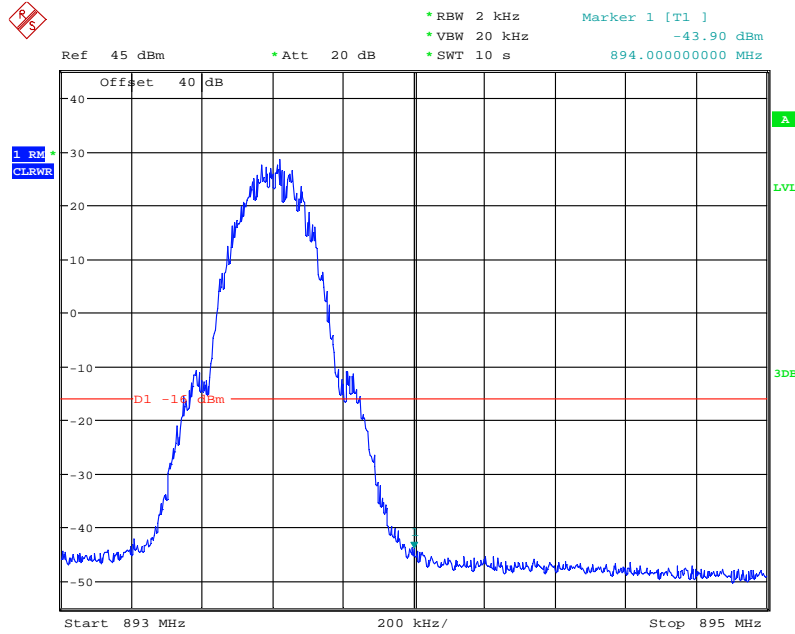
Note: The results for frequencies offset up to 1MHz away from the band edge should be compared to a limit of -17.8dBm.



Date: 10.MAR.2014 13:15:53

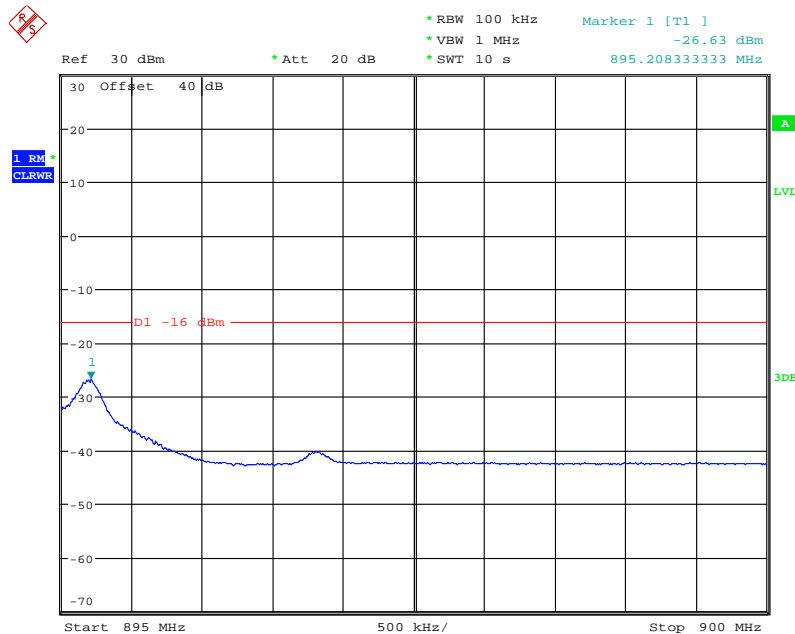


Configuration 1 - Mode 6 - L3&G&G



Date: 10.MAR.2014 15:54:44

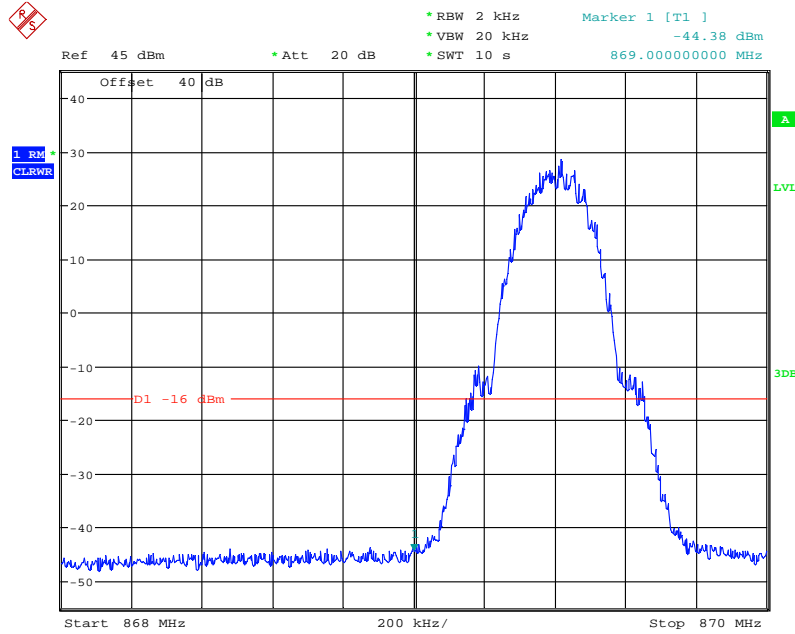
Note: The results for frequencies offset up to 1MHz away from the band edge should be compared to a limit of -17.8dBm.



Date: 10.MAR.2014 15:56:05

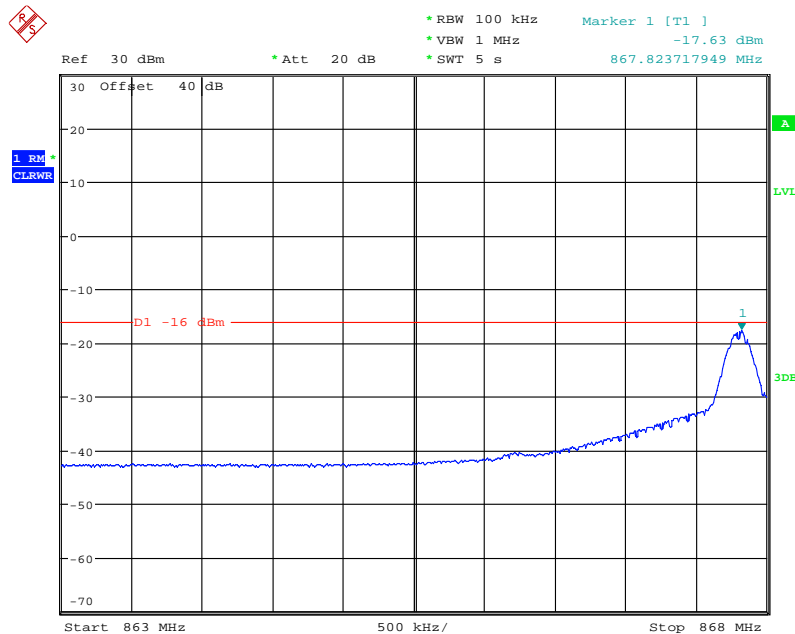


Configuration 1 - Mode 4 - G&G&L5



Date: 10.MAR.2014 12:55:14

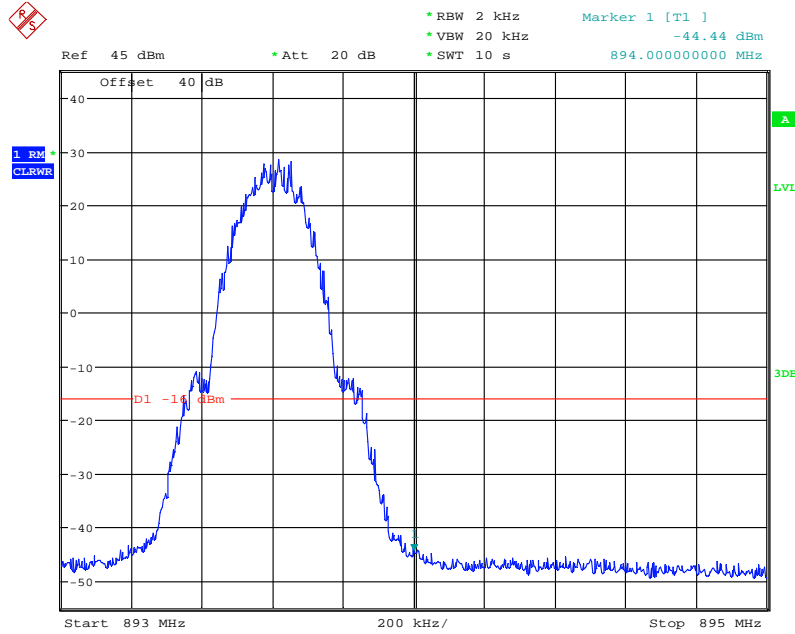
Note: The results for frequencies offset up to 1MHz away from the band edge should be compared to a limit of -17.8dBm.



Date: 10.MAR.2014 13:01:53

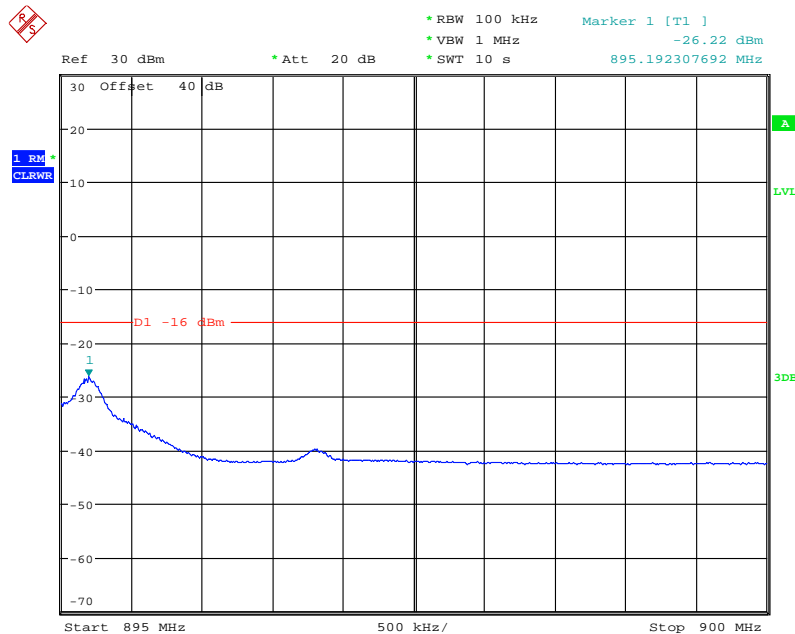


Configuration 1 - Mode 6 - L5&G&G



Date: 10.MAR.2014 16:10:08

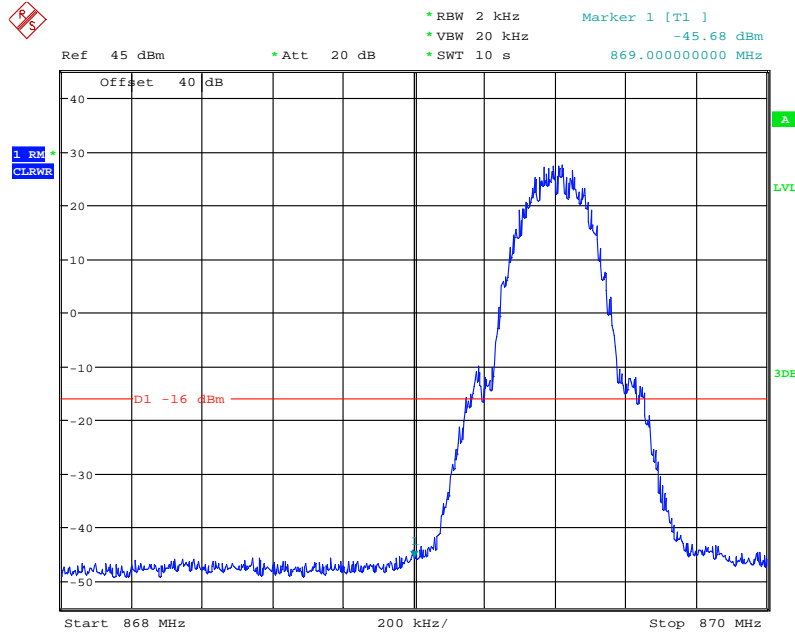
Note: The results for frequencies offset up to 1MHz away from the band edge should be compared to a limit of -17.8dBm.



Date: 10.MAR.2014 16:08:47

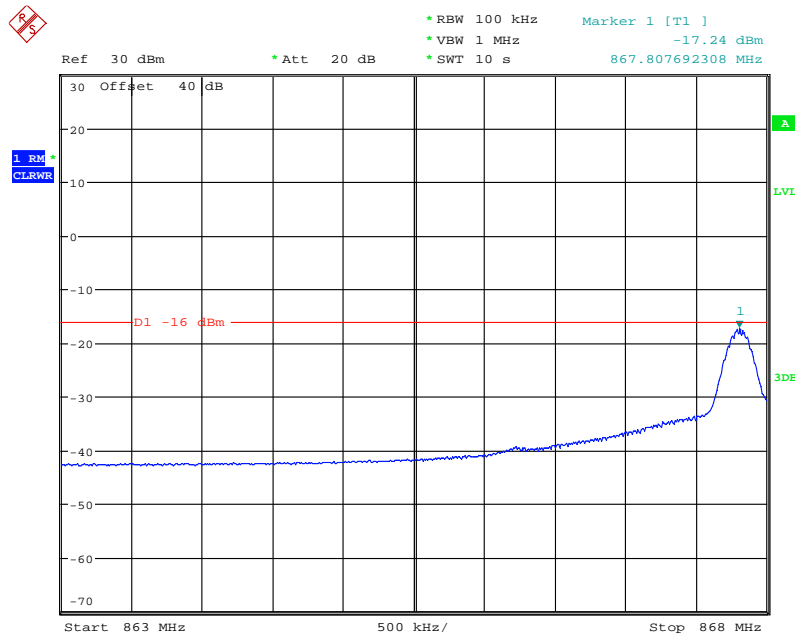


Configuration 1 - Mode 4 - G&G&L10



Date: 10.MAR.2014 13:40:49

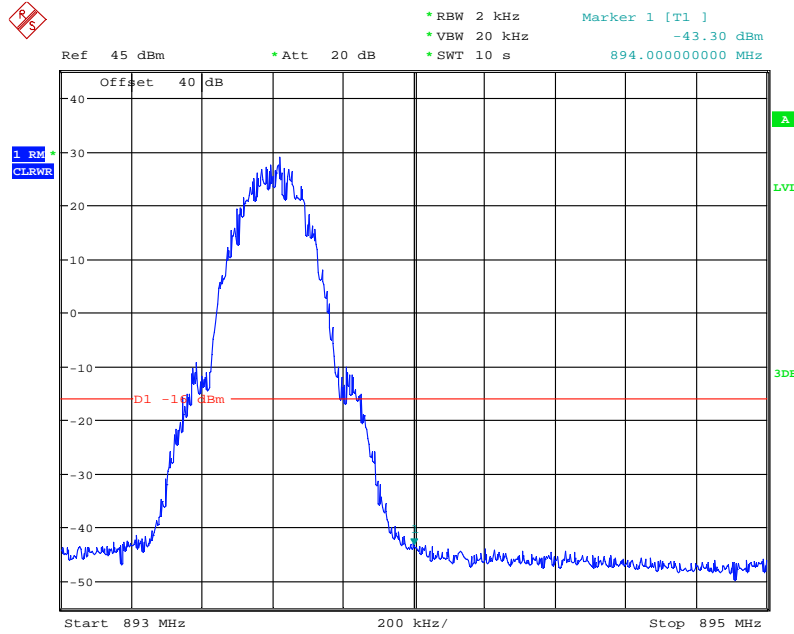
Note: The results for frequencies offset up to 1MHz away from the band edge should be compared to a limit of -17.8dBm.



Date: 10.MAR.2014 13:55:54

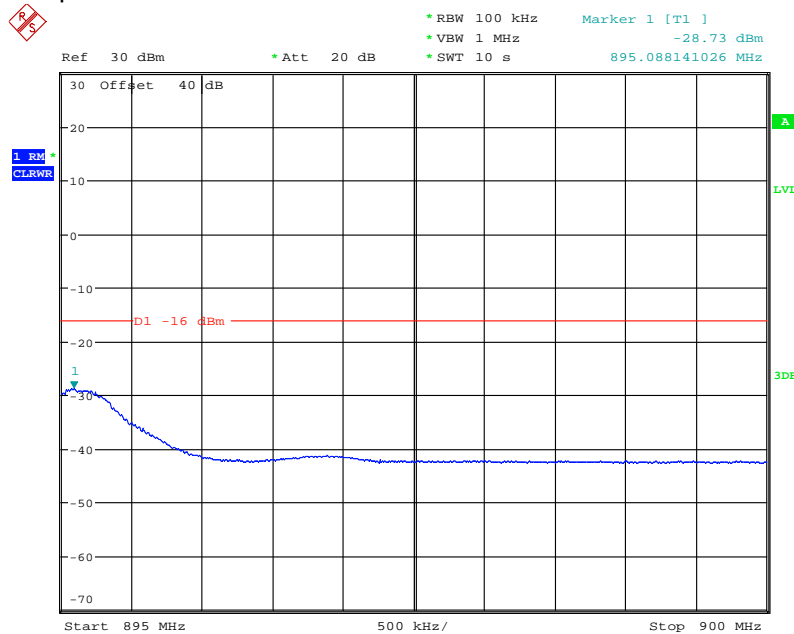


Configuration 1 - Mode 6 - L10&G&G



Date: 10.MAR.2014 15:41:55

Note: The results for frequencies offset up to 1MHz away from the band edge should be compared to a limit of -17.8dBm.



Date: 10.MAR.2014 15:40:53

Limit

The power of any emission outside the frequency band shall be attenuated below the transmitter power (P) by at least $43 + 10\log P \text{ dB} + 10\log(\text{NANT})$.



Product Service

2.4 RADIATED SPURIOUS EMISSIONS

2.4.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1053
FCC CFR 47 Part 22, Clause 22.917 (a)
Industry Canada RSS-132, Clause 5.5

2.4.2 Equipment Under Test

RUS 01 B5 / KRC 118 64/3, S/N: D168263201 / D168263247

2.4.3 Date of Test and Modification State

25 and 26 March 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 22 and Industry Canada RSS-132.

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 – 10GHz were then formally measured using a Peak detector as the worst case.

In the frequency Range 30MHz – 10GHz, the measurement was performed with a resolution bandwidth of 1MHz as the worst case.

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 - $(43 + 10\text{Log}(P))$ dB

Where:

Field Strength is measured in dB μ V/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 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:

$$E_{(v/m)} = (30 \times 1.64 \times 51.88)^{0.5} / 3 = 16.84 \text{V/m} = 144.53 \text{dB}\mu\text{V/m}$$

As per 22.917 (a) the spurious emission must be attenuated by $43 + 10\log(P_o)$ dB this gives:

$$43 + 10\log(51.88) = 60.15 \text{dB}$$

Therefore the limit at 3m measurement distance is:

$$144.53 - 60.15 = 84.4 \text{dB}\mu\text{V/m}$$

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 - G&L1.4
- Mode 2 - G&L1.4, G&L3, G&L5, G&L10, G&L15
- Mode 3 - L1.4&G
- Mode 5 - G&G&L1.4
- Mode 7 - G&G&G&L1.4
- Mode 8 - G&G&L1.4&L1.4

2.4.6 Environmental Conditions

Ambient Temperature 22.5 – 25.0°C

Relative Humidity 30.5 – 36.0%



2.4.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 2 & Part 22 and Industry Canada RSS-132 for Radiated Spurious Emissions.

The test results are shown below

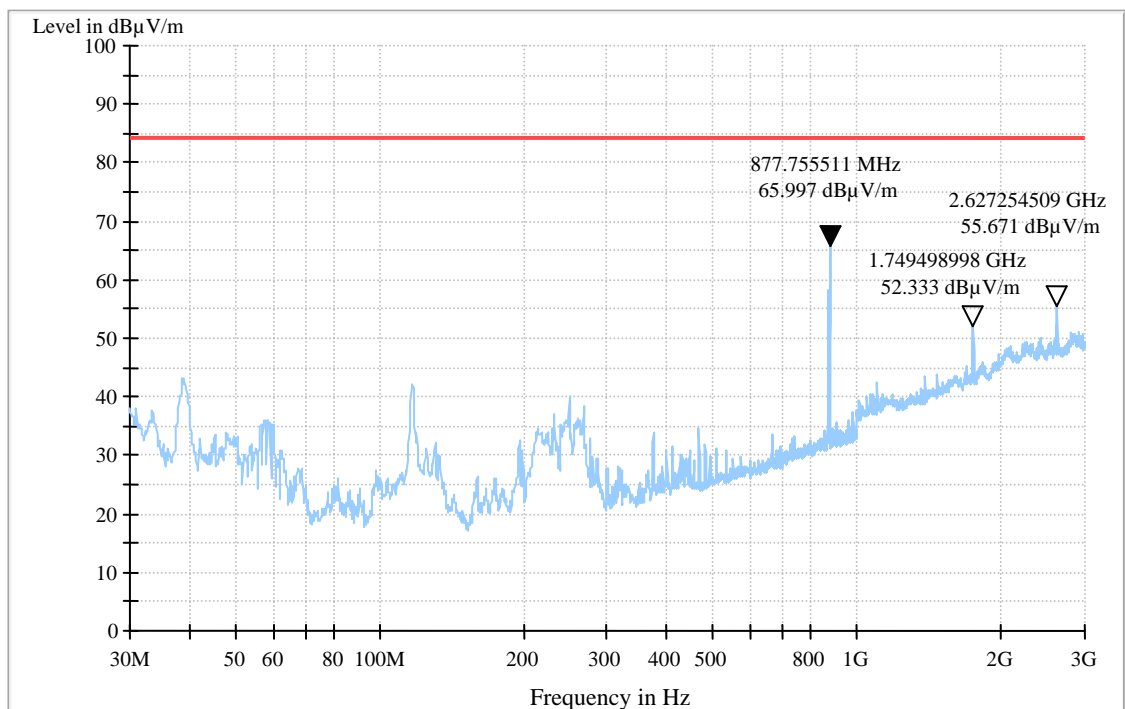
Note: Only the worst case results plots have been included as all of the emissions are greater than 20dB below the limit. A set of plots have been included to show the measurement system noise floor.

Mix Carrier(x2): 1G+1L

GSM (GMSK) & LTE (E-TM1.1)

Configuration 1 - Mode 1 - G&L1.4

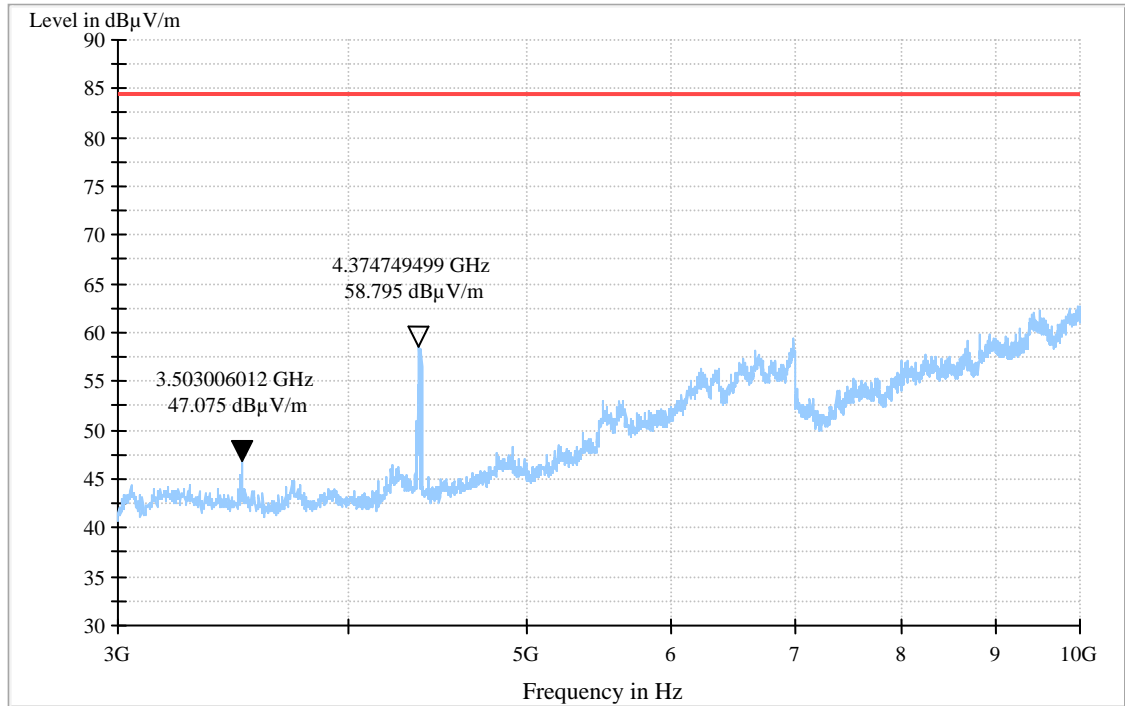
30MHz - 3GHz



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



3GHz - 10GHz



Configuration 1 - Mode 2 - G&L1.4

No emissions were detected within 20dB of the limit.

Configuration 1 - Mode 3 - L1.4&LG

No emissions were detected within 20dB of the limit.

Configuration 1 - Mode 2 - G&L3

No emissions were detected within 20dB of the limit.

Configuration 1 - Mode 2 - G&L5

No emissions were detected within 20dB of the limit.

Configuration 1 - Mode 2 - G&L10

No emissions were detected within 20dB of the limit.

Configuration 1 - Mode 2 - G&L15

No emissions were detected within 20dB of the limit.



Product Service

GSM (GMSK) & LTE (E-TM3.2)

Configuration 1 - Mode 2 - G&L1.4

No emissions were detected within 20dB of the limit.

GSM (GMSK) & LTE (E-TM3.1)

Configuration 1 - Mode 2 - G&L1.4

No emissions were detected within 20dB of the limit.

Mix Carrier(x3): 2G+1L

GSM (GMSK) & LTE (E-TM1.1)

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

No emissions were detected within 20dB of the limit.

Mix Carrier(x4): 2G+1L

GSM (GMSK) & LTE (E-TM1.1)

Configuration 1 - Mode 7 - G&G&G&L1.4

No emissions were detected within 20dB of the limit.

Mix Carrier(x4): 2G+2L

GSM (GMSK) & LTE (E-TM1.1)

Configuration 1 - Mode 8 - G&G&L1.4&L1.4

No emissions were detected within 20dB of the limit.

| | |
|-------|----------------------------|
| Limit | -13dBm or 84.4dB μ V/m |
|-------|----------------------------|

Remarks

The EUT does not exceed -13dBm or 84.4dB μ V/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 22, Clause 22.917 (a)
 Industry Canada RSS-132, Clause 5.5

2.5.2 Equipment Under Test

RUS 01 B5 / KRC 118 64/3, S/N: D168263201 / D168263247

2.5.3 Date of Test and Modification State

05 to 18 March 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 22 and Industry Canada RSS-132.

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 10GHz. The EUT was set to transmit on maximum power. The resolution was set to 100kHz for 9kHz to 10GHz thus meeting the requirements of FCC CFR 47 Part 22, Clause 22.917 (a) and Industry Canada RSS-132, Clause 5.5. The spectrum analyzer detector was set to peak and trace was kept on Max Hold.

According to FCC KDB662911 D01 Multiple Transmitter Output v02r01, the limit was adjusted with a correction of -3dB [10Log(2)] to -13dBm by using the Measure and Add 10Log(N) dB technique as LTE transmit simultaneous at antenna ports RF A1 and RF A2.

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 10th harmonic 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 - G&L1.4
- Mode 2 - G&L1.4, G&L3, G&L5, G&L10, G&L15
- Mode 3 - L1.4&G
- Mode 4 - G&G&L1.4
- Mode 5 - G&G&L1.4, G&G&L3, G&G&L5, G&G&L10
- Mode 6 - L1.4&G&G
- Mode 7 - G&G&G&L1.4
- Mode 8 - G&G&L1.4&L1.4



Product Service

2.5.6 Environmental Conditions

Ambient Temperature 21.8 – 24.6°C
 Relative Humidity 25.5 – 31.0%

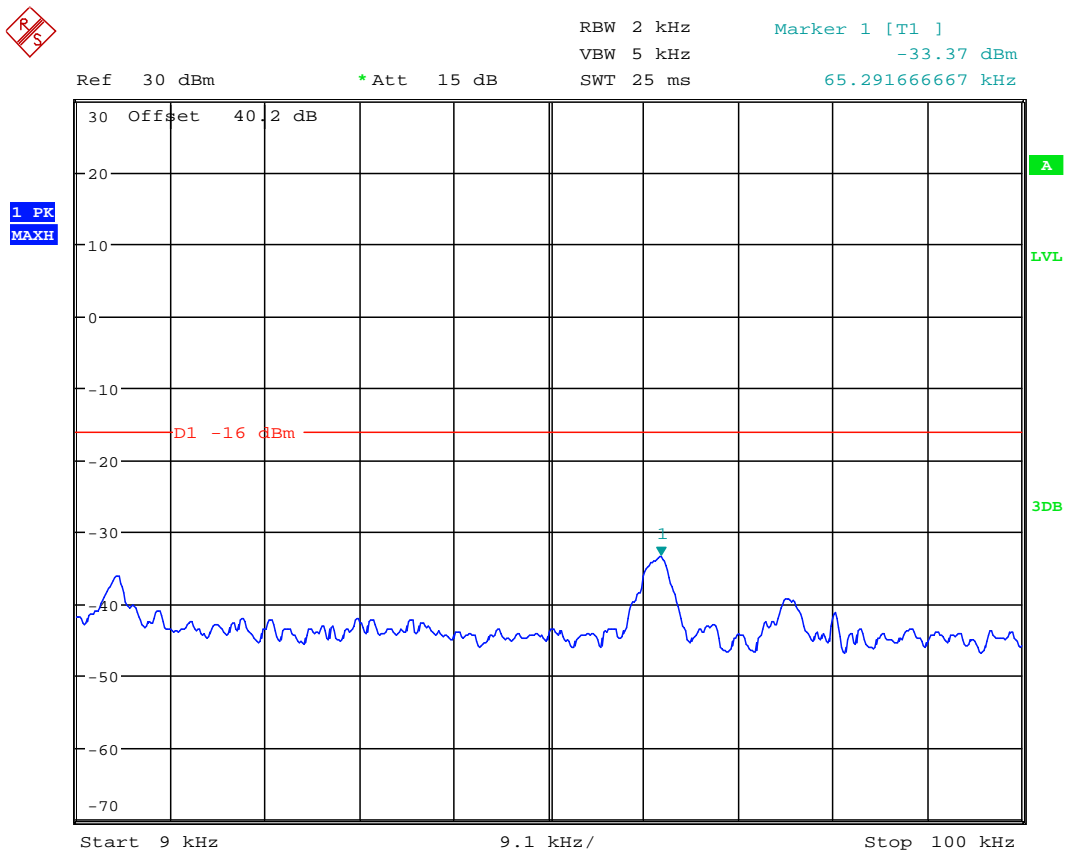
2.5.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 2 and Part 22 and Industry Canada RSS-132 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.



Date: 7.MAR.2014 13:48:40



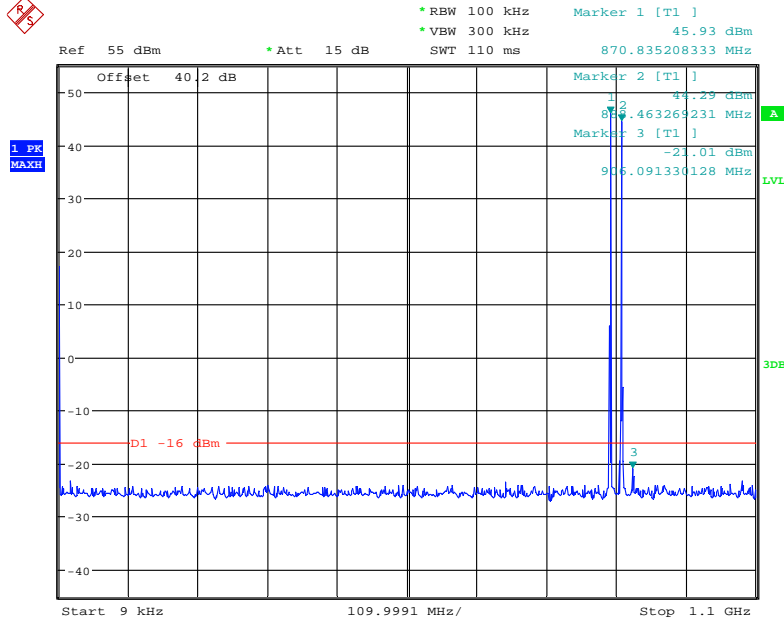
Product Service

GSM/LTE MSR:

Mix Carrier(x2): 1G+1L

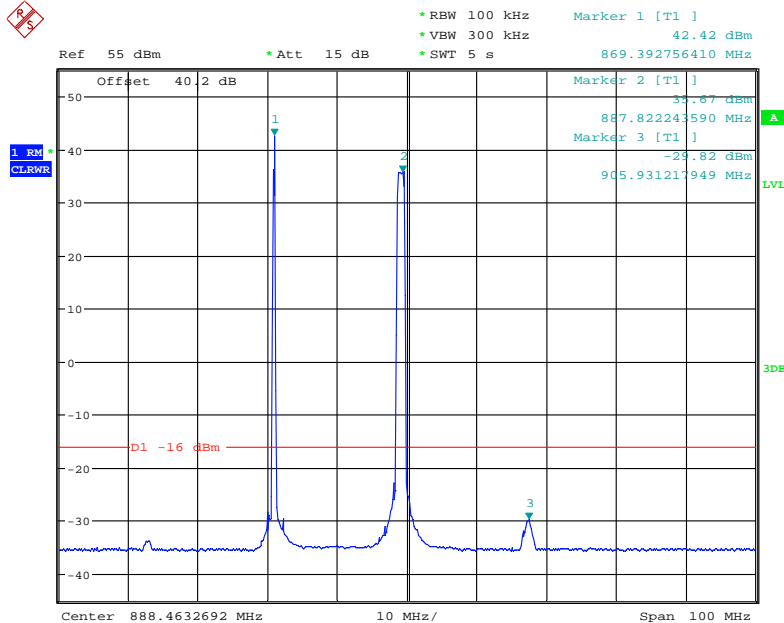
Configuration 1 - Mode 1 - G&L1.4

9kHz to 1.1GHz



Date: 5.MAR.2014 15:36:07

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

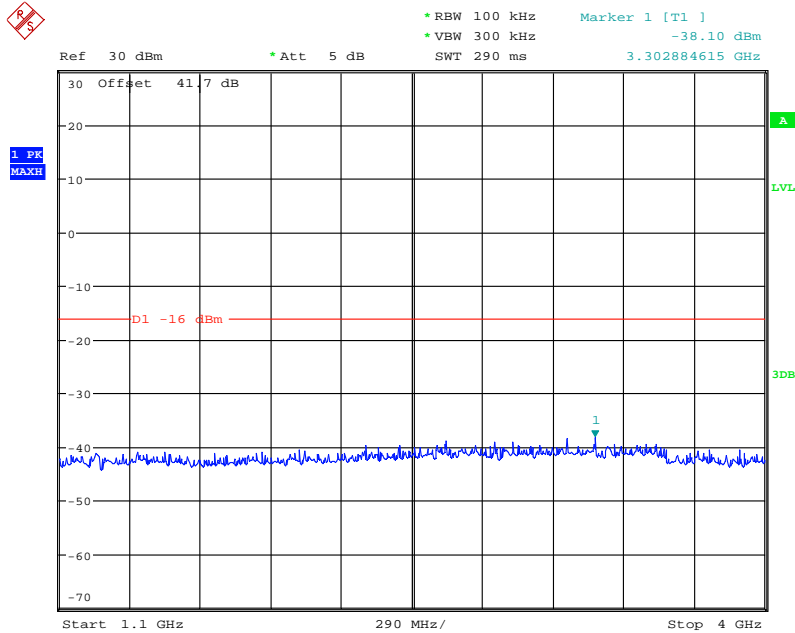


Date: 5.MAR.2014 15:37:52

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

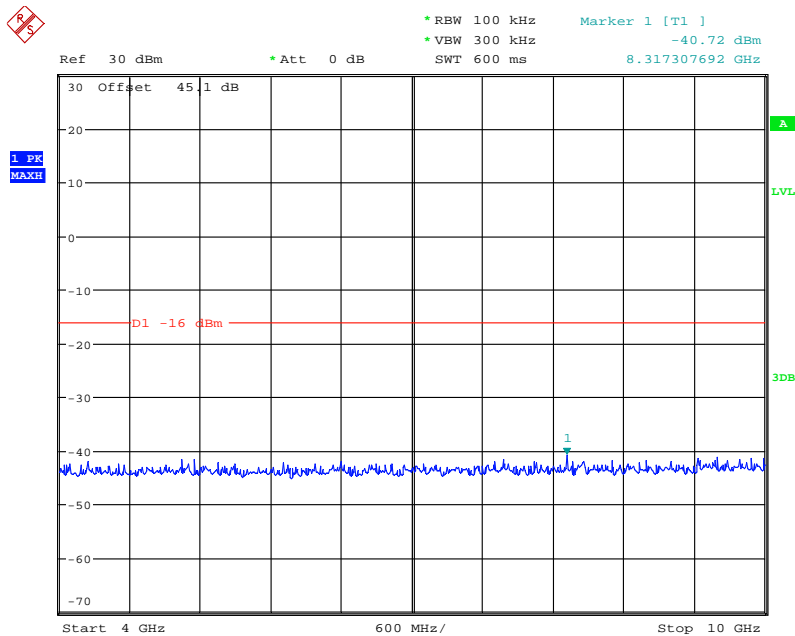


1.1GHz to 4GHz



Date: 5.MAR.2014 16:10:08

4GHz to 10GHz

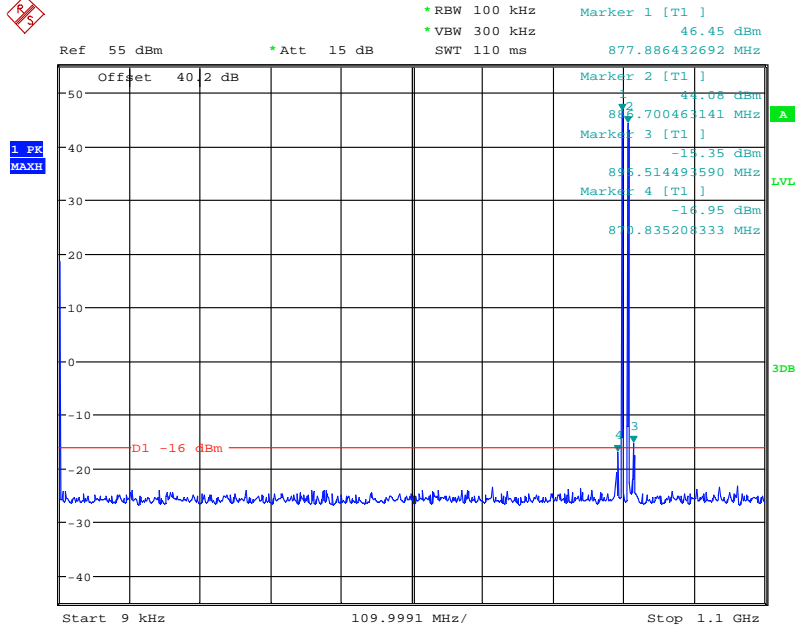


Date: 5.MAR.2014 15:29:55



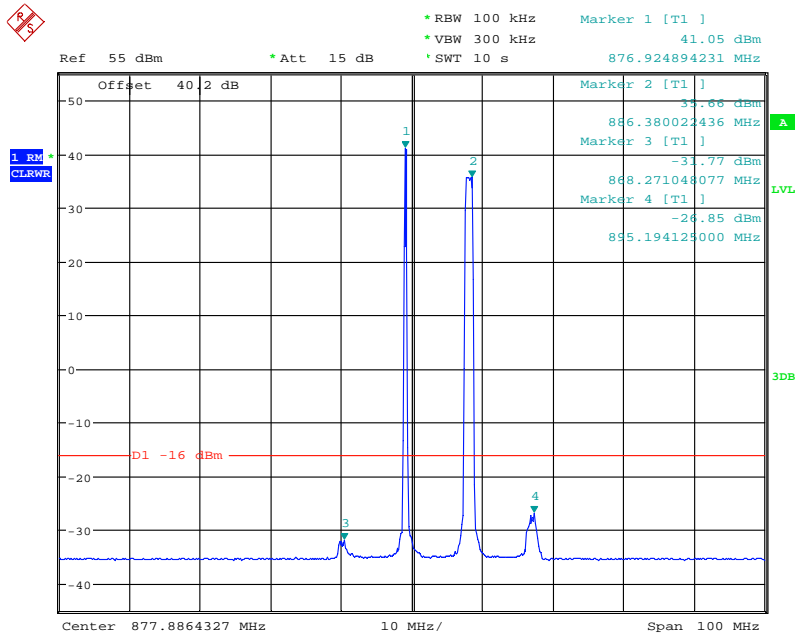
Configuration 1 - Mode 2 - G&L1.4

9kHz to 1.1GHz



Date: 7.MAR.2014 09:48:39

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



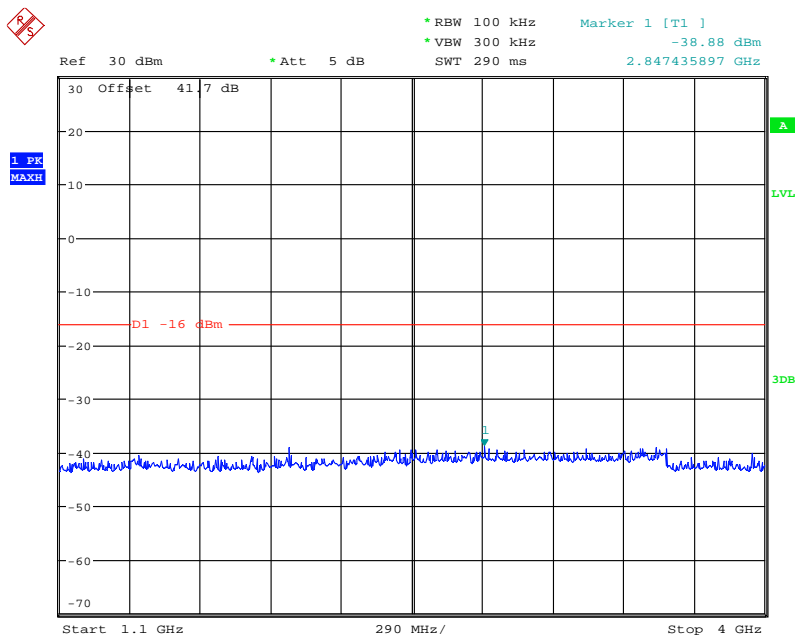
Date: 7.MAR.2014 09:51:42

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



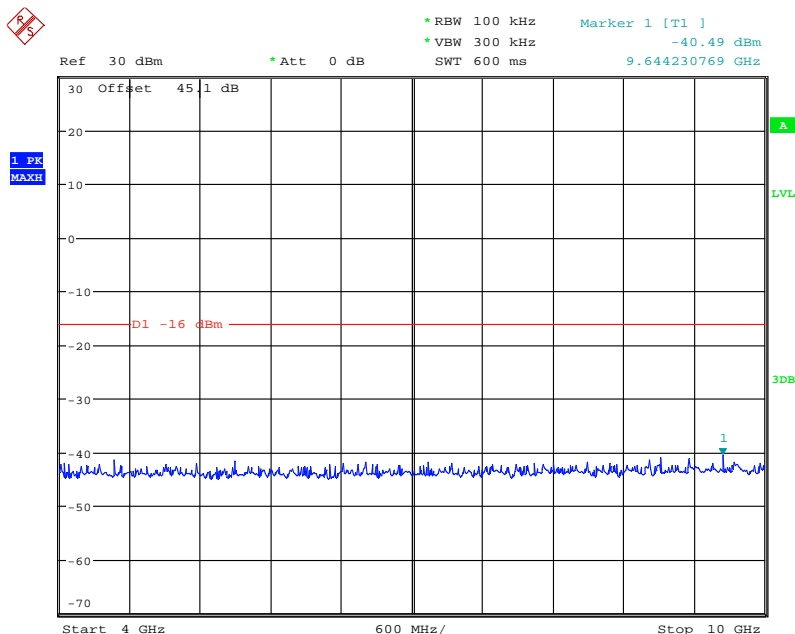
Product Service

1.1GHz to 4GHz



Date: 7.MAR.2014 10:46:37

4GHz to 10GHz

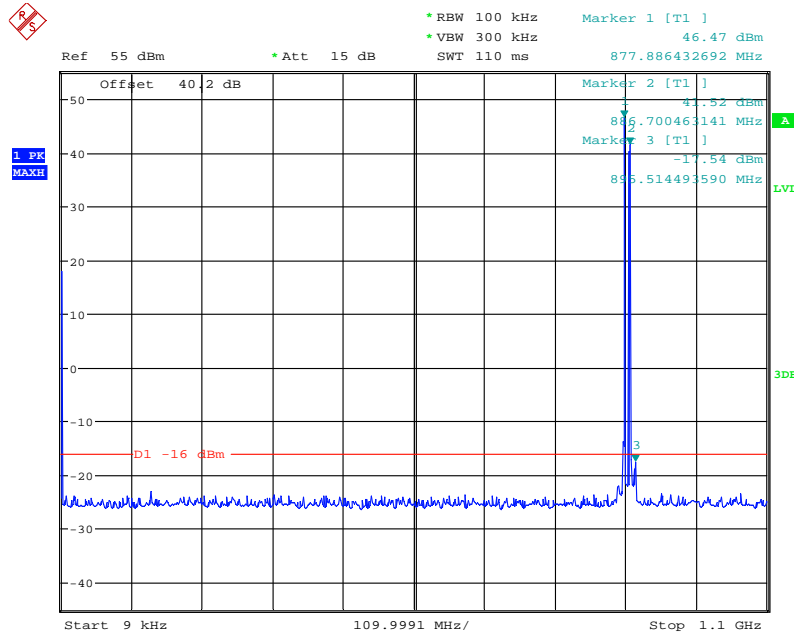


Date: 7.MAR.2014 09:53:14



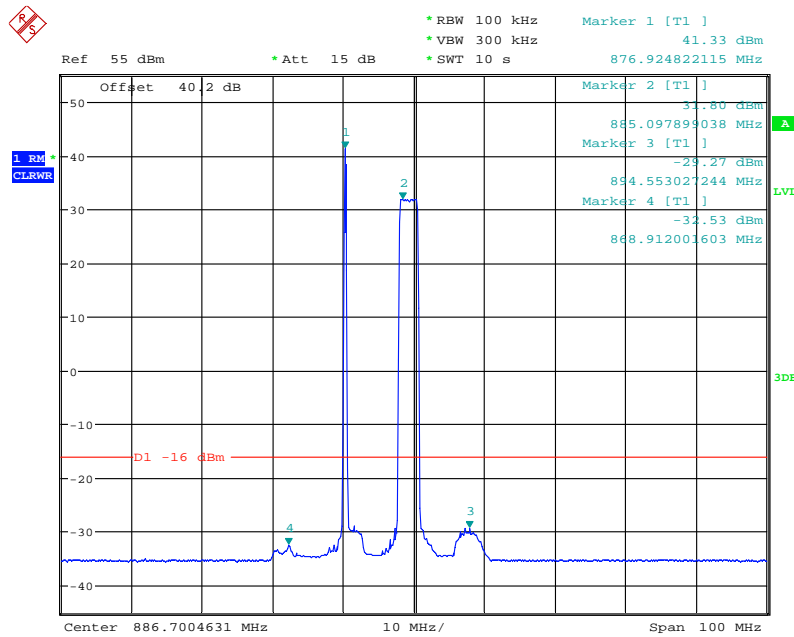
Configuration 1 - Mode 2 - G&L3

9kHz to 1.1GHz



Date: 7.MAR.2014 10:02:14

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



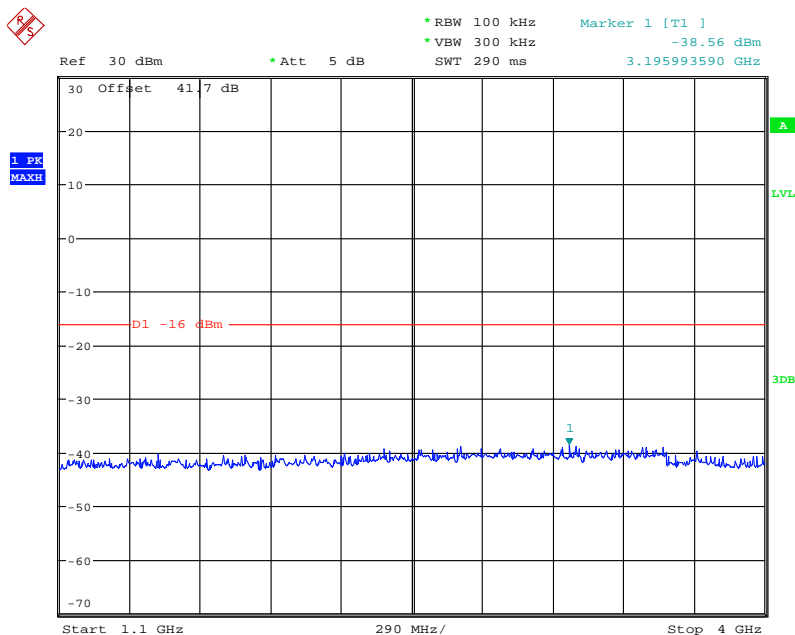
Date: 7.MAR.2014 10:03:29

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



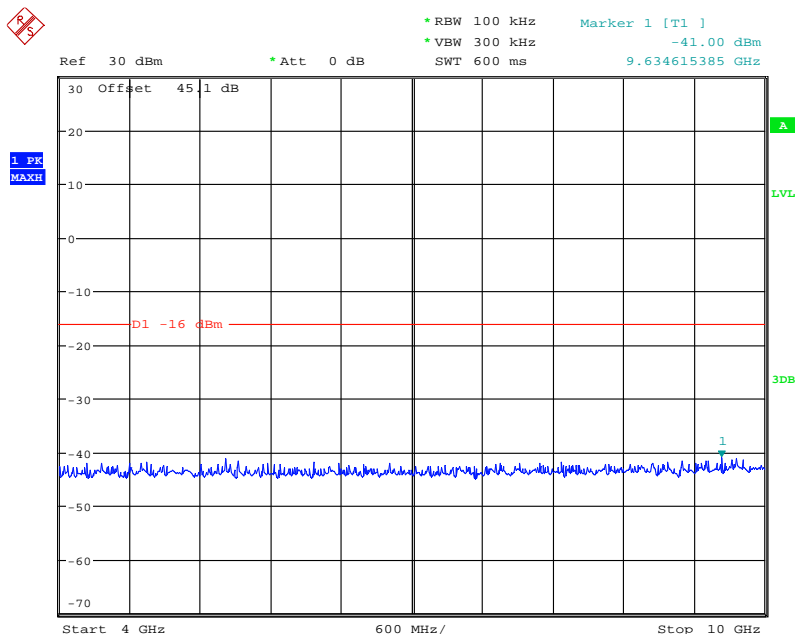
Product Service

1.1GHz to 4GHz



Date: 7.MAR.2014 10:45:10

4GHz to 10GHz

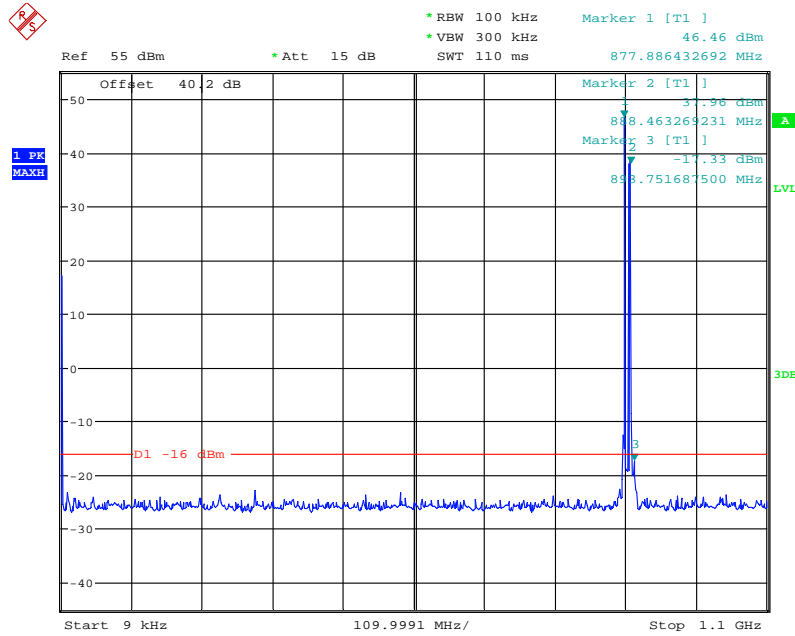


Date: 7.MAR.2014 09:58:04



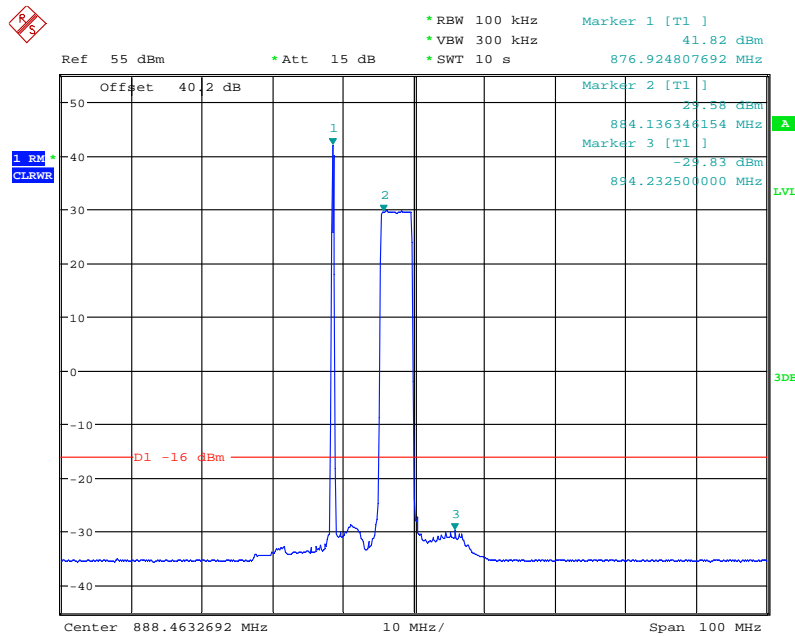
Configuration 1 - Mode 2 - G&L5

9kHz to 1.1GHz



Date: 7.MAR.2014 10:16:16

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

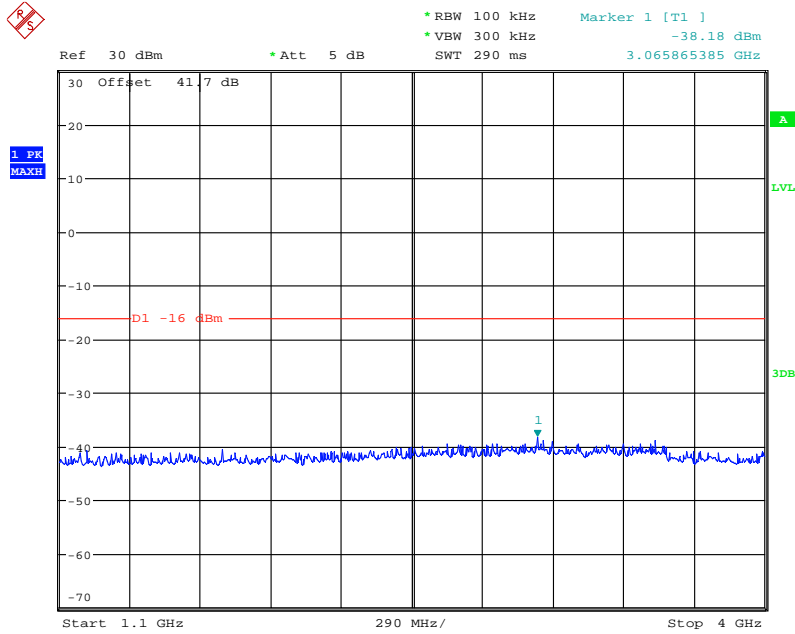


Date: 7.MAR.2014 10:17:27

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

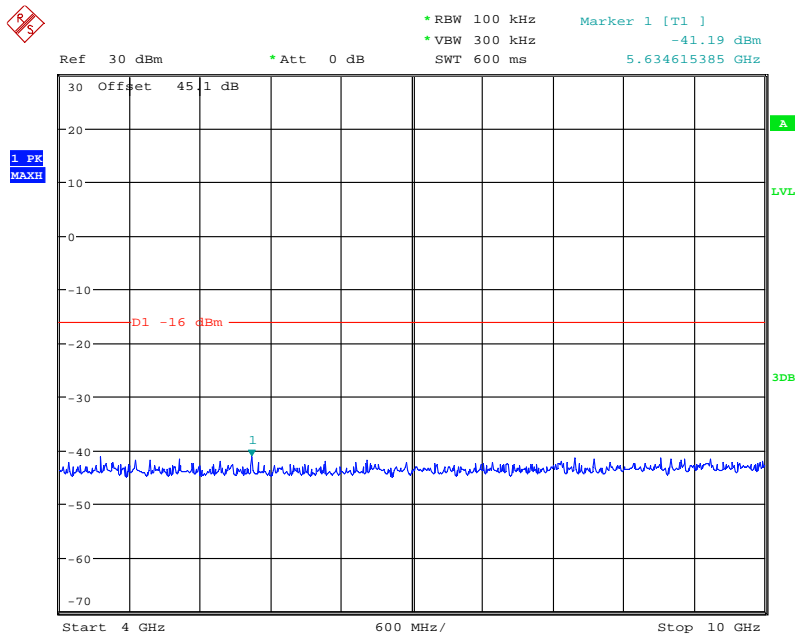


1.1GHz to 4GHz



Date: 7.MAR.2014 10:32:19

4GHz to 10GHz

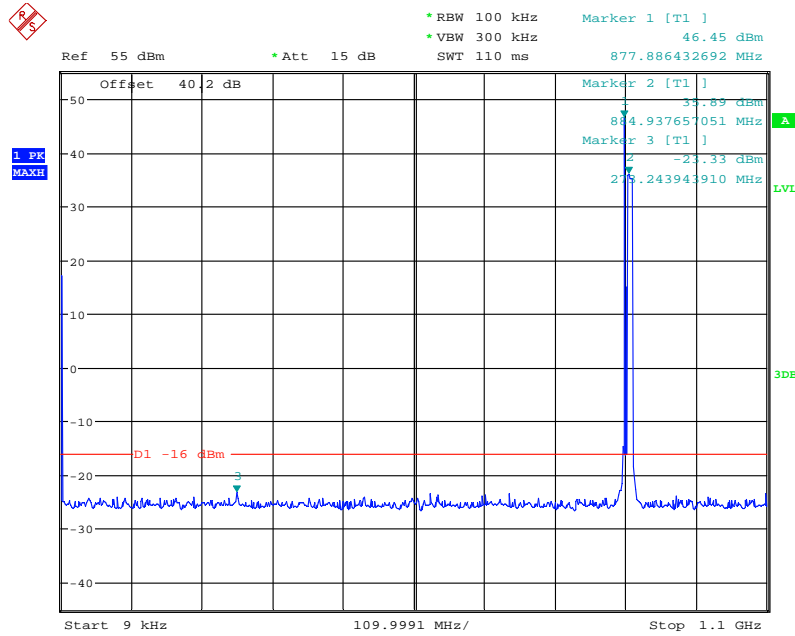


Date: 7.MAR.2014 10:18:16



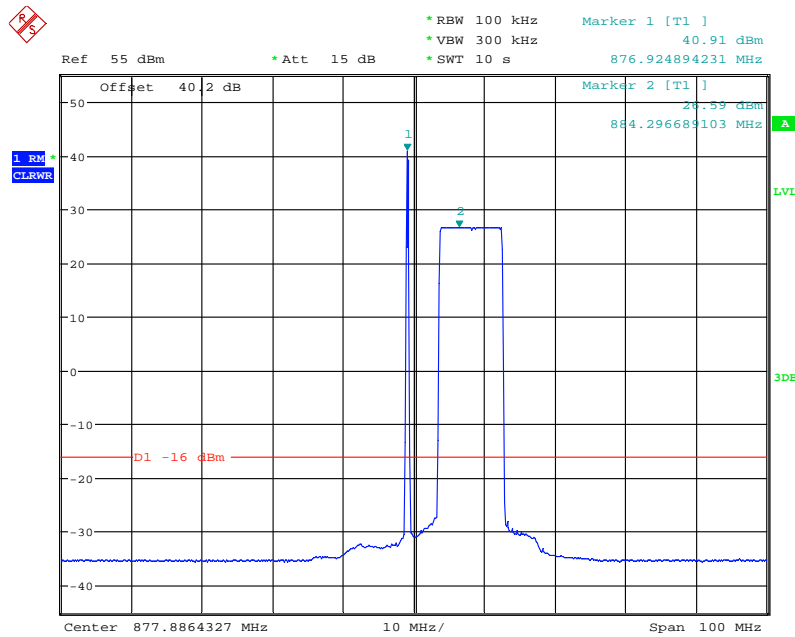
Configuration 1 - Mode 2 - G&L10

9kHz to 1.1GHz



Date: 7.MAR.2014 10:23:29

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

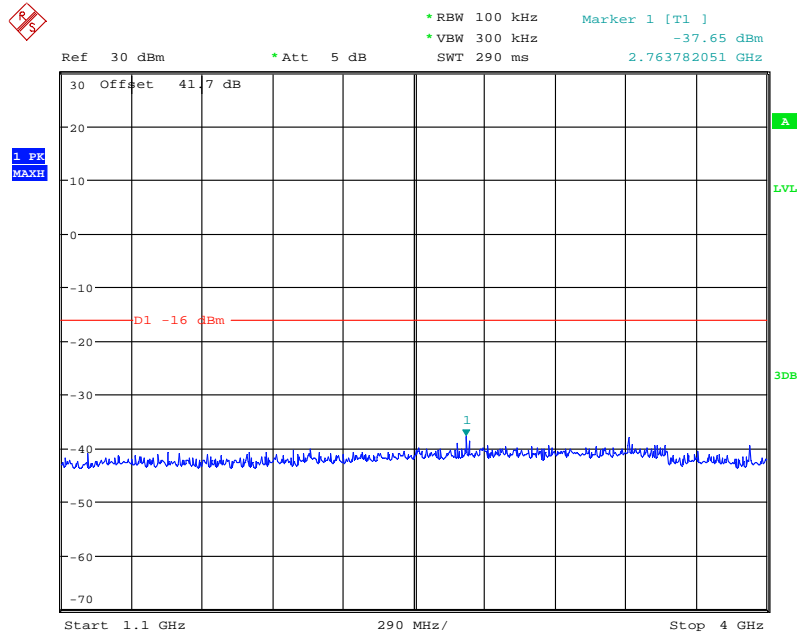


Date: 7.MAR.2014 10:24:27

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

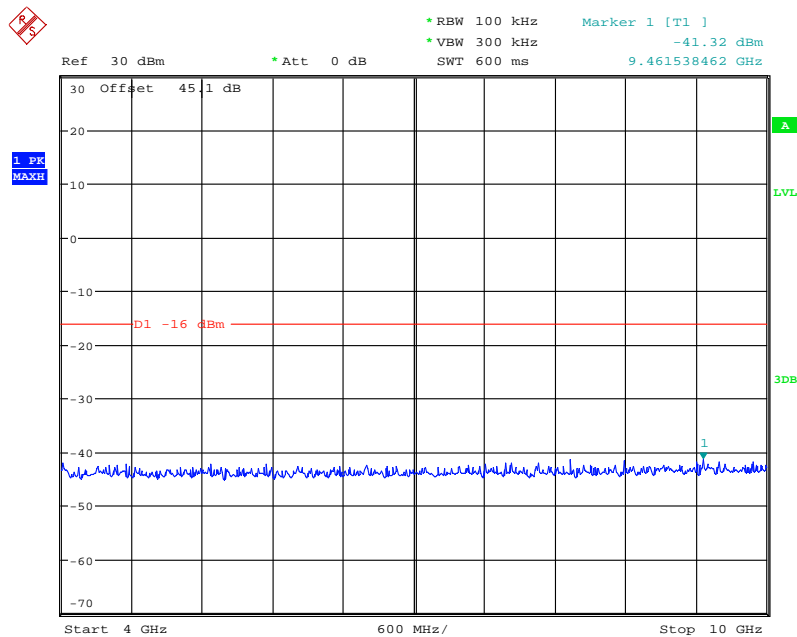


1.1GHz to 4GHz



Date: 7.MAR.2014 10:31:45

4GHz to 10GHz



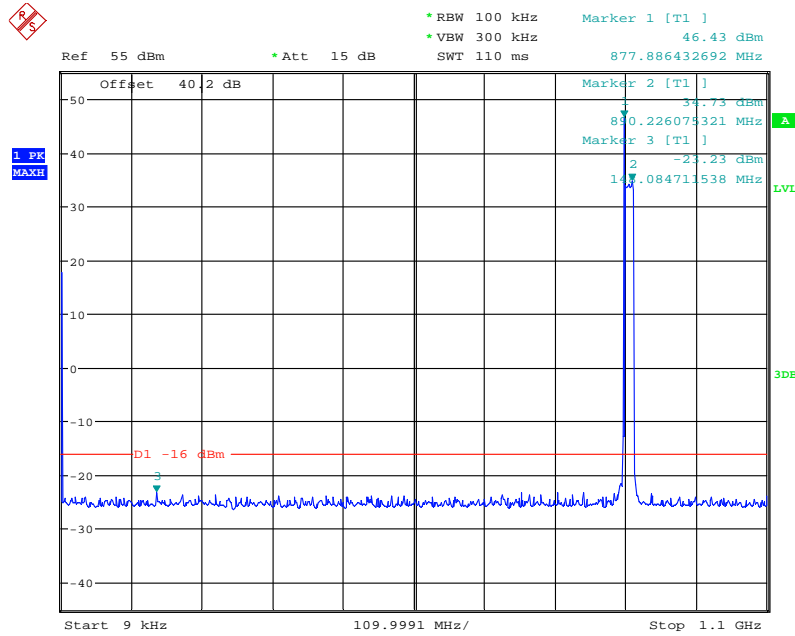
Date: 7.MAR.2014 10:22:28



Product Service

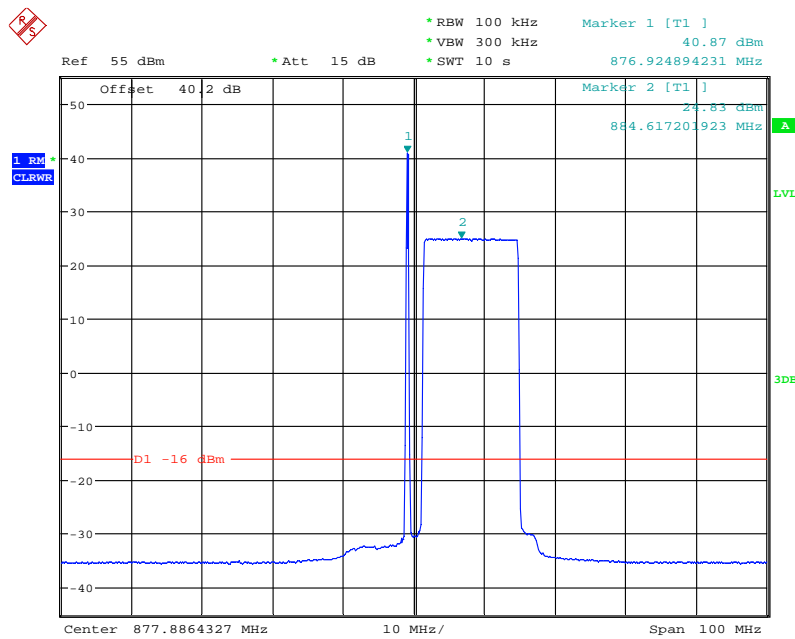
Configuration 1 - Mode 2 - G&L15

9kHz to 1.1GHz



Date: 7.MAR.2014 10:28:42

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

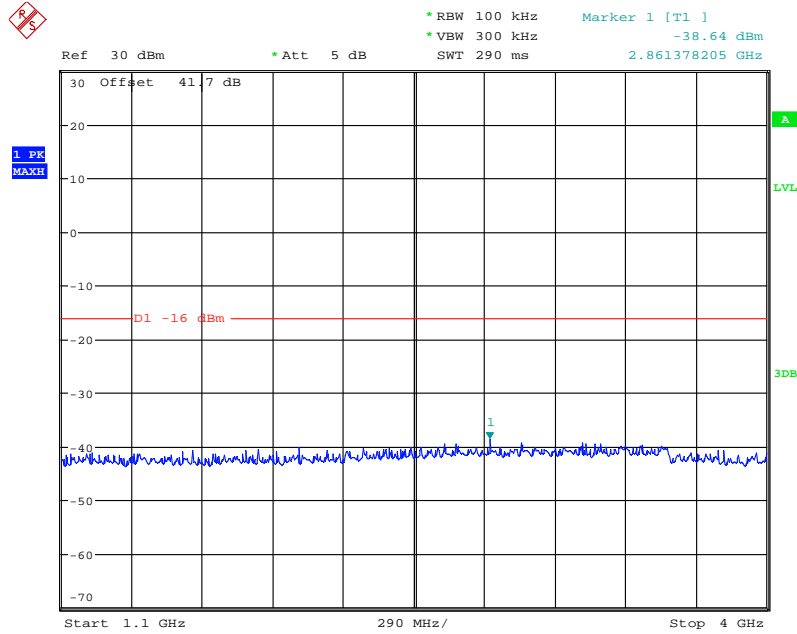


Date: 7.MAR.2014 10:29:39

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

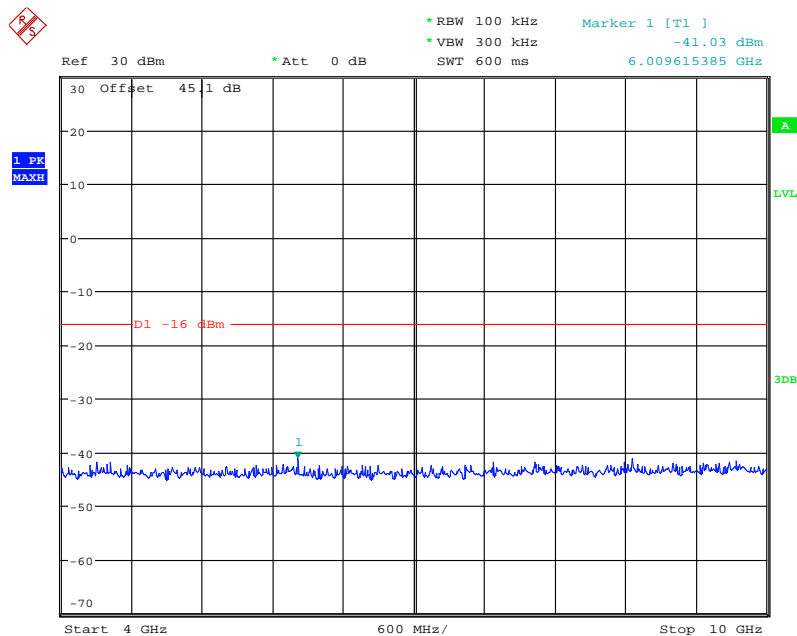


1.1GHz to 4GHz



Date: 7.MAR.2014 10:31:24

4GHz to 10GHz

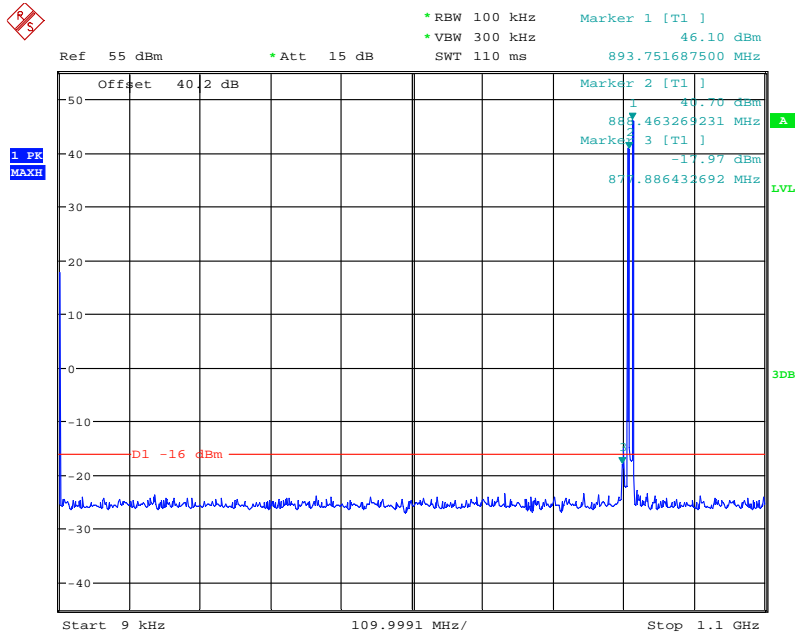


Date: 7.MAR.2014 10:30:18



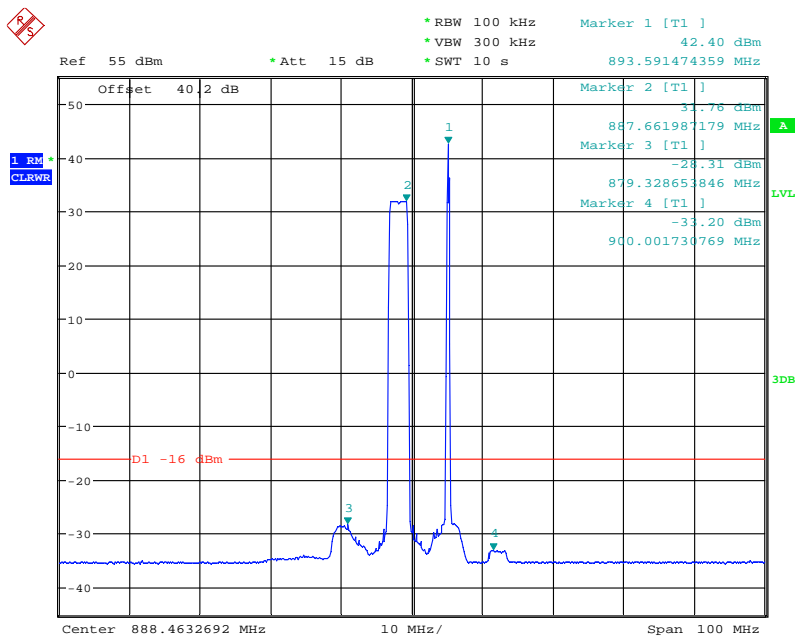
Configuration 1 - Mode 3 - L1.4&G

9kHz to 1.1GHz



Date: 6.MAR.2014 13:22:56

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



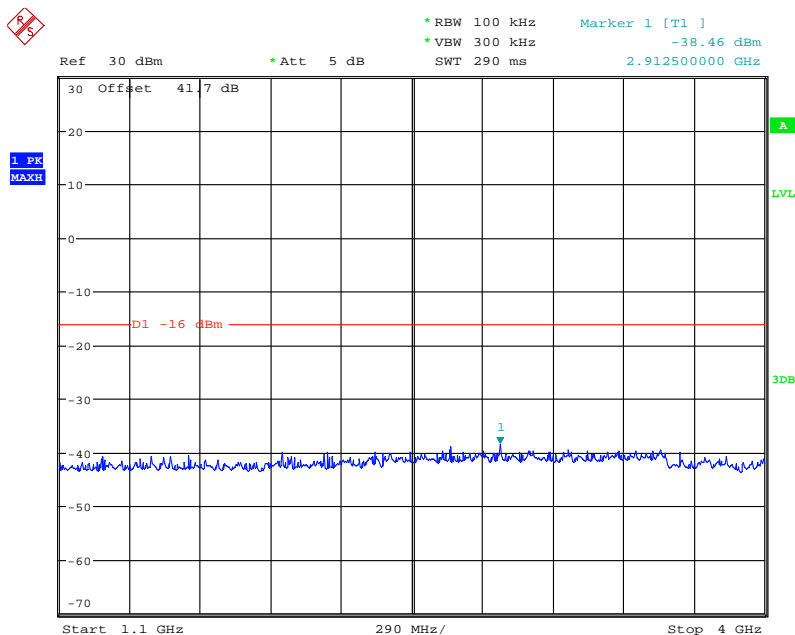
Date: 6.MAR.2014 13:23:59

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



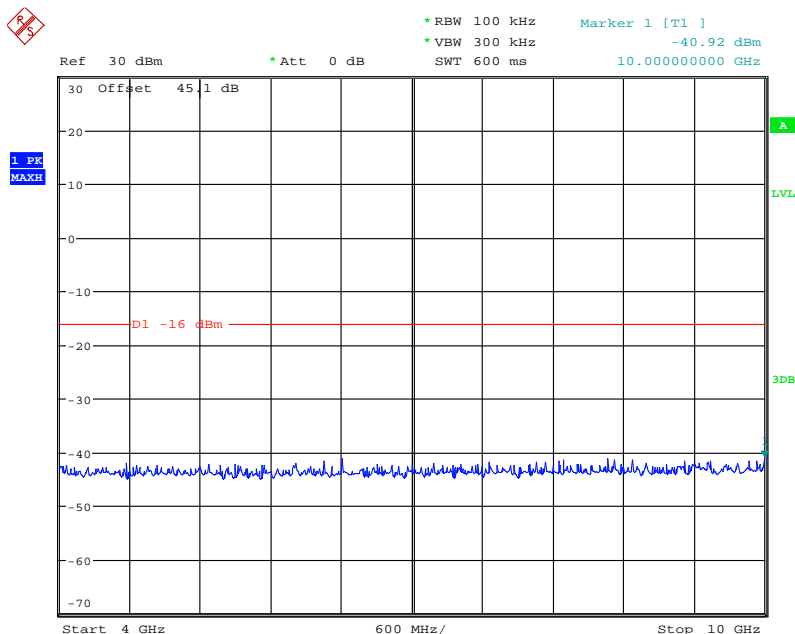
Product Service

1.1GHz to 4GHz



Date: 6.MAR.2014 13:25:38

4GHz to 10GHz



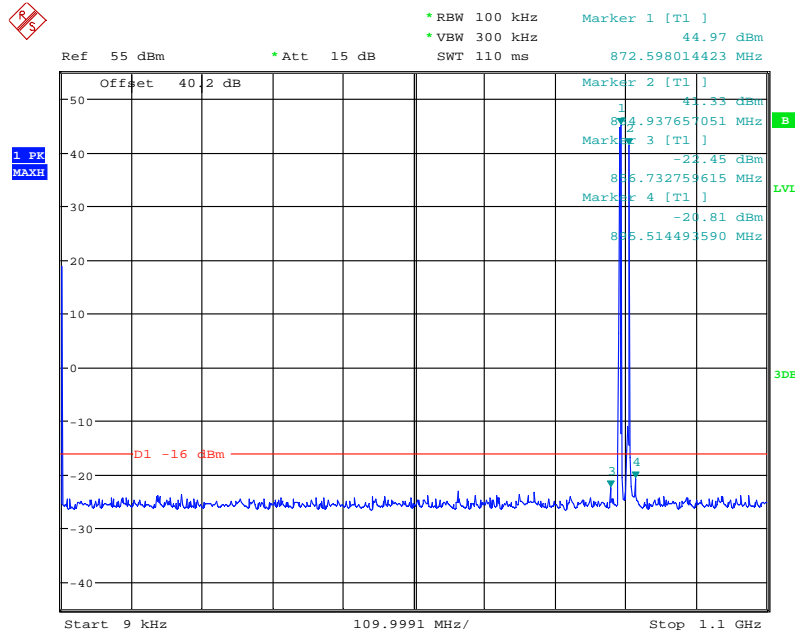
Date: 6.MAR.2014 13:21:13



Mix Carrier(x3): 2G+1L

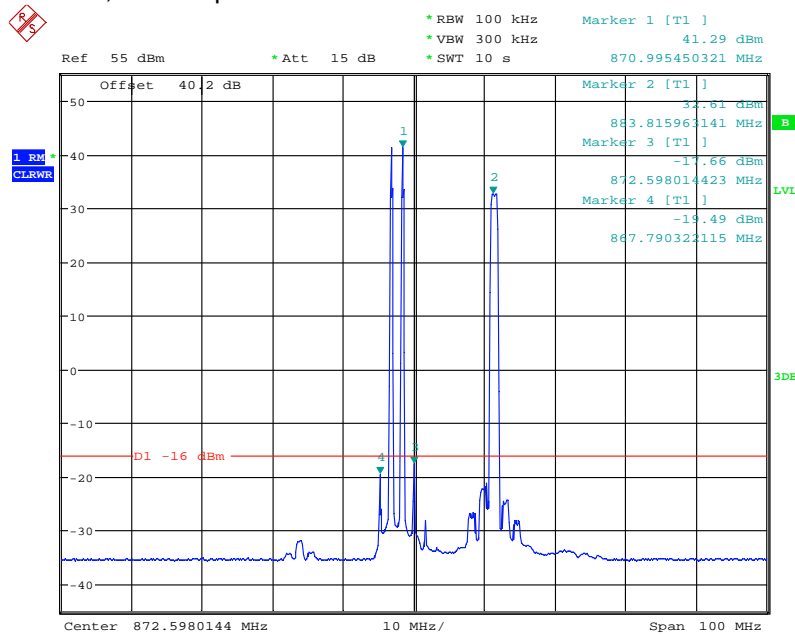
Configuration 1 - Mode 4 - G&G&L1.4

9kHz to 1.1GHz



Date: 10.MAR.2014 10:13:46

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



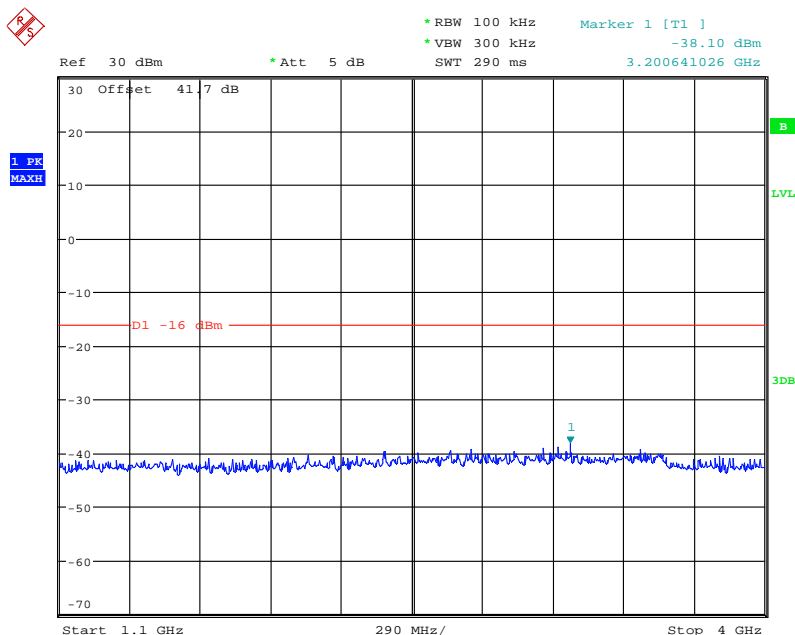
Date: 10.MAR.2014 10:14:57

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



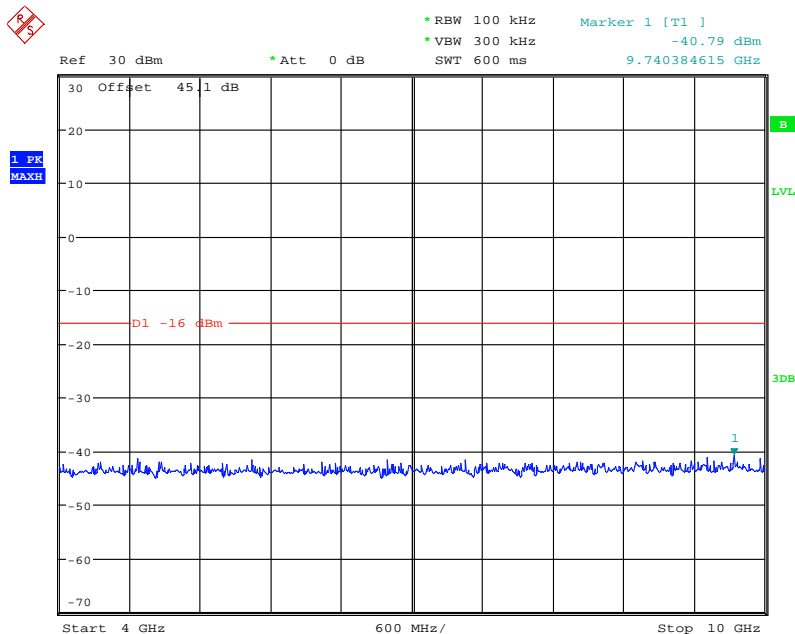
Product Service

1.1GHz to 4GHz



Date: 7.MAR.2014 17:18:20

4GHz to 10GHz

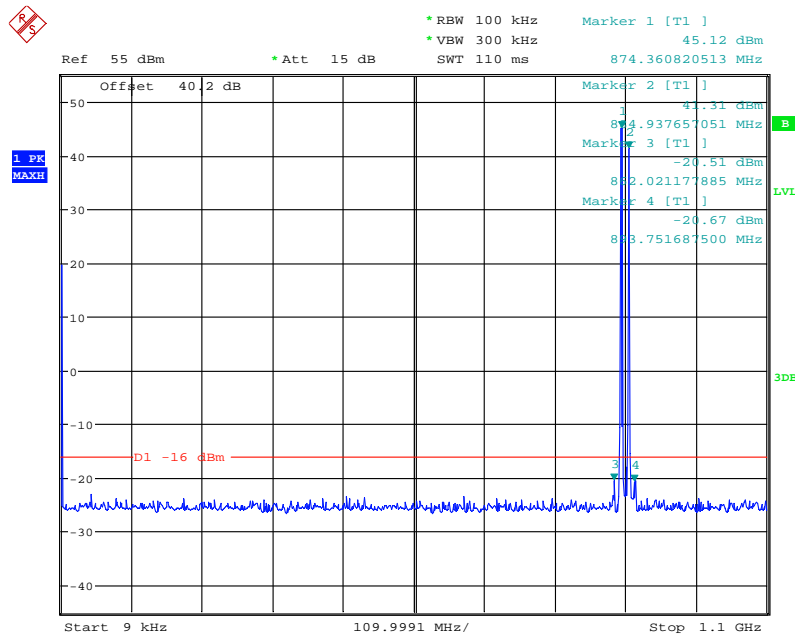


Date: 10.MAR.2014 10:17:52



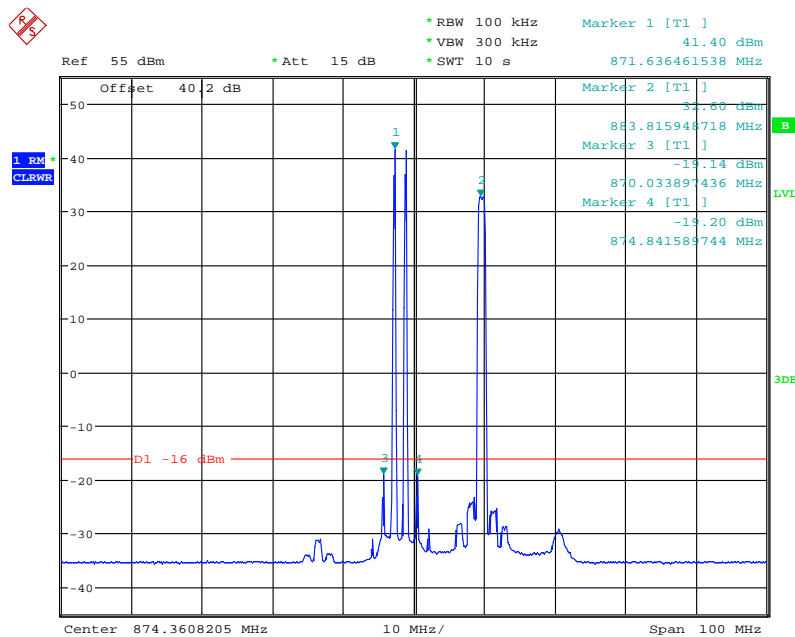
Configuration 1 - Mode 5 - G&G L1.4

9kHz to 1.1GHz



Date: 12.MAR.2014 13:17:17

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

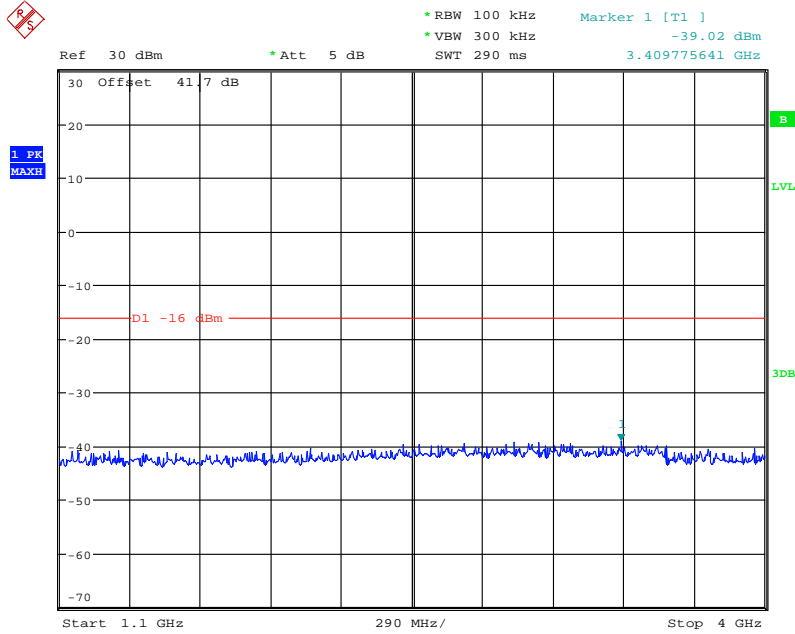


Date: 12.MAR.2014 13:19:27

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

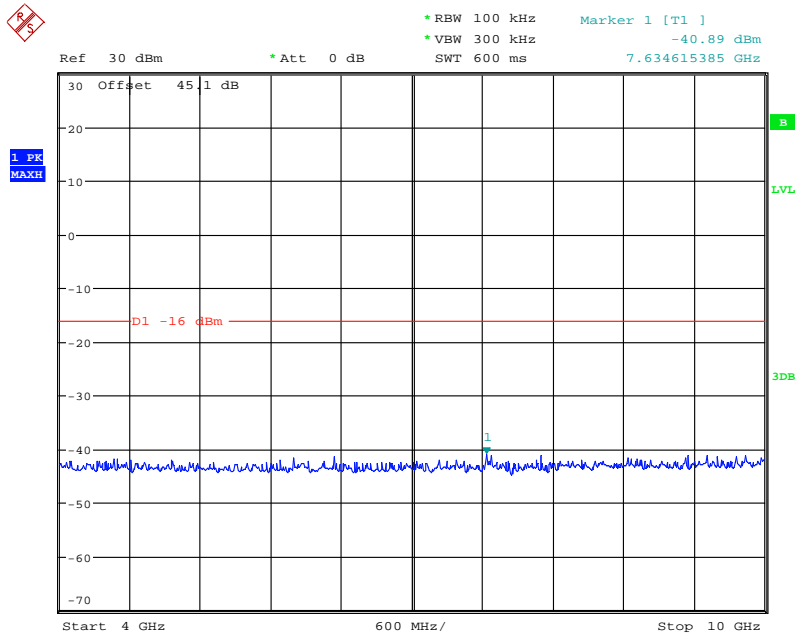


1.1GHz to 4GHz



Date: 12.MAR.2014 17:09:19

4GHz to 10GHz

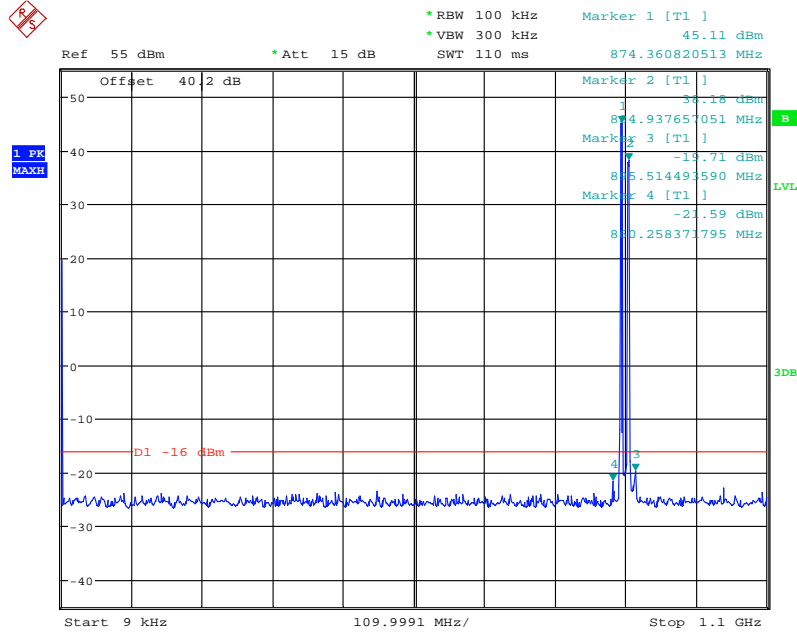


Date: 12.MAR.2014 13:22:14



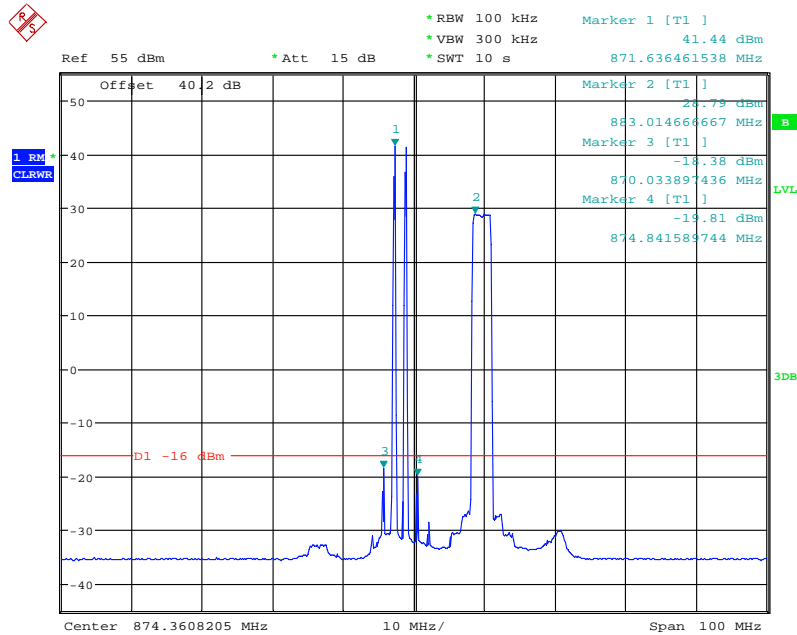
Configuration 1 - Mode 5 - G&G&L3

9kHz to 1.1GHz



Date: 12.MAR.2014 13:28:18

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



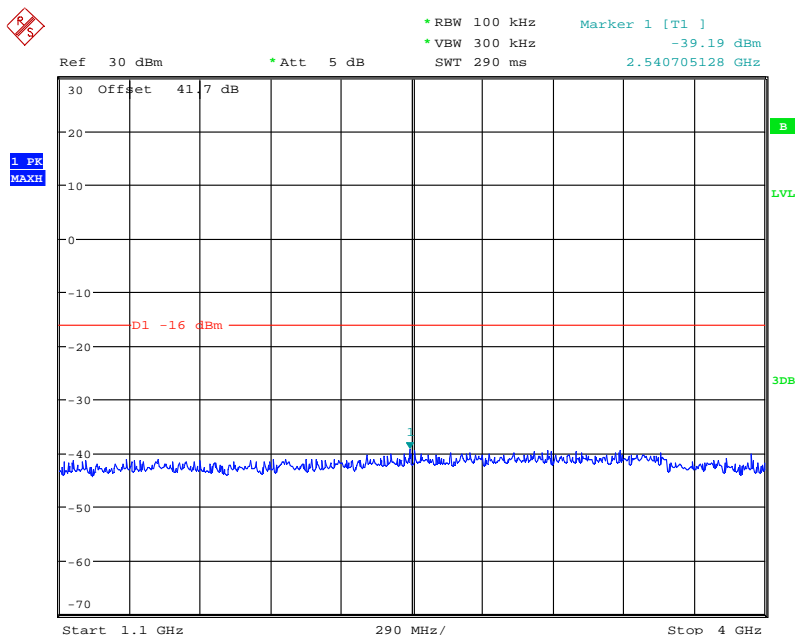
Date: 12.MAR.2014 13:29:03

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



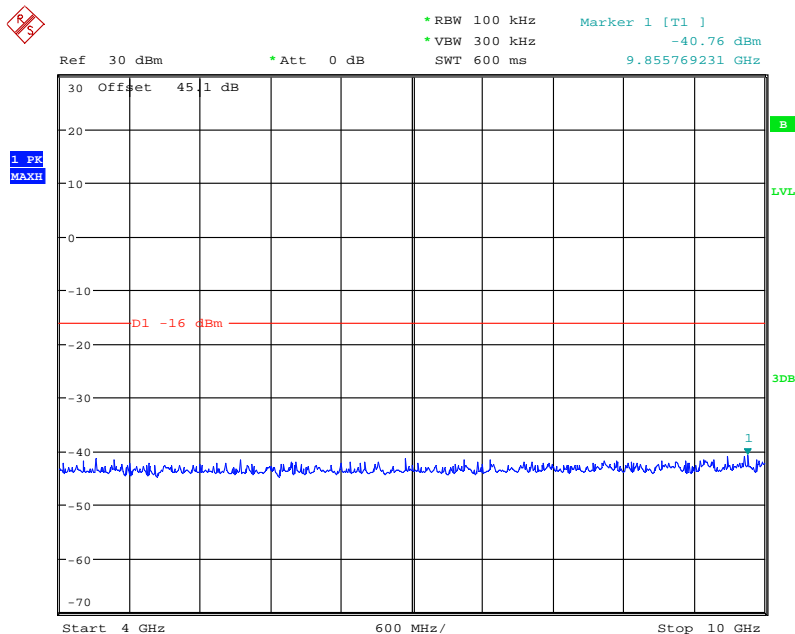
Product Service

1.1GHz to 4GHz



Date: 12.MAR.2014 17:08:30

4GHz to 10GHz



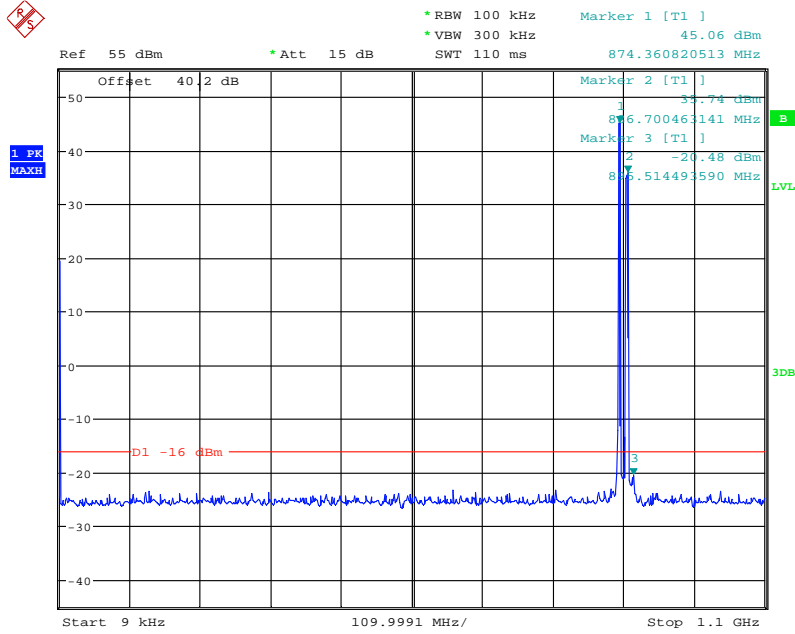
Date: 12.MAR.2014 13:26:08



Product Service

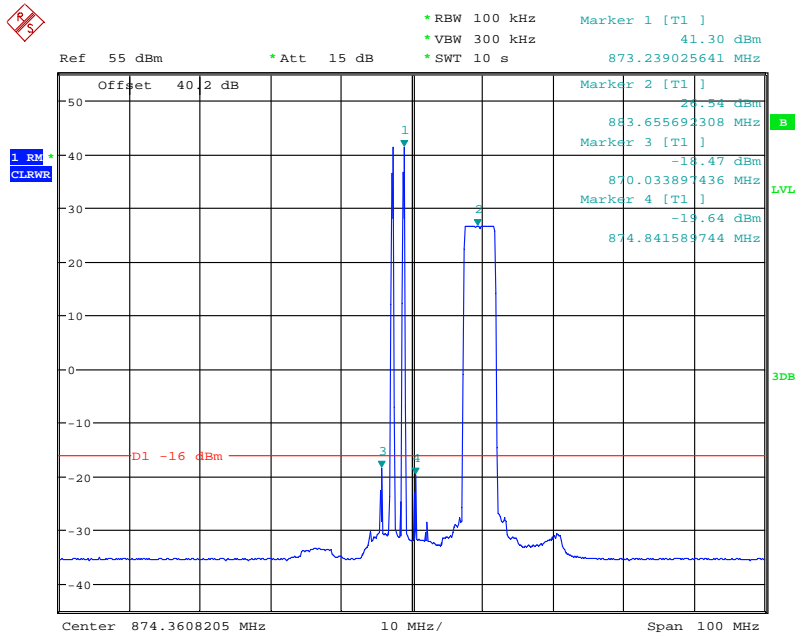
Configuration 1 - Mode 5 - G&G&L5

9kHz to 1.1GHz



Date: 12.MAR.2014 13:35:05

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

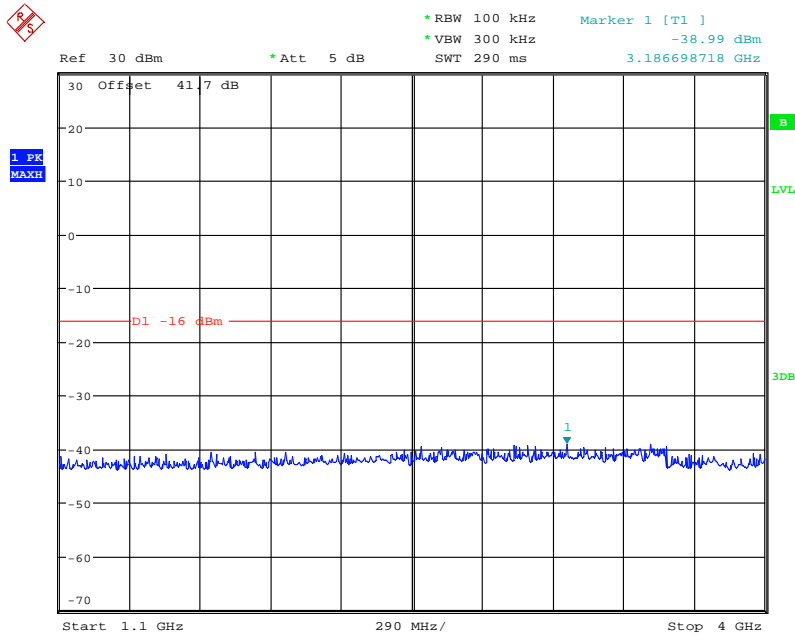


Date: 12.MAR.2014 13:36:01

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

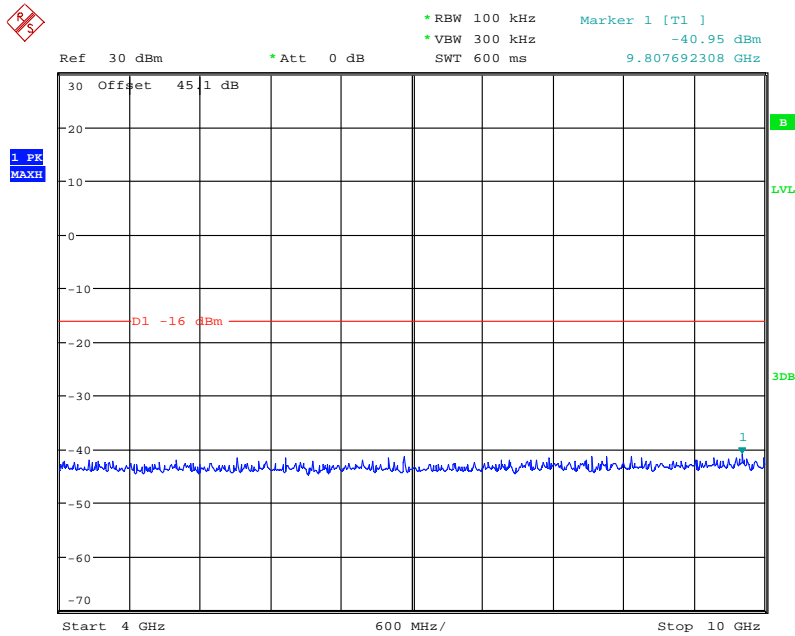


1.1GHz to 4GHz



Date: 12.MAR.2014 17:08:04

4GHz to 10GHz

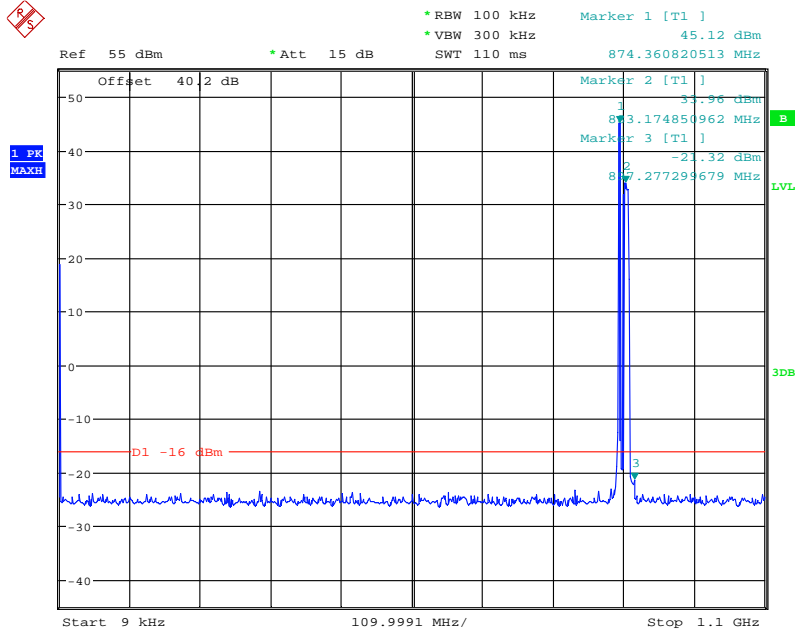


Date: 12.MAR.2014 13:37:25



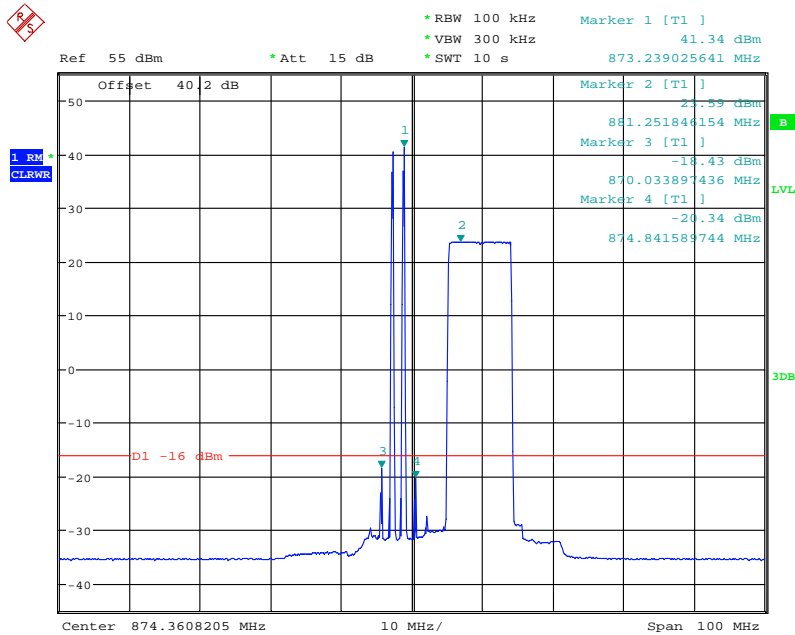
Configuration 1 - Mode 5 - G&G&L10

9kHz to 1.1GHz



Date: 12.MAR.2014 13:54:03

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

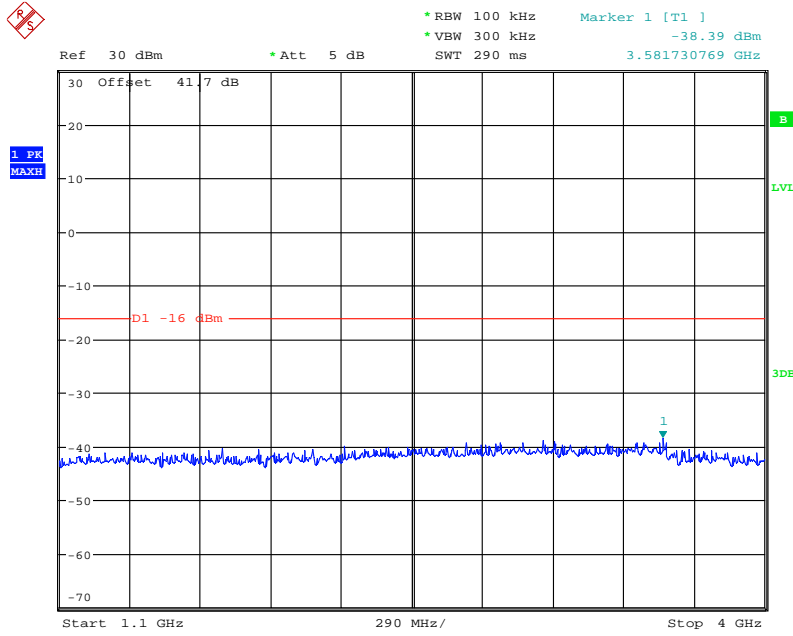


Date: 12.MAR.2014 13:56:24

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

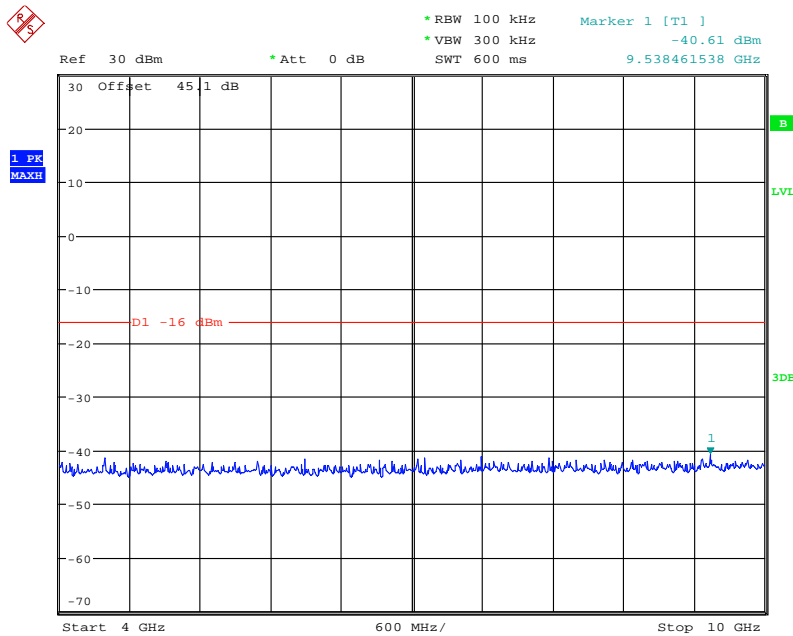


1.1GHz to 4GHz



Date: 12.MAR.2014 17:07:31

4GHz to 10GHz

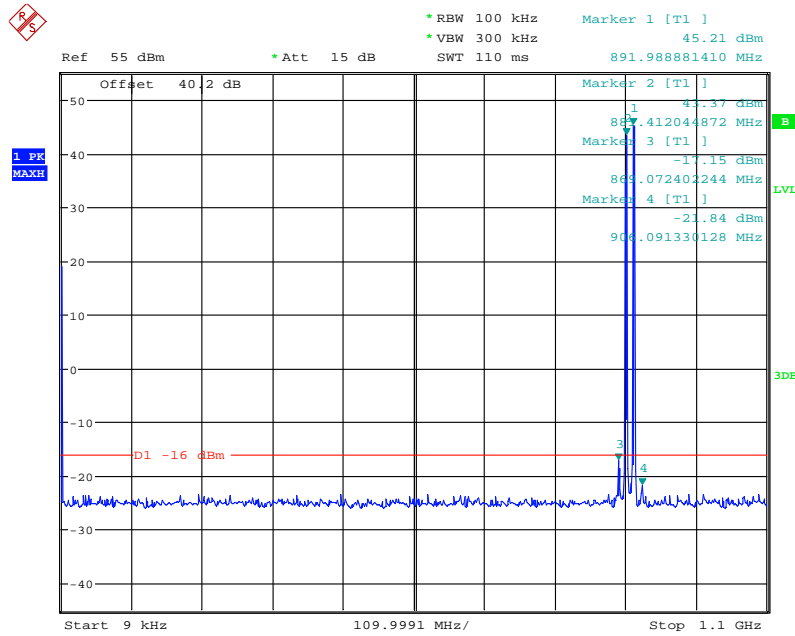


Date: 12.MAR.2014 13:52:18



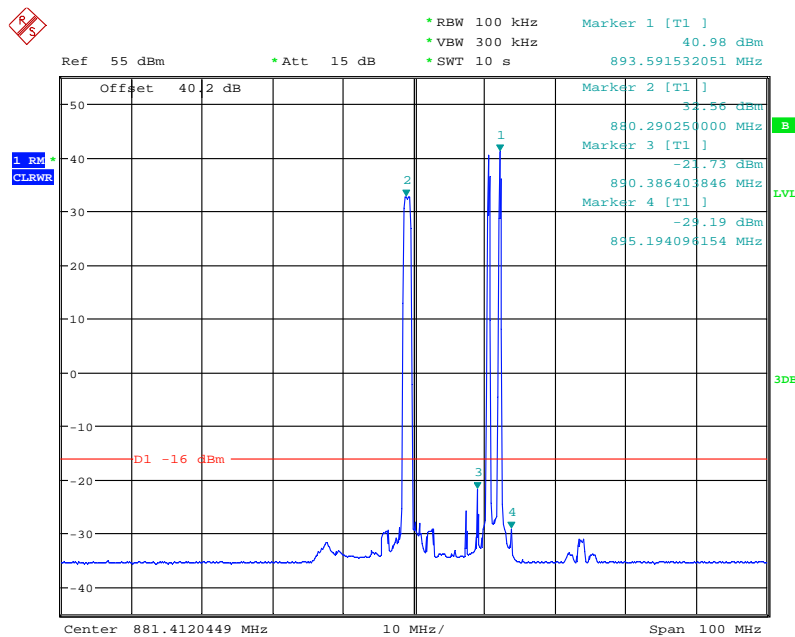
Configuration 1 - Mode 6 - L1.4&G&G

9kHz to 1.1GHz



Date: 10.MAR.2014 15:08:40

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

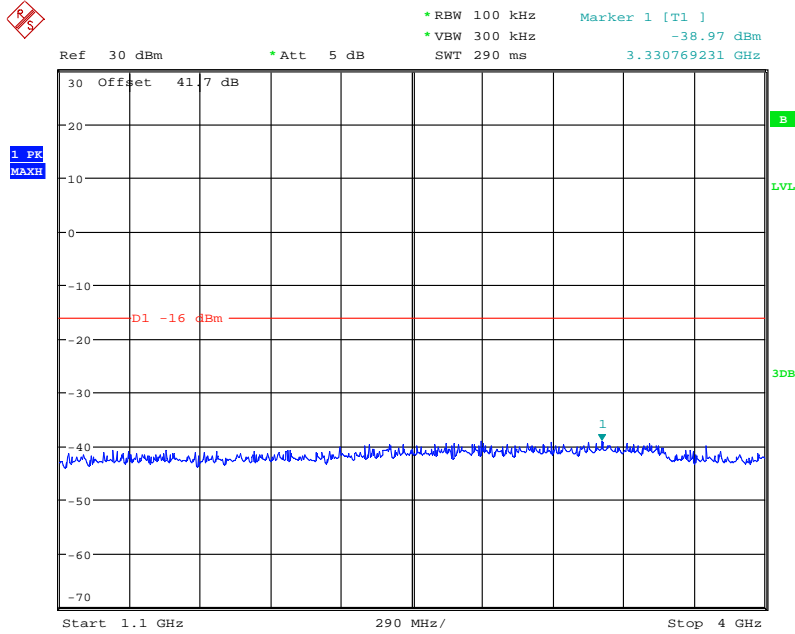


Date: 10.MAR.2014 15:12:39

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

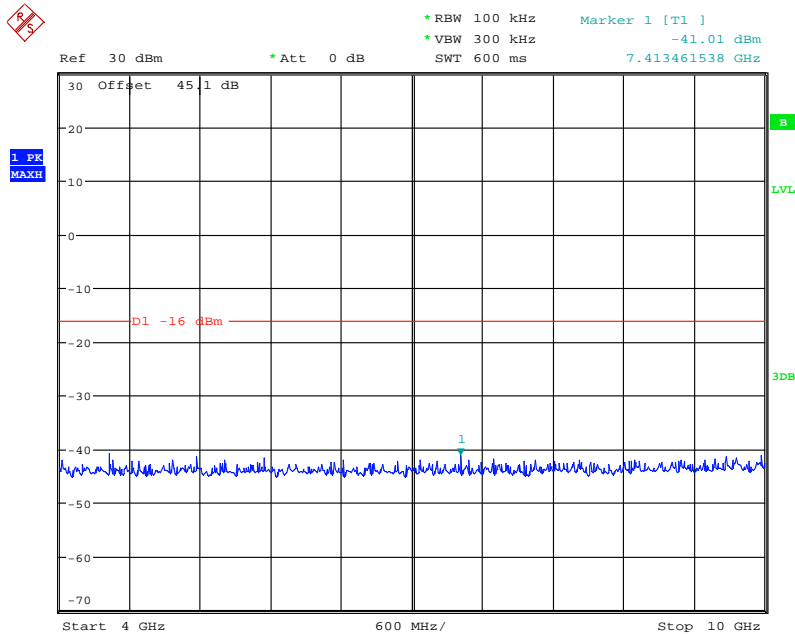


1.1GHz to 4GHz



Date: 10.MAR.2014 17:28:48

4GHz to 10GHz



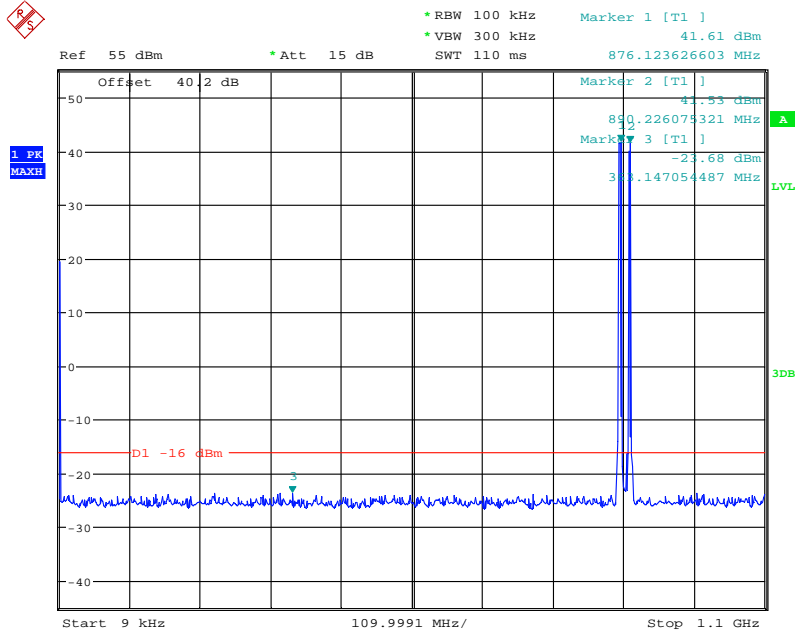
Date: 10.MAR.2014 15:14:00



Mix Carrier(x4): 3G+1L

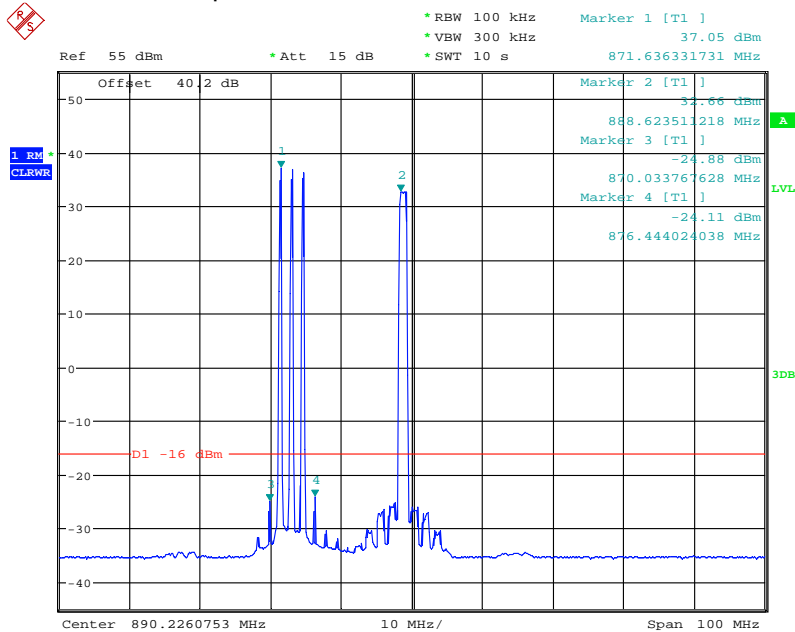
Configuration 1 - Mode 7 - G&G&G&L1.4

9kHz to 1.1GHz



Date: 18.MAR.2014 15:04:48

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



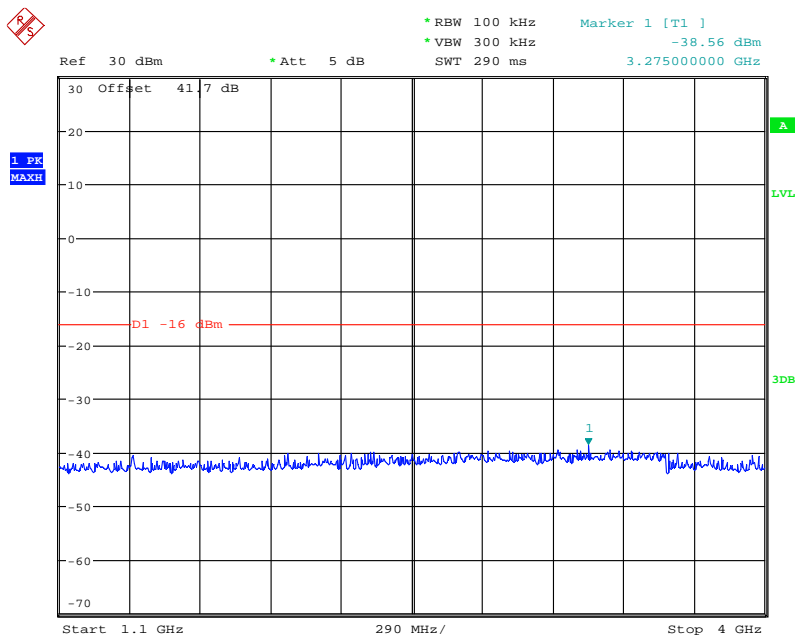
Date: 18.MAR.2014 15:05:28

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



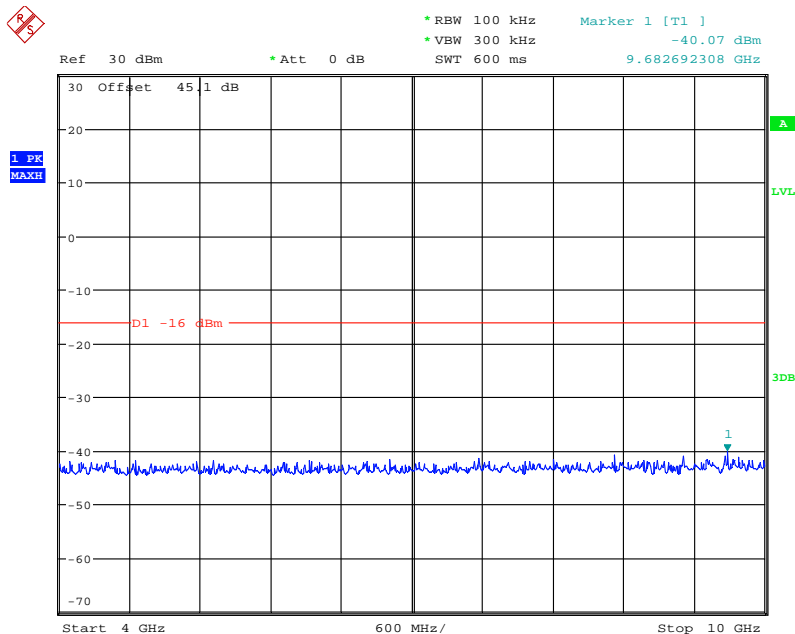
Product Service

1.1GHz to 4GHz



Date: 18.MAR.2014 15:30:41

4GHz to 10GHz



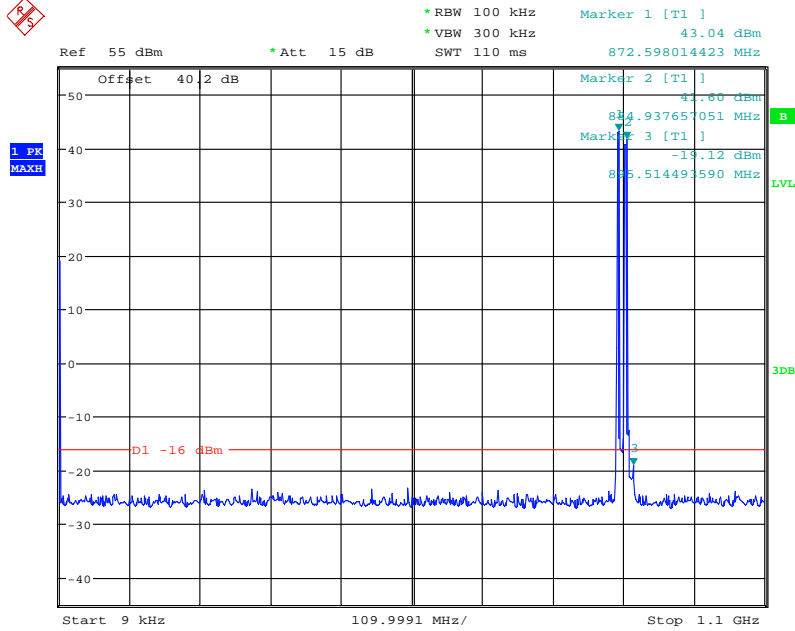
Date: 18.MAR.2014 15:07:30



Mix Carrier(x4): 2G+2L

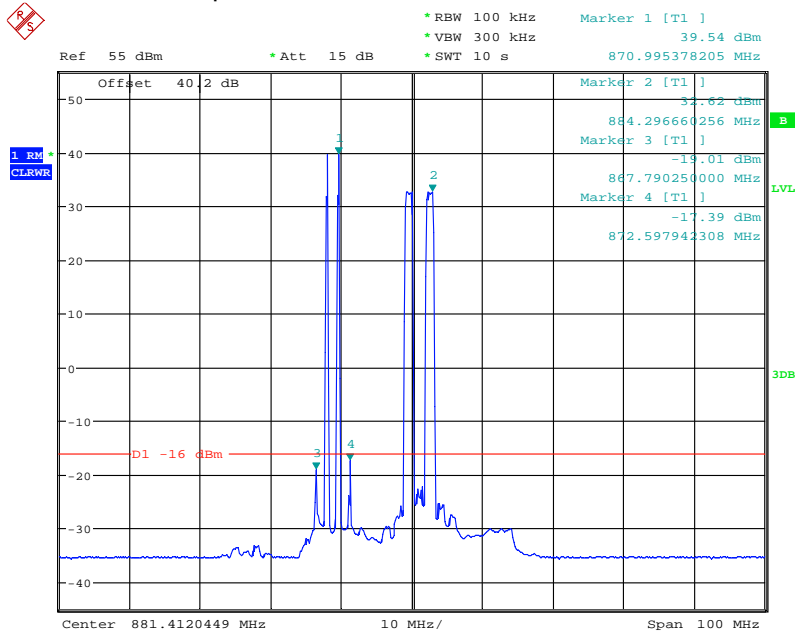
Configuration 1 - Mode 8 - G&G&L1.4&L1.4

9kHz to 1.1GHz



Date: 12.MAR.2014 16:10:38

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

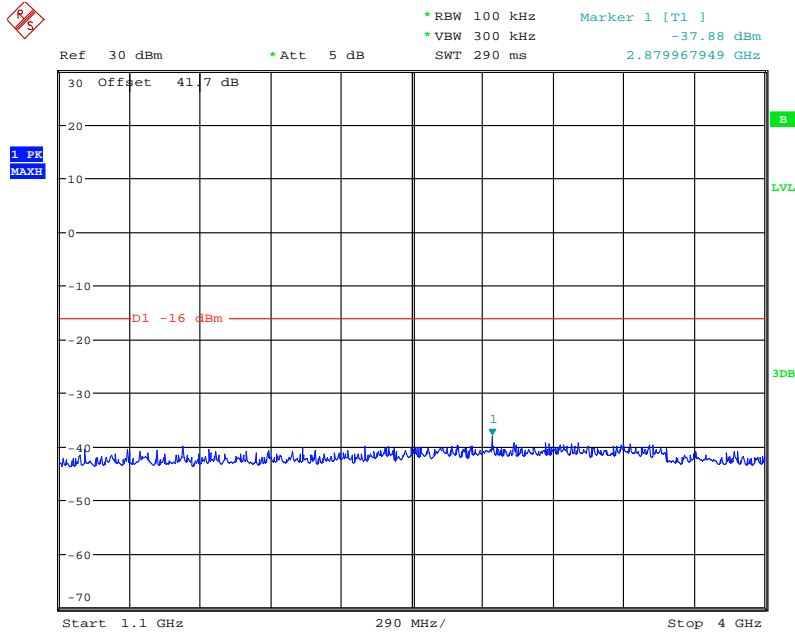


Date: 12.MAR.2014 16:20:43

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

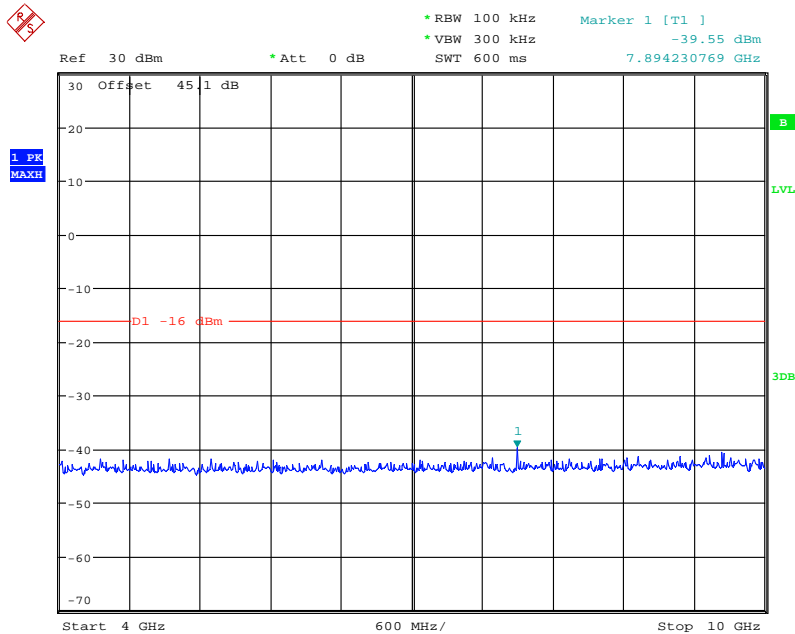


1.1GHz to 4GHz



Date: 12.MAR.2014 17:06:16

4GHz to 10GHz



Date: 12.MAR.2014 16:23:55

Remarks

The EUT does not exceed -16dBm at the frequency range of 9kHz to 10GHz.



Product Service

2.6 RECEIVER SPURIOUS EMISSIONS

2.6.1 Specification Reference

FCC CFR 47 Part 15, Clause 15.111

2.6.2 Equipment Under Test

RUS 01 B5 / KRC 118 64/3, S/N: D168263201

2.6.3 Date of Test and Modification State

13 March 2014 – Modification State 0

2.6.4 Test Equipment Used

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

2.6.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 15.

In accordance with FCC CFR 47 Part 15 Clause 15.111, the receiver spurious emissions from the antenna terminal were measured. Measurements were performed on the receiver antenna connector RF B1. The EUT was set to transmitter mode on the TX connector RF A1 and during the measurement the RF A1 was terminated with match load, (50 Ohm).

The resolution was set to 1MHz in the frequency range 9kHz to 10GHz. The spectrum analyzer detector was set to peak and trace was kept on Max Hold to give the worst case. The limit line that apply is -57dBm, 2 nanowatts in band 9kHz to 10GHz.

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

Measurements were made from 9kHz up to at least 5th harmonic 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 - G&L1.4
- Mode 2 - G&L1.4
- Mode 3 - L1.4&G



Product Service

2.6.6 Environmental Conditions

Ambient Temperature 22.6°C

Relative Humidity 27.5%

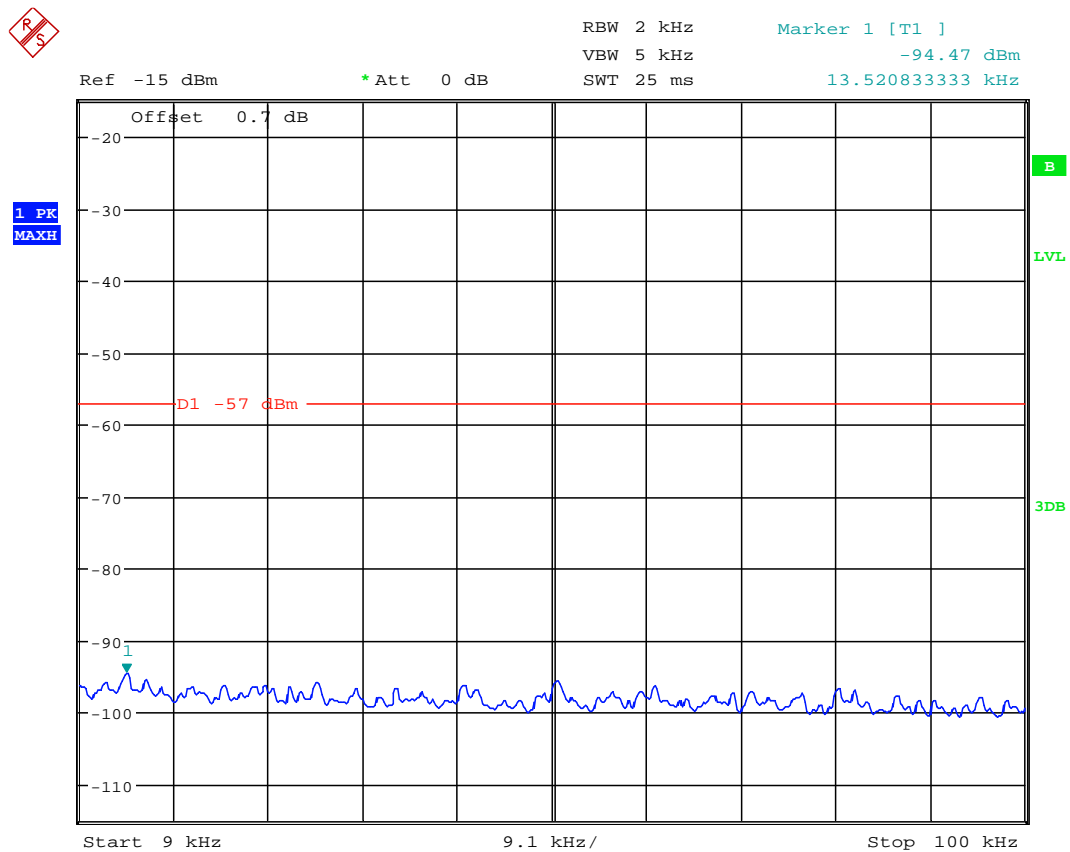
2.6.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15 for Receiver 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.



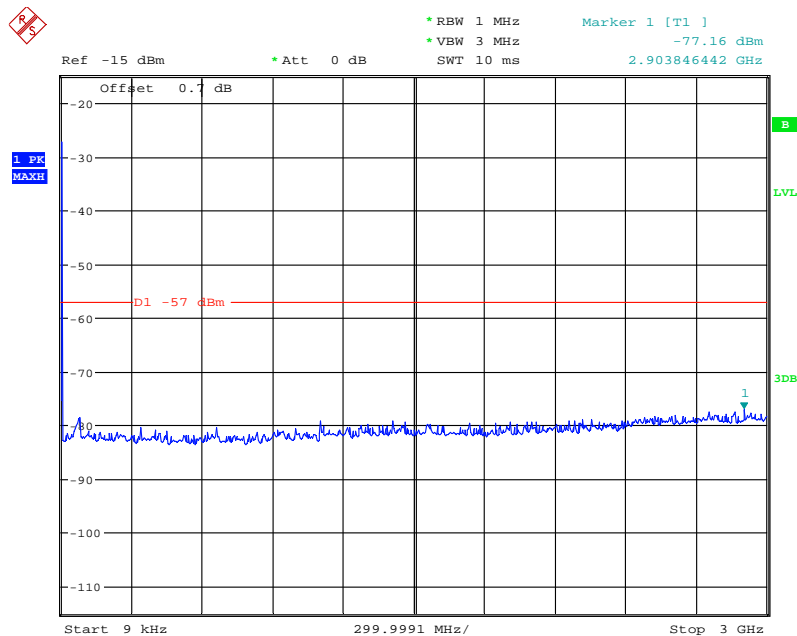
Date: 13.MAR.2014 15:13:29



Product Service

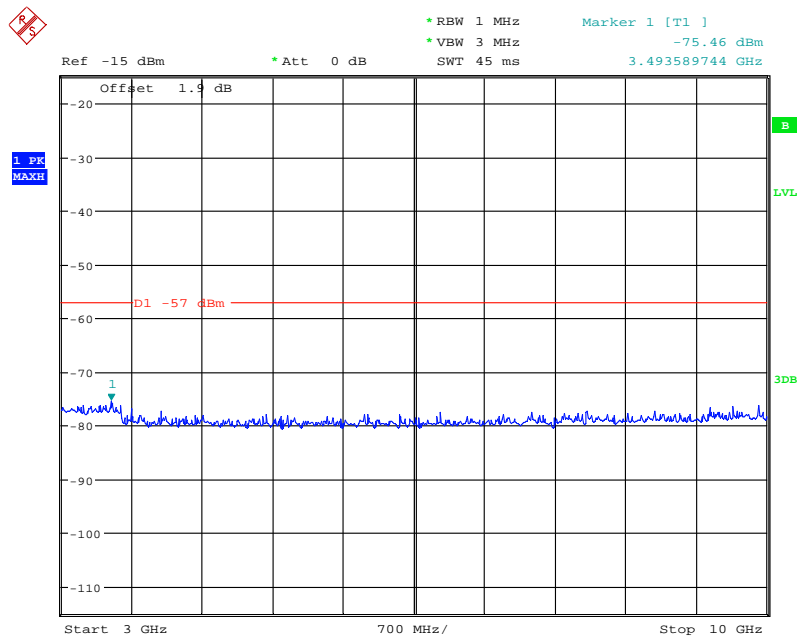
Configuration 1 - Mode 1 - G&L1.4

9kHz to 3GHz



Date: 13.MAR.2014 15:12:20

3GHz to 10GHz



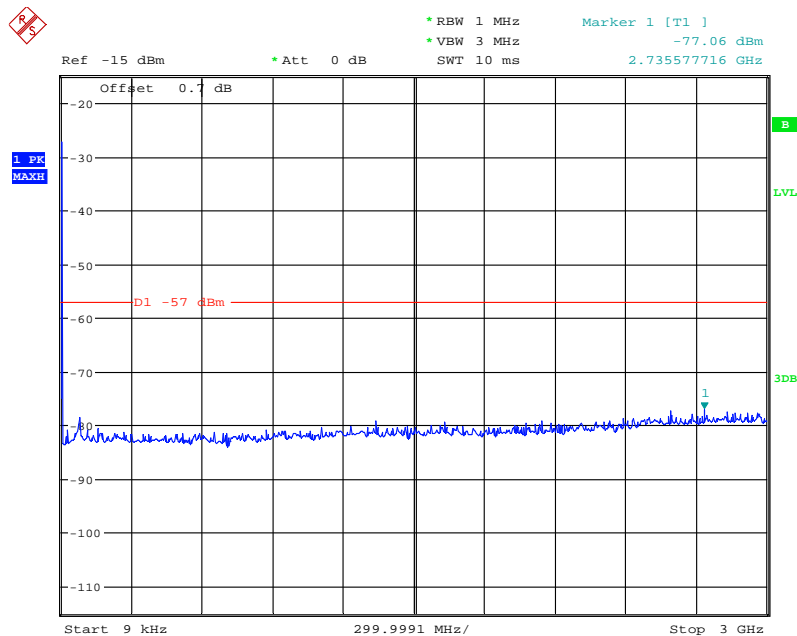
Date: 13.MAR.2014 15:14:55



Product Service

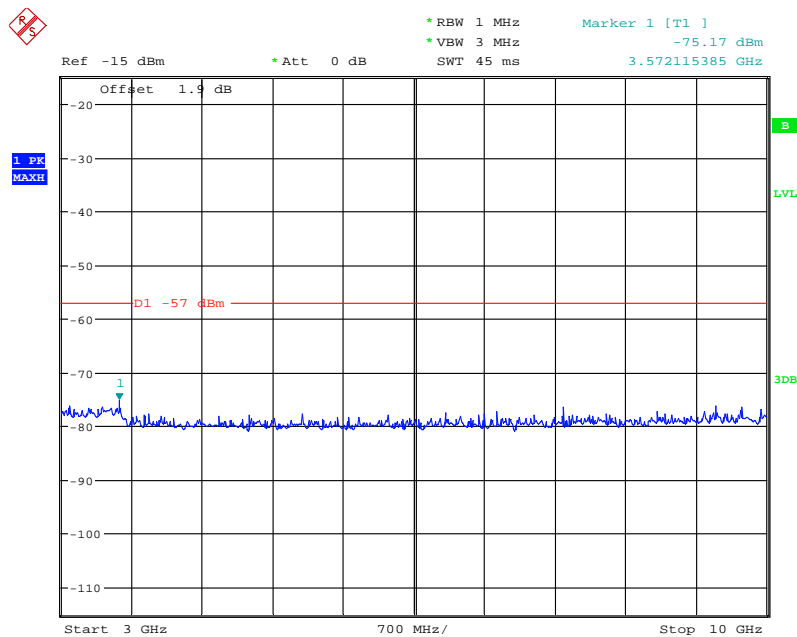
Configuration 1 - Mode 2 - G&L1.4

9kHz to 3GHz



Date: 13.MAR.2014 15:22:08

3GHz to 10GHz



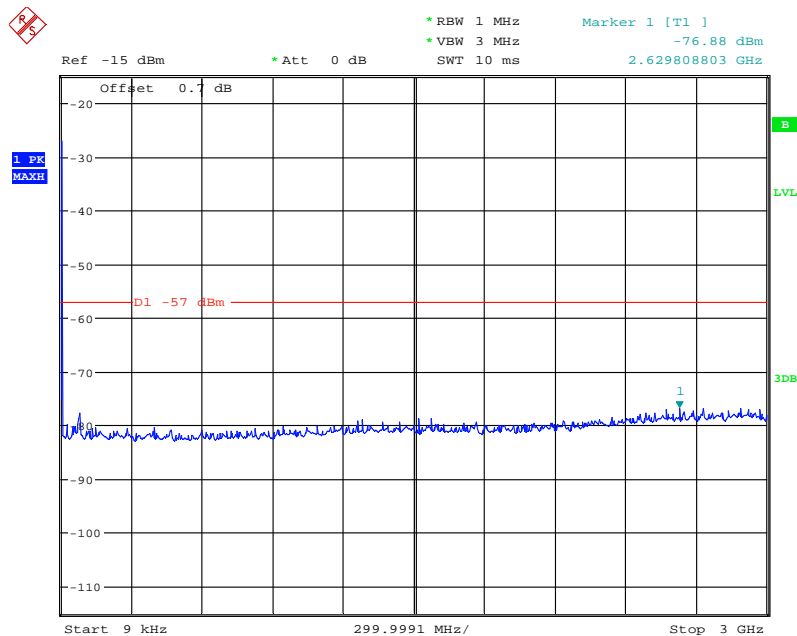
Date: 13.MAR.2014 15:21:27



Product Service

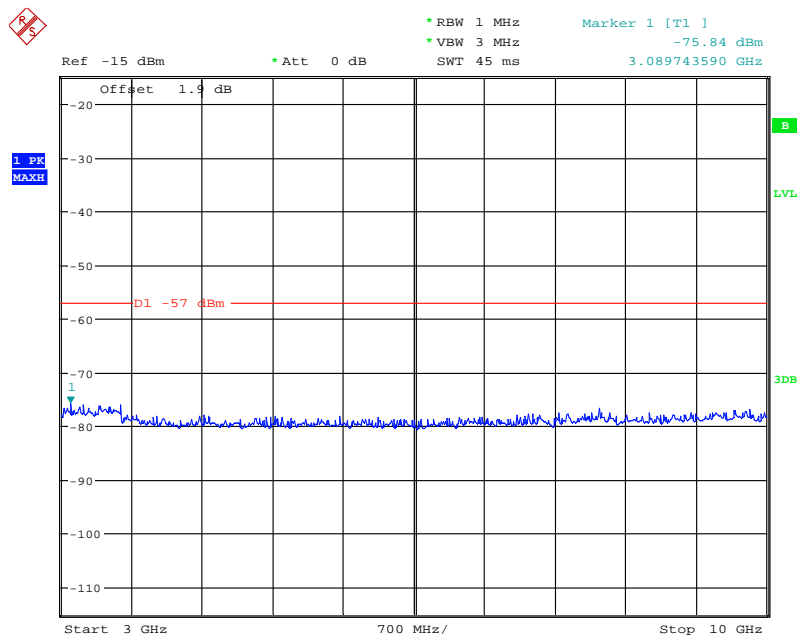
Configuration 1 - Mode 3 - L1.4&G

9kHz to 3GHz



Date: 13.MAR.2014 16:30:00

3GHz to 10GHz



Date: 13.MAR.2014 16:30:47



Product Service

Limit

Receiver spurious emissions shall not exceed -57dBm / 2 nanowatts in the band 9kHz to 10GHz.

Remarks

The EUT does not exceed the limit at the frequency range of 9kHz to 10GHz.



Product Service

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, 2.5, 2.6 – Maximum Conducted Output Power, Peak – Average Ratio, Spurious Emissions at Antenna Terminals (± 1MHz), Conducted Spurious Emissions and Receiver Spurious Emissions. | | | | | |
| Spectrum Analyzer | Rohde & Schwarz | FSQ26 | 100253 | 12 | 04-Aug-2014 |
| Power Meter | Rohde & Schwarz | NRP | 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 | 66-40-43 | CE6211 | - | 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 | 090323194 | - | O/P MON |
| Load | Shanghai Huaxiang | TFE5-3 | 090323220 | - | O/P MON |
| Power Supply | Dahua | DH1716-5D | 2008040041 | - | O/P MON |
| Power Supply | Dahua | DH1716A-10 | ETQ-123 | - | O/P MON |
| Digital Multi-meter | FLUKE | 179 | 91820401 | 12 | 24-Dec-2014 |
| Thermo-hygrometer | AZ Instruments | 8705 | 9151665 | 12 | 12-Dec-2014 |



Product Service

| Instrument | Manufacturer | Type No. | Serial No. | Calibration Period (months) | Calibration Due |
|--|-------------------|------------------------|------------|-----------------------------|-----------------|
| 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 | 090323194 | - | O/P MON |
| Load | Shanghai Huaxiang | TFE5-3 | 090323220 | - | O/P MON |
| EMI Receiver | Rohde & Schwarz | ESIB26 | 100301 | 12 | 27-Mar-2015 |
| BiLog Antenna | Rohde & Schwarz | HL562 | 100488 | 12 | 15-Feb-2015 |
| Double Ridge Guide Horn Antenna | ETS-Lindgren | EMCO 3117 | 00056645 | 12 | 15-Feb-2015 |
| Double Ridge Guide Horn Antenna | ETS-Lindgren | EMCO 3117 | 00056662 | 12 | 15-Feb-2015 |
| Semi Anechoic Chamber | ETS-Lindgren | 9.6m×6.72m×5.98m | - | 12 | 18-Mar-2015 |
| 30MHz~3GHz Pre-amplifier | Rohde & Schwarz | SCU03 | 10005 | - | O/P MON |
| 3GHz~18GHz Pre-amplifier | Rohde & Schwarz | AFS42-00101800-25-S-42 | 1078388 | | O/P MON |
| Filters Array | Rohde & Schwarz | TS-Filt | - | - | O/P MON |
| Switches Array | Rohde & Schwarz | TS-RSP | 100241 | - | O/P MON |
| Multi-Device Controller | ETS-Lindgren | 2090 | 00049393 | - | O/P MON |
| Viedo monitoring system | ETS-Lindgren | Y21953A | 2501103 | - | O/P MON |
| Power Supply | Dahua | DH1716-5D | 2008040041 | - | O/P MON |
| Power Supply | Dahua | DH1716A-10 | ETQ-123 | - | O/P MON |
| Digital Multi-meter | FLUKE | 179 | 91820401 | 12 | 24-Dec-2014 |
| Thermo-hygrometer | AZ Instruments | 8705 | 9151665 | 12 | 12-Dec-2014 |

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



Product Service

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



Product Service

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).

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