
**Figure 136 - Core0 (C) 2440 MHz (CH19) 6 dB Bandwidth**


**Figure 137 - Core0 (C) 2480 MHz (CH39) 99% Bandwidth**


**Figure 138 - Core0 (C) 2480 MHz (CH39) 6 dB Bandwidth**

| Test Configuration | | | |
|---|---|---|---|
| Frequency Range: | 2400-2483.5 MHz | Band: | 2.4 GHz |
| Specification Clause(s): | 15.247 (a)(2)<br>RSS-247 5.2 a) | Test Method(s): | C63.10 6.9.3<br>C63.10 11.8.1 |
| Additional Reference(s): | - | | |

| DUT Configuration | | | |
|---|---|---|---|
| Mode: | iPa GFSK (LE 2M) | Duty Cycle (%): | - |
| Antenna Configuration: | SISO | DCCF (dB): | - |
| Active Ports(s): | C (Core0) | Antenna Gain (dBi): | - |

| Test Frequency (MHz) | 6 dB Bandwidth (MHz) | | | | | Limit (kHz) |
|---|---|---|---|---|---|---|
| | A | B | C | D | Minimum | |
| 2402 | - | - | 1.184 | - | 1.184 | ≥500.0 |
| 2440 | - | - | 1.184 | - | 1.184 | ≥500.0 |
| 2480 | - | - | 1.184 | - | 1.184 | ≥500.0 |

**Table 102 - 6 dB Bandwidth Results**

| Test Frequency (MHz) | 99% Bandwidth (MHz) | | | | | Limit (kHz) |
|---|---|---|---|---|---|---|
| | A | B | C | D | Minimum | |
| 2402 | - | - | 2.048 | - | 2.048 | - |
| 2440 | - | - | 2.056 | - | 2.056 | - |
| 2480 | - | - | 2.056 | - | 2.056 | - |

**Table 103 - 99% Bandwidth Results**


**Figure 139 - Core0 (C) 2402 MHz (CH0) 99% Bandwidth**


**Figure 140 - Core0 (C) 2402 MHz (CH0) 6 dB Bandwidth**


**Figure 141 - Core0 (C) 2440 MHz (CH19) 99% Bandwidth**


**Figure 142 - Core0 (C) 2440 MHz (CH19) 6 dB Bandwidth**


**Figure 143 - Core0 (C) 2480 MHz (CH39) 99% Bandwidth**

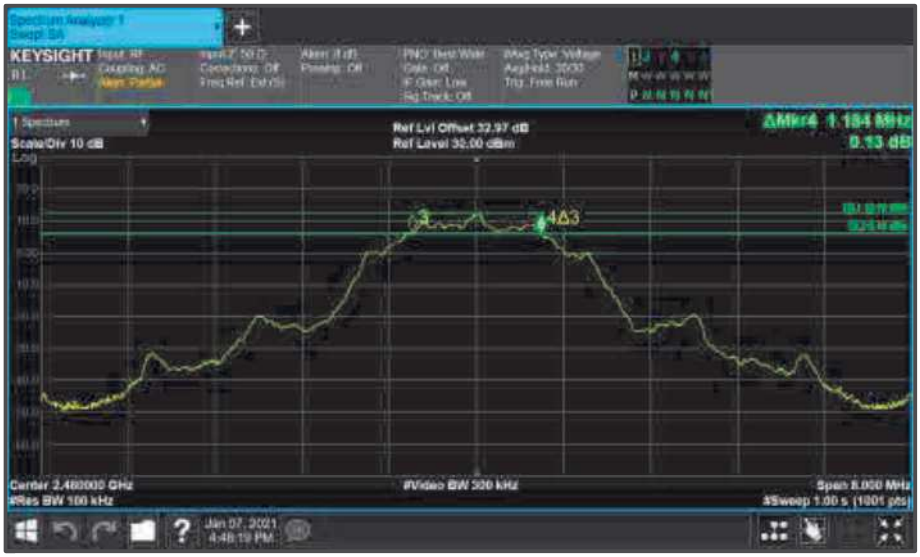


**Figure 144 - Core0 (C) 2480 MHz (CH39) 6 dB Bandwidth**

| Test Configuration | | | |
|---|---|---|---|
| Frequency Range: | 2400-2483.5 MHz | Band: | 2.4 GHz |
| Specification Clause(s): | 15.247 (a)(2)<br>RSS-247 5.2 a) | Test Method(s): | C63.10 6.9.3<br>C63.10 11.8.1 |
| Additional Reference(s): | - | | |

| DUT Configuration | | | |
|---|---|---|---|
| Mode: | iPa GFSK (LE 1M) | Duty Cycle (%): | - |
| Antenna Configuration: | Beamforming | DCCF (dB): | - |
| Active Ports(s): | B+C (Core1 + Core0) | Antenna Gain (dBi): | - |

| Test Frequency (MHz) | 6 dB Bandwidth (MHz) | | | | | Limit (kHz) |
|---|---|---|---|---|---|---|
| | A | B | C | D | Minimum | |
| 2402 | - | 0.684 | 0.700 | - | 0.684 | ≥500.0 |
| 2440 | - | 0.688 | 0.700 | - | 0.688 | ≥500.0 |
| 2480 | - | 0.692 | 0.716 | - | 0.692 | ≥500.0 |

**Table 104 - 6 dB Bandwidth Results**

| Test Frequency (MHz) | 99% Bandwidth (MHz) | | | | | Limit (kHz) |
|---|---|---|---|---|---|---|
| | A | B | C | D | Minimum | |
| 2402 | - | 1.040 | 1.032 | - | 1.032 | - |
| 2440 | - | 1.036 | 1.036 | - | 1.036 | - |
| 2480 | - | 1.040 | 1.036 | - | 1.036 | - |

**Table 105 - 99% Bandwidth Results**


**Figure 145 - Core1 (B) 2402 MHz (CH0) 99% Bandwidth**


**Figure 146 - Core1 (B) 2402 MHz (CH0) 6 dB Bandwidth**


**Figure 147 - Core0 (C) 2402 MHz (CH0) 99% Bandwidth**


**Figure 148 - Core0 (C) 2402 MHz (CH0) 6 dB Bandwidth**


**Figure 149 - Core1 (B) 2440 MHz (CH19) 99% Bandwidth**


**Figure 150 - Core1 (B) 2440 MHz (CH19) 6 dB Bandwidth**


**Figure 151 - Core0 (C) 2440 MHz (CH19) 99% Bandwidth**


**Figure 152 - Core0 (C) 2440 MHz (CH19) 6 dB Bandwidth**


**Figure 153 - Core1 (B) 2480 MHz (CH39) 99% Bandwidth**


**Figure 154 - Core1 (B) 2480 MHz (CH39) 6 dB Bandwidth**


**Figure 155 - Core0 (C) 2480 MHz (CH39) 99% Bandwidth**


**Figure 156 - Core0 (C) 2480 MHz (CH39) 6 dB Bandwidth**

| Test Configuration | | | |
|---|---|---|---|
| Frequency Range: | 2400-2483.5 MHz | Band: | 2.4 GHz |
| Specification Clause(s): | 15.247 (a)(2)<br>RSS-247 5.2 a) | Test Method(s): | C63.10 6.9.3<br>C63.10 11.8.1 |
| Additional Reference(s): | - | | |

| DUT Configuration | | | |
|---|---|---|---|
| Mode: | iPa GFSK (LE 2M) | Duty Cycle (%): | - |
| Antenna Configuration: | Beamforming | DCCF (dB): | - |
| Active Ports(s): | B+C (Core1 + Core0) | Antenna Gain (dBi): | - |

| Test Frequency (MHz) | 6 dB Bandwidth (MHz) | | | | | Limit (kHz) |
|---|---|---|---|---|---|---|
| | A | B | C | D | Minimum | |
| 2402 | - | 1.184 | 1.184 | - | 1.184 | ≥500.0 |
| 2440 | - | 1.184 | 1.184 | - | 1.184 | ≥500.0 |
| 2480 | - | 1.184 | 1.184 | - | 1.184 | ≥500.0 |

**Table 106 - 6 dB Bandwidth Results**

| Test Frequency (MHz) | 99% Bandwidth (MHz) | | | | | Limit (kHz) |
|---|---|---|---|---|---|---|
| | A | B | C | D | Minimum | |
| 2402 | - | 2.048 | 2.048 | - | 2.048 | - |
| 2440 | - | 2.048 | 2.048 | - | 2.048 | - |
| 2480 | - | 2.056 | 2.056 | - | 2.056 | - |

**Table 107 - 99% Bandwidth Results**


**Figure 157 - Core1 (B) 2402 MHz (CH0) 99% Bandwidth**


**Figure 158 - Core1 (B) 2402 MHz (CH0) 6 dB Bandwidth**


**Figure 159 - Core0 (C) 2402 MHz (CH0) 99% Bandwidth**


**Figure 160 - Core0 (C) 2402 MHz (CH0) 6 dB Bandwidth**


**Figure 161 - Core1 (B) 2440 MHz (CH19) 99% Bandwidth**


**Figure 162 - Core1 (B) 2440 MHz (CH19) 6 dB Bandwidth**


**Figure 163 - Core0 (C) 2440 MHz (CH19) 99% Bandwidth**


**Figure 164 - Core0 (C) 2440 MHz (CH19) 6 dB Bandwidth**


**Figure 165 - Core1 (B) 2480 MHz (CH39) 99% Bandwidth**


**Figure 166 - Core1 (B) 2480 MHz (CH39) 6 dB Bandwidth**


**Figure 167 - Core0 (C) 2480 MHz (CH39) 99% Bandwidth**


**Figure 168 - Core0 (C) 2480 MHz (CH39) 6 dB Bandwidth**

FCC 47 CFR Part 15, Limit Clause 15.247(a)(2) and ISED RSS-247, Clause 5.2(a)

The minimum 6 dB Bandwidth shall be at least 500 kHz.

### 2.3.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 1.

| Instrument | Manufacturer | Type No | TE No | Calibration Period (months) | Calibration Due |
|---|---|---|---|---|---|
| Rubidium Standard | Rohde & Schwarz | XSRM | 1316 | 6 | 17-May-2021 |
| Multimeter | Iso-tech | IDM101 | 2424 | 12 | 14-Dec-2021 |
| Hygrometer | Rotronic | I-1000 | 3220 | 12 | 16-Oct-2021 |
| Frequency Standard | Spectracom | SecureSync 1200-0408-0601 | 4393 | 6 | 17-May-2021 |
| Climatic Chamber | Aralab | FitoTerm 300E45 | 4823 | 12 | 19-Mar-2021 |
| AC Programmable Power Supply | iTech | IT7324 | 5225 | - | O/P Mon |
| MXA Signal Analyser | Keysight Technologies | N9020B | 5528 | 24 | 04-Mar-2022 |
| Signal Commissioning Unit | TUV SUD | SCU001 | 5546 | 12 | 15-Apr-2021 |

**Table 108**

O/P Mon – Output Monitored using calibrated equipment

## 2.4 Authorised Band Edges

### 2.4.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.247 (d)
ISED RSS-247, Clause 5.5

### 2.4.2 Equipment Under Test and Modification State

A2438, S/N: C02DM00Q087X - Modification State 0

### 2.4.3 Date of Test

09-October-2020 to 09-January-2021

### 2.4.4 Test Method

The test was performed in accordance with ANSI C63.10, clause 6.10.4.

Authorised band edge measurements were performed with the device operating in SISO and Beamforming configurations across the various modes supported by the device.

### 2.4.5 Environmental Conditions

| | |
|---|---|
| Ambient Temperature | 20.5 - 23.0 °C |
| Relative Humidity | 30.1 - 43.0 % |

### 2.4.6 Test Results

2.4 GHz Bluetooth - DTS

LE1M

iPA

| Modulation | Packet Type | Core | Tx Frequency (MHz) | Band Edge Frequency (MHz) | Level (dBc) |
|---|---|---|---|---|---|
| GFSK | DH1 | 0 | 2402 | 2400.0 | -58.05 |

**Table 109 - Authorised Band Edge Results**

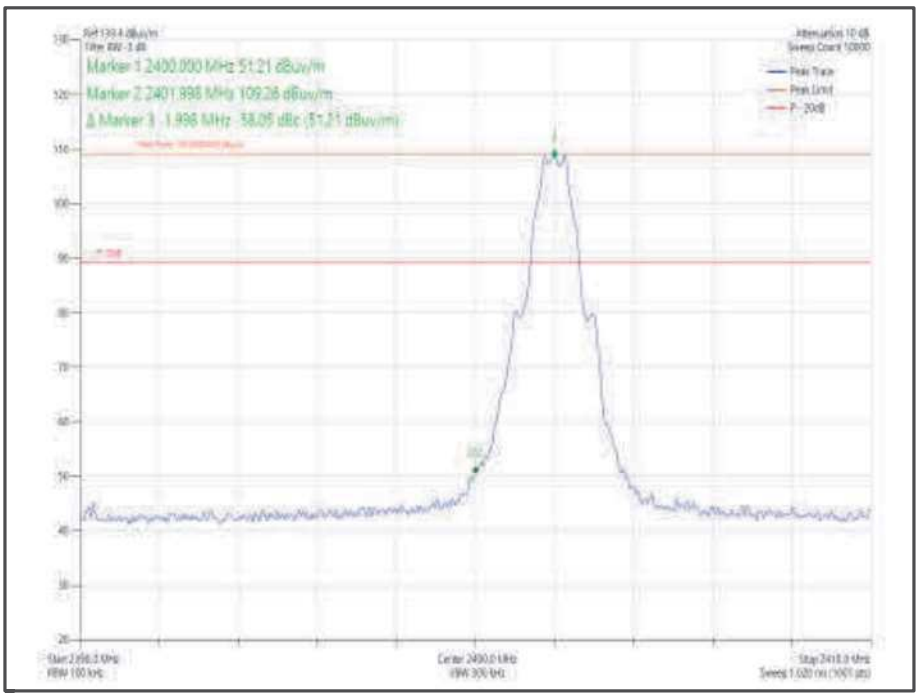


**Figure 169 – Core 0, GFSK/DH1- 2402 MHz – Band Edge Frequency 2400.0 MHz**

| Modulation | Packet Type | Core | Tx Frequency (MHz) | Band Edge Frequency (MHz) | Level (dBc) |
|---|---|---|---|---|---|
| GFSK | DH1 | 2 | 2402 | 2400.0 | -56.27 |

**Table 110 - Authorised Band Edge Results**

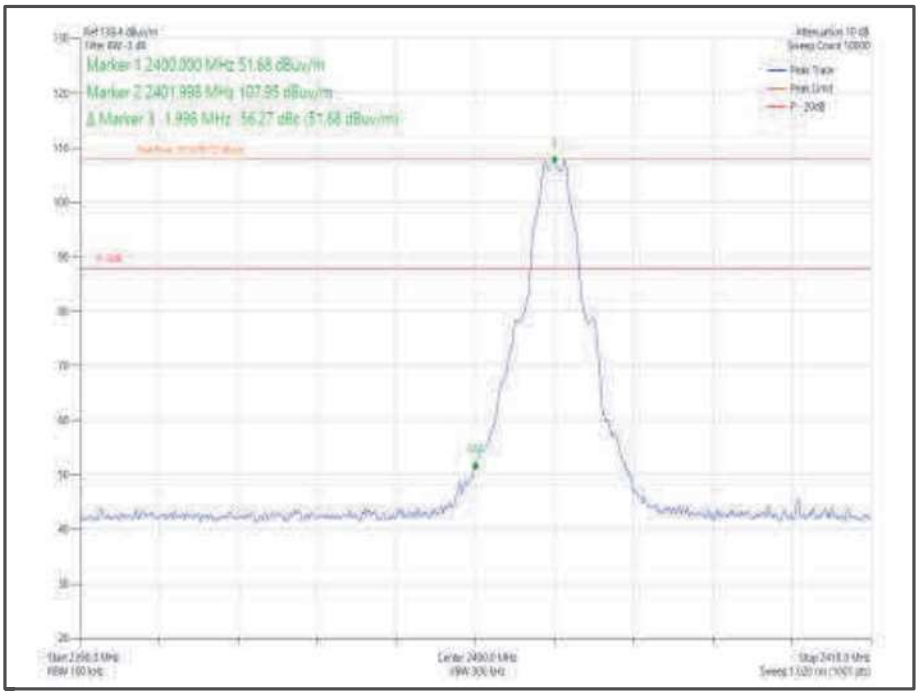


**Figure 170 – Core 2, GFSK/DH1- 2402 MHz – Band Edge Frequency 2400.0 MHz**

| Modulation | Packet Type | Core | Tx Frequency (MHz) | Band Edge Frequency (MHz) | Level (dBc) |
|---|---|---|---|---|---|
| GFSK | DH1 | 0-1 | 2402 | 2400.0 | -57.17 |

**Table 111 - Authorised Band Edge Results**

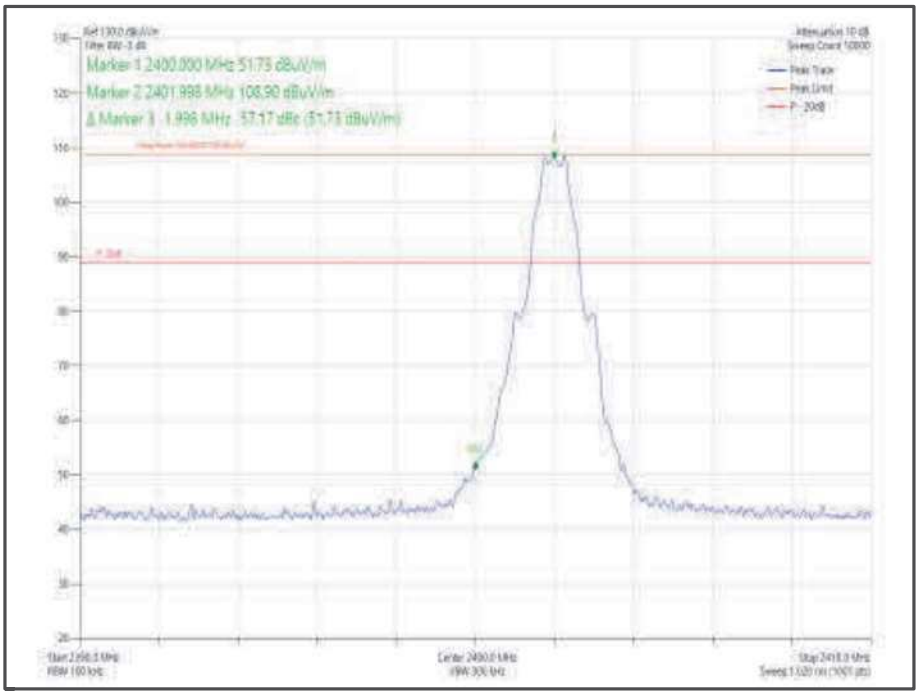


**Figure 171 – Core 0-1, GFSK/DH1 - 2402 MHz – Band Edge Frequency 2400.0 MHz**

ePA

| Modulation | Packet Type | Core | Tx Frequency (MHz) | Band Edge Frequency (MHz) | Level (dBc) |
|---|---|---|---|---|---|
| GFSK | DH1 | 0 | 2402 | 2400.0 | -66.31 |

**Table 112 - Authorised Band Edge Results**

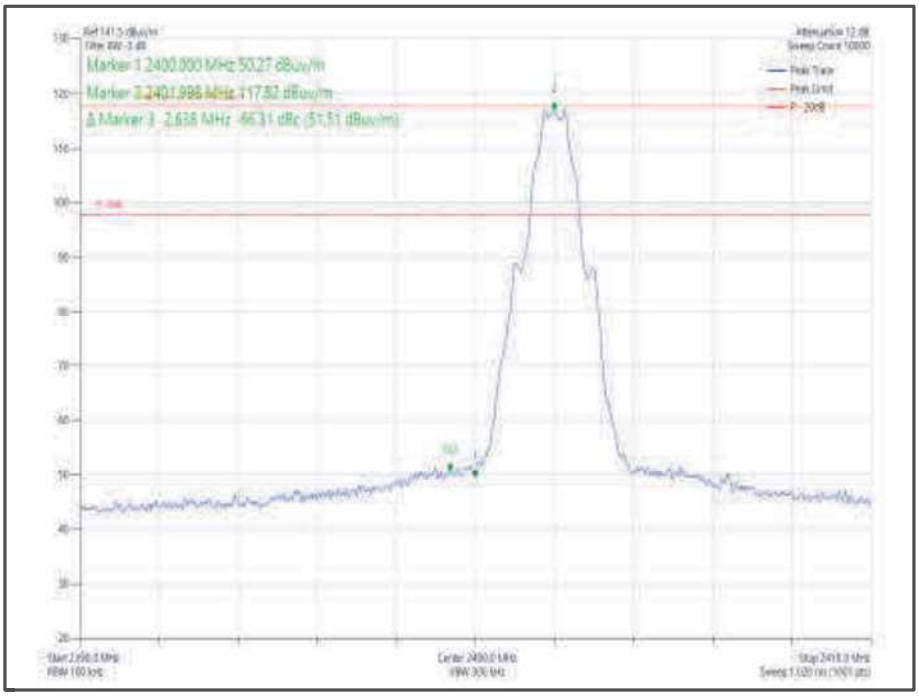


**Figure 172 – Core 0, GFSK/DH1- 2402 MHz – Band Edge Frequency 2400.0 MHz**

| Modulation | Packet Type | Core | Tx Frequency (MHz) | Band Edge Frequency (MHz) | Level (dBc) |
|---|---|---|---|---|---|
| GFSK | DH1 | 0-1 | 2402 | 2400.0 | -67.27 |

**Table 113 - Authorised Band Edge Results**

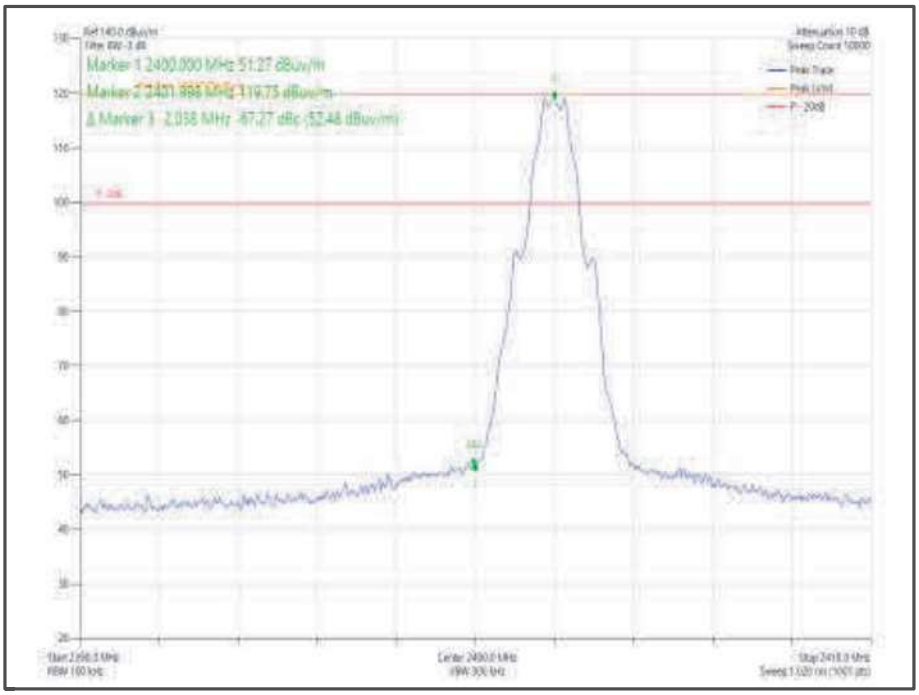


**Figure 173 – Core 0-1, GFSK/DH1- 2402 MHz – Band Edge Frequency 2400.0 MHz**

LE2M

iPA

| Modulation | Packet Type | Core | Tx Frequency (MHz) | Band Edge Frequency (MHz) | Level (dBc) |
|---|---|---|---|---|---|
| GFSK | DH1 | 0 | 2402 | 2400.0 | -34.26 |

**Table 114 - Authorised Band Edge Results**

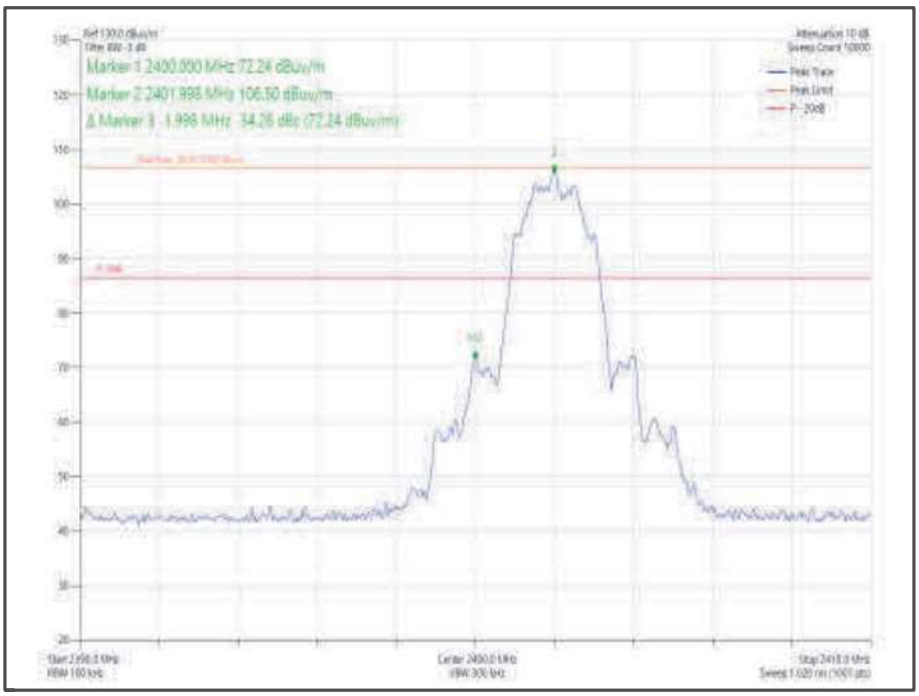


**Figure 174 – Core 0, GFSK/DH1- 2402 MHz – Band Edge Frequency 2400.0 MHz**

| Modulation | Packet Type | Core | Tx Frequency (MHz) | Band Edge Frequency (MHz) | Level (dBc) |
|---|---|---|---|---|---|
| GFSK | DH1 | 2 | 2402 | 2400.0 | -33.06 |

**Table 115 - Authorised Band Edge Results**

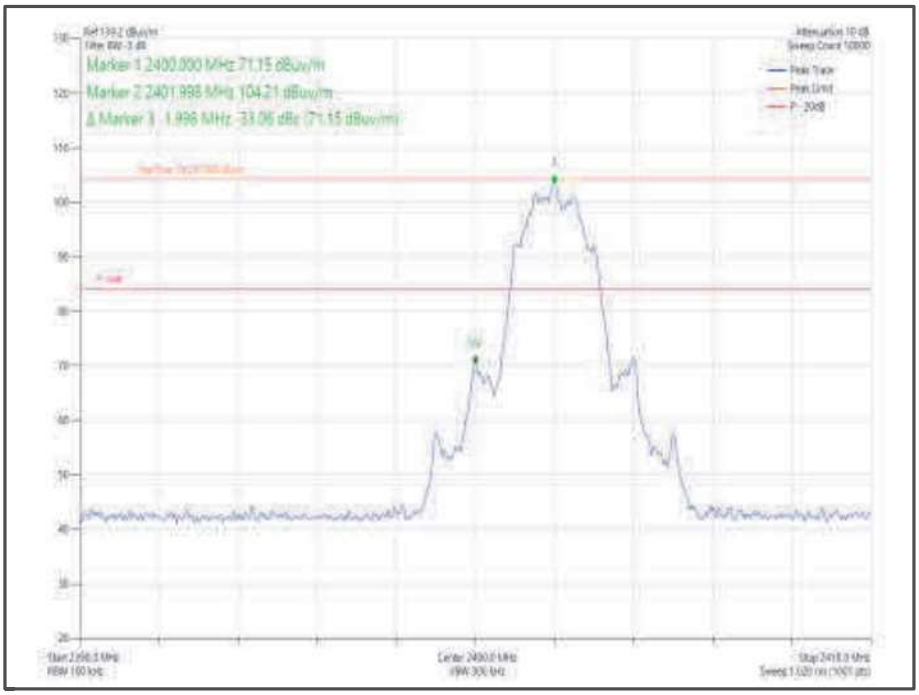


**Figure 175 – Core 2, GFSK/DH1- 2402 MHz – Band Edge Frequency 2400.0 MHz**

| Modulation | Packet Type | Core | Tx Frequency (MHz) | Band Edge Frequency (MHz) | Level (dBc) |
|---|---|---|---|---|---|
| GFSK | DH1 | 0-1 | 2402 | 2400.0 | -34.01 |

**Table 116 - Authorised Band Edge Results**

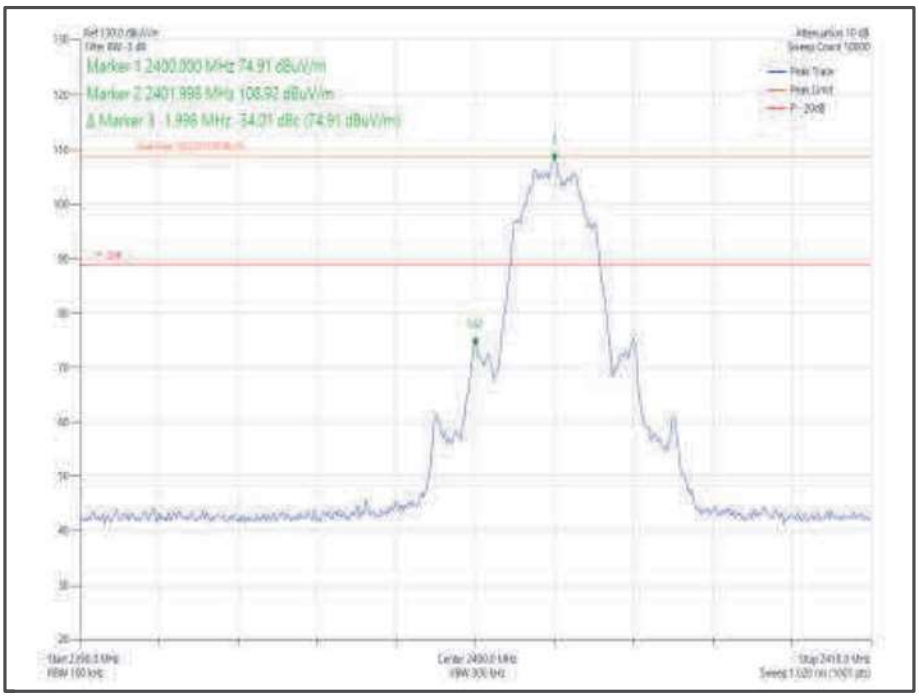


**Figure 176 – Core 0-1, GFSK/DH1- 2402 MHz – Band Edge Frequency 2400.0 MHz**

ePA

| Modulation | Packet Type | Core | Tx Frequency (MHz) | Band Edge Frequency (MHz) | Level (dBc) |
|---|---|---|---|---|---|
| GFSK | DH1 | 0 | 2402 | 2400.0 | -42.09 |

**Table 117 - Authorised Band Edge Results**

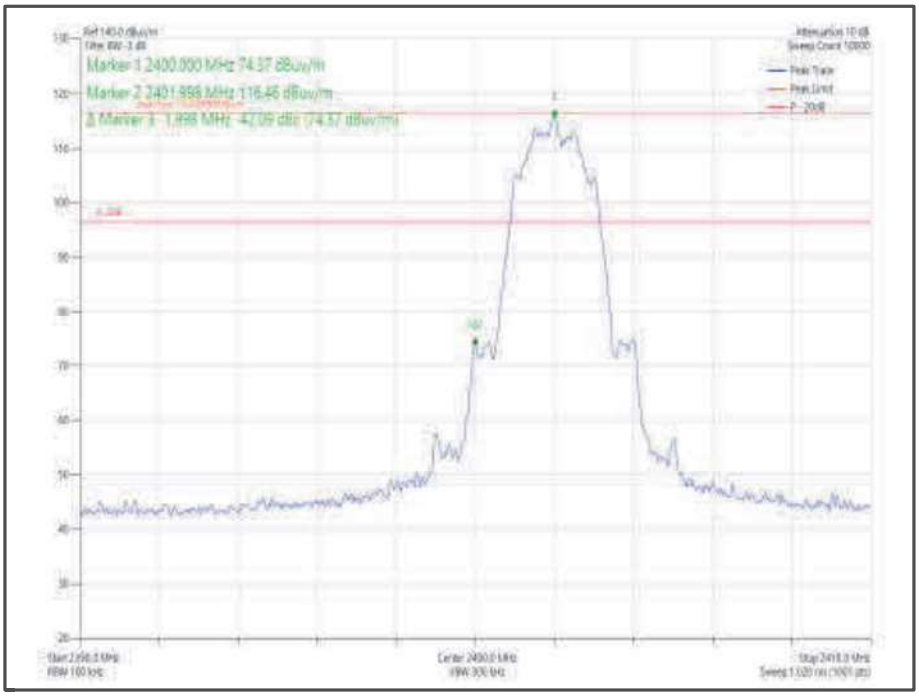


**Figure 177 – Core 0, GFSK/DH1- 2402 MHz – Band Edge Frequency 2400.0 MHz**

| Modulation | Packet Type | Core | Tx Frequency (MHz) | Band Edge Frequency (MHz) | Level (dBc) |
|---|---|---|---|---|---|
| GFSK | DH1 | 0-1 | 2402 | 2400.0 | -43.21 |

**Table 118 - Authorised Band Edge Results**

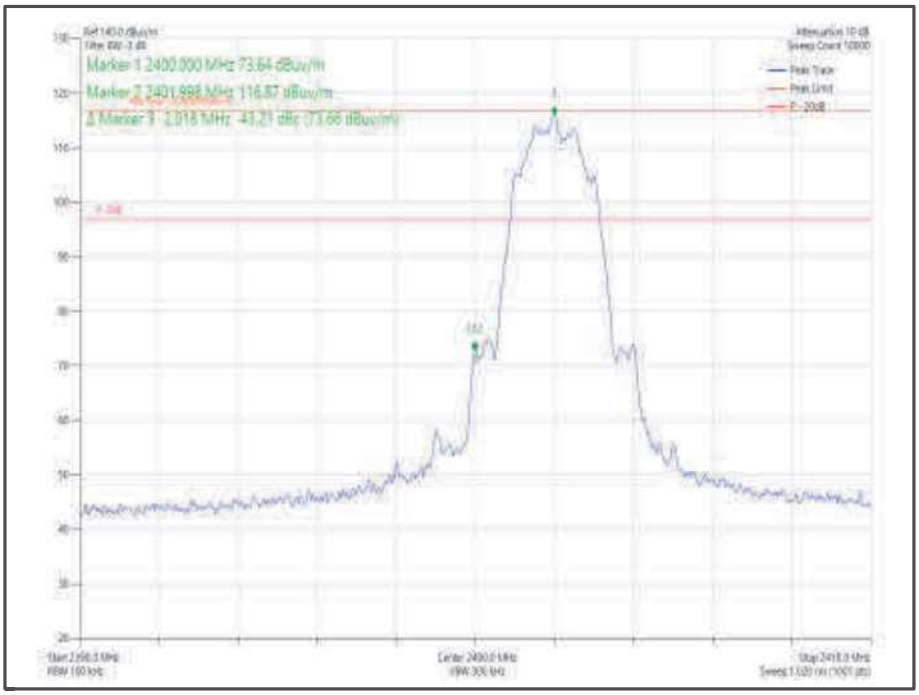


**Figure 178 – Core 0-1, GFSK/DH1- 2402 MHz – Band Edge Frequency 2400.0 MHz**

HDR4

iPA

| Modulation | Packet Type | Core | Tx Frequency (MHz) | Band Edge Frequency (MHz) | Level (dBc) |
|---|---|---|---|---|---|
| π/4 DQPSK | HDR4 | 0 | 2404 | 2400.0 | -59.72 |

**Table 119 - Authorised Band Edge Results**

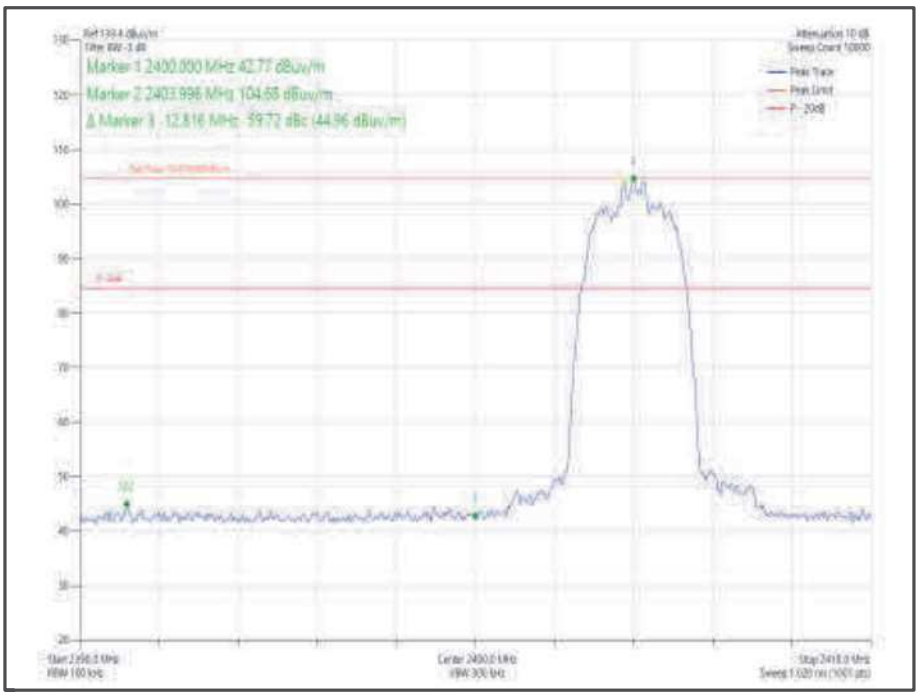


**Figure 179 - Core 0, π/4 DQPSK /HDR4 - 2404 MHz – Band Edge Frequency 2400.0 MHz**

| Modulation | Packet Type | Core | Tx Frequency (MHz) | Band Edge Frequency (MHz) | Level (dBc) |
|---|---|---|---|---|---|
| π/4 DQPSK | HDR4 | 2 | 2404 | 2400.0 | -57.26 |

**Table 120 - Authorised Band Edge Results**

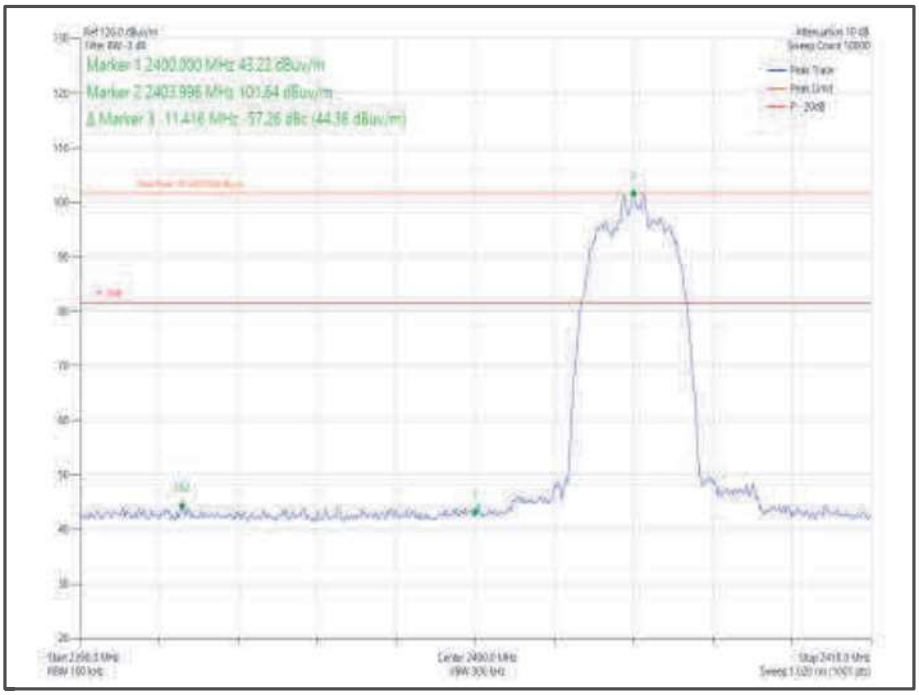


**Figure 180 - Core 2, π/4 DQPSK /HDR4- 2404 MHz – Band Edge Frequency 2400.0 MHz**

| Modulation | Packet Type | Core | Tx Frequency (MHz) | Band Edge Frequency (MHz) | Level (dBc) |
|---|---|---|---|---|---|
| π/4 DQPSK | HDR4 | 0-1 | 2404 | 2400.0 | -56.85 |

**Table 121 - Authorised Band Edge Results**

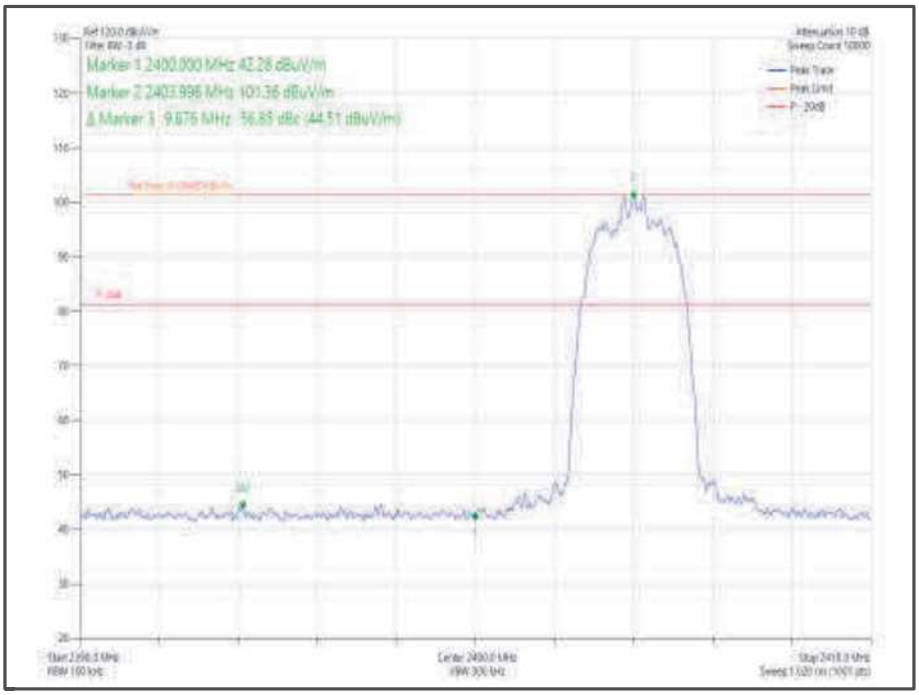


**Figure 181 - Core 0-1, π/4 DQPSK /HDR4 - 2404 MHz – Band Edge Frequency 2400.0 MHz**

ePA

| Modulation | Packet Type | Core | Tx Frequency (MHz) | Band Edge Frequency (MHz) | Level (dBc) |
|---|---|---|---|---|---|
| π/4 DQPSK | HDR4 | 0 | 2404 | 2400.0 | -65.79 |

**Table 122 - Authorised Band Edge Results**

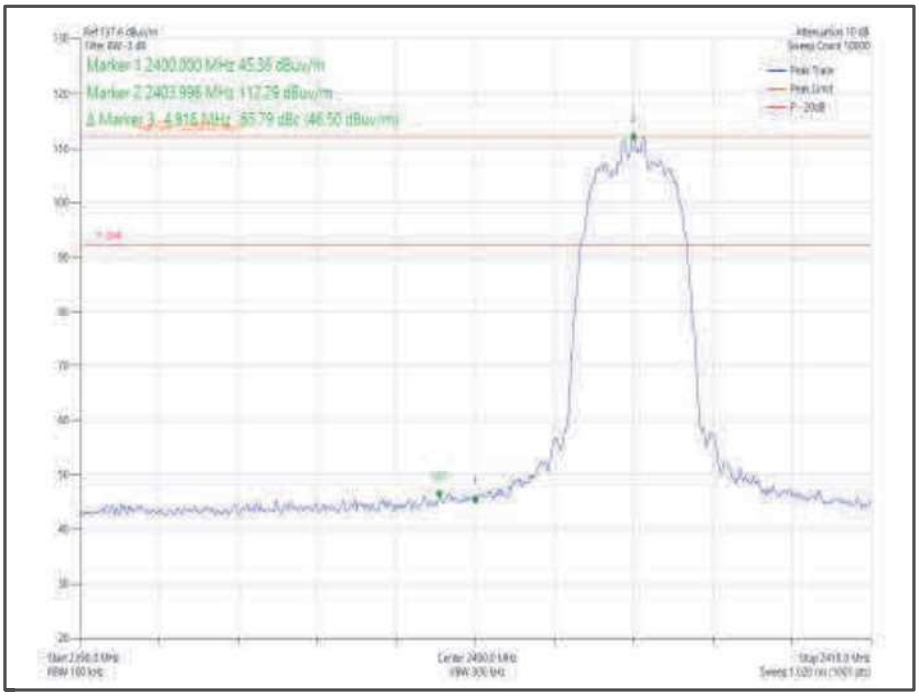


**Figure 182 - Core 0, π/4 DQPSK /HDR4 - 2404 MHz – Band Edge Frequency 2400.0 MHz**

| Modulation | Packet Type | Core | Tx Frequency (MHz) | Band Edge Frequency (MHz) | Level (dBc) |
|---|---|---|---|---|---|
| π/4 DQPSK | HDR4 | 0-1 | 2404 | 2400.0 | -54.52 |

**Table 123 - Authorised Band Edge Results**

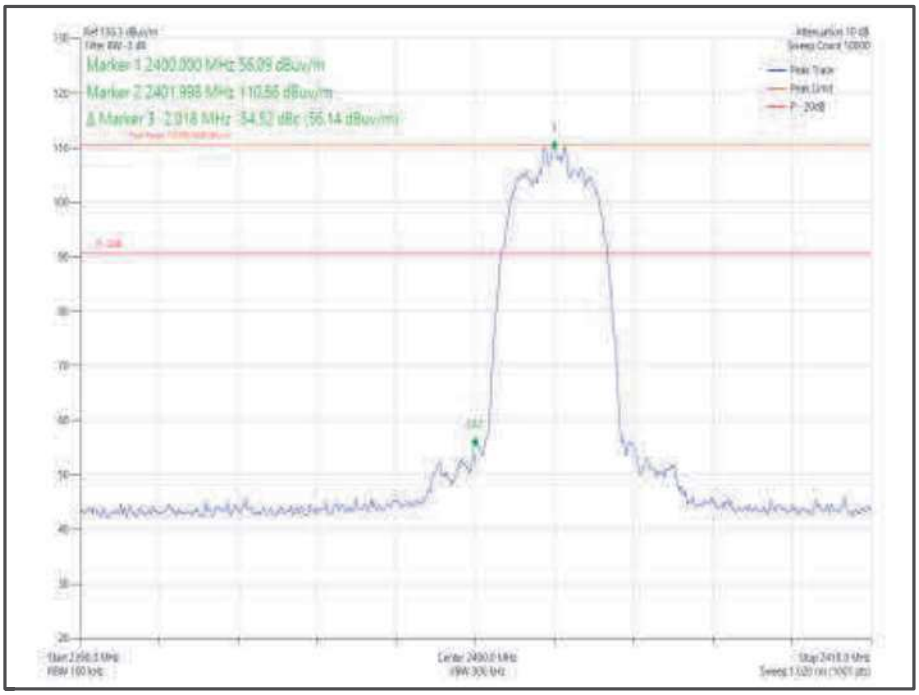


**Figure 183 - Core 0-1, π/4 DQPSK /HDR4- 2404 MHz – Band Edge Frequency 2400.0 MHz**

HDR8

iPA

| Modulation | Packet Type | Core | Tx Frequency (MHz) | Band Edge Frequency (MHz) | Level (dBc) |
|---|---|---|---|---|---|
| π/4 DQPSK | HDR8 | 0 | 2404 | 2400.0 | -59.75 |

**Table 124 - Authorised Band Edge Results**

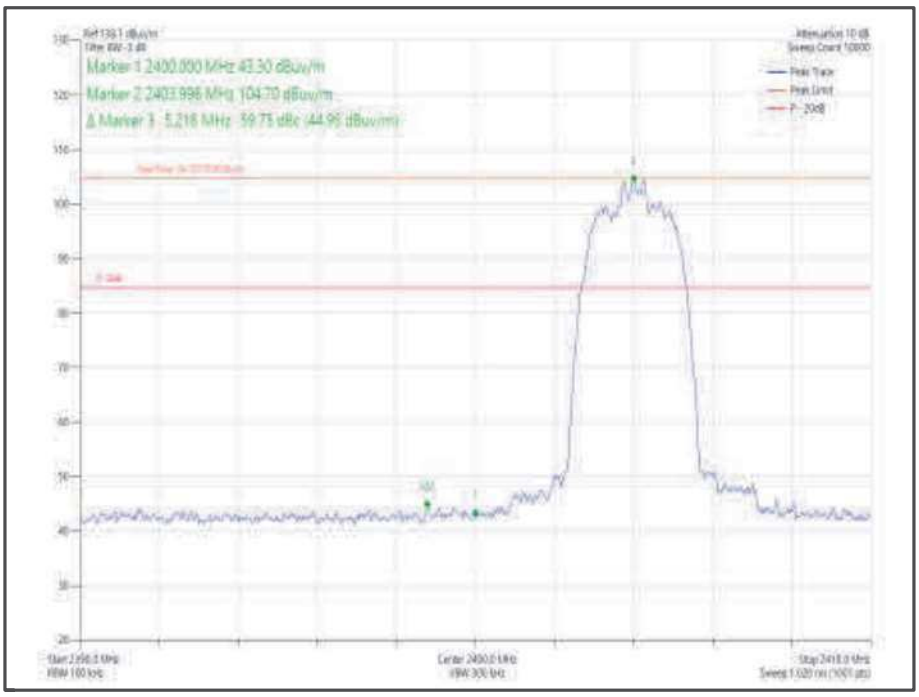


**Figure 184 - Core 0, π/4 DQPSK/HDR8 - 2404 MHz – Band Edge Frequency 2400.0 MHz**

| Modulation | Packet Type | Core | Tx Frequency (MHz) | Band Edge Frequency (MHz) | Level (dBc) |
|---|---|---|---|---|---|
| π/4 DQPSK | HDR8 | 2 | 2404 | 2400.0 | -55.87 |

**Table 125 - Authorised Band Edge Results**

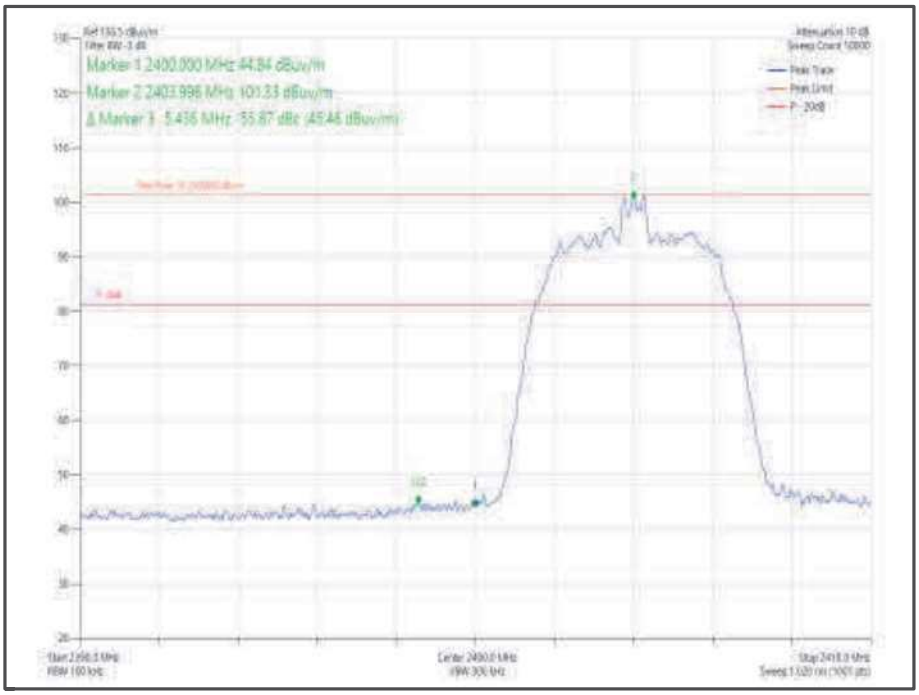


**Figure 185 - Core 2 - π/4 DQPSK/HDR8 - 2404 MHz – Band Edge Frequency 2400.0 MHz**

| Modulation | Packet Type | Core | Tx Frequency (MHz) | Band Edge Frequency (MHz) | Level (dBc) |
|---|---|---|---|---|---|
| π/4 DQPSK | HDR8 | 0-1 | 2404 | 2400.0 | -55.43 |

**Table 126 - Authorised Band Edge Results**

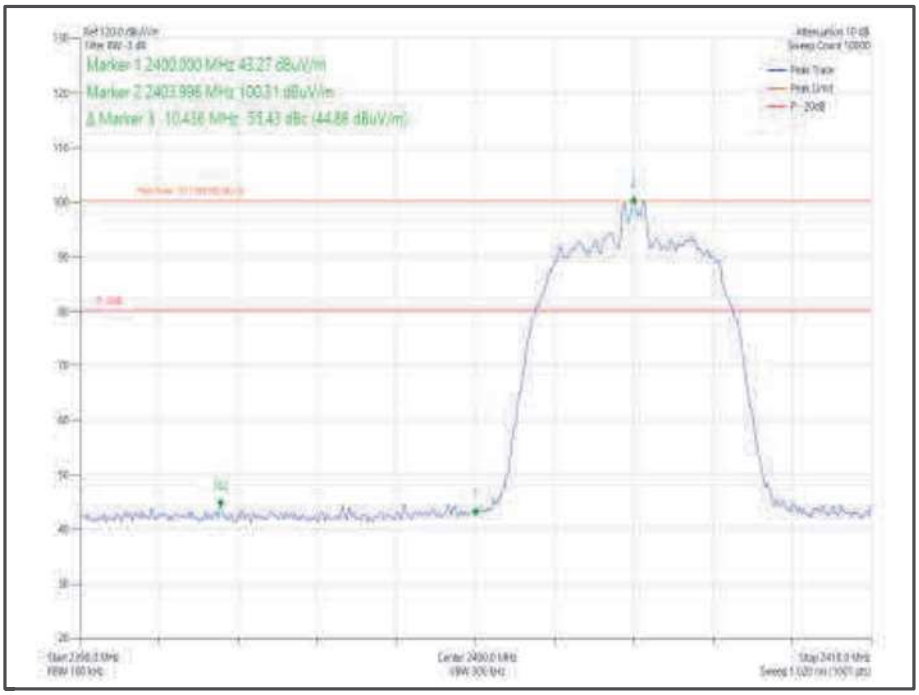


**Figure 186 - Core 0-1 - π/4 DQPSK/HDR8 - 2404 MHz – Band Edge Frequency 2400.0 MHz**

ePA

| Modulation | Packet Type | Core | Tx Frequency (MHz) | Band Edge Frequency (MHz) | Level (dBc) |
|---|---|---|---|---|---|
| π/4 DQPSK | HDR8 | 0 | 2404 | 2400.0 | -63.54 |

**Table 127 - Authorised Band Edge Results**

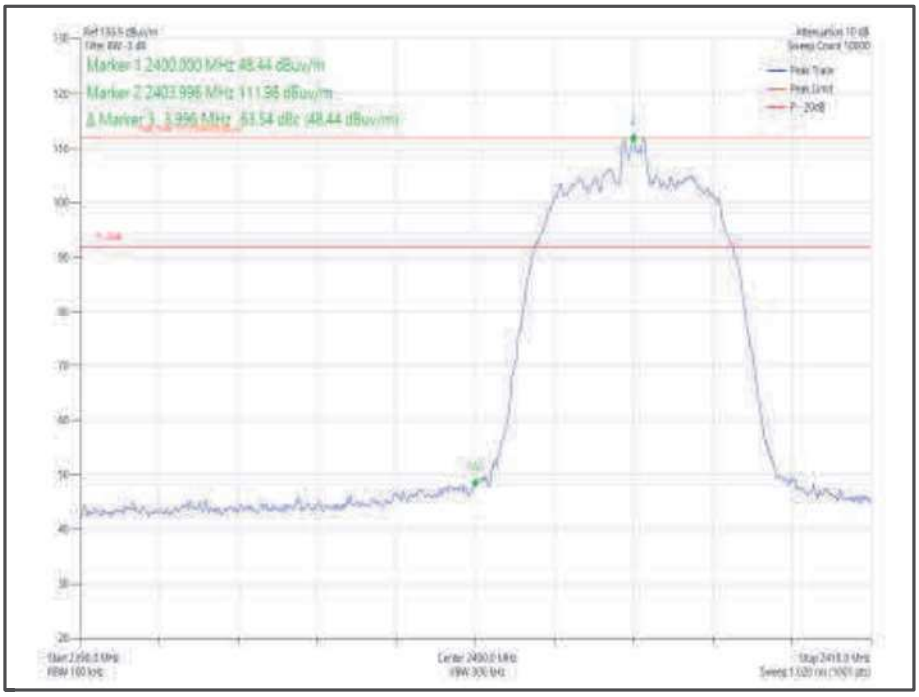


**Figure 187 - Core 0, π/4 DQPSK/HDR8 - 2404 MHz – Band Edge Frequency 2400.0 MHz**

| Modulation | Packet Type | Core | Tx Frequency (MHz) | Band Edge Frequency (MHz) | Level (dBc) |
|---|---|---|---|---|---|
| π/4 DQPSK | HDR8 | 0-1 | 2404 | 2400.0 | -60.52 |

**Table 128 - Authorised Band Edge Results**

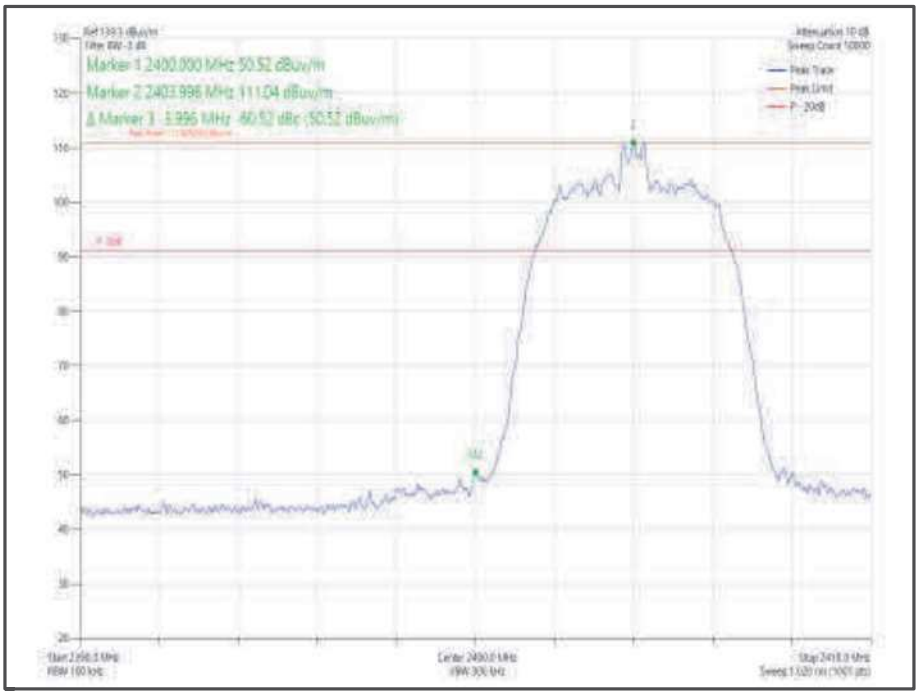


**Figure 188 - Core 0-1, π/4 DQPSK/HDR8 - 2404 MHz – Band Edge Frequency 2400.0 MHz**

FCC 47 CFR Part 15, Limit Clause 15.247 (d)

20 dB below the fundamental measured in a 100 kHz bandwidth using a peak detector. If the transmitter complies with the conducted power limits, based on the use of RMS averaging over a time interval, the attenuation required shall be 30 dB below the fundamental instead of 20 dB.

ISED RSS-247, Limit Clause 5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

### 2.4.7 Test Location and Test Equipment Used

This test was carried out in RF Chamber 11.

| Instrument | Manufacturer | Type No | TE No | Calibration Period (months) | Calibration Due |
|---|---|---|---|---|---|
| True RMS Multimeter | Fluke | 179 | 4007 | 12 | 29-Oct-2021 |
| EMI Test Receiver | Rohde & Schwarz | ESW44 | 5084 | 12 | 04-Feb-2021 |
| EmX Emissions Software | TUV SUD | V2.1.0 | 5125 | - | Software |
| Screened Room (11) | Rainford | Rainford | 5136 | 36 | 01-Nov-2021 |
| Mast | Maturo | TAM 4.0-P | 5158 | - | TU |
| Mast and Turntable Controller | Maturo | Maturo NCD | 5159 | - | TU |
| Turntable | Maturo | TT 15WF | 5160 | - | TU |
| Horn Antenna (1-10GHz) | Schwarzbeck | BBHA 9120 B | 5215 | 12 | 10-Mar-2021 |
| Thermo-Hygro-Barometer | PCE Instruments | PCE-THB-40 | 5475 | 12 | 17-Mar-2021 |
| 2m SMA Cable | Junkosha | MWX221-02000AMSAMS/A | 5518 | 12 | 01-Apr-2021 |
| 8m N Type Cable | Junkosha | MWX221-08000NMSNMS/B | 5522 | 12 | 24-Mar-2021 |

**Table 129**

TU - Traceability Unscheduled

## 2.5 Restricted Band Edges

### 2.5.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.205
ISED RSS-GEN, Clause 8.10

### 2.5.2 Equipment Under Test and Modification State

A2438, S/N: C02DM00Q087X - Modification State 0

### 2.5.3 Date of Test

09-November-2020 to 09-January-2021

### 2.5.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 6.10.5 and 11.12.1.

Plots for average measurements were taken in accordance with ANSI C63.10, clause 11.12.2.5.2.

### 2.5.5 Environmental Conditions

| | |
|---|---|
| Ambient Temperature | 20.5 - 23.0 °C |
| Relative Humidity | 30.1 - 43.0 % |

### 2.5.6 Test Results

2.4 GHz Bluetooth - DTS

LE1M

iPA

| Modulation | Tx Frequency (MHz) | Core | Band Edge Frequency (MHz) | Peak Level (dBµV/m) | Average Level (dBµV/m) |
|---|---|---|---|---|---|
| GFSK/DH1 | 2402 | Core 0 | 2390.0 | 53.00 | 40.85 |
| GFSK/DH1 | 2480 | Core 0 | 2483.5 | 53.31 | 41.52 |

**Table 130 - Restricted Band Edge Results**

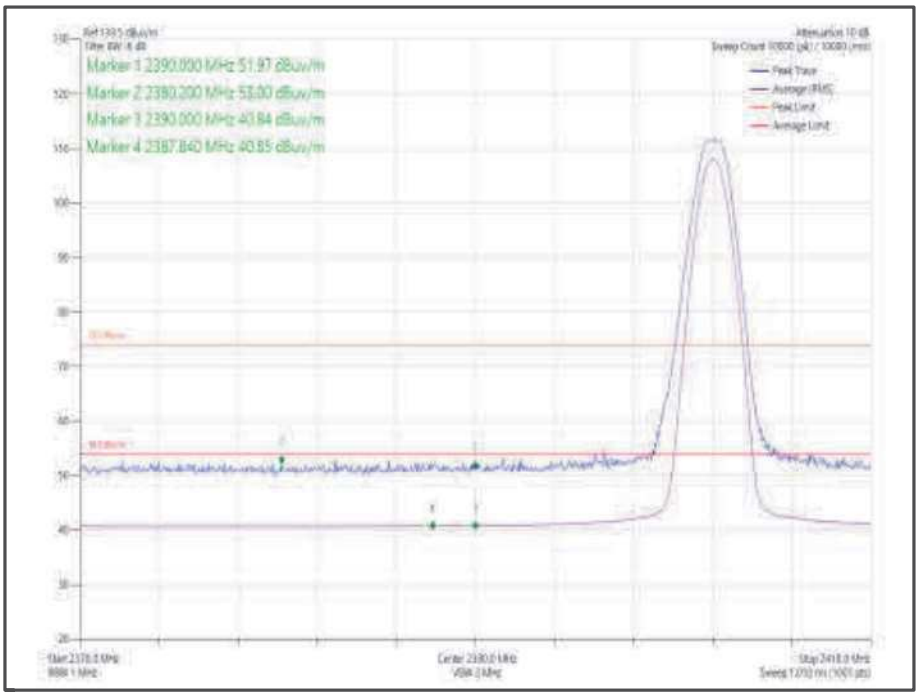


**Figure 189 – Core 0, GFSK/DH1 - 2402 MHz - Band Edge Frequency 2390.0 MHz**

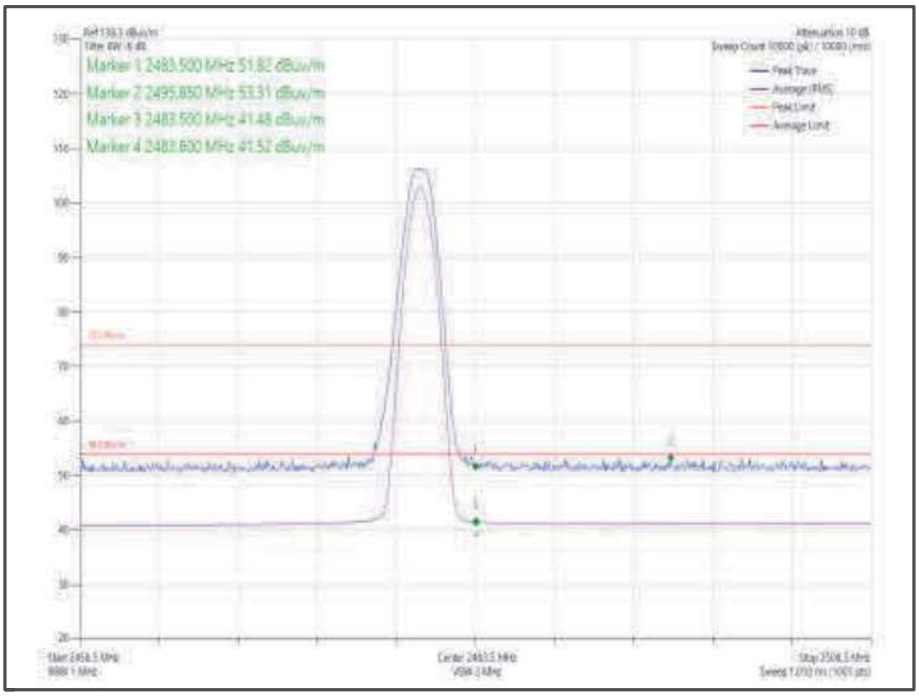


**Figure 190 – Core 0, GFSK/DH1 - 2480 MHz - Band Edge Frequency 2483.5 MHz**

| Modulation | Tx Frequency (MHz) | Core | Band Edge Frequency (MHz) | Peak Level (dBµV/m) | Average Level (dBµV/m) |
|---|---|---|---|---|---|
| GFSK/DH1 | 2402 | Core 2 | 2390.0 | 53.26 | 40.92 |
| GFSK/DH1 | 2480 | Core 2 | 2483.5 | 53.90 | 41.76 |

**Table 131 - Restricted Band Edge Results**

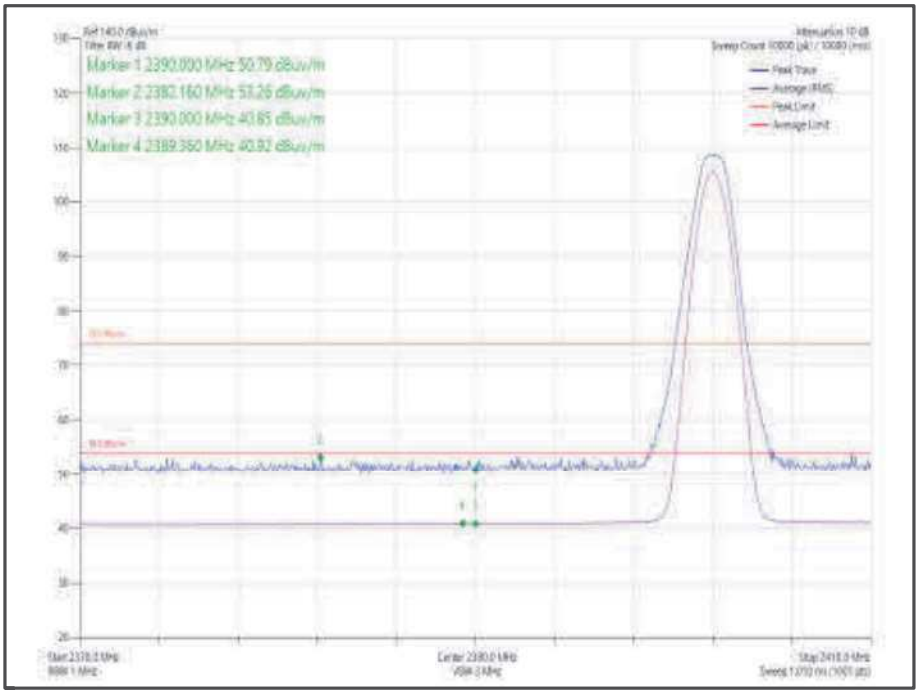


**Figure 191 – Core 2, GFSK/DH1 - 2402 MHz - Band Edge Frequency 2390.0 MHz**

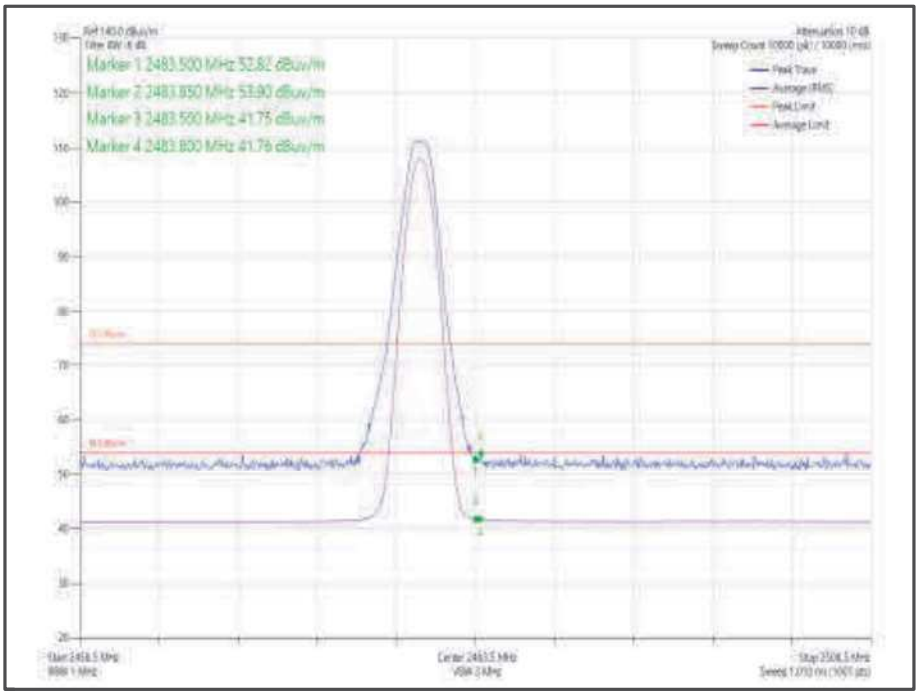


**Figure 192 – Core 2, GFSK/DH1 - 2480 MHz - Band Edge Frequency 2483.5 MHz**

| Modulation | Tx Frequency (MHz) | Core | Band Edge Frequency (MHz) | Peak Level (dBµV/m) | Average Level (dBµV/m) |
|---|---|---|---|---|---|
| GFSK/DH1 | 2402 | Core 0-1 | 2390.0 | 53.50 | 40.89 |
| GFSK/DH1 | 2480 | Core 0-1 | 2483.5 | 53.60 | 41.78 |

**Table 132 - Restricted Band Edge Results**

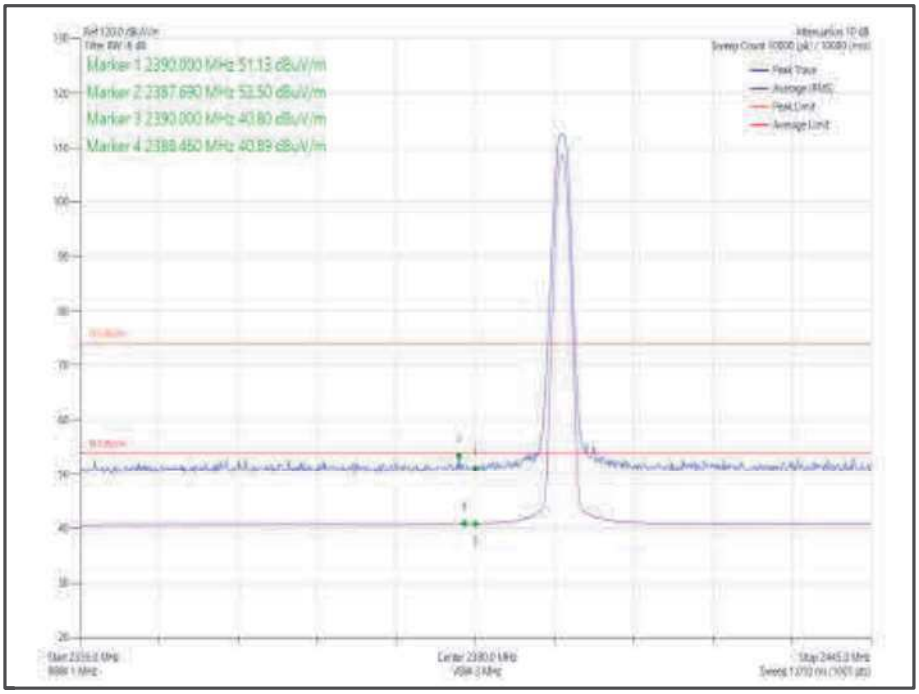


**Figure 193 – Core 0-1, GFSK/DH1 - 2402 MHz - Band Edge Frequency 2390.0 MHz**

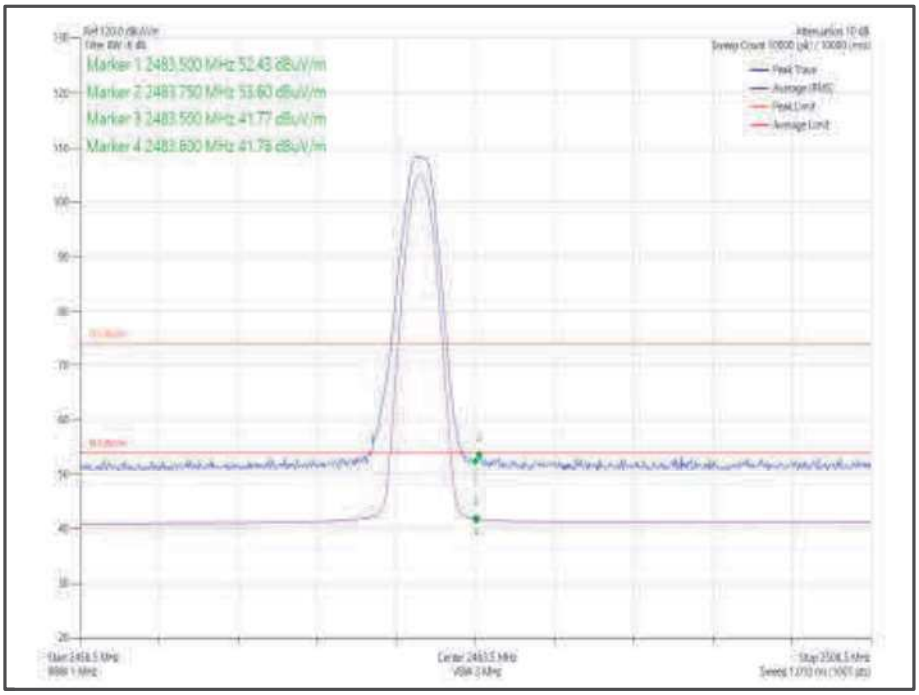


**Figure 194 – Core 0-1, GFSK/DH1 - 2480 MHz - Band Edge Frequency 2483.5 MHz**

ePA

| Modulation | Tx Frequency (MHz) | Core | Band Edge Frequency (MHz) | Peak Level (dBµV/m) | Average Level (dBµV/m) |
|---|---|---|---|---|---|
| GFSK/DH1 | 2402 | Core 0 | 2390.0 | 53.60 | 41.98 |
| GFSK/DH1 | 2480 | Core 0 | 2483.5 | 55.51 | 43.37 |

**Table 133 - Restricted Band Edge Results**

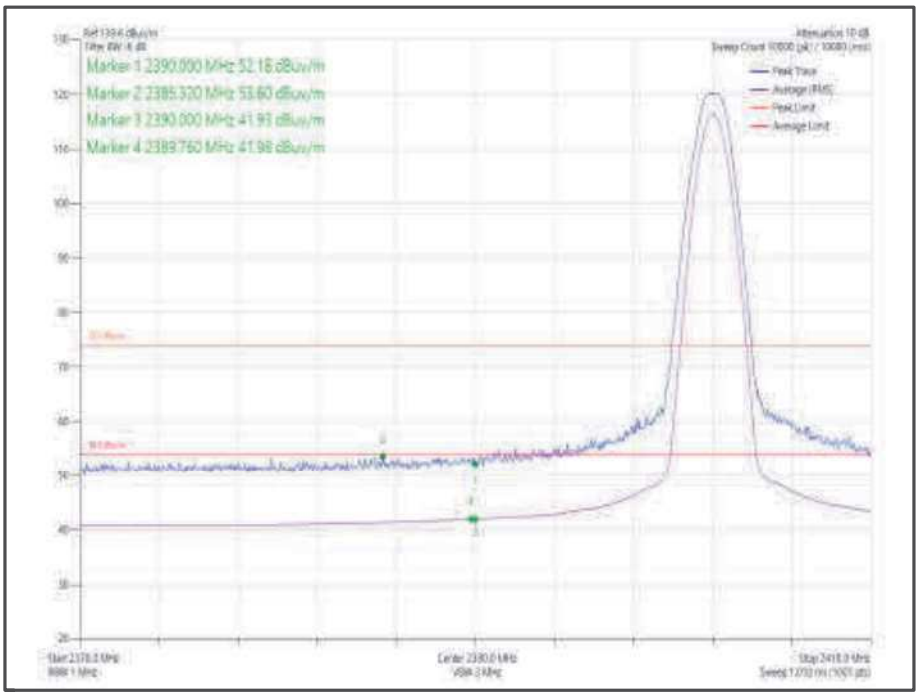


**Figure 195 – Core 0, GFSK/DH1 - 2402 MHz - Band Edge Frequency 2390.0 MHz**

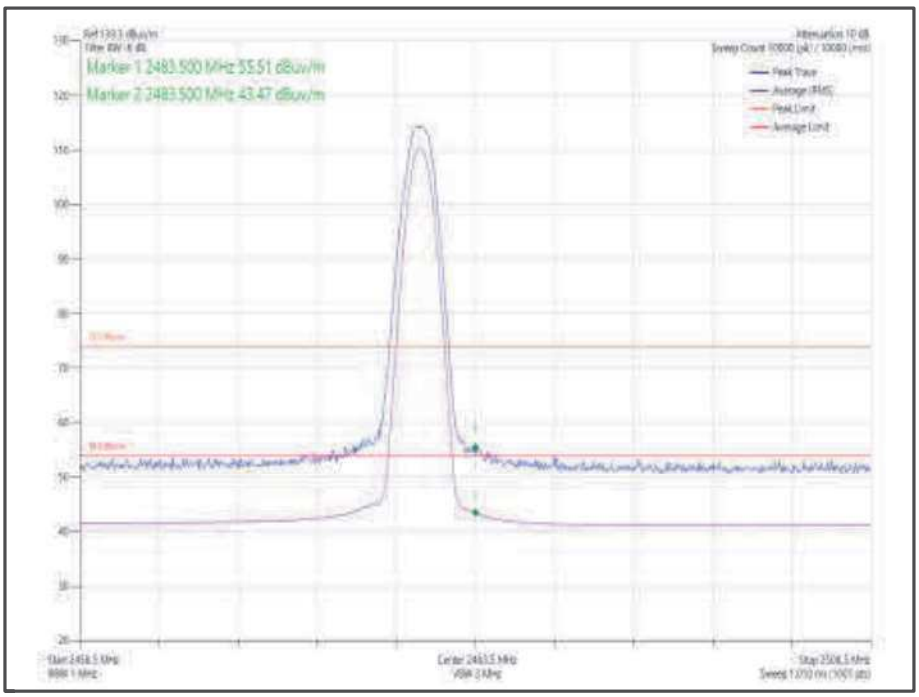


**Figure 196 – Core 0, GFSK/DH1 - 2480 MHz - Band Edge Frequency 2483.5 MHz**

| Modulation | Tx Frequency (MHz) | Core | Band Edge Frequency (MHz) | Peak Level (dBµV/m) | Average Level (dBµV/m) |
|---|---|---|---|---|---|
| GFSK/DH1 | 2402 | Core 0-1 | 2390.0 | 53.71 | 41.78 |
| GFSK/DH1 | 2480 | Core 0-1 | 2483.5 | 58.32 | 45.83 |

**Table 134 - Restricted Band Edge Results**

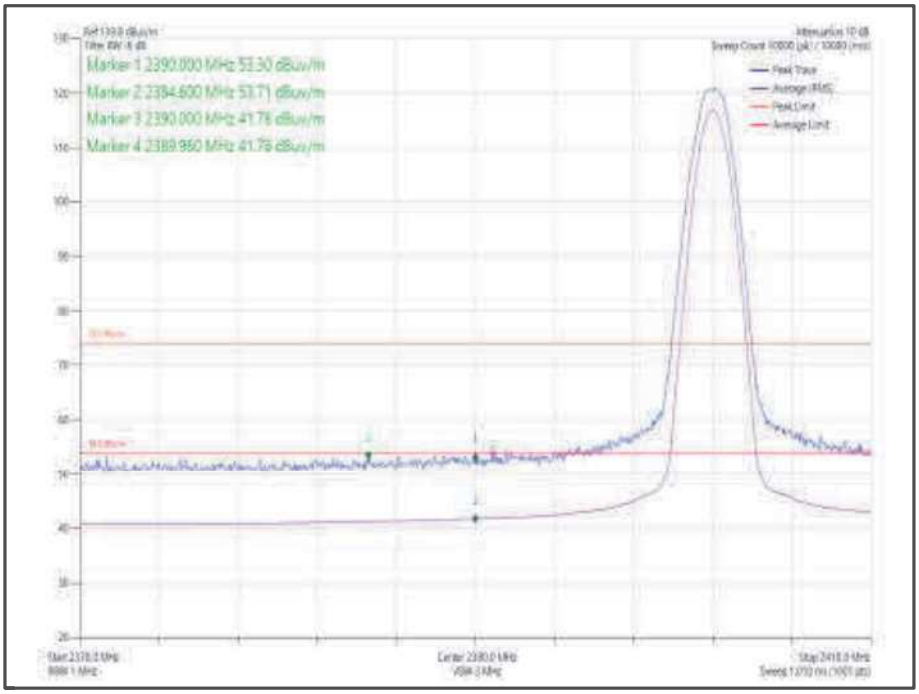


**Figure 197 – Core 0-1, GFSK/DH1 - 2402 MHz - Band Edge Frequency 2390.0 MHz**

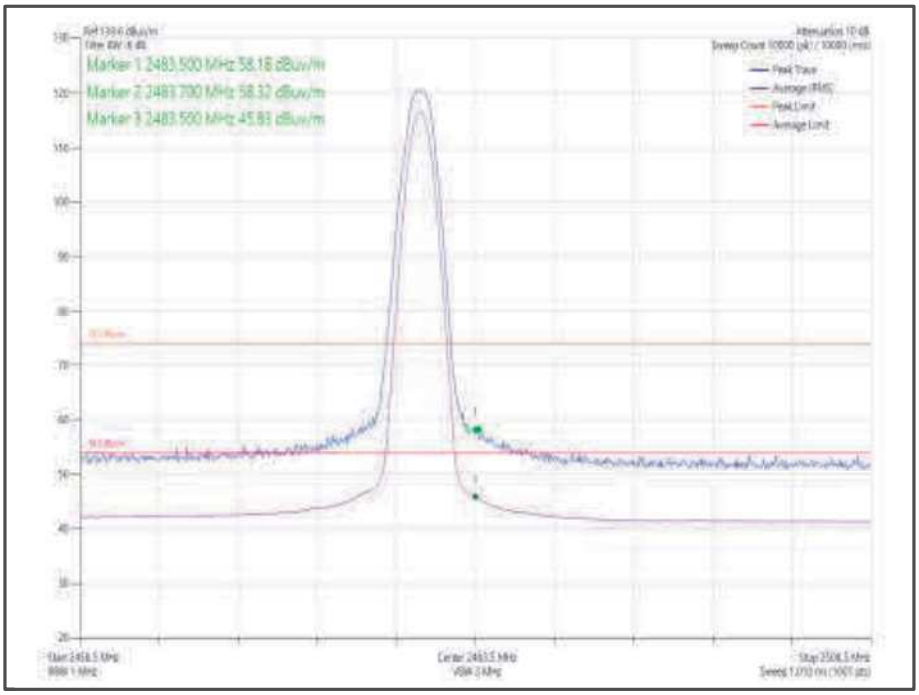


**Figure 198 – Core 0-1, GFSK/DH1 - 2480 MHz - Band Edge Frequency 2483.5 MHz**

LE2M

iPA

| Modulation | Tx Frequency (MHz) | Core | Band Edge Frequency (MHz) | Peak Level (dBµV/m) | Average Level (dBµV/m) |
|---|---|---|---|---|---|
| GFSK/DH1 | 2402 | Core 0 | 2390.0 | 52.97 | 40.77 |
| GFSK/DH1 | 2480 | Core 0 | 2483.5 | 55.76 | 43.53 |

**Table 135 - Restricted Band Edge Results**

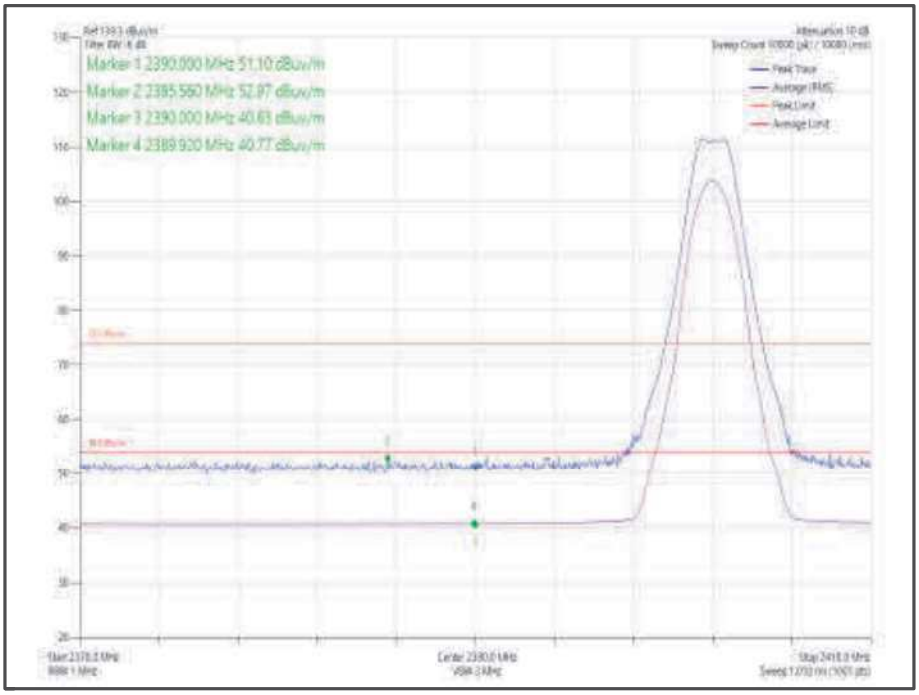


**Figure 199 – Core 0, GFSK/DH1 - 2402 MHz - Band Edge Frequency 2390.0 MHz**

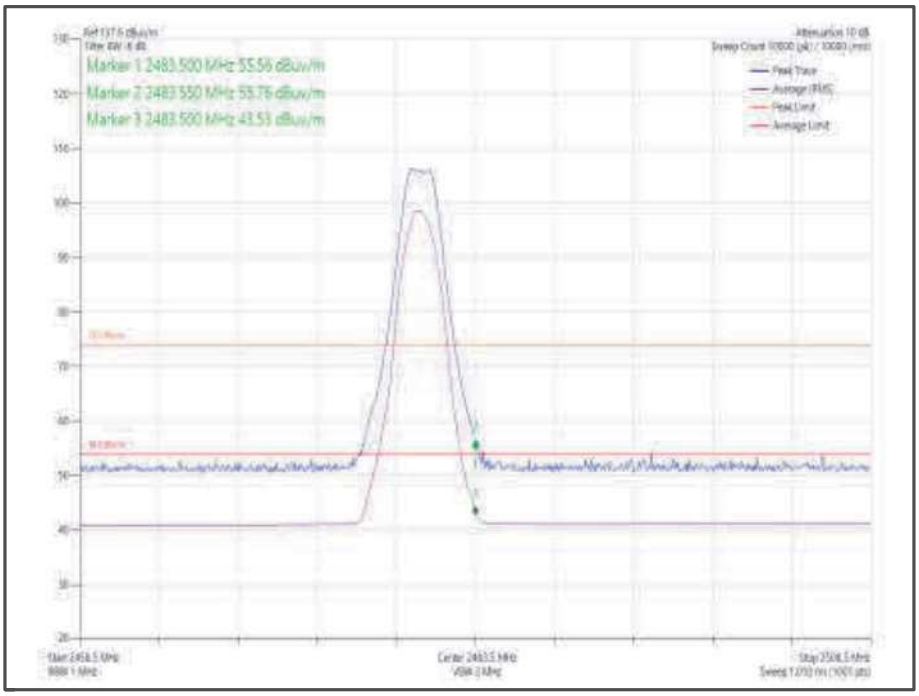


**Figure 200 – Core 0, GFSK/DH1 - 2480 MHz - Band Edge Frequency 2483.5 MHz**

| Modulation | Tx Frequency (MHz) | Core | Band Edge Frequency (MHz) | Peak Level (dBµV/m) | Average Level (dBµV/m) |
|---|---|---|---|---|---|
| GFSK/DH1 | 2402 | Core 2 | 2390.0 | 53.38 | 40.93 |
| GFSK/DH1 | 2480 | Core 2 | 2483.5 | 62.96 | 49.98 |

**Table 136 - Restricted Band Edge Results**

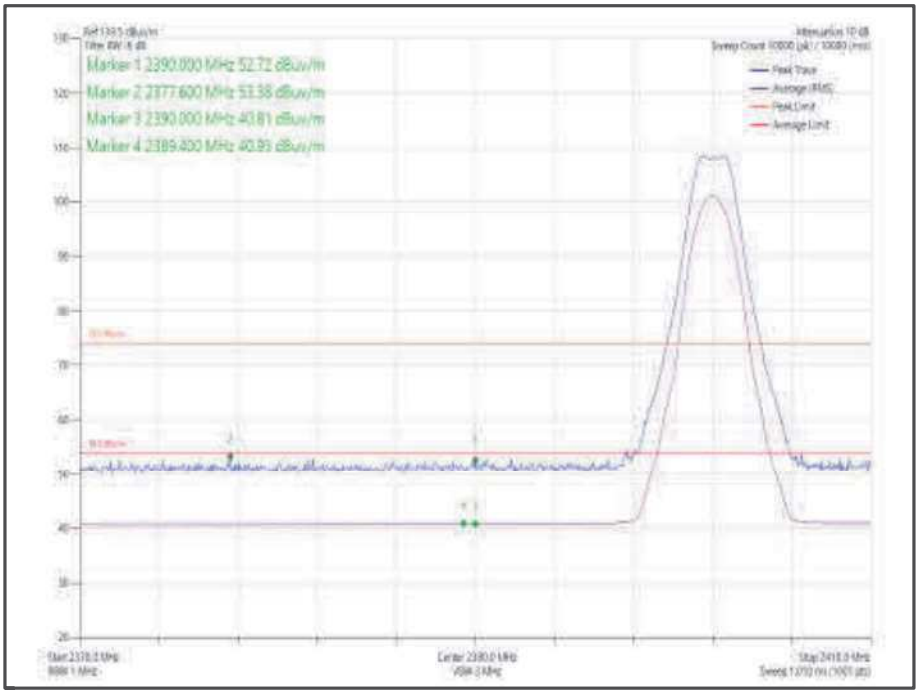


**Figure 201 – Core 2, GFSK/DH1 - 2402 MHz - Band Edge Frequency 2390.0 MHz**

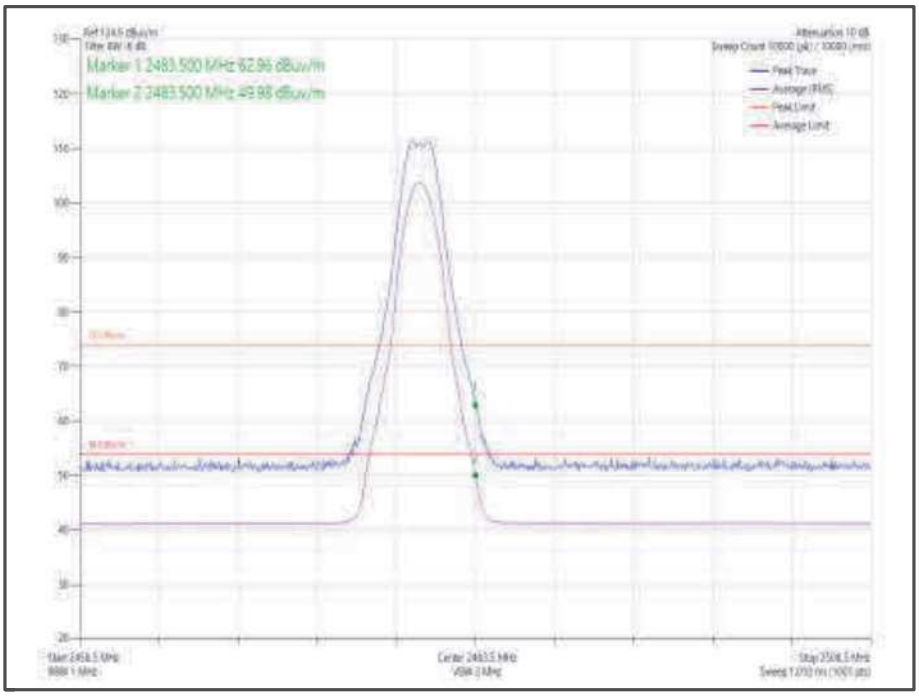


**Figure 202 – Core 2, GFSK/DH1 - 2480 MHz - Band Edge Frequency 2483.5 MHz**

| Modulation | Tx Frequency (MHz) | Core | Band Edge Frequency (MHz) | Peak Level (dBµV/m) | Average Level (dBµV/m) |
|---|---|---|---|---|---|
| GFSK/DH1 | 2402 | Core 0-1 | 2390.0 | 53.18 | 40.85 |
| GFSK/DH1 | 2480 | Core 0-1 | 2483.5 | 59.38 | 46.15 |

**Table 137 - Restricted Band Edge Results**

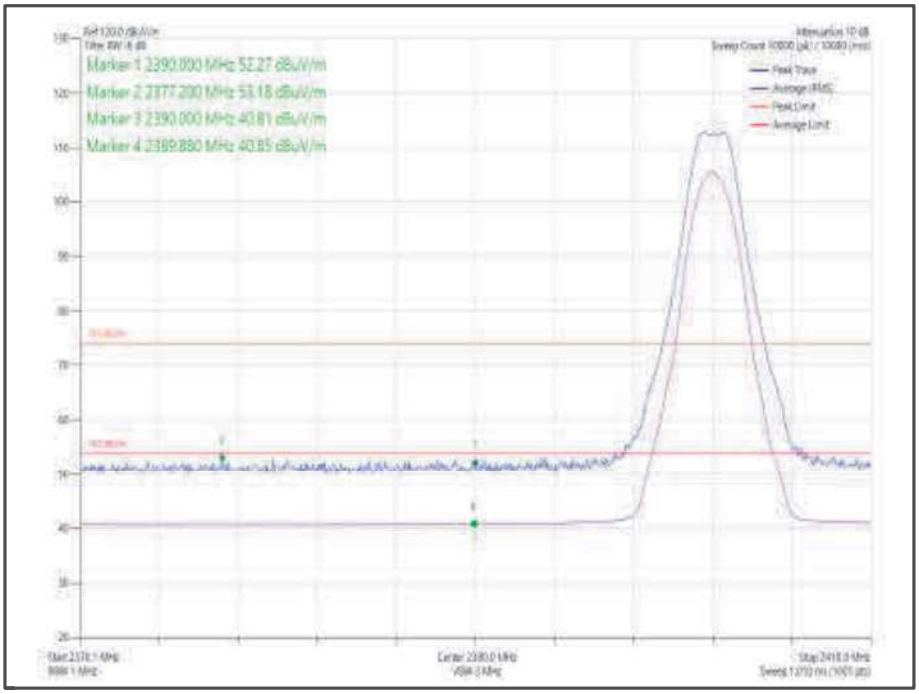


**Figure 203 – Core 0-1, GFSK/DH1 - 2402 MHz - Band Edge Frequency 2390.0 MHz**

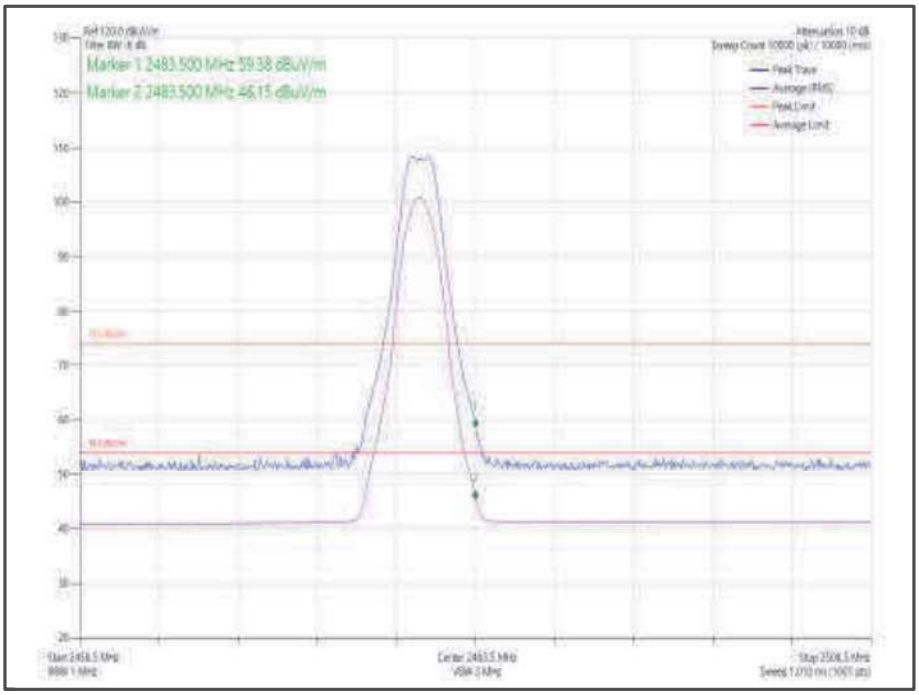


**Figure 204 – Core 0-1, GFSK/DH1 - 2480 MHz - Band Edge Frequency 2483.5 MHz**

ePA

| Modulation | Tx Frequency (MHz) | Core | Band Edge Frequency (MHz) | Peak Level (dBµV/m) | Average Level (dBµV/m) |
|---|---|---|---|---|---|
| GFSK/DH1 | 2402 | Core 0 | 2390.0 | 55.16 | 41.45 |
| GFSK/DH1 | 2480 | Core 0 | 2483.5 | 56.06 | 42.95 |

**Table 138 - Restricted Band Edge Results**

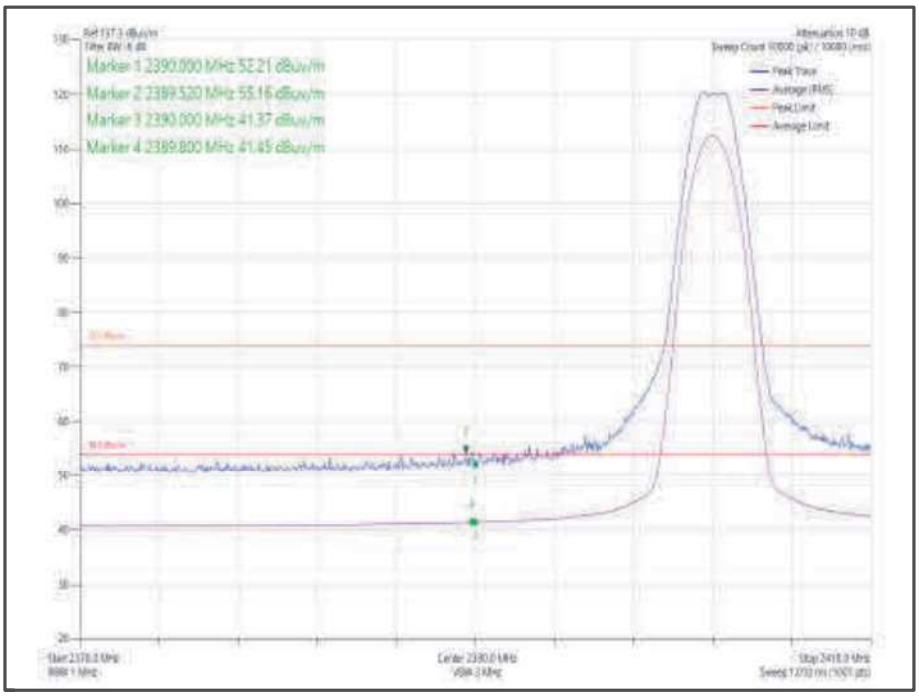


**Figure 205 – Core 0, GFSK/DH1 - 2402 MHz - Band Edge Frequency 2390.0 MHz**

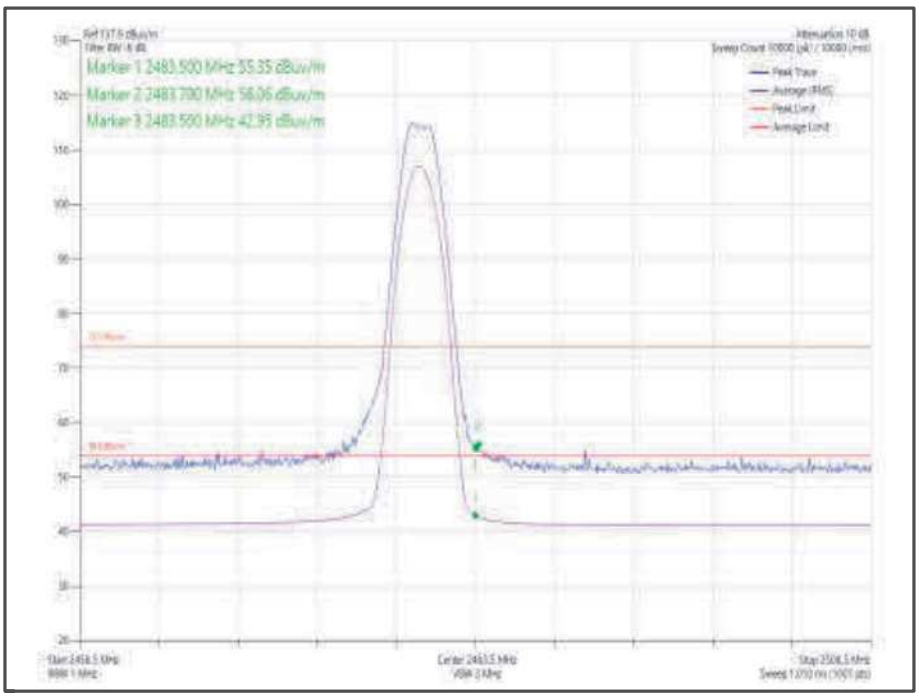


**Figure 206 – Core 0, GFSK/DH1 - 2480 MHz - Band Edge Frequency 2483.5 MHz**

| Modulation | Tx Frequency (MHz) | Core | Band Edge Frequency (MHz) | Peak Level (dBµV/m) | Average Level (dBµV/m) |
|---|---|---|---|---|---|
| GFSK/DH1 | 2402 | Core 0-1 | 2390.0 | 54.26 | 41.56 |
| GFSK/DH1 | 2480 | Core 0-1 | 2483.5 | 60.82 | 45.98 |

**Table 139 - Restricted Band Edge Results**

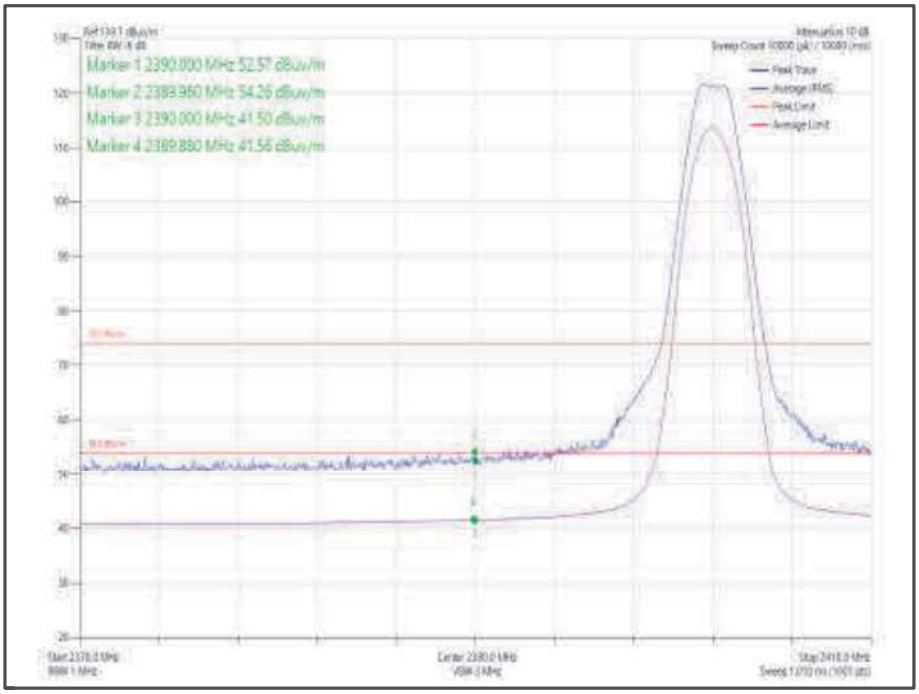


**Figure 207 – Core 0-1, GFSK/DH1 - 2402 MHz - Band Edge Frequency 2390.0 MHz**

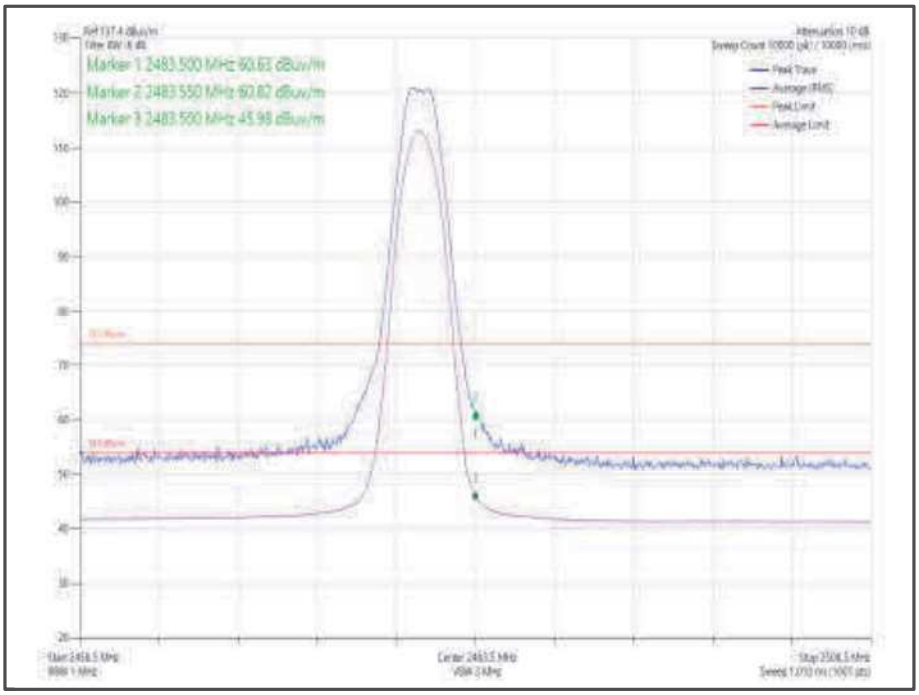


**Figure 208 – Core 0-1, GFSK/DH1 - 2480 MHz - Band Edge Frequency 2483.5 MHz**

HDR4

iPA

| Mode | Modulation | Core | Packet Type | Tx Frequency (MHz) | Band Edge Frequency (MHz) | Peak Level (dBµV/m) | Average Level (dBµV/m) |
|---|---|---|---|---|---|---|---|
| Static | π/4 DQPSK | Core 0 | HDR4 | 2404 | 2390.0 | 54.84 | 42.41 |
| Static | π/4 DQPSK | Core 0 | HDR4 | 2478 | 2483.5 | 53.86 | 41.25 |

**Table 140 - Restricted Band Edge Results**

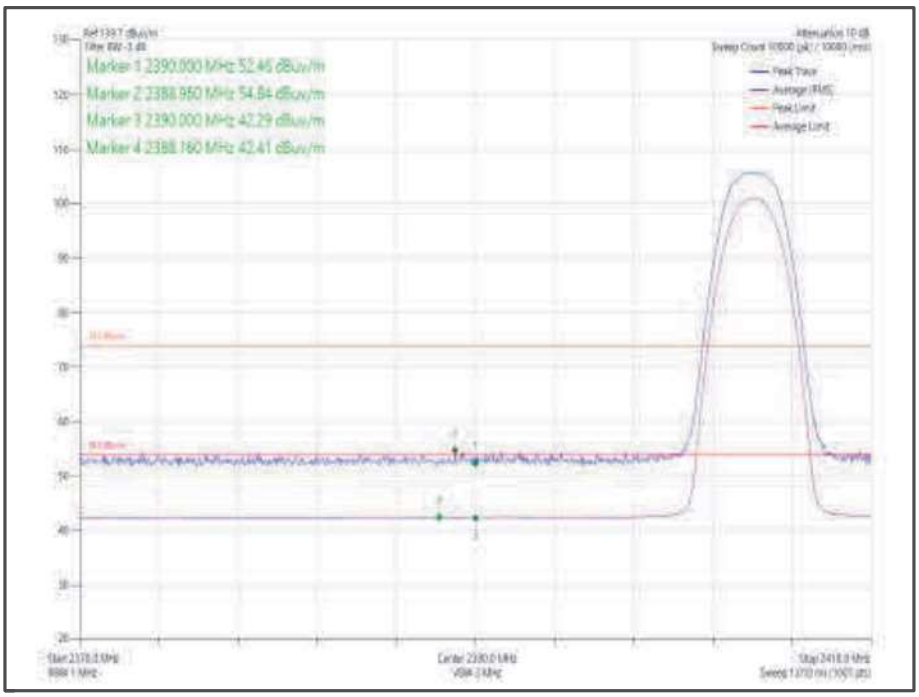


**Figure 209 - Static – Core 0, Π/4 DQPSK/HDR4 - 2404 MHz - Band Edge Frequency 2390.0 MHz**

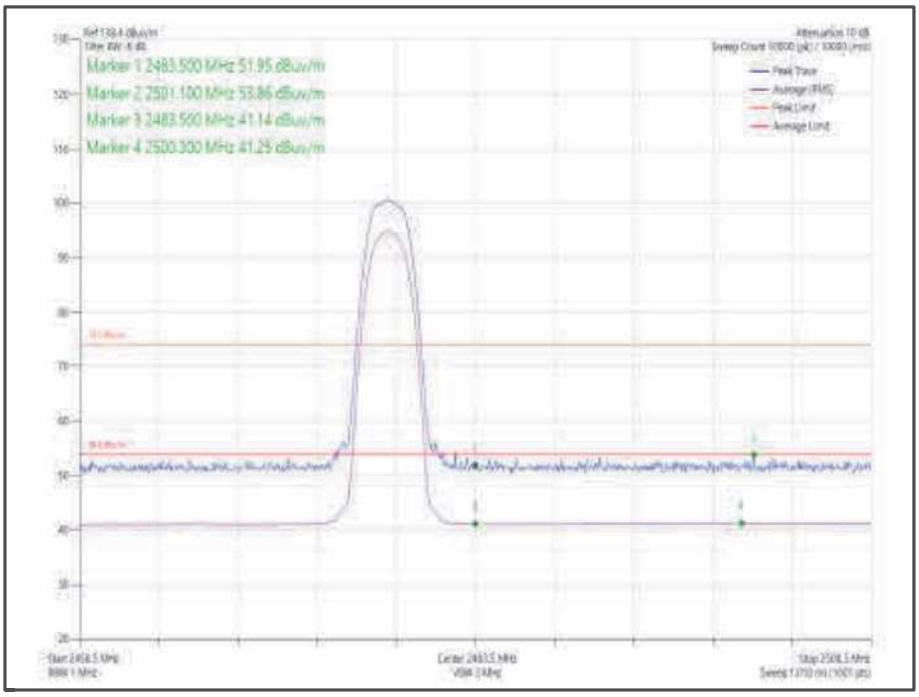


**Figure 210 - Static - Core 0, Π/4 DQPSK/HDR4 - 2478 MHz - Band Edge Frequency 2483.5 MHz**

| Mode | Modulation | Core | Packet Type | Tx Frequency (MHz) | Band Edge Frequency (MHz) | Peak Level (dBµV/m) | Average Level (dBµV/m) |
|---|---|---|---|---|---|---|---|
| Static | Π/4 DQPSK | Core 2 | HDR4 | 2404 | 2390.0 | 54.82 | 42.41 |
| Static | Π/4 DQPSK | Core 2 | HDR4 | 2478 | 2483.5 | 53.55 | 41.67 |

**Table 141 - Restricted Band Edge Results**

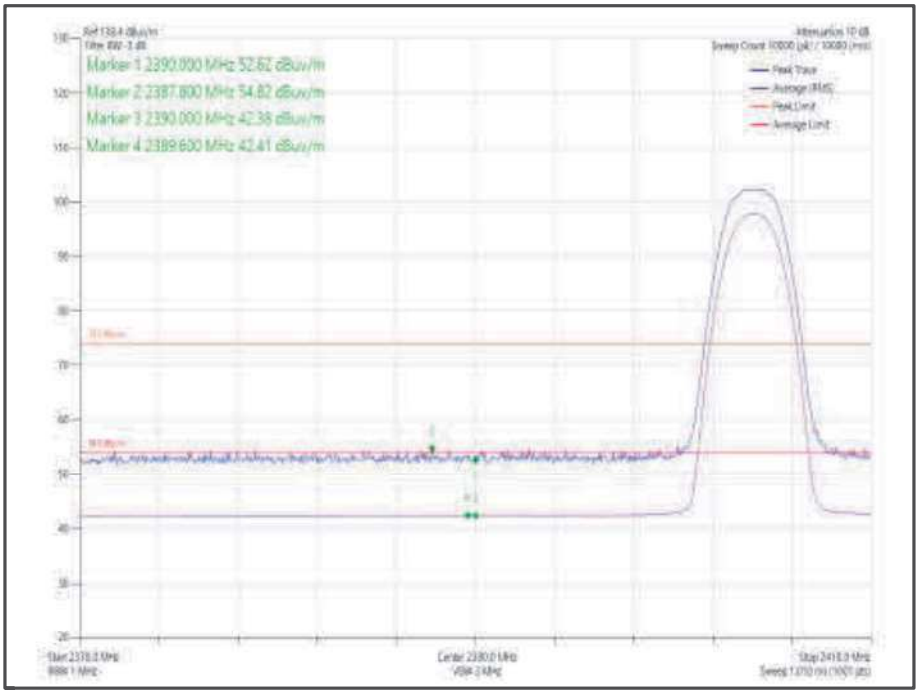


**Figure 211 - Static - Core 2, Π/4 DQPSK/HDR4 - 2404 MHz - Band Edge Frequency 2390.0 MHz**

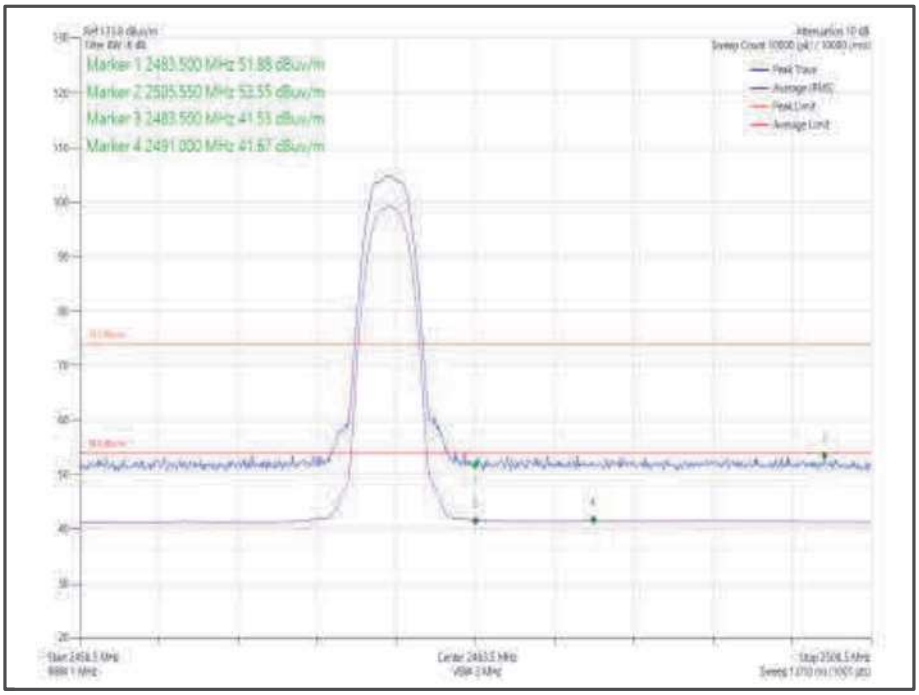


**Figure 212 - Static - Core 2, Π/4 DQPSK/HDR4 - 2478 MHz - Band Edge Frequency 2483.5 MHz**

| Mode | Modulation | Core | Packet Type | Tx Frequency (MHz) | Band Edge Frequency (MHz) | Peak Level (dBµV/m) | Average Level (dBµV/m) |
|---|---|---|---|---|---|---|---|
| Static | Π/4 DQPSK | Core 0-1 | HDR4 | 2404 | 2390.0 | 54.43 | 42.45 |
| Static | Π/4 DQPSK | Core 0-1 | HDR4 | 2478 | 2483.5 | 53.65 | 41.51 |

**Table 142 - Restricted Band Edge Results**

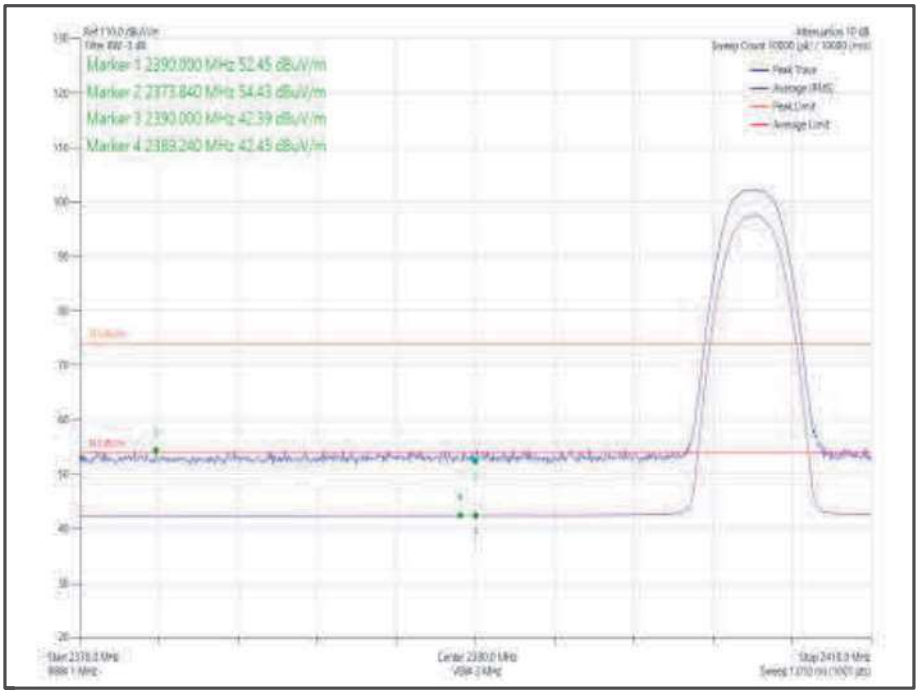


**Figure 213 - Static - Core 0-1, Π/4 DQPSK/HDR4 - 2404 MHz - Band Edge Frequency 2390.0 MHz**

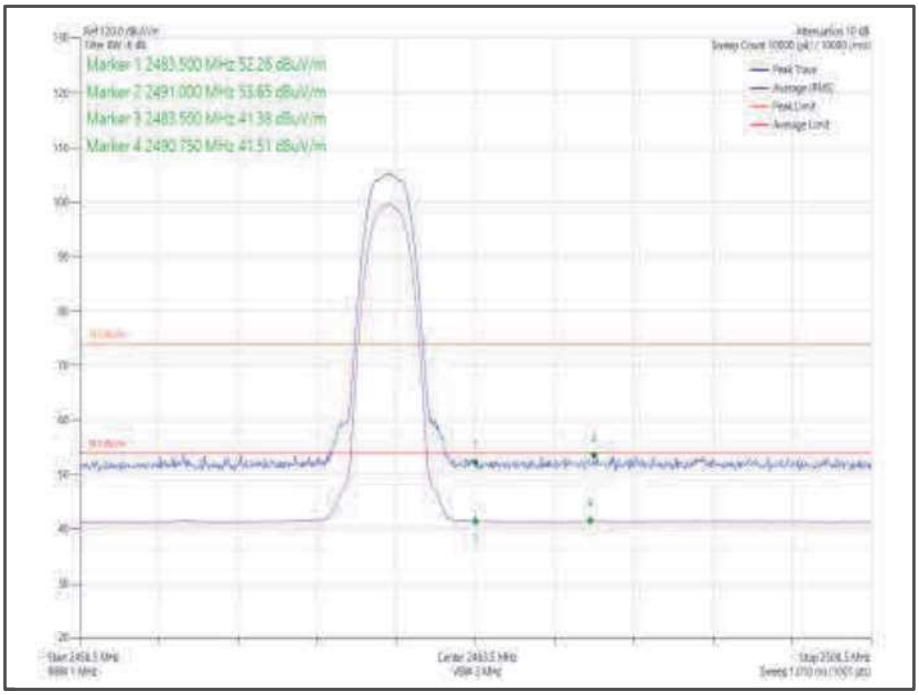


**Figure 214 - Static - Core 0-1, Π/4 DQPSK/HDR4 - 2478 MHz - Band Edge Frequency 2483.5 MHz**

ePA

| Mode | Modulation | Core | Packet Type | Tx Frequency (MHz) | Band Edge Frequency (MHz) | Peak Level (dBµV/m) | Average Level (dBµV/m) |
|---|---|---|---|---|---|---|---|
| Static | Π/4 DQPSK | Core 0 | HDR4 | 2404 | 2390.0 | 56.50 | 43.04 |
| Static | Π/4 DQPSK | Core 0 | HDR4 | 2478 | 2483.5 | 54.71 | 41.57 |

**Table 143 - Restricted Band Edge Results**

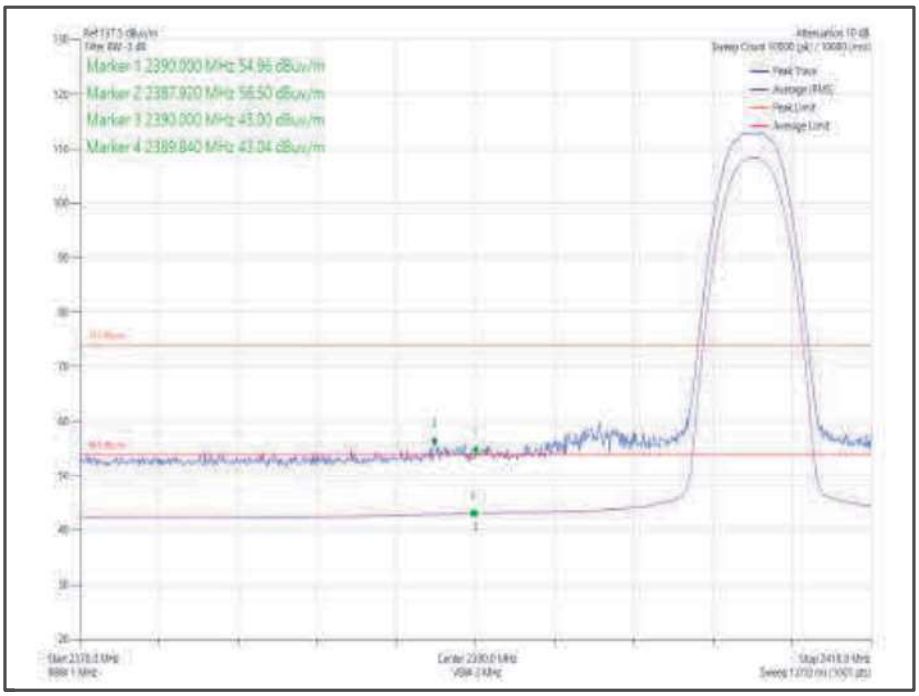


**Figure 215 - Static – Core 0, Π/4 DQPSK/HDR4 - 2404 MHz - Band Edge Frequency 2390.0 MHz**

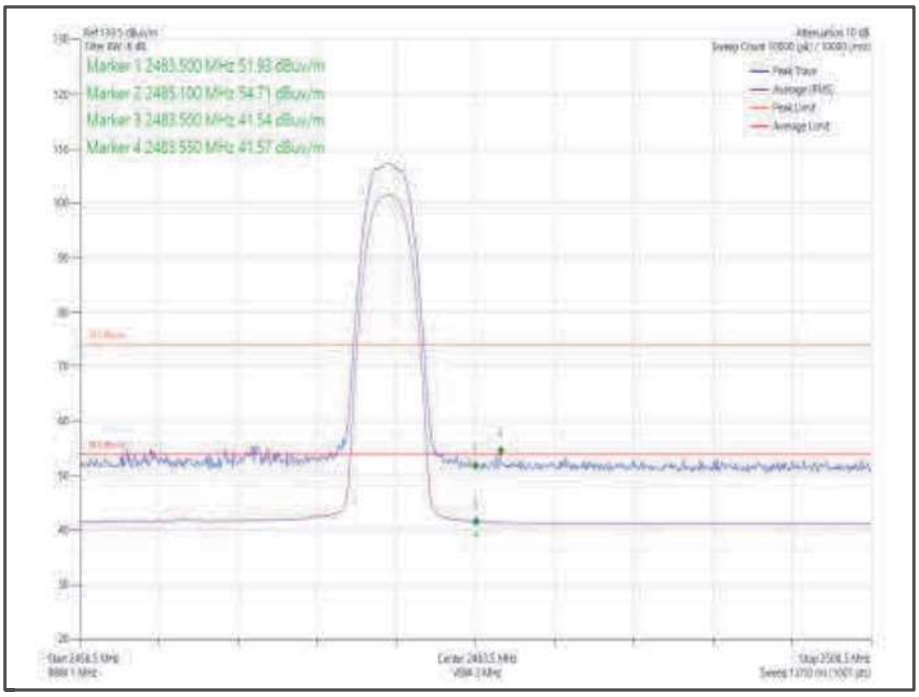


**Figure 216 - Static - Core 0, Π/4 DQPSK/HDR4 - 2478 MHz - Band Edge Frequency 2483.5 MHz**

| Mode | Modulation | Core | Packet Type | Tx Frequency (MHz) | Band Edge Frequency (MHz) | Peak Level (dBµV/m) | Average Level (dBµV/m) |
|---|---|---|---|---|---|---|---|
| Static | Π/4 DQPSK | Core 0-1 | HDR4 | 2404 | 2390.0 | 56.20 | 43.01 |
| Static | Π/4 DQPSK | Core 0-1 | HDR4 | 2478 | 2483.5 | 56.45 | 42.03 |

**Table 144 - Restricted Band Edge Results**

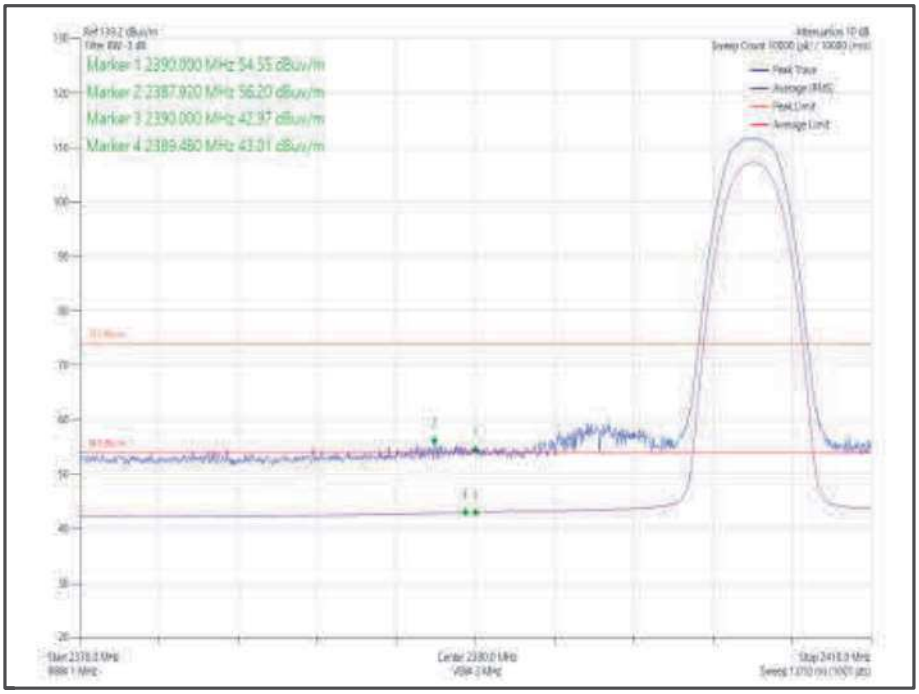


**Figure 217 - Static - Core 0-1, Π/4 DQPSK/HDR4 - 2404 MHz - Band Edge Frequency 2390.0 MHz**

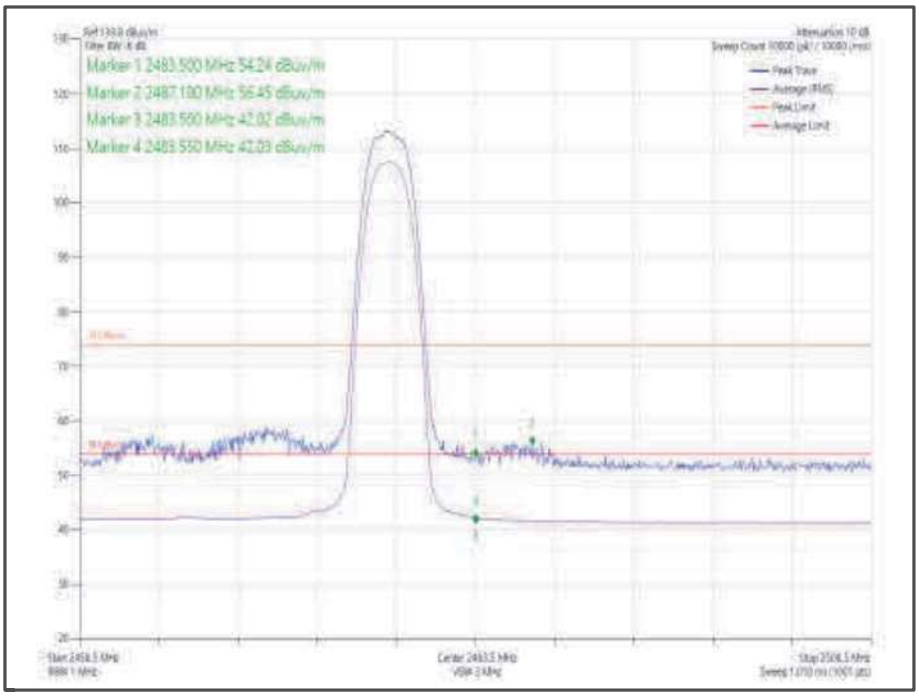


**Figure 218 - Static - Core 0-1, Π/4 DQPSK/HDR4 - 2478 MHz - Band Edge Frequency 2483.5 MHz**

HDR8

iPA

| Mode | Modulation | Core | Packet Type | Tx Frequency (MHz) | Band Edge Frequency (MHz) | Peak Level (dBµV/m) | Average Level (dBµV/m) |
|---|---|---|---|---|---|---|---|
| Static | Π/4 DQPSK | Core 0 | HDR8 | 2404 | 2390.0 | 54.60 | 42.42 |
| Static | Π/4 DQPSK | Core 0 | HDR8 | 2478 | 2483.5 | 54.55 | 42.32 |

**Table 145 - Restricted Band Edge Results**

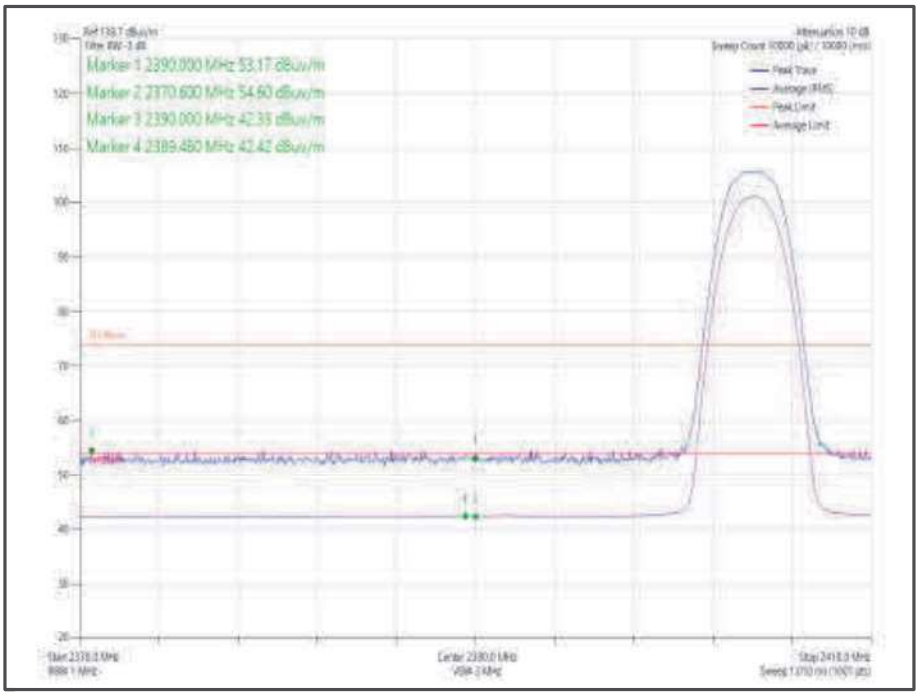


**Figure 219- Static - Core 0, Π/4 DQPSK/HDR8 - 2404 MHz - Band Edge Frequency 2390.0 MHz**

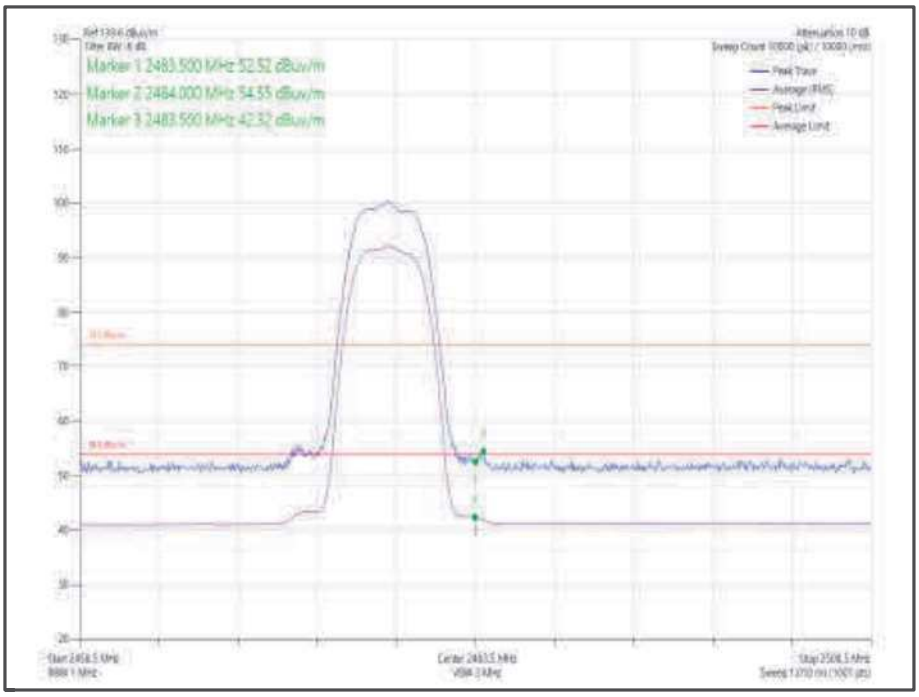


**Figure 220 - Static - Core 0, Π/4 DQPSK/HDR8 - 2478 MHz - Band Edge Frequency 2483.5 MHz**

| Mode | Modulation | Core | Packet Type | Tx Frequency (MHz) | Band Edge Frequency (MHz) | Peak Level (dBµV/m) | Average Level (dBµV/m) |
|---|---|---|---|---|---|---|---|
| Static | Π/4 DQPSK | Core 2 | HDR8 | 2404 | 2390.0 | 54.34 | 42.42 |
| Static | Π/4 DQPSK | Core 2 | HDR | 2478 | 2483.5 | 58.96 | 46.06 |

**Table 146 - Restricted Band Edge Results**

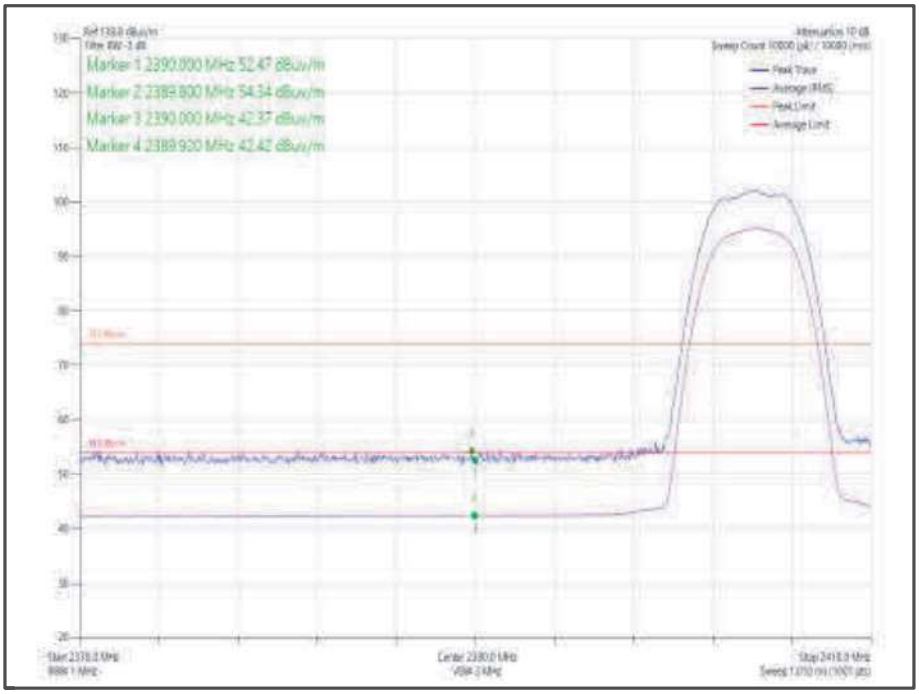


**Figure 221 - Static - Core 2, Π/4 DQPSK/HDR8 - 2404 MHz - Band Edge Frequency 2390.0 MHz**

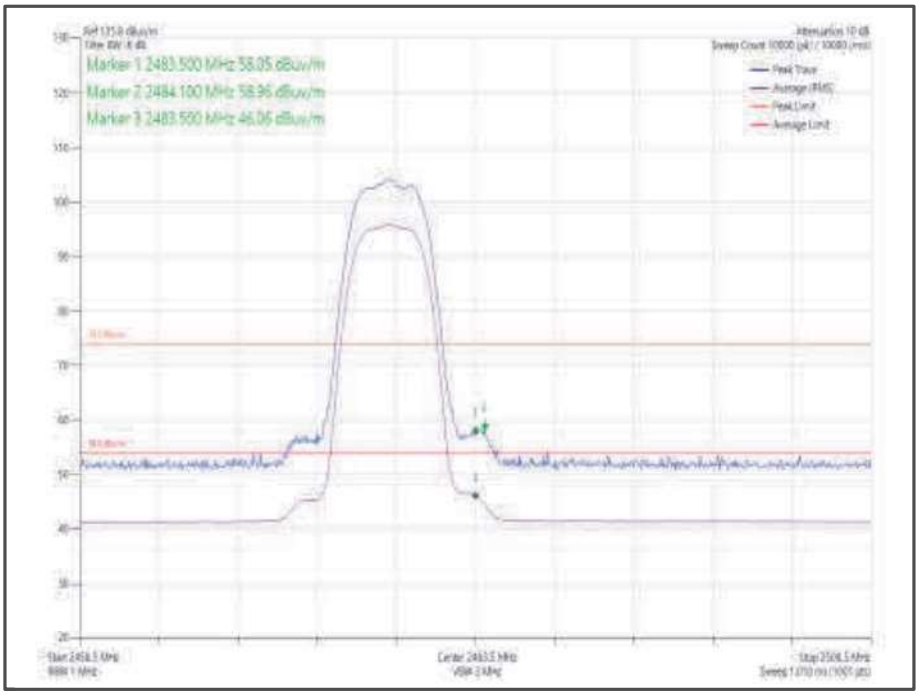


**Figure 222 - Static - Core 2, Π/4 DQPSK/HDR8 - 2478 MHz - Band Edge Frequency 2483.5 MHz**

| Mode | Modulation | Core | Packet Type | Tx Frequency (MHz) | Band Edge Frequency (MHz) | Peak Level (dBµV/m) | Average Level (dBµV/m) |
|---|---|---|---|---|---|---|---|
| Static | Π/4 DQPSK | Core 0-1 | HDR8 | 2404 | 2390.0 | 54.99 | 42.31 |
| Static | Π/4 DQPSK | Core 0-1 | HDR8 | 2478 | 2483.5 | 53.79 | 42.26 |

**Table 147 - Restricted Band Edge Results**

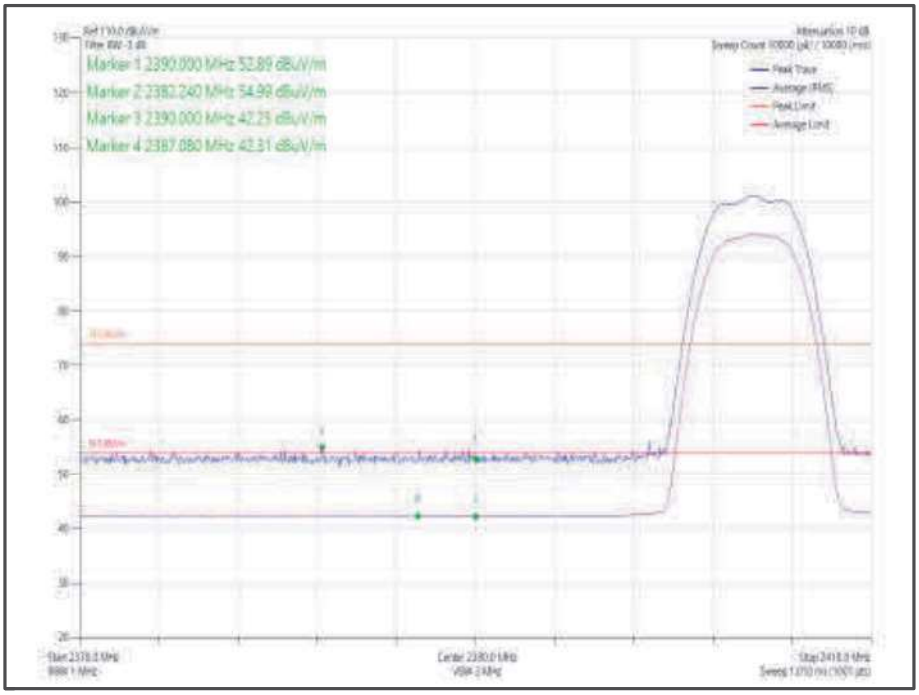


**Figure 223- Static - Core 0-1, Π/4 DQPSK/HDR8 - 2404 MHz - Band Edge Frequency 2390.0 MHz**

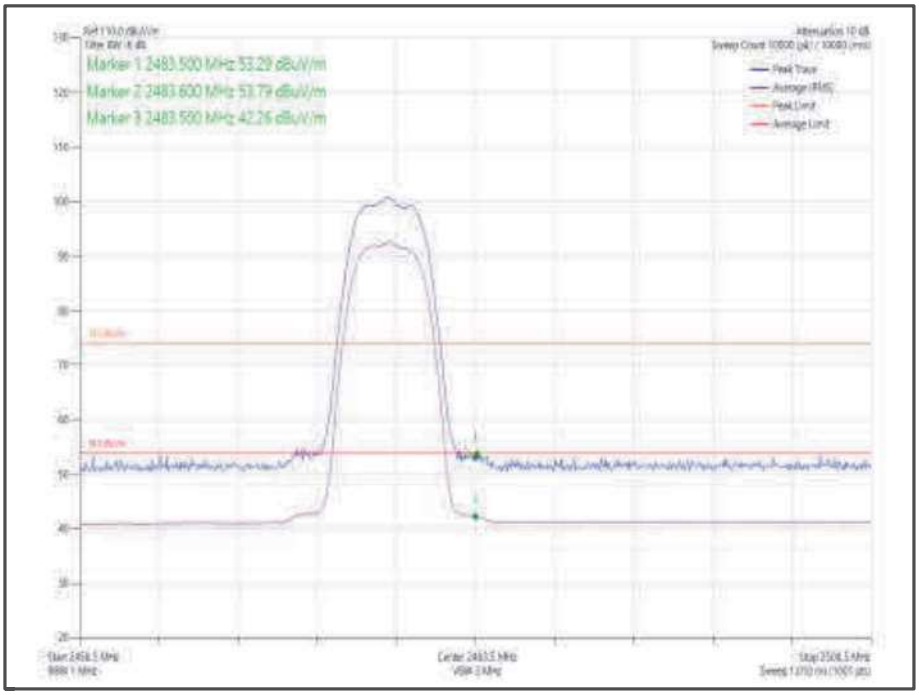


**Figure 224 - Static - Core 0-1, Π/4 DQPSK/HDR8 - 2478 MHz - Band Edge Frequency 2483.5 MHz**

ePA

| Mode | Modulation | Core | Packet Type | Tx Frequency (MHz) | Band Edge Frequency (MHz) | Peak Level (dBµV/m) | Average Level (dBµV/m) |
|---|---|---|---|---|---|---|---|
| Static | Π/4 DQPSK | Core 0 | HDR8 | 2404 | 2390.0 | 56.90 | 43.09 |
| Static | Π/4 DQPSK | Core 0 | HDR8 | 2478 | 2483.5 | 54.15 | 42.22 |

**Table 148 - Restricted Band Edge Results**

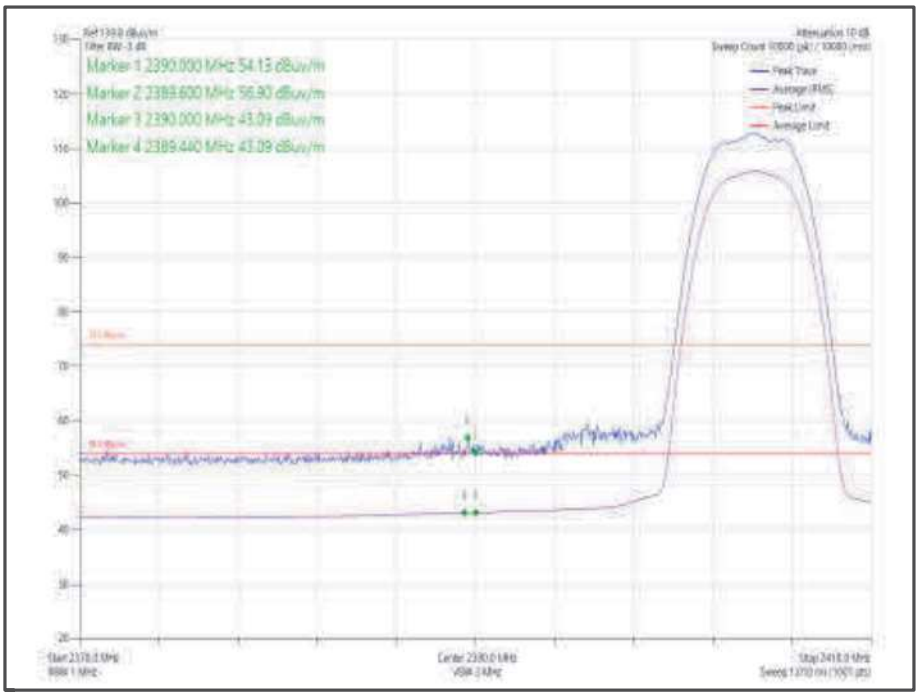


**Figure 225- Static - Core 0, Π/4 DQPSK/HDR8 - 2404 MHz - Band Edge Frequency 2390.0 MHz**

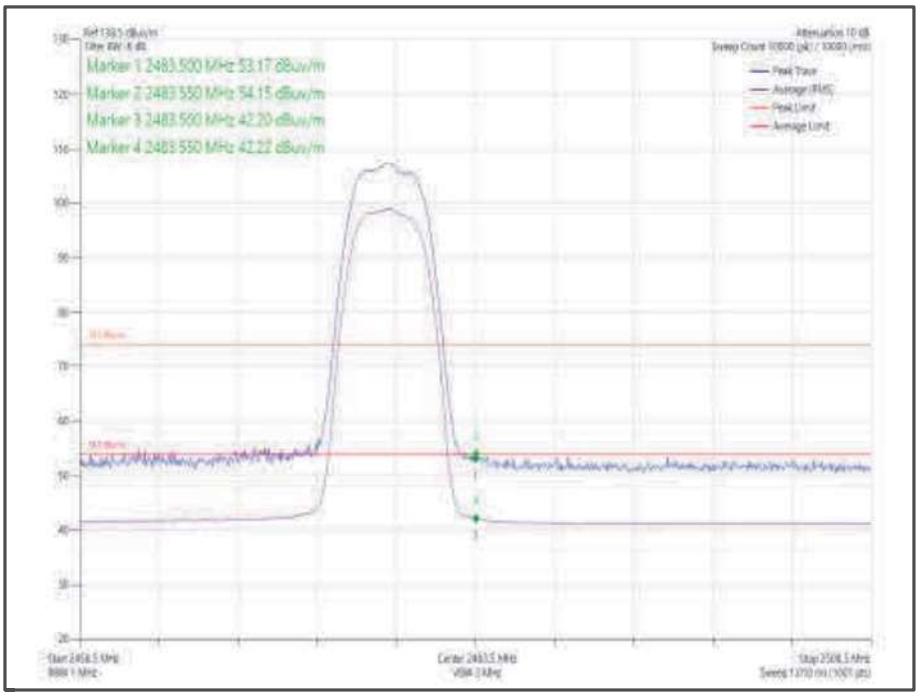


**Figure 226 - Static - Core 0, Π/4 DQPSK/HDR8 - 2478 MHz - Band Edge Frequency 2483.5 MHz**

| Mode | Modulation | Core | Packet Type | Tx Frequency (MHz) | Band Edge Frequency (MHz) | Peak Level (dBµV/m) | Average Level (dBµV/m) |
|---|---|---|---|---|---|---|---|
| Static | Π/4 DQPSK | Core 0-1 | HDR8 | 2404 | 2390.0 | 56.60 | 43.07 |
| Static | Π/4 DQPSK | Core 0-1 | HDR8 | 2478 | 2483.5 | 56.17 | 43.36 |

**Table 149 - Restricted Band Edge Results**

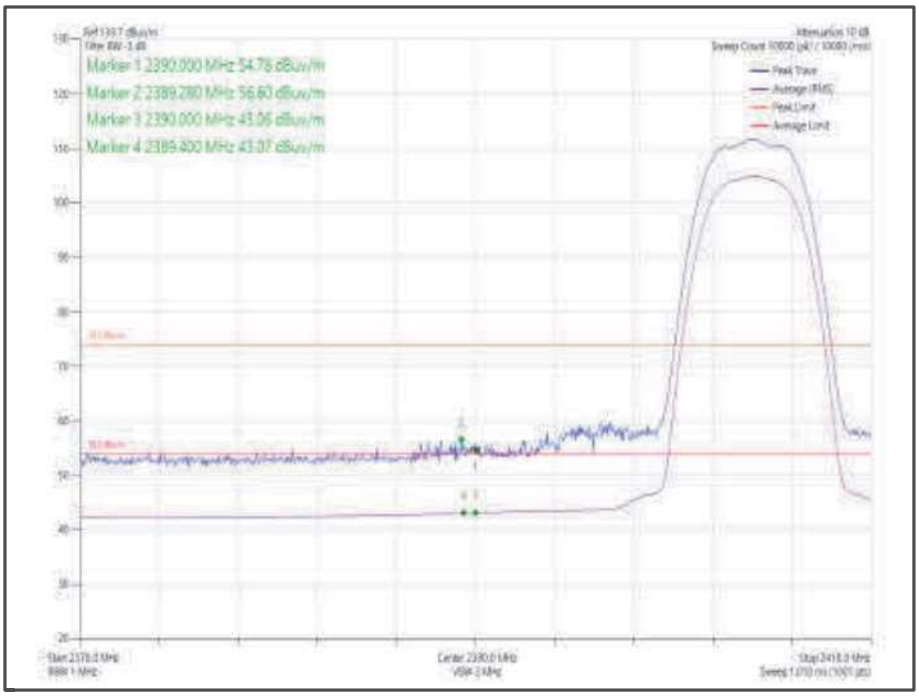


**Figure 227- Static - Core 0, Π/4 DQPSK/HDR8 - 2404 MHz - Band Edge Frequency 2390.0 MHz**

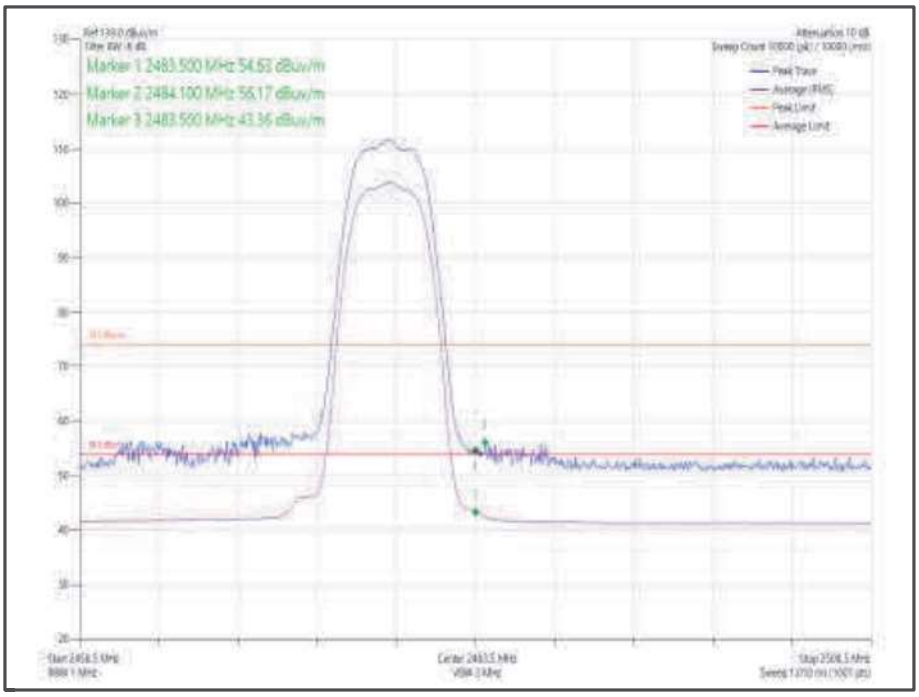


**Figure 228 - Static - Core 0, Π/4 DQPSK/HDR8 - 2478 MHz - Band Edge Frequency 2483.5 MHz**

FCC 47 CFR Part 15, Limit Clause 15.209

| Frequency (MHz) | Field Strength (µV/m at 3 m) |
|---|---|
| 30 to 88 | 100 |
| 88 to 216 | 150 |
| 216 to 960 | 200 |
| Above 960 | 500 |

ISED RSS-GEN, Limit Clause 8.9

| Frequency (MHz) | Field Strength (µV/m at 3 m) |
|---|---|
| 30 to 88 | 100 |
| 88 to 216 | 150 |
| 216 to 960 | 200 |
| Above 960* | 500 |

**Table 150**

*Unless otherwise specified, for all frequencies greater than 1 GHz, the radiated emission limits for licence-exempt radio apparatus stated in applicable RSSs (including RSS-Gen) are based on measurements using a linear average detector function having a minimum resolution bandwidth of 1 MHz. If an average limit is specified for the EUT, then the peak emission shall also be measured with instrumentation properly adjusted for such factors as pulse desensitization to ensure the peak emission is less than 20 dB above the average limit.

### 2.5.7 Test Location and Test Equipment Used

This test was carried out in RF Chamber 11.

| Instrument | Manufacturer | Type No | TE No | Calibration Period (months) | Calibration Due |
|---|---|---|---|---|---|
| True RMS Multimeter | Fluke | 179 | 4007 | 12 | 29-Oct-2021 |
| EMI Test Receiver | Rohde & Schwarz | ESW44 | 5084 | 12 | 04-Feb-2021 |
| EmX Emissions Software | TUV SUD | V2.1.0 | 5125 | - | Software |
| Screened Room (11) | Rainford | Rainford | 5136 | 36 | 01-Nov-2021 |
| Mast | Maturo | TAM 4.0-P | 5158 | - | TU |
| Mast and Turntable Controller | Maturo | Maturo NCD | 5159 | - | TU |
| Turntable | Maturo | TT 15WF | 5160 | - | TU |
| Horn Antenna (1-10GHz) | Schwarzbeck | BBHA 9120 B | 5215 | 12 | 10-Mar-2021 |
| Thermo-Hygro-Barometer | PCE Instruments | PCE-THB-40 | 5475 | 12 | 17-Mar-2021 |
| 2m SMA Cable | Junkosha | MWX221-02000AMSAMS/A | 5518 | 12 | 01-Apr-2021 |
| 8m N Type Cable | Junkosha | MWX221-08000NMSNMS/B | 5522 | 12 | 24-Mar-2021 |

**Table 151**

TU - Traceability Unscheduled

## 2.6 Spurious Radiated Emissions

### 2.6.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.247 (d) and 15.205
ISED RSS-247, Clause 3.3
ISED RSS-GEN, Clause 6.13

### 2.6.2 Equipment Under Test and Modification State

A2438, S/N: C02DM00Q087X - Modification State 0

### 2.6.3 Date of Test

19-December-2020 to 04-January-2021

### 2.6.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 6.3, 6.5 and 6.6.

The EUT was placed on the non-conducting platform in a manner typical of a normal installation. Ports on the EUT were terminated with loads as described in ANSI C63.4 clause 6.2.4. One port of each type was loaded.

For frequencies > 1 GHz, plots for average measurements were taken in accordance with ANSI C63.10, clause 11.12.2.5.2.

The plots shown are the characterisation of the EUT. The limits on the plots represent the most stringent case for restricted bands, (74/54 dBuV/m) when compared to 20 dBc outside restricted bands. The limits shown have been used as a threshold to determine where further measurements are necessary. Where results are within 10 dB of the limits shown on the plots, further investigation was carried out and reported in results tables.

The following conversion can be applied to convert from dBµV/m to µV/m:
10^(Field Strength in dBµV/m/20).

To determine the emission characteristic of the EUT above 18 GHz, the test antenna was swept over all faces of the EUT whilst observing a spectral display. The frequency of any emissions of interest was noted for formal measurement at the correct measurement distance of 1m. This procedure was repeated for all relevant transmit operating channels.

At a measurement distance of 1 meter the limit line was increased by 20*LOG(3/1) = 9.54 dB.

Representative noise floor plots are presented in the plot section of the report for one operating channel only.

Where formal measurements have been necessary, the results have been presented in the emissions table.

In the 30 MHz to 1 GHz range pre-scans were only performed on the main radio mid channel (2440 MHz).

### 2.6.5 Example Test Setup Diagram

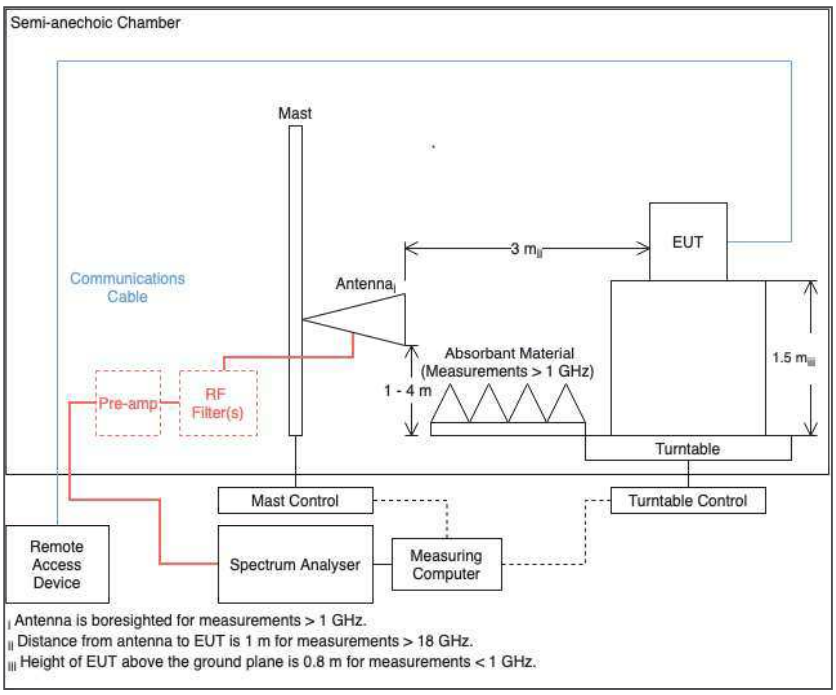


**Figure 229**

### 2.6.6 Environmental Conditions

| | |
|---|---|
| Ambient Temperature | 20.2 - 24.2 °C |
| Relative Humidity | 40.8 - 51.2 % |

### 2.6.7 Test Results

2.4 GHz Bluetooth - DTS

| Frequency (MHz) | Level (dBuv/m) | Limit (dBuv/m) | Margin (dB) | Detector | Angle (°) | Height (cm) | Polarisation |
|---|---|---|---|---|---|---|---|
| * | | | | | | | |

**Table 152 - 2402 MHz (CH0), LE1M, ePA, Core 0, 1 GHz to 26 GHz**

*No emissions found within 10 dB of the limit.

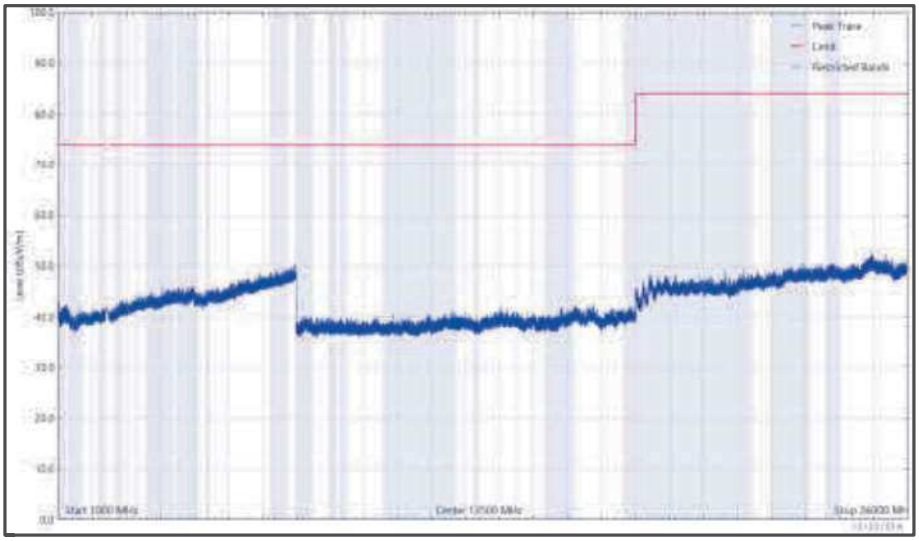

**Figure 230 - 2402 MHz (CH0), LE1M, ePA, Core 0, 1 GHz to 26 GHz, Horizontal (Peak)**

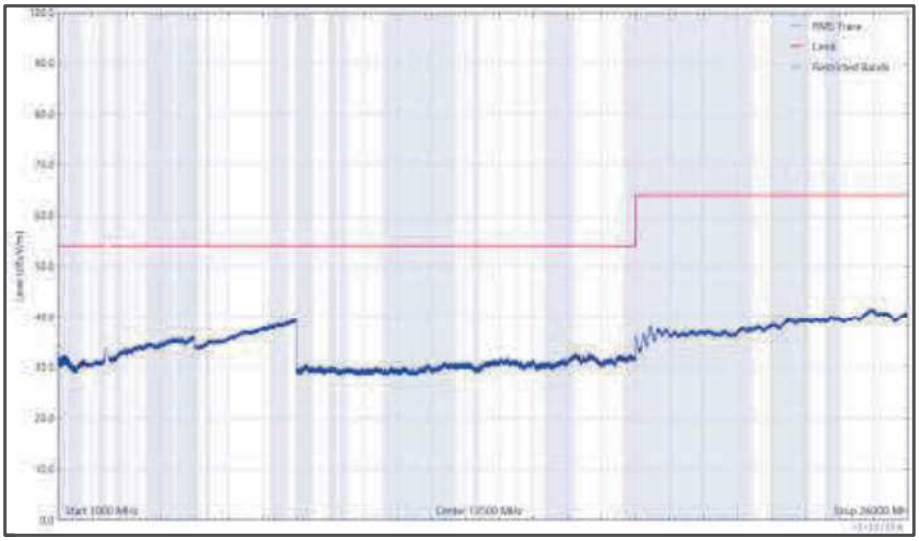

**Figure 231 - 2402 MHz (CH0), LE1M, ePA, Core 0, 1 GHz to 26 GHz, Horizontal (rms)**

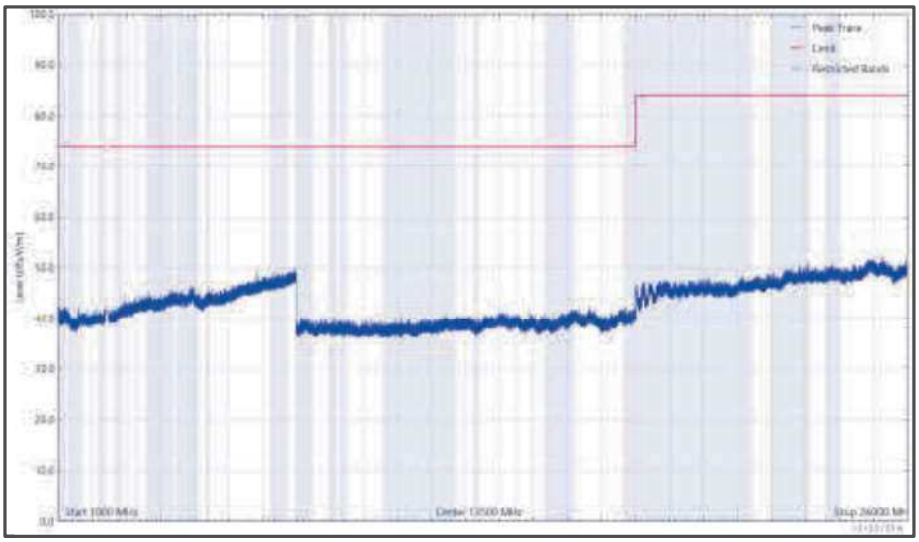

**Figure 232 - 2402 MHz (CH0), LE1M, ePA, Core 0, 1 GHz to 26 GHz, Vertical (Peak)**

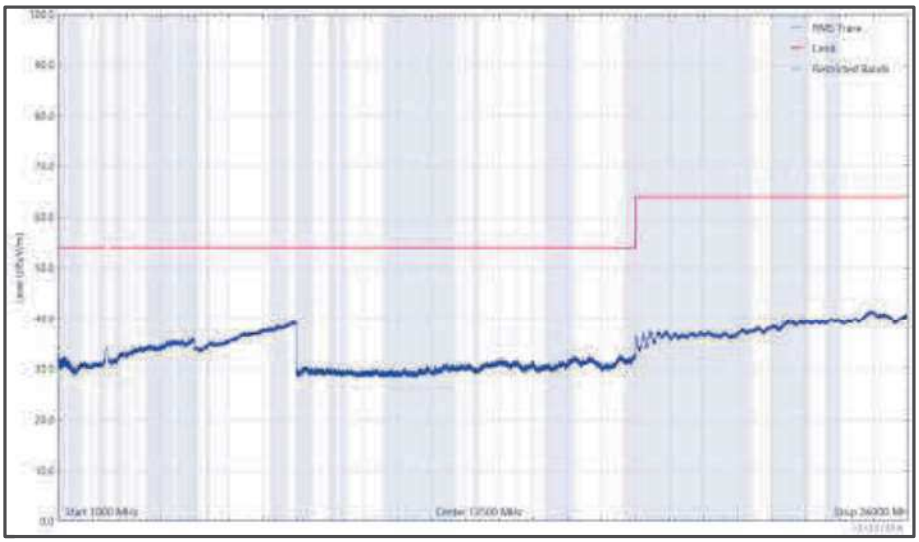

**Figure 233 - 2402 MHz (CH0), LE1M, ePA, Core 0, 1 GHz to 26 GHz, Vertical (rms)**

| Frequency (MHz) | Level (dBuv/m) | Limit (dBuv/m) | Margin (dB) | Detector | Angle (°) | Height (cm) | Polarisation |
|---|---|---|---|---|---|---|---|
| 274.859 | 26.6 | 46.0 | -19.4 | Q-Peak | 14 | 104 | Horizontal |

**Table 153 - 2440 MHz (CH17), LE1M, ePA, Core 0, 30 MHz to 26 GHz**

No other emissions found within 10 dB of the limit.

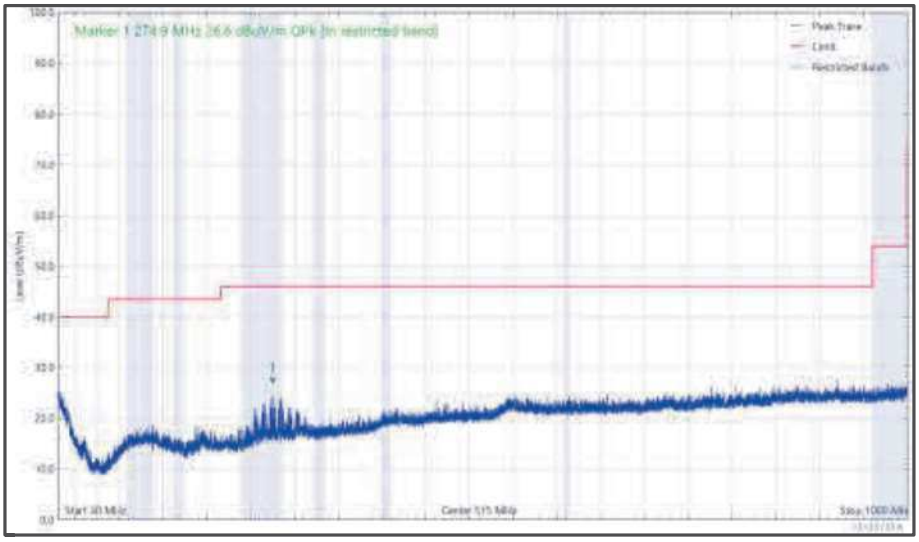

**Figure 234 - 2440 MHz (CH17), LE1M, ePA, Core 0, 30 MHz to 1 GHz, Horizontal (Peak)**

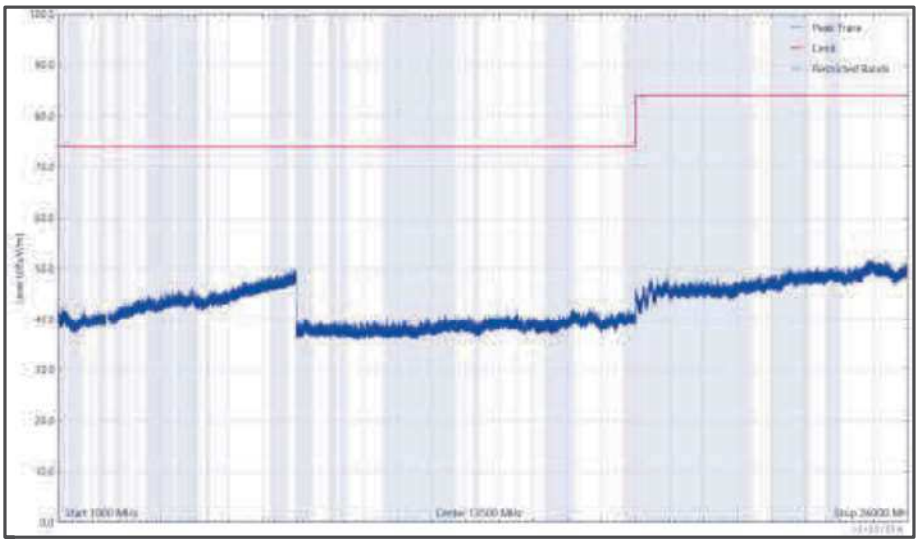

**Figure 235 - 2440 MHz (CH17), LE1M, ePA, Core 0, 1 GHz to 26 GHz, Horizontal (Peak)**

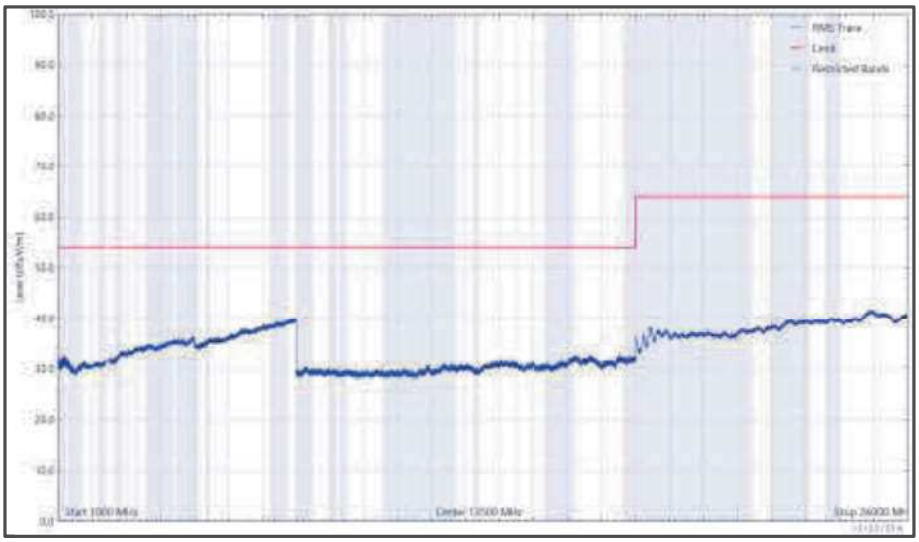

**Figure 236 - 2440 MHz (CH17), LE1M, ePA, Core 0, 1 GHz to 26 GHz, Horizontal (rms)**

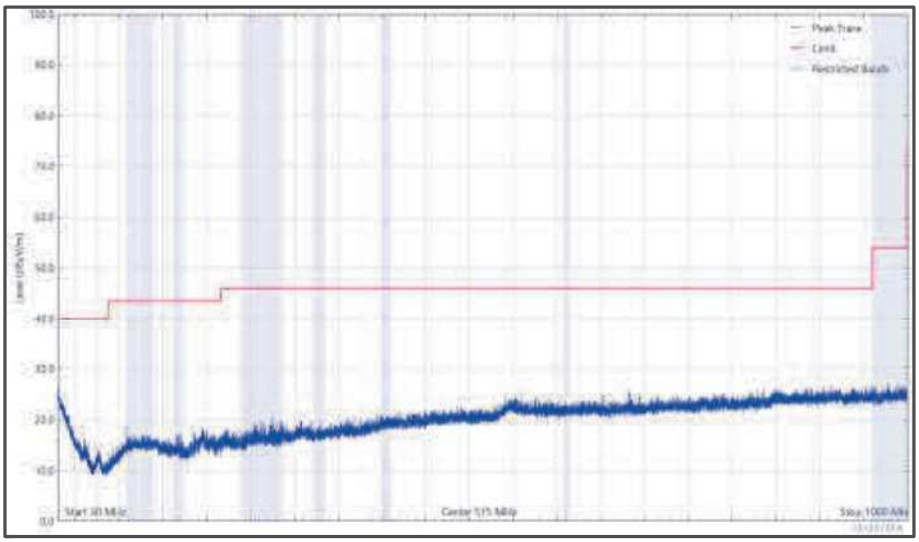

**Figure 237 - 2440 MHz (CH17), LE1M, ePA, Core 0, 30 MHz to 1 GHz, Vertical (Peak)**

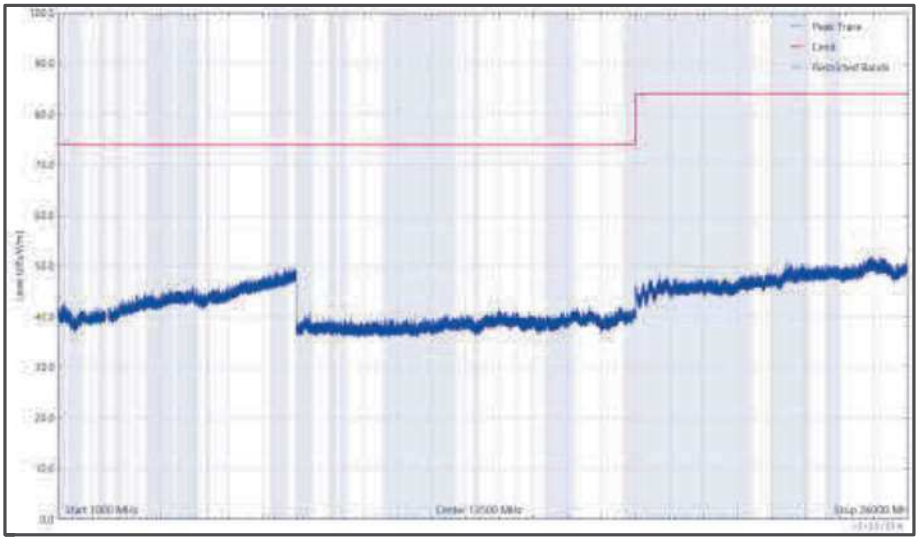

**Figure 238 - 2440 MHz (CH17), LE1M, ePA, Core 0, 1 GHz to 26 GHz, Vertical (Peak)**

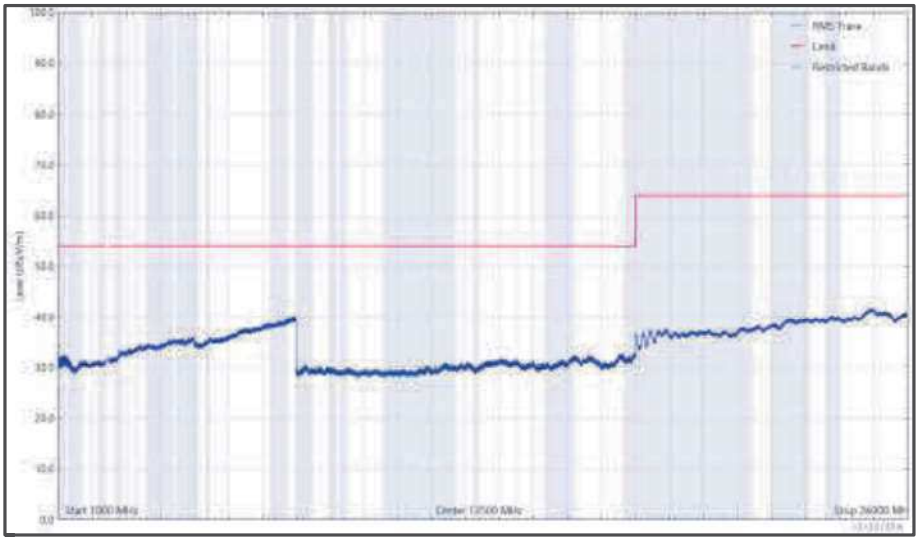

**Figure 239 - 2440 MHz (CH17), LE1M, ePA, Core 0, 1 GHz to 26 GHz, Vertical (rms)**

| Frequency (MHz) | Level (dBuv/m) | Limit (dBuv/m) | Margin (dB) | Detector | Angle (°) | Height (cm) | Polarisation |
|---|---|---|---|---|---|---|---|
| * | | | | | | | |

**Table 154 - 2480 MHz (CH39), LE1M, ePA, Core 0, 1 GHz to 26 GHz**

*No emissions found within 10 dB of the limit.

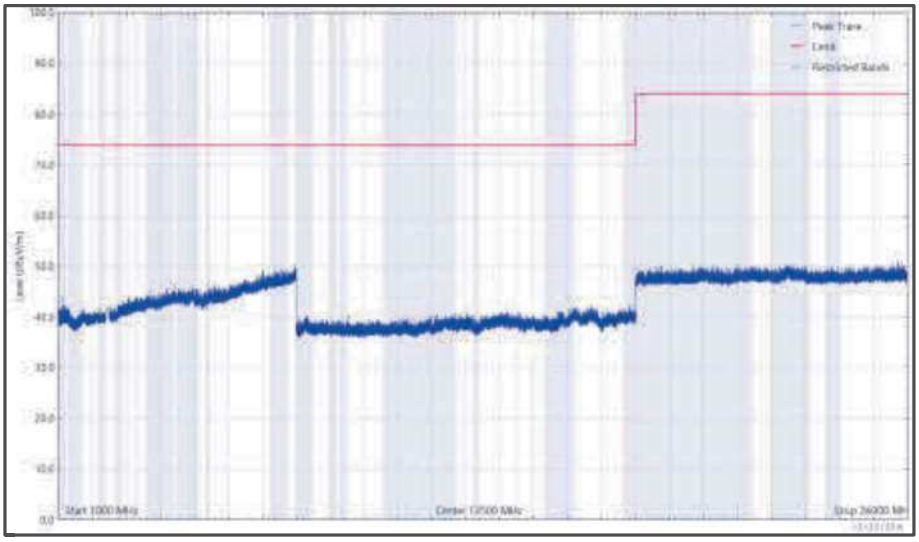

**Figure 240 - 2480 MHz (CH39), LE1M, ePA, Core 0, 1 GHz to 26 GHz, Horizontal (Peak)**

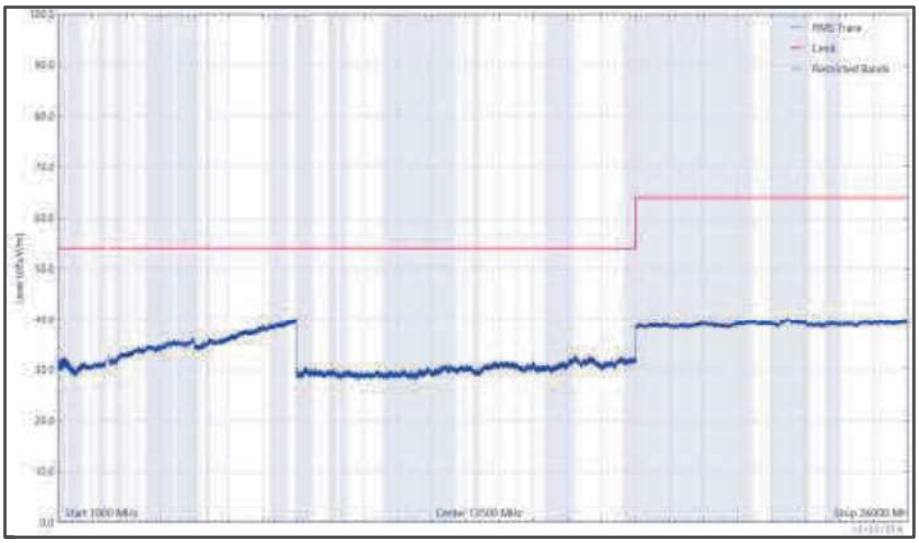

**Figure 241 - 2480 MHz (CH39), LE1M, ePA, Core 0, 1 GHz to 26 GHz, Horizontal (rms)**

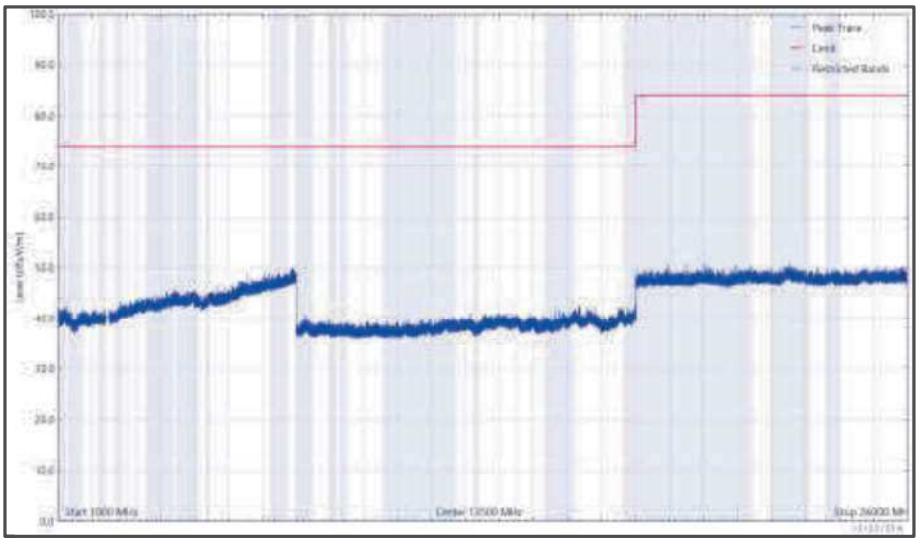

**Figure 242 - 2480 MHz (CH39), LE1M, ePA, Core 0, 1 GHz to 26 GHz, Vertical (Peak)**

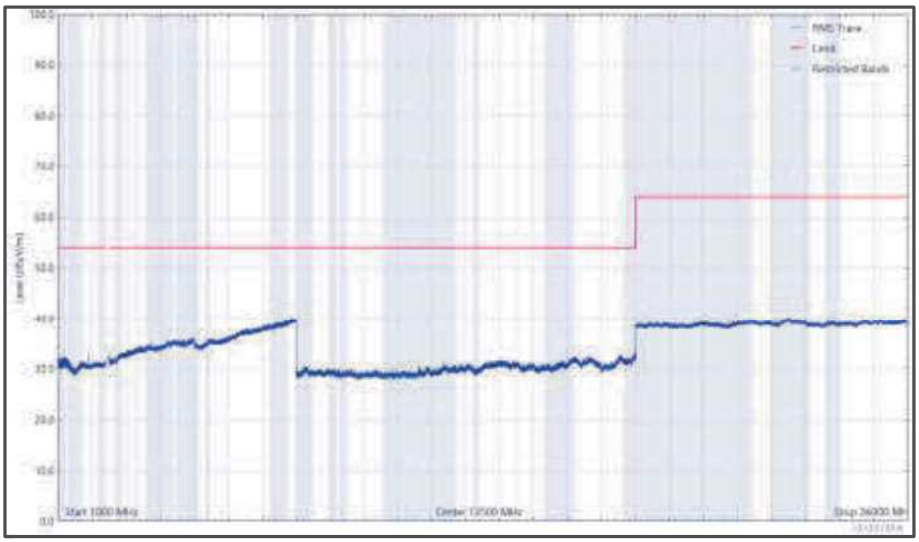

**Figure 243 - 2480 MHz (CH39), LE1M, ePA, Core 0, 1 GHz to 26 GHz, Vertical (rms)**

| Frequency (MHz) | Level (dBuv/m) | Limit (dBuv/m) | Margin (dB) | Detector | Angle (°) | Height (cm) | Polarisation |
|---|---|---|---|---|---|---|---|
| * | | | | | | | |

**Table 155 - 2402 MHz (CH0), LE1M, ePA, Core 1, 1 GHz to 26 GHz**

*No emissions found within 10 dB of the limit.

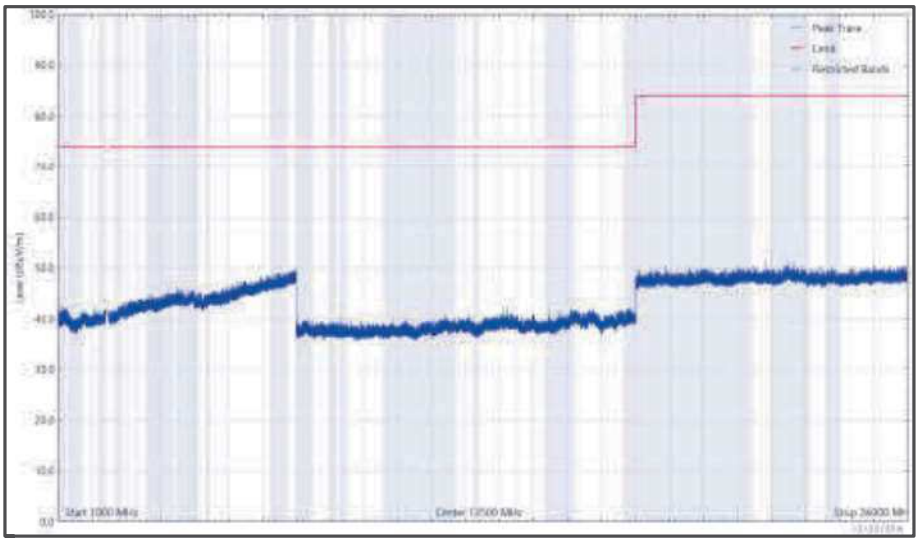

**Figure 244 - 2402 MHz (CH0), LE1M, ePA, Core 1, 1 GHz to 26 GHz, Horizontal (Peak)**

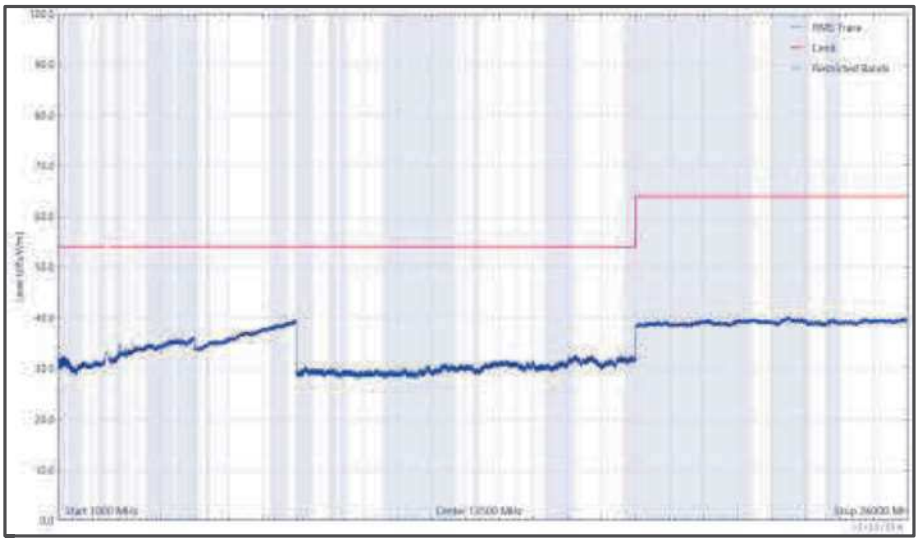

**Figure 245 - 2402 MHz (CH0), LE1M, ePA, Core 1, 1 GHz to 26 GHz, Horizontal (rms)**

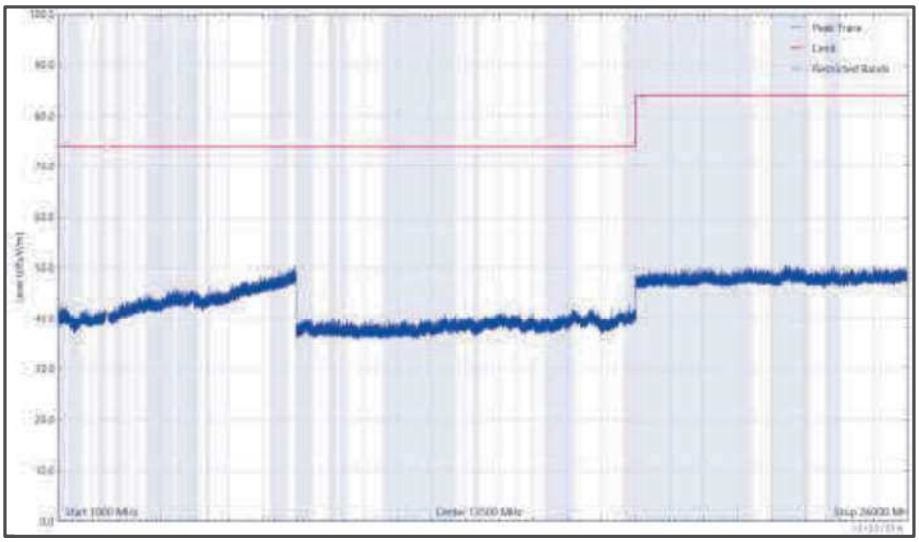

**Figure 246 - 2402 MHz (CH0), LE1M, ePA, Core 1, 1 GHz to 26 GHz, Vertical (Peak)**

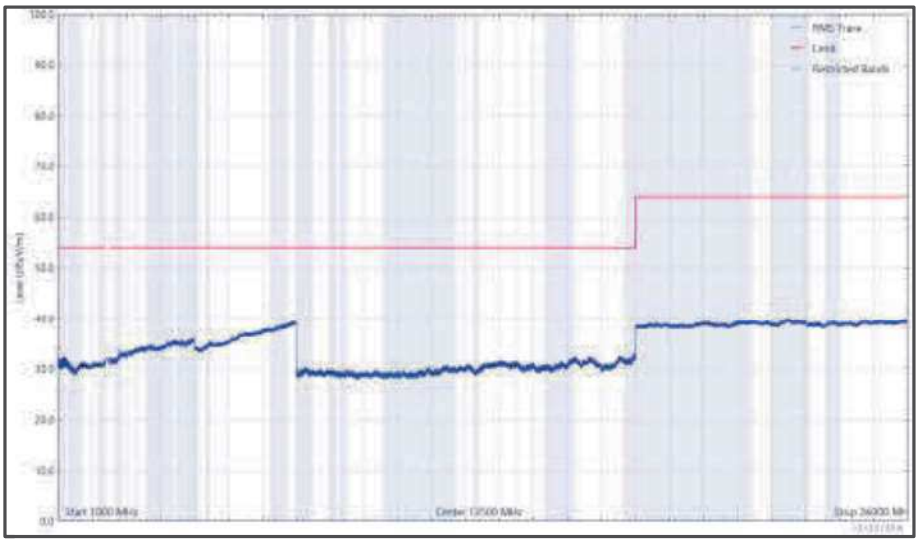

**Figure 247 - 2402 MHz (CH0), LE1M, ePA, Core 1, 1 GHz to 26 GHz, Vertical (rms)**

| Frequency (MHz) | Level (dBuv/m) | Limit (dBuv/m) | Margin (dB) | Detector | Angle (°) | Height (cm) | Polarisation |
|---|---|---|---|---|---|---|---|
| 2846.822 | 33.4 | 54.0 | -20.6 | RMS | 359 | 183 | Horizontal |

**Table 156 - 2440 MHz (CH17), LE1M, ePA, Core 1, 30 MHz to 26 GHz**

No other emissions found within 10 dB of the limit.

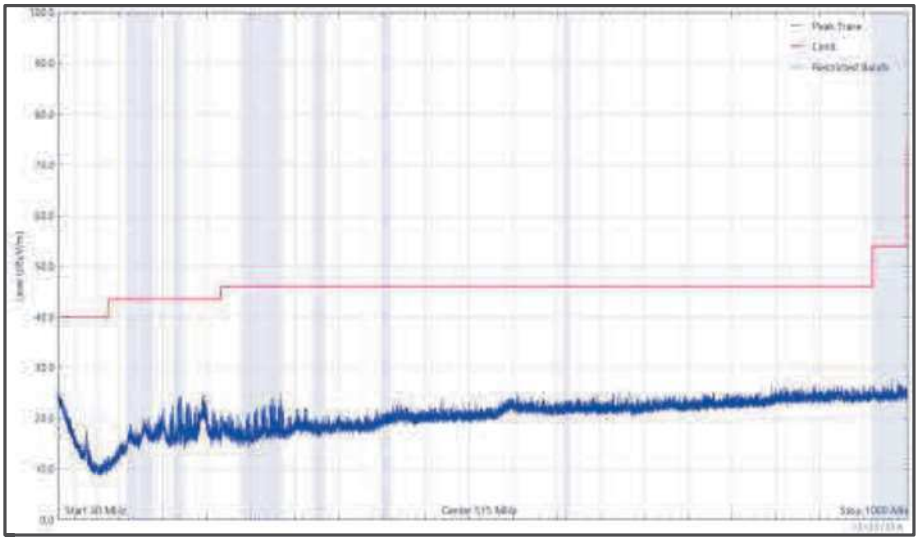

**Figure 248 - 2440 MHz (CH17), LE1M, ePA, Core 1, 30 MHz to 1 GHz, Horizontal (Peak)**

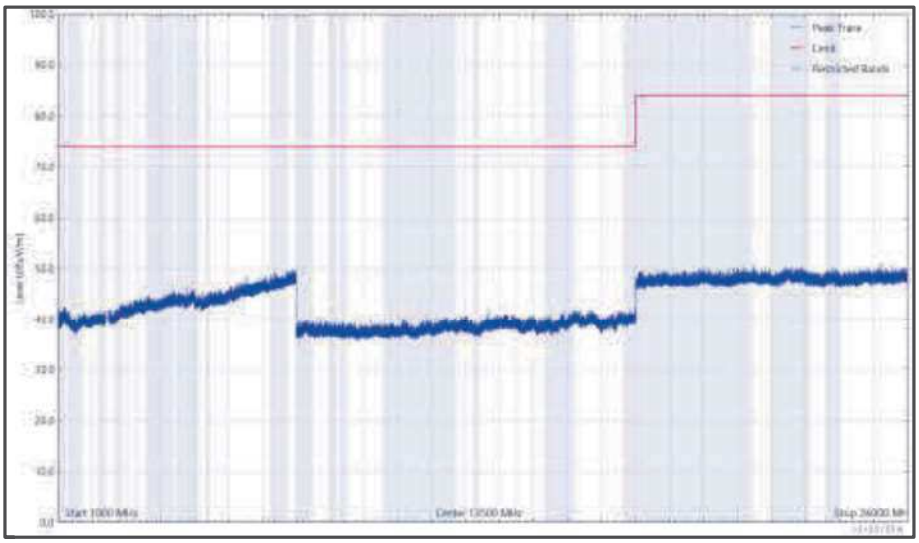

**Figure 249 - 2440 MHz (CH17), LE1M, ePA, Core 1, 1 GHz to 26 GHz, Horizontal (Peak)**

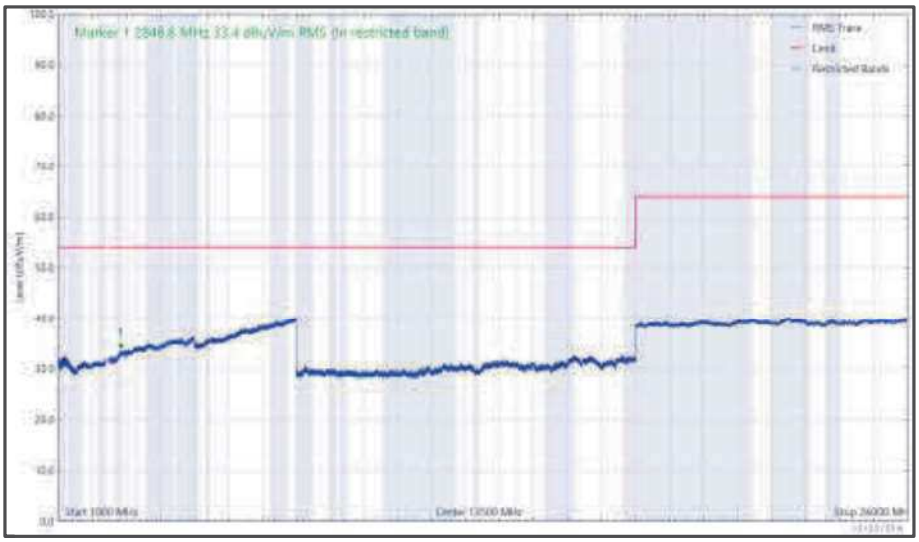

**Figure 250 - 2440 MHz (CH17), LE1M, ePA, Core 1, 1 GHz to 26 GHz, Horizontal (rms)**

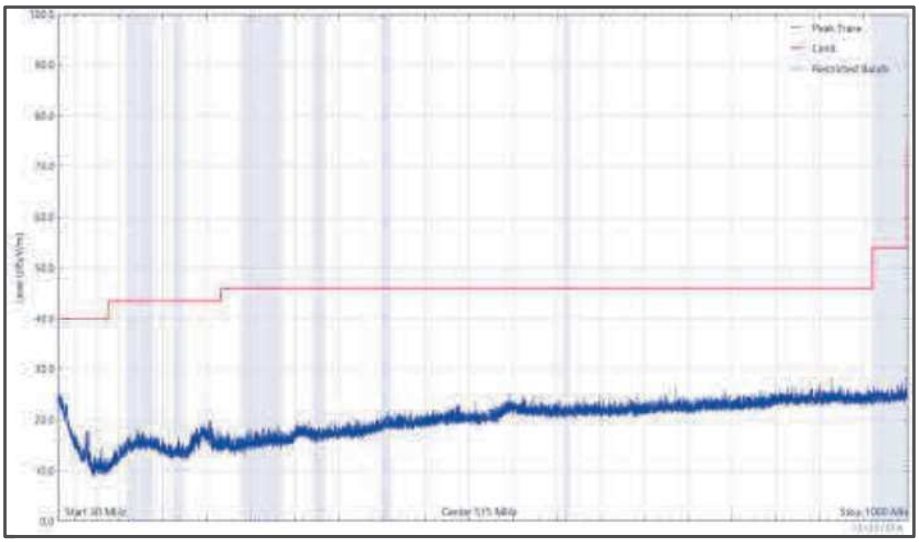

**Figure 251 - 2440 MHz (CH17), LE1M, ePA, Core 1, 30 MHz to 1 GHz, Vertical (Peak)**

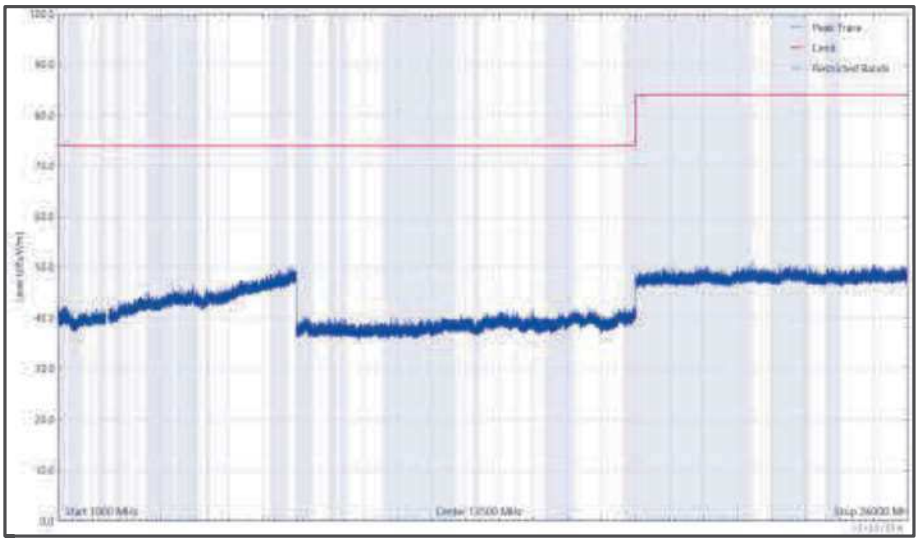

**Figure 252 - 2440 MHz (CH17), LE1M, ePA, Core 1, 1 GHz to 26 GHz, Vertical (Peak)**

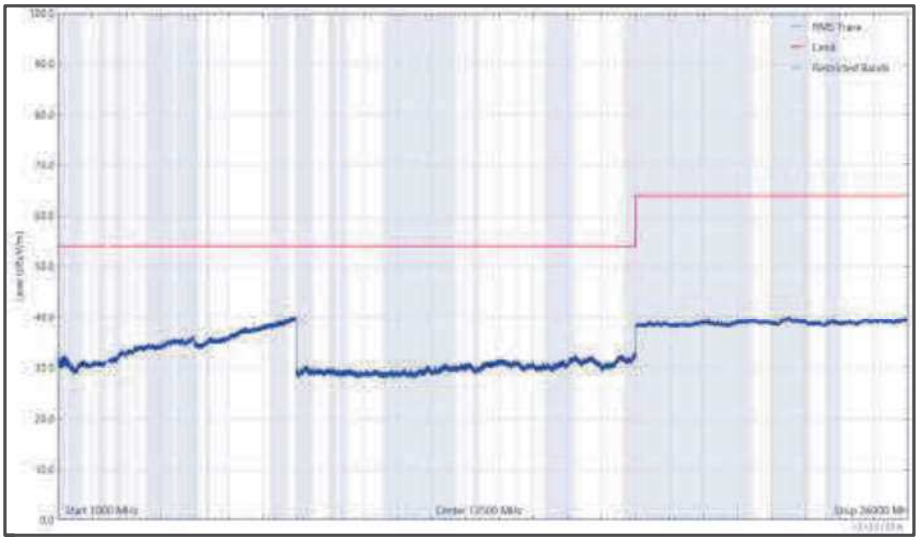

**Figure 253 - 2440 MHz (CH17), LE1M, ePA, Core 1, 1 GHz to 26 GHz, Vertical (rms)**

| Frequency (MHz) | Level (dBuv/m) | Limit (dBuv/m) | Margin (dB) | Detector | Angle (°) | Height (cm) | Polarisation |
|---|---|---|---|---|---|---|---|
| * | | | | | | | |

**Table 157 - 2480 MHz (CH39), LE1M, ePA, Core 1, 1 GHz to 26 GHz**

*No emissions found within 10 dB of the limit.

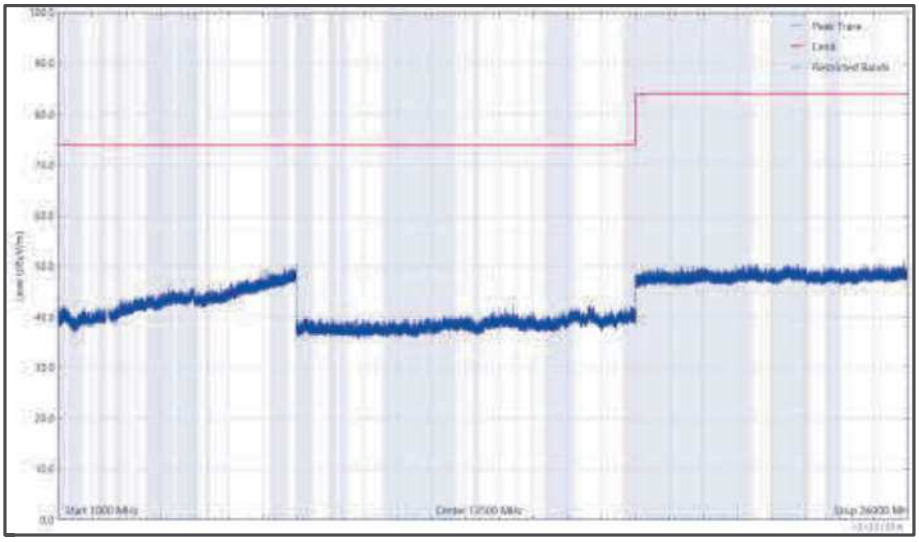

**Figure 254 - 2480 MHz (CH39), LE1M, ePA, Core 1, 1 GHz to 26 GHz, Horizontal (Peak)**

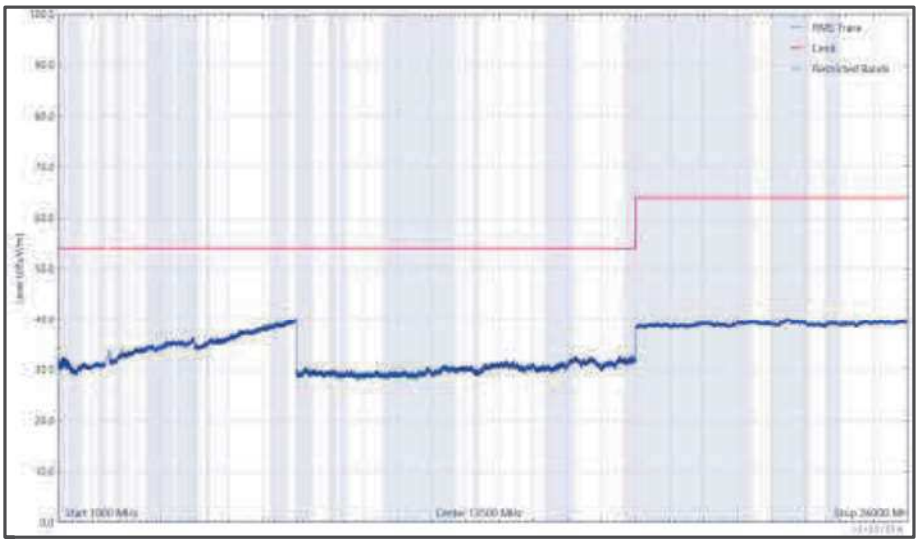

**Figure 255 - 2480 MHz (CH39), LE1M, ePA, Core 1, 1 GHz to 26 GHz, Horizontal (rms)**

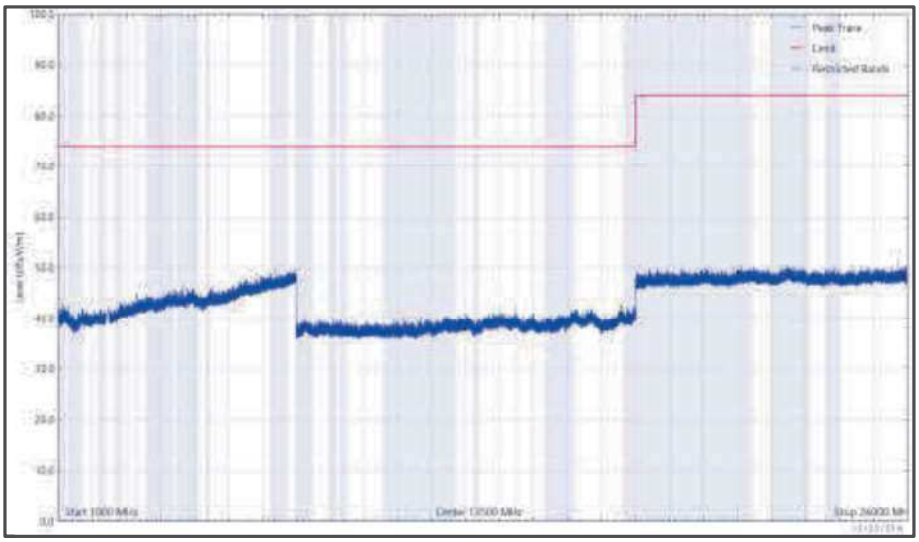

**Figure 256 - 2480 MHz (CH39), LE1M, ePA, Core 1, 1 GHz to 26 GHz, Vertical (Peak)**

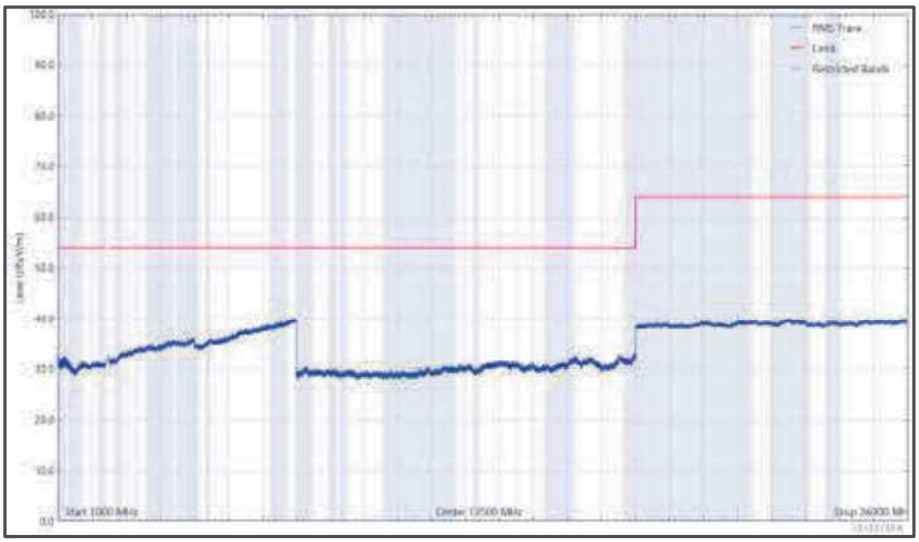

**Figure 257 - 2480 MHz (CH39), LE1M, ePA, Core 1, 1 GHz to 26 GHz, Vertical (rms)**

| Frequency (MHz) | Level (dBuv/m) | Limit (dBuv/m) | Margin (dB) | Detector | Angle (°) | Height (cm) | Polarisation |
|---|---|---|---|---|---|---|---|
| * | | | | | | | |

**Table 158 - 2402 MHz (CH0), LE1M, iPA, Core 0, 1 GHz to 26 GHz**

*No emissions found within 10 dB of the limit.

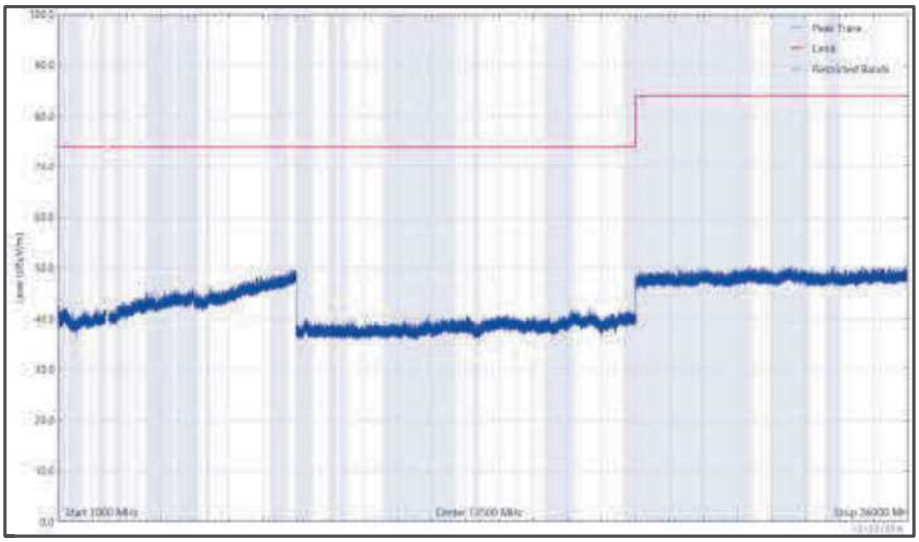

**Figure 258 - 2402 MHz (CH0), LE1M, iPA, Core 0, 1 GHz to 26 GHz, Horizontal (Peak)**

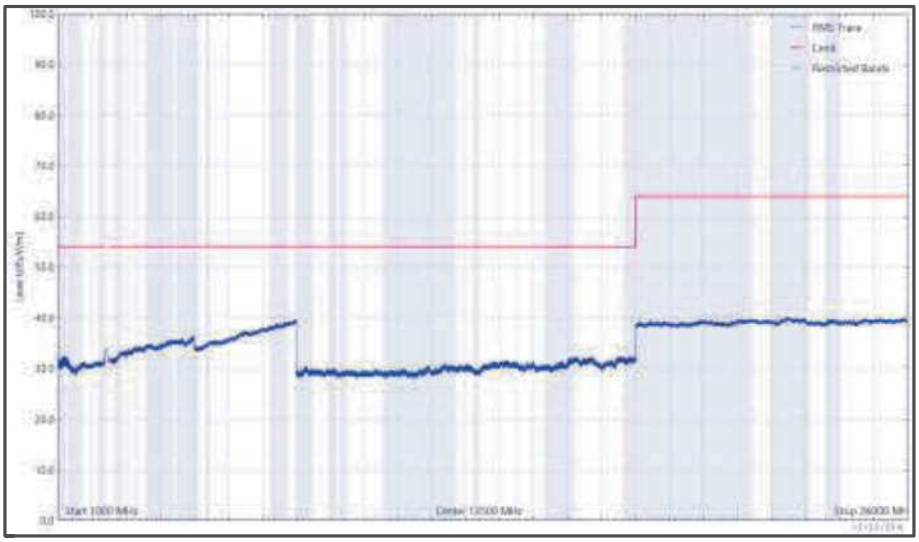

**Figure 259 - 2402 MHz (CH0), LE1M, iPA, Core 0, 1 GHz to 26 GHz, Horizontal (rms)**

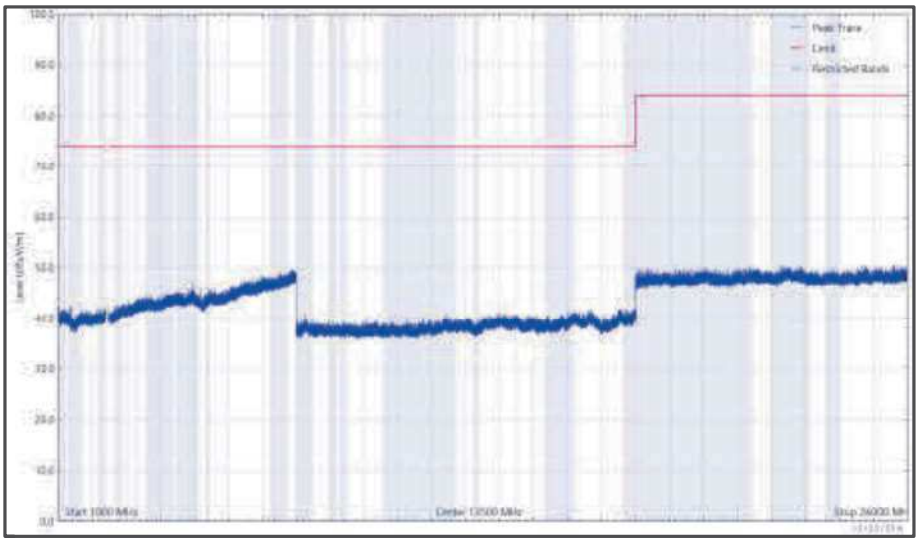

**Figure 260 - 2402 MHz (CH0), LE1M, iPA, Core 0, 1 GHz to 26 GHz, Vertical (Peak)**

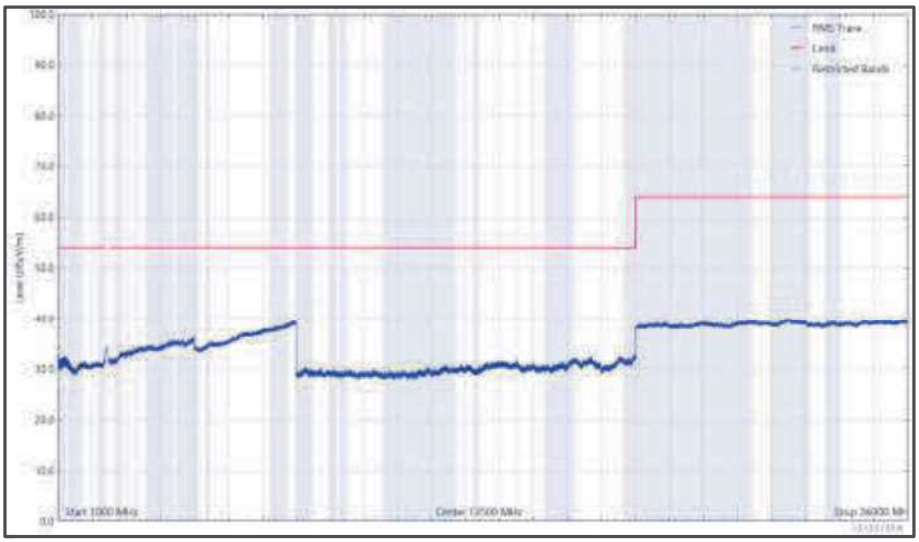

**Figure 261 - 2402 MHz (CH0), LE1M, iPA, Core 0, 1 GHz to 26 GHz, Vertical (rms)**

| Frequency (MHz) | Level (dBuv/m) | Limit (dBuv/m) | Margin (dB) | Detector | Angle (°) | Height (cm) | Polarisation |
|---|---|---|---|---|---|---|---|
| * | | | | | | | |

**Table 159 - 2440 MHz (CH17), LE1M, iPA, Core 0, 30 MHz to 26 GHz**

*No emissions found within 10 dB of the limit.

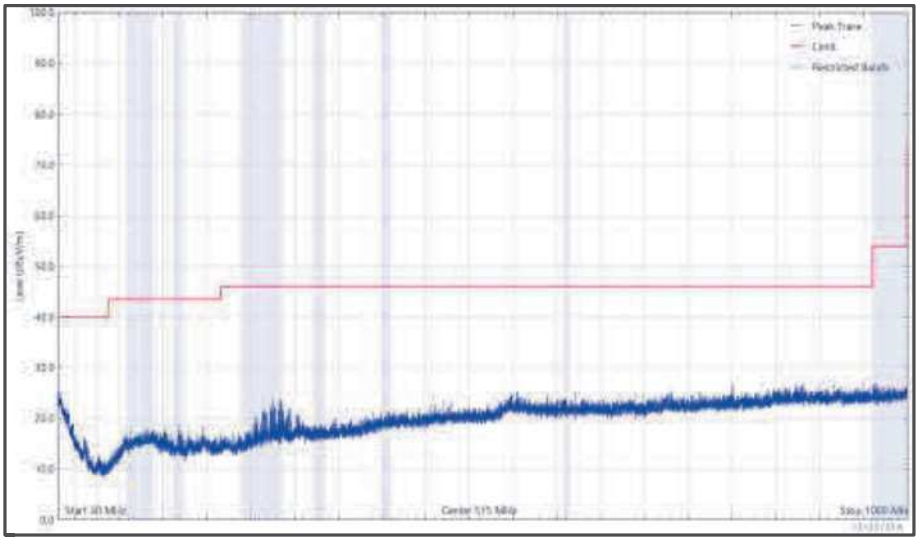

**Figure 262 - 2440 MHz (CH17), LE1M, iPA, Core 0, 30 MHz to 1 GHz, Horizontal (Peak)**

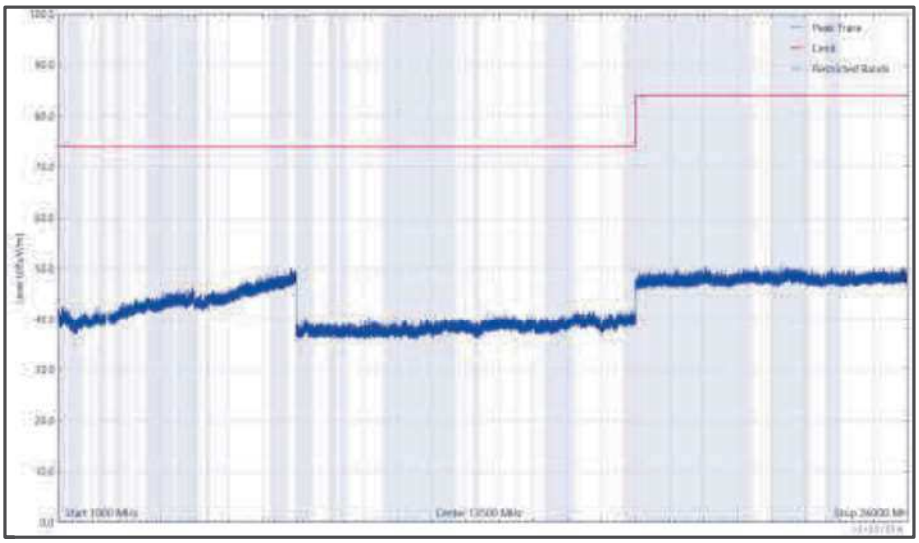

**Figure 263 - 2440 MHz (CH17), LE1M, iPA, Core 0, 1 GHz to 26 GHz, Horizontal (Peak)**

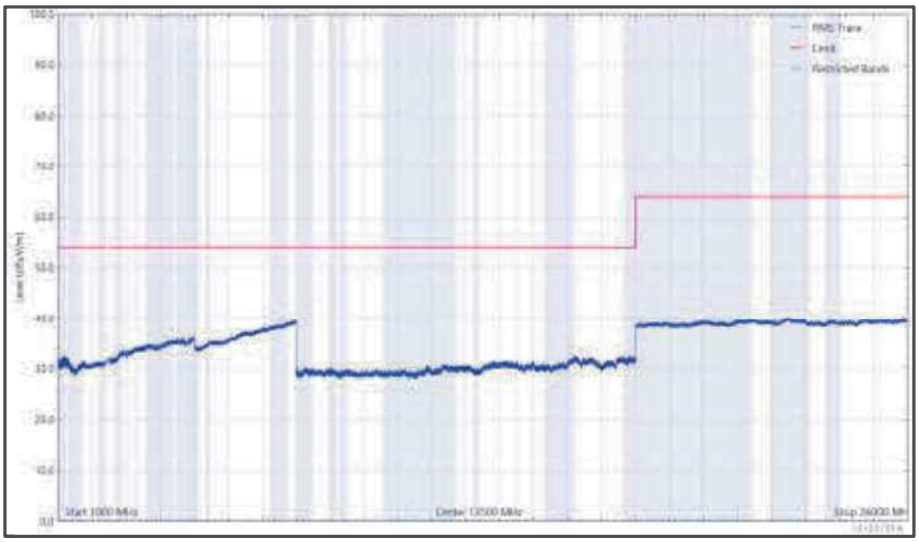

**Figure 264 - 2440 MHz (CH17), LE1M, iPA, Core 0, 1 GHz to 26 GHz, Horizontal (rms)**

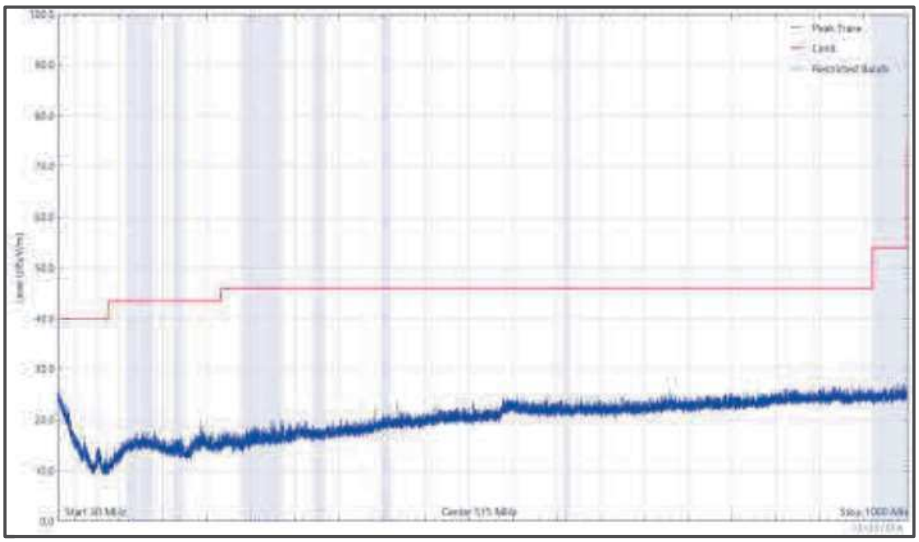

**Figure 265 - 2440 MHz (CH17), LE1M, iPA, Core 0, 30 MHz to 1 GHz, Vertical (Peak)**

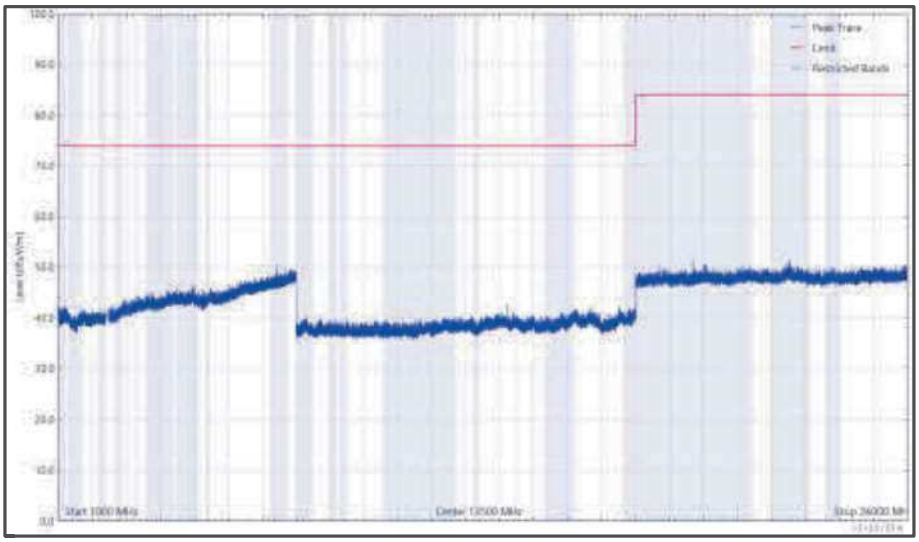

**Figure 266 - 2440 MHz (CH17), LE1M, iPA, Core 0, 1 GHz to 26 GHz, Vertical (Peak)**

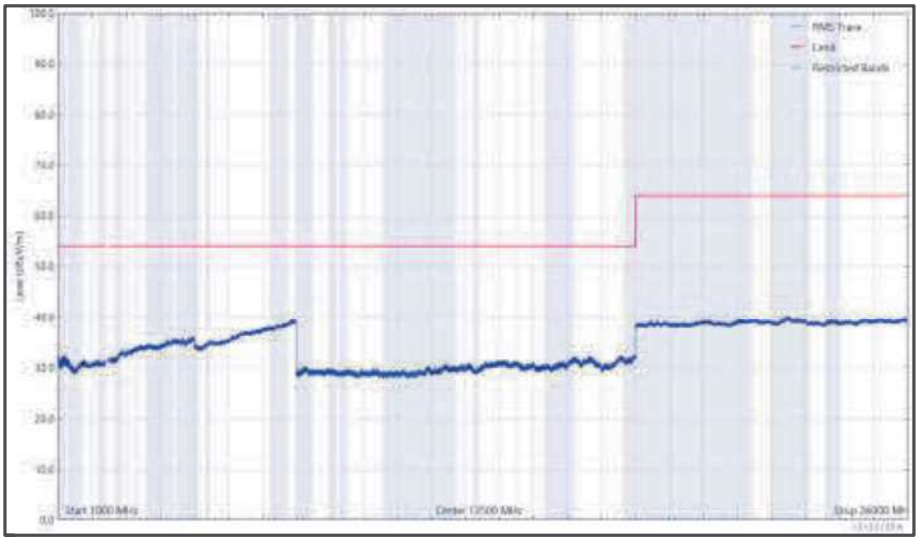

**Figure 267 - 2440 MHz (CH17), LE1M, iPA, Core 0, 1 GHz to 26 GHz, Vertical (rms)**

| Frequency (MHz) | Level (dBuv/m) | Limit (dBuv/m) | Margin (dB) | Detector | Angle (°) | Height (cm) | Polarisation |
|---|---|---|---|---|---|---|---|
| * | | | | | | | |

**Table 160 - 2480 MHz (CH39), LE1M, iPA, Core 0, 1 GHz to 26 GHz**

*No emissions found within 10 dB of the limit.

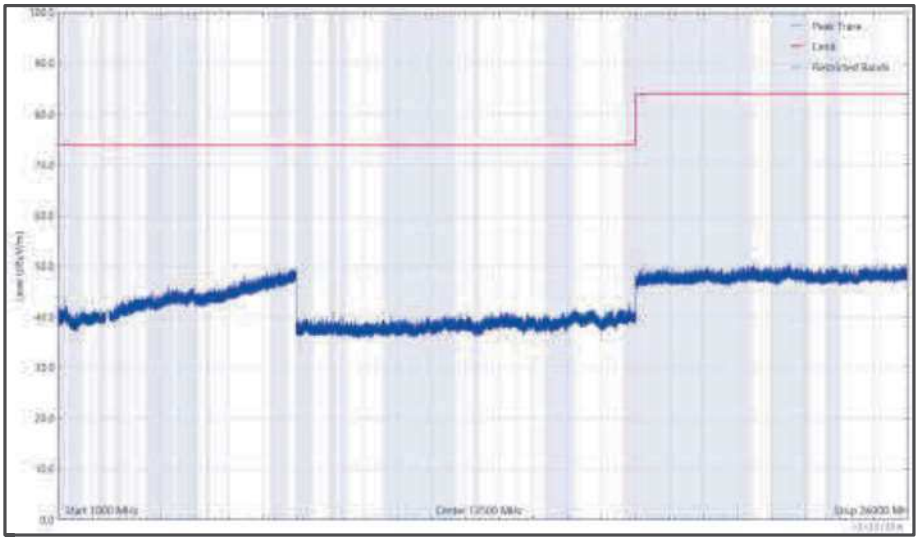

**Figure 268 - 2480 MHz (CH39), LE1M, iPA, Core 0, 1 GHz to 26 GHz, Horizontal (Peak)**

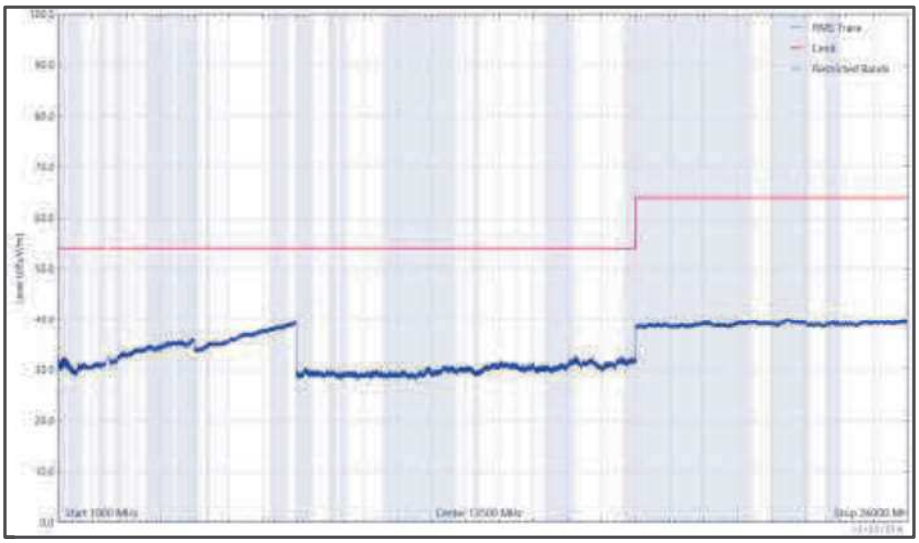

**Figure 269 - 2480 MHz (CH39), LE1M, iPA, Core 0, 1 GHz to 26 GHz, Horizontal (rms)**

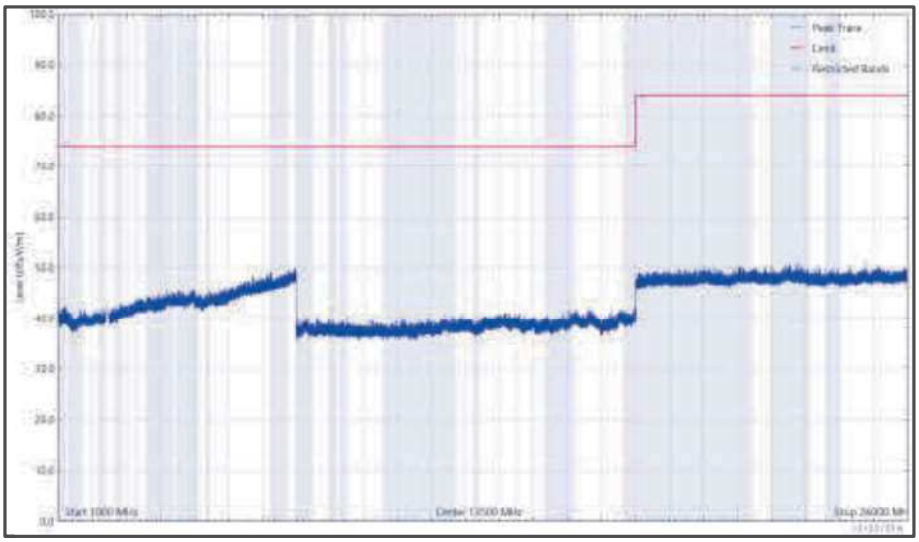

**Figure 270 - 2480 MHz (CH39), LE1M, iPA, Core 0, 1 GHz to 26 GHz, Vertical (Peak)**

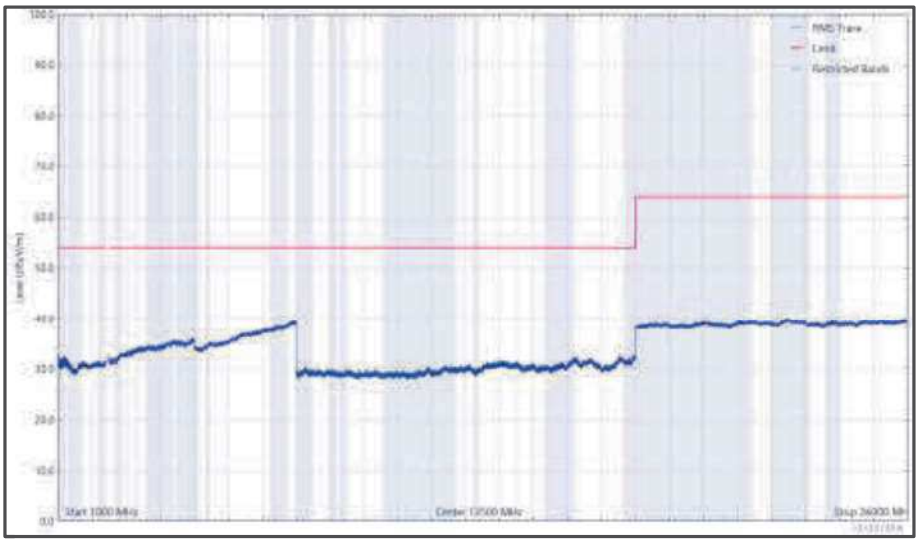

**Figure 271 - 2480 MHz (CH39), LE1M, iPA, Core 0, 1 GHz to 26 GHz, Vertical (rms)**

| Frequency (MHz) | Level (dBuv/m) | Limit (dBuv/m) | Margin (dB) | Detector | Angle (°) | Height (cm) | Polarisation |
|---|---|---|---|---|---|---|---|
| 2802.118 | 32.8 | 54.0 | -21.2 | RMS | 0 | 106 | Vertical |
| 2802.208 | 33.5 | 54.0 | -20.5 | RMS | 333 | 106 | Horizontal |

**Table 161 - 2402 MHz (CH0), LE1M, iPA, Core 1, 1 GHz to 26 GHz**

No other emissions found within 10 dB of the limit.

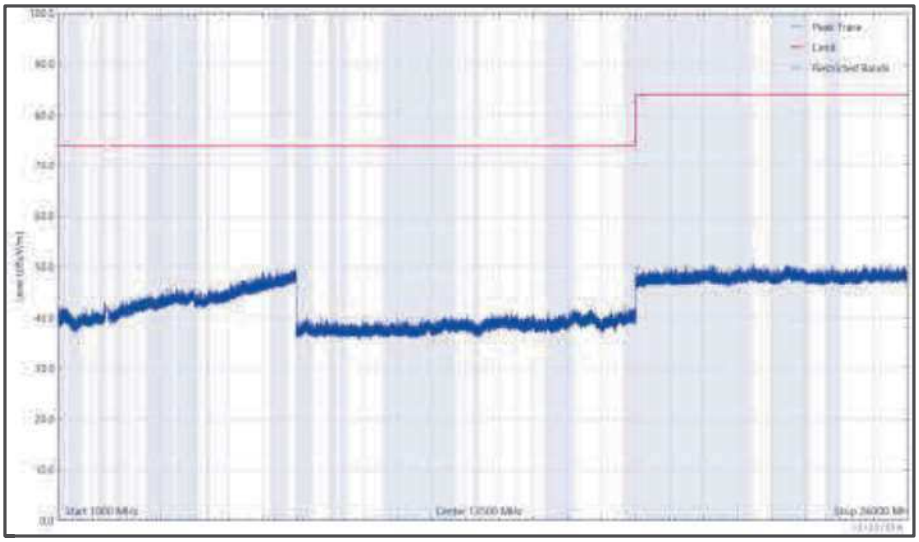

**Figure 272 - 2402 MHz (CH0), LE1M, iPA, Core 1, 1 GHz to 26 GHz, Horizontal (Peak)**

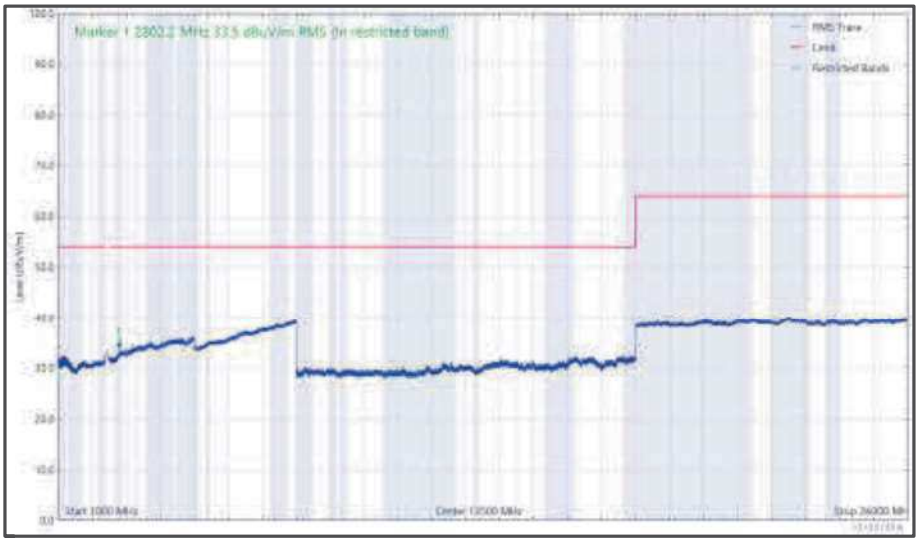

**Figure 273 - 2402 MHz (CH0), LE1M, iPA, Core 1, 1 GHz to 26 GHz, Horizontal (rms)**

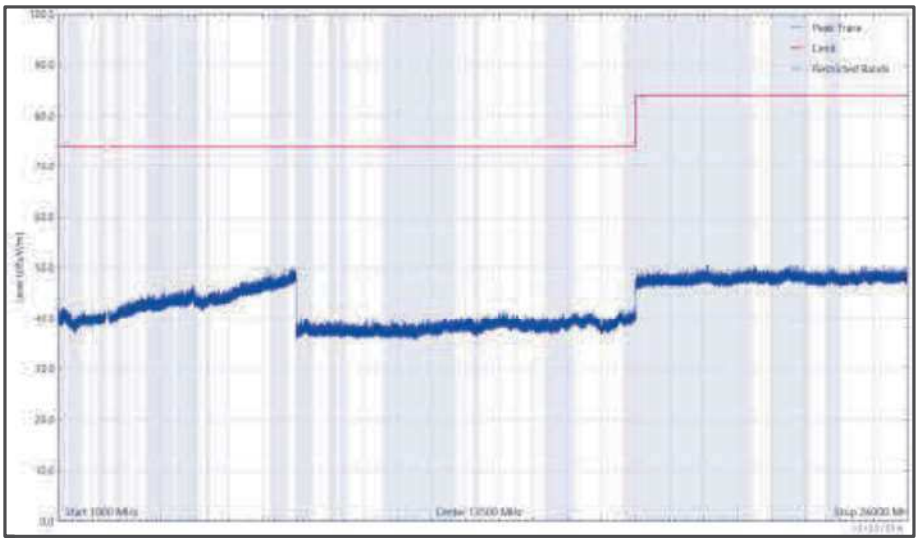

**Figure 274 - 2402 MHz (CH0), LE1M, iPA, Core 1, 1 GHz to 26 GHz, Vertical (Peak)**

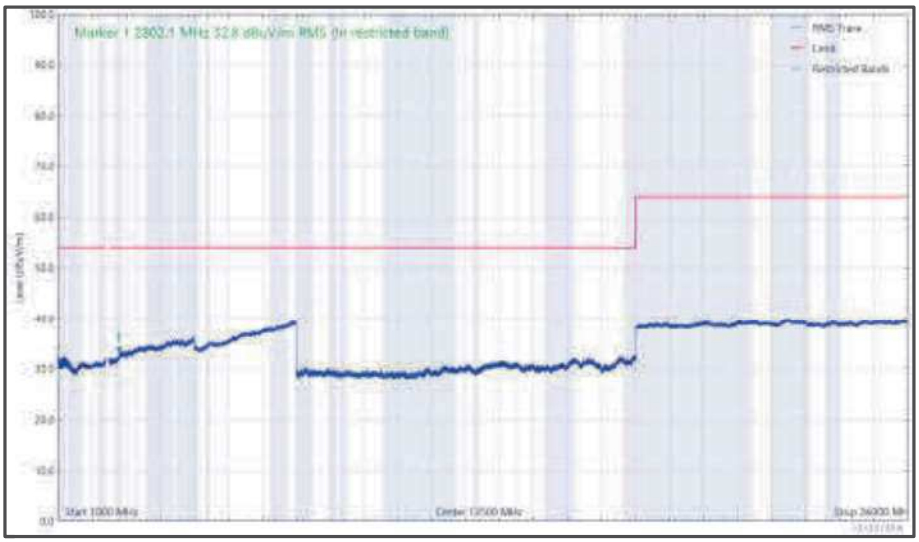

**Figure 275 - 2402 MHz (CH0), LE1M, iPA, Core 1, 1 GHz to 26 GHz, Vertical (rms)**

| Frequency (MHz) | Level (dBuv/m) | Limit (dBuv/m) | Margin (dB) | Detector | Angle (°) | Height (cm) | Polarisation |
|---|---|---|---|---|---|---|---|
| 2846.567 | 32.9 | 54.0 | -21.2 | RMS | 94 | 110 | Horizontal |

**Table 162 - 2440 MHz (CH17), LE1M, iPA, Core 1, 30 MHz to 26 GHz**

No other emissions found within 10 dB of the limit.

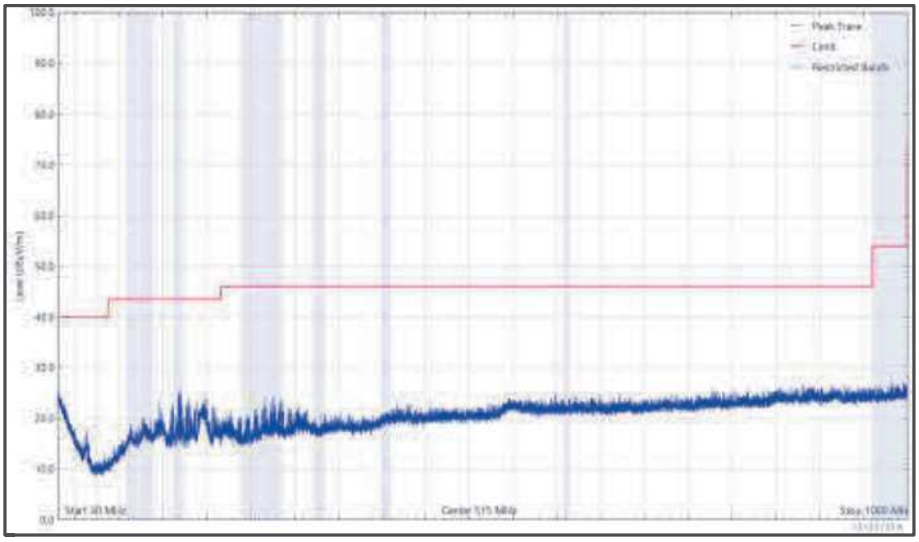

**Figure 276 - 2440 MHz (CH17), LE1M, iPA, Core 1, 30 MHz to 1 GHz, Horizontal (Peak)**

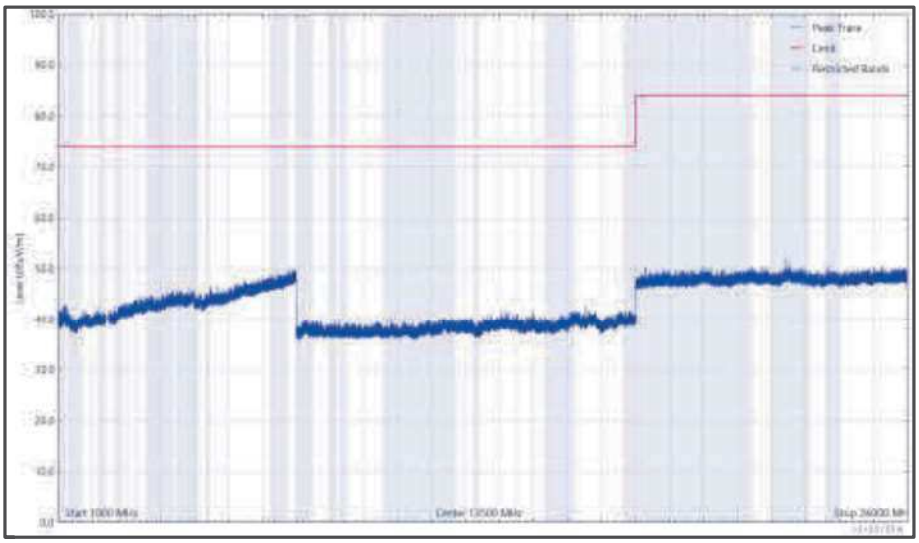

**Figure 277 - 2440 MHz (CH17), LE1M, iPA, Core 1, 1 GHz to 26 GHz, Horizontal (Peak)**

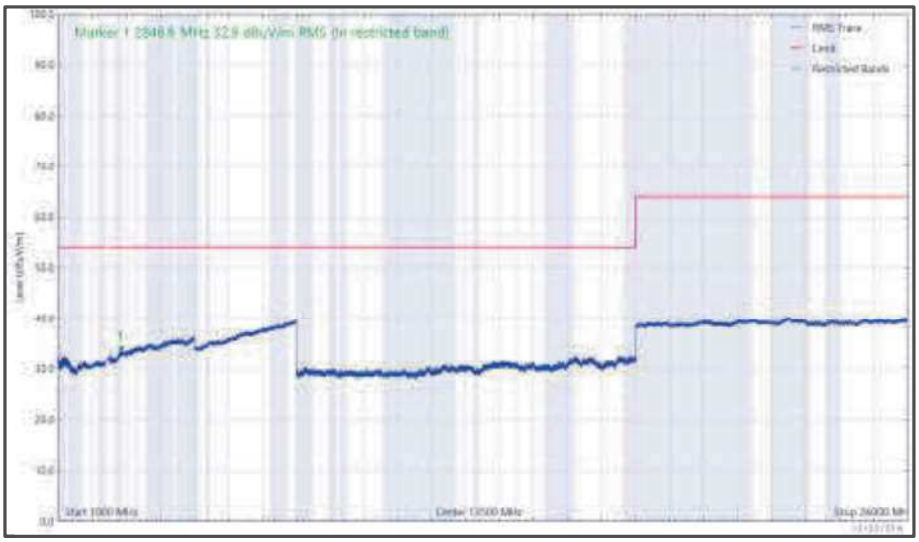

**Figure 278 - 2440 MHz (CH17), LE1M, iPA, Core 1, 1 GHz to 26 GHz, Horizontal (rms)**

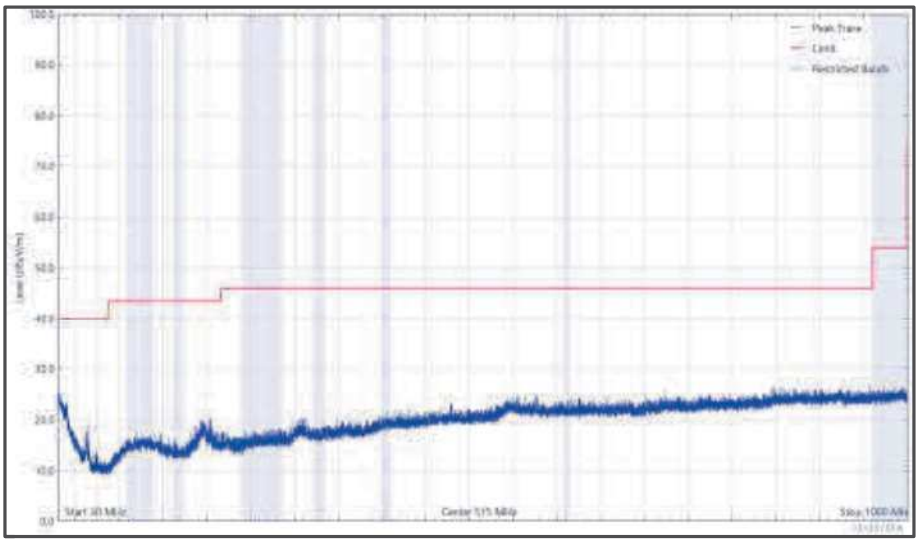

**Figure 279 - 2440 MHz (CH17), LE1M, iPA, Core 1, 30 MHz to 1 GHz, Vertical (Peak)**

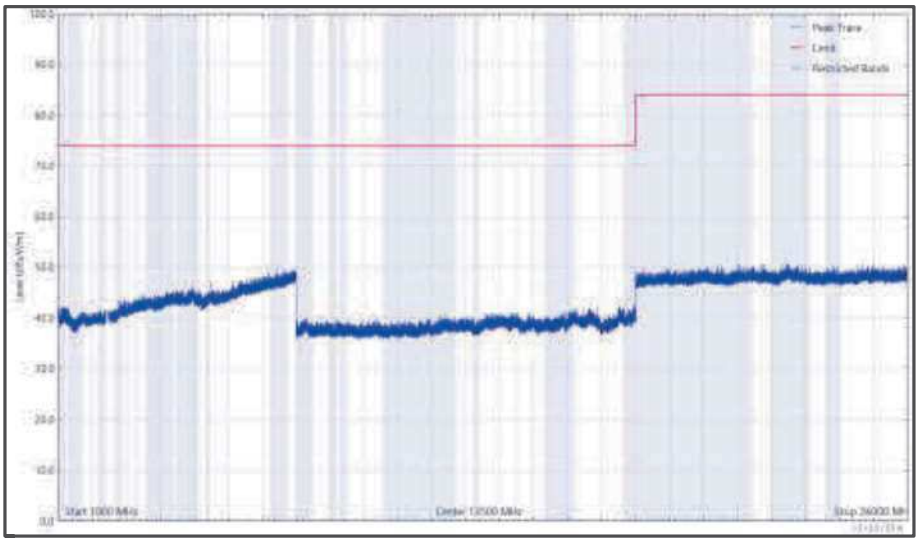

**Figure 280 - 2440 MHz (CH17), LE1M, iPA, Core 1, 1 GHz to 26 GHz, Vertical (Peak)**

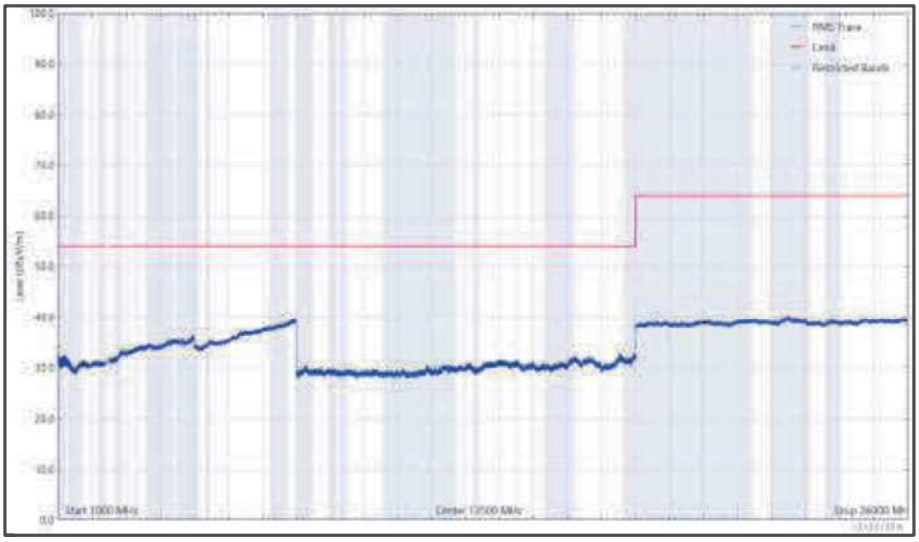

**Figure 281 - 2440 MHz (CH17), LE1M, iPA, Core 1, 1 GHz to 26 GHz, Vertical (rms)**

| Frequency (MHz) | Level (dBuv/m) | Limit (dBuv/m) | Margin (dB) | Detector | Angle (°) | Height (cm) | Polarisation |
|---|---|---|---|---|---|---|---|
| * | | | | | | | |

**Table 163 - 2480 MHz (CH39), LE1M, iPA, Core 1, 1 GHz to 26 GHz**

*No emissions found within 10 dB of the limit.

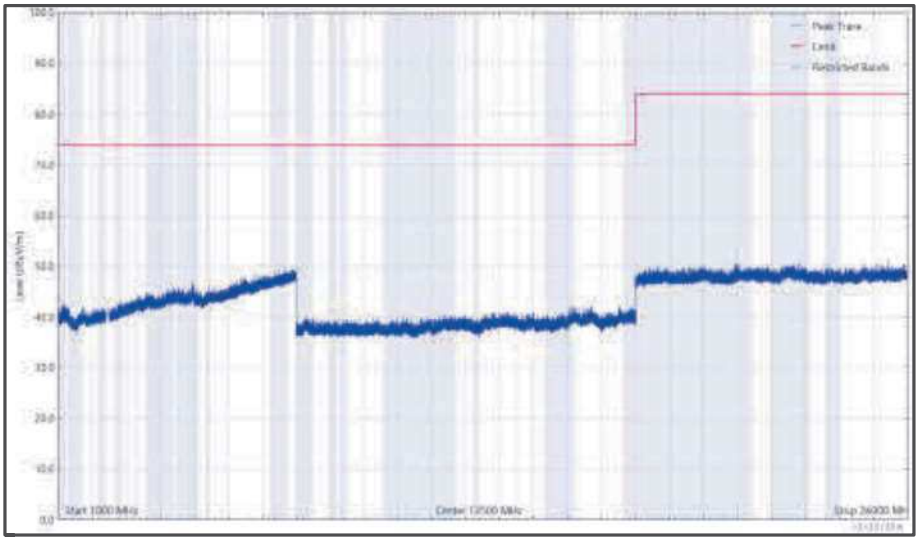

**Figure 282 - 2480 MHz (CH39), LE1M, iPA, Core 1, 1 GHz to 26 GHz, Horizontal (Peak)**

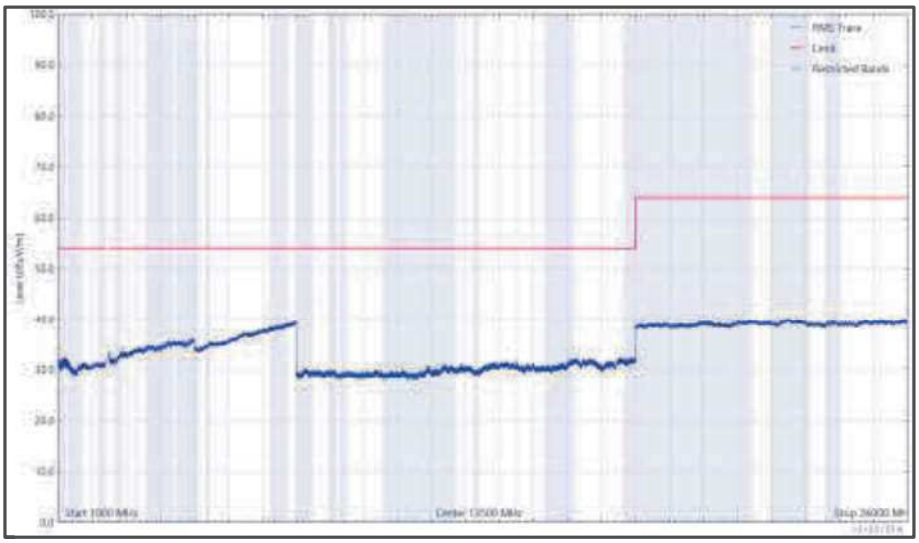

**Figure 283 - 2480 MHz (CH39), LE1M, iPA, Core 1, 1 GHz to 26 GHz, Horizontal (rms)**

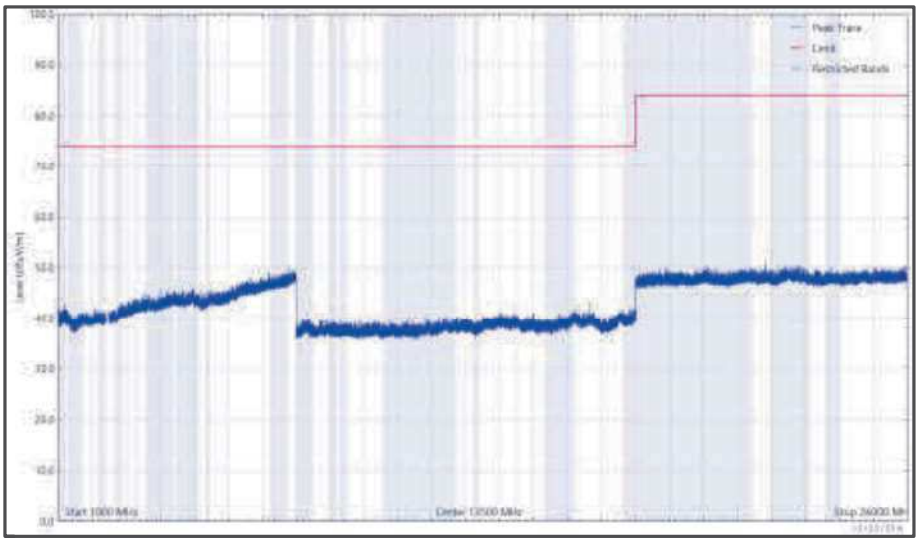

**Figure 284 - 2480 MHz (CH39), LE1M, iPA, Core 1, 1 GHz to 26 GHz, Vertical (Peak)**

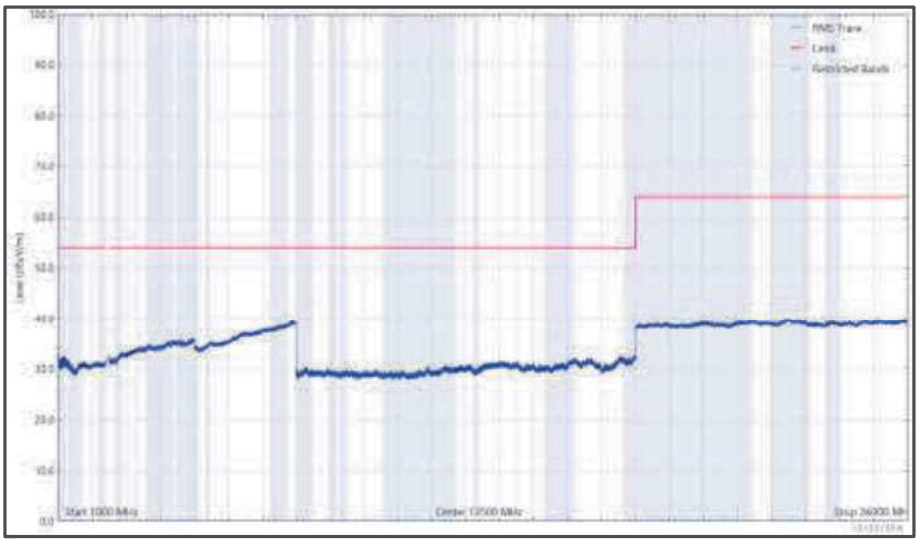

**Figure 285 - 2480 MHz (CH39), LE1M, iPA, Core 1, 1 GHz to 26 GHz, Vertical (rms)**

| Frequency (MHz) | Level (dBuv/m) | Limit (dBuv/m) | Margin (dB) | Detector | Angle (°) | Height (cm) | Polarisation |
|---|---|---|---|---|---|---|---|
| 2802.388 | 34.6 | 54.0 | -19.4 | RMS | 354 | 101 | Horizontal |

**Table 164 - 2402 MHz (CH0), LE1M, iPA, Core 2, 1 GHz to 26 GHz**

No other emissions found within 10 dB of the limit.

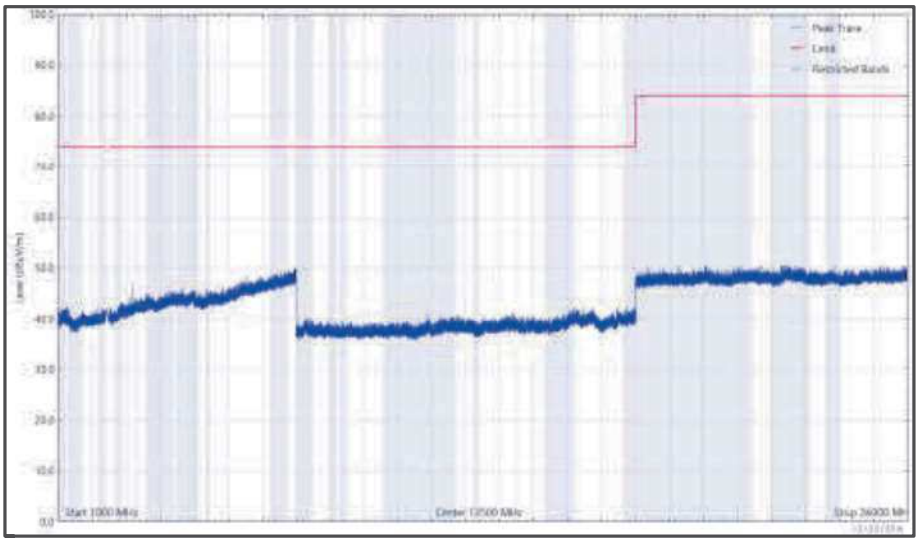

**Figure 286 - 2402 MHz (CH0), LE1M, iPA, Core 2, 1 GHz to 26 GHz, Horizontal (Peak)**

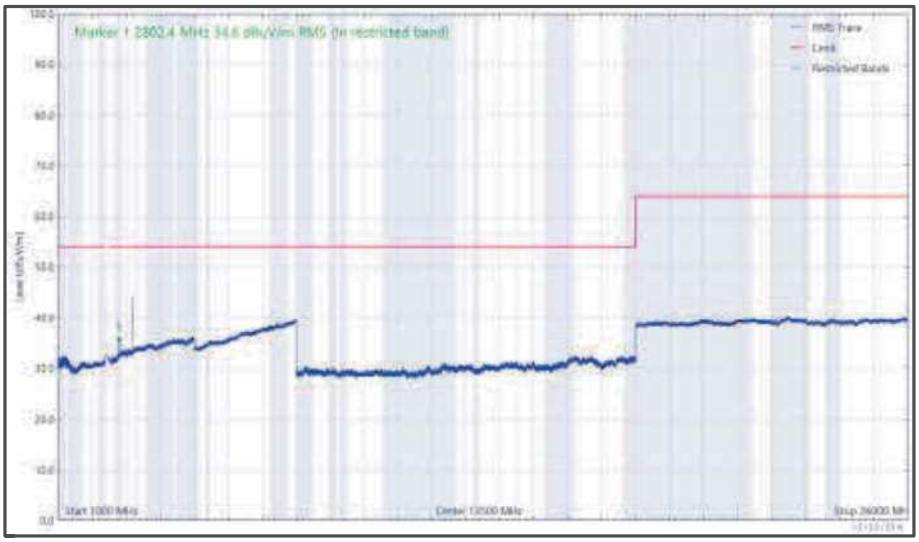

**Figure 287 - 2402 MHz (CH0), LE1M, iPA, Core 2, 1 GHz to 26 GHz, Horizontal (rms)**

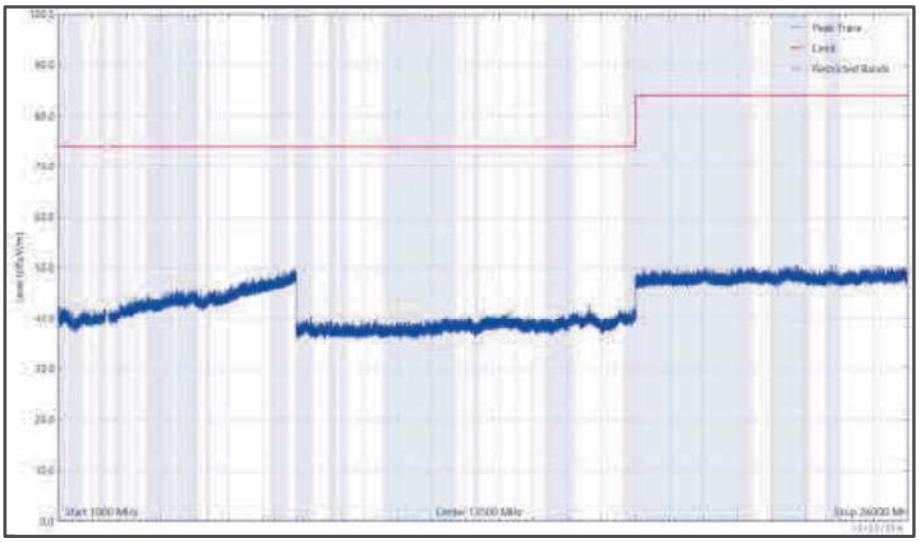

**Figure 288 - 2402 MHz (CH0), LE1M, iPA, Core 2, 1 GHz to 26 GHz, Vertical (Peak)**

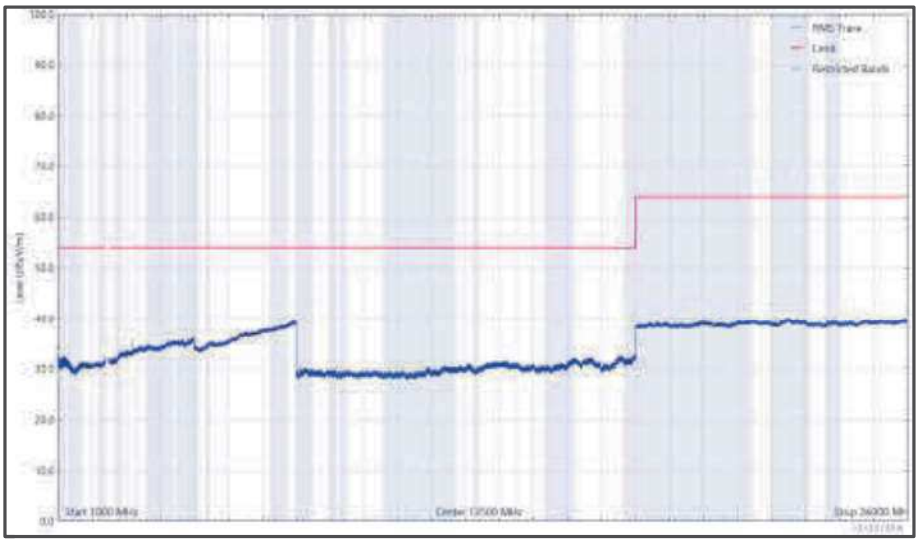

**Figure 289 - 2402 MHz (CH0), LE1M, iPA, Core 2, 1 GHz to 26 GHz, Vertical (rms)**

| Frequency (MHz) | Level (dBuv/m) | Limit (dBuv/m) | Margin (dB) | Detector | Angle (°) | Height (cm) | Polarisation |
|---|---|---|---|---|---|---|---|
| 2846.697 | 33.3 | 54.0 | -20.7 | RMS | 0 | 105 | Horizontal |

**Table 165 - 2440 MHz (CH17), LE1M, iPA, Core 2, 30 MHz to 26 GHz**

No other emissions found within 10 dB of the limit.

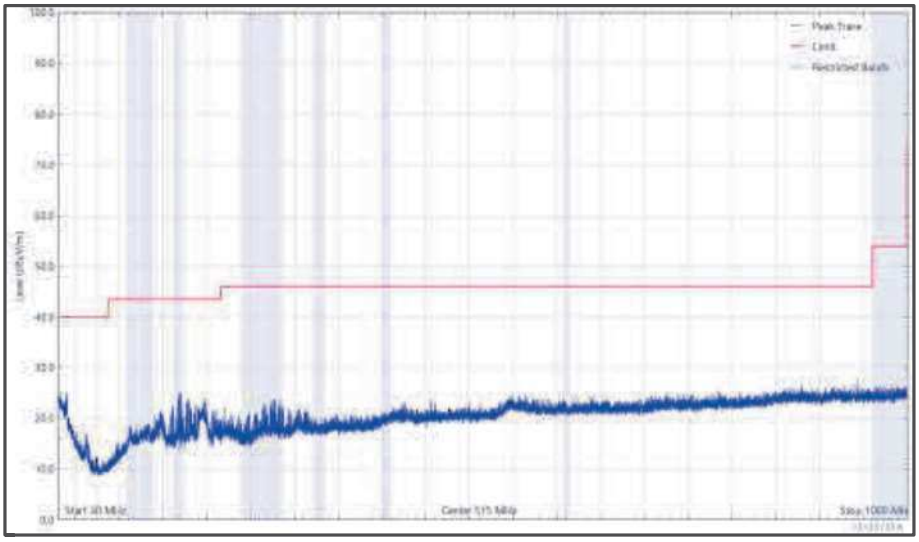

**Figure 290 - 2440 MHz (CH17), LE1M, iPA, Core 2, 30 MHz to 1 GHz, Horizontal (Peak)**

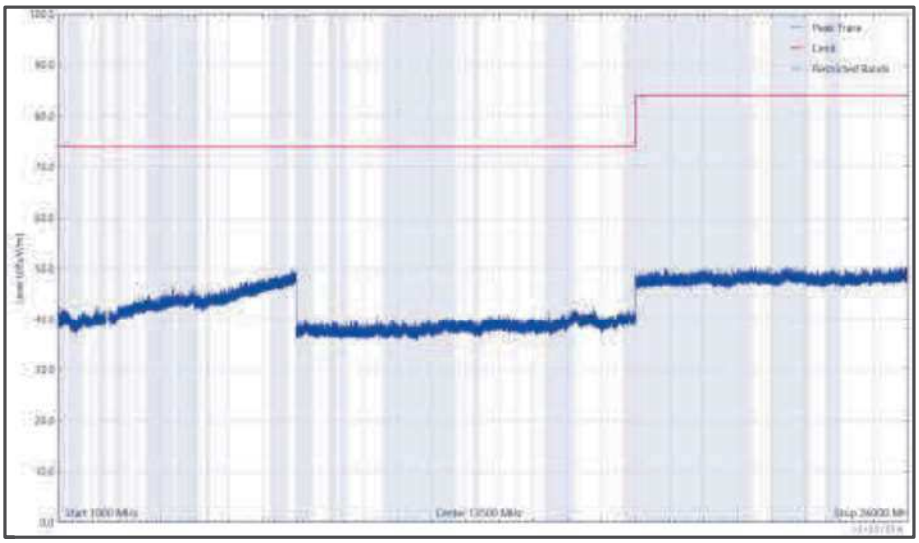

**Figure 291 - 2440 MHz (CH17), LE1M, iPA, Core 2, 1 GHz to 26 GHz, Horizontal (Peak)**

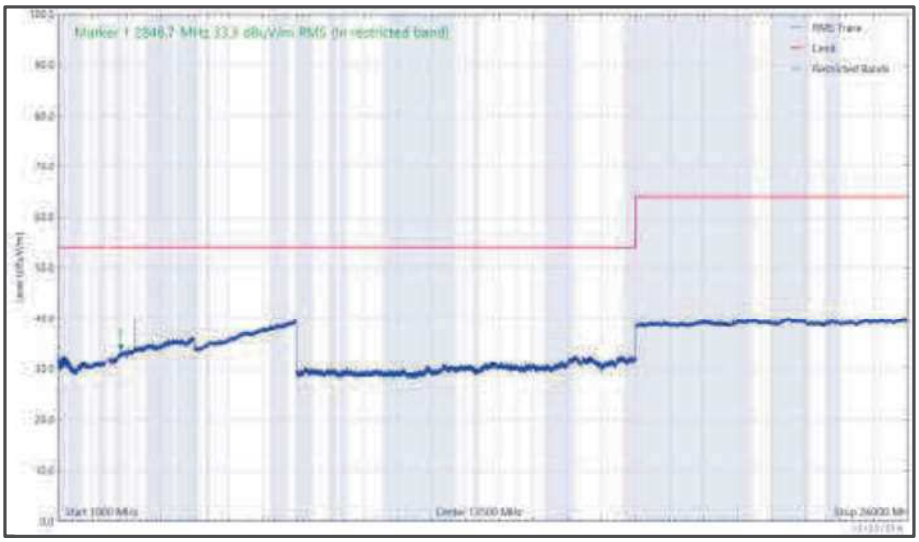

**Figure 292 - 2440 MHz (CH17), LE1M, iPA, Core 2, 1 GHz to 26 GHz, Horizontal (rms)**

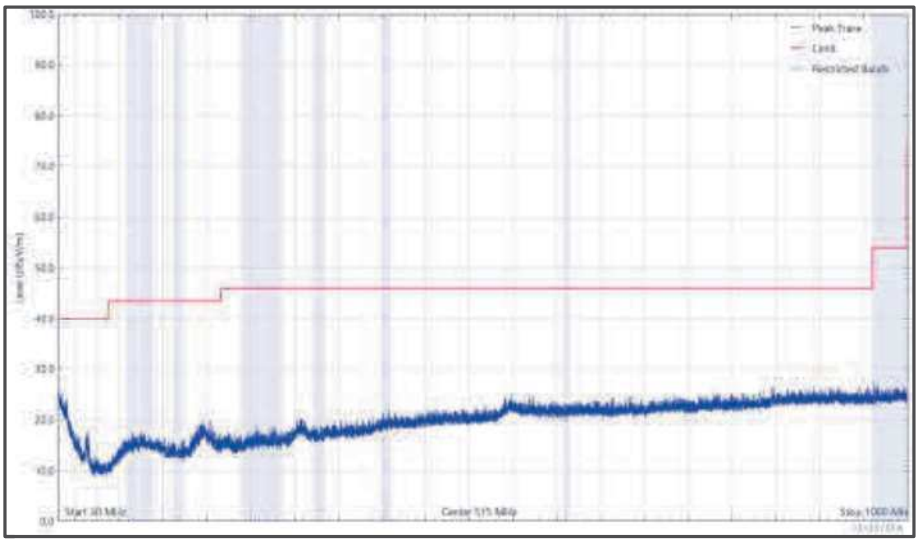

**Figure 293 - 2440 MHz (CH17), LE1M, iPA, Core 2, 30 MHz to 1 GHz, Vertical (Peak)**

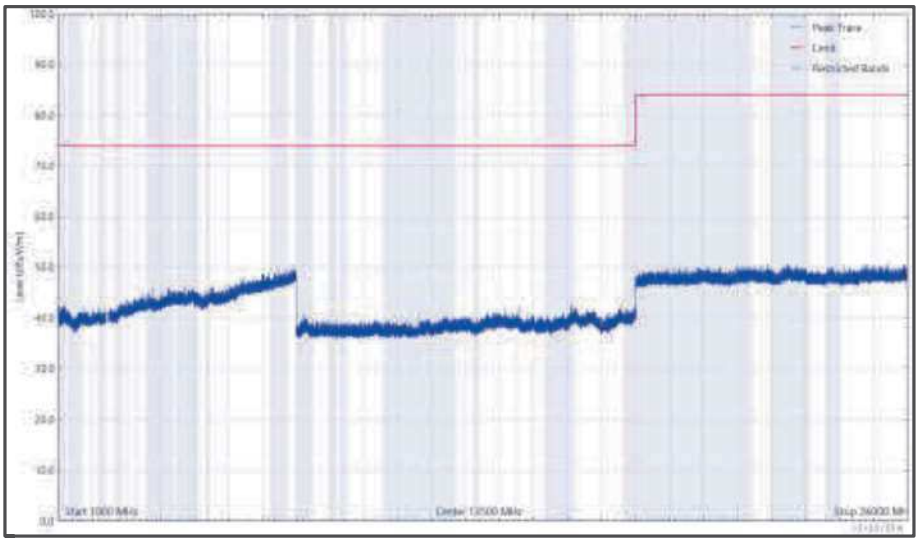

**Figure 294 - 2440 MHz (CH17), LE1M, iPA, Core 2, 1 GHz to 26 GHz, Vertical (Peak)**

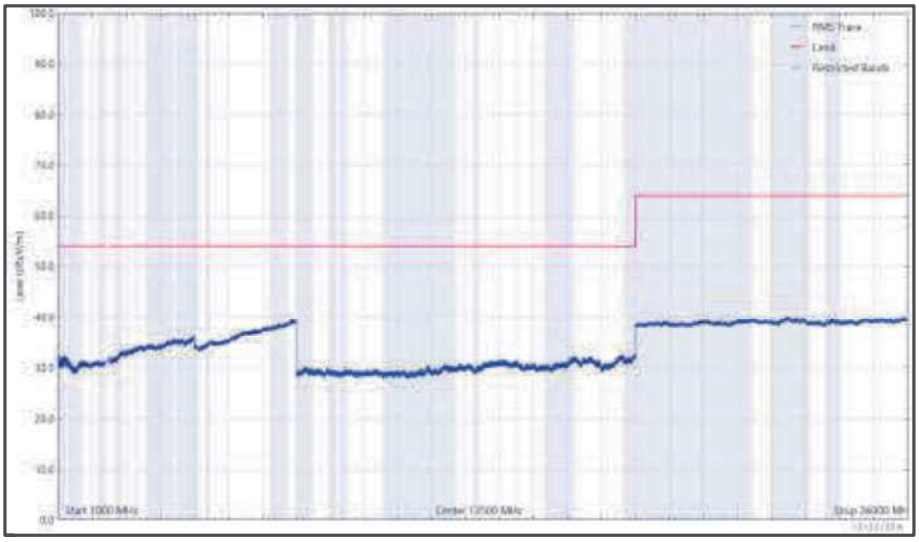

**Figure 295 - 2440 MHz (CH17), LE1M, iPA, Core 2, 1 GHz to 26 GHz, Vertical (rms)**

| Frequency (MHz) | Level (dBuv/m) | Limit (dBuv/m) | Margin (dB) | Detector | Angle (°) | Height (cm) | Polarisation |
|---|---|---|---|---|---|---|---|
| * | | | | | | | |

**Table 166 - 2480 MHz (CH39), LE1M, iPA, Core 2, 1 GHz to 26 GHz**

*No emissions found within 10 dB of the limit.

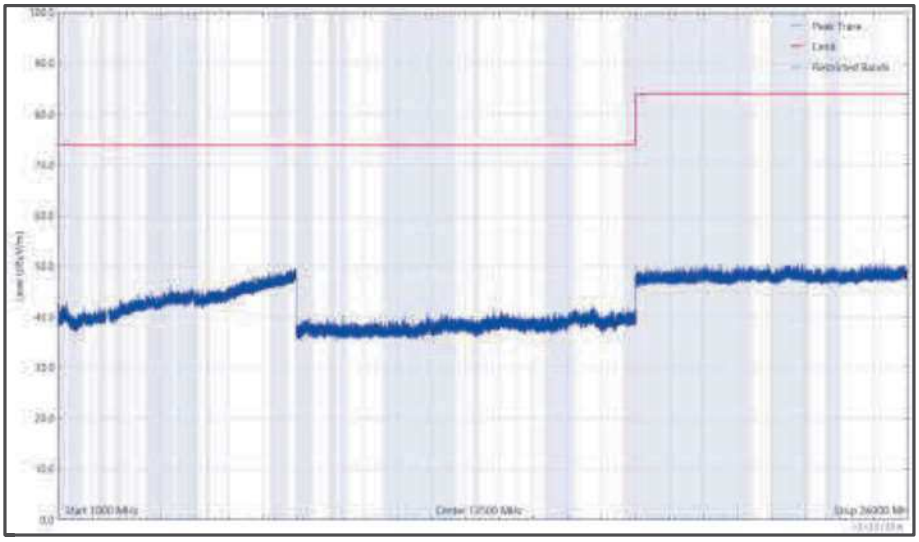

**Figure 296 - 2480 MHz (CH39), LE1M, iPA, Core 2, 1 GHz to 26 GHz, Horizontal (Peak)**

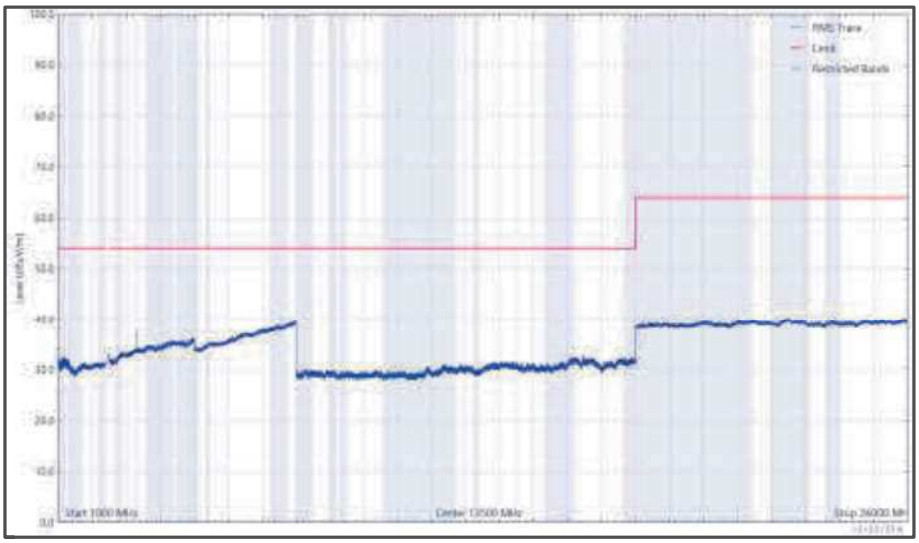

**Figure 297 - 2480 MHz (CH39), LE1M, iPA, Core 2, 1 GHz to 26 GHz, Horizontal (rms)**

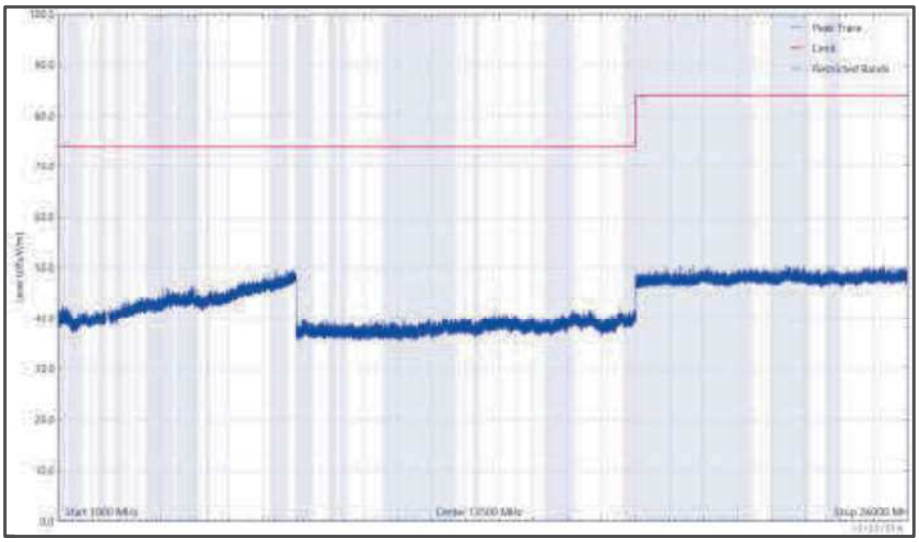

**Figure 298 - 2480 MHz (CH39), LE1M, iPA, Core 2, 1 GHz to 26 GHz, Vertical (Peak)**

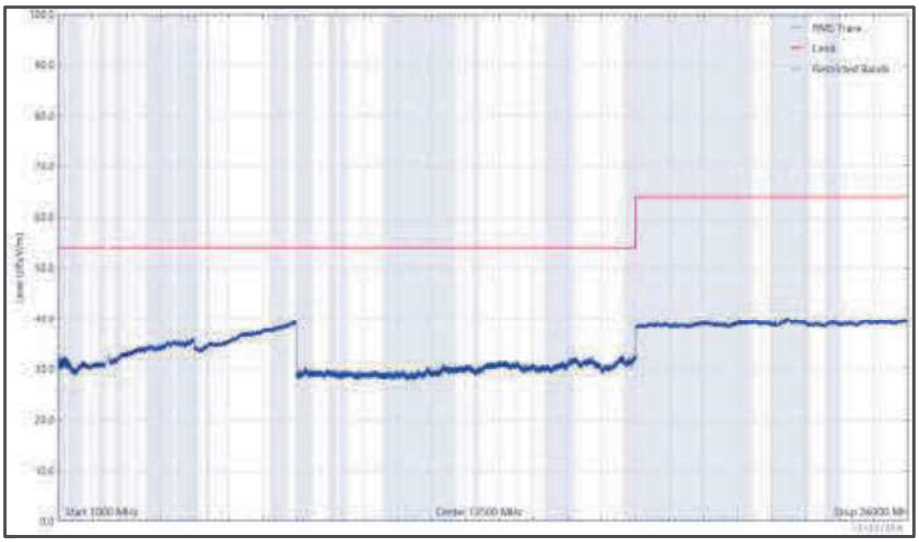

**Figure 299 - 2480 MHz (CH39), LE1M, iPA, Core 2, 1 GHz to 26 GHz, Vertical (rms)**

| Frequency (MHz) | Level (dBuv/m) | Limit (dBuv/m) | Margin (dB) | Detector | Angle (°) | Height (cm) | Polarisation |
|---|---|---|---|---|---|---|---|
| * | | | | | | | |

**Table 167 - 2404 MHz (CH2), HDR4, ePA, Core 0, 1 GHz to 26 GHz**

*No emissions found within 10 dB of the limit.

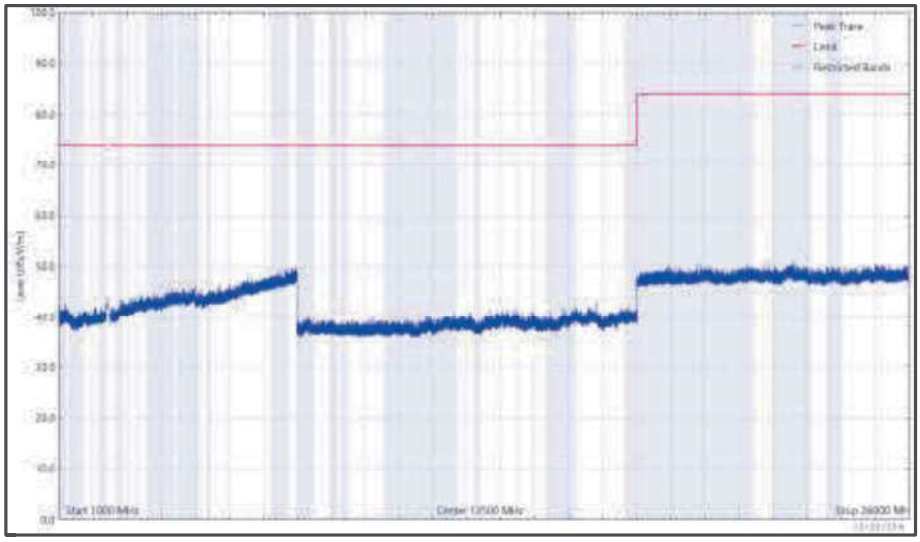

**Figure 300 - 2404 MHz (CH2), HDR4, ePA, Core 0, 1 GHz to 26 GHz, Horizontal (Peak)**

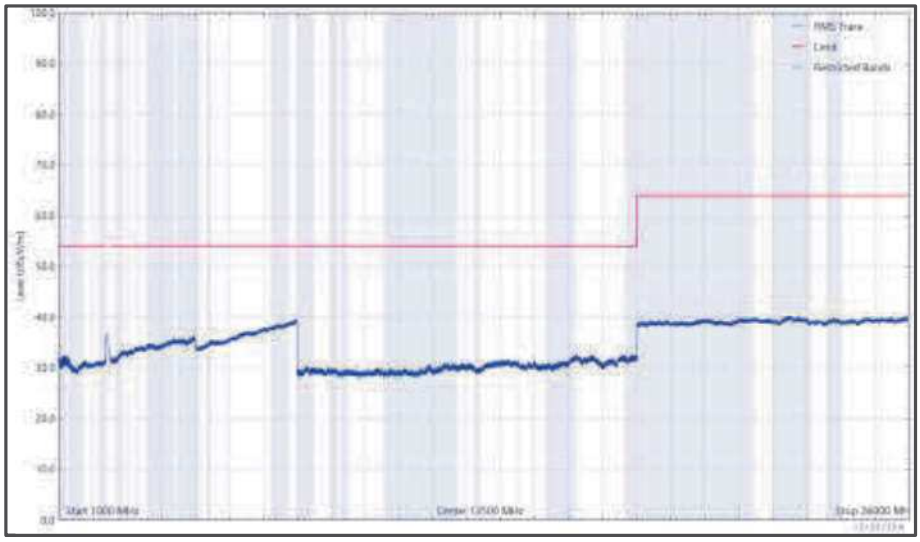

**Figure 301 - 2404 MHz (CH2), HDR4, ePA, Core 0, 1 GHz to 26 GHz, Horizontal (rms)**

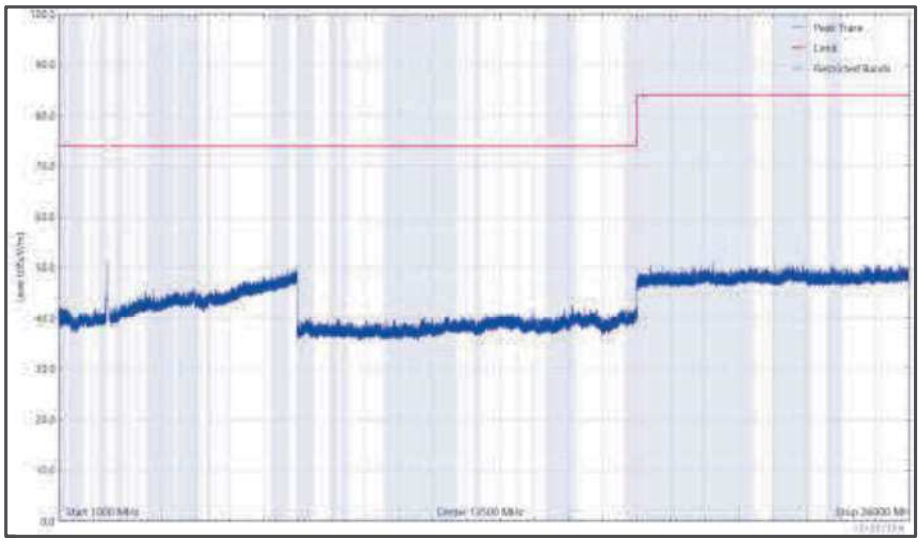

**Figure 302 - 2404 MHz (CH2), HDR4, ePA, Core 0, 1 GHz to 26 GHz, Vertical (Peak)**

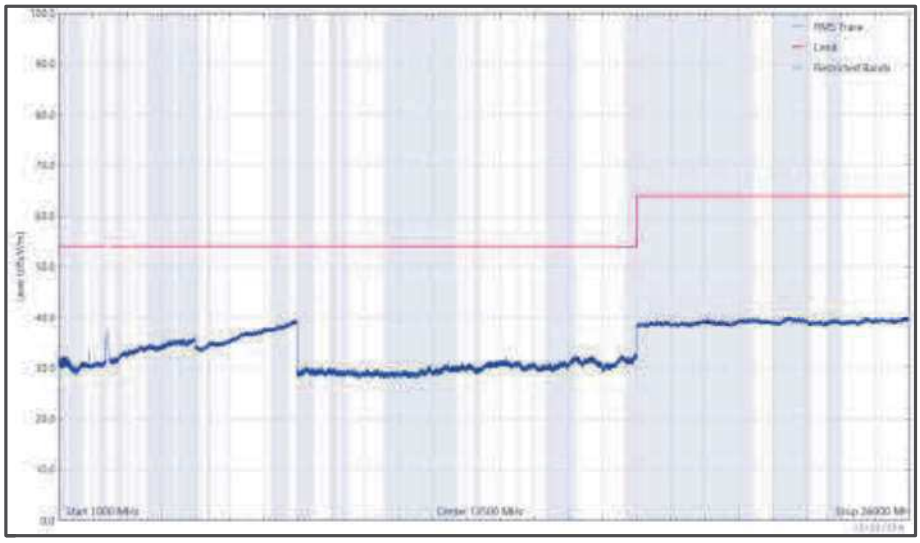

**Figure 303 - 2404 MHz (CH2), HDR4, ePA, Core 0, 1 GHz to 26 GHz, Vertical (rms)**

| Frequency (MHz) | Level (dBuv/m) | Limit (dBuv/m) | Margin (dB) | Detector | Angle (°) | Height (cm) | Polarisation |
|---|---|---|---|---|---|---|---|
| * | | | | | | | |

**Table 168 - 2441 MHz (CH39), HDR4, ePA, Core 0, 30 MHz to 26 GHz**

*No emissions found within 10 dB of the limit.

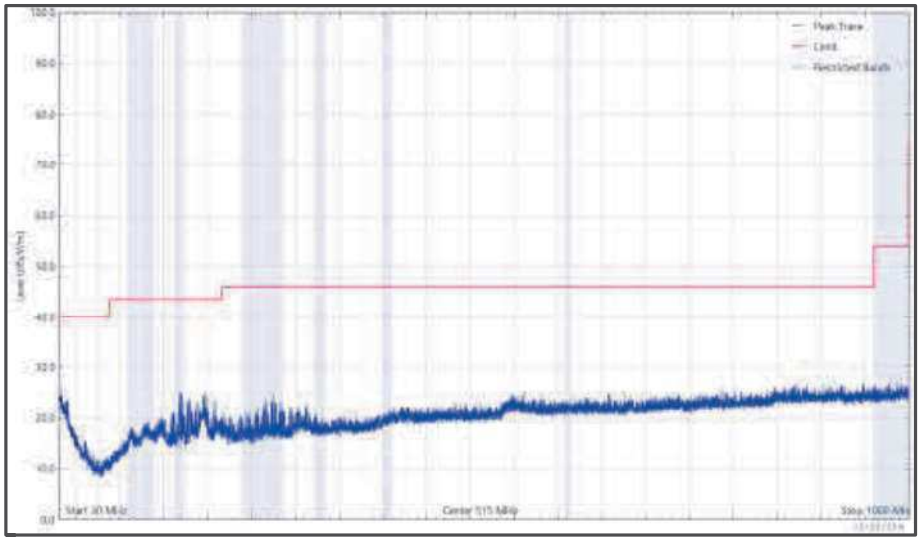

**Figure 304 - 2441 MHz (CH39), HDR4, ePA, Core 0, 30 MHz to 1 GHz, Horizontal (Peak)**

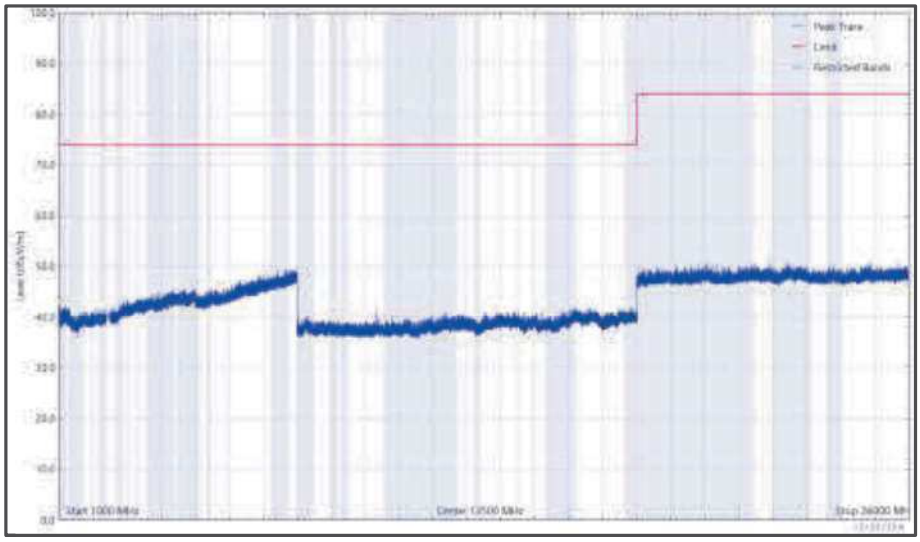

**Figure 305 - 2441 MHz (CH39), HDR4, ePA, Core 0, 1 GHz to 26 GHz, Horizontal (Peak)**

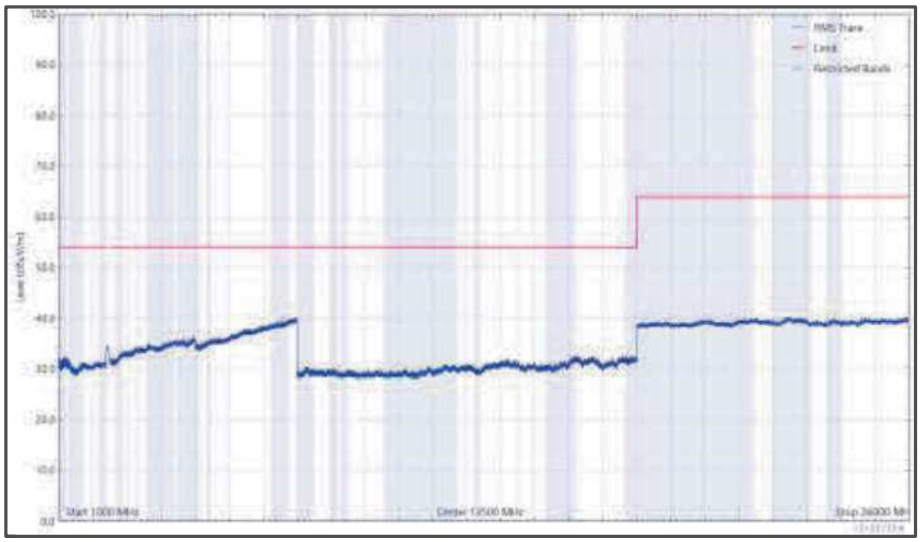

**Figure 306 - 2441 MHz (CH39), HDR4, ePA, Core 0, 1 GHz to 26 GHz, Horizontal (rms)**

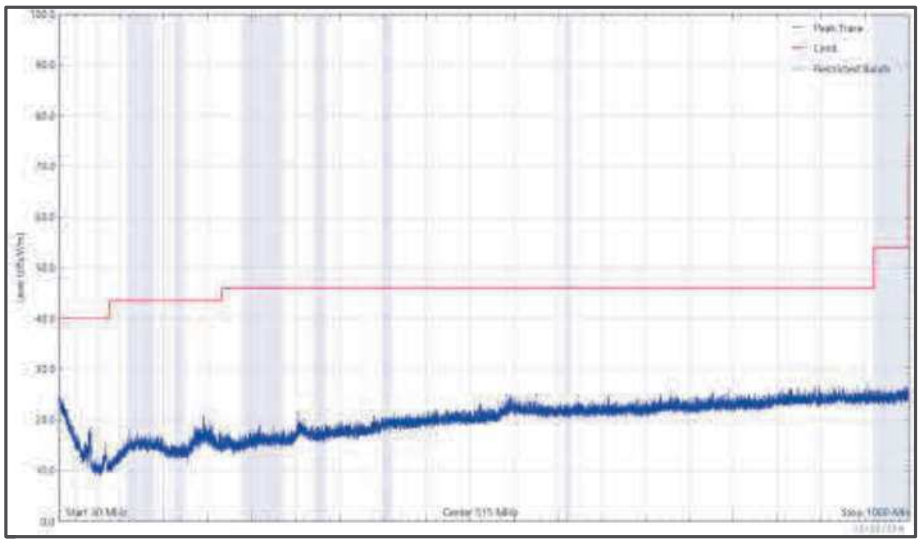

**Figure 307 - 2441 MHz (CH39), HDR4, ePA, Core 0, 30 MHz to 1 GHz, Vertical (Peak)**

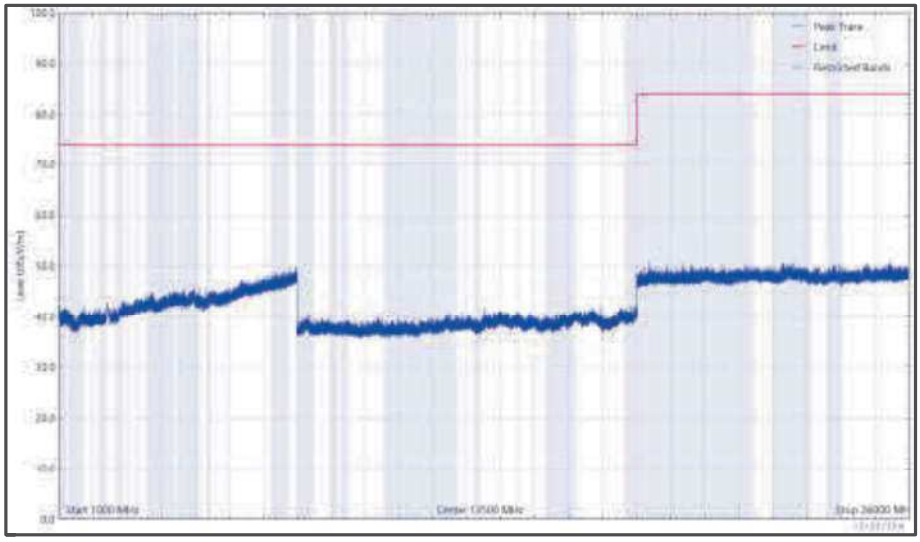

**Figure 308 - 2441 MHz (CH39), HDR4, ePA, Core 0, 1 GHz to 26 GHz, Vertical (Peak)**

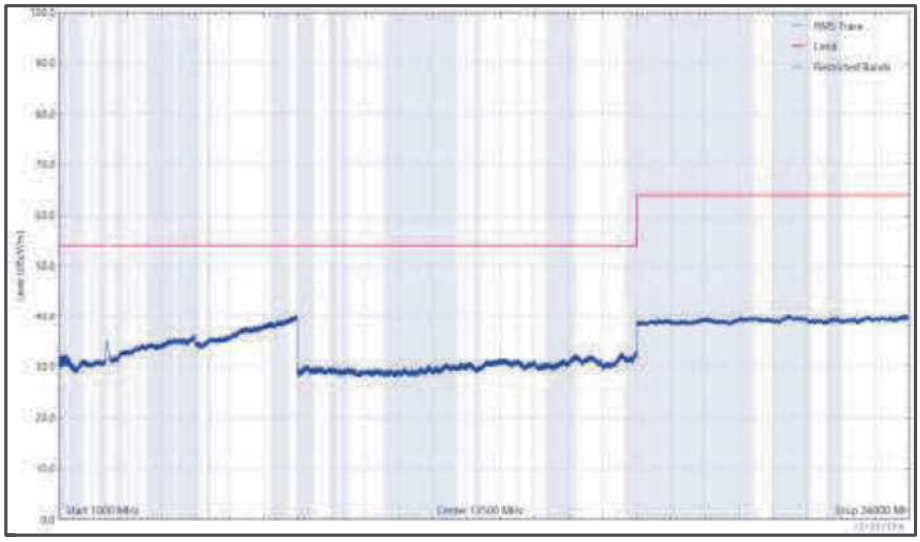

**Figure 309 - 2441 MHz (CH39), HDR4, ePA, Core 0, 1 GHz to 26 GHz, Vertical (rms)**

| Frequency (MHz) | Level (dBuv/m) | Limit (dBuv/m) | Margin (dB) | Detector | Angle (°) | Height (cm) | Polarisation |
|---|---|---|---|---|---|---|---|
| * | | | | | | | |

**Table 169 - 2478 MHz (CH76), HDR4, ePA, Core 0, 1 GHz to 26 GHz**

*No emissions found within 10 dB of the limit.

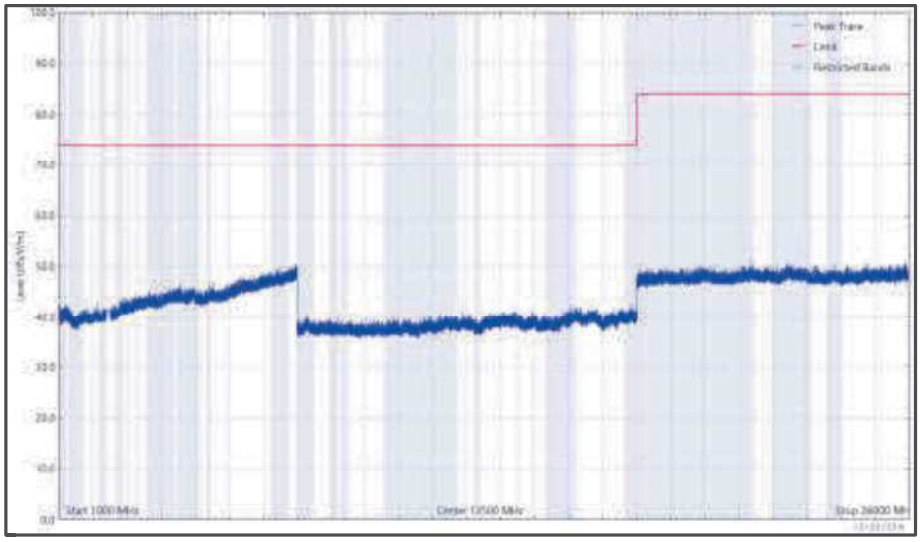

**Figure 310 - 2478 MHz (CH76), HDR4, ePA, Core 0, 1 GHz to 26 GHz, Horizontal (Peak)**

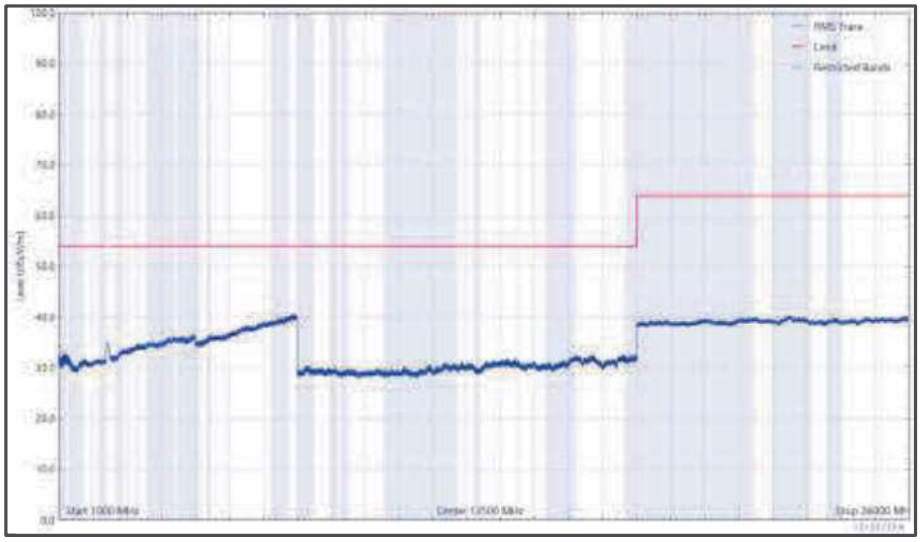

**Figure 311 - 2478 MHz (CH76), HDR4, ePA, Core 0, 1 GHz to 26 GHz, Horizontal (rms)**

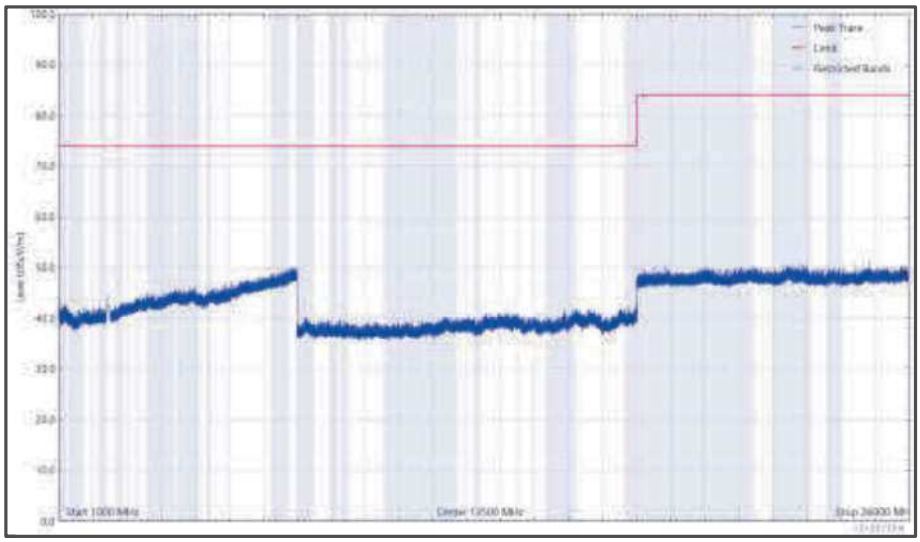

**Figure 312 - 2478 MHz (CH76), HDR4, ePA, Core 0, 1 GHz to 26 GHz, Vertical (Peak)**

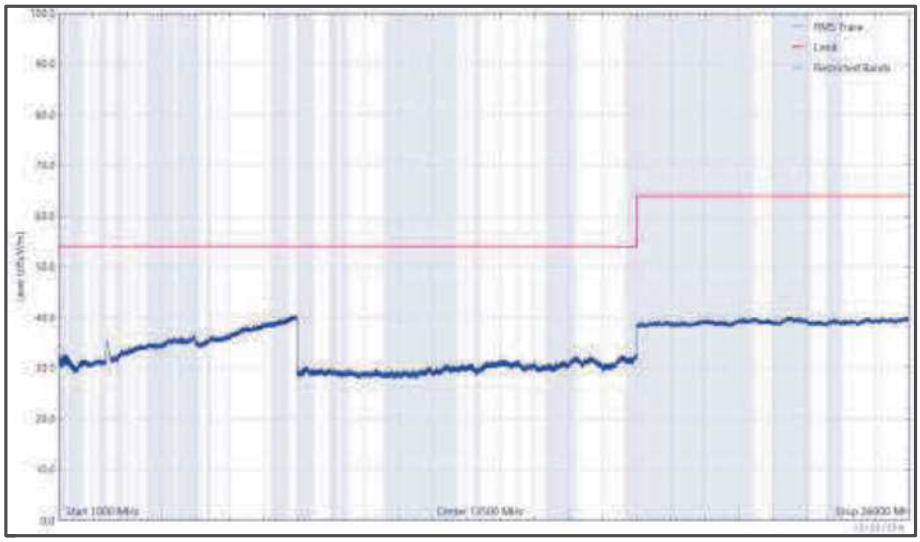

**Figure 313 - 2478 MHz (CH76), HDR4, ePA, Core 0, 1 GHz to 26 GHz, Vertical (rms)**

| Frequency (MHz) | Level (dBuv/m) | Limit (dBuv/m) | Margin (dB) | Detector | Angle (°) | Height (cm) | Polarisation |
|---|---|---|---|---|---|---|---|
| * | | | | | | | |

**Table 170 - 2404 MHz (CH2), HDR4, ePA, Core 1, 1 GHz to 26 GHz**

*No emissions found within 10 dB of the limit.

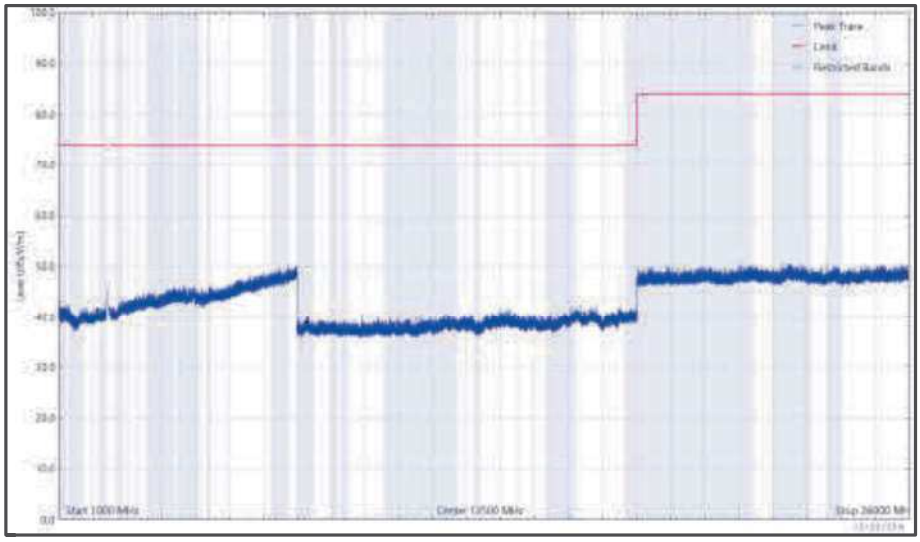

**Figure 314 - 2404 MHz (CH2), HDR4, ePA, Core 1, 1 GHz to 26 GHz, Horizontal (Peak)**

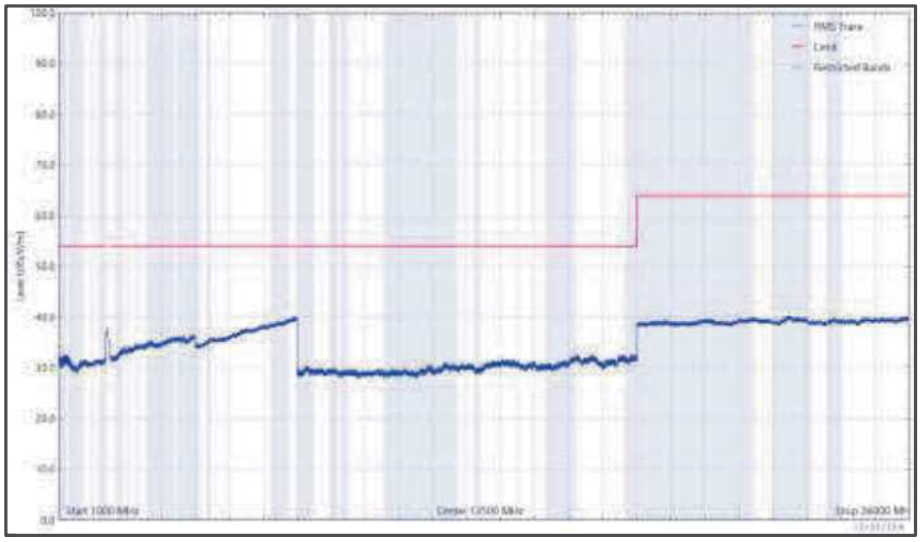

**Figure 315 - 2404 MHz (CH2), HDR4, ePA, Core 1, 1 GHz to 26 GHz, Horizontal (rms)**

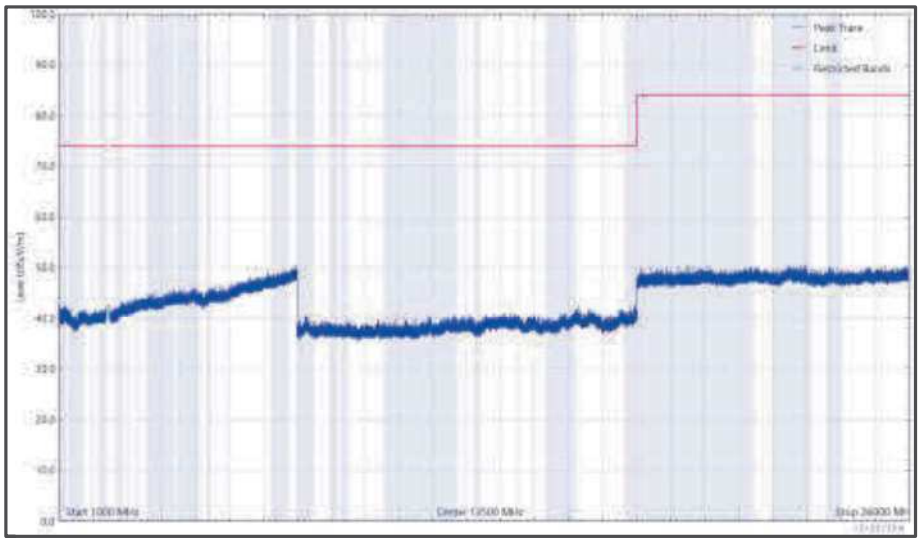

**Figure 316 - 2404 MHz (CH2), HDR4, ePA, Core 1, 1 GHz to 26 GHz, Vertical (Peak)**

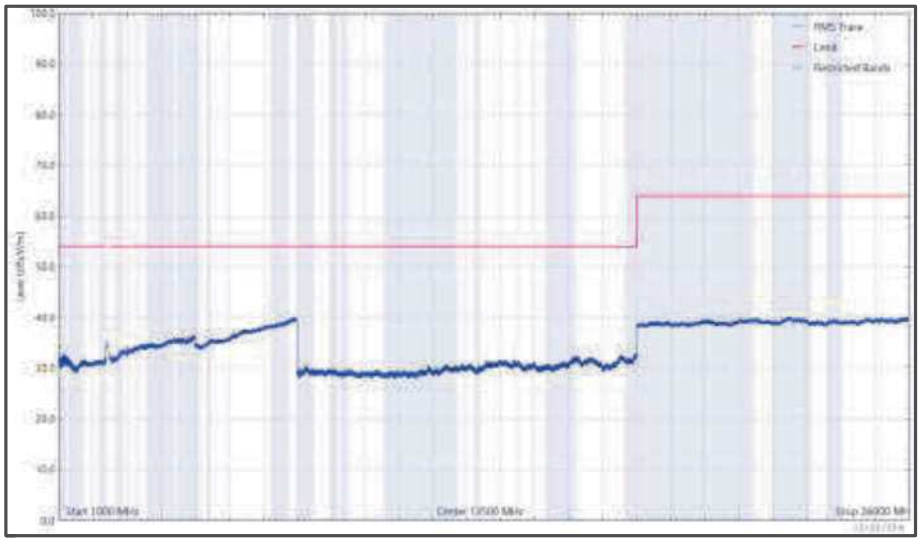

**Figure 317 - 2404 MHz (CH2), HDR4, ePA, Core 1, 1 GHz to 26 GHz, Vertical (rms)**

| Frequency (MHz) | Level (dBuv/m) | Limit (dBuv/m) | Margin (dB) | Detector | Angle (°) | Height (cm) | Polarisation |
|---|---|---|---|---|---|---|---|
| * | | | | | | | |

**Table 171 - 2441 MHz (CH39), HDR4, ePA, Core 1, 30 MHz to 26 GHz**

*No emissions found within 10 dB of the limit.

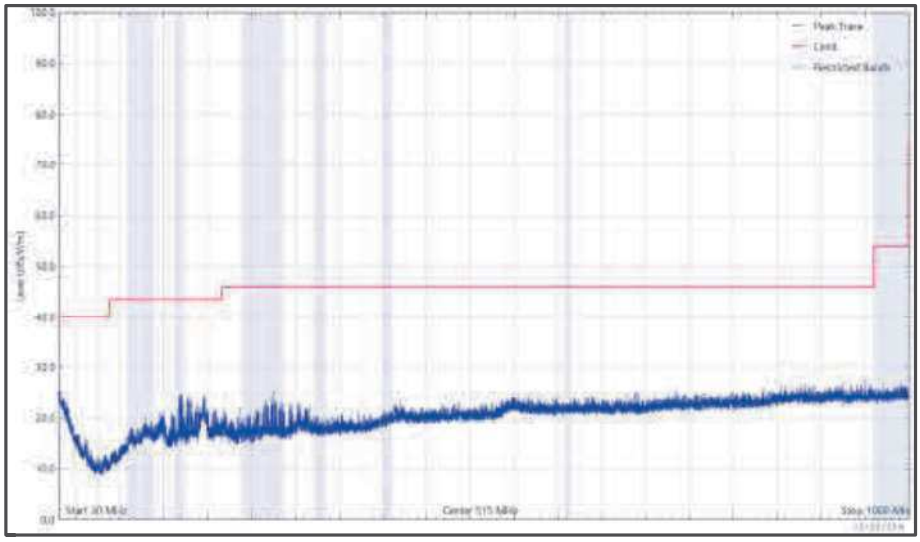

**Figure 318 - 2441 MHz (CH39), HDR4, ePA, Core 1, 30 MHz to 1 GHz, Horizontal (Peak)**

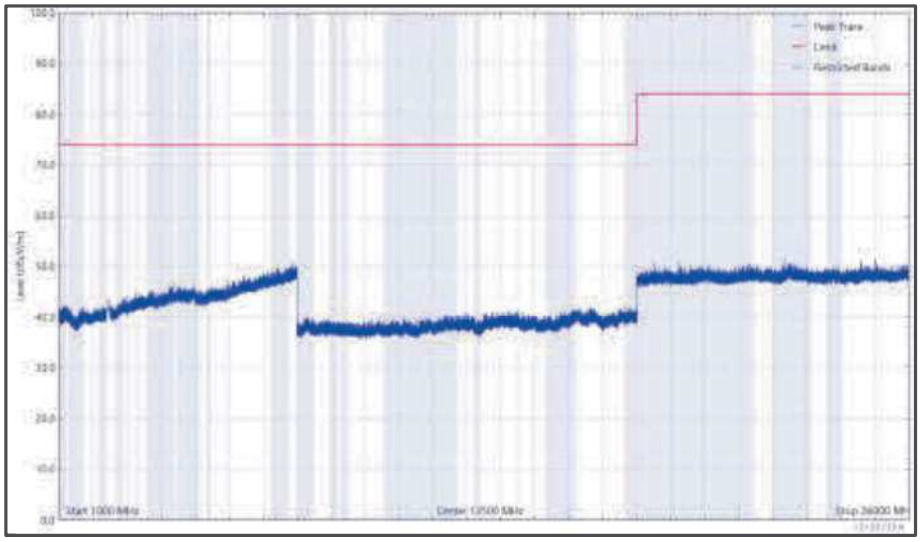

**Figure 319 - 2441 MHz (CH39), HDR4, ePA, Core 1, 1 GHz to 26 GHz, Horizontal (Peak)**

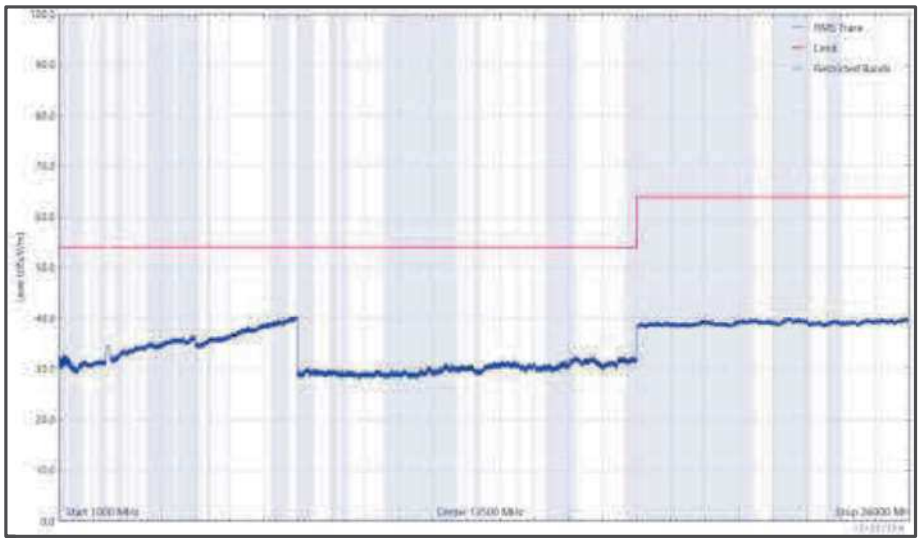

**Figure 320 - 2441 MHz (CH39), HDR4, ePA, Core 1, 1 GHz to 26 GHz, Horizontal (rms)**

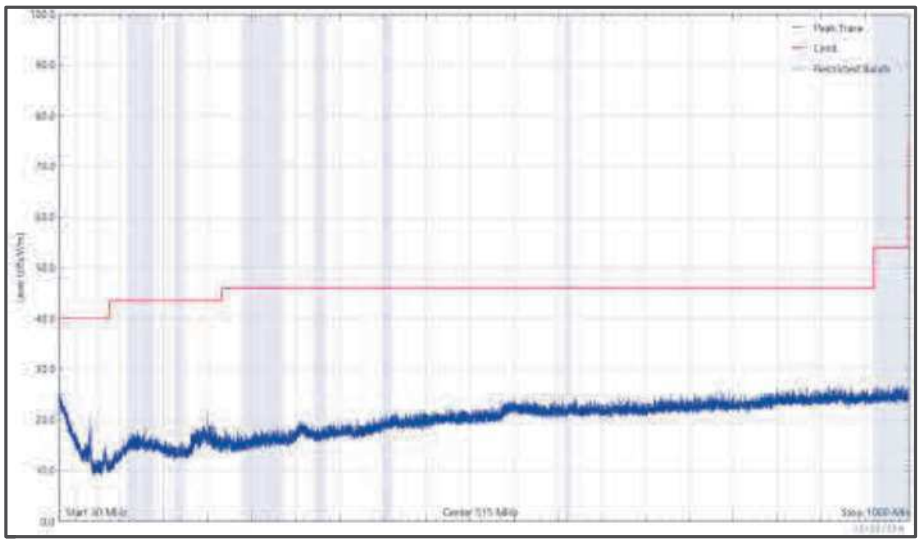

**Figure 321 - 2441 MHz (CH39), HDR4, ePA, Core 1, 30 MHz to 1 GHz, Vertical (Peak)**

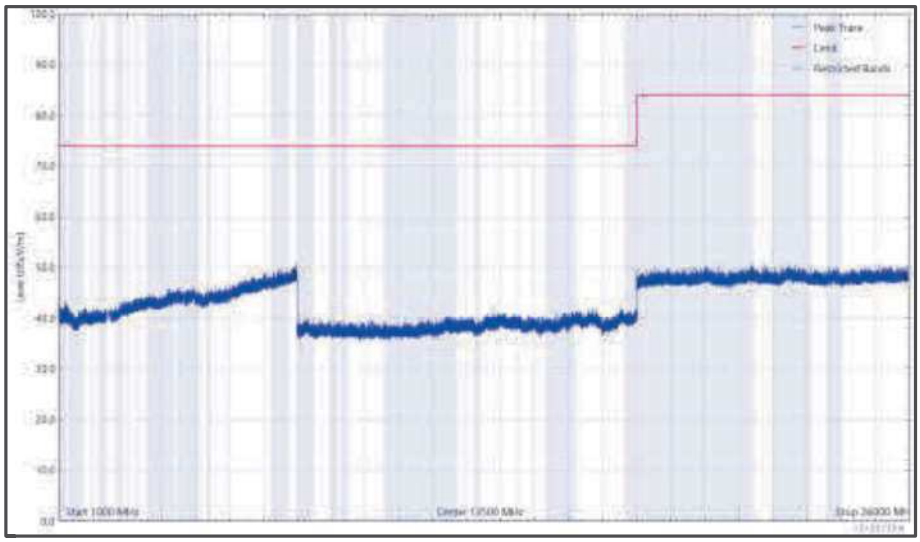

**Figure 322 - 2441 MHz (CH39), HDR4, ePA, Core 1, 1 GHz to 26 GHz, Vertical (Peak)**

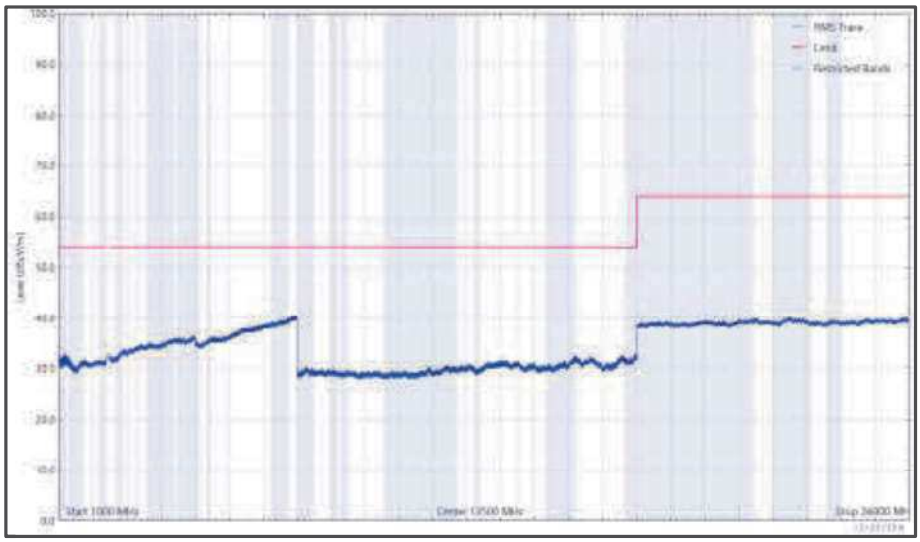

**Figure 323 - 2441 MHz (CH39), HDR4, ePA, Core 1, 1 GHz to 26 GHz, Vertical (rms)**

| Frequency (MHz) | Level (dBuv/m) | Limit (dBuv/m) | Margin (dB) | Detector | Angle (°) | Height (cm) | Polarisation |
|---|---|---|---|---|---|---|---|
| * | | | | | | | |

**Table 172 - 2478 MHz (CH76), HDR4, ePA, Core 1, 1 GHz to 26 GHz**

*No emissions found within 10 dB of the limit.

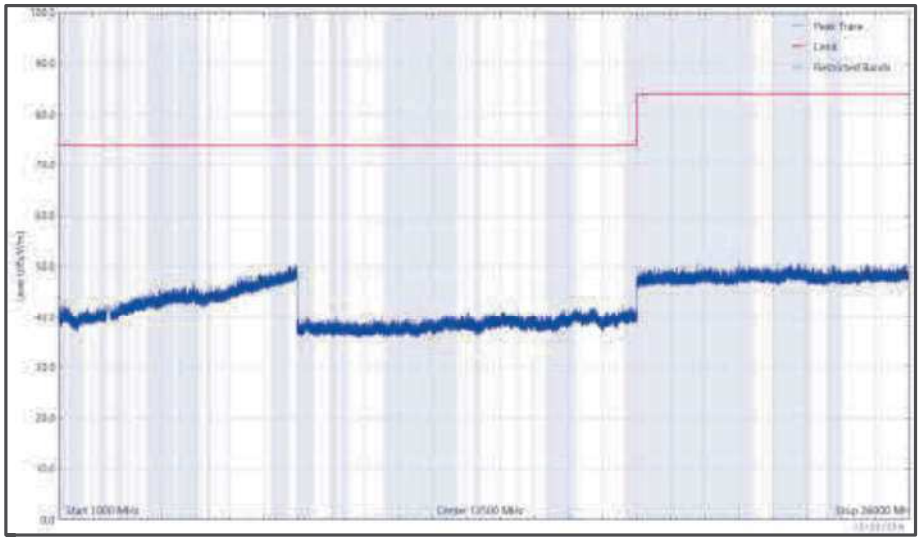

**Figure 324 - 2478 MHz (CH76), HDR4, ePA, Core 1, 1 GHz to 26 GHz, Horizontal (Peak)**

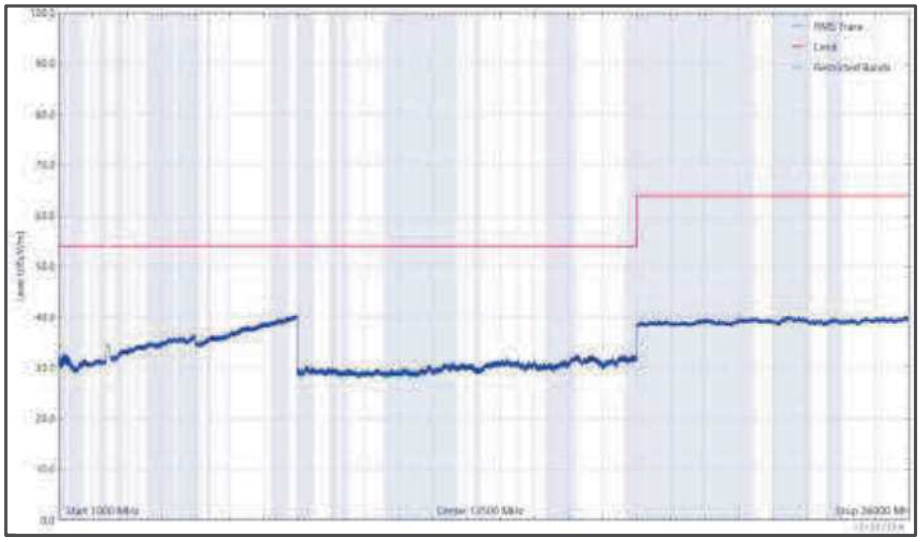

**Figure 325 - 2478 MHz (CH76), HDR4, ePA, Core 1, 1 GHz to 26 GHz, Horizontal (rms)**

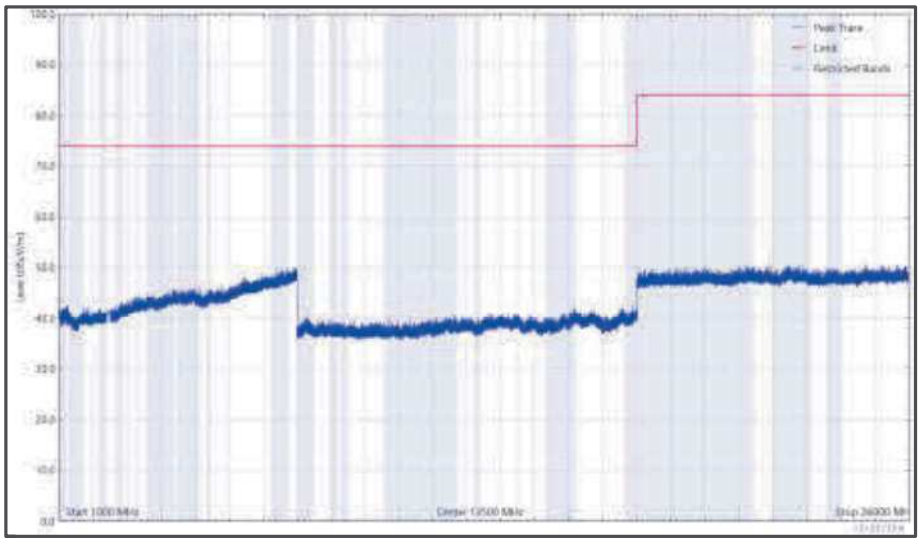

**Figure 326 - 2478 MHz (CH76), HDR4, ePA, Core 1, 1 GHz to 26 GHz, Vertical (Peak)**

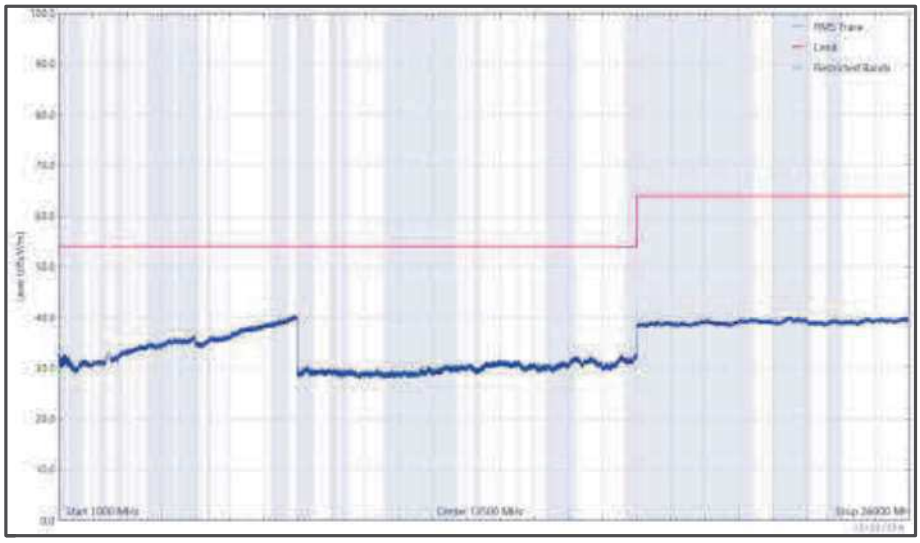

**Figure 327 - 2478 MHz (CH76), HDR4, ePA, Core 1, 1 GHz to 26 GHz, Vertical (rms)**

FCC 47 CFR Part 15, Limit Clause 15.247 (d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in 15.209(a)

ISEDC RSS-247, Limit Clause 5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

### 2.6.8 Test Location and Test Equipment Used

This test was carried out in RF Chamber 11.

| Instrument | Manufacturer | Type No | TE No | Calibration Period (months) | Calibration Due |
|---|---|---|---|---|---|
| Antenna 18-40GHz (Double Ridge Guide) | Link Microtek Ltd | AM180HA-K-TU2 | 230 | 24 | 27-Jul-2022 |
| 18GHz - 40GHz Pre-Amplifier | Phase One | PSO4-0087 | 1534 | 12 | 18-Feb-2021 |
| Antenna with permanent attenuator (Bilog) | Chase | CBL6143 | 2904 | 24 | 30-Sep-2021 |
| True RMS Multimeter | Fluke | 179 | 4007 | 12 | 29-Oct-2021 |
| Cable 1503 2M 2.92(P)m 2.92(P)m | Rhophase | KPS-1503A-2000-KPS | 4293 | 12 | 16-Nov-2021 |
| Band Reject Filter - 2.425 GHz | Wainwright | WRCGV14-2390-2400-2450-2460-50SS | 5066 | 12 | 12-Oct-2021 |
| Band Reject Filter - 2.4585 GHz | Wainwright | WRCGV14-2423.5-2433.5-2483.5-2493.5-50SS | 5068 | 12 | 12-Oct-2021 |
| EMI Test Receiver | Rohde & Schwarz | ESW44 | 5084 | 12 | 04-Feb-2021 |
| Cable (18 GHz) | Rosenberger | LU7-071-1000 | 5102 | 12 | 12-Oct-2021 |
| Cable (18 GHz) | Rosenberger | LU7-071-1000 | 5103 | 12 | 12-Oct-2021 |
| Cable (18 GHz) | Rosenberger | LU7-071-1000 | 5104 | 12 | 10-Dec-2021 |
| EmX Emissions Software | TUV SUD | V2.1.0 | 5125 | - | Software |
| Horn Antenna (1-10GHz) | Schwarzbeck | BBHA 9120 B | 5215 | 12 | 10-Mar-2021 |
| DRG Horn Antenna (7.5-18GHz) | Schwarzbeck | HWRD750 | 5216 | 12 | 10-Mar-2021 |
| Horn Antenna (15-40GHz) | Schwarzbeck | BBHA 9170 | 5217 | 12 | 14-Oct-2021 |
| Pre Amp 1 - 26.5 GHz | Agilent Technologies | 8449B | 5445 | 12 | 06-May-2021 |
| Thermo-Hygro-Barometer | PCE Instruments | PCE-THB-40 | 5475 | 12 | 17-Mar-2021 |
| 1m K-Type Cable | Junkosha | MWX241-01000KMSKMS/A | 5512 | 12 | 03-Apr-2021 |
| 2m SMA Cable | Junkosha | MWX221-02000AMSAMS/A | 5518 | 12 | 01-Apr-2021 |
| 8m N Type Cable | Junkosha | MWX221-08000NMSNMS/B | 5522 | 12 | 24-Mar-2021 |
| 2m K Type Cable | Junkosha | MWX241-02000KMSKMS/A | 5524 | 12 | 03-Apr-2021 |
| 3 GHz High pass Filter | Wainwright | WHKX12-2580-3000-18000-80SS | 5547 | 12 | 05-May-2021 |
| 1200 MHz Low Pass Filter (02) | Mini-Circuits | VLF-1200+ | 5560 | 12 | 23-May-2021 |
| 8 - 18 GHz Amplifier | Wright Technologies | APS06-0061 | 5595 | 12 | 25-Aug-2021 |

**Table 173**

# 3 Measurement Uncertainty

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

| Test Name | Measurement Uncertainty |
|---|---|
| Maximum Conducted Output Power | ± 3.2 dB |
| Power Spectral Density | ± 3.2 dB |
| Emission Bandwidth | ± 144.25 kHz |
| Authorised Band Edges | 30 MHz to 1 GHz: ± 5.2 dB<br>1 GHz to 40 GHz: ± 6.3 dB |
| Restricted Band Edges | 30 MHz to 1 GHz: ± 5.2 dB<br>1 GHz to 40 GHz: ± 6.3 dB |
| Spurious Radiated Emissions | 30 MHz to 1 GHz: ± 5.2 dB<br>1 GHz to 40 GHz: ± 6.3 dB |

**Table 174**

Measurement Uncertainty Decision Rule

Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115: 2007, clause 4.4.3 and 4.5.1.