### Amber Helm Development L.C.

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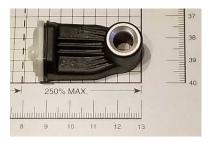
# **EMC Test Report**

SCHTP-WR1812TX Issued: January 2, 2019

regarding

USA: CFR Title 47, Part 15.231 (Emissions) Canada: ISED RSS-210/GENe (Emissions)

for



AG5MWD

Category: TPMS

Judgments: 15.2319(e)/RSS-210v9 Compliant Transmitter Testing Completed: December 22, 2018



Prepared for:

## Schrader Electronics

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### **Revision History**

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| r0<br>r1 |   | January 2, 2019<br>January 26, 2019  | Initial Release.<br>Minor corrections. | J. Brunett<br>J. Brunett  |
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| Tał      | ole of Cont   | ents   |  | 2   |
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|          |   | fications and Procedur<br>pecification and General P   | <b>es</b><br>rocedures                 | <b>6</b><br>6   |
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|          | $\begin{array}{r} 4.1.1 \\ 4.1.2 \\ 4.1.3 \\ 4.2 \\ \text{Intentio} \\ 4.2.1 \\ 4.2.2 \\ 4.2.3 \\ 4.3 \\ \text{Uninten} \end{array}$                            | Radiated Test Setup and<br>Conducted Emissions Tes<br>Power Supply Variation<br>onal Emissions<br>Fundamental Emission P<br>Fundamental Emission B<br>Fundamental Emission Fintional Emissions | Procedures                             | 9         11         11         11         11         11         11         12         12         13         14         15         16         17         18         18         11         12         12         12         12         12         12         12         12         12         12         12         13         14         15         16         17         18         11         12         13         14         15         16         17         18         11         12         13         14         15         16         17         18         11         12         13         14         15 |
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### 1 Test Report Scope and Limitations

### 1.1 Laboratory Authorization

Test Facility description and attenuation characteristics are on file with the FCC Laboratory, Columbia, Maryland (FCC Reg. No: US5348 and US5356) and with ISED Canada, Ottawa, ON (File Ref. No: 3161A and 24249). Amber Helm Development L.C. holds accreditation under NVLAP Lab Code 200129-0.

### 1.2 Report Retention

For equipment verified to comply with the regulations herein, the manufacturer is obliged to retain this report with the product records for the life of the product, and no less than ten years. A copy of this Report will remain on file with this laboratory until February 2029.

### 1.3 Subcontracted Testing

This report does not contain data produced under subcontract.

### 1.4 Test Data

This test report contains data included within the laboratories scope of accreditation.

### 1.5 Limitation of Results

The test results contained in this report relate only to the item(s) tested. Any electrical or mechanical modification made to the test item subsequent to the test date shall invalidate the data presented in this report. Any electrical or mechanical modification made to the test item subsequent to this test date shall require reevaluation.

### 1.6 Copyright

This report shall not be reproduced, except in full, without the written approval of Amber Helm Development L.C.

### 1.7 Endorsements

This report shall not be used to claim product endorsement by any accrediting, regulatory, or governmental agency.

### 1.8 Test Location

The EUT was fully tested by **Amber Helm Development L.C.**, headquartered at 92723 Michigan Hwy-152, Sister Lakes, Michigan 49047 USA. Table 1 lists all sites employed herein. Specific test sites utilized are also listed in the test results sections of this report where needed.

|                          | Table 1: Test Site List.                            |              |
|--------------------------|---|--------------|
| Description              | Location  | Quality Num. |
| OATS $(3 \text{ meter})$ | 3615 E Grand River Rd., Williamston, Michigan 48895 | OATSC        |

### 1.9 Traceability and Equipment Used

Pertinent test equipment used for measurements at this facility is listed in Table 2. The quality system employed at Amber Helm Development L.C. has been established to ensure all equipment has a clearly identifiable classification, calibration expiry date, and that all calibrations are traceable to the SI through NIST, other recognized national laboratories, accepted fundamental or natural physical constants, ratio type of calibration, or by comparison to consensus standards.

### Table 2: Equipment List.

| Description          | Manufacturer/Model      | $\mathbf{SN}$ | Quality Num.      | Last Cal By / Date Due |
|----------------------|-------------------------|---------------|-------------------|------------------------|
|                      |                         |               |                   |                        |
| Biconical            | EMCO / 93110B           | 9802-3039     | BICEMCO01         | Keysight / Aug-2019    |
| Log Periodic Antenna | EMCO / 3146             | 9305 - 3614   | LOGEMCO01         | Keysight / Aug-2019    |
| BNC-BNC Coax         | WRTL / $RG58/U$         | 001           | CAB001-BLACK      | AHD / Mar-2019         |
| BNC-BNC Coax         | WRTL / $RG58/U$         | 001           | CAB002-BLACK      | AHD / Mar-2019         |
| 3.5-3.5MM Coax       | PhaseFlex / PhaseFlex   | 001           | CAB015-<br>PURPLE | AHD / Mar-2019         |
| Spectrum Analyzer    | Rohde & Schwarz / FSV30 | 101660        | RSFSV30001        | RS / Apr-2019          |
| Quad Ridge Horn      | Singer / A6100          | C35200        | HQR1TO18S01       | Keysight / Aug-2019    |

### 2 Test Specifications and Procedures

### 2.1 Test Specification and General Procedures

The ultimate goal of Schrader Electronics is to demonstrate that the Equipment Under Test (EUT) complies with the Rules and/or Directives below. Detailed in this report are the results of testing the Schrader Electronics AG5MWD for compliance to:

| Country/Region | Rules or Directive          | Referenced Section(s)     |
|----------------|-----------------------------|---------------------------|
| United States  | Code of Federal Regulations | CFR Title 47, Part 15.231 |
| Canada         | ISED Canada                 | ISED RSS-210/GENe         |

It has been determined that the equipment under test is subject to the rules and directives above at the date of this testing. In conjunction with these rules and directives, the following specifications and procedures are followed herein to demonstrate compliance (in whole or in part) with these regulations.

| ANSI C63.4:2014  | "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" $$ |
|------------------|---|
| ANSI C63.10:2013 | "American National Standard of Procedures for Compliance Testing of Unli-<br>censed Wireless Devices"                                     |
| TP0102RA         | "AHD Internal Document TP0102 - Radiated Emissions Test Procedure"  |
| ISED Canada      | "The Measurement of Occupied Bandwidth"   |

### Date: January 2, 2019

### 3 Configuration and Identification of the Equipment Under Test

### 3.1 Description and Declarations

The equipment under test is a wireless tire pressure and temperature sensor. The EUT is approximately  $5 \ge 2 \ge 2 \ge 2$  cm in dimension, and is depicted in Figure 1. It is powered by 3 VDC Lithium cell battery. In use, this device is permanently affixed inside the tire of a motor vehicle. Table 3 outlines provider declared EUT specifications.



Figure 1: Photos of EUT.

| Table 3: | EUT | Declarations.     |
|----------|-----|-------------------|
| 10010 01 |     | 10 00101 00101101 |

| General Declarations |                            |                     |  |
|----------------------|----------------------------|---------------------|--|
| Equipment Type:      | TPMS                       | Country of Origin:  | UK   |
| Nominal Supply:      | 3 VDC                      | Oper. Temp Range:   | Not Declared                                 |
| Frequency Range:     | 314.6 - 315.4, 433.92  MHz | Antenna Dimension:  | Not Declared                                 |
| Antenna Type:        | PCB Trace                  | Antenna Gain:       | -25  dBi (approx)                            |
| Number of Channels:  | 1                          | Channel Spacing:    | Not Applicable                               |
| Alignment Range:     | Not Declared               | Type of Modulation: | ASK+FSK                                      |
| United States        |                            |                     |  |
| FCC ID Number:       | MRXAG5MWD                  | Classification:     | DSC  |
| Canada               |                            |                     |  |
| IC Number:           | 2546A-AG5MWD               | Classification:     | Remote Control Device, Ve-<br>hicular Device |

### 3.1.1 EUT Configuration

The EUT is configured for testing as depicted in Figure 2.

### 3.1.2 Modes of Operation

This device is capable of three key modes of operation. When the EUT is installed in the vehicle tire and the vehicle drives, it can, in the worst case, periodically transmit where the duration of each transmission is always less than 1 second and the silent period between transmissions is at least 30 times the duration of the transmission, and never less than 10 seconds. In the case of an emergency condition, the EUT will transmit tire pressure and temperature

### EUT FCC ID: MRXAG5MWD IC: 2546A-AG5MWD

Figure 2: EUT Test Configuration Diagram.

information throughout the duration of the condition. Upon manually activated LF interrogation (through the use of special LF tool at a vehicle dealership), the EUT responds with a single transmission containing a set of frames used to configure the device with the vehicle. This EUT can be programmed via a manufacturer supplied LF tool to emulate a wide range of tire pressure sensors at a single tool selected frequency.

### 3.1.3 Variants

There is only a single variant of the EUT, as tested herein.

### 3.1.4 Test Samples

Six samples in total were provided, all capable of normal operation, test activation, and CW mode via LF tools provided. Two of the normal operating samples were provided un-welded for testing and internal photographs.

### 3.1.5 Functional Exerciser

Normal operating EUT functionality was verified by observation of transmitted signal.

### 3.1.6 Modifications Made

There were no modifications made to the EUT by this laboratory.

### 3.1.7 Production Intent

The EUT appears to be a production ready sample.

### 3.1.8 Declared Exemptions and Additional Product Notes

The EUT is permanently installed in a transportation vehicle. As such, digital emissions are exempt from US and Canadian digital emissions regulations (per FCC 15.103(a) and IC correspondence on ICES-003). The EUT also employs some modes of operation that alert the vehicle user of sudden changes in tire pressure. Such alert modes fall under FCC 15.231(a)(4), and may operate during the pendency of the alarm condition. A detailed list of all operating modes is included in the Description of Operation exhibit included in this application.

### 4 Emissions

### 4.1 General Test Procedures

#### 4.1.1 Radiated Test Setup and Procedures

Radiated electromagnetic emissions from the EUT are first pre-scanned in our screen room. Spectrum and modulation characteristics of all emissions are recorded. Instrumentation, including spectrum analyzers and other test equipment as detailed in Section 1.8 are employed. After pre-scan, emission measurements are made on the test site of record. If the EUT connects to auxiliary equipment and is table or floor standing, the configurations prescribed in relevant test standards are followed. Alternatively, a layout closest to normal use (as declared by the provider) is employed if the resulting emissions appear to be worst-case in such a configuration. See Figure 3. All intentionally radiating elements that are not fixed-mounted in use are placed on the test table lying flat, on their side, and on their end (3-axes) and the resulting worst case emissions are recorded. If the EUT is fixed-mounted in use, measurements are made with the device oriented in the manner consistent with installation and then emissions are recorded. If the EUT exhibits spurious emissions due to internal receiver circuitry, such emissions are measured with an appropriate carrier signal applied.

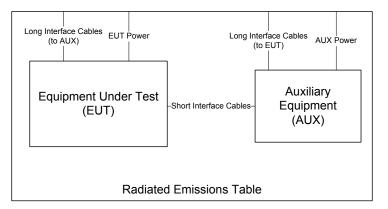


Figure 3: Radiated Emissions Diagram of the EUT.

For devices with intentional emissions below 30 MHz, a shielded loop antenna and/or E-field and H-Field broadband probes are used depending on the regulations. Shielded loops are placed at a 1 meter receive height at the desired measurement distance. For exposure in this band, the broadband probes employed are 10cm diameter single-axis shielded transducers and measurements are repeated and summed over three axes.

Emissions between 30 MHz and 1 GHz are measured using calibrated broadband antennas. For both horizontal and vertical polarizations, the test antenna is raised and lowered from 1 to 4 m in height until a maximum emission level is detected. The EUT is then rotated through  $360^{\circ}$  in azimuth until the highest emission is detected. The test antenna is then raised and lowered one last time from 1 to 4 m and the worst case value is recorded. Emissions above 1 GHz are characterized using standard gain or broadband ridge-horn antennas on our OATS with a  $4 \times 5$  m rectangle of ECCOSORB absorber covering the OATS ground screen and a 1.5m table height. Care is taken to ensure that test receiver resolution and video bandwidths meet the regulatory requirements, and that the emission bandwidth of the EUT is not reduced. Photographs of the test setup employed are depicted in Figure 4.

Where regulations allow for direct measurement of field strength, power values (dBm) measured on the test receiver / analyzer are converted to  $dB\mu V/m$  at the regulatory distance, using

$$E_{dist} = 107 + P_R + K_A - K_G + K_E - C_F$$

where  $P_R$  is the power recorded on spectrum analyzer, in dBm,  $K_A$  is the test antenna factor in dB/m,  $K_G$  is the combined pre-amplifier gain and cable loss in dB,  $K_E$  is duty correction factor (when applicable) in dB, and  $C_F$  is a distance conversion (employed only if limits are specified at alternate distance) in dB. This field strength value is then compared with the regulatory limit. If effective isotropic radiated power (EIRP) is computed, it is computed as

$$EIRP(dBm) = E_{3m}(dB\mu V/m) - 95.2.$$

When presenting data at each frequency, the highest measured emission under all possible EUT orientations (3-axes) is reported.



Figure 4: Radiated Emissions Test Setup Photograph(s).

### 4.1.2 Conducted Emissions Test Setup and Procedures

The EUT is not subject to measurement of power line conducted emissions as it is powered solely by its internal battery.

### 4.1.3 Power Supply Variation

Tests at extreme supply voltages are made if required by the procedures specified in the test standard, and results of this testing are detailed in this report.

In the case the EUT is designed for operation from a battery power source, the extreme test voltages are evaluated over the range specified in the test standard; no less than  $\pm 10\%$  of the nominal battery voltage declared by the manufacturer. For all battery operated equipment, worst case intentional and spurious emissions are re-checked employing a new (fully charged) battery.

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### 4.2 Intentional Emissions

### 4.2.1 Fundamental Emission Pulsed Operation

**Test Setup & Procedure** The test equipment and facilities were setup in accordance with the standards and procedures listed in Section 2.1. Environmental conditions were set at the appropriate temperature and thermal balance was checked with a thermocouple based probe. Duty cycle is reported for all relevant modes of operation. The test equipment employed includes HP8546A, BILOG3142.

**Measurement Results** The details and results of testing the EUT are summarized in Table 4. Plots showing the measurements made to obtain these values are provided in Figure 5.

|           |   | Detector<br>Pk           | Span<br>0        | IF Bandwidth<br>3 MHz        |                           | <b>Bandwidth</b><br>) MHz | Test Date:<br>Test Engineer:<br>EUT:<br>EUT Mode:<br>Meas. Distance:   | Josep<br>Schrade<br>Mo | -Dec-18<br>oh Brunett<br>or AG5MWD<br>odulated<br>10 cm |
|-----------|---|--------------------------|------------------|------------------------------|---------------------------|---------------------------|--|------------------------|---|
|           |   |                          |                  |                              |                           |                           |  |                        | FCC/IC  |
|           |   | Over                     | all Trans        | mission                      |                           | Internal I                | Frame Characteristics  |                        |   |
|           |   | Min.                     | Max.             | Total                        |                           |                           |  | Compute                | ed Duty Cycle   |
| Frequency | EUT Test Mode*                                | Repetition<br>Rate (sec) | No. of<br>Frames | Transmission<br>Length (sec) | Max. Frame<br>Length (ms) | Min. Frame<br>Period (ms) | Frame Encoding   | (%)                    | ( <b>dB</b> )   |
| 1.5       | Periodic FSK, see<br>Subfigure (a)            | 10.2                     | 3                | 0.220                        | 29.000                    | 89.3                      | Worst case periodic FSK transmission<br>consists of 3 frames with a 29 ms on time and<br>a 89.3 ms interframe period repeating every<br>10.2 seconds   | 32.5                   | -9.8  |
|           | Periodic ASK, see<br>Subfigure (a)            | 31.2                     | 10               | 0.960                        | 41.550                    | 99.0                      | Worst case periodic ASK transmission<br>consists of 10 50% duty ASK frames with a<br>41.55 ms length and a 99 ms interframe<br>period repeating every 31.2 seconds                               | 21.0                   | -13.6   |
| 314.9 MHz | Manual Activated<br>ASK, See<br>Subfigure (b) | single                   | 16               | 1.750                        | 28.600                    | 86.2                      | Worst case single activated ASK<br>transmission consists of 16 frames in 1.75<br>seconds. Each frame is 28.6 ms long with<br>50% ASK duty repeating with a minimum<br>86.2 ms interframe period. | 16.6                   | -15.6   |
|           | Manual Activated<br>FSK, See<br>Subfigure (c) | single                   | 6                | 0.658                        | 9.400                     | 52.6                      | Worst Case periodic transmission consists of<br>three ASK frames occurring once every 31.2<br>seconds. Duty cycle of ASK frame is 50%.   | 17.9                   | -15.0   |
|           | Periodic FSK, see<br>Subfigure (d)            | 10.2                     | 3                | 0.2079                       | 29.800                    | 89.1                      | Worst case periodic FSK transmission<br>consists of 3 frames with a 29.8 ms on time<br>and a 89.1 ms interframe period repeating<br>every 10.2 seconds   | 33.4                   | -9.5  |
| 433.9 MHz | Periodic ASK, see<br>Subfigure (d)            | 31.4                     | 10               | 0.9324                       | 39.957                    | 98.6                      | Worst case periodic ASK transmission<br>consists of 10 50% duty ASK frames with a<br>39.95 ms length and a 98.6 ms interframe<br>period repeating every 31.4 seconds                             | 20.3                   | -13.9   |
|           | Manual Activated<br>ASK, See<br>Subfigure (e) | single                   | 16               | 1.590                        | 28.600                    | 86.0                      | Worst case single activated ASK<br>transmission consists of 16 frames in 1.75<br>seconds. Each frame is 28.6 ms long with<br>50% ASK duty repeating with a minimum<br>86.2 ms interframe period. | 16.6                   | -15.6   |
|           |   |                          |                  | Not tested                   | 1 – same as 314.          | 9 MHz above               |  | 17.9                   | -15.0   |

Table 4: Fundamental Emission Pulsed Operation.

Example Calculation: Worst Case 315 FSK Duty (%) =  $(29.0 \text{ ms} / 89.3 \text{ ms}) \times 100 = 32.5 \%$ 

Example Calculation: Worst Case 433.9 ASK Duty (%) = ( 39.957 ms x 50% / 98.6 ms ) x 100 = 20.3 %

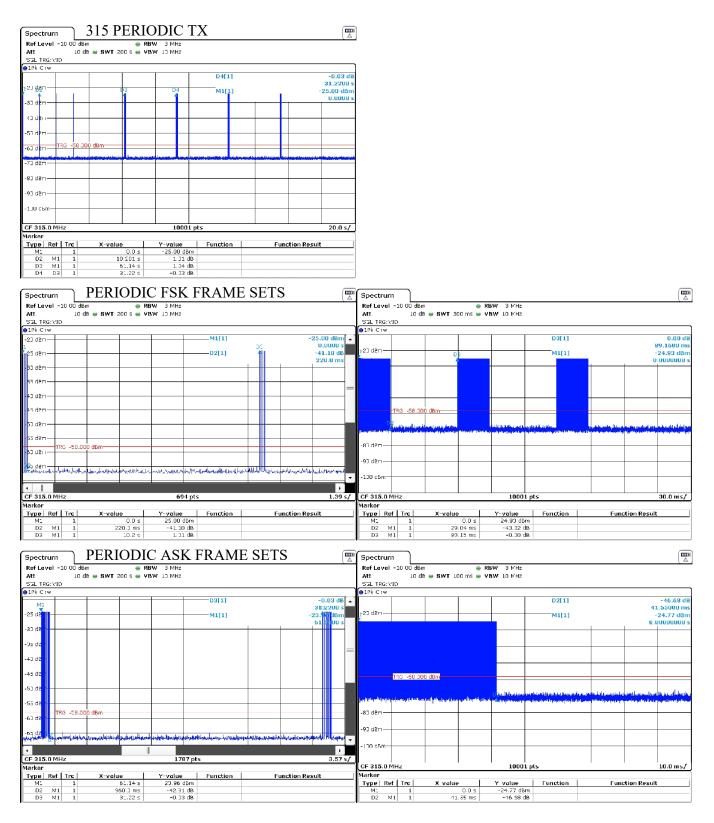


Figure 5(a): Fundamental Emission Pulsed Operation.

| SINGLE MANUAL ACTIVATED A  | ASK 📼   | Spectrum  |                       |                                 |                     |                  |  |            |           | m  |
|--|---|---|-----------------------|---------------------------------|---------------------|------------------|--|------------|-----------|--|
| RefLevel -10 00 dBm  | ĮΔ.   | Ref Level -10   | 00 dBm                | e RBW                           | 3 MHz               |                  |  |            |           | (A)  |
| Att 10 dB • SWT 10 s • VBW 10 MHz  |   | Att   | 10 dB 🖷 SV            | VT2 s 🖬 VBW                     | 10 MHz              |                  |  |            |           |  |
| S3L  |   | SGL TRG: VID  |                       |                                 |                     |                  |  |            |           |  |
| 1Pk C rw     D3[1]   | -42.61 dB   | ⊜1Pk Crw  |                       |                                 |                     | D2[1]            |  |            |           | -0.07 dB   |
|  | 5.00000 s   |   |                       |                                 |                     | 02[1]            |  |            |           | 100.00 ms  |
| -23 dPn41 M1[1]  | -24.58 dBm  | -20 dBm   |                       |                                 |                     | M1[1]            | 1 h  | 2          |           | -24.71 dBm   |
|  | 800.00 ms   |   |                       | n n                             |                     |                  | והו  | <b>n</b> [ | ם ו       | 1.37200 s  |
| -33 020  |   | -53 081   |                       |                                 |                     |                  |  |            |           |  |
| -+J dĽm  |   | -#J dBm   |                       |                                 |                     |                  |  |            |           |  |
|  |   |   |                       |                                 |                     |                  |  |            |           |  |
| 50 dB (1   |   | 50 dBi (  |                       |                                 |                     |                  |  |            |           |  |
| -62 d2n  |   | -50 d8m TRO   | 3 -58.000 dBm-        |                                 |                     |                  |  |            |           |  |
|  |   |   |                       |                                 |                     |                  |  |            |           | LD.  |
| างกระวุณสไปไม่ไปไปไปไปไปไปไปไปได้แหน่งมาและครามและแหน่งกระวุณของหนึ่งที่และสามารถสามารถและกระวุณสามารถ<br>-73 dem  | deriver and the second s | -70 den   | liphical Symmetry has | werd broked have                | the hermost have    | ed based because | wander when  | how        | halphal ( | workersterenter                                      |
|  |   |   |                       |                                 |                     |                  |  |            |           |  |
| -81 dPm  |   | -81 dPm   |                       |                                 |                     |                  |  |            |           |  |
|  |   | an dhe  |                       |                                 |                     |                  |  |            |           |  |
| -90 den  |   | -90 dem   |                       |                                 |                     |                  |  |            |           |  |
| -100 c6m   |   | -100 c6m  |                       |                                 | _                   |                  |  |            |           |  |
|  |   |   |                       |                                 |                     |                  |  |            |           |  |
| CF 315.0 MHz 1001 pts  | 1.0 s/  | CF 315.0 MHz  | 2                     |                                 | 1001                | pts              |  |            |           | 200.0 ms/  |
| Marker   |   | Marker  |                       |                                 |                     |                  |  |            |           |  |
| Type   Ref   Trc   X-value   Y-value   Function   Function Res   | sult  | Type Ref 1  |                       | value                           | Y-value             | Function         |  | Funct      | ion Resul | t  |
| M1 1 000.0 ms 24.50 dBm<br>D2 M1 1 1.75 s -42.21 dB  |   | M1<br>D2 M1   | 1                     | 1.172 s<br>100.0 ms             | 24.71 dB<br>-0.07 c |                  |  |            |           |  |
| D2         M1         1         1.75 s         -42.21 dB           D3         M1         1         5.0 s         -12.51 dB   |   | D2 M1<br>D3 M1  | 1                     | 628.3 ms                        | -0.07 c             |                  |  |            |           |  |
|  |   | ¢   |                       |                                 |                     |                  |  |            |           |  |
| Spectrum   |   | Spectrum  |                       |                                 |                     |                  |  |            |           |  |
| RefLevel -10 00 dBm 😑 RBW 3 MHz  |   |   |                       |                                 |                     |                  |  |            |           |  |
|  |   | Ref Level -10   | 0 00 dBm              | e Ri                            | 3W 3 MHz            |                  |  |            |           | [Δ]  |
| Att 10 dB • SWT 200 ms • VBW 10 MHz  |   | Att   |                       | ⊜ Ri<br>¥T 40 ms <del>■</del> V |                     |                  |  |            |           | ( Δ )  |
| SGL TRG: VID   |   | Att<br>SGL TRG:VID  |                       | -                               |                     |                  |  |            |           | (A)  |
| SSL TRG(YID<br>D1Pk Crw  | -0.08 dB  | Att   |                       | -                               |                     | MILLI            |  |            |           |  |
| S3L TRG:VID<br>DIPK CTW D4[1]  | -0.08 dB<br>100.000 ms  | Att<br>SGL TRG: VID<br>● 1Pk Crw  |                       | -                               |                     | M1[1]            |  |            |           | -24.48 dBm<br>J.0000000 s                            |
| S3L TRG:VID           91Pk Crw           -2J den           -2J den           -2J den   | 100.000 ms<br>-24.78 dBm  | Att<br>SGL TRG:VID  |                       | -                               |                     | M1[1]            |  |            | L.        | -24.48 dBm<br>J.000000 s<br>-45.17 dB                |
| SGL TRG:VID<br>91Pk C rw<br>-2J den V1<br>-2J de | 100.000 ms  | Att<br>SGL TRG: VID<br>● 1Pk Crw  |                       | -                               |                     |                  | חות מות המותחת המות |            | L.        | -24.48 dBm<br>J.0000000 s                            |
| S3L TRG:VID           91Pk Crw           -2J den           -2J den           -2J den   | 100.000 ms<br>-24.78 dBm  | Att<br>SGL TRG: VID<br>● 1Pk Crw  |                       | -                               |                     |                  |  |            | L.        | -24.48 dBm<br>J.000000 s<br>-45.17 dB                |
| SGL TRG:VID<br>91Pk C rw<br>-2J den V1<br>-2J de | 100.000 ms<br>-24.78 dBm  | Att<br>SGL TRG: VID<br>● 1Pk Crw  |                       | -                               |                     |                  |  |            | L.        | -24.48 dBm<br>J.000000 s<br>-45.17 dB                |
| SSL TRG:VID  SSL TRG:VID  S1/K C1w  -2J den -33 den -10 de1 -33  | 100.000 ms<br>-24.78 dBm  | Att<br>SGL TRG: VID<br>● 1Pk Crw  |                       | -                               |                     |                  |  |            | L.        | -24.48 dBm<br>J.000000 s<br>-45.17 dB                |
| SSL TRG:VID  S1/K C1w  -2J den   | 100.000 ms<br>-24.78 dBm  | Att<br>SGL TRG: VID<br>● 1Pk Crw  |                       | -                               |                     |                  |  |            | L.        | -24.48 dBm<br>J.000000 s<br>-45.17 dB                |
| SSL TRG:VID  SSL TRG:VID  S1/K C1w  -2J den -33 den -10 de1 -33  | 100.000 ms<br>-24.78 dBm  | Att<br>SSL TRG: VID<br>● TPk C rw<br>> 20 dPn<br>- 10 dPn<br>- 10 dPn<br>- 10 dPn   |                       | -                               |                     |                  |  |            | L.        | -24.48 dBm<br>J.000000 s<br>-45.17 dB                |
| S3L TRG:VID  S3L TRG:VID  22J dEn  V1  C3J dEn  TG  S5L 100  C3J dEn  TG  S5L 000  C4[1]  C3J dEn  C3J dEn  TG  C5L 000  C4[1]   | 100.000 ms<br>-24.78 dBm<br>1.399400 s  | Att<br>SSL TRG: VID<br>● TPk C rw<br>> 20 dPn<br>- 10 dPn<br>- 10 dPn<br>- 10 dPn   |                       | -                               |                     |                  |  |            | L.        | -24.48 dBm<br>J.000000 s<br>-45.17 dB                |
| S3L TRG:VID           910k C1w           -2J d8m           -43 d8m           -43 d8m   | 100.000 ms<br>-24.78 dBm<br>1.399400 s  | Att<br>SSL TRG: VID<br>● TPk C rw<br>> 20 dPn<br>- 10 dPn<br>- 10 dPn<br>- 10 dPn   |                       | -                               |                     |                  |  |            | L.        | -24.48 dBm<br>J.000000 s<br>-45.17 dB                |
| S3L TRG:VID           D1Pk C rw           -2J dEn           -41 dEn           -30 dEn           -51 dEn           -53 dEn           -63 dEn           -73 dEn           -63 dEn           -73 dEn           -74 dEn           -75 dEn           -75 dEn           -75 dEn           -77 dEn    | 100.000 ms<br>-24.78 dBm<br>1.399400 s  | Att<br>SSL TRG: VID<br>● TPk C rw<br>> 20 dPn<br>- 10 dPn<br>- 10 dPn<br>- 10 dPn   |                       | -                               |                     |                  |  |            | L.        | -24.48 dBm<br>J.000000 s<br>-45.17 dB                |
| S3L TRG:VID  S3L TRG:VID  22J dEn  V1  C3J dEn  TG  S5L 00 dEm  C3J dEn  TG  S5L 00 dEm  C3J dEn  TG  S5L 00 dEm  C3J dEn  TG  C41  C41  C41  C41  C41  C41  C41  C4   | 100.000 ms<br>-24.78 dBm<br>1.399400 s  | Att<br>SGL TRG: VID<br>91Pk Crw<br>220 dBm<br>- ED dBm  |                       | -                               |                     |                  |  |            | L.        | -24.48 dBm<br>J.000000 s<br>-45.17 dB                |
| S3L TRG:VID           D1Pk C rw           -2J dEn           -41 dEn           -30 dEn           -51 dEn           -53 dEn           -63 dEn           -73 dEn           -63 dEn           -73 dEn           -74 dEn           -75 dEn           -75 dEn           -75 dEn           -77 dEn    | 100.000 ms<br>-24.78 dBm<br>1.399400 s  | Att<br>SSL TRG: VID<br>● TPk C rw<br>> 20 dPn<br>- 10 dPn<br>- 10 dPn<br>- 10 dPn   |                       | -                               |                     |                  |  |            | L.        | -24.48 dBm<br>J.000000 s<br>-45.17 dB                |
| S3L TRG:VID       910k Crw       -2J den       -41 den       -30 den       -60 den   | 100.000 ms<br>-24.78 dBm<br>1.399400 s  | Att<br>SGL TRG: VID<br>91Pk Crw<br>220 dBm<br>- ED dBm  |                       | -                               |                     |                  |  |            | L.        | -24.48 dBm<br>J.000000 s<br>-45.17 dB                |
| S3L TRG:VID       910k Crw       -2J den       -41 den       -30 den       -60 den   | 100.000 ms<br>-24.78 dBm<br>1.399400 s  | Att<br>Sat TR6: VID<br>9 TPk Crw<br>22 dPm<br>- 10 dPm<br>- 10 dPm<br>- 10 dPm<br>- 20 dPm<br>- 10 dPm<br>- 80 dPm<br>- 80 dPm  |                       | -                               |                     |                  |  |            | L.        | -24.48 dBm<br>J.000000 s<br>-45.17 dB                |
| S3L R6:VID       91/k Crw       -20 d8n       -40 d8n       -60 d8n       -70 d8n       -60 d8n       -70 d8n </td <td>100.000 ms<br/>-24.78 dBm<br/>1.399400 s</td> <td>Att<br/>Sat TR6: VID<br/>9 TPk Crw<br/>22 dPm<br/>- 10 dPm<br/>- 10 dPm<br/>- 10 dPm<br/>- 20 dPm<br/>- 10 dPm<br/>- 80 dPm<br/>- 80 dPm</td> <td></td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td>L.</td> <td>-24.48 dBm<br/>J.000000 s<br/>-45.17 dB</td>   | 100.000 ms<br>-24.78 dBm<br>1.399400 s  | Att<br>Sat TR6: VID<br>9 TPk Crw<br>22 dPm<br>- 10 dPm<br>- 10 dPm<br>- 10 dPm<br>- 20 dPm<br>- 10 dPm<br>- 80 dPm<br>- 80 dPm  |                       | -                               |                     |                  |  |            | L.        | -24.48 dBm<br>J.000000 s<br>-45.17 dB                |
| S3L TRG:VID       910k Crw       -2J den       -41       -30 den       -51 den       -60 den       -70 den       -71 U com   | 100.000 ms<br>-24.78 dBm<br>1.399400 s  | Att<br>Sal TRC VID<br>1Pk C tw<br>220 dbn<br>- 60 dbn<br>- 60 dbn<br>- 60 dbn<br>- 70 dbn<br>- 90 dbn<br>- 90 dbn   |                       | -                               |                     |                  |  |            | L.        | -24.48 dBm<br>J.000000 s<br>-45.17 dB                |
| S3L TRG:VID       31/k C rw       -2J den       -43 den       -43 den       -53 den       -63 den       -10 den       176 - 58.000 dem       -63 den       -63 den       -10 den       176 - 58.000 dem       -63 den       -64 den       -65 den       -65 den       -65 den       -65 den       -65 den <t< td=""><td>20.0 ms/</td><td>Att<br/>Sal TRC VID<br/>1Pk C tw<br/>220 dbn<br/>- 60 dbn<br/>- 60 dbn<br/>- 60 dbn<br/>- 70 dbn<br/>- 90 dbn<br/>- 90 dbn</td><td>10 d8 <b>- SV</b></td><td>-</td><td></td><td></td><td></td><td></td><td>L.</td><td>-24.48 dBm<br/>JJUUUUUU 5<br/>-45.17 dB<br/>28.4000 ms</td></t<>  | 20.0 ms/  | Att<br>Sal TRC VID<br>1Pk C tw<br>220 dbn<br>- 60 dbn<br>- 60 dbn<br>- 60 dbn<br>- 70 dbn<br>- 90 dbn<br>- 90 dbn   | 10 d8 <b>- SV</b>     | -                               |                     |                  |  |            | L.        | -24.48 dBm<br>JJUUUUUU 5<br>-45.17 dB<br>28.4000 ms  |
| S3L TRG:VID       910k Crw       -2J den       -41       -30 den       -51 den       -60 den       -70 den       -71 U com   | 20.0 ms/  | Att<br>SSL TRC VID<br>© 1PK C IW<br>220 dPm<br>- 10 | 10 dB = SV            | -                               |                     |                  |  |            | L.        | -24.48 dBm<br>J.000000 s<br>-45.17 dB                |
| S2L TRG:VID           PIPk Crw           -2J den           -41           -33 den           -33 den           -33 den           -34 den           -37 den           -37 den           -37 den           -37 den           -37 den           -38 den           -37 den           -39 den           -30 den           -31 Lobn   | 20.0 ms/  | Att<br>SSL TRC VID<br>SIL TRC VID  | 10 dB = SV            |                                 | 3W 10 MHz           | 22[1]            |  |            | L.        | -24.48 dBm<br>J.UUUUUUU 5<br>-45.17 dB<br>28.4000 ms |
| S3L TRG:VID           31/k C rw           -2J dEn           -30 dEn           -30 dEn           -40 dEn           -51 dEn           -60 dEn           -90 dEn           -90 dEn           -10 u cbm  | 20.0 ms/  | Att<br>SSL TRC VID<br>© 1PK C IW<br>220 dPm<br>- 10 | 10 dB = SV            |                                 |                     | 22[1]            |  |            | Larower   | -24.48 dBm<br>J.UUUUUUU 5<br>-45.17 dB<br>28.4000 ms |

Figure 5(b): Fundamental Emission Pulsed Operation.

| Spectrum   | SINGLE                | MANU   | AL ACT   | IVATE  | D FSK                            | 🖫 Spectrum   |                     |   |                             |                       |               |                                |                             |                               |
|--|-----------------------|--|--|--|----------------------------------|--|---------------------|---|-----------------------------|-----------------------|---------------|--------------------------------|-----------------------------|-------------------------------|
| Ref Level -10 00 dB  |                       | RBW 3 MHz  |  |  |                                  | Ref Level  | -10 00 dBm          | e RBW   | 3 MHz                       |                       |               |                                |                             | <u>, -</u>                    |
|  | dB 🗰 SWT 10 s 👄       | VBW 10 MHz   |  |  |                                  | Att  |                     | WT 1 🗉 🖬 VBW  | 10 MHz                      |                       |               |                                |                             |                               |
| SGL  |                       |  |  |  |                                  | SGL TRG:VI   | D                   |   |                             |                       |               |                                |                             |                               |
| ●1Pk Crw   |                       |  | D3[1]  |  | -25.2                            | ●1Pk Crw   |                     |   | 1                           | D5                    | C 1 1         |                                |                             | -26.79 dB                     |
|  |                       |  | 03[1]  |  | 5.000                            |  |                     |   |                             |                       |               |                                | e                           | 58.000 ms                     |
| -2U dBm  |                       |  | M1[1]  |  | -41.91                           | Bm   |                     |   |                             | MI                    | [1]           |                                | -                           | 40.55 dBm                     |
| -30 dBm  |                       |  |  |  | 1.070                            | -3J dBm  |                     |   |                             |                       |               | 1                              |                             | 0.000000 s                    |
|  |                       |  |  |  |                                  | 1  |                     |   |                             | 03                    | D4            |                                |                             |                               |
| -10 dBr ( 10 00 00 00 00 00 00 00 00 00 00 00 00   |                       |  |  |  |                                  |  |                     |   |                             | [                     | 4             |                                |                             |                               |
| -51 dPm  |                       |  |  |  |                                  | -shiden  |                     |   |                             |                       |               |                                |                             |                               |
| -a ruerr   |                       |  |  |  |                                  |  |                     |   |                             |                       |               |                                |                             |                               |
| -60 dBm  |                       |  |  |  |                                  |  | RG -61.000 dBm-     |   |                             |                       | 115           |                                |                             |                               |
| final march and the  | - hunderhalenen weber | Marine Sharmon Martin  | LALLAN DB  | -  | Une marken from the state of the |  | والطافح بحميت بالجا | مراقع والمحمد المراجع المحمد المحم | ويجز الحططية والعروس لا     | en suiter luiter du d | [กษมกใ]ไว้แกม | weather work and the street of | ويدح الحاستها بلتويز برواله | e., des else antra y se se se |
| -70 dem  |                       |  |  |  |                                  |  |                     |   |                             |                       |               |                                |                             |                               |
| -80 dBm  |                       |  |  |  |                                  | -81 qRu  |                     |   |                             |                       |               |                                |                             |                               |
|  |                       |  |  |  |                                  | -90 d2m  |                     |   |                             |                       |               |                                |                             |                               |
| -90 dBm  |                       |  |  |  |                                  |  |                     |   |                             |                       |               |                                |                             |                               |
| -1JU c6m   |                       |  |  |  |                                  | 100 c6m-   |                     |   |                             |                       |               |                                |                             |                               |
| -130 050   |                       |  |  |  |                                  |  |                     |   |                             |                       |               |                                |                             |                               |
| OF OLE O MUS   |                       | 1001   |  |  | 1.0                              | CF 315.0 M   | liz                 |   | 1001                        | . pts                 |               |                                | 1                           | .00.0 ms/                     |
| CF 315.0 MHz<br>Marker   |                       | 1001   | ots  |  | 1.0                              |  | 1 m 1 N             |   |                             | 1                     |               | -                              |                             |                               |
| Type Ret Trc   | X-value               | Y-value  | Function   | Eupr   | ction Result                     | Type Ref   | 1 Inc x-            | value<br>0.0 s  | <u>Y-value</u><br>-40.55 dB | Funct                 | ion           | Fun                            | ction Result                |                               |
| ML 1   | 1.07 s                | -41.91 dBm   | 1  |  |                                  | D2 M   | 1                   | 100.0 ms  | -25.58 c                    | jВ                    |               |                                |                             |                               |
| D2 M1 1  | 650.00 ms             |  |  |  |                                  |  | 1                   | 552.0 ms  | 0.01 c                      |                       |               |                                |                             |                               |
| D3 M1 1  | 5.0 s                 |  |  |  |                                  | D0 _ M   |                     |   |                             |                       |               |                                |                             |                               |
| D1 D3 1<br>Spectrum<br>Ref Level -10 00 d8   | -6.04502 s            |  |  |  |                                  |  | 1                   | 100.3 ms<br>658.3 ms  | -0.04 (<br>-26.79 (         |                       |               |                                |                             |                               |
| Spectrum<br>Ref Level -10 00 dB<br>Att 10  | -6.04592 s            | -0.02 de   |  |  |                                  | D4 D:<br>D5 M  | 1                   |   |                             |                       |               |                                |                             |                               |
| Spectrum<br>Ref Level -10 00 df<br>Att 10 -<br>SGL TRG:VID   | -6.04502 s<br>3m      | -0.02 de   | 3  |  |                                  |  | 1                   |   |                             |                       |               |                                |                             |                               |
| Spectrum<br>Ref Level -10 00 df<br>Att 10 -<br>SGL TRG:VID   | -6.04502 s<br>3m      | -0.02 de   |  |  | -39.89                           | D4 D3 M  | 1                   |   |                             |                       |               |                                |                             |                               |
| Spectrum<br>Ref Level -10 00 df<br>Att 10 -<br>SGL TRG:VID   | -6.04502 s<br>3m      | -0.02 de   | M1[1]  |  | 0.00000                          | <u>D4</u> D5 М   | 1                   |   |                             |                       |               |                                |                             |                               |
| Spectrum           Ref Level = 10 00 df           Att = 10 00 df           SSL TRG:VID           1Pk Crw           -2J den   | -6.04502 s<br>3m      | -0.02 de   | 3  |  |                                  | D4 D:<br>D5 M  | 1                   |   |                             |                       |               |                                |                             |                               |
| Spectrum<br>Ref Level -10 00 dž<br>Att 10 i<br>S3L TRG:VID<br>01Pk Crw   | -6.04502 s<br>3m      | -0.02 de   | M1[1]<br>D2[1]   |  | 0.00000<br>-28.9                 | D4 D:<br>D5 M  | 1                   |   |                             |                       |               |                                |                             |                               |
| Spectrum<br>Ref Level -10 00 df<br>Att 10 -<br>SGL TRG:VID<br>=1Pk Crw<br>-2J dPn  | -6.04502 s<br>3m      | -0.02 de   | M1[1]  |  | 0.00000<br>-28.9                 | D4 D:<br>D5 M  | 1                   |   |                             |                       |               |                                |                             |                               |
| Spectrum Ref Level = 10 00 dd Stl Tracvol = 10 10 0 dd Stl Tracvol = 10 10 0 de 10 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  | -6.04502 s<br>3m      | -0.02 de   | M1[1]<br>D2[1]   |  | 0.00000<br>-28.9                 | D4 D:<br>D5 M  | 1                   |   |                             |                       |               |                                |                             |                               |
| Spectrum           Ref Level - 10 00 db           Att         10 db           SSL TRG: VID           •INk Crw           •20 dbm           -30 dbm           1  | -6.04502 s<br>3m      | -0.02 de   | M1[1]<br>D2[1]   |  | 0.00000<br>-28.9                 | D4 D:<br>D5 M  | 1                   |   |                             |                       |               |                                |                             |                               |
| Spectrum           Ref Level - 10 00 dd           Att           93L TRG: VID           10k Crw           -20 d8m           1           10-00 d8m           10-00 d8m           10-00 d8m           10-00 d8m           10-00 d8m           10-00 d8m   | -6.04202 c            | -0.02 de   | M1[1]<br>D2[1]   |  | 0.00000<br>-28.9                 | D4 D:<br>D5 M  | 1                   |   |                             |                       |               |                                |                             |                               |
| Spectrum Ref Level - 10 00 dd Att S3L TRG:VID IN: Crw -20 ddm30 ddm  | -6.04202 c            | -0.32 de   | M1[1]<br>D2[1]   |  | 0.00000<br>-28.9<br>9.4001       | Bm<br>JU s<br>M<br>Bm<br>Bm<br>Bm<br>Bm<br>Bm<br>Bm<br>Bm<br>Bm<br>Bm<br>Bm  | 1                   |   |                             |                       |               |                                |                             |                               |
| Spectrum           Ref Level - 10 00 dd           Att           10 53L TRG:VID           10k Crw           -20 d8n           1           -50 d8n   | -6.04202 c            | -0.32 de   | M1[1]<br>D2[1]   |  | 0.00000<br>-28.9                 | Bm<br>JU s<br>M<br>Bm<br>S<br>M<br>Bm<br>S<br>M<br>S<br>M<br>S<br>M<br>S<br>M<br>S<br>M<br>S<br>M<br>S<br>M<br>S<br>M<br>S<br>M<br>S   | 1                   |   |                             |                       |               |                                |                             |                               |
| Spectrum           Ref Lavel - 10 00 dd           Att           93L TRG:VID           1Pk Crw           -20 ddn           -30 ddn           -60 ddn           -70 ddn  | -6.04202 c            | -0.32 de   | M1[1]<br>D2[1]   | The first state of the second state of the sec | 0.00000<br>-28.9<br>9.4001       | Bm<br>JU s<br>M<br>Bm<br>S<br>M<br>Bm<br>S<br>M<br>S<br>M<br>S<br>M<br>S<br>M<br>S<br>M<br>S<br>M<br>S<br>M<br>S<br>M<br>S<br>M<br>S   | 1                   |   |                             |                       |               |                                |                             |                               |
| Spectrum Ref Level - 10 00 dd Att S3L TRG:VID IN: Crw -20 ddm30 ddm  | -6.04202 c            | -0.32 de   | M1[1]<br>D2[1]   | مرید اور میراند.<br>مورد اور هوارد مارو دور هم در هم   | 0.00000<br>-28.9<br>9.4001       | Bm<br>JU s<br>M<br>Bm<br>S<br>M<br>Bm<br>S<br>M<br>S<br>M<br>S<br>M<br>S<br>M<br>S<br>M<br>S<br>M<br>S<br>M<br>S<br>M<br>S<br>M<br>S   | 1                   |   |                             |                       |               |                                |                             |                               |
| Spectrum           Ref Lavel - 10 00 dd           Att           93L TRG:VID           1Pk Crw           -20 ddn           -30 ddn           -60 ddn           -70 ddn  | -6.04202 c            | -0.32 de   | M1[1]<br>D2[1]   | tiga in difan di angena sam  | 0.00000<br>-28.9<br>9.4001       | Bm<br>JU s<br>M<br>Bm<br>S<br>M<br>Bm<br>S<br>M<br>S<br>M<br>S<br>M<br>S<br>M<br>S<br>M<br>S<br>M<br>S<br>M<br>S<br>M<br>S<br>M<br>S   | 1                   |   |                             |                       |               |                                |                             |                               |
| Spectrum           Rof Level - 10 00 df           Att         10   | -6.04202 c            | -0.32 de   | M1[1]<br>D2[1]   | tige de dé si de server  | 9,400                            | Bm<br>JU s<br>M<br>Bm<br>S<br>M<br>Bm<br>S<br>M<br>S<br>M<br>S<br>M<br>S<br>M<br>S<br>M<br>S<br>M<br>S<br>M<br>S<br>M<br>S<br>M<br>S   | 1                   |   |                             |                       |               |                                |                             |                               |
| Spectrum           Ref Level - 10 00 dt           Att         10.0           S3L TRG:VID           91Pk Crw           -20 d2n           -30 d2n           1           -60 d2n           -70 d2n           -80 d2n  | -6.04202 c            | -0.32 de   | M1[1]<br>D2[1]   |  | 9,400                            | Bm<br>JU s<br>M<br>Bm<br>S<br>M<br>Bm<br>S<br>M<br>S<br>M<br>S<br>M<br>S<br>M<br>S<br>M<br>S<br>M<br>S<br>M<br>S<br>M<br>S<br>M<br>S   | 1                   |   |                             |                       |               |                                |                             |                               |
| Spectrum           Ref Level -10 00 dit           Att         10           S3L TR3:VID           31Nc Crw           -22 dith           -33 dith           -53 dith           -60 dith           10 dith           -70 dith           -90 dith           -90 dith           -91 dith  | -6.04202 c            | -0.32 de   | M1[1]<br>D2[1]   | ter a transmission   | 0.00000<br>-28.9<br>9.4001       | Bm<br>3/0 4 0:<br>05 M<br>05 M | 1                   |   |                             |                       |               |                                |                             |                               |
| Spectrum           Ref Level - 10 00 df           Att         10           932 TRG:VID           91Pk Crw           -20 dEn           -30 dEn           -60 dEn           -70 dEn           -90 dEn           -90 dEn           -110 Com           CF 315.0 MHz  | -6.04202 c            | -0.32 de   | M1[1]<br>D2[1]   | tige at all industries and   | 9,400                            | Bm<br>3/0 4 0:<br>05 M<br>05 M | 1                   |   |                             |                       |               |                                |                             |                               |
| Spectrum           Ref Level - 10 00 dd           Att         10           93L TRG:VID           10k Crw           -20 ddn           -30 ddn           -60 ddn           -70 ddn           -90 ddn           -100 ddn           -20 ddn           -20 ddn           -20 ddn           -20 ddn           -30 ddn           -20 ddn           -20 ddn           -20 ddn           -90 ddn           -1.00 cbm           CF 315.0 MHz           Marker  | -6.04802 c            | -0.32 de   | M1[1]<br>D2[1]<br>D3<br>D3<br>D3<br>D3<br>D3<br>D3<br>D3<br>D3<br>D3<br>D3   |  | 0.00000<br>-28.9<br>9.4001<br>   | Bm<br>3/0 4 0:<br>05 M<br>05 M | 1                   |   |                             |                       |               |                                |                             |                               |
| Spectrum           Ref Level - 10 00 df           Att         10           531 FRG: VID           -1Pk C rw           -22 dPm           -33 dPm           -53 dPm           -63 dPm           -77 dPm           -83 dPm           -93 dPm           -10 dPm           -22 dPm           -63 dPm           -73 dPm           -63 dPm           -73 dPm           -63 dPm           -73 dPm           -1100 cbm           CF 315.0 MHz           Marker           Type   Ref   Trc   | -6.04802 c            | -0.32 de<br>RBW 3 MHz<br>VBW 10 MHz<br>VBW 10 MHz<br>10 MHz<br>1001          | M1[1]<br>D2[1]<br>D2<br>D2<br>D2<br>D2<br>D2<br>D2<br>D2<br>D2<br>D2<br>D2<br>D2<br>D2<br>D2   |  | 0.00000<br>-28.9<br>9.4001       | Bm<br>3/0 4 0:<br>05 M<br>05 M | 1                   |   |                             |                       |               |                                |                             |                               |
| Spectrum           Ref Level - 10 00 df           Att         10           93L TRG: VID           1Pk C rw           -22 dPn           -33 dPn           -33 dPn           -53 dPn           -63 dPn           -77 dPn           -63 dPn           -93 dPn           -93 dPn           -1100 cbm           CF 315.0 MHz           Marker           Type   Ref           M2         1   | -6.04802 c            | -0.32 de<br>RBW 3 MHz<br>VBW 10 MHz<br>VBW 10 MHz<br>10 MHz<br>10 01<br>1001 | M1[1]<br>D2[1]<br>D2<br>D2<br>D2<br>D2<br>D2<br>D2<br>D2<br>D2<br>D2<br>D2<br>D2<br>D2<br>D2   |  | 0.00000<br>-28.9<br>9.4001<br>   | Bm<br>3/0 4 0:<br>05 M<br>05 M | 1                   |   |                             |                       |               |                                |                             |                               |
| Spectrum           Ref Level - 10 00 dd           Att         10           93L TRG:VID           10k Crw           -20 ddn           -30 ddn           -50 ddn           -70 ddn           -90 ddn           -100 cdm           -20 ddn           -20 ddn           -20 ddn           -20 ddn           -30 ddn           -20 ddn           -100 cbm           CF 315.0 MHz           Marker           Type   Ref   Trc             M2 | -6.04802 c            | -0.32 de<br>RBW 3 MHz<br>VBW 10 MHz<br>VBW 10 MHz<br>                        | MI[1]<br>D2[1]<br>D3<br>D3<br>D3<br>D3<br>D3<br>D3<br>D3<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4<br>D4 |  | 0.00000<br>-28.9<br>9.4001<br>   | Bm<br>3/0 4 0:<br>05 M<br>05 M | 1                   |   |                             |                       |               |                                |                             |                               |

Figure 5(c): Fundamental Emission Pulsed Operation.



Figure 5(d): Fundamental Emission Pulsed Operation.

| Spectrum  | SINGLE N  | /IANU/  | AL ACT                 | TIVATE   | ED AS                        | SK 💬   | Spectrum   | ר                             |                |             |           |                            |          |         |             |          |        |           |                               |                             |
|---|---|---|------------------------|--|------------------------------|--|--|-------------------------------|----------------|-------------|-----------|----------------------------|----------|---------|-------------|----------|--------|-----------|-------------------------------|-----------------------------|
| Ref Level -10 00 dBr  |   | V 3 MHz   |                        |  |                              | <u> </u>   | Ref Level -10  | 00 dBm                        |                | e R         | RBW 31    | MHz                        |          |         |             |          |        |           |                               |                             |
|   | B 🖶 SWT 10 s 🖶 VBV  | N 10 MHz  |                        |  |                              |  | Att  | 10 dB (                       | SWT 1          | L.6 S 🕳 V   | /BW 101   | MHz                        |          |         |             |          |        |           |                               |                             |
| SGL   |   |   |                        |  |                              |  | SGL TRG: VID   |                               |                |             |           |                            |          |         |             |          |        |           |                               |                             |
| ●1Pk Cirw   |   |   |                        |  |                              |  | ●1Pk Crw   |                               |                |             |           |                            |          |         |             |          |        |           |                               |                             |
|   |   |   | D3[1]                  |  |                              | -41.85 dB<br>5.00000 s   |  |                               |                |             |           |                            |          | M1[1]   |             |          |        |           | -24.86 c                      |                             |
| -20 dBm   |   |   | M1[1]                  |  |                              | 25.16 dBm  | -20 dBm  |                               |                | _           |           | ML                         |          | D2[1]   |             |          |        |           | -0.06                         |                             |
|   |   |   |                        |  |                              | 1.12024 s  |  | m h                           | і <b>г</b> і   | pro-        | m         | 5                          | D2       |         |             |          | - m    |           | 100.00                        |                             |
| -30 dBu   |   | + +   |                        |  |                              |  | -\$0 d2m   |                               |                |             |           | _                          |          |         |             | _        |        |           |                               |                             |
|   |   |   |                        |  |                              |  |  |                               |                |             |           |                            |          |         |             |          |        |           |                               |                             |
| -4u ditim   |   |   |                        |  |                              |  | -+D dBri   |                               |                |             |           |                            |          |         |             |          |        |           |                               |                             |
| 50 dBr i  |   |   |                        |  |                              |  |  |                               |                |             |           |                            |          |         |             |          |        |           |                               |                             |
| 35 acr 1  |   |   |                        |  |                              |  | \$0 den  |                               |                |             |           |                            |          |         |             |          |        |           |                               |                             |
| -60 dBm   |   |   |                        |  |                              |  | TRG  | -50.000                       | dBm            |             |           |                            |          |         |             |          |        |           |                               |                             |
| an a  | Wals Brownerster  | unpersonal and  | and an internet Des    | and a second | umana                        | at a summer  | -6J dBm  |                               |                |             |           |                            |          |         |             |          |        |           |                               |                             |
| -70 dPm   | all a st to Townson straw   |   | No. Alara and Township |  | CANOL HARD SHOWE             |  | hadren land  | l hand                        | have be        | where where | enough he | يها الهرس                  | and have | I have  | l literance | المل الم | unal u | unel leh  | in homest                     | سا ا                        |
|   |   |   |                        |  |                              |  | - \1 95W   |                               |                |             |           |                            |          |         |             |          |        |           |                               |                             |
| -81 dPm   | + + +   | + +   |                        |  |                              |  | -80 dBm  |                               |                |             |           |                            |          |         |             |          |        |           |                               |                             |
| 0.0 - 10  |   |   |                        |  |                              |  |  |                               |                |             |           |                            |          |         |             |          |        |           |                               |                             |
| -90 dPm   |   |   |                        |  |                              |  | -90 dBm  |                               |                |             |           |                            |          |         |             |          |        |           | _                             |                             |
| -100 c6m  |   |   |                        |  |                              |  |  |                               |                |             |           |                            |          |         |             |          |        |           |                               |                             |
|   |   |   |                        |  |                              |  | -100 c6m   |                               |                |             |           |                            |          |         |             |          |        |           |                               |                             |
| CF 433.9 MHz  |   | 1001  |                        |  |                              | 1.0 s/   |  |                               |                |             |           |                            |          |         |             |          |        |           |                               |                             |
| CF 433.9 MHZ<br>Marker  |   | 1001 p  | ts                     |  |                              | 1.0 \$7  | CF 133.9 MHz   | 1                             |                | I           | 1         | 1001                       | nis.     |         | 1           |          |        |           | 160.0 m                       |                             |
| Marker<br>Type Ref Trc  | X-value   | Y-value   | Function               | Euror  | tion Result                  |  | Marker   |                               |                |             |           | 100.                       | . pts    |         |             |          |        |           | 100.01                        |                             |
| MI 1  | 1.12C24 s   | 25.16 dBm   |                        | Func   | alon Kesult                  | ·  | Type   Ref   T   | ne l                          | X valu         | e           | Yv        | alue                       | 1 r      | unction | 1           |          | Funct  | ion Res   | ilt                           |                             |
| D2 M1 1   | 1.59C12 s   | -42.24 dB   |                        |  |                              |  | ML.  | 1                             | 742            | 2.64 ms     | -24       | 4.86 dE                    | m        |         |             |          |        |           |                               |                             |
| D3 M1 1   | 5.0 s   | -11.35 dB   |                        |  |                              |  | D2 M1  | 1                             | 10             | 00.0 ms     |           | -0.06                      | 1B       |         |             |          |        |           |                               |                             |
|   |   |   |                        |  |                              |  |  | T                             |                |             |           | 0.50                       |          |         |             |          |        |           |                               |                             |
|   |   |   |                        |  |                              |  | ·  |                               |                |             |           | 0.50                       |          |         |             |          |        |           |                               |                             |
| Spectrum  |   |   |                        |  |                              |  | Spectrum   |                               |                |             |           |                            |          |         |             |          |        |           |                               |                             |
| Ref Level -10 00 dBr  |   | NBW 3 MHz   |                        |  |                              |  | Spectrum<br>Ref Level -10  | 00 dBm                        |                |             | RBW 3     | MHz                        |          |         |             |          |        |           |                               |                             |
| RefLevel -10 00 dBr<br>Att 10 d   | m 👄 🗑<br>B 🖶 SWT 200 ms 🖷 V   |   |                        |  |                              |  | Spectrum<br>Ref Level -10<br>Att   | 00 dBm                        | • SWT 3        |             |           | MHz                        |          |         |             |          |        |           |                               |                             |
| Ref Level -10 00 dBr<br>Att 10 d<br>SGL TRG: VID  |   |   |                        |  |                              |  | Spectrum<br>Ref Level -10<br>Att<br>SSL TRG:VID  | 00 dBm                        |                |             |           | MHz                        |          |         |             |          |        |           |                               |                             |
| RefLevel -10 00 dBr<br>Att 10 d   |   |   | D4E13                  |  |                              |  | Spectrum<br>Ref Level -10<br>Att   | 00 dBm                        |                |             |           | MHz                        | '        | MIN     |             |          |        |           |                               |                             |
| RefLevel -10 00 dBr<br>Att 10 d<br>SGL TRG: VID<br>PIPK Crw   |   |   | D4[1]                  |  |                              | -0.10 dB   | Spectrum<br>Ref Level -10<br>Att<br>SGL TRG:VID<br>IPk Crw   | 00 dBm                        |                |             |           | MHz                        |          | M1[1]   |             |          |        |           | -24.83 c                      | 1Bm                         |
| Ref Level -10 00 dBr<br>Att 10 d<br>SGL TRG: VID  |   |   | D4[1]<br>M1[1]         |  |                              |  | Spectrum<br>Ref Level -10<br>Att<br>SSL TRG:VID  | 00 dBm                        |                |             |           | MHz                        |          | M1[1]   |             |          |        |           |                               | lBm<br>UU s                 |
| Ref Level -10 00 dBr<br>Att 10 d<br>SGL TRG: VID<br>01Pk Crw<br>12J d2n   |   | ABW 10 MHz  |                        |  | -                            | -0.10 dB   | Spectrum<br>Ref Level -10<br>Att<br>SGL TRG:VID<br>IPk Crw   | 00 dBm                        |                |             |           | MHz                        |          |         |             | ות הר מ  |        | וות ה היה | -24.83 c                      | lBm<br>UU s<br>3 dB         |
| RefLevel -10 00 dBr<br>Att 10 d<br>SGL TRG: VID<br>PIPK Crw   |   | ABW 10 MHz  |                        |  | -                            | -0.10 dB<br>100.000 ms<br>24.93 dBm  | Spectrum<br>Ref Level -10<br>Att<br>SGL TRG:VID<br>IPk Crw   | 00 dBm                        |                |             |           | MHz                        |          |         |             |          |        |           | -24.83 c<br>0.00000<br>-44.68 | lBm<br>UU s<br>3 dB         |
| Ref Level -10 00 dBr<br>Att 10 d<br>SGL TRG: VID<br>01Pk Crw<br>12J d2n   |   | ABW 10 MHz  |                        |  | -                            | -0.10 dB<br>100.000 ms<br>24.93 dBm  | Spectrum<br>Ref Level -10<br>Att<br>SGL TRG:VID<br>IPk Crw   | 00 dBm                        |                |             |           | MHz                        |          |         |             |          |        |           | -24.83 c<br>0.00000<br>-44.68 | lBm<br>UU s<br>3 dB         |
| Ref Level -10 00 dBr           Att         10 db           S3L TRG: VID           910k Crw           12J dEn           -30 dEn  |   | ABW 10 MHz  |                        |  | -                            | -0.10 dB<br>100.000 ms<br>24.93 dBm  | Spectrum<br>Ref Level -10<br>Att<br>SGL TRG:VID<br>IPk Crw   | 00 dBm                        |                |             |           | MHz                        |          |         |             |          |        |           | -24.83 c<br>0.00000<br>-44.68 | lBm<br>UU s<br>3 dB         |
| Ref Level -10 00 dBr           Att         10 dl           SGL TRG: VID           © IPK Crw           320 dPn   |   | ABW 10 MHz  |                        |  | -                            | -0.10 dB<br>100.000 ms<br>24.93 dBm  | Spectrum<br>Ref Level -10<br>Att<br>SGL TRG:VID<br>IPk Crw   | 00 dBm                        |                |             |           | MHz                        |          |         |             |          |        |           | -24.83 c<br>0.00000<br>-44.68 | lBm<br>UU s<br>3 dB         |
| Ref Level - 10 00 dBr           Att         10 d           SSL TRG: VID           ●1Pk Crw           •20 dBr           •30 dBr           •10 ub           •10 ub  | B SWT 200 ms V  | ABW 10 MHz  |                        |  | -                            | -0.10 dB<br>100.000 ms<br>24.93 dBm  | Spectrum<br>Ref Level -10<br>Att<br>SGL TRG:VID<br>IPk Crw   | 00 dBm                        |                |             |           | MHz                        |          |         |             |          |        |           | -24.83 c<br>0.00000<br>-44.68 | lBm<br>UU s<br>3 dB         |
| Ref Level - 10 00 dBr           Att         10 d           SSL TRG: VID           ●10k Crw           22 dBr           -33 dBr           -51 dPr   |   | ABW 10 MHz  |                        |  | -                            | -0.10 dB<br>100.000 ms<br>24.93 dBm  | Spectrum<br>Ref Level -10<br>Att<br>SGL TRG:VID<br>IPk Crw   | 00 dBm                        |                |             |           | MHz                        |          |         |             |          |        |           | -24.83 c<br>0.00000<br>-44.68 | lBm<br>UU s<br>3 dB         |
| Ref Level - 10 00 dBr           Att         10 d           SSL TRG: VID           ●10k Crw           •10 dBr           •30 dBr           -30 dBr           -51 dBr           •17 dBr           •0 dBr           •0 dBr  | B SWT 200 ms V  | ABW 10 MHz  | M1[1]                  |  |                              | -0,10 dB<br>LUU.UUU ms<br>24.93 dBm<br>/42.4UU ms                            | Spectrum<br>Ref Level -10<br>Att<br>SGL TRG:VID<br>IPk Crw   | 00 dBm                        |                |             |           | MHz                        |          |         |             |          |        |           | -24.83 c<br>0.00000<br>-44.68 | lBm<br>UU s<br>3 dB         |
| Ref Level - 10 00 dBr           Att         10 d           SSL TRG: VID           ●1Pk C rw           23 dBh           10 dB           -51 dBh           -51 dBh           -60 dBh           -60 dBh  | B SWT 200 ms V  | ABW 10 MHz  | M1[1]                  | Active relationships   |                              | -0,10 dB<br>LUU.UUU ms<br>24.93 dBm<br>/42.4UU ms                            | Spectrum<br>Ref Level -10<br>Att<br>SGL TRG:VID<br>IPk Crw   | 00 dBm                        |                |             |           | MHz                        |          |         |             |          |        |           | -24.83 c<br>0.00000<br>-44.68 | lBm<br>UU s<br>3 dB         |
| Ref Level - 10 00 dBr           Att         10 d           SSL TRG: VID           ●10k Crw           •10 dBr           •30 dBr           -30 dBr           -51 dBr           •17 dBr           •0 dBr           •0 dBr  | B SWT 200 ms V  | ABW 10 MHz  | M1[1]                  |  |                              | -0,10 dB<br>LUU.UUU ms<br>24.93 dBm<br>/42.4UU ms                            | Spectrum<br>Ref Level -10<br>Att<br>SGL TRG:VID<br>IPk Crw   | 00 dBm                        |                |             |           | MHz                        |          |         |             |          |        |           | -24.83 c<br>0.00000<br>-44.68 | lBm<br>UU s<br>3 dB         |
| Ref Level - 10 00 dBr           Att         10 d           SSL TRG: VID           ●10k Crw           •10 dBr           •30 dBr           •51 dPr           •50 dBr           •60 dBr           •70 dBr           •80 dBr  | B SWT 200 ms V  | ABW 10 MHz  | M1[1]                  |  |                              | -0.10 dB<br>LUU.UUU ms<br>24.93 dBm<br>/42.4UU ms                            | Spectrum<br>Ref Level -10<br>Att<br>SGL TRG:VID<br>IPk Crw   | 00 dBm                        |                |             |           | MHz                        |          |         |             |          |        |           | -24.83 c<br>0.00000<br>-44.68 | lBm<br>UU s<br>3 dB         |
| Ref Level - 10 00 dBr           Att         10 d           S3L TRG: VID           91Pk Crw           -33 dBh           -33 dBh           -53 dBh           -60 dBh           -73 dBh  | B SWT 200 ms V  | ABW 10 MHz  | M1[1]                  |  |                              | -0.10 dB<br>LUU.UUU ms<br>24.93 dBm<br>/42.4UU ms                            | Spectrum           Ref Level - 10<br>Att           SSL TRG:VID           91Pk C1w           •10k C1w           •20 dPn           •30 dEn           •30 dEn           •50 dEn           •00 den   | 00 dBm                        |                |             |           | MHz                        |          |         |             |          |        |           | -24.83 c<br>0.00000<br>-44.68 | lBm<br>UU s<br>3 dB         |
| Ref Level - 10 00 dBr           Att         10 d           S3L TR3: VID           91Pk C rw           12 Jd Br           -51 dPr           -60 dBr           -80 dBr           -90 dBr  | B SWT 200 ms V  | ABW 10 MHz  | M1[1]                  |  |                              | -0.10 dB<br>LUU.UUU ms<br>24.93 dBm<br>/42.4UU ms                            | Spectrum           Ref Level - 10<br>Att           SSL TRG:VID           91Pk C1w           •10k C1w           •20 dPn           •30 dEn           •30 dEn           •50 dEn           •00 den   | 00 dBm                        |                |             |           | MHz                        |          |         |             |          |        |           | -24.83 c<br>0.00000<br>-44.68 | lBm<br>UU s<br>3 dB         |
| Ref Level - 10 00 dBr           Att         10 d           SSL TRG: VID           ●10k Crw           •10 dBr           •30 dBr           •51 dPr           •50 dBr           •60 dBr           •70 dBr           •80 dBr  | B SWT 200 ms V  | ABW 10 MHz  | M1[1]                  | wice and the acceptory   |                              | -0.10 dB<br>LUU.UUU ms<br>24.93 dBm<br>/42.4UU ms                            | Spectrum<br>Ref Level -10<br>Att<br>SSL TRG:VID<br>●1Pk CTW<br>+20 dPn<br>+20 | 00 dBm                        |                |             |           | MHz                        |          |         |             |          |        |           | -24.83 c<br>0.00000<br>-44.68 | lBm<br>UU s<br>3 dB         |
| Ref Level - 10 00 der           Att         10 der           SL TRG: VID           SILT RG: VID    | B SWT 200 ms V  |   | M1(1)                  | vice and name sign   | - 7<br>7<br>Leocharaeolustop | -0.10 dB<br>100.000 ms<br>24.93 dBm<br>442.400 ms                            | Spectrum<br>Ref Level -10<br>Att<br>SSL TRG:VID<br>●1Pk CTW<br>+20 dPn<br>+20 | 00 dBm                        |                |             |           | MHz                        |          |         |             |          |        |           | -24.83 c<br>0.00000<br>-44.68 | lBm<br>UU s<br>3 dB         |
| Ref Level - 10 00 dBr           Att         10 d           SSL TR3: VID           910k Crw           920 dBn           -33 dB           -33 dB           -51 dB           -51 dB           -63 dB           -63 dB           -77 dB           -93 dB           -93 dB           -1.00 cbm           CF 433.9 MHz  | B SWT 200 ms V  | ABW 10 MHz  | M1(1)                  | veljo- joniški sko-pijeto  | - 7<br>7<br>Leocharaeolustop | -0.10 dB<br>LUU.UUU ms<br>24.93 dBm<br>/42.4UU ms                            | Spectrum<br>Rof Lavel -10<br>Att<br>Stat TRE:VID<br>@1Pk C rw<br>-23 dPn<br>-2 dPn<br>-2 dPn<br>-2 dPn<br>-3 dPn<br>-93 dPn  | 00 dBm                        |                |             |           | MHz                        |          |         |             |          |        |           | -24.83 c<br>0.00000<br>-44.68 | lBm<br>UU s<br>3 dB         |
| Ref Lavel - 10 00 der           Att         10 der           Stall TRG: VID           S1L TRG: VID           S1D TRG: VID           S2D TRG: VID |   | 1001 pt   | M1[1]                  |  | / /                          | -0.10 dB<br>100.000 ms<br>42.400 ms<br>42.400 ms<br>42.400 ms<br>400.000 ms/ | Spectrum           Ref Level - 10<br>Att           SSL TRG:VID           910k Crw           22 dBm           -32 dBm           -32 dBm           -52 dBm           -83 dBm           -93 dBm           -10 c5m   | 00 dBm                        |                |             |           |                            |          |         |             |          |        |           | -24.83 c                      | iBm<br>UU s<br>3 dB<br>I ms |
| Ref Level - 10 00 dBr           Att         10 d           S3L TR3: VID           91Pk Crw           22 J dBn           -33 dBn           -51 dBn           -50 dBn           -90 dBn           -1JU cbm           CF 433.9 MHz           Marker           Type Ref Trc   | B SWT 200 ms V  | /BW 10 MHz  | M1[1]                  |  | - 7<br>7<br>Leocharaeolustop | -0.10 dB<br>100.000 ms<br>42.400 ms<br>42.400 ms<br>42.400 ms<br>400.000 ms/ | Spectrum<br>Ref Lavel -10<br>Att<br>SL T65:VID<br>@1Pk Crw<br>-23 dPn<br>-23 dPn<br>-23 dPn<br>-25 d                                 | 00 dBm                        |                |             |           | MHz                        |          |         |             |          |        |           | -24.83 c<br>0.00000<br>-44.68 | iBm<br>UU s<br>3 dB<br>I ms |
| Ref Level - 10 00 der<br>Att         10 00 der<br>SIL TRG: VID           SIL TRG: VID         10 de           SIL TRG: VID         10 de           -30 de   | B SWT 200 ms V  | 24.93 GBM   | M1[1]                  |  | / /                          | -0.10 dB<br>100.000 ms<br>42.400 ms<br>42.400 ms<br>42.400 ms<br>400.000 ms/ | Spectrum           Ref Lavel -10<br>Att           SL TR3:VID           I'Ik CTW           20 dEn           -20 dEn           -20 dEn           -80 dEn           -90 dEn           -10 cSm           CF 133.9 MHz           Marker   | -50 200                       | 8 <b>SWT</b> 3 | 30 ms       |           | MHz<br>MHz<br>0000700      |          |         |             |          |        |           | -24.83 c                      | iBm<br>UU s<br>3 dB<br>I ms |
| Ref Level - 10 00 dBr           Att         10 d           S3L TR3: VID           91Pk Crw           22 J dBn           -33 dBn           -51 dBn           -50 dBn           -90 dBn           -1JU cbm           CF 433.9 MHz           Marker           Type Ref Trc   | B SWT 200 ms V  | /BW 10 MHz  | M1[1]                  |  | / /                          | -0.10 dB<br>100.000 ms<br>42.400 ms<br>42.400 ms<br>42.400 ms<br>400.000 ms/ | Spectrum<br>Ref Lavel -10<br>Att<br>SL T65:VID<br>@1Pk Crw<br>-23 dPn<br>-23 dPn<br>-23 dPn<br>-25 d                                 | -50 200                       |                | 30 ms       | YBW 10    |                            |          |         |             |          |        | ion Rest  | -24.83 c                      | iBm<br>UU s<br>3 dB<br>I ms |
| Ref Level - 10 00 dBr           Att         10 d           S3L TR3: VID           91Pk C tw           *20 dBn           *33 dBn           *33 dBn           *50 dBn           *50 dBn           *90 dBn           *11 Ut Cbm           CF 433.9 MHz           Marker           Type Ret         Trc           M1 1         11   | B SWT 200 ms V<br>B B SWT 200 ms V<br>D dBm<br>D dBm<br>D dBm<br>Value<br>X-value<br>X-value<br>742.4 ms<br>20.5 ms | 24.93 dbm<br>4.32 dbm<br>4.32 dbm<br>4.32 dbm<br>4.32 dbm<br>4.32 dbm<br>4.32 dbm<br>4.32 dbm | M1[1]                  |  | / /                          | -0.10 dB<br>100.000 ms<br>42.400 ms<br>42.400 ms<br>42.400 ms<br>400.000 ms/ | Spectrum           Ref Lavel -10           Att           SL 165:VID           ●10k C rw           +20 d8n           +30 d8n           +90 d8n           -90 d8n           -10 n5m           GE 133.9 MHz           Marker           Type Ref   | 00 dBm<br>10 dB<br>-50 500 00 | SWT 2          | e           | VBW 10    | MHz<br>MHz<br>1001<br>1001 |          |         |             |          | Γunct  | ion Res   | -24.83 c                      | iBm<br>UU s<br>3 dB<br>I ms |

Figure 5(e): Fundamental Emission Pulsed Operation.

### 4.2.2 Fundamental Emission Bandwidth

**Test Setup & Procedure** The test equipment and facilities were setup in accordance with the standards and procedures listed in Section 2.1. Environmental conditions were set at the appropriate temperature and thermal balance was checked with a thermocouple based probe. Emission bandwidth (EBW) of the EUT is measured with the device placed in the test mode(s) with the shortest available frame length and minimum frame spacing. The 20 dB EBW is measured as the max-held peak-detected signal when the IF bandwidth is greater than or equal to 1% of the receiver span. For complex modulations other than ASK and FSK, the 99% emission bandwidth per IC test procedures has a different result, and is also reported. The test equipment employed includes HP8546A, BILOG3142.

**Measurement Results** The details and results of testing the EUT are summarized in Table 5. Plots showing the measurements made to obtain these values are provided in Figure 6.

| Table 5: Fundamental | Emission | Bandwidth. |
|----------------------|----------|------------|
|----------------------|----------|------------|

|   |            |                  |                 |           | Test Date:       | 18-Dec-18       |
|---|------------|------------------|-----------------|-----------|------------------|-----------------|
|   | Detector   | IF Bandwidth     | Video Bandwidth |           | Test Engineer:   | Joseph Brunett  |
|   | Pk         | 10 kHz           | 30 kHz          |           | EUT:             | Schrader AG5MWD |
|   |            |                  |                 |           | <b>EUT Mode:</b> | Modulated       |
|   |            |                  |                 |           | Meas. Distance:  | 10 cm           |
|   |            |                  |                 |           |                  | FCC/IC          |
|   |            | Center Frequency | 20 dB EBW       | EBW Limit | 99% OBW          |                 |
| # | Modulation | (MHz)            | (MHz)           | (MHz)     | (MHz)            |                 |
| 1 | ASK        | 314.90           | 0.120           | 0.7873    | 0.502            |                 |
| 2 | FSK        | 314.95           | 0.139           | 0.787375  | 0.198            |                 |
| 3 | ASK        | 433.9            | 0.122           | 1.08475   | 0.516            |                 |
| 4 | FSK        | 433.9            | 0.143           | 1.08475   | 0.207            |                 |

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| Spectrum   | 314.9 MH  | Iz - A   | SK  |              |  | Spectrum  | 31 ך  | 4.9 MH         | z - FS  | K  |       |   |  |
|--|---|--|---|--------------|--|---|---|----------------|---|--|-------|---|--|
| RefLevel - 10 00 dBr<br>All 5 d  |   | ₩ 10 kHz   |   |              |  | RefLevel -10 00 dBm   |   |                |   |  |       |   |  |
| ALL 5 U<br>D1Pk Max  | 18 🖷 SWT 30 ms 🖷 VB1  | W SU KH2   | MODE AUTO FFT   |              |  | ALL<br>I I I I I I I I I I I I I I I I I I I  | 5 UB 🔲 🕏  | SWAT 30 ms 🖷 🕅 | SW EU KH2   | MODE ALTC FFT  |       |   |  |
| -  |   |  | D0[1]   |              | -0.01 dC<br>119.900 kHz  |   |   |                |   | D0[1]  |       | 13  | -0.50 dB<br>8.900 kHz                                      |
| -20 UBi i  |   | Μ  | 1 Occ Bw<br>M1[1]   | 582          | .497502497 kHz<br>-26.33 dBm   | -20 dBr i   |   |                | M   | 1 Occ Bw<br>/M1[1]   |       | 197.80219                                     | 7802 kHz<br>5.97 dBm                                       |
| -31 dPm  |   |  | (   |              | 314.948100 MHz   | -31 dPm   |   |                |   |  |       |   | 8100 MHz   |
| -40 dBm  |   | D2   | 1 03  |              |  | -40 dBm   |   |                | т1 🕬  |  |       |   |  |
| -50 dBm  | T.1   | <u>Ā</u> j   |   | T2           |  | -50 dBm   |   |                |   | - <del>X</del>   |       |   |  |
| -pu dino -/ A_A  | h X han   | 9  |   | A. J. A.     | A A.A.A  | -oj dyn   |   | AA             | μ   | 1  | r. mm |   |  |
| -70 dem  |   |  |   |              | - www  | -70 dPm   | m   | ~~~            |   |  |       | how   | m  |
|  |   |  |   |              |  |   |   |                |   |  |       |   |  |
| 80 dBi i   |   |  |   |              |  | 80 dBri   |   |                |   |  |       |   |  |
| -91 dPm  |   |  |   |              |  | -91 dPm   |   |                |   |  |       |   |  |
| -130 c6m   |   |  |   |              |  | -100 c6m  |   |                |   |  |       |   |  |
| CF 314.9401 MHz  |   | 1001   | nts   |              | Span 1.0 MHz   | СГ 314.9401 М   | 112   |                | 1001  | nts  |       | Snan  | 1.0 MHz  |
| Marker   |   | 1001   |   |              | oparraio   | Marker  |   |                |   |  |       | opun  |  |
| Type Ref Trc   | X-value   | Y-value  | Function  | Function F   | Result   | Type Ref T  | inc X   | -value         | Y-value   | Function   | Fur   | iction Result                                 |  |
| ML 1<br>TL 1   | 314.9481 MHz<br>314.696352 MHz  | -26.33 dBi<br>-57.87 dBi   |   | 512          | .497502497 kHz   | M1<br>T1  |   | 314.9481 MHz   | -25.97 dB<br>-49.47 dB  |  |       | 197.80219                                     | 7802 kHz   |
| T2 1   | 015.190049 MHz  | 55.71 dBi  | m   | 022          |  | T2  | 1 019   | 5.005962 MHz   | 40.09 dB  | m  |       | 151100215                                     | TOOL NIL   |
| D2 M1 1  | -58.9 kHz   | -20.04 d   | ie.   |              |  | D2 M1   | 1   | -29.C kHz      | -20.25 (  | iB   |       |   |  |
|  |   |  |   |              |  |   |   | 100 C Mun      | 0.52.4  | In   |       |   |  |
| D3 D2 1  | 119.0 kHz   | -0.01 d  |   |              |  | D3 D2   | 1   | 138.0 kHz      | -0.53 (   | 1B.  |       |   |  |
| D3 D2 1  |   | -0.01 d  | IB.   |              | Ē  | D3 D2   | 1   | 138.5 kHz      |   |  |       |   | Ē  |
|  | 433.9 MH  | -0.01 d  | IB.   |              |  | D3 D2   | ı<br>43 _   | 3.9 MH         |   |  |       |   |  |
| Spectrum<br>Ref Level -10 00 dBi<br>All 5 d  | 433.9 MH  | -0.01 d<br>[Z - A]<br>W 10 kHz   | ßK  |              | (m   | D3 D2<br>Spectrum<br>Ref Level -10<br>All   | 1<br>43   | 3.9 MH         | z - FS  | K  |       |   |  |
| D3 D2 1<br>Spectrum<br>Ref Level -10 00 dB/  | 119.6 kHz<br>433.9 MH   | -0.01 d<br>[Z - A]<br>W 10 kHz   | IB<br>SK<br>Mode Auto FFT   |              | •  | D3 D2<br>Spectrum<br>Ref Level -10  | 1<br>43   | 3.9 MH         | z - FS  | Mode Auto FFT  |       |   |  |
| D3 D2 1<br>Spectrum<br>Ref Level -10 00 dB/<br>All 5 d<br>@1Pk Mex   | 119.6 kHz<br>433.9 MH   | -0.01 d<br>[Z - A]<br>W 10 kHz   | B SK<br>Mode Auto FFT   |              | 0.56 d0<br>121.900 kHz   | D3 D2<br>Spectrum<br>Ref Level -10<br>All<br>• 1Pk Max  | 1<br>43   | 3.9 MH         | z - FS  | Mode Auto FFT  |       |   | 0.05 dB<br>2.900 kHz                                       |
| 03 02 1<br>Spectrum<br>Ref Level -10 00 dB/<br>AtL 5 d<br>01Pk Mex<br>-20 dB/ 1  | 119.6 kHz<br>433.9 MH   | -0.01 d<br>[Z - A]<br>W 10 kHz   | B SK<br>Mode Auto FFT<br>DO[1]  | 516          | 0.56 d0<br>121.900 kHz<br>.483516483 kHz   | D3 D2<br>Spectrum<br>Ref Level -10<br>All<br>• 1Pk Max<br>-23 dPi i   | 1<br>43   | 3.9 MH         | z - FS  | Mode Auto FFT  |       | 206.79320                                     | -0.05 dB<br>2.900 kHz<br>16793 kHz                         |
| D3 D2 1<br>Spectrum<br>Ref Level -10 00 dBA<br>All 5 d<br>@1Pk Mex   | 119.6 kHz<br>433.9 MH   | -0.01 d<br>[Z - A]<br>W 10 kHz   | B SK<br>Mode Auto FFT   |              | 0.56 d0<br>121.900 kHz   | D3 D2<br>Spectrum<br>Ref Level -10<br>All<br>• 1Pk Max  | 1<br>43   | 3.9 MH         | z - FS  | Mode Auto FFT  |       | 206.79320                                     | 0.05 dB<br>2.900 kHz                                       |
| 03 02 1<br>Spectrum<br>Ref Level -10 00 dB/<br>AtL 5 d<br>01Pk Mex<br>-20 dB/ 1  | 119.6 kHz<br>433.9 MH   | -0.01 d<br>Iz - A<br>w 10 kHz<br>w 20 kHz                                    | B<br>B<br>Mode ALLC FFT<br>D3[1]<br>AL<br>ODC BW<br>M1[1]<br>U  |              | 0.56 d0<br>121.900 kHz<br>.483516483 kHz<br>-25.10 dBm                                   | D3 D2<br>Spectrum<br>Ref Level -10<br>All<br>• 1Pk Max<br>-23 dPi i   | 1<br>43   | 3.9 MH         |   | Mode Auto FFT  |       | 206.79320                                     | -0.05 dB<br>2.900 kHz<br>16793 kHz<br>25.38 dBm            |
| D3         D2         1           Spectrum         Ref Level -10 00 dBi         30           Att         S d         91Pk Mex           -20 dBi  | 119.6 kHz<br>433.9 MH   | -0.01 d<br>[Z - A]<br>W 10 kHz   | B SK<br>Mode Auto FFT<br>DO[1]  |              | 0.56 d0<br>121.900 kHz<br>.483516483 kHz<br>-25.10 dBm                                   | D3 D2<br>Spectrum<br>Ref Level -10<br>All<br>1Pk Mex<br>-20 dBi i<br>-31 dPm  | 1<br>43   | 3.9 MH         | z - FS  | Mode Auto FFT  |       | 206.79320                                     | -0.05 dB<br>2.900 kHz<br>16793 kHz<br>25.38 dBm            |
| D3         D2         1           Spectrum         Ref Level - 10 00 dBi         30           Att         5 d         5 d           #1Pk Mex         -23 dBi   | 119.6 kHz<br>433.9 MH   | -0.01 d<br>Iz - A<br>w 10 kHz<br>w 20 kHz                                    | B<br>B<br>Mode ALLC FFT<br>D3[1]<br>AL<br>ODC BW<br>M1[1]<br>U  |              | 0.56 dC<br>121.900 kHz<br>.483516483 kHz<br>-25.10 dBm                                   | D3         D2           Spectrum         Ref Level -10<br>All           ●1Pk Mex         -23 UP: 1           -31 dPn         -43 dPn  | 1<br>43   | 3.9 MH         |   | Mode Auto FFT  |       | 206.79320<br>-2<br>433.95                     | -0.05 dB<br>2.900 kHz<br>16793 kHz<br>5.38 dBm<br>7000 MHz |
| 03         02         1           Spectrum   |   | -0.01 d<br>Iz - A<br>w 10 kHz<br>w 20 kHz                                    | B<br>B<br>Mode ALLC FFT<br>D3[1]<br>AL<br>ODC BW<br>M1[1]<br>U  |              | 0.56 d0<br>121.900 kHz<br>-483516483 kHz<br>-25.10 dBm<br>-25.10 dBm<br>433.9 i 6000 MHz | D3         D2           Spectrum         Ref Level -10           All         91Pk Mex           • 1Pk Mex         -20 UB II           • 31 dPn         -31 dPn           • 50 dBn         -50 dBn   | 1<br>43   | 3.9 MH         |   | Mode Auto FFT  |       | 206.79320                                     | -0.05 dB<br>2.900 kHz<br>16793 kHz<br>5.38 dBm<br>7000 MHz |
| D3 02 1      Spectrum      Ref Level -10 00 dB      Att 5 0      PPk Max  -23 dB  -31 dPn  -53 dBn  -53 dBn  -73 dBn  -75 d |   | -0.01 d  | B<br>B<br>Mode ALLC FFT<br>D3[1]<br>AL<br>ODC BW<br>M1[1]<br>U  |              | 0.56 d0<br>121.900 kHz<br>-483516483 kHz<br>-25.10 dBm<br>-25.10 dBm<br>433.9 i 6000 MHz | D3         D2           Spectrum         Ref Level -10           All         P1Pk Max           -20 UR I  | 1<br>43   | 3.9 MH         |   | Mode Auto FFT  |       | 206.79320<br>-2<br>433.95                     | -0.05 dB<br>2.900 kHz<br>16793 kHz<br>5.38 dBm<br>7000 MHz |
| 03         02         1           Spectrum   |   | -0.01 d  | B<br>B<br>Mode ALLC FFT<br>D3[1]<br>AL<br>ODC BW<br>M1[1]<br>U  |              | 0.56 d0<br>121.900 kHz<br>-483516483 kHz<br>-25.10 dBm<br>-25.10 dBm<br>433.9 i 6000 MHz | D3         D2           Spectrum         Ref Level -10           All         91Pk Mex           • 1Pk Mex         -20 UB II           • 31 dPn         -31 dPn           • 50 dBn         -50 dBn   | 1<br>43   | 3.9 MH         |   | Mode Auto FFT  |       | 206.79320<br>-2<br>433.95                     | -0.05 dB<br>2.900 kHz<br>16793 kHz<br>5.38 dBm<br>7000 MHz |
| D3 02 1      Spectrum      Ref Level -10 00 dB      Pk Mex  -23 JB  -31 dP  -43 dB  -55 dB  -75  |   | -0.01 d  | B<br>B<br>Mode ALLC FFT<br>D3[1]<br>AL<br>ODC BW<br>M1[1]<br>U  |              | 0.56 d0<br>121.900 kHz<br>-483516483 kHz<br>-25.10 dBm<br>-25.10 dBm<br>433.9 i 6000 MHz | D3         D2           Spectrum         Ref Level -10           All         P1Pk Max           -20 UR I  | 1<br>43   | 3.9 MH         |   | Mode Auto FFT  |       | 206.79320<br>-2<br>433.95                     | -0.05 dB<br>2.900 kHz<br>16793 kHz<br>5.38 dBm<br>7000 MHz |
| D3 02 1      Spectrum     Ref Level -10 00 dB     All     5 u      PPk Max -23 uB  |   | -0.01 d  | B<br>B<br>Mode ALLC FFT<br>D3[1]<br>AL<br>ODC BW<br>M1[1]<br>U  |              | 0.56 d0<br>121.900 kHz<br>-483516483 kHz<br>-25.10 dBm<br>-25.10 dBm<br>433.9 i 6000 MHz | D3         D2           Spectrum         Ref Lavel - 10           Ref Lavel - 10         All           ● IPk Mex         -23 d2n           -33 d2n         -33 d2n           -53 d2n         -73 d2n           83 J2i i         -83 J2i i   | 1<br>43   | 3.9 MH         |   | Mode Auto FFT  |       | 206.79320<br>-2<br>433.95                     | -0.05 dB<br>2.900 kHz<br>16793 kHz<br>5.38 dBm<br>7000 MHz |
| D3         D2         1           Spectrum         Ref Level - 10 00 dBi         5 u           MI         5 u         5 u           19k Max         5 u         5 u           -23 UBi I  |   | -0.01 d  | B B B B B B B B B B B B B B B B B B B   |              | 0.56 d0<br>121.900 kHz<br>-483516483 kHz<br>-25.10 dBm<br>-25.10 dBm<br>+33.9 i 6000 MHz | D3         D2           Spectrum         Ref Lavel - 10           Ref Lavel - 10         All           -20 JB:  | 1 43<br>00 dBm<br>5 dB • 1  | 3.9 MH         |   | Mode Auto FFT  |       | 206.79320<br>-2<br>433.95                     | -0.05 dB<br>2.900 kHz<br>16793 kHz<br>5.38 dBm<br>7000 MHz |
| 03         02         1           Spectrum         Ref Level - 10 00 dB.         3           Main         5 ui         5           -23 uBi i   |   | -0.31 d<br>IZ - A<br>W 10 HHz<br>W 20 HHz                                    | BI DO[1]  | . A. TE A. A | 0.55 d0<br>121.900 kHz<br>-25.10 dBm<br>+23.10 dBm<br>+43.9 I 6000 MHz<br>               | D3         D2           Spectrum         Ref Lavel - 10           All         -20           #1Pk Max         -20           -20         20           -31         dPn           -43         dPn           -53         dPn           -75         dPn           -75         dPn           -91         dPn           -130         c6m           CF         433.907 Mill           Marker                   | 1 43<br>00 dbm<br>5 uB • s  | 3.9 MH         | z - FS  | Made Auto FPT  |       | 206.79370<br>-2<br>433.95                     | 0.05 dB<br>2.900 KHz<br>16793 KHz<br>5.38 dBm<br>7000 MHz  |
| 03         02         1           Spectrum         Ref Level - 10 00 dBi         50           Marker         50         61 Pk Max           -20 dBi  | 110.0 KH2<br>433.9 MH<br>m R84<br>B SWT 30 m5 VB1<br>T1<br>T1<br>T1<br>T1<br>T1<br>T1<br>T1<br>T1<br>T1<br>T  | -0.01 d<br>IZ - A<br>W 10 kHz<br>W 20 kHz                                    | B. DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1] |              | 0.55 d0<br>121.900 kHz<br>-25.10 dBm<br>+23.10 dBm<br>+43.9 I 6000 MHz<br>               | D3         D2           Spectrum         Ref Level -10           All         -20           -20         B1Pk Max           -20         B2           -31         APn           -43         A2n           -53         APn           -53         APn           -73         APn           -90         APn           -100         c6m           CT         433.907 Mil           Marker         Type Jeef T | 1<br>43<br>00 dBm<br>5 uB • s<br>5 uB • s<br>10<br>11<br>12<br>12<br>12 | 3.9 MH         | z - FS  | Mode Auto FFT DO[1] DO[1] DO[1] DO[2] DO[2 | Fur   | 206.79320<br>-2<br>433.95                     | 0.05 dB<br>2.900 KHz<br>16793 KHz<br>5.38 dBm<br>7000 MHz  |
| 03         02         1           Spectrum   | 110.6 KH2<br>433.9 MH<br>m RB4<br>B SWT 30 ms VBV<br>T1<br>T1<br>T1<br>T1<br>T1<br>T1<br>T1<br>T1<br>T1<br>T1 | -0.31 d<br>IZ - A<br>W 10 kHz<br>W 20 kHz<br>1001<br>Y-velue<br>-25.16 db    | BI DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1] | Function F   | 0.55 d0<br>121.900 kHz<br>-25.10 dBm<br>+23.10 dBm<br>+43.9 I 6000 MHz<br>               | D3         D2           Spectrum         Ref Level -10           All         -23 dB1  | 1<br>43<br>00 dBm<br>5 uB • s<br>5 uB • s<br>1<br>1<br>433<br>1<br>433  | 3.9 MH         | z - FS<br>W 10 kHz<br>W 20 kHz<br>A<br>A<br>A<br>A<br>A<br>A<br>A<br>A<br>A<br>A<br>A<br>A<br>A | Mode Auto FFT DO[1] DO[1] DO[1] DO[2] DO[2 | Fur   | 206.79370<br>-2<br>433.95                     | 0.05 dB<br>2.900 kHz<br>16793 kHz<br>15.38 dBm<br>7000 MHz |
| 03         02         1           Spectrum           Ref Level - 10         00         dB           Max         5         0           •1Pk Max         5         0           •23         dB         -           -43         dB         -           -53         dB         -           -53         dB         -           -53         dB         -           -73         dB         -           93         dB         -           -100         c6         -           Marker         -         -           Marker         -         1   | 110.0 KH2   | -0.31 d<br>IZ - A<br>W 10 HH2<br>W 20 HH2<br>028<br>029<br>1001<br>-25.10 db | BI DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1]<br>DO[1] | Function F   | 0.55 d0<br>121.900 kHz<br>-25.10 dBm<br>+25.10 dBm<br>+43.916000 MHz<br>                 | D3         D2           Spectrum         Ref Level - 10           All         -23 d81           -23 d81         -           -31 d87         -           -43 d87         -           -53 d87         -           -83 d81         -           -91 d87         -           -100 c6m         -           Cf 430.907 MI         Marker           Type   ed   T         Marker                              | 1<br>43<br>00 dBm<br>5 uB • s<br>5 uB • s<br>1<br>1<br>433<br>1<br>433  | 3.9 MH         | z - FS<br>W 10 kHz<br>W 20 kHz<br>A<br>A<br>A<br>A<br>A<br>A<br>A<br>A<br>A<br>A<br>A<br>A<br>A | Made Aute FFT DO[1] DO[1 | Fur   | 206.79320<br>433.95<br>433.95<br>5pon<br>spon | 0.05 dB<br>2.900 kHz<br>16793 kHz<br>15.38 dBm<br>7000 MHz |

Figure 6: Fundamental Emission Bandwidth.

### 4.2.3 Fundamental Emission Field Strength

**Test Setup & Procedure** The test equipment and facilities were setup in accordance with the standards and procedures listed in Section 2.1. Environmental conditions were set at the appropriate temperature and thermal balance was checked with a thermocouple based probe. Fundamental emissions are measured at the regulatory distance on our OATS. The test equipment employed includes HP8546A, BILOG3142.

Measurement Results The details and results of testing the EUT are summarized in Table 6.

Table 6: Fundamental Emission Field Strength.

|   | <b>Frequency</b><br>25 MHz f | y <b>Range</b><br>1 000 MHz |      | <b>Det</b><br>Pk/QPk | <b>IF Bandwi</b><br>120 kHz |      |      | Video Band<br>300 kH: |          |                  | Test Date:<br>Test Engineer: | Test Date:22-Dec-18est Engineer:J. Brunett |               |
|---|------------------------------|-----------------------------|------|----------------------|-----------------------------|------|------|-----------------------|----------|------------------|------------------------------|--|---------------|
|   | f > 1 000                    | ) MHz                       |      | Pk                   | 1 MHz                       |      |      | 3 MHz                 |          |                  | EUT:                         | Sc   | hrader AG5MWD |
|   | f > 1 000                    | ) MHz                       |      | Avg                  | 1 MHz                       |      |      | 10 kHz                |          |                  | EUT Mode:                    |  | CW            |
|   |                              |                             |      |                      |                             |      |      |                       |          |                  | Meas. Distance:              |  | 3 meters      |
|   |                              |                             |      |                      |                             |      |      |                       |          |                  |                              |  | FCC/IC        |
|   | Freq.                        | Ant.                        | Ant. | Table Azim.          | Ant Height                  | Ka   | Kg   | E3(Pk)**              | E3(Avg)* | FCC/IC E3(Pk)    | FCC/IC E3(Avg)               | Pass                                       |               |
| # | MHz                          | Used                        | Pol. | deg                  | m                           | dB/m | dB   | dBµV/m                | dBµV/m   | Lim. $dB\mu V/m$ | Lim. $dB\mu V/m$             | dB   | Comments      |
| 1 | 314.9                        | LOGEMCO01                   | Н    | .0                   | 1.0                         | 14.1 | -1.2 | 70.4                  | 60.6     | 87.7             | 67.7                         | 7.1  | end           |
| 2 | 314.9                        | LOGEMCO01                   | V    | .0                   | 1.4                         | 14.1 | -1.2 | 67.9                  | 58.1     | 87.7             | 67.7                         | 9.6  | side          |
| 3 | 433.9                        | LOGEMCO01                   | Н    | 80.0                 | 1.0                         | 16.3 | -1.5 | 73.8                  | 64.3     | 92.9             | 72.9                         | 8.6  | end           |
| 4 | 433.9                        | LOGEMCO01                   | V    | .0                   | 1.4                         | 16.3 | -1.5 | 73.3                  | 63.8     | 92.9             | 72.9                         | 9.1  | side          |

\*Avg data computed from Peak Measured Data and EUT Duty Cycle. EUT in CW mode.

\*\* Worst case emissions from both variants of housing.

### 4.3 Unintentional Emissions

### 4.3.1 Transmit Chain Spurious Emissions

**Test Setup & Procedure** The test equipment and facilities were setup in accordance with the standards and procedures listed in Section 2.1. Environmental conditions were set at the appropriate temperature and thermal balance was checked with a thermocouple based probe. Spurious radiated emissions measurements are performed to 10 times the highest fundamental operating frequency. The test equipment employed includes HP8546A, BILOG3142, RH3115.

Measurement Results The details and results of testing the EUT are summarized in Table 7.

|    | Free   | quency Range |      | Det         |            | IF Ban | dwidth | Video Ba | ndwidth |                   | 1                  | Test Date: | 22-Dec-18       |
|----|--|--------------|------|-------------|------------|--------|--------|----------|---------|-------------------|--------------------|------------|-----------------|
|    | 25 MHz                                       | f 1 000 MHz  |      | Pk/QPk      |            | 120    | kHz    | 300      | kHz     |                   | Test               | Engineer:  | J. Brunett      |
|    | f >  | 1 000 MHz    |      | Pk          |            | 1 N    | 1Hz    | 3 M      | Hz      |                   |                    | EUT:       | Schrader AG5MWD |
|    | f >  | 1 000 MHz    |      | Avg         |            | 1 N    | 1Hz    | 10k      | Hz      |                   | EU                 | JT Mode:   | CW              |
|    |  |              |      |             |            |        |        |          |         |                   | Meas.              | Distance:  | 3 meters        |
|    | Transmitter Unintentional Spurious Emissions |              |      |             |            |        |        |          | FCC/IC  |                   |                    |            |                 |
|    | Freq.  | Ant.         | Ant. | Table Azim. | Ant Height | Ka     | Kg     | E3(Pk)** | E3(Avg) | FCC/IC E3lim (Pk) | FCC/IC E3lim (Avg) | Pass       |                 |
| #  | MHz  | Used         | Pol. | deg         | m          | dB/m   | dB     | dBµV/m   | dBµV/m  | dBµV/m            | dBµV/m             | dB         | Comments        |
| 1  | 630.0  | LOGEMCO01    | Н    | .0          | 1.00       | 19.5   | -2.1   | 42.3     | 32.5    | 74.0              | 54.0               | 21.5       | flat            |
| 2  | 630.0  | LOGEMCO01    | V    | .0          | 1.30       | 19.5   | -5.7   | 40.2     | 30.4    | 74.0              | 54.0               | 23.6       | flat            |
| 3  | 945.0  | LOGEMCO01    | Н    | .0          | 1.10       | 23.2   | -3.0   | 38.2     | 28.4    | 74.0              | 54.0               | 25.6       | max all         |
| 4  | 945.0  | LOGEMCO01    | V    | .0          | 1.50       | 23.2   | -7.2   | 40.0     | 30.2    | 74.0              | 54.0               | 23.8       | flat            |
| 5  | 1260.0                                       | HQR1TO18S01  | H/V  | max all     | 1.50       | 32.8   | -3.5   | 41.7     | 31.9    | 74.0              | 54.0               | 22.1       | max all         |
| 6  | 1575.0                                       | HQR1TO18S01  | H/V  | max all     | 1.50       | 30.9   | -4.0   | 41.4     | 31.6    | 74.0              | 54.0               | 22.4       | max all         |
| 7  | 1890.0                                       | HQR1TO18S01  | H/V  | max all     | 1.50       | 30.0   | -4.4   | 49.8     | 40.0    | 74.0              | 54.0               | 14.0       | max all         |
| 8  | 2205.0                                       | HQR1TO18S01  | H/V  | max all     | 1.50       | 29.8   | -4.8   | 45.7     | 35.9    | 74.0              | 54.0               | 18.1       | max all         |
| 9  | 2520.0                                       | HQR1TO18S01  | H/V  | max all     | 1.50       | 30.0   | -5.2   | 54.4     | 44.6    | 74.0              | 54.0               | 9.4        | max all         |
| 10 | 2835.0                                       | HQR1TO18S01  | H/V  | max all     | 1.50       | 30.4   | -5.5   | 51.5     | 41.7    | 74.0              | 54.0               | 12.3       | max all         |
| 11 | 3150.0                                       | HQR1TO18S01  | H/V  | max all     | 1.50       | 30.8   | -5.8   | 52.5     | 42.7    | 74.0              | 54.0               | 11.3       | max all         |
| 12 |  |              |      |             |            |        |        |          |         |                   |                    |            |                 |
| 13 | 867.8  | LOGEMCO01    | Н    | 80.0        | 1.00       | 22.2   | -2.8   | 44.5     | 35.0    | 74.0              | 54.0               | 19.0       | end             |
| 14 | 867.8  | LOGEMCO01    | V    | .0          | 1.40       | 22.2   | -6.9   | 42.5     | 33.0    | 74.0              | 54.0               | 21.0       | flat            |
| 15 | 1301.8                                       | HQR1TO18S01  | H/V  | max all     | 1.50       | 32.4   | -3.5   | 42.3     | 32.8    | 74.0              | 54.0               | 21.2       | max all         |
| 16 | 1735.7                                       | HQR1TO18S01  | H/V  | max all     | 1.50       | 30.4   | -4.2   | 44.0     | 34.5    | 74.0              | 54.0               | 19.5       | max all         |
| 17 | 2169.6                                       | HQR1TO18S01  | H/V  | max all     | 1.50       | 29.8   | -4.8   | 42.2     | 32.7    | 74.0              | 54.0               | 21.3       | max all         |
| 18 | 2603.5                                       | HQR1TO18S01  | H/V  | max all     | 1.50       | 30.1   | -5.3   | 55.8     | 46.3    | 74.0              | 54.0               | 7.7        | max all         |
| 19 | 3037.4                                       | HQR1TO18S01  | H/V  | max all     | 1.50       | 30.7   | -5.7   | 48.1     | 38.6    | 74.0              | 54.0               | 15.4       | max all         |
| 20 | 3471.4                                       | HQR1TO18S01  | H/V  | max all     | 1.50       | 31.3   | -6.1   | 46.2     | 36.7    | 74.0              | 54.0               | 17.3       | max all         |
| 21 | 3905.3                                       | HQR1TO18S01  | H/V  | max all     | 1.50       | 31.8   | -6.4   | 42.9     | 33.4    | 74.0              | 54.0               | 20.6       | max all, noise  |
| 22 | 4339.2                                       | HQR1TO18S01  | H/V  | max all     | 1.50       | 32.1   | -6.7   | 43.6     | 34.1    | 74.0              | 54.0               | 19.9       | max all, noise  |
| 23 |  |              |      |             |            |        |        |          |         |                   |                    |            |                 |

### Table 7: Transmit Chain Spurious Emissions.

\*Avg data computed from Peak Measured Data and EUT Duty Cycle. EUT in CW mode.

\*\* Worst case emissions from both variants of housing.

### 5 Measurement Uncertainty and Accreditation Documents

The maximum values of measurement uncertainty for the laboratory test equipment and facilities associated with each test are given in the table below. This uncertainty is computed for a 95.45% confidence level based on a coverage factor of k = 2.

Table 8: Measurement Uncertainty.

| ${\bf Measurement} ~ {\bf Uncertainty}^{\dagger}$                |
|--|
| $\pm (f_{Mkr}/10^7 + RBW/10 + (SPN/(PTS - 1))/2 + 1 \text{ Hz})$ |
| $\pm 1.9\mathrm{dB}$   |
| $\pm 4.0\mathrm{dB}$   |
| $\pm 5.2\mathrm{dB}$   |
| $\pm 3.7\mathrm{dB}$   |
|  |

<sup>†</sup>Ref: CISPR 16-4-2:2011+A1:2014

| United States Department of Commerce<br>National Institute of Standards and Technology   | FEDERAL COMMUNICATIONS COMMISSION<br>Laboratory Division<br>7435 Oaktand Millis Read<br>Columbia, MD 21046<br>July 06, 2018   |
|--|---|
| Certificate of Accreditation to ISO/IEC 17025:2005   | National Voluntary Laboratory Accreditation Program<br>100 Brenan Diro<br>Gaithersburg, MD 20899-2140   |
| NVLAP LAB CODE: 200129-0<br>AHD (Amber Helm Development, L.C.)<br>Sister Lakes, MI   | Attention:     Timothy Rasinski       Re:     Accreditation of AHD (Amber Helm Development, L.C.)       Designation     Designation of AS9064   |
| is eccretited by the National Voluntary Laboratory Accreditation Program for specific services,<br>Island on the Scope 3 Accreditation, for.<br><b>Electromagnetic Compatibility &amp; Telecommunications</b><br>This islowatory is accredited in accrediance with her recognized internations' Standard 150/REC 17025.2005.<br>This accreditation domination technical completence for defined access and the operation of a biotrary guilty<br>management system (refer to joint ISC-LAC-LAF Communicate adult January 2009).<br>20:8-07-02 (corrupt 2019-06-10<br>Planets Takes | Dear Sir or Madam:<br>We have been notified by National Voluntary Laboratory Accreditation Program that AHD (Amber Helm<br>Development, L.C.) has been accredited as a testing laboratory.<br>At this time AHD (Amber Helm Development, L.C.) is breeby recognized to perform compliance testing on<br>equipment subject to Declaration Of Conformity (DOC) and Certification of the Commission's Rules.<br>This recognition will expire upon expiration of the accreditation or notification of withdrawal of recognition<br>Ary queations about this recognition should be submitted as an inquiry to the FCC Knowledge Database at<br>www.icc.gov/adb.<br>Sincerely, |
|  | George Tannahill<br>Electronics Engineer  |



Figure 7: Accreditation Documents