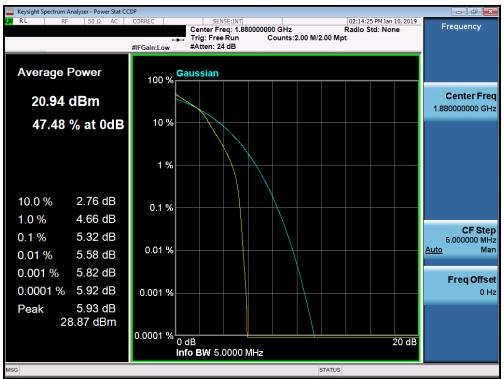


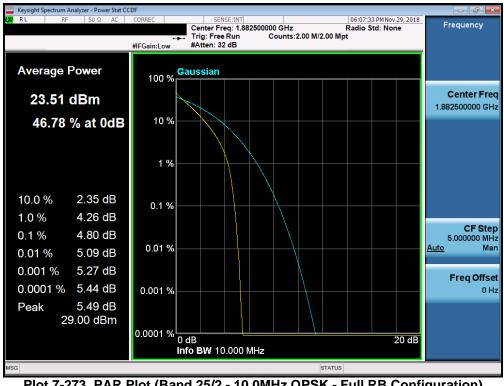
Plot 7-271. PAR Plot (Band 25/2 - 5.0MHz 16-QAM - Full RB Configuration)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dage 160 of 245 |
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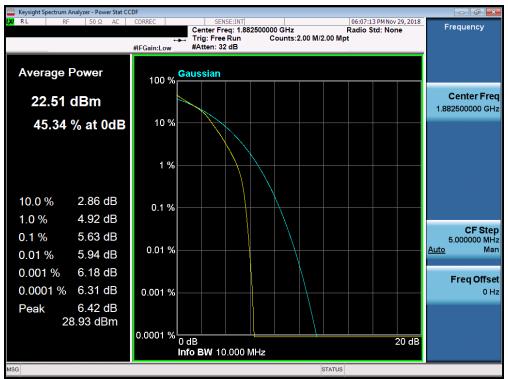
Plot 7-272. PAR Plot (Band 25/2 - 5.0MHz 64-QAM - Full RB Configuration)



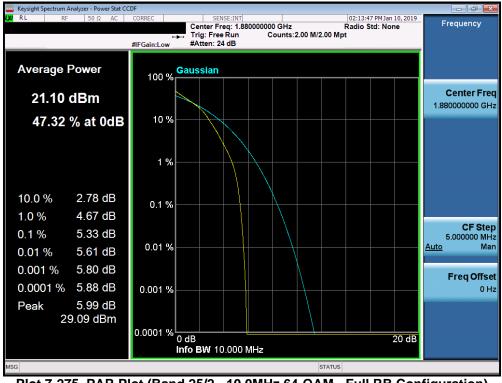
Plot 7-273. PAR Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Dage 161 of 245 |
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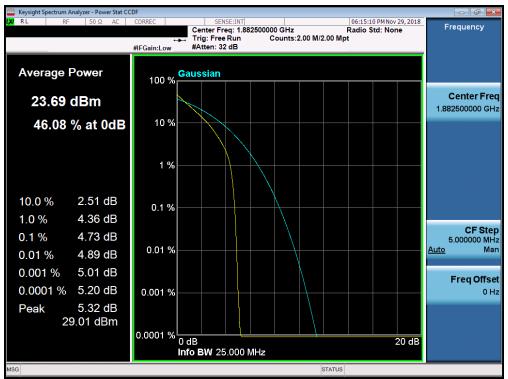


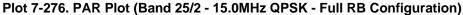


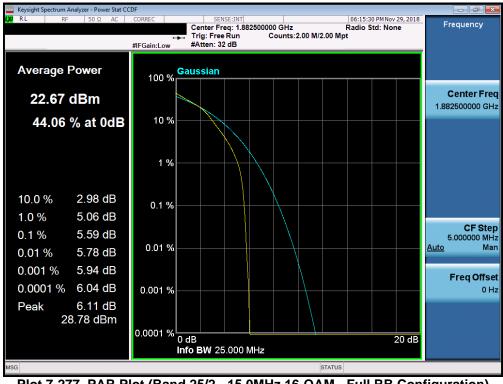
Plot 7-275. PAR Plot (Band 25/2 - 10.0MHz 64-QAM - Full RB Configuration)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dogo 162 of 245 |
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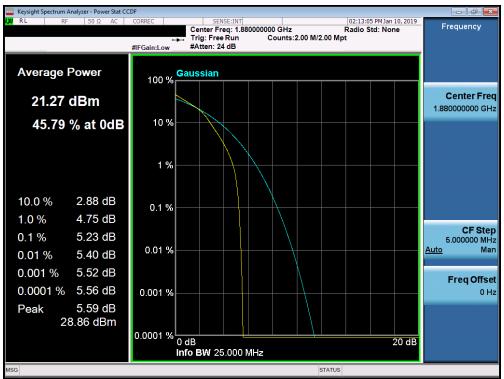




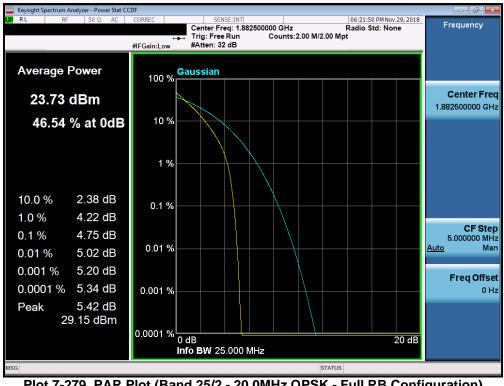
Plot 7-277. PAR Plot (Band 25/2 - 15.0MHz 16-QAM - Full RB Configuration)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dogo 162 of 245 |
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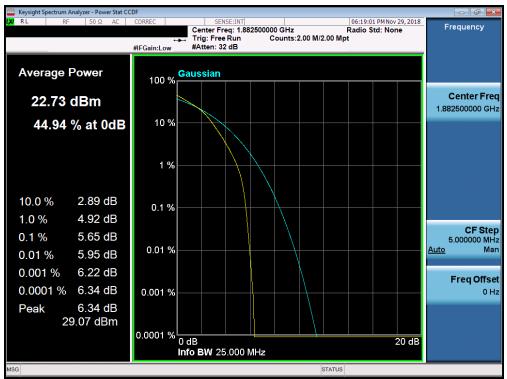




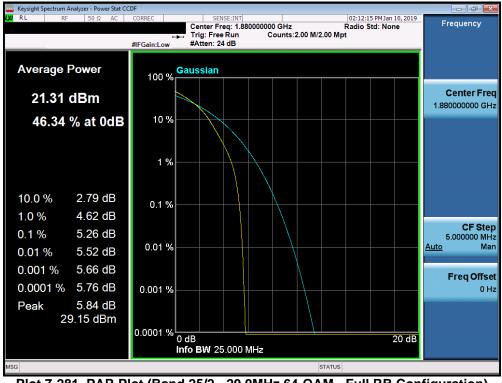
Plot 7-279. PAR Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Dogo 164 of 245 |
| 1M1811230205-03-R1.ZNF | 11/19/2018 - 1/17/2019 | Portable Handset | | Page 164 of 245 |
| © 2019 PCTEST Engineering Labora | V 8.8 11/19/2018 | | | |









Plot 7-281. PAR Plot (Band 25/2 - 20.0MHz 64-QAM - Full RB Configuration)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dage 165 of 245 |
| 1M1811230205-03-R1.ZNF | 11/19/2018 - 1/17/2019 | Portable Handset | Page 165 of 245 |
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7.6 Additional Maximum Power Reduction (A-MPR) §2.1046

Test Overview

A-MPR is implemented in this device when operating at Power Class 2 in LTE Band 41 per the A-MPR specification in 3GPP TS 36.101. The conducted powers are shown herein to cover the different A-MPR levels specified in the standard. Measurement equipment was set up with triggering/gating on the spectrum analyzer such that powers were measured only during the on-time of the signal.

Test Procedure Used

KDB 971168 D01 v03r01 - Section 5.2.2

Test Settings

- 1. Span = $2 \times OBW$ to $3 \times OBW$
- 2. RBW = 1% to 5% of the OBW
- 3. Number of measurement points in sweep $\geq 2 \times \text{span} / \text{RBW}$
- 4. Sweep = auto-couple (less than transmission burst duration)
- 5. Detector = RMS (power)
- 6. Trigger was set to enable power measurements only on full power bursts
- 7. Trace was allowed to stabilize
- 8. Spectrum analyzer's "Channel Power" function was used to compute the power by integrating the spectrum across the OBW of the signal

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



Figure 7-5. Test Instrument & Measurement Setup

Test Notes

None.

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | G | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|---|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Dage 166 of 245 |
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| Test Case | NS | MCC | MNC | Channel BW [MHz] | Channel Number | Channel Frequency [MHz] | Modulation | RB Size | RB Offset | MPR [dB] | A-MPR [dB] | Measured Power [dBm] | | |
|--------------|----|-----|-------|------------------|----------------|-------------------------------|------------------|----------------|--------------|-------------|---------------|----------------------------|-------|-------|
| | | | | _ | | | QPSK | | _ | 0 | | 23.79 | | |
| 1 | | | | 5 | 39675 | 2498.5 | 16-QAM 64-QAM | 1 | 0 | ≤ 1 ≤ 2 | ≤3 | 23.03 | | |
| | | | | | | | QPSK | | | <u> </u> | | 21.69 26.80 | | |
| 2 | | | | 5 | 39675 | 2498.5 | 16-QAM | 1 | 9 | ≤ 1 | 0 | 26.09 | | |
| | | | | | | | | 64-QAM | | | ≤ 2 | | 24.76 | |
| | | | | | | | QPSK | 1 | 0 | 0 | | 26.68 | | |
| 3 | | | | 10 | 39700 | 2501 | 16-QAM 64-QAM | <u>1</u> 1 | 0 | ≤ 1 ≤ 2 | ≤ 5 | 26.00 25.30 | | |
| | | | | | | | QPSK | 20 | 0 | <u>≥</u> ∠0 | | 23.30 | | |
| 4 | | | | 10 | 39700 | 2501 | 16-QAM | 20 | 0 | ≤ 1 | ≤2 | 23.12 | | |
| | | | | | | | 64-QAM | 20 | 0 | ≤ 2 | | 22.02 | | |
| | | | | | | | QPSK | 50 | 0 | 0 | | 23.00 | | |
| 5 | | | | 10 | 39700 | 2501 | 16-QAM | 50 | 0 | ≤1 | ≤3 | 22.05 | | |
| | | | | | | | 64-QAM QPSK | 50 25 | 0 20 | ≤ 2 0 | | 20.92 24.88 | | |
| 6 | | | | 10 | 39700 | 2501 | 16-QAM | 25 | 20 | ≤ 1 | ≤ 1 | 23.90 | | |
| | | | | | | | 64-QAM | 25 | 20 | ≤ 2 | | 22.86 | | |
| | | | | | | | QPSK | 1 | 36 | 0 | | 26.64 | | |
| 7 | | | | 10 | 39700 | 2501 | 16-QAM | 1 | 36 | ≤ 1 | 0 | 26.04 | | |
| | | | | | | | 64-QAM QPSK | 1 | 36 0 | ≤ 2 | | 25.24 26.73 | | |
| 8 | | | | 15 | 39725 | 2503.5 | 16-QAM | 1 1 | 0 | 0 ≤ 1 | ≤ 5 | 26.73 | | |
| Ŭ | | | | 10 | 00120 | 2000.0 | 64-QAM | 1 | 0 | ≤2 | | 25.38 | | |
| | | | | | | | QPSK | 20 | 0 | 0 | ≤2 | 24.05 | | |
| 9 | 01 | 310 | 120 | 15 | 39725 | 2503.5 | 16-QAM | 20 | 0 | ≤ 1 | | 23.00 | | |
| | | | | | | | 64-QAM QPSK | 20 75 | 0 | ≤ 2 0 | | 21.99 22.23 | | |
| 10 | | | | | 15 | 15 | 15 39725 | 2503.5 | 16-QAM | 75 | 0 | 0 ≤ 1 | ≤ 4 | 22.23 |
| | | | | | | 00720 | | 2000.0 | 64-QAM | 75 | 0 | ≤ 2 | 1 - | 20.08 |
| | | | | | | | QPSK | 50 | 15 | 0 | | 22.76 | | |
| 11 | | | | 15 | 39725 | 2503.5 | 16-QAM | 50 | 15 | ≤ 1 | ≤3 | 21.90 | | |
| | | | | | | | 64-QAM QPSK | <u>50</u> 1 | 15 60 | ≤ 2 0 | | 20.98 26.88 | | |
| 12 | | | | 15 | 39725 | 2503.5 | 16-QAM | 1 | 60 | 0 ≤ 1 | 0 | 26.30 | | |
| | | | | | 00120 | 2000.0 | 64-QAM | 1 | 60 | ≤ 2 | Ĩ | 25.42 | | |
| | | | | | | | QPSK | 1 | 0 | 0 | | 26.65 | | |
| 13 | | | | 20 | 39750 | 2506 | 16-QAM | 1 | 0 | ≤ 1 | ≤ 5 | 26.21 | | |
| | | | | | | | 64-QAM QPSK | 1 20 | 0 | ≤ 2 0 | | 24.68 24.29 | | |
| 14 | | | | 20 | 39750 | 2506 | 16-QAM | 20 | 0 | 0 ≤ 1 | ≤ 2 | 24.29 | | |
| | | | | | 00100 | 2000 | 64-QAM | 20 | 0 | ≤ 2 | 1 | 22.45 | | |
| | | | | | | | QPSK | 100 | 0 | 0 | | 22.16 | | |
| 15 | | | | 20 | 39750 | 2506 | 16-QAM | 100 | 0 | ≤ 1 | ≤ 4 | 21.11 | | |
| | | | | | | | 64-QAM QPSK | 100 | 0 | ≤ 2 | | 20.10 | | |
| 16 | | | | 20 | 39750 | 2506 | 16-QAM | 75 75 | 24 24 | 0 ≤ 1 | ≤3 | 23.15 22.02 | | |
| | | | | | 22700 | | 64-QAM | 75 | 24 | ≤ 2 | 1 | 20.88 | | |
| | | | | | | | QPSK | 1 | 77 | 0 | | 26.88 | | |
| 17 | | | | 20 | 39750 | 2506 | 16-QAM | 1 | 77 | ≤ 1 | 0 | 26.22 | | |
| | | | | | | | 64-QAM | 1 | 77 | ≤ 2 | | 24.75 | | |
| 18 | 01 | 312 | 530 | 5 | 39675 | 2498.5 | QPSK 16-QAM | 1 | 0 | 0 ≤ 1 | < 2 2 | 23.81 23.1 | | |
| 10 | 01 | 512 | - 330 | 5 | 39013 | 2430.0 | 64-QAM | I | 0 | ≤ 1 ≤ 2 | ≤3 | 23.1 | | |
| | | | | | | | QPSK | | | 0 | | 26.65 | | |
| 19 | 01 | 001 | 01 | 5 | 39675 | 2498.5 | 16-QAM | 1 | 0 | ≤ 1 | 0 | 25.94 | | |
| | | | | | | | 64-QAM | | | ≤ 2 |] | 24.7 | | |

Table 7-3. A-MPR Conducted Power Measurements

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | | Approved by: Quality Manager | |
|----------------------------------|------------------------|---------------------------------------|--|---------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | | Dage 167 of 045 | |
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7.7 Uplink Carrier Aggregation §27.53(m)

Test Overview

The EUT is set up to transmit two contiguous LTE channels. The power level of both carriers and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

For Band 38/41, the minimum permissible attenuation level of any spurious emission is 55 + log₁₀(P_[Watts]).

Test Procedure Used

KDB 971168 D01 v03r01 - Section 6.0

Test Settings

- 1. Start frequency was set to 30MHz and stop frequency was set to at least 10 * the fundamental frequency (separated into at least two plots per channel)
- 2. Detector = RMS
- 3. Trace mode = trace average for continuous emissions, max hold for pulse emissions
- 4. Sweep time = auto couple
- 5. The trace was allowed to stabilize
- 6. Please see test notes below for RBW and VBW settings

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



Figure 7-6. Test Instrument & Measurement Setup

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dogo 168 of 245 |
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- 1. Uplink carrier aggregation is only supported in this EUT while operating in Power Class 3.
- 2. Conducted power and spurious emissions measurements were evaluated for the two contiguous channels using various combinations of RB size, RB offset, modulation, and channel bandwidth. Channel bandwidth data is shown in the tables below based only on the channel bandwidths that were supported in this device. The worst case (highest) powers were found while operating with QPSK modulation, as shown in Table 7-503 and 7-504 below, with both carriers set to transmit using 1RB.
- 3. Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for frequencies less than 1 GHz and 1 MHz or greater for frequencies greater than 1 GHz. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

| | | | | PCC | | | | | | | SCC | | | | Power |
|-------------|----------|---------------------------|---------------------|--------------------------------|------------|---------------|---------------------|----------|---------------------------|---------------------|--------------------------------|------------|---------------|---------------------|---------------------------|
| Power State | PCC Band | PCC Bandwidth [MHz] | PCC (UL) Channel | PCC (UL) Frequency [MHz] | Modulation | PCC UL# RB | PCC UL RB Offset | SCC Band | SCC Bandwidth [MHz] | SCC (UL) Channel | SCC (UL) Frequency [MHz] | Modulation | SCC UL# RB | SCC UL RB Offset | ULCA Tx.Power (dBm) |
| Max | LTE B41 | 20 | 39750 | 2506 | QPSK | 1 | 0 | LTE B41 | 20 | 39948 | 2525.8 | QPSK | 1 | 0 | 18.00 |
| Max | LTE B41 | 20 | 39750 | 2506 | QPSK | 1 | 99 | LTE B41 | 20 | 39948 | 2525.8 | QPSK | 1 | 99 | 14.17 |
| Max | LTE B41 | 20 | 39750 | 2506 | QPSK | 1 | 0 | LTE B41 | 20 | 39948 | 2525.8 | QPSK | 1 | 99 | 10.66 |
| Max | LTE B41 | 20 | 39750 | 2506 | QPSK | 1 | 50 | LTE B41 | 20 | 39948 | 2525.8 | QPSK | 1 | 50 | 19.59 |
| Max | LTE B41 | 20 | 39750 | 2506 | QPSK | 1 | 99 | LTE B41 | 20 | 39948 | 2525.8 | QPSK | 1 | 0 | 24.42 |
| Max | LTE B41 | 20 | 39750 | 2506 | QPSK | 100 | 0 | LTE B41 | 20 | 39948 | 2525.8 | QPSK | 100 | 0 | 21.26 |
| Max | LTE B41 | 20 | 39750 | 2506 | 16-QAM | 100 | 0 | LTE B41 | 20 | 39948 | 2525.8 | 16-QAM | 100 | 0 | 20.11 |
| Max | LTE B41 | 20 | 39750 | 2506 | 64-QAM | 100 | 0 | LTE B41 | 20 | 39948 | 2525.8 | 64-QAM | 100 | 0 | 19.02 |

Table 7-4. Conducted Powers (B41 with Various Combinations for 20MHz Channel Bandwidth)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | | | | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|--|-----------------|--|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Dage 160 of 045 | | |
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| | ctrum Analyze | | | | | | | | | | |
|------------------------|---------------|---------|---------------------------|-------------------------|------------------------|--------------------|--------------|-----------------------|--|----------------------|-----------------------------|
| XI RL | RF | 50 Ω AC | CORREC | | ISE:INT | #Avg Typ | e:RMS | TRA | M Jan 10, 2019 CE 1 2 3 4 5 6 PE M WWWWW | Fred | uency |
| 10 dB/div | Gate: LO | 00 dBm | PNO: Fast 🕞 IFGain:Low | Trig: Free Atten: 30 | | | M | □ Ikr1 2.46 | ET A NNNNN | A | uto Tun |
| | | | | | | | | | | | nter Fre 00000 G⊦ |
| -10.0 | | | | | | | | | | | Start Fre |
| -20.0 | | | | | | | | | DL1 -25.00 dBm | | Stop Fre 00000 Gi |
| 40.0 | | | | و المراجع المراجع الم | وروا المراجعة والمراجع | بالروح ومد فند الد | و بر بار الم | وروافا وروار والمراور | hand the filter | 246.6 <u>Auto</u> | CF Ste 00000 M M |
| -50.0 -60.0 | | | | | and the state from | | | | | Fr | eq Offs 0 I |
| -70.0 | | | | | | | | | | | cale Typ |
| Start 0.030 #Res BW | | | #VBW | 3.0 MHz | | | Sweep | Stop 2 1.000 ms | 2.496 GHz (4933 pts) | LUG | L |
| ISG | | | | | | | STAT | US | | | |

Table 7-282. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Mid Channel)

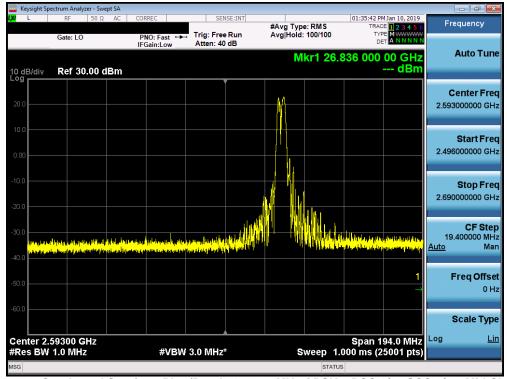


Table 7-283. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Mid Channel)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dage 170 of 245 |
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| | ectrum Analyzer - Swe | | | | | | | | | | |
|-----------------------|-------------------------|-------------|---|-------------------------|-----------------|-----------------------------|---------------------------|--|----------------------------------|-----------------------|---------------------------------|
| L <mark>XI</mark> RL | RF 50 Ω | AC COF | RREC | | ISE:INT | #Avg Typ | e: RMS | TRA | M Jan 10, 2019 CE 1 2 3 4 5 6 | Free | quency |
| 10 dB/div | Gate: LO Ref 20.00 d | IFO | NO:Fast 🕞 Gain:Low | Trig: Free Atten: 30 | | | Mk | □ r1 14.73 | 8 5 GHz 84 dBm | ¢ | uto Tune |
| 10.0 | | | | | | | | | | | e nter Freq 00000 GHz |
| -10.0 | | | | | | | | | | | Start Fred 000000 GHz |
| -20.0 | | | | | | | | | DL1 -25.00 dBm | | Stop Fred |
| -40.0 | A Louise Louis Data and | | l Magaginer y Southeast Age an Source of the State of State of State | tana talay tayon sing | narin phisteria | a garde for we are set by a | (haya di sa dakatelahanak | na si na dina si di kalenda si di Kalendari si na di kalendari di kalendari di kalendari si kalendari si kalendari di kalendari di kalendari di k | | 1.2310 <u>Auto</u> | CF Step 00000 GH: Mar |
| -60.0 | | | | | | | | | | Fi | r eq Offse 0 H |
| -70.0 | | | | | | | | | | | cale Type |
| Start 2.69 #Res BW | | | #VBW | 3.0 MHz | | s | weep 1 | Stop 15 000 ms (2 | .000 GHz 24621 pts) | LUg | |
| мsg 🧼 Poin | nts changed; all ti | races clear | ed | | | | STATU | JS | | | |

Table 7-284. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Mid Channel)



Table 7-285. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Mid Channel)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager | |
|----------------------------------|------------------------|---------------------------------------|------|---------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | | Dago 171 of 245 | |
| 1M1811230205-03-R1.ZNF | 11/19/2018 - 1/17/2019 | Portable Handset | | Page 171 of 245 | |
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| | pectrum Analy: | | | | | | | | | | _ | |
|----------------------|---------------------|----------|---------|----------------------|-----------------------|-----------------------------|----------------------------------|--|-----------------------|---|--------------------|---------------------------------|
| X/RL | RF | 50Ω A | AC CORI | | | SE:INT | #Avg Typ | e: RMS | TRA | PM Jan 10, 2019 CE 1 2 3 4 5 6 PE M WWWWW | F | requency |
| 10 dB/div | Gate: LO Ref 20 |).00 dBi | IFG | O: Fast 😱 ain:Low | Atten: 30 | | | M | □ Ikr1 2.49 | ET A NNNNN | | Auto Tun |
| 10.0 | | | | | , | | | | | | | Center Fre 3000000 G⊦ |
| -10.0 | | | | | | | | | | | 30 | Start Fre |
| -20.0 | | | | | | | | | | DL1 -25.00 dBm | 2.49 | Stop Fre 6000000 GI |
| 40.0 | | | | | | | رو المتعاقلة والمتأمر من عمر الم | والمتعادية والمحادثة | المراجد المغارم أحفاس | 1 | 246 <u>Auto</u> | CF St 6.600000 M M |
| 60.0 | | | | | angenta processi e re | a y casta di japang panakai | | e it se ries (y, e tê dê | | | | Freq Offs 0 |
| 70.0 | | | | | | | | | | | Log | Scale Typ |
| Start 0.0 ≇Res BW | 30 GHz / 1.0 MHz | 2 | | #VBW | 3.0 MHz | | | Sweep | | 2.496 GHz (4933 pts) | Log | L |
| ISG | | | | | | | | STAT | US | | | |

Table 7-286. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 100/0 SCC 100/0 – Mid Channel)

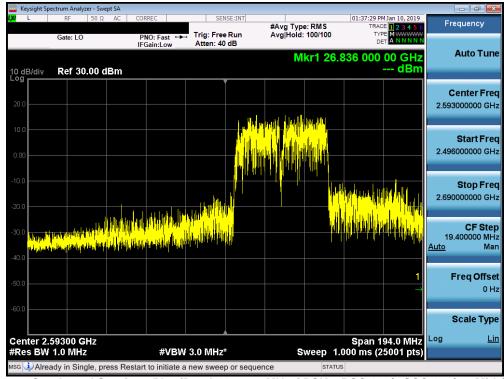


Table 7-287. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 100/0 SCC 100/0 – Mid Channel)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | ì | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|---|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Dage 170 of 045 |
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| 10 dB/div Ref 20.00 dBm | CORREC | SENSE:INT Trig: Free Run Atten: 30 dB | #Avg Type: RMS | 01:13:15 PMJan 10, 2019 TRACE 1 2 3 4 5 6 TYPE MWWW DET ANNNNN Ikr1 2.690 0 GHz | Frequency Auto Tune |
|------------------------------------|---|--|--|--|--|
| | PNO: Fast 😱 IFGain:Low | | N | | Auto Tune |
| | | | | -34.19 dBm | |
| 10.0 | | | | | Center Freq 8.845000000 GHz |
| -10.0 | | | | | Start Freq 2.690000000 GHz |
| -20.0 | | | | DL1 -25.00 dBm | Stop Freq 15.000000000 GHz |
| -40.0 | روا المراجعة إن المراجع من المراجع المراجع المراجع المادي منابع المراجع المراجع من المراجع المراجع المراجع المادي المادي | nd for pay and any filled for some determine the start start and the source of the start and the | a a part legis promise for part of the part of the test of the | e fyr hefned yn yn cynnife y de fan yn ffered y y ferfan yn yn ferfan yn yn ferfan yn yn ferfan yn yn ferfan yn Mee'n fel ar yn galler yn ar yn ferfan yn gall yn ferfan yn galler yn galler yn gall yn galler yn galler yn gal | CF Step 1.231000000 GHz <u>Auto</u> Man |
| -60.0 | | | | | Freq Offset 0 Hz |
| -70.0 | | | | | Scale Type |
| Start 2.690 GHz #Res BW 1.0 MHz | #VBM | 3.0 MHz | Sween | Stop 15.000 GHz .000 ms (24621 pts) | Log <u>Lin</u> |
| MSG Points changed; all traces | | 0.0 NIT2 | SWIGG | | |

Table 7-288. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 100/0 SCC 100/0 – Mid Channel)



Table 7-289. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 100/0 SCC 100/0 – Mid Channel)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager | |
|----------------------------------|------------------------|---------------------------------------|------|---------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | | Dogo 172 of 245 | |
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Table 7-290. Lower ACP Plot (Band 41 QPSK – PCC:20 MHz SCC:20 MHz – Full RB)

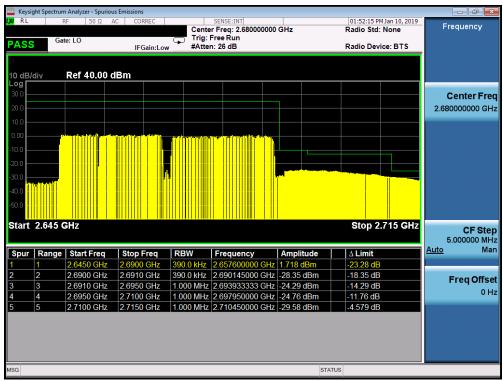


Table 7-291. Upper ACP Plot (Band 41 QPSK – PCC:20 MHz SCC:20 MHz – Full RB)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager | |
|----------------------------------|------------------------|---------------------------------------|---------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | Dage 174 of 245 | |
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7.8 Radiated Power (ERP/EIRP)

Test Overview

Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized tuned broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v03r01 - Section 5.2.1

ANSI/TIA-603-E-2016 - Section 2.2.17

Test Settings

- Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation. For signals with burst transmission, the signal analyzer's "time domain power" measurement capability is used
- 2. RBW = 1 5% of the expected OBW, not to exceed 1MHz
- 3. VBW \geq 3 x RBW
- 4. Span = 1.5 times the OBW
- 5. No. of sweep points \geq 2 x span / RBW
- 6. Detector = RMS
- 7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto". Trigger is set to enable triggering only on full power bursts with the sweep time set less than or equal to the transmission burst duration
- 8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation. For signals with burst transmission, the "gating" function was enabled to ensure that measurements are performed during times in which the transmitter is operating at its maximum power
- 9. Trace mode = trace averaging (RMS) over 100 sweeps
- 10. The trace was allowed to stabilize

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | LG | Approved by: Quality Manager | |
|----------------------------------|------------------------|---------------------------------------|----|---------------------------------|--|
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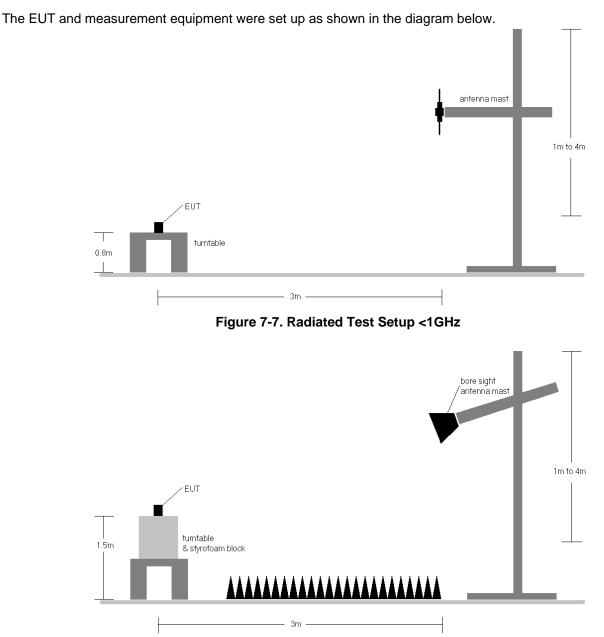


Figure 7-8. Radiated Test Setup >1GHz

Test Notes

- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) This unit was tested with its standard battery.

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager | | | | | | | |
|---|--|---------------------------------------|---------------------------------|--|--|--|--|--|--|--|
| Test Report S/N: | Test Dates: | EUT Type: | Dage 176 of 045 | | | | | | | |
| 1M1811230205-03-R1.ZNF | 11/19/2018 - 1/17/2019 | Portable Handset | Page 176 of 245 | | | | | | | |
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| Frequency [MHz] | Channel Bandwidth [MHz] | Mod. | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | RB Size/Offset | Substitute Level [dBm] | Ant. Gain [dBi] | ERP [dBm] | ERP [Watts] | ERP Limit [dBm] | Margin [dB] |
|--------------------|-------------------------------|--------|-----------------------|---------------------------|----------------------------------|-------------------|------------------------------|-----------------------|--------------|----------------|-----------------------|----------------|
| 665.50 | 5 | QPSK | Н | 166 | 170 | 1 / 24 | 15.04 | 3.84 | 16.73 | 0.047 | 34.77 | -18.05 |
| 680.50 | 5 | QPSK | Н | 155 | 0 | 1 / 24 | 14.65 | 3.91 | 16.41 | 0.044 | 34.77 | -18.36 |
| 695.50 | 5 | QPSK | Н | 168 | 162 | 1 / 24 | 14.94 | 3.98 | 16.77 | 0.048 | 34.77 | -18.00 |
| 695.50 | 5 | 16-QAM | Н | 168 | 162 | 1 / 24 | 14.24 | 3.98 | 16.07 | 0.040 | 34.77 | -18.70 |
| 695.50 | 5 | 64-QAM | н | 168 | 162 | 1 / 24 | 13.32 | 3.98 | 15.15 | 0.033 | 34.77 | -19.62 |
| 668.00 | 10 | QPSK | Н | 167 | 177 | 1 / 49 | 15.38 | 3.85 | 17.08 | 0.051 | 34.77 | -17.69 |
| 680.50 | 10 | QPSK | Н | 169 | 168 | 1 / 49 | 15.62 | 3.91 | 17.38 | 0.055 | 34.77 | -17.39 |
| 693.00 | 10 | QPSK | Н | 173 | 168 | 1 / 49 | 15.51 | 3.97 | 17.33 | 0.054 | 34.77 | -17.44 |
| 680.50 | 10 | 16-QAM | Н | 169 | 168 | 1 / 49 | 14.92 | 3.91 | 16.68 | 0.047 | 34.77 | -18.09 |
| 680.50 | 10 | 64-QAM | Н | 169 | 168 | 1 / 49 | 14.22 | 3.91 | 15.98 | 0.040 | 34.77 | -18.79 |
| 670.50 | 15 | QPSK | Н | 166 | 174 | 1 / 74 | 15.35 | 3.86 | 17.06 | 0.051 | 34.77 | -17.71 |
| 680.50 | 15 | QPSK | Н | 174 | 165 | 1 / 74 | 15.02 | 3.91 | 16.78 | 0.048 | 34.77 | -17.99 |
| 690.50 | 15 | QPSK | Н | 170 | 166 | 1 / 0 | 15.33 | 3.96 | 17.14 | 0.052 | 34.77 | -17.64 |
| 690.50 | 15 | 16-QAM | Н | 170 | 166 | 1 / 0 | 14.53 | 3.96 | 16.34 | 0.043 | 34.77 | -18.44 |
| 690.50 | 15 | 64-QAM | Н | 170 | 166 | 1 / 0 | 13.64 | 3.96 | 15.45 | 0.035 | 34.77 | -19.33 |
| 673.00 | 20 | QPSK | Н | 163 | 170 | 1 / 99 | 15.47 | 3.87 | 17.19 | 0.052 | 34.77 | -17.58 |
| 680.50 | 20 | QPSK | Н | 173 | 165 | 1 / 0 | 15.43 | 3.91 | 17.19 | 0.052 | 34.77 | -17.58 |
| 688.00 | 20 | QPSK | Н | 175 | 166 | 1/0 | 15.73 | 3.94 | 17.52 | 0.057 | 34.77 | -17.25 |
| 688.00 | 20 | 16-QAM | Н | 175 | 166 | 1/0 | 14.97 | 3.94 | 16.76 | 0.047 | 34.77 | -18.01 |
| 688.00 | 20 | 64-QAM | Н | 175 | 166 | 1/0 | 14.08 | 3.94 | 15.87 | 0.039 | 34.77 | -18.90 |
| 688.00 | 20 | QPSK | V | 218 | 355 | 1 / 0 | 13.99 | 3.94 | 15.78 | 0.038 | 34.77 | -18.99 |
| 688.00 | 20 (WCP) | QPSK | Н | 204 | 193 | 1 / 0 | 15.12 | 3.94 | 16.91 | 0.049 | 34.77 | -17.86 |

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Table 7-5. ERP Data (Band 71)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Dage 177 of 045 |
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| Frequency [MHz] | Channel Bandwidth [MHz] | Mod. | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | RB Size/Offset | Substitute Level [dBm] | Ant. Gain [dBi] | ERP [dBm] | ERP [Watts] | ERP Limit [dBm] | Margin [dB] |
|--------------------|-------------------------------|--------|-----------------------|---------------------------|----------------------------------|-------------------|------------------------------|-----------------------|--------------|----------------|-----------------------|----------------|
| 699.70 | 1.4 | QPSK | Н | 160 | 159 | 3/2 | 15.27 | 4.00 | 17.12 | 0.052 | 34.77 | -17.65 |
| 707.50 | 1.4 | QPSK | Н | 163 | 169 | 3/2 | 15.32 | 4.22 | 17.39 | 0.055 | 34.77 | -17.39 |
| 715.30 | 1.4 | QPSK | Н | 152 | 170 | 1 / 5 | 15.69 | 4.44 | 17.98 | 0.063 | 34.77 | -16.79 |
| 715.30 | 1.4 | 16-QAM | Н | 152 | 170 | 1 / 5 | 14.85 | 4.44 | 17.14 | 0.052 | 34.77 | -17.63 |
| 715.30 | 1.4 | 64-QAM | Н | 152 | 170 | 1 / 5 | 14.04 | 4.44 | 16.33 | 0.043 | 34.77 | -18.44 |
| 700.50 | 3 | QPSK | Н | 168 | 166 | 8 / 4 | 15.52 | 4.01 | 17.38 | 0.055 | 34.77 | -17.39 |
| 707.50 | 3 | QPSK | Н | 167 | 166 | 8 / 4 | 15.32 | 4.22 | 17.39 | 0.055 | 34.77 | -17.39 |
| 714.50 | 3 | QPSK | Н | 153 | 173 | 1 / 14 | 15.55 | 4.41 | 17.81 | 0.060 | 34.77 | -16.96 |
| 714.50 | 3 | 16-QAM | Н | 153 | 173 | 1 / 14 | 14.72 | 4.41 | 16.98 | 0.050 | 34.77 | -17.79 |
| 714.50 | 3 | 64-QAM | Н | 153 | 173 | 1 / 14 | 13.71 | 4.41 | 15.97 | 0.040 | 34.77 | -18.80 |
| 701.50 | 5 | QPSK | Н | 169 | 161 | 1 / 0 | 15.48 | 4.04 | 17.37 | 0.055 | 34.77 | -17.40 |
| 707.50 | 5 | QPSK | Н | 165 | 167 | 1 / 0 | 15.47 | 4.22 | 17.54 | 0.057 | 34.77 | -17.24 |
| 713.50 | 5 | QPSK | Н | 158 | 172 | 1 / 24 | 15.70 | 4.39 | 17.94 | 0.062 | 34.77 | -16.83 |
| 713.50 | 5 | 16-QAM | Н | 158 | 172 | 1 / 24 | 14.99 | 4.39 | 17.23 | 0.053 | 34.77 | -17.54 |
| 713.50 | 5 | 64-QAM | Н | 158 | 172 | 1 / 24 | 13.88 | 4.39 | 16.12 | 0.041 | 34.77 | -18.65 |
| 704.00 | 10 | QPSK | Н | 170 | 162 | 1 / 0 | 15.57 | 4.12 | 17.54 | 0.057 | 34.77 | -17.24 |
| 707.50 | 10 | QPSK | Н | 168 | 168 | 1 / 0 | 15.52 | 4.22 | 17.59 | 0.057 | 34.77 | -17.19 |
| 711.00 | 10 | QPSK | Н | 162 | 170 | 1 / 49 | 15.84 | 4.32 | 18.01 | 0.063 | 34.77 | -16.77 |
| 711.00 | 10 | 16-QAM | Н | 162 | 170 | 1 / 49 | 15.06 | 4.32 | 17.23 | 0.053 | 34.77 | -17.55 |
| 711.00 | 10 | 64-QAM | Н | 162 | 170 | 1 / 49 | 13.98 | 4.32 | 16.15 | 0.041 | 34.77 | -18.63 |
| 711.00 | 10 | QPSK | V | 220 | 358 | 1 / 49 | 14.41 | 4.32 | 16.58 | 0.045 | 34.77 | -18.20 |
| 711.00 | 10 (WCP) | QPSK | Н | 171 | 120 | 1 / 49 | 14.70 | 4.32 | 16.87 | 0.049 | 34.77 | -17.91 |

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Table 7-6. ERP Data (Band 12/17)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Dage 179 of 045 |
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| Frequency [MHz] | Channel Bandwidth [MHz] | Mod. | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | RB Size/Offset | Substitute Level [dBm] | Ant. Gain [dBi] | ERP [dBm] | ERP [Watts] | ERP Limit [dBm] | Margin [dB] |
|--------------------|-------------------------------|--------|-----------------------|---------------------------|----------------------------------|-------------------|------------------------------|-----------------------|--------------|----------------|-----------------------|----------------|
| 779.50 | 5 | QPSK | Н | 130 | 357 | 1 / 24 | 15.72 | 6.18 | 19.75 | 0.094 | 34.77 | -15.03 |
| 782.00 | 5 | QPSK | Н | 136 | 356 | 1 / 24 | 15.92 | 6.24 | 20.01 | 0.100 | 34.77 | -14.76 |
| 784.50 | 5 | QPSK | Н | 138 | 351 | 12/6 | 15.79 | 6.30 | 19.94 | 0.099 | 34.77 | -14.83 |
| 784.50 | 5 | 16-QAM | Н | 138 | 351 | 12/6 | 15.18 | 6.30 | 19.33 | 0.086 | 34.77 | -15.44 |
| 784.50 | 5 | 64-QAM | Н | 138 | 351 | 12/6 | 14.29 | 6.30 | 18.44 | 0.070 | 34.77 | -16.33 |
| 782.00 | 10 | QPSK | Н | 122 | 354 | 25 / 12 | 15.09 | 6.24 | 19.18 | 0.083 | 34.77 | -15.59 |
| 782.00 | 10 | 16-QAM | Н | 122 | 354 | 25 / 12 | 14.18 | 6.24 | 18.27 | 0.067 | 34.77 | -16.50 |
| 782.00 | 10 | 64-QAM | Н | 122 | 354 | 25 / 12 | 13.43 | 6.24 | 17.52 | 0.056 | 34.77 | -17.25 |
| 782.00 | 5 | QPSK | V | 212 | 350 | 1 / 24 | 13.24 | 6.24 | 17.33 | 0.054 | 34.77 | -17.44 |
| 782.00 | 5 (WCP) | QPSK | Н | 110 | 17 | 1 / 24 | 15.27 | 6.24 | 19.36 | 0.086 | 34.77 | -15.41 |

Table 7-7. ERP Data (Band 13)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Dage 170 of 045 |
| 1M1811230205-03-R1.ZNF | 11/19/2018 - 1/17/2019 | Portable Handset | | Page 179 of 245 |
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| Frequency [MHz] | Channel Bandwidth [MHz] | Mod. | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | RB Size/Offset | Substitute Level [dBm] | Ant. Gain [dBi] | ERP [dBm] | ERP [Watts] | ERP Limit [dBm] | Margin [dB] |
|--------------------|-------------------------------|--------|-----------------------|---------------------------|----------------------------------|-------------------|------------------------------|-----------------------|--------------|----------------|-----------------------|----------------|
| 824.70 | 1.4 | QPSK | Н | 150 | 90 | 1 / 0 | 20.77 | 1.50 | 20.12 | 0.103 | 38.45 | -18.33 |
| 836.50 | 1.4 | QPSK | Н | 150 | 348 | 1 / 0 | 21.71 | 1.50 | 21.06 | 0.128 | 38.45 | -17.39 |
| 848.30 | 1.4 | QPSK | Н | 150 | 342 | 1 / 0 | 21.10 | 1.50 | 20.45 | 0.111 | 38.45 | -18.00 |
| 836.50 | 1.4 | 16-QAM | Н | 150 | 348 | 1 / 0 | 20.89 | 1.50 | 20.24 | 0.106 | 38.45 | -18.21 |
| 836.50 | 1.4 | 64-QAM | Н | 150 | 348 | 1 / 0 | 20.21 | 1.50 | 19.56 | 0.090 | 38.45 | -18.89 |
| 825.50 | 3 | QPSK | Н | 150 | 343 | 1 / 0 | 20.71 | 1.50 | 20.06 | 0.101 | 38.45 | -18.39 |
| 836.50 | 3 | QPSK | Н | 150 | 345 | 1 / 0 | 21.77 | 1.50 | 21.12 | 0.129 | 38.45 | -17.33 |
| 847.50 | 3 | QPSK | Н | 150 | 343 | 1 / 0 | 21.79 | 1.50 | 21.14 | 0.130 | 38.45 | -17.31 |
| 836.50 | 3 | 16-QAM | Н | 150 | 345 | 1 / 0 | 21.01 | 1.50 | 20.36 | 0.109 | 38.45 | -18.09 |
| 836.50 | 3 | 64-QAM | н | 150 | 345 | 1 / 0 | 20.18 | 1.50 | 19.53 | 0.090 | 38.45 | -18.92 |
| 826.50 | 5 | QPSK | Н | 150 | 340 | 1 / 0 | 20.40 | 1.50 | 19.75 | 0.094 | 38.45 | -18.70 |
| 836.50 | 5 | QPSK | Н | 150 | 350 | 1 / 0 | 21.88 | 1.50 | 21.23 | 0.133 | 38.45 | -17.22 |
| 846.50 | 5 | QPSK | Н | 150 | 345 | 1 / 0 | 21.58 | 1.50 | 20.93 | 0.124 | 38.45 | -17.52 |
| 836.50 | 5 | 16-QAM | Н | 150 | 350 | 1 / 0 | 21.03 | 1.50 | 20.38 | 0.109 | 38.45 | -18.07 |
| 836.50 | 5 | 64-QAM | Н | 150 | 350 | 1 / 0 | 20.41 | 1.50 | 19.76 | 0.095 | 38.45 | -18.69 |
| 829.00 | 10 | QPSK | Н | 150 | 349 | 1 / 0 | 20.51 | 1.50 | 19.86 | 0.097 | 38.45 | -18.59 |
| 836.50 | 10 | QPSK | Н | 150 | 342 | 1 / 0 | 21.99 | 1.50 | 21.34 | 0.136 | 38.45 | -17.11 |
| 844.00 | 10 | QPSK | Н | 150 | 344 | 1 / 0 | 21.24 | 1.50 | 20.59 | 0.115 | 38.45 | -17.86 |
| 836.50 | 10 | 16-QAM | н | 150 | 342 | 1 / 0 | 21.15 | 1.50 | 20.50 | 0.112 | 38.45 | -17.95 |
| 836.50 | 10 | 64-QAM | Н | 150 | 342 | 1 / 0 | 20.48 | 1.50 | 19.83 | 0.096 | 38.45 | -18.62 |
| 831.50 | 15 | QPSK | Н | 150 | 342 | 1 / 0 | 20.55 | 1.50 | 19.90 | 0.098 | 38.45 | -18.55 |
| 836.50 | 15 | QPSK | Н | 150 | 344 | 1/0 | 21.79 | 1.50 | 21.14 | 0.130 | 38.45 | -17.31 |
| 841.50 | 15 | QPSK | Н | 150 | 337 | 1/0 | 21.87 | 1.50 | 21.22 | 0.132 | 38.45 | -17.23 |
| 841.50 | 15 | 16-QAM | Н | 150 | 337 | 1 / 0 | 20.97 | 1.50 | 20.32 | 0.108 | 38.45 | -18.13 |
| 841.50 | 15 | 64-QAM | Н | 150 | 337 | 1 / 0 | 20.07 | 1.50 | 19.42 | 0.087 | 38.45 | -19.03 |
| 836.50 | 10 | QPSK | V | 150 | 291 | 1/0 | 20.22 | 1.50 | 19.57 | 0.091 | 38.45 | -18.88 |
| 836.50 | 10 (WCP) | QPSK | Н | 150 | 351 | 1/0 | 21.57 | 1.50 | 20.92 | 0.124 | 38.45 | -17.53 |

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Table 7-8. ERP Data (Band 26/5)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dage 190 of 245 |
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|------|------------------------------|
| \ | ENGINEERING LABORATORY, INC. |

| Frequency [MHz] | Channel Bandwidth [MHz] | Mod. | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | RB Size/Offset | Substitute Level [dBm] | Ant. Gain [dBi] | EIRP [dBm] | EIRP [Watts] | EIRP Limit [dBm] | Margin [dB] |
|--------------------|-------------------------------|--------|-----------------------|---------------------------|----------------------------------|-------------------|------------------------------|-----------------------|---------------|-----------------|------------------------|----------------|
| 1710.70 | 1.4 | QPSK | Н | 100 | 234 | 1 / 0 | 11.09 | 8.16 | 19.25 | 0.084 | 30.00 | -10.75 |
| 1732.50 | 1.4 | QPSK | Н | 222 | 241 | 1 / 5 | 11.16 | 8.18 | 19.34 | 0.086 | 30.00 | -10.66 |
| 1754.30 | 1.4 | QPSK | Н | 116 | 227 | 3/2 | 11.59 | 8.21 | 19.80 | 0.095 | 30.00 | -10.20 |
| 1754.30 | 1.4 | 16-QAM | Н | 116 | 227 | 3/2 | 10.70 | 8.21 | 18.91 | 0.078 | 30.00 | -11.09 |
| 1732.50 | 1.4 | 64-QAM | Н | 222 | 241 | 1 / 5 | 9.87 | 8.18 | 18.05 | 0.064 | 30.00 | -11.95 |
| 1711.50 | 3 | QPSK | Н | 100 | 232 | 8 / 4 | 11.83 | 8.16 | 19.99 | 0.100 | 30.00 | -10.01 |
| 1732.50 | 3 | QPSK | Н | 102 | 235 | 1 / 0 | 11.48 | 8.18 | 19.66 | 0.092 | 30.00 | -10.34 |
| 1753.50 | 3 | QPSK | Н | 170 | 234 | 8 / 4 | 11.78 | 8.21 | 19.99 | 0.100 | 30.00 | -10.01 |
| 1753.50 | 3 | 16-QAM | Н | 170 | 234 | 8 / 4 | 11.02 | 8.21 | 19.23 | 0.084 | 30.00 | -10.77 |
| 1753.50 | 3 | 64-QAM | Н | 170 | 234 | 8 / 4 | 10.38 | 8.21 | 18.59 | 0.072 | 30.00 | -11.41 |
| 1712.50 | 5 | QPSK | Н | 109 | 233 | 12/6 | 11.76 | 8.16 | 19.92 | 0.098 | 30.00 | -10.08 |
| 1732.50 | 5 | QPSK | Н | 106 | 241 | 12/6 | 11.22 | 8.18 | 19.40 | 0.087 | 30.00 | -10.60 |
| 1752.50 | 5 | QPSK | Н | 175 | 233 | 12/6 | 11.69 | 8.20 | 19.89 | 0.098 | 30.00 | -10.11 |
| 1712.50 | 5 | 16-QAM | Н | 109 | 233 | 12/6 | 10.84 | 8.16 | 19.00 | 0.079 | 30.00 | -11.00 |
| 1752.50 | 5 | 64-QAM | Н | 175 | 233 | 12/6 | 9.76 | 8.20 | 17.96 | 0.063 | 30.00 | -12.04 |
| 1715.00 | 10 | QPSK | Н | 110 | 238 | 25 / 12 | 12.14 | 8.16 | 20.30 | 0.107 | 30.00 | -9.70 |
| 1732.50 | 10 | QPSK | Н | 100 | 240 | 25 / 12 | 11.48 | 8.18 | 19.66 | 0.092 | 30.00 | -10.34 |
| 1750.00 | 10 | QPSK | Н | 119 | 235 | 25 / 12 | 12.17 | 8.20 | 20.37 | 0.109 | 30.00 | -9.63 |
| 1750.00 | 10 | 16-QAM | Н | 119 | 235 | 25 / 12 | 11.36 | 8.20 | 19.56 | 0.090 | 30.00 | -10.44 |
| 1750.00 | 10 | 64-QAM | Н | 119 | 235 | 25 / 12 | 10.24 | 8.20 | 18.44 | 0.070 | 30.00 | -11.56 |
| 1717.50 | 15 | QPSK | Н | 107 | 237 | 36 / 18 | 12.07 | 8.16 | 20.23 | 0.106 | 30.00 | -9.77 |
| 1732.50 | 15 | QPSK | Н | 106 | 242 | 1 / 0 | 11.54 | 8.18 | 19.72 | 0.094 | 30.00 | -10.28 |
| 1747.50 | 15 | QPSK | Н | 115 | 233 | 36 / 18 | 12.16 | 8.20 | 20.36 | 0.109 | 30.00 | -9.64 |
| 1747.50 | 15 | 16-QAM | Н | 115 | 233 | 36 / 18 | 11.25 | 8.20 | 19.45 | 0.088 | 30.00 | -10.55 |
| 1747.50 | 15 | 64-QAM | Н | 115 | 233 | 36 / 18 | 10.13 | 8.20 | 18.33 | 0.068 | 30.00 | -11.67 |
| 1720.00 | 20 | QPSK | Н | 100 | 246 | 1 / 0 | 11.86 | 8.17 | 20.03 | 0.101 | 30.00 | -9.97 |
| 1732.50 | 20 | QPSK | Н | 103 | 236 | 1 / 99 | 11.36 | 8.18 | 19.54 | 0.090 | 30.00 | -10.46 |
| 1745.00 | 20 | QPSK | Н | 112 | 235 | 1/0 | 11.80 | 8.19 | 19.99 | 0.100 | 30.00 | -10.01 |
| 1720.00 | 20 | 16-QAM | Н | 100 | 246 | 1/0 | 10.87 | 8.17 | 19.04 | 0.080 | 30.00 | -10.96 |
| 1745.00 | 20 | 64-QAM | Н | 112 | 235 | 1/0 | 10.01 | 8.19 | 18.20 | 0.066 | 30.00 | -11.80 |
| 1750.00 | 10 | QPSK | V | 359 | 144 | 25 / 12 | 11.82 | 8.20 | 20.02 | 0.100 | 30.00 | -9.98 |
| 1750.00 | 10 (WCP) | QPSK | Н | 110 | 249 | 25 / 12 | 12.10 | 8.20 | 20.30 | 0.107 | 30.00 | -9.70 |

Table 7-9. EIRP Data (Band 66/4)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dage 101 of 045 |
| 1M1811230205-03-R1.ZNF | 11/19/2018 - 1/17/2019 | Portable Handset | Page 181 of 245 |
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| Frequency [MHz] | Channel Bandwidth [MHz] | Mod. | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | RB Size/Offset | Substitute Level [dBm] | Ant. Gain [dBi] | EIRP [dBm] | EIRP [Watts] | EIRP Limit [dBm] | Margin [dB] |
|--------------------|-------------------------------|--------|-----------------------|---------------------------|----------------------------------|-------------------|------------------------------|-----------------------|---------------|-----------------|------------------------|----------------|
| 1850.70 | 1.4 | QPSK | н | 213 | 59 | 1/0 | 10.94 | 8.37 | 19.31 | 0.085 | 33.01 | -13.70 |
| 1880.00 | 1.4 | QPSK | Н | 144 | 66 | 1 / 0 | 12.13 | 8.41 | 20.54 | 0.113 | 33.01 | -12.47 |
| 1909.30 | 1.4 | QPSK | Н | 151 | 84 | 1 / 5 | 12.10 | 8.46 | 20.56 | 0.114 | 33.01 | -12.45 |
| 1880.00 | 1.4 | 16-QAM | Н | 144 | 66 | 1 / 0 | 11.32 | 8.41 | 19.73 | 0.094 | 33.01 | -13.28 |
| 1880.00 | 1.4 | 64-QAM | Н | 144 | 66 | 1 / 0 | 10.18 | 8.41 | 18.59 | 0.072 | 33.01 | -14.42 |
| 1851.50 | 3 | QPSK | Н | 201 | 38 | 1 / 0 | 11.16 | 8.37 | 19.53 | 0.090 | 33.01 | -13.48 |
| 1880.00 | 3 | QPSK | Н | 157 | 65 | 1 / 0 | 12.37 | 8.41 | 20.78 | 0.120 | 33.01 | -12.23 |
| 1908.50 | 3 | QPSK | Н | 140 | 70 | 1 / 14 | 12.05 | 8.46 | 20.51 | 0.112 | 33.01 | -12.50 |
| 1880.00 | 3 | 16-QAM | Н | 157 | 65 | 1 / 0 | 11.29 | 8.41 | 19.70 | 0.093 | 33.01 | -13.31 |
| 1908.50 | 3 | 64-QAM | Н | 140 | 70 | 1 / 14 | 10.27 | 8.46 | 18.73 | 0.075 | 33.01 | -14.28 |
| 1852.50 | 5 | QPSK | Н | 196 | 33 | 1 / 24 | 11.24 | 8.37 | 19.61 | 0.091 | 33.01 | -13.40 |
| 1880.00 | 5 | QPSK | Н | 157 | 59 | 1 / 0 | 12.34 | 8.41 | 20.75 | 0.119 | 33.01 | -12.26 |
| 1907.50 | 5 | QPSK | Н | 148 | 64 | 1 / 24 | 12.12 | 8.46 | 20.58 | 0.114 | 33.01 | -12.43 |
| 1880.00 | 5 | 16-QAM | Н | 157 | 59 | 1 / 0 | 11.53 | 8.41 | 19.94 | 0.099 | 33.01 | -13.07 |
| 1880.00 | 5 | 64-QAM | Н | 157 | 59 | 1 / 0 | 10.50 | 8.41 | 18.91 | 0.078 | 33.01 | -14.10 |
| 1855.00 | 10 | QPSK | Н | 199 | 14 | 1 / 49 | 12.16 | 8.37 | 20.53 | 0.113 | 33.01 | -12.48 |
| 1880.00 | 10 | QPSK | Н | 153 | 57 | 1 / 0 | 13.58 | 8.41 | 21.99 | 0.158 | 33.01 | -11.02 |
| 1905.00 | 10 | QPSK | Н | 101 | 61 | 1 / 0 | 11.59 | 8.45 | 20.04 | 0.101 | 33.01 | -12.97 |
| 1880.00 | 10 | 16-QAM | Н | 153 | 57 | 1 / 0 | 12.66 | 8.41 | 21.07 | 0.128 | 33.01 | -11.94 |
| 1880.00 | 10 | 64-QAM | Н | 153 | 57 | 1 / 0 | 11.52 | 8.41 | 19.93 | 0.099 | 33.01 | -13.08 |
| 1857.50 | 15 | QPSK | Н | 142 | 20 | 1 / 74 | 12.11 | 8.38 | 20.49 | 0.112 | 33.01 | -12.52 |
| 1880.00 | 15 | QPSK | Н | 151 | 53 | 1 / 0 | 12.70 | 8.41 | 21.11 | 0.129 | 33.01 | -11.90 |
| 1902.50 | 15 | QPSK | Н | 142 | 64 | 1 / 0 | 12.35 | 8.45 | 20.80 | 0.120 | 33.01 | -12.21 |
| 1880.00 | 15 | 16-QAM | Н | 151 | 53 | 1 / 0 | 11.75 | 8.41 | 20.16 | 0.104 | 33.01 | -12.85 |
| 1880.00 | 15 | 64-QAM | н | 151 | 53 | 1 / 0 | 10.71 | 8.41 | 19.12 | 0.082 | 33.01 | -13.89 |
| 1860.00 | 20 | QPSK | Н | 149 | 42 | 1 / 99 | 12.45 | 8.38 | 20.83 | 0.121 | 33.01 | -12.18 |
| 1880.00 | 20 | QPSK | Н | 153 | 56 | 1/0 | 12.76 | 8.41 | 21.17 | 0.131 | 33.01 | -11.84 |
| 1900.00 | 20 | QPSK | Н | 106 | 65 | 1/0 | 12.16 | 8.45 | 20.61 | 0.115 | 33.01 | -12.40 |
| 1860.00 | 20 | 16-QAM | Н | 149 | 42 | 1 / 99 | 11.77 | 8.38 | 20.15 | 0.104 | 33.01 | -12.86 |
| 1880.00 | 20 | 64-QAM | н | 153 | 56 | 1/0 | 10.86 | 8.41 | 19.27 | 0.085 | 33.01 | -13.74 |
| 1880.00 | 10 | QPSK | V | 357 | 161 | 1/0 | 12.62 | 8.41 | 21.03 | 0.127 | 33.01 | -11.98 |
| 1880.00 | 10 (WCP) | QPSK | Н | 166 | 70 | 1/0 | 13.54 | 8.41 | 21.95 | 0.157 | 33.01 | -11.06 |

Table 7-10. EIRP Data (Band 25/2)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Daga 102 of 245 |
| 1M1811230205-03-R1.ZNF | 11/19/2018 - 1/17/2019 | Portable Handset | Page 182 of 245 |
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| Frequency [MHz] | Channel Bandwidth [MHz] | Mod. | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | RB Size/Offset | Substitute Level [dBm] | Ant. Gain [dBi] | EIRP [dBm] | EIRP [Watts] | EIRP Limit [dBm] | Margin [dB] |
|--------------------|-------------------------------|--------|-----------------------|---------------------------|----------------------------------|-------------------|------------------------------|-----------------------|---------------|-----------------|------------------------|----------------|
| 2498.50 | 5 | QPSK | Н | 111 | 70 | 1 / 24 | 16.77 | 7.90 | 24.67 | 0.293 | 33.01 | -8.34 |
| 2593.00 | 5 | QPSK | Н | 106 | 47 | 1 / 24 | 17.27 | 7.71 | 24.98 | 0.315 | 33.01 | -8.03 |
| 2687.50 | 5 | QPSK | Н | 106 | 50 | 1 / 24 | 16.65 | 7.52 | 24.17 | 0.261 | 33.01 | -8.84 |
| 2593.00 | 5 | 16-QAM | Н | 106 | 47 | 1 / 24 | 16.35 | 7.71 | 24.06 | 0.255 | 33.01 | -8.95 |
| 2498.50 | 5 | 64-QAM | Н | 111 | 70 | 1 / 24 | 15.50 | 7.90 | 23.40 | 0.219 | 33.01 | -9.61 |
| 2501.00 | 10 | QPSK | Н | 116 | 68 | 1 / 49 | 16.89 | 7.90 | 24.79 | 0.301 | 33.01 | -8.22 |
| 2593.00 | 10 | QPSK | Н | 108 | 61 | 1 / 49 | 17.36 | 7.71 | 25.07 | 0.321 | 33.01 | -7.94 |
| 2685.00 | 10 | QPSK | Н | 102 | 131 | 1 / 0 | 16.76 | 7.53 | 24.29 | 0.268 | 33.01 | -8.72 |
| 2501.00 | 10 | 16-QAM | Н | 116 | 68 | 1 / 49 | 16.18 | 7.90 | 24.08 | 0.256 | 33.01 | -8.93 |
| 2501.00 | 10 | 64-QAM | Н | 116 | 68 | 1 / 49 | 15.63 | 7.90 | 23.53 | 0.225 | 33.01 | -9.48 |
| 2503.50 | 15 | QPSK | Н | 111 | 47 | 1 / 74 | 16.68 | 7.89 | 24.57 | 0.287 | 33.01 | -8.44 |
| 2593.00 | 15 | QPSK | Н | 108 | 65 | 1 / 74 | 17.03 | 7.71 | 24.74 | 0.298 | 33.01 | -8.27 |
| 2682.50 | 15 | QPSK | Н | 100 | 125 | 1 / 0 | 15.75 | 7.53 | 23.28 | 0.213 | 33.01 | -9.73 |
| 2593.00 | 15 | 16-QAM | Н | 108 | 65 | 1 / 74 | 16.29 | 7.71 | 24.00 | 0.251 | 33.01 | -9.01 |
| 2593.00 | 15 | 64-QAM | Н | 108 | 65 | 1 / 74 | 15.58 | 7.71 | 23.29 | 0.213 | 33.01 | -9.72 |
| 2506.00 | 20 | QPSK | Н | 101 | 125 | 1 / 99 | 16.28 | 7.89 | 24.17 | 0.261 | 33.01 | -8.84 |
| 2593.00 | 20 | QPSK | Н | 108 | 48 | 1 / 99 | 17.03 | 7.71 | 24.74 | 0.298 | 33.01 | -8.27 |
| 2680.00 | 20 | QPSK | Н | 115 | 130 | 1 / 0 | 16.81 | 7.54 | 24.35 | 0.272 | 33.01 | -8.67 |
| 2593.00 | 20 | 16-QAM | Н | 108 | 48 | 1 / 99 | 16.61 | 7.71 | 24.32 | 0.270 | 33.01 | -8.69 |
| 2593.00 | 20 | 64-QAM | Н | 108 | 48 | 1 / 99 | 15.76 | 7.71 | 23.47 | 0.222 | 33.01 | -9.54 |
| 2593.00 | 10 | QPSK | V | 221 | 340 | 1 / 49 | 15.64 | 7.71 | 23.35 | 0.216 | 33.01 | -9.66 |
| 2593.00 | 10 (WCP) | QPSK | Н | 112 | 139 | 1 / 49 | 16.89 | 7.71 | 24.60 | 0.288 | 33.01 | -8.41 |
| 2593.00 | 10 (PC3) | QPSK | Н | 114 | 127 | 1 / 49 | 14.71 | 7.71 | 22.42 | 0.175 | 33.01 | -10.59 |

Table 7-11. EIRP Data (Band 41)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|----------------------------------|---|---------------------------------------|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Dage 192 of 245 |
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7.9 Radiated Spurious Emissions Measurements

Test Overview

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas.

Test Procedures Used

KDB 971168 D01 v03r01 - Section 5.8

ANSI/TIA-603-E-2016 - Section 2.2.12

Test Settings

- 1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
- 2. VBW \geq 3 x RBW
- 3. Span = 1.5 times the OBW
- 4. No. of sweep points > 2 x span / RBW
- 5. Detector = RMS
- 6. Trace mode = Average (Max Hold for pulsed emissions)
- 7. The trace was allowed to stabilize

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager | | | | |
|---|---|---------------------------------------|---------------------------------|--|--|--|--|
| Test Report S/N: | Test Dates: | EUT Type: | Dogo 194 of 245 | | | | |
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EUT turntable & styrofoam block

The EUT and measurement equipment were set up as shown in the diagram below.

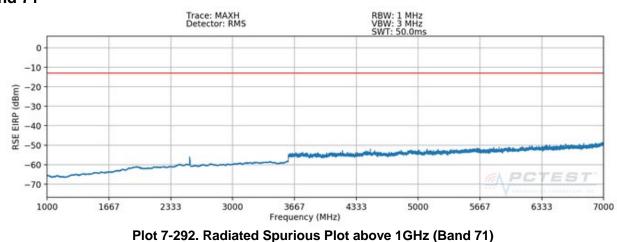
Figure 7-9. Test Instrument & Measurement Setup

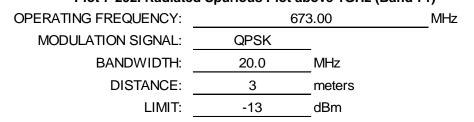
Test Notes

- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) This unit was tested with its standard battery.
- 3) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 4) Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
- 5) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager | | | | |
|--|---|---------------------------------------|---------------------------------|--|--|--|--|
| Test Report S/N: Test Dates: | | EUT Type: | Dogo 195 of 245 | | | | |
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| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|-----------------------|---------------------------|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------------|
| 1346.00 | Н | 288 | 355 | -73.83 | 8.20 | -65.63 | -52.6 |
| 2019.00 | Н | 226 | 12 | -63.54 | 8.54 | -55.00 | -42.0 |
| 2692.00 | Н | - | - | -75.78 | 7.51 | -68.27 | -55.3 |

Table 7-12. Radiated Spurious Data (Band 71 – Low Channel)

MHz

| | • | • | |
|----------------------|------|--------|--|
| OPERATING FREQUENCY: | (| 680.50 | |
| MODULATION SIGNAL: | QPSK | | |
| BANDWIDTH: | 20.0 | MHz | |
| DISTANCE: | 3 | meters | |
| LIMIT: | -13 | dBm | |
| | | | |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|-----------------------|---------------------------|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------------|
| 1361.00 | Н | 180 | 271 | -75.25 | 8.17 | -67.08 | -54.1 |
| 2041.50 | Н | 205 | 339 | -64.62 | 8.48 | -56.14 | -43.1 |
| 2722.00 | Н | - | - | -76.35 | 7.45 | -68.90 | -55.9 |

Table 7-13. Radiated Spurious Data (Band 71 – Mid Channel)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|----------------------------------|---|---------------------------------------|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Dage 196 of 245 |
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| OPERATING FREQUENCY: | 0.50 | MHz | |
|----------------------|------|--------|--|
| MODULATION SIGNAL: | QPSK | _ | |
| BANDWIDTH: | 20.0 | MHz | |
| DISTANCE: | 3 | meters | |
| LIMIT: | -13 | dBm | |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|-----------------------|---------------------------|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------------|
| 1361.00 | Н | 180 | 271 | -75.25 | 8.17 | -67.08 | -54.1 |
| 2041.50 | Н | 205 | 339 | -64.62 | 8.48 | -56.14 | -43.1 |
| 2722.00 | H | - | - | -76.35 | 7.45 | -68.90 | -55.9 |

Table 7-14. Radiated Spurious Data (Band 71 – High Channel)

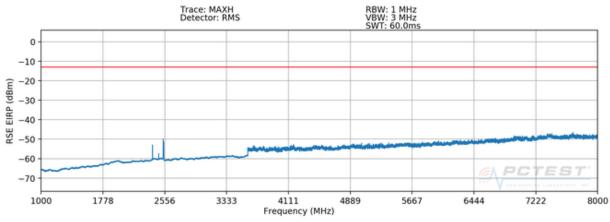
| OPERATING FREQUENCY: | 688 | 3.00 MHz |
|----------------------|------|----------|
| MODULATION SIGNAL: | QPSK | _ |
| BANDWIDTH: | 20.0 | MHz |
| DISTANCE: | 3 | meters |
| LIMIT: | -13 | dBm |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|-----------------------|---------------------------|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------------|
| 1376.00 | Н | 176 | 348 | -74.17 | 8.14 | -66.04 | -53.0 |
| 2064.00 | Н | 225 | 250 | -63.63 | 8.41 | -55.22 | -42.2 |
| 2752.00 | Н | - | - | -75.50 | 7.40 | -68.10 | -55.1 |

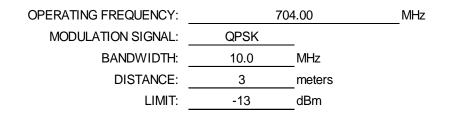
Table 7-15. Radiated Spurious Data with WCP (Band 71 – High Channel)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dogo 197 of 245 |
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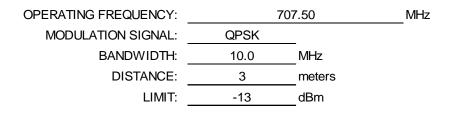


Plot 7-293. Radiated Spurious Plot above 1GHz (Band 12/17)



| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|-----------------------|---------------------------|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------------|
| 1408.00 | Н | 270 | 341 | -71.52 | 8.07 | -63.44 | -50.4 |
| 2112.00 | Н | 263 | 322 | -56.72 | 8.28 | -48.45 | -35.4 |
| 2816.00 | Н | - | - | -76.72 | 7.29 | -69.43 | -56.4 |

Table 7-16. Radiated Spurious Data (Band 12/17 – Low Channel)



| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|-----------------------|---------------------------|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------------|
| 1415.00 | Н | 293 | 230 | -70.14 | 8.06 | -62.08 | -49.1 |
| 2122.50 | Н | 166 | 253 | -55.83 | 8.25 | -47.58 | -34.6 |
| 2830.00 | Н | - | - | -76.18 | 7.27 | -68.91 | -55.9 |

Table 7-17. Radiated Spurious Data (Band 12/17 – Mid Channel)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dage 199 of 245 |
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| OPERATING FREQUENCY: | 71 | 1.00 | MHz |
|----------------------|------|--------|-----|
| MODULATION SIGNAL: | QPSK | _ | |
| BANDWIDTH: | 10.0 | MHz | |
| DISTANCE: | 3 | meters | |
| LIMIT: | -13 | dBm | |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|-----------------------|---------------------------|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------------|
| 1422.00 | Н | 176 | 345 | -71.51 | 8.05 | -63.46 | -50.5 |
| 2133.00 | Н | 380 | 318 | -54.08 | 8.22 | -45.87 | -32.9 |
| 2844.00 | Н | - | - | -75.96 | 7.25 | -68.71 | -55.7 |

Table 7-18. Radiated Spurious Data (Band 12/17 – High Channel)

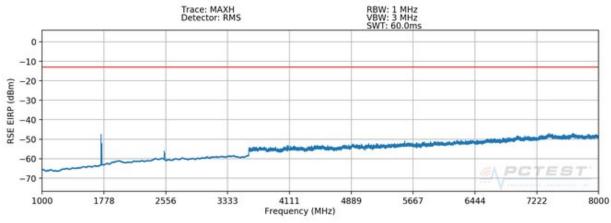
| OPERATING FREQUENCY: | 71 | 1.00 MHz |
|----------------------|------|----------|
| MODULATION SIGNAL: | QPSK | _ |
| BANDWIDTH: | 10.0 | MHz |
| DISTANCE: | 3 | meters |
| LIMIT: | -13 | dBm |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|-----------------------|---------------------------|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------------|
| 1422.00 | Н | 158 | 352 | -73.99 | 8.05 | -65.94 | -52.9 |
| 2133.00 | Н | 217 | 356 | -63.34 | 8.22 | -55.13 | -42.1 |
| 2844.00 | Н | - | - | -74.76 | 7.25 | -67.51 | -54.5 |

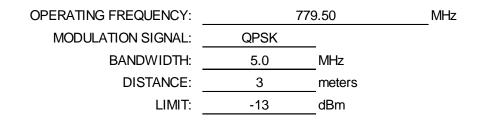
Table 7-19. Radiated Spurious Data with WCP (Band 12/17 – High Channel)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | | Approved by: Quality Manager | |
|----------------------------------|------------------------|---------------------------------------|---|--|--|
| Test Report S/N: | Test Dates: | EUT Type: | | logo 100 of 045 | |
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Plot 7-294. Radiated Spurious Plot above 1GHz (Band 13)



| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|-----------------------|---------------------------|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------------|
| 2338.50 | Н | 140 | 273 | -48.98 | 7.90 | -41.08 | -28.1 |
| 3118.00 | Н | - | - | -74.31 | 7.00 | -67.31 | -54.3 |

Table 7-20. Radiated Spurious Data (Band 13 – Low Channel)

OPERATING FREQUENCY:782.00MHzMODULATION SIGNAL:QPSKBANDWIDTH:5.0MHzDISTANCE:3metersLIMIT:-13dBm

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|-----------------------|---------------------------|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------------|
| 2346.00 | Н | 210 | 149 | -47.76 | 7.90 | -39.86 | -26.9 |
| 3128.00 | Н | - | - | -74.37 | 7.00 | -67.37 | -54.4 |

Table 7-21. Radiated Spurious Data (Band 13 – Mid Channel)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager | |
|----------------------------------|------------------------|---------------------------------------|------|---------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | | Dogo 100 of 245 | |
| 1M1811230205-03-R1.ZNF | 11/19/2018 - 1/17/2019 | Portable Handset | | Page 190 of 245 | |
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| OPERATING FREQUENCY: | 784.50 | | |
|----------------------|--------|--------|--|
| MODULATION SIGNAL: | QPSK | _ | |
| BANDWIDTH: | 5.0 | MHz | |
| DISTANCE: | 3 | meters | |
| LIMIT: | -13 | dBm | |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|-----------------------|---------------------------|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------------|
| 2353.50 | Н | 118 | 275 | -47.31 | 7.90 | -39.41 | -26.4 |
| 3138.00 | Н | - | - | -73.53 | 7.00 | -66.53 | -53.5 |

Table 7-22. Radiated Spurious Data (Band 13 – High Channel)

| MODULATION SIGNAL: | QPSK | _ |
|----------------------------|------|---------|
| BANDWIDTH: | 5.00 | MHz |
| DISTANCE: | 3 | meters |
| NARROWBAND EMISSION LIMIT: | -50 | dBm |
| WIDEBAND EMISSION LIMIT: | -40 | dBm/MHz |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|-----------------------|---------------------------|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------------|
| 1559.00 | Н | 229 | 29 | -69.05 | 7.98 | -61.08 | -21.1 |
| 1564.00 | Н | 153 | 319 | -68.79 | 7.98 | -60.81 | -20.8 |
| 1569.00 | Н | 225 | 33 | -67.20 | 7.99 | -59.22 | -19.2 |

Table 7-23. Radiated Spurious Data (Band 13 – 1559-1610MHz Band)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dage 101 of 245 |
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| OPERATING FREQUENCY: | 782 | MHz | |
|----------------------|------|--------|--|
| MODULATION SIGNAL: | QPSK | _ | |
| BANDWIDTH: | 5.0 | MHz | |
| DISTANCE: | 3 | meters | |
| LIMIT: | -13 | dBm | |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|-----------------------|---------------------------|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------------|
| 2346.00 | Н | 216 | 110 | -54.66 | 7.90 | -46.76 | -33.8 |
| 3128.00 | Н | - | - | -72.26 | 7.00 | -65.26 | -52.3 |

Table 7-24. Radiated Spurious Data with WCP (Band 13 – Mid Channel)

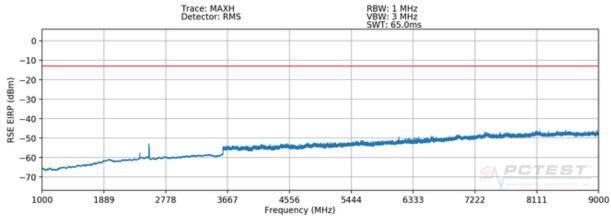
| MODULATION SIGNAL: | QPSK | _ |
|----------------------------|------|---------|
| BANDWIDTH: | 5.00 | MHz |
| DISTANCE: | 3 | meters |
| NARROWBAND EMISSION LIMIT: | -50 | dBm |
| WIDEBAND EMISSION LIMIT: | -40 | dBm/MHz |
| | | - |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|-----------------------|---------------------------|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------------|
| 1564.00 | Н | 124 | 337 | -71.21 | 7.98 | -63.23 | -23.2 |

Table 7-25. Radiated Spurious Data with WCP (Band 13 – 1559-1610MHz Band)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Page 192 of 245 |
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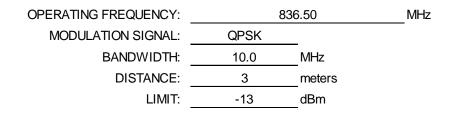


Plot 7-295. Radiated Spurious Plot above 1GHz (Band 26/5)

| OPERATING FREQUENCY: | 82 | MHz | |
|----------------------|------|--------|--|
| MODULATION SIGNAL: | QPSK | | |
| BANDWIDTH: | 10.0 | MHz | |
| DISTANCE: | 3 | meters | |
| LIMIT: | -13 | _dBm | |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|-----------------------|---------------------------|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------------|
| 1658.00 | Н | - | - | -78.61 | 8.09 | -70.52 | -57.5 |
| 2487.00 | Н | 201 | 337 | -68.23 | 7.90 | -60.33 | -47.3 |
| 3316.00 | Н | - | - | -69.40 | 7.00 | -62.40 | -49.4 |

Table 7-26. Radiated Spurious Data (Band 26/5 - Low Channel)



| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|-----------------------|---------------------------|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------------|
| 1673.00 | Н | - | - | -78.43 | 8.11 | -70.31 | -57.3 |
| 2509.50 | Н | 120 | 339 | -64.44 | 7.88 | -56.56 | -43.6 |
| 3346.00 | Н | - | - | -70.97 | 7.00 | -63.97 | -51.0 |

Table 7-27. Radiated Spurious Data (Band 26/5 - Mid Channel)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dogo 102 of 245 |
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| OPERATING FREQUENCY: | 844 | 4.00 | MHz |
|----------------------|------|--------|-----|
| MODULATION SIGNAL: | QPSK | _ | |
| BANDWIDTH: | 10.0 | MHz | |
| DISTANCE: | 3 | meters | |
| LIMIT: | -13 | dBm | |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|-----------------------|---------------------------|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------------|
| 1688.00 | Н | - | - | -78.17 | 8.13 | -70.04 | -57.0 |
| 2532.00 | Н | 145 | 330 | -66.52 | 7.83 | -58.69 | -45.7 |
| 3376.00 | Н | - | - | -71.23 | 7.00 | -64.23 | -51.2 |

Table 7-28. Radiated Spurious Data (Band 26/5 – High Channel)

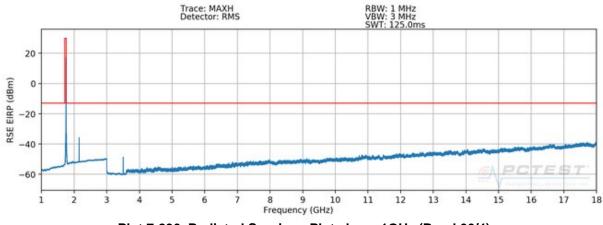
| OPERATING FREQUENCY: | 836 | 6.50 MHz |
|----------------------|------|----------|
| MODULATION SIGNAL: | QPSK | _ |
| BANDWIDTH: | 10.0 | MHz |
| DISTANCE: | 3 | meters |
| LIMIT: | -13 | dBm |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|-----------------------|---------------------------|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------------|
| 1673.00 | Н | - | - | -78.69 | 8.11 | -70.57 | -57.6 |
| 2509.50 | Н | 112 | 355 | -68.11 | 7.88 | -60.23 | -47.2 |
| 3346.00 | Н | - | - | -71.83 | 7.00 | -64.83 | -51.8 |

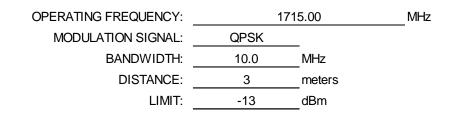
Table 7-29. Radiated Spurious Data with WCP (Band 26/5 – Mid Channel)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Dogo 104 of 245 |
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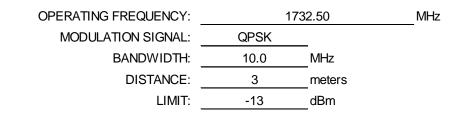


Plot 7-296. Radiated Spurious Plot above 1GHz (Band 66/4)



| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|-----------------------|---------------------------|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------------|
| 3430.00 | Н | 117 | 319 | -55.00 | 7.00 | -48.00 | -35.0 |
| 5145.00 | Н | 128 | 195 | -66.70 | 8.65 | -58.05 | -45.1 |
| 6860.00 | Н | - | - | -71.81 | 9.84 | -61.97 | -49.0 |

Table 7-30. Radiated Spurious Data (Band 66/4 – Low Channel)



| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|-----------------------|---------------------------|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------------|
| 3465.00 | Н | 113 | 318 | -59.34 | 7.00 | -52.34 | -39.3 |
| 5197.50 | Н | 118 | 209 | -70.00 | 8.52 | -61.48 | -48.5 |
| 6930.00 | Н | - | - | -71.93 | 9.87 | -62.05 | -49.1 |

Table 7-31. Radiated Spurious Data (Band 66/4 - Mid Channel)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|------|---------------------------------|
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| OPERATING FREQUENCY: | 175 | 0.00 | MHz |
|----------------------|------|--------|-----|
| MODULATION SIGNAL: | QPSK | _ | |
| BANDWIDTH: | 10.0 | MHz | |
| DISTANCE: | 3 | meters | |
| LIMIT: | -13 | dBm | |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|-----------------------|---------------------------|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------------|
| 3500.00 | H | 187 | 315 | -60.32 | 7.00 | -53.32 | -40.3 |
| 5250.00 | Н | 118 | 50 | -70.03 | 8.40 | -61.63 | -48.6 |
| 7000.00 | Н | - | - | -72.07 | 9.90 | -62.17 | -49.2 |

Table 7-32. Radiated Spurious Data (Band 66/4 – High Channel)

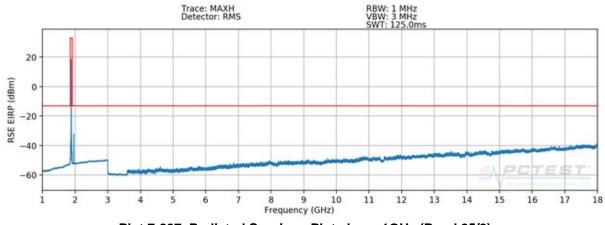
| OPERATING FREQUENCY: | 1750.00 | | |
|----------------------|---------|--------|--|
| MODULATION SIGNAL: | QPSK | _ | |
| BANDWIDTH: | 10.0 | MHz | |
| DISTANCE: | 3 | meters | |
| LIMIT: | -13 | dBm | |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|-----------------------|---------------------------|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------------|
| 3500.00 | Н | 202 | 347 | -64.44 | 7.00 | -57.44 | -44.4 |
| 5250.00 | Н | 112 | 23 | -67.98 | 8.40 | -59.58 | -46.6 |
| 7000.00 | Н | - | - | -71.27 | 9.90 | -61.37 | -48.4 |

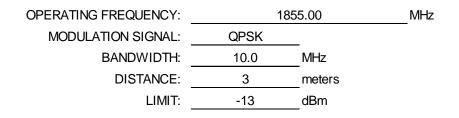
Table 7-33. Radiated Spurious Data with WCP (Band 66/4 - High Channel)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|--------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Page 196 of 245 |
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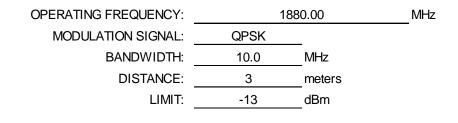


Plot 7-297. Radiated Spurious Plot above 1GHz (Band 25/2)



| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|-----------------------|---------------------------|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------------|
| 3710.00 | Н | 174 | 231 | -67.73 | 5.40 | -62.34 | -49.3 |
| 5565.00 | Н | 120 | 237 | -71.83 | 9.49 | -62.34 | -49.3 |
| 7420.00 | Н | - | - | -70.30 | 9.77 | -60.53 | -47.5 |

Table 7-34. Radiated Spurious Data (Band 25/2 - Low Channel)



| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|-----------------------|---------------------------|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------------|
| 3760.00 | Н | 133 | 277 | -63.65 | 5.10 | -58.54 | -45.5 |
| 5640.00 | Н | 170 | 228 | -66.19 | 9.70 | -56.49 | -43.5 |
| 7520.00 | Н | - | - | -70.48 | 9.79 | -60.69 | -47.7 |

Table 7-35. Radiated Spurious Data (Band 25/2 – Mid Channel)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|-----------------|---------------------------------|
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| OPERATING FREQUENCY: | 190 | 5.00 | MHz |
|----------------------|------|--------|-----|
| MODULATION SIGNAL: | QPSK | _ | |
| BANDWIDTH: | 10.0 | MHz | |
| DISTANCE: | 3 | meters | |
| LIMIT: | -13 | dBm | |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|-----------------------|---------------------------|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------------|
| 3810.00 | Н | 132 | 171 | -68.94 | 5.12 | -63.82 | -50.8 |
| 5715.00 | Н | 113 | 228 | -70.52 | 9.90 | -60.62 | -47.6 |
| 7620.00 | Н | - | - | -70.64 | 9.75 | -60.89 | -47.9 |

Table 7-36. Radiated Spurious Data (Band 25/2 – High Channel)

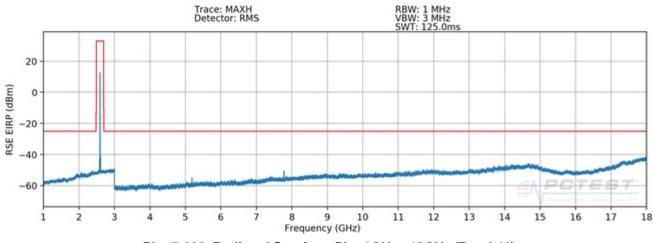
| OPERATING FREQUENCY: | 1880.00 | | |
|----------------------|---------|--------|--|
| MODULATION SIGNAL: | QPSK | _ | |
| BANDWIDTH: | 10.0 | MHz | |
| DISTANCE: | 3 | meters | |
| LIMIT: | -13 | dBm | |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|-----------------------|---------------------------|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------------|
| 3760.00 | Н | 110 | 249 | -63.07 | 5.10 | -57.96 | -45.0 |
| 5640.00 | Н | 227 | 231 | -69.25 | 9.70 | -59.55 | -46.6 |
| 7520.00 | Н | - | - | -69.19 | 9.79 | -59.40 | -46.4 |

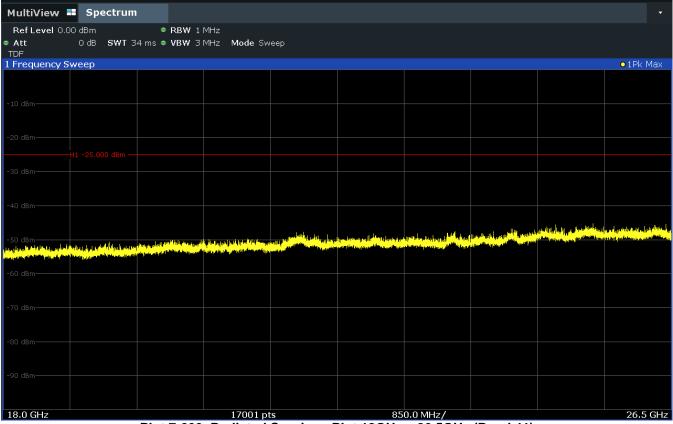
Table 7-37. Radiated Spurious Data with WCP (Band 25/2 – Mid Channel)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|------|---------------------------------|
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Plot 7-299. Radiated Spurious Plot 18GHz – 26.5GHz (Band 41)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Dage 100 of 245 |
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| OPERATING FREQUENCY: | 250 | 1.00 | MHz |
|----------------------|------|--------|-----|
| MODULATION SIGNAL: | QPSK | _ | |
| BANDWIDTH: | 10.0 | MHz | |
| DISTANCE: | 3 | meters | |
| LIMIT: | -25 | dBm | |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|-----------------------|---------------------------|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------------|
| 5002.00 | Н | - | - | -73.54 | 10.93 | -62.61 | -37.6 |
| 7503.00 | Н | - | - | -69.94 | 11.08 | -58.87 | -33.9 |

Table 7-38. Radiated Spurious Data (Band 41 – Low Channel)

2593.00

MHz

meters

OPERATING FREQUENCY:

QPSK MODULATION SIGNAL: 10.0

MHz

BANDWIDTH:

DISTANCE:

LIMIT: -25 dBm

3

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|-----------------------|---------------------------|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------------|
| 5186.00 | Н | 400 | 40 | -68.17 | 10.74 | -57.43 | -32.4 |
| 7779.00 | Н | 112 | 332 | -59.95 | 11.44 | -48.51 | -23.5 |
| 10372.00 | Н | 148 | 348 | -67.62 | 12.42 | -55.19 | -30.2 |
| 12965.00 | Н | - | - | -66.40 | 13.29 | -53.10 | -28.1 |

Table 7-39. Radiated Spurious Data (Band 41 – Mid Channel)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dage 200 of 245 |
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| OPERATING FREQUENCY: | 268 | 5.00 | MHz |
|----------------------|------|--------|-----|
| MODULATION SIGNAL: | QPSK | _ | |
| BANDWIDTH: | 10.0 | MHz | |
| DISTANCE: | 3 | meters | |
| LIMIT: | -25 | dBm | |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|-----------------------|---------------------------|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------------|
| 5370.00 | Н | 313 | 4 | -63.67 | 10.69 | -52.98 | -28.0 |
| 8055.00 | Н | 115 | 324 | -58.52 | 11.17 | -47.35 | -22.4 |
| 10740.00 | Н | 399 | 41 | -68.09 | 12.61 | -55.49 | -30.5 |
| 13425.00 | H | - | - | -65.02 | 12.59 | -52.43 | -27.4 |

Table 7-40. Radiated Spurious Data (Band 41 – High Channel)

| OPERATING FREQUENCY: | 259 | 3.00 | MHz |
|----------------------|------|--------|-----|
| MODULATION SIGNAL: | QPSK | _ | |
| BANDWIDTH: | 10.0 | MHz | |
| DISTANCE: | 3 | meters | |
| LIMIT: | -25 | dBm | |
| | | | |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|-----------------------|---------------------------|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------------|
| 5186.00 | Н | 205 | 347 | -66.84 | 10.74 | -56.10 | -31.1 |
| 7779.00 | Н | 123 | 354 | -66.31 | 11.44 | -54.87 | -29.9 |
| 10372.00 | Н | - | - | -66.87 | 12.42 | -54.45 | -29.4 |

Table 7-41. Radiated Spurious Data with WCP (Band 41 – Mid Channel)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|------|---------------------------------|
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7.10 Uplink Carrier Aggregation Radiated Measurements §2.1053, §27.53(m)

Test Overview

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-D-2010 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as peak measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v02r02 - Section 5.8

ANSI/TIA-603-D-2010 - Section 2.2.12

Test Settings

- 1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
- 2. VBW \geq 3 x RBW
- 3. No. of sweep points > 2 x span / RBW
- 4. Detector = RMS
- 5. Trace mode = trace average for continuous emissions, max hold for pulse emissions
- 6. The trace was allowed to stabilize

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|---------------------------------|
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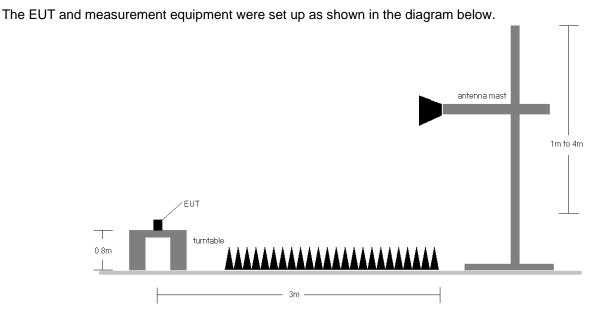


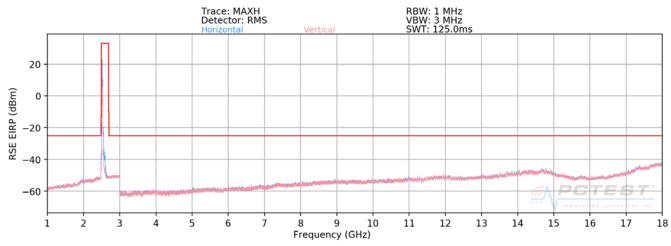
Figure 7-10. Test Instrument & Measurement Setup

Test Notes

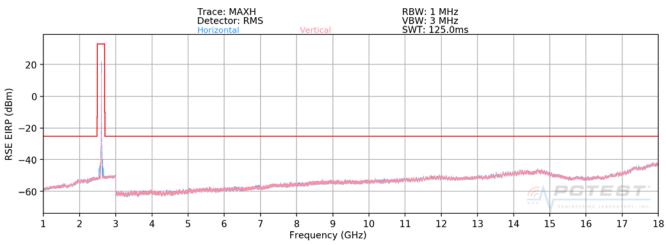
- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) This unit was tested with its standard battery.
- 3) Radiated spurious emissions measurements were evaluated for the two contiguous channels using various combinations of RB size, RB offset, modulation, and channel bandwidth. The worst case (highest) emissions were found while operating with QPSK modulation with both carriers set to transmit using 1RB.
- 4) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 5) Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
- 6) No significant emissions were found as a result of two uplink carriers operating contiguously.

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|----------------------------------|------------------------|--|---------------------------------|
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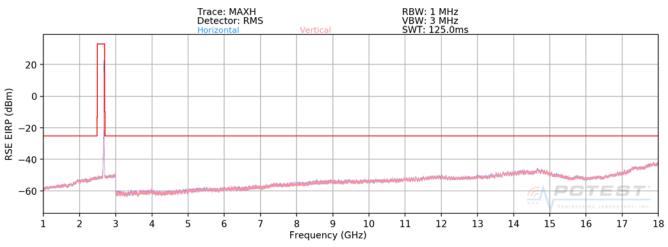








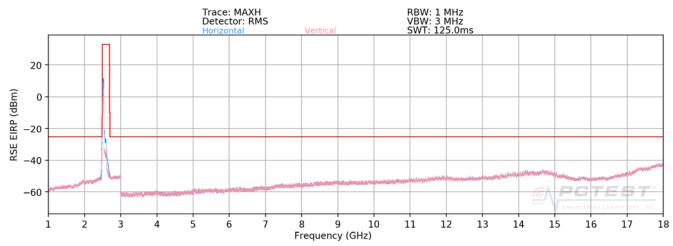
Plot 7-43. Radiated Spurious Plot (ULCA B41 PCC: RB 1 Offset 99, SCC: RB 1 Offset 0-Mid Channel)



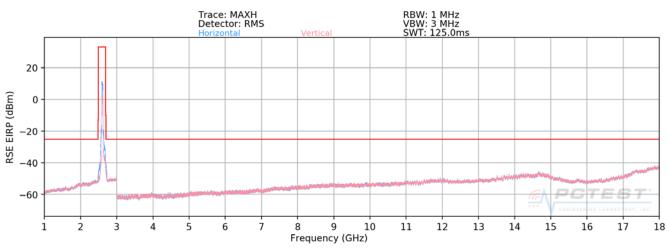
Plot 7-44. Radiated Spurious Plot (ULCA B41 PCC: RB 1 Offset 0, SCC: RB 1 Offset 99-High Channel)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager | |
|----------------------------------|------------------------|--|------|---------------------------------|--|
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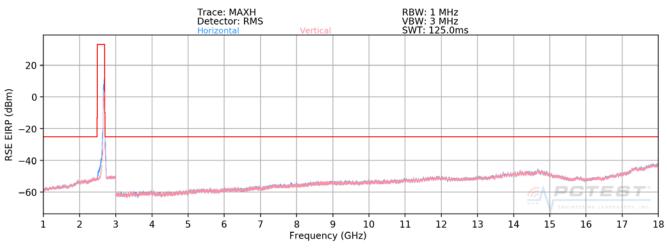








Plot 7-46. Radiated Spurious Plot (ULCA B41 PCC: RB 100 Offset 0, SCC: RB 100 Offset 0-Mid Channel)



Plot 7-47. Radiated Spurious Plot (ULCA B41 PCC: RB 100 Offset 0, SCC: RB 100 Offset 0-High Channel)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager | |
|----------------------------------|------------------------|---------------------------------------|------|---------------------------------|--|
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| 250 | 6.00 | MHz |
|------|--------------------------------------|----------------------|
| 252 | 5.80 | MHz |
| 39 | 750 | |
| 39 | | |
| QPSK | _ | |
| 20.0 | MHz | |
| 3 | meters | |
| -25 | dBm | |
| | 252 39 39 QPSK 20.0 3 | 20.0 MHz 3 meters |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|-----------------------|---------------------------|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------------|
| 5012.00 | Н | - | - | -73.79 | 10.93 | -62.86 | -37.9 |
| 7513.00 | Н | - | - | -69.80 | 11.08 | -58.72 | -33.7 |

Table 7-48. Radiated Spurious Data (ULCA B41 PCC: RB 1 Offset 99, SCC: RB 1 Offset 0-Low Channel)

| OPERATING FREQUENCY (PCC): | 259 | MHz | |
|----------------------------|------|---------|---------|
| OPERATING FREQUENCY (SCC): | 26 | 12.80 | MHz |
| CHANNEL (PCC): | 40 |)620 | |
| CHANNEL (SCC): | 40 |)818 | |
| MODULATION SIGNAL: | QPSK | _ | |
| BANDWIDTH: | 20.0 | MHz | |
| DISTANCE: | 3 | meters | |
| LIMIT: | -25 | dBm | |
| | | | |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|-----------------------|---------------------------|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------------|
| 5186.00 | Н | - | - | -72.94 | 10.74 | -62.20 | -37.2 |
| 7779.00 | Н | - | - | -70.30 | 11.44 | -58.86 | -33.9 |

Table 7-49. Radiated Spurious Data (ULCA B41 PCC: RB 1 Offset 99, SCC: RB 1 Offset 0-Mid Channel)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager | |
|----------------------------------|------------------------|---------------------------------------|------|---------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | | Dage 206 of 245 | |
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| 268 | MHz | |
|------|--------------------------------------|----------------------|
| 266 | MHz | |
| 41 | | |
| 41 | | |
| QPSK | _ | |
| 20.0 | MHz | |
| 3 | meters | |
| -25 | dBm | |
| | 266 41 41 QPSK 20.0 3 | 20.0 MHz 3 meters |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|-----------------------|---------------------------|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------------|
| 5360.00 | Н | 362 | 364 | -63.17 | 10.69 | -52.48 | -27.5 |
| 8045.00 | Н | 113 | 325 | -56.19 | 11.17 | -45.02 | -20.0 |
| 10730.00 | Н | 399 | 63 | -68.00 | 12.61 | -55.39 | -30.4 |
| 13415.00 | Н | - | - | -65.10 | 12.59 | -52.51 | -27.5 |

Table 7-50. Radiated Spurious Data (ULCA B41 PCC: RB 1 Offset 0, SCC: RB 1 Offset 99-High Channel)

| OPERATING FREQUENCY (PCC): | 268 | 80.00 | MHz |
|----------------------------|------|--------|-----|
| OPERATING FREQUENCY (SCC): | 260 | 60.20 | MHz |
| CHANNEL (PCC): | 41 | 1490 | |
| CHANNEL (SCC): | 41 | 1292 | |
| MODULATION SIGNAL: | QPSK | _ | |
| BANDWIDTH: | 20.0 | MHz | |
| DISTANCE: | 3 | meters | |
| LIMIT: | -25 | _dBm | |
| | | | |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|-----------------------|---------------------------|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|----------------|
| 5360.00 | Н | 350 | 348 | -67.37 | 10.69 | -56.68 | -31.7 |
| 7953.00 | H | 125 | 312 | -64.06 | 11.17 | -52.90 | -27.9 |
| 10546.00 | Н | - | - | -67.92 | 12.61 | -55.32 | -30.3 |
| 13139.00 | Н | - | - | -66.84 | 12.59 | -54.25 | -29.3 |

Table 7-51. Radiated Spurious Data with WCP (ULCA B41 PCC: RB 1 Offset 0, SCC: RB 1 Offset 99-High Channel)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
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7.11 Frequency Stability / Temperature Variation

Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-E-2016. The frequency stability of the transmitter is measured by:

- a.) **Temperature:** The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.
- b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

For Part 22, the frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ (± 2.5 ppm) of the center frequency. For Part 24, Part 27, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test Procedure Used

ANSI/TIA-603-E-2016

Test Settings

- 1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
- 2. The equipment is turned on in a "standby" condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
- 3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

Test Setup

The EUT was connected via an RF cable to a spectrum analyzer with the EUT placed inside an environmental chamber.

Test Notes

None

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|--|------------------------|---------------------------------------|------|---------------------------------|
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Band 71 Frequency Stability Measurements

| OPERATING FREQUENCY: | 680,500,000 | _Hz |
|----------------------|-------------|-----|
| REFERENCE VOLTAGE: | 3.87 | VDC |

| VOLTAGE (%) | POWER (VDC) | ТЕМР (°С) | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|----------------|----------------|---------------------|-------------------|--------------------|------------------|
| 100 % | 3.87 | - 30 | 680,500,287 | 287 | 0.0000422 |
| 100 % | | - 20 | 680,499,876 | -124 | -0.0000182 |
| 100 % | | - 10 | 680,500,089 | 89 | 0.0000131 |
| 100 % | | 0 | 680,500,246 | 246 | 0.0000361 |
| 100 % | | + 10 | 680,500,279 | 279 | 0.0000410 |
| 100 % | | + 20 | 680,499,790 | -210 | -0.0000309 |
| 100 % | | + 30 | 680,499,855 | -145 | -0.0000213 |
| 100 % | | + 40 | 680,499,969 | -31 | -0.0000046 |
| 100 % | | + 50 | 680,500,153 | 153 | 0.0000225 |
| BATT. ENDPOINT | 3.19 | + 20 | 680,500,374 | 374 | 0.0000550 |

Table 7-52. Frequency Stability Data (Band 71)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|------|---------------------------------|
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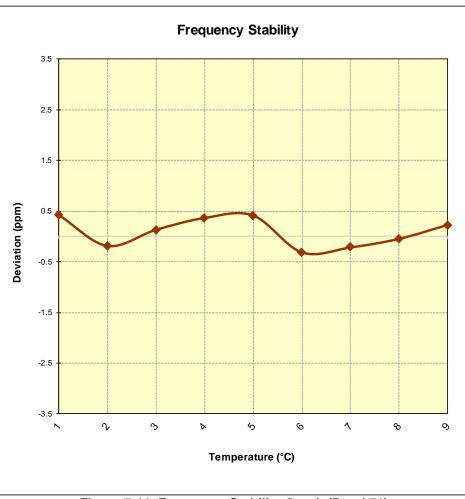


Figure 7-11. Frequency Stability Graph (Band 71)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dama 210 of 245 |
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Band 12/17 Frequency Stability Measurements

| OPERATING FREQUENCY: | 707,500,000 | _Hz |
|----------------------|-------------|-----|
| REFERENCE VOLTAGE: | 3.87 | VDC |

| VOLTAGE (%) | POWER (VDC) | ТЕМР ([°] С) | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|----------------|----------------|----------------------------------|-------------------|--------------------|------------------|
| 100 % | 3.87 | - 30 | 707,499,781 | -219 | -0.0000310 |
| 100 % | | - 20 | 707,500,421 | 421 | 0.0000595 |
| 100 % | | - 10 | 707,499,721 | -279 | -0.0000394 |
| 100 % | | 0 | 707,500,300 | 300 | 0.0000424 |
| 100 % | | + 10 | 707,500,135 | 135 | 0.0000191 |
| 100 % | | + 20 | 707,499,987 | -13 | -0.0000018 |
| 100 % | | + 30 | 707,499,749 | -251 | -0.0000355 |
| 100 % | | + 40 | 707,499,917 | -83 | -0.0000117 |
| 100 % | | + 50 | 707,499,997 | -3 | -0.0000004 |
| BATT. ENDPOINT | 3.19 | + 20 | 707,499,625 | -375 | -0.0000530 |

Table 7-53. Frequency Stability Data (Band 12/17)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | LG | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|----|---------------------------------|
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Band 12/17 Frequency Stability Measurements

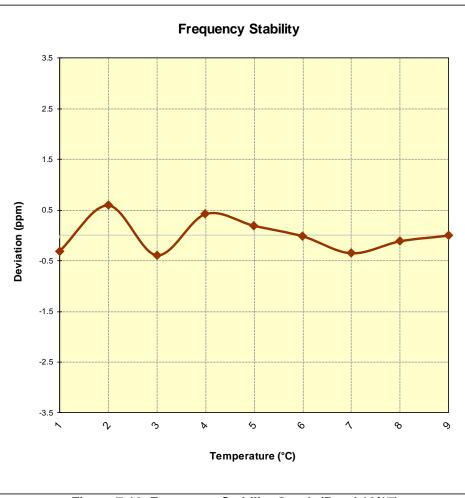


Figure 7-12. Frequency Stability Graph (Band 12/17)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager | |
|--|------------------------|---------------------------------------|---------------------------------|--|
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Band 13 Frequency Stability Measurements

| OPERATING FREQUENCY: | 782,000,000 | Hz |
|----------------------|-------------|-----|
| REFERENCE VOLTAGE: | 3.87 | VDC |

| VOLTAGE (%) | POWER (VDC) | ТЕМР (°С) | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|----------------|----------------|---------------------|-------------------|--------------------|------------------|
| 100 % | 3.87 | - 30 | 782,000,040 | 40 | 0.0000051 |
| 100 % | | - 20 | 781,999,937 | -63 | -0.0000081 |
| 100 % | | - 10 | 782,000,393 | 393 | 0.0000503 |
| 100 % | | 0 | 781,999,816 | -184 | -0.0000235 |
| 100 % | | + 10 | 781,999,731 | -269 | -0.0000344 |
| 100 % | | + 20 | 781,999,888 | -112 | -0.0000143 |
| 100 % | | + 30 | 782,000,221 | 221 | 0.0000283 |
| 100 % | | + 40 | 782,000,238 | 238 | 0.0000304 |
| 100 % | | + 50 | 781,999,928 | -72 | -0.0000092 |
| BATT. ENDPOINT | 3.19 | + 20 | 781,999,880 | -120 | -0.0000153 |

Table 7-54. Frequency Stability Data (Band 13)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|--|------------------------|---------------------------------------|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Dago 212 of 245 |
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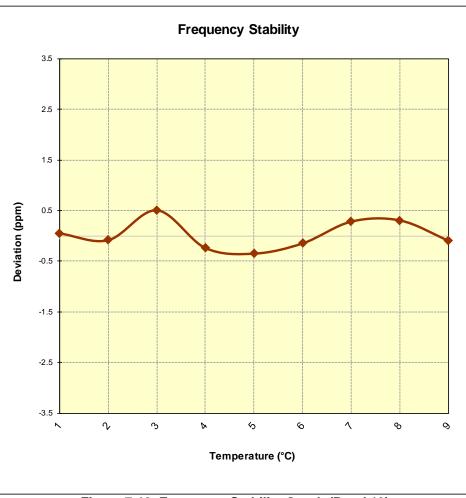


Figure 7-13. Frequency Stability Graph (Band 13)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager | |
|--|------------------------|---------------------------------------|---------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | Dage 214 of 245 | |
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Band 26/5 Frequency Stability Measurements

 OPERATING FREQUENCY:
 836,500,000
 Hz

 REFERENCE VOLTAGE:
 3.87
 VDC

 DEVIATION LIMIT:
 ± 0.00025 % or 2.5 ppm
 VDC

| VOLTAGE (%) | POWER (VDC) | TEMP (°C) | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|----------------|----------------|--------------|-------------------|--------------------|------------------|
| 100 % | 3.87 | - 30 | 836,500,020 | 20 | 0.0000024 |
| 100 % | | - 20 | 836,499,775 | -225 | -0.0000269 |
| 100 % | | - 10 | 836,500,073 | 73 | 0.000087 |
| 100 % | | 0 | 836,499,714 | -286 | -0.0000342 |
| 100 % | | + 10 | 836,499,909 | -91 | -0.0000109 |
| 100 % | | + 20 | 836,499,810 | -190 | -0.0000227 |
| 100 % | | + 30 | 836,500,057 | 57 | 0.000068 |
| 100 % | | + 40 | 836,499,688 | -312 | -0.0000373 |
| 100 % | | + 50 | 836,500,148 | 148 | 0.0000177 |
| BATT. ENDPOINT | 3.19 | + 20 | 836,499,978 | -22 | -0.0000026 |

Table 7-55. Frequency Stability Data (Band 26/5)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|------|---------------------------------|
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Band 26/5 Frequency Stability Measurements

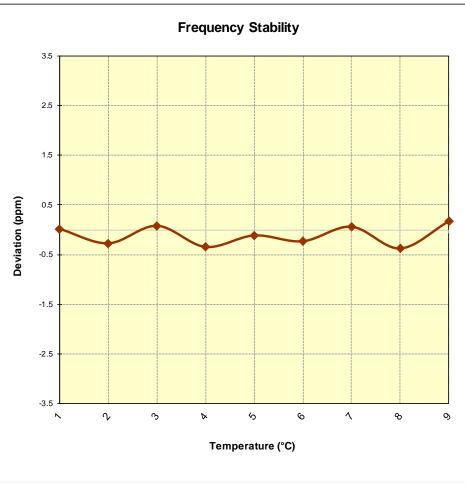


Figure 7-14. Frequency Stability Graph (Band 26/5)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|------|---------------------------------|
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Band 66/4 Frequency Stability Measurements

| OPERATING FREQUENCY: | 1,745,000,000 | Hz |
|----------------------|---------------|-----|
| REFERENCE VOLTAGE: | 3.87 | VDC |

| VOLTAGE (%) | POWER (VDC) | TEMP (°C) | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|----------------|----------------|--------------|-------------------|--------------------|------------------|
| 100 % | 3.87 | - 30 | 1,744,999,614 | -386 | -0.0000221 |
| 100 % | | - 20 | 1,745,000,295 | 295 | 0.0000169 |
| 100 % | | - 10 | 1,745,000,061 | 61 | 0.0000035 |
| 100 % | | 0 | 1,745,000,323 | 323 | 0.0000185 |
| 100 % | | + 10 | 1,744,999,993 | -7 | -0.0000004 |
| 100 % | | + 20 | 1,745,000,048 | 48 | 0.0000028 |
| 100 % | | + 30 | 1,744,999,853 | -147 | -0.0000084 |
| 100 % | | + 40 | 1,744,999,937 | -63 | -0.0000036 |
| 100 % | | + 50 | 1,744,999,911 | -89 | -0.0000051 |
| BATT. ENDPOINT | 3.19 | + 20 | 1,745,000,081 | 81 | 0.0000046 |

Table 7-56. Frequency Stability Data (Band 66/4)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|--|------------------------|---------------------------------------|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Dago 217 of 245 |
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| 2019 PCTEST Engineering Laboratory, Inc. | | | | V 8.8 11/19/2018 |



Band 66/4 Frequency Stability Measurements

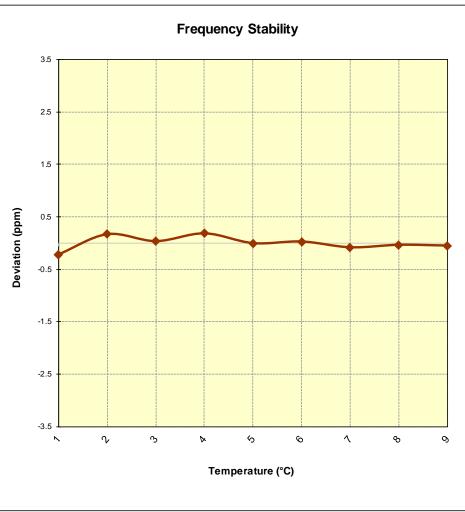


Figure 7-15. Frequency Stability Graph (Band 66/4)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|------|---------------------------------|
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Band 25/2 Frequency Stability Measurements

 OPERATING FREQUENCY:
 1,882,500,000
 Hz

 REFERENCE VOLTAGE:
 3.87
 VDC

 DEVIATION LIMIT:
 ± 0.00025 % or 2.5 ppm

| VOLTAGE (%) | POWER (VDC) | ТЕМР (°С) | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|----------------|----------------|---------------------|-------------------|--------------------|------------------|
| 100 % | 3.87 | - 30 | 1,882,500,425 | 425 | 0.0000226 |
| 100 % | | - 20 | 1,882,499,905 | -95 | -0.0000050 |
| 100 % | | - 10 | 1,882,499,924 | -76 | -0.0000040 |
| 100 % | | 0 | 1,882,500,215 | 215 | 0.0000114 |
| 100 % | | + 10 | 1,882,499,939 | -61 | -0.0000032 |
| 100 % | | + 20 | 1,882,499,988 | -12 | -0.0000006 |
| 100 % | | + 30 | 1,882,499,992 | -8 | -0.0000004 |
| 100 % | | + 40 | 1,882,500,199 | 199 | 0.0000106 |
| 100 % | | + 50 | 1,882,500,049 | 49 | 0.0000026 |
| BATT. ENDPOINT | 3.19 | + 20 | 1,882,499,826 | -174 | -0.0000092 |

Table 7-57. Frequency Stability Data (Band 25/2)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|--|------------------------|---------------------------------------|------|---------------------------------|
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Band 25/2 Frequency Stability Measurements

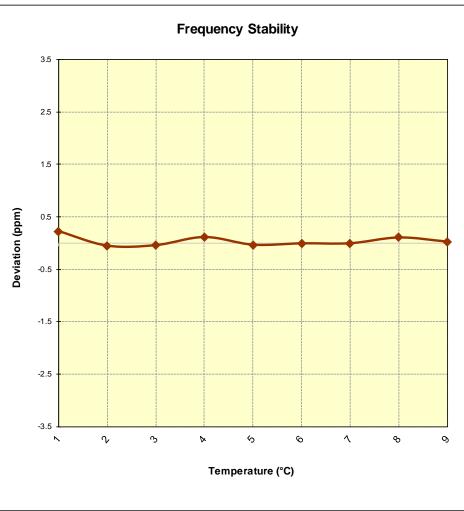


Figure 7-16. Frequency Stability Graph (Band 25/2)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Daga 220 of 245 |
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Band 41 Frequency Stability Measurements

| OPERATING FREQUENCY: | 2,593,000,000 | Hz |
|----------------------|---------------|-----|
| REFERENCE VOLTAGE: | 3.87 | VDC |

| VOLTAGE (%) | POWER (VDC) | ТЕМР (°С) | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|----------------|----------------|---------------------|-------------------|--------------------|------------------|
| 100 % | 3.87 | - 30 | 2,592,999,966 | -34 | -0.0000013 |
| 100 % | | - 20 | 2,592,999,840 | -160 | -0.0000062 |
| 100 % | | - 10 | 2,593,000,047 | 47 | 0.0000018 |
| 100 % | | 0 | 2,592,999,805 | -195 | -0.0000075 |
| 100 % | | + 10 | 2,592,999,828 | -172 | -0.0000066 |
| 100 % | | + 20 | 2,592,999,726 | -274 | -0.0000106 |
| 100 % | | + 30 | 2,593,000,034 | 34 | 0.0000013 |
| 100 % | | + 40 | 2,592,999,896 | -104 | -0.0000040 |
| 100 % | | + 50 | 2,593,000,289 | 289 | 0.0000111 |
| BATT. ENDPOINT | 3.19 | + 20 | 2,592,999,963 | -37 | -0.0000014 |

Table 7-58. Frequency Stability Data (Band 41)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager | | | | | |
|----------------------------------|--|---------------------------------------|---------------------------------|--|--|--|--|--|
| Test Report S/N: | Test Dates: | EUT Type: | Page 221 of 245 | | | | | |
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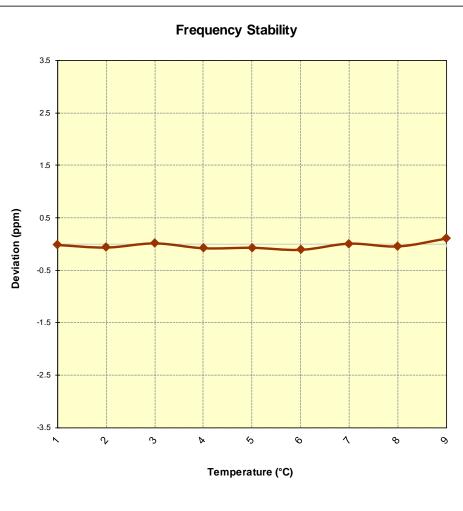


Figure 7-17. Frequency Stability Graph (Band 41)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕞 LG | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Dogo 222 of 245 |
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7.12 n41 (ENDC) Test Results



Plot 300. Occupied Bandwidth Plot (n41 60MHz CP-QPSK - Full RB Configuration)



Plot 301. Occupied Bandwidth Plot (n41 60MHz CP-16QAM - Full RB Configuration)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | | | |
|----------------------------------|------------------------|---------------------------------------|-----------------|-----------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | | Dage 222 of 245 | |
| 1M1811230205-03-R1.ZNF | 11/19/2018 - 1/17/2019 | Portable Handset | Page 223 of 245 | | |
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| 🔤 Keysight Spectrum Analyzer - C | | | | | | | | | | |
|----------------------------------|----------------|------------|------------|-------------------------------|-----------|-----------|-------------------------|----------------|------|-------------|
| Span 90.000 MHz | Ω DC | | | ISE:INT ea: 2.59299 | 000 GHz | | 02:32:54 P Radio Std | MDec 20, 2018 | Trac | e/Detector |
| Span 90.000 MHZ | NFE | | Trig: Free | Run | Avg Hold: | :>100/100 | | | | |
| | #1 | IFGain:Low | #Atten: 24 | 4 dB | | | Radio Dev | ice: BTS | | |
| | | | | | | | | | | |
| | 00 dBm | | | | | | | | | |
| Log 20.0 | | | | | | | | | | |
| 10.0 | Mar Contractor | mm | mound | Long | mound | man | | | (| Clear Write |
| 0.00 | | | | | | | | | | |
| | | | | | | | | | | |
| man although a thread | | | | | | | -mon | Mathendramon . | | Average |
| -20.0 | | | | | | | | | | Average |
| -30.0 | | | | | | | | | | |
| -40.0 | | | | | | | | | | |
| -50.0 | | | | | | | | | | Max Hold |
| -60.0 | | | | | | | | | | |
| Center 2.593 GHz | | | | | | | Spa | n 90 MHz | | |
| Res BW 820 kHz | | | VBV | | | | | ep 1 ms | | Min Hold |
| | | | | | | | | | | Minitiona |
| Occupied Ban | dwidth | | | Total P | ower | 29.9 | dBm | | | |
| | 57. | 640 MH | Z | | | | | | | Detector |
| | | | | | | | | | | Peak▶ |
| Transmit Freq E | rror | -25.039 kl | Z | % of OE | SW Powe | er 99 | .00 % | | Auto | <u>Man</u> |
| x dB Bandwidth | | 60.39 MI | Iz | x dB | | -26. | 00 dB | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| MSG | | | | | | STATUS | 5 | | | |

Plot 302. Occupied Bandwidth Plot (n41 60MHz CP-64QAM - Full RB Configuration)



Plot 303. Occupied Bandwidth Plot (n41 40MHz CP-QPSK - Full RB Configuration)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager | |
|----------------------------------|------------------------|---------------------------------------|---------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | Dogo 224 of 245 | |
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| © 2019 PCTEST Engineering Labora | V 8.8 11/19/2018 | | | |



| Keysight Spectrum Ar RF | | Occupied Ω DC | BW | | | SENSE:INT | | | | 02:22:10 P | M Dec 20, 2018 | | | |
|--------------------------------|---------|------------------|--------|--|---------|-----------------------------|----------|------------|-------------------|--------------|-------------------------|-------|-------------|--|
| | | | 1 | | | r Freq: 2.59299 Free Run | | l:>100/100 | Radio Std: None | | | Tra | ce/Detector | |
| | | NFE | #IFG | ⊂ ain:Low | | n: 24 dB | Avginoid | 1.>100/100 | Radio Device: BTS | | | | | |
| | | | | | | | | | | | | | | |
| 0 dB/div | ef 30 | .00 dE | m | | | | | | | | | | | |
| og | | | | | | | | | | | | | | |
| 20.0 | | and market | \sim | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ | ren and | | | m | | | | | Clear Wri | |
| 10.0 | | / | | | | | | | | | | | | |
| 0.00 | and the | | | | | | | | | Wy Wy Markey | Ind hard and the second | | | |
| 10.0 Mathing the second second | | | | | | | | | | | | | _ | |
| 20.0 | | | | | | | | | | | | | Avera | |
| 30.0 | | | | | | | | | | | | | | |
| 40.0 | | | | | | | | | | | | | | |
| 50.0 | | | | | | | | | | | | | Max Ho | |
| 60.0 | | | | | | | | | | | | | | |
| Center 2.593 G | SH7 | | | | | | | | | Sna | n 60 MHz | | | |
| Res BW 560 kl | | | | VBW 6 MHz | | | | | Sweep 1 ms | | | | Min Hol | |
| | | | | | | T - 4 - 1 - 5 | | 20 | 32.3 dBm | | | | | |
| Occupied | Ban | | | | | Total F | ower | 32 | .3 (| aBm | | | | |
| | | 3 | 8.6 | 99 M | Hz | | | | | | | | Detect | |
| Transmit Fr | rea F | rror | _/ | 19.592 | kH7 | % of O | BW Pow | or () | 1 0 (| 00 % | | Auto | Peal M | |
| | | | | | | | DWIOW | | | | | riato | <u></u> | |
| x dB Bandw | vidth | | | 59.86 | MHZ | x dB | | -20 | 5.00 | 0 dB | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| SG | | | | | | | | STAT | บร | | | | | |

Plot 304. Occupied Bandwidth Plot (n41 40MHz CP-16QAM - Full RB Configuration)



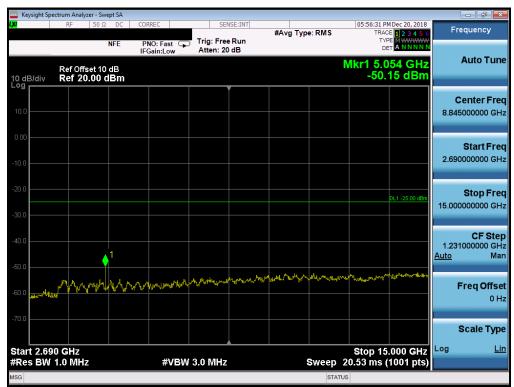
Plot 305. Occupied Bandwidth Plot (n41 40MHz CP-64QAM- Full RB Configuration)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager | |
|----------------------------------|------------------------|---------------------------------------|---------------------------------|--|
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| 🔤 Keysight Sp | ectrum Analyz | | | | | | | | | | | |
|-----------------------|------------------------|--------------------------------|------------------|-----------------------------|-------------------------|----------|----------------|---------------------|--|----------------------------------|---------------------|--------------------------------|
| l XI | RF | 50 Ω DC | CORREC | C | SEI | NSE:INT | #Avg Typ | e: RMS | TRA | M Dec 20, 2018 CE 1 2 3 4 5 6 | Fre | quency |
| | | NFE | PNO: IFGair | Fast 🖵 n:Low | Trig: Free Atten: 20 | | • // | | TY D | | | |
| 10 dB/div Log | | set 10 dB . 00 dBm | 1 | | | | | М | kr1 2.10 -52 | 5 8 GHz 79 dBm | | Auto Tune |
| 10.0 | | | | | | | | | | | | enter Frec 500000 GH2 |
| 10.00 | | | | | | | | | | | 30. | Start Free 000000 MH: |
| 20.0 | | | | | | | | | | DL1 -25.00 dBm | 2.475 | Stop Fred 000000 GH; |
| -40.0 | | | | | | | | | 1 | | 244. <u>Auto</u> | CF Step 500000 MH: Mar |
| | the contraction of the | put ^{an} i,seationaly | <u>مەنبىرىمە</u> | lhimle-h _{alter} e | waysauthe | free and | Mar Winter and | Nanyakê walî la îve | ann an the state of the state o | Riverin lipe Indensity of | F | r eq Offse 0 Ha |
| -70.0 | | | | | | | | | | | ę | Scale Type |
| Start 0.03 #Res BW | | | | #\/B\M | 3.0 MHz | | | Sweep | Stop 2 | 2.475 GHz (1001 pts) | Log | Lir |
| HICES DVV | no winz | | | #VLIV | 5.0 191112 | | | SWEEP | | (Too T pts) | | |

Plot 306. Conducted Spurious Plot (n41 - 60MHz CP-QPSK - RB Size 1, RB Offset 81 - Low Channel)



Plot 307. Conducted Spurious Plot (n41 - 60MHz CP-QPSK - RB Size 1, RB Offset 81 - Low Channel)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dage 226 of 245 |
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| 🔤 Keysight S | pectrum Analyzer - Swe | pt SA | | | | | | | | |
|-------------------|----------------------------------|------------|------------------------|-------------------------------------|------------|--|----------------|-----------------------|-----------------------|--|
| L <mark>XI</mark> | RF 50 Ω | DC CO | RREC | SEN | ISE:INT | #Avg Typ | e: RMS | | Dec 20, 2018 | Frequency |
| 10 dB/div | Ref Offset 10 Ref 0.00 dB | IF dB | NO: Fast 🖵 Gain:Low | Trig: Free Atten: 6 c | | | | TYF DE kr1 23.8 | 92 GHz 07 dBm | Auto Tune |
| -10.0 | | | | | | | | | | Center Freq 21.00000000 GHz |
| -20.0 | | | | | | | | | DL1 -25.00 dBm | Start Freq 15.00000000 GHz |
| -40.0 | | | | | | | | | | Stop Freq 27.000000000 GHz |
| -60.0 | and the advertise address in the | MPLAUMMERT | d Anthology Antonio | u,u ^{uk} u,Herejan,Irejan, | kepten def | hy hy or the state of the state | 1 multinium | Marturation | mintenderen | CF Step 1.200000000 GHz <u>Auto</u> Man |
| -80.0 | | | | | | | | | | Freq Offset 0 Hz |
| Start 15. | 000 GHz / 1.0 MHz | | #VBM | 3.0 MHz | | | Sween 2 | Stop 27 | .000 GHz 1001 pts) | Scale Type |
| MSG | | | | | | | STATUS | | reter proj | |

Plot 308. Conducted Spurious Plot (n41 - 60MHz CP-QPSK - RB Size 1, RB Offset 81 - Low Channel)

| | ectrum Analyzer - Swe | • | | | | | | | | |
|-----------|------------------------------|----------------------------|---|---------------|---------------|------------------------|---------------------|----------------|--|--------------------------|
| | RF 50 Ω | | NO: Fast | | | #Avg Typ | e: RMS | TRAC | M Dec 20, 2018 CE 1 2 3 4 5 6 PE M WWWWW ET A A N N N N | Frequency |
| | | IF | Gain:Low | Atten: 16 | | | N | ₀ Ikr1 2.49 | | Auto Tu |
| 0 dB/div | Ref Offset 10 Ref 16.00 c | | | | | | | -37.6 | 29 dBm | |
| 09 | | | | l l | Í | | | | | Center Fr |
| 6.00 | | | | | | | | | | 1.263000000 G |
| | | | | | | | | | | |
| | | | | | | | | | | Start Fr |
| 4.0 | | | | | | | | | | 30.000000 M |
| 4.0 | | | | | | | | | DI 1 -25.00 dBm | |
| .4.0 | | | | | | | | | | Stop Fr 2.496000000 G |
| 4.0 | | | | | | | | | <u>−1</u> | 2.4500000000 |
| 4.0 | | | | | | | | | 17 | CF St |
| 4.0 | | | | | | | | | | 246.600000 M Auto M |
| 4.0 | | | | | | | | | | |
| | | | adered and the | ut a da stade | ullinenshalla | J. Mary and The select | and share the state | www.www. | where the second | Freq Offs |
| | te-layon falson and the | an and the property of the | and the second secon | ALC: NO. | | | | | | 0 |
| 4.0 | | | | | | | | | | |
| | | | | | | | | | | Scale Ty |
| tart 0.03 | | | <i>#</i>) (5). | | | | | | | Log ! |
| Res BW | 1.0 MHz | | #VBW | 3.0 MHz | | | sweep | 3.067 ms | (1001 pts) | |

Plot 309. Conducted Spurious Plot (n41 - 60MHz CP-QPSK - RB Size 1, RB Offset 81 - Mid Channel)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|---------------------------------|
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| 🔤 Keysight Sp | ectrum Analyzer - | | | | | | |
|-----------------------|------------------------|-----------------------------|---------------------------|-------------------------------|---|--|---|
| L <mark>XI</mark> | RF 50 | Ω DC | CORREC | SENSE:INT | #Avg Type: RN | | 5 6 Frequency |
| | | NFE | PNO: Fast IFGain:Low | Trig: Free Run Atten: 6 dB | - // | TYPE M WWW DET A A N N | |
| 10 dB/div Log | Ref Offset Ref 6.00 | | | | | Mkr1 2.690 GF -42.034 dB | 74 |
| -4.00 | | | | | | | Center Freq 8.845000000 GHz |
| -14.0 | | | | | | DL1 -25.00 c | Start Fred 2.690000000 GHz |
| -34.0 | | | | | | | Stop Fred 15.000000000 GH2 |
| -54.0 | | | | | | | CF Step 1.231000000 GH: <u>Auto</u> Mar |
| -74.0 | www. | $\mathcal{A}_{\mathcal{A}}$ | bether managed and a star | Murturante | ryon ^a y prostrike have been all the | wayn tylonghywrheit y channahailet | Freq Offse 0 Hz |
| -84.0 | | | | | | | Scale Type |
| Start 2.69 #Res BW | | | #VBW | 3.0 MHz | Swe | Stop 15.000 GF ep 20.53 ms (1001 pt | tz ^{Log <u>Lin</u> ts)} |
| MSG | | | | | | STATUS | |

Plot 310. Conducted Spurious Plot (n41 - 60MHz CP-QPSK - RB Size 1, RB Offset 81 - Mid Channel)



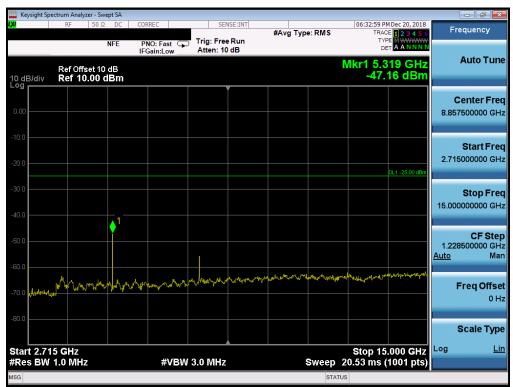
Plot 311. Conducted Spurious Plot (n41 - 60MHz CP-QPSK - RB Size 1, RB Offset 81 – Mid Channel)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|---------------------------------|
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| 🔤 Keysight Spe | ectrum Analyze | | | | | | | | | | × |
|-------------------|----------------------|---------|-----------------------------|------------------|---------------|------------|---|--------------------------|----------------|-----------------------|---------------|
| L <mark>XI</mark> | RF | 50 Ω DC | CORREC | SE | NSE:INT | #Avg Typ | e: RMS | | MDec 20, 2018 | Frequency | У |
| | | NFE | PNO: Fast (IFGain: I ow | Trig: Fre | | Avg Hold | | TYP | | | |
| | | | IFGain:Low | Atten: 2 | 000 | | | Mkr1 9 | 9.0 MHz | Auto T | Tune |
| 10 dB/div | Ref Offse Ref 20. | | | | | | | -48.8 | 99 dBm | | |
| | | | | | Ĭ | | | | | Center | From |
| 10.0 | | | | | | | | | | 1.263000000 | |
| | | | | | | | | | | | |
| 0.00 | | | | | | | | | | Oterret | - |
| | | | | | | | | | | Start 30.000000 | |
| -10.0 | | | | | | | | | | | 1011 12 |
| -20.0 | | | | | | | | | | | |
| | | | | | | | | | DL1 -25.00 dBm | Stop I 2.496000000 | |
| -30.0 | | | | | | | | | | 2.43000000 | GHZ |
| | | | | | | | | | | CES | Step |
| -40.0 | | | | | | | | | | 246.600000 | MHz |
| -50.0 | | | | | | | | | | <u>Auto</u> | Man |
| | | | | | | | | الملحد ال | alandah | | |
| -60.0 | alk hadhada li Ada | - | yn Lyfer yn hylle yn hail | apparent and and | William Heats | Amongobier | han and a state of the second s | U. Allinger and a second | | Freq O | ffset 0 Hz |
| i Marca alla | also a dese | | | | | | | | | | 0 H2 |
| -70.0 | | | | | | | | | | Scale 1 | Time |
| | | | | | | | | | | Scale | ype |
| Start 0.03 | | | | | | | | Stop 2 | .496 GHz | Log | Lin |
| #Res BW | 1.0 MHz | | #VB | W 3.0 MHz | * | | | | 1001 pts) | | |
| MSG | | | | | | | STATU | 6 | | | |

Plot 312. Conducted Spurious Plot (n41 - 60MHz CP-QPSK - RB Size 1, RB Offset 81 - High Channel)



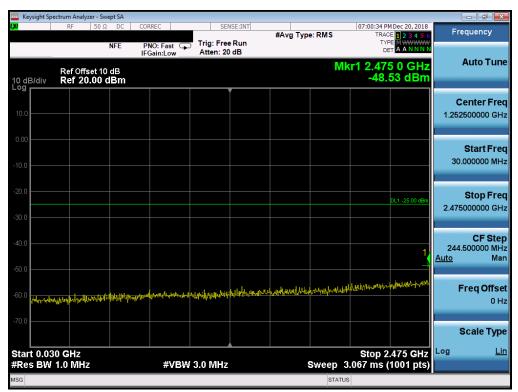
Plot 313. Conducted Spurious Plot (n41 - 60MHz CP-QPSK - RB Size 1, RB Offset 81 - High Channel)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
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| 🔤 Ke | ysight Sp | | nalyzer - Sw | | | | | | | | | | |
|---------------------|-----------|--------|------------------------|-----------------------------|----------------|------------------|------------------------|---|-------------------|--------------|--|------------------------|---|
| L <mark>XI</mark> | | RF | 50 Ω | DC | CORRE | C | SEI | NSE:INT | #Avg Typ | e: RMS | TRAC | MDec 20, 2018 | Frequency |
| 10 di | B/div | | Offset 10 0.00 dl | | PNO: IFGair | :Fast 🖵 n:Low | Trig: Free Atten: 6 | | | М | DE kr1 26.0 | 40 GHz 77 dBm | Auto Tune |
| Log -10.0 | | | | | | | | | | | | | Center Freq 21.000000000 GHz |
| -20.0 -30.0 | | | | | | | | | | | | DL1 -25.00 dBm | Start Freq 15.00000000 GHz |
| -40.0 -50.0 | | | | | | | | | | | | | Stop Freq 27.00000000 GHz |
| -60.0 | nhaharaya | Norman | nathuraw ^{an} | vertel ^{yl} sterne | paratrand | pt Joy Andrew | y Manson ways | nghryf ^{gi} r _w nof | at the second and | handrade and | ang the state of t | 1 profestiventering | CF Step 1.20000000 GHz <u>Auto</u> Man |
| -80.0 | | | | | | | | | | | | | Freq Offset 0 Hz |
| -90.0 Star | t 15.0 | 00 G | H7 | | | | | | | | Stop 27 | .000 GHz | Scale Type |
| | s BW | | | | | #VBW | 3.0 MHz | | | Sweep 2 | 0.00 ms (| 1001 pts) | |
| MSG | | | | | | | | | | STATUS | | | |

Plot 314. Conducted Spurious Plot (n41 - 60MHz CP-QPSK - RB Size 1, RB Offset 81 – High Channel)



Plot 315. Conducted Spurious Plot (n41 - 40MHz CP-QPSK - RB Size 53, RB Offset 26 - Low Channel)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Dage 220 of 245 |
| 1M1811230205-03-R1.ZNF | 11/19/2018 - 1/17/2019 | Portable Handset | | Page 230 of 245 |
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| 🔤 Keysight Sp | ectrum Analyzer - S | | | | | | | | | - 7 - |
|---------------------------|---------------------------|--------|---|-------------------------|------------------|---------------|------------------|------------------|-----------------------|--|
| <mark>l)XI</mark> | RF 50 | Ω DC (| CORREC | SEN | NSE:INT | #Avg Typ | e: RMS | | Dec 20, 2018 | Frequency |
| | | NFE | PNO: Fast 🕞 IFGain:Low | Trig: Free Atten: 10 | | | | TYP | | |
| 10 dB/div Log | Ref Offset 1 Ref 10.00 | | | | | | | Mkr1 5.0 -50. | 29 GHz 95 dBm | Auto Tune |
| 0.00 | | | | | | | | | | Center Freq 8.845000000 GHz |
| -10.0 | | | | | | | | | DL1 -25.00 dBm | Start Freq 2.69000000 GHz |
| -30.0 | | | | | | | | | | Stop Freq 15.00000000 GHz |
| -50.0 | | ↓ 1 | | | | | | | | CF Step 1.231000000 GHz <u>Auto</u> Man |
| -70.0 <mark>x1/777</mark> | w have | | han han an a | whynkarhuutso | noprod-by prover | qraantarty wa | ant and a second | er allow and | han Masshand | Freq Offset 0 Hz |
| -80.0 | | | | | | | | | | Scale Type |
| Start 2.69 #Res BW | | | #\/B\M | 3.0 MHz | | | Swoon 7 | Stop 15 | .000 GHz 1001 pts) | Log <u>Lin</u> |
| #Res DW | | | #V DVV | 3.0 WINZ | | | sweep z | | Toor pis) | |
| | | | | | | | STATUC | | | |

Plot 316. Conducted Spurious Plot (n41 - 40MHz CP-QPSK - RB Size 53, RB Offset 26 - Low Channel)

| | ectrum Analyzer - Sw | | | | | | | | | | d X |
|-------------------|---|-----------------|-------------------------|---------------------------|----------------------|--------------------|-----------------|--------------|---|--------------------------------|----------------------|
| | RF 50 Ω | NFE P | RREC | Trig: Free | | #Avg Ty | oe: RMS | TRAC TY | M Dec 20, 2018 CE 1 2 3 4 5 6 PE M WWWW FT A A N N N N | Frequer | ncy |
| 0 dB/div | Ref Offset 10 Ref 6.00 dl |) dB | Gain:Low | Atten: 6 | dB | | | Mkr1 26.0 | | Auto | o Tun |
| 4.00 | | | | | | | | | | Cente 21.0000000 | |
| 4.0 | | | | | | | | | DL1-25.00 dBm | Stai 15.0000000 | rt Fre |
| 14.0 | | | | | | | | | | Sto 27.0000000 | p Fr 100 G |
| 54.0 | | | | | | | hernellinger | wa manakatan | 1 | CI 1.2000000 <u>Auto</u> | F Ste 100 GI M |
| 4.0 | unnallatrapyhan _{ing} o ^t a | when when we we | _₽ ₩µ₳₩₽₩₽₩₽~ | Je ^{kt} ustorije | and the second first | affenitik arterato | Nel controler - | a . Mar Mar | | Freq | Offs 0 |
| 14.0 tart 15.0 | 00 647 | | | | | | | Stop 27 | .000 GHz | Scale | е Туј |
| tart IJ.U | 1.0 MHz | | | 3.0 MHz | | | - | 20.00 ms (| .000 GHZ | | |

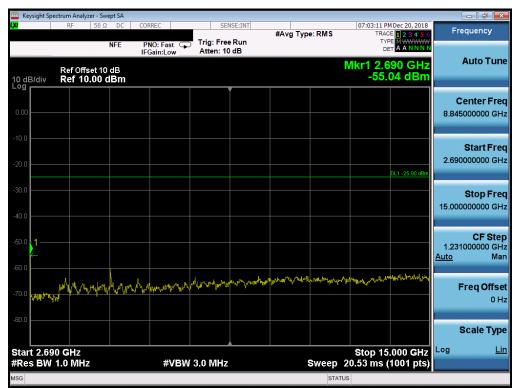
Plot 317. Conducted Spurious Plot (n41 - 40MHz CP-QPSK - RB Size 53, RB Offset 26 - Low Channel)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | Approved k Quality Man | , |
|----------------------------------|------------------------|---------------------------------------|---------------------------|-------|
| Test Report S/N: | Test Dates: | EUT Type: | Dage 221 el | 6045 |
| 1M1811230205-03-R1.ZNF | 11/19/2018 - 1/17/2019 | Portable Handset | Page 231 of | 1 245 |
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| Log Center Freq 100 Center Freq 100 Start Stop Freq 2.49600000 GHz 100 Start Stop Freq 2.49600000 GHz 100 Start Stop Freq 2.49600000 GHz 100 Start Stop Freq 100 Start Stop Freq 100 Stop Freq | 🔤 Keysight Sp | ectrum Analyz | | | | | | | | | |
|--|---------------|------------------|---------|-----------------------------|---|---------------|----------------|------------|---------------------|-------------------|----------------|
| NFE PRO: Fast IFGain:Low Trig: Free Run Atten: 20 dB Trig: Free Run Atten: 20 dB Auto Tune 0 dB/div Ref Offset 10 dB Ref 20.00 dBm Mkr1 2.496 0 GHz -45.80 dBm Center Freq 1.26300000 GHz 00 Image: Start Freq 30.000000 MHz Image: Start Freq 30.000000 MHz Image: Start Freq 30.000000 MHz 00 Image: Start Freq 30.000000 MHz Image: Start Freq 30.000000 MHz Image: Start Freq 30.000000 MHz 00 Image: Start Freq 30.000000 MHz Image: Start Freq 30.000000 MHz Image: Start Freq 30.000000 MHz 00 Image: Start Freq 30.00000 MHz Image: Start Freq 30.00000 MHz Image: Start Freq 30.00000 MHz 00 Image: Start Freq 30.00000 MHz Image: Start Freq 30.00000 MHz Image: Start Freq 30.00000 MHz 01 Image: Start Freq 30.00000 MHz Image: Start Freq 30.00000 MHz Image: Start Freq 30.00000 MHz 01 Image: Start Freq 30.0000 MHz Image: Start Freq 30.0000 MHz Image: Start Freq 30.0000 MHz Image: Start Freq 30.0000 MHz 01 Image: Start Freq 30.0000 MHz Image: Start Freq 30.0000 MHz Image: Start Freq 30.0000 MHz Image: Start Freq 30.0000 MHz 02 Image: Start Freq 30.0000 MHz Image: Start Freq 30.0000 MHz Image: Start Freq 30.0000 MHz Image: Sta | LXI | RF | 50 Ω DC | CORREC | SEN | | #Avg Type | e: RMS | | | Frequency |
| Ref Offset 10 dB MikT 2.4496 U GHz 10 dB/div Ref 20.00 dBm -45.80 dBm 20 dB/div -45.80 dBm -45.80 dBm 40 dB/div -45.80 dBm -46.600000 | | | NFE | PNO: Fast G | | Run | | | TYF DE | | |
| 100 Image: Center Freq 2.49600000 MHz Image: C | 10 dB/div | | | | | | | Mk | r1 2.490 -45.8 | 5 0 GHz 80 dBm | Auto Tune |
| 100 Start Freq 200 011-2500cm 201 011-2500cm </td <td></td> | | | | | | | | | | | |
| 300 311-25.00 den 311-25.00 den 310 400 410 410 410 410 500 410 410 410 410 500 410 410 410 410 500 410 410 410 410 500 410 410 410 410 500 410 410 410 410 500 410 410 410 410 500 410 410 410 410 600 410 410 410 410 600 410 410 410 410 600 410 410 410 410 600 410 410 410 410 600 410 410 410 410 600 410 410 410 410 700 500 500 700 700 8 500 500 500 700 700 500 500 700 700 8 500 500 700 700 8 700 700 700 700 8 700 | -10.0 | | | | | | | | | | |
| 4400 | -20.0 | | | | | | | | | DL1 -25.00 dBm | |
| -600 with the set of t | -40.0 | | | | | | | | | 1 | 246.600000 MHz |
| Start 0.030 GHz #Res BW 1.0 MHz #VBW 3.0 MHz Sweep 3.067 ms (1001 pts) | | when whether the | muthing | geographic location of test | han an a | annifperiodad | portillarlyans | Myharinnan | ulmannf Albenni | without | |
| Built 0.050 GHZ Stop 2.450 GHZ #Res BW 1.0 MHz #VBW 3.0 MHz Sweep 3.067 ms (1001 pts) | -70.0 | | | | | | | | | | Scale Type |
| | | | | #VBV | V 3.0 MHz | | | Sweep 3 | Stop 2 .067 ms (| 450 GHZ | Log <u>Lin</u> |
| | MSG | | | | | | | | | | |

Plot 318. Conducted Spurious Plot (n41 - 40MHz CP-QPSK - RB Size 53, RB Offset 26 - Mid Channel)



Plot 319. Conducted Spurious Plot (n41 - 40MHz CP-QPSK - RB Size 53, RB Offset 26 - Mid Channel)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Daga 222 of 245 |
| 1M1811230205-03-R1.ZNF | 11/19/2018 - 1/17/2019 | Portable Handset | Page 232 of 245 |
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| RF 50 Ω DC CORREC SENSE:INT 07:03:48 PM Dec 20, 2018 Frequency NFE PNO: Fast IFGain:Low Trig: Free Run Atten: 6 dB #Avg Type: RMS TRACE II 23:45:6 TYPE IV MANNANT Frequency Ref Offset 10 dB Mkr1 26.436 GHz -61.43 dBm Auto Tune |
|--|
| NFE PNO: Fast IFGain:Low Trig: Free Run Atten: 6 dB Trig: Free Run Det A ANNNN Trig: Free Run Det A ANNNN Ref Offset 10 dB Mkr1 26.436 GHz -61.43 dBm Auto Tune |
| og |
| 10.0 Center Fred 21.00000000 GH2 |
| 20.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 |
| 40.0 Stop Fred 50.0 Stop Fred 27.00000000 GH2 |
| 50.0 70.0 |
| 500 Freq Offset 0 Hz |
| Scale Type |
| tart 15.000 GHz Stop 27.000 GHz ^{Log} L ^{ir} Res BW 1.0 MHz #VBW 3.0 MHz Sweep 20.00 ms (1001 pts) |
| SG STATUS |

Plot 320. Conducted Spurious Plot (n41 - 40MHz CP-QPSK - RB Size 53, RB Offset 26 - Mid Channel)

| | | | | | | | | | rum Analyzer - Swe | |
|-------------------------------|---|----------------------|---------------|----------|-----------|---------------|-----------------|---|-------------------------------------|-----------|
| Frequency | M Dec 20, 2018 E 1 2 3 4 5 6 PE M WWWWWW T A A N N N N | TRAC | e: RMS | #Avg Typ | | Trig: Free | REC | | RF 50 Ω | |
| Auto Tur | | | | | | Atten: 20 | Gain:Low | | | |
| | 06 dBm | kr1 2.49 -50. | IVI | | | | | | Ref Offset 10 Ref 20.00 d | 0 dB/div |
| Center Fre | | | | | | | | | | 08 |
| 1.263000000 GI | | | | | | | | | | 10.0 |
| | | | | | | | | | | .00 |
| Start Fre 30.000000 Mi | | | | | | | | | | 0.0 |
| | | | | | | | | | | 0.0 |
| Stop Fr | DL1 -25.00 dBm | | | | | | | | | 0.0 |
| 2.496000000 G | | | | | | | | | | 0.0 |
| CF St | | | | | | | | | | 0.0 |
| 246.600000 M <u>Auto</u> M | 1 | | | | | | | | | |
| | المحملين معروبين ال | | | | | | | | | 0.0 |
| Freq Offs | and an an an an an | la-trician provident | pendonaryhden | hoursen | hyphpharm | epflannskeren | hanne artal and | and the state of the | ution the second strates | |
| | | | | | | | | | | 0.0 |
| Scale Ty | | | | | | | | | | |
| Log <u>L</u> | .496 GHz | Stop 2 | | | | | | | GHz | tart 0.03 |
| | | 3.067 ms (| Sweep (| | | 3.0 MHz | #VBW | | | Res BW |

Plot 321. Conducted Spurious Plot (n41 - 40MHz CP-QPSK - RB Size 53, RB Offset 26 - High Channel)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|--|-------------|---------------------------------------|------|---------------------------------|
| Test Report S/N: Test Dates: 1M1811230205-03-R1.ZNF 11/19/2018 – 1/17/2019 | | EUT Type: | | Dogo 222 of 245 |
| | | Portable Handset | | Page 233 of 245 |
| © 2019 PCTEST Engineering Labora | atory, Inc. | | | V 8.8 11/19/2018 |



| Keysight Sp | ectrum Analyzer - S | | | | | | | | | - 7 - |
|-----------------------|---------------------------|---------|---|-------------------------|---------------|-----------------|--|----------------------|--------------------------------|---|
| <mark>LXI</mark> | RF 50 9 | 2 DC CC | RREC | SEN | ISE:INT | #Avg Typ | e: RMS | | Dec 20, 2018 | Frequency |
| | | IF | PNO: Fast 🕞 Gain:Low | Trig: Free Atten: 10 | | | | TYF DE | | Auto Tune |
| 10 dB/div Log | Ref Offset 1 Ref 10.00 | | | | | | | -41.3 | 23 dBm | |
| 0.00 | | | | | | | | | | Center Freq 8.857500000 GHz |
| -10.0 | | | | | | | | | DL1 -25.00 dBm | Start Freq 2.715000000 GHz |
| -30.0 -40.0 | | | | | | | | | | Stop Freq 15.00000000 GHz |
| -50.0 | | | | | | | | | | CF Step 1.228500000 GHz <u>Auto</u> Man |
| -70.0 June May | Mumm | man | hanna an | muhahan | have proposed | n soar an an an | ornorn _{ho} ud _{aa} aa | at "blokest the rad" | nogelyw ¹ 4flodyniu | Freq Offset 0 Hz |
| -80.0 | | | | | | | | | | Scale Type |
| Start 2.71 #Res BW | | | #VBM | 3.0 MHz | | | Sween_2 | Stop 15 | .000 GHz 1001 pts) | Log <u>Lin</u> |
| MSG | Try 10112 | | ~*D** | 0.011112 | | | STATU | | 1001 pt3) | |
| | | | | | | | | | | |

Plot 322. Conducted Spurious Plot (n41 - 40MHz CP-QPSK - RB Size 53, RB Offset 26 - High Channel)



Plot 323. Conducted Spurious Plot (n41 - 40MHz CP-QPSK - RB Size 53, RB Offset 26 - High Channel)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | LG | Approved by: Quality Manager | | |
|---|--|---------------------------------------|----|---------------------------------|--|--|
| Test Report S/N: | Test Dates: | EUT Type: | | Daga 224 of 245 | | |
| 1M1811230205-03-R1.ZNF 11/19/2018 - 1/17/2019 | | Portable Handset | | Page 234 of 245 | | |
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| Key: | | n Analyzer - Spuriou | | | osuos turi | | | |
|-------------|----------------|----------------------|------------|-----------|-------------------------------|----------------|--------------------------------------|----------------|
| ., . | . 1 | RF 50Ω [| DC CORREC | | SENSE:INT r Freq: 2.506000 | 000 GHz | 06:40:04 PM Dec 2 Radio Std: None | |
| PAS | s | NF | | | Free Run n: 28 dB | | Radio Device: B | TE |
| 1.40 | | | IFGain:Low | , #Atte | n. 26 dB | | Radio Device: B | |
| | | | | | | | | |
| 10 dB | 3/div | Ref 30.00 (| dBm | | | | | |
| Log 20.0 | | | | | | | | Contor Fro |
| | | | | | | | | Center Free |
| 10.0 | | | | | | | | 2.506000000 GH |
| 0.00 | | | | | | | | |
| -10.0 | | | | | | | | |
| -20.0 | | | | | | | | |
| -30.0 | | | | | | | | |
| | | | | | | | | |
| -40.0 | | | | | | | | |
| -50.0 | and the second | | | | | | | |
| -60.0 | | | | | | | | |
| L | | | | | | | | |
| Start | t 2.475 C | GHz | | | | | Stop 2.517 | GHz CF Step |
| | | | | | | | | 5.000000 MH |
| Spur | Range | Start Freq | Stop Freq | RBW | Frequency | Amplitude | ∆ Limit | Auto Mai |
| 1 | 1 | 2.4750 GHz | 2.4905 GHz | | | GHz -36.03 dBm | -11.03 dB | |
| 2 | 2 | 2.4905 GHz | 2.4950 GHz | | | Hz -34.38 dBm | -21.38 dB | FreqOffse |
| 3 | 3 | 2.4950 GHz | 2.4960 GHz | | | Hz -27.87 dBm | -14.87 dB | 0 H |
| 4 | 4 | 2.4960 GHz | 2.5170 GHz | 1.000 MHz | 2.516720000 | Hz -1.506 dBm | -26.51 dB | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| //SG | | | | | | STA | TUS | |
| _ | | | | | | | | |





Plot 325. Upper Band Edge Plot (n41 - 60MHz CP-QPSK - Full RB Configuration)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | G | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|---|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Dage 225 of 245 |
| 1M1811230205-03-R1.ZNF | 11/19/2018 - 1/17/2019 | Portable Handset | | Page 235 of 245 |
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| Keys XI L | F | Analyzer - Spurio F 50 Ω NF | DC CORREC | Trig: | SENSE:INT r Freq: 2.506000000 Free Run | GHz | 06:40:43 PM Dec 27, 2018 Radio Std: None | Frequency |
|-------------------------------|---------|-----------------------------------|------------|-----------|--|------------|---|-------------------------------------|
| | | D -6 00 00 | IFGain:Low | #Atte | n: 28 dB | | Radio Device: BTS | Ī |
| 10 dB Log 20.0 | S/dIV | Ref 30.00 (| | | | | | Center Fre 2.506000000 GH |
| 0.00 -10.0 -20.0 | | | | | | | | |
| -30.0 - -40.0 - -50.0 - | | | | | | | | |
| -60.0 Start | 2.475 C | SHz | | | | | Stop 2.517 GHz | 5.000000 MH |
| Spur | Range | Start Freq | Stop Freq | RBW | Frequency | Amplitude | ∆ Limit | Auto Ma |
| 1 | 1 | 2.4750 GHz | 2.4905 GHz | 1.000 MHz | 2.490448333 GHz | -32.17 dBm | -7.168 dB | |
| 2 | 2 | 2.4905 GHz | 2.4950 GHz | 1.000 MHz | 2.494940000 GHz | -30.73 dBm | -17.73 dB | Freq Offs |
| 3 | 3 | 2.4950 GHz | 2.4960 GHz | 1.000 MHz | 2.496000000 GHz | -25.15 dBm | -12.15 dB | |
| 4 | 4 | 2.4960 GHz | 2.5170 GHz | 1.000 MHz | 2.515285000 GHz | 1.857 dBm | -23.14 dB | 01 |
| | | | | | | | | |
| | | | | | | | | |





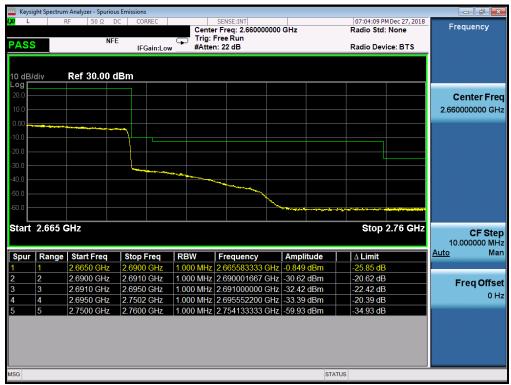
Plot 327. Upper Band Edge Plot (n41 - 60MHz CP-16QAM - Full RB Configuration)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dama 226 of 245 |
| 1M1811230205-03-R1.ZNF | 11/19/2018 - 1/17/2019 | Portable Handset | Page 236 of 245 |
| © 2019 PCTEST Engineering Labora | atory, Inc. | • | V 8.8 11/19/2018 |



| XI L | | m Analyzer - Spurio RF 50 Ω NF | DC CORREC | Trig: | SENSE:INT r Freq: 2.506000000 Free Run | GHz | 06:41:18 PM Dec 27, 20 Radio Std: None | D18 Frequency |
|--------------|----------------------|--------------------------------------|------------|-----------|---|------------|---|----------------|
| PAS | S | | IFGain:Lov | v 🔭 #Atte | n: 28 dB | | Radio Device: BTS | |
| | | | | | | | | |
| | | | | | | | | |
| 10 dE Log | 3/div | Ref 30.00 | aBm | | | | | |
| 20.0 | | | | | | | | Contor Ero |
| | | | | | | | | Center Fre |
| 10.0 | | | | | | | | 2.506000000 GH |
| 0.00 | | | | | and the second se | | | |
| -10.0 | | | | | | | | |
| -20.0 | | | | | | | | |
| | | | | | | | | |
| -30.0 | | | | | | | | |
| -40.0 | | | | | | | | |
| -50.0 | _ | | | | | | | |
| | (harrow and a second | | | | | | | |
| -60.0 | | | | | | | | |
| 04- I | t 2.475 (| | | | | | Oten 2 547 Ol | |
| ગવા | [2.473 | GH2 | | | | | Stop 2.517 GI | 5.000000 MH |
| Spu | r Range | Start Freq | Stop Freq | RBW | Frequency | Amplitude | ∆ Limit | Auto Ma |
| 1 | 1 | 2.4750 GHz | 2.4905 GHz | 1.000 MHz | 2.490448333 GHz | -33.64 dBm | -8.637 dB | |
| 2 | 2 | 2.4905 GHz | 2.4950 GHz | 1.000 MHz | 2.494992500 GHz | -32.61 dBm | -19.61 dB | Freq Offs |
| 3 | 3 | 2.4950 GHz | 2.4960 GHz | 1.000 MHz | 2.495996667 GHz | -26.45 dBm | -13.45 dB | |
| 4 | 4 | 2.4960 GHz | 2.5170 GHz | 1.000 MHz | 2.513010000 GHz | 0.763 dBm | -24.24 dB | 0 + |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |





Plot 329. Upper Band Edge Plot (n41 - 60MHz CP-64QAM - Full RB Configuration)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Dogo 227 of 245 |
| 1M1811230205-03-R1.ZNF | 11/19/2018 - 1/17/2019 | Portable Handset | | Page 237 of 245 |
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| PASS | RF 50 Ω | | | SENSE:INT | | 0C-25-07 DMD++ 27, 201 | |
|------------|--------------------------|------------|-------------|----------------------|------------|--|----------------|
| | NF | | Cente | er Freg: 2.506000000 | GHz | 06:25:07 PM Dec 27, 201 Radio Std: None | Frequency |
| | | E | Trig: | Free Run | | | |
| 10 dB/div | | IFGain:Lov | w #Atte | n: 28 dB | | Radio Device: BTS | _ |
| 10 dB/div | | | | | | | |
| | Ref 30.00 | dBm | | | | | |
| _og | Kci 30.00 | | | | | | |
| 20.0 | | | | | | | Center Fre |
| 10.0 | | | | | | | 2.506000000 GI |
| | | | | | | | 2.50000000 G |
| 0.00 | | | | | | | |
| 10.0 | | | | | | | |
| 20.0 | | | | | | | |
| | | | | | | | |
| 30.0 | | | | | | | |
| 40.0 | | | | | | | |
| 50.0 | AND I WANT | | | | | | |
| 60.0 | | | | | | | |
| 00.0 | | | | | | | |
| Start 2.47 | 5 GHz | | | | | Stop 2.517 GH | 7 |
| | | | | | | | 5.000000 Mi |
| Spur Ran | ge Start Freq | Stop Freq | RBW | Frequency | Amplitude | ∆ Limit | Auto Ma |
| 1 | 2.4750 GHz | 2.4905 GHz | 1.000 MHz | 2.489983333 GHz | | -6.095 dB | |
| | 2 4005 011- | 2.4950 GHz | 1.000 MHz | 2.494790000 GHz | -28.62 dBm | -15.62 dB | Freq Offs |
| 2 2 | 2.4905 GHz | | 4.000 MILL- | 2.495996667 GHz | -25 75 dBm | -12.75 dB | Frequis |
| 2 2 3 3 | 2.4905 GHZ 2.4950 GHz | 2.4960 GHz | 1.000 MHZ | 2.493990007 GHZ | | -12.75 db | . 01 |





Plot 331. Upper Band Edge Plot (n41 - 40MHz CP-QPSK - Full RB Configuration)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Dogo 220 of 245 |
| 1M1811230205-03-R1.ZNF | 11/19/2018 - 1/17/2019 | Portable Handset | | Page 238 of 245 |
| © 2019 PCTEST Engineering Labora | tory. Inc. | • | | V 8.8 11/19/2018 |



| Log 20.0 10.0 0.00 -10.0 | Ref 30.00 o | IFGain:Low | , #Atte | n: 28 dB | | Radio Device | e: BTS | o már = |
|--------------------------------------|-------------|-------------|-------------|------------------|------------|--------------|--------|----------------|
| Log 20.0 10.0 0.00 -10.0 | Ref 30.00 c | IBm | | | | | | 0 |
| Log 20.0 10.0 0.00 -10.0 | Ref 30.00 c | IBm | | | | | | Ourstan = |
| Log 20.0 10.0 0.00 -10.0 | Ref 30.00 (| | | | | | | 0 - mt - = |
| 20.0 | | | | | | | | 0 |
| 10.0 0.00 -10.0 | | | | | | | | |
| -10.0 | | | | | | | | Center Fre |
| -10.0 | | | | | | | | 2.506000000 GH |
| | | | | | | | | |
| | | | | | | | | |
| | | | | —/ | | | | |
| -20.0 | | | | | | | | |
| -30.0 | | | | | | | | |
| -40.0 | | | | | | | | |
| | | | | | | | | |
| -50.0 | | | | | | | | |
| -60.0 | | | | | | | | |
| | | | | | | | | |
| Start 2.475 C | GHz | | | | | Stop 2.57 | 17 GHz | CF Ste |
| | | | | | | | | 5.000000 MH |
| Spur Range | Start Freq | Stop Freq | RBW | Frequency | Amplitude | ∆ Limit | | Auto Ma |
| 1 1 | 2.4750 GHz | 2.4905 GHz | | 2.489957500 GHz | | -3.943 dB | | |
| · · | 2.4905 GHz | 2.4950 GHz | | 2.494940000 GHz | | -13.64 dB | | _ |
| 3 3 | 2.4950 GHz | 2.4950 GHz | | 2.496000000 GHz | | -11.58 dB | | Freq Offs |
| 4 4 | 2.4960 GHz | 2.5170 GHz | | 2.516055000 GHz | | -16.64 dB | | 0 H |
| * * | 2.4300 0112 | 2.5170 0112 | 1.000 10112 | 2.310033000 0112 | 0.550 0011 | -10.04 uD | | |





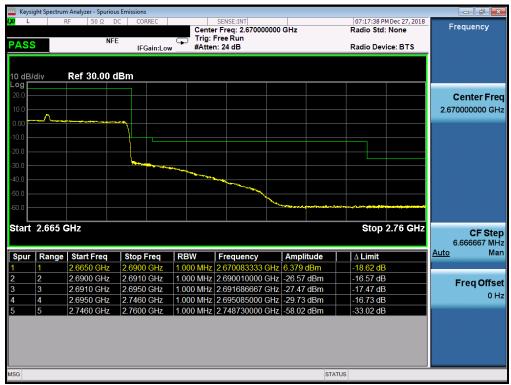
Plot 333. Upper Band Edge Plot (n41 - 40MHz CP-16QAM - Full RB Configuration)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Daga 220 of 245 |
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| | | RF 50Ω C | | Trig: | SENSE:INT r Freq: 2.506000000 Free Run | GHz | Radio Std: | | Frequency |
|------------------------------|--|---|--|-------------------------------------|---|--|--|---------|--|
| PAS | <u>s</u> | | IFGain:Lov | / #Atte | n: 28 dB | | Radio Devi | ce: BTS | |
| | | | | | | | | | |
| 10.15 | | D-6 20 00 - | Das | | | | | | |
| 10 dB Log [| siaiv | Ref 30.00 c | авти | | | | | | |
| 20.0 | | | | | | | | | Center Fre |
| | | | | | | | | | |
| 10.0 | | | | | | | | \sim | 2.506000000 GH |
| 0.00 | | | | | | | | | |
| -10.0 | | | | | | | | | |
| -20.0 | | | | | | | | | |
| -20.0 | | | | | | | | | |
| -30.0 | | | | | | | | | |
| -40.0 | | | | | | | | | |
| -50.0 | , NO | | | | | | | | |
| · · · · , | and the second | | | | | | | | |
| -60.0 | | | | | | | | | |
| _ L | | | | | | | | | |
| | | | | | | | | | |
| stari | t 2.475 C | GHz | | | | | Stop 2. | 517 GHz | CF Ste |
| stari | 1 2.475 0 | GHz | | | | | Stop 2. | 517 GHZ | 5.000000 MH |
| | | | Stop Freg | RBW | Frequency | Amplitude | Stop 2. | 517 GHZ | 5.000000 MI |
| | | Start Freq | Stop Freq | | Frequency 2.489621667 GHz | Amplitude | ∆ Limit | 517 GHZ | 5.000000 Mi |
| Spur 1 | Range | Start Freq 2.4750 GHz | Stop Freq 2.4905 GHz 2.4950 GHz | 1.000 MHz | 2.489621667 GHz | -31.64 dBm | ∆ Limit -6.640 dB | 517 GHZ | 5.000000 Mi <u>Auto</u> Mi |
| Start Spur 1 2 3 | r Range 1 2 | Start Freq 2.4750 GHz 2.4905 GHz | 2.4905 GHz 2.4950 GHz | 1.000 MHz 1.000 MHz | 2.489621667 GHz 2.494257500 GHz | -31.64 dBm -29.48 dBm | Δ Limit -6.640 dB -16.48 dB | | 5.000000 Mł <u>Auto</u> Ma Freq Offs |
| Spur 1 2 3 | r Range | Start Freq 2.4750 GHz 2.4905 GHz 2.4950 GHz | 2.4905 GHz 2.4950 GHz 2.4960 GHz | 1.000 MHz 1.000 MHz 1.000 MHz | 2.489621667 GHz 2.494257500 GHz 2.495996667 GHz | -31.64 dBm -29.48 dBm -26.36 dBm | Δ Limit -6.640 dB -16.48 dB -13.36 dB | | CF Ste 5.00000 MH <u>Auto</u> Ma Freq Offs 0 H |
| Spur 1 2 3 | Range 1 2 3 | Start Freq 2.4750 GHz 2.4905 GHz | 2.4905 GHz 2.4950 GHz | 1.000 MHz 1.000 MHz 1.000 MHz | 2.489621667 GHz 2.494257500 GHz | -31.64 dBm -29.48 dBm -26.36 dBm | Δ Limit -6.640 dB -16.48 dB | | 5.000000 Mi <u>Auto</u> Mi Freq Offs |
| Spur 1 2 3 | Range 1 2 3 | Start Freq 2.4750 GHz 2.4905 GHz 2.4950 GHz | 2.4905 GHz 2.4950 GHz 2.4960 GHz | 1.000 MHz 1.000 MHz 1.000 MHz | 2.489621667 GHz 2.494257500 GHz 2.495996667 GHz | -31.64 dBm -29.48 dBm -26.36 dBm | Δ Limit -6.640 dB -16.48 dB -13.36 dB | | 5.000000 Mi <u>Auto</u> Mi Freq Offs |
| Spur 1 2 | Range 1 2 3 | Start Freq 2.4750 GHz 2.4905 GHz 2.4950 GHz | 2.4905 GHz 2.4950 GHz 2.4960 GHz | 1.000 MHz 1.000 MHz 1.000 MHz | 2.489621667 GHz 2.494257500 GHz 2.495996667 GHz | -31.64 dBm -29.48 dBm -26.36 dBm | Δ Limit -6.640 dB -16.48 dB -13.36 dB | | 5.000000 Mł <u>Auto</u> Ma Freq Offs |
| Spur 1 2 3 | Range 1 2 3 | Start Freq 2.4750 GHz 2.4905 GHz 2.4950 GHz | 2.4905 GHz 2.4950 GHz 2.4960 GHz | 1.000 MHz 1.000 MHz 1.000 MHz | 2.489621667 GHz 2.494257500 GHz 2.495996667 GHz | -31.64 dBm -29.48 dBm -26.36 dBm | Δ Limit -6.640 dB -16.48 dB -13.36 dB | | 5.000000 Mi <u>Auto</u> Mi Freq Offs |
| Spur 1 2 3 | Range 1 2 3 | Start Freq 2.4750 GHz 2.4905 GHz 2.4950 GHz | 2.4905 GHz 2.4950 GHz 2.4960 GHz | 1.000 MHz 1.000 MHz 1.000 MHz | 2.489621667 GHz 2.494257500 GHz 2.495996667 GHz | -31.64 dBm -29.48 dBm -26.36 dBm | Δ Limit -6.640 dB -16.48 dB -13.36 dB | | 5.000000 Mi <u>Auto</u> Mi Freq Offs |
| Spur 1 2 3 | Range 1 2 3 | Start Freq 2.4750 GHz 2.4905 GHz 2.4950 GHz | 2.4905 GHz 2.4950 GHz 2.4960 GHz | 1.000 MHz 1.000 MHz 1.000 MHz | 2.489621667 GHz 2.494257500 GHz 2.495996667 GHz | -31.64 dBm -29.48 dBm -26.36 dBm | Δ Limit -6.640 dB -16.48 dB -13.36 dB | | 5.000000 Mi <u>Auto</u> M Freq Offs |





Plot 335. Upper Band Edge Plot (n41 - 40MHz CP-64QAM - Full RB Configuration)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|---------------------------------|
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| © 2019 PCTEST Engineering Labora | tory, Inc. | | V 8.8 11/19/2018 |

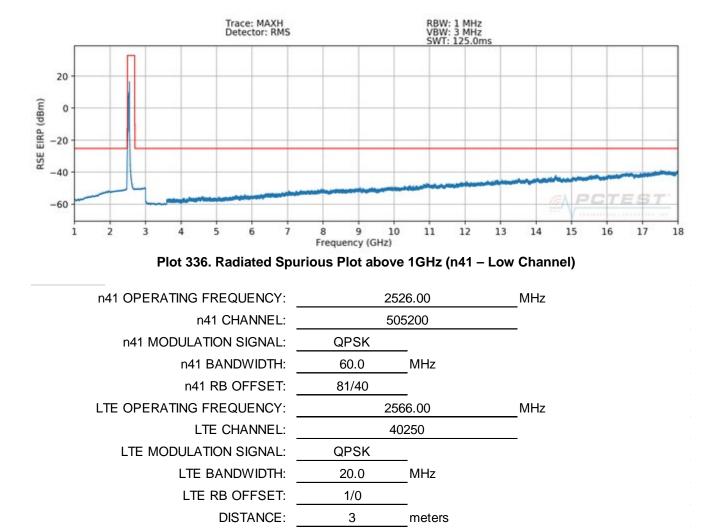


| Frequency [MHz] | Channel Bandwidth [MHz] | Mod. | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | RB Size/Offset | Substitute Level [dBm] | Ant. Gain [dBi] | EIRP [dBm] | EIRP [Watts] | EIRP Limit [dBm] | Margin [dB] |
|--------------------|-------------------------------|------------|-----------------------|---------------------------|----------------------------------|-------------------|------------------------------|-----------------------|---------------|-----------------|------------------------|----------------|
| 2526.00 | 60 | QPSK | Н | 110 | 259 | 81/40 | 13.46 | 7.85 | 21.31 | 0.135 | 33.01 | -11.70 |
| 2592.99 | 60 | QPSK | Н | 182 | 176 | 81/40 | 14.30 | 7.71 | 22.01 | 0.159 | 33.01 | -11.00 |
| 2659.98 | 60 | QPSK | Н | 103 | 132 | 81/40 | 9.89 | 7.57 | 17.46 | 0.056 | 33.01 | -15.55 |
| 2592.99 | 60 | 16- QAM | Н | 139 | 99 | 1/0 | 13.84 | 7.85 | 21.69 | 0.147 | 33.01 | -11.32 |
| 2592.99 | 60 | 64- QAM | Н | 115 | 190 | 81/0 | 9.77 | 7.71 | 17.48 | 0.056 | 33.01 | -15.53 |
| 2516.00 | 40 | QPSK | Н | 139 | 87 | 53/26 | 12.72 | 7.87 | 20.59 | 0.114 | 33.01 | -12.42 |
| 2593.00 | 40 | QPSK | Н | 141 | 270 | 53/26 | 13.56 | 7.71 | 21.27 | 0.134 | 33.01 | -11.74 |
| 2670.00 | 40 | QPSK | Н | 119 | 86 | 53/26 | 12.22 | 7.55 | 19.77 | 0.095 | 33.01 | -13.24 |
| 2593.00 | 40 | 16- QAM | Н | 124 | 88 | 1/52 | 13.06 | 7.71 | 20.77 | 0.119 | 33.01 | -12.24 |
| 2593.00 | 40 | 64- QAM | Н | 110 | 97 | 106/0 | 10.29 | 7.71 | 18.00 | 0.063 | 33.01 | -15.01 |

Table 59. EIRP Data (n41)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Dago 241 of 245 |
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| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntabl e Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|--------------------|---------------------------|--------------------------------------|--|-------------------------------------|-------------------------------------|----------------|
| 5052.00 | Н | - | - | -60.40 | 8.57 | -51.83 | -26.8 |
| 7578.00 | Н | - | - | -55.78 | 8.44 | -47.34 | -22.3 |
| 10104.00 | Н | - | - | -55.14 | 9.81 | -45.33 | -20.3 |

-25

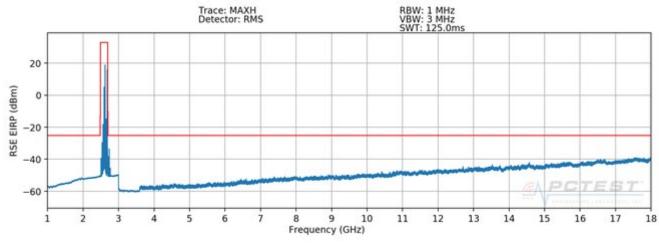
dBm

LIMIT:

Table 60. Radiated Spurious Data (n41 – Low Channel)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager | |
|----------------------------------|------------------------|---------------------------------------|------|---------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | | Dage 242 of 245 | |
| 1M1811230205-03-R1.ZNF | 11/19/2018 - 1/17/2019 | Portable Handset | | Page 242 of 245 | |
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Plot 337. Radiated Spurious Plot above 1GHz (n41 - Mid Channel)

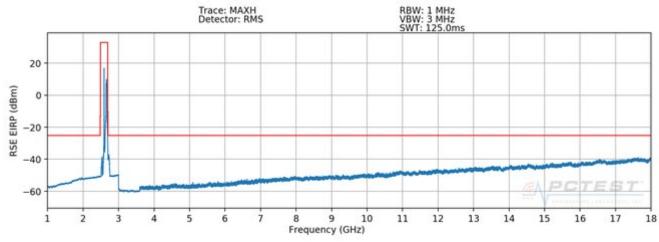
| n41 OPERATING FREQUENCY: | 25 | MHz | |
|--------------------------|-------|--------|-----|
| n41 CHANNEL: | 5 | 18598 | |
| n41 MODULATION SIGNAL: | QPSK | | |
| n41 BANDWIDTH: | 60.0 | MHz | |
| n41 RB OFFSET: | 81/40 | | |
| LTE OPERATING FREQUENCY: | 26 | 680.00 | MHz |
| LTE CHANNEL: | 4 | 1490 | |
| LTE MODULATION SIGNAL: | QPSK | | |
| LTE BANDWIDTH: | 20.0 | MHz | |
| LTE RB OFFSET: | 1/50 | | |
| DISTANCE: | 3 | meters | |
| LIMIT: | -25 | dBm | |
| | | | |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntabl e Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|--------------------|---------------------------|--------------------------------------|--|-------------------------------------|-------------------------------------|----------------|
| 5185.98 | Н | - | - | -61.15 | 8.70 | -52.45 | -27.4 |
| 7778.97 | Н | - | - | -56.15 | 8.69 | -47.47 | -22.5 |
| 10371.96 | Н | - | - | -54.21 | 9.62 | -44.59 | -19.6 |

Table 61. Radiated Spurious Data (n41 – Mid Channel)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---|------------------|---------------------------------------|---------------------------------|
| Test Report S/N: Test Dates: | | EUT Type: | Daga 242 of 245 |
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Plot 338. Radiated Spurious Plot above 1GHz (n41 - High Channel)

| requency | Ant. Pol. | Antenna Height | Turntabl e | Level at Antenna | Substitute Antenna Gain | Spurio Emission |
|----------------|-----------|-------------------|---------------|---------------------|----------------------------|--------------------|
| | | | LIMIT: | | | |
| | | DI | STANCE: | -25 | dBm | |
| LTE RB OFFSET: | | | | 1/50 | | |
| | | LTE BAN | DWIDTH: | 20.0 | MHz | |
| | LTE MO | DULATION | SIGNAL: | QPSK | | _ |
| | | LTE C | HANNEL: | 40620 | | _ |
| Ľ | TE OPERA | | QUENCY: | 2593.00 | | MHz |
| | | n41 RB | OFFSET: | 81/40 | | |
| | | n41 BAN | DWIDTH: | 60.0 | MHz | |
| | n41 MO | DULATION | SIGNAL: | QPSK | | _ |
| | | n41 Cl | HANNEL: | 531996 | | _ |
| n | 41 OPERA | TING FREC | QUENCY: | 2659.98 | | MHz |

| Frequency [MHz] | Ant. Pol. [H/V] | Antenna Height [cm] | Turntabl e Azimuth [degree] | Level at Antenna Terminals [dBm] | Substitute Antenna Gain [dBi] | Spurious Emission Level [dBm] | Margin [dB] |
|--------------------|--------------------|---------------------------|--------------------------------------|--|-------------------------------------|-------------------------------------|----------------|
| 5319.96 | Н | - | - | -61.35 | 8.73 | -52.62 | -27.6 |
| 7979.94 | Н | - | - | -55.55 | 8.85 | -46.69 | -21.7 |
| 10639.92 | Н | - | - | -53.29 | 9.50 | -43.79 | -18.8 |

Table 62. Radiated Spurious Data (n41 – High Channel)

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager | |
|---|------------------|---------------------------------------|------|---------------------------------|--|
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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFV450PM** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules for LTE and n41 (ENDC) operation only.

| FCC ID: ZNFV450PM | | MEASUREMENT REPORT (CERTIFICATION) | 🕒 LG | Approved by: Quality Manager |
|----------------------------------|------------------------|---------------------------------------|------|---------------------------------|
| Test Report S/N: Test Dates: | | EUT Type: | | Dogo 245 of 245 |
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