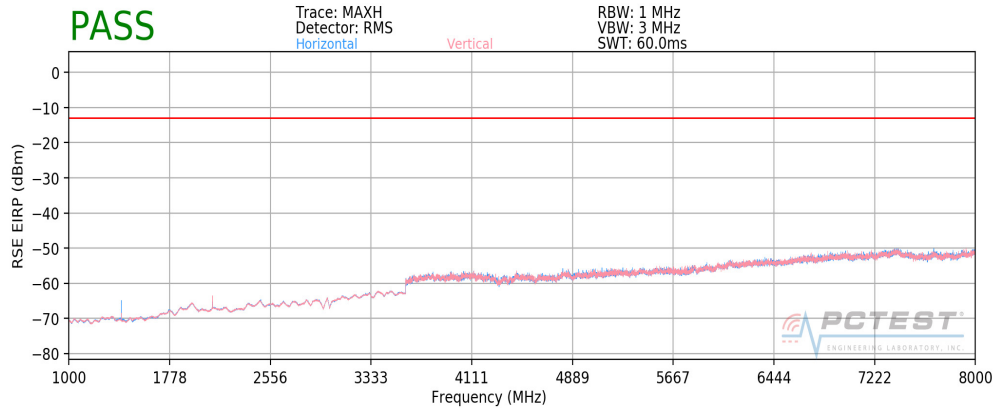


## Band 12



**Plot 7-191. Radiated Spurious Plot above 1GHz (Band 12)**

OPERATING FREQUENCY: 704.00 MHz

CHANNEL: 23060

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]
1408.00	H	130	208	-78.12	8.00	-70.11	-57.1
2112.00	H	260	187	-78.69	8.89	-69.79	-56.8
2816.00	H	-	-	-80.33	10.10	-70.23	-57.2

**Table 7-11. Radiated Spurious Data (Band 12 – Low Channel)**

FCC ID: ZNFL211BL	<b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Quality Manager
Test Report S/N: 1M1804240084-03.ZNF	Test Dates: 4/24/2018-5/18/2018	EUT Type: Portable Handset	Page 126 of 145

OPERATING FREQUENCY: 707.50 MHz  
 CHANNEL: 23095  
 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]
1415.00	H	181	194	-78.18	8.09	-70.09	-57.1
2122.50	H	272	109	-77.13	8.88	-68.25	-55.2
2830.00	H	-	-	-79.26	10.13	-69.13	-56.1

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

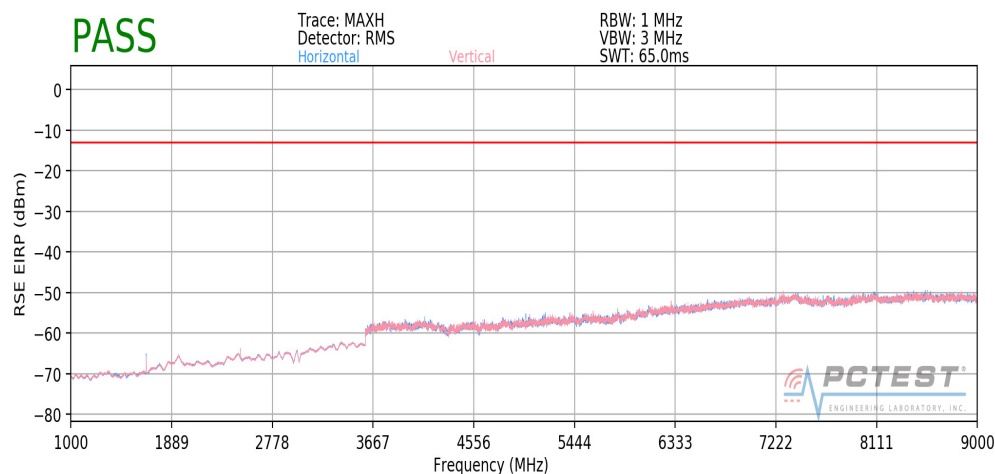
OPERATING FREQUENCY: 711.00 MHz  
 CHANNEL: 23130  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

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	H	140	194	-77.96	8.17	-69.79	-56.8
2133.00	H	172	131	-77.26	8.87	-68.39	-55.4
2844.00	H	-	-	-78.26	10.16	-68.09	-55.1

Table 7-13. Radiated Spurious Data (Band 12 – High Channel)

FCC ID: ZNFL211BL	 <b>MEASUREMENT REPORT (CERTIFICATION)</b> 		Approved by: Quality Manager
Test Report S/N: 1M1804240084-03.ZNF	Test Dates: 4/24/2018-5/18/2018	EUT Type: Portable Handset	Page 127 of 145

## Band 5



**Plot 7-192. Radiated Spurious Plot above 1GHz (Band 5)**

OPERATING FREQUENCY: 825.50 MHz

CHANNEL: 20415

MODULATION SIGNAL: QPSK

BANDWIDTH: 3.0 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]
1651.00	H	125	113	-76.69	9.01	-67.68	-54.7
2476.50	H	140	180	-74.74	9.12	-65.62	-52.6
3302.00	H	-	-	-76.35	9.37	-66.99	-54.0

**Table 7-14. Radiated Spurious Data (Band 5 – Low Channel)**

FCC ID: ZNFL211BL	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1804240084-03.ZNF	Test Dates: 4/24/2018-5/18/2018	EUT Type: Portable Handset		Page 128 of 145

OPERATING FREQUENCY: 836.50 MHz  
CHANNEL: 20525  
MODULATION SIGNAL: QPSK  
BANDWIDTH: 3.0 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	H	204	133	-75.65	8.85	-66.80	-53.8
2509.50	H	130	178	-76.52	9.17	-67.35	-54.4
3346.00	H	-	-	-77.25	9.36	-67.89	-54.9

Table 7-15. Radiated Spurious Data (Band 5 – Mid Channel)

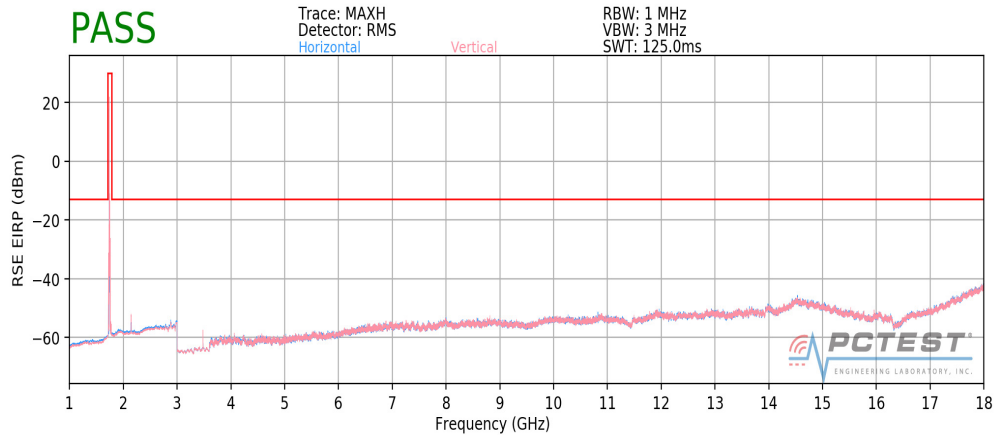
OPERATING FREQUENCY: 847.50 MHz  
CHANNEL: 20635  
MODULATION SIGNAL: QPSK  
BANDWIDTH: 3.0 MHz  
DISTANCE: 3 meters  
LIMIT: -13 dBm

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]
1695.00	H	227	49	-73.88	8.69	-65.19	-52.2
2542.50	H	133	166	-77.81	9.27	-68.54	-55.5
3390.00	H	-	-	-76.45	9.45	-67.00	-54.0

Table 7-16. Radiated Spurious Data (Band 5 – High Channel)

FCC ID: ZNFL211BL	 <b>MEASUREMENT REPORT</b> (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1804240084-03.ZNF	Test Dates: 4/24/2018-5/18/2018	EUT Type: Portable Handset	Page 129 of 145

**Band 4/66**



**Plot 7-193. Radiated Spurious Plot above 1GHz (Band 4/66)**

OPERATING FREQUENCY: 1717.50 MHz

CHANNEL: 132047

MODULATION SIGNAL: QPSK

BANDWIDTH: 15.0 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]
3435.00	V	149	288	-64.85	9.54	-55.32	-42.3
5152.50	V	-	-	-67.68	10.79	-56.89	-43.9

**Table 7-17. Radiated Spurious Data (Band 4/66 – Low Channel)**

FCC ID: ZNFL211BL	<b>MEASUREMENT REPORT</b> (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1804240084-03.ZNF	Test Dates: 4/24/2018-5/18/2018	EUT Type: Portable Handset		Page 130 of 145

OPERATING FREQUENCY: 1745.00 MHz  
 CHANNEL: 132322  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 15.0 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]
3490.00	V	177	301	-65.75	9.65	-56.11	-43.1
5235.00	V	-	-	-68.02	10.93	-57.10	-44.1

Table 7-18. Radiated Spurious Data (Band 4/66 – Mid Channel)

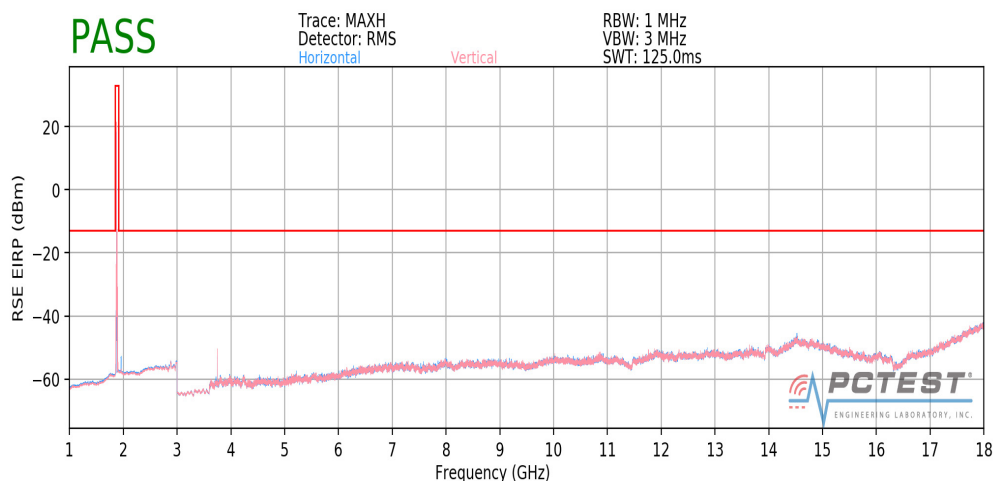
OPERATING FREQUENCY: 1772.50 MHz  
 CHANNEL: 132597  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 15.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

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]
3545.00	V	200	299	-67.00	9.70	-57.30	-44.3

Table 7-19. Radiated Spurious Data (Band 4/66 – High Channel)

FCC ID: ZNFL211BL	 <b>MEASUREMENT REPORT</b> (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1804240084-03.ZNF	Test Dates: 4/24/2018-5/18/2018	EUT Type: Portable Handset		Page 131 of 145

## Band 2



**Plot 7-194. Radiated Spurious Plot above 1GHz (Band 2)**

OPERATING FREQUENCY: 1855.00 MHz

CHANNEL: 18650

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]
3710.00	H	104	145	-58.82	9.70	-49.12	-36.1
5565.00	H	-	-	-68.03	11.00	-57.03	-44.0

**Table 7-20. Radiated Spurious Data (Band 2 – Low Channel)**

FCC ID: ZNFL211BL	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1804240084-03.ZNF	Test Dates: 4/24/2018-5/18/2018	EUT Type: Portable Handset		Page 132 of 145

OPERATING FREQUENCY: 1880.00 MHz  
 CHANNEL: 18900  
 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	H	100	140	-60.93	9.50	-51.43	-38.4
5640.00	H	-	-	-68.25	11.16	-57.09	-44.1

Table 7-21. Radiated Spurious Data (Band 2 – Mid Channel)

OPERATING FREQUENCY: 1905.00 MHz  
 CHANNEL: 19150  
 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	H	115	141	-56.37	9.32	-47.05	-34.0
5715.00	H	-	-	-68.54	11.32	-57.22	-44.2

Table 7-22. Radiated Spurious Data (Band 2 – High Channel)

FCC ID: ZNFL211BL	 <b>MEASUREMENT REPORT</b> (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1804240084-03.ZNF	Test Dates: 4/24/2018-5/18/2018	EUT Type: Portable Handset		Page 133 of 145



## 7.8 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  $\pm 0.00025\%$  ( $\pm 2.5$  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: ZNFL211BL		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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## Band 71 Frequency Stability Measurements

OPERATING FREQUENCY: 680,500,000 Hz  
 CHANNEL: 133297  
 REFERENCE VOLTAGE: 3.85 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	680,499,736	-264	-0.0000388
100 %		- 30	680,499,883	-117	-0.0000172
100 %		- 20	680,499,893	-107	-0.0000157
100 %		- 10	680,499,925	-75	-0.0000110
100 %		0	680,500,007	7	0.0000010
100 %		+ 10	680,500,417	417	0.0000613
100 %		+ 20	680,500,054	54	0.0000079
100 %		+ 30	680,499,880	-120	-0.0000176
100 %		+ 40	680,500,178	178	0.0000262
100 %		+ 50	680,499,837	-163	-0.0000240
BATT. ENDPOINT	3.45	+ 20	680,500,038	38	0.0000056

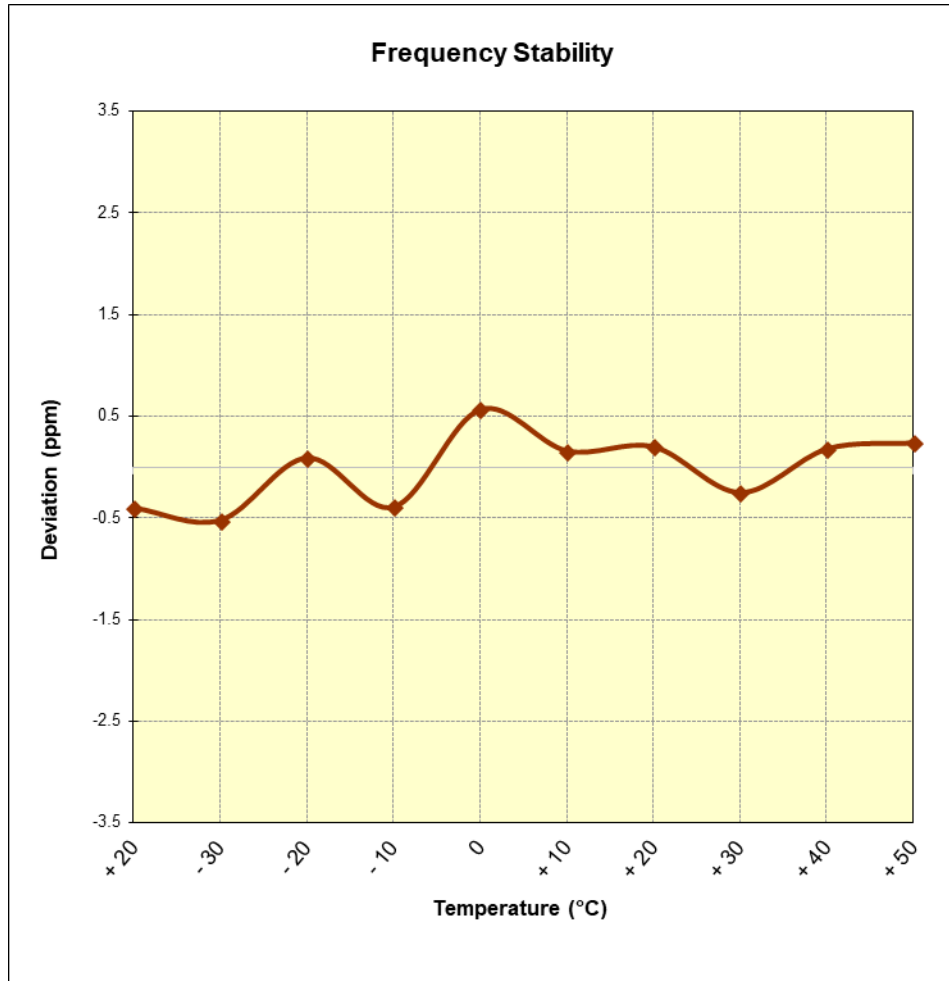
Table 7-23. Frequency Stability Data (Band 71)

### 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: ZNFL211BL	 <b>MEASUREMENT REPORT</b> (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1804240084-03.ZNF	Test Dates: 4/24/2018-5/18/2018	EUT Type: Portable Handset	Page 135 of 145	

## Band 71 Frequency Stability Measurements



**Figure 7-8. Frequency Stability Graph (Band 71)**

FCC ID: ZNFL211BL	 <b>MEASUREMENT REPORT (CERTIFICATION)</b> 		Approved by: Quality Manager
Test Report S/N: 1M1804240084-03.ZNF	Test Dates: 4/24/2018-5/18/2018	EUT Type: Portable Handset	Page 136 of 145

## Band 12 Frequency Stability Measurements

OPERATING FREQUENCY: 707,500,000 Hz  
 CHANNEL: 23790  
 REFERENCE VOLTAGE: 3.85 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	707,499,715	-285	-0.0000403
100 %		- 30	707,499,629	-371	-0.0000524
100 %		- 20	707,500,064	64	0.0000090
100 %		- 10	707,499,721	-279	-0.0000394
100 %		0	707,500,401	401	0.0000567
100 %		+ 10	707,500,113	113	0.0000160
100 %		+ 20	707,500,141	141	0.0000199
100 %		+ 30	707,499,822	-178	-0.0000252
100 %		+ 40	707,500,127	127	0.0000180
100 %		+ 50	707,500,169	169	0.0000239
BATT. ENDPOINT	3.45	+ 20	707,499,989	-11	-0.0000016

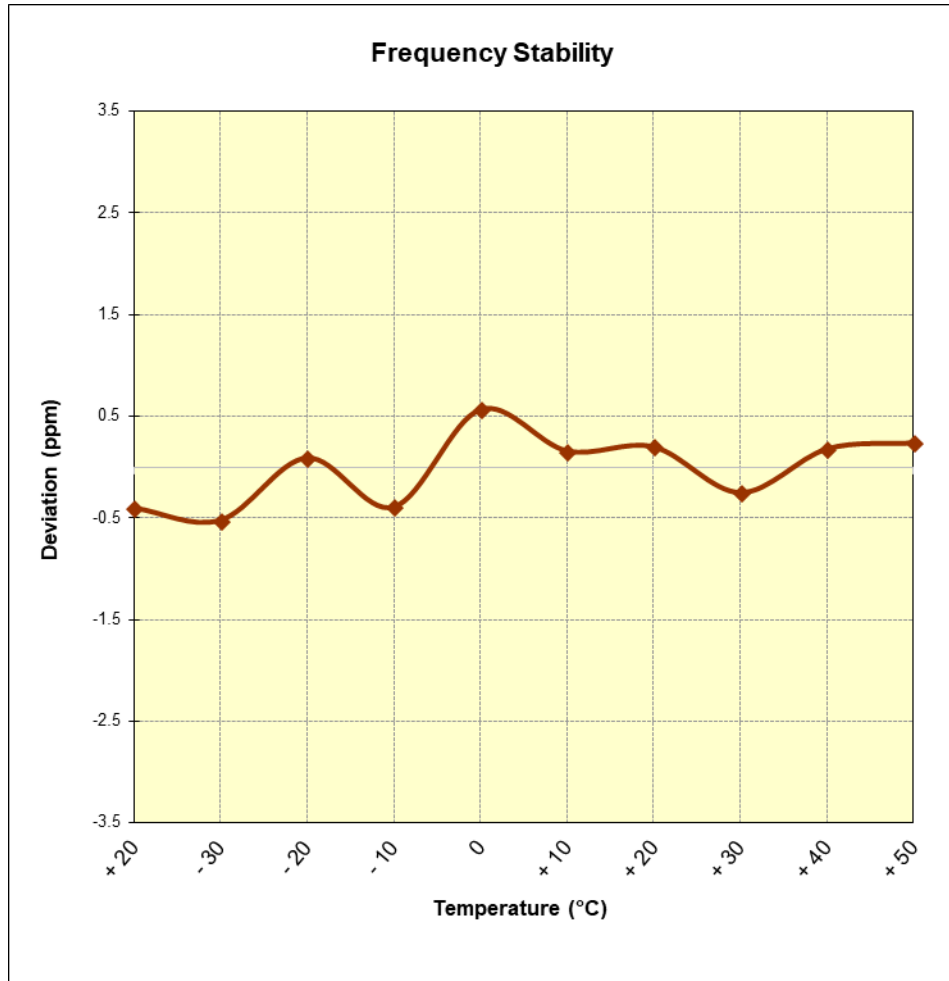
Table 7-24. Frequency Stability Data (Band 12)

### 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: ZNFL211BL	 <b>MEASUREMENT REPORT</b> (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1804240084-03.ZNF	Test Dates: 4/24/2018-5/18/2018	EUT Type: Portable Handset		Page 137 of 145

## Band 12 Frequency Stability Measurements



**Figure 7-9. Frequency Stability Graph (Band 12)**

FCC ID: ZNFL211BL	 <b>MEASUREMENT REPORT (CERTIFICATION)</b> 		Approved by: Quality Manager
Test Report S/N: 1M1804240084-03.ZNF	Test Dates: 4/24/2018-5/18/2018	EUT Type: Portable Handset	Page 138 of 145

## Band 5 Frequency Stability Measurements

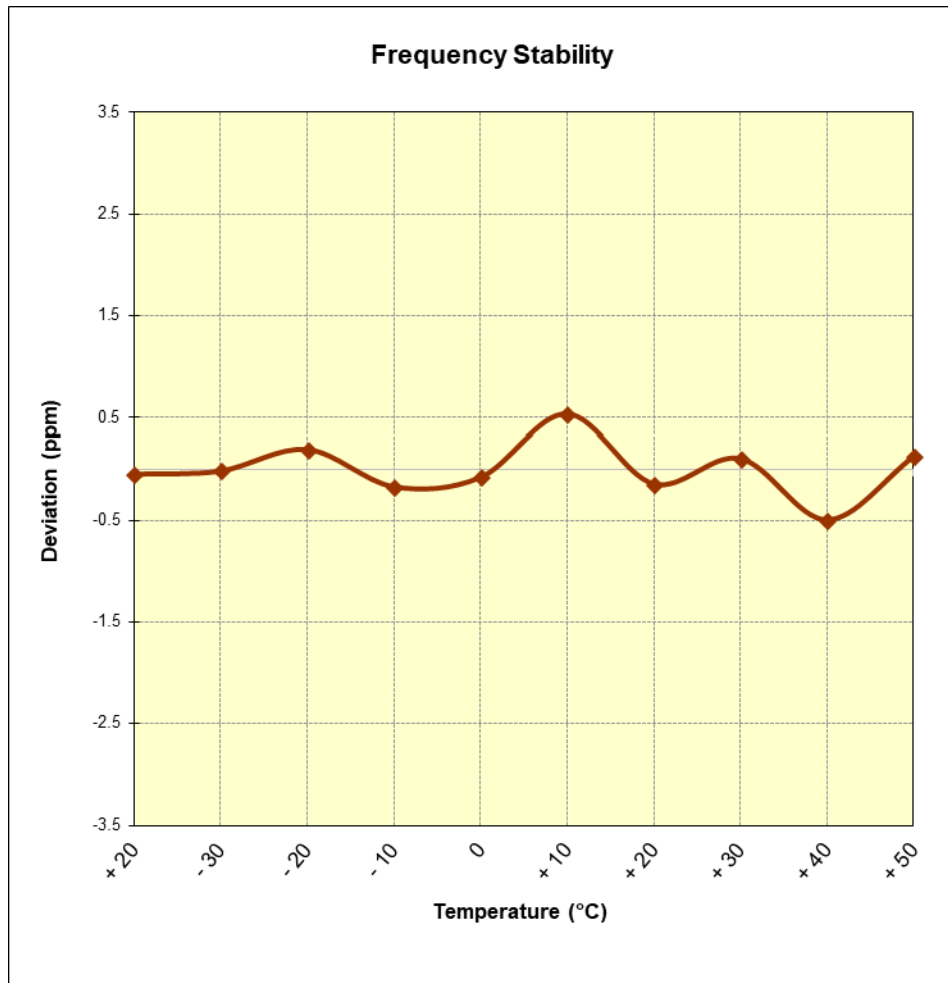
OPERATING FREQUENCY: 836,500,000 Hz  
 CHANNEL: 20525  
 REFERENCE VOLTAGE: 3.85 VDC  
 DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	836,499,964	-36	-0.0000043
100 %		- 30	836,499,990	-10	-0.0000012
100 %		- 20	836,500,167	167	0.0000200
100 %		- 10	836,499,861	-139	-0.0000166
100 %		0	836,499,937	-63	-0.0000075
100 %		+ 10	836,500,452	452	0.0000540
100 %		+ 20	836,499,884	-116	-0.0000139
100 %		+ 30	836,500,092	92	0.0000110
100 %		+ 40	836,499,588	-412	-0.0000493
100 %		+ 50	836,500,109	109	0.0000130
BATT. ENDPOINT	3.45	+ 20	836,500,120	120	0.0000143

Table 7-25. Frequency Stability Data (Band 5)

FCC ID: ZNFL211BL	 <b>MEASUREMENT REPORT (CERTIFICATION)</b> 		Approved by: Quality Manager
Test Report S/N: 1M1804240084-03.ZNF	Test Dates: 4/24/2018-5/18/2018	EUT Type: Portable Handset	Page 139 of 145

## Band 5 Frequency Stability Measurements



**Figure 7-10. Frequency Stability Graph (Band 5)**

FCC ID: ZNFL211BL	 <b>MEASUREMENT REPORT (CERTIFICATION)</b> 		Approved by: Quality Manager
Test Report S/N: 1M1804240084-03.ZNF	Test Dates: 4/24/2018-5/18/2018	EUT Type: Portable Handset	Page 140 of 145

## Band 4/66 Frequency Stability Measurements

OPERATING FREQUENCY: 1,745,000,000 Hz  
 CHANNEL: 132322  
 REFERENCE VOLTAGE: 3.85 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	1,745,000,042	42	0.0000024
100 %		- 30	1,744,999,914	-86	-0.0000049
100 %		- 20	1,745,000,082	82	0.0000047
100 %		- 10	1,745,000,051	51	0.0000029
100 %		0	1,744,999,906	-94	-0.0000054
100 %		+ 10	1,745,000,187	187	0.0000107
100 %		+ 20	1,744,999,905	-95	-0.0000054
100 %		+ 30	1,744,999,961	-39	-0.0000022
100 %		+ 40	1,745,000,194	194	0.0000111
100 %		+ 50	1,745,000,056	56	0.0000032
BATT. ENDPOINT	3.45	+ 20	1,745,000,204	204	0.0000117

Table 7-26. Frequency Stability Data (Band 4/66)

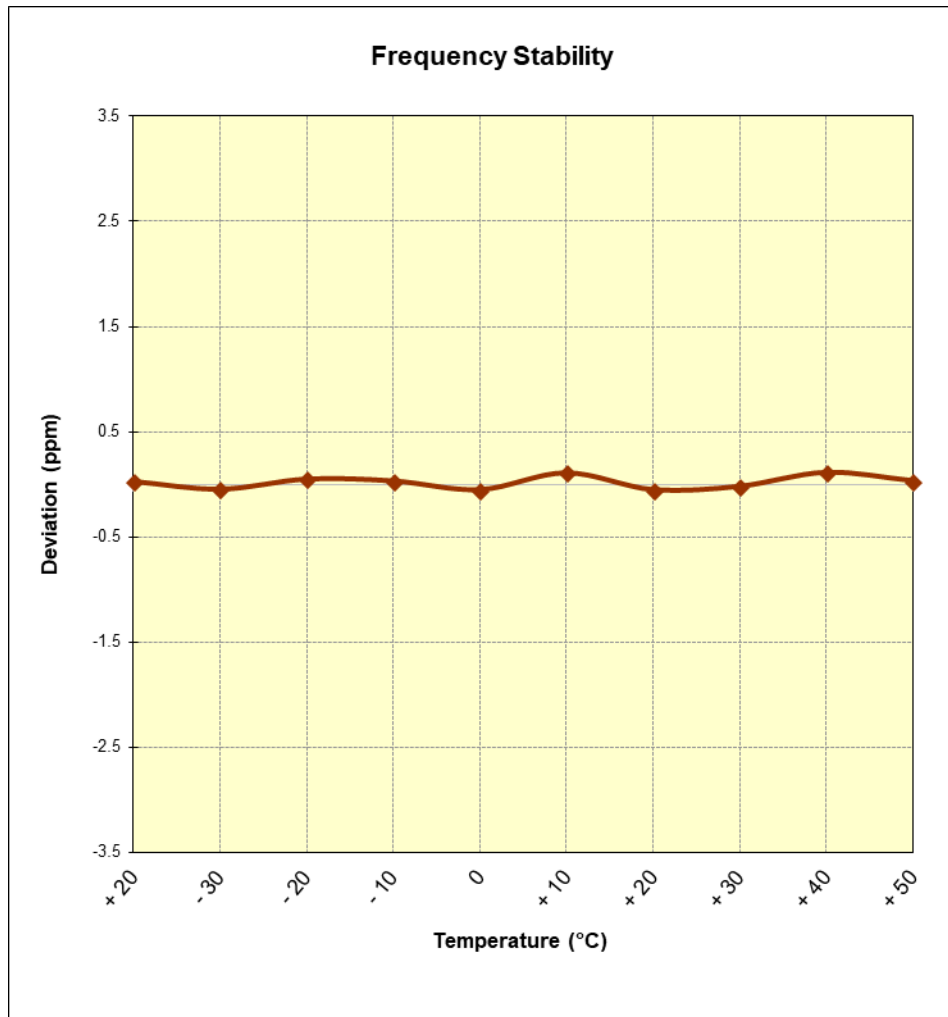
### Note:

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: ZNFL211BL	 <b>MEASUREMENT REPORT</b> (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1804240084-03.ZNF	Test Dates: 4/24/2018-5/18/2018	EUT Type: Portable Handset		Page 141 of 145



## Band 4/66 Frequency Stability Measurements



**Figure 7-11. Frequency Stability Graph (Band 4/66)**

FCC ID: ZNFL211BL	 <b>MEASUREMENT REPORT (CERTIFICATION)</b> 		Approved by: Quality Manager
Test Report S/N: 1M1804240084-03.ZNF	Test Dates: 4/24/2018-5/18/2018	EUT Type: Portable Handset	Page 142 of 145

## Band 2 Frequency Stability Measurements

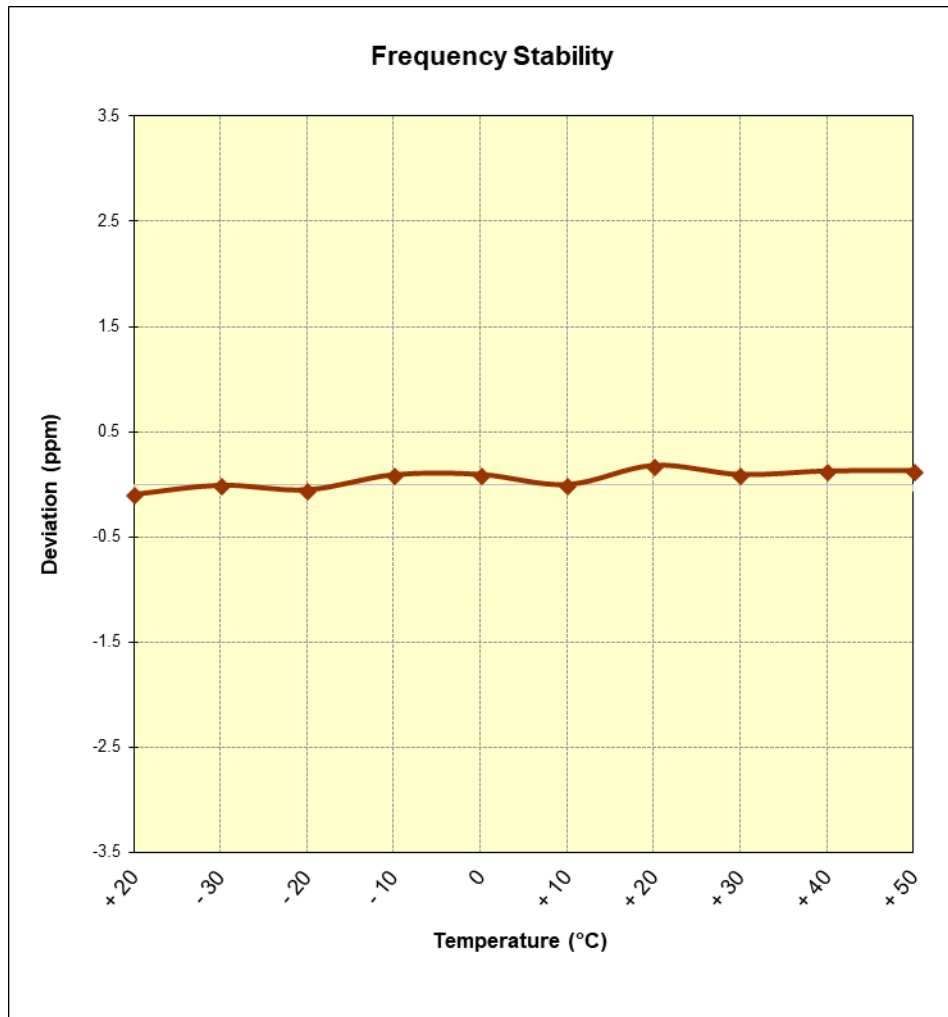
OPERATING FREQUENCY: 1,880,000,000 Hz  
 CHANNEL: 18900  
 REFERENCE VOLTAGE: 3.85 VDC  
 DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	1,879,999,816	-184	-0.0000098
100 %		- 30	1,879,999,982	-18	-0.0000010
100 %		- 20	1,879,999,900	-100	-0.0000053
100 %		- 10	1,880,000,170	170	0.0000090
100 %		0	1,880,000,176	176	0.0000094
100 %		+ 10	1,879,999,994	-6	-0.0000003
100 %		+ 20	1,880,000,337	337	0.0000179
100 %		+ 30	1,880,000,174	174	0.0000093
100 %		+ 40	1,880,000,238	238	0.0000127
100 %		+ 50	1,880,000,242	242	0.0000129
BATT. ENDPOINT	3.45	+ 20	1,880,000,307	307	0.0000163

Table 7-27. Frequency Stability Data (Band 2)

FCC ID: ZNFL211BL	 <b>MEASUREMENT REPORT (CERTIFICATION)</b> 		Approved by: Quality Manager
Test Report S/N: 1M1804240084-03.ZNF	Test Dates: 4/24/2018-5/18/2018	EUT Type: Portable Handset	Page 143 of 145

## Band 2 Frequency Stability Measurements



**Figure 7-12. Frequency Stability Graph (Band 2)**

FCC ID: ZNFL211BL	 <b>MEASUREMENT REPORT (CERTIFICATION)</b> 		Approved by: Quality Manager
Test Report S/N: 1M1804240084-03.ZNF	Test Dates: 4/24/2018-5/18/2018	EUT Type: Portable Handset	Page 144 of 145

## 8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFL211BL** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules for LTE operation only.

<b>FCC ID:</b> ZNFL211BL		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1804240084-03.ZNF	<b>Test Dates:</b> 4/24/2018-5/18/2018	<b>EUT Type:</b> Portable Handset	Page 145 of 145	