Prepared by: LabTest Certification Inc.

Date Issued: 02 December 2019
Project No.: 18280
Revision No.: 1

Client: Dali Wireless, Inc.

Input-Versus-Output Signal Comparison

Governing Doc	FCC Part 90.210 (j) (h) (g) (c) (d) and (e)		Room Temperature (°C)		20.5
Test Procedure	ANSI/TIA-603- E; FCC KDB 935210 D05, v01r03		Relative Humidity (%)		38.6
Test Location	Richmond		Barometric Pressure (kPa)		101.8
Test Engineer	Daniel Lee		Date		Nov 08, 2019
EUT Voltage)Hz	
Toot Equipment Head	Manufacturer	Model	Serial Number	Calibration	Calibration
Test Equipment Used Signal Generator	Keysight	N5172B		06/12/19	06/12/21
			MY53050270	07/29/19	07/23/21
Spectrum Analyzer	Keysight	N9010A	MY50520285		
Frequency Range:	⊠ 806 MHz – 816 MHz	⊠ 450 M	Hz – 470 MHz	⊠ 152 MHz –	1/4 MHz
Detector:	⊠ Peak				
RBW/VBW:	⊠100 Hz				
Type of Facility:	⊠ Test bench				
Distance:	⊠ direct connect				
Arrangement of EUT:	☑ Table-top only ☐ Floor-standing only ☐ Rack Mounted				
851 - 854 MHz must co 854 - 861 MHz must co	210, transmitters without a mply to emission mask H; mply to emission mask G; s with 6 25kHz channel m				
851 - 854 MHz must co 854 - 861 MHz must co 450 - 512 MHz operate 450 - 512 MHz operate For simplicity of the tes	mply to emission mask H;	ust comply ust comply are strigent	to emission mask to emission mask than SEM G and S	E; D. SEM C, SEM I	
851 - 854 MHz must co 854 - 861 MHz must co 450 - 512 MHz operate 450 - 512 MHz operate For simplicity of the tes limit check on channels	Imply to emission mask H; Imply to emission mask G; Is with 6.25kHz channel m Is with 12.5kHz channel m It, noting that SEM H is mo	ust comply ust comply ore strigent d 854 - 86	to emission mask to emission mask than SEM G and S I MHz in this test r	E; D. SEM C, SEM I	

Page 26 of 97

Prepared by: LabTest Certification Inc.
Date Issued: 02 December 2019

Date Issued: 02 December 2019

Project No.: 18280-2E

Revision No.: 1

Client: Dali Wireless, Inc.

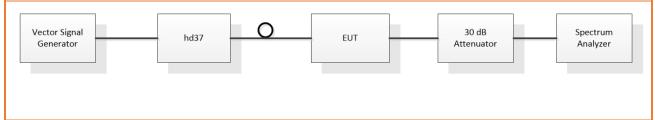
Compliant oxtimes Non-Compliant oxtimes Not Applicable oxtimes

Test setup

Description of test set-up:

Spectrum Emission Mask is measured by connecting a Spectrum Analyzer to the RF output connector. The input power was adjusted to produce maximum output power on the antenna port. The reference level was measured with integrated BW of the designated channel BW. The emission was measured with RBW 100 Hz.

The EUT was set to Operation Mode #1 with configuration Mode #1.



Prepared by: LabTest Certification Inc.

Date Issued: 02 December 2019

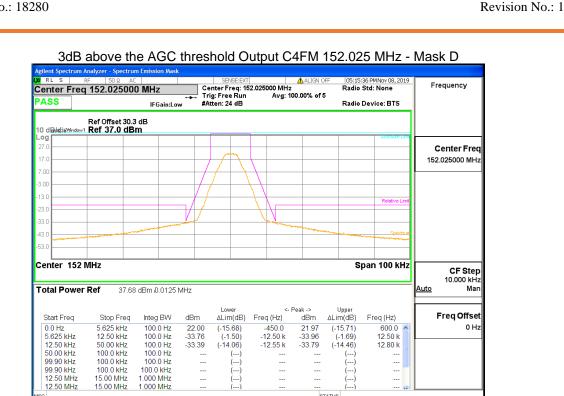
Project No.: 18280-2E

Revision No.: 1

Client: Dali Wireless, Inc.

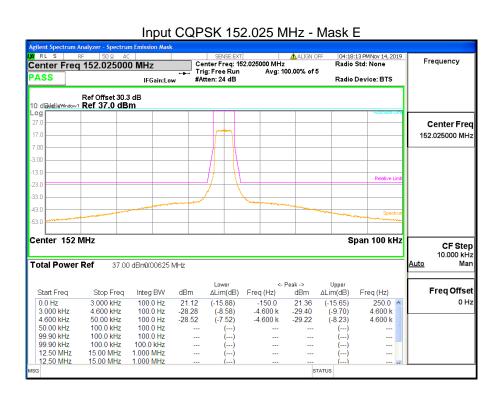


Page 28 of 97



Client: Dali Wireless, Inc.

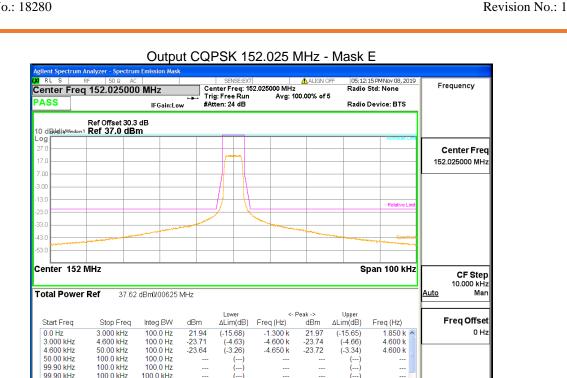
Report No.: 18280-2E



Page 29 of 97

> 15.00 MHz 15.00 MHz

12.50 MHz 12.50 MHz 1.000 MHz 1.000 MHz



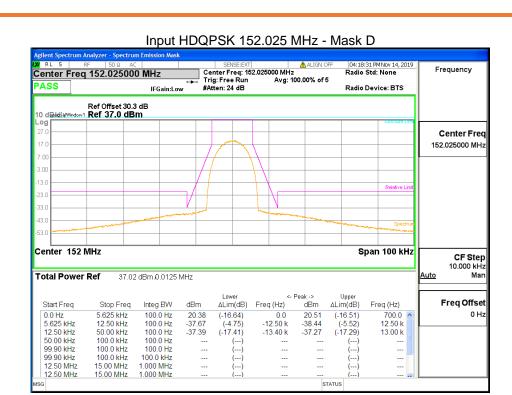
Client: Dali Wireless, Inc.

Report No.: 18280-2E

3dB above the AGC threshold Output CQPSK 152.025 MHz - Mask E Center Freq: 152.025000 MHz Trig: Free Run Avg: 100.00% of 5 #Atten: 24 dB 05:15:54 PMNov 08, 2019 Radio Std: None Frequency Center Freq 152.025000 MHz PASS Radio Device: BTS IFGain:Low Ref Offset 30.3 dB Ref 37.0 dBm Center Freq 152.025000 MHz 3.00 Center 152 MHz Span 100 kHz CF Step 10.000 kHz Mar Total Power Ref 37.70 dBm0/00625 MHz Peak -> dBm Freq Offset Start Freq Stop Freq Integ BW dBm ΔLim(dB) Freq (Hz) ΔLim(dB) Freq (Hz) 0.0 Hz 3.000 kHz 100.0 Hz 21.68 (-16.02) -1.550 k 21.62 (-16.08) 550.0 3 000 kHz 4.600 kHz 100.0 Hz -23 42 (-4.42)-4 600 k -22 91 (-3.91) 4 600 k 4.600 kHz 50.00 kHz 100.0 Hz -23.66 (-3.36) -23.24 (-2.94) -4.600 k 4.700 k 50.00 kHz 100.0 kHz 100.0 Hz (---) 99.90 kHz 100.0 kHz 100.0 kHz 100.0 Hz 100.0 kHz 99.90 kHz 1.000 MHz 1.000 MHz 12 50 MHz 15 00 MHz 12.50 MHz 15.00 MHz STATUS

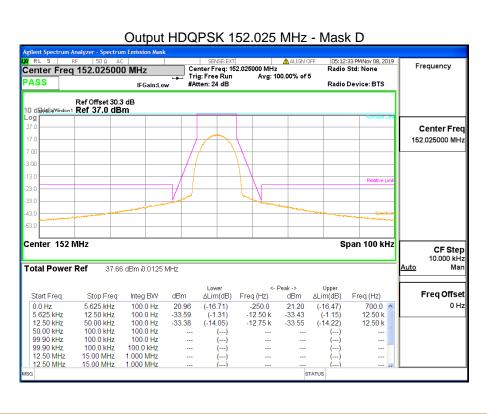
STATUS

Page 30 of 97

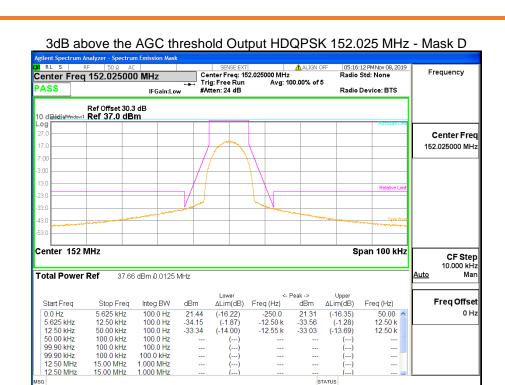


Client: Dali Wireless, Inc.

Report No.: 18280-2E

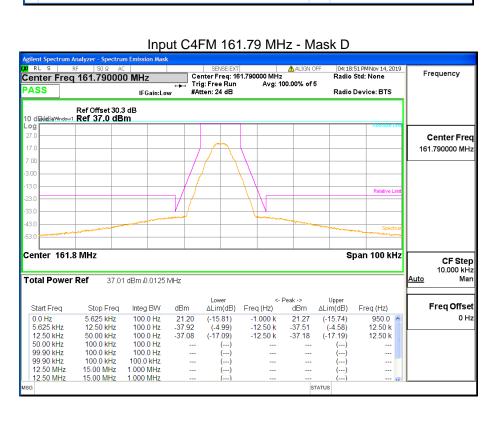


Page 31 of 97

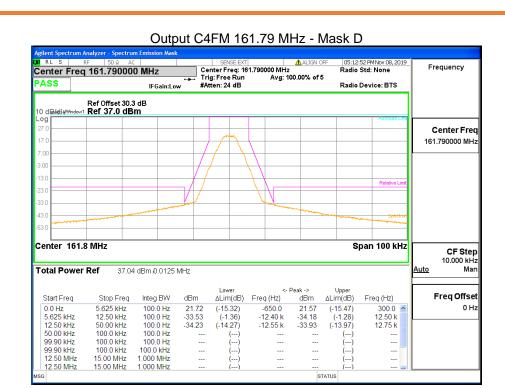


Client: Dali Wireless, Inc.

Report No.: 18280-2E



Page 32 of 97



Client: Dali Wireless, Inc.

Report No.: 18280-2E

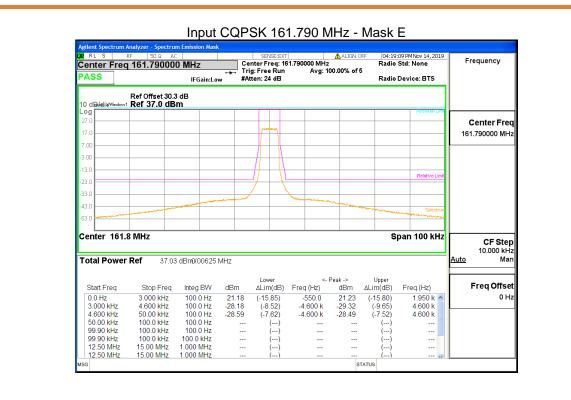
Revision No.: 1

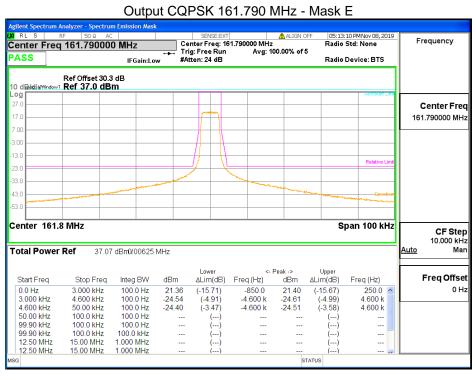
3dB above the AGC threshold Output C4FM 161.79 MHz - Mask D SENSE:EXT ALIGN OFF Center Freq: 161.790000 MHz Trig: Free Run Avg: 100.00% of 5 #Atten: 24 dB 05:16:30 PM Nov 08, 2019 Radio Std: None Frequency Center Freq 161.790000 MHz IFGain:Low Radio Device: BTS Ref Offset 30.3 dB Ref 37.0 dBm 10 dB√idia/Windo Center Fred 161.790000 MHz 3.00 Center 161.8 MHz Span 100 kHz CF Step Total Power Ref 37.41 dBm .0.0125 MHz Mar Upper ΔLim(dB) Freq Offset Start Freq Stop Freq Integ BW dBm ∆Lim(dB) Freq (Hz) dBm Freq (Hz) 0.0 Hz 5.625 kHz 5.625 kHz 12.50 kHz -850.0 -12.50 k 100.0 Hz 21.59 (-15.82) 21.77 (-15.64) 950.0 0 H 100.0 Hz -34.33 (-1.80)-33.84 (-1.31) (-14.40) 12.50 k 12.50 kHz 50.00 kHz 100.0 Hz -33.86 (-14.27)-12.65 k -33.99 12.95 k 50.00 kHz 100.0 kHz 100.0 Hz 100 0 Hz 99 90 kHz 100 0 kHz 99.90 kHz 12.50 MHz 100.0 kHz 15.00 MHz 100.0 kHz 1.000 MHz 12.50 MHz 15.00 MHz 1.000 MHz STATUS

Page 33 of 97

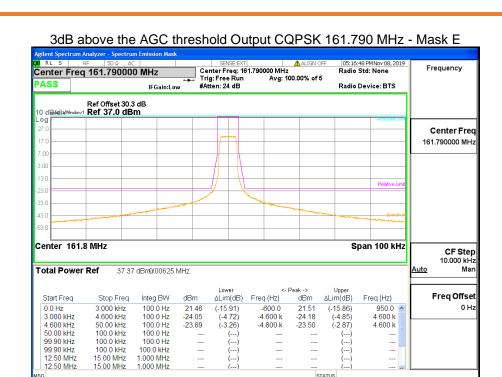
Project No.: 18280

Client: Dali Wireless, Inc. Report No.: 18280-2E Revision No.: 1



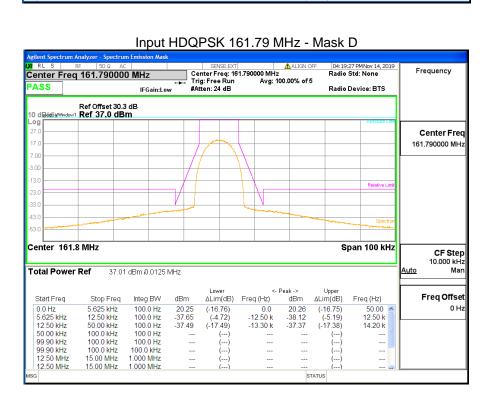


Page 34 of 97

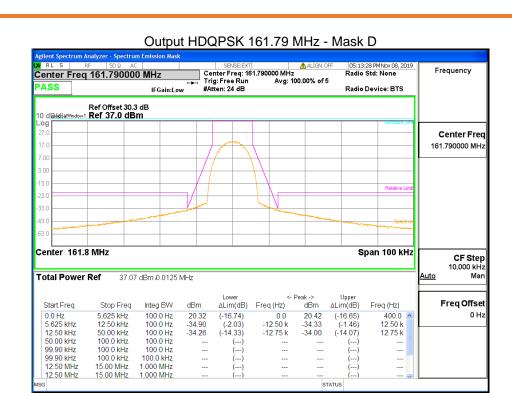


Client: Dali Wireless, Inc.

Report No.: 18280-2E



Page 35 of 97



Client: Dali Wireless, Inc.

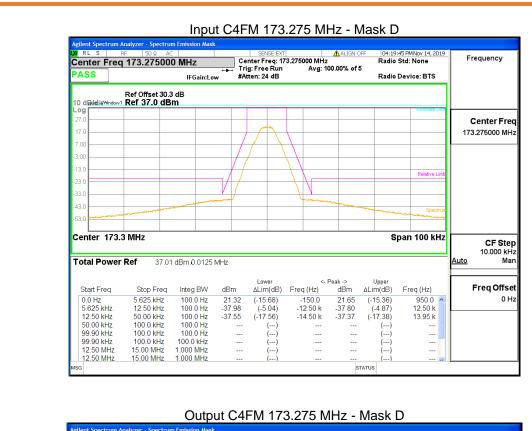
Report No.: 18280-2E

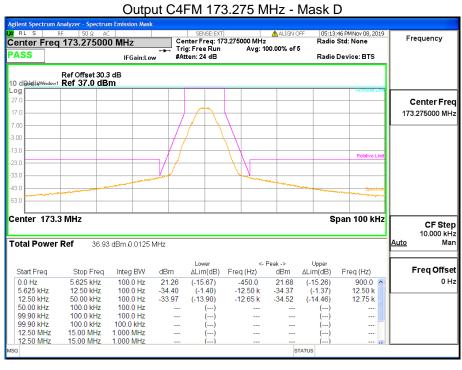




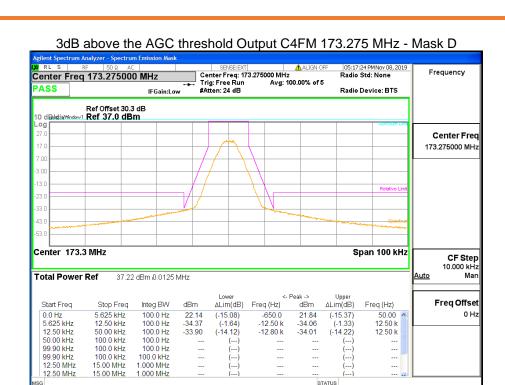
Page 36 of 97

Client: Dali Wireless, Inc. Report No.: 18280-2E Revision No.: 1



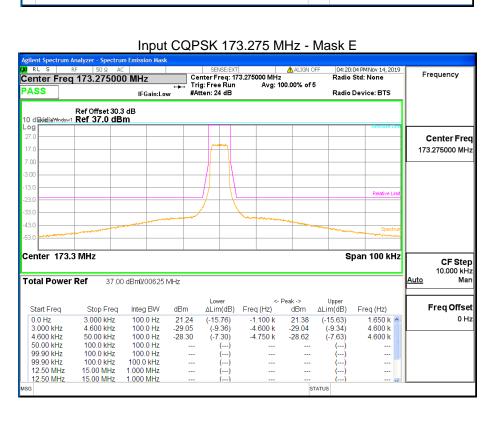


Page 37 of 97

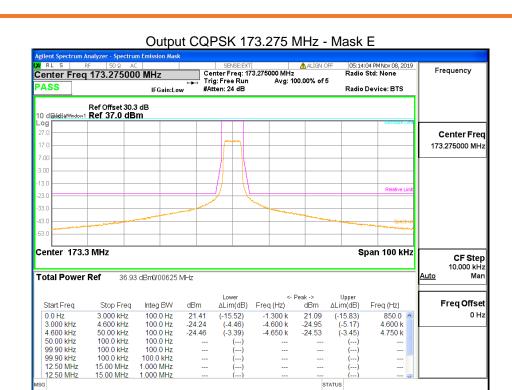


Client: Dali Wireless, Inc.

Report No.: 18280-2E

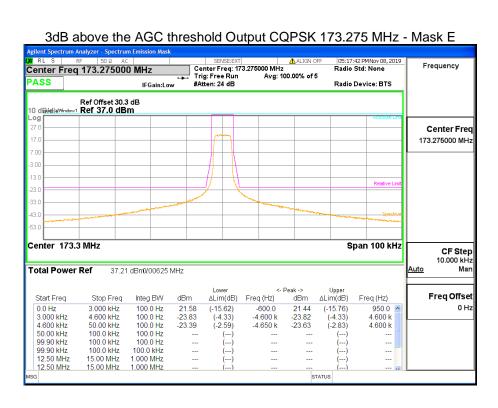


Page 38 of 97

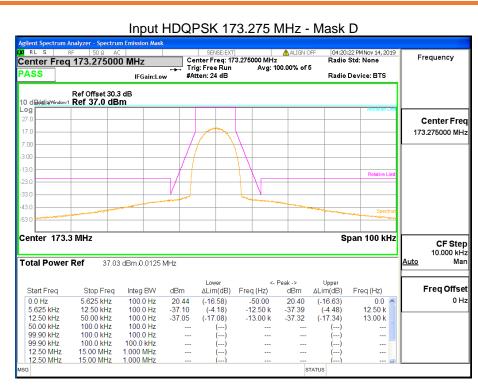


Client: Dali Wireless, Inc.

Report No.: 18280-2E

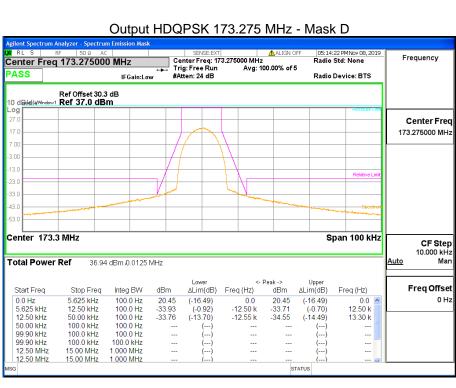


Page 39 of 97

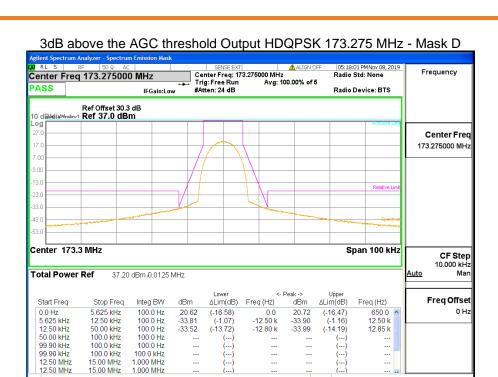


Client: Dali Wireless, Inc.

Report No.: 18280-2E

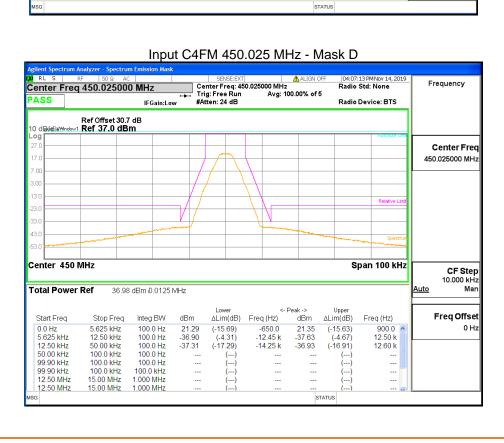


Page 40 of 97

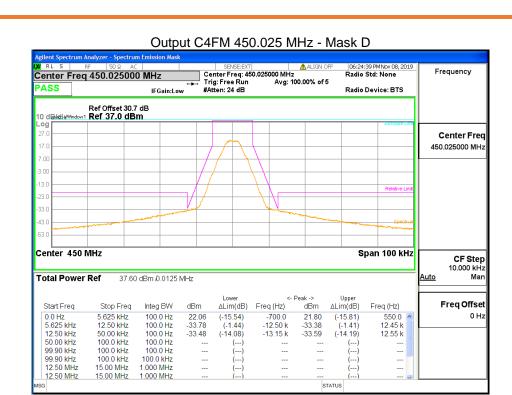


Client: Dali Wireless, Inc.

Report No.: 18280-2E



Page 41 of 97



Client: Dali Wireless, Inc.

Report No.: 18280-2E

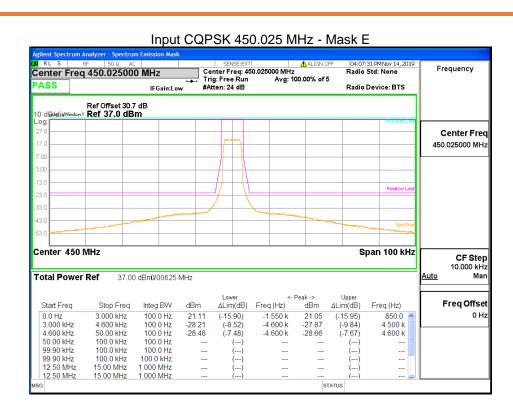
Revision No.: 1

3dB above the AGC threshold Output C4FM 450.025 MHz - Mask D 06:28:24 PMNov 08, 2019 Radio Std: None ▲ ALIGN OFF Center Freq: 450.025000 MHz Trig: Free Run Avg: 10 #Atten: 24 dB Frequency Center Freq 450.025000 MHz Avg: 100.00% of 5 PASS Radio Device: BTS IFGain:Low Ref Offset 30.7 dB Ref 37.0 dBm Center Freq 450 025000 MH Center 450 MHz Span 100 kHz CF Step Total Power Ref 37.72 dBm .0.0125 MHz Lower ΔLim(dB) Freq (Hz) Upper ∆Lim(dB) Freq Offset Start Freq Stop Freq Integ BW dBm Freq (Hz) dBm -700.0 5.625 kHz 100.0 Hz 22.14 (-15.58) 21.95 (-15.77) 650.0 0 H 0.0 Hz 5.625 kHz (-1.21) (-14.28) 12 50 kHz 100 0 Hz -33.80 (-1.58) -12 50 k -33 43 12 50 k 50.00 kHz 100.0 Hz -33.46 (-14.18) -12.70 k -33.56 12.75 k 50 00 kHz 100 0 kHz 100 0 Hz 100.0 kHz 100.0 kHz 100.0 Hz 100.0 kHz 99.90 kHz 15.00 MHz 15.00 MHz 1.000 MHz 1.000 MHz 12.50 MHz 12.50 MHz

Page 42 of 97

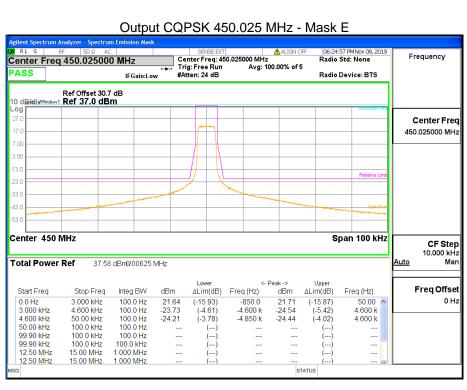
Prepared by: LabTest Certification Inc.
Date Issued: 02 December 2019

Date Issued: 02 December 2019 Project No.: 18280

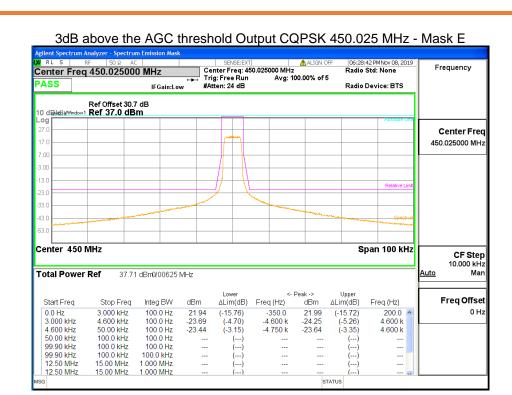


Client: Dali Wireless, Inc.

Report No.: 18280-2E



Page 43 of 97



Client: Dali Wireless, Inc.

Report No.: 18280-2E

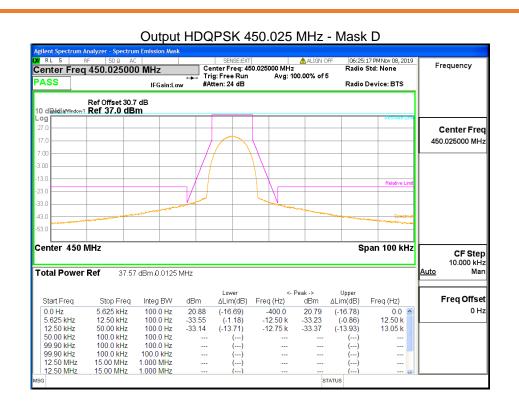


Page 44 of 97

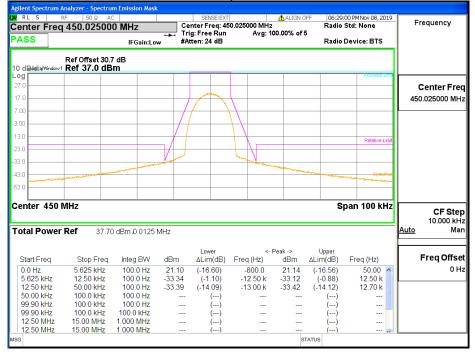
Prepared by: LabTest Certification Inc. Date Issued: 02 December 2019

Project No.: 18280

Client: Dali Wireless, Inc. Report No.: 18280-2E Revision No.: 1



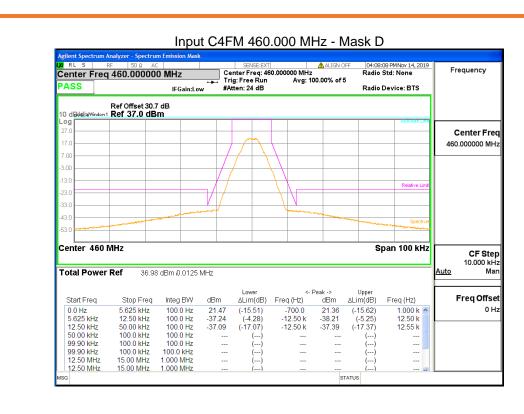
3dB above the AGC threshold Output HDQPSK 450.025 MHz - Mask D

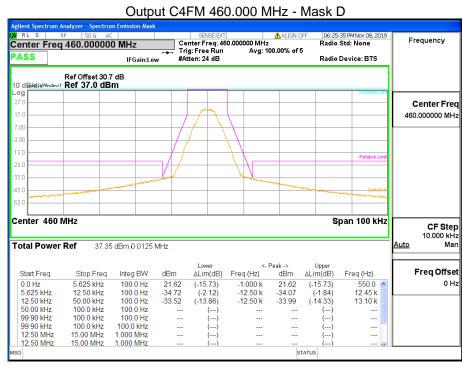


Page 45 of 97

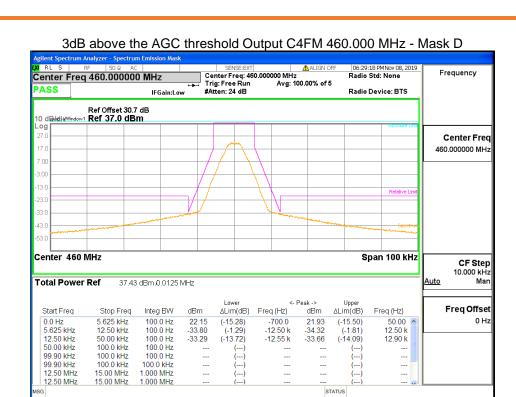
Project No.: 18280

Client: Dali Wireless, Inc. Report No.: 18280-2E Revision No.: 1



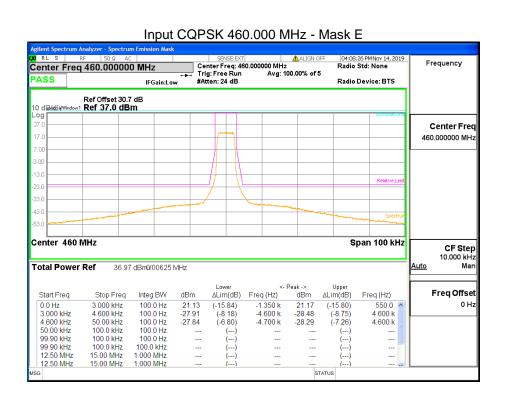


Page 46 of 97

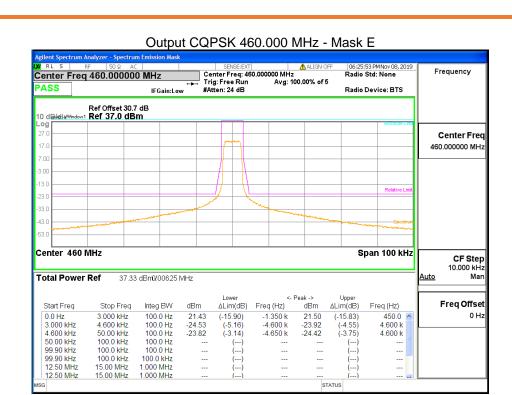


Client: Dali Wireless, Inc.

Report No.: 18280-2E

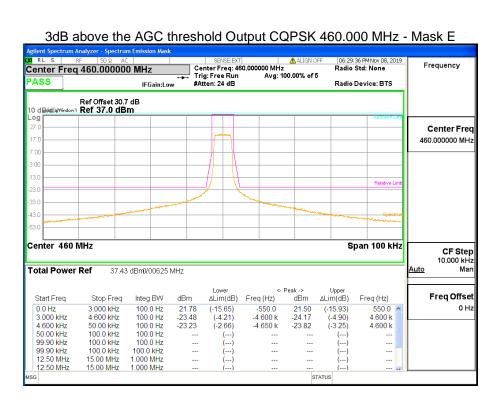


Page 47 of 97



Client: Dali Wireless, Inc.

Report No.: 18280-2E



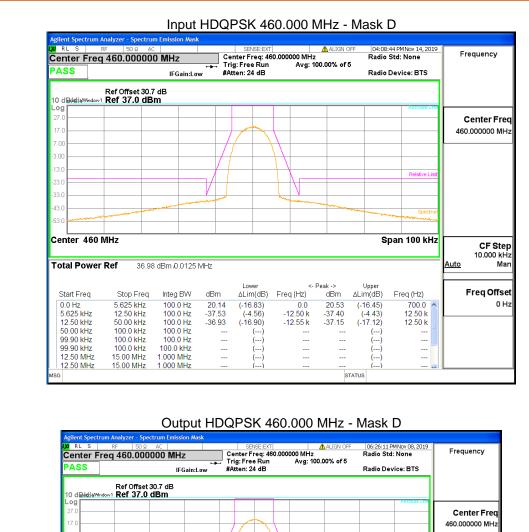
Page 48 of 97

Prepared by: LabTest Certification Inc. Date Issued: 02 December 2019

Project No.: 18280

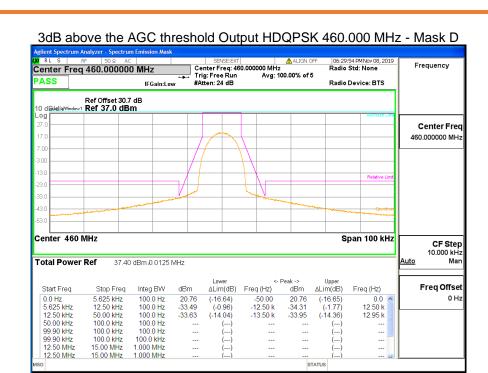
Client: Dali Wireless, Inc.

Report No.: 18280-2E



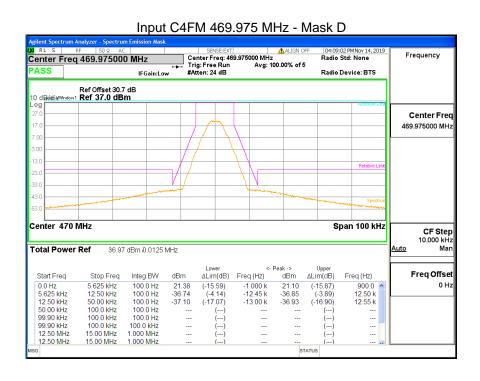
Center 460 MHz Span 100 kHz **CF Step** 10.000 kHz Mar Total Power Ref 37.34 dBm 0.0125 MHz <- Peak -> dBm Upper ΔLim(dB) Freq Offset Start Freq Stop Freq Integ BW dBm ΔLim(dB) Freq (Hz) Freq (Hz) 5.625 kHz 12.50 kHz (-16.39) (-16.39) 0.0 12.50 k 0 Hz 0.0 Hz -12.50 k 5.625 kHz -33.68 (-1.07) (-14.07) 100.0 Hz (-1.08)-33.67 12.50 kHz 50.00 kHz 50.00 kHz 100.0 kHz 100.0 Hz 100.0 Hz -33.72 (-14.06)-12.55 k -33.73 13.20 k 100.0 Hz 99.90 kHz 100.0 kHz 99 90 kHz 100 0 kHz 100.0 kHz 12.50 MHz 12.50 MHz 15.00 MHz 15.00 MHz 1.000 MHz 1.000 MHz STATUS

Page 49 of 97



Client: Dali Wireless, Inc.

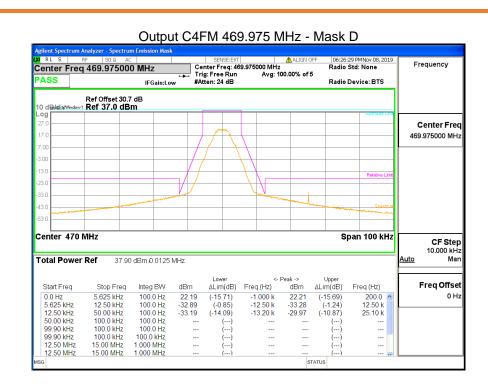
Report No.: 18280-2E



Page 50 of 97

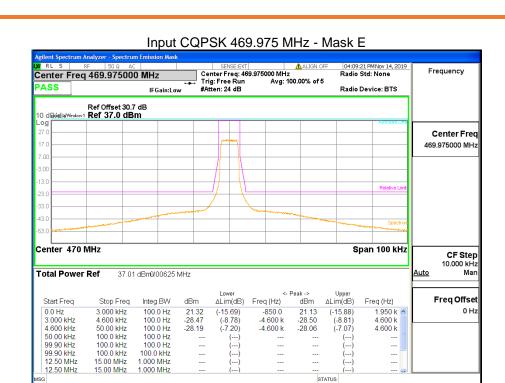
Project No.: 18280

Client: Dali Wireless, Inc. Report No.: 18280-2E Revision No.: 1



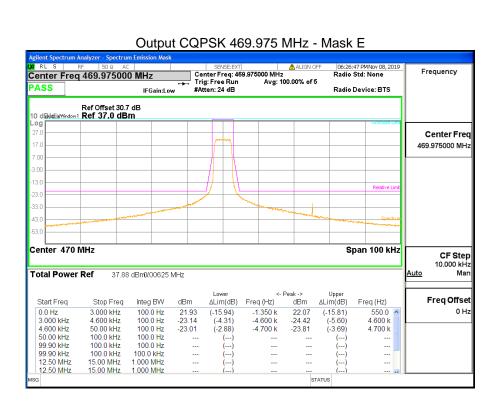
3dB above the AGC threshold Output C4FM 469.975 MHz - Mask D Center Freq 469.975000 MHz Frequency PASS Radio Device: BTS IFGain:Low Ref Offset 30.7 dB Ref 37.0 dBm Center Freq 469.975000 MH Center 470 MHz Span 100 kHz CF Step 10.000 kHz Mai Total Power Ref 37.91 dBm 0.0125 MHz <- Peak -> dBm Upper ΔLim(dB) Lower ∆Lim(dB) Freq (Hz) Freq Offset Start Freq Stop Freq Integ BW Freq (Hz) 0.0 Hz 5.625 kHz 12.50 kHz 900.0 12.50 k 25.10 k 5.625 kHz 12.50 kHz 100.0 Hz 100.0 Hz 22.20 -33.43 22.42 -33.75 (-15.71) (-15.49) 0 Hz (-1.72) (-13.36) 50.00 kHz 100.0 Hz -33.30 (-14.21)-12.55 k -32.45 100.00 KHz 100.00 kHz 100.00 kHz 100.00 KHz 15.000 MHz 15.000 MHz 50.00 kHz 99.90 kHz 99.90 kHz 12.50 MHz 100.0 Hz 100.0 Hz 100.0 kHz 1.000 MHz 12.50 MHz 1.000 MHz STATUS

Page 51 of 97



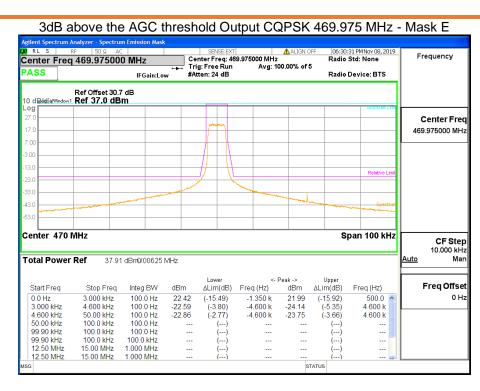
Client: Dali Wireless, Inc.

Report No.: 18280-2E

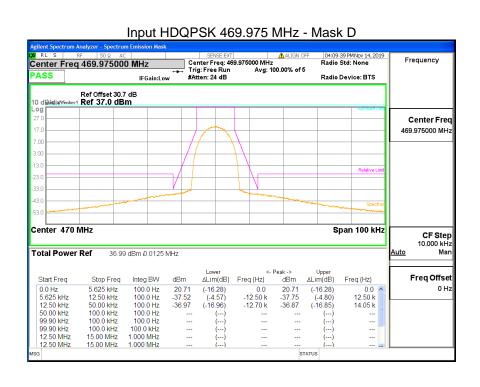


Page 52 of 97

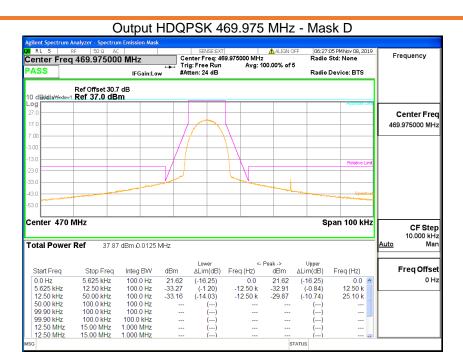
Report No.: 18280-2E Project No.: 18280



Client: Dali Wireless, Inc.



Page 53 of 97

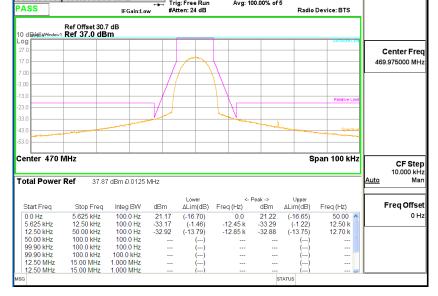


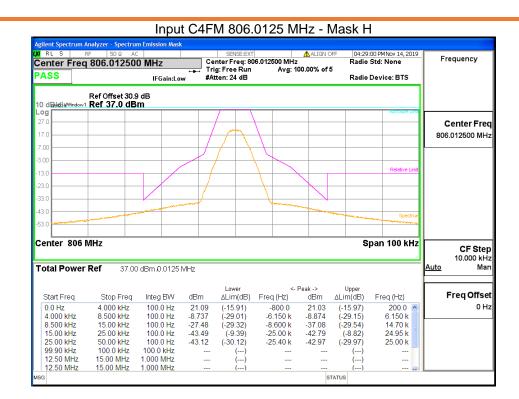
Client: Dali Wireless, Inc.

Report No.: 18280-2E

Revision No.: 1

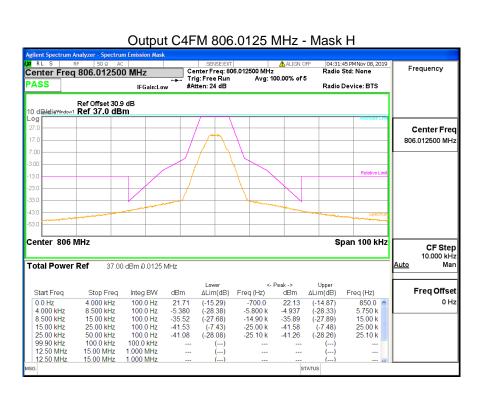
3dB above the AGC threshold Output HDQPSK 469.975 MHz - Mask D Apllent Spectrum Analyzer - Spectrum Emission Mask W RL S RF 50 \(\text{SQ} \) AC SENSE(XT) Center Freq 469.975000 MHz Trig: Free Run Avg: 100.00% of 5 Radio Std: None Radio Device RTS



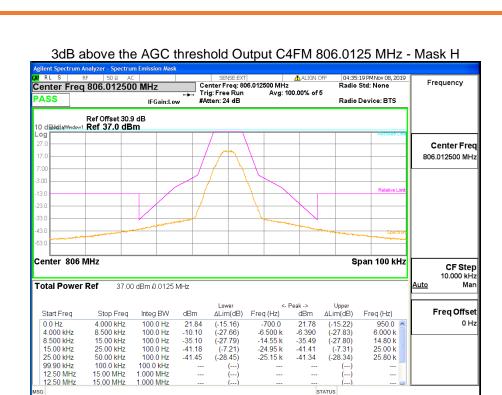


Client: Dali Wireless, Inc.

Report No.: 18280-2E

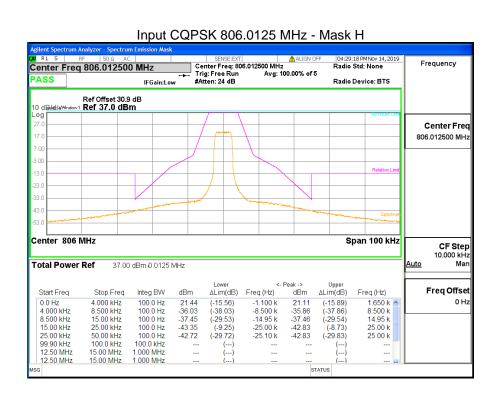


Page 55 of 97



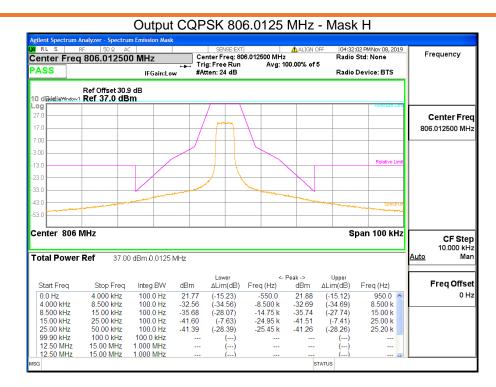
Client: Dali Wireless, Inc.

Report No.: 18280-2E

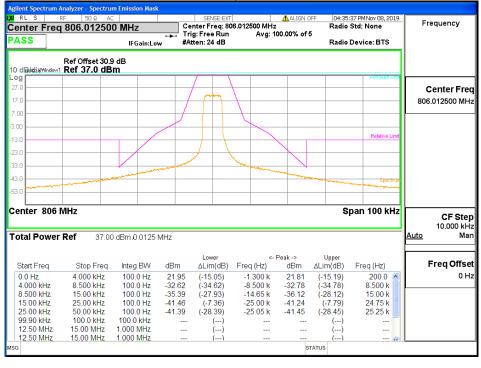


Page 56 of 97

Client: Dali Wireless, Inc. Report No.: 18280-2E Revision No.: 1



3dB above the AGC threshold Output CQPSK 806.0125 MHz - Mask H



Page 57 of 97

25.00 kHz

99.90 kHz

12 50 MHz

12.50 MHz

50.00 kHz 100.0 kHz

15.00 MHz

15.00 MHz

100.0 Hz

100.0 kHz

1 000 MHz

1.000 MHz

-41.40

(-28.40)

Date Issued: 02 December 2019



Client: Dali Wireless, Inc.

Report No.: 18280-2E

Page 58 of 97

-25.05 k

-41.03

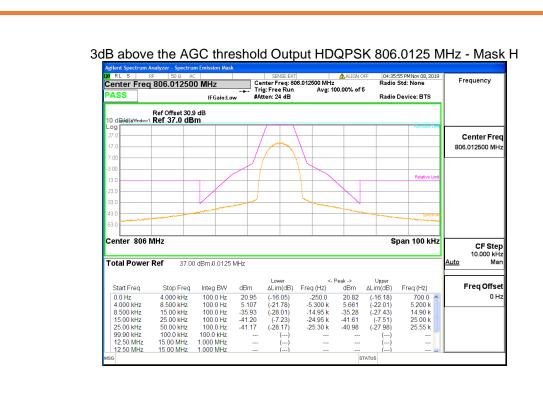
(-28.03)

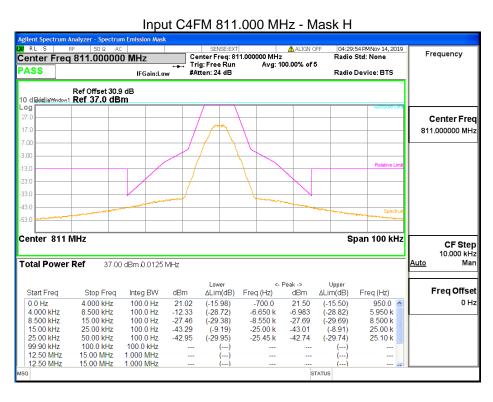
STATUS

25.20 k

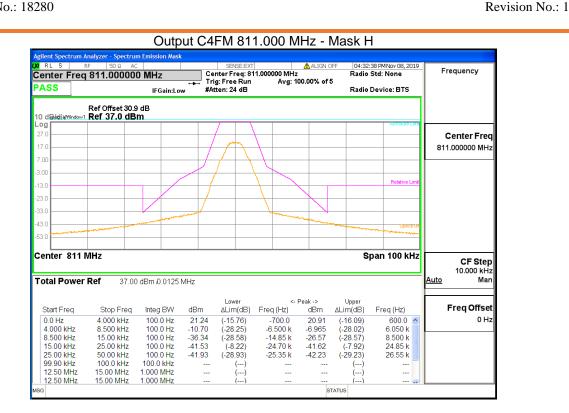
ertification Inc.
er 2019

Client: Dali Wireless, Inc.
Report No.: 18280-2E
Revision No.: 1





Page 59 of 97

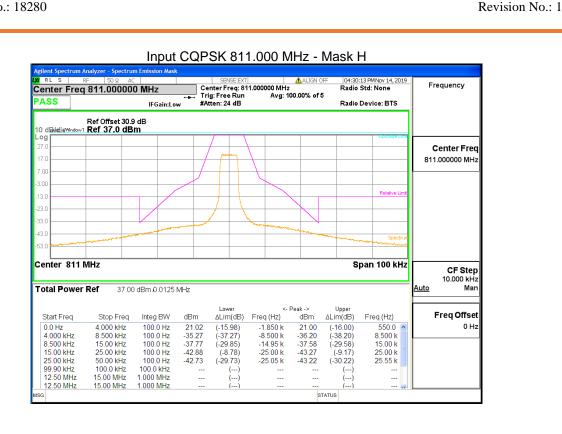


Client: Dali Wireless, Inc.

Report No.: 18280-2E

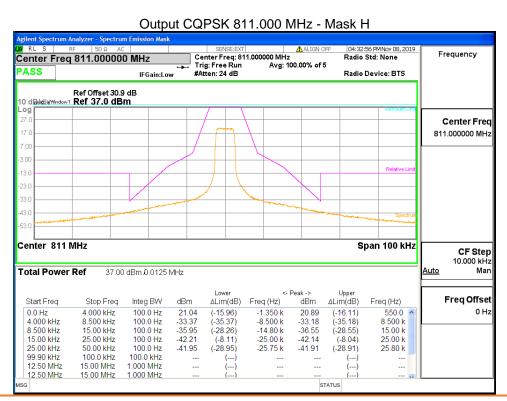
3dB above the AGC threshold Output C4FM 811.000 MHz - Mask H lyzer - Spectrum Emission Mask ▲ ALIGN OFF Center Freq: 811.000000 MHz Trig: Free Run Avg: 10 Frequency Center Freq 811.000000 MHz Radio Std: None Avg: 100.00% of 5 PASS IFGain:Low #Atten: 24 dB Radio Device: BTS Ref Offset 30.9 dB Ref 37.0 dBm Center Freq 811.000000 MHz Center 811 MHz Span 100 kHz CF Step 10.000 kH Total Power Ref 37.00 dBm 0.0125 MHz Freq Offset Start Freq Stop Freq Integ BW Freq (Hz) dBm ∆Lim(dB) Freq (Hz) dBm ∆Lim(dB) 0.0 Hz 4.000 kHz 100.0 Hz 21.52 (-15.48) -800.0 21.34 (-15.66)1.000 k 🔼 0 Hz 4 000 kHz 8 500 kHz 100 0 Hz -2315(-28.26)-8 100 k -24 16 (-28.10)8 250 k 8.500 kHz 15.00 kHz -36.23 -15.00 k -35.85 (-28.39) 14.65 k 100.0 Hz (-28.23)15.00 kHz 25.00 kHz 100.0 Hz -41.70 (-7.60)-25.00 k -41.77 (-8.06)24.85 k 25 00 kHz 50 00 kHz 100 0 Hz -41.52 (-28.52)-25 05 k -41.53 (-28.53)25 70 k 99.90 kHz 100.0 kHz 100.0 kHz 12.50 MHz 15.00 MHz 1.000 MHz 1.000 MHz 12.50 MHz 15.00 MHz STATUS

Page 60 of 97



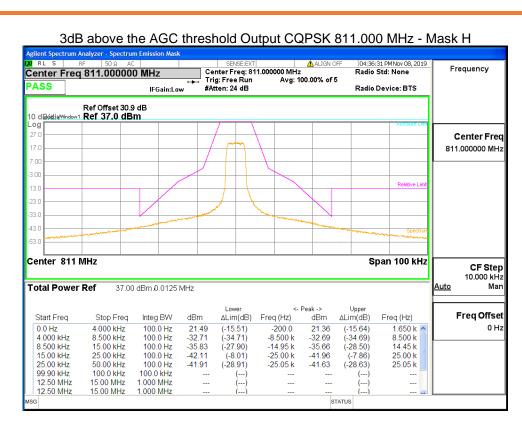
Client: Dali Wireless, Inc.

Report No.: 18280-2E

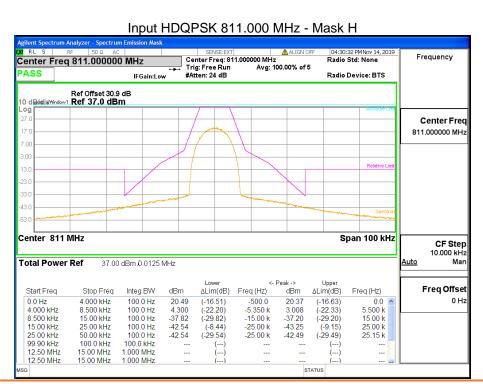


Page 61 of 97

Report No.: 18280-2E Project No.: 18280

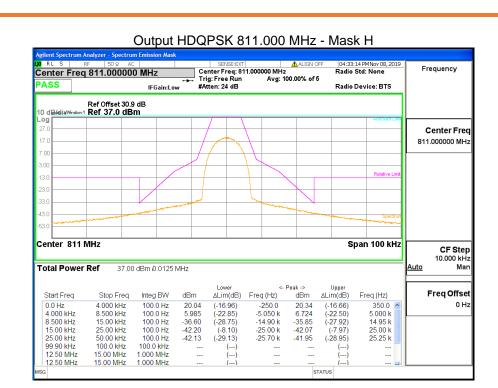


Client: Dali Wireless, Inc.



Page 62 of 97

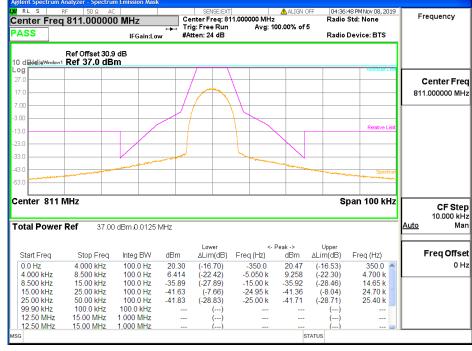
Date Issued: 02 December 2019 Project No.: 18280



Client: Dali Wireless, Inc.

Report No.: 18280-2E

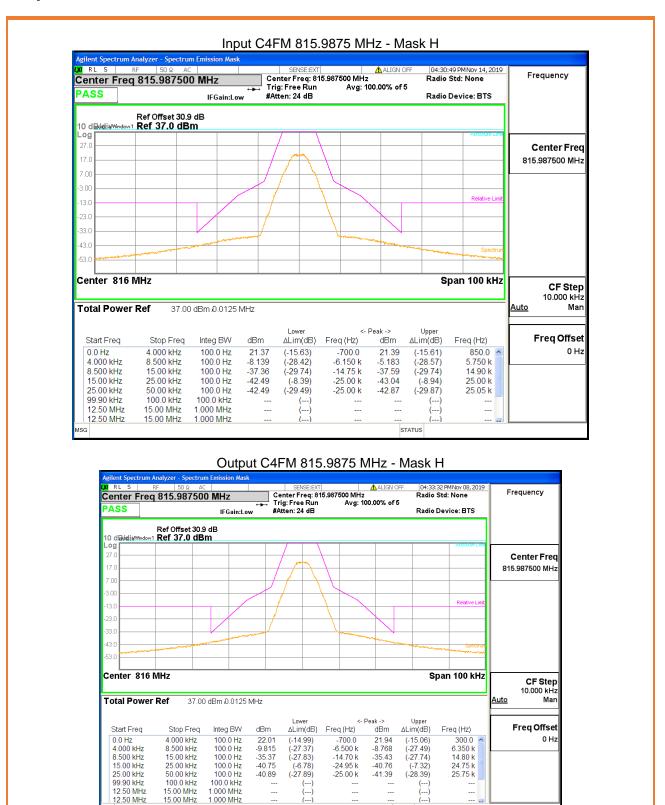




Page 63 of 97

Project No.: 18280

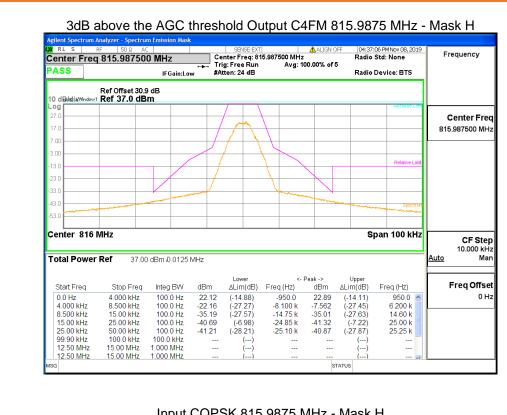
Client: Dali Wireless, Inc. Report No.: 18280-2E Revision No.: 1

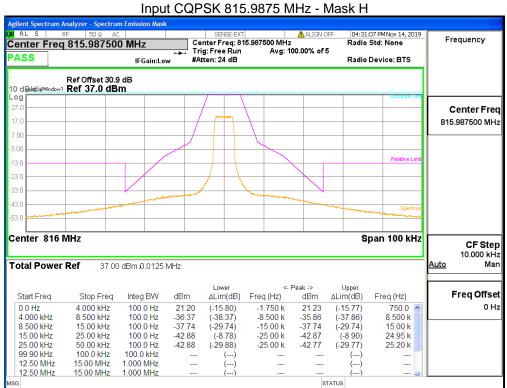


Page 64 of 97

STATUS

Client: Dali Wireless, Inc. Report No.: 18280-2E Revision No.: 1





Page 65 of 97

Date Issued: 02 December 2019

Project No.: 18280

Report No.: 18280-2E

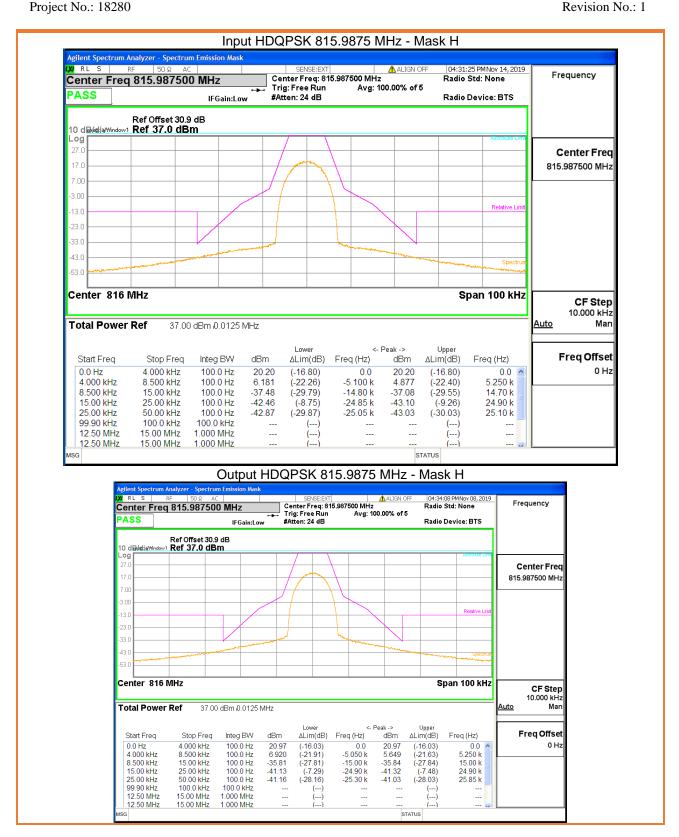
Revision No.: 1

Client: Dali Wireless, Inc.



Page 66 of 97

Date Issued: 02 December 2019

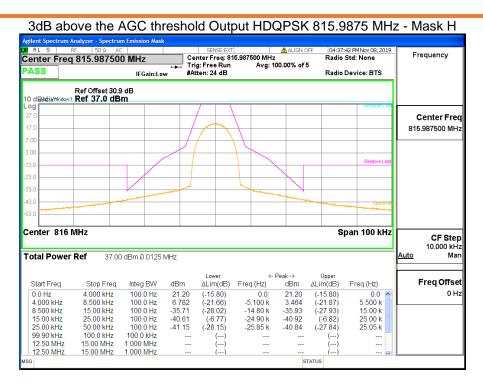


Client: Dali Wireless, Inc.

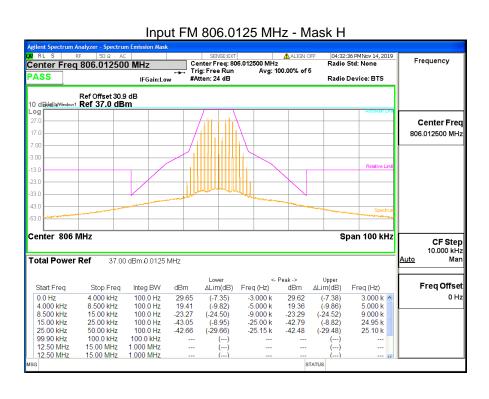
Report No.: 18280-2E

Page 67 of 97

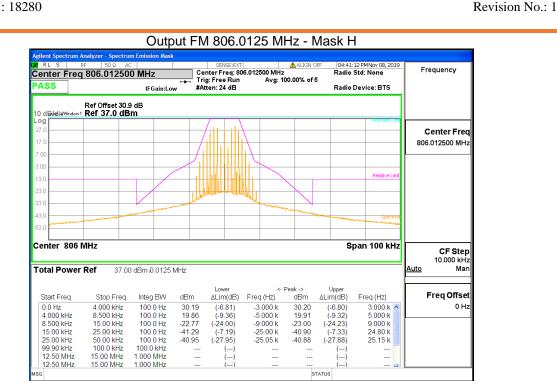
Report No.: 18280-2E Project No.: 18280



Client: Dali Wireless, Inc.



Page 68 of 97



Client: Dali Wireless, Inc.

Report No.: 18280-2E

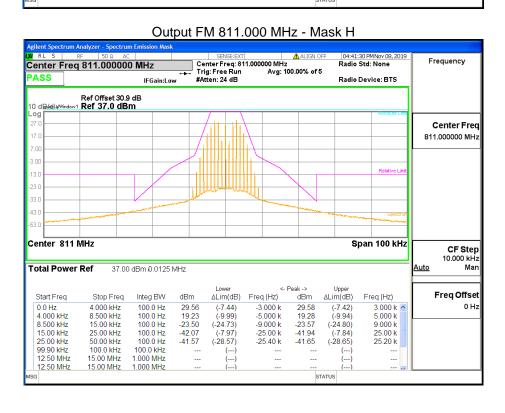
3dB above the AGC threshold Output FM 806.0125 MHz - Mask H 04:42:23 PMNov 08, 2019 Radio Std: None Frequency Center Freq 806.012500 MHz PASS Radio Device: BTS IFGain:Low Ref Offset 30.9 dB Ref 37.0 dBm Center Freq 806 012500 MHz Center 806 MHz Span 100 kHz **CF Step** Total Power Ref 37.00 dBm .0.0125 MHz Start Freq Stop Freq Integ BW ΔLim(dB) Freq (Hz) ΔLim(dB) Freq (Hz) Freq Offset 4.000 kHz 8.500 kHz 15.00 kHz 25.00 kHz 50.00 kHz 30.22 19.92 -22.72 -41.05 -41.01 (-6.78) (-9.30) (-23.95) (-7.09) (-28.01) 0.0 Hz 4.000 kHz 100.0 Hz 100.0 Hz 30.20 19.88 (-6.80) (-9.34) -3.000 k -5.000 k 3.000 k 5.000 k 0 Hz 9.000 k 24.95 k 25.35 k (-24.03) (-7.26) (-28.12) 8 500 kHz 100 0 Hz -22.80 -9.000 k 15.00 kHz 25.00 kHz 100.0 Hz 100.0 Hz -40.44 -41.12 -24.65 k -25.10 k 99.90 kHz 100.0 kHz 100.0 kHz 12 50 MHz 15 00 MHz 1.000 MHz 1.000 MHz 12.50 MHz 15.00 MHz STATUS

Page 69 of 97

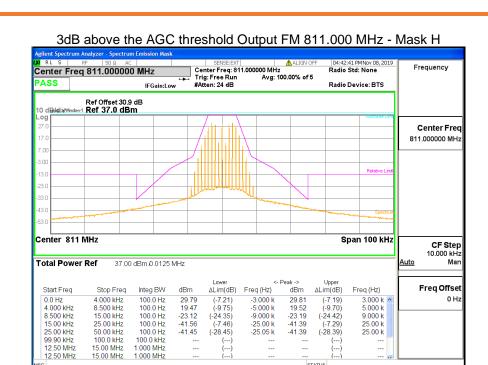
Input FM 811.000 MHz - Mask H Center Freq: 811.000000 MHz Trig: Free Run Avg: 100.00% of 5 #Atten: 24 dB 04:32:54 PMNov 14, 2019 Frequency Center Freq 811.000000 MHz Radio Std: None PASS Radio Device: BTS IFGain:Low Ref Offset 30.9 dB Ref 37.0 dBm Center Freq 811.000000 MHz 3.0 Center 811 MHz Span 100 kHz CF Step 10.000 kHz Total Power Ref 37.00 dBm .0.0125 MHz Mai <- Peak -> Freq Offset Start Freq Stop Freq Integ BW dBm ΔLim(dB) Freq (Hz) dBm ΔLim(dB) Freq (Hz) 0.0 Hz 4.000 kHz 4.000 kHz 8.500 kHz 29.65 19.41 -3.000 k -5.000 k 29.62 19.37 (-7.38) (-9.85) 3.000 k 5.000 k 100.0 Hz (-7.35) 0 Hz 100.0 Hz (-9.81)8.500 kHz 15.00 kHz 15.00 kHz 25.00 kHz 100.0 Hz 100.0 Hz -23.30 -42.48 (-24.53) (-8.77) -9.000 k -24.85 k -23.15 -42.37 (-24.38) (-8.93) 9.000 k 24.75 k 25.00 kHz 99.90 kHz 50.00 kHz 100.0 Hz -42.85 (-29.85)-25.40 k -42.65 (-29.65)25.35 k 100.0 kHz 15.00 MHz 12.50 MHz 1.000 MHz 12.50 MHz 15.00 MHz 1.000 MHz STATUS

Client: Dali Wireless, Inc.

Report No.: 18280-2E

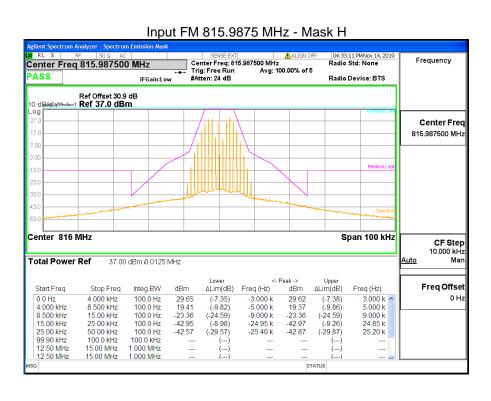


Page 70 of 97

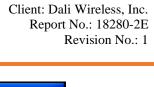


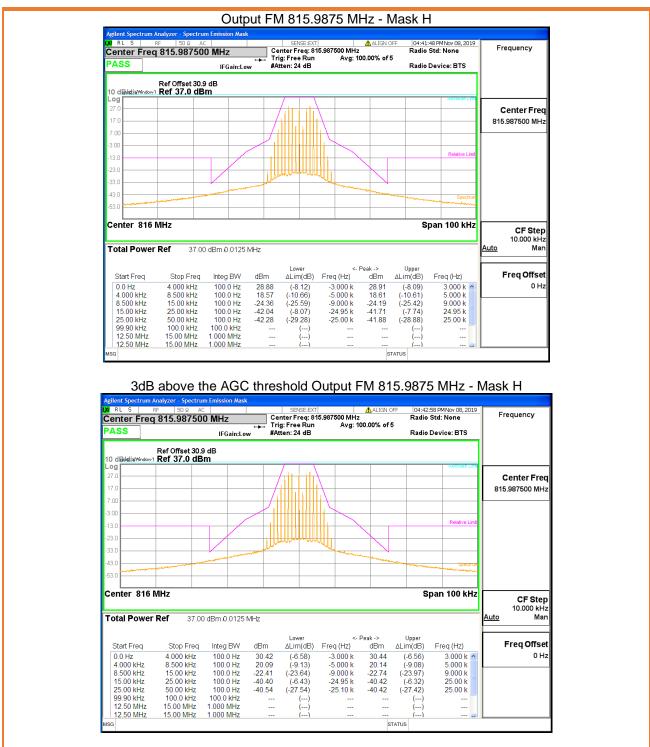
Client: Dali Wireless, Inc.

Report No.: 18280-2E



Page 71 of 97





Date Issued: 02 December 2019

Project No.: 18280

Report No.: 18280-2E

Revision No.: 1

Client: Dali Wireless, Inc.

Input/output Power and Amplifier/Booster Gain

Governing Doc	FCC Part 90.219		Room Temperature (°C)		20.5	
Test Procedure	ANSI/TIA-603- E; FCC KDB 935210 D05, v01r03		Relative Humidity (%)		38.6	
Test Location	Richmond		Barometric Pressure (kPa)		101.8	
Test Engineer	Daniel Lee		Date		Nov 08, 2019	
EUT Voltage			120VAC @ 60Hz			
Test Equipment	Manufacturer	Model	Identifier	Calibration	Calibration due	
Signal Generator	Keysight	N5172B	MY53050270	06/12/19	06/12/21	
Spectrum Analyzer	Keysight	MY50520285	07/29/19	07/23/21		
Span:	⊠ Max Gain Frequency ± 1500kHz					
Detector:	⊠ Peak					
RBW/VBW:	⊠100k Hz/ 300 kHz					
Type of Facility:	□ Tabletop					
Distance:						
Maximum booster gain is 95.1dB.						
Compliant ⊠	Compliant ⊠ Non-Compliant □		Not Applicable □			

Test setup

Description of test set-up:

The procedure used was ANSI/TIA-603-E-2016 and FCC KDB 935210 D05 Indus Booster Basic Meas v01r02:. A CW tone was input at the frequency where the system gain is the maximum in the pass band, with the nominal input power level -58 dBm. The spectrum analyzer was connected to the output RF port via a 50 Ohm 30 dB attenuator. The maximum hold trace and peak detector was used to capture the output power. The output power minus the input power (-58dBm) equals to the booster gain in dB.

The EUT was set to Operation Mode #1 with configuration Mode #1.



Date Issued: 02 December 2019

Project No.: 18280

Report No.: 18280-2E

Revision No.: 1

Client: Dali Wireless, Inc.

Results

Test Band	Frequency (MHz)	Input Power (dBm)	Output Power (dBm)	Gain (dB)
150PS	163	-58.1	37	95.1
450PS	460	-56.5	37	93.5
800PS	811	-54.9	37	91.9

Date Issued: 02 December 2019

Project No.: 18280-2E

Revision No.: 1

Client: Dali Wireless, Inc.

Noise Figure

FCC Part 90.219		Room Temperature (°C)		20.5		
ANSI/TIA-603- E; FCC KDB 935210 D05, v01r03		Relative Humidity (%)		38.6		
Richmond		Barometric Pressure (kPa)		101.8		
Daniel Lee	Date	Date				
⊠ DC	□ 12	OVAC @ 60Hz				
Manufacturer	Model	Serial Number	Calibration	Calibration due		
Keysight	N9010A	MY50520285	07/29/19	07/23/21		
□ 2 times of the passband on each band						
⊠ Average						
⊠ 910 kHz						
⊠ Tabletop						
□ Direct						
Noise Figure on each band is less than the 9 dB required.						
Non-Compliant □		Not Appl				
	ANSI/TIA-603- E; FCC KDB 935210 D05, v Richmond Daniel Lee DC Manufacturer Keysight 2 times of the passba Average 910 kHz Tabletop Direct and is less than the 9 dB r	ANSI/TIA-603- E; FCC KDB 935210 D05, v01r03 Richmond Daniel Lee DC D120 Manufacturer Model Keysight N9010A 2 times of the passband on each to the	ANSI/TIA-603- E; FCC KDB 935210 D05, v01r03 Richmond Daniel Lee Date DC 120VAC @ 60Hz Manufacturer Model Keysight N9010A MY50520285 2 times of the passband on each band Average 910 kHz Tabletop Direct And is less than the 9 dB required.	ANSI/TIA-603- E; FCC KDB 935210 D05, v01r03 Richmond Barometric Pressure (kPa) Daniel Lee Date DC 120VAC @ 60Hz Manufacturer Model Serial Number Calibration Keysight N9010A MY50520285 07/29/19 2 times of the passband on each band Average 910 kHz Tabletop Direct and is less than the 9 dB required.		

Test setup

Based on FCC KDB 935210 D05 Indus Booster Basic Meas v01r03: 2019, the system maximum gain and the noise density is measured. Measurements were performed within the EUT's passband. The noise figure is then calculated by NF = NP – Gain + KTB Noise; where NP is in band noise power per Herz, Gain is measured at the maximum noise frequence with -55 dBm input signal in UL. KTB Noise is 174dBm/Hz. The EUT was set to **Operation Mode #1 with configuration Mode #1.**Spectrum Analyzer hd37 EUT 50 Ω Terminator

Date Issued: 02 December 2019

Project No.: 18280

Report No.: 18280-2E

Revision No.: 1

Client: Dali Wireless, Inc.

Results

Test Ban	d Link	Gain (dB)	kTB (dBm/Hz)	Measured Value (dBm/Hz)	Noise Figure (dB)
150PS	DownLink	95.1	174	-73.56	5.34
450PS	DownLink	93.3	174	-75.59	5.11
800PS	DownLink	91.9	174	-76.47	5.63

Date Issued: 02 December 2019

Project No.: 18280-2E

Revision No.: 1

Client: Dali Wireless, Inc.

Out-Of-Band / Out-Of-Block Intermodulation and Spurious Emissions

			T			
Governing Doc	FCC Part 90.219		Room Temperature (°C)		20.5	
Test Procedure	ANSI/TIA-603- E; FCC KDB 935210 D05, v01r03		Relative Humidity (%)		38.6	
Test Location	Richmond		Barometric Pressure (kPa)		101.8	
Test Engineer	Daniel Lee		Date		Nov 08, 2019	
EUT Voltage	⊠ +48VDC	120VAC @ 60Hz				
Test Equipment Used	Manufacturer	Model	Serial Number	Calibration	Calibration due	
Signal Generator	Keysight	N5172B	MY53050270	06/12/19	06/12/21	
Spectrum Analyzer	Keysight	N9010A	MY50520285	07/29/19	07/29/21	
Frequency Range:	⊠ Max Gain Frequency ± 50kHz					
Detector:	⊠ Average					
RBW/VBW:	⊠100/910Hz					
Type of Facility:	⊠ Tabletop					
Distance:	☑ Direct					
On 800 band, 450 band and 150 band: The intermodulation product of 2 tone is below the -13dBm emission limit with input power - 0.5dBm below AGC threshold and - 3 dB above AGC threshold						
Compliant ⊠	Non-Compliar	nt 🗆	Not Appl	icable 🗆		

Test setup

Description of test set-up:

The procedure used was ANSI/TIA-603-E-2016. Two tones (CW) method was used. The input power to the amplifier was set at maximum drive level by combining the two tones. The two tones were chosen in such a way (1) the third order intermodulation product frequencies are located within the pass band of the DUT and (2) they produce the worst-case emissions out of band. All signals were modulated.

Based on FCC KDB 935210 D05 Indus Booster Basic Meas v01r03: 2019, the two tone was located on either side of the maximum gain frequence in the passing band, and separated with the available spacing, which is 12.5kHz.

Measurements were performed with modulated -tone at identical input amplitude which produced integrated maximum rated output power.

The EUT was set to Operation Mode #1 with configuration Mode #1.



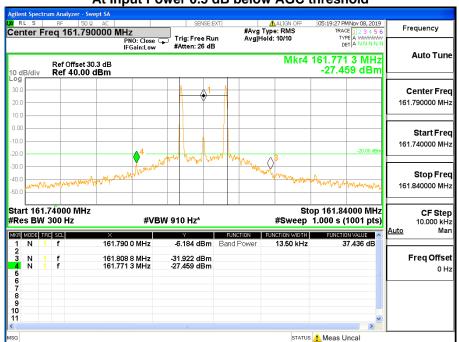
Page 77 of 97

Date Issued: 02 December 2019 Project No.: 18280

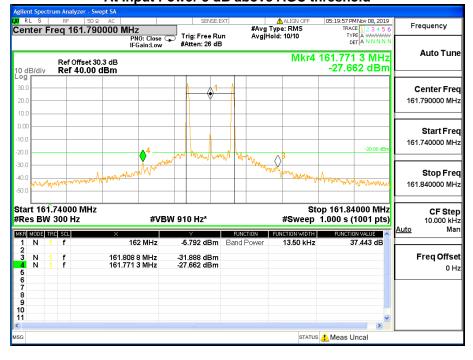
Results Screenshots

Client: Dali Wireless, Inc. Report No.: 18280-2E Revision No.: 1

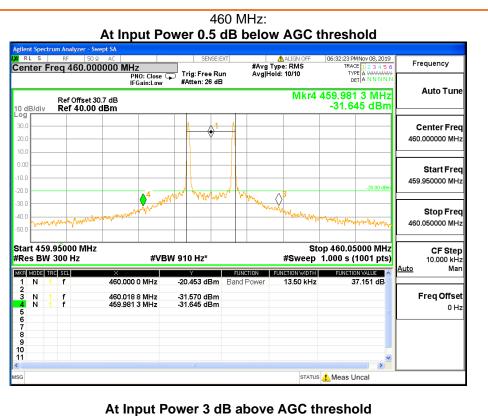
161.79 MHz: _____At Input Power 0.5 dB below AGC threshold



At Input Power 3 dB above AGC threshold

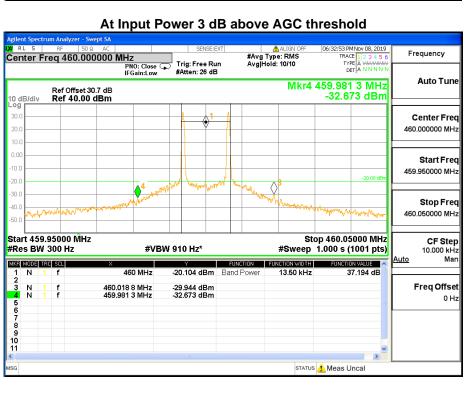


Page 78 of 97



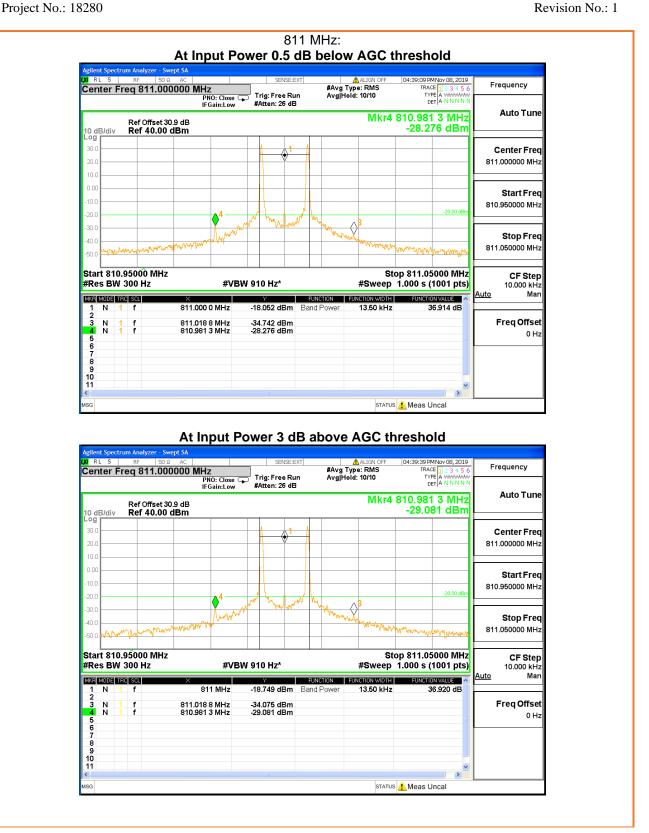
Client: Dali Wireless, Inc.

Report No.: 18280-2E



Page 79 of 97

Date Issued: 02 December 2019



Client: Dali Wireless, Inc.

Report No.: 18280-2E

Page 80 of 97

Report No.: 18280-2E Project No.: 18280

Client: Dali Wireless, Inc.



Project No.: 18280



Client: Dali Wireless, Inc.

Report No.: 18280-2E

Project No.: 18280



Client: Dali Wireless, Inc.



Date Issued: 02 December 2019 Project No.: 18280



Client: Dali Wireless, Inc.

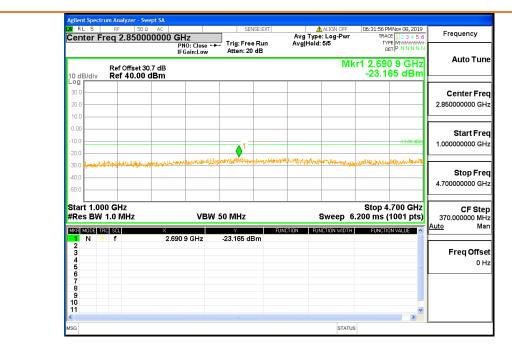
Report No.: 18280-2E

Project No.: 18280

Client: Dali Wireless, Inc. Report No.: 18280-2E Revision No.: 1



Project No.: 18280



Client: Dali Wireless, Inc.

Report No.: 18280-2E

Page 86 of 97

Project No.: 18280



Client: Dali Wireless, Inc.

Report No.: 18280-2E

Report No.: 18280-2E Project No.: 18280

Client: Dali Wireless, Inc.



Project No.: 18280



Client: Dali Wireless, Inc.

Report No.: 18280-2E

Date Issued: 02 December 2019

Project No.: 18280-2E

Revision No.: 1

Client: Dali Wireless, Inc.

Frequency Stability

The AH37 and hd37 are sychronized to the same reference clock. Therefore there is no frequency error after down and up frequency conversion are performed.

The frequency stability check is not applicable to the EUT.

Date Issued: 02 December 2019

Project No.: 18280-2E

Revision No.: 1

Client: Dali Wireless, Inc.

Spurious emissions radiated measurements

Governing Doc	FCC Part 2.1053, FCC Part 90.210 & FCC Part 90.219	Room Ten	Room Temperature (°C)			21.8 to 22.9	
Test Procedure	ANSI C63.4	Relative H	Relative Humidity (%)			40.7 to 46.7	
Test Location	Richmond	Barometrio	Pressure	(kPa)	101.7 to 103.3		
Test Engineer	Daniel Lee	Date			Oct. 23 & 25, 2019		
EUT Voltage							
Test Equipment Used	Manufacturer	Model	Identifier	Calibration	on date	Calibration	
EMC Analyzer	KeySight	N9038A	702	13-May	-2019	13-May-2020	
Broadband Antenna	Sunol	JB1	967	12-Oct-	-2018	12-Oct-2020	
LPDA Antenna	Schwarzbeck Mess	VUSLP9111B	996	26-Mar	-2019	26-Mar-2021	
BiCon Antenna	A.H Systems	SAS-540	1115	29-Apr-	-2019	29-Apr-2021	
Horn Antenna	A.H Systems	SAS-571	227C	18-Oct-	-2018	18-Oct-2020	
Motion Controller	Sunol	SC104V	235A	IHC) 1	IHC ¹	
Antenna Tower	Sunol	TWR95-4	235B	IHC) 1	IHC ¹	
Turn Table	Sunol	SM46C	235C	IHC ¹		IHC ¹	
EMC Shielded Enclosure	USC	USC-26	374	IHC ¹		IHC ¹	
RF Cable	MRO	n/a	n/a	IHC ²		IHC ²	
RF Preamplifier	Agilent	8449B	273	IHC) 2	IHC ²	
AC Power Source	California Instruments	5001i	059	IHC) 3	IHC ³	
Used Software	⊠ Tile 7! v7.3.0.6						
_FCC_RadEmi_30-300MHz_Final_20190716 Used Template							
Note1) In House Calibration Ref. # 4 Note2) In House Calibration Ref. # 6 Note3) In House Calibration Ref. # 7							
Frequency Range:	⊠ 9kHz-30MHz	⊠ 30-1000MHz	<u>z</u>	⊠ 1-180	GHz		
Detector:	□ Peak (for Prescan)	⊠ Quasi-Peak((for Formal)) ⊠ A\	/erage(f	or Formal)	
RBW/VBW:	⊠ 9/30kHz	⊠ 120/300kHz			Hz		
Type of Facility:	⊠ SAC	⊠ FSOATS		□ in-sit	tu		
Distance:		☐ 10meter		☐ 1met	er		
Arrangement of EUT:	□ Table-top only	☐ Floor-standi	ng only	□ Rack	Mounte	d	
Compliant ⊠	Non-Compliant		Not Ap	plicable [_		

Date Issued: 02 December 2019

Project No.: 18280

Report No.: 18280-2E

Revision No.: 1

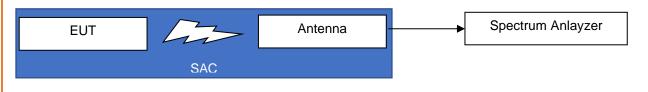
Client: Dali Wireless, Inc.

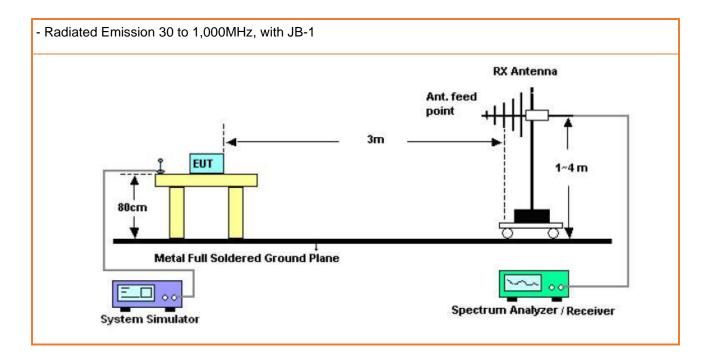
Test setup

Description of test set-up:

The EUT was placed on a nonconducting platform (i.e., an "EUT support table"), of nominal size 1 m by 1.5 m, whose top surface is nominally 80 cm above the reference ground plane. The EUT was set up on 3 meters away from the EUT. The EUT was set continually on its Radio, 5W Max., which was downlinked from airHost. And the output of RF was terminated via 30dB attenuator, for rejecting the high power of carrier. The lowest, middle and highest channels were used for measuring of all radiated spurious emisions .

The EUT was set to Operation Mode #1 with configuration Mode #1.



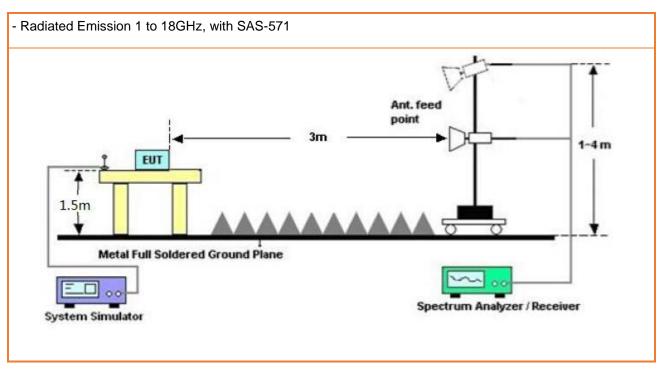


Date Issued: 02 December 2019

Project No.: 18280-2E

Revision No.: 1

Client: Dali Wireless, Inc.



Measurement Procedure

Testing was performed in accordance with the test standard(s) referenced in the test summary section of this report. The Equipment Under Test (EUT) was configured based upon the requirements of the applicable test standard. Initially, the primary emission frequencies are identified by positioning a broadband receive antenna three meter from the EUT.

Scans were made with an EMC Analyzer, controlled by EMC Test Software, Tile7!, from 30kHz to 10GHz with the receiver in the peak mode. The receiver IF bandwidth was 9kHz,120 kHz or 1MHz as appropriate for the frequency and scan step was about 30kHz. To ensure that the maximum emission at each discrete frequency of interest is observed, the receive antenna is varied in height from one to four meters and rotated to produce horizontal and vertical polarities while the turntable is rotated to determine the worst emitting configuration. Under 30MHz was only tested at 1meter height and Antenna was changed both polarization, Horizontal and Vertical. Measurements were then made using CISPR quasi peak when the peak readings were within 10dB of the limit line. The numerical results are included herein to demonstrate compliance.

Test Result

The output of EUT was set to 5 Watts(\pm 37dBm), the PASS level of Spurious is: 43 \pm 10log(P) = 43 \pm 10log(5) = 50dB attenuation = -13dBm Since of radiated measurement was performed at 3 meters, the limit line was converted to dBuV/m using the formulas ad outlined in KDB 971168: -13 dBm ERP = 84.38 dBuV/m at 3 meters. Spurious Emission level (dBuV/m) = Detected level (dBuV) + Path Loss(dB) + Antenna Factor (dB/m) - Preamplifier's Gain (dB)

Date Issued: 02 December 2019

Project No.: 18280-2E

Revision No.: 1

Client: Dali Wireless, Inc.

Graphical Representation for Emission - Radiated 30kHz to 30MHz

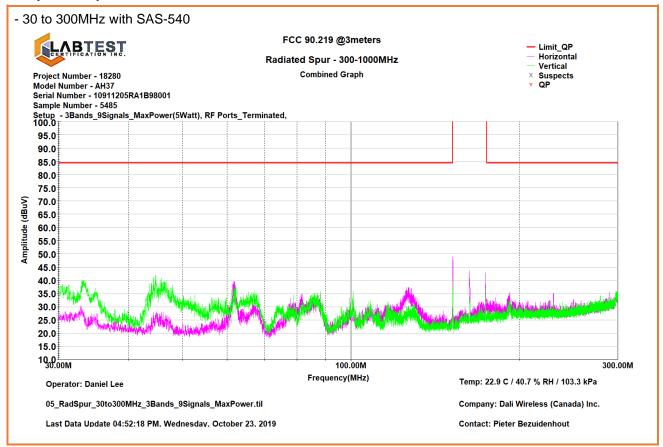
Spectrum was scanned manually from 30kHz to 30MHz. No automated plot is available for this frequency range. No spurious emissions from the product were detectable.

Date Issued: 02 December 2019

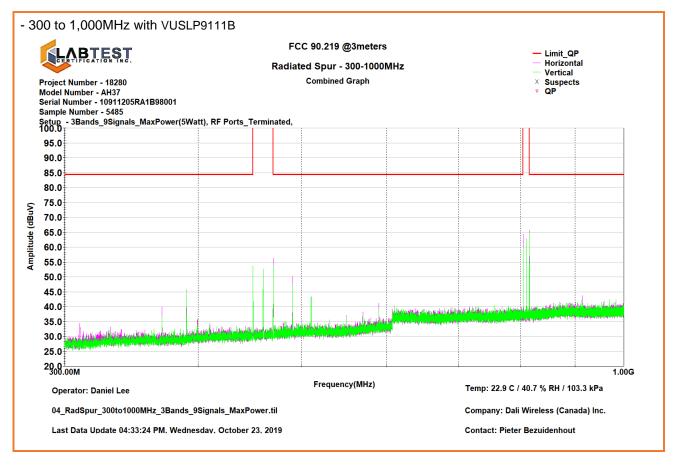
Project No.: 18280

Client: Dali Wireless, Inc. Report No.: 18280-2E Revision No.: 1

Graphical Representation for Emission - Radiated 30MHz to 1GHz



Project No.: 18280



Client: Dali Wireless, Inc.

Report No.: 18280-2E

Date Issued: 02 December 2019

Project No.: 18280

Client: Dali Wireless, Inc. Report No.: 18280-2E Revision No.: 1

Graphical Representation for Emission - Radiated 1 to 10GHz

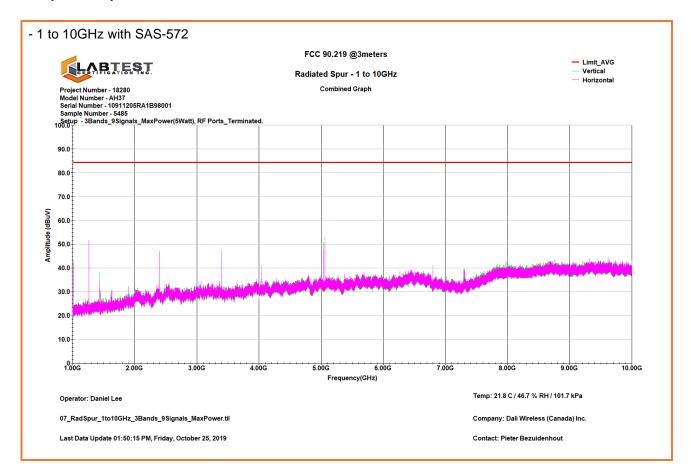


Table Representation for Emission - Radiated 30MHz to 10GHz

No Emissions were measured. All emissions detected, other than the fundamental, were related to the Digital Mode circuitry. No Transmitter Spurious Emissions were detectable and are greater than 20dB below the limit line.

END OF REPORT