

Report No.: T201102D09-RP16

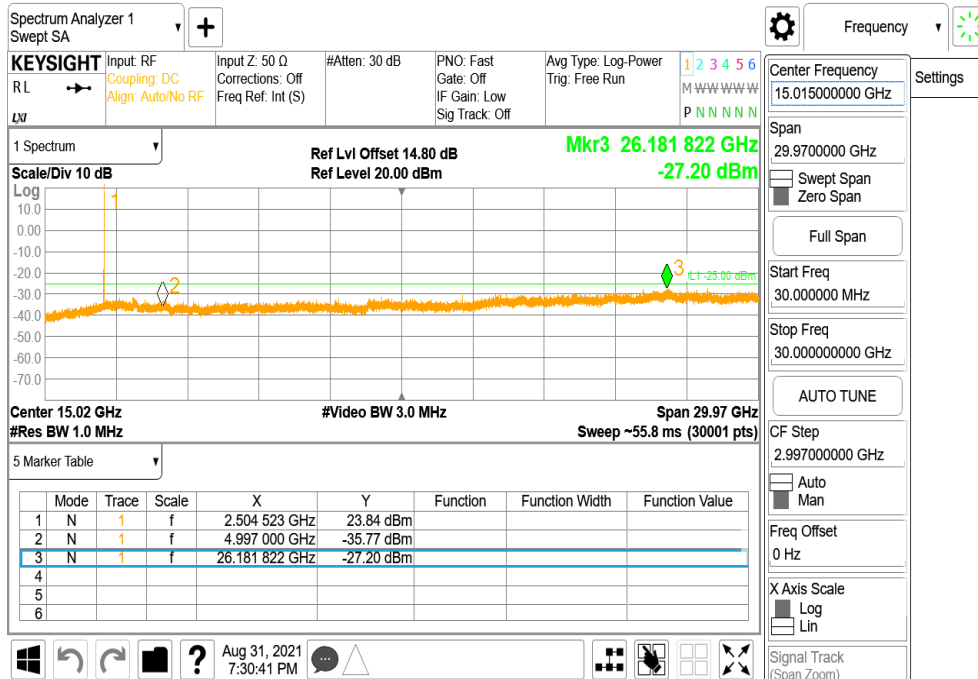
## Spurious Emission

### LTE Band 41

For IC low ch

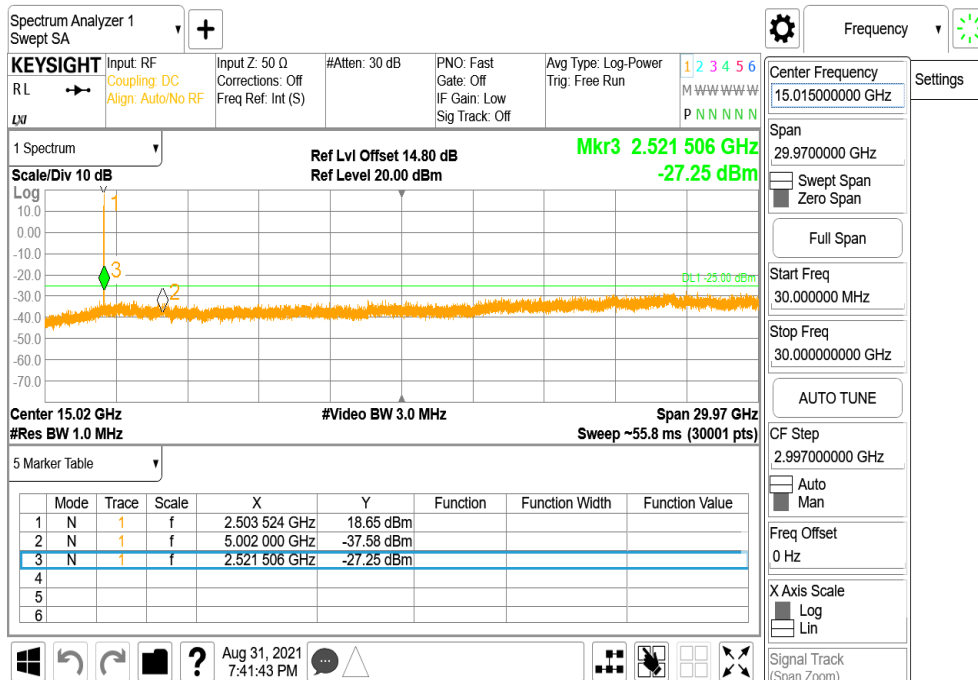
CHANNEL BANDWIDTH: 5MHz /QPSK / RB =1, RB Offset = 0

### CH Low



### CHANNEL BANDWIDTH: 10MHz /QPSK / RB =1, RB Offset = 0

### CH Low



Report No.: T201102D09-RP16

## CHANNEL BANDWIDTH: 15MHz /QPSK / RB =1, RB Offset = 0

### CH Low

Spectrum Analyzer 1  
Swept SA

**KEYSIGHT** Input: RF  
Coupling: DC  
Align: Auto/No RF

Input Z: 50 Ω  
Corrections: Off  
Freq Ref: Int (S)

#Atten: 30 dB

PNO: Fast  
Gate: Off  
IF Gain: Low  
Sig Track: Off

Avg Type: Log-Power  
Trig: Free Run

1 2 3 4 5 6  
M WWWWWW  
P NNNNN

Center Frequency  
15.015000000 GHz

Span  
29.9700000 GHz

Swept Span  
Zero Span

Full Span

Start Freq  
30.0000000 MHz

Stop Freq  
30.000000000 GHz

AUTO TUNE

CF Step  
2.997000000 GHz

Auto  
Man

Freq Offset  
0 Hz

X Axis Scale  
Log  
Lin

Signal Track  
(Span Zoom)

1 Spectrum

Ref Lvl Offset 14.80 dB  
Ref Level 20.00 dBm

Mkr3 26.363 640 GHz  
-27.84 dBm

Center 15.02 GHz  
#Res BW 1.0 MHz

#Video BW 3.0 MHz

Span 29.97 GHz  
Sweep ~55.8 ms (30001 pts)

5 Marker Table

	Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	N	1	f	2.503 524 GHz	23.68 dBm			
2	N	1	f	5.007 000 GHz	-34.87 dBm			
3	N	1	f	26.363 640 GHz	-27.84 dBm			
4								
5								
6								

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## CHANNEL BANDWIDTH: 20MHz /QPSK / RB =1, RB Offset = 0

### CH Low

Spectrum Analyzer 1  
Swept SA

**KEYSIGHT** Input: RF  
Coupling: DC  
Align: Auto/No RF

Input Z: 50 Ω  
Corrections: Off  
Freq Ref: Int (S)

#Atten: 30 dB

PNO: Fast  
Gate: Off  
IF Gain: Low  
Sig Track: Off

Avg Type: Log-Power  
Trig: Free Run

1 2 3 4 5 6  
M WWWWWW  
P NNNNN

Center Frequency  
15.015000000 GHz

Span  
29.9700000 GHz

Swept Span  
Zero Span

Full Span

Start Freq  
30.0000000 MHz

Stop Freq  
30.000000000 GHz

AUTO TUNE

CF Step  
2.997000000 GHz

Auto  
Man

Freq Offset  
0 Hz

X Axis Scale  
Log  
Lin

Signal Track  
(Span Zoom)

1 Spectrum

Ref Lvl Offset 14.80 dB  
Ref Level 20.00 dBm

Mkr3 26.166 837 GHz  
-27.85 dBm

Center 15.02 GHz  
#Res BW 1.0 MHz

#Video BW 3.0 MHz

Span 29.97 GHz  
Sweep ~55.8 ms (30001 pts)

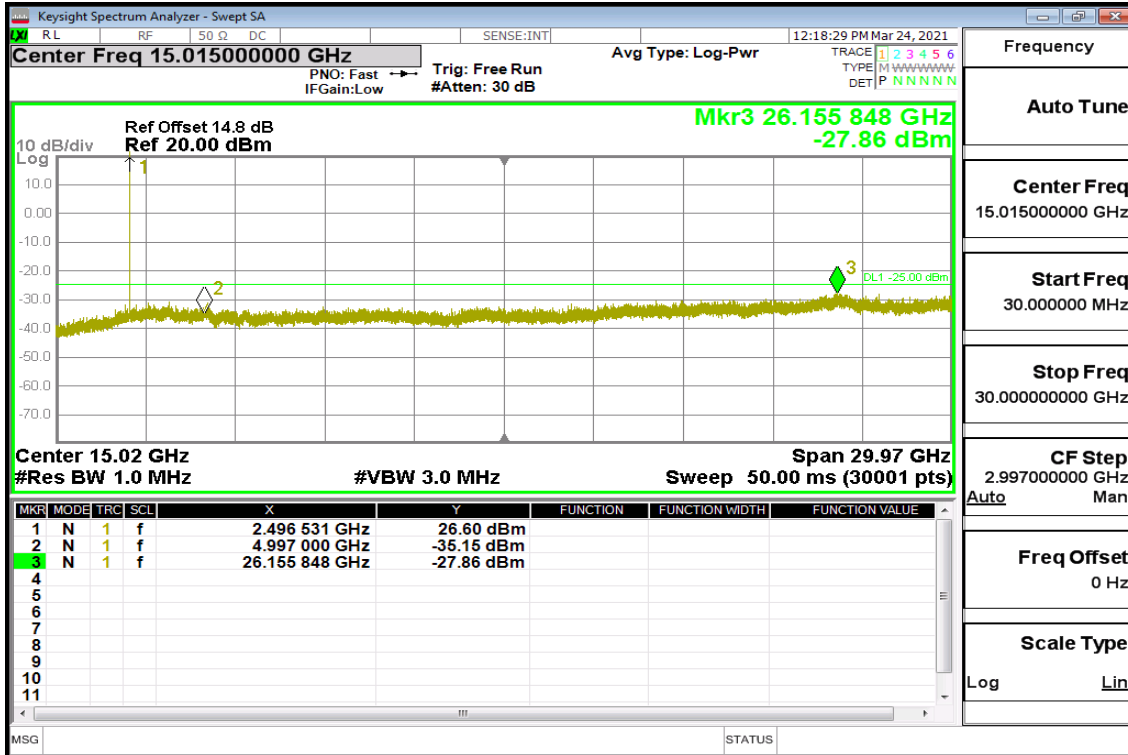
5 Marker Table

	Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	N	1	f	2.514 513 GHz	16.51 dBm			
2	N	1	f	5.012 000 GHz	-36.95 dBm			
3	N	1	f	26.166 837 GHz	-27.85 dBm			
4								
5								
6								

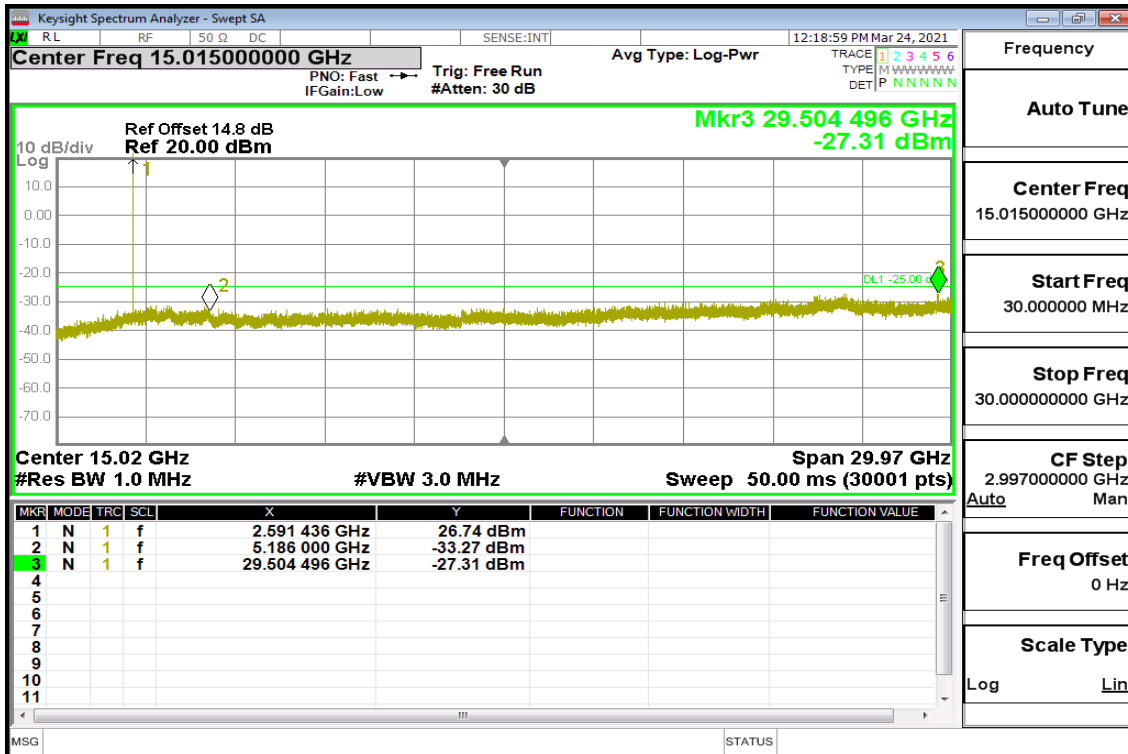
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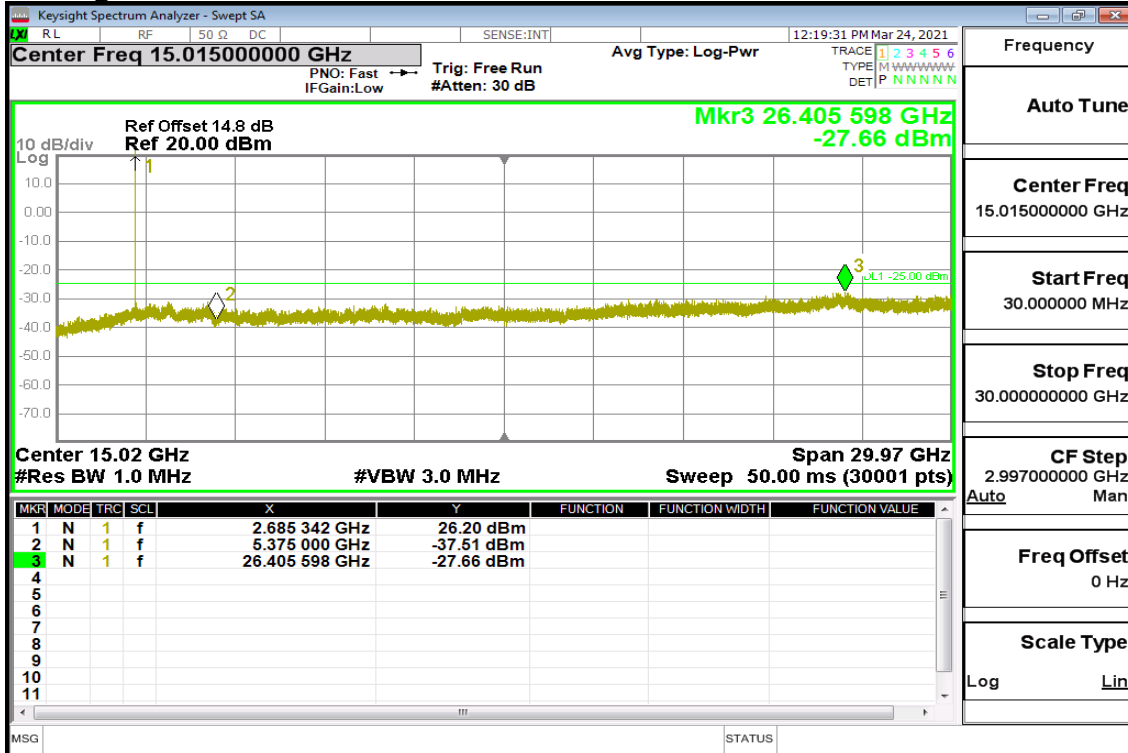
## CHANNEL BANDWIDTH: 5MHz /QPSK / RB =1, RB Offset = 0 CH Low



## CH Mid

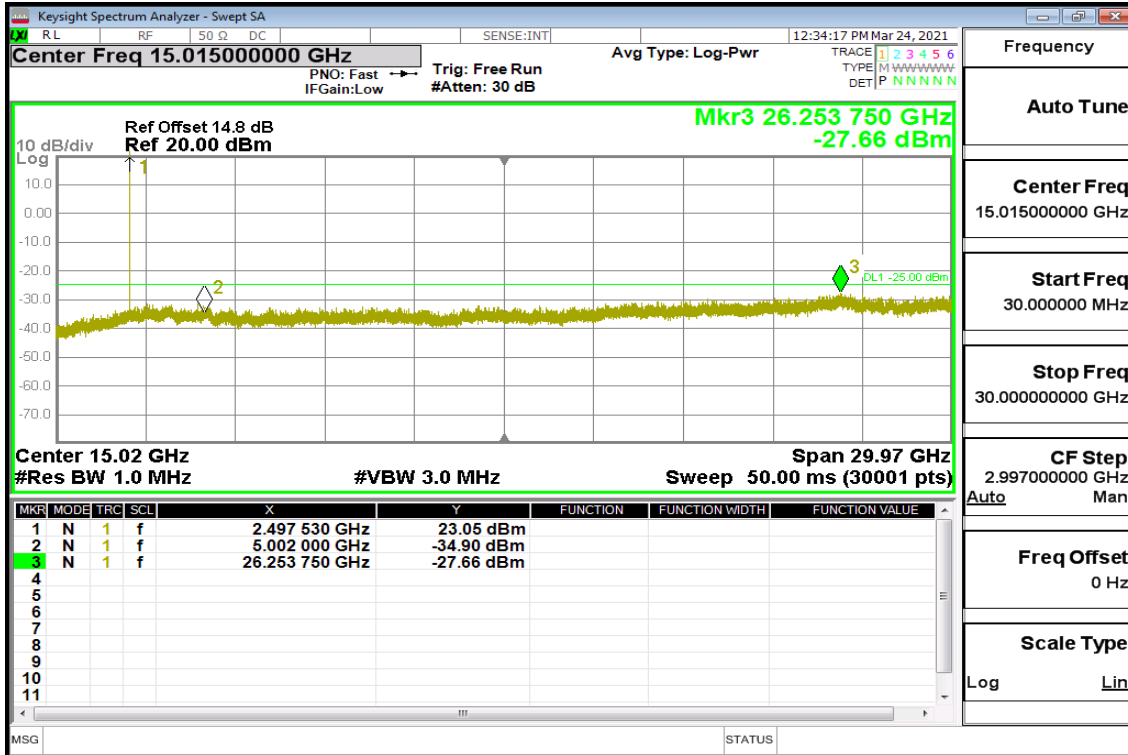


## CH High

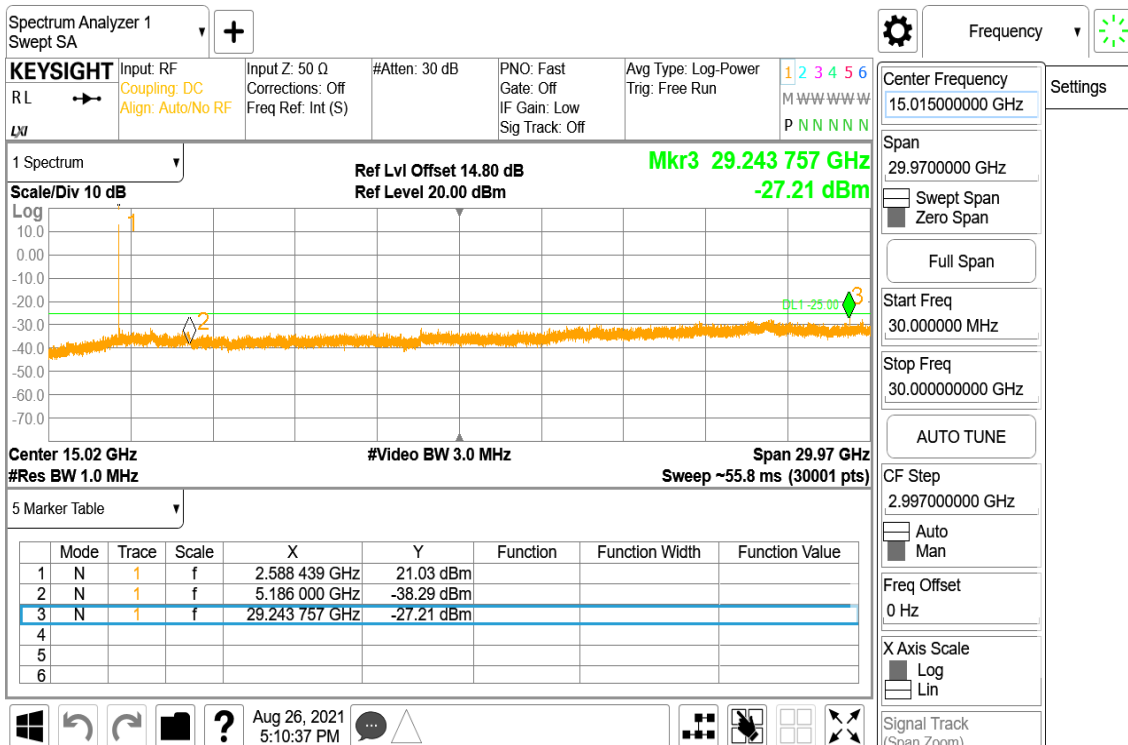


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## CHANNEL BANDWIDTH: 10MHz /QPSK / RB =1, RB Offset = 0 CH Low

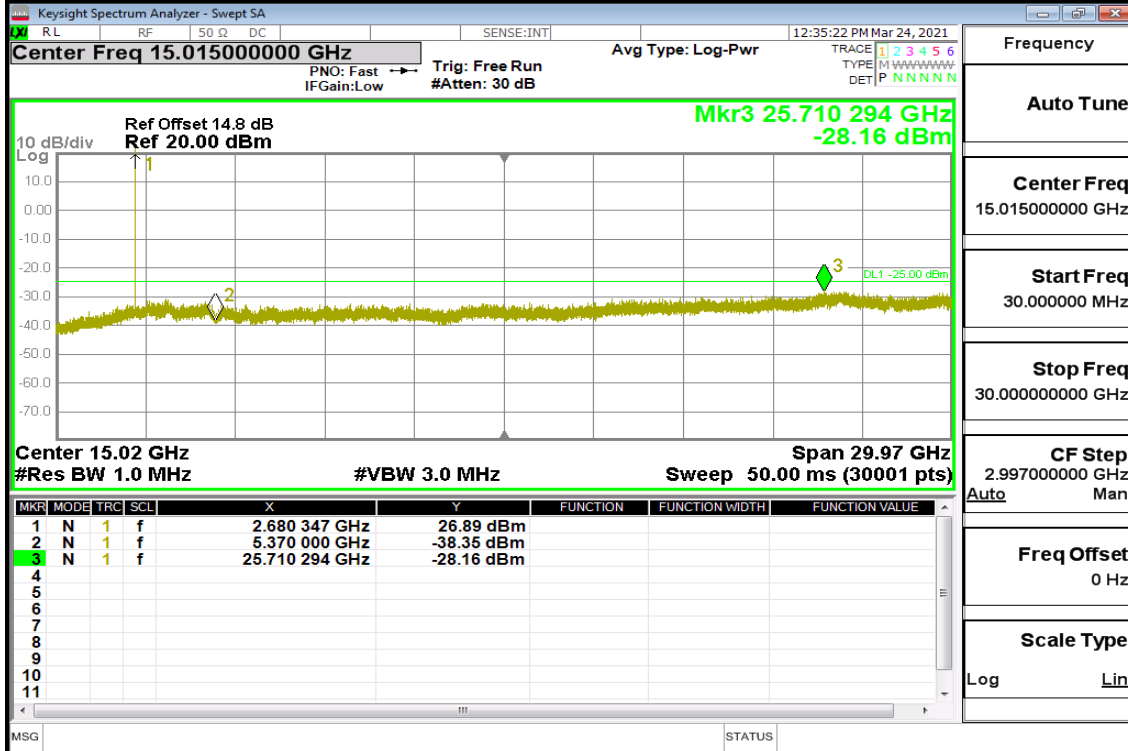


## CH Mid



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## CH High



Report No.: T201102D09-RP16

## CHANNEL BANDWIDTH: 15MHz /QPSK / RB =1, RB Offset = 0

### CH Low

Spectrum Analyzer 1  
Swept SA

**KEYSIGHT** Input: RF    Input Z: 50 Ω    #Atten: 30 dB    PNO: Fast    Avg Type: Log-Power  
 RL →    Coupling: DC    Corrections: Off    Gate: Off    Trig: Free Run  
 Align: Auto/No RF    Freq Ref: Int (S)    IF Gain: Low    Sig Track: Off

1 Spectrum    Ref Lvl Offset 14.80 dB    Mkr3 26.217 786 GHz  
 Scale/Div 10 dB    Ref Level 20.00 dBm    -27.50 dBm

Center 15.02 GHz    #Video BW 3.0 MHz    Span 29.97 GHz  
 #Res BW 1.0 MHz    Sweep ~55.8 ms (30001 pts)

5 Marker Table

Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	N	1	f	2.497 530 GHz	22.64 dBm		
2	N	1	f	5.007 000 GHz	-35.66 dBm		
3	N	1	f	26.217 786 GHz	-27.50 dBm		
4							
5							
6							

Frequency

Center Frequency  
15.015000000 GHz

Span  
29.9700000 GHz

Start Freq  
30.0000000 MHz

Stop Freq  
30.000000000 GHz

AUTO TUNE

CF Step  
2.997000000 GHz

Freq Offset  
0 Hz

X Axis Scale  
Log

Signal Track  
(Span Zoom)

### CH Mid

Spectrum Analyzer 1  
Swept SA

**KEYSIGHT** Input: RF    Input Z: 50 Ω    #Atten: 30 dB    PNO: Fast    Avg Type: Log-Power  
 RL →    Coupling: DC    Corrections: Off    Gate: Off    Trig: Free Run  
 Align: Auto/No RF    Freq Ref: Int (S)    IF Gain: Low    Sig Track: Off

1 Spectrum    Ref Lvl Offset 14.80 dB    Mkr3 25.769 235 GHz  
 Scale/Div 10 dB    Ref Level 20.00 dBm    -27.25 dBm

Center 15.02 GHz    #Video BW 3.0 MHz    Span 29.97 GHz  
 #Res BW 1.0 MHz    Sweep ~55.8 ms (30001 pts)

5 Marker Table

Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	N	1	f	2.586 441 GHz	21.97 dBm		
2	N	1	f	5.186 000 GHz	-37.14 dBm		
3	N	1	f	25.769 235 GHz	-27.25 dBm		
4							
5							
6							

Frequency

Center Frequency  
15.015000000 GHz

Span  
29.9700000 GHz

Start Freq  
30.0000000 MHz

Stop Freq  
30.000000000 GHz

AUTO TUNE

CF Step  
2.997000000 GHz

Freq Offset  
0 Hz

X Axis Scale  
Log

Signal Track  
(Span Zoom)

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## CH High

Spectrum Analyzer 1  
Swept SA

**KEYSIGHT** Input: RF    Input Z: 50 Ω    #Atten: 30 dB    PNO: Fast    Avg Type: Log-Power  
 R.L.    Coupling: DC    Corrections: Off    Gate: Off    Avg/Hold: 100/100  
 Align: Auto/No RF    Freq Ref: Int (S)    IF Gain: Low    Trng: Free Run

1 2 3 4 5 6  
M W W W W W W W  
P N N N N N

Marker

Select Marker  
Marker 1

Marker Frequency  
2.67735000 GHz

Settings

Peak Search

Next Peak

Next Pk Right

Next Pk Left

Minimum Peak

Pk-Pk Search

Marker Delta

Mkr→CF

Mkr→Ref Lvl

Continuous Peak Search  
 On  
 Off

1 Spectrum    Ref Lvl Offset 14.80 dB    **Mkr1 2.677 350 GHz**  
 Scale/Div 10 dB    Ref Level 20.00 dBm    **13.02 dBm**

Center 15.02 GHz    #Video BW 3.0 MHz    Span 29.97 GHz  
 #Res BW 1.0 MHz    Sweep ~55.8 ms (30001 pts)

5 Marker Table

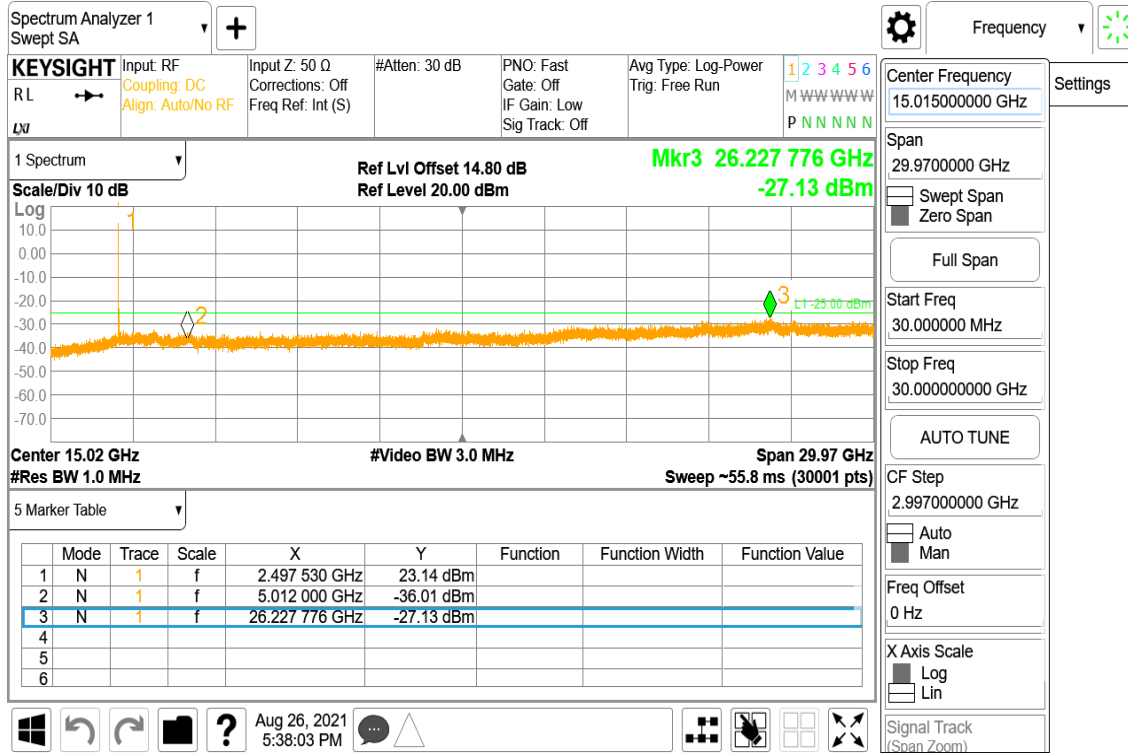
Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	N	1	f	2.677 350 GHz	13.02 dBm		
2	N	1	f	5.365 000 GHz	-36.80 dBm		
3	N	1	f	26.174 829 GHz	-30.02 dBm		
4							
5							
6							

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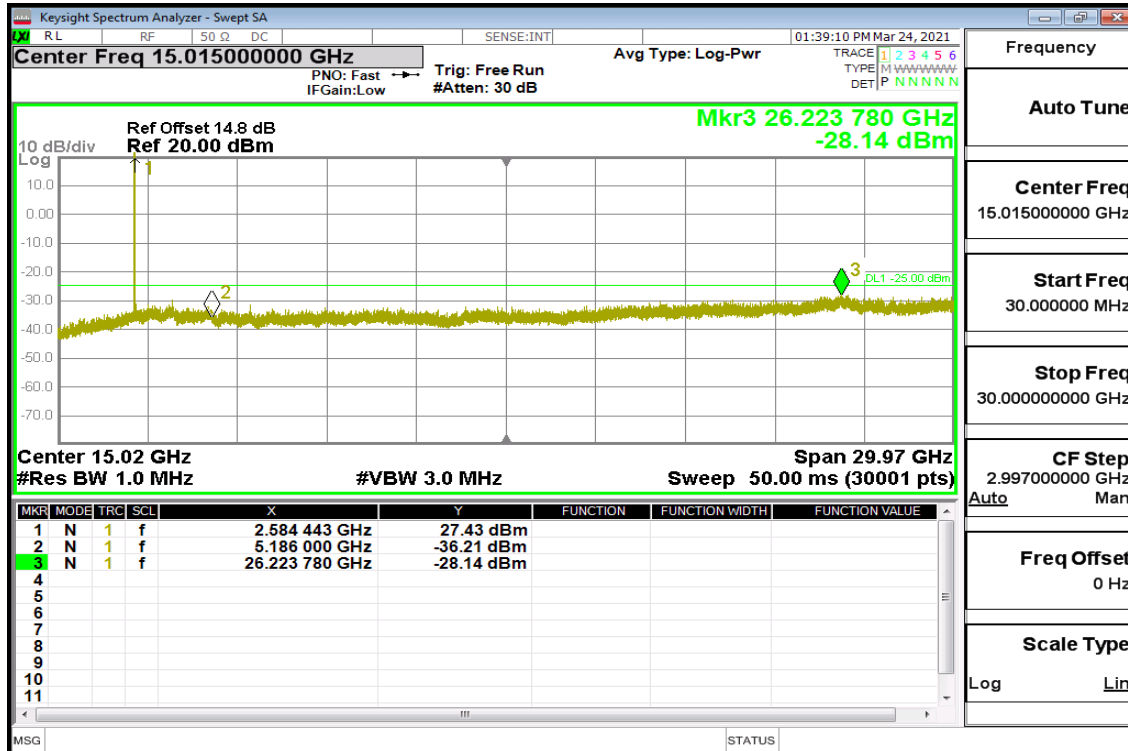


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## CHANNEL BANDWIDTH: 20MHz /QPSK / RB =1, RB Offset = 0 CH Low



## CH Mid



Report No.: T201102D09-RP16

## CH High

Spectrum Analyzer 1  
Swept SA

**KEYSIGHT** Input: RF    Input Z: 50 Ω    #Atten: 30 dB    PNO: Fast    Avg Type: Log-Power  
 R.L.    Coupling: DC    Corrections: Off    Gate: Off    Avg/Hold: 80/100  
 Align: Auto/No RF    Freq Ref: Int (S)    IF Gain: Low    Trng: Free Run

1 2 3 4 5 6  
M N N N N N  
P N N N N N

Marker

Select Marker  
Marker 1

Marker Frequency  
2.672355000 GHz

Settings

Peak Search

Next Peak

Next Pk Right

Next Pk Left

Minimum Peak

Pk-Pk Search

Marker Delta

Mkr→CF

Mkr→Ref Lvl

Continuous Peak Search  
 On  
 Off

1 Spectrum    Ref Lvl Offset 14.80 dB    **Mkr1 2.672 355 GHz**  
 Scale/Div 10 dB    Ref Level 20.00 dBm    **19.51 dBm**

Center 15.02 GHz    #Video BW 3.0 MHz    Span 29.97 GHz  
 #Res BW 1.0 MHz    Sweep ~55.8 ms (30001 pts)

5 Marker Table

Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	N	1	f	2.672 355 GHz	19.51 dBm		
2	N	1	f	5.360 000 GHz	-38.32 dBm		
3	N	1	f	26.210 793 GHz	-27.39 dBm		
4							
5							
6							

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## 8.6 RADIATED EMISSION MEASUREMENT

### LIMITS

#### **FCC §27.53(h), Band 41**

General protection levels. Except as otherwise specified below, for operations in the 1710-1755MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  dB.

#### **According to RSS-199, Band 41**

For mobile subscriber equipment, the power of any unwanted emissions measured as above shall be attenuated (in dB) below the transmitter power, P (dBW), by at least:

- (i)  $40 + 10 \log_{10} p$  from the channel edges to 5 MHz away
- (ii)  $43 + 10 \log_{10} p$  between 5 MHz and X MHz from the channel edges, and
- (iii)  $55 + 10 \log_{10} p$  at X MHz and beyond from the channel edges

In addition, the attenuation shall not be less than  $43 + 10 \log_{10} p$  on all frequencies between 2490.5 MHz and 2496 MHz, and  $55 + 10 \log_{10} p$  at or below 2490.5 MHz.

**p** is the transmitter power measured in watts and **X** is 6 MHz or the equipment occupied bandwidth, whichever is greater.

### TEST PROCEDURES

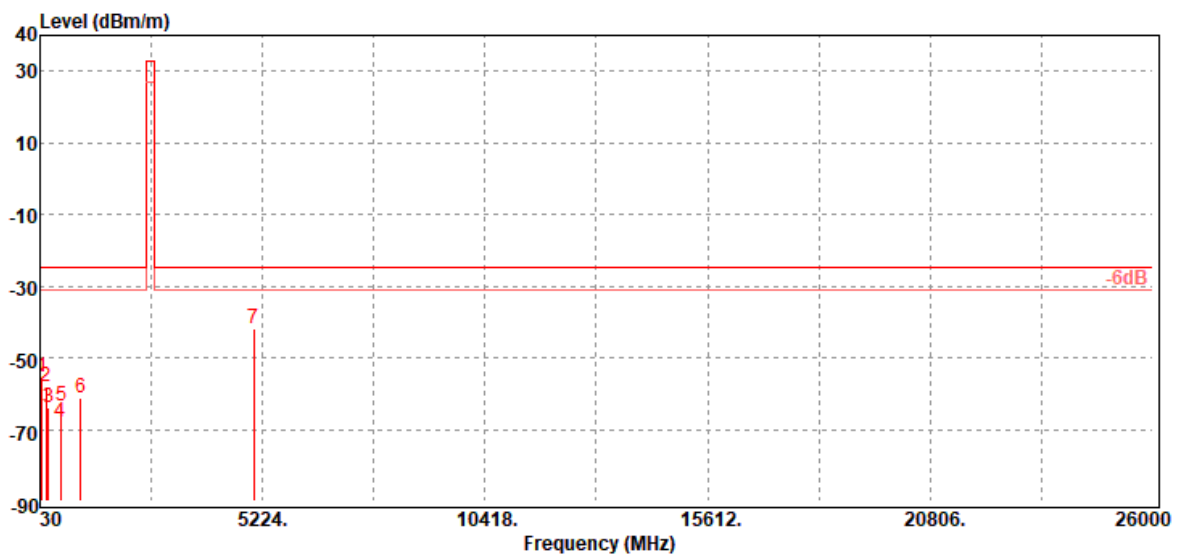
1. According to KDB 971168 D01 and ANSI C63.26.
2. The EUT was placed on a turntable
  - (1) Below 1G : 0.8m
  - (2) Above 1G : 1.5m
  - (3) EUT set 3m from the receiving antenna
  - (4) The table was rotated 360 degrees of the highest spurious emission to determine the position.
3. Set the spectrum analyzer , RBW=1MHz, VBW=3MHz.
4. A horn antenna was driven by a signal generator.
5. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.

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**Test Results**

**LTE Band 41 / BW: 20MHz / QPSK / RB =1, RB Offset = 0**

**Operation Mode:** Tx / Low CH      **Test Date:** December 15, 2020  
**Temperature:** 21.5°C      **Tested by:** Jerry Chang  
**Humidity:** 60% RH      **Polarity:** Ver.

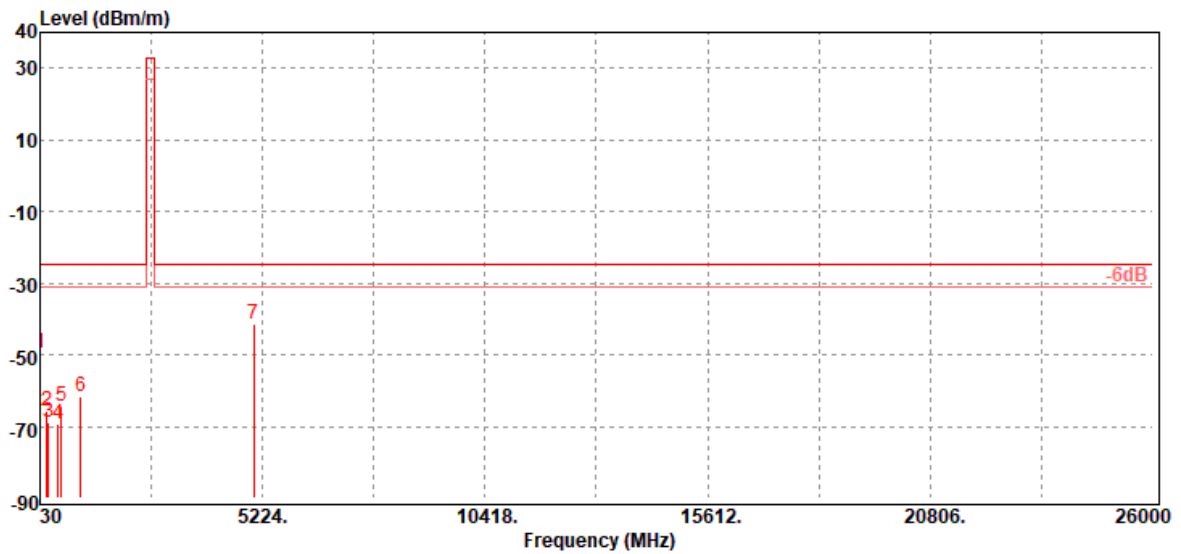


Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB	Antenna Polarization (V/H)
85.29	-55.32	-46.76	-7.81	-0.75	-25.00	-30.32	V
163.86	-58.00	-51.04	-5.91	-1.05	-25.00	-33.00	V
219.15	-63.97	-60.73	-2.02	-1.22	-25.00	-38.97	V
500.45	-68.10	-64.24	-1.99	-1.87	-25.00	-43.10	V
531.49	-63.57	-60.35	-1.30	-1.92	-25.00	-38.57	V
985.45	-60.99	-56.93	-1.40	-2.66	-25.00	-35.99	V
5012.00	-41.84	-47.75	12.48	-6.57	-25.00	-16.84	V

Report No.: T201102D09-RP16

**Operation Mode:** Tx / Low CH  
**Temperature:** 21.5°C  
**Humidity:** 60% RH

**Test Date:** December 15, 2020  
**Tested by:** Jerry Chang  
**Polarity:** Hor.

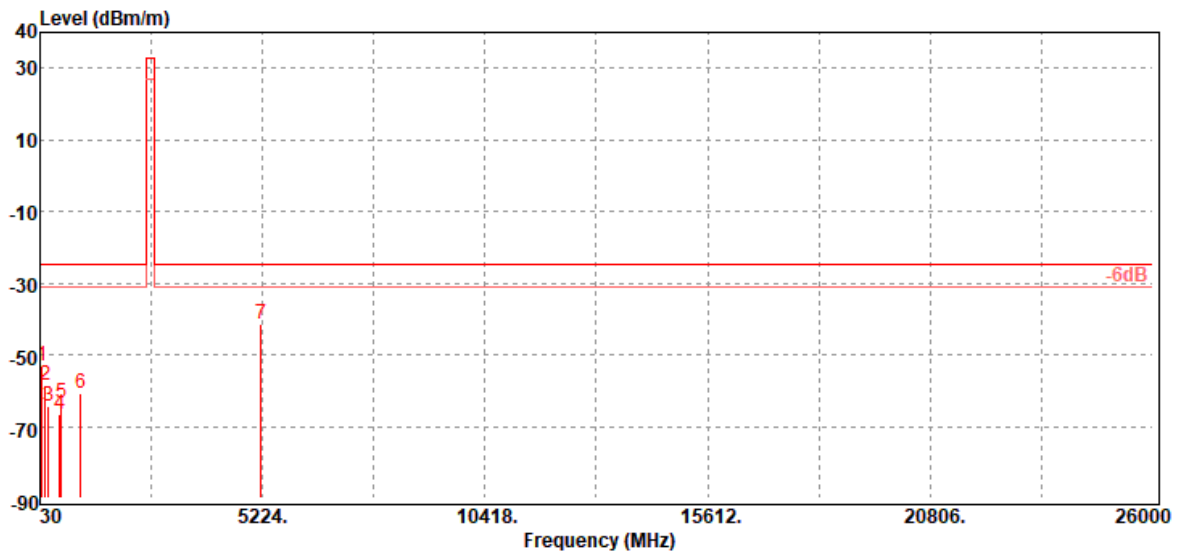


Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB	Antenna Polarization (V/H)
41.64	-49.39	-30.25	-18.62	-0.52	-25.00	-24.39	H
180.35	-65.62	-60.16	-4.36	-1.10	-25.00	-40.62	H
222.06	-68.72	-65.54	-1.96	-1.22	-25.00	-43.72	H
444.19	-69.34	-65.49	-2.10	-1.75	-25.00	-44.34	H
529.55	-64.19	-60.97	-1.30	-1.92	-25.00	-39.19	H
988.36	-61.55	-57.49	-1.40	-2.66	-25.00	-36.55	H
5012.00	-41.20	-47.11	12.48	-6.57	-25.00	-16.20	H

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**Operation Mode:** Tx / Mid CH  
**Temperature:** 21.5°C  
**Humidity:** 60% RH

**Test Date:** December 15, 2020  
**Tested by:** Jerry Chang  
**Polarity:** Ver.



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB	Antenna Polarization (V/H)
86.26	-53.00	-44.69	-7.55	-0.76	-25.00	-28.00	V
152.22	-58.69	-50.82	-6.86	-1.01	-25.00	-33.69	V
219.15	-64.22	-60.98	-2.02	-1.22	-25.00	-39.22	V
481.05	-66.70	-62.50	-2.38	-1.82	-25.00	-41.70	V
527.61	-63.56	-60.34	-1.30	-1.92	-25.00	-38.56	V
975.75	-60.68	-56.66	-1.38	-2.64	-25.00	-35.68	V
5186.00	-41.40	-47.58	12.92	-6.74	-25.00	-16.40	V

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**Operation Mode:** Tx / Mid CH

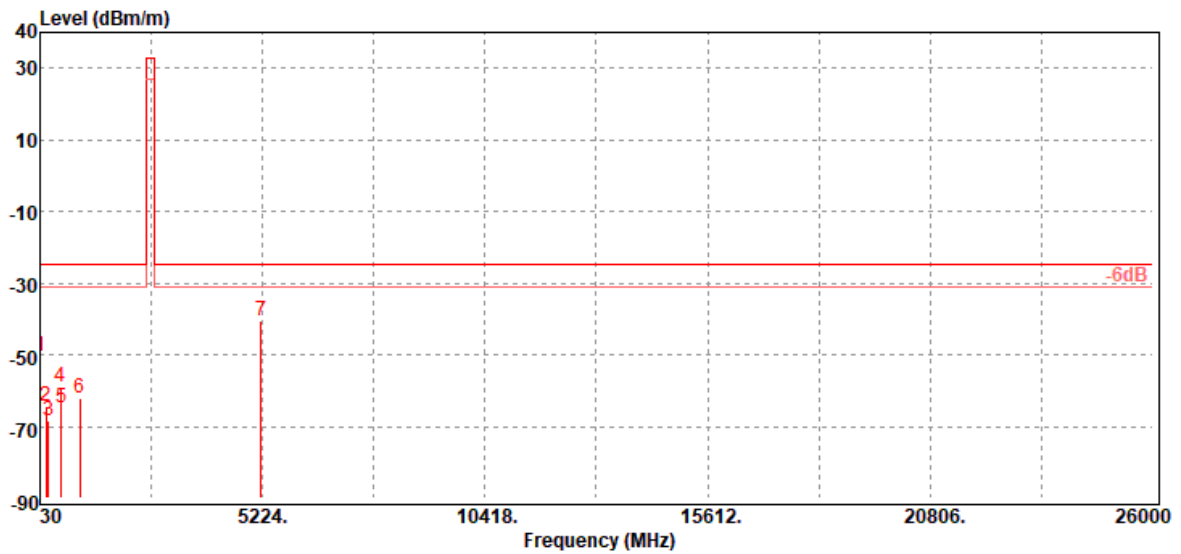
**Test Date:** December 15, 2020

**Temperature:** 21.5°C

**Tested by:** Jerry Chang

**Humidity:** 60% RH

**Polarity:** Hor.

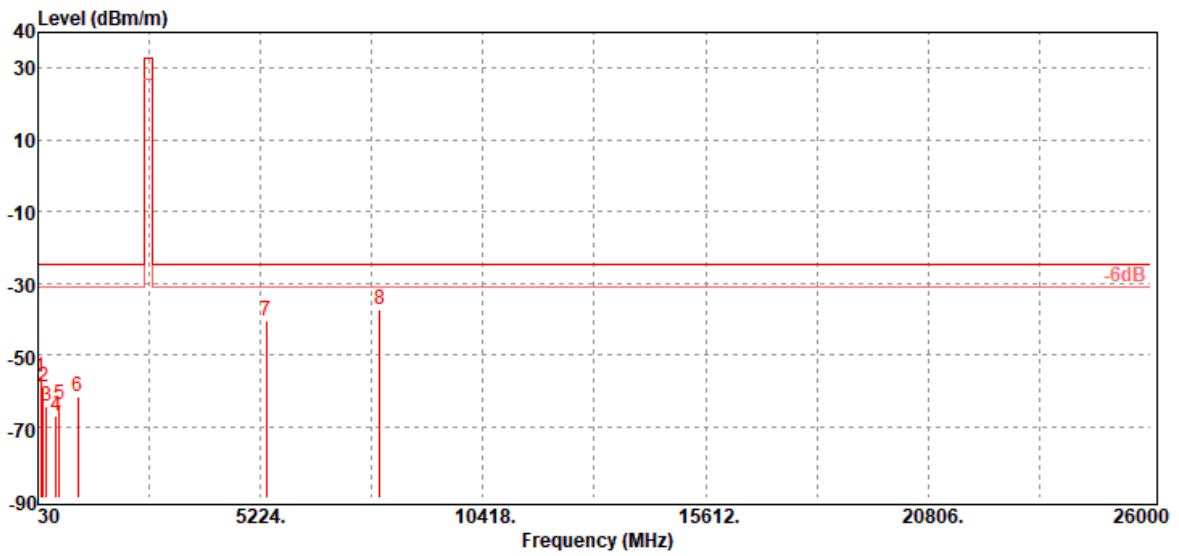


Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB	Antenna Polarization (V/H)
44.55	-50.62	-34.22	-15.86	-0.54	-25.00	-25.62	H
172.59	-64.28	-58.06	-5.14	-1.08	-25.00	-39.28	H
219.15	-68.46	-65.22	-2.02	-1.22	-25.00	-43.46	H
500.45	-59.10	-55.24	-1.99	-1.87	-25.00	-34.10	H
527.61	-64.87	-61.65	-1.30	-1.92	-25.00	-39.87	H
963.14	-61.98	-58.05	-1.30	-2.63	-25.00	-36.98	H
5186.00	-40.60	-46.78	12.92	-6.74	-25.00	-15.60	H

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**Operation Mode:** Tx / High CH  
**Temperature:** 21.5°C  
**Humidity:** 60% RH

**Test Date:** December 15, 2020  
**Tested by:** Jerry Chang  
**Polarity:** Ver.



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB	Antenna Polarization (V/H)
88.20	-56.15	-48.22	-7.16	-0.77	-25.00	-31.15	V
153.19	-58.88	-51.14	-6.72	-1.02	-25.00	-33.88	V
221.09	-64.40	-61.20	-1.98	-1.22	-25.00	-39.40	V
447.10	-67.15	-63.30	-2.10	-1.75	-25.00	-42.15	V
527.61	-63.86	-60.64	-1.30	-1.92	-25.00	-38.86	V
956.35	-61.62	-57.77	-1.23	-2.62	-25.00	-36.62	V
5360.00	-40.72	-47.07	13.26	-6.91	-25.00	-15.72	V
8000.00	-37.36	-39.47	10.50	-8.39	-25.00	-12.36	V



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**Operation Mode:** Tx / High CH

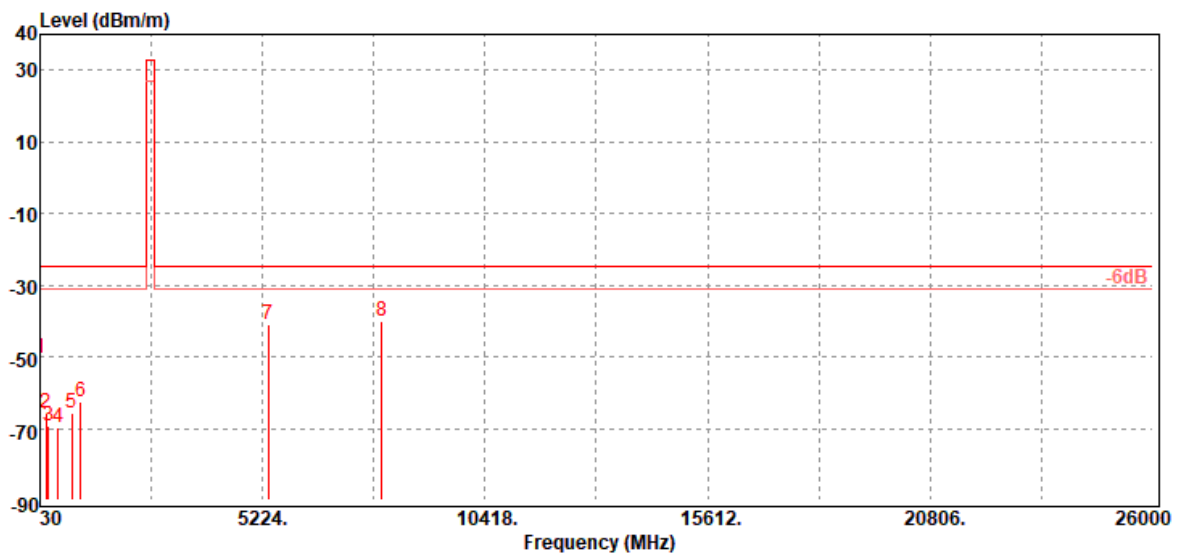
**Test Date:** December 15, 2020

**Temperature:** 21.5°C

**Tested by:** Jerry Chang

**Humidity:** 60% RH

**Polarity:** Hor.



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB	Antenna Polarization (V/H)
42.61	-50.23	-31.95	-17.75	-0.53	-25.00	-25.23	H
172.59	-65.88	-59.66	-5.14	-1.08	-25.00	-40.88	H
222.06	-69.32	-66.14	-1.96	-1.22	-25.00	-44.32	H
458.74	-69.63	-65.75	-2.10	-1.78	-25.00	-44.63	H
776.90	-65.92	-62.14	-1.44	-2.34	-25.00	-40.92	H
988.36	-62.48	-58.42	-1.40	-2.66	-25.00	-37.48	H
5360.00	-40.96	-47.31	13.26	-6.91	-25.00	-15.96	H
8000.00	-40.05	-42.16	10.50	-8.39	-25.00	-15.05	H

- End of Test Report -