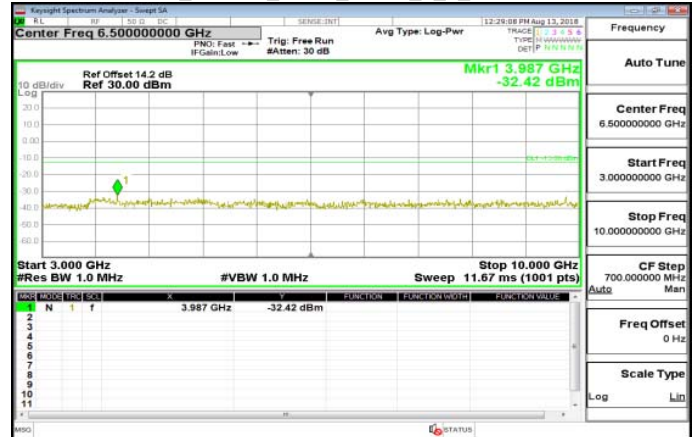


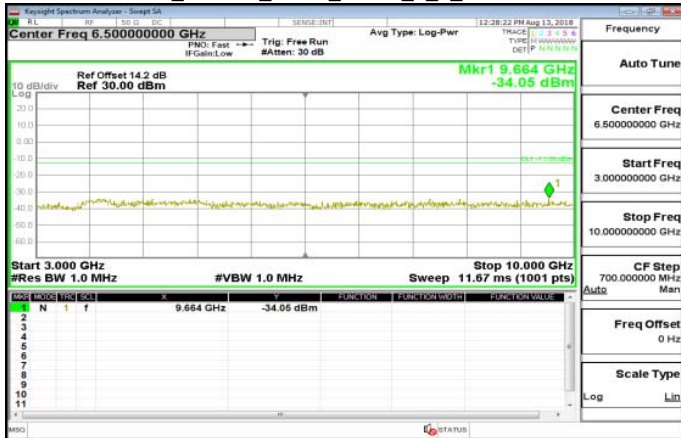
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3GHz~10GHz\_Band12\_5MHz\_QPSK\_1\_0\_MidCH23095-707.5



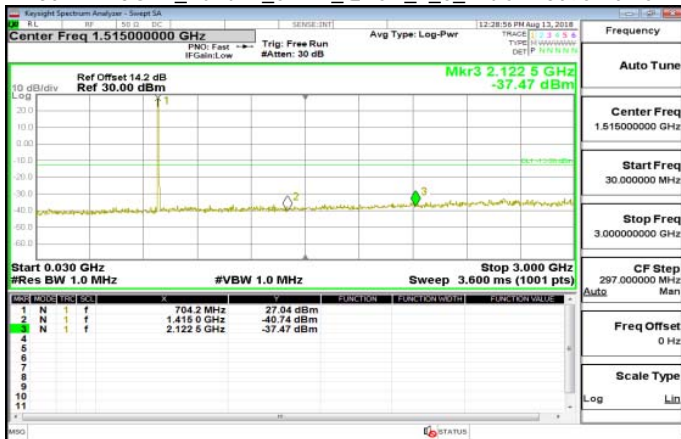
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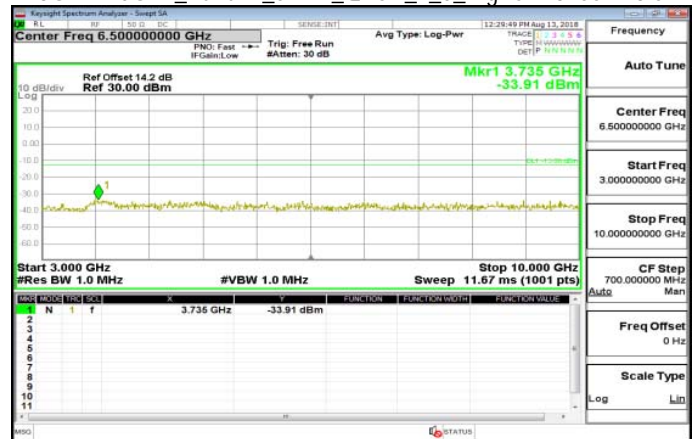
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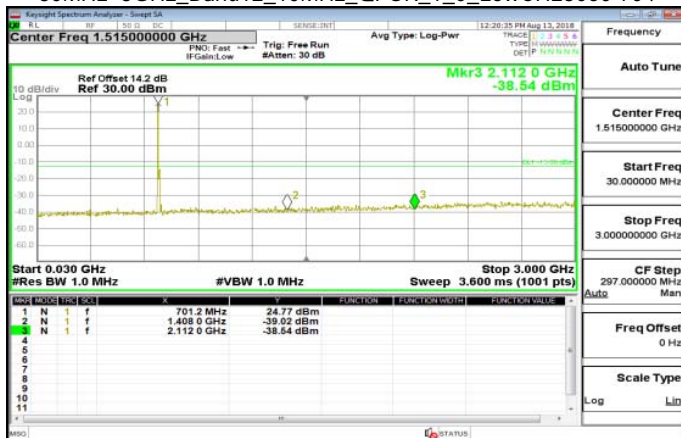
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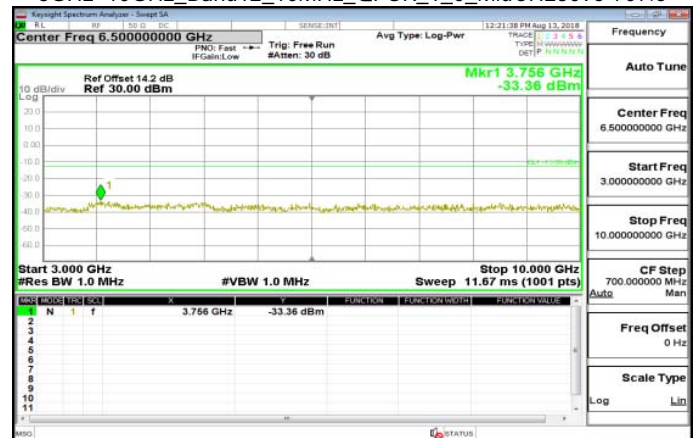
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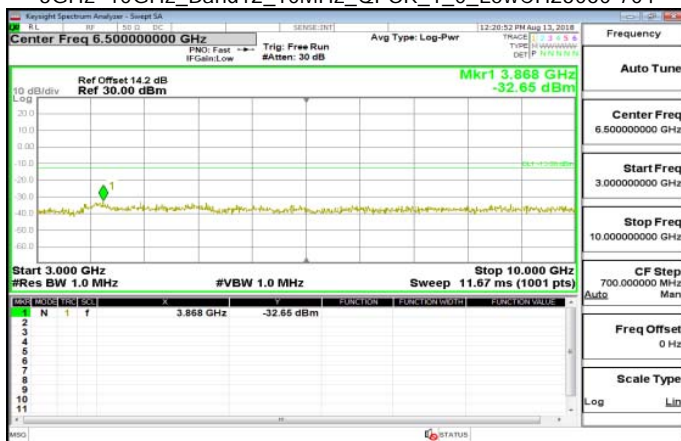
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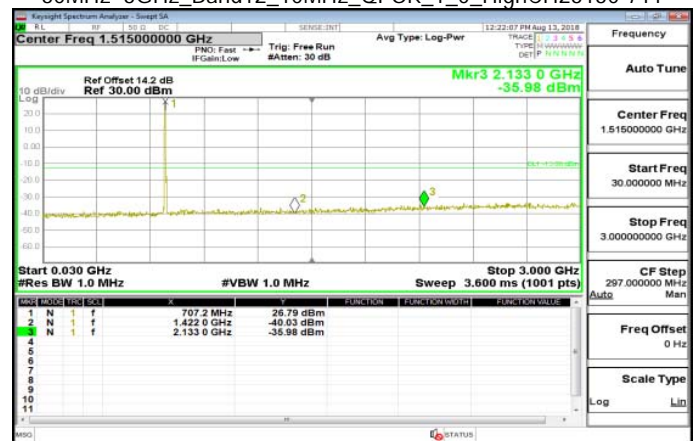
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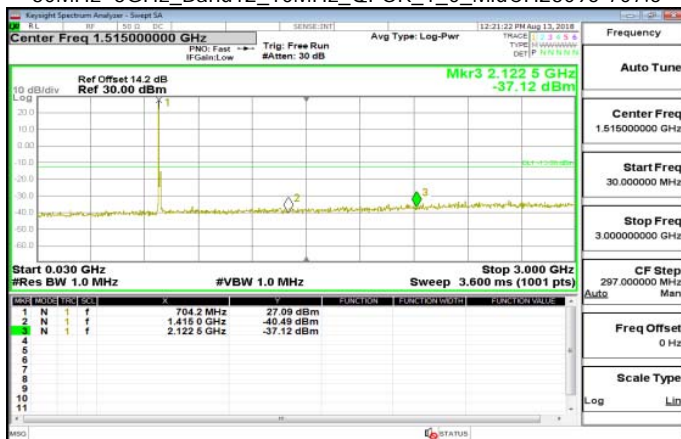
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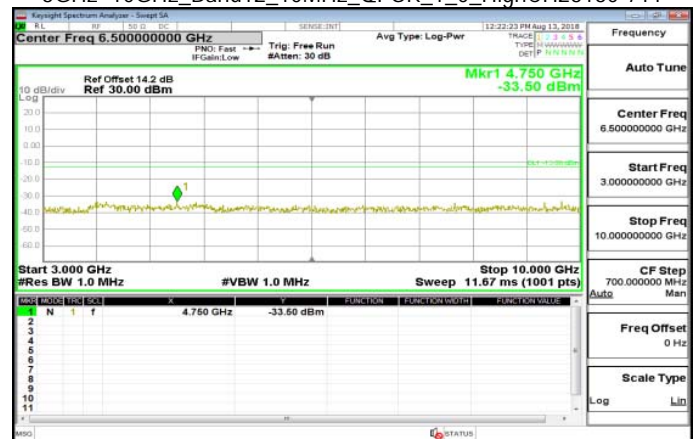
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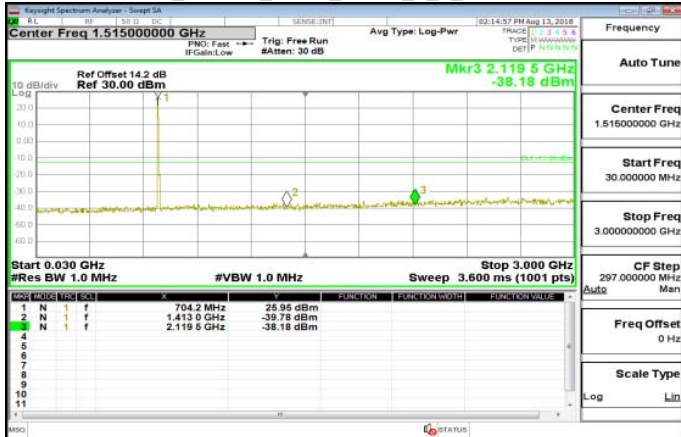
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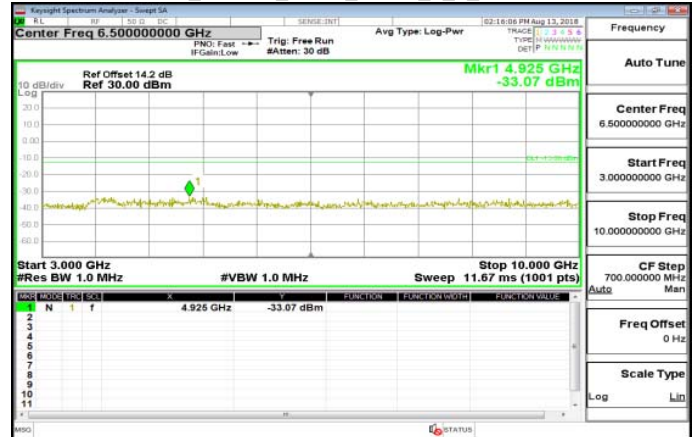
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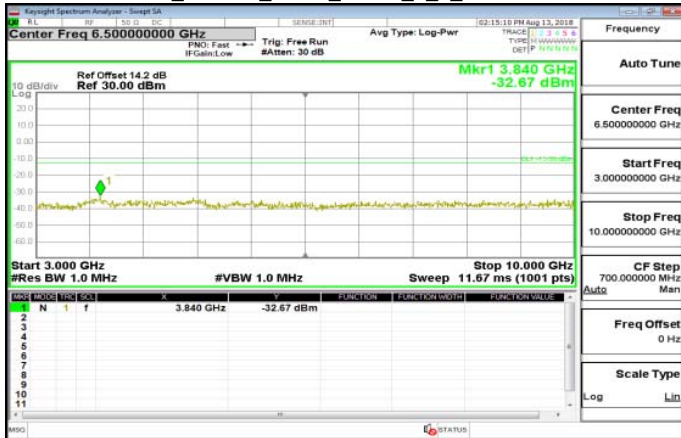
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3GHz~10GHz\_Band17\_5MHz\_QPSK\_1\_0\_MidCH23790-710



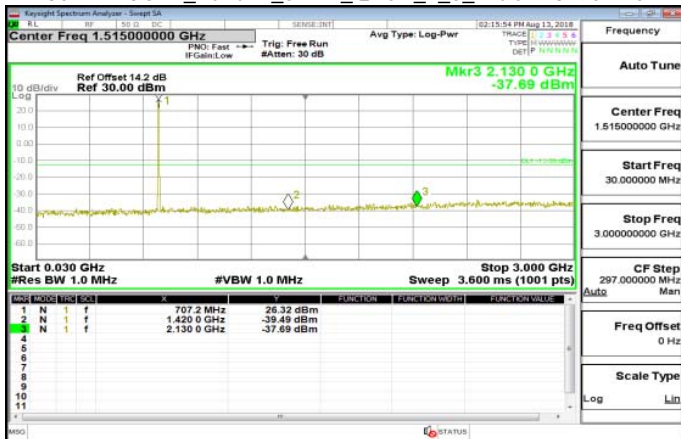
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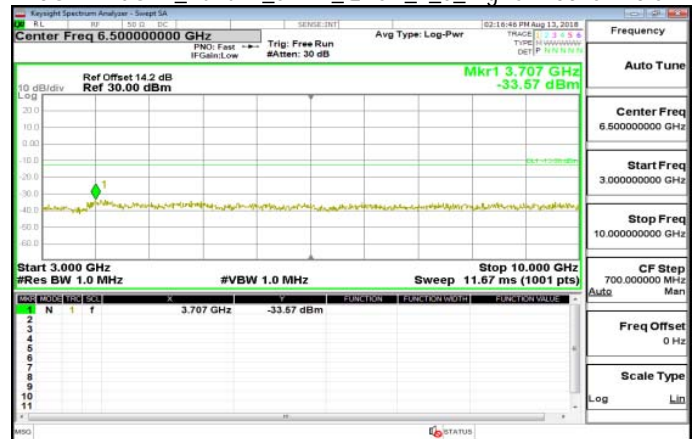
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3GHz~10GHz\_Band17\_5MHz\_QPSK\_1\_0\_HighCH23825-713.5



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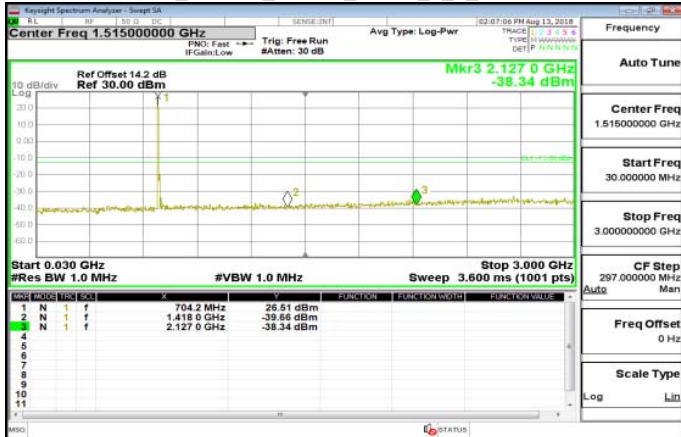
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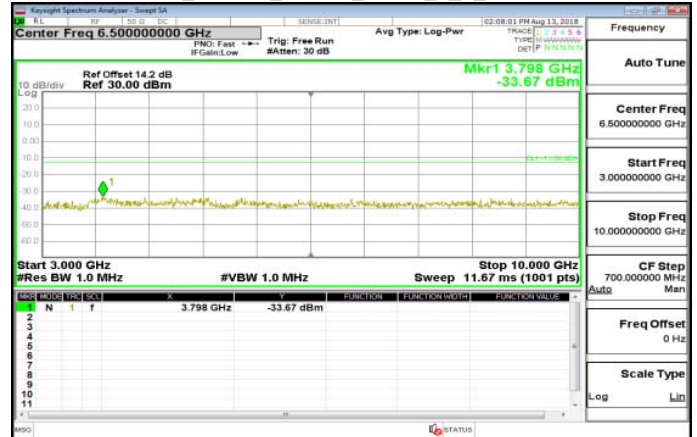
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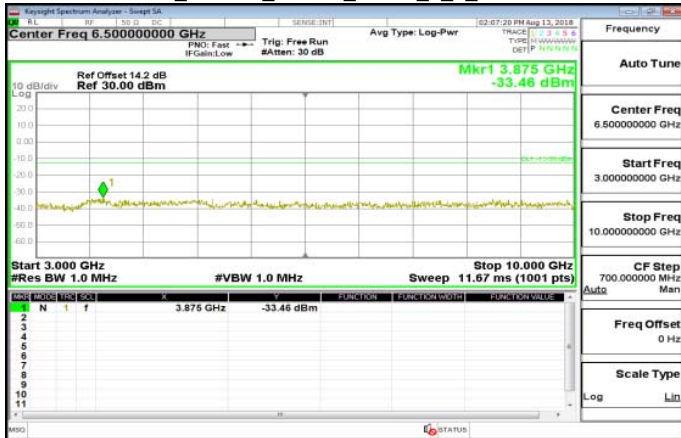
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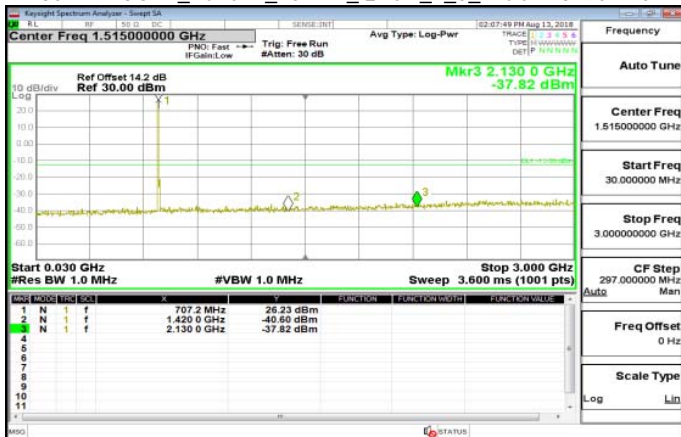
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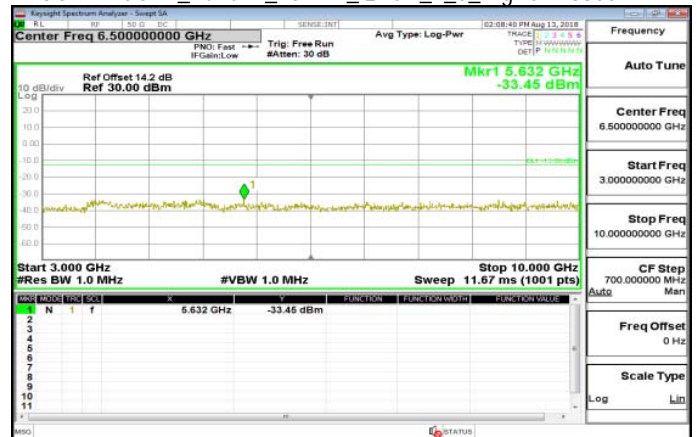
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30MHz-3GHz\_Band17\_10MHz\_QPSK\_1\_0\_MidCH23790-710



3GHz-10GHz\_Band17\_10MHz\_QPSK\_1\_0\_HighCH23800-711



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## 10. FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

### 10.1. Standard Applicable

According to FCC §2.1053,

FCC §22.917(a) , §24.238(a) , the magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under the conditions specified in the instruction manual and/ or alignment procedure, shall not be less than  $43 + 10 \log$  (mean output power in watts) dBc below the mean power output outside a licensee's frequency block (-13dBm).

FCC §27.53(g)

Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

FCC §27.53(h) (3)

Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

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## FCC §27.53(m) (4)

For mobile digital stations, the attenuation factor shall be not less than  $40 + 10 \log (P)$  dB on all frequencies between the channel edge and 5 megahertz from the channel edge,  $43 + 10 \log (P)$  dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and  $55 + 10 \log (P)$  dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than  $43 + 10 \log (P)$  dB on all frequencies between 2490.5 MHz and 2496 MHz and  $55 + 10 \log (P)$  dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. 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; for mobile digital stations, in the 1 megahertz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 megahertz band is 2495-2496 MHz, in which case a resolution bandwidth of at least one percent may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 megahertz or 1 percent of emission bandwidth, as specified; or 1 megahertz or 2 percent for mobile digital stations, except in the band 2495-2496 MHz). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. With respect to television operations, measurements must be made of the separate visual and aural operating powers at sufficiently frequent intervals to ensure compliance with the rules.

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**Table 2 — Unwanted Emissions for Mobile, Portable and Low-Power Fixed Subscriber Equipment**

Frequency (MHz)	Attenuation (dB)
<2200	$43 + 10 \log_{10}(p)$
2200 - 2288	$70 + 10 \log_{10}(p)$
2288 - 2292	$67 + 10 \log_{10}(p)$
2292 - 2296	$61 + 10 \log_{10}(p)$
2296 - 2300	$55 + 10 \log_{10}(p)$
2300 - 2305	$43 + 10 \log_{10}(p)$
2305 - 2320	$43 + 10 \log_{10}(p)^{\text{Note}}$
2320 - 2324	$55 + 10 \log_{10}(p)$
2324 - 2328	$61 + 10 \log_{10}(p)$
2328 - 2337	$67 + 10 \log_{10}(p)$
2337 - 2341	$61 + 10 \log_{10}(p)$
2341 - 2345	$55 + 10 \log_{10}(p)$
2345 - 2360	$43 + 10 \log_{10}(p)^{\text{Note}}$
2360 - 2365	$43 + 10 \log_{10}(p)$
2365 - 2395	$70 + 10 \log_{10}(p)$
>2395	$43 + 10 \log_{10}(p)$

**Note:** Measured at the edges of the highest and lowest frequency range(s) in which the equipment is designed to operate. See Section 1.2 for the permitted frequency ranges for various equipment types.

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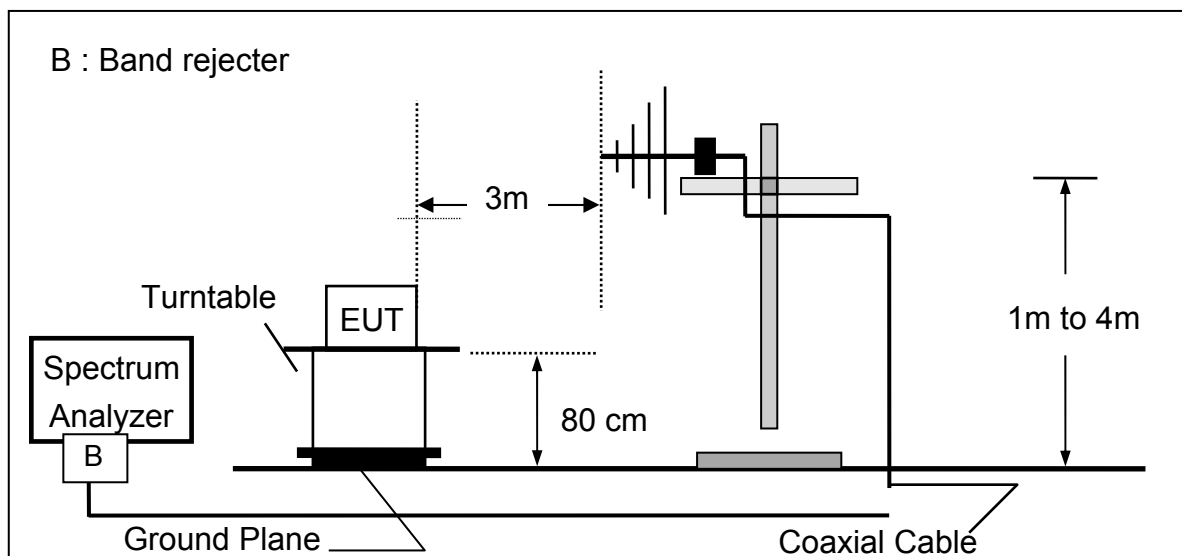
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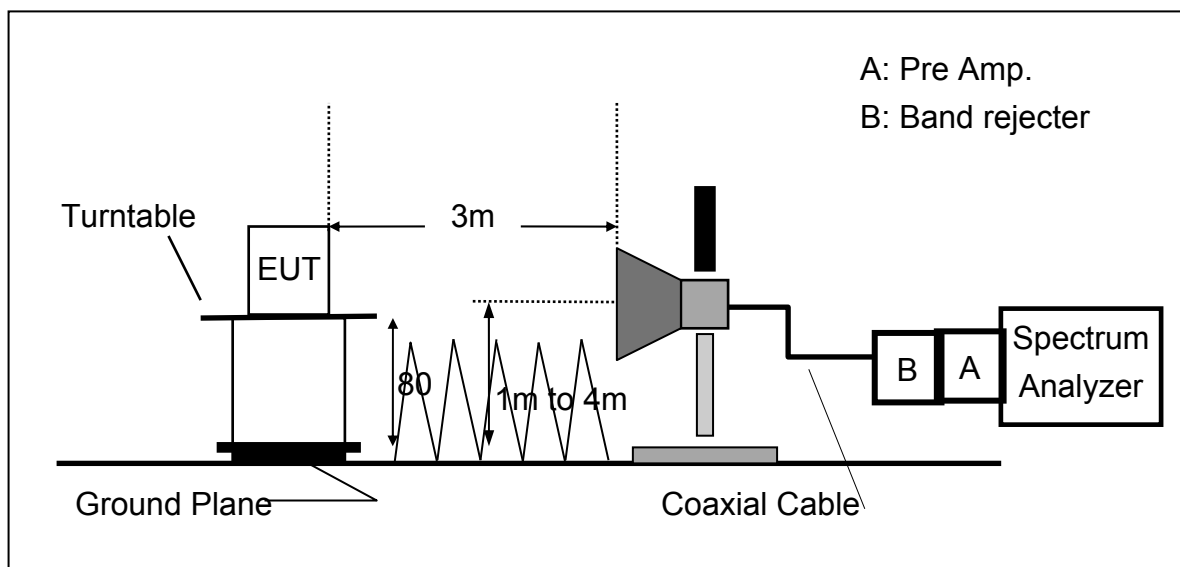
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## 10.2. EUT Setup

### Radiated Emission Test Set-Up, Frequency Below 1000MHz



### Radiated Emission Test Set-UP Frequency Over 1 GHz



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### 10.3. Measurement Procedure:

The EUT was placed on a non-conductive; the measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

The frequency range up to tenth harmonic was investigated for each of three fundamental frequencies (low, middle and high channels). Once spurious emission was identified, the power of the emission was determined using the substitution method.

The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency.

ERP (dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

EIRP (dBm) = SG Level(dBm) + Antenna Gain(dBi) + Cable Loss(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

### 10.4. Measurement Equipment Used:

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Bi-log Antenna	SCHWAZBECK	VULB9168	378	2017/12/29	2018/12/28
Bi-log Antenna	SCHWAZBECK	VULB9168	300	2017/12/20	2018/12/19
Horn Antenna	Schwarzbeck	BBHA9120D	309	2018/01/04	2019/01/03
Horn Antenna	Schwarzbeck	BBHA9120D	1441	2017/08/04	2018/08/03
Spectrum Analyzer	Agilent	E4446A	MY51100003	2017/05/10	2018/05/09
EMI Test Receiver	R&S	ESCI7	100760	2017/06/06	2018/06/05
Network Analyzer	Anritsu	MS4644A	1216312	2017/05/25	2018/05/24
Radio Communication Analyser	Anritsu	MT8820C	6201465317	2018/01/15	2019/01/14
Pre-Amplifier	HP	8449B	3008A00578	2018/01/02	2019/01/01
Pre-Amplifier	HP	8447D	2944A07676	2018/01/02	2019/01/01
Attenuator	Mini-Circuit	BW-S10W2+	N/A	2018/01/02	2019/01/01
Filter 800-1000	Micro-Tronics	EWT	M1	2018/01/02	2019/01/01
1GHz High Pass Filter	Micro-Tronics	HPM50108	32	2018/01/02	2019/01/01
Low Loss Cable	Huber Suhner	966_RX	9	2018/01/02	2019/01/01
Low Loss Cable	Huber Suhner	966 TX	1	2018/01/02	2019/01/01

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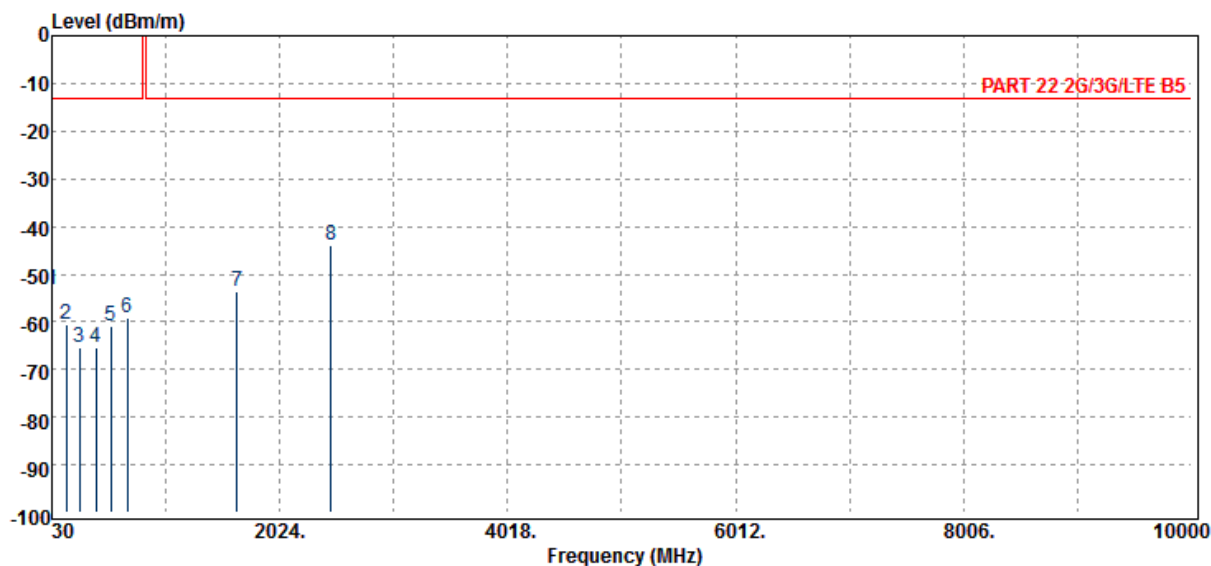
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## 10.5. Measurement Result:

### Radiated Spurious Emission Measurement Result: GPRS 850 Mode

Operation Band	:GPRS 850	Temp./Humi.	:24 deg_C / 61 RH
Fundamental Frequency	:824.2 MHz	Engineer	:Tin
Operation Mode	:Tx CH LOW		
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB
30.00	-53.44	-38.28	-14.58	-0.58	-13.00	-40.44
154.16	-60.54	-57.67	-1.57	-1.30	-13.00	-47.54
272.50	-65.49	-67.24	3.48	-1.73	-13.00	-52.49
416.06	-65.35	-66.89	3.66	-2.12	-13.00	-52.35
544.10	-60.94	-63.14	3.99	-1.79	-13.00	-47.94
692.51	-59.13	-60.07	3.70	-2.76	-13.00	-46.13
1648.40	-53.57	-56.19	6.97	-4.35	-13.00	-40.57
2472.60	-44.07	-46.92	8.34	-5.49	-13.00	-31.07

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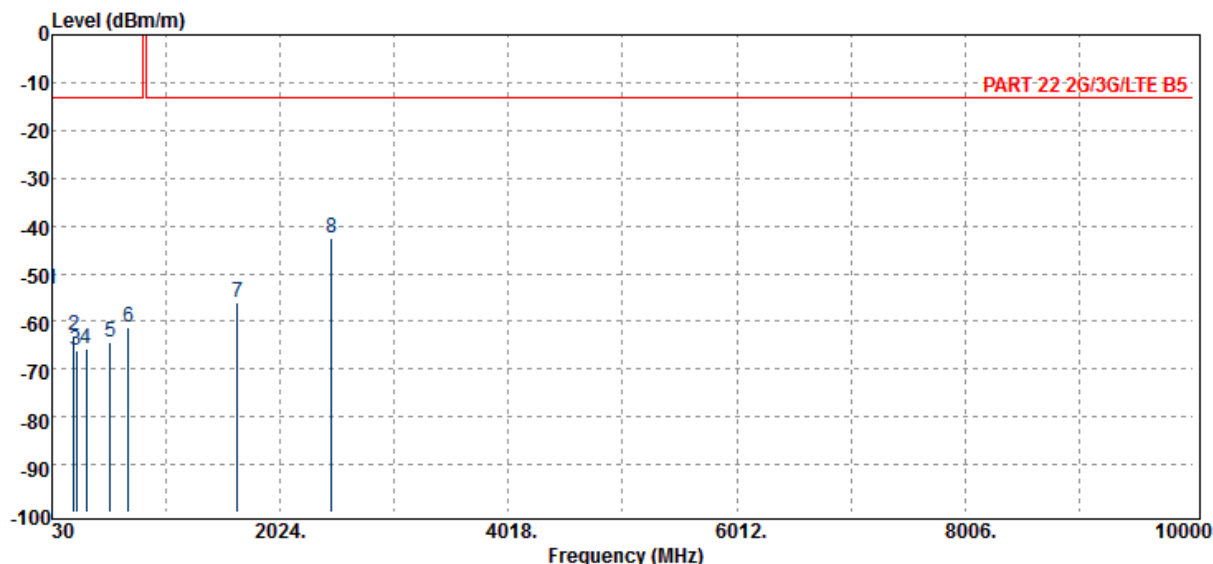
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Operation Band :GPRS 850  
Fundamental Frequency :824.2 MHz  
Operation Mode :Tx CH LOW  
EUT Pol. :H Plane

Temp./Humi. :24 deg\_C / 61 RH  
Engineer :Tin

Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB
30.00	-53.26	-38.10	-14.58	-0.58	-13.00	-40.26
220.12	-63.00	-64.75	3.32	-1.58	-13.00	-50.00
245.34	-66.11	-67.92	3.51	-1.69	-13.00	-53.11
332.64	-65.70	-67.55	3.78	-1.93	-13.00	-52.70
537.31	-64.47	-66.41	4.00	-2.07	-13.00	-51.47
696.39	-61.36	-62.59	3.69	-2.46	-13.00	-48.36
1648.40	-56.07	-58.70	6.97	-4.35	-13.00	-43.07
2472.60	-42.53	-45.37	8.34	-5.49	-13.00	-29.53

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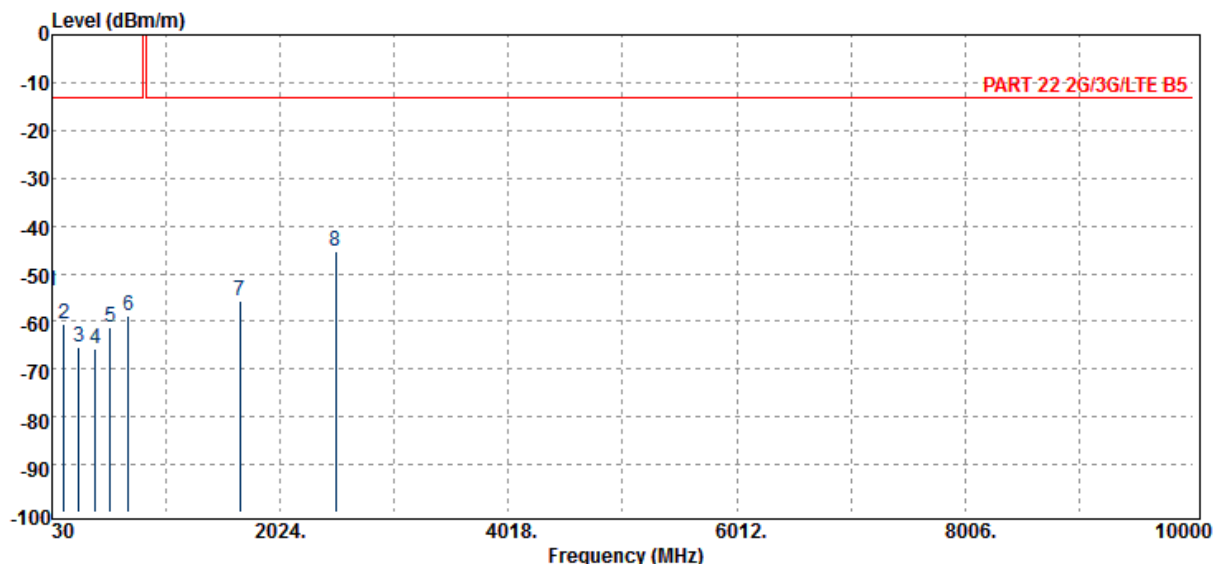
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Operation Band :GPRS 850  
Fundamental Frequency :836.6 MHz  
Operation Mode :Tx CH MID  
EUT Pol. :H Plane

Temp./Humi. :24 deg\_C / 61 RH  
Engineer :Tin

Measurement Antenna Pol. :VERTICAL



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB
30.00	-53.76	-38.60	-14.58	-0.58	-13.00	-40.76
136.70	-60.48	-57.04	-2.19	-1.24	-13.00	-47.48
267.65	-65.54	-67.37	3.54	-1.71	-13.00	-52.54
408.30	-65.80	-67.34	3.68	-2.14	-13.00	-52.80
542.16	-61.19	-63.32	3.99	-1.87	-13.00	-48.19
696.39	-58.94	-60.16	3.69	-2.46	-13.00	-45.94
1673.20	-55.88	-58.55	7.06	-4.39	-13.00	-42.88
2509.80	-45.40	-48.23	8.37	-5.53	-13.00	-32.40

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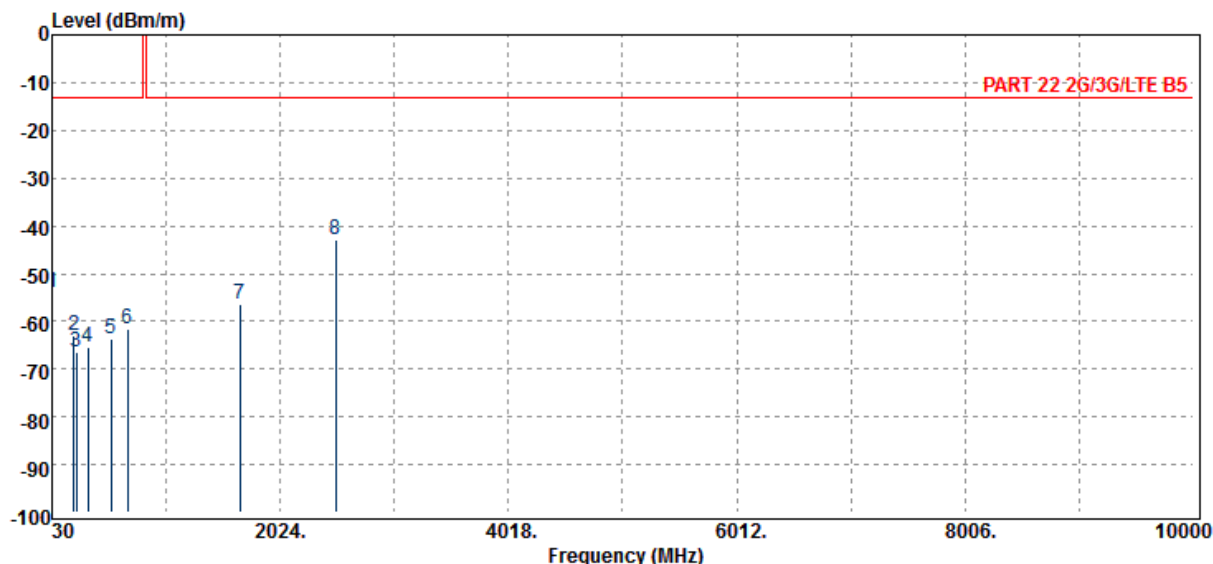
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Operation Band :GPRS 850  
Fundamental Frequency :836.6 MHz  
Operation Mode :Tx CH MID  
EUT Pol. :H Plane

Temp./Humi. :24 deg\_C / 61 RH  
Engineer :Tin

Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB
30.00	-53.93	-38.77	-14.58	-0.58	-13.00	-40.93
220.12	-63.15	-64.89	3.32	-1.58	-13.00	-50.15
246.31	-66.28	-68.10	3.51	-1.69	-13.00	-53.28
347.19	-65.51	-67.34	3.84	-2.02	-13.00	-52.51
547.01	-63.63	-65.75	3.98	-1.86	-13.00	-50.63
691.54	-61.63	-62.50	3.70	-2.83	-13.00	-48.63
1673.20	-56.40	-59.07	7.06	-4.39	-13.00	-43.40
2509.80	-42.86	-45.70	8.37	-5.53	-13.00	-29.86

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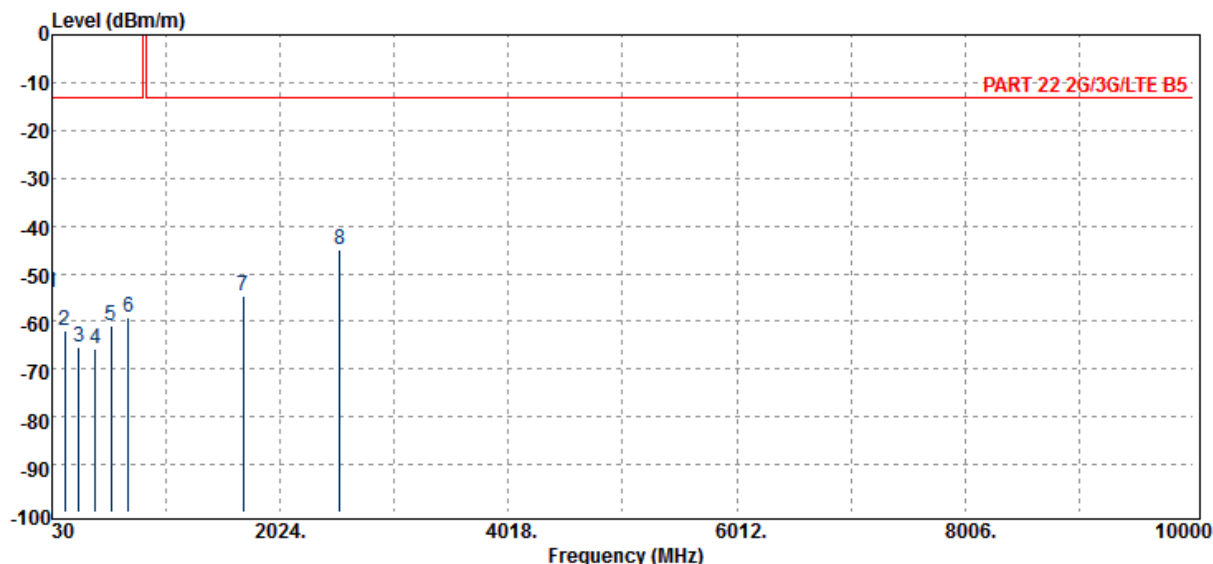
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Operation Band :GPRS 850  
Fundamental Frequency :848.8 MHz  
Operation Mode :Tx CH HIGH  
EUT Pol. :H Plane

Temp./Humi. :24 deg\_C / 61 RH  
Engineer :Tin

Measurement Antenna Pol. :VERTICAL



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB
30.00	-53.86	-38.70	-14.58	-0.58	-13.00	-40.86
139.61	-61.87	-58.32	-2.29	-1.26	-13.00	-48.87
262.80	-65.44	-67.36	3.62	-1.71	-13.00	-52.44
405.39	-65.59	-67.14	3.69	-2.15	-13.00	-52.59
548.95	-60.84	-62.85	3.98	-1.97	-13.00	-47.84
700.27	-59.14	-60.65	3.67	-2.16	-13.00	-46.14
1697.60	-54.84	-57.55	7.14	-4.43	-13.00	-41.84
2546.40	-45.05	-47.89	8.42	-5.58	-13.00	-32.05

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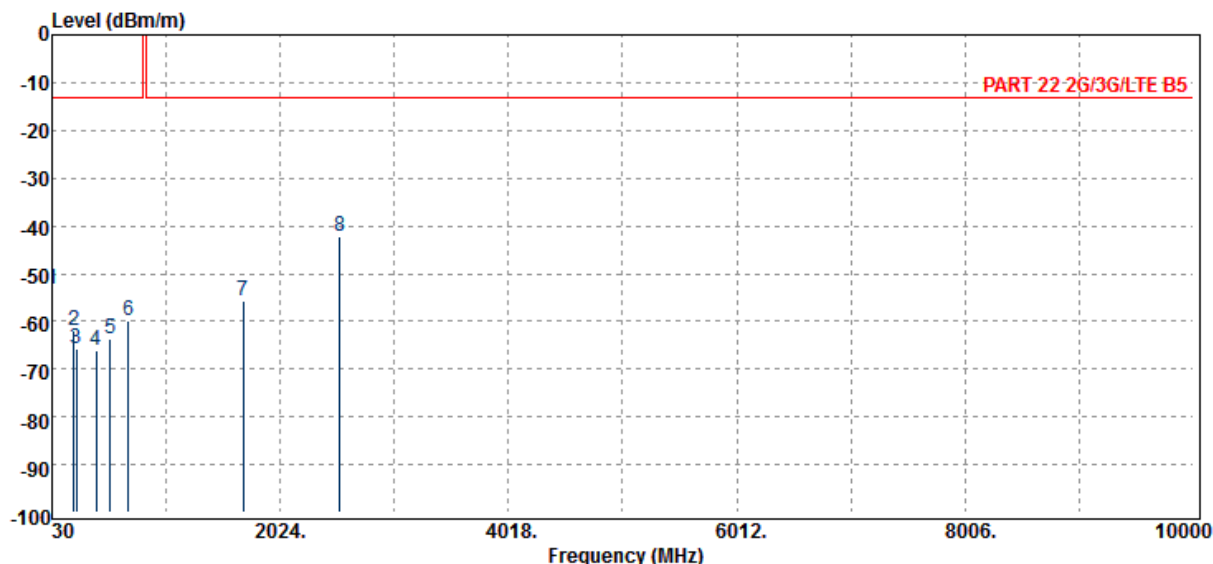
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Operation Band :GPRS 850  
Fundamental Frequency :848.8 MHz  
Operation Mode :Tx CH HIGH  
EUT Pol. :H Plane

Temp./Humi. :24 deg\_C / 61 RH  
Engineer :Tin

Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB
30.00	-53.23	-38.07	-14.58	-0.58	-13.00	-40.23
219.15	-61.86	-63.64	3.35	-1.57	-13.00	-48.86
243.40	-65.87	-67.69	3.50	-1.68	-13.00	-52.87
416.06	-66.12	-67.66	3.66	-2.12	-13.00	-53.12
537.31	-63.83	-65.76	4.00	-2.07	-13.00	-50.83
694.45	-59.93	-61.02	3.69	-2.61	-13.00	-46.93
1697.60	-55.82	-58.53	7.14	-4.43	-13.00	-42.82
2546.40	-42.26	-45.10	8.42	-5.58	-13.00	-29.26

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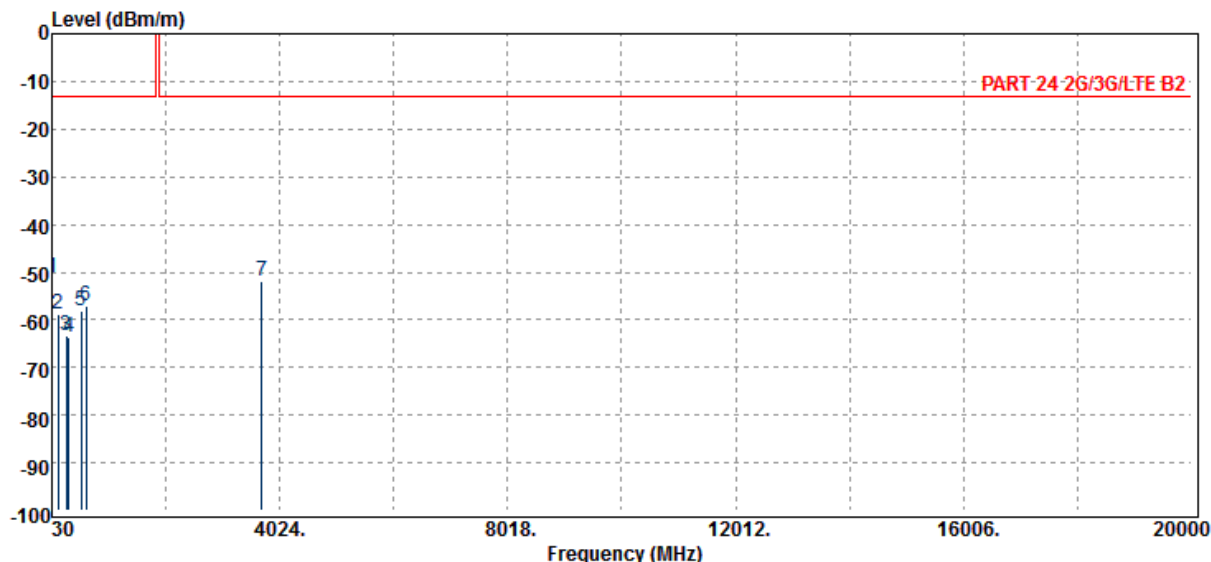
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## Radiated Spurious Emission Measurement Result: GPRS 1900 Mode

Operation Band	:GPRS 1900	Temp./Humi.	:22 deg_C / 62 RH
Fundamental Frequency	:1850.2 MHz	Engineer	:Tin
Operation Mode	:Tx CH LOW		
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB
30.00	-51.32	-38.31	-12.43	-0.58	-13.00	-38.32
134.76	-58.82	-57.62	0.03	-1.23	-13.00	-45.82
282.20	-63.38	-67.19	5.57	-1.75	-13.00	-50.38
330.70	-63.71	-67.71	5.92	-1.92	-13.00	-50.71
542.16	-58.17	-62.44	6.14	-1.87	-13.00	-45.17
624.61	-57.00	-60.04	5.83	-2.80	-13.00	-44.00
3700.40	-52.06	-57.71	12.57	-6.91	-13.00	-39.06

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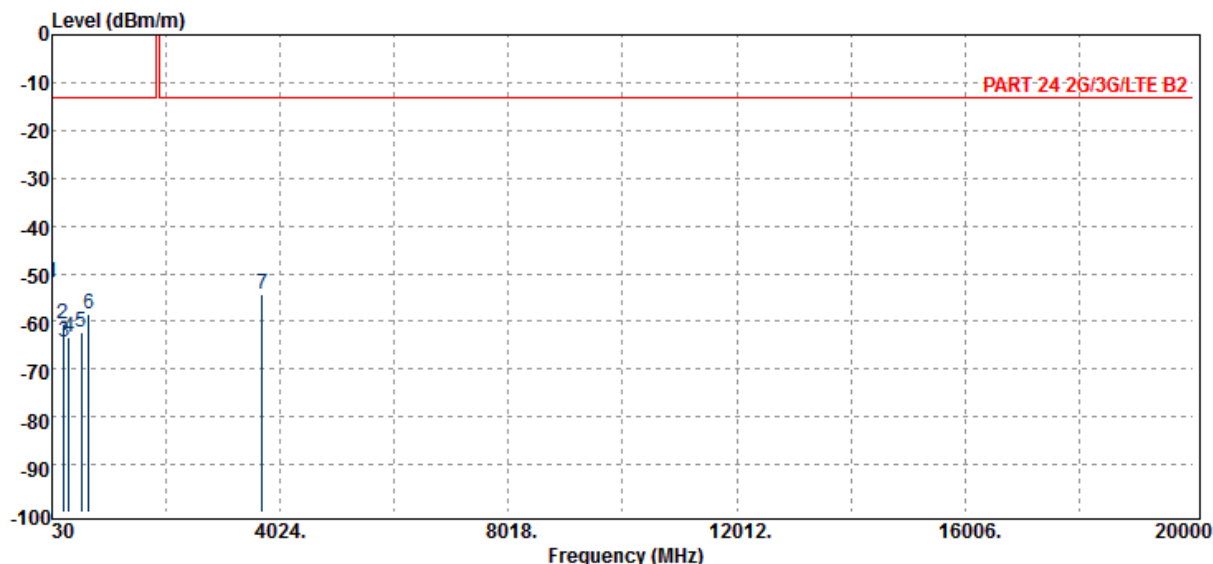
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Operation Band :GPRS 1900  
Fundamental Frequency :1850.2 MHz  
Operation Mode :Tx CH LOW  
EUT Pol. :H Plane

Temp./Humi. :22 deg\_C / 62 RH  
Engineer :Tin

Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB
30.00	-51.79	-38.78	-12.43	-0.58	-13.00	-38.79
220.12	-60.45	-64.34	5.47	-1.58	-13.00	-47.45
245.34	-64.36	-68.32	5.66	-1.69	-13.00	-51.36
332.64	-63.25	-67.24	5.93	-1.93	-13.00	-50.25
537.31	-62.29	-66.37	6.15	-2.07	-13.00	-49.29
668.26	-58.50	-62.25	5.92	-2.17	-13.00	-45.50
3700.40	-54.49	-60.15	12.57	-6.91	-13.00	-41.49

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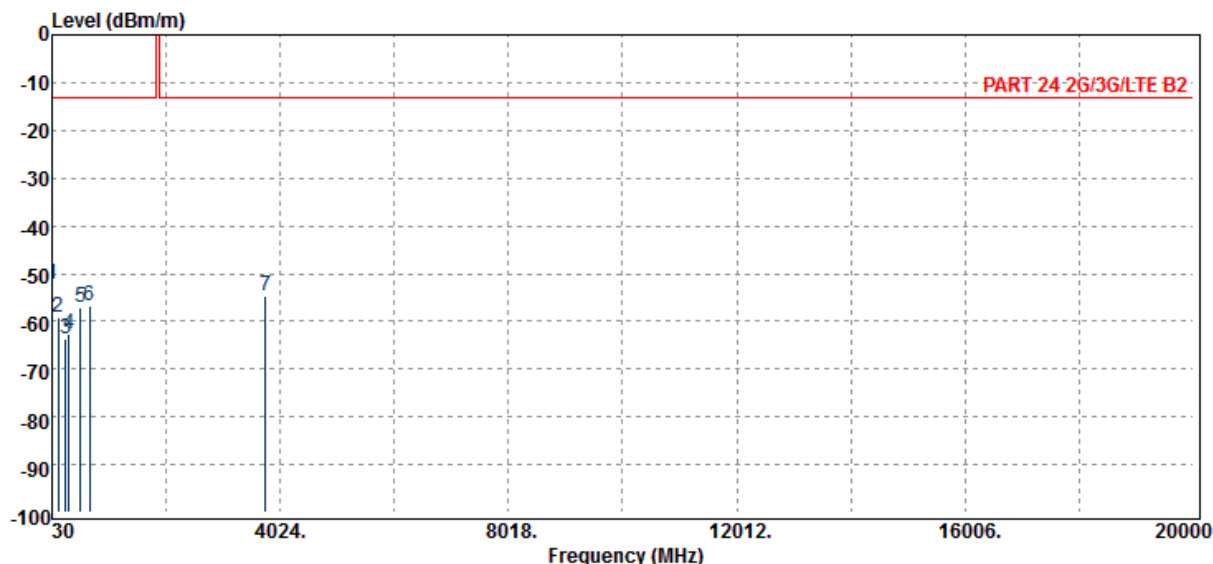
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Operation Band :GPRS 1900 Temp./Humi. :22 deg\_C / 62 RH  
Fundamental Frequency :1880 MHz Engineer :Tin  
Operation Mode :Tx CH MID  
EUT Pol. :H Plane Measurement Antenna Pol. :VERTICAL



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB
30.00	-52.21	-39.20	-12.43	-0.58	-13.00	-39.21
138.64	-59.34	-57.98	-0.11	-1.25	-13.00	-46.34
272.50	-63.52	-67.42	5.63	-1.73	-13.00	-50.52
330.70	-62.68	-66.68	5.92	-1.92	-13.00	-49.68
534.40	-57.17	-61.14	6.15	-2.19	-13.00	-44.17
692.51	-56.58	-59.67	5.85	-2.76	-13.00	-43.58
3760.00	-54.78	-60.51	12.61	-6.89	-13.00	-41.78

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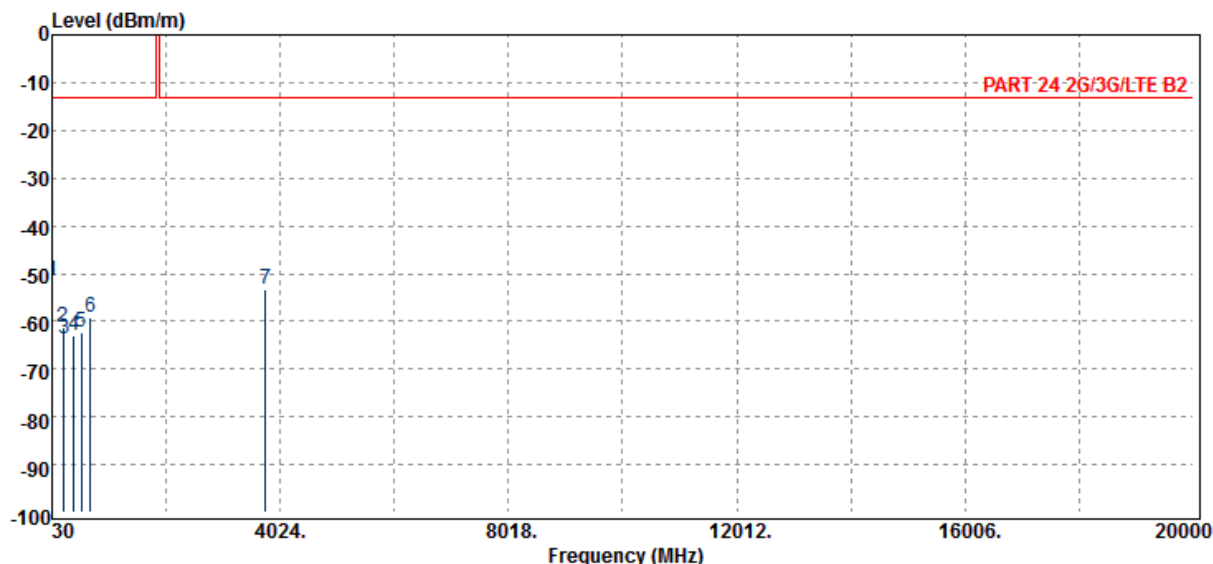
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Operation Band :GPRS 1900  
Fundamental Frequency :1880 MHz  
Operation Mode :Tx CH MID  
EUT Pol. :H Plane

Temp./Humi. :22 deg\_C / 62 RH  
Engineer :Tin

Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB
30.00	-51.61	-38.60	-12.43	-0.58	-13.00	-38.61
220.12	-61.38	-65.27	5.47	-1.58	-13.00	-48.38
245.34	-63.66	-67.62	5.66	-1.69	-13.00	-50.66
410.24	-62.93	-66.63	5.83	-2.13	-13.00	-49.93
542.16	-62.25	-66.52	6.14	-1.87	-13.00	-49.25
697.36	-59.30	-62.75	5.83	-2.38	-13.00	-46.30
3760.00	-53.24	-58.97	12.61	-6.89	-13.00	-40.24

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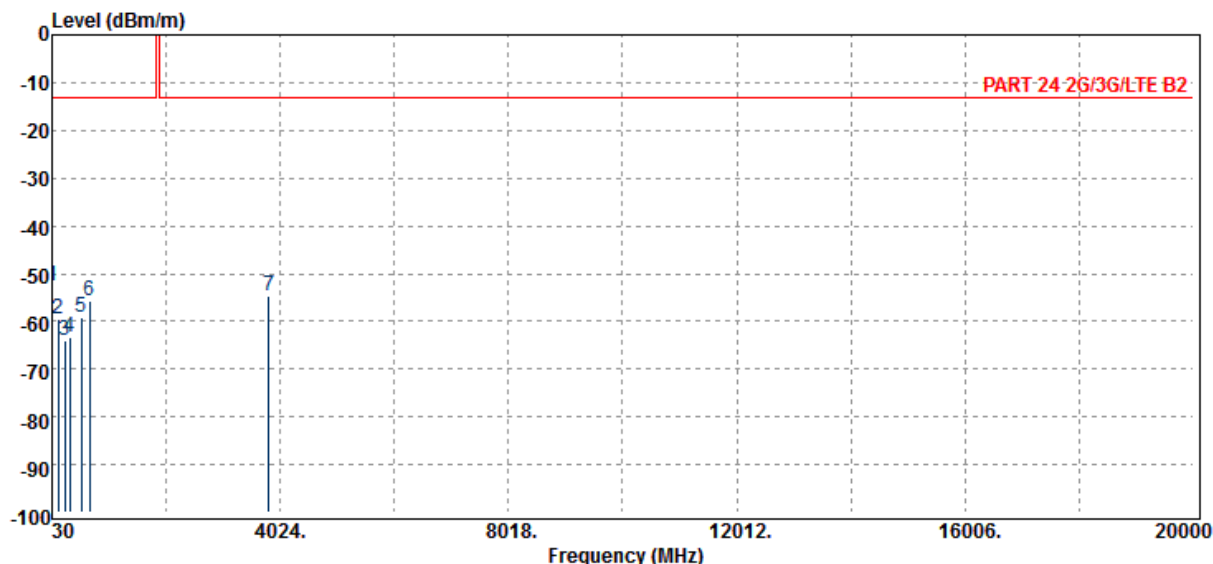
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Operation Band :GPRS 1900  
Fundamental Frequency :1909.8 MHz  
Operation Mode :Tx CH HIGH  
EUT Pol. :H Plane

Temp./Humi. :22 deg\_C / 62 RH  
Engineer :Tin

Measurement Antenna Pol. :VERTICAL



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB
30.00	-52.47	-39.47	-12.43	-0.58	-13.00	-39.47
134.76	-59.41	-58.20	0.03	-1.23	-13.00	-46.41
256.01	-64.15	-68.22	5.77	-1.70	-13.00	-51.15
340.40	-63.39	-67.38	5.96	-1.98	-13.00	-50.39
541.19	-59.25	-63.49	6.14	-1.91	-13.00	-46.25
694.45	-55.81	-59.04	5.84	-2.61	-13.00	-42.81
3819.60	-54.68	-60.32	12.66	-7.02	-13.00	-41.68

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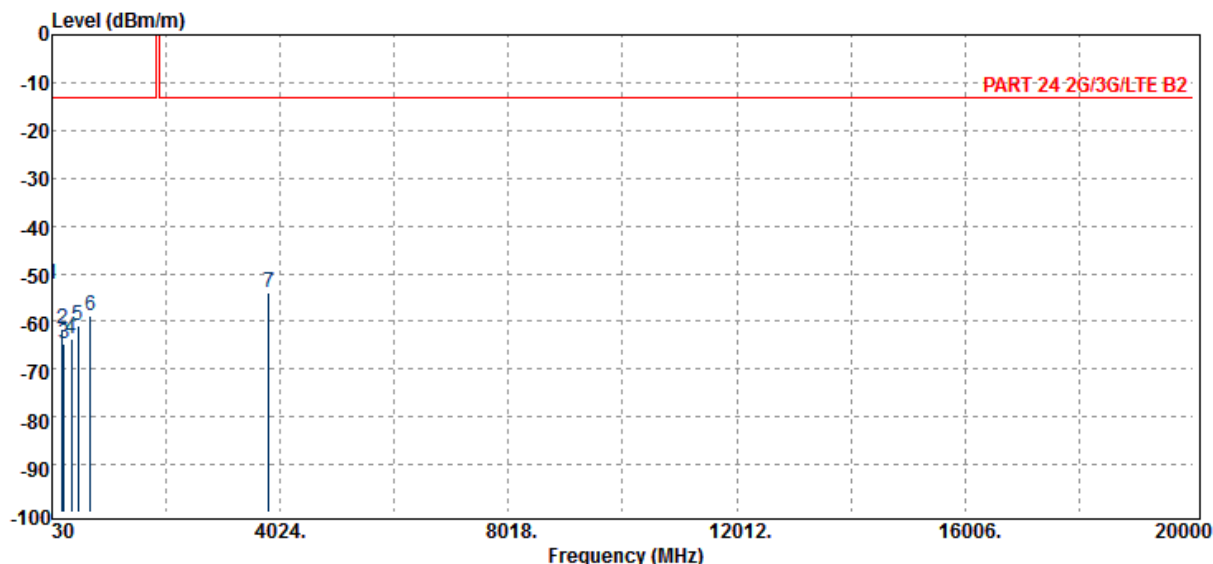
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Operation Band :GPRS 1900  
Fundamental Frequency :1909.8 MHz  
Operation Mode :Tx CH HIGH  
EUT Pol. :H Plane

Temp./Humi. :22 deg\_C / 62 RH  
Engineer :Tin

Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB
30.00	-52.15	-39.14	-12.43	-0.58	-13.00	-39.15
217.21	-61.55	-65.56	5.58	-1.56	-13.00	-48.55
245.34	-64.60	-68.57	5.66	-1.69	-13.00	-51.60
367.56	-63.51	-67.40	5.95	-2.06	-13.00	-50.51
487.84	-61.02	-65.22	6.08	-1.89	-13.00	-48.02
700.27	-58.98	-62.65	5.82	-2.16	-13.00	-45.98
3819.60	-54.04	-59.68	12.66	-7.02	-13.00	-41.04

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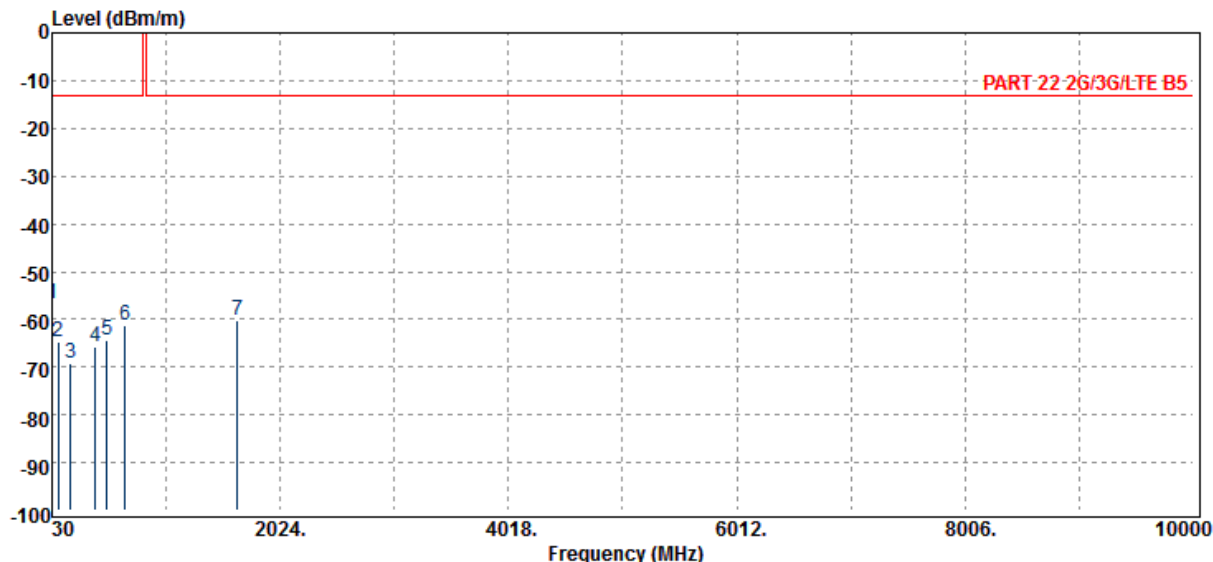
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## Radiated Spurious Emission Measurement Result: WCDMA Band 5 Mode

Operation Band	:WCDMA B5	Temp./Humi.	:24 deg_C / 61 RH
Fundamental Frequency	:824.2 MHz	Engineer	:Tin
Operation Mode	:Tx CH LOW		
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB
31.94	-56.78	-42.10	-14.08	-0.59	-13.00	-43.78
84.32	-64.54	-62.00	-1.55	-0.98	-13.00	-51.54
193.93	-69.05	-70.37	2.77	-1.45	-13.00	-56.05
405.39	-65.71	-67.25	3.69	-2.15	-13.00	-52.71
508.21	-64.37	-66.04	4.04	-2.36	-13.00	-51.37
668.26	-61.12	-62.72	3.77	-2.17	-13.00	-48.12
1652.80	-60.08	-62.71	6.99	-4.36	-13.00	-47.08

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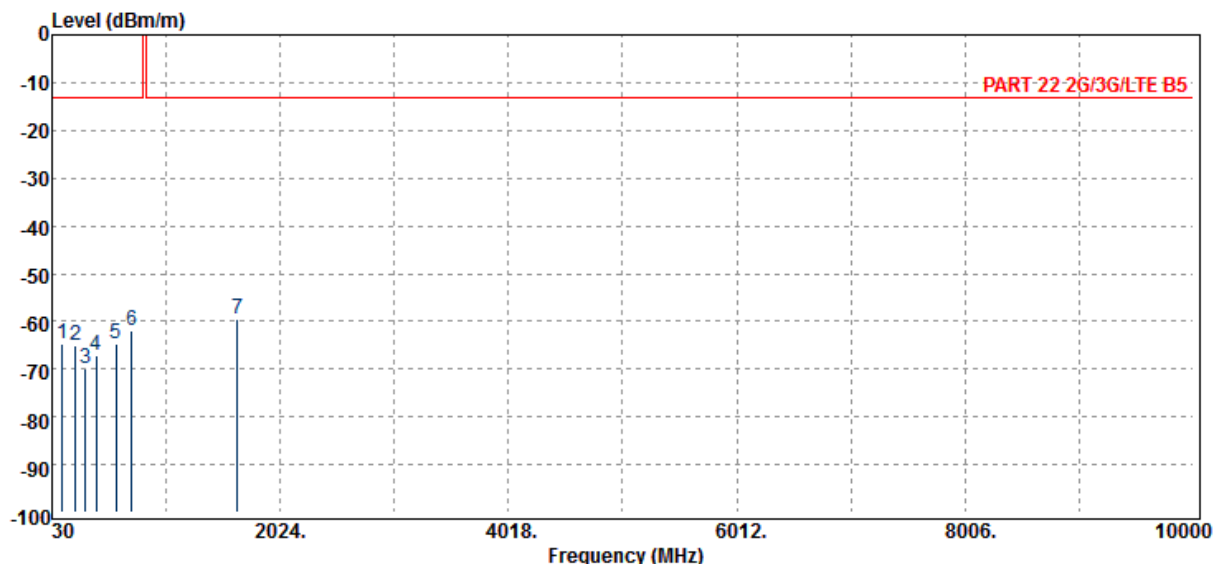
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Operation Band :WCDMA B5  
Fundamental Frequency :824.2 MHz  
Operation Mode :Tx CH LOW  
EUT Pol. :H Plane

Temp./Humi. :24 deg\_C / 61 RH  
Engineer :Tin

Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB
123.12	-64.73	-61.68	-1.88	-1.17	-13.00	-51.73
232.73	-65.02	-66.74	3.35	-1.64	-13.00	-52.02
320.03	-69.74	-71.58	3.72	-1.87	-13.00	-56.74
416.06	-67.10	-68.63	3.66	-2.12	-13.00	-54.10
590.66	-64.63	-66.03	3.62	-2.21	-13.00	-51.63
724.52	-61.92	-62.48	3.58	-3.01	-13.00	-48.92
1652.80	-59.66	-62.29	6.99	-4.36	-13.00	-46.66

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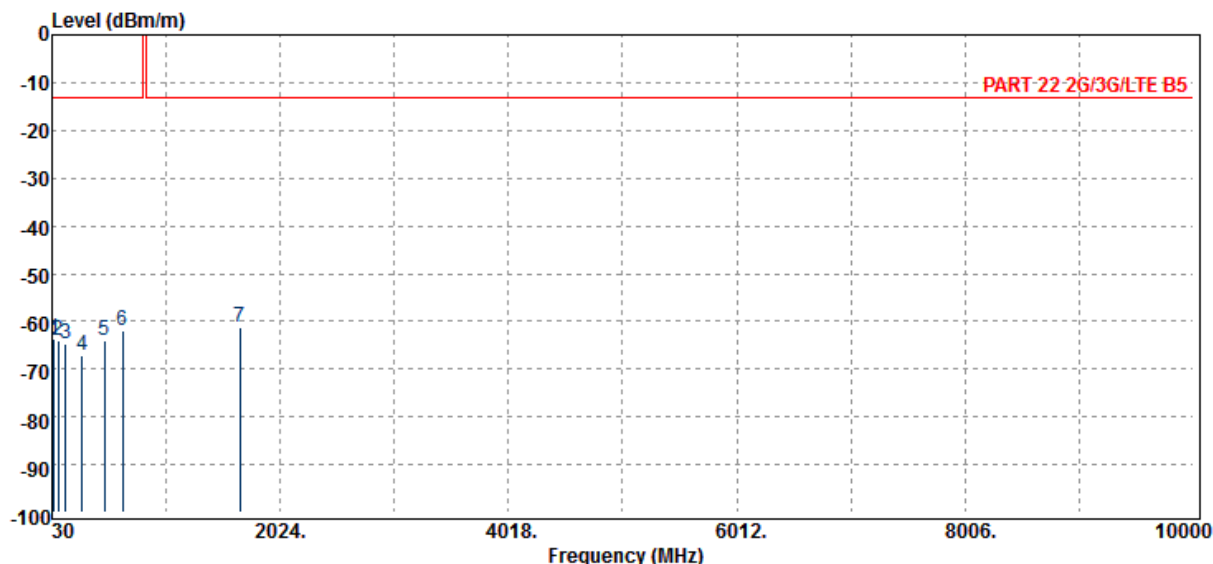
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Operation Band :WCDMA B5  
Fundamental Frequency :836.6 MHz  
Operation Mode :Tx CH MID  
EUT Pol. :H Plane

Temp./Humi. :24 deg\_C / 61 RH  
Engineer :Tin

Measurement Antenna Pol. :VERTICAL



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB
45.52	-63.62	-50.94	-11.97	-0.70	-13.00	-50.62
86.26	-64.05	-61.86	-1.20	-0.99	-13.00	-51.05
150.28	-64.69	-61.60	-1.79	-1.29	-13.00	-51.69
289.96	-67.04	-68.68	3.42	-1.78	-13.00	-54.04
487.84	-63.98	-66.02	3.93	-1.89	-13.00	-50.98
648.86	-61.84	-63.37	3.83	-2.30	-13.00	-48.84
1673.20	-61.12	-63.78	7.06	-4.39	-13.00	-48.12

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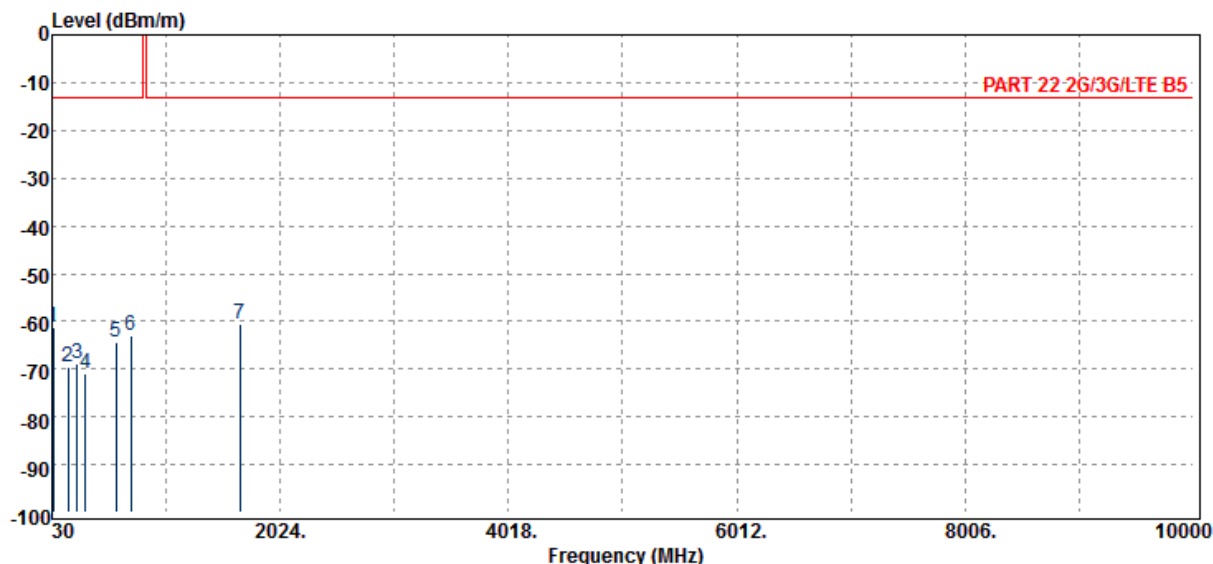
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Operation Band :WCDMA B5  
Fundamental Frequency :836.6 MHz  
Operation Mode :Tx CH MID  
EUT Pol. :H Plane

Temp./Humi. :24 deg\_C / 61 RH  
Engineer :Tin

Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB
37.76	-61.38	-47.77	-12.97	-0.64	-13.00	-48.38
169.68	-69.57	-67.61	-0.64	-1.33	-13.00	-56.57
251.16	-68.71	-70.57	3.55	-1.70	-13.00	-55.71
320.03	-70.87	-72.72	3.72	-1.87	-13.00	-57.87
588.72	-64.32	-65.74	3.63	-2.22	-13.00	-51.32
715.79	-62.95	-64.09	3.61	-2.48	-13.00	-49.95
1673.20	-60.68	-63.34	7.06	-4.39	-13.00	-47.68

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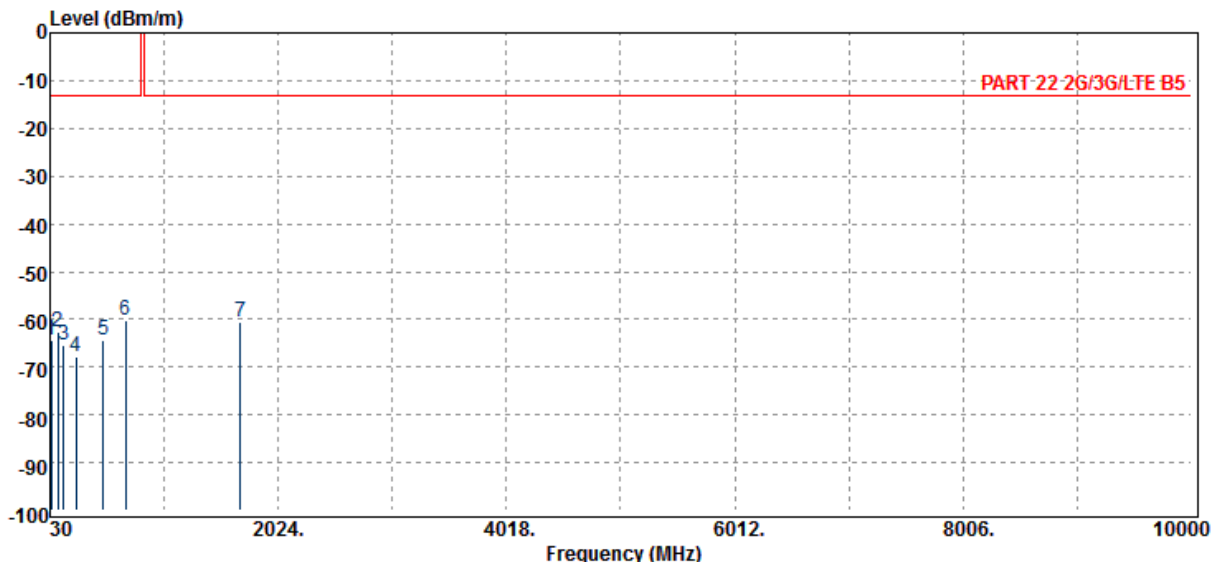
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Operation Band	:WCDMA B5	Temp./Humi.	:24 deg_C / 61 RH
Fundamental Frequency	:848.8 MHz	Engineer	:Tin
Operation Mode	:Tx CH HIGH		
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB
43.58	-64.53	-51.62	-12.23	-0.68	-13.00	-51.53
99.84	-62.70	-60.44	-1.22	-1.05	-13.00	-49.70
148.34	-65.29	-62.11	-1.89	-1.29	-13.00	-52.29
256.01	-67.75	-69.67	3.62	-1.70	-13.00	-54.75
495.60	-64.39	-66.32	4.01	-2.09	-13.00	-51.39
693.48	-60.10	-61.12	3.69	-2.68	-13.00	-47.10
1693.20	-60.42	-63.12	7.12	-4.43	-13.00	-47.42

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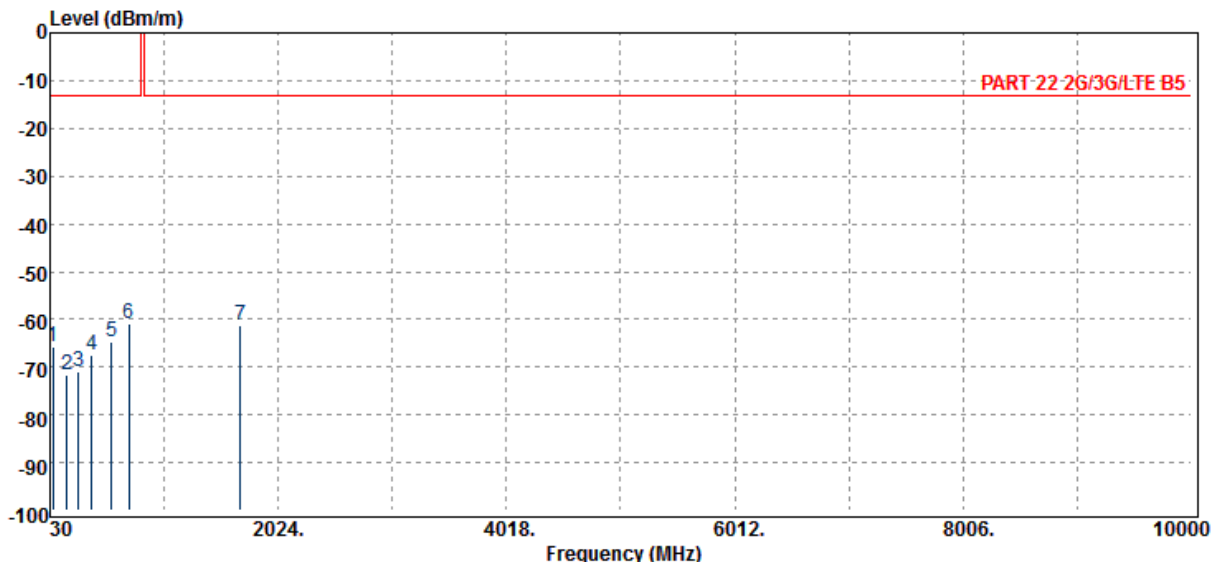
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Operation Band	:WCDMA B5	Temp./Humi.	:24 deg_C / 61 RH
Fundamental Frequency	:848.8 MHz	Engineer	:Tin
Operation Mode	:Tx CH HIGH		
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB
55.22	-65.75	-55.02	-9.95	-0.79	-13.00	-52.75
177.44	-71.69	-70.90	0.58	-1.37	-13.00	-58.69
277.35	-71.00	-72.70	3.44	-1.74	-13.00	-58.00
394.72	-67.60	-69.26	3.73	-2.08	-13.00	-54.60
564.47	-64.68	-65.72	3.85	-2.81	-13.00	-51.68
720.64	-60.85	-61.66	3.59	-2.78	-13.00	-47.85
1693.20	-61.21	-63.91	7.12	-4.43	-13.00	-48.21

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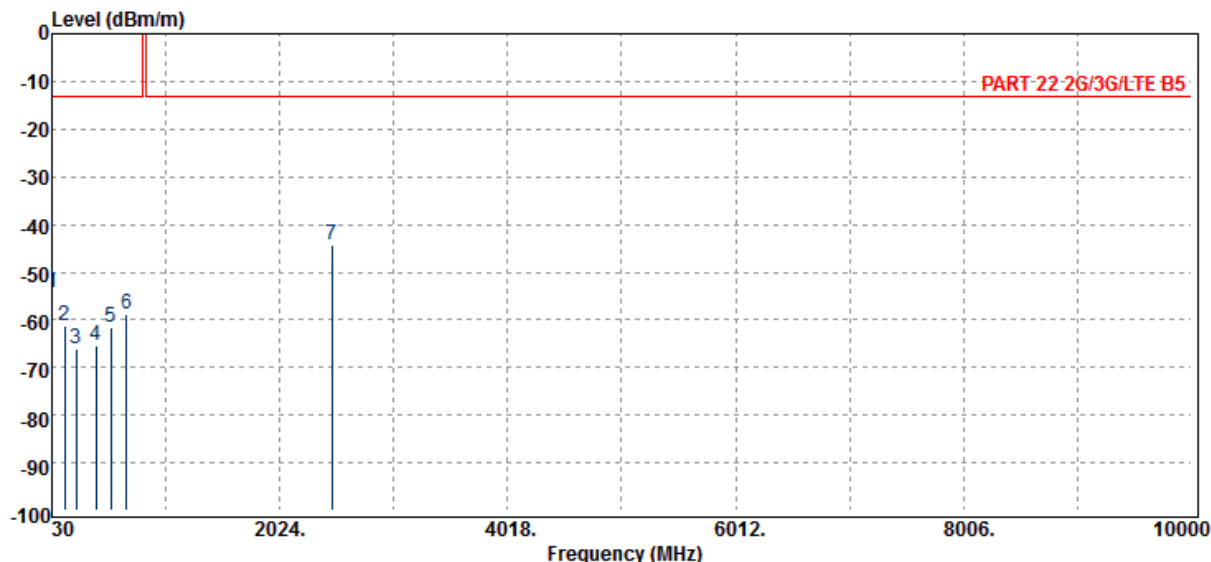
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## Radiated Spurious Emission Measurement Result: LTE-Band 5 (The Worst Case)

Operation Band	:LTE B5	Temp./Humi.	:24.1 deg_C / 65 RH
Fundamental Frequency	:826.5 MHz	Engineer	:Tin
Operation Mode	:Tx CH LOW		
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB
30.00	-54.33	-39.17	-14.58	-0.58	-13.00	-41.33
138.64	-61.23	-57.72	-2.26	-1.25	-13.00	-48.23
240.49	-66.13	-67.94	3.48	-1.67	-13.00	-53.13
416.06	-65.38	-66.91	3.66	-2.12	-13.00	-52.38
547.01	-61.48	-63.60	3.98	-1.86	-13.00	-48.48
681.84	-58.97	-59.58	3.73	-3.12	-13.00	-45.97
2479.50	-44.39	-49.38	10.49	-5.50	-13.00	-31.39

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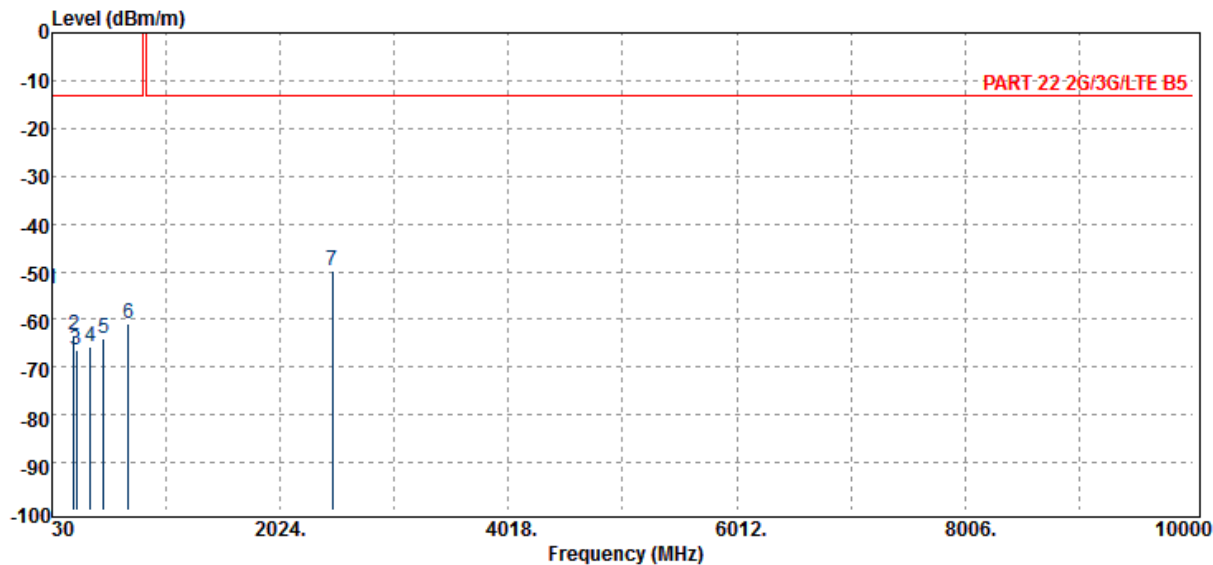
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Operation Band	:LTE B5	Temp./Humi.	:24.1 deg_C / 65 RH
Fundamental Frequency	:826.5 MHz	Engineer	:Tin
Operation Mode	:Tx CH LOW		
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB
30.00	-53.60	-38.44	-14.58	-0.58	-13.00	-40.60
219.15	-63.49	-65.27	3.35	-1.57	-13.00	-50.49
243.40	-66.34	-68.15	3.50	-1.68	-13.00	-53.34
366.59	-65.67	-67.41	3.81	-2.07	-13.00	-52.67
479.11	-64.08	-65.89	3.84	-2.04	-13.00	-51.08
694.45	-60.88	-61.96	3.69	-2.61	-13.00	-47.88
2479.50	-49.81	-54.80	10.49	-5.50	-13.00	-36.81

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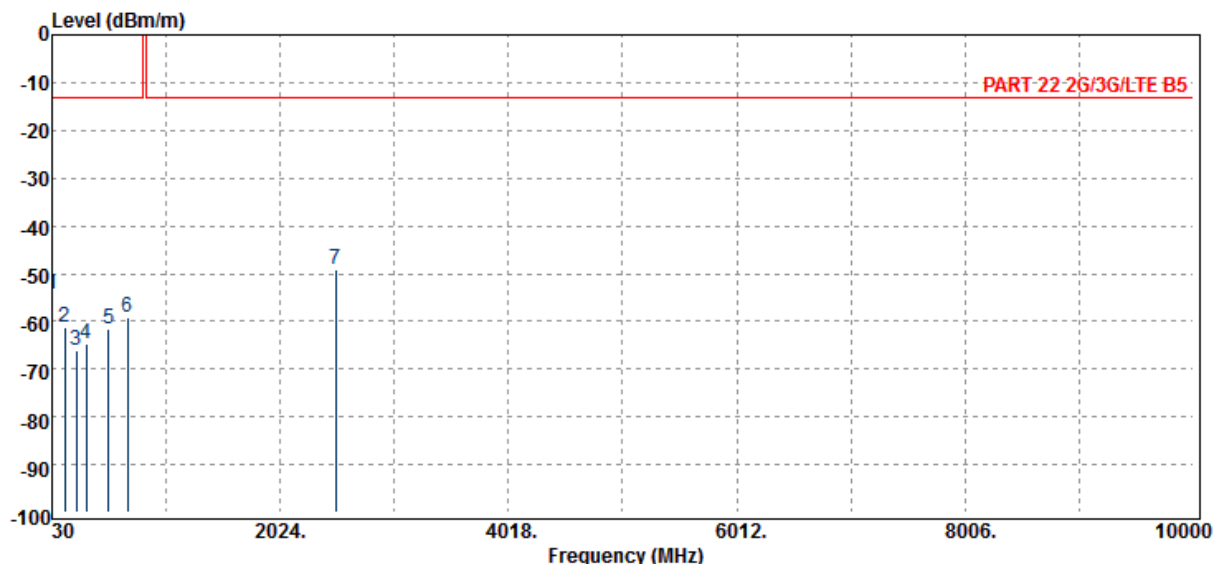
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Operation Band :LTE B5  
Fundamental Frequency :836.5 MHz  
Operation Mode :Tx CH MID  
EUT Pol. :H Plane

Temp./Humi. :24.1 deg\_C / 65 RH  
Engineer :Tin

Measurement Antenna Pol. :VERTICAL



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB
30.00	-54.32	-39.16	-14.58	-0.58	-13.00	-41.32
138.64	-61.11	-57.60	-2.26	-1.25	-13.00	-48.11
243.40	-66.15	-67.96	3.50	-1.68	-13.00	-53.15
330.70	-64.71	-66.57	3.77	-1.92	-13.00	-51.71
524.70	-61.51	-62.96	4.02	-2.57	-13.00	-48.51
691.54	-59.25	-60.12	3.70	-2.83	-13.00	-46.25
2509.50	-49.27	-54.25	10.51	-5.53	-13.00	-36.27

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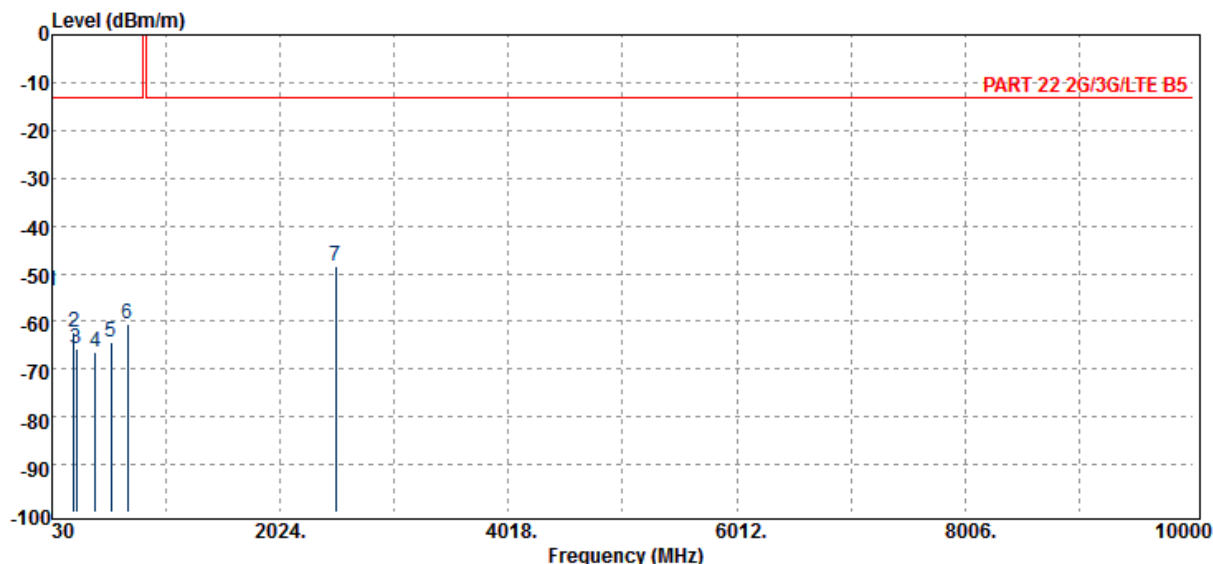
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Operation Band :LTE B5  
Fundamental Frequency :836.5 MHz  
Operation Mode :Tx CH MID  
EUT Pol. :H Plane

Temp./Humi. :24.1 deg\_C / 65 RH  
Engineer :Tin

Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB
30.00	-53.74	-38.58	-14.58	-0.58	-13.00	-40.74
219.15	-62.45	-64.23	3.35	-1.57	-13.00	-49.45
245.34	-65.91	-67.72	3.51	-1.69	-13.00	-52.91
410.24	-66.45	-67.99	3.68	-2.13	-13.00	-53.45
544.10	-64.49	-66.69	3.99	-1.79	-13.00	-51.49
692.51	-60.68	-61.62	3.70	-2.76	-13.00	-47.68
2509.50	-48.43	-53.42	10.51	-5.53	-13.00	-35.43

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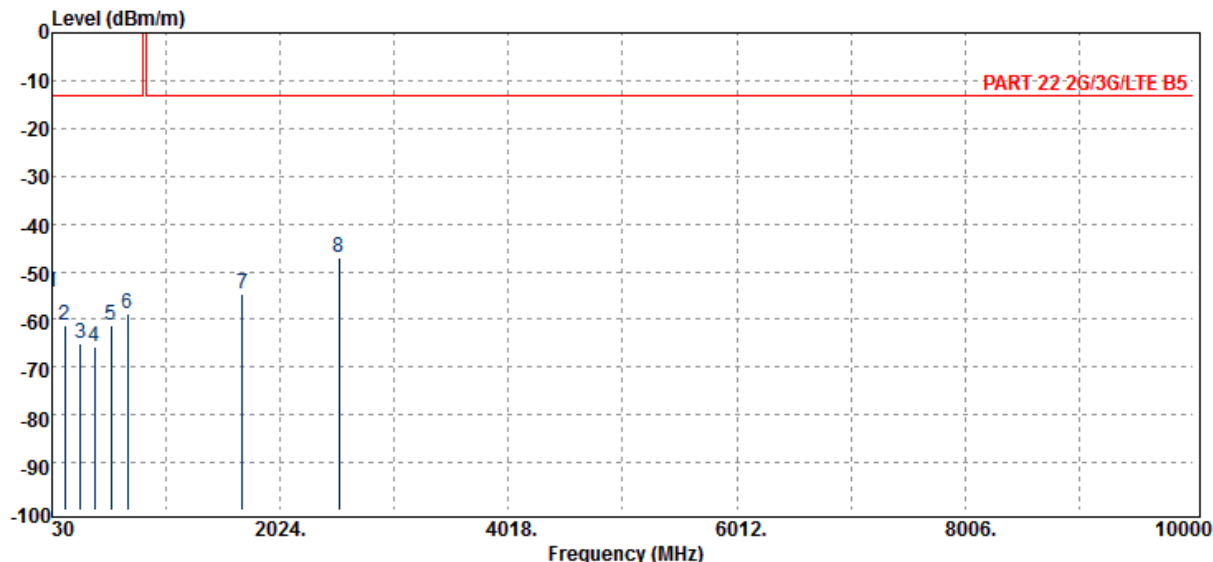
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Operation Band	:LTE B5	Temp./Humi.	:24.1 deg_C / 65 RH
Fundamental Frequency	:846.5 MHz	Engineer	:Tin
Operation Mode	:Tx CH HIGH		
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB
30.00	-54.20	-39.04	-14.58	-0.58	-13.00	-41.20
139.61	-61.33	-57.78	-2.29	-1.26	-13.00	-48.33
279.29	-65.18	-66.86	3.42	-1.74	-13.00	-52.18
403.45	-65.79	-67.35	3.70	-2.14	-13.00	-52.79
547.01	-61.16	-63.28	3.98	-1.86	-13.00	-48.16
692.51	-58.92	-59.86	3.70	-2.76	-13.00	-45.92
1693.00	-54.73	-57.43	7.12	-4.43	-13.00	-41.73
2539.50	-46.94	-49.78	8.41	-5.57	-13.00	-33.94

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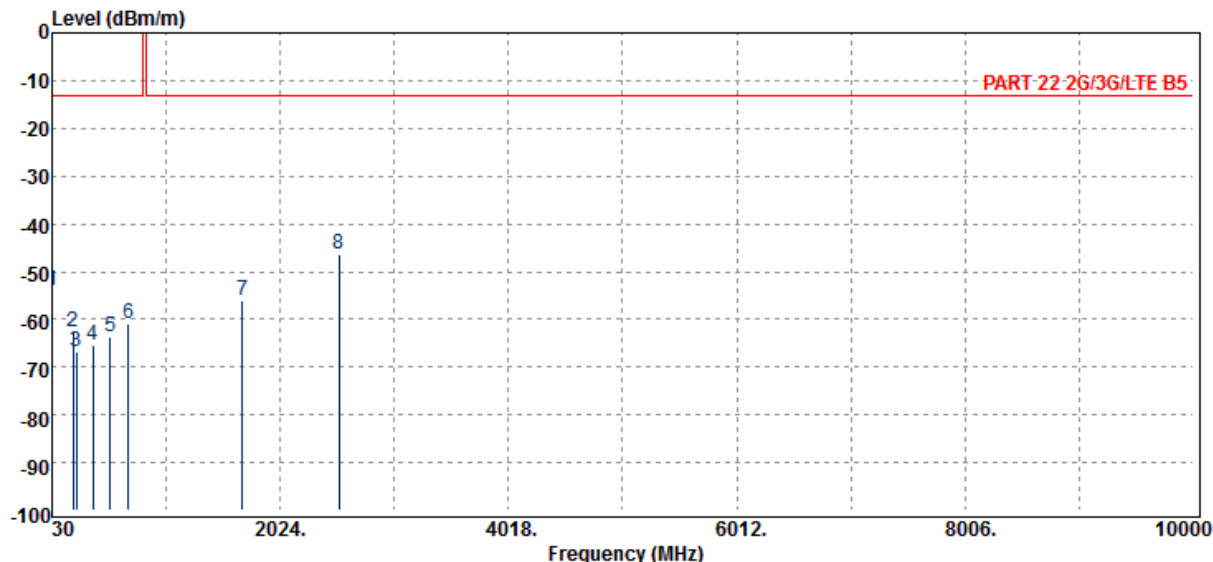
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Operation Band	:LTE B5	Temp./Humi.	:24.1 deg_C / 65 RH
Fundamental Frequency	:846.5 MHz	Engineer	:Tin
Operation Mode	:Tx CH HIGH		
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB
30.00	-54.11	-38.96	-14.58	-0.58	-13.00	-41.11
217.21	-62.65	-64.52	3.43	-1.56	-13.00	-49.65
245.34	-66.83	-68.65	3.51	-1.69	-13.00	-53.83
384.05	-65.45	-67.20	3.76	-2.01	-13.00	-52.45
536.34	-63.73	-65.62	4.00	-2.11	-13.00	-50.73
699.30	-60.84	-62.28	3.68	-2.24	-13.00	-47.84
1693.00	-56.07	-58.77	7.12	-4.43	-13.00	-43.07
2539.50	-46.35	-49.20	8.41	-5.57	-13.00	-33.35

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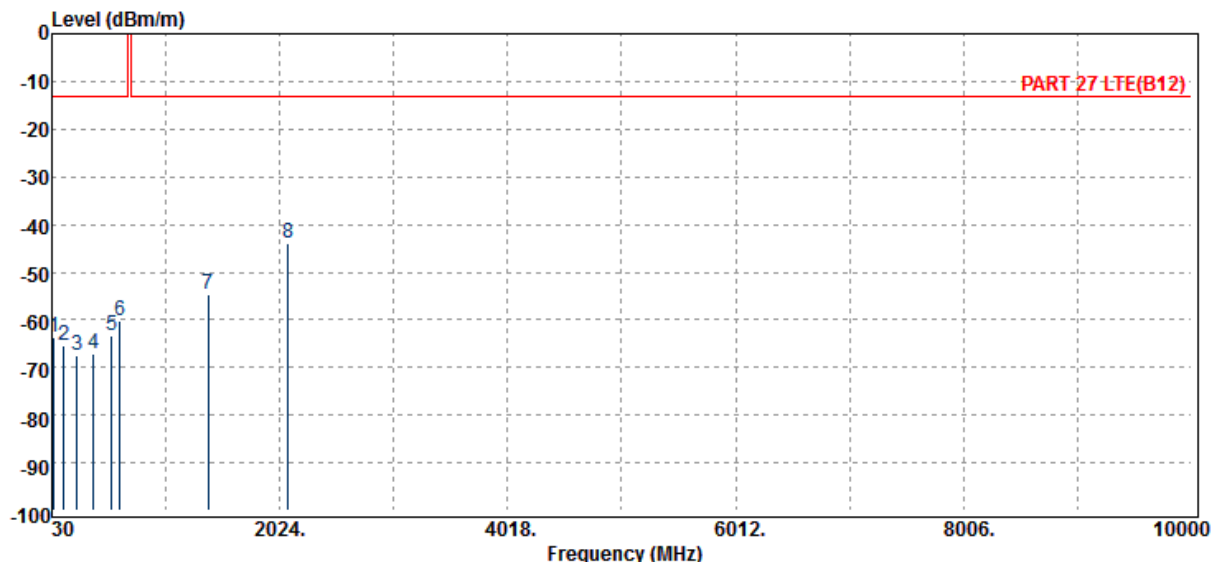
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## Radiated Spurious Emission Measurement Result: LTE-Band 12 (The Worst Case)

Operation Band	:LTE B12	Temp./Humi.	:22 deg_C / 62 RH
Fundamental Frequency	:699.7 MHz	Engineer	:Tin
Operation Mode	:Tx CH LOW		
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB
47.46	-63.80	-51.43	-11.65	-0.72	-13.00	-50.80
132.82	-65.34	-62.07	-2.05	-1.22	-13.00	-52.34
251.16	-67.43	-69.28	3.55	-1.70	-13.00	-54.43
397.63	-66.98	-68.60	3.72	-2.10	-13.00	-53.98
554.77	-63.40	-65.04	3.94	-2.29	-13.00	-50.40
625.58	-60.24	-61.13	3.69	-2.80	-13.00	-47.24
1399.40	-54.55	-58.75	8.19	-3.98	-13.00	-41.55
2099.10	-43.82	-49.09	10.27	-5.00	-13.00	-30.82

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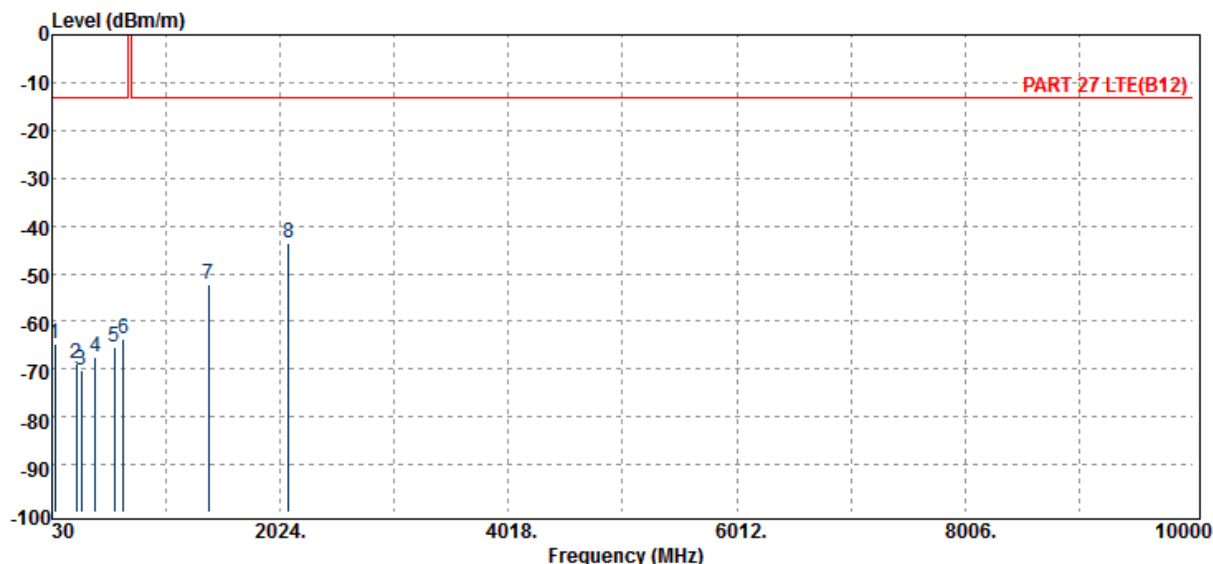
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Operation Band	:LTE B12	Temp./Humi.	:22 deg_C / 62 RH
Fundamental Frequency	:699.7 MHz	Engineer	:Tin
Operation Mode	:Tx CH LOW		
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB
52.31	-64.54	-53.12	-10.66	-0.76	-13.00	-51.54
241.46	-68.95	-70.76	3.49	-1.68	-13.00	-55.95
284.14	-70.31	-71.97	3.42	-1.76	-13.00	-57.31
412.18	-67.47	-69.01	3.67	-2.13	-13.00	-54.47
574.17	-65.41	-66.61	3.76	-2.56	-13.00	-52.41
655.65	-63.83	-65.49	3.81	-2.15	-13.00	-50.83
1399.40	-52.25	-56.46	8.19	-3.98	-13.00	-39.25
2099.10	-43.71	-48.98	10.27	-5.00	-13.00	-30.71

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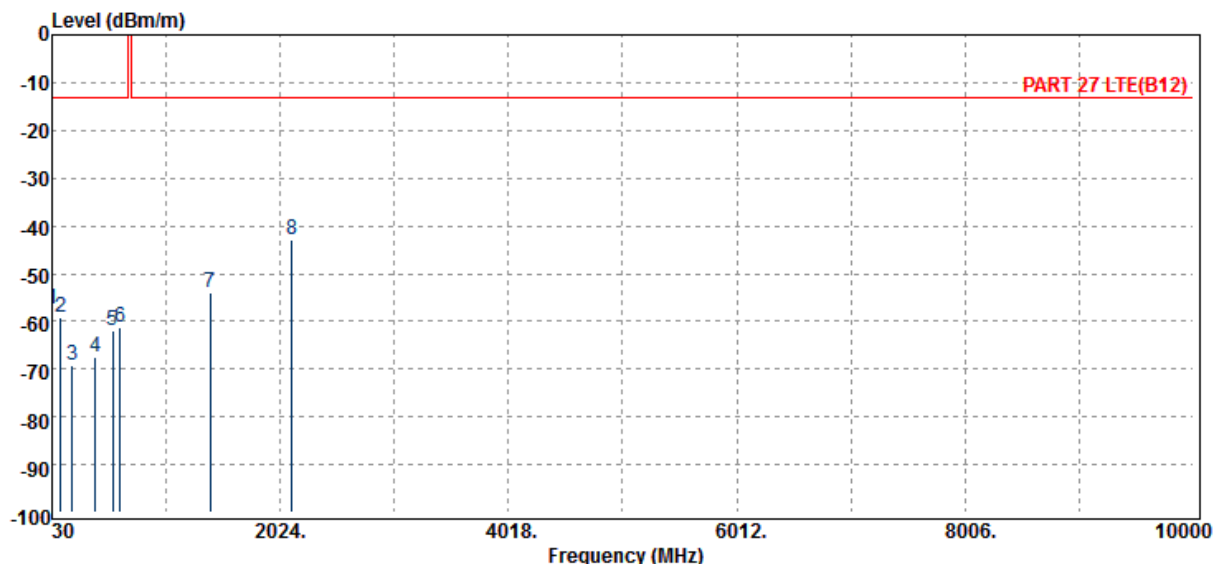
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Operation Band :LTE B12  
Fundamental Frequency :707.5 MHz  
Operation Mode :Tx CH MID  
EUT Pol. :H Plane

Temp./Humi. :22 deg\_C / 62 RH  
Engineer :Tin

Measurement Antenna Pol. :VERTICAL



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB
31.94	-57.49	-42.82	-14.08	-0.59	-13.00	-44.49
104.69	-59.25	-56.54	-1.65	-1.07	-13.00	-46.25
206.54	-69.37	-71.37	3.51	-1.51	-13.00	-56.37
410.24	-67.34	-68.88	3.68	-2.13	-13.00	-54.34
557.68	-61.87	-63.33	3.91	-2.45	-13.00	-48.87
627.52	-61.23	-62.18	3.70	-2.75	-13.00	-48.23
1415.00	-53.85	-58.10	8.25	-4.01	-13.00	-40.85
2122.50	-42.84	-48.10	10.28	-5.02	-13.00	-29.84

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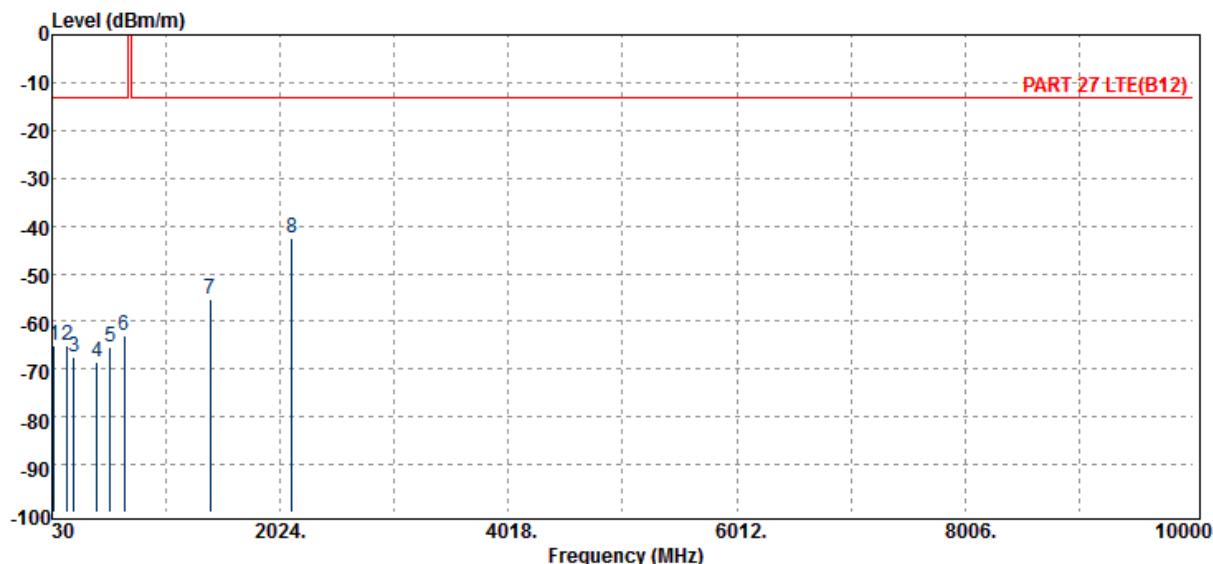
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Operation Band :LTE B12  
Fundamental Frequency :707.5 MHz  
Operation Mode :Tx CH MID  
EUT Pol. :H Plane

Temp./Humi. :22 deg\_C / 62 RH  
Engineer :Tin

Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB
50.37	-64.93	-53.04	-11.15	-0.74	-13.00	-51.93
165.80	-65.06	-62.87	-0.88	-1.31	-13.00	-52.06
224.00	-67.35	-69.07	3.32	-1.60	-13.00	-54.35
419.94	-68.35	-69.88	3.64	-2.11	-13.00	-55.35
539.25	-65.51	-67.52	4.00	-1.99	-13.00	-52.51
660.50	-63.00	-64.76	3.80	-2.04	-13.00	-50.00
1415.00	-55.51	-59.76	8.25	-4.01	-13.00	-42.51
2122.50	-42.41	-47.67	10.28	-5.02	-13.00	-29.41

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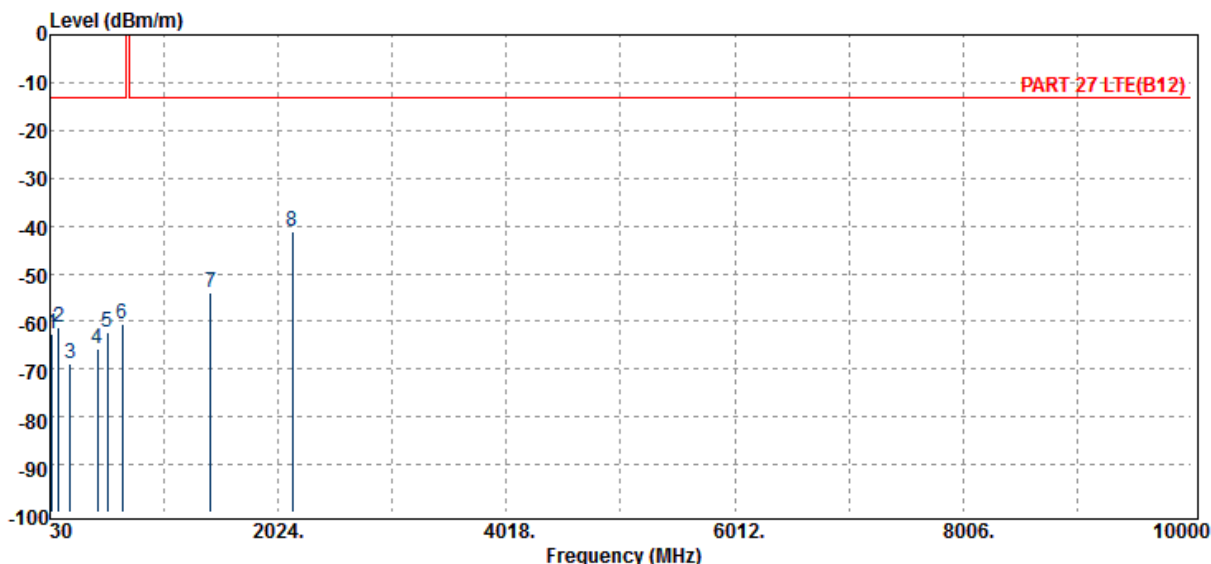
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Operation Band	:LTE B12	Temp./Humi.	:22 deg_C / 62 RH
Fundamental Frequency	:715.3 MHz	Engineer	:Tin
Operation Mode	:Tx CH HIGH		
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB
45.52	-62.61	-49.94	-11.97	-0.70	-13.00	-49.61
107.60	-61.37	-58.39	-1.90	-1.08	-13.00	-48.37
208.48	-69.00	-71.10	3.62	-1.52	-13.00	-56.00
444.19	-65.60	-67.24	3.56	-1.92	-13.00	-52.60
528.58	-62.13	-63.72	4.01	-2.43	-13.00	-49.13
658.56	-60.50	-62.22	3.80	-2.08	-13.00	-47.50
1430.60	-53.82	-58.10	8.32	-4.03	-13.00	-40.82
2145.90	-41.03	-46.27	10.29	-5.05	-13.00	-28.03

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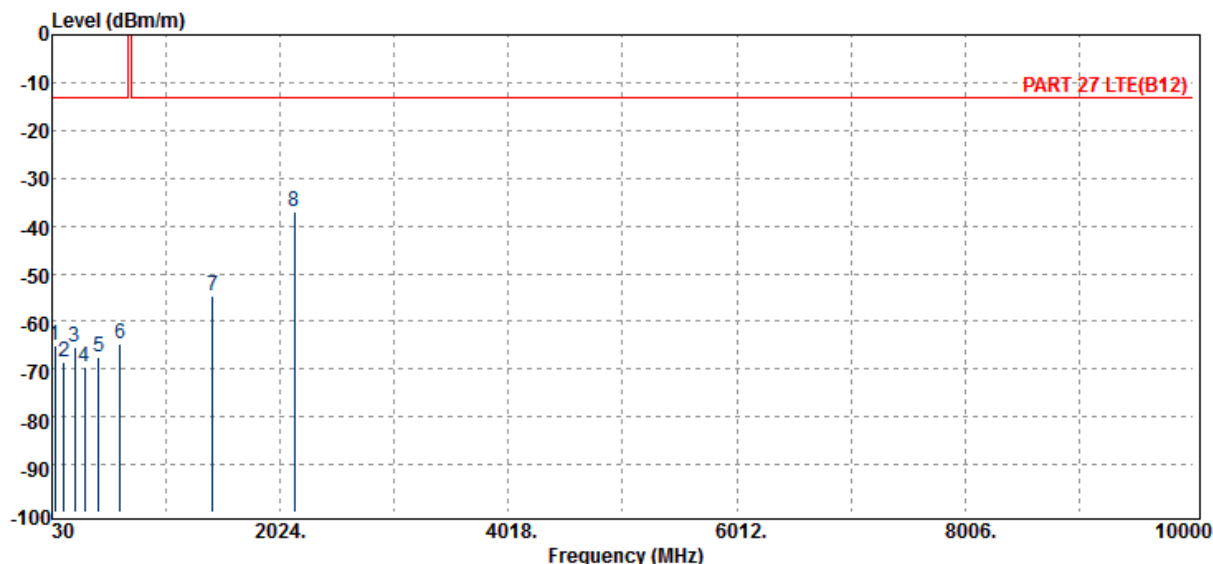
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Operation Band	:LTE B12	Temp./Humi.	:22 deg_C / 62 RH
Fundamental Frequency	:715.3 MHz	Engineer	:Tin
Operation Mode	:Tx CH HIGH		
EUT Pol.	:H Plane	Measurement Antenna Pol.	:HORIZONTAL



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB
56.19	-64.90	-54.38	-9.72	-0.79	-13.00	-51.90
133.79	-68.68	-65.36	-2.09	-1.23	-13.00	-55.68
230.79	-65.53	-67.23	3.32	-1.63	-13.00	-52.53
314.21	-69.58	-71.41	3.69	-1.86	-13.00	-56.58
435.46	-67.41	-69.00	3.59	-2.00	-13.00	-54.41
622.67	-64.59	-65.53	3.67	-2.73	-13.00	-51.59
1430.60	-54.62	-58.90	8.32	-4.03	-13.00	-41.62
2145.90	-36.89	-42.13	10.29	-5.05	-13.00	-23.89

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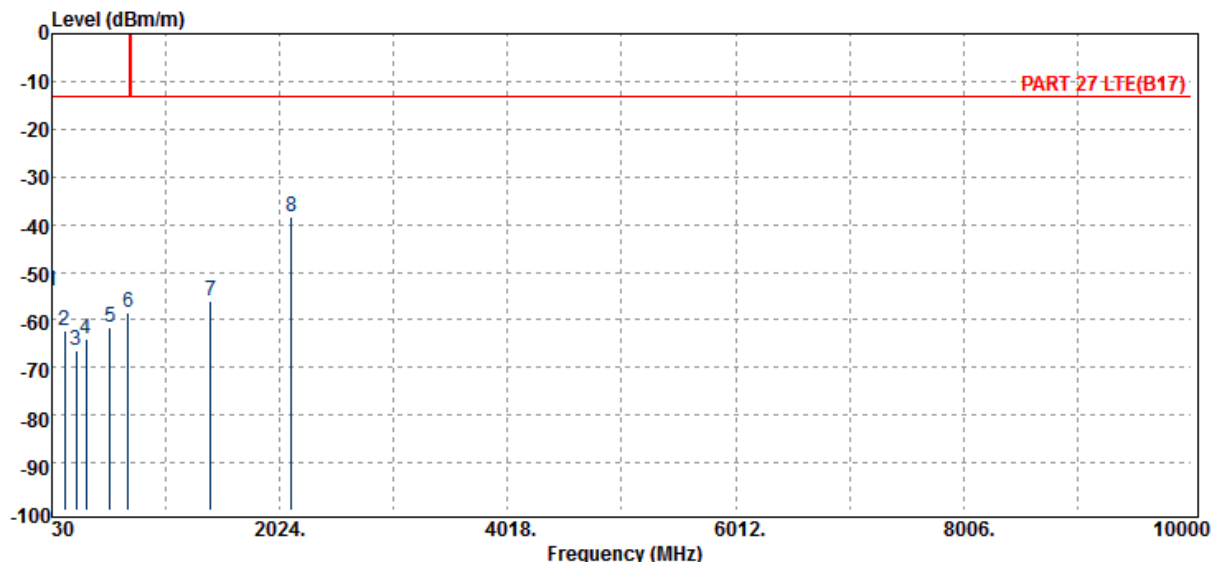
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## Radiated Spurious Emission Measurement Result: LTE-Band 17 (The Worst Case)

Operation Band	:LTE B17	Temp./Humi.	:22 deg_C / 62 RH
Fundamental Frequency	:709 MHz	Engineer	:Tin
Operation Mode	:Tx CH LOW		
EUT Pol.	:H Plane	Measurement Antenna Pol.	:VERTICAL



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB
30.00	-53.95	-38.79	-14.58	-0.58	-13.00	-40.95
138.64	-62.31	-58.79	-2.26	-1.25	-13.00	-49.31
239.52	-66.28	-68.09	3.47	-1.67	-13.00	-53.28
332.64	-63.93	-65.78	3.78	-1.93	-13.00	-50.93
539.25	-61.74	-63.74	4.00	-1.99	-13.00	-48.74
699.30	-58.60	-60.04	3.68	-2.24	-13.00	-45.60
1418.00	-55.97	-60.22	8.27	-4.01	-13.00	-42.97
2127.00	-38.24	-43.50	10.28	-5.02	-13.00	-25.24

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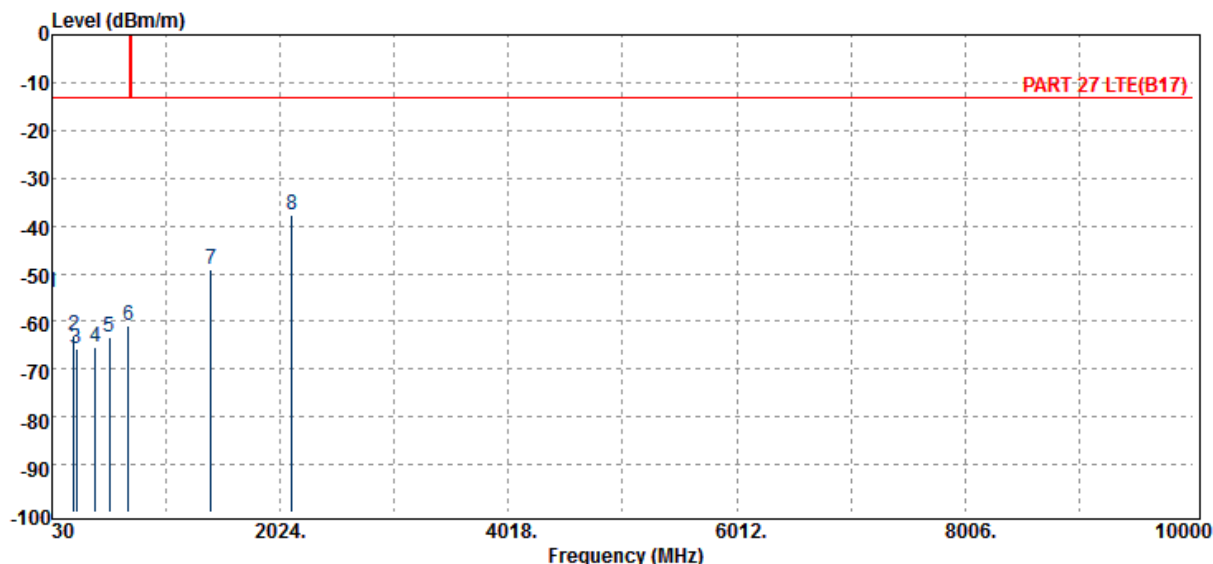
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Operation Band :LTE B17  
Fundamental Frequency :709 MHz  
Operation Mode :Tx CH LOW  
EUT Pol. :H Plane

Temp./Humi. :22 deg\_C / 62 RH  
Engineer :Tin

Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB
30.00	-53.90	-38.74	-14.58	-0.58	-13.00	-40.90
219.15	-63.01	-64.79	3.35	-1.57	-13.00	-50.01
246.31	-65.91	-67.73	3.51	-1.69	-13.00	-52.91
408.30	-65.37	-66.91	3.68	-2.14	-13.00	-52.37
531.49	-63.32	-65.02	4.01	-2.31	-13.00	-50.32
700.27	-60.92	-62.44	3.67	-2.16	-13.00	-47.92
1418.00	-49.07	-53.33	8.27	-4.01	-13.00	-36.07
2127.00	-37.59	-42.85	10.28	-5.02	-13.00	-24.59

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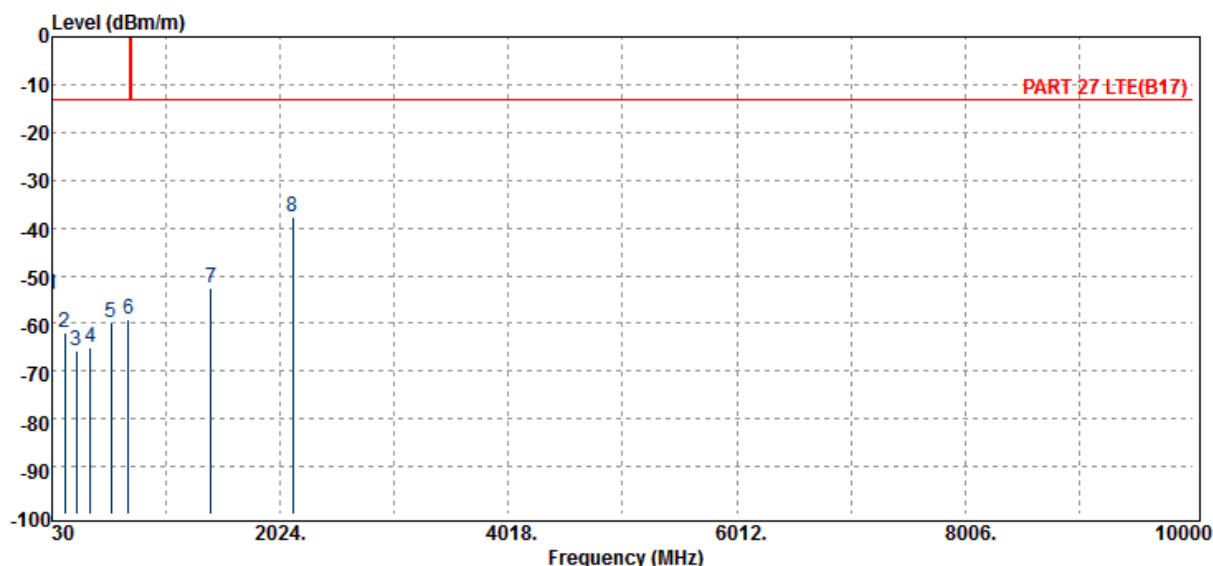
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Operation Band :LTE B17  
Fundamental Frequency :710 MHz  
Operation Mode :Tx CH MID  
EUT Pol. :H Plane

Temp./Humi. :22 deg\_C / 62 RH  
Engineer :Tin

Measurement Antenna Pol. :VERTICAL



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB
30.00	-54.09	-38.93	-14.58	-0.58	-13.00	-41.09
138.64	-61.80	-58.29	-2.26	-1.25	-13.00	-48.80
241.46	-65.59	-67.40	3.49	-1.68	-13.00	-52.59
362.71	-64.97	-66.72	3.82	-2.07	-13.00	-51.97
544.10	-59.93	-62.13	3.99	-1.79	-13.00	-46.93
697.36	-59.09	-60.39	3.68	-2.38	-13.00	-46.09
1420.00	-52.64	-56.90	8.28	-4.01	-13.00	-39.64
2130.00	-37.67	-42.93	10.28	-5.02	-13.00	-24.67

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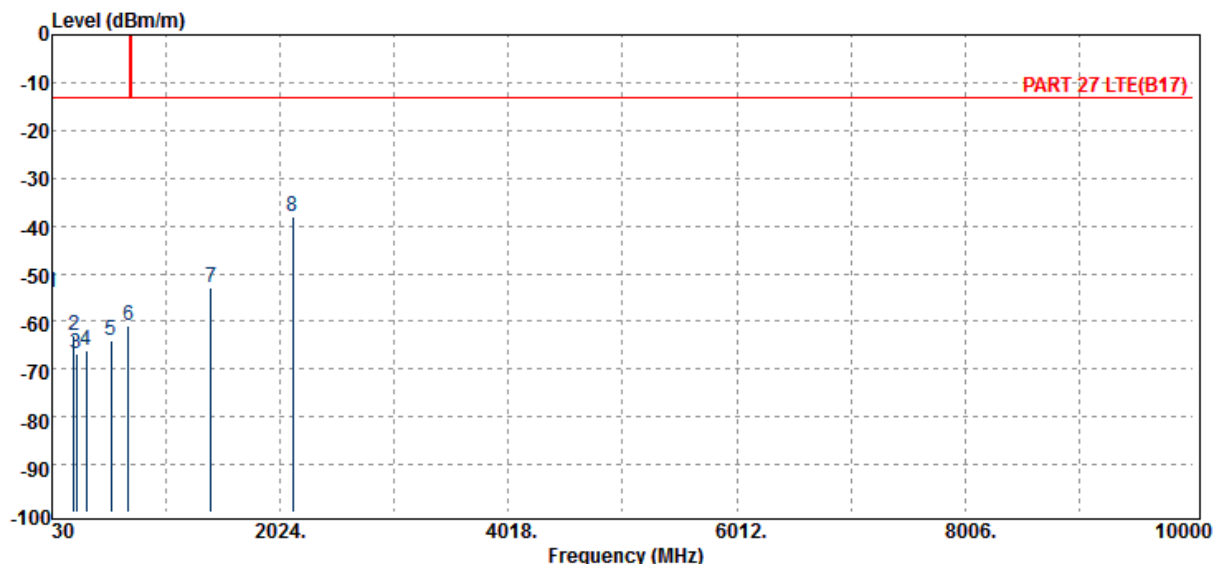
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Operation Band :LTE B17  
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Operation Mode :Tx CH MID  
EUT Pol. :H Plane

Temp./Humi. :22 deg\_C / 62 RH  
Engineer :Tin

Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB
30.00	-54.00	-38.84	-14.58	-0.58	-13.00	-41.00
219.15	-63.13	-64.92	3.35	-1.57	-13.00	-50.13
243.40	-66.64	-68.46	3.50	-1.68	-13.00	-53.64
330.70	-66.03	-67.88	3.77	-1.92	-13.00	-53.03
546.04	-64.15	-66.32	3.99	-1.81	-13.00	-51.15
694.45	-60.82	-61.90	3.69	-2.61	-13.00	-47.82
1420.00	-52.95	-57.21	8.28	-4.01	-13.00	-39.95
2130.00	-38.02	-43.28	10.28	-5.02	-13.00	-25.02

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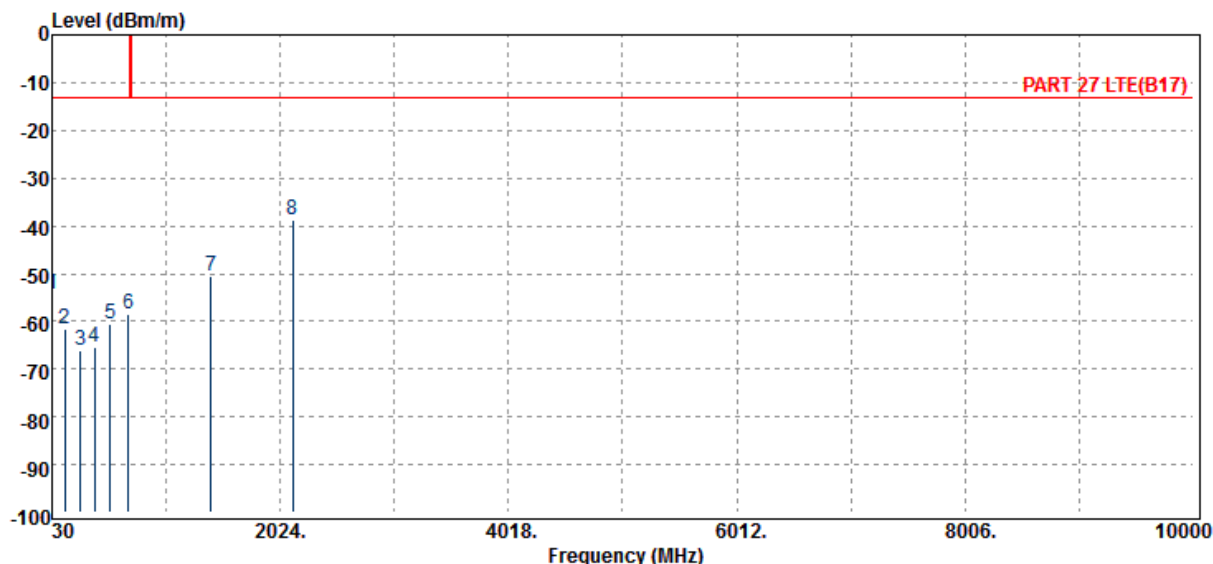
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Operation Band :LTE B17  
Fundamental Frequency :711 MHz  
Operation Mode :Tx CH HIGH  
EUT Pol. :H Plane

Temp./Humi. :22 deg\_C / 62 RH  
Engineer :Tin

Measurement Antenna Pol. :VERTICAL



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB
30.00	-54.42	-39.26	-14.58	-0.58	-13.00	-41.42
139.61	-61.62	-58.07	-2.29	-1.26	-13.00	-48.62
279.29	-65.95	-67.63	3.42	-1.74	-13.00	-52.95
398.60	-65.52	-67.13	3.72	-2.10	-13.00	-52.52
536.34	-60.61	-62.51	4.00	-2.11	-13.00	-47.61
696.39	-58.35	-59.57	3.69	-2.46	-13.00	-45.35
1422.00	-50.60	-54.87	8.28	-4.02	-13.00	-37.60
2133.00	-38.86	-44.12	10.29	-5.03	-13.00	-25.86

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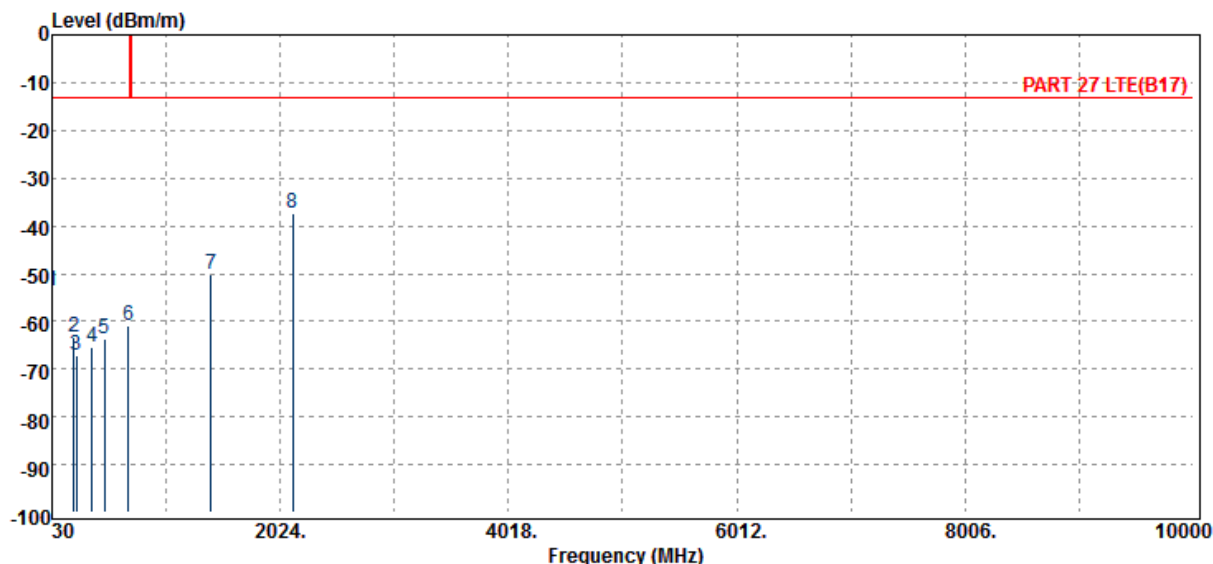
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EUT Pol. :H Plane

Temp./Humi. :22 deg\_C / 62 RH  
Engineer :Tin

Measurement Antenna Pol. :HORIZONTAL



Freq. MHz	ERP/EIRP dBm	SG Output Level dBm	Antenna Gain dBd/dBi	Cable Loss dB	Limit dBm	Margin dB
30.00	-53.78	-38.62	-14.58	-0.58	-13.00	-40.78
220.12	-63.33	-65.07	3.32	-1.58	-13.00	-50.33
243.40	-67.10	-68.91	3.50	-1.68	-13.00	-54.10
382.11	-65.49	-67.24	3.76	-2.02	-13.00	-52.49
487.84	-63.53	-65.57	3.93	-1.89	-13.00	-50.53
699.30	-60.84	-62.28	3.68	-2.24	-13.00	-47.84
1422.00	-50.28	-54.54	8.28	-4.02	-13.00	-37.28
2133.00	-37.43	-42.68	10.29	-5.03	-13.00	-24.43

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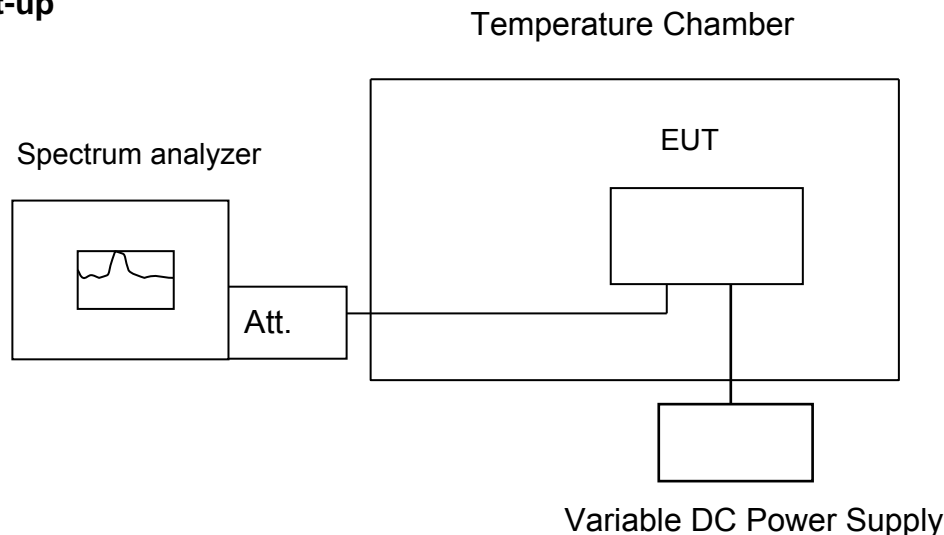
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## 11. FREQUENCY STABILITY MEASUREMENT

### 11.1. Standard Applicable

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

### 11.2. Test Set-up



**Note:** Measurement setup for testing on Antenna connector

### 11.3. Measurement Procedure

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

Set chamber temperature to 25°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency. Reduce the input voltage to specify extreme voltage variation (+/- 15%) and endpoint as declared by the manufacturer, record the maximum frequency change.

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#### 11.4. Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EXA Spectrum Analyzer	Agilent	N9010A	MY57120290	2018/02/14	2019/02/13
Radio Communication Analyser	Anritsu	MT8815B	6200711454	2018/04/05	2019/04/04
Radio Communication Analyser	Anritsu	MT8820C	6200995019	2018/04/05	2019/04/04
DC Power Supply	Anritsu	E3640A	MY52410006	2017/11/28	2018/11/27
Temperature Chamber	TERCHY	MHG-120LF	911009	2018/05/18	2019/05/17
Attenuator	Mini-Circuit	BW-S10W2+	2	2018/01/02	2019/01/01
DC Block	Mini-Circuits	BLK-18-S+	1	2018/01/02	2019/01/01
Splitter	RF-LAMBDA	RFLT2W1G18G	11-JSPF412-018	2018/01/02	2019/01/01
Coaxial Cable	Huber Su-hner	SUCOFLEX 102EPA	MY2616/2	2018/01/02	2019/01/01

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## 11.5. Measurement Result

### FREQUENCY ERROR vs. VOLTAGE

GPRS 850 Mid Channel			836.6	MHz
Limit: +/- 2.5 ppm				
Vdc	Temp. (°C)	Freq. (MHz)	Delta (Hz)	Limit (Hz)
FREQUENCY ERROR vs. VOLTAGE				
4.43	20	836.60008	80.00000003	2091
3.85	20	836.60041	410	2091
3.27	20	836.6001	99.99999997	2091
3 (End point)	20	836.60017	170	2091

### FREQUENCY ERROR vs. TEMPERATURE

FREQUENCY ERROR vs. Temp.				
3.85	50	836.60014	140	2091
3.85	40	836.60021	209.9999999	2091
3.85	30	836.59993	-70.00000005	2091
3.85	20	836.6003	299.9999999	2091
3.85	10	836.59992	-80.00000003	2091
3.85	0	836.60038	380	2091
3.85	-10	836.60014	140	2091
3.85	-20	836.60011	109.9999999	2091
3.85	-30	836.60049	490	2091

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### FREQUENCY ERROR vs. VOLTAGE

GPRS 1900 Mid Channel 1880 MHz				
Limit: +/- 2.5 ppm				
Vdc	Temp. (°C)	Freq. (MHz)	Delta (Hz)	Limit (Hz)
FREQUENCY ERROR vs. VOLTAGE				
4.43	20	1879.99998	-19.99999995	4700
3.85	20	1880.00006	60.00000008	4700
3.27	20	1879.99997	-29.99999992	4700
3 (End point)	20	1880.00006	60.00000008	4700

### FREQUENCY ERROR vs. TEMPERATURE

FREQUENCY ERROR vs. Temp.				
3.85	50	1880.00008	80.00000003	4700
3.85	40	1880.00006	60.00000008	4700
3.85	30	1879.99993	-70.00000005	4700
3.85	20	1879.99999	-9.999999975	4700
3.85	10	1880.00009	90	4700
3.85	0	1879.99996	-39.9999999	4700
3.85	-10	1880.00009	90	4700
3.85	-20	1879.9999	-99.99999997	4700
3.85	-30	1880.0001	99.99999997	4700

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### FREQUENCY ERROR vs. VOLTAGE

WCDMA V Mid Channel					836.6	MHz
Limit: +/- 2.5 ppm						
Vdc	Temp. (°C)	Freq. (MHz)	Delta (Hz)	Limit (Hz)		
FREQUENCY ERROR vs. VOLTAGE						
4.43	20	836.59995	-49.99999999	2091		
3.85	20	836.60044	440	2091		
3.27	20	836.6003	299.9999999	2091		
3 (End point)	20	836.60038	380	2091		

### FREQUENCY ERROR vs. TEMPERATURE

FREQUENCY ERROR vs. Temp.				
3.85	50	836.60014	140	2091
3.85	40	836.6005	500	2091
3.85	30	836.60037	370	2091
3.85	20	836.60011	109.9999999	2091
3.85	10	836.60006	59.99999996	2091
3.85	0	836.6004	400	2091
3.85	-10	836.60042	420	2091
3.85	-20	836.60016	159.9999999	2091
3.85	-30	836.59996	-40.00000001	2091

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Reference Freq.:		LTE B5 Mid Channel		836.5 MHz	10M QPSK CH 20525
Power Supply Vdc	Temp. (°C)	Freq. (MHz)	Delta (Hz)	Limit = +/- 2.5 ppm (Hz)	
Freq. ERROR vs. VOLTAGE					
4.43	25	836.499995	-5	2091	
3.85	25	836.500004	3.99999999	2091	
3.27	25	836.500003	2.99999999	2091	
3 (End Point)	25	836.500007	6.99999998	2091	
Freq. ERROR vs. Temp.					
3.85	-30	836.499993	-7	2091	
3.85	-20	836.499996	-4	2091	
3.85	-10	836.499999	-1	2091	
3.85	0	836.499993	-7	2091	
3.85	10	836.499992	-8	2091	
3.85	20	836.499997	-3	2091	
3.85	30	836.500004	3.99999999	2091	
3.85	40	836.499991	-9	2091	
3.85	50	836.500000	0	2091	

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Reference Freq.:		LTE B12 Mid Channel		707.5 MHz	10M QPSK CH 23095
Power Supply Vdc	Temp. (°C)	Freq. (MHz)	Delta (Hz)	Limit = +/- 2.5 ppm (Hz)	
Freq. ERROR vs. VOLTAGE					
4.43	25	707.500008	7.99999998	1769	
3.85	25	707.499994	-6	1769	
3.27	25	707.500005	4.99999999	1769	
3 (End Point)	25	707.499999	-1	1769	
Freq. ERROR vs. Temp.					
3.85	-30	707.499995	-5	1769	
3.85	-20	707.500002	1.99999999	1769	
3.85	-10	707.500001	1	1769	
3.85	0	707.499998	-2	1769	
3.85	10	707.500003	2.99999999	1769	
3.85	20	707.500002	1.99999999	1769	
3.85	30	707.499998	-2	1769	
3.85	40	707.500010	9.99999997	1769	
3.85	50	707.499996	-4	1769	

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Reference Freq.:		LTE B17 Mid Channel		710	MHz	10M QPSK CH 23790
Power Supply Vdc	Temp. (°C)	Freq. (MHz)	Delta (Hz)	Limit = +/- 2.5 ppm (Hz)		
Freq. ERROR vs. VOLTAGE						
4.43	25	710.000007	6.99999998	1775		
3.85	25	710.000003	2.99999999	1775		
3.27	25	709.999998	-2	1775		
3 (End Point)	25	710.000008	7.99999998	1775		
Freq. ERROR vs. Temp.						
3.85	-30	709.999992	-8	1775		
3.85	-20	710.000004	3.99999999	1775		
3.85	-10	710.000003	2.99999999	1775		
3.85	0	709.999994	-6	1775		
3.85	10	709.999993	-7	1775		
3.85	20	709.999999	-1	1775		
3.85	30	709.999994	-6	1775		
3.85	40	710.000006	5.99999998	1775		
3.85	50	709.999990	-10	1775		

**Note: The battery is rated 3.85V dc.**

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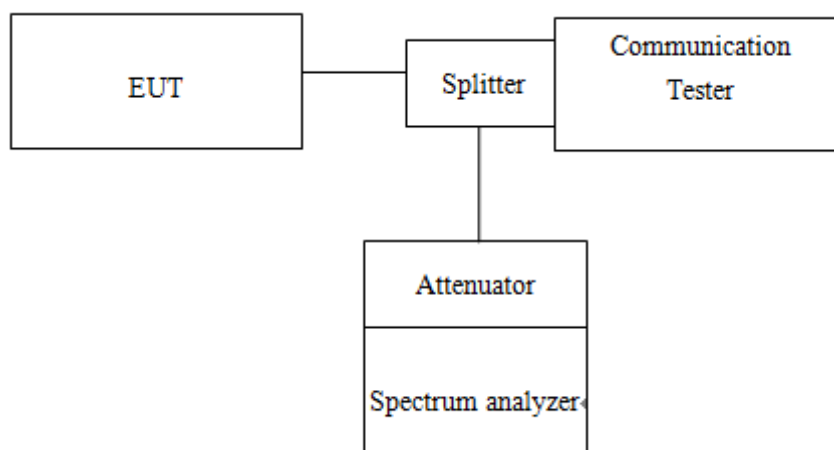
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## 12. PEAK TO AVERAGE RATIO

### 12.1. Standard Applicable

The peak-to-average ratio (PAR) of the transmission may not exceed 13dB.

### 12.2. Test SET-UP



### 12.3. Measurement Procedure

1. KDB 971168 D01 is employed as the following procedure is proper adjusted accordingly:
2. Set resolution/measurement bandwidth  $\geq$  signal's occupied bandwidth; & internal = 1ms
3. Set the number of counts to a value that stabilizes the measured CCDF curve.

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## 12.4. Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EXA Spectrum Analyzer	Agilent	N9010A	MY57120290	2018/02/14	2019/02/13
Radio Communication Analyzer	Anritsu	MT8815B	6200711454	2018/04/05	2019/04/04
Radio Communication Analyzer	Anritsu	MT8820C	6200995019	2018/04/05	2019/04/04
DC Power Supply	Anritsu	E3640A	MY52410006	2017/11/28	2018/11/27
Temperature Chamber	TERCHY	MHG-120LF	911009	2018/05/18	2019/05/17
Attenuator	Mini-Circuit	BW-S10W2+	2	2018/01/02	2019/01/01
DC Block	Mini-Circuits	BLK-18-S+	1	2018/01/02	2019/01/01
Splitter	RF-LAMBAD	RFLT2W1G18G	11-JSPF412-018	2018/01/02	2019/01/01
Coaxial Cable	Huber Su-hner	SUCOFLEX 102EPA	MY2616/2	2018/01/02	2019/01/01

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## 12.5. Measurement Result

### Tabular Results:

Freq. (MHz)	CH	Peak-to-Average Ratio (dB)	
		GSM 850	GPRS 850
824.2	128	10.28	9.67
836.6	190	9.66	11.54
848.8	251	9.13	10.33

Freq. (MHz)	CH	Peak-to-Average Ratio (dB)	
		GSM 1900	GPRS 1900
1850.2	512	10.37	9.58
1880	661	9.38	9.64
1909.8	810	11.63	9.89

Freq. (MHz)	CH	Peak-to-Average Ratio (dB)		
		WCDMA V	HSDPA V	HSUPA V
826.4	4132	3.14	3.19	3.20
836.6	4183	3.12	3.08	3.08
846.6	4233	3.05	3.03	3.04

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LTE BAND 5							
Channel bandwidth: 1.4MHz				Channel bandwidth: 3MHz			
Freq. (MHz)	CH	PAPR (dB)		Freq. (MHz)	CH	PAPR (dB)	
		16QAM	Limit			16QAM	Limit
824.7	20407	5.47	13	825.5	20415	5.95	13
836.5	20525	6.11	13	836.5	20525	6.31	13
848.3	20643	6.11	13	847.5	20635	6.14	13

LTE BAND 5							
Channel bandwidth: 5MHz				Channel bandwidth: 10MHz			
Freq. (MHz)	CH	PAPR (dB)		Freq. (MHz)	CH	PAPR (dB)	
		16QAM	Limit			16QAM	Limit
826.5	20425	5.91	13	829.0	20450	6.12	13
836.5	20525	6.02	13	836.5	20525	5.99	13
846.5	20625	6.32	13	844.0	20600	6.27	13

LTE BAND 12							
Channel bandwidth: 1.4MHz				Channel bandwidth: 3MHz			
Freq. (MHz)	CH	PAPR (dB)		Freq. (MHz)	CH	PAPR (dB)	
		16QAM	Limit			16QAM	Limit
699.7	23017	6.14	13	700.5	23025	6.18	13
707.5	23095	5.42	13	707.5	23095	5.69	13
715.3	23173	5.99	13	714.5	23165	6.17	13

LTE BAND 12							
Channel bandwidth: 5MHz				Channel bandwidth: 10MHz			
Freq. (MHz)	CH	PAPR (dB)		Freq. (MHz)	CH	PAPR (dB)	
		16QAM	Limit			16QAM	Limit
701.5	23035	6.11	13	704.0	23060	6.03	13
707.5	23095	5.67	13	707.5	23095	5.84	13
713.5	23155	6.09	13	711.0	23130	6.06	13

LTE BAND 17							
Channel bandwidth: 1.4MHz				Channel bandwidth: 3MHz			
Freq. (MHz)	CH	PAPR (dB)		Freq. (MHz)	CH	PAPR (dB)	
		16QAM	Limit			16QAM	Limit
706.5	23755	5.97	13	709.0	23780	5.89	13
710.0	23790	5.89	13	710.0	23790	5.95	13
713.5	23825	6.24	13	711.0	23800	5.97	13

## Measurement Results:

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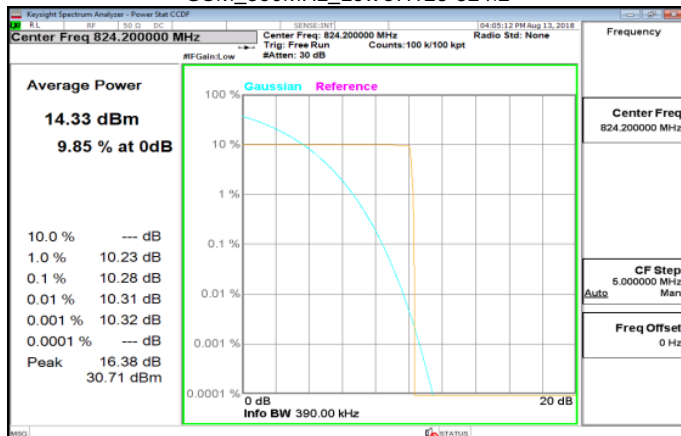
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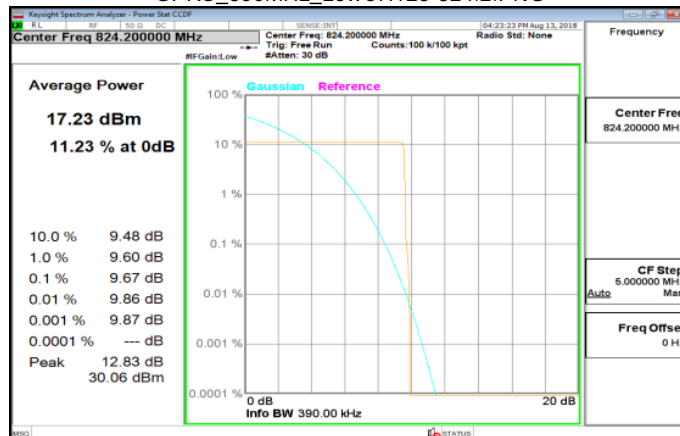
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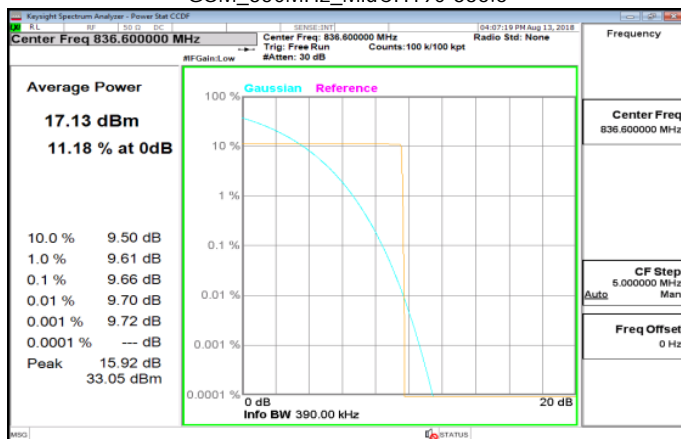
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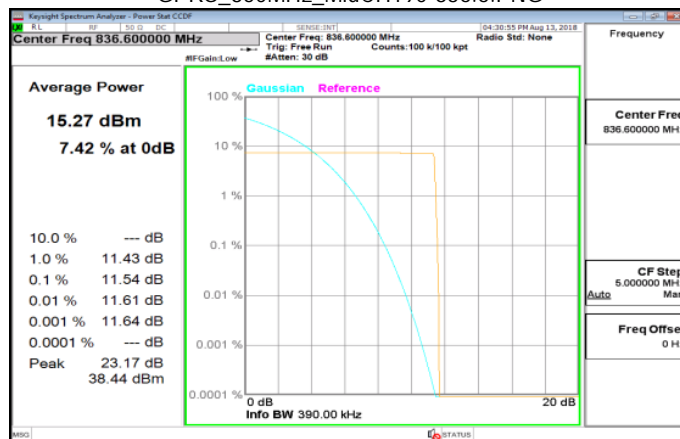
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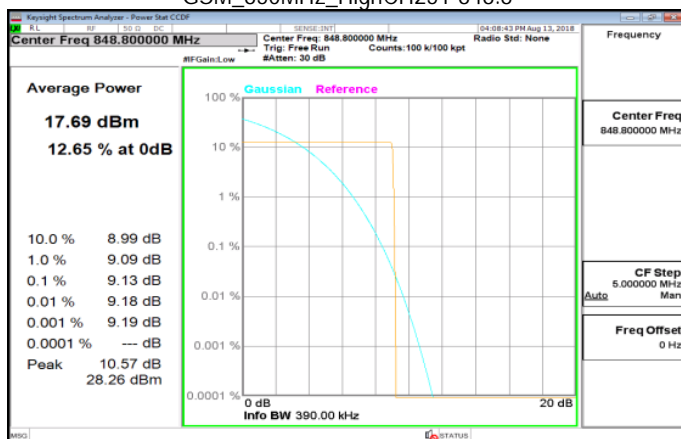
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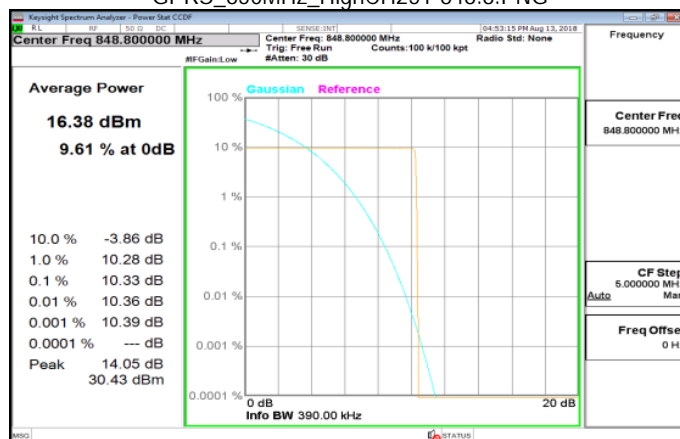
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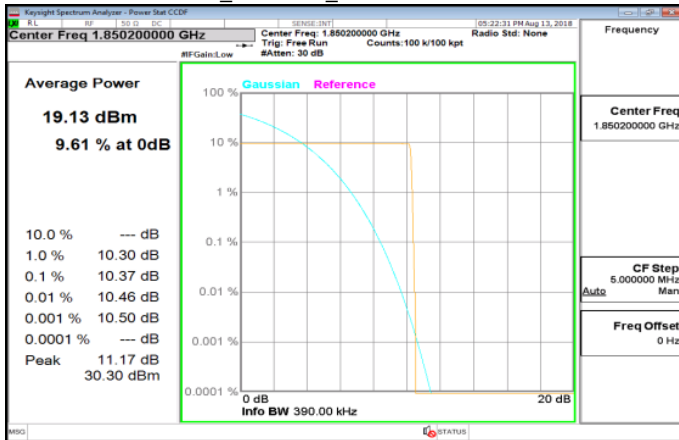
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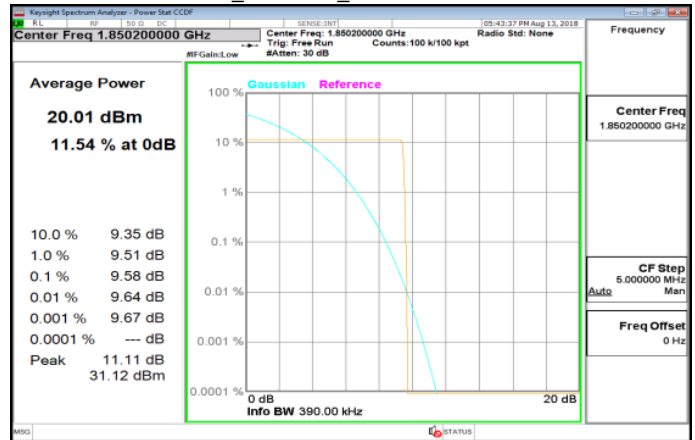
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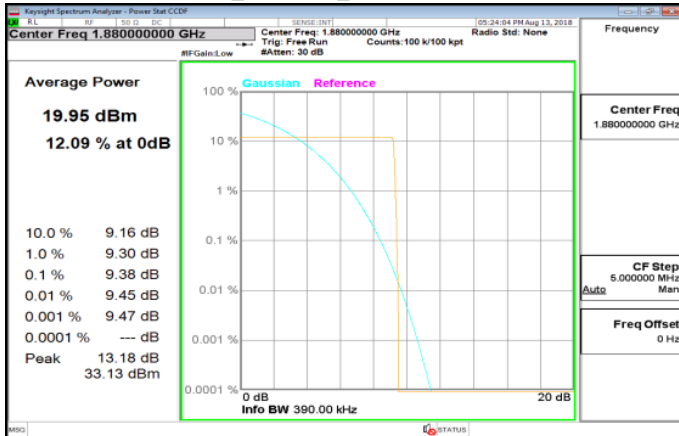
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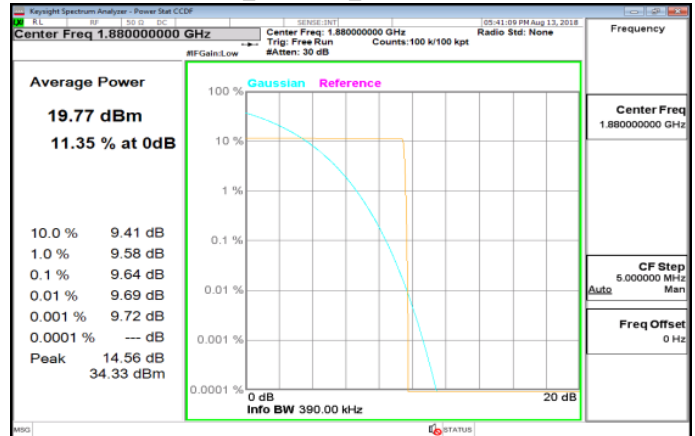
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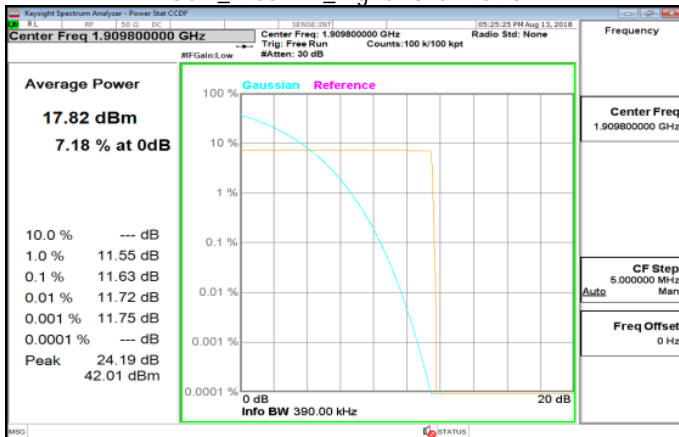
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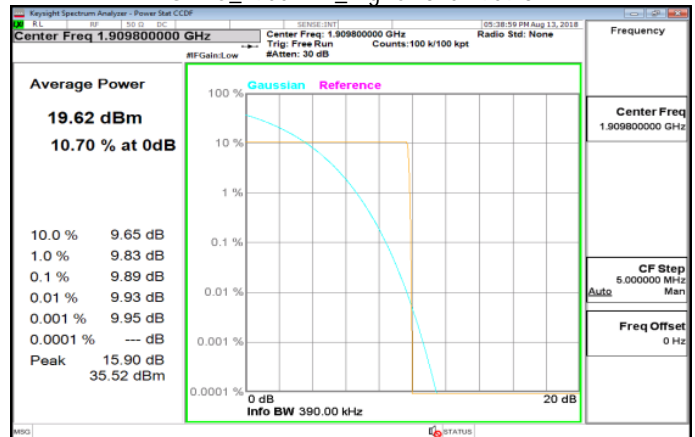
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GSM\_1900MHz\_HighCH810-1909.8



GPRS\_1900MHz\_HighCH810-1909.8



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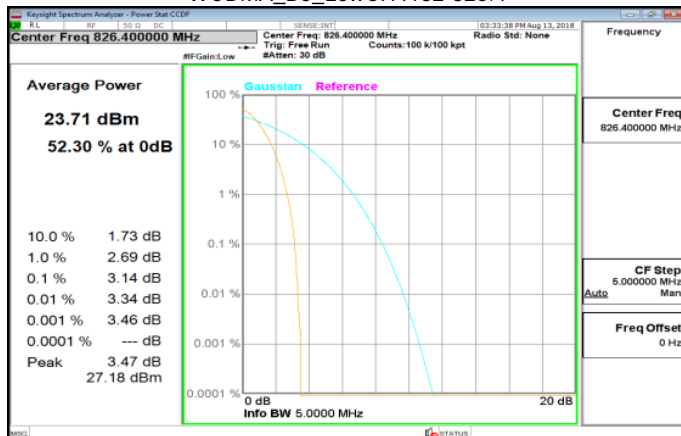
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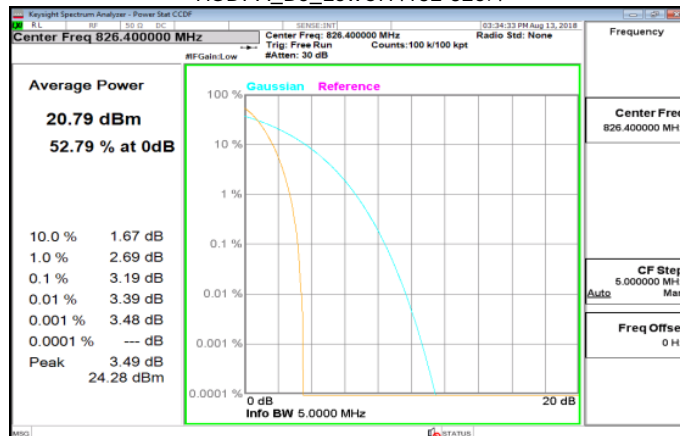
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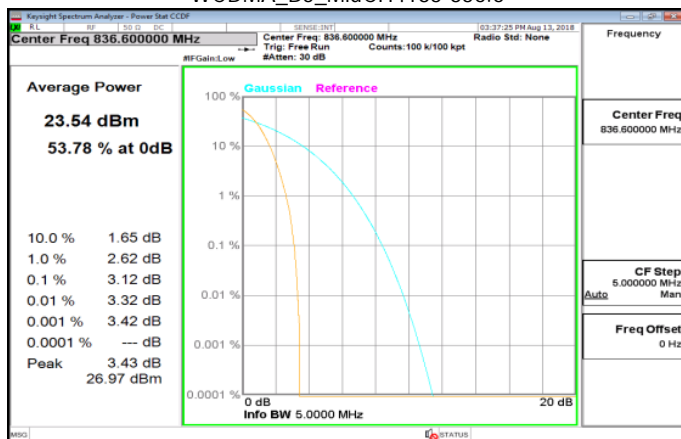
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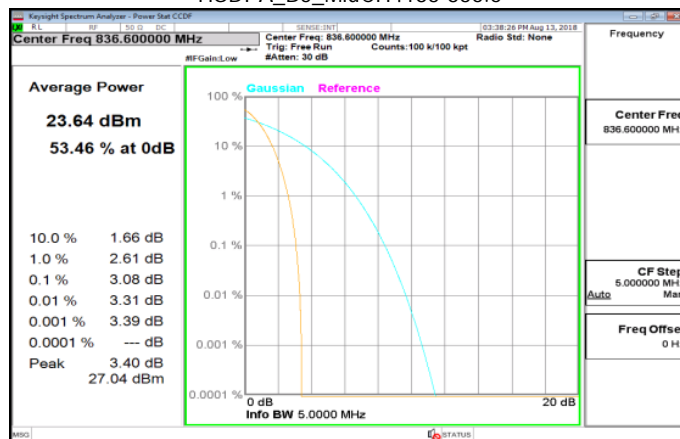
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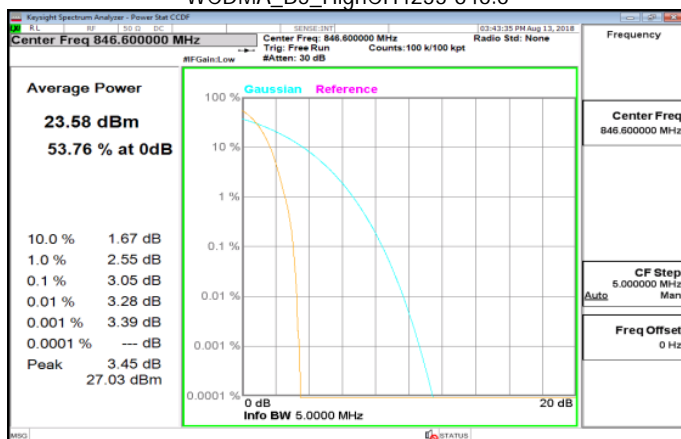
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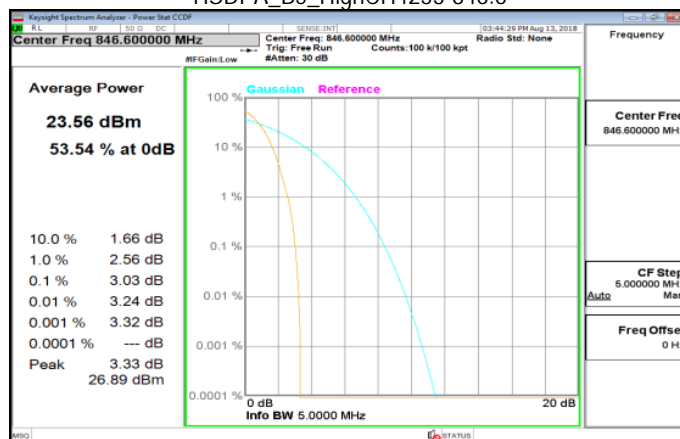
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HSDPA\_B5\_HighCH4233-846.6



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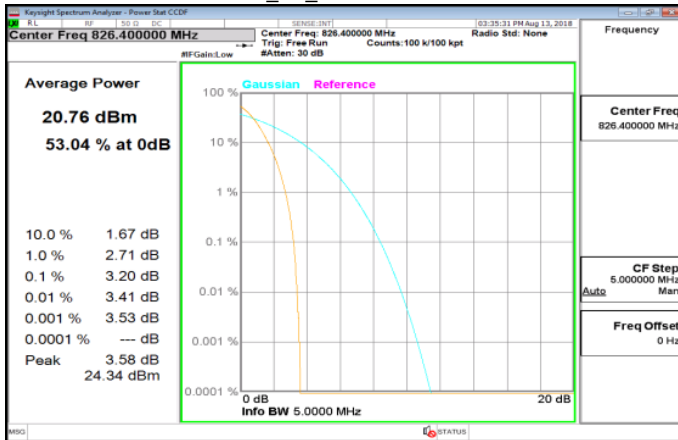
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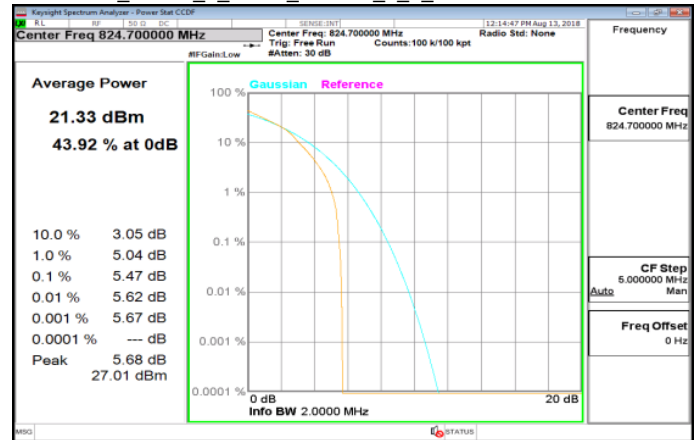
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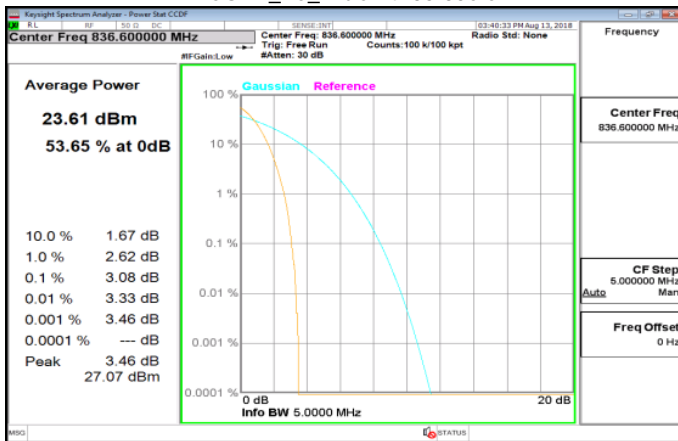
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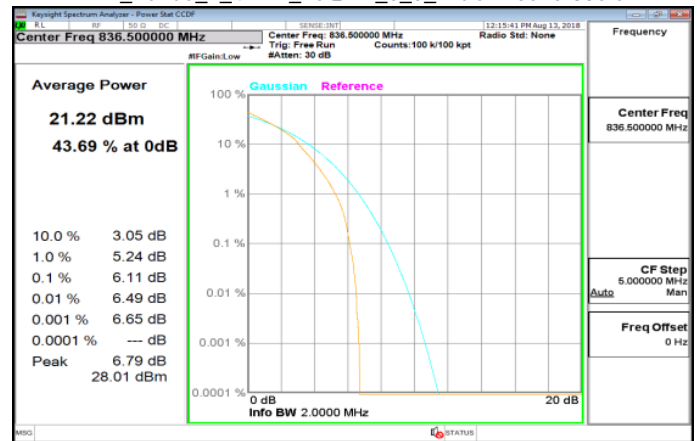
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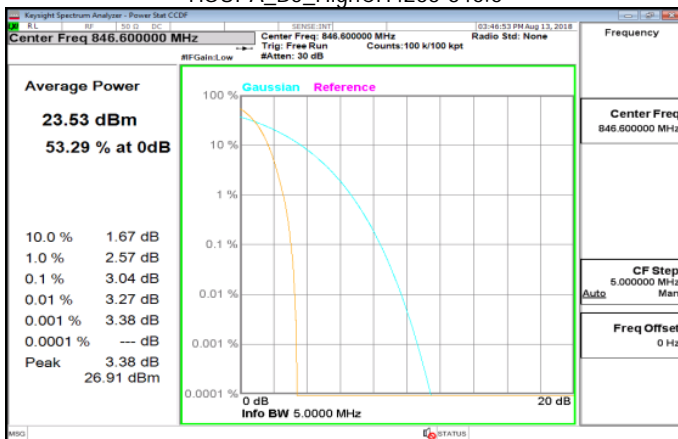
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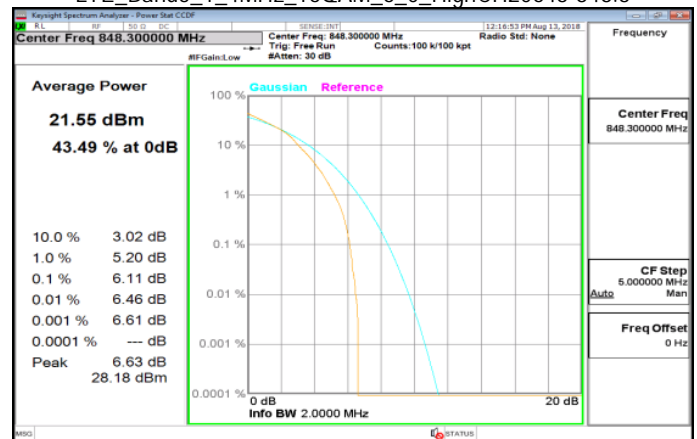
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HSUPA\_B5\_HighCH4233-846.6



LTE\_Band5\_1\_4MHz\_16QAM\_6\_0\_HighCH20643-848.3



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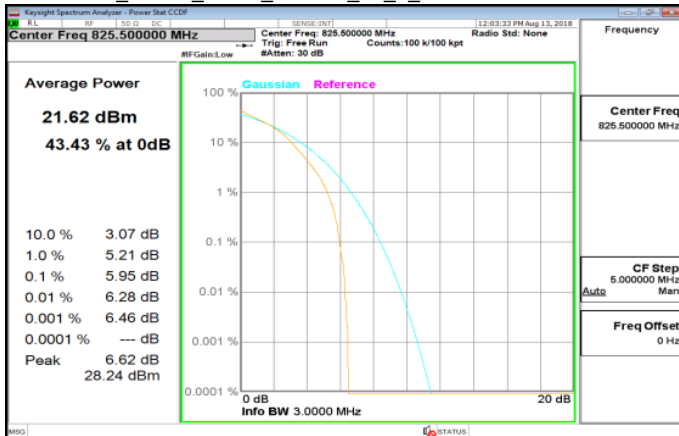
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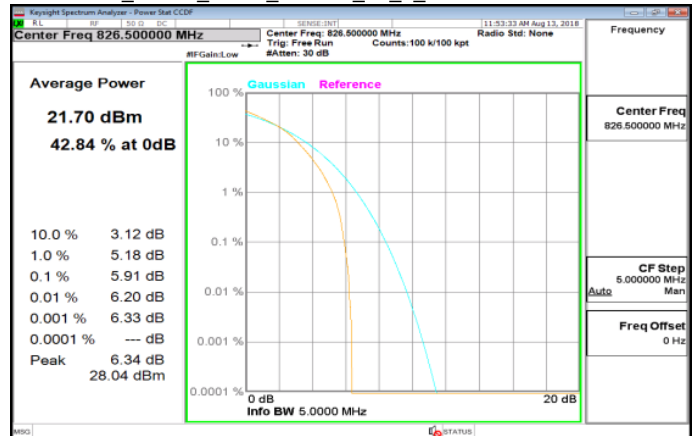
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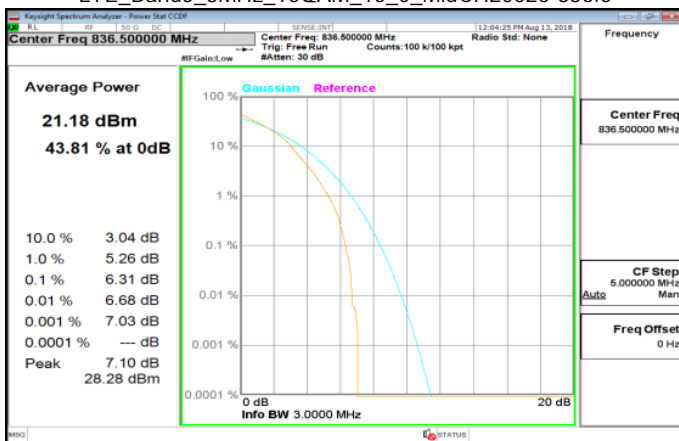
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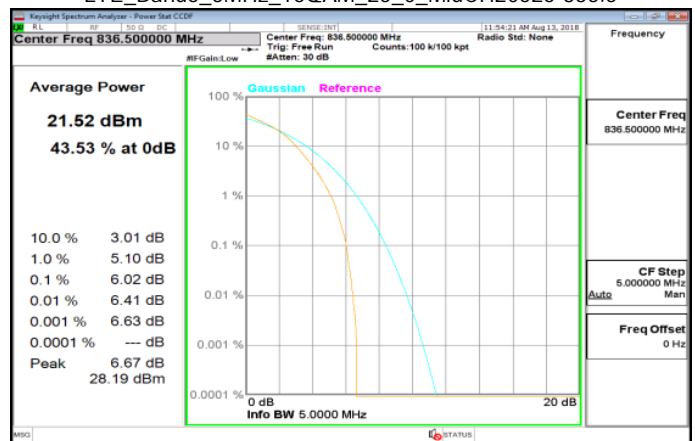
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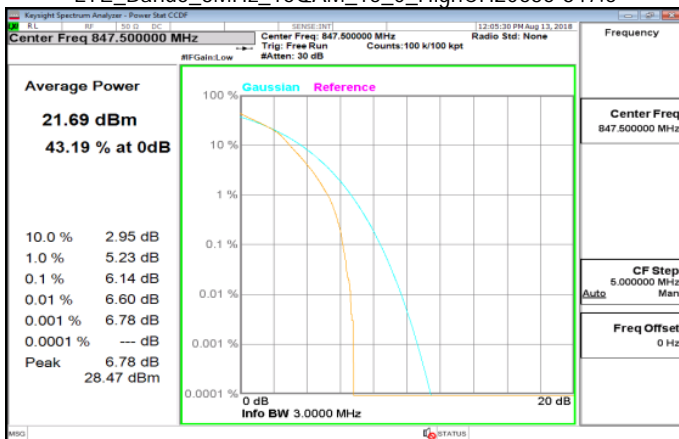
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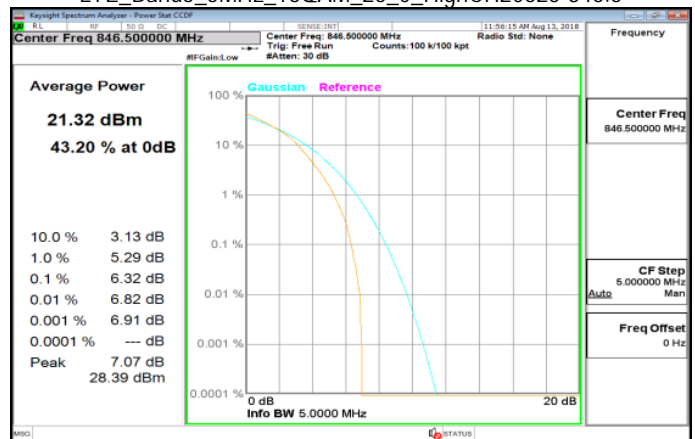
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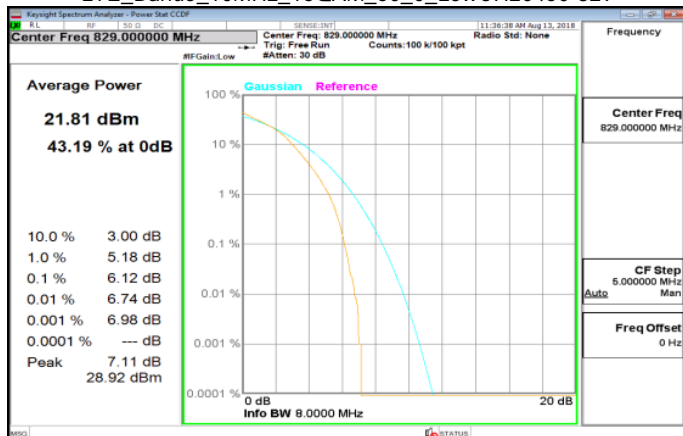
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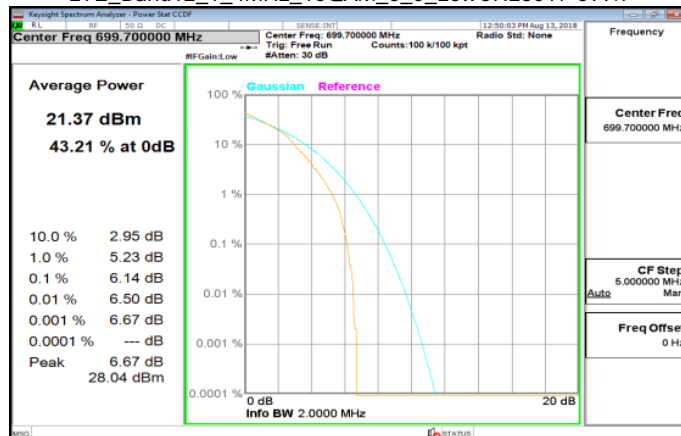
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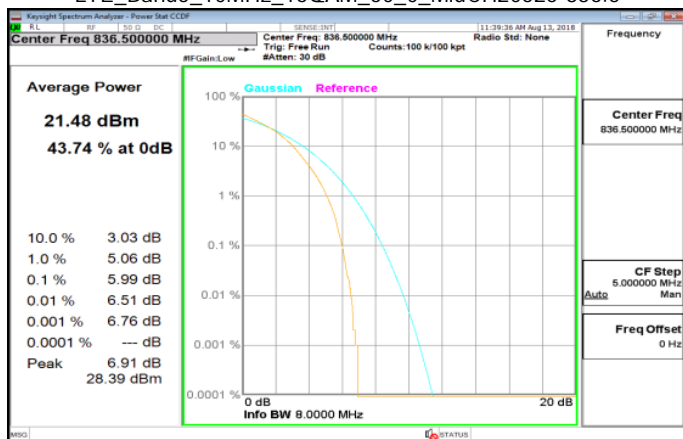
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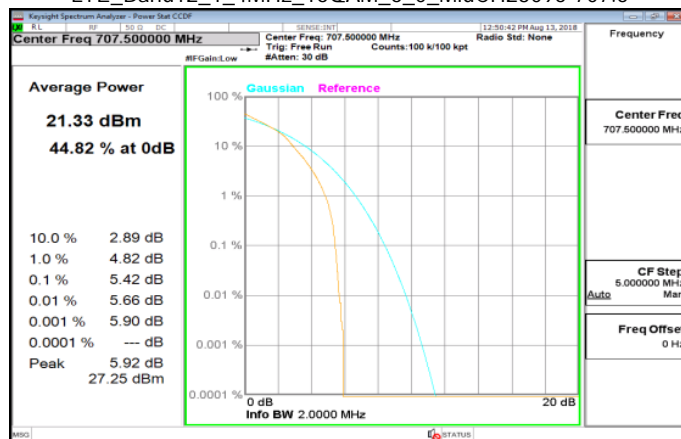
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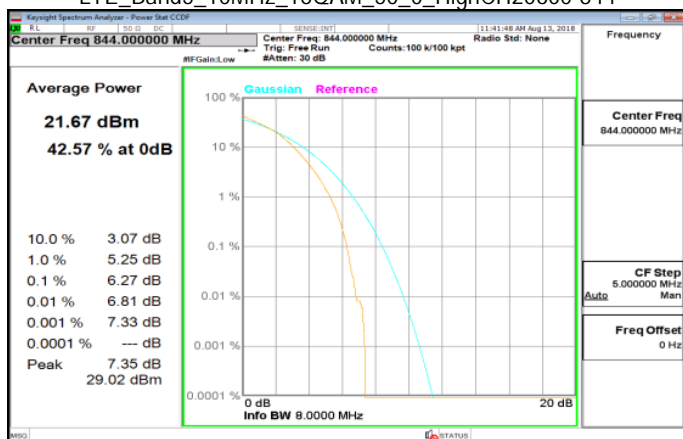
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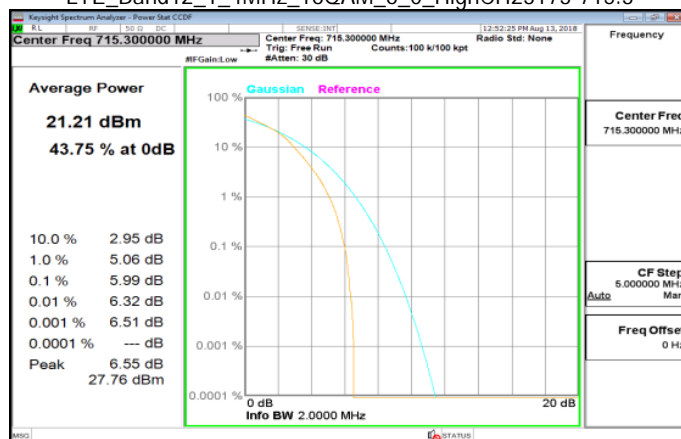
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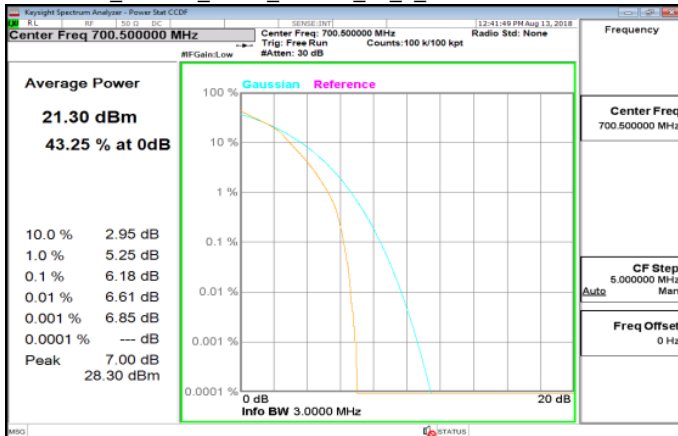
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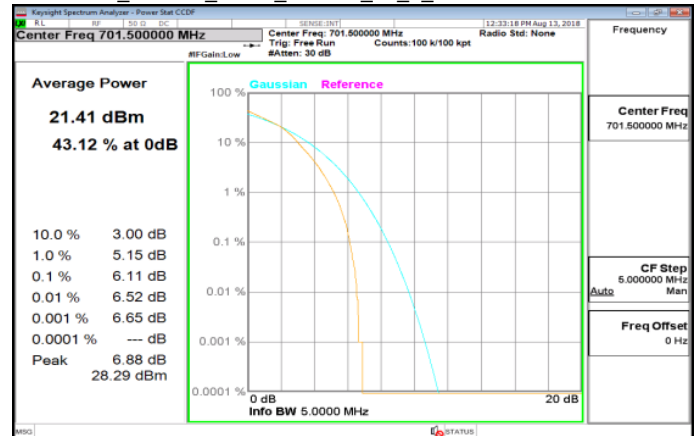
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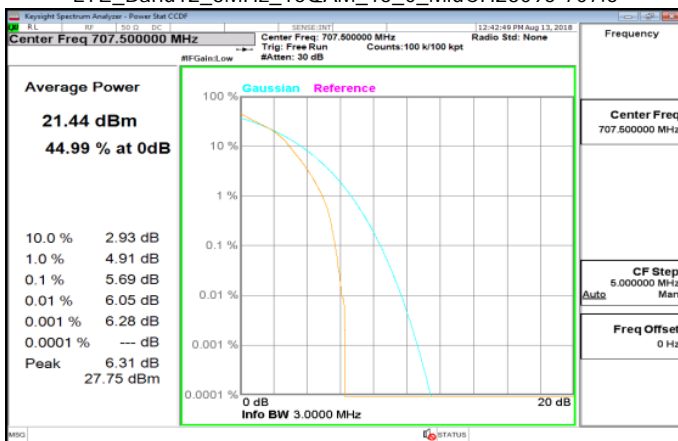
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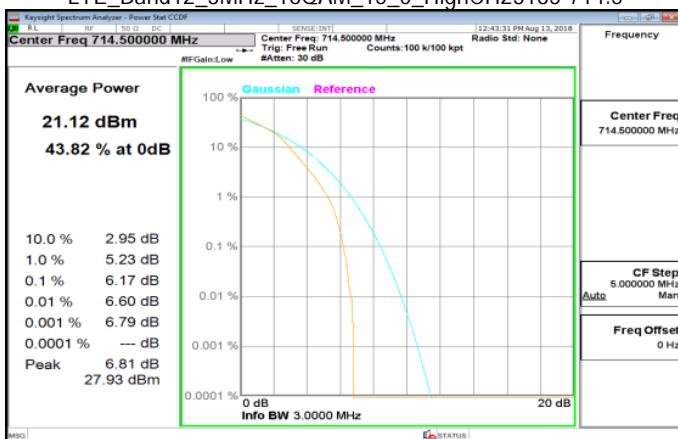
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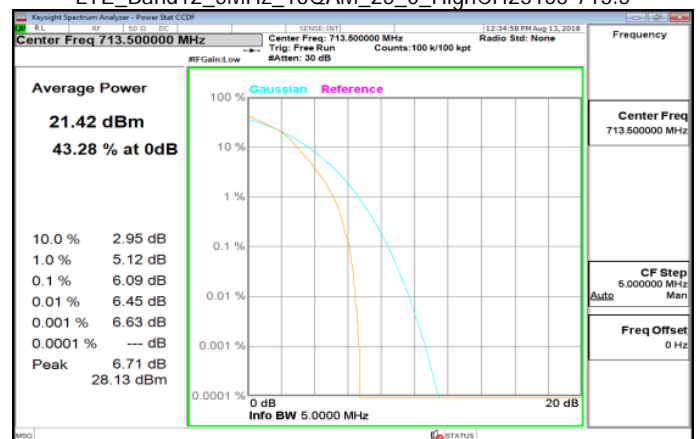
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LTE\_Band12\_5MHz\_16QAM\_25\_0\_HighCH23155-713.5



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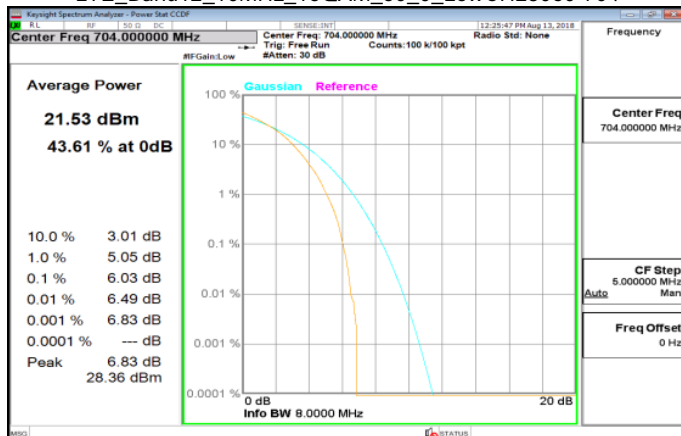
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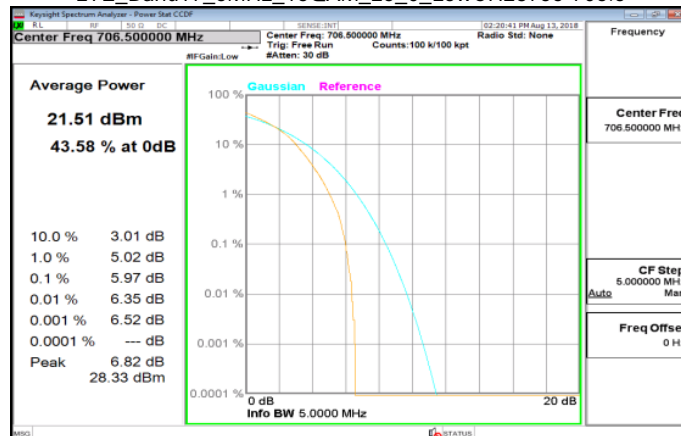
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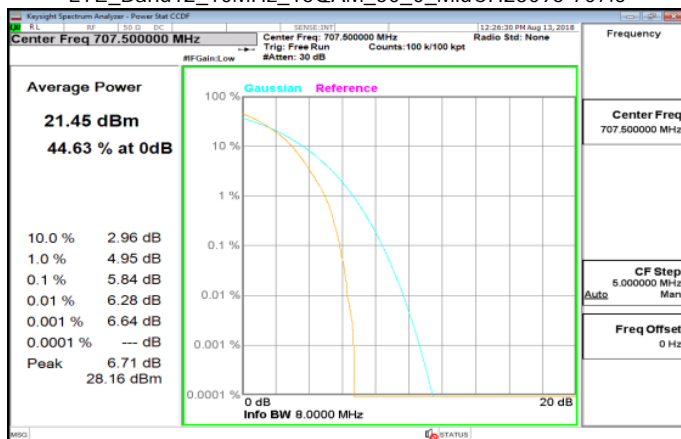
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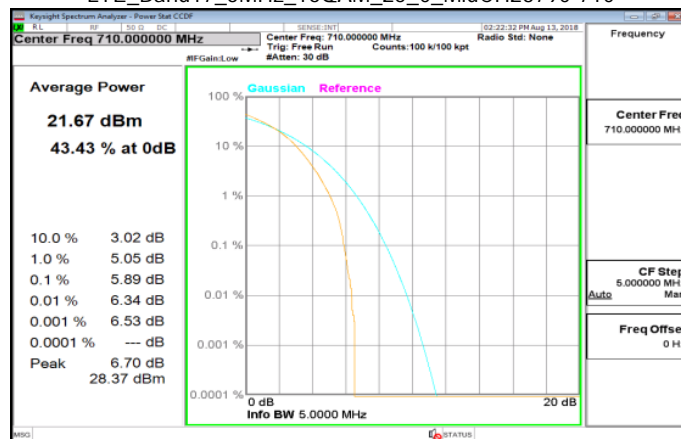
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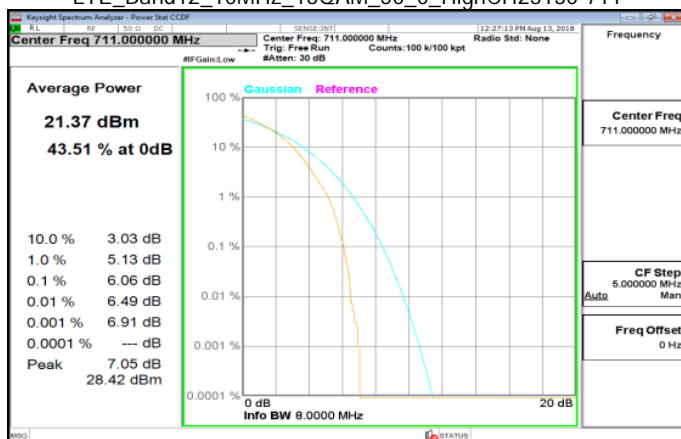
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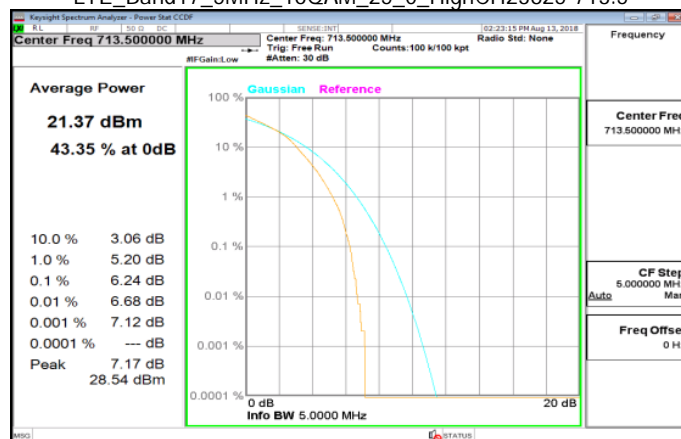
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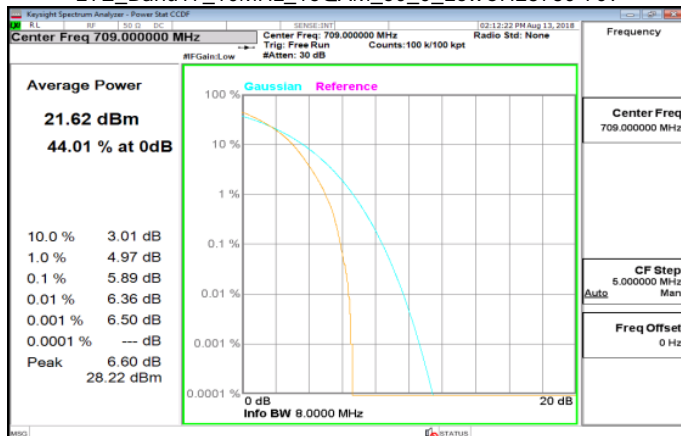
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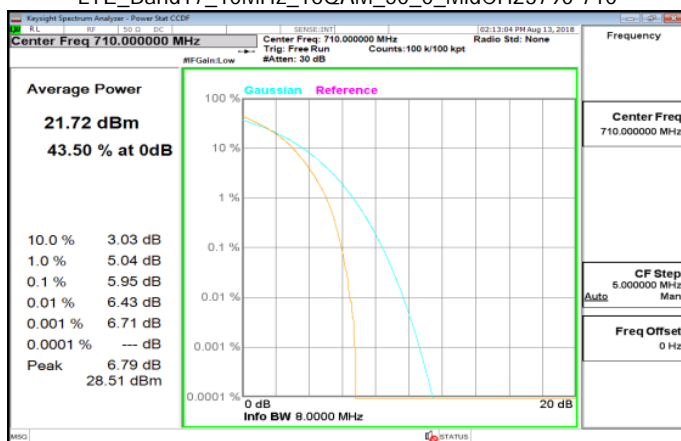
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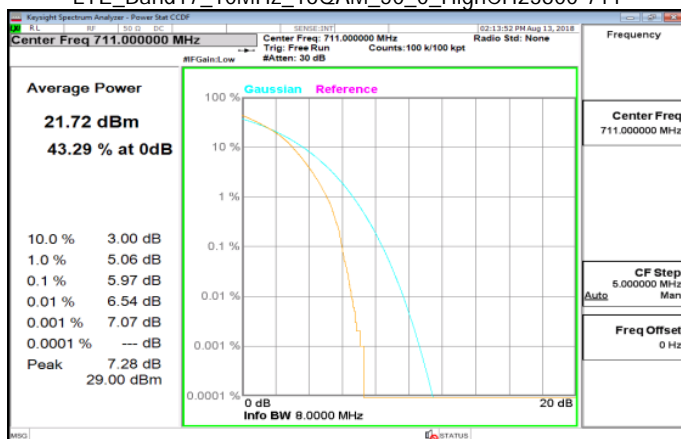
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LTE\_Band17\_10MHz\_16QAM\_50\_0\_HighCH23800-711



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SGS Taiwan Ltd.

No. 134, WuKungRoad, NewTaipeiIndustrialPark, WukuDistrict, NewTaipeiCity, Taiwan24803/新北市五股區新北產業園區五工路 134 號

台灣檢驗科技股份有限公司

t (886-2) 2299-3279

f (886-2) 2298-0488

www.tw.sgs.com

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