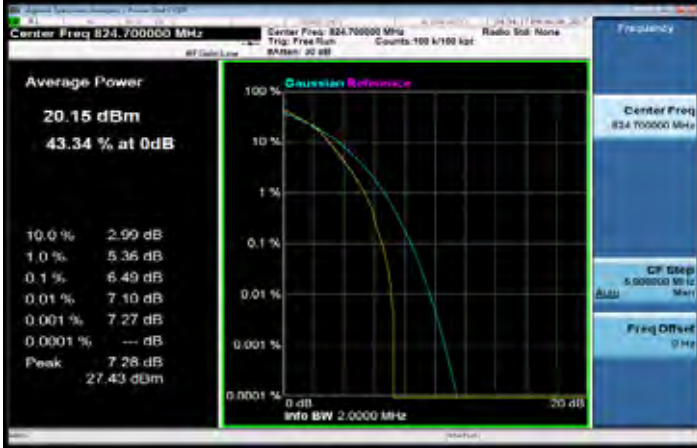
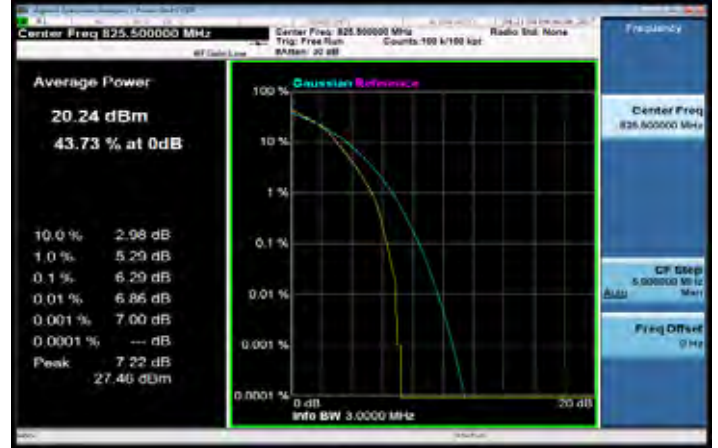


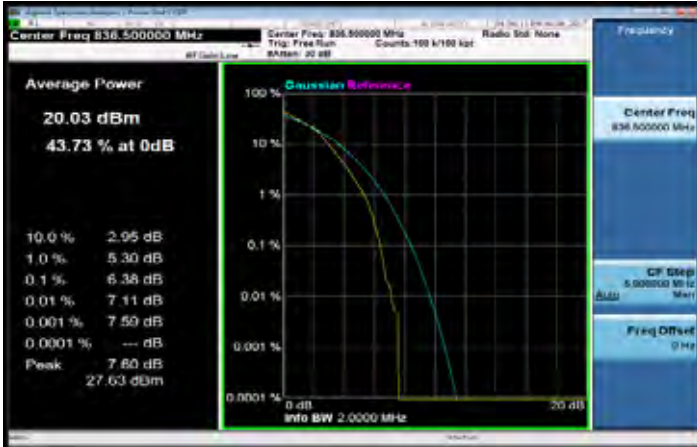
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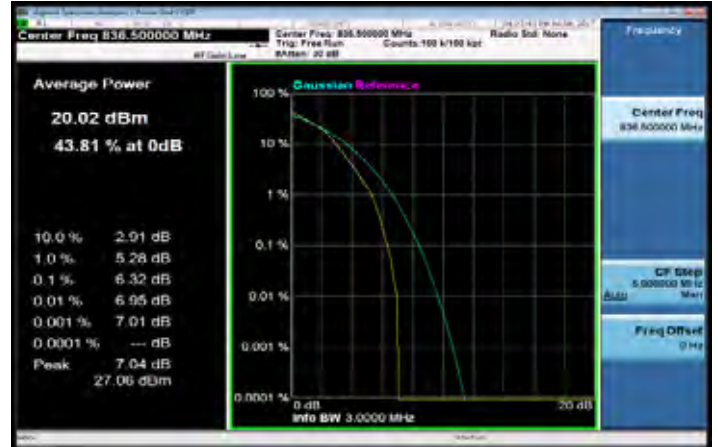
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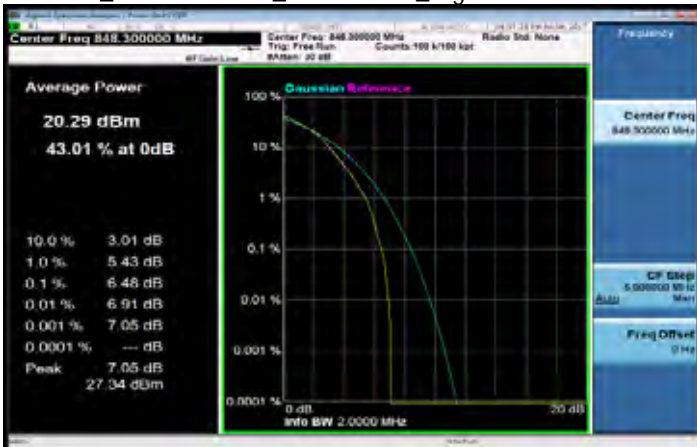
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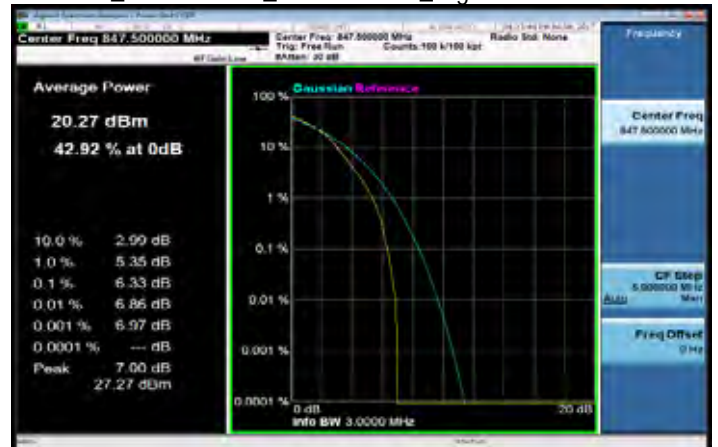
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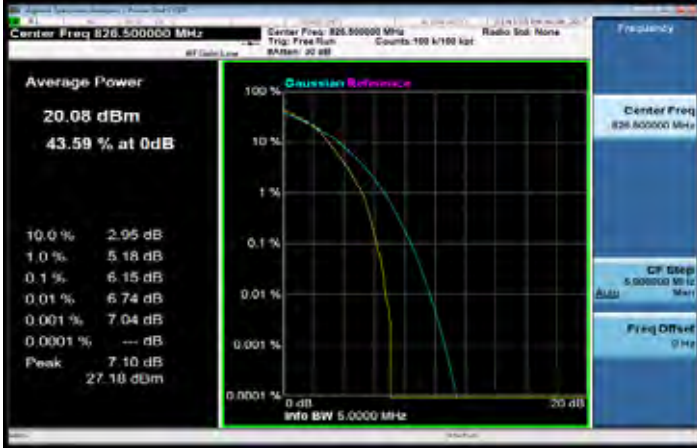
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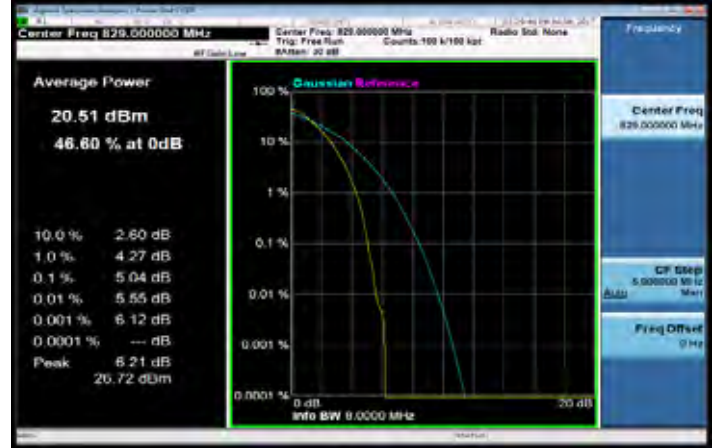
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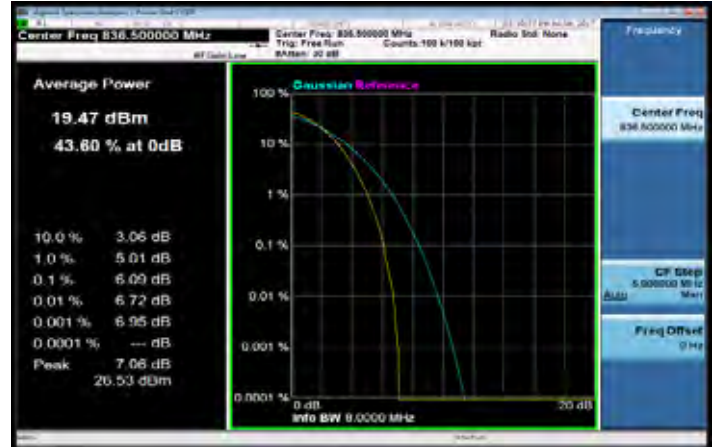
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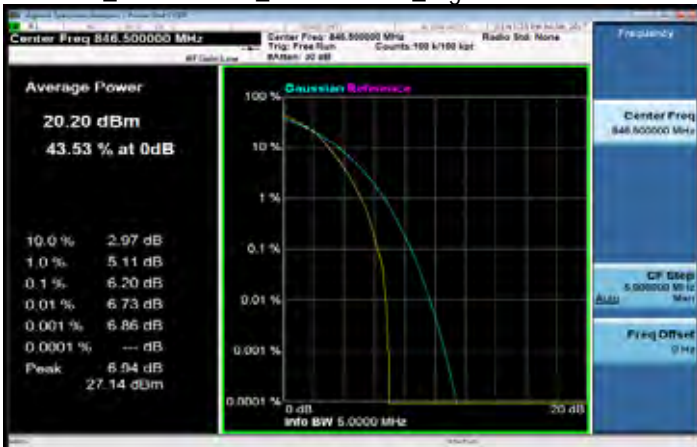
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LTE\_Band5 10MHz\_16-QAM 50 0\_HighCH20600-844



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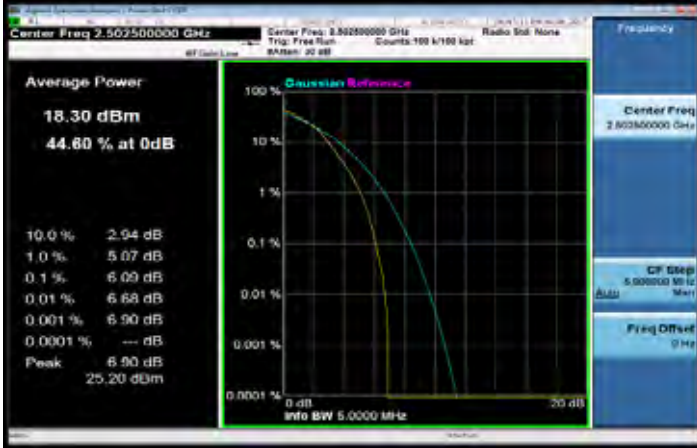
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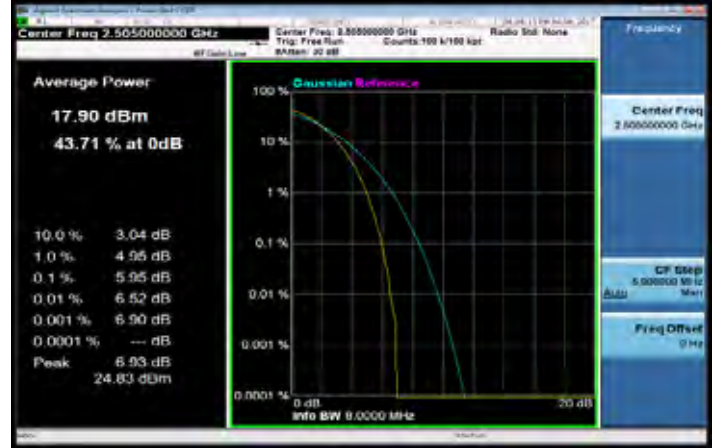
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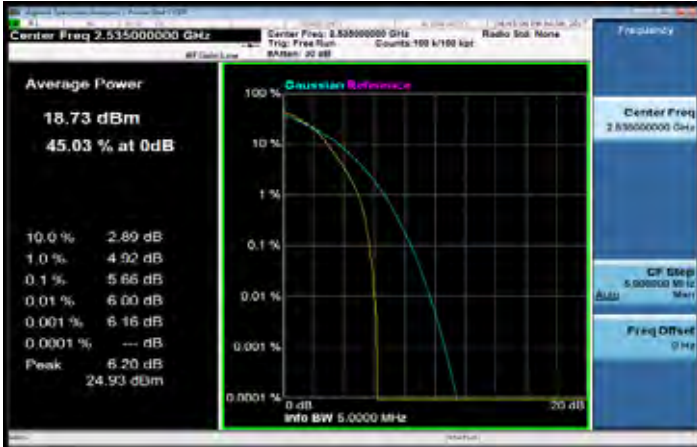
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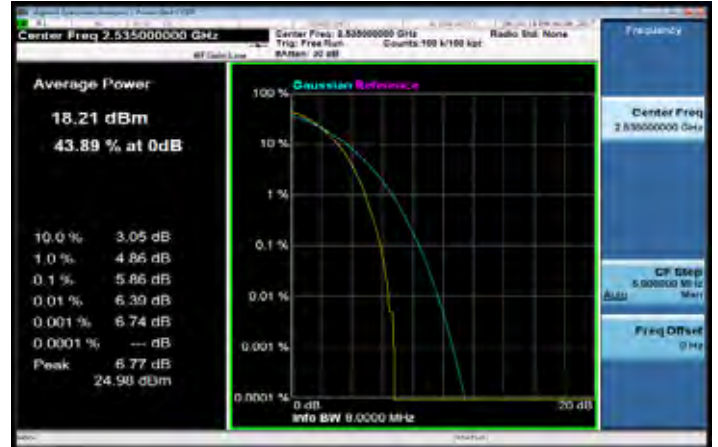
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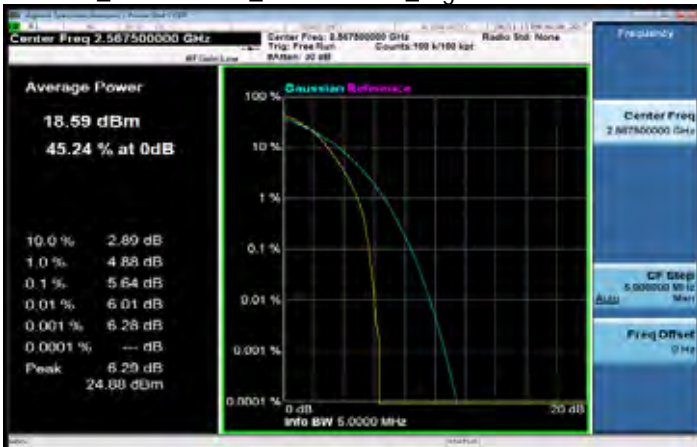
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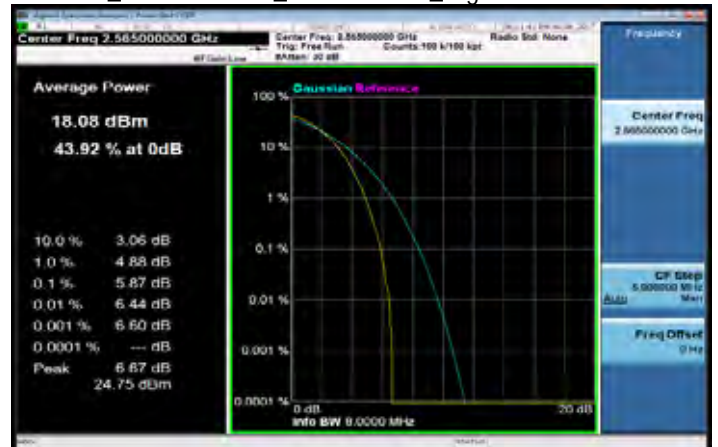
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LTE\_Band7 10MHz\_16-QAM 50 0\_HighCH21400-2565



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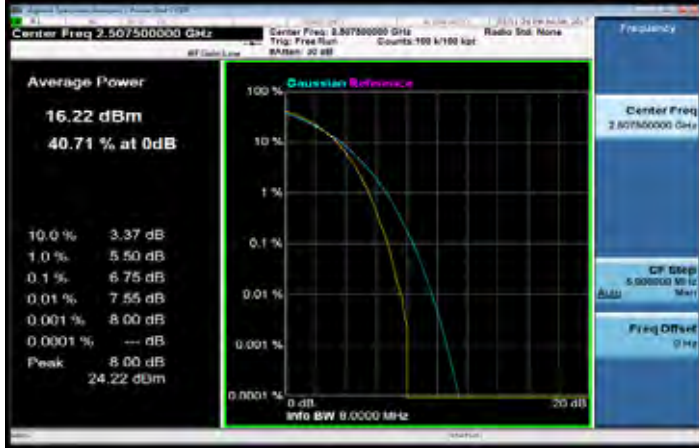
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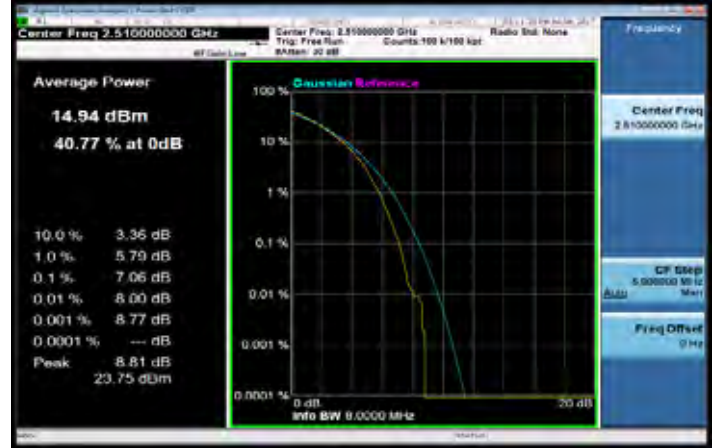
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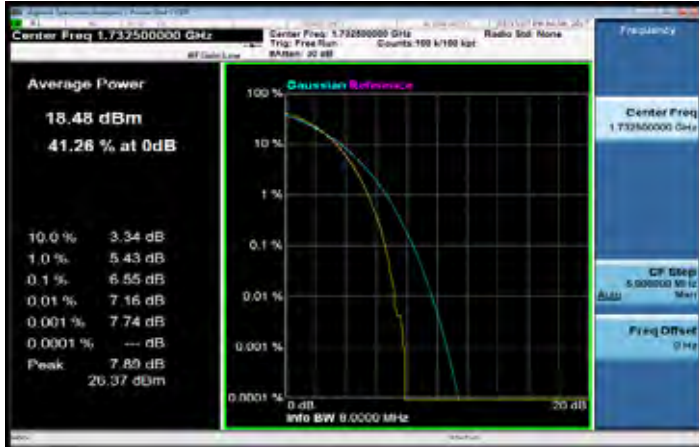
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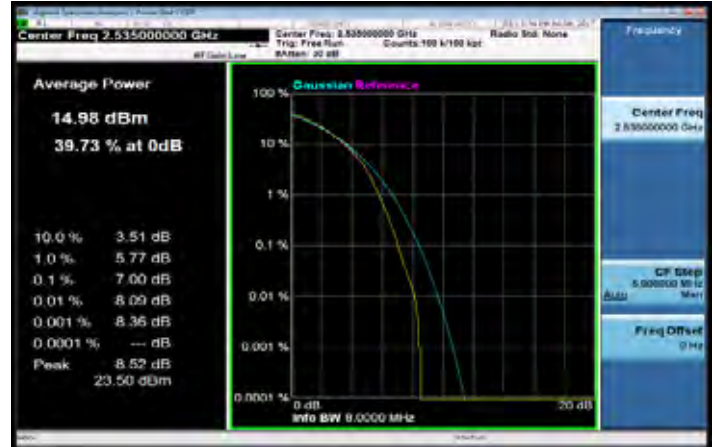
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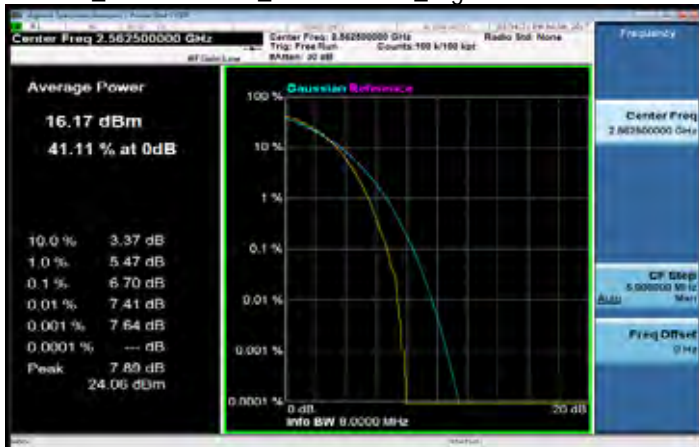
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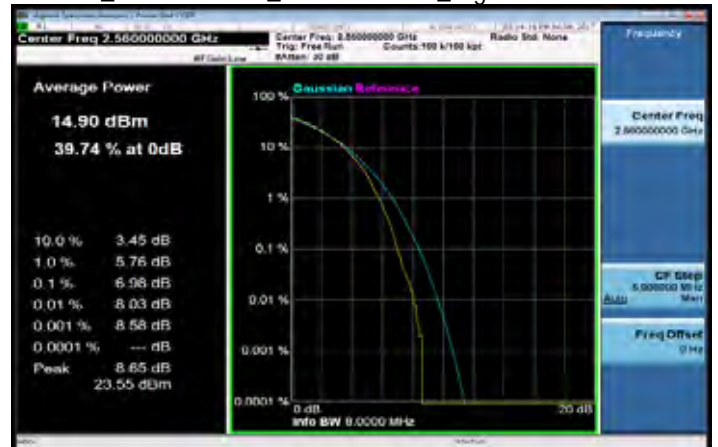
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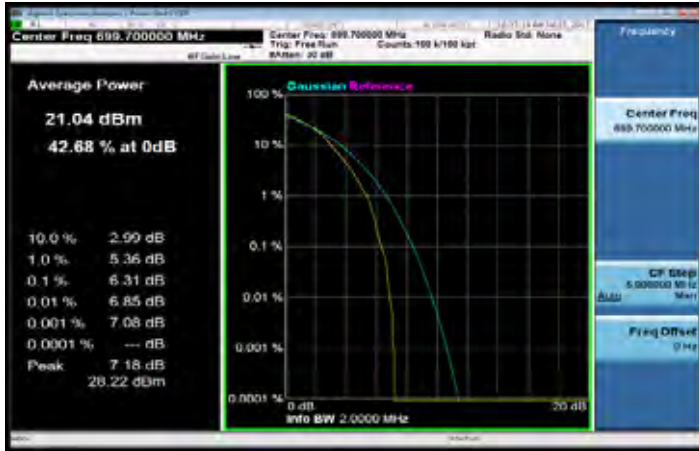
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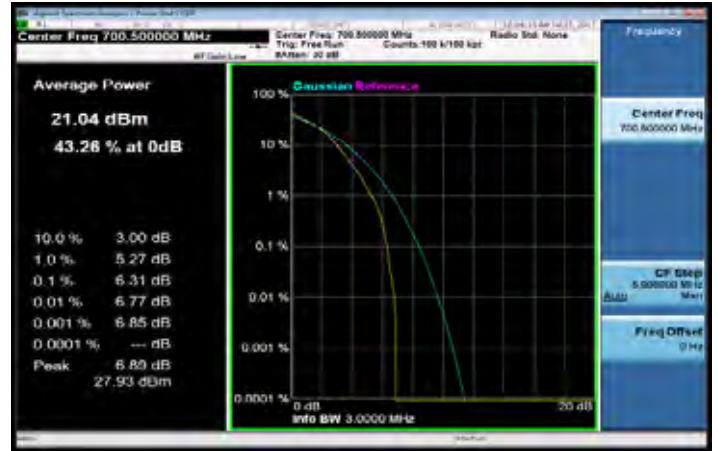
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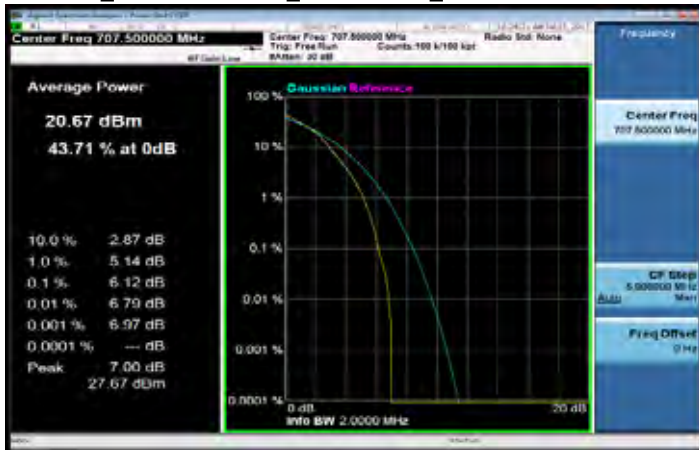
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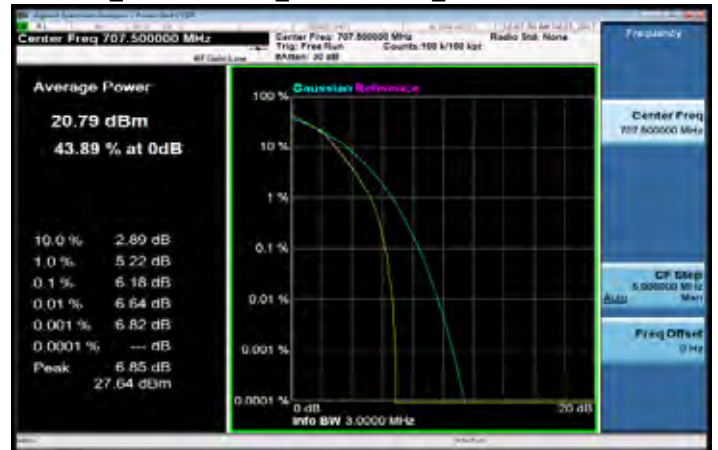
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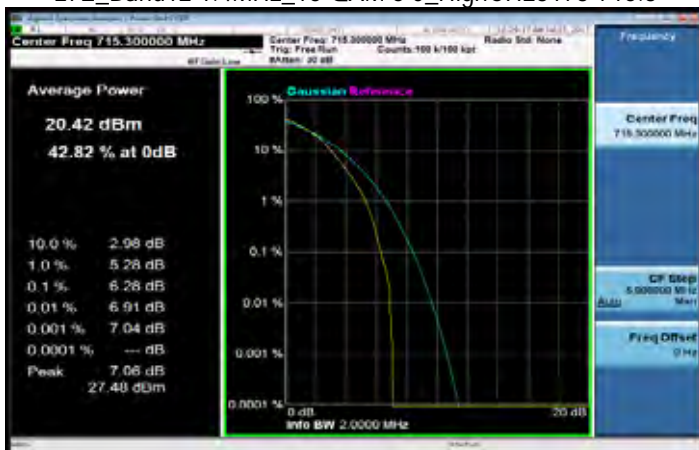
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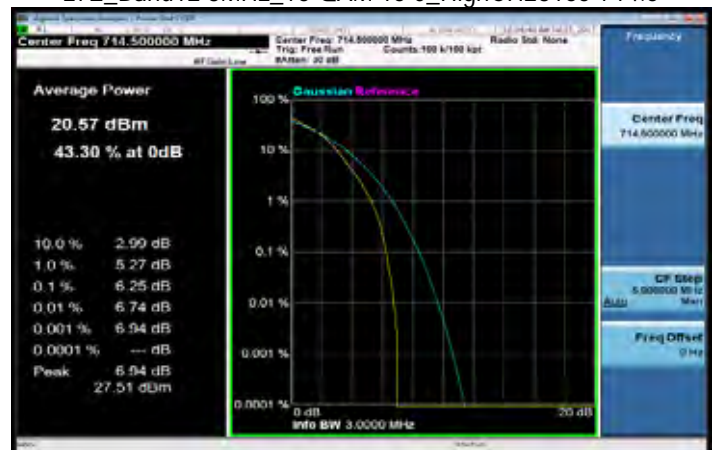
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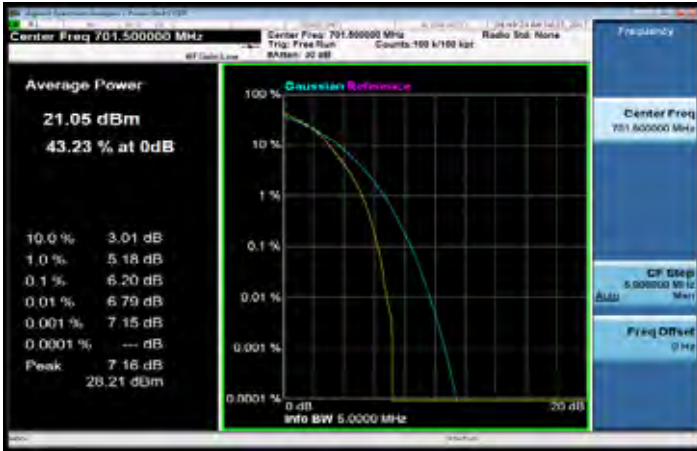
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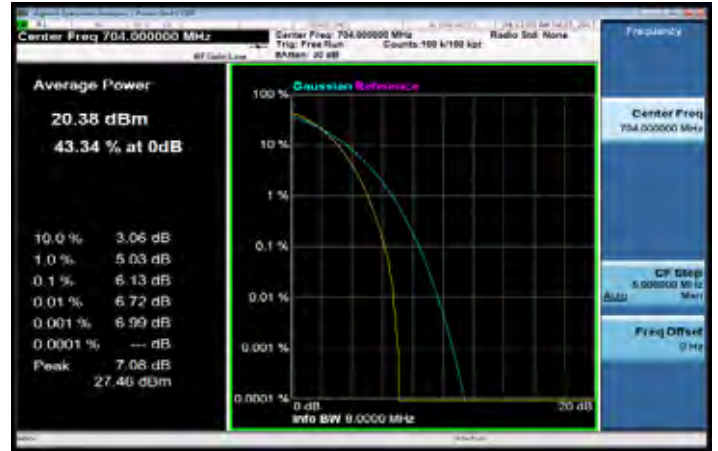
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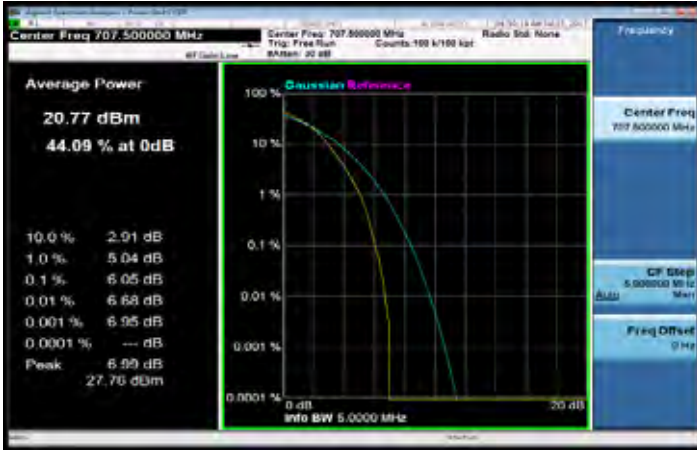
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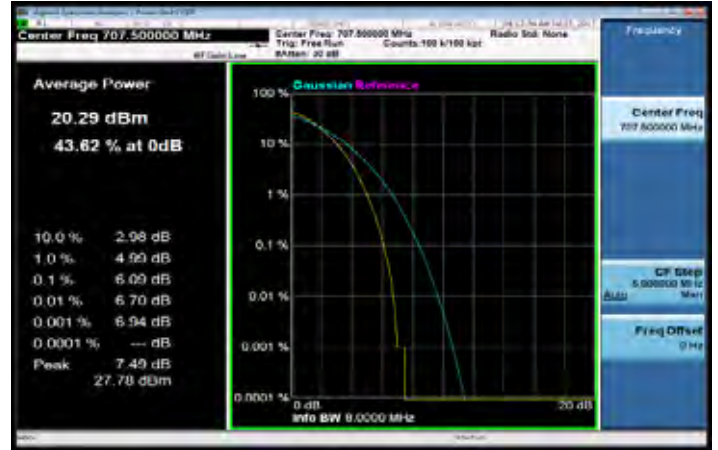
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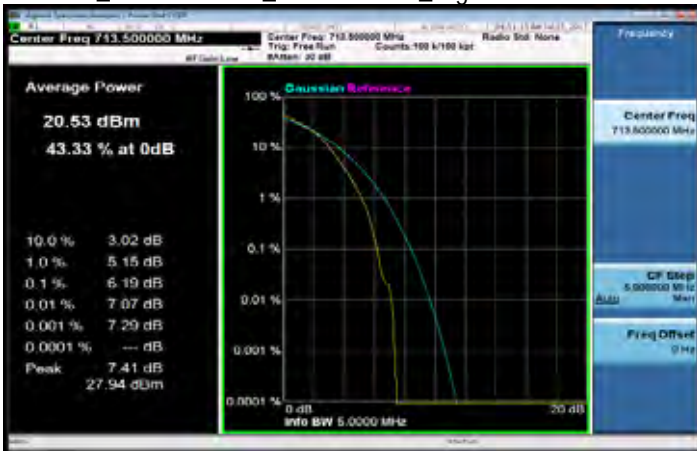
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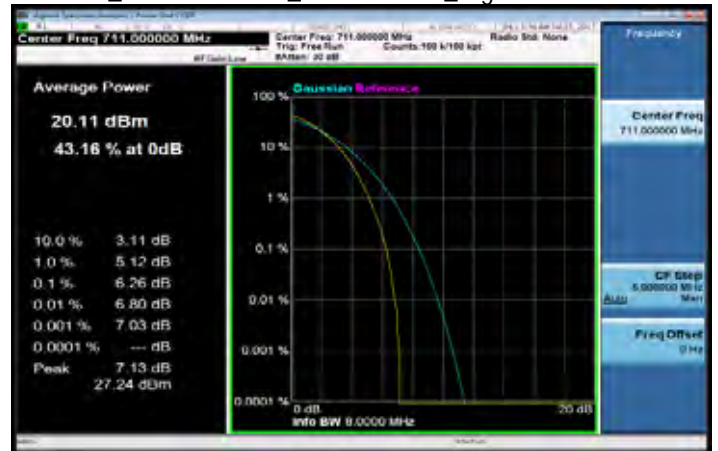
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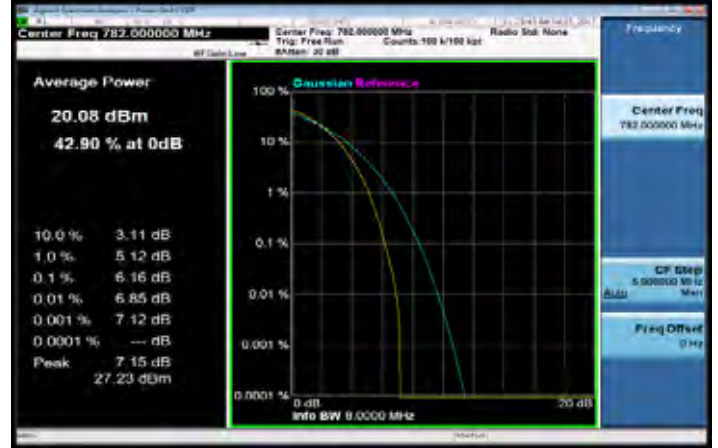
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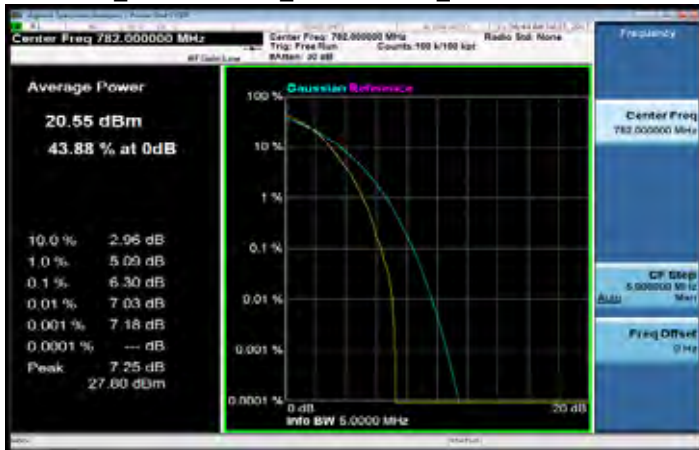
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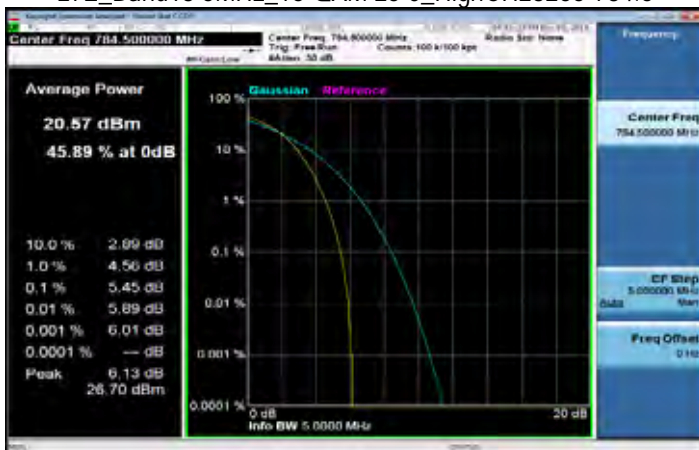
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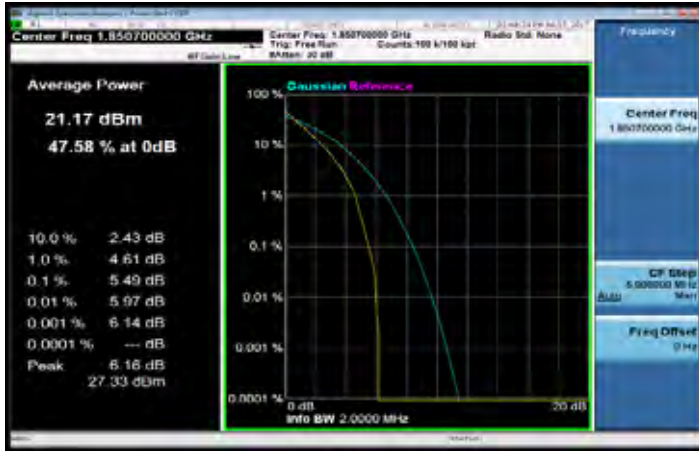
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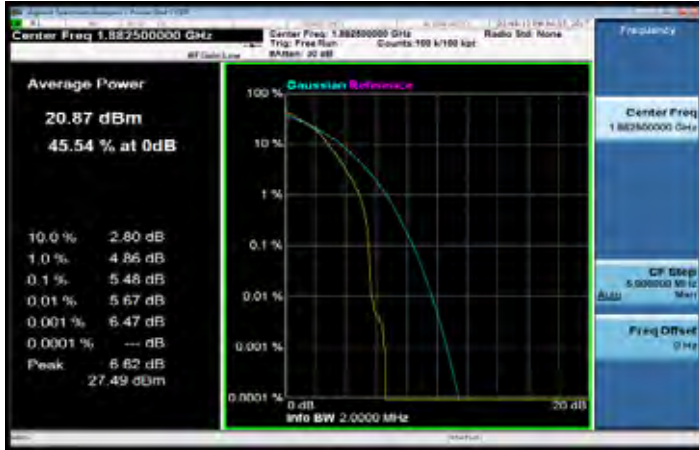
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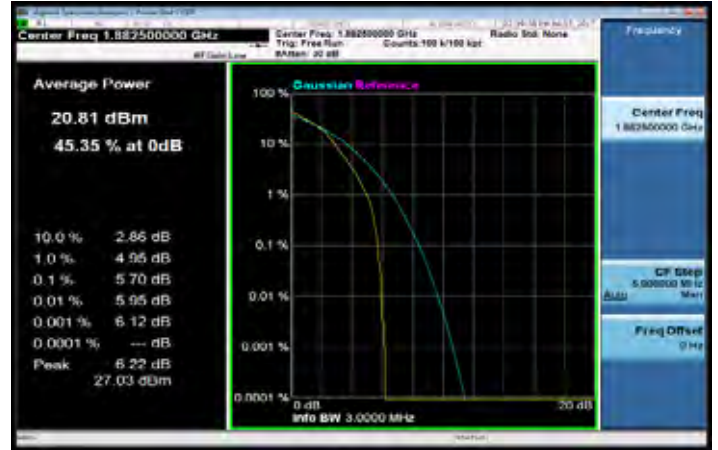
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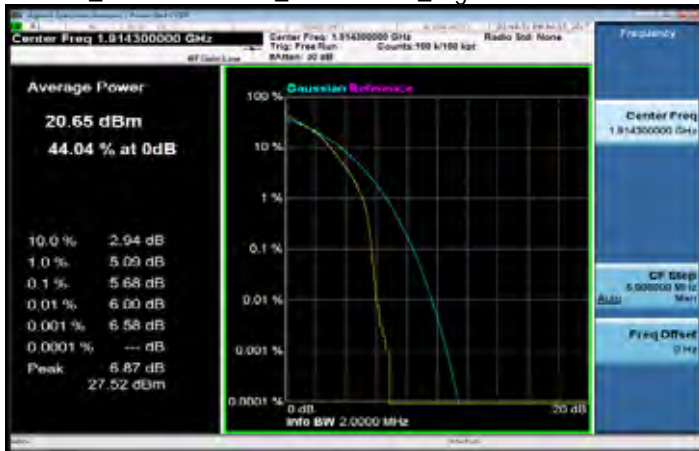
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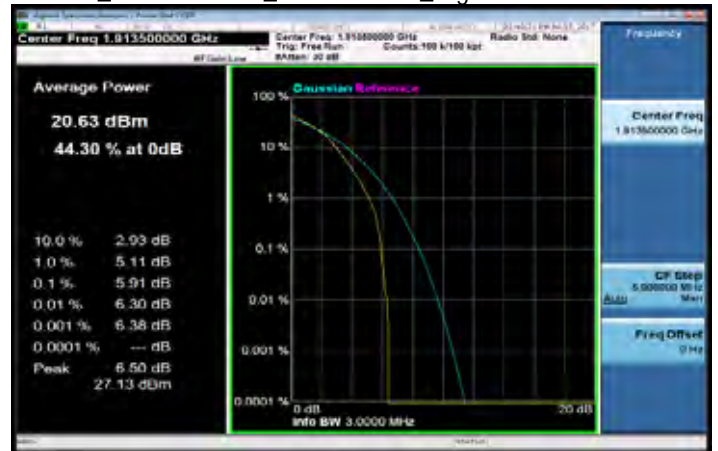
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LTE\_Band25 3MHz\_16-QAM 15\_0\_HighCH26675-1913.5



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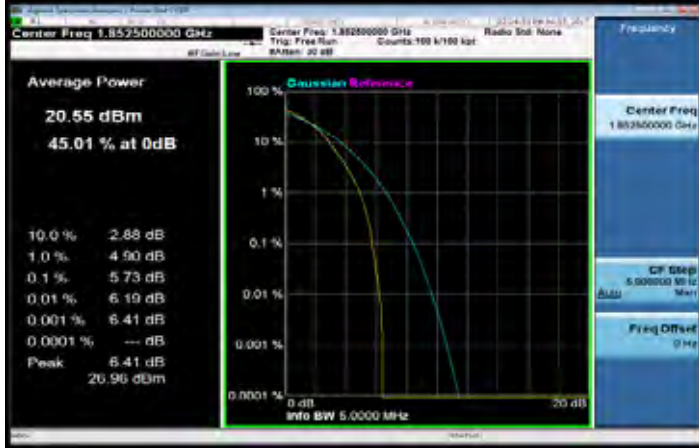
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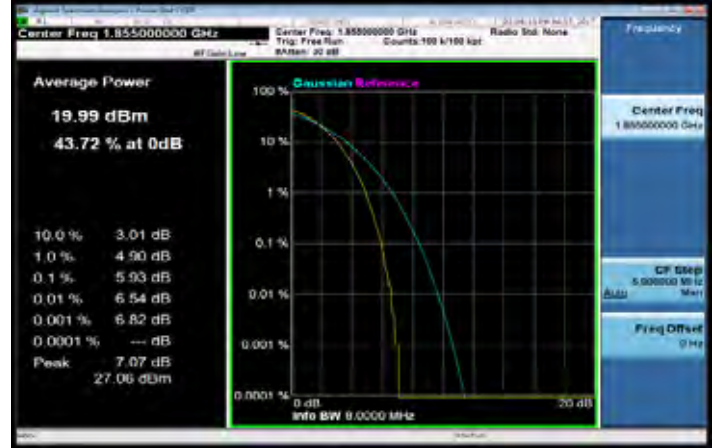
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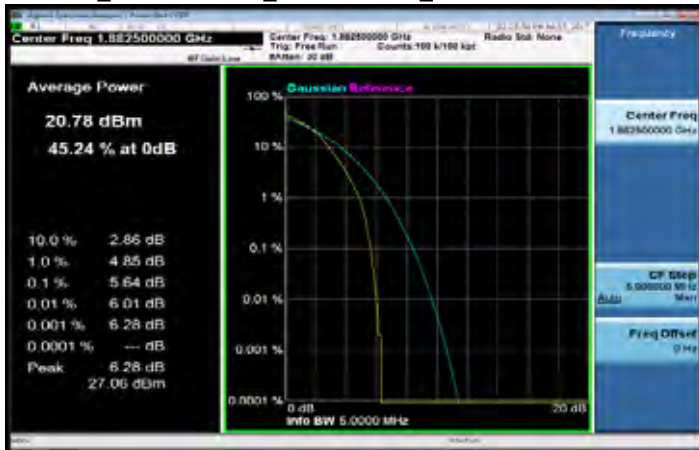
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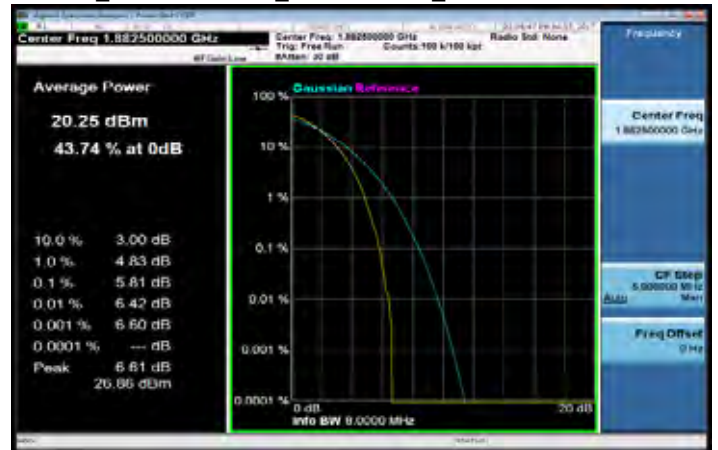
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LTE\_Band25 5MHz\_16-QAM 25 0\_HighCH26665-1912.5



LTE\_Band25 10MHz\_16-QAM 50 0\_HighCH26640-1910



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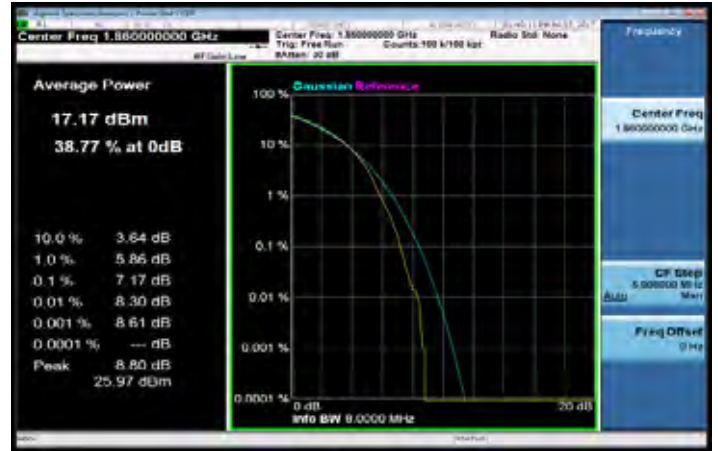
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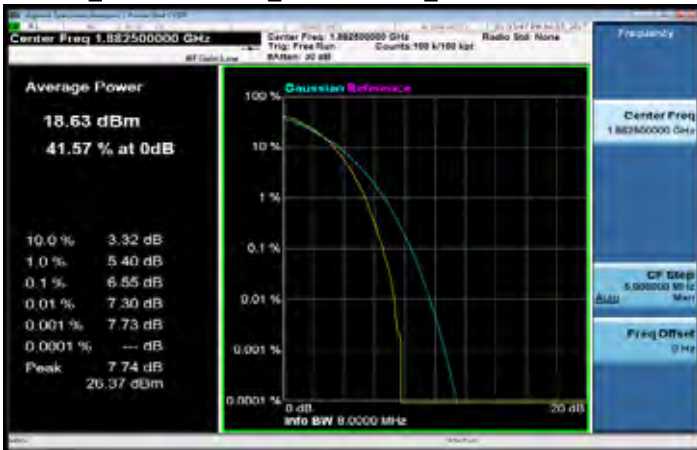
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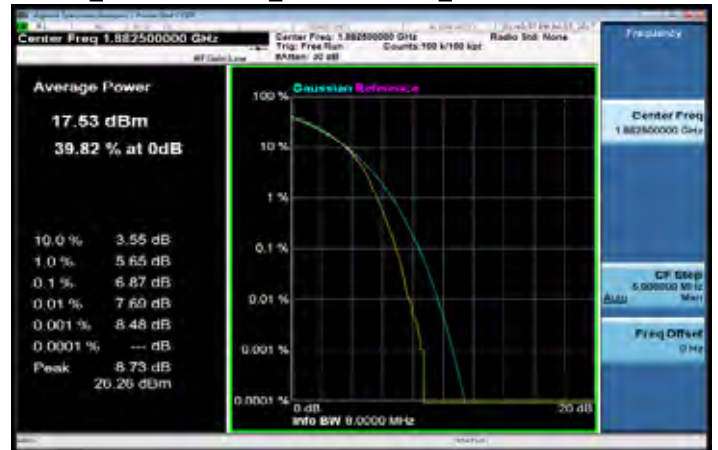
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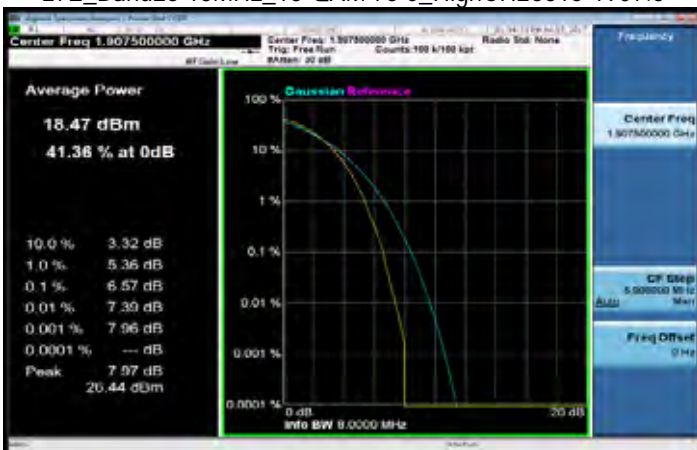
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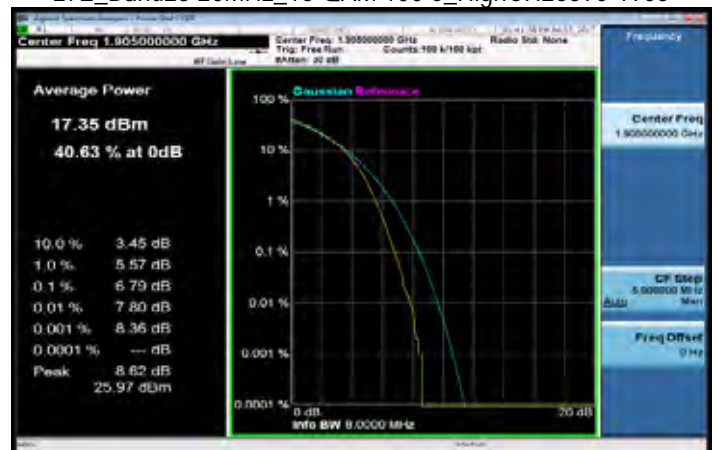
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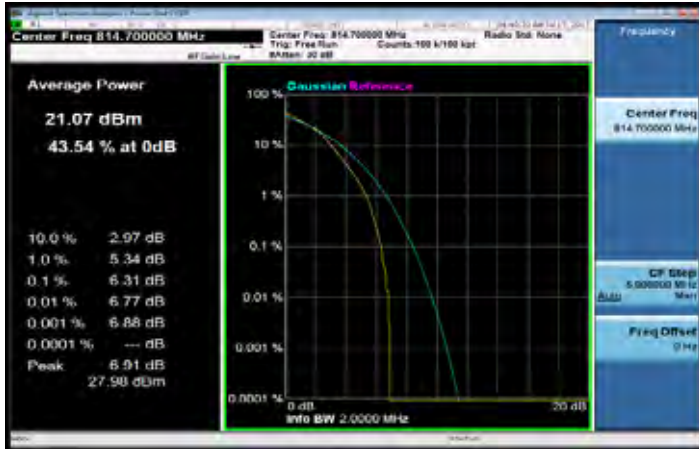
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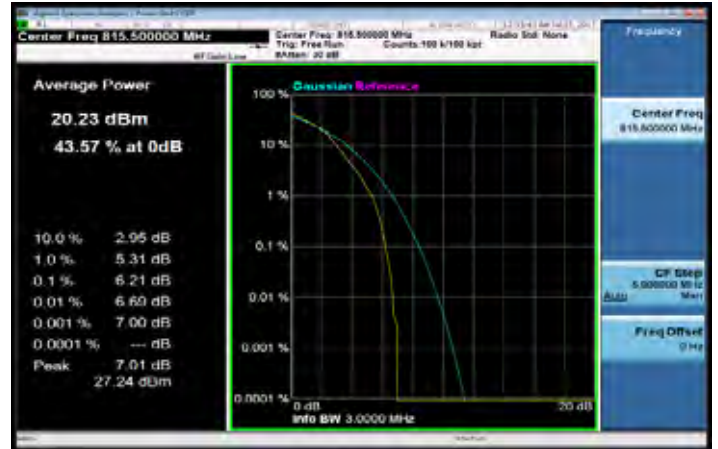
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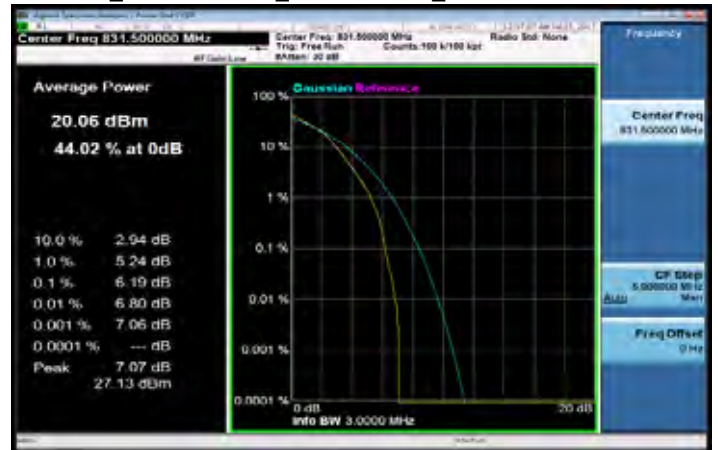
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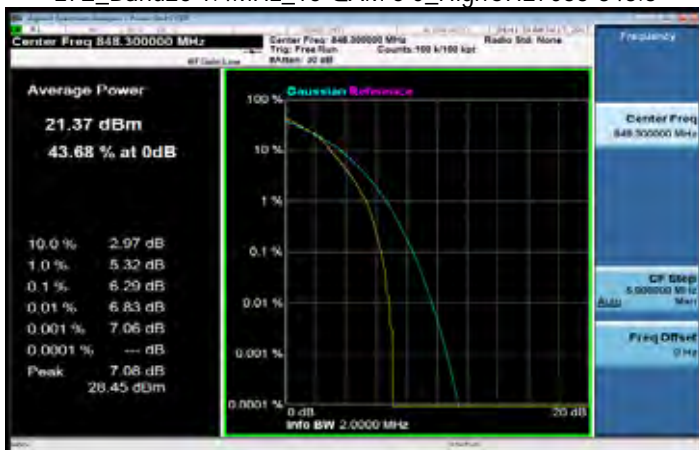
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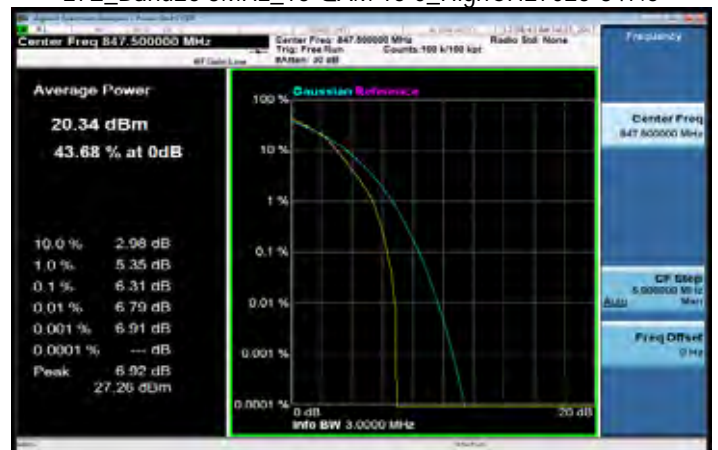
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LTE\_Band26 3MHz\_16-QAM 15 0\_HighCH27025-847.5



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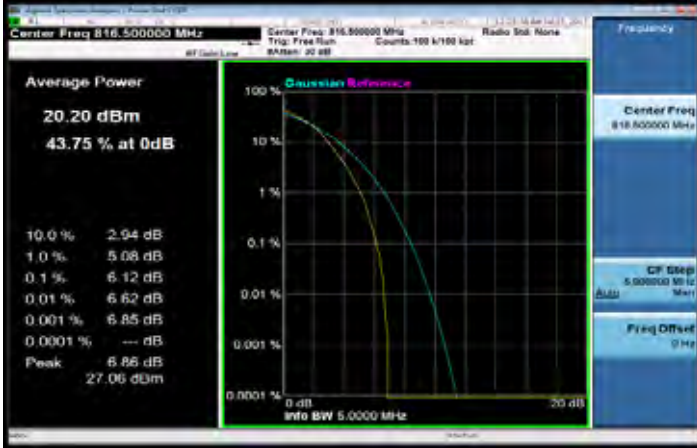
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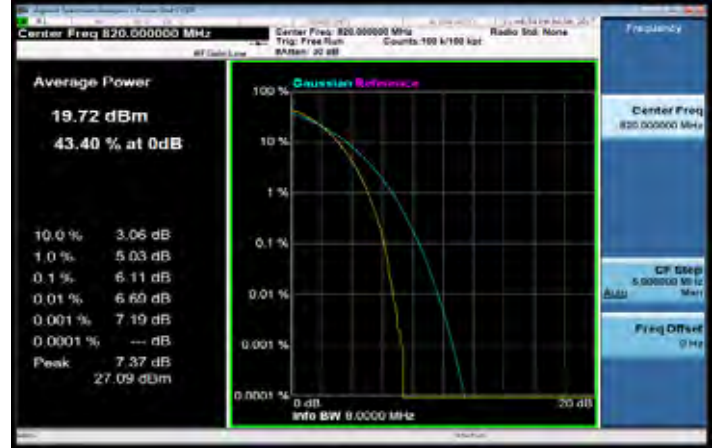
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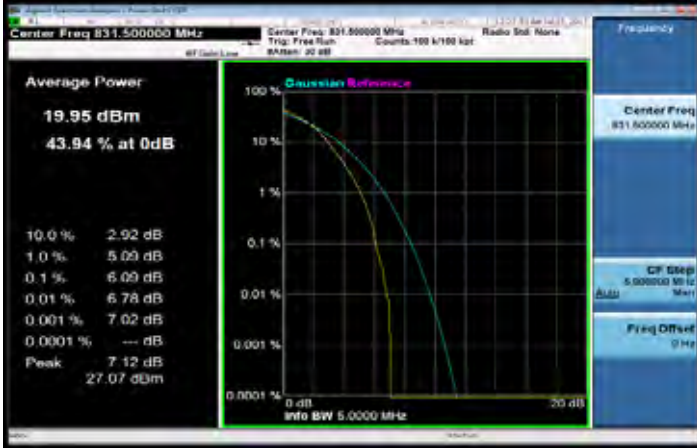
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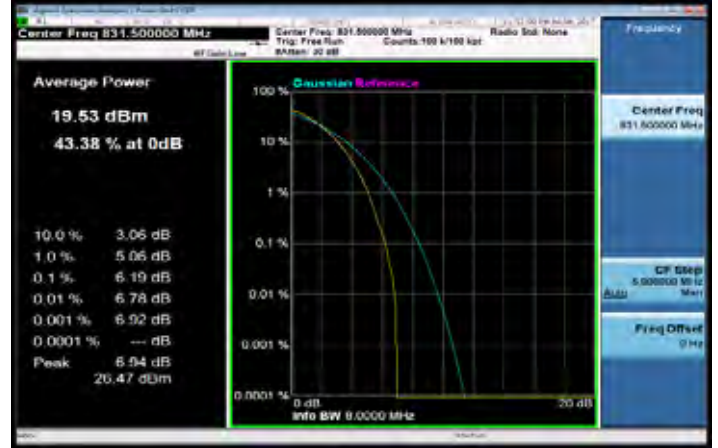
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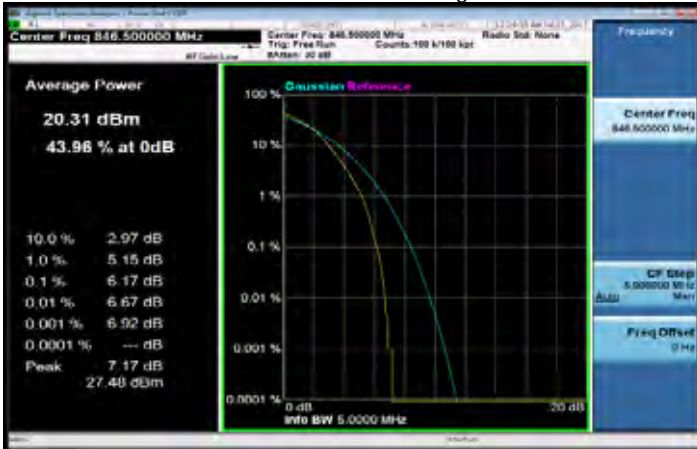
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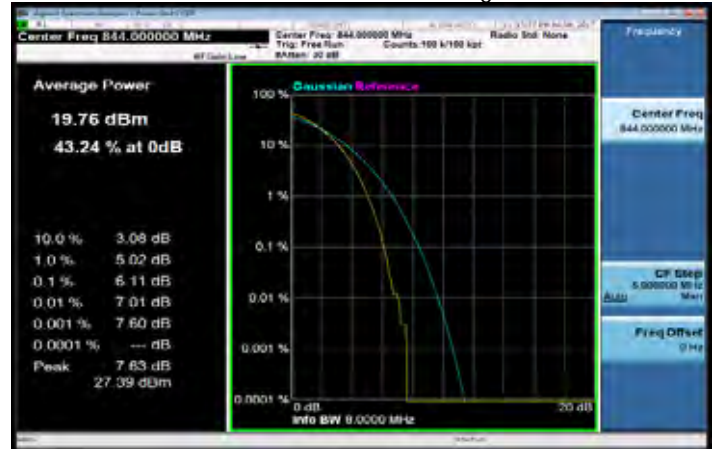
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LTE\_Band26 10MHz\_16-QAM 50\_0\_HighCH26990-844



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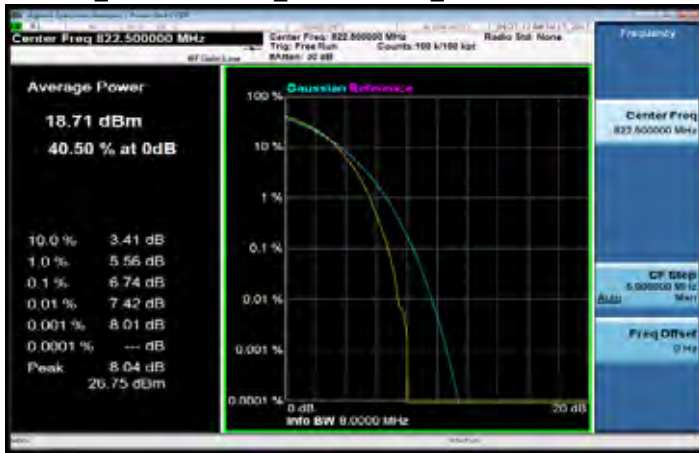
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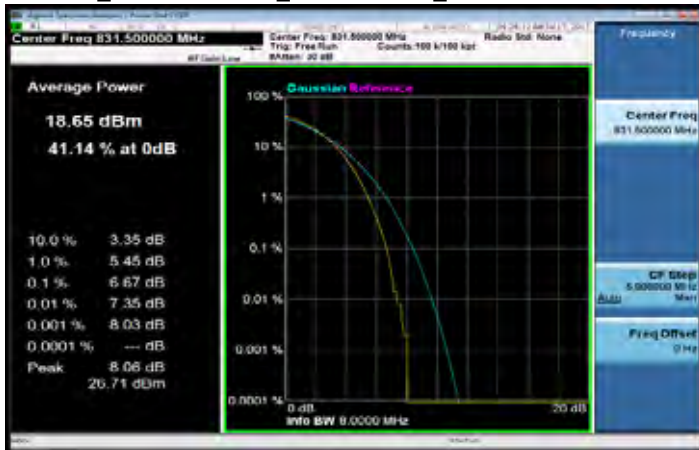
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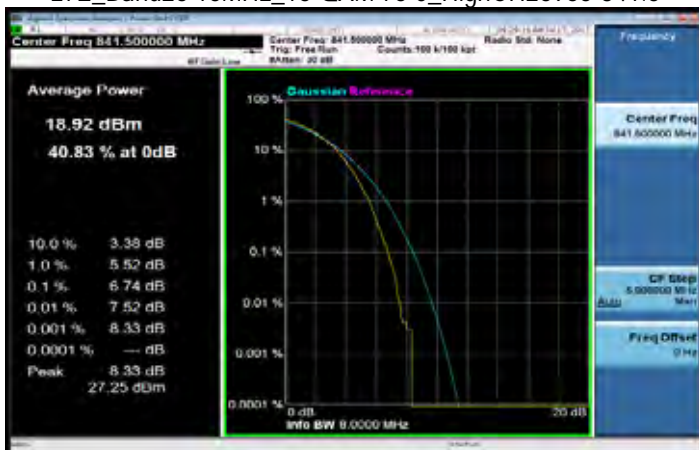
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LTE\_Band26 15MHz\_16-QAM 75 0\_HighCH26965-841.5



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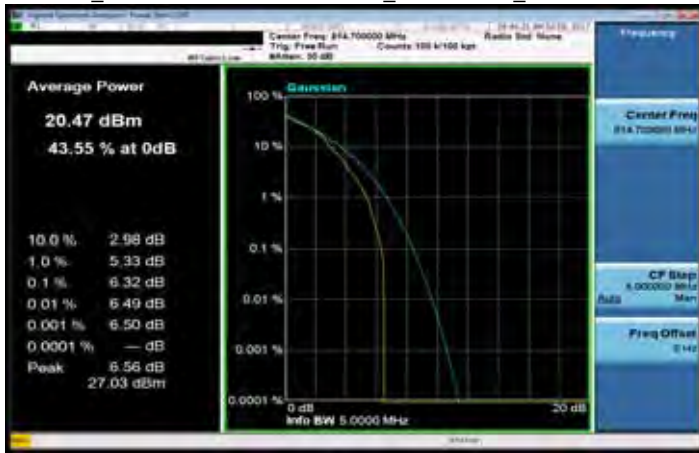
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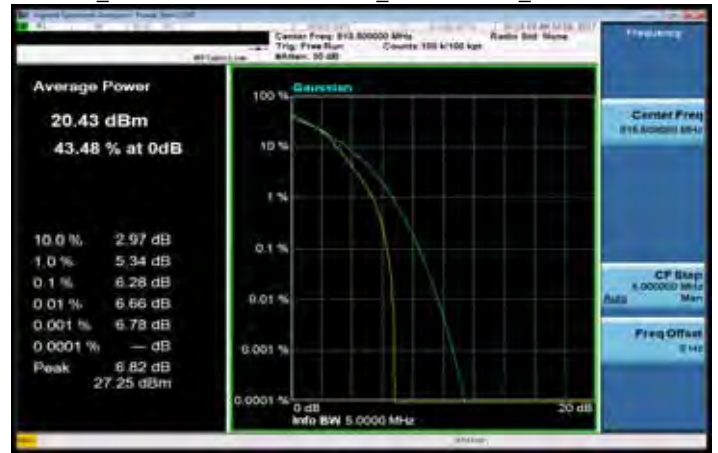
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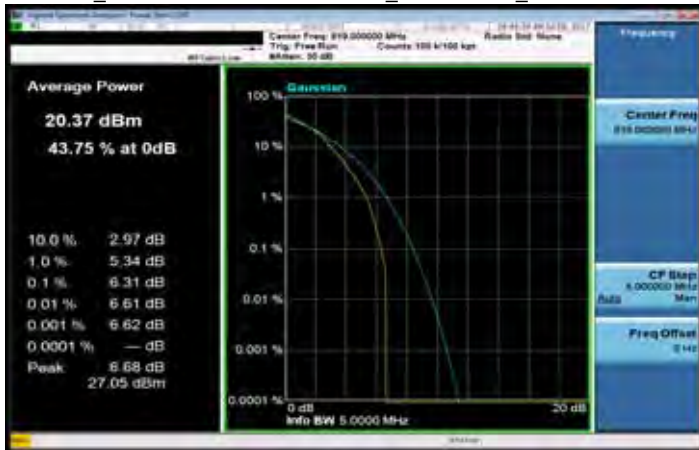
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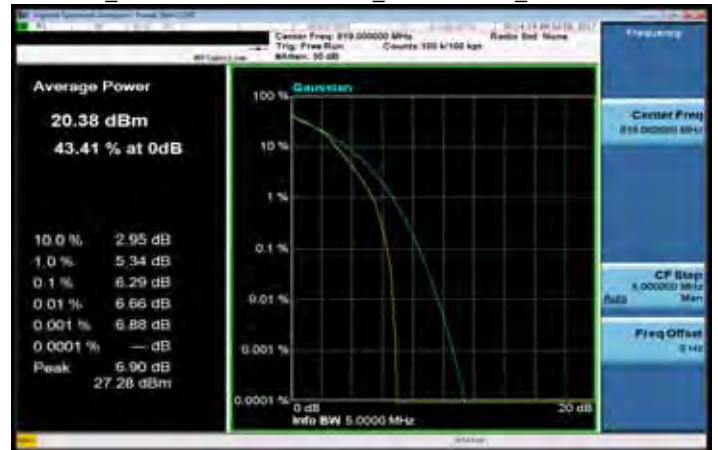
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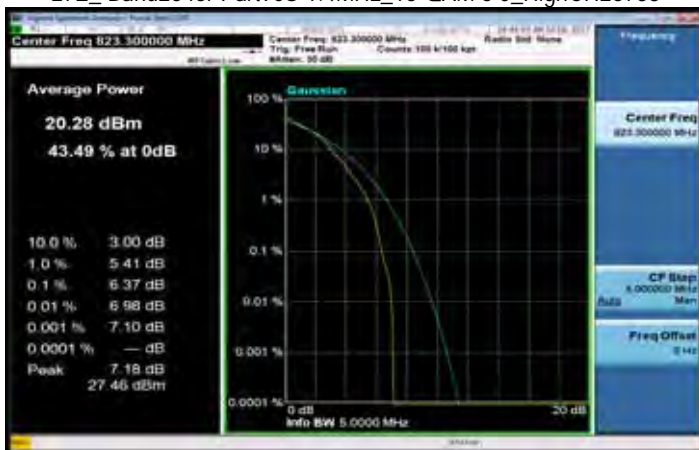
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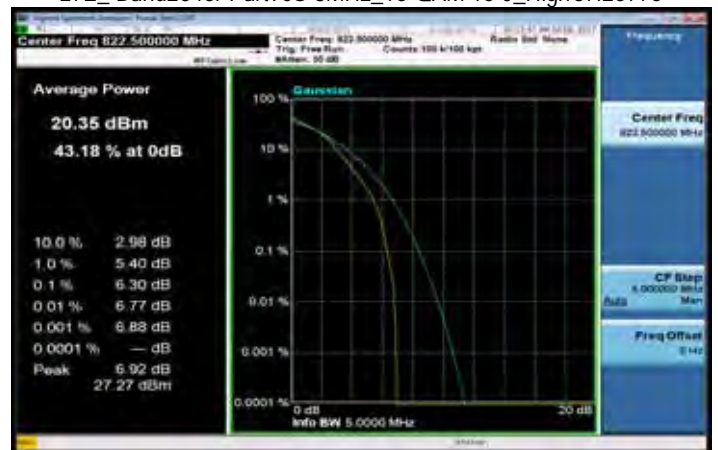
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LTE\_Band26 for Part90S 3MHz\_16-QAM 15\_0\_HighCH26775



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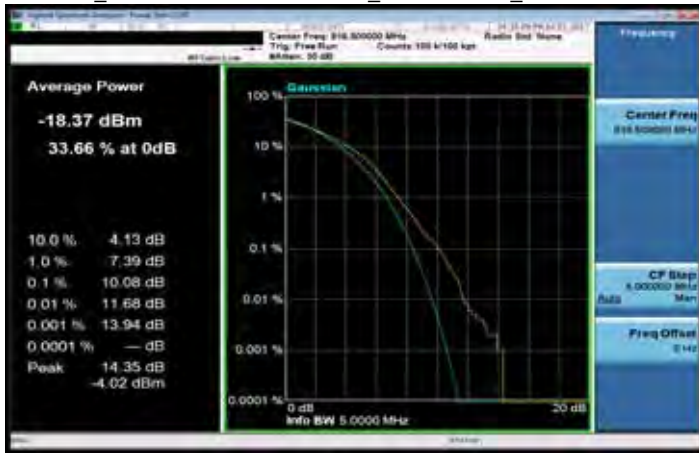
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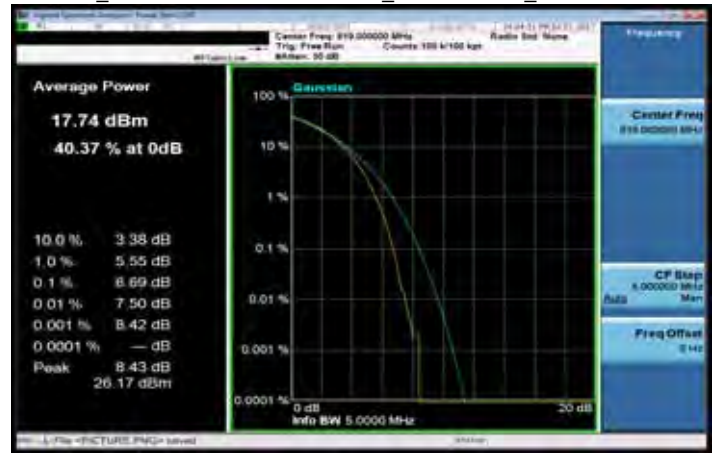
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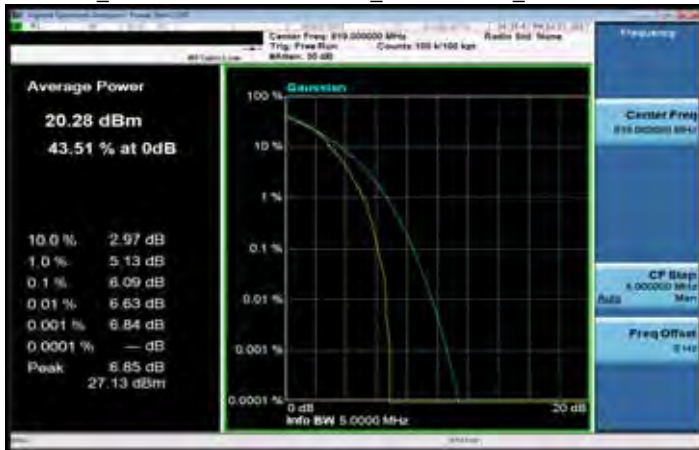
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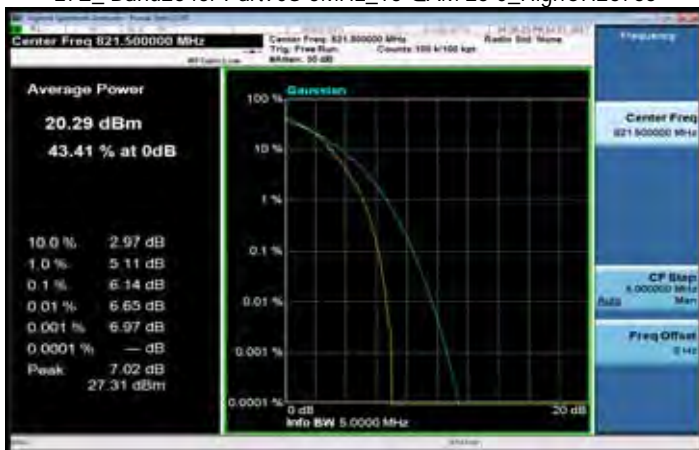
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LTE\_Band26 for Part90S 5MHz\_16-QAM 25 0\_HighCH26765



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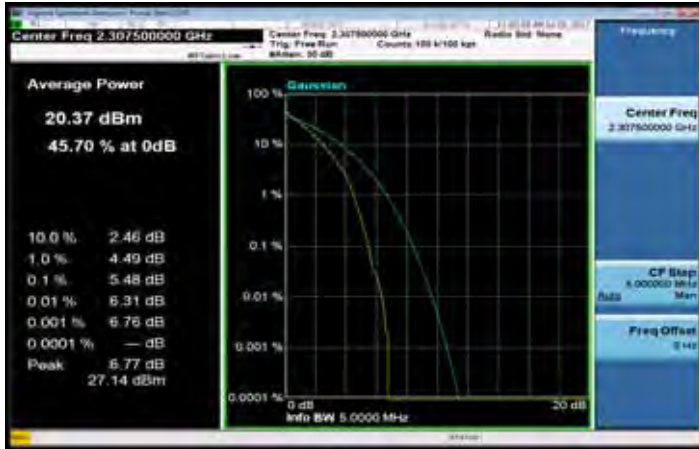
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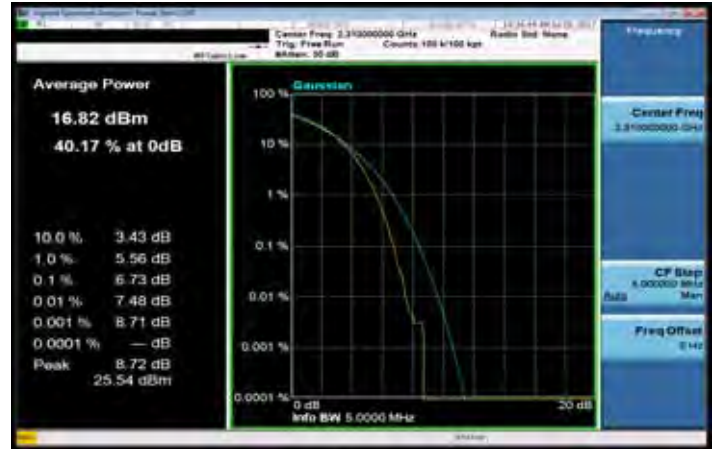
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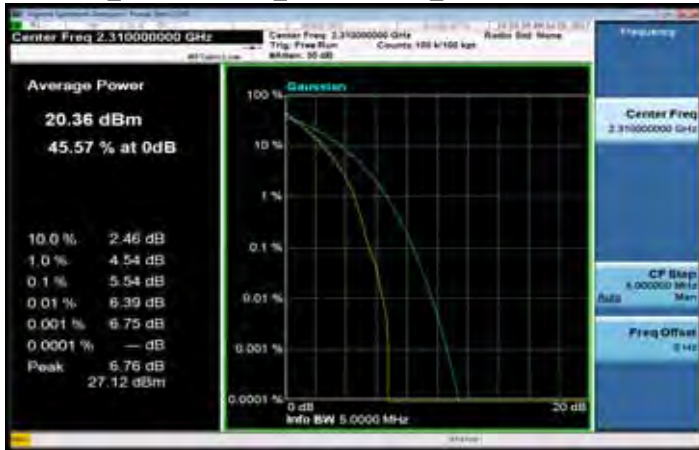
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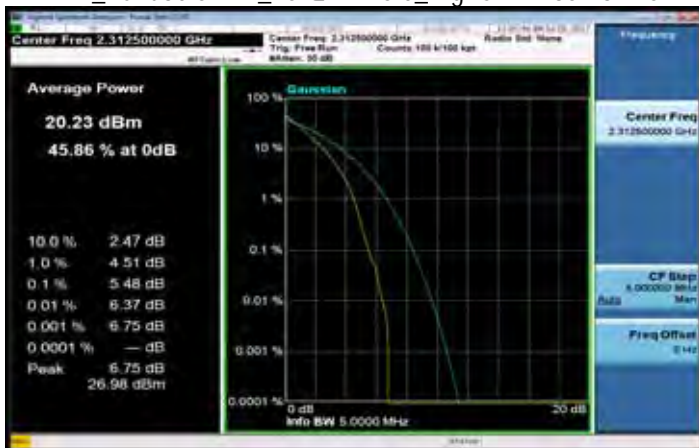
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LTE\_Band30 5MHz\_16-QAM 25 0\_MidCH27710-2310



LTE\_Band30 5MHz\_16-QAM 25 0\_HighCH27735-2312.5



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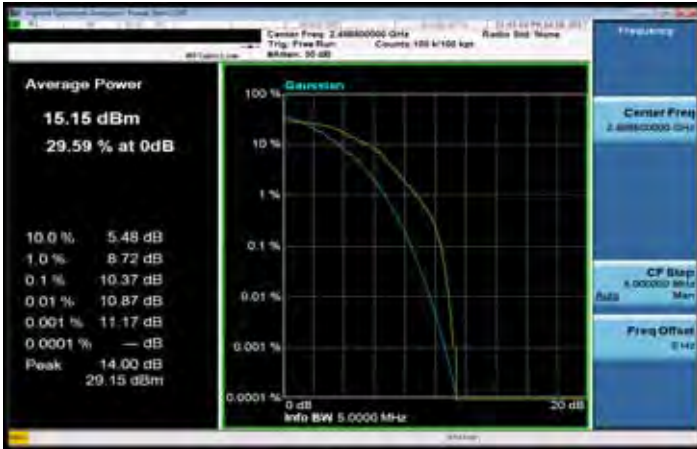
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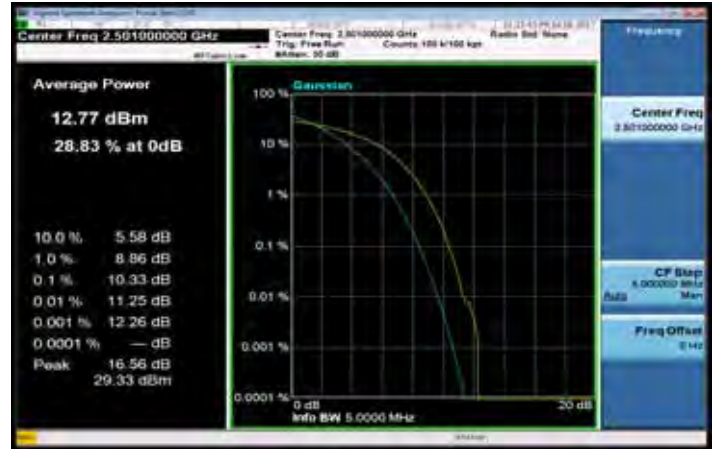
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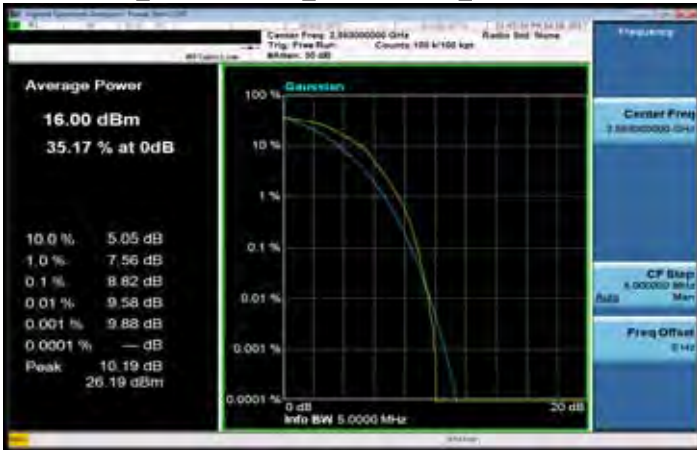
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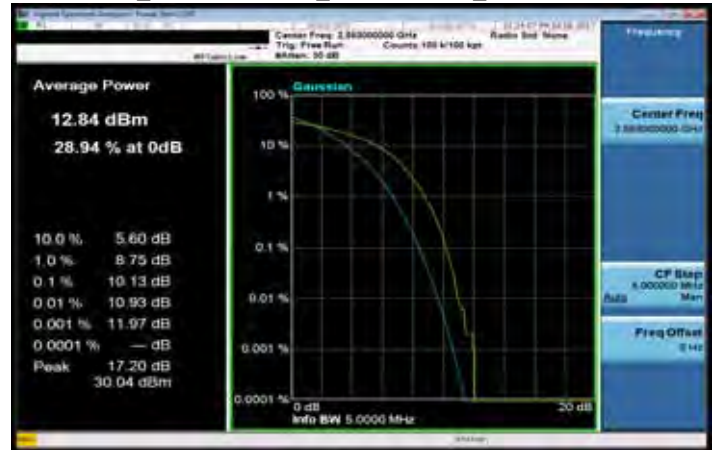
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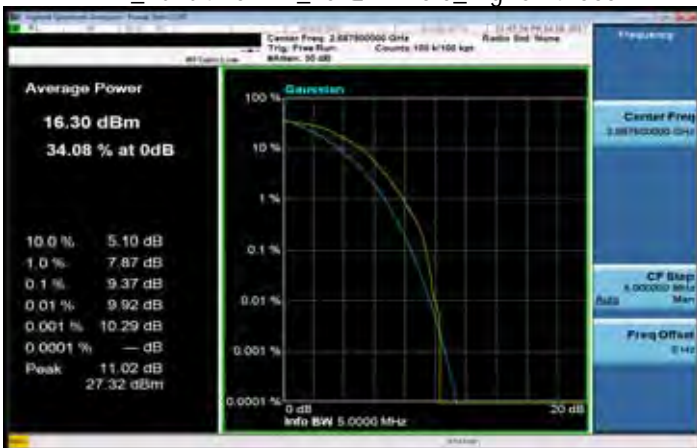
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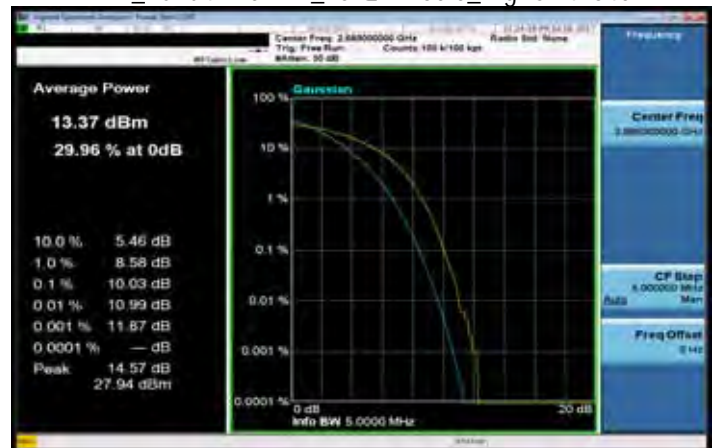
LTE\_Band41 10MHz\_16-QAM 50 0\_MidCH40620



LTE\_Band41 5MHz\_16-QAM 25 0\_HighCH41565



LTE\_Band41 10MHz\_16-QAM 50 0\_HighCH41540



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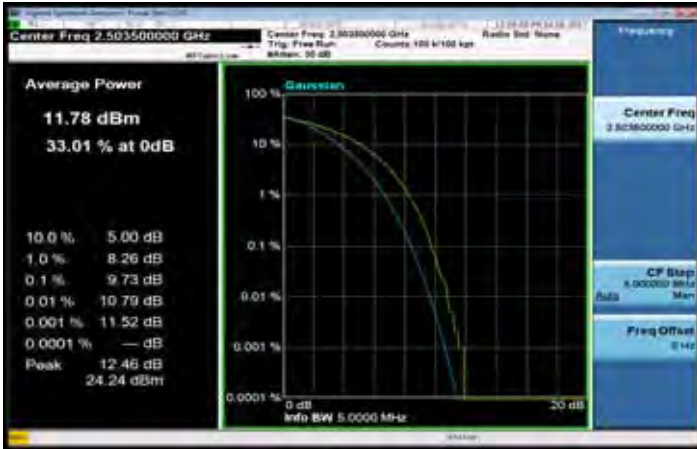
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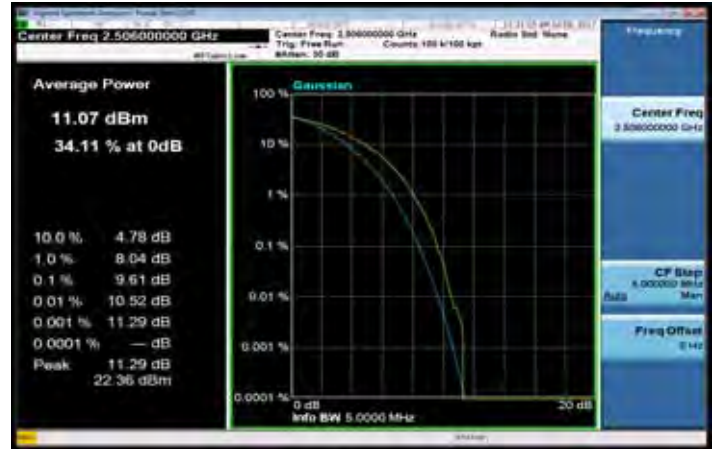
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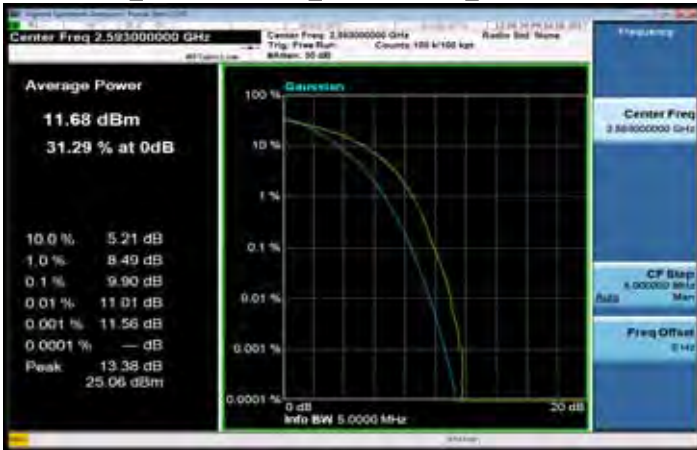
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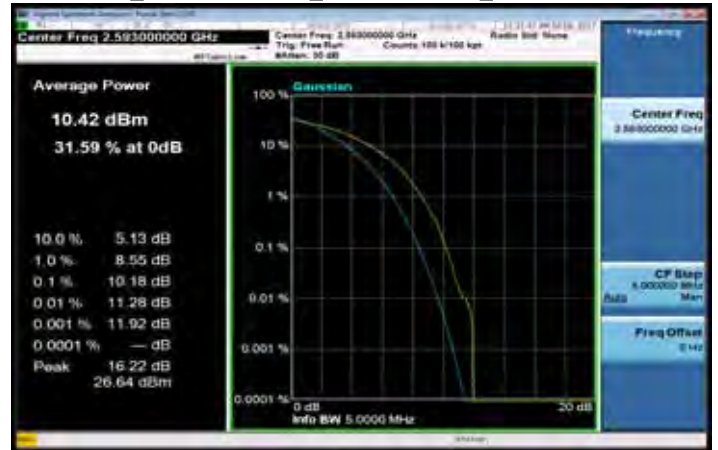
LTE\_Band41 20MHz\_16-QAM 100 0\_LowCH39750



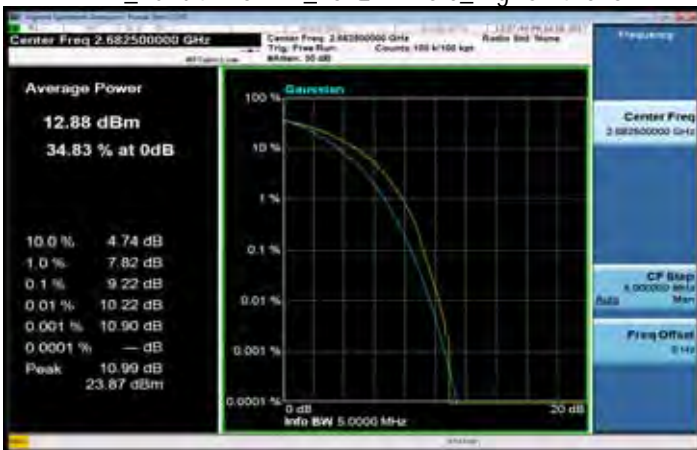
LTE\_Band41 15MHz\_16-QAM 75 0\_MidCH40620



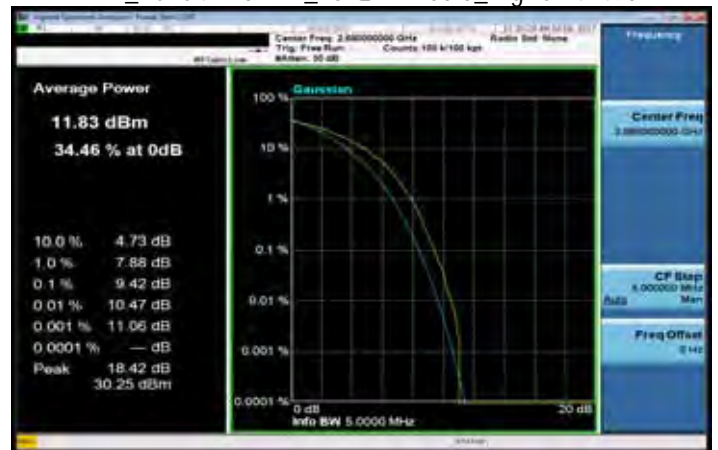
LTE\_Band41 20MHz\_16-QAM 100 0\_MidCH40620



LTE\_Band41 15MHz\_16-QAM 75 0\_HighCH41515



LTE\_Band41 20MHz\_16-QAM 100 0\_HighCH41490



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### 13. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

#### 13.1. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended to comply with § 2.1091 Radiofrequency radiation exposure evaluation: mobile devices of the FCC CFR 47 Rules, CFR 1.1310 (b) Radio frequency Radiation Exposure Requirement.

#### 13.2. Special Accessories

Not available for this EUT intended for grant

#### 13.3. Equipment Modifications

Not available for this EUT intended for grant.

#### 13.4. Limitation

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Averaging Time (minute)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f <sup>2</sup> )	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	F/1500	30
1500-15000	/	/	1.0	30

F = frequency in MHz

\* = Plane-wave equipment power density

#### 13.5. Exposure (MPE) Evaluation

The evaluation and calculation as deduces below presents only worst-case that produces highest value of the result:

Operation Configuration of the Worst-Case picked up to evaluate:

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Operation in WCDMA II band (1852.4 – 1907.6 MHz)

EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
	MHz		V/H	dBm	dBi	dB	dBm	dBm
WCDMA Band II	1852.4	9262	V	26.49	9.6	-5.05	31.04	33.00
			H	15.44	9.6	-5.05	19.99	33.00
	1880.0	9400	V	26.57	9.69	-5.16	<b>31.10</b>	33.00
			H	14.03	9.69	-5.16	18.56	33.00
	1907.6	9538	V	25.82	9.78	-5.12	30.48	33.00
			H	13.12	9.78	-5.12	17.78	33.00

**Power Density = EIRP\*Duty Cycle/(4πR<sup>2</sup>)**

Duty Cycle is 1 for WCDMA II band operation and R is 20cm.

EIRP	31.10	(dBm)
EIRP	1288.250	(mW)
Duty cycle:	100	(%)
Maximum Pav :	1288.24955	(mW)
Prediction distance:	20	(cm)
Prediction frequency:	1880	(MHz)
MPE limit for uncontrolled exposure at prediction	1.0000	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.25642	(mW/cm <sup>2</sup> )

**Measurement Result**

The predicted power density level at 20 cm is 0.25642 mW/cm<sup>2</sup>.

This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 1880MHz.

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Operation in WCDMA V band (826.4 – 846.6 MHz)

EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
WCDMA Band V	826.4	4132	V	21.50	5.48	-3.21	23.77	38.45
			H	18.33	5.48	-3.21	20.60	38.45
	836.6	4183	V	21.59	5.47	-3.26	<b>23.80</b>	38.45
			H	19.51	5.47	-3.26	21.72	38.45
	846.6	4233	V	20.93	5.45	-3.19	23.19	38.45
			H	19.37	5.45	-3.19	21.63	38.45

**Power Density = ERP\*Duty Cycle/(4πR<sup>2</sup>)**

Duty Cycle is 1 for WCDMA V band operation and R is 20cm.

ERP	<b>23.80</b>	(dBm)
ERP	239.883	(mW)
Duty cycle:	<b>100</b>	(%)
Maximum Pav :	239.883292	(mW)
Prediction distance:	20	(cm)
Prediction frequency:	<b>836.6</b>	(MHz)
MPE limit for uncontrolled exposure at prediction	0.5577	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.04775	(mW/cm <sup>2</sup> )

**Measurement Result**

The predicted power density level at 20 cm is 0.04775 mW/cm<sup>2</sup>.

This is below the uncontrolled exposure limit of 0.5577 mW/cm<sup>2</sup> at 836.6MHz.

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Operation in LTE 2 band (1855.0 – 1905.0 MHz)

EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
	MHz		V/H	dBm	dBi	dB	dBm	dBm
<b>BAND 2 BW: 3M QPSK RB: 1,14</b>	1851.5	18615	V	27.98	9.60	-5.05	<b>32.53</b>	33.01
			H	15.77	9.60	-5.05	20.32	33.01
	1880.0	18900	V	27.74	9.70	-5.17	32.27	33.01
			H	16.85	9.70	-5.17	21.38	33.01
	1908.5	19185	V	26.67	9.79	-5.13	31.33	33.01
			H	17.45	9.79	-5.13	22.11	33.01

**Power Density = EIRP\*Duty Cycle/(4πR<sup>2</sup>)**

Duty Cycle is 1 for LTE 2 band operation and R is 20cm.

EIRP	<b>32.53</b>	(dBm)
EIRP	1790.606	(mW)
Duty cycle:	<b>100</b>	(%)
Maximum Pav :	1790.60585	(mW)
Prediction distance:	20	(cm)
Prediction frequency:	<b>1851.5</b>	(MHz)
MPE limit for uncontrolled exposure at prediction	1.0000	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.35641	(mW/cm <sup>2</sup> )

**Measurement Result**

The predicted power density level at 20 cm is 0.35641 mW/cm<sup>2</sup>.

This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 1851.5MHz.

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**Operation in LTE 4 band (1711.5 – 1753.5 MHz)**

EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
	MHz		V/H	dBm	dBi	dB	dBm	dBm
<b>BAND 4 BW: 3M QPSK RB: 1,0</b>	1711.5	19965	V	25.36	9.12	-4.82	<b>29.66</b>	30.00
			H	17.68	9.12	-4.82	21.98	30.00
	1732.5	20175	V	24.72	9.19	-4.85	29.06	30.00
			H	15.79	9.19	-4.85	20.13	30.00
	1753.5	20385	V	24.86	9.26	-4.91	29.21	30.00
			H	15.28	9.26	-4.91	19.63	30.00

**Power Density = EIRP\*Duty Cycle/(4πR<sup>2</sup>)**

**Duty Cycle is 1 for LTE 4 band operation and R is 20cm.**

EIRP	<b>29.66</b>	(dBm)
EIRP	924.698	(mW)
Duty cycle:	<b>100</b>	(%)
Maximum Pav :	924.698174	(mW)
Prediction distance:	20	(cm)
Prediction frequency:	<b>1711.5</b>	(MHz)
MPE limit for uncontrolled exposure at prediction	1.0000	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.18406	(mW/cm <sup>2</sup> )

**Measurement Result**

The predicted power density level at 20 cm is 0.18406 mW/cm<sup>2</sup>.

This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 1711.5MHz.

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**Operation in LTE 5 band (825.5 – 847.5 MHz)**

EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
<b>BAND 5 BW: 1.4M QPSK RB: 1,0</b>	824.7	20407	V	24.70	5.49	-3.30	<b>26.89</b>	38.45
			H	21.16	5.49	-3.30	23.35	38.45
	836.5	20525	V	23.68	5.47	-3.35	25.80	38.45
			H	21.82	5.47	-3.35	23.94	38.45
	848.3	20643	V	21.56	5.45	-3.07	23.94	38.45
			H	21.08	5.45	-3.07	23.46	38.45

**Power Density = ERP\*Duty Cycle/(4πR<sup>2</sup>)**

**Duty Cycle is 1 for LTE 5 band operation and R is 20cm.**

ERP	<b>26.89</b>	(dBm)
ERP	488.652	(mW)
Duty cycle:	<b>100</b>	(%)
Maximum Pav :	488.652359	(mW)
Prediction distance:	20	(cm)
Prediction frequency:	<b>824.7</b>	(MHz)
MPE limit for uncontrolled exposure at prediction	0.5498	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.09726	(mW/cm <sup>2</sup> )

**Measurement Result**

The predicted power density level at 20 cm is 0.09726 mW/cm<sup>2</sup>.

This is below the uncontrolled exposure limit of 0.5498 mW/cm<sup>2</sup> at 824.7MHz.

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**Operation in LTE 7 band (2507.5 – 2562.5 MHz)**

EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
	MHz		V/H	dBm	dBi	dB	dBm	dBm
<b>BAND 7 BW: 10M QPSK RB: 1,49</b>	2505.0	20800	V	27.58	10.42	-5.89	<b>32.11</b>	33.01
			H	17.07	10.42	-5.89	21.60	33.01
	2535.0	21100	V	26.23	10.47	-5.90	30.80	33.01
			H	18.21	10.47	-5.90	22.78	33.01
	2565.0	21400	V	26.90	10.52	-5.98	31.44	33.01
			H	13.74	10.52	-5.98	18.28	33.01

**Power Density = EIRP\*Duty Cycle/(4πR<sup>2</sup>)**

**Duty Cycle is 1 for LTE 7 band operation and R is 20cm.**

EIRP	<b>32.11</b>	(dBm)
EIRP	1625.549	(mW)
Duty cycle:	<b>100</b>	(%)
Maximum Pav :	1625.54876	(mW)
Prediction distance:	20	(cm)
Prediction frequency:	<b>2505</b>	(MHz)
MPE limit for uncontrolled exposure at prediction	1.0000	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.32356	(mW/cm <sup>2</sup> )

**Measurement Result**

The predicted power density level at 20 cm is 0.32356 mW/cm<sup>2</sup>.

This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 2505MHz.

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**Operation in LTE 12 band (700.5 – 714.5 MHz)**

EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
<b>BAND 12 BW: 1.4M QPSK RB: 1,0</b>	699.7	23017	V	23.60	5.44	-3.28	<b>25.76</b>	34.77
			H	12.89	5.44	-3.28	15.05	34.77
	707.5	23095	V	20.72	5.46	-3.23	22.95	34.77
			H	13.70	5.46	-3.23	15.93	34.77
	715.3	23173	V	20.15	5.46	-3.01	22.60	34.77
			H	11.62	5.46	-3.01	14.07	34.77

$$\text{Power Density} = \text{ERP} \cdot \text{Duty Cycle} / (4\pi R^2)$$

Duty Cycle is 1 for LTE 12 band operation and R is 20cm.

ERP	<b>25.76</b>	(dBm)
ERP	376.704	(mW)
Duty cycle:	<b>100</b>	(%)
Maximum Pav :	376.703799	(mW)
Prediction distance:	20	(cm)
Prediction frequency:	<b>699.7</b>	(MHz)
MPE limit for uncontrolled exposure at prediction	0.4665	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.07498	(mW/cm <sup>2</sup> )

**Measurement Result**

The predicted power density level at 20 cm is 0.07498 mW/cm<sup>2</sup>.

This is below the uncontrolled exposure limit of 0.4665 mW/cm<sup>2</sup> at 699.7MHz.

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**Operation in LTE 13 band (779.5 – 784.5 MHz)**

EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
<b>BAND 13 BW: 10M QPSK RB: 1,49</b>	782.0	23230	V	22.13	5.49	-3.11	<b>24.51</b>	34.77
			H	21.00	5.49	-3.11	23.38	34.77

**Power Density = ERP\*Duty Cycle/(4πR<sup>2</sup>)**

**Duty Cycle is 1 for LTE 13 band operation and R is 20cm.**

ERP	24.51	(dBm)
ERP	282.488	(mW)
Duty cycle:	100	(%)
Maximum Pav :	282.487997	(mW)
Prediction distance:	20	(cm)
Prediction frequency:	782	(MHz)
MPE limit for uncontrolled exposure at prediction	0.5213	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.05623	(mW/cm <sup>2</sup> )

**Measurement Result**

The predicted power density level at 20 cm is 0.05623 mW/cm<sup>2</sup>.

This is below the uncontrolled exposure limit of 0.5213 mW/cm<sup>2</sup> at 782MHz.

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Operation in LTE 25 band (1850.7 – 1914.3 MHz)

EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
	MHz		V/H	dBm	dBi	dB	dBm	dBm
<b>BAND 25 BW: 3M QPSK RB: 1,0</b>	1851.5	26055	V	22.37	9.59	-5.05	26.91	33.01
			H	15.21	9.59	-5.05	19.75	33.01
	1882.5	26365	V	23.28	9.70	-5.16	27.82	33.01
			H	16.93	9.70	-5.16	21.47	33.01
	1913.5	26675	V	26.70	9.80	-5.14	<b>31.36</b>	33.01
			H	18.61	9.80	-5.14	23.27	33.01

$$\text{Power Density} = \text{ERP} \cdot \text{Duty Cycle} / (4\pi R^2)$$

Duty Cycle is 1 for LTE 25 band operation and R is 20cm.

EIRP	<b>31.36</b>	(dBm)
EIRP	1367.729	(mW)
Duty cycle:	<b>100</b>	(%)
Maximum Pav :	1367.72883	(mW)
Prediction distance:	20	(cm)
Prediction frequency:	<b>1913.5</b>	(MHz)
MPE limit for uncontrolled exposure at prediction	1.0000	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.27224	(mW/cm <sup>2</sup> )

**Measurement Result**

The predicted power density level at 20 cm is 0.27224 mW/cm<sup>2</sup>.

This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 1913.5MHz.

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**Operation in LTE 26 band (825.5 – 847.5 MHz)**

EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
<b>BAND 26 BW: 1.4M QPSK RB: 1,0</b>	824.7	26797	V	23.85	5.49	-3.29	<b>26.05</b>	38.50
			H	16.47	5.49	-3.29	18.67	38.50
	836.5	26915	V	22.57	5.47	-3.32	24.72	38.50
			H	17.02	5.47	-3.32	19.17	38.50
	848.3	27033	V	19.68	5.45	-3.08	22.05	38.50
			H	18.57	5.45	-3.08	20.94	38.50

**Power Density = ERP\*Duty Cycle/(4πR<sup>2</sup>)**

Duty Cycle is 1 for LTE 26 band operation and R is 20cm.

ERP	<b>26.05</b>	(dBm)
ERP	402.717	(mW)
Duty cycle:	<b>100</b>	(%)
Maximum Pav :	402.717034	(mW)
Prediction distance:	20	(cm)
Prediction frequency:	<b>824.7</b>	(MHz)
MPE limit for uncontrolled exposure at prediction	0.5498	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.08016	(mW/cm <sup>2</sup> )

**Measurement Result**

The predicted power density level at 20 cm is 0.08016 mW/cm<sup>2</sup>.

This is below the uncontrolled exposure limit of 0.5498 mW/cm<sup>2</sup> at 824.7MHz.

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Operation in LTE 26 band (815.5 – 822.5 MHz) for Part 90S

EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
<b>BAND 26 BW: 1.4M QPSK RB: 1,0</b>	814.7	26697	V	22.27	5.50	-3.50	24.27	50.00
			H	15.12	5.50	-3.50	17.12	50.00
	819.0	26740	V	23.75	5.50	-3.24	26.01	50.00
			H	16.43	5.50	-3.24	18.69	50.00
	823.3	26783	V	24.52	5.49	-3.51	<b>26.50</b>	50.00
			H	17.14	5.49	-3.51	19.12	50.00

**Power Density = ERP\*Duty Cycle/(4πR<sup>2</sup>)**

Duty Cycle is 1 for LTE 26 band operation and R is 20cm.

ERP	<b>26.50</b>	(dBm)
ERP	446.684	(mW)
Duty cycle:	<b>100</b>	(%)
Maximum Pav :	446.683592	(mW)
Prediction distance:	20	(cm)
Prediction frequency:	<b>823.3</b>	(MHz)
MPE limit for uncontrolled exposure at prediction	0.5489	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.08891	(mW/cm <sup>2</sup> )

**Measurement Result**

The predicted power density level at 20 cm is 0.08891 mW/cm<sup>2</sup>.

This is below the uncontrolled exposure limit of 0.5489 mW/cm<sup>2</sup> at 823.3MHz.

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Operation in LTE 30 band (2307.5 – 2312.5 MHz)

EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
<b>BAND 30</b> <b>BW: 10M</b> <b>16QAM</b> <b>RB: 1,0</b>	2310.0	27710	V	26.17	10.28	-5.65	<b>30.80</b>	34.77
			H	19.67	10.28	-5.65	24.30	34.77

$$\text{Power Density} = \text{ERP} \cdot \text{Duty Cycle} / (4\pi R^2)$$

Duty Cycle is 1 for LTE 30 band operation and R is 20cm.

EIRP	<b>30.80</b>	(dBm)
EIRP	1202.264	(mW)
Duty cycle:	<b>100</b>	(%)
Maximum Pav :	1202.26443	(mW)
Prediction distance:	20	(cm)
Prediction frequency:	<b>2310</b>	(MHz)
MPE limit for uncontrolled exposure at prediction	1.0000	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.23930	(mW/cm <sup>2</sup> )

**Measurement Result**

The predicted power density level at 20 cm is 0.2393 mW/cm<sup>2</sup>.

This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 2310MHz.

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Operation in LTE 41 band (2506.0 – 2680.0 MHz)

EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
	MHz		V/H	dBm	dBi	dB	dBm	dBm
<b>BAND 41 BW: 5M QPSK RB: 1,0</b>	2547.5	40165	V	26.06	10.39	-5.88	<b>30.57</b>	33.01
			H	16.15	10.39	-5.88	20.66	33.01
	2600.0	40690	V	24.58	10.57	-6.00	29.15	33.01
			H	12.67	10.57	-6.00	17.24	33.01
	2652.5	41215	V	20.94	10.73	-6.16	25.51	33.01
			H	11.33	10.73	-6.16	15.90	33.01

**Power Density = EIRP\*Duty Cycle/(4πR<sup>2</sup>)**

Duty Cycle is 1 for LTE 41 band operation and R is 20cm.

EIRP	<b>30.57</b>	(dBm)
EIRP	1140.250	(mW)
Duty cycle:	<b>100</b>	(%)
Maximum Pav :	1140.24979	(mW)
Prediction distance:	20	(cm)
Prediction frequency:	<b>2547.5</b>	(MHz)
MPE limit for uncontrolled exposure at prediction	1.0000	(mW/cm <sup>2</sup> )
Power density at predication frequency at 20 (cm)	0.22696	(mW/cm <sup>2</sup> )

**Measurement Result**

The predicted power density level at 20 cm is 0.22696 mW/cm<sup>2</sup>.

This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 2547.5MHz.

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### 13.6. Collocated MPE Analysis

The modem may transmit simultaneously with other collocated radio transmitters within a host device, provided the following conditions are met:

Each collocated radio transmitter has been certified by FCC/IC for mobile application (that will be met since SQNS module will have its own FCC ID and host device will have its own FCC ID) At least 20 cm separation distance between the antennas of the collocated transmitters and the user's body must be maintained at all times (host installation should taking care of that)

The output power and antenna gain in a collocated configuration must not exceed the limits and configurations stipulated in the following table 1. The power density calculations for the individual transmitters per wireless technology at an exposure minimum separation distance of 20cm.

#### Exclusion of test condition:

*Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on calculated or measured field strengths or power density, is  $\leq 1.0$ .*

$$MPE\ ratio1 + MPE\ ratio2 + MPE\ ratio3 \leq 1.0$$

*The spreadsheet as FCC deduces, and releases is employed to conduct the measurement:*

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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](http://www.tw.sgs.com)

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Table 1 : Collocated MPE Calculation (Worse-case table)

Technology	Frequency (MHz)	Max Conducted Power (dBm)	Max Gain (dBi)	Duty Cycle	FCC Power Density @20cm (mW/cm <sup>2</sup> )	FCC MPE Limit (mW/cm <sup>2</sup> )
LTE B12	699.7	23.47	-3.21	1.00	0.021	0.466
LTE B26	824.7	23.20	1.63	1.00	0.061	0.550
LTE B4	1711.5	23.20	0.13	1.00	0.043	1.000
LTE B2	1851.5	23.35	0.69	1.00	0.050	1.000
LTE B7	2535.0	22.07	3.82	1.00	0.077	1.000
LTE B30	2310	21.76	2.55	1.00	0.054	1.000
LTE B41	2547.5	21.78	3.82	1.00	0.072	1.000
WLAN (2.4GHz MIMO)	2412	15.97	5.8	1.00	0.030	1.000
WLAN (5GHz MIMO)	5825	12.99	7.38	1.00	0.022	1.000

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Scenario 1:

Wifi\_MIMO 2.4G + Wifi\_MIMO 5G + 3/4G (frequency band 700)

WLAN 2.4G (mW/cm <sup>2</sup> )	WLAN 2.4G / MPE limit	(WLAN 2.4G) / MPE limit	WLAN 5G MIMO (mW/cm <sup>2</sup> )	WLAN 5G MIMO / MPE limit	(WLAN 5G) MIMO / MPE limit	WWAN 700 MHz (mW/cm <sup>2</sup> )	FCC MPE limit (mW/cm <sup>2</sup> )	(WWAN 700MHz) / MPE limit	(WWAN 700MHz +WLAN MIMO 2.4G + WLAN MIMO 5G)	FCC Limit (mW/cm <sup>2</sup> )
0.030	1.00	0.030	0.022	1.00	0.022	0.021	0.521	0.045	0.097	1.000

Scenario 2:

Wifi\_MIMO 2.4G + Wifi\_MIMO 5G + 3/4G (frequency band 850)

WLAN 2.4G (mW/cm <sup>2</sup> )	WLAN 2.4G / MPE limit	(WLAN 2.4G) / MPE limit	WLAN 5G MIMO (mW/cm <sup>2</sup> )	WLAN 5G MIMO / MPE limit	(WLAN 5G) MIMO / MPE limit	WWAN 850 MHz (mW/cm <sup>2</sup> )	FCC MPE limit (mW/cm <sup>2</sup> )	(WWAN 700MHz) / MPE limit	(WWAN 850MHz +WLAN MIMO 2.4G + WLAN MIMO 5G)	FCC Limit (mW/cm <sup>2</sup> )
0.030	1.00	0.030	0.022	1.00	0.022	0.061	0.550	0.111	0.163	1.000

Scenario 3:

Wifi\_MIMO 2.4G + Wifi\_MIMO 5G + 3/4G (frequency band 1700)

WLAN 2.4G (mW/cm <sup>2</sup> )	WLAN 2.4G / MPE limit	(WLAN 2.4G) / MPE limit	WLAN 5G MIMO (mW/cm <sup>2</sup> )	WLAN 5G MIMO / MPE limit	(WLAN 5G) MIMO / MPE limit	WWAN 1700 MHz (mW/cm <sup>2</sup> )	FCC MPE limit (mW/cm <sup>2</sup> )	(WWAN 1700MHz) / MPE limit	(WWAN 1700MHz +WLAN MIMO 2.4G + WLAN MIMO 5G)	FCC Limit (mW/cm <sup>2</sup> )
0.030	1.00	0.030	0.022	1.00	0.022	0.043	1.00	0.043	0.095	1.000

Scenario 4:

Wifi\_MIMO 2.4G + Wifi\_MIMO 5G + 3/4G (frequency band 1900)

WLAN 2.4G (mW/cm <sup>2</sup> )	WLAN 2.4G / MPE limit	(WLAN 2.4G) / MPE limit	WLAN 5G MIMO (mW/cm <sup>2</sup> )	WLAN 5G MIMO / MPE limit	(WLAN 5G) MIMO / MPE limit	WWAN 1900 MHz (mW/cm <sup>2</sup> )	FCC MPE limit (mW/cm <sup>2</sup> )	(WWAN 1900MHz) / MPE limit	(WWAN 1900MHz +WLAN MIMO 2.4G + WLAN MIMO 5G)	FCC Limit (mW/cm <sup>2</sup> )
0.030	1.00	0.030	0.022	1.00	0.022	0.050	1.00	0.050	0.102	1.000

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Scenario 5:

Wifi\_MIMO 2.4G + Wifi\_MIMO 5G + 3/4G (frequency band 2500)

WLAN 2.4G (mW/cm <sup>2</sup> )	WLAN 2.4G / MPE limit	(WLAN 2.4G) / MPE limit	WLAN 5G MIMO (mW/cm <sup>2</sup> )	WLAN 5G MIMO / MPE limit	(WLAN 5G) MIMO / MPE limit	WWAN 2500 MHz (mW/cm <sup>2</sup> )	FCC MPE limit (mW/cm <sup>2</sup> )	(WWAN 2500MHz ) / MPE limit	(WWAN 2500MHz +WLAN MIMO 2.4G + WLAN MIMO 5G	FCC Limit (mW/cm <sup>2</sup> )
0.030	1.00	0.030	0.022	1.00	0.022	0.077	1.00	0.077	0.129	1.000

Scenario 56

Wifi\_MIMO 2.4G + Wifi\_MIMO 5G + 3/4G (frequency band 2300)

WLAN 2.4G (mW/cm <sup>2</sup> )	WLAN 2.4G / MPE limit	(WLAN 2.4G) / MPE limit	WLAN 5G MIMO (mW/cm <sup>2</sup> )	WLAN 5G MIMO / MPE limit	(WLAN 5G) MIMO / MPE limit	WWAN 2500 MHz (mW/cm <sup>2</sup> )	FCC MPE limit (mW/cm <sup>2</sup> )	(WWAN 2500MHz ) / MPE limit	(WWAN 2500MHz +WLAN MIMO 2.4G + WLAN MIMO 5G	FCC Limit (mW/cm <sup>2</sup> )
0.030	1.00	0.030	0.022	1.00	0.022	0.054	1.00	0.054	0.106	1.000

Scenario 7:

Wifi\_MIMO 2.4G + Wifi\_MIMO 5G + 3/4G (frequency band 2600)

WLAN 2.4G (mW/cm <sup>2</sup> )	WLAN 2.4G / MPE limit	(WLAN 2.4G) / MPE limit	WLAN 5G MIMO (mW/cm <sup>2</sup> )	WLAN 5G MIMO / MPE limit	(WLAN 5G) MIMO / MPE limit	WWAN 2500 MHz (mW/cm <sup>2</sup> )	FCC MPE limit (mW/cm <sup>2</sup> )	(WWAN 2500MHz ) / MPE limit	(WWAN 2500MHz +WLAN MIMO 2.4G + WLAN MIMO 5G	FCC Limit (mW/cm <sup>2</sup> )
0.030	1.00	0.030	0.022	1.00	0.022	0.072	1.00	0.072	0.124	1.000

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