

TA9210D

12.5W CW 0.03 – 4.0 GHz GaN Power Transistor

Application Note: TA9210D EVB I

Application Note

3300MHz~3800MHz

36V 50mA

Rev-1.3

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1. General Description

The TA9210D is a broadband capable 12.5W GaN power transistor covering 30MHz to 2.7GHz frequency band with a single match. TA9210D is usable up to 4GHz. The input and output can be matched for best power and efficiency for the desired band.

The TA9210D is packaged in a compact, low-cost Quad Flat No lead (QFN) 3x6x0.75mm, 32 leads plastic package. TA9210D-EVB-I is tuned from 3300MHz to 3800MHz.

2. TA9210D-EVB-I Board Details

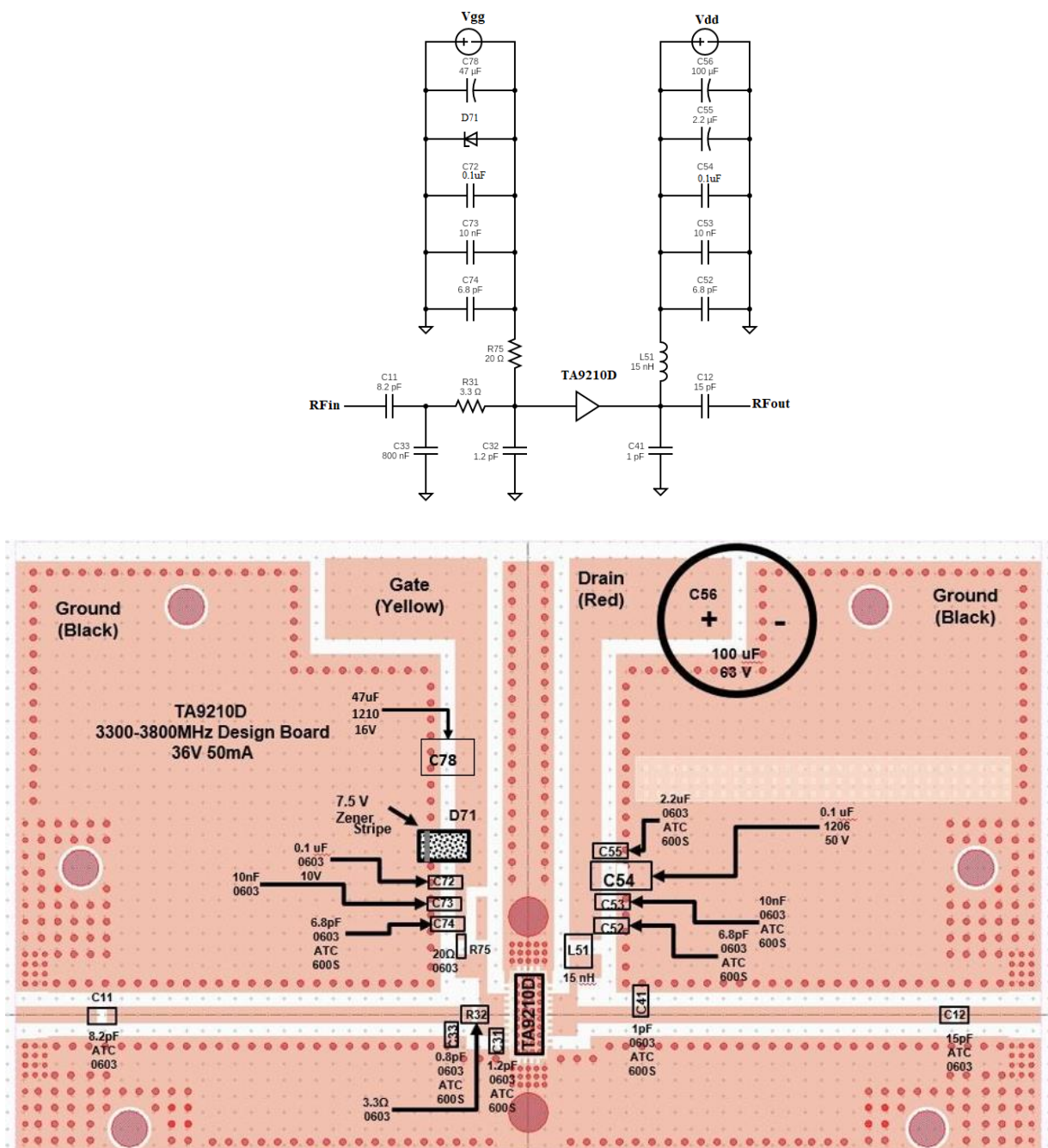


Figure 2.1 TA9210D-EVB-I 3300MHz ~ 3800MHz Schematic and EVB Layout

3. [TA9210D-EVB-I Bill of Material](#)

Component ID	Value	Manufacturer	Recommended Part Number
C11	8.2pF	AVX	600S8R2CT250XT
C12	15pF	AVX	600S150JT250XT
C31	1.2pF	AVX	600S1R2BT250XT
R32	3.3Ω	Vishay	CRCW06033R30FKEAHP
C33	0.8pF	AVX	600S0R8AT250XT
C41	1pF	AVX	600S1R0BT250XT
L51	15nH	Coil craft	0603HC-15NXGRW
C52, C74	6.8pF	AVX	600S6R8CT250XT
C53, C72	10nF, 50V	Murata	GCM1887U1H103JA16J
C54	0.1μF, 50V	Murata	GRM31C5C1H104JA01L
C55	2.2μF, 50V	Murata	GRM188R61H225KE11D
C56	100uF	Nichicon	UPW1J101MPD1TD
D71	7.5 V Zener	On Semiconductor	MMSZ5236BT 1G
C72	0.1μF, 10V	AVX	0603ZC104K4T2A
R75	20Ω	Vishay	CRCW060320R0FKEAHP
C78	47μF, 16V	Murata	GRM32ER61C476ME15L
Q1	12.5W GaN Transistor	Tagore Technology	TA9210D
PCB	Rogers RO4350B, 20 mils, 2 oz copper		

Table 3.1 TA9210D-EVB-I BOM

4. [TA9210D-EVB-I Biasing Sequence](#)

Turn ON Device	Turn OFF Device
<ol style="list-style-type: none"> 1. Set V_G to -5V 2. Set V_D to +36V 3. Adjust V_G to reach required I_{DQ} current 4. Apply RF power 	<ol style="list-style-type: none"> 1. Turn RF power off 2. Turn off V_D 3. Turn off V_G

Table 4.1 TA9210D-EVB-I Bias and Sequencing

5. [TA9210D-EVB-I Board Measurement Summary](#)

Frequency (GHz)	S21 Gain(dB)	S11 (dB)	S22 (dB)
3.3	13	-6.6	-5.8
3.5	13.8	-8.8	-7.6
3.7	14.3	-8.9	-11.5
3.8	14.3	-7.8	-14.4
4.2	12.4	-4.6	-9.0

Table 5.1 TA9210D-EVB-I 36V 50mA Electrical Characteristics Summary

6. TA9210D-EVB-I Test Results

All the tests are carried out at room temperature.

6.1. S parameters

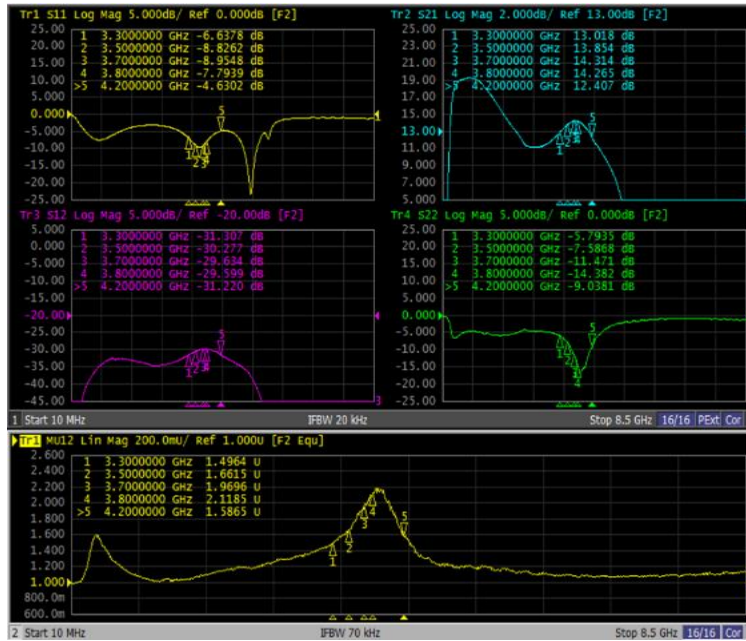


Figure 6.1.1. S parameters of TA9210D-EVB-I 36V 50mA

6.2. Spectrum Mask Plot at 3.8GHz

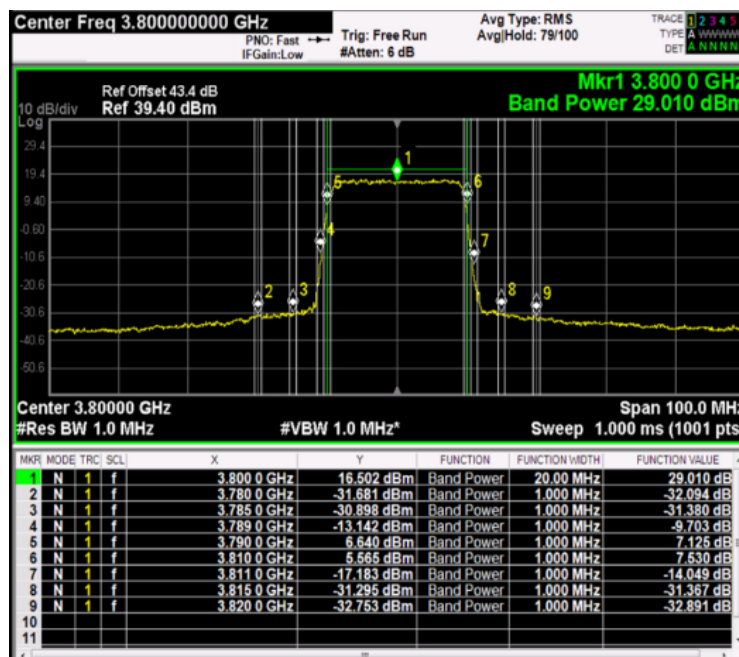


Figure 6.2.1. Spectrum Mask Plot at 3.8GHz @ Pout = 29dBm, 36V, 50mA Idq
DC Power dissipation <7W at Pout = 29dBm

6.3. Spectrum Mask Plot at 3300-3800MHz @ Pout = 21dBm

Center 3.30000 GHz						Span 100.0 MHz					
#Res BW 1.0 MHz						#VBW 1.0 MHz*					
Sweep 1.000 ms (1001 pts)											
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE			
1	N	1	f	3.300 0 GHz	8.443 dBm	Band Power	20.00 MHz	-21.083 dB			
2	N	1	f	3.280 0 GHz	-32.653 dBm	Band Power	1.000 MHz	-32.806 dB			
3	N	1	f	3.285 0 GHz	-30.747 dBm	Band Power	1.000 MHz	-30.758 dB			
4	N	1	f	3.289 0 GHz	-20.778 dBm	Band Power	1.000 MHz	-17.106 dB			
5	N	1	f	3.290 0 GHz	-1.158 dBm	Band Power	1.000 MHz	-0.455 dB			
6	N	1	f	3.310 0 GHz	-2.805 dBm	Band Power	1.000 MHz	-1.125 dB			
7	N	1	f	3.311 0 GHz	-24.268 dBm	Band Power	1.000 MHz	-21.993 dB			
8	N	1	f	3.315 0 GHz	-31.344 dBm	Band Power	1.000 MHz	-31.304 dB			
9	N	1	f	3.320 0 GHz	-32.956 dBm	Band Power	1.000 MHz	-33.286 dB			

Center 3.40000 GHz						Span 100.0 MHz					
#Res BW 1.0 MHz						#VBW 1.0 MHz*					
Sweep 1.000 ms (1001 pts)											
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE			
1	N	1	f	3.400 0 GHz	8.634 dBm	Band Power	20.00 MHz	-21.091 dB			
2	N	1	f	3.380 0 GHz	-32.825 dBm	Band Power	1.000 MHz	-33.056 dB			
3	N	1	f	3.385 0 GHz	-31.190 dBm	Band Power	1.000 MHz	-31.132 dB			
4	N	1	f	3.389 0 GHz	-21.563 dBm	Band Power	1.000 MHz	-17.443 dB			
5	N	1	f	3.390 0 GHz	-1.011 dBm	Band Power	1.000 MHz	-0.801 dB			
6	N	1	f	3.410 0 GHz	-2.840 dBm	Band Power	1.000 MHz	-0.855 dB			
7	N	1	f	3.411 0 GHz	-24.276 dBm	Band Power	1.000 MHz	-21.767 dB			
8	N	1	f	3.415 0 GHz	-31.217 dBm	Band Power	1.000 MHz	-31.364 dB			
9	N	1	f	3.420 0 GHz	-32.877 dBm	Band Power	1.000 MHz	-33.239 dB			

Center 3.50000 GHz						Span 100.0 MHz					
#Res BW 1.0 MHz						#VBW 1.0 MHz*					
Sweep 1.000 ms (1001 pts)											
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE			
1	N	1	f	3.500 0 GHz	8.451 dBm	Band Power	20.00 MHz	-21.028 dB			
2	N	1	f	3.480 0 GHz	-33.639 dBm	Band Power	1.000 MHz	-33.786 dB			
3	N	1	f	3.485 0 GHz	-32.109 dBm	Band Power	1.000 MHz	-32.376 dB			
4	N	1	f	3.489 0 GHz	-21.775 dBm	Band Power	1.000 MHz	-17.250 dB			
5	N	1	f	3.490 0 GHz	-1.157 dBm	Band Power	1.000 MHz	-0.191 dB			
6	N	1	f	3.510 0 GHz	-2.787 dBm	Band Power	1.000 MHz	-1.234 dB			
7	N	1	f	3.511 0 GHz	-25.688 dBm	Band Power	1.000 MHz	-22.197 dB			
8	N	1	f	3.515 0 GHz	-32.559 dBm	Band Power	1.000 MHz	-32.814 dB			
9	N	1	f	3.520 0 GHz	-34.372 dBm	Band Power	1.000 MHz	-34.656 dB			

Center 3.60000 GHz						Span 100.0 MHz					
#Res BW 1.0 MHz						#VBW 1.0 MHz*					
Sweep 1.000 ms (1001 pts)											
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE			
1	N	1	f	3.600 0 GHz	9.611 dBm	Band Power	20.00 MHz	-21.012 dB			
2	N	1	f	3.580 0 GHz	-34.219 dBm	Band Power	1.000 MHz	-34.052 dB			
3	N	1	f	3.585 0 GHz	-32.531 dBm	Band Power	1.000 MHz	-32.718 dB			
4	N	1	f	3.589 0 GHz	-22.715 dBm	Band Power	1.000 MHz	-18.859 dB			
5	N	1	f	3.590 0 GHz	-1.702 dBm	Band Power	1.000 MHz	-1.321 dB			
6	N	1	f	3.610 0 GHz	-2.399 dBm	Band Power	1.000 MHz	-0.248 dB			
7	N	1	f	3.611 0 GHz	-27.124 dBm	Band Power	1.000 MHz	-22.623 dB			
8	N	1	f	3.615 0 GHz	-32.258 dBm	Band Power	1.000 MHz	-32.342 dB			
9	N	1	f	3.620 0 GHz	-34.343 dBm	Band Power	1.000 MHz	-34.616 dB			

Center 3.70000 GHz						Span 100.0 MHz					
#Res BW 1.0 MHz						#VBW 1.0 MHz*					
Sweep 1.000 ms (1001 pts)											
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE			
1	N	1	f	3.700 0 GHz	8.312 dBm	Band Power	20.00 MHz	-21.031 dB			
2	N	1	f	3.680 0 GHz	-33.753 dBm	Band Power	1.000 MHz	-34.052 dB			
3	N	1	f	3.685 0 GHz	-31.584 dBm	Band Power	1.000 MHz	-32.007 dB			
4	N	1	f	3.689 0 GHz	-21.613 dBm	Band Power	1.000 MHz	-17.117 dB			
5	N	1	f	3.690 0 GHz	-0.950 dBm	Band Power	1.000 MHz	-0.367 dB			
6	N	1	f	3.710 0 GHz	-3.192 dBm	Band Power	1.000 MHz	-1.470 dB			
7	N	1	f	3.711 0 GHz	-24.042 dBm	Band Power	1.000 MHz	-22.506 dB			
8	N	1	f	3.715 0 GHz	-32.555 dBm	Band Power	1.000 MHz	-32.629 dB			
9	N	1	f	3.720 0 GHz	-34.074 dBm	Band Power	1.000 MHz	-34.733 dB			

Center 3.80000 GHz						Span 100.0 MHz					
#Res BW 1.0 MHz						#VBW 1.0 MHz*					
Sweep 1.000 ms (1001 pts)											
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE			
1	N	1	f	3.800 0 GHz	8.618 dBm	Band Power	20.00 MHz	-20.993 dB			
2	N	1	f	3.780 0 GHz	-32.424 dBm	Band Power	1.000 MHz	-32.916 dB			
3	N	1	f	3.785 0 GHz	-29.676 dBm	Band Power	1.000 MHz	-29.967 dB			
4	N	1	f	3.789 0 GHz	-21.852 dBm	Band Power	1.000 MHz	-17.697 dB			
5	N	1	f	3.790 0 GHz	-1.687 dBm	Band Power	1.000 MHz	-0.866 dB			
6	N	1	f	3.810 0 GHz	-2.591 dBm	Band Power	1.000 MHz	-0.892 dB			
7	N	1	f	3.811 0 GHz	-23.638 dBm	Band Power	1.000 MHz	-21.378 dB			
8	N	1	f	3.815 0 GHz	-29.853 dBm	Band Power	1.000 MHz	-29.781 dB			
9	N	1	f	3.820 0 GHz	-32.486 dBm	Band Power	1.000 MHz	-32.553 dB			

Figure 6.3.1. Spectrum Mask Plot @ Pout = 21dBm, 36V, 50mA Idq

6.4. Spectrum Mask Plot at 3300-3800MHz @ Pout = 23dBm

Center 3.30000 GHz						Span 100.0 MHz					
#Res BW 1.0 MHz						#VBW 1.0 MHz*					
Sweep 1.000 ms (1001 pts)											
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE			
1	N	1	f	3.300 0 GHz	10.432 dBm	Band Power	20.00 MHz	-23.062 dB			
2	N	1	f	3.280 0 GHz	-31.291 dBm	Band Power	1.000 MHz	-31.855 dB			
3	N	1	f	3.285 0 GHz	-29.900 dBm	Band Power	1.000 MHz	-29.799 dB			
4	N	1	f	3.289 0 GHz	-18.860 dBm	Band Power	1.000 MHz	-15.296 dB			
5	N	1	f	3.290 0 GHz	1.044 dBm	Band Power	1.000 MHz	1.497 dB			
6	N	1	f	3.310 0 GHz	-1.002 dBm	Band Power	1.000 MHz	0.748 dB			
7	N	1	f	3.311 0 GHz	-21.650 dBm	Band Power	1.000 MHz	-19.979 dB			
8	N	1	f	3.315 0 GHz	-30.149 dBm	Band Power	1.000 MHz	-30.402 dB			
9	N	1	f	3.320 0 GHz	-32.169 dBm	Band Power	1.000 MHz	-32.307 dB			

Center 3.40000 GHz						Span 100.0 MHz					
#Res BW 1.0 MHz						#VBW 1.0 MHz*					
Sweep 1.000 ms (1001 pts)											
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE			
1	N	1	f	3.400 0 GHz	10.305 dBm	Band Power	20.00 MHz	-23.054 dB			
2	N	1	f	3.380 0 GHz	-32.395 dBm	Band Power	1.000 MHz	-32.163 dB			
3	N	1	f	3.385 0 GHz	-30.508 dBm	Band Power	1.000 MHz	-30.676 dB			
4	N	1	f	3.389 0 GHz	-19.572 dBm	Band Power	1.000 MHz	-15.437 dB			
5	N	1	f	3.390 0 GHz	0.311 dBm	Band Power	1.000 MHz	1.518 dB			
6	N	1	f	3.410 0 GHz	-0.490 dBm	Band Power	1.000 MHz	1.186 dB			
7	N	1	f	3.411 0 GHz	-23.387 dBm	Band Power	1.000 MHz	-20.201 dB			
8	N	1	f	3.415 0 GHz	-29.977 dBm	Band Power	1.000 MHz	-30.643 dB			
9	N	1	f	3.420 0 GHz	-32.336 dBm	Band Power	1.000 MHz	-32.469 dB			

Center 3.50000 GHz						Span 100.0 MHz					
#Res BW 1.0 MHz						#VBW 1.0 MHz*					
Sweep 1.000 ms (1001 pts)											
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE			
1	N	1	f	3.500 0 GHz	10.809 dBm	Band Power	20.00 MHz	-23.077 dB			
2	N	1	f	3.480 0 GHz	-32.792 dBm	Band Power	1.000 MHz	-33.041 dB			
3	N	1	f	3.485 0 GHz	-31.809 dBm	Band Power	1.000 MHz	-31.833 dB			
4	N	1	f	3.489 0 GHz	-20.626 dBm	Band Power	1.000 MHz	-16.194 dB			
5	N	1	f	3.490 0 GHz	0.990 dBm	Band Power	1.000 MHz	1.876 dB			
6	N	1	f	3.510 0 GHz	-0.764 dBm	Band Power	1.000 MHz	1.012 dB			
7	N	1	f	3.511 0 GHz	-23.551 dBm	Band Power	1.000 MHz	-20.407 dB			
8	N	1	f	3.515 0 GHz	-31.928 dBm	Band Power	1.000 MHz	-32.099 dB			
9	N	1	f	3.520 0 GHz	-34.155 dBm	Band Power	1.000 MHz	-33.891 dB			

Center 3.60000 GHz						Span 100.0 MHz					
#Res BW 1.0 MHz						#VBW 1.0 MHz*					
Sweep 1.000 ms (1001 pts)											
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE			
1	N	1	f	3.600 0 GHz	10.618 dBm	Band Power	20.00 MHz	-23.050 dB			
2	N	1	f	3.580 0 GHz	-33.900 dBm	Band Power	1.000 MHz	-34.251 dB			
3	N	1	f	3.585 0 GHz	-31.941 dBm	Band Power	1.000 MHz	-32.123 dB			
4	N	1	f	3.589 0 GHz	-18.381 dBm	Band Power	1.000 MHz	-15.950 dB			
5	N	1	f	3.590 0 GHz	-0.454 dBm	Band Power	1.000 MHz	0.755 dB			
6	N	1	f	3.610 0 GHz	-0.013 dBm	Band Power	1.000 MHz	1.145 dB			
7	N	1	f	3.611 0 GHz	-21.192 dBm	Band Power	1.000 MHz	-19.810 dB			
8	N	1	f	3.615 0 GHz	-31.762 dBm	Band Power	1.000 MHz	-31.586 dB			
9	N	1	f	3.620 0 GHz	-33.103 dBm	Band Power	1.000 MHz	-33.625 dB			

Center 3.70000 GHz						Span 100.0 MHz					
#Res BW 1.0 MHz						#VBW 1.0 MHz*					
Sweep 1.000 ms (1001 pts)											
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE			
1	N	1	f	3.700 0 GHz	11.111 dBm	Band Power	20.00 MHz	-23.019 dB			
2	N	1	f	3.680 0 GHz	-32.975 dBm	Band Power	1.000 MHz	-33.450 dB			
3	N	1	f	3.685 0 GHz	-30.604 dBm	Band Power	1.000 MHz	-31.650 dB			
4	N	1	f	3.689 0 GHz	-19.783 dBm	Band Power	1.000 MHz	-15.285 dB			
5	N	1	f	3.690 0 GHz	1.029 dBm	Band Power	1.000 MHz	1.828 dB			
6	N	1	f	3.710 0 GHz	-0.692 dBm	Band Power	1.000 MHz	0.796 dB			
7	N	1	f	3.711 0 GHz	-26.852 dBm	Band Power	1.000 MHz	-20.600 dB			
8	N	1	f	3.715 0 GHz	-32.394 dBm	Band Power	1.000 MHz	-32.092 dB			
9	N	1	f	3.720 0 GHz	-33.860 dBm	Band Power	1.000 MHz	-33.895 dB			

Center 3.80000 GHz						Span 100.0 MHz					
#Res BW 1.0 MHz						#VBW 1.0 MHz*					
Sweep 1.000 ms (1001											

6.5. Spectrum Mask Plot at 3300-3800MHz @Pout = 25dBm

Center 3.30000 GHz		#Res BW 1.0 MHz		#VBW 1.0 MHz*		Span 100.0 MHz		Sweep 1.000 ms (1001 pts)	
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	
1	N	1	f	3.300 0 GHz	12.472 dBm	Band Power	20.00 MHz	25.034 dB	
2	N	1	f	3.280 0 GHz	-30.362 dBm	Band Power	1.000 MHz	-30.578 dB	
3	N	1	f	3.285 0 GHz	-28.454 dBm	Band Power	1.000 MHz	-28.974 dB	
4	N	1	f	3.289 0 GHz	-17.472 dBm	Band Power	1.000 MHz	-13.224 dB	
5	N	1	f	3.290 0 GHz	2.738 dBm	Band Power	1.000 MHz	3.586 dB	
6	N	1	f	3.310 0 GHz	1.107 dBm	Band Power	1.000 MHz	2.881 dB	
7	N	1	f	3.311 0 GHz	-22.807 dBm	Band Power	1.000 MHz	-18.273 dB	
8	N	1	f	3.315 0 GHz	-29.485 dBm	Band Power	1.000 MHz	-29.705 dB	
9	N	1	f	3.320 0 GHz	-31.327 dBm	Band Power	1.000 MHz	-31.445 dB	

Center 3.40000 GHz		#Res BW 1.0 MHz		#VBW 1.0 MHz*		Span 100.0 MHz		Sweep 1.000 ms (1001 pts)	
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	
1	N	1	f	3.400 0 GHz	12.212 dBm	Band Power	20.00 MHz	25.040 dB	
2	N	1	f	3.380 0 GHz	-30.702 dBm	Band Power	1.000 MHz	-31.238 dB	
3	N	1	f	3.385 0 GHz	-30.001 dBm	Band Power	1.000 MHz	-29.917 dB	
4	N	1	f	3.389 0 GHz	-18.568 dBm	Band Power	1.000 MHz	-13.539 dB	
5	N	1	f	3.390 0 GHz	2.198 dBm	Band Power	1.000 MHz	3.426 dB	
6	N	1	f	3.410 0 GHz	1.623 dBm	Band Power	1.000 MHz	3.119 dB	
7	N	1	f	3.411 0 GHz	-21.922 dBm	Band Power	1.000 MHz	-17.827 dB	
8	N	1	f	3.415 0 GHz	-29.492 dBm	Band Power	1.000 MHz	-30.021 dB	
9	N	1	f	3.420 0 GHz	-31.238 dBm	Band Power	1.000 MHz	-31.660 dB	

Center 3.50000 GHz		#Res BW 1.0 MHz		#VBW 1.0 MHz*		Span 100.0 MHz		Sweep 1.000 ms (1001 pts)	
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	
1	N	1	f	3.500 0 GHz	12.351 dBm	Band Power	20.00 MHz	25.079 dB	
2	N	1	f	3.480 0 GHz	-31.818 dBm	Band Power	1.000 MHz	-32.101 dB	
3	N	1	f	3.485 0 GHz	-31.252 dBm	Band Power	1.000 MHz	-31.221 dB	
4	N	1	f	3.489 0 GHz	-17.523 dBm	Band Power	1.000 MHz	-13.661 dB	
5	N	1	f	3.490 0 GHz	3.060 dBm	Band Power	1.000 MHz	3.909 dB	
6	N	1	f	3.510 0 GHz	1.384 dBm	Band Power	1.000 MHz	2.798 dB	
7	N	1	f	3.511 0 GHz	-26.438 dBm	Band Power	1.000 MHz	-18.161 dB	
8	N	1	f	3.515 0 GHz	-31.483 dBm	Band Power	1.000 MHz	-31.779 dB	
9	N	1	f	3.520 0 GHz	-32.554 dBm	Band Power	1.000 MHz	-33.014 dB	

Center 3.60000 GHz		#Res BW 1.0 MHz		#VBW 1.0 MHz*		Span 100.0 MHz		Sweep 1.000 ms (1001 pts)	
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	
1	N	1	f	3.600 0 GHz	12.149 dBm	Band Power	20.00 MHz	25.044 dB	
2	N	1	f	3.580 0 GHz	-33.470 dBm	Band Power	1.000 MHz	-33.537 dB	
3	N	1	f	3.585 0 GHz	-31.901 dBm	Band Power	1.000 MHz	-32.267 dB	
4	N	1	f	3.589 0 GHz	-19.171 dBm	Band Power	1.000 MHz	-14.691 dB	
5	N	1	f	3.590 0 GHz	1.829 dBm	Band Power	1.000 MHz	2.704 dB	
6	N	1	f	3.610 0 GHz	1.902 dBm	Band Power	1.000 MHz	3.662 dB	
7	N	1	f	3.611 0 GHz	-20.343 dBm	Band Power	1.000 MHz	-17.749 dB	
8	N	1	f	3.615 0 GHz	-31.149 dBm	Band Power	1.000 MHz	-31.412 dB	
9	N	1	f	3.620 0 GHz	-32.764 dBm	Band Power	1.000 MHz	-33.097 dB	

Center 3.70000 GHz		#Res BW 1.0 MHz		#VBW 1.0 MHz*		Span 100.0 MHz		Sweep 1.000 ms (1001 pts)	
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	
1	N	1	f	3.700 0 GHz	12.607 dBm	Band Power	20.00 MHz	24.968 dB	
2	N	1	f	3.680 0 GHz	-34.090 dBm	Band Power	1.000 MHz	-33.578 dB	
3	N	1	f	3.685 0 GHz	-32.392 dBm	Band Power	1.000 MHz	-32.333 dB	
4	N	1	f	3.689 0 GHz	-20.762 dBm	Band Power	1.000 MHz	-13.558 dB	
5	N	1	f	3.690 0 GHz	3.302 dBm	Band Power	1.000 MHz	3.781 dB	
6	N	1	f	3.710 0 GHz	0.371 dBm	Band Power	1.000 MHz	2.750 dB	
7	N	1	f	3.711 0 GHz	-23.685 dBm	Band Power	1.000 MHz	-18.450 dB	
8	N	1	f	3.715 0 GHz	-32.413 dBm	Band Power	1.000 MHz	-32.687 dB	
9	N	1	f	3.720 0 GHz	-33.882 dBm	Band Power	1.000 MHz	-33.923 dB	

Center 3.80000 GHz		#Res BW 1.0 MHz		#VBW 1.0 MHz*		Span 100.0 MHz		Sweep 1.000 ms (1001 pts)	
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	
1	N	1	f	3.800 0 GHz	12.359 dBm	Band Power	20.00 MHz	25.055 dB	
2	N	1	f	3.780 0 GHz	-32.082 dBm	Band Power	1.000 MHz	-32.425 dB	
3	N	1	f	3.785 0 GHz	-31.005 dBm	Band Power	1.000 MHz	-30.855 dB	
4	N	1	f	3.789 0 GHz	-19.002 dBm	Band Power	1.000 MHz	-13.832 dB	
5	N	1	f	3.790 0 GHz	2.271 dBm	Band Power	1.000 MHz	3.479 dB	
6	N	1	f	3.810 0 GHz	1.632 dBm	Band Power	1.000 MHz	3.365 dB	
7	N	1	f	3.811 0 GHz	-21.553 dBm	Band Power	1.000 MHz	-18.511 dB	
8	N	1	f	3.815 0 GHz	-29.501 dBm	Band Power	1.000 MHz	-29.871 dB	
9	N	1	f	3.820 0 GHz	-31.335 dBm	Band Power	1.000 MHz	-31.526 dB	

Figure 6.5.1. Spectrum Mask Plot @ Pout = 25dBm, 36V, 50mA Idq

6.6. Spectrum Mask Plot at 3300-3800MHz @ Pout = 27dBm

Center 3.30000 GHz		#Res BW 1.0 MHz		#VBW 1.0 MHz*		Span 100.0 MHz		Sweep 1.000 ms (1001 pts)	
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	
1	N	1	f	3.300 0 GHz	14.288 dBm	Band Power	20.00 MHz	27.064 dB	
2	N	1	f	3.280 0 GHz	-29.378 dBm	Band Power	1.000 MHz	-29.459 dB	
3	N	1	f	3.285 0 GHz	-27.683 dBm	Band Power	1.000 MHz	-28.124 dB	
4	N	1	f	3.289 0 GHz	-16.701 dBm	Band Power	1.000 MHz	-12.492 dB	
5	N	1	f	3.290 0 GHz	4.806 dBm	Band Power	1.000 MHz	5.521 dB	
6	N	1	f	3.310 0 GHz	2.667 dBm	Band Power	1.000 MHz	4.742 dB	
7	N	1	f	3.311 0 GHz	-20.295 dBm	Band Power	1.000 MHz	-16.228 dB	
8	N	1	f	3.315 0 GHz	-28.972 dBm	Band Power	1.000 MHz	-29.064 dB	
9	N	1	f	3.320 0 GHz	-30.454 dBm	Band Power	1.000 MHz	-30.793 dB	

Center 3.40000 GHz		#Res BW 1.0 MHz		#VBW 1.0 MHz*		Span 100.0 MHz		Sweep 1.000 ms (1001 pts)	
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	
1	N	1	f	3.400 0 GHz	14.365 dBm	Band Power	20.00 MHz	27.004 dB	
2	N	1	f	3.380 0 GHz	-29.704 dBm	Band Power	1.000 MHz	-30.081 dB	
3	N	1	f	3.385 0 GHz	-28.770 dBm	Band Power	1.000 MHz	-29.033 dB	
4	N	1	f	3.389 0 GHz	-16.120 dBm	Band Power	1.000 MHz	-11.471 dB	
5	N	1	f	3.390 0 GHz	4.296 dBm	Band Power	1.000 MHz	5.347 dB	
6	N	1	f	3.410 0 GHz	3.433 dBm	Band Power	1.000 MHz	5.068 dB	
7	N	1	f	3.411 0 GHz	-19.374 dBm	Band Power	1.000 MHz	-15.630 dB	
8	N	1	f	3.415 0 GHz	-29.501 dBm	Band Power	1.000 MHz	-29.469 dB	
9	N	1	f	3.420 0 GHz	-30.692 dBm	Band Power	1.000 MHz	-31.089 dB	

Center 3.50000 GHz		#Res BW 1.0 MHz		#VBW 1.0 MHz*		Span 100.0 MHz		Sweep 1.000 ms (1001 pts)	
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	
1	N	1	f	3.500 0 GHz	14.387 dBm	Band Power	20.00 MHz	27.020 dB	
2	N	1	f	3.480 0 GHz	-31.161 dBm	Band Power	1.000 MHz	-31.429 dB	
3	N	1	f	3.485 0 GHz	-30.129 dBm	Band Power	1.000 MHz	-30.726 dB	
4	N	1	f	3.489 0 GHz	-15.052 dBm	Band Power	1.000 MHz	-11.289 dB	
5	N	1	f	3.490 0 GHz	4.865 dBm	Band Power	1.000 MHz	5.613 dB	
6	N	1	f	3.510 0 GHz	2.935 dBm	Band Power	1.000 MHz	4.752 dB	
7	N	1	f	3.511 0 GHz	-22.101 dBm	Band Power	1.000 MHz	-16.896 dB	
8	N	1	f	3.515 0 GHz	-31.616 dBm	Band Power	1.000 MHz	-31.730 dB	
9	N	1	f	3.520 0 GHz	-32.968 dBm	Band Power	1.000 MHz	-32.979 dB	

Center 3.60000 GHz		#Res BW 1.0 MHz		#VBW 1.0 MHz*		Span 100.0 MHz		Sweep 1.000 ms (1001 pts)	
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	
1	N	1	f	3.600 0 GHz	15.087 dBm	Band Power	20.00 MHz	27.067 dB	
2	N	1	f	3.580 0 GHz	-32.477 dBm	Band Power	1.000 MHz	-33.231 dB	
3	N	1	f	3.585 0 GHz	-32.668 dBm	Band Power	1.000 MHz	-32.169 dB	
4	N	1	f	3.589 0 GHz	-16.324 dBm	Band Power	1.000 MHz	-12.536 dB	
5	N	1	f	3.590 0 GHz	4.170 dBm	Band Power	1.000 MHz	4.849 dB	
6	N	1	f	3.610 0 GHz	4.278 dBm	Band Power	1.000 MHz	5.623 dB	
7	N	1	f	3.611 0 GHz	-15.952 dBm	Band Power	1.000 MHz	-15.646 dB	
8	N	1	f	3.615 0 GHz	-31.744 dBm	Band Power	1.000 MHz	-32.019 dB	
9	N	1	f	3.620 0 GHz	-32.940 dBm	Band Power	1.000 MHz	-33.309 dB	

Center 3.70000 GHz		#Res BW 1.0 MHz		#VBW 1.0 MHz*		Span 100.0 MHz		Sweep 1.000 ms (1001 pts)	
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	
1	N	1	f	3.700 0 GHz	14.473 dBm	Band Power	20.00 MHz	27.032 dB	
2	N	1	f	3.680 0 GHz	-33.407 dBm	Band Power	1.000 MHz	-33.678 dB	
3	N	1	f	3.685 0 GHz	-32.792 dBm	Band Power	1.000 MHz	-33.182 dB	
4	N	1	f	3.689 0 GHz	-17.015 dBm	Band Power	1.000 MHz	-11.595 dB	
5	N	1	f	3.690 0 GHz	4.854 dBm	Band Power	1.000 MHz	5.656 dB	
6	N	1	f	3.710 0 GHz	2.673 dBm	Band Power	1.000 MHz	4.480 dB	
7	N	1	f	3.711 0 GHz	-18.606 dBm	Band Power	1.000 MHz	-16.850 dB	
8	N	1	f	3.715 0 GHz	-32.597 dBm	Band Power	1.000 MHz	-33.255 dB	
9	N	1	f	3.720 0 GHz	-33.724 dBm	Band Power	1.000 MHz	-34.225 dB	

Center 3.80000 GHz		#Res BW 1.0 MHz		#VBW 1.0 MHz*		Span 100.0 MHz		Sweep 1.000 ms (1001 pts)	
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	
1	N	1	f	3.800 0 GHz	14.714 dBm	Band Power	20.00 MHz	27.001 dB	
2	N	1	f	3.780 0 GHz	-32.563 dBm	Band Power	1.000 MHz	-32.375 dB	
3	N	1	f	3.785 0 GHz	-31.949 dBm	Band Power	1.000 MHz	-31.799 dB	
4	N	1	f	3.789 0 GHz	-17.410 dBm	Band Power	1.000 MHz	-11.782 dB	
5	N	1	f	3.790 0 GHz	4.333 dBm	Band Power	1.000 MHz	4.933 dB	
6	N	1	f	3.810 0 GHz	3.159 dBm	Band Power	1.000 MHz	4.788 dB	
7	N	1	f	3.811 0 GHz	-18.598 dBm	Band Power	1.000 MHz	-15.737 dB	
8	N	1	f	3.815 0 GHz	-31.205 dBm	Band Power	1.000 MHz	-31.665 dB	
9	N	1	f	3.820 0 GHz	-32.613 dBm	Band Power	1.000 MHz	-32.549 dB	

Figure 6.6.1. Spectrum Mask Plot @ Pout = 27dBm, 36V, 50mA Idq

6.7. Spectrum Mask Plot at 3300-3800MHz @ Pout = 29dBm

Center 3.30000 GHz		Span 100.0 MHz						
#Res BW 1.0 MHz		#VBW 1.0 MHz*						
		Sweep 1.000 ms (1001 pts)						
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	f	f	3.300 0 GHz	16.639 dBm	Band Power	20.00 MHz	28.979 dB
2	N	f	f	3.280 0 GHz	-28.893 dBm	Band Power	1.000 MHz	-28.708 dB
3	N	f	f	3.285 0 GHz	-27.273 dBm	Band Power	1.000 MHz	-27.465 dB
4	N	f	f	3.289 0 GHz	-12.576 dBm	Band Power	1.000 MHz	-9.387 dB
5	N	f	f	3.290 0 GHz	7.053 dBm	Band Power	1.000 MHz	7.446 dB
6	N	f	f	3.310 0 GHz	5.006 dBm	Band Power	1.000 MHz	6.800 dB
7	N	f	f	3.311 0 GHz	-16.595 dBm	Band Power	1.000 MHz	-13.891 dB
8	N	f	f	3.315 0 GHz	-28.863 dBm	Band Power	1.000 MHz	-28.956 dB
9	N	f	f	3.320 0 GHz	-30.140 dBm	Band Power	1.000 MHz	-30.497 dB

Center 3.40000 GHz		Span 100.0 MHz						
#Res BW 1.0 MHz		#VBW 1.0 MHz*						
		Sweep 1.000 ms (1001 pts)						
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	f	f	3.400 0 GHz	16.257 dBm	Band Power	20.00 MHz	29.039 dB
2	N	f	f	3.380 0 GHz	-29.244 dBm	Band Power	1.000 MHz	-29.479 dB
3	N	f	f	3.385 0 GHz	-28.714 dBm	Band Power	1.000 MHz	-28.609 dB
4	N	f	f	3.389 0 GHz	-14.092 dBm	Band Power	1.000 MHz	-9.684 dB
5	N	f	f	3.390 0 GHz	6.403 dBm	Band Power	1.000 MHz	7.405 dB
6	N	f	f	3.410 0 GHz	5.835 dBm	Band Power	1.000 MHz	7.312 dB
7	N	f	f	3.411 0 GHz	-16.156 dBm	Band Power	1.000 MHz	-14.206 dB
8	N	f	f	3.415 0 GHz	-29.265 dBm	Band Power	1.000 MHz	-29.319 dB
9	N	f	f	3.420 0 GHz	-30.851 dBm	Band Power	1.000 MHz	-30.974 dB

Center 3.50000 GHz		Span 100.0 MHz						
#Res BW 1.0 MHz		#VBW 1.0 MHz*						
		Sweep 1.000 ms (1001 pts)						
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	f	f	3.500 0 GHz	16.207 dBm	Band Power	20.00 MHz	29.085 dB
2	N	f	f	3.480 0 GHz	-30.535 dBm	Band Power	1.000 MHz	-30.810 dB
3	N	f	f	3.485 0 GHz	-29.812 dBm	Band Power	1.000 MHz	-30.480 dB
4	N	f	f	3.489 0 GHz	-14.658 dBm	Band Power	1.000 MHz	-9.317 dB
5	N	f	f	3.490 0 GHz	7.029 dBm	Band Power	1.000 MHz	7.583 dB
6	N	f	f	3.510 0 GHz	5.133 dBm	Band Power	1.000 MHz	6.995 dB
7	N	f	f	3.511 0 GHz	-17.747 dBm	Band Power	1.000 MHz	-14.516 dB
8	N	f	f	3.515 0 GHz	-31.433 dBm	Band Power	1.000 MHz	-31.900 dB
9	N	f	f	3.520 0 GHz	-32.605 dBm	Band Power	1.000 MHz	-32.905 dB

Center 3.60000 GHz		Span 100.0 MHz						
#Res BW 1.0 MHz		#VBW 1.0 MHz*						
		Sweep 1.000 ms (1001 pts)						
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	f	f	3.600 0 GHz	16.397 dBm	Band Power	20.00 MHz	29.006 dB
2	N	f	f	3.580 0 GHz	-32.289 dBm	Band Power	1.000 MHz	-33.101 dB
3	N	f	f	3.585 0 GHz	-31.041 dBm	Band Power	1.000 MHz	-32.005 dB
4	N	f	f	3.589 0 GHz	-13.841 dBm	Band Power	1.000 MHz	-10.569 dB
5	N	f	f	3.590 0 GHz	5.470 dBm	Band Power	1.000 MHz	6.684 dB
6	N	f	f	3.610 0 GHz	6.266 dBm	Band Power	1.000 MHz	7.302 dB
7	N	f	f	3.611 0 GHz	-13.293 dBm	Band Power	1.000 MHz	-14.249 dB
8	N	f	f	3.615 0 GHz	-31.732 dBm	Band Power	1.000 MHz	-32.228 dB
9	N	f	f	3.620 0 GHz	-33.084 dBm	Band Power	1.000 MHz	-33.216 dB

Center 3.70000 GHz		Span 100.0 MHz						
#Res BW 1.0 MHz		#VBW 1.0 MHz*						
		Sweep 1.000 ms (1001 pts)						
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	f	f	3.700 0 GHz	16.529 dBm	Band Power	20.00 MHz	29.022 dB
2	N	f	f	3.680 0 GHz	-32.939 dBm	Band Power	1.000 MHz	-32.983 dB
3	N	f	f	3.685 0 GHz	-32.259 dBm	Band Power	1.000 MHz	-32.226 dB
4	N	f	f	3.689 0 GHz	-14.393 dBm	Band Power	1.000 MHz	-9.077 dB
5	N	f	f	3.690 0 GHz	7.089 dBm	Band Power	1.000 MHz	7.526 dB
6	N	f	f	3.710 0 GHz	4.955 dBm	Band Power	1.000 MHz	6.690 dB
7	N	f	f	3.711 0 GHz	-18.739 dBm	Band Power	1.000 MHz	-14.856 dB
8	N	f	f	3.715 0 GHz	-31.055 dBm	Band Power	1.000 MHz	-31.496 dB
9	N	f	f	3.720 0 GHz	-33.222 dBm	Band Power	1.000 MHz	-33.691 dB

Center 3.80000 GHz		Span 100.0 MHz						
#Res BW 1.0 MHz		#VBW 1.0 MHz*						
		Sweep 1.000 ms (1001 pts)						
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	f	f	3.800 0 GHz	16.502 dBm	Band Power	20.00 MHz	29.010 dB
2	N	f	f	3.780 0 GHz	-31.681 dBm	Band Power	1.000 MHz	-32.094 dB
3	N	f	f	3.785 0 GHz	-30.898 dBm	Band Power	1.000 MHz	-31.380 dB
4	N	f	f	3.789 0 GHz	-13.142 dBm	Band Power	1.000 MHz	-9.703 dB
5	N	f	f	3.790 0 GHz	6.640 dBm	Band Power	1.000 MHz	7.125 dB
6	N	f	f	3.810 0 GHz	5.565 dBm	Band Power	1.000 MHz	7.530 dB
7	N	f	f	3.811 0 GHz	-17.183 dBm	Band Power	1.000 MHz	-14.049 dB
8	N	f	f	3.815 0 GHz	-31.295 dBm	Band Power	1.000 MHz	-31.357 dB
9	N	f	f	3.820 0 GHz	-32.753 dBm	Band Power	1.000 MHz	-32.891 dB

Figure 6.7.1. Spectrum Mask Plot @ Pout = 29dBm, 36V, 50mA Idq

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