MGA-43828
## 925–960 MHz Linear Power Amplifier Module

Avago TECHNOLOGIES

Data Sheet

Description

The Avago MGA-43828 is a fully matched, highly linear power amplifier (PA) designed for use in the 925-960 MHz band. Based on Avago's proprietary 0.25 μm GaAs E-pHEMT technology, the device features high linearity, gain and power-added efficiency (PAE) with integrated power detector and shutdown functions. The MGA-43828 is ideal for use as a final stage PA for Small Cell base transceiver station (BTS) applications.
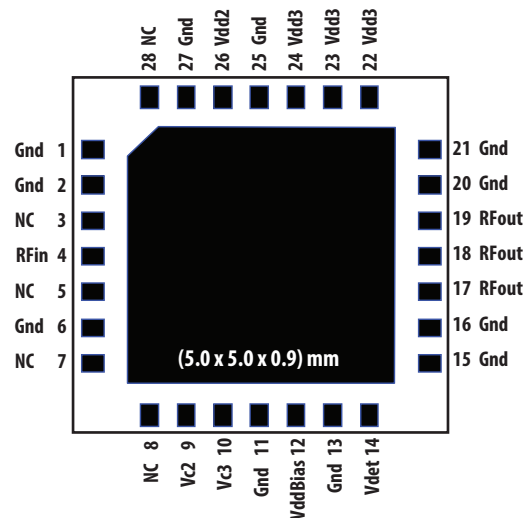
Component Image

$(5.0 \times 5.0 \times 0.9)$ mm Package Outline

AVAGO
43828
YYWW
XXXX
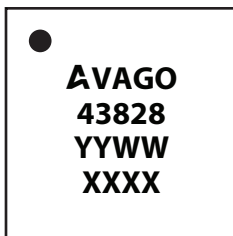
TOP VIEW

Notes:
Package marking provides orientation and identification
"43828" = Device part number
"YYWW" = Year and work week
"XXXX" = Assembly lot number

Pin Configuration

Pins (top, left to right): 28 NC, 27 Gnd, 26 Vdd2, 25 Gnd, 24 Vdd3, 23 Vdd3, 22 Vdd3

Pins (left, top to bottom): Gnd 1, Gnd 2, NC 3, RFin 4, NC 5, Gnd 6, NC 7

Pins (right, top to bottom): 21 Gnd, 20 Gnd, 19 RFout, 18 RFout, 17 RFout, 16 Gnd, 15 Gnd

Center: (5.0 x 5.0 x 0.9) mm

Pins (bottom, left to right): NC 8, Vc2 9, Vc3 10, Gnd 11, VddBias 12, Gnd 13, Vdet 14

Attention: Observe Precautions for handling electrostatic sensitive devices.
ESD Machine Model = 60 V
ESD Human Body Model = 400 V
Refer to Avago Application Note A004R: Electrostatic Discharge Damage and Control.

Features

- High linearity performance : Max -50 dBc ACLR1[1] at 27 dBm linear output power (biased with 5.0 V supply)
- High gain: 33 dB
- Good efficiency
- Fully matched
- Built-in detector
- GaAs E-pHEMT Technology[2]
- Low cost small package size: $(5.0 \times 5.0 \times 0.9)$ mm
- MSL3
- Lead free/Halogen free/RoHS compliance

Specifications

940 MHz; 5.0 V, Idqtotal =316 mA (typ), W-CDMA Test model #1, 64DPCH downlink signal

- PAE: 14.7%
- 27 dBm linear P_{out} @ ACLR1 = -50 dBc[1]
- 33 dB Gain
- Detector range: 20 dB

Applications

- Final stage high linearity amplifier for Picocell and Enterprise Femtocell PA targeted for small cell BTS downlink applications.

Notes:
1. W-CDMA Test model #1, 64DPCH downlink signal
2. Enhancement mode technology employs positive V_{GS}, thereby eliminating the need of negative gate voltage associated with conventional depletion mode devices.

Functional Block Diagram
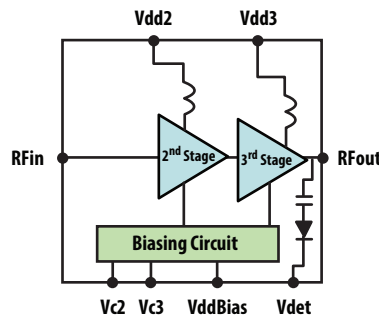
Absolute Maximum Rating [1] T_A=25 °C

Symbol	Parameter	Units	Absolute Max.
V_{dd}, V_{ddBias}	Supply voltages, bias supply voltage	V	6.0
V_c	Control Voltage	V	(V_{dd})
$P_{in,max}$	CW RF Input Power	dBm	20
P_{diss}	Total Power Dissipation [3]	W	4.9
T_j	Junction Temperature	°C	150
T_{STG}	Storage Temperature	°C	-65 to 150

Thermal Resistance [2,3]

θ_{jc} = 12 °C/W

Notes:
1. Operation of this device in excess of any of these limits may cause permanent damage.
2. Thermal resistance measured using Infra-Red Measurement Technique.
3. Board temperature (T_B) is 25 °C , for T_B >91 °C derate the device power at 83 mW per °C rise in Board (package belly) temperature.

Electrical Specifications

T_A = 25 °C, Vdd = VddBias = 5.0 V, Vc2=3.5 V, Vc3=2.8 V, Idqtotal = 316 mA, RF performance at 940 MHz, W-CDMA Test model #1, 64DPCH downlink signal operation, unless otherwise stated.

| Symbol	Parameter and Test Condition	Units	Min.	Typ.	Max.
Vdd	Supply Voltage	V	-	5.0	-
Idqtotal	Quiescent Supply Current	mA	-	316	560
Gain	Gain	dB	31	33	-
OP1dB	Output Power at 1dB Gain Compression	dBm	-	36	-
ACLR1 @ P_{out}=27.0 dBm	W-CDMA Test model #1, 64DPCH downlink signal	dBc	-	-50	-
PAE	Power Added Efficiency	%	13	14.7	-
|S11|	Input Return Loss, 50 Ω source	dB	-	13.9	-
DetR	Detector RF dynamic range	dB	-	20	-
2fo	2fo Harmonics (W-CDMA Test model #1, 64DPCH downlink signal)	dBc		-35	

Product Consistency Distribution Charts [1]
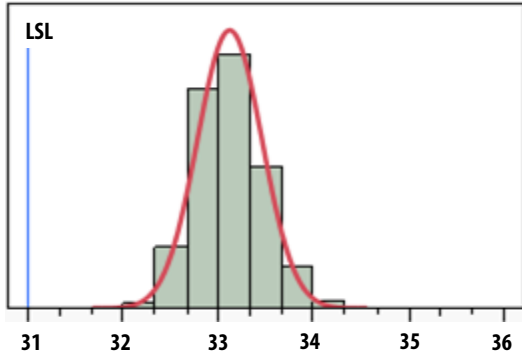
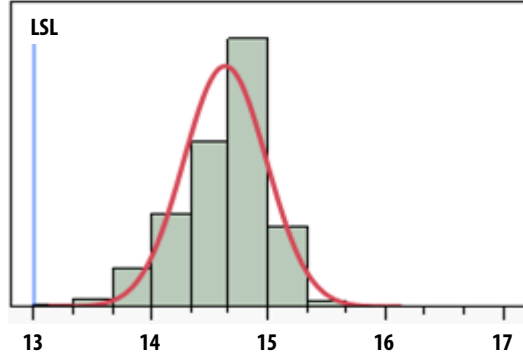Figure 1. Gain at P_{out}=27 dBm, LSL= 31 dB, nominal = 33 dB

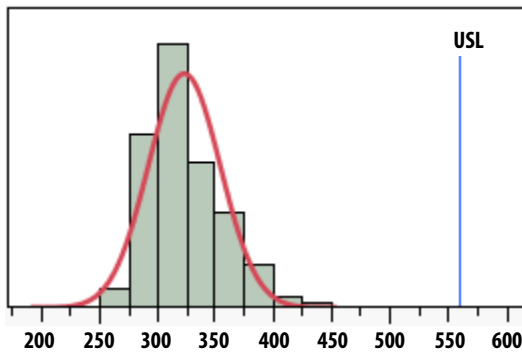Figure 2. PAE at P_{out}=27 dBm, LSL=13%, nominal = 14.7%

Figure 3. Idqtotal, Nominal = 316 mA, USL=560 mA

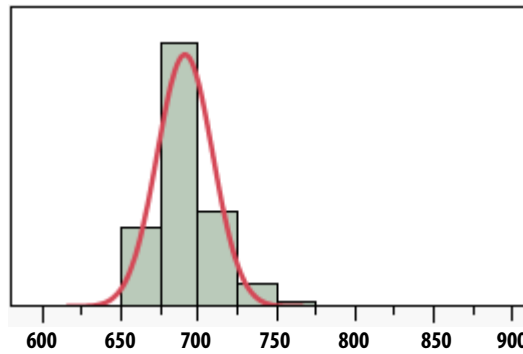Figure 4. Idd_Total at P_{out}=27 dBm, nominal = 687 mA
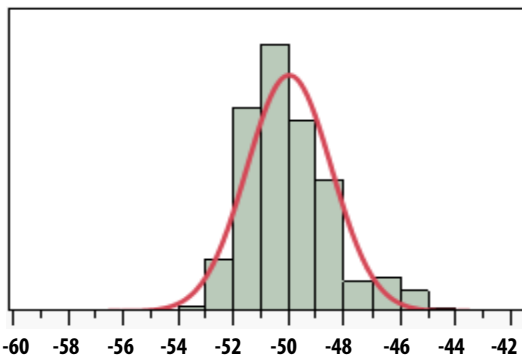

Figure 5. ACLR1 at P_{out}=27 dBm, nominal = -50.3 dBc

Note:
1. Distribution data sample size is 1500 samples taken from three wafer lots. T_A = 25 °C, Vdd=VddBias = 5.0 V, Vc2 = 3.5 V, Vc3 = 2.8 V, RF performance at 940 MHz, unless otherwise stated. Future wafers allocated to this product may have nominal values anywhere between the upper and lower limits.

MGA-43828 typical over-temperature performance at Vc2=3.5 V, Vc3=2.8 V (Vdd=VddBias=5 V) as shown in Figure 27 and Vc2= 3.6 V, Vc3=2.5 V (Vdd=VddBias=5.5 V), unless otherwise stated.
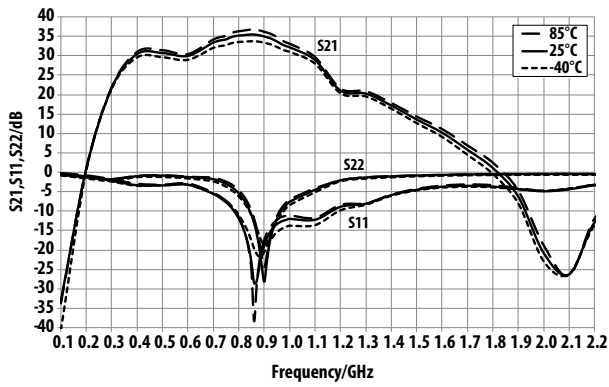
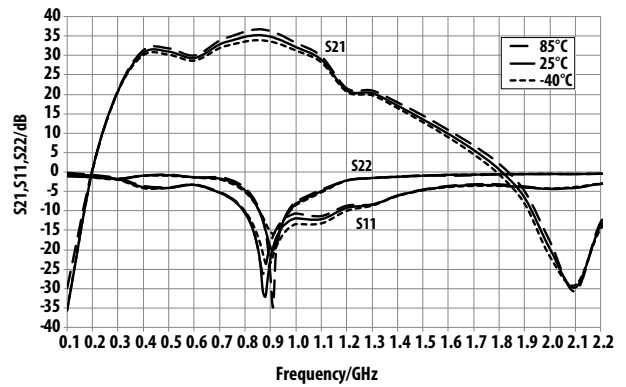Figure 6. Small-signal performance Over-temperature Vdd=VddBias=5.0 V operating voltage

Figure 7. Small-signal performance Over-temperature Vdd=VddBias=5.5 V operating voltage

Figure 8. Over-temperature ACLR1, PAE vs. P_{out} @ 927.4 MHz Vdd=VddBias=5.0 V operating voltage

Figure 9. Over-temperature ACLR1, PAE vs. P_{out} @ 927.4 MHz Vdd=VddBias=5.5 V operating voltage

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MGA-43828 typical over-temperature performance at Vc2=3.5 V, Vc3=2.8 V (Vdd=VddBias=5 V) as shown in Figure 27 and Vc2= 3.6 V, Vc3=2.5 V (Vdd=VddBias=5.5 V), unless otherwise stated.

Figure 10. Over-temperature ACLR1, PAE vs. P$_{out}$ @ 940 MHz
Vdd=VddBias=5.0V operating voltage

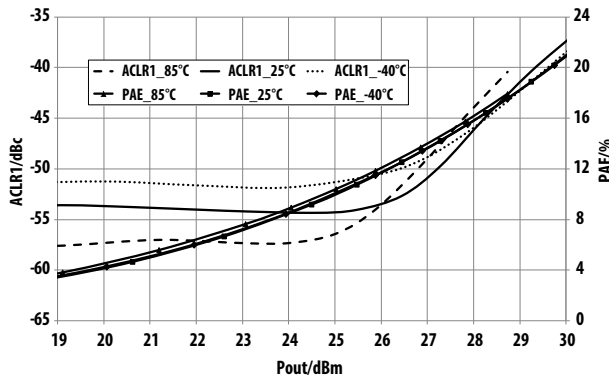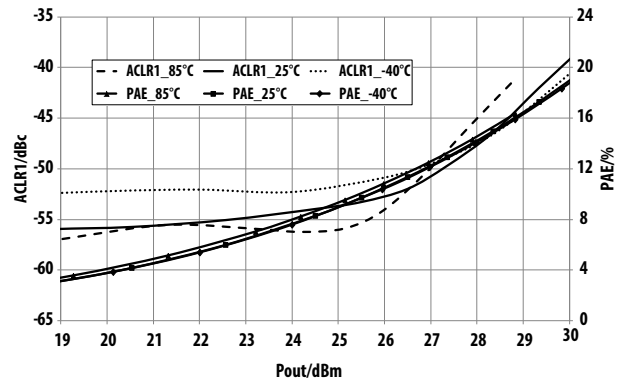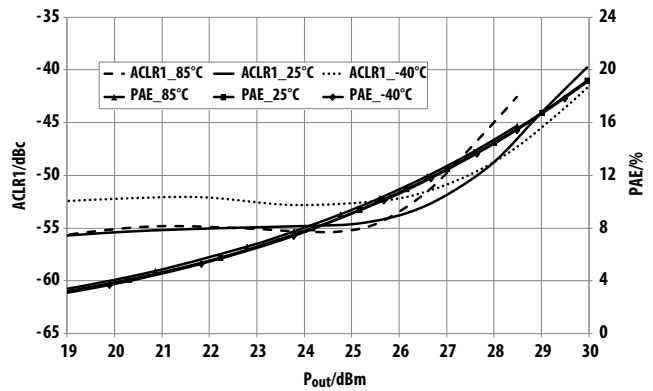Figure 11. Over-temperature ACLR1, PAE vs. P$_{out}$ @ 940 MHz
Vdd=VddBias=5.5 V operating voltage

Figure 12. Over-temperature ACLR1, PAE vs. P$_{out}$ @ 957.6 MHz
Vdd=VddBias=5.0 V operating voltage
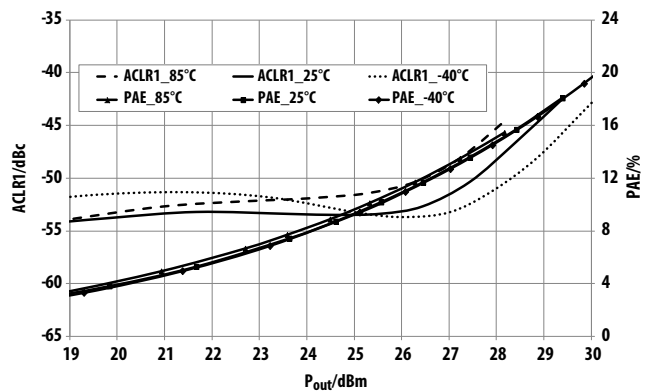
Figure 13. Over-temperature ACLR1, PAE vs. P$_{out}$ @ 957.6 MHz
Vdd=VddBias=5.5 V operating voltage
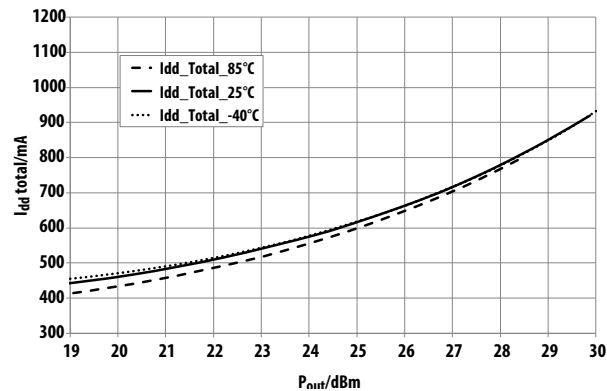
Figure 14. Over-temperature Idd_Total vs. P$_{out}$ @ 940 MHz
Vdd=VddBias=5.0 V operating voltage
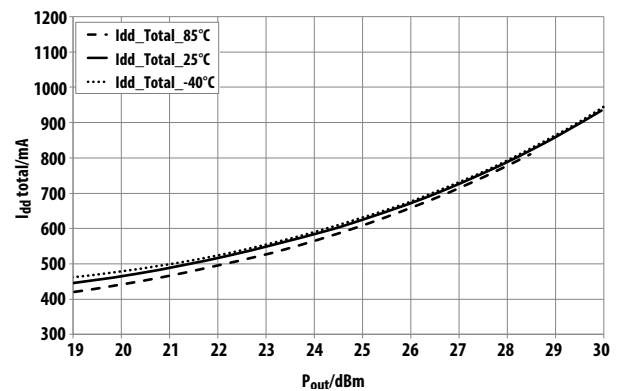
Figure 15. Over-temperature Idd_Total vs. P$_{out}$ @ 940 MHz
Vdd=VddBias=5.5 V operating voltage

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MGA-43828 typical over-temperature performance at Vc2=3.5V, Vc3=2.8V (Vdd=VddBias=5V) as shown in Figure 27 and Vc2= 3.6V, Vc3=2.5V (Vdd=VddBias=5.5V), unless otherwise stated.

Figure 16. Over-temperature ACLR1, ACLR2 P_{out} @ 940 MHz
Vdd=VddBias=5.0 V operating voltage

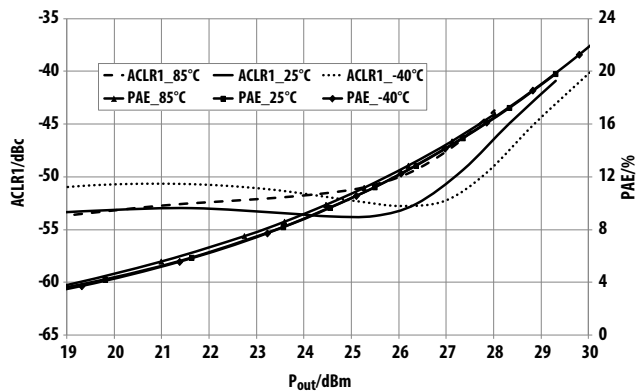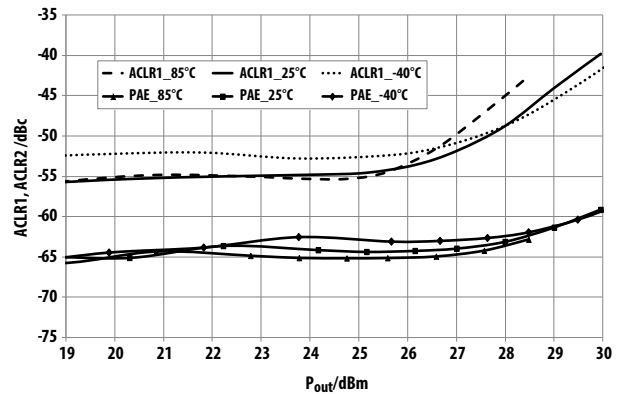**Figure 17. Over-temperature ACLR1, ACLR2 vs. P_{out} @ 940 MHz**
Vdd=VddBias=5.5 V operating voltage
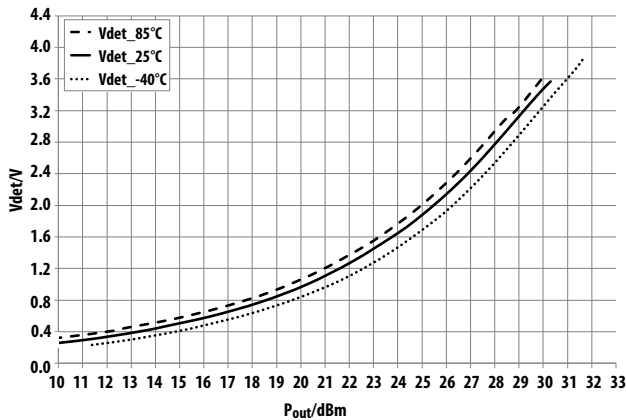
Figure 18. Over-temperature Vdet vs. P_{out} @ 940 MHz
Vdd=VddBias=5.0 V operating voltage
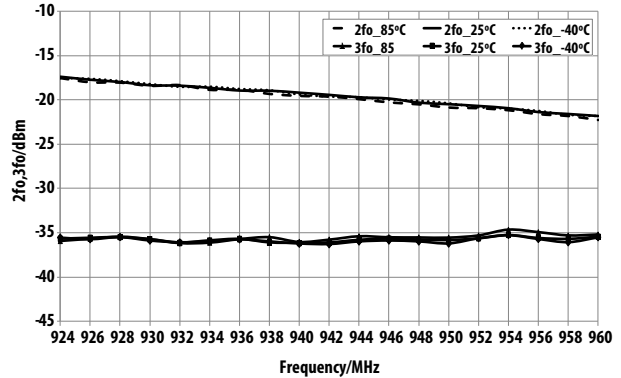
Figure 19. Over-temperature 2nd, 3rd Harmonics vs. Freq at P_{out}=27 dBm,
Vdd=VddBias=5.0 V operating voltage
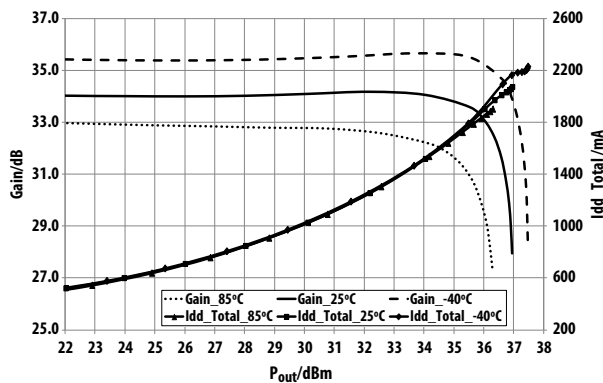
Figure 20. Over-temperature Gain, Idd_Total vs. P_{out} @ 927.4 MHz
Vdd=VddBias=5.0 V operating voltage
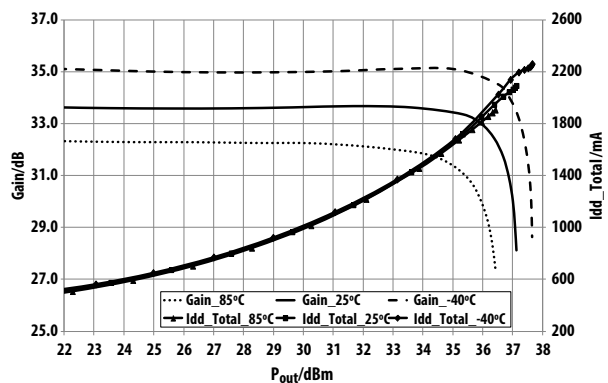
Figure 21. Over-temperature Gain, Idd_Total vs. P_{out} @ 940 MHz
Vdd=VddBias=5.0 V voltage

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MGA-43828 typical over-temperature performance at Vc2=3.5V, Vc3=2.8V (Vdd=VddBias=5V) as shown in Figure 27 and Vc2= 3.6V, Vc3=2.5V (Vdd=VddBias=5.5V), unless otherwise stated.

Figure 22. Over-temperature Gain, Idd_Total vs. P$_{out}$ @ 957.6 MHz
Vdd=VddBias=5.0 V operating voltage

MGA-43828 typical 3GPP W-CDMA Test model #1 Spectrum Emission Mask performance at Vdd=VddBias=5.0 V, Vc2=3.5 V, Vc3=2.8 V, unless otherwise stated.

Figure 23. SEM at P$_{out}$=28 dBm @ 927.4 MHz

Figure 24. SEM at P$_{out}$=28 dBm @ 940 MHz

Figure 25. SEM at P$_{out}$=28 dBm @ 957.6 MHz

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S-Parameter [1] (Vdd=VddBias=5.0 V, Vc2=3.5 V, Vc3=2.8 V, T$_A$=25 °C, 50 Ω)

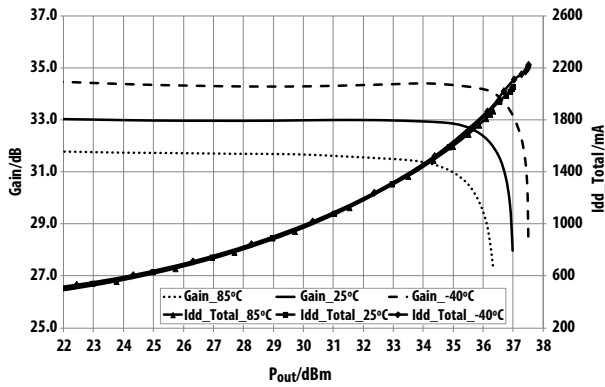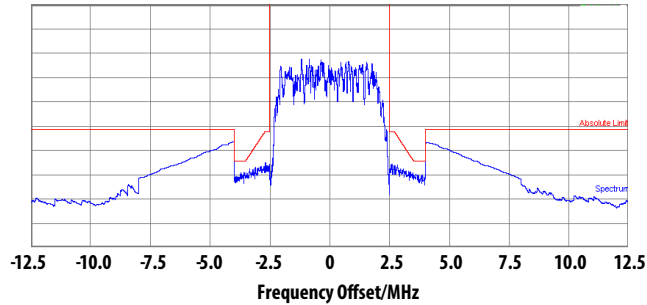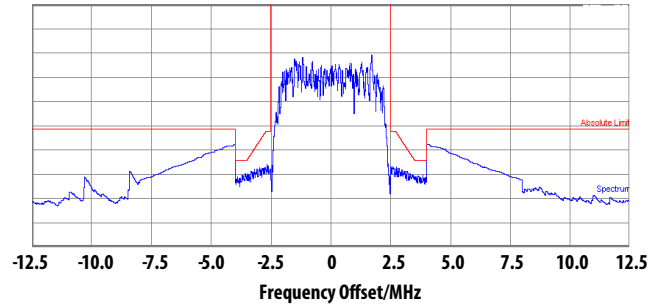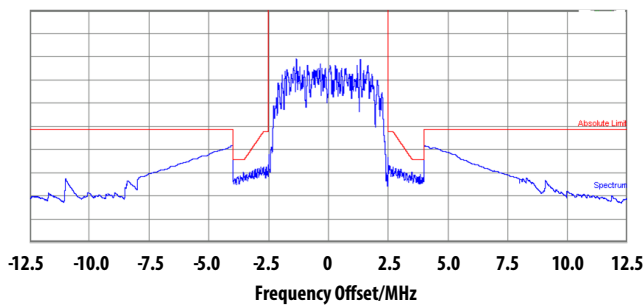| Freq (GHz)	S11 (dB)	S11 (ang)	S21 (dB)	S21 (ang)	S12 (dB)	S12 (ang)	S22 (dB)	S22 (ang)
0.1	-0.359	-157.571	-34.761	-102.9	-36.702	-102.238	-0.904	164.201
0.2	-0.881	137.362	0.529	-72.729	-45.521	82.428	-1.285	153.007
0.3	-1.757	67.025	20.673	-156.637	-48.881	-65.082	-1.757	145.489
0.4	-3.964	-59.742	30.519	83.853	-50.864	151.083	-0.931	135.958
0.5	-3.995	-163.302	30.757	-4.738	-51.199	119.754	-0.871	119.03
0.6	-3.275	142.059	29.167	-52.396	-51.986	32.633	-1.332	103.983
0.70	-5.163	95.642	32.698	-103.112	-51.1	107.186	-1.661	80.291
0.75	-6.846	73.334	33.741	-131.18	-55.921	80.146	-2.667	66.154
0.76	-7.342	68.349	33.967	-137.056	-49.075	56.547	-2.92	62.95
0.77	-7.863	63.826	34.127	-143.311	-55.627	102.524	-3.276	59.029
0.78	-8.465	59.276	34.329	-149.46	-49.175	93.336	-3.672	55.503
0.79	-9.207	54.497	34.519	-155.449	-46.883	76.874	-4.105	52.346
0.80	-10.071	49.55	34.689	-161.611	-47.456	67.861	-4.623	49.093
0.81	-10.963	44.632	34.859	-168.476	-47.256	61.135	-5.32	45.102
0.82	-12.082	39.151	34.963	-175.226	-48.693	51.458	-6.041	42.262
0.83	-13.499	34.735	35.084	177.901	-46.03	64.591	-6.884	38.325
0.84	-15.307	30.159	35.157	170.998	-45.43	56.645	-7.871	34.847
0.85	-17.641	25.929	35.191	164.029	-46.723	43.339	-9.093	31.904
0.86	-20.738	23.691	35.231	156.89	-47.452	69.799	-10.718	28.809
0.87	-25.297	27.081	35.17	149.618	-49.674	28.78	-12.547	27.814
0.88	-30.69	68.189	35.097	142.575	-45.883	13.146	-14.706	28.954
0.89	-29.795	116.55	34.991	135.676	-45.028	5.629	-17.489	37.2
0.90	-24.733	149.892	34.855	128.747	-45.904	2.195	-20.79	55.762
0.91	-21.208	152.212	34.707	121.591	-44.622	5.33	-23.116	85.872
0.92	-18.628	149.76	34.476	114.705	-47.318	4.122	-20.334	115.638
0.93	-16.984	145.958	34.256	108.269	-46.64	1.502	-17.255	130.482
0.94	-15.785	142.698	34.018	101.662	-44.273	-5.232	-14.996	135.594
0.95	-14.818	139.63	33.746	95.019	-43.426	-15.692	-13.298	135.883
0.96	-13.979	135.281	33.429	88.849	-47.383	-27.149	-11.806	136.273
0.97	-13.438	131.11	33.145	82.666	-48.89	-29.658	-10.578	135.041
0.98	-12.909	127.622	32.822	76.819	-44.362	-24.384	-9.588	133.28
0.99	-12.586	125.009	32.511	71.017	-44.602	-39.641	-8.804	131.261
1.0	-12.386	122.608	32.208	65.214	-48.818	-59.526	-8.131	129.013
1.1	-12.603	109.113	28.929	11.021	-46.832	-100.49	-4.826	109.346
1.2	-9.625	102.813	21.051	-31.884	-51.572	-116.036	-2.181	99.966
1.3	-8.711	100.583	20.254	-59.035	-51.981	-108.943	-1.542	77.621
1.4	-6.245	87.113	17.062	-95.823	-63.774	-93.767	-1.24	63.215
1.5	-4.696	68.9	13.543	-129.96	-55.54	140.092	-0.952	49.655
1.6	-3.821	49.575	9.822	-162.801	-51.645	150.591	-0.766	36.848
1.7	-3.38	31.081	5.648	164.175	-55.371	133.889	-0.728	24.747
1.8	-3.417	13.393	0.717	129.544	-58.633	63.838	-0.558	13.194
1.9	-3.889	-0.984	-6.592	94.167	-57.276	13.68	-0.527	1.474
2.0	-4.37	-11.093	-19.911	67.624	-56.615	-15.052	-0.52	-9.914
2.1	-3.991	-17.321	-29.949	-106.864	-57.184	173.406	-0.544	-20.892
2.2	-3.005	-30.017	-13.616	-132.307	-57.272	-119.431	-0.469	-32.058
2.3	-2.689	-44.99	-10.868	-174.392	-56.635	156.631	-0.529	-42.577
2.4	-2.54	-58.058	-11.827	154.999	-54.139	-143.436	-0.525	-53.929
2.5	-2.396	-70.801	-8.932	153.353	-56.184	26.353	-0.688	-62.648
2.6	-2.17	-83.78	-10.65	109.066	-56.02	112.474	-0.521	-73.899
2.7	-2.069	-96.423	-12.235	86.813	-57.74	124.982	-0.499	-84.103

Freq (GHz)	S11 (dB)	S11 (ang)	S21 (dB)	S21 (ang)	S12 (dB)	S12 (ang)	S22 (dB)	S22 (ang)
2.8	-2.007	-108.836	-13.701	66.954	-51.969	142.564	-0.451	-94.878
2.9	-1.898	-121.119	-15.071	48.285	-53.476	-74.177	-0.438	-105.505
3.0	-1.922	-133.57	-16.36	30.874	-53.454	101.956	-0.494	-115.896
3.5	-1.907	166.013	-18.36	-61.594	-50.776	129.344	-0.585	-166.55
4.0	-2.2	107.455	-22.351	120.744	-50.308	108.894	-0.734	142.545
4.5	-2.503	48.389	-43.708	-55.204	-55.107	-61.003	-0.775	91.568
5.0	-2.654	-10.266	-47.204	-137.021	-63.527	16.224	-0.929	38.977
5.5	-2.679	-68.289	-49.899	136.102	-55.523	-172.831	-0.968	-13.883
6.0	-2.486	-124.478	-57.512	-3.34	-58.889	168.161	-1.003	-68.181
7.0	-2.195	126.283	-51.591	113.375	-62.855	-110.466	-1.049	-176.356
8.0	-2.387	15.148	-43.87	-53.461	-55.431	-154.545	-1.187	74.532
9.0	-4.275	-107.8	-41.097	154.062	-58.909	-24.969	-1.549	-36.248
10.0	-17.076	-141.433	-42.288	-55.872	-55.416	169.511	-2.353	-170.483
11.0	-2.864	72.097	-58.161	169.438	-54.893	46.247	-2.779	35.768
12.0	-2.492	-58.091	-61.051	14.466	-52.097	-69.384	-2.87	-114.526
13.0	-3.851	-172.445	-47.829	90.467	-45.973	95.231	-3.375	93.686
14.0	-9.548	57.765	-45.557	168.472	-54.816	-17.289	-5.223	-110.742
15.0	-10.935	-161.748	-49.26	166.883	-50.717	156.985	-4.809	-73.706
16.0	-6.88	42.484	-50.838	-33.442	-55.751	83.993	-2.25	133.687
17.0	-5.916	-126.515	-46.178	160.746	-46.378	178.252	-2.079	23.243
18.0	-3.547	101.728	-44.471	-0.854	-46.377	34.175	-5.227	-132.033
19.0	-2.458	-0.217	-44.168	-135.248	-45.382	-148.213	-8.059	19.384
20.0	-4.331	-102.231	-49.442	53.435	-50.726	12.901	-6.152	-78.343

S-Parameter [1] (Vdd=VddBias=5.5V, Vc2=3.6V, Vc3=2.5V, T_A=25 °C, 50 Ω)

Freq (GHz)	S11 (dB)	S11 (ang)	S21 (dB)	S21 (ang)	S12 (dB)	S12 (ang)	S22 (dB)	S22 (ang)
0.1	-0.363	-157.363	-35.738	-96.678	-43.49	-71.16	-0.955	163.27
0.2	-0.921	137.115	0.647	-72.378	-44.971	159.783	-1.324	153.1
0.3	-1.802	66.591	20.898	-155.636	-49.064	-104.929	-1.793	145.593
0.4	-3.848	-60.36	30.773	84.054	-43.433	-109.351	-0.951	136.052
0.5	-4.059	-163.859	31.07	-4.84	-48.503	97.579	-0.843	119.228
0.6	-3.277	141.315	29.427	-52.97	-50.346	169.627	-1.367	103.837
0.70	-5.288	94.48	32.957	-104.038	-48.118	129.423	-1.706	80.189
0.75	-7.071	71.736	33.992	-132.361	-47.633	100.102	-2.737	66.475
0.76	-7.59	66.889	34.209	-138.324	-48.62	70.332	-3.007	63.172
0.77	-8.204	61.85	34.364	-144.566	-54.992	73.059	-3.37	59.71
0.78	-8.839	57.262	34.557	-150.888	-52.08	77.538	-3.791	55.93
0.79	-9.666	52.151	34.742	-157.021	-47.85	73.709	-4.24	52.696
0.80	-10.678	46.766	34.908	-163.217	-46.178	64.245	-4.761	49.729
0.81	-11.702	42.002	35.065	-170.013	-48.446	58.621	-5.46	46.128
0.82	-13.053	35.782	35.13	-176.881	-48.887	34.262	-6.265	43.319
0.83	-14.705	30.718	35.235	176.197	-49.315	34.102	-7.101	39.975
0.84	-16.762	25.727	35.304	169.243	-46.939	42.351	-8.132	36.894
0.85	-19.504	20.961	35.329	162.281	-43.821	48.061	-9.406	34.825
0.86	-23.67	17.644	35.34	155.316	-42.202	42.785	-10.855	34.342
0.87	-30.802	23.733	35.257	147.911	-45.287	21.63	-12.637	33.093
0.88	-32.063	106.472	35.179	140.91	-48.414	23.704	-14.865	37.204
0.89	-26.771	157.726	35.07	134.138	-47.826	19.998	-17.307	46.456
0.90	-22.087	162.697	34.925	127.328	-45.827	15.15	-19.415	63.005
0.91	-19.398	160.14	34.756	120.188	-46.743	29.694	-20.209	89.273
0.92	-17.242	154.945	34.504	113.274	-45.944	8.5	-18.655	110.453

9

0.93	-15.92	150.446	34.297	106.9	-47.772	-9.175	-16.512	123.073
0.94	-14.764	146.101	34.057	100.46	-49.404	-33.987	-14.414	129.044
0.95	-13.817	141.883	33.765	93.978	-48.905	-43.971	-12.713	130.817
0.96	-13.281	137.977	33.446	87.797	-46.582	-5.476	-11.562	131.353
0.97	-12.726	133.391	33.175	81.564	-45.376	-16.291	-10.475	130.899
0.98	-12.316	129.684	32.865	75.842	-48.252	-27.024	-9.63	129.567
0.99	-12.066	126.202	32.552	70.13	-47.161	-38.937	-8.83	127.869
1.0	-11.87	123.088	32.237	64.363	-44.962	-48.601	-8.117	126.084
1.1	-12.097	109.472	28.995	10.246	-48.604	-107.732	-4.951	108.201
1.2	-9.189	102.51	21.083	-32.332	-53.627	-131.32	-2.191	99.955
1.3	-8.407	99.238	20.355	-59.812	-51.003	-153.031	-1.567	77.698
1.4	-6.052	85.94	17.145	-96.791	-55.202	150.905	-1.26	63.241
1.5	-4.585	67.96	13.551	-130.911	-51.134	124.131	-0.988	50.087
1.6	-3.684	48.898	9.848	-164.251	-61.998	75.099	-0.742	37.112
1.7	-3.321	30.388	5.634	162.691	-52.037	114.13	-0.708	24.615
1.8	-3.386	12.855	0.614	128.288	-54.707	-10.831	-0.598	13.28
1.9	-3.902	-1.305	-6.669	93.501	-47.883	-18.835	-0.586	1.717
2.0	-4.293	-11.53	-19.919	68.345	-54.356	58.042	-0.528	-9.624
2.1	-3.968	-18.142	-29.76	-111.318	-54.998	-177.471	-0.552	-20.587
2.2	-3.008	-30.788	-13.699	-130.762	-64.701	-130.559	-0.481	-31.598
2.3	-2.733	-45.473	-10.928	-173.67	-53.718	110.909	-0.513	-42.268
2.4	-2.542	-58.425	-11.76	155.771	-56.856	99.023	-0.475	-53.767
2.5	-2.375	-71.445	-8.74	154.506	-55.147	92.595	-0.678	-62.995
2.6	-2.24	-84.452	-10.513	109.311	-59.247	52.574	-0.501	-74.071
2.7	-2.15	-96.887	-12.044	86.927	-60.781	-16.77	-0.517	-84.564
2.8	-2.024	-109.285	-13.539	67.104	-61.456	102.686	-0.504	-95.311
2.9	-1.935	-122.07	-14.707	48.13	-57.916	-30.14	-0.465	-105.959
3.0	-1.967	-134.43	-16.164	30.424	-55.016	-53.787	-0.54	-116.424
3.5	-1.974	165.035	-18.119	-62.624	-54.931	-123.19	-0.607	-167.743
4.0	-2.21	107.046	-22.344	120.161	-57.185	101.398	-0.839	141.387
4.5	-2.474	48.11	-42.17	-57.868	-59.388	80.971	-0.83	91.013
5.0	-2.647	-10.421	-48.662	-139.353	-63.742	13.508	-0.93	38.913
5.5	-2.758	-68.222	-54.447	140.834	-56.238	-8.165	-0.993	-13.403
6.0	-2.645	-125.732	-63.373	74.546	-59.303	157.99	-1.145	-68.365
7.0	-2.357	124.578	-52.493	98.891	-54.818	29.866	-2.115	-176.377
8.0	-2.4	15.057	-46.215	-47.005	-58.471	-89.574	-1.492	76.606
9.0	-4.992	-106.44	-42.045	155.973	-58.601	-100.194	-1.513	-34.954
10.0	-18.2	-133.977	-42.845	-46.266	-49.614	-149.66	-2.35	-165.752
11.0	-3.179	72.763	-56.969	-166.779	-55.254	78.18	-2.776	37.529
12.0	-2.498	-56.435	-57.532	28	-56.671	-85.326	-2.762	-112.048
13.0	-4.072	-165.978	-49.529	106.178	-49.234	129.04	-3.463	96.178
14.0	-9.988	57.584	-43.317	-179.126	-44.447	-18.046	-5.046	-107.853
15.0	-10.358	-156.525	-47.425	-166.179	-51.511	158.496	-4.717	-72.741
16.0	-6.977	42.596	-49.172	7.584	-52.216	67.308	-2.068	137.07
17.0	-5.399	-124.424	-47.281	142.1	-50.398	166.878	-2.023	25.404
18.0	-3.22	103.778	-47.01	1.183	-47.386	27.591	-4.854	-129.506
19.0	-2.448	0.839	-42.578	-155.4	-44.211	-111.995	-8.384	22.683
20.0	-4.267	-102.402	-43.909	29.314	-45.786	12.927	-6.153	-78.467

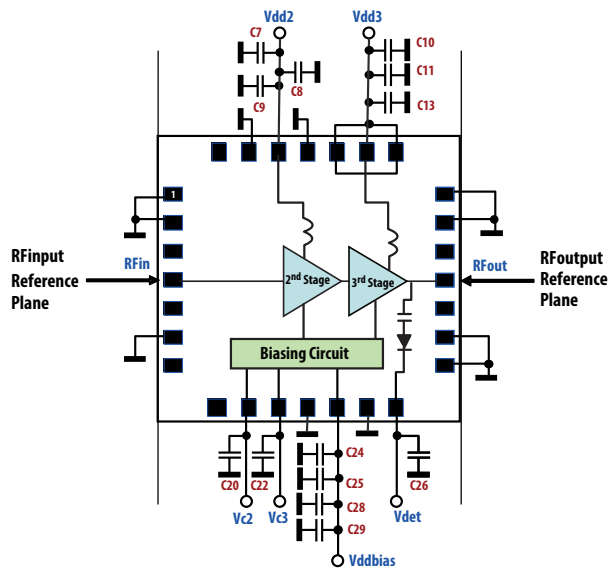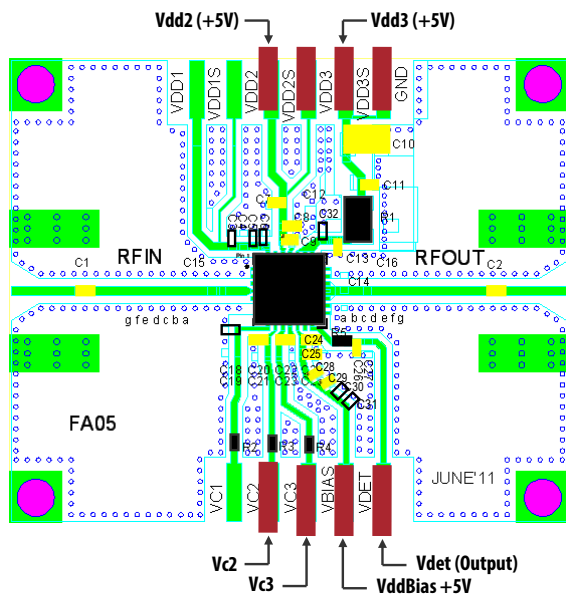Note 1. S-parameter is measured with de-embedded reference plane at DUT RFin and RFout pins.

**Figure 26. RFinput and RFoutput Reference Plane**

## Demonstration Board Top View (Vdd=VddBias=5.0 V, Vc2=3.5 V, Vc3=2.8 V)

Component	Value	Part Number
C1, C2, C20, C22	56 pF ± 5%	GRM1555C1H056JA01D
C11, C29	0.1 µF ± 10%	GRM155R71C104KA88D
C24	82 pF ± 5%	GRM1555C1H820JA01D
C8, C25	2200 pF ± 10%	GRM155R71H222KA01D
C7, C13, C28	0.047 µF ± 10%	GRM155R71E473KA88D
C9	12 pF ± 5%	GRM1555C1H120JA01D
C26	22 nF ± 10%	CM05X7R223K16AHF
C10	2.2 µF ±10%	GRM21BR71E225KA73L
R1	0 Ω	RMC1/10 JPTP
R3, R4, R5	0 Ω	RMC1/16S JPTH

Note:
For performance optimization, control voltage for individual stages can be adjusted by varying R2, R3 and R4 resistor value.
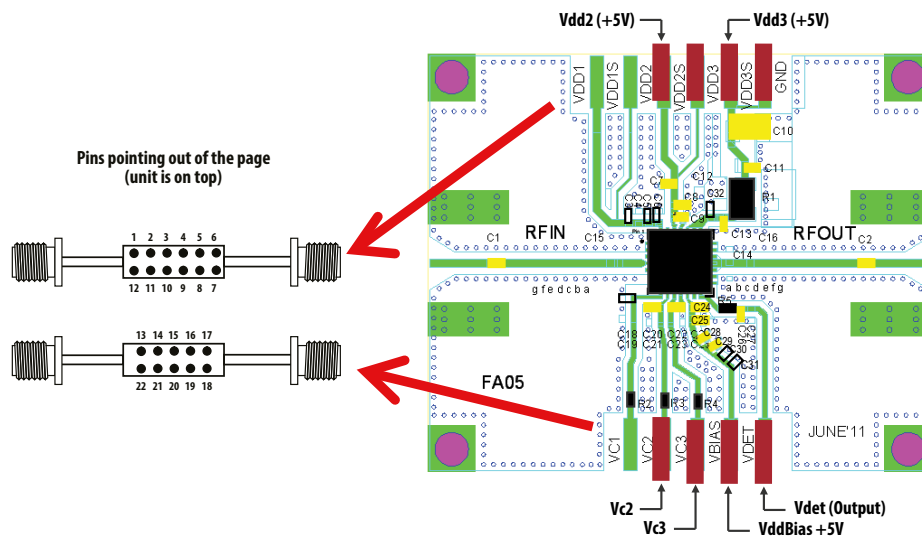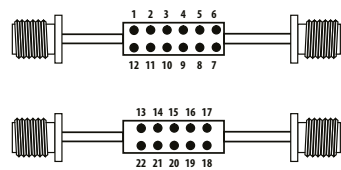
Application board pin header assignments

Pin 1 : Vdd3 (Sense)
Pin 2 : Vdd3 (Force)
Pin 3 : Vdd2 (Sense)
Pin 4 : Vdd2 (Force)
Pin 5 : Vdd1 (Sense) – not used
Pin 6 : Vdd1 (Force) – not used
Pin 13 : Vc1 – not used
Pin 14 : Vc2
Pin 15 : Vc3
Pin 16 : VddBias
Pin 17 : Vdet

Other pins are grounded

Figure 27. Demonstration board application circuit for MGA-43828 module
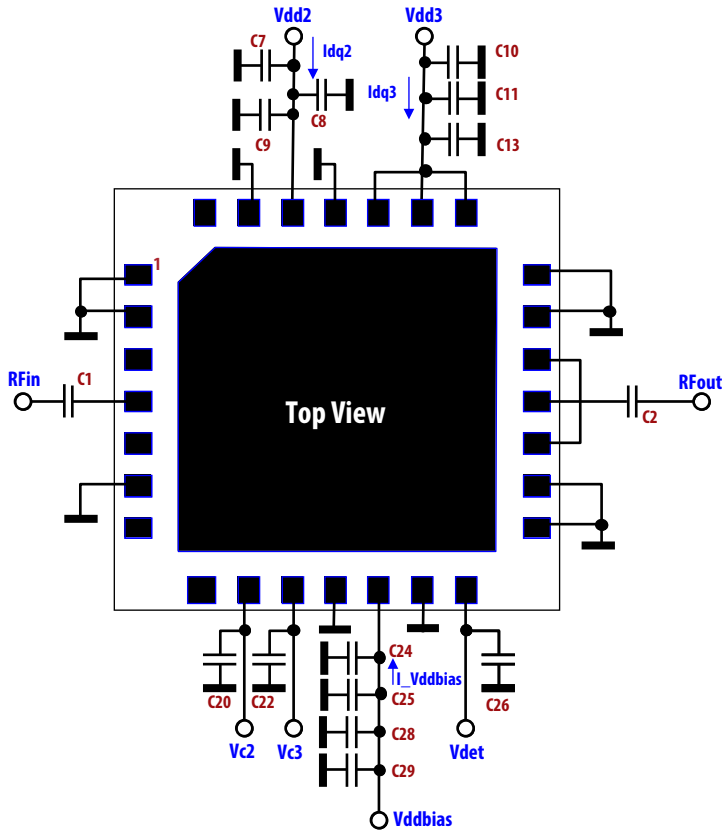
Application Schematic

Figure 28. Application schematic in demonstration board

Notes
1. All capacitors on supply lines are bypass capacitors
2. C1 / C2 are RF coupling capacitors.
3. For Vdd=VddBias=5 V, Idq2 = 110 mA, Idq3 = 235 mA, I_VddBias = 14 mA. Idq 2/3 are adjusted by voltages to CMOS-compatible control pins Vc 2/3 respectively. These typical bias currents were obtained with Vc 2/3 voltages in Figure 2. Adjustment of these currents enable optimum bias conditions to be achieved for best linearity and efficiency for a given modulation type.

MGA-43828 typical Ic2, Ic3 vs. Vc ,unless otherwise stated
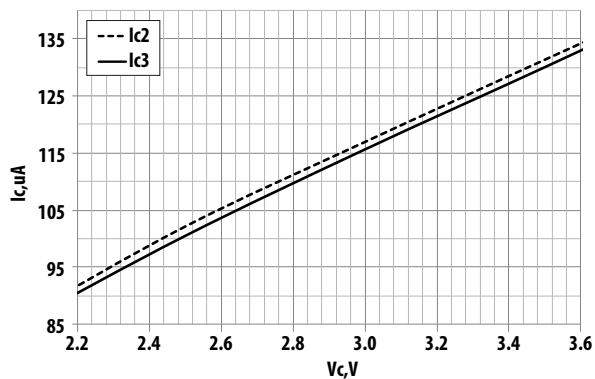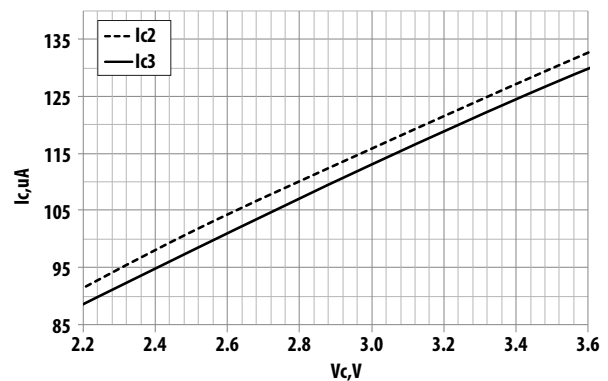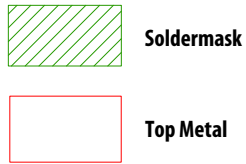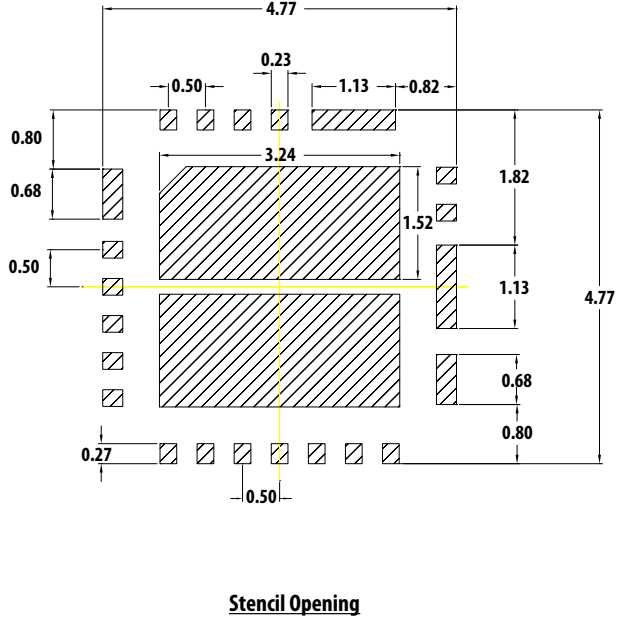

Figure 29. I_c vs. V_c at Vdd=VddBias=5.0 V

Figure 30. I_c vs. V_c at Vdd=VddBias=5.5 V

PCB Land Pattern and Stencil Outline

Land Pattern

Stencil Opening

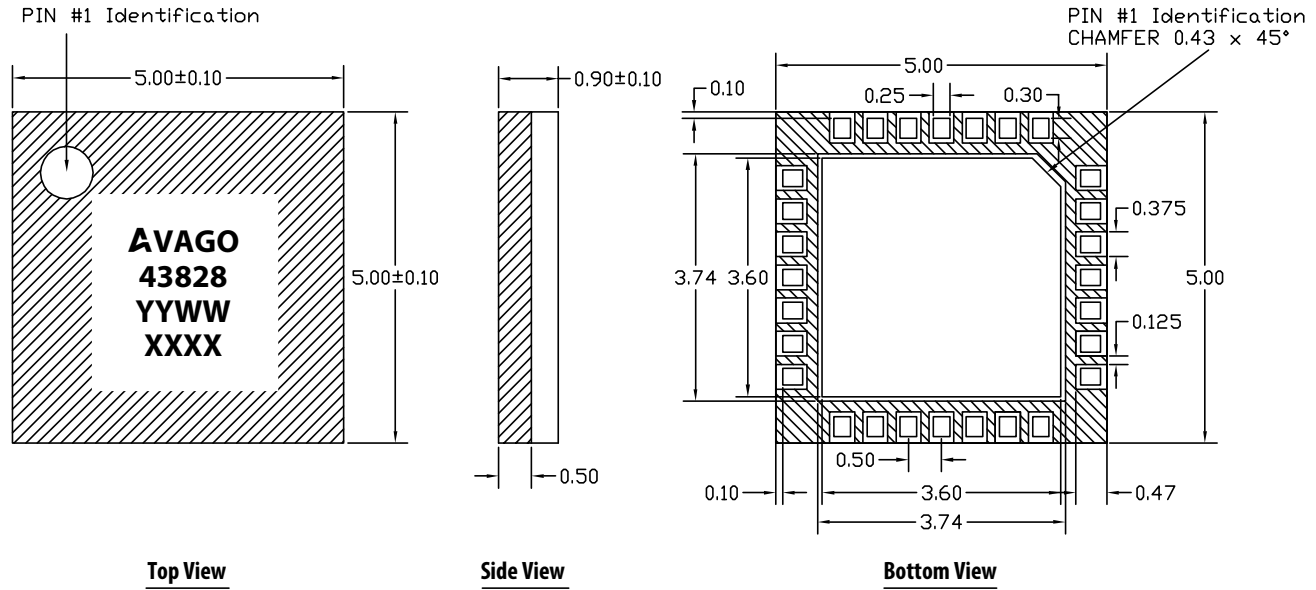**Combination of Land Pattern & Stencil Opening**

Soldermask

Top Metal
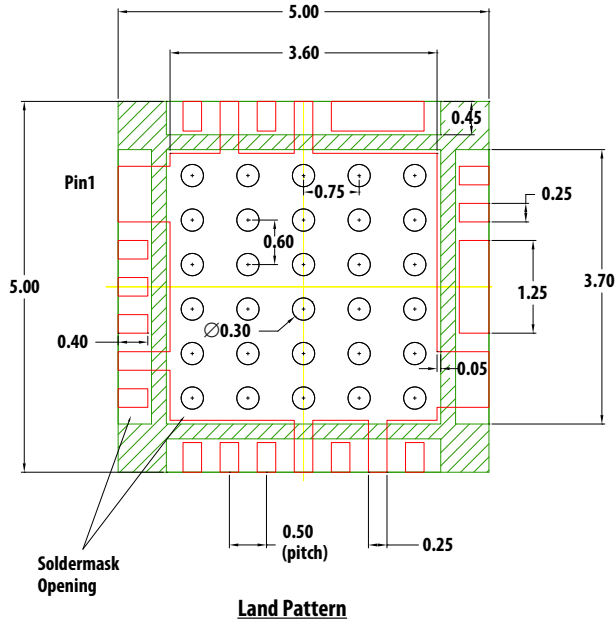
Note :
1. Recommended Land Pattern and Stencil.
2. 4 mils stencil thickness recommended.
3. All dimensions are in mm
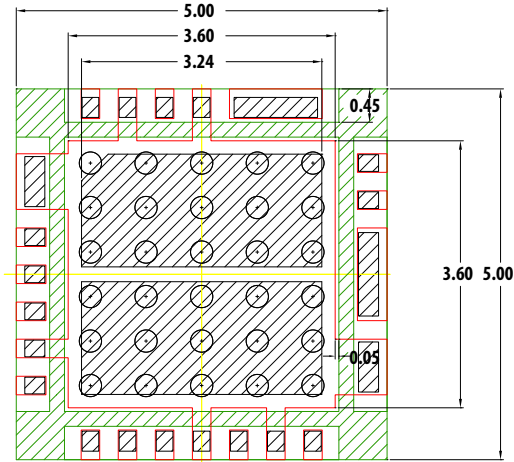
MCOB (5.0 × 5.0 × 0.9) mm 28-Lead Package Dimensions

PIN #1 Identification

5.00±0.10

AVAGO
43828
YYWW
XXXX

5.00±0.10

Top View

0.90±0.10

0.50

Side View

PIN #1 Identification
CHAMFER 0.43 x 45°

5.00

0.10

0.25

0.30

0.375

3.74 3.60

5.00

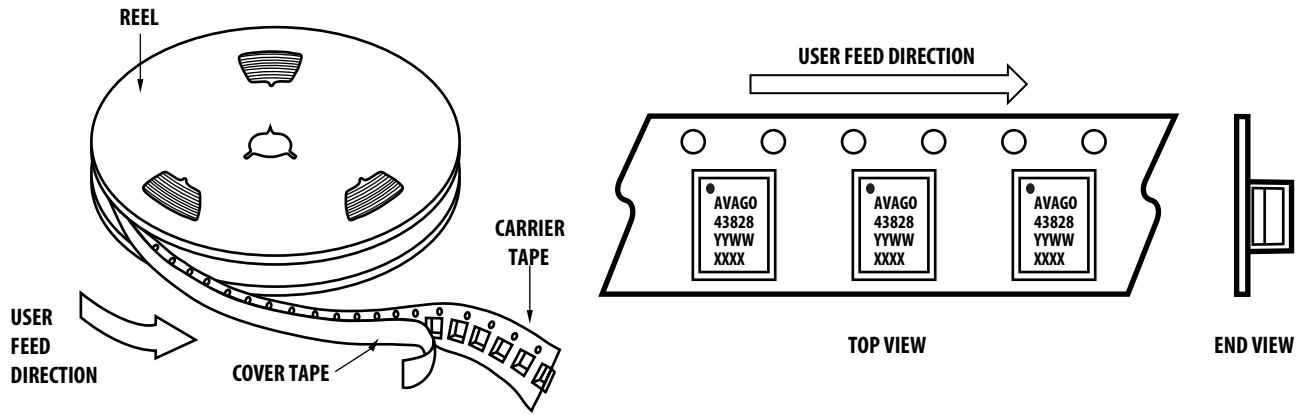0.125

0.50

0.10

3.60

0.47

3.74

Bottom View

Note
1. All dimensions are in millimeters.
2. Dimensions are inclusive of plating.
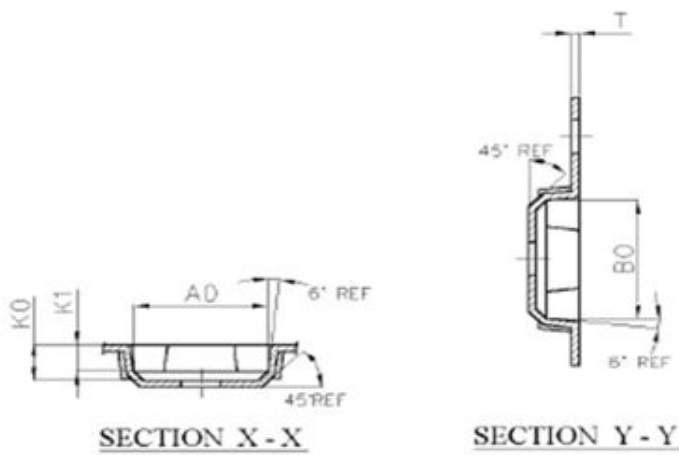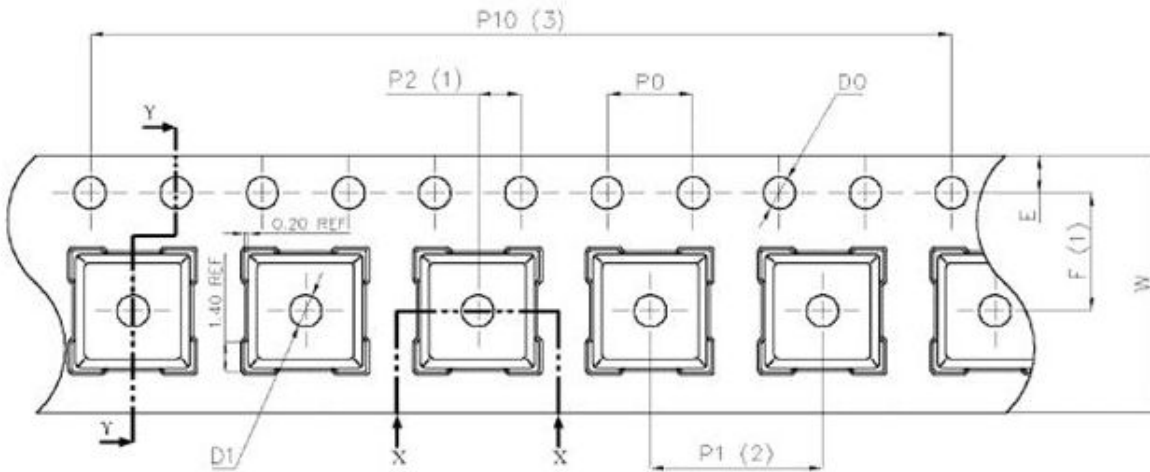3. Dimensions are exclusive of mold flash and metal burr

Part Number Ordering Information

Part #	Qty	Container
MGA-43828-BLKG	100	Antistatic Bag
MGA-43828-TR1G	1000	7" Reel

Device Orientation

REEL

USER FEED DIRECTION

CARRIER TAPE

USER FEED DIRECTION

COVER TAPE

AVAGO
43828
YYWW
XXXX

AVAGO
43828
YYWW
XXXX

AVAGO
43828
YYWW
XXXX

TOP VIEW

END VIEW

Tape Dimensions

P10 (3)

P2 (1)

P0

D0

Y

0.20 REF

1.40 REF

D1

X   X

P1 (2)

E

F (1)

W

Y

SECTION X-X

K0 K1

A0

6° REF

45°REF

SECTION Y-Y

T

45° REF

B0

6° REF

Dimension List			
Annote	Millimeter	Annote	Millimeter
A0	5.40±0.10	P0	4.00±0.10
B0	5.40±0.10	P2	2.00±0.10
D0	1.50$^{+0.10}_{-0}$	P10	40.00±0.20
D1	1.60±0.10	E	1.75±0.10
K0	1.90±0.10	F	5.50±0.10
K1	1.50±0.10	T	0.30±0.03
P1	8.00±0.10	W	12.00±0.30

Reel Dimensions (7" reel)

Ø178.0±1.0

FRONT   BACK

SEE DETAIL "X"

RECYCLE LOGO   FRONT VIEW

65°   45°

R10.65

R5.2

Slot hole 'b'

60°

7.9 - 10.9*

8.4 +1.5* -0.0

FRONT   BACK

Ø55.0±0.5

Ø178.0±1.0

Slot hole 'a'

Ø51.2±0.3

EMBOSSED RIBS
RAISED: 0.25mm, WIDTH: 1.25mm

BACK VIEW

14.4*
MAX.
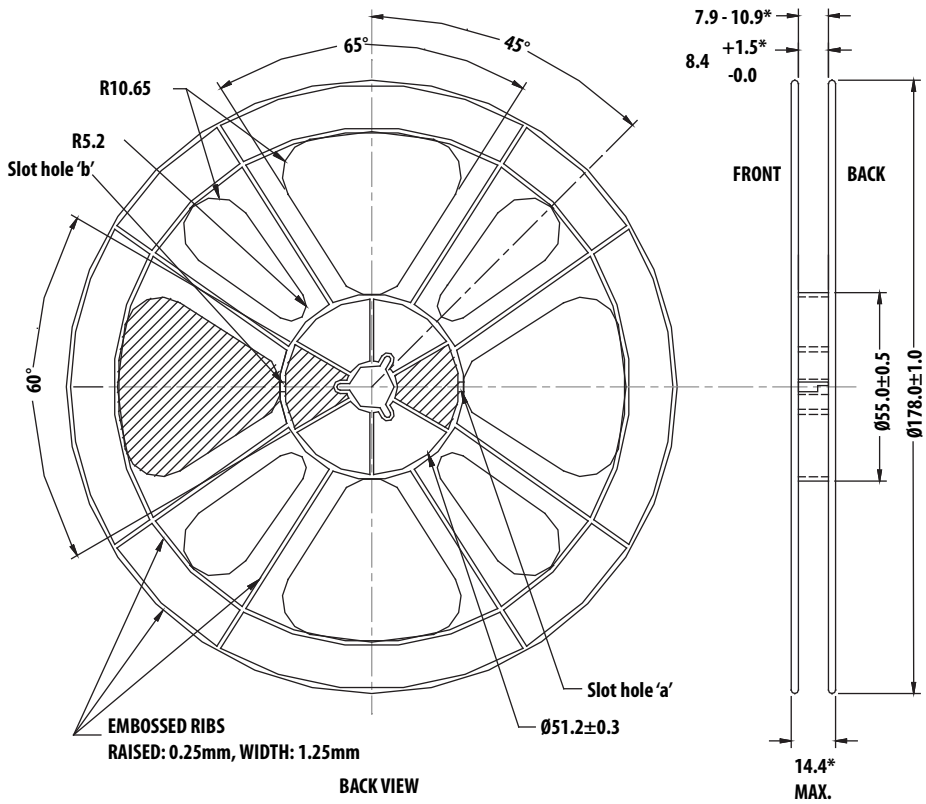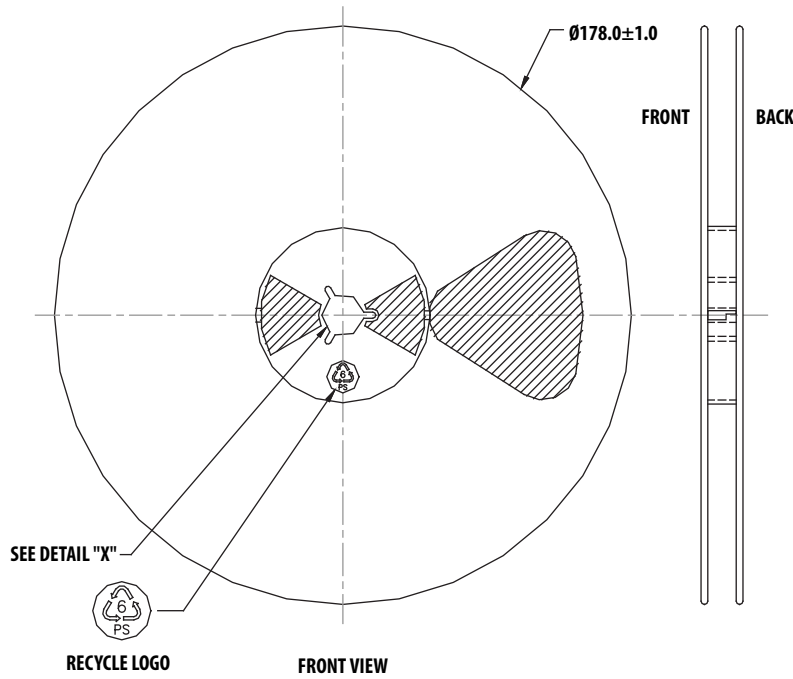
For product information and a complete list of distributors, please go to our web site: **www.avagotech.com**

Avago
T E C H N O L O G I E S