

Wideband, Microwave, 0.5W

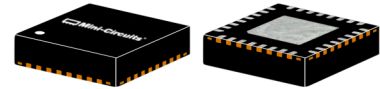
Monolithic Amplifier

AVM-273HP+

50Ω 13 to 26.5 GHz

The Big Deal

- Wideband 13 to 26.5 GHz
- Output power up to +27dBm
- Excellent directivity, 43 dB typ. @ 20 GHz
- Unconditionally stable
- Excellent gain flatness, ± 1 dB
- Sequencing and DC Control module (VCM-1+) is available



CASE STYLE: DG1677-1

Product Overview

Mini-Circuits AVM-273HP+ is a three stage balanced, wideband monolithic amplifier delivering up to 0.5W power and operating over 13 to 26.5 GHz. It is designed using PHEMT technology and is unconditionally stable. Its outstanding isolation enables it to be used as a wideband isolation amplifier or buffer amplifier in a variety of microwave systems including point to point radios, military EW and radar, DBS, and VSAT.

Key Features

Feature	Advantages
Wideband	Wide frequency coverage up to 26.5 GHz supports many microwave applications.
Pout up to +27 dBm	Can be used as a low-cost driver for high power amplifiers.
Excellent active directivity, 43 dB @ 20 GHz (directivity = isolation – gain)	Can be used as an inter-stage isolation amplifier, minimizing interaction of adjacent components.
Unconditionally stable	Eliminates the need for any compensating network to prevent unintended oscillation.
Small package	Small size for high power with low inductance, repeatable transitions, and excellent thermal contact to PCB.



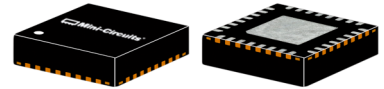
Wideband, Microwave, 0.5W

Monolithic Amplifier

13-26.5 GHz

Product Features

- Gain, 13 dB typ.
- Output Power, up to +27 dBm typ.
- Excellent directivity, 43 dB typ. at 20 GHz
- Unconditionally Stable
- Aqueous washable; 5 mm x 5 mm SMT package



CASE STYLE: DG1677-1

Typical Applications

- Point to Point Radio
- Military EW and Radar
- DBS
- VSAT
- Wideband Isolation amplifier

AVM-273HP+

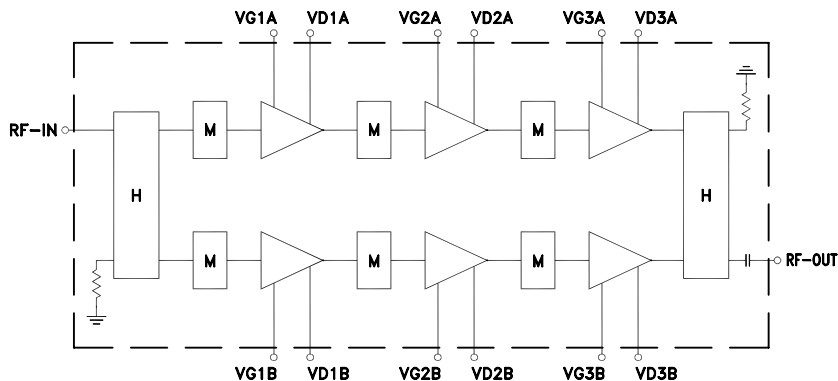
+RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

General Description

The AVM-273HP+ is a three stage balanced wideband monolithic amplifier delivering up to 0.5W power operating over 13 to 26.5 GHz. It is manufactured using PHEMT technology and is unconditionally stable. Its outstanding isolation enables it to be used as a wideband isolation amplifier or buffer amplifier in a variety of microwave systems.

Simplified Schematic



Notes:
H - 90° Hybrid
M - Matching Network



Electrical Specifications ⁽¹⁾ at 25°C, Zo=50Ω, (refer to characterization circuit, Fig.1)

Parameter	Condition (GHz)	Min.	Typ.	Max.	Units.
Frequency Range		13.0		26.5	GHz
DC Voltage (VD1 to VD3 (A)&(B)) ⚠			5.0		V
DC Voltage (VG1 to VG3 (A)&(B)) ⚠			-0.8		V
DC Current (ID1+ID2+ID3; (A)&(B))			559	590	mA
DC Current (IG1+IG2+IG3; (A)&(B))			0.5		mA
Gain	13.0	—	12.8		dB
	14.0	—	12.8		
	15.0	—	13.0		
	16.0	—	13.6		
	17.0	—	14.2		
	18.0	12.0	15.1		
	20.0	—	14.7		
	24.0	—	13.8		
Input Return Loss	26.5	—	13.2		dB
	13.0		16.9		
	14.0		17.1		
	15.0		17.6		
	16.0		17.0		
	17.0		19.4		
	18.0		15.5		
	20.0		8.9		
Output Return Loss	24.0		9.0		dB
	26.5		7.2		
	13.0		8.1		
	14.0		12.7		
	15.0		18.9		
	16.0		19.3		
	17.0		16.6		
	18.0		13.2		
Directivity (Isolation- Gain)	20.0		43		dB
	24.0		10.6		
	26.5		8.8		
	13.0		22.6		
	14.0		24.3		
	15.0		25.6		
	16.0		26.3		
	17.0		26.4		
Output Power @ 1 dB compression	18.0		26.9		dBm
	20.0		26.6		
	24.0		26.5		
	26.5		25.7		
	13.0		28.7		
	14.0		30.6		
	15.0		32.2		
	16.0		32.4		
OIP3	17.0		33.2		dBm
	18.0		32.1		
	20.0		31.0		
	24.0		29.7		
	26.4		29.5		
	13.0		9.8		
	14.0		9.6		
	15.0		9.3		
Noise Figure	16.0		8.9		dB
	17.0		8.8		
	18.0		8.4		
	20.0		8.5		
	24.0		7.5		
	26.5		8.5		
DC Current Variation vs. Temperature (2)			0.32		mA/°C
DC Current Variation vs. Voltage			0.145		mA/mV
Thermal Resistance			16.3		°C/W

Absolute Maximum Ratings⁽³⁾

Operating Temperature ⁽⁴⁾	-40°C to 85°C
Storage Temperature	-65°C to 150°C
Channel Temperature	136°C
DC Voltage-Drain (Pads 11,13,15,26,28,30) @ VG=-0.8V ⁽⁵⁾	+6 V
DC Voltage-Gate (Pads 10,12,14,27,29,31) @ VD=+5V ⁽⁶⁾	-6 V
Power Dissipation	3.1 W
DC Current (Pads 11,13,15,26,28,30)	620 mA
Input Power (CW)	16 dBm
DC Voltage on pins 19 & 20 (@VD=5V & VG=-0.8V)	+10V

Notes:

1. Measured on Mini-Circuits Test Board TB-715-5V. See Characterization Test Circuit (Fig. 1), See cautionary note ⚠.
2. (Current at 85°C - Current at -45°C)/130
3. Permanent damage may occur if any of these limits are exceeded. These maximum ratings are not intended for continuous normal operation.
4. Defined with reference to ground pad temperature.
5. VG=VG1, VG2, VG3 (A&B)
6. VD= VD1, VD2, VD3 (A&B)

Bias Sequence and Conditions

NOTE: to prevent damage to the AVM-273HP+, and to ensure proper operation, all bias voltages must be applied in the following sequence for both Power On and for Power Off:

Power ON

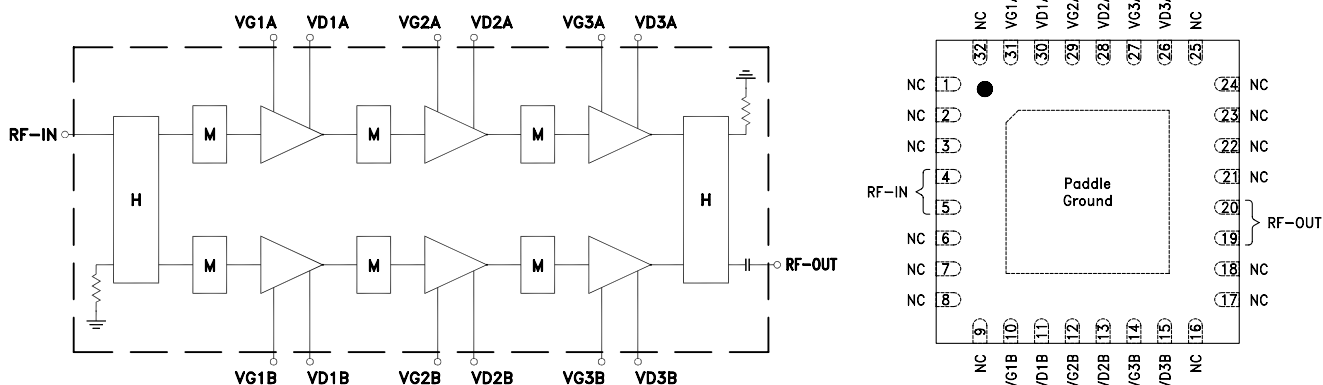
1. Connect all Vg wires together (to ensure all stages are biased simultaneously).
2. Connect all Vd wires together (to ensure all stages are biased simultaneously).
3. Set Vg to -2V, apply Vg
4. Set Vd to +5V, apply Vd
5. Adjust Vg until the desired I_{dd} is reached (the typical Vg is around -0.8V).
6. Apply RF signal.

Power OFF

1. Turn OFF RF signal
2. Set Vg to -2.0V
3. Turn OFF Vd (Vd to 0V)
4. Turn OFF Vg (Vg to 0V)

ALTERNATELY – VCM-1+ module provide voltage sequencing and DC control automatically.

Following these requirements are required for proper operation and are a condition of Mini-Circuits Warranty.

Simplified Schematic and Pad Description

Notes:

H - 90° Hybrid
M - Matching Network

Function	Pad Number	Description (See Application Circuit)
RF-In	4,5	RF Input
RF-Out	19,20	RF-Output (DC blocked)
VG1 A	31	Gate Voltage of first stage amplifier (Top)
VG2 A	29	Gate Voltage of second stage amplifier (Top)
VG3 A	27	Gate Voltage of third stage amplifier (Top)
VD1 A	30	Drain Voltage of first stage amplifier (Top)
VD2 A	28	Drain Voltage of second stage amplifier (Top)
VD3 A	26	Drain Voltage of third stage amplifier (Top)

Function	Pad Number	Description (See Application Circuit)
VG1 B	10	Gate Voltage of first stage amplifier (Bottom)
VG2 B	12	Gate Voltage of second stage amplifier (Bottom)
VG3 B	14	Gate Voltage of third stage amplifier (Bottom)
VD1 B	11	Drain Voltage of first stage amplifier (Bottom)
VD2 B	13	Drain Voltage of second stage amplifier (Bottom)
VD3 B	15	Drain Voltage of third stage amplifier (Bottom)
NC	1-3, 6-9, 16-18, 21-25, 32	No Connection, not used internally

Characterization Test Circuit

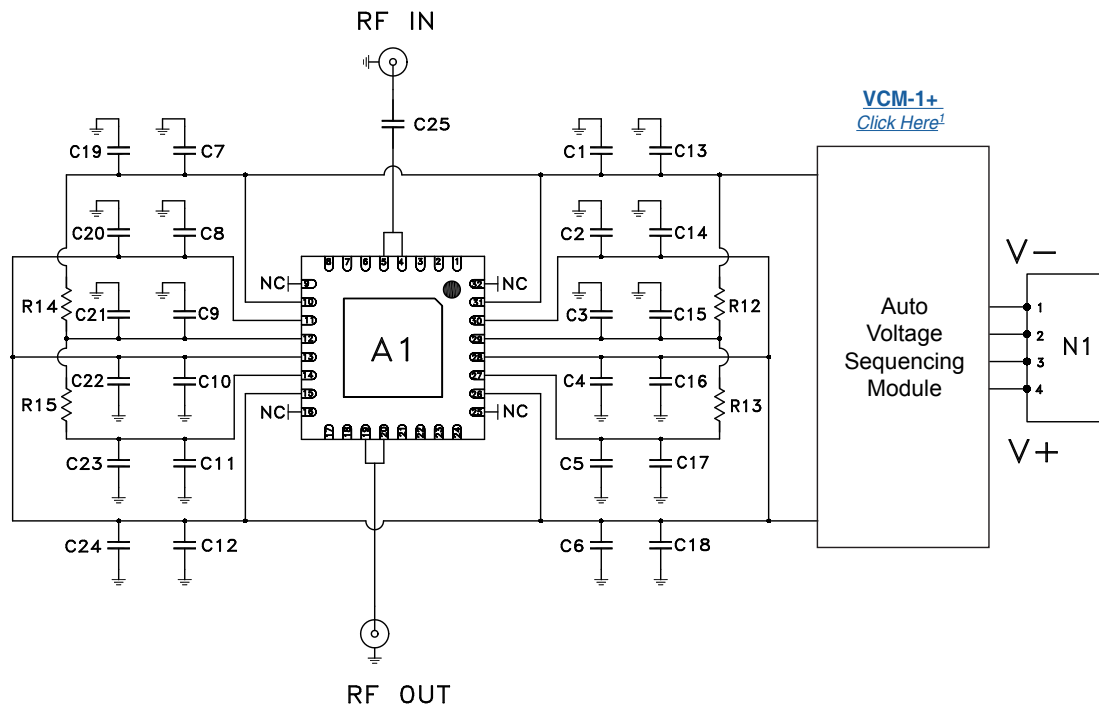


Fig. 1 Schematic of Test Board TBD (Test & Application)

TBD incorporates Current stabilization, automatic voltage sequencing, reverse voltage protection circuitry.

Test board used for characterization. (DUT soldered on Mini-Circuits Characterization Test Board TBD) Gain, Output power at 1dB compression (P1dB), Noise Figure, Output IP3 (OIP3) are measured using Agilent's N5242A PNA-X microwave network analyzer.

Conditions:

1. Gain: Pin=-25 dBm
2. Output IP3 (OIP3): Two tones, spaced 1 MHz apart, 0 dBm/tone at output.
3. V+ set to +6.1V to account for 1.1V drop in bias circuit resulting in +5V at drain (VD1 to VD3 (A&B))
4. V- is set to -5V to realize proper gate voltage (-0.8V typ.)

NOTE 1: The voltage sequencing and DC control circuit is available as a self-contained, surface mount module, see page 7

Product Marking



Additional Detailed Technical Information	
additional information is available on our dash board. To access this information click here	
Performance Data	Data Table
	Swept Graphs
	S-Parameter (S2P Files) Data Set (.zip file)
Case Style	DG1677-1 (SOT 89) <i>Plastic package, exposed paddle, lead finish: tin-silver over nickel</i>
Tape & Reel	F68
Standard quantities available on reel	7" reels with 10, 20, 50, 100, 200, 500 or 1K devices
Suggested Layout for PCB Design	PL-401
Evaluation Board	TB-715-5V

ESD Rating

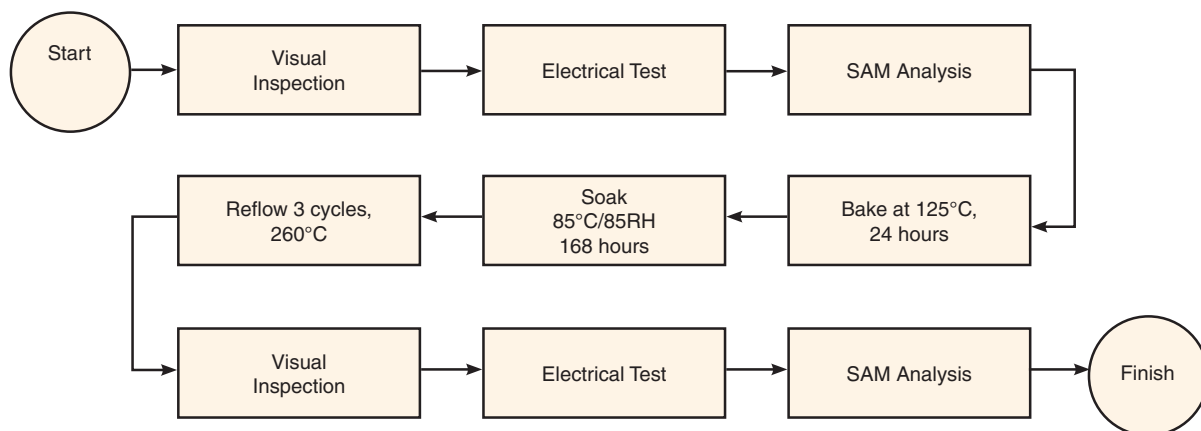
Human Body Model (HBM): Class 1A in accordance with JESD22-A114F

Machine Model (MM): Class A (pass 25V) in accordance JESD22-A115

MSL Rating

Moisture Sensitivity: MSL1 in accordance with IPC/JEDEC J-STD-020D

MSL Test Flow Chart



Additional Notes

- Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp

VCM-1+



+RoHS Compliant
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

A	B	C	D	E	F	G	H
.750	.750	.220	.100	.075	--	.060	.040
19.05	19.05	5.59	2.54	1.91	--	1.52	1.02

J	K	L	M	N	P	Q	wt
.070	.791	--	.063	.061	--	.140	grams
1.78	20.09	--	1.60	1.55	--	3.56	2.05

SEQ	Manufacturer P/N	Description	Manufacturer
Q1,Q2	MMBT3906	PNP Transistor	Fairchild Semiconductor
Q3	MMBT3904	NPN Transistor	Fairchild Semiconductor
Q4	NTS4101PT1G	P-Channel MOSFET	ON Semiconductor
D1	MMSZ5228BT1G	Zener Diode	ON Semiconductor
D2-D4	MBR0520LT1G	Schottky Diode	ON Semiconductor
C26,C27	GRM1555C1H101GA01D	0402 Capacitor, 100 pF, 2%	Murata Electronics
C28,C29	GRM188R71C105KA12D	0603 Capacitor, 1µF	Murata Electronics
R1,R2,R9,R10	RK73H1JTTD1002F	0603 Resistor, 10kΩ	KOA Speer
R3-R5	RK73H2BTTD3R32F	1206 Resistor, 3.32 Ω	KOA Speer
R6	RK73H1JTTD1000F	0603 Resistor, 100 Ω	KOA Speer
R7	RK73H1JTTD1501F	0603 Resistor, 1.5 kΩ	KOA Speer
R8	RK73H1JTTD1001F	0603 Resistor, 1.0 kΩ	KOA Speer
R11	RK73Z2BTTD	1206 Resistor, 0 Ω	KOA Speer

Typical Performance Data

NOTE: Use PDF Bookmarks to view DATA at required conditions

Definitions:

Input Return Loss = -S11 (dB)

Gain(Power Gain) = S21 (dB)

Reverse Isolation = -S12 (dB)

Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 5.00V, Id = 559.85mA @ Temperature = +25°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(GHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
12.0	12.72	54.58	16.01	4.69	39.78	0.68	26.79	17.44	10.15
12.2	13.07	53.16	16.04	5.11	34.00	0.71	27.98	18.33	10.11
12.4	13.30	53.67	16.02	5.63	36.90	0.75	27.51	18.98	10.10
12.6	13.36	51.77	16.04	6.20	30.90	0.78	29.19	19.59	9.93
12.8	13.44	52.13	16.15	6.77	33.20	0.81	29.36	20.06	9.90
13.0	13.43	52.70	16.37	7.45	36.87	0.84	30.39	20.81	9.88
13.2	13.45	52.68	17.13	8.33	38.35	0.87	30.96	21.30	9.85
13.4	13.45	54.41	17.41	9.12	48.15	0.89	30.88	21.76	9.77
13.6	13.45	55.25	16.76	9.97	54.19	0.92	32.02	21.86	9.73
13.8	13.46	55.07	17.11	11.09	54.37	0.94	32.10	22.33	9.58
14.0	13.49	55.69	17.22	12.26	59.41	0.96	32.72	22.52	9.60
14.5	13.71	56.28	17.75	15.69	64.30	0.99	33.26	23.84	9.32
15.0	13.98	59.89	18.49	19.48	96.14	1.00	33.42	24.49	9.32
15.5	14.40	58.48	18.33	23.62	78.44	1.01	34.04	24.81	9.11
16.0	14.75	61.96	18.27	30.02	112.85	1.01	34.12	25.31	8.79
17.0	15.22	58.52	20.64	23.55	72.13	1.00	34.29	25.44	8.60
17.5	15.35	70.47	26.11	16.52	278.30	0.98	33.86	24.91	8.74
18.0	15.90	62.60	27.86	15.17	104.70	0.97	33.65	26.32	8.60
18.5	15.98	55.90	19.29	13.23	46.67	0.96	33.15	25.76	8.33
19.0	15.59	54.22	15.10	14.72	39.94	1.00	32.52	25.70	8.33
19.5	15.91	60.12	11.85	15.49	73.76	1.03	32.44	25.81	8.31
20.0	15.76	60.57	10.28	14.34	75.97	1.05	32.31	25.86	8.61
20.5	15.11	61.80	8.26	15.09	88.97	1.11	32.16	25.86	8.88
21.0	14.67	63.20	7.61	14.54	106.42	1.13	31.47	25.86	8.91
21.5	14.29	61.82	7.00	14.32	91.82	1.15	31.16	25.86	8.96
22.0	14.11	60.36	6.96	12.62	77.66	1.13	30.85	25.35	8.80
22.5	13.95	61.27	6.81	11.78	85.89	1.13	31.27	25.49	8.49
23.0	14.02	59.64	7.28	11.91	72.64	1.11	31.83	25.63	8.28
23.5	14.07	53.01	7.82	11.95	34.52	1.09	31.05	25.56	8.04
24.0	14.58	50.66	9.55	11.74	26.35	1.04	30.89	24.97	7.71
24.5	15.05	45.23	11.31	13.16	14.19	1.02	30.78	25.24	7.17
25.0	15.28	42.81	12.05	13.37	10.71	1.01	30.46	24.50	7.08
25.4	14.74	39.99	13.79	11.77	8.26	0.96	31.25	25.06	6.81
25.6	14.36	41.38	14.44	11.63	10.14	0.96	30.61	25.21	6.82
25.8	14.23	41.70	15.79	11.37	10.74	0.95	31.01	24.91	6.96
26.0	14.05	40.65	15.13	10.65	9.54	0.93	31.18	24.45	6.87
26.2	14.13	42.25	14.93	10.83	11.37	0.94	31.35	24.61	6.89
26.4	14.30	40.80	12.65	10.43	9.17	0.95	31.15	24.16	7.27
26.5	14.26	41.20	11.39	10.28	9.43	0.96	31.11	24.16	7.14

Typical Performance Data

Definitions:

Input Return Loss = -S11 (dB)

Gain(Power Gain) = S21 (dB)

Reverse Isolation = -S12 (dB)

Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 4.75V, Id = 525.06mA @ Temperature = +25°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(GHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
12.0	12.95	54.72	16.04	4.71	39.46	0.68	27.34	16.77	10.06
12.2	13.31	53.16	16.08	5.14	33.18	0.71	28.50	17.67	9.97
12.4	13.54	53.78	16.03	5.64	36.40	0.75	28.04	18.33	9.95
12.6	13.61	52.08	16.01	6.19	31.08	0.78	29.86	18.98	9.88
12.8	13.67	52.27	16.13	6.77	32.80	0.81	29.96	19.44	9.80
13.0	13.66	53.01	16.40	7.44	37.22	0.84	30.97	20.21	9.80
13.2	13.68	53.28	17.16	8.31	40.01	0.87	31.66	20.70	9.77
13.4	13.67	54.58	17.45	9.09	47.89	0.89	31.64	21.18	9.66
13.6	13.65	55.69	16.77	9.92	55.62	0.92	32.84	21.25	9.61
13.8	13.66	55.23	17.17	11.05	54.19	0.94	32.72	21.76	9.44
14.0	13.68	55.70	17.29	12.19	58.19	0.96	33.57	21.93	9.41
14.5	13.88	56.05	17.71	15.57	61.38	0.99	34.01	23.28	9.29
15.0	14.15	58.42	18.45	19.25	79.65	1.00	34.21	23.89	9.16
15.5	14.52	58.98	18.27	23.52	81.87	1.01	34.62	24.19	8.98
16.0	14.87	60.85	18.35	29.92	97.97	1.01	34.44	24.67	8.72
17.0	15.28	56.04	20.65	23.90	53.88	1.00	33.95	24.83	8.53
17.5	15.41	71.69	26.07	16.56	317.65	0.98	34.46	24.22	8.59
18.0	15.93	63.91	27.77	15.30	121.33	0.97	34.02	25.67	8.42
18.5	16.00	56.25	19.30	13.31	48.49	0.96	33.32	25.15	8.18
19.0	15.58	54.83	15.16	14.88	42.98	1.00	32.94	24.93	8.23
19.5	15.88	58.95	11.85	15.53	64.71	1.03	32.50	25.03	8.20
20.0	15.72	61.61	10.24	14.25	85.80	1.05	32.78	25.15	8.51
20.5	15.05	61.19	8.29	14.88	83.45	1.11	32.14	25.17	8.64
21.0	14.61	63.14	7.64	14.37	106.45	1.13	31.57	25.14	8.74
21.5	14.24	60.93	7.03	14.15	83.38	1.15	31.57	25.02	8.74
22.0	14.09	61.29	6.99	12.64	86.76	1.13	31.24	24.43	8.62
22.5	13.94	61.25	6.83	11.84	86.00	1.13	31.84	24.63	8.31
23.0	14.01	58.50	7.24	11.96	63.66	1.11	32.13	24.83	8.10
23.5	14.07	52.89	7.85	12.06	34.17	1.09	31.40	24.80	7.86
24.0	14.58	51.08	9.53	11.87	27.69	1.04	31.60	24.20	7.51
24.5	15.09	45.28	11.38	13.21	14.24	1.02	30.86	24.47	7.13
25.0	15.34	42.96	12.08	13.41	10.82	1.01	30.74	23.72	6.95
25.4	14.95	39.89	13.86	12.16	8.03	0.97	31.50	24.31	6.73
25.6	14.44	41.92	14.62	11.73	10.72	0.96	31.15	24.48	6.73
25.8	14.35	41.98	15.93	11.56	10.97	0.95	31.50	24.17	6.85
26.0	14.02	40.49	14.83	10.62	9.38	0.94	31.65	23.74	6.84
26.2	14.29	42.84	15.23	10.99	12.01	0.94	31.83	23.87	6.89
26.4	14.24	40.83	12.57	10.40	9.25	0.95	31.72	23.44	7.12
26.5	14.27	41.06	11.53	10.29	9.30	0.96	31.35	23.41	7.09

Typical Performance Data

Definitions:

Input Return Loss = -S11 (dB)

Gain(Power Gain) = S21 (dB)

Reverse Isolation = -S12 (dB)

Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 5.25V, Id = 597.91mA @ Temperature = +25°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(GHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
12.0	12.29	54.45	16.02	4.70	41.24	0.68	26.53	18.03	10.35
12.2	12.64	52.83	16.11	5.14	34.50	0.71	27.70	18.93	10.18
12.4	12.87	54.08	16.13	5.67	40.85	0.75	27.25	19.57	10.21
12.6	12.94	51.83	16.06	6.21	32.66	0.78	28.94	20.18	10.10
12.8	13.02	52.35	16.22	6.82	35.82	0.81	29.05	20.63	10.05
13.0	13.02	53.17	16.44	7.50	40.91	0.84	30.02	21.36	10.08
13.2	13.05	53.61	17.17	8.38	44.78	0.87	30.58	21.83	9.99
13.4	13.05	54.34	17.49	9.21	50.17	0.89	30.56	22.30	9.96
13.6	13.05	55.47	16.79	10.06	58.31	0.92	31.65	22.36	9.87
13.8	13.09	55.61	17.23	11.20	60.61	0.94	31.47	22.85	9.68
14.0	13.13	55.25	17.29	12.37	59.01	0.96	32.39	23.00	9.72
14.5	13.35	56.26	17.82	15.85	66.89	0.99	32.91	24.32	9.61
15.0	13.68	58.12	18.38	19.55	81.23	1.00	33.10	25.00	9.37
15.5	14.09	59.30	18.22	23.89	89.35	1.01	33.62	25.33	9.26
16.0	14.49	61.06	18.27	30.53	104.76	1.01	33.99	25.85	9.02
17.0	14.97	55.64	20.76	23.74	53.34	1.00	33.38	26.07	8.84
17.5	15.11	72.23	26.01	16.17	349.53	0.98	33.40	25.58	8.86
18.0	15.66	63.79	27.67	15.04	123.23	0.97	33.42	26.99	8.74
18.5	15.76	55.70	19.18	12.98	46.61	0.96	33.19	26.48	8.48
19.0	15.36	55.02	15.08	14.50	44.90	0.99	32.26	26.36	8.56
19.5	15.73	57.48	11.82	15.28	55.47	1.03	32.19	26.42	8.55
20.0	15.59	59.98	10.20	14.35	72.20	1.06	32.21	26.49	8.86
20.5	14.96	60.48	8.31	15.31	78.05	1.11	31.64	26.54	9.04
21.0	14.52	64.68	7.68	14.88	129.16	1.13	31.35	26.62	9.16
21.5	14.12	60.89	7.06	14.57	84.56	1.15	31.09	26.62	9.20
22.0	13.94	61.18	7.02	12.72	87.42	1.13	30.74	26.20	9.07
22.5	13.73	59.71	6.85	11.84	73.79	1.13	31.24	26.25	8.65
23.0	13.78	59.51	7.26	11.90	73.47	1.11	31.53	26.33	8.44
23.5	13.80	53.50	7.85	11.90	37.74	1.09	30.88	26.26	8.21
24.0	14.26	50.91	9.51	11.70	28.05	1.04	30.51	25.63	7.82
24.5	14.73	45.30	11.30	12.95	14.82	1.02	30.29	25.89	7.25
25.0	14.89	42.67	11.77	12.90	10.92	1.01	30.04	25.12	7.29
25.4	14.51	40.43	14.02	12.03	8.97	0.97	30.82	25.73	6.98
25.6	14.02	41.96	14.67	11.62	11.28	0.96	30.28	25.84	7.08
25.8	13.98	42.60	16.19	11.56	12.30	0.95	30.62	25.56	7.09
26.0	13.66	40.50	15.15	10.52	9.78	0.93	30.82	25.08	7.21
26.2	13.98	43.61	15.52	11.03	13.62	0.94	30.92	25.27	7.11
26.4	13.90	41.05	12.78	10.53	9.92	0.95	30.88	24.79	7.38
26.5	13.92	41.08	11.62	10.24	9.71	0.96	30.56	24.81	7.38

Typical Performance Data

Definitions:

Input Return Loss = -S11 (dB)

Gain(Power Gain) = S21 (dB)

Reverse Isolation = -S12 (dB)

Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 5.00V, Id = 537.02mA @ Temperature = -45°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(GHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
12.0	13.93	54.49	14.43	4.05	31.07	0.63	25.29	17.40	9.20
12.2	14.33	53.23	14.08	4.37	26.75	0.66	26.41	18.27	8.79
12.4	14.57	53.54	14.01	4.82	28.52	0.70	25.87	18.87	8.60
12.6	14.67	54.56	13.64	5.27	33.23	0.73	27.78	19.45	8.94
12.8	14.78	52.94	14.46	5.93	29.06	0.77	27.50	20.02	8.78
13.0	14.78	52.91	13.77	6.53	30.13	0.81	28.84	20.69	8.63
13.2	14.86	53.10	15.31	7.67	32.91	0.85	29.14	21.33	8.78
13.4	14.84	54.65	15.35	8.32	40.58	0.88	29.38	21.71	8.53
13.6	14.86	55.32	15.16	9.73	45.69	0.92	30.38	21.84	8.51
13.8	14.90	54.45	15.96	11.18	42.76	0.95	30.45	22.23	8.56
14.0	14.92	54.87	15.43	12.80	45.72	0.97	31.36	22.48	8.31
14.5	15.13	56.32	16.83	18.25	55.34	1.01	32.42	23.85	8.47
15.0	15.36	58.92	18.12	19.63	73.40	1.00	32.98	24.77	8.13
15.5	15.75	57.42	19.44	20.74	59.41	1.00	33.98	25.09	7.87
16.0	16.06	59.14	19.80	21.63	70.02	1.00	34.58	25.59	7.66
17.0	16.60	58.34	20.27	19.99	59.89	1.00	34.64	25.73	7.74
17.5	16.68	69.03	20.10	16.04	200.25	0.98	34.33	25.21	7.47
18.0	17.49	62.08	20.69	15.98	81.93	0.98	34.61	26.81	7.33
18.5	17.77	55.60	20.61	14.19	37.15	0.97	34.35	26.25	7.18
19.0	17.48	52.90	14.01	15.53	27.50	1.01	33.58	26.47	7.24
19.5	17.81	59.47	11.47	15.54	54.67	1.04	33.18	26.66	7.51
20.0	17.80	56.19	8.34	12.34	33.44	1.08	33.21	26.68	7.79
20.5	17.06	58.97	6.75	11.84	45.82	1.13	33.09	26.45	7.40
21.0	16.43	59.85	5.55	10.64	48.79	1.17	32.39	26.48	7.41
21.5	16.07	61.60	5.30	11.70	62.24	1.21	31.74	26.72	7.41
22.0	16.03	61.31	5.66	10.28	60.73	1.15	31.16	26.48	7.50
22.5	16.07	58.55	6.62	9.94	46.80	1.09	31.54	26.49	7.22
23.0	16.26	62.46	7.25	10.84	76.01	1.09	31.84	26.39	7.22
23.5	16.32	53.20	8.46	11.85	27.93	1.07	30.87	26.18	6.91
24.0	16.75	49.07	8.81	11.83	16.70	1.06	30.59	25.74	6.58
24.5	17.32	44.07	10.92	13.80	9.55	1.04	30.04	25.98	6.36
25.0	17.88	40.77	10.85	14.75	6.24	1.04	29.42	25.29	6.01
25.4	17.15	40.23	11.34	10.76	6.17	0.97	30.20	25.75	5.66
25.6	16.65	40.65	11.67	10.43	6.83	0.96	29.96	25.97	5.73
25.8	16.38	40.97	12.60	9.44	7.21	0.92	30.50	25.55	5.53
26.0	16.18	40.62	14.02	9.16	7.13	0.90	30.35	25.13	5.84
26.2	16.22	42.73	13.60	9.19	8.99	0.91	30.98	25.28	5.96
26.4	16.27	40.29	13.16	8.91	6.69	0.90	30.73	25.00	5.79
26.5	16.28	40.35	11.64	8.72	6.55	0.91	30.53	24.95	5.68

Typical Performance Data

Definitions:

Input Return Loss = -S11 (dB)

Gain(Power Gain) = S21 (dB)

Reverse Isolation = -S12 (dB)

Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 4.75V, Id = 501.98mA @ Temperature = -45°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(GHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
12.0	13.90	54.97	14.47	4.05	32.96	0.63	25.19	16.76	8.91
12.2	14.31	53.59	14.13	4.37	27.95	0.66	26.29	17.63	8.80
12.4	14.54	53.48	14.01	4.82	28.41	0.70	25.76	18.22	8.73
12.6	14.65	54.48	13.68	5.27	33.00	0.73	27.70	18.84	8.66
12.8	14.77	53.06	14.45	5.92	29.50	0.77	27.39	19.37	8.63
13.0	14.75	52.97	13.76	6.51	30.37	0.81	28.75	20.05	8.61
13.2	14.83	53.03	15.41	7.65	32.79	0.85	29.00	20.72	8.48
13.4	14.81	54.68	15.32	8.30	40.80	0.88	29.32	21.10	8.43
13.6	14.83	55.14	15.11	9.71	44.92	0.92	30.37	21.18	8.42
13.8	14.85	54.27	15.98	11.16	42.11	0.95	30.46	21.60	8.27
14.0	14.88	55.01	15.36	12.76	46.68	0.97	31.43	21.86	8.24
14.5	15.08	56.32	16.81	18.20	55.58	1.01	32.40	23.25	8.13
15.0	15.29	59.19	18.11	19.59	76.25	1.00	33.06	24.22	7.92
15.5	15.67	57.89	19.31	20.71	63.27	1.00	33.97	24.55	7.85
16.0	16.00	59.15	19.86	21.57	70.63	1.00	34.38	25.03	7.57
17.0	16.54	57.57	20.27	20.11	55.22	1.00	34.93	25.13	7.37
17.5	16.62	70.00	20.13	16.05	225.35	0.98	34.36	24.63	7.43
18.0	17.43	62.50	20.63	16.01	86.59	0.98	34.65	26.26	7.29
18.5	17.71	55.67	20.58	14.19	37.74	0.97	34.68	25.72	7.12
19.0	17.41	53.09	14.07	15.61	28.39	1.01	33.31	25.81	6.91
19.5	17.73	60.57	11.48	15.50	62.56	1.04	33.48	26.05	7.08
20.0	17.73	59.46	8.34	12.41	49.18	1.08	33.23	26.14	7.36
20.5	16.98	60.14	6.73	11.78	52.76	1.13	33.03	25.94	7.21
21.0	16.36	61.01	5.55	10.56	56.14	1.17	32.08	25.95	7.40
21.5	16.00	62.53	5.30	11.59	69.72	1.20	31.60	26.12	7.38
22.0	15.98	62.91	5.68	10.32	73.66	1.15	31.12	25.82	7.32
22.5	16.04	60.43	6.64	10.03	58.55	1.10	31.52	25.81	6.92
23.0	16.21	61.24	7.21	10.91	66.40	1.09	31.68	25.77	6.94
23.5	16.28	53.71	8.45	11.82	29.72	1.07	30.80	25.52	6.75
24.0	16.71	50.52	8.82	11.91	19.86	1.06	30.59	25.14	6.57
24.5	17.28	44.24	10.95	13.71	9.78	1.04	29.97	25.36	6.14
25.0	17.85	40.93	10.91	14.78	6.39	1.04	29.47	24.70	5.79
25.4	17.12	39.95	11.25	10.80	5.98	0.97	30.16	25.18	5.38
25.6	16.61	40.37	11.67	10.39	6.64	0.96	29.93	25.41	5.45
25.8	16.31	40.95	12.49	9.47	7.25	0.92	30.38	24.98	5.48
26.0	16.15	40.48	13.96	9.15	7.03	0.90	30.43	24.57	5.43
26.2	16.20	42.63	13.68	9.21	8.92	0.91	30.92	24.66	5.68
26.4	16.23	40.63	13.22	8.98	7.00	0.90	30.80	24.44	5.63
26.5	16.24	40.50	11.77	8.77	6.72	0.91	30.43	24.36	5.62

Typical Performance Data

Definitions:

Input Return Loss = -S11 (dB)

Gain(Power Gain) = S21 (dB)

Reverse Isolation = -S12 (dB)

Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 5.25V, Id = 575.09mA @ Temperature = -45°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(GHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
12.0	13.81	55.08	14.43	4.06	33.80	0.63	25.48	17.97	9.12
12.2	14.21	53.68	14.10	4.38	28.63	0.66	26.58	18.84	9.01
12.4	14.44	53.14	13.98	4.83	27.68	0.70	26.05	19.45	8.91
12.6	14.55	54.39	13.67	5.29	33.14	0.73	27.93	20.06	8.84
12.8	14.67	53.06	14.43	5.95	29.89	0.77	27.68	20.57	8.83
13.0	14.66	52.79	13.72	6.55	30.12	0.81	28.97	21.29	8.83
13.2	14.75	53.06	15.41	7.71	33.29	0.85	29.22	21.92	8.78
13.4	14.74	54.53	15.34	8.37	40.53	0.88	29.46	22.30	8.71
13.6	14.77	55.34	15.14	9.80	46.37	0.92	30.41	22.39	8.63
13.8	14.81	54.09	15.96	11.27	41.49	0.95	30.50	22.82	8.53
14.0	14.84	54.98	15.40	12.88	46.78	0.98	31.39	23.07	8.47
14.5	15.05	55.82	16.80	18.41	52.72	1.01	32.40	24.38	8.39
15.0	15.29	59.02	18.09	19.77	74.80	1.00	32.85	25.27	8.20
15.5	15.69	58.04	19.32	20.86	64.26	1.00	33.74	25.61	8.01
16.0	16.01	59.22	19.71	21.69	71.10	1.00	33.97	26.11	7.79
17.0	16.56	56.72	20.26	20.22	49.97	1.00	34.45	26.32	7.66
17.5	16.61	83.43	20.12	15.89	1057.33	0.98	34.11	25.85	7.65
18.0	17.43	61.85	20.76	15.89	80.30	0.98	34.68	27.41	7.51
18.5	17.71	55.80	20.31	14.07	38.23	0.97	34.38	26.84	7.33
19.0	17.42	53.29	14.08	15.44	28.99	1.01	33.10	27.01	7.17
19.5	17.74	59.64	11.52	15.39	56.18	1.04	32.80	27.19	7.37
20.0	17.74	57.73	8.37	12.34	40.28	1.08	33.11	27.22	7.61
20.5	16.98	59.10	6.71	11.81	46.80	1.13	32.74	27.06	7.53
21.0	16.34	60.67	5.55	10.67	54.24	1.17	32.09	27.16	7.68
21.5	15.98	61.42	5.31	11.75	61.71	1.21	31.61	27.38	7.71
22.0	15.94	59.19	5.68	10.23	48.13	1.15	31.17	27.22	7.63
22.5	15.99	59.11	6.66	9.96	50.56	1.09	31.34	27.11	7.26
23.0	16.15	63.12	7.24	10.86	83.05	1.09	31.69	26.93	7.21
23.5	16.21	53.02	8.51	11.78	27.73	1.07	30.73	26.67	7.00
24.0	16.64	49.54	8.82	11.82	17.87	1.06	30.65	26.29	6.66
24.5	17.19	44.02	10.88	13.76	9.63	1.04	30.09	26.51	6.11
25.0	17.71	40.98	10.85	14.51	6.51	1.04	29.49	25.84	6.05
25.4	16.95	39.52	11.17	10.55	5.78	0.96	30.27	26.31	5.68
25.6	16.48	40.62	11.69	10.42	6.93	0.96	30.02	26.51	5.70
25.8	16.12	40.73	12.39	9.30	7.18	0.92	30.37	26.10	5.76
26.0	15.97	40.09	13.78	9.01	6.84	0.90	30.40	25.67	5.77
26.2	16.10	42.73	13.66	9.20	9.12	0.91	30.77	25.76	5.85
26.4	16.15	40.89	13.20	9.01	7.28	0.91	30.75	25.52	5.96
26.5	16.26	41.54	11.97	9.00	7.62	0.92	30.28	25.46	5.91

Typical Performance Data

Definitions:

Input Return Loss = -S11 (dB)

Gain(Power Gain) = S21 (dB)

Reverse Isolation = -S12 (dB)

Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 5.00V, Id = 576.92mA @ Temperature = +85°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(GHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
12.0	11.45	55.58	17.26	5.08	54.36	0.70	27.89	17.76	11.02
12.2	11.80	55.40	17.92	5.65	54.15	0.74	28.99	18.67	10.89
12.4	12.04	53.41	17.81	6.20	43.79	0.77	28.78	19.31	10.77
12.6	12.12	52.23	17.96	6.78	39.36	0.80	30.19	19.96	10.75
12.8	12.19	54.38	17.76	7.41	51.83	0.83	30.49	20.26	10.64
13.0	12.20	54.89	18.61	8.13	56.94	0.86	31.08	21.04	10.68
13.2	12.19	54.08	19.03	8.91	53.54	0.88	31.68	21.35	10.63
13.4	12.20	53.42	19.41	9.80	50.94	0.90	31.29	21.92	10.47
13.6	12.18	53.31	18.25	10.43	51.04	0.92	32.23	21.87	10.48
13.8	12.21	54.93	18.23	11.35	62.40	0.94	31.79	22.39	10.35
14.0	12.28	56.63	18.75	12.25	76.56	0.95	32.05	22.45	10.26
14.5	12.49	57.40	18.28	14.89	83.88	0.98	32.19	23.65	10.16
15.0	12.83	57.99	18.55	18.73	88.15	1.00	31.88	24.23	10.05
15.5	13.23	59.20	17.65	23.02	97.29	1.01	32.28	24.50	9.75
16.0	13.65	60.62	18.04	34.83	109.71	1.02	32.30	25.05	9.60
17.0	13.99	58.12	20.38	24.21	79.35	1.01	31.82	25.33	9.51
17.5	14.19	63.25	32.27	16.19	138.42	0.98	32.11	25.10	9.48
18.0	14.54	67.29	22.26	14.09	207.23	0.97	31.92	26.34	9.40
18.5	14.40	55.71	14.82	11.60	52.31	0.96	31.71	25.75	9.20
19.0	14.16	57.05	14.07	13.10	63.72	0.99	31.31	25.23	9.39
19.5	14.36	58.82	11.35	13.91	74.29	1.03	31.12	25.20	9.38
20.0	14.06	60.11	10.84	13.88	88.27	1.04	31.22	25.38	9.57
20.5	13.59	61.47	9.34	14.93	105.79	1.08	30.53	25.63	9.65
21.0	13.20	64.36	8.98	15.85	153.90	1.10	30.32	25.63	9.73
21.5	12.91	58.85	8.54	15.48	82.89	1.11	30.41	25.29	9.78
22.0	12.71	62.63	8.40	14.34	129.22	1.10	30.18	24.75	9.65
22.5	12.45	61.37	7.61	13.77	110.68	1.12	30.82	25.01	9.41
23.0	12.40	60.54	7.75	13.34	101.31	1.11	31.19	25.48	9.30
23.5	12.44	54.16	8.06	13.05	48.89	1.10	30.69	25.57	8.93
24.0	12.80	49.48	9.40	11.95	28.20	1.05	30.65	24.60	8.44
24.5	13.25	45.94	11.72	13.06	19.10	1.02	30.17	24.75	8.13
25.0	13.22	42.87	12.65	12.39	13.61	0.99	30.08	23.99	7.94
25.4	12.76	42.00	15.07	12.28	13.26	0.97	30.74	24.81	7.79
25.6	12.43	41.31	15.93	11.74	12.68	0.95	30.40	25.04	7.81
25.8	12.45	42.72	18.00	11.85	15.05	0.95	30.53	24.60	7.74
26.0	12.29	42.11	16.50	11.55	14.14	0.95	30.75	24.31	7.86
26.2	12.57	41.74	15.62	11.35	13.01	0.95	30.51	24.31	7.91
26.4	12.76	40.69	13.29	11.85	11.17	0.97	30.73	23.80	8.31
26.5	12.63	41.13	11.78	11.21	11.57	0.98	30.49	23.88	8.20

Typical Performance Data

Definitions:

Input Return Loss = -S11 (dB)

Gain(Power Gain) = S21 (dB)

Reverse Isolation = -S12 (dB)

Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 4.75V, Id = 542.29mA @ Temperature = +85°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(GHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
12.0	11.84	55.54	17.21	5.11	51.90	0.71	27.78	16.94	11.36
12.2	12.19	55.02	17.91	5.66	49.66	0.74	28.89	17.90	10.81
12.4	12.43	53.67	17.79	6.22	43.16	0.77	28.70	18.50	10.75
12.6	12.51	52.26	17.99	6.78	37.78	0.80	30.05	19.24	11.10
12.8	12.57	54.62	17.78	7.40	50.92	0.83	30.39	19.53	10.83
13.0	12.58	55.18	18.60	8.11	56.28	0.86	30.97	20.32	10.69
13.2	12.56	54.20	19.04	8.89	51.99	0.88	31.52	20.65	10.79
13.4	12.57	53.53	19.39	9.76	49.41	0.90	31.17	21.17	10.63
13.6	12.54	53.50	18.26	10.38	50.05	0.92	31.92	21.19	10.55
13.8	12.56	55.12	18.23	11.28	61.24	0.94	31.48	21.69	10.57
14.0	12.61	56.43	18.71	12.16	71.90	0.95	31.76	21.77	10.33
14.5	12.80	57.26	18.23	14.76	79.57	0.98	31.92	23.08	10.43
15.0	13.12	57.69	18.49	18.58	82.32	1.00	31.60	23.63	10.18
15.5	13.48	59.19	17.67	22.86	94.36	1.01	32.04	23.87	9.91
16.0	13.88	60.69	18.07	34.48	107.84	1.02	32.12	24.40	9.73
17.0	14.16	58.58	20.40	24.16	82.13	1.01	31.69	24.73	9.78
17.5	14.33	62.08	32.27	16.21	119.01	0.98	31.99	24.50	9.53
18.0	14.66	66.84	22.19	14.19	194.34	0.97	31.97	25.73	9.40
18.5	14.49	56.06	14.83	11.74	54.01	0.96	31.61	25.07	9.22
19.0	14.23	58.24	14.09	13.24	72.54	0.99	31.37	24.49	9.57
19.5	14.40	59.54	11.35	13.94	80.38	1.03	31.04	24.56	9.64
20.0	14.08	60.98	10.85	13.76	97.22	1.04	30.98	24.85	9.91
20.5	13.59	62.30	9.35	14.62	116.20	1.08	30.54	25.15	9.71
21.0	13.21	65.22	9.00	15.57	169.39	1.09	30.37	25.04	9.70
21.5	12.94	59.17	8.54	15.33	85.58	1.11	30.43	24.61	9.73
22.0	12.76	62.82	8.44	14.33	131.52	1.10	30.24	23.92	9.79
22.5	12.52	60.80	7.65	13.81	102.96	1.12	30.75	24.17	9.65
23.0	12.49	61.27	7.77	13.44	109.23	1.11	31.26	24.71	9.51
23.5	12.55	53.91	8.06	13.18	46.93	1.10	30.72	24.79	9.00
24.0	12.94	49.51	9.42	12.11	27.93	1.05	30.61	23.84	8.65
24.5	13.40	45.73	11.82	13.25	18.40	1.02	30.59	23.95	8.26
25.0	13.40	42.77	12.73	12.54	13.22	0.99	30.32	23.15	8.16
25.4	12.97	41.92	15.04	12.43	12.86	0.97	31.02	23.95	8.05
25.6	12.58	41.24	15.79	11.86	12.40	0.96	30.67	24.19	8.02
25.8	12.62	42.76	18.14	11.91	14.84	0.95	30.68	23.71	7.95
26.0	12.46	42.00	16.56	11.56	13.69	0.95	30.77	23.51	8.16
26.2	12.69	41.85	15.42	11.36	12.98	0.95	30.88	23.41	8.37
26.4	12.89	40.74	13.23	11.80	11.05	0.97	31.08	22.92	8.36
26.5	12.73	40.75	11.58	11.17	10.91	0.98	30.75	23.06	8.33

Typical Performance Data

Definitions:

Input Return Loss = -S11 (dB)

Gain(Power Gain) = S21 (dB)

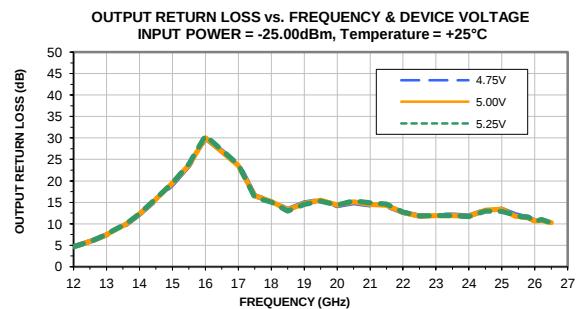
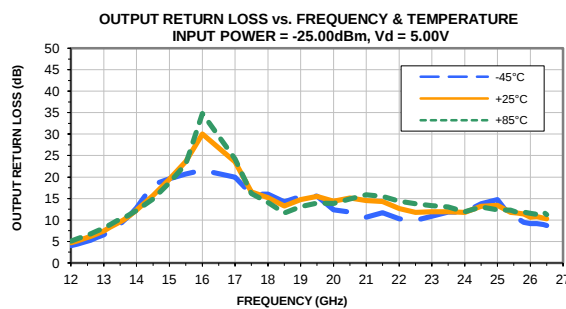
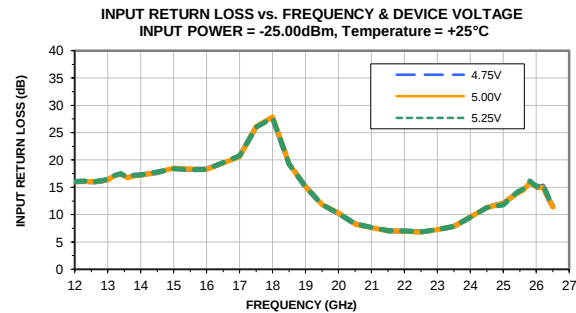
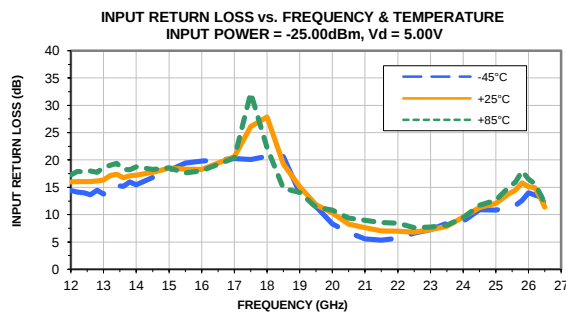
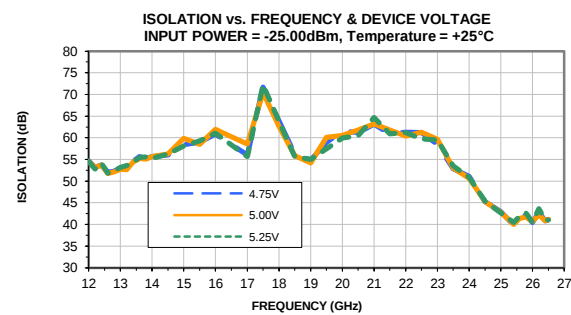
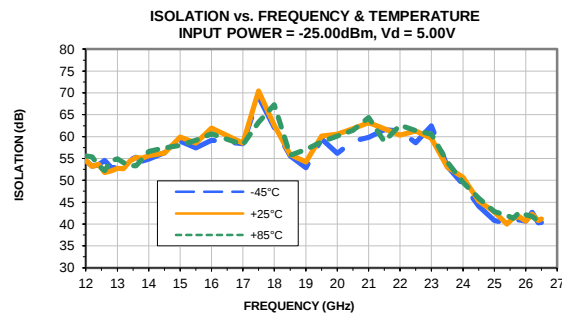
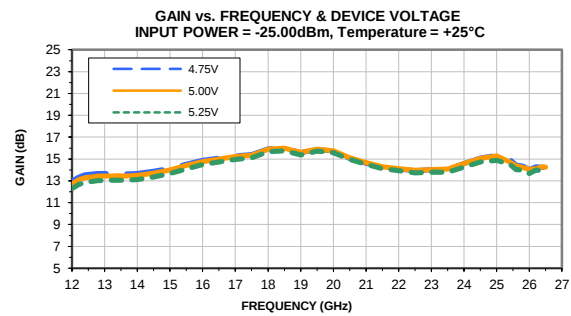
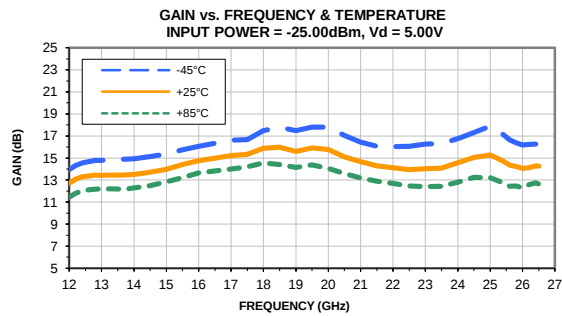
Reverse Isolation = -S12 (dB)

Output Return Loss = -S22 (dB)

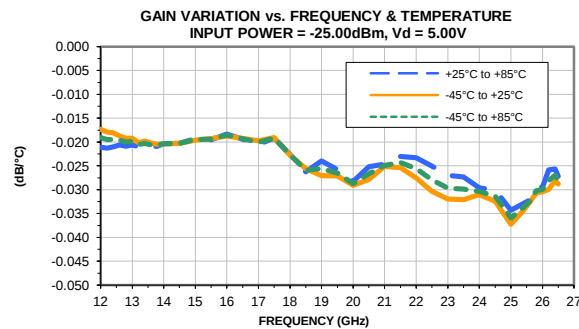
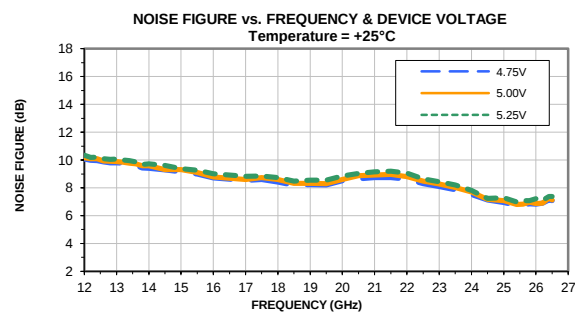
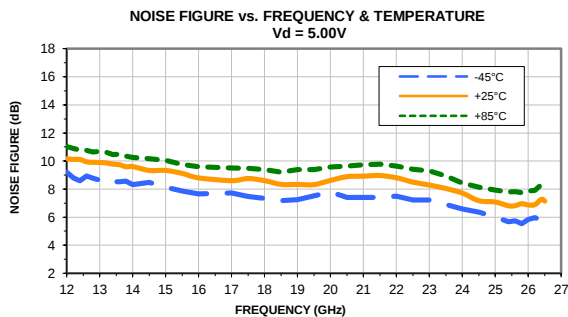
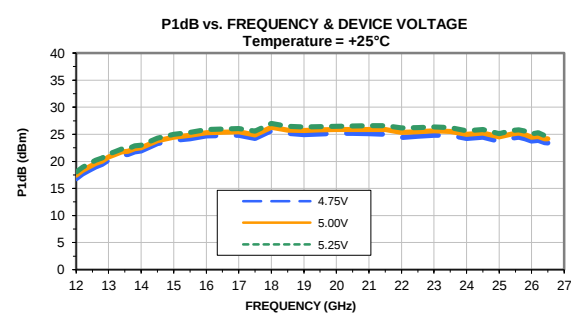
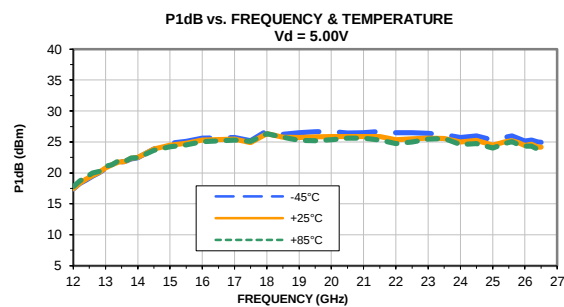
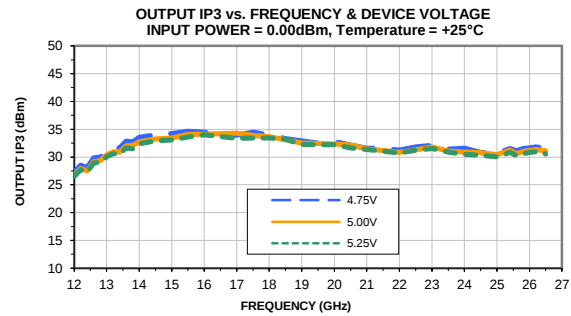
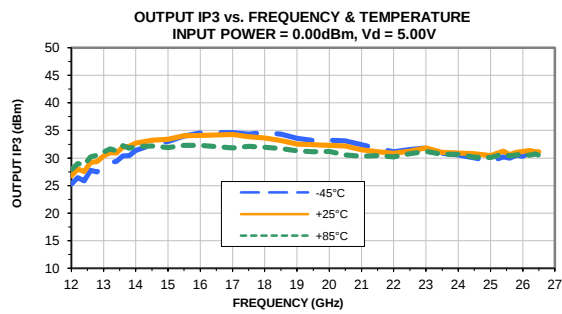
TEST CONDITIONS: Vd = 5.25V, Id = 614.98mA @ Temperature = +85°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(GHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
12.0	10.84	55.50	17.23	5.10	57.86	0.70	27.77	18.46	11.16
12.2	11.19	54.69	17.93	5.66	53.60	0.74	28.89	19.38	11.06
12.4	11.42	53.77	17.88	6.24	49.08	0.77	28.67	19.99	11.05
12.6	11.51	52.14	18.06	6.82	41.89	0.80	30.15	20.61	10.98
12.8	11.57	54.48	17.87	7.46	56.42	0.83	30.48	20.91	10.88
13.0	11.59	55.11	18.70	8.18	62.74	0.86	31.16	21.69	10.88
13.2	11.60	53.81	19.07	8.99	55.69	0.88	31.83	22.00	10.80
13.4	11.62	53.53	19.40	9.88	55.29	0.91	31.49	22.52	10.76
13.6	11.61	53.33	18.31	10.53	54.81	0.92	32.40	22.48	10.67
13.8	11.65	54.75	18.24	11.46	65.36	0.94	32.00	22.99	10.58
14.0	11.72	56.05	18.67	12.36	76.47	0.95	32.44	23.01	10.56
14.5	11.97	57.24	18.23	14.99	87.52	0.98	32.45	24.20	10.34
15.0	12.33	57.24	18.46	18.80	85.60	1.00	32.27	24.80	10.22
15.5	12.76	58.90	17.61	23.09	99.16	1.01	32.66	25.08	10.02
16.0	13.21	60.63	17.99	35.43	115.68	1.02	32.85	25.65	9.81
17.0	13.58	57.79	20.43	24.20	80.07	1.01	32.16	26.01	9.74
17.5	13.78	62.18	32.45	15.90	127.92	0.97	32.35	25.86	9.79
18.0	14.17	68.03	22.09	13.91	235.08	0.97	32.18	27.07	9.69
18.5	14.03	55.93	14.77	11.43	55.78	0.96	31.85	26.40	9.50
19.0	13.82	58.82	14.02	12.89	81.02	0.99	31.34	25.87	9.56
19.5	14.02	59.12	11.29	13.81	79.88	1.03	31.25	25.84	9.61
20.0	13.74	59.65	10.85	13.99	86.91	1.04	31.16	26.04	9.87
20.5	13.27	62.51	9.37	15.11	124.12	1.08	30.73	26.38	9.95
21.0	12.88	64.99	9.03	16.10	172.15	1.10	30.45	26.47	10.09
21.5	12.57	58.82	8.58	15.62	86.12	1.11	30.51	26.22	10.09
22.0	12.33	62.33	8.47	14.35	130.70	1.10	30.26	25.73	9.97
22.5	12.04	60.05	7.67	13.81	99.86	1.12	30.80	25.87	9.68
23.0	11.98	61.09	7.79	13.34	113.47	1.11	31.18	26.31	9.60
23.5	12.00	54.18	8.10	13.00	51.51	1.10	30.50	26.42	9.25
24.0	12.34	49.90	9.37	11.83	31.11	1.04	30.39	25.40	8.78
24.5	12.73	45.86	11.67	12.87	20.04	1.01	30.32	25.52	8.43
25.0	12.69	43.04	12.74	12.19	14.72	0.99	30.19	24.75	8.25
25.4	12.28	42.16	15.28	12.27	14.30	0.97	30.70	25.61	8.07
25.6	11.96	41.48	16.15	11.86	13.70	0.95	30.47	25.81	8.04
25.8	11.96	42.65	18.32	11.83	15.79	0.95	30.60	25.42	8.10
26.0	11.84	41.71	16.63	11.53	14.22	0.95	30.91	25.13	8.14
26.2	12.10	41.66	15.60	11.39	13.62	0.95	30.78	25.12	8.22
26.4	12.28	40.60	13.43	11.87	11.70	0.97	30.75	24.57	8.59
26.5	12.16	40.55	11.71	11.22	11.40	0.98	30.57	24.71	8.45

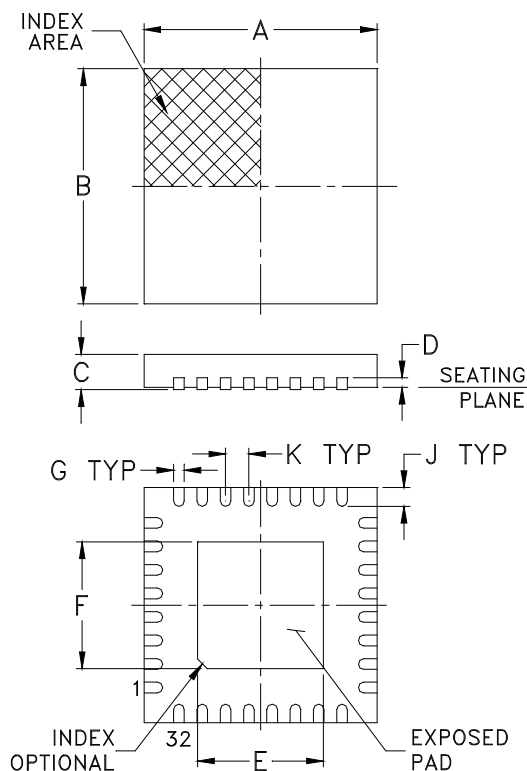
Typical Performance Curves



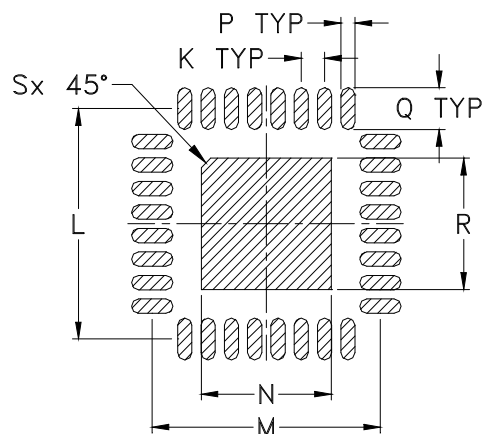
Typical Performance Curves



Outline Dimensions



PCB Land Pattern



Suggested Layout,
Tolerance to be within $\pm .002$

CASE #	A	B	C MAX	C MIN	D	E	F	G	H	J
DG1677	.197 (5.00)	.197 (5.00)	.039 (1.00)	.031 (0.80)	.008 (0.20)	.106 (2.70)	.106 (2.70)	.009 (0.23)	- -	.016 (0.40)

CASE #	K	L	M	N	P	Q	R	S	WT. GRAM
DG1677	.020 (0.50)	.193 (4.90)	.193 (4.90)	.110 (2.79)	.012 (0.30)	.035 (0.89)	.110 (2.79)	.008 (0.20)	.05

Dimensions are in inches (mm). Tolerances: 2 Pl. $\pm .01$; 3 Pl. $\pm .005$

Notes:

- Case material: Plastic.
- Termination finish:

For RoHS Case Styles: Tin-Silver alloy plate over Nickel barrier transitioning to Matte-Tin.

All models, (+) suffix. See Data sheet.

For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.

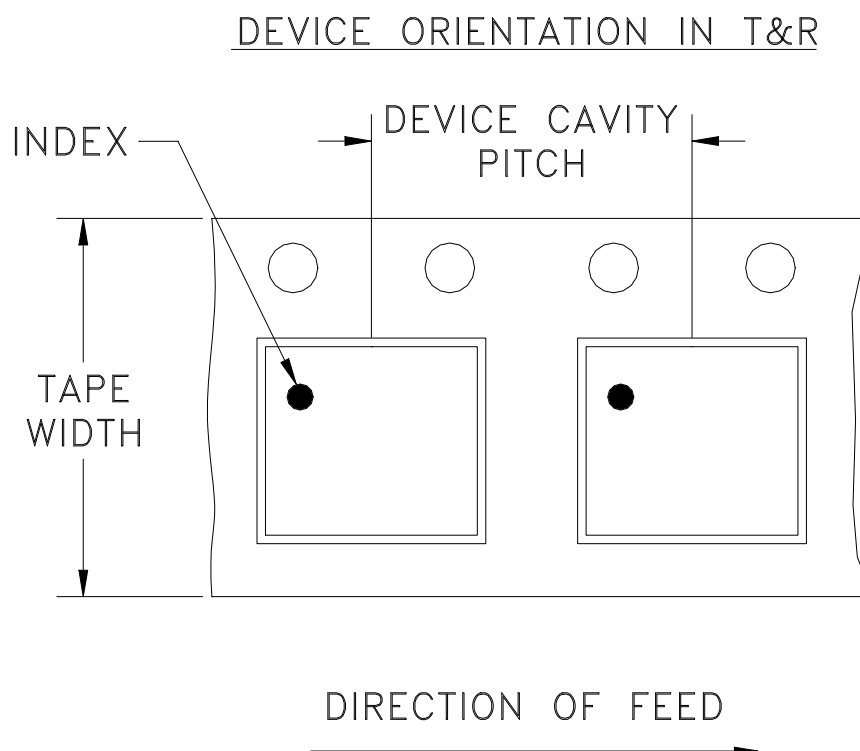


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The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com



RF/IF MICROWAVE COMPONENTS

Tape & Reel Packaging TR-F68



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel see note	
12	8	7	Small quantity standard	20
				50
				100
				200
				500
		7	Standard	1000
		13	Standard	2000
				3000
				4000

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Go to: www.minicircuits.com/pages/pdfs/tape.pdf

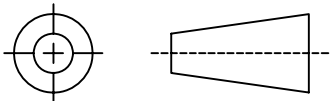


INTERNET <http://www.minicircuits.com>

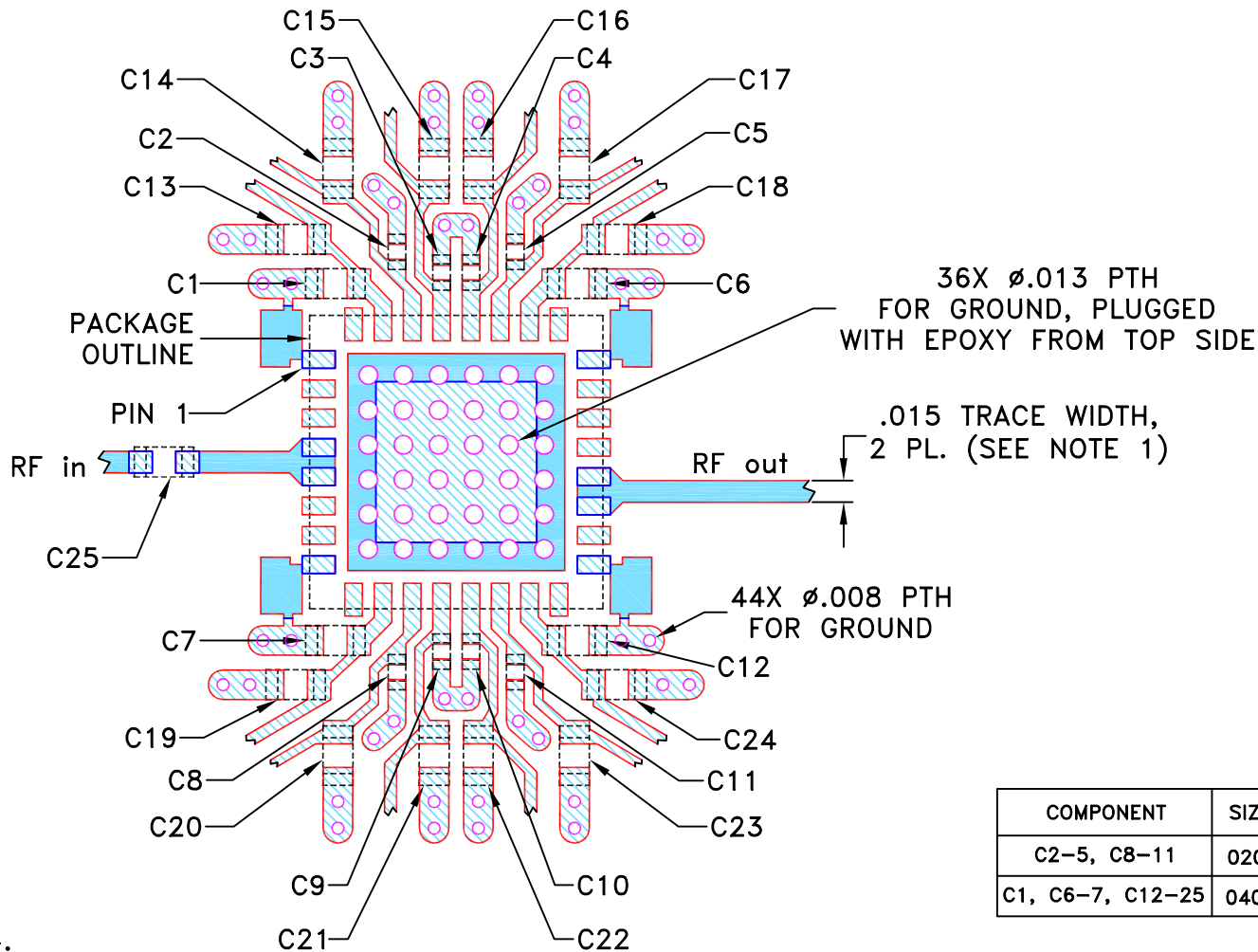
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THIRD ANGLE PROJECTION		REVISIONS				
	REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
	OR	M144565	NEW RELEASE	12/31/13	AV	DJ
	A	M145986	TB-715-5V, WAS TB-715-5V+	04/04/14	ITG	IL

SUGGESTED MOUNTING CONFIGURATION
FOR DG1677 CASE STYLE, "32AM05" PIN CODE



NOTES:

- TRACE WIDTH PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS $.0066" \pm .0007"$. COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
- CHIP COMPONENT FOOT PRINTS SHOWN FOR REFERENCE. FOR COMPONENT VALUES REFER TO TB-715-5V.
- BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

 DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER).

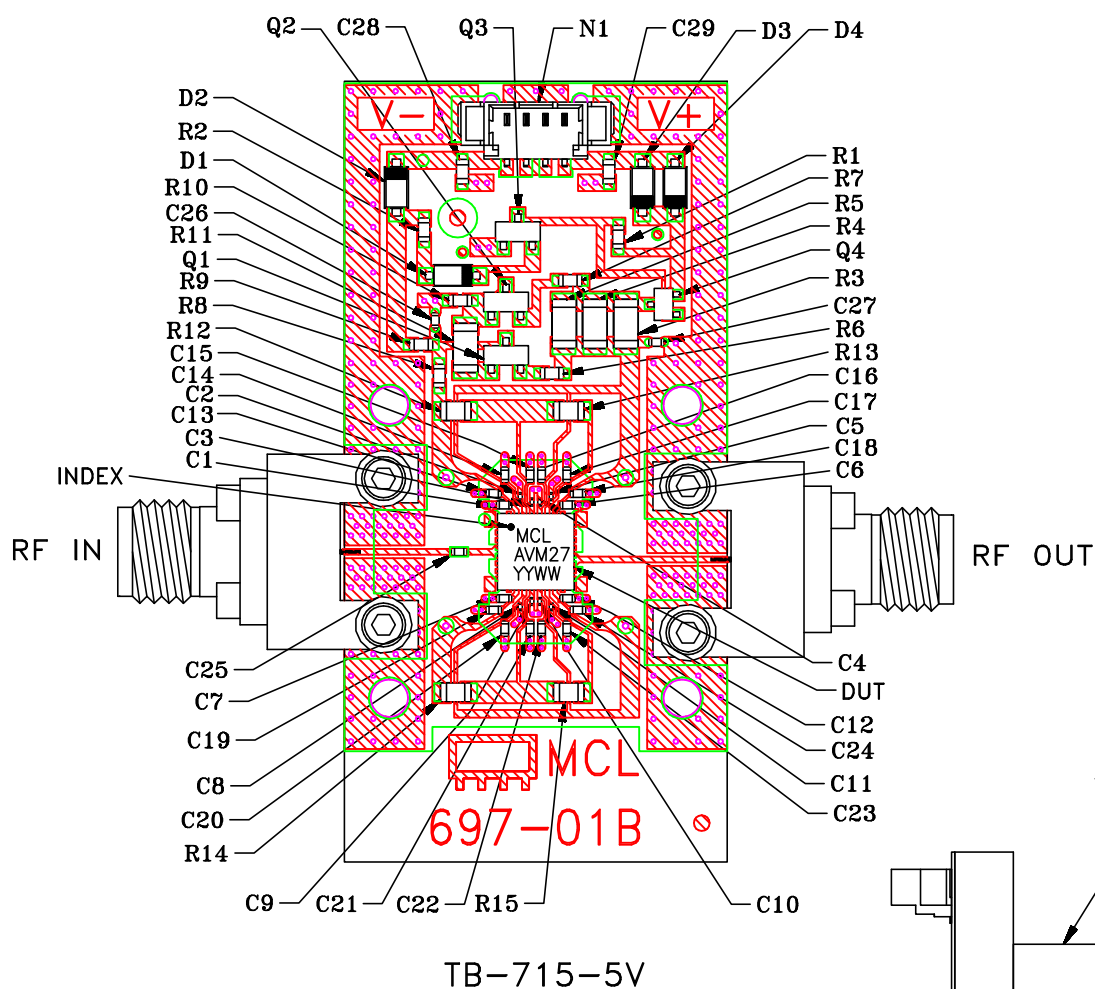
 DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK.

UNLESS OTHERWISE SPECIFIED		INITIALS		DATE		Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235							
DIMENSIONS ARE IN INCHES		DRAWN	AV	12/20/13		PL, 32AM05, DG1677, TB-715-5V							
TOLERANCES ON:		CHECKED	GF	12/31/13									
2 PL DECIMALS ±		APPROVED	DJ	12/31/13									
3 PL DECIMALS ± .005													
ANGLES ±													
FRACTIONS ±													
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ASHEETA1.DWG REV:A DATE:01/12/95						FILE: 98PL401		SCALE: 8:1		SHEET: 1 OF 1			

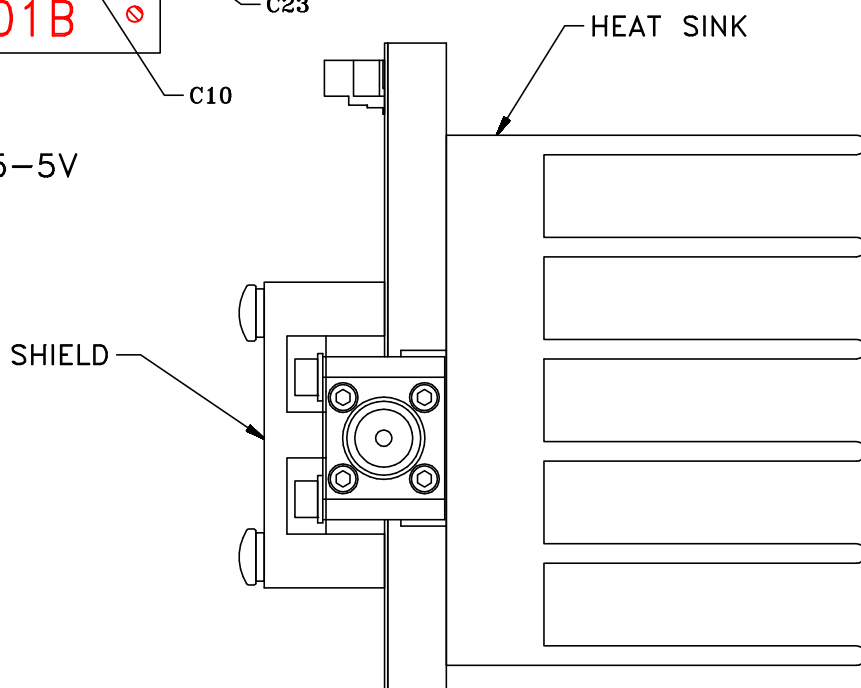
Evaluation Board and Circuit

TOP VIEW

SEE NOTE 1



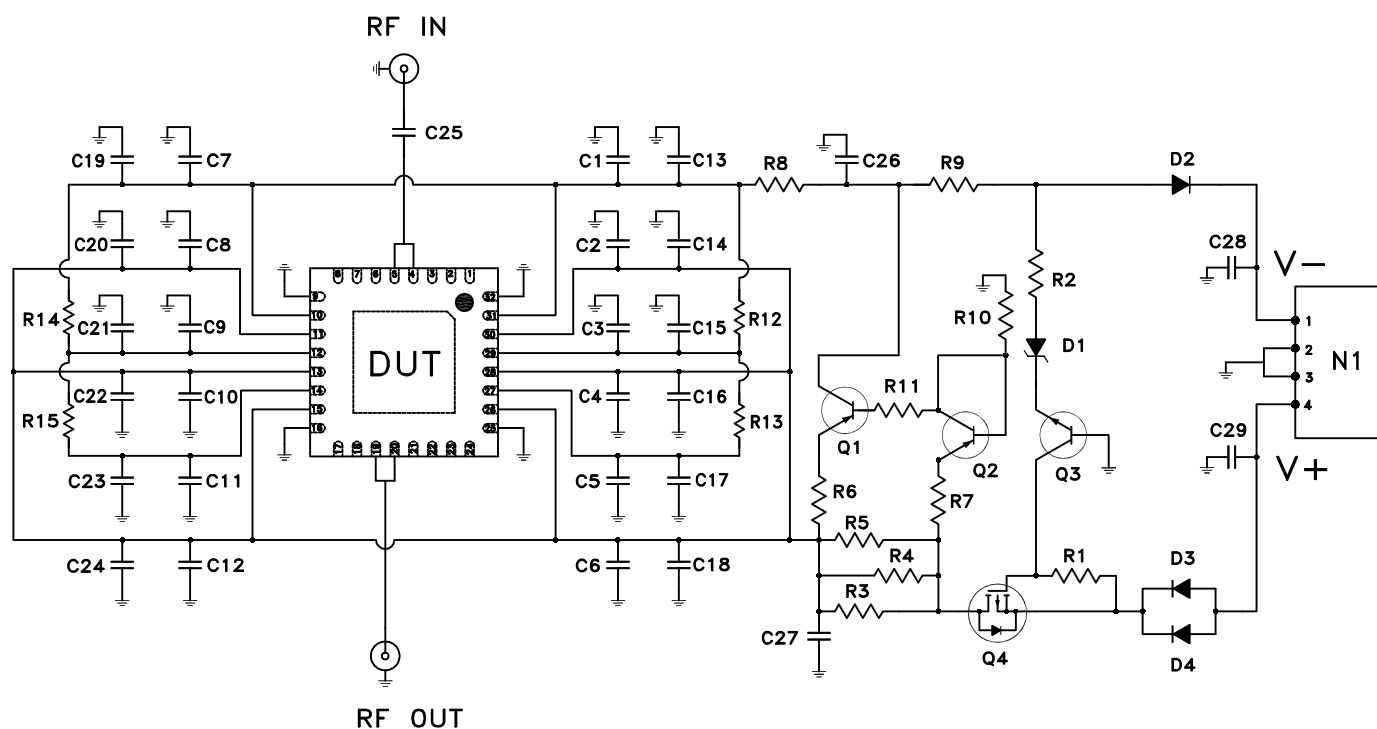
SIDE VIEW



Notes:

1. Shield is not shown on the top view for clarity.
2. Test cable for "N1" is included in TB-715-5V.
3. 50 Ohm 2.92 mm End Launch Female connectors.
4. PCB Material: R04350 or equivalent,
Dielectric Constant=3.5, Thickness=.0066 inch.

 **Mini-Circuits®**



Schematic Diagram

COMPONENT	VALUE/ PART NUMBER	SIZE
DUT	AVM-273HP+	—
N1	CONN VERTICAL HEADER 4 POS	—
Q1,Q2	PNP TRANSISTOR	—
Q3	NPN TRANSISTOR	—
Q4	MOSFET TRANSISTOR	—
D1	DIOD ZENER 3.9V	—
D2-D4	DIOD SCHOTTKY	—
C1,C6,C7,C12-C24	.1 uF	.04 X .02
C2-C5,C8-C11	470 pF	.02 X .01
C25	.1 uF	.04 X .02
C26,C27	100 pF	.04 X .02
C28,C29	1 uF	.06 X .03
R1,R2,R9,R10	10 KOhm	.06 X .03
R3-R5	3.32 Ohm	.12 X .06
R6	100 Ohm	.06 X .03
R7	1.5 KOhm	.06 X .03
R8	1.0 KOhm	.06 X .03
R11	0 Ohm	.12 X .06
R12-R15	0 Ohm	.08 X .05
TEST CABLE	B66-225+M	—



All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-40° to 85° C or -45° to 85° C or -55° to 105° C or -40° to 105° C or -40° to 95° C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C or -65° to 150° Ambient Environment	Individual Model Data Sheet
HTOL	1000 hours at 125°C	MIL-STD-883, Method 1005, Condition B
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Mechanical Shock	1.5Kg, 0.5 ms, 5 shock pulses, Y1 direction only	MIL-STD-883, Method 2002, Condition B, except Y1 direction only
Vibration (Variable Frequency)	50g peak	MIL-STD-883, Method 2007, Condition B
Autoclave	15 psig, 100% RH, 121°C, 96 hours	JESD22-A102, Condition C
HAST	130°C, 85% RH, 96 hours	JESD22-A110
Solderability	10X Magnification	J-STD-002, Para 4.2.5, Test S, 95% Coverage
Solder Reflow Heat	Sn-Pb Eutetic Process: 240°C peak Pb-Free Process: 260°C peak	J-STD-020, Table 4-1, 4-2 and 5-2; Figure 5-1
Moisture Sensitivity: Level 1	Bake at 125°C for 24 hours Soak at 85°C/85% RH for 168 hours, Reflow 3 cycles at 260°C peak	J-STD-020



All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Marking Resistance to Solvents	Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C	MIL-STD-202, Method 215