MMIC SURFACE MOUNT

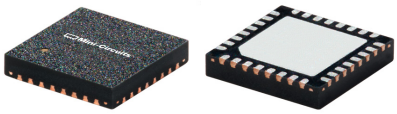
Power Amplifier

PMA5-123-3W+

50Ω 8 to 12 GHz 3.5 W P_{SAT}

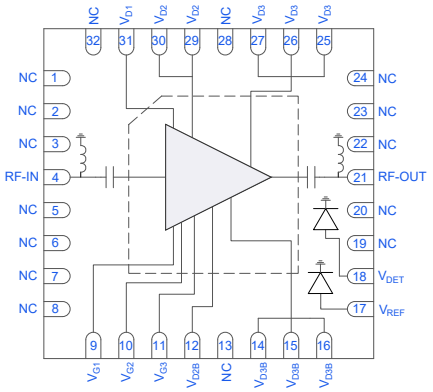
THE BIG DEAL

- High Gain, Typ. 28.3 dB
- High P_{SAT}, Typ. +35.7 dBm
- Excellent PAE, Typ. 30%
- Supply Voltage, +7 V @ 1250 mA
- Integrated Power Detector
- 5x5 mm 32-Lead QFN-Style Package



Generic photo used for illustration purposes only

FUNCTIONAL DIAGRAM



APPLICATIONS

- Radar, EW, and ECM Defense Systems
- MIMO Wireless Infrastructure Systems
- Microwave Radio & VSAT

PRODUCT OVERVIEW

Mini-Circuits' PMA5-123-3W+ is a GaAs MMIC power amplifier operating from 8 to 12 GHz. This internally matched 50Ω amplifier provides 28.3 dB of gain, +35.7 dBm saturated output power, and +43.8 dBm output IP3, while operating from a +7 V power supply and consuming 1250 mA of current. In addition, an integrated power detector allows for seamless output power monitoring. These characteristics make it ideally suited for microwave radio, satellite communications, and radar systems that require high operating output power, while maintaining very low distortion characteristics.

KEY FEATURES

Features	Advantages
High P_{SAT} Typ. +35.7 dBm	With 3.5 W of output power, this device can be used as a driver stage or as the power amplifier in microwave radio, satellite communications, or radar systems.
High Efficiency PAE Typ. 30%	Best in-class PAE allows for system power conservation and reduced thermal dissipation.
Integrated Power Detector	An on-chip power detector provides a log-linear output voltage over a 0 to +35 dBm output power range. Useful for power monitoring systems with dynamic gain and output power control.
5x5 mm 32-Lead QFN-Style Package	Small footprint saves space in dense layouts while providing low inductance, repeatable transitions, and excellent thermal contact to the PCB. Industry standard packaging allows for ease of assembly in high volume manufacturing processes.

REV. OR
ECO-023949
PMA5-123-3W+
MCL NY
241213

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ELECTRICAL SPECIFICATIONS[1] AT +25°C, V_{DD} = +7 V, UNLESS NOTED OTHERWISE

Parameter	Condition (GHz)	Min.	Typ.	Max.	Units
Frequency Range		8		12	GHz
Gain	8		27.7		dB
	9		29.0		
	10		28.3		
	11		28.3		
	12		28.7		
Output Power at 1 dB Compression (P1dB)	8		+33.5		dBm
	9		+35.2		
	10		+34.4		
	11		+34.3		
	12		+33.6		
Output Power at Saturation (P_{SAT})[2]	8		+34.4		dBm
	9		+36.1		
	10		+35.7		
	11		+35.9		
	12		+35.8		
Power Added Efficiency (PAE) at P_{SAT}			30		%
Output Third-Order Intercept (P_{OUT} = +20 dBm/Tone)	8		+41.8		dBm
	9		+43.3		
	10		+43.8		
	11		+43.0		
	12		+40.8		
Input Return Loss	8		18		dB
	9		13		
	10		13		
	11		10		
	12		12		
Output Return Loss	8		10		dB
	9		14		
	10		20		
	11		13		
	12		8		
Isolation	8		66		dB
	9		64		
	10		64		
	11		59		
	12		57		
Noise Figure	8		8.7		dB
	9		7.7		
	10		6.9		
	11		6.3		
	12		6.1		
Power Detector Range			0 to +35		dBm
Device Operating Voltage (V_{DD})[3]		+6	+7	+8	V
Device Operating Current (I_{DD})[4]			1250		mA
Device Gate Voltage (V_{GG})[5]			-0.75		V
Device Gate Current (I_{GG})				14	mA
DC Current Variation vs. Temperature[6]			-10		µA/°C
DC Current Variation vs. Voltage[7]			-1.56		µA/mV

1. Tested on Mini-Circuits Characterization Test Board TB-PMA5-1233WC+. See Figure 2. Loss de-embedded to the RF input and output pins of the device.
2. P_{SAT} is defined as when the Output Power changes 0.1 dB per 1 dB change in Input Power.
3. $V_{DD} = V_{D1} = V_{D2} = V_{D3} = V_{D2B} = V_{D3B}$
4. Current at P_{IN} = -10 dBm. Increases to 1450 mA at P1dB.
5. $V_{GG} = V_{G1} = V_{G2} = V_{G3}$
6. (Current at +85°C – Current at -45°C)/(130°C)
7. (Current at +8 V – Current at +6 V)/(+2 V)

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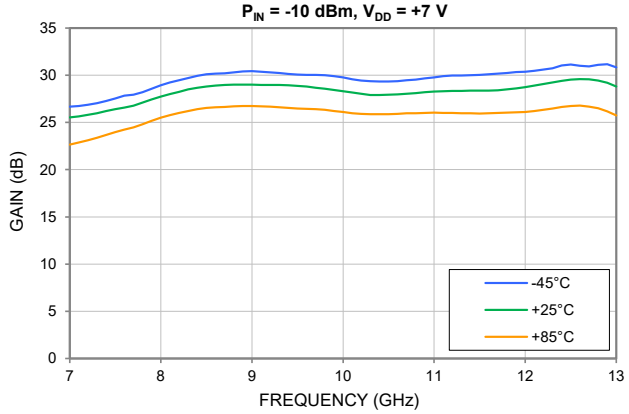
TYPICAL PERFORMANCE GRAPHS

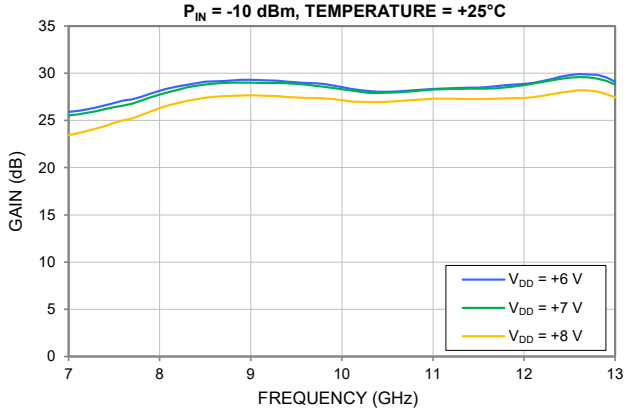
GAIN vs. TEMPERATURE

P_{IN} = -10 dBm, V_{DD} = +7 V



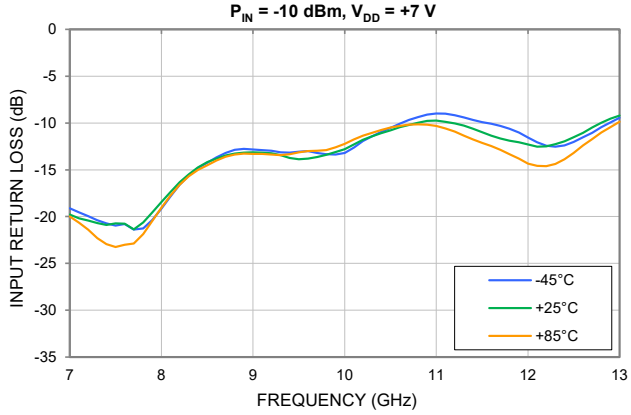
GAIN vs. DEVICE VOLTAGE

P_{IN} = -10 dBm, TEMPERATURE = +25°C



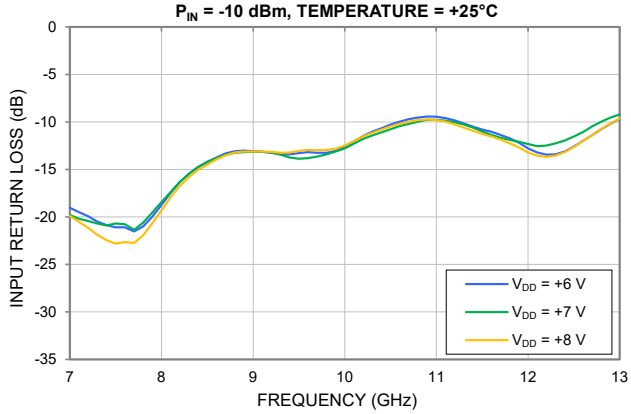
INPUT RETURN LOSS vs.TEMPERATURE

P_{IN} = -10 dBm, V_{DD} = +7 V



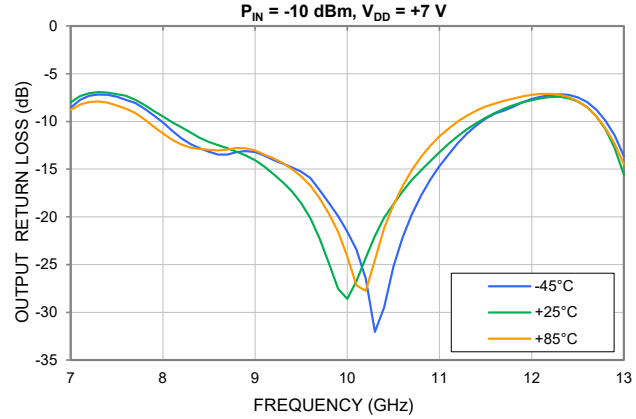
INPUT RETURN LOSS vs. DEVICE VOLTAGE

P_{IN} = -10 dBm, TEMPERATURE = +25°C



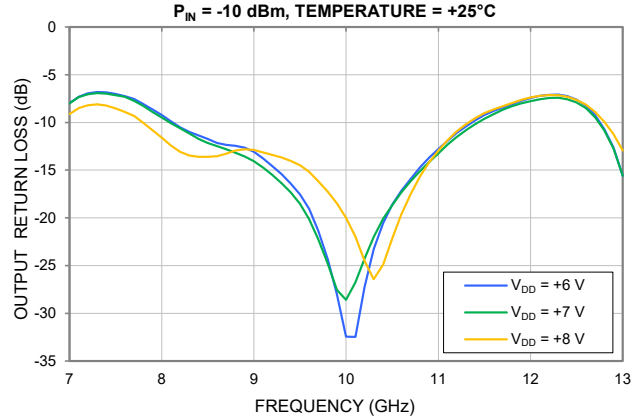
OUTPUT RETURN LOSS vs. TEMPERATURE

P_{IN} = -10 dBm, V_{DD} = +7 V



OUTPUT RETURN LOSS vs. DEVICE VOLTAGE

P_{IN} = -10 dBm, TEMPERATURE = +25°C



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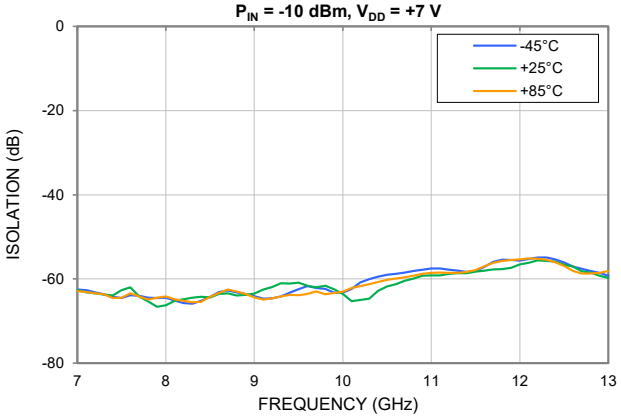
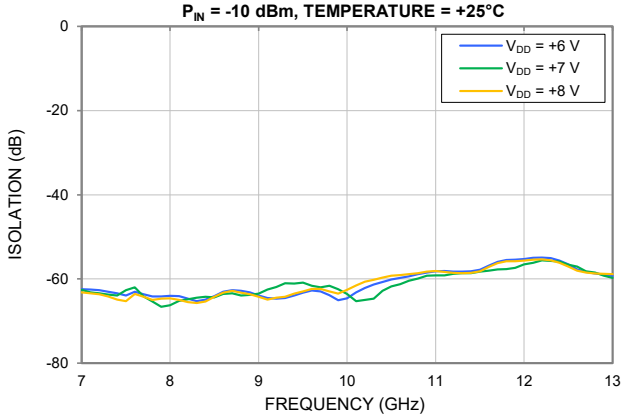
TYPICAL PERFORMANCE GRAPHS

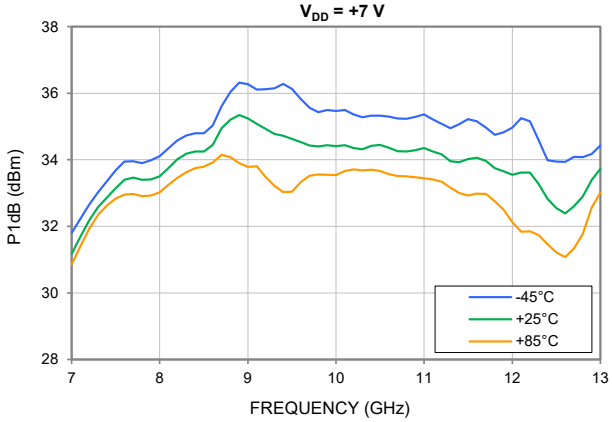
ISOLATION vs.TEMPERATURE
P_{IN} = -10 dBm, V_{DD} = +7 V



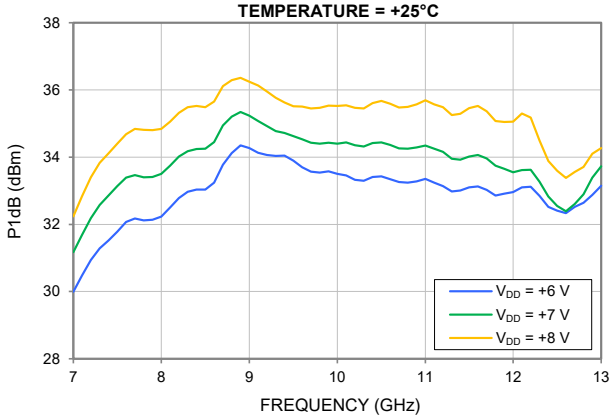
ISOLATION vs. DEVICE VOLTAGE
P_{IN} = -10 dBm, TEMPERATURE = +25°C



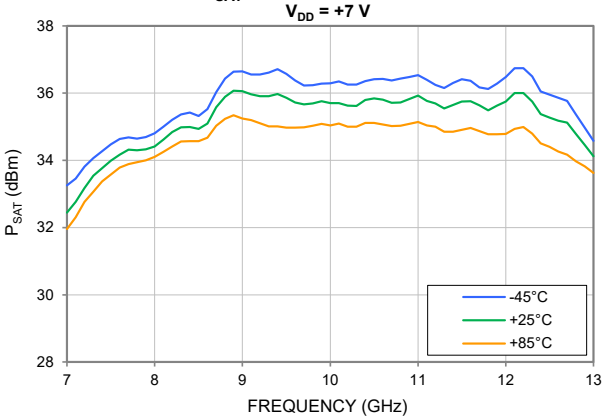
P1dB vs. TEMPERATURE
V_{DD} = +7 V



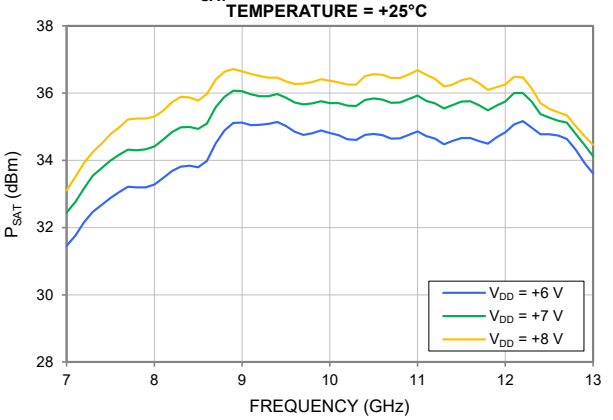
P1dB vs. DEVICE VOLTAGE
TEMPERATURE = +25°C



P_{SAT} vs. TEMPERATURE
V_{DD} = +7 V



P_{SAT} vs. DEVICE VOLTAGE
TEMPERATURE = +25°C



Power Amplifier

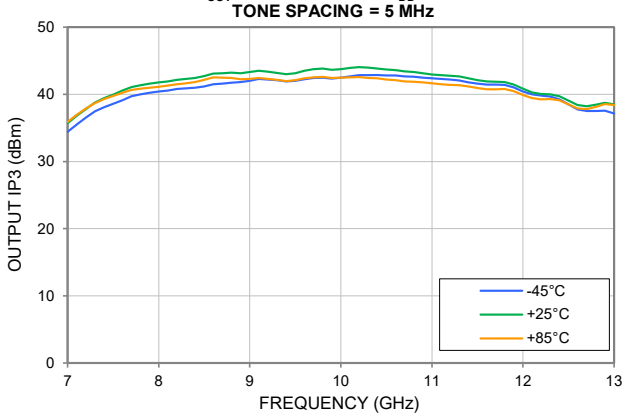
PMA5-123-3W+

50Ω 8 to 12 GHz 3.5 W P_{SAT}

TYPICAL PERFORMANCE GRAPHS

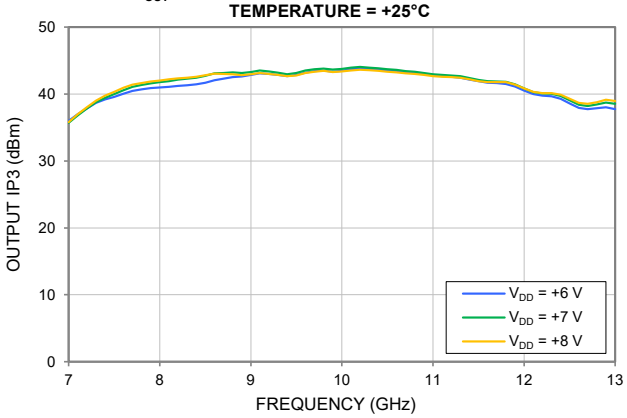
OUTPUT IP3 vs. TEMPERATURE

P_{OUT} = +20 dBm/TONE, V_{DD} = +7 V,
TONE SPACING = 5 MHz



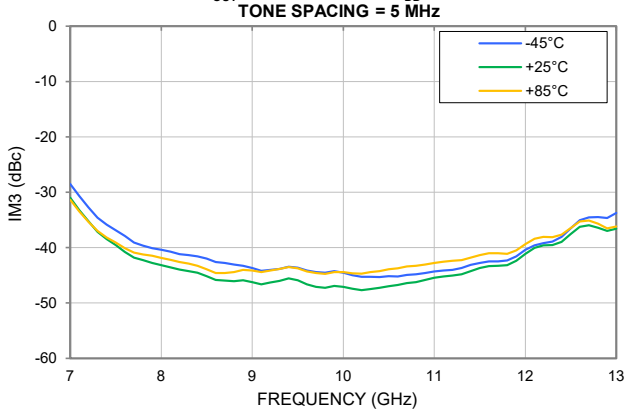
OUTPUT IP3 vs. DEVICE VOLTAGE

P_{OUT} = +20 dBm/TONE, TONE SPACING = 5 MHz,
TEMPERATURE = +25°C



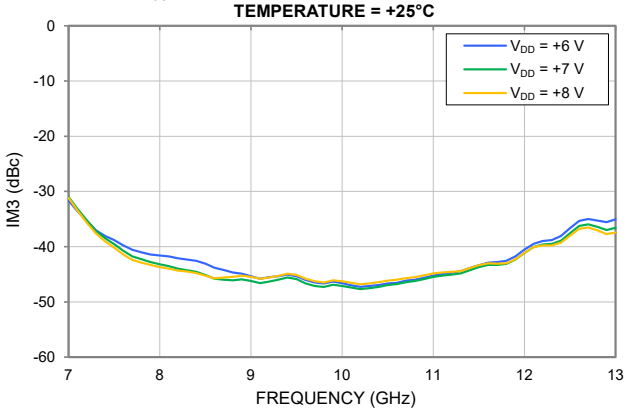
IM3 vs. TEMPERATURE

P_{OUT} = +20 dBm/TONE, V_{DD} = +7 V,
TONE SPACING = 5 MHz



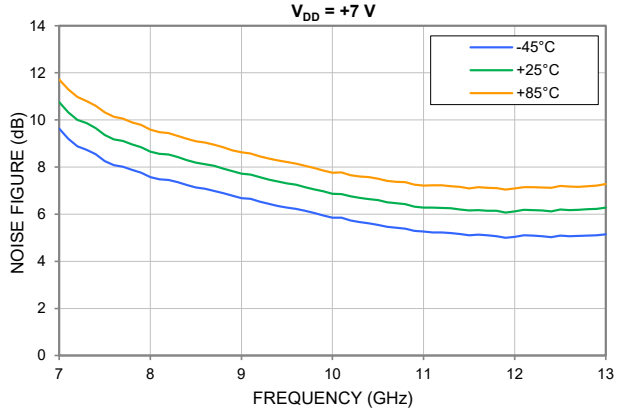
IM3 vs. DEVICE VOLTAGE

P_{OUT} = +20 dBm/TONE, TONE SPACING = 5 MHz
TEMPERATURE = +25°C



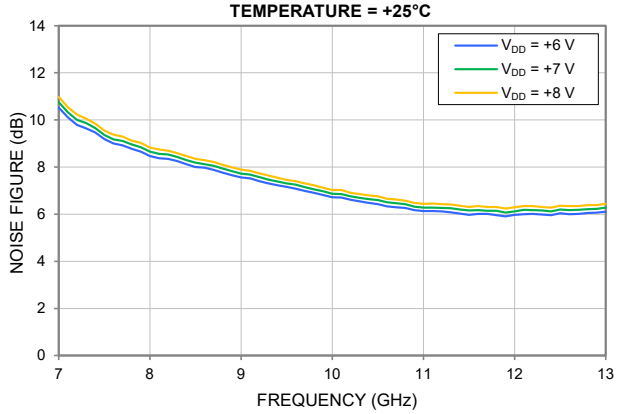
NOISE FIGURE vs. TEMPERATURE

V_{DD} = +7 V



NOISE FIGURE vs. DEVICE VOLTAGE

TEMPERATURE = +25°C



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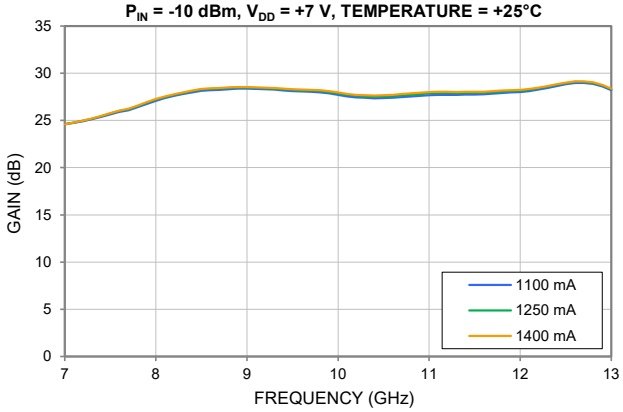
TYPICAL PERFORMANCE GRAPHS

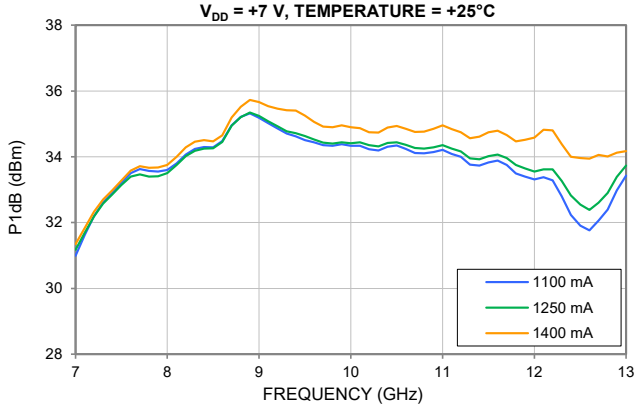
GAIN vs. CURRENT

P_{IN} = -10 dBm, V_{DD} = +7 V, TEMPERATURE = +25°C



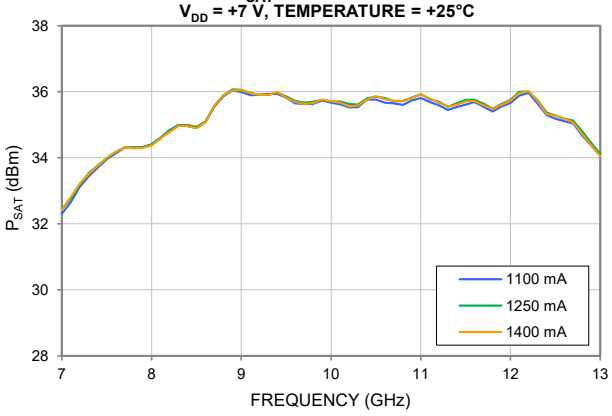
P1dB vs. CURRENT

V_{DD} = +7 V, TEMPERATURE = +25°C



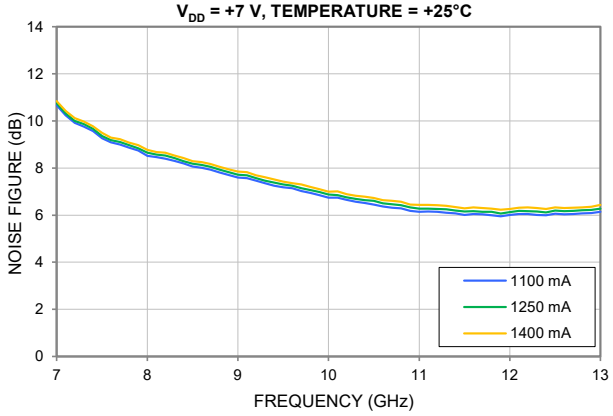
P_{SAT} vs. CURRENT

V_{DD} = +7 V, TEMPERATURE = +25°C



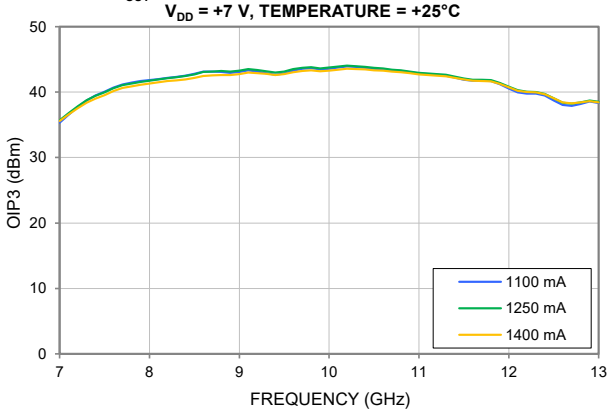
NOISE FIGURE vs. CURRENT

V_{DD} = +7 V, TEMPERATURE = +25°C



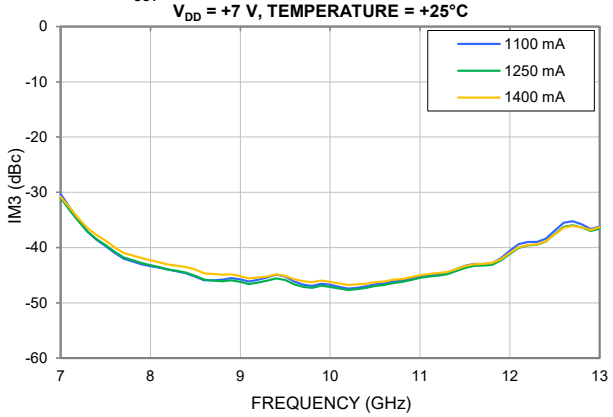
OIP3 vs. CURRENT

P_{OUT} = +20 dBm/TONE, TONE SPACING = 5 MHz,
V_{DD} = +7 V, TEMPERATURE = +25°C



IM3 vs. CURRENT

P_{OUT} = +20 dBm/TONE, TONE SPACING = 5 MHz,
V_{DD} = +7 V, TEMPERATURE = +25°C



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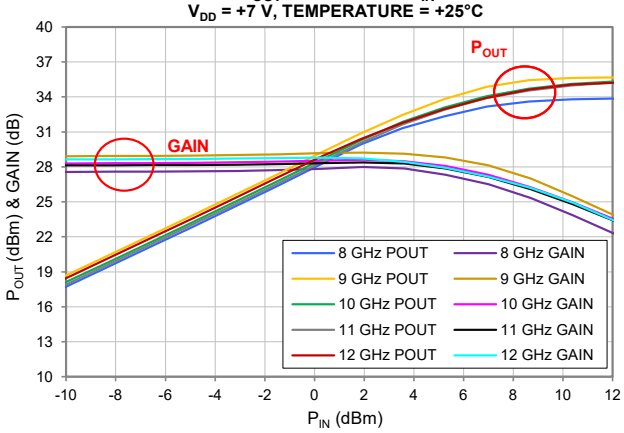
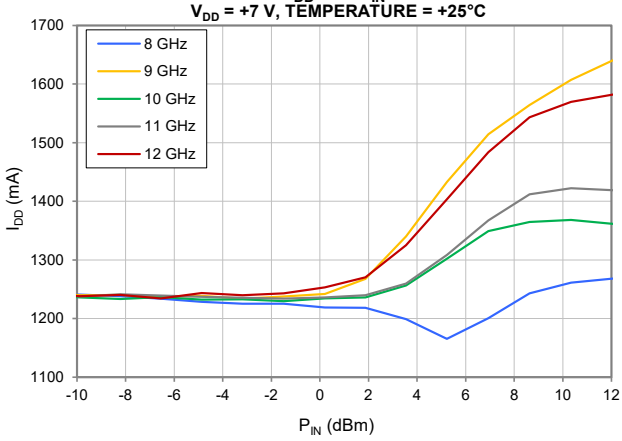
50Ω 8 to 12 GHz 3.5 W P_{SAT}

TYPICAL PERFORMANCE GRAPHS

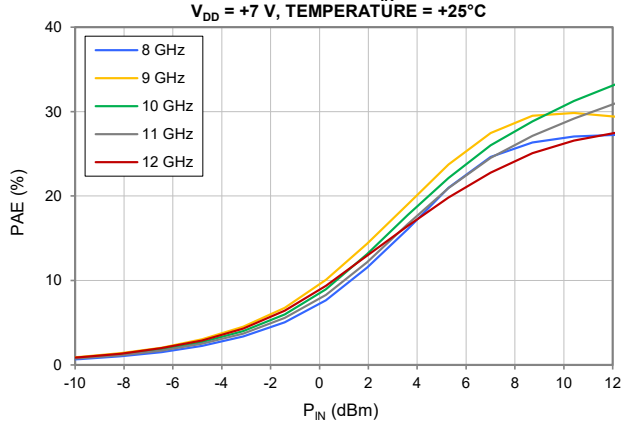
P_{OUT} & GAIN vs. P_{IN}
V_{DD} = +7 V, TEMPERATURE = +25°C



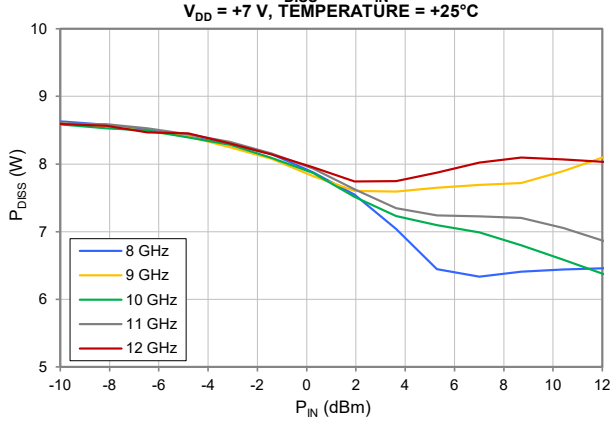
I_{DD} vs. P_{IN}
V_{DD} = +7 V, TEMPERATURE = +25°C



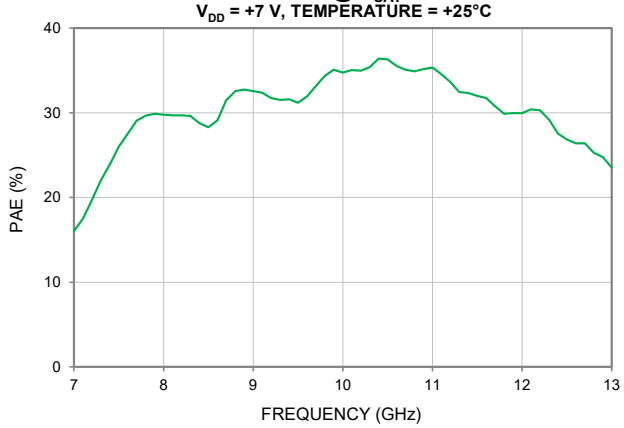
PAE vs. P_{IN}
V_{DD} = +7 V, TEMPERATURE = +25°C



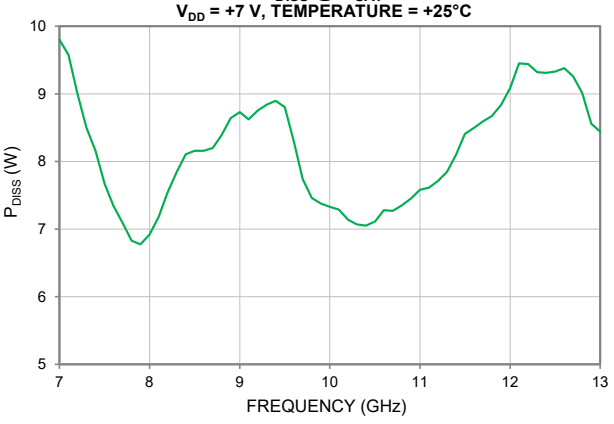
P_{DISS} vs. P_{IN}
V_{DD} = +7 V, TEMPERATURE = +25°C



PAE @ P_{SAT}
V_{DD} = +7 V, TEMPERATURE = +25°C



P_{DISS} @ P_{SAT}
V_{DD} = +7 V, TEMPERATURE = +25°C



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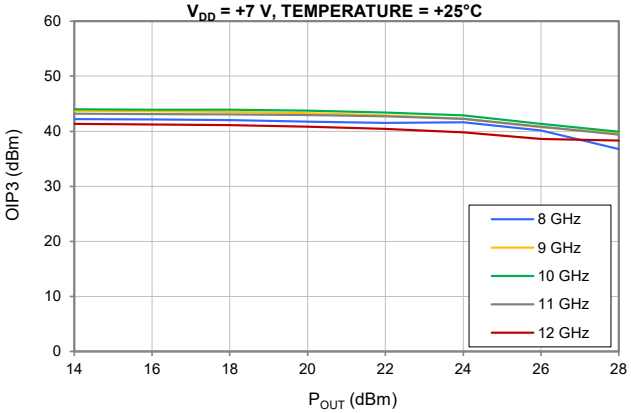
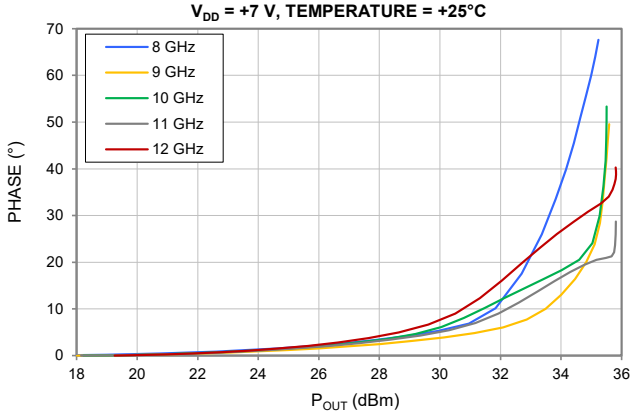
TYPICAL PERFORMANCE GRAPHS

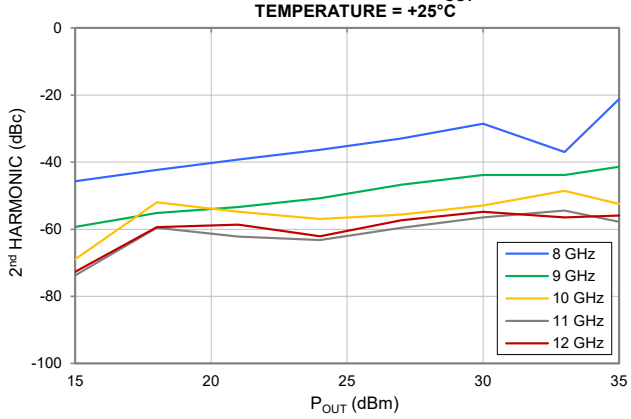
OIP3 vs. P_{OUT}/TONE
TONE SPACING = 5 MHz,
V_{DD} = +7 V, TEMPERATURE = +25°C



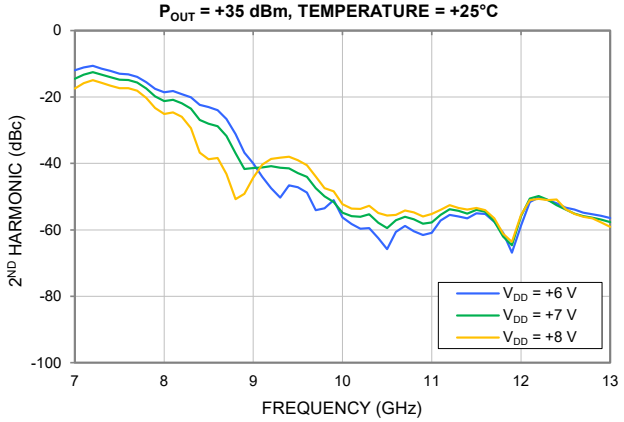
AM - PM
V_{DD} = +7 V, TEMPERATURE = +25°C



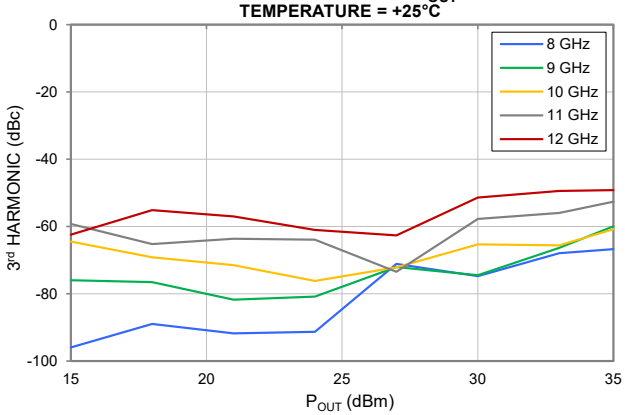
2nd HARMONIC vs. P_{OUT}
TEMPERATURE = +25°C



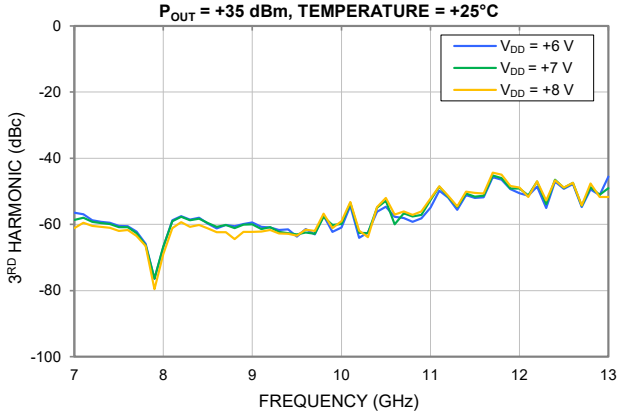
2nd HARMONIC vs. DEVICE VOLTAGE
P_{OUT} = +35 dBm, TEMPERATURE = +25°C



3rd HARMONIC vs. P_{OUT}
TEMPERATURE = +25°C

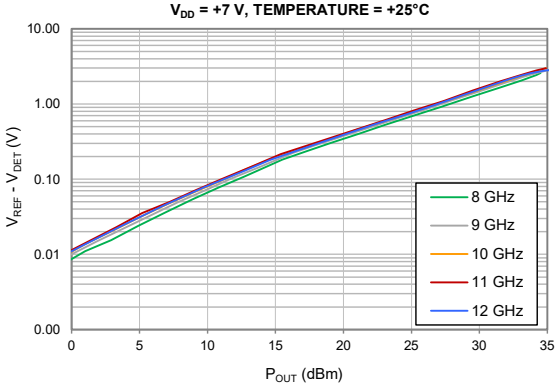


3rd HARMONIC vs. DEVICE VOLTAGE
P_{OUT} = +35 dBm, TEMPERATURE = +25°C

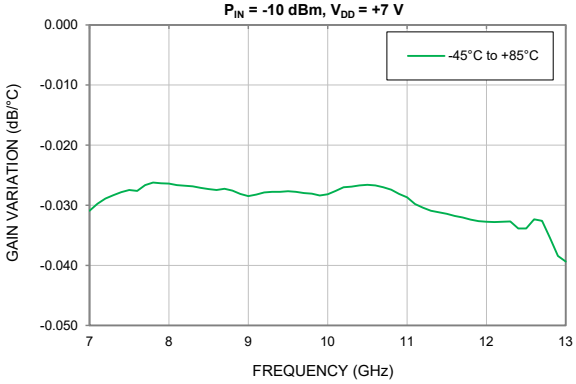


TYPICAL PERFORMANCE GRAPHS

POWER DETECTOR OUTPUT VOLTAGE*
V_{DD} = +7 V, TEMPERATURE = +25°C



GAIN VARIATION vs. TEMPERATURE
P_{IN} = -10 dBm, V_{DD} = +7 V



* Logarithmic scale base 10

ABSOLUTE MAXIMUM RATINGS[8]

Parameter	Ratings
Operating Temperature[9]	-45°C to +85°C
Storage Temperature	-65°C to +150°C
Junction Temperature[10]	+175°C
Total Power Dissipation	14.7 W
Input Power (CW), V_{DD} = +7 V	+27 dBm
DC Drain Voltage at V_{DD}[11]	+8.5 V
DC Gate Voltage at V_{GG}[12]	-3.0 V (min) / -0.4 V (max)
DC Drain Current I_{DD}	3 A
DC Gate Current I_{GG}	14 mA

8. Permanent damage may occur if these limits are exceeded. Maximum ratings are not intended for continuous normal operation.
9. Bottom of Die.
10. Peak temperature on top of Die.
11. $V_{DD} = V_{D1} = V_{D2} = V_{D3} = V_{D2B} = V_{D3B}$
12. $V_{GG} = V_{G1} = V_{G2} = V_{G3}$

THERMAL RESISTANCE

Parameter	Ratings
Thermal Resistance (Θ_{JC})[13]	7.7°C/W

13. Θ_{JC}= (Hot Spot Temperature on Die - Temperature at Ground Lead)/Dissipated Power

ESD RATING

	Class	Voltage Range	Reference Standard
HBM	1B	500 V to < 1000 V	ANSI/ESDA/JEDEC JS-001-2023
CDM	C3	≥ 1000 V	ANSI/ESDA/JEDEC JS-002-2022

ESD HANDLING PRECAUTION: This device is designed to be Class 1B for HBM. Static charges may easily produce potentials higher than this with improper handling and can discharge into DUT and damage it. As a preventive measure Industry standard ESD handling precautions should be used at all times to protect the device from ESD damage.

MSL RATING

Moisture Sensitivity: MSL1 in accordance with IPC/JEDEC J-STD-020E/JEDEC J-STD-033C

Power Amplifier

PMA5-123-3W+

50Ω 8 to 12 GHz 3.5 W P_{SAT}

FUNCTIONAL DIAGRAM

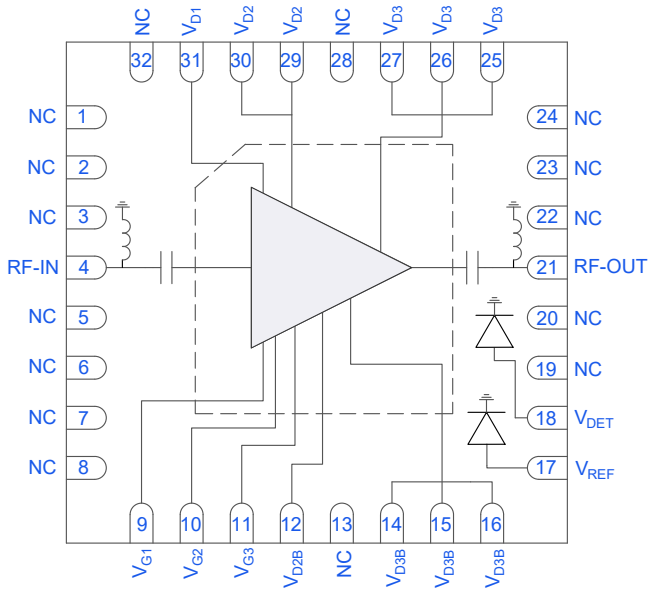


Figure 1. PMA5-123-3W+ Functional Diagram

PAD DESCRIPTION

Function	Pad Number	Description (Refer to Figure 1)
RF-IN	4	RF-IN pad connects to RF Input port.
RF-OUT	21	RF-OUT pad connects to RF Output port.
V_{D1}	31	DC Input pad connects to First Stage Drain Voltage port.
V_{G1}	9	DC Input pad connects to First Stage Gate Voltage port.
V_{D2}	29, 30	DC Input pad connects to Second Stage Drain Voltage port.
V_{G2}	10	DC Input pad connect to Second Stage Gate Voltage port.
V_{D3}	25, 26, 27	DC Input pad connects to Third Stage Drain Voltage port.
V_{G3}	11	DC Input pad connects to Third Stage Gate Voltage port.
V_{D2B}[14]	12	DC Input pad connects to Second Stage Drain Voltage Alternate port.
V_{D3B}[15]	14, 15, 16	DC Input pad connect to Third Stage Drain Voltage Alternate port.
V_{DET}	18	DC Output pad connects to Power Detector Output Voltage port. Voltage is proportional to RF Output Power.
V_{REF}	17	DC Output pad connects to Power Detector Reference Voltage port.
NC	1-3, 5-8, 13, 19, 20, 22-24, 28, 32	Not used internally. Connected to ground on test board.
GND	Paddle	Connects to ground.

14. V_{D2B} can be used as an alternate to V_{D2}. V_{D2B} and V_{D2} are connected internally. Voltage may be applied to both ports. On the Evaluation Circuit, DC bias is only applied to V_{D2}.
15. V_{D3B} can be used as an alternate to V_{D3}. V_{D3B} and V_{D3} are connected internally. For optimal performance voltage should be applied to both ports. On the Evaluation Circuit, DC bias is applied to both V_{D3} and V_{D3B}. During characterization, V_{D3} and V_{D3B} were connected via a jumper.

EVALUATION BOARD

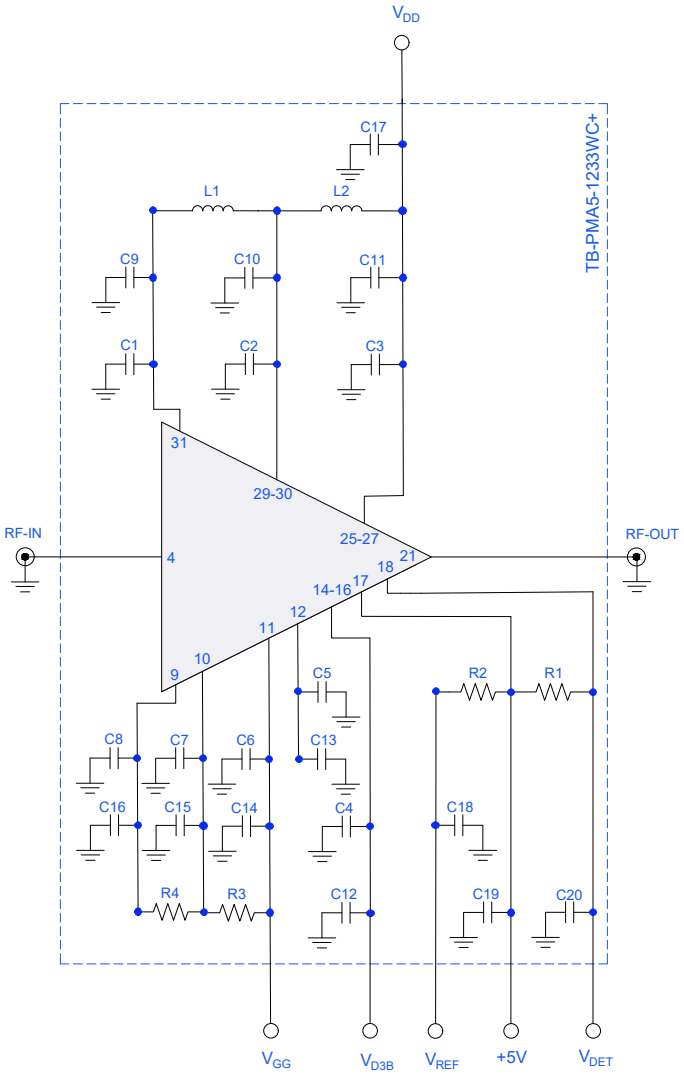


Figure 2. PMA5-123-3W+ Evaluation and Characterization Circuit

Electrical Parameters and Conditions
Gain, Return Loss, Output Power at 1 dB Compression (P1dB), Output IP3 (OIP3), and Noise Figure measured using N5247B PNA-X Microwave Network Analyzer.

Conditions:
a. Gain and Return Loss: P_{IN} = -10 dBm
b. Output IP3 (OIP3): Two tones, spaced 5 MHz apart, +20 dBm/Tone at output.

Power ON/Power OFF Sequence[16]
Caution: Permanent damage to the device will occur if the Power ON and Power OFF sequences are not followed.

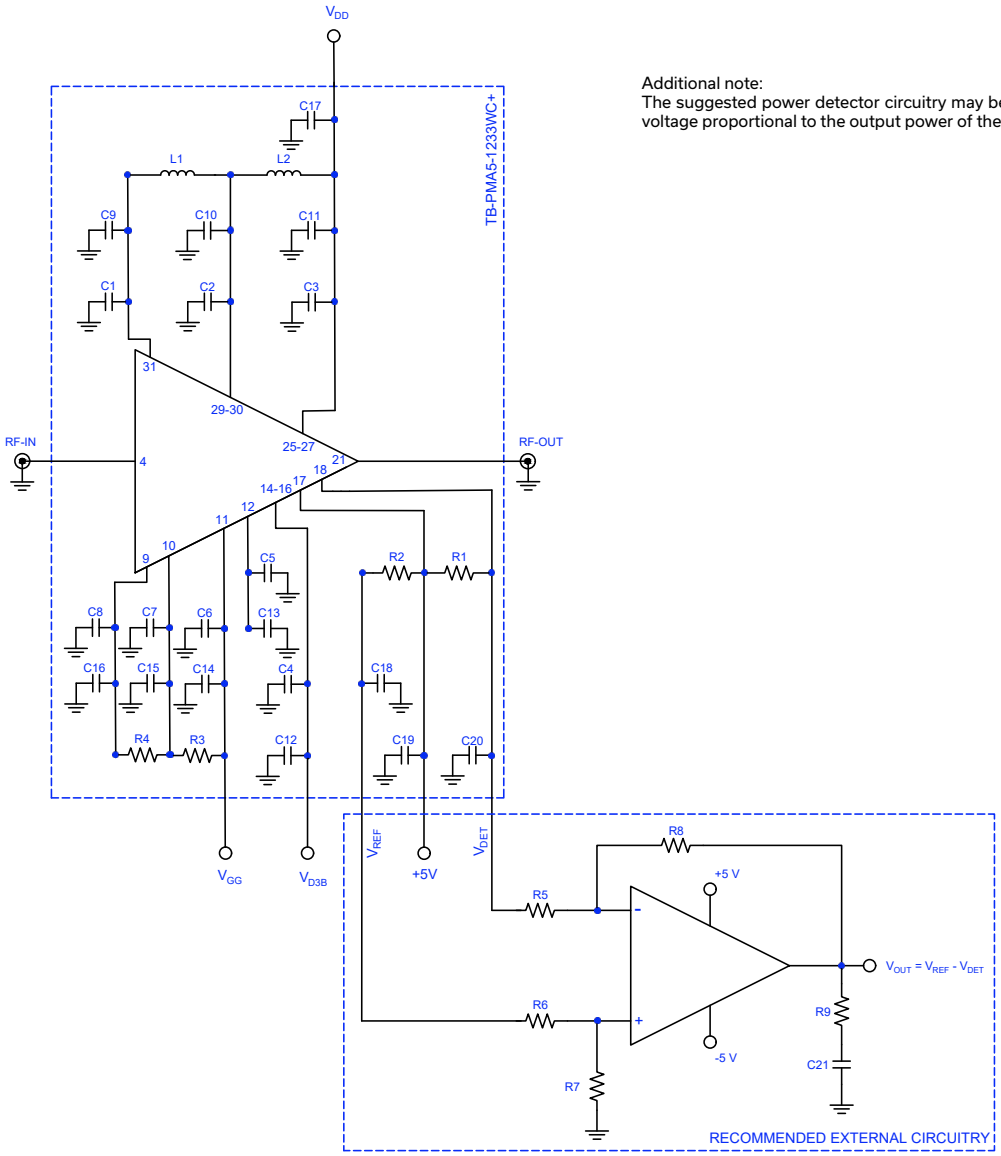
POWER ON:
1) Set V_{GG} = -1.5 V. Apply V_{GG}.
2) Set V_{DD} = +7 V. Apply V_{DD}.
3) Increase V_{GG} to obtain desired I_{DD} as shown in spec table.
4) Apply RF Signal.

POWER OFF:
1) Turn off RF Signal.
2) Adjust V_{GG} down to -1.5 V.
3) Turn off V_{DD}.
4) Turn off V_{GG}.

16. In instances of applying V_{DD}, V_{D3B} may be applied along with V_{D3} via a jumper for optimal performance.

Component	Value	Size	Part Number	Manufacturer
C1 – C8	0.001 µF	0402	GRM1555C1H102JA01D	MURATA
C9 – C16, C18 – C20	0.1 µF	0402	GRM155R71E104KE14D	MURATA
C17	47 µF	1206	1206YD476MAT2A	KYOCERA AVX
L1, L2	150 nH	0402	0402DF-151XJRW	COILCRAFT
R1, R2	100kΩ	0402	RK73H1ETTP1003F	KOA SPEER
R3	0Ω	0402	RK73Z1ETTP	KOA SPEER
R4	100Ω	0402	RK73H1ETTP1000F	KOA SPEER

EVALUATION BOARD & RECOMMENDED POWER DETECTOR CIRCUITRY



Additional note:
The suggested power detector circuitry may be used to provide a temperature compensated output voltage proportional to the output power of the device. +5 V must be applied at shunt capacitor C19.

Figure 3. PMA5-123-3W+ Characterization Circuit with Power Detector Circuitry

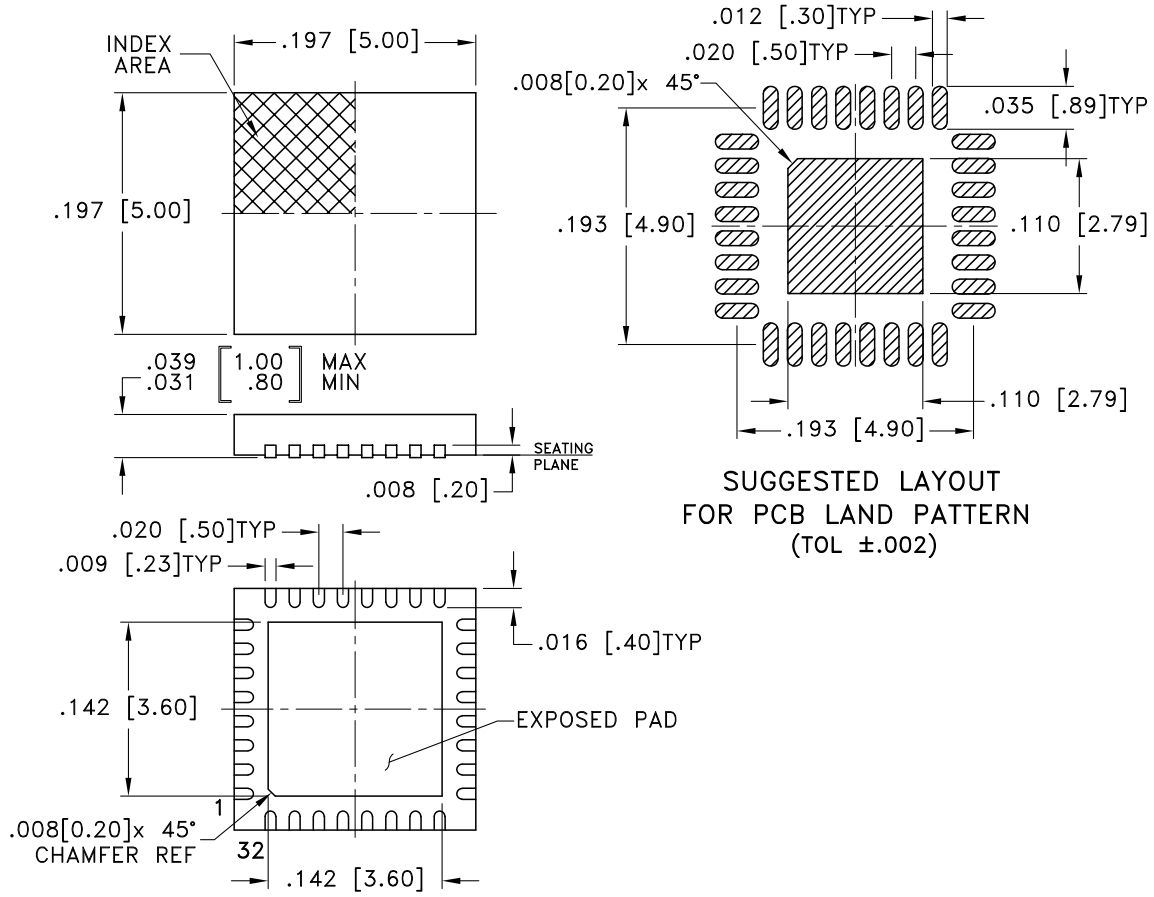
Component	Value	Size	Part Number	Manufacturer
R5-R8	10kΩ	0402	RK73H1ETTP1002F	KOA SPEER
R9	2.21Ω	0402	RK73H1ETTP2R21F	KOA SPEER
C21	4.7 µF	0805	08053C475KAT2A	KYOCERA AVX

Power Amplifier

PMA5-123-3W+

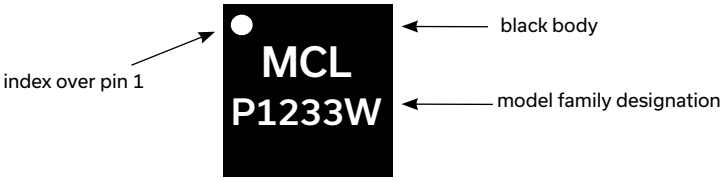
50Ω 8 to 12 GHz 3.5 W P_{SAT}

CASE STYLE DRAWING



Weight: .05 grams
Dimensions are in inches [mm]. Tolerances: 2 Pl.±.01; 3Pl.±.005 Inch

PRODUCT MARKING



Marking may contain other features or characters for internal lot control

MMIC SURFACE MOUNT

Power Amplifier

PMA5-123-3W+

50Ω 8 to 12 GHz 3.5 W P_{SAT}

ADDITIONAL DETAILED INFORMATION IS AVAILABLE ON OUR DASHBOARD CLICK HERE

Performance Data & Graphs	Data Graphs S-Parameter (S2P Files) Data Set (.zip file)
Case Style	DG1677-10 Plastic package, exposed paddle, Lead Finish: Matte-Tin
RoHS Status	Compliant
Tape & Reel **Standard quantities available on reel**	F68-1 7" reels with 10, 50, 100, 200, 500, 1K, or 2K 13" reels with 2K, 3K, or 4K
Suggested Layout for PCB Design	PL-783
Evaluation Board	TB-PMA5-1233WC+ Gerber File
Environmental Ratings	ENV08T1

NOTES

A. 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.

B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.

C. 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/terms/viewterm.html

Typical Performance Data

NOTE: Use PDF Bookmarks to view DATA at required

Definitions:

Input Return Loss = S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = S12 (dB)
Output Return Loss = S22 (dB)

TEST CONDITIONS: V_{DD} = +7 V, I_{DD} = 1250 mA @ Temperature = +25°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	IP-3 Output	IM3 Output	1dB Comp. Output	Psat Output	Noise Figure	2nd Harmonics	3rd Harmonics
(GHz)	(dB)	(dB)	(dB)	(dB)	(dBm)	(dBc)	(dBm)	(dBm)	(dB)	(dBc)	(dBc)
7.0	25.5	-62.56	-19.79	-8.00	35.69	-30.99	31.17	32.44	10.76	-14.46	-58.66
7.1	25.7	-63.15	-20.18	-7.36	36.80	-33.21	31.69	32.77	10.32	-13.26	-57.96
7.2	25.8	-63.38	-20.43	-7.04	37.82	-35.24	32.18	33.17	10.01	-12.52	-59.26
7.3	26.0	-63.74	-20.69	-6.93	38.76	-37.15	32.57	33.54	9.86	-13.29	-59.58
7.4	26.2	-63.93	-20.88	-6.99	39.43	-38.47	32.86	33.76	9.66	-14.04	-59.89
7.5	26.4	-62.70	-20.71	-7.15	39.97	-39.55	33.14	33.99	9.36	-14.79	-60.84
7.6	26.6	-62.01	-20.76	-7.31	40.57	-40.76	33.39	34.17	9.18	-14.89	-60.84
7.7	26.8	-64.15	-21.36	-7.74	41.08	-41.79	33.47	34.32	9.11	-15.64	-62.61
7.8	27.1	-65.37	-20.61	-8.27	41.33	-42.29	33.40	34.30	8.97	-17.45	-66.38
7.9	27.4	-66.61	-19.55	-8.88	41.57	-42.78	33.41	34.33	8.84	-19.79	-76.39
8.0	27.7	-66.25	-18.43	-9.48	41.76	-43.19	33.50	34.41	8.66	-21.21	-66.74
8.1	28.0	-65.24	-17.37	-10.08	41.93	-43.56	33.75	34.61	8.57	-20.83	-59.07
8.2	28.3	-64.82	-16.32	-10.62	42.14	-43.97	34.02	34.84	8.53	-21.87	-57.66
8.3	28.5	-64.44	-15.47	-11.17	42.28	-44.24	34.18	34.98	8.43	-23.50	-58.73
8.4	28.7	-64.26	-14.73	-11.71	42.44	-44.55	34.25	34.99	8.30	-26.95	-58.27
8.5	28.8	-64.37	-14.17	-12.14	42.72	-45.15	34.25	34.93	8.18	-28.03	-59.57
8.6	28.9	-63.55	-13.80	-12.50	43.09	-45.82	34.45	35.10	8.13	-28.77	-60.73
8.7	29.0	-63.45	-13.48	-12.81	43.15	-45.96	34.94	35.58	8.05	-31.76	-60.20
8.8	29.0	-63.95	-13.25	-13.18	43.21	-46.07	35.20	35.89	7.93	-36.93	-61.09
8.9	29.0	-63.82	-13.17	-13.58	43.15	-45.91	35.34	36.07	7.83	-41.69	-60.11
9.0	29.0	-63.52	-13.14	-14.08	43.30	-46.20	35.24	36.06	7.72	-41.40	-59.95
9.1	29.0	-62.54	-13.16	-14.74	43.50	-46.60	35.08	35.96	7.69	-41.23	-61.44
9.2	29.0	-61.95	-13.22	-15.52	43.35	-46.31	34.93	35.91	7.57	-40.80	-60.82
9.3	29.0	-61.04	-13.45	-16.36	43.18	-45.98	34.78	35.91	7.47	-41.27	-62.30
9.4	29.0	-61.07	-13.73	-17.33	42.97	-45.55	34.72	35.97	7.39	-41.47	-62.61
9.5	28.9	-60.88	-13.86	-18.55	43.13	-45.87	34.62	35.86	7.31	-42.88	-63.05
9.6	28.8	-61.60	-13.79	-20.15	43.50	-46.64	34.53	35.72	7.25	-44.06	-62.42
9.7	28.7	-62.03	-13.64	-22.27	43.72	-47.10	34.43	35.67	7.15	-47.48	-62.79
9.8	28.6	-61.64	-13.40	-24.81	43.82	-47.26	34.40	35.69	7.06	-49.92	-57.67
9.9	28.4	-62.42	-13.11	-27.55	43.64	-46.89	34.43	35.76	6.98	-51.66	-60.15
10.0	28.3	-63.59	-12.80	-28.59	43.75	-47.11	34.41	35.70	6.87	-54.82	-59.91
10.1	28.2	-65.29	-12.30	-26.75	43.92	-47.43	34.44	35.71	6.85	-55.83	-53.55
10.2	28.0	-64.97	-11.80	-24.27	44.05	-47.68	34.35	35.63	6.76	-56.11	-62.55
10.3	27.9	-64.66	-11.43	-22.01	43.96	-47.49	34.32	35.62	6.69	-55.30	-62.67
10.4	27.9	-62.85	-11.10	-20.11	43.85	-47.28	34.42	35.80	6.64	-57.90	-54.99
10.5	27.9	-61.76	-10.77	-18.69	43.69	-46.96	34.44	35.84	6.60	-59.45	-52.81
10.6	28.0	-61.27	-10.44	-17.33	43.60	-46.77	34.36	35.81	6.50	-57.07	-60.02
10.7	28.0	-60.41	-10.22	-16.13	43.43	-46.42	34.26	35.71	6.46	-56.10	-56.66
10.8	28.1	-59.89	-9.98	-15.12	43.34	-46.23	34.25	35.72	6.42	-56.81	-57.60
10.9	28.2	-59.24	-9.78	-14.15	43.15	-45.85	34.29	35.82	6.32	-58.16	-57.12
11.0	28.3	-59.15	-9.76	-13.23	42.96	-45.45	34.35	35.93	6.28	-57.78	-52.62
11.1	28.3	-59.16	-9.87	-12.32	42.85	-45.24	34.25	35.77	6.27	-55.52	-48.58
11.2	28.3	-58.81	-10.04	-11.51	42.76	-45.05	34.16	35.70	6.26	-53.84	-51.57
11.3	28.4	-58.61	-10.27	-10.79	42.65	-44.83	33.96	35.54	6.25	-54.25	-54.78
11.4	28.4	-58.63	-10.60	-10.18	42.37	-44.26	33.93	35.65	6.20	-55.10	-50.62
11.5	28.4	-58.27	-10.99	-9.62	42.09	-43.70	34.02	35.75	6.16	-54.02	-51.61
11.6	28.4	-58.03	-11.36	-9.11	41.90	-43.32	34.06	35.75	6.17	-54.57	-51.29
11.7	28.4	-57.75	-11.67	-8.68	41.88	-43.28	33.96	35.64	6.15	-57.52	-45.21
11.8	28.5	-57.64	-11.88	-8.30	41.82	-43.15	33.75	35.48	6.14	-62.06	-46.06
11.9	28.6	-57.35	-12.07	-7.99	41.42	-42.36	33.65	35.63	6.07	-64.66	-49.14
12.0	28.7	-56.55	-12.31	-7.77	40.82	-41.13	33.55	35.75	6.12	-55.88	-49.19
12.1	28.9	-56.16	-12.54	-7.58	40.28	-40.05	33.61	36.00	6.18	-50.56	-51.25
12.2	29.1	-55.58	-12.50	-7.46	40.06	-39.61	33.62	36.00	6.17	-49.81	-47.05
12.3	29.2	-55.72	-12.26	-7.42	40.02	-39.52	33.27	35.75	6.16	-50.92	-53.86
12.4	29.4	-55.85	-11.97	-7.56	39.73	-38.94	32.83	35.37	6.12	-52.54	-46.46
12.5	29.5	-56.60	-11.53	-7.91	39.04	-37.54	32.55	35.28	6.19	-53.91	-49.00
12.6	29.6	-57.04	-11.05	-8.50	38.39	-36.25	32.39	35.18	6.17	-55.15	-47.46
12.7	29.6	-58.15	-10.47	-9.44	38.23	-35.94	32.61	35.13	6.18	-55.90	-54.40
12.8	29.4	-58.51	-9.96	-10.80	38.44	-36.39	32.90	34.79	6.21	-56.33	-48.77
12.9	29.2	-59.23	-9.53	-12.73	38.73	-36.99	33.39	34.45	6.22	-56.95	-51.05
13.0	28.8	-59.76	-9.21	-15.57	38.52	-36.57	33.73	34.12	6.27	-57.70	-49.03

Typical Performance Data

NOTE: Use PDF Bookmarks to view DATA at required

Definitions:

Input Return Loss = S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = S12 (dB)
Output Return Loss = S22 (dB)

TEST CONDITIONS: V_{DD} = +6 V, I_{DD} = 1250 mA @ Temperature = +25°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	IP-3 Output	IM3 Output	1dB Comp. Output	Psat Output	Noise Figure	2nd Harmonics	3rd Harmonics
(GHz)	(dB)	(dB)	(dB)	(dB)	(dBm)	(dBc)	(dBm)	(dBm)	(dB)	(dBc)	(dBc)
7.0	25.9	-62.41	-19.04	-7.96	35.99	-31.63	29.99	31.45	10.53	-11.95	-56.46
7.1	26.0	-62.54	-19.50	-7.30	36.98	-33.63	30.48	31.76	10.11	-11.11	-56.93
7.2	26.2	-62.63	-19.94	-6.96	37.84	-35.35	30.94	32.16	9.79	-10.61	-58.79
7.3	26.4	-63.03	-20.48	-6.81	38.68	-37.04	31.28	32.47	9.65	-11.47	-59.25
7.4	26.6	-63.45	-20.85	-6.85	39.18	-38.05	31.52	32.67	9.47	-12.18	-59.47
7.5	26.9	-63.92	-21.09	-7.02	39.57	-38.80	31.79	32.88	9.19	-12.96	-60.48
7.6	27.1	-63.04	-21.09	-7.24	40.04	-39.76	32.07	33.06	9.00	-13.19	-60.57
7.7	27.2	-63.62	-21.53	-7.55	40.46	-40.59	32.18	33.21	8.93	-13.95	-62.21
7.8	27.5	-64.18	-21.01	-8.07	40.69	-41.04	32.12	33.19	8.78	-15.54	-65.88
7.9	27.8	-64.13	-19.95	-8.61	40.86	-41.41	32.14	33.20	8.66	-17.50	-76.49
8.0	28.1	-64.04	-18.75	-9.22	40.96	-41.62	32.23	33.28	8.46	-18.61	-66.90
8.1	28.4	-64.08	-17.49	-9.87	41.05	-41.79	32.50	33.48	8.38	-18.24	-58.78
8.2	28.6	-64.70	-16.36	-10.49	41.20	-42.11	32.78	33.68	8.35	-19.14	-57.52
8.3	28.8	-65.28	-15.44	-10.99	41.31	-42.31	32.97	33.81	8.25	-20.06	-58.53
8.4	29.0	-64.90	-14.74	-11.36	41.44	-42.56	33.04	33.84	8.11	-22.35	-58.02
8.5	29.1	-64.11	-14.26	-11.74	41.69	-43.06	33.03	33.80	8.00	-23.03	-59.81
8.6	29.1	-63.06	-13.74	-12.14	42.07	-43.80	33.24	33.98	7.97	-23.95	-61.23
8.7	29.2	-62.65	-13.32	-12.36	42.29	-44.23	33.77	34.51	7.88	-26.66	-60.14
8.8	29.2	-62.85	-13.07	-12.44	42.53	-44.69	34.12	34.89	7.76	-31.20	-60.58
8.9	29.3	-63.20	-13.02	-12.65	42.63	-44.92	34.35	35.12	7.66	-36.73	-59.87
9.0	29.3	-63.94	-13.08	-13.06	42.85	-45.35	34.27	35.12	7.56	-39.98	-59.45
9.1	29.3	-64.52	-13.16	-13.77	43.09	-45.79	34.13	35.05	7.52	-44.00	-60.72
9.2	29.2	-64.66	-13.26	-14.58	42.98	-45.54	34.07	35.06	7.40	-47.47	-60.93
9.3	29.2	-64.52	-13.42	-15.42	42.85	-45.34	34.03	35.08	7.31	-50.33	-61.65
9.4	29.1	-63.91	-13.43	-16.41	42.69	-45.04	34.05	35.14	7.23	-46.63	-61.51
9.5	29.0	-63.27	-13.29	-17.55	42.86	-45.38	33.90	35.02	7.16	-47.20	-63.66
9.6	29.0	-62.75	-13.19	-19.07	43.20	-46.05	33.70	34.85	7.08	-48.73	-61.37
9.7	28.9	-62.95	-13.26	-21.37	43.40	-46.49	33.57	34.75	6.99	-54.08	-63.04
9.8	28.9	-63.89	-13.25	-24.34	43.49	-46.65	33.54	34.81	6.91	-53.49	-57.33
9.9	28.7	-65.03	-13.06	-28.01	43.34	-46.33	33.58	34.89	6.82	-51.07	-62.23
10.0	28.5	-64.64	-12.64	-32.46	43.49	-46.61	33.51	34.82	6.72	-56.27	-60.98
10.1	28.3	-63.21	-12.04	-32.47	43.68	-47.00	33.46	34.75	6.71	-58.23	-54.36
10.2	28.2	-62.12	-11.48	-27.24	43.82	-47.27	33.33	34.63	6.61	-59.71	-64.04
10.3	28.1	-61.34	-11.04	-23.28	43.73	-47.09	33.30	34.61	6.54	-59.52	-62.44
10.4	28.0	-60.73	-10.65	-20.55	43.65	-46.92	33.41	34.76	6.48	-62.53	-56.14
10.5	28.0	-60.11	-10.28	-18.62	43.51	-46.64	33.43	34.79	6.43	-65.81	-54.65
10.6	28.1	-59.76	-9.96	-17.16	43.45	-46.52	33.34	34.74	6.33	-60.59	-57.73
10.7	28.1	-59.37	-9.71	-15.90	43.27	-46.15	33.26	34.65	6.30	-58.82	-58.05
10.8	28.2	-58.88	-9.53	-14.74	43.19	-45.97	33.24	34.65	6.26	-60.46	-59.20
10.9	28.3	-58.47	-9.43	-13.70	43.02	-45.62	33.28	34.76	6.17	-61.60	-58.16
11.0	28.4	-58.16	-9.45	-12.78	42.83	-45.24	33.35	34.86	6.13	-60.86	-54.95
11.1	28.4	-58.11	-9.60	-11.93	42.68	-44.94	33.24	34.72	6.14	-57.23	-49.83
11.2	28.4	-58.25	-9.85	-11.11	42.56	-44.70	33.14	34.65	6.12	-55.46	-51.88
11.3	28.4	-58.27	-10.17	-10.39	42.43	-44.44	32.98	34.48	6.08	-55.99	-55.60
11.4	28.5	-58.16	-10.50	-9.77	42.16	-43.88	33.01	34.58	6.03	-56.53	-51.17
11.5	28.5	-57.78	-10.80	-9.21	41.90	-43.35	33.10	34.66	5.98	-55.01	-52.00
11.6	28.5	-56.81	-11.04	-8.79	41.68	-42.90	33.13	34.66	6.01	-55.19	-51.85
11.7	28.6	-55.93	-11.35	-8.44	41.62	-42.78	33.03	34.57	6.01	-57.56	-45.70
11.8	28.7	-55.47	-11.73	-8.08	41.51	-42.56	32.86	34.50	5.96	-60.90	-46.46
11.9	28.8	-55.44	-12.20	-7.73	41.11	-41.76	32.92	34.68	5.91	-66.88	-49.37
12.0	28.9	-55.29	-12.79	-7.43	40.52	-40.54	32.96	34.83	5.97	-58.75	-50.60
12.1	29.0	-54.94	-13.21	-7.22	40.00	-39.48	33.10	35.06	6.00	-51.65	-51.31
12.2	29.2	-54.93	-13.44	-7.10	39.75	-39.00	33.12	35.17	6.01	-50.26	-48.53
12.3	29.4	-55.03	-13.41	-7.09	39.64	-38.78	32.85	34.97	5.98	-51.03	-55.03
12.4	29.6	-55.65	-13.11	-7.24	39.29	-38.08	32.52	34.78	5.96	-51.99	-47.03
12.5	29.8	-56.57	-12.60	-7.60	38.58	-36.64	32.40	34.78	6.04	-53.35	-49.28
12.6	29.9	-57.73	-11.98	-8.24	37.93	-35.33	32.33	34.74	5.99	-53.87	-47.77
12.7	29.9	-58.30	-11.39	-9.22	37.74	-34.98	32.52	34.64	6.01	-54.83	-54.74
12.8	29.8	-58.71	-10.76	-10.66	37.86	-35.25	32.65	34.32	6.05	-55.31	-49.44
12.9	29.6	-58.93	-10.21	-12.65	38.01	-35.55	32.88	33.92	6.06	-55.75	-51.16
13.0	29.1	-59.27	-9.68	-15.57	37.74	-35.02	33.15	33.60	6.11	-56.48	-45.56

Typical Performance Data

NOTE: Use PDF Bookmarks to view DATA at required

Definitions:

Input Return Loss = S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = S12 (dB)
Output Return Loss = S22 (dB)

TEST CONDITIONS: V_{DD} = +8 V, I_{DD} = 1250 mA @ Temperature = +25°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	IP-3 Output	IM3 Output	1dB Comp. Output	Psat Output	Noise Figure	2nd Harmonics	3rd Harmonics
(GHz)	(dB)	(dB)	(dB)	(dB)	(dBm)	(dBc)	(dBm)	(dBm)	(dB)	(dBc)	(dBc)
7.0	23.4	-63.16	-19.90	-9.13	35.80	-31.16	32.24	33.10	10.98	-17.41	-61.14
7.1	23.6	-63.39	-20.53	-8.50	36.97	-33.49	32.83	33.51	10.54	-15.86	-59.50
7.2	23.9	-63.65	-21.15	-8.20	38.04	-35.65	33.40	33.94	10.23	-14.94	-60.43
7.3	24.1	-64.19	-21.89	-8.11	39.03	-37.63	33.83	34.24	10.06	-15.73	-60.75
7.4	24.4	-64.89	-22.45	-8.24	39.74	-39.04	34.11	34.50	9.85	-16.59	-61.06
7.5	24.7	-65.31	-22.80	-8.52	40.32	-40.20	34.40	34.78	9.55	-17.38	-61.95
7.6	25.0	-63.56	-22.63	-8.88	40.92	-41.40	34.69	34.98	9.38	-17.35	-61.66
7.7	25.2	-64.23	-22.73	-9.32	41.41	-42.39	34.84	35.21	9.30	-18.11	-63.46
7.8	25.6	-64.97	-21.93	-10.03	41.64	-42.88	34.81	35.24	9.13	-20.26	-66.59
7.9	25.9	-64.68	-20.66	-10.79	41.86	-43.30	34.80	35.25	9.02	-23.31	-79.59
8.0	26.3	-64.62	-19.30	-11.61	42.03	-43.68	34.84	35.30	8.83	-25.14	-69.03
8.1	26.6	-65.00	-17.96	-12.42	42.18	-43.97	35.06	35.48	8.75	-24.59	-61.16
8.2	26.9	-65.52	-16.76	-13.09	42.34	-44.30	35.32	35.73	8.69	-25.94	-59.27
8.3	27.1	-65.72	-15.78	-13.47	42.44	-44.53	35.49	35.89	8.59	-29.32	-60.75
8.4	27.3	-65.34	-15.03	-13.59	42.57	-44.77	35.53	35.87	8.46	-36.73	-60.17
8.5	27.4	-64.22	-14.49	-13.61	42.80	-45.24	35.49	35.77	8.34	-38.78	-61.24
8.6	27.5	-63.23	-13.95	-13.54	43.05	-45.73	35.66	35.98	8.29	-38.39	-62.33
8.7	27.6	-62.82	-13.50	-13.26	42.99	-45.59	36.11	36.41	8.22	-43.20	-62.40
8.8	27.6	-63.25	-13.22	-12.94	42.94	-45.49	36.29	36.64	8.09	-50.79	-64.50
8.9	27.7	-63.67	-13.12	-12.81	42.82	-45.23	36.36	36.72	7.99	-49.19	-62.28
9.0	27.7	-64.20	-13.11	-12.87	42.94	-45.45	36.25	36.65	7.89	-44.34	-62.25
9.1	27.6	-64.87	-13.12	-13.13	43.12	-45.81	36.13	36.58	7.84	-40.37	-62.17
9.2	27.6	-64.47	-13.16	-13.40	43.00	-45.57	35.95	36.51	7.73	-38.63	-61.72
9.3	27.6	-64.21	-13.25	-13.66	42.86	-45.29	35.76	36.46	7.64	-38.26	-62.71
9.4	27.5	-63.50	-13.21	-14.03	42.66	-44.88	35.63	36.46	7.54	-38.03	-62.81
9.5	27.4	-62.93	-13.05	-14.50	42.78	-45.13	35.52	36.34	7.45	-39.07	-63.37
9.6	27.4	-62.37	-12.94	-15.19	43.12	-45.83	35.50	36.27	7.41	-40.54	-61.59
9.7	27.4	-62.37	-12.98	-16.17	43.35	-46.28	35.45	36.28	7.31	-43.99	-61.99
9.8	27.3	-62.94	-12.96	-17.26	43.45	-46.47	35.47	36.33	7.23	-47.46	-56.72
9.9	27.3	-63.51	-12.82	-18.47	43.28	-46.12	35.53	36.41	7.13	-48.44	-61.14
10.0	27.1	-62.60	-12.50	-20.01	43.36	-46.28	35.52	36.37	7.02	-52.26	-59.04
10.1	27.0	-61.56	-12.02	-21.97	43.50	-46.55	35.54	36.32	7.03	-53.58	-53.25
10.2	27.0	-60.68	-11.54	-24.51	43.63	-46.80	35.46	36.25	6.91	-53.69	-61.93
10.3	26.9	-60.17	-11.16	-26.43	43.56	-46.66	35.45	36.26	6.85	-52.73	-63.88
10.4	26.9	-59.66	-10.81	-24.89	43.46	-46.45	35.61	36.51	6.79	-54.94	-54.80
10.5	27.0	-59.22	-10.48	-22.15	43.31	-46.15	35.68	36.56	6.76	-55.70	-52.02
10.6	27.0	-59.08	-10.19	-19.64	43.23	-45.97	35.59	36.54	6.65	-55.50	-57.01
10.7	27.1	-58.87	-9.96	-17.49	43.08	-45.69	35.48	36.45	6.62	-54.14	-56.09
10.8	27.2	-58.62	-9.81	-15.68	43.00	-45.53	35.49	36.45	6.57	-54.74	-57.17
10.9	27.2	-58.27	-9.75	-14.19	42.84	-45.20	35.57	36.56	6.48	-56.01	-56.07
11.0	27.3	-58.14	-9.80	-12.95	42.67	-44.86	35.69	36.69	6.43	-55.18	-52.16
11.1	27.3	-58.33	-9.98	-11.86	42.59	-44.69	35.57	36.54	6.45	-53.96	-48.52
11.2	27.3	-58.54	-10.26	-10.93	42.52	-44.56	35.49	36.42	6.42	-52.60	-51.31
11.3	27.3	-58.64	-10.60	-10.18	42.45	-44.42	35.26	36.20	6.41	-53.43	-54.55
11.4	27.3	-58.55	-10.95	-9.55	42.19	-43.87	35.29	36.26	6.36	-53.93	-50.10
11.5	27.3	-58.20	-11.25	-9.01	41.94	-43.37	35.46	36.39	6.31	-53.39	-50.51
11.6	27.3	-57.15	-11.52	-8.62	41.77	-43.04	35.52	36.44	6.34	-54.04	-50.67
11.7	27.3	-56.21	-11.85	-8.29	41.79	-43.08	35.36	36.29	6.31	-56.50	-44.35
11.8	27.3	-55.80	-12.24	-7.95	41.77	-43.03	35.08	36.10	6.30	-61.20	-44.94
11.9	27.4	-55.77	-12.69	-7.63	41.40	-42.27	35.04	36.18	6.24	-63.62	-48.36
12.0	27.4	-55.64	-13.21	-7.39	40.83	-41.13	35.05	36.26	6.29	-55.54	-48.82
12.1	27.5	-55.40	-13.54	-7.22	40.31	-40.08	35.30	36.49	6.34	-51.03	-51.75
12.2	27.6	-55.35	-13.68	-7.14	40.13	-39.76	35.17	36.47	6.35	-50.63	-46.99
12.3	27.8	-55.55	-13.55	-7.15	40.14	-39.76	34.49	36.15	6.31	-51.03	-52.78
12.4	27.9	-56.16	-13.19	-7.30	39.91	-39.29	33.88	35.70	6.28	-50.83	-46.67
12.5	28.1	-57.06	-12.64	-7.62	39.26	-37.98	33.60	35.53	6.36	-53.78	-48.89
12.6	28.2	-58.02	-12.00	-8.14	38.66	-36.77	33.38	35.44	6.34	-55.23	-47.45
12.7	28.2	-58.50	-11.39	-8.88	38.52	-36.50	33.56	35.34	6.34	-56.06	-54.30
12.8	28.1	-58.72	-10.74	-9.91	38.78	-37.02	33.71	35.02	6.38	-56.57	-47.60
12.9	27.8	-58.76	-10.18	-11.22	39.13	-37.75	34.10	34.72	6.38	-57.81	-51.72
13.0	27.4	-58.86	-9.64	-12.93	38.96	-37.42	34.27	34.45	6.45	-59.12	-51.72

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: V_{DD} = +7 V, I_{DD} = 1250 mA @ Temperature = -45°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	IP-3 Output	IM3 Output	1dB Comp. Output	Psat Output	Noise Figure
(GHz)	(dB)	(dB)	(dB)	(dB)	(dBm)	(dBc)	(dBm)	(dBm)	(dB)
7.0	26.68	-62.52	-19.10	-8.55	34.41	-28.51	31.80	33.25	9.63
7.1	26.74	-62.69	-19.53	-7.74	35.50	-30.66	32.22	33.46	9.20
7.2	26.87	-63.17	-19.94	-7.32	36.53	-32.70	32.65	33.81	8.89
7.3	27.05	-63.62	-20.39	-7.16	37.46	-34.58	33.02	34.07	8.74
7.4	27.28	-64.21	-20.73	-7.22	38.10	-35.81	33.35	34.27	8.55
7.5	27.54	-64.56	-20.96	-7.42	38.61	-36.84	33.68	34.48	8.26
7.6	27.83	-63.86	-20.78	-7.73	39.12	-37.88	33.94	34.63	8.08
7.7	27.94	-64.04	-21.38	-8.05	39.71	-39.10	33.96	34.69	8.02
7.8	28.22	-64.47	-21.25	-8.65	39.98	-39.63	33.90	34.64	7.88
7.9	28.59	-64.54	-20.35	-9.36	40.25	-40.11	33.98	34.70	7.76
8.0	28.94	-64.42	-19.14	-10.13	40.40	-40.41	34.11	34.80	7.57
8.1	29.24	-65.13	-17.83	-10.95	40.57	-40.74	34.34	35.00	7.48
8.2	29.49	-65.73	-16.61	-11.75	40.77	-41.16	34.58	35.21	7.46
8.3	29.71	-65.88	-15.61	-12.38	40.88	-41.38	34.73	35.36	7.36
8.4	29.92	-65.19	-14.82	-12.82	40.99	-41.59	34.80	35.42	7.24
8.5	30.10	-64.23	-14.26	-13.17	41.18	-41.95	34.80	35.32	7.13
8.6	30.19	-63.14	-13.68	-13.47	41.49	-42.58	35.03	35.53	7.08
8.7	30.20	-62.71	-13.19	-13.46	41.60	-42.80	35.61	36.03	6.99
8.8	30.29	-63.16	-12.88	-13.22	41.74	-43.07	36.03	36.44	6.89
8.9	30.39	-63.57	-12.78	-13.12	41.82	-43.28	36.32	36.64	6.78
9.0	30.43	-64.07	-12.83	-13.20	42.02	-43.67	36.27	36.65	6.68
9.1	30.37	-64.68	-12.91	-13.56	42.27	-44.18	36.11	36.55	6.65
9.2	30.30	-64.63	-12.98	-14.05	42.22	-44.03	36.12	36.56	6.53
9.3	30.23	-64.13	-13.12	-14.41	42.12	-43.85	36.15	36.61	6.43
9.4	30.14	-63.29	-13.16	-14.82	41.91	-43.43	36.28	36.71	6.35
9.5	30.07	-62.47	-13.05	-15.25	42.02	-43.61	36.13	36.57	6.28
9.6	30.04	-61.71	-13.02	-15.96	42.27	-44.11	35.82	36.37	6.23
9.7	30.04	-62.11	-13.20	-17.18	42.41	-44.40	35.56	36.23	6.14
9.8	30.00	-62.34	-13.32	-18.51	42.49	-44.53	35.43	36.23	6.05
9.9	29.92	-63.29	-13.38	-19.94	42.36	-44.27	35.50	36.29	5.94
10.0	29.76	-63.28	-13.19	-21.54	42.49	-44.53	35.47	36.29	5.85
10.1	29.57	-62.34	-12.62	-23.41	42.68	-44.97	35.49	36.35	5.85
10.2	29.43	-60.81	-11.93	-26.47	42.87	-45.29	35.36	36.25	5.73
10.3	29.39	-60.08	-11.41	-32.05	42.85	-45.29	35.28	36.26	5.67
10.4	29.34	-59.46	-10.95	-29.52	42.87	-45.32	35.32	36.36	5.62
10.5	29.35	-59.04	-10.50	-25.20	42.82	-45.16	35.32	36.41	5.55
10.6	29.39	-58.75	-10.06	-22.15	42.82	-45.21	35.30	36.42	5.46
10.7	29.48	-58.46	-9.67	-19.78	42.66	-44.93	35.24	36.37	5.42
10.8	29.55	-58.07	-9.36	-17.77	42.61	-44.84	35.23	36.43	5.38
10.9	29.67	-57.78	-9.11	-16.09	42.48	-44.57	35.29	36.48	5.29
11.0	29.77	-57.49	-8.99	-14.70	42.36	-44.31	35.36	36.54	5.26
11.1	29.90	-57.55	-9.00	-13.44	42.29	-44.16	35.21	36.39	5.23
11.2	29.96	-57.78	-9.16	-12.26	42.20	-44.00	35.08	36.25	5.22
11.3	29.99	-58.05	-9.41	-11.25	42.05	-43.70	34.94	36.15	5.20
11.4	30.02	-58.32	-9.67	-10.42	41.77	-43.12	35.07	36.31	5.16
11.5	30.04	-58.12	-9.91	-9.71	41.58	-42.75	35.22	36.41	5.10
11.6	30.09	-57.16	-10.09	-9.20	41.45	-42.48	35.16	36.36	5.13
11.7	30.17	-55.94	-10.30	-8.85	41.47	-42.49	34.96	36.17	5.10
11.8	30.26	-55.39	-10.60	-8.46	41.38	-42.32	34.75	36.12	5.07
11.9	30.34	-55.53	-11.00	-8.02	41.00	-41.60	34.83	36.28	5.00
12.0	30.37	-55.64	-11.56	-7.65	40.42	-40.36	34.97	36.48	5.04
12.1	30.48	-55.27	-12.05	-7.40	40.00	-39.60	35.25	36.74	5.10
12.2	30.61	-54.91	-12.43	-7.23	39.81	-39.19	35.16	36.74	5.09
12.3	30.74	-54.92	-12.55	-7.15	39.69	-38.91	34.58	36.50	5.06
12.4	31.03	-55.38	-12.39	-7.21	39.27	-38.04	33.99	36.05	5.02
12.5	31.14	-56.13	-12.01	-7.48	38.50	-36.50	33.95	35.96	5.09
12.6	31.00	-57.08	-11.52	-7.97	37.77	-35.03	33.94	35.86	5.07
12.7	30.93	-57.59	-11.04	-8.75	37.50	-34.54	34.09	35.77	5.08
12.8	31.10	-58.08	-10.46	-9.90	37.52	-34.49	34.08	35.37	5.09
12.9	31.17	-58.58	-9.95	-11.44	37.56	-34.62	34.18	34.97	5.11
13.0	30.85	-59.21	-9.43	-13.62	37.13	-33.74	34.42	34.58	5.15

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: V_{DD} = +7 V, I_{DD} = 1250 mA @ Temperature = +85°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	IP-3 Output	IM3 Output	1dB Comp. Output	Psat Output	Noise Figure
(GHz)	(dB)	(dB)	(dB)	(dB)	(dBm)	(dBc)	(dBm)	(dBm)	(dB)
7.0	22.65	-62.86	-19.97	-8.79	35.89	-31.35	30.86	31.95	11.72
7.1	22.88	-63.08	-20.66	-8.22	36.93	-33.43	31.40	32.31	11.29
7.2	23.11	-63.43	-21.40	-7.96	37.87	-35.31	31.92	32.76	10.97
7.3	23.37	-63.64	-22.28	-7.90	38.71	-36.98	32.34	33.07	10.80
7.4	23.66	-64.50	-22.94	-8.05	39.30	-38.18	32.62	33.37	10.61
7.5	23.97	-64.42	-23.25	-8.33	39.75	-39.09	32.83	33.58	10.33
7.6	24.24	-63.44	-23.01	-8.65	40.24	-40.08	32.96	33.78	10.13
7.7	24.48	-64.19	-22.87	-9.13	40.65	-40.91	32.97	33.89	10.05
7.8	24.81	-64.94	-21.85	-9.79	40.83	-41.25	32.90	33.94	9.89
7.9	25.17	-64.44	-20.45	-10.53	40.97	-41.49	32.92	34.00	9.79
8.0	25.51	-64.15	-19.05	-11.27	41.13	-41.86	33.02	34.10	9.59
8.1	25.78	-64.81	-17.73	-11.91	41.30	-42.20	33.25	34.25	9.49
8.2	26.01	-65.18	-16.60	-12.43	41.50	-42.60	33.45	34.41	9.45
8.3	26.22	-65.54	-15.69	-12.75	41.65	-42.89	33.62	34.56	9.32
8.4	26.40	-65.43	-15.00	-12.88	41.84	-43.27	33.75	34.57	9.21
8.5	26.55	-64.21	-14.52	-12.97	42.14	-43.88	33.80	34.57	9.09
8.6	26.62	-63.31	-14.02	-13.03	42.51	-44.60	33.92	34.68	9.04
8.7	26.65	-62.53	-13.62	-12.93	42.49	-44.57	34.15	35.03	8.95
8.8	26.71	-62.95	-13.36	-12.78	42.42	-44.41	34.07	35.24	8.84
8.9	26.74	-63.55	-13.27	-12.81	42.22	-44.01	33.90	35.34	8.71
9.0	26.73	-64.40	-13.29	-13.04	42.29	-44.11	33.79	35.25	8.62
9.1	26.71	-64.93	-13.31	-13.46	42.42	-44.39	33.81	35.20	8.58
9.2	26.68	-64.64	-13.35	-13.88	42.29	-44.12	33.48	35.11	8.45
9.3	26.62	-64.18	-13.42	-14.35	42.15	-43.85	33.22	35.01	8.36
9.4	26.53	-63.76	-13.33	-14.98	41.97	-43.49	33.03	35.01	8.28
9.5	26.47	-63.87	-13.14	-15.74	42.09	-43.74	33.04	34.97	8.21
9.6	26.43	-63.57	-13.00	-16.73	42.38	-44.31	33.33	34.97	8.14
9.7	26.40	-62.96	-12.97	-18.04	42.53	-44.61	33.52	34.98	8.06
9.8	26.34	-63.64	-12.89	-19.63	42.59	-44.74	33.56	35.03	7.97
9.9	26.23	-63.35	-12.60	-21.57	42.43	-44.42	33.55	35.09	7.86
10.0	26.10	-63.08	-12.22	-24.13	42.46	-44.44	33.54	35.04	7.76
10.1	25.98	-62.14	-11.77	-27.17	42.53	-44.62	33.66	35.10	7.78
10.2	25.92	-61.67	-11.37	-27.75	42.57	-44.71	33.71	35.00	7.66
10.3	25.89	-61.23	-11.04	-24.50	42.45	-44.44	33.68	35.01	7.60
10.4	25.87	-60.70	-10.75	-21.22	42.37	-44.26	33.70	35.11	7.57
10.5	25.89	-60.20	-10.50	-18.74	42.19	-43.92	33.67	35.11	7.50
10.6	25.92	-59.90	-10.30	-16.78	42.10	-43.73	33.56	35.07	7.41
10.7	25.97	-59.62	-10.17	-15.12	41.93	-43.39	33.51	35.02	7.37
10.8	25.99	-59.23	-10.13	-13.72	41.86	-43.26	33.50	35.03	7.36
10.9	26.01	-58.80	-10.16	-12.55	41.76	-43.04	33.48	35.08	7.25
11.0	26.04	-58.57	-10.32	-11.58	41.61	-42.74	33.45	35.14	7.21
11.1	26.02	-58.52	-10.58	-10.73	41.51	-42.54	33.41	35.04	7.22
11.2	26.00	-58.59	-10.93	-9.99	41.42	-42.39	33.35	35.00	7.22
11.3	25.97	-58.54	-11.34	-9.38	41.36	-42.25	33.16	34.85	7.19
11.4	25.97	-58.32	-11.76	-8.86	41.15	-41.80	33.01	34.86	7.16
11.5	25.95	-57.91	-12.13	-8.44	40.91	-41.35	32.93	34.91	7.09
11.6	25.96	-57.02	-12.46	-8.13	40.74	-41.00	32.98	34.96	7.15
11.7	26.00	-56.20	-12.86	-7.85	40.76	-41.02	32.97	34.87	7.12
11.8	26.05	-55.74	-13.32	-7.59	40.78	-41.13	32.75	34.77	7.11
11.9	26.09	-55.46	-13.81	-7.36	40.47	-40.47	32.50	34.78	7.04
12.0	26.11	-55.33	-14.34	-7.21	39.92	-39.36	32.12	34.78	7.09
12.1	26.22	-55.13	-14.58	-7.12	39.44	-38.39	31.84	34.94	7.15
12.2	26.35	-55.17	-14.61	-7.11	39.26	-38.03	31.85	34.99	7.15
12.3	26.49	-55.40	-14.37	-7.20	39.31	-38.11	31.74	34.80	7.13
12.4	26.63	-55.99	-13.87	-7.43	39.09	-37.64	31.46	34.50	7.12
12.5	26.74	-56.93	-13.19	-7.87	38.48	-36.47	31.21	34.41	7.19
12.6	26.79	-58.13	-12.41	-8.53	37.89	-35.29	31.08	34.26	7.17
12.7	26.69	-58.68	-11.72	-9.44	37.81	-35.09	31.34	34.17	7.16
12.8	26.49	-58.70	-11.03	-10.71	38.12	-35.70	31.78	33.97	7.18
12.9	26.17	-58.54	-10.43	-12.33	38.53	-36.50	32.55	33.82	7.21
13.0	25.73	-58.14	-9.87	-14.50	38.41	-36.20	33.01	33.63	7.28

Typical Performance Data

TEST CONDITIONS: V_{DD} = +7 V, I_{DD} = 1100 mA, 1250 mA, 1400 mA @ Temperature = +25°C

FREQ	Gain @ 1100 mA	Gain @ 1250 mA	Gain @ 1400 mA	1dB Comp. Output @ 1100 mA	1dB Comp. Output @ 1250 mA	1dB Comp. Output @ 1400 mA	Psat Output @ 1100 mA	Psat Output @ 1250 mA	Psat Output @ 1400 mA
(GHz)	(dB)	(dB)	(dB)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)
7.0	24.6	24.6	24.6	30.99	31.17	31.35	32.30	32.44	32.43
7.1	24.7	24.8	24.8	31.63	31.69	31.84	32.66	32.77	32.81
7.2	24.9	25.0	25.0	32.19	32.18	32.33	33.11	33.17	33.21
7.3	25.1	25.2	25.2	32.61	32.57	32.70	33.44	33.54	33.52
7.4	25.4	25.5	25.5	32.90	32.86	32.97	33.70	33.76	33.75
7.5	25.6	25.7	25.8	33.20	33.14	33.28	33.95	33.99	34.00
7.6	25.9	26.0	26.1	33.50	33.39	33.58	34.13	34.17	34.18
7.7	26.1	26.2	26.2	33.63	33.47	33.71	34.31	34.32	34.31
7.8	26.4	26.5	26.6	33.57	33.40	33.67	34.32	34.30	34.29
7.9	26.8	26.9	26.9	33.55	33.41	33.68	34.32	34.33	34.30
8.0	27.1	27.2	27.3	33.60	33.50	33.75	34.40	34.41	34.38
8.1	27.4	27.5	27.6	33.80	33.75	34.00	34.58	34.61	34.58
8.2	27.6	27.7	27.8	34.06	34.02	34.28	34.83	34.84	34.78
8.3	27.8	27.9	28.0	34.24	34.18	34.46	34.99	34.98	34.96
8.4	28.0	28.1	28.2	34.30	34.25	34.50	34.97	34.99	34.97
8.5	28.1	28.3	28.3	34.29	34.25	34.46	34.90	34.93	34.90
8.6	28.2	28.3	28.4	34.47	34.45	34.65	35.08	35.10	35.08
8.7	28.2	28.4	28.4	34.96	34.94	35.19	35.56	35.58	35.58
8.8	28.3	28.4	28.5	35.21	35.20	35.51	35.86	35.89	35.89
8.9	28.4	28.5	28.5	35.32	35.34	35.73	36.04	36.07	36.04
9.0	28.4	28.5	28.5	35.18	35.24	35.67	36.00	36.06	36.05
9.1	28.3	28.4	28.5	35.02	35.08	35.54	35.90	35.96	35.95
9.2	28.3	28.4	28.5	34.86	34.93	35.47	35.91	35.91	35.91
9.3	28.3	28.4	28.4	34.71	34.78	35.42	35.93	35.91	35.91
9.4	28.2	28.3	28.4	34.62	34.72	35.41	35.94	35.97	35.99
9.5	28.1	28.2	28.3	34.51	34.62	35.25	35.82	35.86	35.82
9.6	28.1	28.2	28.3	34.44	34.53	35.06	35.65	35.72	35.70
9.7	28.0	28.2	28.2	34.35	34.43	34.92	35.63	35.67	35.63
9.8	28.0	28.1	28.2	34.34	34.40	34.90	35.63	35.69	35.66
9.9	27.9	28.0	28.1	34.38	34.43	34.96	35.74	35.76	35.76
10.0	27.7	27.9	28.0	34.33	34.41	34.90	35.67	35.70	35.72
10.1	27.6	27.7	27.8	34.33	34.44	34.86	35.62	35.71	35.67
10.2	27.5	27.6	27.7	34.23	34.35	34.75	35.53	35.63	35.55
10.3	27.4	27.6	27.7	34.19	34.32	34.73	35.53	35.62	35.58
10.4	27.4	27.5	27.7	34.31	34.42	34.89	35.76	35.80	35.76
10.5	27.4	27.5	27.7	34.34	34.44	34.93	35.76	35.84	35.86
10.6	27.4	27.6	27.7	34.23	34.36	34.85	35.67	35.81	35.77
10.7	27.5	27.7	27.8	34.12	34.26	34.76	35.65	35.71	35.72
10.8	27.5	27.7	27.9	34.10	34.25	34.77	35.60	35.72	35.73
10.9	27.6	27.8	27.9	34.14	34.29	34.85	35.73	35.82	35.81
11.0	27.7	27.9	28.0	34.21	34.35	34.96	35.81	35.93	35.91
11.1	27.7	27.9	28.0	34.09	34.25	34.84	35.69	35.77	35.79
11.2	27.7	27.9	28.0	34.00	34.16	34.74	35.60	35.70	35.67
11.3	27.7	27.9	28.0	33.76	33.96	34.56	35.45	35.54	35.55
11.4	27.7	27.9	28.0	33.73	33.93	34.61	35.53	35.65	35.61
11.5	27.7	27.9	28.0	33.83	34.02	34.75	35.61	35.75	35.71
11.6	27.8	27.9	28.1	33.88	34.06	34.79	35.69	35.75	35.71
11.7	27.8	28.0	28.1	33.75	33.96	34.66	35.54	35.64	35.59
11.8	27.9	28.1	28.2	33.49	33.75	34.47	35.40	35.48	35.47
11.9	28.0	28.1	28.2	33.39	33.65	34.51	35.55	35.63	35.60
12.0	28.0	28.1	28.2	33.31	33.55	34.58	35.66	35.75	35.73
12.1	28.1	28.2	28.3	33.38	33.61	34.82	35.89	36.00	35.96
12.2	28.3	28.4	28.5	33.28	33.62	34.81	35.97	36.00	36.02
12.3	28.4	28.6	28.7	32.79	33.27	34.38	35.65	35.75	35.72
12.4	28.6	28.8	28.9	32.23	32.83	34.00	35.30	35.37	35.33
12.5	28.8	29.0	29.0	31.90	32.55	33.96	35.18	35.28	35.28
12.6	29.0	29.1	29.1	31.77	32.39	33.94	35.11	35.18	35.19
12.7	29.0	29.1	29.1	32.06	32.61	34.05	35.04	35.13	35.07
12.8	28.9	29.0	29.0	32.39	32.90	34.01	34.67	34.79	34.72
12.9	28.6	28.7	28.8	32.98	33.39	34.12	34.37	34.45	34.37
13.0	28.2	28.3	28.4	33.42	33.73	34.17	34.10	34.12	34.05

Typical Performance Data

TEST CONDITIONS: V_{DD} = +7 V, I_{DD} = 1100 mA, 1250 mA, 1400 mA @ Temperature = +25°C

FREQ	IP-3 @ 1100 mA	IP-3 @ 1250 mA	IP-3 @ 1400 mA	IM3 @ 1100 mA	IM3 @ 1250 mA	IM3 @ 1400 mA	Noise Figure @ 1100 mA	Noise Figure @ 1250 mA	Noise Figure @ 1400 mA
(GHz)	(dBm)	(dBm)	(dBm)	(dBc)	(dBc)	(dBc)	(dB)	(dB)	(dB)
7.0	35.3	35.7	35.6	-30.29	-30.99	-30.79	10.67	10.76	10.84
7.1	36.6	36.8	36.6	-32.74	-33.21	-32.80	10.24	10.32	10.43
7.2	37.7	37.8	37.5	-35.00	-35.24	-34.69	9.92	10.01	10.12
7.3	38.7	38.8	38.4	-37.08	-37.15	-36.46	9.76	9.86	9.98
7.4	39.5	39.4	39.0	-38.57	-38.47	-37.71	9.57	9.66	9.78
7.5	40.1	40.0	39.6	-39.73	-39.55	-38.73	9.27	9.36	9.50
7.6	40.7	40.6	40.1	-40.99	-40.76	-39.95	9.09	9.18	9.29
7.7	41.2	41.1	40.6	-42.00	-41.79	-40.95	9.00	9.11	9.23
7.8	41.4	41.3	40.9	-42.48	-42.29	-41.41	8.87	8.97	9.08
7.9	41.7	41.6	41.1	-43.01	-42.78	-41.91	8.74	8.84	8.97
8.0	41.9	41.8	41.3	-43.37	-43.19	-42.31	8.52	8.66	8.77
8.1	42.0	41.9	41.5	-43.67	-43.56	-42.67	8.46	8.57	8.68
8.2	42.2	42.1	41.7	-44.02	-43.97	-43.06	8.40	8.53	8.65
8.3	42.3	42.3	41.8	-44.30	-44.24	-43.32	8.31	8.43	8.54
8.4	42.5	42.4	41.9	-44.66	-44.55	-43.56	8.20	8.30	8.42
8.5	42.8	42.7	42.2	-45.27	-45.15	-44.01	8.06	8.18	8.29
8.6	43.2	43.1	42.5	-45.94	-45.82	-44.65	8.01	8.13	8.25
8.7	43.1	43.2	42.5	-45.91	-45.96	-44.80	7.93	8.05	8.17
8.8	43.1	43.2	42.6	-45.83	-46.07	-44.93	7.81	7.93	8.05
8.9	43.0	43.1	42.6	-45.52	-45.91	-44.85	7.70	7.83	7.94
9.0	43.1	43.3	42.8	-45.76	-46.20	-45.18	7.60	7.72	7.85
9.1	43.3	43.5	43.0	-46.17	-46.60	-45.59	7.57	7.69	7.82
9.2	43.1	43.4	42.9	-45.80	-46.31	-45.40	7.46	7.57	7.68
9.3	42.9	43.2	42.8	-45.41	-45.98	-45.22	7.35	7.47	7.61
9.4	42.7	43.0	42.6	-44.91	-45.55	-44.86	7.26	7.39	7.52
9.5	42.8	43.1	42.7	-45.26	-45.87	-45.11	7.19	7.31	7.42
9.6	43.3	43.5	43.0	-46.17	-46.64	-45.74	7.14	7.25	7.36
9.7	43.6	43.7	43.2	-46.74	-47.10	-46.12	7.02	7.15	7.30
9.8	43.7	43.8	43.3	-46.94	-47.26	-46.29	6.94	7.06	7.19
9.9	43.5	43.6	43.2	-46.52	-46.89	-45.98	6.85	6.98	7.10
10.0	43.6	43.8	43.3	-46.73	-47.11	-46.20	6.74	6.87	6.99
10.1	43.8	43.9	43.4	-47.10	-47.43	-46.50	6.74	6.85	7.01
10.2	43.9	44.0	43.6	-47.42	-47.68	-46.78	6.64	6.76	6.89
10.3	43.9	44.0	43.5	-47.27	-47.49	-46.65	6.57	6.69	6.82
10.4	43.7	43.9	43.5	-47.02	-47.28	-46.52	6.51	6.64	6.78
10.5	43.6	43.7	43.3	-46.68	-46.96	-46.27	6.44	6.60	6.73
10.6	43.5	43.6	43.3	-46.49	-46.77	-46.14	6.37	6.50	6.64
10.7	43.3	43.4	43.1	-46.16	-46.42	-45.83	6.31	6.46	6.61
10.8	43.2	43.3	43.0	-45.97	-46.23	-45.68	6.28	6.42	6.57
10.9	43.0	43.2	42.9	-45.60	-45.85	-45.35	6.19	6.32	6.45
11.0	42.8	43.0	42.7	-45.18	-45.45	-45.02	6.14	6.28	6.43
11.1	42.7	42.8	42.6	-45.01	-45.24	-44.80	6.15	6.27	6.43
11.2	42.7	42.8	42.5	-44.83	-45.05	-44.62	6.14	6.26	6.42
11.3	42.5	42.6	42.4	-44.58	-44.83	-44.43	6.10	6.25	6.39
11.4	42.2	42.4	42.2	-43.91	-44.26	-43.91	6.07	6.20	6.34
11.5	41.9	42.1	41.9	-43.33	-43.70	-43.38	6.01	6.16	6.29
11.6	41.7	41.9	41.7	-42.95	-43.32	-42.99	6.05	6.17	6.32
11.7	41.7	41.9	41.7	-42.98	-43.28	-42.94	6.04	6.15	6.30
11.8	41.7	41.8	41.6	-42.85	-43.15	-42.82	6.00	6.14	6.28
11.9	41.2	41.4	41.3	-41.94	-42.36	-42.08	5.95	6.07	6.23
12.0	40.6	40.8	40.7	-40.59	-41.13	-40.95	6.01	6.12	6.27
12.1	40.0	40.3	40.2	-39.38	-40.05	-39.97	6.05	6.18	6.32
12.2	39.8	40.1	40.0	-38.99	-39.61	-39.54	6.05	6.17	6.32
12.3	39.8	40.0	40.0	-38.99	-39.52	-39.43	6.01	6.16	6.30
12.4	39.5	39.7	39.7	-38.42	-38.94	-38.89	5.99	6.12	6.26
12.5	38.7	39.0	39.0	-36.91	-37.54	-37.61	6.06	6.19	6.34
12.6	38.0	38.4	38.4	-35.52	-36.25	-36.41	6.04	6.17	6.31
12.7	37.9	38.2	38.3	-35.24	-35.94	-36.07	6.05	6.18	6.32
12.8	38.2	38.4	38.4	-35.82	-36.39	-36.37	6.08	6.21	6.33
12.9	38.6	38.7	38.6	-36.63	-36.99	-36.81	6.08	6.22	6.36
13.0	38.3	38.5	38.4	-36.19	-36.57	-36.33	6.14	6.27	6.43

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: V_{DD} = +7 V, I_{DD} = 1250 mA @ Temperature = +25°C

Power	OIP3 (@8 GHz)	OIP3 (@9 GHz)	OIP3 (@10 GHz)	OIP3 (@11 GHz)	OIP3 (@12 GHz)
(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)
14.00	42.20	43.73	44.0	43.2	41.3
16.00	42.15	43.63	43.9	43.1	41.2
18.00	42.04	43.52	43.9	43.1	41.1
20.00	41.76	43.30	43.8	43.0	40.8
22.00	41.53	42.88	43.4	42.7	40.5
24.00	41.61	42.23	42.9	42.2	39.8
26.00	40.13	40.71	41.4	40.8	38.6
28.00	36.76	39.68	39.9	39.4	38.3

Typical Performance Data

TEST CONDITIONS: V_{DD} = +7 V, I_{DD} = 1250 mA @ Temperature = +25°C

FREQ	P_{IN}	Gain	FREQ	P_{IN}	Gain	FREQ	P_{IN}	Gain
(GHz)	(dBm)	(dB)	(GHz)	(dBm)	(dB)	(GHz)	(dBm)	(dB)
8.00	-24	27.6	10.00	-24	28.3	12.00	-24	28.6
8.00	-23	27.6	10.00	-23	28.3	12.00	-23	28.6
8.00	-21	27.6	10.00	-21	28.3	12.00	-21	28.6
8.00	-20	27.6	10.00	-20	28.3	12.00	-20	28.7
8.00	-18	27.6	10.00	-18	28.3	12.00	-18	28.7
8.00	-16	27.6	10.00	-16	28.3	12.00	-16	28.6
8.00	-15	27.5	10.00	-15	28.3	12.00	-15	28.6
8.00	-13	27.6	10.00	-13	28.3	12.00	-13	28.6
8.00	-11	27.6	10.00	-11	28.3	12.00	-11	28.6
8.00	-10	27.6	10.00	-10	28.3	12.00	-10	28.7
8.00	-8	27.6	10.00	-8	28.3	12.00	-8	28.7
8.00	-6	27.6	10.00	-6	28.3	12.00	-6	28.7
8.00	-5	27.6	10.00	-5	28.4	12.00	-5	28.7
8.00	-3	27.6	10.00	-3	28.4	12.00	-3	28.7
8.00	-1	27.7	10.00	-1	28.5	12.00	-1	28.8
8.00	0	27.8	10.00	0	28.5	12.00	0	28.8
8.00	2	28.0	10.00	2	28.6	12.00	2	28.7
8.00	4	27.9	10.00	4	28.5	12.00	4	28.4
8.00	5	27.3	10.00	5	28.1	12.00	5	27.9
8.00	7	26.5	10.00	7	27.3	12.00	7	27.2
8.00	9	25.3	10.00	9	26.3	12.00	9	26.2
8.00	10	23.8	10.00	10	25.0	12.00	10	24.9
8.00	12	22.2	10.00	12	23.5	12.00	12	23.3
9.00	-24	28.9	11.00	-24	28.1			
9.00	-23	28.9	11.00	-23	28.1			
9.00	-21	28.9	11.00	-21	28.1			
9.00	-20	28.9	11.00	-20	28.1			
9.00	-18	28.9	11.00	-18	28.1			
9.00	-16	28.9	11.00	-16	28.1			
9.00	-15	28.9	11.00	-15	28.1			
9.00	-13	28.9	11.00	-13	28.1			
9.00	-11	28.9	11.00	-11	28.1			
9.00	-10	28.9	11.00	-10	28.1			
9.00	-8	28.9	11.00	-8	28.1			
9.00	-6	28.9	11.00	-6	28.1			
9.00	-5	29.0	11.00	-5	28.2			
9.00	-3	29.0	11.00	-3	28.2			
9.00	-1	29.1	11.00	-1	28.2			
9.00	0	29.2	11.00	0	28.3			
9.00	2	29.2	11.00	2	28.4			
9.00	4	29.1	11.00	4	28.3			
9.00	5	28.8	11.00	5	27.9			
9.00	7	28.1	11.00	7	27.1			
9.00	9	27.0	11.00	9	26.1			
9.00	10	25.5	11.00	10	24.8			
9.00	12	23.8	11.00	12	23.3			

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: V_{DD} = +7 V, I_{DD} = 1250 mA @ Temperature = +25°C

P_{IN}	P_{OUT} (@8 GHz)	P_{OUT} (@9 GHz)	P_{OUT} (@10 GHz)	P_{OUT} (@11 GHz)	P_{OUT} (@12 GHz)	I_{DD} (@8 GHz)	I_{DD} (@9 GHz)	I_{DD} (@10 GHz)	I_{DD} (@11 GHz)	I_{DD} (@12 GHz)
(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(mA)	(mA)	(mA)	(mA)	(mA)
-25	3.13	4.02	3.40	3.21	3.75	1247.59	1244.16	1243.05	1245.55	1239.25
-23	4.70	5.60	4.99	4.81	5.35	1244.35	1247.03	1247.13	1245.37	1242.77
-21	6.30	7.20	6.61	6.43	6.98	1245.92	1243.88	1243.88	1245.37	1242.03
-20	7.92	8.83	8.26	8.07	8.63	1246.66	1245.64	1246.85	1240.64	1243.42
-18	9.55	10.48	9.90	9.73	10.28	1243.33	1245.46	1244.72	1250.37	1241.94
-17	11.19	12.14	11.56	11.38	11.93	1245.37	1244.25	1243.51	1247.50	1243.24
-15	12.84	13.79	13.22	13.04	13.58	1241.66	1247.03	1244.35	1244.90	1240.27
-13	14.49	15.46	14.89	14.71	15.24	1243.14	1246.11	1242.77	1244.25	1240.92
-12	16.16	17.14	16.56	16.39	16.92	1241.94	1248.15	1241.10	1245.09	1241.85
-10	17.86	18.83	18.25	18.05	18.59	1240.92	1240.09	1236.20	1237.95	1238.42
-8	19.51	20.49	19.91	19.71	20.25	1238.14	1240.18	1233.51	1241.38	1240.18
-7	21.19	22.16	21.58	21.38	21.92	1233.88	1237.40	1236.38	1239.35	1234.34
-5	22.87	23.87	23.28	23.08	23.61	1228.69	1238.51	1232.49	1237.03	1243.79
-3	24.60	25.59	25.00	24.79	25.33	1225.54	1233.97	1232.95	1235.45	1240.09
-1	26.36	27.36	26.75	26.55	27.07	1225.17	1237.68	1229.71	1234.06	1243.24
0	28.16	29.15	28.55	28.32	28.80	1218.78	1242.12	1234.53	1235.82	1253.33
2	29.93	30.88	30.30	30.06	30.40	1218.32	1267.97	1236.10	1240.09	1270.56
4	31.32	32.46	31.84	31.64	31.78	1199.14	1340.13	1256.58	1259.63	1325.31
5	32.34	33.83	33.09	32.91	32.97	1165.42	1433.14	1302.24	1308.54	1403.40
7	33.17	34.86	34.08	33.90	33.92	1200.81	1514.57	1349.12	1367.46	1483.63
9	33.62	35.44	34.70	34.56	34.64	1242.86	1564.50	1364.59	1412.20	1543.56
10	33.80	35.62	35.11	34.98	35.07	1261.21	1607.20	1368.29	1422.39	1569.59
12	33.86	35.68	35.33	35.24	35.22	1268.25	1640.64	1361.53	1418.97	1582.19

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: V_{DD} = +7 V, I_{DD} = 1250 mA @ Temperature = +25°C

Power	P_{DISS} (@8 GHz)	P_{DISS} (@9 GHz)	P_{DISS} (@10 GHz)	P_{DISS} (@11 GHz)	P_{DISS} (@12 GHz)	PAE (@8 GHz)	PAE (@9 GHz)	PAE (@10 GHz)	PAE (@11 GHz)	PAE (@12 GHz)
(dBm)	(W)	(W)	(W)	(W)	(W)	(%)	(%)	(%)	(%)	(%)
-24	8.73	8.71	8.70	8.72	8.67	0.02	0.03	0.03	0.03	0.03
-23	8.71	8.73	8.73	8.71	8.70	0.03	0.05	0.04	0.04	0.04
-21	8.72	8.70	8.70	8.71	8.69	0.05	0.07	0.06	0.05	0.06
-20	8.72	8.71	8.72	8.68	8.70	0.07	0.10	0.08	0.08	0.09
-18	8.69	8.71	8.70	8.74	8.68	0.10	0.14	0.12	0.12	0.14
-16	8.70	8.69	8.69	8.72	8.69	0.15	0.20	0.18	0.17	0.20
-15	8.67	8.70	8.69	8.69	8.66	0.22	0.30	0.26	0.25	0.29
-13	8.67	8.68	8.67	8.68	8.65	0.32	0.44	0.39	0.36	0.42
-11	8.65	8.68	8.64	8.67	8.64	0.47	0.64	0.57	0.54	0.62
-10	8.63	8.60	8.58	8.60	8.59	0.70	0.95	0.85	0.79	0.92
-8	8.58	8.56	8.53	8.59	8.56	1.03	1.39	1.24	1.15	1.34
-6	8.51	8.48	8.50	8.53	8.47	1.52	2.05	1.82	1.70	1.98
-5	8.41	8.41	8.39	8.44	8.45	2.25	3.03	2.69	2.51	2.90
-3	8.29	8.25	8.29	8.33	8.31	3.36	4.51	3.99	3.72	4.32
-1	8.14	8.08	8.09	8.16	8.14	5.03	6.75	5.98	5.57	6.42
0	7.88	7.82	7.87	7.93	7.95	7.67	10.06	8.96	8.29	9.35
2	7.55	7.60	7.52	7.63	7.74	11.52	14.37	13.13	12.14	12.95
4	7.04	7.59	7.23	7.35	7.75	16.12	19.06	17.79	16.69	16.50
5	6.45	7.65	7.10	7.24	7.87	20.98	23.75	22.15	20.95	19.85
7	6.33	7.69	6.99	7.23	8.02	24.64	27.47	26.01	24.51	22.79
9	6.41	7.72	6.80	7.20	8.09	26.34	29.52	28.85	27.14	25.09
10	6.44	7.89	6.59	7.05	8.07	27.06	29.84	31.25	29.16	26.56
12	6.46	8.11	6.36	6.86	8.03	27.24	29.40	33.22	30.98	27.49

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: V_{DD} = +7 V, I_{DD} = 1250 mA @ Temperature = +25°C

FREQ	P_{DISS} (@ P_{SAT})	PAE (@ P_{SAT})
(GHz)	(W)	(%)
7.00	9.80	16.04
7.10	9.58	17.47
7.20	8.99	19.70
7.30	8.50	22.03
7.40	8.16	23.91
7.50	7.67	26.00
7.60	7.34	27.56
7.70	7.09	29.08
7.80	6.83	29.67
7.90	6.77	29.87
8.00	6.92	29.76
8.10	7.18	29.70
8.20	7.54	29.71
8.30	7.84	29.62
8.40	8.10	28.78
8.50	8.16	28.30
8.60	8.16	29.10
8.70	8.20	31.47
8.80	8.39	32.55
8.90	8.64	32.75
9.00	8.73	32.57
9.10	8.62	32.36
9.20	8.75	31.75
9.30	8.84	31.51
9.40	8.90	31.60
9.50	8.80	31.20
9.60	8.29	31.91
9.70	7.74	33.16
9.80	7.46	34.38
9.90	7.38	35.07
10.00	7.33	34.75
10.10	7.29	35.03
10.20	7.14	34.98
10.30	7.07	35.39
10.40	7.05	36.40
10.50	7.11	36.30
10.60	7.28	35.53
10.70	7.27	35.08
10.80	7.36	34.91
10.90	7.45	35.17
11.00	7.58	35.36
11.10	7.61	34.55
11.20	7.71	33.61
11.30	7.85	32.44
11.40	8.10	32.32
11.50	8.41	31.99
11.60	8.50	31.73
11.70	8.59	30.78
11.80	8.67	29.89
11.90	8.84	29.94
12.00	9.09	29.97
12.10	9.45	30.40
12.20	9.44	30.31
12.30	9.32	29.16
12.40	9.31	27.56
12.50	9.33	26.85
12.60	9.38	26.39
12.70	9.26	26.38
12.80	9.01	25.26
12.90	8.56	24.76
13.00	8.44	23.54

Typical Performance Data

TEST CONDITIONS: V_{DD} = +7 V, I_{DD} = 1250 mA @ Temperature = +25°C

FREQ	P_{OUT}	2nd Harmonics	FREQ	P_{OUT}	3rd Harmonics
(GHz)	(dBm)	(dBc)	(GHz)	(dBm)	(dBc)
7.00	15.0	-39.2	7.00	15.0	-85.1
7.00	18.0	-36.1	7.00	18.0	-86.1
7.00	21.0	-33.2	7.00	21.0	-87.2
7.00	24.0	-30.1	7.00	24.0	-90.1
7.00	27.0	-26.8	7.00	27.0	-84.8
7.00	30.0	-22.7	7.00	30.0	-75.3
7.00	33.0	-24.5	7.00	33.0	-67.3
7.00	35.0	-14.5	7.00	35.0	-58.7
8.00	15.0	-45.7	8.00	15.0	-96.0
8.00	18.0	-42.3	8.00	18.0	-89.0
8.00	21.0	-39.3	8.00	21.0	-91.8
8.00	24.0	-36.3	8.00	24.0	-91.3
8.00	27.0	-32.9	8.00	27.0	-71.1
8.00	30.0	-28.6	8.00	30.0	-74.8
8.00	33.0	-37.0	8.00	33.0	-68.0
8.00	35.0	-21.2	8.00	35.0	-66.7
9.00	15.0	-59.3	9.00	15.0	-76.0
9.00	18.0	-55.2	9.00	18.0	-76.5
9.00	21.0	-53.3	9.00	21.0	-81.8
9.00	24.0	-50.7	9.00	24.0	-80.9
9.00	27.0	-46.7	9.00	27.0	-72.1
9.00	30.0	-43.9	9.00	30.0	-74.5
9.00	33.0	-43.9	9.00	33.0	-66.4
9.00	35.0	-41.4	9.00	35.0	-60.0
10.00	15.0	-69.0	10.00	15.0	-64.5
10.00	18.0	-52.0	10.00	18.0	-69.2
10.00	21.0	-54.8	10.00	21.0	-71.5
10.00	24.0	-57.0	10.00	24.0	-76.2
10.00	27.0	-55.6	10.00	27.0	-72.2
10.00	30.0	-52.9	10.00	30.0	-65.3
10.00	33.0	-48.6	10.00	33.0	-65.6
10.00	35.0	-52.5	10.00	35.0	-60.8
11.00	15.0	-73.8	11.00	15.0	-59.2
11.00	18.0	-59.5	11.00	18.0	-65.2
11.00	21.0	-62.2	11.00	21.0	-63.7
11.00	24.0	-63.2	11.00	24.0	-64.0
11.00	27.0	-59.6	11.00	27.0	-73.5
11.00	30.0	-56.5	11.00	30.0	-57.8
11.00	33.0	-54.4	11.00	33.0	-56.0
11.00	35.0	-57.8	11.00	35.0	-52.6
12.00	15.0	-72.7	12.00	15.0	-62.4
12.00	18.0	-59.4	12.00	18.0	-55.2
12.00	21.0	-58.6	12.00	21.0	-57.0
12.00	24.0	-62.1	12.00	24.0	-61.0
12.00	27.0	-57.3	12.00	27.0	-62.7
12.00	30.0	-54.8	12.00	30.0	-51.4
12.00	33.0	-56.4	12.00	33.0	-49.4
12.00	35.0	-55.9	12.00	35.0	-49.2
13.00	15.0	-76.0	13.00	15.0	-56.5
13.00	18.0	-53.8	13.00	18.0	-60.9
13.00	21.0	-56.6	13.00	21.0	-55.2
13.00	24.0	-58.8	13.00	24.0	-59.1
13.00	27.0	-59.7	13.00	27.0	-57.9
13.00	30.0	-57.4	13.00	30.0	-55.2
13.00	33.0	-57.1	13.00	33.0	-53.0
13.00	35.0	-57.7	13.00	35.0	-49.0

Typical Performance Data

TEST CONDITIONS: V_{DD} = +7 V, I_{DD} = 1250 mA @ Temperature = +25°C

FREQ	P_{OUT}	Phase	FREQ	P_{OUT}	Phase	FREQ	P_{OUT}	Phase
(GHz)	(dBm)	(°)	(GHz)	(dBm)	(°)	(GHz)	(dBm)	(°)
8.00	16.0	0.00	10.00	18.2	0.0	12.00	19.3	0.0
8.00	16.7	0.02	10.00	19.0	0.0	12.00	20.1	0.1
8.00	17.4	0.03	10.00	19.8	0.1	12.00	20.9	0.2
8.00	18.2	0.08	10.00	20.7	0.3	12.00	21.8	0.4
8.00	19.0	0.17	10.00	21.6	0.4	12.00	22.7	0.7
8.00	19.8	0.30	10.00	22.5	0.6	12.00	23.7	1.1
8.00	20.7	0.43	10.00	23.4	0.9	12.00	24.7	1.5
8.00	21.7	0.63	10.00	24.3	1.2	12.00	25.6	2.1
8.00	22.6	0.86	10.00	25.3	1.7	12.00	26.6	2.8
8.00	23.6	1.17	10.00	26.3	2.2	12.00	27.6	3.7
8.00	24.6	1.53	10.00	27.3	2.8	12.00	28.6	5.0
8.00	25.6	1.98	10.00	28.3	3.6	12.00	29.6	6.6
8.00	26.7	2.54	10.00	29.2	4.6	12.00	30.5	9.0
8.00	27.8	3.24	10.00	30.0	6.1	12.00	31.3	12.3
8.00	28.9	4.15	10.00	30.8	8.0	12.00	32.0	16.1
8.00	29.9	5.30	10.00	31.5	10.2	12.00	32.7	19.7
8.00	31.0	6.85	10.00	32.1	12.4	12.00	33.3	23.0
8.00	31.8	10.16	10.00	32.8	14.4	12.00	33.9	26.0
8.00	32.7	17.53	10.00	33.4	16.3	12.00	34.4	28.6
8.00	33.4	25.94	10.00	34.0	18.3	12.00	34.9	30.8
8.00	33.8	33.50	10.00	34.6	20.5	12.00	35.3	32.6
8.00	34.2	39.86	10.00	35.0	24.1	12.00	35.6	34.1
8.00	34.4	45.50	10.00	35.3	29.9	12.00	35.7	35.5
8.00	34.6	50.84	10.00	35.4	36.2	12.00	35.8	36.8
8.00	34.8	55.44	10.00	35.5	41.7	12.00	35.8	37.8
8.00	35.0	59.95	10.00	35.5	46.3	12.00	35.8	38.7
8.00	35.1	64.01	10.00	35.5	50.2	12.00	35.8	39.5
8.00	35.2	67.62	10.00	35.5	53.3	12.00	35.8	40.3
9.00	18.0	0.00	11.00	18.2	0.0			
9.00	18.8	0.04	11.00	18.9	0.0			
9.00	19.5	0.09	11.00	19.8	0.1			
9.00	20.4	0.18	11.00	20.7	0.2			
9.00	21.2	0.30	11.00	21.5	0.4			
9.00	22.1	0.46	11.00	22.5	0.6			
9.00	23.0	0.65	11.00	23.4	0.8			
9.00	24.0	0.89	11.00	24.4	1.2			
9.00	25.0	1.19	11.00	25.3	1.6			
9.00	26.0	1.54	11.00	26.3	2.1			
9.00	27.0	1.97	11.00	27.3	2.7			
9.00	28.0	2.48	11.00	28.3	3.4			
9.00	29.1	3.10	11.00	29.3	4.3			
9.00	30.1	3.86	11.00	30.3	5.4			
9.00	31.1	4.79	11.00	31.2	6.9			
9.00	32.1	6.03	11.00	31.9	9.0			
9.00	32.9	7.72	11.00	32.6	11.4			
9.00	33.5	10.02	11.00	33.2	13.7			
9.00	34.0	13.02	11.00	33.8	15.9			
9.00	34.5	16.41	11.00	34.3	17.9			
9.00	34.8	19.99	11.00	34.8	19.4			
9.00	35.1	23.80	11.00	35.2	20.5			
9.00	35.3	28.37	11.00	35.5	20.9			
9.00	35.4	33.23	11.00	35.7	21.3			
9.00	35.4	38.00	11.00	35.7	22.2			
9.00	35.5	42.26	11.00	35.8	23.6			
9.00	35.5	46.09	11.00	35.8	25.9			
9.00	35.6	49.56	11.00	35.8	28.7			

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: V_{DD} = +7 V, I_{DD} = 1250 mA @ Temperature = +25°C

FREQ	P_{OUT} (dBm)	V_{REF} - V_{DET}	FREQ	P_{OUT} (dBm)	V_{REF} - V_{DET}	FREQ	P_{OUT} (dBm)	V_{REF} - V_{DET}
(GHz)	(dBm)	(V)	(GHz)	(dBm)	(V)	(GHz)	(dBm)	(V)
8.0	-4.4	0.003	9.0	-3.6	0.005	10.0	-4.5	0.004
8.0	-2.7	0.005	9.0	-1.9	0.007	10.0	-2.7	0.006
8.0	-0.9	0.007	9.0	0.0	0.010	10.0	-0.8	0.009
8.0	1.0	0.011	9.0	1.9	0.015	10.0	1.1	0.014
8.0	2.9	0.016	9.0	3.8	0.022	10.0	3.1	0.021
8.0	4.9	0.024	9.0	5.8	0.033	10.0	5.0	0.031
8.0	6.9	0.036	9.0	7.8	0.049	10.0	7.0	0.046
8.0	8.9	0.054	9.0	9.8	0.071	10.0	9.0	0.067
8.0	10.8	0.077	9.0	11.8	0.103	10.0	11.0	0.096
8.0	12.8	0.110	9.0	13.8	0.144	10.0	13.0	0.140
8.0	15.5	0.183	9.0	16.3	0.223	10.0	15.3	0.206
8.0	17.2	0.233	9.0	18.0	0.286	10.0	17.2	0.264
8.0	19.1	0.305	9.0	19.9	0.372	10.0	19.1	0.346
8.0	21.1	0.398	9.0	21.9	0.488	10.0	21.0	0.454
8.0	23.0	0.523	9.0	23.9	0.640	10.0	23.1	0.597
8.0	25.1	0.691	9.0	26.0	0.846	10.0	25.1	0.783
8.0	27.2	0.922	9.0	28.1	1.134	10.0	27.2	1.044
8.0	29.5	1.258	9.0	30.3	1.543	10.0	29.4	1.408
8.0	31.6	1.679	9.0	32.4	2.058	10.0	31.4	1.874
8.0	33.1	2.050	9.0	33.3	2.316	10.0	33.1	2.368
8.0	34.2	2.427	9.0	34.1	2.538	10.0	33.9	2.606
8.0	34.5	2.582	9.0	35.1	2.832	10.0	34.9	2.989

Typical Performance Data

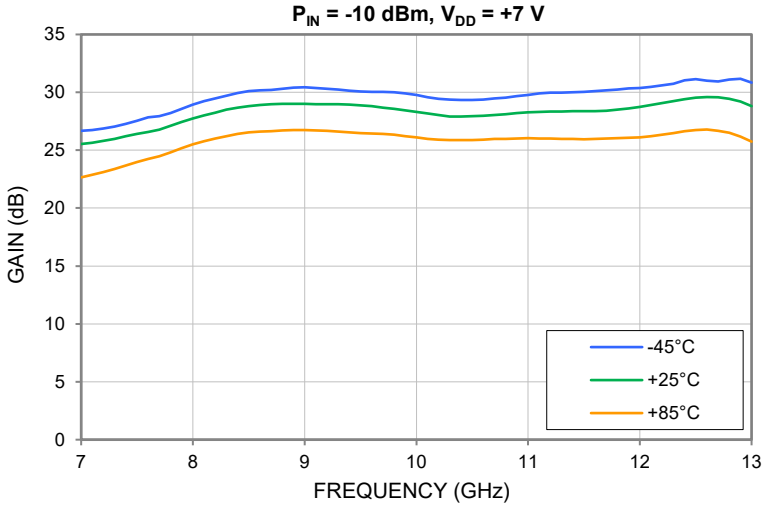
Definitions:
Input Return Loss = S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = S12 (dB)
Output Return Loss = S22 (dB)

TEST CONDITIONS: V_{DD} = +7 V, I_{DD} = 1250 mA @ Temperature = +25°C

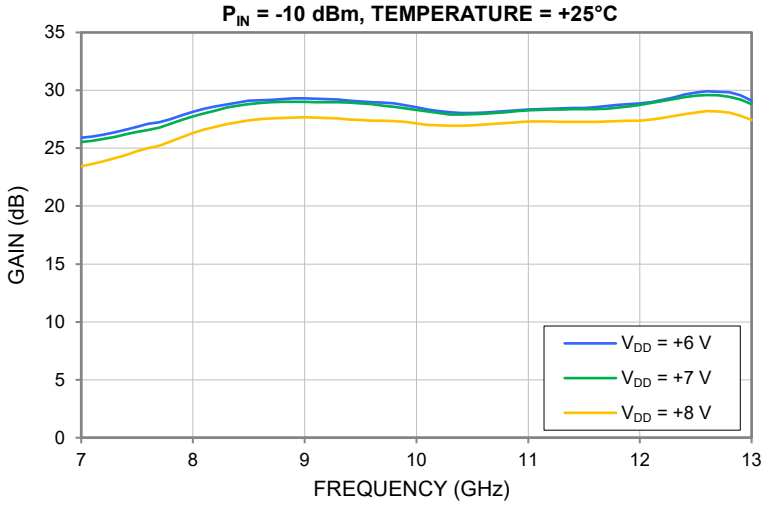
FREQ	P_{OUT} (dBm)	V_{REF} - V_{DET}	FREQ	P_{OUT} (dBm)	V_{REF} - V_{DET}
(GHz)	(dBm)	(V)	(GHz)	(dBm)	(V)
11.0	-4.4	0.005	12.0	-4.9	0.004
11.0	-2.6	0.007	12.0	-2.1	0.007
11.0	-0.6	0.010	12.0	0.8	0.013
11.0	1.3	0.015	12.0	3.7	0.024
11.0	3.3	0.023	12.0	6.7	0.044
11.0	5.2	0.036	12.0	9.7	0.077
11.0	7.2	0.050	12.0	12.7	0.129
11.0	9.2	0.072	12.0	14.6	0.181
11.0	11.2	0.103	12.0	16.5	0.236
11.0	13.2	0.145	12.0	18.4	0.312
11.0	15.4	0.215	12.0	20.4	0.412
11.0	17.2	0.276	12.0	22.4	0.543
11.0	19.2	0.361	12.0	24.5	0.716
11.0	21.2	0.475	12.0	26.6	0.953
11.0	23.2	0.622	12.0	28.6	1.278
11.0	25.2	0.820	12.0	30.5	1.670
11.0	27.4	1.101	12.0	32.2	2.137
11.0	29.5	1.501	12.0	33.1	2.390
11.0	31.6	2.009	12.0	33.8	2.576
11.0	33.2	2.471	12.0	34.5	2.705
11.0	34.2	2.801	12.0	34.9	2.782
11.0	34.9	2.990	12.0	35.2	2.816

Typical Performance Curves

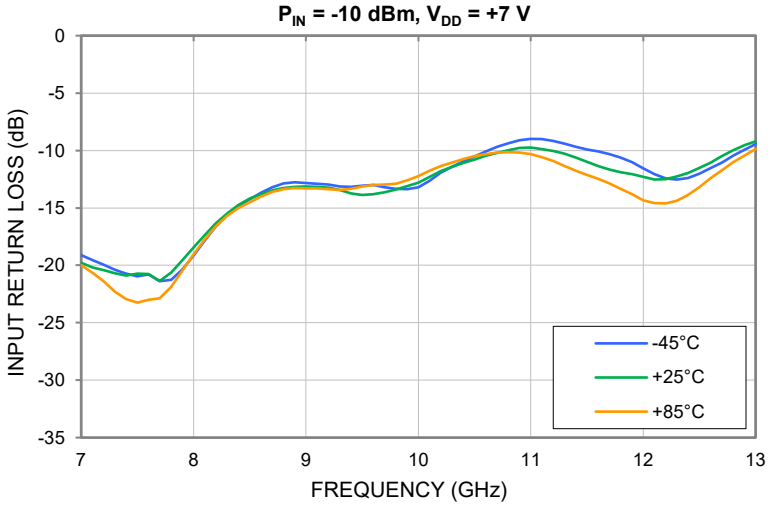
GAIN vs. TEMPERATURE
P_{IN} = -10 dBm, V_{DD} = +7 V



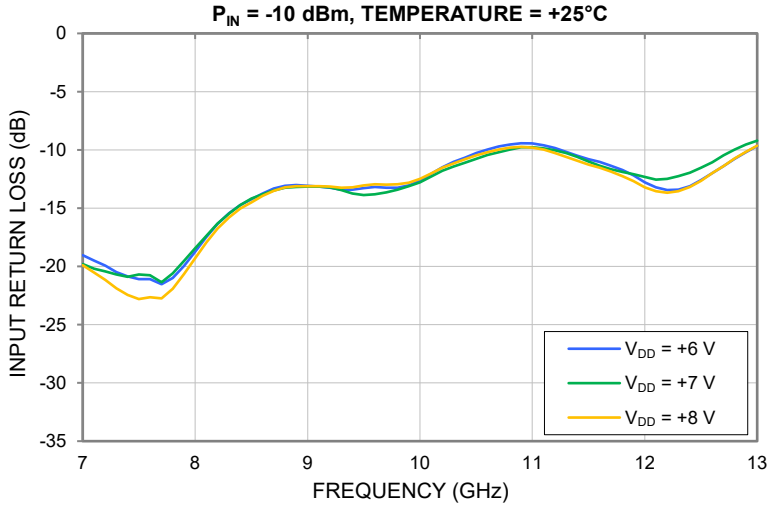
GAIN vs. DEVICE VOLTAGE
P_{IN} = -10 dBm, TEMPERATURE = +25°C



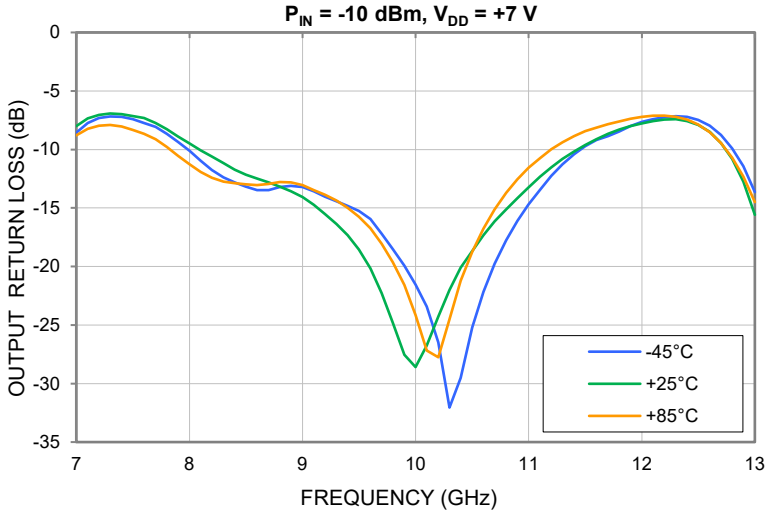
INPUT RETURN LOSS vs.TEMPERATURE
P_{IN} = -10 dBm, V_{DD} = +7 V



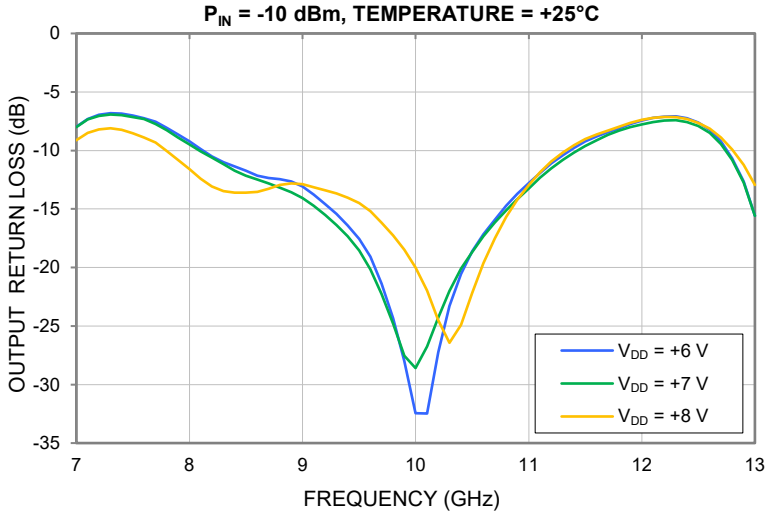
INPUT RETURN LOSS vs. DEVICE VOLTAGE
P_{IN} = -10 dBm, TEMPERATURE = +25°C



OUTPUT RETURN LOSS vs. TEMPERATURE
P_{IN} = -10 dBm, V_{DD} = +7 V

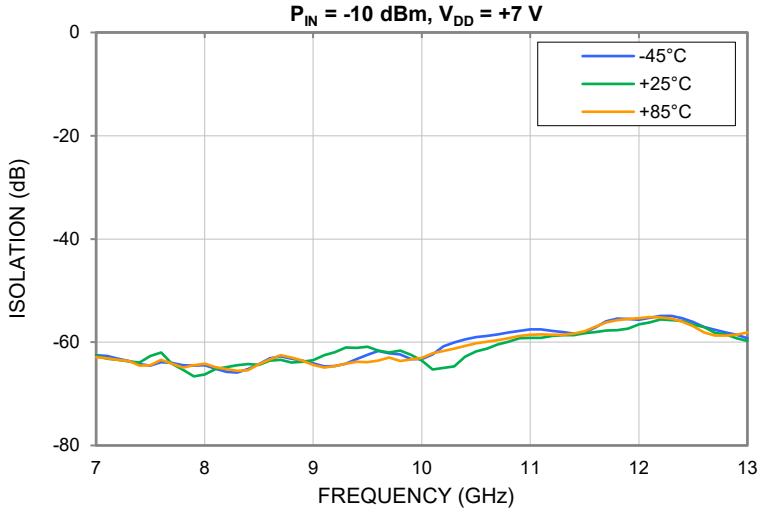


OUTPUT RETURN LOSS vs. DEVICE VOLTAGE
P_{IN} = -10 dBm, TEMPERATURE = +25°C

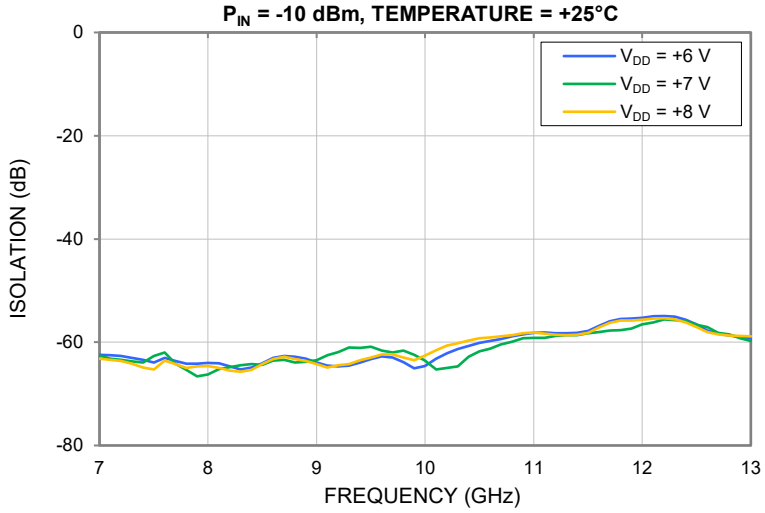


Typical Performance Curves

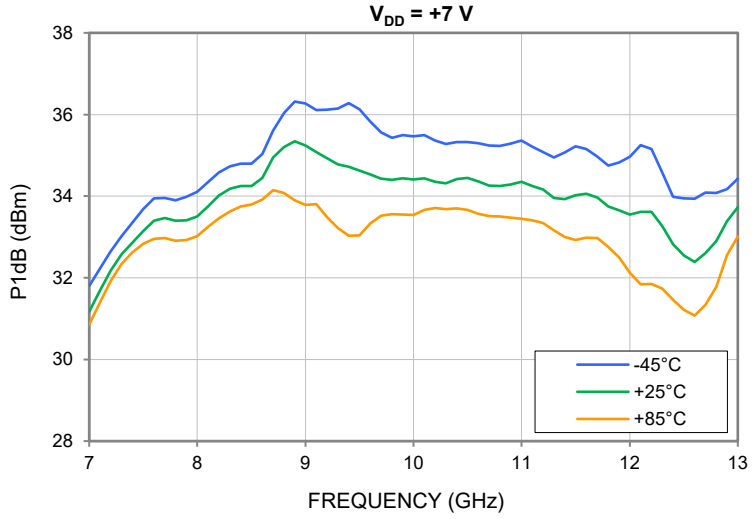
ISOLATION vs.TEMPERATURE
P_{IN} = -10 dBm, V_{DD} = +7 V



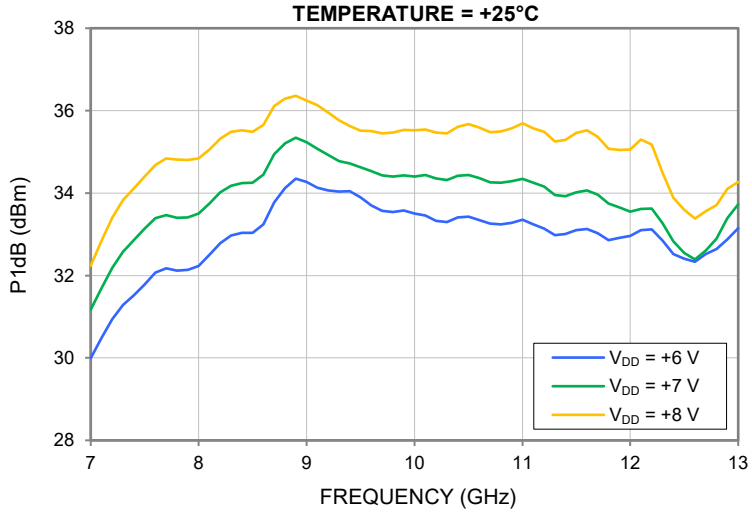
ISOLATION vs. DEVICE VOLTAGE
P_{IN} = -10 dBm, TEMPERATURE = +25°C



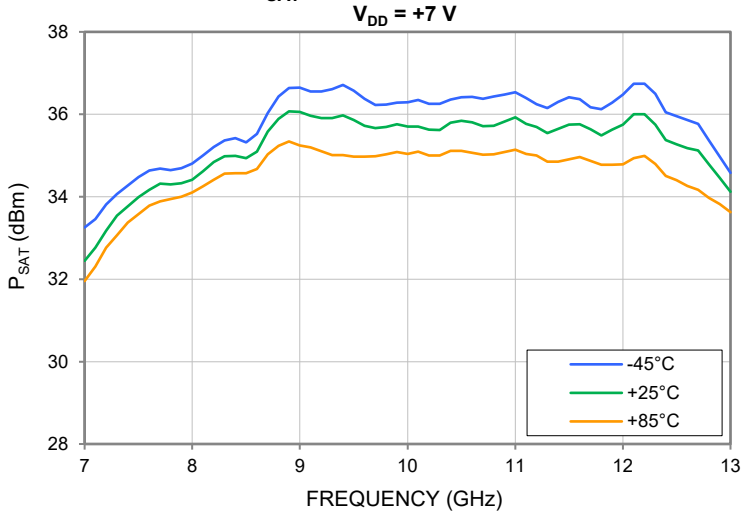
P1dB vs. TEMPERATURE
V_{DD} = +7 V



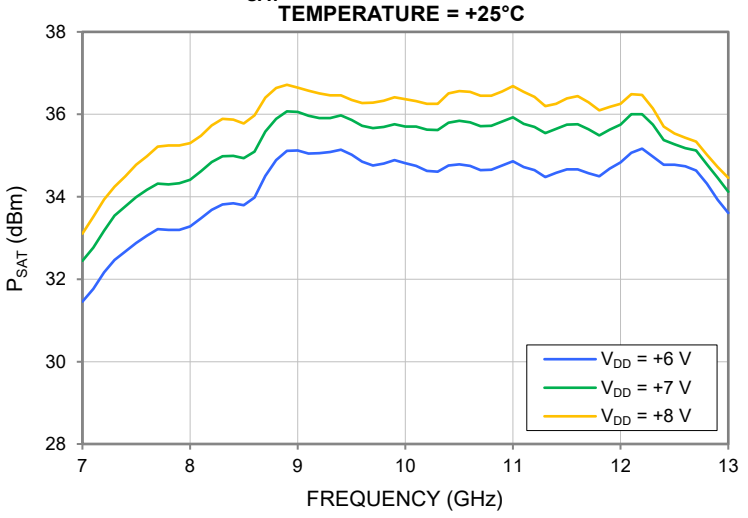
P1dB vs. DEVICE VOLTAGE
TEMPERATURE = +25°C



P_{SAT} vs. TEMPERATURE
V_{DD} = +7 V

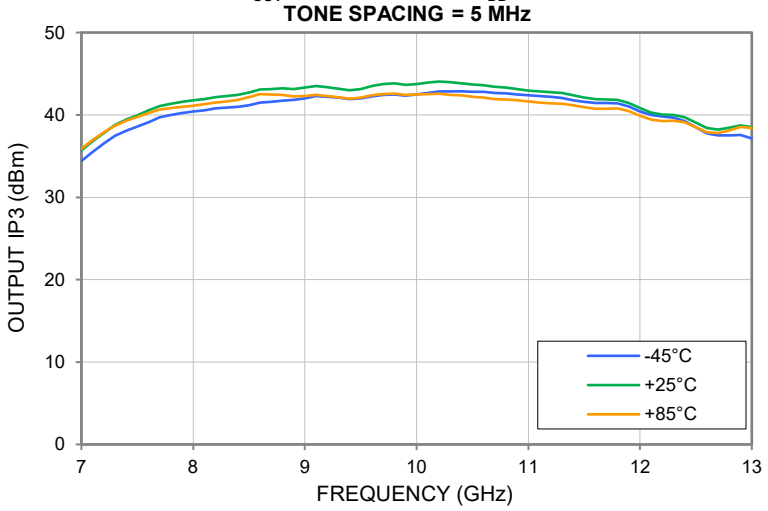


P_{SAT} vs. DEVICE VOLTAGE
TEMPERATURE = +25°C

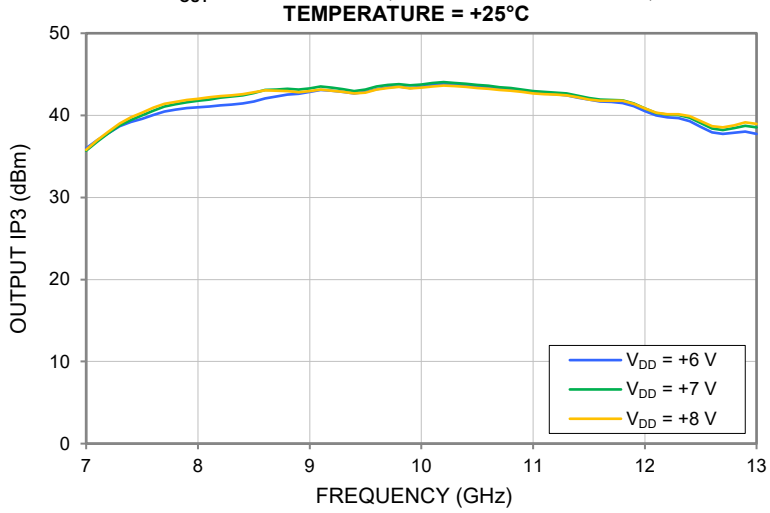


Typical Performance Curves

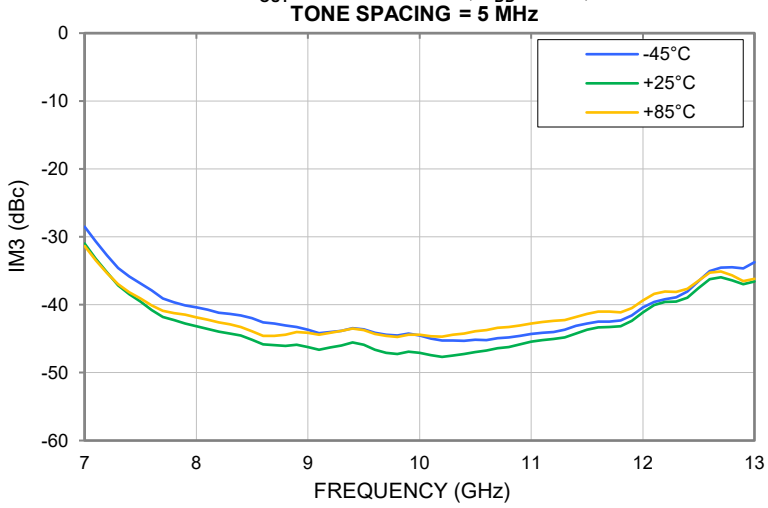
OUTPUT IP3 vs. TEMPERATURE
P_{OUT} = +20 dBm/TONE, V_{DD} = +7 V, TONE SPACING = 5 MHz



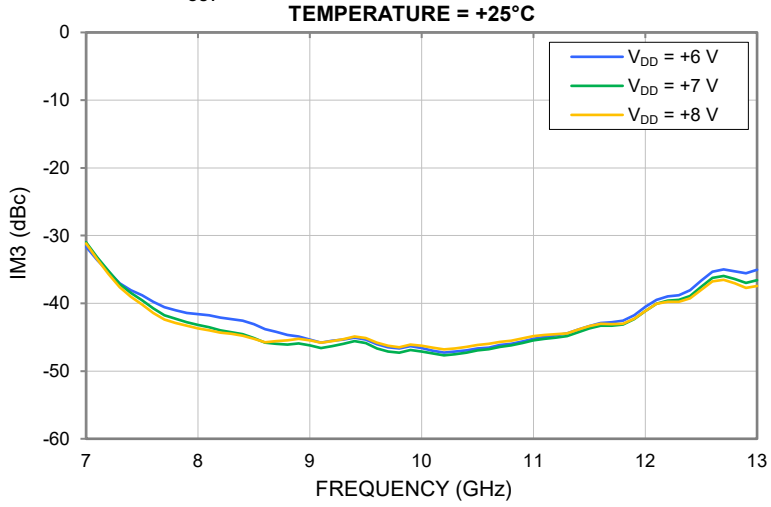
OUTPUT IP3 vs. DEVICE VOLTAGE
P_{OUT} = +20 dBm/TONE, TONE SPACING = 5 MHz, TEMPERATURE = +25°C



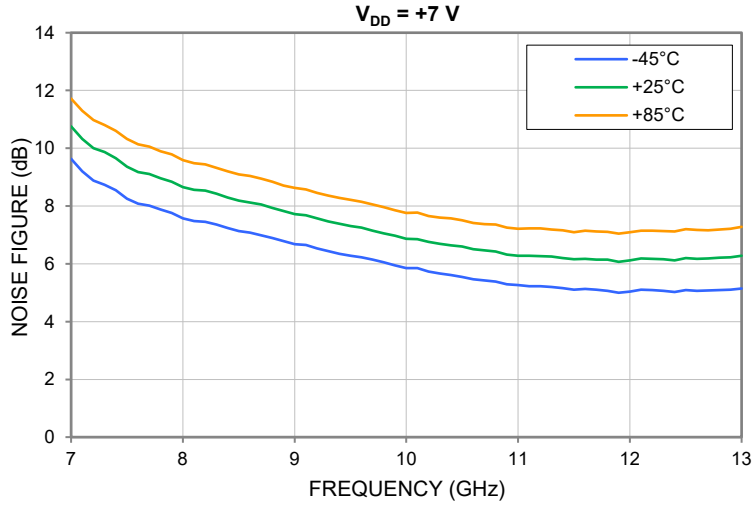
IM3 vs. TEMPERATURE
P_{OUT} = +20 dBm/TONE, V_{DD} = +7 V, TONE SPACING = 5 MHz



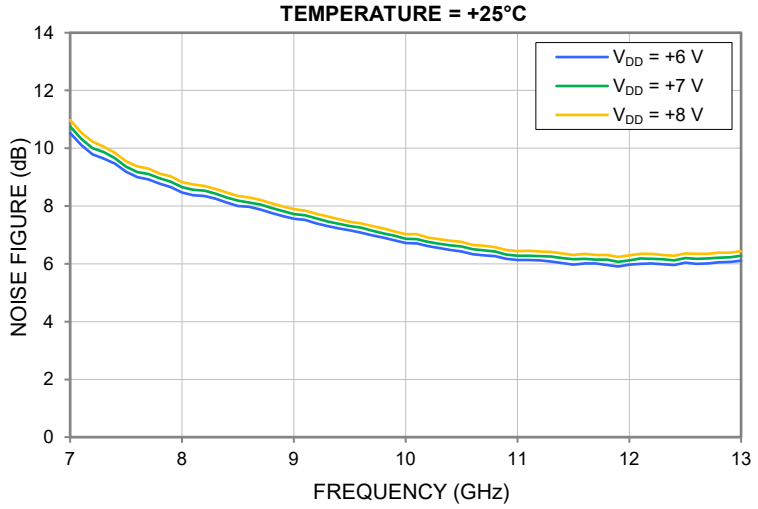
IM3 vs. DEVICE VOLTAGE
P_{OUT} = +20 dBm/TONE, TONE SPACING = 5 MHz TEMPERATURE = +25°C



NOISE FIGURE vs. TEMPERATURE
V_{DD} = +7 V

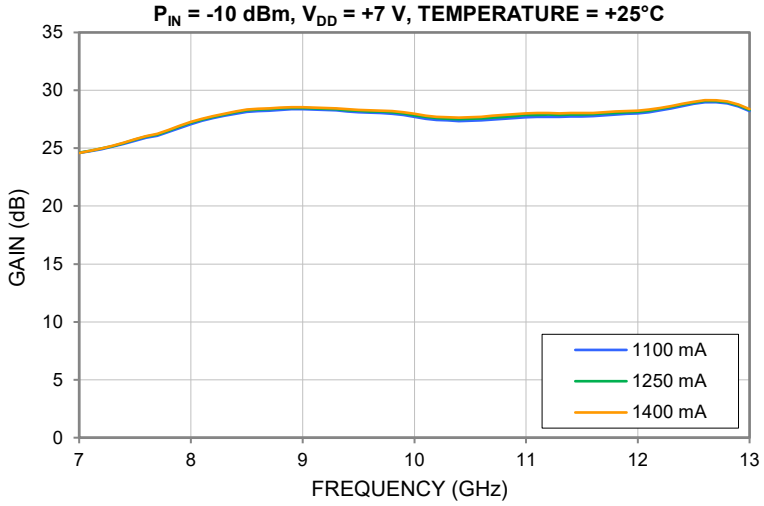


NOISE FIGURE vs. DEVICE VOLTAGE
TEMPERATURE = +25°C

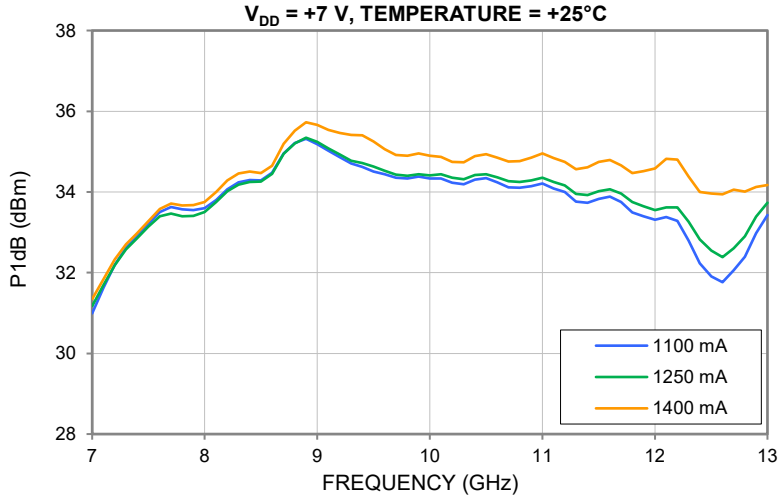


Typical Performance Curves

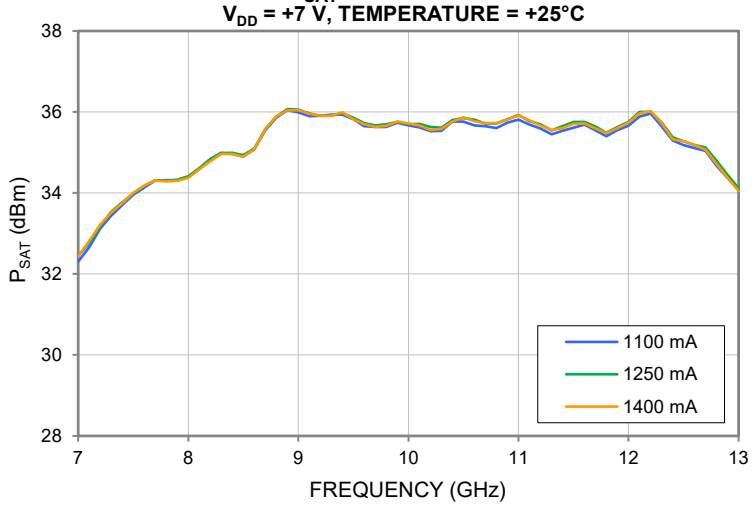
GAIN vs. CURRENT
P_{IN} = -10 dBm, V_{DD} = +7 V, TEMPERATURE = +25°C



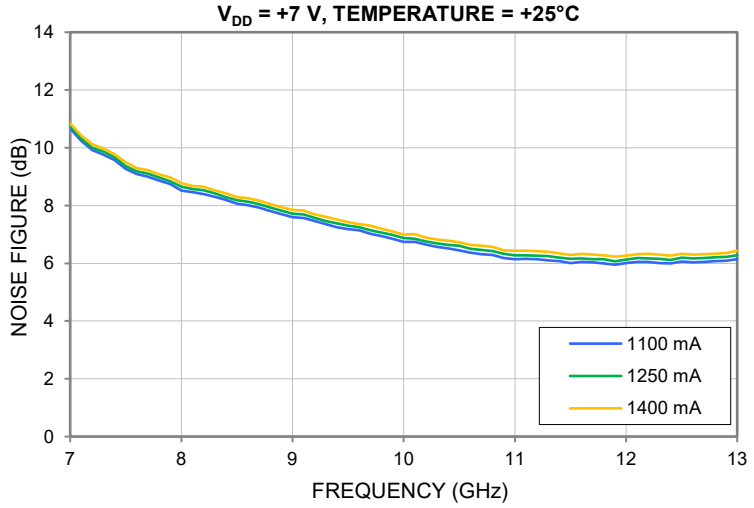
P1dB vs. CURRENT
V_{DD} = +7 V, TEMPERATURE = +25°C



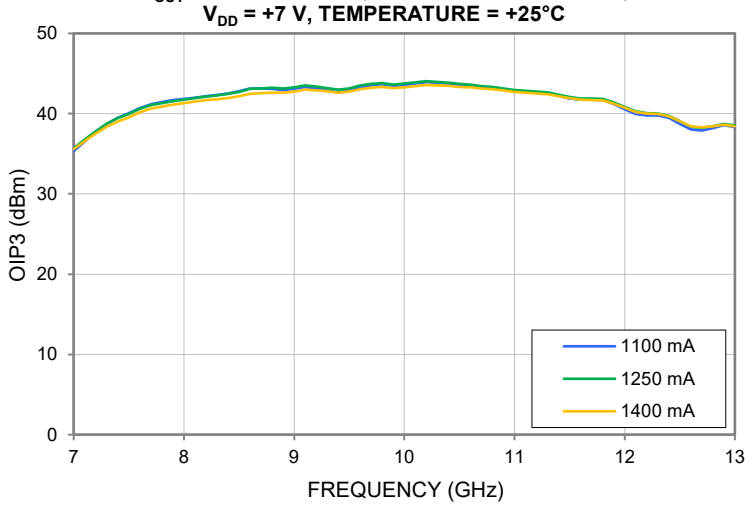
P_{SAT} vs. CURRENT
V_{DD} = +7 V, TEMPERATURE = +25°C



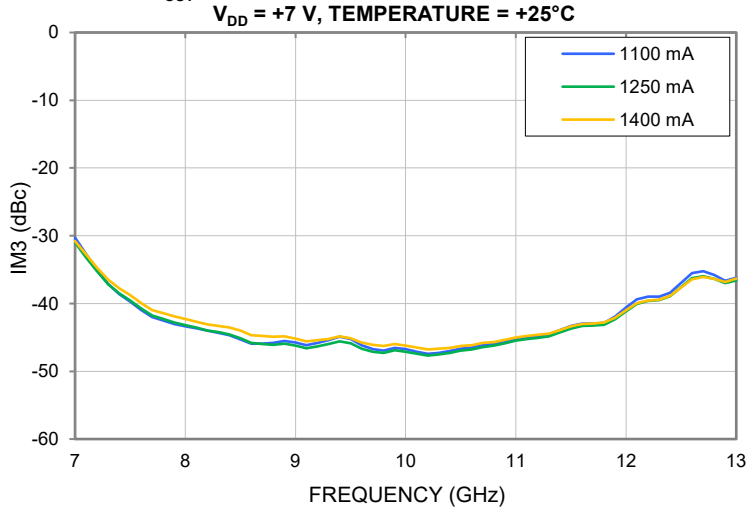
NOISE FIGURE vs. CURRENT
V_{DD} = +7 V, TEMPERATURE = +25°C



OIP3 vs. CURRENT
P_{OUT} = +20 dBm/TONE, TONE SPACING = 5 MHz,
V_{DD} = +7 V, TEMPERATURE = +25°C

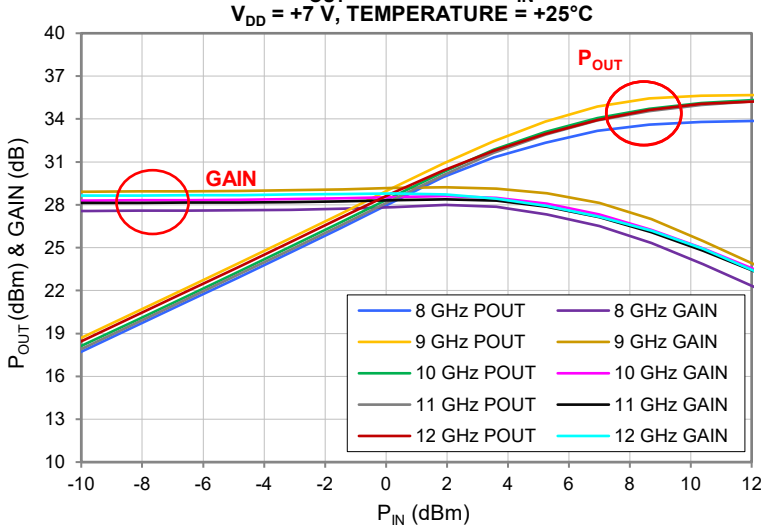


IM3 vs. CURRENT
P_{OUT} = +20 dBm/TONE, TONE SPACING = 5 MHz,
V_{DD} = +7 V, TEMPERATURE = +25°C

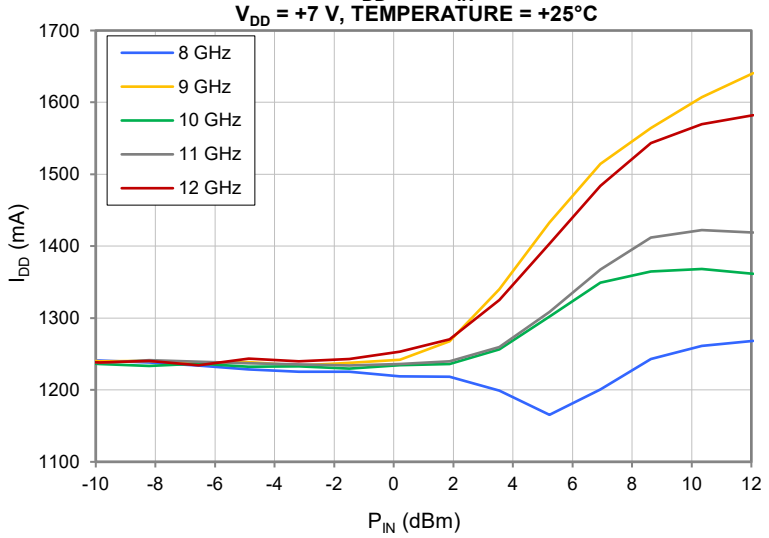


Typical Performance Curves

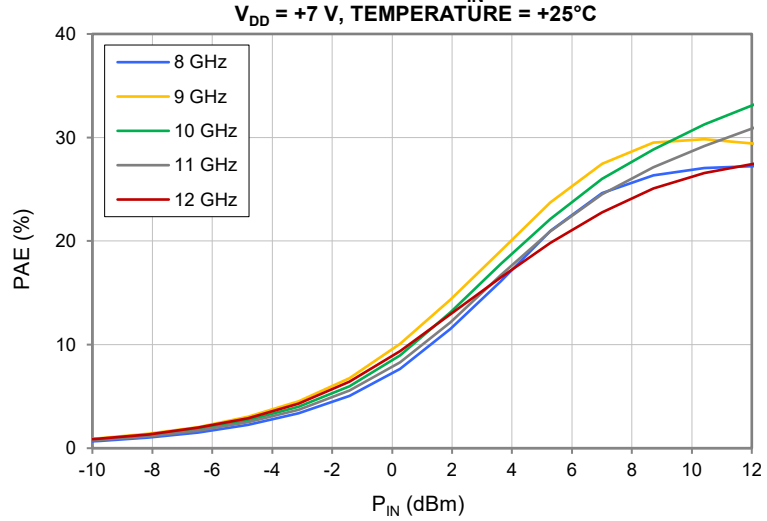
P_{OUT} & GAIN vs. P_{IN}
V_{DD} = +7 V, TEMPERATURE = +25°C



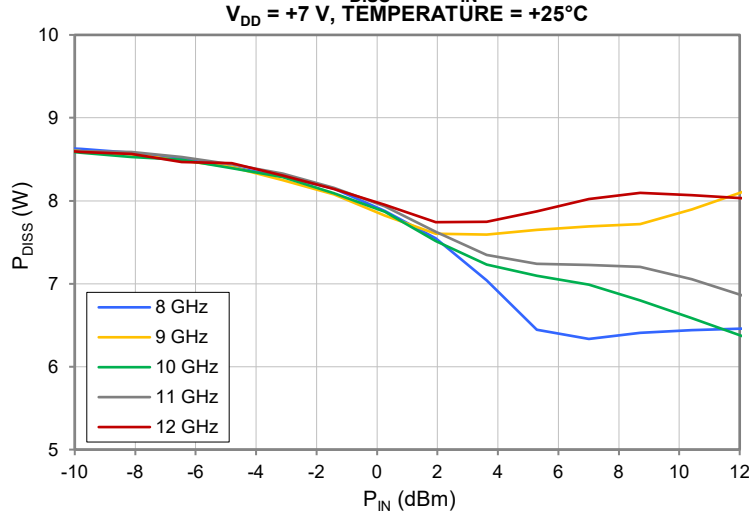
I_{DD} vs. P_{IN}
V_{DD} = +7 V, TEMPERATURE = +25°C



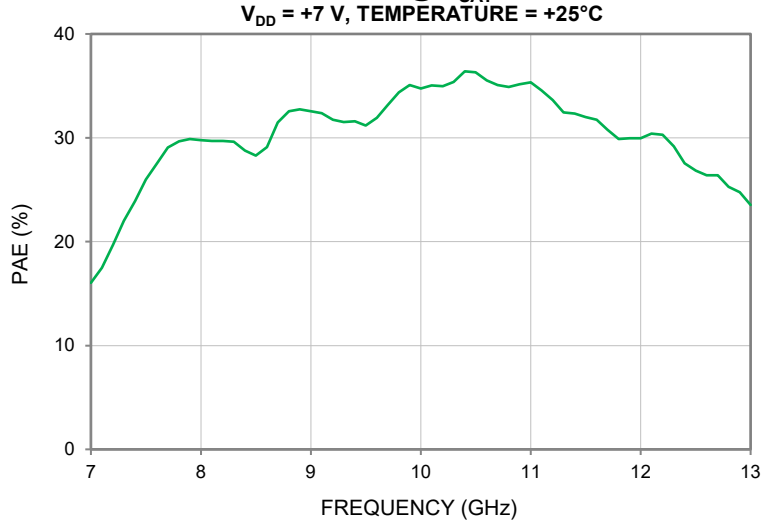
PAE vs. P_{IN}
V_{DD} = +7 V, TEMPERATURE = +25°C



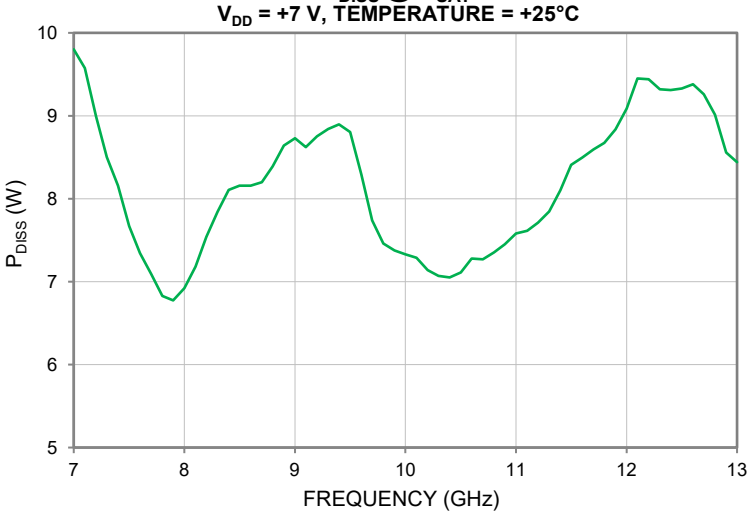
P_{DISS} vs. P_{IN}
V_{DD} = +7 V, TEMPERATURE = +25°C



PAE @ P_{SAT}
V_{DD} = +7 V, TEMPERATURE = +25°C

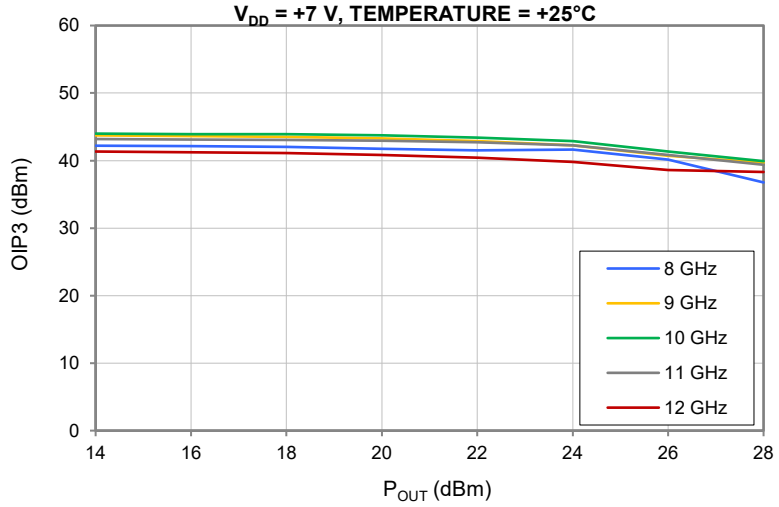


P_{DISS} @ P_{SAT}
V_{DD} = +7 V, TEMPERATURE = +25°C

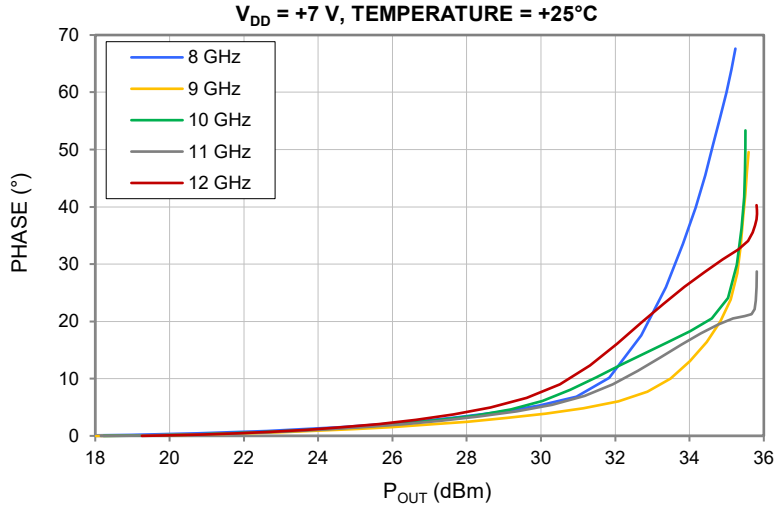


Typical Performance Curves

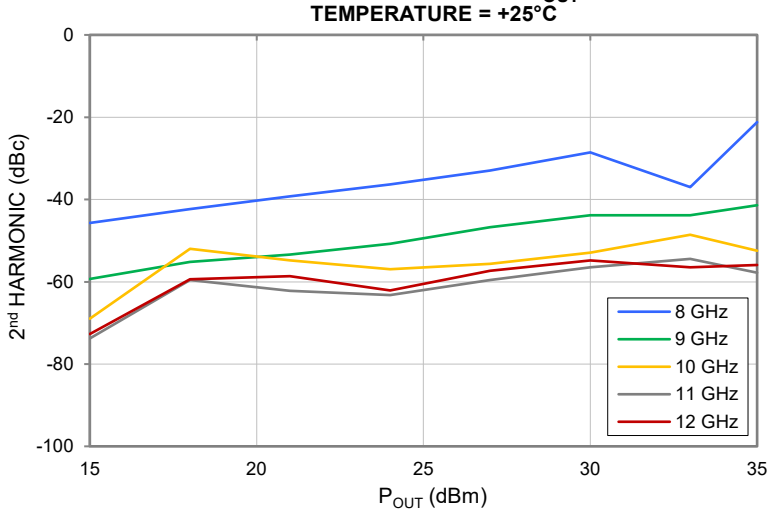
OIP3 vs. P_{OUT}/TONE
TONE SPACING = 5 MHz,
V_{DD} = +7 V, TEMPERATURE = +25°C



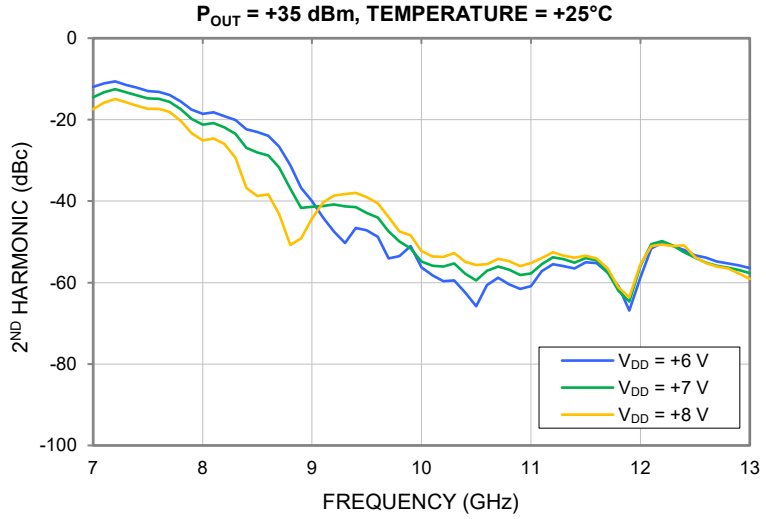
AM - PM
V_{DD} = +7 V, TEMPERATURE = +25°C



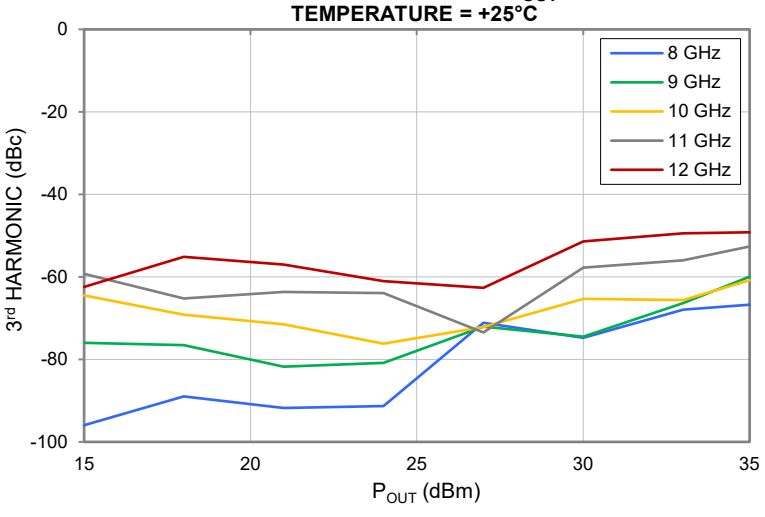
2nd HARMONIC vs. P_{OUT}
TEMPERATURE = +25°C



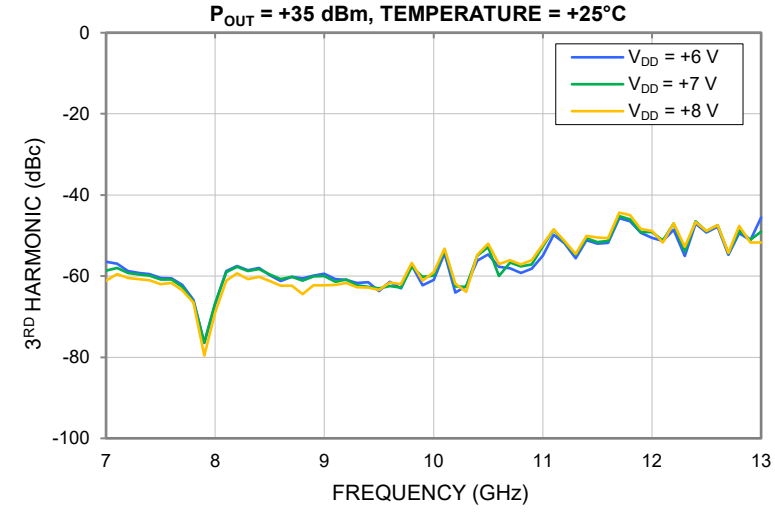
2nd HARMONIC vs. DEVICE VOLTAGE
P_{OUT} = +35 dBm, TEMPERATURE = +25°C



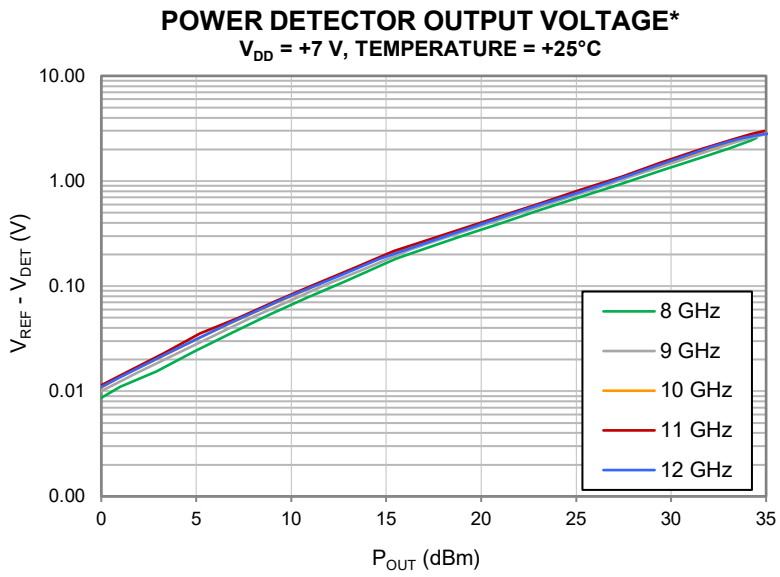
3rd HARMONIC vs. P_{OUT}
TEMPERATURE = +25°C

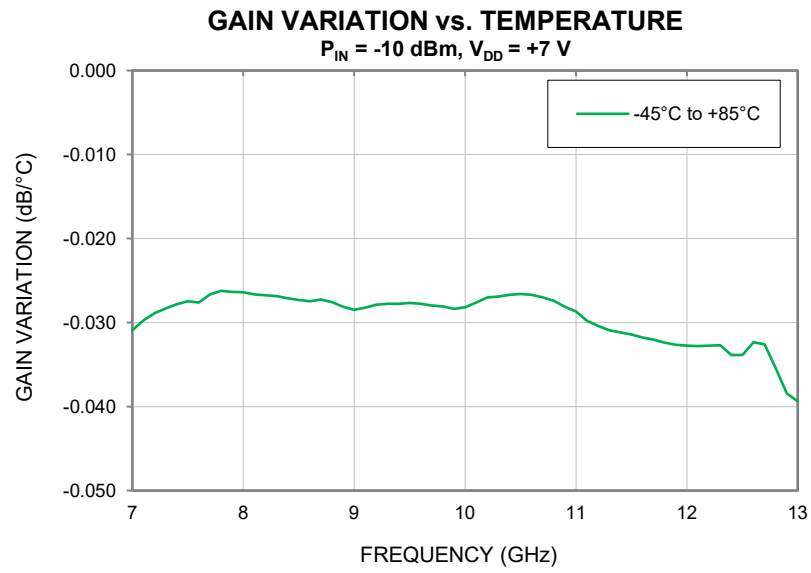


3rd HARMONIC vs. DEVICE VOLTAGE
P_{OUT} = +35 dBm, TEMPERATURE = +25°C



Typical Performance Curves



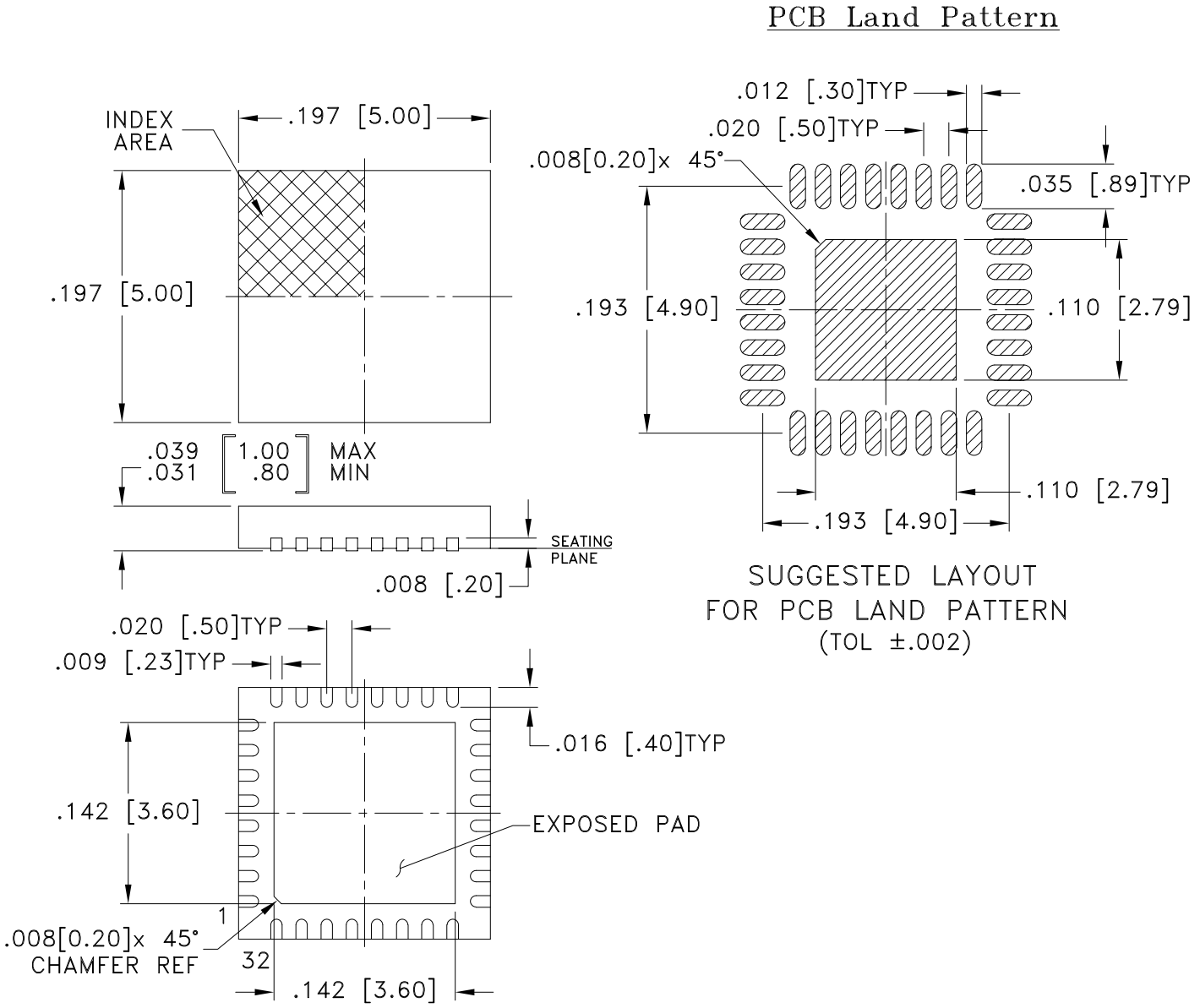


* Logarithmic scale base 10

Case Style DG

Outline Dimensions

DG1677-10



Weight: .05 grams

Dimensions are in inches [mm]. Tolerances: 2 Pl.±.01; 3 Pl. ±.005 Inch

Notes:

1. Case material: Plastic.
2. 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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RF/IF MICROWAVE COMPONENTS

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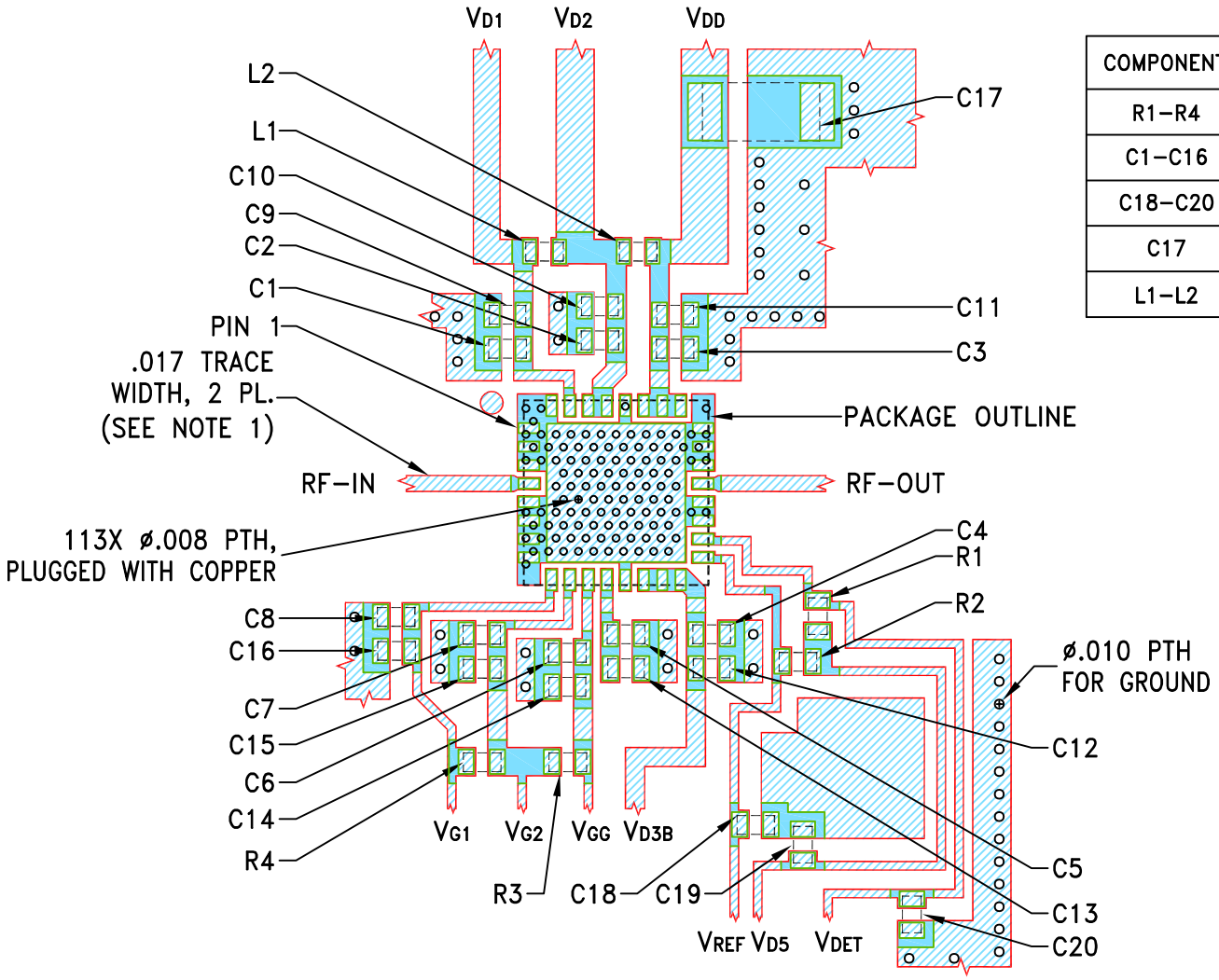
THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	ECO-021853	NEW RELEASE	05/22/24	ITG	IL
A	ECO-024144	CHANGED AS RER NEW LAYOUT	01/08/25	ITG	IL

SUGGESTED MOUNTING CONFIGURATION FOR DG1677-10 CASE STYLE



COMPONENT	SIZE
R1-R4	0402
C1-C16	0402
C18-C20	0402
C17	1206
L1-L2	0402

NOTES:

1. TRACE WIDTH IS SHOWN FOR ROGERS RO4003C LoPro FOIL WITH DIELECTRIC THICKNESS .0087".
   COPPER: 1 OZ. EACH SIDE. FINAL COPPER THICKNESS SHALL BE 2 OZ.
   FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. CHIP COMPONENT FOOT PRINTS SHOWN FOR REFERENCE, FOR COMPONENT VALUES REFER TO TB-PMA5-1233WC+.
3. 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
DIMENSIONS ARE IN INCHES	DRAWN	ITG	05/22/24
TOLERANCES ON:	CHECKED	GF	05/22/24
2 PL DECIMALS ±	APPROVED	IL	05/22/24
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

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ASHEETA1.DWG REV:A DATE:01/12/95

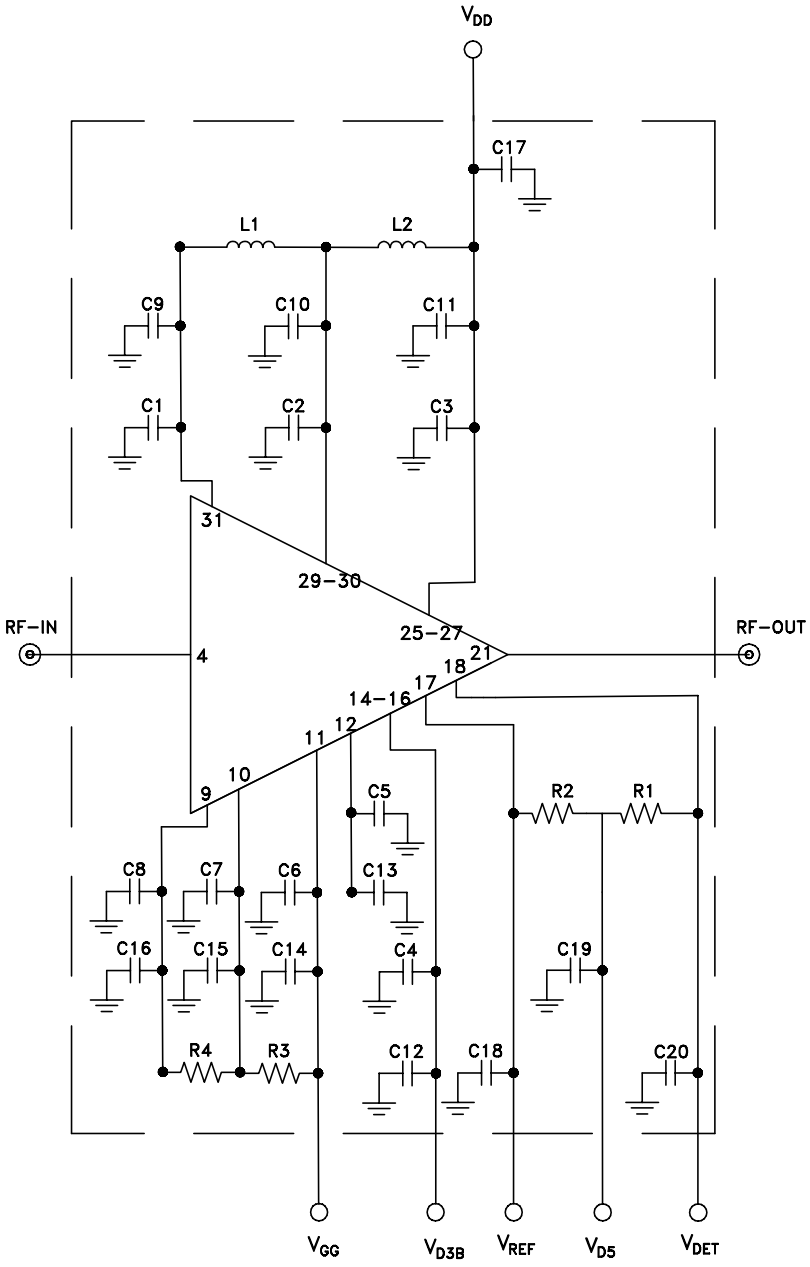
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL, DG1677-10, TB-PMA5-1233WC+

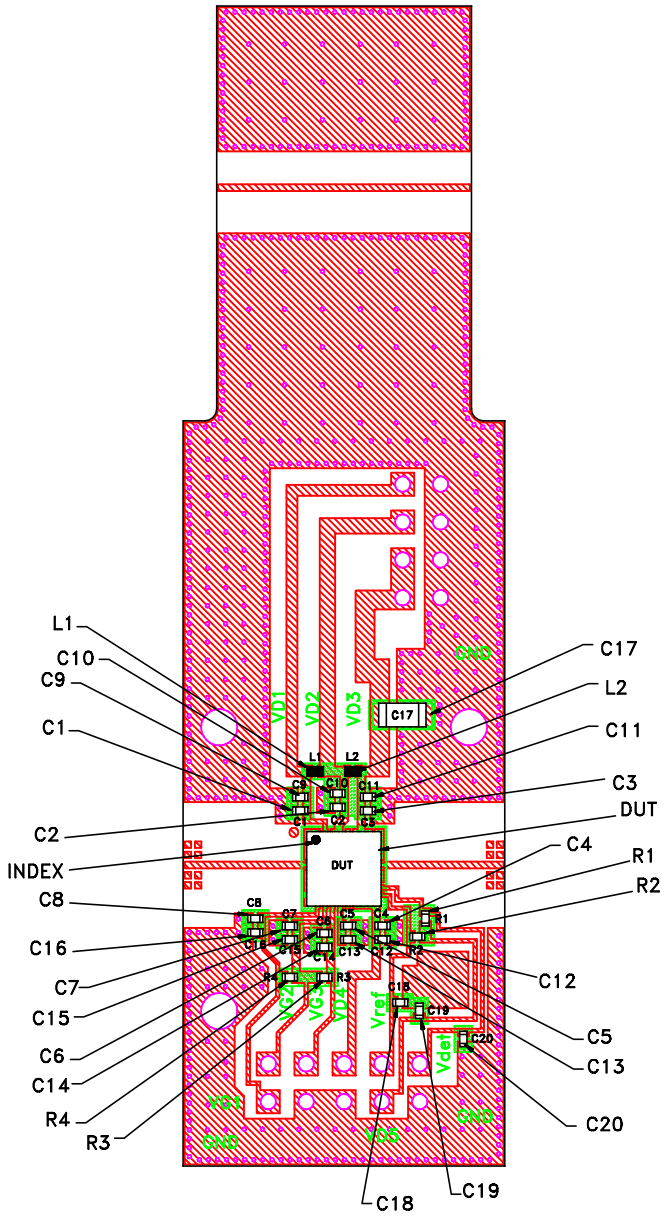
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-783	A

FILE:	SCALE:	SHEET:
98PL783	5:1	1 OF 1

Evaluation Board and Circuit



SCHEMATIC DIAGRAM



DETAIL "C"

LOCATION OF INTERCONNECTOR AND UNITS COMPONENTS

Component	Size	Value	PartNumber	Manufacturer
R1–R2	0402	100KΩ	RK73H1ETTP1003F	KOA SPEER ELECTRONICS
R3	0402	0Ω	RK73Z1ETTP	KOA SPEER ELECTRONICS
R4	0402	100Ω	RK73H1ETTP1000F	KOA SPEER ELECTRONICS
C1–C8	0402	0.001μF	GRM1555C1H102JA01D	MURATA
C9–C16,C18–C20	0402	0.1μF	GRM155R71E104KE14D	MURATA
C17	1206	47μF	1206YD476MAT2A	AVX CORPORATION
L1,L2	0402	150nH	0402DF-151XJRW	COILCRAFT

Notes:

1. 2.92mm Female Connectors.
2. PCB Material: Roger RO4003C LOPRO or equivalent, Thickness=0.0087±.001 inch

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Mini-Circuits

Environmental Specifications ENV08T1

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

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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

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