

# GaN on SiC Amplifier, 25 W, 50 V DC - 1.4 GHz



**MACOM PURE CARBIDE™**

**MAPC-A1002-AD**

Rev. V1

## Features

- MACOM PURE CARBIDE™ Amplifier Series
- Input Matched
- 28 V & 50 V
- Saturated Power: 25 W
- Drain Efficiency: 70%
- Small Signal Gain: 20 dB
- DFN 5 x 6 8-L Plastic Package
- RoHS\* Compliant



DFN 5x6 8L

## Applications

- Avionics - TACAN, DME, IFF
- L-band Radar
- Suitable for Linear & Saturated Applications
- CW & Pulsed Operation: 25 W Output Power

## Description

The MAPC-A1002-AD is a 28 W packaged, input matched transistor utilizing a high performance, GaN on SiC production process. This transistor supports both defense and commercial related applications.

Offered in a 5 x 6 DFN package, the MAPC-A1002-AD provides superior performance under CW operation allowing customers to improve SWaP-C benchmarks in their next generation systems.

## Typical RF Performance:

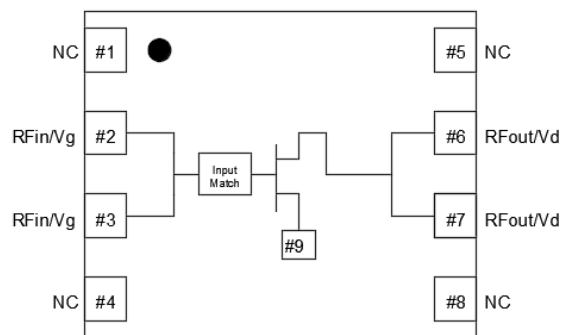
- Measured in a 1.2 - 1.4 GHz evaluation fixture, CW,  $P_{IN} = 28.5$  dBm,  $V_{DS} = 50$  V,  $I_{DQ} = 50$  mA,  $T_C = 25^\circ$  C

Frequency (GHz)	Output Power (dBm)	Gain (dB)	$\eta_D$ (%)
1.2	44.5	16.0	70.5
1.3	44.6	16.1	73.2
1.4	44.0	15.5	68.9

- Measured in a 0.03 - 1.4 GHz evaluation fixture, CW,  $P_{IN} = 31$  dBm,  $V_{DS} = 50$  V,  $I_{DQ} = 50$  mA,  $T_C = 25^\circ$  C

Frequency (GHz)	Output Power (dBm)	Gain (dB)	$\eta_D$ (%)
0.03	44.1	13.1	80.2
0.50	44.6	13.6	68.5
0.75	43.9	12.9	59.2
1.00	43.8	12.8	57.9
1.40	43.9	12.9	53.1

## Functional Schematic



## Pin Configuration

Pin #	Pin Name	Function
2,3	RF <sub>IN</sub> / V <sub>G</sub>	RF Input / Gate
6,7	RF <sub>OUT</sub> / V <sub>D</sub>	RF Output / Drain
1,4,5,8,9	Flange <sup>1</sup>	Ground / Source

1. The flange on the package bottom must be connected to RF, DC and thermal ground.

## Ordering Information

Part Number	MOQ Increment
MAPC-A1002-AD000	Bulk
MAPC-A1002-ADTR1	Tape and Reel
MAPC-A1002-ADSB1	Sample Board, 1.2 - 1.4 GHz
MAPC-A1002-ADSB2	Sample Board, 0.03 - 1.4 GHz

\* Restrictions on Hazardous Substances, compliant to current RoHS EU directive.

**RF Electrical Specifications<sup>2</sup>:  $T_A = +25^\circ\text{C}$ ,  $V_{DS} = 28\text{ V}$ ,  $V_{DD} = 50\text{ V}$ ,  $I_{DQ} = 50\text{ mA}$ ,**

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Units
Output Power	$P_{IN} = 28.5\text{ dBm}$ , Pulsed, 25 $\mu\text{s}$ , 1%	$P_{OUT}$	25.7	27.5	-	W
Drain Efficiency	$P_{IN} = 28.5\text{ dBm}$ , Pulsed, 25 $\mu\text{s}$ , 1%	$\eta_{SAT}$	64.5	73.3	-	%
Low Power Gain	$P_{IN} = 28.5\text{ dBm}$ , Pulsed, 25 $\mu\text{s}$ , 1%	$G_{SS}$	15.6	15.9	-	dB

2. Final testing and screening for all transistor sales is performed using the MAPC-A1002-AD production socket fixture at 1.4 GHz.

**Absolute Maximum Ratings<sup>3,4</sup>**

Parameter	Absolute Maximum
Drain-Source Voltage	50 V
Gate Voltage	-10, +2 V
Drain Current	1.5 A
Gate Current	4 mA
Junction Temperature <sup>5,6</sup>	+220°C
Operating Temperature	-40°C to +85°C
Storage Temperature	-55C to +150°C
Mounting Temperature	+245°C

- Exceeding any one or combination of these limits may cause permanent damage to this device.
- MACOM does not recommend sustained operation near these survivability limits.
- Operating at nominal conditions with  $T_J \leq +220\text{ C}$  will ensure  $MTTF > 1 \times 10^6$  hours.
- Junction Temperature ( $T_J$ ) =  $T_C + \Theta_{jc} * (V * I)$   
Typical thermal resistance ( $\Theta_{jc}$ ) = 6.32 °C/W for CW.  
a) For  $T_C = +85^\circ\text{C}$ ,  
 $T_J = 159\text{ }^\circ\text{C}$  @  $P_{DISS} = 11.7\text{ W}$

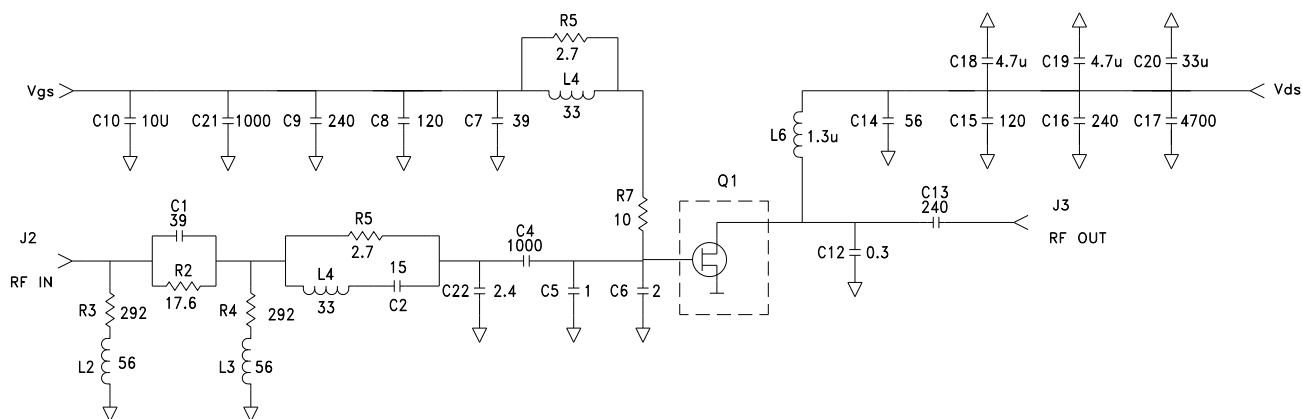
**Handling Procedures**

Please observe the following precautions to avoid damage:

**Static Sensitivity**

These electronic devices are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

**Evaluation Test Fixture and Recommended Tuning Solution, 0.03 - 1.4 GHz**



**Description**

Parts measured on evaluation board (20-mil thick RO4350B). Matching is provided using a combination of lumped elements and transmission lines as shown in the simplified schematic above. Recommended tuning solution component placement, transmission lines, and details are shown on the next page.

**Biasing Sequence**

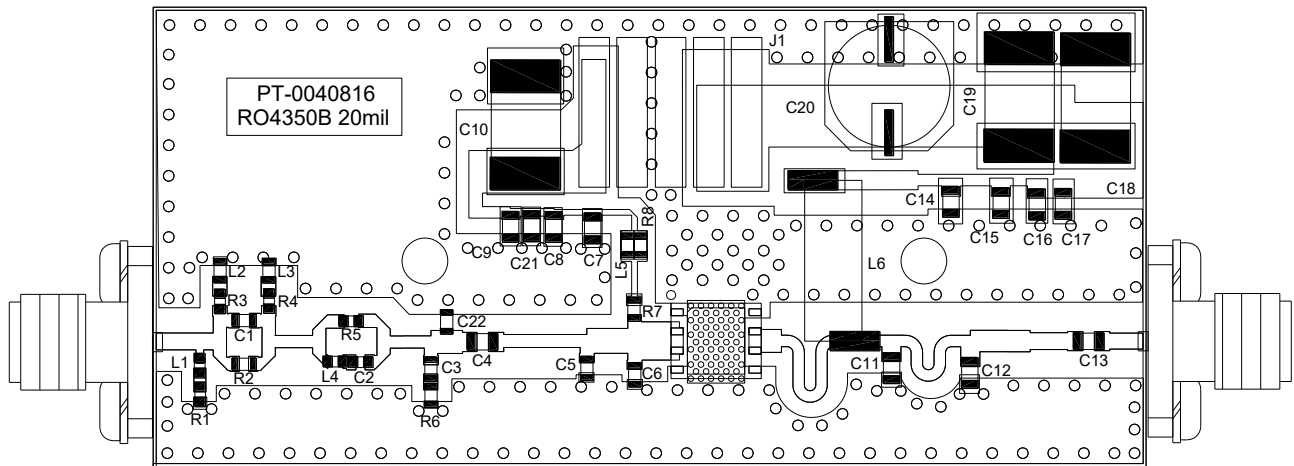
**Bias ON**

1. Ensure RF is turned off
2. Apply pinch-off voltage of -5 V to the gate
3. Apply nominal drain voltage
4. Bias gate to desired quiescent drain current
5. Apply RF

**Bias OFF**

1. Turn RF off
2. Apply pinch-off voltage of -5 V to the gate
3. Turn-off drain voltage
4. Turn-off gate voltage

**Evaluation Test Fixture and Recommended Tuning Solution, 0.03 - 1.4 GHz**



**Assembly Parts List**

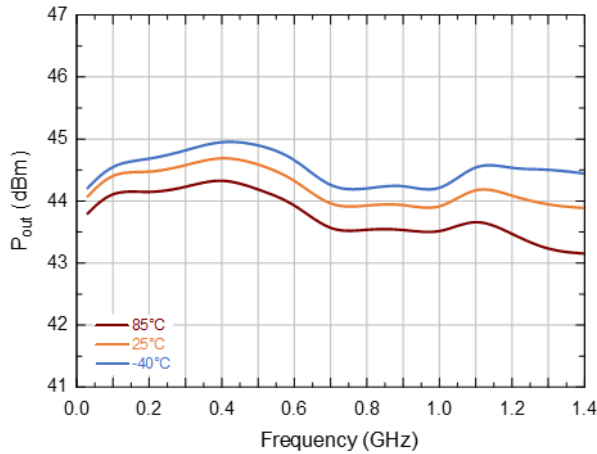
Reference Designator	Description	Manufacturer	Part Number
C1	CAP, 39pF, 0603 ATC 600S	AVX	600S390JT250XT
C2	CAP, 15pF, 0603 ATC 600S	AVX	600S150JT250XT
C4	CAP, 1000pF, 0603 SMT	AVX	06032C102MAT2A
C5	CAP, 1pF, 0603 ATC 600S	AVX	600S1R0AT250XT
C6	CAP, 2pF, 0603 ATC 600S	AVX	600S2R0BT250XT
C7	CAP, 39pF, 0805 ATC 600F	AVX	600F390JT250XT
C8	CAP, 120pF, 0805 ATC 600F	AVX	600F121JT250XT
C9, C13, C16	CAP, 240pF ATC 600F 0805	AVX	600F241JT250XT
C10	CAP 10UF 16V TANTALUM	AVX	TAJC106M016RNJ
C12	CAP, 0.3pF, 0805 ATC 600F	AVX	600F0R3BT250XT
C14	CAP, 56pF, 0805 ATC 600F	AVX	600F560JT250XT
C15	CAP, 120pF, 0805 ATC 600F	AVX	600F121JT250XT
C17	CAP, 47000pF, 0805 100V	AVX	KAF21KR72A473KL
C18, C19	CAP, 4.7uF 100V SMT2010	AVX	KAF21KR72A473KL
C20	CAP, 33uF, 80V, Aluminium	KEMET	A768KS336M1KLAE038
C21	CAP, 1000 SMT0805	AVX	08051A102FAT2
C22	CAP, 2.4pF, 0603 ATC 600S	AVX	600S2R4AT250XT
L2, L3	IND, 56nH, LQG18	MURATA	LQG18HN56NJ00D
L4	IND, 33nH, LQW04A	MURATA	LQW04AN33NH00D
L5	IND, 180Nh, Coilcraft 0603HP	Coilcraft	0603HP-R18XJRU
L6	IND, 1.3uH, Coilcraft 4310	Coilcraft	4310LC-132KEB
R2	RES, 17.6 OHM. IMS 0603 SMT	IMS	ND3 - 0603CS17R6
R3, R4	RES, 292 OHM. 0603 SMT	Vishay	PAT0603E2910BST1
R5	RES, 2.7 OHM. 0603 SMT	Vishay	CRCW06032R70FKEA
R7	RES, 10 OHM. 0603 SMT	Yageo	RC0805FR-0710RL
R8	RES, 220 OHM. 0603 SMT	Vishay	MCT06030C2200FP5
PCB	PCB, RO4350B, 20 MIL, 0.03-1.4GHz		
J1	5 PIN HEADER	AMP	640457-5
J2-3	SMA CONNECTOR	AMPHENOL	132150
Q1	Macom GaN Amplifier		MAPC-A1002-AD

### Typical Performance Curves as Measured in the 0.03 - 1.4 GHz Evaluation Test Fixture

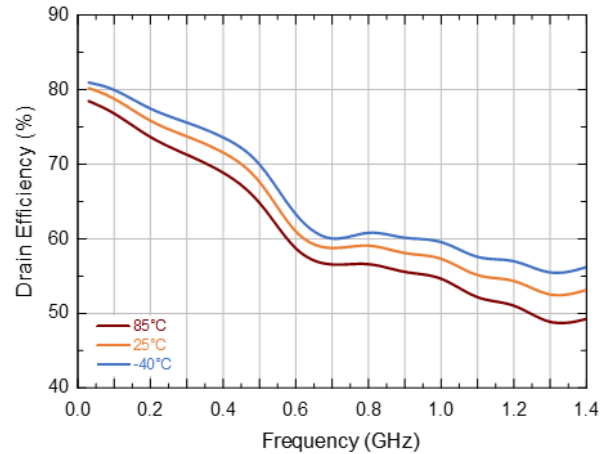
CW,  $P_{IN} = 31$  dBm,  $V_{DS} = 50$  V,  $I_{DQ} = 50$  mA, Frequency = 750 MHz (Unless Otherwise Noted)

For Engineering Evaluation Only – This data does not Modify MACOM's Datasheet Limits.

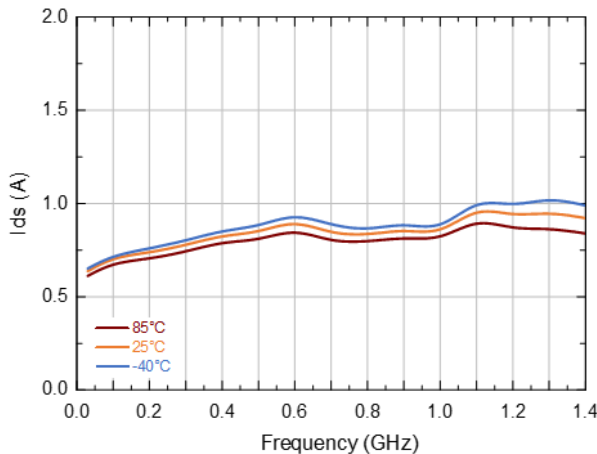
**Output Power vs. Temperature and Frequency**



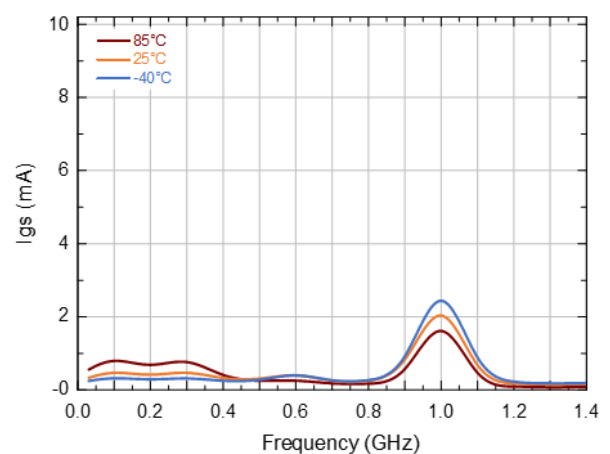
**Drain Efficiency vs. Temperature and Frequency**



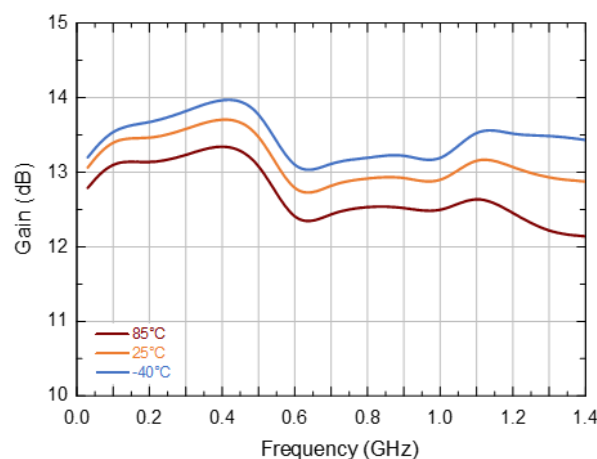
**Drain Current vs. Temperature and Frequency**



**Gate Current vs. Temperature and Frequency**



**Large Signal Gain vs. Temperature and Frequency**

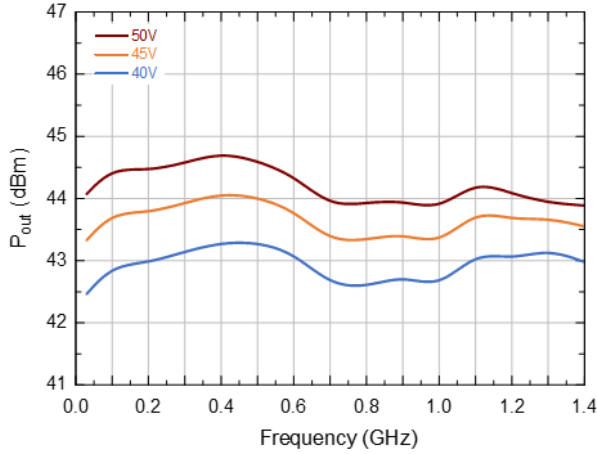


**Typical Performance Curves as Measured in the 0.03 - 1.4 GHz Evaluation Test Fixture**

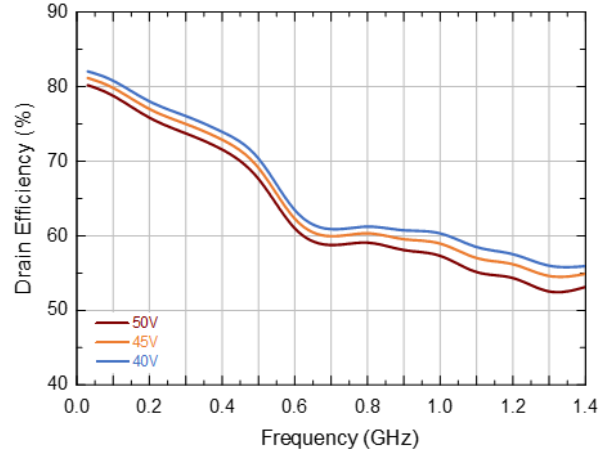
CW,  $P_{IN} = 31$  dBm,  $V_{DS} = 50$  V,  $I_{DQ} = 50$  mA, Frequency = 750 MHz (Unless Otherwise Noted)

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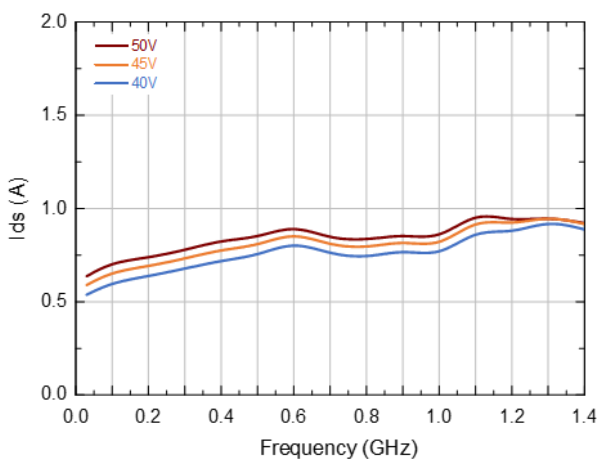
**Output Power vs.  $V_{DS}$  and Frequency**



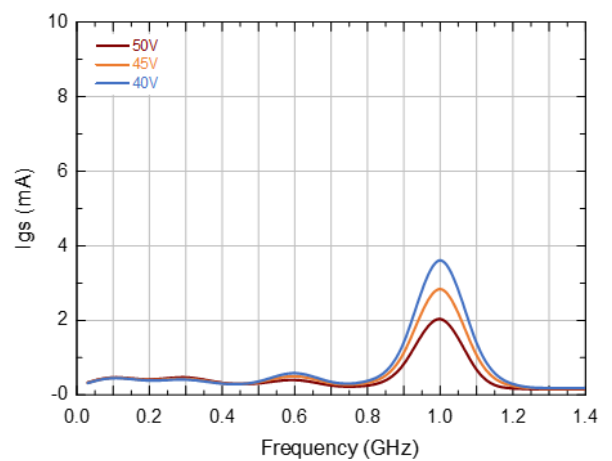
**Drain Efficiency vs.  $V_{DS}$  and Frequency**



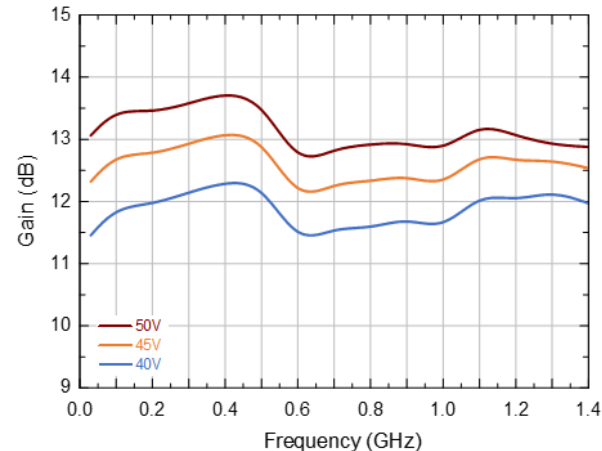
**Drain Current vs.  $V_{DS}$  and Frequency**



**Gate Current vs.  $V_{DS}$  and Frequency**



**Large Signal Gain vs.  $V_{DS}$  and Frequency**

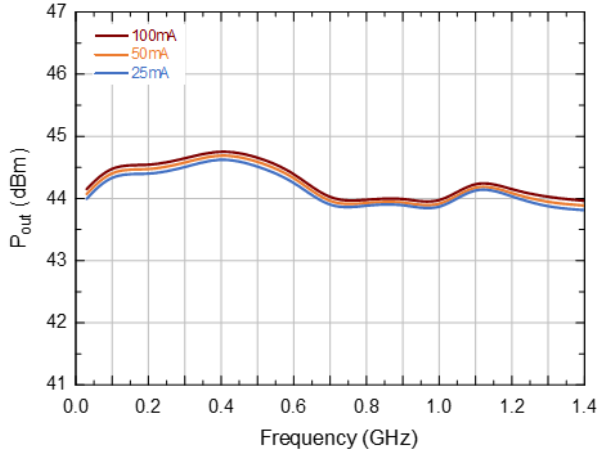


**Typical Performance Curves as Measured in the 0.03 - 1.4 GHz Evaluation Test Fixture**

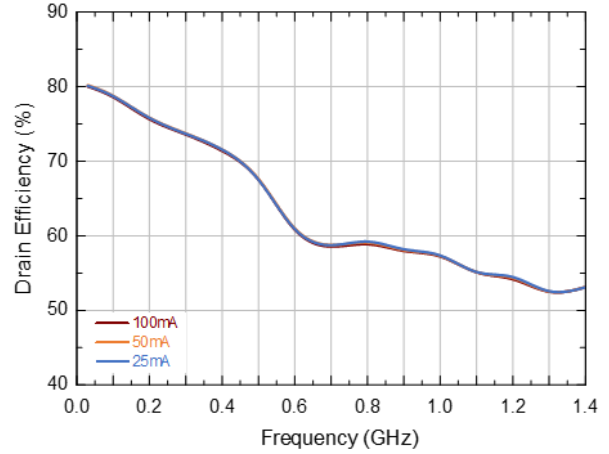
CW,  $P_{IN} = 31$  dBm,  $V_{DS} = 50$  V,  $I_{DQ} = 50$  mA, Frequency = 750 MHz (Unless Otherwise Noted)

For Engineering Evaluation Only – This data does not Modify MACOM's Datasheet Limits.

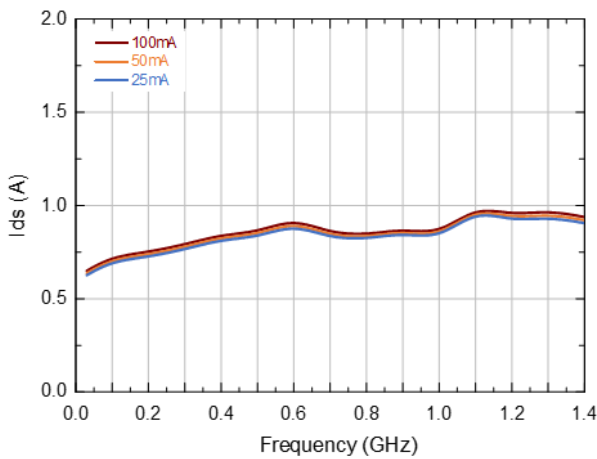
**Output Power vs.  $I_{DQ}$  and Frequency**



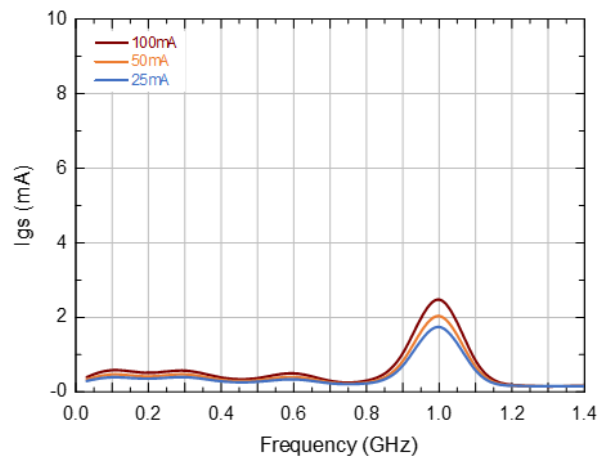
**Drain Efficiency vs.  $I_{DQ}$  and Frequency**



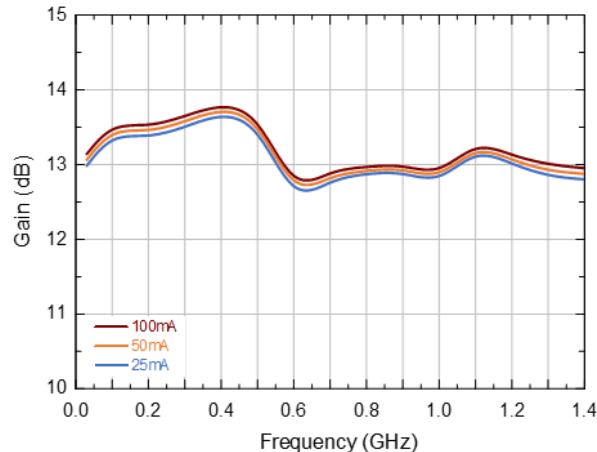
**Drain Current vs.  $I_{DQ}$  and Frequency**



**Gate Current vs.  $I_{DQ}$  and Frequency**



**Large Signal Gain vs.  $I_{DQ}$  and Frequency**

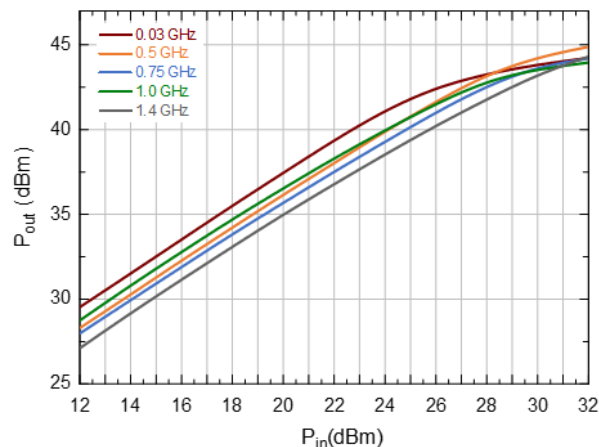


### Typical Performance Curves as Measured in the 0.03 - 1.4 GHz Evaluation Test Fixture

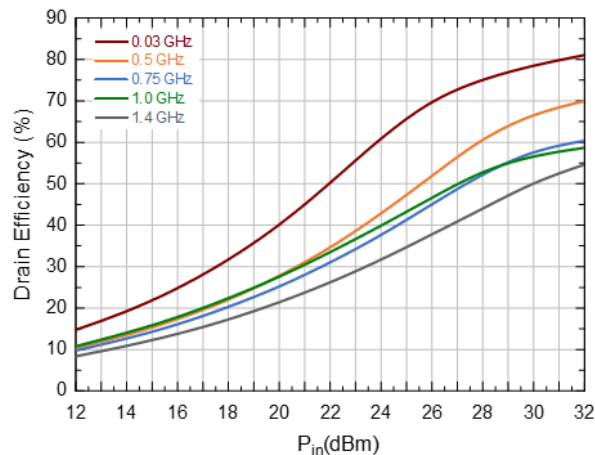
CW,  $P_{IN} = 31$  dBm,  $V_{DS} = 50$  V,  $I_{DQ} = 50$  mA, Frequency = 750 MHz (Unless Otherwise Noted)

For Engineering Evaluation Only – This data does not Modify MACOM's Datasheet Limits.

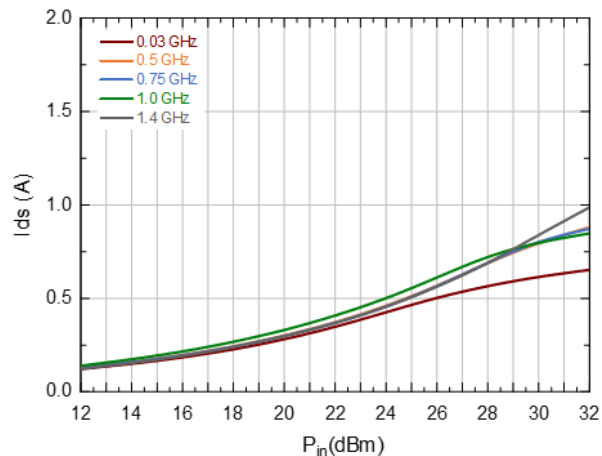
**Output Power vs. Frequency and  $P_{IN}$**



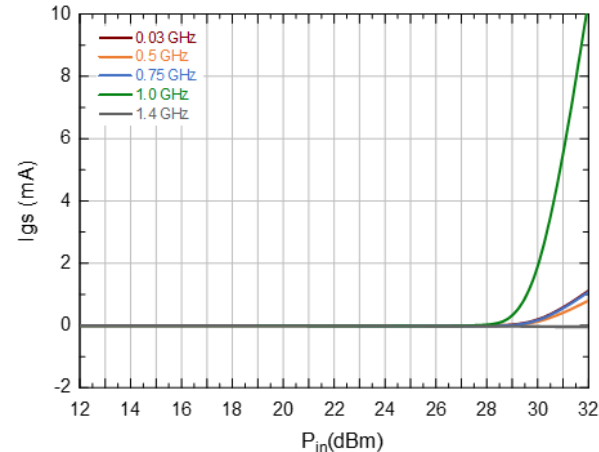
**Drain Efficiency vs. Frequency and  $P_{IN}$**



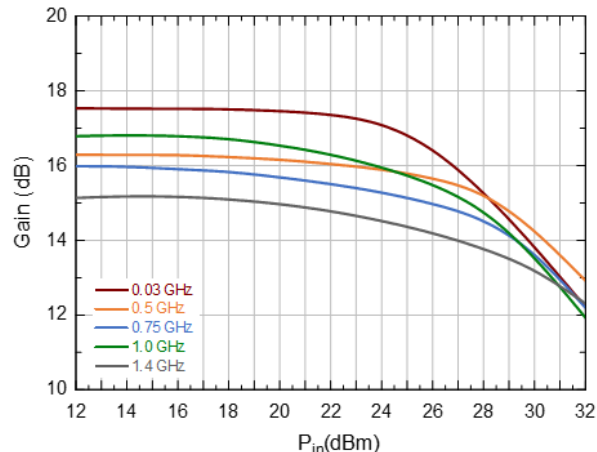
**Drain Current vs. Frequency and  $P_{IN}$**



**Gate Current vs. Frequency and  $P_{IN}$**



**Large Signal Gain vs. Frequency and  $P_{IN}$**



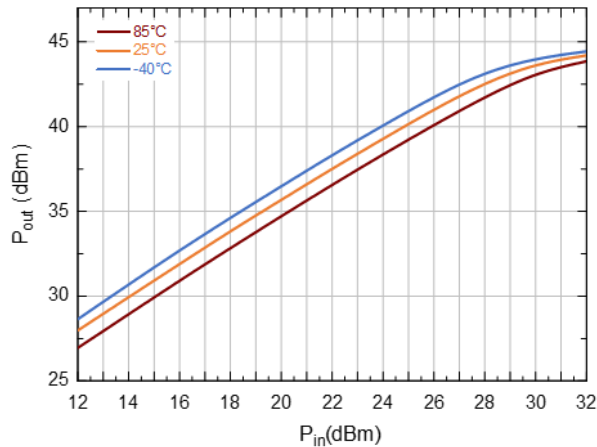


### Typical Performance Curves as Measured in the 0.03 - 1.4 GHz Evaluation Test Fixture

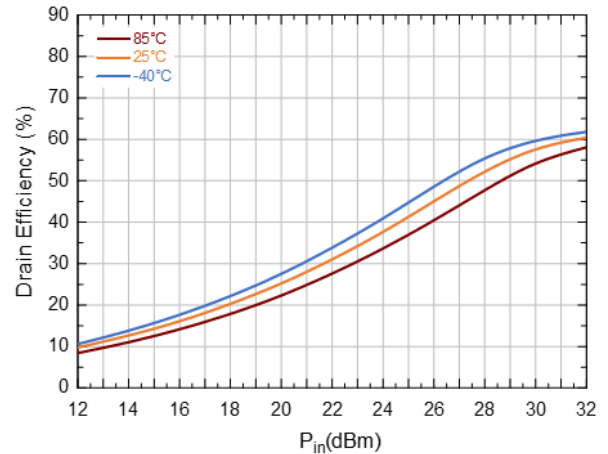
CW,  $P_{IN} = 31$  dBm,  $V_{DS} = 50$  V,  $I_{DQ} = 50$  mA, Frequency = 750 MHz (Unless Otherwise Noted)

For Engineering Evaluation Only – This data does not Modify MACOM's Datasheet Limits.

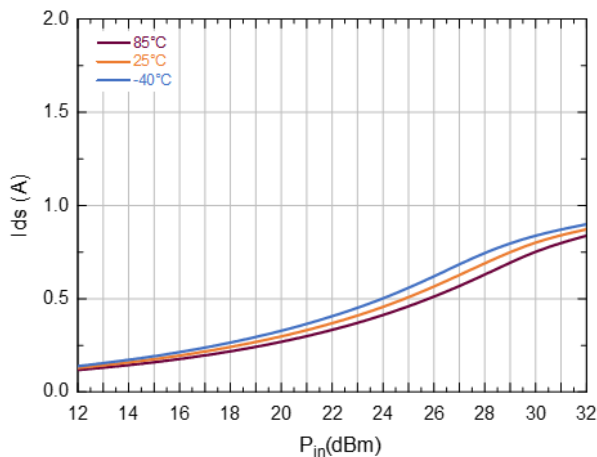
**Output Power vs. Temperature and  $P_{IN}$**



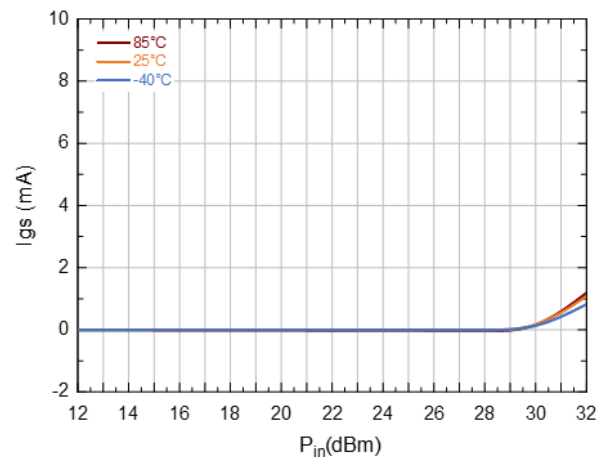
**Drain Efficiency vs. Temperature and  $P_{IN}$**



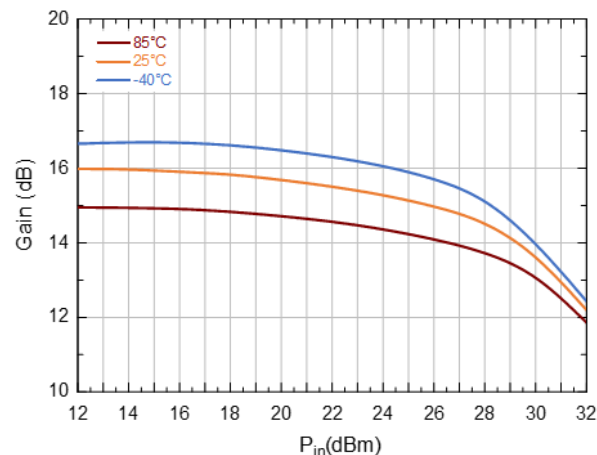
**Drain Current vs. Temperature and  $P_{IN}$**



**Gate Current vs. Temperature and  $P_{IN}$**



**Large Signal Gain vs. Temperature and  $P_{IN}$**

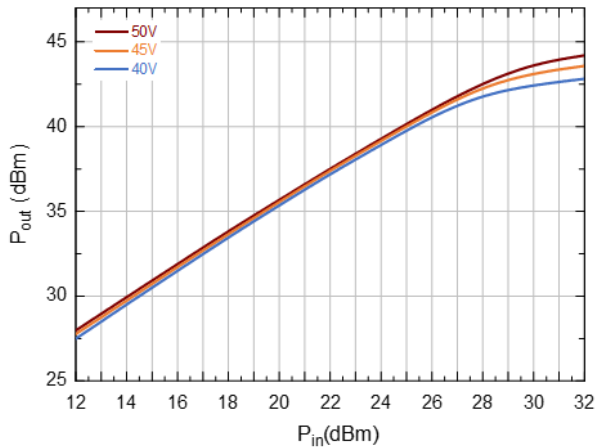


## Typical Performance Curves as Measured in the 0.03 - 1.4 GHz Evaluation Test Fixture

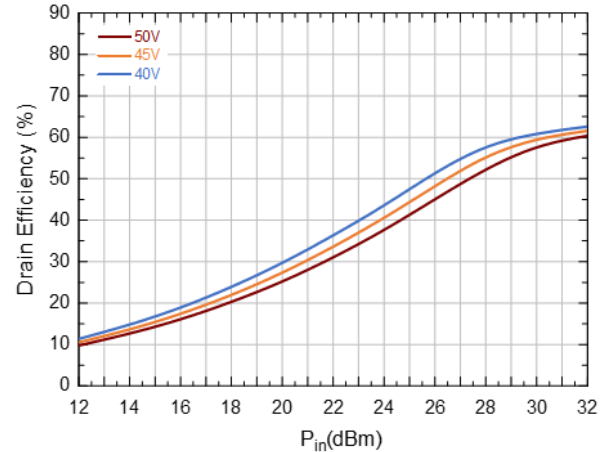
CW,  $P_{IN} = 31$  dBm,  $V_{DS} = 50$  V,  $I_{DQ} = 50$  mA, Frequency = 750 MHz (Unless Otherwise Noted)

For Engineering Evaluation Only – This data does not Modify MACOM's Datasheet Limits.

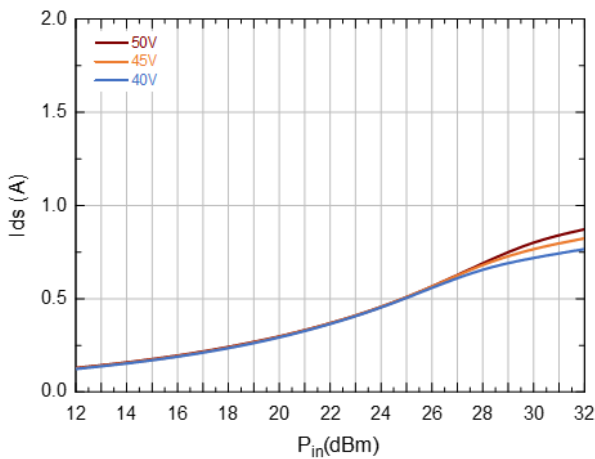
**Output Power vs.  $V_{DS}$  and  $P_{IN}$**



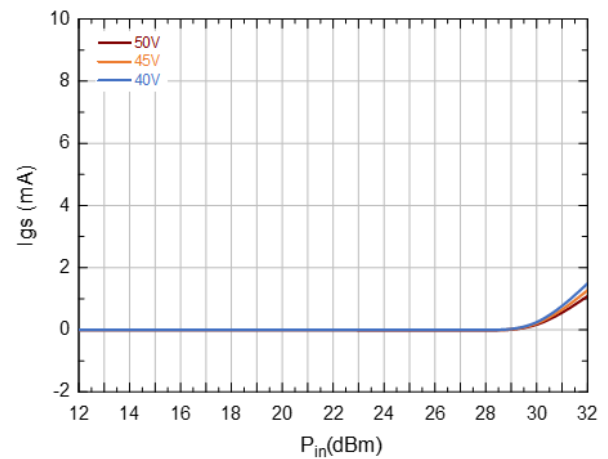
**Drain Efficiency vs.  $V_{DS}$  and  $P_{IN}$**



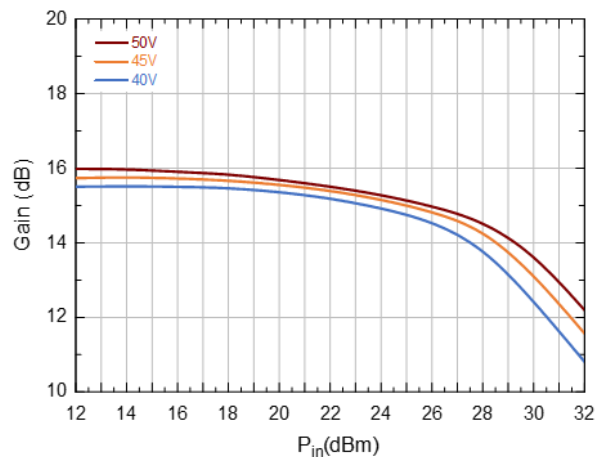
**Drain Current vs.  $V_{DS}$  and  $P_{IN}$**



**Gate Current vs.  $V_{DS}$  and  $P_{IN}$**



**Large Signal Gain vs.  $V_{DS}$  and  $P_{IN}$**

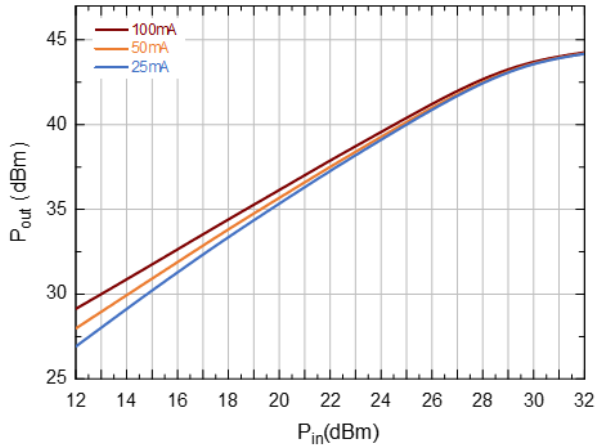


**Typical Performance Curves as Measured in the 0.03 - 1.4 GHz Evaluation Test Fixture**

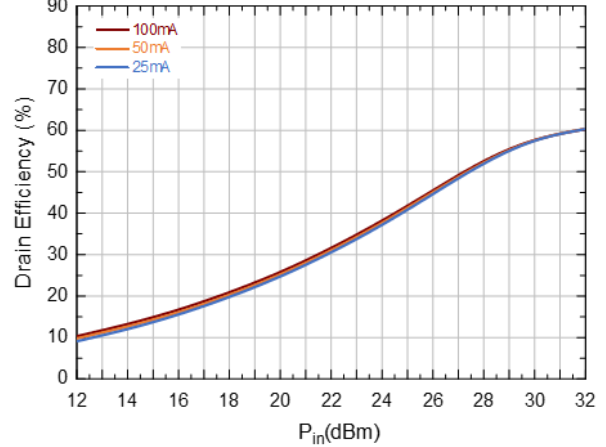
CW,  $P_{IN} = 31$  dBm,  $V_{DS} = 50$  V,  $I_{DQ} = 50$  mA, Frequency = 750 MHz (Unless Otherwise Noted)

For Engineering Evaluation Only – This data does not Modify MACOM's Datasheet Limits.

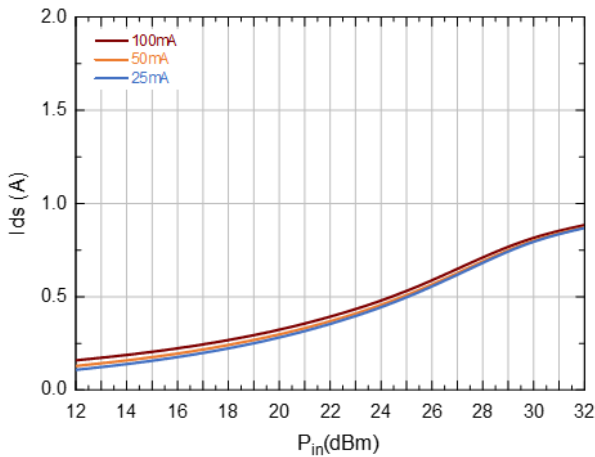
**Output Power vs.  $I_{DQ}$  and  $P_{IN}$**



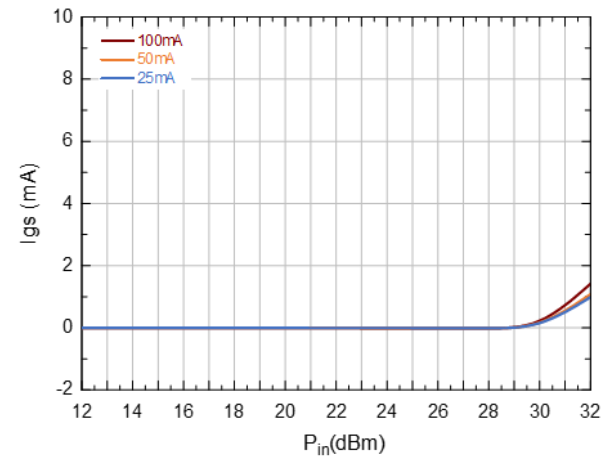
**Drain Efficiency vs.  $I_{DQ}$  and  $P_{IN}$**



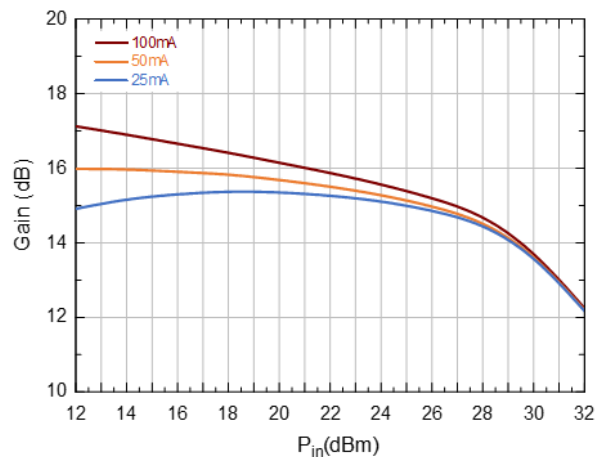
**Drain Current vs.  $I_{DQ}$  and  $P_{IN}$**



**Gate Current vs.  $I_{DQ}$  and  $P_{IN}$**



**Large Signal Gain vs.  $I_{DQ}$  and  $P_{IN}$**

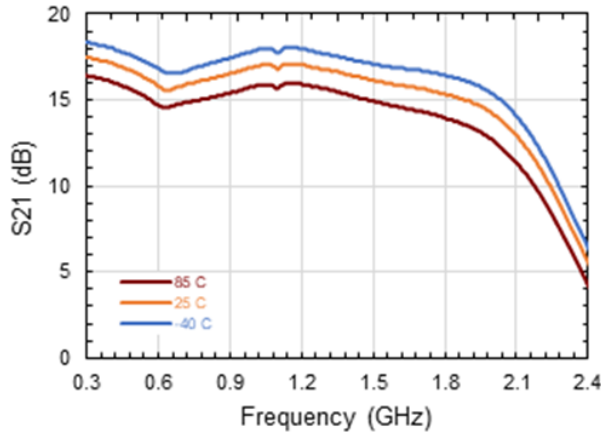


**Typical Performance Curves as Measured in the 0.03 - 1.4 GHz Evaluation Test Fixture:**

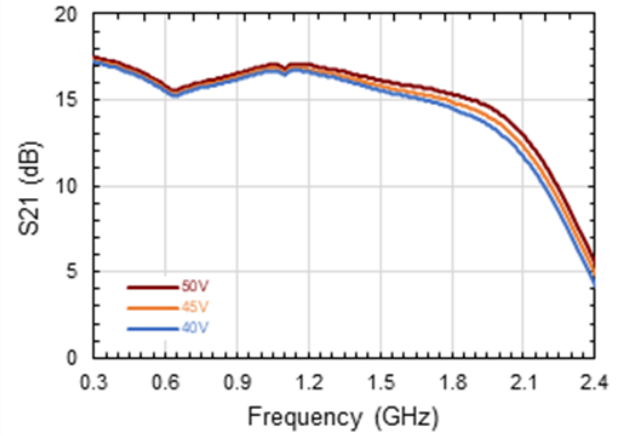
CW,  $V_{DS} = 50$  V,  $I_{DQ} = 50$  mA,  $P_{in} = -10$  dBm (Unless Otherwise Noted)

For Engineering Evaluation Only—This data does not Modify MACOM's Datasheet Limits.

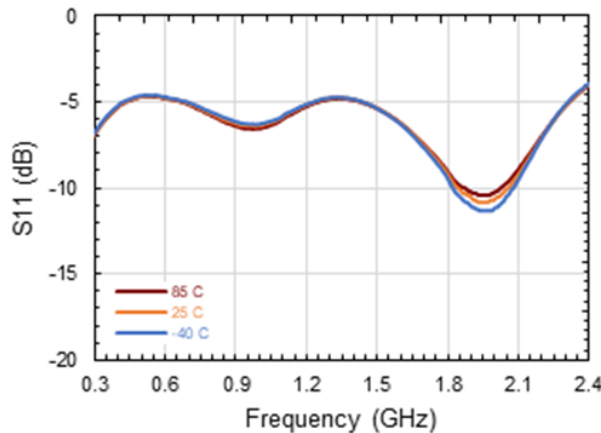
**S21 vs Frequency and Temperature**



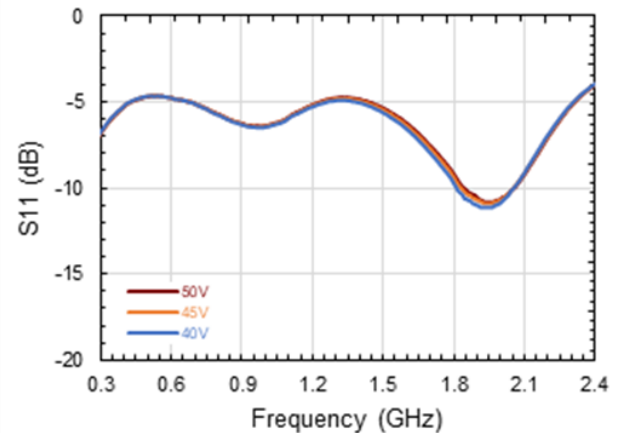
**S21 vs Frequency and  $V_{DS}$**



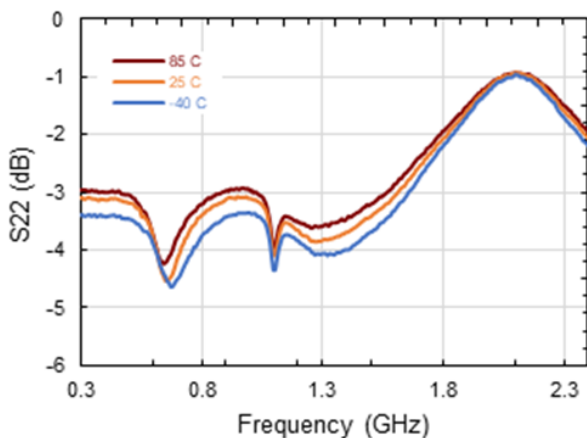
**S11 vs Frequency and Temperature**



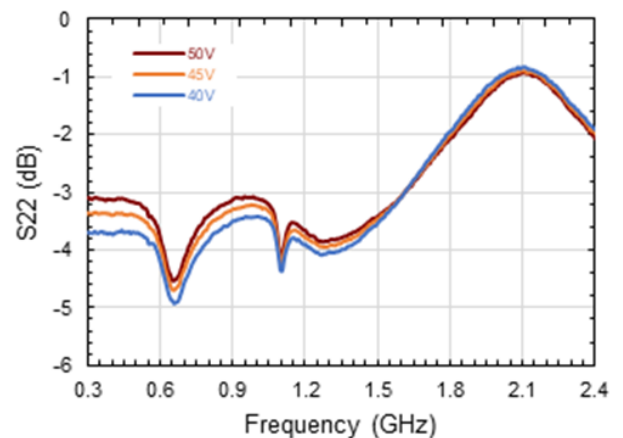
**S11 vs Frequency and  $V_{DS}$**



**S22 vs Frequency and Temperature**



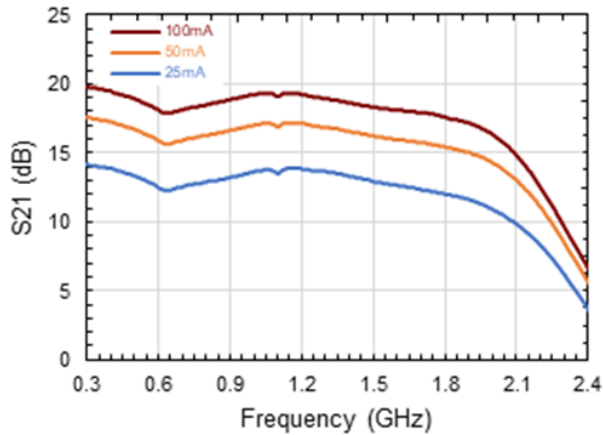
**S22 vs Frequency and  $V_{DS}$**



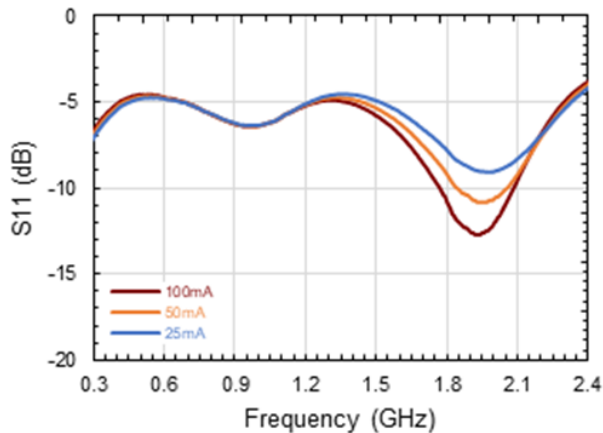
**Typical Performance Curves as Measured in the 0.03 - 1.4 GHz Evaluation Test Fixture:**

CW,  $V_{DS} = 50\text{ V}$ ,  $I_{DQ} = 50\text{ mA}$ ,  $P_{in} = -10\text{ dBm}$  (Unless Otherwise Noted)  
For Engineering Evaluation Only—This data does not Modify MACOM's Datasheet Limits.

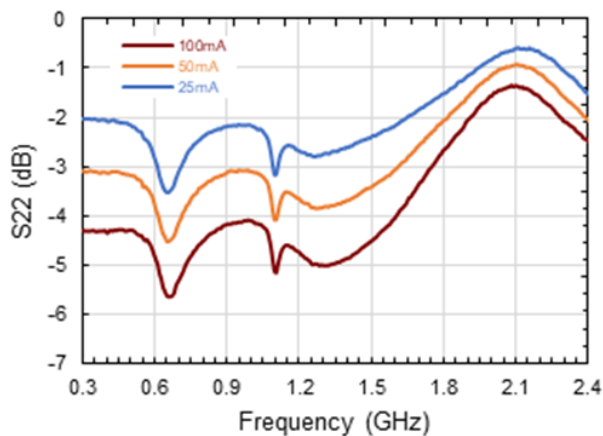
**S21 vs Frequency and  $I_{DQ}$**



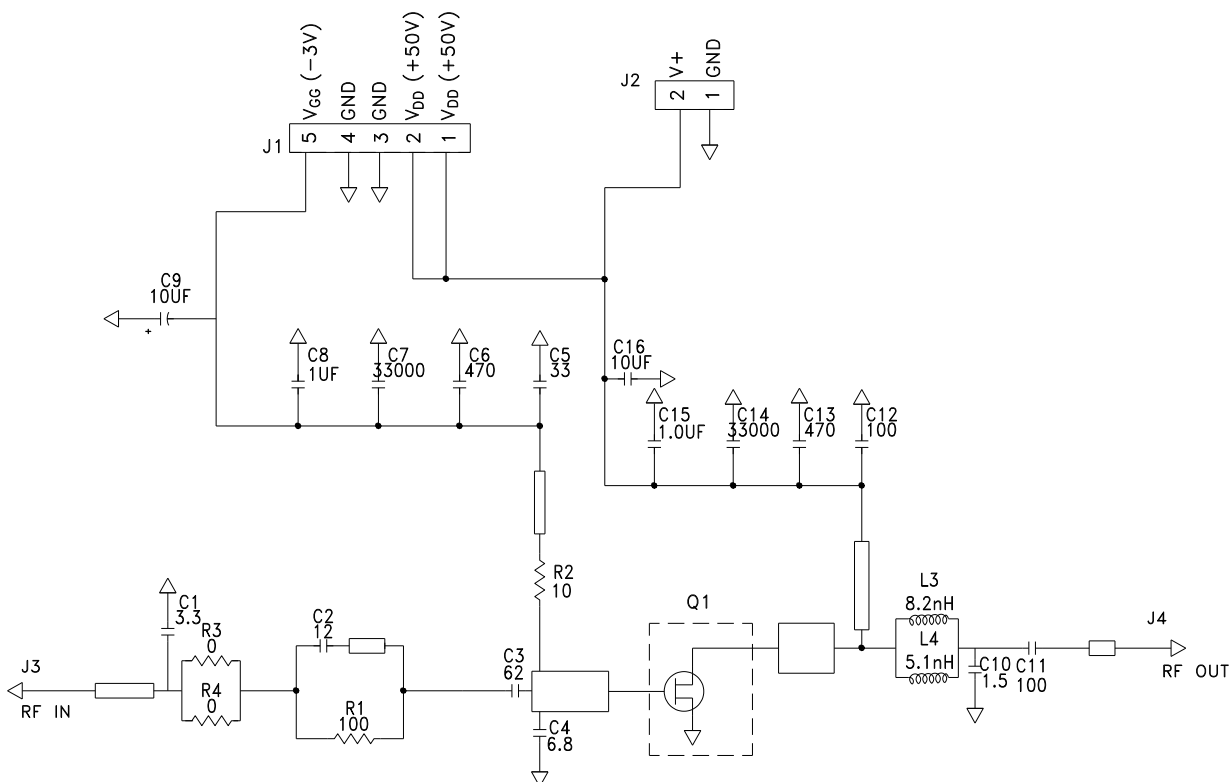
**S11 vs Frequency and  $I_{DQ}$**



**S22 vs Frequency and  $I_{DQ}$**



**Evaluation Test Fixture and Recommended Tuning Solution, 1.2 - 1.4 GHz**



**Description**

Parts measured on evaluation board (20-mil thick RT/duroid 6035). Matching is provided using a combination of lumped elements and transmission lines as shown in the simplified schematic above. Recommended tuning solution component placement, transmission lines, and details are shown on the next page.

**Biasing Sequence**

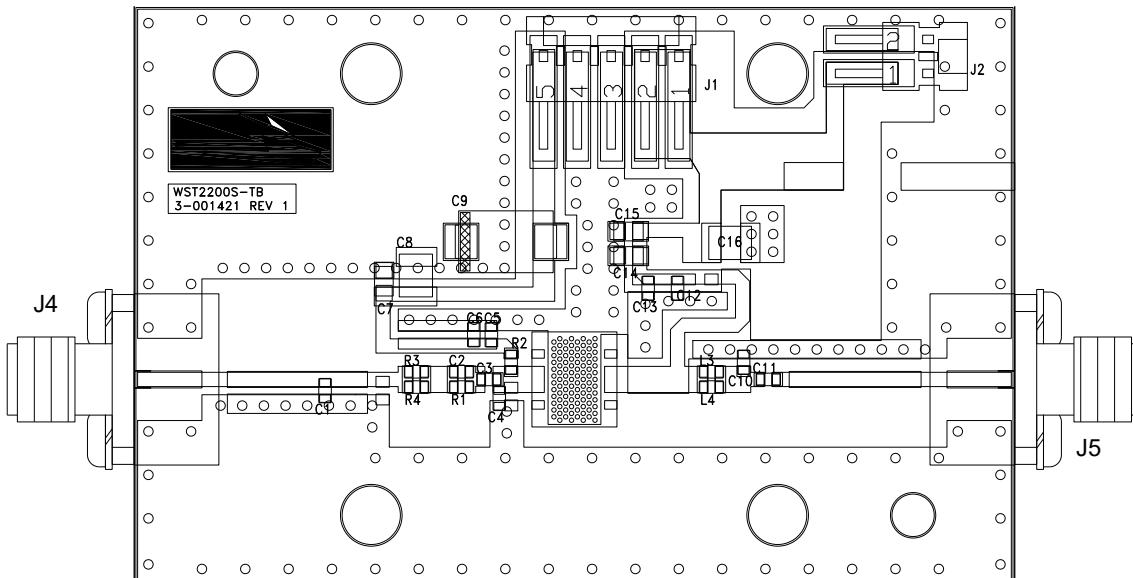
**Bias ON**

1. Ensure RF is turned off
2. Apply pinch-off voltage of -5 V to the gate
3. Apply nominal drain voltage
4. Bias gate to desired quiescent drain current
5. Apply RF

**Bias OFF**

1. Turn RF off
2. Apply pinch-off voltage of -5 V to the gate
3. Turn-off drain voltage
4. Turn-off gate voltage

**Evaluation Test Fixture and Recommended Tuning Solution, 1.2 - 1.4 GHz**



**Assembly Parts List**

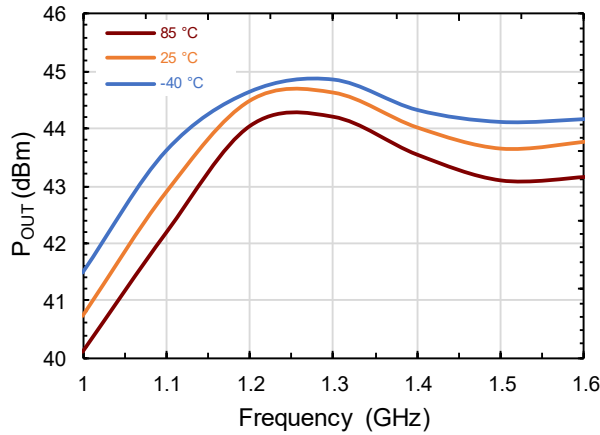
Reference Designator	Description	Manufacturer	Part Number
C1	CAP, 3.3 pF, 0603 ATC 600S	AVX	600S3R3BT250XT
C2	CAP, 12 pF, 0603, ATC 600S	AVX	600S120JT250XT
C3	CAP, 62 pF, 0603, ATC 600S	AVX	600S620JT250XT
C4	CAP, 6.8 pF, 0603, ATC 600S	AVX	600S6R8BT250XT
C5	CAP, 33 pF, 0603, ATC 600S	AVX	600S330FW250XT
C6, C13	CAP, 470pF, 0603, 100V	Murata	GCM1885C2A471JA16
C7, C14	CAP, 0.033 μF, 0805, 100V	Murata	GRM21BR72A333KA01
C8	CAP, 1uF, 1210, 63V	Murata	GRM32ER72A105KA01
C9	CAP, 10 μF, 16V., TANTALUM	AVX	TRJC106M016RRJ
C10	CAP, 1.5 pF 0603, ATC 600S	AVX	600S1R5BT250XT
C11, C12	CAP, 100 pF 0603, ATC 600S	AVX	600S101FT250XT
C15	CAP, 1 μF 0805, 100V	Murata	GCM21BC72A105KE36
C16	CAP, 10 μF 1210, 100V	Murata	GRM32EC72A106KE05
L3	IND, 8.2 nH 0603	Coilcraft	0603CT-8N2XGRW
L4	IND, 5.1 nH 0603	Coilcraft	0603CS-5N1XGLU
R1	RES, 100 Ω 0603, 1/10W	Yageo	RC0603JR-07100RL
R2	RES, 10 Ω 0603, 1/16W	Yageo	RC0603FR-0710RL
R3, R4	RES, 0 Ω 0402	Panasonic	ERJ-2GE0R00X
PCB	PCB, MAPC-A1002, RT/duroid 6035, 0.020, 1.2-1.4 GHz		
J1	5 PIN HEADER	AMP	640457-5
J2	2 PIN HEADER	AMP	640457-2
J3, J4	SMA CONNECTOR	AMPHENOL	132150
Q1	MAPC-A1002-AD		MAPC-A1002-AD

**Typical Performance Curves as Measured in the 1.2 - 1.4 GHz Evaluation Test Fixture**

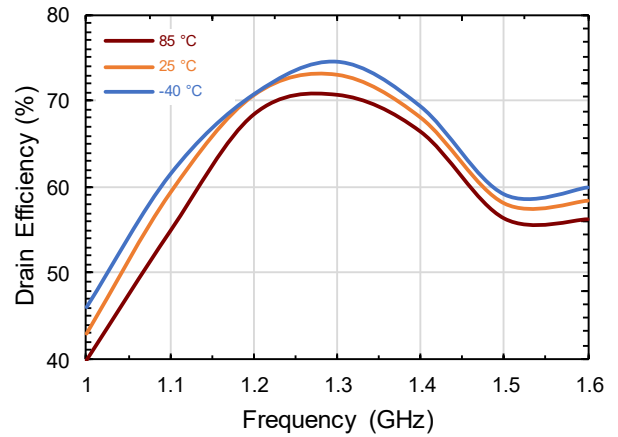
CW,  $P_{IN} = 28.5$  dBm,  $V_{DS} = 50$  V,  $I_{DQ} = 50$  mA, Frequency = 1.3 GHz (Unless Otherwise Noted)

For Engineering Evaluation Only – This data does not Modify MACOM's Datasheet Limits.

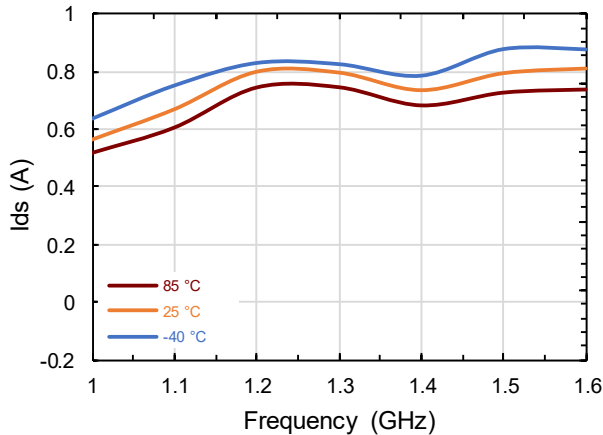
**Output Power vs. Temperature and Frequency**



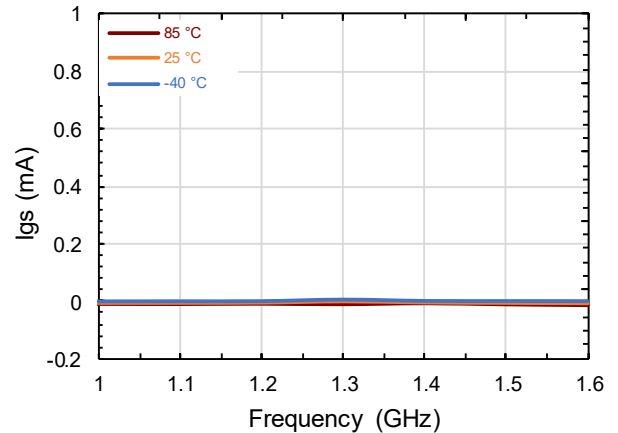
**Drain Efficiency vs. Temperature and Frequency**



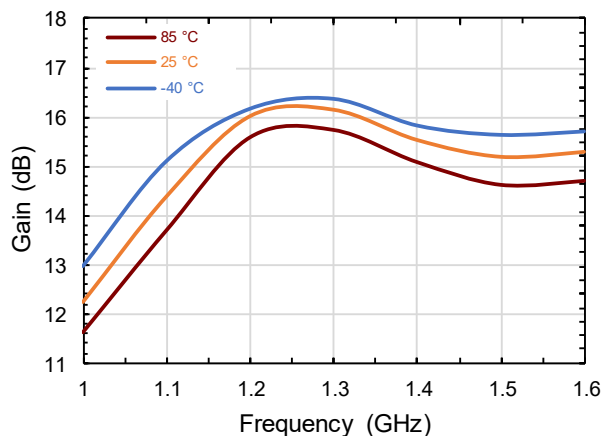
**Drain Current vs. Temperature and Frequency**



**Gate Current vs. Temperature and Frequency**



**Large Signal Gain vs. Temperature and Frequency**



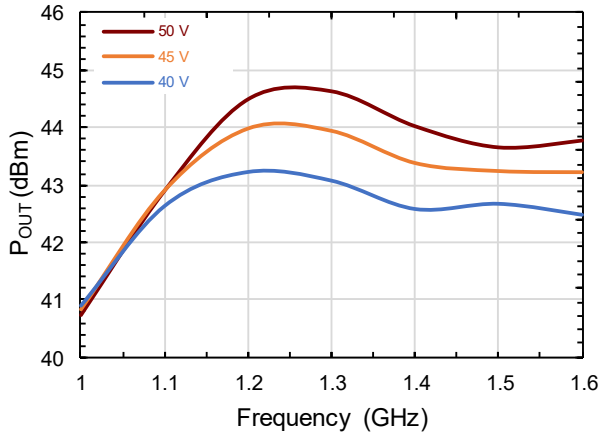


**Typical Performance Curves as Measured in the 1.2 - 1.4 GHz Evaluation Test Fixture**

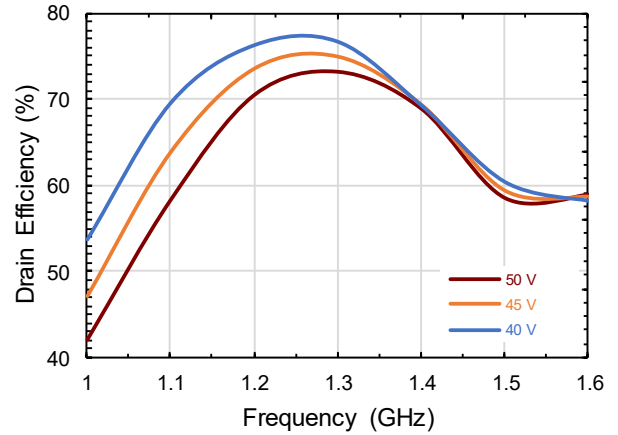
CW,  $P_{IN} = 28.5$  dBm,  $V_{DS} = 50$  V,  $I_{DQ} = 50$  mA, Frequency = 1.3 GHz (Unless Otherwise Noted)

For Engineering Evaluation Only – This data does not Modify MACOM's Datasheet Limits.

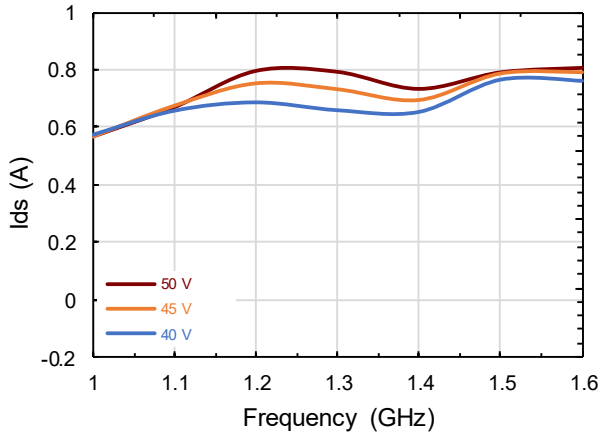
**Output Power vs.  $V_{DS}$  and Frequency**



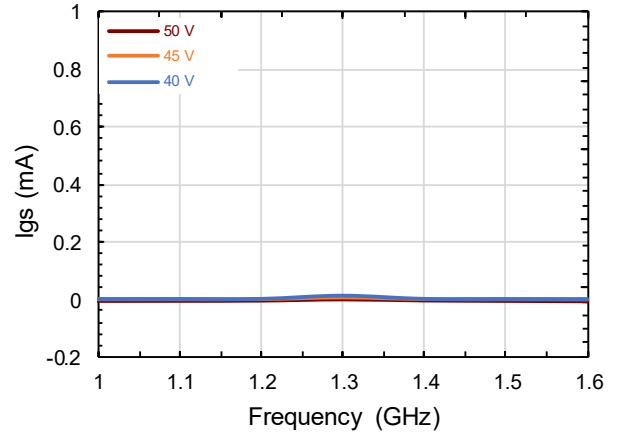
**Drain Efficiency vs.  $V_{DS}$  and Frequency**



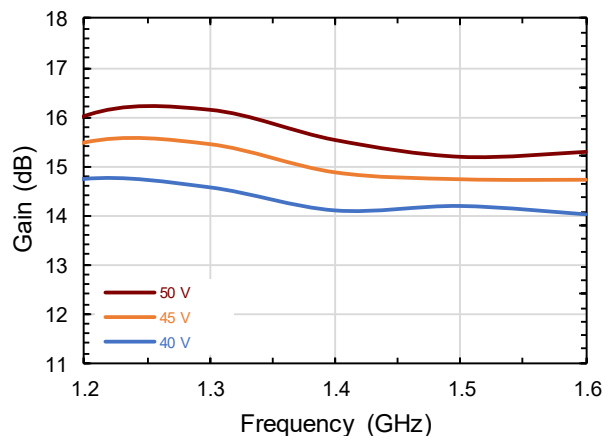
**Drain Current vs.  $V_{DS}$  and Frequency**



**Gate Current vs.  $V_{DS}$  and Frequency**



**Large Signal Gain vs.  $V_{DS}$  and Frequency**

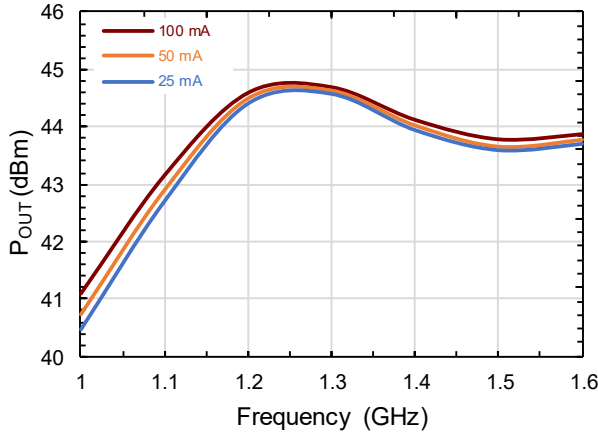


**Typical Performance Curves as Measured in the 1.2 - 1.4 GHz Evaluation Test Fixture**

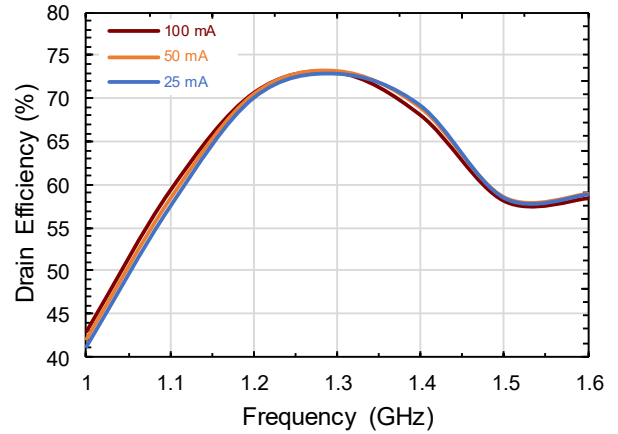
CW,  $P_{IN} = 28.5$  dBm,  $V_{DS} = 50$  V,  $I_{DQ} = 50$  mA, Frequency = 1.3 GHz (Unless Otherwise Noted)

For Engineering Evaluation Only – This data does not Modify MACOM's Datasheet Limits.

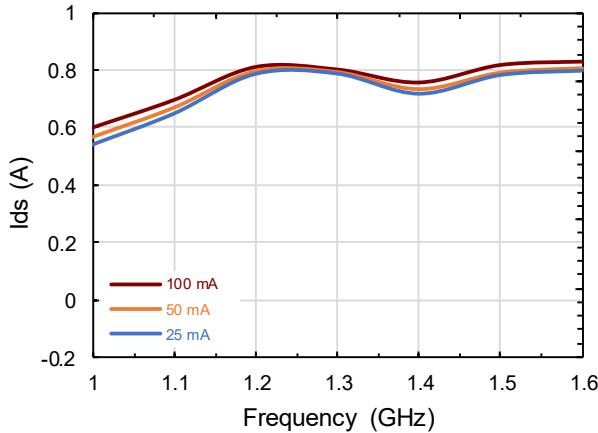
**Output Power vs.  $I_{DQ}$  and Frequency**



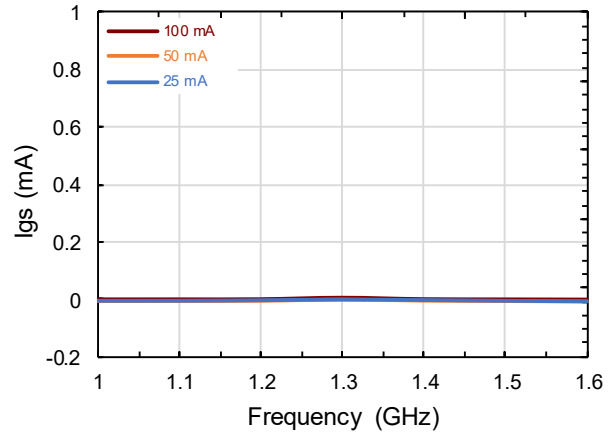
**Drain Efficiency vs.  $I_{DQ}$  and Frequency**



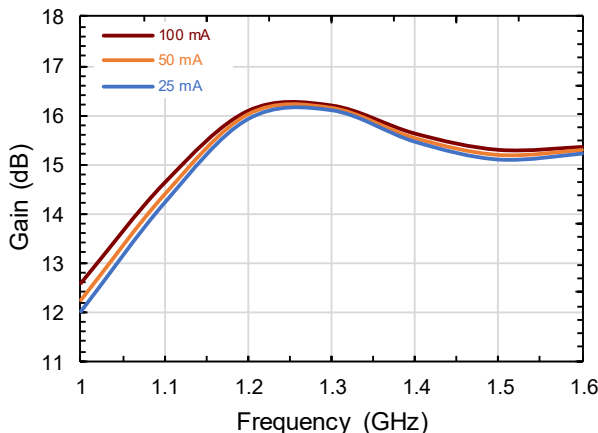
**Drain Current vs.  $I_{DQ}$  and Frequency**



**Gate Current vs.  $I_{DQ}$  and Frequency**



**Large Signal Gain vs.  $I_{DQ}$  and Frequency**

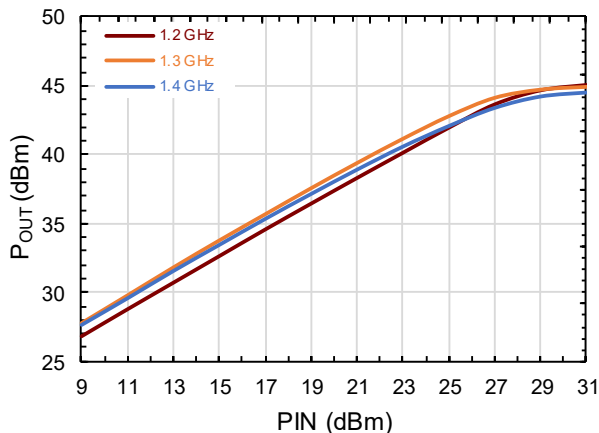


**Typical Performance Curves as Measured in the 1.2 - 1.4 GHz Evaluation Test Fixture**

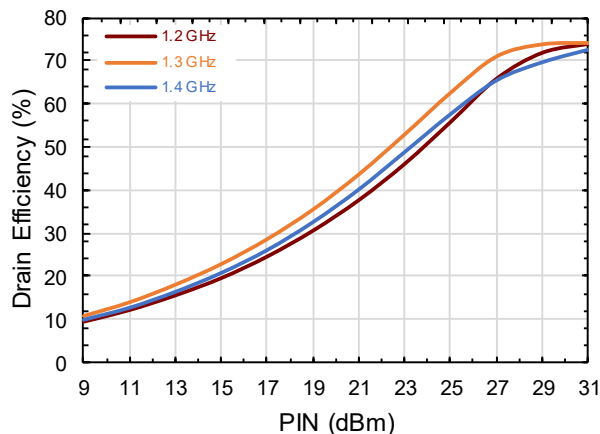
CW,  $P_{IN} = 28.5 \text{ dBm}$ ,  $V_{DS} = 50 \text{ V}$ ,  $I_{DQ} = 50 \text{ mA}$ , Frequency = 1.3 GHz (Unless Otherwise Noted)

For Engineering Evaluation Only – This data does not Modify MACOM's Datasheet Limits.

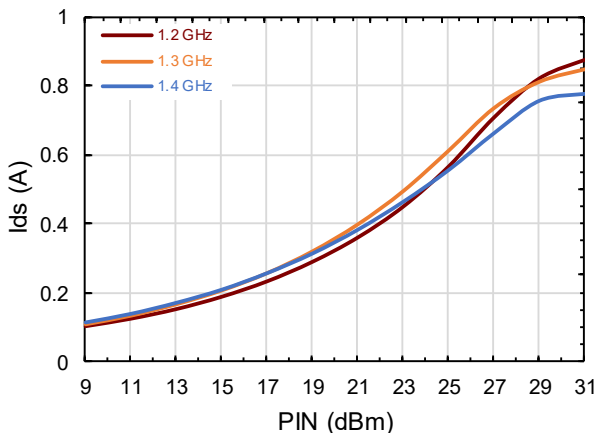
**Output Power vs. Frequency and  $P_{IN}$**



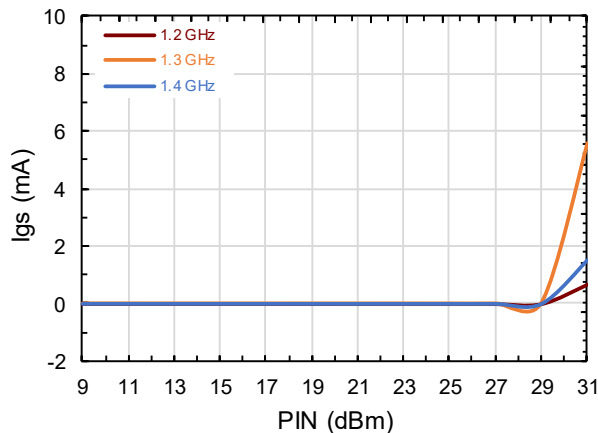
**Drain Efficiency vs. Frequency and  $P_{IN}$**



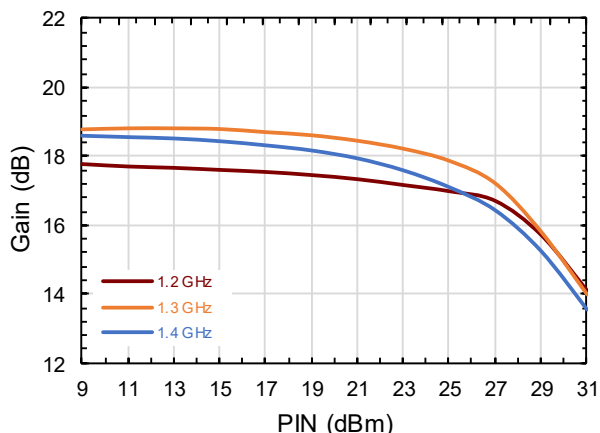
**Drain Current vs. Frequency and  $P_{IN}$**



**Gate Current vs. Frequency and  $P_{IN}$**



**Large Signal Gain vs. Frequency and  $P_{IN}$**

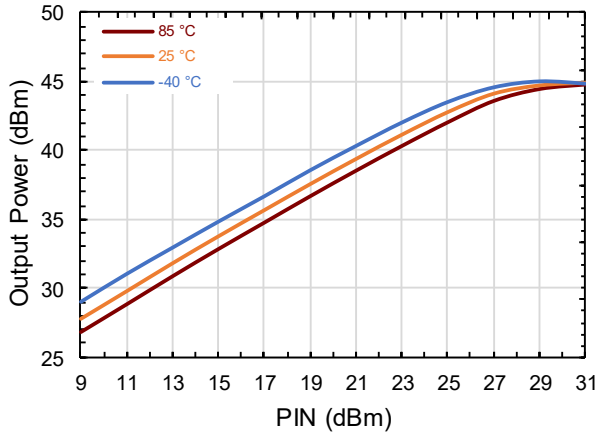


**Typical Performance Curves as Measured in the 1.2 - 1.4 GHz Evaluation Test Fixture**

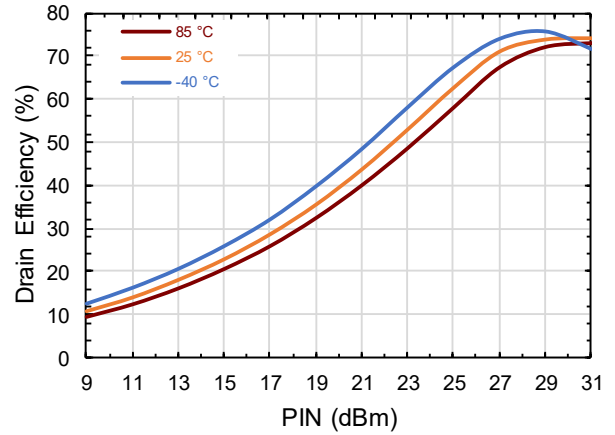
CW,  $P_{IN} = 28.5 \text{ dBm}$ ,  $V_{DS} = 50 \text{ V}$ ,  $I_{DQ} = 50 \text{ mA}$ , Frequency = 1.3 GHz (Unless Otherwise Noted)

For Engineering Evaluation Only – This data does not Modify MACOM's Datasheet Limits.

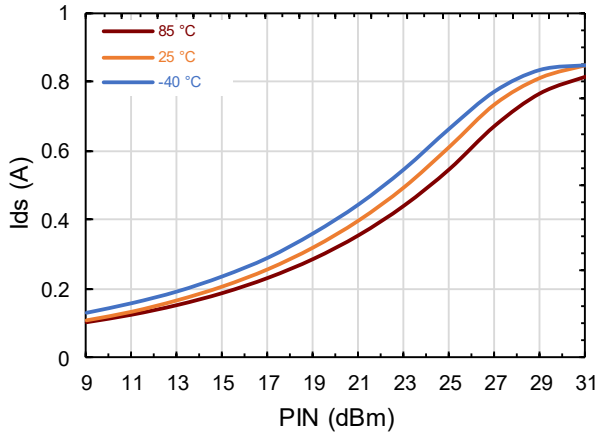
**Output Power vs. Temperature and  $P_{IN}$**



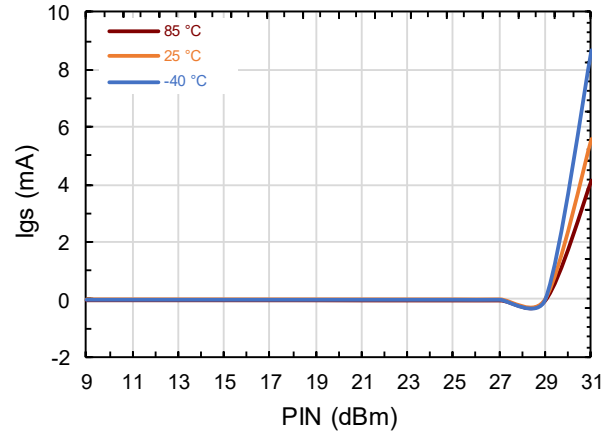
**Drain Efficiency vs. Temperature and  $P_{IN}$**



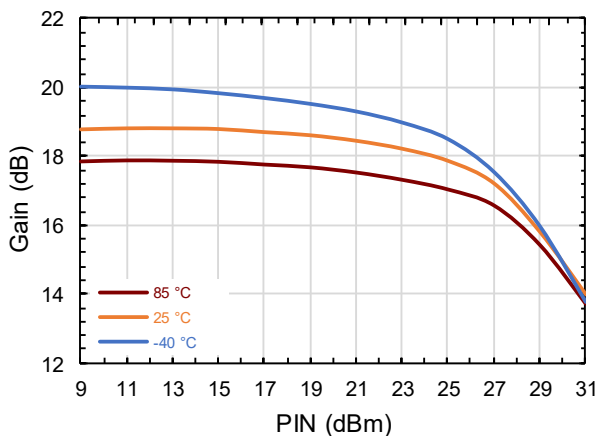
**Drain Current vs. Temperature and  $P_{IN}$**



**Gate Current vs. Temperature and  $P_{IN}$**



**Large Signal Gain vs. Temperature and  $P_{IN}$**

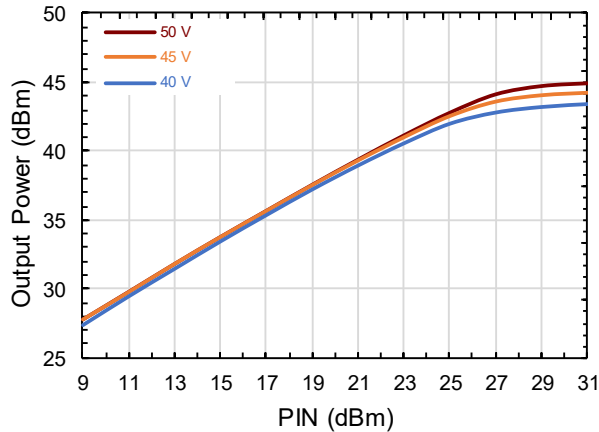


**Typical Performance Curves as Measured in the 1.2 - 1.4 GHz Evaluation Test Fixture**

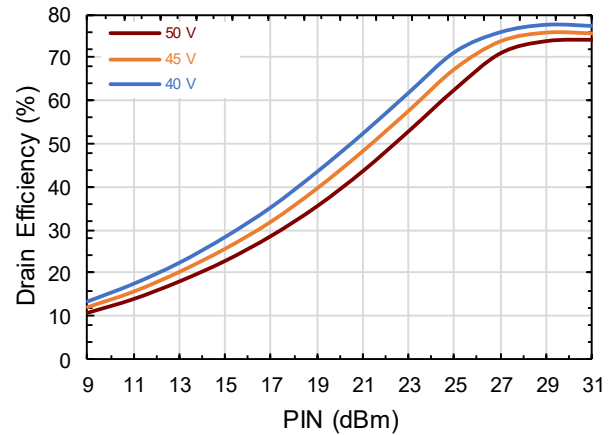
CW,  $P_{IN} = 28.5 \text{ dBm}$ ,  $V_{DS} = 50 \text{ V}$ ,  $I_{DQ} = 50 \text{ mA}$ , Frequency = 1.3 GHz (Unless Otherwise Noted)

For Engineering Evaluation Only – This data does not Modify MACOM's Datasheet Limits.

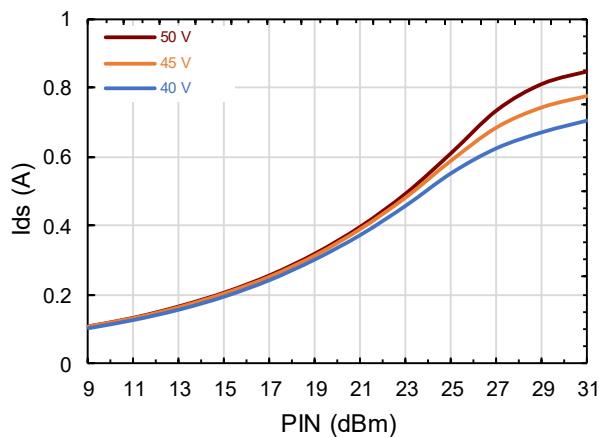
**Output Power vs.  $V_{DS}$  and  $P_{IN}$**



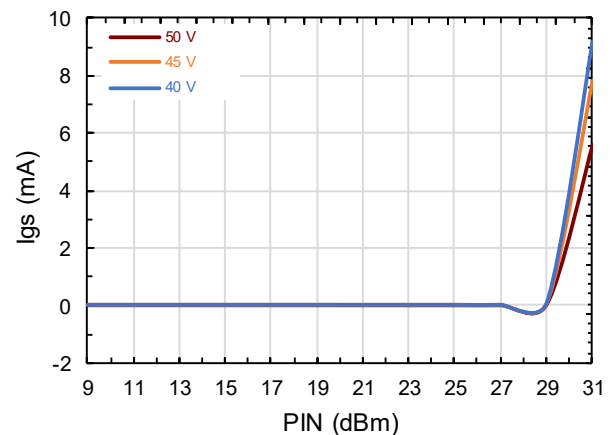
**Drain Efficiency vs.  $V_{DS}$  and  $P_{IN}$**



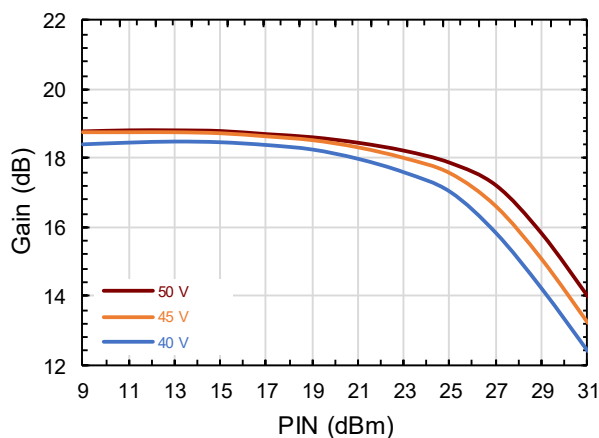
**Drain Current vs.  $V_{DS}$  and  $P_{IN}$**



**Gate Current vs.  $V_{DS}$  and  $P_{IN}$**



**Large Signal Gain vs.  $V_{DS}$  and  $P_{IN}$**

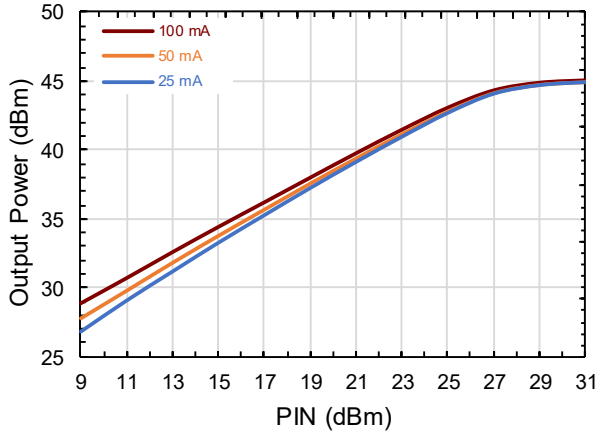


**Typical Performance Curves as Measured in the 1.2 - 1.4 GHz Evaluation Test Fixture**

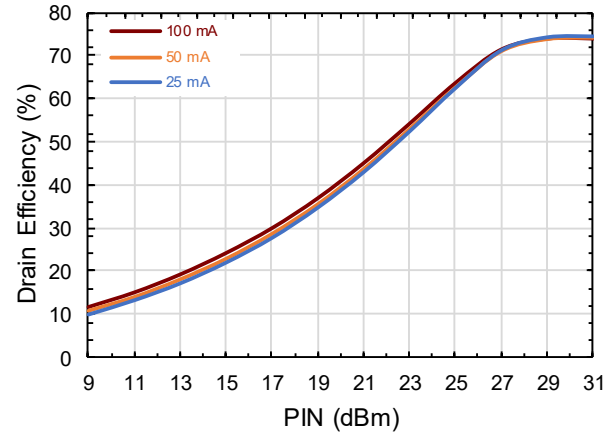
CW,  $P_{IN} = 28.5 \text{ dBm}$ ,  $V_{DS} = 50 \text{ V}$ ,  $I_{DQ} = 50 \text{ mA}$ , Frequency = 1.3 GHz (Unless Otherwise Noted)

For Engineering Evaluation Only – This data does not Modify MACOM's Datasheet Limits.

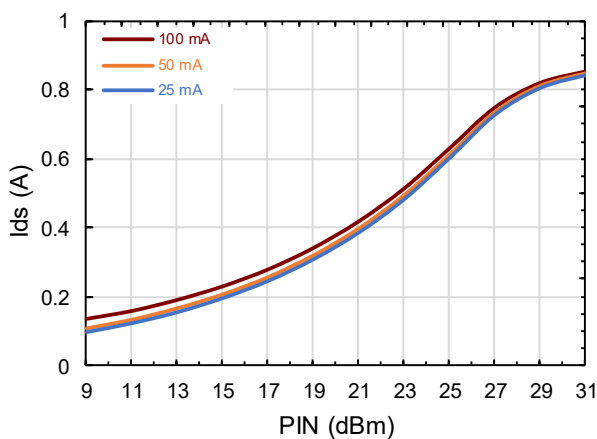
**Output Power vs.  $I_{DQ}$  and  $P_{IN}$**



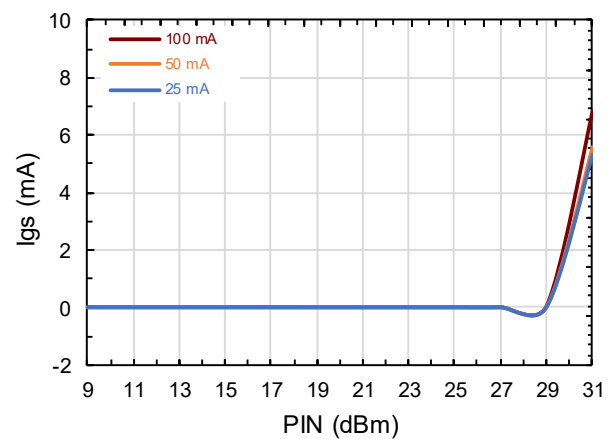
**Drain Efficiency vs.  $I_{DQ}$  and  $P_{IN}$**



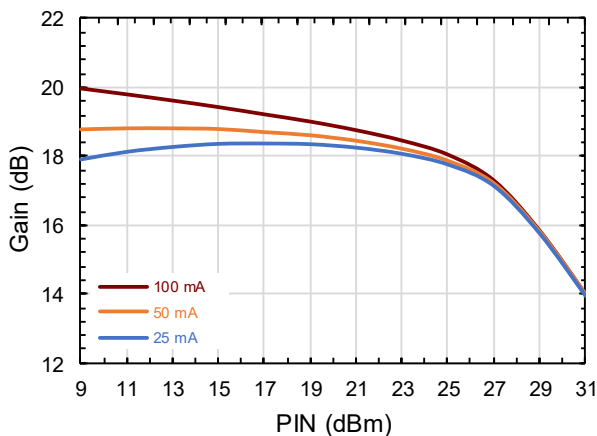
**Drain Current vs.  $I_{DQ}$  and  $P_{IN}$**



**Gate Current vs.  $I_{DQ}$  and  $P_{IN}$**



**Large Signal Gain vs.  $I_{DQ}$  and  $P_{IN}$**

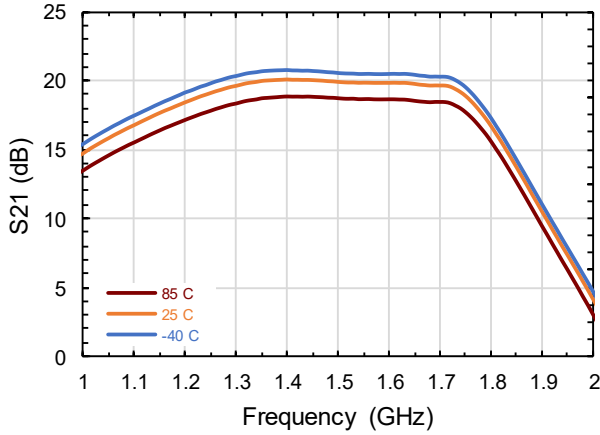


**Typical Performance Curves as Measured in the 1.2 - 1.4 GHz Evaluation Test Fixture:**

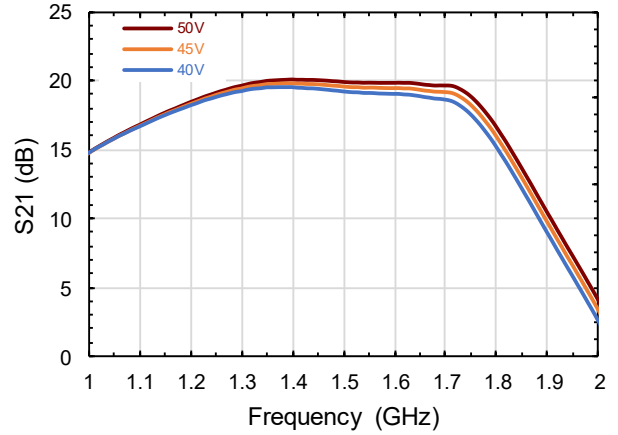
CW,  $V_{DS} = 50\text{ V}$ ,  $I_{DQ} = 50\text{ mA}$ ,  $P_{in} = -10\text{ dBm}$  (Unless Otherwise Noted)

For Engineering Evaluation Only—This data does not Modify MACOM's Datasheet Limits.

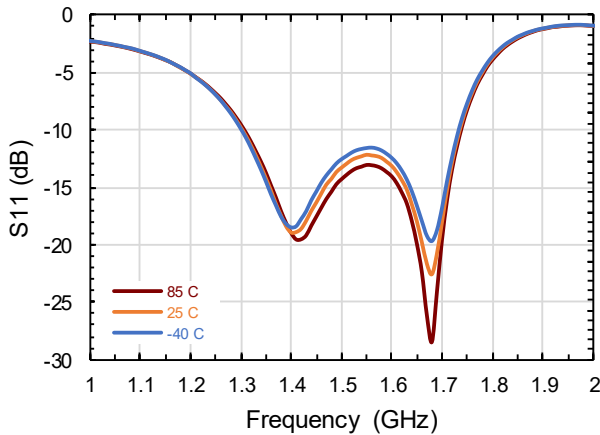
**S21 vs Frequency and Temperature**



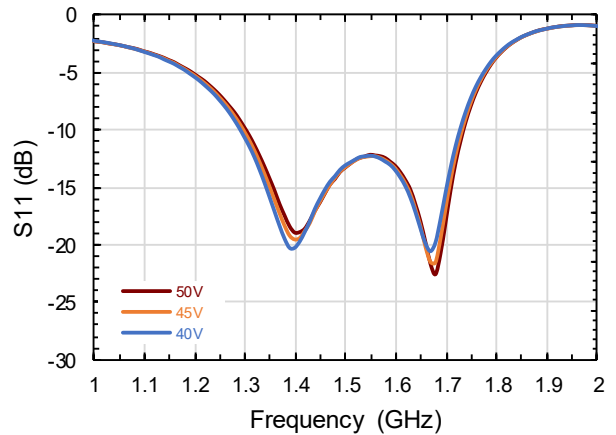
**S21 vs Frequency and  $V_{DS}$**



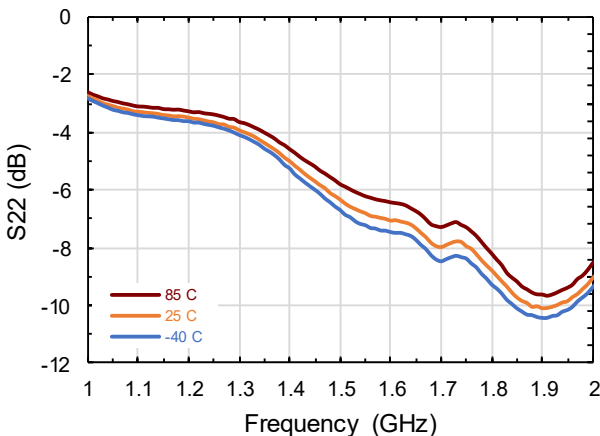
**S11 vs Frequency and Temperature**



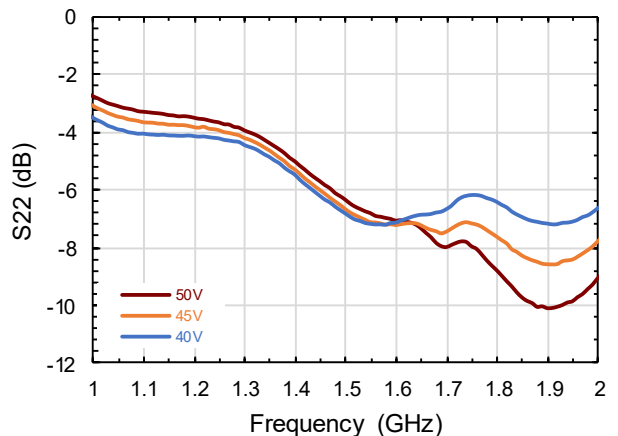
**S11 vs Frequency and  $V_{DS}$**



**S22 vs Frequency and Temperature**



**S22 vs Frequency and  $V_{DS}$**

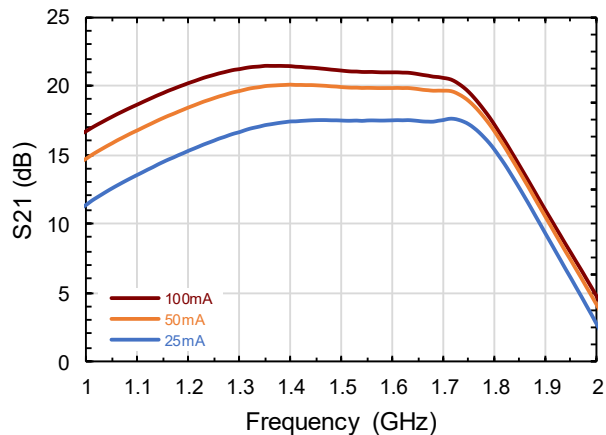


**Typical Performance Curves as Measured in the 1.2 - 1.4 GHz Evaluation Test Fixture:**

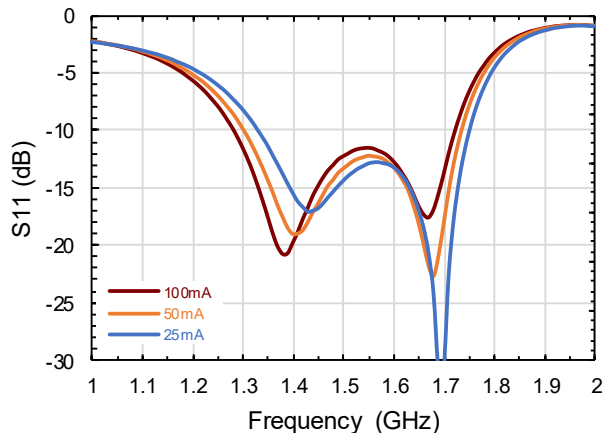
CW,  $V_{DS} = 50\text{ V}$ ,  $I_{DQ} = 50\text{ mA}$ ,  $P_{in} = -10\text{ dBm}$  (Unless Otherwise Noted)

For Engineering Evaluation Only—This data does not Modify MACOM's Datasheet Limits.

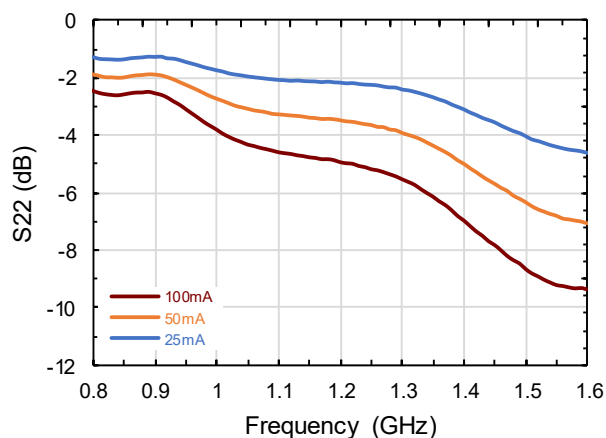
**S21 vs Frequency and  $I_{DQ}$**



**S11 vs Frequency and  $I_{DQ}$**

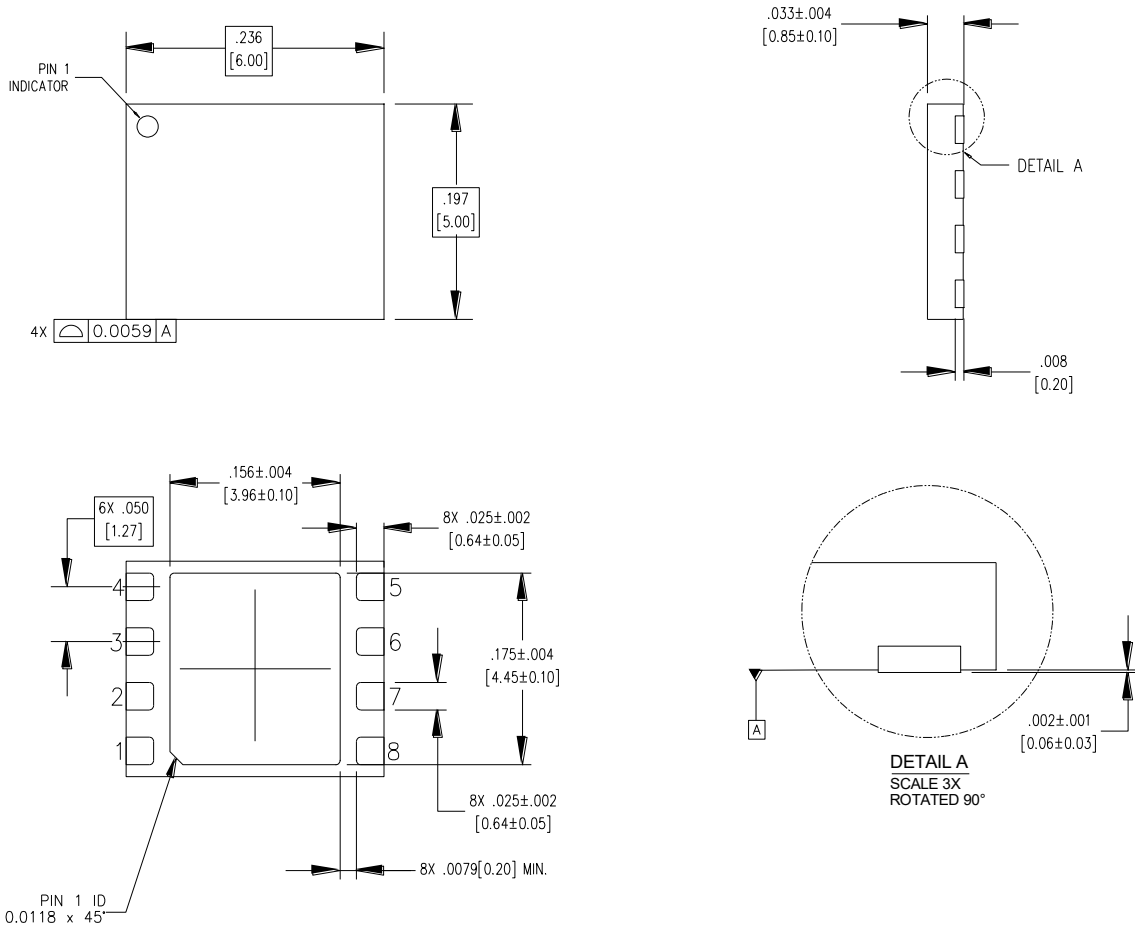


**S22 vs Frequency and  $I_{DQ}$**





Lead-free 5 x 6 mm 8-Lead Package Dimensions



ALL DIMENSIONS SHOWN AS in[mm]. CONTROLLING DIMENSIONS ARE IN in. CONVERTED mm DIMENSIONS ARE NOT NECESSARILY EXACT.

EXPOSED LEADS 100% Sn MATTE.

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