MMIC SURFACE MOUNT

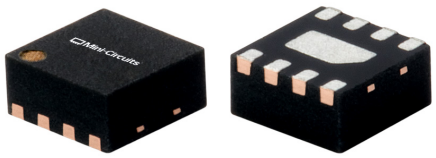
Low Noise Amplifier

TSS-43ULN+

50Ω 500 to 4000 MHz Shutdown Feature

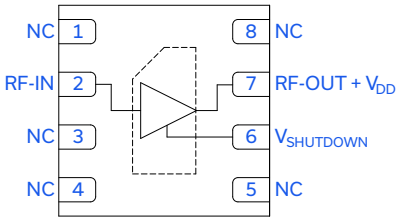
THE BIG DEAL

- Low Noise Figure, Typ. 0.4 dB
- High Gain, Typ. 19 dB
- High OIP3, Typ. +36.1 dBm
- Fast Shutdown Feature, 14.4 ns
- Single Supply Voltage, +5 V at 59 mA
- 2x2 mm 8-Lead QFN-style Package



Generic photo used for illustration purposes only

FUNCTIONAL DIAGRAM (TOP VIEW)



APPLICATIONS

- Cellular Infrastructure
- Satellite Communications
- Radar, EW, and ECM Defense Systems

PRODUCT OVERVIEW

The TSS-43ULN+ is a pHEMT-based wideband, ultra-low noise MMIC amplifier with high P1dB, high IP3, and voltage-controlled shutdown capability. Operating from 500 to 4000 MHz, this amplifier features typical 0.4 dB noise figure, 19 dB gain, +23.7 dBm P1dB, and +36.1 dBm OIP3. This combination of characteristics makes it ideal for sensitive receiver applications. TSS-43ULN+ operates on a single +5 V supply and comes in a small, low profile, 2x2 mm QFN-style package for ease of integration into dense circuit board layouts.

KEY FEATURES

Features	Advantages
Ultra-Low Noise Figure, Typ. 0.4 dB	Operating from a single supply, this ultra-low noise MMIC enables low system noise figure performance, without the need for complicated discrete-based solutions.
High Gain, Typ. 19 dB	The MMIC amplifier's high gain enables fewer system components in receiver signal chains.
Shutdown Feature	A voltage-controlled shutdown feature allows the part to be quickly disabled to conserve power when not in use.
High Dynamic Range • Gain, Typ. 19 dB • OIP3, Typ. +36.1 dBm • P1dB, Typ. +23.7 dBm	The MMIC amplifier's unique combination of low noise figure, high gain, high P1dB, and high OIP3 enables optimum performance in sensitive high dynamic range receivers.
2x2 mm 8-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-028765
TSS-43ULN+
MCL NY
251120

Low Noise Amplifier

TSS-43ULN+

50Ω 500 to 4000 MHz Shutdown Feature

ELECTRICAL SPECIFICATIONS[1] AT +25°C AND Zo = 50Ω UNLESS NOTED OTHERWISE

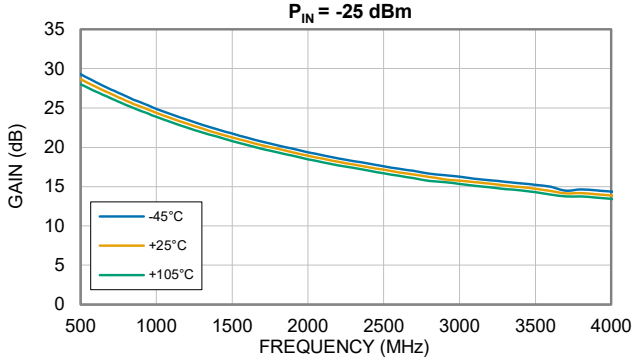
Parameter	Condition (MHz)	Amplifier - ON V_{DD} = +5 V ($V_{SHUTDOWN}$ = 0 V) Min.	Typ.	Max.	Amplifier - ON V_{DD} = +3 V ($V_{SHUTDOWN}$ = 0 V) Typ.	Amplifier - OFF[2] V_{DD} = +5 V ($V_{SHUTDOWN}$ = +5 V) Typ.	Units
Frequency Range		500		4000	500-4000	500-4000	MHz
Gain	500	27.4	28.7		26.8	-42.3	dB
	1000	23.1	24.4		23.0	-44.3	
	2000	17.7	19.0		17.8	-31.7	
	3000	14.6	15.8		14.6	-23.5	
	4000	12.3	13.9		12.6	-18.0	
Input Return Loss	500		5		4		dB
	1000		8		7		
	2000		11		10		
	3000		12		10		
	4000		11		9		
Output Return Loss	500		5		5		dB
	1000		6		7		
	2000		6		7		
	3000		7		9		
	4000		9		11		
Isolation	500-4000		28.6		26.8	32.3	dB
Output Power at 1 dB Compression (P1dB)	500		+22.9		+18.0		dBm
	1000		+23.3		+18.3		
	2000		+23.7		+18.8		
	3000		+24.0		+19.1		
	4000		+23.6		+18.7		
Output Third-Order Intercept Point (P_{OUT} = +4 dBm/Tone)	500		+33.6		+25.8		dBm
	1000		+34.6		+26.2		
	2000		+36.1		+26.6		
	3000		+37.4		+27.2		
	4000		+38.2		+27.0		
Noise Figure[3]	500		0.2		0.2		dB
	1000		0.3		0.3		
	2000		0.4		0.4		
	3000		0.4		0.5		
	4000		0.7		0.8		
ON Time (50% V_{CTRL} to 90% RF)			32.1				ns
RISE Time (10% RF to 90% RF)			6.3				ns
FALL Time (90% RF to 10% RF)			6.3				ns
OFF Time (50% V_{CTRL} to 10% RF)			14.4				ns
Device Operating Voltage (V_{DD})		+4.75	+5	+5.25	+3	+5	V
Device Operating Current (I_{DD})[4]			59		30	3	mA
Device Shutdown Voltage ($V_{SHUTDOWN}$)			0		0	+5	V
Device Shutdown Current ($I_{SHUTDOWN}$)			0.1		0.02	33	µA
Device Current Variation vs. Temperature[5]			0.007		0.007		mA/°C
Device Current Variation vs. Voltage[6]			0.0144		0.0144		mA/mV

1. Tested in Mini-Circuits Characterization Test/Evaluation Board TB-TSS-43ULNC+. See Figure 2. Board loss de-embedded to the device.
2. Performance is comparable when $V_{SHUTDOWN}$ = +5 V or +3 V when amplifier is OFF.
3. Typical value verified and set by averaging performance across multiple measurement setups.
4. Current at P_{IN} = -25 dBm. Increases to 105 mA at P1dB.
5. (Current at +105°C - Current at -45°C) / (+150°C)
6. (Current at +5.25 V - Current at +4.75 V) / (+0.5 V)

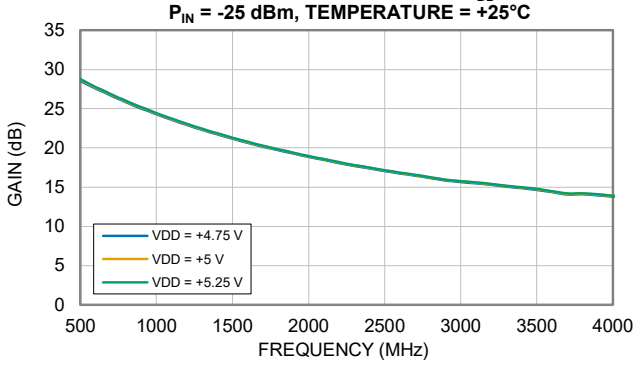
TYPICAL PERFORMANCE GRAPHS

Note: The following data was taken on the Mini-Circuits Characterization Test Board TB-TSS-43ULNC+ (Figure 2). All data taken at nominal condition of V_{DD} = +5 V and at $V_{SHUTDOWN}$ = 0 V unless noted otherwise.

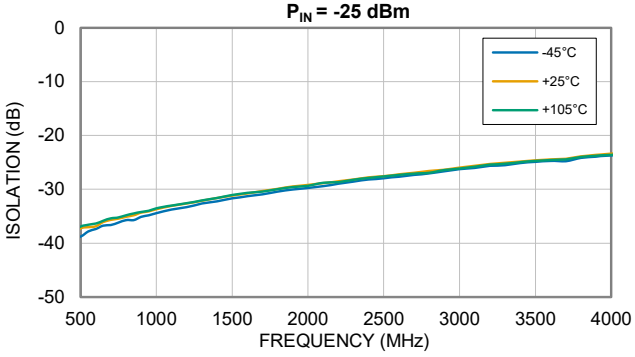
GAIN vs. TEMPERATURE
P_{IN} = -25 dBm



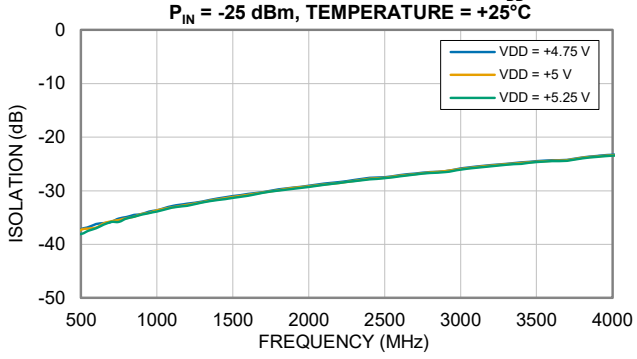
GAIN vs. DEVICE VOLTAGE (V_{DD})
P_{IN} = -25 dBm, TEMPERATURE = +25°C



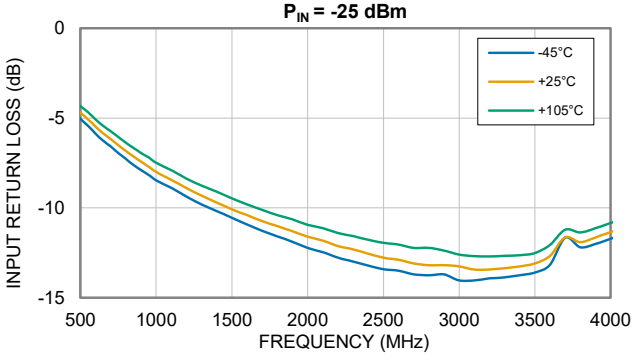
ISOLATION vs. TEMPERATURE
P_{IN} = -25 dBm



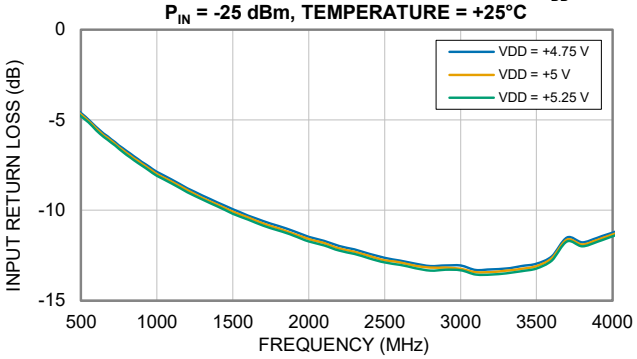
ISOLATION vs. DEVICE VOLTAGE (V_{DD})
P_{IN} = -25 dBm, TEMPERATURE = +25°C



INPUT RETURN LOSS vs. TEMPERATURE
P_{IN} = -25 dBm

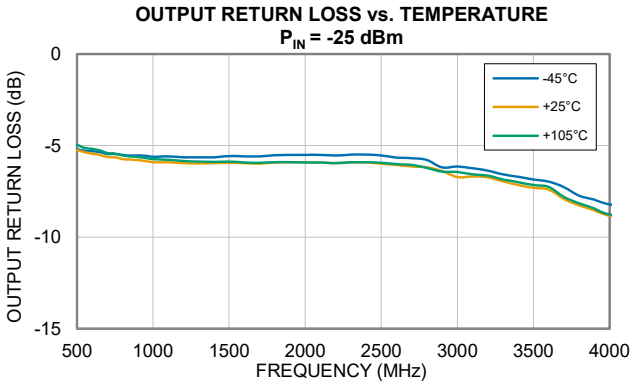


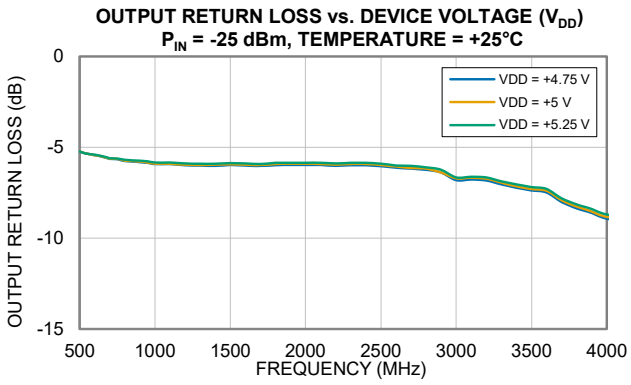
INPUT RETURN LOSS vs. DEVICE VOLTAGE (V_{DD})
P_{IN} = -25 dBm, TEMPERATURE = +25°C

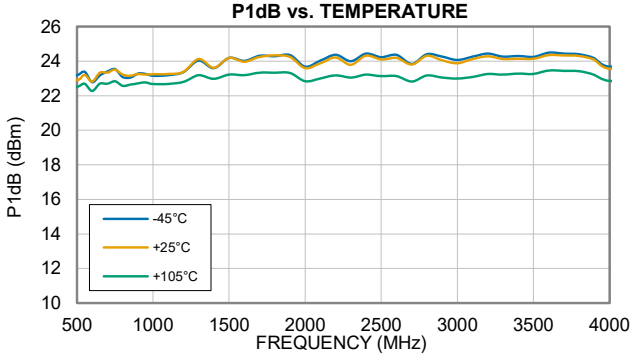


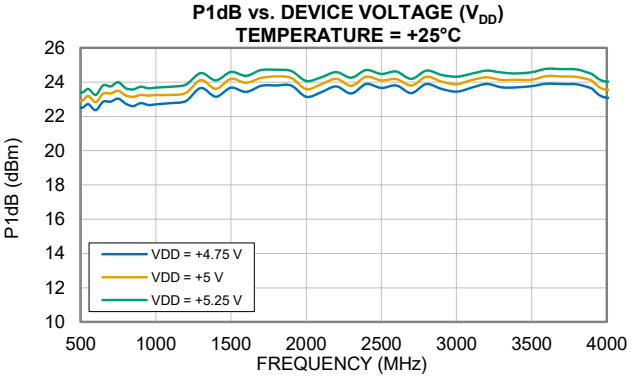
TYPICAL PERFORMANCE GRAPHS

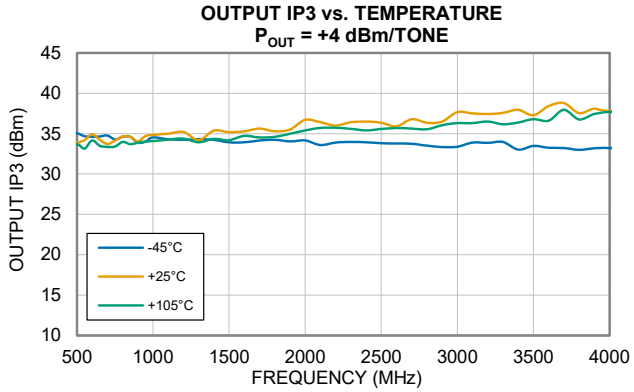
Note: The following data was taken on the Mini-Circuits Characterization Test Board TB-TSS-43ULNC+ (Figure 2). All data taken at nominal condition of V_{DD} = +5 V and at $V_{SHUTDOWN}$ = 0 V unless noted otherwise.

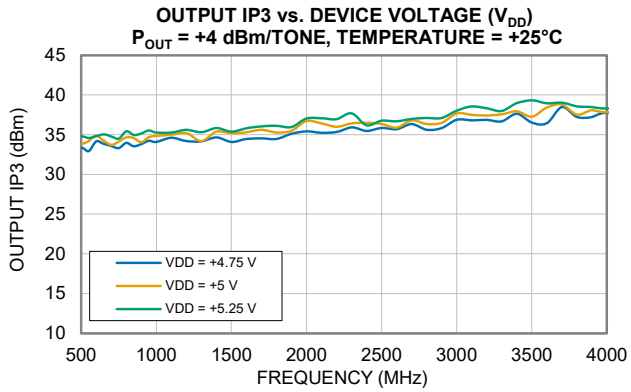








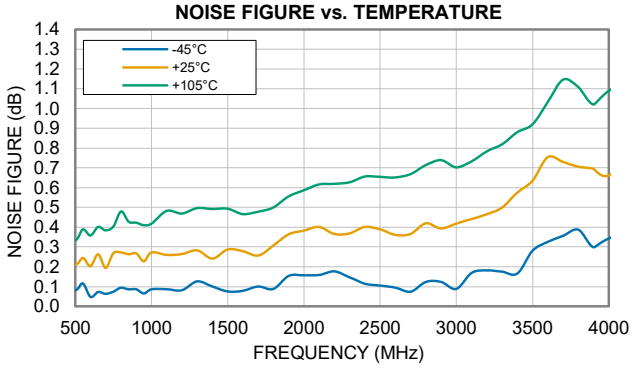




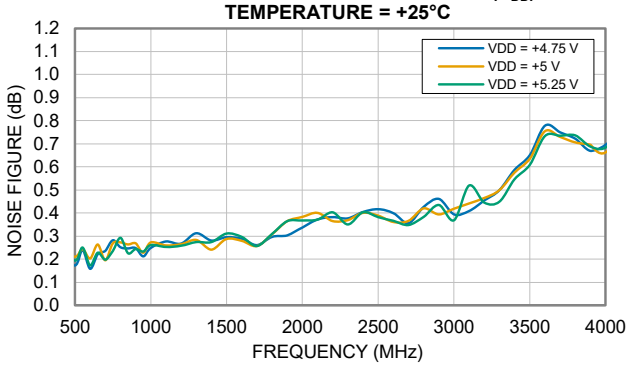
TYPICAL PERFORMANCE GRAPHS

Note: The following data was taken on the Mini-Circuits Characterization Test Board TB-TSS-43ULNC+ (Figure 2). All data taken at nominal condition of V_{DD} = +5 V and at $V_{SHUTDOWN}$ = 0 V unless noted otherwise.

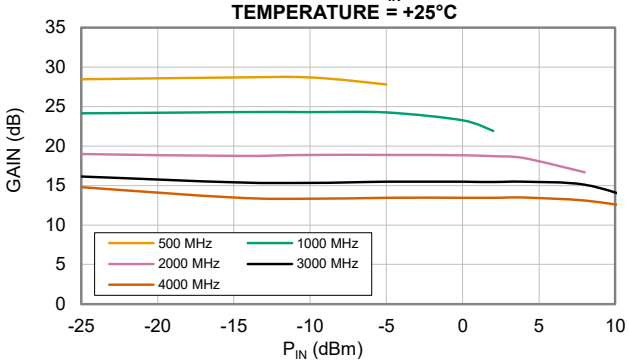
NOISE FIGURE vs. TEMPERATURE



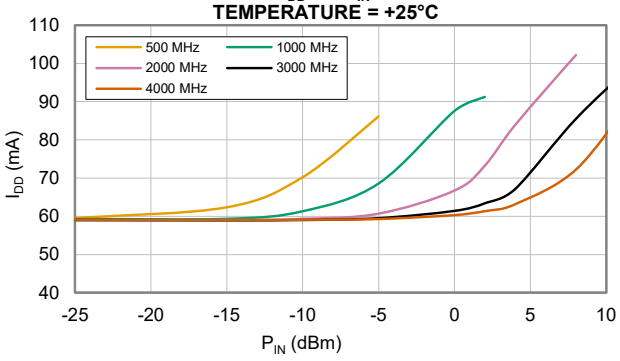
NOISE FIGURE vs. DEVICE VOLTAGE (V_{DD})
TEMPERATURE = +25°C



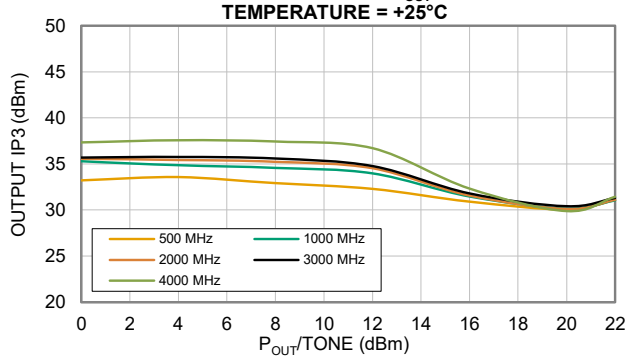
GAIN vs. P_{IN}
TEMPERATURE = +25°C



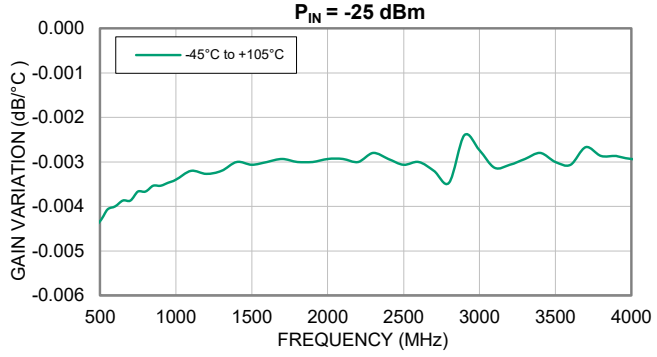
I_{DD} vs. P_{IN}
TEMPERATURE = +25°C



OUTPUT IP3 vs. P_{OUT}
TEMPERATURE = +25°C



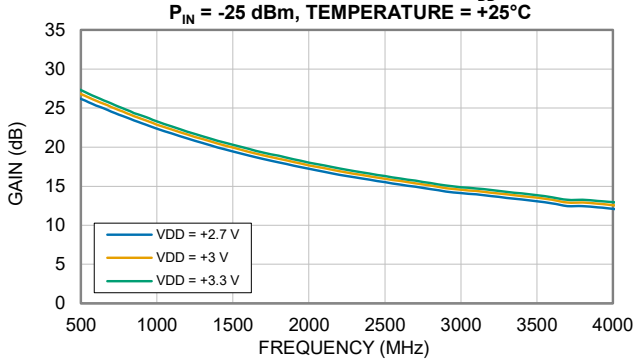
GAIN VARIATION vs. TEMPERATURE
P_{IN} = -25 dBm



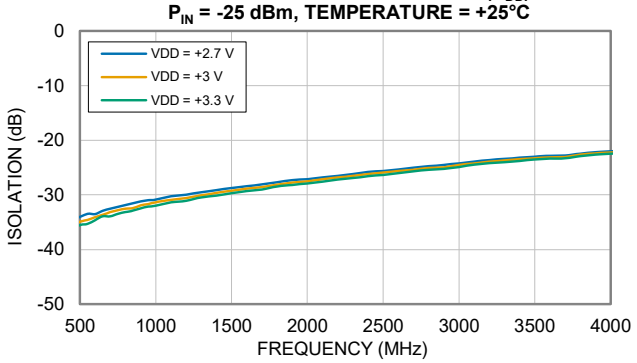
TYPICAL LOW VOLTAGE PERFORMANCE GRAPHS

Note: The following data was taken on the Mini-Circuits Characterization Test Board TB-TSS-43ULNC+ (Figure 2). All data taken at $V_{SHUTDOWN}$ = 0 V unless noted otherwise.

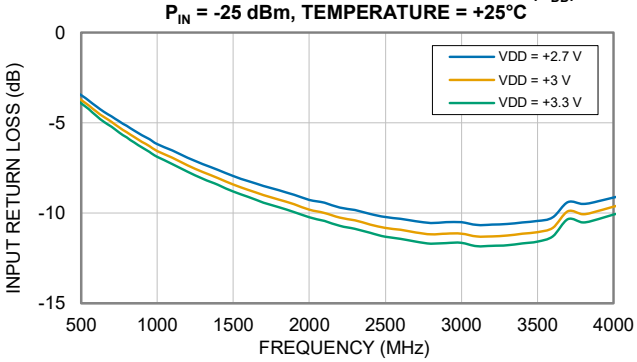
GAIN vs. DEVICE VOLTAGE (V_{DD})
P_{IN} = -25 dBm, TEMPERATURE = +25°C



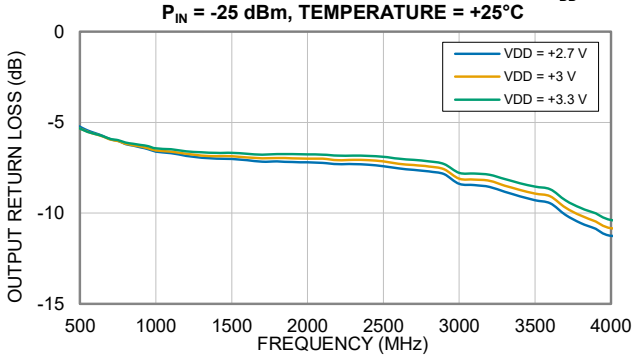
ISOLATION vs. DEVICE VOLTAGE (V_{DD})
P_{IN} = -25 dBm, TEMPERATURE = +25°C



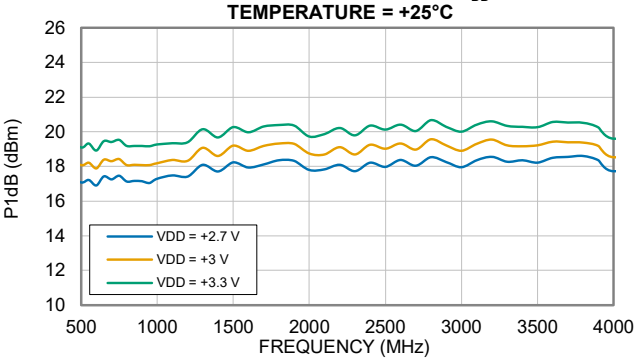
INPUT RETURN LOSS vs. DEVICE VOLTAGE (V_{DD})
P_{IN} = -25 dBm, TEMPERATURE = +25°C



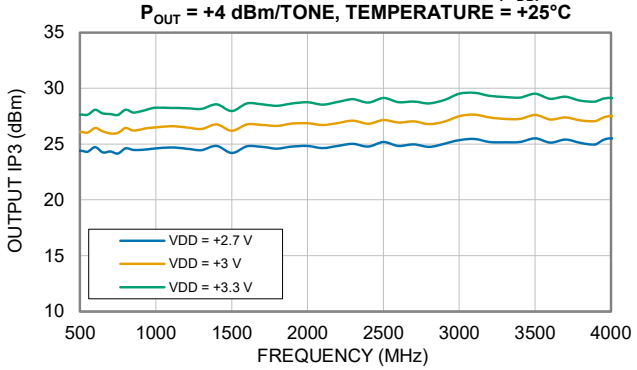
OUTPUT RETURN LOSS vs. DEVICE VOLTAGE (V_{DD})
P_{IN} = -25 dBm, TEMPERATURE = +25°C



P1dB vs. DEVICE VOLTAGE (V_{DD})
TEMPERATURE = +25°C

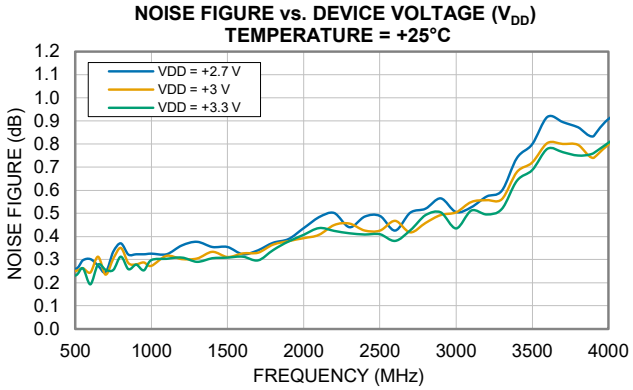


OUTPUT IP3 vs. DEVICE VOLTAGE (V_{DD})
P_{OUT} = +4 dBm/TONE, TEMPERATURE = +25°C



TYPICAL LOW VOLTAGE PERFORMANCE GRAPHS

Note: The following data was taken on the Mini-Circuits Characterization Test Board TB-TSS-43ULNC+ (Figure 2). All data taken at $V_{SHUTDOWN}$ = 0 V unless noted otherwise.



Low Noise Amplifier

TSS-43ULN+

50Ω 500 to 4000 MHz Shutdown Feature

ABSOLUTE MAXIMUM RATINGS[7]

Parameter	Ratings
Operating Temperature	-45°C to +105°C
Storage Temperature	-65°C to +150°C
Total Power Dissipation	1.2 W
Junction Temperature[8]	+150°C
Input Power (CW)	
V_{DD} = +5 V & $V_{SHUTDOWN}$ = 0 V	+21 dBm
V_{DD} = +3 V & $V_{SHUTDOWN}$ = 0 V	+21 dBm
DC Voltage on RF-OUT & V_{DD}	
$V_{SHUTDOWN}$ = 0 V	+10 V
$V_{SHUTDOWN}$ = +5 V	+10 V
DC Voltage on RF-IN	
$V_{SHUTDOWN}$ = 0 V	+1 V
$V_{SHUTDOWN}$ = +5 V	+1 V
DC Voltage on $V_{SHUTDOWN}$	
V_{DD} = 0 V	+10 V
V_{DD} = +5 V	+10 V
DC Current on RF-OUT & V_{DD}	
$V_{SHUTDOWN}$ = 0 V	130 mA
$V_{SHUTDOWN}$ = +5 V	10 mA
DC Current $V_{SHUTDOWN}$	
$V_{SHUTDOWN}$ = 0 V	3 mA
$V_{SHUTDOWN}$ = +5 V	6 mA

7. Permanent damage may occur if any of these limits are exceeded. Maximum ratings are not intended for continuous normal operation.
8. Peak temperature on top of Die.

POWER ON / POWER OFF LOGIC

Amplifier State	V_{DD}			$V_{SHUTDOWN}$		
	Min	Typ.	Max	Min	Typ.	Max
Amplifier - ON (V_{DD} = +5 V)	+2.7 V	+5 V	+5.25 V	0 V	0 V	+1 V
Amplifier - OFF (V_{DD} = +5 V)				+1.1 V	+5 V	+5.25 V
Amplifier - ON (V_{DD} = +3 V)	+2.7 V	+3 V	+5.25 V	0 V	0 V	+1 V
Amplifier - OFF (V_{DD} = +3 V)				+1.1 V	+3 V	+5.25 V

THERMAL RESISTANCE

Parameter	Ratings
Thermal Resistance (Θ_{JC})[9]	37.7°C/W

9. 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

Low Noise Amplifier

TSS-43ULN+

50Ω 500 to 4000 MHz Shutdown Feature

FUNCTIONAL DIAGRAM (TOP VIEW)

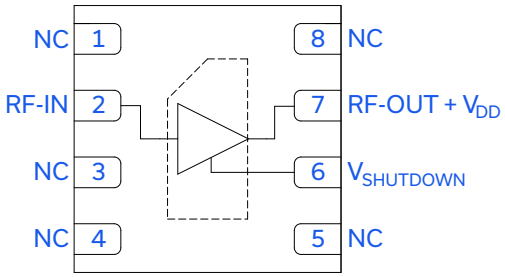


Figure 1. TSS-43ULN+ Functional Diagram

PAD DESCRIPTION

Function	Pad Number	Description (Refer to Figure 2)
RF-OUT + V_{DD}	7	RF-OUT + V_{DD} Pad connects to RF-Output port and voltage input port, V_{DD}.
$V_{SHUTDOWN}$	6	DC Input Pad connects to voltage input port, $V_{SHUTDOWN}$.
RF-IN	2	RF-IN Pad connects to RF-Input port.
NC	1,3-5 & 8	Not used internally. May be connected to ground or left floating. All pins but pin 1 are grounded on evaluation board.
GND	Paddle	Connects to ground.

EVALUATION BOARD

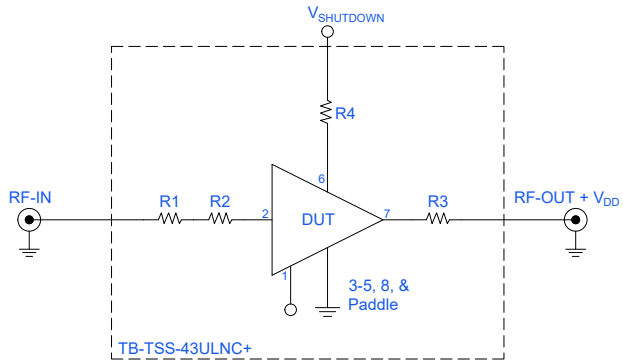


Figure 2. TSS-43ULN+ Evaluation and Application Circuit

Component	Size	Value	Part Number	Manufacturer
R1-R4	0402	0Ω	RK73Z1ETTP	KOA Speer

Electrical Parameters and Conditions
Gain, Return Loss, Output Power at 1 dB Compression (P1dB), Output IP3 (OIP3), and Noise Figure measured using N5242A PNA-X microwave network analyzer.

Conditions:
1. Gain and Return Loss: P_{IN} = -25 dBm
2. Output IP3 (OIP3): Two tones, spaced 1 MHz apart, +4 dBm/tone at output.

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

POWER ON:
1. Set V_{DD} = +5 V.
2. Set $V_{SHUTDOWN}$ = 0 V for ON mode or $V_{SHUTDOWN}$ = +5 V for OFF mode.
3. Turn on V_{DD}.
4. Turn on $V_{SHUTDOWN}$.
5. Apply RF signal.

POWER OFF:
1. Turn off RF signal.
2. Turn off $V_{SHUTDOWN}$.
3. Turn off V_{DD}.

APPLICATION CIRCUIT

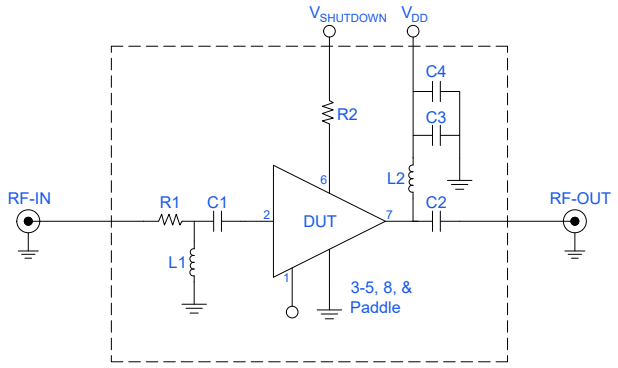


Figure 3. TSS-43ULN+ 1900-2700 MHz Application Circuit

Electrical Parameters and Conditions
Gain, Return Loss, Output Power at 1 dB Compression (P1dB), Output IP3 (OIP3), and Noise Figure measured using N5242A PNA-X microwave network analyzer.

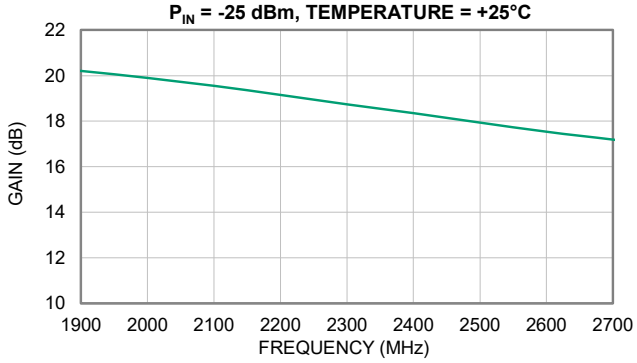
Conditions:
3. Gain and Return Loss: P_{IN} = -25 dBm
4. Output IP3 (OIP3): Two tones, spaced 1 MHz apart, +4 dBm/tone at output.

Component	Size	Value	Part Number	Manufacturer
R1-R2	0402	0Ω	RK73Z1ETTP	KOA Speer
C1	0402	3.6 pF	GJM1555C1H3R6CB01	Murata
C2	0402	3 pF	GJM1555C1H3R0CB01	Murata
C3	0402	100 pF	GRM1555C1H101GA01D	Murata
C4	0402	1 µF	GRM155Z71A105KE01J	Murata
L1	0402	5.6 nH	LQG15HS5N6B02	Murata
L2	0402	2.2 nH	LQG15HS2N2B02	Murata

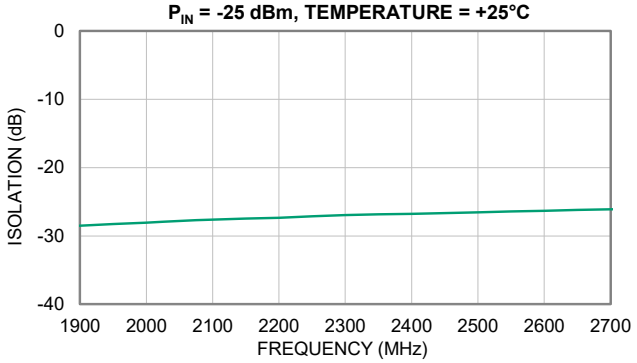
TYPICAL MATCHING TEST BOARD PERFORMANCE GRAPHS

Note: The following data was taken on the Mini-Circuits 1900-2700 MHz Matched Characterization Test Board (Figure 3). All data taken at nominal condition of V_{DD} = +5 V and at $V_{SHUTDOWN}$ = 0 V.

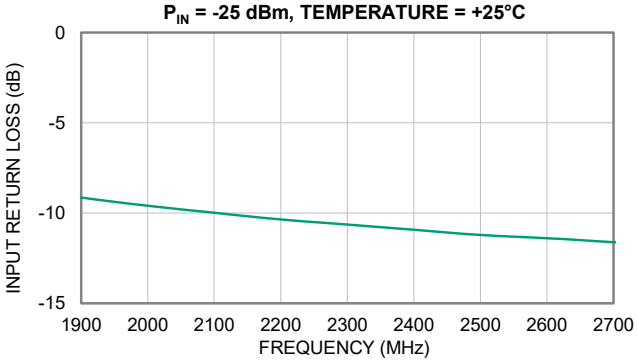
GAIN vs. FREQUENCY
P_{IN} = -25 dBm, TEMPERATURE = +25°C



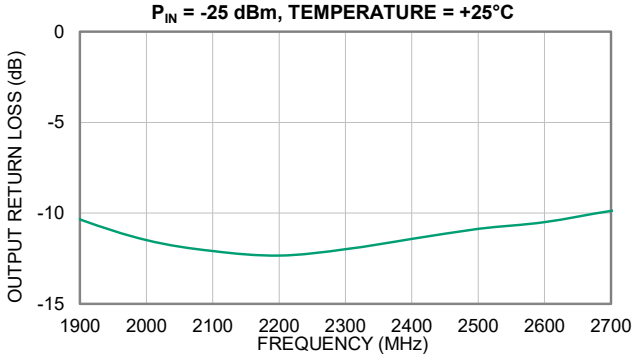
ISOLATION vs. FREQUENCY
P_{IN} = -25 dBm, TEMPERATURE = +25°C



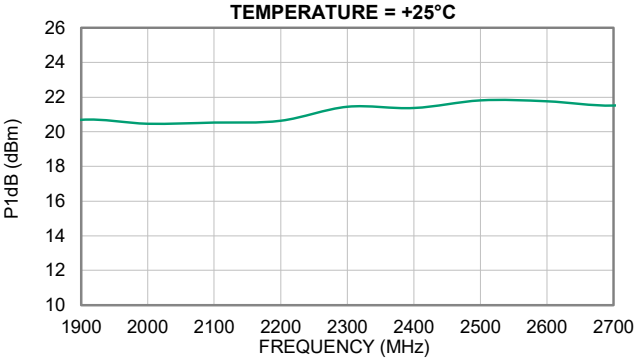
INPUT RETURN LOSS vs. FREQUENCY
P_{IN} = -25 dBm, TEMPERATURE = +25°C



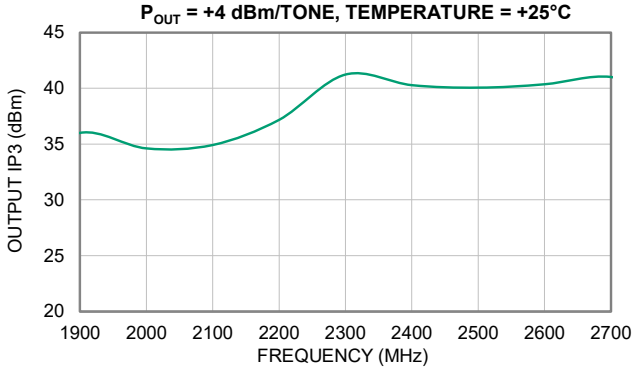
OUTPUT RETURN LOSS vs. FREQUENCY
P_{IN} = -25 dBm, TEMPERATURE = +25°C



P1dB vs. FREQUENCY
TEMPERATURE = +25°C

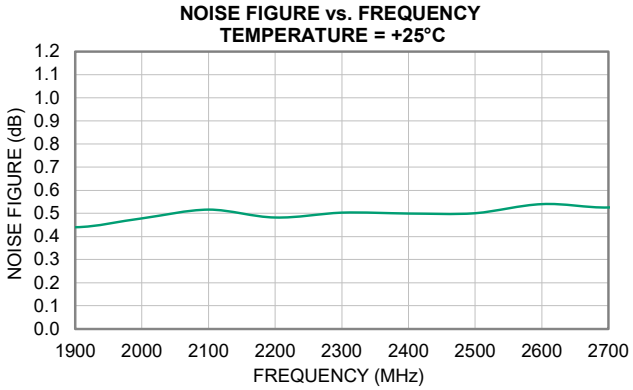


OUTPUT IP3 vs. FREQUENCY
P_{OUT} = +4 dBm/TONE, TEMPERATURE = +25°C



TYPICAL MATCHING TEST BOARD PERFORMANCE GRAPHS

Note: The following data was taken on the Mini-Circuits 1900-2700 MHz Matched Characterization Test Board (Figure 3). All data taken at nominal condition of V_{DD} = +5 V and at $V_{SHUTDOWN}$ = 0 V.

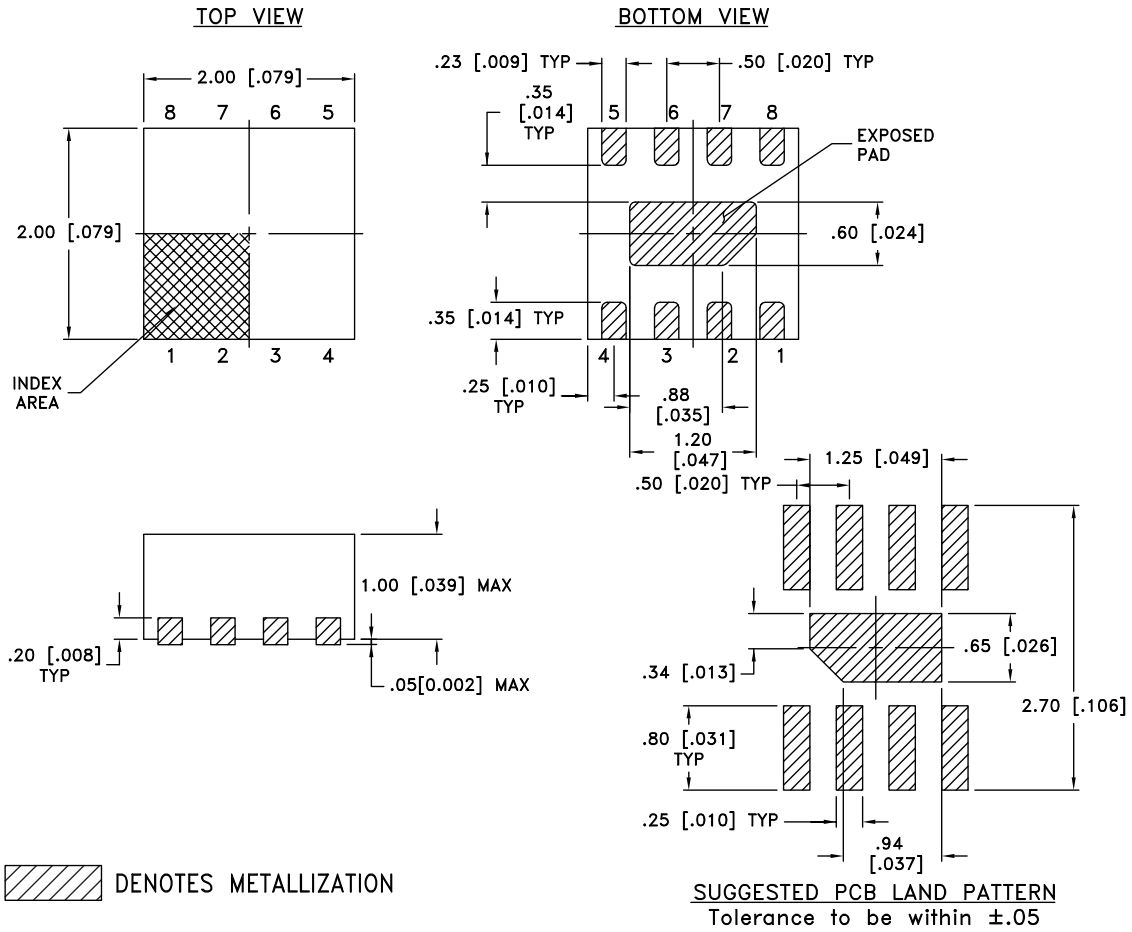


Low Noise Amplifier

TSS-43ULN+

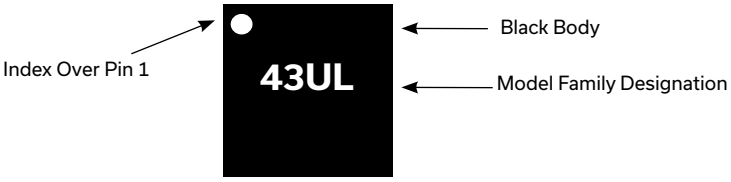
50Ω 500 to 4000 MHz Shutdown Feature

CASE STYLE DRAWING



Weight: 0.006 grams
Dimensions are in mm [Inches]. Tolerances: 2 Pl. ± 0.13 mm

PRODUCT MARKING



Marking may contain other features or characters for internal lot control.

Low Noise Amplifier

TSS-43ULN+

50Ω 500 to 4000 MHz Shutdown Feature

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	MC1631-1. Plastic package, exposed paddle, Lead Finish: Matte-Tin
RoHS Status	Compliant
Tape & Reel **Standard Quantities Available on Reel**	F66 7" Reels with 20, 50, 100, 200, 500, 1000, 2000, or 3000 devices
Suggested Layout for PCB Design	PL-844
Evaluation Board	TB-TSS-43ULNC+ 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-Circuits' 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 conditions

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

TEST CONDITIONS: V_{DD} = +2.7 V, $V_{SHUTDOWN}$ = 0 V, I_{DD} = 25 mA, $I_{SHUTDOWN}$ = 0.0189 µA @ Temperature = +25°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		1dB Comp. Output	Noise Figure	IP-3 Output P_{OUT} = +4
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dB)	(dBm)
300	27.7	-37.3	-2.3	-4.5	0.7	0.8	17.5	0.3	24.5
400	26.9	-35.2	-2.9	-4.9	0.7	0.8	17.5	0.3	24.2
500	26.2	-34.0	-3.5	-5.2	0.7	0.8	17.1	0.3	24.4
550	25.8	-33.5	-3.8	-5.4	0.7	0.8	17.2	0.3	24.3
600	25.3	-33.5	-4.1	-5.6	0.8	0.9	16.9	0.3	24.7
650	25.0	-32.9	-4.4	-5.7	0.8	0.9	17.4	0.3	24.3
700	24.6	-32.5	-4.6	-5.9	0.8	0.9	17.3	0.2	24.3
750	24.2	-32.2	-4.9	-6.0	0.8	0.9	17.5	0.3	24.2
800	23.8	-31.8	-5.2	-6.2	0.8	0.9	17.1	0.4	24.6
850	23.4	-31.5	-5.4	-6.3	0.9	0.9	17.2	0.3	24.5
900	23.1	-31.2	-5.7	-6.4	0.9	0.9	17.1	0.3	24.5
950	22.7	-31.0	-5.9	-6.5	0.9	0.9	17.1	0.3	24.5
1000	22.4	-30.9	-6.2	-6.6	0.9	0.9	17.3	0.3	24.6
1100	21.7	-30.3	-6.5	-6.7	1.0	0.9	17.5	0.3	24.7
1200	21.1	-29.9	-6.9	-6.8	1.0	0.9	17.4	0.4	24.6
1300	20.5	-29.5	-7.3	-6.9	1.0	0.9	18.1	0.4	24.5
1400	20.0	-29.1	-7.6	-7.0	1.1	0.9	17.7	0.4	24.9
1500	19.5	-28.7	-8.0	-7.0	1.1	0.9	18.2	0.4	24.2
1600	19.0	-28.4	-8.2	-7.1	1.1	0.9	17.9	0.3	24.8
1700	18.5	-28.1	-8.5	-7.2	1.2	0.9	18.1	0.3	24.8
1800	18.1	-27.7	-8.7	-7.2	1.2	0.9	18.4	0.4	24.6
1900	17.6	-27.3	-9.0	-7.2	1.2	0.9	18.3	0.4	24.8
2000	17.2	-27.1	-9.3	-7.2	1.2	0.9	17.8	0.4	24.8
2100	16.9	-26.8	-9.4	-7.2	1.2	0.9	17.8	0.5	24.7
2200	16.5	-26.5	-9.7	-7.3	1.3	0.9	18.1	0.5	24.8
2300	16.1	-26.2	-9.8	-7.3	1.3	0.9	17.7	0.4	25.0
2400	15.8	-25.8	-10.1	-7.3	1.3	0.8	18.2	0.5	24.8
2500	15.5	-25.6	-10.2	-7.4	1.3	0.9	18.0	0.5	25.2
2600	15.2	-25.3	-10.3	-7.5	1.3	0.9	18.4	0.4	24.8
2700	14.9	-25.0	-10.5	-7.6	1.3	0.9	18.0	0.5	25.0
2800	14.6	-24.8	-10.6	-7.7	1.3	0.9	18.5	0.5	24.8
2900	14.3	-24.5	-10.5	-7.9	1.3	0.9	18.3	0.6	25.0
3000	14.1	-24.2	-10.5	-8.4	1.4	0.9	18.0	0.5	25.4
3100	14.0	-23.9	-10.7	-8.5	1.4	0.9	18.4	0.5	25.5
3200	13.8	-23.6	-10.6	-8.6	1.3	0.9	18.6	0.6	25.2
3300	13.5	-23.4	-10.6	-8.8	1.4	0.9	18.3	0.6	25.2
3400	13.3	-23.2	-10.5	-9.1	1.4	0.9	18.4	0.7	25.2
3500	13.1	-23.0	-10.4	-9.3	1.4	0.9	18.2	0.8	25.5
3600	12.8	-22.8	-10.2	-9.5	1.4	0.9	18.5	0.9	25.1
3700	12.5	-22.8	-9.4	-10.1	1.4	1.0	18.6	0.9	25.4
3800	12.5	-22.4	-9.5	-10.5	1.4	1.0	18.6	0.9	25.1
3900	12.3	-22.2	-9.3	-10.9	1.4	1.0	18.4	0.8	25.0
4000	12.1	-22.0	-9.1	-11.2	1.4	1.0	17.7	0.9	25.5
5000	10.1	-20.8	-7.2	-11.8	1.4	1.1	18.1	1.4	24.3

Typical Performance Data

NOTE: Use PDF Bookmarks to view DATA at required conditions

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

TEST CONDITIONS: V_{DD} = +3 V, $V_{SHUTDOWN}$ = 0 V, I_{DD} = 30 mA, $I_{SHUTDOWN}$ = 0.0293 µA @ Temperature = +25°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		1dB Comp. Output	Noise Figure	IP-3 Output P_{OUT} = +4
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dB)	(dBm)
300	28.4	-37.8	-2.5	-4.6	0.8	0.8	18.5	0.3	26.1
400	27.6	-36.3	-3.1	-5.0	0.8	0.8	18.5	0.3	25.8
500	26.8	-34.9	-3.7	-5.3	0.8	0.8	18.1	0.2	26.1
550	26.4	-34.6	-4.0	-5.5	0.8	0.8	18.2	0.3	26.0
600	25.9	-34.1	-4.4	-5.6	0.8	0.8	17.9	0.2	26.4
650	25.6	-33.7	-4.7	-5.8	0.8	0.8	18.4	0.3	26.1
700	25.2	-33.1	-5.0	-5.9	0.8	0.8	18.3	0.2	26.0
750	24.7	-32.8	-5.3	-6.0	0.9	0.8	18.4	0.3	26.0
800	24.4	-32.5	-5.5	-6.2	0.9	0.8	18.1	0.4	26.4
850	24.0	-32.4	-5.8	-6.3	0.9	0.9	18.1	0.3	26.2
900	23.6	-31.9	-6.1	-6.3	0.9	0.8	18.1	0.3	26.3
950	23.3	-31.7	-6.3	-6.4	0.9	0.8	18.1	0.3	26.4
1000	22.9	-31.3	-6.6	-6.5	1.0	0.8	18.2	0.3	26.5
1100	22.3	-30.9	-6.9	-6.6	1.0	0.8	18.4	0.3	26.6
1200	21.6	-30.5	-7.4	-6.7	1.0	0.9	18.3	0.3	26.5
1300	21.0	-30.1	-7.7	-6.8	1.1	0.9	19.1	0.3	26.4
1400	20.5	-29.6	-8.1	-6.9	1.1	0.8	18.6	0.3	26.8
1500	19.9	-29.2	-8.4	-6.9	1.1	0.8	19.2	0.3	26.2
1600	19.4	-28.9	-8.7	-6.9	1.2	0.8	18.9	0.3	26.8
1700	19.0	-28.5	-9.0	-7.0	1.2	0.8	19.2	0.3	26.7
1800	18.5	-28.1	-9.3	-7.0	1.2	0.8	19.3	0.4	26.6
1900	18.1	-27.8	-9.5	-7.0	1.2	0.8	19.3	0.4	26.8
2000	17.7	-27.5	-9.8	-7.0	1.2	0.8	18.7	0.4	26.9
2100	17.3	-27.1	-10.0	-7.0	1.2	0.8	18.7	0.4	26.7
2200	16.9	-26.8	-10.3	-7.1	1.3	0.8	19.1	0.4	26.9
2300	16.6	-26.5	-10.4	-7.1	1.3	0.8	18.7	0.5	27.1
2400	16.3	-26.2	-10.6	-7.1	1.3	0.8	19.3	0.4	26.8
2500	16.0	-25.9	-10.8	-7.2	1.3	0.8	19.0	0.4	27.2
2600	15.7	-25.6	-10.9	-7.3	1.3	0.8	19.3	0.5	26.9
2700	15.4	-25.4	-11.1	-7.4	1.3	0.8	19.0	0.4	27.0
2800	15.1	-25.1	-11.2	-7.4	1.3	0.8	19.6	0.5	26.8
2900	14.8	-24.9	-11.1	-7.6	1.4	0.8	19.2	0.5	27.0
3000	14.6	-24.5	-11.1	-8.1	1.4	0.9	18.9	0.5	27.5
3100	14.4	-24.2	-11.3	-8.1	1.3	0.9	19.3	0.5	27.7
3200	14.2	-23.9	-11.3	-8.2	1.3	0.9	19.6	0.6	27.4
3300	14.0	-23.7	-11.3	-8.5	1.4	0.9	19.2	0.6	27.3
3400	13.7	-23.5	-11.2	-8.7	1.4	0.9	19.2	0.7	27.3
3500	13.5	-23.3	-11.1	-8.9	1.4	0.9	19.2	0.7	27.6
3600	13.3	-23.1	-10.8	-9.1	1.4	0.9	19.4	0.8	27.2
3700	12.9	-23.1	-9.9	-9.7	1.4	1.0	19.4	0.8	27.4
3800	12.9	-22.6	-10.1	-10.1	1.4	1.0	19.4	0.8	27.1
3900	12.8	-22.4	-9.9	-10.5	1.4	1.0	19.2	0.7	27.1
4000	12.6	-22.2	-9.7	-10.8	1.4	1.0	18.5	0.8	27.5
5000	10.6	-21.0	-7.6	-11.7	1.4	1.1	18.7	1.3	26.2

Typical Performance Data

NOTE: Use PDF Bookmarks to view DATA at required conditions

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

TEST CONDITIONS: V_{DD} = +3.3 V, $V_{SHUTDOWN}$ = 0 V, I_{DD} = 35 mA, $I_{SHUTDOWN}$ = 0.0243 µA @ Temperature = +25°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		1dB Comp. Output	Noise Figure	IP-3 Output P_{OUT} = +4
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dB)	(dBm)
300	28.9	-38.1	-2.6	-4.7	0.8	0.8	19.5	0.2	27.6
400	28.1	-36.8	-3.3	-5.1	0.8	0.8	19.6	0.2	27.5
500	27.3	-35.5	-3.9	-5.3	0.8	0.8	19.1	0.2	27.7
550	26.9	-35.3	-4.2	-5.5	0.8	0.8	19.3	0.3	27.6
600	26.4	-34.6	-4.6	-5.6	0.8	0.8	18.9	0.2	28.1
650	26.0	-33.9	-4.9	-5.8	0.8	0.8	19.5	0.3	27.8
700	25.6	-33.9	-5.2	-5.9	0.9	0.8	19.4	0.3	27.7
750	25.2	-33.5	-5.5	-6.0	0.9	0.8	19.5	0.3	27.6
800	24.8	-33.1	-5.8	-6.1	0.9	0.8	19.2	0.3	28.1
850	24.4	-32.9	-6.1	-6.2	0.9	0.8	19.2	0.3	27.8
900	24.0	-32.4	-6.4	-6.2	0.9	0.8	19.2	0.3	27.9
950	23.7	-32.1	-6.6	-6.3	1.0	0.8	19.2	0.3	28.1
1000	23.3	-32.0	-6.9	-6.4	1.0	0.8	19.3	0.3	28.3
1100	22.6	-31.4	-7.3	-6.5	1.0	0.8	19.3	0.3	28.2
1200	22.0	-31.1	-7.7	-6.6	1.1	0.8	19.4	0.3	28.2
1300	21.4	-30.4	-8.1	-6.6	1.1	0.8	20.2	0.3	28.2
1400	20.8	-30.1	-8.4	-6.7	1.1	0.8	19.7	0.3	28.6
1500	20.3	-29.7	-8.8	-6.7	1.1	0.8	20.3	0.3	28.0
1600	19.8	-29.3	-9.1	-6.7	1.2	0.8	20.0	0.3	28.7
1700	19.3	-29.0	-9.4	-6.8	1.2	0.8	20.3	0.3	28.6
1800	18.9	-28.4	-9.7	-6.7	1.2	0.8	20.4	0.3	28.4
1900	18.5	-28.2	-9.9	-6.7	1.2	0.8	20.4	0.4	28.7
2000	18.0	-27.9	-10.2	-6.8	1.2	0.8	19.7	0.4	28.8
2100	17.7	-27.6	-10.4	-6.8	1.3	0.8	19.9	0.4	28.6
2200	17.3	-27.2	-10.7	-6.8	1.3	0.8	20.2	0.4	28.8
2300	16.9	-26.9	-10.9	-6.8	1.3	0.8	19.8	0.4	29.0
2400	16.6	-26.6	-11.1	-6.8	1.3	0.8	20.4	0.4	28.7
2500	16.3	-26.3	-11.3	-6.9	1.3	0.8	20.1	0.4	29.1
2600	16.0	-26.0	-11.4	-7.0	1.3	0.8	20.4	0.4	28.8
2700	15.7	-25.7	-11.6	-7.1	1.3	0.8	20.0	0.4	28.8
2800	15.4	-25.4	-11.7	-7.1	1.3	0.8	20.7	0.5	28.7
2900	15.1	-25.2	-11.7	-7.3	1.3	0.8	20.3	0.5	29.0
3000	14.9	-24.9	-11.7	-7.8	1.4	0.8	20.0	0.4	29.5
3100	14.7	-24.4	-11.8	-7.8	1.3	0.8	20.4	0.5	29.6
3200	14.5	-24.2	-11.8	-7.9	1.3	0.8	20.6	0.5	29.3
3300	14.3	-24.0	-11.8	-8.1	1.3	0.9	20.3	0.5	29.2
3400	14.1	-23.8	-11.7	-8.3	1.4	0.9	20.3	0.6	29.2
3500	13.9	-23.5	-11.6	-8.5	1.4	0.9	20.3	0.7	29.5
3600	13.6	-23.4	-11.3	-8.7	1.4	0.9	20.6	0.8	29.1
3700	13.3	-23.3	-10.3	-9.3	1.4	0.9	20.5	0.8	29.3
3800	13.3	-22.9	-10.5	-9.7	1.4	0.9	20.5	0.8	28.9
3900	13.1	-22.6	-10.3	-10.0	1.4	0.9	20.3	0.8	28.8
4000	12.9	-22.5	-10.1	-10.4	1.4	1.0	19.6	0.8	29.1
5000	11.0	-21.2	-7.8	-11.5	1.4	1.1	19.7	1.2	27.8

Typical Performance Data

NOTE: Use PDF Bookmarks to view DATA at required conditions

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

TEST CONDITIONS: V_{DD} = +4.75 V, $V_{SHUTDOWN}$ = 0 V, I_{DD} = 57 mA, $I_{SHUTDOWN}$ = 0.0306 µA @ Temperature = +25°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		1dB Comp. Output	Noise Figure	IP-3 Output P_{OUT} = +4
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dB)	(dBm)
300	30.4	-39.8	-3.1	-4.7	0.9	0.8	22.8	0.2	33.3
400	29.4	-38.8	-3.9	-5.0	0.9	0.8	23.0	0.2	33.0
500	28.6	-37.2	-4.6	-5.2	0.9	0.8	22.5	0.2	33.4
550	28.1	-36.8	-5.0	-5.4	0.9	0.8	22.7	0.2	32.9
600	27.6	-36.2	-5.4	-5.4	0.9	0.8	22.4	0.2	34.2
650	27.1	-36.1	-5.8	-5.5	1.0	0.8	22.9	0.2	33.9
700	26.7	-35.8	-6.1	-5.6	1.0	0.8	22.9	0.2	33.6
750	26.2	-35.2	-6.4	-5.7	1.0	0.8	23.1	0.3	33.3
800	25.8	-34.9	-6.7	-5.8	1.0	0.8	22.8	0.3	34.0
850	25.4	-34.5	-7.0	-5.8	1.0	0.8	22.6	0.2	33.5
900	25.0	-34.4	-7.3	-5.8	1.1	0.8	22.8	0.2	33.8
950	24.7	-33.9	-7.6	-5.9	1.1	0.8	22.7	0.2	34.2
1000	24.3	-33.6	-7.9	-5.9	1.1	0.8	22.7	0.2	34.1
1100	23.6	-32.9	-8.3	-5.9	1.1	0.8	22.8	0.3	34.6
1200	22.9	-32.4	-8.8	-6.0	1.1	0.8	22.9	0.3	34.2
1300	22.3	-32.0	-9.2	-6.0	1.2	0.8	23.7	0.3	34.2
1400	21.7	-31.4	-9.6	-6.0	1.2	0.8	23.2	0.3	34.7
1500	21.2	-31.0	-10.0	-6.0	1.2	0.8	23.7	0.3	34.1
1600	20.6	-30.6	-10.3	-6.0	1.2	0.8	23.4	0.3	34.5
1700	20.2	-30.3	-10.6	-6.0	1.2	0.8	23.8	0.3	34.5
1800	19.7	-29.8	-10.9	-6.0	1.2	0.7	23.8	0.3	34.5
1900	19.3	-29.4	-11.2	-6.0	1.3	0.7	23.8	0.3	35.1
2000	18.8	-29.1	-11.5	-6.0	1.3	0.7	23.2	0.3	35.4
2100	18.5	-28.7	-11.7	-6.0	1.3	0.7	23.4	0.4	35.3
2200	18.1	-28.4	-12.0	-6.0	1.3	0.7	23.8	0.4	35.3
2300	17.7	-28.0	-12.2	-6.0	1.3	0.7	23.3	0.4	35.9
2400	17.4	-27.6	-12.4	-6.0	1.3	0.7	23.9	0.4	35.5
2500	17.1	-27.5	-12.6	-6.0	1.3	0.7	23.7	0.4	35.8
2600	16.7	-27.1	-12.8	-6.1	1.3	0.7	23.8	0.4	35.7
2700	16.5	-26.8	-13.0	-6.2	1.3	0.7	23.4	0.4	36.3
2800	16.2	-26.5	-13.1	-6.2	1.3	0.7	23.9	0.4	35.6
2900	15.8	-26.4	-13.1	-6.4	1.4	0.8	23.6	0.5	35.8
3000	15.6	-25.9	-13.1	-6.8	1.4	0.8	23.4	0.4	36.9
3100	15.5	-25.5	-13.3	-6.8	1.3	0.8	23.7	0.4	36.8
3200	15.3	-25.3	-13.3	-6.8	1.3	0.8	23.9	0.5	36.9
3300	15.1	-25.0	-13.2	-7.0	1.3	0.8	23.7	0.5	36.7
3400	14.9	-24.7	-13.1	-7.2	1.3	0.8	23.7	0.6	37.6
3500	14.6	-24.5	-13.0	-7.4	1.3	0.8	23.8	0.7	36.5
3600	14.4	-24.3	-12.6	-7.5	1.4	0.8	23.9	0.8	36.5
3700	14.1	-24.2	-11.5	-8.0	1.4	0.9	23.9	0.7	38.5
3800	14.1	-23.8	-11.8	-8.4	1.4	0.9	23.9	0.7	37.2
3900	14.0	-23.5	-11.5	-8.6	1.3	0.9	23.6	0.7	37.2
4000	13.8	-23.3	-11.2	-8.9	1.3	0.9	23.1	0.7	37.8
5000	11.9	-21.9	-8.4	-10.5	1.4	1.0	23.0	1.2	36.6

Typical Performance Data

NOTE: Use PDF Bookmarks to view DATA at required conditions

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

TEST CONDITIONS: V_{DD} = +5 V, $V_{SHUTDOWN}$ = 0 V, I_{DD} = 61 mA, $I_{SHUTDOWN}$ = 0.0276 µA @ Temperature = +25°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		1dB Comp. Output	Noise Figure	IP-3 Output P_{OUT} = +4
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dB)	(dBm)
300	30.6	-39.9	-3.1	-4.8	0.9	0.8	23.2	0.2	34.1
400	29.6	-38.9	-3.9	-5.0	0.9	0.8	23.4	0.2	33.5
500	28.7	-37.3	-4.7	-5.2	0.9	0.7	22.9	0.2	33.8
550	28.2	-37.1	-5.1	-5.4	0.9	0.8	23.2	0.2	34.2
600	27.7	-36.9	-5.5	-5.4	1.0	0.8	22.8	0.2	34.9
650	27.3	-36.1	-5.9	-5.5	1.0	0.8	23.3	0.3	34.2
700	26.8	-35.7	-6.2	-5.6	1.0	0.8	23.3	0.2	33.7
750	26.4	-35.5	-6.5	-5.6	1.0	0.8	23.5	0.3	34.1
800	25.9	-35.1	-6.8	-5.7	1.0	0.8	23.2	0.3	34.7
850	25.5	-34.8	-7.1	-5.8	1.1	0.8	23.2	0.3	34.6
900	25.1	-34.3	-7.4	-5.8	1.1	0.8	23.3	0.3	34.0
950	24.8	-34.1	-7.7	-5.8	1.1	0.8	23.2	0.2	34.7
1000	24.4	-33.7	-8.0	-5.9	1.1	0.8	23.3	0.3	34.8
1100	23.7	-33.1	-8.4	-5.9	1.1	0.8	23.3	0.3	35.0
1200	23.0	-32.7	-8.9	-6.0	1.1	0.8	23.4	0.3	35.2
1300	22.4	-32.1	-9.3	-6.0	1.2	0.8	24.1	0.3	34.2
1400	21.8	-31.6	-9.7	-6.0	1.2	0.8	23.6	0.2	35.4
1500	21.3	-31.2	-10.1	-5.9	1.2	0.8	24.2	0.3	35.2
1600	20.7	-30.8	-10.4	-6.0	1.2	0.7	24.0	0.3	35.3
1700	20.2	-30.3	-10.7	-6.0	1.2	0.7	24.2	0.3	35.6
1800	19.8	-29.9	-11.0	-5.9	1.2	0.7	24.3	0.3	35.3
1900	19.4	-29.5	-11.3	-5.9	1.2	0.7	24.3	0.4	35.5
2000	18.9	-29.2	-11.6	-5.9	1.3	0.7	23.6	0.4	36.7
2100	18.5	-28.9	-11.8	-5.9	1.3	0.7	23.9	0.4	36.4
2200	18.1	-28.5	-12.1	-6.0	1.3	0.7	24.2	0.4	36.0
2300	17.8	-28.2	-12.3	-5.9	1.3	0.7	23.8	0.4	36.4
2400	17.5	-27.8	-12.5	-5.9	1.3	0.7	24.3	0.4	36.5
2500	17.1	-27.6	-12.8	-6.0	1.3	0.7	24.1	0.4	36.3
2600	16.8	-27.2	-12.9	-6.1	1.3	0.7	24.2	0.4	35.9
2700	16.5	-26.9	-13.1	-6.1	1.3	0.7	23.8	0.4	36.8
2800	16.2	-26.6	-13.2	-6.2	1.3	0.7	24.3	0.4	36.3
2900	15.9	-26.3	-13.2	-6.4	1.4	0.8	24.0	0.4	36.5
3000	15.7	-26.0	-13.3	-6.7	1.4	0.8	23.9	0.4	37.7
3100	15.6	-25.6	-13.4	-6.7	1.3	0.8	24.1	0.4	37.5
3200	15.4	-25.3	-13.4	-6.7	1.3	0.8	24.3	0.5	37.4
3300	15.1	-25.1	-13.4	-7.0	1.3	0.8	24.1	0.5	37.6
3400	14.9	-24.8	-13.3	-7.2	1.3	0.8	24.1	0.6	37.9
3500	14.7	-24.6	-13.1	-7.3	1.3	0.8	24.1	0.6	37.3
3600	14.4	-24.4	-12.7	-7.4	1.4	0.8	24.4	0.8	38.4
3700	14.1	-24.3	-11.6	-7.9	1.4	0.9	24.3	0.7	38.8
3800	14.2	-23.9	-11.9	-8.3	1.4	0.9	24.3	0.7	37.5
3900	14.0	-23.6	-11.6	-8.5	1.3	0.9	24.1	0.7	38.1
4000	13.9	-23.4	-11.3	-8.8	1.3	0.9	23.6	0.7	37.8
5000	12.0	-21.9	-8.4	-10.4	1.4	1.0	23.6	1.1	38.1

Typical Performance Data

NOTE: Use PDF Bookmarks to view DATA at required conditions

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

TEST CONDITIONS: V_{DD} = +5.25 V, $V_{SHUTDOWN}$ = 0 V, I_{DD} = 64 mA, $I_{SHUTDOWN}$ = 0.0222 µA @ Temperature = +25°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		1dB Comp. Output	Noise Figure	IP-3 Output P_{OUT} = +4
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dB)	(dBm)
300	30.7	-40.5	-3.2	-4.8	0.9	0.8	23.6	0.2	34.5
400	29.7	-38.4	-4.0	-5.0	0.9	0.7	23.8	0.3	34.2
500	28.8	-38.1	-4.8	-5.2	1.0	0.8	23.4	0.2	34.8
550	28.3	-37.5	-5.1	-5.4	1.0	0.8	23.6	0.3	34.6
600	27.8	-37.0	-5.6	-5.4	1.0	0.8	23.3	0.2	34.8
650	27.3	-36.3	-6.0	-5.5	1.0	0.8	23.8	0.2	35.1
700	26.9	-35.8	-6.3	-5.6	1.0	0.8	23.8	0.2	34.8
750	26.4	-35.8	-6.6	-5.6	1.0	0.8	24.0	0.2	34.5
800	26.0	-35.2	-6.9	-5.7	1.0	0.8	23.7	0.3	35.4
850	25.6	-34.8	-7.2	-5.7	1.1	0.8	23.6	0.2	35.0
900	25.2	-34.4	-7.5	-5.7	1.1	0.8	23.7	0.2	35.1
950	24.8	-34.2	-7.8	-5.8	1.1	0.8	23.6	0.2	35.5
1000	24.4	-33.9	-8.1	-5.8	1.1	0.8	23.7	0.3	35.3
1100	23.7	-33.2	-8.5	-5.8	1.1	0.8	23.7	0.3	35.3
1200	23.1	-32.8	-9.0	-5.9	1.2	0.8	23.9	0.3	35.6
1300	22.5	-32.2	-9.4	-5.9	1.2	0.8	24.5	0.3	35.3
1400	21.9	-31.7	-9.8	-5.9	1.2	0.7	24.1	0.3	35.8
1500	21.3	-31.4	-10.2	-5.9	1.2	0.7	24.6	0.3	35.4
1600	20.8	-30.9	-10.5	-5.9	1.2	0.7	24.4	0.3	35.8
1700	20.3	-30.4	-10.9	-5.9	1.2	0.7	24.7	0.3	36.1
1800	19.8	-30.0	-11.1	-5.9	1.2	0.7	24.7	0.3	36.1
1900	19.4	-29.7	-11.4	-5.9	1.3	0.7	24.7	0.4	36.0
2000	19.0	-29.3	-11.7	-5.9	1.3	0.7	24.1	0.4	37.1
2100	18.6	-28.9	-11.9	-5.9	1.3	0.7	24.3	0.4	37.1
2200	18.2	-28.6	-12.2	-5.9	1.3	0.7	24.6	0.4	37.0
2300	17.8	-28.2	-12.4	-5.9	1.3	0.7	24.3	0.4	37.7
2400	17.5	-27.9	-12.7	-5.9	1.3	0.7	24.7	0.4	36.2
2500	17.2	-27.7	-12.9	-5.9	1.3	0.7	24.5	0.4	36.8
2600	16.9	-27.3	-13.0	-6.0	1.3	0.7	24.6	0.4	36.7
2700	16.6	-27.0	-13.2	-6.0	1.3	0.7	24.2	0.3	37.0
2800	16.3	-26.7	-13.3	-6.1	1.3	0.7	24.7	0.4	37.1
2900	16.0	-26.6	-13.3	-6.2	1.4	0.8	24.4	0.4	37.1
3000	15.8	-26.1	-13.3	-6.7	1.4	0.8	24.3	0.4	38.0
3100	15.6	-25.7	-13.6	-6.6	1.3	0.8	24.5	0.5	38.6
3200	15.4	-25.5	-13.6	-6.7	1.3	0.8	24.7	0.4	38.3
3300	15.2	-25.2	-13.5	-6.9	1.3	0.8	24.6	0.4	38.0
3400	15.0	-25.0	-13.4	-7.0	1.3	0.8	24.5	0.5	39.0
3500	14.8	-24.7	-13.2	-7.2	1.3	0.8	24.6	0.6	39.3
3600	14.5	-24.5	-12.8	-7.3	1.4	0.8	24.8	0.7	39.0
3700	14.2	-24.4	-11.7	-7.8	1.4	0.9	24.8	0.7	39.0
3800	14.2	-24.0	-12.0	-8.2	1.4	0.9	24.7	0.7	38.6
3900	14.1	-23.7	-11.8	-8.4	1.3	0.9	24.5	0.7	38.5
4000	13.9	-23.5	-11.5	-8.7	1.3	0.9	24.0	0.7	38.3
5000	12.1	-22.0	-8.5	-10.3	1.4	1.0	23.9	1.1	39.0

Typical Performance Data

NOTE: Use PDF Bookmarks to view DATA at required conditions

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

TEST CONDITIONS: V_{DD} = +5 V, $V_{SHUTDOWN}$ = 0 V, I_{DD} = 59 mA, $I_{SHUTDOWN}$ = 0.0347 µA @ Temperature = -45°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		1dB Comp. Output	Noise Figure	IP-3 Output P_{OUT} = +4
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dB)	(dBm)
300	31.3	-41.3	-3.3	-4.8	1.0	0.7	23.2	0.1	36.1
400	30.2	-39.8	-4.2	-5.0	1.0	0.7	23.2	0.1	35.6
500	29.3	-38.8	-5.0	-5.2	1.0	0.7	23.2	0.1	35.1
550	28.8	-37.9	-5.4	-5.3	1.0	0.7	23.4	0.1	34.7
600	28.3	-37.4	-5.9	-5.3	1.0	0.7	22.8	0.0	34.6
650	27.8	-36.8	-6.3	-5.4	1.0	0.7	23.2	0.1	34.6
700	27.4	-36.6	-6.6	-5.5	1.0	0.7	23.4	0.1	34.8
750	26.9	-36.2	-6.9	-5.5	1.0	0.7	23.5	0.1	34.3
800	26.5	-35.7	-7.3	-5.5	1.1	0.7	23.1	0.1	34.6
850	26.1	-35.7	-7.6	-5.5	1.1	0.7	23.0	0.1	34.6
900	25.7	-35.1	-7.9	-5.5	1.1	0.7	23.3	0.1	33.9
950	25.3	-34.9	-8.2	-5.6	1.1	0.7	23.3	0.1	34.0
1000	24.9	-34.4	-8.5	-5.6	1.1	0.7	23.2	0.1	34.5
1100	24.2	-33.8	-8.9	-5.6	1.1	0.7	23.2	0.1	34.3
1200	23.5	-33.3	-9.4	-5.6	1.2	0.7	23.4	0.1	34.2
1300	22.9	-32.7	-9.8	-5.6	1.2	0.7	24.0	0.1	34.3
1400	22.3	-32.2	-10.2	-5.6	1.2	0.7	23.6	0.1	34.2
1500	21.7	-31.7	-10.5	-5.6	1.2	0.7	24.2	0.1	33.9
1600	21.2	-31.3	-10.9	-5.6	1.2	0.7	24.0	0.1	33.9
1700	20.7	-30.9	-11.3	-5.6	1.2	0.7	24.3	0.1	34.1
1800	20.3	-30.4	-11.6	-5.5	1.2	0.7	24.3	0.1	34.2
1900	19.8	-30.1	-11.9	-5.5	1.2	0.7	24.4	0.2	34.0
2000	19.4	-29.7	-12.2	-5.5	1.3	0.7	23.7	0.2	34.1
2100	19.0	-29.4	-12.5	-5.5	1.3	0.7	24.0	0.2	33.6
2200	18.6	-29.0	-12.8	-5.5	1.3	0.7	24.4	0.2	33.9
2300	18.3	-28.6	-13.0	-5.5	1.3	0.7	24.0	0.1	34.0
2400	17.9	-28.2	-13.2	-5.5	1.3	0.7	24.4	0.1	33.9
2500	17.6	-28.0	-13.4	-5.5	1.3	0.7	24.2	0.1	33.8
2600	17.3	-27.7	-13.5	-5.7	1.3	0.7	24.4	0.1	33.8
2700	17.0	-27.4	-13.7	-5.7	1.3	0.7	23.8	0.1	33.7
2800	16.6	-27.0	-13.7	-5.8	1.3	0.7	24.4	0.1	33.5
2900	16.4	-26.7	-13.7	-6.2	1.3	0.7	24.3	0.1	33.3
3000	16.3	-26.3	-14.0	-6.1	1.3	0.7	24.1	0.1	33.4
3100	16.0	-26.0	-14.0	-6.2	1.3	0.7	24.3	0.2	33.9
3200	15.8	-25.7	-13.9	-6.4	1.3	0.7	24.4	0.2	33.8
3300	15.6	-25.5	-13.9	-6.6	1.3	0.8	24.3	0.2	34.0
3400	15.4	-25.1	-13.7	-6.7	1.3	0.8	24.3	0.2	33.0
3500	15.2	-24.9	-13.6	-6.8	1.3	0.8	24.3	0.3	33.5
3600	15.0	-24.7	-13.2	-7.0	1.3	0.8	24.5	0.3	33.3
3700	14.5	-24.8	-11.7	-7.3	1.3	0.8	24.4	0.4	33.2
3800	14.6	-24.2	-12.2	-7.7	1.3	0.8	24.4	0.4	33.0
3900	14.5	-23.9	-12.0	-8.0	1.3	0.8	24.2	0.3	33.2
4000	14.4	-23.7	-11.7	-8.2	1.3	0.9	23.7	0.3	33.2
5000	12.5	-22.1	-8.7	-9.7	1.3	1.0	23.8	0.7	32.1

Typical Performance Data

NOTE: Use PDF Bookmarks to view DATA at required conditions

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

TEST CONDITIONS: V_{DD} = +5 V, $V_{SHUTDOWN}$ = 0 V, I_{DD} = 60 mA, $I_{SHUTDOWN}$ = 0.0247 µA @ Temperature = +105°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		1dB Comp. Output	Noise Figure	IP-3 Output P_{OUT} = +4
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dB)	(dBm)
300	29.8	-39.6	-2.9	-4.5	0.9	0.7	22.5	0.3	33.8
400	28.9	-38.4	-3.6	-4.7	0.9	0.7	22.6	0.3	33.2
500	28.0	-36.9	-4.3	-5.0	0.9	0.7	22.5	0.3	33.7
550	27.6	-36.6	-4.7	-5.1	0.9	0.8	22.7	0.4	33.1
600	27.1	-36.4	-5.1	-5.2	0.9	0.8	22.3	0.4	34.2
650	26.7	-35.9	-5.4	-5.3	0.9	0.8	22.7	0.4	33.5
700	26.2	-35.4	-5.7	-5.4	1.0	0.8	22.7	0.4	33.4
750	25.8	-35.2	-6.1	-5.4	1.0	0.8	22.8	0.4	33.4
800	25.4	-34.8	-6.4	-5.5	1.0	0.8	22.6	0.5	34.0
850	25.0	-34.5	-6.7	-5.6	1.0	0.8	22.6	0.4	33.7
900	24.6	-34.2	-6.9	-5.6	1.0	0.8	22.7	0.4	33.9
950	24.3	-34.0	-7.2	-5.7	1.1	0.8	22.8	0.4	34.0
1000	23.9	-33.5	-7.5	-5.7	1.1	0.8	22.7	0.4	34.1
1100	23.2	-33.0	-7.9	-5.8	1.1	0.8	22.7	0.5	34.2
1200	22.5	-32.6	-8.4	-5.8	1.2	0.8	22.8	0.5	34.4
1300	21.9	-32.1	-8.8	-5.9	1.2	0.8	23.2	0.5	33.9
1400	21.4	-31.6	-9.1	-5.9	1.2	0.8	23.0	0.5	34.3
1500	20.8	-31.1	-9.5	-5.9	1.2	0.8	23.2	0.5	34.2
1600	20.3	-30.7	-9.8	-5.9	1.2	0.8	23.2	0.5	34.7
1700	19.8	-30.4	-10.1	-5.9	1.3	0.8	23.3	0.5	34.5
1800	19.4	-30.0	-10.4	-5.9	1.3	0.8	23.3	0.5	34.6
1900	18.9	-29.6	-10.6	-5.9	1.3	0.8	23.3	0.6	35.0
2000	18.5	-29.4	-10.9	-5.9	1.3	0.8	22.8	0.6	35.4
2100	18.1	-28.8	-11.1	-5.9	1.3	0.8	23.0	0.6	35.7
2200	17.7	-28.7	-11.4	-6.0	1.4	0.8	23.2	0.6	35.7
2300	17.4	-28.2	-11.6	-5.9	1.3	0.8	23.1	0.6	35.6
2400	17.0	-27.9	-11.8	-5.9	1.3	0.7	23.2	0.7	35.4
2500	16.7	-27.6	-11.9	-5.9	1.4	0.8	23.1	0.7	35.6
2600	16.4	-27.3	-12.0	-6.0	1.4	0.8	23.1	0.7	35.7
2700	16.1	-27.1	-12.2	-6.1	1.4	0.8	22.8	0.7	35.6
2800	15.7	-26.9	-12.2	-6.2	1.4	0.8	23.2	0.7	35.5
2900	15.6	-26.4	-12.4	-6.4	1.4	0.8	23.1	0.7	36.0
3000	15.3	-26.2	-12.6	-6.4	1.4	0.8	23.0	0.7	36.3
3100	15.1	-25.8	-12.7	-6.6	1.4	0.8	23.1	0.7	36.3
3200	14.9	-25.4	-12.7	-6.6	1.4	0.8	23.3	0.8	36.5
3300	14.7	-25.3	-12.7	-6.8	1.4	0.8	23.2	0.8	36.2
3400	14.5	-25.0	-12.6	-7.0	1.4	0.8	23.3	0.9	36.4
3500	14.3	-24.7	-12.5	-7.2	1.4	0.8	23.3	0.9	36.8
3600	14.0	-24.6	-12.1	-7.3	1.4	0.8	23.5	1.0	36.6
3700	13.7	-24.4	-11.2	-7.8	1.4	0.9	23.4	1.1	37.9
3800	13.7	-24.0	-11.4	-8.1	1.4	0.9	23.4	1.1	36.8
3900	13.6	-23.8	-11.1	-8.4	1.4	0.9	23.2	1.0	37.4
4000	13.4	-23.6	-10.8	-8.8	1.4	0.9	22.9	1.1	37.7
5000	11.5	-22.1	-8.1	-10.2	1.4	1.0	22.8	1.6	38.0

Typical Performance Data on 1900-2700 MHz Matching Test Board

NOTE: Use PDF Bookmarks to view DATA at required conditions

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

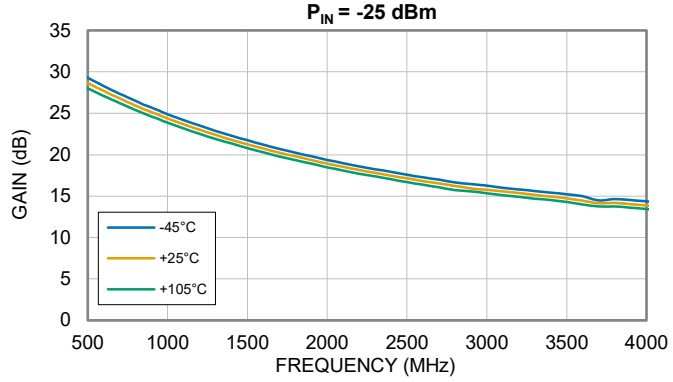
TEST CONDITIONS: V_{DD} = +5 V, $V_{SHUTDOWN}$ = 0 V, I_{DD} = 61 mA, $I_{SHUTDOWN}$ = 0.0276 µA @ Temperature = +25°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		1dB Comp. Output	Noise Figure	IP-3 Output P_{OUT} = +4
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dB)	(dBm)
300	-15.4	-60.9	-0.3	-0.1	7.2	0.1	-4.2	10.0	7.7
400	-7.6	-61.9	-0.4	-0.2	6.6	0.1	-2.2	6.2	10.7
500	-0.5	-62.3	-0.5	-0.3	5.4	0.1	4.4	3.7	11.5
550	3.1	-61.5	-0.5	-1.0	11.0	0.4	8.9	2.9	14.1
600	-3.4	-62.4	-0.6	-0.5	14.6	0.2	-1.2	2.6	12.1
650	0.8	-66.5	-0.7	-0.3	10.4	0.1	1.8	2.3	11.2
700	3.6	-59.8	-0.8	-0.4	5.0	0.1	5.1	1.8	12.6
750	5.9	-56.1	-0.9	-0.4	3.1	0.1	7.0	1.6	13.7
800	7.8	-53.1	-1.0	-0.4	2.5	0.2	8.5	1.5	15.5
850	9.5	-50.6	-1.2	-0.5	2.0	0.2	10.0	1.3	18.8
900	11.0	-47.9	-1.4	-0.6	1.8	0.2	11.6	1.2	22.4
950	12.3	-45.7	-1.6	-0.7	1.7	0.2	13.4	1.4	24.4
1000	13.6	-44.3	-1.8	-0.8	1.6	0.2	14.6	0.9	25.1
1100	15.8	-40.8	-2.4	-1.1	1.5	0.3	16.7	0.8	27.3
1200	17.6	-37.9	-3.1	-1.6	1.4	0.3	17.8	0.6	30.1
1300	18.8	-35.5	-4.0	-2.3	1.4	0.4	18.4	0.6	30.1
1400	19.8	-33.5	-5.1	-3.1	1.3	0.5	19.2	0.5	31.1
1500	20.3	-32.0	-6.1	-4.4	1.3	0.6	19.0	0.5	28.7
1600	20.6	-30.7	-7.1	-5.7	1.3	0.7	19.8	0.5	32.2
1700	20.6	-29.8	-7.9	-7.3	1.3	0.7	20.2	0.5	34.5
1800	20.4	-29.1	-8.6	-8.9	1.3	0.8	20.0	0.5	32.5
1900	20.2	-28.5	-9.1	-10.3	1.3	0.8	20.7	0.4	36.0
2000	19.9	-28.0	-9.6	-11.5	1.3	0.9	20.5	0.5	34.6
2100	19.6	-27.6	-10.0	-12.1	1.3	0.9	20.5	0.5	34.9
2200	19.2	-27.3	-10.4	-12.3	1.3	0.9	20.6	0.5	37.2
2300	18.7	-27.0	-10.6	-12.0	1.3	0.9	21.4	0.5	41.2
2400	18.3	-26.8	-10.9	-11.4	1.3	0.9	21.4	0.5	40.3
2500	17.9	-26.6	-11.2	-10.9	1.3	0.9	21.8	0.5	40.1
2600	17.5	-26.3	-11.4	-10.5	1.3	0.9	21.8	0.5	40.4
2700	17.2	-26.1	-11.6	-9.9	1.3	0.9	21.5	0.5	41.0
2800	16.8	-26.0	-11.7	-9.4	1.3	0.9	22.0	0.6	39.0
2900	16.4	-25.7	-11.7	-9.2	1.3	0.9	22.3	0.6	38.8
3000	16.1	-25.5	-11.8	-9.3	1.4	0.9	22.6	0.6	38.5
3100	15.9	-25.1	-12.1	-8.9	1.3	0.8	22.5	0.6	38.5
3200	15.7	-24.9	-12.2	-8.5	1.3	0.8	22.4	0.7	38.7
3300	15.4	-24.7	-12.4	-8.4	1.3	0.8	22.1	0.6	39.0
3400	15.2	-24.4	-12.4	-8.3	1.3	0.8	21.9	0.7	39.2
3500	14.9	-24.3	-12.5	-8.2	1.3	0.8	22.7	0.7	38.4
3600	14.7	-24.0	-12.5	-8.3	1.3	0.8	22.8	0.7	38.4
3700	14.5	-23.8	-12.5	-8.3	1.3	0.8	22.7	0.7	40.1
3800	14.4	-23.6	-12.4	-8.4	1.3	0.8	22.5	0.8	39.0
3900	14.2	-23.3	-12.3	-8.5	1.3	0.8	22.0	0.8	39.6
4000	14.0	-23.1	-12.2	-8.7	1.3	0.8	22.3	0.8	39.7
5000	12.5	-21.4	-10.0	-11.5	1.3	1.0	20.8	1.1	36.6

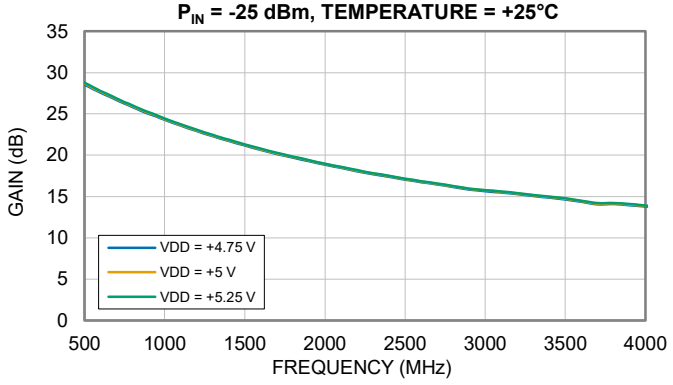
Typical Performance Curves

Note: The following data was taken on the Mini-Circuits Characterization Test Board TB-TSS-43ULNC+ (Figure 2). All data taken at nominal condition of V_{DD} = +5 V and at $V_{SHUTDOWN}$ = 0 V unless noted otherwise.

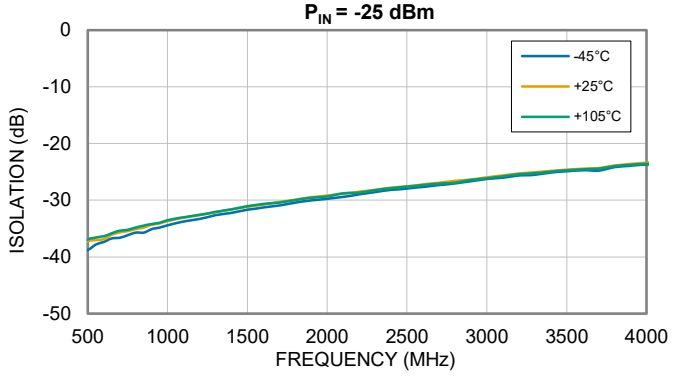
GAIN vs. TEMPERATURE
P_{IN} = -25 dBm



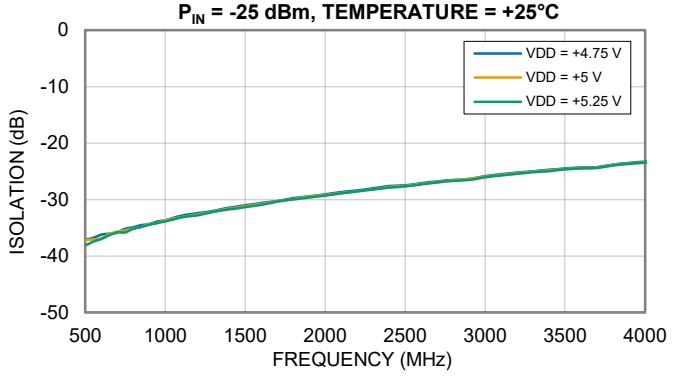
GAIN vs. DEVICE VOLTAGE (V_{DD})
P_{IN} = -25 dBm, TEMPERATURE = +25°C



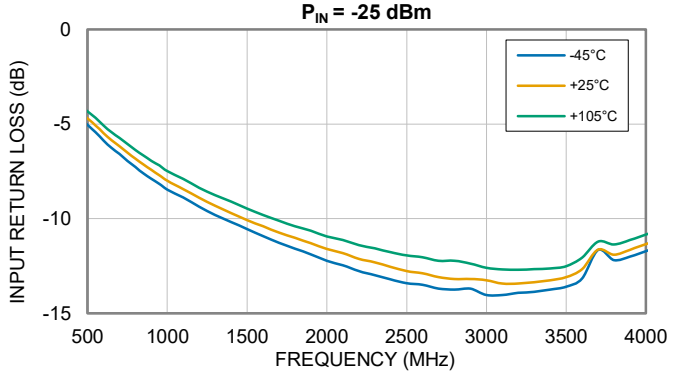
ISOLATION vs. TEMPERATURE
P_{IN} = -25 dBm



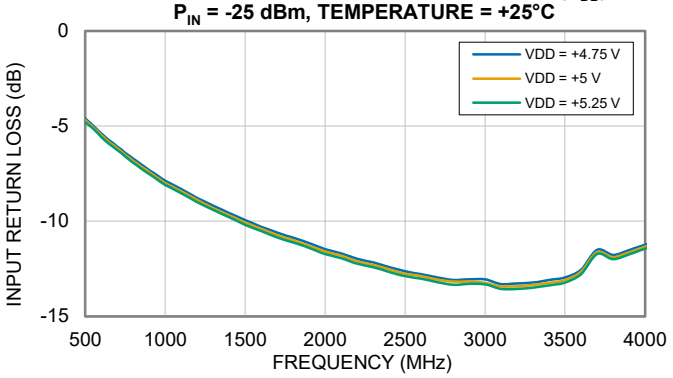
ISOLATION vs. DEVICE VOLTAGE (V_{DD})
P_{IN} = -25 dBm, TEMPERATURE = +25°C



INPUT RETURN LOSS vs. TEMPERATURE
P_{IN} = -25 dBm



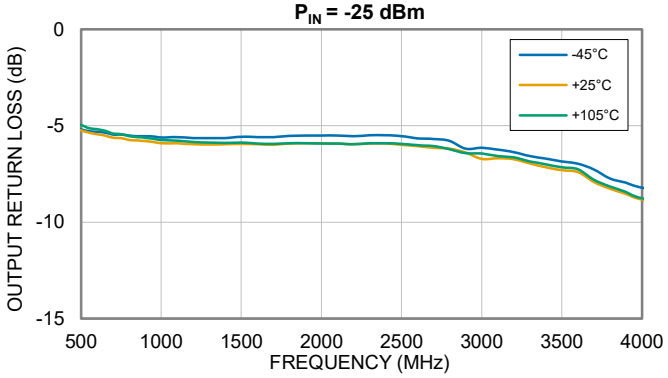
INPUT RETURN LOSS vs. DEVICE VOLTAGE (V_{DD})
P_{IN} = -25 dBm, TEMPERATURE = +25°C



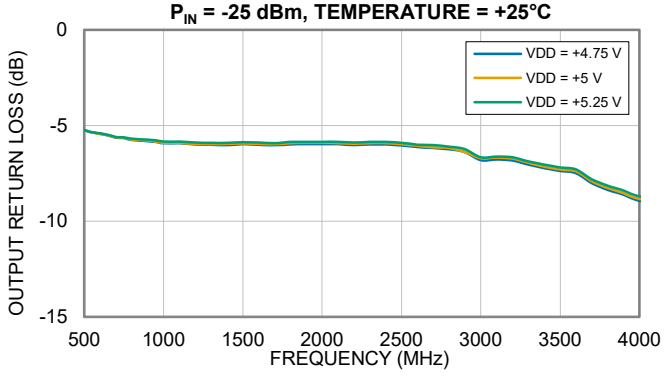
Typical Performance Curves

Note: The following data was taken on the Mini-Circuits Characterization Test Board TB-TSS-43ULNC+ (Figure 2). All data taken at nominal condition of V_{DD} = +5 V and at $V_{SHUTDOWN}$ = 0 V unless noted otherwise.

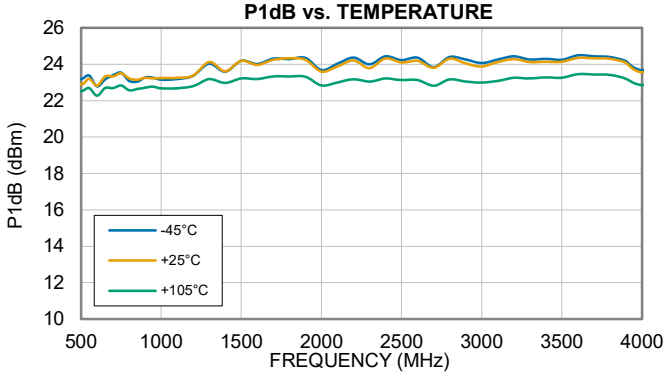
OUTPUT RETURN LOSS vs. TEMPERATURE
P_{IN} = -25 dBm



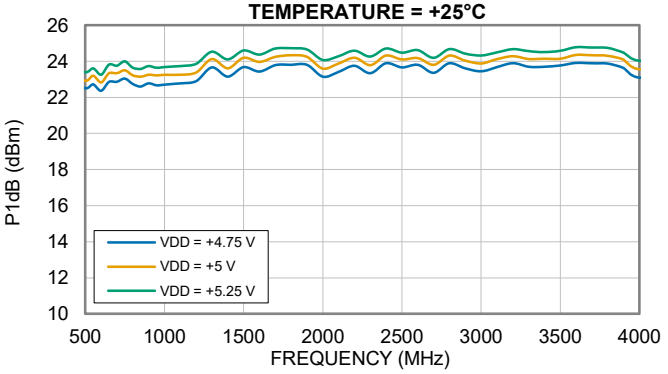
OUTPUT RETURN LOSS vs. DEVICE VOLTAGE (V_{DD})
P_{IN} = -25 dBm, TEMPERATURE = +25°C



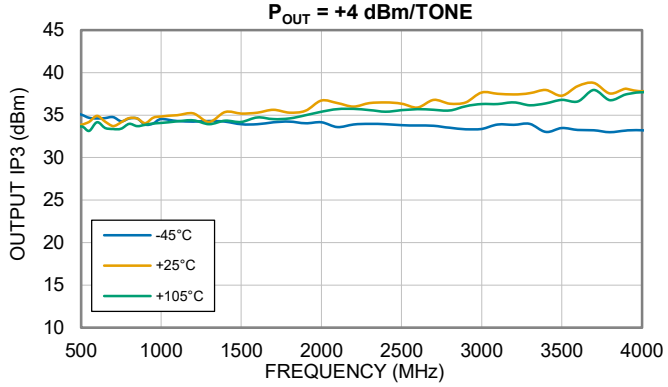
P1dB vs. TEMPERATURE



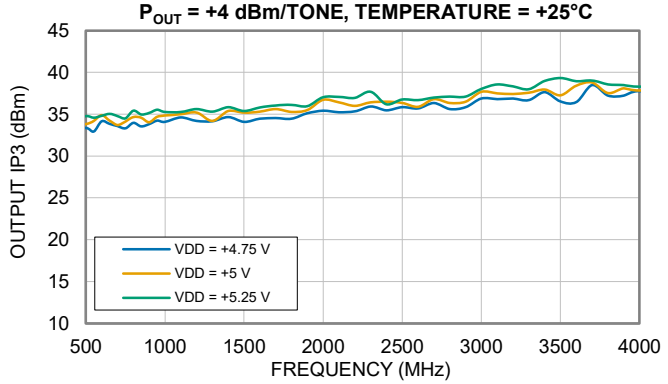
P1dB vs. DEVICE VOLTAGE (V_{DD})
TEMPERATURE = +25°C



OUTPUT IP3 vs. TEMPERATURE
P_{OUT} = +4 dBm/TONE



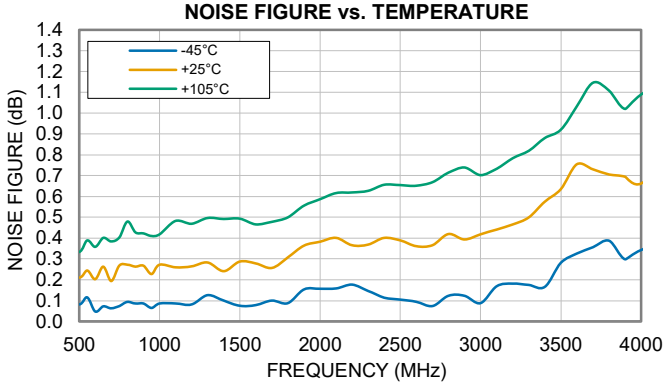
OUTPUT IP3 vs. DEVICE VOLTAGE (V_{DD})
P_{OUT} = +4 dBm/TONE, TEMPERATURE = +25°C



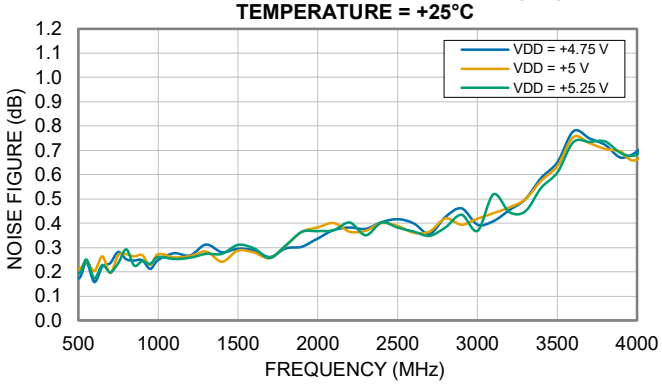
Typical Performance Curves

Note: The following data was taken on the Mini-Circuits Characterization Test Board TB-TSS-43ULNC+ (Figure 2). All data taken at nominal condition of V_{DD} = +5 V and at $V_{SHUTDOWN}$ = 0 V unless noted otherwise.

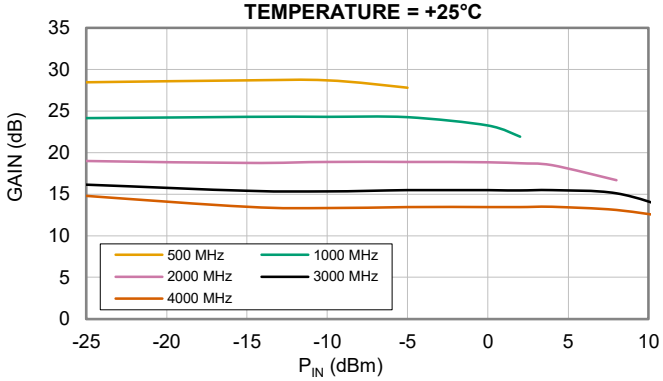
NOISE FIGURE vs. TEMPERATURE



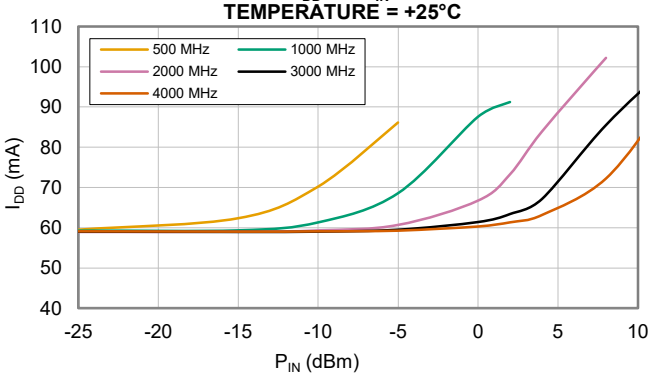
NOISE FIGURE vs. DEVICE VOLTAGE (V_{DD})
TEMPERATURE = +25°C



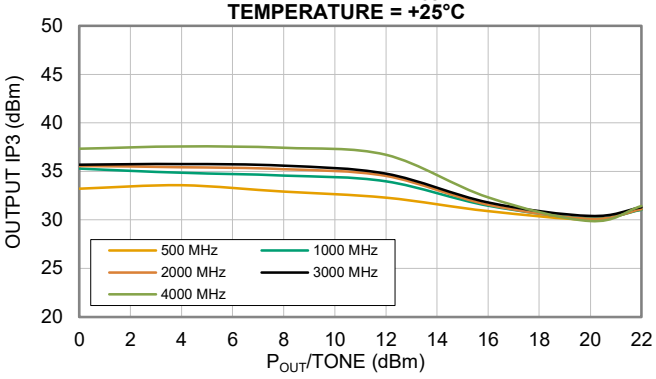
GAIN vs. P_{IN}
TEMPERATURE = +25°C



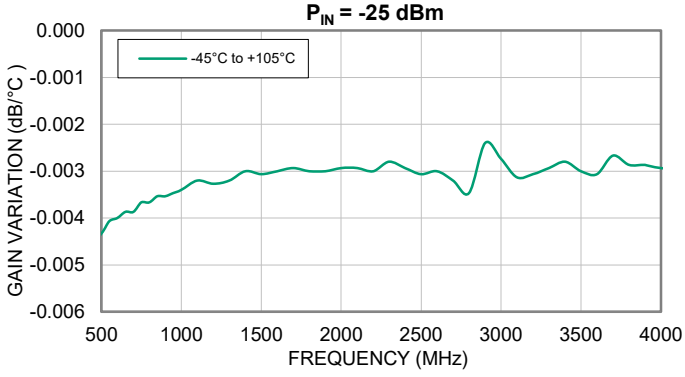
I_{DD} vs. P_{IN}
TEMPERATURE = +25°C



OUTPUT IP3 vs. P_{OUT}
TEMPERATURE = +25°C



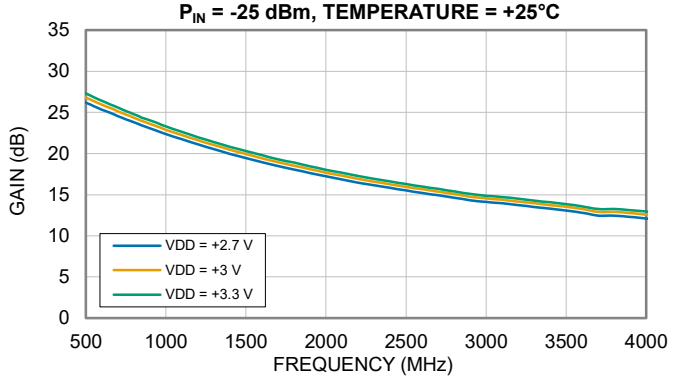
GAIN VARIATION vs. TEMPERATURE
P_{IN} = -25 dBm



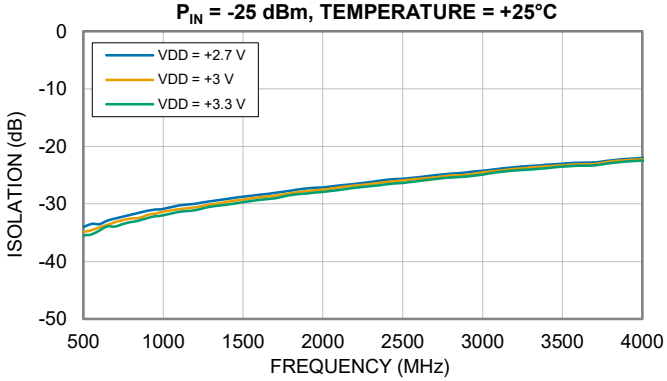
Typical Performance Curves

Note: The following data was taken on the Mini-Circuits Characterization Test Board TB-TSS-43ULNC+ (Figure 2). All data taken at $V_{SHUTDOWN}$ = 0 V unless noted otherwise.

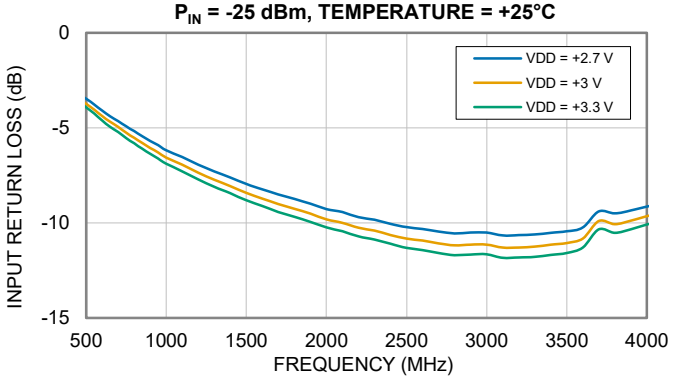
GAIN vs. DEVICE VOLTAGE (V_{DD})
P_{IN} = -25 dBm, TEMPERATURE = +25°C



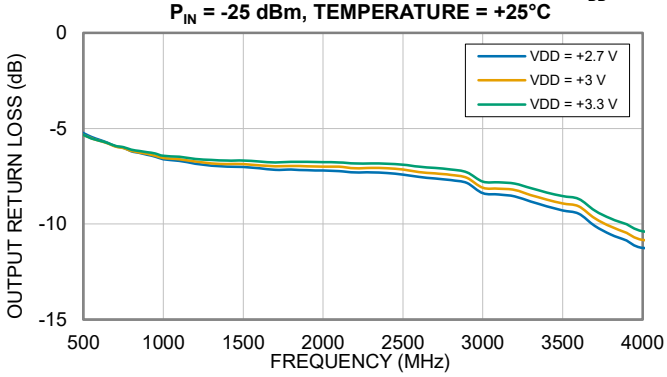
ISOLATION vs. DEVICE VOLTAGE (V_{DD})
P_{IN} = -25 dBm, TEMPERATURE = +25°C



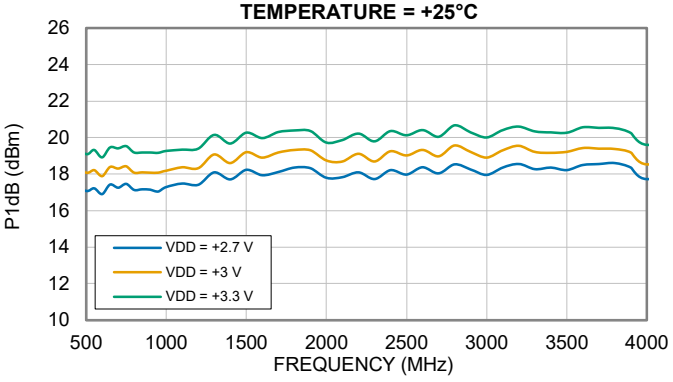
INPUT RETURN LOSS vs. DEVICE VOLTAGE (V_{DD})
P_{IN} = -25 dBm, TEMPERATURE = +25°C



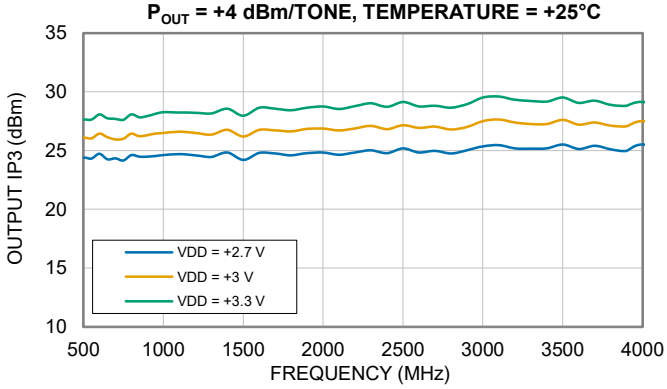
OUTPUT RETURN LOSS vs. DEVICE VOLTAGE (V_{DD})
P_{IN} = -25 dBm, TEMPERATURE = +25°C



P1dB vs. DEVICE VOLTAGE (V_{DD})
TEMPERATURE = +25°C



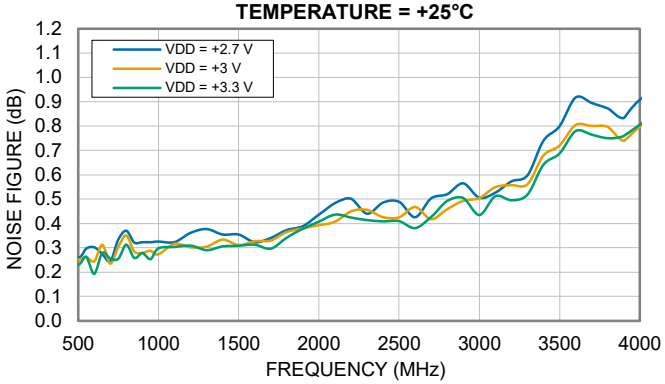
OUTPUT IP3 vs. DEVICE VOLTAGE (V_{DD})
P_{OUT} = +4 dBm/TONE, TEMPERATURE = +25°C



Typical Performance Curves

Note: The following data was taken on the Mini-Circuits Characterization Test Board TB-TSS-43ULNC+ (Figure 2). All data taken at $V_{SHUTDOWN}$ = 0 V unless noted otherwise.

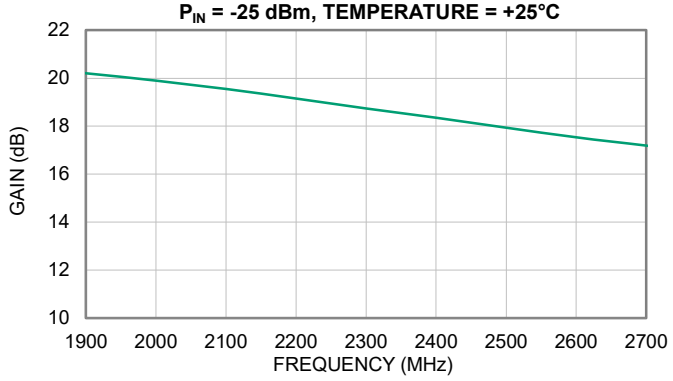
NOISE FIGURE vs. DEVICE VOLTAGE (V_{DD})
TEMPERATURE = +25°C



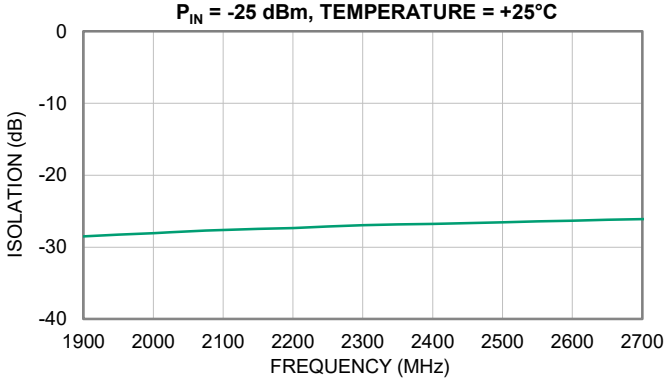
Typical Performance Curves

Note: The following data was taken on the Mini-Circuits 1900-2700 MHz Matched Characterization Test Board (Figure 3). All data taken at nominal condition of V_{DD} = +5 V and at $V_{SHUTDOWN}$ = 0 V.

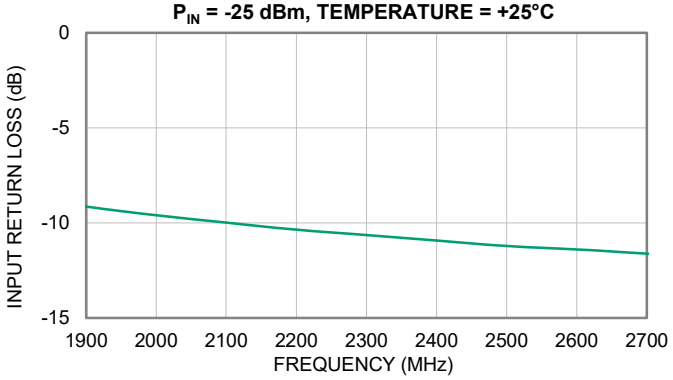
GAIN vs. FREQUENCY
P_{IN} = -25 dBm, TEMPERATURE = +25°C



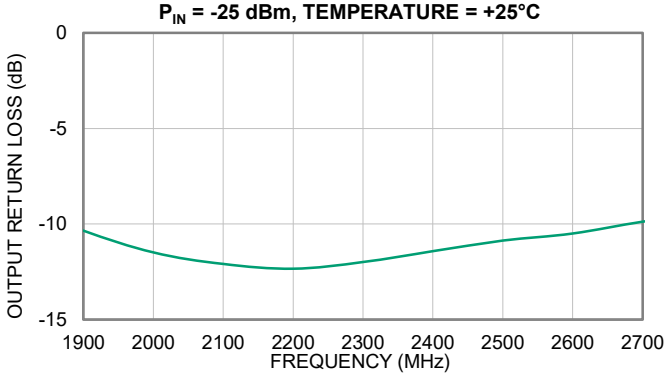
ISOLATION vs. FREQUENCY
P_{IN} = -25 dBm, TEMPERATURE = +25°C



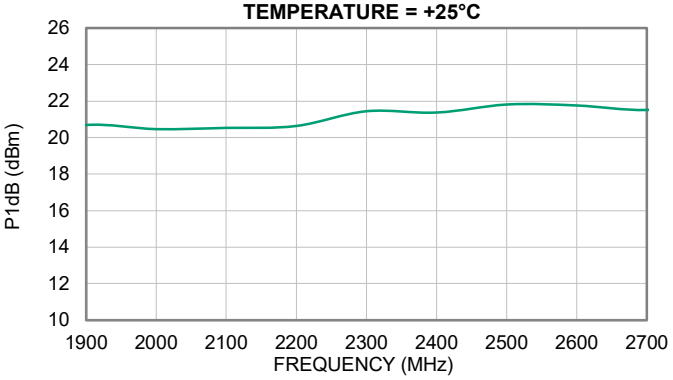
INPUT RETURN LOSS vs. FREQUENCY
P_{IN} = -25 dBm, TEMPERATURE = +25°C



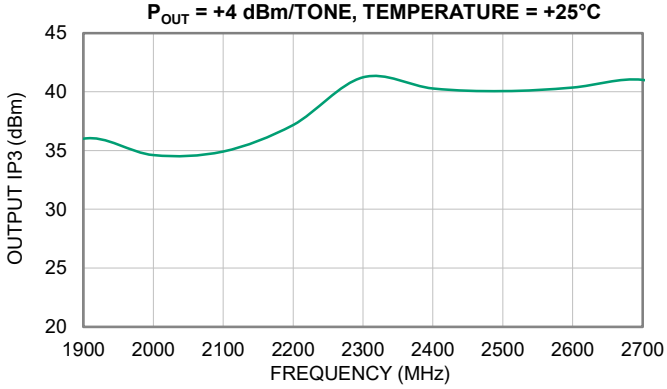
OUTPUT RETURN LOSS vs. FREQUENCY
P_{IN} = -25 dBm, TEMPERATURE = +25°C



P1dB vs. FREQUENCY
TEMPERATURE = +25°C



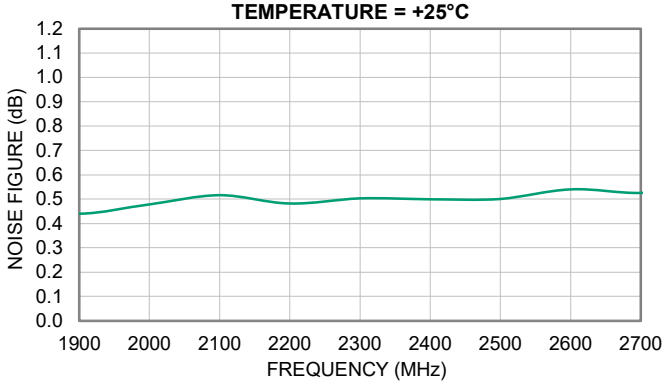
OUTPUT IP3 vs. FREQUENCY
P_{OUT} = +4 dBm/TONE, TEMPERATURE = +25°C



Typical Performance Curves

Note: The following data was taken on the Mini-Circuits 1900-2700 MHz Matched Characterization Test Board (Figure 3). All data taken at nominal condition of V_{DD} = +5 V and at $V_{SHUTDOWN}$ = 0 V.

NOISE FIGURE vs. FREQUENCY
TEMPERATURE = +25°C

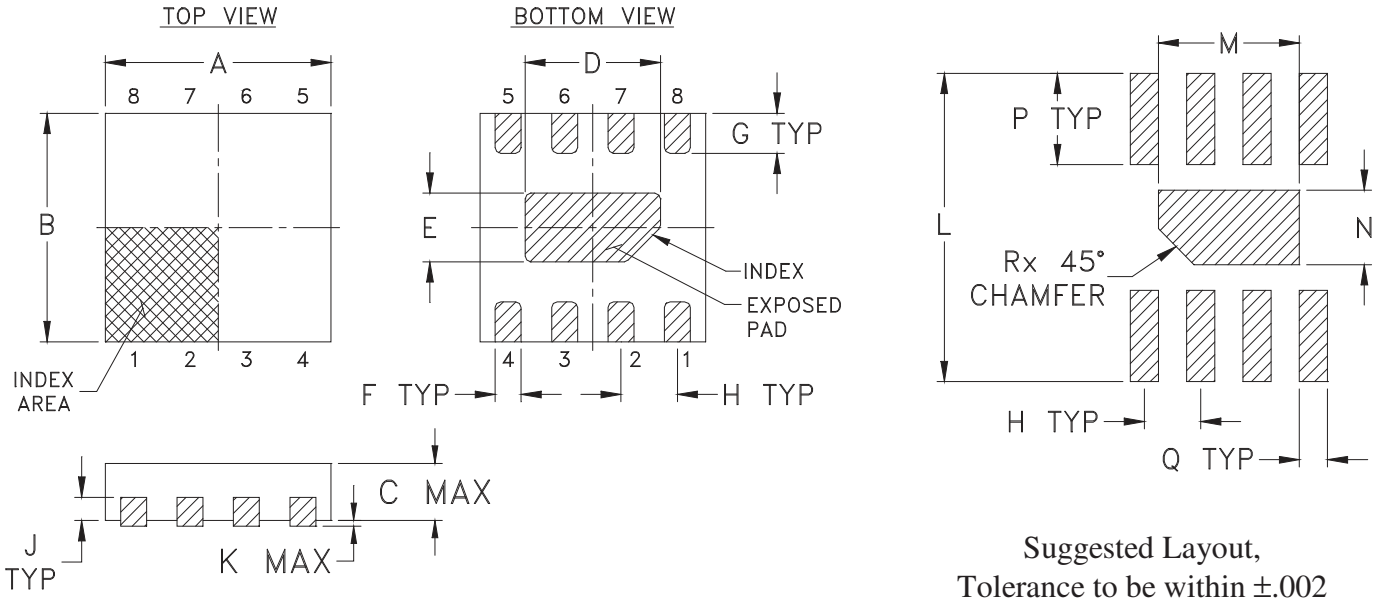


Case Style MC

MC1631-1

Outline Dimensions

PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

SE #.	A	B	C	D	E	F	G	H	J	K	L	M	N	P
MC1631-1	.079 (2.00)	.079 (2.00)	.039 (1.00)	.047 (1.20)	.024 (.60)	.009 (.23)	.014 (.35)	.020 (.50)	.008 (.20)	.002 (.05)	.106 (2.70)	.049 (1.25)	.026 (.65)	.031 (.80)

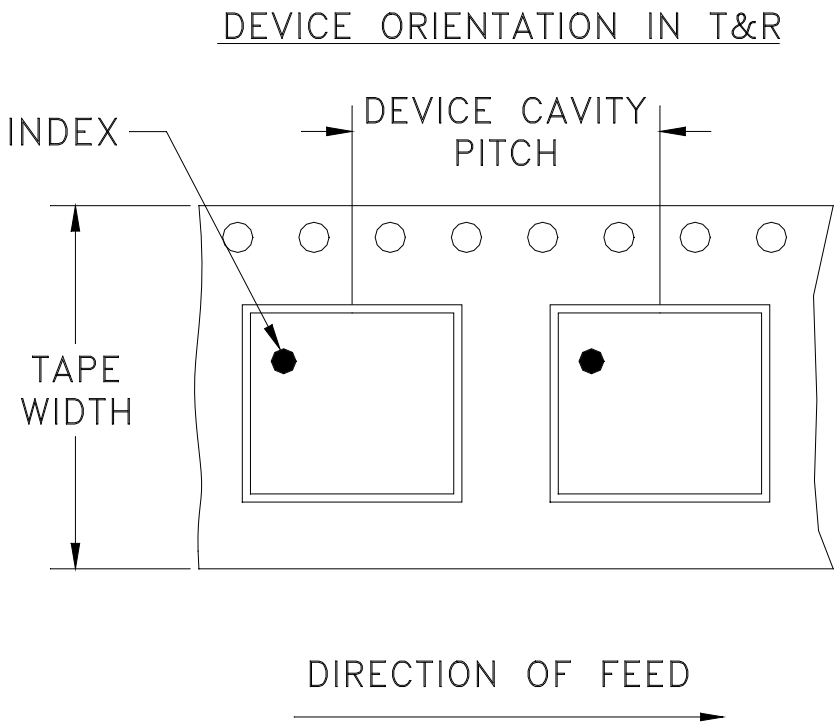
CASE #.	Q	R	WT, GRAM
MC1631-1	.010 (.25)	.012 (.30)	.006

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

Notes:

1. Case material: Plastic.
2. Termination finish:
   For RoHS Case Styles: Tin-Silver over Nickel plated or Matte-Tin Plated (See Data sheet).
   All models, (+) suffix.
3. Lead #1 identifier shall be located in the cross-hatched area shown.
   Identifier may be either a molded or marked feature.

Tape & Reel Packaging TR-F66



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel see note	
8	4	7	Small quantity standard	20
				50
				100
				200
				500
		7	Standard	1000, 2000, 3000

Note: Please consult individual model data sheet to determine device per reel availability.

Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

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

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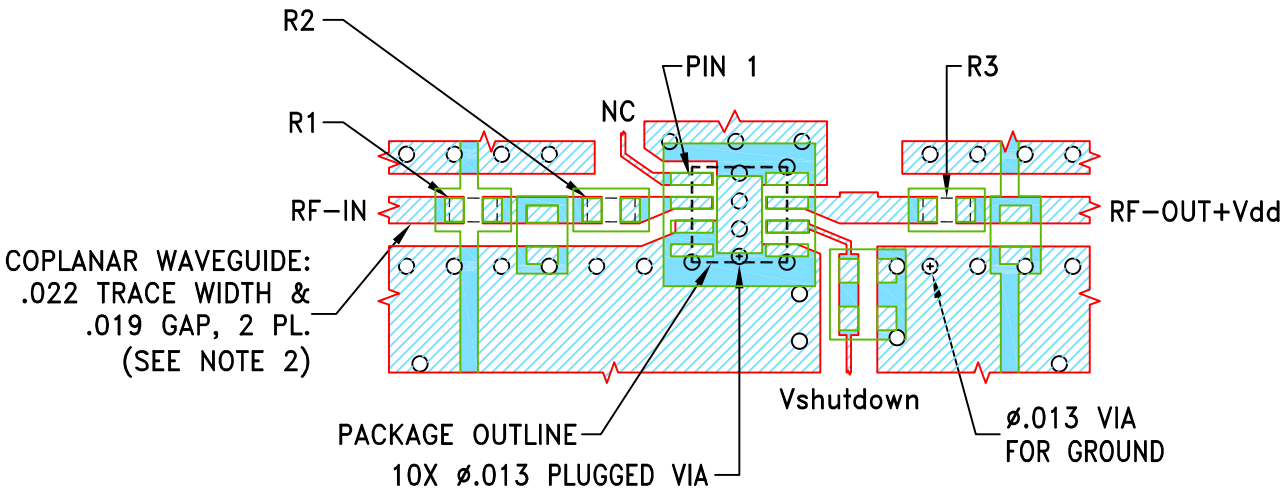
THIRD ANGLE PROJECTION

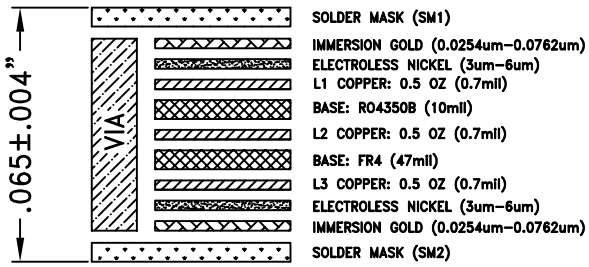
REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	ECO-027688	NEW RELEASE	11/17/25	ITG	IL

SUGGESTED MOUNTING CONFIGURATION FOR MC1631-1 CASE STYLE



COMPONENT	SIZE
R1-R3	0402

3 LAYER STACK-UP DETAIL



NOTES:
1. PCB IS MULTILAYER PCB, SEE STACK-UP DIAGRAM.
2. TRACE WIDTH & GAP ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .010".
   COPPER: 1/2 OZ. EACH LAYER. FOR OTHER MATERIALS TRACE WIDTH & GAP MAY NEED TO BE MODIFIED.
3. CHIP COMPONENT FOOT PRINTS SHOWN FOR REFERENCE, FOR COMPONENT VALUES REFER TO TB-TSS-43ULNC+.
4. LAYERS 2 & 3 OF PCB ARE CONTINUOUS GROUND PLANE.
5. UNIT LAND PATTERN WAS OPTIMIZED FOR BETTER PERFORMANCE.

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	11/17/25
TOLERANCES ON:	CHECKED	GF	11/17/25
2 PL DECIMALS ±	APPROVED	IL	11/17/25
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

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

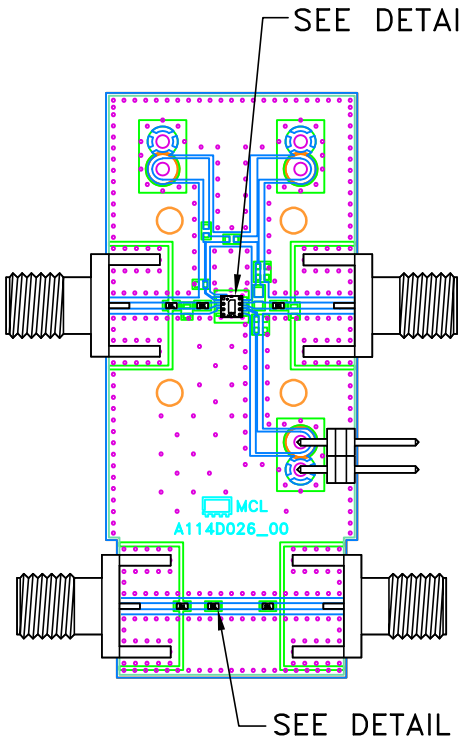
Mini-Circuits®
13 Neptune Avenue
Brooklyn NY 11235

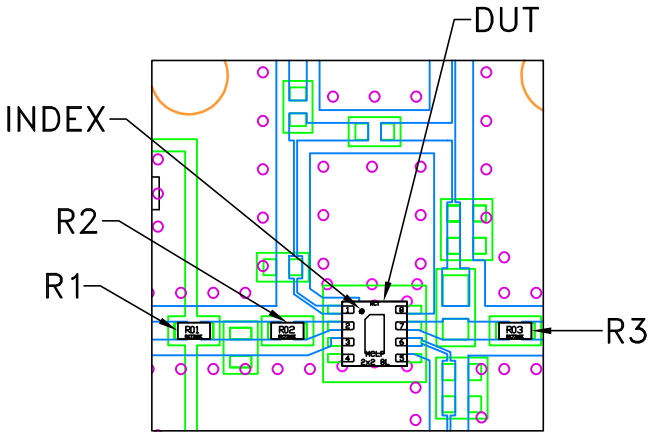
PL, MC1631-1, TB-TSS-43ULNC+

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-844	OR

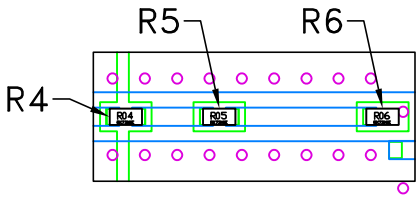
FILE:	SCALE:	SHEET:
98PL844	6:1	1 OF 1

Evaluation Board and Circuit

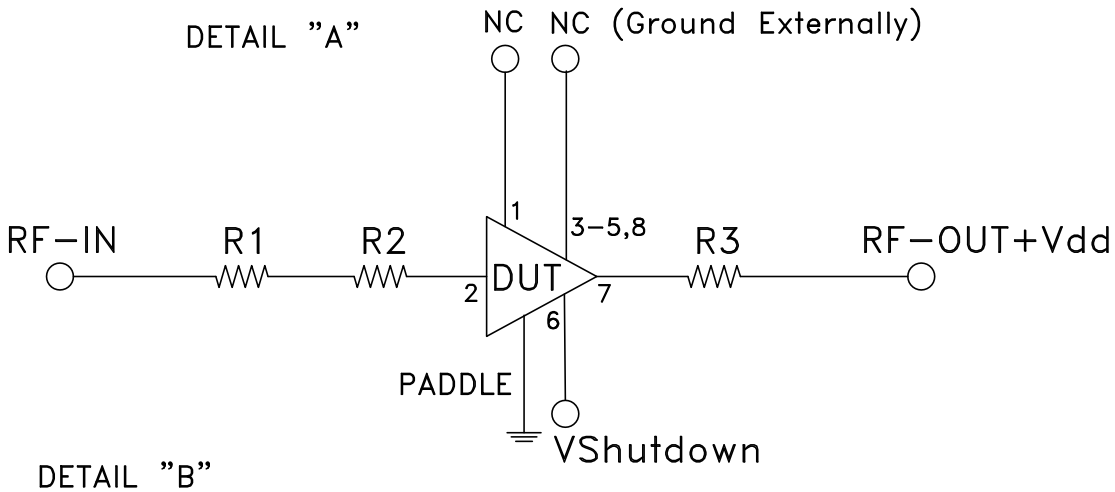




DETAIL "A"
LOCATION OF COMPONENTS ON THE PCB
(SCALE 3:1)



DETAIL "B"
LOCATION OF COMPONENTS ON THE PCB
(SCALE 3:1)



THRU LINE
SCHEMATIC DIAGRAM

Component	Size	Value	Part Number	Manufacturer
R1,R2,R3,R4,R5,R6	0402	00hm	RK73Z1ETTP	KOA Speer

NOTES:

1. 50 Ohm SMA Female Connectors.
2. PCB Material: Roger RO4350B or equivalent, Dielectric constant=3.5, Thickness=0.010 inch

Mini-Circuits®

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

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