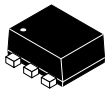
MMIC Amplifier

5 V, 22.7 mA, 0.1 to 3 GHz, MCPH6

SMA3117



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Features

- High Gain : Gp = 33.5 dB Typ. @ 2.2 GHz
- Wideband Response : fu = 3.0 GHz
- Low Current : I_{CC} = 22.7 mA Typ
- High Output Power: Po(1dB) = 5.7 dBm
- Port Impedance : Input/Output 50 Ω
- This Device is Pb−Free and Halide Free

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)

Symbol	Parameter	Ratings	Unit
V_{CC}	Supply Voltage	6	V
I_{CC}	Circuit Current	40	mA
P_D	Allowable Power Dissipation	280	mW
T_{opr}	Operating Temperature	−40 to +85	°C
T_{STG}	Storage Temperature	−55 to +150	°C

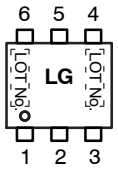
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

RECOMMENDED OPERATING CONDITIONS

(T_A = 25°C unless otherwise noted)

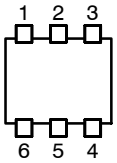
Symbol	Parameter	Ratings			Unit
		Min	Typ	Max	
V_{CC}	Supply Voltage	4.5	5	5.5	V
T_{opr}	Operating Ambient Temperature	−40	+25	+85	°C

MARKING DIAGRAM



LG = Specific Device Code

PIN DESCRIPTION



1: VCC
2: GND
3: OUT
4: GND
5: GND
6: IN

ORDERING INFORMATION

Device	Package	Shipping†
SMA3117−TL−H	MCPH6 (Pb-Free)	3000 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

ELECTRICAL CHARACTERISTICS (T_A = 25°C, V_{CC} = 5 V, Z_s = Z_L = 50 Ω)

Symbol	Parameter	Conditions	Ratings			Unit
			Min	Typ	Max	
I_{CC}	Circuit Current		18.5	22.7	28.0	mA
Gp	Power Gain	f = 1 GHz	29.5	31.2	32.5	dB
		f = 2.2 GHz	30.5	33.5	35.5	
ISL	Isolation	f = 1 GHz	35.0	37.6	–	dB
		f = 2.2 GHz	34.0	36.5	–	dB
RLin	Input Return Loss	f = 1 GHz	9.0	11.2	–	dB
		f = 2.2 GHz	4.5	6.0	–	
RLout	Output Return Loss	f = 1 GHz	11.0	14.3	–	dB
		f = 2.2 GHz	12.0	16.3	–	dB
NF	Noise Figure	f = 1 GHz	–	4.1	5.0	dB
		f = 2.2 GHz	–	3.9	5.0	
Po(1dB)	Gain 1 dB Compression Output Power (Note 1)	f = 1 GHz	7.5	9.8	–	dBm
		f = 2.2 GHz	3.7	5.7	–	
fu	Upper Limit Operating Frequency (Note 1)	3 dB down below flat gain at f = 1 GHz	–	3.0	–	GHz

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

1. On evaluation board

NOTE: Pay attention to handling since it is liable to be affected by static electricity due to the high frequency process adopted.

Test Circuit

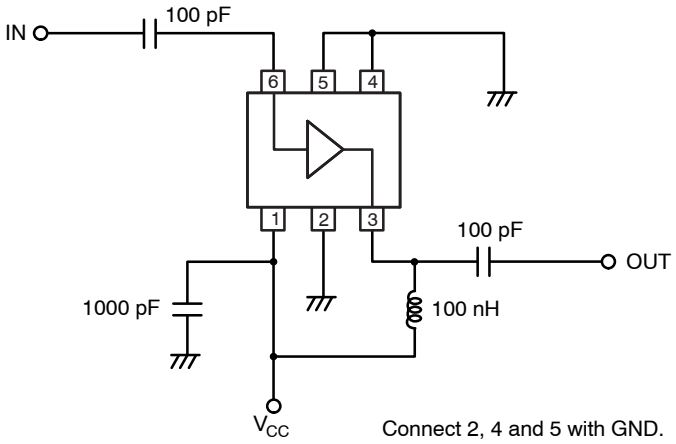
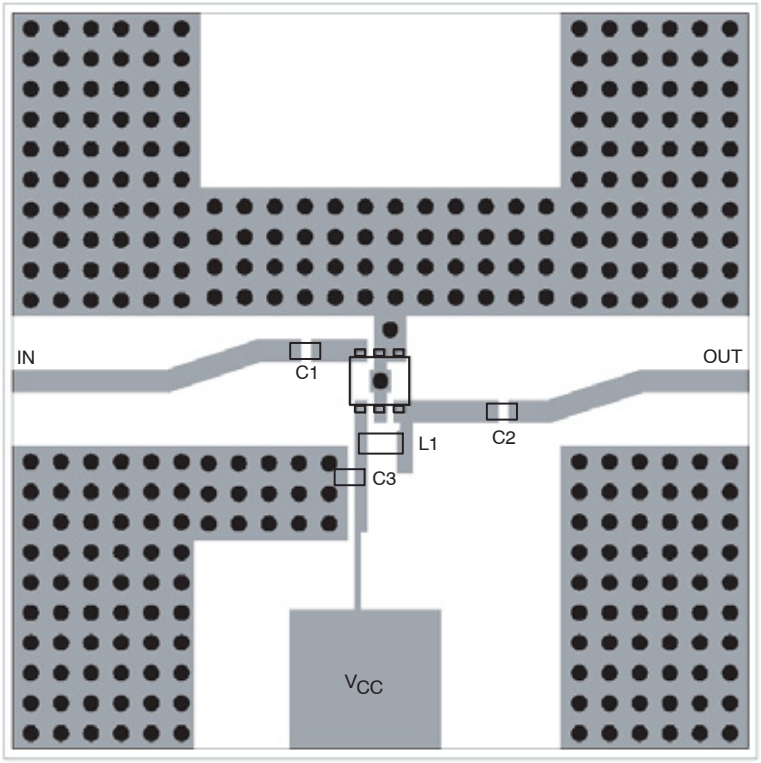


Figure 1. Test Circuit

Evaluation Board



Symbol	Value
C1, C2	100 pF
C3	1000 pF
L1	100 nH

Figure 2. Evaluation Board

TYPICAL PERFORMANCE CHARACTERISTICS

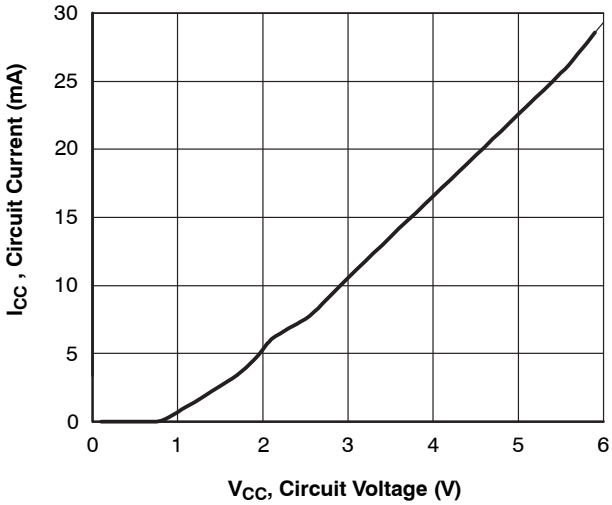


Figure 3. I_{CC} – V_{CC}

TYPICAL PERFORMANCE CHARACTERISTICS (continued)

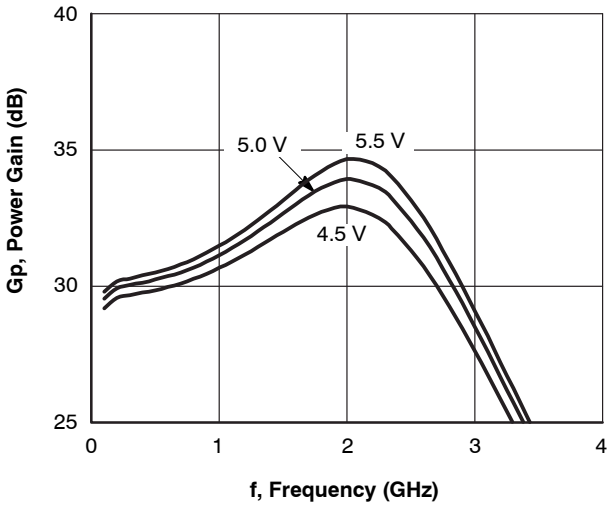


Figure 4. G_p – f

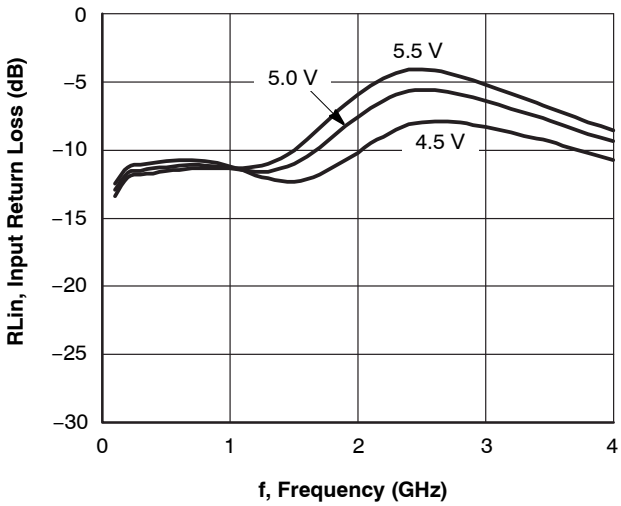


Figure 5. RLin – f

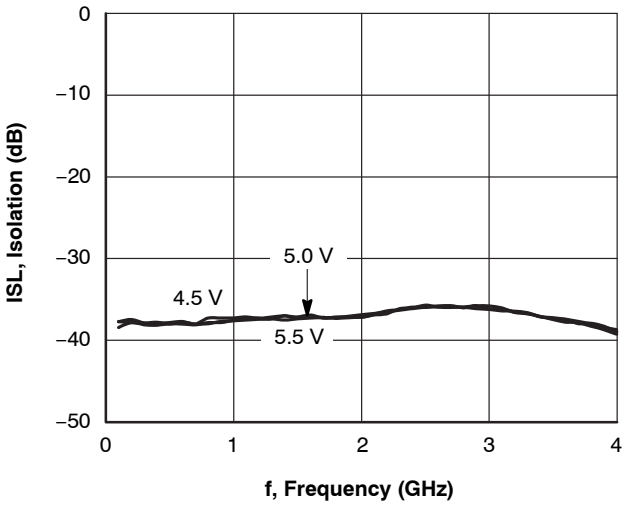


Figure 6. ISL – f

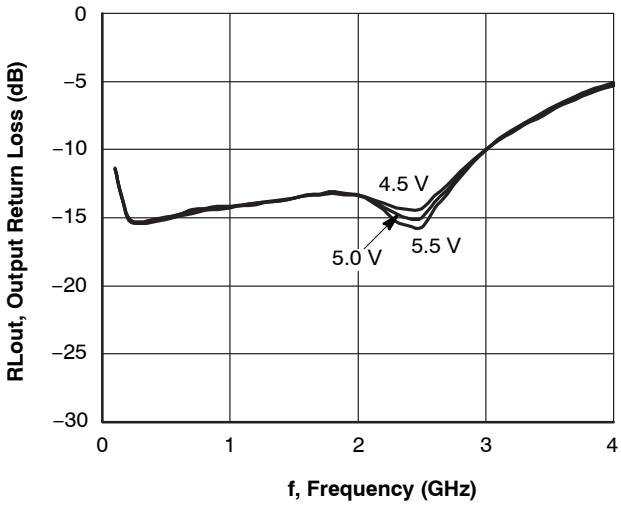


Figure 7. RLout – f

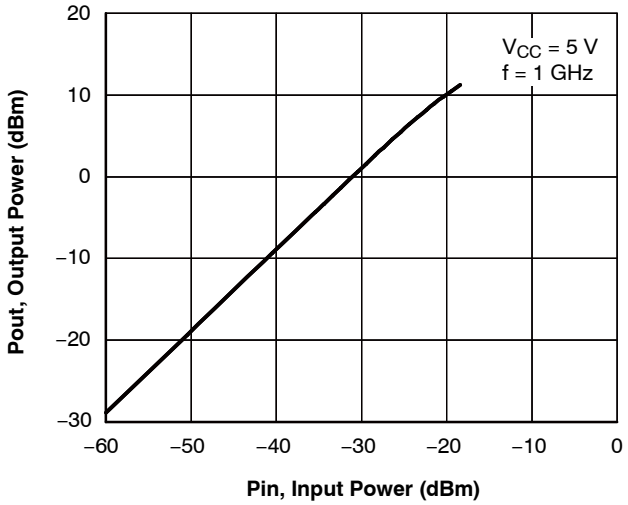


Figure 8. Pout – Pin

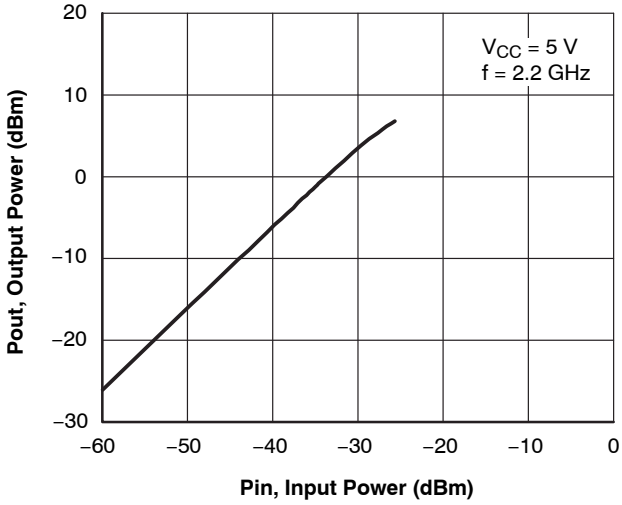


Figure 9. Pout – Pin

S Parameter (V_{CC} = 5 V)

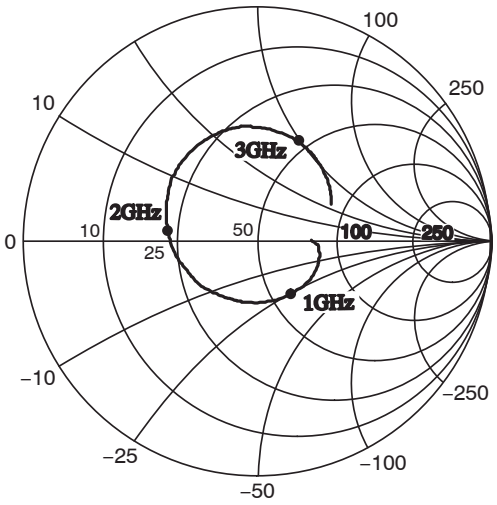


Figure 10. S Parameter, S11

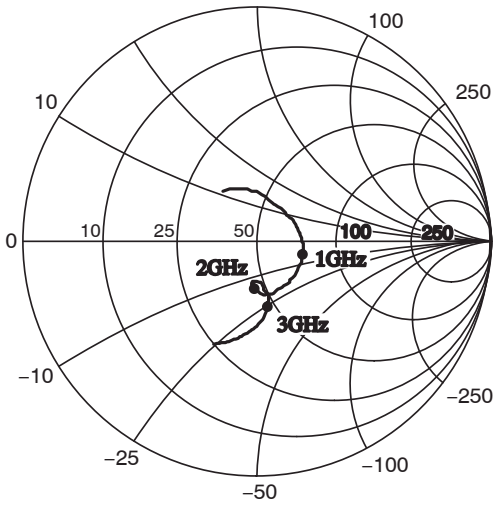
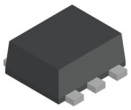


Figure 11. S Parameter, S22



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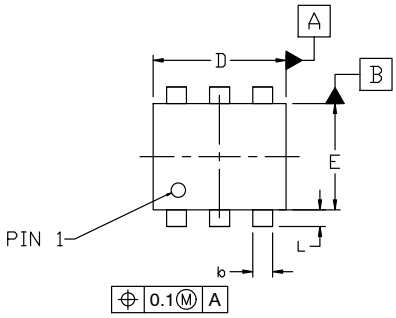
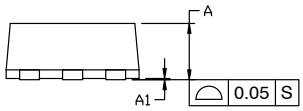
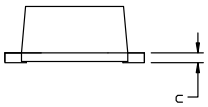
DATE 28 SEP 2022



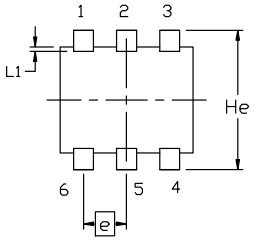
TOP VIEW



SIDE VIEW



FRONT VIEW



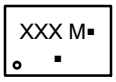
BOTTOM VIEW

NOTES:

1. NO INDUSTRY STANDARD APPLIES TO THIS PACKAGE.
2. ALL DIMENSIONS ARE IN MILLIMETERS.
3. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH AND THE BAR PROTRUSIONS.

DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.80	0.85	0.90
A1	0.00	---	0.02
b	0.25	0.30	0.40
c	0.12	0.15	0.25
D	1.94	2.00	2.06
E	1.54	1.60	1.66
He	2.05	2.10	2.15
L	0.19	0.25	0.31
L1	0.00	0.07	0.12
e	0.65 BSC		

GENERIC
MARKING DIAGRAM*



XXX = Specific Device Code
M = Date Code
▪ = Pb−Free Package

(Note: Microdot may be in either location)

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, “G” or microdot “▪”, may or may not be present. Some products may not follow the Generic Marking.

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