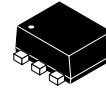


# MMIC Amplifier, 5 V, 22.7 mA, 0.1 to 3 GHz, MCPH6

## NSVG3117SG6



SC-88FL / MCPH6  
CASE 419AS

### Features

- High Gain:  $G_p = 33.5$  dB typ. @ 2.2 GHz
- Wideband Response:  $f_u = 3.0$  GHz
- Low Current:  $I_{CC} = 22.7$  mA typ.
- High Output Power:  $P_o$  (1 dB) = 5.7 dBm
- Port Impedance: Input/Output: 50  $\Omega$
- NSV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q100 Qualified and PPAP Capable
- This is a Pb-Free Device

### ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

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 +125	°C
$T_{stg}$	Storage Temperature	-55 to +150	°C

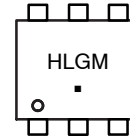
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

### RECOMMENDED OPERATING CONDITIONS (Ta = 25°C)

Symbol	Parameter	Ratings			Unit
		Min	Typ	Max	
$V_{CC}$	Supply Voltage	4.5	5	5.5	V
$T_{opr}$	Operating Ambient Temperature	-40	+25	+125	°C

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied. Extended exposure to stresses beyond the Recommended Operating Ranges limits may affect device reliability.

### MARKING DIAGRAM



HLG = Specific Device Code  
M = Date Code  
▪ = Pb-Free Package

### ORDERING INFORMATION

See detailed ordering and shipping information on page 5 of this data sheet.

# NSVG3117SG6

## ELECTRICAL CHARACTERISTICS (Ta = 25°C, VCC = 5 V, Zs = ZL = 50 Ω)

Symbol	Parameter	Conditions	Ratings			Unit
			Min	Typ	Max	
I <sub>CC</sub>	Circuit Current		18.5	22.7	28.0	mA
G <sub>p</sub>	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	-	
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	-	
NF	Noise Figure	f = 1 GHz	-	4.1	5.0	dB
		f = 2.2 GHz	-	3.9	5.0	
Po (1dB)	Gain 1dB Compression Output Power (Note 2)	f = 1 GHz	7.5	9.8	-	dBm
		f = 2.2 GHz	3.7	5.7	-	
f <sub>u</sub>	Upper Limit Operating Frequency (Note 2)	3 dB down below flat gain at f = 1GHz	-	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. Pay attention to handling since it is liable to be affected by static electricity due to the high frequency process adopted.
2. On evaluation board.

### Test Circuit

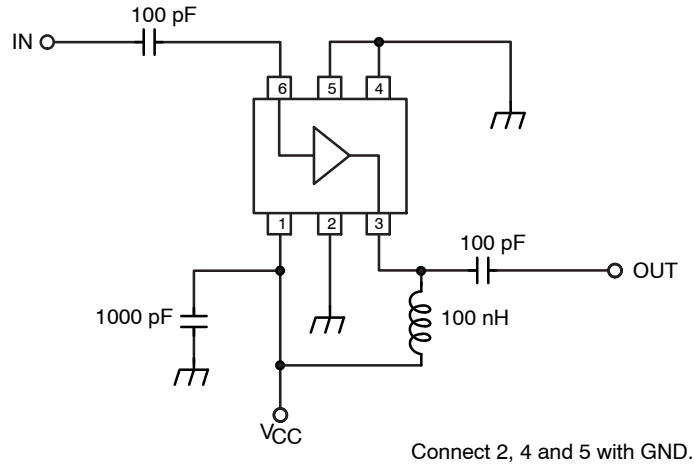
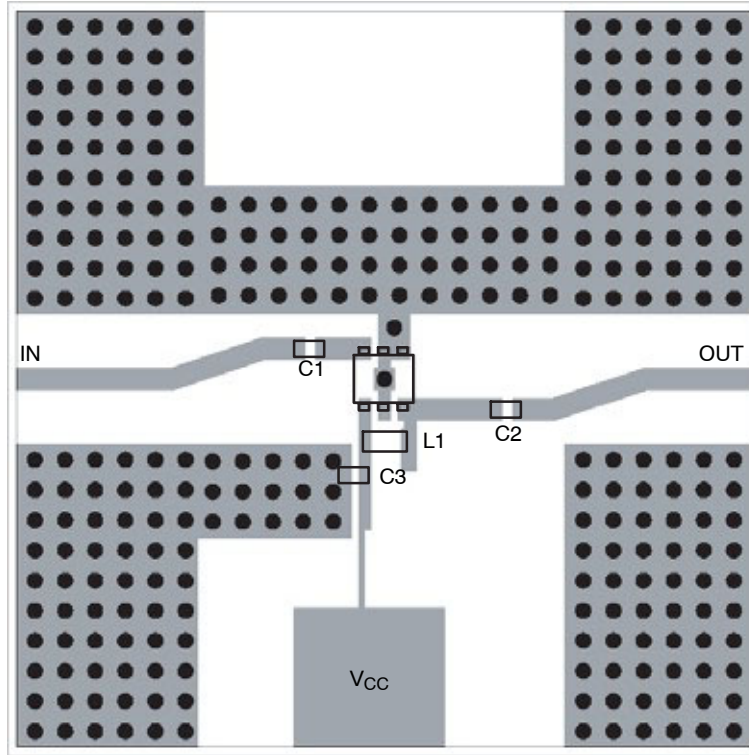


Figure 1. Test Circuit

# NSVG3117SG6

## Evaluation Board



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

Figure 2. Evaluation Board

## Characteristics

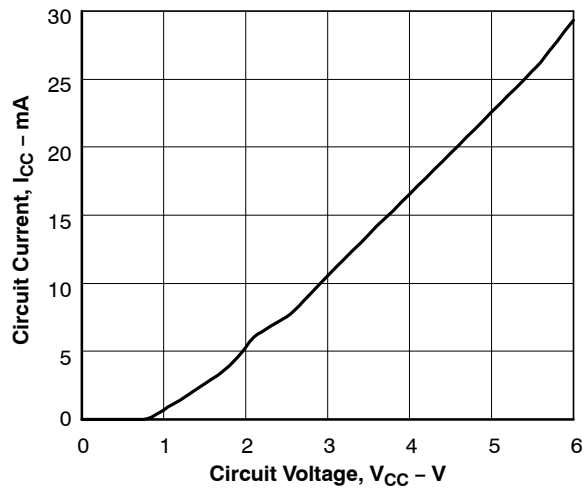


Figure 3.  $I_{CC}$  -  $V_{CC}$

# NSVG3117SG6

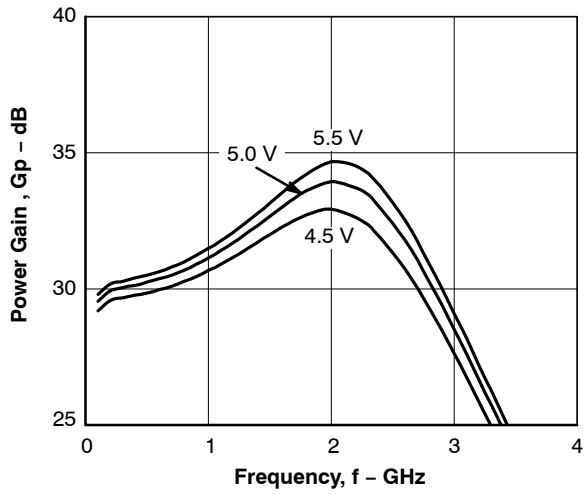


Figure 4.  $G_p - f$

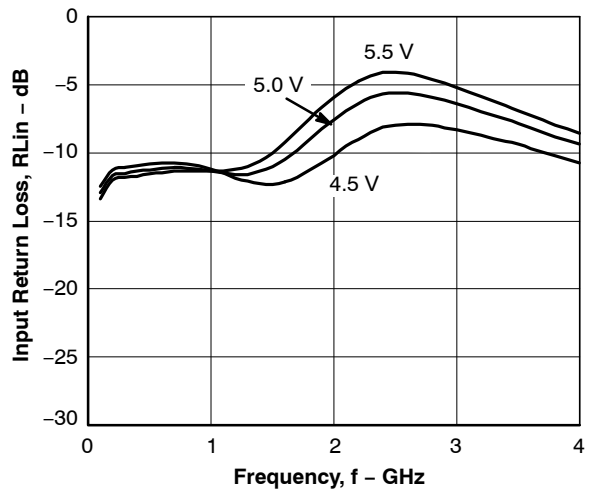


Figure 5.  $RL_{in} - f$

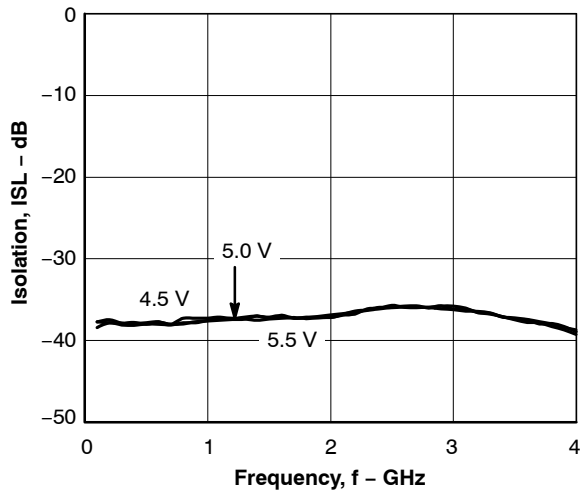


Figure 6.  $ISL - f$

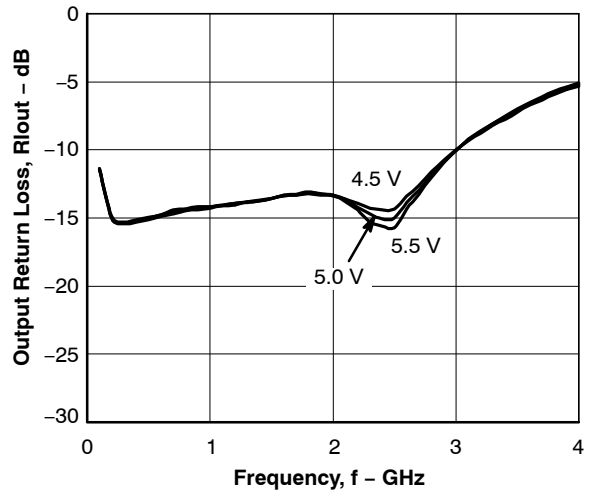


Figure 7.  $RL_{out} - f$

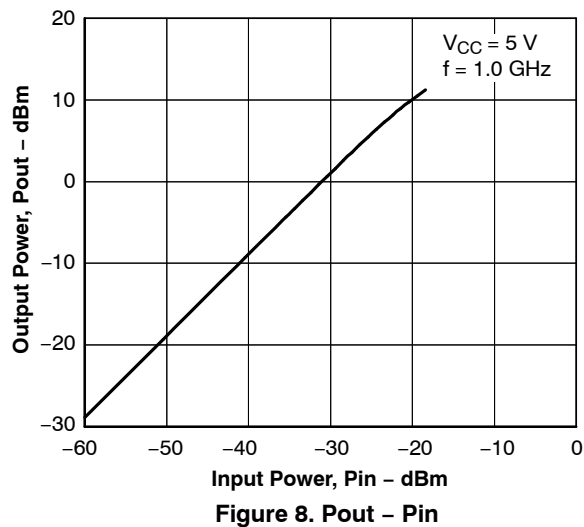


Figure 8.  $P_{out} - P_{in}$

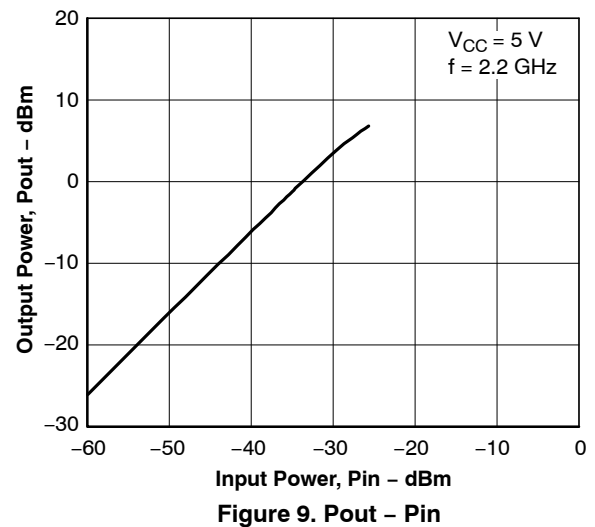


Figure 9.  $P_{out} - P_{in}$

# NSVG3117SG6

## S Parameter

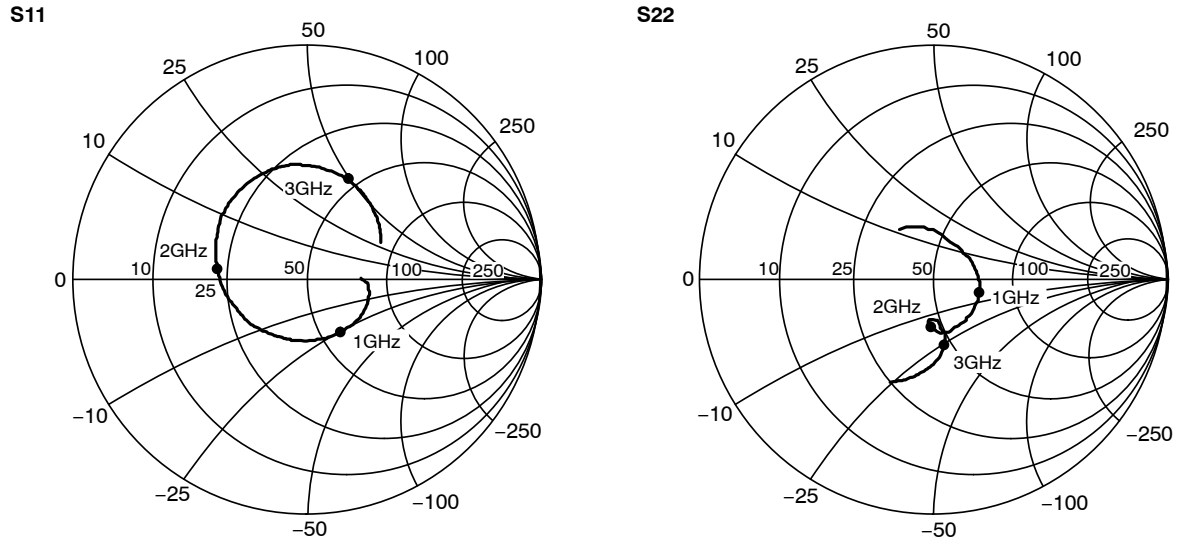


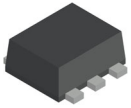
Figure 10. S Parameter ( $V_{CC} = 5\text{ V}$ )

## ORDERING INFORMATION

Device Order Number	Specific Device Marking	Package Type (JEITA, JEDEC)	Package Type	Shipping <sup>†</sup>
NSVG3117SG6T1G	HLG	SC-88FL (Pb-Free/Halogen Free)	MCPH6 (Pb-Free/Halogen Free)	3000 / Tape & Reel

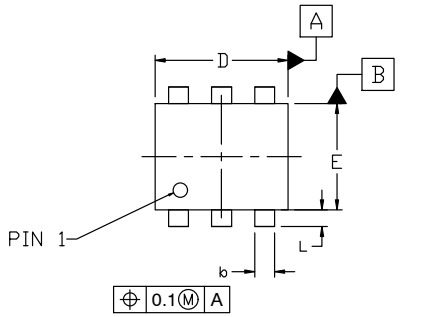
<sup>†</sup>For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

# MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS

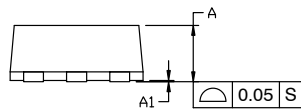


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ISSUE A

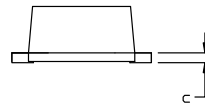
DATE 28 SEP 2022



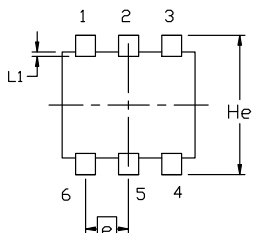
TOP VIEW



SIDE VIEW



FRONT VIEW



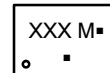
BOTTOM VIEW

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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<b>DESCRIPTION:</b>	<b>SC-88FL / MCPH6</b>	<b>PAGE 1 OF 1</b>

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