



# SMA3109

**ON Semiconductor®**

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## MMIC

### Amplifier, 3V, 16mA, 0.1 to 3.6GHz, MCPH6

#### Features

- High Gain :  $G_p=23\text{dB typ. @1GHz}$
- Wideband response :  $f_u=3.6\text{GHz}$
- Low current :  $I_{CC}=16\text{mA typ.}$
- High output power :  $P_o(1\text{dB})=4\text{dBm}$
- Port impedance : input/output  $50\Omega$

#### Specifications

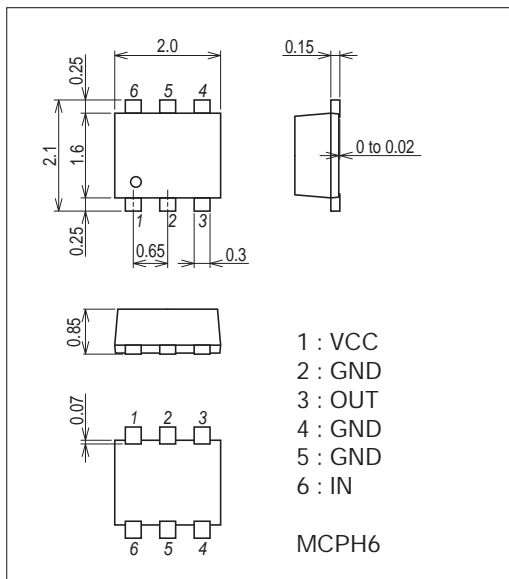
Absolute Maximum Ratings at  $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Supply Voltage	$V_{CC}$		5	V
Circuit Current	$I_{CC}$		25	mA
Allowable Power Dissipation	$P_D$		280	mW
Operating Temperature	$T_{opr}$		-40 to +85	$^\circ\text{C}$
Storage Temperature	$T_{stg}$		-55 to +150	$^\circ\text{C}$

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

#### Package Dimensions

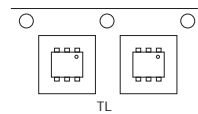
unit : mm (typ)  
7022A-018



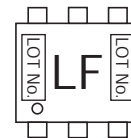
#### Product & Package Information

- Package : MCPH6
- JEITA, JEDEC : SC82, SC82A, SC88
- Minimum Packing Quantity : 3,000pcs/reel

#### Type of Taping: TL



#### Marking



# SMA3109

## Recommended Operating Conditions at $T_a=25^\circ\text{C}$

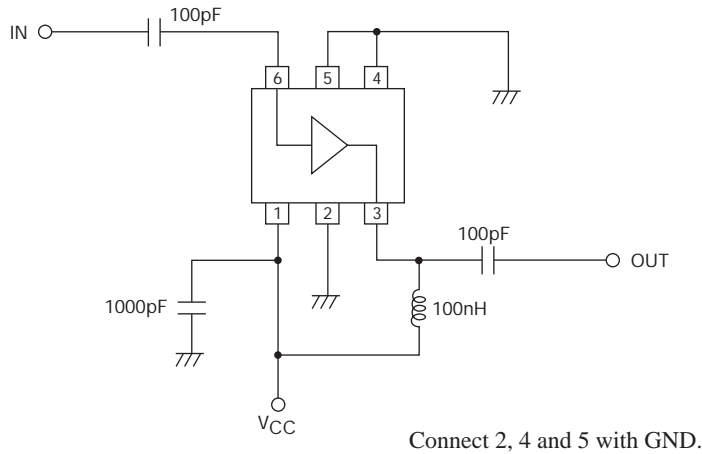
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Supply Voltage	VCC		2.7	3	3.3	V
Operating Ambient Temperature	Topr		-40	+25	+85	$^\circ\text{C}$

## Electrical Characteristics at $T_a=25^\circ\text{C}$ , $V_{CC}=3\text{V}$ , $Z_s=Z_L=50\Omega$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Circuit Current	ICC		11.5	16.0	20.5	mA
Power Gain	Gp	f=1GHz	21.0	23.0	26.0	dB
		f=2.2GHz	22.0	24.0	27.0	
Isolation	ISL	f=1GHz	27.0	31.5		dB
		f=2.2GHz	27.0	31.5		
Input Return Loss	RLin	f=1GHz	16.0	20.5		dB
		f=2.2GHz	10.0	15.0		
Output Return Loss	RLout	f=1GHz	15.0	20.0		dB
		f=2.2GHz	10.0	14.0		
Noise Figure	NF	f=1GHz		4.3	5.0	dB
		f=2.2GHz		4.3	5.0	
Gain 1dB Compression Output Power	Po(1dB)	f=1GHz	4.0	6.4		dBm
		f=2.2GHz	2.0	4.2		
Upper Limit Operating Frequency	fu	3dB down below flat gain at f =1GHz		3.6		GHz

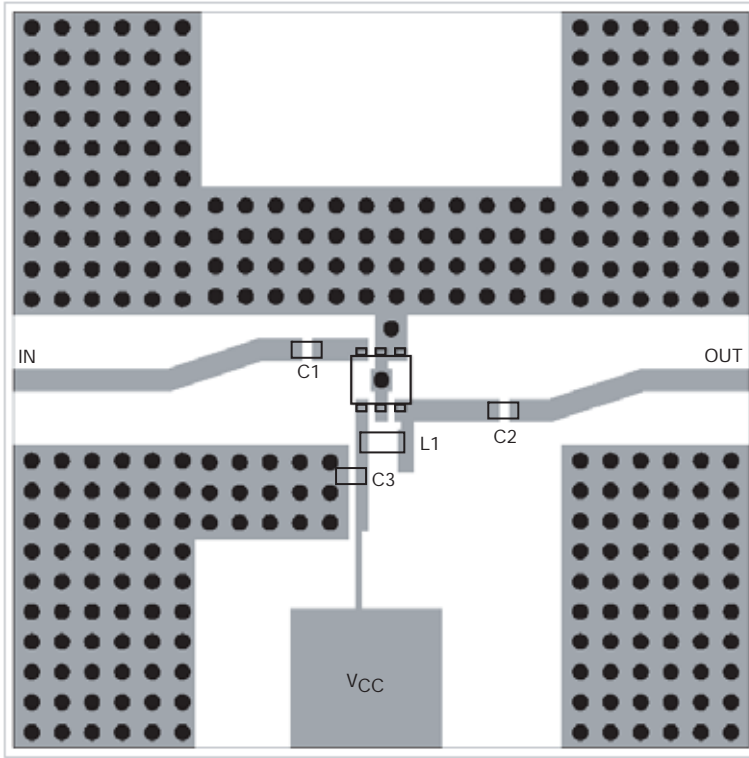
Note) Pay attention to handling since it is liable to be affected by static electricity due to the high frequency process adopted.

## Test Circuit

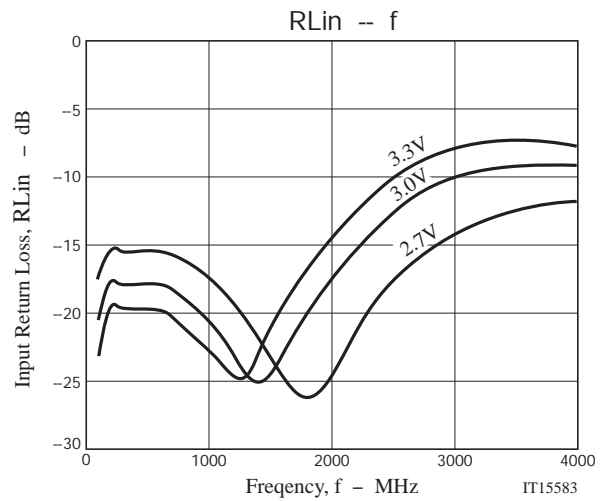
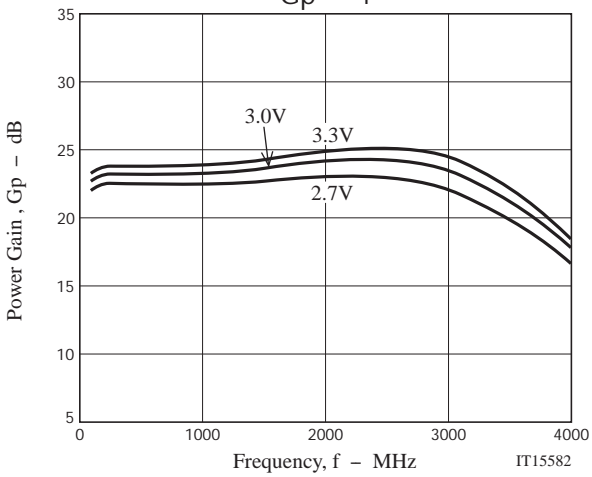
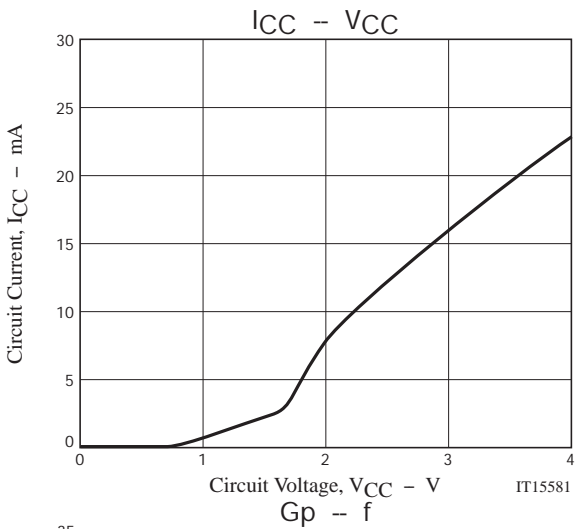


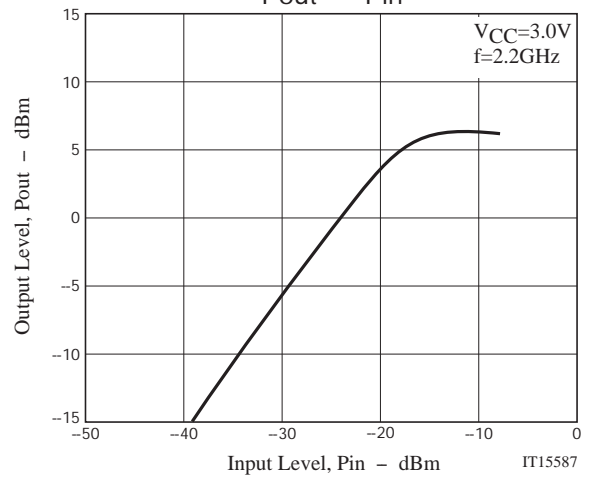
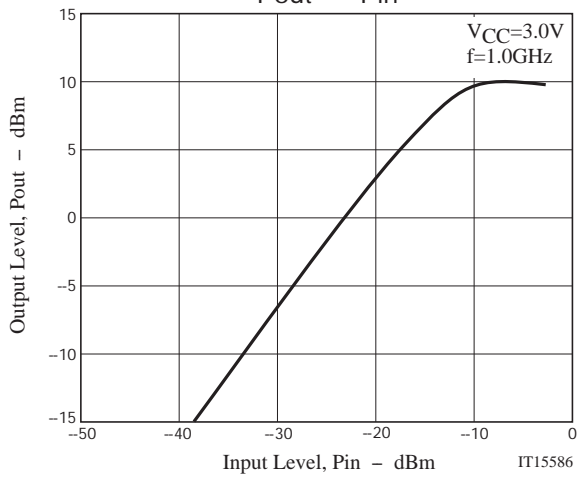
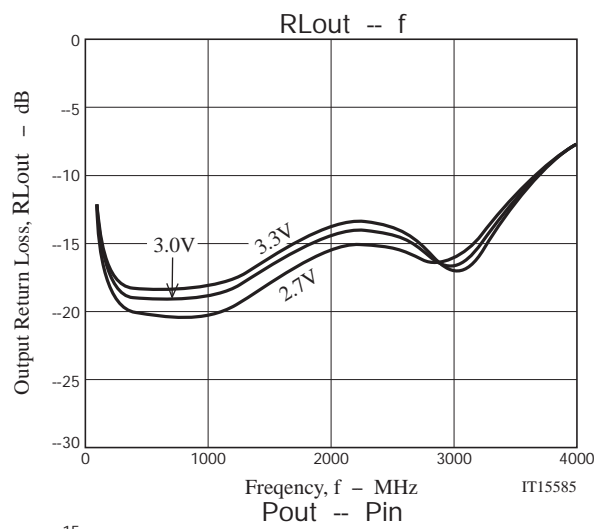
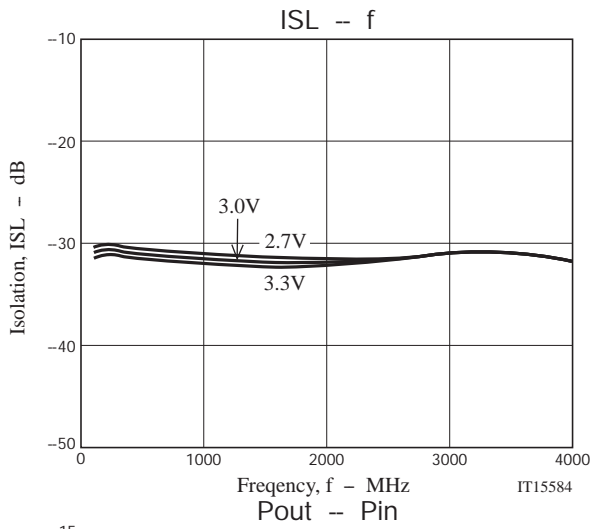
IT15580

Evaluation Board

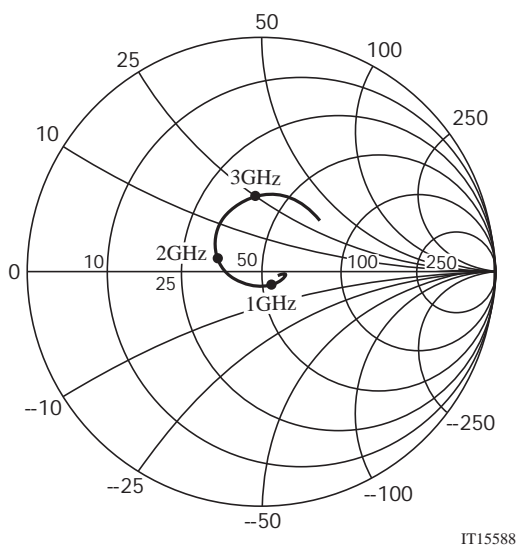


Symbol	Value
C1, C2	100pF
C3	1000pF
L1	100nH

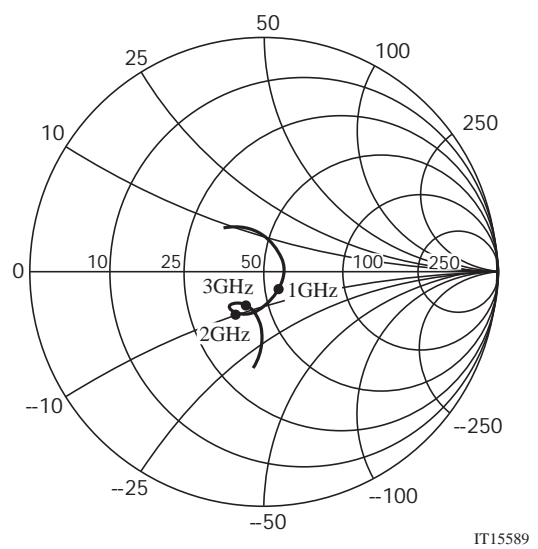




S Parameter  
S11



S22



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