



# SMA3103

## MMIC

### Amplifier, 5V, 19mA, 0.1 to 3.3GHz, MCPH6

ON Semiconductor®

<http://onsemi.com>

#### Features

- High Gain :  $G_p=26.5\text{dB typ. @1GHz}$
- Wideband response :  $f_u=3.3\text{GHz}$
- Low current :  $I_{CC}=19\text{mA typ}$
- High output power :  $P_o(1\text{dB})=5\text{dBm}$
- Port impedance : input/output  $50\Omega$

#### Specifications

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

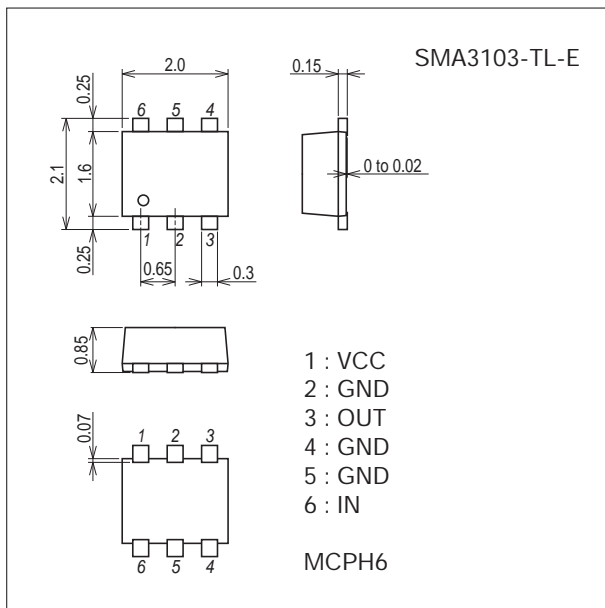
Parameter	Symbol	Conditions	Ratings	Unit
Supply Voltage	$V_{CC}$		6	V
Circuit Current	$I_{CC}$		40	mA
Allowable Power Dissipation	$P_D$		280	mW
Operating Temperature	$T_{opr}$		-40 to +85	$^\circ\text{C}$
Storage Temperature	$T_{stg}$		-55 to +150	$^\circ\text{C}$

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)

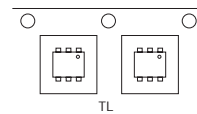
7022A-018



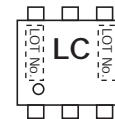
#### Product & Package Information

- Package : MCPH6
- JEITA, JEDEC : SC-88, SC-70-6, SOT-363
- Minimum Packing Quantity : 3,000 pcs./reel

#### Packing Type : TL



#### Marking



# SMA3103

## Recommended Operating Condition at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Supply Voltage	VCC		4.5	5	5.5	V
Operating Ambient Temperature	Topr		-40	+25	+85	°C

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

## Electrical Characteristics at Ta=25°C, VCC=5V, Zs=ZL=50Ω

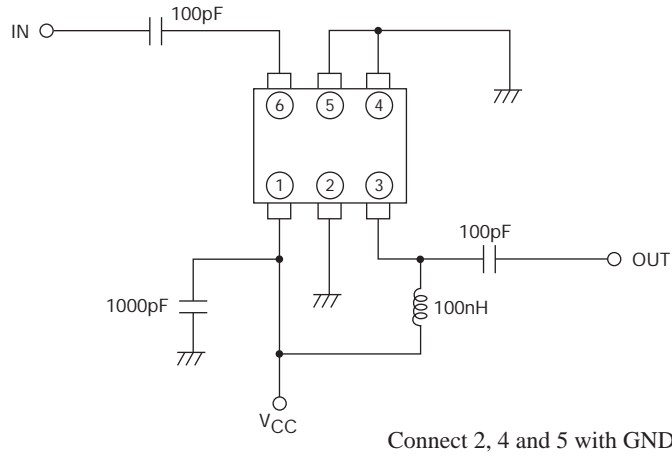
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Circuit Current	ICC		14.0	19.0	25.0	mA
Power Gain	Gp	f=1GHz	24.0	26.5	29.0	dB
		f=2.2GHz	24.0	27.0	30.0	
Isolation	ISL	f=1GHz	31.0	33.0		dB
		f=2.2GHz	31.0	33.0		
Input Return Loss	RLin	f=1GHz	12.0	20.0		dB
		f=2.2GHz	10.0	14.0		
Output Return Loss	RLout	f=1GHz	12.0	20.0		dB
		f=2.2GHz	10.0	16.0		
Noise Figure	NF	f=1GHz		4.7	5.3	dB
		f=2.2GHz		4.7	5.3	
Gain 1dB Compression Output Power	Po(1dB)	f=1GHz	6.0	8.2		dBm
		f=2.2GHz	4.0	5.7		
Upper Limit Operating Frequency	fu	3dB down below flat gain at f =1GHz		3.3		GHz

## Ordering Information

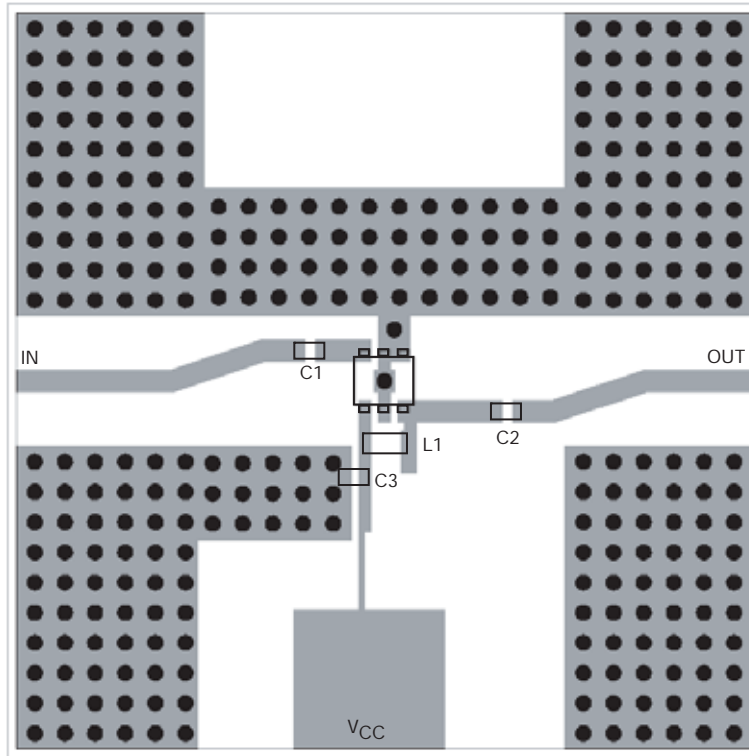
Device	Package	Shipping	memo
SMA3103-TL-E	MCPH6	3,000pcs./reel	Pb Free

# SMA3103

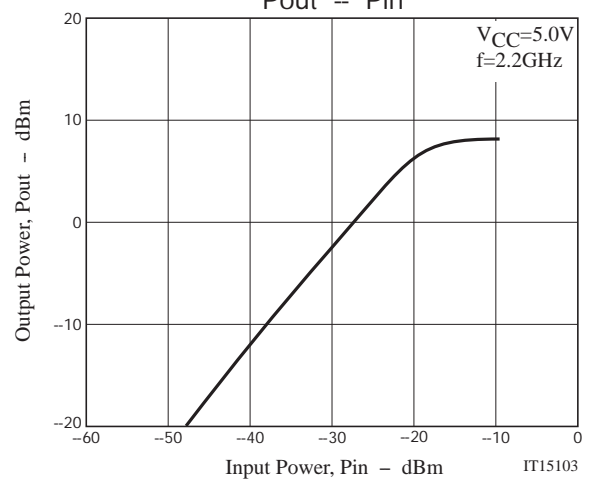
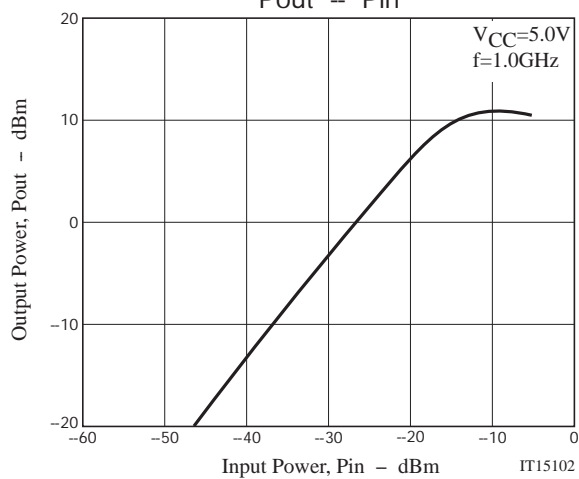
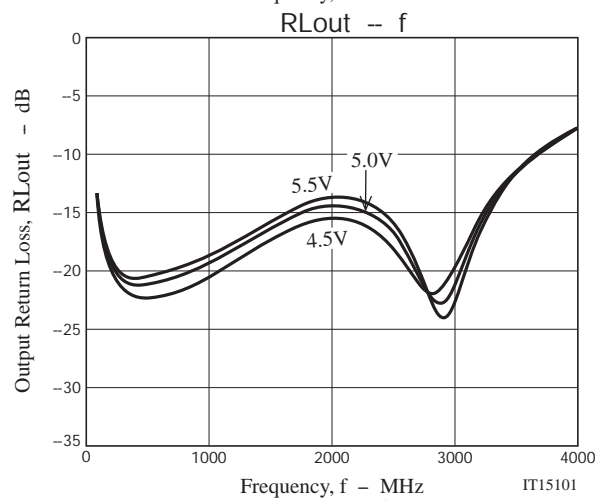
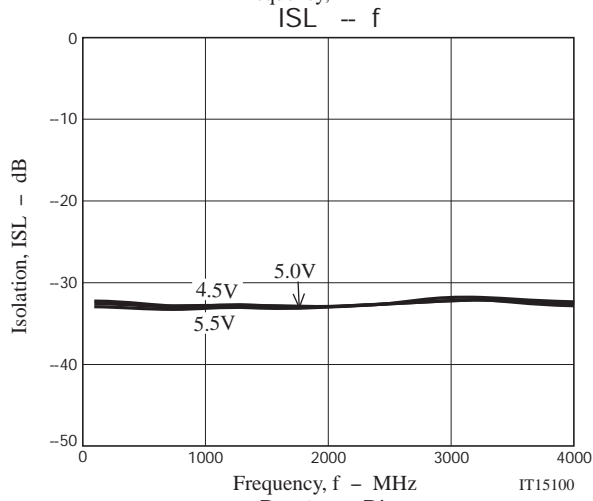
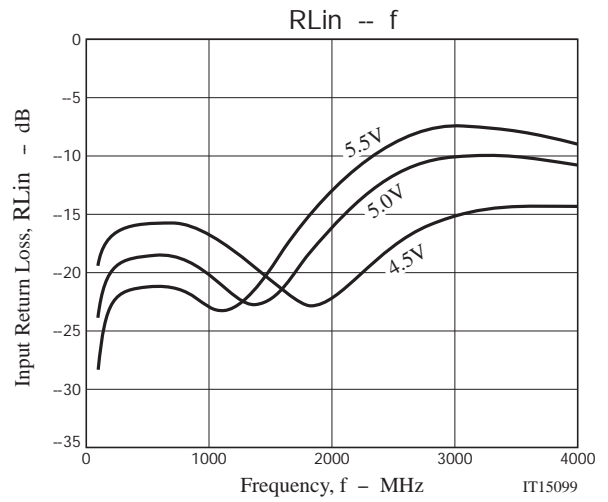
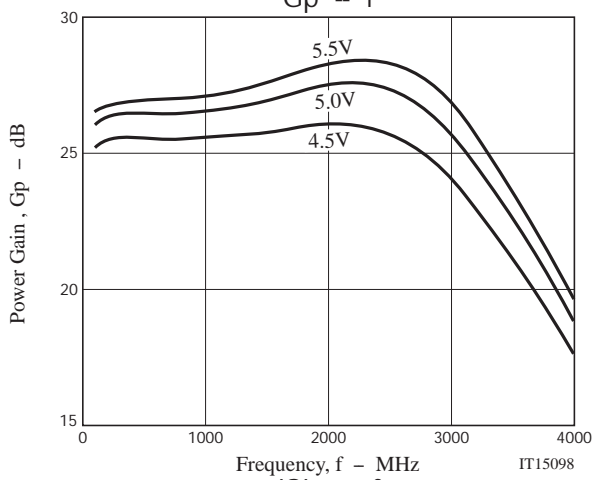
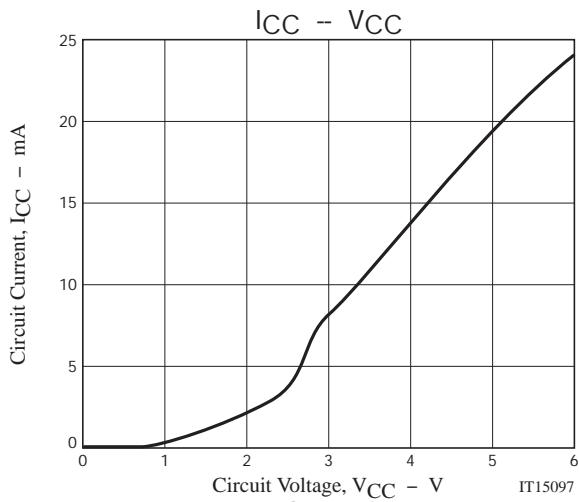
## Test Circuit



## Design of the Evaluation Board

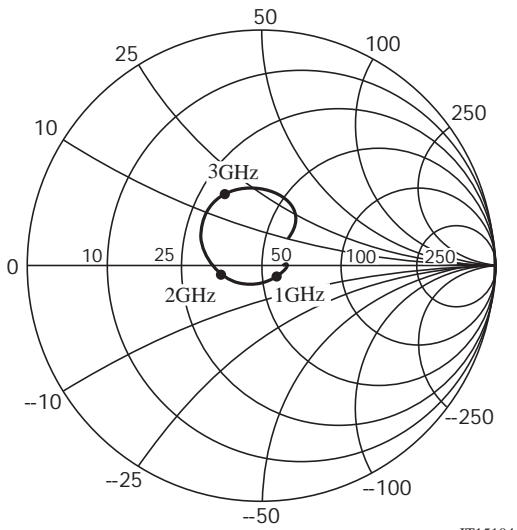


Symbol	Value
C1, C2	100pF
C3	1000pF
L1	100nH

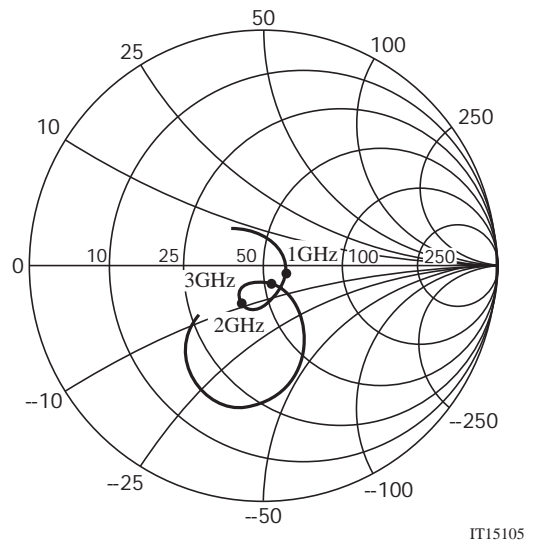


# SMA3103

S Parameter  
S11



S22



# SMA3103

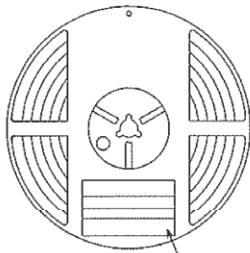
## Embossed Taping Specification

SMA3103-TL-E

### 1. Packing Format

Package Name	Carrier Tape Type	Maximum Number of devices contained (pcs)			Packing format	
		Reel	Inner box	Outer box	Inner BOX (C-1)	Outer BOX (A-7)
MCPH6	MCP4	3,000	15,000	90,000	5 reels contained Dimensions:mm (external) 183×72×185	6 inner boxes contained Dimensions:mm (external) 440×195×210

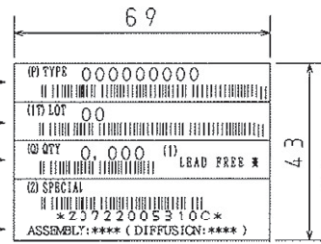
#### Packing method



Type No.  
LOT No.  
Quantity  
Origin

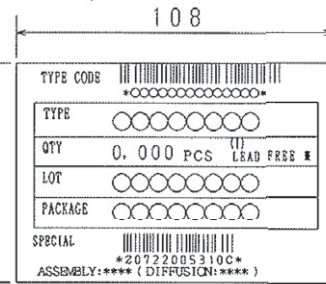
Reel label

Reel label, Inner box label  
(unit :mm)



Outer box label

It is a label at the time of factory shipments.  
The form of a label may change in physical distribution process.



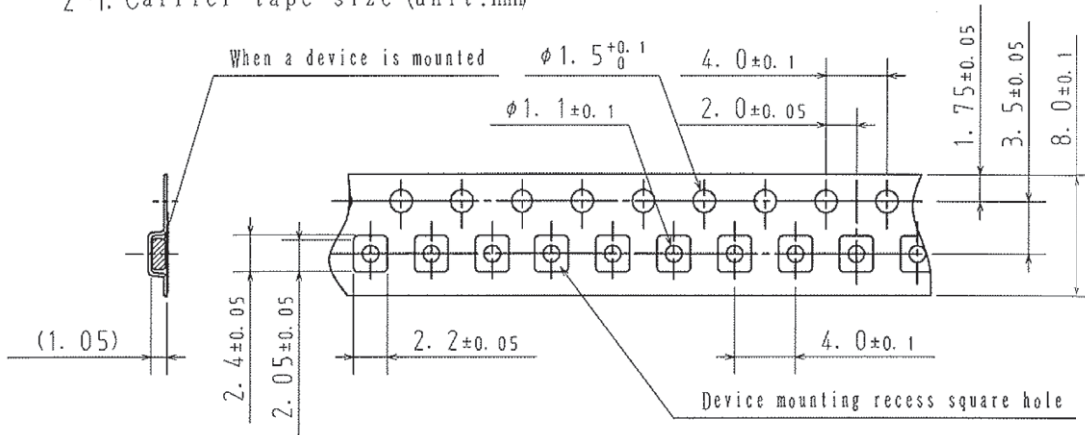
NOTE (1)

The LEAD FREE \* description shows that the surface treatment of the terminal is lead free.

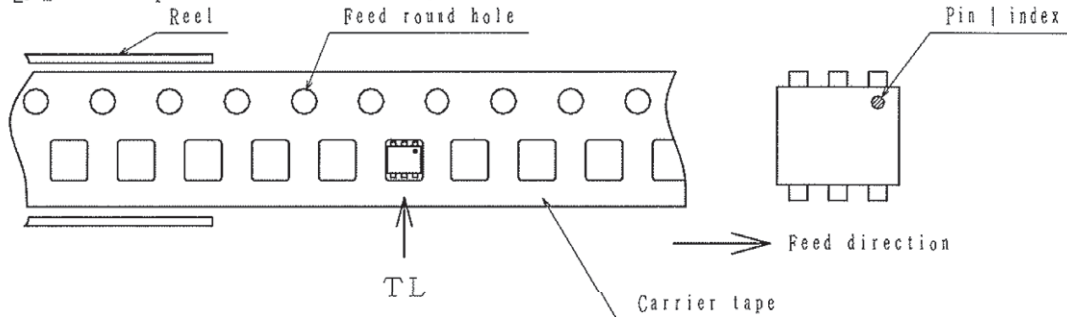
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

### 2. Taping configuration

#### 2-1. Carrier tape size (unit:mm)



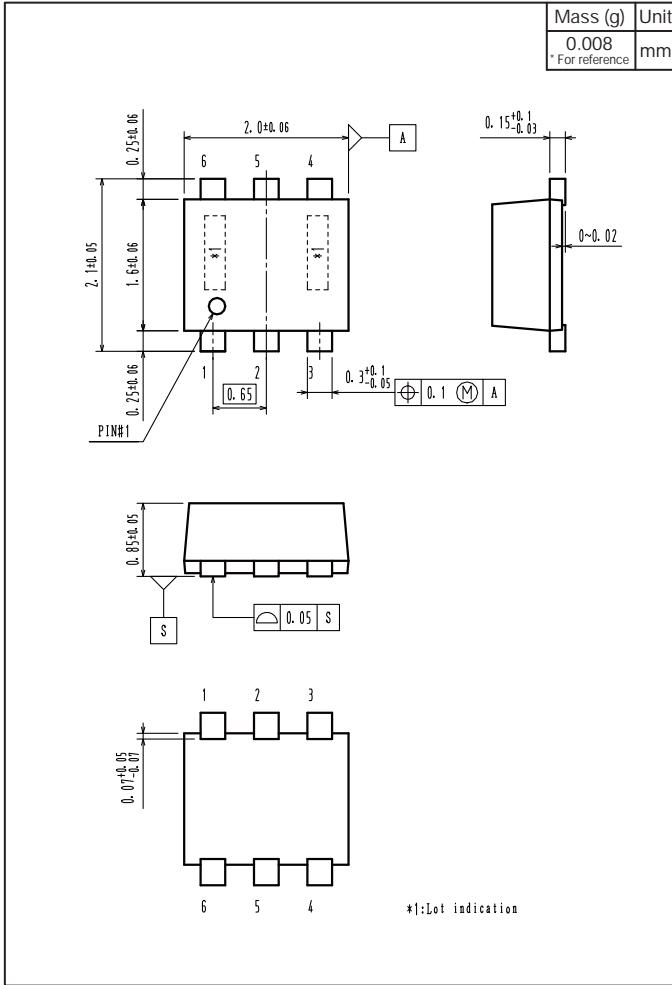
#### 2-2. Device placement direction



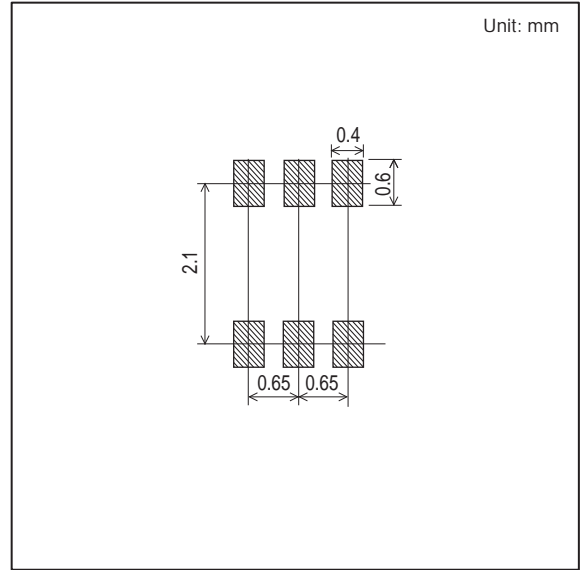
Those with pin | index on the feed hole side.....TL

# SMA3103

## Outline Drawing SMA3103-TL-E



## Land Pattern Example



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