

## 5 - 6 GHz 1W MMIC

### FEATURES

- P<sub>-1</sub> dB: 30 dBm
- Small Signal Gain: 21 dB
- Power Added Efficiency: 25 %
- IP3: 39 dBm
- Matched to 50 Ω operation
- Bias condition: 600 mA @ 7 V

### PHOTO ENLARGEMENT



### DESCRIPTION

The TC3538 is a 2-stage PHEMT MMIC power amplifier. It is designed for use in low cost, high volume, 5 - 6 GHz band applications. The MMIC is matched to 50Ω operation. It provides a typical gain of 21 dB and P1dB power of more than 30 dBm. Typical bias condition is 7V at 600 mA. The MMIC is packaged in a low-cost surface-mountable plastic package.

### APPLICATIONS

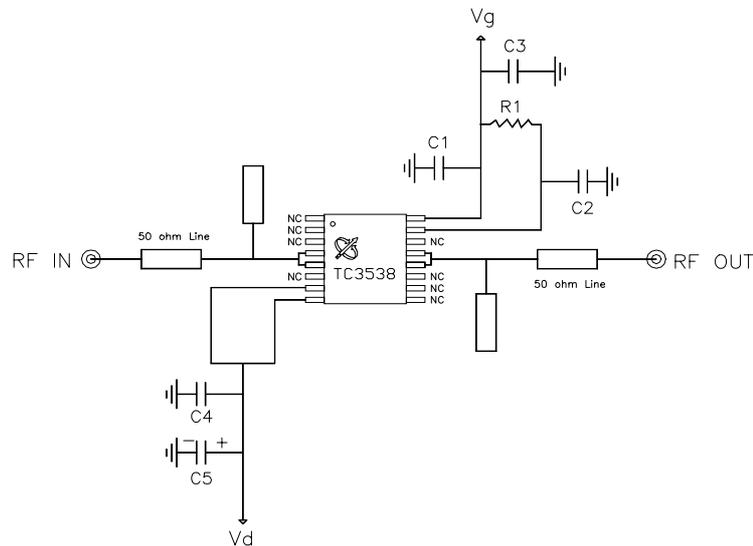
- Wireless Internet Access

### ELECTRICAL SPECIFICATIONS (Ta = 25 °C)

SYMBOL	DESCRIPTION	MIN	TYP	MAX	UNITS
FREQ	Frequency Range	5		6	GHz
SSG	Small Signal Gain	19	21		dB
GOF	Small Signal Gain Flatness @5.7 ~ 5.9 GHz		± 0.5		
GOF	Small Signal Gain Flatness @5 ~ 6 GHz		± 1	± 2	
P <sub>-1</sub> dB	Output Power at 1 dB Gain Compression	29	30		dBm
P <sub>-3</sub> dB	Output Power at 3 dB Gain Compression	30	31		dBm
IP3	Third Order Intercept Point	37	39		dBm
VSWR, IN	Input VSWR		2:1		
VDD	Supply Voltage		7		Volt
Vg	Gate Voltage	-0.6	-1.0	-1.5	Volt
IDD	Current Supply Without RF		600		mA
IDP <sub>-1</sub>	Current Supply @ Pout=P <sub>-1</sub> dB		620		mA
ηa	Power Added Efficiency		25		%

**TEST CIRCUITS**

## Evaluation Board Schematic


**EVALUATION BOARD**

DXF file of the PCB can be downloaded from our web-site at [www.transcominc.com.tw](http://www.transcominc.com.tw)

PCB Material: RO4003

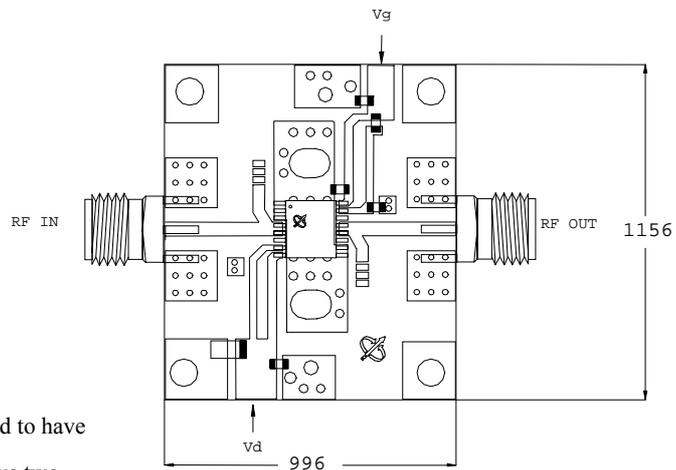
ER = 3.38

Thickness = 20 mil

Unit: mil

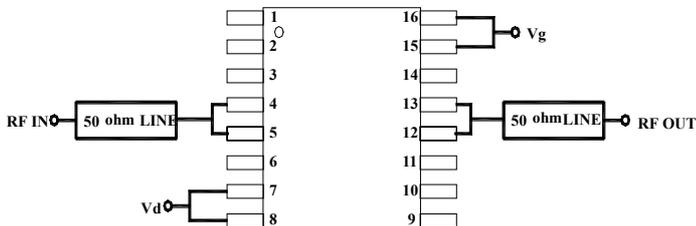
**Application Notes:**

For better heat sinking and grounding, it's recommended to have the via holes beneath TC3538 filled with solder and have two screws besides TC3538 installed on the PCB area.

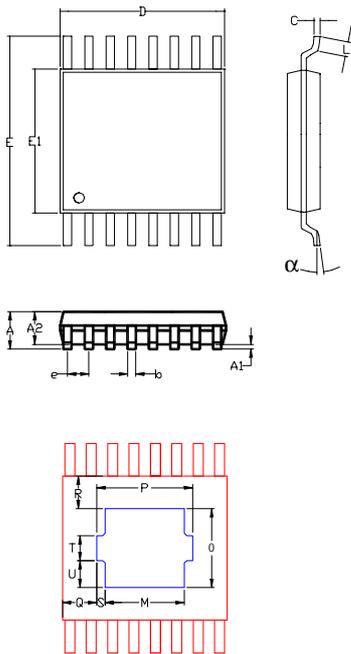


**Evaluation Board Parts List**

Part Type	Reference Designator	Description	Manufacturer	Part Number
Capacitor	C1, C2	1000pF 0603	Murata	GRM39C0G102J50V
Capacitor	C3, C4	0.1 uF 0603	Murata	GRM39Y5V104Z25V
Capacitor	C5	4.7uF Tantalum Cap.		
Resistor	R1	200 ohm 0603		

**CONNECTION DIAGRAM AND PIN DESCRIPTIONS**


Pin #	Name	Description
4, 5	RF IN	RF input (internally DC blocked)
7, 8	V <sub>d</sub>	MMIC drain bias
15, 16	V <sub>g</sub>	MMIC gate bias
12, 13	RF OUT	RF output (internally DC blocked)
Others	NC	No Connection

**PHYSICAL DIMENSIONS (Unit: inch)**


DIMENSION	MINIMUM	NOMINAL	MAXIMUM
A			0.045
A1	0.000		0.004
A2	0.031	0.039	0.041
b	0.007		0.012
C	0.004		0.008
D	0.193	0.197	0.201
E		0.252	
E1	0.169	0.173	0.177
e		0.026	
L	0.018	0.024	0.030
M		0.095	
O		0.095	
P		0.115	
Q		0.041	
R		0.039	
S		0.010	
T		0.030	
U		0.033	
Y			0.004
$\alpha$	0°		8°

Dimensions in inches