



Preliminary

May 2002

5 ~ 6 GHz 1W MMIC

FEATURES

- P₁ 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



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 50 Ω 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
- Wireless Local Loop
- Two way radio

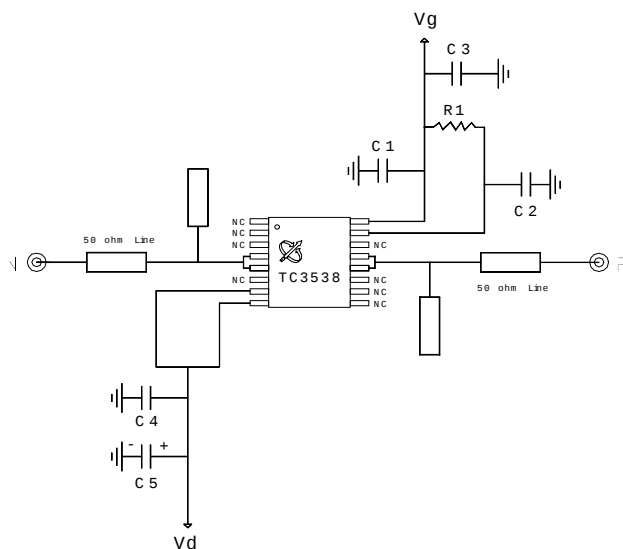
ELECTRICAL SPECIFICATIONS (Ta = 25 °C)

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	± 0.75	
GOF	Small Signal Gain Flatness @5 ~ 6 GHz		± 1	± 2	
P ₁ dB	Output Power at 1 dB Gain Compression	29	30		dBm
P ₃ 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 ₁	Current Supply @ Pout=P ₁ dB		600	650	mA
η_a	Power Added Efficiency		25		%



TEST CIRCUITS

Evaluation Board Schematic



EVALUATION BOARD

DXF file of the PCB can be

downloaded from our web-site at

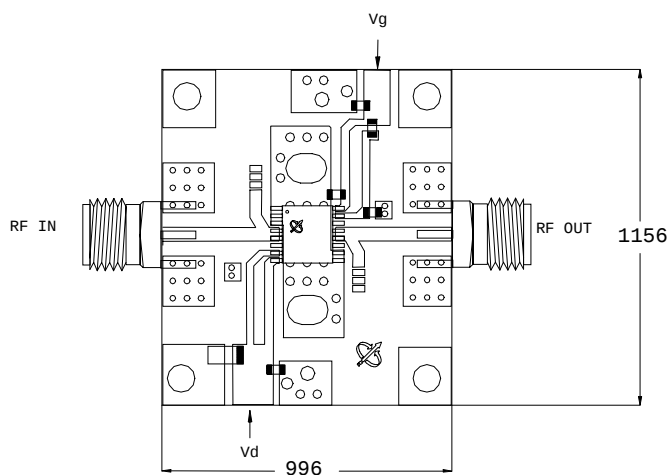
www.transcominc.com.tw

PCB Material: RO4003

$$\text{ER} = 3.38$$

Thickness = 20 mil

Unit: mil

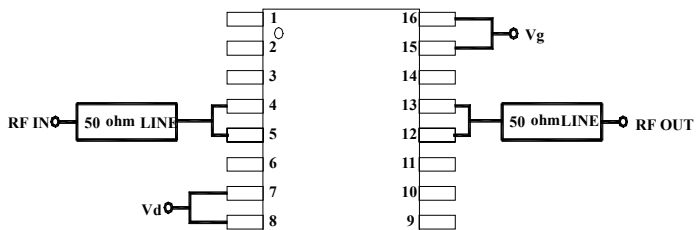




Evaluation Board Parts List

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		

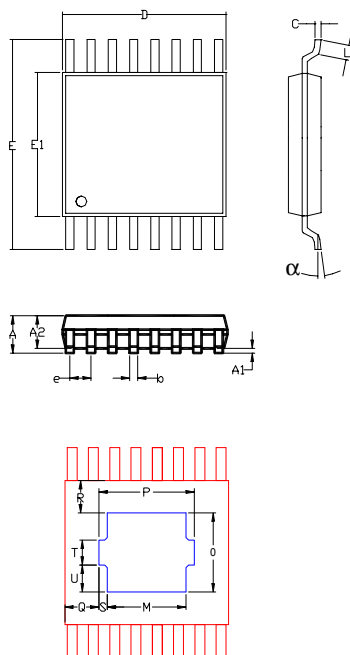
CONNECTION DIAGRAM AND PIN DESCRIPTIONS



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



PHYSICAL DIMENSIONS (Unit: inches)



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
α	0°		8°

Dimensions in inches