

### 3.3 - 4.0 GHz 1W Single Bias MMIC

#### FEATURES

- P<sub>1</sub> dB: 30 dBm
- Small Signal Gain: 27 dB
- Power Added Efficiency: 25 %
- IP3: 39 dBm
- Input/Output 50  $\Omega$  Match
- Bias condition: 500 mA @ 9 V

#### PHOTO ENLARGEMENT



#### DESCRIPTION

The TC3332 is a 2-stage PHEMT Single Bias MMIC power amplifier. It is designed for use in low cost and high volume 3.3-4.0 GHz band applications. The MMIC is matched to 50 $\Omega$  operation. It provides a typical gain of 27 dB and P1dB power of 30 dBm. Typical bias condition is 9V at 500 mA. The MMIC is packaged in a copper based ceramic 10 pins power package. The copper based carrier of the package allows direct soldering of the device to the PCB.

#### APPLICATIONS

- WiMAX
- Wireless Local Loop
- Two way radio

#### ELECTRICAL SPECIFICATIONS (T<sub>A</sub>=25 °C)

SYMBOL	DESCRIPTION	MIN	TYP	MAX	UNITS
SSG	Small Signal Gain (for 3.3-3.8GHz)	26	27		dB
	Small Signal Gain (for 3.3-4.0GHz)	25.5	26.5		dB
GOF	Small Signal Gain Flatness		±0.5		
P <sub>1</sub> dB	Output Power at 1 dB Gain Compression	28.5	30		dBm
IP3	Third Order Intercept Point	37	39		dBm
VSWR IN	Input VSWR		2:1		
VDD	Supply Voltage		9		Volt
IDD	Current Supply Without RF		500		mA
$\eta$ <sub>a</sub>	Power Added Efficiency		25		%
OTR	Operating Temperature Range	-30		75	°C

#### Absolute Maximum Ratings

Symbol	Parameter/Conditions	Min.	Max.	Units
V <sub>dd</sub>	Drain-Source Voltage		10	Volts
P <sub>in</sub>	RF Input Power		7	dBm
P <sub>t</sub>	Power Dissipation		5.7	W
T <sub>ch</sub>	Operating Channel Temperature		175	°C
T <sub>STG</sub>	Storage Temperature	-65	175	°C

#### Note:

1. This GaAs MMIC is susceptible to damage from Electrostatic Discharge. Proper precautions should be used when handling these devices.
2. Specifications subject to change without notice.

## EVALUATION BOARD

PCB Material: RO4003

ER = 3.38

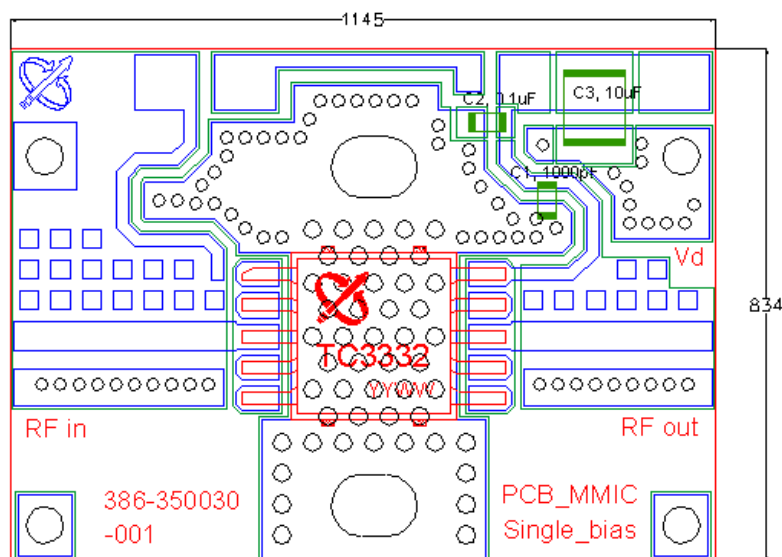
Thickness = 20 mil

Unit: mil

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

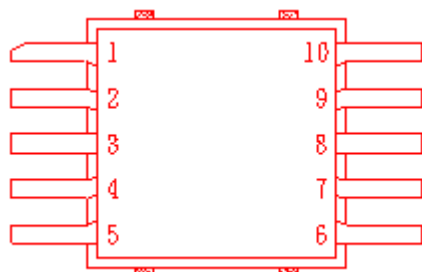
\* Application Notes:

For better heat sinking and grounding, it's recommended to have the via holes beneath TC3332 filled with solder and have two screws installed on required heat sink plate besides TC3332 on the PCB area.



## Evaluation Board Parts List

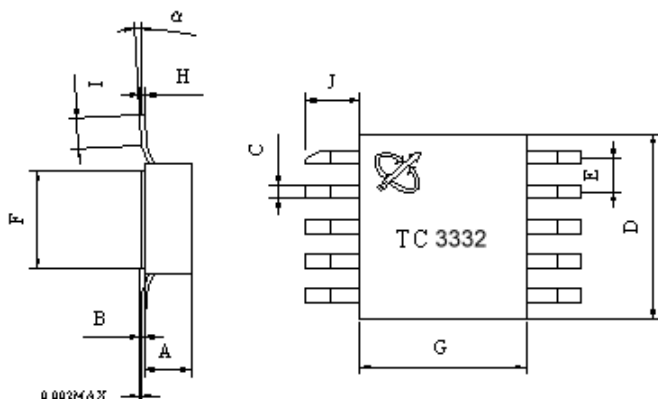
Part Type	Reference Designator	Description	Manufacturer	Part Number
Capacitor	C1	Chip CAP (0603) 1000PF±10%	Murata	GRM39X7R102K50V
Capacitor	C2	Chip CAP (0603) 0.1μF±20%	Murata	GRM39Y5V104Z25V
Capacitor	C3	Chip CAP (1210) 10μF±20% or Chip CAP (1206) 10μF±20%	Murata	GRM42-6Y5V106Z25V or GRM31CF5E106ZA01L



Pin #	Name	Description
1,2,4,5,6,7,9	NC	No Connection
3	RF IN	RF input (internally no DC blocked)
8	RF OUT	RF output (internally DC blocked)
10	V <sub>d</sub>	MMIC drain bias

## CONNECTION DIAGRAM AND PIN DESCRIPTIONS

### PHYSICAL DIMENSIONS (Unit: inch)



DIMENSION	MINIMUM	NOMINAL	MAXIMUM
A	0.054	0.057	0.060
B	0.007	0.008	0.009
C	0.017	0.020	0.023
D	0.267	0.270	0.273
E	0.047	0.050	0.053
F	0.247	0.250	0.253
G	0.267	0.270	0.273
H	0.007	0.008	0.009
I	0.020		0.040
J	0.073	0.080	0.087
K	0°		7°