

- Preliminary Datasheet -

## 1 W Single-Bias GaAs Power PHEMTs prematched for 5~8 GHz

### FEATURES

- Prematched for 5~8 GHz
- 1W of Typical Output Power at 5~8 GHz
- 8dB of Typical Linear Power Gain at 8 GHz
- High Linearity: IP3 = 40 dBm Typical at 5~8 GHz
- High Power Added Efficiency: Nominal PAE of 35 % at 5~8 GHz
- Breakdown Voltage:  $BV_{DGO} \geq 15V$
- $W_g = 2.4$  mm
- 100 % DC Tested
- Suitable for High Reliability Application
- Lost Cost SMT Ceramic Package

### PHOTO ENLARGEMENT



### DESCRIPTION

The TC3953 is a single-bias and prematched GaAs PHEMT. It is designed for use in low cost and high volume 1W amplifiers for 5~8GHz. It provides typical gain of 8dB and P1dB of 30dBm at 8GHz. The single positive drain bias is 9V and the typical drain-source current is 300mA. The device is packaged in copper based ceramic 10 pins SMT packages. The copper based carrier of the package allows direct soldering of the device to the PCB.

### ELECTRICAL SPECIFICATIONS ( $T_A=25^\circ C$ )

Symbol	CONDITIONS	MIN	TYP	MAX	UNIT
$P_{1dB}$	Output Power at 1dB Gain Compression Point, $f = 8$ GHz $V_{DS} = 9V$	29	30		dBm
$G_L$	Linear Power Gain, $f = 8$ GHz $V_{DS} = 9V$	7	8		dB
IP3	Intercept Point of the 3 <sup>rd</sup> -order Intermodulation, $f = 8$ GHz $V_{DS} = 9V$ , $*P_{SCL} = 17$ dBm		40		dBm
PAE	Power Added Efficiency at 1dB Compression Power, $f = 8$ GHz		35		%
$I_{DS}$	Drain-Source Current at $V_{DS} = 9V$		300		mA
$BV_{DGO}$	Drain-Gate Breakdown Voltage at $I_{DGO} = 1.2$ mA	15	18		Volts

**Note:**  $*P_{SCL}$ : Output Power of Single Carrier Level.

**ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub>=25 °C)**

Symbol	Parameter	Rating
V <sub>DS</sub>	Drain-Source Voltage	12 V
P <sub>in</sub>	RF Input Power, CW	28 dBm
P <sub>T</sub>	Continuous Dissipation	3.8 W
T <sub>CH</sub>	Channel Temperature	175 °C
T <sub>STG</sub>	Storage Temperature	- 65 °C to +175 °C

**RECOMMENDED OPERATING CONDITION**

Symbol	Parameter	Rating
V <sub>DS</sub>	Drain to Source Voltage	9V

**HANDLING PRECAUTIONS:**

The user must operate in a clean, dry environment. Electrostatic Discharge (ESD) precautions should be observed at all stages of storage, handling, assembly, and testing. The static discharge must be less than 300V.

**EVALUATION BOARD**

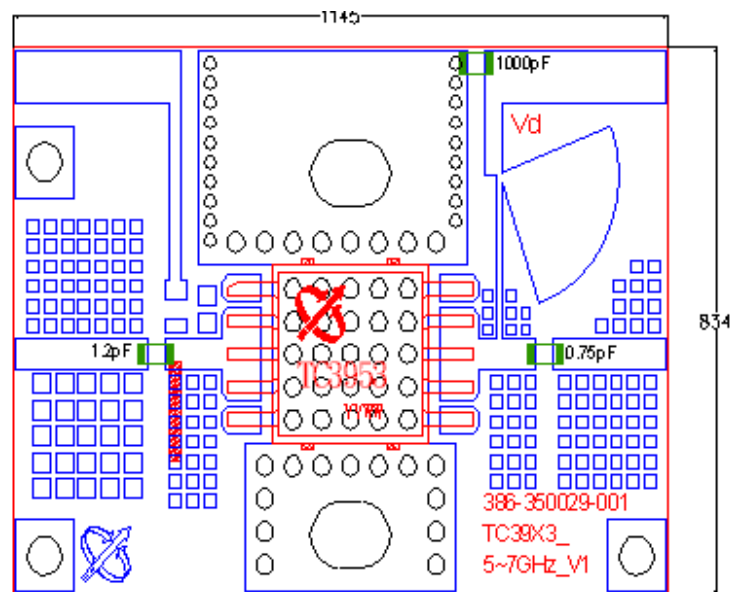
**PCB Material: RO4003**

**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)


**Evaluation Board Parts List**

Qt'y	Description	Reference Designator	Manufacturer	Inventory ID
1	Chip CAP(0603)0.75PF±5%		Murata	GRM39COG0R75C50V
1	Chip CAP(0603)1000PF±10%		Murata	GRM39X7R102K50V
1	Chip CAP(0603)1.2PF±5%		Murata	GRM39COG1R2C50V