0.5W Single-Bias and Prematched GaAs Power PHEMTs using SMT package

FEATURES

- Prematched for 5~10 GHz
- 0.5W Typical Output Power at 5~10GHz
- 7dB Typical Linear Power Gain at 10GHz
- High Linearity: IP3 = 37 dBm Typical at 5~10GHz
- High Power Added Efficiency: Nominal PAE of 30% at 5~10GHz
- Breakdown Voltage: $BV_{DGO} \geq 15V$
- Wg = 1.2 mm
- 100 % DC Tested
- Suitable for High Reliability Application
- Lost Cost SMT Ceramic Package

PHOTO ENLARGEMENT



DESCRIPTION

The TC3943 is a Single-bias and prematched GaAs PHEMT. It is designed for use in low cost, high volume, and 5~10 GHz 0.5W amplifiers. It provides a typical gain of 7dB and P1dB of 27dBm at 10GHz. The single positive drain bias is 8V and the typical drain-source current is 150mA. 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℃)

Symbol	CONDITIONS	MIN	TYP	MAX	UNIT
P_{1dB}	Output Power at 1dB Gain Compression Point, f = 10GHz V_{DS} = 8V	26	27		dBm
G_L	Linear Power Gain, f = 10GHz V_{DS} = 8V	6	7		dB
IP3	Intercept Point of the 3rd-order Intermodulation, f = 10GHz V_{DS} = 8V, *P_{SCL} = 14 dBm		37		dBm
PAE	Power Added Efficiency at 1dB Compression Power, f = 10GHz		30		%
I_{DS}	Drain-Source Current at V_{DS} = 8V		150		mA
BV_{DGO}	Drain-Gate Breakdown Voltage at I_{DGO} = 0.6mA	15	18		Volts

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

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ABSOLUTE MAXIMUM RATINGS (T_A=25 °C)

Symbol	Parameter	Rating
V_{DS}	Drain-Source Voltage	10V
P_{in}	RF Input Power, CW	26 dBm
P_T	Continuous Dissipation	1.9 W
T_{CH}	Channel Temperature	175 °C
T_{STG}	Storage Temperature	- 65 °C to +175 °C

RECOMMANDED OPERATING CONDITION

Symbol	Parameter	Rating
V_{DS}	Drain to Source Voltage	8V

HANDLING PRECAUTIONS:

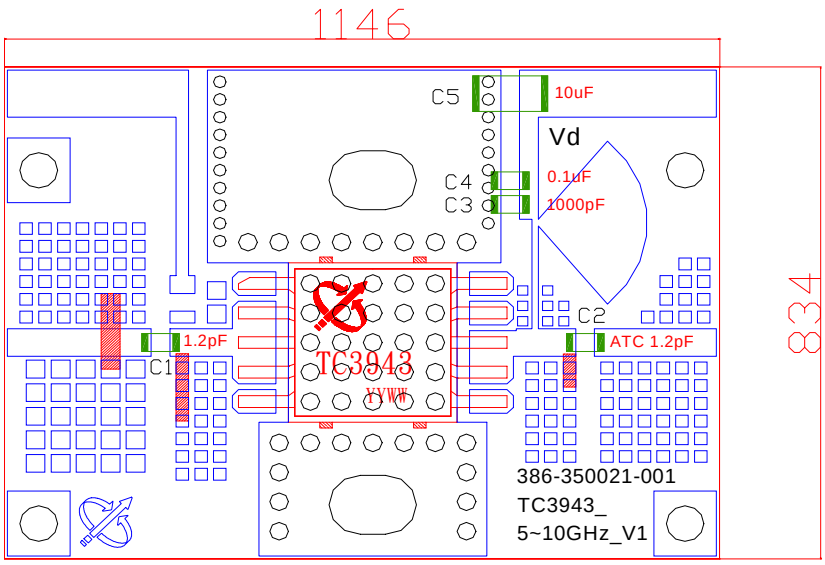
The user must operate in a clean, dry environment. Electrostatic Discharge (ESD) precautions should be observed at all stages of storage, handling, assembly, and testing. The static discharge must be less than 300V.

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

*** Application Notes:**
For better heat sinking and grounding, it's recommended to have the via holes beneath TC3943 filled with solder and have two screws besides TC3943 installed on the PCB area.



Evaluation Board Parts List

Part Type	Qt'y	Reference Designator	Description	Manufacturer	Part Number
Capacitor	1	C1	(0603) 1.2pF±5%	Murata	GRM39COG1R2C50V
Capacitor	1	C2	(0805) 1.2pF±0.1pF	ATC	ATC 600F 1R2BT (1.2pF±0.1pF 250WVDC)
Capacitor	1	C3	(0603) 1000pF±10%	Murata	GRM39X7R102K50V
Capacitor	1	C4	(0603) 0.1μF±20%	Murata	GRM39Y5V104Z25V
Capacitor	1	C5	(0603) 10μF±20%	Murata	GRM42-6Y5V106Z25V (GRM31CF5E106ZA01L)