

- Preliminary Datasheet -

## **1W Self-Bias and Prematched GaAs Power PHEMTs using SMT package**

### **FEATURES**

- Prematched for 8~10 GHz
- 1W Typical Output Power at 8~10GHz
- 5.5dB Typical Linear Power Gain at 10GHz
- High Linearity:  
IP3 = 40 dBm Typical at 8~10GHz
- High Power Added Efficiency:  
Nominal PAE of 35% at 8~10GHz
- Breakdown Voltage:  $BV_{DGO} \geq 15V$
- $W_g = 2.4 \text{ mm}$
- 100 % DC Tested
- Suitable for High Reliability Application
- Lost Cost SMT Ceramic Package

### **DESCRIPTION**

The TC3953A is a self-bias and prematched GaAs PHEMT. It is designed for use in low cost, high volume, and 8~10 GHz 1W amplifiers. It provides a typical gain of 5.5dB and P1dB of 30dBm at 10GHz. 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.

# TC3953A

## ELECTRICAL SPECIFICATIONS ( $T_A=25$ )

Symbol	CONDITIONS	MIN	TYP	MAX	UNIT
$P_{1dB}$	Output Power at 1dB Gain Compression Point, $f = 10\text{GHz}$ $V_{DS} = 9\text{V}$	29	30		dBm
$G_L$	Linear Power Gain, $f = 10\text{GHz}$ $V_{DS} = 9\text{V}$		5.5		dB
IP3	Intercept Point of the 3 <sup>rd</sup> -order Intermodulation, $f = 10\text{GHz}$ $V_{DS} = 9\text{V}$ , $*P_{SCL} = 17\text{ dBm}$		40		dBm
PAE	Power Added Efficiency at 1dB Compression Power, $f = 10\text{GHz}$		35		%
$I_{DS}$	Drain-Source Current at $V_{DS} = 9\text{V}$		300		mA
$BV_{DGO}$	Drain-Gate Breakdown Voltage at $I_{DGO} = 1.2\text{mA}$	15	18		Volts

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

## ABSOLUTE MAXIMUM RATINGS ( $T_A=25$ °C)

Symbol	Parameter	Rating
$V_{DS}$	Drain-Source Voltage	12 V
$P_{in}$	RF Input Power, CW	26 dBm
$P_T$	Continuous Dissipation	3.8 W
$T_{CH}$	Channel Temperature	175 °C
$T_{STG}$	Storage Temperature	- 65 °C to +175 °C

## RECOMMENDED OPERATING CONDITION

Symbol	Parameter	Rating
$V_{DS}$	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.