

## 1W Packaged Single-Bias PHEMT GaAs Power FETs

### FEATURES

- 1W Typical Output Power at 6GHz
- 10dB Typical Linear Power Gain at 6GHz
- High Linearity: IP3 = 40 dBm Typical at 6GHz
- High Power Added Efficiency:  
Nominal PAE of 35% at 6GHz
- Breakdown Voltage:  $BV_{DGO} \geq 15V$
- $L_g = 0.35 \mu m$ ,  $W_g = 2.4 mm$
- 100 % DC Tested
- Suitable for High Reliability Application
- Lost Cost Ceramic Package

### PHOTO ENLARGEMENT



### DESCRIPTION

The TC3957 is a self-bias Cu-based ceramic packaged device with TC1501N PHEMT GaAs FETs, which is designed to provide the single power supply application. The Cu-based ceramic package provides excellent thermal conductivity for the GaAs FET. The devices only need to provide the positive voltage to drain and ground the source, which is suitable for oscillator, power amplifier application in a wide range of commercial application. All devices are 100% DC tested to assure consistent quality.

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

Symbol	CONDITIONS	MIN	TYP	MAX	UNIT
$P_{1dB}$	Output Power at 1dB Gain Compression Point, $f = 6GHz$ $V_{DS} = 8 V$	29	30		dBm
$G_L$	Linear Power Gain, $f = 6GHz$ $V_{DS} = 8 V$		10		dB
IP3	Intercept Point of the 3 <sup>rd</sup> -order Intermodulation, $f = 6GHz$ $V_{DS} = 8 V$ , $*P_{SCL} = 17 dBm$		40		dBm
PAE	Power Added Efficiency at 1dB Compression Power, $f = 6GHz$		35		%
$I_{DS}$	Drain-Source Current at $V_{DS} = 8 V$		300		mA
$BV_{DGO}$	Drain-Gate Breakdown Voltage at $I_{DGO} = 1.2mA$	15	18		Volts
$R_{th}$	Thermal Resistance		16		$^\circ C/W$

**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	26 dBm
P <sub>T</sub>	Continuous Dissipation	3 W
T <sub>CH</sub>	Channel Temperature	175 °C
T <sub>STG</sub>	Storage Temperature	- 65 °C to +175 °C

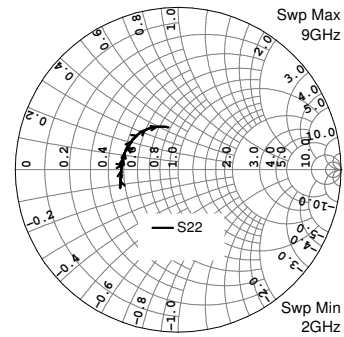
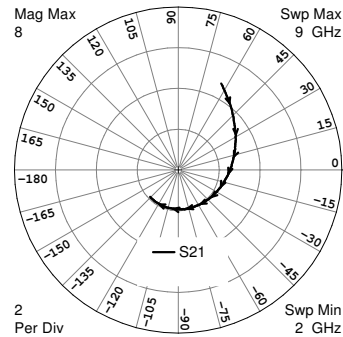
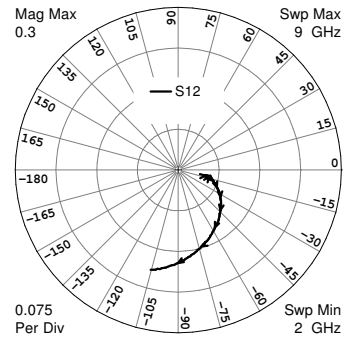
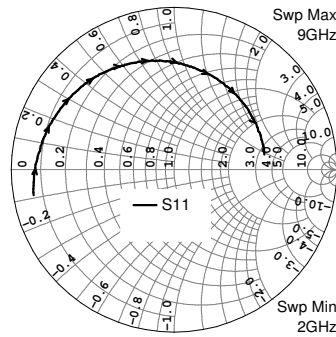
**RECOMMENDED OPERATING CONDITION**

Symbol	Parameter	Rating
V <sub>DS</sub>	Drain to Source Voltage	8 V

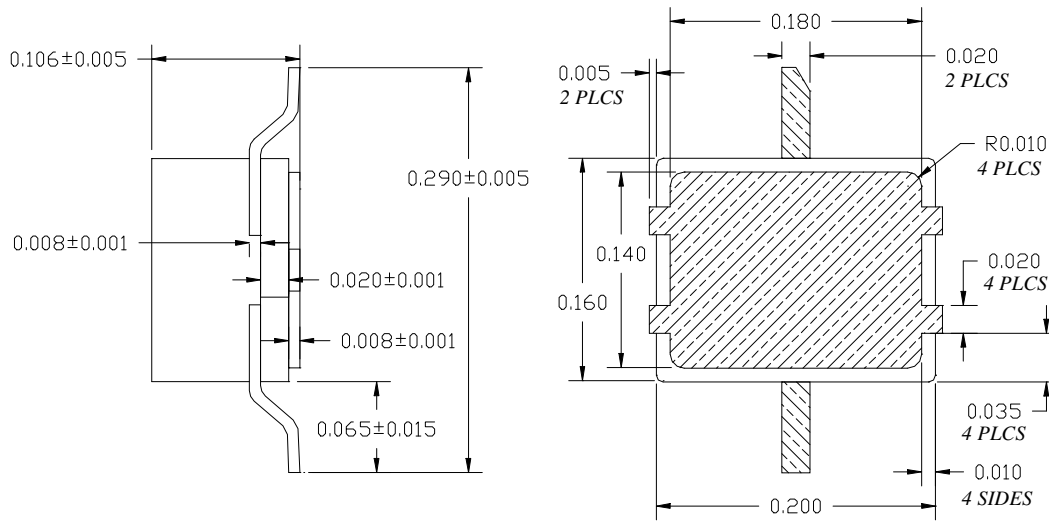
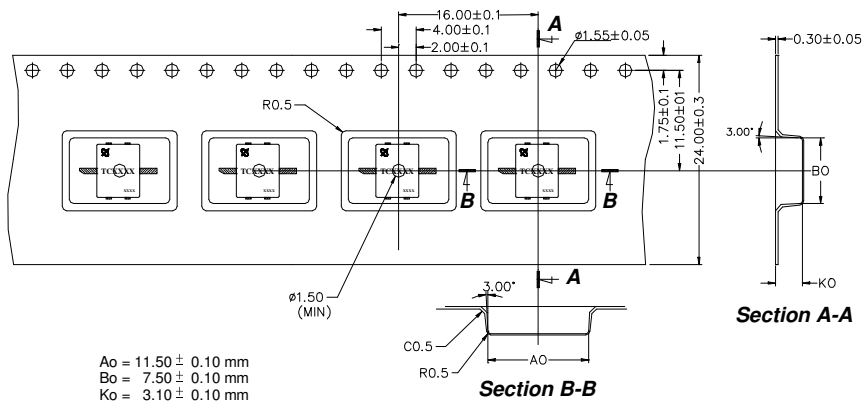
**HANDLING PRECAUTIONS:**

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.

**TYPICAL SCATTERING PARAMETERS (T<sub>A</sub>=25°C)**

 Power Bias : V<sub>DS</sub> = 8 V


FREQUENCY (GHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
2	0.8771	-169.70	4.7327	63.74	0.0502	-12.55	0.3727	-162.37
3	0.8138	161.54	3.3265	32.43	0.0506	-11.65	0.3511	-177.70
4	0.7667	139.73	2.6305	5.72	0.0619	-14.13	0.3464	172.54
5	0.7226	119.09	2.2550	-19.69	0.0769	-23.02	0.3433	163.24
6	0.6779	97.92	2.0514	-45.40	0.0979	-36.57	0.3409	153.98
7	0.6332	73.98	1.9521	-73.02	0.1221	-54.71	0.3298	142.20
8	0.5922	45.49	1.9171	-103.41	0.1545	-78.11	0.3119	126.20
9	0.5628	9.60	1.9021	-136.54	0.1909	-105.36	0.2676	102.60

**OUTLINE DIMENSIONS (in inch)**

**Tape & Reel Package Orientation (mm)**


Standard Reel Size	7 inch
Standard Reel Quantity	400