

## Packaged Single-Bias Low Noise PHEMT GaAs FETs

### FEATURES

- 0.9 dB Typical Noise Figure at 12 GHz
- High Associated Gain:  $G_a = 12$  dB Typical at 12 GHz
- 21.5dBm Typical Power at 12 GHz
- 13 dB Typical Linear Power Gain at 12 GHz
- $L_g = 0.25 \mu\text{m}$ ,  $W_g = 300 \mu\text{m}$
- 100 % DC Tested
- Micro-X Metal Ceramic Package

### PHOTO ENLARGEMENT



### DESCRIPTION

The TC3928 is a single-bias medium power ceramic micro-x packaged device with TC1201 PHEMT GaAs FETs, which is designed to provide the single power supply application. The device is suitable for oscillator, medium power amplifier in a wide range of commercial applications. All devices are 100% DC tested to assure consistent quality.

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

Symbol	Conditions	MIN	TYP	MAX	UNIT
NF	Noise Figure at $V_{DS} = 5 \text{ V}$ , $f = 12\text{GHz}$		0.9	1.5	dB
$G_a$	Associated Gain at $V_{DS} = 5 \text{ V}$ , $f = 12\text{GHz}$	10	12		dB
$P_{1dB}$	Output Power at 1dB Gain Compression Point, $f = 12\text{GHz}$ $V_{DS} = 5 \text{ V}$	20.5	21.5		dBm
$G_L$	Linear Power Gain, $f = 12\text{GHz}$ $V_{DS} = 5 \text{ V}$	12	13		dB
$I_{DS}$	Drain-Source Current at $V_{DS} = 2 \text{ V}$		50		mA
$R_{th}$	Thermal Resistance		125		$^\circ\text{C/W}$

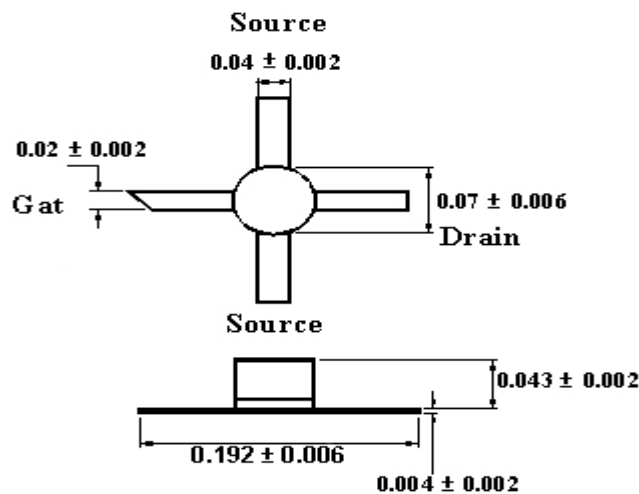
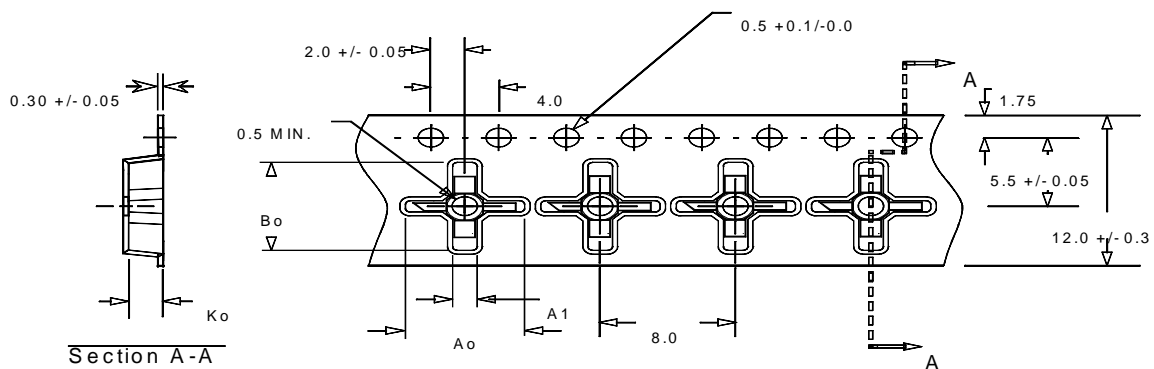
### ABSOLUTE MAXIMUM RATINGS ( $T_A=25^\circ\text{C}$ )

Symbol	Parameter	Rating
$V_{DS}$	Drain-Source Voltage	7.0 V
$P_{in}$	RF Input Power, CW	21 dBm
$P_T$	Continuous Dissipation	300 mW
$T_{CH}$	Channel Temperature	175 $^\circ\text{C}$
$T_{STG}$	Storage Temperature	-65 $^\circ\text{C}$ to +175 $^\circ\text{C}$

### 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.

FREQUENCY (GHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
2	0.9964	-53.37	7.7977	141.36	0.0356	49.29	0.6101	-40.69
3	0.8974	-76.39	7.2049	116.92	0.0439	39.05	0.5327	-54.72
4	0.7881	-95.18	6.4031	96.41	0.0491	32.74	0.4841	-65.93
5	0.6876	-111.36	5.7272	78.79	0.0534	27.70	0.4567	-76.44
6	0.5894	-126.38	5.1760	63.17	0.0575	23.66	0.4417	-86.50
7	0.5017	-141.64	4.7123	48.68	0.0613	20.46	0.4334	-96.09
8	0.4316	-162.83	4.3293	32.87	0.0653	14.29	0.4257	-105.97
9	0.3788	-176.39	4.0611	19.95	0.0688	12.36	0.4292	-112.08
10	0.3796	153.48	3.8586	5.59	0.0774	6.71	0.4065	-120.81
11	0.3950	130.35	3.6560	-7.47	0.0820	0.10	0.3772	-127.70
12	0.4367	113.02	3.5474	-21.55	0.0883	-4.83	0.3559	-137.85
13	0.5023	96.70	3.4426	-36.05	0.0955	-14.37	0.3150	-152.42
14	0.5525	81.62	3.3692	-52.72	0.1026	-24.14	0.2836	-172.77
15	0.6122	67.18	3.1921	-69.08	0.1098	-36.02	0.2578	155.44
16	0.6416	52.52	3.0295	-86.37	0.1133	-49.13	0.2678	123.35
17	0.6540	39.31	2.7844	-101.86	0.1168	-62.02	0.3315	97.87
18	0.6526	27.27	2.6086	-115.69	0.1213	-77.28	0.4095	82.48

**OUTLINE DIMENSIONS (in inch)**

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


$A_0 = 7.0 \text{ mm}$   
 $A_1 = 1.45 \text{ mm}$   
 $B_0 = 7.0 \text{ mm}$   
 $B_1 = 0.9 \text{ mm}$   
 $K_0 = 2.0 \text{ mm}$

- Standard Reel Size : 7"
- Standard Reel Quantity : 1000