

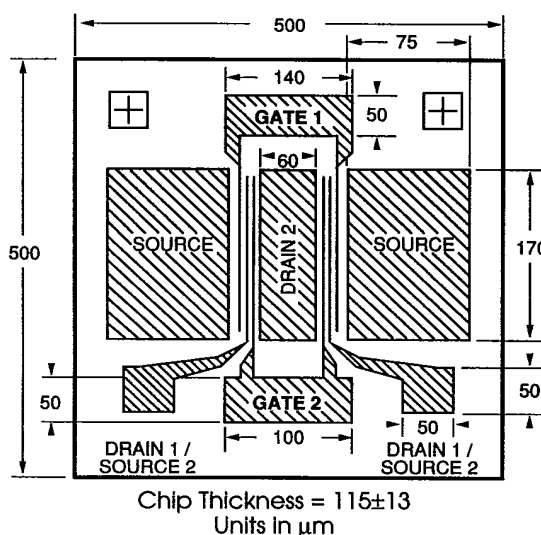
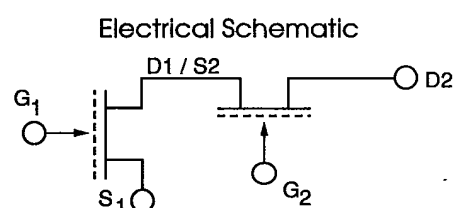
Electron Devices

Preliminary Specifications

D-2704

FEATURES

- MAG 18 dB @ 8 GHz
- Noise Figure 2.5 dB @ 8 GHz
- Gain at NF 13 dB @ 8 GHz
- Mixer, Switch, AGC, and Temperature Compinsation Applications
- 0.5 x 340 μ m Ti/Pt/Au Gate



DESCRIPTION AND APPLICATIONS

The D-2704 is a Gallium Arsenide (GaAs) n-channel Dual Gate Field Effect Transistor (FET) utilizing a 0.5 micron long Schottky-barrier gate. The device offers low noise figure and high associated gain, which makes it ideal for microwave integrated circuits, operating up to 12 GHz. Litton uses the latest design and production techniques to manufacture state-of-the-art devices for Electronic Warfare applications.

Quality is assured by quality control and test procedures patterned after MIL-STD-19500 and MIL-STD-750.

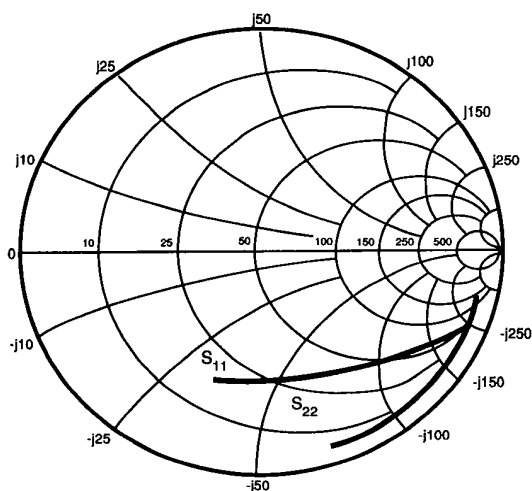
The D-2704 is a device for industrial, military, and space applications. Typical uses would be in high gain, low noise, wide band, small signal receiver, telecommunication, and EW systems. Other applications include mixing, switching, AGC and temperature compensating.

RF PERFORMANCE SPECIFICATIONS (T_a = 25° C)

SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	D-2704		
			MIN	TYP	MAX
MAG	Maximum Available Gain V _{DS} =4V, I _{DS} =1/2 I _{DSS} , V _{G2S} =0	•f= 4 GHz •f= 8 GHz dB dB		20 18	
AGC	Available Gain Control V _{DS} =4V, I _{DS} =1/2 I _{DSS} , V _{G2S} =0 to -4V	•f= 8 GHz dB		30	
NF	Minimum Noise Figure V _{DS} =3.5V, I _{DS} =15 mA, V _{G2S} =0	•f= 4 GHz •f= 8 GHz dB dB		2 2.5	3.0
G _{NF}	Associated Gain at NF V _{DS} =3.5V, I _{DS} =15 mA, V _{G2S} =0	•f= 4 GHz •f= 8 GHz dB dB	11	15 13	

Litton**Preliminary Specifications****DC PERFORMANCE SPECIFICATIONS ($T_a = 25^\circ\text{C}$)****D-2704**

SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	D-2704		
			MIN	TYP	MAX
I_{DSS}	Saturated Drain Current $V_{DS}=3V, V_{G1S}=0V, V_{G2S}=\text{open}$	mA	40	60	80
V_P	Pinch-off voltage $V_{DS}=3V, I_D=1\text{mA}, V_{G2S}=\text{open}$	V		-3.0	
G_M	Transconductance $V_{DS}=3V, I_{DS}=1/2 I_{DSS}, V_{G2S}=\text{open}$	mmho	15	20	
I_{GS}	Gate-to Source Leakage Current $V_{GS}=-3V$	μA		1	10
I_{GD}	Gate to Drain Leakage Current $V_{GD}=-5V$	μA		1	10
θ_J	Thermal Resistance (AuSn Eutectic Die Attach)	$^\circ\text{C/W}$		180	

**ABSOLUTE MAXIMUM RATINGS at 25°C**

SYMBOLS	PARAMETERS	UNITS	RATINGS**
V_{DS}	Drain-Source Voltage	V	10
V_{G1S}/V_{G2S}	Gate-Source Voltage	V	-8
I_{DS}	Drain Current	mA	I_{DSS}
I_{GSF}	Forward Gate Current	mA	50
P_{IN}	RF Input Power	mW	200
T_{CH}	Channel Temperature	$^\circ\text{C}$	175
T_{SIG}	Storage Temperature	$^\circ\text{C}$	-65 to +175
P_T	Power Dissipation	mW	300

S-PARAMETERS:* $V_{DS}=4\text{ volts}, I_{DS}=25\text{mA}, V_{G2S}=0V$

FREQUENCY (GHZ)	S11		S21			S12			S22	
	MAG	ANG	MAG	ANG	dB	MAG	ANG	dB	MAG	ANG
2	.94	-23	2.70	149	8.63	.01	81	-40	.89	-11
4	.85	-36	2.33	130	7.35	.01	120	-40	.88	-15
6	.72	-54	1.99	107	5.98	.01	120	-40	.88	-23
8	.63	-73	1.92	79	5.67	.03	161	-30	.88	-36
10	.60	-87	1.88	60	5.48	.06	178	-24	.88	-52
12	.60	-90	1.83	45	5.25	.12	178	-18	.89	-61
14	.62	-107	1.81	40	5.15	.23	179	-13	.90	-70

NOTE: * Measurements include 0.7 mil diameter Au bonding wire.
 ** Operation of this device above any one of these parameters may cause permanent damage.