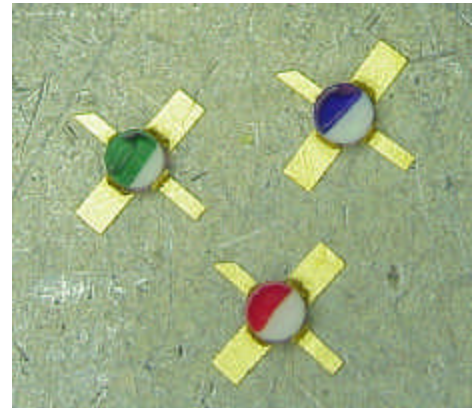


- FEATURES

- ◆ 0.7 dB Noise Figure at 12 GHz
- ◆ 12 dB Associated Gain at 12 GHz
- ◆ 0.4 dB Noise Figure at 2 GHz
- ◆ 18 dB Associated Gain at 2 GHz
- ◆ Low DC Power Consumption: 30mW



- DESCRIPTION AND APPLICATIONS

The LP7512P70 is a packaged Aluminum Gallium Arsenide / Indium Gallium Arsenide (AlGaAs/InGaAs) Pseudomorphic High Electron Mobility Transistor (PHEMT), utilizing an Electron-Beam direct-write 0.25  $\mu\text{m}$  by 200  $\mu\text{m}$  Schottky barrier gate. The recessed “mushroom” Ti/Pt/Au gate structure minimizes parasitic gate-source and gate resistances. The epitaxial structure and processing have been optimized for optimum low noise performance. The LP7512’s active areas are passivated with  $\text{Si}_3\text{N}_4$ , and the P70 ceramic package is ideal for low-cost, high-performance applications that require a surface-mount package.

Typical applications include low noise receiver preamplifiers in wireless systems.

- ELECTRICAL SPECIFICATIONS @  $T_{\text{Ambient}} = 25^\circ\text{C}^*$

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Saturated Drain-Source Current**	$I_{\text{DSS}}$	$V_{\text{DS}} = 2 \text{ V}; V_{\text{GS}} = 0 \text{ V}$	15		30	mA
Noise Figure	NF	$V_{\text{DS}} = 2 \text{ V}; I_{\text{DS}} = 25\% I_{\text{DSS}}$		0.7	1.0	dB
Associated Gain at minimum NF	$G_{\text{A}}$	$V_{\text{DS}} = 2 \text{ V}; I_{\text{DS}} = 25\% I_{\text{DSS}}$	11	12		dB
Transconductance	$G_{\text{M}}$	$V_{\text{DS}} = 2 \text{ V}; V_{\text{GS}} = 0 \text{ V}$	60	90		mS
Gate-Source Leakage Current	$I_{\text{GSO}}$	$V_{\text{GS}} = -3 \text{ V}$		1	15	$\mu\text{A}$
Gate-Drain Leakage Current	$I_{\text{GDO}}$	$V_{\text{GS}} = -3 \text{ V}$		1	15	$\mu\text{A}$
Pinch-Off Voltage	$V_{\text{P}}$	$V_{\text{DS}} = 2 \text{ V}; I_{\text{DS}} = 1 \text{ mA}$	-0.2	-0.4	-1.5	V

\*frequency=18 GHz, unless otherwise noted

\*\*Formerly binned as: LP7512P70-1 = 15-30 mA and LP7512P70-2 = 31-50 mA

- ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Test Conditions	Min	Max	Units
Drain-Source Voltage	$V_{DS}$	$T_{Ambient} = 22 \pm 3 \text{ }^{\circ}\text{C}$		4	V
Gate-Source Voltage	$V_{GS}$	$T_{Ambient} = 22 \pm 3 \text{ }^{\circ}\text{C}$		-2	V
Drain-Source Current	$I_{DS}$	$T_{Ambient} = 22 \pm 3 \text{ }^{\circ}\text{C}$		$I_{DSS}$	mA
Gate Current	$I_G$	$T_{Ambient} = 22 \pm 3 \text{ }^{\circ}\text{C}$		2	mA
RF Input Power	$P_{IN}$	$T_{Ambient} = 22 \pm 3 \text{ }^{\circ}\text{C}$		50	mW
Channel Operating Temperature	$T_{CH}$	$T_{Ambient} = 22 \pm 3 \text{ }^{\circ}\text{C}$		175	$^{\circ}\text{C}$
Storage Temperature	$T_{STG}$	—	-65	175	$^{\circ}\text{C}$
Total Power Dissipation	$P_{TOT}$	$T_{Ambient} = 22 \pm 3 \text{ }^{\circ}\text{C}$		300	mW

Notes:

- Operating conditions that exceed the Absolute Maximum Ratings could result in permanent damage to the device.
- Power Dissipation defined as:  $P_{TOT} \equiv (P_{DC} + P_{IN}) - P_{OUT}$ , where  
 $P_{DC}$ : DC Bias Power  
 $P_{IN}$ : RF Input Power  
 $P_{OUT}$ : RF Output Power
- Absolute Maximum Power Dissipation to be de-rated as follows above 25 $^{\circ}\text{C}$ :  
 $P_{TOT} = 300\text{mW} - (3.5\text{mW}/^{\circ}\text{C}) \times T_{HS}$   
 where  $T_{HS}$  = heatsink or ambient temperature.
- This PHEMT is susceptible to damage from Electrostatic Discharge. Proper precautions should be used when handling these devices.

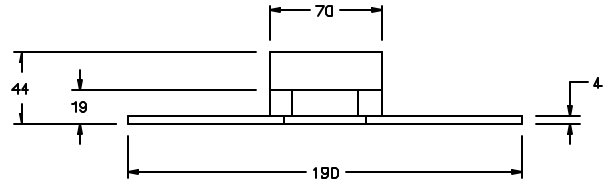
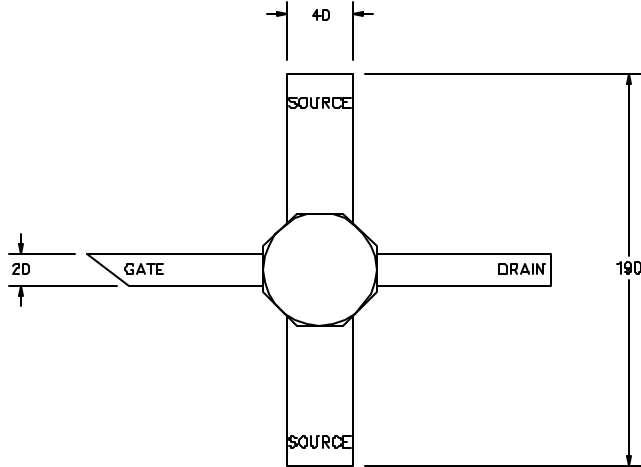
- HANDLING PRECAUTIONS

To avoid damage to the devices care should be exercised during handling. Proper Electrostatic Discharge (ESD) precautions should be observed at all stages of storage, handling, assembly, and testing. These devices should be treated as Class 1A (0-500 V). Further information on ESD control measures can be found in MIL-STD-1686 and MIL-HDBK-263.

- APPLICATIONS NOTES & DESIGN DATA

Applications Notes are available from your local Filtronic Sales Representative or directly from the factory. Complete design data, including S-parameters, noise data, and large-signal models are available on the Filtronic web site.

- PACKAGE OUTLINE  
(dimensions in mils)



All information and specifications are subject to change without notice.