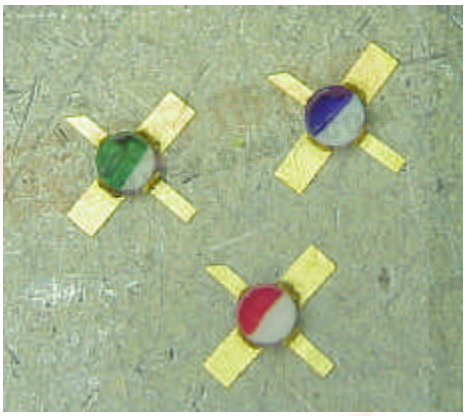
Filtronic

LP7512P70

PACKAGED ULTRA LOW NOISE PHEMT



- 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 µm by 200 µm 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 Si_3N_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 @ $T_{Ambient}$ = 25°C*

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Saturated Drain-Source Current**	I_{DSS}	V_{DS} = 2 V; V_{GS} = 0 V	15		30	mA
Noise Figure	NF	V_{DS} = 2 V; I_{DS} = 25% I_{DSS}		0.7	1.0	dB
Associated Gain at minimum NF	G_A	V_{DS} = 2 V; I_{DS} = 25% I_{DSS}	11	12		dB
Transconductance	G_M	V_{DS} = 2 V; V_{GS} = 0 V	60	90		mS
Gate-Source Leakage Current	I_{GSO}	V_{GS} = -3 V		1	15	µA
Gate-Drain Leakage Current	I_{GDO}	V_{GS} = -3 V		1	15	µA
Pinch-Off Voltage	V_P	V_{DS} = 2 V; I_{DS} = 1 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}	$T_{Ambient} = 22 \pm 3$ °C		4	V
Gate-Source Voltage	V_{GS}	$T_{Ambient} = 22 \pm 3$ °C		-2	V
Drain-Source Current	I_{DS}	$T_{Ambient} = 22 \pm 3$ °C		I_{DSS}	mA
Gate Current	I_G	$T_{Ambient} = 22 \pm 3$ °C		2	mA
RF Input Power	P_{IN}	$T_{Ambient} = 22 \pm 3$ °C		50	mW
Channel Operating Temperature	T_{CH}	$T_{Ambient} = 22 \pm 3$ °C		175	ºC
Storage Temperature	T_{STG}	—	-65	175	ºC
Total Power Dissipation	P_{TOT}	$T_{Ambient} = 22 \pm 3$ °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°C:
  P_{TOT}= 300mW – (3.5mW/°C) x 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)