Filtronic

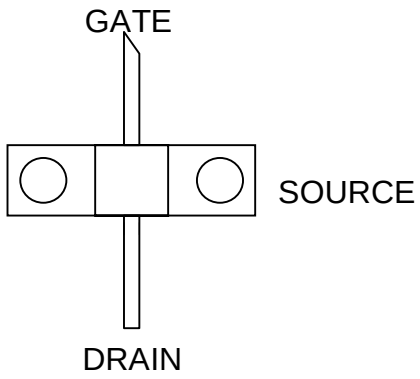
Solid State

LP3000P100

PACKAGED 2W POWER PHEMT

FEATURES

- **+33.0 dBm Typical Power at 15 GHz**
- **10 dB Typical Power Gain at 15 GHz**
- **Low Intermodulation Distortion**
- **45% Power-Added-Efficiency**



DESCRIPTION AND APPLICATIONS

The LP3000P100 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 3000 µm Schottky barrier gate. The recessed "mushroom" gate structure minimizes parasitic gate-source and gate resistances. The epitaxial structure and processing have been optimized for reliable high-power applications. The LP3000 also features Si_3N_4 passivation and is also available in die form.

Typical applications include commercial and military high-performance power amplifiers, including SATCOM uplink transmitters, and medium-haul digital radio transmitters. The LP3000 -P100 may be procured in a variety of grades, depending upon specific user requirements. Standard lot screening is patterned after MIL-STD-19500, JANC grade. Space level screening to FSS JANS is also available.

PERFORMANCE SPECIFICATIONS (T_A = 25°C)

SYMBOLS	PARAMETERS		MIN	TYP	MAX	UNITS
P_{1dB}	Output Power at 1dB Gain Compression V_{DS} = 8.0V, I_{DS} = 50% I_{DSS}	*f* = 15 GHz	32.0	33.0		dBm
G_{1dB}	Power Gain at 1dB Gain Compression V_{DS} = 8.0V, I_{DS} = 50% I_{DSS} (LP)	*f* = 15 Ghz	7.0	8.0		dB
I_{DSS}	Saturated Drain-Source Current V_{DS} = 2V V_{GS} = 0V	LP3000-P100-1 BLUE LP3000-P100-2 GREEN LP3000-P100-3 RED	800 925 1025	860 975 1060	925 1025 1100	mA
η_{ADD}	PAE @ P-1, V_{DS} = +8.0V, I_{DS} = 50% I_{DSS}	*f* = 15 Ghz		45		%
I_{MAX}	Maximum Drain-Source Current	V_{DS} = 2V V_{GS} = +1V		1700		mA
G_M	Transconductance	V_{DS} = 2V V_{GS} = 0V	700	900		mS
V_P	Pinch-Off Voltage	V_{DS} = 2V I_{DS} = 10mA	-0.25	-1.2	-2.0	V
I_{GSO}	Gate-Source Leakage Current	V_{GS} = -5V		15	130	µA
BV_{GS}	Gate-Source Breakdown Voltage	I_{GS} = 15mA	-12	-15		V
BV_{GD}	Gate-Drain Breakdown Voltage	I_{GD} = 15mA	-12	-16		V

DSS-028 WG

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ABSOLUTE MAXIMUM RATINGS (25°C)		
SYMBOL	**PARAMETER**	**RATING[1]**
V_{DS}	Drain-Source Voltage	12V
V_{GS}	Gate-Source Voltage	-4V
I_{DS}	Drain-Source Current	2 x I_{DSS}
I_G	Gate Current	120 mA
P_{IN}	RF Input Power	1.2 W
T_{CH}	Channel Temperature	175°C
T_{STG}	Storage Temperature	-65/175°C
P_T	Power Dissipation	5.0W[3,4]

RECOMMENDED CONTINUOUS OPERATING LIMITS		
SYMBOL	**PARAMETER**	**RATING[2]**
V_{DS}	Drain-Source Voltage	8V
V_{GS}	Gate-Source Voltage	-1V
I_{DS}	Drain-Source Current	0.8 x I_{DSS}
I_G	Gate Current	40 mA
P_{IN}	RF Input Power	600 mW
T_{CH}	Channel Temperature	150°C
T_{STG}	Storage Temperature	-20/50°C
P_T	Power Dissipation	4.2 W[3,4]
G_{XdB}	Gain Compression	8 dB

NOTES:

1. Operating conditions that exceed the Absolute Maximum Ratings could result in permanent damage to the device. Recommended Continuous Operating Limits should be observed for reliable device operation.
2. Power Dissipation defined as: $P_T \equiv (P_{DC} + P_{IN}) - P_{OUT}$, where: P_{DC} = DC bias power, P_{OUT} = RF output power, and P_{IN} = RF input power.
3. Power Dissipation to be de-rated as follows above 25°C:
   - Absolute Maximum: $P_T = 5.0W - (33mW/°C) \times T_{HS}$
   - Recommended Continuous Operating: $P_T = 1.4W - (33mW/°C) \times T_{HS}$
   - where T_{HS} = heatsink or ambient temperature.
4. Specifications subject to change without notice.

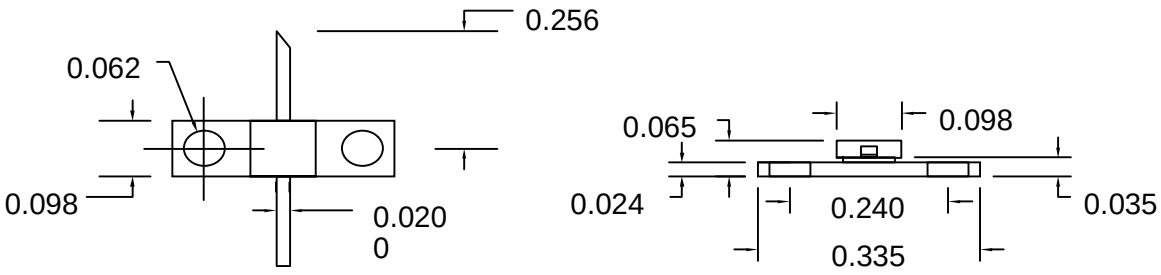
HANDLING PRECAUTIONS:

Care should be exercised during handling to avoid damage to the devices. 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 (0-500V), and further information on ESD control measures can be found in MIL-STD-1686 and MIL-HDBK-263.

APPLICATIONS NOTES AND DESIGN DATA:

Applications Notes are available from your local FSS Sales Representative, or directly from the factory. Complete design data, including S-parameters, and Large-Signal models, is available on 3.5" diskette, or may be down-loaded from our Web Page.

PACKAGE OUTLINE: (DIMENSIONS IN INCHES)



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