Filtronic

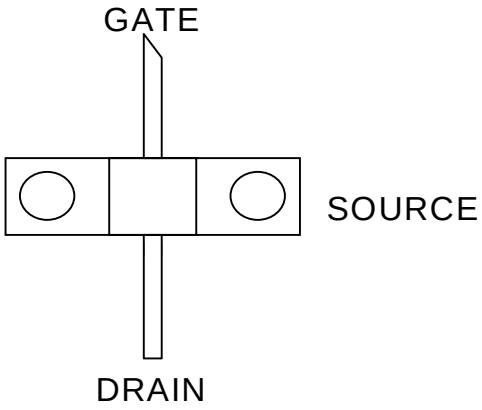
Solid State

LP1500P100

PACKAGED 1W POWER PHEMT

FEATURES

- **+31 dBm Typical Power at 15 GHz**
- **12.5 dB Typical Power Gain at 15 GHz**
- **Low Intermodulation Distortion**
- **50% Power-Added-Efficiency**
- **Color-coded by I_{DSS} range**



DESCRIPTION AND APPLICATIONS

The LP1500P100 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 1500 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 LP1500 also features Si_3N_4 passivation and is available in die form or in a low cost plastic surface-mount packages, SOT-223 or SOT-89. Packages are color-coded by I_{DSS} range.

Typical applications include commercial and military high-performance power amplifiers, including SATCOM uplink transmitters, and medium-haul digital radio transmitters.

The LP 1500P100 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 LSSD JANS grade is also available.

PERFORMANCE SPECIFICATIONS (T_A = 25°C)

SYMBOLS	PARAMETERS		MIN	TYP	MAX	UNITS
I_{DSS}	Saturated Drain-Source Current	LP1500-P100-1 BLUE	375	410	450	mA
	V_{DS} = 2V V_{GS} = 0V	LP1500-P100-2 GREEN	451	490	526	
		LP1500-P100-3 RED	527	565	600	
P_{1dB}	Output Power at 1dB Gain Compression					
	V_{DS} = 8.0V, I_{DS} = 50% I_{DSS}	*f* = 15 GHz	29.5	31.0		dBm
G_{1dB}	Power Gain at 1dB Gain Compression					
	V_{DS} = 8.0V, I_{DS} = 50% I_{DSS}	*f* = 15 GHz	8.0	9.0		dB
η_{ADD}	Power-Added Efficiency			50		%
I_{MAX}	Maximum Drain-Source Current	V_{DS} = 2V V_{GS} = +1V		925		mA
G_M	Transconductance	V_{DS} = 2V V_{GS} = 0V	300	400		mS
V_P	Pinch-Off Voltage	V_{DS} = 2V I_{DS} = 5mA	-0.25	-1.2	-2.0	V
I_{GSO}	Gate-Source Leakage Current	V_{GS} = -5V		10	100	µA
BV_{GS}	Gate-Source Breakdown Voltage	I_{GS} = 8mA	-12	-15		V
BV_{GD}	Gate-Drain Breakdown Voltage	I_{GD} = 8mA	-12	-16		V

DSS-025 WD

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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	70 mA
P_{IN}	RF Input Power	700 mW
T_{CH}	Channel Temperature	+175°C
T_{STG}	Storage Temperature	-65/175°C
P_T	Power Dissipation	3.0W[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	15 mA
P_{IN}	RF Input Power	300 mW
T_{CH}	Channel Temperature	+150°C
T_{STG}	Storage Temperature	-20/50°C
P_T	Power Dissipation	2.5 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.
2. Recommended Continuous Operating Limits should be observed for reliable device operation.
3. 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.
4. Power Dissipation to be de-rated as follows above 25°C:
   Absolute Maximum: $P_T = 3.0W - (20mW/°C) \times T_{HS}$
   Recommended Continuous Operating: $P_T = 2.5W - (20mW/°C) \times T_{HS}$
   where T_{HS} = heatsink or ambient temperature.
5. Specifications subject to change without notice.

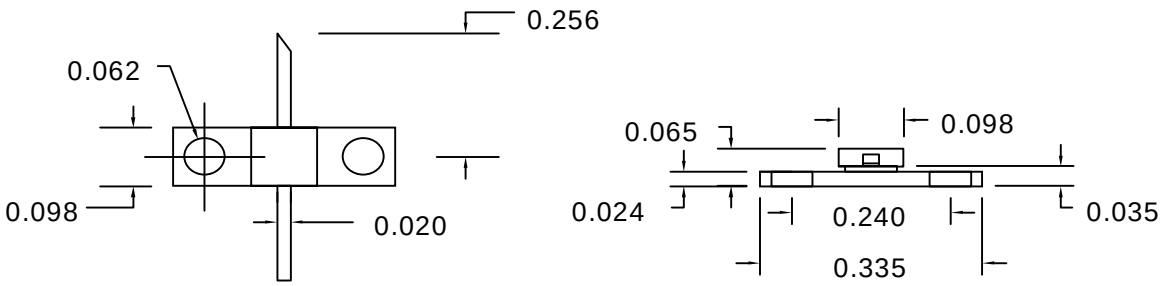
HANDLING PRECAUTIONS:

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 LSSD Sales Representative, or directly from the factory. Complete design data, including S-parameters, Noise data, 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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