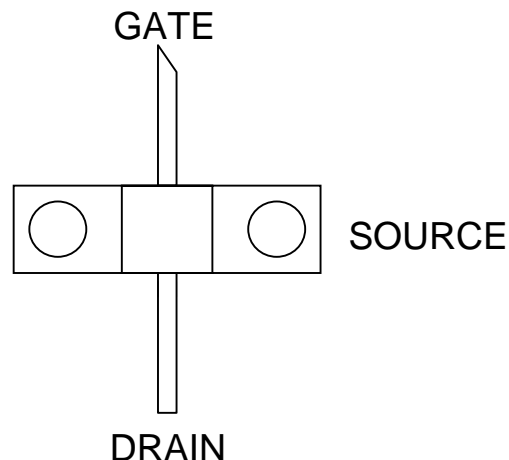


## Solid State

## Packaged 0.25W Power PHEMT

### FEATURES

- +24.5 dBm Typical Power at 15 GHz
- 12 dB Typical Power Gain at 15 GHz
- Low Intermodulation Distortion
- 55% Power-Added-Efficiency
- Color-coded by  $I_{DSS}$  range



### DESCRIPTION AND APPLICATIONS

The LP6836P100 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 360  $\mu\text{m}$  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 LP6836 also features  $\text{Si}_3\text{N}_4$  passivation and is available in die form, or P70 packages. 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 LP6836P100 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 grade is also available.

### PERFORMANCE SPECIFICATIONS ( $T_A = 25^\circ\text{C}$ )

SYMBOLS	PARAMETERS	MIN	TYP	MAX	UNITS
$I_{DSS}$	Saturated Drain-Source Current $V_{DS} = 2V$ $V_{GS} = 0V$	80 96 106	90 100 115	95 105 125	mA
$P_{1dB}$	Output Power at 1dB Gain Compression $V_{DS} = 8.0V$ , $I_{DS} = 50\% I_{DSS}$ $f = 15\text{ GHz}$	23.5	24.5		dBm
$G_{1dB}$	Power Gain at 1dB Gain Compression $V_{DS} = 8.0V$ , $I_{DS} = 50\% I_{DSS}$ $f = 15\text{ GHz}$	8.5	9.5		dB
$\eta_{ADD}$	Power-Added Efficiency		55		%
$I_{MAX}$	Maximum Drain-Source Current $V_{DS} = 2V$ $V_{GS} = +1V$		190		mA
$G_M$	Transconductance $V_{DS} = 2V$ $V_{GS} = 0V$	70	95		mS
$V_P$	Pinch-Off Voltage $V_{DS} = 2V$ $I_{DS} = 2\text{mA}$	-0.25	-0.8	-1.5	V
$I_{GSO}$	Gate-Source Leakage Current $V_{GS} = -5V$		1	15	$\mu\text{A}$
$BV_{GS}$	Gate-Source Breakdown Voltage $I_{GS} = 2\text{mA}$	-11	-15		V
$BV_{GD}$	Gate-Drain Breakdown Voltage $I_{GD} = 2\text{mA}$	-12	-16		V

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ABSOLUTE MAXIMUM RATINGS (25°C)		
SYMBOL	PARAMETER	RATING <sup>1</sup>
V <sub>DS</sub>	Drain-Source Voltage	10V
V <sub>GS</sub>	Gate-Source Voltage	-4V
I <sub>DS</sub>	Drain-Source Current	2 x I <sub>DSS</sub>
I <sub>G</sub>	Gate Current	18 mA
P <sub>IN</sub>	RF Input Power	180 mW
T <sub>CH</sub>	Channel Temperature	175°C
T <sub>STG</sub>	Storage Temperature	-65/175°C
P <sub>T</sub>	Power Dissipation	1.3W <sup>3,4</sup>

RECOMMENDED CONTINUOUS OPERATING LIMITS		
SYMBOL	PARAMETER	RATING <sup>2</sup>
V <sub>DS</sub>	Drain-Source Voltage	8V
V <sub>GS</sub>	Gate-Source Voltage	-0.8V
I <sub>DS</sub>	Drain-Source Current	0.85 x I <sub>DSS</sub>
I <sub>G</sub>	Gate Current	3 mA
P <sub>IN</sub>	RF Input Power	90 mW
T <sub>CH</sub>	Channel Temperature	150°C
T <sub>STG</sub>	Storage Temperature	-20/50°C
P <sub>T</sub>	Power Dissipation	1.1 W <sup>3,4</sup>
G <sub>x</sub> dB	Gain Compression	8 dB

**NOTES:**

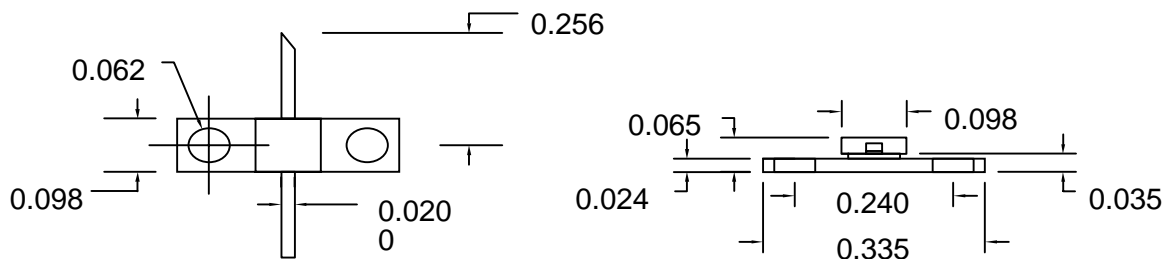
- Operating conditions that exceed the Absolute Maximum Ratings could result in permanent damage to the device.
- Recommended Continuous Operating Limits should be observed for reliable device operation.
- Power Dissipation defined as:  $P_T \equiv (P_{DC} + P_{IN}) - P_{OUT}$ , where:  $P_{DC}$  = DC bias power,  $P_{OUT}$  = RF output power, and  $P_{IN}$  = RF input power.
- Power Dissipation to be de-rated as follows above 25°C:  
 Absolute Maximum:  $P_T = 1.3W - (9mW/°C) \times T_{HS}$   
 Recommended Continuous Operating:  $P_T = 1.1W - (9mW/°C) \times T_{HS}$   
 where  $T_{HS}$  = heatsink or ambient temperature.
- 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, 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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