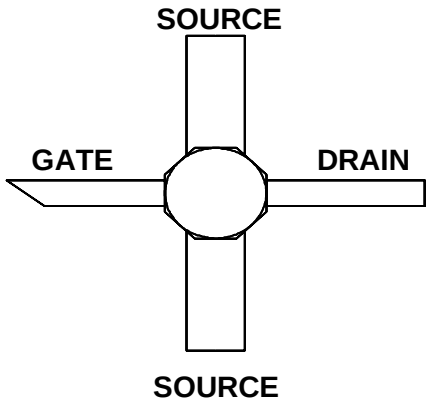
FEATURES

- **+20 dBm Typical Power at 18 GHz**
- **9.5 dB Typical Power Gain at 18 GHz**
- **16 dB Typical SSG at 2 GHz**
- **0.8 dB Typical Noise Figure at 2 GHz**
- **Low Intermodulation Distortion**
- **Color-Coded by I_{DSS} range**



DESCRIPTION AND APPLICATIONS

The LPD200-P70 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 high dynamic range. The LPD200'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. Packages are color-coded by I_{DSS} range.

Typical applications include high dynamic range receiver preamplifiers for commercial applications including Cellular/PCS systems, broad bandwidth commercial instrumentation and military EW amplifiers, and commercial Space applications.

The LPD200 die-level. screening is patterned after MIL-STD-19500, JANC grade.

PERFORMANCE SPECIFICATIONS (T_A = 25°C)

SYMBOLS	PARAMETERS		MIN	TYP	MAX	UNITS
I_{DSS}	Saturated Drain-Source Current V_{DS} = 2V V_{GS} = 0V	LPD200-P70-1 GREEN LPD200-P70-2 RED	40 66		65 85	mA mA
P_{1dB}	Output Power at 1dB Gain Compression at f = 18 GHz V_{DS} = 5.0V, I_{DS} = 50% I_{DSS}		19.0	20.0		dBm
G_{1dB}	Power Gain at 1dB Gain Compression at f = 18 GHz V_{DS} = 5.0V, I_{DS} = 50% I_{DSS}		8.0	9.5		dB
NF_{MIN}	Minimum Noise Figure at f = 2 GHz V_{DS} = 3.3V, I_{DS} = 25% I_{DSS}			0.8		dB
η_{ADD}	Power-Added Efficiency			50		%
I_{MAX}	Maximum Drain-Source Current	V_{DS} = 2V V_{GS} = +1V		125		mA
G_M	Transconductance	V_{DS} = 2V V_{GS} = 0V	60	80		mS
V_P	Pinch-Off Voltage	V_{DS} = 2V I_{DS} = 1mA	-0.25	-0.8	-1.5	V
I_{GSO}	Gate-Source Leakage Current	V_{GS} = -5V		1	15	µA
BV_{GS}	Gate-Source Breakdown Voltage	I_{GS} = 1mA	-6	-7		V
BV_{GD}	Gate-Drain Breakdown Voltage	I_{GD} = 1mA	-8	-9		V

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ABSOLUTE MAXIMUM RATINGS (25°C)		
SYMBOL	**PARAMETER**	**RATING[1]**
V_{DS}	Drain-Source Voltage	8V
V_{GS}	Gate-Source Voltage	-3V
I_{DS}	Drain-Source Current	I_{DSS}
I_G	Gate Current	5 mA
P_{IN}	RF Input Power	60 mW
T_{CH}	Channel Temperature	175°C
T_{STG}	Storage Temperature	-65/175°C
P_T	Power Dissipation	400mW[3,4]

RECOMMENDED CONTINUOUS OPERATING LIMITS		
SYMBOL	**PARAMETER**	**RATING[2]**
V_{DS}	Drain-Source Voltage	5V
V_{GS}	Gate-Source Voltage	-0.8V
I_{DS}	Drain-Source Current	0.50 x I_{DSS}
I_G	Gate Current	2 mA
P_{IN}	RF Input Power	30 mW
T_{CH}	Channel Temperature	150°C
T_{STG}	Storage Temperature	-20/50°C
P_T	Power Dissipation	350 mW[3,4]
G_{XdB}	Gain Compression	6 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: $P_T = 400mW - (3.1mW/°C) \times T_{HS}$
   Recommended Continuous Operating: $P_T = 350mW - (3.1mW/°C) \times T_{HS}$
   where T_{HS} = heatsink or ambient temperature.

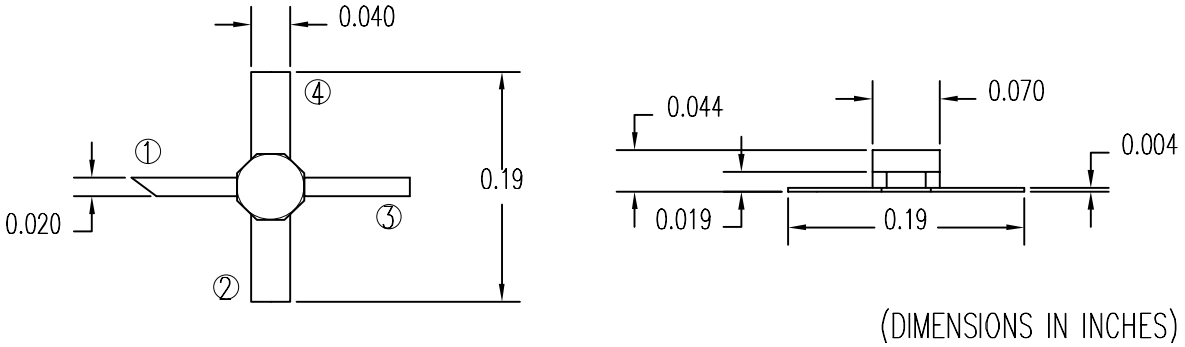
HANDLING PRECAUTIONS:

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.

PACKAGE CHARACTERISTICS:

The P70 package is available with a standard gold over nickel finish. The package lids are epoxy sealed and are capable of passing MIL-STD hermeticity (Gross Leak).

PACKAGE OUTLINE:



(DIMENSIONS IN INCHES)

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