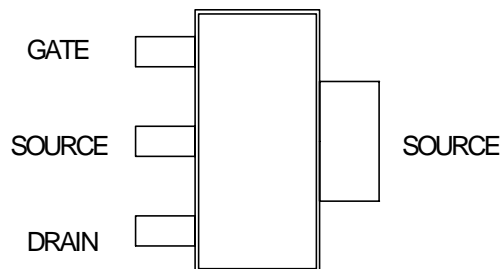


FEATURES

- **+27 dBm Typical Power at 1800 MHz**
- **15 dB Typical Power Gain at 1800 MHz**
- **1.0 dB Typical Noise Figure**
- **+42 dBm Typical Intercept Point**
- **Color-coded by I_{DSS} range**



(TOP VIEW)

DESCRIPTION AND APPLICATIONS

The LP1500SOT223 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 $1500\ \mu\text{m}$ 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 LP1500 also features Si_3N_4 passivation and is available in a die form or in a flanged ceramic package (P100) for high-power applications, or in the SOT-89 plastic package.

Typical applications include PCS/Cellular low-voltage high-efficiency output amplifiers, and general purpose power amplifiers. The LP 1500 may be procured in a variety of grades, depending upon specific user requirements. Standard lot screening is patterned after MIL-STD-19500, JANC grade.

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

SYMBOLS	PARAMETERS	MIN	TYP	MAX	UNITS
I_{DSS}	Saturated Drain-Source Current $V_{DS} = 2\text{V}$ $V_{GS} = 0\text{V}$ LP1500-SOT223-1 BLUE LP1500-SOT223-2 GREEN LP1500-SOT223-3 RED	375 451 527	420 490 560	450 526 600	mA
P_{1dB}	Output Power at 1dB Gain Compression $V_{DS} = 3.3\text{V}$, $I_{DS} = 33\% I_{DSS}$ $f = 1800\text{ MHz}$	25.0	27.0		dBm
G_{1dB}	Power Gain at 1dB Gain Compression $V_{DS} = 3.3\text{V}$, $I_{DS} = 33\% I_{DSS}$ $f = 1800\text{ MHz}$	13.5	15.0		dB
NF	Noise Figure $V_{DS} = 3.3\text{V}$, $I_{DS} = 33\% I_{DSS}$, $f = 1.8\text{ GHz}$		1.0		dB
IP3	Output Intercept Point $V_{DS} = 3.3\text{V}$, $I_{DS} = 33\% I_{DSS}$, $f = 1.8\text{ GHz}$		42		dBm
I_{MAX}	Maximum Drain-Source Current $V_{DS} = 2\text{V}$ $V_{GS} = +1\text{V}$		925		mA
G_M	Transconductance $V_{DS} = 2\text{V}$ $V_{GS} = 0\text{V}$	300	400		mS
V_P	Pinch-Off Voltage $V_{DS} = 2\text{V}$ $I_{DS} = 5\text{mA}$	-0.25	-1.2	-2.0	V
I_{GSO}	Gate-Source Leakage Current $V_{GS} = -3\text{V}$		10	75	μA
BV_{GS}	Gate-Source Breakdown Voltage $I_{GS} = 8\text{mA}$	-8	-10		V
BV_{GD}	Gate-Drain Breakdown Voltage $I_{GD} = 8\text{mA}$	-8	-11		V

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ABSOLUTE MAXIMUM RATINGS (25°C)		
SYMBOL	PARAMETER	RATING ¹
V _{DS}	Drain-Source Voltage	4V
V _{GS}	Gate-Source Voltage	-3V
I _{DS}	Drain-Source Current	I _{DSS}
I _G	Gate Current	50 mA
P _{IN}	RF Input Power	350 mW
T _{CH}	Channel Temperature	175°C
T _{STG}	Storage Temperature	-65/175°C
P _T	Power Dissipation	1.7W ^{3,4}

RECOMMENDED CONTINUOUS OPERATING LIMITS		
SYMBOL	PARAMETER	RATING ²
V _{DS}	Drain-Source Voltage	3.5V
V _{GS}	Gate-Source Voltage	-1V
I _{DS}	Drain-Source Current	0.5 x I _{DSS}
I _G	Gate Current	15 mA
P _{IN}	RF Input Power	250 mW
T _{CH}	Channel Temperature	150°C
T _{STG}	Storage Temperature	-20/50°C
P _T	Power Dissipation	1.4 W ^{3,4}
G _{XdB}	Gain Compression	8 dB

NOTES:

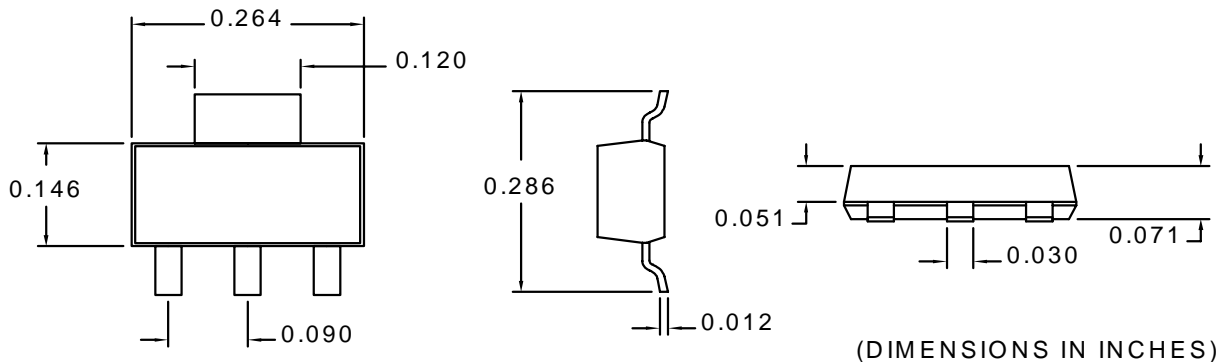
- Operating conditions that exceed the Absolute Maximum Ratings could result in permanent damage to the device.
- Recommended Continuous Operating Limits should be observed for reliable device operation.
- Power Dissipation defined as: $P_T \equiv (P_{DC} + P_{IN}) - P_{OUT}$, where: P_{DC} = DC bias power, P_{OUT} = RF output power, and P_{IN} = RF input power. **Provide for adequate heatsinking at the large source lead.**
- Power Dissipation to be de-rated as follows above 25°C:
 Absolute Maximum: $P_T = 1.7W - (10mW/^\circ C) \times T_{HS}$
 Recommended Continuous Operating: $P_T = 1.4W - (10mW/^\circ C) \times T_{HS}$
 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:

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