HIGH TEMPERATURE N-CHANNEL POWER FET HTNFET

FEATURES

- Specified Over -55 to +225°C
- Output Current up to 1 Amp Continuous
- Typical Input Voltage up to 60V
- Silicon-On-Insulator (SOI)
- 4-Pin Power-Tab Package,
  8-Pin Ceramic Dip with Integral Heat Sink or
  Die Dimensions 4.699 x 2.286 mm

APPLICATIONS

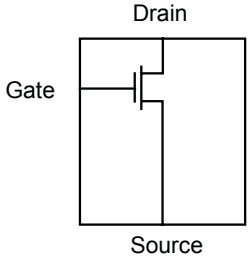
- Down-Hole Oil, Gas and Geothermal Well
- Aerospace and Avionics
- Turbine Engine Control
- Industrial Process Control
- Nuclear Reactor
- Electric Power Conversion
- Heavy Duty Internal Combustion Engines

GENERAL DESCRIPTION

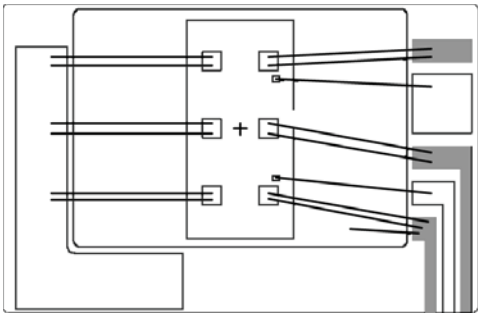
The HTNFET is a high reliability N-Channel Power FET designed specifically for extremely wide temperature range applications such as down-hole instrumentation, aerospace, turbine engine and industrial process control. This power FET is fabricated using a Silicon-On-Insulator (SOI) process that dramatically reduces leakage currents at high temperatures.

High DC current capability combined with low Rds-ON make this component suitable both for DC and switching applications. Typically, parts will operate at +300°C up to a year, with derated performance. All parts are burned in to eliminate infant mortality. Additionally, each part is tested over -55 to +225°C to provide guaranteed performance over the entire temperature band.

FUNCTIONAL DIAGRAM

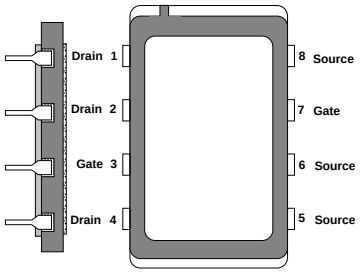


DIE DIAGRAM

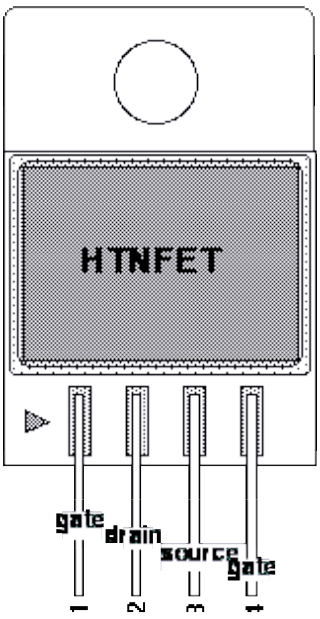


PACKAGE DIAGRAMS

8-Pin Ceramic DIP With Heat Sink



4-Pin Power-Tab Package



HTNFET

ELECTRICAL CHARACTERISTICS

-55 to +225°C, unless otherwise specified

Symbol	Parameters	Test Conditions	Typ (1)	Worst Case (2)		Units
				Min	Max	
V(BR)DSS	Drain-source breakdown voltage	VGS = 0, ID = 100 µADC		55		V
RDS (on)	Static drain-to-source on-state resistance @ Ta=25° C	VGS = +5VDC, ID = 0.1A	0.4			Ω
VGS (th)	Gate threshold voltage @ Ta=25° C	VGS = VDS, ID = 100 µA	1.6		2.4	V
IGSS	Gate-to-source forward leakage	VGS = +5 VDC			100	nA
	Gate-to-source reverse leakage	VGS = -5 VDC			-100	nA
Guaranteed by design						
Qg	Total gate charge (CGS + CGD)	VDD = +50 V; VGS = +5 V (VGS, sweep = 0 to +10 V); d = 10%; τ = 1 ms	4.3			nC
td (on)	Turn-on delay time	VDD=+50 V; VGS, sweep = 0 to +10 V; d= 0.1%; τ= 1 ms; RD= 15 Ω, RG= 30 Ω	10			ns
t r	Rise time		20			ns
td (off)	Turn-off delay time		64			ns
t f	Fall time		20			ns
Ciss	Input capacitance	VGS=0, VDS = +28 V f = 1.0 MHz (0.1 V oscillation)	290			pF
Coss	Output capacitance		87			pF
Crss	Reverse transfer capacitance		14			pF

(1) Typical operating conditions: VDS = 10 V, TA=25°C.
(2) Worst case operating conditions: VDS = 50 V, TA = -55 to 225°C.

ABSOLUTE MAXIMUM RATINGS (1, 2)

Symbol	Parameters	Conditions	Value	Units
ID	Continuous Drain Current	@Tj = 25° C	TBD	A
ID	Continuous Drain Current	@Tj = 200° C	TBD	A
VGS	Gate-To-Source Voltage		10	V
dv/dt	Peak Diode Recovery		TBD	V/ns
TJ	Operating Junction		-55 to +300	° C
Tstg	Storage Temperature Range		-55 to +300	° C
Pd	Operating Power	@Tj = 250° C	50	W (3)

(1) Stresses in excess of those listed above may result in permanent damage. These are stress ratings only, and operation at these levels is not implied. Frequent or extended exposure to absolute maximum conditions may affect device reliability.
(2) ESD sensitivity is determined by the gate capacitance; additional ESD protection would decrease performance.
(3) Derate power at 1W/C to Tj = 300°C.

IDSS vs TEMPERATURE