

SENSITRON

SEMICONDUCTOR

TECHNICAL DATA
DATA SHEET 4998, REV. -

RAD TOLERANT LOW R_{DS} HERMETIC POWER MOSFET - P-CHANNEL

FEATURES:

- 100 Volt, 0.023 Ohm, 90A MOSFET (current limited to 50A by package)
- Characterized for V_{GS} of 4.5V for Logic Level Drive
- Total Dose Characterized to 300 Krad
- Single Event Effect Capability Characterized to 60 MeVcm²/mg LET
- Isolated Hermetic Metal Package; Ultra Low $R_{DS(on)}$
- Ceramic Seals with Glidcop leads
- Also available with glass seals and copper core alloy 52 leads

MAXIMUM RATINGS

ALL RATINGS ARE AT $T_C = 25^\circ\text{C}$ UNLESS OTHERWISE SPECIFIED.

RATING	SYMBOL	MIN.	TYP.	MAX.	UNITS
GATE TO SOURCE VOLTAGE	V_{GS}	-	-	± 20	Volts
ON-STATE DRAIN CURRENT	I_{D25}	-	-	- 50	Amps
PULSED DRAIN CURRENT	I_{DM}	-	-	- 90	Amps
OPERATING AND STORAGE TEMPERATURE	T_J/T_{STG}	-55	-	+150	$^\circ\text{C}$
TOTAL DEVICE DISSIPATION	P_D	-	-	225	Watts
THERMAL RESISTANCE, JUNCTION TO CASE	$R_{\theta JC}$	-	-	0.55	$^\circ\text{C/W}$

ELECTRICAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNITS
DRAIN TO SOURCE BREAKDOWN VOLTAGE $V_{GS} = 0\text{V}, I_D = -250\mu\text{A}$	BV_{DSS}	-100	-	-	Volts
STATIC DRAIN TO SOURCE ON STATE RESISTANCE $V_{GS} = -10\text{V}, I_D = -20\text{A}$ $V_{GS} = -4.5\text{V}, I_D = -15\text{A}$	$R_{DS(ON)}$	-	0.019 0.021	0.023 0.025	Ω
GATE THRESHOLD VOLTAGE $V_{DS} = V_{GS}, I_D = -250\mu\text{A}$	$V_{GS(th)}$	- 1	-	- 3	Volts
FORWARD TRANSCONDUCTANCE $V_{DS} = -15\text{V}, I_D = -20\text{A}$	g_{fs}	-	80	-	S(1/ Ω)
ZERO GATE VOLTAGE DRAIN CURRENT $V_{DS} = 0.8 \times \text{Max. rating}, V_{GS} = 0\text{V}, T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$	I_{DSS}	-	-	- 1 - 500	μA
GATE TO SOURCE LEAKAGE FORWARD $V_{GS} = 20\text{V}$ GATE TO SOURCE LEAKAGE REVERSE $V_{GS} = -20\text{V}$	I_{GSS}	-	-	100 -100	nA
TURN ON DELAY TIME RISE TIME $V_{DD} = -50\text{V}$ $I_D = -50\text{A}$	$t_{d(ON)}$ t_r	-	20 510	30 855	nsec
TURN OFF DELAY TIME FALL TIME $V_{GS} = -10\text{V}$ $R_G = 1\Omega$	$t_{d(OFF)}$ t_f	-	145 870	220 1300	nsec
DIODE FORWARD VOLTAGE $I_F = -20\text{A}, V_{GS} = 0\text{V}$ Pulse test, $t \leq 300\mu\text{s}$, duty cycle $d \leq 2\%$	V_{SD}	-	- 1.0	- 1.5	Volts
REVERSE RECOVERY TIME $T_J = 25^\circ\text{C}$, $I_F = -20\text{A}, V_R = -50\text{V}$ $di/dt = -100\text{A}/\mu\text{sec}$	t_{rr}	-	80	120	nsec
INPUT CAPACITANCE $V_{GS} = 0\text{V}$, OUTPUT CAPACITANCE $V_{DS} = -50\text{V}$, REVERSE TRANSFER CAPACITANCE $f = 1.0\text{MHz}$	C_{iss} C_{oss} C_{rss}	-	11100 700 1700	-	pF

SENSITRON

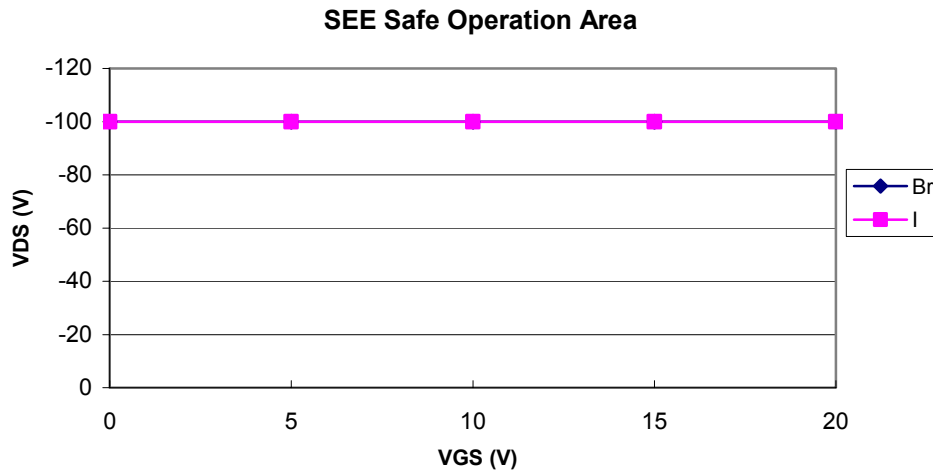
**TECHNICAL DATA
DATA SHEET 4998, REV. -**

Post-Total Dose (up to TID ratings) Irradiation Data

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNITS
DRAIN TO SOURCE BREAKDOWN VOLTAGE $V_{GS} = 0V, I_D = -250\mu A$	BV_{DSS}	-100	-	-	Volts
STATIC DRAIN TO SOURCE ON STATE RESISTANCE $V_{GS} = -10V, I_D = -20A$ $V_{GS} = -4.5V, I_D = -15A$	$R_{DS(ON)}$	-	0.019 0.021	0.023 0.025	Ω
GATE THRESHOLD VOLTAGE $V_{DS} = V_{GS}, I_D = -250\mu A$	$V_{GS(th)}$	-1	-	-3	Volts
ZERO GATE VOLTAGE DRAIN CURRENT $V_{DS} = 0.8 \times \text{Max. rating}, V_{GS} = 0V, T_J = 25^\circ C$	I_{DSS}	-	-	-1	μA
GATE TO SOURCE LEAKAGE FORWARD $V_{GS} = 20V$	I_{GSS}	-	-	100	nA
GATE TO SOURCE LEAKAGE REVERSE $V_{GS} = -20V$				-100	
DIODE FORWARD VOLTAGE $I_F = -20A, V_{GS} = 0V$ Pulse test, $t \leq 300 \mu s$, duty cycle $d \leq 2\%$	V_{SD}	-	-1.0	-1.5	Volts

Single Event Effect Safe Operating Area

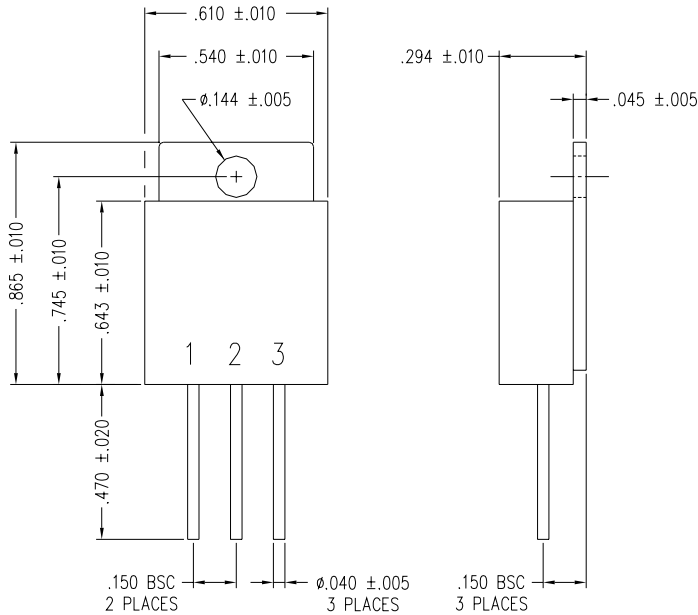
Ion	LET (MeVcm ² /mg)	Energy (MeV)	Range (μm)	V_{DS} (V)				
				$V_{GS}=0V$	$V_{GS}=5V$	$V_{GS}=10V$	$V_{GS}=15V$	$V_{GS}=20V$
Br	37.47	278	36.1	-100	-100	-100	-100	-100
I	59.72	320	31.1	-100	-100	-100	-100	-100



SENSITRON

**TECHNICAL DATA
DATA SHEET 4998, REV. -**

MECHANICAL DIMENSIONS: in Inches / mm



TO-254CG
(Modified)

PINOUT TABLE

DEVICE TYPE	PIN-1	PIN-2	PIN-3
P-CHANNEL MOSFET MODIFIED TO-254 PACKAGE	DRAIN	SOURCE	GATE

DISCLAIMER:

1- The information given herein, including the specifications and dimensions, is subject to change without prior notice to improve product characteristics. Before ordering, purchasers are advised to contact the Sensitron Semiconductor sales department for the latest version of the datasheet(s).

2- In cases where extremely high reliability is required (such as use in nuclear power control, aerospace and aviation, traffic equipment, medical equipment, and safety equipment), safety should be ensured by using semiconductor devices that feature assured safety or by means of users' fail-safe precautions or other arrangement.

3- In no event shall Sensitron Semiconductor be liable for any damages that may result from an accident or any other cause during operation of the user's units according to the datasheet(s). Sensitron Semiconductor assumes no responsibility for any intellectual property claims or any other problems that may result from applications of information, products or circuits described in the datasheets.

4- In no event shall Sensitron Semiconductor be liable for any failure in a semiconductor device or any secondary damage resulting from use at a value exceeding the absolute maximum rating.

5- No license is granted by the datasheet(s) under any patents or other rights of any third party or Sensitron Semiconductor.

6- The datasheet(s) may not be reproduced or duplicated, in any form, in whole or part, without the expressed written permission of Sensitron Semiconductor.

7- The products (technologies) described in the datasheet(s) are not to be provided to any party whose purpose in their application will hinder maintenance of international peace and safety nor are they to be applied to that purpose by their direct purchasers or any third party. When exporting these products (technologies), the necessary procedures are to be taken in accordance with related laws and regulations.