

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°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 | °C |
| TOTAL DEVICE DISSIPATION | P _D | - | - | 225 | Watts |
| THERMAL RESISTANCE, JUNCTION TO CASE | R _{θJC} | - | - | 0.55 | °C/W |

ELECTRICAL CHARACTERISTICS

| CHARACTERISTIC | SYMBOL | MIN. | TYP. | MAX. | UNITS |
|---|--|------|----------------------|----------------|--------|
| DRAIN TO SOURCE BREAKDOWN VOLTAGE V _{GS} = 0V, I _D = - 250μA | 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 = - 250μA | V _{GS(th)} | - 1 | - | - 3 | Volts |
| FORWARD TRANSCONDUCTANCE V _{DS} = - 15V, I _D = - 20A | g _{fs} | - | 80 | - | S(1/Ω) |
| ZERO GATE VOLTAGE DRAIN CURRENT V _{DS} = 0.8 x Max. rating, V _{GS} = 0V, T _J = 25°C T _J = 125°C | I _{DSS} | - | - | - 1 - 500 | μA |
| GATE TO SOURCE LEAKAGE FORWARD GATE TO SOURCE LEAKAGE REVERSE V _{GS} = 20V V _{GS} = -20V | I _{GSS} | - | - | 100 -100 | nA |
| TURN ON DELAY TIME RISE TIME V _{DD} = - 50V I _D = - 50A | t _{d(ON)} t _r | - | 20 510 | 30 855 | nsec |
| TURN OFF DELAY TIME FALL TIME V _{GS} = - 10V R _G = 1Ω | t _{d(OFF)} t _f | - | 145 870 | 220 1300 | nsec |
| DIODE FORWARD VOLTAGE I _F = - 20A, V _{GS} = 0V Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 % | V _{SD} | - | - 1.0 | - 1.5 | Volts |
| REVERSE RECOVERY TIME T _J = 25°C, I _F = - 20A, V _R = - 50V di/dt = - 100A/μsec | t _{rr} | - | 80 | 120 | nsec |
| INPUT CAPACITANCE OUTPUT CAPACITANCE REVERSE TRANSFER CAPACITANCE V _{GS} = 0 V, V _{DS} = - 50 V, f = 1.0MHz | C _{iss} C _{oss} C _{rss} | - | 11100 700 1700 | - | pF |

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TECHNICAL DATA

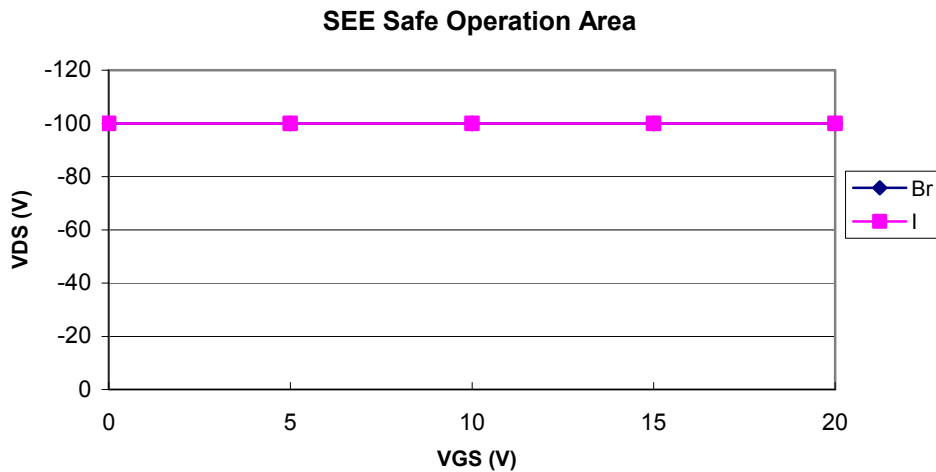
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Post-Total Dose (up to TID ratings) Irradiation Data

| 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 |

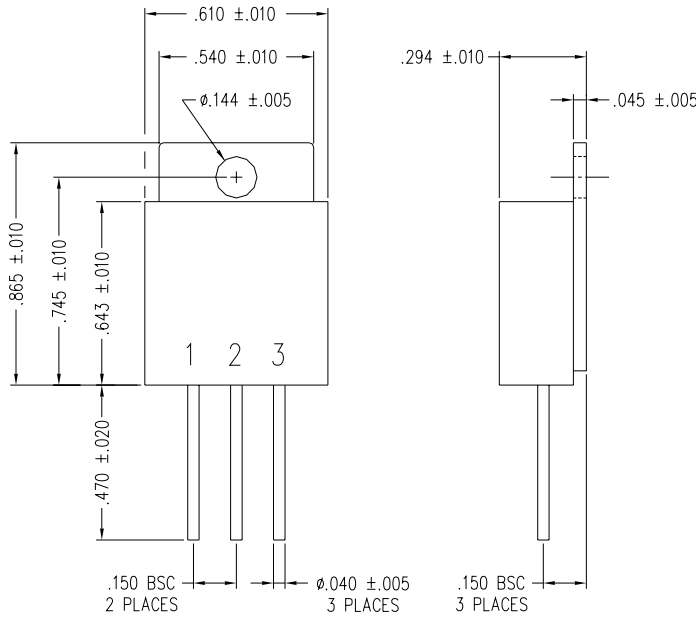


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MECHANICAL DIMENSIONS: in Inches / mm



**TO-254CG
(Modified)**

PINOUT TABLE

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

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