

**SOLID STATE DEVICES, INC**

**14849 Firestone Boulevard · La Mirada, CA 90638**  
**Phone: (714) 670-SSDI (7734) · Fax: (714) 522-7424**

**SFFR150M**  
**SFFD150M**

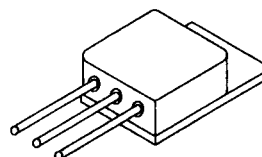
## Designer's Data Sheet

## FEATURES:

- Hermetically Sealed, Isolated Package
  - Ceramic Seals
  - Available with formed leads
  - TX, TXV and S Level
  - Replaces: IRH7150/8150, FRF150 R/H, 2N7268, Mil-S-19500/603
  - Also available in TO-254Z, TO-258, TO-259, TO-61 and MILPACK
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- Second Generation Radiation Hardened Mosfet results from new design concepts.
  - Gamma:
    - A) Meets pre-rad specifications to 100 KRad(Si)
    - B) Defined end-point specs at 300 and 1000 KRad(Si)
    - C) Performance permits limited use to 3000 KRad(Si)
  - Gamma Dot survives  $3E9$  Rad(Si)/sec at 80% BVDSS typically and survives  $2E12$  typically if current limited to IDM.
  - Photo Current is typically 7.0nA per Rad(Si)/sec.
  - Neutron:
    - A) Pre-rad specifications for  $3E13$  neutrons/cm<sup>2</sup>
    - B) Usable to  $3E14$  neutrons/cm<sup>2</sup>
  - Single Event: typically survives  $1E5$  ions/cm<sup>2</sup> having an LET < 35 MeV/mg/cm<sup>2</sup> and a range  $\geq 30\mu\text{m}$  at 80% BVDSS

**34 AMP**  
**100 VOLTS**  
**0.07  $\Omega$**   
**RADIATION HARDENED**  
**N-CHANNEL MOSFET**  
**SFFR150M: 100KRad(Si) Gamma**  
**SFFD150M: 10KRad (Si) Gamma**

TO-254



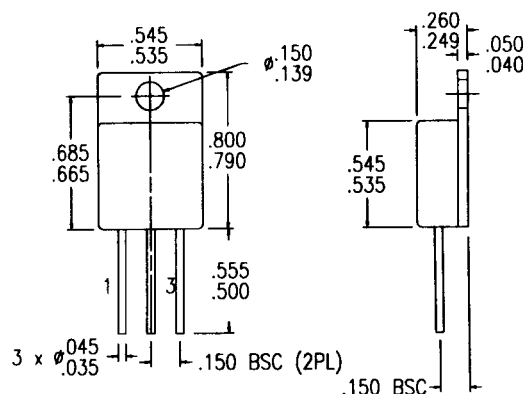
## MAXIMUM RATINGS

| CHARACTERISTIC                                                     | SYMBOL                             | VALUE       | UNIT  |
|--------------------------------------------------------------------|------------------------------------|-------------|-------|
| Drain to Source Voltage                                            | V <sub>DS</sub>                    | 100         | Volts |
| Gate to Source Voltage                                             | V <sub>GS</sub>                    | ± 20        | Volts |
| Continuous Drain Current                                           | I <sub>D</sub>                     | 34          | Amps  |
| Operating and Storage Temperature                                  | T <sub>OP</sub> & T <sub>STG</sub> | -55 to +150 | °C    |
| Thermal Resistance, Junction to Case                               | R <sub>θJC</sub>                   | 0.83        | °C/W  |
| Total Device Dissipation @ TA=25°C<br>Derate above 25°C @ 1.2 W/°C | P <sub>D</sub>                     | 150         | Watts |

## PACKAGE OUTLINE: TO-254

**PIN OUT:**

**PIN 1: DRAIN**  
**PIN 2: SOURCE**  
**PIN 3: GATE**



**NOTE: All specifications are subject to change without notification. SCD's for these devices should be reviewed by SSDI prior to release.**

**DATA SHEET #: FR0015B**

**MED**

# SFFR150M SFFD150M

PRELIMINARY



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## ELECTRICAL CHARACTERISTICS @ T<sub>J</sub>=25 °C (Unless Otherwise Specified)

| RATING                                                                                                                                                                                             |                                                                                               | SYMBOL                                                                                                | MIN | TYP | MAX                     | UNIT                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|-----|-----|-------------------------|--------------------------|
| <b>Drain to Source Breakdown Voltage</b><br>(V <sub>GS</sub> =0 V, I <sub>D</sub> =1mA)                                                                                                            |                                                                                               | <b>BV<sub>DSS</sub></b>                                                                               | 100 |     | ---                     | <b>V</b>                 |
| <b>Drain to Source on State Resistance</b><br>(V <sub>GS</sub> =10 V, I <sub>D</sub> =21 A)                                                                                                        |                                                                                               | <b>R<sub>DS(on)</sub></b>                                                                             | --- | --- | 0.07                    | <b>Ω</b>                 |
| <b>On State Drain Current</b><br>(V <sub>DS</sub> >I <sub>D(on)</sub> X R <sub>DS(on)</sub> Max., V <sub>GS</sub> =10V)                                                                            |                                                                                               | <b>I<sub>D(on)</sub></b>                                                                              | 34  |     | ---                     | <b>A</b>                 |
| <b>Gate Threshold Voltage</b><br>(V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =1mA)                                                                                                          |                                                                                               | <b>V<sub>GS(th)</sub></b>                                                                             | 2.0 |     | 4.0                     | <b>V</b>                 |
| <b>Forward Transconductance</b><br>(V <sub>DS</sub> >I <sub>D(on)</sub> X R <sub>DS(on)</sub> Max,<br>I <sub>DS</sub> =21 A)                                                                       |                                                                                               | <b>g<sub>fs</sub></b>                                                                                 | 8   |     | ---                     | <b>S(Ω)</b>              |
| <b>Zero Gate Voltage Drain Current</b><br>(V <sub>DS</sub> =80% rated voltage, V <sub>GS</sub> =0 V)<br>(V <sub>DS</sub> =80% rated V <sub>DS</sub> , V <sub>GS</sub> =0 V, T <sub>A</sub> =125°C) |                                                                                               | <b>I<sub>DSS</sub></b>                                                                                | --- |     | 50<br>250               | <b>μA</b>                |
| <b>Gate to Source Leakage Forward</b><br><b>Gate to Source Leakage Reverse</b>                                                                                                                     | At rated V <sub>GS</sub>                                                                      | <b>I<sub>GSSF</sub></b><br><b>I<sub>GSSR</sub></b>                                                    | --- |     | 100<br>100              | <b>nA</b>                |
| <b>Total Gate Charge</b><br><b>Gate to Source Charge</b><br><b>Gate to Drain Charge</b>                                                                                                            | 0≤V <sub>GS</sub> ≤20 Volts<br>50% rated V <sub>DS</sub><br>Rated I <sub>D</sub>              | <b>Q<sub>g</sub></b><br><b>Q<sub>gs</sub></b><br><b>Q<sub>gd</sub></b>                                | --- |     | 160<br>35<br>65         | <b>nC</b>                |
| <b>Turn on Delay Time</b><br><b>Rise Time</b><br><b>Turn Off Delay Time</b><br><b>Fall Time</b>                                                                                                    | V <sub>DD</sub> =50%<br>rated V <sub>DS</sub><br>I <sub>D</sub> =21 A<br>R <sub>G</sub> =2.5Ω | <b>t<sub>d(on)</sub></b><br><b>t<sub>r</sub></b><br><b>t<sub>d(off)</sub></b><br><b>t<sub>f</sub></b> | --- |     | 45<br>190<br>170<br>130 | <b>nsec</b>              |
| <b>Diode Forward Voltage</b><br>(I <sub>S</sub> =rated I <sub>D</sub> , V <sub>GS</sub> =0 V, T <sub>J</sub> =25°C)                                                                                |                                                                                               | <b>V<sub>SD</sub></b>                                                                                 | --- |     | 1.9                     | <b>V</b>                 |
| <b>Diode Reverse Recovery Time</b><br><b>Reverse Recovery Charge</b>                                                                                                                               | T <sub>J</sub> =25°C<br>I <sub>F</sub> =rated I <sub>D</sub><br>di/dt=100 A/μsec              | <b>t<sub>rr</sub></b><br><b>Q<sub>RR</sub></b>                                                        | --- |     | 570<br>---              | <b>nsec</b><br><b>μC</b> |

For thermal derating curves and other characteristic curves please contact SSDI Marketing Department.