

SOLID STATE DEVICES, INC

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

SFFR250M
SFFD250M

27 AMP
200 VOLTS
0.100 Ω

RADIATION HARDENED N-CHANNEL MOSFET

SFFR250M: 100KRad(Si) Gamma

SFFD250M: 10KRad (Si) Gamma

Designer's Data Sheet

FEATURES:

- Hermetically Sealed, Isolated Package
 - Ceramic Seals
 - Available with formed leads
 - TX, TXV and S Level
 - Replaces: IRFM7250/8450, FRF250 R/H
 - 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 500 BVDSS typically and survives 2E12 typically if current limited to IDM.
 - Photo Current is typically 30nA per Rad(Si)/sec.
 - Neutron:
 - A) Pre-rad specifications for 3E12 neutrons/cm²
 - B) Usable to 3E13 neutrons
 - Single Event: typically survives 1E3 ions/cm² having an LET < 35 MeV/mg/cm² and a range > 30μm at 200 BVDSS

This MOSFET is well suited for applications exposed to radiation environments such as switching regulation, switching converters, synchronous rectification, motor drives, relay drivers and drivers for high-power bipolar switching transistors requiring high speed and low gate drive power. This type can be operated directly from integrated circuits.

This part may be supplied as a die or in other packages. Reliability screening is performed in SSDI's JANS and Space Station Freedom approved facility.

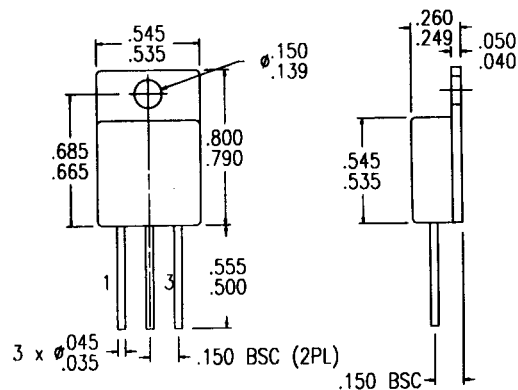
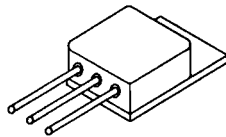
MAXIMUM RATINGS

CHARACTERISTIC	SYMBOL	VALUE	UNIT
Drain to Source Voltage	V _{DS}	200	Volts
Gate to Source Voltage	V _{GS}	± 20	Volts
Continuous Drain Current	I _D	27	Amps
Operating and Storage Temperature	T _{OP} & T _{STG}	-55 to +150	°C
Thermal Resistance, Junction to Case	R _{θJC}	1.0	°C/W
Total Device Dissipation @ T _A =25°C Derate above 25°C @ 1 W/°C	P _D	125	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 #: FR0001 B**MED**

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PRELIMINARY



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ELECTRICAL CHARACTERISTICS @ T _J =25 °C (Unless Otherwise Specified)						
RATING		SYMBOL	MIN	TYP	MAX	UNIT
Drain to Source Breakdown Voltage (V _{GS} =0 V, I _D =1mA)		BV _{DSS}	200		---	V
Drain to Source on State Resistance (V _{GS} =10 V, I _D =17A)		R _{DS(on)}	---		0.100	Ω
On State Drain Current (V _{DS} >I _{D(on)} X R _{DS(on)} Max., V _{GS} =10V)		I _{D(on)}	27		---	A
Gate Threshold Voltage (V _{DS} =V _{GS} , I _D =1mA)		V _{GS(th)}	2.0		4.0	V
Forward Transconductance (V _{DS} > I _{D(on)} X R _{DS(on)} Max, I _{DS} =60% rated ID)		g _{fs}	13		---	S(Ω)
Zero Gate Voltage Drain Current (V _{DS} =max rated voltage, V _{GS} =0 V) (V _{DS} =80% rated V _{DS} , V _{GS} =0 V, T _A =125°C)		I _{DSS}	---		500 250	μA
Gate to Source Leakage Forward Gate to Source Leakage Reverse	At rated V _{GS}	I _{GSS}	---		100 100	nA
Total Gate Charge Gate to Source Charge Gate to Drain Charge	V _{GS} =10 Volts 50% rated V _{DS} Rated I _D	Q _g Q _{gs} Q _{gd}	60 10 30		250 50 100	nC
Turn on Delay Time Rise Time Turn Off Delay Time Fall Time	V _{DD} =50% rated V _{DS} rated I _D R _G =25Ω 0 ≤ V _{GS} ≤ 10	t _{d(on)} t _r t _{d(off)} t _f	---		170 600 580 500	nsec
Diode Forward Voltage (I _S =rated I _D , V _{GS} =0 V, T _J =25°C)		V _{SD}	---		2.0	V
Diode Reverse Recovery Time Reverse Recovery Charge	T _J =25°C I _F =rated I _D di/dt=100 A/μsec	t _{rr} Q _{RR}	---		1700 ---	nsec μC

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