



PRELIMINARY

**SOLID STATE DEVICES, INC**

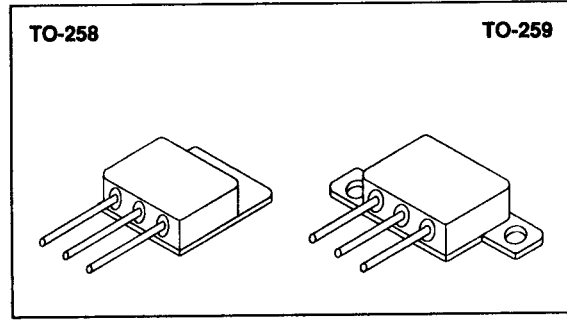
14849 Firestone Boulevard · La Mirada, CA 90638  
 Phone: (714) 670-SSDI (7734) · Fax: (714) 522-7424

**SFFR160N  
SFFD160P**

**50 AMP  
100 VOLTS  
0.04 Ω  
RADIATION HARDENED  
N-CHANNEL MOSFET**  
 SFFR9160N: 100KRad(Si) Gamma  
 SFFD9160N: 10KRad (Si) Gamma

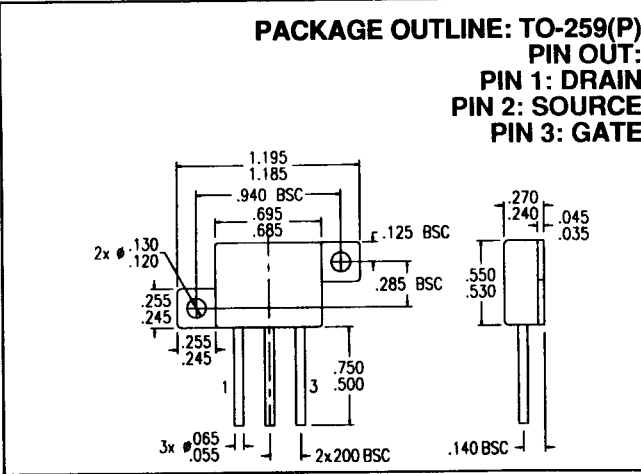
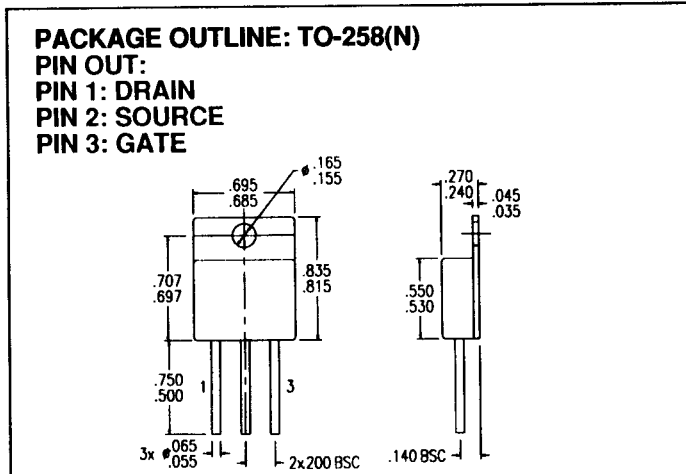
**Designer's Data Sheet**

- FEATURES:**
- Hermetically Sealed, Isolated Package
  - Ceramic Seals
  - Available with formed leads
  - TX, TXV and S Level
  - Replaces: FRK160, 2N7299
  - 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/cm<sup>2</sup>
    - B) Usable to 3E13 neutrons
  - Single Event: typically survives 1E3 ions/cm<sup>2</sup> having an LET < 35 MeV/mg/cm<sup>2</sup> and a range ≥ 30μm at 200 BVDSS



**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 @ TC=25°C	I <sub>D</sub>	50	Amps
Operating and Storage Temperature	Top & T <sub>stg</sub>	-55 to +150	°C
Thermal Resistance, Junction to Case	R <sub>θJC</sub>	0.4	°C/W
Total Device Dissipation @ TA=25°C Derate above 25°C @ 2.5 W/°C	P <sub>D</sub>	300	Watts



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

**DATA SHEET #: FR0011 A**

**MED**

**SFFR160N  
SFFD160P**

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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> (VGS=0 V, ID=250μA)		<b>BVDSS</b>	100	---	---	<b>V</b>
<b>Drain to Source on State Resistance</b> (VGS=10 V, ID=42 A)		<b>RDS(on)</b>	---	---	0.040	<b>Ω</b>
<b>On State Drain Current</b> (VDS > ID(on) X RDS(on) Max, VGS=10 V)		<b>ID(on)</b>	50	---	---	<b>A</b>
<b>Gate Threshold Voltage</b> (VDS=VGS, ID=250μA)		<b>VGS(th)</b>	2.0	---	4.0	<b>V</b>
<b>Forward Transconductance</b> (VDS > ID(on) X RDS(on) Max, IDS=60% rated ID)		<b>gfs</b>	---	---	---	<b>S(τ)</b>
<b>Zero Gate Voltage Drain Current</b> (VDS=80% rated voltage, VGS=0 V) (VDS=80% rated VDS, VGS=0 V, TA=125°C)		<b>IDSS</b>	---	---	25 250	<b>μA</b>
<b>Gate to Source Leakage Forward</b> <b>Gate to Source Leakage Reverse</b>	At rated VGS	<b>IGSS</b>	---	---	+100 -100	<b>nA</b>
<b>Total Gate Charge</b> <b>Gate to Source Charge</b> <b>Gate to Drain Charge</b>	VGS=10 Volts 80% rated VDS Rated ID	<b>Qg</b> <b>Qgs</b> <b>Qgd</b>	82 20 24	240 30 130	330 108 176	<b>nC</b>
<b>Turn on Delay Time</b> <b>Rise Time</b> <b>Turn Off Delay Time</b> <b>Fall Time</b>	VDD=50% rated VDS ID=50A RG=10Ω 0 ≤ VGS < 10	<b>td(on)</b> <b>tr</b> <b>td(off)</b> <b>tf</b>	---	40 50 125 65	150 900 700 500	<b>nsec</b>
<b>Diode Forward Voltage</b> (IS=rated ID, VGS=0 V, T <sub>J</sub> =25°C)		<b>VSD</b>	0.6	---	1.8	<b>V</b>
<b>Diode Reverse Recovery Time</b> <b>Reverse Recovery Charge</b>	T <sub>J</sub> =25°C IF=10 A di/dt=100 A/μsec	<b>trr</b> <b>QRR</b>	---	300 ---	600 ---	<b>nsec</b> <b>μC</b>
<b>Input Capacitance</b> <b>Output Capacitance</b> <b>Reverse Transfer Capacitance</b>	VGS=0 Volts VDS=25 Volts f=1 MHz	<b>Ciss</b> <b>Coss</b> <b>Crss</b>	---	---	---	<b>pF</b>

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