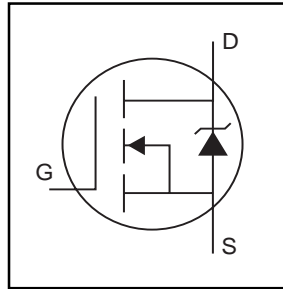


# FB180SA10

HEXFET® Power MOSFET

- Fully Isolated Package
- Easy to Use and Parallel
- Very Low On-Resistance
- Dynamic dv/dt Rating
- Fully Avalanche Rated
- Simple Drive Requirements
- Low Drain to Case Capacitance
- Low Internal Inductance

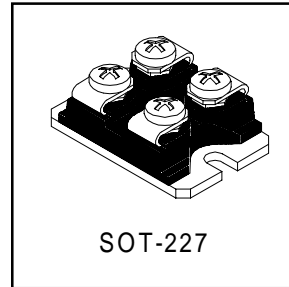


$V_{DSS} = 100V$
$R_{DS(on)} = 0.0065\Omega$
$I_D = 180A$

## Description

Fifth Generation, high current density HEXFETS are paralleled into a compact, high power module providing the best combination of switching, ruggedized design, very low ON resistance and cost effectiveness.

The isolated SOT-227 package is preferred for all commercial - industrial applications at power dissipation levels to approximately 500 watts. The low thermal resistance and easy connection to the SOT-227 package contribute to its universal acceptance throughout the industry.



## Absolute Maximum Ratings

	Parameter	Max.	Units
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	180	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	120	
$I_{DM}$	Pulsed Drain Current ①	720	
$P_D @ T_C = 25^\circ C$	Power Dissipation	480	W
	Linear Derating Factor	2.7	W/°C
$V_{GS}$	Gate-to-Source Voltage	$\pm 20$	V
$E_{AS}$	Single Pulse Avalanche Energy②	700	mJ
$I_{AR}$	Avalanche Current③	180	A
$E_{AR}$	Repetitive Avalanche Energy④	48	mJ
dv/dt	Peak Diode Recovery dv/dt ⑤	5.7	V/ns
$T_J$	Operating Junction and	-55 to + 150	°C
$T_{STG}$	Storage Temperature Range		
$V_{ISO}$	Insulation Withstand Voltage (AC-RMS)	2.5	kV
	Mounting torque, M4 screw	1.3	N•m

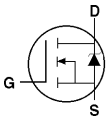
## Thermal Resistance

	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	—	0.26	°C/W
$R_{\theta CS}$	Case-to-Sink, Flat, Greased Surface	0.05	—	

## Electrical Characteristics @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	100	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
$dV_{(BR)DSS}/dT_J$	Breakdown Voltage Temp. Coefficient	—	0.093	—	V/°C	Reference to $25^\circ\text{C}$ , $I_D = 1\text{mA}$
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	—	0.0065	$\Omega$	$V_{GS} = 10V, I_D = 108A$ ④
$V_{GS(th)}$	Gate Threshold Voltage	2.0	—	4.0	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
$g_{fs}$	Forward Transconductance	93	—	—	S	$V_{DS} = 25V, I_D = 108A$
$I_{DSS}$	Drain-to-Source Leakage Current	—	—	50	$\mu A$	$V_{DS} = 100V, V_{GS} = 0V$
		—	—	500		$V_{DS} = 80V, V_{GS} = 0V, T_J = 125^\circ\text{C}$
$I_{GSS}$	Gate-to-Source Forward Leakage	—	—	200	nA	$V_{GS} = 20V$
	Gate-to-Source Reverse Leakage	—	—	-200		$V_{GS} = -20V$
$Q_g$	Total Gate Charge	—	250	380	nC	$I_D = 180A$
$Q_{gs}$	Gate-to-Source Charge	—	40	60		$V_{DS} = 80V$
$Q_{gd}$	Gate-to-Drain ("Miller") Charge	—	110	165		$V_{GS} = 10.0V$ , See Fig. 6 and 13 ④
$t_{d(on)}$	Turn-On Delay Time	—	45	—	ns	$V_{DD} = 50V$
$t_r$	Rise Time	—	351	—		$I_D = 180A$
$t_{d(off)}$	Turn-Off Delay Time	—	181	—		$R_G = 2.0\Omega$ (Internal)
$t_f$	Fall Time	—	335	—		$R_D = 0.27\Omega$ , See Fig. 10 ④
$L_s$	Internal Source Inductance	—	5.0	—	nH	Between lead, and center of die contact
$C_{iss}$	Input Capacitance	—	10700	—	pF	$V_{GS} = 0V$
$C_{oss}$	Output Capacitance	—	2800	—		$V_{DS} = 25V$
$C_{rss}$	Reverse Transfer Capacitance	—	1300	—		$f = 1.0\text{MHz}$ , See Fig. 5

## Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
$I_S$	Continuous Source Current (Body Diode)	—	—	180	A	MOSFET symbol showing the integral reverse p-n junction diode. 
$I_{SM}$	Pulsed Source Current (Body Diode) ①	—	—	720		
$V_{SD}$	Diode Forward Voltage	—	—	1.3	V	$T_J = 25^\circ\text{C}, I_S = 180A, V_{GS} = 0V$ ④
$t_{rr}$	Reverse Recovery Time	—	300	450	ns	$T_J = 25^\circ\text{C}, I_F = 180A$
$Q_{rr}$	Reverse Recovery Charge	—	2.6	3.9	$\mu C$	$di/dt = 100A/\mu s$ ④
$t_{on}$	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by $L_S+L_D$ )				

### Notes:

① Repetitive rating; pulse width limited by max. junction temperature. ( See fig. 11 )

② Starting  $T_J = 25^\circ\text{C}$ ,  $L = 43\mu H$   
 $R_G = 25\Omega$ ,  $I_{AS} = 180A$ . (See Figure 12)

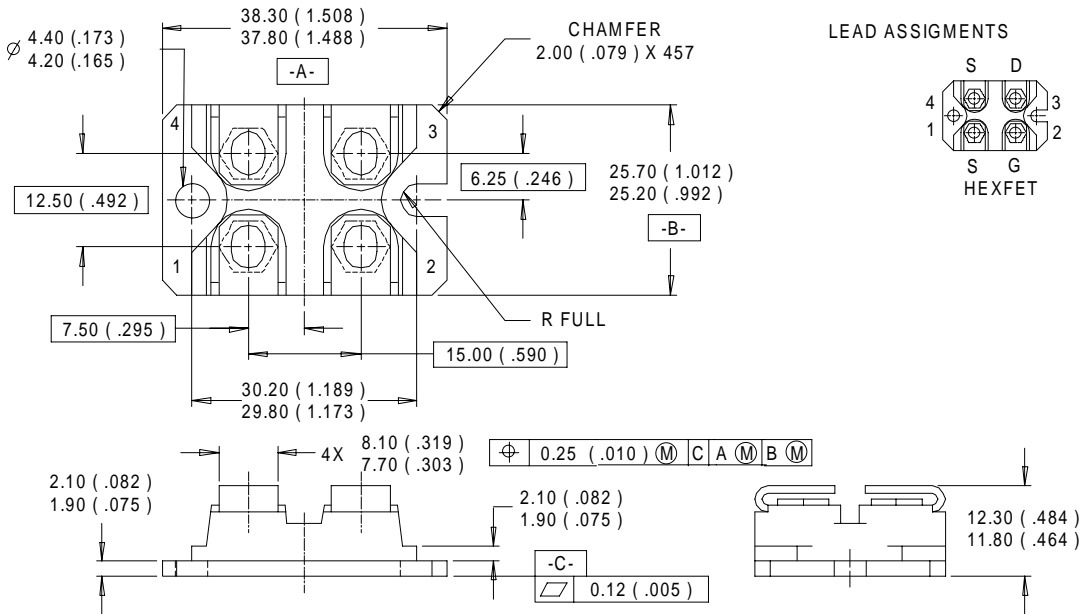
③  $I_{SD} \leq 180A$ ,  $di/dt \leq 83A/\mu s$ ,  $V_{DD} \leq V_{(BR)DSS}$ ,  
 $T_J \leq 150^\circ\text{C}$

④ Pulse width  $\leq 300\mu s$ ; duty cycle  $\leq 2\%$ .

# FB180SA10

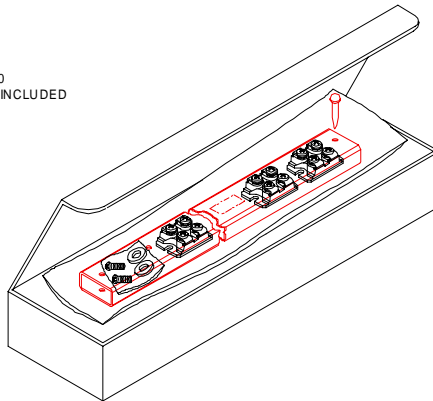
International  
**IR** Rectifier

## SOT-227 Package Details



### Tube

QUANTITY PER TUBE IS 10  
M4 SREW AND WASHER INCLUDED



International  
**IR** Rectifier

**WORLD HEADQUARTERS:** 233 Kansas St., El Segundo, California 90245, Tel: (310) 322 3331

**IR GREAT BRITAIN:** Hurst Green, Oxted, Surrey RH8 9BB, UK Tel: ++ 44 1883 732020

**IR CANADA:** 15 Lincoln Court, Brampton, Ontario L6T3Z2, Tel: (905) 453 2200

**IR GERMANY:** Saalburgstrasse 157, 61350 Bad Homburg Tel: ++ 49 6172 96590

**IR ITALY:** Via Liguria 49, 10071 Borgaro, Torino Tel: ++ 39 11 451 0111

**IR FAR EAST:** K&H Bldg., 2F, 30-4 Nishi-Ikebukuro 3-Chome, Toshima-Ku, Tokyo Japan 171 Tel: 81 3 3983 0086

**IR SOUTHEAST ASIA:** 1 Kim Seng Promenade, Great World City West Tower, 13-11, Singapore 237994 Tel: ++ 65 838 4630

**IR TAIWAN:** 16 Fl. Suite D. 207, Sec. 2, Tun Haw South Road, Taipei, 10673, Taiwan Tel: 886-2-2377-9936

<http://www.irf.com/>

Data and specifications subject to change without notice. 2/99