

### IGBT Module

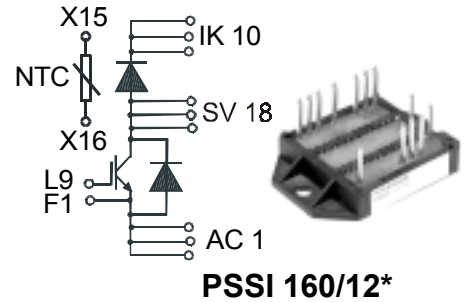
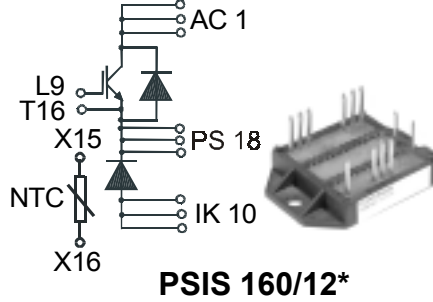
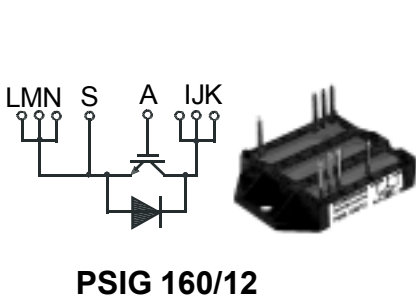
**PSIG 160/12**  
**PSIS 160/12\***  
**PSSI 160/12\***

$I_{C25} = 169 \text{ A}$   
 $V_{CES} = 1200 \text{ V}$   
 $V_{CE(sat)typ.} = 2.9 \text{ V}$

### Short Circuit SOA Capability

#### Square RBSOA

Preliminary Data Sheet



### IGBTs

Symbol	Conditions	Maximum Ratings	
$V_{CES}$	$T_{VJ} = 25^\circ\text{C to } 150^\circ\text{C}$	1200	V
$V_{GES}$		$\pm 20$	V
$I_{C25}$	$T_C = 25^\circ\text{C}$	169	A
$I_{C80}$	$T_C = 80^\circ\text{C}$	117	A
$I_{CM}$ $V_{CEK}$	$V_{GE} = \pm 15 \text{ V}; R_G = 6.8 \Omega; T_{VJ} = 125^\circ\text{C}$ RBSOA, Clamped inductive load; $L = 100 \mu\text{H}$	200	A
		$V_{CES}$	
$t_{SC}$ (SCSOA)	$V_{CE} = V_{CES}; V_{GE} = \pm 15 \text{ V}; R_G = 6.8 \Omega; T_{VJ} = 125^\circ\text{C}$ non-repetitive	10	$\mu\text{s}$
$P_{tot}$	$T_C = 25^\circ\text{C}$	694	W

\*NTC optional

### Features

- Package with DCB ceramic base plate
- Isolation voltage 3000 V~
- Planar glass passivated chips
- Low forward voltage drop
- Leads suitable for PC board soldering
- UL registered, E 148688

### Applications

- AC and DC motor control
- AC servo and robot drives
- power supplies
- welding inverters

### Advantages

- Easy to mount with two screws
- Space and weight savings
- Improved temperature and power cycling capability
- High power density
- Small and light weight
- Leads with expansion bend for stress relief

**Caution:** These Devices are sensitive to electrostatic discharge. Users should observe proper ESD handling precautions.

Symbol	Conditions	Characteristic Values ( $T_{VJ} = 25^\circ\text{C}$ , unless otherwise specified)			
		min.	typ.	max.	
$V_{CE(sat)}$	$I_C = 160 \text{ A}; V_{GE} = 15 \text{ V}; T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$		2.9 3.3	3.5 V	
$V_{GE(th)}$	$I_C = 4 \text{ mA}; V_{GE} = V_{CE}$	4.5		6.5 V	
$I_{CES}$	$V_{CE} = V_{CES}; V_{GE} = 0 \text{ V}; T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$			6 mA 19 mA	
$I_{GES}$	$V_{CE} = 0 \text{ V}; V_{GE} = \pm 20 \text{ V}$			400 nA	
$t_{d(on)}$ $t_r$ $t_{d(off)}$ $t_f$ $E_{on}$ $E_{off}$	Inductive load, $T_{VJ} = 125^\circ\text{C}$ $V_{CE} = 600 \text{ V}; I_C = 100 \text{ A}$ $V_{GE} = 15/0 \text{ V}; R_G = 6.8 \Omega$		100 60 600 90	ns ns ns ns	
				16.1 14.6	mJ mJ
$C_{ies}$		$V_{CE} = 25 \text{ V}; V_{GE} = 0 \text{ V}; f = 1 \text{ MHz}$		6.5	nF
$R_{thJC}$ $R_{thJH}$		(per IGBT) with heatsink compound (0.42 K/m.K; 50 $\mu\text{m}$ )		0.36	0.18 K/W K/W

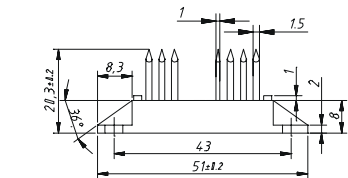
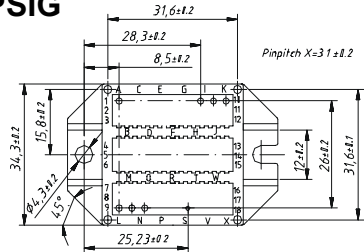
### Reverse diodes (FRED)

Symbol	Conditions	Maximum Ratings	
$I_{F25}$	$T_C = 25^\circ\text{C}$	154	A
$I_{F80}$	$T_C = 80^\circ\text{C}$	97	A

Package style and outline  
Dimensions in mm (1mm = 0.0394")

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
$V_F$	$I_F = 100\text{ A}; T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$	2.3	2.7	V
$I_{RM}$	$I_F = 75\text{ A}; di_F/dt = 750\text{ A}/\mu\text{s}; T_{VJ} = 125^\circ\text{C}$ $V_R = 600\text{ V}; V_{GE} = 0\text{ V}$	79		A
$t_{Tr}$		220		ns
$R_{thJC}$	with heatsink compound (0.42 K/m.K; 50 $\mu\text{m}$ )		0.45	K/W
$R_{thJH}$		0.9		K/W

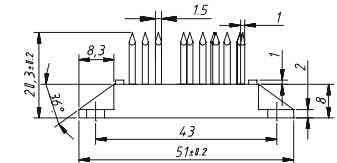
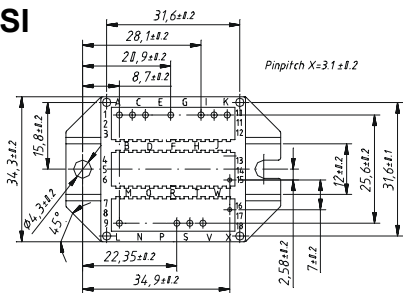
### PSIG



### Temperature Sensor NTC

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
$R_{25}$	$T = 25^\circ\text{C}$	4.75	5.0	5.25 k $\Omega$
$B_{25/50}$			3375	K

### PSSI

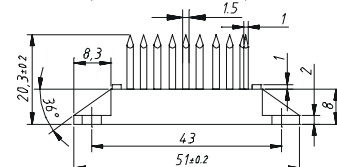
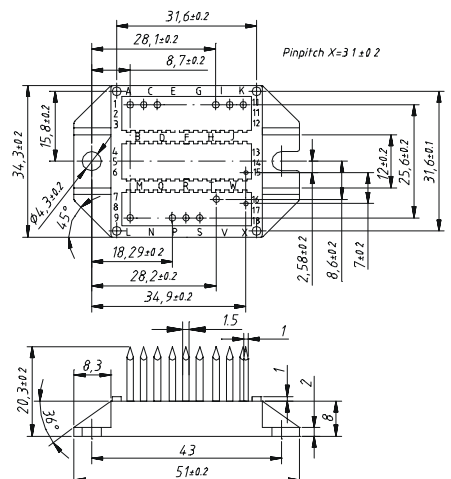


### Module

Symbol	Conditions	Maximum Ratings	
$T_{VJ}$		-40...+150	$^\circ\text{C}$
$T_{stg}$		-40...+150	$^\circ\text{C}$
$V_{ISOL}$	$I_{ISOL} \leq 1\text{ mA}; 50/60\text{ Hz}$	3000	V~
$M_d$	Mounting torque (M4)	1.5 - 2.0	Nm
		14 - 18	lb.in.
$a$	Max. allowable acceleration	50	$\text{m/s}^2$

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
$d_s$	Creepage distance on surface (Pin to heatsink)	11.2		mm
$d_A$	Strike distance in air (Pin to heatsink)	11.2		mm
Weight		24		g

### PSIS



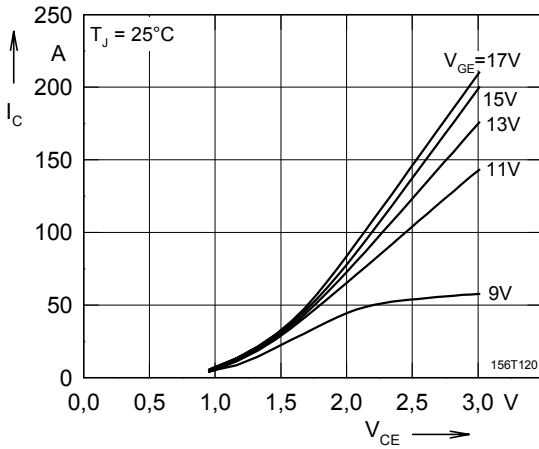


Fig. 1 Typ. output characteristics

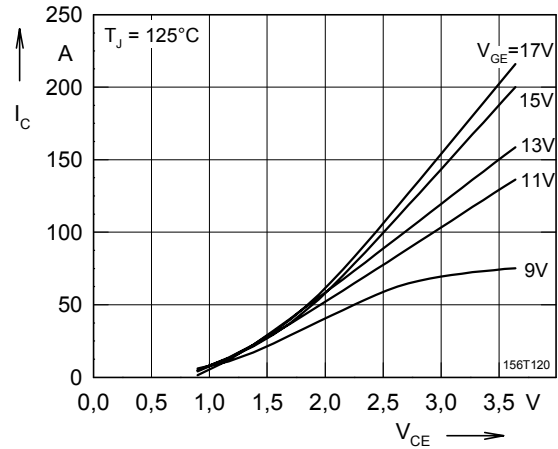


Fig. 2 Typ. output characteristics

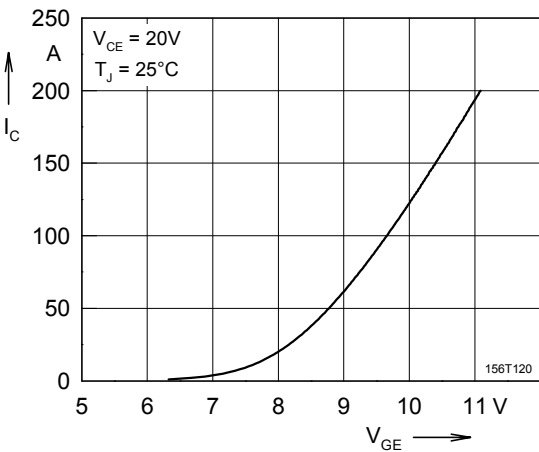


Fig. 3 Typ. transfer characteristics

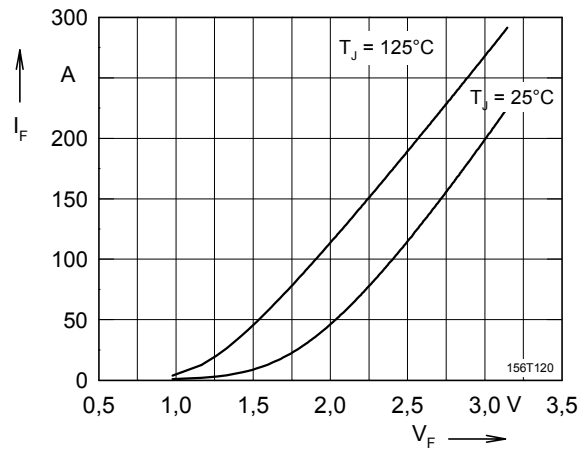


Fig. 4 Typ. forward characteristics of free wheeling diode

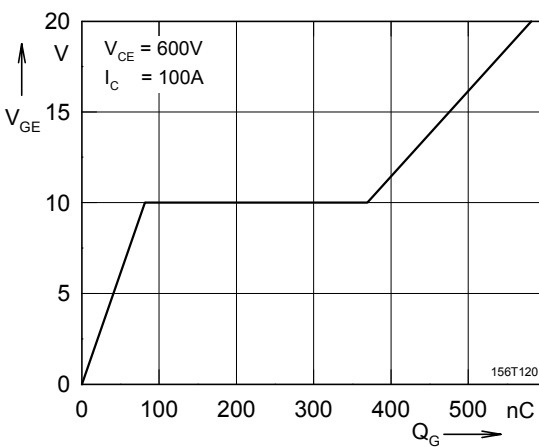


Fig. 5 Typ. turn on gate charge

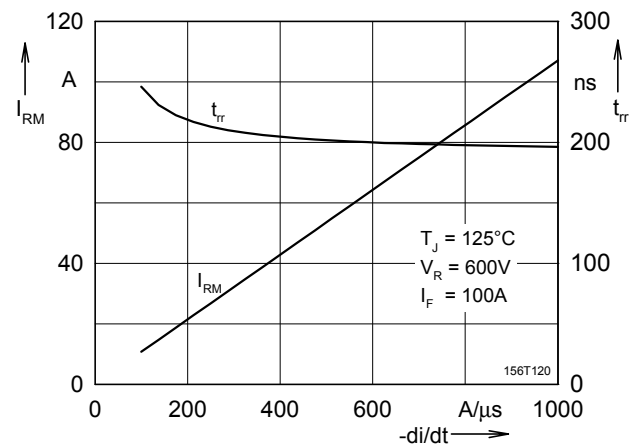


Fig. 6 Typ. turn off characteristics of free wheeling diode

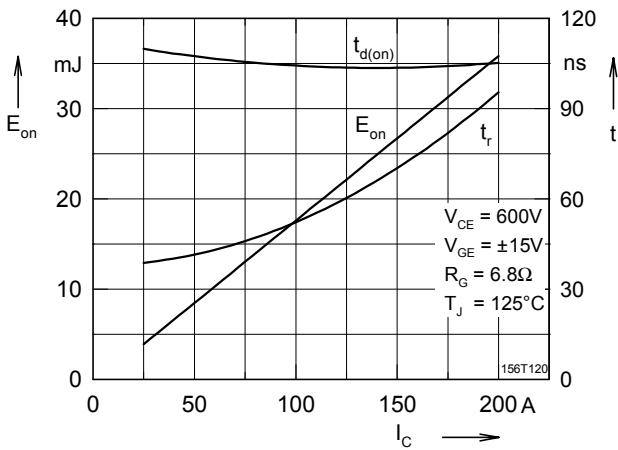


Fig. 7 Typ. turn on energy and switching times versus collector current

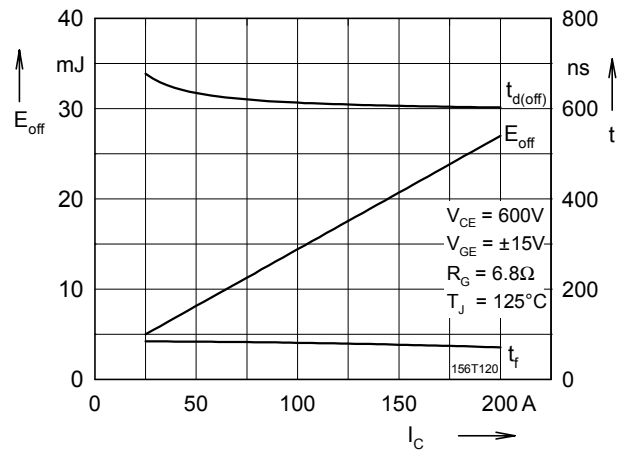


Fig. 8 Typ. turn off energy and switching times versus collector current

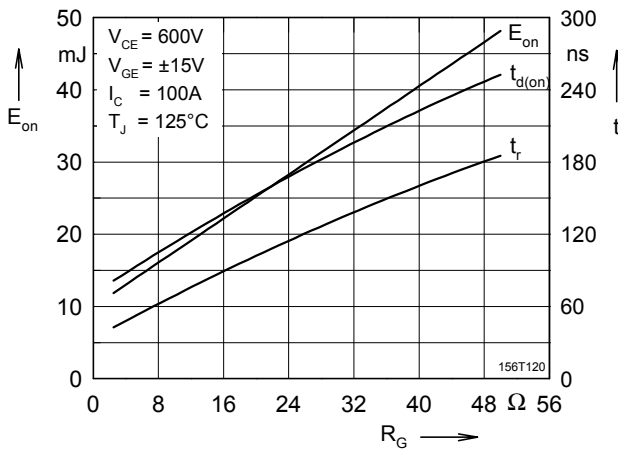


Fig. 9 Typ. turn on energy and switching times versus gate resistor

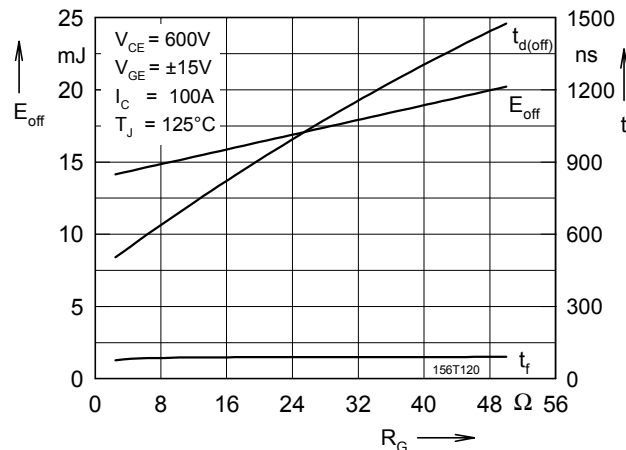


Fig. 10 Typ. turn off energy and switching times versus gate resistor

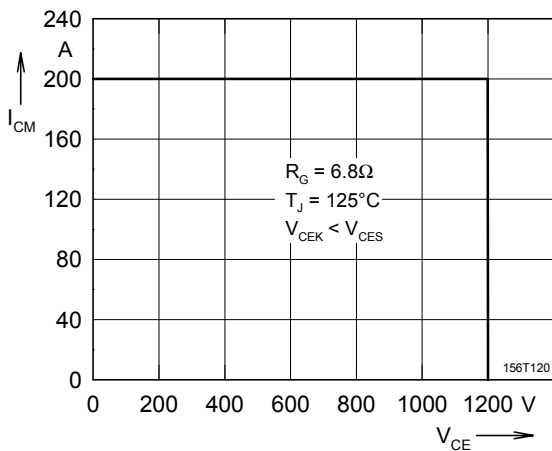


Fig. 11 Reverse biased safe operating area RBSOA

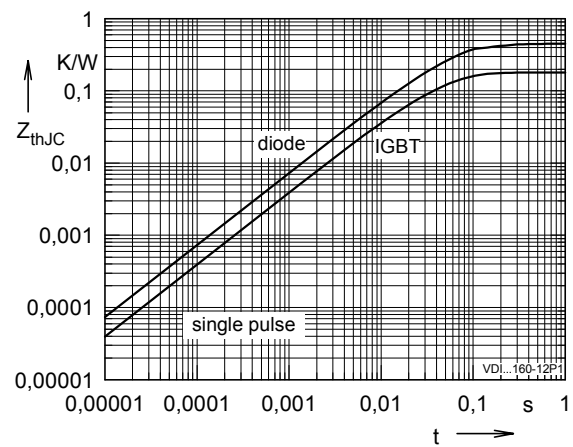


Fig. 12 Typ. transient thermal impedance