POWERSEM

ECO-PAC™ 2

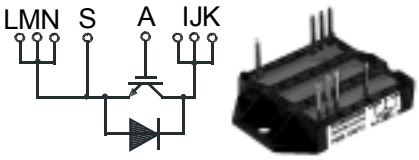
IGBT Module

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

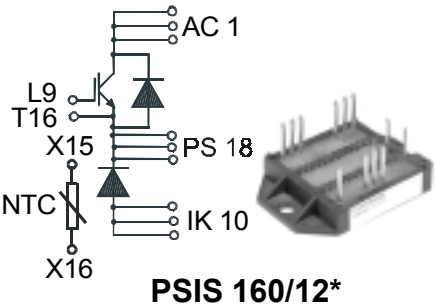
I_{C25} = 169 A
V_{CES} = 1200 V
$V_{CE(sat)typ.}$ = 2.9 V

Short Circuit SOA Capability
Square RBSOA

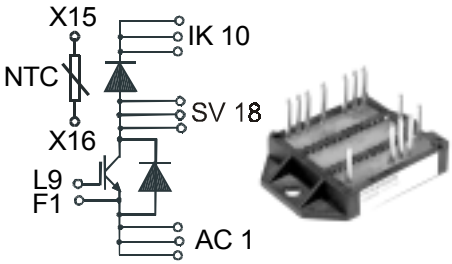
Preliminary Data Sheet



PSIG 160/12



PSIS 160/12*



PSSI 160/12*

IGBTs

Symbol	Conditions	Maximum Ratings	
V_{CES}	T_{VJ} = 25°C to 150°C	1200	V
V_{GES}		± 20	V
I_{C25}	T_C = 25°C	169	A
I_{C80}	T_C = 80°C	117	A
I_{CM}	V_{GE} = ±15 V; R_G = 6.8 Ω; T_{VJ} = 125°C	200	A
V_{CEK}	RBSOA, Clamped inductive load; L = 100 µH	V_{CES}	
t_{SC} (SCSOA)	V_{CE} = V_{CES}; V_{GE} = ±15 V; R_G = 6.8 Ω; T_{VJ} = 125°C non-repetitive	10	µs
P_{tot}	T_C = 25°C	694	W

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

POWERSEM GmbH, Walpersdorfer Str. 53
D - 91126 Schwabach
Phone: 09122 - 9764 - 0 FAX: 09122 - 9764 - 20

Reverse diodes (FRED)

Symbol	Conditions	Maximum Ratings	
I_{F25}	T_C = 25°C	154	A
I_{F80}	T_C = 80°C	97	A

Symbol	Conditions	Characteristic Values min.	typ.	max.	
V_F	I_F = 100 A; T_{VJ} = 25°C		2.3	2.7	V
	T_{VJ} = 125°C		1.7		V
I_{RM}	I_F = 75 A; di_F/dt = 750 A/µs; T_{VJ} = 125°C		79		A
t_{rr}	V_R = 600 V; V_{GE} = 0 V		220		ns
R_{thJC}				0.45	K/W
R_{thJH}	with heatsink compound (0.42 K/m.K; 50 µm)		0.9		K/W

Temperature Sensor NTC

Symbol	Conditions	Characteristic Values min.	typ.	max.	
R_{25}	T = 25°C	4.75	5.0	5.25	kΩ
$B_{25/50}$			3375		K

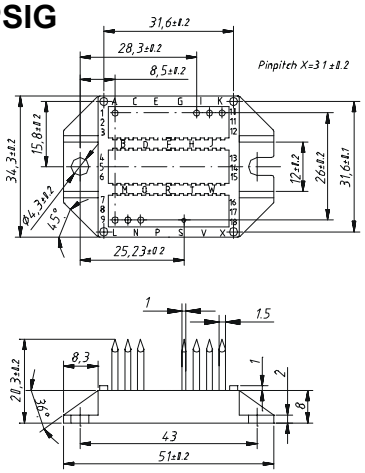
Module

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

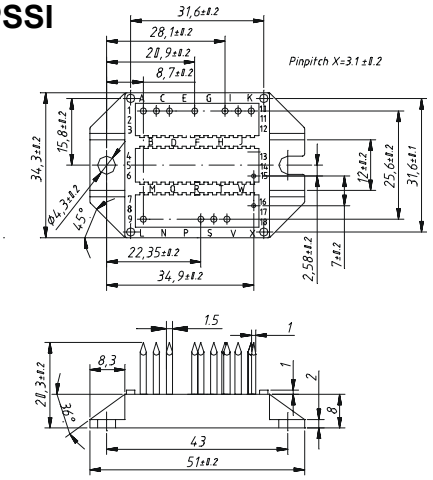
Symbol	Conditions	Characteristic Values min.	typ.	max.	
d_S	Creepage distance on surface (Pin to heatsink)	11.2			mm
d_A	Strike distance in air (Pin to heatsink)	11.2			mm
Weight			24		g

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

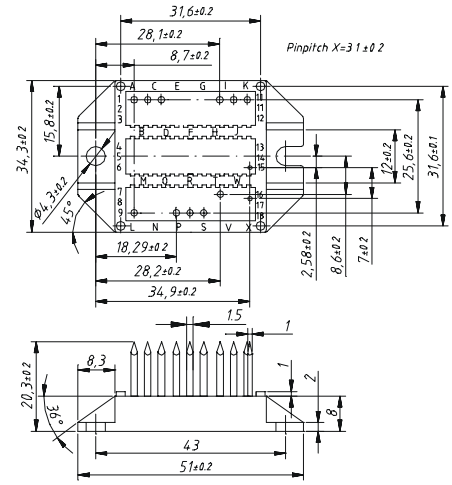
PSIG



PSSI



PSIS



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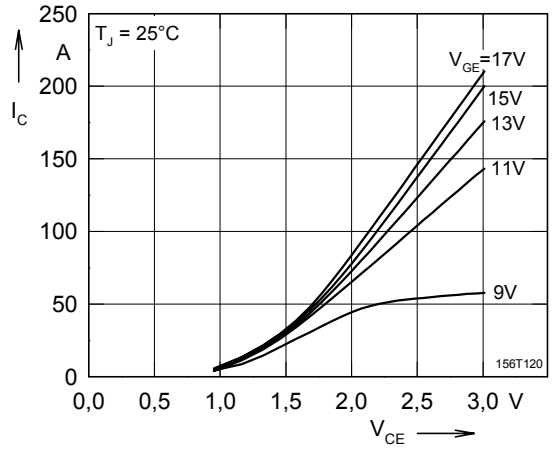

Fig. 1 Typ. output characteristics

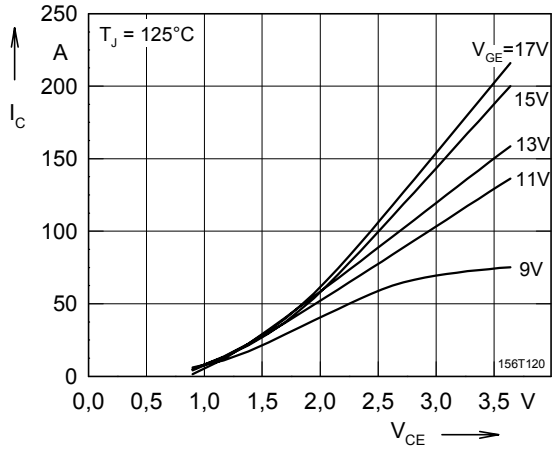

Fig. 2 Typ. output characteristics

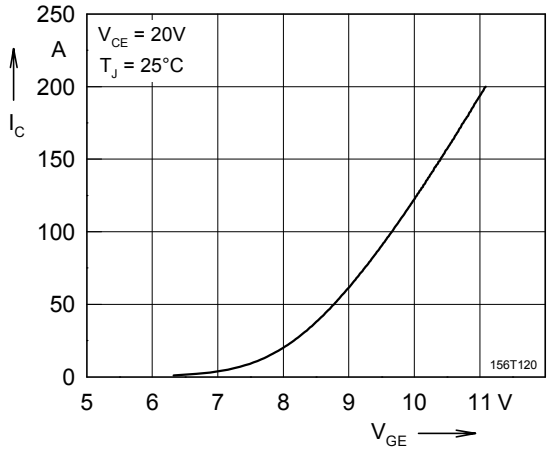

Fig. 3 Typ. transfer characteristics

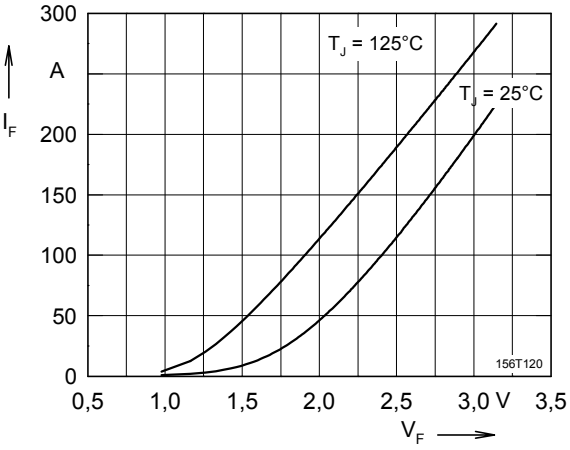

Fig. 4 Typ. forward characteristics of free wheeling diode

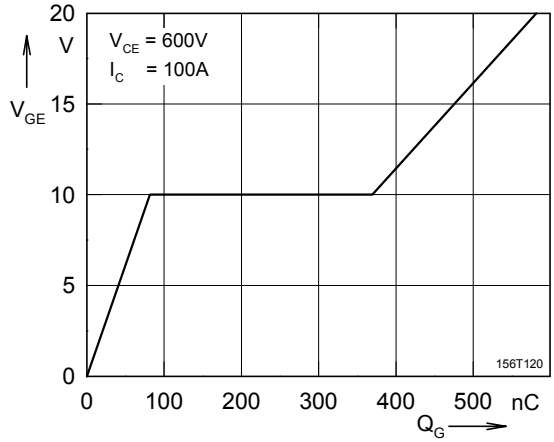

Fig. 5 Typ. turn on gate charge

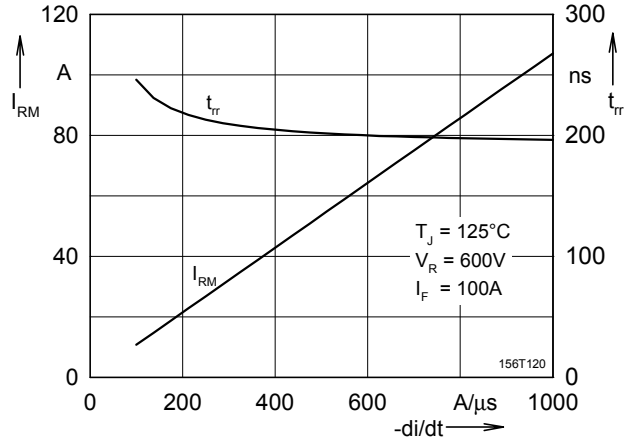

Fig. 6 Typ. turn off characteristics of free wheeling diode

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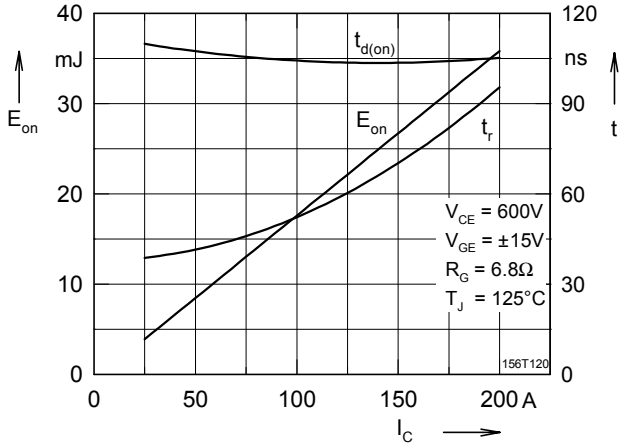

Fig. 7 Typ. turn on energy and switching times versus collector current

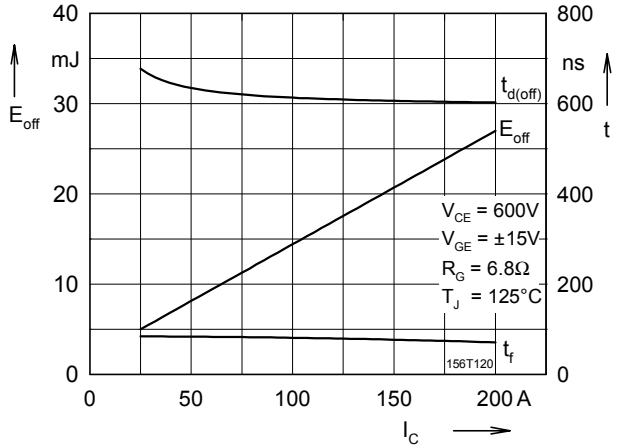

Fig. 8 Typ. turn off energy and switching times versus collector current

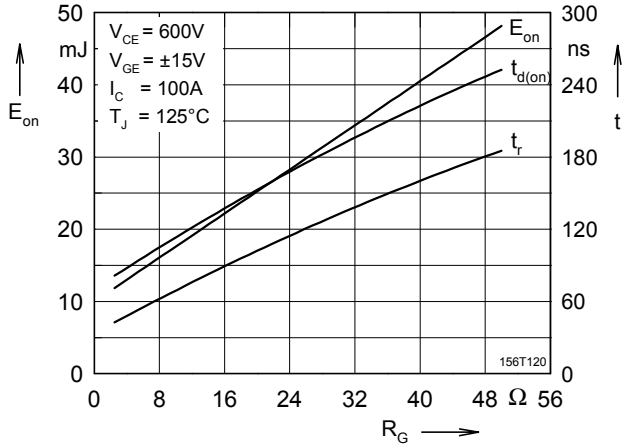

Fig. 9 Typ. turn on energy and switching times versus gate resistor

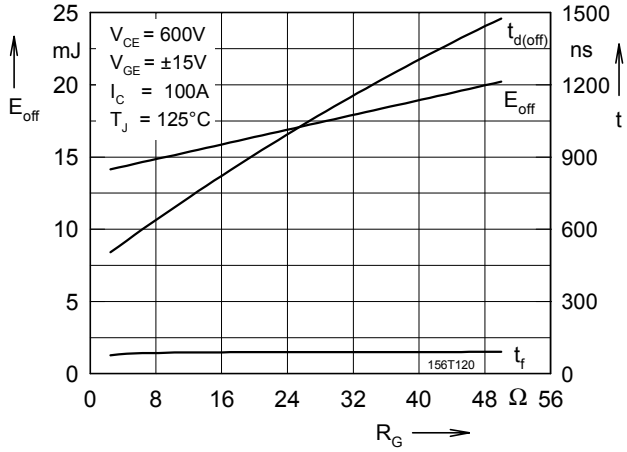

Fig.10 Typ. turn off energy and switching times versus gate resistor

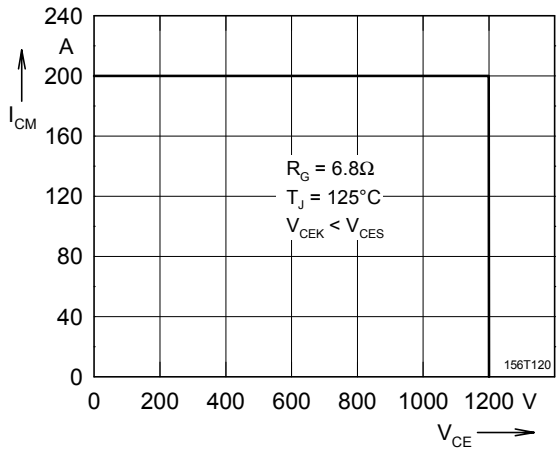

Fig. 11 Reverse biased safe operating area RBSOA

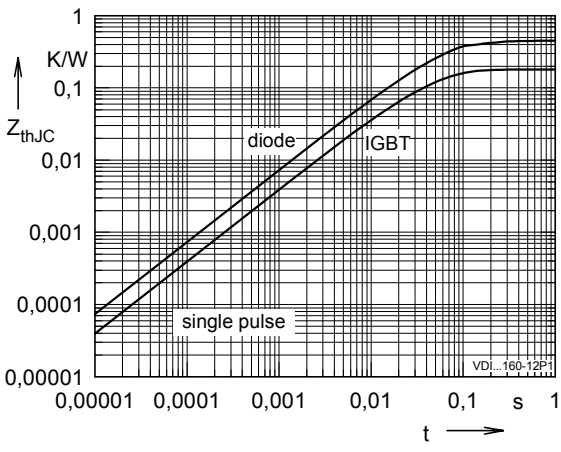

Fig. 12 Typ. transient thermal impedance

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