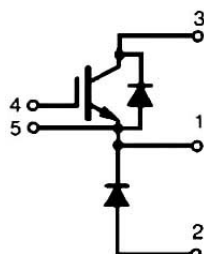
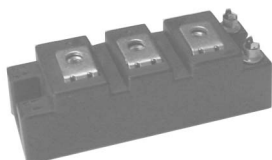


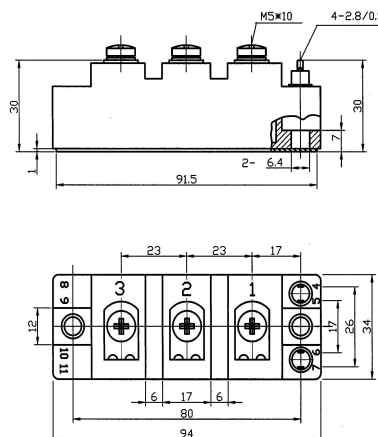
# SDI145S12

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## SPT IGBT Modules



Dimensions in mm (1mm = 0.0394")



### Absolute Maximum Ratings

$T_c = 25^{\circ}\text{C}$ , unless otherwise specified

Symbol	Conditions	Values	Units
<b>IGBT</b>			
$V_{CES}$		1200	V
$I_C$	$T_c = 25(80)^{\circ}\text{C}$	190(135)	A
$I_{CRM}$	$T_c = 25(80)^{\circ}\text{C}$ , $t_P = 1\text{ms}$	380(270)	A
$V_{GES}$		$\pm 20$	V
$T_{Vj}, (T_{stg})$	$T_{OPERATION} \leq T_{stg}$	$-40 \dots +150(125)$	$^{\circ}\text{C}$
$V_{isol}$	AC, 1min	4000	V
<b>Inverse Diode</b>			
$I_F = -I_C$	$T_c = 25(80)^{\circ}\text{C}$	130(90)	A
$I_{FRM}$	$T_c = 25(80)^{\circ}\text{C}$ , $t_P = 1\text{ms}$	380(270)	A
$I_{FSM}$	$t_P = 10\text{ms}$ ; sin.; $T_j = 150^{\circ}\text{C}$	1100	A
<b>Freewheeling diode</b>			
$I_F = -I_C$	$T_c = 25(80)^{\circ}\text{C}$	130(90)	A
$I_{FRM}$	$T_c = 25(80)^{\circ}\text{C}$ , $t_P = 1\text{ms}$	350(260)	A
$I_{FSM}$	$t_P = 10\text{ms}$ ; sin.; $T_j = 150^{\circ}\text{C}$	1100	A

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## SPT IGBT Modules

### Characteristics

T<sub>c</sub> = 25°C, unless otherwise specified

Symbol	Conditions	min.	typ.	max.	Units
<b>IGBT</b>					
V <sub>GE(th)</sub>	V <sub>GE</sub> = V <sub>CE</sub> , I <sub>c</sub> = 2mA	4.5	5.5	6.5	V
I <sub>CES</sub>	V <sub>GE</sub> = 0; V <sub>CE</sub> = V <sub>CE(s)</sub> ; T <sub>j</sub> = 25(125)°C		0.1	0.3	mA
V <sub>CE(TO)</sub>	T <sub>j</sub> = 25(125)°C		1(0.9)	1.15(1.05)	V
r <sub>CE</sub>	V <sub>GE</sub> = 15V, T <sub>j</sub> = 25(125)°C		9(12)	12(15)	mΩ
V <sub>CE(sat)</sub>	I <sub>c</sub> = 100A; V <sub>GE</sub> = 15V; chip level		1.9(2.1)	2.35(2.55)	V
C <sub>ies</sub>	under following conditions		9		nF
C <sub>oes</sub>	V <sub>GE</sub> = 0, V <sub>CE</sub> = 25V, f = 1MHz		1		
C <sub>res</sub>			1		
L <sub>CE</sub>				25	nH
R <sub>CC'+EE'</sub>	res., terminal-chip T <sub>c</sub> = 25(125)°C		0.75(1)		mΩ
under following conditions:					
t <sub>d(on)</sub>	V <sub>CC</sub> = 600V, I <sub>c</sub> = 100A		190		ns
t <sub>r</sub>	R <sub>Gon</sub> = R <sub>Goff</sub> = 9 Ω, T <sub>j</sub> = 125°C		50		ns
t <sub>d(off)</sub>	V <sub>GE</sub> = ± 15V		590		ns
t <sub>f</sub>			50		ns
E <sub>on</sub> (E <sub>off</sub> )			11.5(9.5)		mJ
<b>Inverse Diode</b> under following conditions:					
V <sub>F</sub> = V <sub>EC</sub>	I <sub>F</sub> = 100A; V <sub>GE</sub> = 0V; T <sub>j</sub> = 25(125)°C		2(1.8)	2.5	V
V <sub>(TO)</sub>	T <sub>j</sub> = 25(125)°C		1.1	1.4	V
r <sub>T</sub>	T <sub>j</sub> = 25(125)°C		9	13	mΩ
I <sub>RRM</sub>	I <sub>F</sub> = 100A; T <sub>j</sub> = 125°C		130		A
Q <sub>rr</sub>	di/dt = 3500A/us		14		uC
E <sub>rr</sub>	V <sub>GE</sub> = V		4.8		mJ
<b>FWD</b> under following conditions:					
V <sub>F</sub> = V <sub>EC</sub>	I <sub>F</sub> = 100A; V <sub>GE</sub> = 0V; T <sub>j</sub> = 25(125)°C		2.1(1.8)	2.5	V
V <sub>(TO)</sub>	T <sub>j</sub> = 25(125)°C		1.1	1.4	V
r <sub>T</sub>	T <sub>j</sub> = 25(125)°C		9	13	mΩ
I <sub>RRM</sub>	I <sub>F</sub> = 100A; T <sub>j</sub> = 25(125)°C		130		A
Q <sub>rr</sub>	di/dt = A/us		14		uC
E <sub>rr</sub>	V <sub>GE</sub> = V		4.8		mJ
<b>Thermal Characteristics</b>					
R <sub>th(j-c)</sub>	per IGBT			0.165	K/W
R <sub>th(j-c)D</sub>	per Inverse Diode			0.36	K/W
R <sub>th(c-s)</sub>	per module			0.05	K/W
<b>Mechanical Data</b>					
M <sub>s</sub>	to heatsink M6	3		5	Nm
M <sub>t</sub>	to terminals M5	2.5		5	Nm
w				160	g

