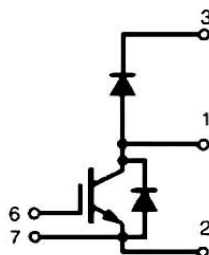
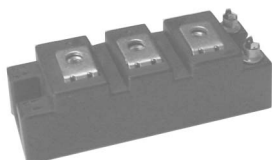
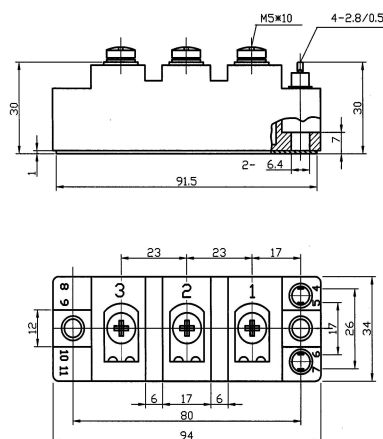


SID145S12

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
IGBT			
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}		± 20	V
$T_{Vj}, (T_{stg})$	$T_{OPERATION} \leq T_{stg}$	$-40 \dots +150(125)$	$^{\circ}\text{C}$
V_{isol}	AC, 1min	4000	V
Inverse Diode			
$I_F = -I_C$	$T_C = 25(80)^{\circ}\text{C}$	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
Freewheeling diode			
$I_F = -I_C$	$T_C = 25(80)^{\circ}\text{C}$	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

SPT IGBT Modules

Characteristics

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

Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 2\text{mA}$	4.5	5.5	6.5	V
I_{CES}	$V_{GE} = 0$; $V_{CE} = V_{CES}$; $T_j = 25(125)^{\circ}\text{C}$		0.1	0.3	mA
$V_{CE(TO)}$	$T_j = 25(125)^{\circ}\text{C}$		1(0.9)	1.15(1.05)	V
r_{CE}	$V_{GE} = 15\text{V}$, $T_j = 25(125)^{\circ}\text{C}$		9(12)	12(15)	$\text{m}\Omega$
$V_{CE(sat)}$	$I_C = 100\text{A}$; $V_{GE} = 15\text{V}$; chip level		1.9(2.1)	2.35(2.55)	V
C_{ies}	under following conditions $V_{GE} = 0$, $V_{CE} = 25\text{V}$, $f = 1\text{MHz}$		9		nF
C_{oes}			1		
C_{res}			1		
L_{CE}				25	nH
$R_{CC'+EE'}$	res., terminal-chip $T_C = 25(125)^{\circ}\text{C}$		0.75(1)		$\text{m}\Omega$
$t_{d(on)}$	under following conditions: $V_{CC} = 600\text{V}$, $I_C = 100\text{A}$ $R_{Gon} = R_{Goff} = 9\Omega$, $T_j = 125^{\circ}\text{C}$ $V_{GE} = \pm 15\text{V}$		190		ns
t_r			50		ns
$t_{d(off)}$			590		ns
t_f			50		ns
$E_{on}(E_{off})$			11.5(9.5)		mJ
Inverse Diode under following conditions:					
$V_F = V_{EC}$	$I_F = 100\text{A}$; $V_{GE} = 0\text{V}$; $T_j = 25(125)^{\circ}\text{C}$		2(1.8)	2.5	V
$V_{(TO)}$	$T_j = 25(125)^{\circ}\text{C}$		1.1	1.4	V
r_T	$T_j = 25(125)^{\circ}\text{C}$		9	13	$\text{m}\Omega$
I_{RRM}	$I_F = 100\text{A}$; $T_j = 125^{\circ}\text{C}$		130		A
Q_{rr}	$di/dt = 3500\text{A/us}$		14		μC
E_{rr}	$V_{GE} = V$		4.8		mJ
FWD under following conditions:					
$V_F = V_{EC}$	$I_F = 100\text{A}$; $V_{GE} = 0\text{V}$; $T_j = 25(125)^{\circ}\text{C}$		2.1(1.8)	2.5	V
$V_{(TO)}$	$T_j = 25(125)^{\circ}\text{C}$		1.1	1.4	V
r_T	$T_j = 25(125)^{\circ}\text{C}$		9	13	$\text{m}\Omega$
I_{RRM}	$I_F = 100\text{A}$; $T_j = 25(125)^{\circ}\text{C}$		130		A
Q_{rr}	$di/dt = \text{A/us}$		14		μC
E_{rr}	$V_{GE} = V$		4.8		mJ
Thermal Characteristics					
$R_{th(j-c)}$	per IGBT			0.165	K/W
$R_{th(j-c)D}$	per Inverse Diode			0.36	K/W
$R_{th(c-s)}$	per module			0.05	K/W
Mechanical Data					
M_s	to heatsink M6	3		5	Nm
M_t	to terminals M5	2.5		5	Nm
W				160	g