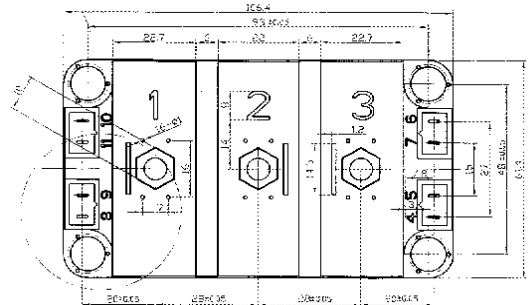
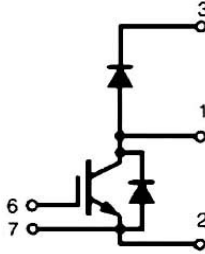
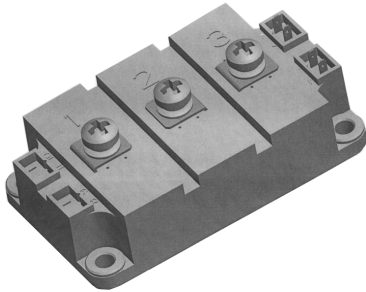


# SID400N12

## NPT 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
$I_c$	$T_c = 25(80)^\circ\text{C}$	400(330)	A
$I_{CRM}$	$T_c = 25(80)^\circ\text{C}$ , $t_P = 1\text{ms}$	800(660)	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>			
$I_{F=-I_c}$	$T_c = 25(80)^\circ\text{C}$	390(260)	A
$I_{FRM}$	$T_c = 25(125)^\circ\text{C}$ , $t_P = 1\text{ms}$	800(660)	A
$I_{FSM}$	$t_P = 10\text{ms}$ ; sin.; $T_j = 150^\circ\text{C}$	2900	A

# SID400N12

## NPT 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> = 12mA	4.8	5.5	6.45	V
I <sub>CES</sub>	V <sub>GE</sub> = 0; V <sub>CE</sub> = V <sub>CES</sub> ; T <sub>j</sub> = 25°C		0.1	0.3	mA
V <sub>CE(TO)</sub>	T <sub>j</sub> = 25(125)°C		1.4(1.6)	1.6(1.8)	V
r <sub>CE</sub>	V <sub>GE</sub> = 15V, T <sub>j</sub> = 25(125)°C		3.66(5)	4.66(6.33)	mΩ
V <sub>CE(sat)</sub>	I <sub>c</sub> = 300A; V <sub>GE</sub> = 15V; chip level		2.5(3.1)	3(3.7)	V
C <sub>ies</sub>	under following conditions		22	30	nF
C <sub>oes</sub>	V <sub>GE</sub> = 0, V <sub>CE</sub> = 25V, f = 1MHz		3.3	4	
C <sub>res</sub>			1.2	1.6	
L <sub>CE</sub>				20	nH
R <sub>CC+EE'</sub>	res., terminal-chip T <sub>c</sub> = 25(125)°C		0.35(0.5)		mΩ
under following conditions:					
t <sub>d(on)</sub>	V <sub>CC</sub> = 600V, I <sub>c</sub> = 300A		200	400	ns
t <sub>r</sub>	R <sub>Gon</sub> = R <sub>Goff</sub> = 3.3Ω, T <sub>j</sub> = 125°C		115	220	ns
t <sub>d(off)</sub>	V <sub>GE</sub> = ± 15V		720	900	ns
t <sub>f</sub>			80	100	ns
E <sub>on(Eoff)</sub>			38(40)		mJ
<b>Inverse Diode</b> under following conditions:					
V <sub>F</sub> = V <sub>EC</sub>	I <sub>F</sub> = 300A; 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> = 125°C			1.2	V
r <sub>T</sub>	T <sub>j</sub> = 125°C		2.5	3.5	mΩ
I <sub>RRM</sub>	I <sub>F</sub> = 300A; T <sub>j</sub> = 25(125)°C		85(140)		A
Q <sub>rr</sub>	di/dt = 2000A/us		13(40)		uC
E <sub>rr</sub>	V <sub>GE</sub> = V				mJ
<b>Thermal Characteristics</b>					
R <sub>th(j-c)</sub>	per IGBT			0.05	K/W
R <sub>th(j-c)D</sub>	per Inverse Diode			0.125	K/W
R <sub>th(c-s)</sub>	per module			0.038	K/W
<b>Mechanical Data</b>					
M <sub>s</sub>	to heatsink M6	3		5	Nm
M <sub>t</sub>	to terminals M6				Nm
w				325	g