

Molding Type Module 1200V/100A 2 in one-package

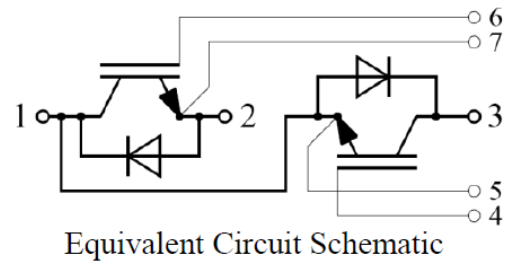
General Description

IGBT Power Module provides ultra low conduction loss as well as short circuit ruggedness. They are designed for the applications such as electronic welders.



Features

- Low $V_{CE(sat)}$ trench IGBT technology
- 10 μ s short circuit capability
- $V_{CE(sat)}$ with positive temperature coefficient
- Maximum junction temperature 175 $^{\circ}$ C
- Low inductance case
- Fast & soft reverse recovery anti-parallel FWD
- Isolated copper baseplate using DBC technology



Typical Applications

- Switching mode power supplies
- Electronic welders

Absolute Maximum Ratings $T_c=25^{\circ}$ C unless otherwise noted

Symbol	Description		Units
V_{CES}	Collector-Emitter Voltage	1200	V
V_{GES}	Gate-Emitter Voltage	± 20	V
I_c	Collector Current @ $T_c=175^{\circ}$ C	100	A
I_{CM}	Pulsed Collector Current $t_p=1ms$	200	A
I_F	Diode Continuous Forward Current	100	A
I_{FM}	Diode Maximum Forward Current $t_p=1ms$	200	A
P_D	Maximum Power Dissipation @ $T_j=175^{\circ}$ C	365	W
T_{jmax}	Maximum Junction Temperature	175	$^{\circ}$ C
T_{STG}	Storage Temperature Range	-40 to +125	$^{\circ}$ C
VISO	Isolation Voltage RMS, $f=50Hz, t=1min$	2500	V
Mounting Torque	Power Terminal Screw:M5 Mounting Screw:M6	2.5 to 5.0 3.0 to 5.0	N.m

Electrical Characteristics of IGBT $T_c=25^{\circ}$ C unless otherwise noted

Off Characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$V_{(BR)CES}$	Collector-Emitter Breakdown Voltage	$T_j=25^\circ\text{C}$	1200			V
I_{CES}	Collector Cut-Off Current	$V_{CE}=1200\text{V}, V_{GE}=0\text{V}, T_j=25^\circ\text{C}$			1.0	mA
I_{GES}	Gate-Emitter Leakage Current	$V_{GE}=15\text{V}, V_{CE}=0\text{V}, T_j=25^\circ\text{C}$			100	nA

On Characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	$I_C=2.4\text{mA}, V_{CE}=V_{GE}, T_j=25^\circ\text{C}$	5.0	-	7.5	V
$V_{CE(sat)}$	Collector to Emitter Saturation Voltage	$I_C=50\text{A}, V_{GE}=15\text{V}, T_j=25^\circ\text{C}$	2.0		3.0	V
		$I_C=50\text{A}, V_{GE}=15\text{V}, T_j=125^\circ\text{C}$		2.9		

Switching Characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units	
$t_d(on)$	Turn-On Delay Time	$V_{CC}=600\text{V}, I_C=100\text{A}, R_G=10\Omega, V_{GE}=\pm 15\text{V}, T_j=25^\circ\text{C}$		150		ns	
t_r	Rise Time			90		ns	
$t_d(off)$	Turn-Off Delay Time			380		ns	
t_f	Fall Time			172		ns	
E_{on}	Turn-On Switching Loss				9.8		mJ
E_{off}	Turn-Off Switching Loss				8.9		mJ
$t_d(on)$	Turn-On Delay Time	$V_{CC}=600\text{V}, I_C=100\text{A}, R_G=10\Omega, V_{GE}=\pm 15\text{V}, T_j=125^\circ\text{C}$		162		ns	
t_r	Rise Time			94		ns	
$t_d(off)$	Turn-Off Delay Time			410		ns	
t_f	Fall Time			196		ns	
E_{on}	Turn-On Switching Loss				10.5		mJ
E_{off}	Turn-Off Switching Loss				10.0		mJ
C_{ies}	Input Capacitance	$V_{CE}=25\text{V}, f=1\text{MHz}, V_{GE}=0\text{V}$		6.68		nF	
C_{res}	Reverse Transfer Capacitance			0.15		nF	

Q _G	Gate Charge	V _{GE} =-15V ...+15V		262		nC
R _{Gint}	Internal Gate Resistance			2.35		Ω
L _{CE}	Stray Inductance				30	nH
R _{CC'+EE'}	Module Lead Resistance, Terminal To Chip			0.75		mΩ

Electrical Characteristics of Diode T_c=25°C unless otherwise noted

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Units
V _F	Diode Forward Voltage	I _F =100A	T _j =25°C		1.72	3.0	V
Q _r	Recovered Charge	I _F =100A, V _R =600V, R _G =10Ω, V _{GE} =-15V	T _j =25°C		12		μC
I _{RM}	Peak Reverse Recovery Current		T _j =25°C		30		A
E _{rec}	Reverse Recovery Energy		T _j =25°C		4.0		mJ

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Units
R _{θJC}	Junction-to-Case (per IGBT)		0.3	K/W
R _{θJC}	Junction-to-Case (per Diode)		0.58	K/W
R _{θCS}	Case-to-Sink (per IGBT -Conductive grease applied)	0.8		
R _{θCS}	Case-to-Sink (per Diode -Conductive grease applied)	0.14		K/W

Package Dimensions

