

1200V/100A IGBT Half-Bridge Module

Features

- High frequency operation
- Low stray inductance
- High reliability and Power density
- Low switching loss and V_{cesat}

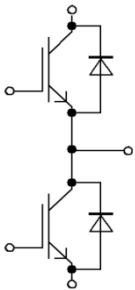


Applications

- Welding machine
- UPS
- Industry Inverter
- Motor Control

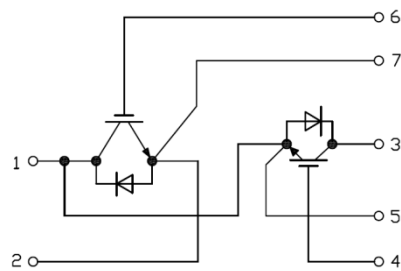
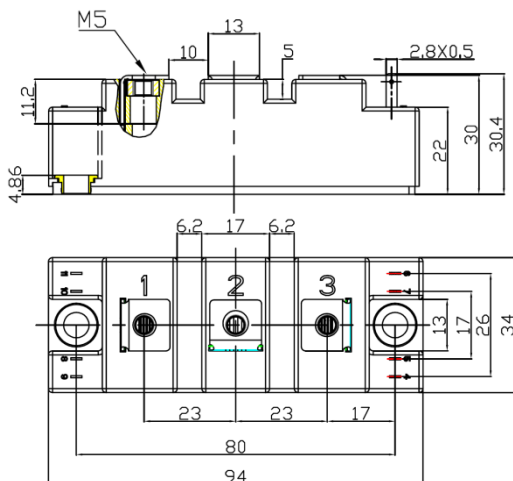
34mm Half-Bridge Module

Circuit Diagram



$V_{ces}=1200v$
 $I_c=100A@T_c=100^{\circ}C$

Package Outlines (Unit: mm)



IGBT Absolute Max Ratings						
Symbol	Parameter	Condition	Units	Maximum		
V_{CES}	Collector-to-Emitter Voltage	$T_{VJ}=25\text{ }^{\circ}\text{C}$	V	1200		
I_C	Continuous DC collector current	$TC = 100^{\circ}\text{C}, T_{VJ\text{ MAX}}=150\text{ }^{\circ}\text{C}$	A	100		
I_{CRM}	Repetitive peak collector current	$t_p=1\text{ms}$	A	200		
P_{total}	Total power dissipation	$TC = 25^{\circ}\text{C}, T_{VJ\text{ MAX}}=150\text{ }^{\circ}\text{C}$	$^{\circ}\text{C/W}$	463		
V_{GES}	Gate-Emitter peak voltage		V	+/- 30		
IGBT Characteristics						
Symbol	Parameter	Test conditions	Units	Min.	Typ.	Max.
$V_{CE(sat)}$	Collector-Emitter Saturation voltage	$V_{GE}=15\text{V}, I_C=100\text{A}, T_{VJ}=25^{\circ}\text{C}$	V	—	1.90	2.2
		$V_{GE}=15\text{V}, I_C=100\text{A}, T_{VJ}=125^{\circ}\text{C}$	V	—	2.15	—
$V_{GE(th)}$	Gate threshold voltage	$V_{GE} = V_{CE}, I_D = 3.3\text{mA}$	V	5.2	-	6.8
I_{CES}	Collector-Emitter leakage current	$V_{CE}=1200\text{V}, V_{GE} = 0\text{V}, T_{VJ}=25^{\circ}\text{C}$	mA	—	—	1
I_{GES}	Gate-Emitter leakage current	$V_{CE}=0\text{V}, V_{GE}=20\text{V}, T_{VJ}=25^{\circ}\text{C}$	nA	—	—	100
C_{iss}	Input capacitance	$V_{GE} = 0\text{V}, V_{CE}= 25\text{V}$ $T_{VJ}=25^{\circ}\text{C}, f = 1\text{MHz}$	nF	—	6.9	—
C_{rss}	Reverse transfer capacitance	$V_{GE} = 0\text{V}, V_{CE}= 25\text{V}$ $T_{VJ}=25^{\circ}\text{C}, f = 1\text{MHz}$	nF	—	0.3	—
T_{don}	Turn-on delay time, inductive load	$V_{CE}=600\text{v}, I_C=100\text{A}$ $R_g = 10\text{ohm}, V_{GE} = 15\text{V}$	nS	—	40	—
T_r	Rise time, inductive load	$V_{CE}=600\text{v}, I_C=100\text{A}$ $R_g = 10\text{ohm}, V_{GE} = 15\text{V}$	ns	—	80	—
E_{on}	Turn-on energy loss per pulse	$V_{CE}=600\text{v}, I_C=100\text{A}$ $R_g = 10\text{ohm}, V_{GE} = 15\text{V}$	mJ	—	9.5	—
T_{doff}	Turn-off delay time, inductive load	$V_{CE}=600\text{v}, I_C=100\text{A}$ $R_g = 10\text{ohm}, V_{GE} = 15\text{V}$	nS	—	240	—
T_f	Fall time, inductive load	$V_{CE}=600\text{v}, I_C=100\text{A}$ $R_g = 10\text{ohm}, V_{GE} = 15\text{V}$	nS	—	385	—
E_{off}	Turn-off energy loss per pulse	$V_{CE}=600\text{v}, I_C=100\text{A}$ $R_g = 10\text{ohm}, V_{GE} = 15\text{V}$	mJ	—	10.2	—
I_{SC}	Short- circuit current	$T_a=25^{\circ}\text{C}, V_{GE}=15\text{V}, V_{CE}=720\text{V}, t_p=10\text{us}$	A	—	500	—
R_{ThJC}	Junction-Case Thermal resistance		K/W	—	—	0.27
$T_{VJ\text{ OP}}$	Temperature under switching		$^{\circ}\text{C}$	-40		150

FRD Absolute Max Ratings						
Symbol	Parameter	Condition	Units	Maximum		
V_{RRM}	Repetitive peak reverse voltage	$T_{VJ}=25\text{ }^{\circ}\text{C}$	V	1200		
I_F	Continuous DC forward current		A	100		
I_{FRM}	Repetitive peak forward current	$T_p=1\text{ms}$	A	200		
I^2t	I^2t Value	$V_R=0\text{V}, T_p=10\text{ms}, T_{VJ}=125\text{ }^{\circ}\text{C}$	A^2s	1580		
FRD Characteristics						
Symbol	Parameter	Test conditions	Units	Min.	Typ.	Max.
V_F	Forward voltage	$I_F=100\text{A}, T_{VJ}=25\text{ }^{\circ}\text{C}$	V	—	2.25	2.5
		$I_F=100\text{A}, T_{VJ}=125\text{ }^{\circ}\text{C}$	V	—	2.05	—
I_{RM}	Peak reverse recovery current	$I_F=100\text{A}, L=500\mu\text{H},$ $V_{dc}=600\text{v}, V_{GE}=15\text{V},$ $R_g=10\text{ohm}, T_{VJ}=25\text{ }^{\circ}\text{C}$	A	—	55	—
Q_r	Recovery charge		μC	—	3.2	—
T_{rr}	Reverse recovery energy		nS	—	120	—
E_{rec}	Reverse recovery energy		mJ	—	0.71	—
I_{RM}	Peak reverse recovery current	$I_F=100\text{A}, L=500\mu\text{H},$ $V_{dc}=600\text{v}, V_{GE}=15\text{V},$ $R_g=10\text{ohm}, T_{VJ}=125\text{ }^{\circ}\text{C}$	A	—	62	—
Q_r	Recovery charge		μC	—	4.5	—
T_{rr}	Reverse recovery energy		nS	—	140	—
E_{rec}	Reverse recovery energy		mJ	—	0.92	—
R_{ThJC}	Junction-Case Thermal Resistance		KW	—	—	0.5
T_{VJOP}	Temperature under switching		$^{\circ}\text{C}$	-40	—	150