

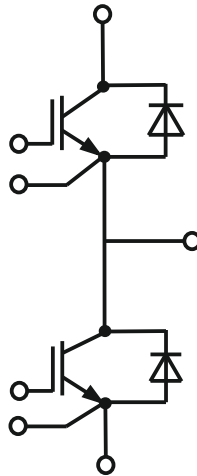
IGBT Module, 1200V/300A

Features

- 1200V 300A, $V_{CE(sat)}=2.50V$
- Planar Field-stop Technology
- High RBSOA capability
- Low turn-off losses

Applications

- Inductive Heating
- Welding Machine
- High Frequency switching Application
- UPS System
- Power Supplies



IGBT, Inverter/IGBT, Maximum Rated Values				
Parameter	Conditions	Symbol	Values	Units
Collector-Emitter Voltage	$T_{vj} = 25^{\circ}C$	V_{CES}	1200	V
Total Power Dissipation	$T_c = 25^{\circ}C, T_{vjmax} = 150^{\circ}C$	P_{tot}	1950	W
Continuous DC Collector Current		$I_{C\ nom}$	300	A
	$T_c = 25^{\circ}C, T_{vjmax} = 150^{\circ}C$	I_C	495	
Repetitive Peak Collector Current	$I_{CRM} = 2 \times I_{C\ nom}$	I_{CRM}	600	A
Gate-emitter peak voltage		V_{GES}	± 20	V

Diode, Inverter Maximum Rated Values				
Parameter	Conditions	Symbol	Values	Units
Peak Repetitive Reverse Voltage	$T_{vj} = 25^{\circ}C$	V_{RRM}	1200	V
Continuous DC Forward Current		I_F	300	A
Repetitive Peak Forward Current	$I_{FRM} = 2 \times I_F$	I_{FRM}	600	A

Module				
Parameter	Conditions	Symbol	Values	Units
Isolation Test Voltage	RMS, $f=50Hz, t=1min$	V_{iso}	3000	V
Material of Module Baseplate			Cu	
Internal Isolation	Basic insulation (class1, IEC61140)		Al_2O_3	
Creepage Distance	terminal to heatsink terminal to terminal		29.0 23.0	mm
Clearance	terminal to heatsink terminal to terminal		23.0 11.0	mm
Comparative Tracking Index		CTI	>400	



Characteristics Values

IGBT						
Parameter	Conditons	Symbol	Min.	Typ.	Max.	Units
Collector-Emitter Saturation Voltage	$I_C = 300A, V_{GE} = 15V, T_{vj} = 25^{\circ}C$ $I_C = 300A, V_{GE} = 15V, T_{vj} = 125^{\circ}C$ $I_C = 300A, V_{GE} = 15V, T_{vj} = 150^{\circ}C$	V_{CEsat}		2.50 2.90 3.00	3.00	V
Gate Threshold Voltage	$V_{CE} = V_{GE}, I_C = 1 mA, T_{vj} = 25^{\circ}C$	$V_{GE(th)}$	5.0	6.0	7.0	V
Gate Charge	$V_{CC} = 600V, V_{GE} = 15V, I_C = 300A, T_{vj} = 25^{\circ}C$	Q_G		2.2		nC
Internal Gate Resistor	$T_{vj} = 25^{\circ}C$	R_{Gint}		5.0		Ω
Input Capacitance	$V_{CE} = 25V, V_{GE} = 0V, f = 1MHz,$	C_{ies}		12.8		nF
Reverse Transfer Capacitance		C_{res}		0.62		
Collector-Emitter Cutoff Current	$V_{CE} = 1200V, V_{GE} = 0V, T_{vj} = 25^{\circ}C$	I_{CES}			5	mA
Gate-emitter Leakage current	$V_{CE} = 0V, V_{GE} = \pm 20V, T_{vj} = 25^{\circ}C$	I_{GES}			± 200	nA
Turn-on Delay Time Inductive Load	$I_C = 300A, V_{CE} = 600V, T_{vj} = 25^{\circ}C$ $V_{GE} = \pm 15V, T_{vj} = 125^{\circ}C$ $R_{Gon} = 1.8\Omega, T_{vj} = 150^{\circ}C$	t_{don}		120 120 120		ns
Rise Time Inductive Load	$I_C = 300A, V_{CE} = 600V, T_{vj} = 25^{\circ}C$ $V_{GE} = \pm 15V, T_{vj} = 125^{\circ}C$ $R_{Gon} = 1.8\Omega, T_{vj} = 150^{\circ}C$	t_r		65 75 75		ns
Turn-off Delay Time Inductive Load	$I_C = 300A, V_{CE} = 600V, T_{vj} = 25^{\circ}C$ $V_{GE} = \pm 15V, T_{vj} = 125^{\circ}C$ $R_{Goff} = 6.8\Omega, T_{vj} = 150^{\circ}C$	t_{doff}		425 565 575		ns
Fall Time Inductive Load	$I_C = 300A, V_{CE} = 600V, T_{vj} = 25^{\circ}C$ $V_{GE} = \pm 15V, T_{vj} = 125^{\circ}C$ $R_{Goff} = 6.8\Omega, T_{vj} = 150^{\circ}C$	t_f		40 40 40		ns
Turn-on Energy Loss per Pulse	$I_C = 300A, V_{CE} = 600V, T_{vj} = 25^{\circ}C$ $L_{\sigma} = 80nH, V_{GE} = \pm 15V, T_{vj} = 125^{\circ}C$ $R_{Gon} = 1.8\Omega, T_{vj} = 150^{\circ}C$	E_{on}		24.5 36.5 40.0		mJ
Turn-off Energy Loss per Pulse	$I_C = 300A, V_{CE} = 600V, T_{vj} = 25^{\circ}C$ $L_{\sigma} = 80nH, V_{GE} = \pm 15V, T_{vj} = 125^{\circ}C$ $V_{GE} = \pm 15V, R_{Goff} = 6.8\Omega, T_{vj} = 150^{\circ}C$	E_{off}		13.0 17.5 18.5		mJ
Thermal Resistance Junction to case	Per IGBT	$R_{th JC}$		0.064		K/W
Temprature under switching conditions		$T_{vj op}$	-40		150	$^{\circ}C$

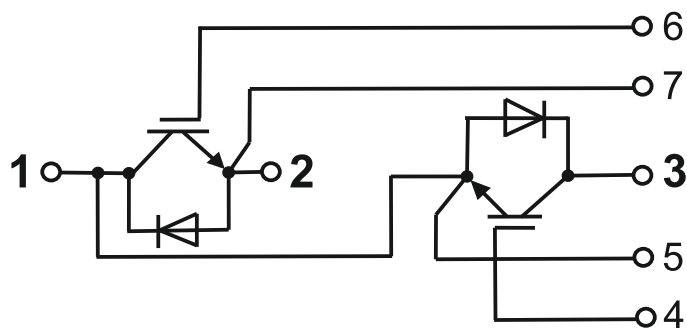


Characteristics Values

Diode						
Parameter	Conditons	Symbol	Min.	Typ.	Max.	Units
Forward Voltage	$I_F = 300A, V_{GE} = 0V$ $I_F = 300A, V_{GE} = 0V$ $I_F = 300A, V_{GE} = 0V$ $T_{vj} = 25^{\circ}C$ $T_{vj} = 125^{\circ}C$ $T_{vj} = 150^{\circ}C$	V_F		2.00 2.00 2.00	2.40	V
Peak Reverse Recovery Current	$I_F = 300A, V_R = 600V$ $-di/dt = 2800A/\mu s$ $V_{GE} = -15V$ $T_{vj} = 25^{\circ}C$ $T_{vj} = 125^{\circ}C$ $T_{vj} = 150^{\circ}C$	I_{RM}		160 165 170		A
Recovery Charge	$I_F = 300A, V_R = 600V$ $-di/dt = 2800A/\mu s$ $V_{GE} = -15V$ $T_{vj} = 25^{\circ}C$ $T_{vj} = 125^{\circ}C$ $T_{vj} = 150^{\circ}C$	Q_R		20.5 38.0 46.5		μC
Reverse Recovery Energy	$I_F = 300A, V_R = 600V$ $-di/dt = 2800A/\mu s$ $V_{GE} = -15V$ $T_{vj} = 25^{\circ}C$ $T_{vj} = 125^{\circ}C$ $T_{vj} = 150^{\circ}C$	E_{rec}		8.00 14.5 18.5		mJ
Thermal Resistance Junction to case	Per Diode	R_{thJC}		0.12		K/W
Temprature under switching conditions		$T_{vj op}$	-40		150	$^{\circ}C$

Module						
Parameter	Conditons	Symbol	Min.	Typ.	Max.	Units
Thermal resistance Case to Heatsink	per Module	R_{thCH}		0.05		K/W
Stray Induction Module		L_{sCE}		20		nH
Module Lead Resistance Terminals-Chip	$T_c = 25^{\circ}C$ per switch	$R_{CC'+EE'}$ $R_{AA'+CC'}$		0.70		m Ω
Storage Temerature		T_{stg}	-40		125	$^{\circ}C$
Mounting torque	Terminal M6	F	2.5		5.0	Nm
	Module M6		3.0		6.0	
Weight		W			320	g

Circuit Schematic



Package Outline

(All dimensions in mm)

