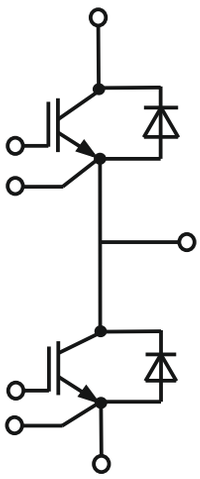
IGBT Module, 1200V/300A

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

Diode,Inverter
Maximum Rated Values

Parameter	Conditons	Symbol	Values	Units
Peak Repetitive Reverse Voltage	T_{vj} = 25°C	V_{RRM}	1200	V
Continuous DC Forward Current		I_F	300	A
Repetitive Peak Forward Current	I_{FRM} =2xI_F	I_{FRM}	600	A

Module				
Parameter	**Conditons**	**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	

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Characteristics Values

IGBT						
Parameter	**Conditons**	**Symbol**	**Min.**	**Typ.**	**Max.**	**Units**
Collector- Emitter Saturation Voltage	I_C =300A, V_{GE} = 15V T_{vj} = 25^{0}C I_C =300A, V_{GE} = 15V T_{vj} =125^{0}C I_C =300A, V_{GE} = 15V T_{vj} =150^{0}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^{0}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^{0}C	Q_G		2.2		nC
Internal Gate Resistor	T_{vj} = 25^{0}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^{0}C	I_{CES}			5	mA
Gate-emitter Leakage current	V_{CE} = 0V, V_{GE} = ±20V, T_{vj} = 25^{0}C	I_{GES}			±200	nA
Turn-on Delay Time Inductive Load	I_C =300A, V_{CE} = 600V T_{vj} = 25^{0}C V_{GE} = ± 15V T_{vj} =125^{0}C R_{Gon}=1.8Ω, T_{vj} =150^{0}C	t_{don}		120 120 120		ns
Rise Time Inductive Load	I_C =300A, V_{CE}= 600V T_{vj} = 25^{0}C V_{GE} = ± 15V T_{vj} =125^{0}C R_{Gon}=1.8Ω, T_{vj} =150^{0}C	t_r		65 75 75		ns
Turn-off Delay Time Inductive Load	I_C =300A, V_{CE} = 600V T_{vj} = 25^{0}C V_{GE} = ± 15V T_{vj} =125^{0}C R_{Goff}=6.8Ω, T_{vj} =150^{0}C	t_{doff}		425 565 575		ns
Fall Time Inductive Load	I_C =300A, V_{CE} = 600V T_{vj} = 25^{0}C V_{GE} = ± 15V T_{vj} =125^{0}C R_{Goff}=6.8Ω, T_{vj} =150^{0}C	t_f		40 40 40		ns
Turn-on Energy Loss per Pulse	I_C =300A, V_{CE} = 600V T_{vj} = 25^{0}C L_σ =80nH, V_{GE} = ± 15V T_{vj} =125^{0}C R_{Gon} =1.8Ω, T_{vj} =150^{0}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^{0}C L_σ =80nH, V_{GE} = ± 15V T_{vj} =125^{0}C V_{GE} = ± R_{Goff} =6.8Ω, T_{vj} =150^{0}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	^{0}C

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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^{0}C T_{vj} =125^{0}C T_{vj} =150^{0}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/us V_{GE} = - 15V	T_{vj} = 25^{0}C T_{vj} =125^{0}C T_{vj} =150^{0}C	I_{RM}		160 165 170		A
Recovery Charge	I_F =300A, V_R = 600V -di /dt=2800A/us V_{GE} = - 15V	T_{vj} = 25^{0}C T_{vj} =125^{0}C T_{vj} =150^{0}C	Q_R		20.5 38.0 46.5		uC
Reverse Recovery Energy	I_F =300A, V_R = 600V -di /dt=2800A/us V_{GE} = - 15V	T_{vj} = 25^{0}C T_{vj} =125^{0}C T_{vj} =150^{0}C	E_{rec}		8.00 14.5 18.5		mJ
Thermal Resistance Junction to case	Per Diode		$R_{th\ JC}$		0.12		K/W
Temprature under switching conditions			$T_{vj\ op}$	-40		150	^{0}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^{0}C per switch	$R_{CC'+EE'}$ $R_{AA'+CC'}$		0.70		mΩ
Storage Temerature		T_{stg}	-40		125	^{0}C
Mounting torque	Terminal M6	F	2.5		5.0	Nm
	Module M6		3.0		6.0	
Weight		W			320	g

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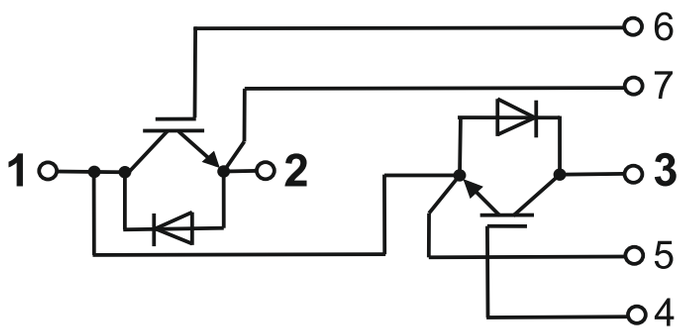
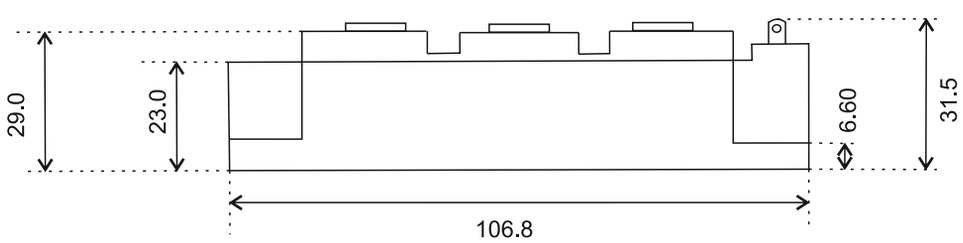
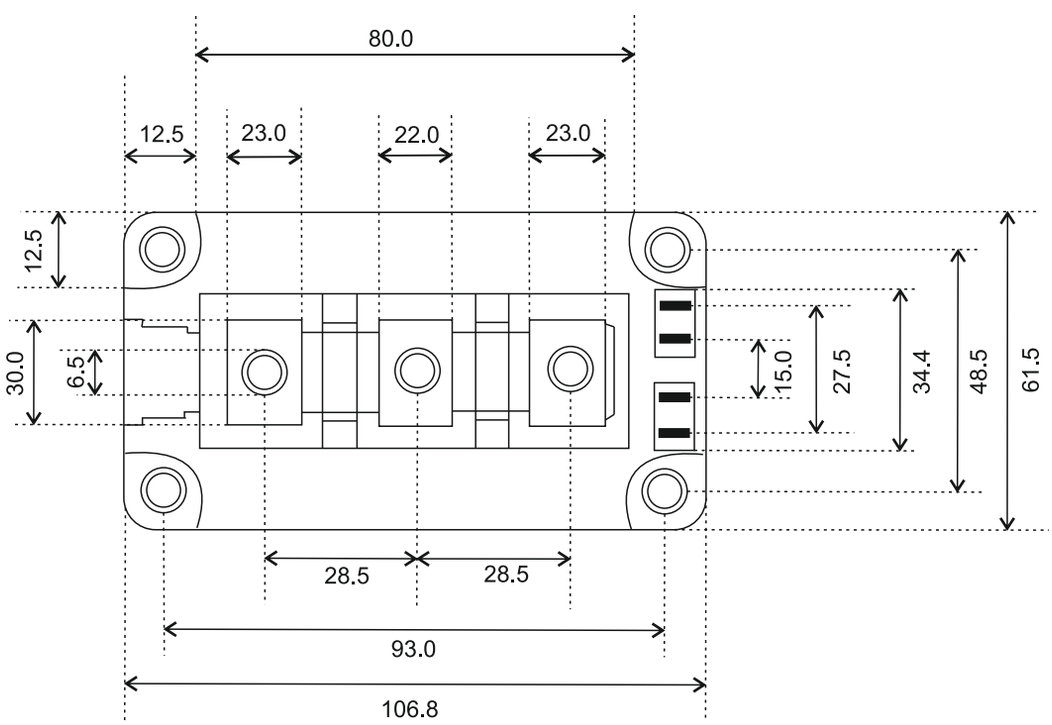
Circuit Schematic



Package Outline

(All dimensions in mm)





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