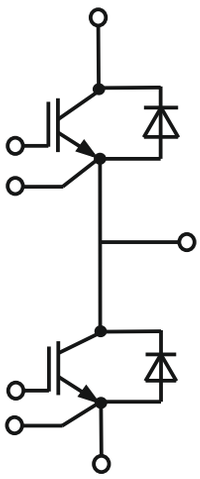
IGBT Module, 1200V/200A

Features

- 1200V 200A, $V_{CE(sat)}$=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}	1135	W
Continuous DC Collector Current		$I_{C\ nom}$	200	A
	T_c = 80°C, T_{vjmax} = 150°C	I_C	220	
Repetitive Peak Collector Current	I_{CRM} =2x$I_{C\ nom}$	I_{CRM}	400	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	200	A
Repetitive Peak Forward Current	I_{FRM} =2xI_F	I_{FRM}	400	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	

D-95, Sector 63, Noida – 201301, India • Tel: 0120-4205450 • Fax: 0120 -4273653
info@nainasemi.com • www.nainasemi.com

Characteristics Values

IGBT						
Parameter	**Conditons**	**Symbol**	**Min.**	**Typ.**	**Max.**	**Units**
Collector- Emitter Saturation Voltage	I_C =200A, V_{GE} = 15V T_{vj} = 25^{0}C I_C =200A, V_{GE} = 15V T_{vj} =125^{0}C I_C =200A, V_{GE} = 15V T_{vj} =150^{0}C	V_{CEsat}		2.50 2.90 3.00	3.20	V
Gate Threshold Voltage	V_{CE} = V_{GE}, I_C = 2 mA T_{vj} = 25^{0}C	$V_{GE(th)}$	5.0	6.0	7.0	V
Gate Charge	V_{GE} = -15V.....+15v	Q_G		1.40		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}		8.76		nF
Reverse Transfer Capacitance		C_{res}		0.40		
Collector-Emitter Cutoff Current	V_{CE} = 1200V, V_{GE} = 0V, T_{vj} = 25^{0}C	I_{CES}			2	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 =200A, V_{CE} = 600V T_{vj} = 25^{0}C V_{GE} = ± 15V T_{vj} =125^{0}C R_{Gon}=2.4Ω, T_{vj} =150^{0}C	t_{don}		58.5 60 60		ns
Rise Time Inductive Load	I_C =200A, V_{CE} = 600V T_{vj} = 25^{0}C V_{GE} = ± 15V T_{vj} =125^{0}C R_{Gon}=2.4Ω, T_{vj} =150^{0}C	t_r		50 55 60		ns
Turn-off Delay Time Inductive Load	I_C =200A, V_{CE} = 600V T_{vj} = 25^{0}C V_{GE} = ± 15V T_{vj} =125^{0}C R_{Goff}=10Ω, T_{vj} =150^{0}C	t_{doff}		415 480 485		ns
Fall Time Inductive Load	I_C =200A, V_{CE} = 600V T_{vj} = 25^{0}C V_{GE} = ± 15V T_{vj} =125^{0}C R_{Goff}=10Ω, T_{vj} =150^{0}C	t_f		32 40 45		ns
Turn-on Energy Loss per Pulse	I_C =200A, V_{CE} = 600V T_{vj} = 25^{0}C L_σ =80nH, V_{GE} = ± 15V T_{vj} =125^{0}C V_{GE} = ± 15V R_{Gon} =2.4Ω, T_{vj} =150^{0}C	E_{on}		19.0 27.0 29.5		mJ
Turn-off Energy Loss per Pulse	I_C =200A, V_{CE} = 600V T_{vj} = 25^{0}C L_σ =80nH, V_{GE} = ± 15V T_{vj} =125^{0}C V_{GE} = ± 15V R_{Goff} =10Ω, T_{vj} =150^{0}C	E_{off}		6.0 10.5 12.0		mJ
Thermal Resistance Junction to case	Per IGBT	$R_{th\,JC}$		0.11		K/W
Temprature under switching conditions		$T_{vj\,op}$	-40		150	^{0}C

D-95, Sector 63, Noida – 201301, India • Tel: 0120-4205450 • Fax: 0120 - 4273653
info@nainasemi.com • www.nainasemi.com

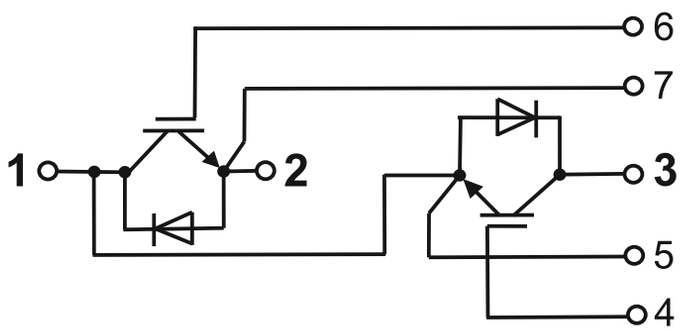
Characteristics Values

Diode						
Parameter	**Conditons**	**Symbol**	**Min.**	**Typ.**	**Max.**	**Units**
Forward Voltage	I_F =200A, V_{GE} = 0V T_{vj} = 25^{0}C I_F =200A, V_{GE} = 0V T_{vj} =125^{0}C I_F =200A, V_{GE} = 0V T_{vj} =150^{0}C	V_F		2.40 2.45 2.50	2.80	V
Peak Reverse Recovery Current	I_F =200A, V_R = 600V T_{vj} = 25^{0}C -di /dt=1980A/us (T_{vj} = 25^{0}C) T_{vj} =125^{0}C V_{GE} = - 15V T_{vj} =150^{0}C	I_{RM}		80 90 90		A
Recovery Charge	I_F =200A, V_R = 600V T_{vj} = 25^{0}C -di /dt=1980A/us (T_{vj} = 25^{0}C) T_{vj} =125^{0}C V_{GE} = - 15V T_{vj} =150^{0}C	Q_R		5.5 12.5 15.5		uC
Reverse Recovery Energy	I_F =200A, V_R = 600V T_{vj} = 25^{0}C -di /dt=1980A/us (T_{vj} = 25^{0}C) T_{vj} =125^{0}C V_{GE} = - 15V T_{vj} =150^{0}C	E_{rec}		1.90 5.50 7.00		mJ
Thermal Resistance Junction to case	Per Diode	$R_{th\ JC}$		0.25		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}		0.01		K/W
Stray Induction Module		L_{sCE}		20		nH
Module Lead Resistance Terminals-Chip	T_C = 25^{0}C per switch	$R_{CC'+EE'}$		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

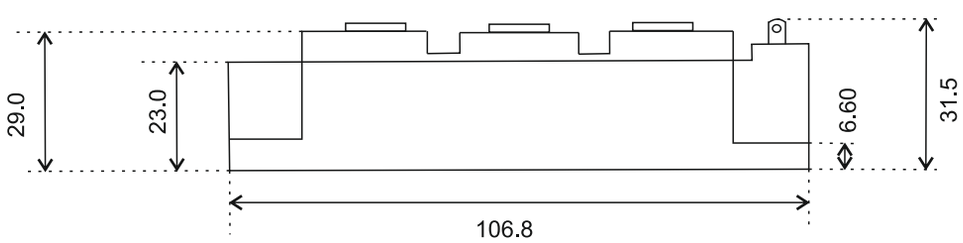
D-95, Sector 63, Noida – 201301, India • Tel: 0120-4205450 • Fax: 0120 -4273653
info@nainasemi.com • www.nainasemi.com

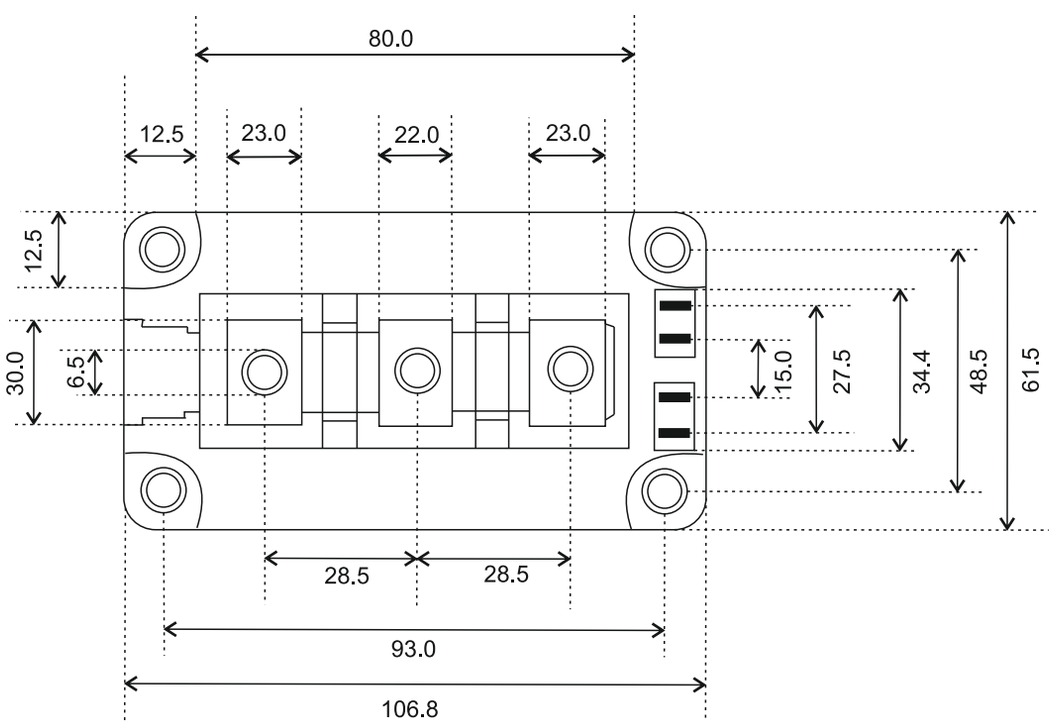
Circuit Schematic



Package Outline

(All dimensions in mm)





D-95, Sector 63, Noida – 201301, India • Tel: 0120-4205450 • Fax: 0120 -4273653
info@nainasemi.com • www.nainasemi.com