TENTATIVE

Nihon Inter Electronics Corporation

PIM MODULE 7.5KW 200V PVD75-6

Futures : Integrated in 3Phase Diode Bridge, Thyristor Switch, Inverter, Brake, and Snubber
For 7.5kw 200V Inverter

Approximate Weight : 400g

MAXMUM RATINGS (Tc=25°C)

Item			Symbol	Rated Value	Unit
3 Phase Rectification Diode	Repetitive Peak Reverse Voltage		V_{RRM}	800	V
	Non-Repetitive Peak Reverse Voltage		V_{RSM}	900	
	Average Rectified Out –Put Current		$I_{O(AV)}$	75	A
	Surge Forward Current		I_{FSM}	800	
	I Squared t		I^2t	3200	A^2s
	Critical Rate of Fall of Forward Current		-di/dt	160(@:I_{FM}=25A, V_R=500V)	A/μs
Switch Thyristor	Repetitive Peak Off-State Voltage		V_{DRM}	800	V
	Non-Repetitive Peak Off-State Voltage		V_{RSM}	900	
	Average Rectified Out-Put Current		$I_{O(AV)}$	75	A
	Surge Forward Current		I_{TSM}	800	
	I Squared t		I^2t	3200	A^2s
	Critical Rate Of Rise Of Turn-On Current		di/dt	100	A/μs
	Peak Gate Power		P_{GM}	5	W
	Average Gate Power		$P_{GM(AV)}$	1	
	Peak Gate Current		I_{GM}	2	A
	Peak Gate Voltage		V_{GM}	10	V
	Peak Gate Reverse Voltage		V_{RGM}	5	
Inverter IGBT	Collector-Emitter Voltage		V_{CES}	600	V
	Gate-Emitter Voltage		V_{GES}	+/- 20V	
	Collector Current	DC	I_C	75	A
		1ms	I_{CP}	150	
	Forward Current	DC	I_F	75	
		1ms	I_{FM}	150	
	Collector Power Dissipation		P_C	300	W
Brake IGBT	Collector-Emitter Voltage		V_{CES}	600	V
	Gate Emitter Voltage		V_{GES}	+/- 20V	
	Collector Current	DC	I_C	30	A
		1ms	I_{CP}	60	
	Collector Power Dissipation		P_C	178	W
Snubber Diode	Repetitive Peak Reverse Voltage		V_{RRM}	600	V
	Forward Current, DC		I_F	15	A
	Surge Forward Current		I_{FSM}	150	
Operating Junction Temperature Range			Tjw	-40 to +150°C(notes:+125 °C > Can not be biased.)	°C
Storage Temperature Range			Tstg	-40 to +125°C	
Isolation Voltage(Terminal to Base)			Viso	2500(@AC, 1minute), 3000(@AC, 1second)	V
Isolation Resistance(Terminal to Base, @DC=500V)			Riso	500	M.ohm
Mounting Torque(Module Base to Heatsink)			Ftor	(M4), 1.4	N·m

ELECTRICAL CHARACTERISTICS (Tc=25°C Unless otherwise noted)

Characteristic		Symbol	Test Condition		Min.	Typ.	Max.	Unit
3 Phase Rectification Diode	Peak Reverse Current *1	I_R	Tj=150°C, V_{RM}=V_{RRM}		-	-	10	mA
	Peak Reverse Voltage *1	V_F	I_F=80A		-	-	1.40	μA
Switch Thyristor	Peak OFF-State Current	I_{DM}	Tj=125°C, V_{DM}=V_{DRM}		-	-	50	mA
	Peak Reverse Current	I_{RM}	Tj=125°C, V_{RM}=V_{RRM}		-	-	50	
	Peak On-State Voltage	V_{TM}	I_T=80A		-	-	1.40	V
	Gate Current to Trigger	I_{GT}	V_D=6V I_T=1A	Tj=-40°C	-	-	200	mA
				Tj=25°C	-	-	100	
				Tj=125°C	-	-	50	
	Gate Voltage to Trigger	V_{GT}	V_D=6V I_T=1A	Tj=-40°C	-	-	40	V
				Tj=25°C	-	-	25	
				Tj=125°C	-	-	20	
	Gate Voltage to Non-Trigger	V_{GD}	Tj=125°C, V_D=2/3V_{DRM}		0.25	-	-	V
	Critical Rate Of Rise Of Off-State Voltage	dv/dt			500	-	-	V/μs

Switch Thyristor	Turn-Off Time		tq	Tj=125°C, V_D=2/3V_{DRM} V_{RM}=100V, dv/dt=20V/μs -di/dt=20A/μs	-	100	-	μs
	Turn-On Time		tgt	Tj=25°C, V_D=2/3V_{DRM} I_G=200mA -di$_G$/dt=0.2A/μs	-	6	-	
	Delay Time		td		-	2	-	
	Rise Time		tr		-	4	-	
	Latching Current		I_L		-	100	-	mA
	Holding Current		I_H		-	80	-	
Inverter IGBT	Collector-Emitter Out-Off Current		I_{CES}	V_{CE}=600V,V_{GE}=0V	-	-	1.0	mA
	Gate-Emitter Leakage Current		I_{GES}	V_{GE}=+/- 20V,V_{CE}=0V	-	-	0.5	μA
	Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	I_C=75A,V_{GE}=15V	-	2.1	2.6	V
	Gate-Emitter Threshold Voltage		$V_{CE(th)}$	V_{CE}=5V,I_C=75mA	4.0	-	8.0	V
	Input Capacitance		Cies	V_{CE}=10V,V_{GE}=0V,f=1MHz	-	7500	-	pF
	Switching Time	Rise Time	tr	V_{CC}= 300V R_L= 2 ohm R_G= 10 ohm V_{GE}= +/- 15V	-	0.15	0.30	μs
		Turn-On Time	ton		-	0.25	0.40	
		Fall Time	tf		-	0.20	0.35	
		Turn-Off Time	toff		-	0.45	0.7	
	Peak Forward Voltage		V_F	I_F=75A	-	1.9	2.4	V
	Reverse Recovery Time		trr	I_F=75A,V_{GE}=-10V, di/dt=75A/μs	-	0.15	0.25	μs
Brake IGBT	Collector-Emitter Cut-Off Current		I_{CES}	V_{CE}=600V,V_{GE}=0V	-	-	1.0	mA
	Gate-Emitter Leakage Current		I_{GES}	V_{GE}=+/- 20V,V_{CE}=0V	-	-	0.5	μA
	Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	I_C=30A,V_{GE}=15V	-	2.0	2.5	V
	Gate-Emitter Threshold Voltage		$V_{GE(th)}$	V_{CE}=5V,I_C=30mA	4.0	-	8.0	V
	Input Capacitance		Cies	V_{CE}=10V,V_{GE}=0V,f=1MHz	-	4000	-	pF
	Switching Time	Rise Time	t_r	V_{CC}= 300V R_L= 10 ohm R_G= 15 ohm V_{GE}= +/- 15V	-	0.15	0.3	μs
		Turn-on Time	t_{on}		-	0.25	0.4	
		Fall Time	t_f		-	0.20	0.35	
		Turn-off Time	t_{off}		-	0.45	0.7	
Snubber Diode	Peak Forward Voltage		V_F	I_F=15A	-	-	2.5	V
	Reverse Recovery Time		trr	I_F=15A, di/dt=50A/μs	-	-	0.3	μs

*1: per 1arm

ELECTRICAL CHARACTERISTICS (Tc=25°C Unless otherwise noted)

Thermister	Resistance	25°C	-	5.00	-	k. ohm
		75°C	-	0.97	-	
		125°C	-	0.27	-	
	B-Value	25°C/50°C	-	3375	-	K
		25°C/85°C	-	3420	-	
	Thermal Time Constant		-	10	-	s

THERMAL CHARACTERISTICS

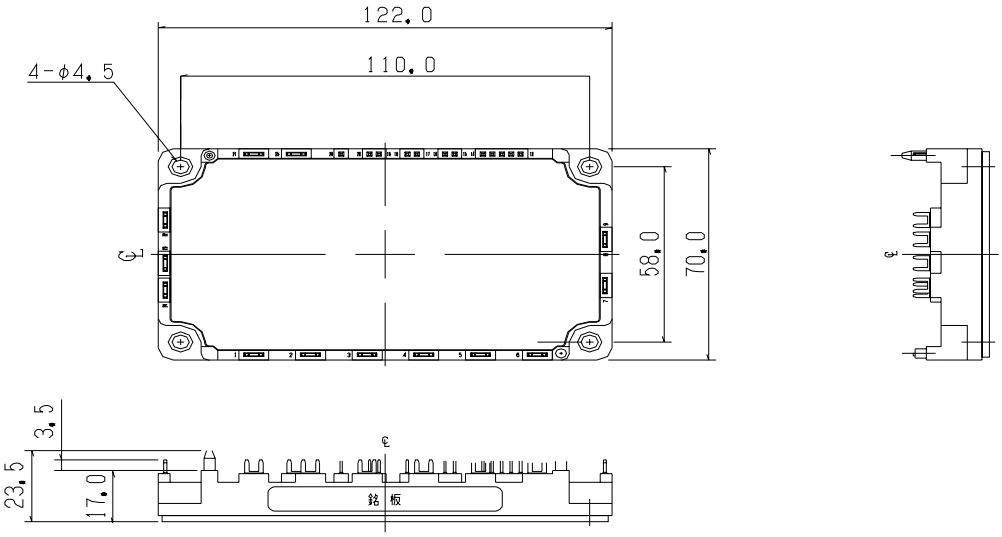
Characteristic			Test Condition	Min.	Typ.	Max.	Unit
Thermal Impedance	$R_{th(j-c)}$ Junction to Case	3 Phase Rectification Diode	Per :1 arm.	-	-	0.75	°C/W
		Switch Thyristor		-	-	0.55	
		Inverter IGBT		-	-	0.42	
		Inverter Free Wheeling Diode		-	-	0.90	
		Brake IGBT		-	-	0.70	

TENTATIVE

Nihon Inter Electronics Corporation

PVD75-6 OUTLINE DRAWING

(Dimensions in mm)



CIRCUIT