

## PIM MODULE 11KW 200V

## PVD110-6

Futures : Integrated in 3Phase Diode Bridge, Thyristor Switch, Inverter, Brake, and Snubber  
For 11kw 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	$I_{O(AV)}$	100	A
	Surge Forward Current	$I_{FSM}$	900	
	I Squared t	$I^2t$	4050	A <sup>2</sup> s
	Critical Rate of Fall of Forward Current	-di/dt	160(@ :I <sub>FM</sub> =60A, V <sub>R</sub> =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	$I_{O(AV)}$	100	A
	Surge Forward Current	$I_{TSM}$	1000	
	I Squared t	$I^2t$	5000	A <sup>2</sup> s
	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	$I_C$	A
		1ms	$I_{CP}$	
	Forward Current	DC	$I_F$	
		1ms	$I_{FM}$	
Brake IGBT	Collector Power Dissipation	$P_C$	390	W
	Collector-Emitter Voltage	$V_{CES}$	600	V
	Gate Emitter Voltage	$V_{GES}$	+/- 20V	
	Collector Current	DC	$I_C$	A
		1ms	$I_{CP}$	
Snubber Diode	Collector Power Dissipation	$P_C$	215	W
	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		$T_{JW}$	-40 to +150°C (notes: +125 °C > Can not be biased.)	°C
Storage Temperature Range		$T_{stg}$	-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 <sub>R</sub>	T <sub>J</sub> =150°C, V <sub>RM</sub> =V <sub>RRM</sub>		-	-	10	mA
	Peak Reverse Voltage *1	V <sub>F</sub>	I <sub>F</sub> =100A		-	-	1.50	μA
Switch Thyristor	Peak OFF-State Current	I <sub>DM</sub>	T <sub>J</sub> =125°C, V <sub>DM</sub> =V <sub>DRM</sub>		-	-	50	mA
	Peak Reverse Current	I <sub>RM</sub>	T <sub>J</sub> =125°C, V <sub>RM</sub> =V <sub>RRM</sub>		-	-	50	
	Peak On-State Voltage	V <sub>TM</sub>	I <sub>T</sub> =100A		-	-	1.50	V
	Gate Current to Trigger	I <sub>GT</sub>	V <sub>D</sub> =6V I <sub>T</sub> =1A	T <sub>J</sub> =-40°C	-	-	200	mA
				T <sub>J</sub> =25°C	-	-	100	
				T <sub>J</sub> =125°C	-	-	50	
	Gate Voltage to Trigger	V <sub>GT</sub>	V <sub>D</sub> =6V I <sub>T</sub> =1A	T <sub>J</sub> =-40°C	-	-	40	V
				T <sub>J</sub> =25°C	-	-	25	
				T <sub>J</sub> =125°C	-	-	20	
	Gate Voltage to Non-Trigger	V <sub>GD</sub>	T <sub>J</sub> =125°C, V <sub>D</sub> =2/3V <sub>DRM</sub>		0.25	-	-	V
Critical Rate Of Rise Of Off-State Voltage	dv/dt	T <sub>J</sub> =125°C, V <sub>D</sub> =2/3V <sub>DRM</sub>		500	-	-	V/μs	

TENTATIVE



Switch Thyristor	Turn-Off Time		tq	T <sub>J</sub> =125°C, V <sub>D</sub> =2/3V <sub>DRM</sub> V <sub>RM</sub> =100V, dv/dt=20V/μs -di/dt=20A/μs	-	100	-	μs
	Turn-On Time		tgt	T <sub>J</sub> =25°C, V <sub>D</sub> =2/3V <sub>DRM</sub>	-	6	-	
	Delay Time		td	I <sub>C</sub> =200mA	-	2	-	
	Rise Time		tr	-di/dt=0.2A/μs	-	4	-	
	Latching Current		I <sub>L</sub>		-	100	-	mA
	Holding Current		I <sub>H</sub>		-	80	-	
Inverter IGBT	Collector-Emitter Out-Off Current		I <sub>CES</sub>	V <sub>CE</sub> =600V, V <sub>GE</sub> =0V	-	-	1.0	mA
	Gate-Emitter Leakage Current		I <sub>GES</sub>	V <sub>GE</sub> =+/- 20V, V <sub>CE</sub> =0V	-	-	0.5	μA
	Collector-Emitter Saturation Voltage		V <sub>CE(sat)</sub>	I <sub>C</sub> =100A, V <sub>GE</sub> =15V	-	2.1	2.6	V
	Gate-Emitter Threshold Voltage		V <sub>GE(th)</sub>	V <sub>CE</sub> =5V, I <sub>C</sub> =100mA	4.0	-	8.0	V
	Input Capacitance		C <sub>ies</sub>	V <sub>CE</sub> =10V, V <sub>GE</sub> =0V, f=1MHz	-	10000	-	pF
	Switching Time	Rise Time	t <sub>r</sub>	V <sub>CC</sub> = 300V	-	0.15	0.30	μs
		Turn-On Time	t <sub>on</sub>	R <sub>L</sub> = 3 ohm	-	0.25	0.40	
		Fall Time	t <sub>f</sub>	R <sub>G</sub> = 7.5 ohm	-	0.20	0.35	
		Turn-Off Time	t <sub>off</sub>	V <sub>GE</sub> = +/- 15V	-	0.45	0.7	
	Peak Forward Voltage		V <sub>F</sub>	I <sub>F</sub> =100A	-	1.9	2.4	V
	Reverse Recovery Time		t <sub>rr</sub>	I <sub>F</sub> =100A, V <sub>GE</sub> =-10V, d/dt=100A/μs	-	0.15	0.25	μs
Brake IGBT	Collector-Emitter Cut-Off Current		I <sub>CES</sub>	V <sub>CE</sub> =600V, V <sub>GE</sub> =0V	-	-	1.0	mA
	Gate-Emitter Leakage Current		I <sub>GES</sub>	V <sub>GE</sub> =+/- 20V, V <sub>CE</sub> =0V	-	-	0.5	μA
	Collector-Emitter Saturation Voltage		V <sub>CE(sat)</sub>	I <sub>C</sub> =50A, V <sub>GE</sub> =15V	-	2.1	2.6	V
	Gate-Emitter Threshold Voltage		V <sub>GE(th)</sub>	V <sub>CE</sub> =5V, I <sub>C</sub> =50mA	4.0	-	8.0	V
	Input Capacitance		C <sub>ies</sub>	V <sub>CE</sub> =10V, V <sub>GE</sub> =0V, f=1MHz	-	5000	-	pF
	Switching Time	Rise Time	t <sub>r</sub>	V <sub>CC</sub> = 300V	-	0.15	0.3	μs
		Turn-on Time	t <sub>on</sub>	R <sub>L</sub> = 6 ohm	-	0.25	0.4	
		Fall Time	t <sub>f</sub>	R <sub>G</sub> = 10 ohm	-	0.20	0.35	
		Turn-off Time	t <sub>off</sub>	V <sub>GE</sub> = +/- 15V	-	0.45	0.7	
Snubber Diode	Peak Forward Voltage		V <sub>F</sub>	I <sub>F</sub> =15A	-	-	2.5	V
	Reverse Recovery Time		t <sub>rr</sub>	I <sub>F</sub> =15A, di/dt=50A/μs	-	-	0.3	μs

\*1: per 1arm

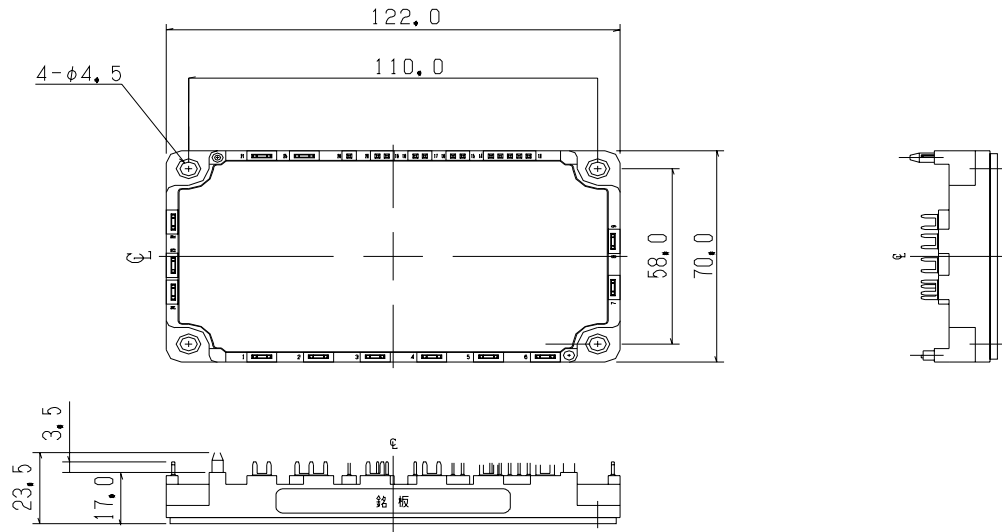
ELECTRICAL CHARACTERISTICS (T<sub>c</sub>=25°C Unless otherwise noted)

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 <sub>th(j-c)</sub> Junction to Case	3 Phase Rectification Diode	Per :1 arm.		-	-	0.50	°C/W
		Switch Thyristor			-	-	0.45	
		Inverter IGBT			-	-	0.32	
		Inverter Free Wheeling Diode			-	-	0.70	
		Brake IGBT			-	-	0.58	

PVD110-6 OUTLINE DRAWING  
(Dimensions in mm)



CIRCUIT

