

PIM MODULE 11KW 400V

PVD110-12

Futures : Integrated in 3Phase Diode Bridge, Thyristor Switch, Inverter, Brake, and Snubber
For 11kw 400V Inverter

Approximate Weight : 400g

MAXMUM RATINGS (Tc=25°C)

Item		Symbol	Rated Value	Unit
3 Phase Rectification Diode	Repetitive Peak Reverse Voltage	V_{RRM}	1600	V
	Non-Repetitive Peak Reverse Voltage	V_{RSM}	1700	
	Average Rectified Out –Put Current	$I_{Q(AV)}$	50	A
	Surge Forward Current	I_{FSM}	440	
	I Squared t	I^2t	968	A ² s
	Critical Rate of Fall of Forward Current	-di/dt	200(@ :I _{FM} =25A, V _R =1000V)	A/μs
Switch Thyristor	Repetitive Peak Off-State Voltage	V_{DRM}	1600	V
	Non-Repetitive Peak Off-State Voltage	V_{RSM}	1700	
	Average Rectified Out-Put Current	$I_{Q(AV)}$	50	A
	Surge Forward Current	I_{TSM}	440	
	I Squared t	I^2t	968	A ² 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}	1200	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	312	W
	Collector-Emitter Voltage	V_{CES}	1200	V
	Gate Emitter Voltage	V_{GES}	+/- 20V	
	Collector Current	DC	I_C	A
		1ms	I_{CP}	
Snubber Diode	Collector Power Dissipation	P_C	186	W
	Repetitive Peak Reverse Voltage	V_{RRM}	1200	V
	Forward Current, DC	I_F	15	A
	Surge Forward Current	I_{FSM}	70	
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_R	T _j =150°C, V _{RM} =V _{RRM}	-	-	10	mA
	Peak Reverse Voltage *1	V_F	I _F =50A	-	-	1.45	μA
Switch Thyristor	Peak OFF-State Current	I_{DM}	T _j =125°C, V _{DM} =V _{DRM}	-	-	50	mA
	Peak Reverse Current	I_{RM}	T _j =125°C, V _{RM} =V _{RRM}	-	-	50	
	Peak On-State Voltage	V_{TM}	I _T =50A	-	-	1.30	V
	Gate Current to Trigger	I_{GT}	V _D =6V I _T =1A	T _j =-40°C	-	200	mA
				T _j =25°C	-	100	
				T _j =125°C	-	50	
	Gate Voltage to Trigger	V_{GT}	V _D =6V I _T =1A	T _j =-40°C	-	40	V
				T _j =25°C	-	25	
				T _j =125°C	-	20	
	Gate Voltage to Non-Trigger	V_{GD}	T _j =125°C, V _D =2/3V _{DRM}	0.25	-	-	V
	Critical Rate Of Rise Of Off-State Voltage	dv/dt		500	-	-	V/μs

TENTATIVE



Switch Thyristor	Turn-Off Time		tq	T _J =125°C, V _D =2/3V _{DRM} V _{RM} =100V, dv/dt=20V/μs -di/dt=20A/μs	-	100	-	μs
	Turn-On Time		tgt	T _J =25°C, V _D =2/3V _{DRM}	-	6	-	
	Delay Time		td	I _G =200mA	-	2	-	
	Rise Time		tr	-di/dt=0.2A/μs	-	4	-	
	Latching Current		I _L		-	100	-	mA
	Holding Current		I _H		-	80	-	
Inverter IGBT	Collector-Emitter Out-Off Current		I _{CEs}	V _{CE} =1200V, V _{GE} =0V	-	-	1.0	mA
	Gate-Emitter Leakage Current		I _{GES}	V _{GE} =+/- 20V, V _{CE} =0V	-	-	1.0	μA
	Collector-Emitter Saturation Voltage		V _{CE(sat)}	I _C =50A, V _{GE} =15V	-	1.9	2.4	V
	Gate-Emitter Threshold Voltage		V _{CE(th)}	V _{CE} =5V, I _C =50mA	4.0	-	8.0	V
	Input Capacitance		C _{ies}	V _{CE} =10V, V _{GE} =0V, f=1MHz	-	4200	-	pF
	Switching Time	Rise Time	tr	V _{CC} = 600V	-	0.25	0.45	μs
		Turn-On Time	ton	R _L = 12 ohm	-	0.40	0.70	
		Fall Time	tf	R _G = 20 ohm	-	0.25	0.35	
		Turn-Off Time	toff	V _{GE} = +/- 15V	-	0.80	1.10	
	Peak Forward Voltage		V _F	I _F =50A	-	1.9	2.4	V
	Reverse Recovery Time		trr	I _F =50A, V _{GE} =-10V, di/dt=100A/μs	-	0.2	0.3	μs
Brake IGBT	Collector-Emitter Cut-Off Current		I _{CEs}	V _{CE} =1200V, V _{GE} =0V	-	-	1.0	mA
	Gate-Emitter Leakage Current		I _{GES}	V _{GE} =+/- 20V, V _{CE} =0V	-	-	1.0	μA
	Collector-Emitter Saturation Voltage		V _{CE(sat)}	I _C =25A, V _{GE} =15V	-	2.0	3.3	V
	Gate-Emitter Threshold Voltage		V _{GE(th)}	V _{CE} =5V, I _C =25mA	3.0	-	7.0	V
	Input Capacitance		C _{ies}	V _{CE} =10V, V _{GE} =0V, f=1MHz	-	2500	-	pF
	Switching Time	Rise Time	tr	V _{CC} = 600V	-	0.3	0.6	μs
		Turn-on Time	ton	R _L = 24 ohm	-	0.5	1.0	
		Fall Time	tf	R _G = 91 ohm	-	0.3	0.5	
		Turn-off Time	toff	V _{GE} = +/- 15V	-	0.80	1.5	
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

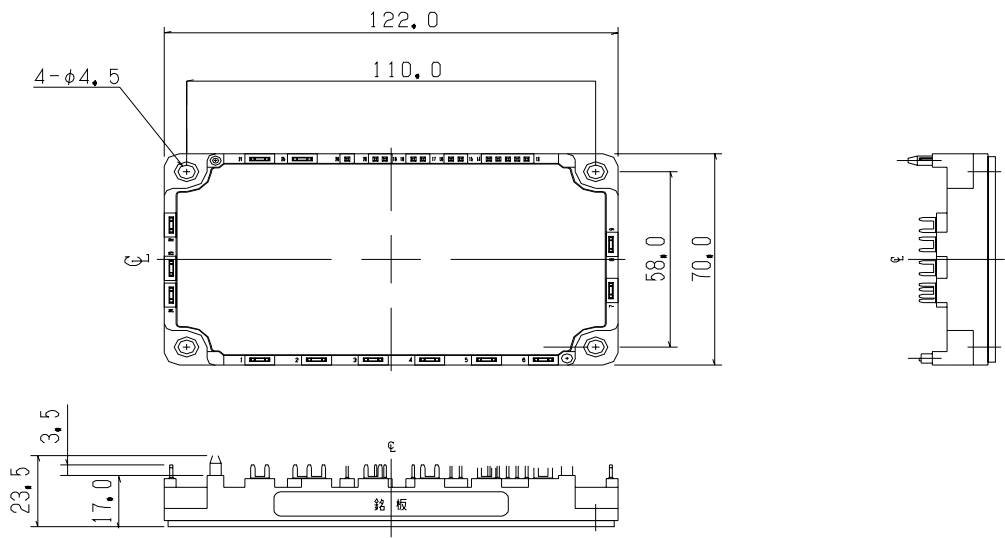
ELECTRICAL CHARACTERISTICS (T_c=25°C Unless otherwise noted)

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.		-	-	0.53	°C/W
		Switch Thyristor			-	-	0.50	
		Inverter IGBT			-	-	0.40	
		Inverter Free Wheeling Diode			-	-	0.70	
		Brake IGBT			-	-	0.67	

PVD110-12 OUTLINE DRAWING
(Dimensions in mm)



CIRCUIT

