

Futures : Integrated in 3Phase Diode Bridge, Thyristor Switch, Inverter, Brake, and Snubber
For 5.5kw 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	$I_{O(AV)}$	50	A	
	Surge Forward Current	I_{FSM}	350		
	I Squared t	I^2t	612	A ² s	
	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	$I_{O(AV)}$	50	A	
	Surge Forward Current	I_{TSM}	350		
	I Squared t	I^2t	612	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}	600	V
Gate-Emitter Voltage		V_{GES}	+/- 20V		
Collector Current		DC	I_C	50	A
		1ms	I_{CP}	100	
Forward Current		DC	I_F	50	
		1ms	I_{FM}	100	
Collector Power Dissipation	P_C	198	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		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	$T_J=150^\circ\text{C}, V_{RM}=V_{RRM}$	-	-	10	mA	
	Peak Reverse Voltage *1	V_F	$I_F=50\text{A}$	-	-	1.40	μA	
Switch Thyristor	Peak OFF-State Current	I_{DM}	$T_J=125^\circ\text{C}, V_{DM}=V_{DRM}$	-	-	50	mA	
	Peak Reverse Current	I_{RM}	$T_J=125^\circ\text{C}, V_{RM}=V_{RRM}$	-	-	50		
	Peak On-State Voltage	V_{TM}	$I_T=50\text{A}$	-	-	1.3 0	V	
	Gate Current to Trigger	I_{GT}	$V_D=6\text{V}$ $I_T=1\text{A}$	$T_J=-40^\circ\text{C}$	-	-	200	mA
				$T_J=25^\circ\text{C}$	-	-	100	
				$T_J=125^\circ\text{C}$	-	-	50	
	Gate Voltage to Trigger	V_{GT}	$V_D=6\text{V}$ $I_T=1\text{A}$	$T_J=-40^\circ\text{C}$	-	-	40	V
				$T_J=25^\circ\text{C}$	-	-	25	
$T_J=125^\circ\text{C}$				-	-	20		
Gate Voltage to Non-Trigger	V_{GD}	$T_J=125^\circ\text{C}, V_D=2/3V_{DRM}$	0.25	-	-	V		
Critical Rate Of Rise Of Off-State Voltage	dv/dt		500	-	-	V/μs		

Switch Thyristor	Turn-Off Time	tq	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 _C =200mA	-	2	-		
	Rise Time	tr	-dic/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} =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 =50A, V _{GE} =15V	-	2.1	2.6	V	
	Gate-Emitter Threshold Voltage	V _{GE(th)}	V _{CE} =5V, I _C =50mA	4.0	-	8.0	V	
	Input Capacitance	C _{ies}	V _{CE} =10V, V _{GE} =0V, f=1MHz	-	5000	-	pF	
	Switching Time	Rise Time	t _r	V _{CC} = 300V	-	0.15	0.30	μs
		Turn-On Time	t _{on}	R _L = 2 ohm	-	0.25	0.40	
		Fall Time	t _f	R _G = 10 ohm	-	0.20	0.35	
		Turn-Off Time	t _{off}	V _{GE} = +/- 15V	-	0.45	0.7	
	Peak Forward Voltage	V _F	I _F =50A	-	1.9	2.4	V	
Reverse Recovery Time	t _{rr}	I _F =50A, V _{CE} =-10V, di/dt=50A/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	C _{ies}	V _{CE} =10V, V _{GE} =0V, f=1MHz	-	4000	-	pF	
	Switching Time	Rise Time	t _r	V _{CC} = 300V	-	0.15	0.3	μs
		Turn-on Time	t _{on}	R _L = 10 ohm	-	0.25	0.4	
Fall Time		t _f	R _G = 15 ohm	-	0.20	0.35		
Turn-off Time		t _{off}	V _{GE} = +/- 15V	-	0.45	0.7		
Snubber Diode	Peak Forward Voltage	V _F	I _F =15A	-	-	2.5	V	
	Reverse Recovery Time	t _{rr}	I _F =15A, di/dt=50A/μs	-	-	0.3	μs	

*1: per 1arm

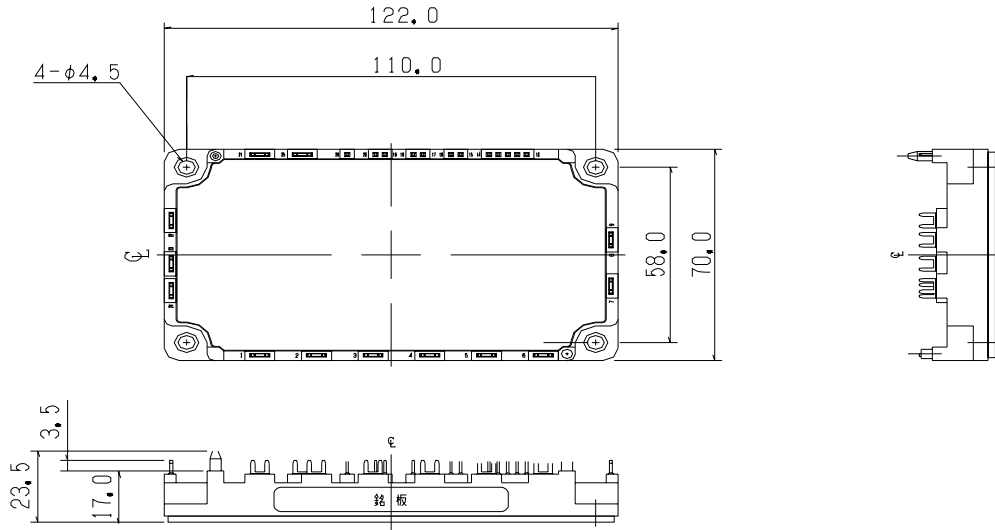
ELECTRICAL CHARACTERISTICS (T_c=25°C Unless otherwise noted)

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	-	-	0.95	°C/W
		Switch Thyristor	-	-	0.55	
		Inverter IGBT	-	-	0.63	
		Inverter Free Wheeling Diode	-	-	1.33	
		Brake IGBT	-	-	0.70	

PVD55-6 OUTLINE DRAWING
(Dimensions in mm)



CIRCUIT

