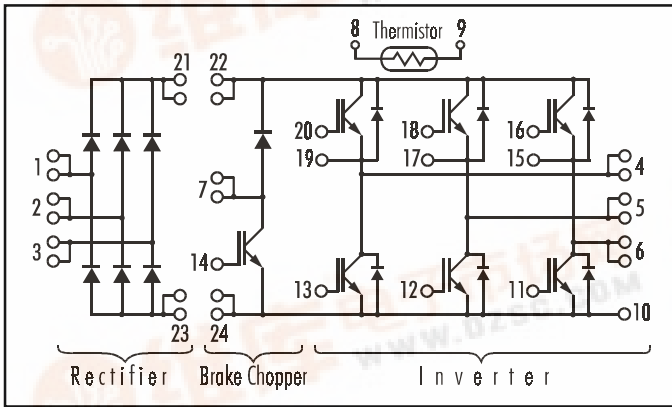


Power Integrated Module (PIM)

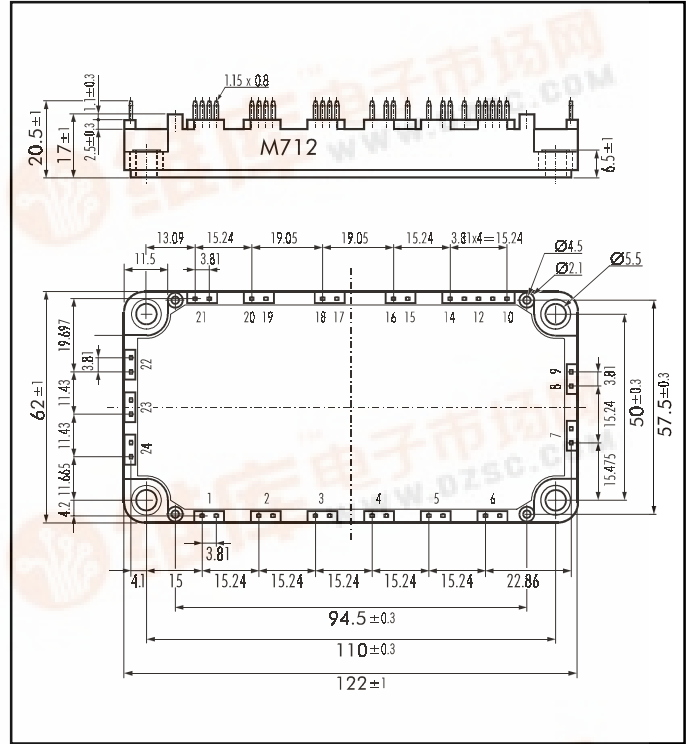
■ Features

- NPT-Technology
- Solderable Package
- Square SC SOA at 10 x I_C
- High Short Circuit Withstand-Capability
- Small Temperature Dependence of the Turn-Off Switching Loss
- Low Losses And Soft Switching

■ Equivalent Circuit



■ Outline Drawing



■ Absolute Maximum Ratings (T_c=25°C)

	Items	Symbols	Test Conditions		Ratings	Units	
Inverter	Collector-Emitter Voltage	V _{CES}			1200	V	
	Gate -Emitter Voltage	V _{GES}			± 20		
	Collector Current	I _C	I _{C PULSE}	Continuous	25°C / 80°C	75 / 50	A
				1ms	25°C / 80°C	150 / 100	
		-I _{C PULSE}			50		
Collector Power Dissipation	P _C	1 device		360	W		
Rectifier	Repetitive Peak Reverse Voltage	V _{RRM}			1600	V	
	Average Output Current	I _O	50Hz/60Hz sinus wave		50	A	
	Surge Current (Non Repetitive)	I _{FSM}	T _j =150°C, 10 ms, sinus wave		520		
	I _t (Non Repetitive)					1352	A ² s
Brake Chopper	Collector-Emitter Voltage	V _{CES}			1200	V	
	Gate -Emitter Voltage	V _{GES}			± 20		
	Collector Current	I _C	I _{C PULSE}	Continuous	25°C / 80°C	35 / 25	A
				1ms	25°C / 80°C	70 / 50	
	Collector Power Dissipation	P _C	1 device		180	W	
Repetitive Peak Reverse Voltage	V _{RRM}			1200	V		
Operating Junction Temperature		T _j			+150	°C	
Storage Temperature		T _{Stg}			-40 ~ +125		
Isolation Voltage		V _{ISO}	A.C. 1min.		2500	V	
Mounting Screw Torque*				3.5	Nm		

Note: *:Recommendable Value; 2.5 ~ 3.5 Nm (M5)

■ Electrical Characteristics($T_j=25^\circ\text{C}$)

Items		Symbols	Test Conditions	Min.	Typ.	Max.	Units	
Inverter	IGBT	Zero Gate Voltage Collector Current	I_{CES}	$V_{GE}=0V$ $V_{CE}=1200V$		1.0	mA	
		Gate-Emitter Leakage Current	I_{GES}	$V_{CE}=0V$ $V_{GE}=\pm 20V$		200	nA	
		Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$V_{GE}=20V$ $I_C=50mA$	5.5	7.2	8.5	V
		Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_{GE}=15V$ $I_C = 50A$	Chip	2.1		
					Terminal	2.3		
	Input Capacitance	C_{ies}	$f=1MHz$, $V_{GE}=0V$, $V_{CE}=10V$		6000		pF	
	Turn-on Time	t_{on}	$V_{CC} = 600V$			0.35	1.2	μs
		$t_{r,x}$	$I_C = 50A$			0.25	0.6	
		$t_{r,i}$	$V_{GE} = \pm 15V$			0.10		
		Turn-off Time	t_{off}		$R_G = 24\Omega$		0.45	
t_f			Inductive Load			0.08	0.3	
FRD	Diode Forward On-Voltage	V_F	$I_F=50A$	Chip	2.3		V	
				Terminal	2.5	3.3		
	Reverse Recovery Time	t_{rr}	$I_F=50A$			350	ns	
Rectifier	Forward Voltage	V_{FM}	$I_F=50A$	Chip	1.1		V	
				Terminal	1.2	1.5		
	Reverse Current	I_{RRM}	$V_R=1600V$			1.0	mA	
Brake Chopper	Zero Gate Voltage Collector Current	I_{CES}	$V_{GE}=0V$ $V_{CE}=1200V$			1.0	mA	
	Gate-Emitter Leakage Current	I_{GES}	$V_{CE}=0V$ $V_{GE}=\pm 20V$			200	nA	
	Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_{GE}=15V$	Chip	2.10			
			$I_C=50A$	Terminal	2.25	2.7		
	Turn-on Time	t_{on}	$V_{CC} = 600V$		0.35	1.2		
		$t_{r,x}$	$I_C = 15A$		0.25	0.6		
		t_{off}	$V_{GE} = \pm 15V$		0.45	1.0		
Turn-off Time	t_f	$R_G = 51\Omega$		0.08	0.3			
	Reverse Current	I_{RRM}	$V_R=1200V$			1.0	mA	
NTC	Resistance	R	$T= 25^\circ\text{C}$		5000		Ω	
			$T=100^\circ\text{C}$	465	495	520		
	B Value	B	$T=25 / 50^\circ\text{C}$	3305	3375	3450	K	

■ Thermal Characteristics

Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance (1 device)	$R_{th(j-c)}$	Inverter IGBT			0.35	$^\circ\text{C/W}$
		Inverter FRD			0.75	
		Brake IGBT			0.69	
		Rectifier Diode			0.50	
Contact Thermal Resistance	$R_{th(c-f)}$	With Thermal Compound		0.05		

