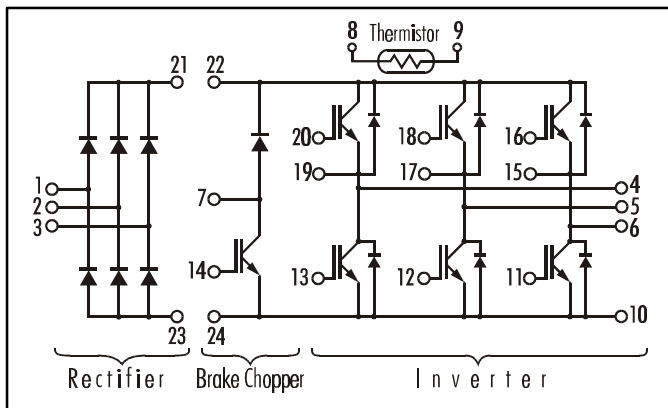


Power Integrated Module (PIM)

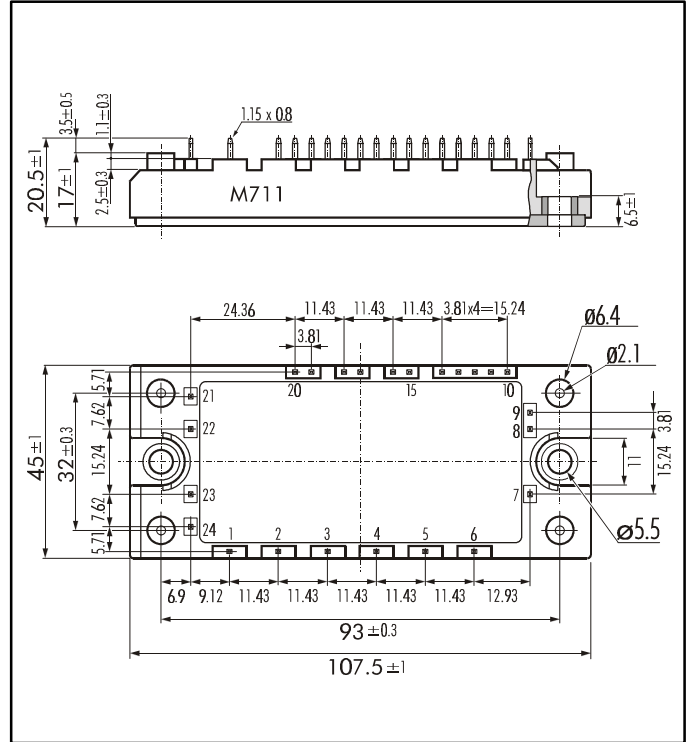
■ Features

- PT-Technology
- Solderable Package
- 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 ($T_c=25^\circ\text{C}$)

	Items	Symbols	Test Conditions	Ratings	Units	
Inverter	Collector-Emitter Voltage	V_{CES}		600	V	
	Gate -Emitter Voltage	V_{GES}		± 20		
	Collector Current	I_C		Continuous	50	A
		$I_{C\ PULSE}$		1ms	100	
		$-I_C\ PULSE$			50	
Collector Power Dissipation	P_C		1 device	200	W	
Rectifier	Repetitive Peak Reverse Voltage	V_{RRM}		800	V	
	Average Output Current	I_O	50Hz/60Hz sinus wave	50	A	
	Surge Current (Non Repetitive)	I_{FSM}	$T_j=150^\circ\text{C}$, 10 ms, sinus wave	350	A^2s	
	I^2t (Non Repetitive)			613		
Brake Chopper	Collector-Emitter Voltage	V_{CES}		600	V	
	Gate -Emitter Voltage	V_{GES}		± 20		
	Collector Current	I_C		Continuous	30	A
		$I_{C\ PULSE}$		1ms	60	
	Collector Power Dissipation	P_C		1 device	120	W
Repetitive Peak Reverse Voltage	V_{RRM}			600	V	
Operating Junction Temperature	T_j			+150	$^\circ\text{C}$	
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°C)

Items		Symbols	Test Conditions	Min.	Typ.	Max.	Units	
Inverter	IGBT	Zero Gate Voltage Collector Current	I _{CES}	V _{GE} =0V V _{CE} =600V			1.0	mA
		Gate-Emitter Leakage Current	I _{GES}	V _{CE} =0V V _{GE} =±20V			200	nA
		Gate-Emitter Threshold Voltage	V _{GE(th)}	V _{GE} =20V I _C =50mA	5.5	7.8	8.5	V
		Collector-Emitter Saturation Voltage	V _{CE(sat)}	V _{GE} =15V I _C = 50A		1.8	2.40	
		Input Capacitance	C _{ies}	f=1MHz, V _{GE} =0V, V _{CE} =10V		5000		pF
	Turn-on Time	t _{on}	V _{CC} = 300V			0.45	1.2	μs
		t _{r,x}	I _C = 50A			0.25	0.6	
		t _{r,i}	V _{GE} = ±15V			0.08		
		t _{off}	R _G = 51Ω			0.40	1.0	
		t _f	Inductive Load			0.05	0.35	
FRD	Diode Forward On-Voltage	V _F	I _F =50A	Chip		1.75	V	
	Reverse Recovery Time	t _{rr}	I _F =50A	Terminal		1.9	2.6	
Rectifier	Forward Voltage	V _{FM}	I _F =50A	Chip		1.1	V	
	Reverse Current	I _R RM	V _R =800V	Terminal		1.2		1.5
Brake Chopper	Zero Gate Voltage Collector Current	I _{CES}	V _{GE} =0V V _{CE} =600V			1.0	mA	
	Gate-Emitter Leakage Current	I _{GES}	V _{CE} =0V V _{GE} =±20V			200	nA	
	Collector-Emitter Saturation Voltage	V _{CE(sat)}	V _{GE} =15V	Chip		1.80		
			I _C =30A	Terminal		1.95	2.4	
	Turn-on Time	t _{on}	V _{CC} = 300V			0.45	1.2	
		t _{r,x}	I _C = 30A			0.25	0.6	
		t _{r,i}	V _{GE} = ±15V			0.40	1.0	
Turn-off Time	t _{off}	R _G = 82Ω			0.05	0.35		
	t _f							
Reverse Current	I _R RM	V _R =600V			1.0	mA		
NTC	Resistance	R	T= 25°C		5000		Ω	
			T=100°C	465	495	520		
B Value	B	T=25 / 50°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			0.63	°C/W
		Inverter FRD			1.33	
		Brake IGBT			1.04	
		Rectifier Diode			2.42	
Contact Thermal Resistance	R _{th(c-f)}	With Thermal Compound		0.05		