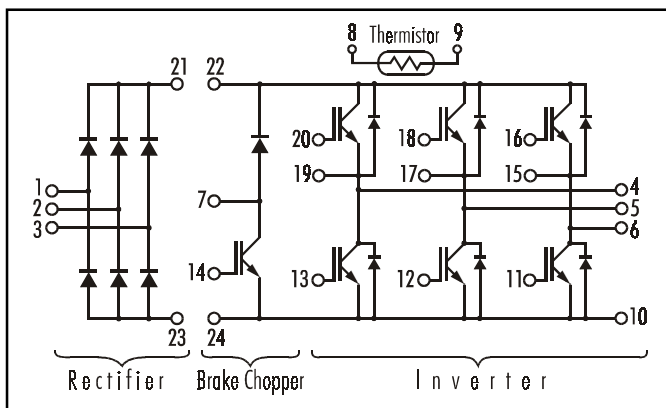


Power Integrated Module (PIM)

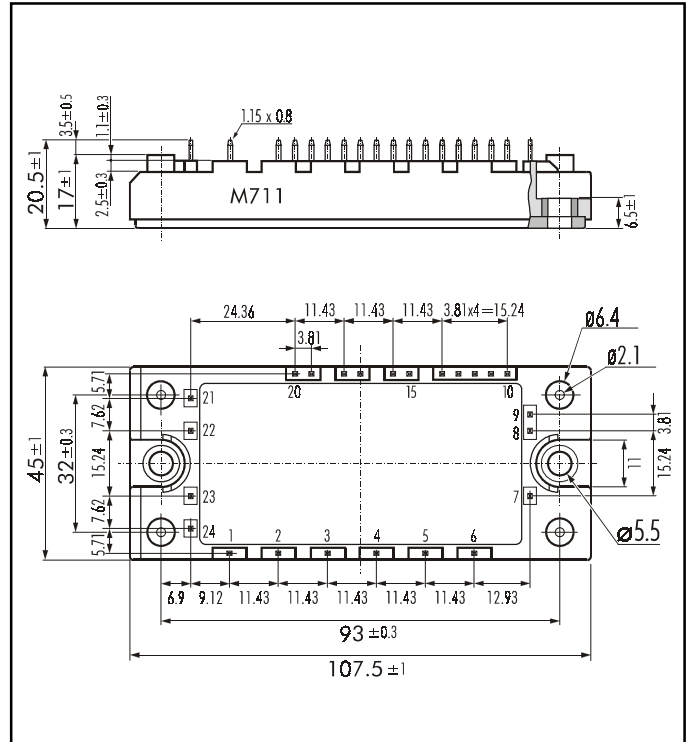
■ Features

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

■ Equivalent Circuit



■ Outline Drawing

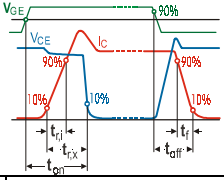
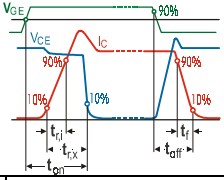


■ Absolute Maximum Ratings ($T_c=25^\circ\text{C}$)

	Items	Symbols	Test Conditions	Ratings	Units	
Inverter	Collector-Emitter Voltage	V_{CES}		1200	V	
	Gate -Emitter Voltage	V_{GES}		± 20		
	Collector Current	I_C	Continuous	$25^\circ\text{C} / 80^\circ\text{C}$	15 / 10	A
		$I_{C\ PULSE}$	1ms	$25^\circ\text{C} / 80^\circ\text{C}$	30 / 20	
		$-I_C\ PULSE$			10	
	Collector Power Dissipation	P_C	1 device	75	W	
Rectifier	Repetitive Peak Reverse Voltage	V_{RRM}		1600	V	
	Average Output Current	I_O	50Hz/60Hz sinus wave	10	A	
	Surge Current (Non Repetitive)	I_{FSM}	$T_j=150^\circ\text{C}$, 10 ms, sinus wave	105		
	I^2t (Non Repetitive)			55	A^2s	
Brake Chopper	Collector-Emitter Voltage	V_{CES}		1200	V	
	Gate -Emitter Voltage	V_{GES}		± 20		
	Collector Current	I_C	Continuous	$25^\circ\text{C} / 80^\circ\text{C}$	15 / 10	A
		$I_{C\ PULSE}$	1ms	$25^\circ\text{C} / 80^\circ\text{C}$	30 / 20	
		Collector Power Dissipation	P_C	1 device	75	W
	Repetitive Peak Reverse Voltage	V_{RRM}		1200	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} =1200V			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 =10mA	5.5	7.2	8.5	V
		Collector-Emitter Saturation Voltage	V _{CE(sat)}	V _{GE} =15V I _C = 10A		2.1		
		Input Capacitance	C _{ies}	f=1MHz, V _{GE} =0V, V _{CE} =10V		1200		pF
	Turn-on Time	t _{on}	V _{CC} = 600V I _C = 10A V _{GE} = ±15V R _G = 120Ω Inductive Load			0.35	1.2	μs
		t _{r,x}				0.25	0.6	
		t _{r,i}				0.10		
		t _{off}				0.45	1.0	
		t _f				0.08	0.3	
FRD	Diode Forward On-Voltage	V _F	I _F =10A	Chip		2.3	V	
	Terminal				2.35	3.2		
	Reverse Recovery Time	t _{rr}	I _F =10A			350	ns	
Rectifier	Forward Voltage	V _{FM}	I _F =10A	Chip		1.1	V	
	Terminal				1.2	1.5		
	Reverse Current	I _R RM	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} =±20V			200	nA	
	Collector-Emitter Saturation Voltage	V _{CE(sat)}	I _C =10A	Chip		2.10		V
				Terminal		2.20	2.6	
	Turn-on Time	t _{on}	V _{CC} = 600V I _C = 10A V _{GE} = ±15V R _G = 120Ω			0.35	1.2	μs
		t _{r,x}				0.25	0.6	
		t _{r,i}				0.45	1.0	
t _{off}					0.08	0.3		
Reverse Current	I _R RM	V _R =1200V			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			1.67	°C/W
		Inverter FRD			2.78	
		Brake IGBT			1.67	
		Rectifier Diode			1.85	
Contact Thermal Resistance	R _{th(c-f)}	With Thermal Compound		0.05		

