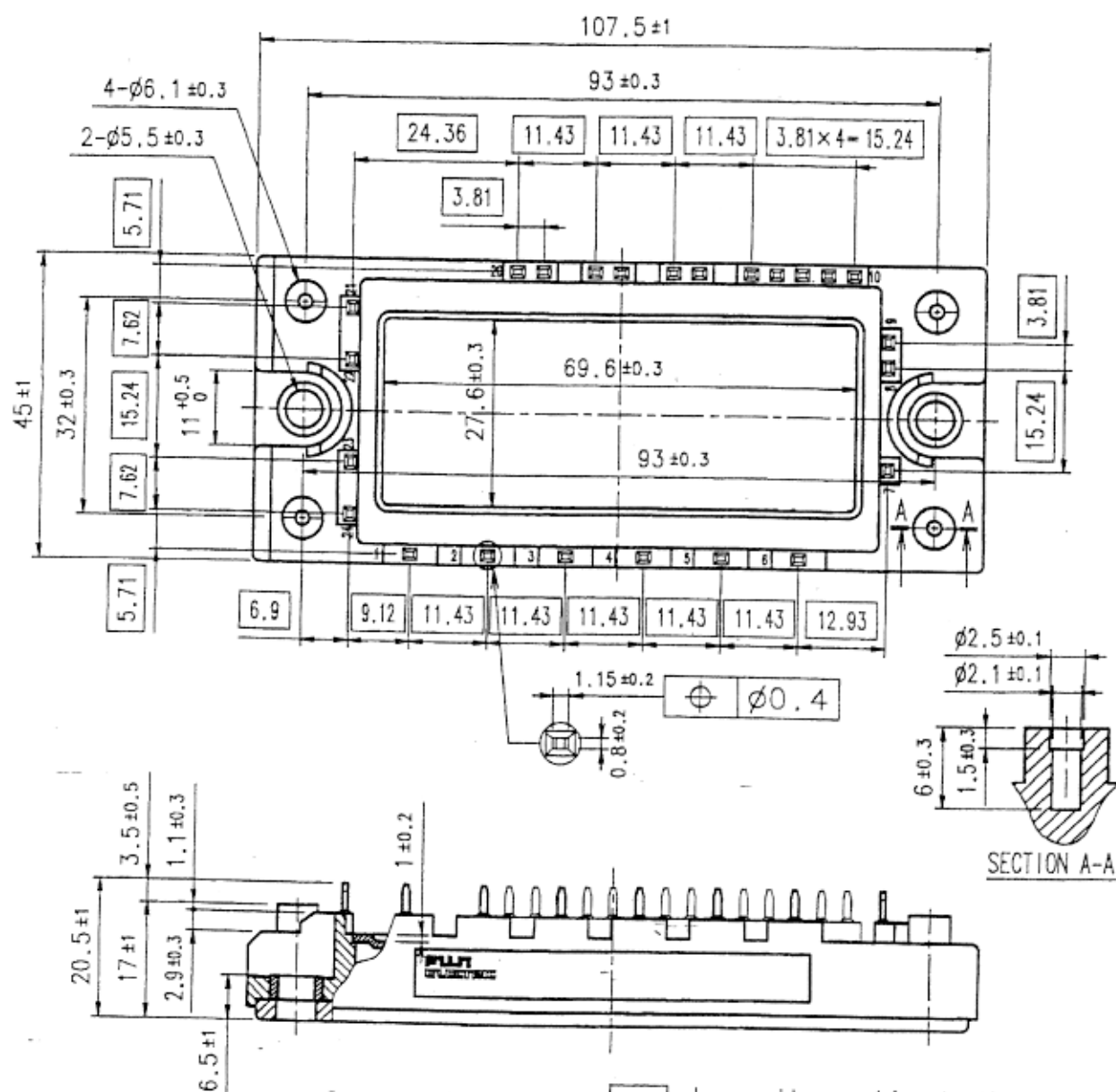
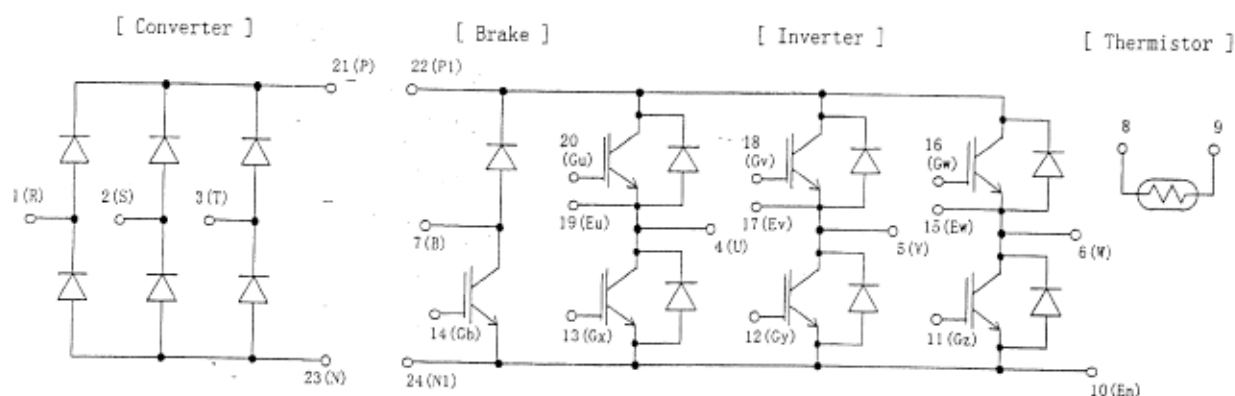


Target Specification of 7MBR20SA060

1. Outline Drawing (Unit : mm)



2. Equivalent circuit



DATE	NAME	APPROVED
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DRAWN Hor-4-'99 T. Sato

CHECKED - - -

REVISIONS

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3. Absolute Maximum Ratings (at $T_c = 25^\circ\text{C}$ unless otherwise specified)

Items		Symbols	Conditions	Maximum Ratings	Units
Inverter	Collector-Emitter voltage	VCES		600	V
	Gate-Emitter voltage	VGES		±20	V
	Collector current	Ic	Continuous	20	A
		Icp	1ms	40	A
		-Ic		20	A
	Collector Power Dissipation	Pc	1 device	70	W
Brake	Collector-Emitter voltage	VCES		600	V
	Gate-Emitter voltage	VGES		±20	V
	Collector current	Ic	Continuous	20	A
		Icp	1ms	40	A
	Collector Power Dissipation	Pc	1 device	70	W
	Repetitive peak reverse Voltage(Diode)	VRRM		600	V
Converter	Repetitive peak reverse Voltage	VRRM		800	V
	Average Output Current	Io	50Hz/60Hz sine wave	20	A
	Surge Current (Non-Repetitive)	IFSM	Tj=150℃, 10ms	140	A
	I ² t (Non-Repetitive)	I ² t	half sine wave	98	A ² s
	Junction temperature	Tj		150	℃
Storage temperature		Tstg		-40~ +125	℃
Isolation voltage	between terminal and copper base ^(*1)	Viso	AC : 1min.	2500	V
	between thermistor and others ^(*2)			2500	V
Mounting Screw Torque ^(*3)				3.5	N・m

(*)1 All terminals should be connected together when isolation test will be done.

(*)2 Terminal 8 and 9 should be connected together. Terminal 1 to 7 and 10 to 24 should be connected together and shorted to copper base.

(*)3 Recommendable Value : 2.5~3.5 N · m (M5)

4. Electrical characteristics (at Tj= 25°C unless otherwise specified)

	Items	Symbols	Conditions	Characteristics			Units
				min.	typ.	Max.	
Inverter	Zero gate voltage Collector current	ICES	VGE = 0 V, VCE = 600 V			1.0	mA
	Gate-Emitter leakage current	IGES	VCE = 0 V, VGE = ±20 V			200	nA
	Gate-Emitter threshold voltage	VGE(th)	VCE = 20 V, Ic = 20 mA	5.5	7.2	8.5	V
	Collector-Emitter saturation voltage	VCE(sat)	VGE = 15 V, chip		1.8		V
			Ic = 20 A terminal		1.9	2.3	
	Input capacitance	Cies	VGE = 0 V, VCE = 10 V f = 1 MHz		2000		pF
	Turn-on time	ton	Vcc= 300 V		0.45	1.2	μs
		tr	Ic = 20 A		0.25	0.6	
		tr(i)	VGE = ±15 V		0.08		
	Turn-off time	toff	RG = 120 Ω		0.40	1.0	
		tf			0.05	0.35	
	Forward on voltage	VF	IF = 20 A chip		1.8		V
			terminal		1.9	2.3	
	Reverse recovery time	trr	IF = 20 A			300	ns
Brake	Zero gate voltage Collector current	ICES	VGE = 0 V, VCE = 600 V			1.0	mA
	Gate-Emitter leakage current	IGES	VCE = 0 V, VGE = ±20 V			200	nA
	Collector-Emitter saturation voltage	VCE(sat)	VGE = 15 V, chip		1.8		V
			Ic = 20 A terminal		1.95	2.4	
	Turn-on time	ton	Vcc= 300 V		0.45	1.2	μs
		tr	Ic = 20 A		0.25	0.6	
	Turn-off time	toff	VGE = ±15 V		0.40	1.0	
		tf	RG = 120 Ω		0.05	0.35	
	Reverse current	IRRM	VR = 600 V			1.0	mA
Converter	Forward on voltage	VFM	IF = 20 A chip		1.00		V
			terminal		1.25	1.50	
	Reverse current	IRRM	VR = 800 V			1.0	mA
Thermistor	Resistance	R	T = 25°C		5000		Ω
			T = 100°C	465	495	520	
	B value	B	T = 25/50°C	3305	3375	3450	K

5. Thermal resistance characteristics

Items	Symbols	Conditions	Characteristics			Units
			min.	typ.	Max.	
Thermal resistance (1 device)	Rth(j-c)	Inverter IGBT			1.81	°C/W
		Inverter FWD			3.81	
		Brake IGBT			1.81	
		Converter Diode			2.00	
Contact Thermal resistance	Rth(c-f)	with Thermal Compound (*)		0.05		°C/W

※ This is the value which is defined mounting on the additional cooling fin with thermal compound.