

2MBI550VJ-170-50

IGBT Modules

IGBT MODULE (V series) 1700V / 550A / 2 in one package

■ Features

- High speed switching
- Voltage drive
- Low Inductance module structure

■ Applications

- Inverter for Motor Drive
- AC and DC Servo Drive Amplifier
- Uninterruptible Power Supply
- Industrial machines, such as Welding machines



■ Maximum Ratings and Characteristics

● Absolute Maximum Ratings (at T_c=25°C unless otherwise specified)

Items		Symbols	Conditions		Maximum ratings	Units
Inverter	Collector-Emitter voltage	V _{CE}			1700	V
	Gate-Emitter voltage	V _{GE}			±20	V
	Collector current	I _C	Continuous	T _C =25°C	750	A
				T _C =100°C	550	
		I _C pulse	1ms	1100		
		-I _C		550		
		-I _C pulse	1ms	1100		
Collector power dissipation	P _C	1 device	3750		W	
Junction temperature		T _J			175	°C
Operating junction temperature (under switching conditions)		T _{Jop}			150	
Storage temperature		T _{stg}			-40 ~ 125	
Isolation voltage	between terminal and copper base (*1) between thermistor and others (*2)	V _{iso}	AC : 1min.		3400	VAC
Screw torque	Mounting (*3)	-			3.5	N m
	Terminals (*4)	-			4.5	
	PC-Board (*5)	-			0.6	

Note *1: All terminals should be connected together during the test.

Note *2: Two thermistor terminals should be connected together, other terminals should be connected together and shorted to base plate during the test.

Note *3: Recommendable Value : 2.5-3.5 Nm (M5)

Note *4: Recommendable Value : 3.5-4.5 Nm (M6)

Note *5: Recommendable Value : 0.4-0.6 Nm (M2.5)

● Electrical characteristics (at T_J= 25°C unless otherwise specified)

Items			Symbols	Conditions	Characteristics			Units	
					min.	typ.	max.		
Inverter	Zero gate voltage collector current		I _{CES}	V _{GE} = 0V, V _{CE} = 1700V		-	-	3.0	mA
	Gate-Emitter leakage current		I _{GES}	V _{CE} = 0V, V _{GE} = ±20V		-	-	600	nA
	Gate-Emitter threshold voltage		V _{GE (th)}	V _{CE} = 20V, I _C = 550mA		6.0	6.5	7.0	V
	Collector-Emitter saturation voltage		V _{CE (sat)} (terminal)	V _{GE} = 15V I _C = 550A	T _J =25°C	-	3.00	3.45	V
					T _J =125°C	-	3.55	-	
					T _J =150°C	-	3.60	-	
			V _{CE (sat)} (chip)		T _J =25°C	-	2.15	2.60	
					T _J =125°C	-	2.70	-	
	Input capacitance		C _{ies}	V _{CE} = 10V, V _{GE} = 0V, f = 1MHz		-	40	-	nF
	Turn-on time		t _{on}	V _{CC} = 900V I _C = 550A V _{GE} = ±15V R _G = 3.3Ω		-	1000	-	nsec
			t _r			-	500	-	
	Turn-off time		t _{r (l)}			-	120	-	
			t _{off}	-	1300	-			
			t _r	-	100	-			
	Forward on voltage		V _F (terminal)	V _{GE} = 0V I _F = 550A	T _J =25°C	-	2.80	3.25	V
T _J =125°C					-	3.10	-		
T _J =150°C					-	3.05	-		
V _F (chip)			T _J =25°C		-	1.95	2.40		
			T _J =125°C		-	2.25	-		
Reverse recovery time		t _{rr}	I _F = 550A		-	250	-	nsec	
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

● Thermal resistance characteristics

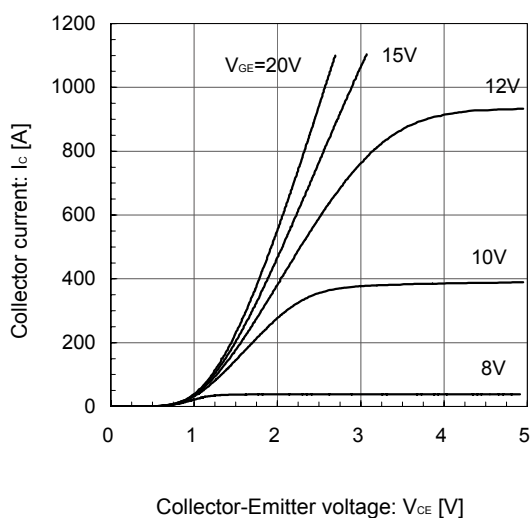
Items	Symbols	Conditions	Characteristics			Units
			min.	typ.	max.	
Thermal resistance(1device)	R _{th(j-c)}	Inverter IGBT	-	-	0.04	°C/W
		Inverter FWD	-	-	0.06	
Contact thermal resistance (1device) (*6)	R _{th(c-f)}	with Thermal Compound	-	0.0167	-	

Note *6: This is the value which is defined mounting on the additional cooling fin with thermal compound.

■ Characteristics (Representative)

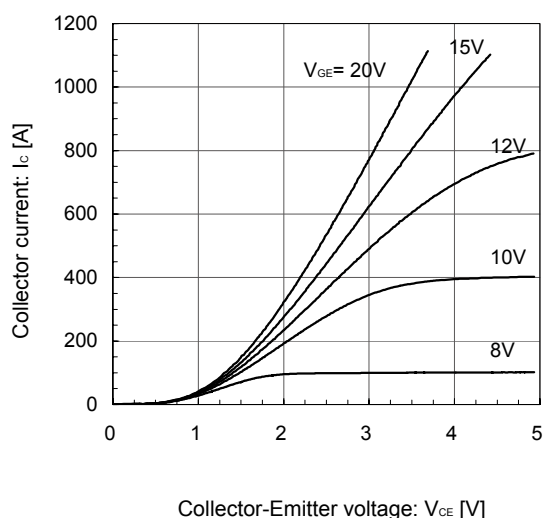
[INVERTER]

Collector current vs. Collector-Emittor voltage (typ.)
 $T_J = 25^\circ\text{C}$ / chip



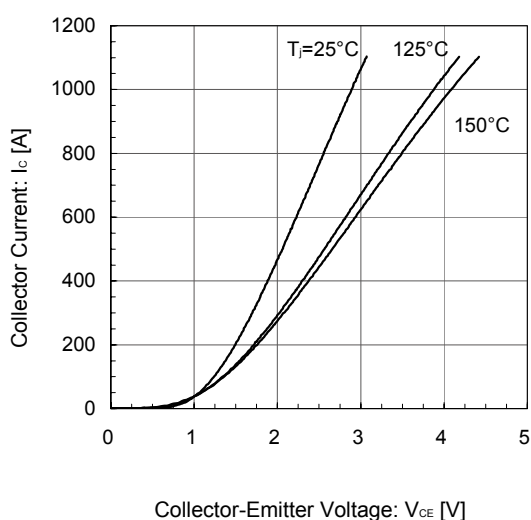
[INVERTER]

Collector current vs. Collector-Emittor voltage (typ.)
 $T_J = 150^\circ\text{C}$ / chip



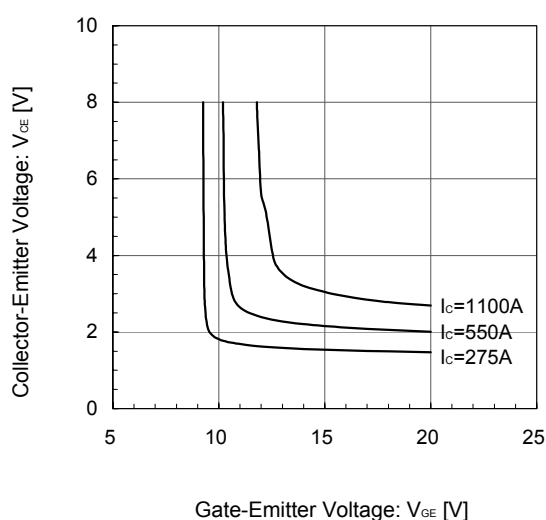
[INVERTER]

Collector current vs. Collector-Emittor voltage (typ.)
 $V_{GE} = 15\text{V}$ / chip



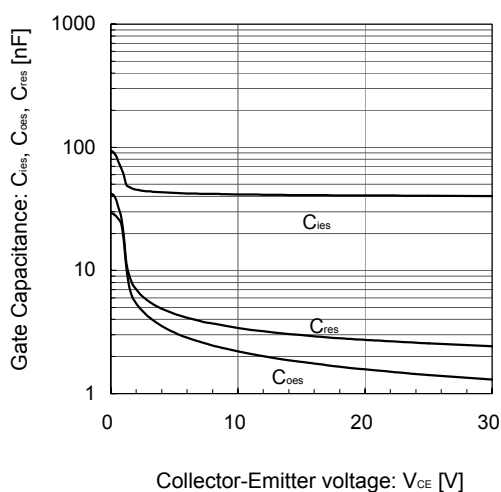
[INVERTER]

Collector-Emittor voltage vs. Gate-Emittor voltage (typ.)
 $T_J = 25^\circ\text{C}$ / chip



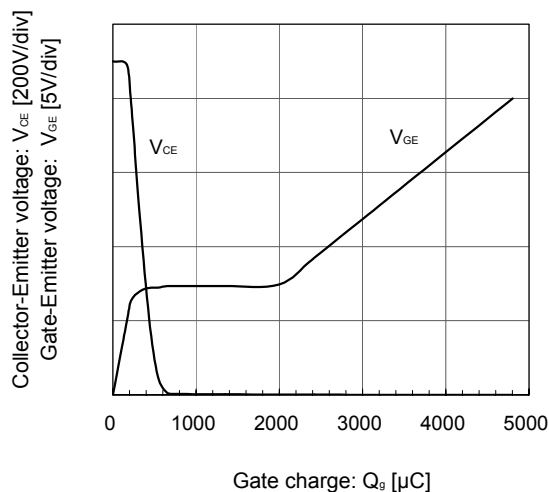
[INVERTER]

Gate Capacitance vs. Collector-Emittor Voltage (typ.)
 $V_{GE} = 0\text{V}$, $f = 1\text{MHz}$, $T_J = 25^\circ\text{C}$



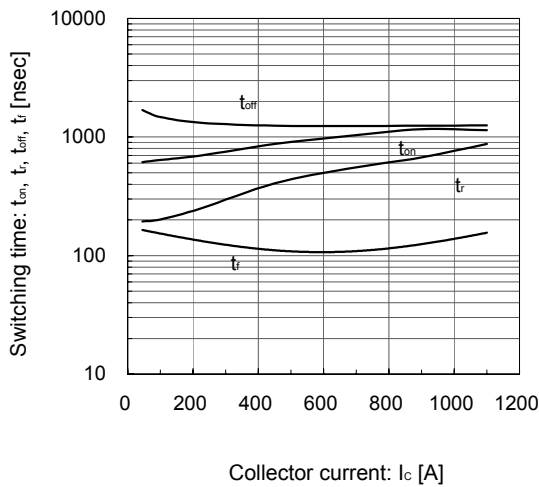
[INVERTER]

Dynamic Gate Charge (typ.)
 $V_{CC} = 900\text{V}$, $I_C = 550\text{A}$, $T_J = 25^\circ\text{C}$



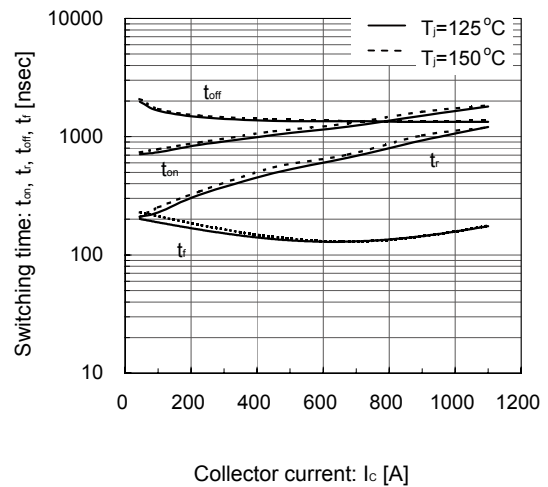
[INVERTER]

Switching time vs. Collector current (typ.)
 $V_{CC}=900V$, $V_{GE}=\pm 15V$, $R_G=3.3\Omega$, $T_J=25^\circ C$



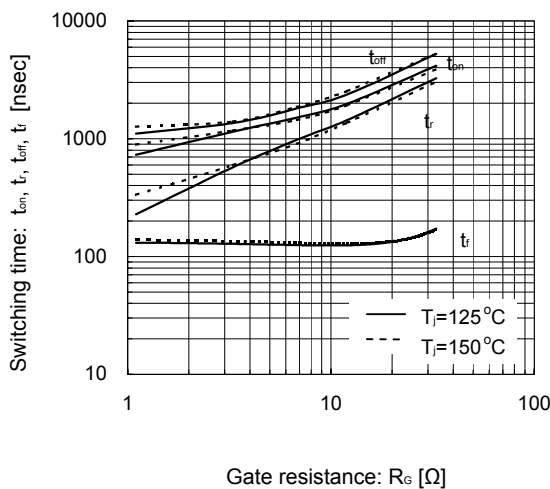
[INVERTER]

Switching time vs. Collector current (typ.)
 $V_{CC}=900V$, $V_{GE}=\pm 15V$, $R_G=3.3\Omega$, $T_J=125^\circ C, 150^\circ C$



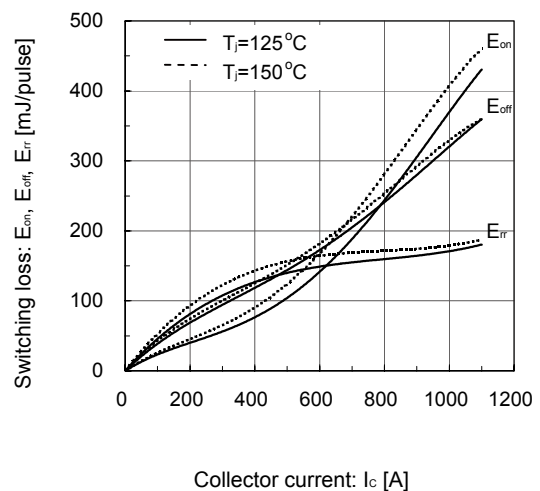
[INVERTER]

Switching time vs. Gate resistance (typ.)
 $V_{CC}=900V$, $I_C=550A$, $V_{GE}=\pm 15V$, $T_J=125^\circ C, 150^\circ C$



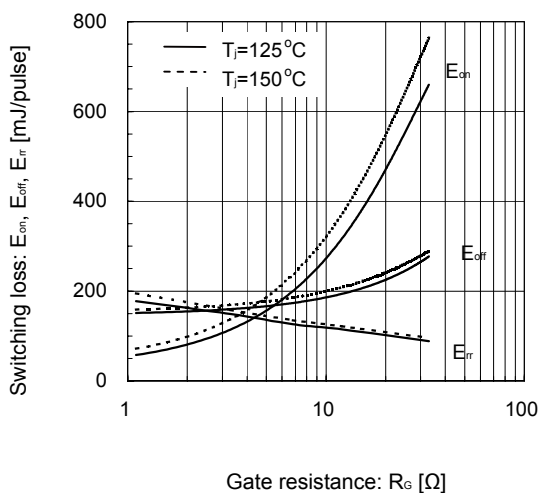
[INVERTER]

Switching loss vs. Collector current (typ.)
 $V_{CC}=900V$, $V_{GE}=\pm 15V$, $R_G=3.3\Omega$, $T_J=125^\circ C, 150^\circ C$



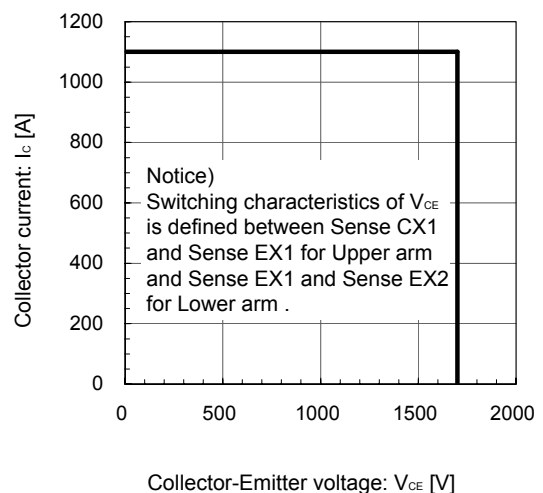
[INVERTER]

Switching loss vs. Gate resistance (typ.)
 $V_{CC}=900V$, $I_C=550A$, $V_{GE}=\pm 15V$, $T_J=125, 150^\circ C$

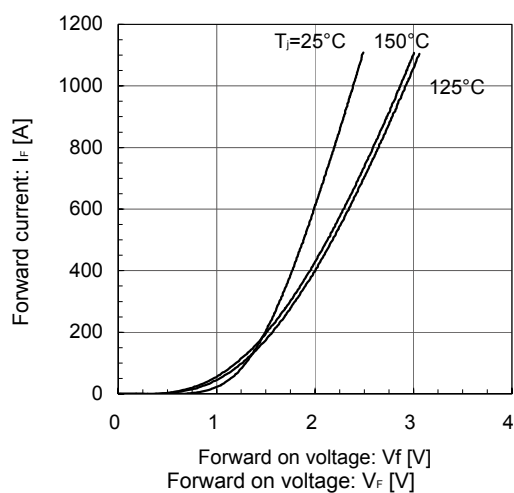


[INVERTER]

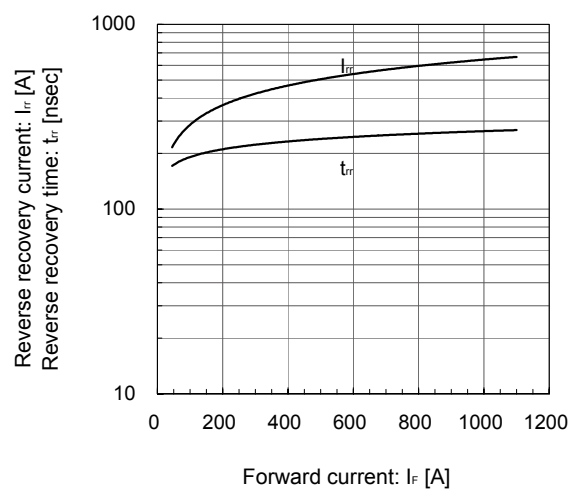
Reverse bias safe operating area (max.)
 $+V_{GE}=15V$, $-V_{GE}=15V$, $R_G=3.3\Omega$, $T_J=150^\circ C$



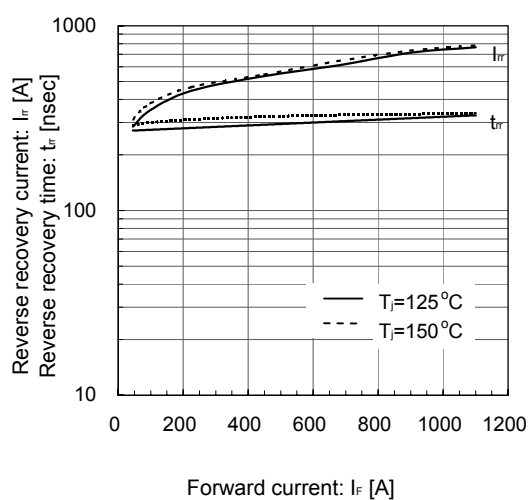
[INVERTER]

Forward Current vs. Forward Voltage (typ.)
chip

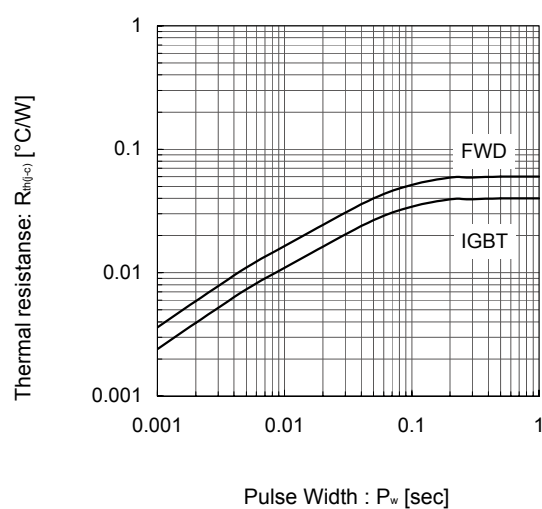
[INVERTER]

Reverse Recovery Characteristics (typ.)
 $V_{CC}=900\text{V}$, $V_{GE}=\pm 15\text{V}$, $R_G=3.3\Omega$, $T_J=25^\circ\text{C}$ 

[INVERTER]

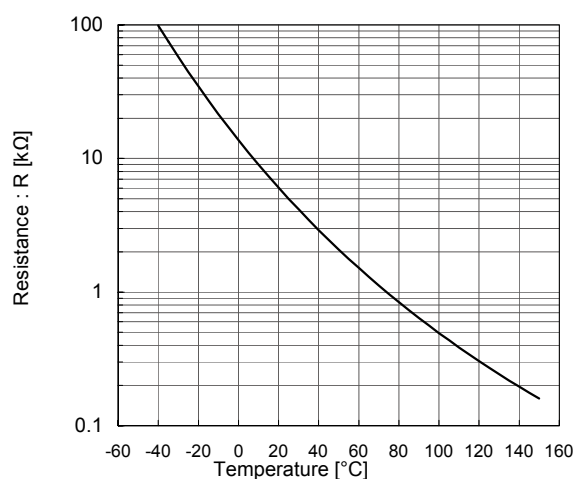
Reverse Recovery Characteristics (typ.)
 $V_{CC}=900\text{V}$, $V_{GE}=\pm 15\text{V}$, $R_G=3.3\Omega$, $T_J=125^\circ\text{C}$, 150°C 

Transient Thermal Resistance (max.)

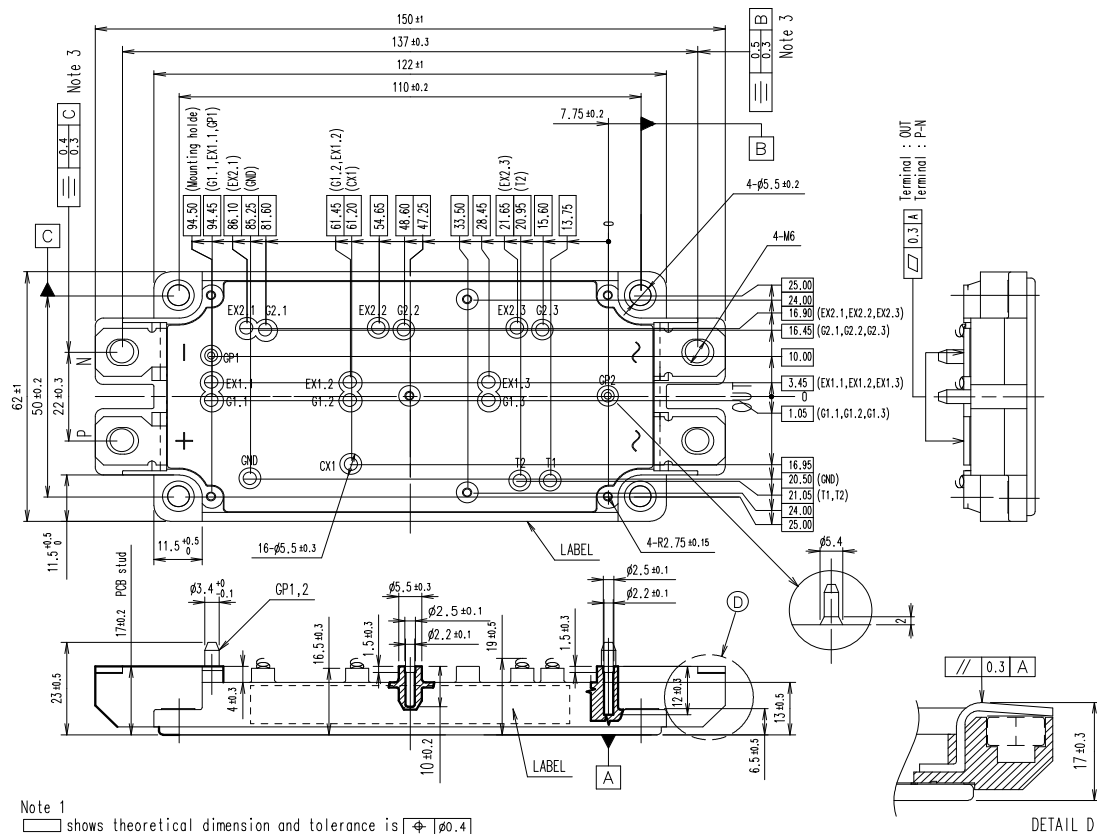


[THERMISTOR]

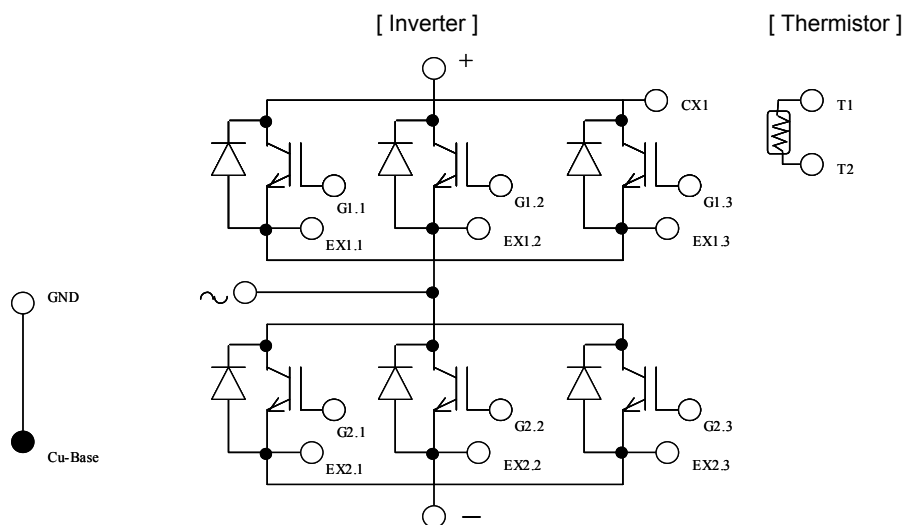
Temperature characteristic (typ.)



Outline Drawings, mm



Equivalent Circuit Schematic



WARNING

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• Medical equipment	
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• Submarine repeater equipment		
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