2MBI900VXA-120P-50

IGBT Modules

IGBT MODULE (V series)
1200V / 900A / 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 Tc=25°C unless otherwise specified)

Items		Symbols	Conditions		Maximum ratings	Units
Inverter	Collector-Emitter voltage	V_{CES}			1200	V
	Gate-Emitter voltage	V_{GES}			±20	V
	Collector current	Ic	Continuous	Tc=25°C	1200	A
				Tc=100°C	900	
		Ic pulse	1ms		1800	
		-Ic			900	
		-Ic pulse	1ms		1800	
	Collector power dissipation	Pc	1 device		5100	W
Junction temperature		Tj			175	°C
Operating junction temperature (under switching conditions)		T_{jop}			150	
Case temperature		T_C			150	
Storage temperature		Tstg			-40 ~ +150	
Isolation voltage	between terminal and copper base (*1)	V_{iso}	AC : 1min.		4000	VAC
	between thermistor and others (*2)					
Screw torque (*3)	Mounting	-	M5		6.0	N m
	Main Terminals		M8		10.0	
	Sense Terminals		M4		2.1	

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 : Mounting 3.0 ~ 6.0 Nm (M5) Recommendable Value : Main Terminals 8.0 ~ 10.0 Nm (M8)
Recommendable Value : Sense Terminals 1.8 ~ 2.1 Nm (M4)

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

Items		Symbols	Conditions		Characteristics min.	Characteristics typ.	Characteristics max.	Units
Inverter	Zero gate voltage collector current	I_{CES}	V_{GE} = 0V, V_{CE} = 1200V		-	-	8.0	mA
	Gate-Emitter leakage current	I_{GES}	V_{CE} = 0V, V_{GE} = ±20V		-	-	1600	nA
	Gate-Emitter threshold voltage	$V_{GE\ (th)}$	V_{CE} = 20V, I_C = 900mA		6.0	6.5	7.0	V
	Collector-Emitter saturation voltage	$V_{CE\ (sat)}$ (terminal) (*4)	V_{GE} = 15V, I_C = 900A	Tj=25°C	-	1.75	2.20	V
				Tj=125°C	-	2.10	-	
				Tj=150°C	-	2.15	-	
		$V_{CE\ (sat)}$ (chip)		Tj=25°C	-	1.65	2.10	
				Tj=125°C	-	2.00	-	
				Tj=150°C	-	2.05	-	
	Input capacitance	Cies	V_{CE} = 10V, V_{GE} = 0V, f = 1MHz		-	83	-	nF
	Turn-on time	ton	V_{CC} = 600V, I_C = 900A, V_{GE} = ±15V, R_G = 1.6Ω		-	1.00	-	μs
		tr			-	0.40	-	
		tr (i)			-	0.15	-	
	Turn-off time	toff			-	1.20	-	
		tf			-	0.15	-	
	Forward on voltage	V_F (terminal) (*4)	V_{GE} = 0V, I_F = 900A	Tj=25°C	-	1.90	2.35	V
				Tj=125°C	-	2.05	-	
				Tj=150°C	-	2.00	-	
		V_F (chip)		Tj=25°C	-	1.80	2.25	
				Tj=125°C	-	1.95	-	
				Tj=150°C	-	1.90	-	
	Reverse recovery time	trr	I_F = 900A		-	0.20	-	μs
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

Note *4: Please refer to page 6 , there is definition of on-state voltage at terminal.

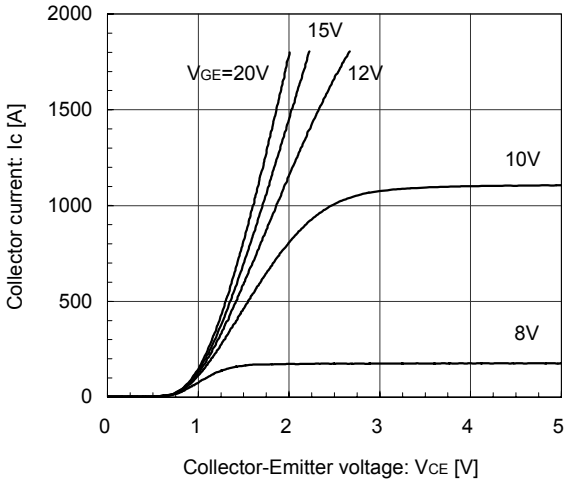
● Thermal resistance characteristics

Items	Symbols	Conditions	Characteristics min.	Characteristics typ.	Characteristics max.	Units
Thermal resistance (1device)	Rth(j-c)	Inverter IGBT	-	-	0.030	°C/W
		Inverter FWD	-	-	0.054	
Contact thermal resistance (1device) (*5)	Rth(c-f)	with Thermal Compound	-	0.00625	-	

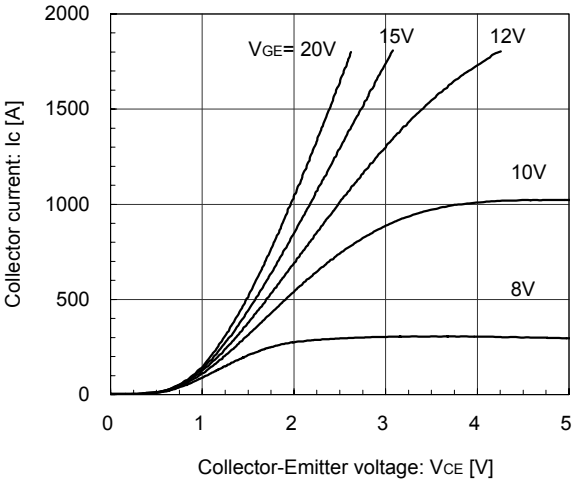
Note *5: This is the value which is defined mounting on the additional cooling fin with thermal compound.

■ Characteristics (Representative)

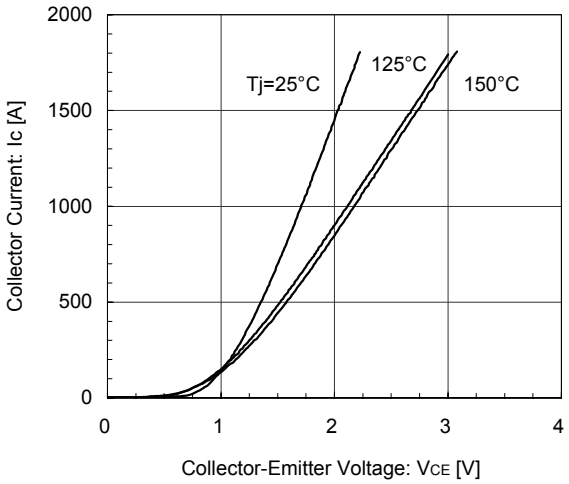
[INVERTER]
Collector current vs. Collector-Emitter voltage (typ.)
Tj= 25°C / chip



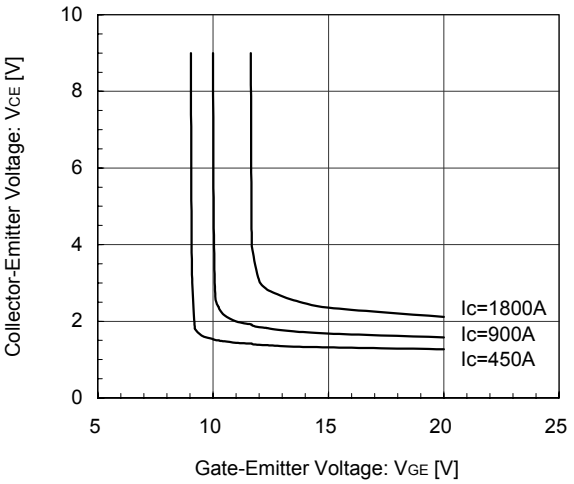
[INVERTER]
Collector current vs. Collector-Emitter voltage (typ.)
Tj= 150°C / chip



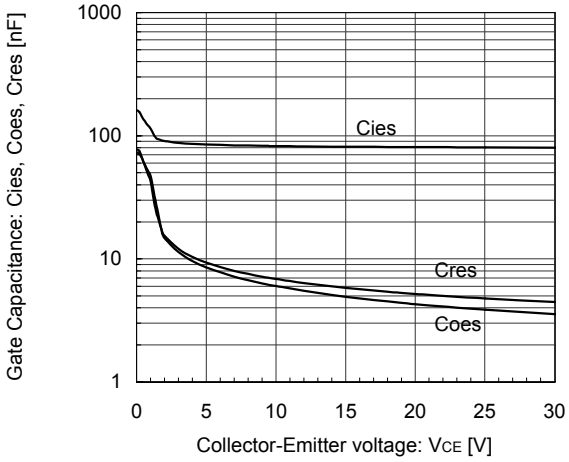
[INVERTER]
Collector current vs. Collector-Emitter voltage (typ.)
VGE= 15V / chip



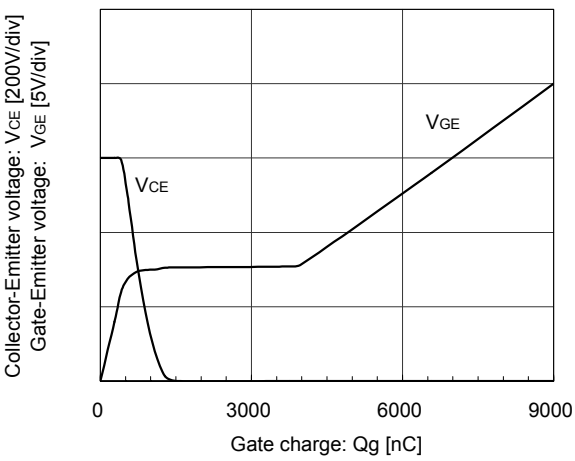
[INVERTER]
Collector-Emitter voltage vs. Gate-Emitter voltage (typ.)
Tj= 25°C / chip



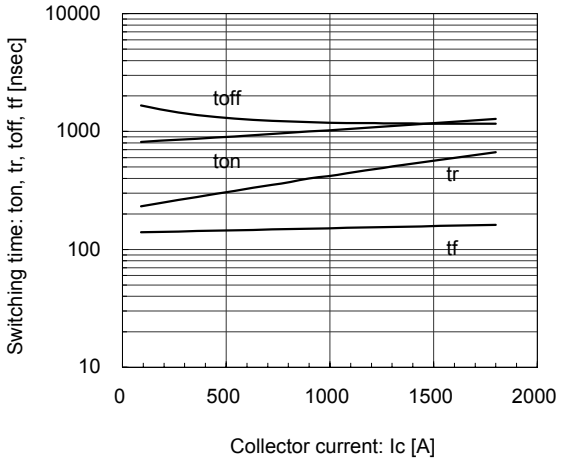
[INVERTER]
Gate Capacitance vs. Collector-Emitter Voltage (typ.)
VGE= 0V, f= 1MHz, Tj= 25°C



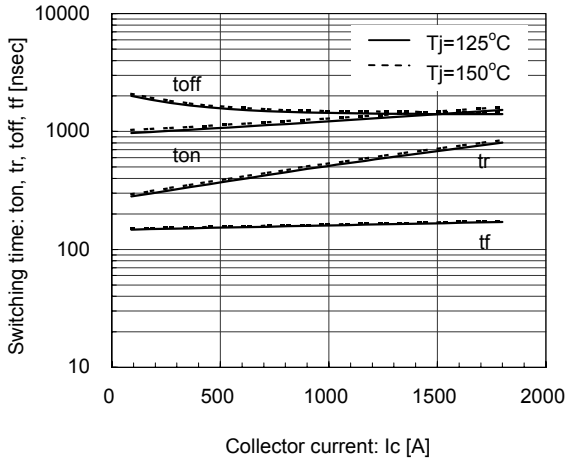
[INVERTER]
Dynamic Gate Charge (typ.)
Vcc=600V, Ic=900A, Tj= 25°C



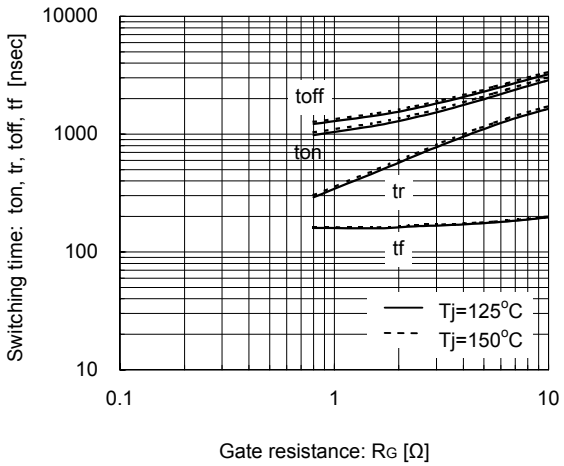
[INVERTER]
Switching time vs. Collector current (typ.)
Vcc=600V, V_{GE}=±15V, R_G=1.6Ω, Tj=25°C



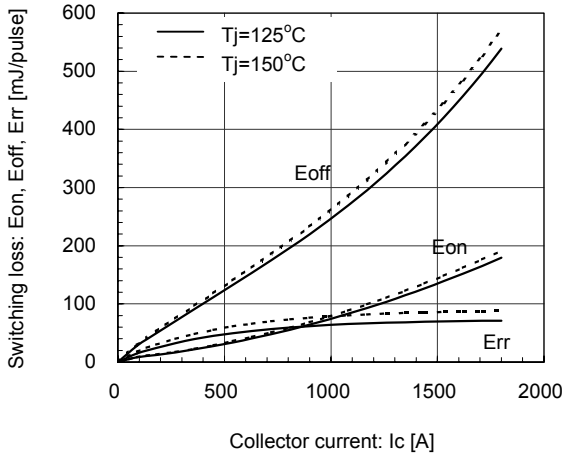
[INVERTER]
Switching time vs. Collector current (typ.)
Vcc=600V, V_{GE}=±15V, R_G=1.6Ω, Tj=125°C, 150°C



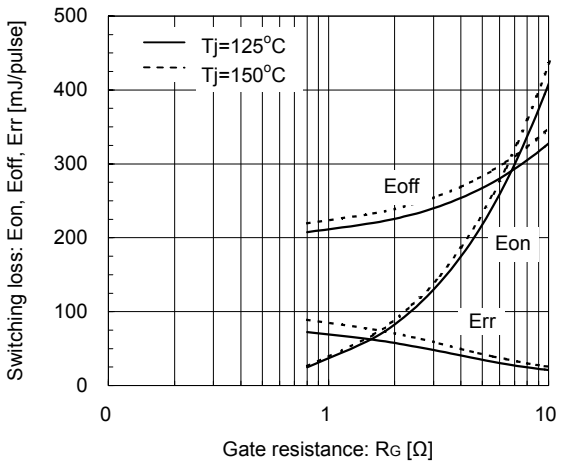
[INVERTER]
Switching time vs. Gate resistance (typ.)
Vcc=600V, Ic=900A, V_{GE}=±15V, Tj=125°C, 150°C



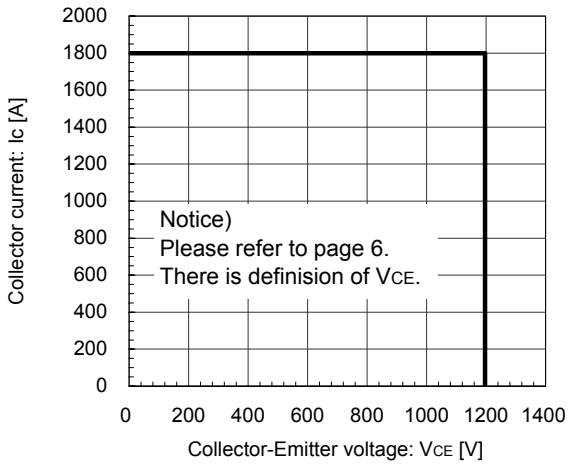
[INVERTER]
Switching loss vs. Collector current (typ.)
Vcc=600, V_{GE}=±15V, R_G=1.6Ω, Tj=125°C, 150°C



[INVERTER]
Switching loss vs. Gate resistance (typ.)
Vcc=600V, Ic=900A, V_{GE}=±15V, Tj=125°C, 150°C



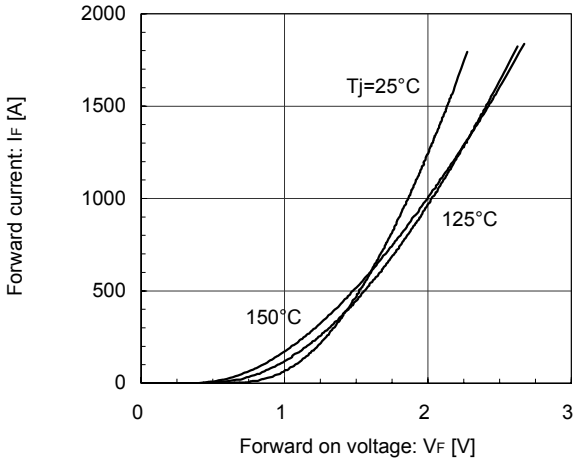
[INVERTER]
Reverse bias safe operating area (max.)
+V_{GE}=15V, -V_{GE}=15V, R_G=1.6Ω, Tj=150°C



[INVERTER]

Forward Current vs. Forward Voltage (typ.)

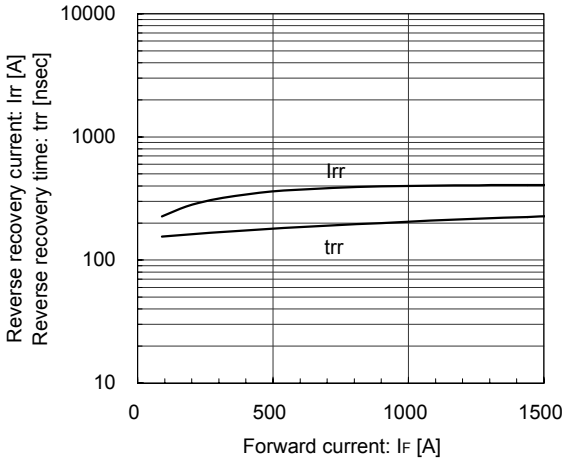
chip



[INVERTER]

Reverse Recovery Characteristics (typ.)

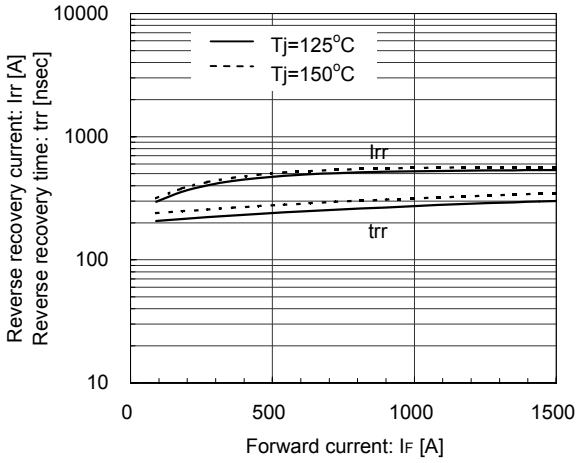
Vcc=600V, VGE=±15V, RG=1.6Ω, Tj=25°C



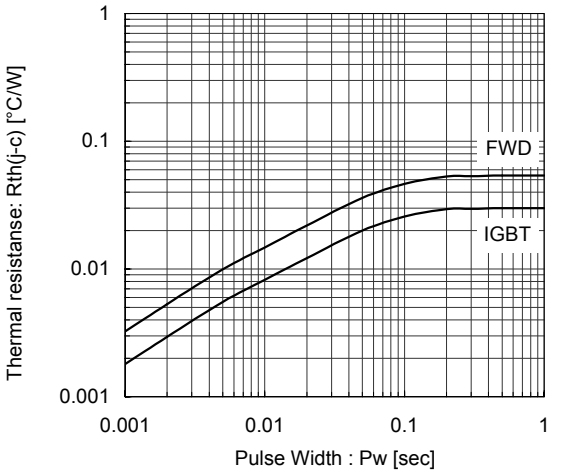
[INVERTER]

Reverse Recovery Characteristics (typ.)

Vcc=600V, VGE=±15V, RG=1.6Ω, Tj=125°C, 150°C

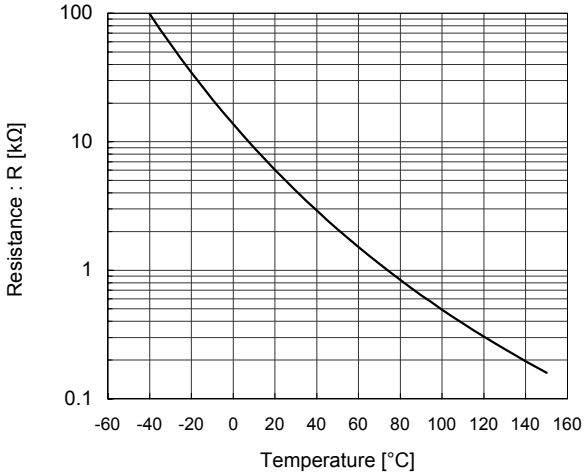


Transient Thermal Resistance (max.)

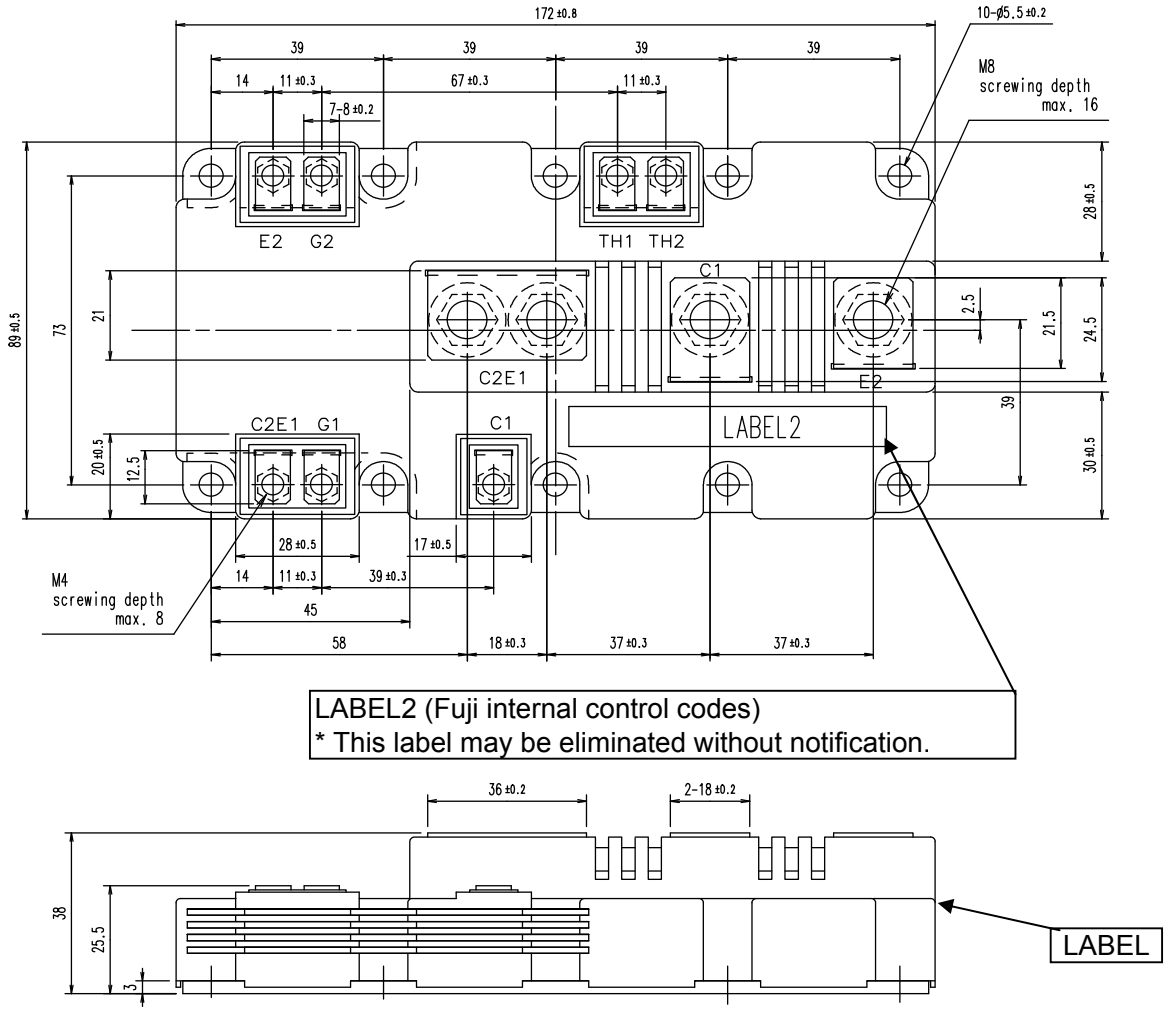


[THERMISTOR]

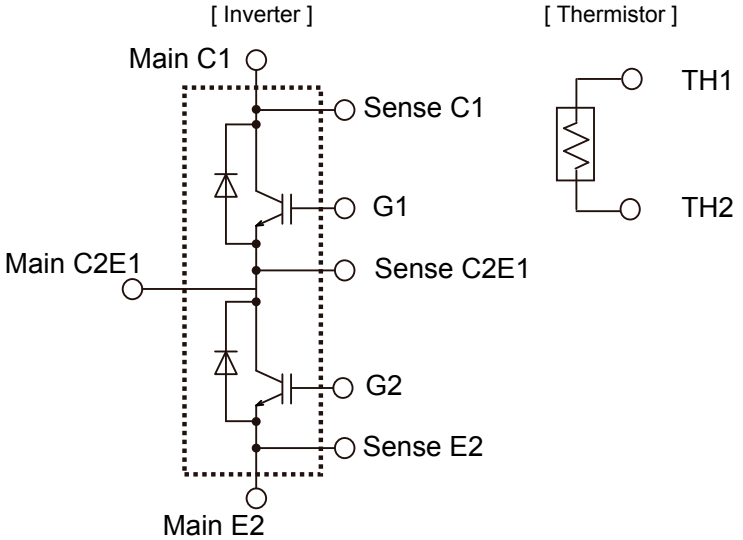
Temperature characteristic (typ.)



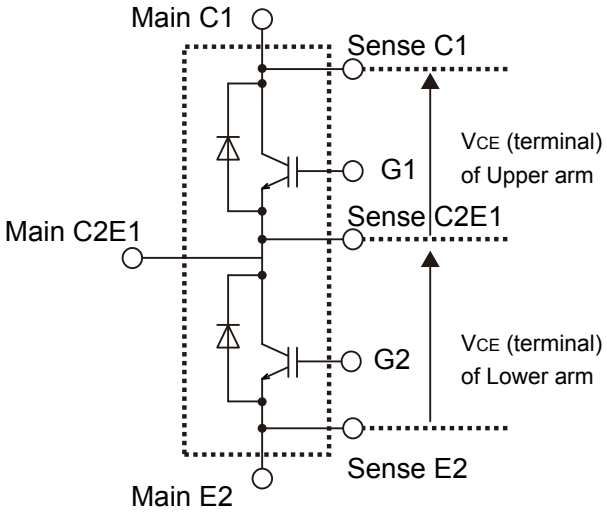
■ Outline Drawings, mm



■ Equivalent Circuit Schematic



■ Definition of on-state voltage at terminal and switching characteristics



Fuji defined V_{CE} value of terminal by using Sense C1 and Sense C2E1 for Upper arm and Sense C2E1 and Sense E2 for Lower arm .

Switching characteristics of V_{CE} also is defined between Sense C1 and Sense C2E1 for Upper arm and Sense C2E1 and Sense E2 for Lower arm .

Please use these terminals whenever measure spike voltage and on-state voltage .

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• Traffic-signal control equipment • Gas leakage detectors with an auto-shut-off feature
• Emergency equipment for responding to disasters and anti-burglary devices • Safety devices
• Medical equipment

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