

6MBI180VX-120-55

IGBT Modules

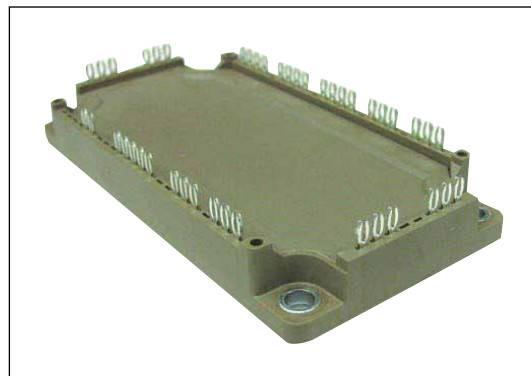
IGBT MODULE (V series) 1200V / 180A / 6 in one package

■ Features

- Compact Package
- P.C.Board Mount
- Low $V_{CE(sat)}$

■ 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 $T_c=25^{\circ}\text{C}$ 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	I _C	Continuous	T _c =100°C	150	A
		I _{C pulse}	1ms	T _c =80°C	400	
		-I _C			150	
		-I _{C pulse}	1ms	400		
Collector power dissipation	P _C	1 device		1075	W	
Junction temperature		T _J			175	°C
Operating junciton temperature (under switching conditions)		T _{Jop}			150	
Case temperature		T _C			125	
Storage temperature		T _{stg}			-40 ~ +125	
Isolation voltage	Between terminal and copper base (*1) Between thermistor and others (*2)	V _{iso}	AC : 1min.		2500	VAC
Screw torque	Mounting (*3)	-	M5		3.5	N m

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)

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

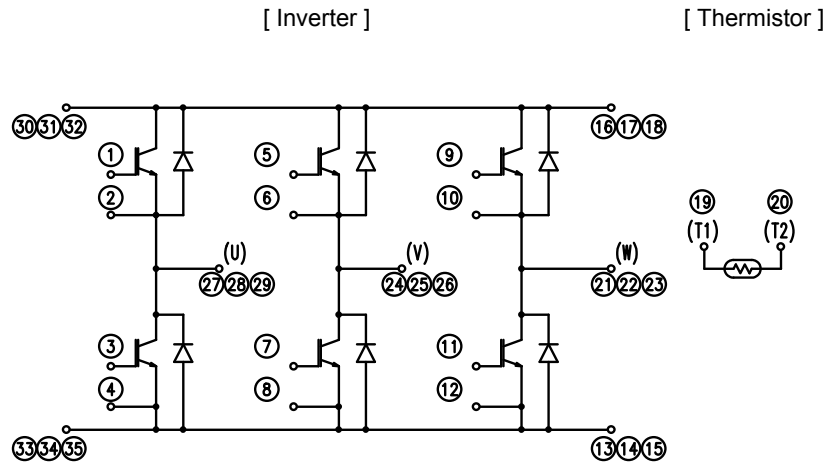
Items	Symbols	Conditions	Characteristics			Units
			min.	typ.	max.	
Zero gate voltage collector current	ICES	VGE = 0V, VCE = 1200V	-	-	1.0	mA
Gate-Emitter leakage current	IGES	VCE = 0V, VGE = ±20V	-	-	200	nA
Gate-Emitter threshold voltage	VGE (th)	VCE = 20V, IC = 200mA	6.0	6.5	7.0	V
Collector-Emitter saturation voltage	VCE (sat) (terminal)	VGE = 15V IC = 200A	Tj=25°C	2.70	3.15	V
			Tj=125°C	3.05	-	
			Tj=150°C	3.10	-	
	VCE (sat) (chip)	VGE = 15V IC = 200A	Tj=25°C	1.85	2.30	
			Tj=125°C	2.20	-	
			Tj=150°C	2.25	-	
Internal gate resistance	RG (int)	-	-	3.8	-	Ω
Input capacitance	Cies	VCE = 10V, VGE = 0V, f = 1MHz	-	16.5	-	nF
Turn-on time	t _{on}	VCC = 600V IC = 200A VGE = +15 / -15V RG = 1.2Ω	-	0.39	1.20	μs
	t _r		-	0.09	0.60	
	t _f (l)		-	0.03	-	
Turn-off time	t _{off}		-	0.53	1.00	
	t _r		-	0.06	0.30	
Forward on voltage	VF (terminal)	IF = 200A	Tj=25°C	2.55	3.00	V
			Tj=125°C	2.70	-	
			Tj=150°C	2.65	-	
	VF (chip)	IF = 200A	Tj=25°C	1.70	2.15	
			Tj=125°C	1.85	-	
			Tj=150°C	1.80	-	
Reverse recovery time	trr	IF = 200A	-	-	0.35	μs
Thermistor	Resistance	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)	Rth(j-c)	Inverter IGBT	-	-	0.14	°C/W
		Inverter FWD	-	-	0.25	
Contact thermal resistance (1device) (*4)	Rth(c-f)	with Thermal Compound	-	0.05	-	

Note *4: This is the value which is defined mounting on the additional cooling fin with thermal compound.

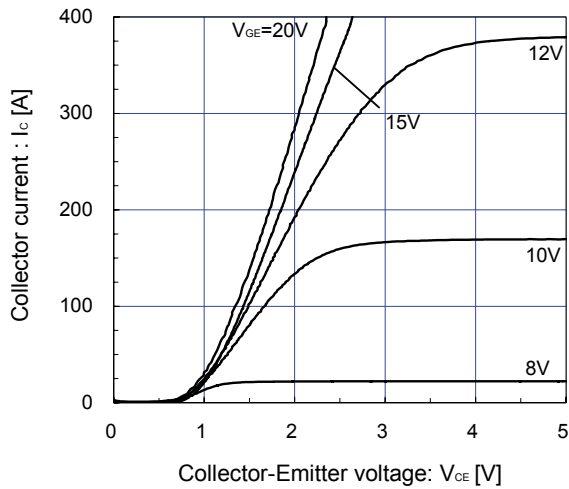
■ Equivalent Circuit Schematic



■ Characteristics (Representative)

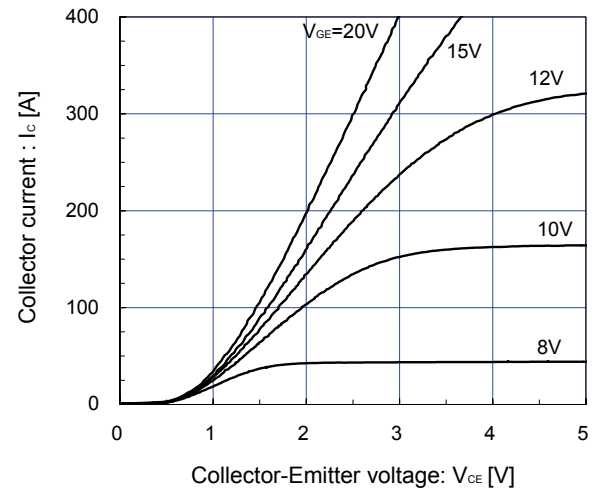
[Inverter]

Collector current vs. Collector-Emittor voltage (typ.)

 $T_J = 25^\circ\text{C}$ / chip

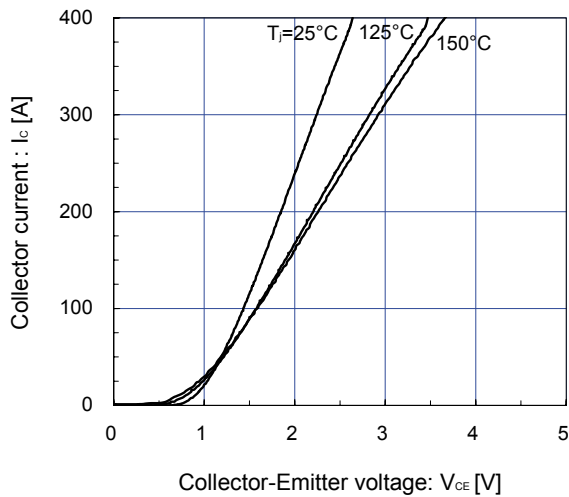
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Collector current vs. Collector-Emittor voltage (typ.)

 $T_J = 150^\circ\text{C}$ / chip

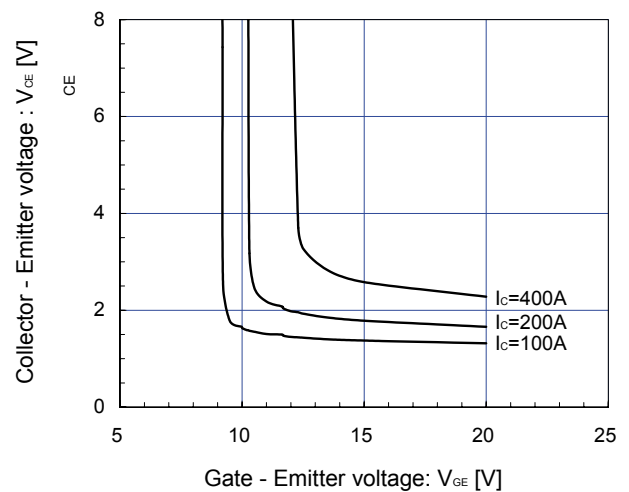
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Collector current vs. Collector-Emittor voltage (typ.)

 $V_{GE} = 15\text{V}$ / chip

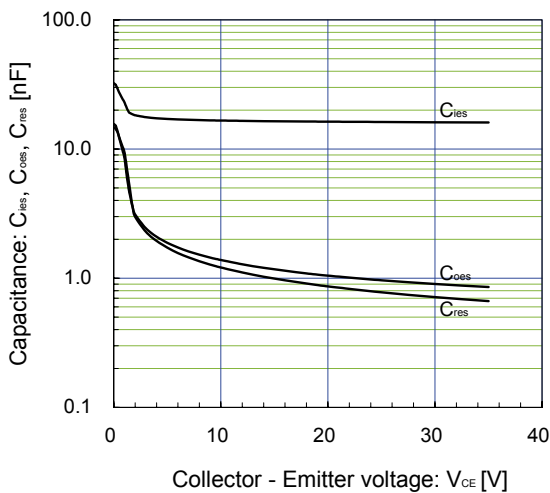
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Collector-Emittor voltage vs. Gate-Emittor voltage (typ.)

 $T_J = 25^\circ\text{C}$ / chip

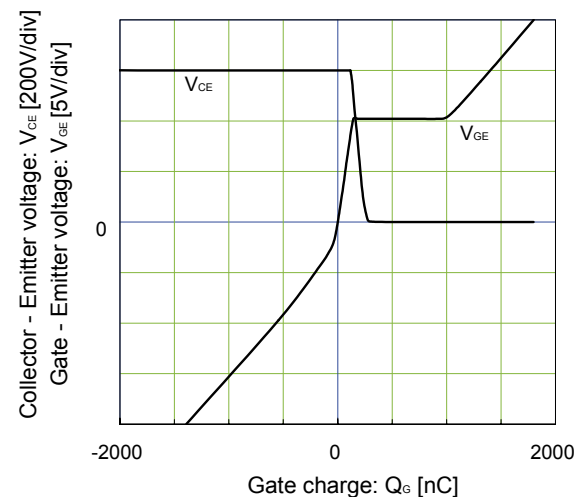
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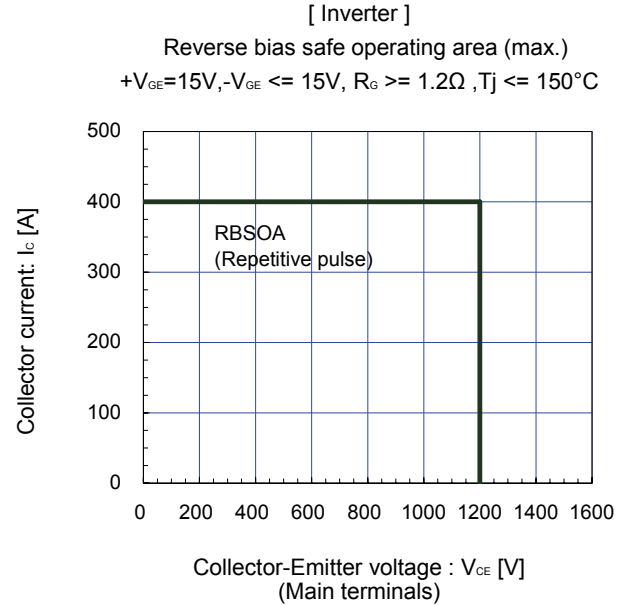
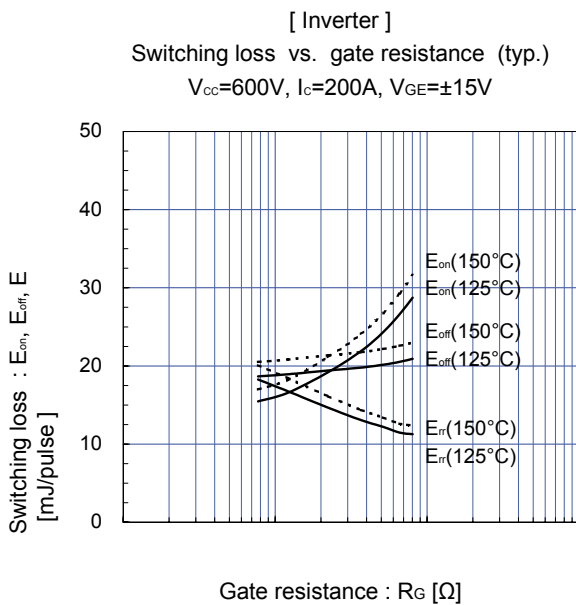
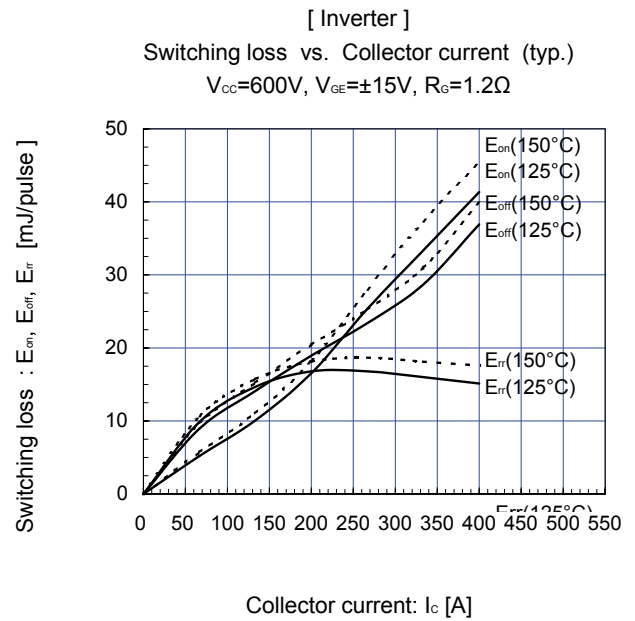
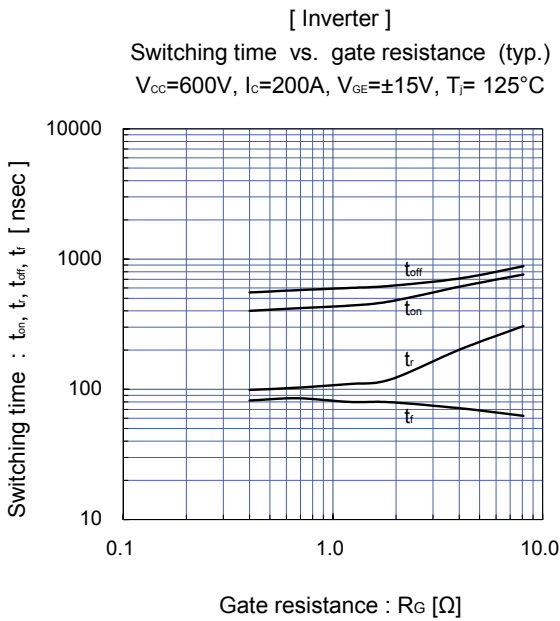
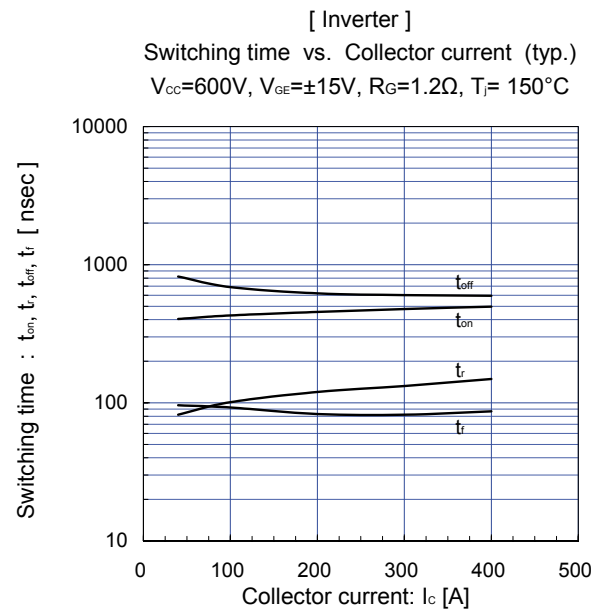
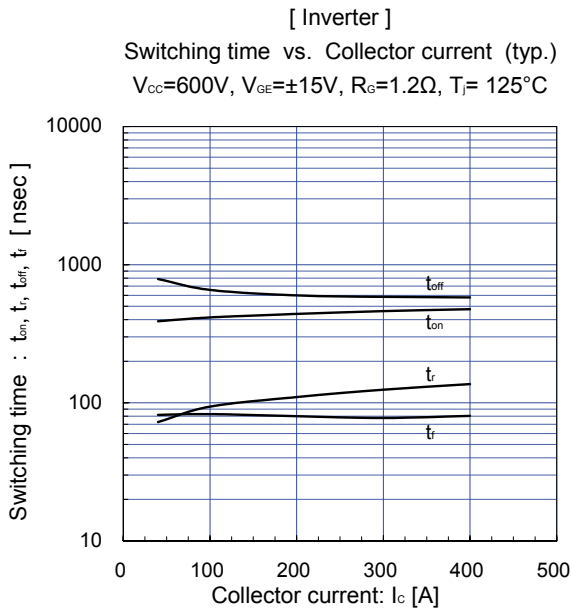
Capacitance vs. Collector-Emittor voltage (typ.)

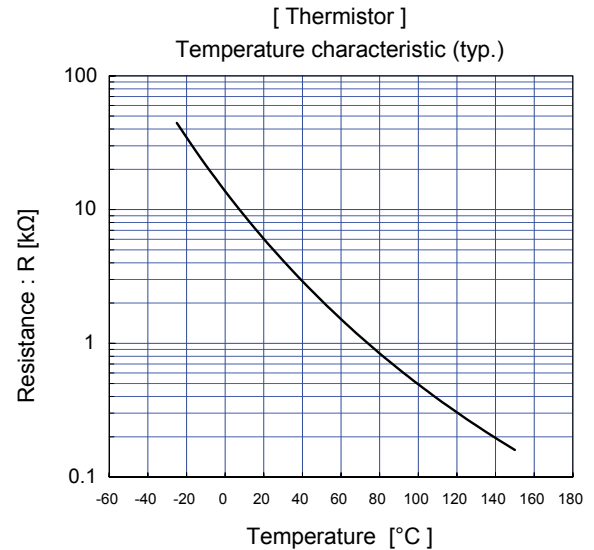
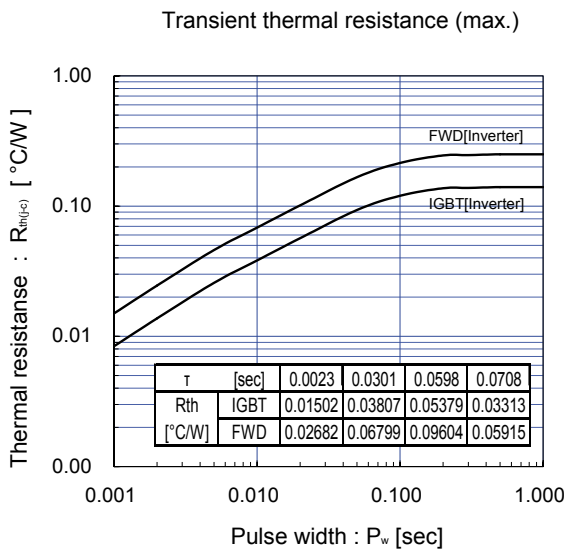
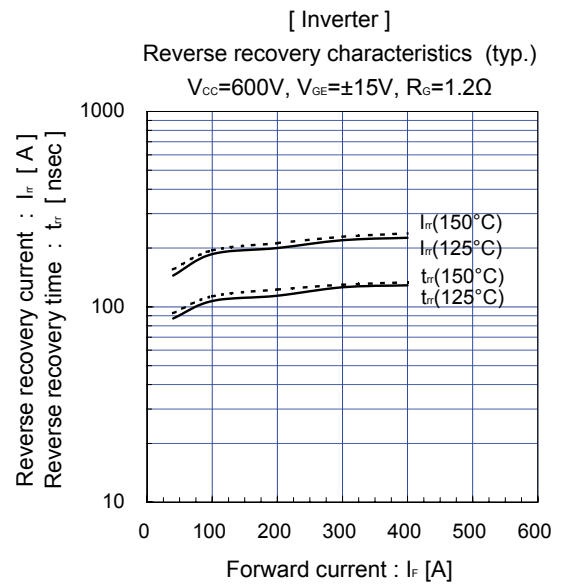
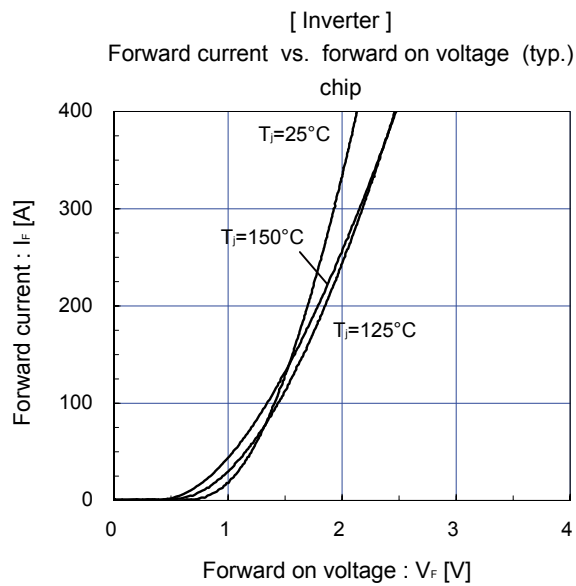
 $V_{GE} = 0\text{V}, f = 1\text{MHz}, T_J = 25^\circ\text{C}$ 

[Inverter]

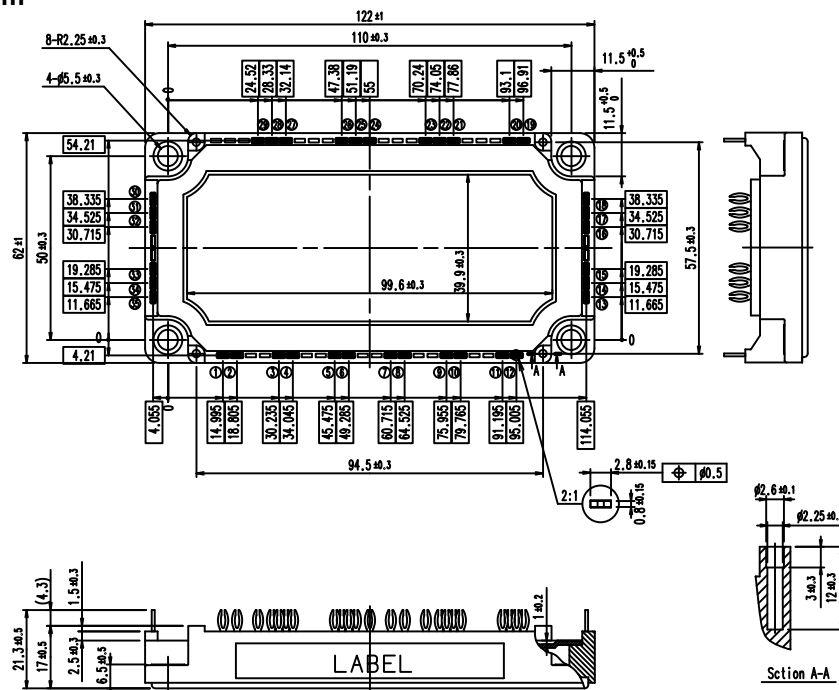
Dynamic gate charge (typ.)

 $V_{CC} = 600\text{V}, I_C = 200\text{A}, T_J = 25^\circ\text{C}$ 





Outline Drawings, mm



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