

6MBI100VX-120-50

IGBT Modules

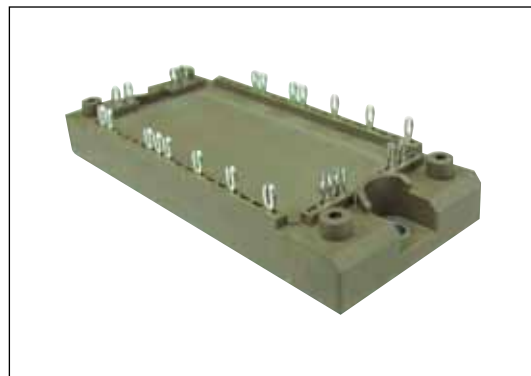
IGBT MODULE (V series) 1200V / 100A / 6 in one package

■ 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 =80°C	100	A
		I _c pulse	1ms	T _c =80°C	200	
		-I _c			100	
		-I _c pulse	1ms	200		
	Collector power dissipation	P _c	1 device		520	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)

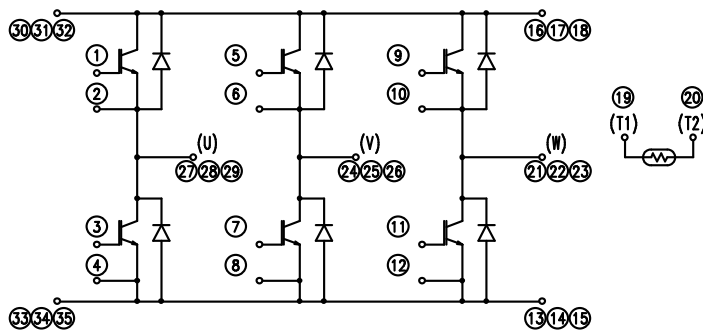
Items	Symbols	Conditions	Characteristics			Units
			min.	typ.	max.	
Zero gate voltage collector current	I_{CES}	$V_{GE} = 0V, V_{CE} = 1200V$	-	-	1.0	mA
Gate-Emitter leakage current	I_{GES}	$V_{CE} = 0V, V_{GE} = \pm 20V$	-	-	200	nA
Gate-Emitter threshold voltage	$V_{GE(th)}$	$V_{CE} = 20V, I_C = 100mA$	6.0	6.5	7.0	V
Collector-Emitter saturation voltage	$V_{CE(sat)}$ (terminal)	$V_{GE} = 15V$ $I_C = 100A$	Tj=25°C	2.25	2.70	V
			Tj=125°C	2.55	-	
			Tj=150°C	2.60	-	
	$V_{CE(sat)}$ (chip)	$V_{GE} = 15V$ $I_C = 100A$	Tj=25°C	1.75	2.20	
			Tj=125°C	2.05	-	
			Tj=150°C	2.10	-	
Input capacitance	C_{ies}	$V_{CE} = 10V, V_{GE} = 0V, f = 1MHz$	-	9.1	-	nF
Turn-on time	t_{on}	$V_{CC} = 600V$ $I_C = 100A$ $V_{GE} = +15 / -15V$ $R_G = 1.6\Omega$	-	0.39	1.20	μs
	t_r		-	0.09	0.60	
	$t_r(i)$		-	0.03	-	
Turn-off time	t_{off}		-	0.53	1.00	μs
	t_f		-	0.06	0.30	
Forward on voltage	V_F (terminal)	$I_F = 100A$	Tj=25°C	2.20	2.65	V
			Tj=125°C	2.35	-	
			Tj=150°C	2.30	-	
	V_F (chip)	$I_F = 100A$	Tj=25°C	1.70	2.15	
			Tj=125°C	1.85	-	
			Tj=150°C	1.80	-	
Reverse recovery time	t_{rr}	$I_F = 100A$	-	-	0.35	μs
Thermistor	Resistance	T = 25°C	-	5000	-	Ω
		T = 100°C	465	495	520	
	B value	T = 25 / 50°C	3305	3375	3450	K

● Thermal resistance characteristics

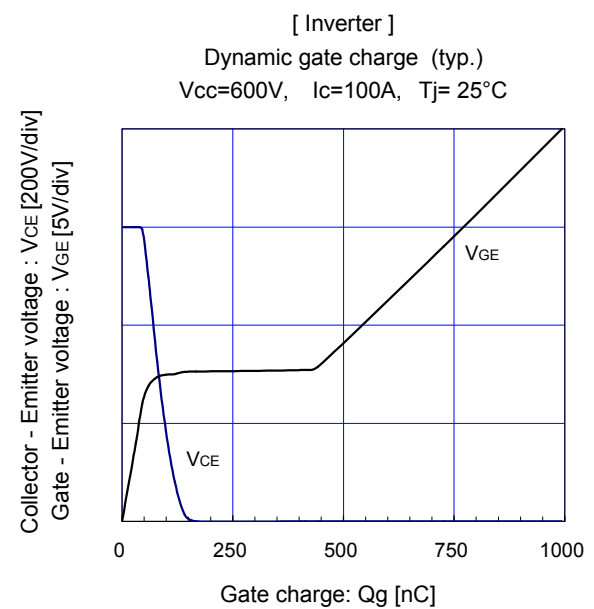
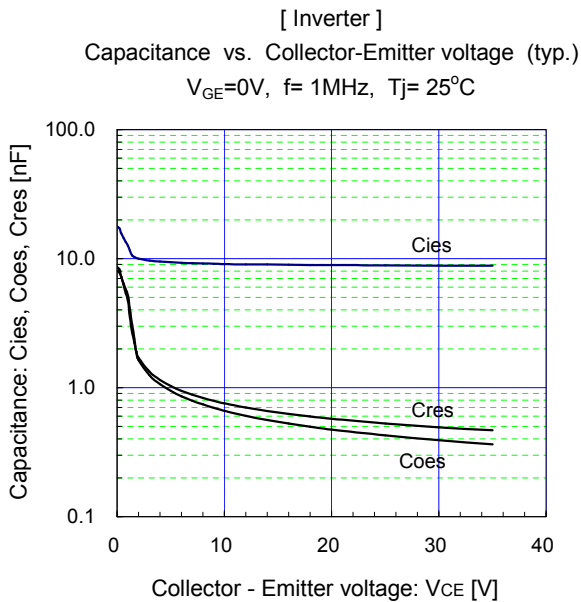
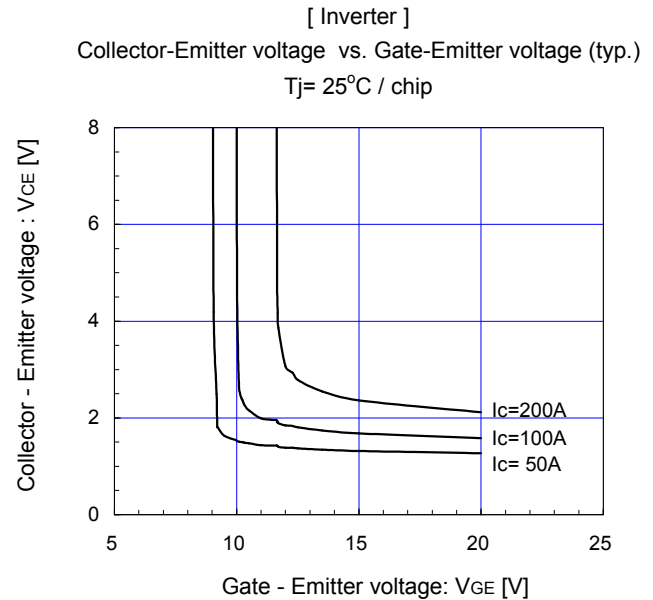
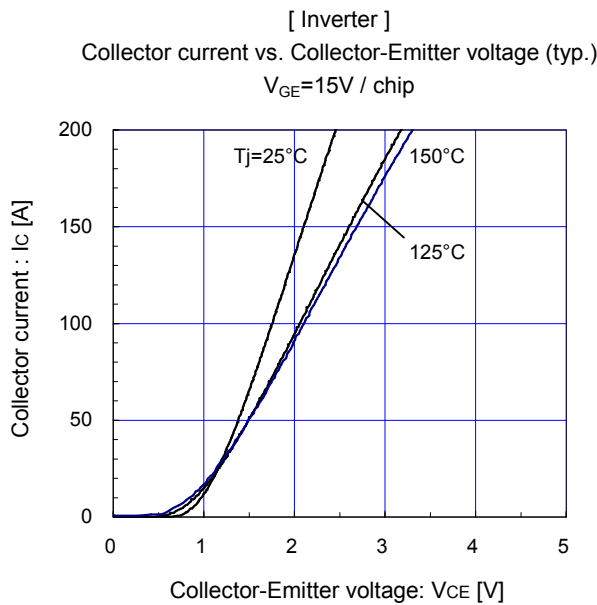
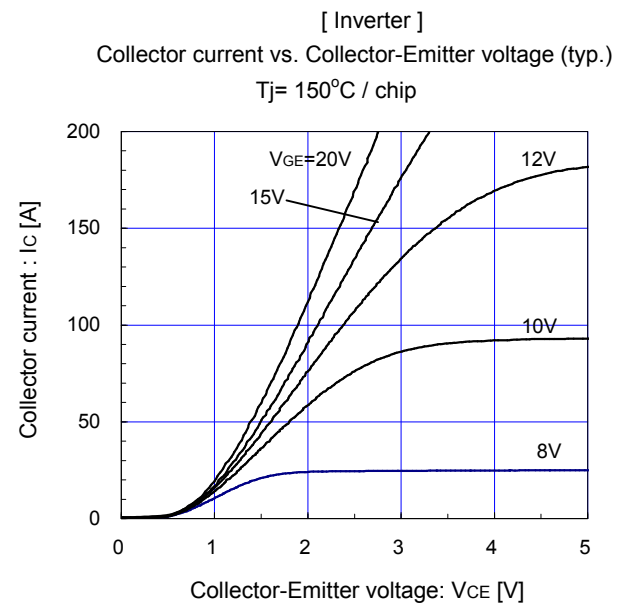
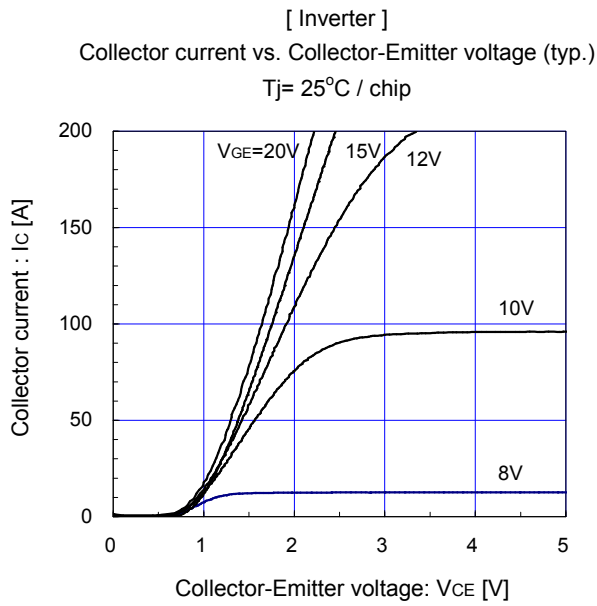
Items	Symbols	Conditions	Characteristics			Units
			min.	typ.	max.	
Thermal resistance (1device)	$R_{th(j-c)}$	Inverter IGBT	-	-	0.29	°C/W
		Inverter FWD	-	-	0.44	
Contact thermal resistance (1device) (*4)	$R_{th(c-f)}$	with Thermal Compound	-	0.05	-	

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

■ Equivalent Circuit Schematic

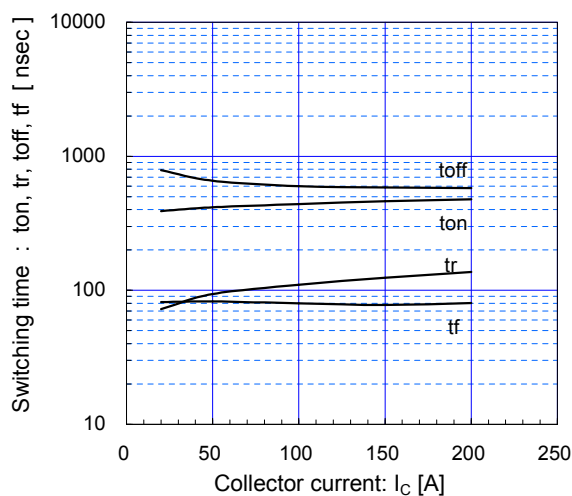


■ Characteristics (Representative)



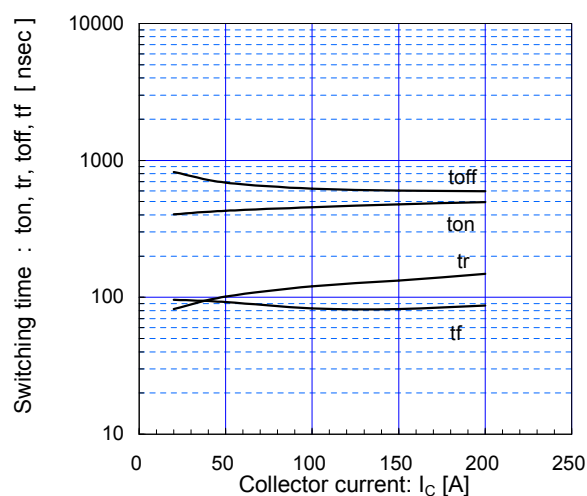
[Inverter]

Switching time vs. Collector current (typ.)
 $V_{CC}=600V$, $V_{GE}=\pm 15V$, $R_G=1.6\Omega$, $T_J=125^\circ C$



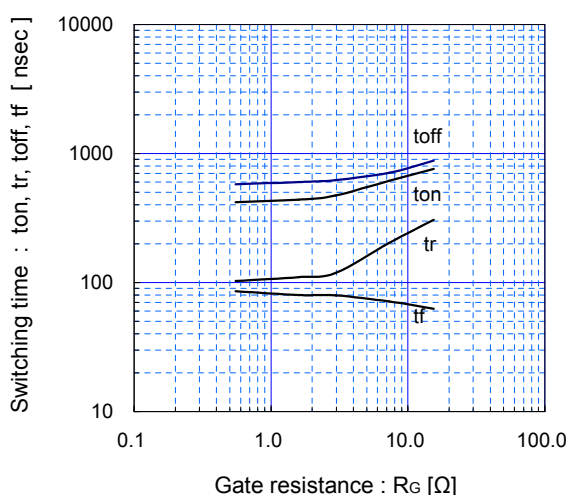
[Inverter]

Switching time vs. Collector current (typ.)
 $V_{CC}=600V$, $V_{GE}=\pm 15V$, $R_G=1.6\Omega$, $T_J=150^\circ C$



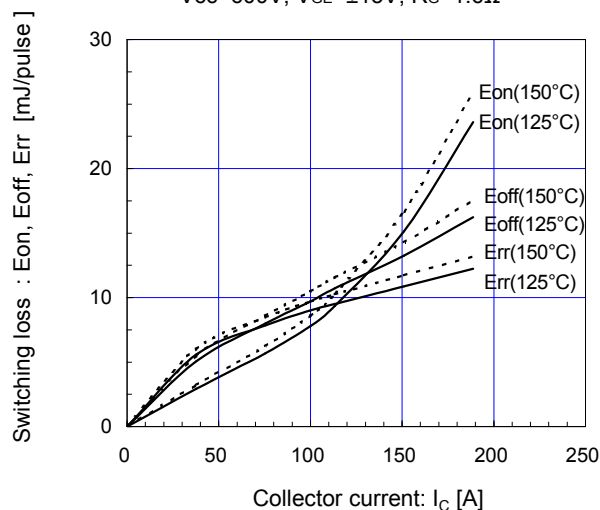
[Inverter]

Switching time vs. gate resistance (typ.)
 $V_{CC}=600V$, $I_C=100A$, $V_{GE}=\pm 15V$, $T_J=125^\circ C$



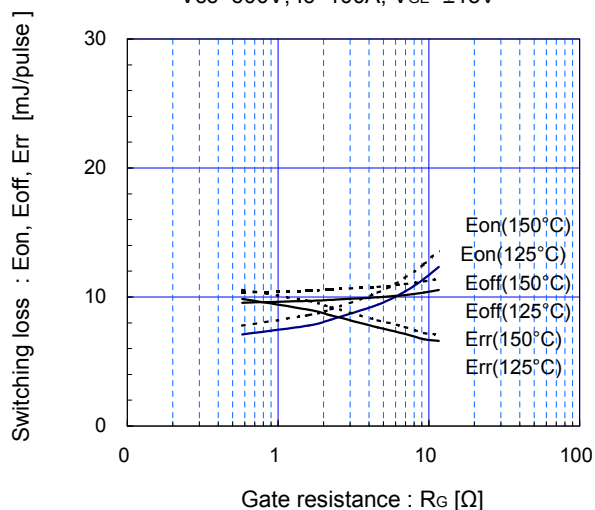
[Inverter]

Switching loss vs. Collector current (typ.)
 $V_{CC}=600V$, $V_{GE}=\pm 15V$, $R_G=1.6\Omega$



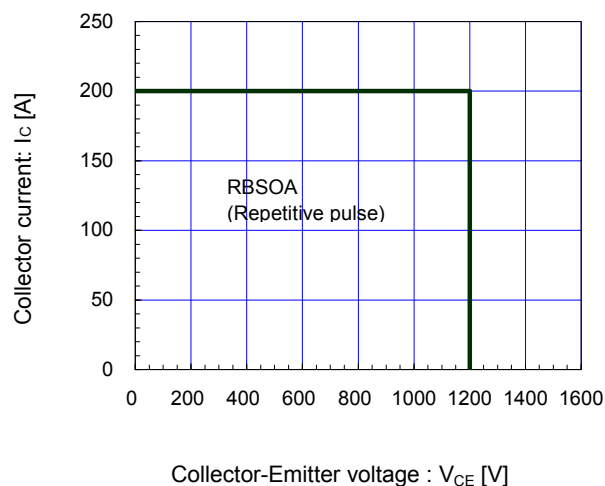
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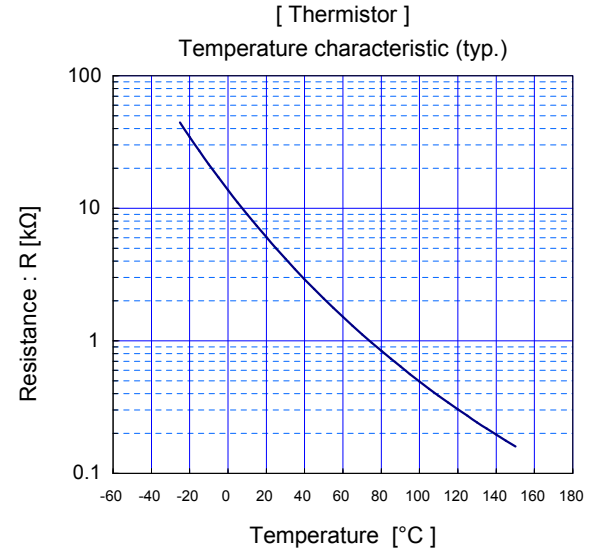
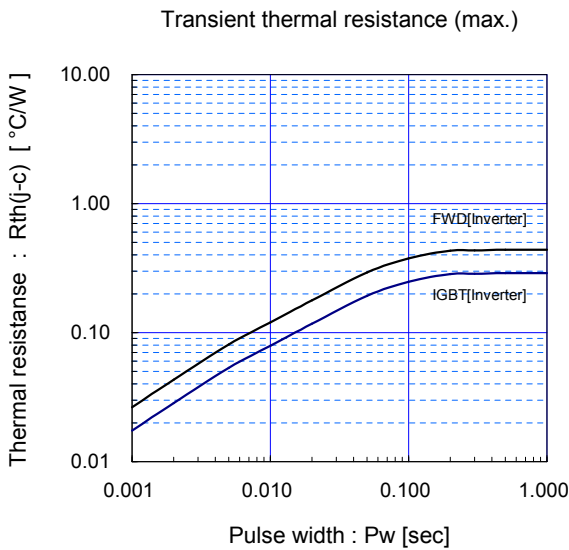
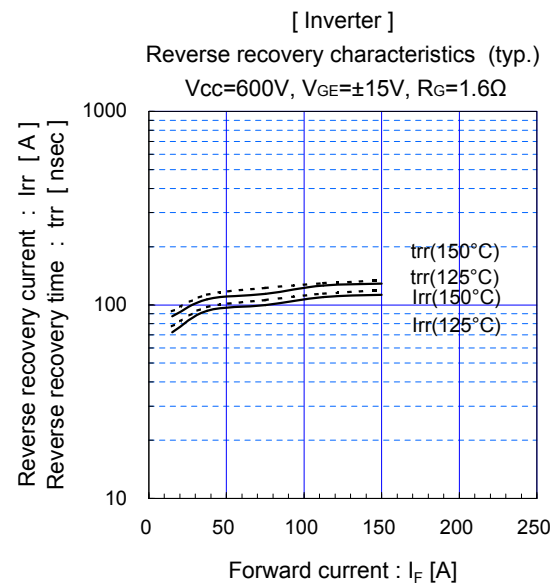
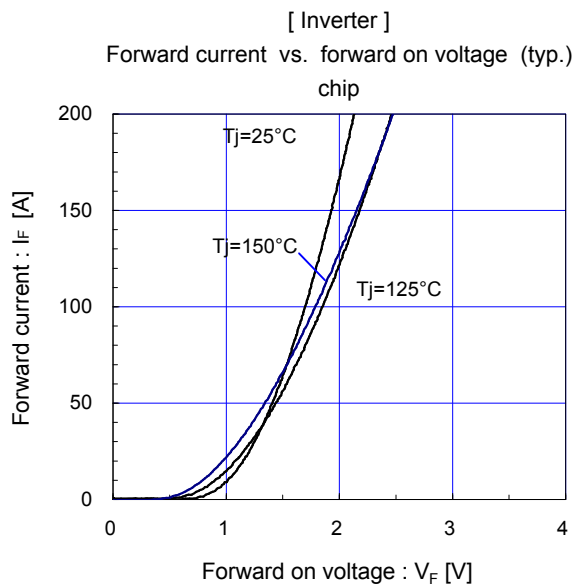
Switching loss vs. gate resistance (typ.)
 $V_{CC}=600V$, $I_C=100A$, $V_{GE}=\pm 15V$



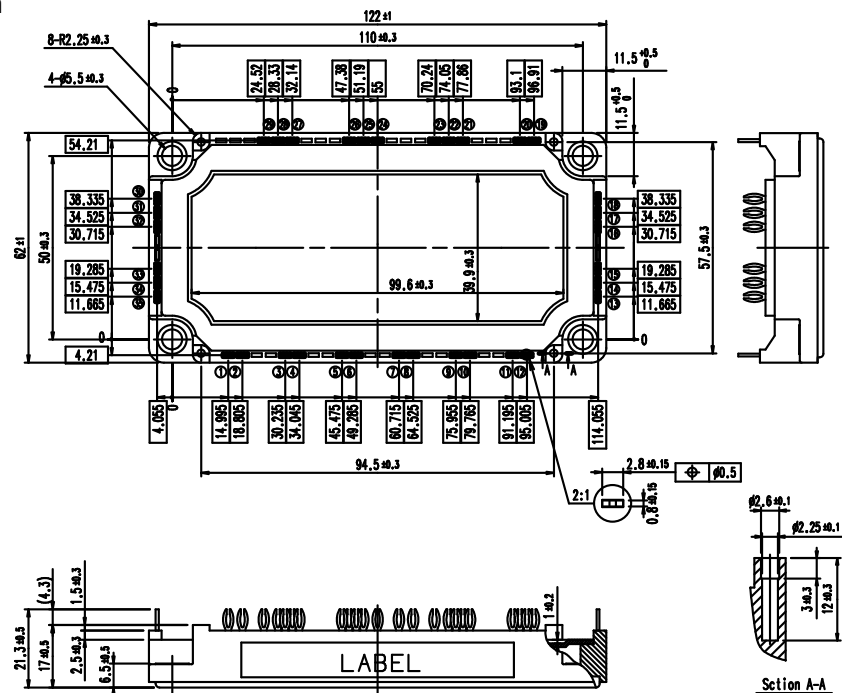
[Inverter]

Reverse bias safe operating area (max.)
 $+V_{GE}=15V$, $-V_{GE} \leq 15V$, $R_G \geq 1.6\Omega$, $T_J \leq 125^\circ C$





Outline Drawings, mm



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