

2MBI600U4G-120

IGBT Modules

IGBT MODULE (U series) 1200V / 600A / 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	Conditions		Units	
Collector-Emitter voltage	Vces			1200		
Gate-Emitter voltage	VGES			±20	V	
Collector current	Ic	Continuous	Tc=25°C	800		
		Continuous	Tc=80°C	600		
	Ic pulse	1ms	Tc=25°C	1600	Α	
		11115	Tc=80°C	1200	A	
	-lc			600		
	-lc pulse	1ms		1200		
Collector power dissipation	Pc	1 device	1 device		W	
Junction temperature	Tj				°C	
Storage temperature	Tstg					
Isolation voltage Between terminal and copper base (*1) V _{iso}	AC: 1min.	AC : 1min.		VAC	
Screw torque Mounting (*2) Terminals (*3)	M6			5.75		
	M8			10	N m	
reminals (3)	M4			2.5		

Note *1: All terminals should be connected together when isolation test will be done.

Note *2: Recommendable Value: Mounting 4.25~5.75 Nm (M6)

Note *3: Recommendable Value: Main Terminals 8~10 Nm (M8)

Sense Terminals 1.7~2.5 Nm (M4)

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

Itama	Cumbala	ymbols Conditions		Characteristics			11
Items	Symbols			min.	typ.	max.	Units
Zero gate voltage collector current	Ices	V _{GE} = 0V, V _{CE} = 1200V		-	-	1.0	mA
Gate-Emitter leakage current	Iges	V _{CE} = 0V, V _{GE} = ±20V		-	-	1200	nA
Gate-Emitter threshold voltage	V _{GE (th)}	Vce = 20V, Ic = 600mA		5.5	6.5	7.5	V
Collector-Emitter saturation voltage	V _{CE} (sat)		Tj=25°C	- 2.08 2	2.26		
	(main terminal)) V _{GE} = 15V I _C = 600A	Tj=125°C	-	2.28	-	V
	V _{CE} (sat)		Tj=25°C	-	1.90	2.05	
	(chip)		Tj=125°C	-	2.10	-	
Input capacitance	Cies	Vce = 10V, Vge = 0V, f = 1MH	Z	-	68	-	nF
Turn-on	ton			-	1.35	-	μs
	tr			-	0.65	-	
Turn-off	toff			-	0.80	-	
	tf			0.20	-]	
Forward on voltage	VF		Tj=25°C	-	1.83	2.01	V
	(main terminal)) V _{GE} = 0V I _F = 600A	Tj=125°C	-	1.93	-	
	V _F		Tj=25°C	-	1.65	1.80	
	(chip)		Tj=125°C	-	1.75	-	
Reverse recovery	trr	I _F = 600A	-	-	0.45	-	μs
Lead resistance, terminal-chip (*4)	R lead			-	0.29	-	mΩ

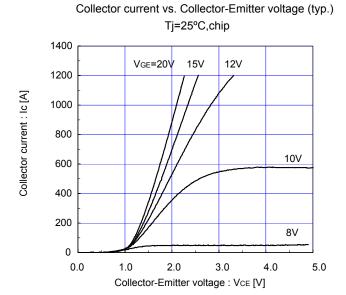
Note *4: Biggest internal terminal resistance among arm.

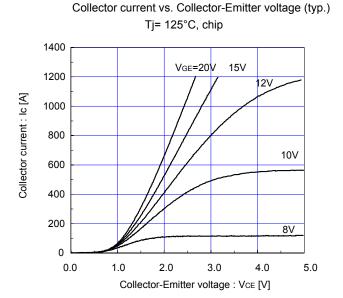
Thermal resistance characteristics

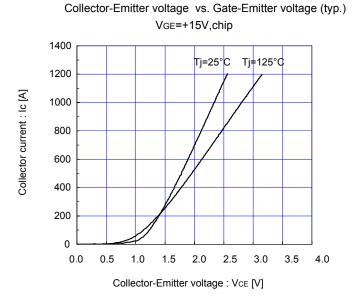
Items	Symbols	Conditions	Characteristics			Units
items	Symbols	Conditions	min.	typ.	max.	Units
Thermal resistance (1device)	Dth/i o)	IGBT	-	-	0.034	°C/W
	Rth(j-c)	FWD	-	-	0.060	
Contact thermal resistance (1device)	Rth(c-f)	with Thermal Compound (*5)	-	0.006	-	

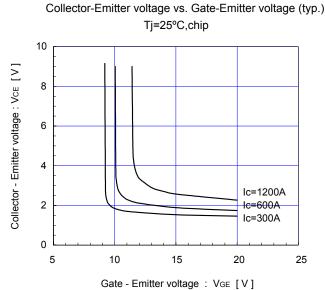
Note *5: This is the value which is defined mounting on the additional cooling fin with thermal compound.

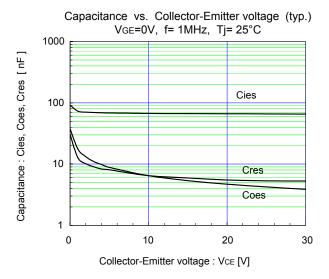
■ Characteristics (Representative)

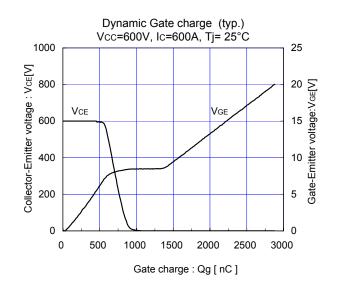




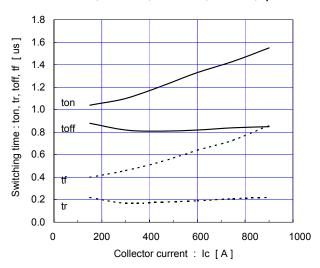




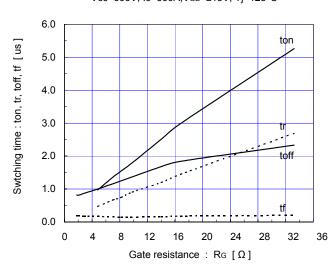




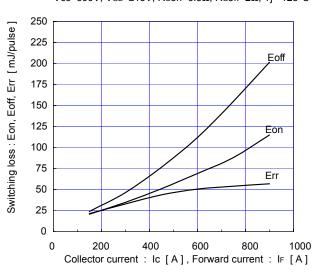
Switching time vs. Collector current (typ.) Vcc=600V, VgE= \pm 15V, Rgon= 6.8Ω , Rgoff= 2Ω , Tj= 125° C



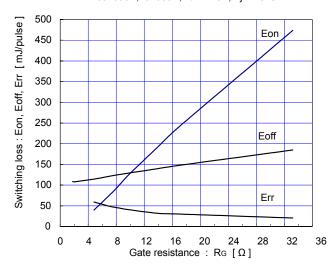
Switching time vs. Gate resistance (typ.) Vcc=600V, Ic=600A, VgE=±15V, Tj=125°C



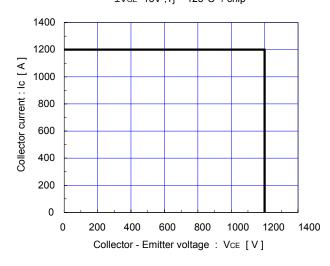
Switching loss vs. Collector current (typ.) Vcc=600V, VgE= \pm 15V, Rgon= 6.8Ω , Rgoff= 2Ω , Tj= 125° C



Switching loss vs. Gate resistance (typ.) Vcc=600V, lc=600A,VGE=±15V, Tj=125°C

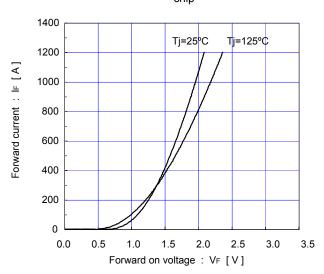


Reverse bias safe operating area (max.) ±Vge=15V ,Tj = 125°C / chip

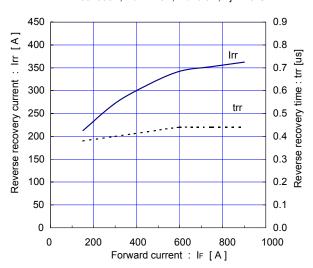


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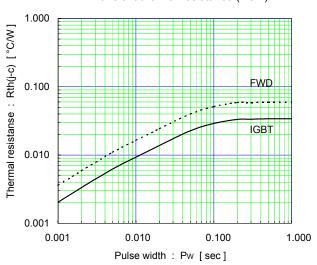
Forward current vs. Forward on voltage (typ.) chip



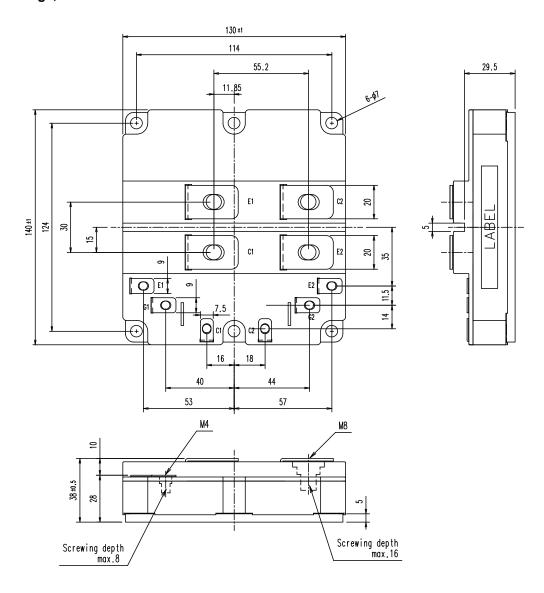
Reverse recovery characteristics (typ.) Vcc=600V, VgE= \pm 15V, Rg= 6.8Ω , Tj= 125° C



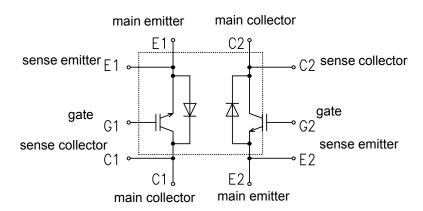
Transient thermal resistance (max.)



■ Outline Drawings, mm



■ Equivalent Circuit Schematic



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