

2MBI300UC-120

IGBT MODULE (U series) 1200V / 300A / 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	
Collector-Emitter voltage	V _{CEs}		1200	V	
Gate-Emitter voltage	V _{GES}		±20	V	
Collector current	I _c	Continuous	T _c =25°C	400	A
			T _c =80°C	300	
	I _c pulse	1ms	T _c =25°C	800	
			T _c =80°C	600	
-I _c			300		
-I _c pulse			600		
Collector power dissipation	P _c	1 device	1470	W	
Junction temperature	T _j		150	°C	
Storage temperature	T _{stg}		-40 to +125	°C	
Isolation voltage	V _{iso}	AC : 1min.	2500	VAC	
Screw torque	Mounting (*2)		3.5	N·m	
	Terminals (*2)		4.5		

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

Note *2: Recommendable value : Mounting : 2.5-3.5 N·m (M5 or M6), Terminals : 3.5-4.5 N·m (M6)

● 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	-	-	2.0	mA	
Gate-Emitter leakage current	I _{GES}	V _{CE} = 0V, V _{GE} = ±20V	-	-	400	nA	
Gate-Emitter threshold voltage	V _{GE(th)}	V _{CE} = 20V, I _c = 300mA	4.5	6.5	8.5	V	
Collector-Emitter saturation voltage	V _{CE(sat)} (terminal)	V _{GE} = 15V I _c = 300A	T _j =25°C	-	1.90	2.25	V
			T _j =125°C	-	2.15	-	
	V _{CE(sat)} (chip)		T _j =25°C	-	1.75	2.10	
			T _j =125°C	-	2.00	-	
Input capacitance	C _{ies}	V _{GE} = 0V, V _{CE} = 10V, f = 1MHz	-	34	-	nF	
Turn-on time	t _{on}	V _{CC} = 600V I _c = 300A V _{GE} = ±15V R _G = 1.1Ω	-	0.36	1.20	μs	
	t _r		-	0.21	0.60		
Turn-off time	t _{off}		-	0.03	-		
	t _f		-	0.37	1.00		
Forward on voltage	V _F (terminal)	V _{GE} = 0V I _F = 300A	T _j =25°C	-	1.75	2.05	V
			T _j =125°C	-	1.85	-	
	V _F (chip)		T _j =25°C	-	1.60	1.90	
			T _j =125°C	-	1.70	-	
Reverse recovery time	t _{rr}	I _F = 300A	-	-	0.35	μs	
Lead resistance, terminal-chip (*3)	R lead		-	0.53	-	mΩ	

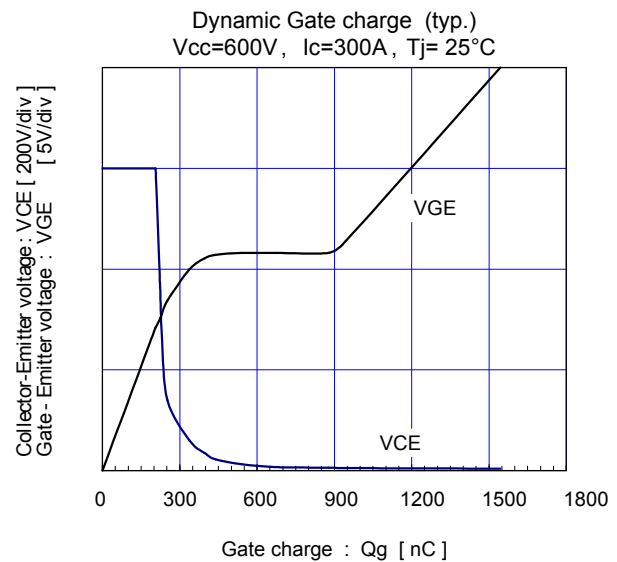
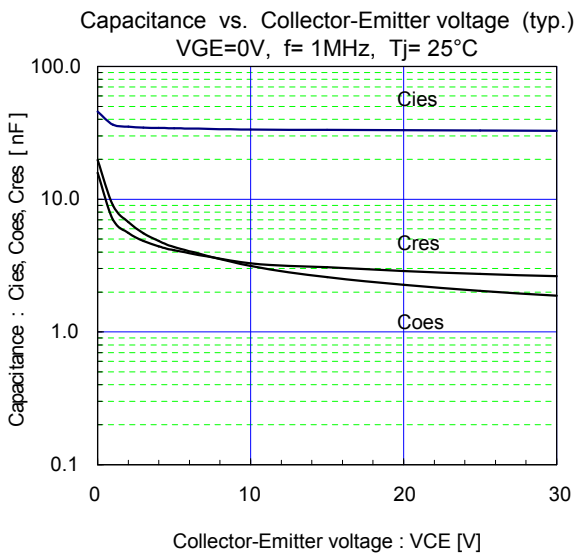
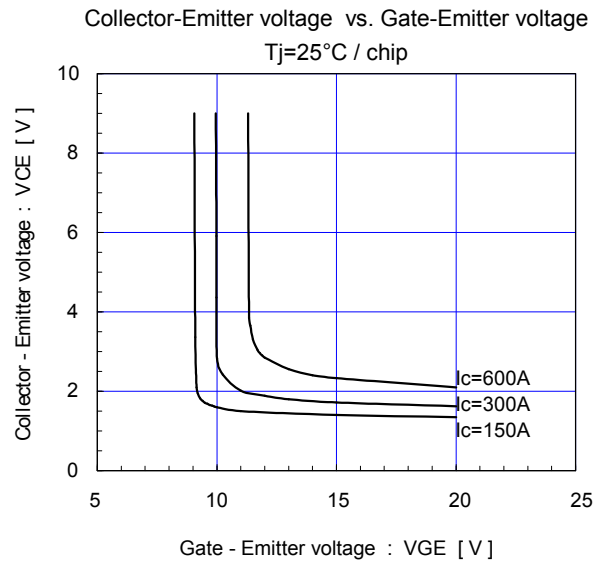
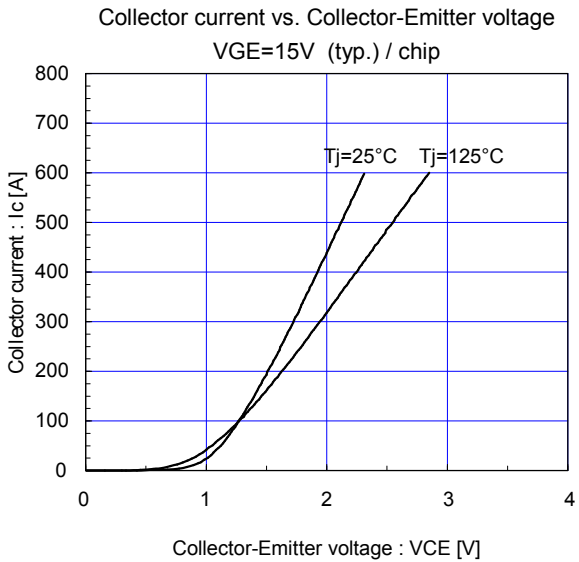
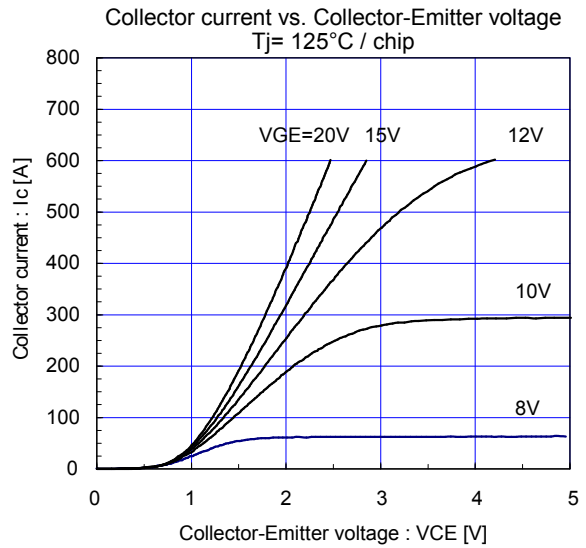
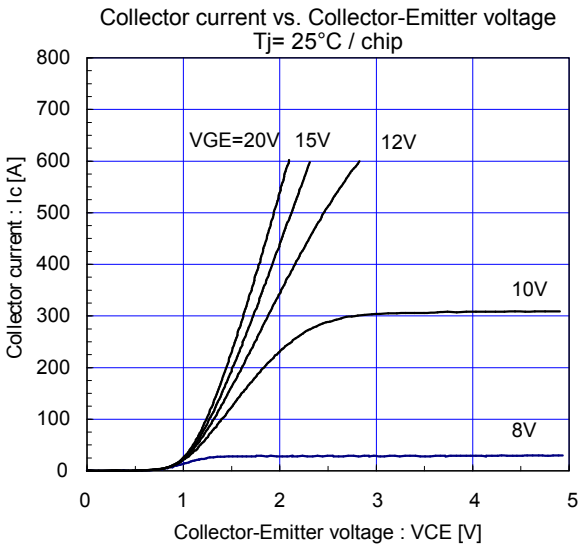
Note *3: Biggest internal terminal resistance among arm.

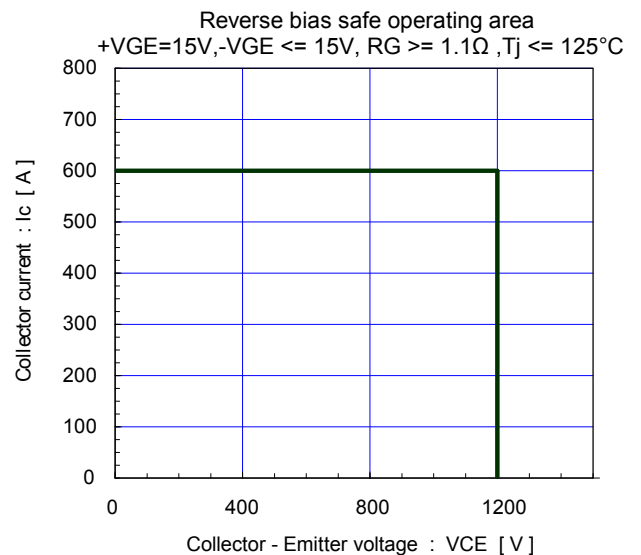
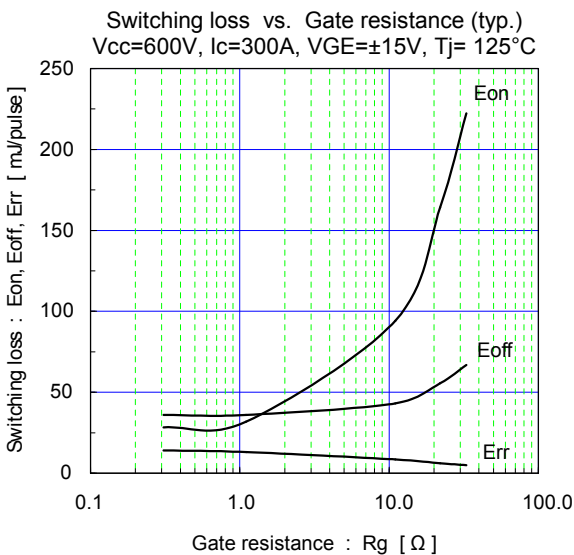
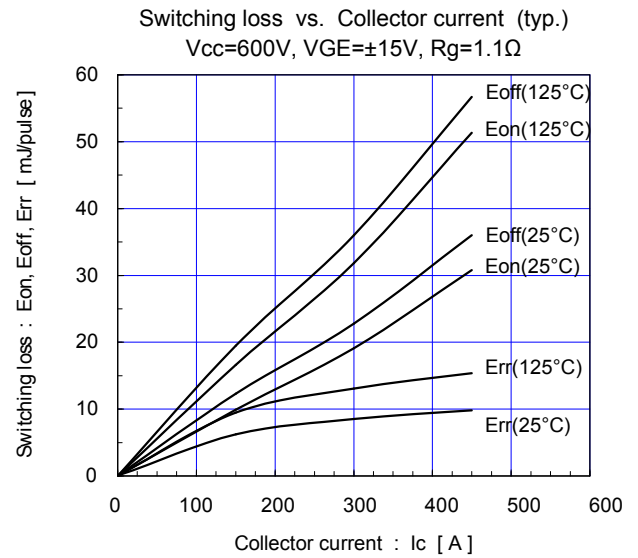
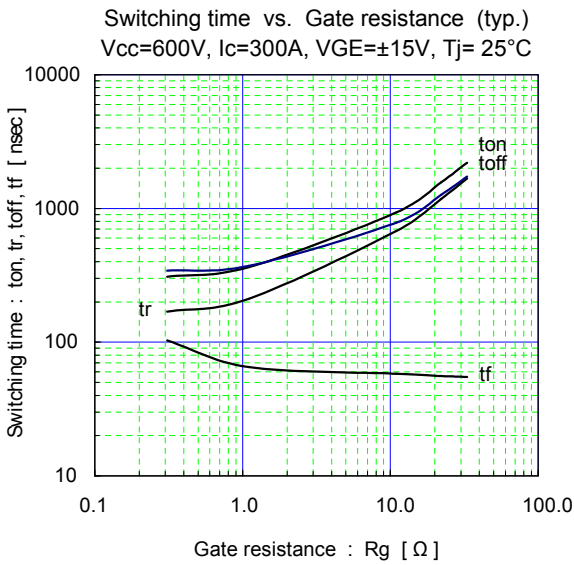
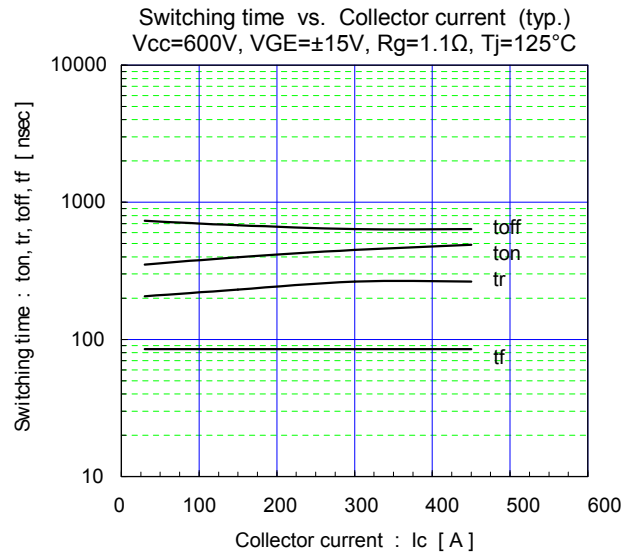
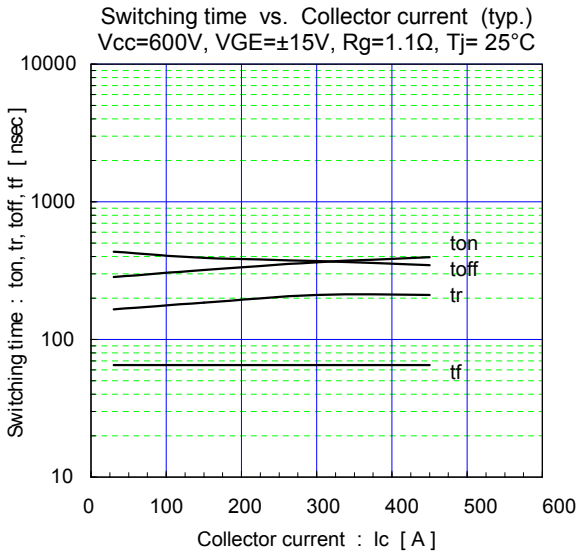
● Thermal resistance characteristics

Items	Symbols	Conditions	Characteristics			Units
			min.	typ.	max.	
Thermal resistance (1device)	R _{th(j-c)}	IGBT	-	-	0.085	°C/W
		FWD	-	-	0.14	
Contact thermal resistance	R _{th(c-f)}	with Thermal Compound (*4)	-	0.025	-	

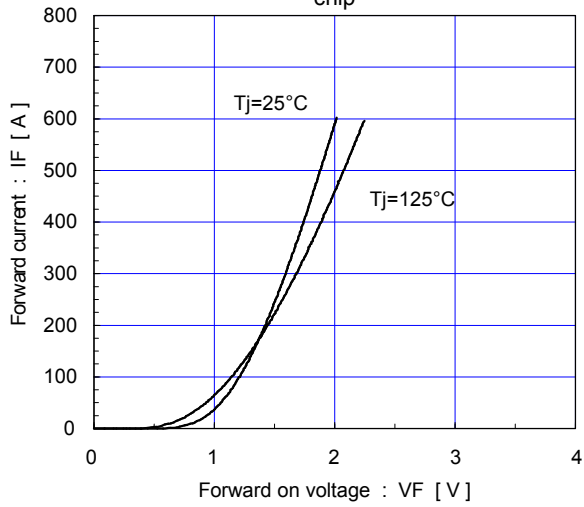
Note *4: This is the value which is defined mounting on the additional cooling fin with thermal compound.

■ Characteristics (Representative)

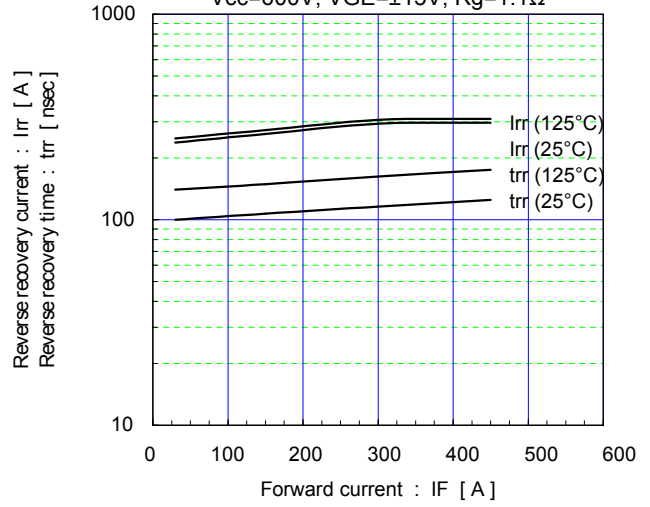




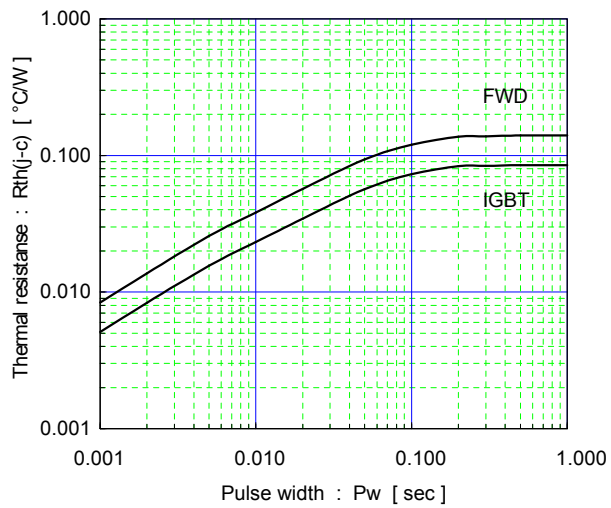
Forward current vs. Forward on voltage (typ.)
chip



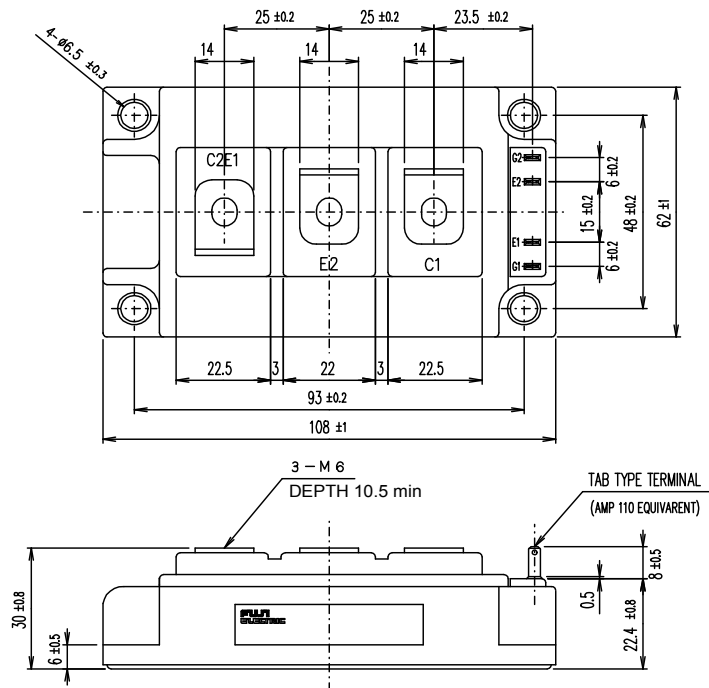
Reverse recovery characteristics (typ.)
Vcc=600V, VGE=±15V, Rg=1.1Ω



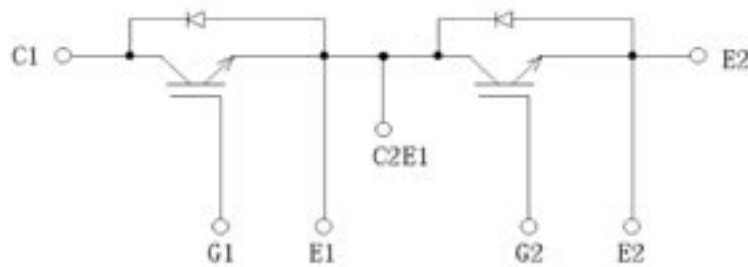
Transient thermal resistance



■ Outline Drawings, mm



■ Equivalent Circuit Schematic



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