

1MBI1200U4C-170

IGBT Modules

IGBT MODULE (U series) 1700V / 1200A / 1 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}			1700	V
Gate-Emitter voltage	V _{GES}			±20	V
Collector current	I _c	Continuous	T _c =25°C	1600	A
			T _c =80°C	1200	
	I _c pulse	1ms	T _c =25°C	3200	
			T _c =80°C	2400	
	-I _c			1200	
	-I _c pulse	1ms			2400
Collector power dissipation	P _c	1 device		7350	W
Junction temperature	T _j			150	°C
Storage temperature	T _{stg}			-40 to +125	°C
Isolation voltage	Between terminal and copper base (*1) V _{so}	AC : 1min.		3400	VAC
Screw torque	Mounting (*2)			5.75	N·m
	Main Terminals (*2)			10	
	Sense Terminals (*2)			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 N·m (M6), Main Terminal : 8-10 N·m (M8), Sense Terminal : 1.7-2.5 N·m (M4)

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

Items	Symbols	Conditions	Characteristics			Units
			min.	typ.	max.	
Zero gate voltage collector current	I_{CES}	$V_{GE} = 0V, V_{CE} = 1700V$	-	-	1.0	mA
Gate-Emitter leakage current	I_{GES}	$V_{CE} = 0V, V_{GE} = \pm 20V$	-	-	2400	nA
Gate-Emitter threshold voltage	$V_{GE(th)}$	$V_{CE} = 20V, I_c = 1200mA$	5.5	6.5	7.5	V
Collector-Emitter saturation voltage	$V_{CE(sat)}$ (main terminal)	$V_{GE} = 15V$ $I_c = 1200A$	Tj=25°C	2.43	2.61	V
			Tj=125°C	2.83	-	
	$V_{CE(sat)}$ (chip)		Tj=25°C	2.25	2.40	
			Tj=125°C	2.65	-	
Input capacitance	C_{ies}	$V_{GE} = 0V, V_{CE} = 10V, f = 1MHz$	-	112	-	nF
Turn-on time	t_{on}	$V_{CC} = 900V, I_c = 1200A$ $V_{GE} = \pm 15V, T_j = 125°C$ $R_{gon} = 3.9\Omega, R_{goff} = 1.5\Omega$	-	1.80	-	µs
	t_r		-	0.85	-	
Turn-off time	t_{off}		-	1.30	-	
	t_f		-	0.35	-	
Forward on voltage	V_F (main terminal)	$V_{GE} = 0V$ $I_F = 1200A$	Tj=25°C	1.98	2.36	V
			Tj=125°C	2.18	-	
	V_F (chip)		Tj=25°C	1.80	2.15	
			Tj=125°C	2.00	-	
Reverse recovery time	t_{rr}	$I_F = 1200A$	-	0.35	-	µs
Lead resistance, terminal-chip (*3)	R lead		-	0.146	-	mΩ

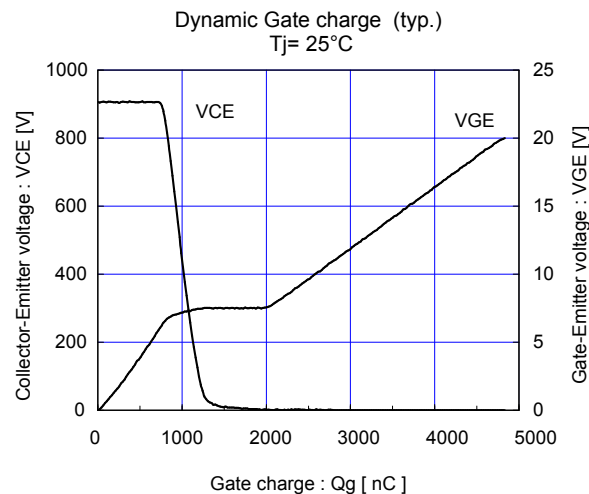
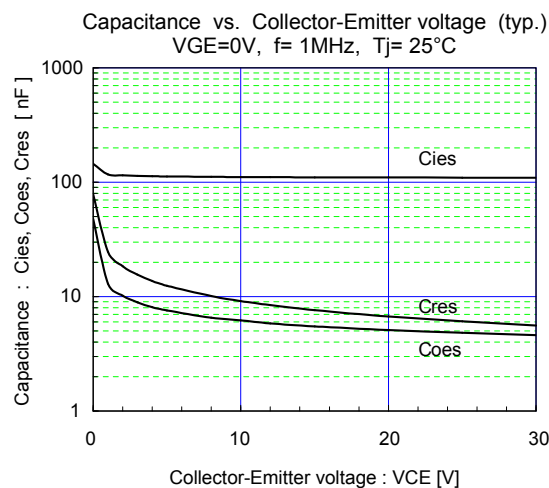
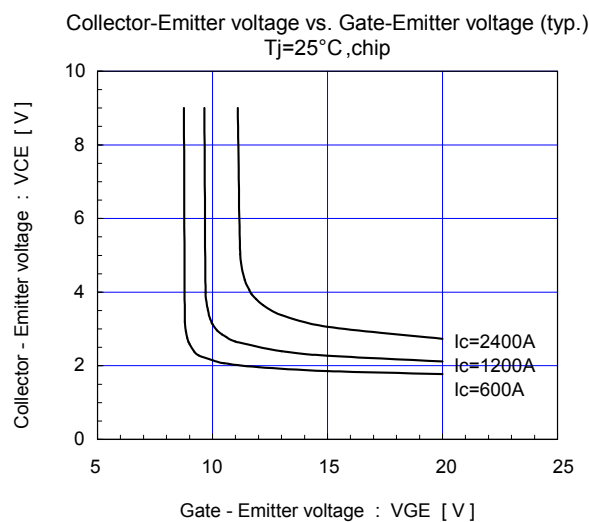
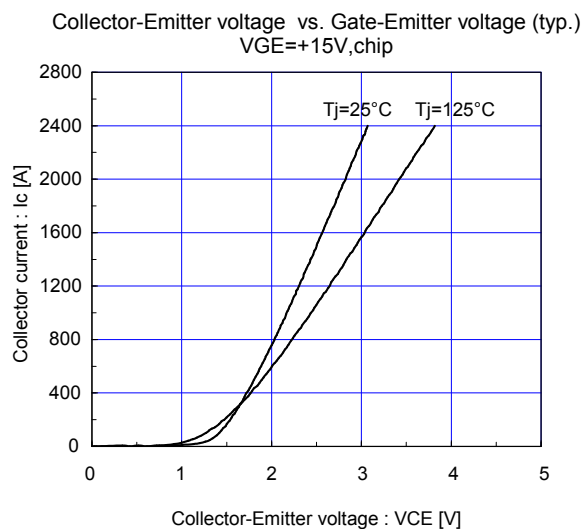
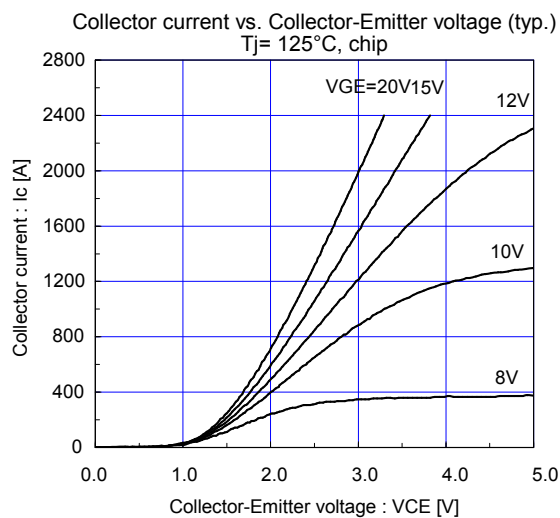
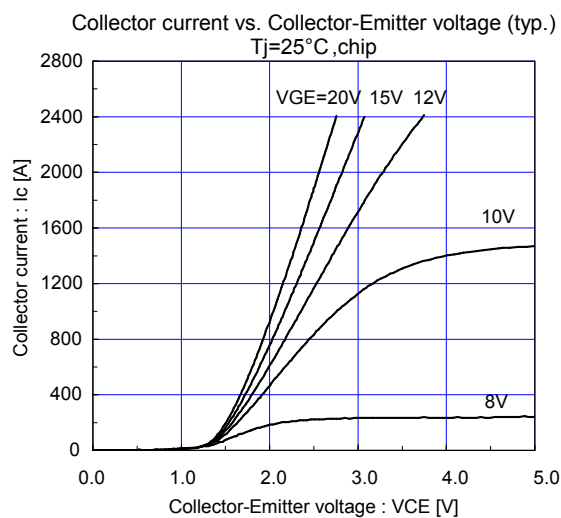
Note *3: Biggest internal terminal resistance among arm.

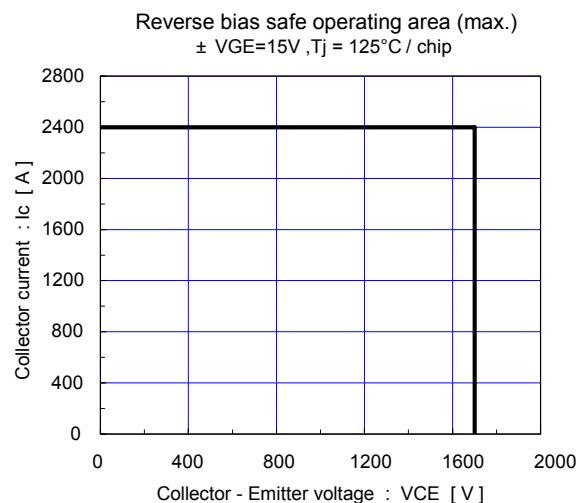
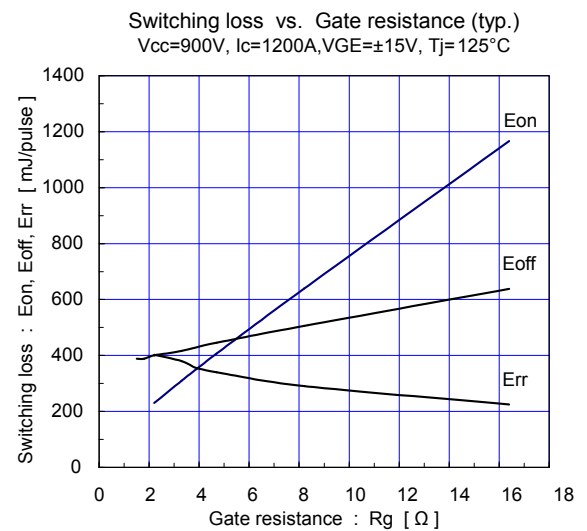
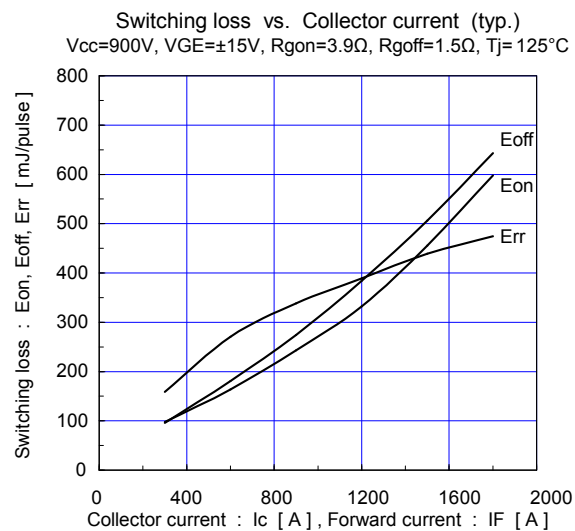
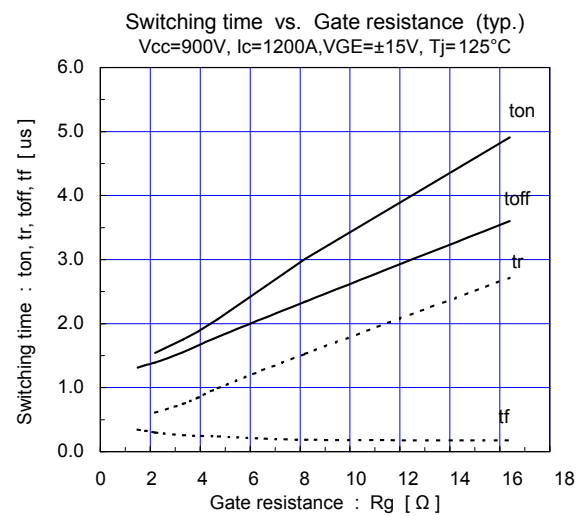
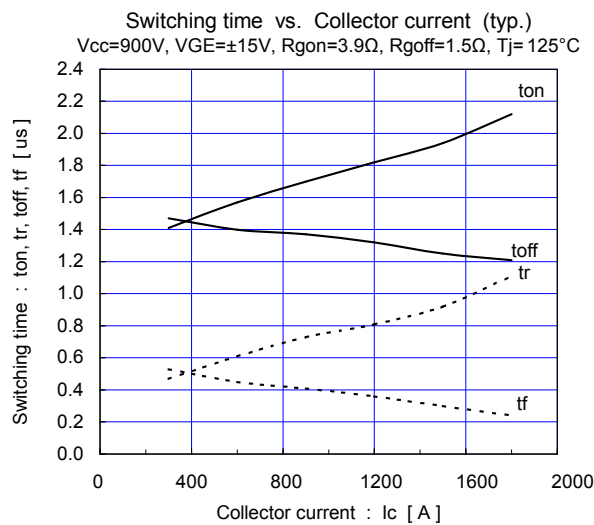
● Thermal resistance characteristics

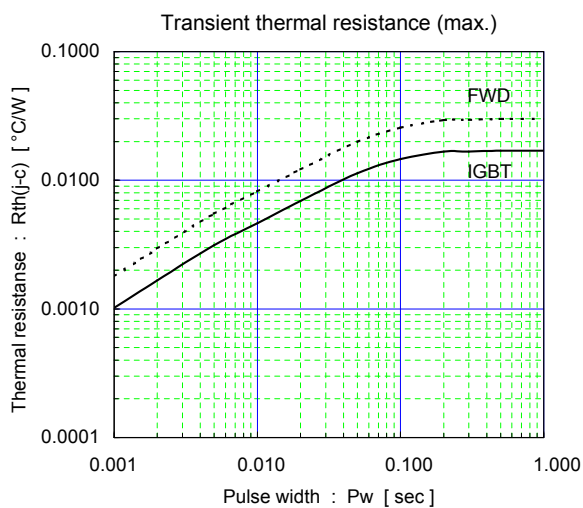
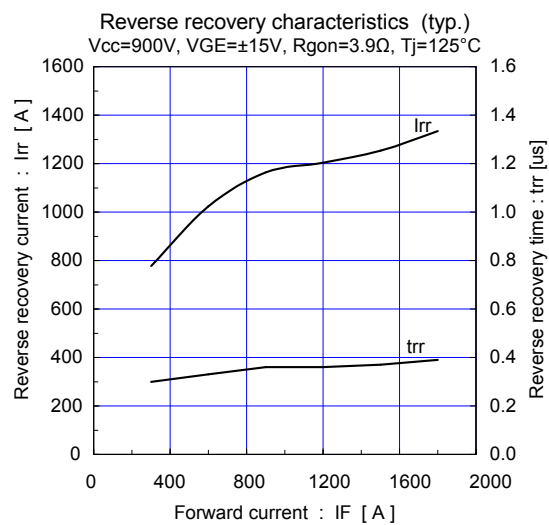
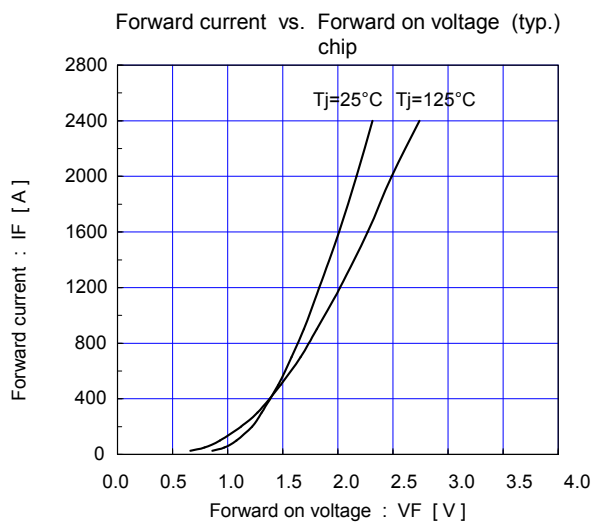
Items	Symbols	Conditions	Characteristics			Units
			min.	typ.	max.	
Thermal resistance (1device)	$R_{th(j-c)}$	IGBT	-	-	0.017	°C/W
		FWD	-	-	0.030	
Contact thermal resistance (1device)	$R_{th(c-f)}$	with Thermal Compound (*4)	-	0.006	-	

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

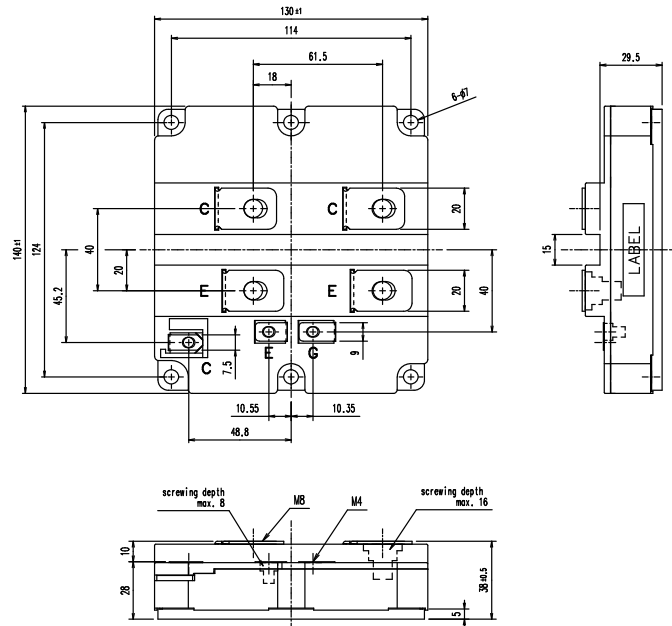
■ Characteristics (Representative)



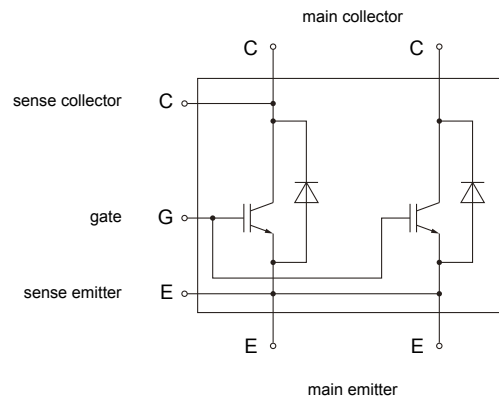




Outline Drawings, mm



Equivalent Circuit Schematic



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