

1MBI1600U4C-170

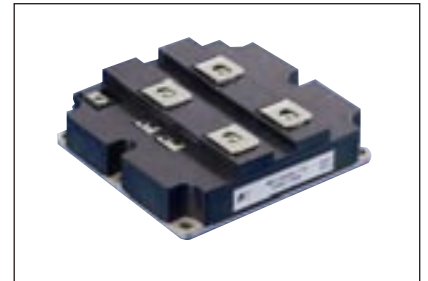
IGBT MODULE (U series) 1700V / 1600A / 1 in one package

■ 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	Tc=25°C	2400	A
			Tc=80°C	1600	
	I _c pulse	1ms	Tc=25°C	4800	
			Tc=80°C	3200	
	-I _c			1600	
-I _c pulse	1ms		3200		
Collector power dissipation	P _c	1 device	9760	W	
Junction temperature	T _j		150	°C	
Storage temperature	T _{stg}		-40 to +125	°C	
Isolation voltage	V _{iso}	AC : 1min.	3400	VAC	
Screw torque	Between terminal and copper base (*1)				
	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} = ±20V	-	-	3200	nA	
Gate-Emitter threshold voltage	V _{GE(th)}	V _{CE} = 20V, I _c = 1600mA	5.5	6.5	7.5	V	
Collector-Emitter saturation voltage	V _{CE(sat)} (main terminal)	V _{GE} = 15V I _c = 1600A	Tj=25°C	-	2.47	2.65	V
			Tj=125°C	-	2.87	-	
	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	-	150	-	nF	
Turn-on time	ton	V _{CC} = 900V, I _c = 1600A V _{GE} = ±15V, Tj = 125°C R _{gon} = 2.7Ω, R _{goff} = 1Ω	-	1.80	-	μs	
	tr		-	0.85	-		
Turn-off time	toff		-	1.30	-		
	tf		-	0.35	-		
Forward on voltage	V _F (main terminal)	V _{GE} = 0V I _F = 1600A	Tj=25°C	-	2.02	2.40	V
			Tj=125°C	-	2.22	-	
	V _F (chip)		Tj=25°C	-	1.80	2.15	
			Tj=125°C	-	2.00	-	
Reverse recovery time	t _{rr}	I _F = 1600A	-	0.35	-	μs	
Lead resistance, terminal-chip (*3)	R lead		-	0.134	-	mΩ	

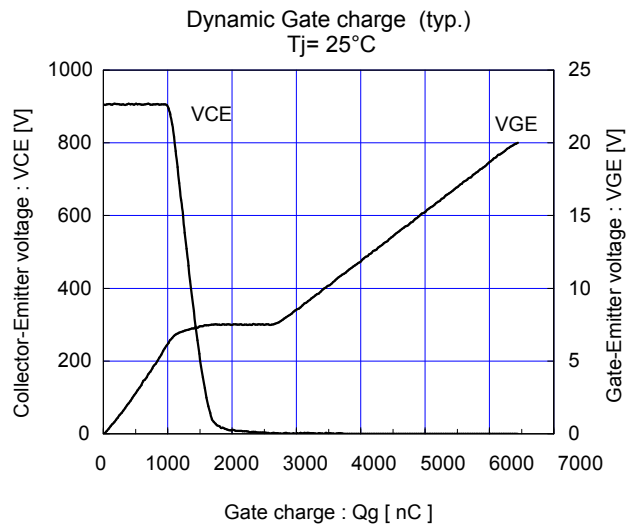
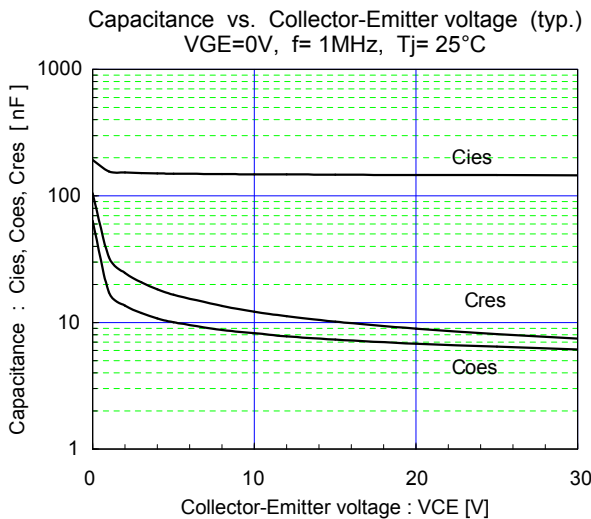
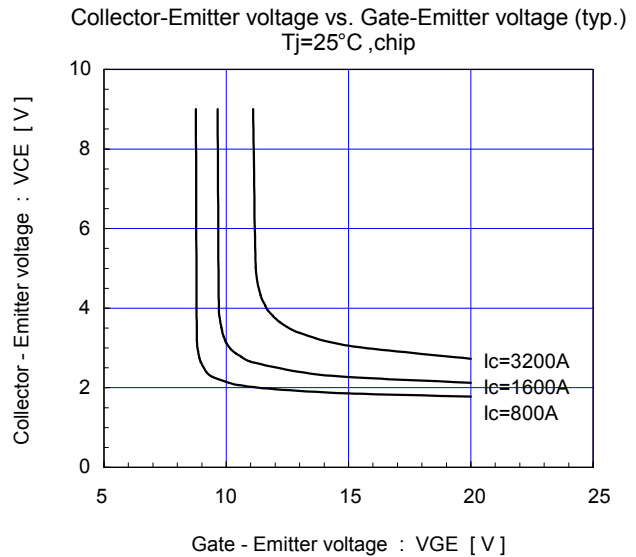
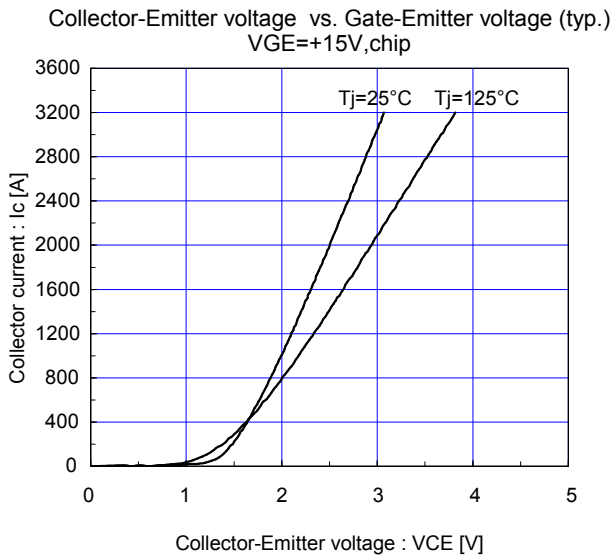
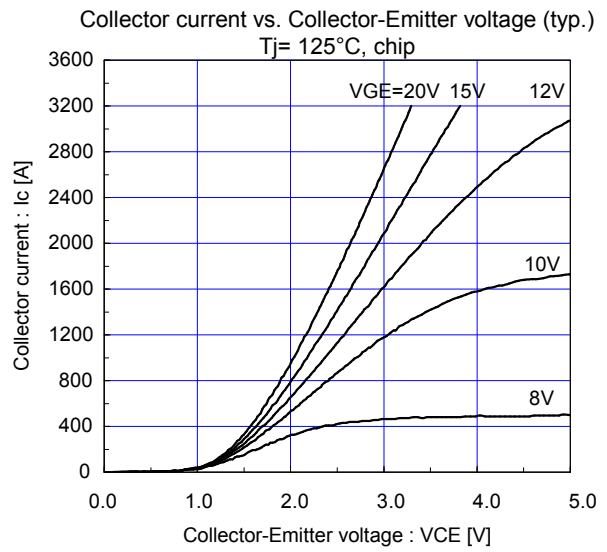
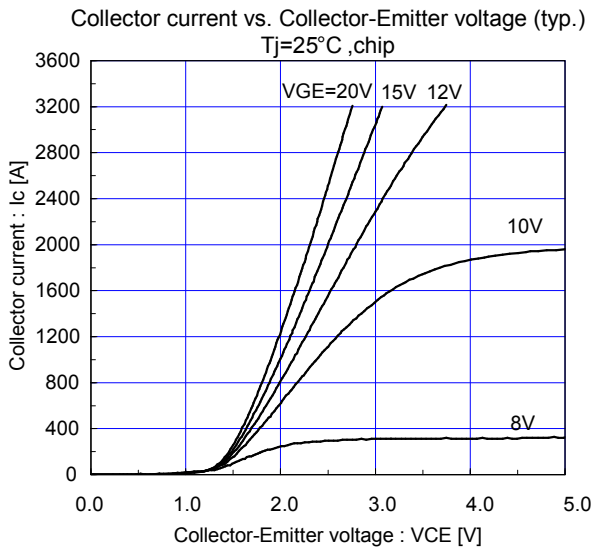
Note *3: Biggest internal terminal resistance among arm.

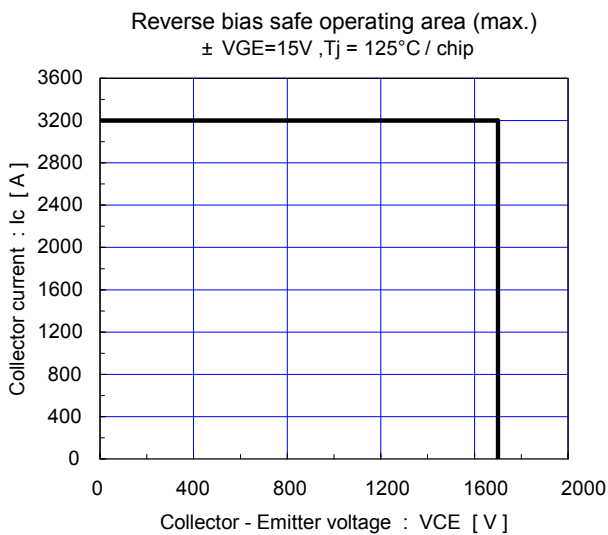
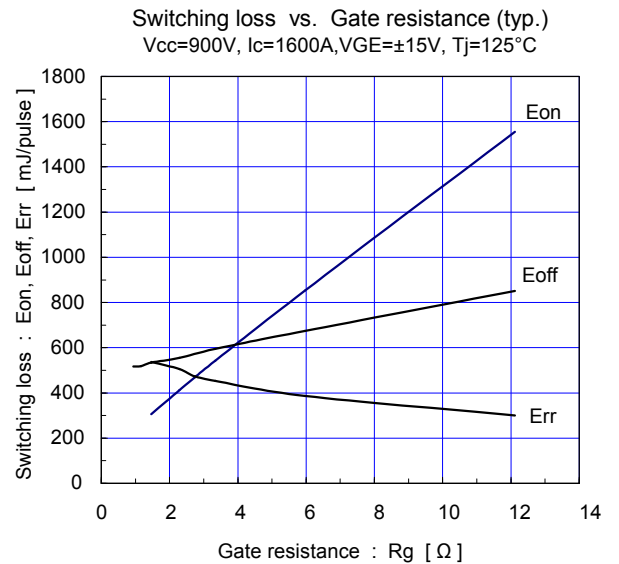
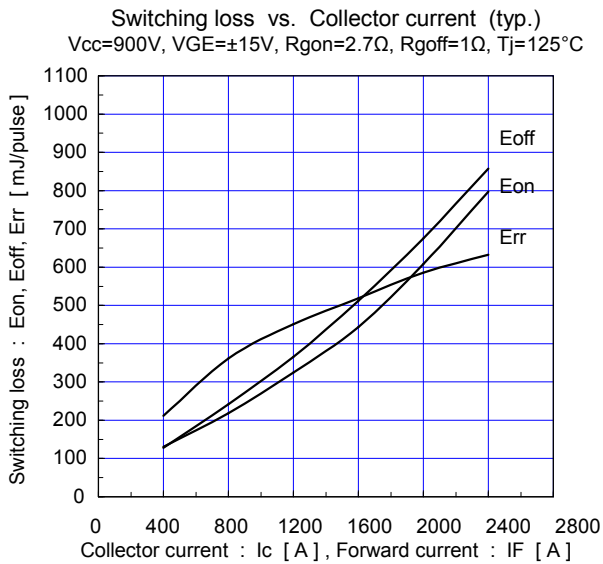
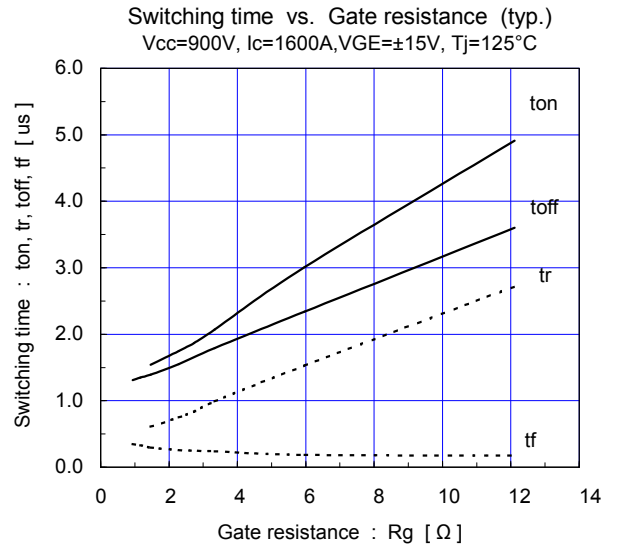
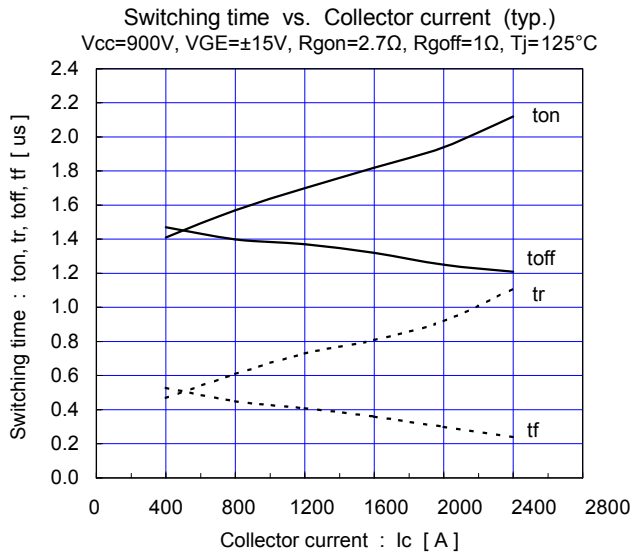
● Thermal resistance characteristics

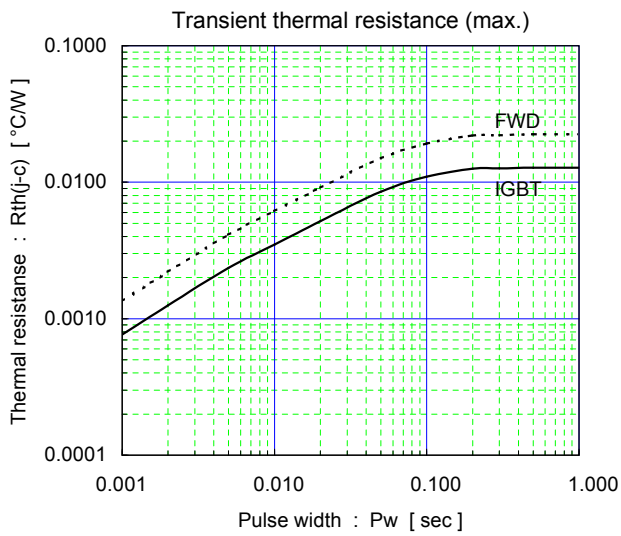
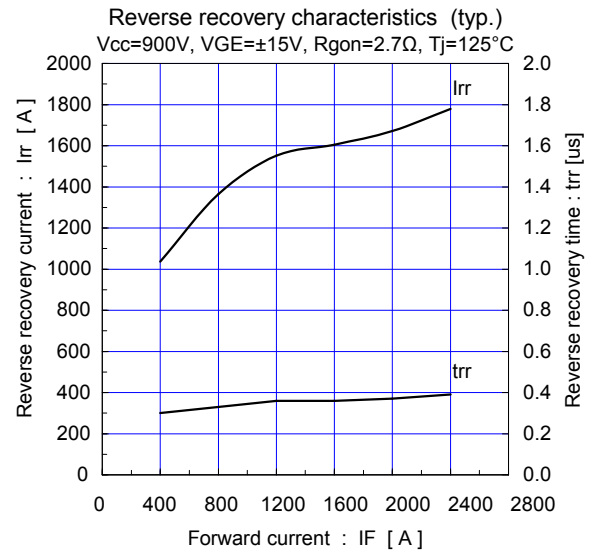
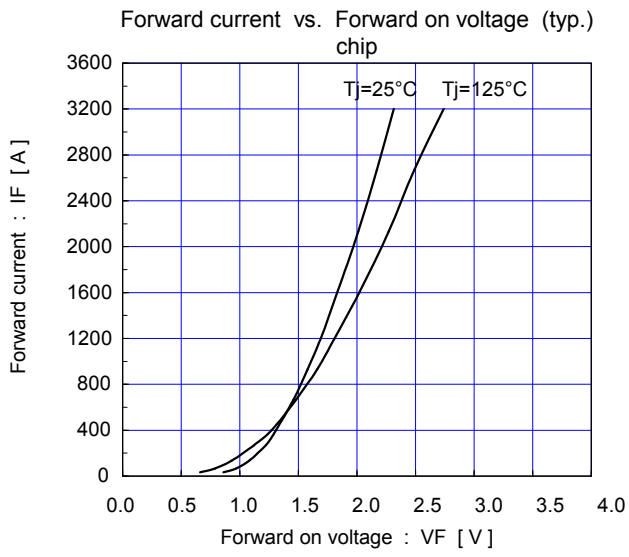
Items	Symbols	Conditions	Characteristics			Units
			min.	typ.	max.	
Thermal resistance (1device)	R _{th(j-c)}	IGBT	-	-	0.013	°C/W
		FWD	-	-	0.023	
Contact thermal resistance (1device)	R _{th(c-f)}	with Thermal Compound (*4)	-	0.006	-	

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

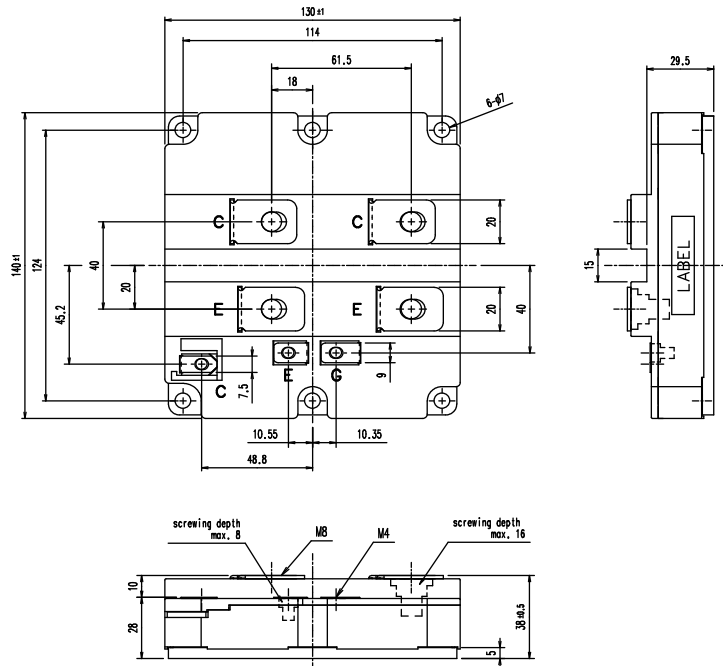
■ Characteristics (Representative)



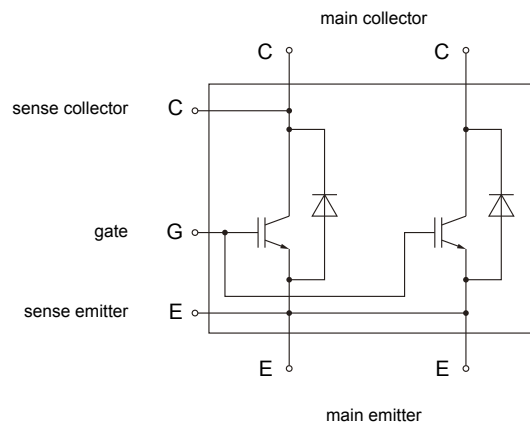




■ Outline Drawings, mm



■ Equivalent Circuit Schematic



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