

1MBI3600U4D-170

IGBT Modules

IGBT MODULE (U series) 1700V / 3600A / 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	Ic	Continuous	Tc=25°C	4800	A
			Tc=80°C	3600	
	Ic pulse	1ms	Tc=25°C	9600	
			Tc=80°C	7200	
	-Ic			3600	
-Ic pulse	1ms		7200		
Collector power dissipation	Pc	1 device		18650	W
Junction temperature	Tj			150	°C
Storage temperature	Tstg			-40 to +125	°C
Isolation voltage	Between terminal and copper base (*1)	Viso	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)

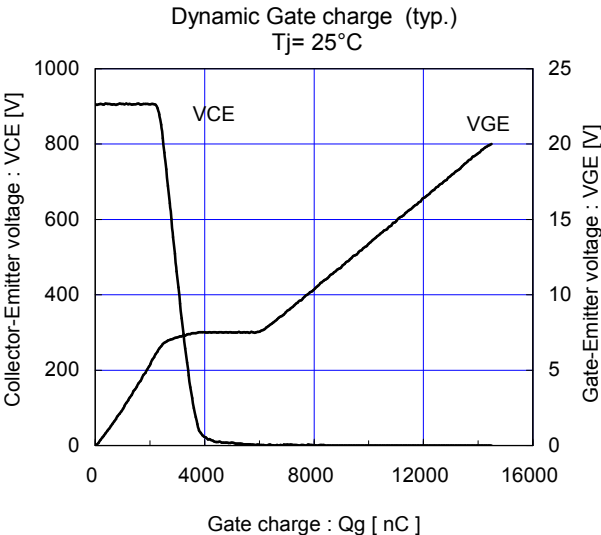
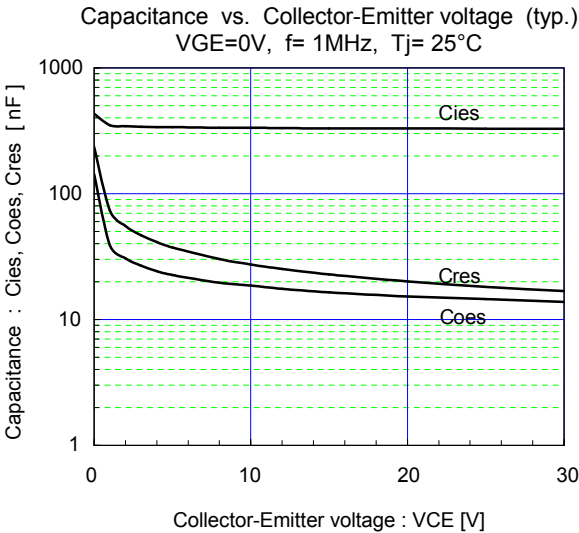
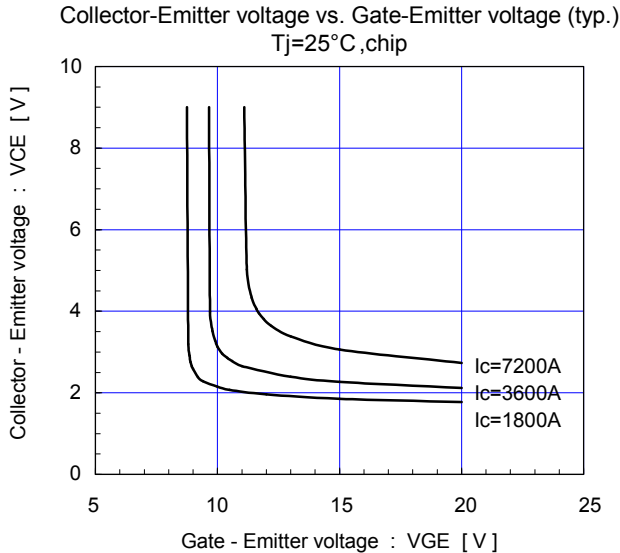
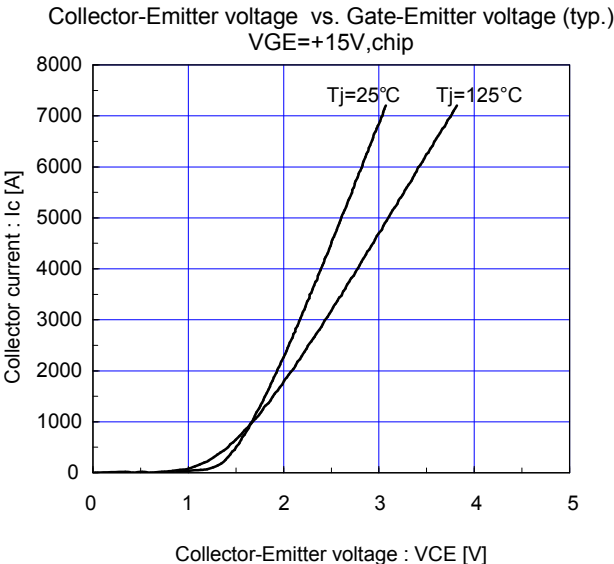
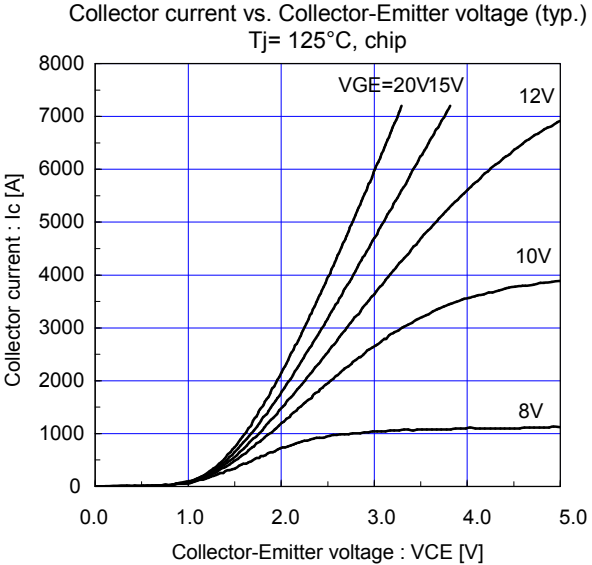
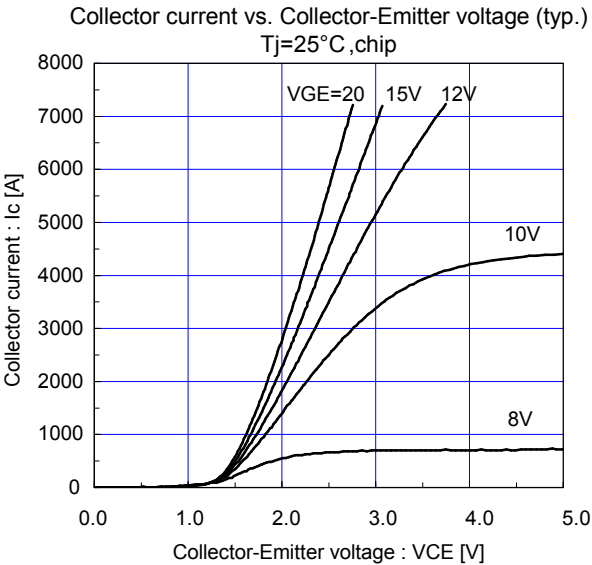
Items	Symbols	Conditions	Characteristics			Units
			min.	typ.	max.	
Zero gate voltage collector current	I_{CES}	$V_{GE} = 0V, V_{CE} = 1700V$	-	-	1.0	mA
Gate-Emitter leakage current	I_{GES}	$V_{CE} = 0V, V_{GE} = \pm 20V$	-	-	4800	nA
Gate-Emitter threshold voltage	$V_{GE(th)}$	$V_{CE} = 20V, I_c = 3600mA$	5.5	6.5	7.5	V
Collector-Emitter saturation voltage	$V_{CE(sat)}$ (main terminal)	$V_{GE} = 15V$ $I_c = 3600A$	Tj=25°C	2.57	2.77	V
			Tj=125°C	2.97	-	
	$V_{CE(sat)}$ (chip)		Tj=25°C	2.25	2.40	
			Tj=125°C	2.65	-	
Input capacitance	C_{ies}	$V_{GE} = 0V, V_{CE} = 10V, f = 1MHz$	-	336	-	nF
Turn-on time	t_{on}	$V_{CC} = 900V, I_c = 3600A$ $V_{GE} = \pm 15V, T_j = 125^\circ C$ $R_{gon} = 1\Omega, R_{goff} = 0.18\Omega$	-	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)	$V_{GE} = 0V$ $I_F = 3600A$	Tj=25°C	2.12	2.52	V
			Tj=125°C	2.32	-	
	V_F (chip)		Tj=25°C	1.80	2.15	
			Tj=125°C	2.00	-	
Reverse recovery time	t_{rr}	$I_F = 3600A$	-	0.35	-	μs
Lead resistance, terminal-chip	R lead		-	0.089	-	mΩ

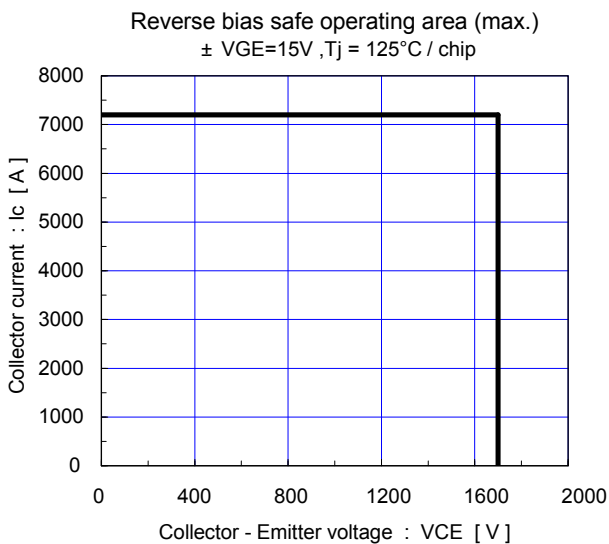
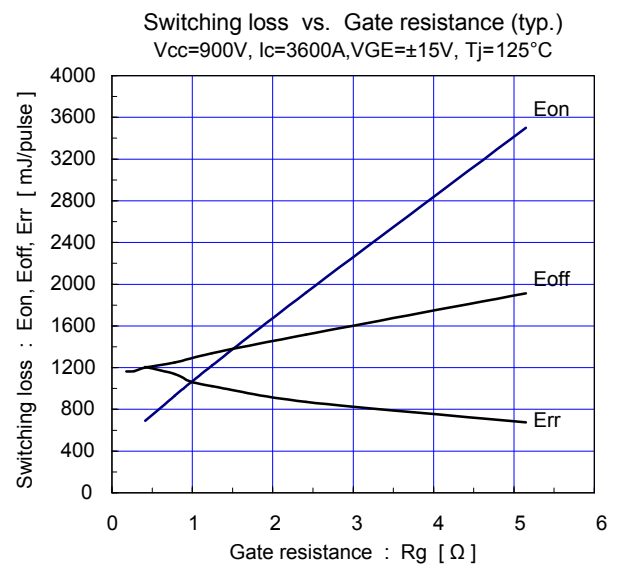
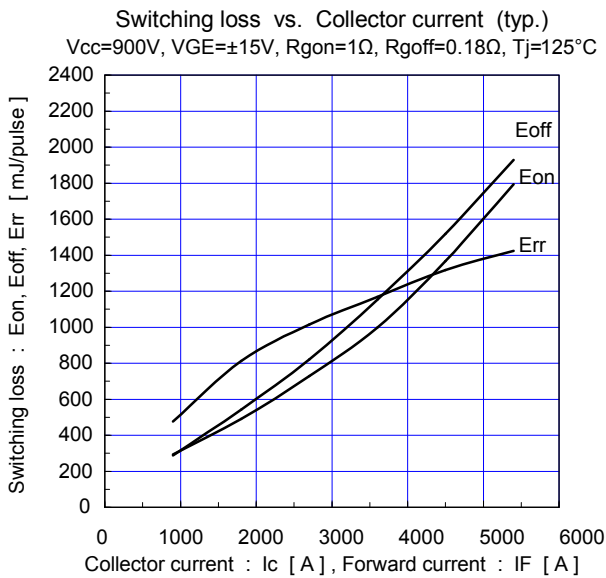
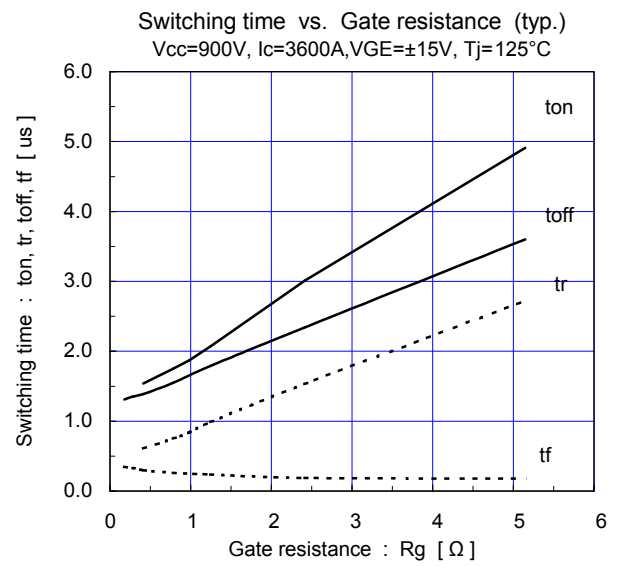
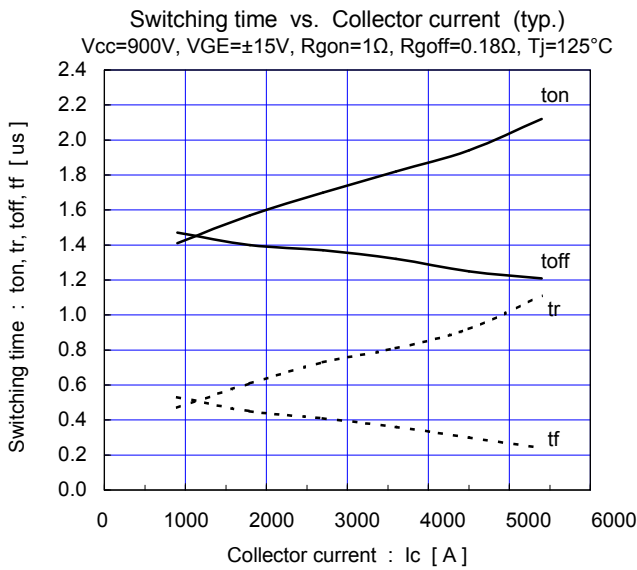
● Thermal resistance characteristics

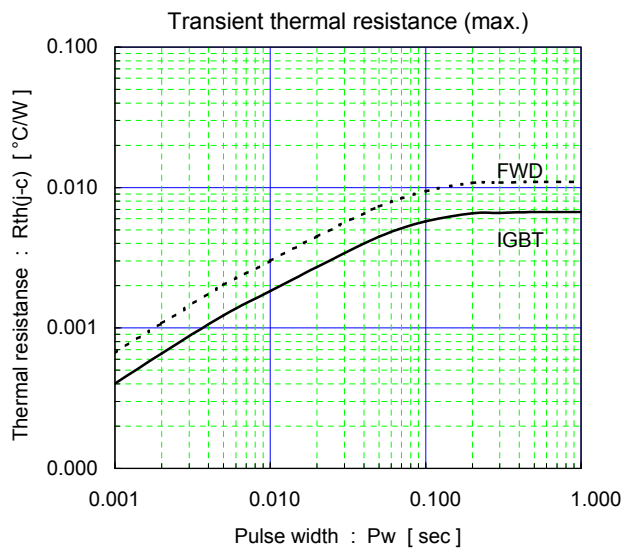
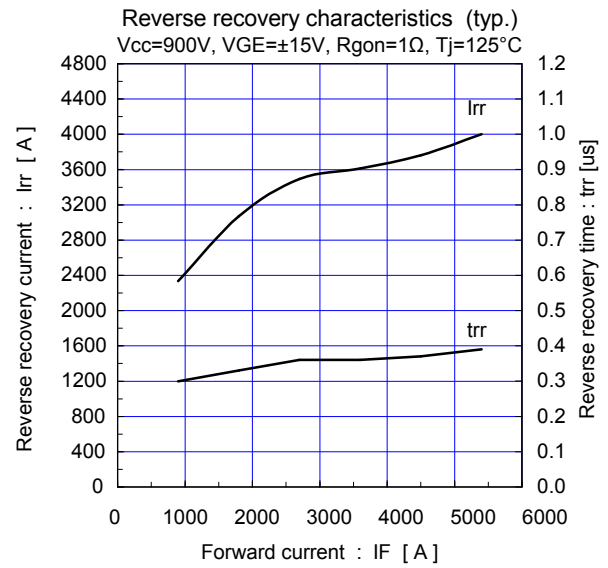
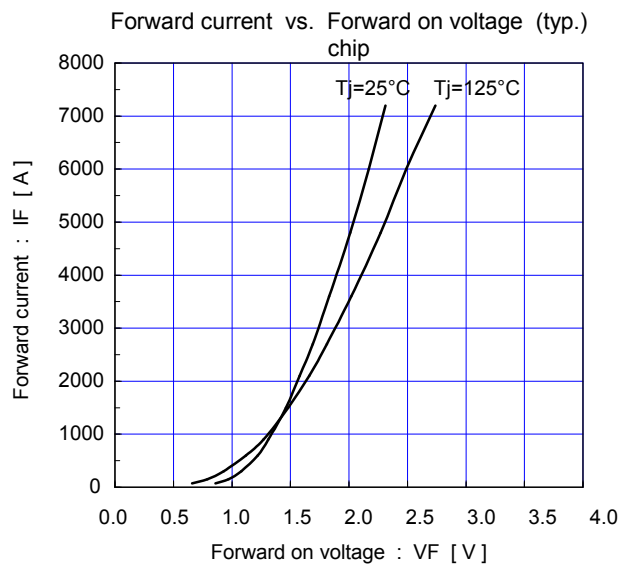
Items	Symbols	Conditions	Characteristics			Units
			min.	typ.	max.	
Thermal resistance (1device)	$R_{th(j-c)}$	IGBT	-	-	0.0067	°C/W
		FWD	-	-	0.011	
Contact thermal resistance (1device)	$R_{th(c-f)}$	with Thermal Compound (*3)	-	0.004	-	

Note *3: This is the value which is defined mounting on the additional cooling fin with thermal compound.

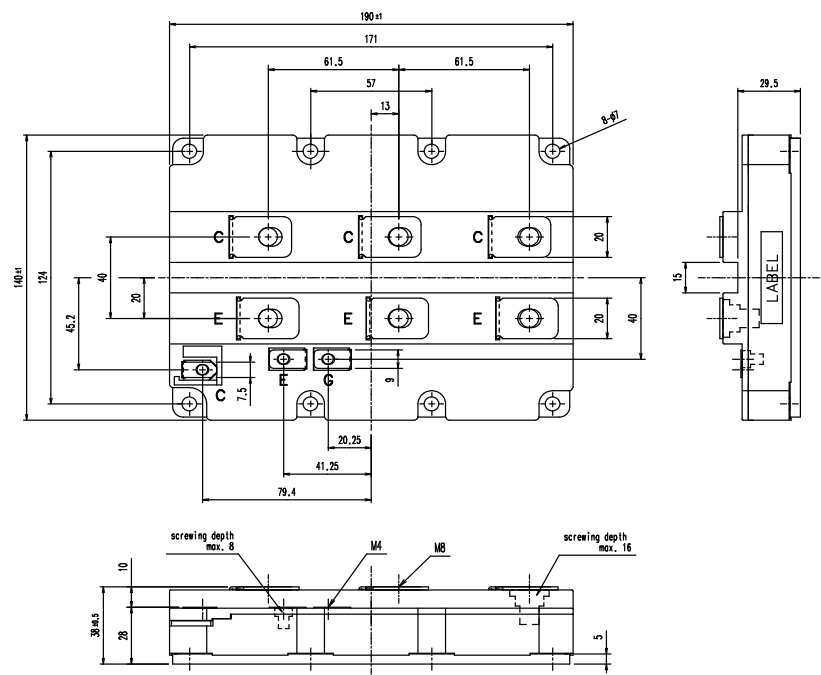
Characteristics (Representative)



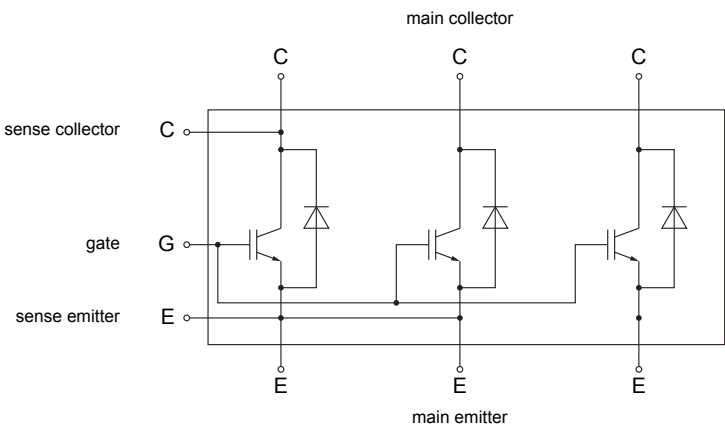




■ Outline Drawings, mm



■ Equivalent Circuit Schematic



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