

# 1MBI2400U4D-120

IGBT Modules

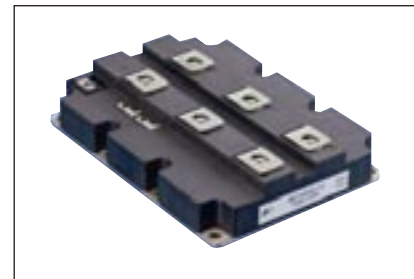
## IGBT MODULE (U series) 1200V / 2400A / 1 in one package

### ■ 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	$V_{CES}$		1200	V
Gate-Emitter voltage	$V_{GES}$		$\pm 20$	V
Collector current	$I_c$	Continuous	Tc=25°C Tc=80°C	A
	$I_c$ pulse	1ms	Tc=25°C Tc=80°C	
	$-I_c$		2400	
	$-I_c$ pulse	1ms	4800	
			4800	
Collector power dissipation	$P_c$	1 device	14700	W
Junction temperature	$T_j$		150	°C
Storage temperature	$T_{stg}$		-40 to +125	°C
Isolation voltage	Between terminal and copper base (*1)	$V_{iso}$	AC : 1min.	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)

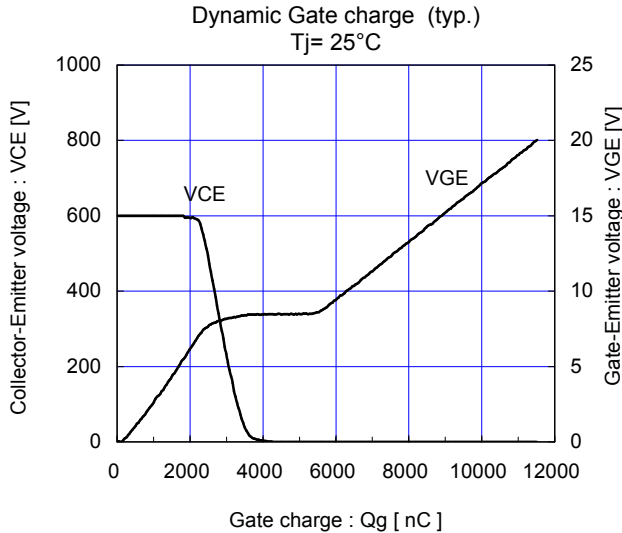
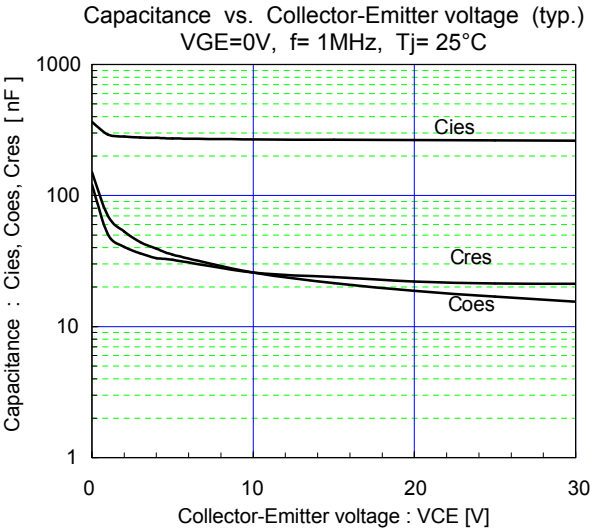
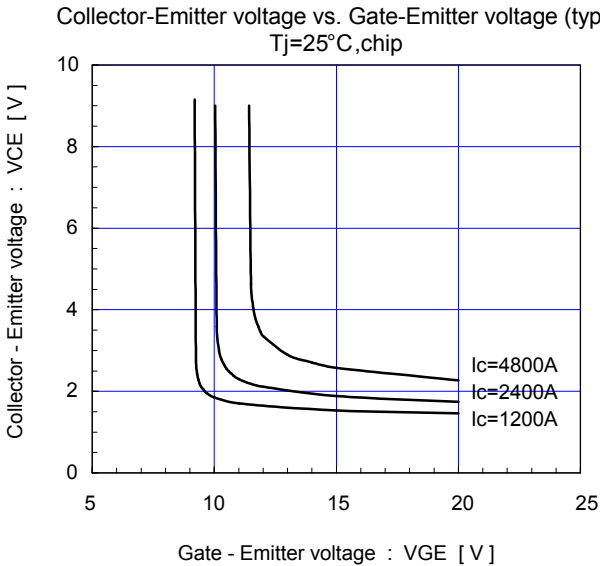
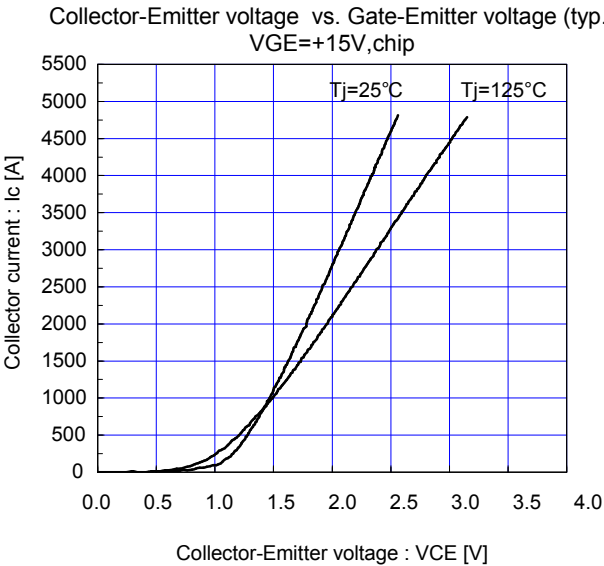
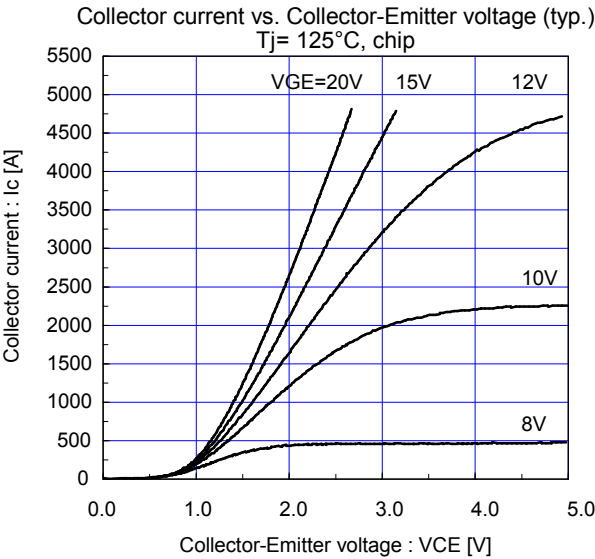
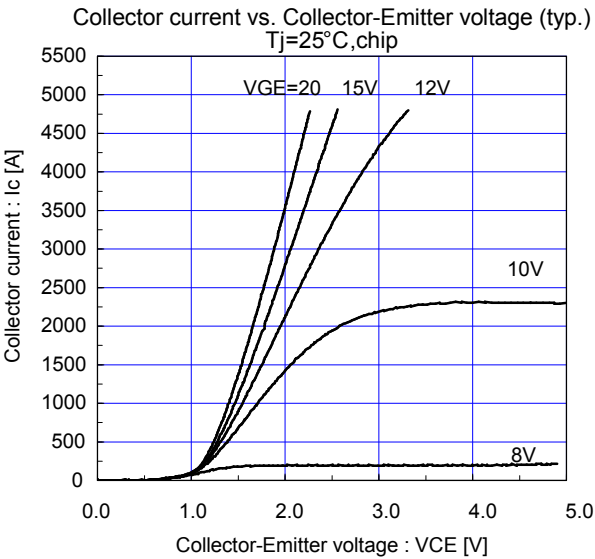
Items	Symbols	Conditions	Characteristics			Units
			min.	typ.	max.	
Zero gate voltage collector current	$I_{CES}$	$V_{GE} = 0V, V_{CE} = 1200V$	-	-	1.0	mA
Gate-Emitter leakage current	$I_{GES}$	$V_{CE} = 0V, V_{GE} = \pm 20V$	-	-	4800	nA
Gate-Emitter threshold voltage	$V_{GE(th)}$	$V_{CE} = 20V, I_c = 2400mA$	5.5	6.5	7.5	V
Collector-Emitter saturation voltage	$V_{CE(sat)}$ (main terminal)	$V_{GE} = 15V$ $I_c = 2400A$	Tj=25°C	2.11	2.29	V
			Tj=125°C	2.31	-	
	$V_{CE(sat)}$ (chip)		Tj=25°C	1.90	2.05	
			Tj=125°C	2.10	-	
Input capacitance	$C_{ies}$	$V_{GE} = 0V, V_{CE} = 10V, f = 1MHz$	-	270	-	nF
Turn-on time	$t_{on}$	$V_{CC} = 600V, I_c = 2400A$ $V_{GE} = \pm 15V, T_j = 125^\circ C$ $R_{gon} = 1\Omega, R_{goff} = 0.5\Omega$	-	0.90	-	$\mu s$
	$t_r$		-	0.50	-	
Turn-off time	$t_{off}$		-	0.80	-	
	$t_f$		-	0.20	-	
Forward on voltage	$V_F$ (main terminal)	$V_{GE} = 0V$ $I_F = 2400A$	Tj=25°C	1.86	2.04	V
			Tj=125°C	1.96	-	
	$V_F$ (chip)		Tj=25°C	1.65	1.80	
			Tj=125°C	1.75	-	
Reverse recovery time	$t_{rr}$	$I_F = 2400A$	-	0.35	-	$\mu s$
Lead resistance, terminal-chip	R lead		-	0.089	-	m $\Omega$

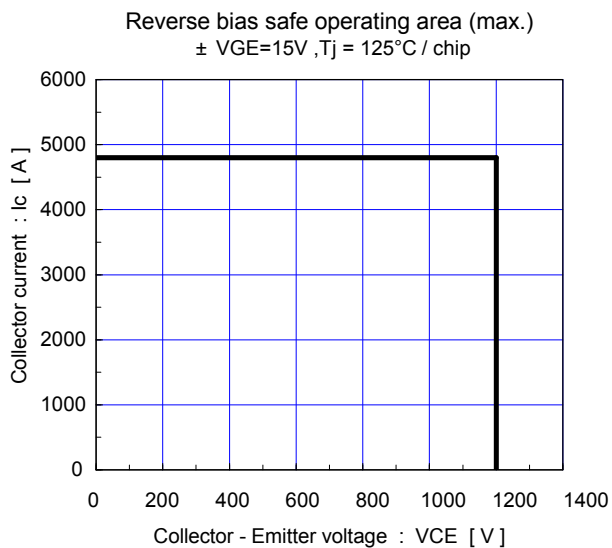
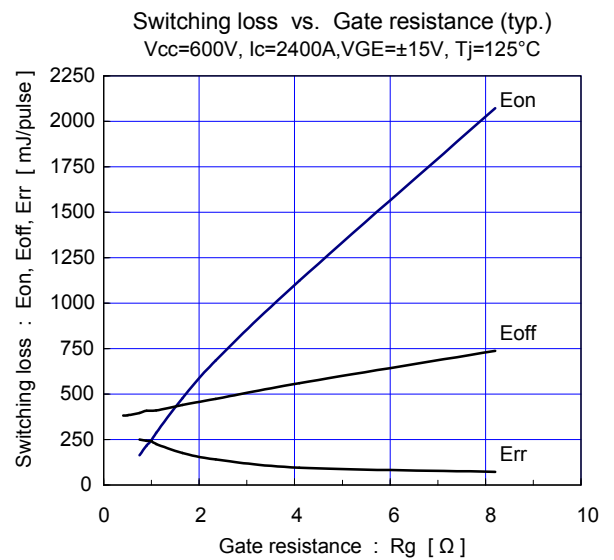
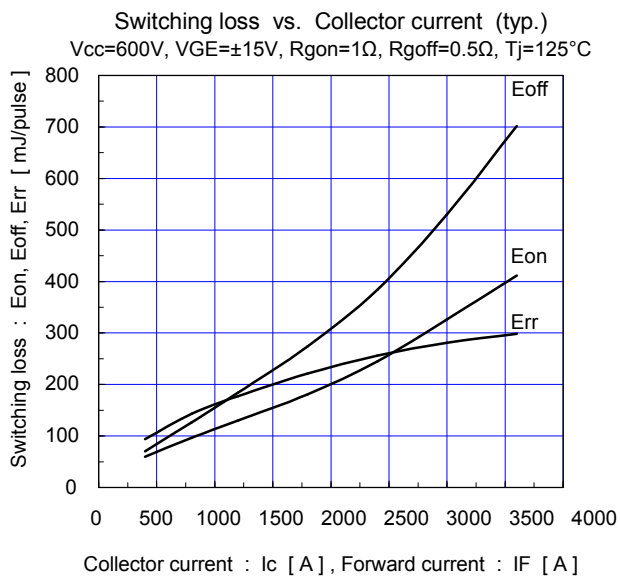
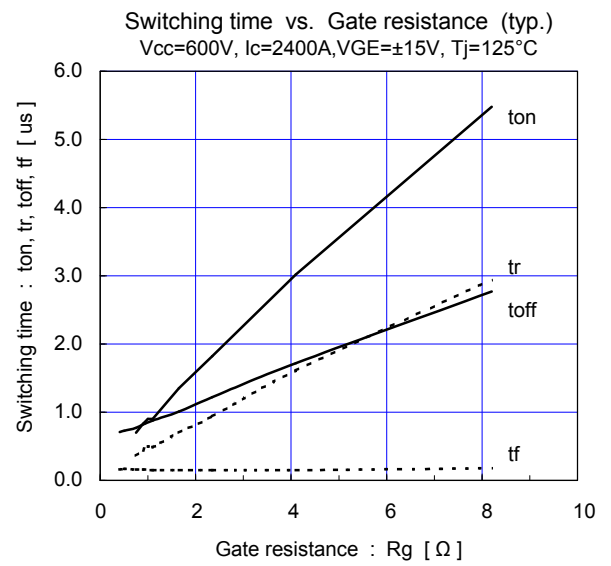
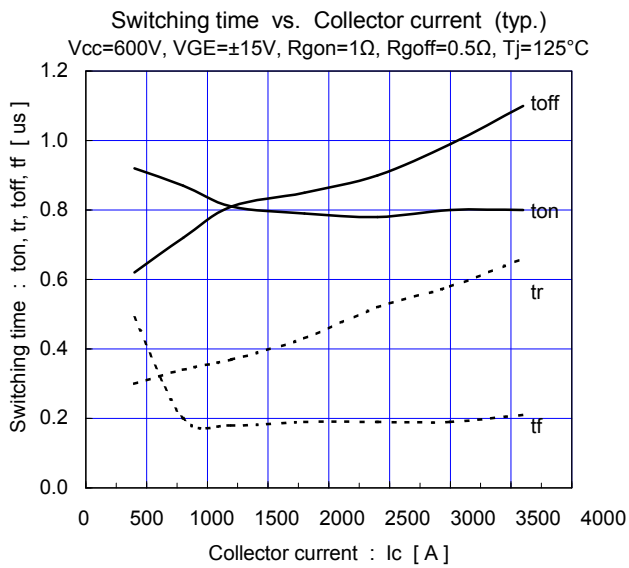
#### ● Thermal resistance characteristics

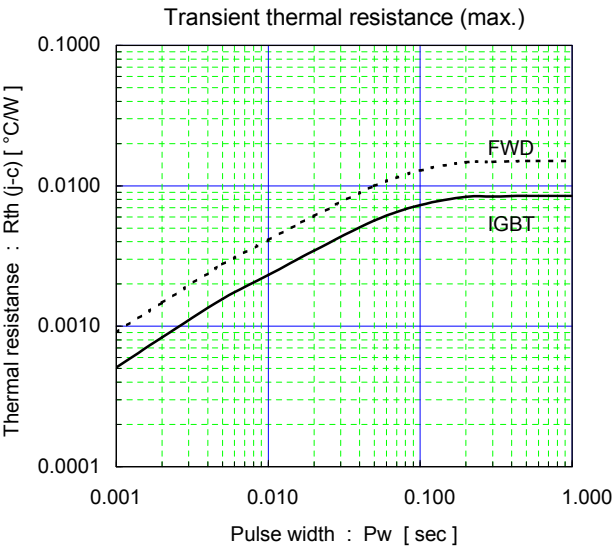
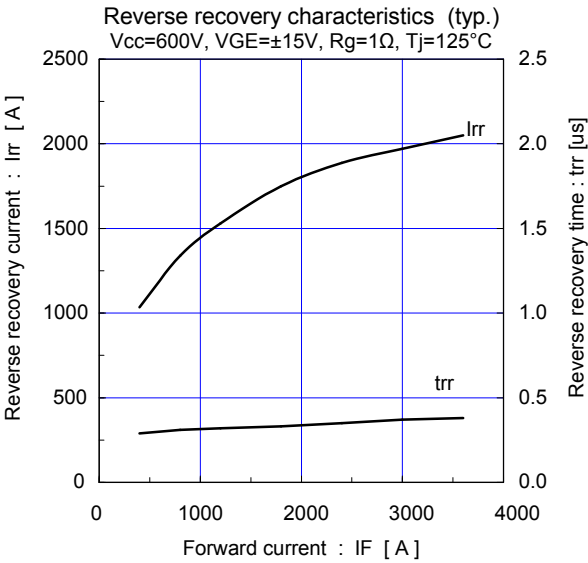
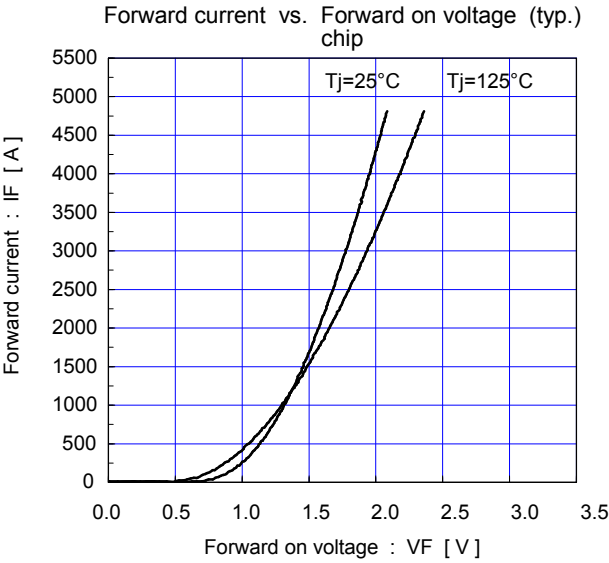
Items	Symbols	Conditions	Characteristics			Units
			min.	typ.	max.	
Thermal resistance (1device)	$R_{th(j-c)}$	IGBT	-	-	0.0085	°C/W
		FWD	-	-	0.015	
Contact thermal resistance (1device)	$R_{th(c-f)}$	with Thermal Compound (*3)	-	0.004	-	

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

Characteristics (Representative)









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