

# 1MBI2400U4D-120

# 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	Vces			1200	V	
Gate-Emitter voltage	Vges			±20	V	
Collector current	lc	Continuouo	Tc=25°C	3600		
		Continuous	Tc=80°C	2400		
	Ic pulse	1ms	Tc=25°C	7200	^	
			Tc=80°C	4800	A	
	-lc			2400		
	-Ic pulse	1ms		4800		
Collector power dissipation	Pc	1 device		14700	W	
Junction temperature	Тј			150	°C	
Storage temperature	Tstg			-40 to +125	°C	
Isolation voltage Between terminal and copper base (*1)	Viso	AC : 1min.		2500	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)

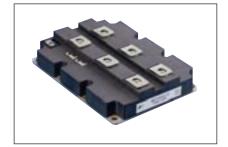
#### • Electrical characteristics (at Tj= 25°C unless otherwise specified)

Harris	Or make a la	Symbols Conditions		Characteristics			11
Items	Symbols			min.	typ.	max.	Units
Zero gate voltage collector current	ICES	V <sub>GE</sub> = 0V, V <sub>CE</sub> = 1200V		-	-	1.0	mA
Gate-Emitter leakage current	Iges	$V_{CE} = 0V, V_{GE} = \pm 20V$		-	-	4800	nA
Gate-Emitter threshold voltage	V <sub>GE (th)</sub>	V <sub>CE</sub> = 20V, I <sub>c</sub> = 2400mA		5.5	6.5	7.5	V
Collector-Emitter saturation voltage	V <sub>CE (sat)</sub>	al) V <sub>GE</sub> = 15V I <sub>c</sub> = 2400A	Tj=25°C	-	2.11	2.29	V
	(main terminal)		Tj=125°C	-	2.31	-	
	V <sub>CE (sat)</sub>		Tj=25°C	-	1.90	2.05	
	(chip)		Tj=125°C	-	2.10	-	
Input capacitance	Cies	V <sub>GE</sub> = 0V, V <sub>CE</sub> = 10V, f = 1MHz		-	270	-	nF
Turn-on time	ton		-	0.90	-	μs	
	tr	$V_{cc} = 600V, I_c = 2400A$	-	0.50	-		
Turn-off time	toff	$V_{GE} = \pm 15V, Tj = 125^{\circ}C$ $R_{gon} = 1\Omega, R_{goff} = 0.5\Omega$	-	0.80	-		
	tf	- 11gon - 1122, 11gon - 0.012	-	0.20	-		
Forward on voltage	VF	) V <sub>GE</sub> = 0V I <sub>F</sub> = 2400A	Tj=25°C	-	1.86	2.04	V
	(main terminal)		Tj=125°C	-	1.96	-	
	VF		Tj=25°C	-	1.65	1.80	
	(chip)		Tj=125°C	-	1.75	-	
Reverse recovery time	trr	IF = 2400A		-	0.35	-	μs
Lead resistance, terminal-chip	R lead			-	0.089	-	mΩ

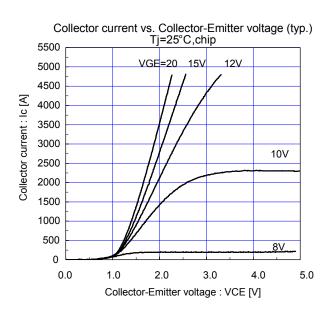
## Thermal resistance characteristics

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

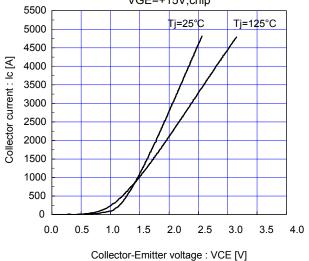
Note \*3: This is the value which is defined mounting on the additional cooling fin with thermal compound.

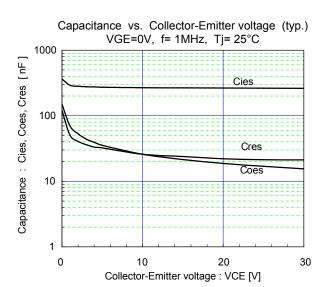


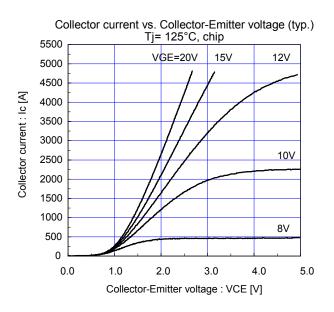
# Characteristics (Representative)



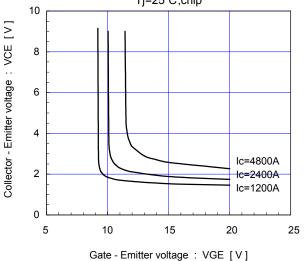
Collector-Emitter voltage vs. Gate-Emitter voltage (typ.) VGE=+15V,chip

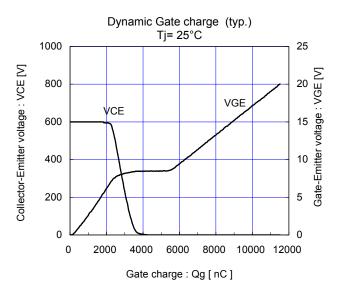


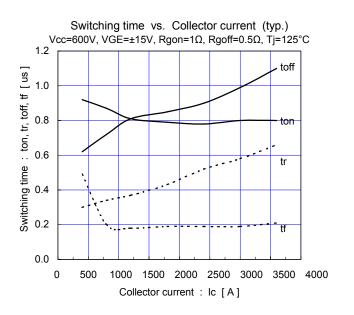


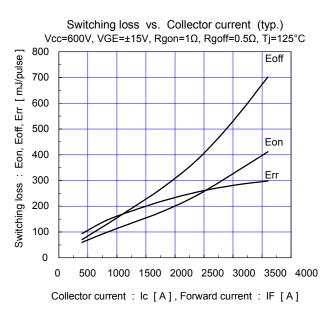


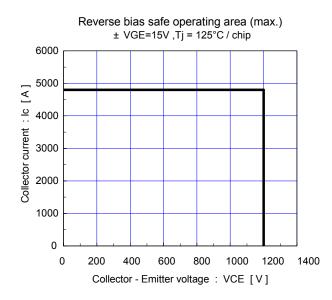
Collector-Emitter voltage vs. Gate-Emitter voltage (typ.) Tj=25°C,chip

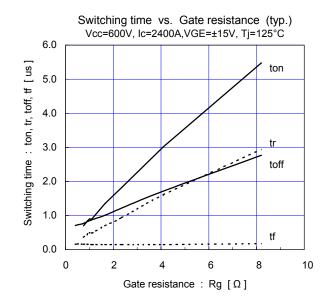




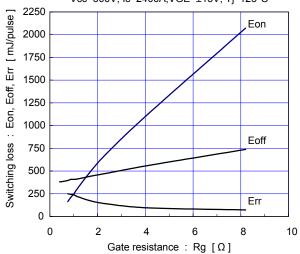




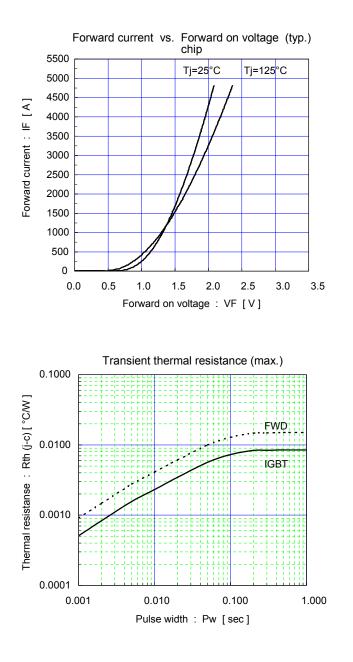


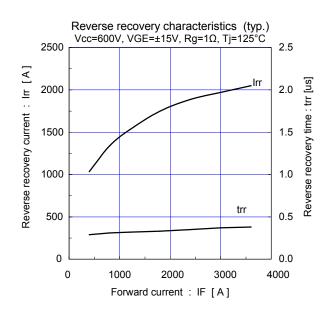


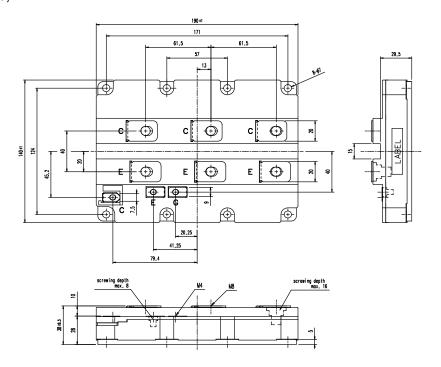
Switching loss vs. Gate resistance (typ.) Vcc=600V, lc=2400A,VGE=±15V, Tj=125°C



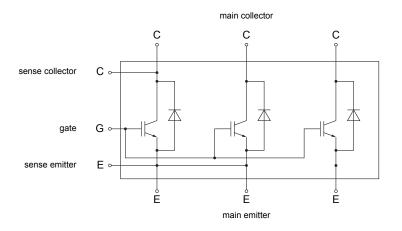








# Equivalent Circuit Schematic



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