

2MBI300VH-170-50

IGBT Modules

IGBT MODULE (V series) 1700V / 300A / 2 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 T_c=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 =100°C	300
			T _c =25°C	440
	I _{c pulse}	1ms	600	A
	-I _c		300	
	-I _{c pulse}	1ms	600	
Collector power dissipation	P _C	1 device	1805	W
Junction temperature	T _j		175	°C
Operating junction temperature (under switching conditions)	T _{jop}		150	
Case temperature	T _c		125	
Storage temperature	T _{stg}		-40 ~ 125	
Isolation voltage between terminal and copper base (*1)	V _{iso}	AC : 1min.	4000	VAC
Screw torque	Mounting (*2)		6.0	N m
	Terminals (*3)		5.0	

Note *1: All terminals should be connected together during the test.

Note *2: Recommendable Value : 3.0-6.0 N·m (M5 or M6)

Note *3: Recommendable Value : 2.5-5.0 N·m (M5)

● Electrical characteristics (at T_j= 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	-	-	2.0	mA	
Gate-Emitter leakage current	I _{GES}	V _{CE} = 0V, V _{GE} = ±20V	-	-	400	nA	
Gate-Emitter threshold voltage	V _{GE(th)}	V _{CE} = 20V, I _c = 300mA	6.0	6.5	7.0	V	
Collector-Emitter saturation voltage	V _{CE(sat)} (terminal)	V _{GE} = 15V I _c = 300A	T _j =25°C	-	2.15	2.60	V
			T _j =125°C	-	2.55	-	
			T _j =150°C	-	2.60	-	
	V _{CE(sat)} (chip)		T _j =25°C	-	2.00	2.45	
			T _j =125°C	-	2.40	-	
			T _j =150°C	-	2.45	-	
Internal gate resistance	R _{G(int)}	-	-	2.5	-	Ω	
Input capacitance	C _{ies}	V _{CE} = 10V, V _{GE} = 0V, f = 1MHz	-	33	-	nF	
Turn-on time	t _{on}	V _{CC} = 900V, I _c = 300A V _{GE} = ±15V, R _{g_on} = 4.7Ω, R _{g_off} = 2.4Ω	-	1150	-	nsec	
	t _r		-	580	-		
	t _(l)		-	60	-		
Turn-off time	t _{off}	T _j =150°C, L _s = 30nH	-	1050	-	nsec	
	t _r		-	140	-		
			-	-	-		
Forward on voltage	V _F (terminal)	V _{GE} = 0V I _F = 300A	T _j =25°C	-	1.95	2.40	V
			T _j =125°C	-	2.15	-	
			T _j =150°C	-	2.15	-	
	V _F (chip)		T _j =25°C	-	1.80	2.25	
			T _j =125°C	-	2.05	-	
			T _j =150°C	-	2.05	-	
Reverse recovery time	t _{rr}	I _F = 300A	-	220	-	nsec	

● Thermal resistance characteristics

Items	Symbols	Conditions	Characteristics			Units
			min.	typ.	max.	
Thermal resistance(1device)	R _{th(j-c)}	IGBT	-	-	0.083	°C/W
		FWD	-	-	0.130	
Contact thermal resistance (1device) (*4)	R _{th(c-f)}	with Thermal Compound	-	0.0125	-	

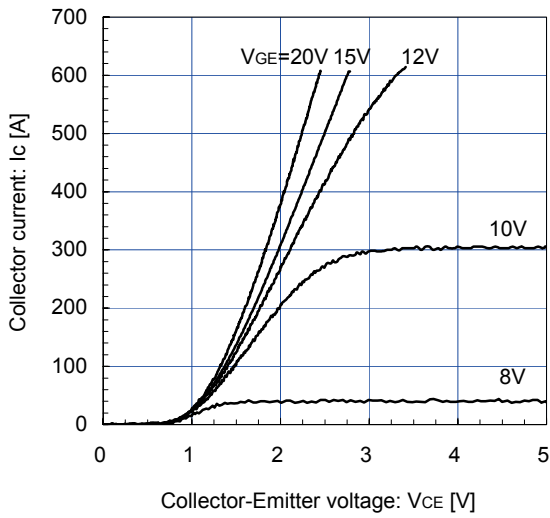
Note *4: This is the value which is defined mounting on the additional cooling fin with thermal compound.

Package No. : M276

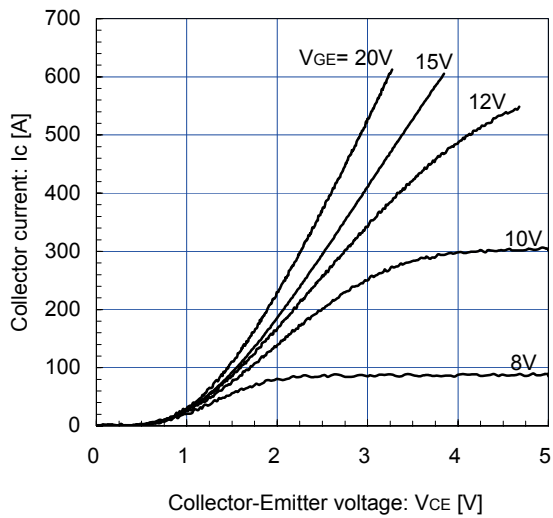


■ Characteristics (Representative)

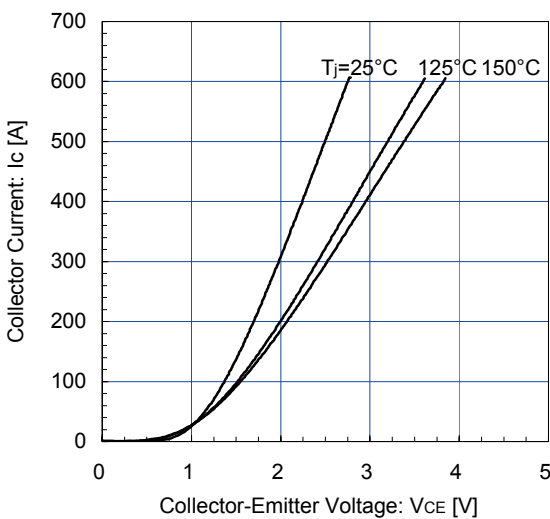
Collector current vs. Collector-Emitter voltage (typ.)
T_j = 25°C / chip



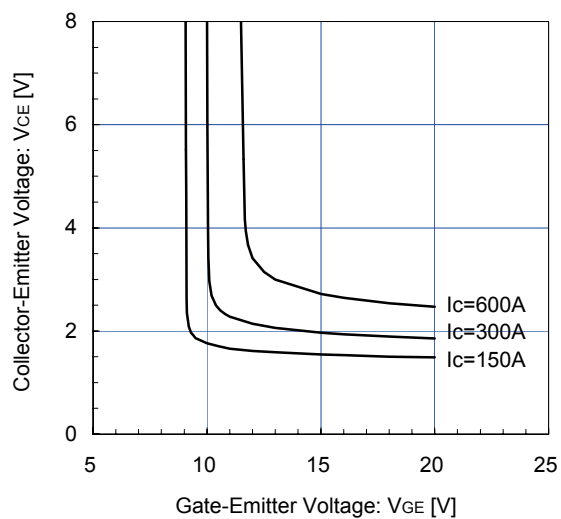
Collector current vs. Collector-Emitter voltage (typ.)
T_j = 150°C / chip



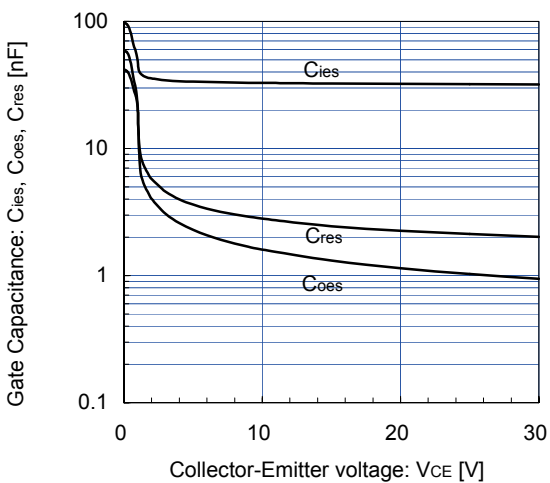
Collector current vs. Collector-Emitter voltage (typ.)
V_{GE} = 15V / chip



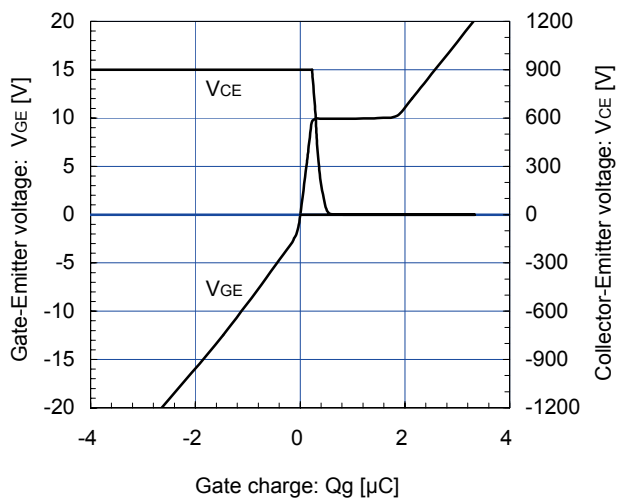
Collector-Emitter voltage vs. Gate-Emitter voltage
T_j = 25°C / chip

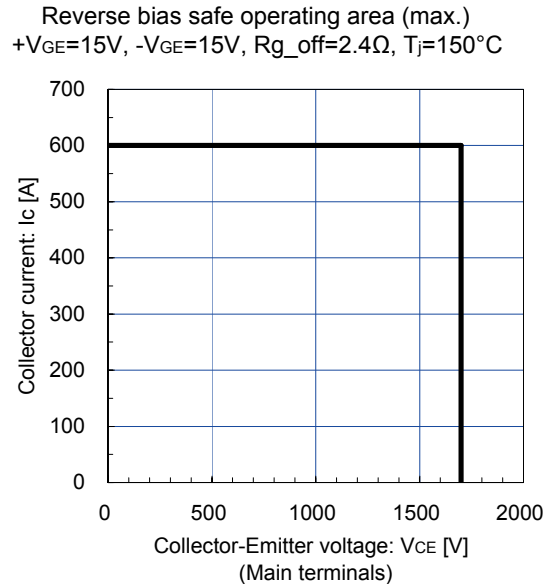
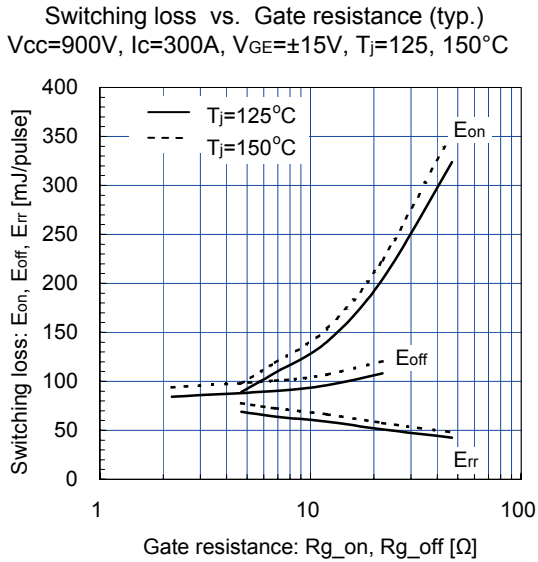
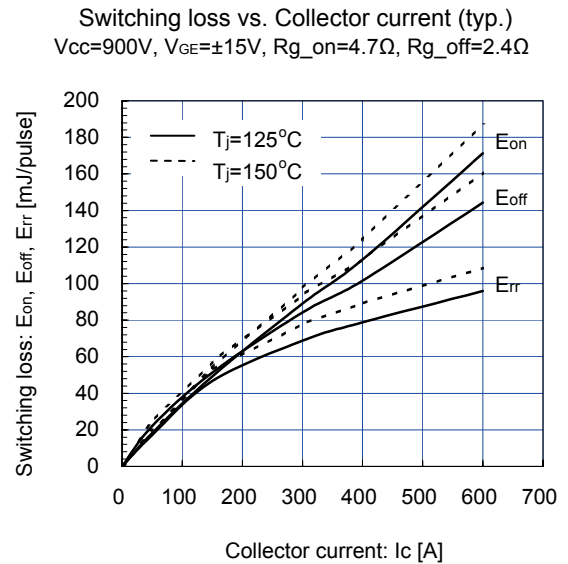
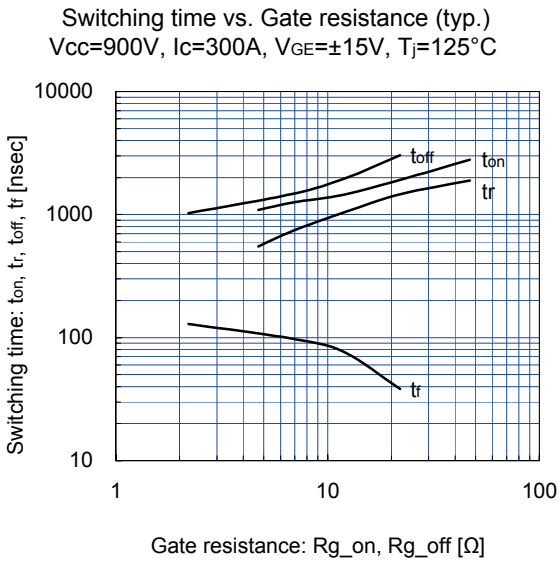
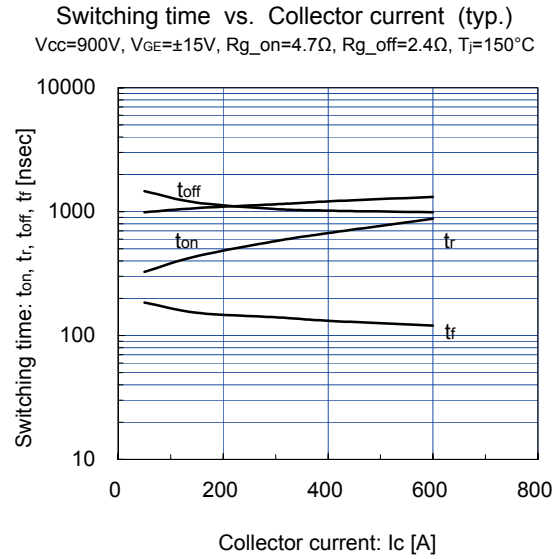
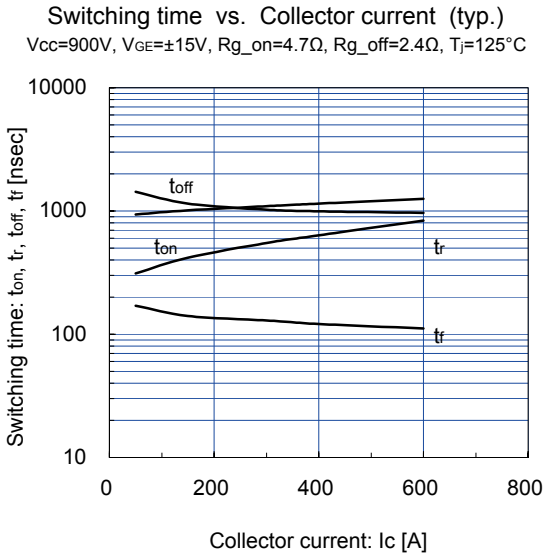


Gate Capacitance vs. Collector-Emitter Voltage
V_{GE} = 0V, f = 1MHz, T_j = 25°C

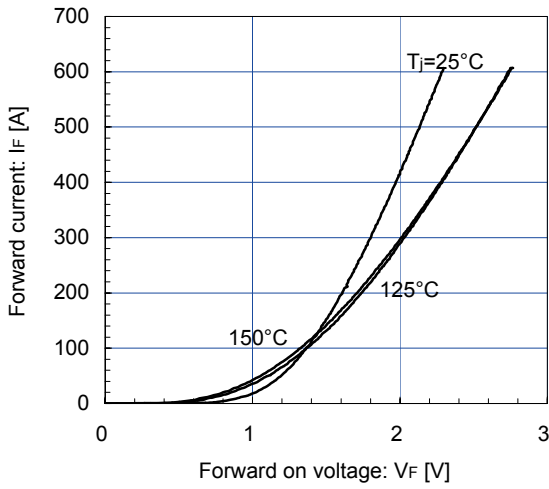


Dynamic Gate Charge (typ.)
V_{CC} = 900V, Ic = 300A, T_j = 25°C

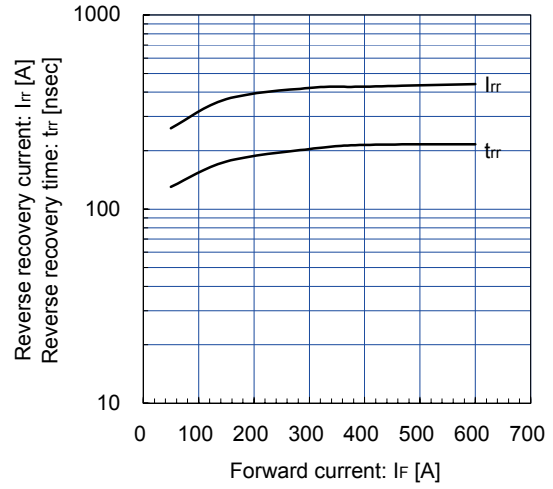




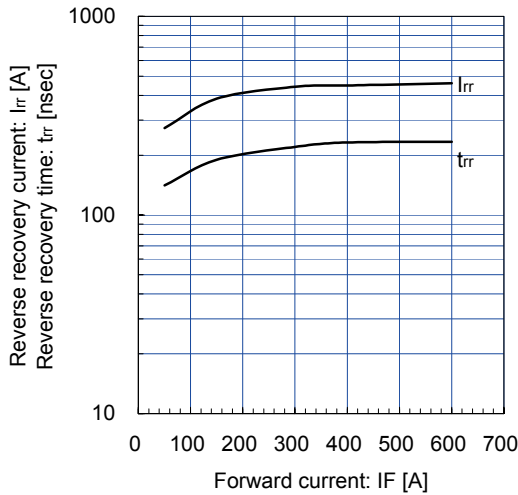
Forward Current vs. Forward Voltage (typ.)
chip



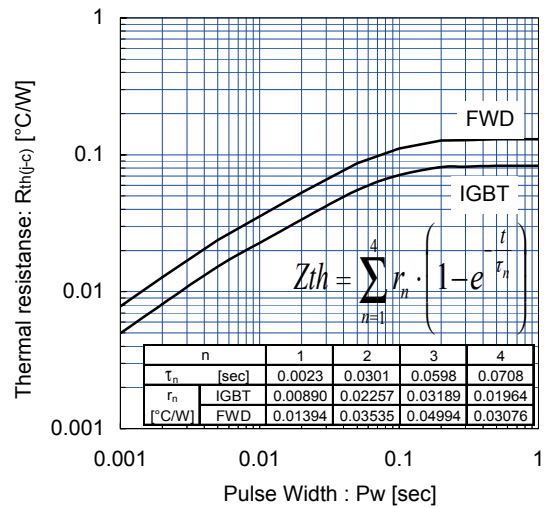
Reverse Recovery Characteristics (typ.)
 $V_{CC}=900\text{V}$, $V_{GE}=\pm 15\text{V}$, $R_{g_on}=4.7\Omega$, $T_j=125^\circ\text{C}$



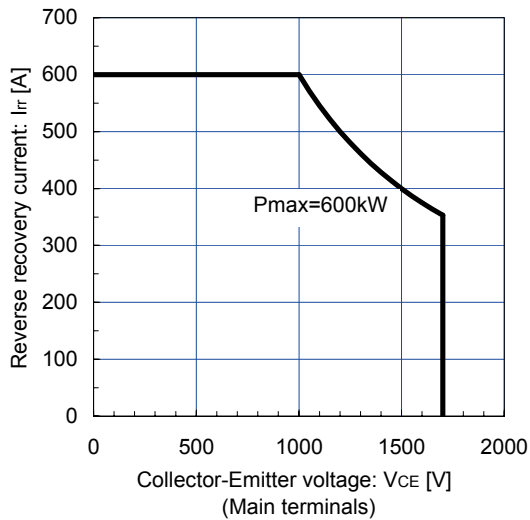
Reverse Recovery Characteristics (typ.)
 $V_{CC}=900\text{V}$, $V_{GE}=\pm 15\text{V}$, $R_{g_on}=4.7\Omega$, $T_j=150^\circ\text{C}$



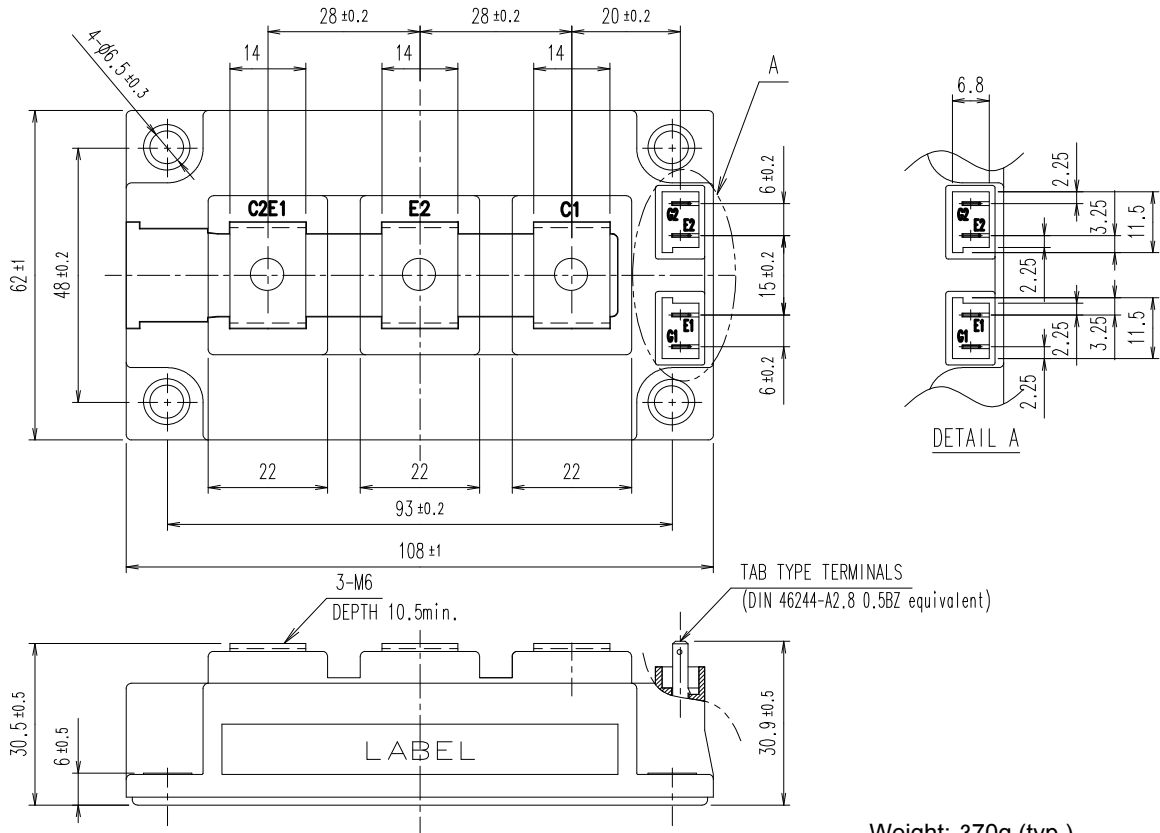
Transient Thermal Resistance (max.)



FWD safe operating area (max.)
 $T_j=150^\circ\text{C}$

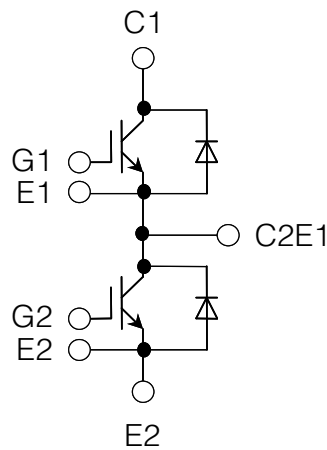


■ Outline Drawings, mm



Weight: 370g (typ.)

■ Equivalent Circuit Schematic



WARNING

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