

2MBI75VA-170-50

IGBT Modules

IGBT MODULE (V series) 1700V / 75A / 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 $T_c=25^\circ\text{C}$ 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	$T_c=25^\circ\text{C}$ $T_c=100^\circ\text{C}$	A
	I_C pulse	1ms	150	
	$-I_C$		75	
	$-I_C$ pulse	1ms	150	
	P_C	1 device	555	
Collector power dissipation	P_C	1 device	555	W
Junction temperature	T_j		175	$^\circ\text{C}$
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)		5.0	N m
	Terminals (*3)		5.0	

Note *1: All terminals should be connected together when isolation test will be done.

Note *2: Recommendable Value : 3.0~5.0 N·m (M5 or M6)

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

● Electrical characteristics (at $T_j=25^\circ\text{C}$ unless otherwise specified)

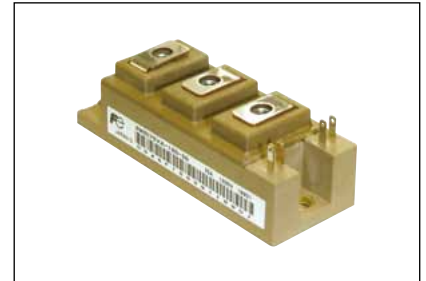
Items	Symbols	Conditions		Characteristics			Units
				min.	typ.	max.	
Zero gate voltage collector current	I _{CES}	V _{GE} = 0V, V _{CE} = 1700V		-	-	1.0	mA
Gate-Emitter leakage current	I _{GES}	V _{CE} = 0V, V _{GE} = ±20V		-	-	200	nA
Gate-Emitter threshold voltage	V _{GE (th)}	V _{CE} = 20V, I _C = 75mA		6.0	6.5	7.0	V
Collector-Emitter saturation voltage	V _{CE (sat)} (terminal)	V _{GE} = 15V I _C = 75A	T _J =25°C	-	2.10	2.55	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)}	-		-	10	-	Ω
Input capacitance	C _{ies}	V _{CE} = 10V, V _{GE} = 0V, f = 1MHz		-	8.2	-	nF
Turn-on time	t _{on}	V _{CC} = 900V, I _C = 75A V _{GE} = ±15V, R _{g_on} =R _{g_off} = 22Ω		-	1250	-	nsec
	t _r			-	550	-	
	t _{r (l)}			-	70	-	
Turn-off time	t _{off}	T _J =150°C, L _S = 30nH		-	1300	-	nsec
	t _r			-	150	-	
Forward on voltage	V _F (terminal)	V _{GE} = 0V I _F = 75A	T _J =25°C	-	1.85	2.30	V
			T _J =125°C	-	2.10	-	
			T _J =150°C	-	2.10	-	
	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 = 75A		-	140	-	nsec

● Thermal resistance characteristics

Items	Symbols	Conditions	Characteristics			Units
			min.	typ.	max.	
Thermal resistance(1device)	$R_{th(j-c)}$	IGBT	-	-	0.27	$^\circ\text{C/W}$
Contact thermal resistance (1device) (*4)	$R_{th(c-f)}$	FWD	-	-	0.50	
		with Thermal Compound	-	0.050	-	

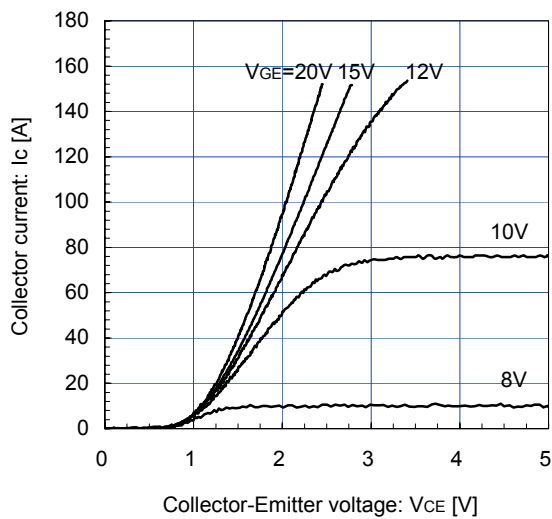
Note *4: This is the value which is defined mounting on the additional cooling fin with thermal compound.

Package No. : M263

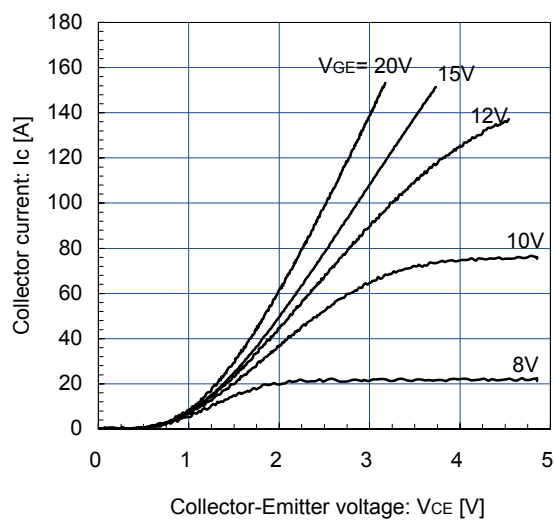


■ Characteristics (Representative)

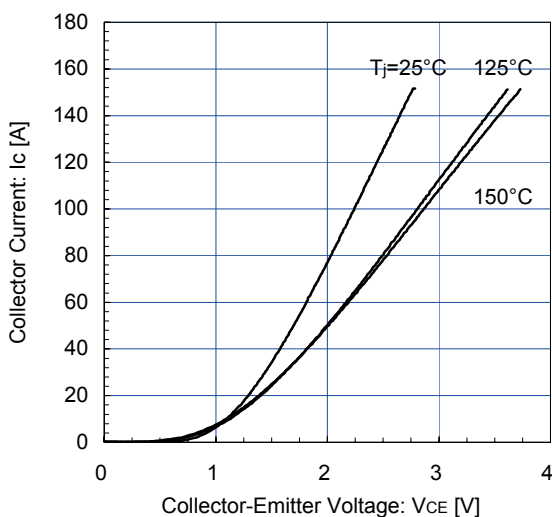
Collector current vs. Collector-Emitter voltage (typ.)
 $T_j = 25^\circ\text{C}$ / chip



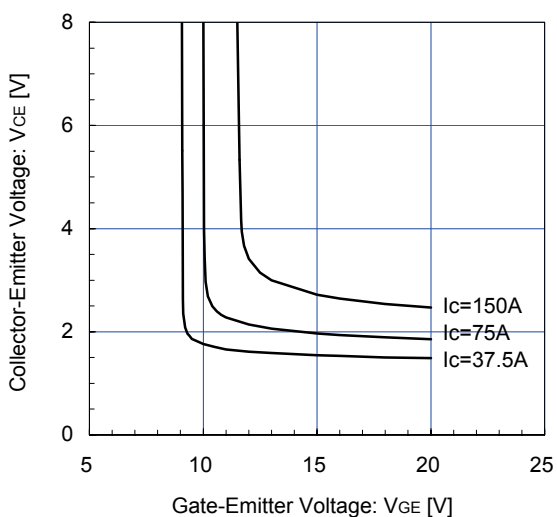
Collector current vs. Collector-Emitter voltage (typ.)
 $T_j = 150^\circ\text{C}$ / chip



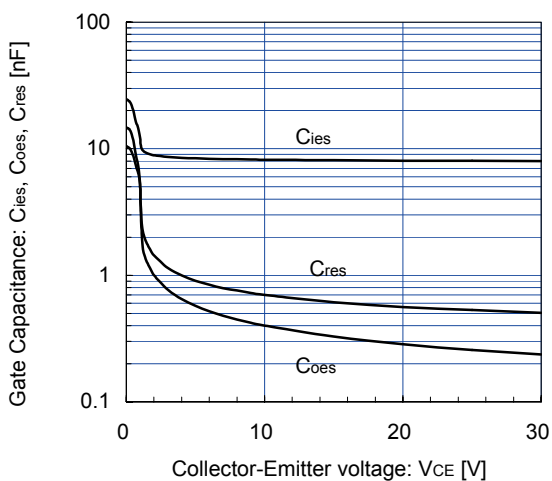
Collector current vs. Collector-Emitter voltage (typ.)
 $V_{GE} = 15\text{V}$ / chip



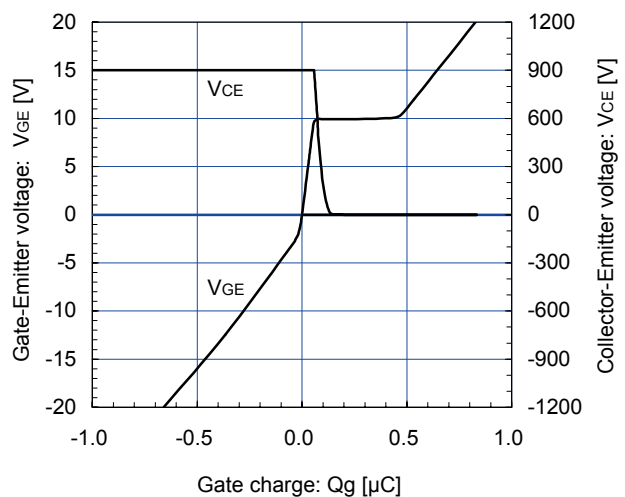
Collector-Emitter voltage vs. Gate-Emitter voltage
 $T_j = 25^\circ\text{C}$ / chip



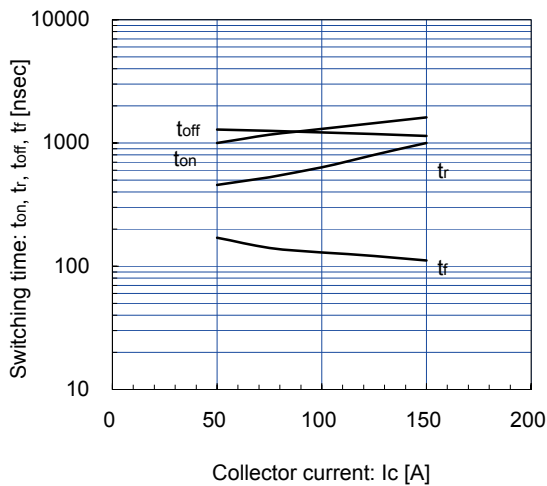
Gate Capacitance vs. Collector-Emitter Voltage
 $V_{GE} = 0\text{V}$, $f = 1\text{MHz}$, $T_j = 25^\circ\text{C}$



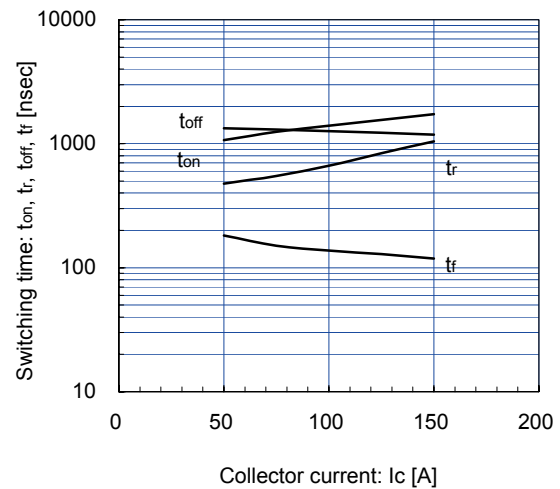
Dynamic Gate Charge (typ.)
 $V_{CC} = 900\text{V}$, $I_C = 75\text{A}$, $T_j = 25^\circ\text{C}$



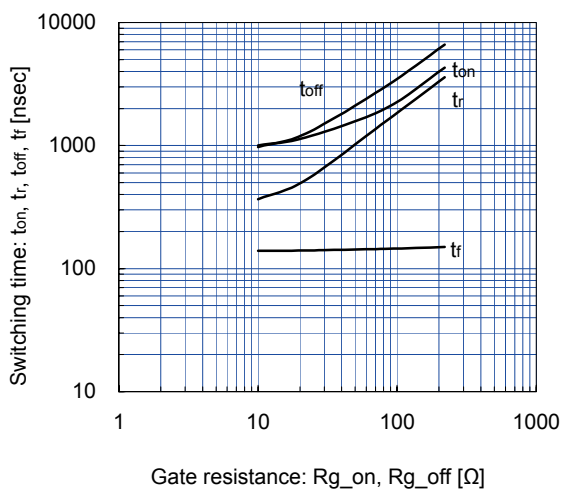
Switching time vs. Collector current (typ.)
 $V_{CC}=900V$, $V_{GE}=\pm 15V$, $R_{g_on}=R_{g_off}=22\Omega$, $T_J=125^\circ C$



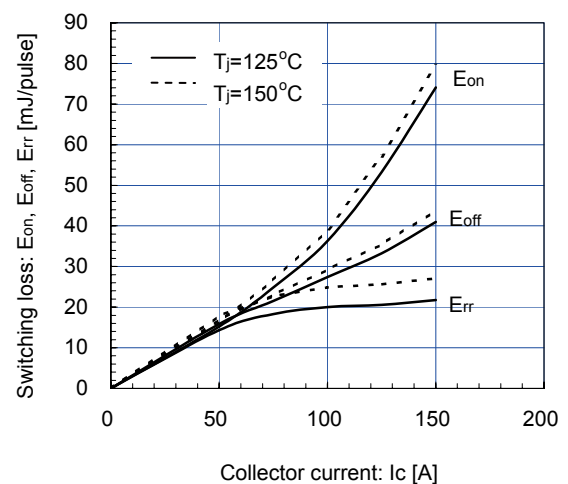
Switching time vs. Collector current (typ.)
 $V_{CC}=900V$, $V_{GE}=\pm 15V$, $R_{g_on}=R_{g_off}=22\Omega$, $T_J=150^\circ C$



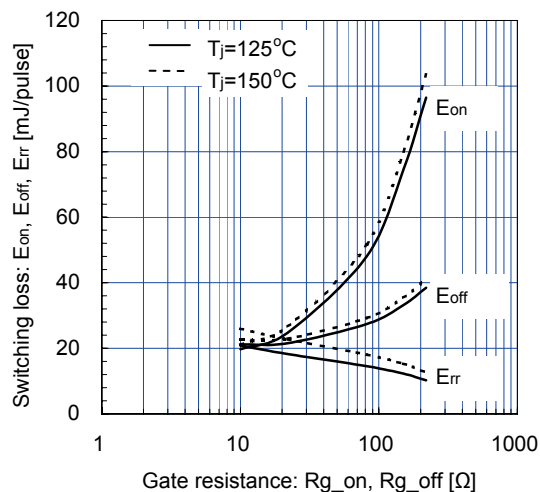
Switching time vs. Gate resistance (typ.)
 $V_{CC}=900V$, $I_c=75A$, $V_{GE}=\pm 15V$, $T_J=125^\circ C$



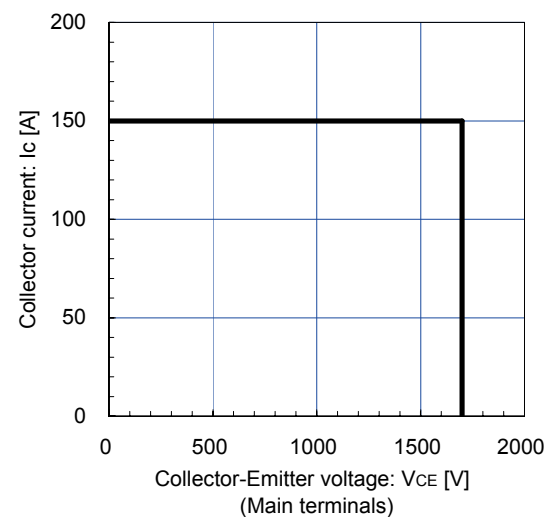
Switching loss vs. Collector current (typ.)
 $V_{CC}=900V$, $V_{GE}=\pm 15V$, $R_{g_on}=R_{g_off}=22\Omega$



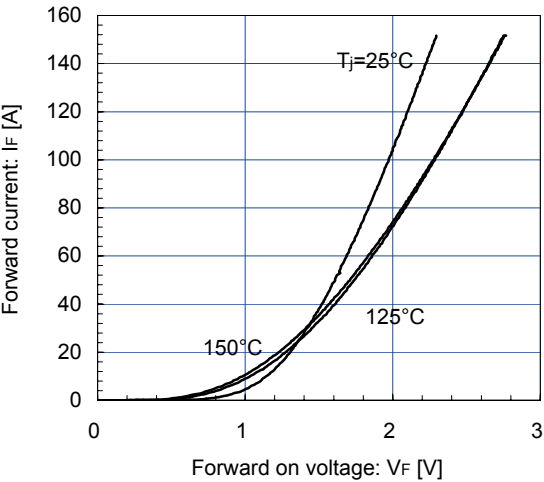
Switching loss vs. Gate resistance (typ.)
 $V_{CC}=900V$, $I_c=75A$, $V_{GE}=\pm 15V$, $T_J=125, 150^\circ C$



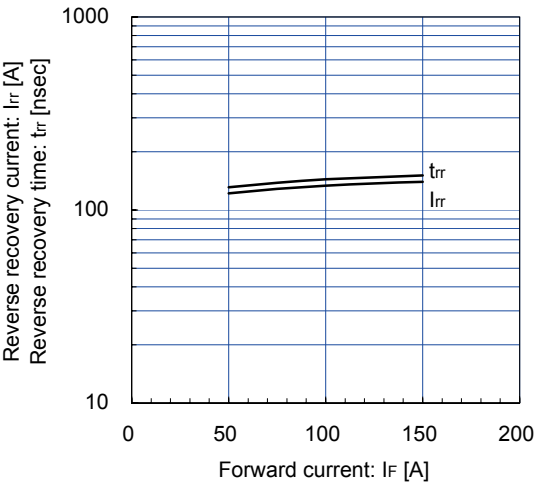
Reverse bias safe operating area (max.)
 $+V_{GE}=15V$, $-V_{GE}=15V$, $R_{g_off}=22\Omega$, $T_J=150^\circ C$



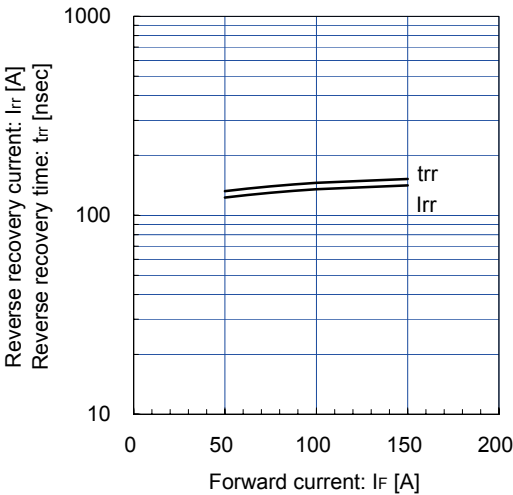
Forward Current vs. Forward Voltage (typ.)
chip



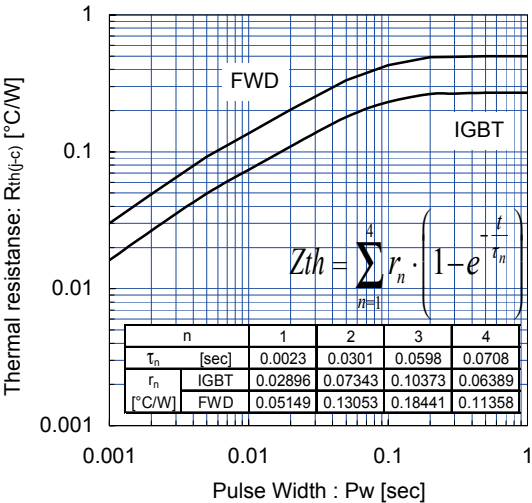
Reverse Recovery Characteristics (typ.)
 $V_{CC}=900\text{V}$, $V_{GE}=\pm 15\text{V}$, $R_{g_on}=22\Omega$, $T_J=125^\circ\text{C}$



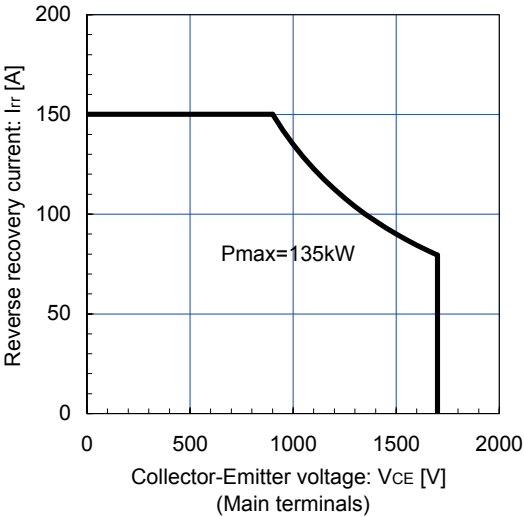
Reverse Recovery Characteristics (typ.)
 $V_{CC}=900\text{V}$, $V_{GE}=\pm 15\text{V}$, $R_{g_on}=22\Omega$, $T_J=150^\circ\text{C}$



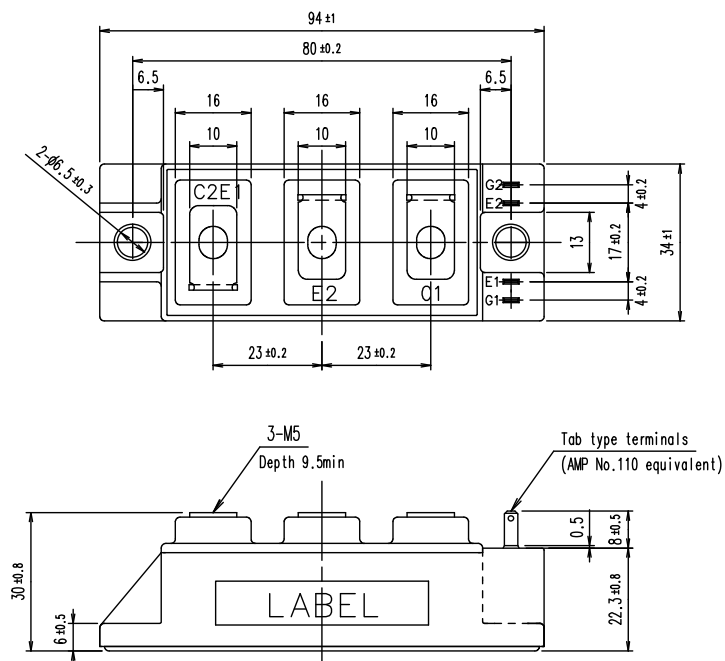
Transient Thermal Resistance (max.)



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

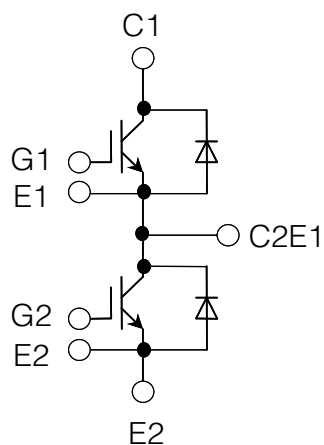


■ Outline Drawings, mm



Weight: 180g (typ.)

■ Equivalent Circuit Schematic



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