

2MBI50P-140

IGBT Modules

IGBT Modules P series

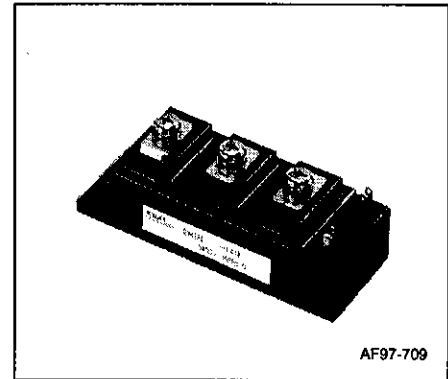
1400V / 50A 2 in one-package

■ Features

- Small temperature dependence of the turn-off switching loss
- Easy to connect in parallel
- Wide RBSOA (square up to 2 times of rated current) and high short-circuit withstand capability
- Low loss and soft-switching (reduction of EMI noise)

■ Applications

- General purpose inverters
- AC servo systems (Drive unit)
- UPS (Uninterruptible Power Supply)

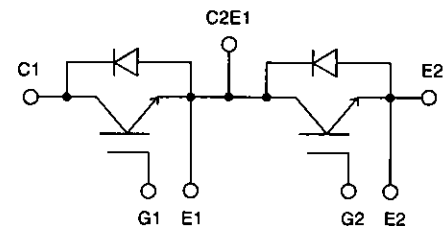


■ Maximum ratings and characteristics

● Absolute maximum ratings (Tc=25°C unless otherwise specified)

Item	Symbol	Rating	Unit		
Collector-Emitter voltage	V _{CE} S	1400	V		
Gate-Emitter voltage	V _{GE} S	±20	V		
Collector current	Continuous	T _c =25°C	I _c	75	A
		T _c =80°C		50	
	1ms	T _c =25°C	I _c pulse	150	
		T _c =80°C		100	
	Continuous	-I _c	50		
1ms	-I _c pulse	100			
Max power dissipation	P _c	400	W		
Operating temperature	T _J	+150	°C		
Storage temperature	T _{stg}	-40 to +125	°C		
Isolation voltage	V _{is}	2500 AC (1min.)	V		
Screw torque	Mounting *	3.5	N·m		
	Terminals *	3.5			

■ Equivalent circuit



Recommendable value
* 2.5 to 3.5 N·m (M5)

● Electrical ratings and characteristics (T_J=25°C unless otherwise specified)

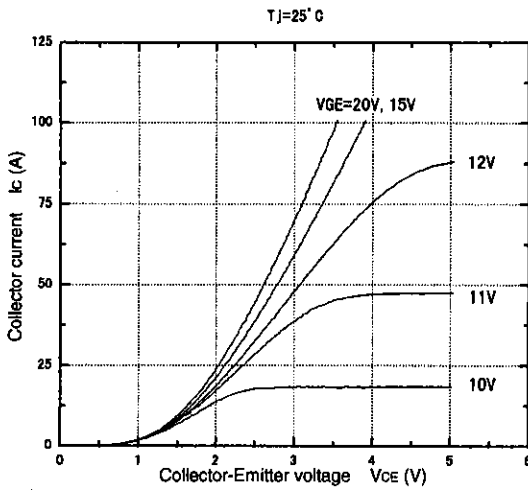
Item	Symbol	Characteristics			Conditions	Unit
		Min.	Typ.	Max.		
Zero gate voltage collector current	I _{CE} S	-	-	1.0	V _{GE} =0V, V _{CE} =1400V	mA
Gate-Emitter leakage current	I _{GES}	-	-	200	V _{CE} =0V, V _{GE} =±20V	nA
Gate-Emitter threshold voltage	V _{GE} (th)	6.0	8.0	9.0	V _{CE} =20V, I _c =50mA	V
Collector-Emitter saturation voltage	V _{CE} (sat)	-	2.7	3.0	T _J =25°C, V _{GE} =15V, I _c =50A	V
		-	3.3	-	T _J =125°C, V _{GE} =15V, I _c =50A	
Input capacitance	C _{ies}	-	5000	-	V _{GE} =0V	pF
Output capacitance	C _{oes}	-	750	-	V _{CE} =10V	
Reverse transfer capacitance	C _{res}	-	330	-	f=1MHz	
Turn-on time	ton	-	-	1.20	V _{CC} =600V	μs
	tr	-	-	0.60	I _c =50A	
Turn-off time	toff	-	-	1.00	V _{GE} =±15V	μs
	tf	-	-	0.30	R _G =24Ω	
Diode forward on voltage	V _F	-	2.4	3.3	I _F =50A, V _{GE} =0V	V
Reverse recovery time	t _{rr}	-	-	0.35	I _F =50A	μs

● Thermal resistance characteristics

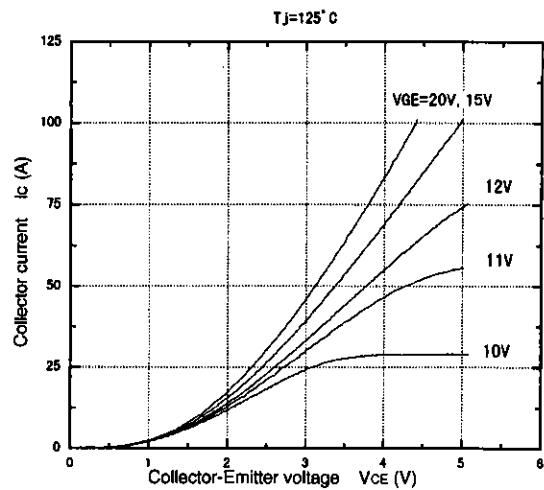
Item	Symbol	Characteristics			Conditions	Unit
		Min.	Typ.	Max.		
Thermal resistance	R _{th} (j-c)	-	-	0.31	IGBT	°C/W
	R _{th} (j-c)	-	-	0.66	Diode	
	R _{th} (c-f)*	-	0.05	-	the base to cooling fin	

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

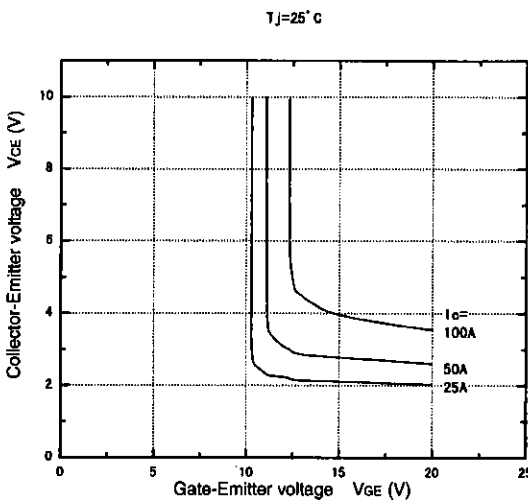
■ Characteristics



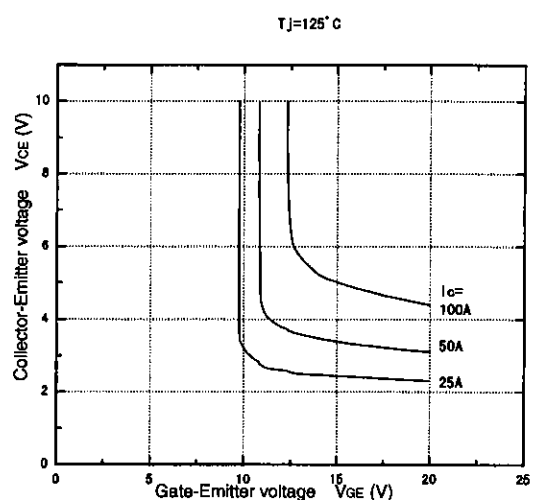
Collector current vs. Collector-Emitter voltage



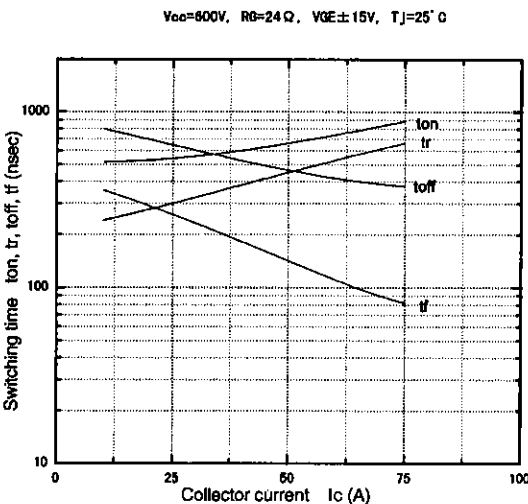
Collector current vs. Collector-Emitter voltage



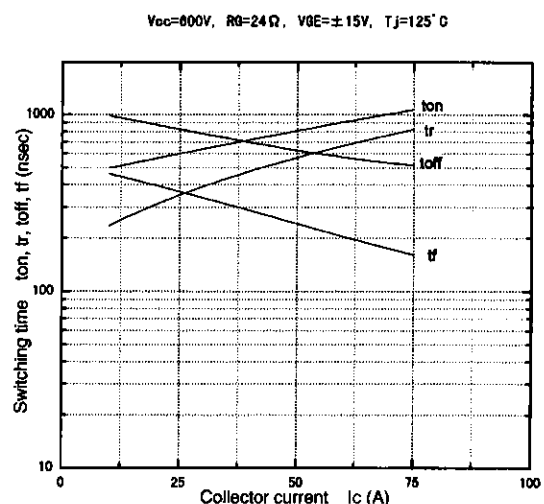
Collector-Emitter voltage vs. Gate-Emitter voltage



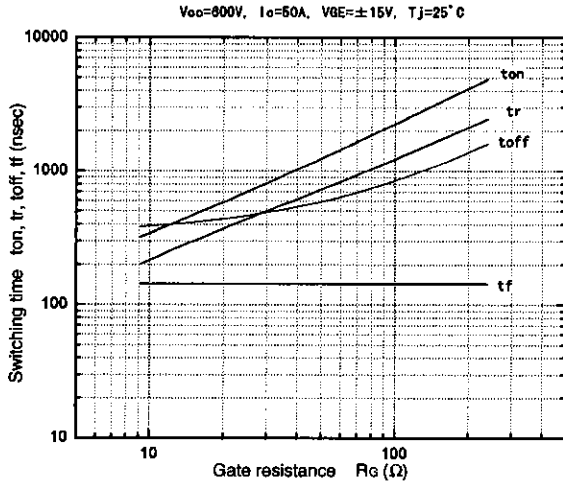
Collector-Emitter voltage vs. Gate-Emitter voltage



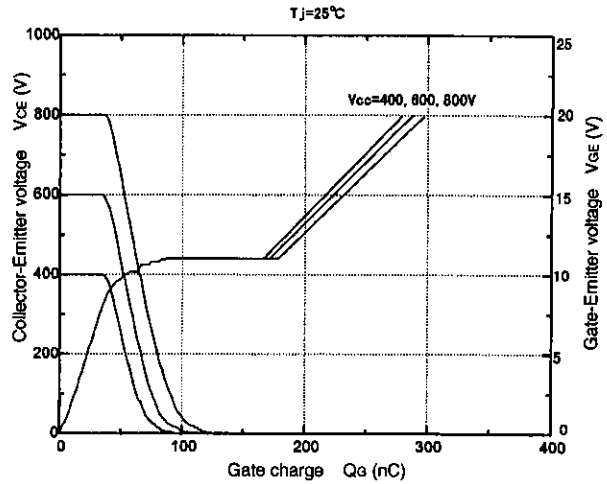
Switching time vs. Collector current



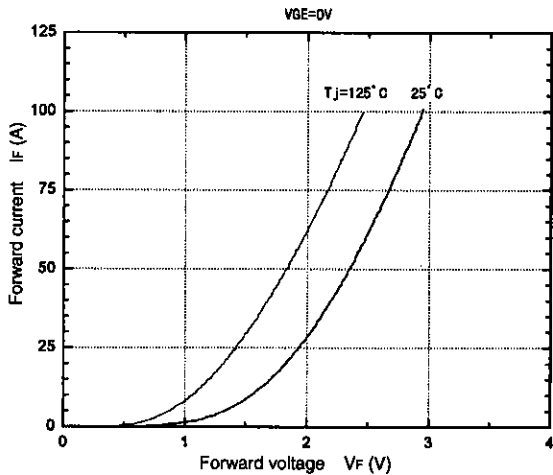
Switching time vs. Collector current



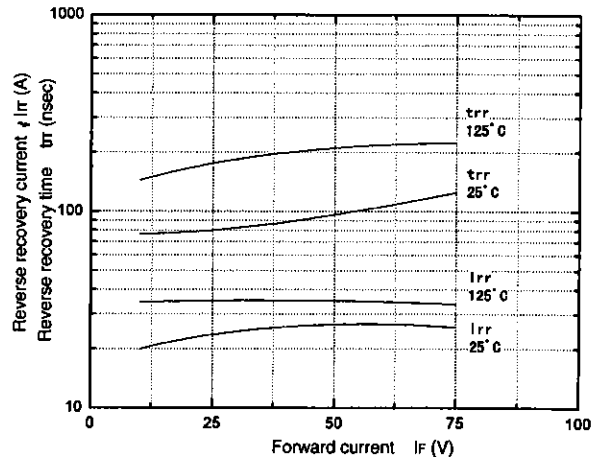
Switching time vs. Gate resistance



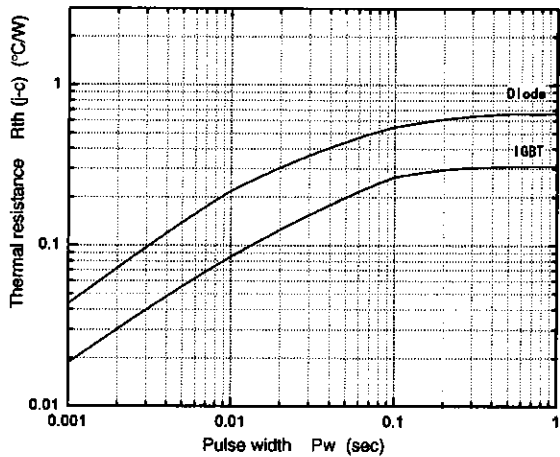
Dynamic input characteristics



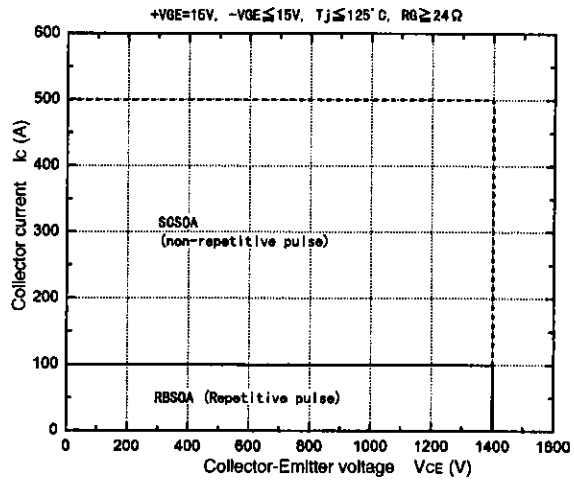
Forward current vs. Forward voltage



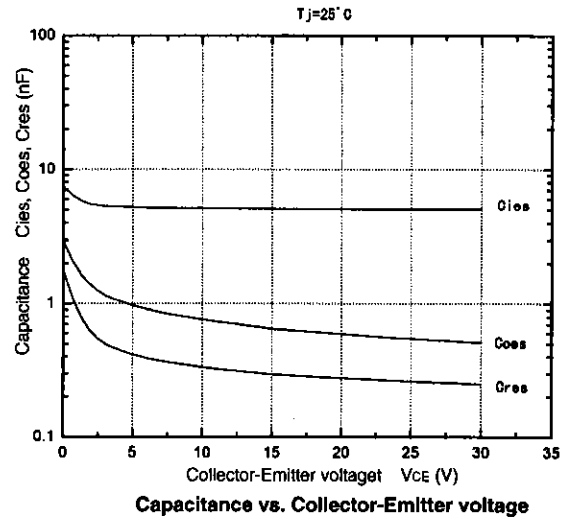
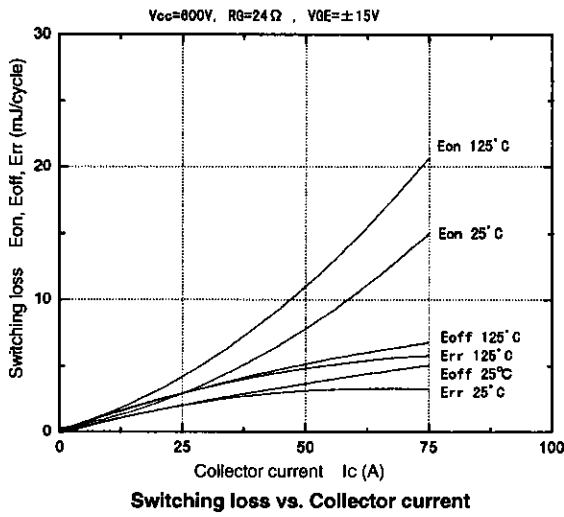
t_{rr}, I_{rr} vs. I_f



Transient thermal resistance

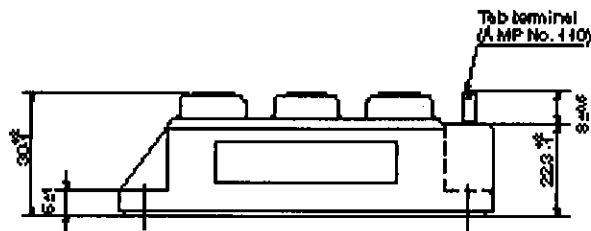
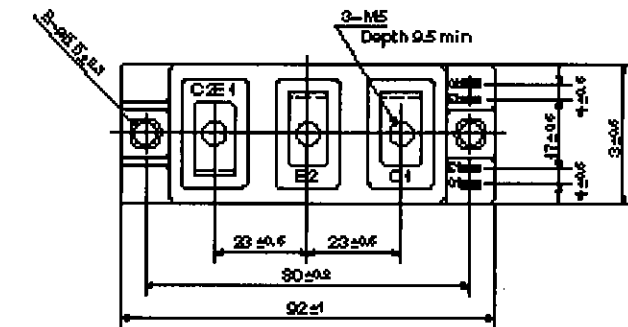


Reverse biased safe operating area



■ Outline drawings, mm

M232



Mass : 180g