6MBI75S-140

IGBT Modules

IGBT MODULE (S series)
1400V / 75A 6 in one-package

■ Features

· Compact Package
· P.C.Board Mount Module
· Low V_{CE}(sat)

■ Applications

· Inverter for Motor drive
· AC and DC Servo drive amplifier
· Uninterruptible power supply
· Industrial machines, such as Welding machines

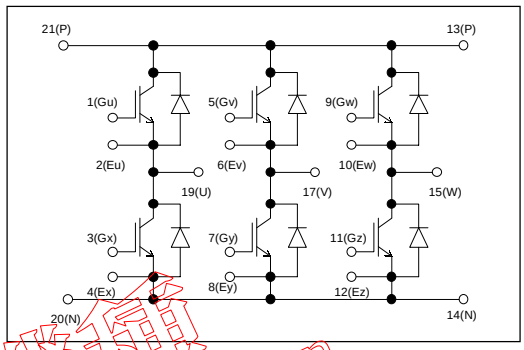
■ Maximum ratings and characteristics

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

Item			Symbol	Rating	Unit
Collector-Emitter voltage			V_{CES}	1400	V
Gate-Emitter voltage			V_{GES}	±20	V
Collector current	Continuous	Tj=25°C	I_C	100	A
		Tj=75°C		75	
	1ms	Tj=25°C	I_C pulse	200	A
		Tj=75°C		150	
			-I_C	75	A
	1ms		-I_C pulse	150	A
Max. power dissipation (1 device)			P_C	520	W
Operating temperature			T_j	+150	°C
Storage temperature			T_{stg}	-40 to +125	°C
Isolation voltage *1			V_{is}	AC 2500 (1min.)	V
Screw torque			Mounting *2	3.5	N·m

*1:All terminals should be connected together when isolation test will be done.
*2: Recommendable value : 2.5 to 3.5 N·m (M5)

■ Equivalent Circuit Schematic



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

Item	Symbol	Characteristics			Conditions		Unit
		Min.	Typ.	Max.			
Zero gate voltage collector current	I_{CES}	–	–	1.0	V_{GE}=0V, V_{CE}=1400V		mA
Gate-Emitter leakage current	I_{GES}	–	–	0.2	V_{CE}=0V, V_{GE}=±20V		μA
Gate-Emitter threshold voltage	$V_{GE(th)}$	5.5	7.2	8.5	V_{CE}=20V, I_C=75mA		V
Collector-Emitter saturation voltage	$V_{CE(sat)}$	–	2.4	2.7	Tj=25°C	V_{GE}=15V, I_C=75A	V
		–	3.0	–	Tj=125°C		
Input capacitance	Cies	–	9000	–	V_{GE}=0V		pF
Output capacitance	Coes	–	1875	–	V_{CE}=10V		
Reverse transfer capacitance	Cres	–	1650	–	f=1MHz		
Turn-on time	t_{on}	–	0.35	1.2	V_{CC}=800V		μs
	t_r	–	0.25	0.6	I_C=75A		
	$t_{r(i)}$	–	0.1	–	V_{GE}=±15V		
Turn-off time	t_{off}	–	0.45	1.0	R_G=16Ω		
	t_f	–	0.08	0.3			
Diode forward on voltage	V_F	–	2.6	3.4	Tj=25°C	I_F=75A, V_{GE}=0V	V
		–	2.2	–	Tj=125°C		
Reverse recovery time	t_{rr}	–	–	0.35	I_F=75A		μs

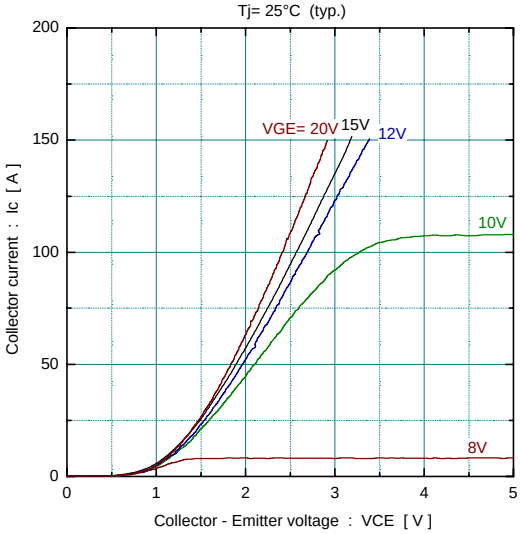
● Thermal resistance characteristics

Item	Symbol	Characteristics			Conditions	Unit
		Min.	Typ.	Max.		
Thermal resistance	Rth(j-c)	–	–	0.24	IGBT	°C/W
	Rth(j-c)	–	–	0.50	FWD	°C/W
	Rth(c-f)*2	–	0.05	–	the base to cooling fin	°C/W

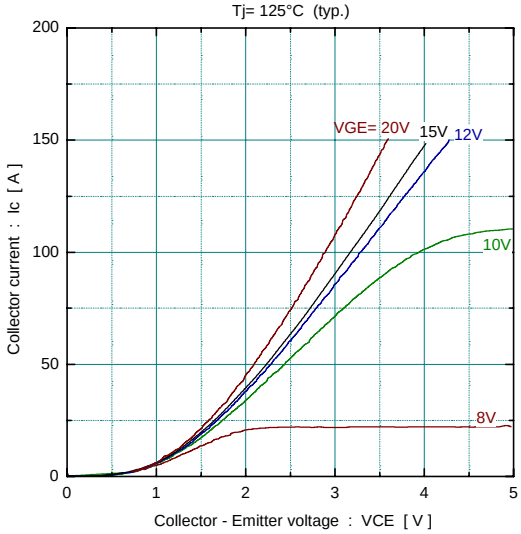
*2 : This is the value which is defined mounting on the additional cooling fin with thermal compound

■ Characteristics

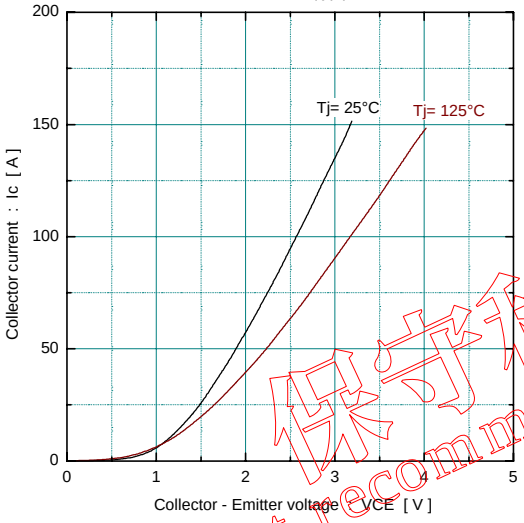
Collector current vs. Collector-Emitter voltage
Tj= 25°C (typ.)



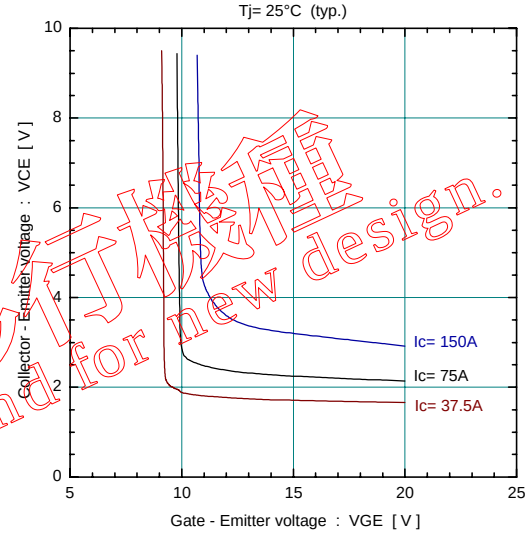
Collector current vs. Collector-Emitter voltage
Tj= 125°C (typ.)



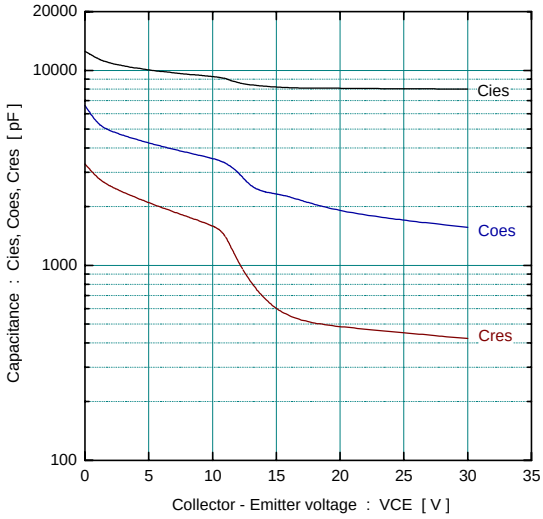
Collector current vs. Collector-Emitter voltage
VGE=15V (typ.)



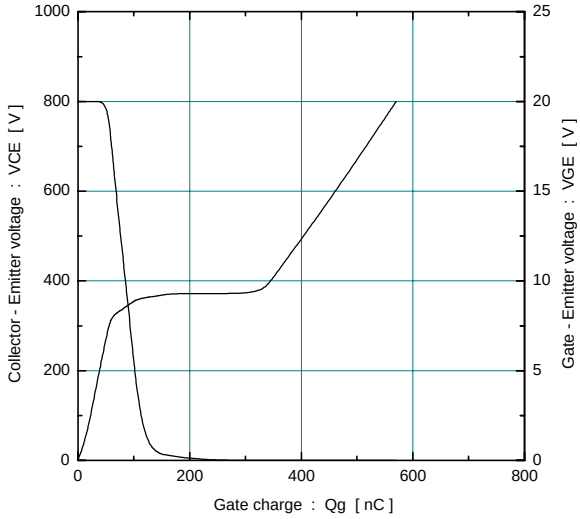
Collector-Emitter voltage vs. Gate-Emitter voltage
Tj= 25°C (typ.)



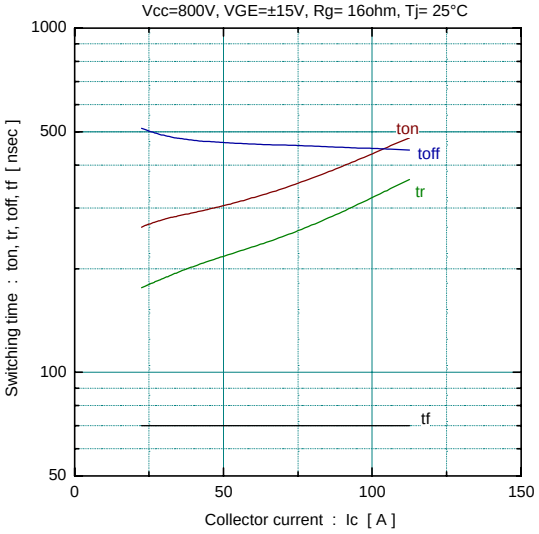
Capacitance vs. Collector-Emitter voltage (typ.)
VGE=0V, f= 1MHz, Tj= 25°C



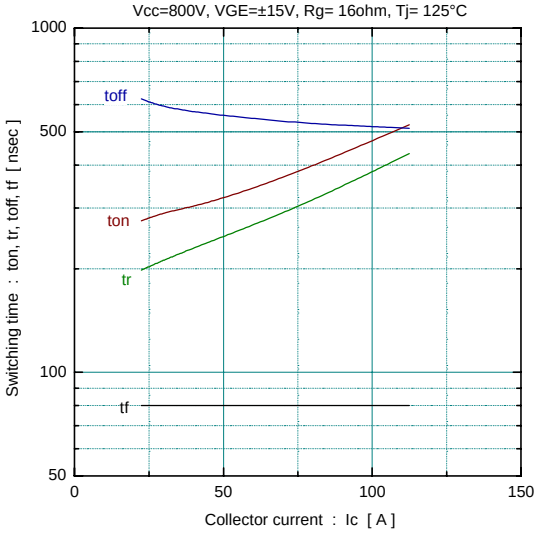
Dynamic Gate charge (typ.)
Vcc=800V, Ic=75A, Tj= 25°C



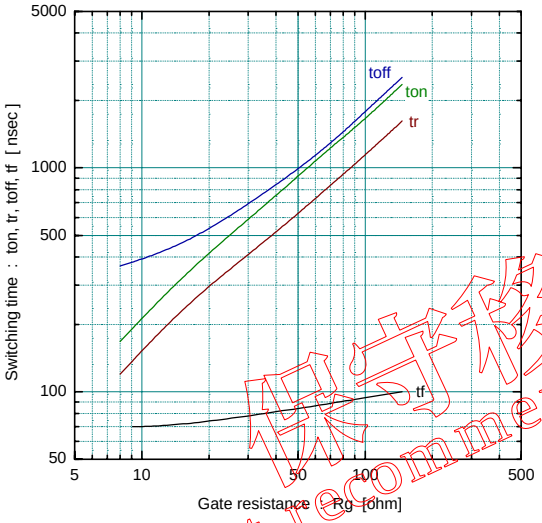
Switching time vs. Collector current (typ.)
Vcc=800V, VGE=±15V, Rg= 16ohm, Tj= 25°C



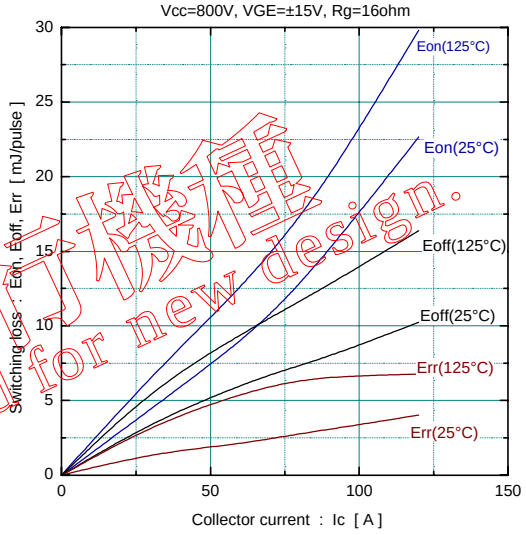
Switching time vs. Collector current (typ.)
Vcc=800V, VGE=±15V, Rg= 16ohm, Tj= 125°C



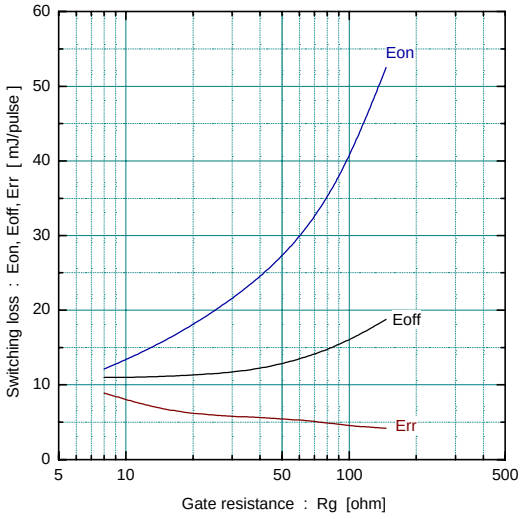
Switching time vs. Gate resistance (typ.)
Vcc=800V, Ic=75A, VGE=±15V, Tj= 25°C



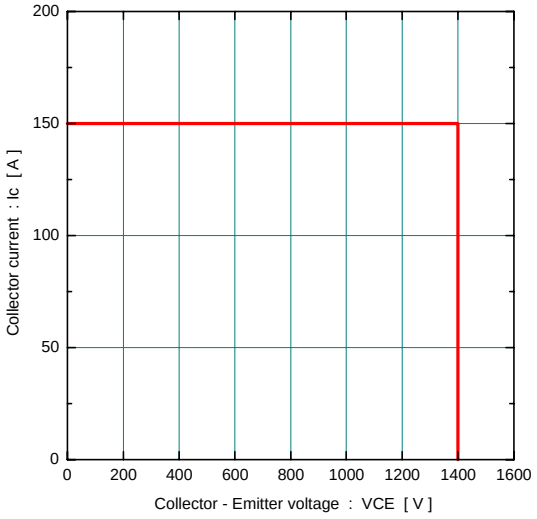
Switching loss vs. Collector current (typ.)
Vcc=800V, VGE=±15V, Rg=16ohm



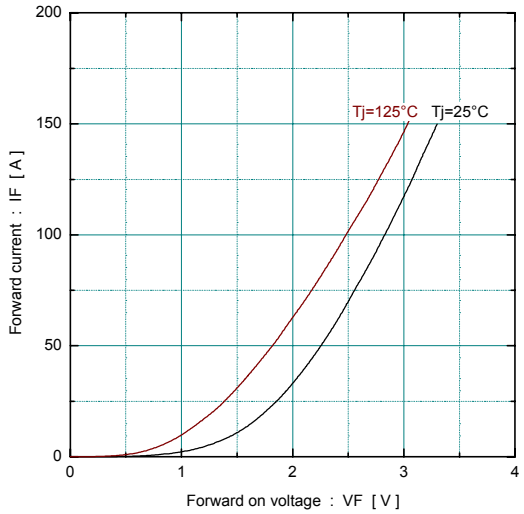
Switching loss vs. Gate resistance (typ.)
Vcc=800V, Ic=75A, VGE=±15V, Tj= 125°C



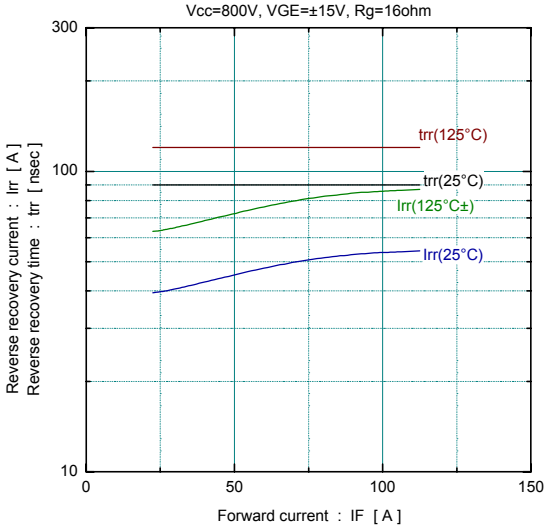
Reverse bias safe operating area
+VGE=15V, -VGE=<15V, Rg=>16ohm, Tj=<125°C



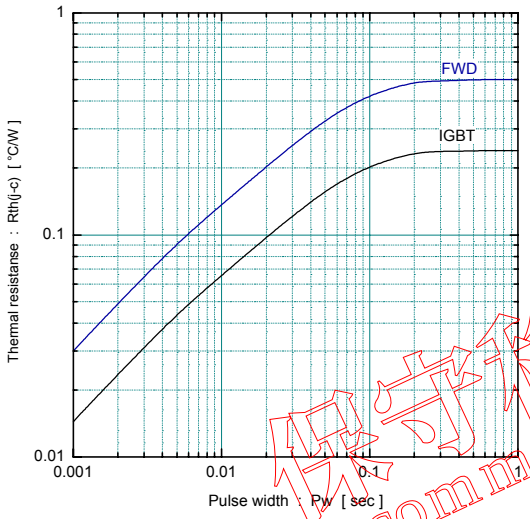
Forward current vs. Forward on voltage (typ.)



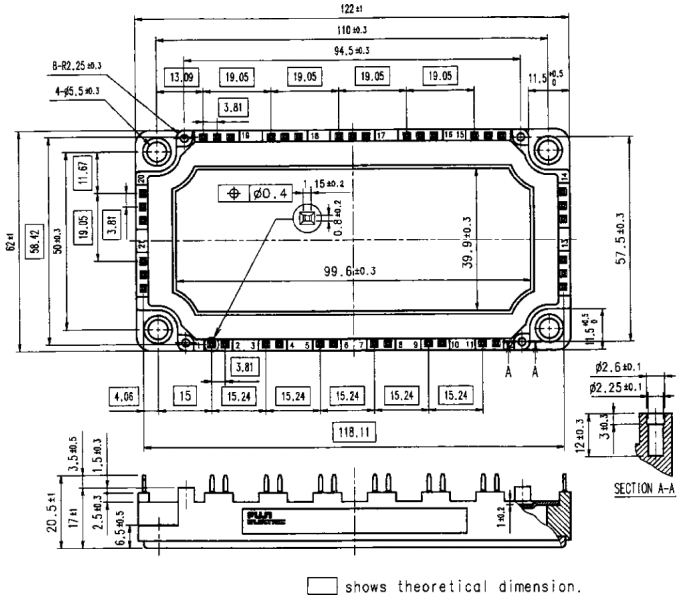
Reverse recovery characteristics (typ.)
Vcc=800V, VGE=±15V, Rg=16ohm



Transient thermal resistance



■ Outline Drawings, mm



mass : 260g