SPECIFICATION

Device Name : IGBT Module

Type Name : 6MBI50S-140

Spec. No. : MS5F 4723

Fuji Electric Co., Ltd.
Matsumoto Factory

	DATE	NAME	APPROVED
DRAWN	Nov. -10-'99	J. Kobayashi	
CHECKED	Nov. -10-'99	S. Ueda	T. Miyasaka

Fuji Electric Co.,Ltd.

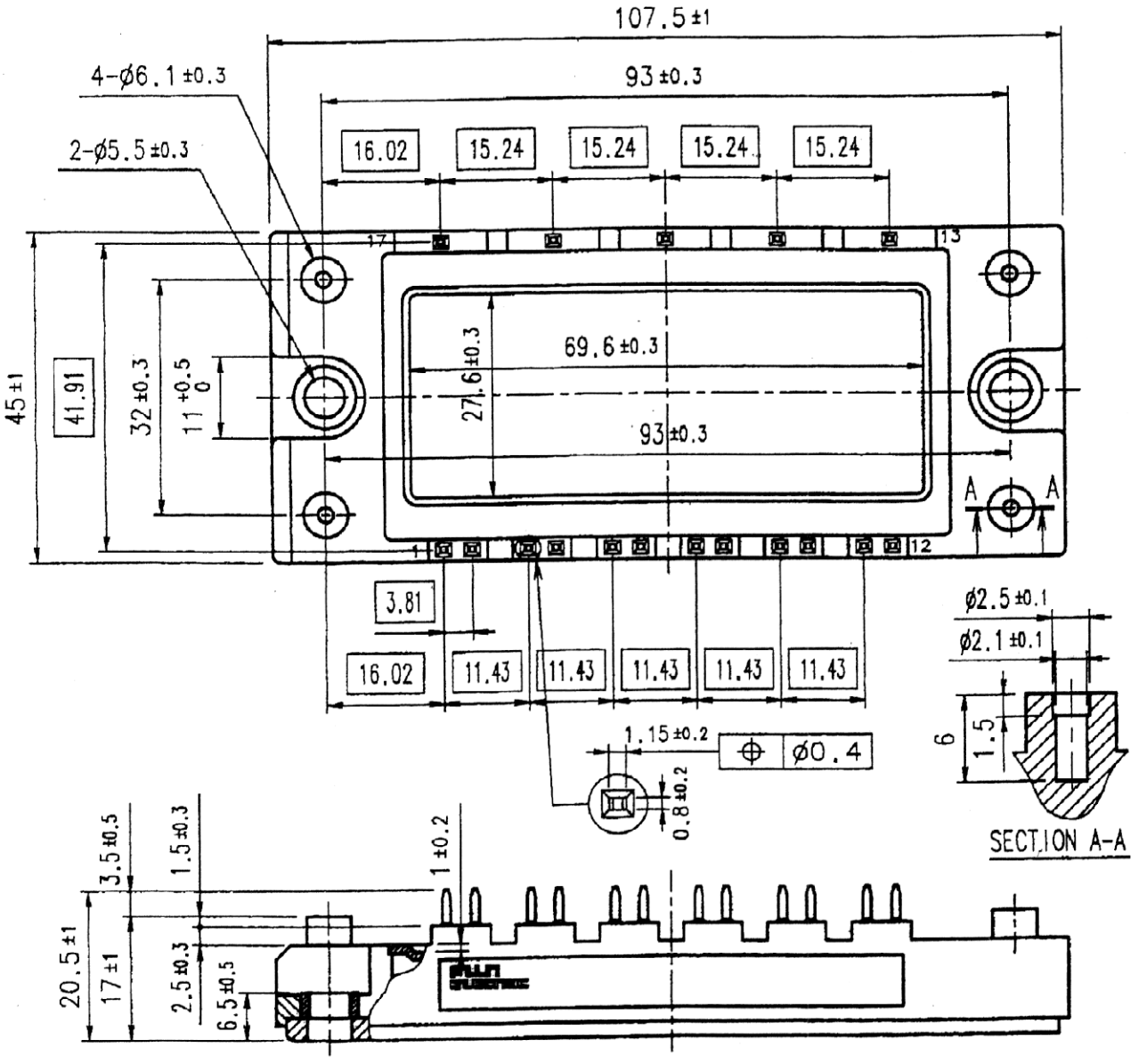
DWG.NO. MS5F 4723 1/8

H04-004-07

Revised Records

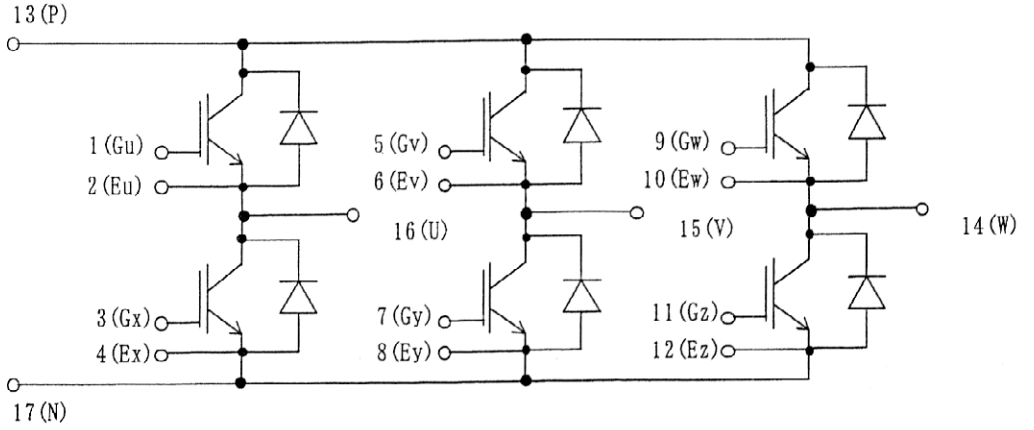
Date	Classi-fication	Ind.	Content	Applied date	Drawn	Checked	Approved
Nov.-10-'99	enactment	—	———	Issued date	—	S.Miyata	T.Miyasaka

1. Outline Drawing (Unit : mm)



shows theoretical dimension.

2. Equivalent circuit



3. Absolute Maximum Ratings (at Tc= 25℃ unless otherwise specified)

Items	Symbols	Conditions		Maximum Ratings	Units
Collector-Emitter voltage	VCES			1400	V
Gate-Emitter voltage	VGES			±20	V
Collector current	Ic	Continuous	Tc=25℃	75	A
			Tc=75℃	50	
	Ic pulse	1ms ※	Tc=25℃	150	
			Tc=75℃	100	
	-Ic			50	
	-Ic pulse	1ms		100	
Collector Power Dissipation	Pc	1 device		360	W
Junction temperature	Tj			150	℃
Storage temperature	Tstg			-40～ +125	℃
Isolation voltage (*1)	Viso	AC : 1min.		2500	V
Mounting Screw Torque (*2)				3.5	N・m

(*1) All terminals should be connected together when isolation test will be done.

(*2) Recommendable Value : 2.5～3.5 N・m (M5)

4. Electrical characteristics (at Tj= 25℃ unless otherwise specified)

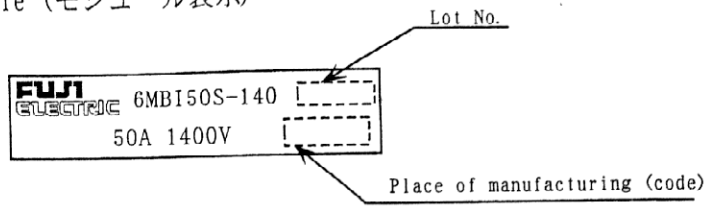
Items	Symbols	Conditions		Characteristics min.	Characteristics typ.	Characteristics Max.	Units
Zero gate voltage Collector current	ICES	VGE = 0 V, VCE = 1400 V				1.0	mA
Gate-Emitter leakage current	IGES	VCE = 0 V, VGE = ±20 V				200	nA
Gate-Emitter threshold voltage	VGE(th)	VCE = 20 V, Ic = 50 mA		5.5	7.2	8.5	V
Collector-Emitter saturation voltage	VCE(sat)	VGE = 15 V	Tj = 25 ℃		2.4	2.75	V
		Ic = 50 A	Tj = 125 ℃		3.0		
Input capacitance	Cies	VGE = 0 V			6000		pF
Output capacitance	Coes	VCE = 10 V			1250		
Reverse transfer capacitance	Cres	f = 1 MHz			1100		
Turn-on time	ton	Vcc = 800 V			0.35	1.2	μs
	tr	Ic = 50 A			0.25	0.6	
	$tr_{(i)}$	VGE = ±15 V			0.1		
Turn-off time	toff	RG = 24 Ω			0.45	1.0	
	tf				0.08	0.3	
Forward on voltage	VF	IF = 50 A	Tj = 25 ℃		2.6	3.4	V
			Tj = 125 ℃		2.2		
Reverse recovery time	trr	IF = 50 A				0.35	μs

5. Thermal resistance characteristics

Items	Symbols	Conditions	Characteristics min.	Characteristics typ.	Characteristics Max.	Units
Thermal resistance (1 device)	Rth(j-c)	IGBT			0.35	℃/W
		FWD			0.75	
Contact Thermal resistance	Rth(c-f)	with Thermal Compound (※)		0.05		

※ This is the value which is defined mounting on the additional cooling fin

6. Indication on module (モジュール表示)



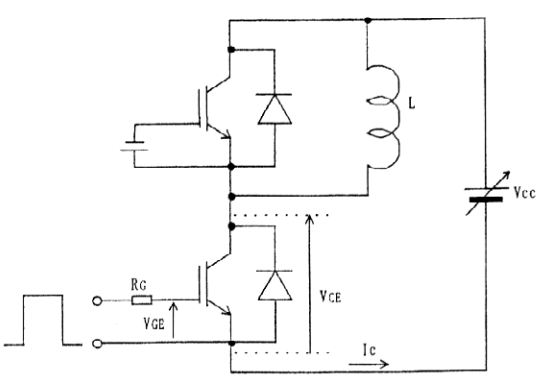
7. Applicable category (適用範囲)

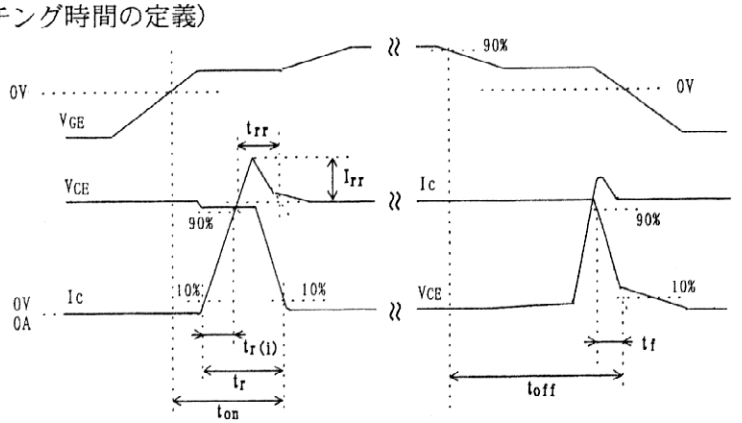
This specification is applied to IGBT Module named 6MBI50S-140 .
本納入仕様書は ＩＧＢＴモジュール　6ＭＢＩ５０Ｓ－１４０　に適用する。

8. Storage and transportation notes (保管・運搬上の注意事項)

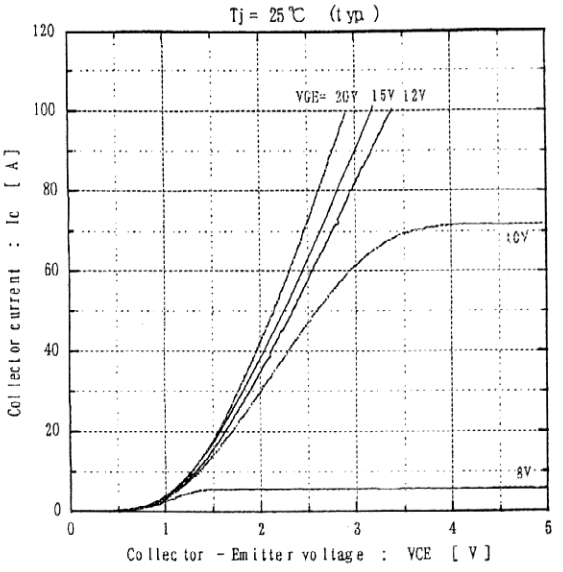
- The module should be stored at a standard temperature of 5 to 35℃ and humidity of 45 to 75% .
  常温・常湿保存が望ましい。(5～35℃, 45～75%)
- Store modules in a place with few temperature changes in order to avoid condensation on the module surface.
  急激な温度変化のなきこと。(モジュール表面が結露しないこと)
- Avoid exposure to corrosive gases and dust.
  腐蝕性ガスの発生場所, 塵埃の多い場所は避けること。
- Avoid excessive external force on the module.
  製品に荷重がかからないように 十分注意すること。
- Store modules with unprocessed terminals.
  モジュールの端子は未加工の状態で保管すること。
- Do not drop or otherwise shock the modules when tranporting.
  製品の運搬時に衝撃を与えたり、落下させたりしないこと。

9. Definitions of switching time (スイッチング時間の定義)

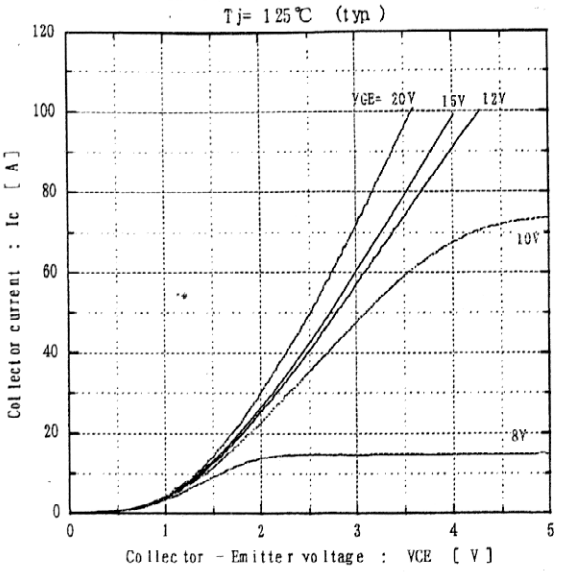




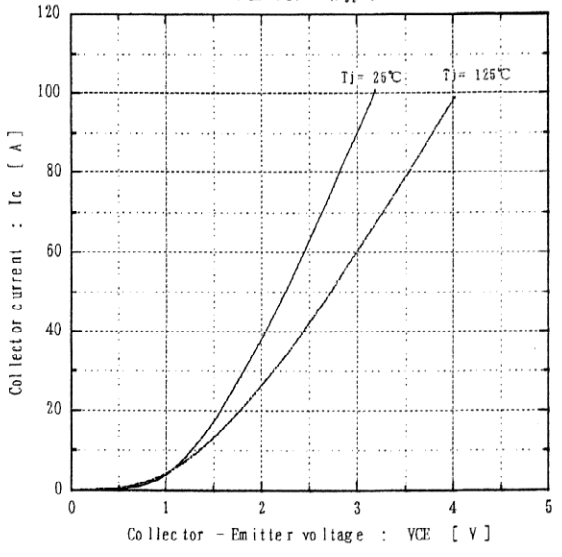
[Inverter]
Collector current vs. Collector-Emitter voltage
Tj = 25℃ (typ.)



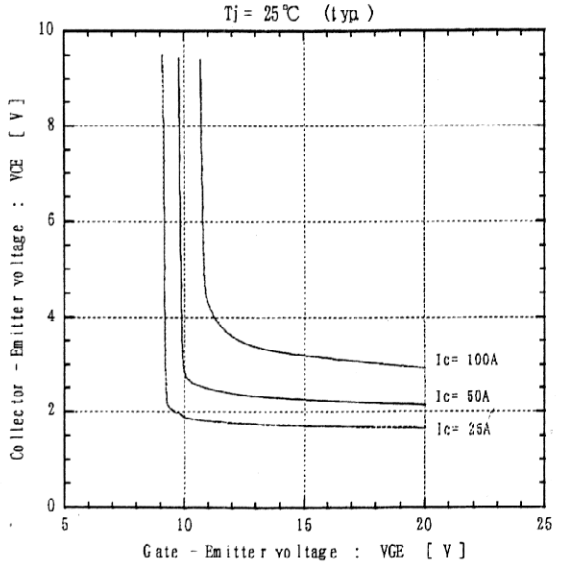
[Inverter]
Collector current vs. Collector-Emitter voltage
Tj= 125℃ (typ.)



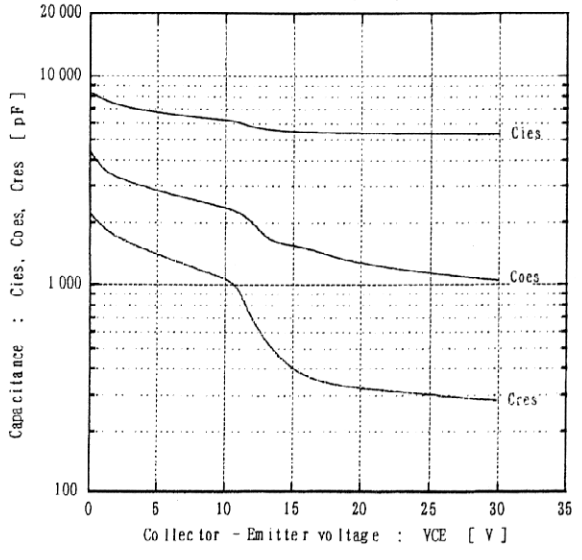
[Inverter]
Collector current vs. Collector-Emitter voltage
VGE=15V (typ.)



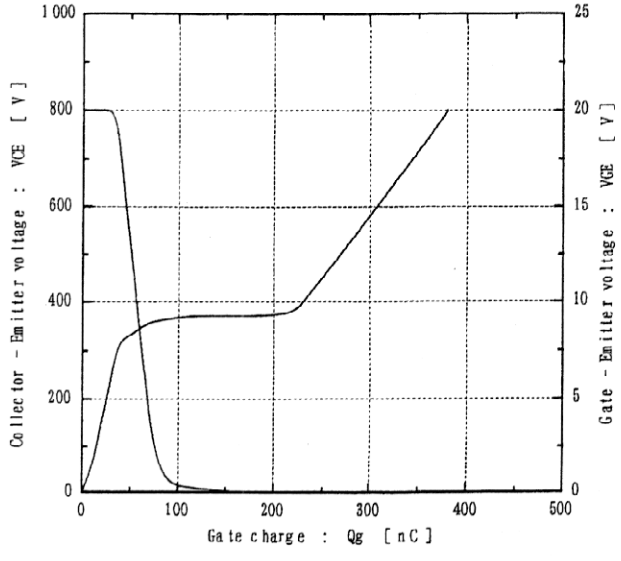
[Inverter]
Collector-Emitter voltage vs. Gate-Emitter voltage
Tj = 25℃ (typ.)



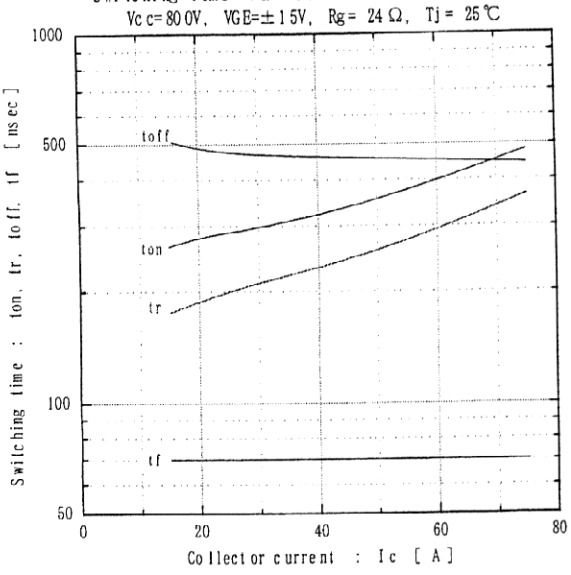
[Inverter]
Capacitance vs. Collector-Emitter voltage (typ.)
VGE=0V, f= 1MHz, Tj= 25℃



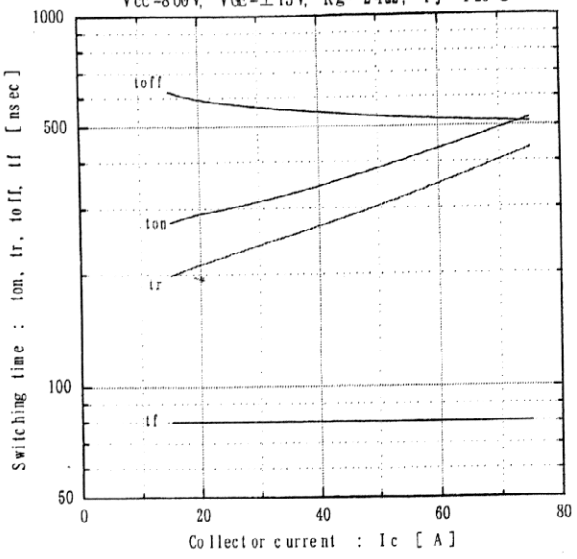
[Inverter]
Dynamic Gate charge (typ.)
Vcc=800V, Ic=50A, Tj= 25℃



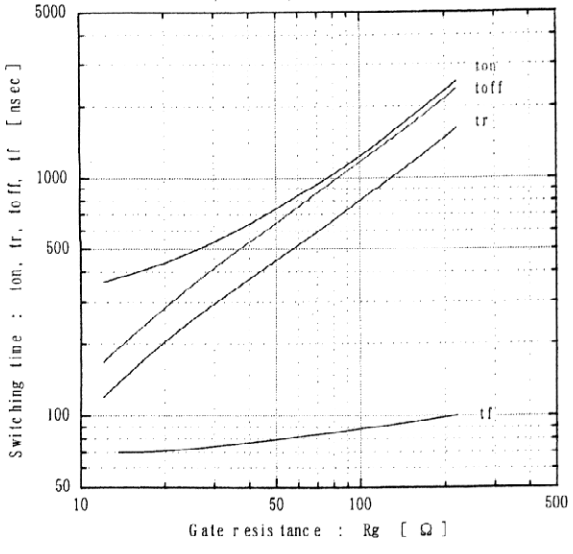
[Inverter]
Switching time vs. Collector current (typ.)
Vcc=800V, VGE=±15V, Rg= 24Ω, Tj= 25℃



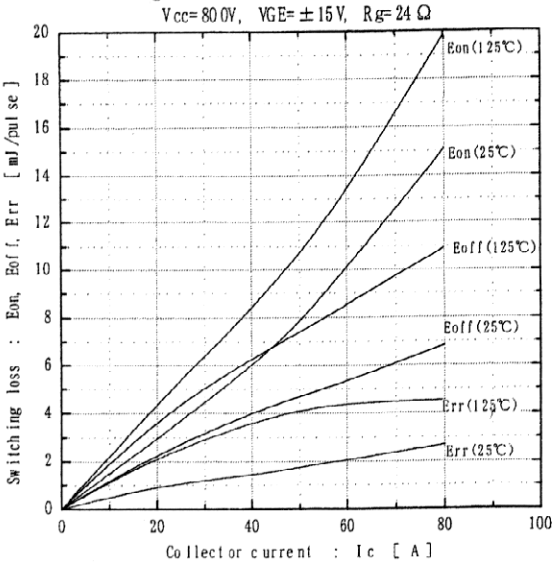
[Inverter]
Switching time vs. Collector current (typ.)
Vcc=800V, VGE=±15V, Rg= 24Ω, Tj= 125℃



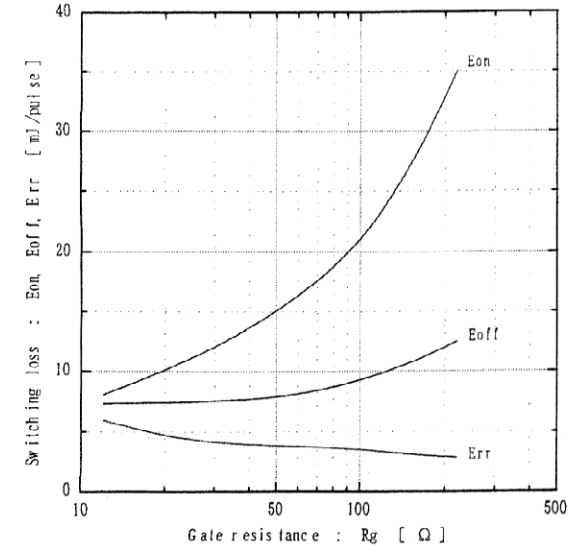
[Inverter]
Switching time vs. Gate resistance (typ.)
Vcc=800V, Ic=50A, VGE=±15V, Tj= 25℃



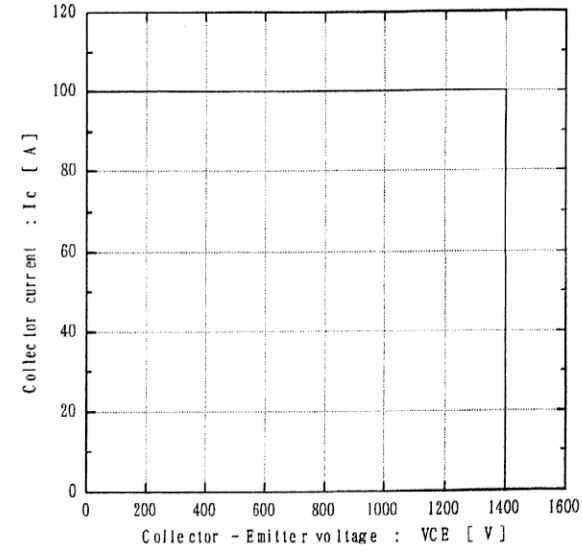
[Inverter]
Switching loss vs. Collector current (typ.)
Vcc=800V, VGE=±15V, Rg=24Ω



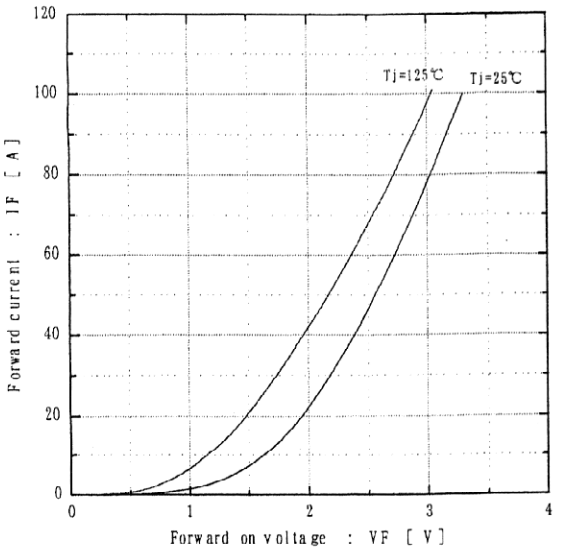
[Inverter]
Switching loss vs. Gate resistance (typ.)
Vcc=800V, Ic=50A, VGE=±15V, Tj= 125℃



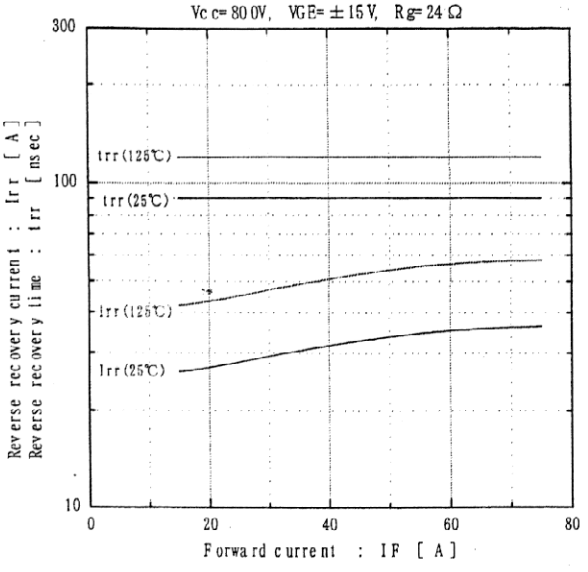
[Inverter]
Reverse bias safe operating area
+VGE=15V, -VGE≦15V, Rg≧24Ω, Tj≦125℃



Forward current vs. Forward on voltage (typ.)



Reverse recovery characteristics (typ.)
Vcc=800V, VGE=±15V, Rg=24Ω



Transient thermal resistance