

Messrs. Rockwell Automation

SPECIFICATION

Device Name : IGBT Module

Type Name : 1MB1600PX-140-03

Spec. No. : MS5F4851

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Fuji Electric Co., Ltd.
Matsumoto Factory

		DATE	NAME	APPROVED	Fuji Electric Co., Ltd.	
DRAWN	May-31-'00	S. Yoshiwara		T. Miyazaki	DWG. NO.	MS5F4851 1/8
CHECKED	May-31-'00	S. Miyata				

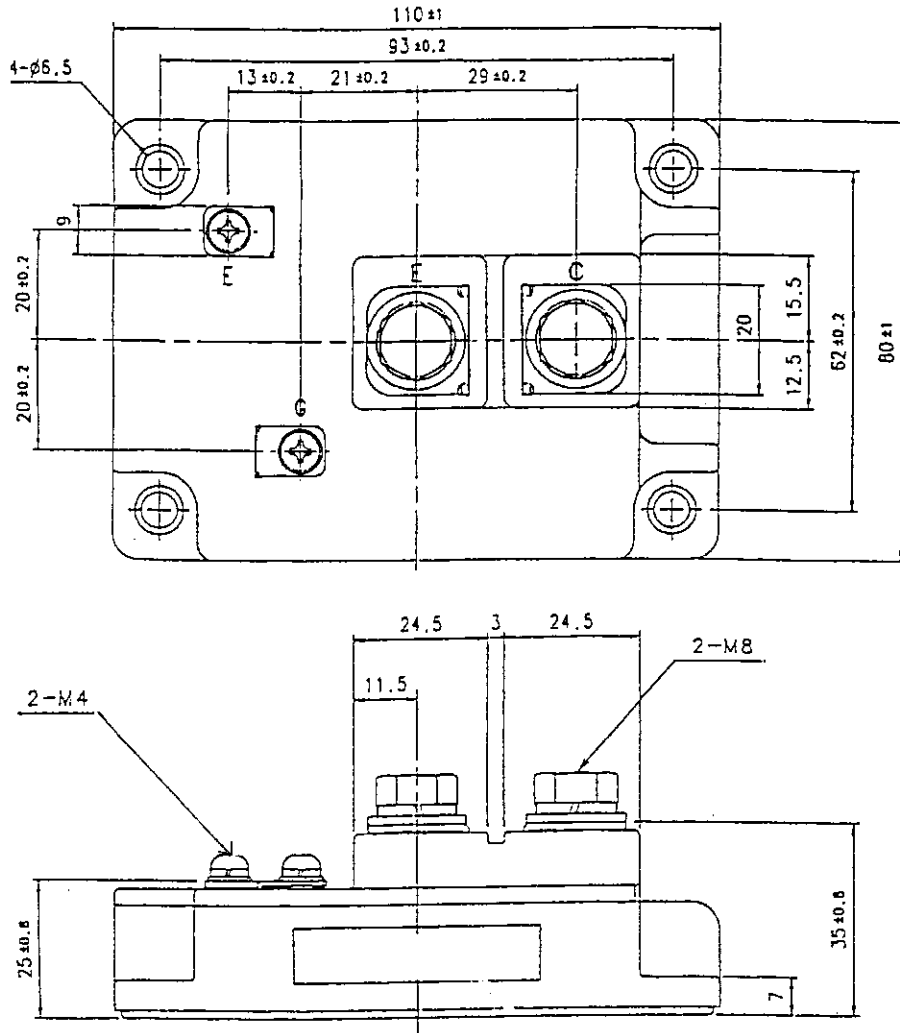
Revised Records

Date	Classi- fication	Ind.	Content	Applied date	Drawn	Checked	Approve
May-31-'00	enactment	—	—	Issued date	—	S. M. A. A.	T. Miyasaka

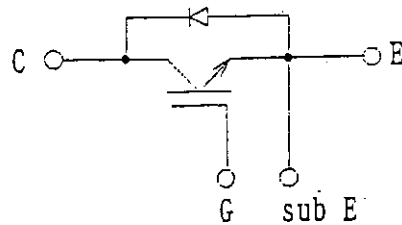
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1MBI600PX-140-03

1. Outline Drawing
Unit : mm



2. Equivalent circuit



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

Items			Symbols	Ratings	Units
Collector-Emitter voltage			V _{CE}	1400	V
Gate-Emitter voltage			V _{GE}	±20	V
Collector current	Continuous	T _c =25℃	I _c	800	A
		T _c =80℃		600	
	1ms	T _c =25℃	I _c pulse	1600	
		T _c =80℃		1200	
			-I _c	600	
	1ms		-I _c pulse	1200	
	Max. power dissipation			P _C	
Operating temperature			T _j	+150	℃
Storage temperature			T _{stg}	-40~+125	℃
Isolation voltage			V _{is}	AC 2500 (1min.)	V
Screw torque			Mounting #1	4.5	N · m
			Terminals #2	11.0	
			Terminals #3	1.7	

Note : #1 Recommendable value : 4.0±0.5 N · m (M6)

Note : #2 Recommendable value : 10.0±1.0 N · m (M8)

Note : #3 Recommendable value : 1.50±0.2 N · m (M4)

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

Items	Symbols	Characteristics			Conditions	Units
		min.	typ.	max.		
Zero gate voltage Collector current	I _{CE}			2.0	V _{GE} =0V, V _{CE} =1400V	mA
Gate-Emitter leakage current	I _{GE}			±0.5	V _{CE} =0V, V _{GE} =±20V	μA
Gate-Emitter threshold voltage	V _{GE(th)}	6.0	8.0	9.0	V _{CE} =20V, I _c =600mA	V
Collector-Emitter saturation voltage	V _{CE(sat)}		2.85	3.2	V _{GE} =15V, I _c =600A	V
Input capacitance	C _{ies}		60		V _{GE} =0V V _{CE} =10V f=1MHz	nF
Output capacitance	C _{oes}		9			
Reverse transfer capacitance	C _{res}		4			
Turn-on time	ton		750	1200	V _{cc} =600V I _c =600A	ns
	tr		200	600		
Turn-off time	toff		650	1000	V _{GE} =±15V R _G =2.0Ω	
	tf		100	300		
Diode forward on voltage	V _F			3.4	I _F =600A, V _{GE} =0V	V
Reverse recovery time	trr			350	I _F =600A	ns

5. Thermal resistance characteristics

Items	Symbols	Characteristics			Conditions	Units
		min.	typ.	max.		
Thermal resistance	R _{th(j-c)}			0.03	IGBT	°C/W
	R _{th(j-c)}			0.06	Diode	
	※		0.0063		the base to cooling fin	
	R _{th(c-f)}					

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

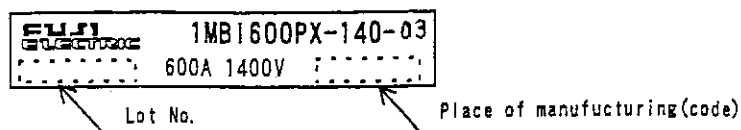
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6. Indication on module (モジュール表示)



7. Applicable category (適用範囲)

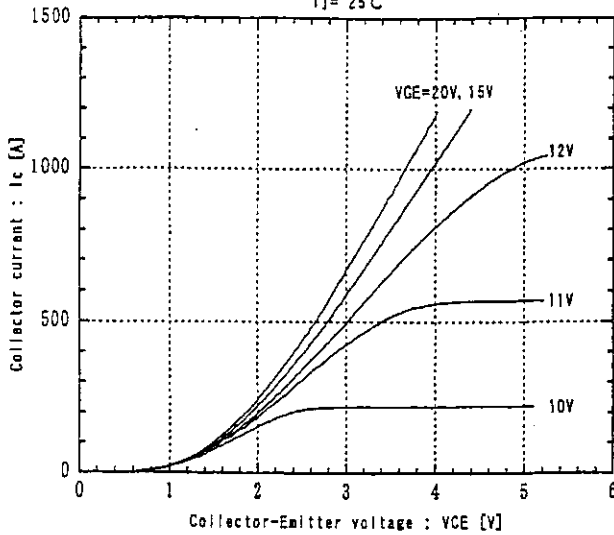
This specification is applied to IGBT module named 1MBI600PX-140-03
本納入仕様書は、IGBTモジュール 1MBI600PX-140-03 に適用する。

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

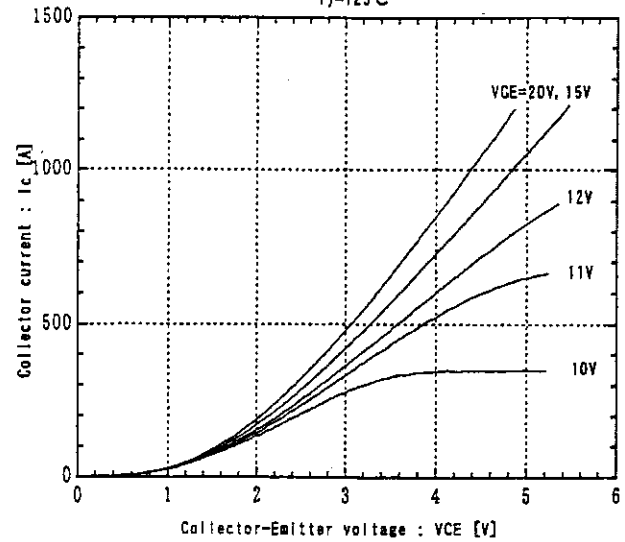
- The IGBT module should be stored at a standard temperature of 5 to 35℃ and humidity of 45 to 75%.
常温保存が望ましい。(5～35℃、45～75%)
- Store modules in a place with few temperature changes in order to avoid condensation on the module surface.
急激な温度変化の無きこと。(モジュール表面が結露しないこと)
- Avoid exposure to corrosive gases 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 transporting.
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。

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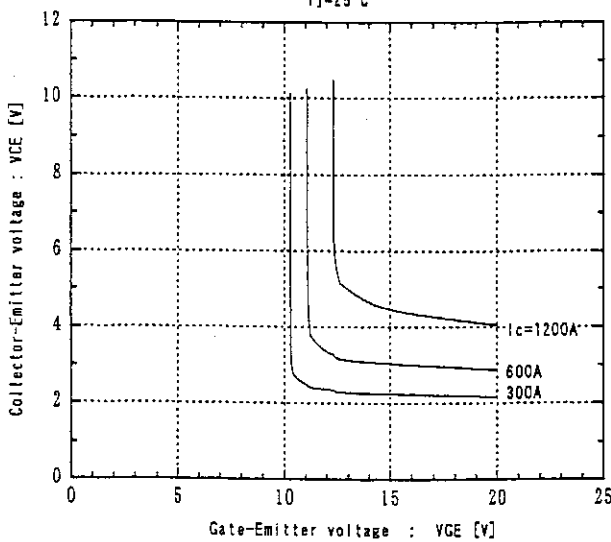
Collector current vs. Collector-Emitter voltage
T_J = 25°C



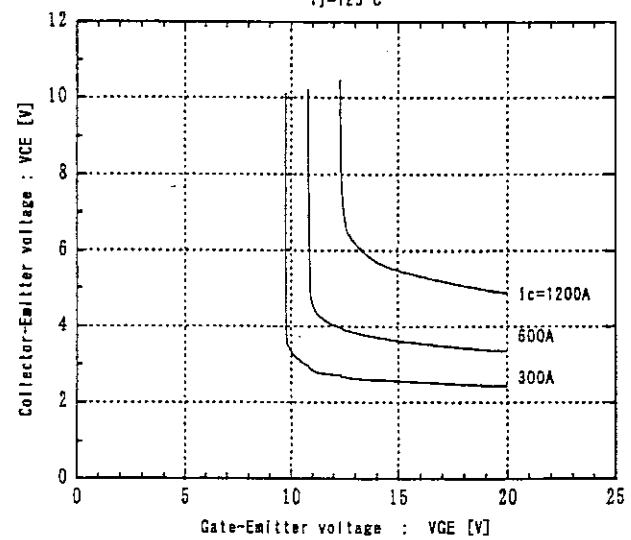
Collector current vs. Collector-Emitter voltage
T_J = 125°C



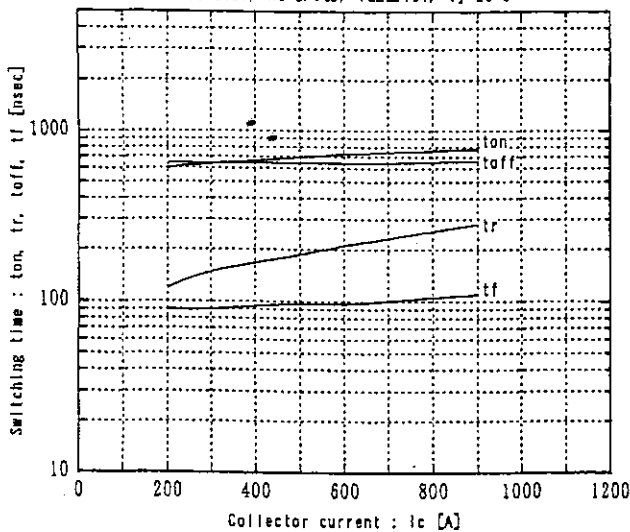
Gate-Emmitter voltage vs. Collector-Emitter voltage
T_J = 25°C



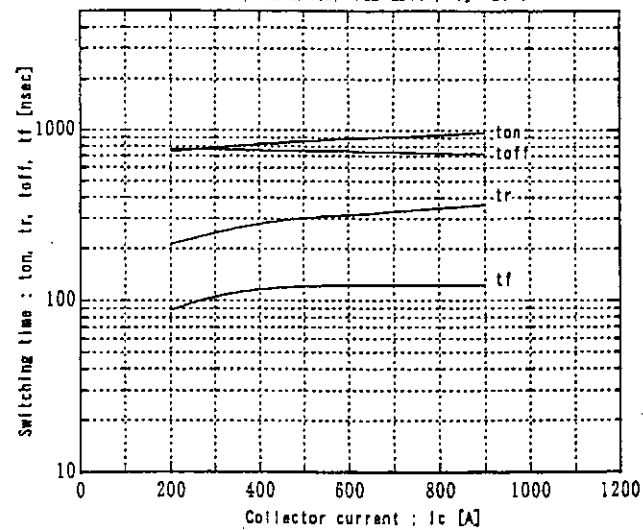
Gate-Emmitter voltage vs. Collector-Emitter voltage
T_J = 125°C



Switching time vs. Collector current
V_{CC} = 600V, R_G = 2.0Ω, V_{GE} = ±15V, T_J = 25°C

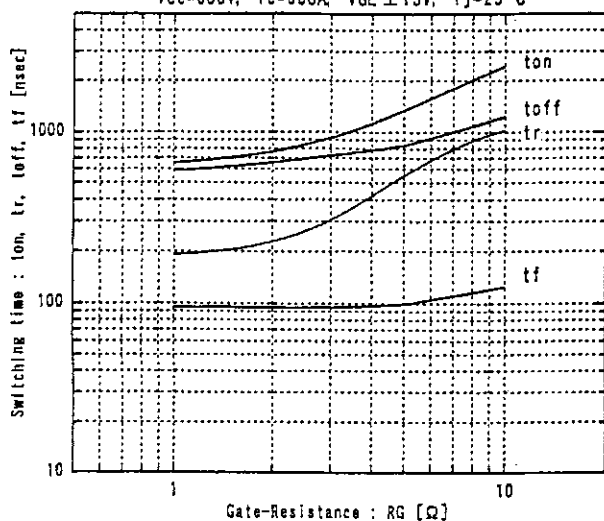


Switching time vs. Collector current
V_{CC} = 600V, R_G = 2.0Ω, V_{GE} = ±15V, T_J = 125°C

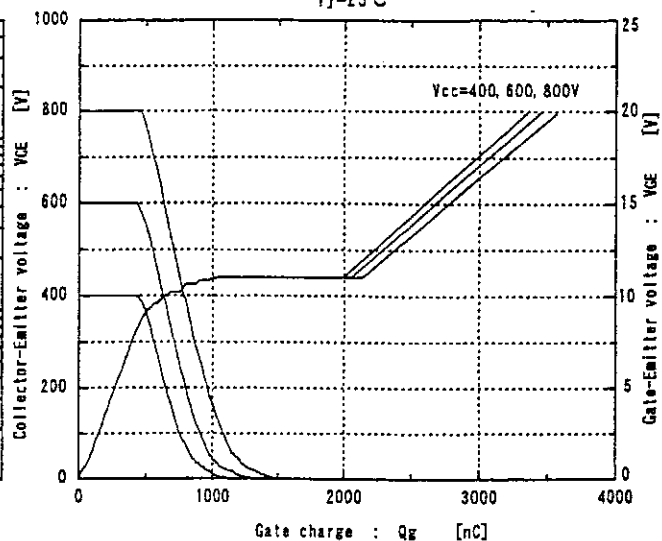


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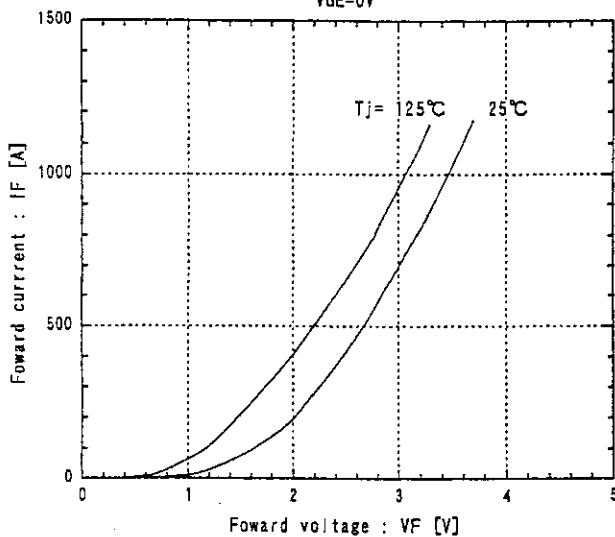
Switching time vs. Gate-Resistance
 $V_{cc}=600V$, $I_c=600A$, $V_{GE} \pm 15V$, $T_j=25^\circ C$



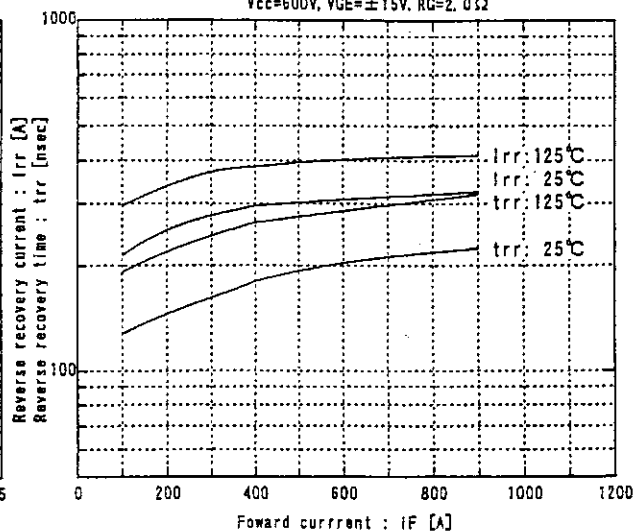
Dynamic input characteristics
 $T_j=25^\circ C$



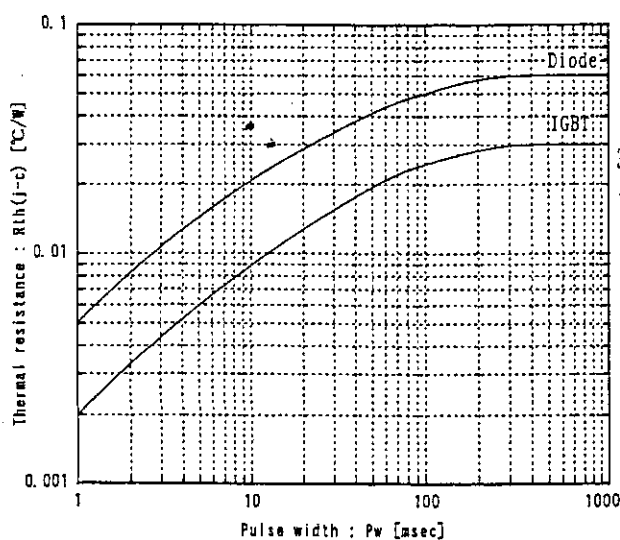
Foward current vs. Foward voltage
 $V_{GE}=0V$



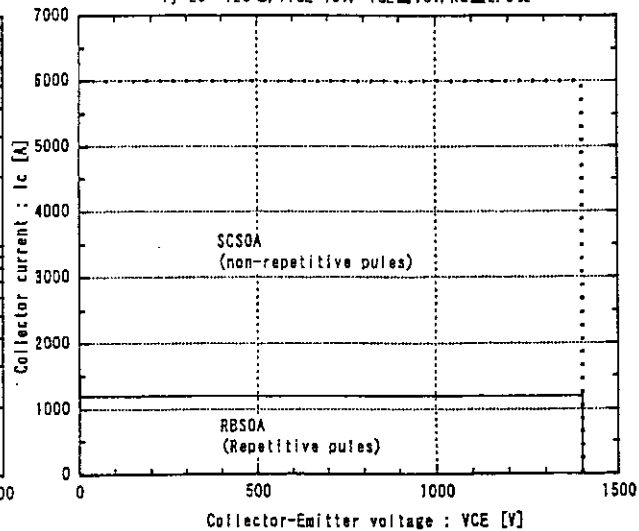
Reverse recovery characteristics (t_{rr} , I_{rr} vs. I_F)
 $V_{cc}=600V$, $V_{GE}=\pm 15V$, $R_G=2.0\Omega$



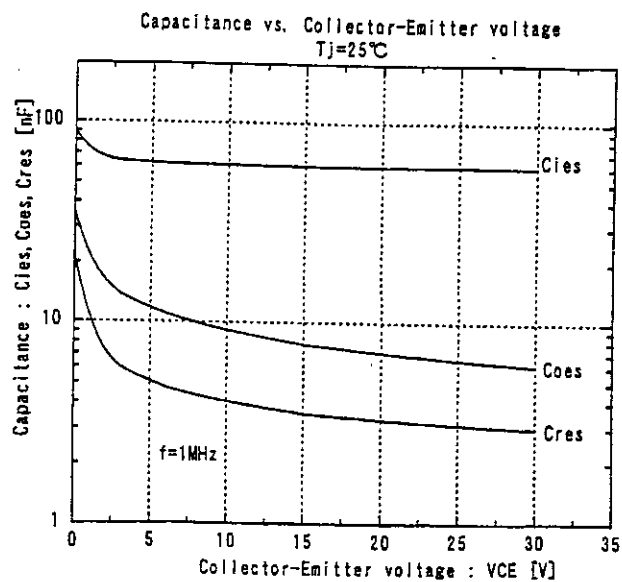
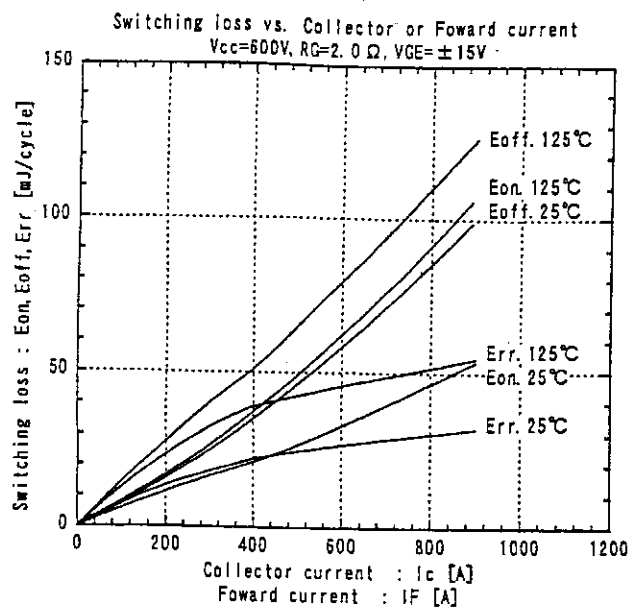
Transient thermal resistance



Reverse biased safty operating area
 $T_j=25\sim 125^\circ C$, $+V_{GE}=15V$, $-V_{GE}\leq 15V$, $R_G\geq 2.0\Omega$



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