

SPECIFICATION

Device Name : IGBT module

Type Name : 2MBI150NT-120-01

Spec. No. : **MS5F3937**

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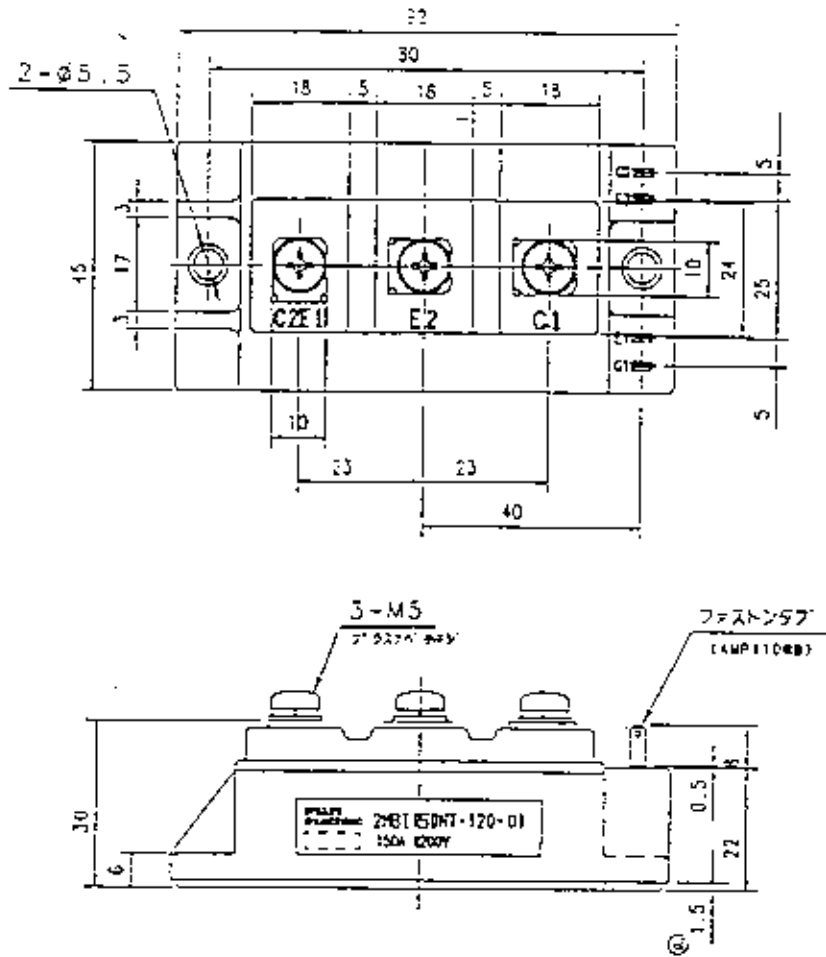
Fuji Electric Co., Ltd.
Matsumoto Factory

	DATE	NAME	APPROVED	Fuji Electric Co., Ltd.	
DRAWN	Feb -21-97	J. Kobayashi	S.K.	DWG. NO.	MS5F3937
CHECKED	Feb -21-97	S. Miyajima			
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2MBI150NT-120-01

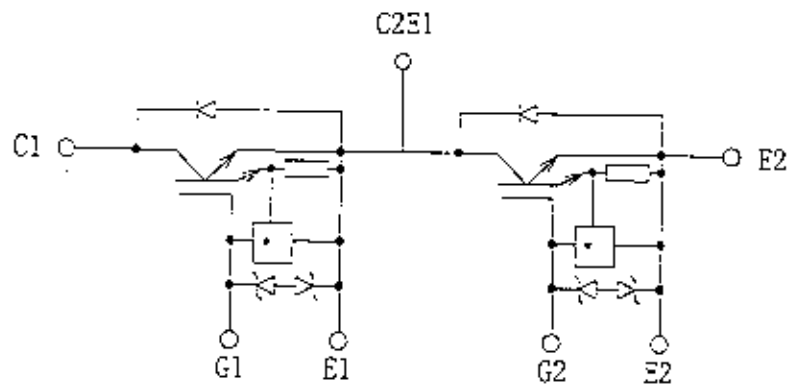
1. Outline Drawing

Unit : mm



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2. Equivalent circuit



* NLU (Over Current Limiting Circuit)

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3. Absolute Maximum Ratings (at $T_c=25^\circ\text{C}$ unless otherwise specified)

Items	Symbols	Ratings	Units	
Collector-Emitter voltage	V_{CES}	1200	V	
Gate-Emitter voltage	V_{GES}	± 20	V	
Collector current	Continuous	I_c	150	A
	1ms	I_c pulse	300	
		$-I_c$	150	
	1ms	$-I_c$ pulse	300	
Max. power dissipation	PC	1210	W	
Operating temperature	T_j	+150	$^\circ\text{C}$	
Storage temperature	T_{stg}	-40~+125	$^\circ\text{C}$	
Isolation voltage	V_{is}	AC 2500 (1min.)	V	
Screw torque	Mounting *1	3.5	N·m	
	Terminals *2	4.5		

Note : *1 Recommendable value : 2.5~3.5 N·m (M5) or (M6)

*2 Recommendable value : 3.5~4.5 N·m (M6)

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

Items	Symbols	Characteristics			Conditions	Units
		min.	typ.	max.		
Zero gate voltage Collector current	I_{CES}			2.0	$V_{GE}=0V, V_{CE}=1200V$	mA
Gate-Emitter leakage current	I_{GES}			30	$V_{CE}=0V, V_{GE}=\pm 20V$	μA
Gate-Emitter threshold voltage	$V_{GE(th)}$	4.5		7.5	$V_{CE}=20V, I_c=150\text{mA}$	V
Collector-Emitter saturation voltage	$V_{CE(sat)}$			3.5	$V_{GE}=15V, I_c=150A$	V
Input capacitance	C_{ies}		27000		$V_{GE}=0V$	μF
Output capacitance	C_{oes}		12500		$V_{CE}=10V$	
Reverse transfer capacitance	C_{res}		10000		$f=1\text{MHz}$	
Turn-on time	t_{on}		0.65	1.2	$V_{cc}=600V$ $I_c=150A$	μs
	t_r		0.25	0.6		
Turn-off time	t_{off}		0.85	1.5	$V_{GE}=\pm 15V$ $R_G=5.6\Omega$	
	t_f		0.35	0.5		
Diode forward on voltage	V_F			3.4	$I_F=150A, V_{GE}=0V$	V
Reverse recovery time	t_{rr}			350	$I_F=150A$	ns
Short-circuit withstand capability	P_w	10			$V_{cc}=800V, V_{GE}=-15V$ $R_G=2.7\Omega$	μs

5. Thermal resistance characteristics

Items	Symbols	Characteristics			Conditions	Units
		min.	typ.	max.		
Thermal resistance	$R_{th(j-c)}$			0.10	IGBT	$^\circ\text{C/W}$
	$R_{th(j-c)}$			0.30	Diode	
	※		0.025		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.

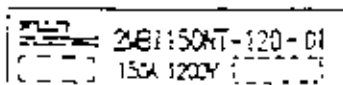
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Lot No.

Place of manufacturing (code)

7. Applicable category (適用範囲)

This specification is applied to IGBT module named 2MBI150NT-120-01.

本納入仕様書は、IGBTモジュール2MBI150NT-120-01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°C and humidity of 45 to 75%.
常温保管が望ましい。(5~35°C、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。

9. Heat sink mounting notes (ヒートシンク取り付け上の注意事項)

- The mounting surface of the heat sink should be finished to a roughness of 10 μ m or less and a warp between screw holes of 100 μ m or less.
本モジュールを取り付ける冷卻体の取付面の仕上げは、粗さ10 μ m以下、取付ネジ間
で平坦度100 μ m以下とする。
- Each mounting screw should be fastened using a specified torque after pre-fastening using a 1/3 specified torque.
取付けネジは、規定の1/3のトルクで仮締を行った後、規定のトルクで本締を行って下さい。
- If the above notes are not met, it has a possibility to break the insulation between the IGBT module's chips and metal base.
上記注意事項の範囲外で御運用した場合、IGBTモジュールのチップと金属ベース間の
絶縁破壊を生ずる可能性があります。

④ 10. Revers gate bias voltage (ゲート逆バイアス電圧)

- ④ • Recommendable value of the revers gate bias voltage : -7V(typ.), -5V(min.) R θ =5.6 Ω
ゲート逆バイアス電圧の推奨値 : -7V(typ.), -5V(min.) R θ =5.6 Ω
- ④ • The revers gate bias voltage means the voltage between the gate terminal and the auxiliary emitter terminal of the modules.
ゲート逆バイアス電圧は、モジュールのゲート端子と補助エミッタ端子間の電圧である。

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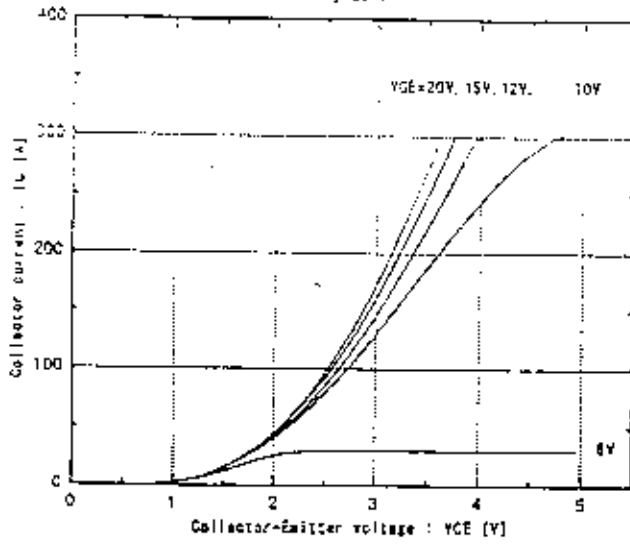
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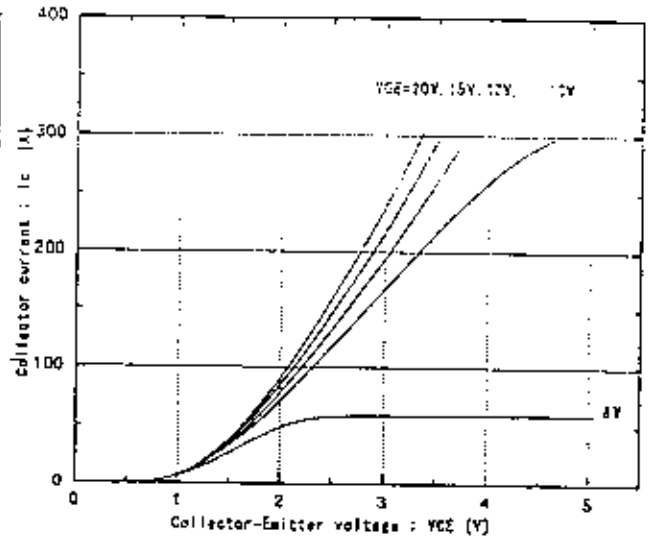
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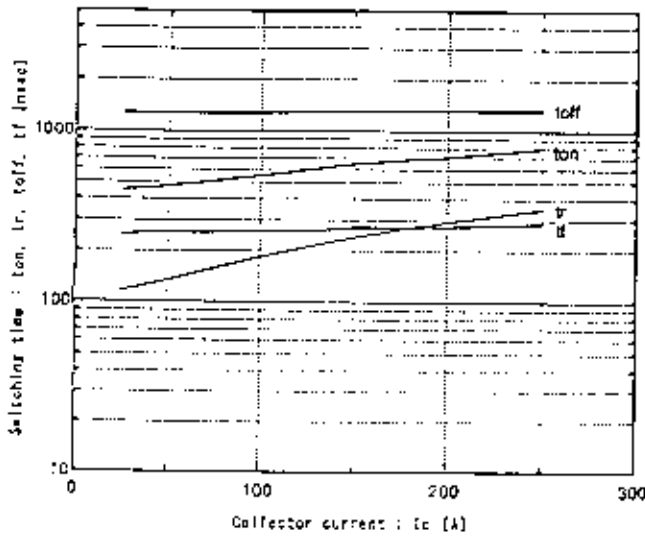
Collector current vs. Collector-Emitter voltage
Tj=25°C



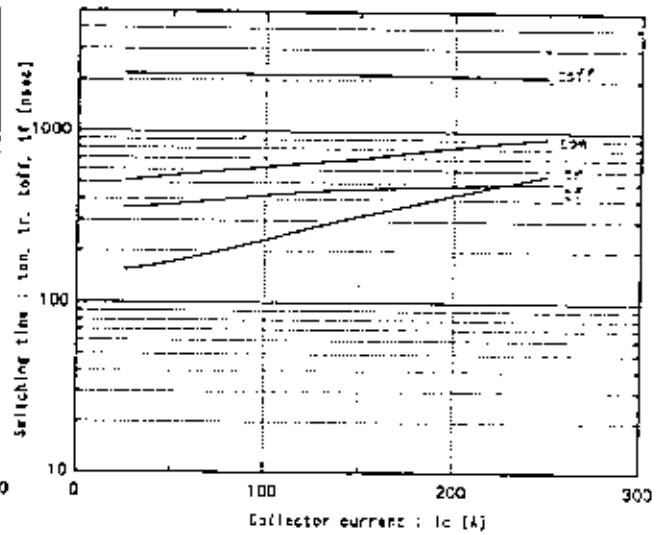
Collector current vs. Collector-Emitter voltage
Tj=135°C



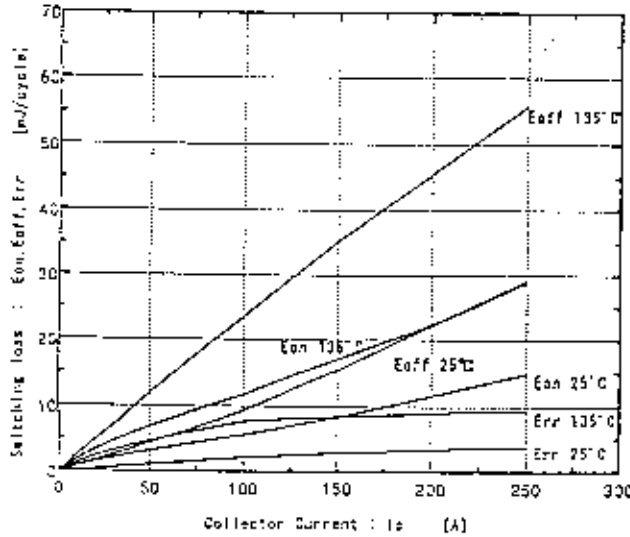
Switching time vs. Collector current
Vcc=700V, Rθ=5.6Ω, VGE=15V/-5V, Tj=25°C



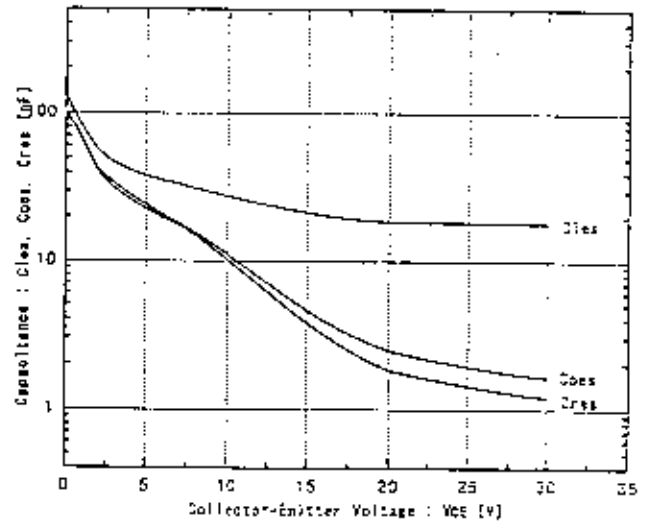
Switching time vs. Collector current
Vcc=700V, Rθ=5.6Ω, VGE=15V/-5V, Tj=135°C



Switching loss vs. Collector current
Vcc=700V, Rθ=5.6Ω, VGE=15V/-5V



Capacitance vs. Collector-Emitter voltage
Tj=25°C



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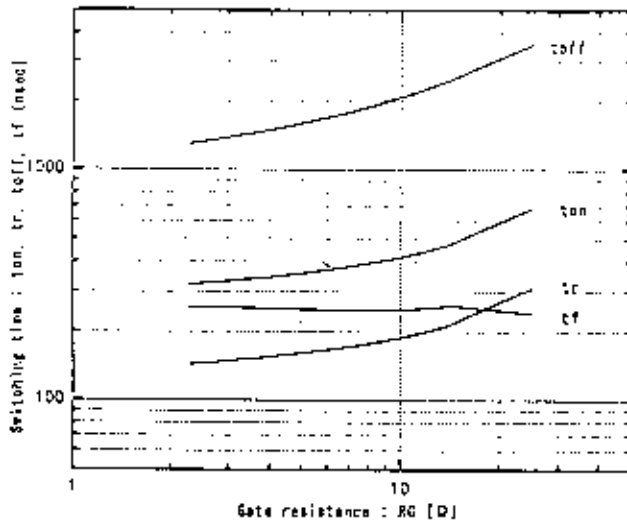
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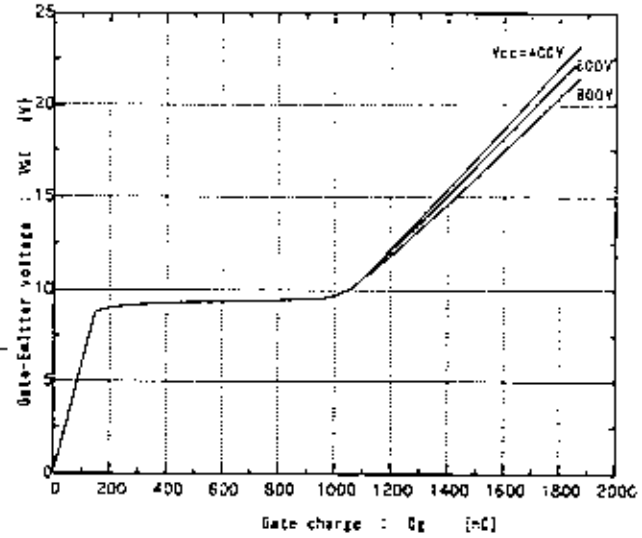
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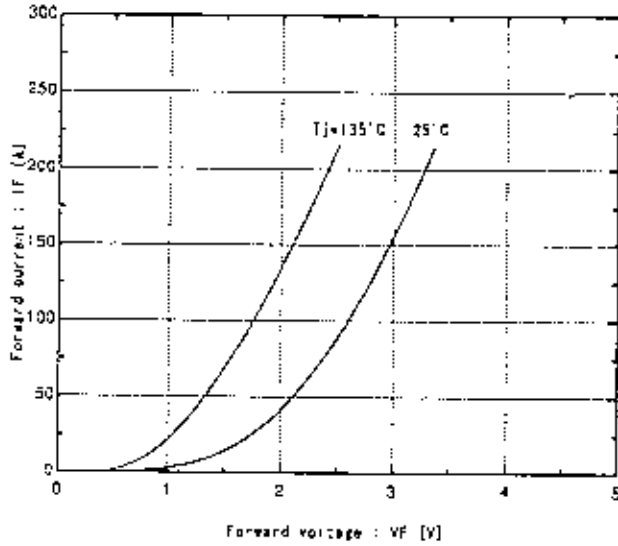
Switching time vs. R_G
 $V_{CC}=700V$, $I_C=150A$, $V_{GE}=+15V/-5V$, $T_J=25^\circ C$



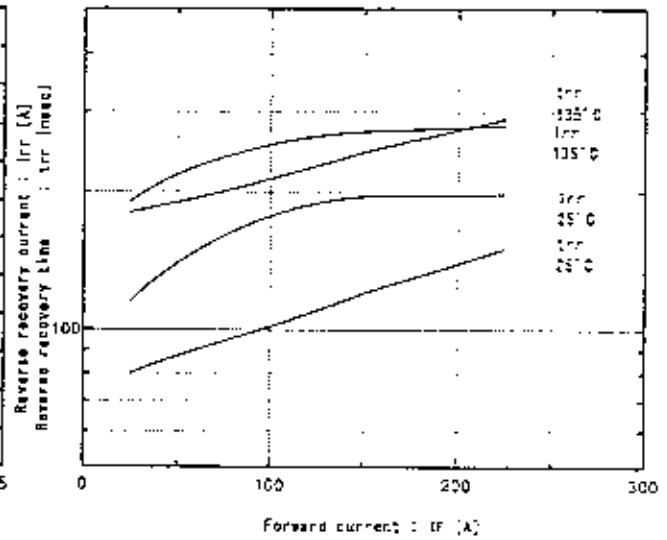
Dynamic input characteristics
 $T_J=25^\circ C$



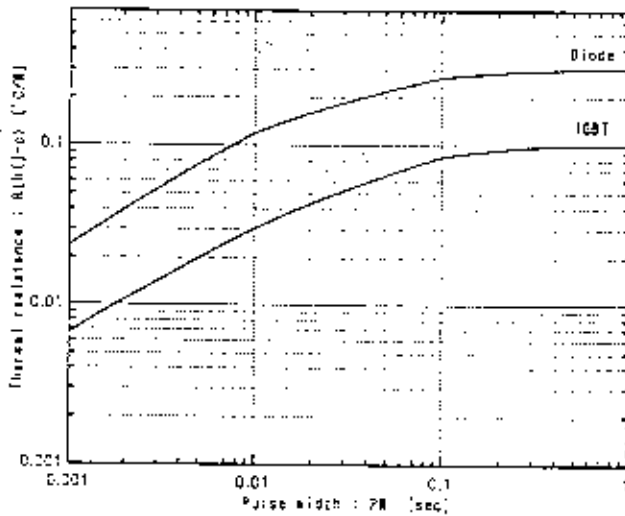
Forward current vs. Forward voltage
 $V_{GE}=0V$



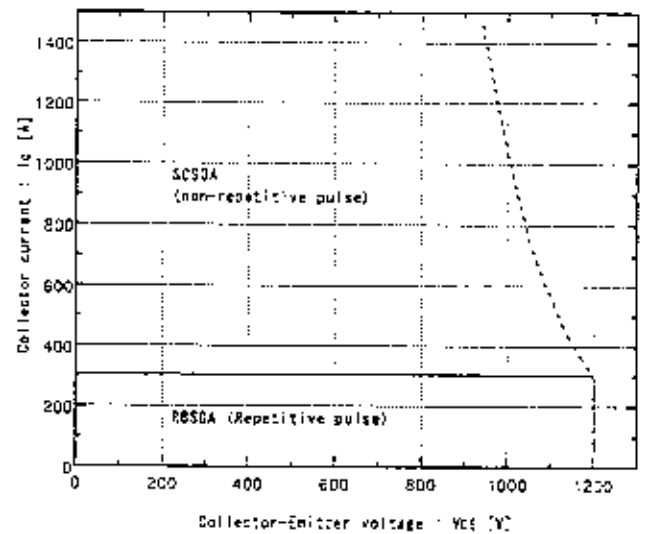
Reverse recovery characteristics
 t_{rr} , I_{rr} vs. I_F



Transient thermal resistance



Reversed biased safe operating area
 $-V_{GE}=-15V$, $-V_{CE} \leq 15V$, $T_J \leq 135^\circ C$



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