

Messrs. Rockwell Automation

SPECIFICATION

Device Name : IGBT Module

Type Name : 1MBI600PX-140-03

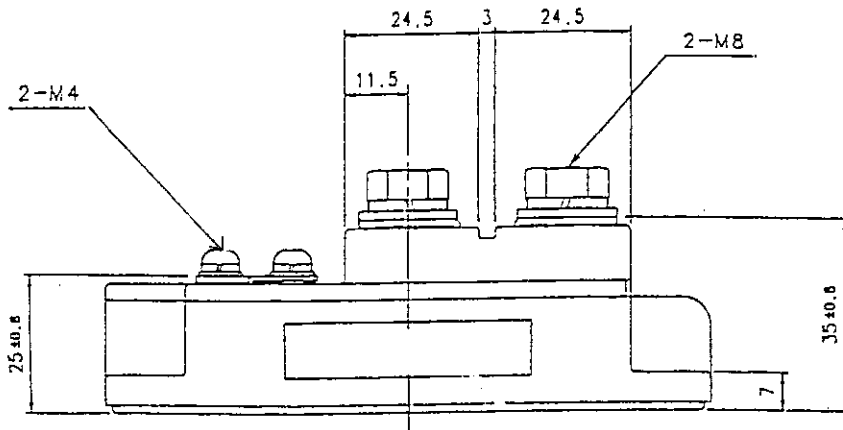
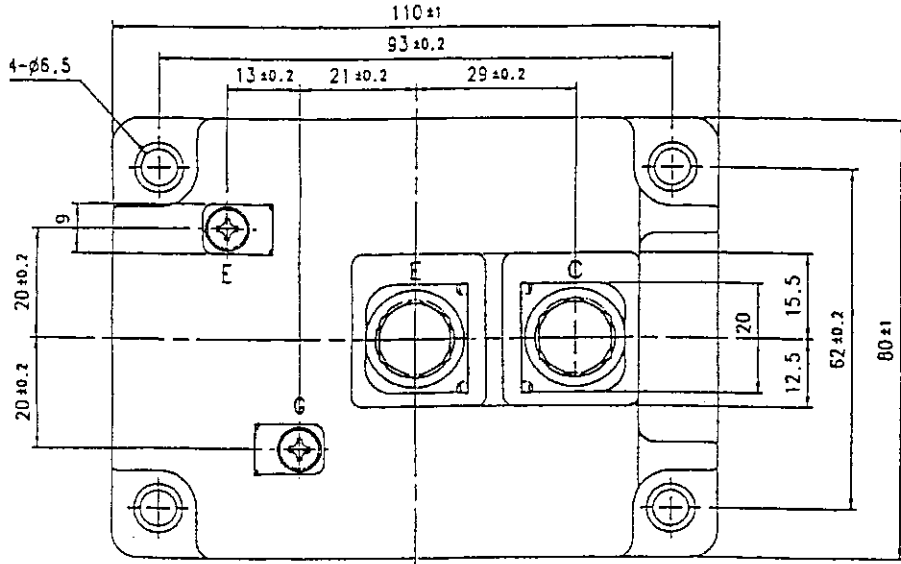
Spec. No. : **MS5F4851**

This material and the information herein is the property of Fuji Electric Co., Ltd. They shall be neither reproduced, copied, lent, or disclosed in any way whatsoever for the use of any third party nor used for the manufacturing purposes without the express written consent of Fuji Electric Co., Ltd.

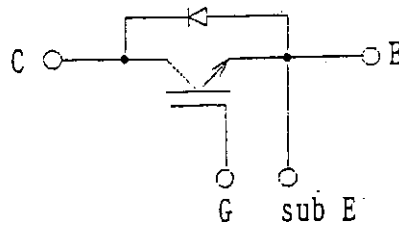
Fuji Electric Co., Ltd.
Matsumoto Factory

	DATE	NAME	APPROVED	Fuji Electric Co., Ltd.	
DRAWN	May-31-'00	S. Yoshiwara	<i>T. Miyasaka</i>	DWG. NO.	MS5F4851
CHECKED	May-31-'00	S. Miyata			

1. Outline Drawing
Unit : mm



2. Equivalent circuit



This information and the information elements are property of Fuji Electric Co. Ltd. They shall be neither reproduced, copied, lent, or disclosed in any way whatsoever for the use of any third party nor used for the manufacturing purposes without the express written consent of Fuji Electric Co., Ltd.

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	Tc=25°C	I _c	800	A
		Tc=80°C		600	
	1ms	Tc=25°C	I _c pulse	1600	
		Tc=80°C		1200	
			-I _c	600	
1ms		-I _c pulse	1200		
Max. power dissipation		P _C	4100	W	
Operating temperature		T _j	+150	°C	
Storage temperature		T _{stg}	-40~+125	°C	
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 _{GES}			±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	t _{on}		750	1200	V _{cc} =600V I _c =600A	ns
	t _r		200	600		
Turn-off time	t _{off}		650	1000	V _{GE} =±15V R _G =2.0Ω	
	t _f		100	300		
Diode forward on voltage	V _F			3.4	I _F =600A, V _{GE} =0V	V
Reverse recovery time	t _{rr}			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	
	* R _{th(c-f)}		0.0063		the base to cooling fin	

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

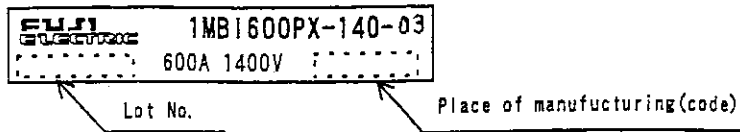
Fuji Electric Co., Ltd

DWG.NO.

MS5F4851

4/8

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 IMBI600PX-140-03
本納入仕様書は、IGBTモジュール 1MBI600PX-140-03 に適用する。

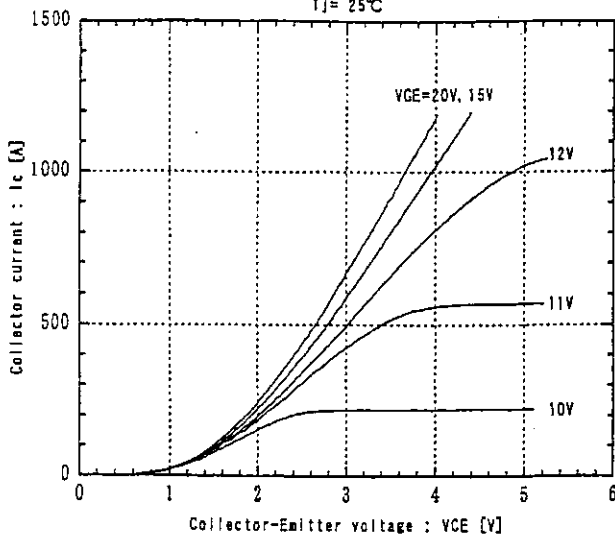
8. Storage and transportation notes (保管、運搬上の注意事項)

- The IGBT module should be stored at a standard temperature of 5 to 35°C and humidity of 45 to 75%.
常温保存が望ましい。(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。

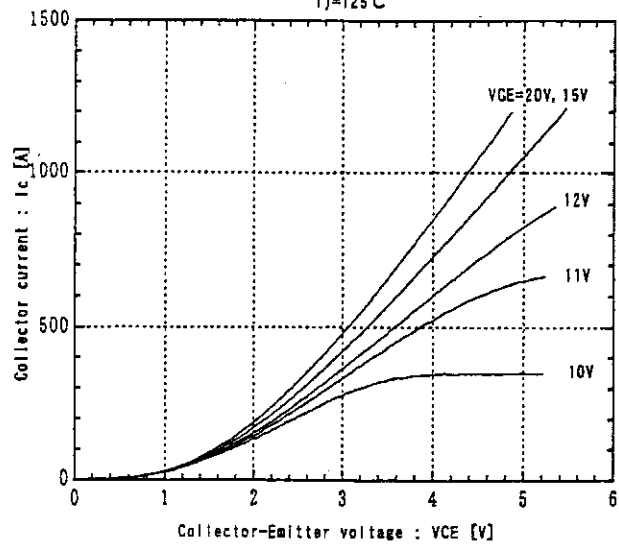
This material and the information herein is the property of Fuji Electric Co., Ltd. They shall be neither reproduced, copied, lent, or disclosed in any way whatsoever for the use of any third party nor used for the manufacturing purposes without the express written consent of Fuji Electric Co., Ltd.

This material and the information herein is the property of Fuji Electric Co., Ltd. They shall be neither reproduced, copied, lent, or disclosed in any way whatsoever for the use of any third party nor used for the manufacturing purposes without the express written consent of Fuji Electric Co., Ltd.

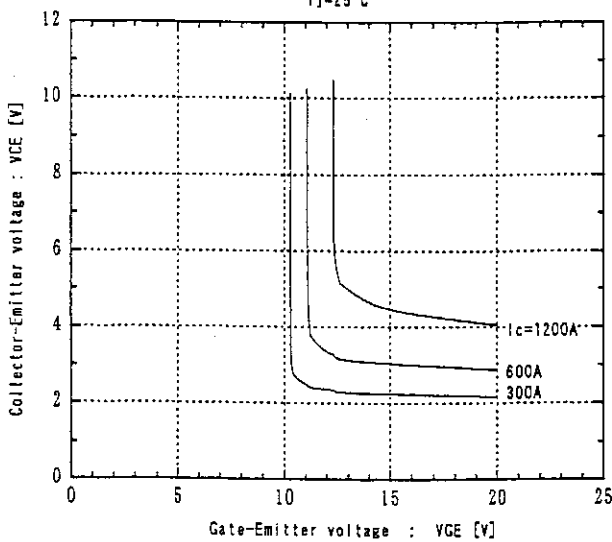
Collector current vs. Collector-Emittor voltage
T_J=25°C



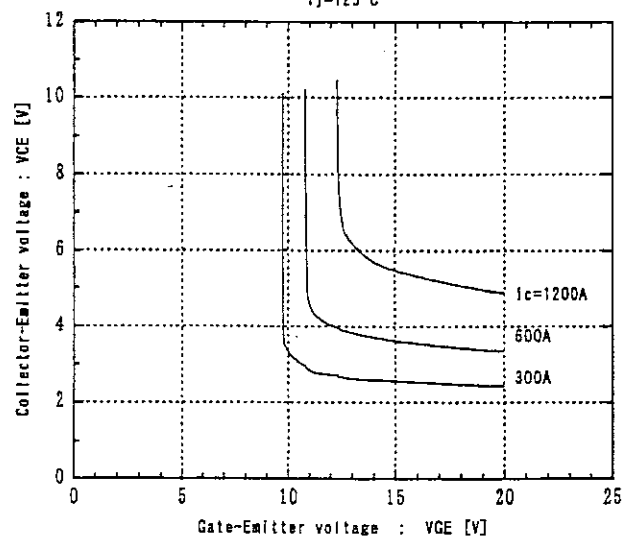
Collector current vs. Collector-Emittor voltage
T_J=125°C



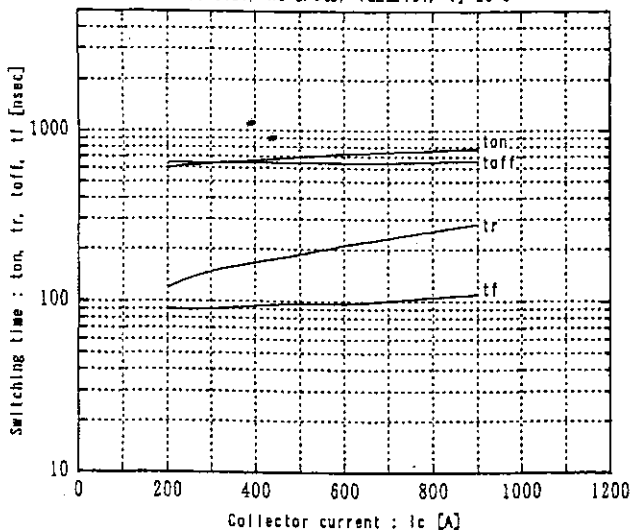
Gate-Emittor voltage vs. Collector-Emittor voltage
T_J=25°C



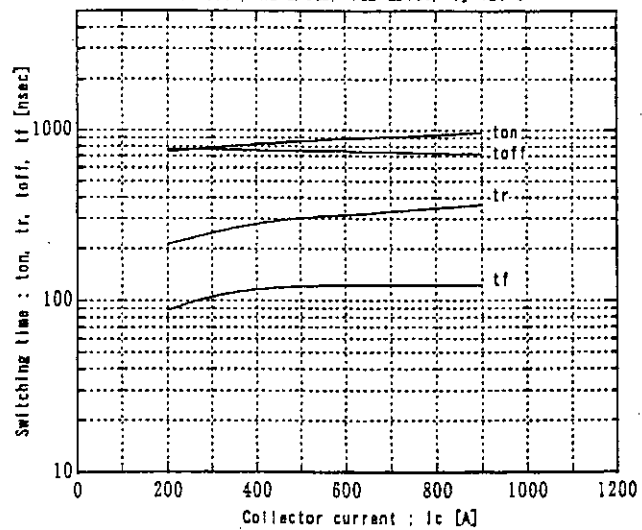
Gate-Emittor voltage vs. Collector-Emittor voltage
T_J=125°C



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

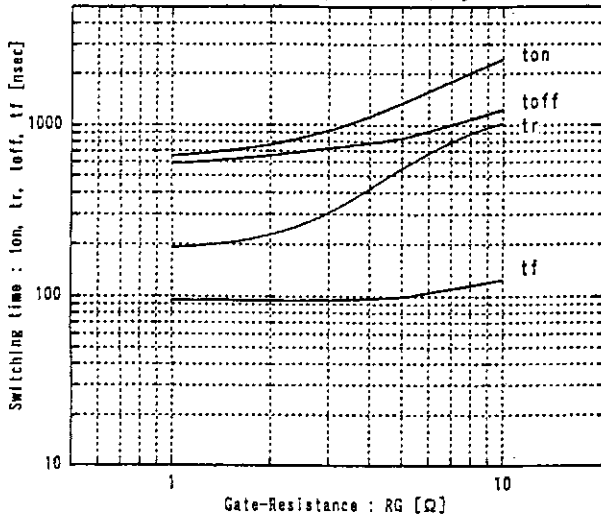


Switching time vs. Collector current
V_{CC}=600V, R_G=2.0Ω, V_{GE}±15V, T_J=125°C

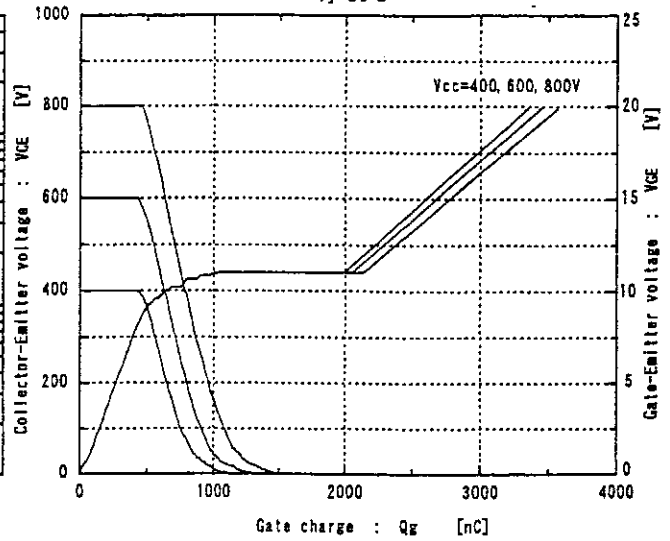


This material and the information herein is the property of Fuji Electric Co., Ltd. They shall be neither reproduced, copied, lent, or disclosed in any way whatsoever for the use of any third party nor used for the manufacturing purposes without the express written consent of Fuji Electric Co., Ltd.

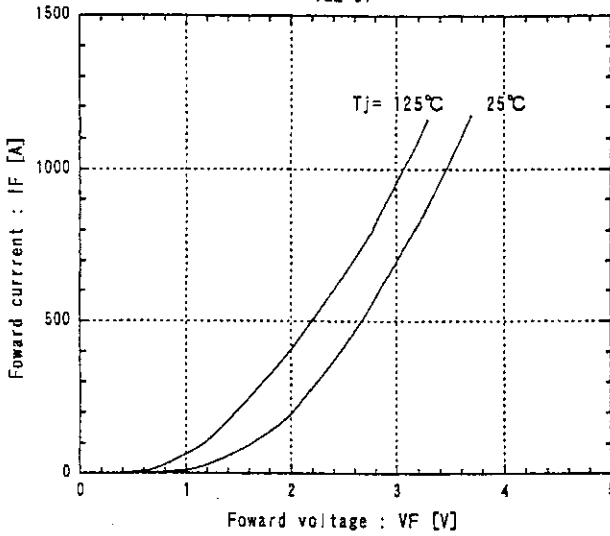
Switching time vs. Gate-Resistance
 $V_{cc}=600V, I_c=600A, V_{GE} \pm 15V, T_j=25^\circ C$



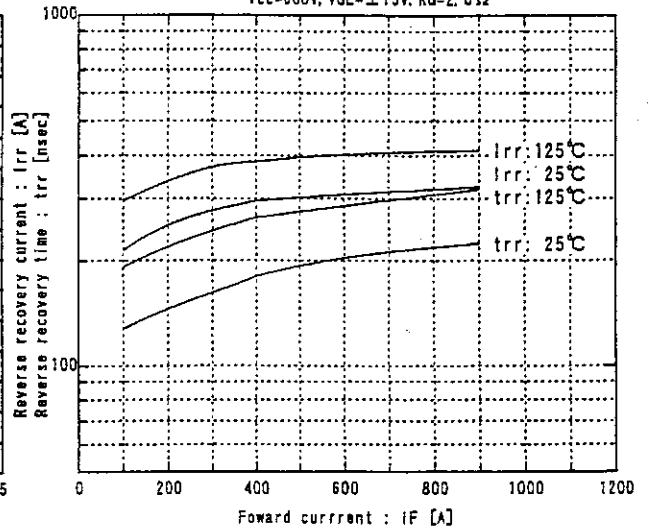
Dynamic input characteristics
 $T_j=25^\circ C$



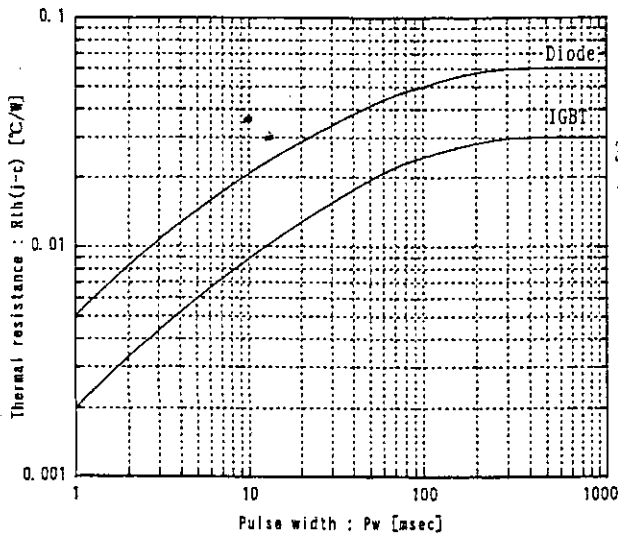
Foward current vs. Foward voltage
 $V_{GE}=0V$



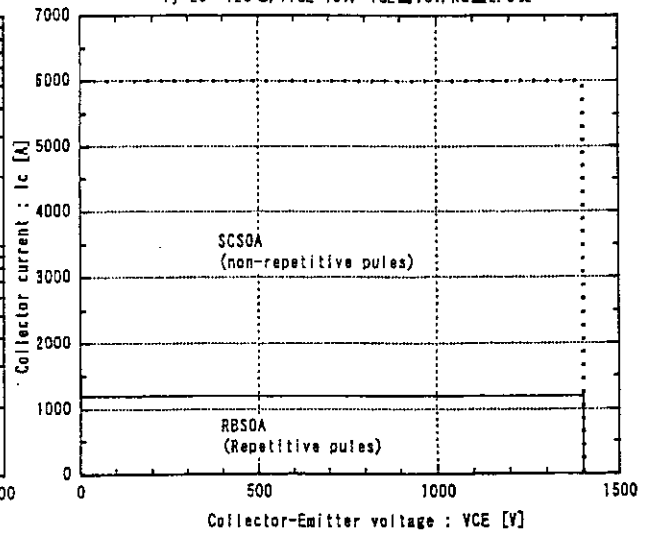
Reverse recovery characteristics (t_{rr}, I_{rr} vs. I_F)
 $V_{cc}=600V, V_{GE}=\pm 15V, R_G=2.0\Omega$



Transient thermal resistance



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



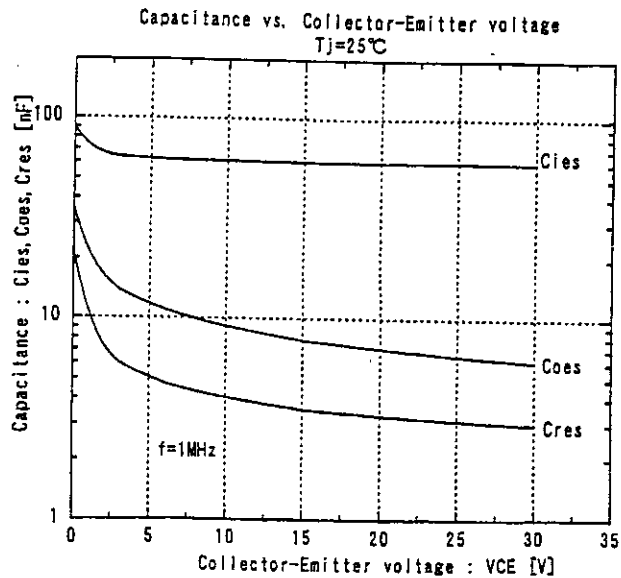
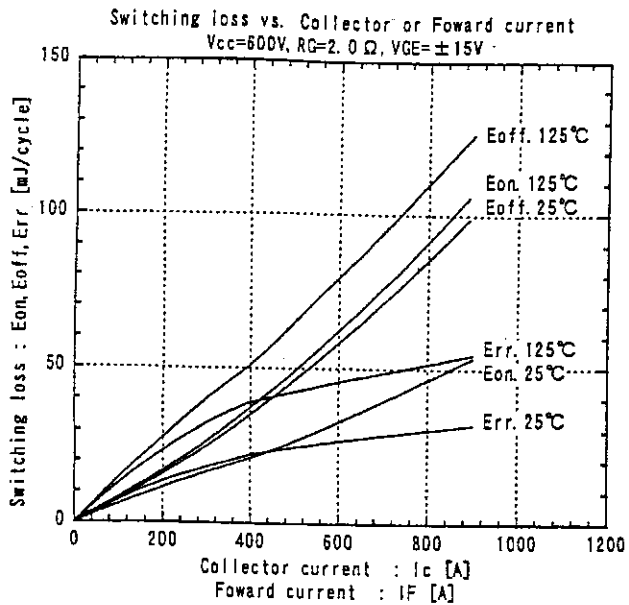
Fuji Electric Co., Ltd

DWG.NO.

MS5F4851

7/8

This material and the information herein is the property of Fuji Electric Co. Ltd. They shall be neither reproduced, copied, lent, or disclosed in any way whatsoever for the use of any third party, nor used for the manufacturing purposes without the express written consent of Fuji Electric Co., Ltd.



Fuji Electric Co., Ltd.

DWG. NO.

MS5F4851

8/8

H04-004-03