

SPECIFICATION

Device Name : IGBT MODULE

Type Name : 1MBI600S-120

Spec. No. : MS5F 5055

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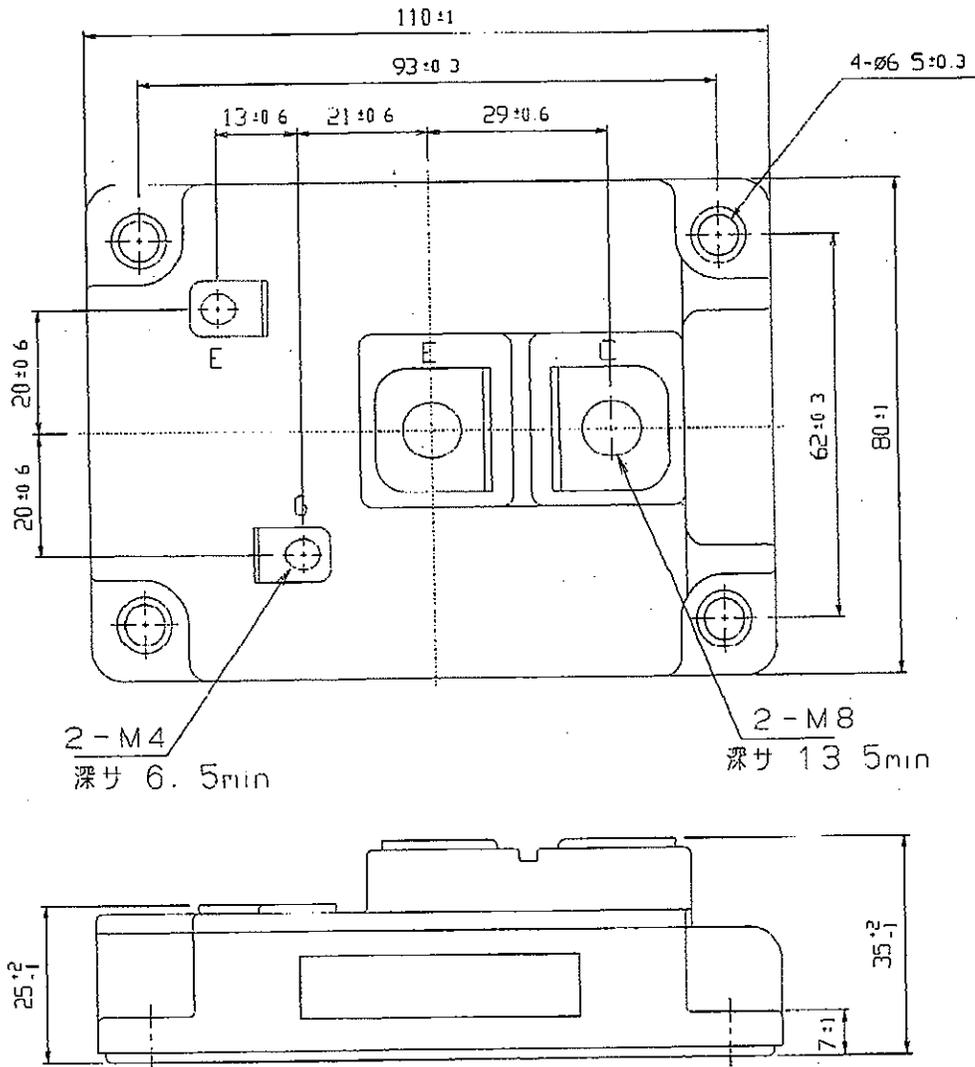
Fuji Electric Co., Ltd.
Matsumoto Factory

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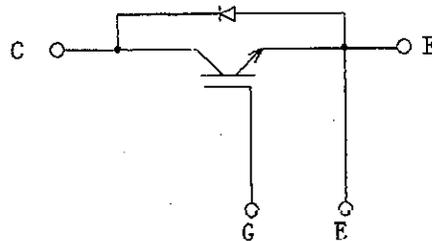
1MBI600S-120

1. Outline Drawing (Unit : mm)



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2. Equivalent circuit



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MS5F 5055

3 / 8

H04-004-03

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

Items	Symbols	Conditions		Maximum Ratings		Units
Collector-Emitter voltage	V _{CE} S			1200		V
Gate-Emitter voltage	V _{GE} S			±20		V
Collector current	I _c	Continuous	T _c =25C	900	A	
			T _c =80C	600		
	I _c pulse	1ms	T _c =25C	1800		
			T _c =80C	1200		
	-I _c			600		
	-I _c pulse	1ms		1200		
Collector Power Dissipation	P _C	1 device		4150	W	
Junction temperature	T _J			150	C	
Storage temperature	T _{stg}			-40~ +125	C	
Isolation voltage ^(*)	V _{iso}	AC : 1min.		2500	V	
Screw Torque	Mounting ^(*)			4.5	N·m.	
	Terminals ^(*)			11.0		
	Terminals ^(*)			1.7		

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

(*2) Recommendable Value : Mounting 4.0+0.5N·m (M6)

Terminal 10.0+1.0Nm (M8), 1.5+0.2Nm (M4)

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

Items	Symbols	Conditions		Characteristics			Units
				min.	typ.	Max.	
Zero gate voltage Collector current	I _{CE} S	V _{GE} = 0 V,	V _{CE} = 1200 V	-	-	2.0	mA
Gate-Emitter leakage current	I _{GES}	V _{CE} = 0 V,	V _{GE} = ±20 V	-	-	1.6	µA
Gate-Emitter threshold voltage	V _{GE(th)}	V _{CE} = 20 V,	I _c = 600 mA	5.5	7.2	8.5	V
Collector-Emitter saturation voltage	V _{CE(sat)}	V _{GE} = 15 V	T _J = 25 C	-	2.3	2.6	V
		I _c = 600 A	T _J = 125 C	-	2.8	-	
Input capacitance	C _{ies}	V _{GE} = 0 V		-	72000	-	pF
Output capacitance	C _{oes}	V _{CE} = 10 V		-	15000	-	
Reverse transfer capacitance	C _{res}	f = 1 MHz		-	13200	-	
Turn-on time	t _{on}	V _{cc} = 600 V		-	0.8	1.2	µs
	t _r	I _c = 600 A		-	0.25	0.6	
	t _{r(0)}	V _{GE} = ±15 V		-	0.1	-	
Turn-off time	t _{off}	R _G = 1.5 Ω		-	0.7	1.0	µs
	t _f			-	0.1	0.3	
Forward on voltage	V _F	I _F = 600 A	T _J = 25 C	-	2.8	3.4	V
			T _J = 125 C	-	2.4	-	
Reverse recovery time	t _{rr}	I _F = 600 A		-	-	0.35	µs

5. Thermal resistance characteristics

Items	Symbols	Conditions		Characteristics			Units
				min.	typ.	Max.	
Thermal resistance (1 device)	R _{th(j-c)}	IGBT		-	-	0.03	C/W
		FWD		-	-	0.06	
Contact Thermal resistance	R _{th(c-f)}	with Thermal Compound (*)		-	0.0063	-	

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

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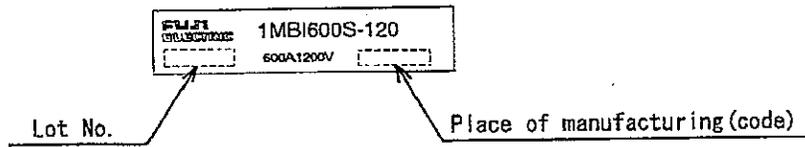
MS5F 5055

4 / 8

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6. Indication on module



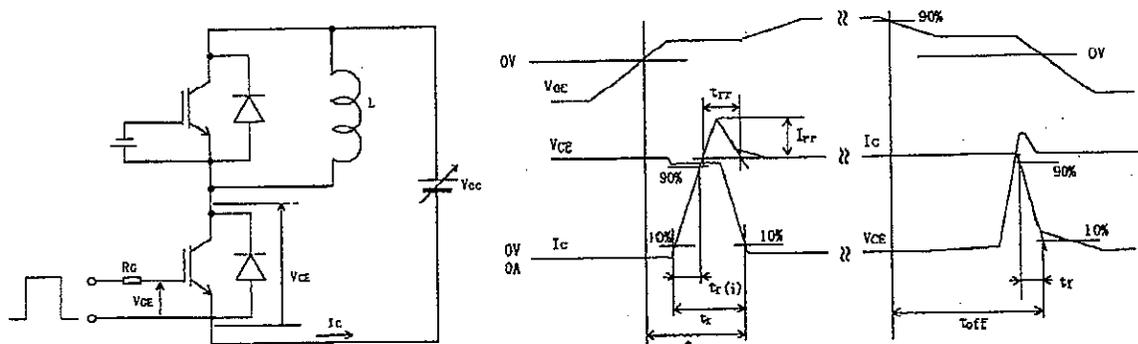
7. Applicable category

This specification is applied to IGBT Module named 1MBI600S-120.

8. Storage and transportation notes

- The module should be stored at a standard temperature of 5 to 35C and humidity of 45 to 75% .
- Store modules in a place with few temperature changes in order to avoid condensation on the module surface.
- Avoid exposure to corrosive gases and dust.
- Avoid excessive external force on the module.
- Store modules with unprocessed terminals.
- Do not drop or otherwise shock the modules when transporting.
- Please connect adequate fuse or protector of circuit between three-phase line and this product to prevent the equipment from causing secondary destruction.

9. Definitions of switching time



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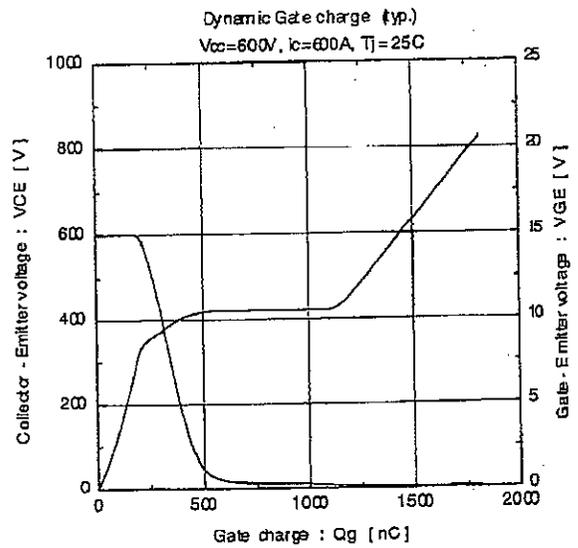
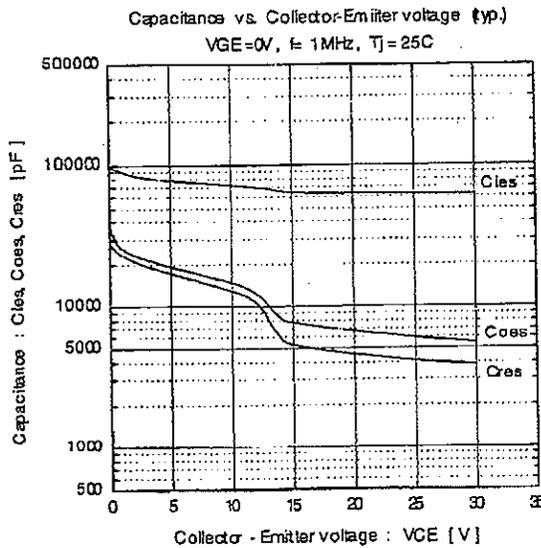
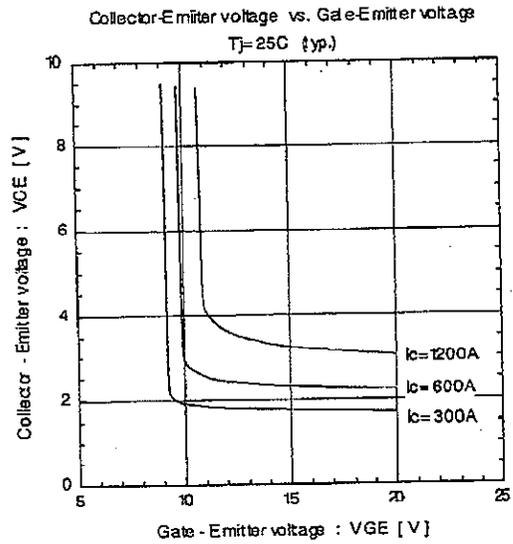
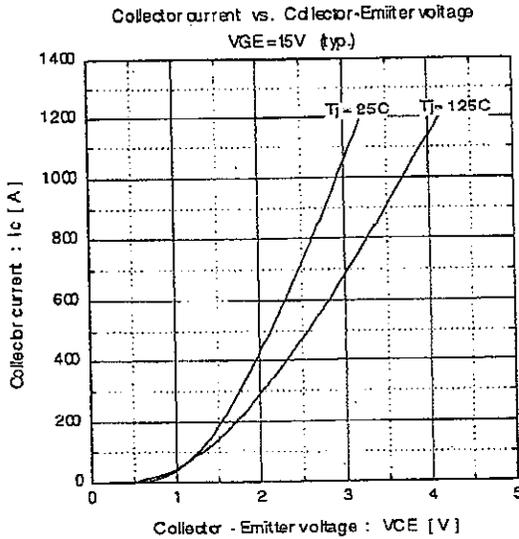
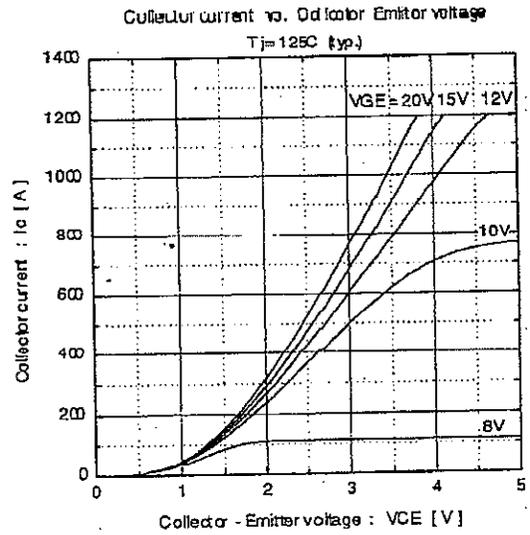
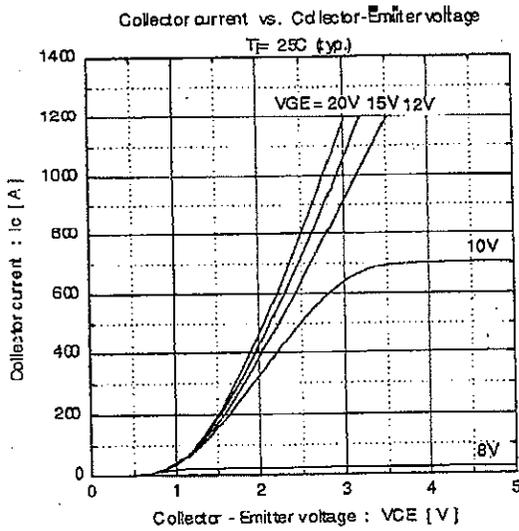
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MS5F 5055

5 / 8

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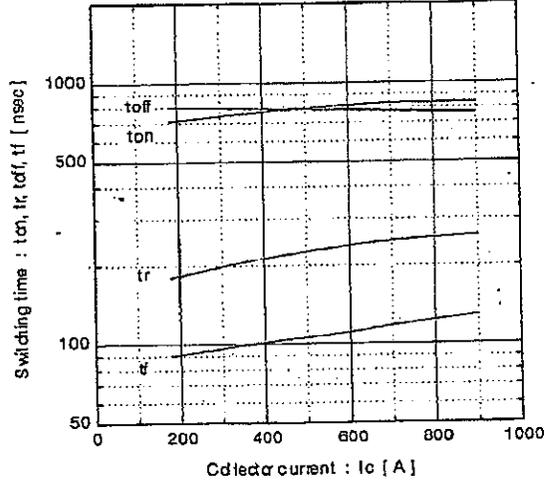
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6/8

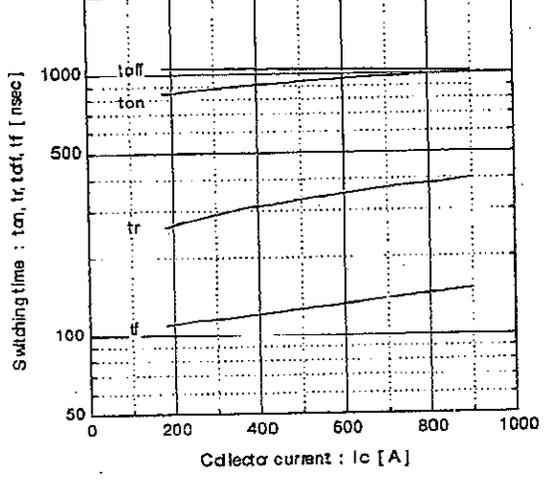
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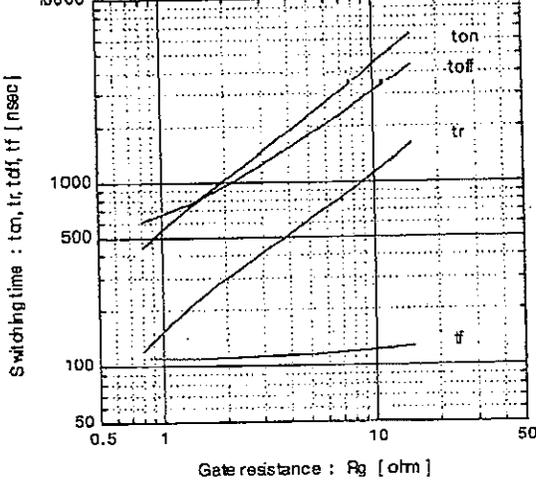
Switching time vs. Collector current (typ)
 $V_{CC}=600V, V_{GE}=\pm 15V, R_g=1.5\Omega, T_J=25C$



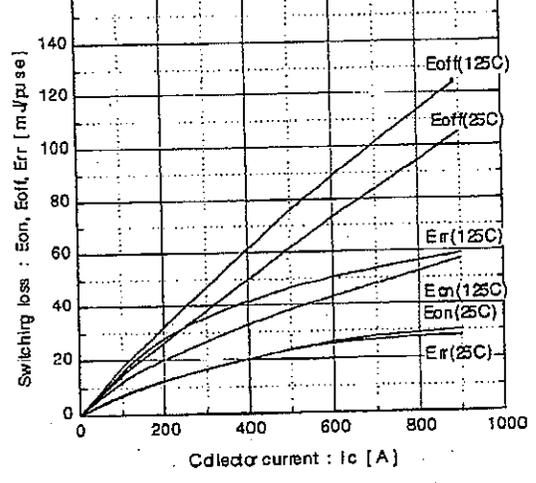
Switching time vs. Collector current (typ)
 $V_{CC}=600V, V_{GE}=\pm 15V, R_g=1.5\Omega, T_J=125C$



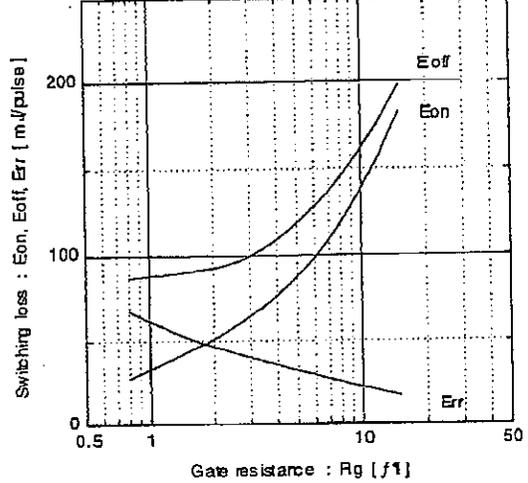
Switching time vs. Gate resistance (typ)
 $V_{CC}=600V, I_c=600A, V_{GE}=\pm 15V, T_J=25C$



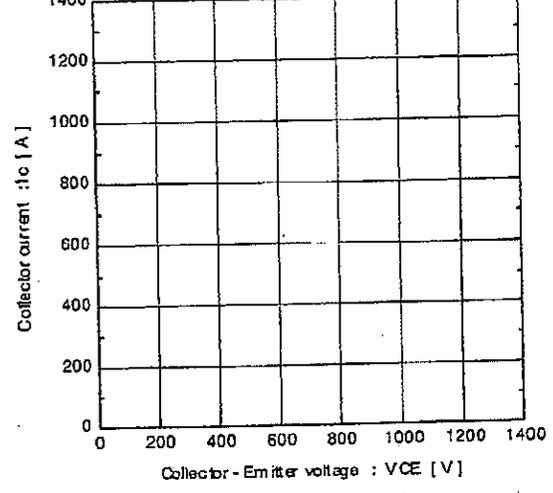
Switching loss vs. Collector current (typ)
 $V_{CC}=600V, V_{GE}=\pm 15V, R_g=1.5\Omega$



Switching loss vs. Gate resistance (typ)
 $V_{CC}=600V, I_c=600A, V_{GE}=\pm 15V, T_J=125C$



Reverse bias safe operating area
 $+V_{GE}=15V, -V_{GE}\le 15V, R_g\ge 1.5\Omega, T_J\le 125C$



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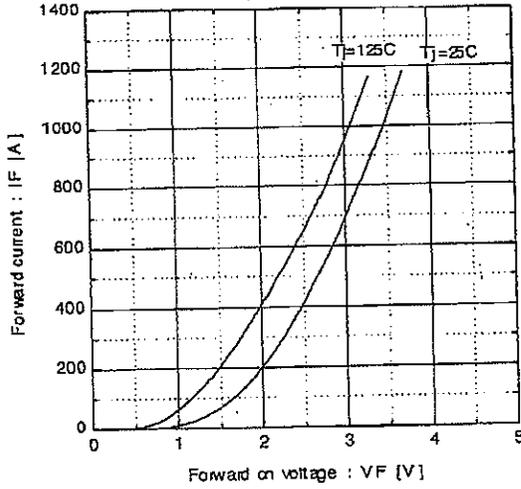
DWG. NO. MS5F 5055

7/8

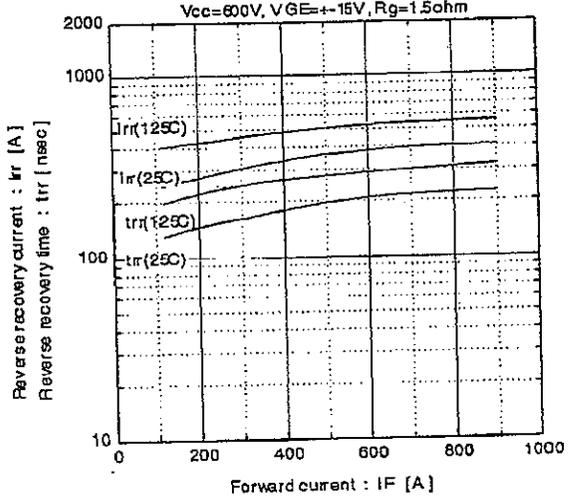
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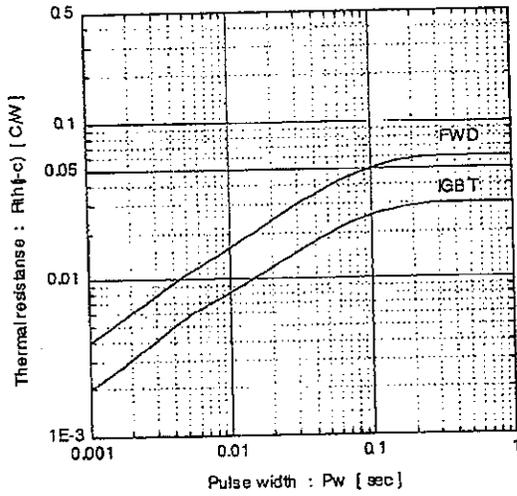
Forward current vs. Forward on voltage (typ.)



Reverse recovery characteristics (typ.)



Transient thermal resistance



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8/8

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