

FEG) Thomas Sam.

SPECIFICATION

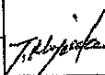
Device Name : IGBT MODULE

Type Name : 1MBI600S-120

Spec. No. : MS5F 5055

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Matsumoto Factory

	DATE	NAME	APPROVED	Fuji Electric Co., Ltd.		
DRAWN	Aug -30 -01	J. Kobayashi		DWG. NO.	MS5F 5055	1 / 8
CHECKED	Aug -30 -01	N. Kato				

H04-004-07

Revised Records

Date	Classification	Ind.	Content	Applied date	Drawn	Checked	Approved
Aug.-30-61	enactment	—	—	Issued date	—	S. Matsuda	T. Miyazaki

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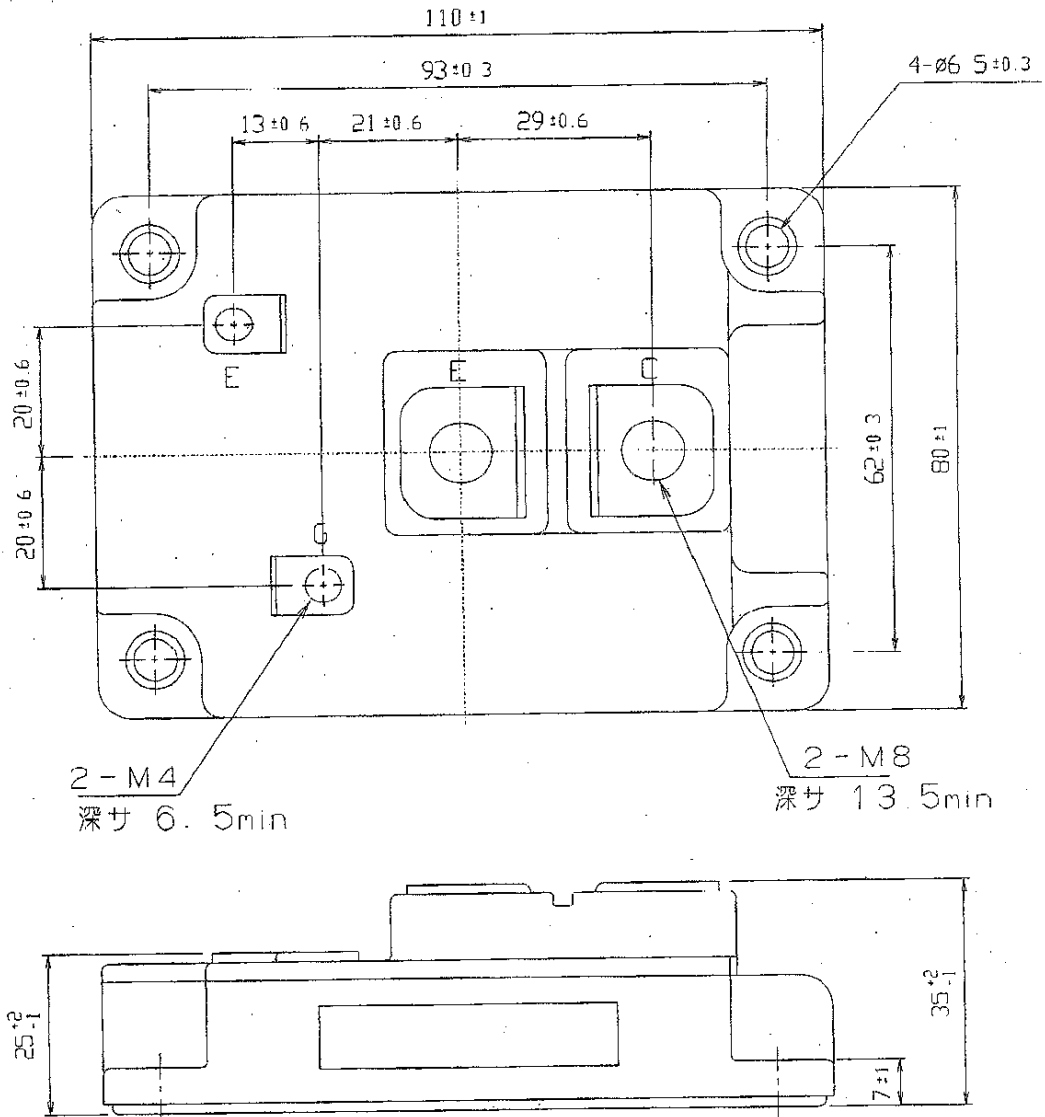
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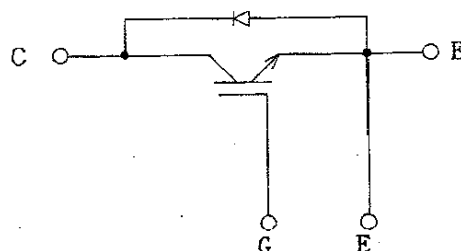
1MBI600S-120

1. Outline Drawing (Unit : mm)



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2. Equivalent circuit



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

Items	Symbols	Conditions	Maximum Ratings		Units
Collector-Emitter voltage	V _{GES}		1200		V
Gate-Emitter voltage	V _{GES}		±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		

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

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

Terminal 10.0±1.0N·m (M8), 1.5±0.2N·m (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 _{GES}	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 I _c = 600 A	T _J = 25 C	-	2.8	2.6	V
			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 I _c = 600 A	-	0.8	1.2	µs	
	t _r	V _{GE} = ±15 V	-	0.25	0.6		
	t _{r(0)}	R _G = 1.5 Ω	-	0.1	-		
Turn-off time	t _{off}		-	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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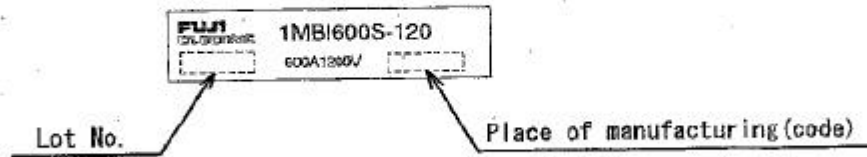
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6. Indication on module



7. Applicable category

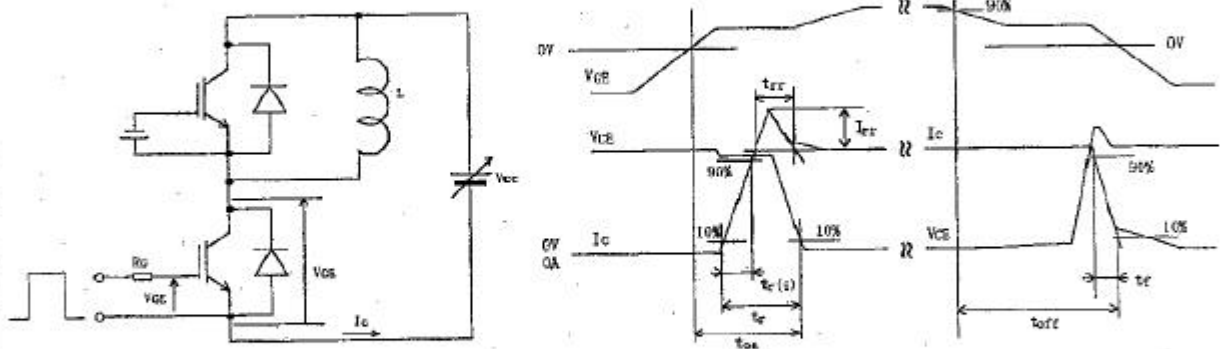
This specification is applied to IGBT Module named 1MBI600S-120.

8. Storage and transportation notes

- The module should be stored at a standard temperature of 5 to 35°C 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.

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9. Definitions of switching time



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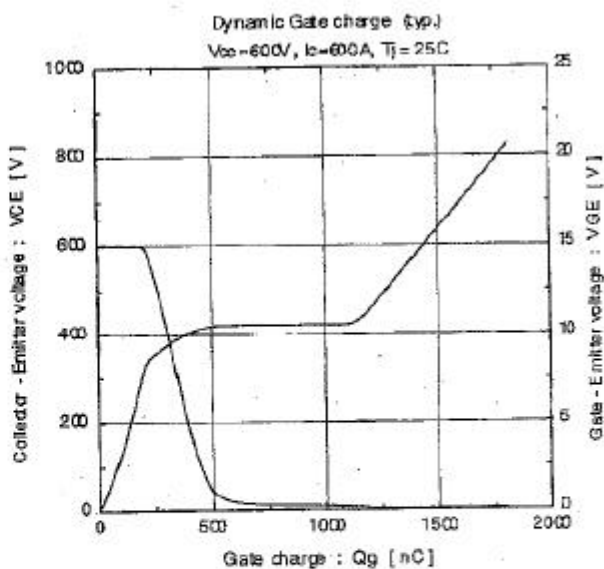
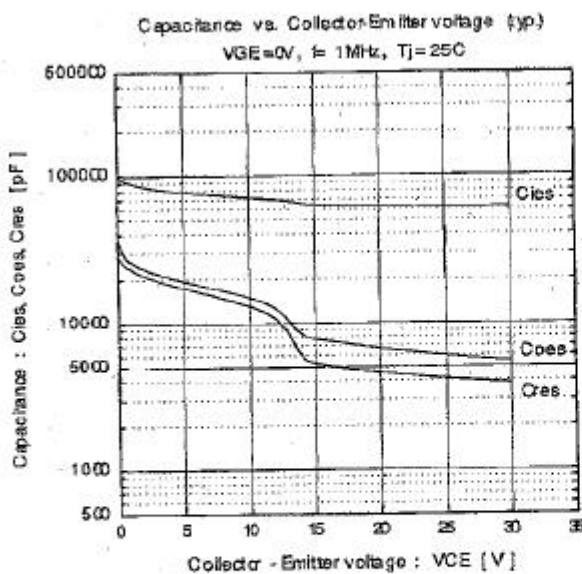
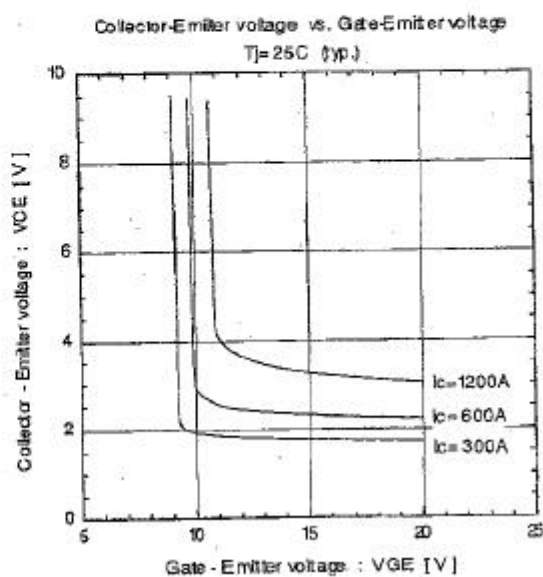
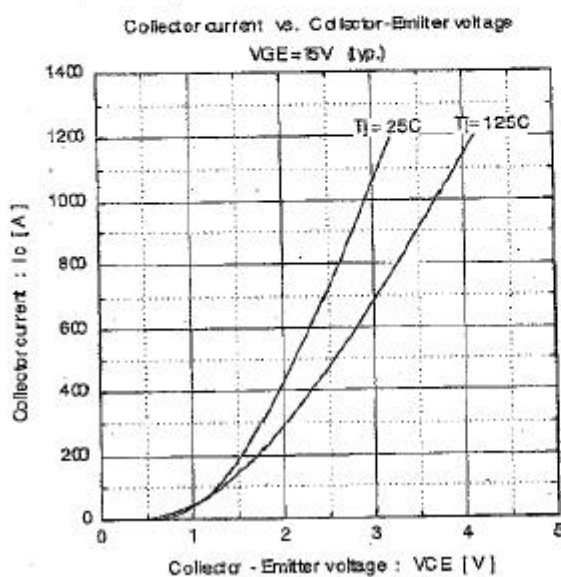
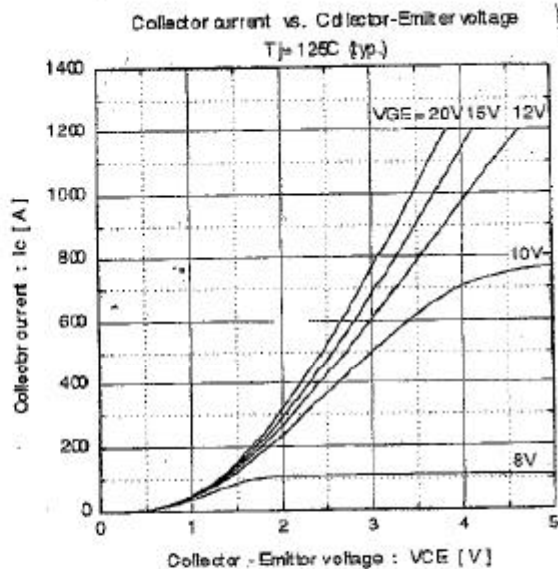
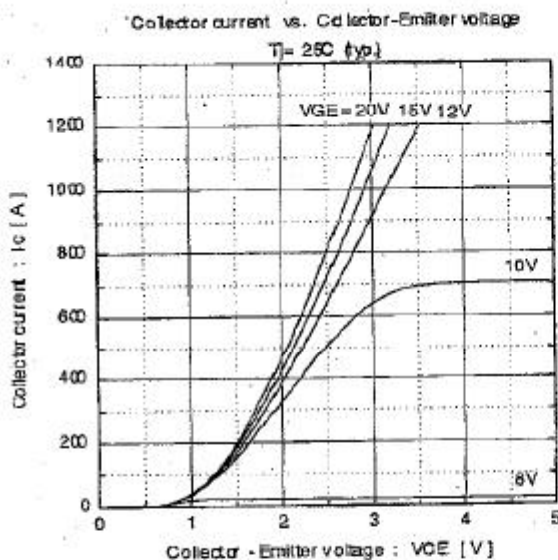
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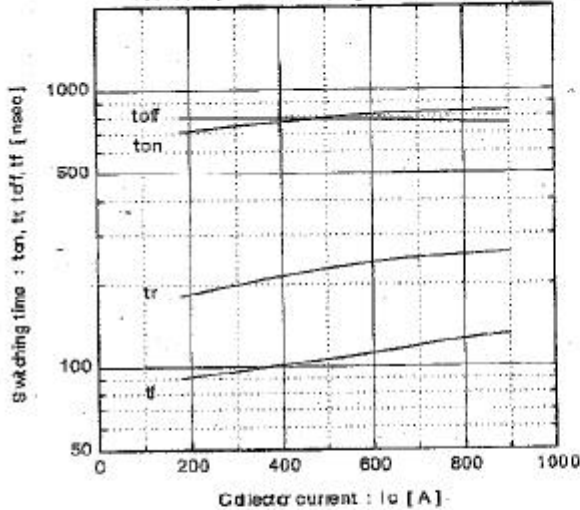
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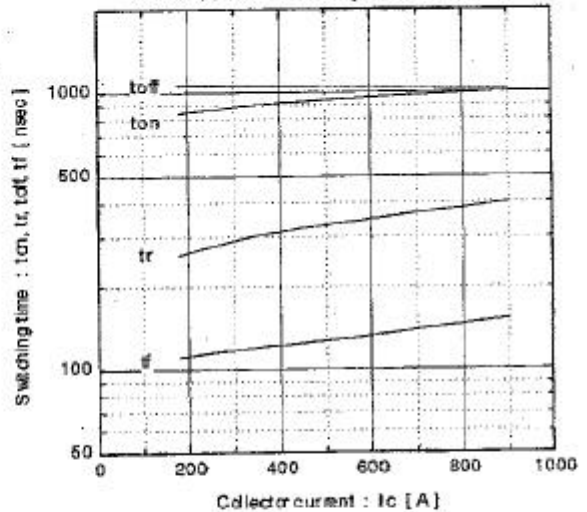
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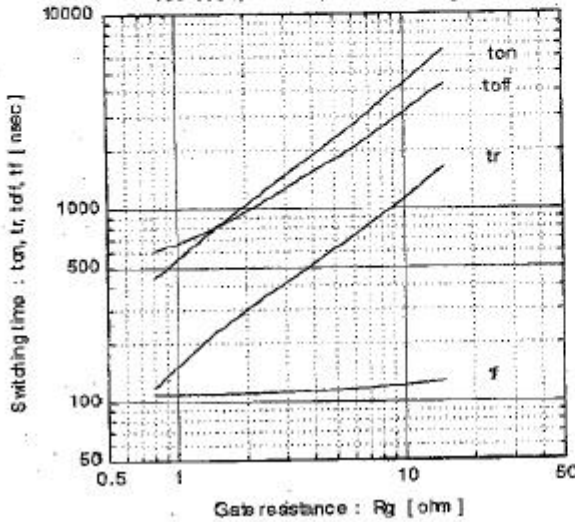
Switching time vs. Collector current (typ.)
 $V_{CC}=600V, V_{GE}=\pm 15V, R_g=1.5\Omega, T_j=25C$



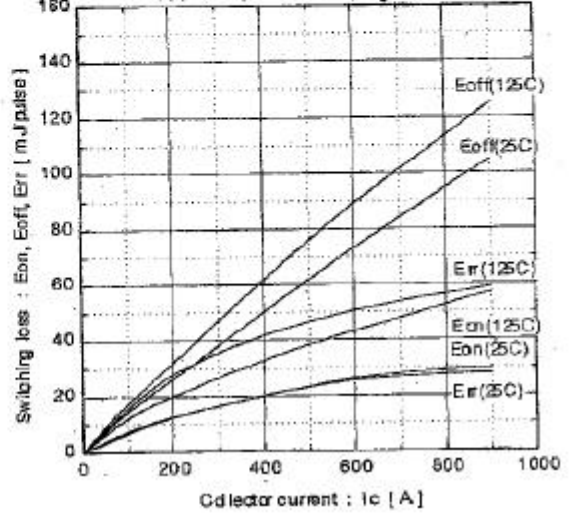
Switching time vs. Collector current (typ.)
 $V_{CC}=600V, V_{GE}=\pm 15V, R_g=1.5\Omega, T_j=125C$



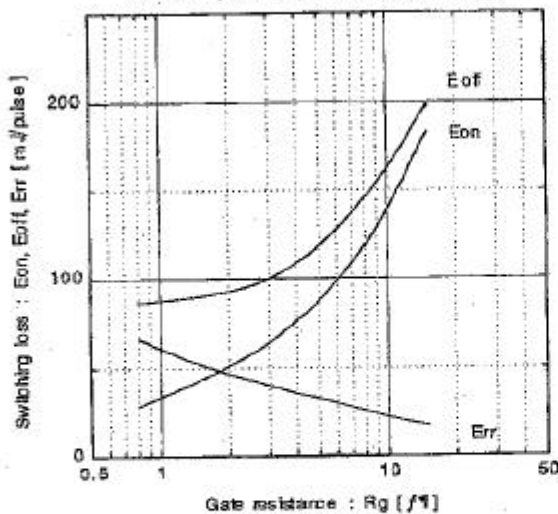
Switching time vs. Gate resistance (typ.)
 $V_{CC}=600V, I_c=600A, V_{GE}=\pm 15V, T_j=25C$



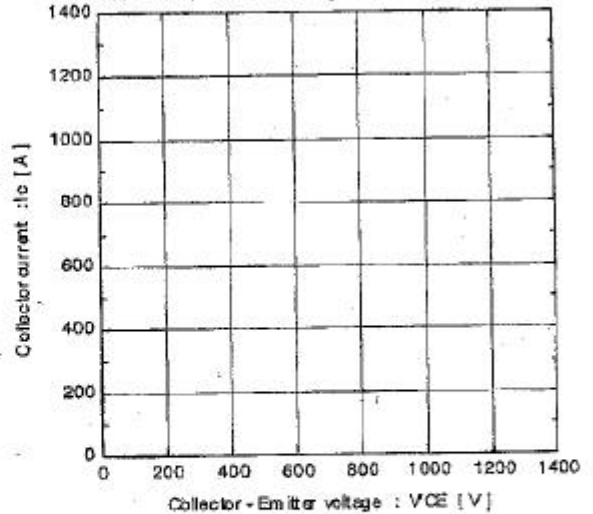
Switching loss vs. Collector current (typ.)
 $V_{CC}=600V, V_{GE}=\pm 15V, R_g=1.5\Omega$



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



Reverse bias safe operating area
 $+V_{GE}=15V, -V_{GE}\leq 15V, R_g\geq 1.5\Omega, T_j\leq 125C$



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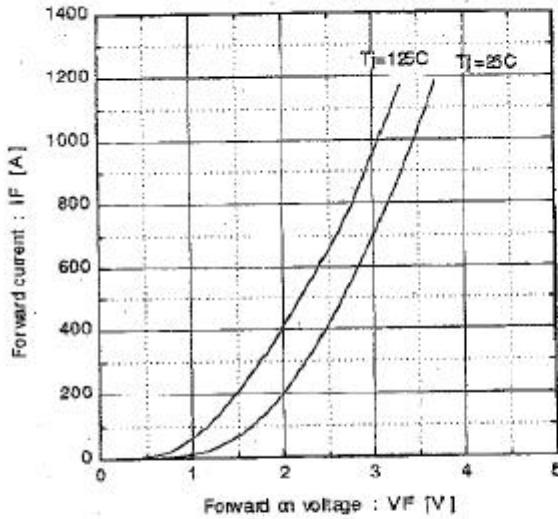
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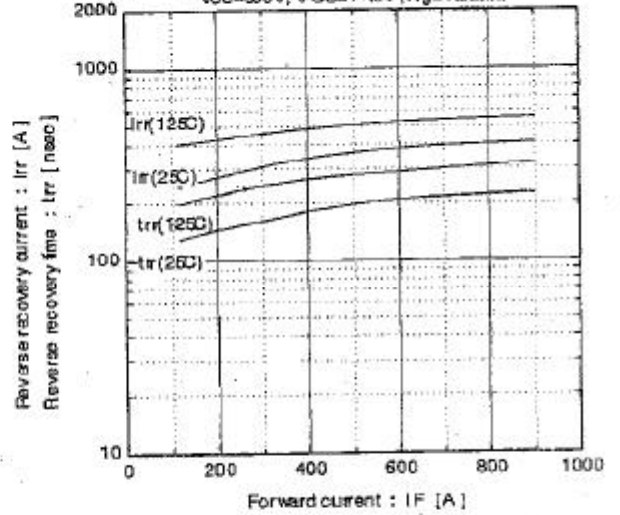
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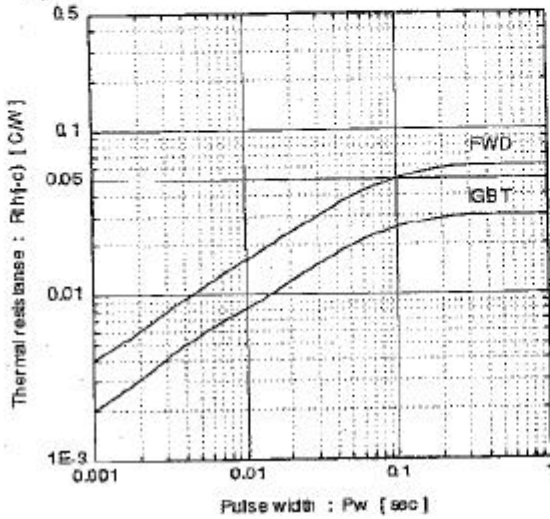
Forward current vs. Forward on voltage (typ)



Reverse recovery characteristics (typ)
Voc=200V, VGE=-15V, Rg=1.5ohm



Transient thermal resistance



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