

SPECIFICATION

DEVICE NAME : IGBT
 TYPE NAME : 1MB05-120
 SPEC. No. : MS5F3527
 DATE : Jun.-25-1996

Fuji Electric Co.,Ltd.

This Specification is subject to change without notice.

	DATE	NAME	APPROVED	Fuji Electric Co.,Ltd		
DRAWN	Jun-25-96	K. Yamaguchi		DWG. NO.	MS5F3527	1/10
CHECKED	Jun-25-96					a

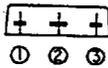
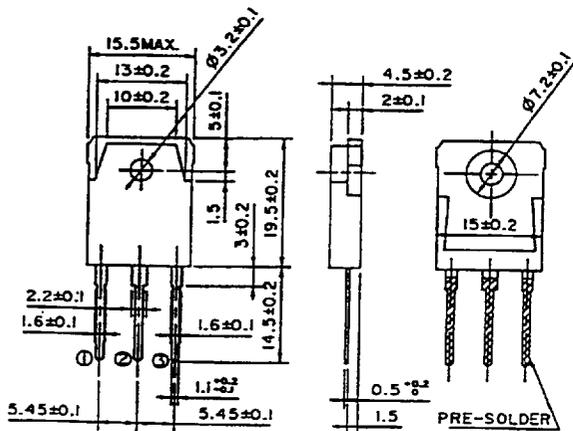
■ 2238792 0004289 T68 ■

H04-004-07

Ratings and characteristics of Fuji IGBT

1MB05-120

1. Outline Drawing

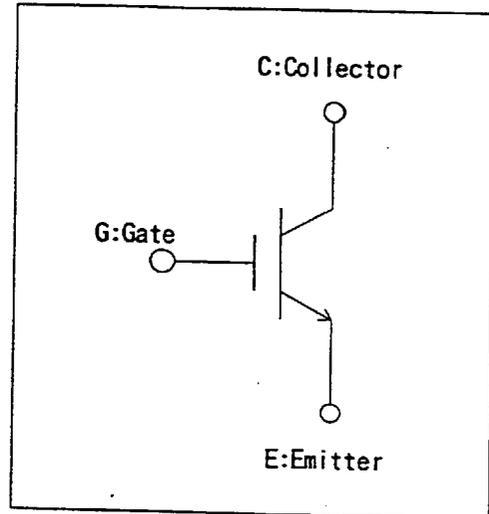


CONNECTION

- ① GATE
- ② COLLECTOR
- ③ EMITTER

EIAJ : SC-65

2. Equivalent circuit



3. Absolute maximum ratings (Tc=25°C)

Items		Symbols	Ratings	Units	
Collector-Emitter Voltage		V_{CES}	1200	V	
Gate-Emitter Voltage		V_{GES}	± 20	V	
Collector Current	DC	Tc=25 °C	I_{C25}	9	A
		Tc=100°C	I_{C100}	5	A
	1ms	Tc=25 °C	I_{CP}	~27	A
IGBT Max. Power Dissipation		P_c	100	W	
Operating Temperature		T_j	+ 150	°C	
Storage Temperature		T_{stg}	-40 ~ +150	°C	
Mounting Screw Torque		—	50	N · cm	

Fuji Electric Co., Ltd.

DWG. NO.

MS5F3527

2/10

2238792 0004290 7&T

H04-004-03

4. Electrical Characteristics (at Tc=25°C unless otherwise specified)

Items	Symbols	Characteristics			Conditions	Unit
		min.	typ.	max.		
Zero gate voltage Collector Current	I_{CES}			1.0	$V_{GE} = 0V$ $V_{CE} = 1200V$	mA
Gate-Emitter leakage Current	I_{GES}			20	$V_{CE} = 0V$ $V_{GE} = \pm 20V$	μA
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	5.5		8.5	$V_{CE} = 20V$ $I_C = 5mA$	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$			3.5	$V_{GE} = 15V$ $I_C = 5A$	V
Input capacitance	C_{ies}		650		$V_{GE} = 0V$ $V_{CE} = 10V$ $f = 1MHz$	pF
Output capacitance	C_{oes}		150			
Reverse transfer capacitance	C_{res}		40			
Switching Time	Turn-on time	t_{on}		1.2	$V_{CC} = 600V$ $I_C = 5 A$ $V_{GE} = \pm 15V$ $R_G = 330 \Omega$ (Half Bridge)	μs
		t_r		0.6		
	Turn-off time	t_{off}		1.5		
		t_f		0.5		
	Turn-on time	t_{on}		0.16	$V_{CC} = 600V$ $I_C = 5 A$ $V_{GE} = +15V$ $R_G = 33 \Omega$ (Half Bridge)	
		t_r		0.11		
	Turn-off time	t_{off}		0.30		
		t_f		0.50		

5. Thermal resistance characteristics

Items	Symbols	Characteristics			Conditions	Unit
		min.	typ.	max.		
Thermal resistance	$R_{th(j-c)}$			1.25	IGBT	$^{\circ}C/W$

Fuji Electric Co.,Ltd.

DWG.NO.

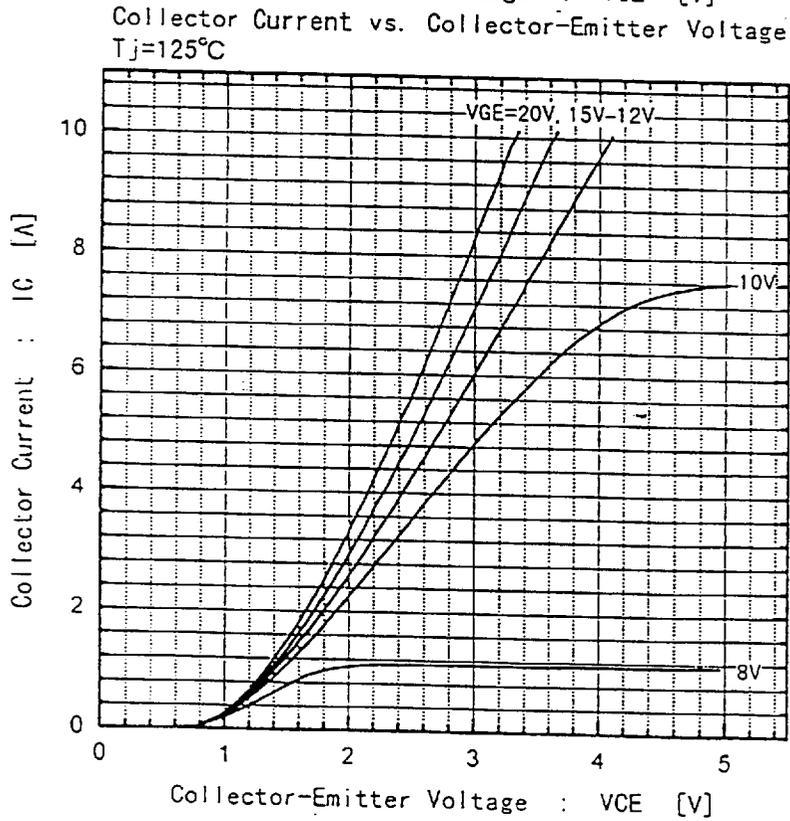
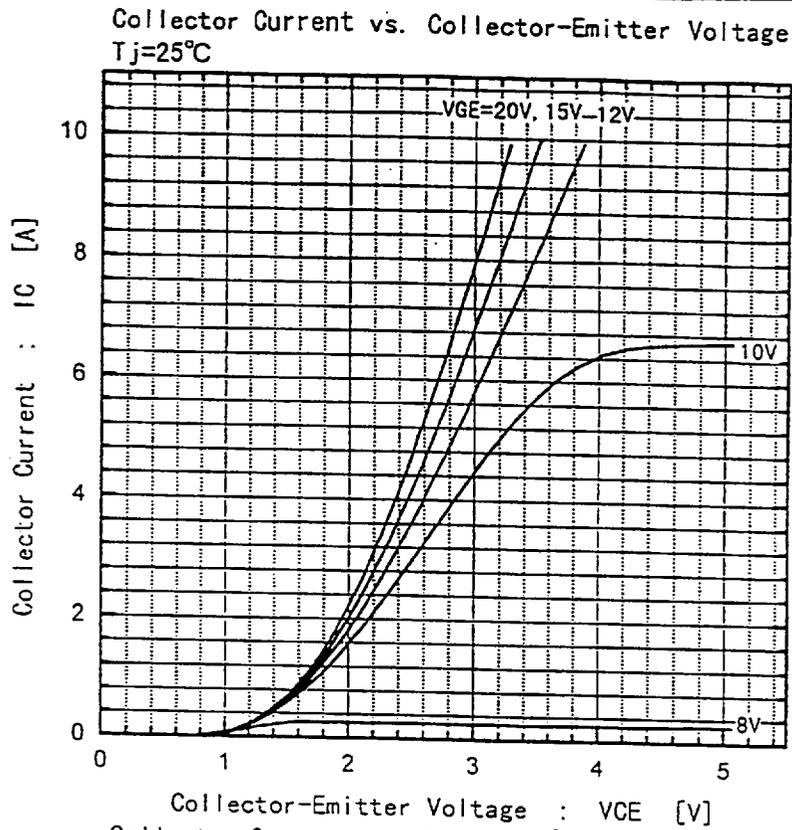
MS 5 F 3 5 2 7

3/10

H04-004-03

2238792 0004291 616

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.

MS5 F 3527

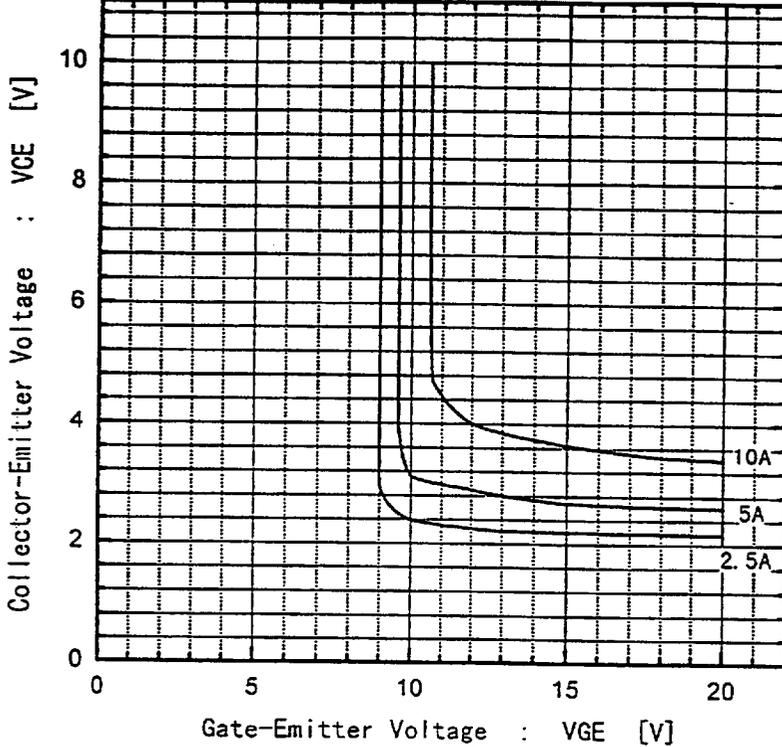
4/10

2238792 0004292 552

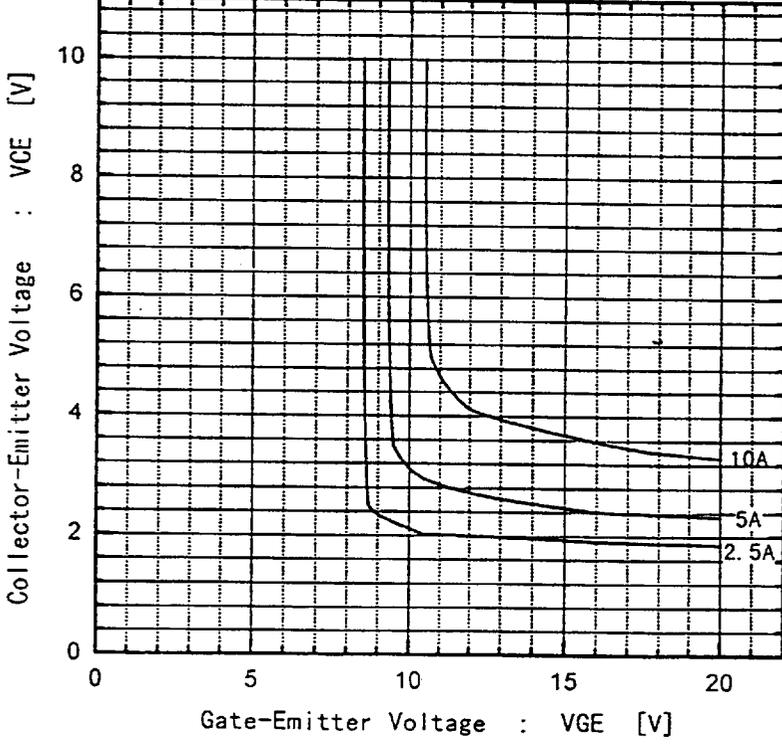
H04-004-03

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-Emitter Voltage vs Gate-Emitter Voltage
T_j=25°C



Collector-Emitter Voltage vs Gate-Emitter Voltage
T_j=125°C



Fuji Electric Co., Ltd.

DWG. NO.

MS5 F 3527

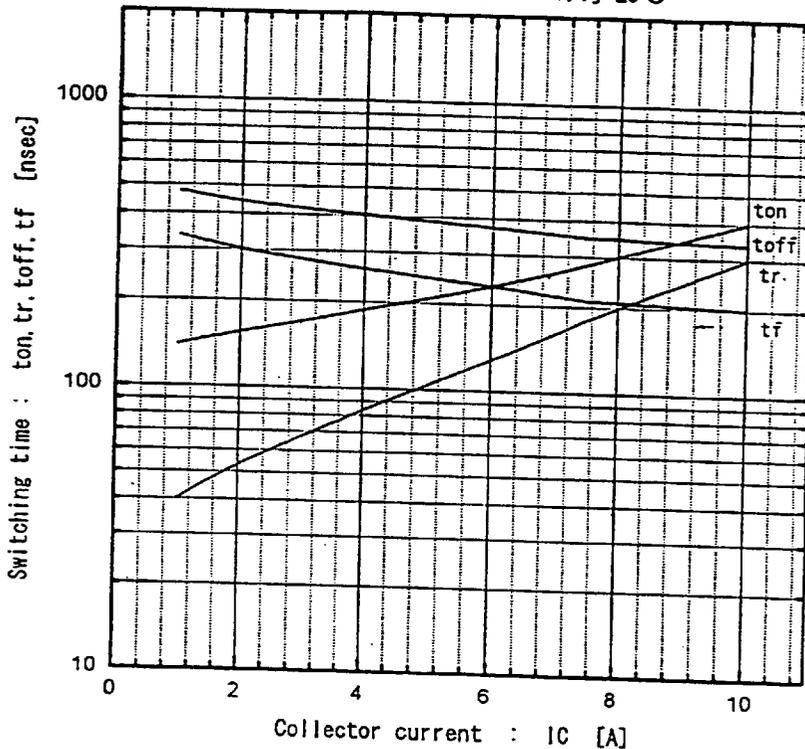
5/10

F04-004-03

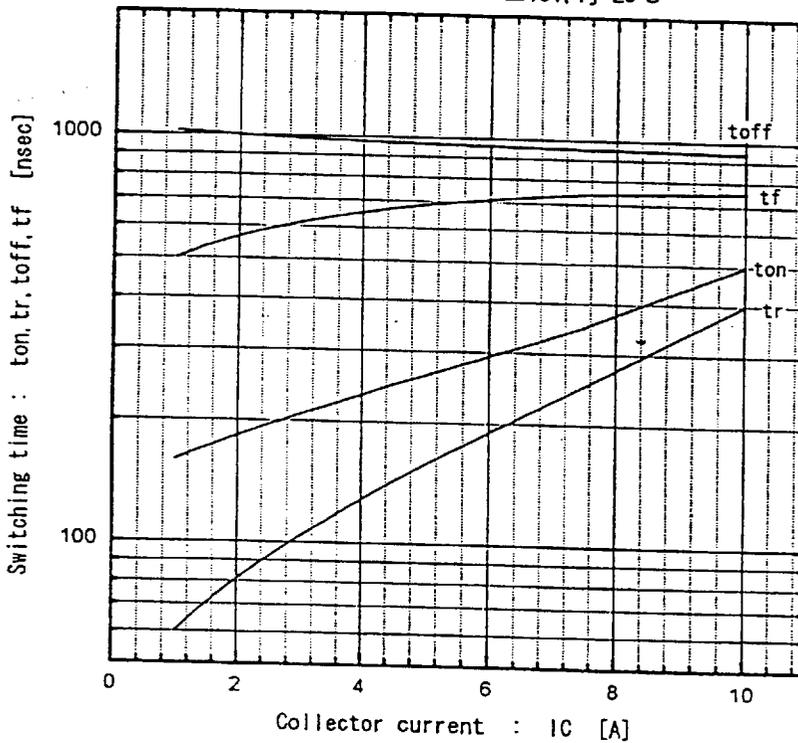
2238792 0004293 499

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. Collector current
 $V_{cc}=600V, R_G=33\Omega, V_{GE}=\pm 15V, T_j=25^\circ C$



Switching time vs. Collector current
 $V_{cc}=600V, R_G=33\Omega, V_{GE}=\pm 15V, T_j=25^\circ C$



Fuji Electric Co., Ltd.

DWG. NO.

MS5 F 3527

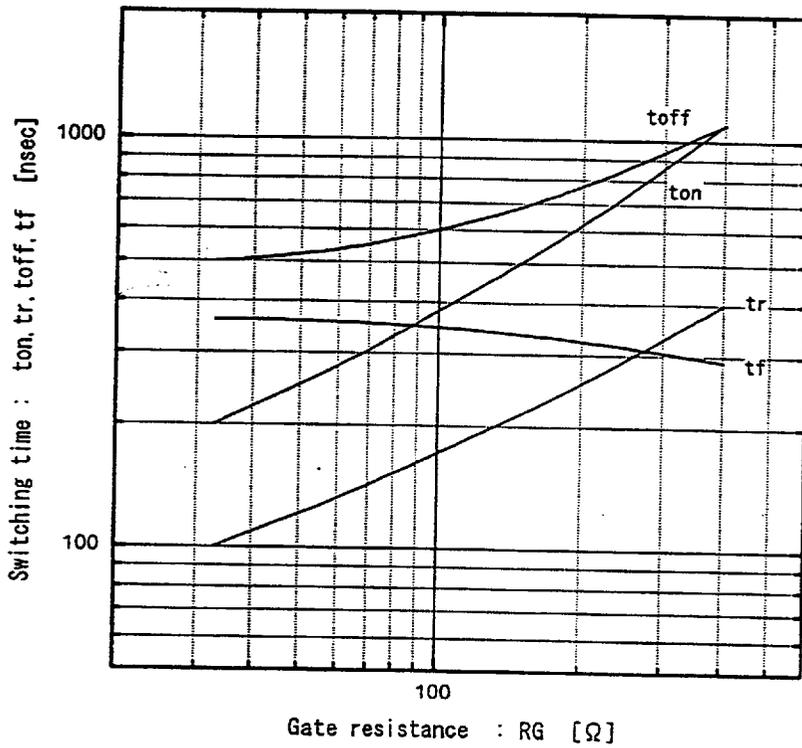
6/10

a

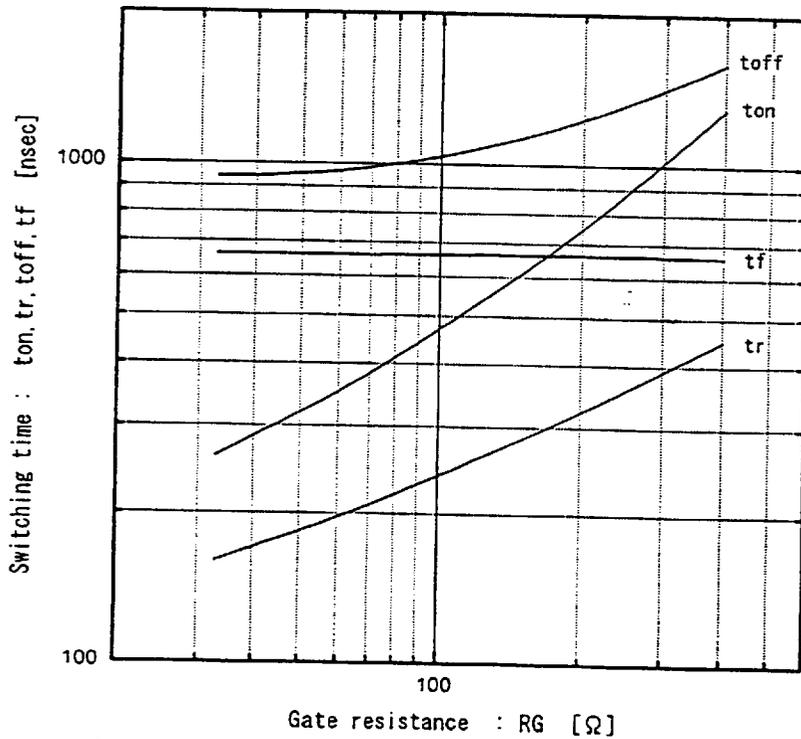
2238792 0004294 325

H04-004-03

Switching time vs. RG
 $V_{cc}=600V, I_C=5A, V_{GE}=\pm 15V, T_j=25^\circ C$



Switching time vs. RG
 $V_{cc}=600V, I_C=5A, V_{GE}=\pm 15V, T_j=125^\circ C$



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.

Fuji Electric Co., Ltd.

DWG. NO.

MS5 F 3527

7/10

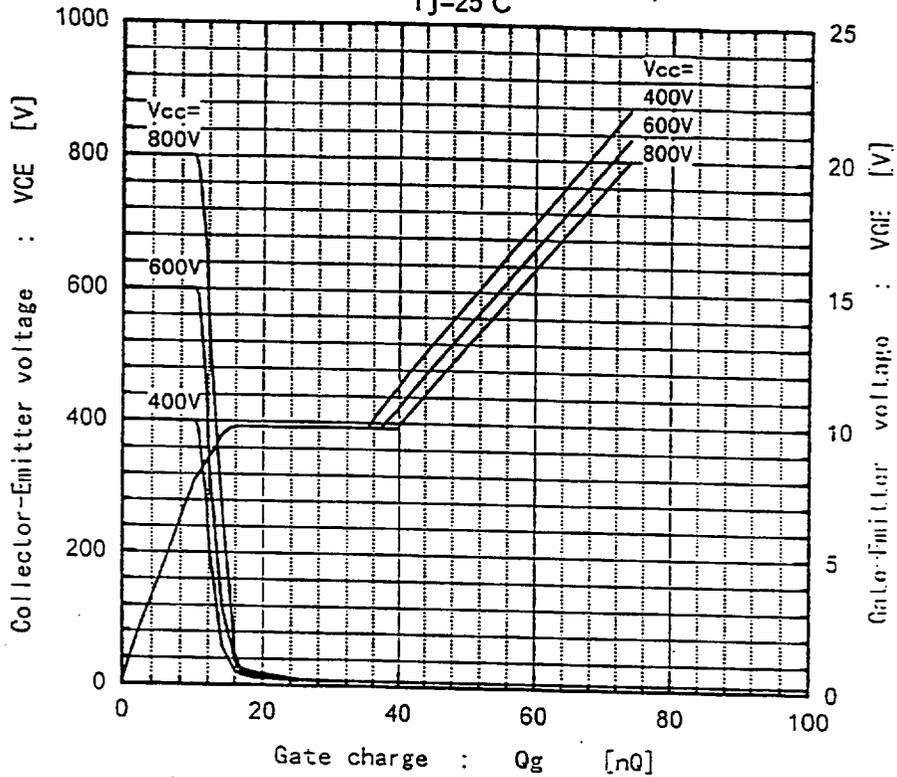
a	

2238792 0004295 261

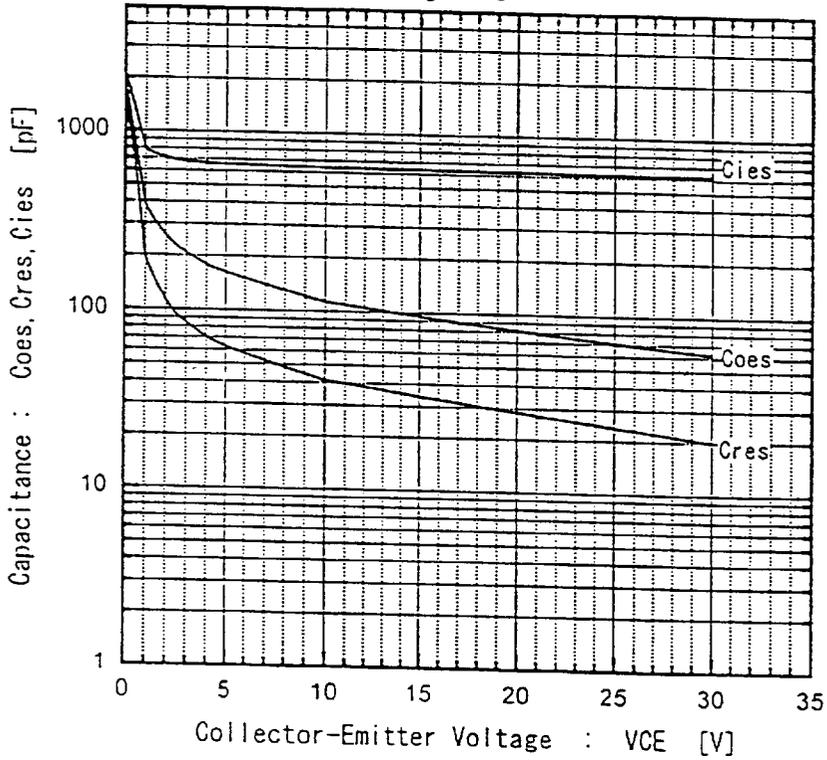
H04-004-03

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.

Dynamic input characteristics
Tj=25°C



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



Fuji Electric Co., Ltd

DWG NO

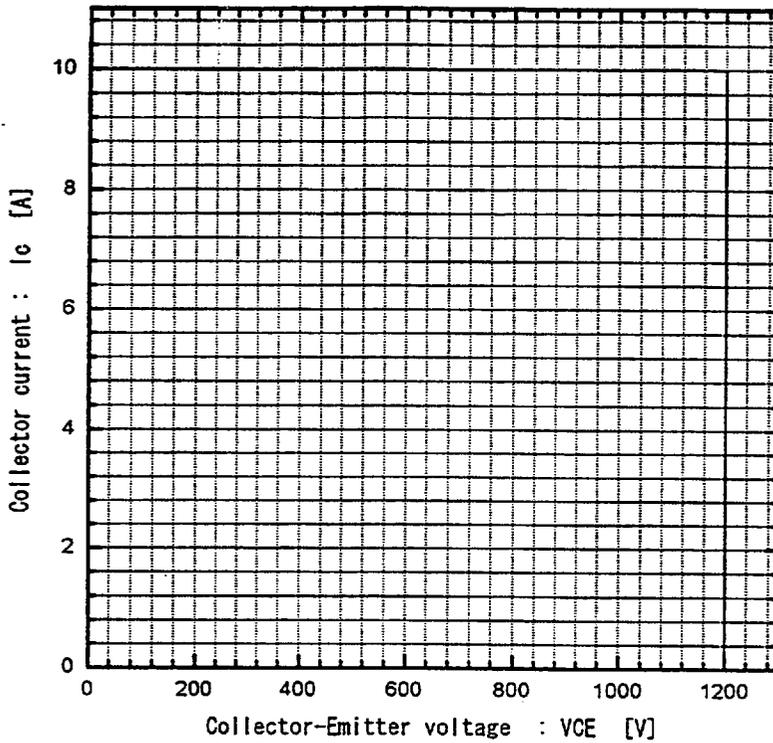
MS5 F 3527

8/10

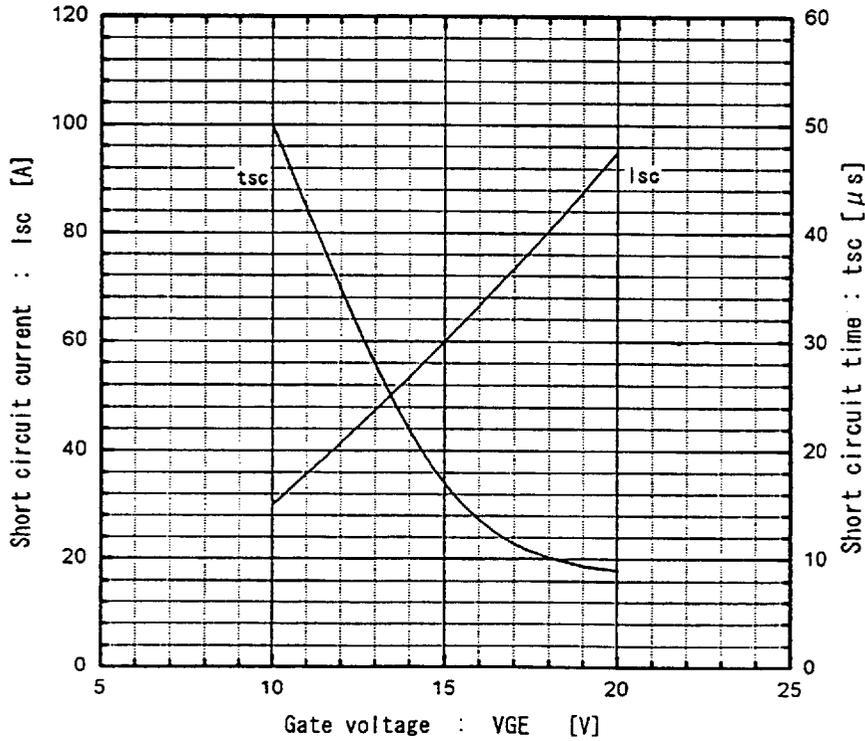
2238792 0004296 1T8

H04-004-03

Reverse Biased Safe Operating Area
 $+V_{GE}=15V, -V_{GE} \leq 15V, T_j \leq 125^\circ C, R_g \geq 33\Omega$



Typical short circuit capability
 $V_{CC}=800V, R_g=33\Omega, T_j=125^\circ C$



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.

Fuji Electric Co., Ltd.

DWG. NO.

MS5 F 3527

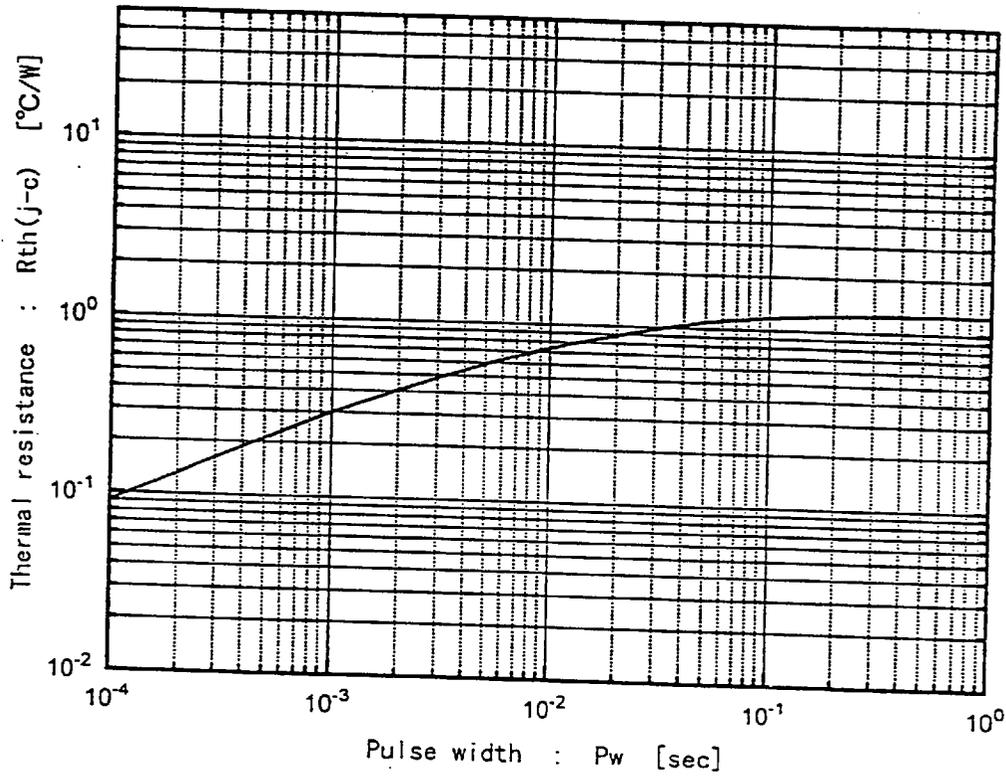
9/10

2

H04-004-03

2238792 0004297 034

Transient thermal resistance



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.

MS5 F 3527

10/10

H04-004-03

2238792 0004298 T70