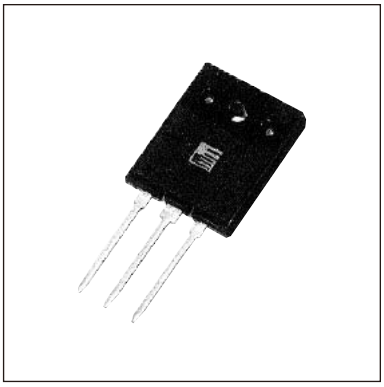
e-Front runners

1MBH10D-120

Molded IGBT

1200V / 10A Molded Package



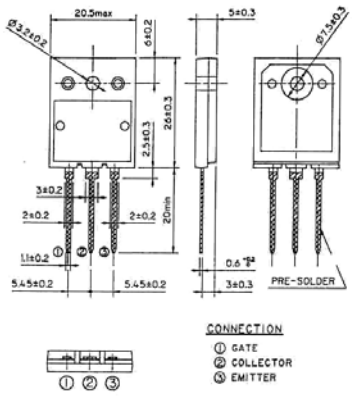
■ Features

- Small molded package
- Low power loss
- Soft switching with low switching surge and noise
- High reliability, high ruggedness (RBSOA, SCSOA etc.)
- Comprehensive line-up

■ Applications

- Inverter for Motor drive
- AC and DC Servo drive amplifier
- Uninterruptible power supply

■ Outline drawings, mm



■ Maximum Ratings and Characteristics

● 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℃	I_{C25}	18	A
		TC=105℃	I_{C110}	10	A
	1ms	TC=25℃	Icp	48	A
IGBT Max. Power Dissipation			Pc	155	W
FWD Max. Power Dissipation			Pc	105	W
Operating Temperature			Tj	+150	℃
Storage Temperature			Tstg	-40 to +150	℃
Mounting Screw Torque			—	70	N・cm

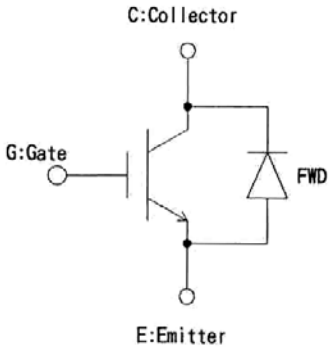
● Electrical Characteristics (at Tc=25°C unless otherwise specified)

Items		Symbols	Characteristics			Conditions	Units
			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} = ±20V	μA
Gate-Emitter Threshold Voltage		$V_{GE(th)}$	5.5	—	8.5	V_{CE} = 20V, Ic = 10mA	V
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	—	—	3.5	V_{GE} = 15V, Ic = 10A	V
Input capacitance		Cies	—	1200	—	V_{GE} = 0V V_{CE} = 10V f = 1MHz	pF
Output capacitance		Coes	—	250	—		
Reverse transfer capacitance		Cres	—	80	—		
Switching Time	Turn-on time	ton	—	—	1.2	Vcc = 600V Ic = 10A V_{GE} = ±15V R_G = 160Ω (Half Bridge)	μs
		tr	—	—	0.6		
	Turn-off time	toff	—	—	1.5		
		tf	—	—	0.5		
	Turn-on time	ton	—	0.16	—	Vcc = 600V Ic = 10A V_{GE} = +15V R_G = 16Ω (Half Bridge)	
		tr	—	0.11	—		
	Turn-off time	toff	—	0.30	—		
		tf	—	—	0.50		
FWD forward voltage drop		VF	—	—	3.0	I_F = 10A	V
Reverse recovery time		trr	—	—	0.35	I_F = 10A, V_{GE} = -10V VR = 200V di/dt = 100A/μs	μs

● Thermal resistance Characteristics

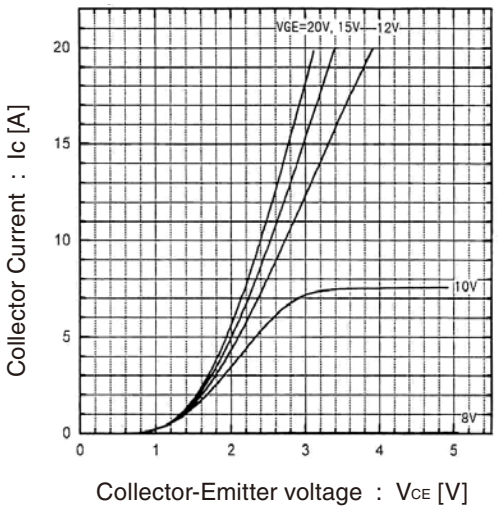
Items	Symbols	Characteristics			Conditions	Units
		min.	typ.	max.		
Thermal resistance	Rth(j-c)	—	—	0.80	IGBT	℃/W
	Rth(j-c)	—	—	1.19	FWD	

■ Equivalent circuit

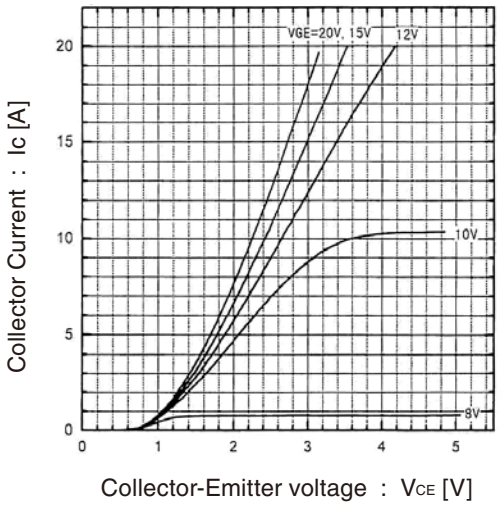


■ Characteristics

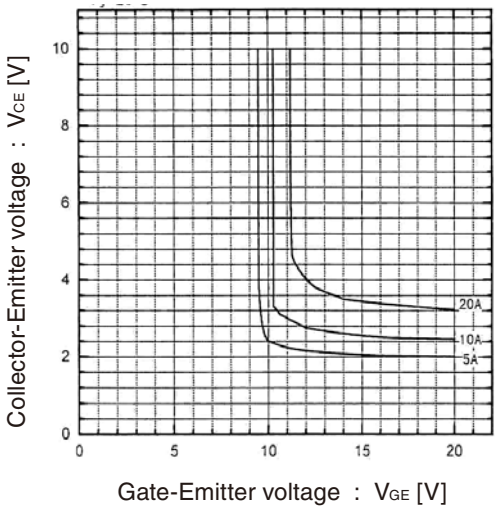
Collector current vs. Collector-Emitter voltage
Tj = 25℃



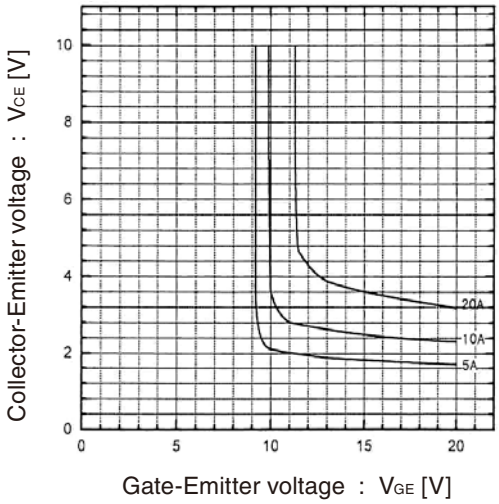
Collector current vs. Collector-Emitter voltage
Tj = 125℃



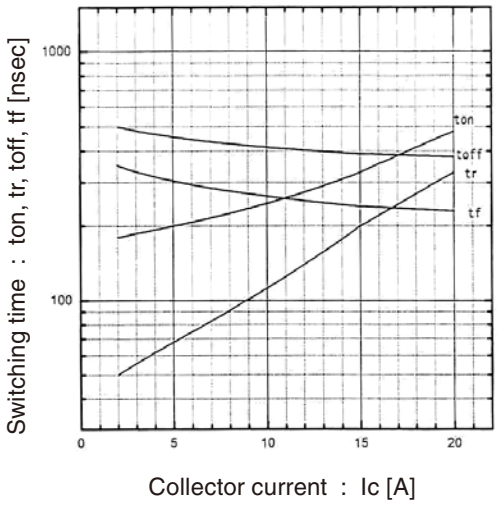
Collector-Emitter voltage vs. Gate-Emitter Voltage
Tj = 25℃



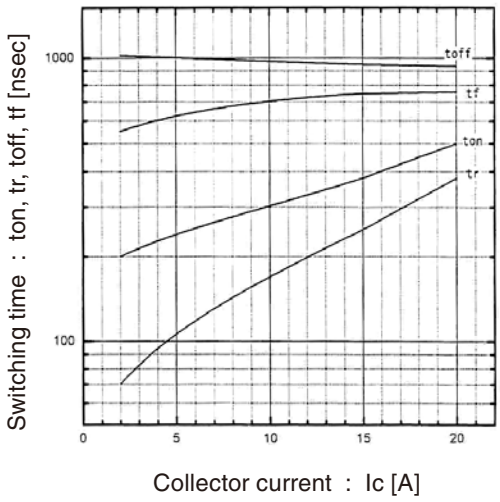
Collector-Emitter voltage vs. Gate-Emitter Voltage
Tj = 125℃



Switching time vs. Collector current
Vcc=600V, RG=16Ω, VGE=±15V, Tj=25℃

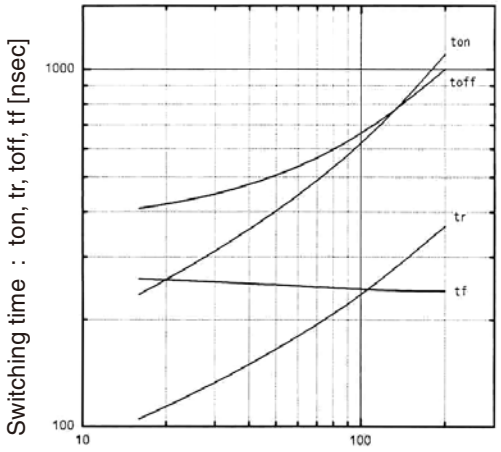


Switching time vs. Collector current
Vcc=600V, RG=16Ω, VGE=±15V, Tj=125℃

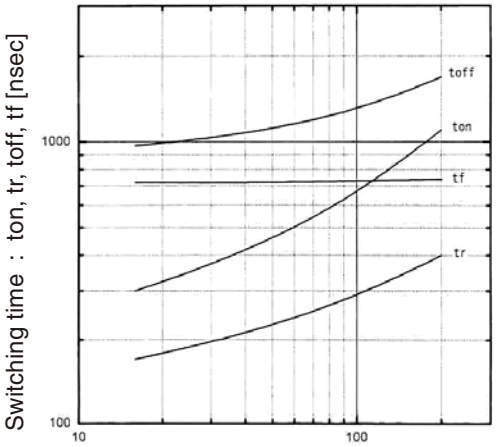


■ Characteristics

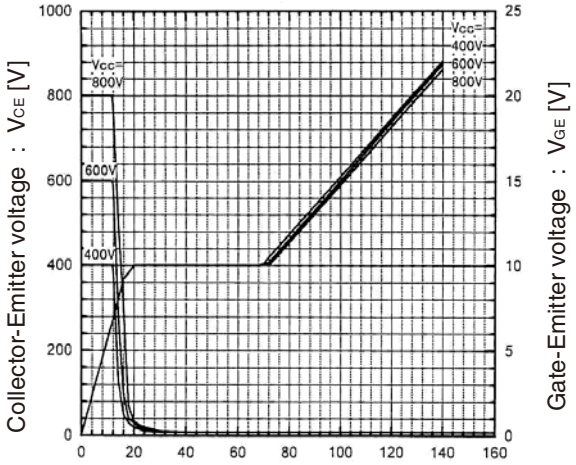
Switching time vs. RG
Vcc=600V, IC=10A, V_{GE}=±15V, Tj=25℃



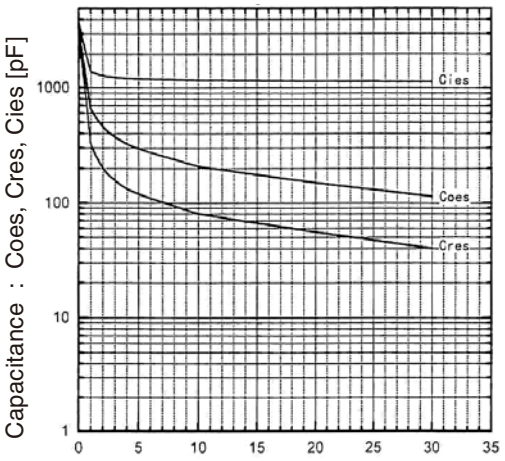
Switching time vs. RG
Vcc=600V, IC=10A, V_{GE}=±15V, Tj=125℃



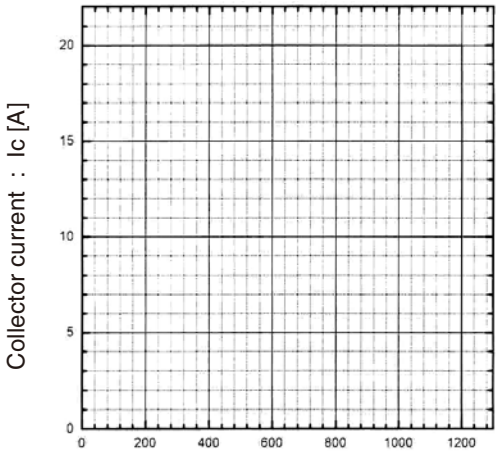
Dynamic input characteristics
Tj=25℃



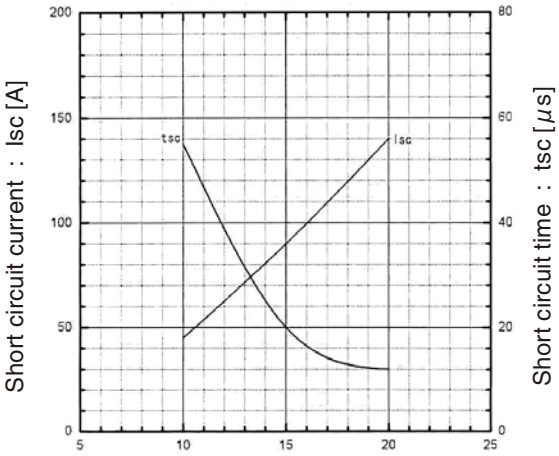
Capacitance vs. Collector-Emitter voltage
Tj=25℃



Reverse Biased Safe Operating Area
+V_{GE}=15V, -V_{GE}≦15V, Tj=125℃, RG≧16Ω

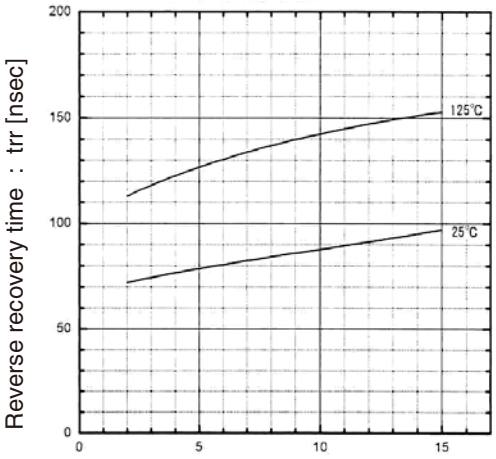


Typical short circuit capability
Vcc=800V, RG=16Ω, Tj=125℃

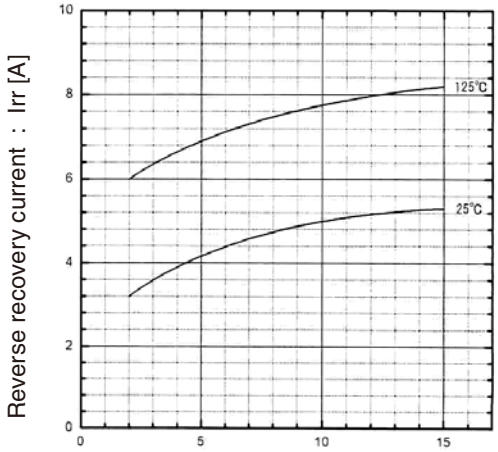


■ Characteristics

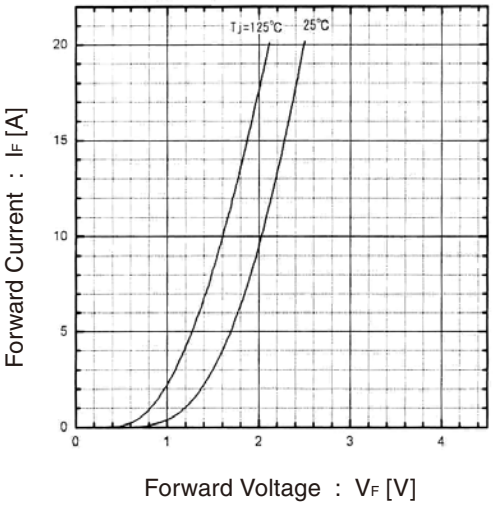
Reverse recovery time vs. Forward current
VR=200V, -di/dt=100A/μsec



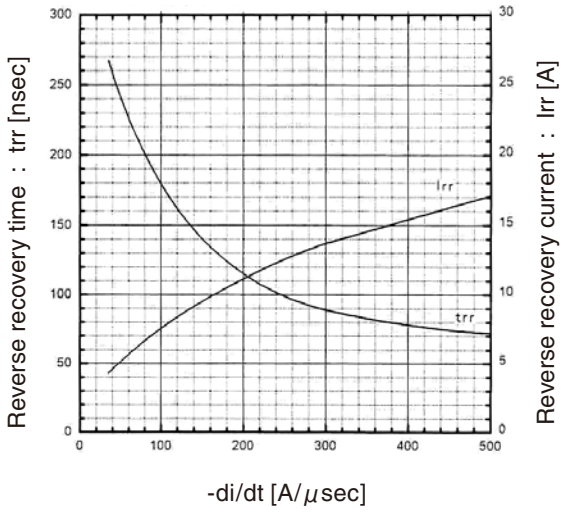
Reverse recovery current vs. Forward current
VR=200V, -di/dt=100A/μsec



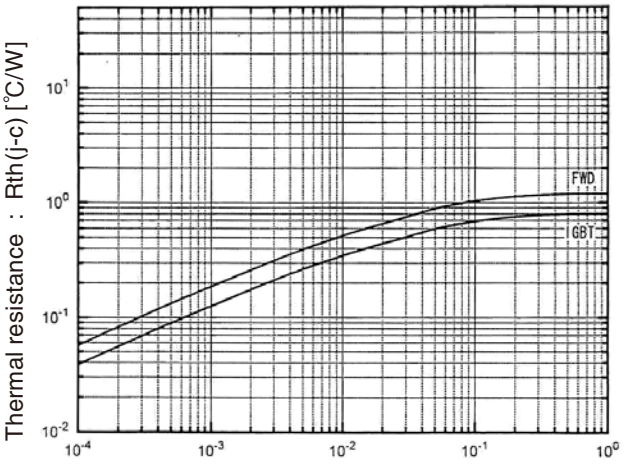
Forward voltage vs. Forward current



Reverse recovery chracteristics vs. -di/dt
IF=10A, Tj=125°C



Transient thermal resistance



WARNING

1. This Catalog contains the product specifications, characteristics, data, materials, and structures as of October 2008.
   The contents are subject to change without notice for specification changes or other reasons. When using a product listed in this Catalog, be sure to obtain the latest specifications.

2. All applications described in this Catalog exemplify the use of Fuji's products for your reference only. No right or license, either express or implied, under any patent, copyright, trade secret or other intellectual property right owned by Fuji Electric Device Technology Co., Ltd. is (or shall be deemed) granted. Fuji Electric Device Technology Co., Ltd. makes no representation or warranty, whether express or implied, relating to the infringement or alleged infringement of other's intellectual property rights which may arise from the use of the applications described herein.

3. Although Fuji Electric Device Technology Co., Ltd. is enhancing product quality and reliability, a small percentage of semiconductor products may become faulty. When using Fuji Electric semiconductor products in your equipment, you are requested to take adequate safety measures to prevent the equipment from causing a physical injury, fire, or other problem if any of the products become faulty. It is recommended to make your design fail-safe, flame retardant, and free of malfunction.

4. The products introduced in this Catalog are intended for use in the following electronic and electrical equipment which has normal reliability requirements.
   • Computers • OA equipment • Communications equipment (terminal devices) • Measurement equipment
   • Machine tools • Audiovisual equipment • Electrical home appliances • Personal equipment • Industrial robots etc.

5. If you need to use a product in this Catalog for equipment requiring higher reliability than normal, such as for the equipment listed below, it is imperative to contact Fuji Electric Device Technology Co., Ltd. to obtain prior approval. When using these products for such equipment, take adequate measures such as a backup system to prevent the equipment from malfunctioning even if a Fuji's product incorporated in the equipment becomes faulty.
   • Transportation equipment (mounted on cars and ships) • Trunk communications equipment
   • Traffic-signal control equipment • Gas leakage detectors with an auto-shut-off feature
   • Emergency equipment for responding to disasters and anti-burglary devices • Safety devices
   • Medical equipment

6. Do not use products in this Catalog for the equipment requiring strict reliability such as the following and equivalents to strategic equipment (without limitation).
   • Space equipment • Aeronautic equipment • Nuclear control equipment
   • Submarine repeater equipment

7.

8. If you have any question about any portion in this Catalog, ask Fuji Electric Device Technology Co., Ltd. or its sales agents before using the product.
   Neither Fuji Electric Device Technology Co., Ltd. nor its agents shall be liable for any injury caused by any use of the products not in accordance with instructions set forth herein.