

1MBH10D-060

Molded IGBT

600V / 10A Molded Package

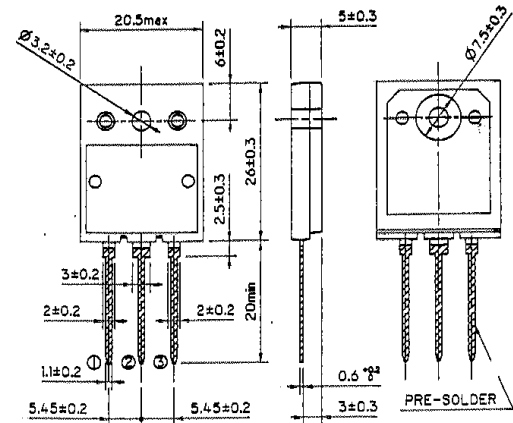
■ Outline drawings, mm TO-3PL

■ 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

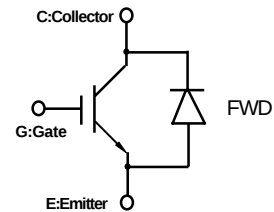
- Inverter for Motor drive
- AC and DC Servo drive amplifier
- Uninterruptible power supply



CONNECTION



■ Equivalent Circuit Schematic



■ Maximum ratings and characteristics

● Absolute maximum ratings (Tc=25°C)

Item			Symbol	Rating	Unit
Collector-Emitter voltage			V _{CES}	600	V
Gate-Emitter voltage			V _{GES}	±20	V
Collector current	DC	T _c =25°C	I _{C25}	30	A
		T _c =115°C	I _{C115}	10	A
	1ms	T _c =25°C	I _{CP}	80	A
Max. power dissipation (IGBT)			P _C	115	W
Max. power dissipation (FWD)			P _C	55	W
Operating temperature			T _J	+150	°C
Storage temperature			T _{stg}	-40 to +150	°C
Screw torque			-	70	N·cm

● Electrical characteristics (at T_c=25°C unless otherwise specified)

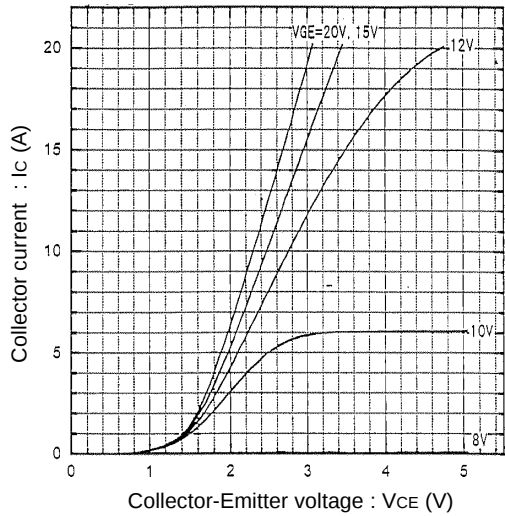
Item	Symbol	Characteristics			Conditions	Unit
		Min.	Typ.	Max.		
Zero gate voltage collector current	I _{CES}	—	—	1.0	V _{GE} =0V, V _{CE} =600V	mA
Gate-Emitter leakage current	I _{GES}	—	—	20	V _{CE} =0V, V _{GE} =±20V	μA
Gate-Emitter threshold voltage	V _{GE(th)}	5.5	—	8.5	V _{CE} =20V, I _c =10mA	V
Collector-Emitter saturation voltage	V _{CE(sat)}	—	—	3.0	V _{GE} =15V, I _c =10A	V
Input capacitance	C _{ies}	—	700	—	V _{GE} =0V	pF
Output capacitance	C _{oes}	—	150	—	V _{CE} =10V	
Reverse transfer capacitance	C _{res}	—	20	—	f=1MHz	
Switching Time	Turn-on time	t _{on}	—	1.2	V _{CC} =300V, I _c =10A	μs
		t _r	—	0.6	V _{GE} =±15V	
	Turn-off time	t _{off}	—	1.0	R _G =220 ohm	μs
		t _f	—	0.35	(Half Bridge)	
	Turn-on time	t _{on}	—	0.16	V _{CC} =300V, I _c =10A	μs
		t _r	—	0.11	V _{GE} =+15V	
FWD forward on voltage	V _F	—	—	3.0	I _F =10A	V
		—	—	0.3	I _F =10A, V _{GE} =-10V, V _R =200V, di/dt=100A/μs	

● Thermal resistance characteristics

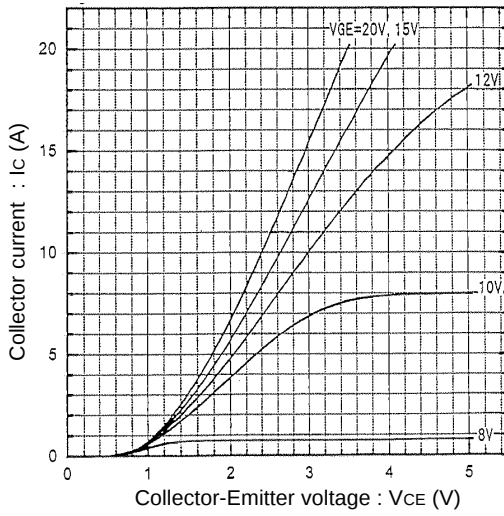
Item	Symbol	Characteristics			Conditions	Unit
		Min.	Typ.	Max.		
Thermal resistance	R _{th(j-c)}	—	—	1.08	IGBT	°C/W
	R _{th(j-c)}	—	—	2.27	FWD	°C/W

Characteristics

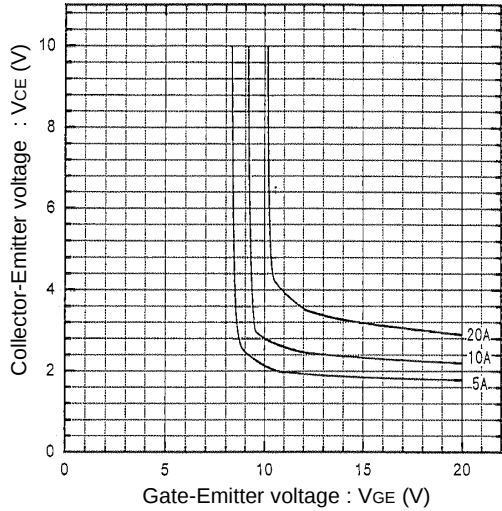
Collector current vs. Collector-Emitter voltage
Tj=25°C



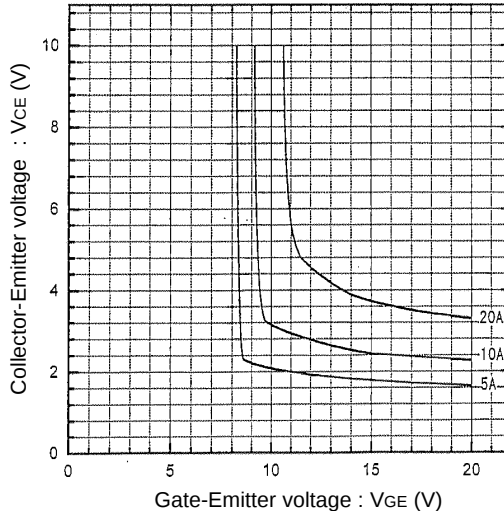
Collector current vs. Collector-Emitter voltage
Tj=125°C



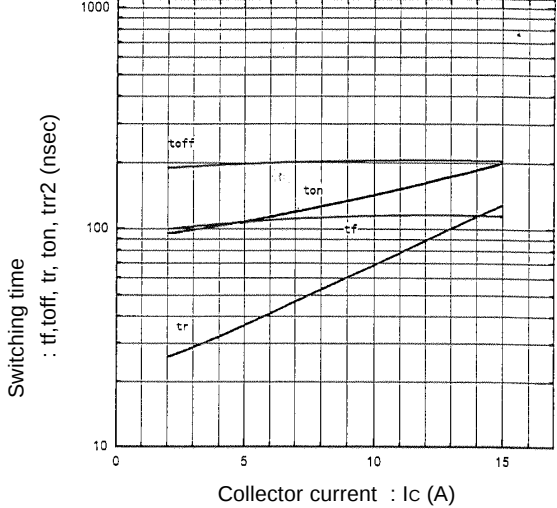
Collector-Emitter voltage vs. Gate-Emitter voltage
Tj=25°C



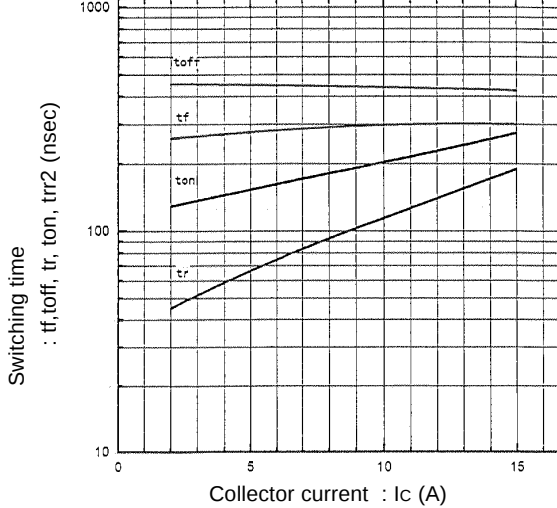
Collector-Emitter voltage vs. Gate-Emitter voltage
Tj=125°C



Switching time vs. Collector current
VCC=300V, RG=22Ω, VGE=±15V, Tj=25°C



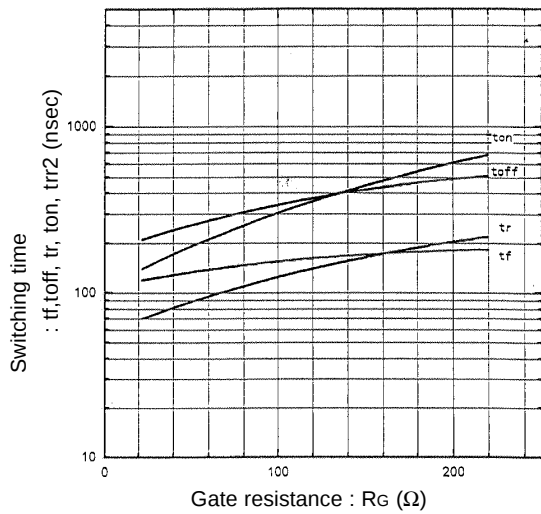
Switching time vs. Collector current
VCC=300V, RG=22Ω, VGE=±15V, Tj=125°C



■ Characteristics

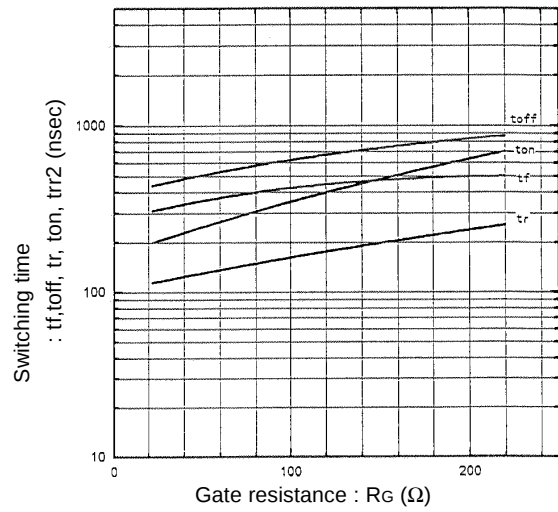
Switching time vs. R_G

$V_{CC}=300V$, $I_C=10A$, $V_{GE}=\pm 15V$, $T_J=25^\circ C$



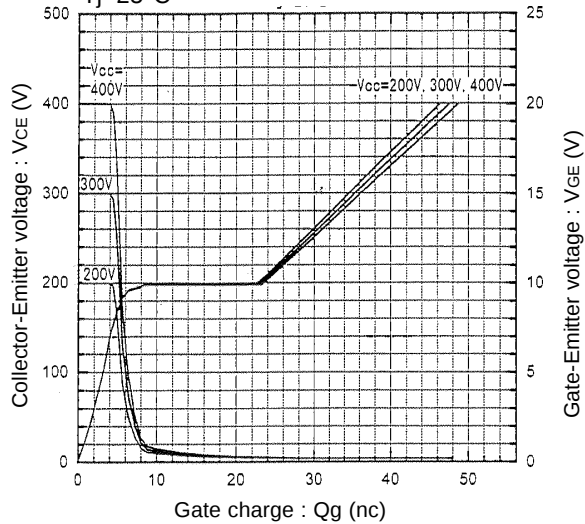
Switching time vs. R_G

$V_{CC}=300V$, $I_C=10A$, $V_{GE}=\pm 15V$, $T_J=125^\circ C$



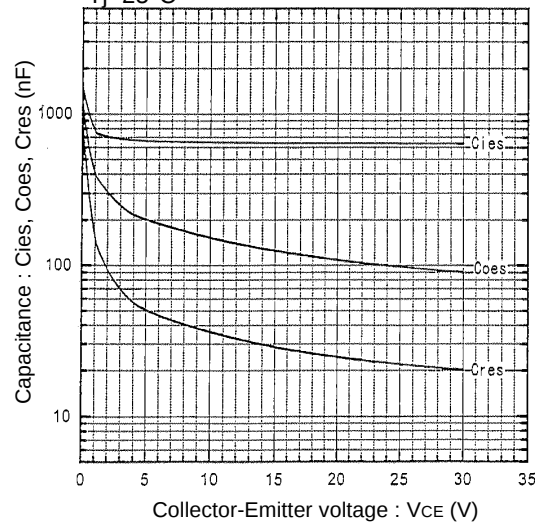
Dynamic input characteristics

$T_J=25^\circ C$



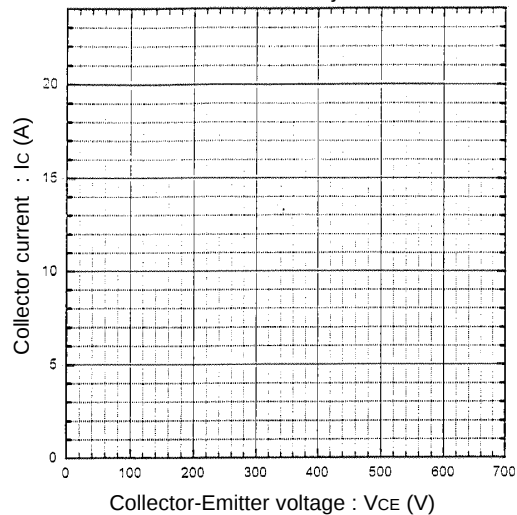
Capacitance vs. Collector-Emitter voltage

$T_J=25^\circ C$



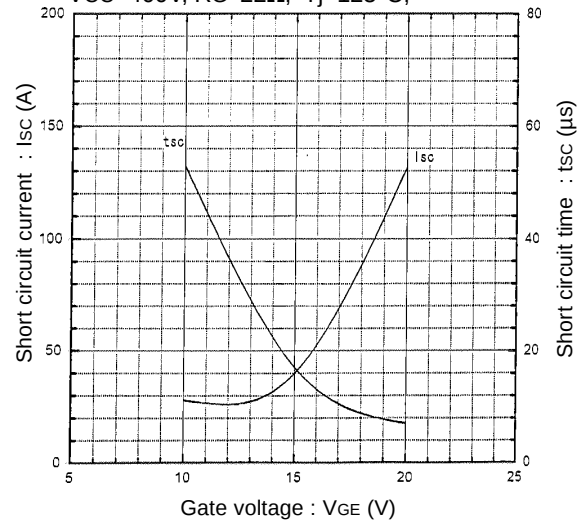
Reverse Biased Safe Operating Area

$+V_{GE}=15V$, $-V_{GE}\leq 15V$, $T_J\leq 125^\circ C$, $R_G\geq 22\Omega$



Typical short circuit capability

$V_{CC}=400V$, $R_G=22\Omega$, $T_J=125^\circ C$,



Characteristics

