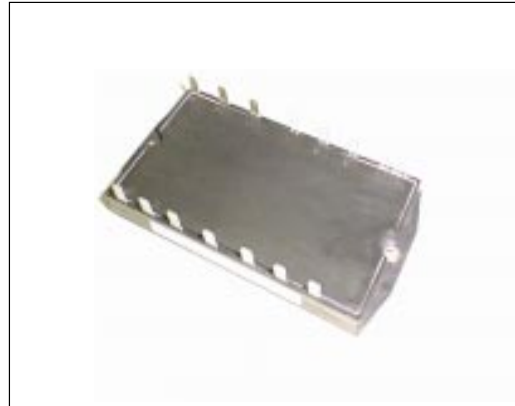


### IGBT MODULE

600V / 30A / PIM



#### ■ Features

- High Speed Switching
- Voltage Drive
- Low Inductance Module Structure
- Converter Diode Bridge Dynamic Brake Circuit

#### ■ Applications

- Inverter for Motor Drive
- AC and DC Servo Drive Amplifier
- Uninterruptible Power Supply

#### ■ Maximum ratings and characteristics

● Absolute maximum ratings (Tc=25°C unless without specified)

Item	Symbol	Condition	Rating	Unit	
Inverter	Collector-Emitter voltage	V <sub>CES</sub>	600	V	
	Gate-Emitter voltage	V <sub>GES</sub>	±20	V	
	Collector current	I <sub>C</sub>	Continuous	30	A
		I <sub>CP</sub>	1ms	60	A
		-I <sub>C</sub>		30	A
Collector power dissipation	P <sub>C</sub>	1 device	120	W	
Brake	Collector-Emitter voltage	V <sub>CES</sub>	600	V	
	Gate-Emitter voltage	V <sub>GES</sub>	±20	V	
	Collector current	I <sub>C</sub>	Continuous	30	A
		I <sub>CP</sub>	1ms	60	A
	Collector power dissipation	P <sub>C</sub>	1 device	120	W
	Repetitive peak reverse voltage	V <sub>RPM</sub>		600	V
	Average forward current	I <sub>F(AV)</sub>		1	A
Surge current	I <sub>FSM</sub>	10ms	50	A	
Converter	Repetitive peak reverse voltage	V <sub>RPM</sub>	800	V	
	Non-Repetitive peak reverse voltage	V <sub>RSM</sub>	900	V	
	Average output current	I <sub>O</sub>	50Hz/60Hz sine wave	50	A
	Surge current (Non-Repetitive)	I <sub>FSM</sub>	T <sub>j</sub> =150°C, 10ms	350	A
	I <sup>2</sup> t (Non-Repetitive)		T <sub>j</sub> =150°C, 10ms	648	A <sup>2</sup> s
Operating junction temperature	T <sub>j</sub>		+150	°C	
Storage temperature	T <sub>stg</sub>		-40 to +125	°C	
Isolation voltage	V <sub>iso</sub>	AC : 1 minute	AC 2500	V	
Mounting screw torque			1.7 *1	N·m	

\*1 Recommendable value : 1.3 to 1.7 N·m (M4)

● Electrical characteristics (Tj=25°C unless without specified)

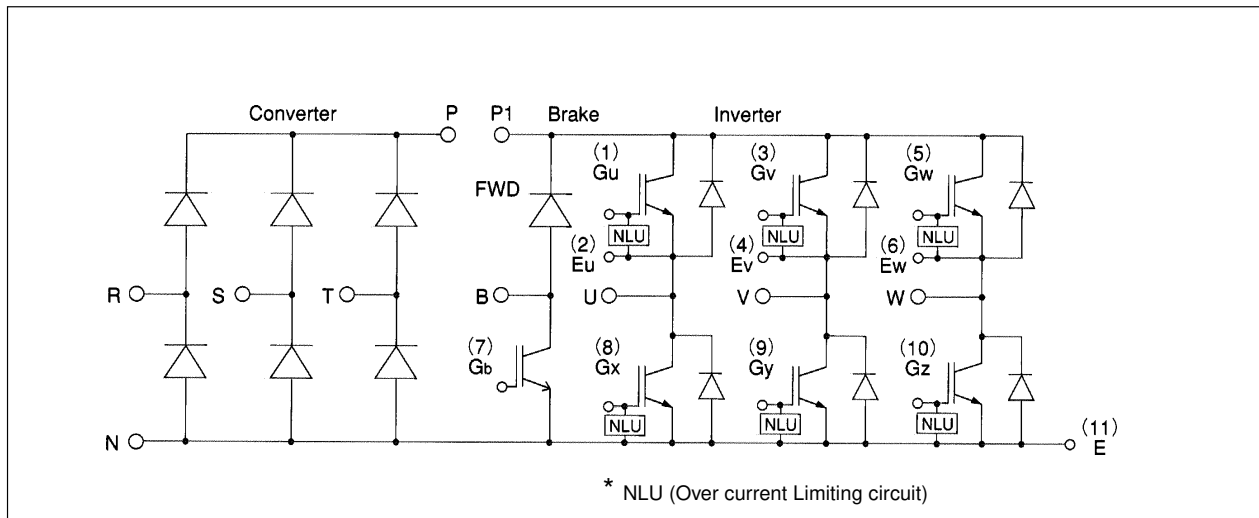
Item	Symbol	Condition	Characteristics			Unit	
			Min.	Typ.	Max.		
Inverter (IGBT)	Zero gate voltage collector current	ICES	VCE=600V, VGE=0V			1.0	mA
	Gate-Emitter leakage current	IGES	VCE=0V, VGE=±20V			20	µA
	Gate-Emitter threshold voltage	VGE(th)	VCE=20V, IC=30mA			4.5	V
	Collector-Emitter saturation voltage	VCE(sat)	VGE=15V, IC=30A			2.8	V
	Collector-Emitter voltage	-VCE	-IC=30A			3.0	V
	Input capacitance	Cies	VGE=0V, VCE=10V, f=1MHz			1980	pF
	Switching time	ton	VCC=300V			1.2	µs
		tr	IC=30A			0.6	µs
		toff	VGE=±15V			1.0	µs
		tf	RG=82 ohm			0.35	µs
Reverse recovery time of FRD	trr	IF=30A			0.3	µs	
Brake (IGBT)	Zero gate voltage collector current	ICES	VCE=600V, VGE=0V			1.0	mA
	Gate-Emitter leakage current	IGES	VCE=0V, VGE=±20V			0.1	µA
	Collector-Emitter saturation voltage	VCE(sat)	IC=30A, VGE=15V			2.8	V
	Switching time	ton	VCC=300V			0.8	µs
		tr	IC=30A			0.6	µs
		toff	VGE=±15V			1.0	µs
		tf	RG=82ohm			0.35	µs
Reverse current	I <sub>RRM</sub>	VR=600V			1.0	mA	
Reverse recovery time	trr				0.6	µs	
Converter	Forward voltage	V <sub>FM</sub>	IF=50A			1.55	V
	Reverse current	I <sub>RRM</sub>	VR=800V			1.0	mA

● Thermal Characteristics

Item	Symbol	Condition	Characteristics			Unit
			Min.	Typ.	Max.	
Thermal resistance ( 1 device )	Rth(j-c)	Inverter IGBT			1.04	°C/W
		Inverter FRD			2.22	
		Brake IGBT			1.04	
		Converter Diode			2.10	
Contact thermal resistance *	Rth(c-f)	With thermal compound		0.05		

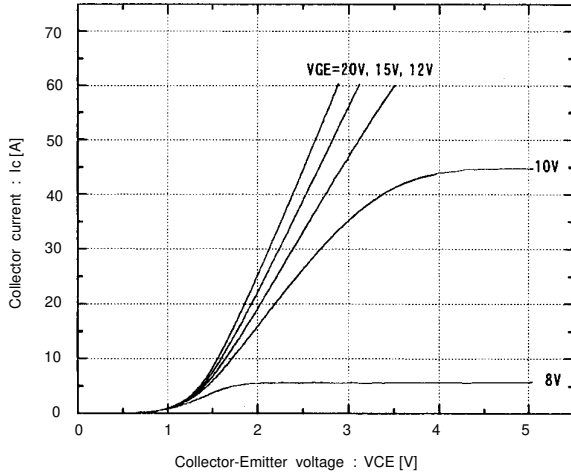
\* This is the value which is defined mounting on the additional cooling fin with thermal compound

■ Equivalent Circuit Schematic

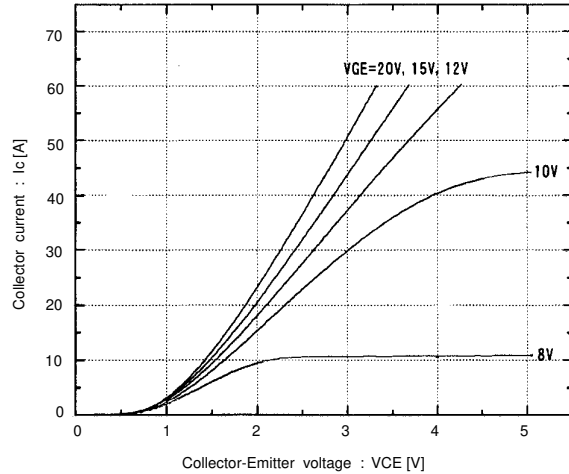


■ Characteristics (Representative)

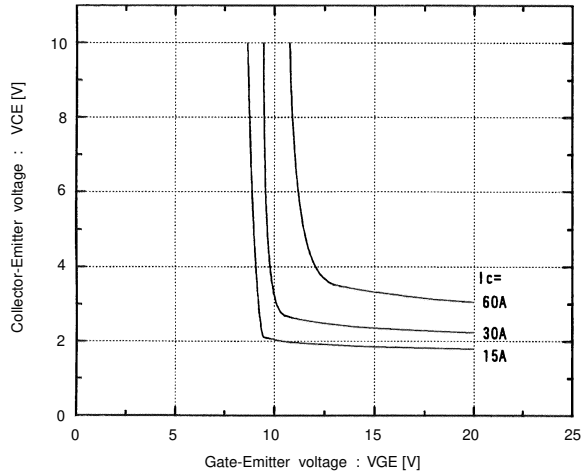
Collector current vs. Collector-Emitter voltage  
T<sub>J</sub>=25°C



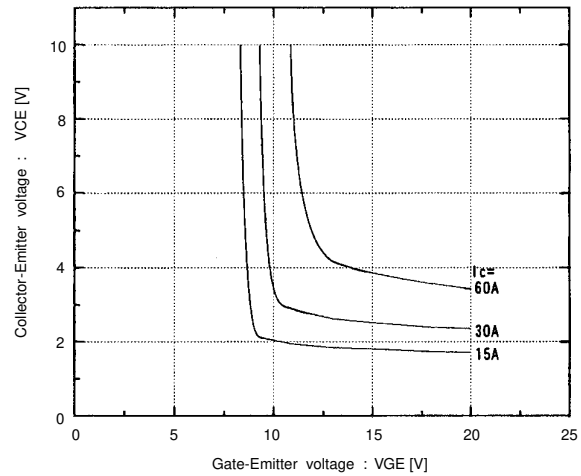
Collector current vs. Collector-Emitter voltage  
T<sub>J</sub>=125°C



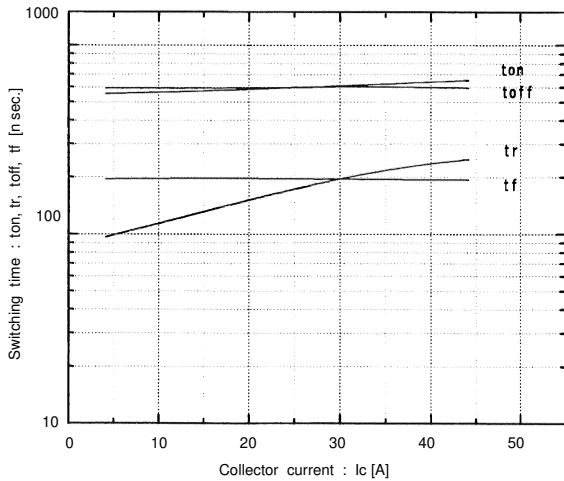
Collector-Emitter vs. Gate-Emitter voltage  
T<sub>J</sub>=25°C



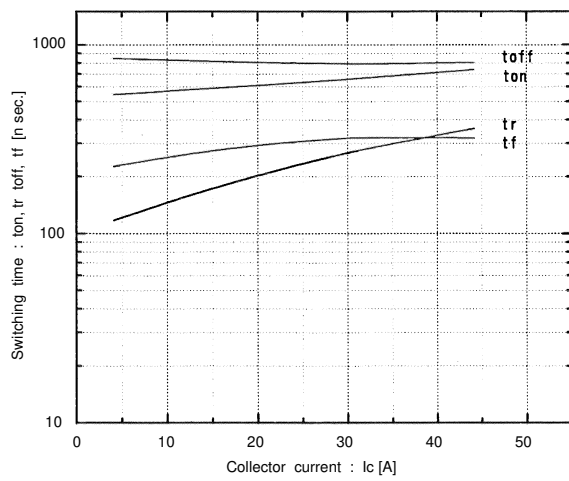
Collector-Emitter vs. Gate-Emitter voltage  
T<sub>J</sub>=125°C

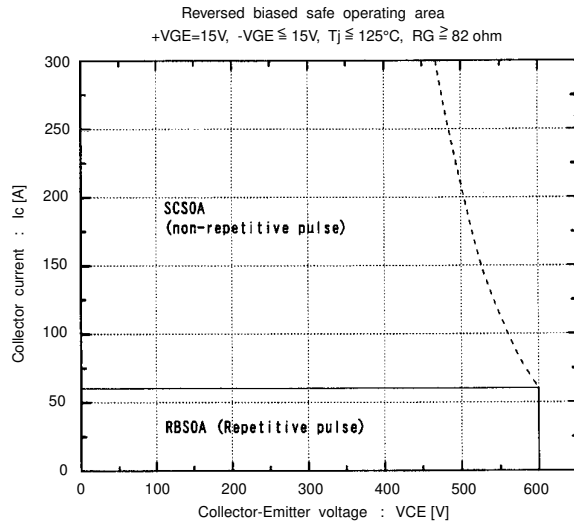
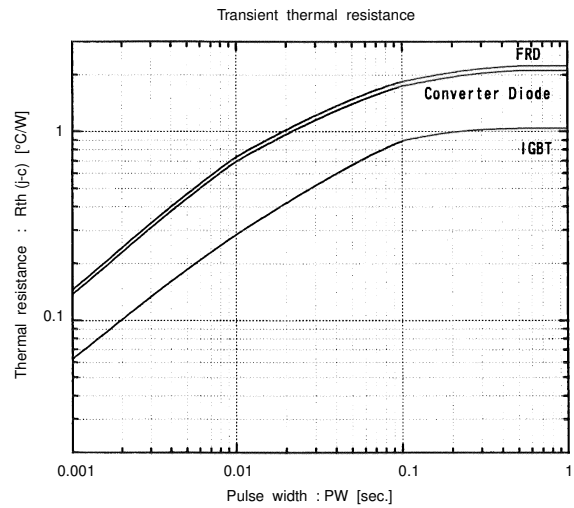
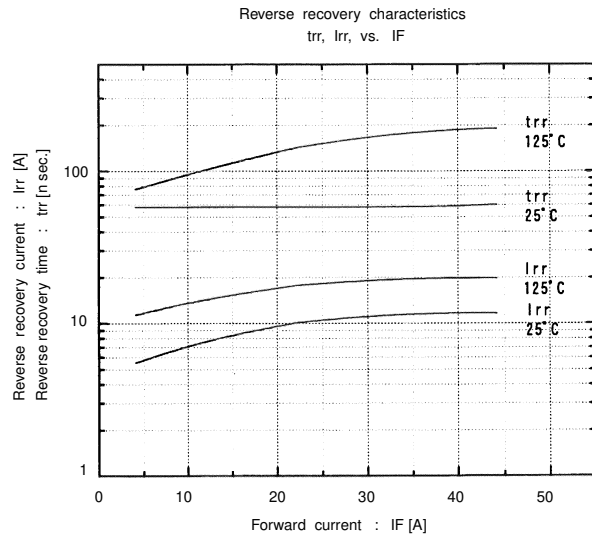
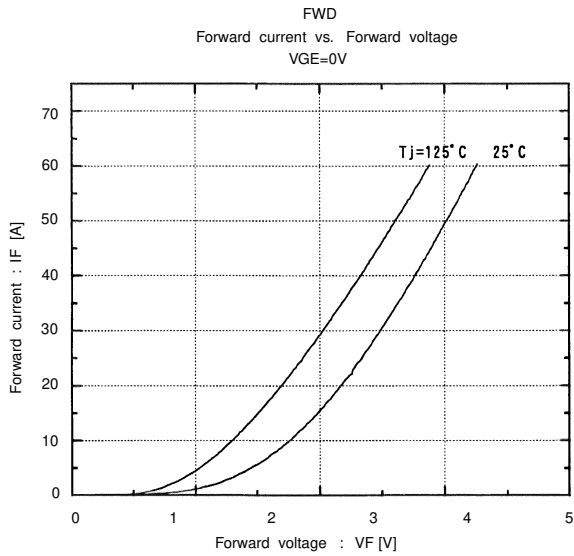
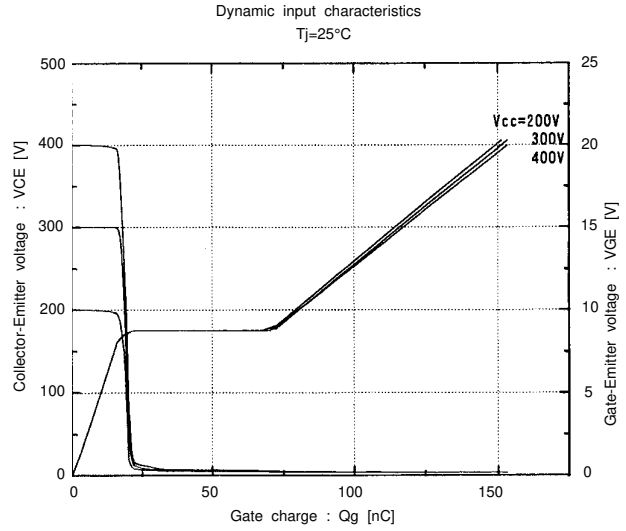
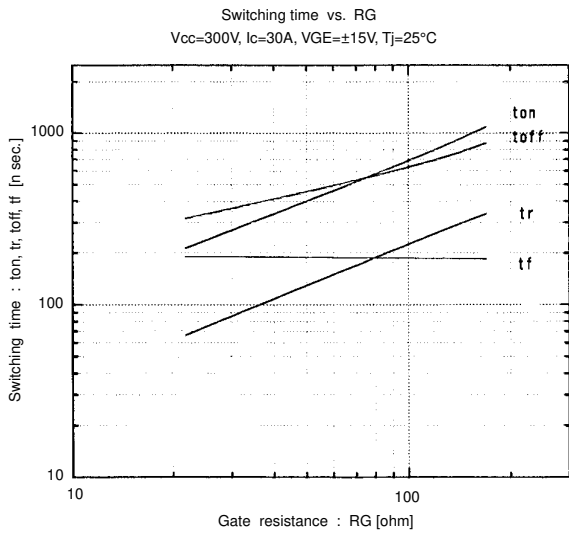


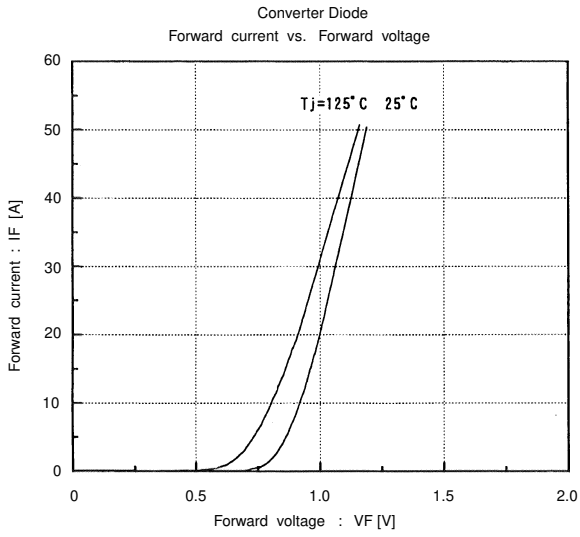
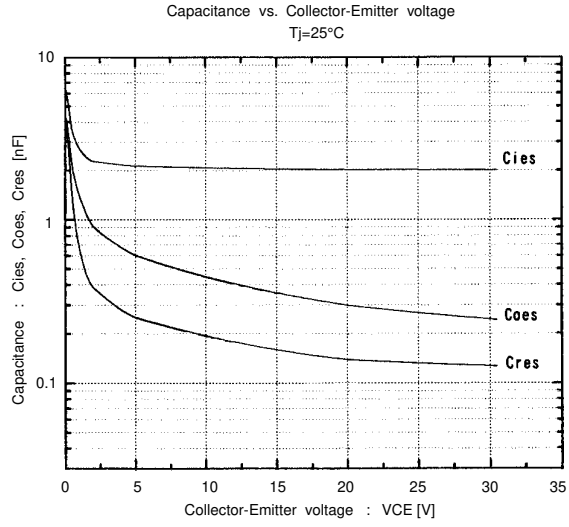
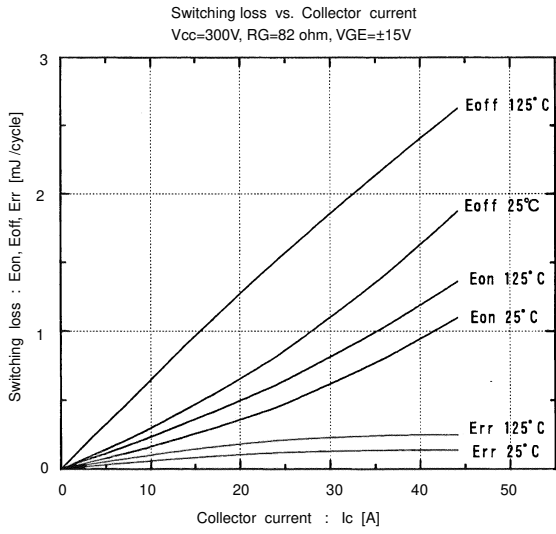
Switching time vs. Collector current  
V<sub>CC</sub>=300V, R<sub>G</sub>=82 ohm, V<sub>GE</sub>=±15V, T<sub>J</sub>=25°C



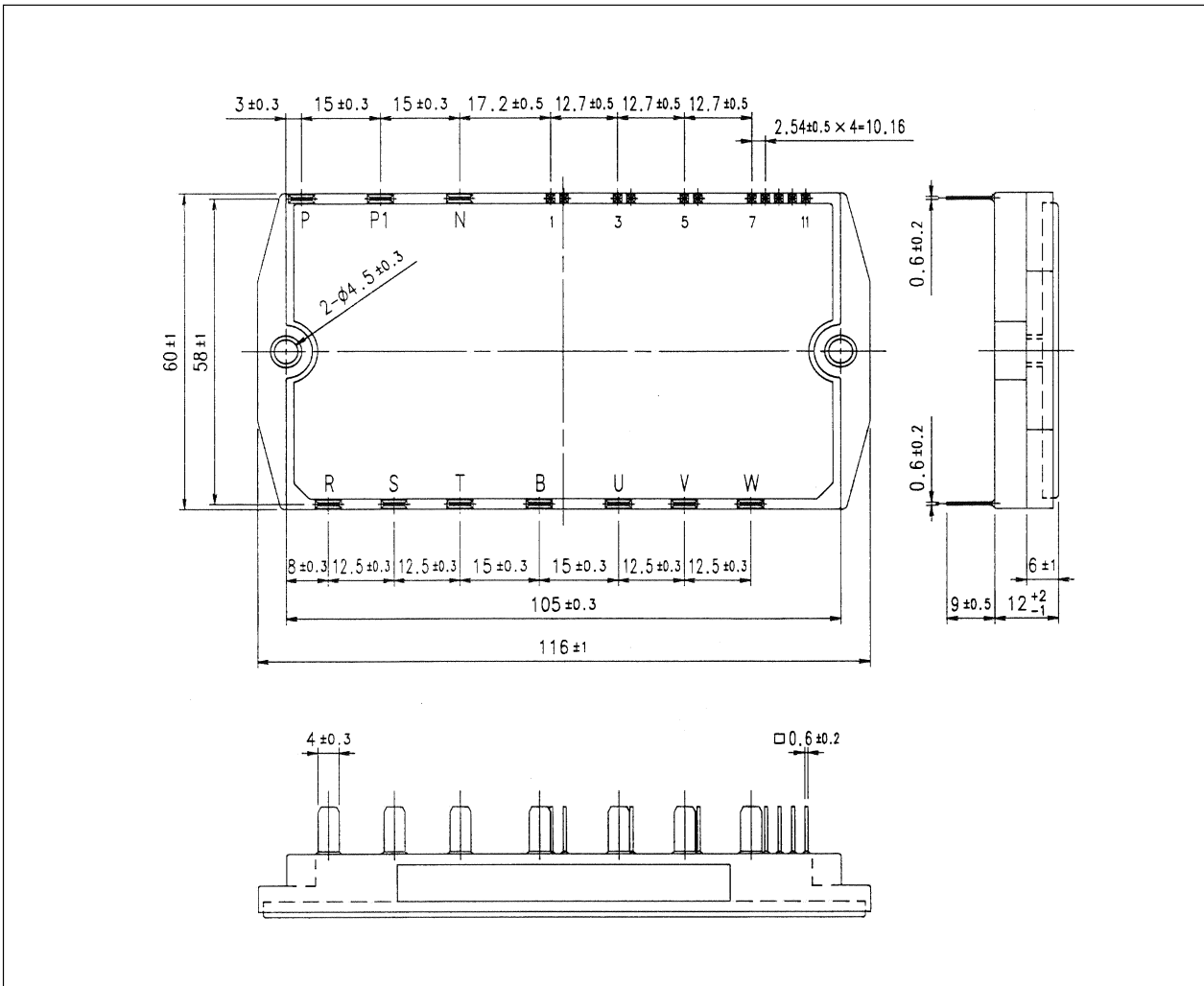
Switching time vs. Collector current  
V<sub>CC</sub>=300V, R<sub>G</sub>=82 ohm, V<sub>GE</sub>=±15V, T<sub>J</sub>=125°C







■ Outline Drawings, mm



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