FUJI ELECTRIC

7MBI 100N-060

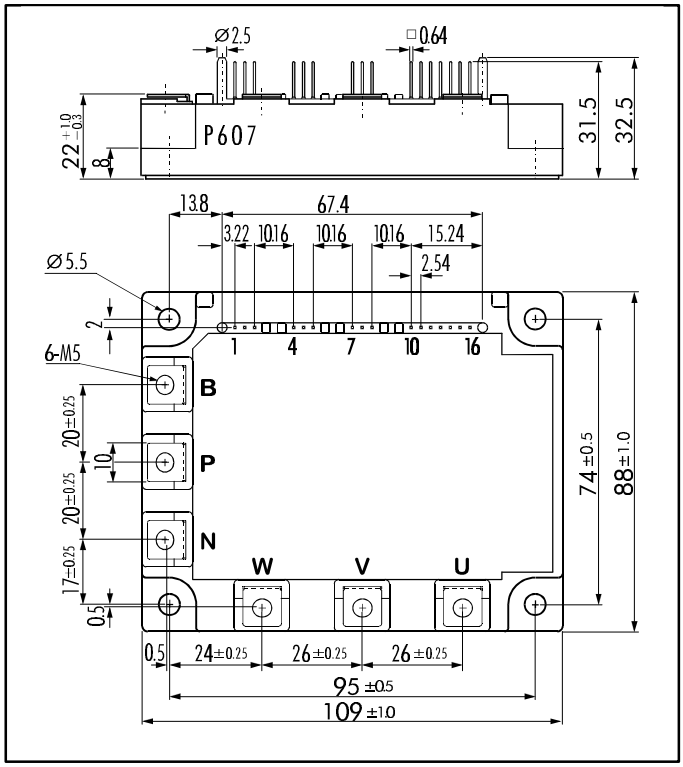
7 in 1 IGBT
600 V
100 A

IGBT MODULE (N series)

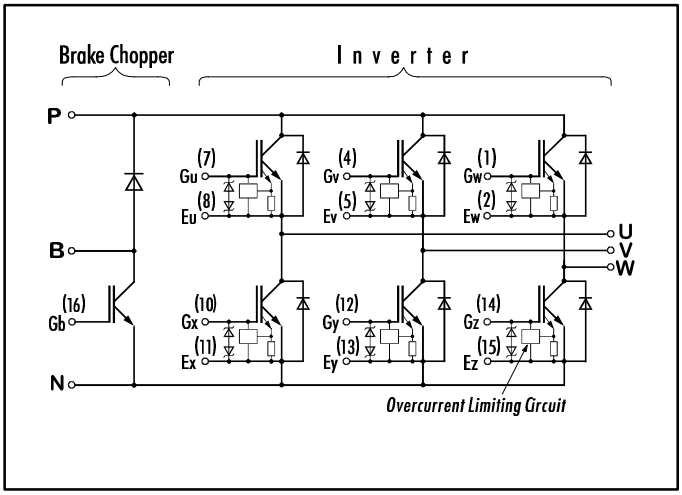
■ Features

- *Including Brake Chopper*
- *Square RBSOA*
- *Low Saturation Voltage*
- *Overcurrent Limiting Function (~ 3 Times Rated Current)*

■ Outline Drawing



■ Equivalent Circuit



■ Absolute Maximum Ratings (T_c=25°C)

	Items	Symbols	Test Conditions	Ratings	Units
Inverter	Collector-Emitter Voltage	V_{CES}		600	V
	Gate -Emitter Voltage	V_{GES}		± 20	
	Collector Current	I_C	Continuous	100	A
		$I_{C\ PULSE}$	1ms	200	
		$-I_{C\ PULSE}$	Continuous	150	
	Collector Power Dissipation	P_C	1 device	400	W
Brake Chopper IGBT	Collector-Emitter Voltage	V_{CES}		600	V
	Gate -Emitter Voltage	V_{CES}		± 20	
	Collector Current	I_C	Continuous	50	
		$I_{C\ PULSE}$	1ms	100	
	Collector Power Dissipation	P_C	1 device	200	W
Brake Chopper FWD	Repetitive Peak Reverse Voltage	V_{RRM}		600	V
	Average Forward Current	$I_{F(AV)}$		1	
	Surge Current	I_{FSM}	10ms	50	
	Operating Junction Temperature	T_j		+150	
	Storage Temperature	T_{Stg}		-40 ~ +125	
	Isolation Voltage	V_{ISO}	A.C. 1min.	2500	V
	Mounting Screw Torque *1			3.5	
	Terminal Screw Torque *1			3.5	

Note: *1:Recommendable Value; 2.5 ~ 3.5 Nm (M5)

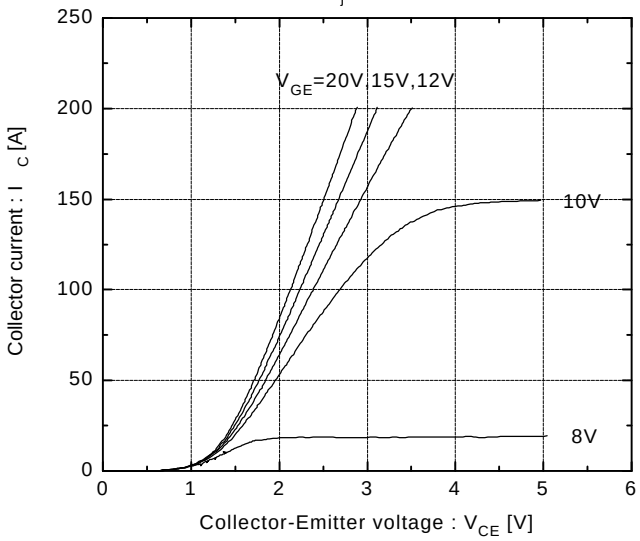
■ Electrical Characteristics(T_j=25°C)

		Items	Symbols	Test Conditions	Min.	Max.	Units
Inverter	IGBT	Zero Gate Voltage Collector Current	I_{CES}	V_{GE}=0V V_{CE}=600V		3.0	mA
		Gate-Emitter Leackage Current	I_{GES}	V_{CE}=0V V_{GE}=± 20V		15	μA
		Gate-Emitter Threshold Voltage	$V_{GE(th)}$	V_{GE}=20V I_C=100mA	4.5	7.5	V
		Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	V_{GE}=15V I_C=100A		2.8	
		Input capacitance	C_{ies}	f=1MHz, V_{GE}=0V, V_{CE}=10V	6600 (typ.)		pF
		Turn-on Time	t_{on}	V_{CC}=300V		1.2	
				I_C =100A			
		Turn-off Time	t_{off}	V_{GE}=±15V		1.5	
			t_f	R_G = 24Ω		0.35	
	FWD	Diode Forward On-Voltage	V_F	I_F=100A V_{GE}=0V		3.3	V
		Reverse Recovery Time	t_{rr}	I_F=100A; V_{GE}=-10V; $-di/dt$=300 A/μs		300	ns
Brake Chopper	IGBT	Zero Gate Voltage Collector Current	I_{CES}	V_{GE}=0V V_{CE}=600V		1.0	mA
		Gate-Emitter Leackage Current	I_{GES}	V_{CE}=0V V_{GE}=± 20V		100	nA
		Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	V_{GE}=15V I_C=50A		2.8	V
		Turn-on Time	t_{on}	V_{CC}=300V		1.2	μs
				I_C = 50A			
		Turn-off Time	t_{off}	V_{GE}=±15V		1.5	
			t_f	R_G = 51Ω		0.35	
	FWD	Reverse Current	I_{RRM}	V_R=600V		1.0	mA
		Reverse Recovery Time	t_{rr}			600	ns

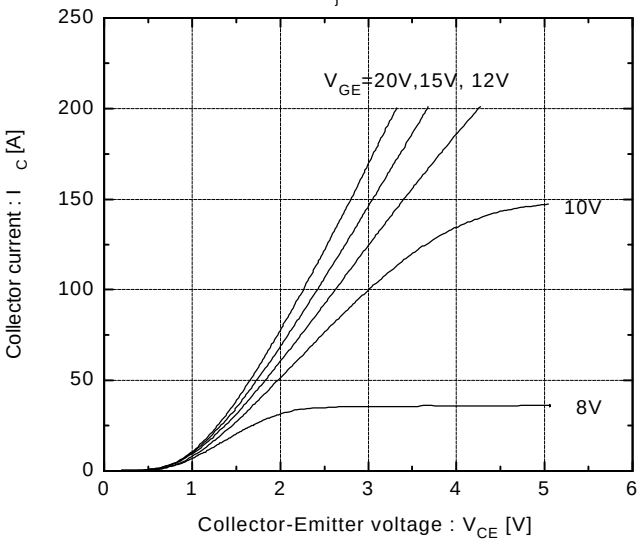
■ Thermal Characteristics

Items	Symbols	Test Conditions	Min.	Max.	Units
Thermal Resistance (1 device)	$R_{th(j-c)}$	Inverter IGBT		0.31	°C/W
		Inverter FRD		0.90	
		Brake IGBT		0.63	
Contact Thermal Resistance	$R_{th(c-f)}$	With Thermal Compound	0.05 (typ.)		

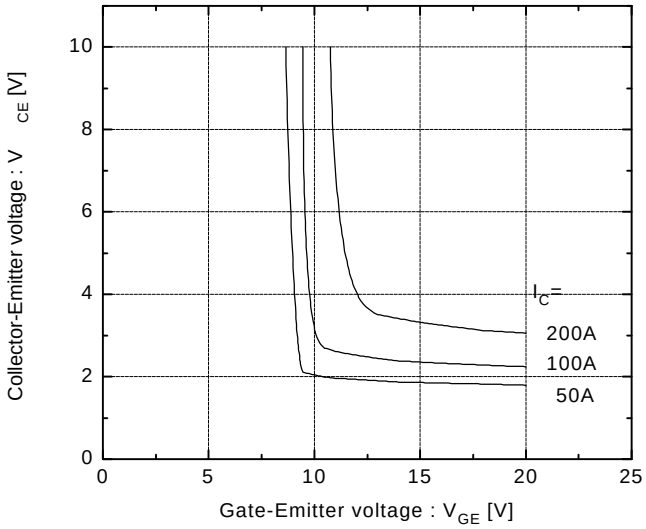
Collector current vs. Collector-Emitter voltage
T_j=25°C



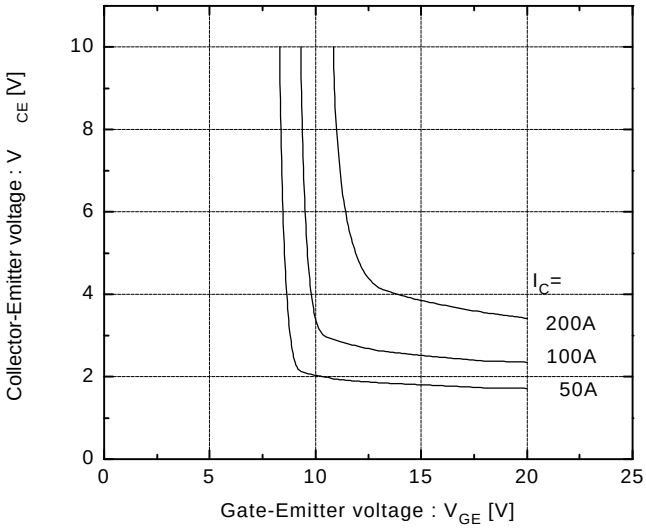
Collector current vs. Collector-Emitter voltage
T_j=125°C



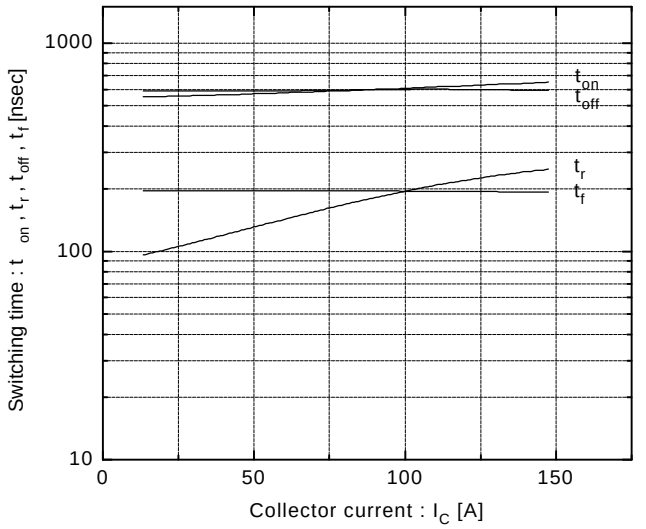
Collector-Emitter vs. Gate-Emitter voltage
T_j=25°C



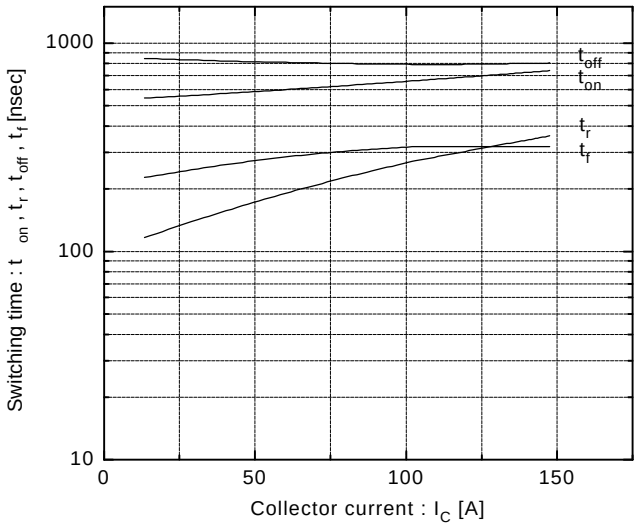
Collector-Emitter vs. Gate-Emitter voltage
T_j=125°C



Switching time vs. Collector current
V_{CC}=300V, R_G=24Ω, V_{GE}=±15V, T_j=25°C

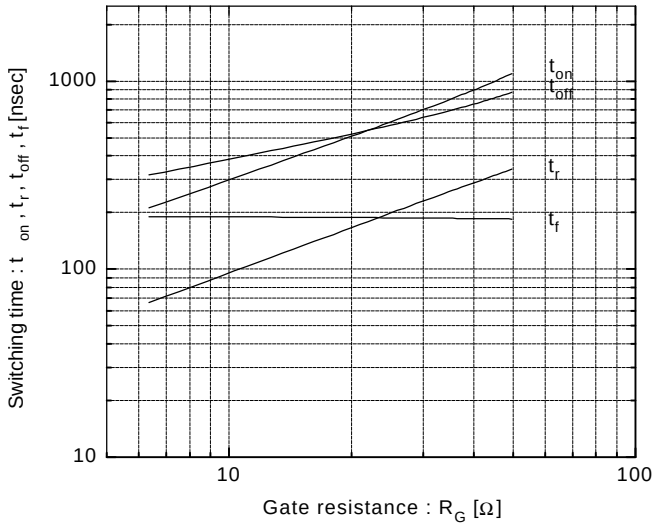


Switching time vs. Collector current
V_{CC}=300V, R_G=24Ω, V_{GE}=±15V, T_j=125°C



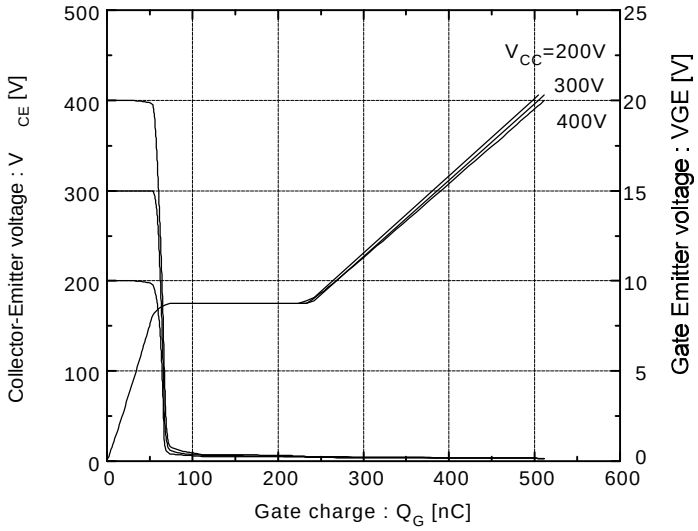
Switching time vs. R_G

V_{CC}=300V, I_C=100A, V_{GE}=±15V, T_j=25°C



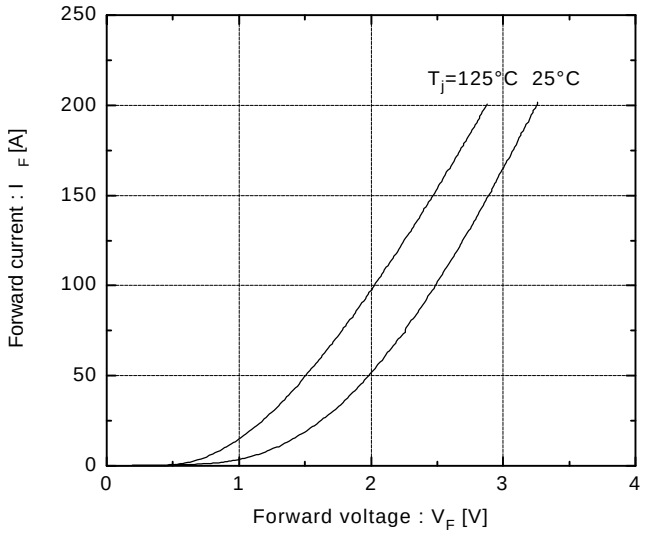
Dynamic input characteristics

T_j=25°C



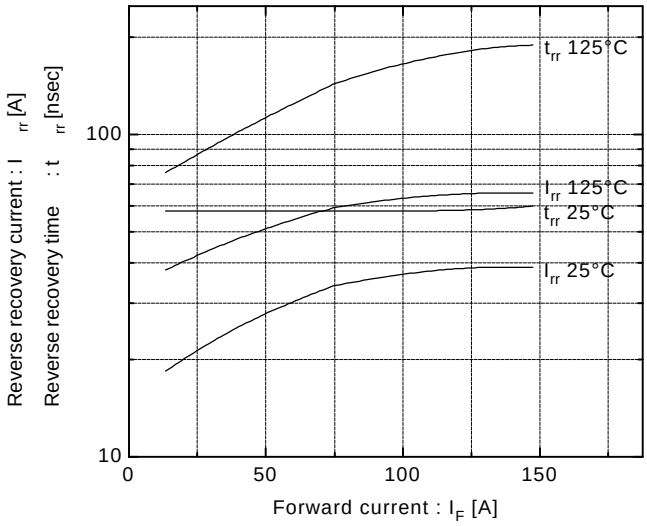
Forward current vs. Forward voltage

V_{GE}=OV

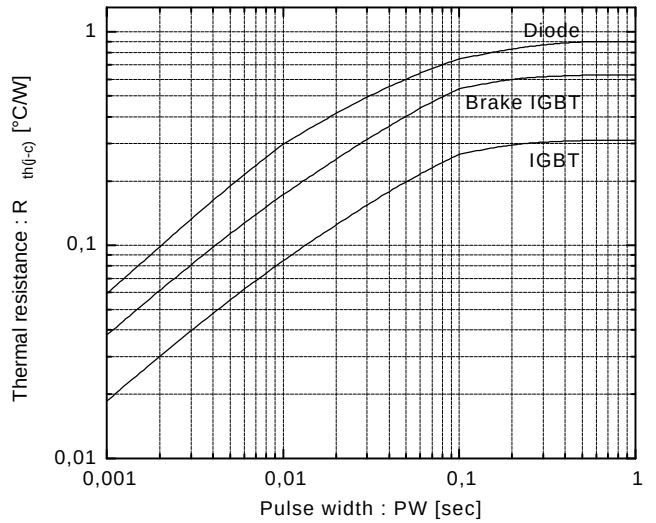


Reverse recovery characteristics

t_{rr} , I_{rr} vs. I_F

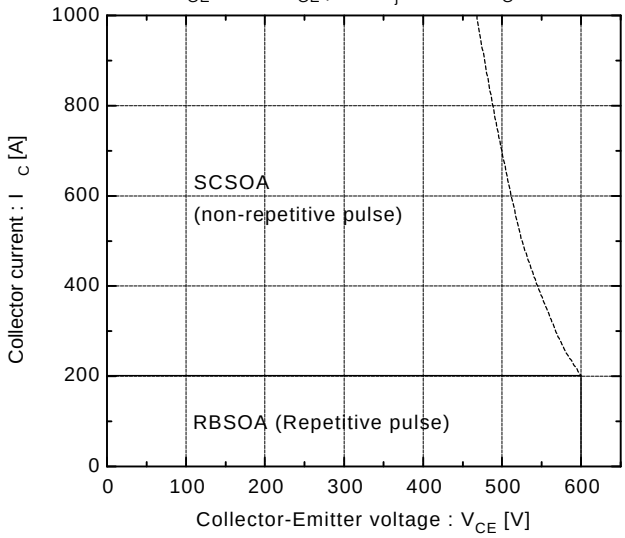


Transient thermal resistance



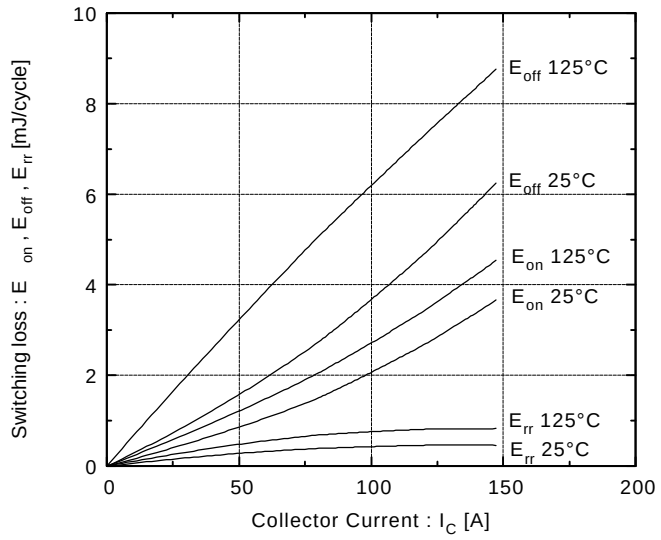
Reversed biased safe operating area

+V_{GE}=15V, -$V_{GE<}$15V, T_j≤125°C, R_G≥24Ω



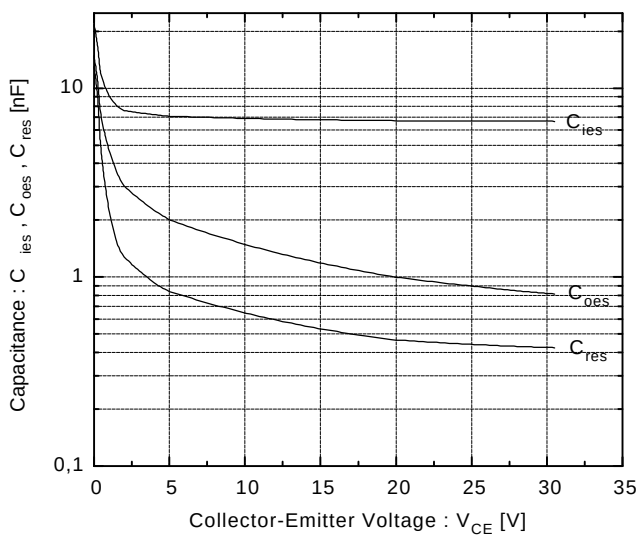
Switching loss vs. Collector current

V_{CC}=300V, R_G=24Ω, V_{GE}=±15V



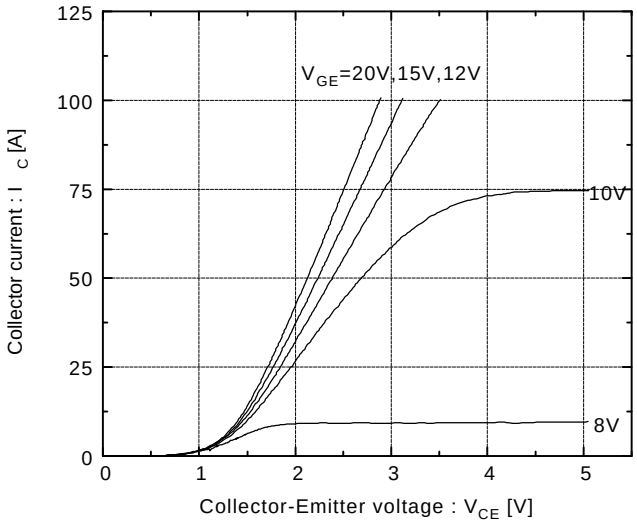
Capacitance vs. Collector-Emitter voltage

T_j=25°C

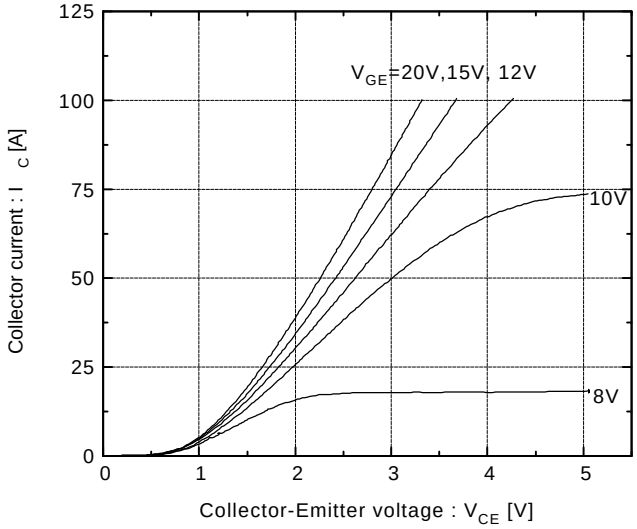


Brake Chopper IGBT

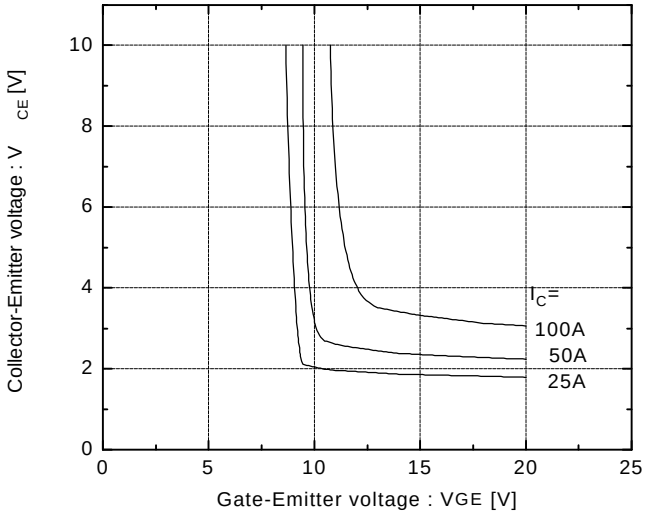
Collector current vs. Collector-Emitter voltage
T_j=25°C



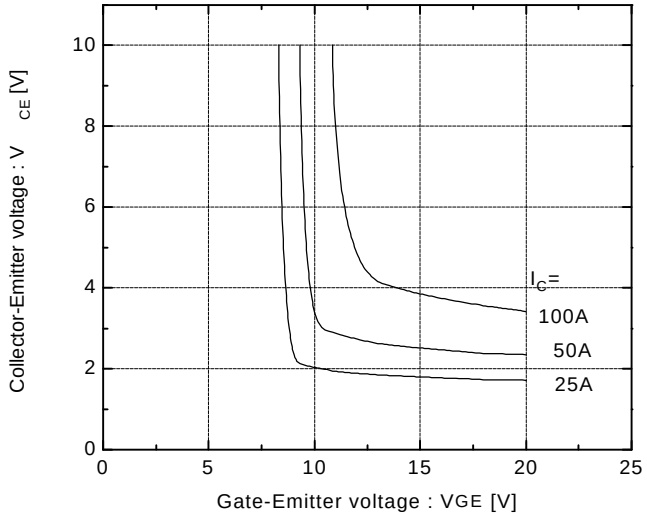
Collector current vs. Collector-Emitter voltage
T_j=125°C



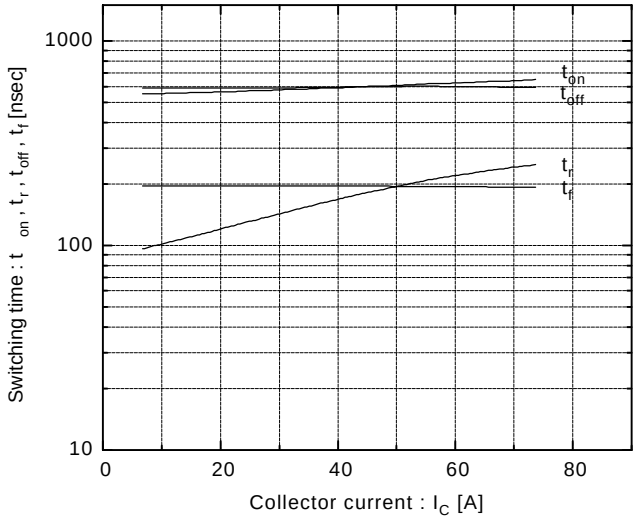
Collector-Emitter vs. Gate-Emitter voltage
T_j=25°C



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



Switching time vs. Collector current
V_{CC}=300V, R_G=51Ω, V_{GE}±15V, T_j=25°C



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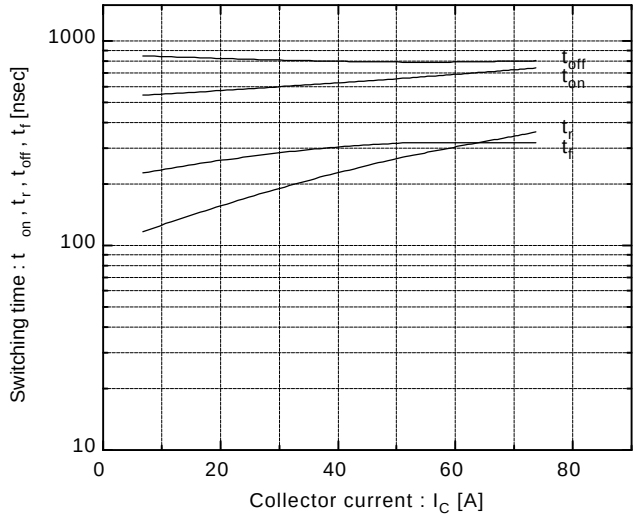
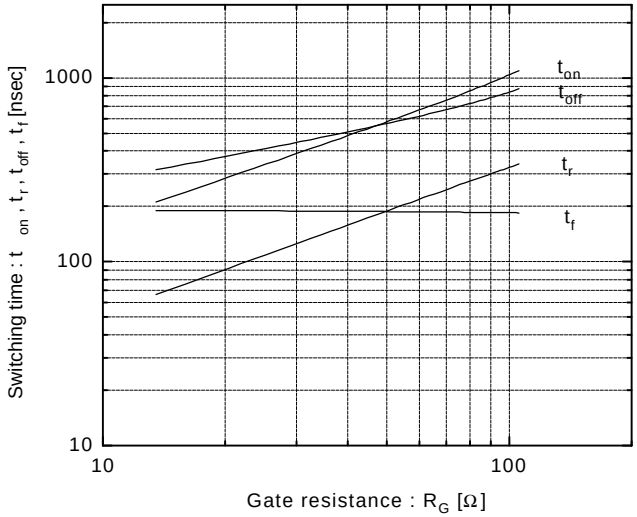
V_{CC}=300V, R_G=51Ω, V_{GE}=±15V, T_j=125°C



Brake Chopper IGBT

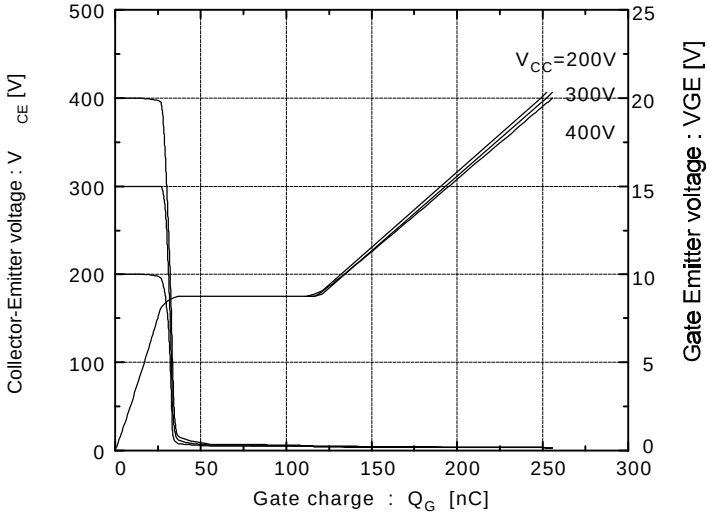
Switching time vs. R_G

V_{CC}=300V, I_C=50A, V_{GE}=±15V, T_j=25°C



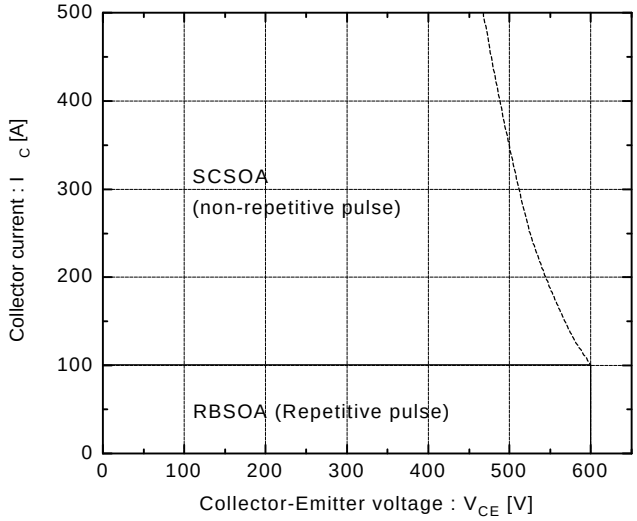
Dynamic input characteristics

T_j=25°C



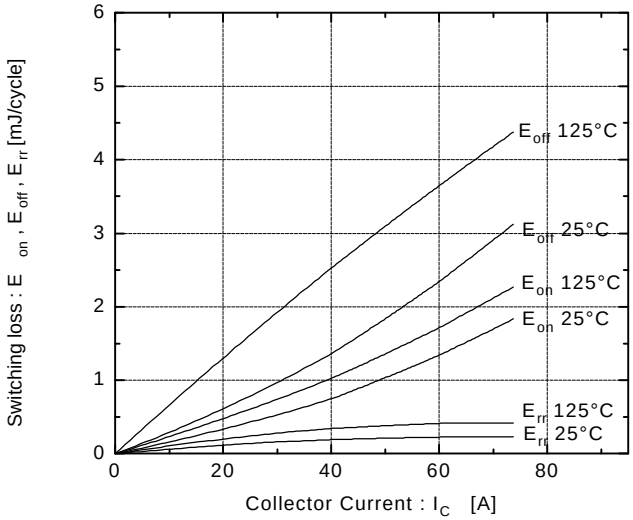
Reversed biased safe operating area

+V_{GE}=15V, -V_{GE}≤15V, T_j≤125°C, R_G≥51Ω



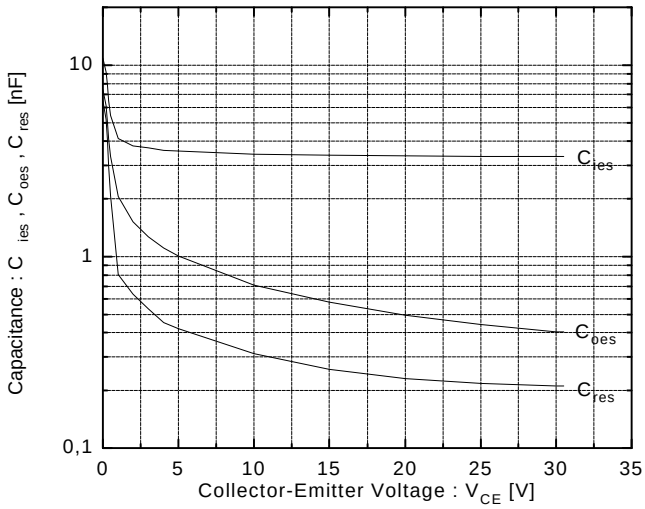
Switching loss vs. Collector current

V_{CC}=300V, R_G=51Ω, V_{GE}=±15V



Capacitance vs. Collector-Emitter voltage

T_j=25°C



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