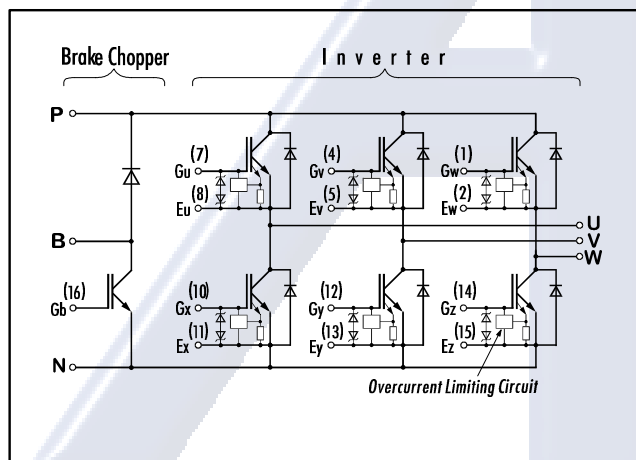
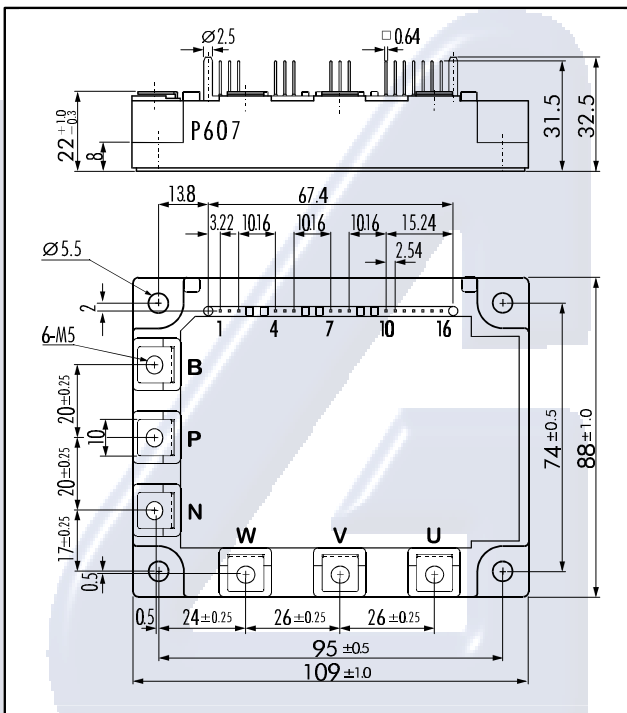


IGBT MODULE (N series)**■ Features**

- Including Brake Chopper
- Square RBSOA
- Low Saturation Voltage
- Overcurrent Limiting Function
(4 ~ 5 Times Rated Current)

■ Equivalent Circuit**■ Outline Drawing****■ Absolute Maximum Ratings (T_c=25°C)**

	Items	Symbols	Test Conditions	Ratings	Units
Inverter	Collector-Emitter Voltage	V _{CES}		1200	V
	Gate -Emitter Voltage	V _{GES}		± 20	
	Collector Current	I _C	Continuous	40	A
		I _{C PULSE}	1ms	80	
		-I _{C PULSE}	Continuous	40	
	Collector Power Dissipation	P _C	1 device	320	W
Brake Chopper IGBT	Collector-Emitter Voltage	V _{CES}		1200	V
	Gate -Emitter Voltage	V _{GES}		± 20	
	Collector Current	I _C	Continuous	15	A
		I _{C PULSE}	1ms	30	
	Collector Power Dissipation	P _C	1 device	120	W
FWD	Repetitive Peak Reverse Voltage	V _{RPM}		1200	V
	Average Forward Current	I _{F(AV)}		1	A
	Surge Current	I _{FSM}	10ms	50	
	Operating Junction Temperature	T _J		+150	°C
	Storage Temperature	T _{Stg}		-40 ~ +125	
	Isolation Voltage	V _{ISO}	A.C. 1min.	2500	V
	Mounting Screw Torque *1			3.5	Nm
	Terminal Screw Torque *1			3.5	

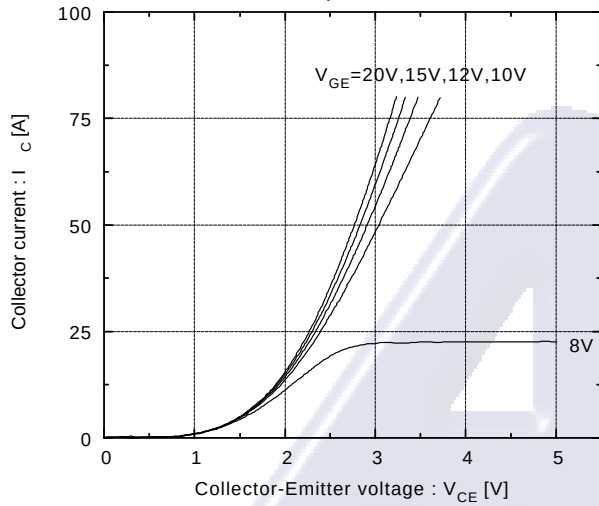
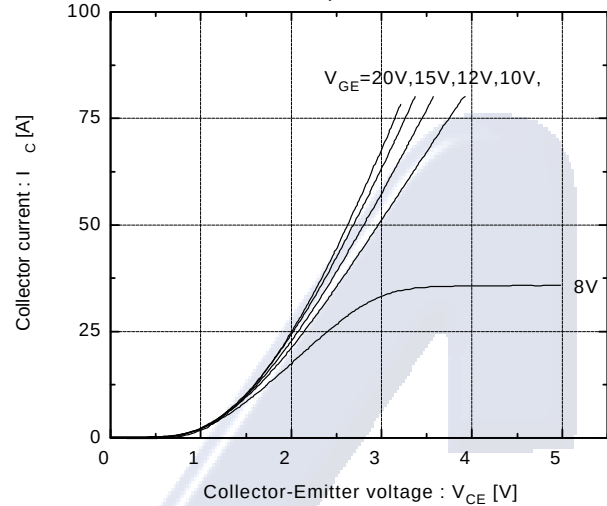
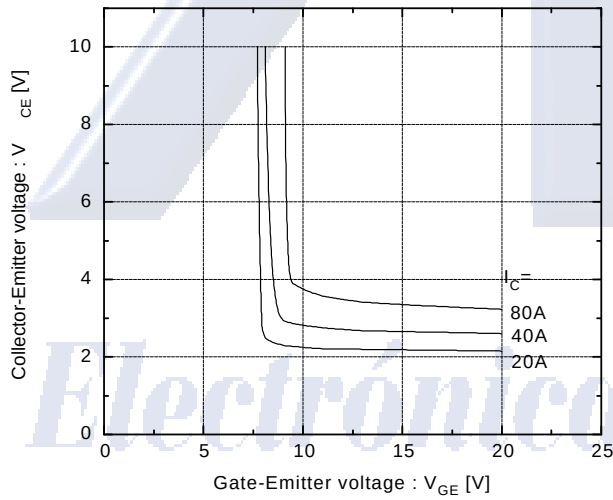
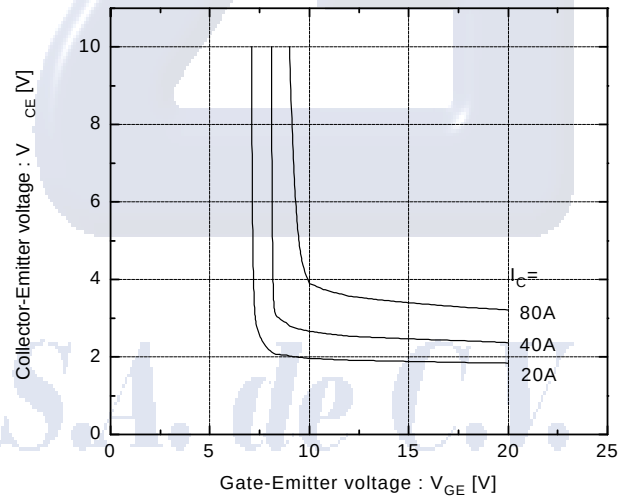
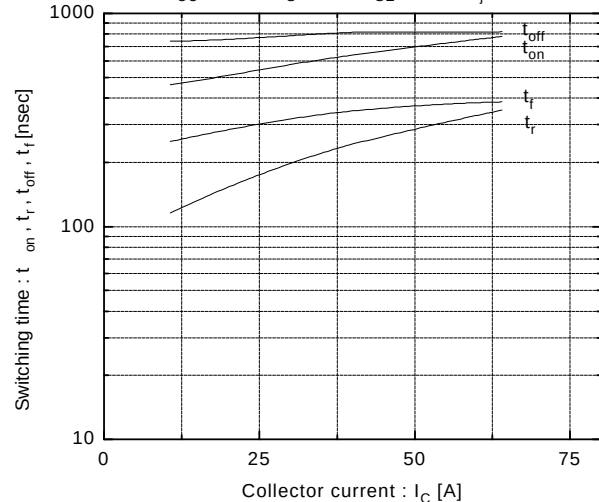
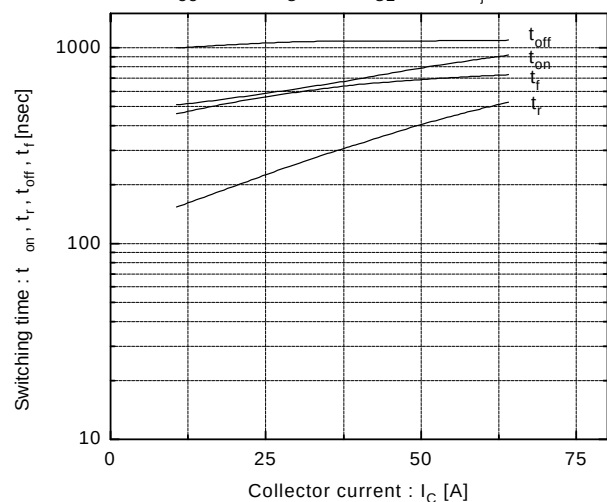
Note: *1:Recommendable Value; 2.5 ~ 3.5 Nm (M5)

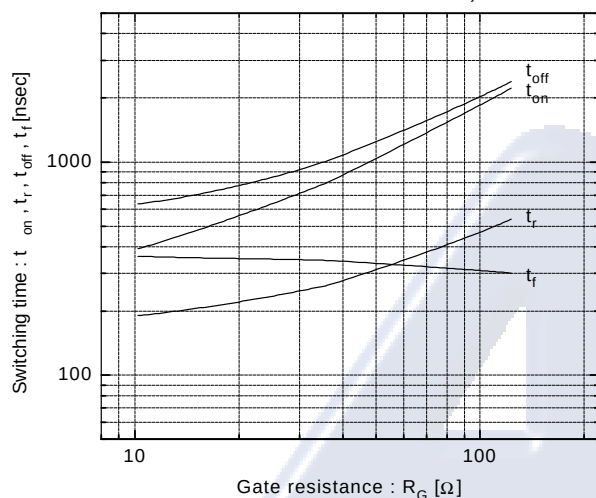
FUJI
ELECTRIC**7MBI 40N-120****7 in 1 IGBT**
1200 V
40 A**■ Electrical Characteristics** ($T_J=25^{\circ}\text{C}$)

	Items	Symbols	Test Conditions	Min.	Max.	Units
Inverter IGBT	Zero Gate Voltage Collector Current	I_{CES}	$V_{GE}=0V$ $V_{CE}=1200V$		3.0	mA
	Gate-Emitter Leakage Current	I_{GES}	$V_{CE}=0V$ $V_{GE}=\pm 20V$		15	μA
	Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$V_{GE}=20V$ $I_C=40\text{mA}$	4.5	7.5	V
	Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_{GE}=15V$ $I_C=40A$		3.3	V
	Input capacitance	C_{ies}	$f=1\text{MHz}$, $V_{GE}=0V$, $V_{CE}=10V$	6200 (typ.)		pF
	Turn-on Time	t_{on}	$V_{CC}=600V$ $I_C = 40A$		1.2	μs
	Turn-off Time	t_{off}	$V_{GE}=\pm 15V$		1.5	
		t_f	$R_G = 24\Omega$		0.5	
	Diode Forward On-Voltage	V_F	$I_F=40A$ $V_{GE}=0V$		3.0	V
	Reverse Recovery Time	t_{rr}	$I_F=40A$; $V_{GE}=-10V$; $\frac{di}{dt}=120 \frac{\text{A}}{\mu\text{s}}$		350	ns
Brake Chopper IGBT	Zero Gate Voltage Collector Current	I_{CES}	$V_{GE}=0V$ $V_{CE}=1200V$		1.0	mA
	Gate-Emitter Leakage Current	I_{GES}	$V_{CE}=0V$ $V_{GE}=\pm 20V$		100	nA
	Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_{GE}=15V$ $I_C=15A$		3.3	V
	Turn-on Time	t_{on}	$V_{CC}=600V$ $I_C = 15A$		1.2	μs
	Turn-off Time	t_{off}	$V_{GE}=\pm 15V$		1.5	
		t_f	$R_G = 82\Omega$		0.5	
	Reverse Current	I_{RRM}	$V_R=1200V$		1.0	mA
FWD	Reverse Recovery Time	t_{rr}			600	ns

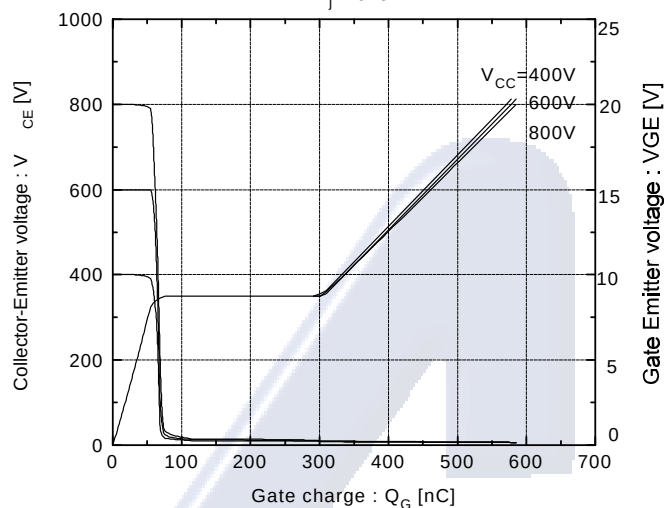
*Electrónica S.A. de C.V.***■ Thermal Characteristics**

Items	Symbols	Test Conditions	Min.	Max.	Units
Thermal Resistance (1 device)	$R_{th(j-c)}$	Inverter IGBT		0.39	$^{\circ}\text{C/W}$
		Inverter FRD		0.85	
		Brake IGBT		1.04	
Contact Thermal Resistance	$R_{th(c-f)}$	With Thermal Compound	0.05 (typ.)		

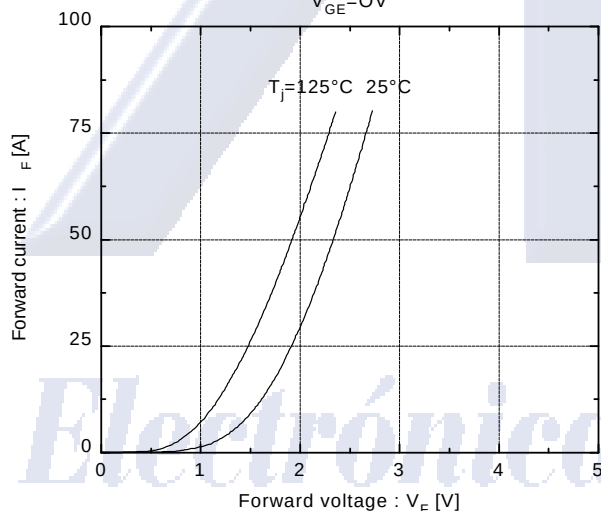
FUJI
ELECTRIC**7MBI 40N-120****7 in 1 IGBT**
1200 V
40 ACollector current vs. Collector-Emittter voltage
 $T_J = 25^\circ\text{C}$ Collector current vs. Collector-Emittter voltage
 $T_J = 125^\circ\text{C}$ Collector-Emittter vs. Gate-Emittter voltage
 $T_J = 25^\circ\text{C}$ Collector-Emittter vs. Gate-Emittter voltage
 $T_J = 125^\circ\text{C}$ Switching time vs. Collector current
 $V_{CC} = 600\text{V}, R_G = 24\Omega, V_{GE} = \pm 15\text{V}, T_J = 25^\circ\text{C}$ Switching time vs. Collector current
 $V_{CC} = 600\text{V}, R_G = 24\Omega, V_{GE} = \pm 15\text{V}, T_J = 125^\circ\text{C}$ 

FUJI
ELECTRIC**7MBI 40N-120****7 in 1 IGBT**
1200 V
40 ASwitching time vs. R_G $V_{CC}=600V$, $I_C=40A$, $V_{GE}=\pm 15V$, $T_J=25^\circ C$ 

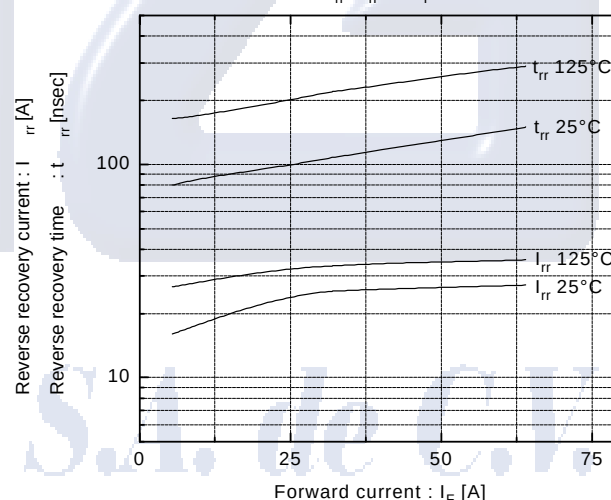
Dynamic input characteristics

 $T_J=25^\circ C$ 

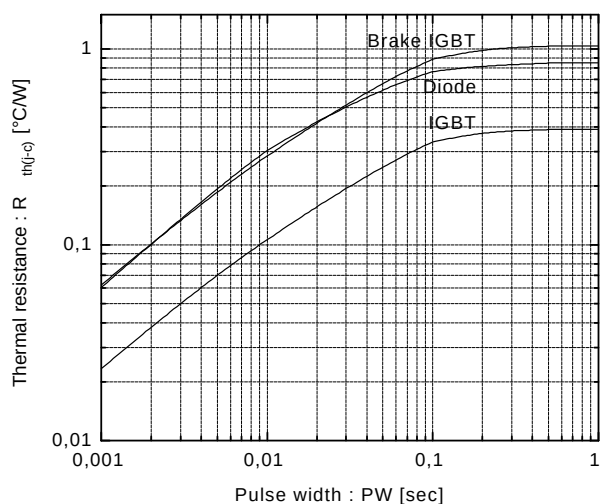
Forward current vs. Forward voltage

 $V_{GE}=0V$ 

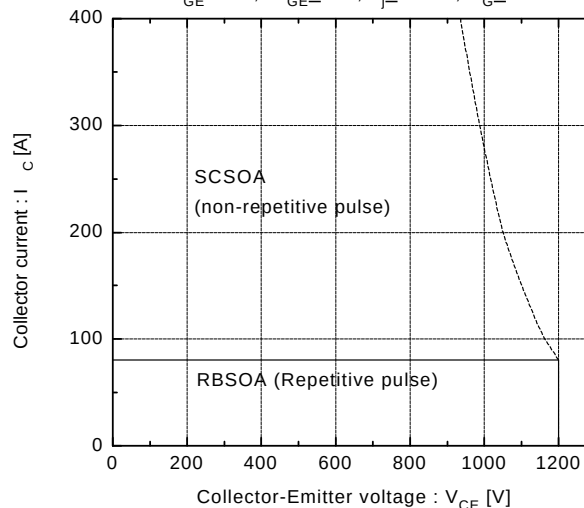
Reverse recovery characteristics

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

Transient thermal resistance

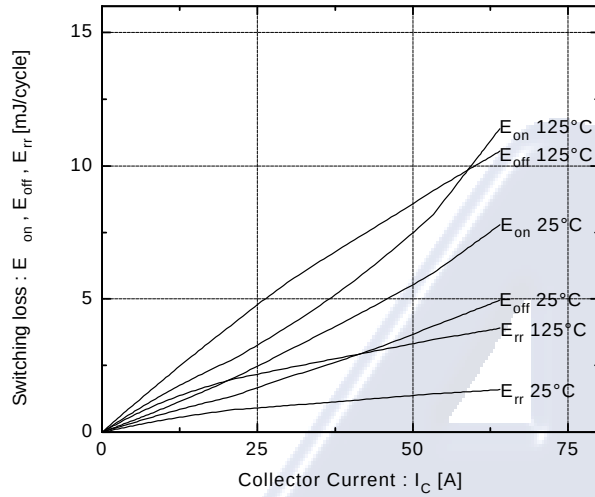


Reversed biased safe operating area

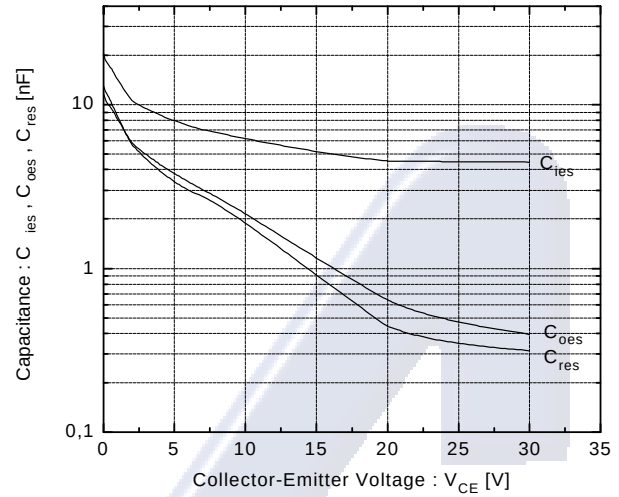
 $+V_{GE}=15V$, $-V_{GE}\leq 15V$, $T_J\leq 125^\circ C$, $R_G\geq 24\Omega$ 

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ELECTRIC**7MBI 40N-120****7 in 1 IGBT**
1200 V
40 A

Switching loss vs. Collector current

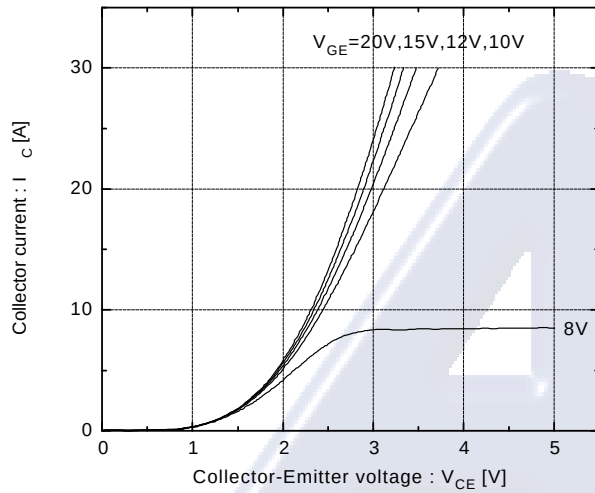
 $V_{CC}=600V$, $R_G=24\Omega$, $V_{GE}=\pm 15V$ 

Capacitance vs. Collector-Emitter voltage

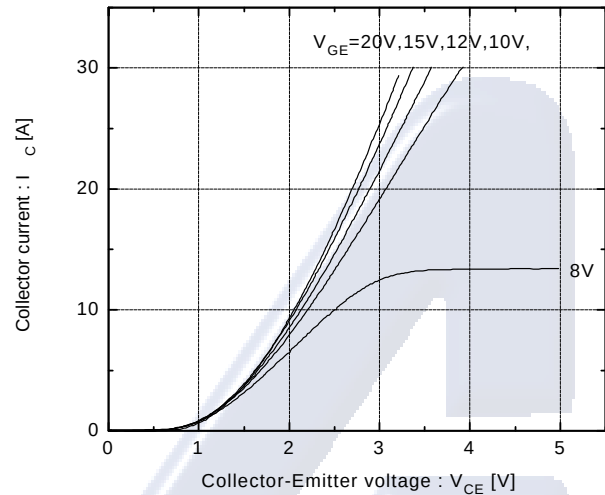
 $T_J=25^\circ C$ *Electrónica S.A. de C.V.*

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ELECTRIC**7MBI 40N-120****7 in 1 IGBT**
1200 V
40 A**Brake Chopper IGBT**

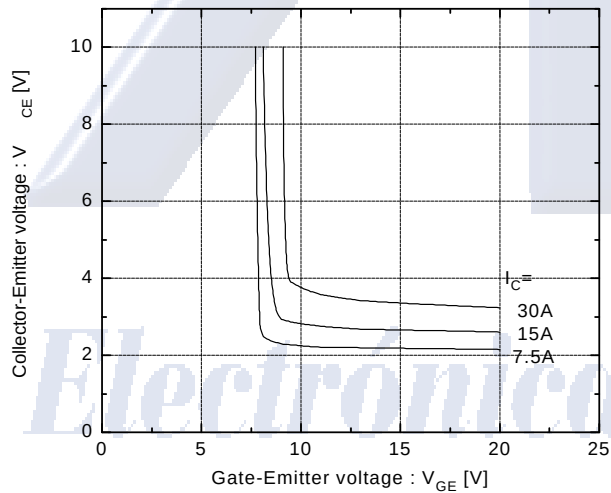
Collector current vs. Collector-Emittor voltage

 $T_J = 25^\circ\text{C}$ 

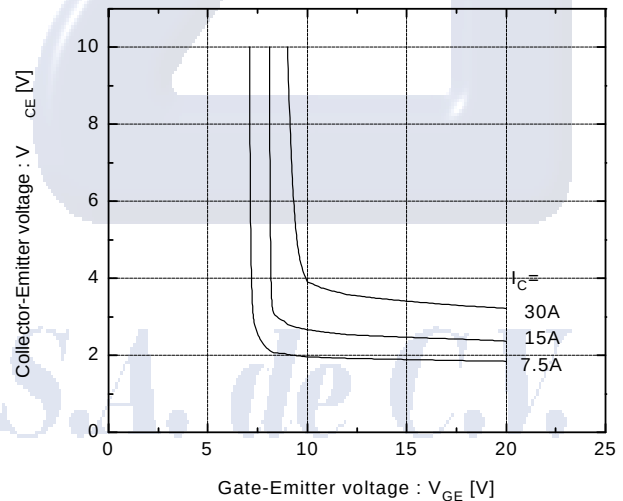
Collector current vs. Collector-Emittor voltage

 $T_J = 125^\circ\text{C}$ 

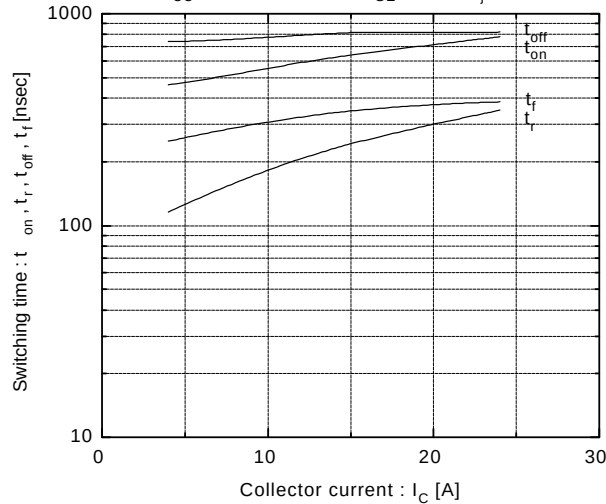
Collector-Emittor vs. Gate-Emittor voltage

 $T_J = 25^\circ\text{C}$ 

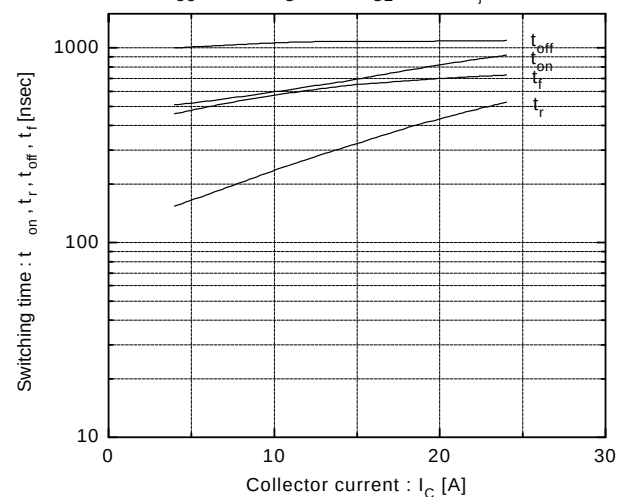
Collector-Emittor vs. Gate-Emittor voltage

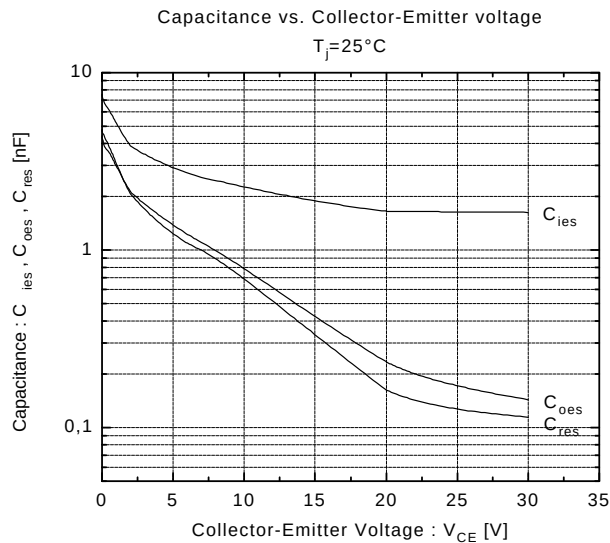
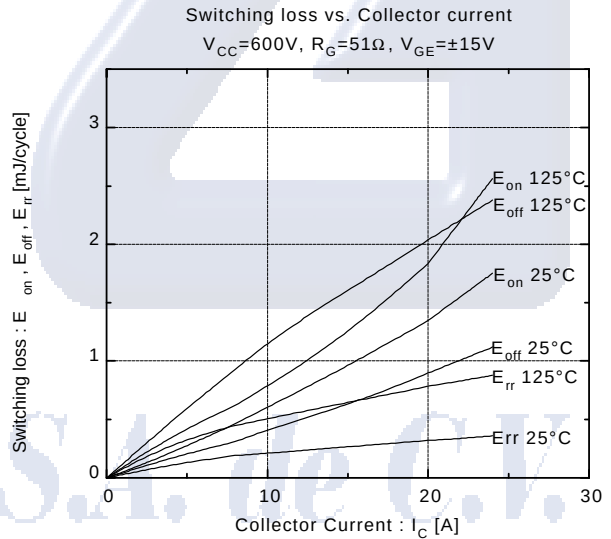
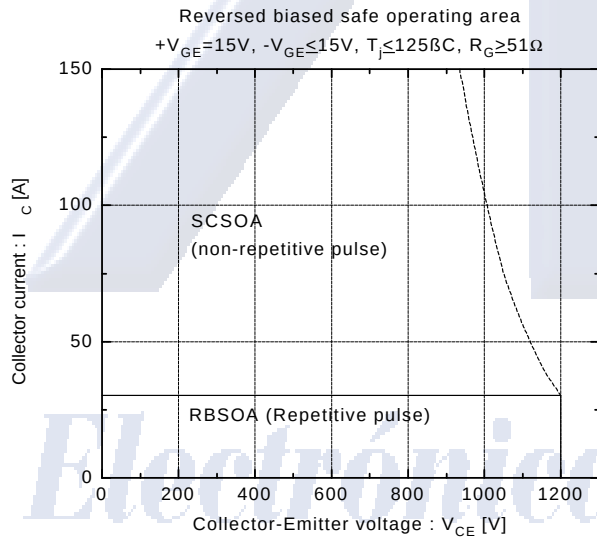
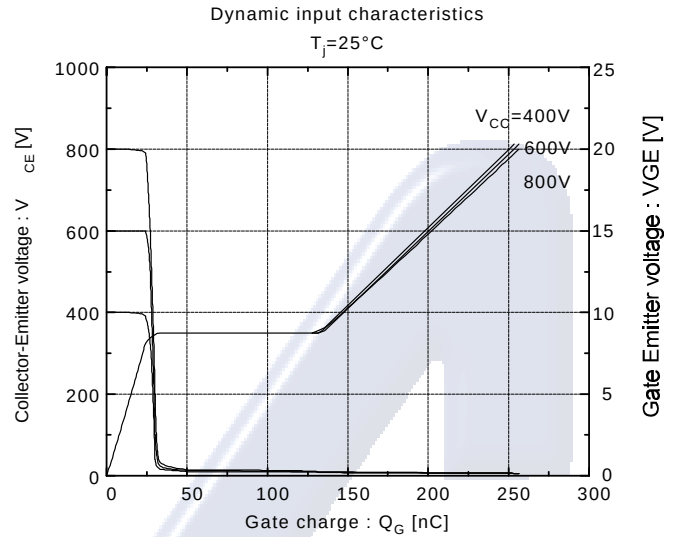
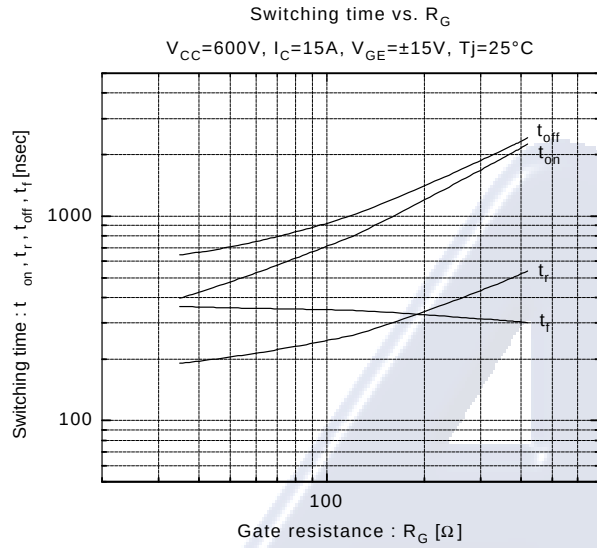
 $T_J = 125^\circ\text{C}$ 

Switching time vs. Collector current

 $V_{CC} = 600\text{V}, R_G = 82\Omega, V_{GE} = \pm 15\text{V}, T_J = 25^\circ\text{C}$ 

Switching time vs. Collector current

 $V_{CC} = 600\text{V}, R_G = 82\Omega, V_{GE} = \pm 15\text{V}, T_J = 125^\circ\text{C}$ 

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ELECTRIC**7MBI 40N-120****7 in 1 IGBT**
1200 V
40 A**Brake Chopper IGBT**

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7MBI 40N-120

7 in 1 IGBT
1200 V
40 A

AG

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