FUJI ELECTRIC

2MBI 300N-060

2-Pack IGBT
600 V
300 A

IGBT MODULE (N series)

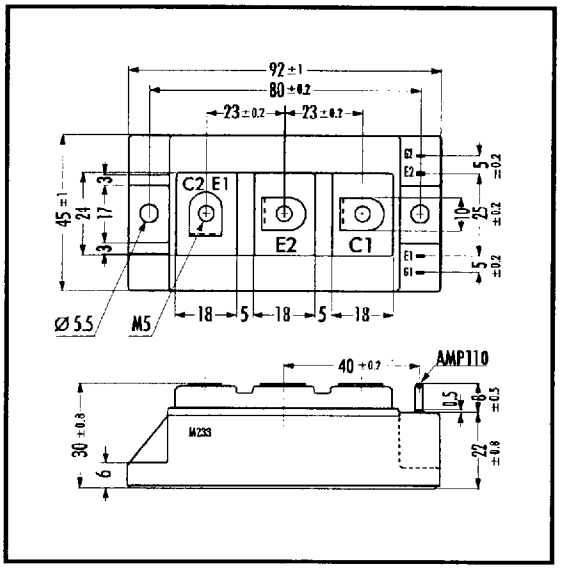
n Features

- *Square RBSOA*
- *Low Saturation Voltage*
- *Less Total Power Dissipation*
- *Improved FWD Characteristic*
- *Minimized Internal Stray Inductance*
- *Overcurrent Limiting Function (~3 Times Rated Current)*

n Applications

- *High Power Switching*
- *A.C. Motor Controls*
- *D.C. Motor Controls*
- *Uninterruptible Power Supply*

n Outline Drawing



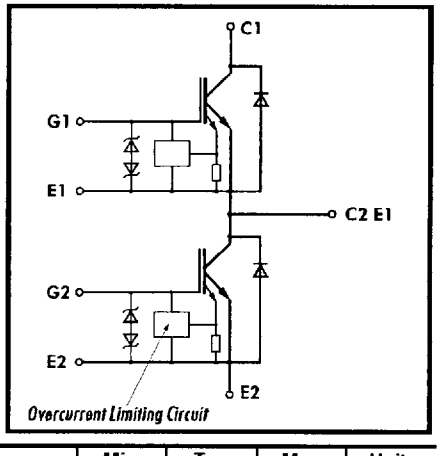
n Maximum Ratings and Characteristics

•Absolute Maximum Ratings (T_c=25°C)

Items		Symbols	Ratings	Units
Collector-Emitter Voltage		V_{CES}	600	V
Gate -Emitter Voltage		V_{GES}	± 20	V
Collector Current	Continuous	I_C	300	A
	1ms	$I_{C\ PULSE}$	600	
	Continuous	$-I_C$	300	
	1ms	$-I_{C\ PULSE}$	600	
Max. Power Dissipation		P_C	1100	W
Operating Temperature		T_j	+150	°C
Storage Temperature		T_{stg}	-40 ~ +125	°C
Isolation Voltage	A.C. 1min.	V_{is}	2500	V
Screw Torque		Mounting *1	3.5	Nm
		Terminals *1	3.5	

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

n Equivalent Circuit



•Electrical Characteristics (at T_j=25°C)

Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Zero Gate Voltage Collector Current	I_{CES}	V_{GE}=0V V_{CE}=600V			2.0	mA
Gate-Emitter Leackage Current	I_{GES}	V_{CE}=0V V_{GE}=± 20V			30	µA
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	V_{CE}=20V I_C=300mA	4.5		7.5	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	V_{GE}=15V I_C=300A			2.8	V
Input capacitance	C_{ies}	V_{GE}=0V		19800		pF
Output capacitance	C_{oes}	V_{CE}=10V		4400		
Reverse Transfer capacitance	C_{res}	f=1MHz		2000		
Turn-on Time	t_{ON}	V_{CC}=300V		0.6	1.2	µs
	t_r	I_C=300A		0.2	0.6	
Turn-off Time	t_{OFF}	V_{GE}=± 15V		0.6	1.0	
	t_f	R_G=6.8Ω		0.2	0.35	
Diode Forward On-Voltage	V_F	I_F=300A V_{GE}=0V			3.0	V
Reverse Recovery Time	t_{rr}	I_F=300A			300	ns

•Thermal Characteristics

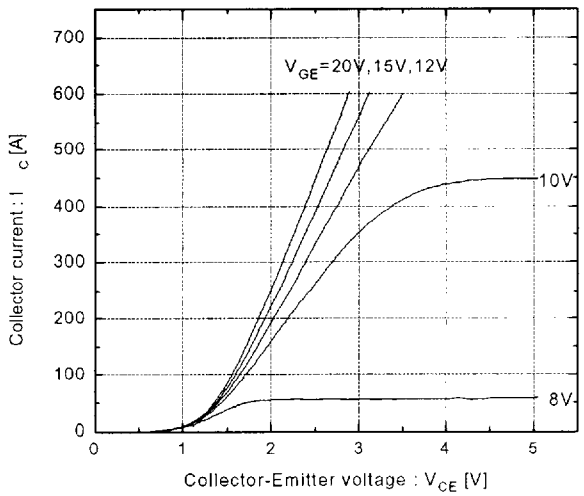
Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance	$R_{th(j-c)}$	IGBT			0.11	°C/W
	$R_{th(j-c)}$	Diode			0.24	
	$R_{th(c-f)}$	With Thermal Compound		0.025		

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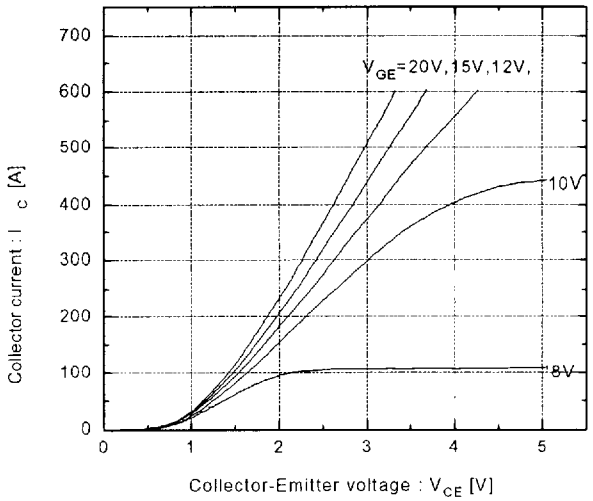
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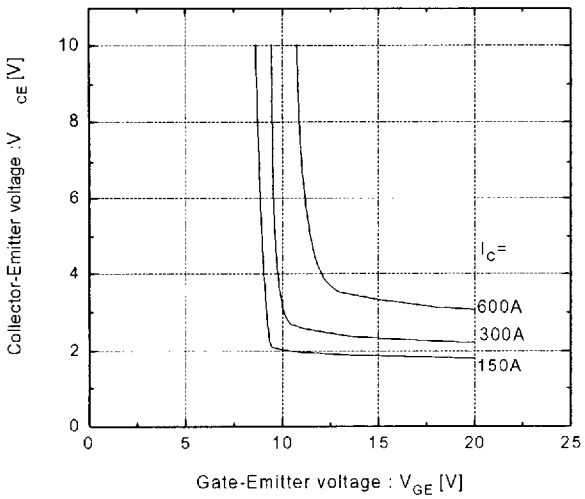
Collector current vs. Collector-Emitter voltage
T_j=25°C



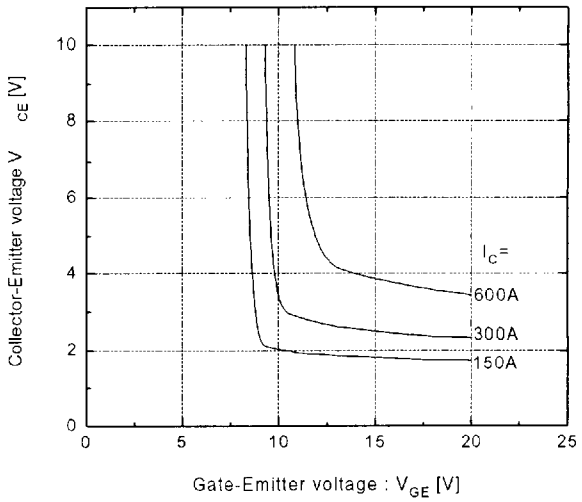
Collector current vs. Collector-Emitter voltage
T_j=125°C



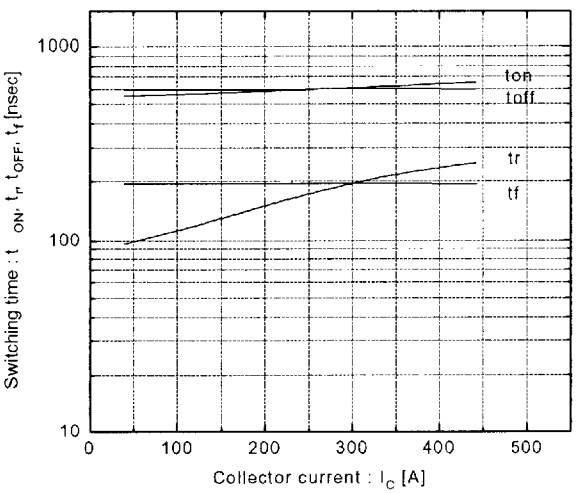
Collector-Emitter vs. Gate-Emitter voltage
T_j=25°C



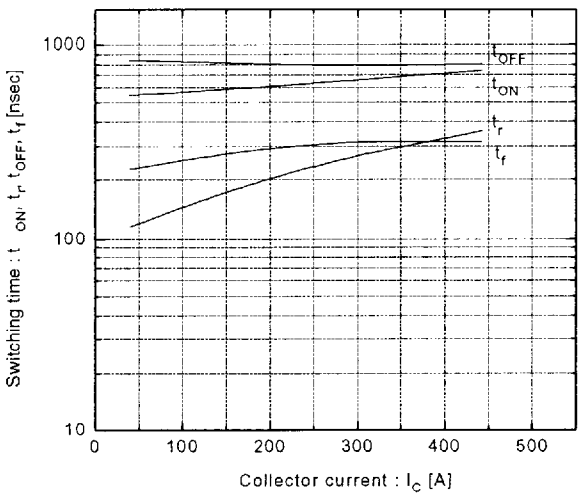
Collector-Emitter vs. Gate-Emitter voltage
T_j=125°C



Switching time vs. Collector current
V_{CC}=300V, R_G=6.8Ω, V_{GE}=±15V, T_j=25°C



Switching time vs. Collector current
V_{CC}=300V, R_G=6.8Ω, V_{GE}=±15V, T_j=125°C



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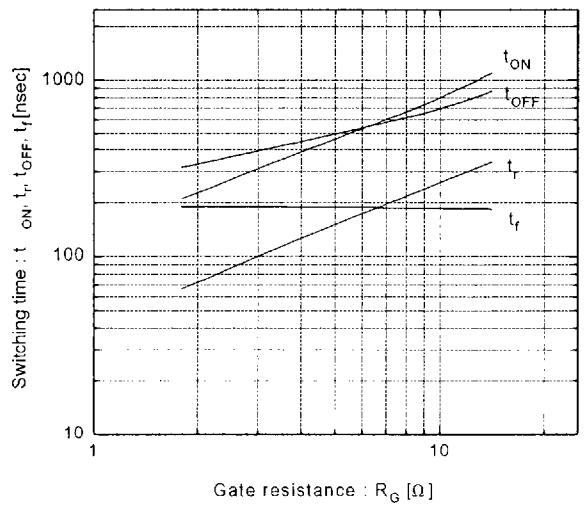
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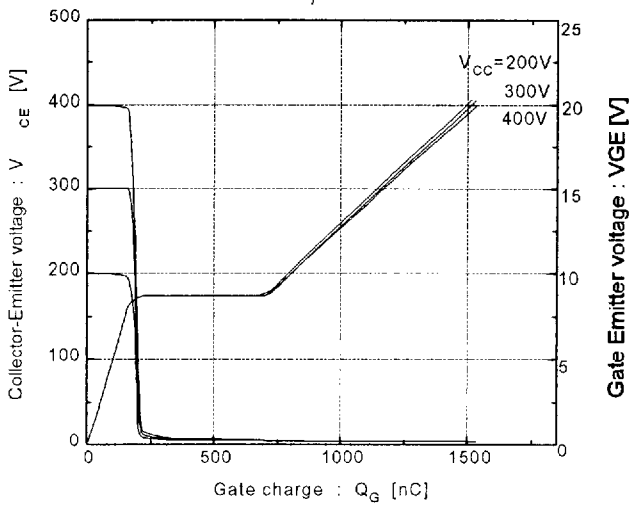
Switching time vs. R_G

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



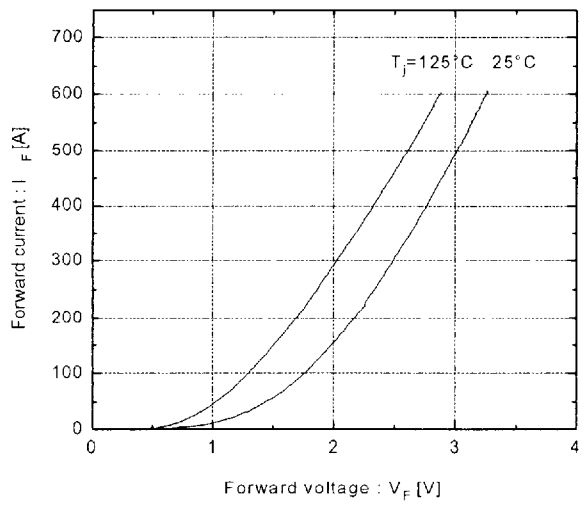
Dynamic input characteristics

T_j=25°C



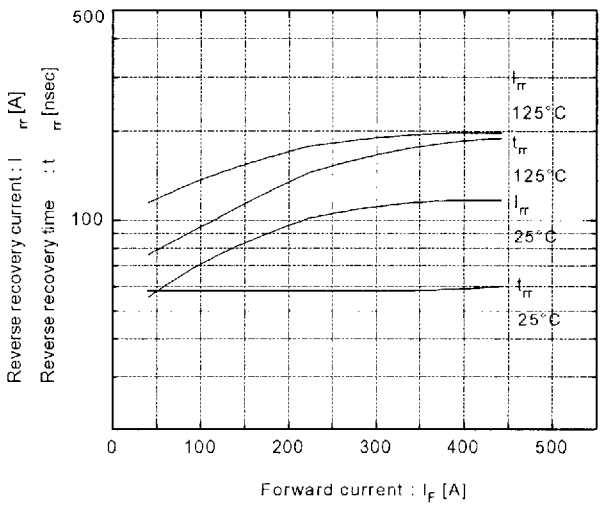
Forward current vs. Forward voltage

V_{GE}=OV

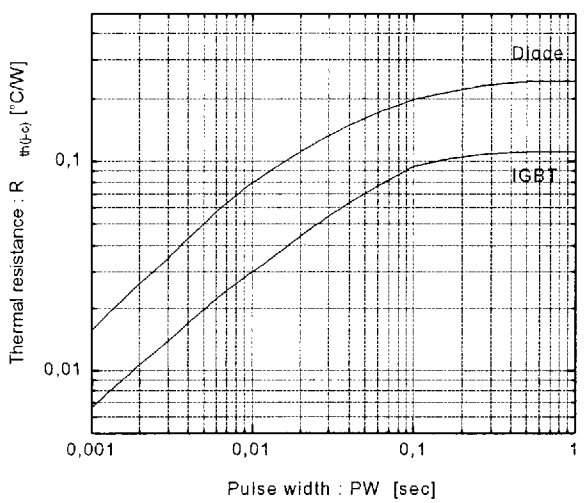


Reverse recovery characteristics

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

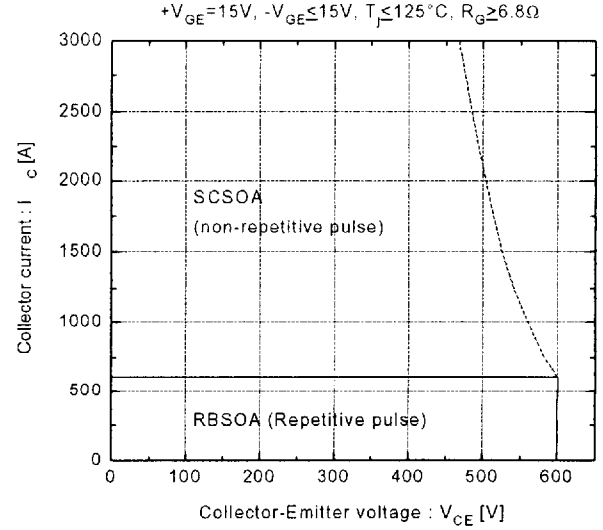


Transient thermal resistance



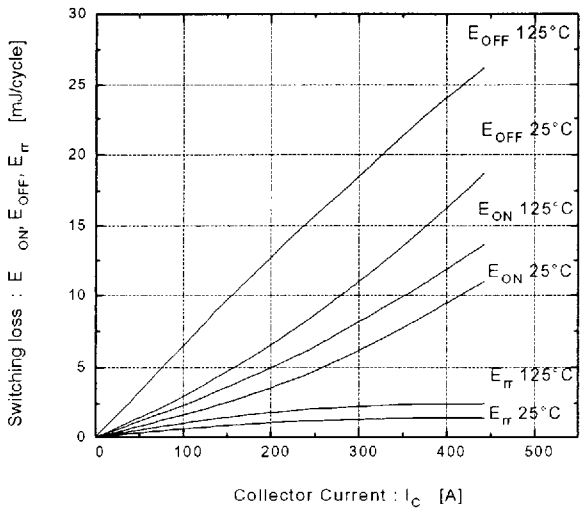
Reversed biased safe operating area

+V_{GE}=15V, -V_{GE}≤15V, T_j≤125°C, R_G≥6.8Ω



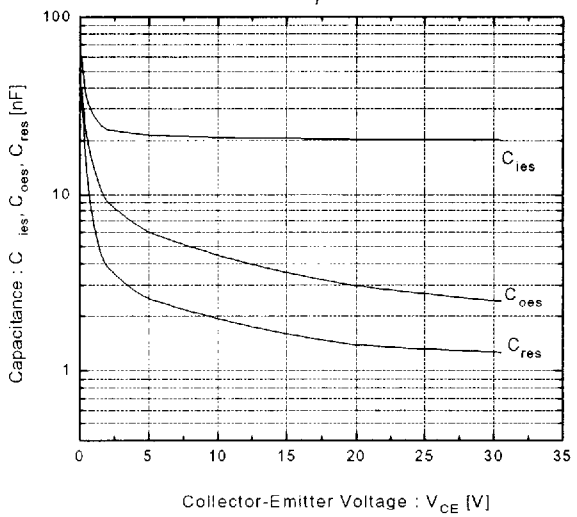
Switching loss vs. Collector current

V_{CC}=300V, R_G=6.8Ω , V_{GE}=±15V



Capacitance vs. Collector-Emitter voltage

T_j=25°C



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