FUJI ELECTRIC

2MBI 300P-140

2-Pack IGBT
1400V
300A

IGBT MODULE (P-Series)

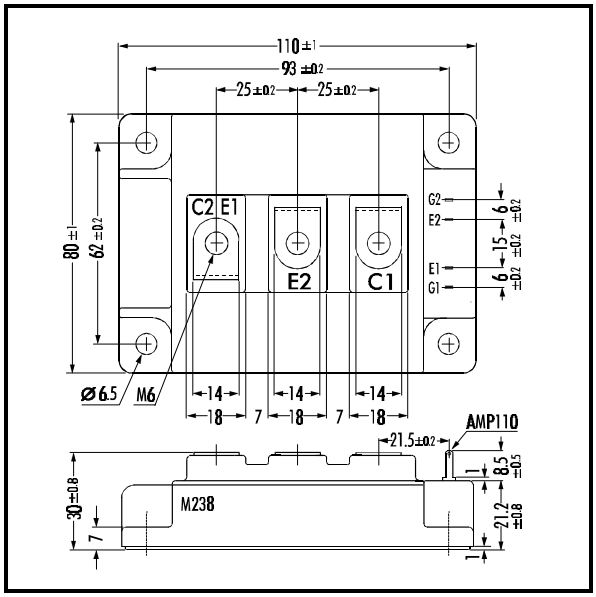
■ Features

- *Square SC SOA at 10 x I_C*
- *Simplified Parallel Connection*
- *Narrow Distribution of Characteristics*
- *High Short Circuit Withstand-Capability*

■ Applications

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

■ Outline Drawing



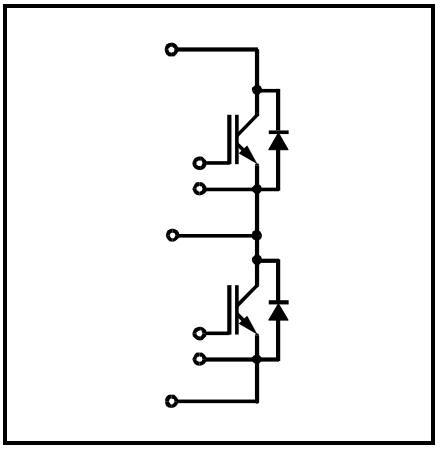
■ Maximum Ratings and Characteristics

• Absolute Maximum Ratings (T_c=25°C)

Items		Symbols	Ratings	Units
Collector-Emitter Voltage		V_{CES}	1400	V
Gate -Emitter Voltage		V_{GES}	± 20	V
Collector Current	Continuous T_C=25°C	I_C	400	A
	Continuous T_C=80°C		300	
	1ms T_C=25°C	$I_{C\ PULSE}$	800	
	1ms T_C=80°C		600	
		$-I_C$	300	
	1ms	$-I_{C\ PULSE}$	600	
Max. Power Dissipation		P_C	2500	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 *2	4.5	

Note: *1:Recommendable Value; 2.5 ~ 3.5 Nm (M5) or (M6)
*2:Recommendable Value; 3.5 ~ 4.5 Nm (M6)

■ 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}=1400V			3.0	mA
Gate-Emitter Leackage Current	I_{GES}	V_{CE}=0V V_{GE}=± 20V			600	µA
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	V_{GE}=20V I_C=300mA	6.0	8.0	9.0	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	T_j= 25°C V_{GE}=15V I_C=300A		2.7	3.0	V
		T_j=125°C V_{GE}=15V I_C=300A		3.3		
Input capacitance	C_{ies}	V_{GE}=0V		30000		pF
Output capacitance	C_{oes}	V_{CE}=10V		4500		
Reverse Transfer capacitance	C_{res}	f=1MHz		2000		
Turn-on Time	t_{ON}	V_{CC}=600V			1.2	µs
	t_r	I_C=300A			0.6	
Turn-off Time	t_{OFF}	V_{GE}=± 15V			1.0	
	t_f	R_G=2.7Ω			0.3	
Diode Forward On-Voltage	V_F	I_F=300A V_{GE}=0V		2.4	3.3	V
Reverse Recovery Time	t_{rr}	I_F=300A			350	ns

• Thermal Characteristics

Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance	$R_{th(j-c)}$	IGBT			0.05	°C/W
	$R_{th(j-c)}$	Diode			0.10	
	$R_{th(c-f)}$	With Thermal Compound		0.0167		

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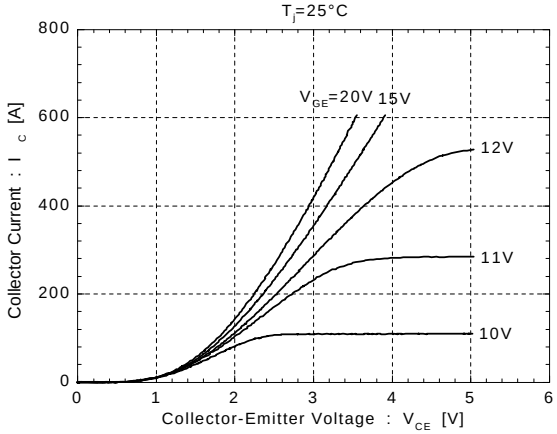
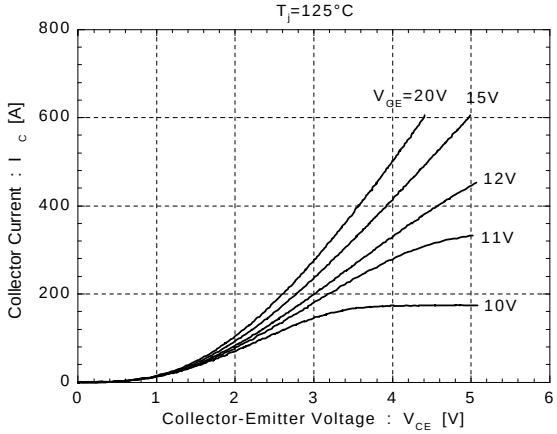
Collector Current vs. Collector-Emitter Voltage

T_j=25°C



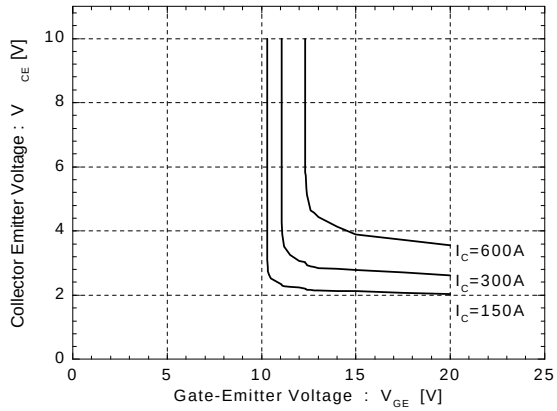
Collector Current vs. Collector-Emitter Voltage

T_j=125°C



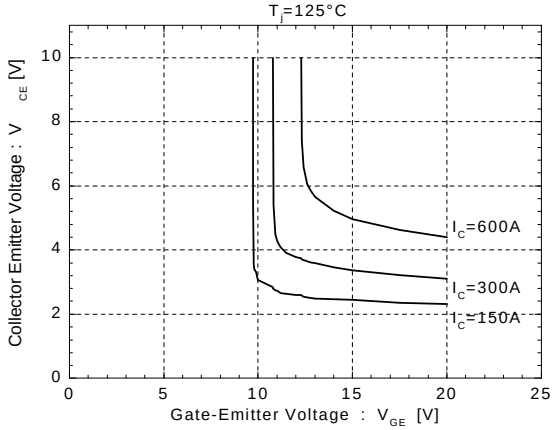
Collector-Emitter vs. Gate-Emitter Voltage

T_j=25°C



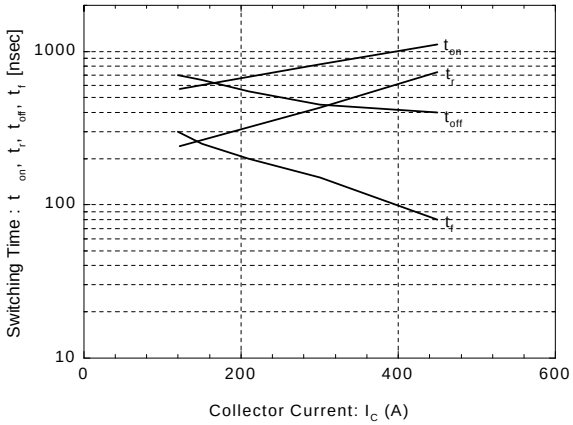
Collector-Emitter vs. Gate-Emitter Voltage

T_j=125°C



Switching Time vs. Collector Current

V_{CC}=600V, R_G=2,7Ω, V_{GE}=±15V, T_j=25°C



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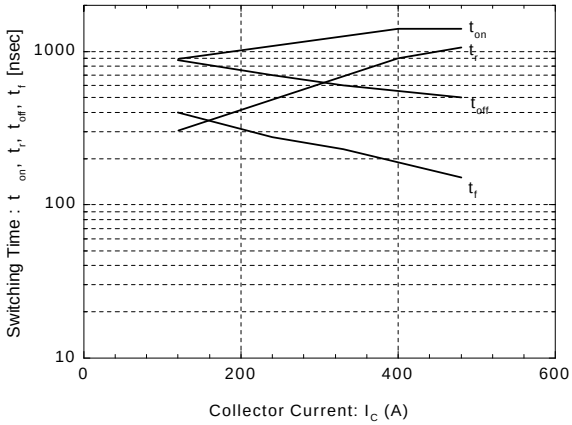

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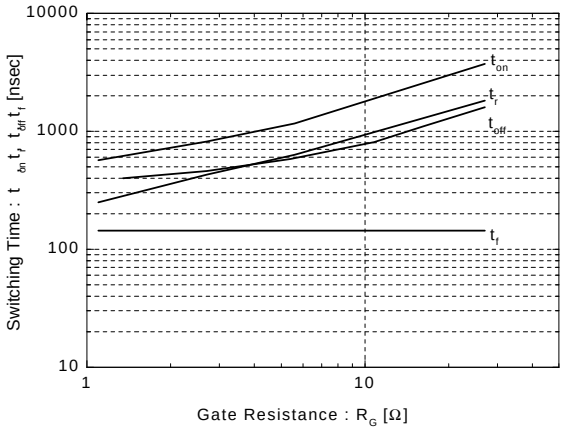
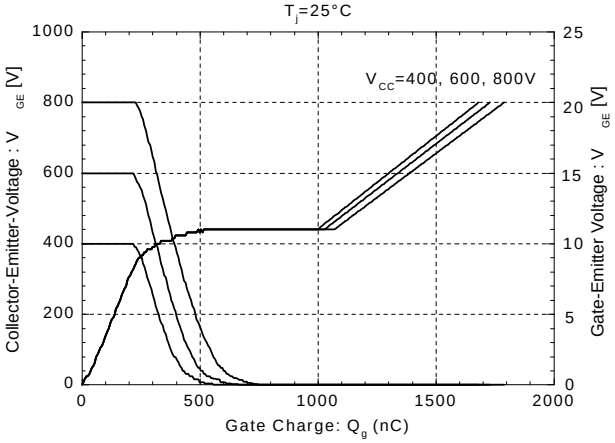
Switching Time vs. R_G

V_{CC}=600V, I_C=300A, V_{GE}=±15V, T_j=25°C



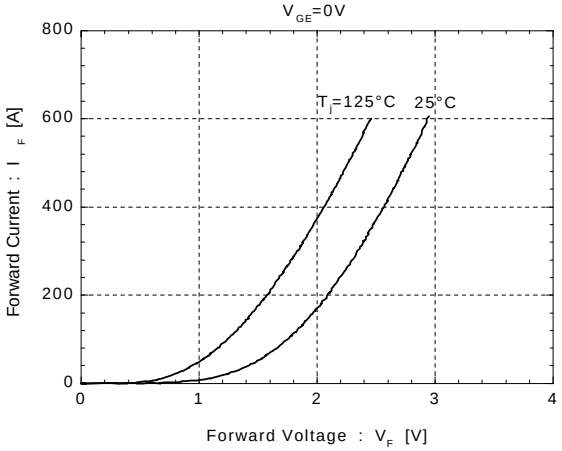
Collector Current vs. Collector-Emitter Voltage

T_j=25°C



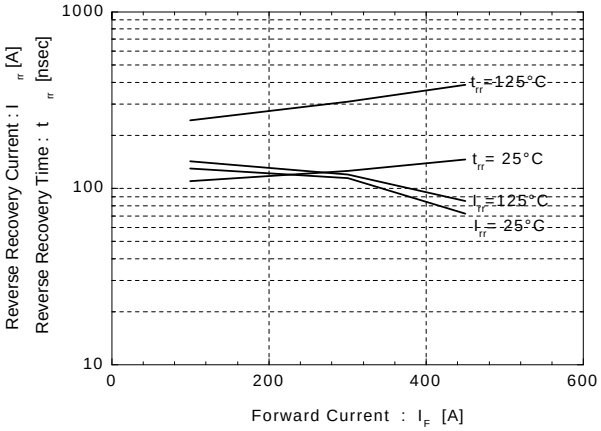
Forward Voltage vs. Forward Current

V_{GE}=0V

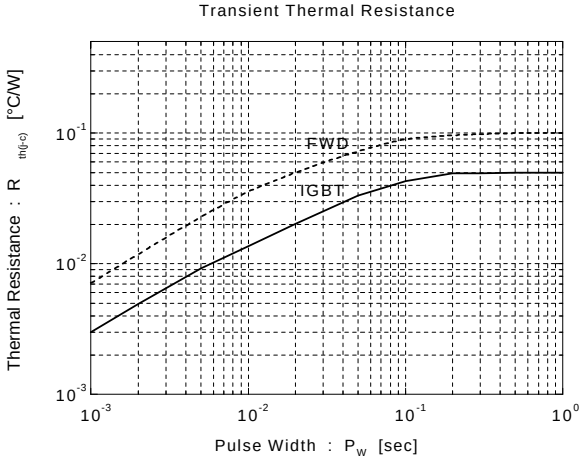


Reverse Recovery Characteristics

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

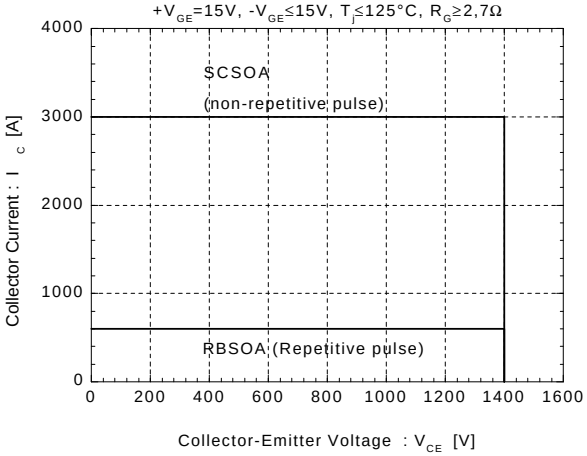


Transient Thermal Resistance



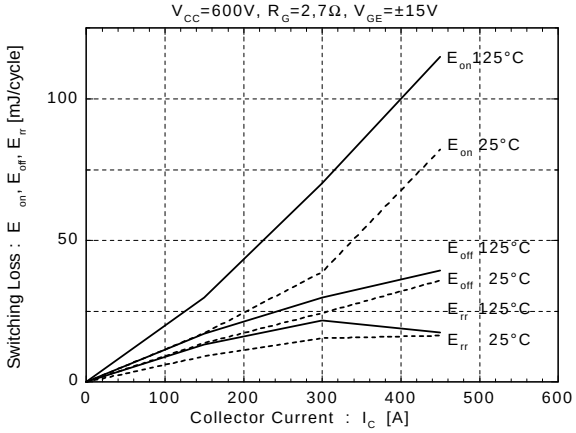
Reverse Biased Safe Operating Area

+V_{GE}=15V, -V_{GE}≤15V, T_j≤125°C, R_G≥2,7Ω



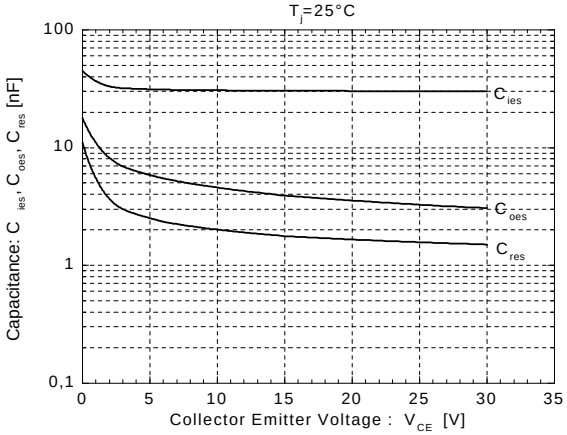
Switching Loss vs. Collector Current

V_{CC}=600V, R_G=2,7Ω, V_{GE}=±15V



Capacitance vs. Collector-Emitter Voltage

T_j=25°C



For more information, contact:

Collmer Semiconductor, Inc.
P.O. Box 702708
Dallas, TX 75370
972-233-1589
972-233-0481 Fax
http://www.collmer.com