

IGBT MODULE (F series)

■ Features

- Low Saturation Voltage
- Voltage Drive
- Variety of Power Capacity Series

■ Applications

- Inverter for Motor Drive
- AC and DC Servo Drive Amplifier
- Uninterruptible Power Supply
- Industrial Machines, such as Welding Machines

■ Maximum Ratings and Characteristics

- **Absolute Maximum Ratings**

Items		Symbols	Ratings	Units
Collector-Emitter Voltage		V _{CES}	600	V
Gate-Emitter Voltage		V _{GES}	±20	V
Collector Current	Continuous	I _C	15	A
	1ms	I _{C pulse}	30	
	Continuous	−I _C	15	
	1ms	−I _{C pulse}	30	
Max. Power Dissipation		P _C	60	W
Operating Temperature		T _J	+150	°C
Storage Temperature		T _{stg}	−40 to +125	°C
Net. Weight			150	g
Isolation Voltage	AC. 1min.	V _{isol}	2500	V
Screw Torque		Mounting *1	3.5 {35}	N · m
		Terminals	—	(kg · cm)

*1 Recommendable Value 2.5 to 3.5 N·m { 25 to 35 kg·cm } (M5)

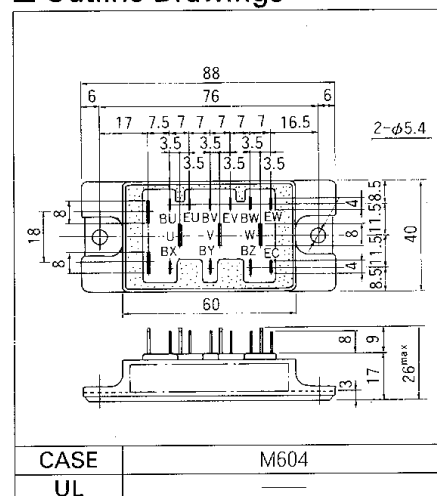
● Electrical Characteristics (Tc=25°C)

Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Zero Gate Voltage Collector Current	ICES	VGE=0V VCE=600V TJ=25°C			1.0	mA
		VGE=0V VCE=600V TJ=125°C			—	mA
Gate-Emitter Leakage Current	IGES	VCE=0V VGE=±20V			100	nA
Gate-Emitter Threshold Voltage	VGE(th)	VCE=20V IC=15mA	3.0		6.0	V
Collector-Emitter Saturation Voltage	VCE(sat)	VGE=15V IC=15A			2.5	V
Input Capacitance	Cies	VGE=0V		1400		pF
Output Capacitance	Coes	VCE=10V		—		
Reverse Transfer Capacitance	Cres	f=1MHz		—		
Turn-on Time	ton	VCC=300V			0.8	μs
	tr	IC=15A			0.6	
Turn-off Time	toff	VGE=±15V			1.5	
	tr	RG=150Ω			1.0	
Diode Forward On-Voltage	VF	IF=15A, VGE=0V			2.5	V
Reverse Recovery Time	trr	IF=15A, -di/dt=50A/μs VGE=-10V			300	ns

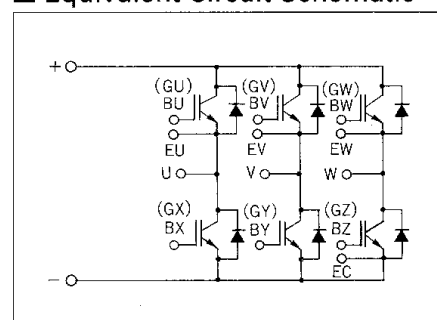
● Thermal Characteristics

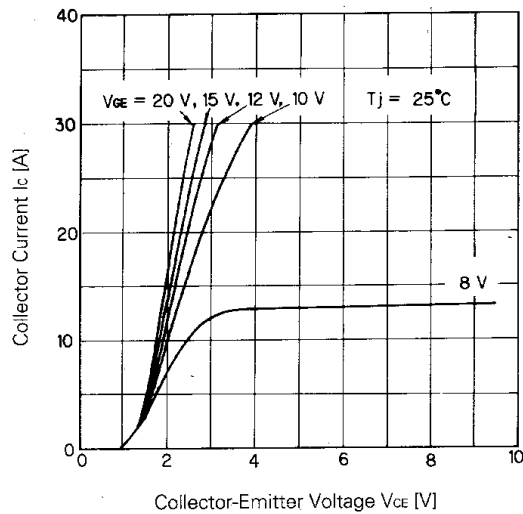
Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance	R _{th(j-c)}	IGBT			2.08	°C/W
	R _{th(j-c)}	Diode			3.30	
	R _{th(c-f)}	With Thermal compound		0.06		

■ Outline Drawings

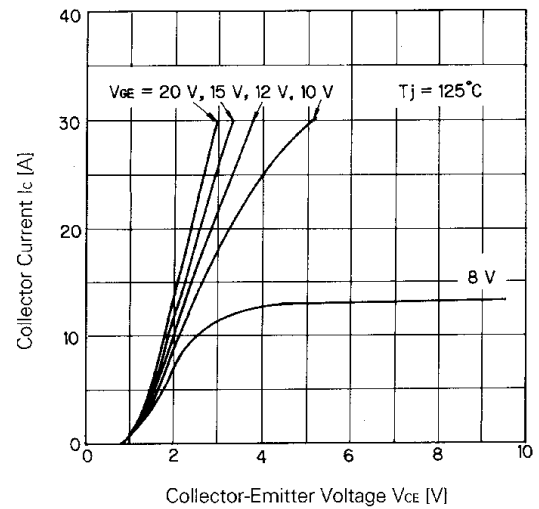


■ Equivalent Circuit Schematic

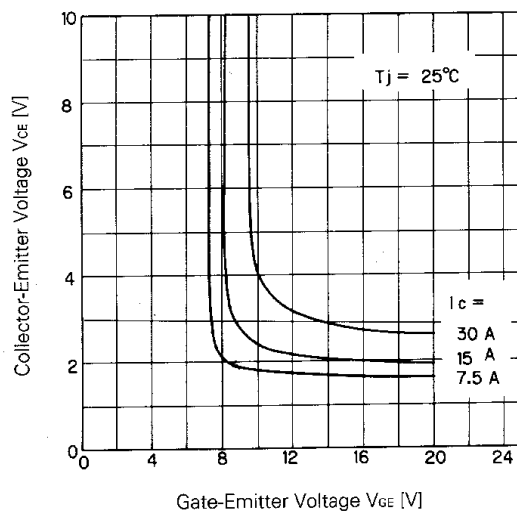




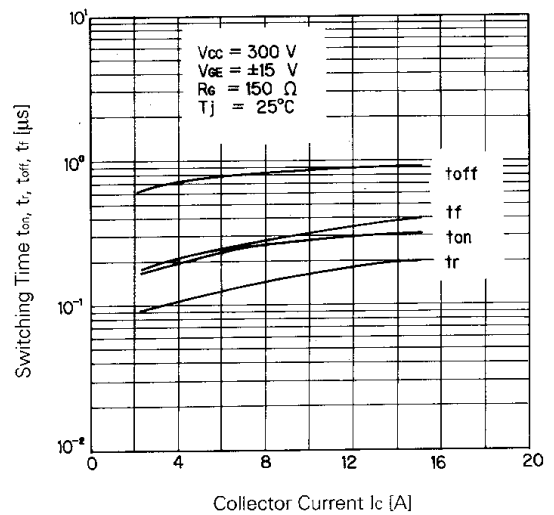
Collector Current vs. Collector-Emitter Voltage



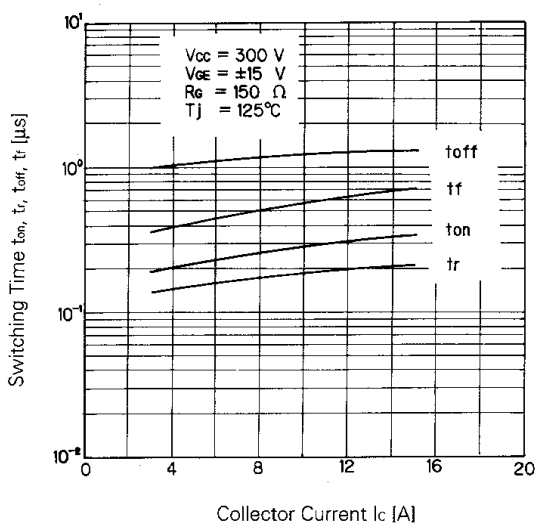
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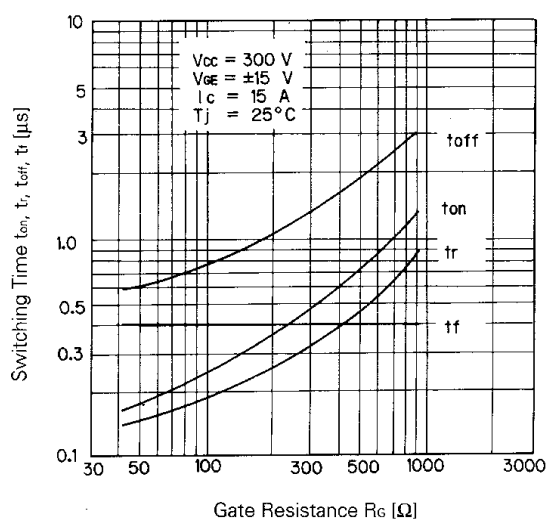
Collector-Emitter Voltage vs. Gate-Emitter Voltage



Switching Time



Switching Time



Switching Time-Gate Resistance

