

IGBT MODULE (F series)

■ Features

- Low Saturation Voltage
- Voltage Drive
- Isolated Package

■ Applications

- Ideal for Shunt Regulator Application
 - AC and DC Servo Drive Supply
 - 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	50
	1ms	I _{c pulse}	100
	Duty = 75%	-I _c	50
	1ms	-I _{c pulse}	100
Max. Power Dissipation	P _c	220	W
Operating Temperature	T _j	+150	°C
Storage Temperature	T _{stg}	-40 to +125	°C
Isolation Voltage	AC. 1min.	V _{is}	2500
Screw Torque	Mounting *1	3.5	N · m
	Terminals *1	3.5	

*1 Recommendable Value 2.5 to 3.5 N·m (M5)

● Electrical Characteristics (T_j=25°C)

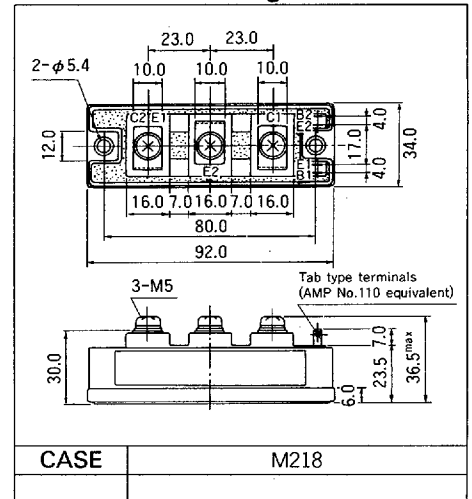
Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Zero Gate Voltage Collector Current	I _{CES}	V _{GE} =0V V _{CE} =600V T _j =25°C			1.0	mA
		V _{GE} =0V V _{CE} =600V T _j =125°C			—	mA
Gate-Emitter Leakage Current	I _{GES}	V _{CE} =0V V _{GE} =±20V			100	nA
Gate-Emitter Threshold Voltage	V _{GE(th)}	V _{CE} =20V I _c =50mA	3.0		6.0	V
Collector-Emitter Saturation Voltage	V _{CE(sat)}	V _{GE} =15V I _c =50A			2.5	V
Input Capacitance	C _{ies}	V _{GE} =0V		4750		pF
Output Capacitance	C _{oes}	V _{CE} =10V		—		
Reverse Transfer Capacitance	C _{res}	f=1MHz		—		
Turn-on Time *2	t _{on}	V _{CC} =300V			0.8	μs
	t _r	I _c =50A			0.6	
Turn-off Time *3	t _{off}	V _{GE} =±15V			1.5	
	t _f	R _G =51Ω			1.0	
Diode Forward On-Voltage	V _F	I _F =50A, V _{GE} =0V			2.5	V
Reverse Recovery Time	t _{rr}	I _F =50A, -di/dt=150A/μs V _{GE} =-10V			300	ns

*2 Resistive load *3 Inductive load

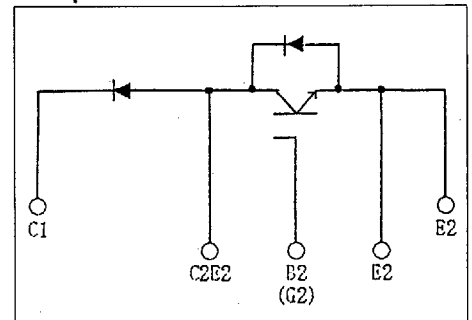
● Thermal Characteristics

Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance	R _{th(j-c)}	IGBT			0.568	°C/W
	R _{th(j-e)}	Diode			1.33	
	R _{th(c-f)}	With Thermal compound		0.05		

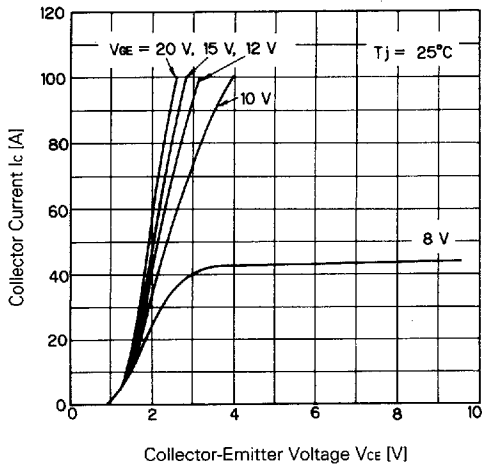
■ Outline Drawings



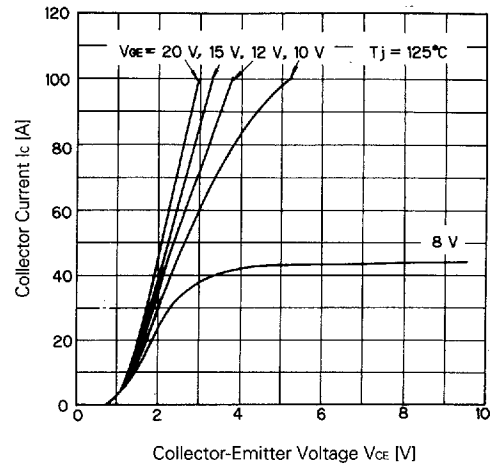
■ Equivalent Circuit Schematic



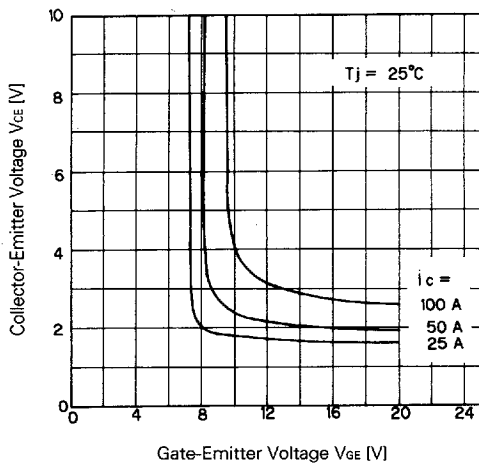
Characteristics



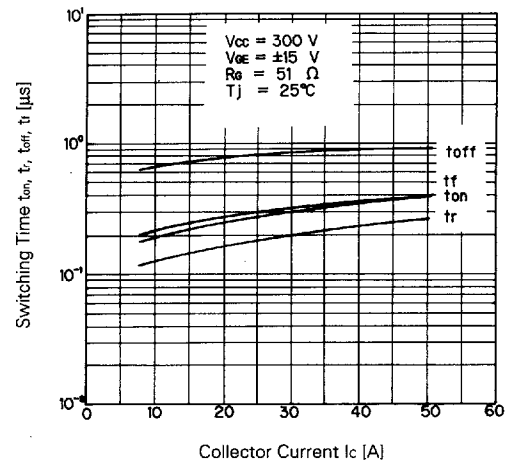
Collector Current vs. Collector-Emitter Voltage



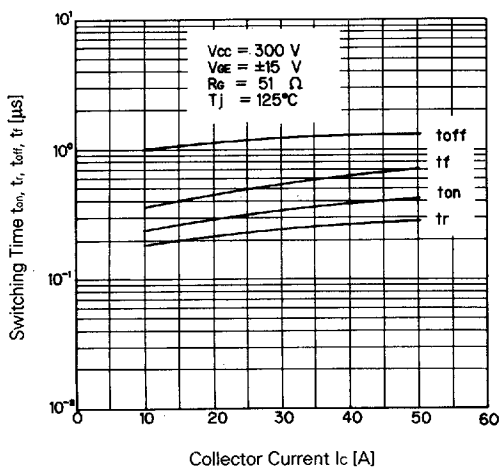
Collector Current vs. Collector-Emitter Voltage



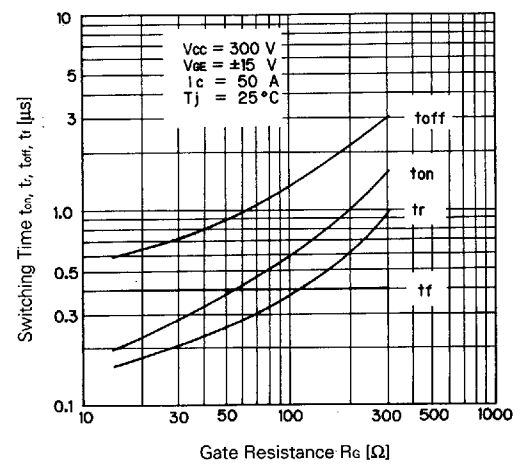
Collector-Emitter Voltage vs. Gate-Emitter Voltage



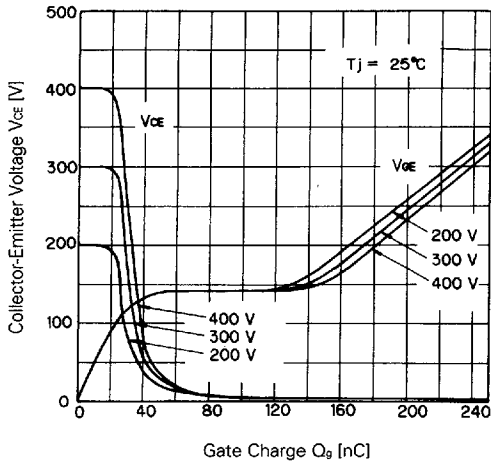
Switching Time



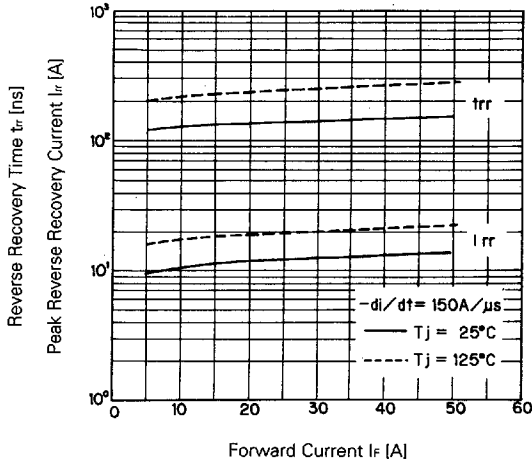
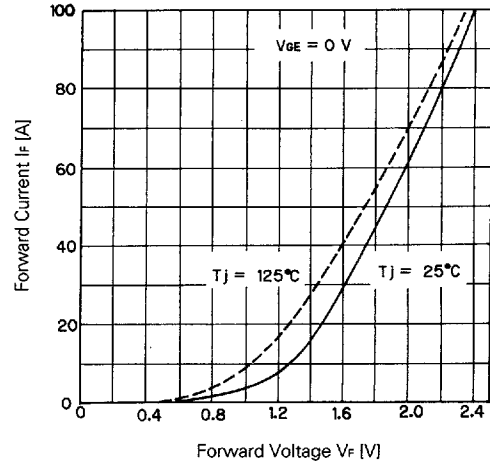
Switching Time



Switching Time-Gate Resistance



Gate-Emitter Voltage Vge [V]



$T_{rr}, I_{rr}-I_f$

