

IGBT MODULE (F series)

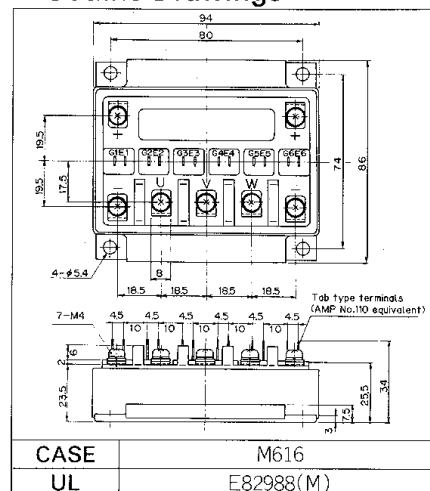
■ Features

- 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

■ Outline Drawings



■ Maximum Ratings and Characteristics

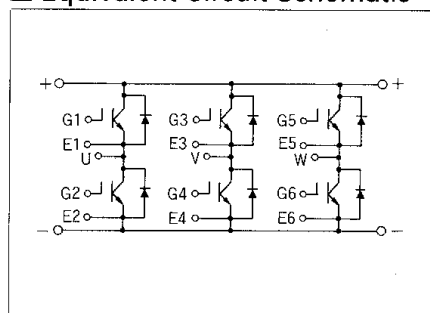
- **Absolute Maximum Ratings**

Items		Symbols	Ratings	Units
Collector-Emitter Voltage		V_{CES}	1200	V
Gate-Emitter Voltage		V_{GES}	± 20	V
Collector Current	Continuous	I_C	25	A
	1ms	I_C pulse	50	
	Continuous	$-I_C$	25	
	1ms	$-I_C$ pulse	50	
Max. Power Dissipation		P_C	220	W
Operating Temperature		T_j	+150	$^{\circ}\text{C}$
Storage Temperature		T_{stg}	-40 to +125	$^{\circ}\text{C}$
Net. Weight			570	g
Isolation Voltage	AC. 1min.	V_{isol}	2500	V
Screw Torque		Mounting *1	3.5 [35]	N · m
		Terminals *2	1.7 [17]	(kg · cm)

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

*1 Recommendable Value	2.5 to 3.5 N•m	25 to 35 kg•cm	(M3)
*2 Recommendable Value	1.3 to 1.7 N•m	13 to 17 kg•cm	(M4)

■ Equivalent Circuit Schematic

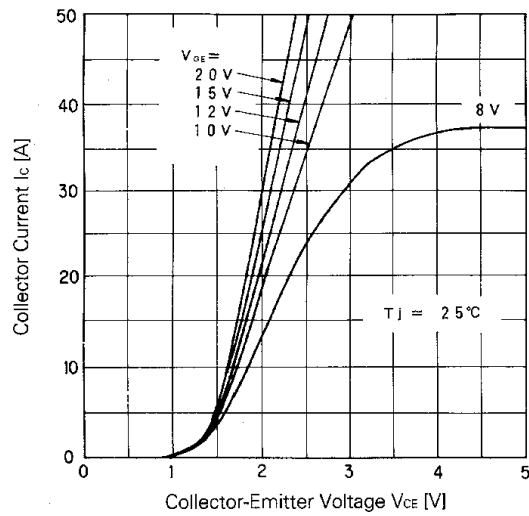


● Electrical Characteristics (T_c=25°C)

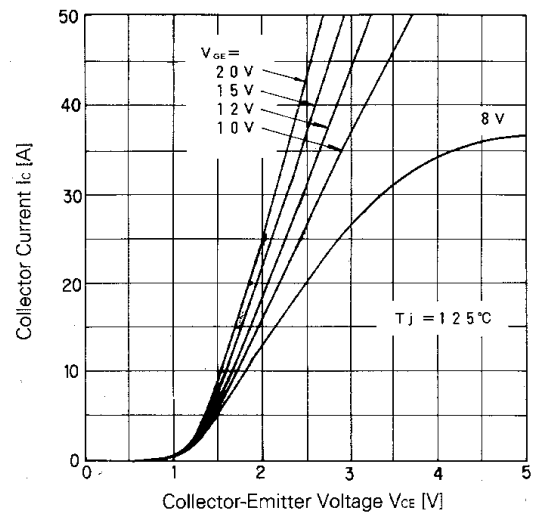
Items	Symbols	Test Conditions		Min.	Typ.	Max.	Units
Zero Gate Voltage Collector Current	I _{CES}	V _{GE} =0V V _{CE} =1200V T _J =25°C				1.0	mA
		V _{GE} =0V V _{CE} =1200V T _J =125°C				—	mA
Gate-Emitter Leakage Current	I _{GES}	V _{CE} =0V V _{GE} =±20V				100	nA
Gate-Emitter Threshold Voltage	V _{GE (th)}	V _{CE} =20V I _C =25mA		3.0		6.0	V
Collector-Emitter Saturation Voltage	V _{CE (sat)}	V _{GE} =15V I _C =25A				2.5	V
Input Capacitance	C _{ies}	V _{GE} =0V			4500		pF
Output Capacitance	C _{oes}	V _{CE} =10V			—		
Reverse Transfer Capacitance	C _{res}	f=1MHz			—		
Turn-on Time	t _{on}	V _{CC} =600V I _C =25A	Resistive load			0.8	μs
	t _r					0.6	
Turn-off Time	t _{off}	V _{GE} =±15V R _G =50Ω	Inductive load			1.5	
	t _f					1.0	
Diode Forward On-Voltage	V _F	I _F =25A, V _{GE} =0V				2.5	V
Reverse Recovery Time	t _{rr}	I _F =25A, -di/dt=75A/μs V _{GE} =-10V				350	ns

● Thermal Characteristics

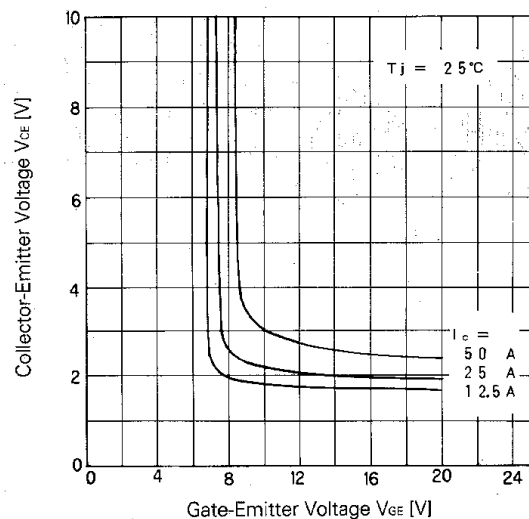
Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance	R _{th(j-c)}	IGBT			0.568	°C/W
	R _{th(j-c)}	Diode			1.33	
	R _{th(c-f)}	With Thermal compound		0.05		



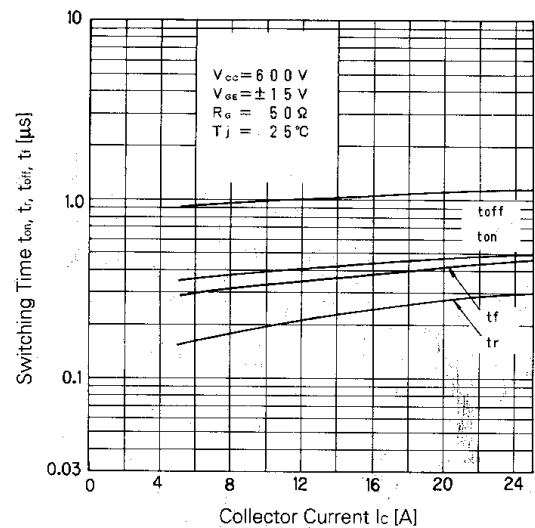
Collector Current vs. Collector-Emitter Voltage



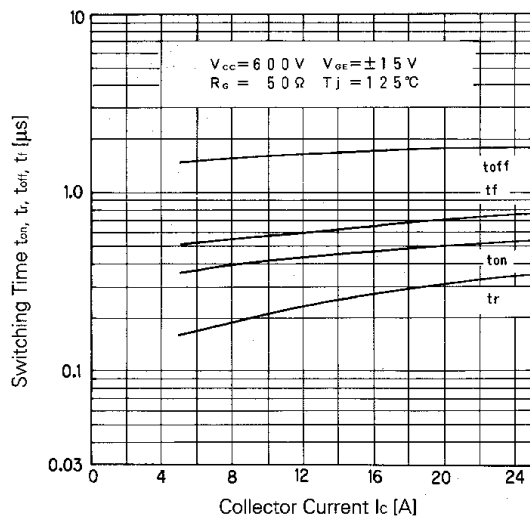
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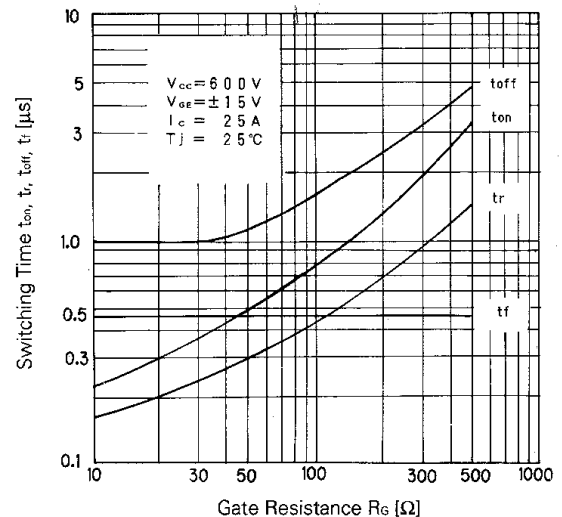
Collector-Emitter Voltage vs. Gate-Emitter Voltage



Switching Time



Switching Time



Switching Time-Gate Resistance

