

GTR Module

Unit in mm

Silicon N Channel IGBT

High Power Switching Applications

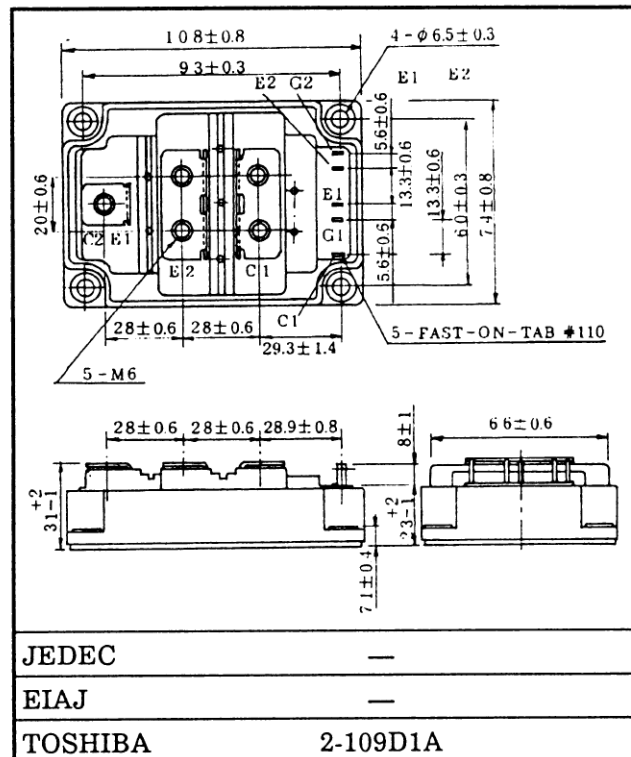
Motor Control Applications

Features

- High input impedance
- High speed: $t_f = 0.30\mu\text{s}$ (Max.) ($I_C = 400\text{A}$)
 $t_{rr} = 0.15\mu\text{s}$ (Max.) ($I_F = 400\text{A}$)
- Low saturation voltage: $V_{CE(sat)} = 2.70$ (Max.) ($I_C = 400\text{A}$)
- Enhancement mode
- The electrodes are isolated from case
- Includes a complete half bridge card in one package

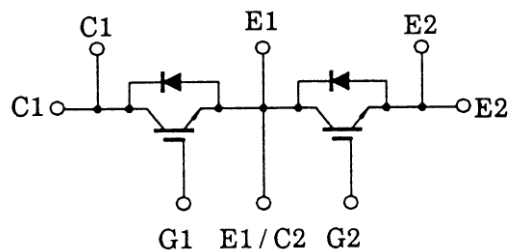
Maximum Ratings ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Emitter Voltage		V_{CES}	600	V
Gate-Emitter Voltage		V_{GES}	± 20	V
Collector Current	DC	I_C	400	A
	1ms	I_{CP}	800	
Forward Current	DC	I_F	400	A
	1ms	I_{FM}	800	
Collector Power Dissipation ($T_c = 25^\circ\text{C}$)		P_C	1800	W
Junction Temperature		T_j	150	$^\circ\text{C}$
Storage Temperature Range		T_{stg}	-40 ~ 125	$^\circ\text{C}$
Isolation Voltage		V_{isol}	2500 (AC 1 min.)	V
Screw Torque (Terminal/Mounting)		—	3/3	N \neq m



Weight : 540g (TYP.)

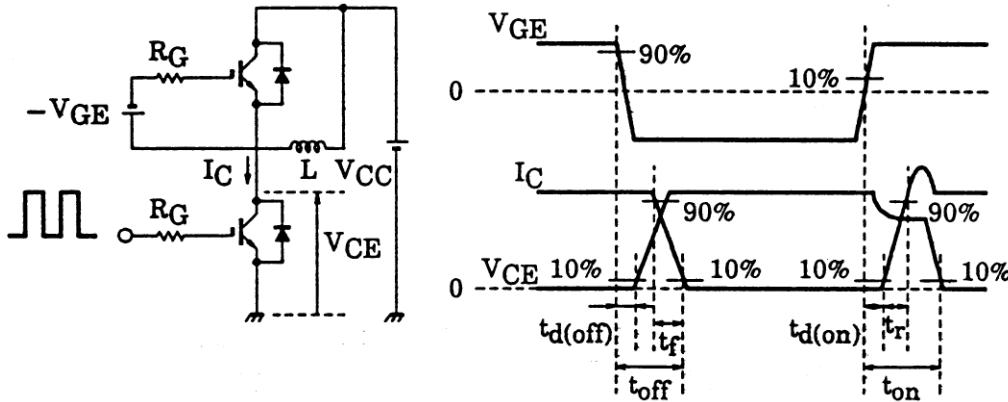
Equivalent Circuit



Electrical Characteristics (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Gate Leakage Current	I_{GES}	$V_{GE} = \pm 20V, V_{CE} = 0$	—	—	± 500	nA	
Collector Cut-off Current	I_{CES}	$V_{CE} = 600V, V_{GE} = 0$	—	—	3.0	mA	
Gate-Emitter Cut-off Voltage	$V_{GE (off)}$	$I_C = 40mA, V_{CE} = 5V$	5.0	7.0	8.0	V	
Collector-Emitter Saturation Voltage	$V_{CE (sat)}$	$I_C = 400A, V_{GE} = 15V$	—	2.10	2.70	V	
Input Capacitance	C_{ies}	$V_{CE} = 10V, V_{GE} = 0, f = 1MHz$	—	46500	—	pF	
Switching Time	Turn-on Delay Time	$t_{d (on)}$	—	0.25	0.50	μs	
	Rise Time	t_r	Inductive Load $V_{CC} = 300V$ $I_C = 400A$ $V_{GE} = \pm 15V$ $R_G = 2.4\Omega$ (Note 1)	—	0.12		0.24
	Turn-on Time	t_{on}		—	0.40		0.80
	Turn-off Delay Time	$t_{d (off)}$		—	0.30		0.60
	Fall Time	t_f		—	0.15		0.30
	Turn-off Time	t_{off}		—	0.50		1.00
Forward Voltage	V_F	$I_F = 400A, V_{GE} = 0$		—	2.30	3.00	V
Reverse Recovery Time	t_{rr}	$I_F = 400A, V_{GE} = -10V$ $di/dt = 400A/\mu s$	—	0.08	0.15	μs	
Thermal Resistance	$R_{th (j - c)}$	Transistor Stage	—	—	0.069	$^{\circ}C/W$	
		Diode Stage	—	—	0.17		
	$R_{th (c - f)}$	Case to Fin (Note 2)	—	—	0.10		

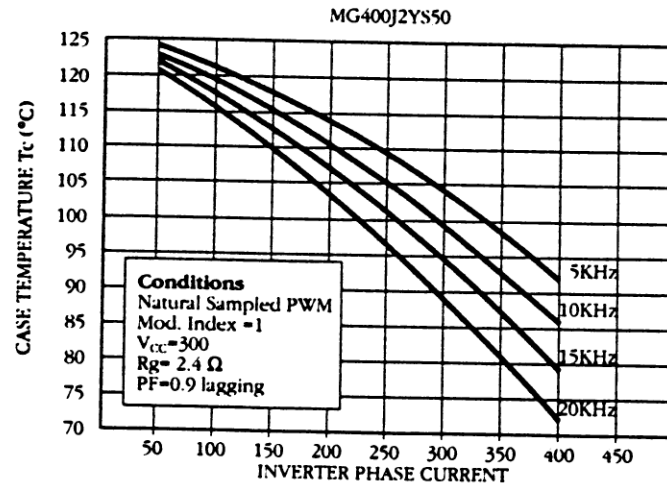
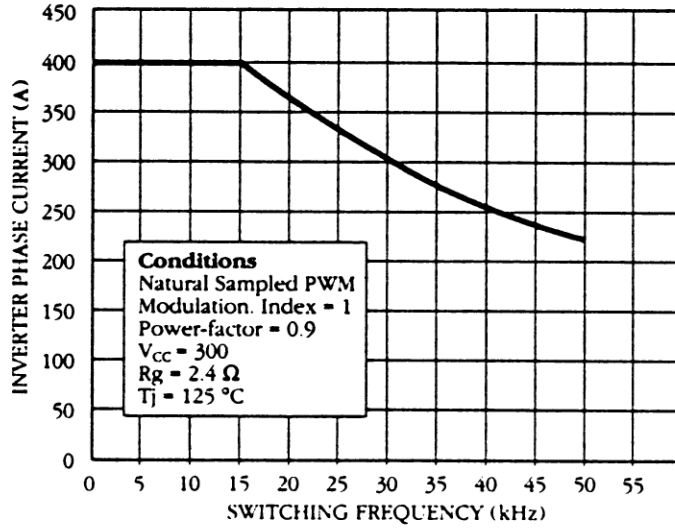
Note 1 Switching Time Test Circuit & Timing Chart.



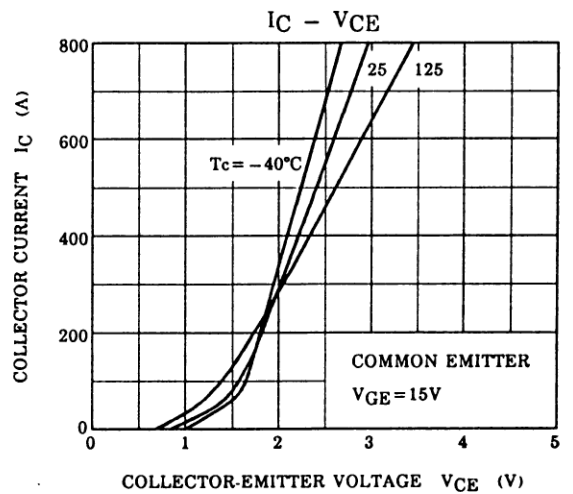
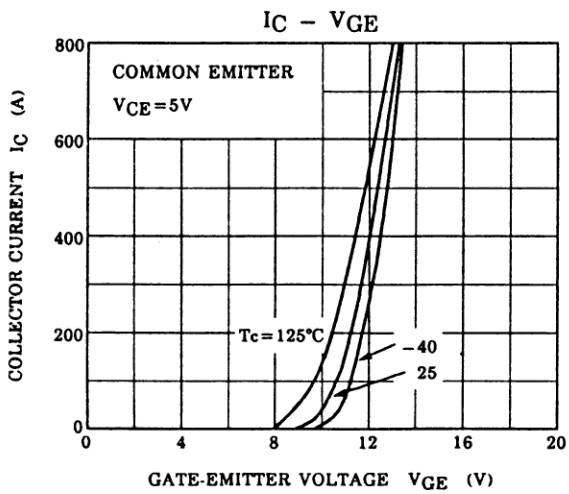
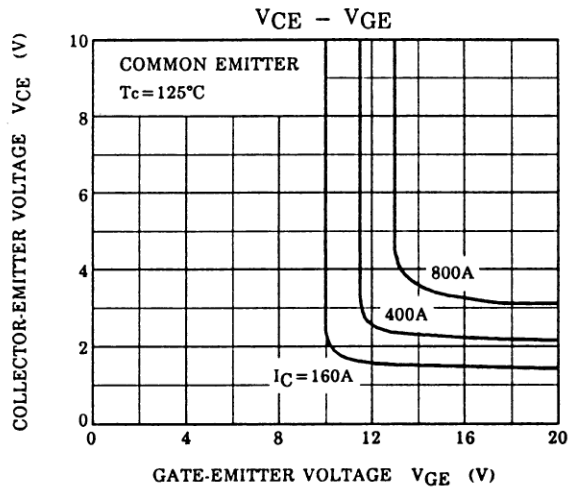
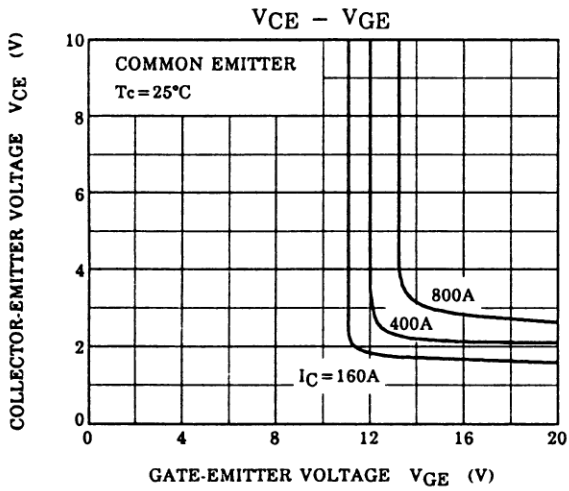
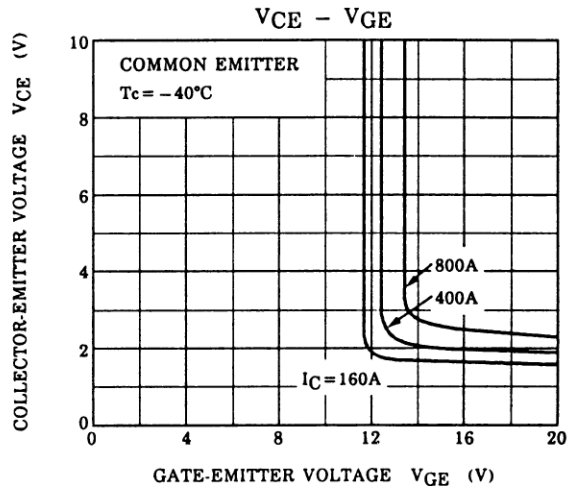
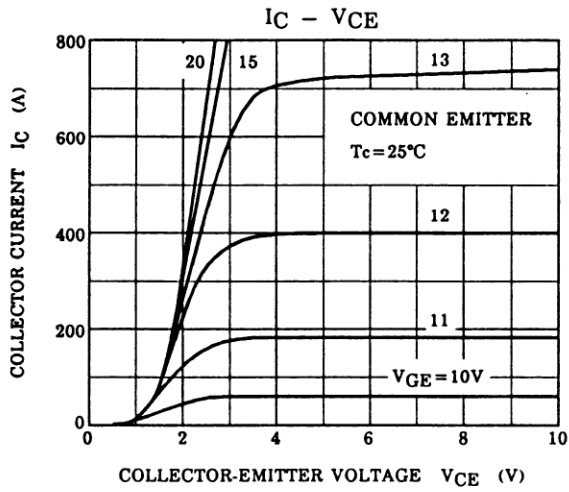
Note 2 Silicone Grease is Applied.

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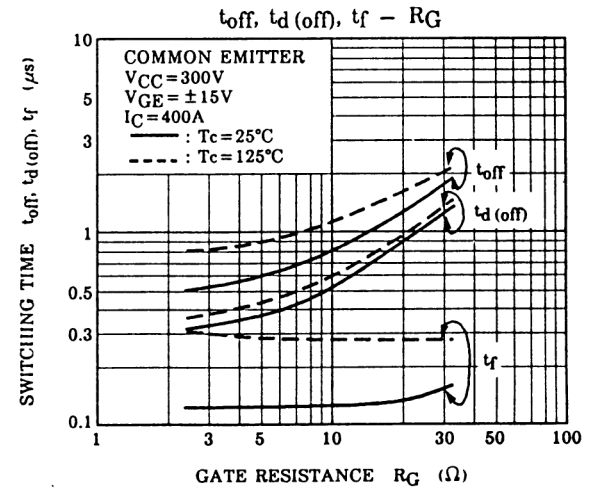
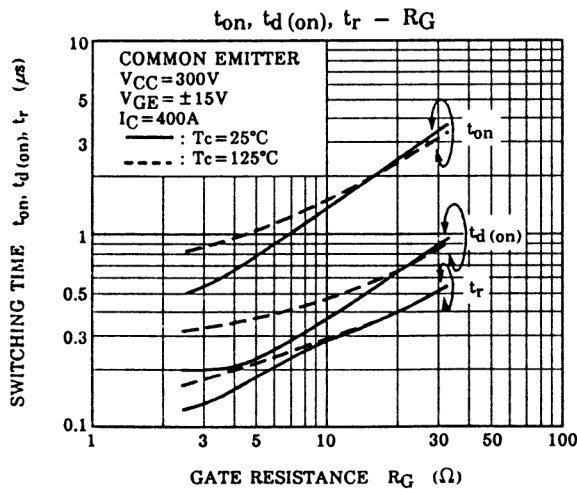
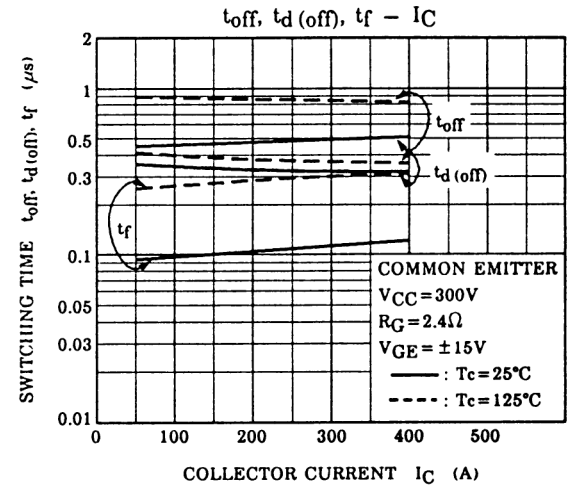
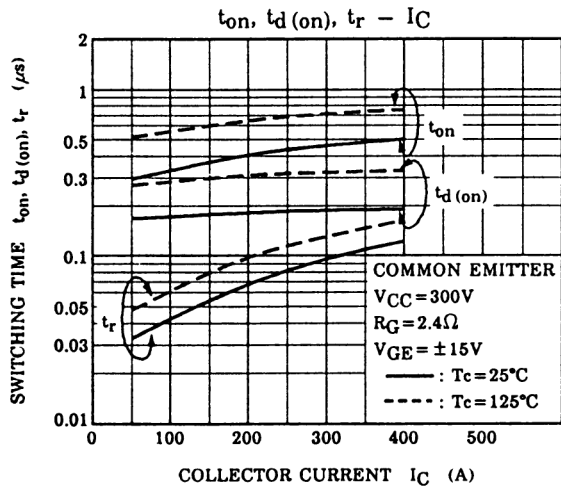
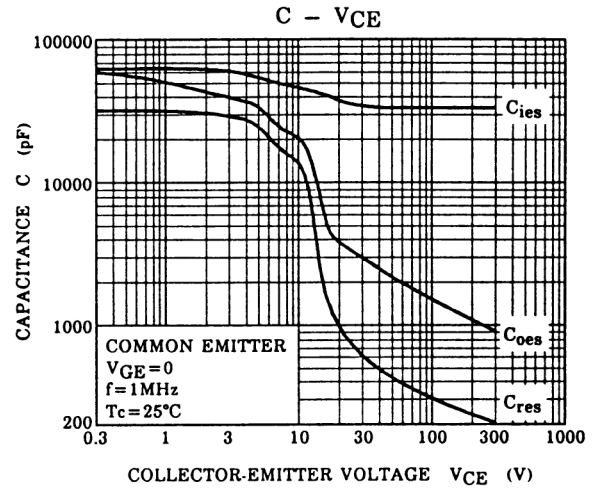
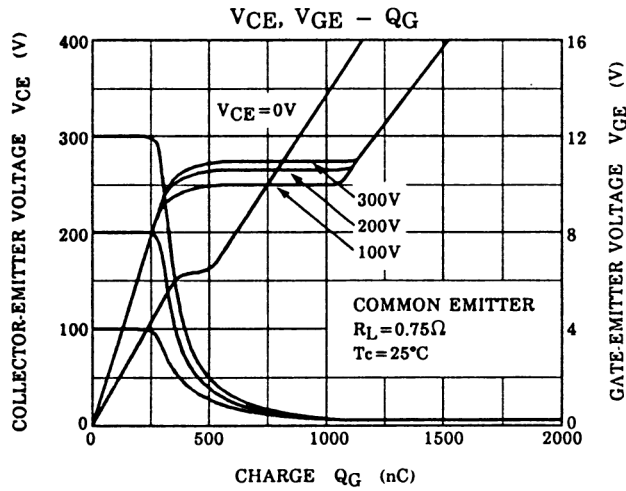
TYPICAL INVERTER PHASE CURRENT AT TCASE = 80 °C



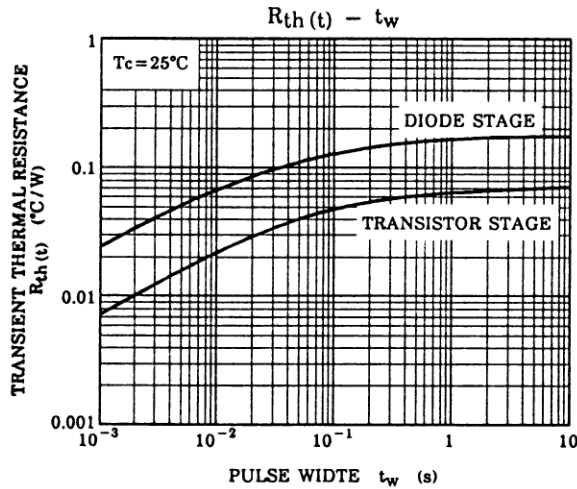
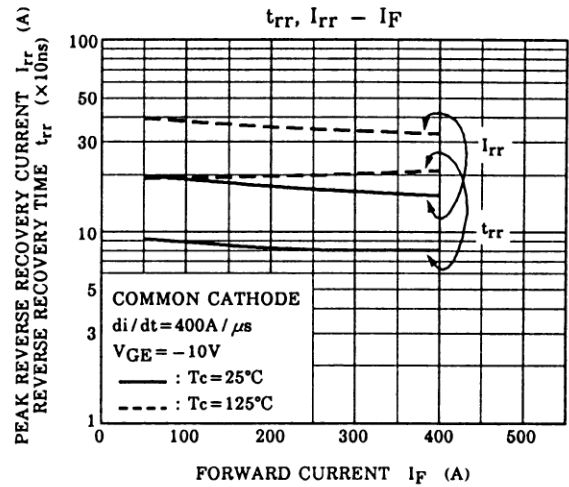
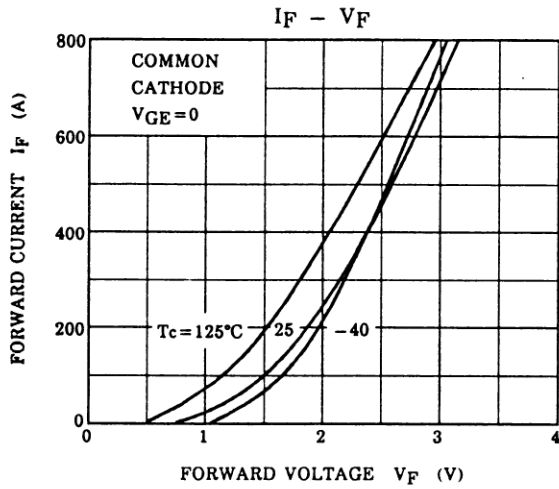
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