TOSHIBA GTR Module Silicon N Channel IGBT

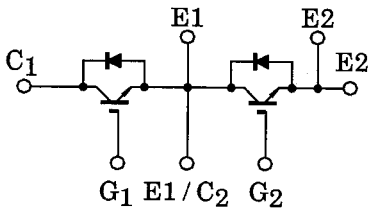
MG90V2YS40

High Power Switching Applications

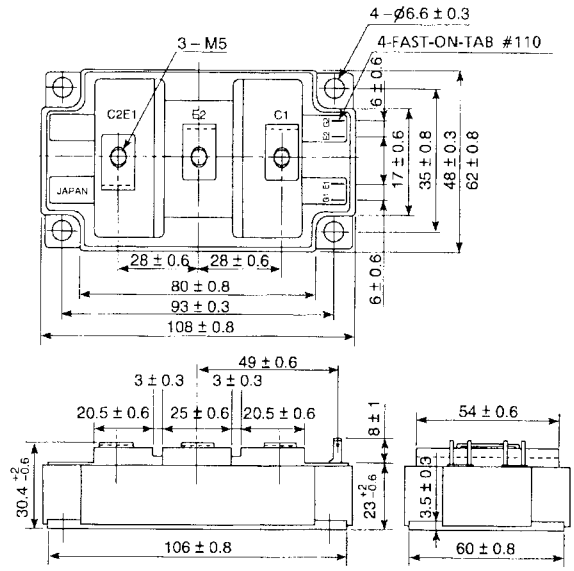
Motor Control Applications

- The electrodes are isolated from case.
- High input impedance
- Includes a complete half bridge in one package.
- Enhancement-mode
- High speed : t_f = 1.5μs (max) (I_C = 90A)
  t_{rr} = 0.3μs (max) (I_F = 90A)

Equivalent Circuit



Unit: mm



JEDEC	—
JEITA	—
TOSHIBA	2-109C1A

Weight: 430g (typ.)

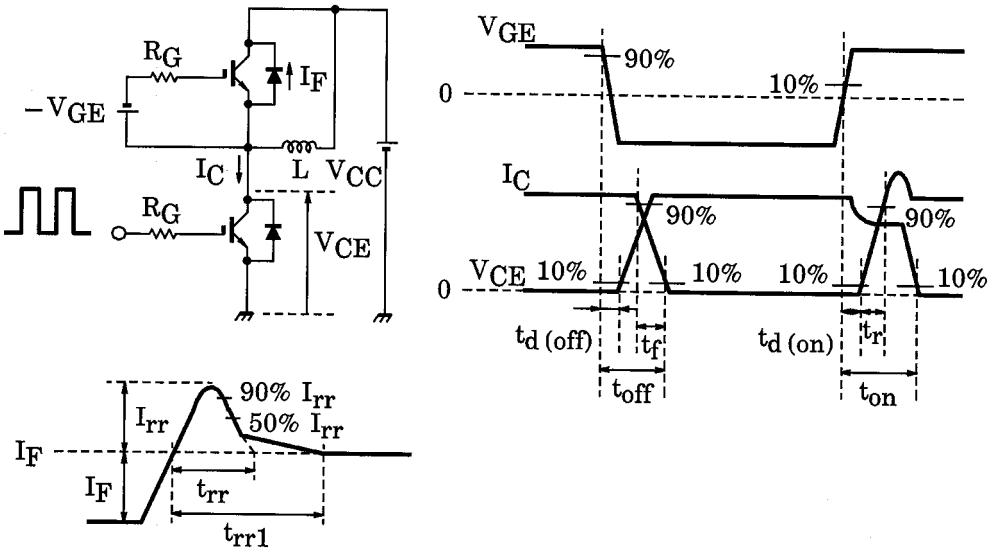
Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit
Collector-emitter voltage		V_{CES}	1700	V
Gate-emitter voltage		V_{GES}	±20	V
Collector current	DC	I_C	90	A
	1ms	I_{CP}	180	
Forward current	DC	I_F	90	A
	1ms	I_{FM}	180	
Collector power dissipation (Tc = 25°C)		P_C	1100	W
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	−40 ~ 125	°C
Isolation voltage		V_{Isol}	4000 (AC 1minute)	V
Screw torque (Terminal / mounting)		—	3 / 3	N·m

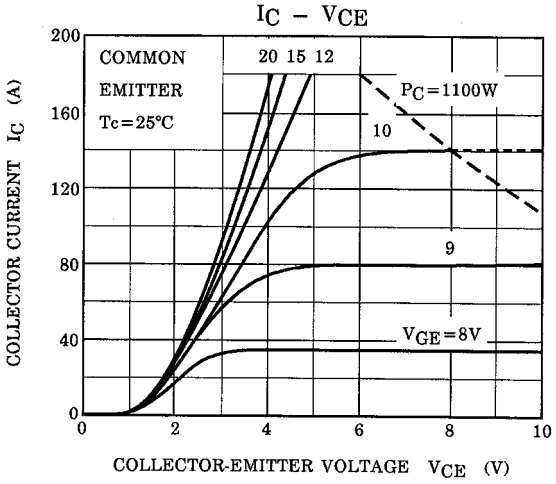
Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		I_{GES}	V_{GE} = ±20 V, V_{CE} = 0	—	—	±100	nA
Collector cut-off current		I_{CES}	V_{CE} = 1700 V, V_{GE} = 0	—	—	1.0	mA
Gate-emitter cut-off voltage		$V_{GE\ (off)}$	I_C = 90 mA, V_{CE} = 5 V	4.0	—	8.0	V
Collector-emitter saturation voltage		$V_{CE\ (sat)}$	I_C = 90 A, V_{GE} = 15 V	—	3.2	4.5	V
Input capacitance		C_{ies}	V_{CE} = 10 V, V_{GE} = 0, f = 1 MHz	—	13000	—	pF
Switching time	Turn-on delay time	$t_{d\ (on)}$	Inductive Load V_{CC} = 900 V I_C = 90 A V_{GE} = ±15 V R_G = 5.6 Ω (Note 1)	—	0.1	—	μs
	Rise-time	t_r		—	0.1	—	
	Turn-on time	t_{on}		—	0.5	—	
	Turn-off delay time	$t_{d\ (off)}$		—	0.4	—	
	Fall time	t_f		—	0.5	1.5	
	Turn-off time	t_{off}		—	1.0	—	
Forward voltage		V_F	I_F = 90 A, V_{GE} = 0	—	3.2	4.5	V
Reverse recovery time		t_{rr}	I_F = 90 A, V_{GE} = −15 V di / dt = 500 A / μs (Note 1)	—	0.2	0.4	μs
Thermal resistance		$R_{th\ (j-c)}$	Transistor stage	—	—	0.114	°C / W
			Diode stage	—	—	0.4	

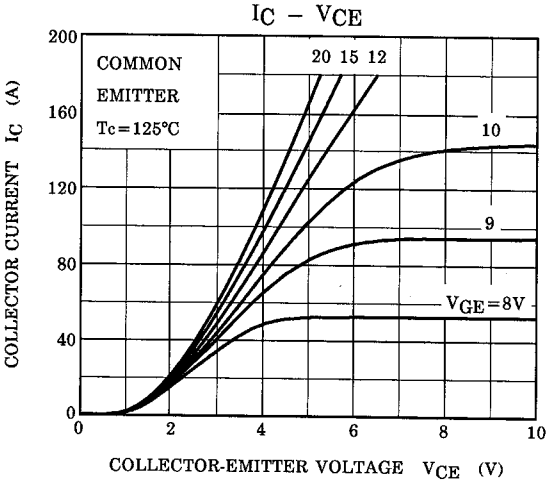
Note 1: Switching time and reverse recovery time test circuit & timing chart



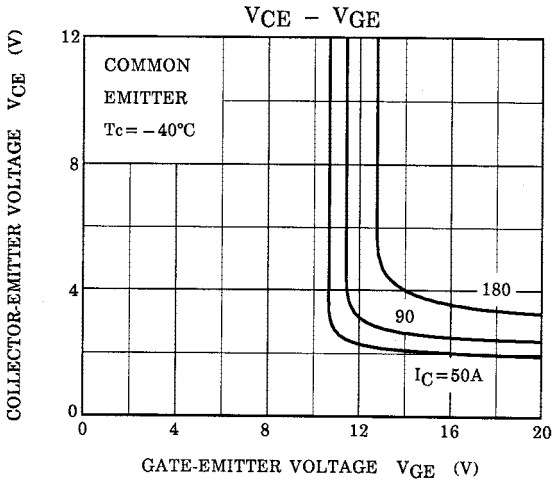
I_C – V_{CE}



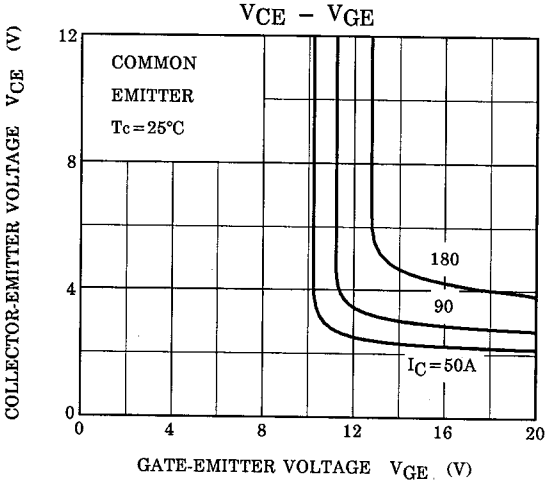
I_C – V_{CE}



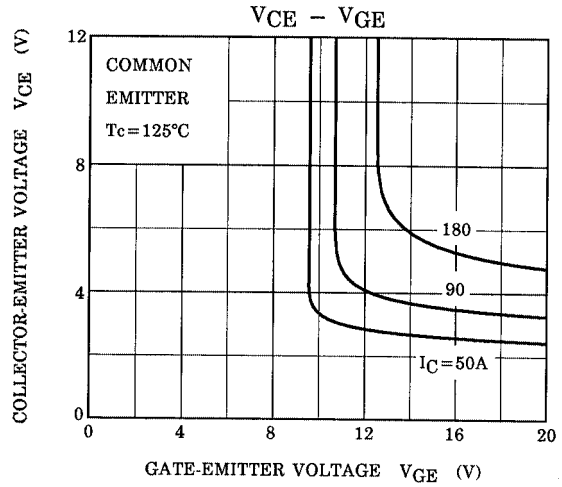
V_{CE} – V_{GE}



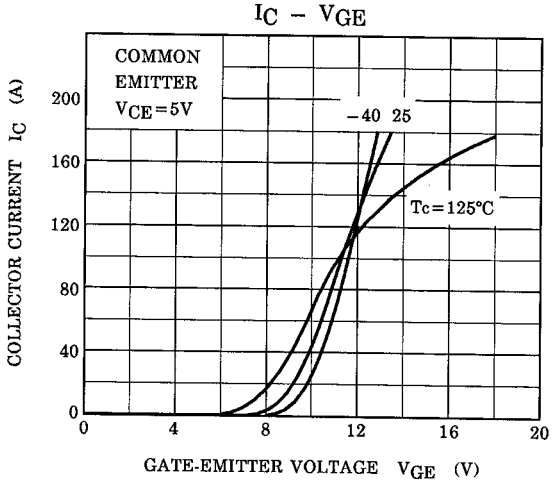
V_{CE} – V_{GE}



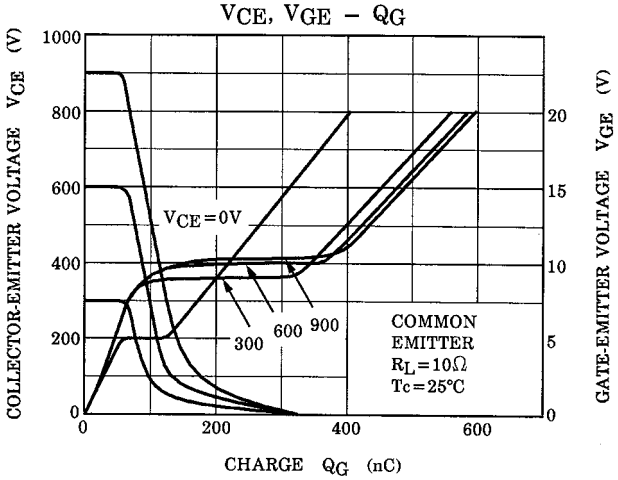
V_{CE} – V_{GE}



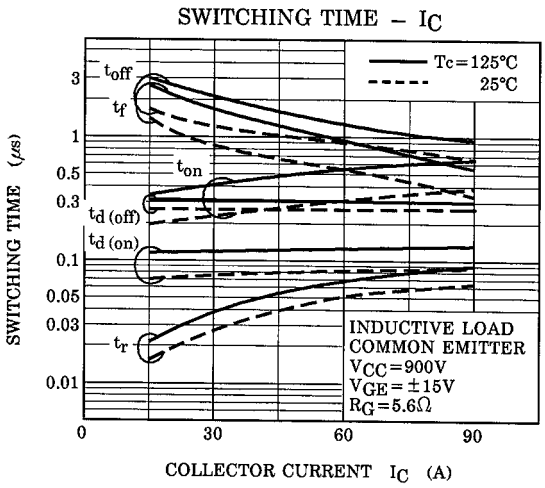
I_C – V_{GE}



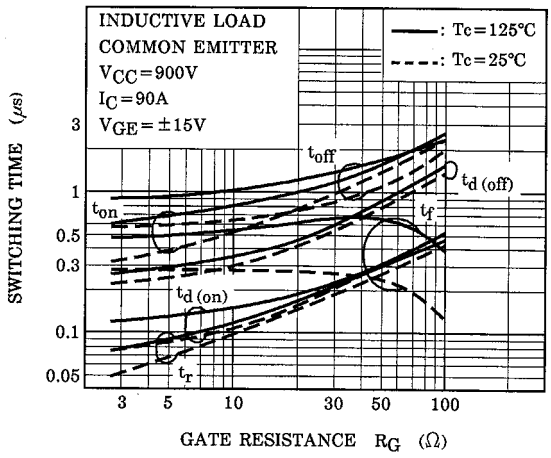
V_{CE}, V_{GE} – Q_G



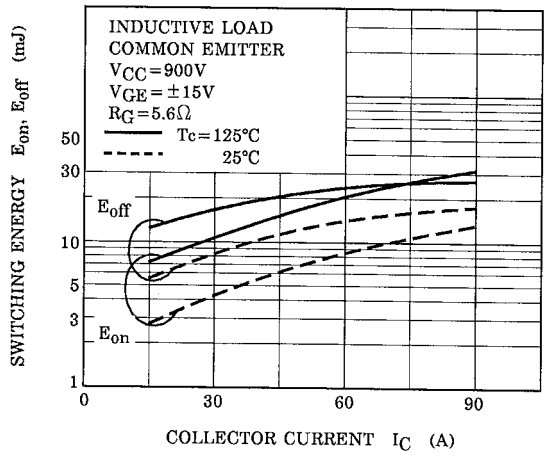
SWITCHING TIME – I_C



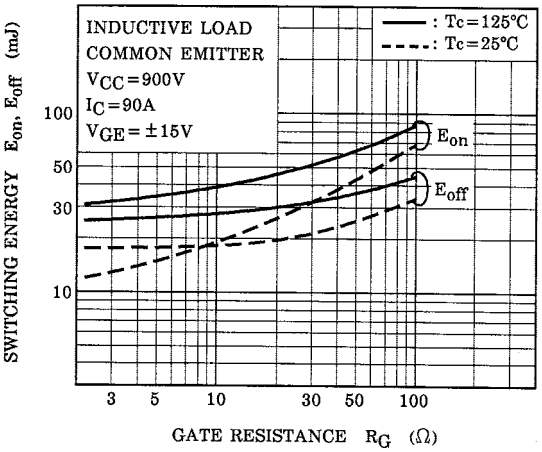
SWITCHING TIME – R_G



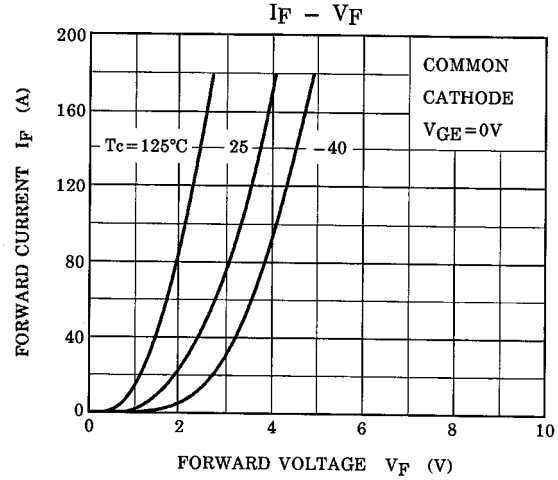
SWITCHING ENERGY – I_C



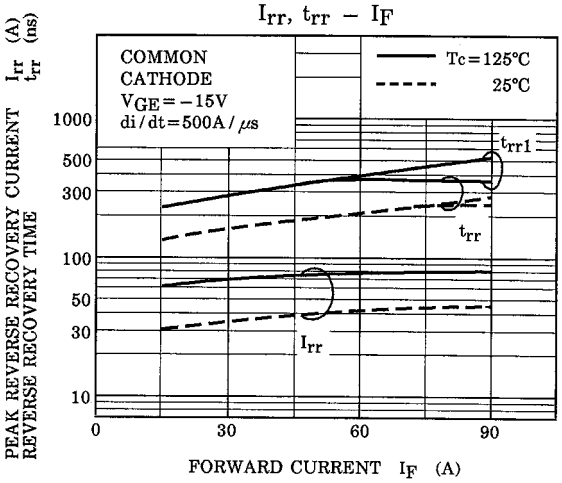
SWITCHING ENERGY – R_G



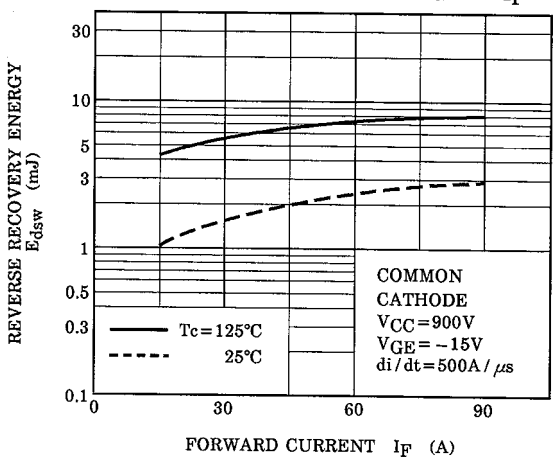
I_F – V_F



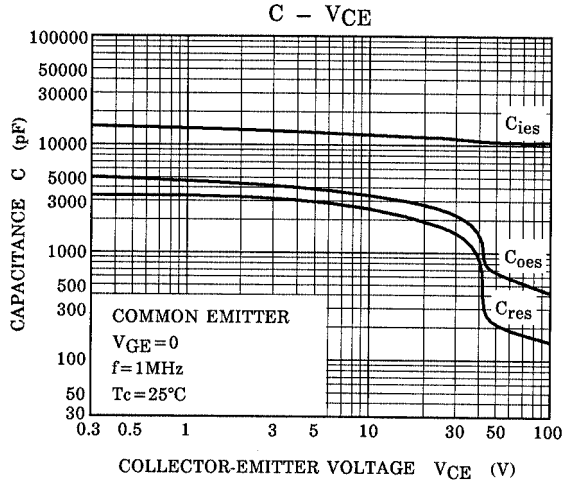
I_{rr}, t_{rr} – I_F



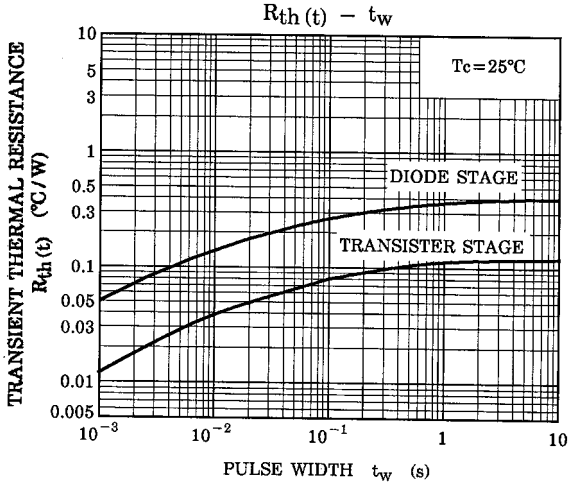
REVERSE RECOVERY ENERGY – I_F



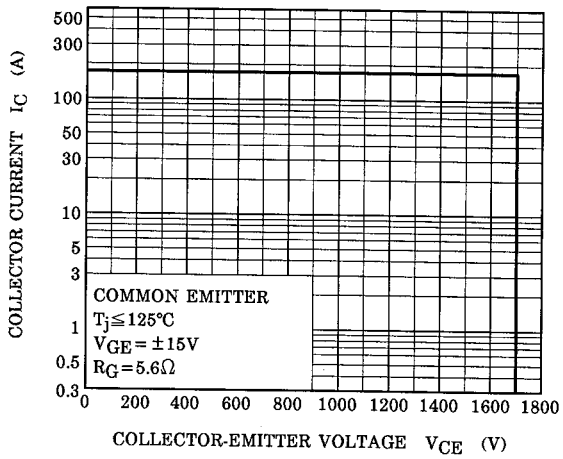
C – V_{CE}



R_{th} (t) – t_w



REVERSE BIAS SOA



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