TOSHIBA GTR Module Silicon N Channel IGBT

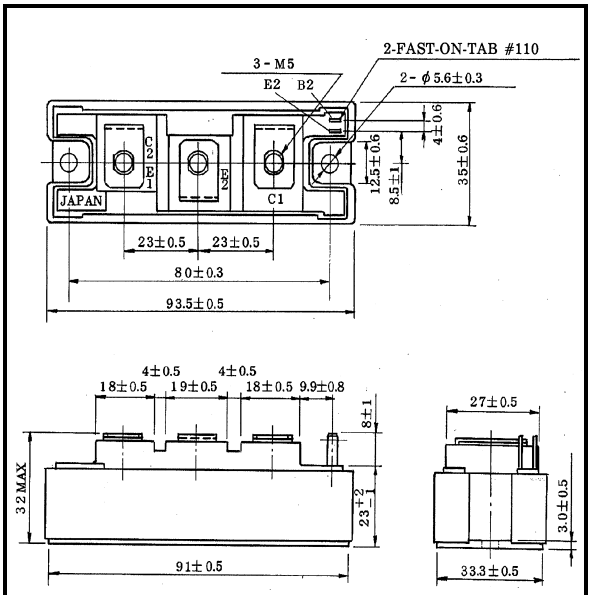
MG75J1ZS40

High Power Switching Applications

Motor Control Applications

- High input impedance
- High speed : t_f = 0.35μs (Max)
  t_{rr} = 0.15μs (Max)
- Low saturation voltage : $V_{CE\ (sat)}$ = 3.5V (Max)
- Enhancement-mode
- The electrodes are isolated from case.

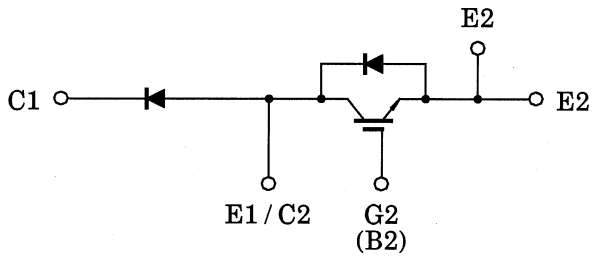
Unit: mm



JEDEC	—
EIAJ	—
TOSHIBA	2-94D2A

Weight: 202g

Equivalent Circuit

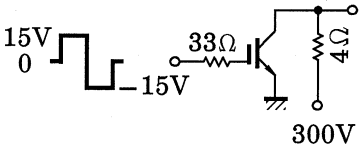


Maximum Ratings (Ta = 25°C)

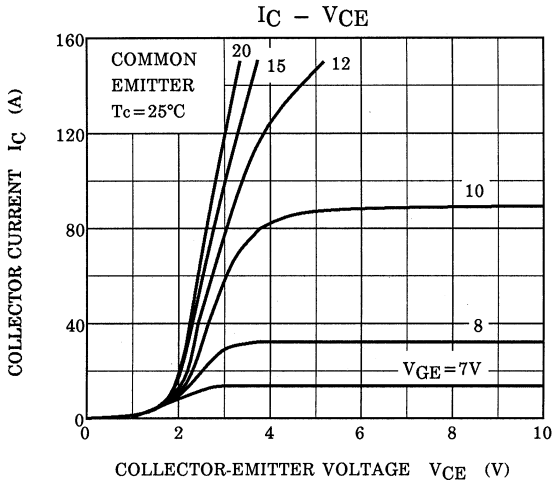
Characteristic		Symbol	Rating	Unit
Collector-emitter voltage		V_{CES}	600	V
Gate-emitter voltage		V_{GES}	±20	V
Collector current	DC	I_C	75	A
	1ms	I_{CP}	150	
Forword current	DC	I_F	75	A
	1ms	I_{FM}	150	
Collector power dissipation (Tc = 25°C)		P_C	350	W
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	−40 ~ 125	°C
Isolation voltage		V_{Isol}	2500 (AC, 1 minute)	V
Screw torque (Terminal / mounting)		—	3 / 3	N·m

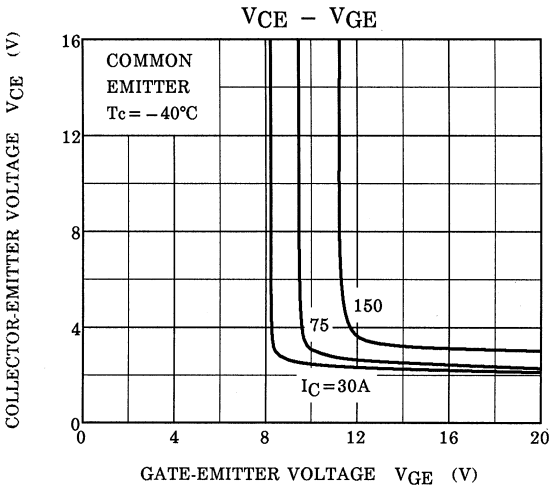
000707EAA2

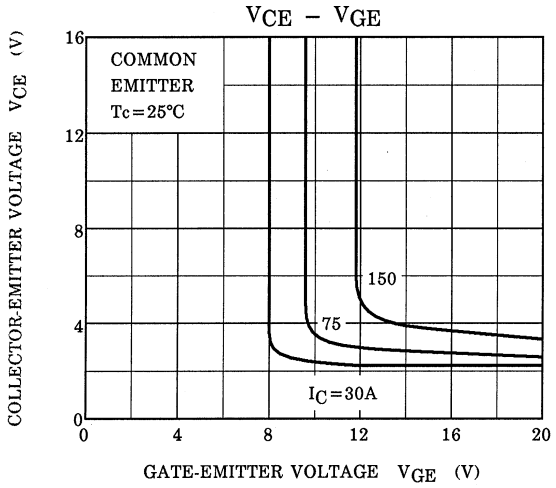
Electrical Characteristics (Ta = 25°C)

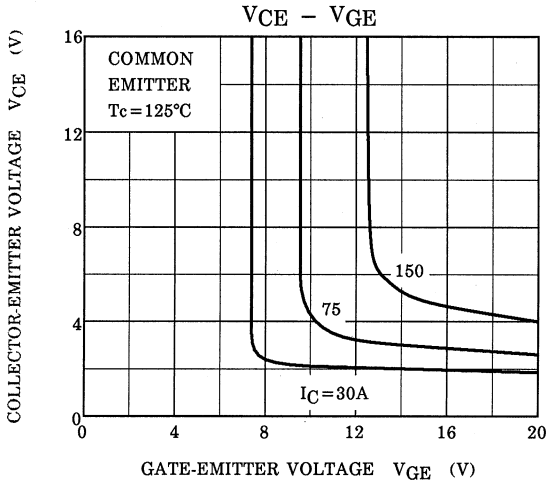
Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		I_{GES}	V_{GE} = ±20V, V_{CE} = 0	—	—	±500	nA
Collector cut-off current		I_{CES}	V_{CE} = 600V, V_{GE} = 0	—	—	1.0	mA
Collector-emitter breakdown voltage		$V_{(BR)\ CES}$	I_C = 10mA, V_{GE} = 0	600	—	—	V
Gate-emitter cut-off voltage		$V_{GE\ (off)}$	I_C = 75mA, V_{CE} = 5V	3.0	—	6.0	V
Collector-emitter saturation voltage		$V_{CE\ (sat)}$	I_C = 75A, V_{GE} = 15V	—	2.7	3.5	V
Input capacitance		C_{ies}	V_{CE} = 10V, V_{GE} = 0, f = 1MHz	—	6800	—	pF
Switching time	Rise time	t_r		—	0.30	0.60	μs
	Turn-on time	t_{on}		—	0.40	0.80	
	Fall time	t_f		—	0.18	0.35	
	Turn-off time	t_{off}		—	0.60	1.00	
Forward voltage		V_F	I_F = 75A, V_{GE} = 0	—	1.7	2.5	V
Reverse recovery time		t_{rr}	I_F = 75A, V_{GE} = −10V, di / dt = 100A / μs	—	0.08	0.15	μs
Thermal resistance		$R_{th\ (j-c)}$	Transistor	—	—	0.35	°C / W
			Diode	—	—	0.83	

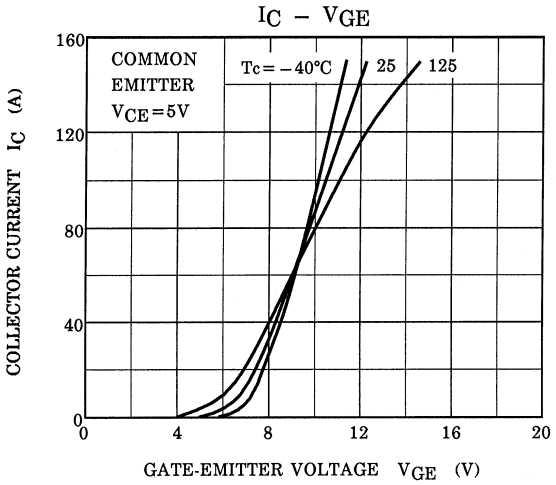
000707EAA2

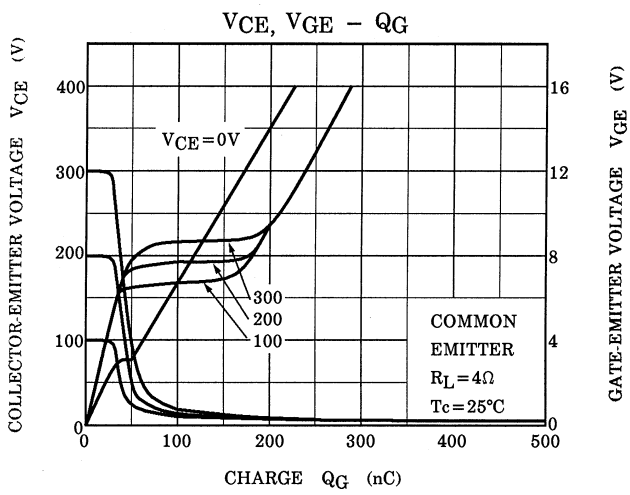

I_C – V_{CE}
COMMON EMITTER
Tc = 25°C
20
15
12
10
8
V_{GE} = 7V
COLLECTOR CURRENT I_C (A)
COLLECTOR-EMITTER VOLTAGE V_{CE} (V)


V_{CE} – V_{GE}
COMMON EMITTER
Tc = –40°C
150
75
I_C = 30A
COLLECTOR-EMITTER VOLTAGE V_{CE} (V)
GATE-EMITTER VOLTAGE V_{GE} (V)

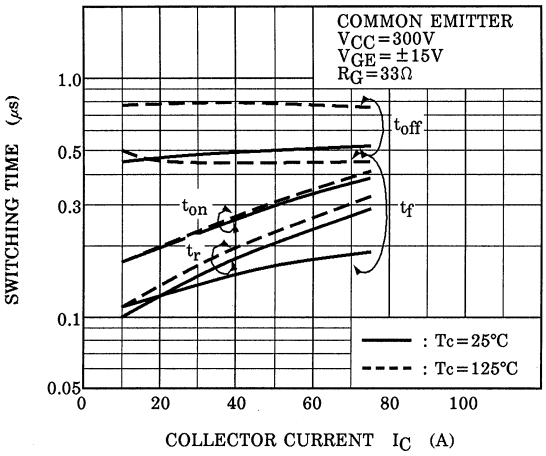

V_{CE} – V_{GE}
COMMON EMITTER
Tc = 25°C
150
75
I_C = 30A
COLLECTOR-EMITTER VOLTAGE V_{CE} (V)
GATE-EMITTER VOLTAGE V_{GE} (V)


V_{CE} – V_{GE}
COMMON EMITTER
Tc = 125°C
150
75
I_C = 30A
COLLECTOR-EMITTER VOLTAGE V_{CE} (V)
GATE-EMITTER VOLTAGE V_{GE} (V)

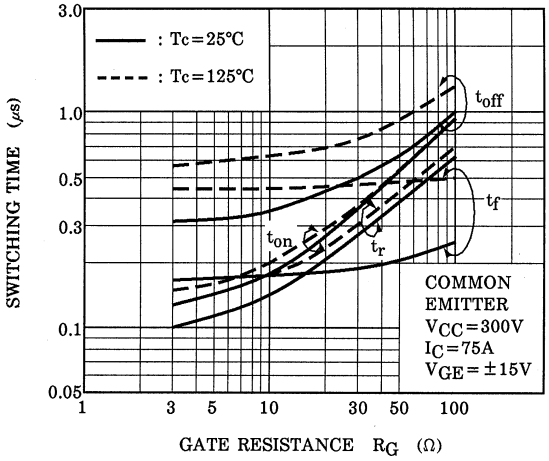

I_C – V_{GE}
COMMON EMITTER
V_{CE} = 5V
Tc = –40°C
25
125
COLLECTOR CURRENT I_C (A)
GATE-EMITTER VOLTAGE V_{GE} (V)


V_{CE}, V_{GE} – Q_G
V_{CE} = 0V
300
200
100
COMMON EMITTER
R_L = 4Ω
Tc = 25°C
COLLECTOR-EMITTER VOLTAGE V_{CE} (V)
GATE-EMITTER VOLTAGE V_{GE} (V)
CHARGE Q_G (nC)

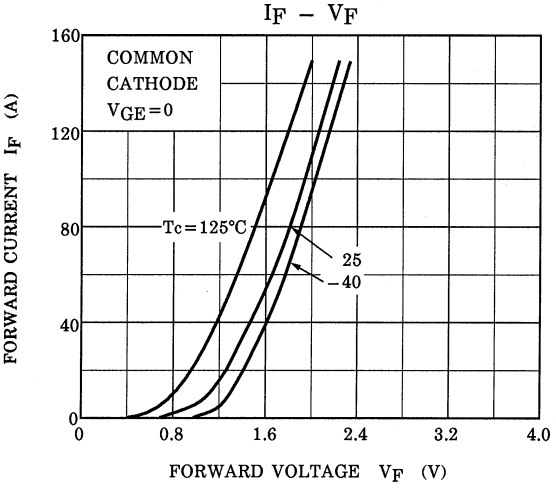
SWITCHING TIME – I_C



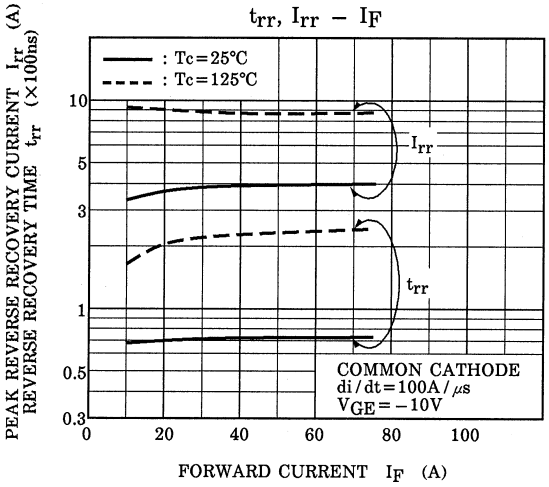
SWITCHING TIME – R_G



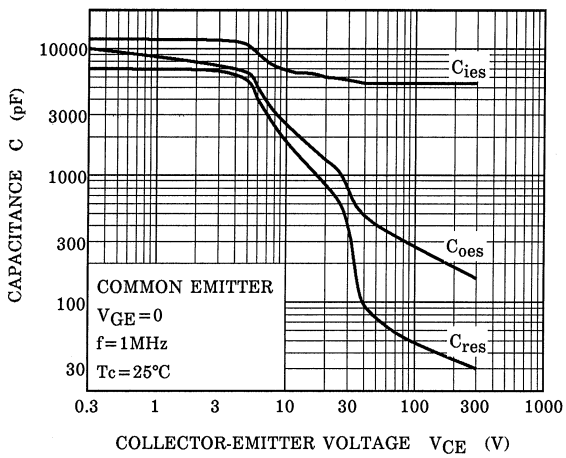
I_F – V_F



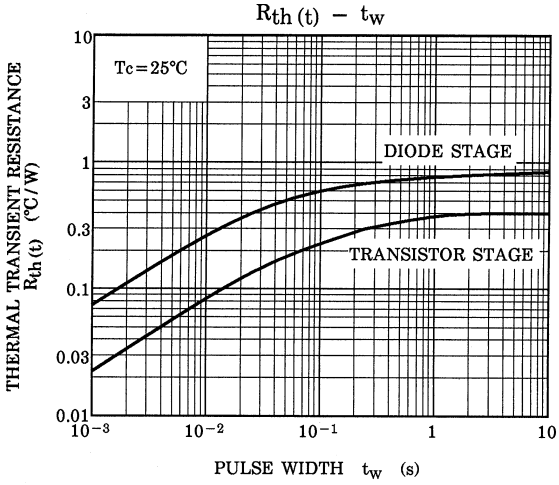
t_{rr}, I_{rr} – I_F



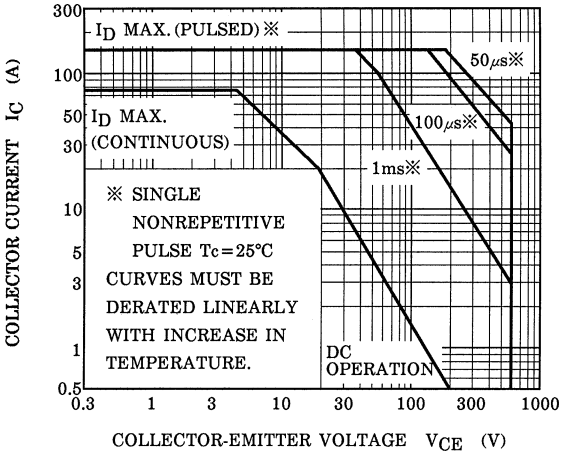
C – V_{CE}



$R_{th\,(t)}$ – t_w



SAFE OPERATING AREA



REVERSE BIAS SOA