TOSHIBA GTR Module Silicon N Channel IGBT

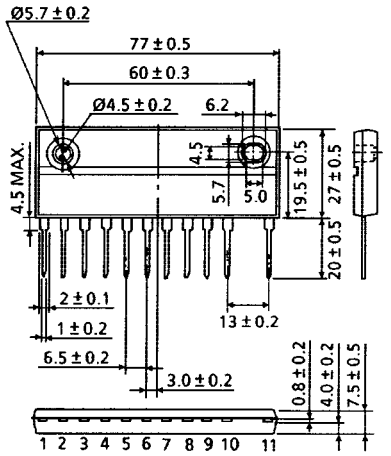
MP6757

High Power Switching Applications

Motor Control Applications

- The electrodes are isolated from case.
- 6 IGBTs are 6 free wheeling diodes are built into 1 package.
- Enhancement-mode
- High speed: t_f = 0.35 μs (max) (I_C = 25 A)
  : t_{rr} = 0.15 μs (max) (I_F = 25 A)

Unit: mm



1. (+) 2. GU 3. U 4. GV 5. V 6. GW
7. W 8. GX 9. GY 10. GZ 11. (−)

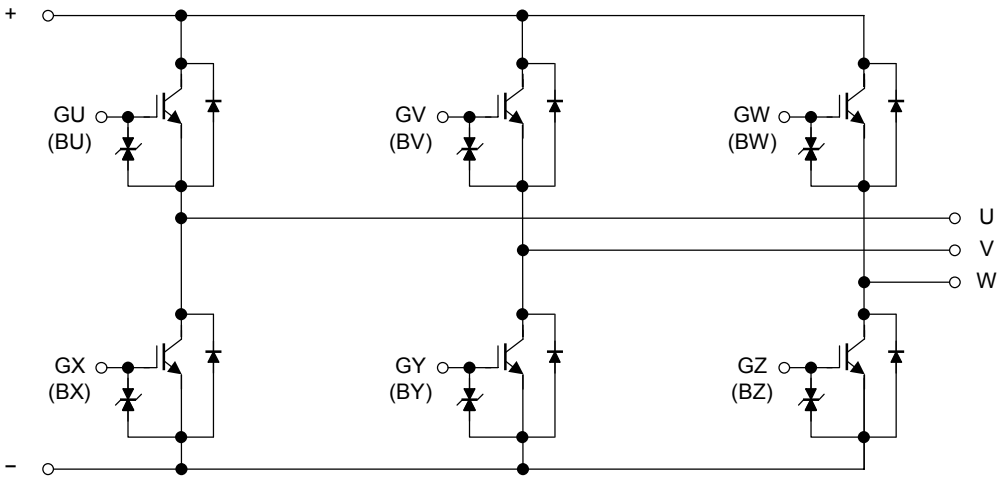
JEDEC	—
JEITA	—
TOSHIBA	2-78A1A

Weight: 44 g (typ.)

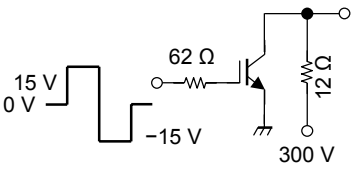
Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit
Collector-emitter voltage		V_{CES}	600	V
Gate-emitter voltage		V_{GES}	±20	V
Collector current	DC	I_C	25	A
	1 ms	I_{CP}	50	
Forward current	DC	I_F	25	A
	1 ms	I_{FM}	50	
Collector power dissipation (Tc = 25°C)		P_C	72	W
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	−40 to 125	°C
Isolation voltage		V_{Isol}	2500 (AC 1 minute)	V
Screw torque		—	1.5	N·m

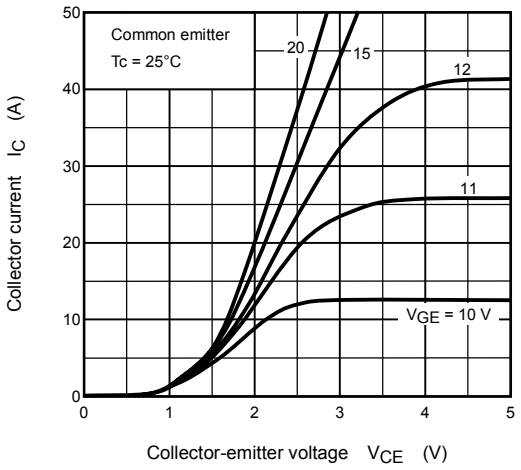
Equivalent Circuit



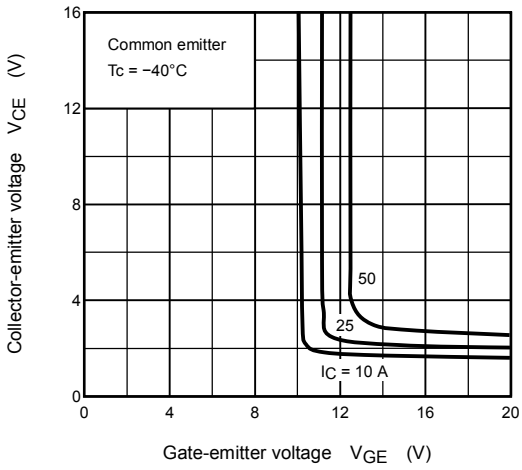
Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		I_{GES}	V_{GE} = ±20 V, V_{CE} = 0 V	—	—	±20	μA
Collector cut-off current		I_{CES}	V_{CE} = 600 V, V_{GE} = 0 V	—	—	1.0	mA
Collector-emitter voltage		V_{CES}	I_C = 10 mA, V_{GE} = 0 V	600	—	—	V
Gate-emitter cut-off voltage		$V_{GE\ (off)}$	V_{CE} = 5 V, I_C = 25 mA	5.6	—	8.6	V
Collector-emitter saturation voltage		$V_{CE\ (sat)}$	I_C = 25 A, V_{GE} = 15 V	—	2.6	3.1	V
Input capacitance		C_{ies}	V_{CE} = 10 V, V_{GE} = 0 V, f = 1 MHz	—	1200	—	pF
Switching time	Rise time	t_r		—	0.3	0.6	μs
	Turn-on time	t_{on}		—	0.6	1.0	
	Fall time	t_f		—	0.2	0.35	
	Turn-off time	t_{off}		—	0.4	0.7	
Forward voltage		V_F	I_F = 25 A, V_{GE} = 0 V	—	2.1	3.2	V
Reverse recovery time		t_{rr}	I_F = 25 A, V_{GE} = −10 V di/dt = 100 A/μs	—	0.08	0.15	μs
Thermal resistance		$R_{th\ (j\text{-}c)}$	Transistor	—	—	1.73	°C/W
			Diode	—	—	2.35	

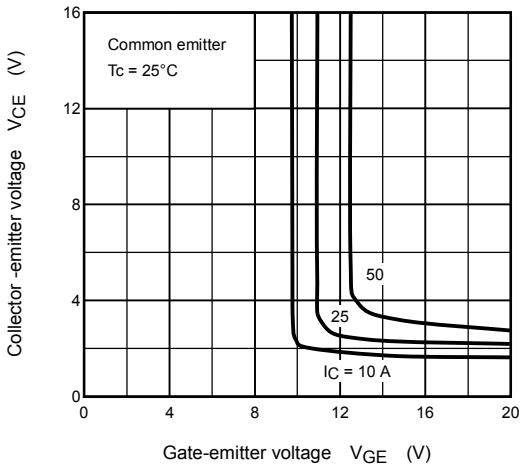
$I_C - V_{CE}$



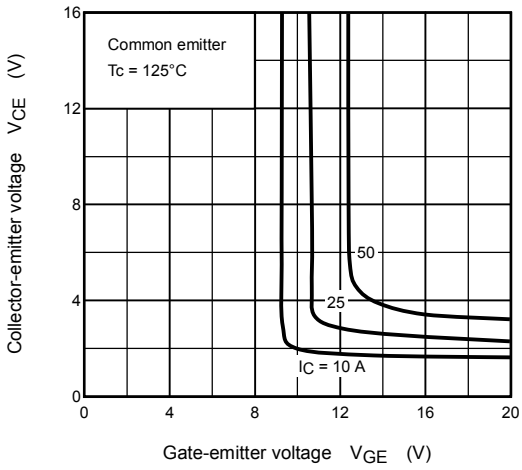
$V_{CE} - V_{GE}$



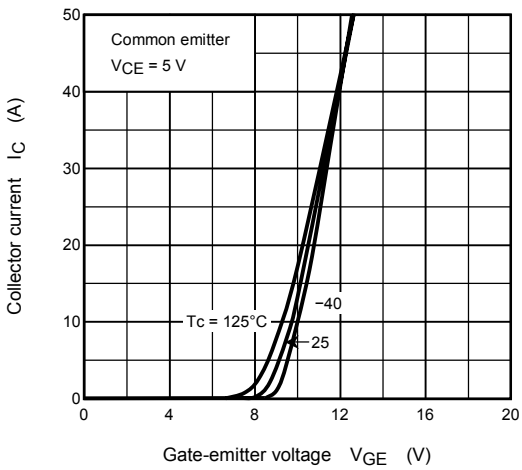
$V_{CE} - V_{GE}$



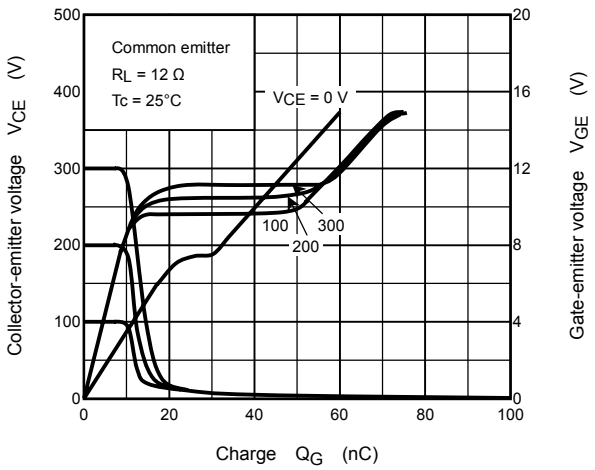
$V_{CE} - V_{GE}$



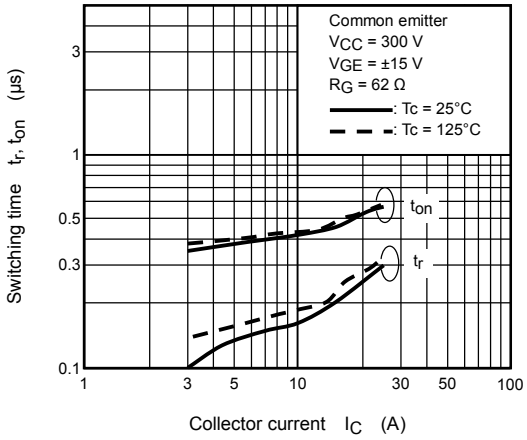
$I_C - V_{GE}$



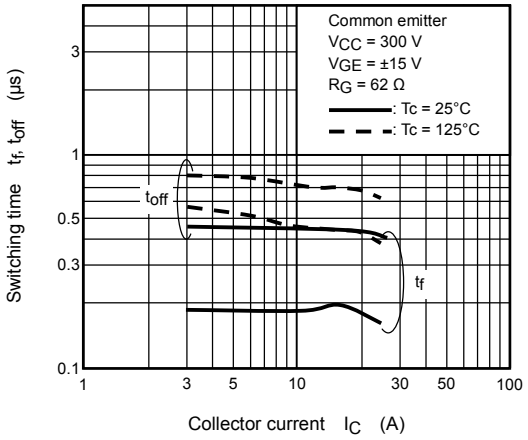
$V_{CE}, V_{GE} - Q_G$



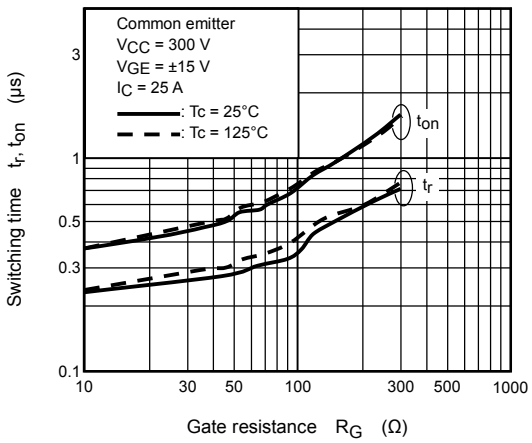
t_r, t_{on} – I_C



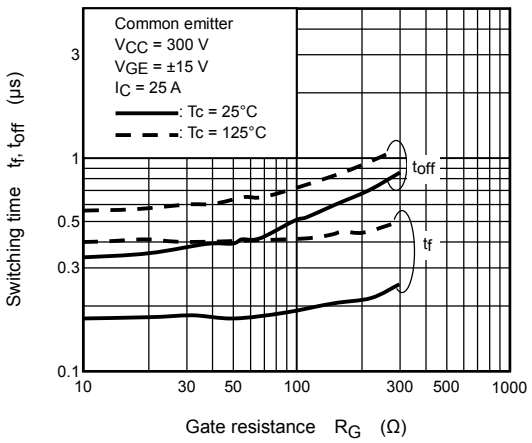
t_f, t_{off} – I_C



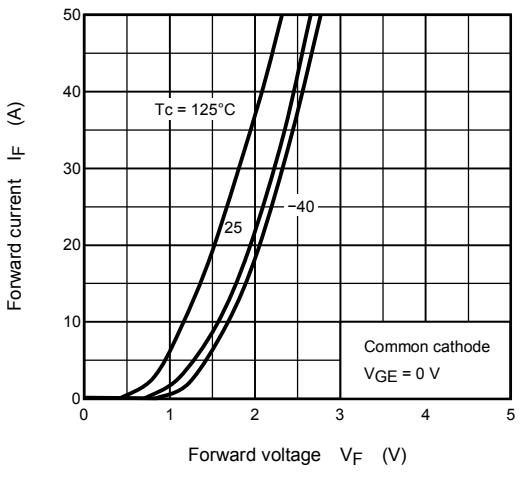
t_r, t_{on} – R_G



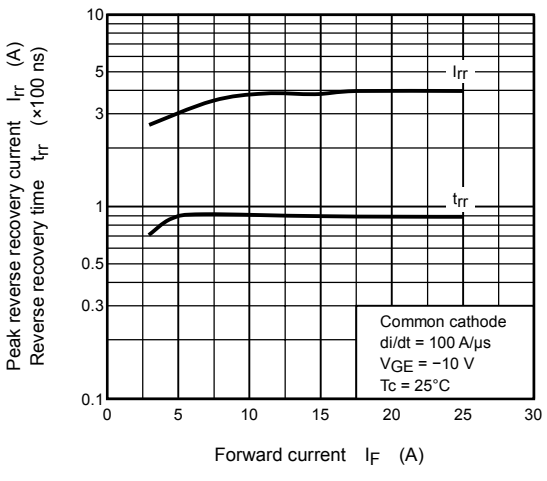
t_f, t_{off} – R_G



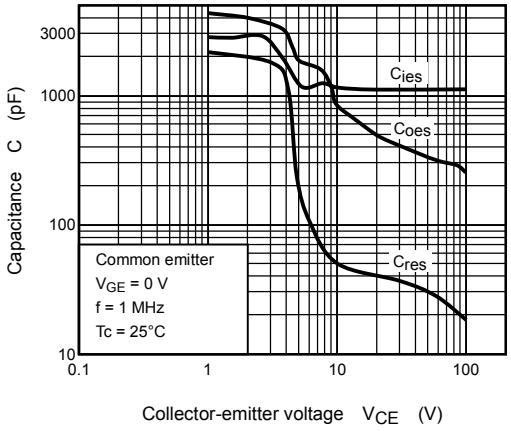
I_F – V_F



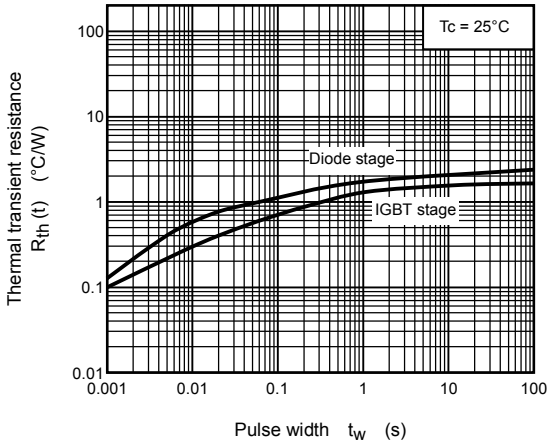
t_{rr}, I_{rr} – I_F



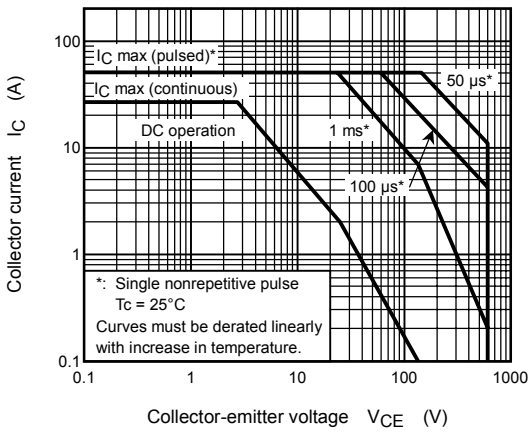
C – V_{CE}



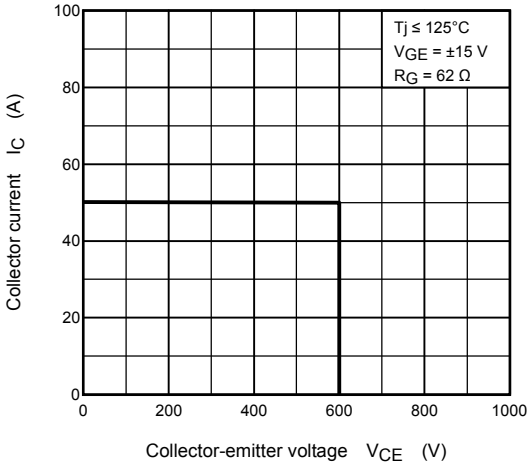
$R_{th\ (t)}$ – t_w



Safe Operating Area



Reverse Bias SOA



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