

Preliminary

# GT40Q322

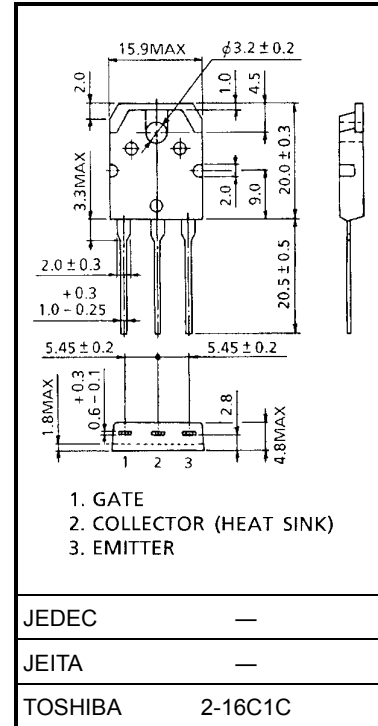
## Voltage Resonance Inverter Switching Application

Unit: mm

- Enhancement-mode
- High speed :  $t_f = 0.14 \mu s$  (typ.) ( $I_C = 40A$ )
- FRD included between emitter and collector
- The 4th generation
- TO-3P(N) (Toshiba package name)

### Maximum Ratings ( $T_a = 25^\circ C$ )

Characteristics	Symbol	Rating	Unit	
Collector-emitter voltage	$V_{CES}$	1200	V	
Gate-emitter voltage	$V_{GES}$	$\pm 25$	V	
Continuous collector current	@ $T_c = 100^\circ C$	20	A	
	@ $T_c = 25^\circ C$	39		
Pulsed collector current	$I_{CP}$	80	A	
Diode forward current	DC	$I_F$	10	A
	Pulsed	$I_{FP}$	80	
Collector power dissipation	@ $T_c = 100^\circ C$	$P_C$	80	W
	@ $T_c = 25^\circ C$		200	W
Junction temperature	$T_j$	150	$^\circ C$	
Storage temperature range	$T_{stg}$	-55 to 150	$^\circ C$	

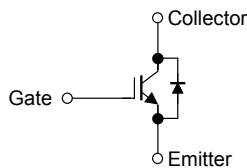


Weight: 4.6 g (typ.)

### Thermal Characteristics

Characteristics	Symbol	Max	Unit
Thermal resistance (IGBT)	$R_{th(j-c)}$	0.625	$^\circ C/W$
Thermal resistance (diode)	$R_{th(j-c)}$	1.79	$^\circ C/W$

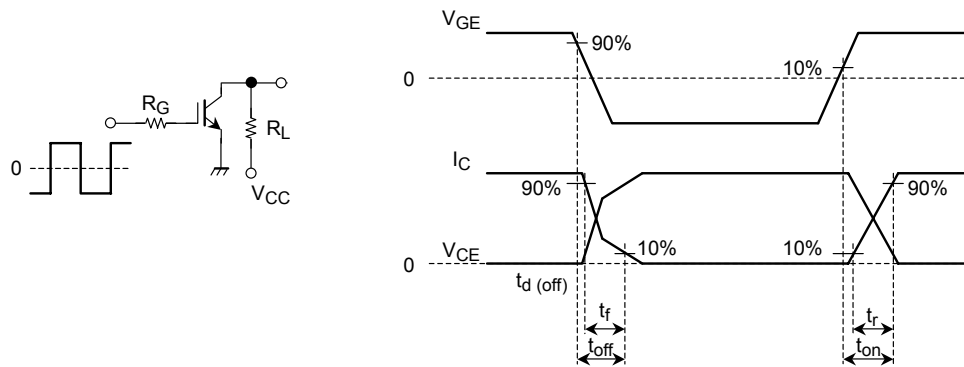
### Equivalent Circuit



## Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		$I_{GES}$	$V_{GE} = \pm 25 \text{ V}, V_{CE} = 0$	—	—	$\pm 500$	nA
Collector cut-off current		$I_{CES}$	$V_{CE} = 1200 \text{ V}, V_{GE} = 0$	—	—	5.0	mA
Gate-emitter cut-off voltage		$V_{GE(OFF)}$	$I_C = 40 \text{ mA}, V_{CE} = 5 \text{ V}$	4.0	—	7.0	V
Collector-emitter saturation voltage		$V_{CE(sat)}$	$I_C = 40 \text{ A}, V_{GE} = 15 \text{ V}$	—	3.0	3.7	V
Input capacitance		$C_{ies}$	$V_{CE} = 10 \text{ V}, V_{GE} = 0, f = 1 \text{ MHz}$	—	5550	—	pF
Switching time	Rise time	$t_r$	Resistive Load $V_{CC} = 600 \text{ V}, I_C = 40 \text{ A}$ $V_{GG} = \pm 15 \text{ V}, R_G = 39 \Omega$ (Note 1)	—	0.18	—	$\mu\text{s}$
	Turn-on time	$t_{on}$		—	0.26	—	
	Fall time	$t_f$		—	0.14	0.21	
	Turn-off time	$t_{off}$		—	0.43	—	
Diode forward voltage		$V_F$	$I_F = 10 \text{ A}, V_{GE} = 0$	—	—	2.0	V
Reverse recovery time		$t_{rr}$	$I_F = 10 \text{ A}, di/dt = -20 \text{ A}/\mu\text{s}$	—	0.6	—	$\mu\text{s}$

Note 1: Switching time measurement circuit and input/output waveforms



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