

# GT40T301

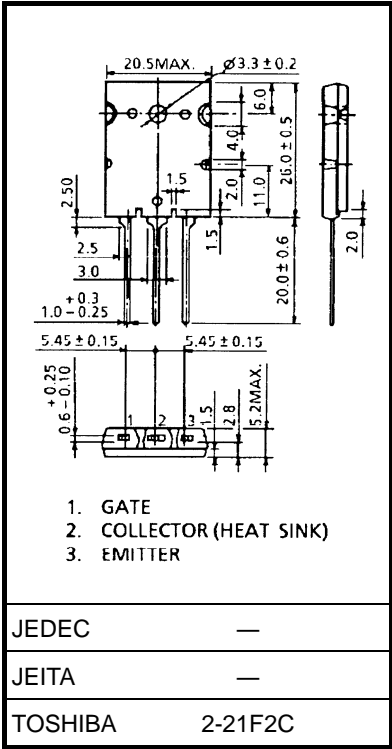
## Parallel Resonance Inverter Switching Applications

Unit: mm

- FRD included between emitter and collector
- Enhancement mode type
- High speed IGBT :  $t_f = 0.25 \mu s$  (typ.) ( $I_C = 40 A$ )  
FRD :  $t_{rr} = 0.7 \mu s$  (typ.) ( $di/dt = -20 A/\mu s$ )
- Low saturation voltage:  $V_{CE(sat)} = 3.7 V$  (typ.) ( $I_C = 40 A$ )

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

Characteristics		Symbol	Rating	Unit
Collector-emitter voltage		$V_{CES}$	1500	V
Gate-emitter voltage		$V_{GES}$	$\pm 25$	V
Collector current	DC	$I_C$	40	A
	1 ms	$I_{CP}$	80	
Emitter-collector forward current	DC	$I_{ECF}$	30	A
	1 ms	$I_{ECPF}$	80	
Collector power dissipation ( $T_c = 25^\circ C$ )		$P_C$	200	W
Junction temperature		$T_j$	150	$^\circ C$
Storage temperature range		$T_{stg}$	$-55 \sim 150$	$^\circ C$

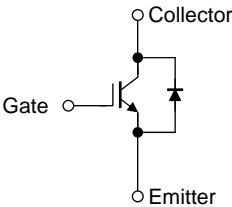


Weight: 9.75 g (typ.)

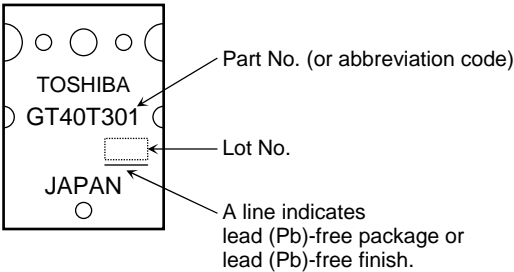
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/Derating Concept and Methods) and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

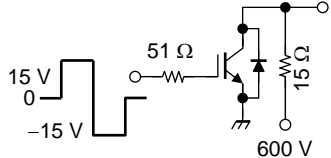
### Equivalent Circuit



### Marking



## 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		$I_{CES}$	$V_{CE} = 1500 \text{ V}, V_{GE} = 0$	—	—	1.0	mA
Gate-emitter cut-off voltage		$V_{GE} \text{ (OFF)}$	$I_C = 40 \text{ mA}, V_{CE} = 5 \text{ V}$	4.0	—	7.0	V
Collector-emitter saturation voltage		$V_{CE} \text{ (sat)}$	$I_C = 40 \text{ A}, V_{GE} = 15 \text{ V}$	—	3.7	5.0	V
Input capacitance		$C_{ies}$	$V_{CE} = 10 \text{ V}, V_{GE} = 0, f = 1 \text{ MHz}$	—	2900	—	pF
Switching time	Rise time	$t_r$		—	0.40	—	$\mu\text{s}$
	Turn-on time	$t_{on}$		—	0.45	—	
	Fall time	$t_f$		—	0.23	0.40	
	Turn-off time	$t_{off}$		—	0.6	—	
Emitter-collector forward voltage		$V_{ECF}$	$I_{ECF} = 30 \text{ A}, V_{GE} = 0$	—	1.9	2.5	V
Reverse recovery time		$t_{rr}$	$I_{ECF} = 30 \text{ A}, V_{GE} = 0, di/dt = -20 \text{ A}/\mu\text{s}$	—	0.7	3.0	$\mu\text{s}$
Thermal resistance		$R_{th} \text{ (j-c)}$	IGBT	—	—	0.625	$^{\circ}\text{C}/\text{W}$
			Diode	—	—	1.25	