

GT40RR21

1. Applications

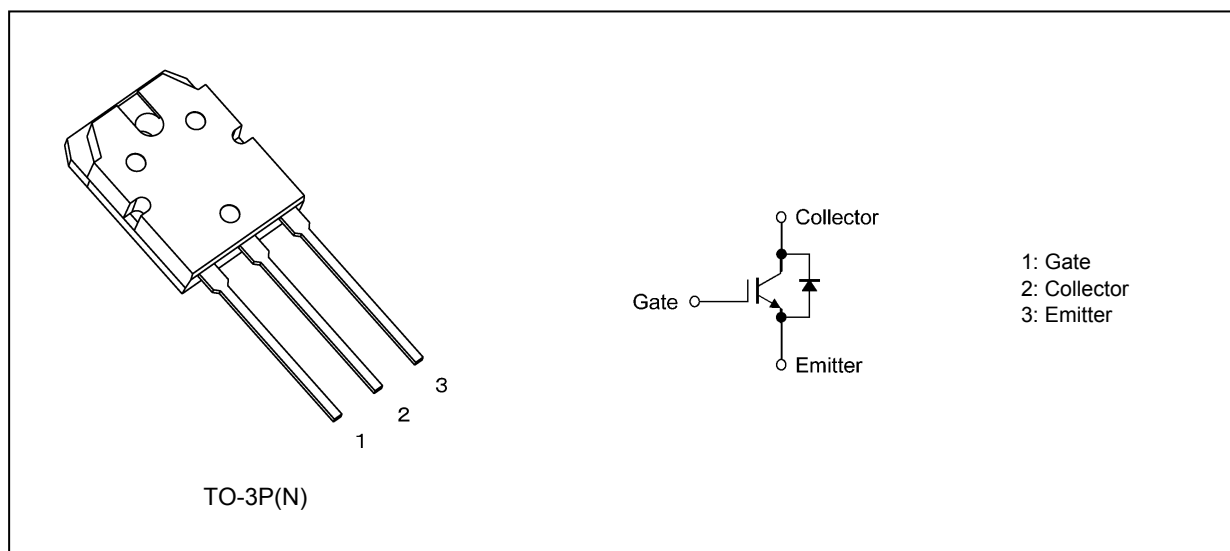
- Dedicated to Voltage-Resonant Inverter Switching Applications

Note: The product(s) described herein should not be used for any other application.

2. Features

- (1) 6.5th generation
- (2) The RC-IGBT consists of a freewheeling diode monolithically integrated in an IGBT chip.
- (3) Enhancement mode
- (4) High-speed switching
IGBT : $t_f = 0.21 \mu\text{s}$ (typ.) ($I_C = 40 \text{ A}$)
FWD : $t_{rr} = 0.60 \mu\text{s}$ (typ.) ($I_F = 15 \text{ A}$)
- (5) Low saturation voltage : $V_{CE(sat)} = 2.05 \text{ V}$ (typ.) ($I_C = 40 \text{ A}$)
- (6) High junction temperature : $T_j = 175^\circ\text{C}$ (max)

3. Packaging and Internal Circuit



4. Absolute Maximum Ratings (Note) ($T_a = 25^\circ\text{C}$, unless otherwise specified)

Characteristics	Symbol	Rating	Unit
Collector-emitter voltage	V_{CES}	1350	V
Gate-emitter voltage	V_{GES}	± 25	
Collector current (DC) ($T_c = 25^\circ\text{C}$)	I_C	40	A
Collector current (DC) ($T_c = 100^\circ\text{C}$)		33	
Collector current (3 μs)	I_{CP}	200	
Collector current (1 ms)		80	
Diode forward current (DC)	I_F	20	
Diode forward current (100 μs)	I_{FP}	80	
Collector power dissipation ($T_c = 25^\circ\text{C}$)	P_C	230	W
Junction temperature (Note 1)	T_j	175	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to 175	
Mounting torque	TOR	0.8	N · m

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).

In general, loss of IGBT increases more when it has positive temperature coefficient and gets higher temperature.

In case that the temperature rise due to loss of IGBT exceeds the heat release capacity of a device, it leads to thermorunaway and results in destruction.

Therefore, please design heat release of a device with due consideration to the temperature rise of IGBT.

Note 1: Ensure that the junction temperature does not exceed 175°C .

5. Thermal Characteristics

Characteristics	Symbol	Max	Unit
Junction-to-case thermal resistance	$R_{th(j-c)}$	0.65	$^\circ\text{C}/\text{W}$