# BCT300-Triac

**Jiangsu Yangjie Runau Semiconductor Co.,Ltd**

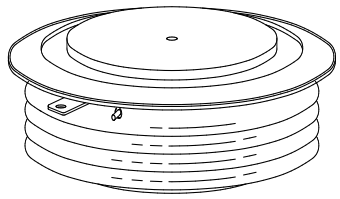
**500 - 1600 $V_{RRM}$; 300 A avg**

## HIGH POWER TRIAC

### Features:

- **All Diffused Structure**
- **Same silicon wafer contains two thyristors**
- **Blocking capability up to 1600 volts**
- **High $d_V/d_t$ Capability**
- **Cold pressing encapsulation**

KT30aT



## ELECTRICAL CHARACTERISTICS AND RATINGS

### Blocking-Off State

| Device Type | $V_{RRM}$ (1) | $V_{DRM}$ (1) | $V_{RSM}$ (1) |
|---|---|---|---|
| BCT300E | 500 | 500 | 600 |
| BCT300M | 600 | 600 | 720 |
| BCT300N | 800 | 800 | 960 |
| BCT300P | 1000 | 1000 | 1150 |
| BCT300PB | 1200 | 1200 | 1300 |
| BCT300PD | 1400 | 1400 | 1500 |
| BCT300PM | 1600 | 1600 | 1700 |

$V_{RRM}$ = Repetitive peak reverse voltage
$V_{DRM}$ = Repetitive peak off state voltage
$V_{RSM}$ = Non Repetitive peak reverse voltage(2)

| | | |
|---|---|---|
| Repetitive peak reverse leakage and off state leakage | $I_{RRM}$ / $I_{DRM}$ | 10 mA<br>30 mA (3) |
| Critical rate of voltage rise | dV/dt (4) | 500 V/µsec |
| Critical rate of reverse voltage rise | $dV/dt_{com}$ | 500 V/µsec |

Notes:
All ratings are specified for Tj=25 °C unless otherwise stated.
(1) All voltage ratings are specified for an applied 50Hz/60zHz sinusoidal waveform over the temperature range -40 to +125 °C
(2) 10 msec. Max. Pulse width
(3) Maximum value for Tj=125 °C.
(4) Minimum value for linear and exponential waveshape to 80% rated $V_{DRM}$. Gate open, Tj=125 °C
(5) Non repetitive value
(6) The value of di/dt is established in accordance with EIA/NIMA Standard RS- 397, Section5-2-2-6.The value defined would be in addition to that obtained from a snubber circuit, comprising a 0.2 µF capacitor and 20 ohms resistance in parallel with the thyristor under test.

### Conducting-on state

| Parameter | Symbol | Min. | Max. | Typ. | Units | Conditions |
|---|---|---|---|---|---|---|
| Average value of on-state current | $I_{T(AV)}$ | | 300 | | A | Sinewave,180° conduction,$T_c$=65°C |
| RMS value of on-state current | $I_{TRMS}$ | | 471 | | A | Nominal value |
| Peak one cycle surge (non repetitive) current | $I_{TSM}$ | | 2500 | | A | 10.0 msec (50Hz), sinusoidal wave-shape, 180° conduction, $T_j$ = 125 °C |
| I square t | $I^2t$ | | 27000 | | $A^2s$ | 10 msec |
| Latching current | $I_L$ | | 800 | | mA | $V_D$ = 24 V; $R_L$= 12 ohms |
| Holding current | $I_H$ | | 400 | | mA | $V_D$ = 24 V; I = 2.5 A |
| Peak on-state voltage | $V_{TM}$ | | 1.65 | | V | $I_{TM}$=500A |
| Critical rate of rise of on-state current(5,6) | di/dt | | 400 | | A/µs | Switching from $V_{DRM} \leq 1000$ V, non-repetitive |
| Critical rate of rise of on-state current(5) | di/dt | | 100 | | A/µs | Switching from $V_{DRM} \leq 1000$ V |

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### Gating

| Parameter | Symbol | Min. | Max. | Typ. | Units | Conditions |
|---|---|---|---|---|---|---|
| Peak gate power dissipation | $P_{GM}$ | | 200 | | W | $t_p$ = 40 us |
| Average gate power dissipation | $P_{G(AV)}$ | | 5 | | W | |
| Peak gate current | $I_{GM}$ | | 10 | | A | |
| Gate trigger current | $I_{GT}$ | | 300 | | mA | $V_D$ = 6 V; $R_L$ = 3 ohms;$T_j$ = -40 °C |
| | | | 150 | | mA | $V_D$ = 6 V; $R_L$ = 3 ohms;$T_j$ = +25 °C |
| | | | 125 | | mA | $V_D$ = 6 V; $R_L$ = 3 ohms;$T_j$ =+125°C |
| Gate trigger voltage | $V_{GT}$ | | 5 | | V | $V_D$ = 6 V; $R_L$ = 3 ohms;$T_j$ = -40 °C |
| | | | 3 | | V | $V_D$ = 6 V; $R_L$ = 3 ohms;$T_j$ = 0-125°C |
| | | 0.30 | | | V | $V_D$ = Rated $V_{DRM}$; $R_L$ = 1000ohms; $T_j$ = + 125 °C |
| Peak negative voltage | $V_{GRM}$ | | 5 | | V | |

### Dynamic

| Parameter | Symbol | Min. | Max. | Typ. | Units | Conditions |
|---|---|---|---|---|---|---|
| Delay time | $t_d$ | | 1.5 | 0.7 | µs | $I_{TM}$ = 50 A; $V_D$ = 67% $V_{DRM}$ Gate pulse: $V_G$ = 30 V; $R_G$ =10 ohms; $t_r$ = 0.1 µs; $t_p$ = 20 µs |
| Turn-off time ($V_R$=-5V) | $t_q$ | | 150 | 100 | µs | $I_{TM}$ > 1000 A; di/dt = 25 A/µs; $V_R$ ≥ -5 V; Re-applied dV/dt = 200 V/µs linear to 67% $V_{DRM}$ ; $T_j$ = 125 °C; Duty cycle ≥ 0.01% |
| Reverse recovery current | $I_{rr}$ | | | | A | $I_{TM}$ > 1000 A; di/dt = 25 A/µs; $V_R$ ≥ -50 V; $T_j$ = 125 °C |

## THERMAL AND MECHANICAL CHARACTERISTICS AND RATINGS

| Parameter | Symbol | Min. | Max. | Typ. | Units | Conditions |
|---|---|---|---|---|---|---|
| Operating temperature | $T_j$ | -40 | +125 | | °C | |
| Storage temperature | $T_{stg}$ | -40 | +150 | | °C | |
| Thermal resistance- junction to case | $R_{\Theta (j-c)}$ | | 0.065<br>0.130 | | °C/W | Double sided cooled<br>Single sided cooled |
| Thermal resistance - case to heatsink | $R_{\Theta (c-s)}$ | | N/A | | °C/W | Double sided cooled *<br>Single sided cooled |
| Mounting force | P | 3000<br>13.4 | 3500<br>15.7 | | lb.<br>kN | |
| Weight | W | | | N/A | g. | |

*** Mounting surfaces smooth, flat and greased**

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## CASE OUTLINE AND DIMENSIONS BCT300-Triac