

**R A E**Runau Electronics(Yangzhou)Manufacturing Co.,Ltd 3600 - 4400 V_{DRM} ; 1650A AVG**YC784-Power Thyristor**

HIGH POWER THYRISTOR FOR PHASE CONTROL APPLICATIONS**Features:**

- . All Diffused Structure
- . Interdigitated Amplifying Gate Configuration
- . Blocking capability up to 4400 volts
- . Guaranteed Maximum Turn-Off Time
- . High dV/dt Capability
- . Pressure Assembled Device

ELECTRICAL CHARACTERISTICS AND RATINGS**Blocking - Off State**

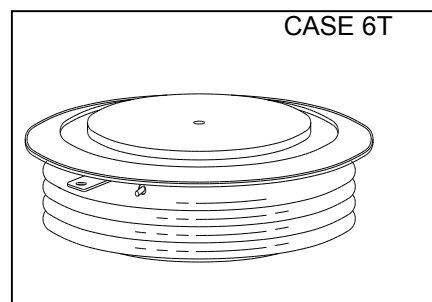
| Device Type | V_{RRM} (1) | V_{DRM} (1) | V_{RSM} (1) |
|-------------|---------------|---------------|---------------|
| YC784CM | 3600 | 3600 | 3700 |
| YC784CN | 3800 | 3800 | 3900 |
| YC784CT | 3900 | 3900 | 4000 |
| YC784DP | 4000 | 4000 | 4100 |
| YC784DA | 4100 | 4100 | 4200 |
| YC784DB | 4200 | 4200 | 4300 |
| YC784DD | 4400 | 4400 | 4500 |

 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 150 mA (3) |
| Critical rate of voltage rise | dV/dt (4) | 500 V/ μ sec |

Conducting - on state

| Parameter | Symbol | Min. | Max. | Typ. | Units | Conditions |
|--|-------------|------|-----------------|------|------------|---|
| Average value of on-state current | $I_{T(AV)}$ | | 1650 | | A | Sinewave, 180° conduction, $T_c=70^\circ\text{C}$ |
| RMS value of on-state current | I_{TRMS} | | 2590 | | A | Nominal value |
| Peak one cycle surge (non repetitive) current | I_{TSM} | | 26000 | | A | 8.3 msec (60Hz), sinusoidal wave-shape, 180° conduction, $T_j = 125^\circ\text{C}$ |
| | | | 24000 | | A | 10.0 msec (50Hz), sinusoidal wave-shape, 180° conduction, $T_j = 125^\circ\text{C}$ |
| I square t | I^2t | | 5×10^6 | | A^2s | 8.3 msec |
| Latching current | I_L | | 400 | | mA | $V_D = 24\text{ V}$; $R_L = 12\text{ ohms}$ |
| Holding current | I_H | | 100 | | mA | $V_D = 24\text{ V}$; $I = 2.5\text{ A}$ |
| Peak on-state voltage | V_{TM} | | 1.85 | | V | $I_{TM} = 2000\text{ A}$; $T_j = 125^\circ\text{C}$ |
| Critical rate of rise of on-state current (5, 6) | di/dt | | 300 | | A/ μ s | Switching from $V_{DRM} \leq 1500\text{ V}$, non-repetitive |
| Critical rate of rise of on-state current (6) | di/dt | | 100 | | A/ μ s | Switching from $V_{DRM} \leq 1500\text{ V}$ |

**Notes:**All ratings are specified for $T_j=25^\circ\text{C}$ unless otherwise stated.(1) All voltage ratings are specified for an applied 50Hz/60Hz sinusoidal waveform over the temperature range -40 to $+125^\circ\text{C}$.

(2) 10 msec. max. pulse width

(3) Maximum value for $T_j = 125^\circ\text{C}$.(4) Minimum value for linear and exponential waveshape to 80% rated V_{DRM} . Gate open. $T_j = 125^\circ\text{C}$.

(5) Non-repetitive value.

(6) The value of di/dt is established in accordance with EIA/NIMA Standard RS-397, Section 5-2-2-6. The value defined would be in addition to that obtained from a snubber circuit, comprising a 0.2 μ F capacitor and 20 ohms resistance in parallel with the thyristor under test.

Gating

| Parameter | Symbol | Min. | Max. | Typ. | Units | Conditions |
|--|-------------|------|-------------------|------|----------------|--|
| Peak gate power dissipation | P_{GM} | | 200 | | W | $t_p = 40 \mu s$ |
| Average gate power dissipation | $P_{G(AV)}$ | | 5 | | W | |
| Peak gate current | I_{GM} | | 15 | | A | |
| Gate current required to trigger all units | I_{GT} | | 300 200 125 | | mA mA mA | $V_D = 6 V; R_L = 3 \text{ ohms}; T_j = -40^\circ C$ $V_D = 6 V; R_L = 3 \text{ ohms}; T_j = +25^\circ C$ $V_D = 6 V; R_L = 3 \text{ ohms}; T_j = +125^\circ C$ |
| Gate voltage required to trigger all units | V_{GT} | 0.30 | 5 4 | | V V V | $V_D = 6 V; R_L = 3 \text{ ohms}; T_j = -40^\circ C$ $V_D = 6 V; R_L = 3 \text{ ohms}; T_j = 0-125^\circ C$ $V_D = \text{Rated } V_{DRM}; R_L = 1000 \text{ ohms}; T_j = +125^\circ C$ |
| Peak negative voltage | V_{GRM} | | 15 | | V | |

Dynamic

| Parameter | Symbol | Min. | Max. | Typ. | Units | Conditions |
|------------------------------------|----------|------|------|------|---------|---|
| Delay time | t_d | | 3.0 | 2.5 | μs | $I_{TM} = 50 A; V_D = 67\% V_{DRM}$ Gate pulse: $V_G = 30 V; R_G = 10 \text{ ohms}; t_r = 0.1 \mu s; t_p = 20 \mu s$ |
| Turn-off time (with $V_R = -5 V$) | t_q | | 400 | 250 | μs | $I_{TM} > 2000 A; di/dt = 5 A/\mu s;$ $V_R \geq -5 V; \text{Re-applied } dV/dt = 1000 \text{ V}/\mu s \text{ linear to } 1000 V_{DRM};$ $T_j = 125^\circ C; \text{Duty cycle } \geq 0.01\%$ |
| Reverse recovery current | I_{rr} | | | | A | $I_{TM} > 2000 A; di/dt = 25 A/\mu s;$ $V_R \geq -50 V; T_j = 125^\circ C$ |

THERMAL AND MECHANICAL CHARACTERISTICS AND RATINGS

| Parameter | Symbol | Min. | Max. | Typ. | Units | Conditions |
|---------------------------------------|-------------------|--------------|---------------|-------------|--------------|-----------------------|
| Operating temperature | T_j | -40 | +125 | | $^\circ C$ | |
| Storage temperature | T_{stg} | -40 | +150 | | $^\circ C$ | |
| Thermal resistance - junction to case | $R_{\Theta(j-c)}$ | | 0.012 | | $^\circ C/W$ | Double sided cooled |
| Thermal resistance - case to sink | $R_{\Theta(c-s)}$ | | 0.001 | | $^\circ C/W$ | Double sided cooled * |
| Mounting force | P | 8000 35.5 | 10000 44.4 | | lb. kN | |
| Weight | W | | | 3.5 1.60 | Lb. Kg. | |

* Mounting surfaces smooth, flat and greased

