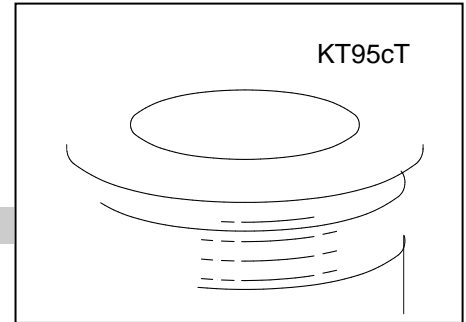




FREE FLOATING TYPE THYRISTOR FOR PHASE CONTROL APPLICATIONS

Features:

- . Free-floating silicon technology
- . Low on-state and switching losses
- . Optimum power handling capability
- . Blocking capability up to 4200 volts
- . Distributed amplifying gate



ELECTRICAL CHARACTERISTICS AND RATINGS

Blocking - Off State

| Device Type | V _{RRM} (1) | V _{DRM} (1) | V _{RSM} (1) |
|-------------|----------------------|----------------------|----------------------|
| KP3170/34 | 3400 | 3400 | 3500 |
| KP3170/36 | 3600 | 3600 | 3700 |
| KP3170/38 | 3800 | 3800 | 3900 |
| KP3170/40 | 4000 | 4000 | 4100 |
| KP3170/42 | 4200 | 4200 | 4300 |

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

Notes:

- (1) All voltage ratings are specified for an applied 50Hz/60Hz sinusoidal waveform over the temperature range 0 to +125 °C.
- (2) 10 msec. max. pulse width
- (3) Maximum value for T_j = 125 °C.
- (4) Minimum value for linear and exponential waveshape to 67% rated V_{DRM}. Gate open. T_j = 125 °C.
- (5). The value of di/dt is established in accordance with EIA/NIMA Standard JB/T 8950.2-2013

| | | |
|---|------------------------------------|--------------------|
| Repetitive peak reverse leakage and off state leakage | I _{RRM} /I _{DRM} | 5 mA 200 mA (3) |
| Critical rate of voltage rise | dv/dt (4) | 1000 V//μsec |

Conducting - On State

| Parameter | Symbol | Min. | Max. | Typ. | Units | Conditions |
|---|---------------------|------|---------------------|------|------------------|--|
| Average value of on-state current | I _{T(AV)} | | 3170 | | A | Sinewave, 180° conduction, T _c =70°C |
| RMS value of on-state current | I _{T(RMS)} | | 4976 | | A | Nominal value |
| Peak one cycle surge (non repetitive) current | I _{TSM} | | 52000 | | A | 10.0 msec (50Hz), sinusoidal waveshape, 180° conduction, T _j = 125 °C |
| I square t | I ² t | | 1.3x10 ⁷ | | A ² s | 10 msec |
| Latching current | I _L | | 1000 | | mA | V _D = 12 V; R _L = 12 ohms |
| Holding current | I _H | | 200 | | mA | V _D = 12 V; I = 2.5 A |
| Peak on-state voltage | V _{TM} | | 1.40 | | V | I _{TM} =3000A; T _j =25°C |
| Threshold voltage, low-level | V _{TO} | | 0.95 | | V | T _j =125°C |
| Slope resistance, low-level | r _T | | 0.15 | | | 3000A to 6000A |
| Critical rate of rise of on-state current | di/dt | | 200 | | | Repetition |

Gating

| Parameter | Symbol | Min. | Max. | Typ. | Units | Conditions |
|--------------------------------|-------------|------|------|------|-------|---|
| Peak gate power dissipation | P_{GM} | | 20 | | W | |
| Average gate power dissipation | $P_{G(AV)}$ | | 4 | | W | |
| Gate-trigger current | I_{GT} | | 200 | | mA | $V_D = 12\text{ V}; R_L = 3\text{ ohms}; T_j = +25\text{ }^\circ\text{C}$ |
| Gate- trigger voltage | V_{GT} | 0.70 | 2.5 | | V | $V_D = 12\text{ V}; R_L = 3\text{ ohms}; T_j = +25\text{ }^\circ\text{C}$ |
| Peak negative voltage | V_{GRM} | | 5 | | V | |

Dynamic

| Parameter | Symbol | Min. | Max. | Typ. | Units | Conditions |
|---|----------|------|------|------|---------------|---|
| Delay time | t_d | | 3.0 | 2.5 | μs | $I_{TM} = 100\text{ A}; V_D = 67\% V_{DRM}$ Gate pulse: $V_G = 30\text{ V}; R_G = 10\text{ ohms};$ $t_r \quad \% \quad p \quad \%$ |
| Turn-off time (with $V_R = -5\text{ V}$) | t_q | | | 600 | μs | $I_{TM} = 2000\text{ A}; di/dt = -10\text{ A}/\mu\text{s};$ $V_R = 50\text{ V}; dV/dt = 30\text{ V}/\mu\text{s};$ $V_D = 67\% V_{DRM}; T_j = 125^\circ\text{C}$ |
| Reverse recovery charge | Q_{rr} | | | 5000 | μC | |

