



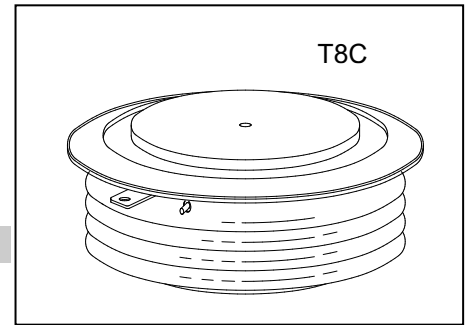
KP1630-POWER THYRISTOR

1200-1800 V_{DRM}

HIGH POWER THYRISTOR FOR PHASE CONTROL APPLICATIONS

Features:

- . All Diffused Structure
- . Amplifying Gate Configuration
- . Blocking capability up to 1800 volts
- . 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) |
|-------------|----------------------|----------------------|----------------------|
| KP1630/12 | 1200 | 1200 | 1400 |
| KP1630/14 | 1400 | 1400 | 1600 |
| KP1630/16 | 1600 | 1600 | 1760 |
| KP1630/18 | 1800 | 1800 | 1900 |

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} | 5 mA 70 mA (3) |
| Critical rate of voltage rise | dv/dt (4) | 1000 V/μs |

Notes:

- (1) All voltage ratings are specified for an applied 50Hz sinusoidal waveform over the temperature range -40 °C 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

Conducting - On State

| Parameter | Symbol | Min. | Max. | Typ. | Units | Conditions |
|---|--------------------|------|----------------------|------|------------------|--|
| Average value of on-state current | I _{T(AV)} | | 1630 | | A | Sinewave, 180° conduction, T _c =70°C |
| RMS value of on-state current | I _{TRMS} | | 2560 | | A | Nominal value |
| Peak one cycle surge (non repetitive) current | I _{TSM} | | 28000 | | A | 10.0 msec (50Hz), sinusoidal waveshape, 180° conduction, T _j = 125 °C |
| I square t | I ² t | | 3.92x10 ⁶ | | A ² s | 10 msec |
| Latching current | I _L | | 700 | | 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} | | 1.55 | | V | I _{TM} =3000A; T _j =25°C |
| Threshold voltage, low-level | V _{TO} | | 0.88 | | V | T _j =125°C |
| Slope resistance, low-level | r _T | | 0.2 | | mΩ | 1000A to 5000A |
| Critical rate of rise of on-state current(5) | di/dt | | 200 | | A/μs | T _j =125°C; V _D = 0.67 V _{DRM} ; f=50Hz; I _{TM} =2000A |

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} | | 150 | | mA | $V_D = 12\text{ V}; R_L = 3\text{ ohms}; T_j = +25\text{ }^\circ\text{C}$ |
| Gate- trigger voltage | V_{GT} | 0.7 | 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: $V_G=30\text{V}; R_G=10\text{ohms};$ $t_r=0.1\mu\text{s}; t_p=20\mu\text{s}$ |
| Turn-off time (with $V_R = -5\text{ V}$) | t_q | | | 250 | μs | $I_{TM} = 1000\text{A}; di/dt = -10\text{A}/\mu\text{s};$ $V_R = 100\text{V}; dv/dt=30\text{V}/\mu\text{s};$ $V_D=67\%V_{DRM}; T_j=125\text{ }^\circ\text{C}$ |
| Reverse recovery charge | Q_{rr} | | | | μC | $I_{TM}=1000\text{A}; di/dt=-10\text{A}/\mu\text{s};$ $V_R=100\text{V}; T_j=125\text{ }^\circ\text{C}$ |

THERMAL AND MECHANICAL CHARACTERISTICS AND RATINGS

| Parameter | Symbol | Min. | Max. | Typ. | Units | Conditions |
|---------------------------------------|-------------------|------|-------|------|---------------------------|---------------------|
| Operating temperature | T_j | -40 | +125 | | $^\circ\text{C}$ | |
| Storage temperature | T_{stg} | -40 | +140 | | $^\circ\text{C}$ | |
| Thermal resistance - junction to case | $R_{\Theta(j-c)}$ | | 0.02 | | $^\circ\text{C}/\text{W}$ | Double sided cooled |
| Thermal resistance - case to heatsink | $R_{\Theta(c-s)}$ | | 0.005 | | $^\circ\text{C}/\text{W}$ | Double sided cooled |
| Mounting force | F | 25 | 29 | 27 | kN | |
| Weight | m | | | 0.5 | kg | |

* Mounting surfaces smooth, flat and greased

