# Technical Data :



# N 0 8 8 2 N C 4 2 0 - Power Thyristor

**4200 $V_{DRM}$;**

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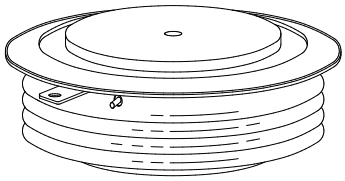
## HIGH POWER THYRISTOR FOR PHASE CONTROL APPLICATIONS

### Features:

- **All Diffused Structure**
- **Center Amplifying Gate Configuration**
- **Blocking capabilty up to 4200 volts**
- **Guaranteed Maximum Turn-Off Time**
- **High dV/dt Capability**
- **Pressure Assembled Device**

CASE 4T



## ELECTRICAL CHARACTERISTICS AND RATINGS

### Blocking - Off State

| Device Type | $V_{RRM}$ (1) | $V_{DRM}$ (1) | $V_{RSM}$ (1) |
|---|---|---|---|
| N0882NC420 | 4200 | 4200 | 4300 |

$V_{RRM}$ = 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 | $I_{RRM}$ / $I_{DRM}$ | 100 mA (3) |
| Critical rate of voltage rise | dV/dt (4) | 1000 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, Section 5-2-2-6. 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 thristor under test.

### Conducting - on state

| Parameter | Symbol | Min. | Max. | Typ. | Units | Conditions |
|---|---|---|---|---|---|---|
| Average value of on-state current | $I_{T(AV)}$ | | 880 | | A | Sinewave,180° conduction,$T_S$=55°C |
| Peak one cPSTCle surge (non repetitive) current | $I_{TSM}$ | | 8470 | | A<br>A | 10.0 msec (50Hz), sinusoidal wave-shape, 180° conduction, $T_j$ = 125 °C |
| I square t | $I^2t$ | | $0.35x10^6$ | | $A^2s$ | 10.0 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 | $V_{TM}$ | | 3.0 | | V | $I_{TM}$ = 1830 A; Duty cPSTCle ≤ 0.01% $T_j$ = 125 °C |
| Critical rate of rise of on-state current (5, 6) | di/dt | | 200 | | A/µs | Switching from $V_{DRM}$ ≤ 1000 V, non-repetitive |
| Critical rate of rise of on-state current (6) | di/dt | | 100 | | A/µs | Switching from $V_{DRM}$ ≤ 1000 V |

# Technical Data :



## ELECTRICAL CHARACTERISTICS AND RATINGS N0882NC420- Power Thyristor

### 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 current required to trigger all units | $I_{GT}$ | | 300<br>150<br>125 | | mA<br>mA<br>mA | $V_D$ = 6 V;$R_L$ = 3 ohms;$T_j$ = -40 °C<br>$V_D$ = 6 V;$R_L$ = 3 ohms;$T_j$ = +25 °C<br>$V_D$ = 6 V;$R_L$ = 3 ohms;$T_j$ = +125°C |
| Gate voltage required to trigger all units | $V_{GT}$ | <br><br>0.30 | 5<br>3<br> | | V<br>V<br>V | $V_D$ = 6 V;$R_L$ = 3 ohms;$T_j$ = -40 °C<br>$V_D$ = 6 V;$R_L$ = 3 ohms;$T_j$ = 0-125°C<br>$V_D$ = Rated $V_{DRM}$; $R_L$ = 1000 ohms; $T_j$ = + 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; $V_D$ = Rated $V_{DRM}$<br>Gate pulse: $V_G$ = 20 V; $R_G$ = 20 ohms; $t_r$ = 0.1 µs; $t_p$ = 20 µs |
| Turn-off time (with $V_R$ = -50 V) | $t_q$ | | 700 | 100 | µs | $I_{TM}$ = 1000 A; di/dt = 25 A/µs; $V_R \geq$ -50 V; Re-applied dV/dt = 20 V/µs linear to 80% $V_{DRM}$; $V_G$ = 0; $T_j$ = 125 °C; Duty cPSTCle ≥ 0.01% |
| Reverse recovery charge | $Q_{rr}$ | | * | | µC | $I_{TM}$ = 1000 A; di/dt = 25 A/µs; $V_R \geq$ -50 V |

* For guaranteed max. value, contact factory.

## 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 | $R_{\Theta(j-s)}$ | | 0.022<br>0.044 | | °C/W | Double sided cooled<br>Single sided cooled |
| Mounting force | P | 19.5 | 26.7 | | kN | |
| Weight | W | | | 510 | g | |

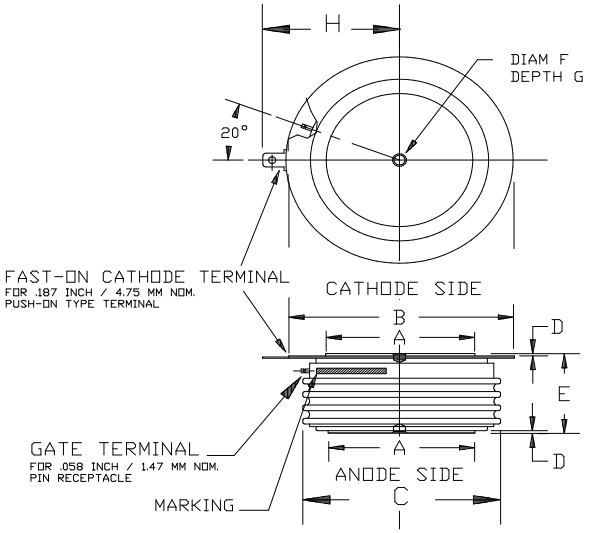
* Mounting surfaces smooth, flat and greased

Note : for case outline and dimensions, see case outline drawing in page 4 of this Technical Data

# Technical Data :



## CASE OUTLINE AND DIMENSIONS. N0882NC420 - Power Thyristor




STRIKE DISTANCE = .58 INCH / 14.7 MM MIN.
CREEPAGE DISTANCE = 1.00 INCH / 25.4 MM MIN.

OUTLIINE DIMENSIONS - CASE 4T

| DIMENSIONS | Min. mm | Max. mm | Min. In. | Max. In. |
|---|---|---|---|---|
| DIAM A | 43.18 | 48.26 | 1.70 | 1.90 |
| DIAM B | 63.50 | 75.18 | 2.50 | 2.96 |
| DIAM C | -- | 67.31 | -- | 2.65 |
| D | 0.76 | -- | 0.03 | -- |
| E | 25.40 | 27.18 | 1.00 | 1.07 |
| F | 3.30 | 3.81 | 0.13 | 0.15 |
| G | 1.78 | 2.03 | 0.07 | 0.08 |
| H | -- | 44.20 | -- | 1.74 |