# DIGITRON SEMICONDUCTORS

## 2N1770A-2N1777A, 2N2619A PHASE CONTROL SCR

Available Non-RoHS (standard) or RoHS compliant (add PBF suffix).
Available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number.

### MAXIMUM RATINGS

| Ratings | Symbol | 2N1770A | 2N1771A | 2N1772A | 2N1773A | 2N1774A | Units |
|---|---|---|---|---|---|---|---|
| **Repetitive peak off-state voltage** | $V_{DRM}$ | 25 | 50 | 100 | 150 | 200 | Volts |
| **Repetitive peak reverse voltage** | $V_{RRM}$ | 25 | 50 | 100 | 150 | 200 | Volts |
| **Non-repetitive peak reverse voltage** | $V_{RSM}$ | 35 | 75 | 150 | 225 | 300 | Volts |

| Ratings | Symbol | 2N1775A | 2N1776A | 2N1777A | 2N2619A | Units |
|---|---|---|---|---|---|---|
| **Repetitive peak off-state voltage** | $V_{DRM}$ | 250 | 300 | 400 | 600 | Volts |
| **Repetitive peak reverse voltage** | $V_{RRM}$ | 250 | 300 | 400 | 600 | Volts |
| **Non-repetitive peak reverse voltage** | $V_{RSM}$ | 350 | 400 | 500 | 720 | Volts |

| Ratings | Symbol | 2N1770A-2N1777A, 2N2619A | Units |
|---|---|---|---|
| **RMS on-state current** | $I_{T(RMS)}$ | 7.4 | Amps |
| **Average on-state current (nominal) $T_C$ = 105°C** | $I_{T(AV)}$ | 4.7 | Amps |
| **Peak one-cycle surge (non-repetitive) on-state current (60 Hz)** | $I_{TSM}$ | 60 | Amps |
| **$I^2t$ (for fusing), 8.3ms** | $I^2t$ | 15 | $A^2$sec |
| **Critical rate of rise of on-state current (repetitive)** | di/dt | 60 | A/µs |
| **Peak gate power dissipation** | $P_{GM}$ | 5 | Watts |
| **Average gate power dissipation** | $P_{G(AV)}$ | 0.5 | Watts |
| **Peak forward gate current** | $I_{FGM}$ | 2 | Amps |
| **Peak reverse gate voltage** | $V_{RGM}$ | 10 | Volts |
| **Storage temperature** | $T_{stg}$ | -65 to +150 | °C |
| **Operating temperature** | $T_J$ | -65 to +150 | °C |
| **Mounting torque** | - | 15 | In.- lbs. |
| **Mounting torque** | - | 17.5 | kg-cm |

### ELECTRICAL CHARACTERISTICS

| Characteristics | Symbol | Test Conditions | 2N1770A | 2N1771A | 2N1772A | 2N1773A | 2N1774A | Units |
|---|---|---|---|---|---|---|---|---|
| **Voltage-Blocking state maximum** Forward leakage, peak | $I_{DRM}$ | $T_J$ = 150°C, $V_D = V_{DRM}$ | 9.0 | 9.0 | 9.0 | 8.0 | 6.0 | mA |
| Reverse leakage, peak | $I_{RRM}$ | $T_J$ = 150°C, $V_R = V_{RRM}$ | 9.0 | 9.0 | 9.0 | 8.0 | 6.0 | mA |

| Characteristics | Symbol | Test Conditions | 2N1775A | 2N1776A | 2N1777A | 2N2619A | Units |
|---|---|---|---|---|---|---|---|
| **Voltage-Blocking state maximum** Forward leakage, peak | $I_{DRM}$ | $T_J$ = 150°C, $V_D = V_{DRM}$ | 5.0 | 4.0 | 2.0 | 2.0 | mA |
| Reverse leakage, peak | $I_{RRM}$ | $T_J$ = 150°C, $V_R = V_{RRM}$ | 5.0 | 4.0 | 2.0 | 2.0 | mA |

| Characteristics | Symbol | Test Conditions | 2N1770A-2N1777A, 2N2619A | | | Units |
|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | |
| **Current- Conducting state** Holding current | $I_H$ | $V_D$ = 24V, $R_L$ = 20Ω, $T_J$ = 25°C | - | - | 25 | mA |
| Peak on state voltage | $V_{TM}$ | $T_C$ = 25°C, $I_{TM}$ = 15A | - | - | 1.85 | Volts |
| **Switching** Typical critical dv/dt exponential to $V_{DRM}$ | dv/dt | - | - | 20 | - | V/µs |
| **Thermal** Maximum thermal resistance, Junction to case | $R_{th(j-c)}$ | - | - | - | 3.1 | °C/Watt |

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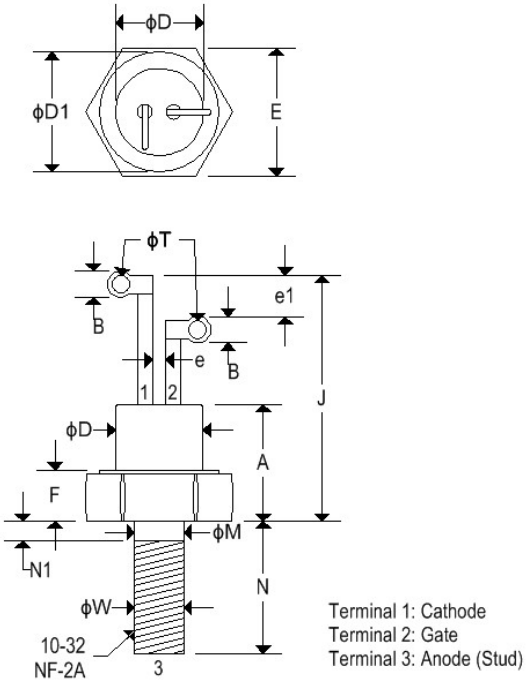
# D I G I T R O N  S E M I C O N D U C T O R S

## 2N1770A-2N1777A, 2N2619A — PHASE CONTROL SCR

| | | | | | | |
|---|---|---|---|---|---|---|
| **Gate- Maximum parameters**<br>Gate current to trigger | $I_{GT}$ | $V_D$ = 12V, $R_L$ = 250Ω, $T_C$ = 25°C<br>$V_D$ = 12V, $R_L$ = 250Ω,$T_C$ = -65°C | -<br>- | -<br>- | 15<br>30 | mA |
| Gate voltage to trigger | $V_{GT}$ | $V_D$ = 12V, $R_L$ = 250Ω, $T_C$ = 150°C | - | - | 2.0 | Volts |
| Minimum non-triggering gate voltage | $V_{GD}$ | $V_D$= $V_{DRM}$, $R_L$ = 250Ω, $T_C$ = 150°C | 0.2 | - | - | Volts |

### MECHANICAL CHARACTERISTICS

| | |
|---|---|
| **Case** | **TO-64** |
| **Marking** | **Alpha-numeric** |
| **Pin out** | **See below** |




| | TO-64 | | | |
|---|---|---|---|---|
| | Inches | | Millimeters | |
| | Min | Max | Min | Max |
| A | 0.300 | 0.400 | 7.620 | 10.160 |
| B | 0.080 | 0.136 | 2.030 | 3.450 |
| **Φ**D | - | 0.424 | - | 10.770 |
| **Φ**$D_1$ | 0.400 | - | 10.160 | - |
| E | 0.424 | 0.437 | 10.770 | 11.100 |
| e | 0.013 | - | 0.330 | - |
| $e_1$ | 0.060 | - | 1.520 | - |
| F | 0.060 | 0.175 | 1.520 | 4.450 |
| J | 0.700 | 0.855 | 17.780 | 21.720 |
| **ΦM** | 0.163 | 0.189 | 4.140 | 4.800 |
| N | 0.400 | 0.453 | 10.160 | 11.510 |
| $N_1$ | - | 0.078 | - | 1.980 |
| **ΦT** | 0.040 | 0.075 | 1.020 | 1.910 |
| **ΦW** | 0.1658 | 0.1697 | 4.212 | 4.310 |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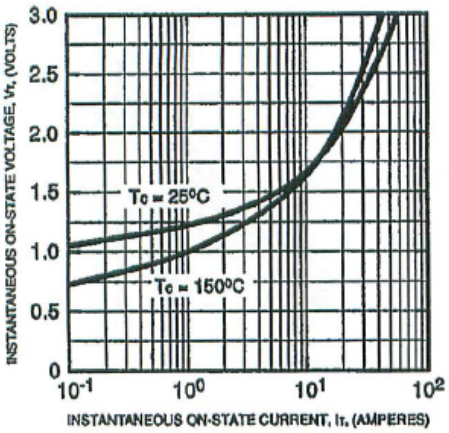
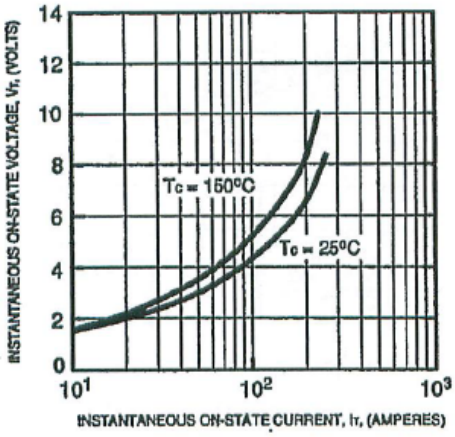
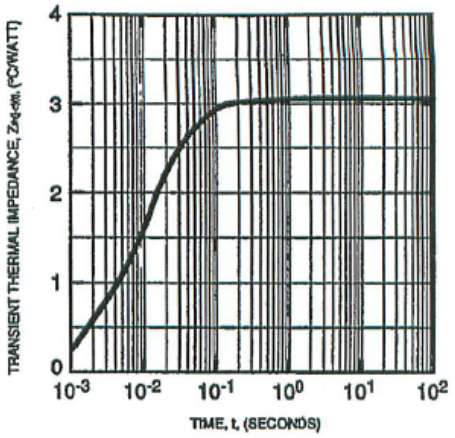
MAXIMUM ON-STATE CHARACTERISTICS



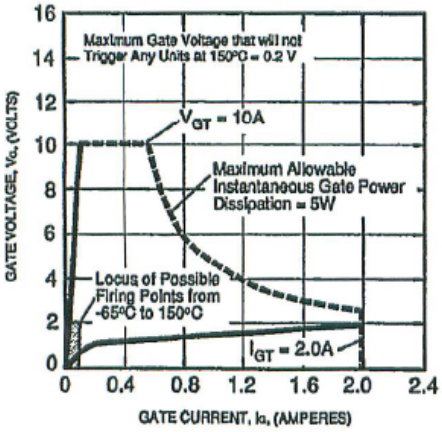

MAXIMUM ON-STATE CHARACTERISTICS (HIGH LEVEL)



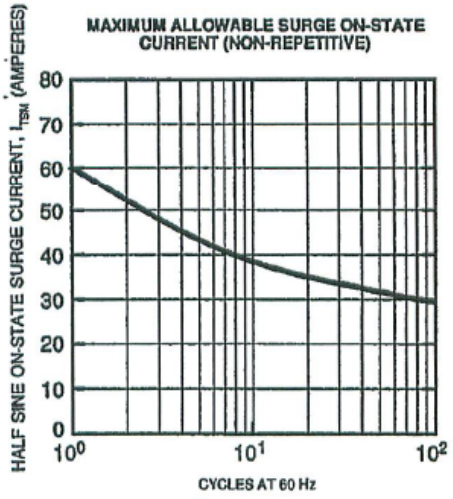

TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)



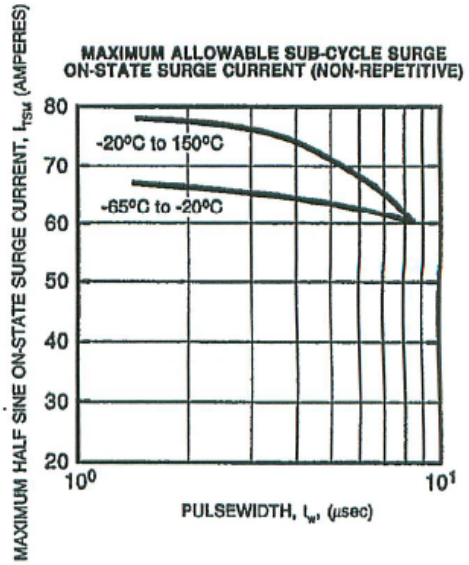

GATE CHARACTERISTICS



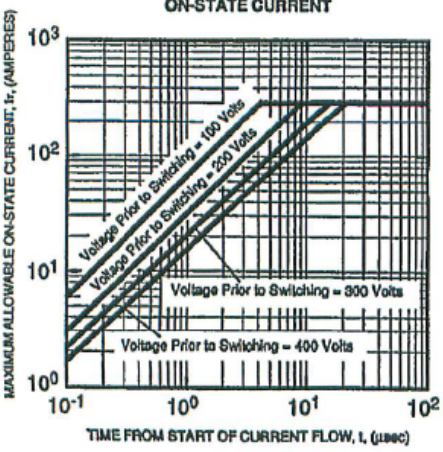

MAXIMUM ALLOWABLE SURGE ON-STATE CURRENT (NON-REPETITIVE)



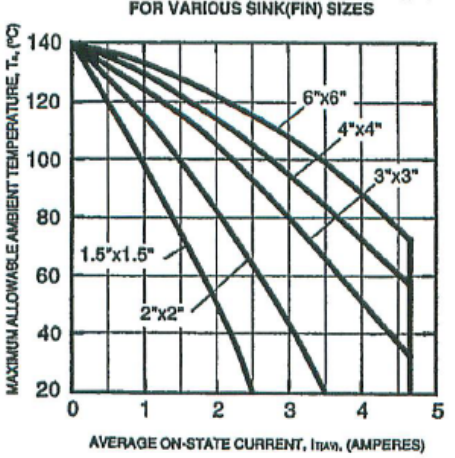

MAXIMUM ALLOWABLE SUB-CYCLE SURGE ON-STATE SURGE CURRENT (NON-REPETITIVE)



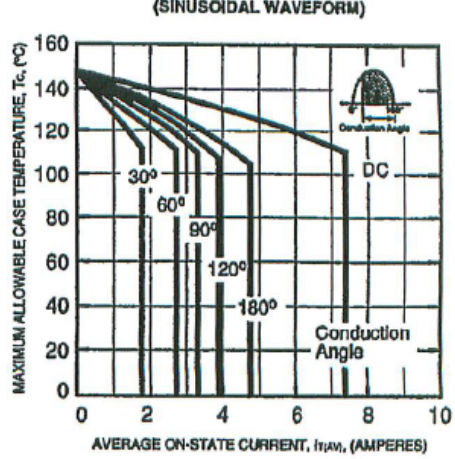

MAXIMUM ALLOWABLE RATE OF RISE OF ON-STATE CURRENT




MAXIMUM ALLOWABLE AMBIENT TEMPERATURE FOR VARIOUS SINK(FIN) SIZES




MAXIMUM ALLOWABLE CASE TEMPERATURE (SINUSOIDAL WAVEFORM)

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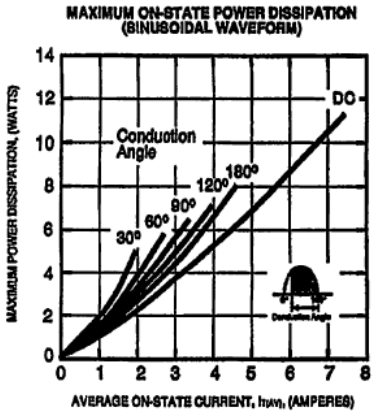


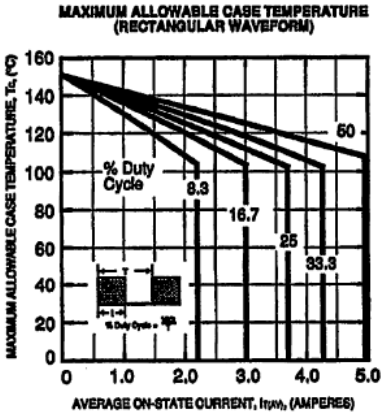


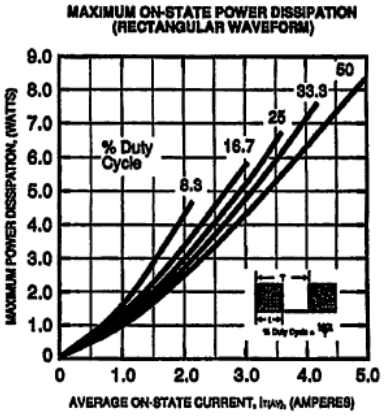


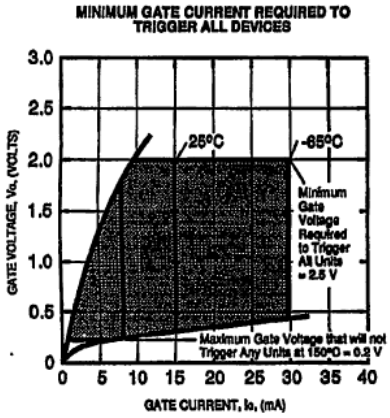



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