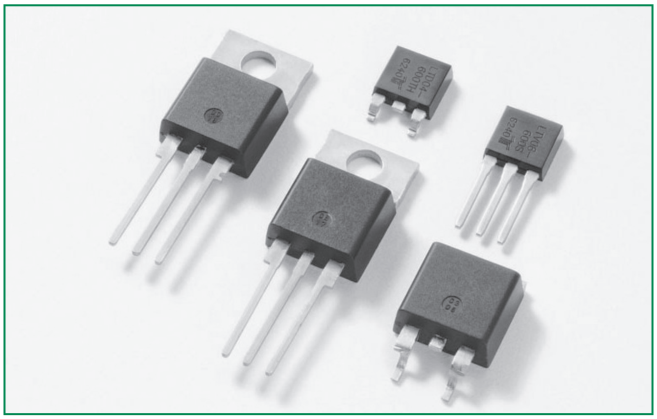
RoHS

# Lxx08xx & Qxx08xx & Qxx08xHx Series



## Description

8 Amp bi-directional solid state switch series is designed for AC switching and phase control applications such as motor speed and temperature modulation controls, lighting controls, and static switching relays.

**Sensitive** type devices guarantee gate control in Quadrants I & IV needed for digital control circuitry.

**Standard** type devices normally operate in Quadrants I & III triggered from AC line.

**Alternistor** type devices only operate in quadrants I, II, & III and are used in circuits requiring high dv/dt capability.

## Agency Approval

| Agency | Agency File Number |
|---|---|
| UR® | L Package: E71639 |

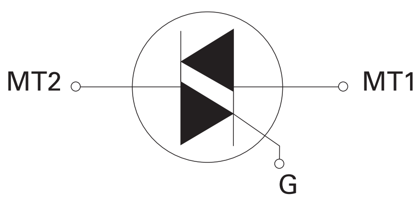
## Main Features

| Symbol | Value | Unit |
|---|---|---|
| $I_{T(RMS)}$ | 8 | A |
| $V_{DRM}/V_{RRM}$ | 400 to 1000 | V |
| $I_{GT\ (Q1)}$ | 5 to 50 | mA |

## Features & Benefits

- RoHS compliant
- Glass – passivated junctions
- Voltage capability up to 1000 V
- Surge capability up to 100 A
- Electrically isolated "L-Package" is UL recognized for 2500Vrms
- Solid-state switching eliminates arcing or contact bounce that create voltage transients
- No contacts to wear out from reaction of switching events
- Restricted (or limited) RFI generation, depending on activation point of sine wave
- Requires only a small gate activation pulse in each half-cycle

## Schematic Symbol




## Applications

Excellent for AC switching and phase control applications such as heating, lighting, and motor speed controls.

Typical applications are AC solid-state switches, light dimmers, power tools, home/brown goods and white goods appliances.

Alternistor Triacs (no snubber required) are used in applications with extremely inductive loads requiring highest commutation performance.

Internally constructed isolated packages are offered for ease of heat sinking with highest isolation voltage.

## Absolute Maximum Ratings — Sensitive Triac (4 Quadrants)

| Symbol | Parameter | | | Value | Unit |
|---|---|---|---|---|---|
| $I_{T(RMS)}$ | RMS on-state current (full sine wave) | Lxx08Ly | $T_C$ = 80°C | 8 | A |
| | | Lxx08Ry / Lxx08Vy / Lxx08Dy | $T_C$ = 85°C | | |
| $I_{TSM}$ | Non repetitive surge peak on-state current (full cycle, $T_J$ initial = 25°C) | f = 50 Hz | t = 20 ms | 65 | A |
| | | f = 60 Hz | t = 16.7 ms | 85 | |
| $I^2t$ | $I^2t$ Value for fusing | $t_p$ = 8.3 ms | | 26.5 | $A^2s$ |
| di/dt | Critical rate of rise of on-state current $I_G$ = 50mA with 0.1μs rise time | f = 120 Hz | $T_J$ = 110°C | 70 | A/μs |
| $I_{GTM}$ | Peak gate trigger current | $t_p$ ≤ 10 μs | $T_J$ = 110°C | 1.6 | A |
| $P_{G(AV)}$ | Average gate power dissipation | | $T_J$ = 110°C | 0.4 | W |
| $T_{stg}$ | Storage temperature range | | | -40 to 150 | °C |
| $T_J$ | Operating junction temperature range | | | -40 to 110 | °C |

Note: xx = voltage, y = sensitivity

## Absolute Maximum Ratings — Standard Triac

| Symbol | Parameter | | | Value | Unit |
|---|---|---|---|---|---|
| $I_{T(RMS)}$ | RMS on-state current (full sine wave) | Qxx08Ry / Qxx08Ny | $T_C$ = 95°C | 8 | A |
| | | Qxx08Ly | $T_C$ = 90°C | | |
| $I_{TSM}$ | Non repetitive surge peak on-state current (full cycle, $T_J$ initial = 25°C) | f = 50 Hz | t = 20 ms | 83 | A |
| | | f = 60 Hz | t = 16.7 ms | 100 | |
| $I^2t$ | $I^2t$ Value for fusing | $t_p$ = 8.3 ms | | 41 | $A^2s$ |
| di/dt | Critical rate of rise of on-state current $I_G$ = 200mA with ≤ 0.1μs rise time | f = 120 Hz | $T_J$ = 125°C | 70 | A/μs |
| $I_{GTM}$ | Peak gate trigger current | $t_p$ ≤ 10 μs; $I_{GT} \leq T_{GTM}$ | $T_J$ = 125°C | 1.8 | A |
| $P_{G(AV)}$ | Average gate power dissipation | | $T_J$ = 125°C | 0.5 | W |
| $T_{stg}$ | Storage temperature range | | | -40 to 150 | °C |
| $T_J$ | Operating junction temperature range | | | -40 to 125 | °C |

Note: xx = voltage, y = sensitivity

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## Absolute Maximum Ratings — Alternistor (3 Quadrants)

| Symbol | Parameter | | | | Value | Unit |
|---|---|---|---|---|---|---|
| $I_{T(RMS)}$ | RMS on-state current (full sine wave) | Qxx08LHy | | $T_C$ = 90°C | 8 | A |
| | | Qxx08RHy / Qxx08NHy Qxx08VHy / Qxx08DHy | | $T_C$ = 95°C | | |
| $I_{TSM}$ | Non repetitive surge peak on-state current (full cycle, $T_J$ initial = 25°C) | f = 50 Hz | t = 20 ms | Qxx08VHy / Qxx08DHy | 80 | A |
| | | | | Qxx08LHy / Qxx08RHy / Qxx08NHy | 83 | |
| | | f = 60 Hz | t = 16.7 ms | Qxx08VHy / Qxx08DHy | 85 | |
| | | | | Qxx08LHy / Qxx08RHy / Qxx08NHy | 100 | |
| $I^2t$ | $I^2t$ Value for fusing | $t_p$ = 8.3 ms | | Qxx08VHy / Qxx08DHy | 30 | $A^2s$ |
| | | | | Qxx08LHy / Qxx08RHy / Qxx08NHy | 41 | |
| di/dt | Critical rate of rise of on-state current | f = 120 Hz | | $T_J$ = 125°C | 70 | A/μs |
| $I_{GTM}$ | Peak gate trigger current | $t_p \le$ 10 μs; $I_{GT} \le I_{GTM}$ | $T_J$ = 125°C | Qxx08VHy / Qxx08DHy | 1.6 | A |
| | | | | Qxx08LHy / Qxx08RHy / Qxx08NHy | 2.0 | |
| $P_{G(AV)}$ | Average gate power dissipation | $T_J$ = 125°C | $I_{GT}$ = 10mA | Qxx08VHy / Qxx08DHy | 0.4 | W |
| | | | $I_{GT}$ = 35mA | Qxx08LHy / Qxx08RHy / Qxx08NHy | 0.5 | |
| $T_{stg}$ | Storage temperature range | | | | -40 to 150 | °C |
| $T_J$ | Operating junction temperature range | | | | -40 to 125 | °C |

Note: xx = voltage, y = sensitivity

## Electrical Characteristics ($T_J$ = 25°C, unless otherwise specified) — Sensitive Triac (4 Quadrants)

| Symbol | Test Conditions | Quadrant | | Lxx08x6 | Lxx08x8 | Unit |
|---|---|---|---|---|---|---|
| $I_{GT}$ | $V_D$ = 12V $R_L$ = 60 Ω | I – II – III<br>IV | MAX. | 5<br>10 | 10<br>20 | mA |
| $V_{GT}$ | | ALL | MAX. | 1.3 | | V |
| $V_{GD}$ | $V_D = V_{DRM}$ $R_L$ = 3.3 kΩ $T_J$ = 110°C | ALL | MIN. | 0.2 | | V |
| $I_H$ | $I_T$ = 100mA | | MAX. | 10 | 20 | mA |
| dv/dt | $V_D = V_{DRM}$ Gate Open $T_J$ = 100°C | 400V | TYP. | 30 | 40 | V/μs |
| | | 600V | | 20 | 30 | |
| (dv/dt)c | (di/dt)c = 4.3 A/ms $T_J$ = 110°C | | TYP. | 2 | 2 | V/μs |
| $t_{gt}$ | $I_G$ = 100mA PW = 15μs $I_T$ = 11.3 A(pk) | | TYP. | 3.0 | 3.2 | μs |

Note: xx = voltage, x = package, y = sensitivity

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## Electrical Characteristics ($T_J$ = 25°C, unless otherwise specified) — Standard Triac

| Symbol | Test Conditions | Quadrant | | Qxx08x4 | Qxx08x5 | Unit |
|---|---|---|---|---|---|---|
| $I_{GT}$ | $V_D$ = 12V $R_L$ = 60 Ω | I – II – III<br>IV | MAX.<br>TYP. | 25<br>50 | 50<br>75 | mA |
| $V_{GT}$ | $V_D$ = 12V $R_L$ = 60 Ω | I – II – III | MAX. | 1.3 | | V |
| $V_{GD}$ | $V_D = V_{DRM}$ $R_L$ = 3.3 kΩ $T_J$ = 125°C | ALL | MIN. | 0.2 | | V |
| $I_H$ | $I_T$ = 200mA | | MAX. | 50 | 50 | mA |
| dv/dt | $V_D = V_{DRM}$ Gate Open $T_J$ = 125°C | 400V | MIN. | 150 | | V/µs |
| | | 600V | | | 125 | |
| | | 800V | | | 100 | |
| | | 1000V | | | 80 | |
| (dv/dt)c | (di/dt)c = 4.3 A/ms $T_J$ = 125°C | | TYP. | 4 | 4 | V/µs |
| $t_{gt}$ | $I_G$ = 100mA PW = 15µs $I_T$ = 11.3 A(pk) | | TYP. | 3.0 | 3.0 | µs |

## Electrical Characteristics ($T_J$ = 25°C, unless otherwise specified) — Alternistor Triac (3 Quadrants)

| Symbol | Test Conditions | Quadrant | | | Qxx08xH3 | Qxx08xH4 | Unit |
|---|---|---|---|---|---|---|---|
| $I_{GT}$ | $V_D$ = 12V $R_L$ = 60 Ω | I – II – III | MAX. | | 10 | 35 | mA |
| $V_{GT}$ | $V_D$ = 12V $R_L$ = 60 Ω | I – II – III | MAX. | | 1.3 | | V |
| $V_{GD}$ | $V_D = V_{DRM}$ $R_L$ = 3.3 kΩ $T_J$ = 125°C | I – II – III | MIN. | | 0.2 | | V |
| $I_H$ | $I_T$ = 100mA | | MAX. | | 15 | 35 | mA |
| dv/dt | $V_D = V_{DRM}$ Gate Open $T_J$ = 125°C | Qxx08LHy / Qxx08RHy / Qxx08NHy | MIN. | 400V | 75 | 400 | V/µs |
| | | | | 600V | 50 | 300 | |
| | | | | 800V | | 200 | |
| | | | | 1000V | | 100 | |
| | | Qxx08VHy / Qxx08DHy | | 400V | 75 | 450 | |
| | | | | 600V | 50 | 350 | |
| | | | | 800V | | 250 | |
| | | | | 1000V | | 150 | |
| (dv/dt)c | (di/dt)c = 4.3 A/ms $T_J$ = 125°C | | MIN. | | 20 | 25 | V/µs |
| $t_{gt}$ | $I_G$ = 100mA PW = 15µs $I_T$ = 11.3 A(pk) | | TYP. | | 4.0 | 4.0 | µs |

Note : xx = voltage, x = package, y = sensitivity

## Static Characteristics

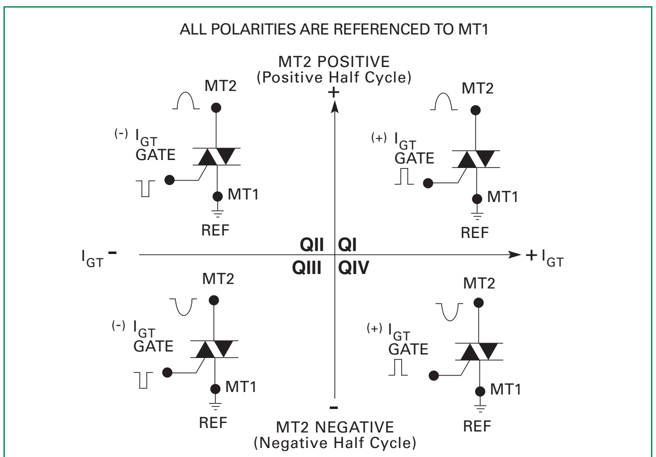
| Symbol | Test Conditions | | | | | Value | Unit |
|---|---|---|---|---|---|---|---|
| $V_{TM}$ | $I_{TM}$ = 11.3A $t_p$ = 380 µs | | | | MAX. | 1.60 | V |
| $I_{DRM}$ $I_{RRM}$ | $V_{DRM} = V_{RRM}$ | Lxx08xy | $T_J$ = 25°C | 400 - 600V | MAX. | 20 | µA |
| | | | $T_J$ = 110°C | 400 - 600V | | 0.5 | mA |
| | | Qxx08xy | $T_J$ = 25°C | 400 - 1000V | | 50 | µA |
| | | | $T_J$ = 125°C | 400 - 800V | | 2 | mA |
| | | | $T_J$ = 100°C | 1000V | | 3 | |
| | | Qxx08xHy | $T_J$ = 25°C | 400 - 800V | | 10 | µA |
| | | | | 1000V | | 20 | |
| | | | $T_J$ = 125°C | 400 - 800V | | 2 | mA |
| | | | $T_J$ = 100°C | 1000V | | 3 | |

## Thermal Resistances

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $R_{\theta(J-C)}$ | Junction to case (AC) | L/Qxx08Ryy / L/Qxx08Nyy | 1.5 | °C/W |
| | | L/Qxx08Lyy | 2.8 | |
| | | L/Qxx08Vyy | 2.1 | |
| $R_{\theta(J-A)}$ | Junction to ambient | L/Qxx08Ryy | 45 | °C/W |
| | | L/Qxx08Lyy | 50 | |
| | | L/Qxx08Vyy | 64 | |

Note: xx = voltage, x = package, y = sensitivity, yy = type & sensitivity

## Figure 1: Definition of Quadrants




Note: Alternistors will not operate in QIV

## Figure 2: Normalized DC Gate Trigger Current for All Quadrants vs. Junction Temperature

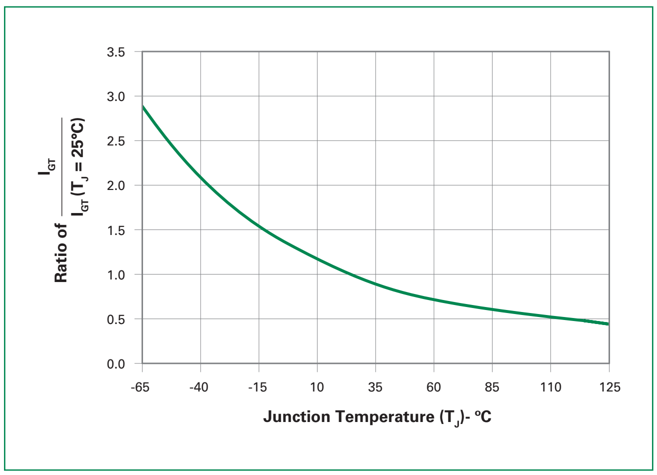


**Figure 3: Normalized DC Holding Current vs. Junction Temperature**

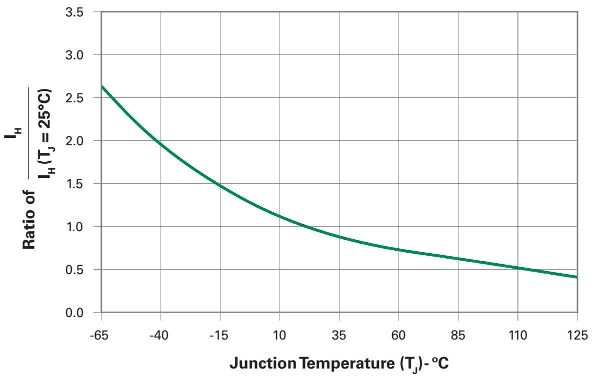



**Figure 4: Normalized DC Gate Trigger Voltage for All Quadrants vs. Junction Temperature**

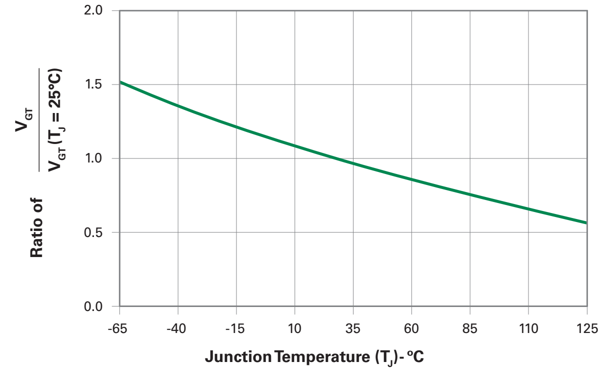



**Figure 5: Power Dissipation (Typical) vs. RMS On-State Current**

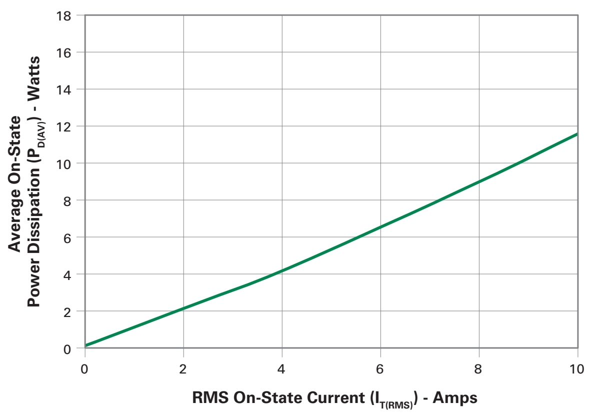



**Figure 6: Maximum Allowable Case Temperature vs. On-State Current (Sensitive Triac)**

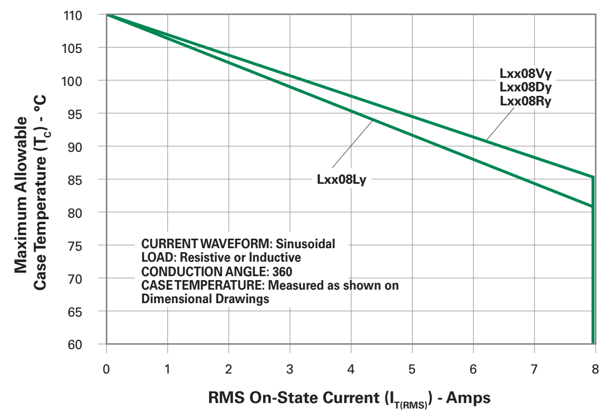



**Figure 7: Maximum Allowable Case Temperature vs. On-State Current (Standard / Alternistor Triac)**

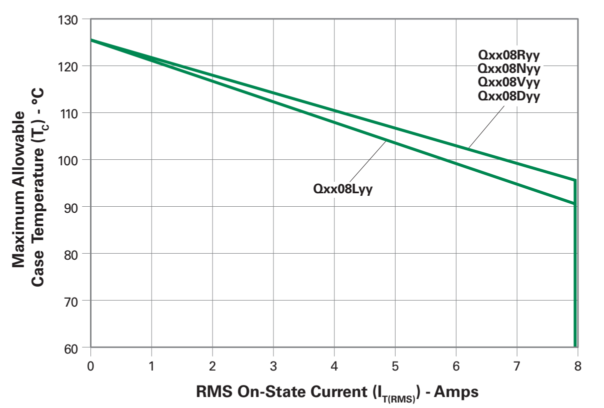
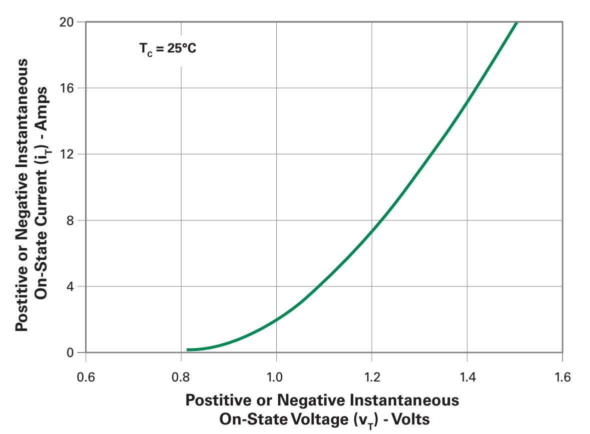
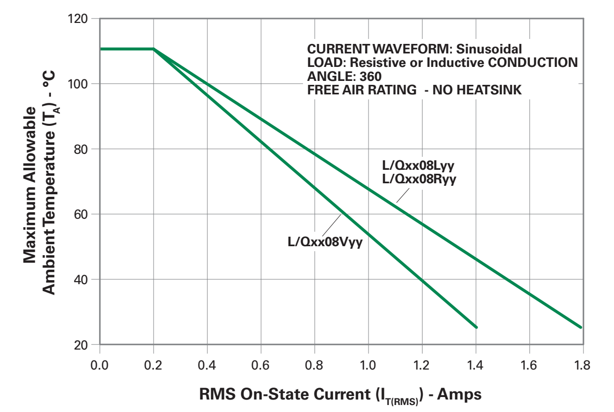



**Figure 8: On-State Current vs. On-State Voltage (Typical)**

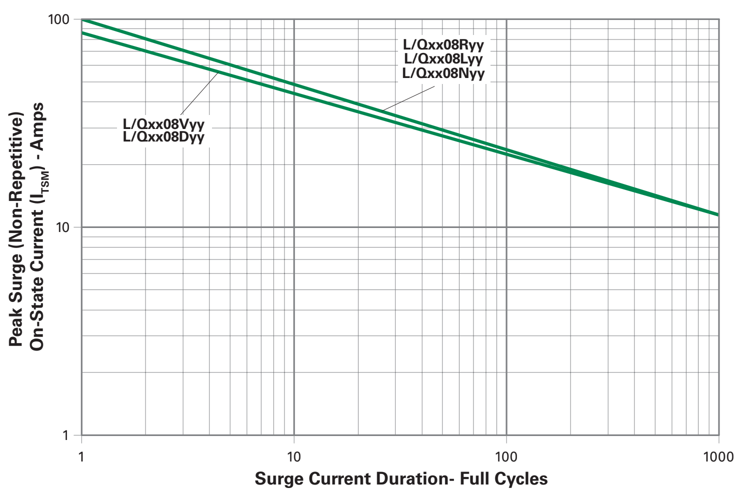



Note: xx = voltage, x = package, y = sensitivity, yy = type & sensitivity

## Figure 9: Maximum Allowable Ambient Temperature vs. On-State Current




## Figure 10: Surge Peak On-State Current vs. Number of Cycles



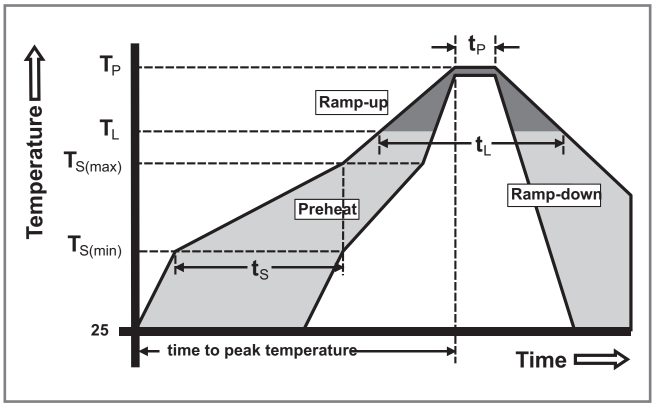

SUPPLY FREQUENCY: 60 Hz Sinusoidal
LOAD: Resistive
RMS On-State Current: [$I_{T(RMS)}$]: Maximum Rated Value at Specified Case Temperature

Notes:
1. Gate control may be lost during and immediately following surge current interval.
2. Overload may not be repeated until junction temperature has returned to steady-state rated value.

Note: xx = voltage, x = package, y = sensitivity, yy = type & sensitivity

## Soldering Parameters

| | | |
|---|---|---|
| Reflow Condition | | Pb – Free assembly |
| Pre Heat | -Temperature Min ($T_{s(min)}$) | 150°C |
| | -Temperature Max ($T_{s(max)}$) | 200°C |
| | -Time (min to max) ($t_s$) | 60 – 180 secs |
| Average ramp up rate (Liquidus Temp) ($T_L$) to peak | | 5°C/second max |
| $T_{S(max)}$ to $T_L$ - Ramp-up Rate | | 5°C/second max |
| Reflow | -Temperature ($T_L$) (Liquidus) | 217°C |
| | -Temperature ($t_L$) | 60 – 150 seconds |
| Peak Temperature ($T_P$) | | $260^{+0/-5}$ °C |
| Time within 5°C of actual peak Temperature ($t_p$) | | 20 – 40 seconds |
| Ramp-down Rate | | 5°C/second max |
| Time 25°C to peak Temperature ($T_P$) | | 8 minutes Max. |
| Do not exceed | | 280°C |




## Physical Specifications

| | |
|---|---|
| **Terminal Finish** | 100% Matte Tin-plated |
| **Body Material** | UL recognized epoxy meeting flammability classification 94V-0 |
| **Terminal Material** | Copper Alloy |

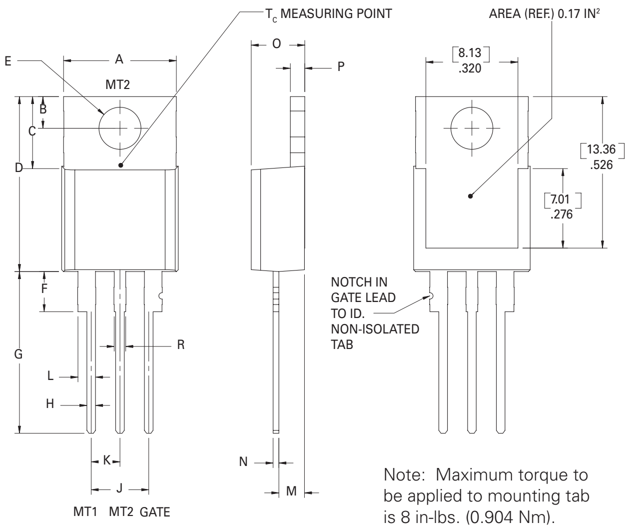
## Design Considerations

Careful selection of the correct device for the application's operating parameters and environment will go a long way toward extending the operating life of the Thyristor. Good design practice should limit the maximum continuous current through the main terminals to 75% of the device rating. Other ways to ensure long life for a power discrete semiconductor are proper heat sinking and selection of voltage ratings for worst case conditions. Overheating, overvoltage (including dv/dt), and surge currents are the main killers of semiconductors. Correct mounting, soldering, and forming of the leads also help protect against component damage.

## Environmental Specifications

| Test | Specifications and Conditions |
|---|---|
| **AC Blocking ($V_{DRM}$)** | MIL-STD-750, M-1040, Cond A Applied Peak AC voltage @ 125°C for 1008 hours |
| **Temperature Cycling** | MIL-STD-750, M-1051, 100 cycles; -40°C to +150°C; 15-min dwell-time |
| **Temperature/ Humidity** | EIA / JEDEC, JESD22-A101 1008 hours; 320V - DC: 85°C; 85% rel humidity |
| **High Temp Storage** | MIL-STD-750, M-1031, 1008 hours; 150°C |
| **Low-Temp Storage** | 1008 hours; -40°C |
| **Thermal Shock** | MIL-STD-750, M-1056 10 cycles; 0°C to 100°C; 5-min dwell-time at each temperature; 10 sec (max) transfer time between temperature |
| **Autoclave** | EIA / JEDEC, JESD22-A102 168 hours (121°C at 2 ATMs) and 100% R/H |
| **Resistance to Solder Heat** | MIL-STD-750 Method 2031 |
| **Solderability** | ANSI/J-STD-002, category 3, Test A |
| **Lead Bend** | MIL-STD-750, M-2036 Cond E |

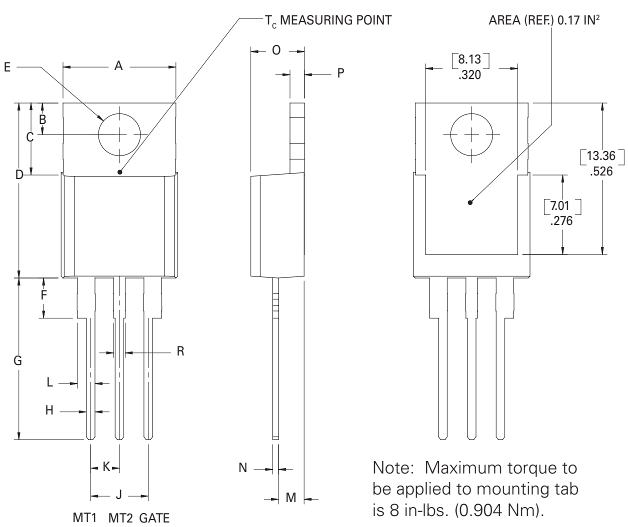
## Dimensions — TO-220AB (R-Package) — Non-Isolated Mounting Tab Common with Center Lead




Note: Maximum torque to be applied to mounting tab is 8 in-lbs. (0.904 Nm).

| Dimension | Inches | | Millimeters | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 0.380 | 0.420 | 9.65 | 10.67 |
| B | 0.105 | 0.115 | 2.67 | 2.92 |
| C | 0.230 | 0.250 | 5.84 | 6.35 |
| D | 0.590 | 0.620 | 14.99 | 15.75 |
| E | 0.142 | 0.147 | 3.61 | 3.73 |
| F | 0.110 | 0.130 | 2.79 | 3.30 |
| G | 0.540 | 0.575 | 13.72 | 14.61 |
| H | 0.025 | 0.035 | 0.64 | 0.89 |
| J | 0.195 | 0.205 | 4.95 | 5.21 |
| K | 0.095 | 0.105 | 2.41 | 2.67 |
| L | 0.060 | 0.075 | 1.52 | 1.91 |
| M | 0.085 | 0.095 | 2.16 | 2.41 |
| N | 0.018 | 0.024 | 0.46 | 0.61 |
| O | 0.178 | 0.188 | 4.52 | 4.78 |
| P | 0.045 | 0.060 | 1.14 | 1.52 |
| R | 0.038 | 0.048 | 0.97 | 1.22 |

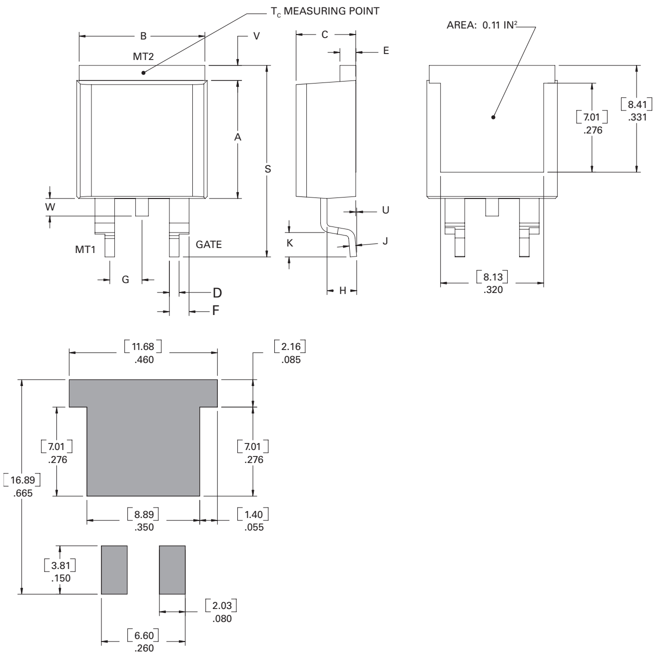
## Dimensions — TO-220AB (L-Package) — Isolated Mounting Tab




Note: Maximum torque to be applied to mounting tab is 8 in-lbs. (0.904 Nm).

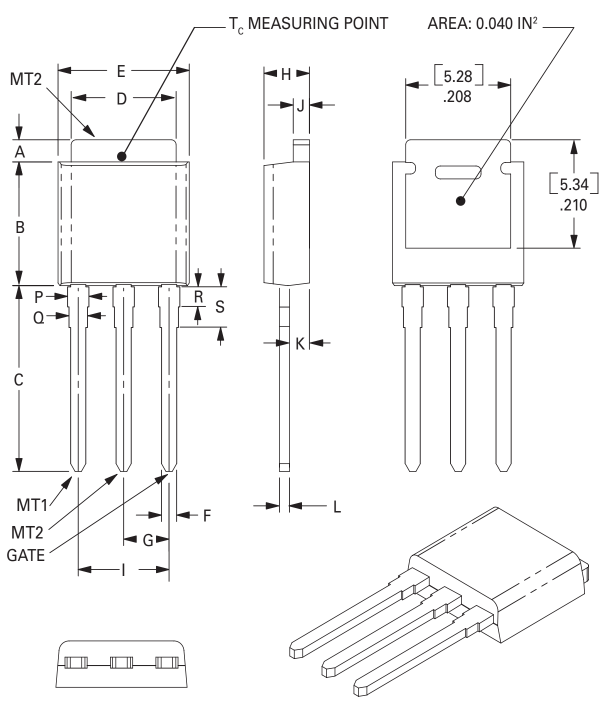
| Dimension | Inches | | Millimeters | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 0.380 | 0.420 | 9.65 | 10.67 |
| B | 0.105 | 0.115 | 2.67 | 2.92 |
| C | 0.230 | 0.250 | 5.84 | 6.35 |
| D | 0.590 | 0.620 | 14.99 | 15.75 |
| E | 0.142 | 0.147 | 3.61 | 3.73 |
| F | 0.110 | 0.130 | 2.79 | 3.30 |
| G | 0.540 | 0.575 | 13.72 | 14.61 |
| H | 0.025 | 0.035 | 0.64 | 0.89 |
| J | 0.195 | 0.205 | 4.95 | 5.21 |
| K | 0.095 | 0.105 | 2.41 | 2.67 |
| L | 0.060 | 0.075 | 1.52 | 1.91 |
| M | 0.085 | 0.095 | 2.16 | 2.41 |
| N | 0.018 | 0.024 | 0.46 | 0.61 |
| O | 0.178 | 0.188 | 4.52 | 4.78 |
| P | 0.045 | 0.060 | 1.14 | 1.52 |
| R | 0.038 | 0.048 | 0.97 | 1.22 |

## Dimensions — TO-263AB (N-Package) — D²-PAK Surface Mount



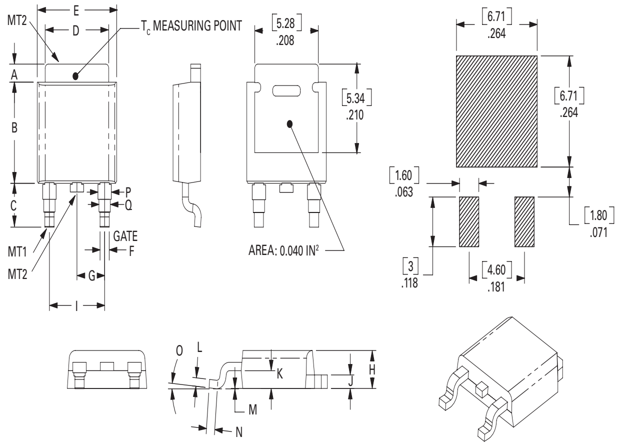

| Dimension | Inches | | Millimeters | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 0.360 | 0.370 | 9.14 | 9.40 |
| B | 0.380 | 0.420 | 9.65 | 10.67 |
| C | 0.178 | 0.188 | 4.52 | 4.78 |
| D | 0.025 | 0.035 | 0.64 | 0.89 |
| E | 0.045 | 0.060 | 1.14 | 1.52 |
| F | 0.060 | 0.075 | 1.52 | 1.91 |
| G | 0.095 | 0.105 | 2.41 | 2.67 |
| H | 0.092 | 0.102 | 2.34 | 2.59 |
| J | 0.018 | 0.024 | 0.46 | 0.61 |
| K | 0.090 | 0.110 | 2.29 | 2.79 |
| S | 0.590 | 0.625 | 14.99 | 15.88 |
| V | 0.035 | 0.045 | 0.89 | 1.14 |
| U | 0.002 | 0.010 | 0.05 | 0.25 |
| W | 0.040 | 0.070 | 1.02 | 1.78 |

## Dimensions — TO-251AA (V-Package) — V-PAK Through Hole




| Dimension | Inches | | | Millimeters | | |
|---|---|---|---|---|---|---|
| | Min | Typ | Max | Min | Typ | Max |
| A | 0.040 | 0.044 | 0.050 | 1.02 | 1.11 | 1.27 |
| B | 0.235 | 0.242 | 0.245 | 5.97 | 6.15 | 6.22 |
| C | 0.350 | 0.361 | 0.375 | 8.89 | 9.18 | 9.53 |
| D | 0.205 | 0.208 | 0.213 | 5.21 | 5.29 | 5.41 |
| E | 0.255 | 0.262 | 0.265 | 6.48 | 6.66 | 6.73 |
| F | 0.027 | 0.031 | 0.033 | 0.69 | 0.80 | 0.84 |
| G | 0.087 | 0.090 | 0.093 | 2.21 | 2.28 | 2.36 |
| H | 0.085 | 0.092 | 0.095 | 2.16 | 2.34 | 2.41 |
| I | 0.176 | 0.180 | 0.184 | 4.47 | 4.57 | 4.67 |
| J | 0.018 | 0.020 | 0.023 | 0.46 | 0.51 | 0.58 |
| K | 0.038 | 0.040 | 0.044 | 0.97 | 1.01 | 1.12 |
| L | 0.018 | 0.020 | 0.023 | 0.46 | 0.52 | 0.58 |
| P | 0.042 | 0.047 | 0.052 | 1.06 | 1.20 | 1.32 |
| Q | 0.034 | 0.039 | 0.044 | 0.86 | 1.00 | 1.11 |
| R | 0.034 | 0.039 | 0.044 | 0.86 | 1.00 | 1.11 |
| S | 0.074 | 0.079 | 0.084 | 1.86 | 2.00 | 2.11 |

## Dimensions — TO-252AA (D-Package) — D-PAK Surface Mount




| Dimension | Inches | | | Millimeters | | |
|---|---|---|---|---|---|---|
| | Min | Typ | Max | Min | Typ | Max |
| A | 0.040 | 0.043 | 0.050 | 1.02 | 1.09 | 1.27 |
| B | 0.235 | 0.243 | 0.245 | 5.97 | 6.16 | 6.22 |
| C | 0.106 | 0.108 | 0.113 | 2.69 | 2.74 | 2.87 |
| D | 0.205 | 0.208 | 0.213 | 5.21 | 5.29 | 5.41 |
| E | 0.255 | 0.262 | 0.265 | 6.48 | 6.65 | 6.73 |
| F | 0.027 | 0.031 | 0.033 | 0.69 | 0.80 | 0.84 |
| G | 0.087 | 0.090 | 0.093 | 2.21 | 2.28 | 2.36 |
| H | 0.085 | 0.092 | 0.095 | 2.16 | 2.33 | 2.41 |
| I | 0.176 | 0.179 | 0.184 | 4.47 | 4.55 | 4.67 |
| J | 0.018 | 0.020 | 0.023 | 0.46 | 0.51 | 0.58 |
| K | 0.038 | 0.040 | 0.044 | 0.97 | 1.02 | 1.12 |
| L | 0.018 | 0.020 | 0.023 | 0.46 | 0.51 | 0.58 |
| M | 0.000 | 0.000 | 0.004 | 0.00 | 0.00 | 0.10 |
| N | 0.021 | 0.026 | 0.027 | 0.53 | 0.67 | 0.69 |
| O | 0° | 0° | 5° | 0° | 0° | 5° |
| P | 0.042 | 0.047 | 0.052 | 1.06 | 1.20 | 1.32 |
| Q | 0.034 | 0.039 | 0.044 | 0.86 | 1.00 | 1.11 |

## Product Selector

| Part Number | Voltage (xx) | | | | Gate Sensitivity Quadrants | | Type | Package |
|---|---|---|---|---|---|---|---|---|
| | 400V | 600V | 800V | 1000V | I – II – III | IV | | |
| Lxx08L6 | X | X | | | 5 mA | 10 mA | Sensitive Triac | TO-220L |
| Lxx08D6 | X | X | | | 5 mA | 10 mA | Sensitive Triac | TO-252 D-PAK |
| Lxx08R6 | X | X | | | 5mA | 10mA | Sensitive Triac | TO-220R |
| Lxx08V6 | X | X | | | 5 mA | 10 mA | Sensitive Triac | TO-251 V-PAK |
| Lxx08L8 | X | X | | | 10 mA | 20 mA | Sensitive Triac | TO-220L |
| Lxx08D8 | X | X | | | 10 mA | 20 mA | Sensitive Triac | TO-252 D-PAK |
| Lxx08R8 | X | X | | | 10mA | 20mA | Sensitive Triac | TO-220R |
| Lxx08V8 | X | X | | | 10 mA | 20 mA | Sensitive Triac | TO-251 V-PAK |
| Qxx08RH3 | X | X | | | 10 mA | | Alternistor Triac | TO-220R |
| Qxx08VH3 | X | X | | | 10 mA | | Alternistor Triac | TO-251 V-PAK |
| Qxx08DH3 | X | X | | | 10 mA | | Alternistor Triac | TO-252 D-PAK |
| Qxx08L4 | X | | | | 25 mA | | Triac | TO-220L |
| Qxx08R4 | X | | | | 25 mA | | Triac | TO-220R |
| Qxx08N4 | X | | | | 25 mA | | Triac | TO-263 D²-PAK |
| Qxx08LH4 | X | X | X | X | 35 mA | | Alternistor Triac | TO-220L |
| Qxx08RH4 | X | X | X | X | 35 mA | | Alternistor Triac | TO-220R |
| Qxx08VH4 | X | X | X | X | 35 mA | | Alternistor Triac | TO-251 V-PAK |
| Qxx08DH4 | X | X | X | X | 35 mA | | Alternistor Triac | TO-252 D-PAK |
| Qxx08NH4 | X | X | X | X | 35 mA | | Alternistor Triac | TO-263 D²-PAK |
| Qxx08L5 | | X | X | X | 50 mA | | Triac | TO-220L |
| Qxx08R5 | | X | X | X | 50 mA | | Triac | TO-220R |
| Qxx08N5 | | X | X | X | 50 mA | | Triac | TO-263 D²-PAK |

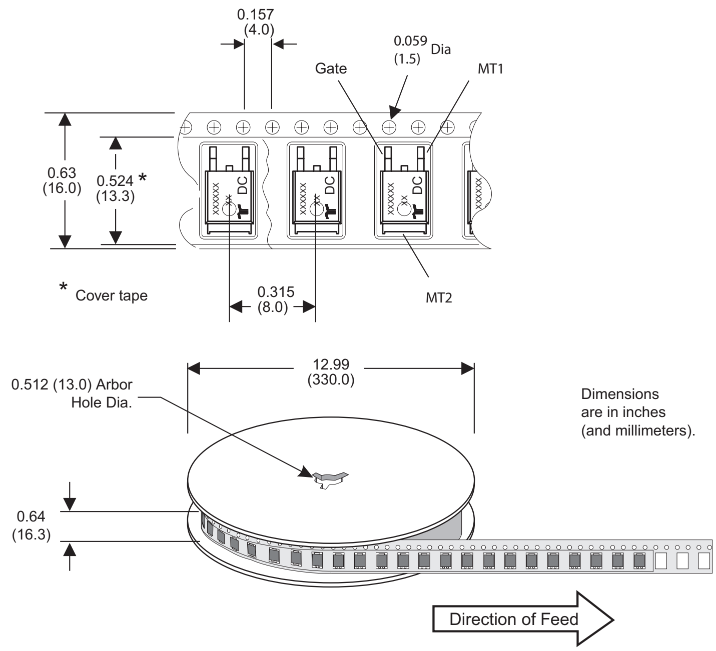
## Packing Options

| Part Number | Marking | Weight | Packing Mode | Base Quantity |
|---|---|---|---|---|
| L/Qxx08L/Ryy | L/Qxx08L/Ryy | 2.2 g | Bulk | 500 |
| L/Qxx08L/RyyTP | L/Qxx08L/Ryy | 2.2 g | Tube Pack | 500 (50 per tube) |
| Qxx08NyyTP | Qxx08Nyy | 1.6 g | Tube | 500 (50 per tube) |
| Qxx08NyyRP | Qxx08Nyy | 1.6 g | Embossed Carrier | 500 |
| L/Qxx08DyyTP | L/Qxx08Dyy | 0.3 g | Tube | 750 (75 per tube) |
| L/Qxx08DyyRP | L/Qxx08Dyy | 0.3 g | Embossed Carrier | 2500 |
| L/Qxx08VyyTP | L/Qxx08Vyy | 0.4 g | Tube | 750 (75 per tube) |

Note: xx = voltage, x = package, y = sensitivity, yy = type & sensitivity

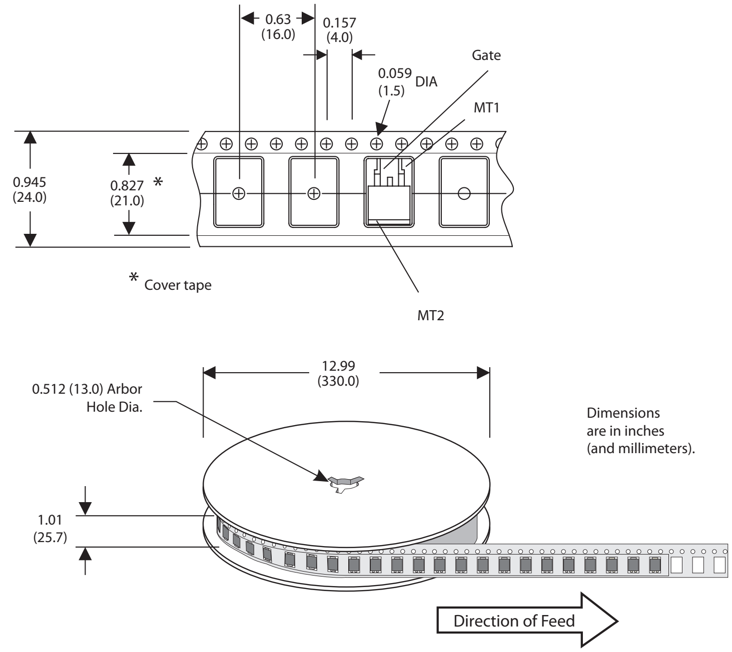
## TO-252 Embossed Carrier Reel Pack (RP) Specifications

### Meets all EIA-481-2 Standards




## TO-263 Embossed Carrier Reel Pack (RP) Specifications

### Meets all EIA-481-2 Standards



## Part Numbering System

**Q 60 08 L 5 56**

**DEVICE TYPE**
**L** : Sensitive Triac
**Q** : Triac or Alternistor

**VOLTAGE RATING**
**40** : 400V
**60** : 600V
**80** : 800V
**K0** : 1000V

**CURRENT**
**08**: 8A

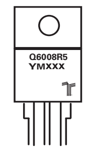
**LEAD FORM DIMENSIONS**
**xx** : Lead Form Option

**SENSITIVITY & TYPE**
**Sensitive Triac:**
**6** : 5 mA (QI, II, III)
10 mA (QIV)
**8** : 10 mA (QI, II, III)
20 mA (QIV)
**Standard Triac:**
**4** : 25 mA (QI, II, III)
**5** : 50 mA (QI, II, III)
**Alternistor Triac:**
**H3** : 10 mA (QI, II, III)
**H4** : 35 mA (QI, II, III)

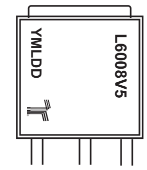
**PACKAGE TYPE**
**L** : TO-220 Isolated
**R** : TO-220 Non-Isolated
**N** : TO-263 ($D^2$PAK)
**V** : TO-251 (VPAK)
**D** : TO-252 (DPAK)

## Part Marking System

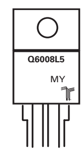
TO-220 AB – (R Package)
TO-263 AB – (N Package)




**TO-252AA – (D Package)**
**TO-251AA – (V Package)**




TO-220 AB – (L Package)



# OCEAN CHIPS
## Океан Электроники
### Поставка электронных компонентов

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения **«JONHON»**, а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов **«FORSTAR»**.

**«JONHON»** (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

**«FORSTAR»** (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).

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