# QSBT40

## QUAD DATA LINE SCHOTTKY BUS TERMINATOR

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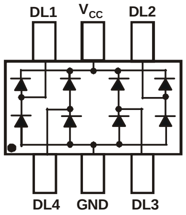
## Features

- Low Forward Voltage Drop
- Fast Switching
- Very High Density
- Ultra-Small Surface Mount Package PN Junction Guard Ring for Transient and ESD Protection
- Provide Transient Protection for High-Speed Data Lines in Accordance With:
  IEC61000-4-2 (ESD) 15kV (Air), 8kV (Contact)
  IEC61000-4-4 (EFT) 80A (tp = 5/50 ns)
  IEC61000-4-5 (Lightning) Class 3
- **Lead Free/RoHS Compliant (Note 2)**
- **"Green" Device (Note 3 and 4)**

Top View

## Mechanical Data

- Case: SOT-363
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe). Solderable per MIL-STD-202, Method 208
- Polarity: See Diagram
- Marking Information: See Page 2
- Ordering Information: See Page 2
- Weight: 0.006 grams (approximate)



Device Schematic

## Maximum Ratings @$T_A$ = 25°C unless otherwise specified

Single phase, half wave, 60Hz, resistive or inductive load.
For capacitance load, derate current by 20%.

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 30 | V |
| Forward Continuous Current (Note 1) | $I_{FM}$ | 200 | mA |
| Non-Repetitive Peak Forward Surge Current @ t < 1.0s | $I_{FSM}$ | 600 | mA |

## Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Power Dissipation (Note 1) | $P_D$ | 200 | mW |
| Thermal Resistance Junction to Ambient Air (Note 1) | $R_{\theta JA}$ | 625 | °C/W |
| Operating Temperature Range | $T_J$ | -55 to +125 | °C |
| Storage Temperature Range | $T_{STG}$ | -65 to +125 | °C |

## Electrical Characteristics @$T_A$ = 25°C unless otherwise specified

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|---|---|---|---|---|---|
| Reverse Breakdown Voltage (Note 5) | $V_{(BR)R}$ | 30 | — | — | V | $I_R = 100\mu A$ |
| Forward Voltage | $V_F$ | — | — | 280<br>350<br>450<br>550<br>1000 | mV | $I_F = 0.1mA$, tp < 300µS<br>$I_F = 1.0mA$, tp < 300µS<br>$I_F = 10mA$, tp < 300µS<br>$I_F = 30mA$, tp < 300µS<br>$I_F = 100mA$, tp < 300µS |
| Reverse Current (Note 5) | $I_R$ | — | — | 2 | µA | $V_R = 25V$ |
| Total Capacitance | $C_T$ | — | 10.0<br>6.5 | — | pF | $V_R = 0$, f = 1.0MH (Note 6)<br>$V_R = 0$, f = 1.0MH$_Z$ (Note 7) |
| Reverse Recovery Time | $t_{rr}$ | — | — | 5.0 | ns | $I_F = I_R = 10mA$,<br>$I_{rr} = 0.1 \times I_R$, $R_L = 100\Omega$ |

Notes:
1. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch; pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at http://www.diodes.com/datasheets/ap02001.pdf.
2. No purposefully added lead.
3. Diodes Inc.'s "Green" policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.
4. Product manufactured with Date Code UO (week 40, 2007) and newer are built with Green Molding Compound. Product manufactured prior to Date Code UO are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants.
5. Short duration pulse test used to minimize self-heating effect.
6. At $V_R$ = 0V, DL(X) to $V_{CC}$ or GND.
7. At $V_R$ = 0V, between Data Lines (e.g., DL1 and DL4).

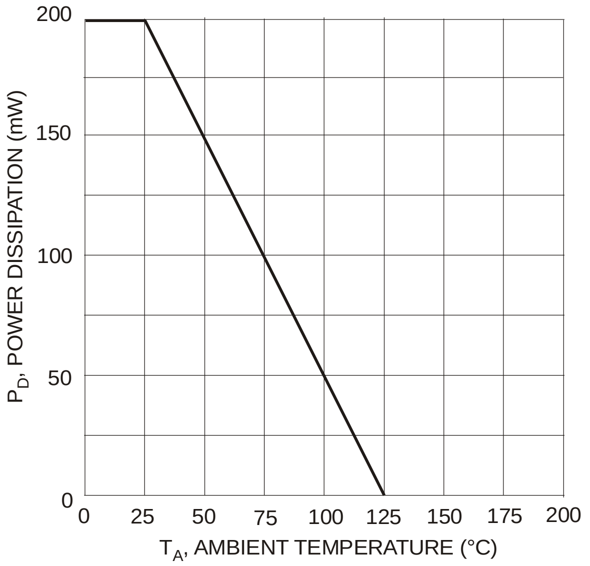


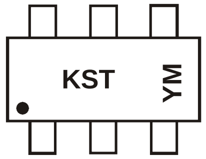
Fig. 1 Max Power Dissipation vs. Ambient Temperature

## Ordering Information (Note 8)

| Part Number | Case | Packaging |
|---|---|---|
| QSBT40-7-F | SOT-363 | 3000/Tape & Reel |

Notes: 8. For packaging details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.

## Marking Information



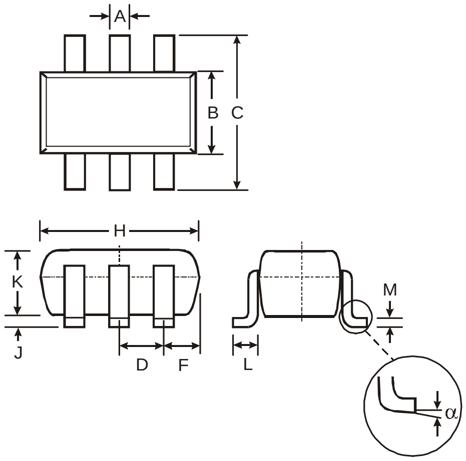
KST = Product Type Marking Code
YM = Date Code Marking
Y = Year ex: N = 2002
M = Month ex: 9 = September

Date Code Key

| **Year** | **2001** | **2002** | **2003** | **2004** | **2005** | **2006** | **2007** | **2008** | **2009** | **2010** | **2011** | **2012** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Code** | M | N | P | R | S | T | U | V | W | X | Y | Z |

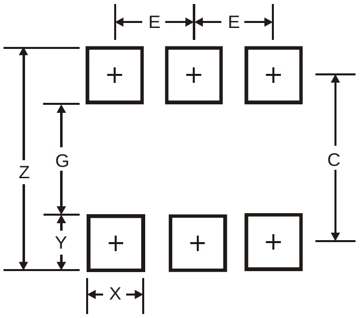
| **Month** | **Jan** | **Feb** | **Mar** | **Apr** | **May** | **Jun** | **Jul** | **Aug** | **Sep** | **Oct** | **Nov** | **Dec** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Code** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | O | N | D |

## Package Outline Dimensions



| SOT-363 | | |
|---|---|---|
| **Dim** | **Min** | **Max** |
| **A** | 0.10 | 0.30 |
| **B** | 1.15 | 1.35 |
| **C** | 2.00 | 2.20 |
| **D** | 0.65 Nominal | |
| **F** | 0.30 | 0.40 |
| **H** | 1.80 | 2.20 |
| **J** | — | 0.10 |
| **K** | 0.90 | 1.00 |
| **L** | 0.25 | 0.40 |
| **M** | 0.10 | 0.25 |
| **α** | 0° | 8° |
| **All Dimensions in mm** | | |

## Suggested Pad Layout



| Dimensions | Value (in mm) |
|---|---|
| **Z** | 2.5 |
| **G** | 1.3 |
| **X** | 0.42 |
| **Y** | 0.6 |
| **C** | 1.9 |
| **E** | 0.65 |