# QUAD DATA LINE SCHOTTKY BUS TERMINATOR

## 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
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Notes 3 & 4)**

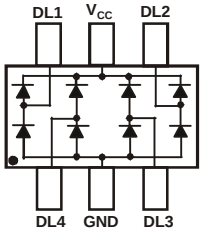
## Mechanical Data

- Case: SOT363
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe). Solderable per MIL-STD-202, Method 208 e3
- Polarity: See Diagram
- Weight: 0.006 grams (approximate)

SOT363



Top View



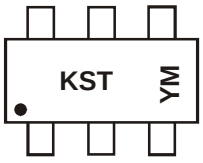

Device Schematic

## Ordering Information (Note 5)

| Part Number | Case | Packaging |
|---|---|---|
| QSBT40-7-F | SOT363 | 3000/Tape & Reel |
| QSBT40-13-F | SOT363 | 10000/Tape & Reel |

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. See http://www.diodes.com for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
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. For packaging details, go to our website at http://www.diodes.com.

## 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 | … | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | M | N | P | R | … | Y | Z | A | B | C | D | E |

| 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 |


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## 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 6) | $I_{FM}$ | 200 | mA |
| Non-Repetitive Peak Forward Surge Current @ t < 1.0s | $I_{FSM}$ | 600 | mA |

## Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Power Dissipation (Note 6) | $P_D$ | 200 | mW |
| Thermal Resistance Junction to Ambient Air (Note 6) | $R_{\theta JA}$ | 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 7) | $V_{(BR)R}$ | 30 | — | — | V | $I_R$ = 100µA |
| 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 7) | $I_R$ | — | — | 2 | µA | $V_R$ = 25V |
| Total Capacitance | $C_T$ | — | 10.0<br>6.5 | — | pF | $V_R$ = 0, f = 1.0MHz (Note 8)<br>$V_R$ = 0, f = 1.0MHz (Note 9) |
| Reverse Recovery Time | $t_{rr}$ | — | — | 5.0 | ns | $I_F$ = $I_R$ = 10mA,<br>$I_{rr}$ = 0.1 x $I_R$, $R_L$ = 100Ω |

Notes:
6. 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.
7. Short duration pulse test used to minimize self-heating effect.
8. At $V_R$ = 0V, DL(X) to $V_{CC}$ or GND.
9. At $V_R$ = 0V, between Data Lines (e.g., DL1 and DL4).

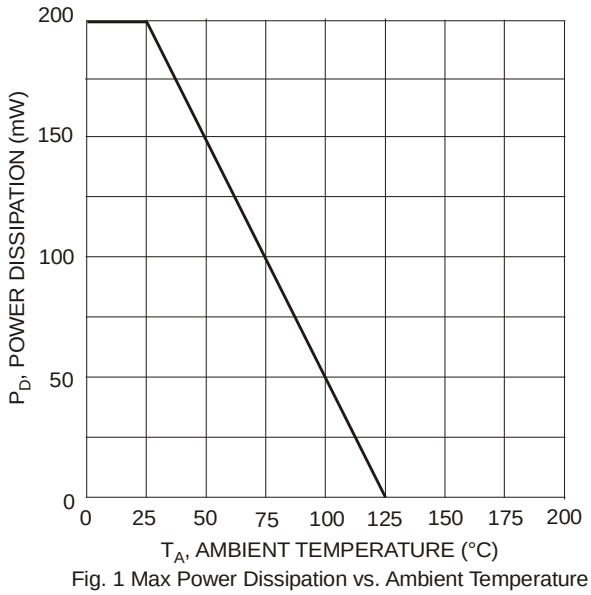
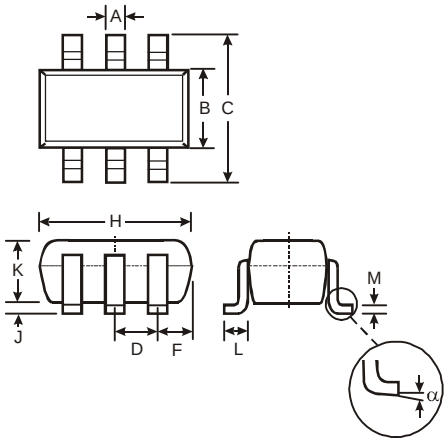



Fig. 1 Max Power Dissipation vs. Ambient Temperature


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## Package Outline Dimensions

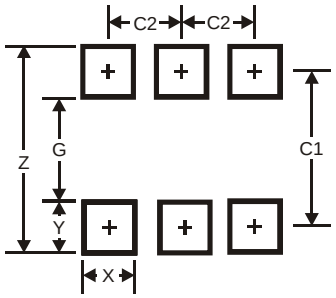
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.




| SOT363 | | | |
|---|---|---|---|
| **Dim** | **Min** | **Max** | **Typ** |
| **A** | 0.10 | 0.30 | 0.25 |
| **B** | 1.15 | 1.35 | 1.30 |
| **C** | 2.00 | 2.20 | 2.10 |
| **D** | 0.65 Typ | | |
| **F** | 0.40 | 0.45 | 0.425 |
| **H** | 1.80 | 2.20 | 2.15 |
| **J** | 0 | 0.10 | 0.05 |
| **K** | 0.90 | 1.00 | 1.00 |
| **L** | 0.25 | 0.40 | 0.30 |
| **M** | 0.10 | 0.22 | 0.11 |
| **α** | 0° | 8° | - |
| **All Dimensions in mm** | | | |

## Package Outline Dimensions

Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.




| Dimensions | Value (in mm) |
|---|---|
| **Z** | 2.5 |
| **G** | 1.3 |
| **X** | 0.42 |
| **Y** | 0.6 |
| **C1** | 1.9 |
| **C2** | 0.65 |


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