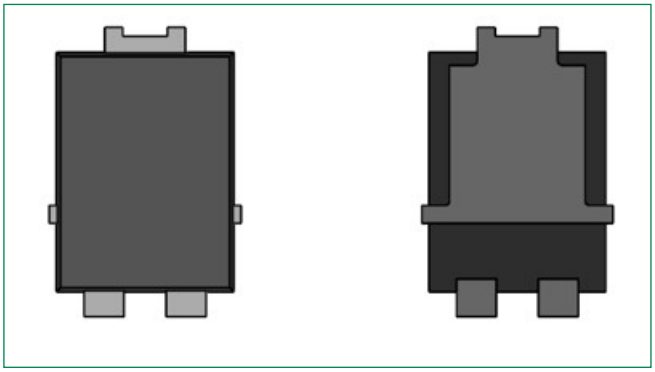
Littelfuse
Expertise Applied | Answers Delivered

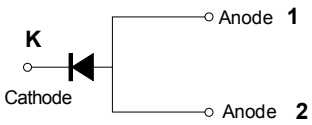
# Schottky Barrier Rectifier

DST2050S, 20A, 50V, TO-277B, Single

## DST2050S



## Pin out




## Description

Littelfuse DST series Ultra Low $V_F$ Schottky Barrier Rectifier is designed to meet the general requirements of commercial and industry applications by providing high temperature, low leakage and lower $V_F$ products.

It is suitable for high frequency switching mode power supply, free-wheeling diodes and polarity protection diodes.

## Features

- Ultra low forward voltage drop
- High frequency operation
- MSL: Level 1 - unlimited
- High junction temperature capability
- Trench MOS Schottky technology
- Single die in TO-277B Package
- Pb-free E3 means 2nd level interconnect is Pb-free and the terminal finish material is tin(Sn) (IPC/ JEDEC J-STD-609A.01)

## Applications

- Switching mode power supply
- DC/DC converters
- Free-Wheeling diodes
- Polarity Protection Diodes

## Maximum Ratings

| Parameters | Symbol | Test Conditions | Max | Unit |
|---|---|---|---|---|
| Peak Inverse Voltage | $V_{RWM}$ | - | 50 | V |
| Average Forward Current | $I_{F(AV)}$ | 50% duty cycle @$T_L$ = 125 °C rectangular wave form | 20 | A |
| Peak One Cycle Non-Repetitive Surge Current | $I_{FSM}$ | 8.3 ms, half Sine pulse | 250 | A |

## Electrical Characteristics

| Parameters | Symbol | Test Conditions | Max | Unit |
|---|---|---|---|---|
| Forward Voltage Drop* | $V_{F1}$ | @20A, Pulse, $T_J$ = 25 °C | 0.65 | V |
| | $V_{F2}$ | @20A, Pulse, $T_J$ = 125 °C | 0.60 | |
| Reverse Current* | $I_{R1}$ | @$V_R$ = rated $V_R$, $T_J$ = 25 °C | 4 | mA |
| | $I_{R2}$ | @$V_R$ = rated $V_R$, $T_J$ = 125 °C | 180 | |

* Pulse Width < 300µs, Duty Cycle <2%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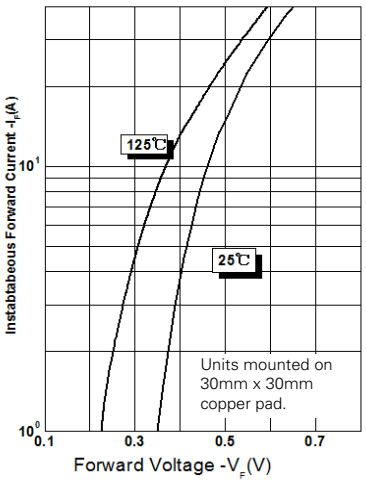
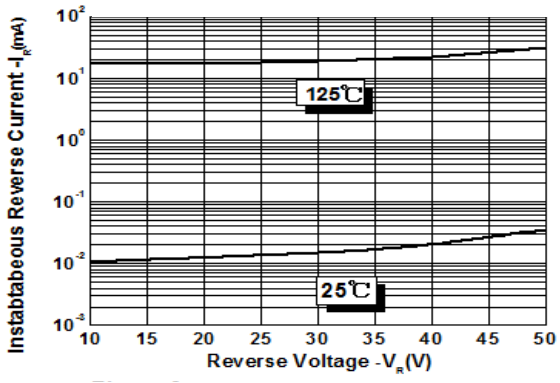
## Thermal-Mechanical Specifications

| Parameters | Symbol | Test Conditions | Max | Unit |
|---|---|---|---|---|
| Junction Temperature | $T_J$ | | -55 to +150 | °C |
| Storage Temperature | $T_{stg}$ | | -55 to +150 | °C |
| Maximum Thermal Resistance Junction to Ambient | $R_{thJA}$ | DC operation | 75 | °C/W |
| Maximum Thermal Resistance Junction to Lead | $R_{thJL}$ | | 3.5 | °C/W |
| Approximate Weight | wt | | 0.08 | g |
| Case Style | TO-277B | | | |

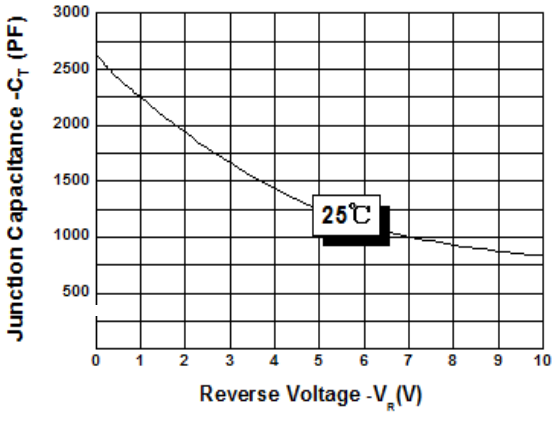
## Figure 1: Typical Forward Characteristics




## Figure 2: Typical Reverse Characteristics




## Figure 3: Typical Junction Capacitance





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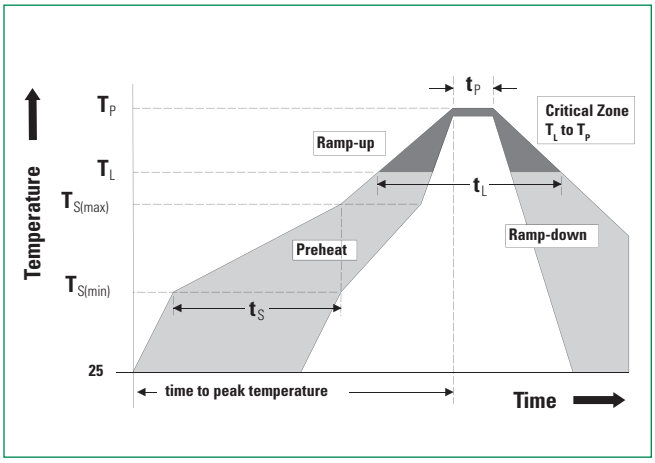
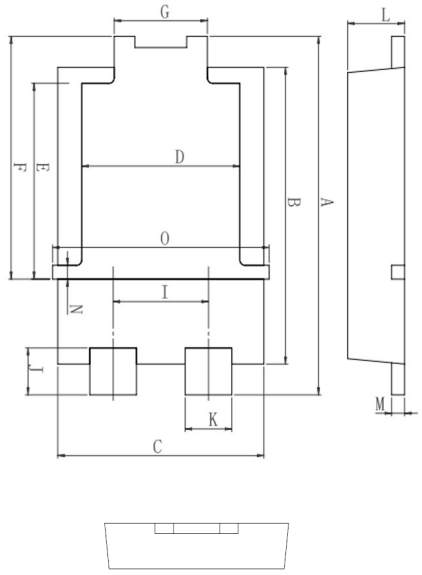
## Soldering Parameters

| | | |
|---|---|---|
| **Reflow Condition** | | Lead–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 – 120 seconds |
| **Average ramp up rate (Liquidus Temp) ($T_L$) to peak** | | 3°C/second max. |
| **$T_{S(max)}$ to $T_L$ - Ramp-up Rate** | | 3°C/second max. |
| **Reflow** | **- Temperature ($T_L$) (Liquidus)** | 217°C |
| | **- Time (min to max) ($t_s$)** | 60 – 150 seconds |
| **Peak Temperature ($T_P$)** | | $260^{+0/-5}$ °C |
| **Time within 5°C of actual peak Temperature ($t_p$)** | | 30 seconds max. |
| **Ramp-down Rate** | | 6°C/second max. |
| **Time 25°C to peak Temperature ($T_P$)** | | 8 minutes max. |
| **Do not exceed** | | 260°C |

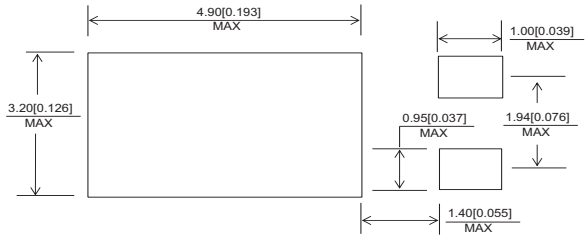



## Dimensions-TO-277B




| Symbol | Millimeters | | |
|---|---|---|---|
| | Min | Typ | Max |
| A | 6.30 | 6.50 | 6.70 |
| B | 5.28 | 5.38 | 5.48 |
| C | 3.88 | 3.98 | 4.08 |
| D | 2.90 | 3.05 | 3.20 |
| E | 3.40 | 3.55 | 3.70 |
| F | 4.20 | 4.40 | 4.60 |
| G | 1.70 | 1.80 | 1.90 |
| I | 1.74 | 1.84 | 1.94 |
| J | 0.65 | 0.85 | 1.05 |
| K | 0.85 | 0.90 | 0.95 |
| L | 0.95 | 1.10 | 1.25 |
| M | 0.20 | 0.25 | 0.30 |
| N | 0.25 | 0.40 | 0.55 |
| O | 4.00 | 4.05 | 4.25 |

### Mounting Pad Layout





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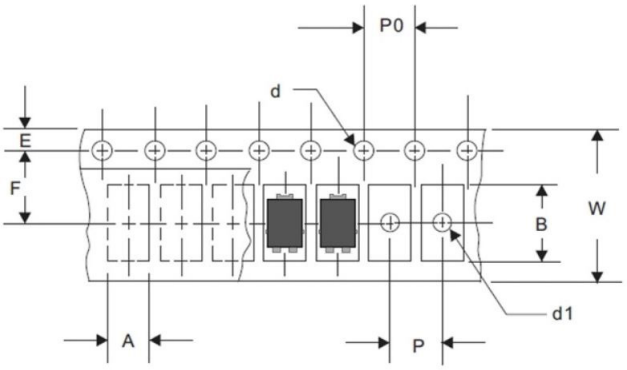
## Packing Options

| Part Number | Marking | Packing Mode | M.O.Q |
|---|---|---|---|
| DST2050S | DST2050S | 5000pcs / Reel | 5000 |

## Part Numbering and Marking System


| | |
|---|---|
| DST | = Device Type |
| 20 | = Forward Current (20A) |
| 50 | = Reverse Voltage (50V) |
| S | = Package Type |
| LF | = Littelfuse |
| YY | = Year |
| WW | = Week |
| L | = Lot Number |

## Carrier Tape & Reel Specification




| Symbol | Millimeters | |
|---|---|---|
| | Min | Max |
| **A** | 4.28 | 4.48 |
| **B** | 6.80 | 7.00 |
| **d** | 1.40 | 1.60 |
| **d1** | - | 1.50 |
| **E** | 1.65 | 1.85 |
| **F** | 5.40 | 5.60 |
| **P** | 7.90 | 8.10 |
| **P0** | 3.90 | 4.10 |
| **W** | 11.70 | 12.30 |