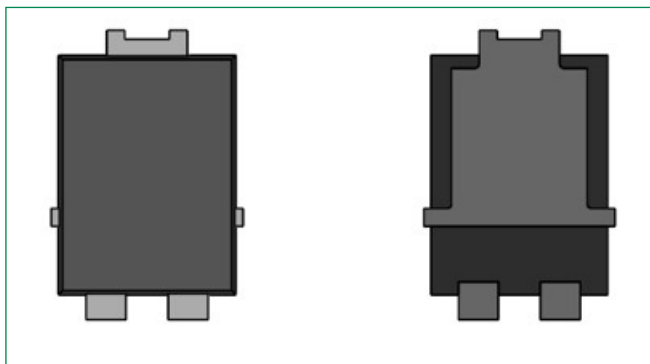
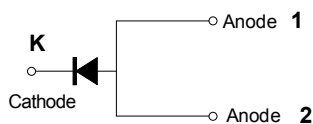


### DST2050S



#### 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 @ $T_L = 125^\circ\text{C}$<br>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, $T_J = 25^\circ\text{C}$                   | 0.65 | V    |
|                       | $V_{F2}$ | @20A, Pulse, $T_J = 125^\circ\text{C}$                  | 0.60 |      |
| Reverse Current*      | $I_{R1}$ | @ $V_R = \text{rated } V_R$ , $T_J = 25^\circ\text{C}$  | 4    | mA   |
|                       | $I_{R2}$ | @ $V_R = \text{rated } V_R$ , $T_J = 125^\circ\text{C}$ | 180  |      |

\* Pulse Width < 300 $\mu\text{s}$ , Duty Cycle < 2%

## 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<br>Junction to Ambient | $R_{thJA}$ | DC operation    | 75          | °C/W |
| Maximum Thermal Resistance<br>Junction to Lead    | $R_{thJL}$ |                 | 3.5         | °C/W |
| Approximate Weight                                | wt         |                 | 0.08        | g    |
| Case Style                                        | TO-277B    |                 |             |      |

Figure 1: Typical Forward Characteristics

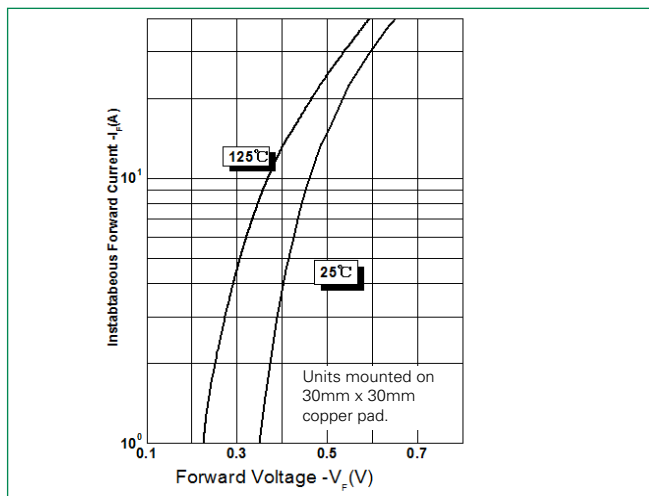


Figure 2: Typical Reverse Characteristics

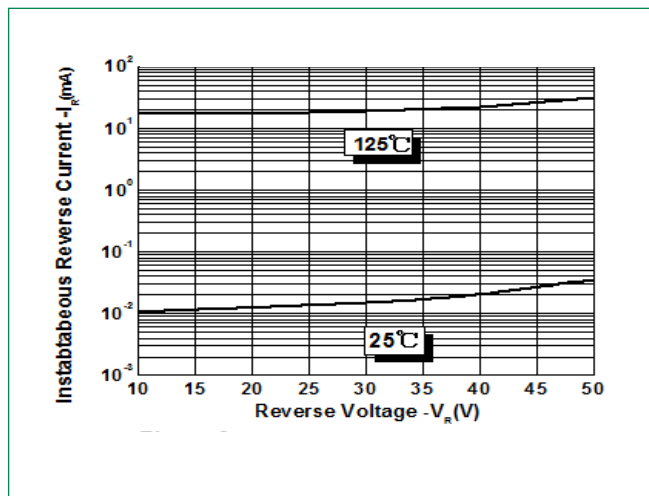
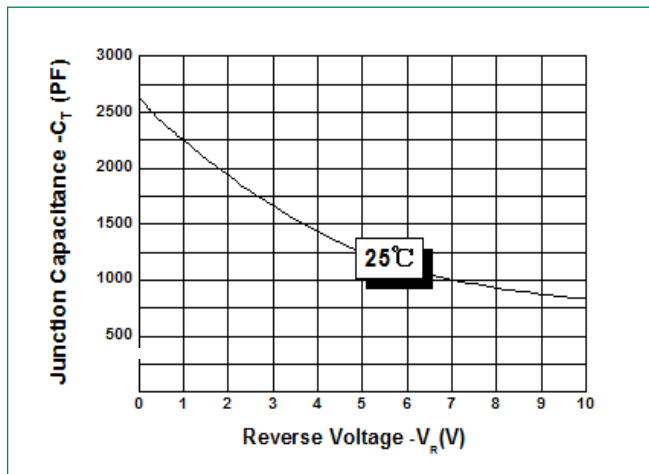
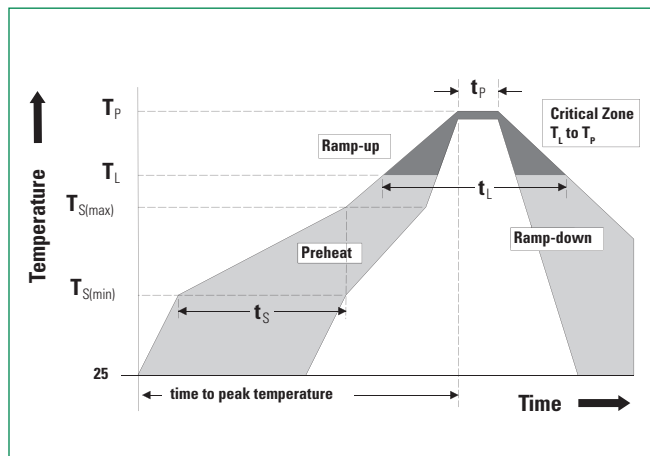


Figure 3: Typical Junction Capacitance

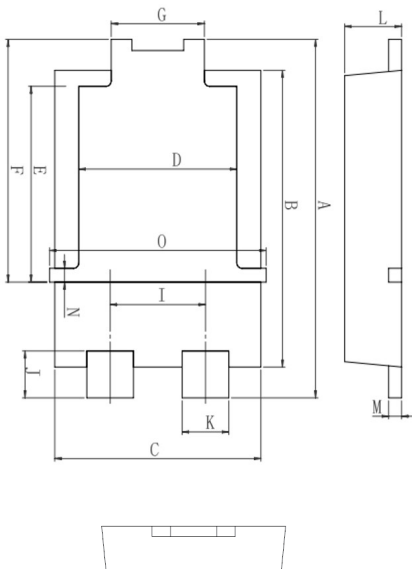


## Soldering Parameters

|                                                                        |                                    |                         |
|------------------------------------------------------------------------|------------------------------------|-------------------------|
| <b>Reflow Condition</b>                                                |                                    | Lead-Free assembly      |
| <b>Pre Heat</b>                                                        | - Temperature Min ( $T_{s(min)}$ ) | 150°C                   |
|                                                                        | - Temperature Max ( $T_{s(max)}$ ) | 200°C                   |
|                                                                        | - Time (min to max) ( $t_s$ )      | 60 – 120 seconds        |
| <b>Average ramp up rate (Liquidus Temp) (<math>T_L</math>) to peak</b> |                                    | 3°C/second max.         |
| <b><math>T_{s(max)}</math> to <math>T_L</math> - Ramp-up Rate</b>      |                                    | 3°C/second max.         |
| <b>Reflow</b>                                                          | - Temperature ( $T_L$ ) (Liquidus) | 217°C                   |
|                                                                        | - Time (min to max) ( $t_s$ )      | 60 – 150 seconds        |
| <b>Peak Temperature (<math>T_p</math>)</b>                             |                                    | 260 <sup>+0/-5</sup> °C |
| <b>Time within 5°C of actual peak Temperature (<math>t_p</math>)</b>   |                                    | 30 seconds max.         |
| <b>Ramp-down Rate</b>                                                  |                                    | 6°C/second max.         |
| <b>Time 25°C to peak Temperature (<math>T_p</math>)</b>                |                                    | 8 minutes max.          |
| <b>Do not exceed</b>                                                   |                                    | 260°C                   |

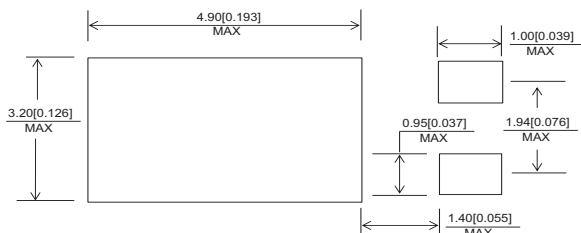


## Dimensions-TO-277B



| 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



### Packing Options

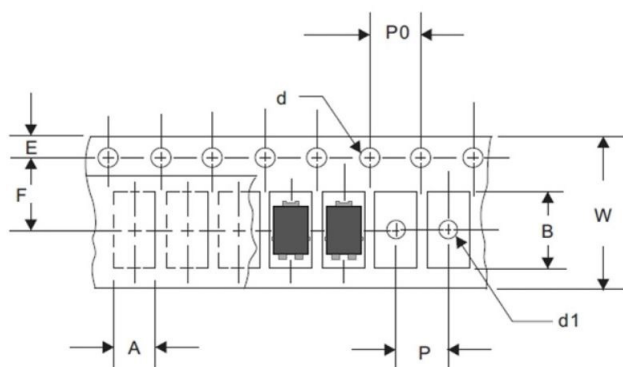
| Part Number | Marking  | Packing Mode   | M.O.Q |
|-------------|----------|----------------|-------|
| DST2050S    | DST2050S | 5000pcs / Reel | 5000  |

### 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   |
| <b>A</b>  | 4.28        | 4.48  |
| <b>B</b>  | 6.80        | 7.00  |
| <b>d</b>  | 1.40        | 1.60  |
| <b>d1</b> | -           | 1.50  |
| <b>E</b>  | 1.65        | 1.85  |
| <b>F</b>  | 5.40        | 5.60  |
| <b>P</b>  | 7.90        | 8.10  |
| <b>P0</b> | 3.90        | 4.10  |
| <b>W</b>  | 11.70       | 12.30 |