



STDD15 series

LOW CAPACITANCE DETECTION DIODE

MAIN PRODUCT CHARACTERISTICS

| | |
|-------------------|--------|
| $I_{F(AV)}$ | 10 mA |
| V_{RRM} | 15 V |
| $T_j(\text{max})$ | 150 °C |
| $V_F(\text{max})$ | 0.51 V |

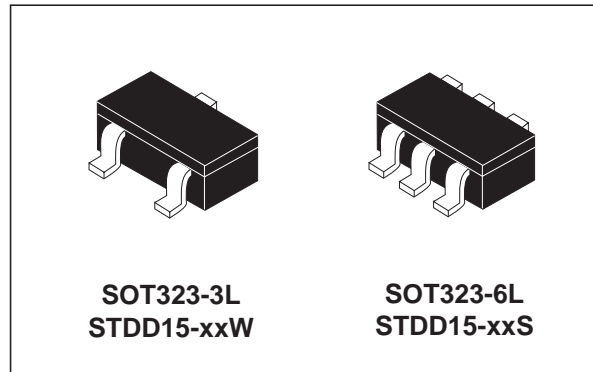
FEATURES AND BENEFITS

- Low diode capacitance
- Device designed for RF application
- Low profile package
- Available in 3 configurations
- Very low parasitic inductor & resistor

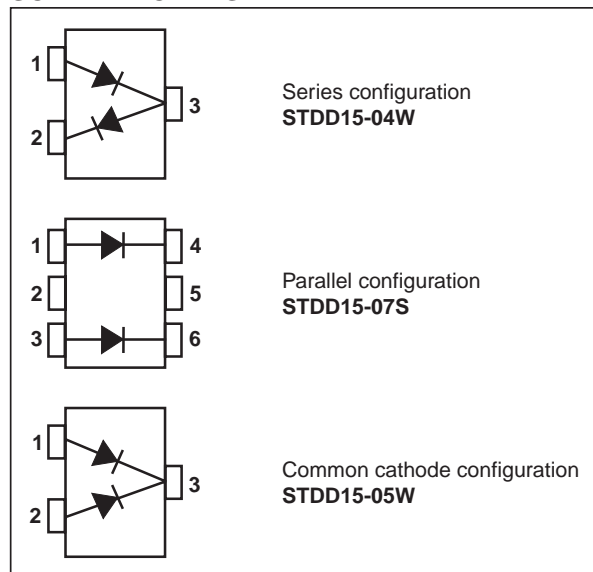
DESCRIPTION

The STDD15 is a dual diode series for the detection of a RF signal and the compensation of the voltage drift with the temperature. The SOT323 package makes the device ideal in application where the space saving is critical like mobile phones.

The low junction capacitance will reduce the disturbance on the RF signal



SCHEMATIC DIAGRAM



ABSOLUTE RATINGS (limiting values)

| Symbol | Parameter | Value | Unit |
|-----------|--|------------|------|
| V_{RRM} | Repetitive peak reverse voltage | 15 | V |
| I_F | Continuous forward current | 10 | mA |
| I_{FSM} | Surge non repetitive forward current | 2 | A |
| T_{stg} | Storage temperature range | - 65 + 150 | °C |
| T_j | Maximum operating junction temperature | 150 | °C |

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THERMAL PARAMETERS

| Symbol | Parameter | Value | Unit |
|-----------------|---------------------|-------|------|
| $R_{th(j-a)}^*$ | Junction to ambient | 500 | °C/W |

*: Mounted with minimum recommended pad size, PC board FR4.

STATIC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Tests conditions | | Min. | Typ. | Max. | Unit |
|---------|-------------------------|---------------------------|---------------------|------|------|-------|---------------|
| I_R^* | Reverse leakage current | $T_j = 25^\circ\text{C}$ | $V_R = 1\text{V}$ | | | 0.035 | μA |
| | | $T_j = 125^\circ\text{C}$ | | | 6 | 30 | |
| | | $T_j = 25^\circ\text{C}$ | $V_R = 15\text{V}$ | | | 0.23 | μA |
| | | $T_j = 125^\circ\text{C}$ | | | 10 | 100 | |
| V_F^* | Forward voltage drop | $T_j = 25^\circ\text{C}$ | $I_F = 1\text{mA}$ | | 350 | 380 | mV |
| | | $T_j = 125^\circ\text{C}$ | | | 230 | 260 | |
| | | $T_j = 25^\circ\text{C}$ | $I_F = 10\text{mA}$ | | 500 | 570 | |
| | | $T_j = 125^\circ\text{C}$ | | | 450 | 510 | |

* Pulse test: $t_p \leq 250\mu\text{s}$, $\Delta \leq 2\%$

ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Tests conditions | | Min. | Typ. | Max. | Unit |
|--------|--------------------|--------------------|---------------------|------|------|------|----------|
| C | Diode capacitance | $V_R = 0\text{V}$ | $F = 1\text{MHz}$ | | | 1.0 | pF |
| R_F | Forward resistance | $I_F = 5\text{mA}$ | $F = 100\text{MHz}$ | | 15 | | Ω |
| Ls | Series inductance | | | | 1.5 | | nH |

Fig. 1: Forward voltage drop versus forward current (typical values).

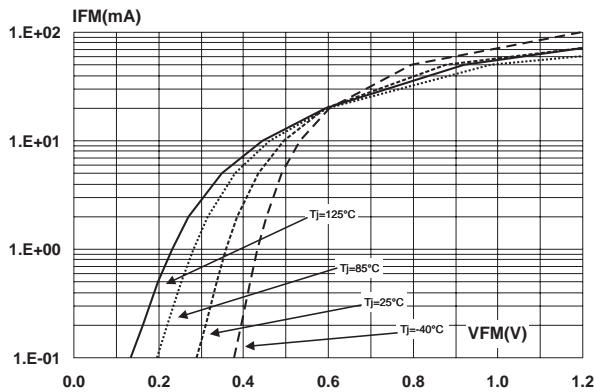


Fig. 2: Reverse leakage current versus reverse voltage applied (typical values).

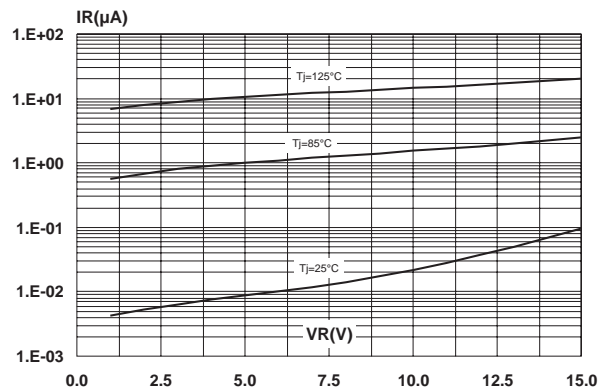


Fig. 3: Differential forward resistance versus forward current (typical values).

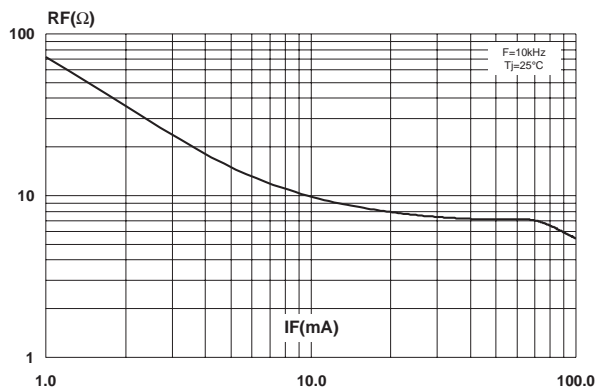


Fig. 4: Junction capacitance versus reverse voltage applied (typical values).

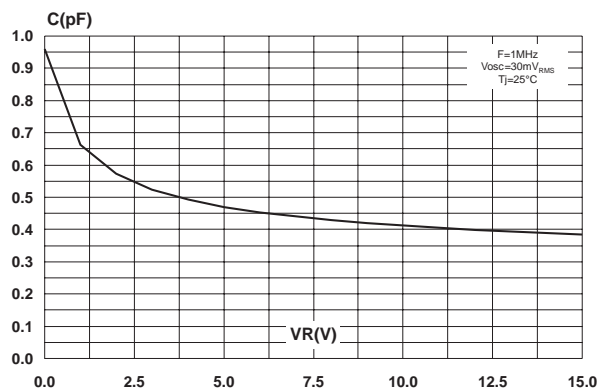


Fig. 5: Variation of thermal impedance junction to ambient versus pulse duration (printed circuit board, epoxy FR4).

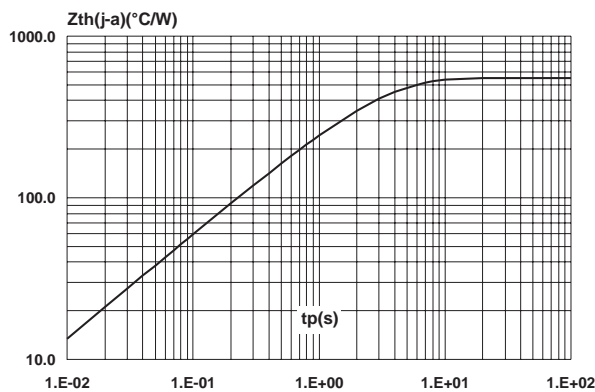
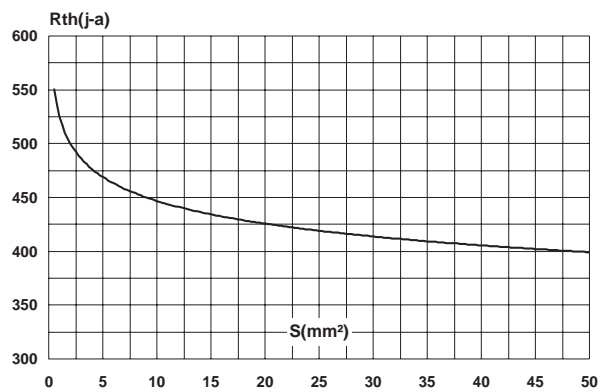


Fig. 6: Thermal resistance junction to ambient versus copper surface under each lead (printed circuit board, epoxy FR4)..



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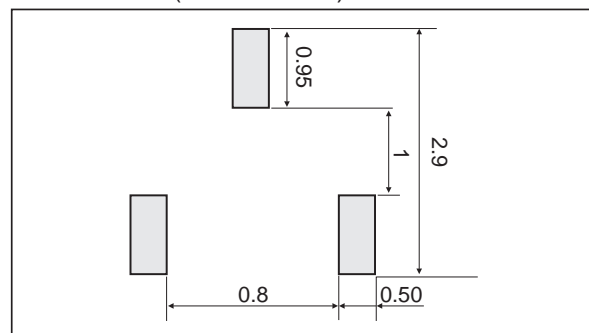
Electrical Model (PSPICE)

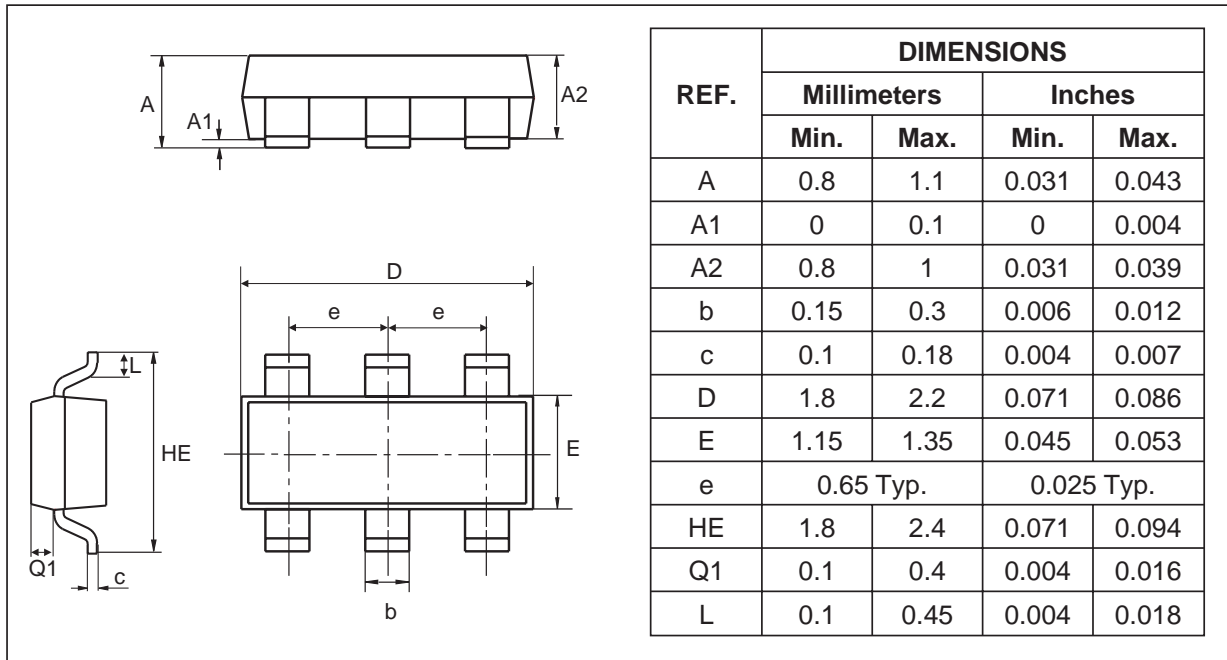
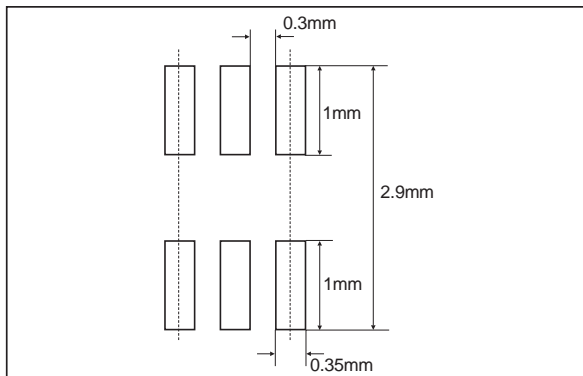
| Parameter | Value | Unit |
|-----------|-----------|------|
| Is | 2.66 e-8 | A |
| N | 1.04 | |
| M | 0.772 | |
| Vj | 0.65 | V |
| Eg | 0.69 | eV |
| Xti | 2 | |
| Rs | 15 | W |
| Cjo | 0.85 e-12 | F |
| Bv | 20 | V |
| Ibv | 10 e-3 | A |

PACKAGE MECHANICAL DATA SOT323-3L

| REF. | DIMENSIONS | | | | | |
|------|-------------|------|------|--------|-------|-------|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 0.8 | | 1.1 | 0.031 | | 0.043 |
| A1 | 0.0 | | 0.1 | 0.0 | | 0.004 |
| b | 0.25 | | 0.4 | 0.010 | | 0.016 |
| c | 0.1 | | 0.26 | 0.004 | | 0.010 |
| D | 1.8 | 2.0 | 2.2 | 0.071 | 0.079 | 0.086 |
| E | 1.15 | 1.25 | 1.35 | 0.045 | 0.049 | 0.053 |
| e | | 0.65 | | | 0.026 | |
| H | 1.8 | 2.1 | 2.4 | 0.071 | 0.083 | 0.094 |
| L | 0.1 | 0.2 | 0.3 | 0.004 | 0.008 | 0.012 |
| θ | 0 | | 30° | 0 | | 30° |

FOOTPRINT (in millimeters)



PACKAGE MECHANICAL DATA
 SOT323-6L

FOOTPRINT (in millimeters)


Note: The device fulfills the MSL level 1 after leadfree soldering profile.

| Ordering code | Marking | Package | Weight | Base qty | Delivery mode |
|---------------|---------|-----------|---------|----------|---------------|
| STDD15-04W | 24 | SOT323-3L | 0.006 g | 3000 | Tape & reel |
| STDD15-05W | 25 | SOT323-3L | 0.006 g | 3000 | Tape & reel |
| STDD15-07S | D25 | SOT323-6L | 0.006 g | 3000 | Tape & reel |

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