

Features

- V_F , R_D and C_J Matching Options
- Chip, Beam Lead and Packaged Devices
- Hi-Rel Screening per MIL-PRF-19500 and MIL-PRF-38534 Available



Description

The MSS30-xxx-x Series of Schottky diodes are fabricated on N-Type epitaxial substrates using proprietary processes that yield the highest FCOs in the industry. Optimum mixer performance is obtained with LO power of -3 dBm to +3 dBm per diode.

Chip

Electrical Specifications: $T_A = 25^\circ\text{C}$

| Model | Configuration | V_F Typ. V | V_{BR} Min. V | C_J Typ. / Max. pF | R_S Typ. Ω | R_D Max. Ω | F_{CO} Typ. GHz | Outline |
|-----------------|-----------------|----------------------|------------------------|--|---------------------------|---------------------------|-------------------------|---------|
| MSS30-046-C15 | Single Junction | 0.29 | 2 | 0.10 / 0.12 | 10 | 18 | 160 | C15 |
| MSS30-050-C15 | Single Junction | 0.27 | 2 | 0.15 / 0.18 | 6 | 15 | 175 | C15 |
| Test Conditions | | $I_F = 1 \text{ mA}$ | $I_R = 10 \mu\text{A}$ | $V_R = 0 \text{ V}$ $F = 1 \text{ MHz}$ | $I = 5 \text{ mA}$ | | | |

Beam Lead

Electrical Specifications: $T_A = 25^\circ\text{C}$

| Model | Configuration | V_F Typ. V | V_{BR} Min. V | C_J Typ. / Max. pF | R_S Typ. Ω | R_D Max. Ω | F_{CO} Typ. GHz | Outline |
|-----------------|-----------------|----------------------|------------------------|--|---------------------------|---------------------------|-------------------------|---------|
| MSS30-142-B10B | Single Junction | 0.29 | 2 | 0.07 / 0.10 | 13 | 22 | 175 | B10B |
| MSS30-148-B10B | Single Junction | 0.27 | 2 | 0.12 / 0.15 | 7 | 15 | 190 | B10B |
| MSS30-154-B10B | Single Junction | 0.25 | 2 | 0.22 / 0.25 | 3 | 12 | 240 | B10B |
| MSS30-242-B20 | Series Tee | 0.29 | 2 | 0.07 / 0.10 | 13 | 22 | 175 | B20 |
| MSS30-248-B20 | Series Tee | 0.27 | 2 | 0.12 / 0.15 | 7 | 15 | 190 | B20 |
| MSS30-254-B20 | Series Tee | 0.25 | 2 | 0.22 / 0.25 | 3 | 12 | 240 | B20 |
| MSS30-442-B41 | Ring Quad | 0.29 | 2 | 0.07 / 0.10 | 13 | 22 | 175 | B41 |
| MSS30-448-B41 | Ring Quad | 0.27 | 2 | 0.12 / 0.15 | 7 | 15 | 190 | B41 |
| MSS30-454-B40 | Ring Quad | 0.25 | 2 | 0.22 / 0.25 | 3 | 12 | 240 | B40 |
| Test Conditions | | $I_F = 1 \text{ mA}$ | $I_R = 10 \mu\text{A}$ | $V_R = 0 \text{ V}$ $F = 1 \text{ MHz}$ | $I = 5 \text{ mA}$ | | | |

Packaged

Electrical Specifications: $T_A = 25^\circ\text{C}$

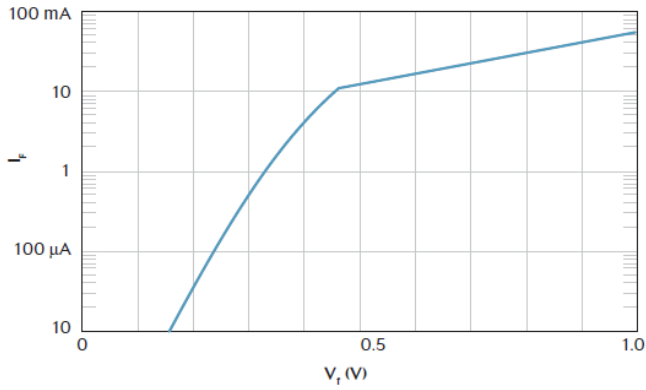
| Model | Configuration | V_F Typ. V | V_{BR} Min. V | C_J Typ. / Max. pF | R_S Typ. Ω | R_D Max. Ω | F_{CO} Typ. GHz | Outline |
|-----------------|-----------------|----------------------|------------------------|--|---------------------------|---------------------------|-------------------------|---------|
| MSS30-046-P55 | Single Junction | 0.29 | 2 | 0.23 / 0.30 | 10 | 18 | 160 | P55 |
| MSS30-046-P86 | Single Junction | 0.29 | 2 | 0.27 / 0.33 | 10 | 18 | 160 | P86 |
| MSS30-050-P55 | Single Junction | 0.27 | 2 | 0.28 / 0.35 | 6 | 15 | 175 | P55 |
| MSS30-050-P86 | Single Junction | 0.27 | 2 | 0.32 / 0.38 | 6 | 15 | 175 | P86 |
| MSS30-142-E25 | Single Junction | 0.29 | 2 | 0.20 / 0.26 | 13 | 22 | 175 | E25 |
| MSS30-142-H20 | Single Junction | 0.29 | 2 | 0.25 / 0.31 | 13 | 22 | 175 | H20 |
| MSS30-148-E25 | Single Junction | 0.27 | 2 | 0.25 / 0.31 | 7 | 15 | 190 | E25 |
| MSS30-148-H20 | Single Junction | 0.27 | 2 | 0.30 / 0.36 | 7 | 15 | 190 | H20 |
| MSS30-154-E25 | Single Junction | 0.25 | 2 | 0.35 / 0.41 | 3 | 12 | 240 | E25 |
| MSS30-154-H20 | Single Junction | 0.25 | 2 | 0.40 / 0.46 | 3 | 12 | 240 | H20 |
| MSS30-242-E35 | Series Tee | 0.29 | 2 | 0.15 / 0.21 | 13 | 22 | 175 | E35 |
| MSS30-242-H30 | Series Tee | 0.29 | 2 | 0.25 / 0.31 | 13 | 22 | 175 | H30 |
| MSS30-248-E35 | Series Tee | 0.27 | 2 | 0.25 / 0.31 | 7 | 15 | 190 | E35 |
| MSS30-248-H30 | Series Tee | 0.27 | 2 | 0.30 / 0.36 | 7 | 15 | 190 | H30 |
| MSS30-254-E35 | Series Tee | 0.25 | 2 | 0.35 / 0.41 | 3 | 12 | 240 | E35 |
| MSS30-254-H30 | Series Tee | 0.25 | 2 | 0.40 / 0.46 | 3 | 12 | 240 | H30 |
| MSS30-442-E45 | Ring Quad | 0.29 | 2 | 0.15 / 0.21 | 13 | 22 | 175 | E45 |
| MSS30-448-E45 | Ring Quad | 0.27 | 2 | 0.20 / 0.26 | 7 | 15 | 190 | E45 |
| MSS30-454-E45 | Ring Quad | 0.25 | 2 | 0.25 / 0.31 | 3 | 12 | 240 | E45 |
| MSS30-454-H40 | Ring Quad | 0.25 | 2 | 0.25 / 0.31 | 3 | 12 | 240 | H40 |
| Test Conditions | | $I_F = 1 \text{ mA}$ | $I_R = 10 \mu\text{A}$ | $V_R = 0 \text{ V}$ $F = 1 \text{ MHz}$ | $I = 5 \text{ mA}$ | | | |

Absolute Maximum Ratings

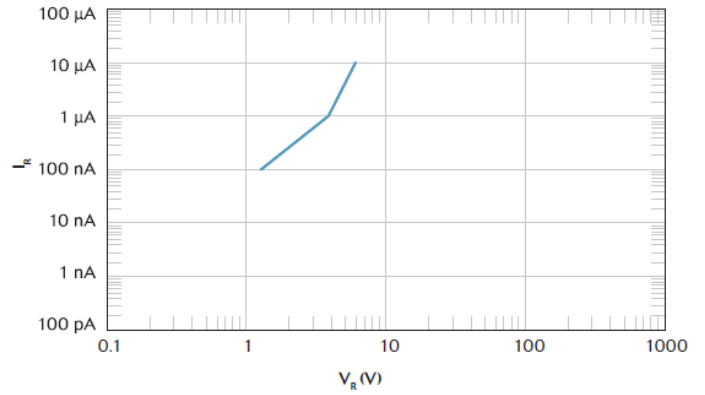
| Parameters | Rating |
|----------------------------------|--|
| Reverse Voltage | Rated V_{BR} |
| Forward Current | 50 mA |
| Power Dissipation | 100 mW, per junction @ $T_A = 25^\circ\text{C}$, derate linearly to 0 @ $T_A = +150^\circ\text{C}$ |
| Operating Temperature | -65°C to $+150^\circ\text{C}$ |
| Storage Temperature | -65°C to $+150^\circ\text{C}$ |
| Soldering Temperature (packaged) | $+230^\circ\text{C}$ for 5 seconds |
| Beam Lead Pull Strength | 4 G minimum |

Typical Performance Curves: $T_A = 25^\circ\text{C}$

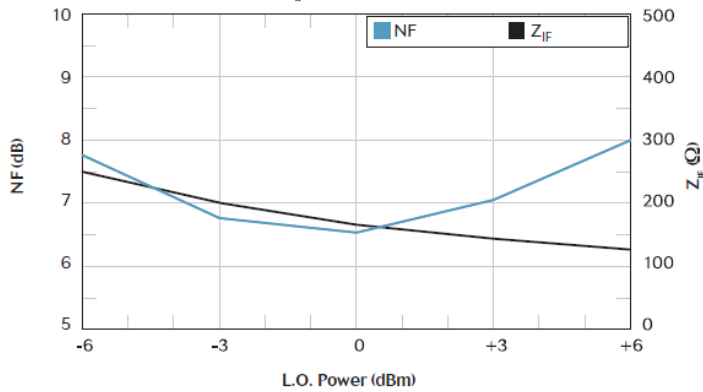
Forward Voltage vs. Current



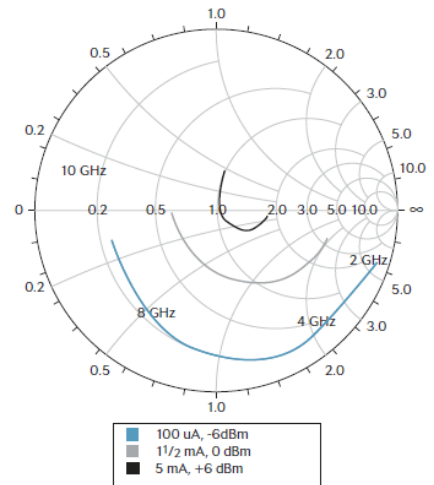
Reverse Current vs. Voltage



NF & Z_{IF} vs. LO Power



Smith Chart - 50 Ω Reference



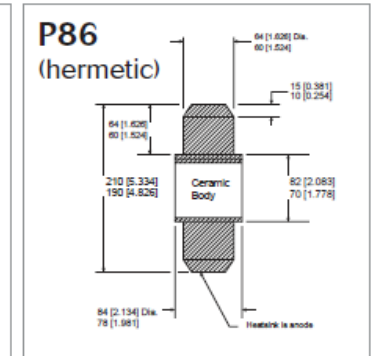
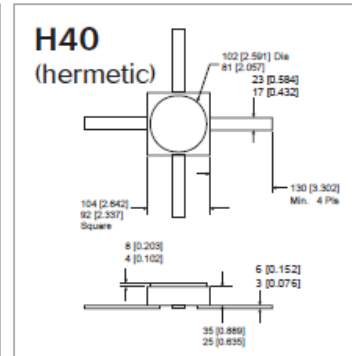
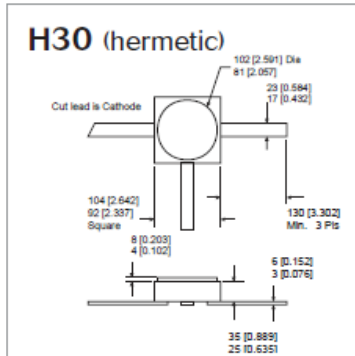
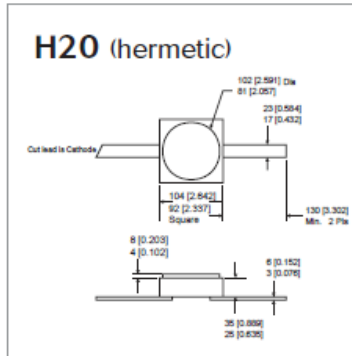
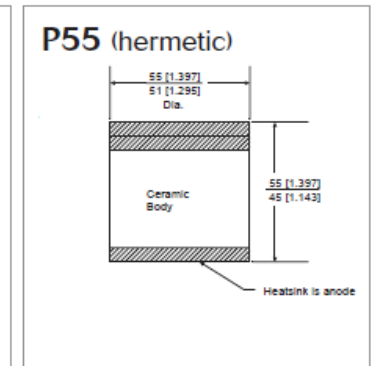
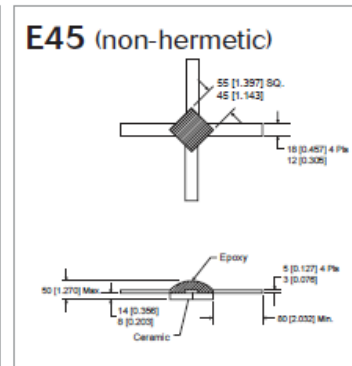
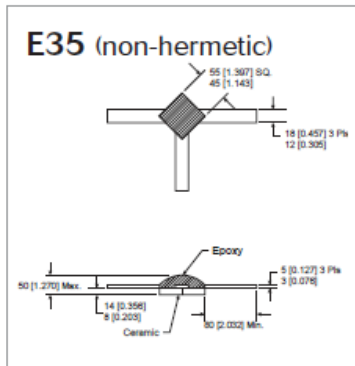
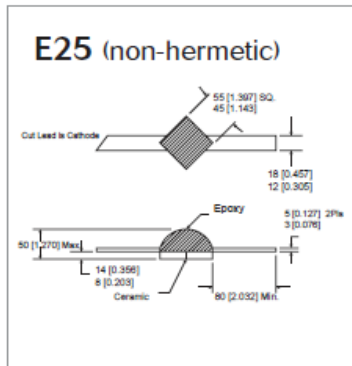
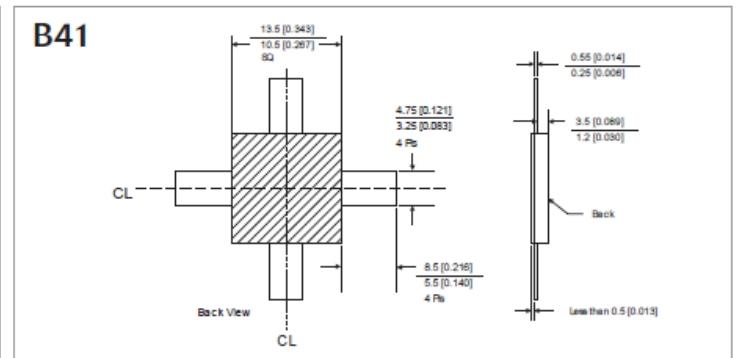
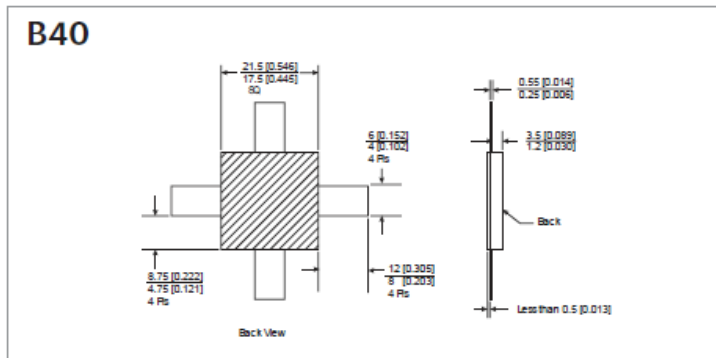
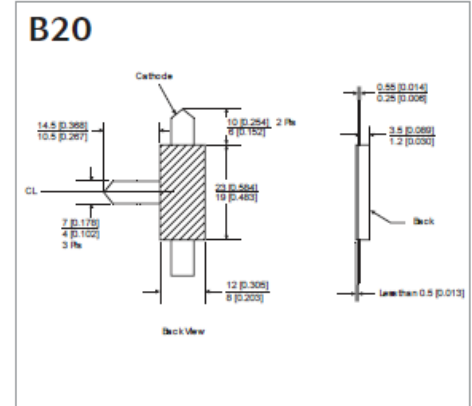
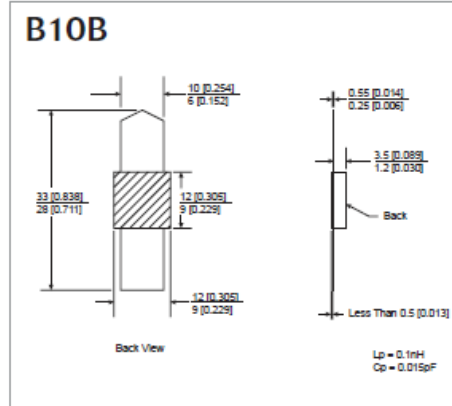
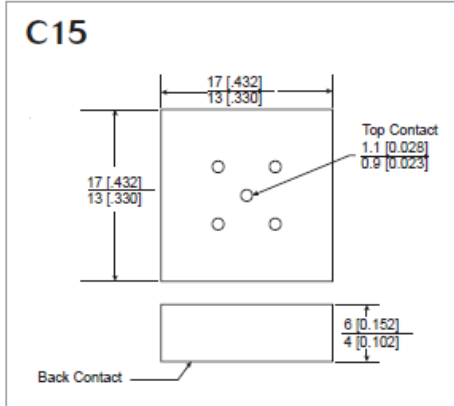
MSS30-xxx-x Series



Low Barrier Silicon Schottky Diodes

Rev. V1

Outline Drawings



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