# Step Recovery Diodes

### Description

The **MicroMetrics** MSD 700 series Step Recovery diodes are epitaxial silicon varactors which provide high output power and efficiencies in harmonic generator applications.

Strict material and process controls result in high reproducibility. A unique silicon dioxide passivation process assures greater stability, reliability and low leakage currents at high temperatures.

Diodes are available in various capacitance ranges for each of the 4 voltage ratings. These diodes represent the lowest transition times (snap time) available for each voltage rating.

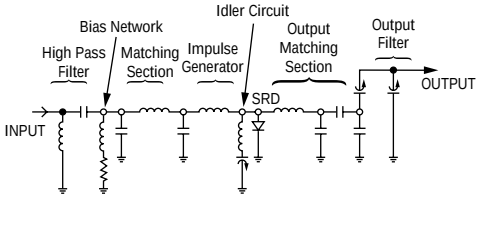
Unless otherwise specified, capacitance will be within the range shown above for each type. A capacitance tolerance of ±10% is available at an additional charge. Diodes can be optimized for custom electrical or mechanical specifications. Custom parameters for capacitance, voltage, transition time, series resistance, etc. are available upon request.

### Applications

The MSD 700 series Step Recovery diodes are used as harmonic generators for all orders of multiplication, x 2 through x 20, for both narrow and wide bandwidths.

Applications include local oscillators, voltage controlled oscillators, frequency synthesizers and up converters. They are also used in comb generators to generate a broad frequency spectrum and in high speed pulse shaping circuits.

**Typical SRD Multiplier**



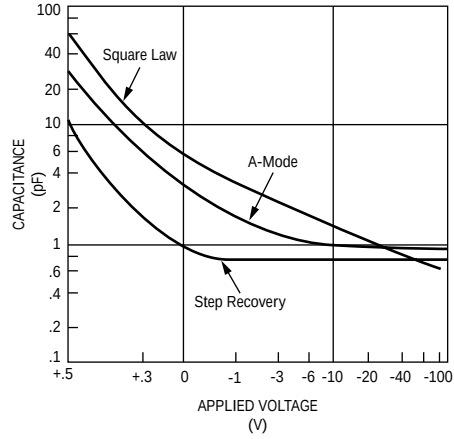

### Features

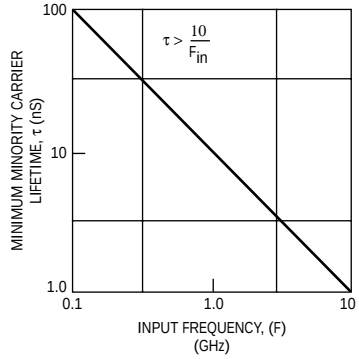
- Wide Selection of Tightend Capacitance Ranges
- Low Transition Times
- High Efficiencies

### Packaging

- Chip, Glass, Ceramic, Surface Mount, Beam Lead

## Typical Performance



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## Electrical Characteristics[4]

| Junction Capacitance, $C_j$[1] @ -6V, 1MHz (pF) | Minimum Breakdown Voltage, $V_b$ @ 10 µA (V) | Minimum Carrier Lifetime, $T_l$ $I_r$ 6 mA, $I_f$ = 10 mA (nS) | Maximum Transition Time, $T_t$ (pS) | Maximum Series Resistance, $R_S$[2] $I_f$ = 25 mA $R_S$ (Ohms) | Maximum Thermal Resistance[3] $\Theta C_j$ °C/W | Part Number |
|---|---|---|---|---|---|---|
| 0.2 - 0.4 | 15 | 8 | 60 | 1.20 | 125 | MSD700 |
| 0.4 - 0.6 | 15 | 8 | 60 | 1.00 | 100 | MSD701 |
| 0.6 - 0.8 | 15 | 8 | 60 | 0.70 | 100 | MSD702 |
| 0.8 - 1.0 | 15 | 8 | 60 | 0.50 | 75 | MSD703 |
| 1.0 - 1.4 | 15 | 8 | 60 | 0.40 | 75 | MSD704 |
| 1.4 - 2.0 | 15 | 8 | 60 | 0.30 | 60 | MSD705 |
| 2.0 - 3.0 | 15 | 8 | 60 | 0.25 | 60 | MSD706 |
| 0.2 - 0.4 | 20 | 11 | 70 | 1.00 | 100 | MSD710 |
| 0.4 - 0.6 | 20 | 11 | 70 | 0.70 | 75 | MSD711 |
| 0.6 - 0.8 | 20 | 11 | 70 | 0.60 | 75 | MSD712 |
| 0.8 - 1.0 | 20 | 11 | 70 | 0.50 | 75 | MSD713 |
| 1.0 - 1.4 | 20 | 11 | 70 | 0.40 | 75 | MSD714 |
| 1.4 - 2.0 | 20 | 11 | 70 | 0.30 | 60 | MSD715 |
| 2.0 - 3.0 | 20 | 11 | 70 | 0.25 | 60 | MSD716 |
| 0.2 - 0.4 | 30 | 17 | 100 | 0.80 | 75 | MSD720 |
| 0.4 - 0.6 | 30 | 17 | 100 | 0.60 | 60 | MSD721 |
| 0.6 - 0.8 | 30 | 17 | 100 | 0.50 | 60 | MSD722 |
| 0.8 - 1.0 | 30 | 17 | 100 | 0.40 | 60 | MSD723 |
| 1.0 - 1.4 | 30 | 17 | 100 | 0.30 | 60 | MSD724 |
| 1.4 - 2.0 | 30 | 17 | 100 | 0.25 | 50 | MSD725 |
| 2.0 - 3.0 | 30 | 17 | 100 | 0.20 | 50 | MSD726 |
| 0.2 - 0.4 | 40 | 21 | 150 | 0.80 | 50 | MSD730 |
| 0.4 - 0.6 | 40 | 21 | 150 | 0.60 | 50 | MSD731 |
| 0.6 - 0.8 | 40 | 21 | 150 | 0.50 | 50 | MSD732 |
| 0.8 - 1.0 | 40 | 21 | 150 | 0.40 | 50 | MSD733 |
| 1.0 - 1.4 | 40 | 21 | 150 | 0.30 | 50 | MSD734 |
| 1.4 - 2.0 | 40 | 21 | 150 | 0.25 | 40 | MSD735 |
| 2.0 - 3.0 | 40 | 21 | 150 | 0.20 | 40 | MSD736 |

Notes:
1. Junction Capacitance is measured at 1 MHz on Hewlett Packard model 4277A LCZ meter.
2. Series Resistance is measured using a Hewlett Packard model 4191A impedance analyzer.
3. Thermal Resistance is measured using pulsed conditions while measuring forward voltage drop across the diode mounted in an infinite heat sink.
4. All specifications are measured in case style CS37.

## Maximum Ratings

| | |
|---|---|
| **Storage Temperature** | -65°C to + 200°C |
| **Operating Temperature** | -55°C to + 150°C |
| **Minimum Voltage Breakdown** | 15, 20, 30 and 40 V at 10 µA |