

### Features

- High Q Values for Higher Frequency Performance
- Large Tuning Ratios
- Low Reverse Current
- Gamma Values to 1.5
- Available as Bondable Chips and as Packaged Diodes
- Available in Chip-on-Board Packaging
- Custom Designs Available



### Applications

- VCOs
- Phase-Locked Oscillators
- High Q Tunable Filters
- Phase Shifters
- Pre-Selectors

### Maximum Ratings

Reverse Voltage	Breakdown Voltage
Forward Current	50 mA @ 25°C
Incident Power	+20 dBm @ 25°C
Operating Temperature	-55°C to +175°C
Storage Temperature	-55°C to +200°C

### Description

Microsemi's GaAs hyperabrupt junction varactor diodes are fabricated from epitaxial layers grown at Microsemi by the Chemical Vapor Deposition technique. The layers are processed at using proprietary techniques resulting in varactors with constant gamma, high Q factor and repeatable tuning curves. These varactors are available in a variety of microwave ceramic packages or bondable chips for operation from UHF to millimeter wave frequencies.

**IMPORTANT:** For the most current data, consult our website: [www.MICROSEMI.com](http://www.MICROSEMI.com)

Specifications are subject to change. Consult factory for the latest information.



These devices are ESD sensitive and must be handled using ESD precautions.

<sup>1</sup> The MS3000 Series of products are supplied with a RoHS compliant Gold finish.

*High Q Constant Gamma Tuning Varactors (Specifications @ 25°C)*

Gamma = 0.75				
Part Number	$C_T @ 4 V \pm 10\%$ (pF) <sup>1,3,4</sup>	Typ. $C_T @ 2V / C_T @ 20V^5$	Min. $V_{BR} @ 10 \mu A (V)$	Typ. $Q @ -4 V^2$
MV32001	0.6	2.8	22	4000
MV32002	1.0	3.1	22	3000
MV32003	1.2	3.2	22	3000
MV32004	1.5	3.3	22	3000
MV32005	1.8	3.4	22	3000
MV32006	2.2	3.5	22	3000
MV32007	2.5	3.6	22	2500
MV32008	3.0	3.6	22	2500
MV32009	3.6	3.7	22	2000
MV32010	4.5	3.8	22	1500

Gamma = 1.00				
Part Number	$C_T @ 4 V \pm 10\%$ (pF) <sup>1,3,4</sup>	Typ. $C_T @ 2V / C_T @ 12V^5$	Min. $V_{BR} @ 10 \mu A (V)$	Typ. $Q @ -4V^2$
MV30001	0.6	3.2	15	4000
MV30002	1.0	3.7	15	3000
MV30003	1.2	3.8	15	3000
MV30004	1.5	4.0	15	3000
MV30005	1.8	4.1	15	3000
MV30006	2.2	4.2	15	3000
MV30007	2.5	4.3	15	2500
MV30008	3.0	4.4	15	2500
MV30009	3.6	4.5	15	2000
MV30010	4.5	4.5	15	1500

Part Number	$C_T @ 4 V \pm 10\%$ (pF) <sup>1,3,4</sup>	Typ. $C_T @ 2V / C_T @ 20V^5$	Min. $V_{BR} @ 10 \mu A (V)$	Typ. $Q @ -4V^2$
MV30011	0.6	3.9	22	4000
MV30012	1.0	4.6	22	3000
MV30013	1.2	4.9	22	3000
MV30014	1.5	5.2	22	3000
MV30015	1.8	5.4	22	3000
MV30016	2.2	5.6	22	3000
MV30017	2.5	5.8	22	2500
MV30018	3.0	6.0	22	2500
MV30019	3.6	6.1	22	2000
MV30020	4.5	6.3	22	1500

Gamma = 1.25				
Part Number	$C_T @ 4V \pm 10\%$ (pF) <sup>1,3,4</sup>	Typ. $C_T @ 2V / C_T @ 12V^5$	Min. $V_{BR} @ 10 \mu A (V)$	Typ. $Q @ -4 V^2$
MV31001	0.6	4.2	15	4000
MV31002	1.0	5.1	15	3000
MV31003	1.2	5.4	15	3000
MV31004	1.5	5.7	15	3000
MV31005	1.8	5.9	15	3000
MV31006	2.2	6.2	15	3000
MV31007	2.5	6.3	15	2000
MV31008	3.0	6.5	15	2000
MV31009	3.6	6.7	15	2000
MV31010	4.5	6.8	15	1500

Part Number	$C_T @ 4 V \pm 10\%$ (pF) <sup>1,3,4</sup>	Typ. $C_T @ 2V / C_T @ 20V^5$	Min. $V_{BR} @ 10 \mu A (V)$	Typ. $Q @ -4V^2$
MV31011	0.5	5.5	22	4000
MV31012	0.7	6.5	22	4000
MV31013	1.0	7.7	22	3000
MV31014	1.2	8.3	22	3000
MV31015	1.5	9.1	22	3000
MV31016	1.8	9.6	22	3000
MV31017	2.0	9.9	22	3000
MV31018	2.2	10.2	22	3000
MV31019	2.7	10.8	22	2000
MV31020	3.3	11.3	22	2000
MV31021	3.7	11.5	22	2000
MV31022	4.7	12.0	22	1500
MV31023	5.6	12.3	22	1500
MV31024	6.8	12.6	22	1500
MV31025	8.2	12.9	22	1500
MV31026	10.0	13.1	22	1500

<sup>1</sup> Capacitance is specified at 1 MHz.

<sup>2</sup> Measured by DeLoach Technique and referenced to 50 MHz.

<sup>3</sup> Tightened tolerances available upon request.

<sup>4</sup> Package capacitance is 0.15 pF is included in the above specification.

<sup>5</sup> The capacitance ratio is calculated using  $C_p = 0.15$  pF. Ratios will vary depending upon package selection.

*High Q Constant Gamma Tuning Varactors (Specifications @ 25°)*

Gamma = 1.50				
Part Number	$C_T @ 4 V$ $\pm 10\%$ (pF) <sup>1,3,4</sup>	Typ. $C_T @ 2 V$ $C_T @ 12V^5$	Min. $V_{BR} @$ $10 \mu A (V)$	Typ. $Q @ -4 V^2$
MV34001	0.5	4.5	15	3000
MV34002	1.0	5.9	15	2500
MV34003	1.8	7.1	15	2500
MV34004	2.8	7.3	15	2500
MV34005	2.2	7.4	15	1800
MV34006	2.5	7.6	15	1800
MV34007	3.0	7.9	15	1800
MV34008	3.8	8.1	15	1800
MV34009	4.5	8.3	15	1200
MV34010	10.0	8.9	15	1200

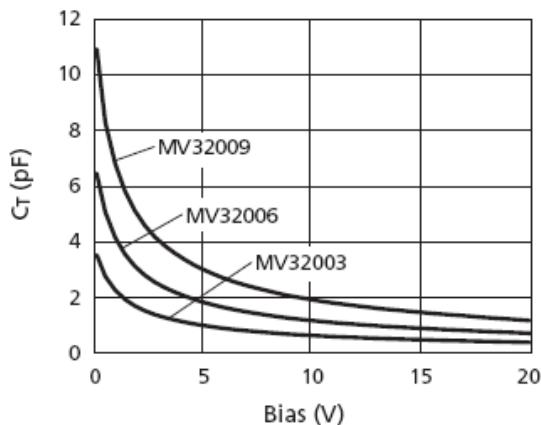
<sup>1</sup> Capacitance is specified at 1 MHz.

<sup>2</sup> Measured by DeLoach Technique and referenced to 50 MHz.

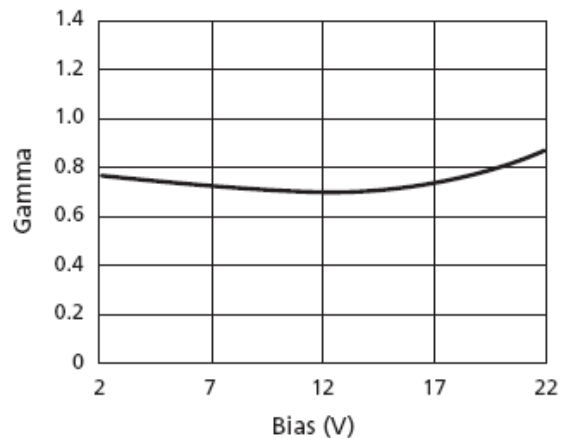
<sup>3</sup> Tightened tolerances available upon request.

<sup>4</sup> Package capacitance is 0.15 pF is included in the above specification.

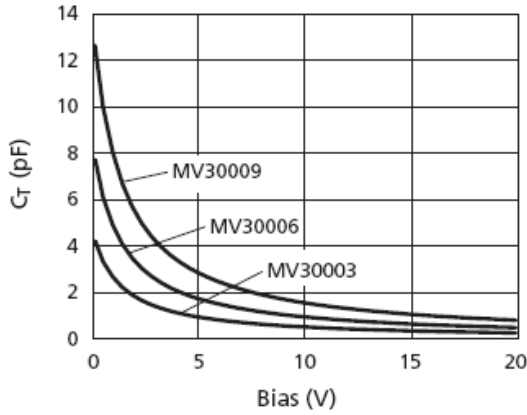
<sup>5</sup> The capacitance ratio is calculated using  $C_p = 0.15$  pF. Ratios will vary depending upon package selection.



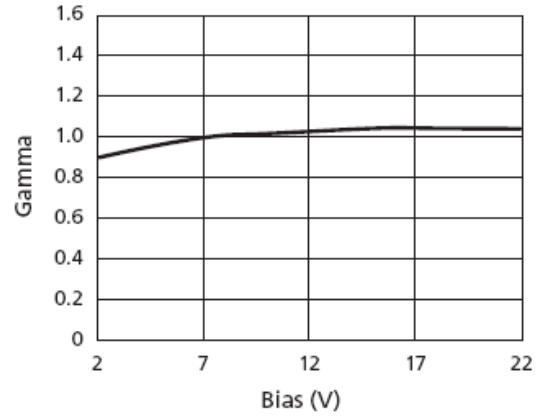
**Typical Total Capacitance vs. Bias**  
Gamma = 0.75



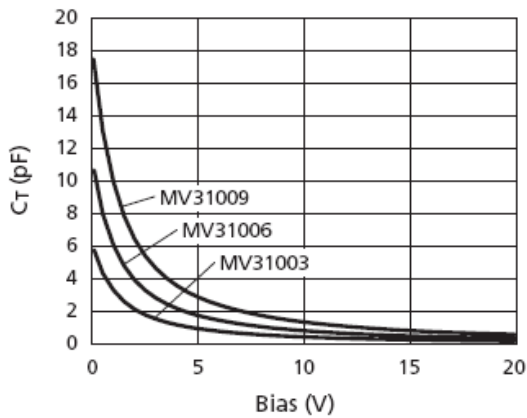
**Typical Gamma vs. Bias**  
Gamma = 0.75

**Typical Characteristics**


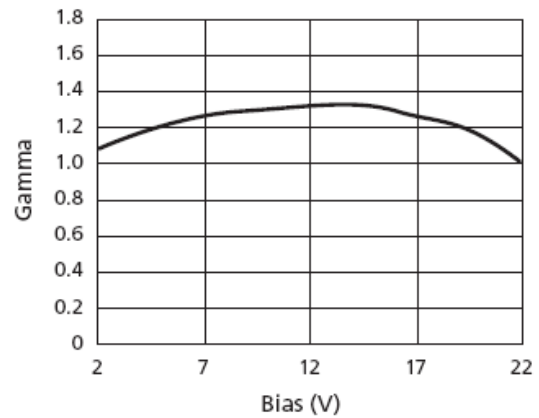
**Typical Total Capacitance vs. Bias**  
Gamma = 1.00



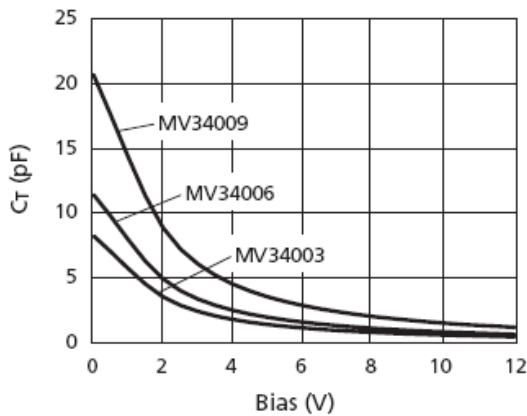
**Typical Gamma vs. Bias**  
Gamma = 1.00



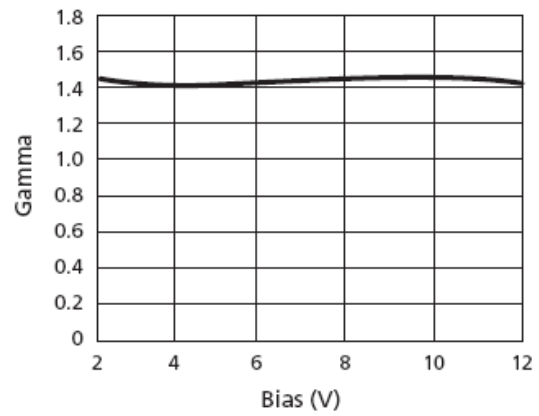
**Typical Total Capacitance vs. Bias**  
Gamma = 1.25



**Typical Gamma vs. Bias**  
Gamma = 1.25



**Typical Total Capacitance vs. Bias**  
Gamma = 1.50



**Typical Gamma vs. Bias**  
Gamma = 1.50