

**Microsemi Corp.**  
The diode experts

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# M\*5283 thru M\*5314 and C†5283 thru C†5314

## HIGH RELIABILITY CURRENT REGULATOR DIODES

### Features

(\*) • Available as screened equivalents using prefixes noted below:

MX as JTX equivalent  
MV as JTXV equivalent  
MS as JANS equivalent

(†) • Available in chip form using prefixes noted below:

CH as Aluminum on top, gold on back  
CNS as Titanium Nickel Silver on top and bottom

• Provides essentially constant current over a wide voltage range. • High Source Impedance

### Maximum Ratings

Operating Temperature: -55° C to +175° C

Storage Temperature: -55° C to +175° C

DC Power Dissipation: 475 mW @  $T_L \leq 75^\circ\text{C}$

Power Derating: 3.1 mW/° C @  $T_L > 75^\circ\text{C}$

Peak Operating Voltage: 100 Volts

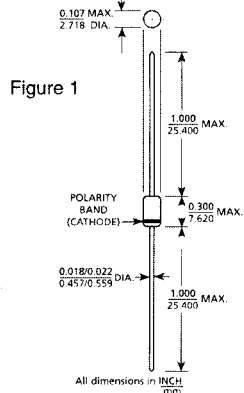
### Electrical Characteristics @ 25°C unless otherwise specified.

| TYPE<br>NUMBER | REGULATOR<br>CURRENT<br>$I_p$ (mA) @ $V_S = 25\text{V}$ |       |       | MINIMUM<br>DYNAMIC<br>IMPEDANCE<br>@ $V_K = 25\text{V}$<br>$Z_S$ (M $\Omega$ )<br>(Note 1) | MINIMUM<br>KNEE<br>IMPEDANCE<br>@ $I_L = 0.8\text{Ip (min)}$<br>$Z_K$ (M $\Omega$ )<br>(Note 2) | MAXIMUM<br>LIMITING<br>VOLTAGE<br>@ $I_L$ (VOLTS)<br>$V_L$ (VOLTS) |
|----------------|---------------------------------------------------------|-------|-------|--------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
|                | NOM                                                     | MIN   | MAX   |                                                                                            |                                                                                                 |                                                                    |
| 1N5283         | 0.22                                                    | 0.198 | 0.242 | 25.0                                                                                       | 2.75                                                                                            | 1.00                                                               |
| 1N5284         | 0.24                                                    | 0.216 | 0.264 | 19.0                                                                                       | 2.35                                                                                            | 1.00                                                               |
| 1N5285         | 0.27                                                    | 0.243 | 0.297 | 14.0                                                                                       | 1.95                                                                                            | 1.00                                                               |
| 1N5286         | 0.30                                                    | 0.270 | 0.330 | 9.0                                                                                        | 1.60                                                                                            | 1.00                                                               |
| 1N5287         | 0.33                                                    | 0.297 | 0.363 | 6.6                                                                                        | 1.35                                                                                            | 1.00                                                               |
| 1N5288         | 0.39                                                    | 0.351 | 0.429 | 4.10                                                                                       | 1.00                                                                                            | 1.05                                                               |
| 1N5289         | 0.43                                                    | 0.387 | 0.473 | 3.30                                                                                       | 0.870                                                                                           | 1.05                                                               |
| 1N5290         | 0.47                                                    | 0.423 | 0.517 | 2.70                                                                                       | 0.750                                                                                           | 1.05                                                               |
| 1N5291         | 0.56                                                    | 0.504 | 0.616 | 1.90                                                                                       | 0.560                                                                                           | 1.10                                                               |
| 1N5292         | 0.62                                                    | 0.558 | 0.682 | 1.55                                                                                       | 0.470                                                                                           | 1.13                                                               |
| 1N5293         | 0.68                                                    | 0.612 | 0.748 | 1.35                                                                                       | 0.400                                                                                           | 1.15                                                               |
| 1N5294         | 0.75                                                    | 0.675 | 0.825 | 1.15                                                                                       | 0.335                                                                                           | 1.20                                                               |
| 1N5295         | 0.82                                                    | 0.738 | 0.902 | 1.00                                                                                       | 0.290                                                                                           | 1.25                                                               |
| 1N5296         | 0.91                                                    | 0.819 | 1.001 | 0.880                                                                                      | 0.240                                                                                           | 1.29                                                               |
| 1N5297         | 1.00                                                    | 0.900 | 1.100 | 0.800                                                                                      | 0.205                                                                                           | 1.35                                                               |
| 1N5298         | 1.10                                                    | 0.990 | 1.210 | 0.700                                                                                      | 0.180                                                                                           | 1.40                                                               |
| 1N5299         | 1.20                                                    | 1.06  | 1.32  | 0.640                                                                                      | 0.155                                                                                           | 1.45                                                               |
| 1N5300         | 1.30                                                    | 1.17  | 1.43  | 0.580                                                                                      | 0.135                                                                                           | 1.50                                                               |
| 1N5301         | 1.40                                                    | 1.26  | 1.54  | 0.540                                                                                      | 0.115                                                                                           | 1.55                                                               |
| 1N5302         | 1.50                                                    | 1.35  | 1.65  | 0.510                                                                                      | 0.105                                                                                           | 1.60                                                               |
| 1N5303         | 1.60                                                    | 1.44  | 1.76  | 0.475                                                                                      | 0.092                                                                                           | 1.65                                                               |
| 1N5304         | 1.80                                                    | 1.62  | 1.98  | 0.420                                                                                      | 0.074                                                                                           | 1.75                                                               |
| 1N5305         | 2.00                                                    | 1.80  | 2.20  | 0.395                                                                                      | 0.061                                                                                           | 1.85                                                               |
| 1N5306         | 2.20                                                    | 1.98  | 2.42  | 0.370                                                                                      | 0.052                                                                                           | 1.95                                                               |
| 1N5307         | 2.40                                                    | 2.16  | 2.64  | 0.345                                                                                      | 0.044                                                                                           | 2.00                                                               |
| 1N5308         | 2.70                                                    | 2.43  | 2.97  | 0.320                                                                                      | 0.035                                                                                           | 2.15                                                               |
| 1N5309         | 3.00                                                    | 2.70  | 3.30  | 0.300                                                                                      | 0.029                                                                                           | 2.25                                                               |
| 1N5310         | 3.30                                                    | 2.97  | 3.63  | 0.280                                                                                      | 0.024                                                                                           | 2.35                                                               |
| 1N5311         | 3.60                                                    | 3.24  | 3.96  | 0.265                                                                                      | 0.020                                                                                           | 2.50                                                               |
| 1N5312         | 3.90                                                    | 3.51  | 4.29  | 0.255                                                                                      | 0.017                                                                                           | 2.60                                                               |
| 1N5313         | 4.30                                                    | 3.87  | 4.73  | 0.245                                                                                      | 0.014                                                                                           | 2.75                                                               |
| 1N5314         | 4.70                                                    | 4.23  | 5.17  | 0.235                                                                                      | 0.012                                                                                           | 2.90                                                               |

NOTE 1:  $Z_S$  is derived by superimposing a 90Hz rms signal equal to 10% of  $V_S$  on  $V_S$ .

NOTE 2:  $Z_K$  is derived by superimposing a 90Hz rms signal equal to 10% of  $V_K$  on  $V_K$ .

Package Drawing



## Mechanical Characteristics

**CASE:** Hermetically sealed glass case. DO-7 outline.

**LEAD MATERIAL:** Dumet.

**LEAD FINISH:** Tin plate.

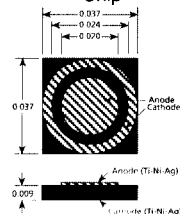
**THERMAL RESISTANCE:** 300° C/W (Typical) junction to ambient.

**POLARITY:** Cathode end is banded.

**WEIGHT:** 0.2 grams

**MOUNTING POSITION:** Any.

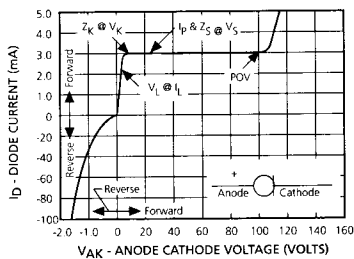
Figure 2  
Chip



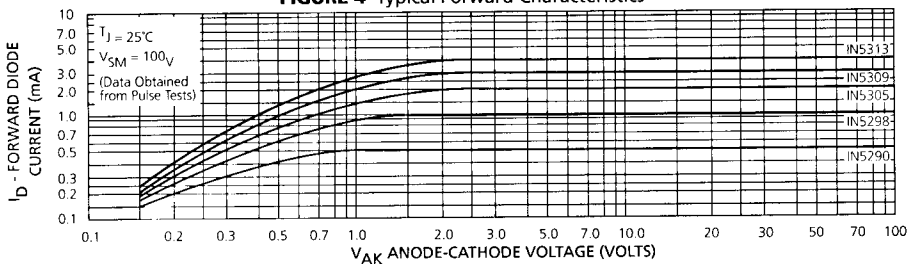
Metallization Substrate  
Dimensions: Nominal, Inches

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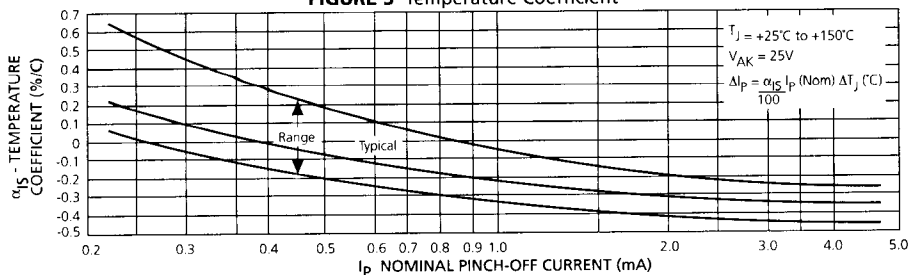
**FIGURE 3**  
Typical Current Regulator Characteristics



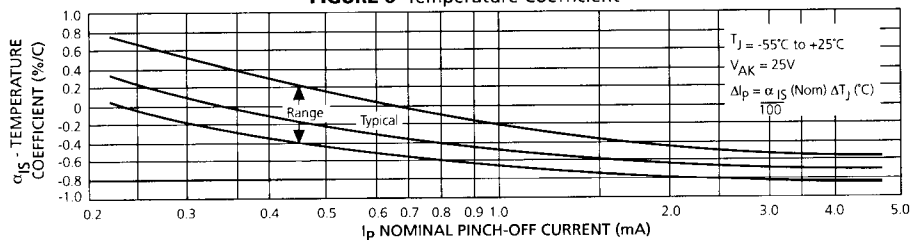
**FIGURE 4** Typical Forward Characteristics



**FIGURE 5** Temperature Coefficient



**FIGURE 6** Temperature Coefficient



## SYMBOLS AND DEFINITIONS

- $I_D$  - Diode Current
- $I_P$  - Pinch-off Current: Regulator current at specified Test Voltage,  $V_S$ .  $I_P$  is sometimes also identified as  $I_S$ .
- POV - Peak Operating Voltage: Maximum voltage to be applied to device.
- $\alpha_{IS}$  - Current Temperature Coefficient.
- $V_K$  - Knee Impedance Test Voltage: Specified voltage used to establish Knee Impedance,  $Z_K$ .
- $V_L$  - Limiting voltage: Measured at  $I_L$ ,  $V_L$ , together with Knee ac Impedance,  $Z_K$ , indicates the Knee characteristics of the device.
- $V_S$  - Test Voltage: Voltage at which  $I_P$  and  $Z_S$  are specified.
- $Z_K$  - Knee AC Impedance at Test Voltage: To test for  $Z_K$ , a 90 Hz signal  $v_K$  with rms value equal to 10% of test voltage  $V_K$  is superimposed on  $V_K$ ;  $Z_K = v_K/i_K$  where  $i_K$  is the resultant ac current due to  $v_K$ . To provide the most constant current from the diode,  $Z_K$  should be as high as possible; therefore, a minimum value of  $Z_K$  is specified.
- $Z_S$  - AC Impedance at Test Voltage: Specified as a minimum value. To test for  $Z_S$ , a 90 Hz signal  $v_S$  with rms value equal to 10% of test voltage,  $V_S$ , is superimposed on  $V_S$ ;  $Z_S = v_S/i_S$  where  $i_S$  is the resultant ac current due to  $v_S$ .