

# 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 @  $T_L > 75^\circ\text{C}$

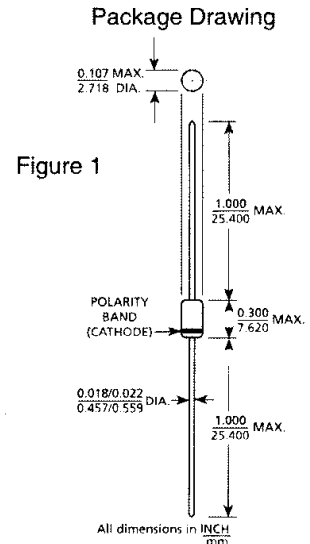
**Peak Operating Voltage:** 100 Volts

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

TYPE NUMBER	REGULATOR CURRENT $I_p$ (mA) @ $V_S = 25V$			MINIMUM DYNAMIC IMPEDANCE @ $V_S = 25V$ $Z_S$ (M $\Omega$ ) (Note 1)	MINIMUM KNEE IMPEDANCE @ $V_K = 6.0V$ $Z_K$ (M $\Omega$ ) (Note 2)	MAXIMUM LIMITING VOLTAGE @ $I_L = 0.8 I_p$ (min) $V_L$ (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  $V_K$ .



### Mechanical Characteristics

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

**LEAD MATERIAL:** Dumet.

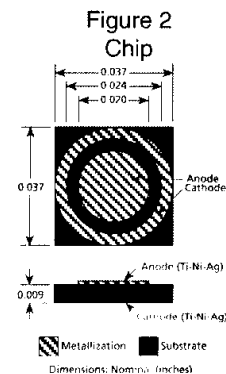
**LEAD FINISH:** Tin plate.

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

**POLARITY:** Cathode end is banded.

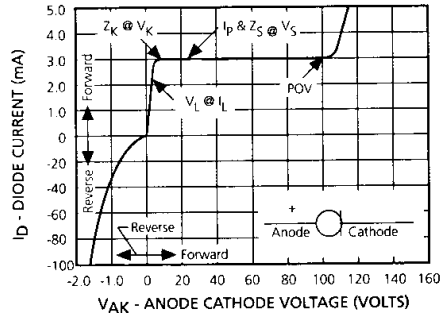
**WEIGHT:** 0.2 grams

**MOUNTING POSITION:** Any.

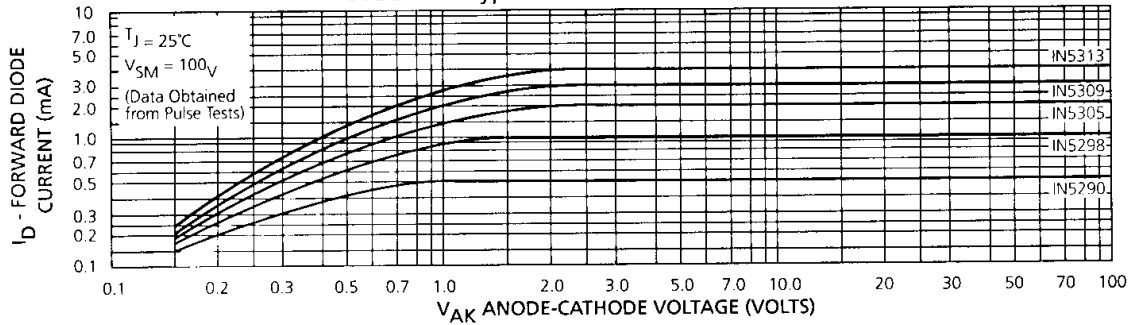


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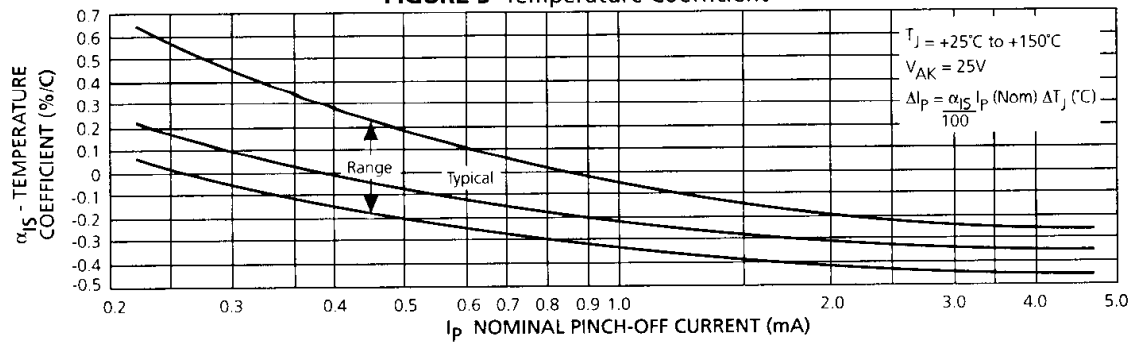
**FIGURE 3**  
Typical Current Regulator Characteristics



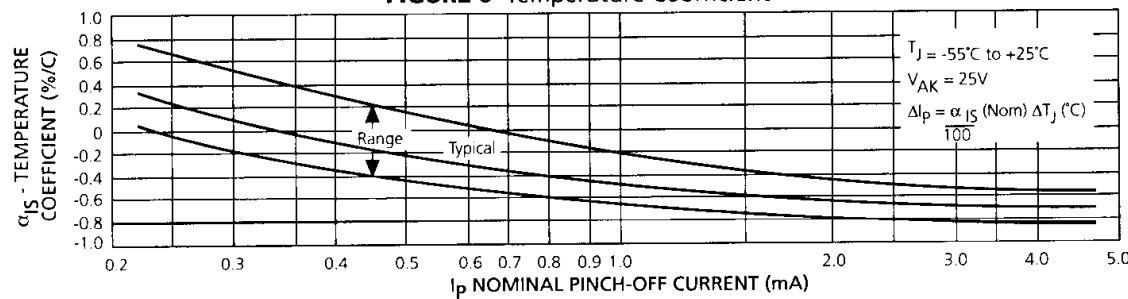
**FIGURE 4** Typical Forward Characteristics



**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.
- $\alpha_{I_S}$  - 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  $v_S$ .