



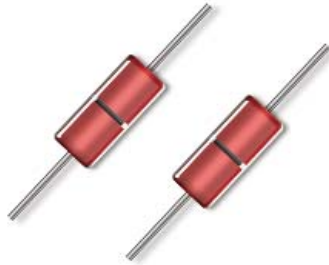
# Current Regulator Diode Series

## 1N5283-1 thru 1N5314-1 & 1N7048-1 thru 1N7055-1



### Features

- High source impedance.
- Internal metallurgical bond.
- JAN, JANTX, and JANTXV qualification per MIL-PRF-19500/463 available.



### Description

The popular 1N5283-1 thru 1N5314-1 and 1N7041-1 thru 1N7055-1 series of 0.5 watt current regulators provides a selection from 0.22 mA to 10 mA in standard 10% tolerances. These devices regulate current over a broad voltage range as a counter part offering to Zeners (that regulate voltage over a broad current range). The somewhat larger DO-7 packaging option offers a double-plug internal bond connection with a larger active die element for its unique function as a current limiter.

### Applications

- Double-plug construction.
- Regulates current over a broad operating voltage and temperature range.
- Extensive selection from 0.22 mA to 10 mA.
- Standard current tolerances are plus/minus 10%.
- Flexible axial-lead mounting terminals.
- Nonsensitive to ESD.

### Maximum Ratings

Parameters / Test Conditions	Symbol	Value	Unit
Junction and Storage Temperature	$T_J$ and $T_{STG}$	-65 to +175	°C
Thermal Resistance Junction-to-Lead @ $L = 0.375$ in	$R_{\theta JL}$	250	°C/W
Thermal Impedance	$Z_{\theta JX}$	25	°C/W
Steady-State Power Dissipation @ $T_L = +50$ °C, $L = 3/8^{(1)}$	$P_o$	500	mW
Working Peak Voltage	$V_{WM}$	100	V
Solder Pad Temperature @ 10 s maximum	$T_{SP}$	260	°C

NOTE 1: Derate at 4 mW/°C above +50 °C.



**Electrical Specifications @ +25 °C (Unless Otherwise Specified)**

Type Number	Regulator Current $I_p$ (mA) @ $V_S = 25$ V			Minimum Dynamic Impedance @ $V_S = 25$ V $Z_S$ (M) (Note 1)	Minimum Knee Impedance @ $V_K = 6.0$ V $Z_K$ (M $\Omega$ ) (Note 2)	Maximum Limiting Voltage @ $I_L = 0.8 I_S$ (min) $V_L$ (volts)	Peak Operating Voltage Volts
	Nominal	Minimum	Maximum				
1N5283-1	0.22	0.198	0.242	25.0	2.75	1.00	100
1N5284-1	0.24	0.216	0.264	19.0	2.35	1.00	100
1N5285-1	0.27	0.243	0.297	14.0	1.95	1.00	100
1N5286-1	0.30	0.270	0.330	9.0	1.60	1.00	100
1N5287-1	0.33	0.297	0.363	8.0	1.35	1.00	100
1N5288-1	0.39	0.351	0.429	4.10	1.000	1.05	100
1N5289-1	0.43	0.387	0.473	3.30	0.870	1.05	100
1N5290-1	0.47	0.423	0.517	2.70	0.750	1.05	100
1N5291-1	0.56	0.504	0.616	1.90	0.560	1.10	100
1N5292-1	0.62	0.558	0.682	1.55	0.470	1.13	100
1N5293-1	0.68	0.612	0.748	1.35	0.400	1.15	100
1N5294-1	0.75	0.675	0.825	1.15	0.335	1.20	100
1N5295-1	0.82	0.738	0.902	1.00	0.290	1.25	100
1N5296-1	0.91	0.819	1.001	0.88	0.240	1.29	100
1N5297-1	1.00	0.900	1.100	0.80	0.205	1.35	100
1N5298-1	1.10	0.99	1.21	0.70	0.180	1.40	100
1N5299-1	1.20	1.08	1.32	0.64	0.155	1.45	100
1N5300-1	1.30	1.17	1.43	0.58	0.135	1.50	100
1N5301-1	1.40	1.26	1.54	0.54	0.115	1.55	100
1N5302-1	1.50	1.35	1.65	0.51	0.105	1.60	100
1N5303-1	1.60	1.44	1.76	0.475	0.092	1.65	100
1N5304-1	1.80	1.62	1.98	0.420	0.074	1.75	100
1N5305-1	2.00	1.80	2.20	0.395	0.061	1.85	100
1N5306-1	2.20	1.98	2.42	0.370	0.052	1.95	100
1N5307-1	2.40	2.16	2.54	0.345	0.044	2.00	100
1N5308-1	2.70	2.43	2.97	0.320	0.035	2.15	100
1N5309-1	3.00	2.70	3.30	0.300	0.029	2.25	100
1N5310-1	3.30	2.97	3.63	0.280	0.024	2.35	100
1N5311-1	3.60	3.24	3.96	0.265	0.020	2.50	100
1N5312-1	3.90	3.51	4.29	0.255	0.017	2.60	100
1N5313-1	4.30	3.87	4.73	0.245	0.014	2.75	100
1N5314-1	4.70	4.23	5.17	0.235	0.012	2.90	100
1N7048-1	5.10	4.59	5.61	100	4.0	3.67	80
1N7049-1	5.60	5.04	6.16	90	4.0	4.03	80
1N7050-1	6.20	5.58	6.82	80	3.0	4.46	70
1N7051-1	6.80	6.12	7.48	70	2.0	4.90	70
1N7052-1	7.50	6.75	8.25	50	1.5	5.40	60
1N7053-1	8.20	7.38	9.02	30	1.5	5.90	60
1N7054-1	9.10	8.19	10.01	20	1.0	6.55	50
1N7055-1	10.00	9.00	11.10	10	1.0	7.20	50

NOTE 1:  $Z_S$  is derived by superimposing A 90 Hz 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  $V_K$

## Graphs

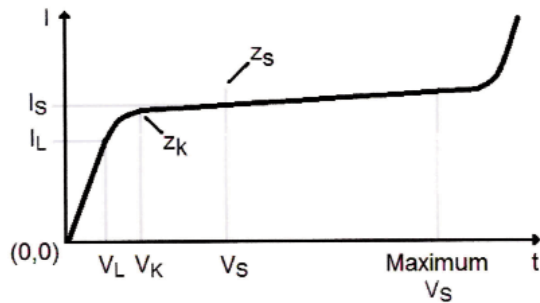


FIGURE 1 – CURRENT-REGULATOR CHARACTERISTICS

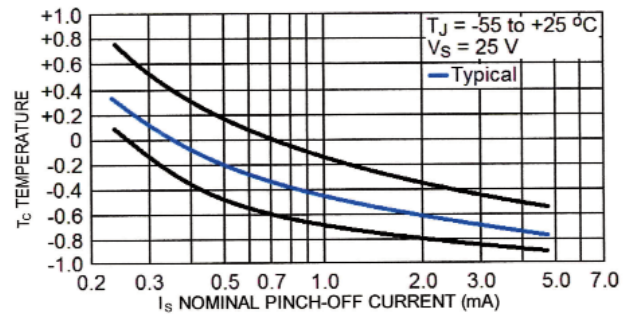


FIGURE 3 – TEMPERATURE COEFFICIENT

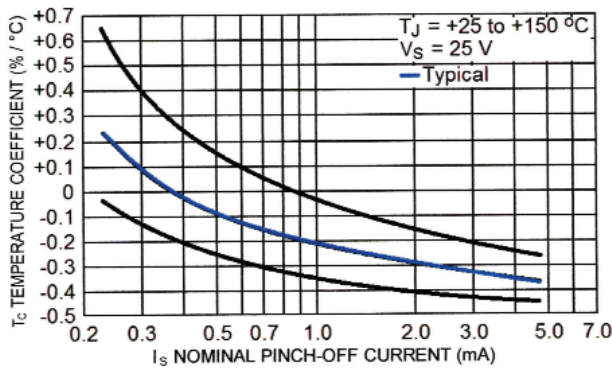


FIGURE 2 – TEMPERATURE COEFFICIENT

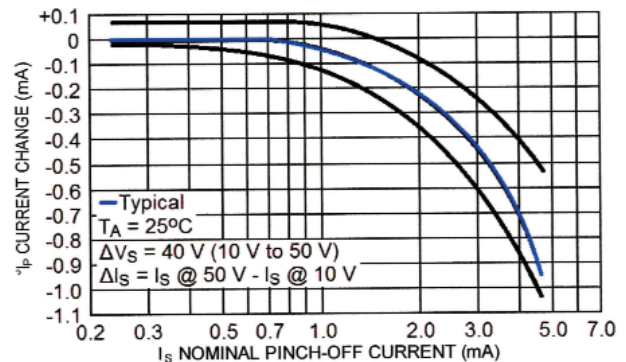
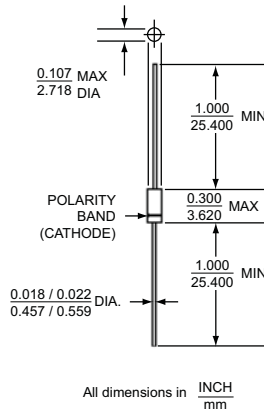


FIGURE 4 – CURRENT REGULATION FACTOR

## Symbols & Definitions

Symbol	Definition
$I_L$	Limiting Current: A specified current below the lower knee of the current-regulating characteristic.
$I_P$	Regulator current: A current within the regulating range of a current-regulator diode.
$P_D$	Power Dissipation: The power dissipation, DC.
$R_{\theta JL}$	Thermal Resistance Junction-to-Lead: The thermal resistance from the virtual junction(s) of a semiconductor device to the lead.
$T_L$	Lead Temperature: The temperature of a lead terminal.
$T_{SP}$	Temperature Solder Pad: The maximum solder temperature that can be safely applied to the terminal.
$V_K$	Knee Voltage: A specified regulator voltage near the lower knee of the current-regulating characteristic.
$V_L$	Limiting Voltage: The voltage at point $I_L$ on the current-voltage characteristic.
$V_S$	Regulator Voltage: A voltage within the regulating range of a current-regulating diode.
$Z_K$	Knee Impedance: The small-signal impedance at operating point $V_K$ on the current-voltage characteristic.
$Z_S$	Regulator Impedance: The small-signal impedance within the regulating range of a current-regulator diode.
$Z_{\theta JL}$	Thermal Impedance: The thermal impedance junction to reference point.

## Outline Drawing



### LEADED DESIGN DATA

**CASE:** Hermetically sealed glass, DO – 7

**LEAD MATERIAL:** Copper clad steel

**LEAD FINISH:** Tin / Lead

**Marking:** Part number and cathode band

**Weight:** 0.2 grams

**POLARITY:** Diode to be operated with the banded (cathode) end negative

**MOUNTING POSITION:** Any

## Aeroflex / Metelics, Inc.

975 Stewart Drive,  
Sunnyvale, CA 94085

Tel: (408) 737-8181

Fax: (408) 733-7645

Sales: 888-641-SEMI (7364)

### Hi-Rel Components

9 Hampshire Street,  
Lawrence, MA 01840

Tel: (603) 641-3800

Fax: (978) 683-3264

[www.aeroflex.com/metelics-hirelcomponents](http://www.aeroflex.com/metelics-hirelcomponents)

[www.aeroflex.com/metelics](http://www.aeroflex.com/metelics)      [metelics-sales@aeroflex.com](mailto:metelics-sales@aeroflex.com)

Aeroflex / Metelics, Inc. reserves the right to make changes to any products and services herein at any time without notice. Consult Aeroflex or an authorized sales representative to verify that the information in this data sheet is current before using this product. Aeroflex does not assume any responsibility or liability arising out of the application or use of any product or service described herein, except as expressly agreed to in writing by Aeroflex; nor does the purchase, lease, or use of a product or service from Aeroflex convey a license under any patent rights, copyrights, trademark rights, or any other of the intellectual rights of Aeroflex or of third parties.

Copyright 2012 Aeroflex / Metelics. All rights reserved.

## ISO 9001: 2008 certified companies



Our passion for performance is defined by three attributes represented by these three icons: solution-minded, performance-driven and customer-focused.