

# Current Regulator Diode Series

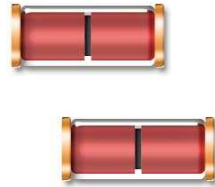


1N5283UR-1 thru 1N5314UR-1 &  
1N7041UR-1 thru 1N7055UR-1



## Features

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



## Description

The 1N5283UR-1 thru 1N5314UR-1 and 1N7041UR-1 thru 1N7055UR-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. The DO-213AB package offers a double plug internal bond connection with a large 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 @ EC = 0.375 in	$R_{\theta JL}$	100	°C/W
Thermal Impedance	$Z_{\theta JX}$	25	°C/W
Steady-State Power Dissipation @ $T_{EC} = +120$ °C, L = 3/8"	$P_D$	500	mW
Solder Pad Temperature @ 10 sec maximum	$T_{SP}$	260	°C

NOTE 1: Derate at 10mW/°C above 125 °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				
1N5283UR	0.22	0.198	0.242	25.0	2.75	1.00	100
1N5284UR	0.24	0.216	0.264	19.0	2.35	1.00	100
1N5285UR	0.27	0.243	0.297	14.0	1.95	1.00	100
1N5286UR	0.30	0.270	0.330	9.0	1.60	1.00	100
1N5287UR	0.33	0.297	0.363	8.0	1.35	1.00	100
1N5288UR	0.39	0.351	0.429	4.10	1.000	1.05	100
1N5289UR	0.43	0.387	0.473	3.30	0.870	1.05	100
1N5290UR	0.47	0.423	0.517	2.70	0.750	1.05	100
1N5291UR	0.56	0.504	0.616	1.90	0.560	1.10	100
1N5292UR	0.62	0.558	0.682	1.55	0.470	1.13	100
1N5293UR	0.68	0.612	0.748	1.35	0.400	1.15	100
1N5294UR	0.75	0.675	0.825	1.15	0.335	1.20	100
1N5295UR	0.82	0.738	0.902	1.00	0.290	1.25	100
1N5296UR	0.91	0.819	1.001	0.88	0.240	1.29	100
1N5297UR	1.00	0.900	1.100	0.80	0.205	1.35	100
1N5298UR	1.10	0.99	1.21	0.70	0.180	1.40	100
1N5299UR	1.20	1.08	1.32	0.64	0.155	1.45	100
1N5300UR	1.30	1.17	1.43	0.58	0.135	1.50	100
1N5301UR	1.40	1.26	1.54	0.54	0.115	1.55	100
1N5302UR	1.50	1.35	1.65	0.51	0.105	1.60	100
1N5303UR	1.60	1.44	1.76	0.475	0.092	1.65	100
1N5304UR	1.80	1.62	1.98	0.420	0.074	1.75	100
1N5305UR	2.00	1.80	2.20	0.395	0.061	1.85	100
1N5306UR	2.20	1.98	2.42	0.370	0.052	1.95	100
1N5307UR	2.40	2.16	2.54	0.345	0.044	2.00	100
1N5308UR	2.70	2.43	2.97	0.320	0.035	2.15	100
1N5309UR	3.00	2.70	3.30	0.300	0.029	2.25	100
1N5310UR	3.30	2.97	3.63	0.280	0.024	2.35	100
1N5311UR	3.60	3.24	3.96	0.265	0.020	2.50	100
1N5312UR	3.90	3.51	4.29	0.255	0.017	2.60	100
1N5313UR	4.30	3.87	4.73	0.245	0.014	2.75	100
1N5314UR	4.70	4.23	5.17	0.235	0.012	2.90	100
1N7048UR	5.10	4.59	5.61	100	4.0	3.67	80
1N7049UR	5.60	5.04	6.16	90	4.0	4.03	80
1N7050UR	6.20	5.58	6.82	80	3.0	4.46	70
1N7051UR	6.80	6.12	7.48	70	2.0	4.90	70
1N7052UR	7.50	6.75	8.25	50	1.5	5.40	60
1N7053UR	8.20	7.38	9.02	30	1.5	5.90	60
1N7054UR	9.10	8.19	10.01	20	1.0	6.55	50
1N7055UR	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

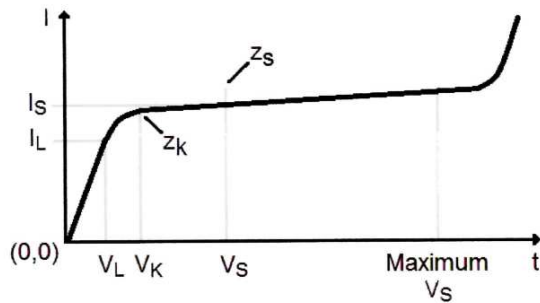


FIGURE 1 – CURRENT-REGULATOR CHARACTERISTICS

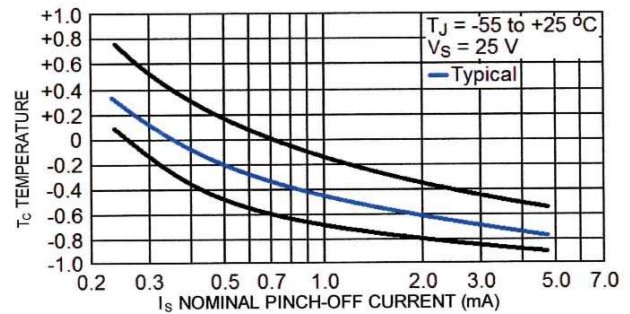


FIGURE 3 – TEMPERATURE COEFFICIENT

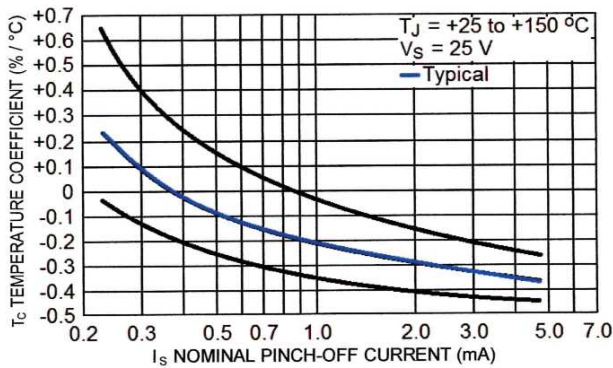


FIGURE 2 – TEMPERATURE COEFFICIENT

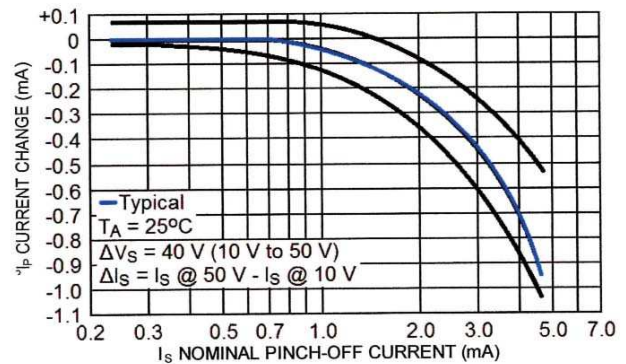
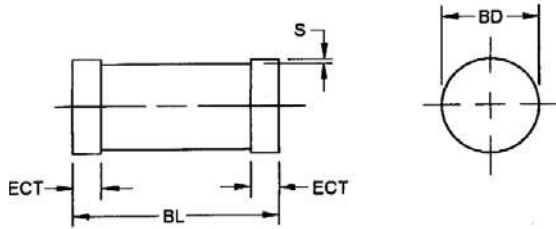


FIGURE 4 – CURRENT REGULATION FACTOR

## 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.
$T_{EC}$	End Cap 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



Symbol	Dimensions			
	Inch		Millimeters	
	Min	Max	Min	Max
BD	0.94	.105	2.39	2.67
BL	.189	.205	4.80	5.21
ECT	.016	.022	0.41	0.55
S	.001 min		0.03 min	

### SURFACE MOUNT DESIGN DATA

**CASE:** DO-213AB, Hermetically sealed glass case. (MELF, LL41)

**LEAD FINISH:** Tin / Lead finished copper clad steel

**MARKING:** Cathode band.

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

**MOUNTING SURFACE SELECTION:** The Axial Coefficient of Expansion (COE) of this device is approximately +6 PPM/°C.

The COE of the Mounting Surface System should be selected to provide a suitable match with this device.

**WEIGHT:** 0.2 grams.

### NOTES:

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. In accordance with ASME Y14.5M, diameters are equivalent to  $\phi x$  Symbology.

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