



钜地半导体
Tudi Semiconductor

Product Specification

TUDI-LM285

Micropower Voltage Reference Diodes

网址 www.sztdbdt.com 🔍

用芯智造 · 卓越品质

**semiconductor device
manufacturer**

- Design
- research and development
- production
- and sales



Features

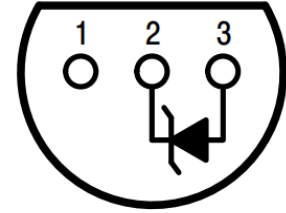
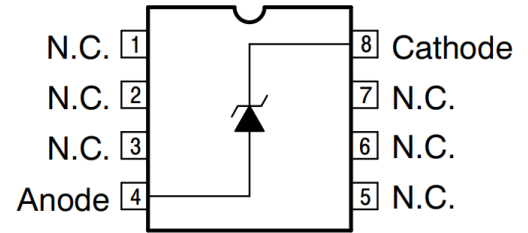
- Operating Current from 10 μ A to 20 mA
- 1.0%, 1.5%, 2.0% and 3.0% Initial Tolerance Grades
- Low Temperature Coefficient
- 1.0 Ω Dynamic Impedance
- Surface Mount Package Available
- Pb-Free Packages are Available

Description

The LM285/LM385 series are micropower two-terminal bandgap voltage regulator diodes. Designed to operate over a wide current range of 10 μ A to 20 mA, these devices feature exceptionally low dynamic impedance, low noise and stable operation over time and temperature. Tight voltage tolerances are achieved by on-chip trimming. The large dynamic operating range enables these devices to be used in applications with widely varying supplies with excellent regulation. Extremely low operating current make these devices ideal for micropower circuitry like portable instrumentation, regulators and other analog circuitry where extended battery life is required.

The LM285/LM385 series are packaged in a low cost TO-226 plastic case and are available in two voltage versions of 1.235 V and 2.500 V as denoted by the device suffix (see Ordering Information table). The LM285 is specified over a -40°C to +85°C temperature range while the LM385 is rated from 0°C to +70°C.

The LM385 is also available in a surface mount plastic package in voltages of 1.235 V and 2.500 V.



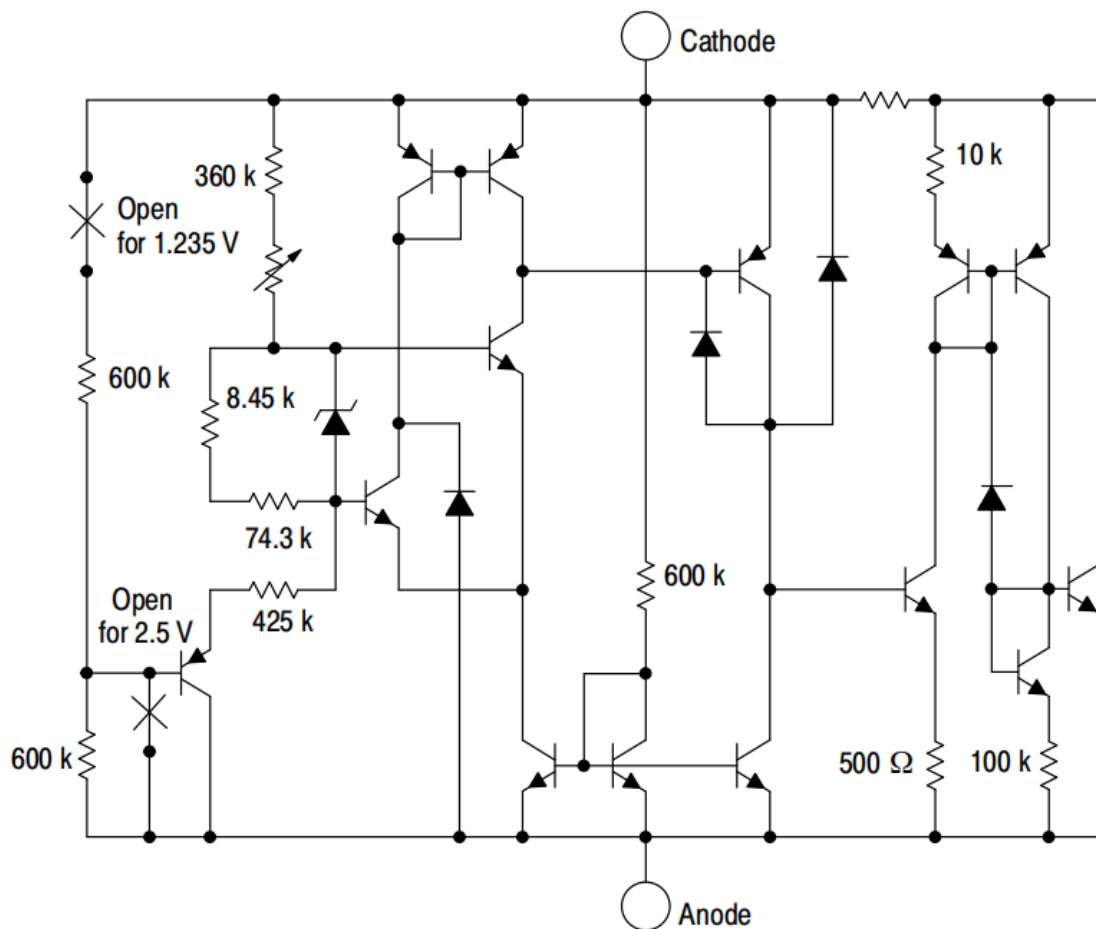


Figure 1. Representative Schematic Diagram

MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$, unless otherwise noted)

Rating	Symbol	Value	Unit
Reverse Current	I_R	30	mA
Forward Current	I_F	10	mA
Operating Ambient Temperature Range LM285 LM385	T_A	-40 to +85 0 to +70	$^\circ\text{C}$
Operating Junction Temperature	T_J	+150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-65 to +150	$^\circ\text{C}$
Electrostatic Discharge Sensitivity (ESD) Human Body Model (HBM) Machine Model (MM) Charged Device Model (CDM)	ESD	4000 400 2000	V

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.



ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise noted)

Characteristic	Symbol	LM285-1.2			LM385-1.2/LM385B-1.2			Unit
		Min	Typ	Max	Min	Typ	Max	
Reverse Breakdown Voltage ($I_{Rmin} \leq I_R \leq 20\text{ mA}$) LM285-1.2/LM385B-1.2 $T_A = T_{low}$ to T_{high} (Note 1) LM385-1.2 $T_A = T_{low}$ to T_{high} (Note 1)	$V_{(BR)R}$	1.223 1.200 - -	1.235 - - -	1.247 1.270 - -	1.223 1.210 1.205 1.192	1.235 - 1.235 -	1.247 1.260 1.260 1.273	V
Minimum Operating Current $T_A = 25^\circ\text{C}$ $T_A = T_{low}$ to T_{high} (Note 1)	I_{Rmin}	- -	8.0 -	10 20	- -	8.0 -	15 20	μA
Reverse Breakdown Voltage Change with Current $I_{Rmin} \leq I_R \leq 1.0\text{ mA}$, $T_A = +25^\circ\text{C}$ $T_A = T_{low}$ to T_{high} (Note 1) $1.0\text{ mA} \leq I_R \leq 20\text{ mA}$, $T_A = +25^\circ\text{C}$ $T_A = T_{low}$ to T_{high} (Note 1)	$\Delta V_{(BR)R}$	- - - -	- - - -	1.0 1.5 10 20	- - - -	- - - -	1.0 1.5 20 25	mV
Reverse Dynamic Impedance $I_R = 100\text{ }\mu\text{A}$, $T_A = +25^\circ\text{C}$	Z	-	0.6	-	-	0.6	-	Ω
Average Temperature Coefficient $10\text{ }\mu\text{A} \leq I_R \leq 20\text{ mA}$, $T_A = T_{low}$ to T_{high} (Note 1)	$\Delta V_{(BR)}/\Delta T$	-	80	-	-	80	-	ppm/ $^\circ\text{C}$
Wideband Noise (RMS) $I_R = 100\text{ }\mu\text{A}$, $10\text{ Hz} \leq f \leq 10\text{ kHz}$	n	-	60	-	-	60	-	μV
Long Term Stability $I_R = 100\text{ }\mu\text{A}$, $T_A = +25^\circ\text{C} \pm 0.1^\circ\text{C}$	S	-	20	-	-	20	-	ppm/kHR
Reverse Breakdown Voltage ($I_{Rmin} \leq I_R \leq 20\text{ mA}$) LM285-2.5/LM385B-2.5 $T_A = T_{low}$ to T_{high} (Note 1) LM385-2.5 $T_A = T_{low}$ to T_{high} (Note 1)	$V_{(BR)R}$	2.462 2.415 - -	2.5 - - -	2.538 2.585 - -	2.462 2.436 2.425 2.400	2.5 - 2.5 -	2.538 2.564 2.575 2.600	V
Minimum Operating Current $T_A = 25^\circ\text{C}$ $T_A = T_{low}$ to T_{high} (Note 1)	I_{Rmin}	- -	13 -	20 30	- -	13 -	20 30	μA

1. $T_{low} = -40^\circ\text{C}$ for LM285-1.2, LM285-2.5
 $T_{high} = +85^\circ\text{C}$ for LM285-1.2, LM285-2.5
 $T_{low} = 0^\circ\text{C}$ for LM385-1.2, LM385B-1.2, LM385-2.5, LM385B-2.5
 $T_{high} = +70^\circ\text{C}$ for LM385-1.2, LM385B-1.2, LM385-2.5, LM385B-2.5



ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise noted)

Characteristic	Symbol	LM285-1.2			LM385-1.2/LM385B-1.2			Unit
		Min	Typ	Max	Min	Typ	Max	
Reverse Breakdown Voltage Change with Current $I_{Rmin} \leq I_R \leq 1.0 \text{ mA}$, $T_A = +25^\circ\text{C}$ $T_A = T_{low}$ to T_{high} (Note 2) $1.0 \text{ mA} \leq I_R \leq 20 \text{ mA}$, $T_A = +25^\circ\text{C}$ $T_A = T_{low}$ to T_{high} (Note 2)	$\Delta V_{(BR)R}$	-	-	1.0 1.5 10 20	-	-	2.0 2.5 20 25	mV
Reverse Dynamic Impedance $I_R = 100 \mu\text{A}$, $T_A = +25^\circ\text{C}$	Z	-	0.6	-	-	0.6	-	Ω
Average Temperature Coefficient $20 \mu\text{A} \leq I_R \leq 20 \text{ mA}$, $T_A = T_{low}$ to T_{high} (Note 2)	$\Delta V_{(BR)}/\Delta T$	-	80	-	-	80	-	ppm/ $^\circ\text{C}$
Wideband Noise (RMS) $I_R = 100 \mu\text{A}$, $10 \text{ Hz} \leq f \leq 10 \text{ kHz}$	n	-	120	-	-	120	-	μV
Long Term Stability $I_R = 100 \mu\text{A}$, $T_A = +25^\circ\text{C} \pm 0.1^\circ\text{C}$	S	-	20	-	-	20	-	ppm/kHR

2. $T_{low} = -40^\circ\text{C}$ for LM285-1.2, LM285-2.5
 $T_{high} = +85^\circ\text{C}$ for LM285-1.2, LM285-2.5
 $T_{low} = 0^\circ\text{C}$ for LM385-1.2, LM385B-1.2, LM385-2.5, LM385B-2.5
 $T_{high} = +70^\circ\text{C}$ for LM385-1.2, LM385B-1.2, LM385-2.5, LM385B-2.5

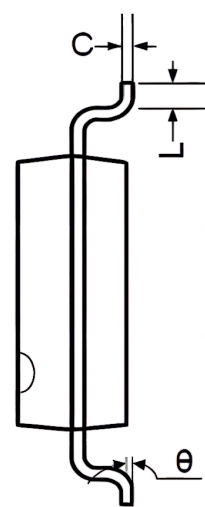
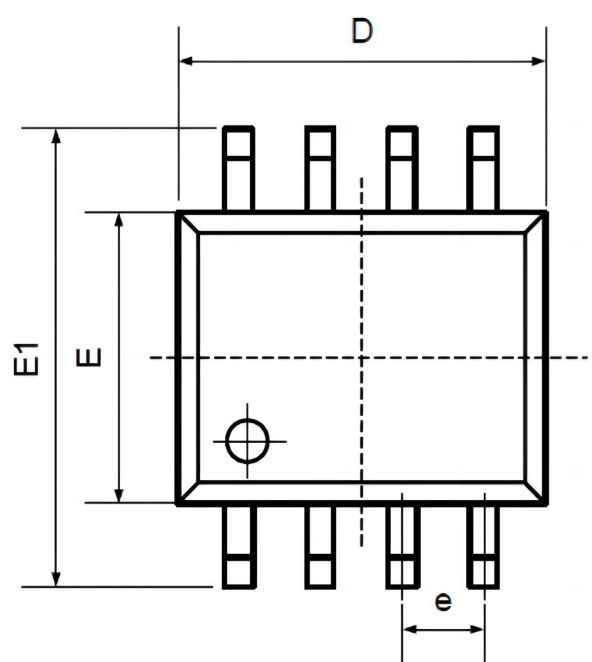


ORDERING INFORMATION

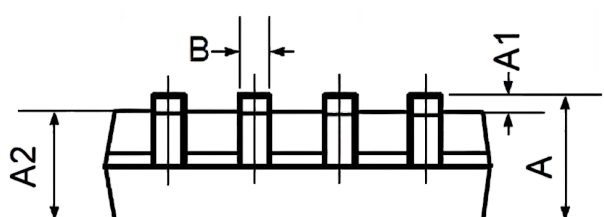
Order Number	Package	Package Quantity	Marking On The park	Temperature
LM285D-1.2R2G	SOP8	Tape,Reel,2500	285-1	-40°C to +85°C
LM285D-2.5R2G	SOP8	Tape,Reel,2500	285-2	
LM285Z-1.2G	TO92	2000/Tape &Reel	LM285Z-1.2	
LM285Z-2.5G	TO92	2000/Tape &Reel	LM285Z-2.5	
LM285Z-1.2RAG	TO92	2000/Tape &Reel	LM285Z-1.2	
LM285Z-2.5RAG	TO92	2000/Tape &Reel	LM285Z-2.5	
LM285Z-2.5RPG	TO92	2000/Tape &Reel	LM285Z-2.5	
LM385BD-1.2R2G	SOP8	Tape,Reel,2500	385B1	0°C to +70°C
LM385BD-2.5R2G	SOP8	Tape,Reel,2500	385B2	
LM385BZ-1.2RAG	TO92	2000/Tape &Reel	LM385BZ-1.2	
LM385BZ-2.5RAG	TO92	2000/Tape &Reel	LM385BZ-2.5	
LM385D-1.2R2G	SOP8	Tape,Reel,2500	385-1	
LM385D-2.5R2G	SOP8	Tape,Reel,2500	385-2	
LM385Z-1.2RAG	TO92	2000/Tape &Reel	LM385Z-1.2	
LM385Z-1.2RPG	TO92	2000/Tape &Reel	LM385Z-1.2	
LM385Z-2.5RPG	TO92	2000/Tape &Reel	LM385Z-2.5	



Package SOP8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
B	0.330	0.510	0.013	0.020
C	0.190	0.250	0.007	0.010
D	4.780	5.000	0.188	0.197
E	3.800	4.000	0.150	0.157
E1	5.800	6.300	0.228	0.248
e	1.270TYP		0.050TYP	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°





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