0.5W Zener Diode – 1N6309 to 1N6349

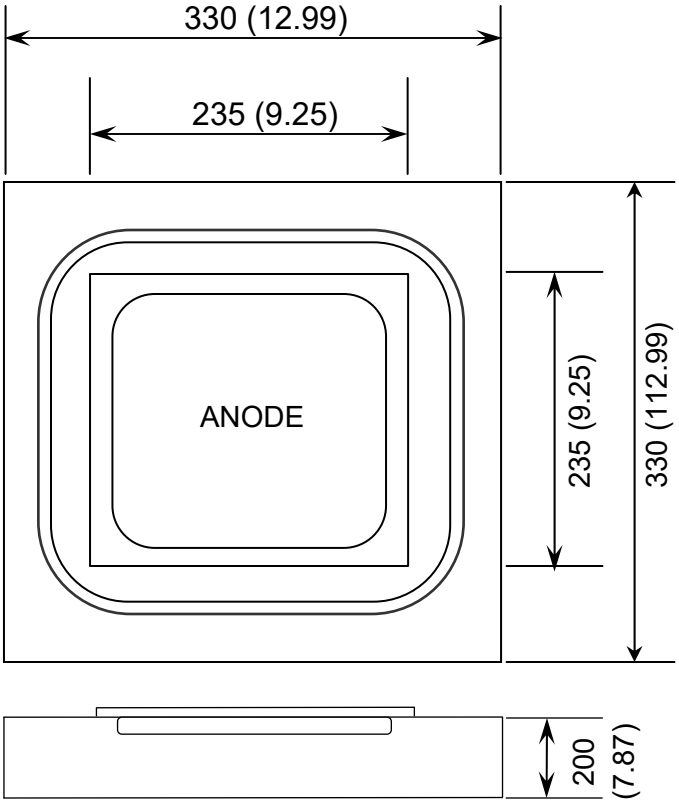
Rev 1.1
10/05/24

Silicon Planar Zener diode in bare die form – 5% tolerance

Features:

- Sharp Reverse Characteristics
- Low Reverse Current Levels
- High Reliability Gold Back Metal
- High Reliability tested grades.

Die Dimensions in µm (mils)



CHIP BACKSIDE IS CATHODE

Ordering Information

The following part suffixes apply:

- No suffix - Commercial grade die
- "**H**"– Hi-rel grade die + MIL-STD-38534 Class H LAT
- "**K**" – Hi-rel grade die + MIL-STD-38534 Class K LAT.

LAT = Lot acceptance Test.

For information on Hi-Rel LAT flows please see below.

www.siliconsupplies.com\bare-die-lot-qualification

Supply Formats:

- Default – Die in Waffle Pack (400 per tray capacity)
- Sawn Wafer on Tape – By specific request
- Unsawn Wafer – By specific request
- With additional electrical selection – By specific request

Mechanical Specification

Die Size (Unsawn)	330 x 330 12.99 x 12.99	µm mils
Anode Pad Size	235 x 235 9.25 x 9.25	µm mils
Die Thickness	200 7.87	µm mils
Top Metal Composition	Al	
Back Metal Composition	AuAs	

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Absolute Maximum Ratings[1] T_A = 25°C unless otherwise stated

PARAMETER	SYMBOL	VALUE	UNIT
Power Dissipation[2]	P_{TOT}	500	mW
Junction Temperature	T_J	175	°C
Storage Temperature Range	T_S	-65 to +175	°C
Forward Voltage @ I_F = 200mA	V_F	1.1	V

Electrical Characteristics T_A = 25°C unless otherwise stated

DEVICE	ZENER VOLTAGE RANGE			TEST CURRENT		REVERSE LEAKAGE CURRENT		DYNAMIC RESISTANCE		MAX CURRENT	ZENER REG[3]	NOISE DENSITY
	V_Z @ I_{ZT1}			I_{ZT1}	I_{ZT2}	I_R @ V_R		Z_Z @ I_{ZT1}	Z_{ZK} @ I_{ZT2}	I_{ZM}	$V_{Z(reg)}$ ΔV_Z	N_D @ 250µA
	V			mA		µA	V	Ω		mA	V	µV/√Hz
	Min.	Nom.	Max.			Max.		Max.		Max.	Typ.	Typ.
1N6309	2.28	2.4	2.52	20	0.25	100	1.0	30	1200	177	1.0	1.0
1N6310	2.57	2.7	2.84	20	0.25	60	1.0	30	1300	157	1.0	1.0
1N6311	2.85	3	3.15	20	0.25	30	1.0	29	1400	141	1.0	1.0
1N6312	3.14	3.3	3.47	20	0.25	5.0	1.0	24	1400	128	1.0	1.0
1N6313	3.42	3.6	3.78	20	0.25	3.0	1.0	22	1400	109	1.0	1.0
1N6314	3.71	3.9	4.10	20	0.25	2.0	1.0	20	1700	118	1.0	1.0
1N6315	4.09	4.3	4.52	20	0.25	2.0	1.0	18	1400	99	0.9	1.0
1N6316	4.47	4.7	4.94	20	0.25	5.0	1.5	16	1500	90	0.5	1.0
1N6317	4.85	5.1	5.36	20	0.25	5.0	2.0	14	1300	83	0.4	1.0
1N6318	5.32	5.6	5.88	20	0.25	5.0	2.5	8	1200	76	0.4	2.0
1N6319	5.89	6.2	6.51	20	0.25	5.0	3.5	3	800	68	0.3	5.0
1N6320	6.46	6.8	7.14	20	0.25	2.0	4.0	3	400	63	0.35	5.0
1N6321	7.13	7.5	7.88	20	0.25	2.0	5.0	4	400	57	0.4	5.0
1N6322	7.79	8.2	8.61	20	0.25	1.0	6.0	5	400	52	0.4	20
1N6323	8.65	9.1	9.56	20	0.25	1.0	7.0	6	500	47	0.5	40
1N6324	9.5	10	10.5	20	0.25	1.0	8.0	6	500	43	0.5	80
1N6325	10.45	11	11.55	20	0.25	1.0	8.5	7	550	39	0.5	100
1N6326	11.4	12	12.6	20	0.25	1.0	9.0	7	550	35	0.55	100
1N6327	12.35	13	13.65	9.5	0.25	0.05	9.9	8	550	33	0.55	100
1N6328	14.25	15	15.75	8.5	0.25	0.05	11	10	600	28	0.70	100
1N6329	15.2	16	16.8	7.8	0.25	0.05	12	12	600	27	0.75	100
1N6330	17.1	18	18.9	7.0	0.25	0.05	14	14	600	24	0.85	100
1N6331	19	20	21	6.2	0.25	0.05	15	18	500	21	0.95	100

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DEVICE	ZENER VOLTAGE RANGE			TEST CURRENT		REVERSE LEAKAGE CURRENT		DYNAMIC RESISTANCE		MAX CURRENT	ZENER REG[3]	NOISE DENSITY[4]
	V_Z @ I_{ZT1}			I_{ZT1}	I_{ZT2}	I_R @ V_R		Z_Z @ I_{ZT1}	Z_{ZK} @ I_{ZT2}	I_{ZM}	$V_{Z(reg)}$ ΔV_Z	N_D @ 250µA
	V			mA		µA	V	Ω		mA	V	µV/√Hz
	Min.	Nom.	Max.			Max.		Max.		Max.	Typ.	Typ.
1N6332	20.90	22	23.10	5.6	0.25	0.05	17	20	500	19	1.05	100
1N6333	22.80	24	25.20	5.2	0.25	0.05	18	24	500	18	1.15	100
1N6334	25.65	27	28.35	4.6	0.25	0.05	21	27	500	16	1.30	100
1N6335	28.5	30	31.50	4.2	0.25	0.05	23	32	500	14	1.45	100
1N6336	31.35	33	34.65	3.8	0.25	0.05	25	40	600	13	1.60	100
1N6337	34.20	36	37.80	3.4	0.25	0.05	27	50	600	12	1.75	100
1N6338	37.05	39	40.95	3.2	0.25	0.05	30	55	700	11	1.90	100
1N6339	40.85	43	45.15	3.0	0.25	0.05	33	65	800	9.9	2.10	80
1N6340	44.65	47	49.35	2.7	0.25	0.05	36	75	900	9.0	2.25	80
1N6341	48.45	51	53.55	2.5	0.25	0.05	39	85	1000	8.3	2.50	80
1N6342	53.20	56	58.80	2.2	0.25	0.05	43	100	1200	7.6	2.70	80
1N6343	58.90	62	65.10	2.0	0.25	0.05	47	125	1300	6.8	2.90	80
1N6344	64.60	68	71.40	1.8	0.25	0.05	52	155	1500	6.3	3.20	80
1N6345	71.25	75	78.75	1.7	0.25	0.05	56	180	1600	5.7	3.40	80
1N6346	77.90	82	86.10	1.5	0.25	0.05	62	220	1800	5.2	3.80	80
1N6347	86.45	91	95.55	1.4	0.25	0.05	69	270	2100	4.7	4.20	80
1N6348	95.00	100	105.0	1.3	0.25	0.05	76	340	2400	4.3	4.40	80
1N6349	104.5	110	115.5	1.1	0.25	0.05	84	500	2800	3.9	4.80	80

1. Operation above the absolute maximum rating may cause device failure. Operation at the absolute maximum ratings, for extended periods, may reduce device reliability. **2.** Assembled in DO-35 package. Performance in die form subject to assembly heat sinking and die attach methods.
3. $V_{Z(reg)}$ = V_Z @ 50% of I_{ZM} minus V_Z @ 10% of I_{ZM} **4.** 1-3 kHz