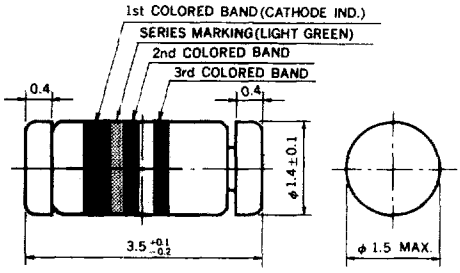
ZENER DIODES
RD4.7K to RD39K

LOW NOISE SHARP BREAKDOWN CHARACTERISTICS ZENER DIODES (Leadless Type)

PACKAGE DIMENSIONS
(Unit: mm)



DESCRIPTION

The RD4.7K to RD39K Series are zener diodes in Leadless Type Package with DHD (Double Heatsink Diode) construction having allowed power dissipation of 400 mW, featuring low noise, sharp breakdown characteristic. To meet various application at customers, V_Z (zener voltage) is classified into the tight tolerance under the specific suffix (B, B1, B2, B3).

FEATURES

- Low Noise
- Sharp Breakdown characteristic
- DHD (Double Heatsink Diode) construction
- Glass sealed package
- V_Z Applied E24 standard

APPLICATIONS

Circuits for, Constant Voltage, Constant Current, Waveform Clipper, etc.

MAXIMUM RATINGS

Maximum Temperature			
Junction Temperature	T_j	+175	°C
Storage Temperature	T_{stg}	−65 to +175	°C
Maximum Power Dissipation (T_a = 25 °C)			
Power Dissipation*	P	400	mW

* When mounted on ceramic substrate of 0.9 cm^2 x 0.7 mm

ELECTRICAL CHARACTERISTICS (T_a = 25 ± 2 °C)

Type Number	Suffix	Zener Voltage V_Z (V) *			Dynamic Impedance Z_Z (Ω) **		Knee Dynamic Impedance Z_{ZK} (Ω) **		Reverse Current I_R (μA)		Type No. Color Indication		
		MIN.	MAX.	I_Z (mA)	MAX.	I_Z (mA)	MAX.	I_Z (mA)	MAX.	V_R (V)	1st	2nd	3rd
RD4.7K	B	4.42	4.90	5	100	5	800	0.5	2	1.0		***	
	B1	4.42	4.61								Yellow	Purple	Brown
	B2	4.55	4.75								Yellow	Purple	Red
	B3	4.69	4.90								Yellow	Purple	Orange
RD5.1K	B	4.84	5.37	5	80	5	500	0.5	2	1.5		***	
	B1	4.84	5.04								Green	Brown	Brown
	B2	4.98	5.20								Green	Brown	Red
	B3	5.14	5.37								Green	Brown	Orange
RD5.6K	B	5.31	5.92	5	60	5	200	0.5	1	2.5		***	
	B1	5.31	5.55								Green	Blue	Brown
	B2	5.49	5.73								Green	Blue	Red
	B3	5.67	5.92								Green	Blue	Orange
RD6.2K	B	5.86	6.53	5	60	5	100	0.5	1	3.0		***	
	B1	5.86	6.12								Blue	Red	Brown
	B2	6.06	6.33								Blue	Red	Red
	B3	6.26	6.53								Blue	Red	Orange
RD6.8K	B	6.47	7.14	5	40	5	60	0.5	0.5	3.5		***	
	B1	6.47	6.73								Blue	Gray	Brown
	B2	6.65	6.93								Blue	Gray	Red
	B3	6.86	7.14								Blue	Gray	Orange
RD7.5K	B	7.06	7.84	5	30	5	60	0.5	0.5	4.0		***	
	B1	7.06	7.36								Purple	Green	Brown
	B2	7.28	7.60								Purple	Green	Red
	B3	7.52	7.84								Purple	Green	Orange
RD8.2K	B	7.76	8.64	5	30	5	60	0.5	0.5	5.0		***	
	B1	7.76	8.10								Gray	Red	Brown
	B2	8.02	8.36								Gray	Red	Red
	B3	8.28	8.64								Gray	Red	Orange
RD9.1K	B	8.56	9.55	5	30	5	60	0.5	0.5	6.0		***	
	B1	8.56	8.93								White	Brown	Brown
	B2	8.85	9.23								White	Brown	Red
	B3	9.15	9.55								White	Brown	Orange
RD10K	B	9.45	10.55	5	30	5	60	0.5	0.1	7.0		***	
	B1	9.45	9.87								Brown	Black	Blue
	B2	9.77	10.21								Brown	Black	Purple
	B3	10.11	10.55								Brown	Black	Gray
RD11K	B	10.44	11.56	5	30	5	60	0.5	0.1	8.0		***	
	B1	10.44	10.88								Brown	Brown	Blue
	B2	10.76	11.22								Brown	Brown	Purple
	B3	11.10	11.56								Brown	Brown	Gray

RD4.7K to RD39K

Type Number	Suffix	Zener Voltage V_Z (V) *			Dynamic Impedance Z_Z (Ω) **		Knee Dynamic Impedance Z_{ZK} (Ω) **		Reverse Current I_R (μA)		Type No. Color Indication		
		MIN.	MAX.	I_Z (mA)	MAX.	I_Z (mA)	MAX.	I_Z (mA)	MAX.	V_R (V)	1st	2nd	3rd
RD12K	B	11.42	12.60	5	30	5	80	0.5	0.1	9.0		***	
	B1	11.42	11.90								Brown	Red	Blue
	B2	11.74	12.24								Brown	Red	Purple
	B3	12.08	12.60								Brown	Red	Gray
RD13K	B	12.47	13.96	5	37	5	80	0.5	0.1	10		***	
	B1	12.47	13.03								Brown	Orange	Blue
	B2	12.91	13.49								Brown	Orange	Purple
	B3	13.37	13.96								Brown	Orange	Gray
RD15K	B	13.84	15.52	5	42	5	80	0.5	0.1	11		***	
	B1	13.84	14.46								Brown	Green	Blue
	B2	14.34	14.98								Brown	Green	Purple
	B3	14.85	15.52								Brown	Green	Gray
RD16K	B	15.37	17.09	5	50	5	80	0.5	0.1	12		***	
	B1	15.37	16.01								Brown	Blue	Blue
	B2	15.85	16.51								Brown	Blue	Purple
	B3	16.35	17.09								Brown	Blue	Gray
RD18K	B	16.94	19.03	5	65	5	80	0.5	0.1	13		***	
	B1	16.94	17.70								Brown	Gray	Blue
	B2	17.56	18.35								Brown	Gray	Purple
	B3	18.21	19.03								Brown	Gray	Gray
RD20K	B	18.86	21.08	5	85	5	100	0.5	0.1	15		***	
	B1	18.86	19.70								Red	Black	Blue
	B2	19.52	20.39								Red	Black	Purple
	B3	20.21	21.08								Red	Black	Gray
RD22K	B	20.88	23.17	5	100	5	100	0.5	0.1	17		***	
	B1	20.88	21.77								Red	Red	Blue
	B2	21.54	22.47								Red	Red	Purple
	B3	22.23	23.17								Red	Red	Gray
RD24K	B	22.93	25.57	5	120	5	120	0.5	0.1	19		***	
	B1	22.93	23.96								Red	Yellow	Blue
	B2	23.72	24.78								Red	Yellow	Purple
	B3	24.54	25.57								Red	Yellow	Gray
RD27K	B	25.10	28.90	5	150	5	150	0.5	0.1	21		***	
	B1	25.20	26.50								Red	Purple	Blue
	B2	26.19	27.53								Red	Purple	Purple
	B3	27.21	28.61								Red	Purple	Gray
RD30K	B	28.00	32.00	5	200	5	200	0.5	0.1	23		***	
	B1	28.22	29.66								Orange	Black	Blue
	B2	29.19	30.69								Orange	Black	Purple
	B3	30.20	31.74								Orange	Black	Gray

Type Number	Suffix	Zener Voltage V_Z (V) *			Dynamic Impednace Z_Z (Ω) **		Knee Dynamic Impedance Z_{zk} (Ω) **		Reverse Current I_R (μA)		Type No. Color Indication		
		MIN.	MAX.	I_Z (mA)	MAX.	I_Z (mA)	MAX.	I_Z (mA)	MAX.	V_R (V)	1st	2nd	3rd
RD33K	B	31.00	35.00	5	250	5	250	0.5	0.1	25	***		
	B1	31.18	32.78								Orange	Orange	Blue
	B2	32.15	33.79								Orange	Orange	Purple
	B3	33.13	34.83								Orange	Orange	Gray
RD36K	B	34.00	38.00	5	300	5	300	0.5	0.1	27	***		
	B1	34.12	35.86								Orange	Blue	Blue
	B2	35.07	36.87								Orange	Blue	Purple
	B3	36.07	37.91								Orange	Blue	Gray
RD39K	B	37.00	41.00	5	360	5	360	0.5	0.1	30	***		
	B1	37.04	38.94								Orange	White	Blue
	B2	38.00	39.94								Orange	White	Purple
	B3	38.99	40.99								Orange	White	Gray

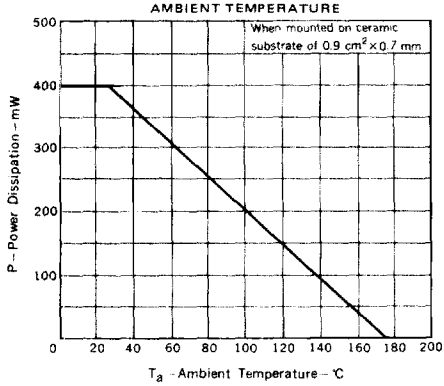
* tested with pulse (40 ms)

** Z_Z and Z_{zk} are measured at I_Z by given a very small A.C. current signal.

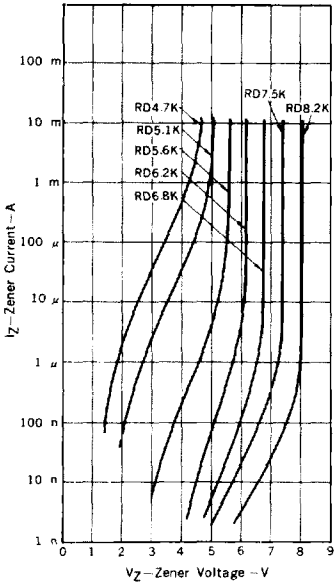
*** Suffix B is Suffix B1, B2 or Suffix B3.

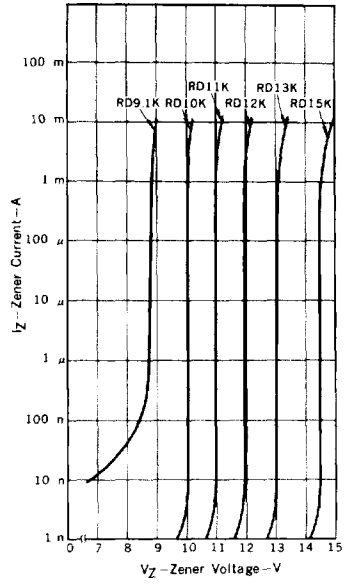
ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

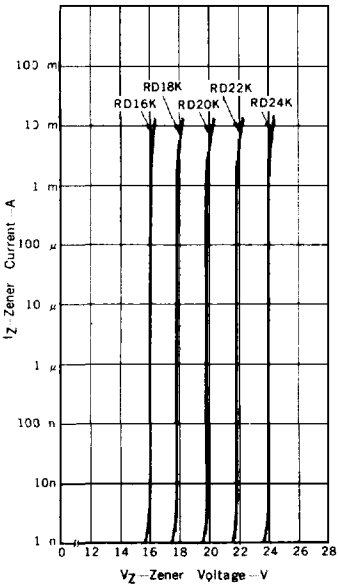
POWER DISSIPATION vs. AMBIENT TEMPERATURE

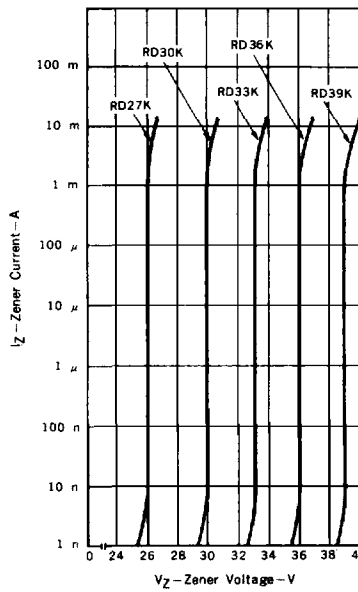


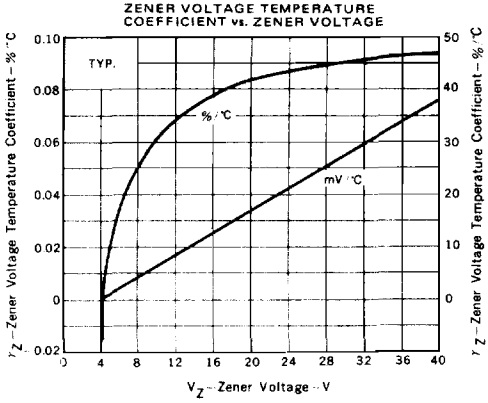
$i_z - v_z$ CHARACTERISTICS



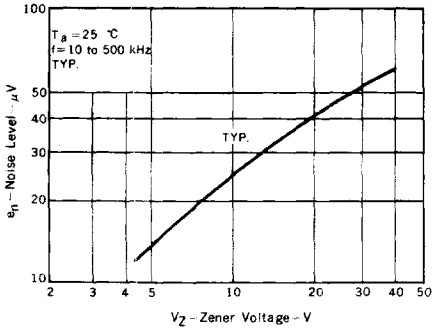



RD16K
RD18K
RD20K
RD22K
RD24K
100 m
10 m
1 m
100 μ
10 μ
1 μ
100 n
10n
1 n
0 12 14 16 18 20 22 24 26 28
IZ Zener Current A
VZ Zener Voltage V


RD27K
RD30K
RD33K
RD36K
RD39K
100 m
10 m
1 m
100 μ
10 μ
1 μ
100 n
10 n
1 n
0 24 26 28 30 32 34 36 38 40
IZ Zener Current A
VZ Zener Voltage V


ZENER VOLTAGE TEMPERATURE COEFFICIENT vs. ZENER VOLTAGE
TYP.
%/°C
mV/°C
0.10
0.08
0.06
0.04
0.02
0
0.02
50
40
30
20
10
0
0 4 8 12 16 20 24 28 32 36 40
γZ Zener Voltage Temperature Coefficient %/°C
γZ Zener Voltage Temperature Coefficient %/°C
VZ Zener Voltage V

NOISE LEVEL vs. ZENER VOLTAGE



DYNAMIC IMPEDANCE vs. ZENER CURRENT