

2010

Product Catalog

**ROHM**  
SEMICONDUCTOR

Discrete Semiconductors

# Schottky Barrier Diodes Zener Diodes



ROHM Co.,Ltd.

# Schottky Barrier Diodes

Original fine process technology and a unique device structure have enabled ROHM to develop Schottky barrier diodes that feature simultaneously low  $V_F$  and  $I_R$  - an unprecedented accomplishment - for higher efficiency, lower loss, and greater reliability. As a result, the RSX Series commands a large market share.

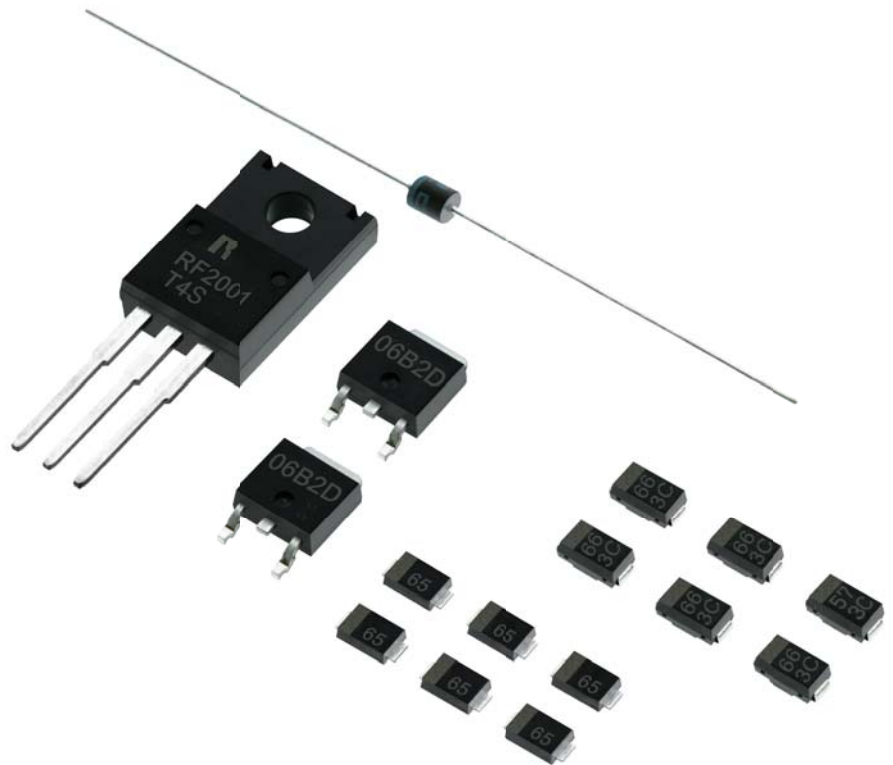
The RB series, widely used in industrial, commercial, and automotive applications, is available in both surface mount and axial package types.

ROHM offers a wide range of packages, from the industry's smallest (GMD2: 0603 size) to standard high power types (TO-220), enabling selection of the ideal solution to meet virtually any need.

# Zener Diodes

ROHM offers Zener diodes in a variety of sizes, including one of the smallest on the market - in the 0603-sized GMD2 package. In addition, ultra-low capacitance models (0.3pF) are available optimized for use as ESD surge protection devices in automotive systems and high-speed signal lines (i.e. USB2.0).

The RSB Series offers bidirectional (positive/negative) surge protection in a single package, ideal for use in high density and portable applications of all types, including mobile phones and next-generation automotive systems.



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# High Efficiency High Reliability Surface Mount Type



## RSX Series

### Summary

Simultaneous low  $V_F$  and low  $I_R$  have been achieved through utilization of original precision processes and device configuration. High ESD resistance is enabled as well.

### Features

- Low  $V_F$
- Low  $I_R$
- High surge resistance
- High reliability

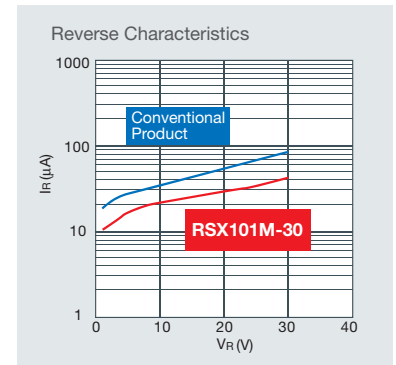
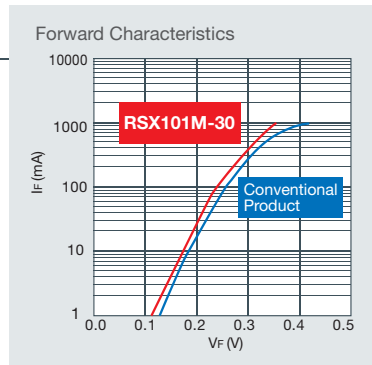
### Applications

- Switches
- Rectifiers

## Low $V_F$ · Low $I_R$

Generally, there is a trade-off between  $V_F$  (Forward Voltage) and  $I_R$  (Reverse Current).

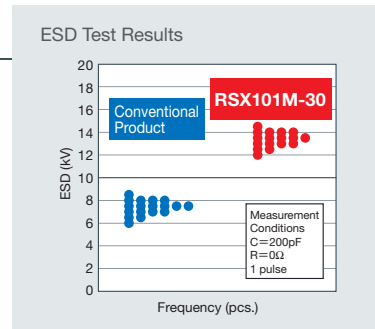
ROHM's RSX series, however, feature simultaneously low  $V_F$  and  $I_R$  by utilizing proprietary precision processes and device configuration.



## High ESD resistance for greater reliability

Conventional Schottky barrier diodes possess weaker ESD resistance than even PN junction diodes.

ROHM's RSX series, on the other hand, features greater resistance to ESD than conventional products due to utilization of advanced processes and a unique device configuration.



### Lineup

Product No.		Absolute Maximum Ratings (Ta=25°C)*1				Electrical Characteristics (Ta=25°C)*1				Package	Equivalent Circuit Diagram
Part No.	Taping Code	$V_{RM}$ (V)	$V_R$ (V)	$I_O$ (A)	$I_{FSM}$ (A) 60Hz, 1ms	$V_F$ (V)		$I_R$ (mA)			
						Max.	$I_F$ (A)	Max.	$V_R$ (V)		
RSX051VA-30	TR	30	30	0.5	5.0	0.39	0.5	0.20	30	TUMD2	
RSX071VA-30	TR	30	30	0.7	5.0	0.42	0.7	0.20	30	TUMD2	
RSX101VA-30	TR	30	30	1	5.0	0.47	1.0	0.20	30	TUMD2	
New RSX201VA-30	TR	30	30	1.5	8.0	0.46	1.5	0.30	30	TUMD2	
RSX101M-30	TR	30	30	1	45	0.39	1.0	0.20	30	PMDU	
RSX301LA-30	TR	30	30	3	70	0.42	3.0	0.20	30	PMDT	
RSX501LA-20	TR	25	20	5	70	0.39	3.0	0.50	20	PMDT	
RSX201L-30	TE25	30	30	2	60	0.44	2.0	0.15	30	PMDS	
New RSX205L-30	TE25	30	30	2	60	0.49	2.0	0.20	30	PMDS	
RSX301L-30	TE25	30	30	3	70	0.42	3.0	0.20	30	PMDS	
RSX501L-20	TE25	25	20	5	70	0.39	3.0	0.50	20	PMDS	
RSX1001T3	Bulk	30	30	10	150	0.44	5.0	0.5	30	TO-220FN	

\*1 : Value / Element

# Ultra-Compact\* 0603-Sized Schottky Barrier Diodes



## GMD2 Package

### Summary

ROHM has developed the industry's first\* commercial Schottky barrier diodes in the 0603 size (0.6mm×0.3mm, t=0.3mm). (Package power is the same as the VMN2 – 100mW)

### Features

- Ultra-small
- Ultra-thin

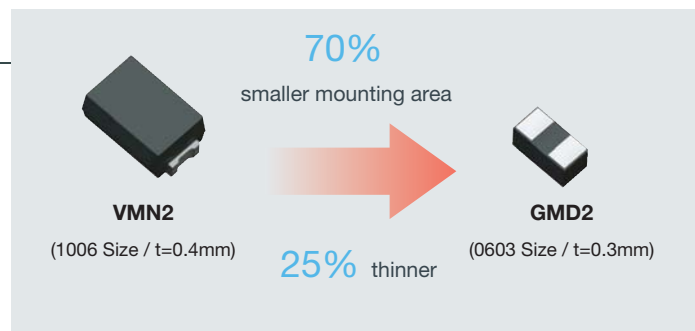
### Applications

- Switches
- Rectifiers

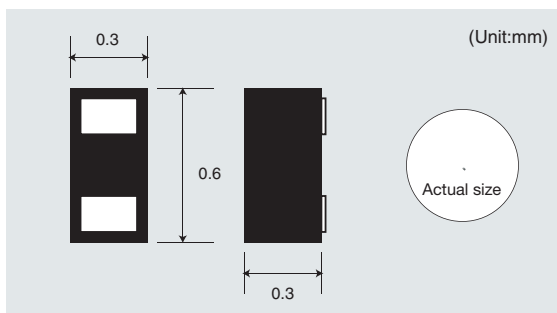
\* ROHM July 2009 survey

## Space-Saving

ROHM has developed the industry's first\* 0603-sized products utilizing an original chip structure combined with proprietary ultra-precise processing technology. Ideal for mobile phones and other portable electronic devices seeking to minimize size.



## Dimensions

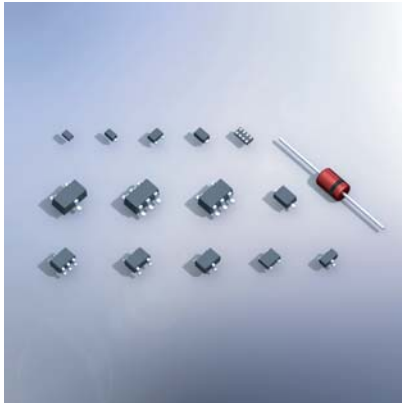


## Lineup

Product No.		Absolute Maximum Ratings (Ta=25°C)*1				Electrical Characteristics (Ta=25°C)*1				Package	Equivalent Circuit Diagram
Part No.	Taping Code	VRM (V)	VR (V)	Io (mA)	IFSM (A) 60Hz.1~	VF (V)		IR (μA)			
						Max.	IF (mA)	Max.	VR (V)		
RB521ZS-30	T2R	30	30	100	0.5	0.37	10	7	10	GMD2	
RB520ZS-30	T2R	30	30	100	0.5	0.46	10	0.3	10	GMD2	

\*1 : Value / Element

# Small Signal Schottky Barrier Diodes



## RB Series

### Summary

ROHM's SBD lineup features high ESD and IFSM resistance with simultaneously low  $V_F$  and low  $I_R$ .

### Features

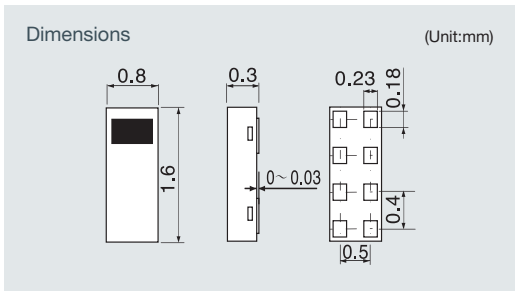
- Switches
- Rectifiers

### Applications

- Small
- High performance

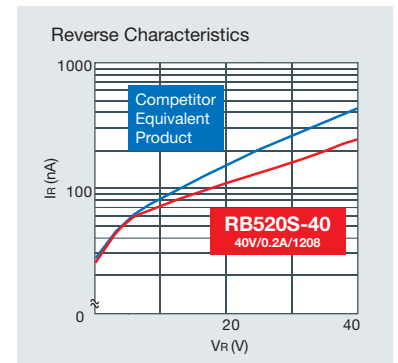
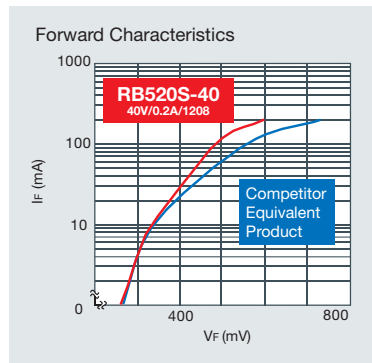
### Ultra-compact multi-chip type (HMD8)

An original chip device structure, combined with ultra-fine processing technology, enable the configuration of multiple diodes in a single package. Internal circuitry and connections are completely customizable to suit user needs.



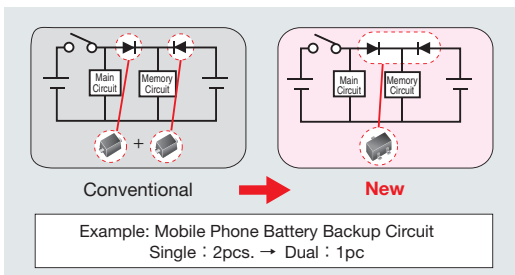
### Superior low $V_F$ , low $I_R$ characteristics

Optimization of device conditions has enabled low  $V_F$  and low  $I_R$ .



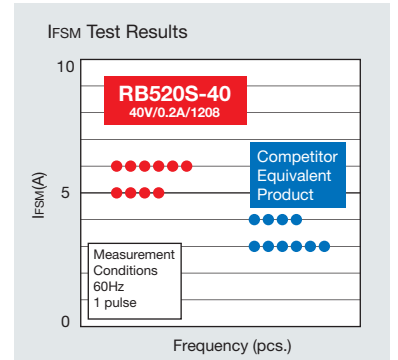
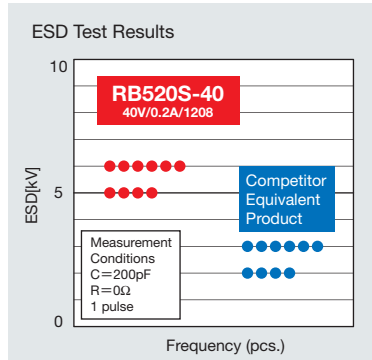
### Saves space

ROHM offers a broad lineup of high-density single-, dual-, and triple-element models that contribute to end-product miniaturization.



### High ESD, high IFSM resistance

Device optimization ensures high ESD and IFSM tolerance.



## Lineup

## ■ Single Type

Product No.		Absolute Maximum Ratings (Ta=25°C)*1				Electrical Characteristics (Ta=25°C)*1				Package	Equivalent Circuit Diagram
Part No.	Packaging Symbol	V <sub>RM</sub> (V)	V <sub>R</sub> (V)	I <sub>O</sub> (mA)	I <sub>FSM</sub> (A) 60Hz.1 ~	V <sub>F</sub> (V) Max.	I <sub>F</sub> (mA)	I <sub>R</sub> (μA) Max.	V <sub>R</sub> (V)		
RB521CS-30	T2R	—	30	100	0.5	0.35	10	10	10	VMN2	
RB520CS-30	T2R	—	30	100	0.5	0.45	10	0.5	10	VMN2	
RB751CS-40	T2R	40	30	30	0.2	0.37	1	0.5	30	VMN2	
RB521G-30	T2R	—	30	100	0.5	0.35	10	10	10	VMD2	
RB520G-30	T2R	—	30	100	0.5	0.45	10	0.5	10	VMD2	
RB751G-40	T2R	40	30	30	0.2	0.37	1	0.5	30	VMD2	
RB521S-30	TE61	—	30	200	1	0.5	200	30	10	EMD2	
RB520S-30	TE61	—	30	200	1	0.6	200	1	10	EMD2	
RB531S-30	TE61	—	30	100	0.5	0.35	10	10	10	EMD2	
RB530S-30	TE61	—	30	100	0.5	0.45	10	0.5	10	EMD2	
RB751S-40	TE61	40	30	30	0.2	0.37	1	0.5	30	EMD2	
RB521S-40	TE61	45	40	200	4	0.45	0.1	90	40	EMD2	
RB520S-40	TE61	40	40	200	1	0.55	100	10	40	EMD2	
RB751V-40	TE-17	40	30	30	0.2	0.37	1	0.5	30	UMD2	
RB501V-40	TE-17	45	40	100	1	0.55	100	30	10	UMD2	
RB500V-40	TE-17	45	40	100	1	0.45	10	1	10	UMD2	
RB721Q-40	T-77	40	40	30	0.2	0.37	1	0.5	25	MSD	
RB441Q-40	T-77	40	40	100	1	0.55	100	100	40	MSD	
RB451F	T106	40	40	100	1	0.55	100	30	10	UMD3	
RB450F	T106	45	40	100	1	0.45	10	1	10	UMD3	
RB421D	T146	40	40	100	1	0.55	100	30	10	SMD3	
RB420D	T146	40	40	100	1	0.45	10	1	10	SMD3	

Note: \*1 Rating per element.

## ■ Dual Type

Product No.		Absolute Maximum Ratings (Ta=25°C)*1				Electrical Characteristics (Ta=25°C)*1				Package	Equivalent Circuit Diagram
Part No.	Packaging Symbol	V <sub>RM</sub> (V)	V <sub>R</sub> (V)	I <sub>O</sub> (mA)	I <sub>FSM</sub> (A) 60Hz.1 ~	V <sub>F</sub> (V) Max.	I <sub>F</sub> (mA)	I <sub>R</sub> (μA) Max.	V <sub>R</sub> (V)		
RB715Z	T2L	40	40	30	0.2	0.37	1	1	10	VMD3	
RB715W	TL	40	40	30	0.2	0.37	1	1	10	EMD3	
RB715F	T106	40	40	30	0.2	0.37	1	1	10	UMD3	
RB495D	T146	40	25	*2 400	2	0.5	200	70	25	SMD3	
RB705D	T146	40	40	30	0.2	0.37	1	1	10	SMD3	
RB425D	T146	40	40	100	1	0.55	100	30	10	SMD3	
RB717F	T106	40	40	30	0.2	0.37	1	1	10	UMD3	
RB557W	TL	—	30	100	0.5	0.35	10	10	10	EMD3	
RB558W	TL	—	30	100	0.5	0.35	10	10	10	EMD3	
RB548W	TL	—	30	100	0.5	0.45	10	0.5	10	EMD3	
RB706F-40	T106	45	40	30	0.2	0.37	1	1	10	UMD3	
RB706D-40	T146	45	40	30	0.2	0.37	1	1	10	SMD3	
RB481Y	T2R	—	30	100	1	0.43	100	30	10	EMD4	
RB480Y	T2R	—	30	100	1	0.53	100	1	10	EMD4	
RB481Y-40	T2R	40	40	200	1	0.45	100	90	40	EMD4	
RB480Y-40	T2R	40	40	200	1	0.55	100	10	40	EMD4	
RB481Y-90	T2R	90	90	100	1	0.61	100	100	90	EMD4	
RB480Y-90	T2R	90	90	100	1	0.69	100	5	90	EMD4	
RB481K	TL	30	30	200	1	0.5	200	30	10	UMD4	
RB480K	TL	45	40	100	1	0.6	100	1	10	UMD4	
RB471E	T148	40	40	100	1	0.55	100	30	10	SMD5	

Note: \*1 Rating per element. \*2 Value / 2 circuits.

## ■ Triple Type

Product No.		Absolute Maximum Ratings (Ta=25°C)*1				Electrical Characteristics (Ta=25°C)*1				Package	Equivalent Circuit Diagram
Part No.	Packaging Symbol	V <sub>RM</sub> (V)	V <sub>R</sub> (V)	I <sub>O</sub> (mA)	I <sub>FSM</sub> (A) 60Hz.1 ~	V <sub>F</sub> (V) Max.	I <sub>F</sub> (mA)	I <sub>R</sub> (μA) Max.	V <sub>R</sub> (V)		
RB531XN	TR	—	30	100	1	0.43	100	30	10	UMD6	
RB530XN	TR	—	30	100	1	0.53	100	1	10	UMD6	
<b>New</b> RB541XN	TR	—	30	100	0.5	0.35	10	10	10	UMD6	
RB731XN	TR	40	40	30	0.2	0.37	1	1	10	UMD6	
RB731U	T108	40	40	30	0.2	0.37	1	1	10	SMD6	

Note: \*1 Rating per element.

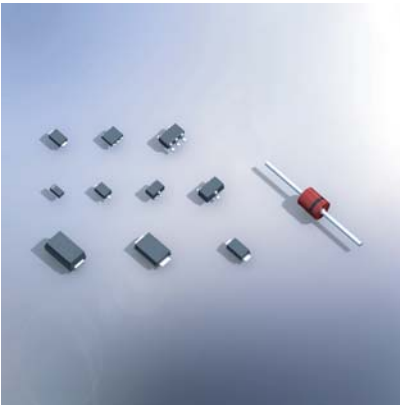
## ■ Multi Type

Product No.		Absolute Maximum Ratings (Ta=25°C)*1				Electrical Characteristics (Ta=25°C)*1				Package	Equivalent Circuit Diagram
Part No.	Packaging Symbol	V <sub>RM</sub> (V)	V <sub>R</sub> (V)	I <sub>O</sub> (mA)	I <sub>FSM</sub> (A) 60Hz.1 ~	V <sub>F</sub> (V) Max.	I <sub>F</sub> (mA)	I <sub>R</sub> (μA) Max.	V <sub>R</sub> (V)		
<b>New</b> RB521ZS8A30	TE61	30	30	100	0.5	0.37	10	9	10	HMD8	

Note: \*1 Rating per element.

# Middle Power Schottky Barrier Diodes

## RB Series



### Summary

The lineup includes compact, low-profile packages, such as a 1608-sized product with  $I_o=1A$ .

### Features

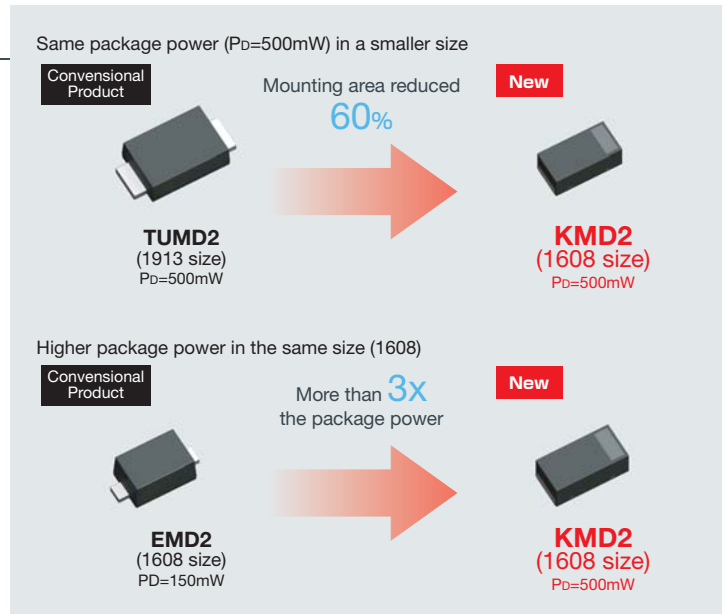
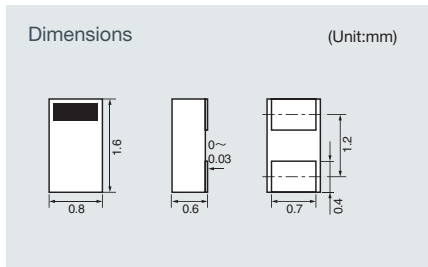
- Small
- High surge resistance

### Applications

- Switches
- Rectifiers

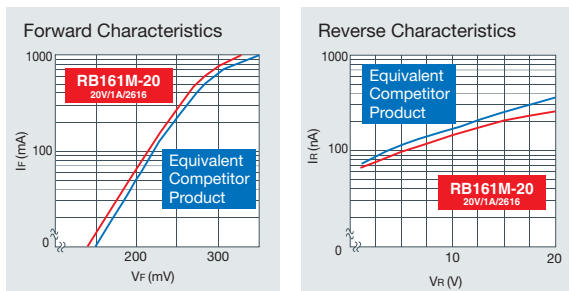
## 1A=I<sub>o</sub> in the 1608 size

A proprietary chip device structure, combined with proven ultra-precise process technology, ensures an output current of 1A in the 1608 size.



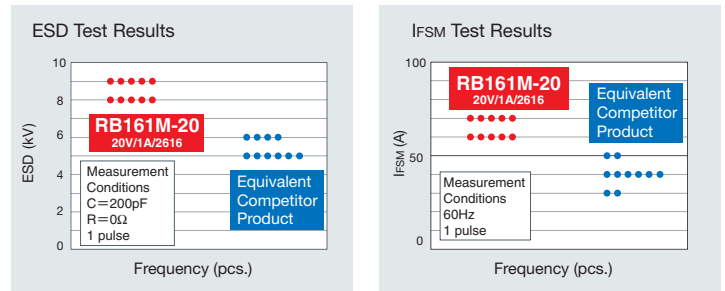
## Simultaneous low $V_F$ and $I_R$

Optimization of device conditions has enabled low  $V_F$  and low  $I_R$ .



## High ESD resistance · High I<sub>FSM</sub> resistance

ROHM's unique wire-free configuration ensures higher  $I_{FSM}$  tolerance and ESD resistance than comparable models for greater surge protection and reliability.





Lineup

Single Type

Product No.		Absolute Maximum Ratings (Ta=25°C)*				Electrical Characteristics (Ta=25°C)*				Package	Equivalent Circuit Diagram	
Part No.	Packaging Symbol	V <sub>RM</sub> (V)	V <sub>R</sub> (V)	I <sub>O</sub> (A)	I <sub>FSM</sub> (A) 60Hz, 1ms	V <sub>F</sub> (V) Max.	I <sub>F</sub> (A)	I <sub>R</sub> (mA) Max.	V <sub>R</sub> (V)			
New	RB551SS-30	T2R	30	20	0.5	5	0.47	0.5	0.1	20	KMD2	
New	RB550SS-30	T2R	30	30	0.5	5	0.59	0.5	0.008	15	KMD2	
New	RB161SS-20	T2R	30	20	1	5	0.42	1	1	20	KMD2	
New	RB160SS-40	T2R	40	40	1	5	0.55	0.7	0.05	20	KMD2	
	RB551V-30	TE-17	30	20	0.5	2	0.36	0.1	0.1	20	UMD2	
	RB161VA-20	TR	30	20	1	5	0.42	1	1	20	TUMD2	
	RB162VA-20	TR	25	20	1	5	0.40	1	1.2	20	TUMD2	
	RB550VA-30	TR	30	30	1	3	0.52	1	0.03	10	TUMD2	
	RB160VA-40	TR	40	40	1	5	0.55	0.7	0.05	40	TUMD2	
	RB411VA-50	TR	50	20	0.5	3	0.5	0.5	0.03	10	TUMD2	
	RB400VA-50	TR	50	40	0.5	3	0.55	0.5	0.05	30	TUMD2	
	RB021VA-90	TR	90	90	0.2	5	0.49	0.2	0.9	90	TUMD2	
	RB161M-20	TR	25	20	1	30	0.35	1	0.7	20	PMDU	
	RB051M-2Y	TR	20	20	3	30	0.46	3	0.9	20	PMDU	
	RB160M-30	TR	30	30	1	30	0.48	1	0.05	30	PMDU	
	RB070M-30	TR	30	30	1.5	30	0.49	1.5	0.05	30	PMDU	
	RB060M-30	TR	30	30	2	55	0.49	2	0.05	30	PMDU	
New	RB050M-30	TR	30	30	3	55	0.51	3	0.05	30	PMDU	
	RB160M-40	TR	40	40	1	30	0.51	1	0.03	40	PMDU	
	RB162M-40	TR	40	40	1	30	0.55	1	0.1	40	PMDU	
	RB160M-60	TR	60	60	1	30	0.55	1	0.05	60	PMDU	
	RB162M-60	TR	60	60	1	20	0.65	1	0.1	60	PMDU	
New	RB060M-60	TR	60	60	2	30	0.61	2	0.05	60	PMDU	
	RB160M-90	TR	90	90	1	30	0.73	1	0.1	90	PMDU	
	RB050LA-30	TR	—	30	3	70	0.45	3	0.15	30	PMDT	
	RB050LA-40	TR	40	40	3	70	0.55	3	0.1	40	PMDT	
	RB051LA-40	TR	40	20	3	70	0.45	3	1	20	PMDT	
	RB055LA-40	TR	40	40	3	70	0.62	3	0.1	40	PMDT	
	RB081L-20	TE25	25	20	5	70	0.45	5	0.7	20	PMS	
New	RB055L-30	TE25	30	30	3	55	0.55	3	0.05	30	PMDS	
New	RB080L-30	TE25	30	30	5	70	0.51	5	0.15	30	PMDS	
	RB161L-40	TE25	40	20	1	70	0.4	1	1	20	PMDS	
	RB051L-40	TE25	40	20	3	70	0.45	3	1	20	PMDS	
	RB160L-40	TE25	40	40	1	70	0.55	1	0.1	40	PMDS	
	RB162L-40	TE25	40	40	1	20	0.55	1	0.5	40	PMDS	
	RB060L-40	TE25	40	40	2	70	0.5	2	1	40	PMDS	
	RB050L-40	TE25	40	40	3	70	0.55	3	1	40	PMDS	
	RB055L-40	TE25	40	40	3	40	0.65	3	0.5	40	PMDS	
	RB056L-40	TE25	40	40	3	70	0.67	3	0.05	40	PMDS	
	RB160L-60	TE25	60	60	1	30	0.58	1	1	60	PMDS	
	RB162L-60	TE25	60	60	1	20	0.65	1	0.1	60	PMDS	
	RB050L-60	TE25	60	60	2	70	0.52	2	0.1	60	PMDS	
	RB160L-90	TE25	95	90	1	30	0.73	1	0.1	90	PMDS	
	RB160A30	T-32	30	30	1	70	0.48	1	0.05	30	MSR	
	RB160A40	T-32	40	40	1	50	0.55	1	0.03	40	MSR	
	RB160A60	T-32	60	60	1	60	0.55	1	0.05	60	MSR	
	RB160A90	T-32	90	90	1	50	0.73	1	0.1	90	MSR	
	RB201A60	T-32	60	60	2	40	0.58	2	0.1	60	MSR	
	RB461F	T106	25	20	0.7	3	0.49	0.7	0.2	20	UMD3	
	RB491D	T146	25	20	1	3	0.45	1	0.2	20	SMD3	
	RB411D	T146	40	20	0.5	3	0.5	0.5	0.03	10	SMD3	
	RB400D	T146	40	40	0.5	3	0.55	0.5	0.05	30	SMD3	

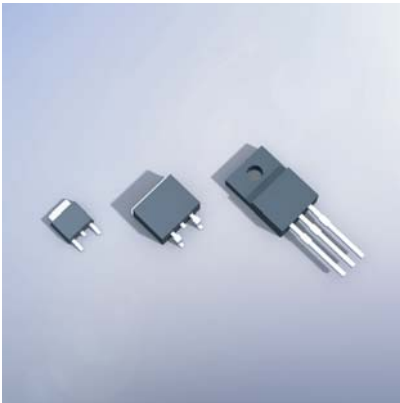
Note: \*1 Rating per element.

Dual Type

Product No.		Absolute Maximum Ratings (Ta=25°C)*				Electrical Characteristics (Ta=25°C)*				Package	Equivalent Circuit Diagram	
Part No.	Packaging Symbol	V <sub>RM</sub> (V)	V <sub>R</sub> (V)	I <sub>O</sub> (A)	I <sub>FSM</sub> (A) 60Hz, 1ms	V <sub>F</sub> (V) Max.	I <sub>F</sub> (A)	I <sub>R</sub> (mA) Max.	V <sub>R</sub> (V)			
	RB496KA	TR	—	20	1	5	0.43	1	0.8	10	TUMD5	
	RB496EA	TR	20	20	1	10	0.4	1	0.5	10	TSMD5	
	RB550EA	TR	30	30	0.7	15	0.49	0.7	0.05	30	TSMD5	

Note: \*1 Rating per element.

# Power Diodes (Includes High Efficiency High Reliability Leaded Models)



## RB Series

### Summary

The lineup includes conventional high power products as well as power diodes featuring a voltage resistance of 100V.

### Features

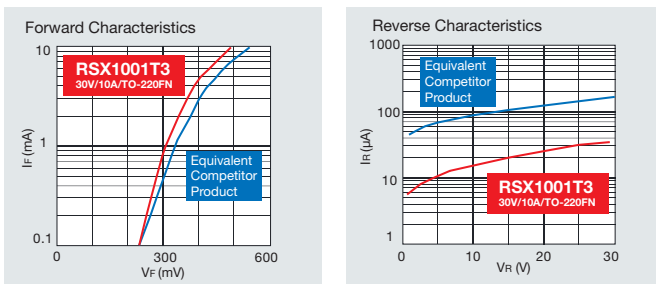
- Low  $V_F$
- Low  $I_R$
- High surge resistance

### Applications

- Switches
- Rectifiers

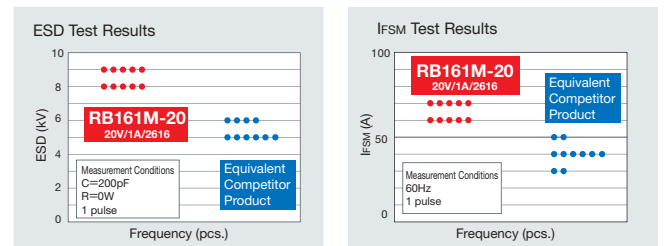
## Superior low $V_F$ , low $I_R$ characteristics

ROHM's diodes feature high efficiency conversion with low  $V_F$  for low heat generation and lower losses with low  $I_R$ , even when running warm.



## High ESD and $I_{FSM}$ resistance

Precision processes and a unique device configuration have resulted in a higher ESD resistance than conventional products.



### Lineup

Product No.		Absolute Maximum Ratings (Ta=25°C) *1				Electrical Characteristics (Ta=25°C) *1				Package	Equivalent Circuit Diagram
Part No.	Packaging Symbol	$V_{RM}$ (V)	$V_R$ (V)	$I_o$ *2 (A)	$I_{FSM}$ (A) 60Hz, 1ms	$V_F$ (V) Max.	$I_F$ (A)	$I_R$ (mA) Max.	$V_R$ (V)		
RB095B-30	TL	35	30	6	45	0.425	3	0.2	30	D-Pack (CPD)	
RB095B-40	TL	45	40	6	45	0.55	3	0.1	40	D-Pack (CPD)	
RB095B-60	TL	60	60	6	45	0.58	3	0.15	60	D-Pack (CPD)	
RB095B-90	TL	90	90	6	45	0.75	3	0.15	90	D-Pack (CPD)	
RB085B-30	TL	35	30	10	35	0.48	4	0.3	30	D-Pack (CPD)	
RB085B-40	TL	45	40	10	45	0.55	5	0.2	40	D-Pack (CPD)	
RB085B-90	TL	90	90	10	45	0.83	5	0.15	90	D-Pack (CPD)	
RB075B40S	TL	40	40	5	45	0.75	5	0.005	40	D-Pack (CPD)	
RB225N-40	TL	40	40	30	50	0.55	15	0.5	40	LPDS	
RB095T-40	Bulk	45	40	6	100	0.55	3	0.1	40	TO-220FN	
RB085T-40	Bulk	45	40	10	100	0.55	5	0.2	40	TO-220FN	
RB205T-40	Bulk	45	40	15	100	0.55	7.5	0.3	40	TO-220FN	
RB215T-40	Bulk	45	40	20	100	0.55	10	0.5	40	TO-220FN	
RB225T-40	Bulk	40	40	30	100	0.63	15	0.5	40	TO-220FN	
RB095T-60	Bulk	60	60	6	100	0.58	3	0.1	60	TO-220FN	
RB085T-60	Bulk	60	60	10	100	0.58	5	0.3	60	TO-220FN	
RB205T-60	Bulk	60	60	15	100	0.58	7.5	0.6	60	TO-220FN	
RB215T-60	Bulk	60	60	20	100	0.58	10	0.6	60	TO-220FN	
RB225T-60	Bulk	60	60	30	100	0.63	15	0.6	60	TO-220FN	
RB095T-90	Bulk	90	90	6	100	0.75	3	0.15	90	TO-220FN	
RB085T-90	Bulk	90	90	10	100	0.83	5	0.15	90	TO-220FN	
RB205T-90	Bulk	90	90	15	100	0.78	7.5	0.3	90	TO-220FN	
RB215T-90	Bulk	90	90	20	100	0.75	10	0.4	90	TO-220FN	
RB225T100	Bulk	100	100	30	100	0.88	15	0.4	100	TO-220FN	

Note: \*1 Value / element. \*2 1/2 lo per diode.

# 2-Terminal (Single) Zener Diodes

## Ultra-compact 0603-sized package



### Summary

The industry's first\* 0603-sized (0.6mm×0.3mm, t=0.3mm) low voltage diode is now available. (Package power is 100mW, equivalent to the VMN2.)

### Features

- Ultra-compact
- Ultra-low profile

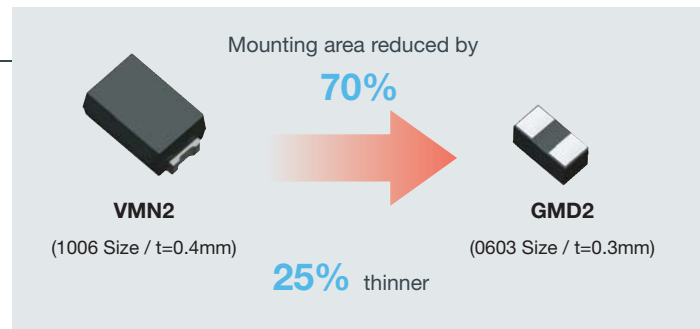
### Applications

- Compact, low-profile, high density sets of all types

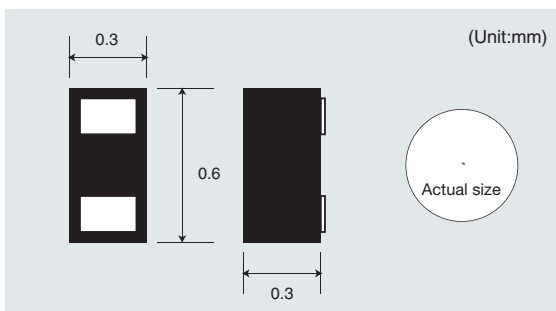
## Space-saving

Ideal for mobile phones and other portable electronic devices requiring the utmost in miniaturization.

ROHM has developed the industry's first\* 0603-sized products using an original chip device structure and proprietary ultra-fine precision processing technology.



### Dimensions



### Absolute Maximum Ratings

Permissible Loss	P	: 100mW
Junction Temperature	T <sub>j</sub>	: 125°C
Storage Temperature	T <sub>stg</sub>	: -55 to 125°C
Operating Temperature	T <sub>opr</sub>	: -55 to 125°C

### Electrical Characteristics

T<sub>a</sub>=25°C

Part No.	Zener Voltage V <sub>z</sub> (V)		Measurement Conditions I <sub>z</sub> (mA)
	Min.	Max.	
<b>GDZ3.9</b>	3.740	4.160	5.0
<b>GDZ4.7</b>	4.420	4.900	5.0
<b>GDZ5.1</b>	4.840	5.370	5.0
<b>GDZ5.6</b>	5.310	5.920	5.0
<b>GDZ6.2</b>	5.860	6.530	5.0
<b>GDZ6.8</b>	6.470	7.140	5.0
<b>GDZ7.5</b>	7.060	7.840	5.0
<b>GDZ8.2</b>	7.760	8.640	5.0

# Compact, High Reliability 1W Constant Voltage Diodes



## KDZ Series

### Summary

High 1W power in the compact 2616 size.

### Features

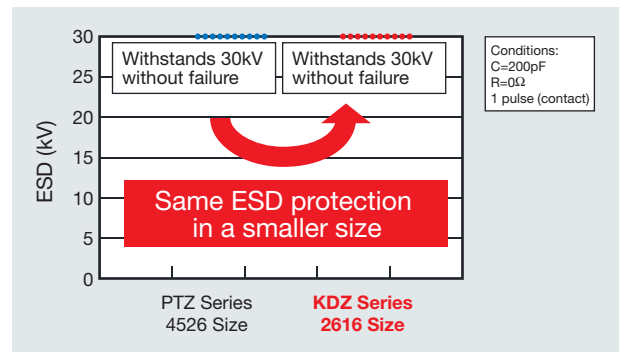
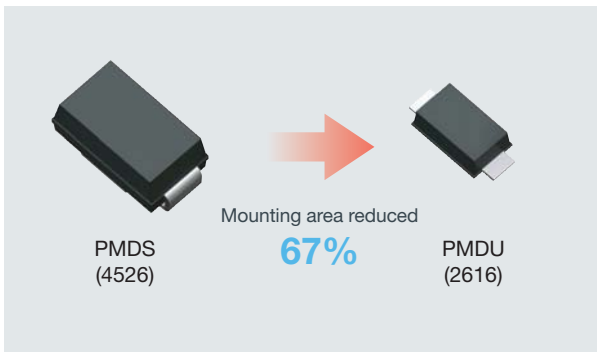
- Compact
- High power

### Applications

- Automotive
- Manufacturing
- Power supplies

## Same ESD protection in a smaller package.

A new lineup of 1W zener diodes in the 2616 size is offered, featuring the same ESD resistance as conventional 4526-size products.



## 1W diode in the 2616 size

	PTZ Series	KDZ Series
Package	PMDS 4.5mm × 2.6mm (t=1.1mm)	<b>PMDU</b> <b>2.6mm × 1.6mm</b> <b>(t=0.8mm)</b>
P	1W	<b>1W</b>
Vz rank	3.6 to 39V	<b>3.6 to 39V</b>

### Absolute Maximum Ratings

Permissible Loss	P : 1W
Junction Temperature	T <sub>J</sub> : 150°C
Storage Temperature	T <sub>stg</sub> : -55 to 150°C
Operating Temperature	T <sub>opr</sub> : -55 to 150°C

### Electrical Characteristics

T<sub>a</sub>=25°C

Part No.	Zener Voltage Vz(V)		Measurement Conditions I <sub>z</sub> (mA)
	Min.	Max.	
KDZ3.6B	3.60	4.00	40
KDZ3.9B	3.90	4.40	40
KDZ4.3B	4.30	4.80	40
KDZ4.7B	4.70	5.20	40
KDZ5.1B	5.10	5.70	40
KDZ5.6B	5.60	6.30	40
KDZ6.2B	6.20	7.00	40
KDZ6.8B	6.80	7.70	40
KDZ7.5B	7.50	8.40	40
KDZ8.2B	8.20	9.30	40
KDZ9.1B	9.10	10.20	40
KDZ10B	10.00	11.20	40
KDZ11B	11.00	12.30	20
KDZ12B	12.00	13.50	20
KDZ13B	13.30	15.00	20
KDZ15B	14.70	16.50	20
KDZ16B	16.20	18.30	20
KDZ18B	18.00	20.30	20
KDZ20B	20.00	22.40	20
KDZ22B	22.00	24.50	10
KDZ24B	24.00	27.60	10
KDZ27B	27.00	30.80	10
KDZ30B	30.00	34.00	10
KDZ33B	33.00	37.00	10
KDZ36B	36.00	40.00	10

# Low Capacitance Zener Diodes



## Optimized for ESD surge protection on High-speed signal lines

### Summary

High-reliability USB2.0-compatible Zener diodes.

### Features

- Compact
- Ultra-low profile
- Low inter-pin capacitance

### Applications

- Mobile phones
- Notebook PCs
- DSCs / DVCs
- LCDs / PDPs

## Low capacitance zener characteristics

## High ESD resistance

**Normal Zener**  
When the inter-pin capacitance is large (30 to 50pF) the signal becomes rounded

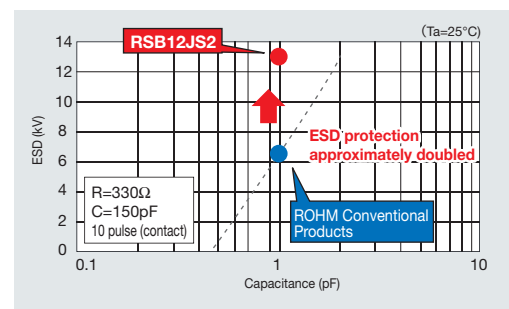
High speed signal → Signal waveform rounded, deteriorating communication.

**Low Capacitance Zener**  
Inter-pin capacitance is small (1 to 8pF)

High speed signal → Signal waveform resists rounding.

Normally, lower  $C_t$  indicates lower ESD protection. However...

**ROHM provides simultaneous low  $C_t$  (1pF) and high ESD (13kV)**



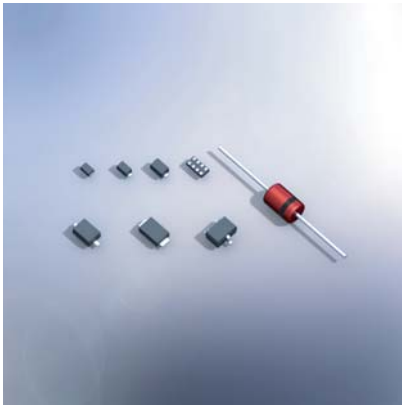
RSB12JS2 (Ta=25°C)	
EMD6 (1612 Size)	
Permissible Loss	150mW / Total
Storage Temperature	-55 to 150°C
Zener Voltage	9.6V to 14.4V
Reverse Current	0.1μA Max.
Capacitance Between Pins	1pF typ.

### Lineup

Part No.	Absolute Maximum Ratings (Ta=25°C)		Electrical Characteristics (Ta=25°C)				Package	Equivalent Circuit Diagram
	P (mW)	V <sub>Z</sub> (V)	I <sub>Z</sub> (mA)	C <sub>t</sub> (pF)	f (MHz)	V <sub>R</sub> (V)		
UMZU6.2N	200	5.9 to 6.5	5	8	1	0	UMD3	
FTZU6.2E	200	5.9 to 6.5	5	8	1	0	SMD5	
CDZC6.8B	100	6.65 to 6.93	5	3	1	0	VMN2	
EDZC6.8B	150	6.65 to 6.93	5	3	1	0	EMD2	
EMZC6.8N	150	6.47 to 7.14	5	3	1	0	EMD3	
VMZT6.8N	150	6.47 to 7.14	5	7	1	0	UMD3	
UMZC6.8N	200	6.47 to 7.14	5	3	1	0	UMD3	
STZC6.8N	200	6.47 to 7.14	5	3	1	0	SMD3	
RSB12Z	100	9.6 to 14.4	5	1	1	0	VMD3	
RSB12W	150	9.6 to 14.4	5	1	1	0	EMD3	
EMZT6.8E	150	6.47 to 7.14	5	7	1	0	EMD5	
<b>New</b> RSB6.8JS2	150	6.00 to 8.00	5	1	1	0	EMD6	
RSB12JS2	150	9.6 to 14.4	5	1	1	0	EMD6	
<b>New</b> RSAC6.8CS	100	6.70 to 7.33	5	0.3	1	0	VMN2	
<b>New</b> RSAC16CS	100	16.49 to 17.51	5	0.3	1	0	VMN2	
<b>New</b> RSB6.8CS	100	6.62 to 7.24	5	1	1	0	VMN2	

\* : The (3) and (6) pin should be OPEN.

# Bidirectional Zener Diodes



Bidirectional surge absorption (positive/negative) in a single package

**Summary**

Protects against both positive and negative surges, reducing the number of components required.

**Features**

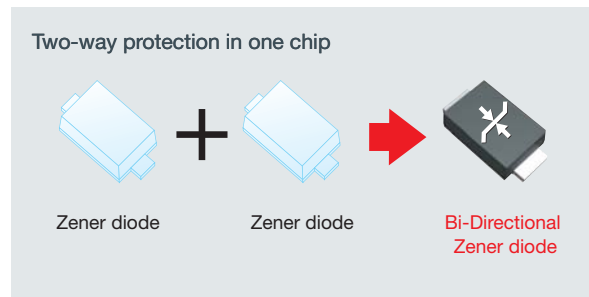
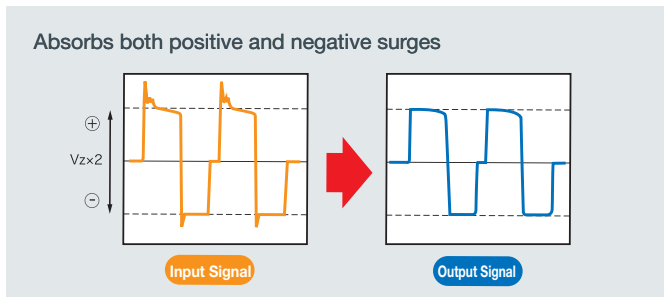
- Compact
- Saves space

**Applications**

- Portable equipment
- DSC / DVCs
- Mobile phones
- Automotive

## Protects against forward and reverse surges.

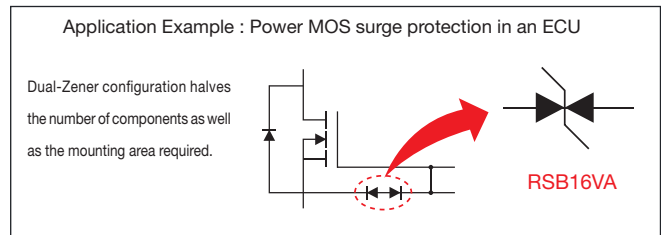
ROHM's zener diodes offer bidirectional surge protection, reducing both parts count and set size.



## High reliability

The TUMD2 package features improved heat dissipation and 500mW package power. Ideal for CAN/LIN bus lines.

**Circuit Example**



**Lineup**

Part No.	Absolute Maximum Ratings (Ta=25°C)		Electrical Characteristics (Ta=25°C)		Remarks	Package	Equivalent Circuit Diagram
	P (mW)	Vz (V)	Iz (mA)				
RSB6.8CS	100	5.78 to 7.82	1			VMN2	
RSB6.8G	100	5.78 to 7.82	1			VMD2	
RSB5.6S	150	4.76 to 6.44	1			EMD2	
RSB6.8S	150	5.78 to 7.82	1			EMD2	
RSB16V	200	14.4 to 17.6	1		IEC61000-4-2	UMD2	
RSB18V	200	16.2 to 19.8	1		150pF, 330Ω	UMD2	
RSB27V	200	26.2 to 32.0	1		Contact 8kV	UMD2	
RSB16VA	500	14.4 to 17.6	1		In air 15kV	TUMD2	
RSB6.8F2	200	5.78 to 7.82	1			UMD3	
RSB16F2	200	14.4 to 17.6	1			UMD3	
RSB18F2	200	16.2 to 19.8	1			UMD3	
RSB27F2	200	26.2 to 32.0	1			UMD3	

# Schottky Barrier Diode Lineup

## High Efficiency High Reliability Surface Mount Type - RSX Series ( $I_o \geq 0.5A$ )

Product No.		Absolute Maximum Ratings (Ta=25°C) *				Electrical Characteristics (Ta=25°C) *				Package	Equivalent Circuit Diagram
Part No.	Packaging Symbol	V <sub>RM</sub> (V)	V <sub>R</sub> (V)	I <sub>o</sub> (A)	I <sub>FSM</sub> (A) 60Hz, 1 $\sim$	V <sub>F</sub> (V) Max.	I <sub>F</sub> (A)	I <sub>R</sub> (mA) Max.	V <sub>R</sub> (V)		
RSX051VA-30	TR	30	30	0.5	5.0	0.39	0.5	0.20	30	TUMD2	
RSX071VA-30	TR	30	30	0.7	5.0	0.42	0.7	0.20	30	TUMD2	
RSX101VA-30	TR	30	30	1	5.0	0.47	1.0	0.20	30	TUMD2	
New RSX201VA-30	TR	30	30	1.5	8.0	0.46	1.5	0.30	30	TUMD2	
RSX101M-30	TR	30	30	1	45	0.39	1.0	0.20	30	PMDU	
RSX301LA-30	TR	30	30	3	70	0.42	3.0	0.20	30	PMDT	
RSX501LA-20	TR	25	20	5	70	0.39	3.0	0.50	20	PMDT	
RSX201L-30	TE25	30	30	2	60	0.44	2.0	0.15	30	PMDS	
New RSX205L-30	TE25	30	30	2	60	0.49	2.0	0.20	30	PMDS	
RSX301L-30	TE25	30	30	3	70	0.42	3.0	0.20	30	PMDS	
RSX501L-20	TE25	25	20	5	70	0.39	3.0	0.50	20	PMDS	
RSX1001T3	Bulk	30	30	10	150	0.44	5.0	0.5	30	TO-220FN	

Note : \* Value / Element.

## Small Signal Schottky Barrier Diodes ( $I_o < 0.5A$ )

Product No.		Absolute Maximum Ratings (Ta=25°C) *1				Electrical Characteristics (Ta=25°C) *1				Package	Equivalent Circuit Diagram
Part No.	Packaging Symbol	V <sub>RM</sub> (V)	V <sub>R</sub> (V)	I <sub>o</sub> (mA)	I <sub>FSM</sub> (A) 60Hz, 1 $\sim$	V <sub>F</sub> (V) Max.	I <sub>F</sub> (mA)	I <sub>R</sub> (μA) Max.	V <sub>R</sub> (V)		
RB521ZS-30	T2R	30	30	100	0.5	0.37	10	7	10	GMD2	
RB520ZS-30	T2R	30	30	100	0.5	0.46	10	0.3	10	GMD2	
RB521CS-30	T2R	—	30	100	0.5	0.35	10	10	10	VMN2	
RB520CS-30	T2R	—	30	100	0.5	0.45	10	0.5	10	VMN2	
RB751CS-40	T2R	40	30	30	0.2	0.37	1	0.5	30	VMN2	
RB521G-30	T2R	—	30	100	0.5	0.35	10	10	10	VMD2	
RB520G-30	T2R	—	30	100	0.5	0.45	10	0.5	10	VMD2	
RB751G-40	T2R	40	30	30	0.2	0.37	1	0.5	30	VMD2	
RB521S-30	TE61	—	30	200	1	0.5	200	30	10	EMD2	
RB520S-30	TE61	—	30	200	1	0.6	200	1	10	EMD2	
RB531S-30	TE61	—	30	100	0.5	0.35	10	10	10	EMD2	
RB530S-30	TE61	—	30	100	0.5	0.45	10	0.5	10	EMD2	
RB751S-40	TE61	40	30	30	0.2	0.37	1	0.5	30	EMD2	
RB521S-40	TE61	45	40	200	4	0.45	0.1	90	40	EMD2	
RB520S-40	TE61	40	40	200	1	0.55	100	10	40	EMD2	
RB751V-40	TE-17	40	30	30	0.2	0.37	1	0.5	30	UMD2	
RB501V-40	TE-17	45	40	100	1	0.55	100	30	10	UMD2	
RB500V-40	TE-17	45	40	100	1	0.45	10	1	10	UMD2	
RB721Q-40	T-77	40	40	30	0.2	0.37	1	0.5	25	MSD	
RB441Q-40	T-77	40	40	100	1	0.55	100	100	40	MSD	
New RB521ZS8A30	TE61	30	30	100	0.5	0.37	10	7	10	HMD8	
RB715Z	T2L	40	40	30	0.2	0.37	1	1	10	VMD3	
RB715W	TL	40	40	30	0.2	0.37	1	1	10	EMD3	
RB715F	T106	40	40	30 *2	0.2	0.37	1	1	10	UMD3	
RB495D	T146	40	25	400	2	0.5	200	70	25	SMD3	
RB705D	T146	40	40	30	0.2	0.37	1	1	10	SMD3	
RB425D	T146	40	40	100	1	0.55	100	30	10	SMD3	
RB717F	T106	40	40	30	0.2	0.37	1	1	10	UMD3	
RB557W	TL	—	30	100	0.5	0.35	10	10	10	EMD3	
RB558W	TL	—	30	100	0.5	0.35	10	10	10	EMD3	
RB548W	TL	—	30	100	0.5	0.45	10	0.5	10	EMD3	
RB706F-40	T106	45	40	30	0.2	0.37	1	1	10	UMD3	
RB706D-40	T146	45	40	30	0.2	0.37	1	1	10	SMD3	
RB451F	T106	40	40	100	1	0.55	100	30	10	UMD3	
RB450F	T106	45	40	100	1	0.45	10	1	10	UMD3	
RB421D	T146	40	40	100	1	0.55	100	30	10	SMD3	
RB420D	T146	40	40	100	1	0.45	10	1	10	SMD3	
RB481Y	T2R	—	30	100	1	0.43	100	30	10	EMD4	
RB480Y	T2R	—	30	100	1	0.53	100	1	10	EMD4	
RB480Y-40	T2R	40	40	200	1	0.55	100	10	40	EMD4	
RB481Y-40	T2R	40	40	200	1	0.45	100	90	40	EMD4	
RB481Y-90	T2R	90	90	100	1	0.61	100	100	90	EMD4	
RB480Y-90	T2R	90	90	100	1	0.69	100	5	90	EMD4	
RB481K	TL	30	30	200	1	0.5	200	30	10	UMD4	
RB480K	TL	45	40	100	1	0.6	100	1	10	UMD4	
RB471E	T148	40	40	100	1	0.55	100	30	10	SMD5	
RB531XN	TR	—	30	100	1	0.43	100	30	10	UMD6	
RB530XN	TR	—	30	100	1	0.53	100	1	10	UMD6	
New RB541XN	TR	—	30	100	0.5	0.35	10	10	10	UMD6	
RB731XN	TR	40	40	30	0.2	0.37	1	1	10	UMD6	
RB731U	T108	40	40	30	0.2	0.37	1	1	10	SMD6	

Note: \*1 Value / Element \*2 1/2 I<sub>o</sub> per diode.

■ Middle Power Schottky Barrier Diodes

Product No.		Absolute Maximum Ratings (Ta=25°C)*				Electrical Characteristics (Ta=25°C)*				Package	Equivalent Circuit Diagram	
Part No.	Packaging Symbol	V <sub>RM</sub> (V)	V <sub>R</sub> (V)	I <sub>O</sub> (A)	I <sub>FSM</sub> (A) 60Hz, 1ms	V <sub>F</sub> (V) Max.	I <sub>F</sub> (A)	I <sub>R</sub> (mA) Max.	V <sub>R</sub> (V)			
New	RB551SS-30	T2R	30	20	0.5	5	0.47	0.5	0.1	20	KMD2	
New	RB550SS-30	T2R	30	30	0.5	5	0.59	0.5	0.008	15	KMD2	
New	RB161SS-20	T2R	30	20	1	5	0.42	1	1	20	KMD2	
New	RB160SS-40	T2R	40	40	1	5	0.55	0.7	0.05	20	KMD2	
	RB551V-30	TE-17	30	20	0.5	2	0.36	0.1	0.1	20	UMD2	
	RB161VA-20	TR	30	20	1	5	0.42	1	1	20	TUMD2	
	RB162VA-20	TR	25	20	1	5	0.40	1	1.2	20	TUMD2	
	RB550VA-30	TR	30	30	1	3	0.52	1	0.03	10	TUMD2	
	RB160VA-40	TR	40	40	1	5	0.55	0.7	0.05	40	TUMD2	
	RB411VA-50	TR	50	20	0.5	3	0.5	0.5	0.03	10	TUMD2	
	RB400VA-50	TR	50	40	0.5	3	0.55	0.5	0.05	30	TUMD2	
	RB021VA-90	TR	90	90	0.2	5	0.49	0.2	0.9	90	TUMD2	
	RB161M-20	TR	25	20	1	30	0.35	1	0.7	20	PMDU	
	RB051M-2Y	TR	20	20	3	30	0.46	3	0.9	20	PMDU	
	RB160M-30	TR	30	30	1	30	0.48	1	0.05	30	PMDU	
	RB070M-30	TR	30	30	1.5	30	0.49	1.5	0.05	30	PMDU	
	RB060M-30	TR	30	30	2	55	0.49	2	0.05	30	PMDU	
New	RB050M-30	TR	30	30	3	55	0.51	3	0.05	30	PMDU	
	RB160M-40	TR	40	40	1	30	0.51	1	0.03	40	PMDU	
	RB162M-40	TR	40	40	1	30	0.55	1	0.1	40	PMDU	
	RB160M-60	TR	60	60	1	30	0.55	1	0.05	60	PMDU	
	RB162M-60	TR	60	60	1	20	0.65	1	0.1	60	PMDU	
New	RB060M-60	TR	60	60	2	30	0.61	2	0.05	60	PMDU	
	RB160M-90	TR	90	90	1	30	0.73	1	0.1	90	PMDU	
	RB050LA-30	TR	—	30	3	70	0.45	3	0.15	30	PMDT	
	RB050LA-40	TR	40	40	3	70	0.55	3	0.1	40	PMDT	
	RB051LA-40	TR	40	20	3	70	0.45	3	1	20	PMDT	
	RB055LA-40	TR	40	40	3	70	0.62	3	0.1	40	PMDT	
	RB081L-20	TE25	25	20	5	70	0.45	5	0.7	20	PMDS	
New	RB055L-30	TE25	30	30	3	55	0.55	3	0.05	30	PMDS	
New	RB080L-30	TE25	30	30	5	70	0.51	5	0.15	30	PMDS	
	RB161L-40	TE25	40	20	1	70	0.4	1	1	20	PMDS	
	RB051L-40	TE25	40	20	3	70	0.45	3	1	20	PMDS	
	RB160L-40	TE25	40	40	1	70	0.55	1	0.1	40	PMDS	
	RB162L-40	TE25	40	40	1	20	0.55	1	0.5	40	PMDS	
	RB060L-40	TE25	40	40	2	70	0.5	2	1	40	PMDS	
	RB050L-40	TE25	40	40	3	70	0.55	3	1	40	PMDS	
	RB055L-40	TE25	40	40	3	40	0.65	3	0.5	40	PMDS	
	RB056L-40	TE25	40	40	3	70	0.67	3	0.05	40	PMDS	
	RB160L-60	TE25	60	60	1	30	0.58	1	1	60	PMDS	
	RB162L-60	TE25	60	60	1	20	0.65	1	0.1	60	PMDS	
	RB050L-60	TE25	60	60	2	70	0.52	2	0.1	60	PMDS	
	RB160L-90	TE25	95	90	1	30	0.73	1	0.1	90	PMDS	
	RB160A30	T-32	30	30	1	70	0.48	1	0.05	30	MSR	
	RB160A40	T-32	40	40	1	50	0.55	1	0.03	40	MSR	
	RB160A60	T-32	60	60	1	60	0.55	1	0.05	60	MSR	
	RB160A90	T-32	90	90	1	50	0.73	1	0.1	90	MSR	
	RB201A60	T-32	60	60	2	40	0.58	2	0.1	60	MSR	
	RB461F	T106	25	20	0.7	3	0.49	0.7	0.2	20	UMD3	
	RB491D	T146	25	20	1	3	0.45	1	0.2	20	SMD3	
	RB411D	T146	40	20	0.5	3	0.5	0.5	0.03	10	SMD3	
	RB400D	T146	40	40	0.5	3	0.55	0.5	0.05	30	SMD3	
	RB496KA	TR	—	20	1	5	0.43	1	0.8	10	TUMD5	
	RB496EA	TR	20	20	1	10	0.4	1	0.5	10	TSMD5	
	RB550EA	TR	30	30	0.7	15	0.49	0.7	0.05	30	TSMD5	

Note: \*1 Value / element.



## Power Schottky Barrier Diodes

Product No.		Absolute Maximum Ratings (Ta=25°C) *1				Electrical Characteristics (Ta=25°C) *1				Package	Equivalent Circuit Diagram
Part No.	Packaging Symbol	V <sub>RM</sub> (V)	V <sub>R</sub> (V)	I <sub>O</sub> *2 (A)	I <sub>FSM</sub> (A) 60Hz, 1/10	V <sub>F</sub> (V) Max.	I <sub>F</sub> (A)	I <sub>R</sub> (mA) Max.	V <sub>R</sub> (V)		
RB095B-30	TL	35	30	6	45	0.425	3	0.2	30	D-Pack (CPD)	
RB095B-40	TL	45	40	6	45	0.55	3	0.1	40	D-Pack (CPD)	
RB095B-60	TL	60	60	6	45	0.58	3	0.1	60	D-Pack (CPD)	
RB095B-90	TL	90	90	6	45	0.75	3	0.15	90	D-Pack (CPD)	
RB085B-30	TL	35	30	10	35	0.48	4	0.3	30	D-Pack (CPD)	
RB085B-40	TL	45	40	10	45	0.55	5	0.2	40	D-Pack (CPD)	
RB085B-90	TL	90	90	10	45	0.83	5	0.15	90	D-Pack (CPD)	
RB075B40S	TL	40	40	5	45	0.75	5	0.005	40	D-Pack (CPD)	
RB225N-40	TL	40	40	30	50	0.55	15	0.5	40	LPDS	
RB095T-40	Bulk	45	40	6	100	0.55	3	0.1	40	TO-220FN	
RB085T-40	Bulk	45	40	10	100	0.55	5	0.2	40	TO-220FN	
RB205T-40	Bulk	45	40	15	100	0.55	7.5	0.3	40	TO-220FN	
RB215T-40	Bulk	45	40	20	100	0.55	10	0.5	40	TO-220FN	
RB225T-40	Bulk	40	40	30	100	0.63	15	0.5	40	TO-220FN	
RB095T-60	Bulk	60	60	6	100	0.58	3	0.1	60	TO-220FN	
RB085T-60	Bulk	60	60	10	100	0.58	5	0.3	60	TO-220FN	
RB205T-60	Bulk	60	60	15	100	0.58	7.5	0.6	60	TO-220FN	
RB215T-60	Bulk	60	60	20	100	0.58	10	0.6	60	TO-220FN	
RB225T-60	Bulk	60	60	30	100	0.63	15	0.6	60	TO-220FN	
RB095T-90	Bulk	90	90	6	100	0.75	3	0.15	90	TO-220FN	
RB085T-90	Bulk	90	90	10	100	0.83	5	0.15	90	TO-220FN	
RB205T-90	Bulk	90	90	15	100	0.78	7.5	0.3	90	TO-220FN	
RB215T-90	Bulk	90	90	20	100	0.75	10	0.4	90	TO-220FN	
RB225T100	Bulk	100	100	30	100	0.88	15	0.4	100	TO-220FN	

Note: \*1 Value / element. \*2 1/2 I<sub>O</sub> per diode.

# Zener Diode Product Lineup

## ■ 2-Terminal (Single) / 4-Terminal (Dual)

Package		Surface Mount Type													
		1006 Size VMN2		1406 Size VMD2		1608 Size EMD2 (SOD-523)		1712 Size UMD2 (SOD-323)		0603 Size GMD2		1913 Size TUMD2			
Equivalent Circuit Diagram															
Series name		<b>CDZ Series</b>		<b>VDZ Series</b>		<b>EDZ Series</b>		<b>UDZ S Series</b>		<b>GDZ Series</b>		<b>TDZ Series</b>			
Power (mW)		100		100		150		200		100		500			
Package symbol		T2R		T2R		TE61		TE-17		T2R		TR			
Electrical Characteristics (Ta=25°C)		Vz (V)	Iz (mA)	Vz (V)	Iz (mA)	Vz (V)	Iz (mA)	Vz (V)	Iz (mA)	Vz (V)	Iz (mA)	Vz (V)	Iz (mA)		
Voltage	<b>3.6B</b>	3.600 to 3.845	5	3.600 to 3.845	5	3.600 to 3.845	5	3.600 to 3.845	5	<b>3.6</b>	—	—	<b>3.6</b>	—	—
	<b>3.9B</b>	3.89 to 4.16	5	3.89 to 4.16	5	3.89 to 4.16	5	3.89 to 4.16	5	<b>3.9</b>	3.740 to 4.160	5	<b>3.9</b>	—	—
	<b>4.3B</b>	4.17 to 4.43	5	4.17 to 4.43	5	4.17 to 4.43	5	4.17 to 4.43	5	<b>4.3</b>	—	—	<b>4.3</b>	—	—
	<b>4.7B</b>	4.55 to 4.75	5	4.55 to 4.75	5	4.55 to 4.75	5	4.55 to 4.75	5	<b>4.7</b>	4.420 to 4.900	5	<b>4.7</b>	—	—
	<b>5.1B</b>	4.98 to 5.20	5	4.98 to 5.20	5	4.98 to 5.20	5	4.98 to 5.20	5	<b>5.1</b>	4.840 to 5.370	5	<b>5.1</b>	4.600 to 5.600	10
	<b>5.6B</b>	5.49 to 5.73	5	5.49 to 5.73	5	5.49 to 5.73	5	5.49 to 5.73	5	<b>5.6</b>	5.310 to 5.920	5	<b>5.6</b>	5.100 to 6.100	10
	<b>6.2B</b>	6.06 to 6.33	5	6.06 to 6.33	5	6.06 to 6.33	5	6.06 to 6.33	5	<b>6.2</b>	5.860 to 6.530	5	<b>6.2</b>	5.600 to 6.800	10
	<b>6.8B</b>	6.65 to 6.93	5	6.65 to 6.93	5	6.65 to 6.93	5	6.65 to 6.93	5	<b>6.8</b>	6.470 to 7.140	5	<b>6.8</b>	6.200 to 7.400	10
	<b>7.5B</b>	7.28 to 7.60	5	7.28 to 7.60	5	7.28 to 7.60	5	7.28 to 7.60	5	<b>7.5</b>	7.060 to 7.840	5	<b>7.5</b>	6.800 to 8.300	10
	<b>8.2B</b>	8.02 to 8.36	5	8.02 to 8.36	5	8.02 to 8.36	5	8.02 to 8.36	5	<b>8.2</b>	7.760 to 8.640	5	<b>8.2</b>	7.400 to 9.000	10
	<b>9.1B</b>	8.85 to 9.23	5	8.85 to 9.23	5	8.85 to 9.23	5	8.85 to 9.23	5	<b>9.1</b>	—	—	<b>9.1</b>	8.200 to 10.00	10
	<b>10B</b>	9.77 to 10.21	5	9.77 to 10.21	5	9.77 to 10.21	5	9.77 to 10.21	5	<b>10</b>	—	—	<b>10</b>	9.000 to 11.00	10
	<b>11B</b>	10.76 to 11.22	5	10.76 to 11.22	5	10.76 to 11.22	5	10.76 to 11.22	5	<b>11</b>	—	—	<b>11</b>	9.900 to 12.10	10
	<b>12B</b>	11.74 to 12.24	5	11.74 to 12.24	5	11.74 to 12.24	5	11.74 to 12.24	5	<b>12</b>	—	—	<b>12</b>	10.80 to 13.20	10
	<b>13B</b>	12.91 to 13.49	5	12.91 to 13.49	5	12.91 to 13.49	5	12.91 to 13.49	5	<b>13</b>	—	—	<b>13</b>	11.70 to 14.30	10
	<b>15B</b>	14.34 to 14.98	5	14.34 to 14.98	5	14.34 to 14.98	5	14.34 to 14.98	5	<b>15</b>	—	—	<b>15</b>	13.50 to 16.50	10
	<b>16B</b>	15.85 to 16.51	5	15.85 to 16.51	5	15.85 to 16.51	5	15.85 to 16.51	5	<b>16</b>	—	—	<b>16</b>	14.40 to 17.60	10
	<b>18B</b>	—	—	17.56 to 18.35	2	17.56 to 18.35	5	17.56 to 18.35	5	<b>18</b>	—	—	<b>18</b>	16.20 to 19.80	10
	<b>20B</b>	—	—	19.52 to 20.39	2	19.52 to 20.39	5	19.52 to 20.39	5	<b>20</b>	—	—	<b>20</b>	18.00 to 22.00	10
	<b>22B</b>	—	—	21.54 to 22.47	2	21.54 to 22.47	5	21.54 to 22.47	5	<b>22</b>	—	—	<b>22</b>	19.80 to 24.20	10
<b>24B</b>	—	—	23.72 to 24.78	2	23.72 to 24.78	5	23.72 to 24.78	5	<b>24</b>	—	—	<b>24</b>	21.60 to 26.40	10	
<b>27B</b>	—	—	26.19 to 27.53	2	26.19 to 27.53	2	26.19 to 27.53	5	<b>27</b>	—	—	<b>27</b>	24.30 to 29.70	10	
<b>30B</b>	—	—	29.19 to 30.69	2	29.19 to 30.69	2	29.19 to 30.69	5	<b>30</b>	—	—	<b>30</b>	27.00 to 33.00	10	
<b>33B</b>	—	—	32.15 to 33.79	2	32.15 to 33.79	2	32.15 to 33.79	5	<b>33</b>	—	—	<b>33</b>	—	—	—
<b>36B</b>	—	—	35.07 to 36.87	2	35.07 to 36.87	2	35.07 to 36.87	5	<b>36</b>	—	—	<b>36</b>	—	—	—
<b>39B</b>	—	—	—	—	—	—	—	—	<b>39</b>	—	—	<b>39</b>	—	—	—
Package		Surface Mount Type				Surface Mounted, Glass Type				Leaded Type		Surface Mount Type			
		1913 Size TUMD2		2616 Size PMDU (SOD-123)		4526 Size PMDS (SOD-106)		3415 Size LLDS (LL-34)		2.7xφ1.8 MSD (DO-34)		2012 Size UMD4 (SOD-343)			
Equivalent Circuit Diagram															
Series name		<b>TFZ Series</b>		<b>KDZ Series</b>		<b>PTZ Series</b>		<b>RLZ Series</b>		<b>MTZ J Series</b>		<b>UMZ K Series</b>			
Power (mW)		500		1000		1000		500		500		200			
Package symbol		TR		TR		TE25		TE-11		T-77		TL			
Electrical Characteristics (Ta=25°C)		Vz (V)	Iz (mA)	Vz (V)	Iz (mA)	Vz (V)	Iz (mA)	Vz (V)	Iz (mA)	Vz (V)	Iz (mA)	Vz (V)	Iz (mA)		
Voltage	<b>3.6B</b>	3.600 to 3.845	20	3.60 to 4.00	40	3.60 to 4.00	40	3.600 to 3.845	20	3.600 to 3.845	5	<b>3.6K</b>	3.600 to 3.845	5	
	<b>3.9B</b>	3.89 to 4.16	20	3.90 to 4.40	40	3.90 to 4.40	40	3.89 to 4.16	20	3.89 to 4.16	5	<b>3.9K</b>	3.89 to 4.16	5	
	<b>4.3B</b>	4.17 to 4.43	20	4.30 to 4.80	40	4.30 to 4.80	40	4.17 to 4.43	20	4.17 to 4.43	5	<b>4.3K</b>	4.17 to 4.43	5	
	<b>4.7B</b>	4.55 to 4.80	20	4.70 to 5.20	40	4.70 to 5.20	40	4.55 to 4.80	20	4.55 to 4.80	5	<b>4.7K</b>	4.55 to 4.75	5	
	<b>5.1B</b>	4.94 to 5.20	20	5.10 to 5.70	40	5.10 to 5.70	40	4.94 to 5.20	20	4.94 to 5.20	5	<b>5.1K</b>	4.98 to 5.20	5	
	<b>5.6B</b>	5.45 to 5.73	20	5.60 to 6.30	40	5.60 to 6.30	40	5.45 to 5.73	20	5.45 to 5.73	5	<b>5.6K</b>	5.49 to 5.73	5	
	<b>6.2B</b>	5.96 to 6.27	20	6.20 to 7.00	40	6.20 to 7.00	40	5.96 to 6.27	20	5.96 to 6.27	5	<b>6.2K</b>	6.06 to 6.33	5	
	<b>6.8B</b>	6.49 to 6.83	20	6.80 to 7.70	40	6.80 to 7.70	40	6.49 to 6.83	20	6.49 to 6.83	5	<b>6.8K</b>	6.65 to 6.93	5	
	<b>7.5B</b>	7.07 to 7.45	20	7.50 to 8.40	40	7.50 to 8.40	40	7.07 to 7.45	20	7.07 to 7.45	5	<b>7.5K</b>	7.28 to 7.60	5	
	<b>8.2B</b>	7.78 to 8.19	20	8.20 to 9.30	40	8.20 to 9.30	40	7.78 to 8.19	20	7.78 to 8.19	5	<b>8.2K</b>	8.02 to 8.36	5	
	<b>9.1B</b>	8.57 to 9.01	20	9.10 to 10.20	40	9.10 to 10.20	40	8.57 to 9.01	20	8.57 to 9.01	5	<b>9.1K</b>	8.85 to 9.23	5	
	<b>10B</b>	9.41 to 9.90	20	10.00 to 11.20	40	10.00 to 11.20	40	9.41 to 9.90	20	9.41 to 9.90	5	<b>10K</b>	9.77 to 10.21	5	
	<b>11B</b>	10.50 to 11.05	10	11.00 to 12.30	20	11.00 to 12.30	20	10.50 to 11.05	10	10.50 to 11.05	5	<b>11K</b>	10.76 to 11.22	5	
	<b>12B</b>	11.44 to 12.03	10	12.00 to 13.50	20	12.00 to 13.50	20	11.44 to 12.03	10	11.44 to 12.03	5	<b>12K</b>	11.74 to 12.24	5	
	<b>13B</b>	12.55 to 13.21	10	13.30 to 15.00	20	13.30 to 15.00	20	12.55 to 13.21	10	12.55 to 13.21	5	<b>13K</b>	12.91 to 13.49	5	
	<b>15B</b>	13.89 to 14.62	10	14.70 to 16.50	20	14.70 to 16.50	20	13.89 to 14.62	10	13.89 to 14.62	5	<b>15K</b>	14.34 to 14.98	5	
	<b>16B</b>	15.25 to 16.04	10	16.20 to 18.30	20	16.20 to 18.30	20	15.25 to 16.04	10	15.25 to 16.04	5	<b>16K</b>	15.85 to 16.51	5	
	<b>18B</b>	16.82 to 17.70	10	18.00 to 20.30	20	18.00 to 20.30	20	16.82 to 17.70	10	16.82 to 17.70	5	<b>18K</b>	17.56 to 18.35	5	
	<b>20B</b>	18.63 to 19.59	10	20.00 to 22.40	20	20.00 to 22.40	20	18.63 to 19.59	10	18.63 to 19.59	5	<b>20K</b>	19.52 to 20.39	5	
	<b>22B</b>	20.64 to 21.71	5	22.00 to 24.50	10	22.00 to 24.50	10	20.64 to 21.71	5	20.64 to 21.71	5	<b>22K</b>	21.54 to 22.47	5	
<b>24B</b>	22.61 to 23.77	5	24.00 to 27.60	10	24.00 to 27.60	10	22.61 to 23.77	5	22.61 to 23.77	5	<b>24K</b>	23.72 to 24.78	5		
<b>27B</b>	24.97 to 26.26	5	27.00 to 30.80	10	27.00 to 30.80	10	24.97 to 26.26	5	24.97 to 26.26	5	<b>27K</b>	26.19 to 27.53	5		
<b>30B</b>	27.70 to 29.13	5	30.00 to 34.00	10	30.00 to 34.00	10	27.70 to 29.13	5	27.70 to 29.13	5	<b>30K</b>	29.19 to 30.69	5		
<b>33B</b>	30.32 to 31.88	5	33.00 to 37.00	10	33.00 to 37.00	10	30.32 to 31.88	5	30.32 to 31.88	5	<b>33K</b>	32.15 to 33.79	5		
<b>36B</b>	32.79 to 34.49	5	36.00 to 40.00	10	36.00 to 40.00	10	32.79 to 34.49	5	32.79 to 34.49	5	<b>36K</b>	35.07 to 36.87	5		
<b>39B</b>	35.36 to 37.19	5	—	—	—	—	35.36 to 37.19	5	35.36 to 37.19	5	<b>39K</b>	—	—	—	

Note: Available voltages are displayed

Zener Arrays (2-4 Elements) for Terminal Protection Devices






Product No.		Absolute Maximum Ratings (Ta=25°C) P (mW)	Electrical Characteristics (Ta=25°C) Vz (V)		Remark	Package	Equivalent Circuit Diagram
Part No.	Packaging Symbol		Iz (mA)				
UMZ8.2T	T106	200	7.76 to 8.64	5		UMD3	
STZ6.8T	T146	200	6.47 to 7.14	5		SMD3	
VMZ6.8N	T2L	150	6.47 to 7.14	5		VMD3	
EMZ6.8N	TL	150	6.47 to 7.14	5		EMD3	
UMZ5.1N	T106	200	4.84 to 5.37	5		UMD3	
UMZ6.8N	T106	200	6.47 to 7.14	5		UMD3	
UMZ8.2N	T106	200	7.76 to 8.64	5		UMD3	
UMZ12N	T106	200	11.0 to 13.0	5		UMD3	
UMZ16N	T106	200	15.85 to 16.51	5		UMD3	
UMZ18N	T106	200	17.56 to 18.35	5	IEC61000-4-2 150pF, 330Ω	UMD3	
UMZ27N	T106	200	26.19 to 27.53	5	Contact 8kV Air 15kV	UMD3	
UMZ30N	T106	200	29.19 to 30.69	5		UMD3	
UMZ36N	T106	200	35.07 to 36.87	5		UMD3	
STZ5.6N	T146	200	5.31 to 5.92	5		SMD3	
STZ6.2N	T146	200	5.81 to 6.40	5		SMD3	
STZ6.8N	T146	200	6.47 to 7.14	5		SMD3	
EMZ6.8E	T2R	150	6.47 to 7.14	5		EMD5	
UMZ6.8EN	TR	200	6.47 to 7.14	5		UMD5	
FTZ4.3E	T148	200	4.04 to 4.57	5		SMD5	
FTZ5.6E	T148	200	5.31 to 5.92	5		SMD5	
FTZ6.8E	T148	200	6.47 to 7.14	5		SMD5	
FTZ30E	T148	200	29.19 to 30.09	5		SMD5	

Low Capacitance Zener Diodes





Part No.	Absolute Maximum Ratings (Ta=25°C) P (mW)	Electrical Characteristics (Ta=25°C)					Package	Equivalent Circuit Diagram
		Vz (V)	Iz (mA)	Ct (pF)	f (MHz)	Vr (V)		
UMZU6.2N	200	5.9 to 6.5	5	8	1	0	UMD3	
FTZU6.2E	200	5.9 to 6.5	5	8	1	0	SMD5	
CDZC6.8B	100	6.65 to 6.93	5	3	1	0	VMN2	
EDZC6.8B	150	6.65 to 6.93	5	3	1	0	EMD2	
EMZC6.8N	150	6.47 to 7.14	5	3	1	0	EMD3	
VMZT6.8N	150	6.47 to 7.14	5	7	1	0	UMD3	
UMZC6.8N	200	6.47 to 7.14	5	3	1	0	UMD3	
STZC6.8N	200	6.47 to 7.14	5	3	1	0	SMD3	
RSB12Z	100	9.6 to 14.4	5	1	1	0	VMD3	
RSB12W	150	9.6 to 14.4	5	1	1	0	EMD3	
EMZT6.8E	150	6.47 to 7.14	5	7	1	0	EMD5	
New RSB6.8JS2	150	6.00 to 8.00	5	1	1	0	EMD6	
RSB12JS2	150	9.6 to 14.4	5	1	1	0	EMD6	
New RSAC6.8CS	100	6.70 to 7.33	5	0.3	1	0	VMN2	
New RSAC16CS	100	16.49 to 17.51	5	0.3	1	0	VMN2	

\* : (3), (6)pin must be open when using.


### ESD Protection Devices (TVS)

Product No.		Absolute Maximum Ratings (Ta=25°C)	Electrical Characteristics (Ta=25°C)		Peak Pulse Power (W) (tp=10×1000μs)	Package	Equivalent Circuit Diagram
Part No.	Packaging Symbol	P (mW)	Vz (V)	Iz (mA)			
<b>RSA6.1J4</b>	T2R	150	6.10 to 7.20	1	10	EMD5	
<b>RSA6.1EN</b>	TR	200	6.10 to 7.20	1	30	UMD5	
<b>RSA6.1U5</b>	T108	200	6.10 to 7.20	1	30	SMD6	
<b>RSA5M</b>	TR	700	6.4 to 7.0	10	200	PMDU	
<b>RSA12M</b>	TR	700	13.3 to 14.7	1	200	PMDU	
<b>RSA5L</b>	TE25	1,000	6.45 to 7.14	10	600	PMDS	
<b>RSA12L</b>	TE25	1,000	13.3 to 14.7	1	600	PMDS	
<b>RSA30L</b>	TE25	1,000	28.5 to 31.5	1	600	PMDS	

### Bidirectional Zener Diodes

Part No.	Absolute Maximum Ratings (Ta=25°C)	Electrical Characteristics (Ta=25°C)		Remark	Package	Equivalent Circuit Diagram
	P (mW)	Vz (V)	Iz (mA)			
<b>RSB6.8CS</b>	100	5.78 to 7.82	1		VMN2	
<b>RSB6.8G</b>	100	5.78 to 7.82	1		VMD2	
<b>RSB5.6S</b>	150	4.76 to 6.44	1		EMD2	
<b>RSB6.8S</b>	150	5.78 to 7.82	1		EMD2	
<b>RSB16V</b>	200	14.4 to 17.6	1	IEC61000-4-2	UMD2	
<b>RSB18V</b>	200	16.2 to 19.8	1	150pF, 330Ω	UMD2	
<b>RSB27V</b>	200	26.2 to 32.0	1	Contact 8kV	UMD2	
<b>RSB16VA</b>	500	14.4 to 17.6	1	Air 15kV	TUMD2	
<b>RSB6.8F2</b>	200	5.78 to 7.82	1		UMD3	
<b>RSB16F2</b>	200	14.4 to 17.6	1		UMD3	
<b>RSB18F2</b>	200	16.2 to 19.8	1		UMD3	
<b>RSB27F2</b>	200	26.2 to 32.0	1		UMD3	

### Ultra-Low Capacitance Bidirectional Zener Diodes

Product No.		Absolute Maximum Ratings (Ta=25°C)	Electrical Characteristics (Ta=25°C)				Package	Equivalent Circuit Diagram	
Part No.	Packaging Symbol	P (mW)	Vz (V)	Iz (mA)	Ct (pF)	f (MHz)			Vr (V)
<b>RSBC6.8CS</b>	TR	100	6.62 to 7.24	5	8	1	0	VMN2	

# Dimensions

(Unit:mm)

● Surface Mount Type

● Surface Mount, Glass Type

● Leaded Type

<p><b>GMD2</b></p>	<p><b>VMN2</b></p>	<p><b>LLDS (LL-34)</b></p>			<p><b>MSD (DO-34)</b></p>
<p><b>VMD2</b></p> <p>Each lead has same dimensions</p>	<p><b>VMD3</b></p>	<p><b>KMD2</b></p>			<p><b>MSR (DO-41mini)</b></p>
<p><b>EMD2 (SOD-523) (SC-79)</b></p> <p>Each lead has same dimensions</p>	<p><b>EMD3 (SOT-416) (SC-75A)</b></p>	<p><b>EMD4 (SC-75A)</b></p> <p>Each lead has same dimensions</p>	<p><b>EMD5 (SC-75A)</b></p> <p>Each lead has same dimensions</p>	<p><b>EMD6 (SC-75A)</b></p> <p>Each lead has same dimensions</p>	
<p><b>UMD2 (SOD-323) (SC-961)</b></p> <p>Each lead has same dimensions</p>	<p><b>UMD3 (SOT-323) (SC-70)</b></p> <p>Each lead has same dimensions</p>	<p><b>UMD4 (SOT-343) (SC-82)</b></p> <p>Each lead has same dimensions</p>	<p><b>UMD5 (SOT-353) (SC-88A)</b></p> <p>Each lead has same dimensions</p>	<p><b>UMD6 (SOT-363) (SC-88)</b></p> <p>Each lead has same dimensions</p>	
<p><b>SMD3 (SOT-346) (SC-59)</b></p> <p>Each lead has same dimensions</p>	<p><b>SMD5 (SC-74A)</b></p> <p>Each lead has same dimensions</p>	<p><b>SMD6 (SOT-457) (SC-74)</b></p> <p>Each lead has same dimensions</p>	<p><b>TUMD2</b></p> <p>Each lead has same dimensions</p>	<p><b>TUMD5</b></p> <p>Each lead has same dimensions</p>	
<p><b>TSMD5</b></p> <p>Each lead has same dimensions</p>	<p><b>PMDU (SOD-123)</b></p> <p>Each lead has same dimensions</p>	<p><b>PMDT</b></p> <p>Each lead has same dimensions</p>	<p><b>PMDS (SOD-106)</b></p> <p>Each lead has same dimensions</p>	<p><b>HMD8</b></p>	
<p><b>CPD (TO-252) (SC-63)</b></p> <p>Each lead has same dimensions</p>		<p><b>LPDS</b></p>		<p><b>TO-220FN</b></p> <p>Each lead has same dimensions</p>	

< > : JEDEC Code, ( ) : JEITA Code

\* Please refer to ROHM's website for additional information (i.e. tolerance, specifications)

# MEMO

# MEMO

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