

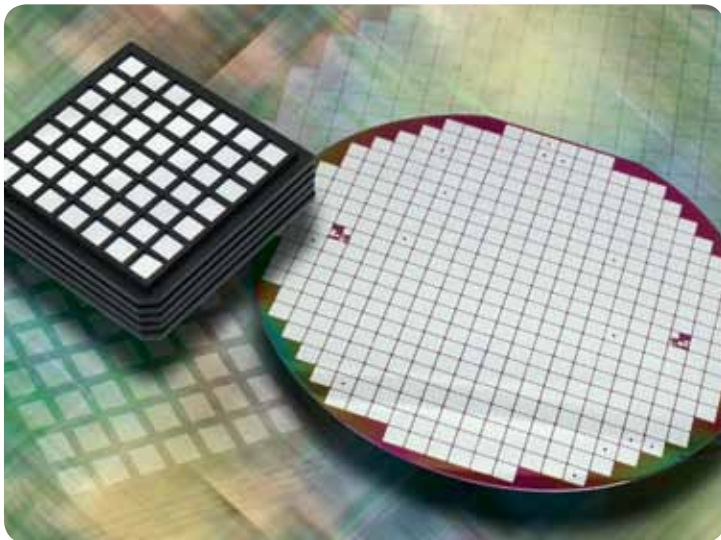


BARE DIE

Small-Signal and Power Diodes



Bare Die Products in Several Versions to Accommodate a Wide Variety of Assembly Techniques and Applications



Diodes - A Wide Range of Bare Die and Wafer Form Products

- Schottky Diodes
- Standard/Fast Diodes
- Ultrafast Diodes
- Transient Voltage Suppressors
- ESD Protection
- Switching Diodes
- Zener Diodes
- Thyristors

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RESOURCES

- For technical support contact diewafer@vishay.com
- For more information contact DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

One of the World's Largest Manufacturers of Discrete Semiconductors and Passive Components





Bare Die

Vishay supplies a wide range of small-signal and power diodes in bare die and wafer form:

- Schottky diodes
- Fred Pt® Ultrafast diodes
- HEXFRED® Ultrafast diodes
- TVS diodes
- Zener diodes
- ESD protection diodes
- Switching diodes
- High Voltage Standard/Fast diodes
- Thyristors

Packing Types

Vishay delivers its bare die products in several versions to accommodate a wide variety of assembly techniques and applications:

- Unsawn wafer: the wafers are delivered in a sealed bag and die are not singulated
- Sawn wafer on film: the wafer is sawn and supplied on blue tape in a plastic frame
- Die in tape and reel: each die is located in a pocket on a continuous antistatic coated reel
- Waffle pack: each die is in a tray

Die Usage Basic Guidelines

Bare die products require careful handling and storage as well as optimized assembly processes and tools to avoid damage and deviations from expected performance. The following hints are based on Vishay's many years of experience in manufacturing and assembling semiconductor devices.

Die Attach

Silicon cannot be joined to copper without the occurrence of thermal shock due to the significant difference in thermal conductivity between these materials. For this reason, and to ensure optimized electrical conductivity, Vishay wafers are coated on the back side with two or three metallic solderable layers which are suitable for a wide range of solders, ranging from solder alloys to conductive epoxies. Fluxes are not recommended for solders because residuals can contaminate the surface of the die, and cause voids under the die thus compromising heat dissipation and electrical performance. In general the safest approach is to adopt the same materials Vishay uses in the assembly of die into discrete packaged parts. Vishay experts can help you choose the best materials for your assembly requirements.

Wire Bonding

Vishay die are typically covered with an aluminum metalization which contains a small percentage of silicon (~1 %) for ultrasonic bonding or thermosonic bonding depending on whether aluminum or gold wires are adopted. The application of wires in parallel and stitch bonding provides protection against surge current in the vicinity of soldered chips. Several platforms are also provided with solderable metalization on the anode side which is suitable for solder attach.



BARE DIE

Small-Signal and Power Diodes



Diodes - A Wide Range of Bare Die and Wafer Form Products

Bare Die Naming Rules for Schottky, FRED Pt®, HEXFRED® and TVS Diodes

SC	105	H	100	A	5	P	R	N
Product Type	Chip size in mils	Process	Voltage	Surface Metal	Wafer Diameter	Quality Level (if defined)	Packaging	Passivation (valid for FRED Pt® only)
SX = Planar Schottky Fab1		For Schottky R = T _J max. 125 °C S = T _J max. 150 °C H = T _J max. 175 °C T = Gen5 Schottky		A = Wirebondable Topside: Ti/Al, Ti/Ni/Al or Pure Al or Al(1%Si) Backside: Ti/Ni/Ag or CrNiAg	4 = 4" 5 = 5" 6 = 6"	P = Packaged Die for T1 O = Packaged Die for T2 N = Non-packaged Die T = Known Tested Die G = Known Good Die	B = Inked probed unsawn wafer (wafer in box) P = Probed die in wafer pack D = Probed die in wafer pack (HEXFRED only)	none = SiO2 N = Silicon Nitride
TY = TMBS® Schottky Fab1				S = Solderable Topside: Ni/Au or Ti/Ni/Ag Backside: Ni/Au or Ti/Ni/Ag or CrNiAg			F = Inked probed sawn wafer on film	Thickness (valid for Planar Schottky Fab2 only) none = standard 14 mils T = 10 mils
TV = PAR® TVS		For TVS PAR B = Named as Vbr T = Named as Vwm L = Load Dump Rectifier named as Vbr		M = Wirebondable for Medical Topside: Ti/Al or Pure Al Backside: Ti/Ni/Au			R = Probed die in tape and 13" reel T = Probed die in 12 mm tape and 4 mm pitch, 7" reel (for 35~75 mil chip)	
SC = Planar Schottky Fab2				Note: Ti(0.12um)/ Ni(0.18um)/ Au(0.05um)			U = Probed die in 12 mm tape and 4 mm pitch, 7" reel (for 76~110 mil chip) V = Probed die in 12 mm tape and 8 mm pitch, 7" reel (for 111~300 mil chip) C = Probed die in plastic can (bulk)	
FD = FRED Pt Ultrafast		For FRED Pt This is SPEED code W = 14 ns to 17 ns H = 18 ns to 35 ns U = 36 ns to 50 ns C = 51 ns to 70 ns S = 71 ns to 90 ns L = 91 ns to 120 ns T = 121 ns to 200 ns N > 200 ns						
H2 = HEXFRED Ultrafast Gen2		For HEXFRED H = Gen2 D = Gen3 E = Gen3						
H3 = HEXFRED Ultrafast Gen3								

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Bare Die Naming Rule for High Voltage Standard/Fast Diodes

VS	180	DM	12	C	S02	CB
Vishay Semiconductor	Chip Size in Mils	Process	Voltage Code x 100	Surface Metal	Speed Code	Packaging
		DM = Standard Recovery Diode - Glassivated Moat LM = Fast Recovery Diode- Glassivated Moat	'06 = 600 V '08 = 800 V '10 = 1000 V '12 = 1200 V '16 = 1600 V	C=Wirebondable Topside: 100% Al Backside: Cr/Ni/Ag H=Solderable Topside: Cr/Ni/Ag Backside: Cr/Ni/Ag	None=Standard Recovery S02=200ns S05=500ns	CB=Probed Uncut Die (Wafer In Box) None=Probed Die in Chip Carrier



BARE DIE

Small-Signal and Power Diodes



Diodes - A Wide Range of Bare Die and Wafer Form Products

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DIODES Bare Die Naming Rule for Thyristors

VS	180	B	G	12	D	CB
Vishay Semiconductor	Chip Size in Mills	Surface Metal B = Wirebondable Topside: 100% Al Backside: Cr/Ni/Ag S = Solderable Topside: Cr/Ni/Ag Backside: Cr/Ni/Ag	Passivation Process G = Glassivated Mesa	Voltage Code x 100 '06 = 600 V '12 = 1200 V '16 = 1600 V	Metallization D = Wirebondable Topside: 100% Al Backside: Cr/Ni/Ag H = Solderable Topside: Cr/Ni/Ag Backside: Cr/Ni/Ag	Packaging CB=Probed Uncut Die (Wafer In Box) None=Probed Die in Chip Carrier



BARE DIE
Schottky



Diodes - A Wide Range of Bare Die and Wafer Form Products

Schottky Diode Features

Schottky diodes are designed for very fast switching between the forward and the reverse direction of the diode. Their metal-semiconductor junction provides a low forward voltage drop compared to p-n diodes. Schottky diodes can be used for general-purpose applications but their low voltage drops at forward biases makes them useful whenever conduction losses are key to ensure high efficiency and for protection of MOS devices.

Vishay Portfolio

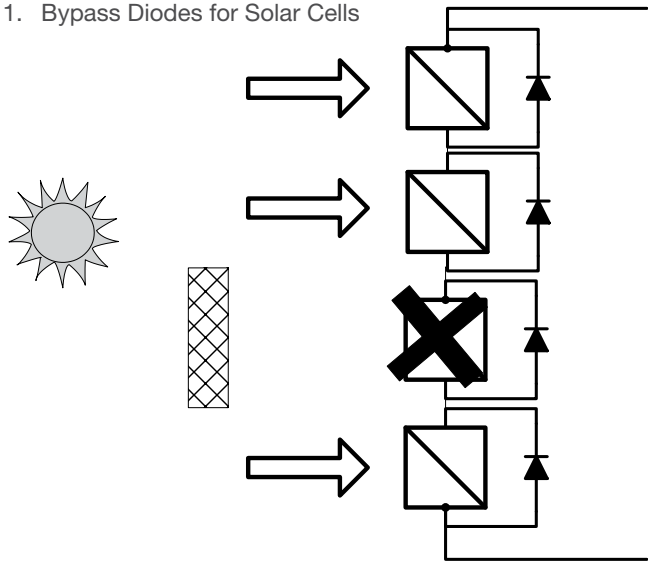
- Vishay offers one of broadest range of Schottky diodes in the market, ranging from 15 V to 200 V
- Maximum junction temperatures from 125 °C to 175 °C are available thanks to a variety of proprietary barrier metals
- Vishay technologies include products optimized for low conduction losses as well as products with extreme low reverse leakage current:
 - TMBS® Trench MOS Barrier Schottky
 - Gen2 (Planar) and Gen5 (Trench)
- Die are available with bondable or solderable metalizations

Typical Applications for Schottky Diodes

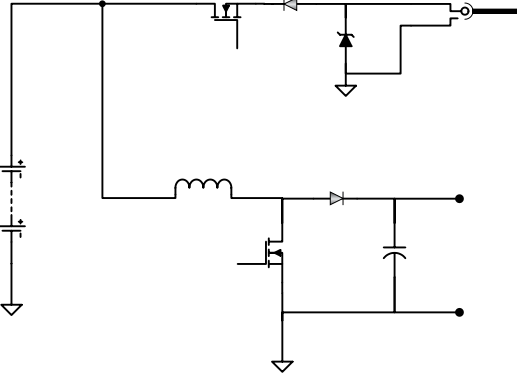
1. Bypass Diodes for Solar Cells
2. Reverse Polarity Battery Protection
3. Battery Chargers and Switchmode Power Supplies

Typical Circuits

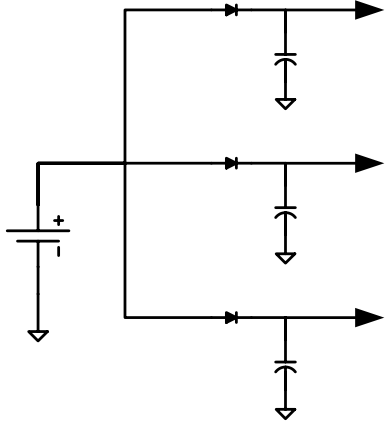
1. Bypass Diodes for Solar Cells



2. Reverse Polarity Battery Protection



3. Battery Chargers and Switchmode Power Supplies





Schottky Die/N List										
Part Number ⁽¹⁾	Optimized for	T _J max (°C)	I _{F(AV)} (A) ⁽²⁾	V _R (V)	V _F at 125 °C (V) ⁽³⁾	Die Size (mils)	Die Thickness (mils)	Front Side Metal	Back Side Metal	Wafer Diameter (inches)
VS-SC036R015S5x	Low V _F	125	1	15	0.32	36 x 36	14	Solderable	Solderable	5
VS-SC125R015S5x	Low V _F	125	9	15	0.25 at 75 °C	125 x 125	14	Solderable	Solderable	5
VS-SC200R015S5x	Low V _F	125	60	15	0.43 at 75 °C	200 x 200	14	Solderable	Solderable	5
VS-SC036S020S5x	Low V _F	150	1	20	0.35	36 x 36	14	Solderable	Solderable	5
VS-SC125S020A5x	Low V _F	150	15	20	0.51 at 40 A at 25 °C	125 x 125	10	Bondable	Solderable	5
VS-SC036S030A5x	Low V _F	150	1	30	0.50	36 x 36	14	Bondable	Solderable	5
VS-SC036S030S5x	Low V _F	150	1	30	0.50	36 x 36	10	Solderable	Solderable	5
VS-SC070S030A5x	Low V _F	150	5	30	0.49	70 x 92	14	Bondable	Solderable	5
VS-SC105S030A5x	Low V _F	150	15	30	0.53	105 x 125	14	Bondable	Solderable	5
VS-SC170S030A5x	Low V _F	150	30	30	0.51	115 x 170	14	Bondable	Solderable	5
VS-SC200S030A5x	Low V _F	150	60	30	0.58	200 x 200	14	Bondable	Solderable	5
VS-SC200S030S5x	Low V _F	150	60	30	0.47	200 x 200	14	Solderable	Solderable	5
VS-SC275S030S5x	Low V _F	150	80	30	0.55 at 150 A at 25 °C	275 x 275	14	Solderable	Solderable	5
VS-SC036S045A5x	Low V _F	150	1	45	0.56	36 x 36	14	Bondable	Solderable	5
VS-SC036S045S5x	Low V _F	150	1	45	0.49	36 x 36	14	Solderable	Solderable	5
VS-SC050H045A5x	Low I _R	175	2	45	Not Av.	50 x 50	14	Bondable	Solderable	5
VS-SC060S045A5x	Low V _F	150	3	45	0.49 at 3 A	60 x 60	14	Bondable	Solderable	5
VS-SC060S045S5x	Low V _F	150	3	45	0.43 at 2 A	60 x 60	14	Solderable	Solderable	5
VS-SC070S045A5x	Low V _F	150	5	45	0.65	70 x 92	14	Bondable	Solderable	5
VS-SC070H045A5x	Low I _R	175	5	45	0.64	70 x 92	14	Bondable	Solderable	5
SX073H045A40x	Low I _R	175	7.5	45	0.73 at 25 °C	73 x 73	11	Bondable	Solderable	4
SX073H045S4Px	Low I _R	175	7.5	45	0.57 at 25 °C	73 x 73	11	Solderable	Solderable	4
SX085H045S4Px	Low I _R	175	10	45	0.75 at 25 °C	85 x 85	11	Solderable	Solderable	4
VS-SC105H045A5x	Low I _R	175	15	45	0.68	105 x 125	14	Bondable	Solderable	5
VS-SC105H045S5x	Low I _R	175	15	45	0.44	105 x 125	14	Solderable	Solderable	5
VS-SC105S045A5x	Low V _F	150	15	45	0.50	105 x 125	14	Bondable	Solderable	5

(1) In the Part Number “x” stands for the delivery version. Contact Vishay to check which among Die-on-Wafer, Die-on-Film, Die-in-tape and reel, Die-in-Waffle-Pack are available for chosen part number.

(2) At I_R of discrete packaged part or based on technology. Review datasheets for details.

(3) Specs taken from datasheet of packaged part or from measurements in package.

Schottky Die/N List

Part Number ⁽¹⁾	Optimized for	T _J max (°C)	I _{F(AV)} (A) ⁽²⁾	V _R (V)	V _F at 125 °C (V) ⁽³⁾	Die Size (mils)	Die Thickness (mils)	Front Side Metal	Back Side Metal	Wafer Diameter (inches)
VS-SC105S045S5x	Low V _F	150	15	45	0.42	105 x 125	10 / 14	Solderable	Solderable	5
VS-SC125H045A5x	Low I _R	175	15	45	0.62 at 25 °C	125 x 125	14	Bondable	Solderable	5
VS-SC125H045S5x	Low I _R	175	15	45	0.62 at 25 °C	125 x 125	14	Solderable	Solderable	5
SX110H045A40x	Low I _R	175	15	45	0.76 at 25 °C	110 x 110	11	Bondable	Solderable	4
SX110H045S4Px	Low I _R	175	16	45	0.66 at 25 °C	110 x 110	11	Solderable	Solderable	4
VS-SC170H045A5x	Low I _R	175	30	45	0.53	115 x 170	14	Bondable	Solderable	5
VS-SC180H045S5x	Low I _R	175	40	45	0.61 at 30 A	150 x 180	14	Solderable	Solderable	5
VS-SC180S045A5x	Low V _F	150	40	45	0.56	150 x 180	14	Bondable	Solderable	5
VS-SC200H045S5x	Low I _R	175	60	45	0.69	200 x 200	14	Solderable	Solderable	5
VS-SC200S045S5x	Low V _F	150	60	45	0.69	200 x 200	14	Solderable	Solderable	5
VS-SC036S060S5x	Low V _F	150	1	60	0.57	36 x 36	14	Solderable	Solderable	5
VS-SC060S060A5x	Low V _F	150	3	60	0.65 at 6 A	60 x 60	14	Bondable	Solderable	5
VS-SC060S060S5x	Low V _F	150	3	60	0.43	60 x 60	14	Solderable	Solderable	5
TY059S060A60x	Low V _F	150	5	60	0.7 at 25 °C	59 x 59	11	Bondable	Solderable	6
SX073H060A40x	Low I _R	175	7.5	60	0.73 at 25 °C	73 x 73	11	Bondable	Solderable	4
SX073H060S4Px	Low I _R	175	7.5	60	0.73 at 25 °C	73 x 73	11	Solderable	Solderable	4
TY078S060A6Px	Low V _F	150	10	60	0.65 at 25 °C	78 x 78	11	Bondable	Solderable	6
VS-SC105S060A5x	Low V _F	150	15	60	0.71	105 x 125	14	Bondable	Solderable	5
VS-SC125S060A5x	Low V _F	150	15	60	0.60 at 25 °C	125 x 125	10	Bondable	Solderable	5
SX110H060S4Px	Low I _R	175	15	60	0.68 at 25 °C	110 x 110	11	Solderable	Solderable	4
TY085S060A60x	Low V _F	150	15	60	0.7 at 25 °C	85 x 85	11	Bondable	Solderable	6
SX128H060S40x	Low I _R	175	20	60	0.69 at 25 °C	128 x 128	11	Solderable	Solderable	4
SC180S060A5x	Low V _F	150	40	60	0.64	150 x 180	14	Bondable	Solderable	5
BDBAS70-BDx	Small signal	125	0.015	70	1.00 at 25 °C	0.24mm x 0.24mm	6	Bondable	Solderable	4
TY056S080A60x	Low V _F	150	5	80	0.72 at 25 °C	56 x 56	11	Bondable	Solderable	6
TY073S080A6Px	Low V _F	150	10	80	0.81 at 25 °C	73 x 73	11	Bondable	Solderable	6

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(2) At I_r of discrete packaged part or based on technology. Review datasheets for details.

(3) Specs taken from datasheet of packaged part or from measurements in package.



Schottky Die/N List

Part Number ⁽¹⁾	Optimized for	T _J max (°C)	I _{F(AV)} (A) ⁽²⁾	V _R (V)	V _F at 125 °C (V) ⁽³⁾	Die Size (mils)	Die Thickness (mils)	Front Side Metal	Back Side Metal	Wafer Diameter (inches)
TY085S080A60x	Low V _F	150	15	80	0.82 at 25 °C	85 x 85	11	Bondable	Solderable	6
TY102S080A60x	Low V _F	150	15	80	0.95 at 25 °C	102 x 102	11	Bondable	Solderable	6
VS-SC036H100S5x	Low I _R	175	1	100	0.68	36 x 36	14	Solderable	Solderable	5
SX050H100S4Px	Low I _R	175	1	100	0.77 at 25 °C	50 x 50	11	Solderable	Solderable	4
VS-SC050H100A5x	Low I _R	175	2	100	0.79	50 x 50	14	Bondable	Solderable	5
SX061H100S4Px	Low I _R	175	2	100	0.79 at 25 °C	61 x 61	11	Solderable	Solderable	4
VS-SC060H100A5x	Low I _R	175	3	100	0.74 at 6A	60 x 60	14	Bondable	Solderable	5
VS-SC060H100S5x	Low I _R	175	3	100	0.62	60 x 60	14	Solderable	Solderable	5
TY045S100S60x	Low V _F	150	3	100	0.8 at 25 °C	45 x 45	12	Solderable	Solderable	6
TY054S100S60x	Low V _F	150	3	100	0.7 at 25 °C	54 x 54	12	Solderable	Solderable	6
VS-SC070H100A5x	Low I _R	175	5	100	0.78	70 x 92	14	Bondable	Solderable	5
SX093H100A40x	Low I _R	175	5	100	0.76 at 25 °C	93 x 93	11	Bondable	Solderable	4
TY066S100A60x	Low V _F	150	5	100	0.85 at 25 °C	66 x 66	11	Bondable	Solderable	6
SX067H100S4Px	Low I _R	175	8	100	0.9 at 25 °C	67 x 67	12	Solderable	Solderable	4
TY080S100S6Px	Low V _F	150	8	100	0.68 at 25 °C	80 x 80	12	Solderable	Solderable	6
TY080S100A60x	Low V _F	150	10	100	0.73 at 25 °C	80 x 80	11	Bondable	Solderable	6
TY093S100S6Px	Low V _F	150	10	100	0.68 at 25 °C	93 x 93	12	Solderable	Solderable	6
TY102S100S60x	Low V _F	150	12	100	0.7 at 25 °C	102 x 102	12	Solderable	Solderable	6
VS-SC105H100A5x	Low I _R	175	15	100	0.69	105 x 125	14	Bondable	Solderable	5
VS-SC105H100S5x	Low I _R	175	15	100	0.52	105 x 125	14	Solderable	Solderable	5
VS-SC125H100A5x	Low I _R	175	15	100	0.86 at 25 °C	125 x 125	14	Bondable	Solderable	5
VS-SC125H100S5x	Low I _R	175	15	100	0.86 at 25 °C	125 x 125	14	Solderable	Solderable	5
SX119H100S4Px	Low I _R	175	15	100	0.82 at 25 °C	119 x 119	11	Solderable	Solderable	4
TY093S100A60x	Low V _F	150	15	100	0.8 at 25 °C	93 x 93	11	Bondable	Solderable	6
TY102S100A60x	Low V _F	150	20	100	0.81 at 25 °C	102 x 102	11	Bondable	Solderable	6
TY119S100A60x	Low V _F	150	20	100	0.73 at 25 °C	119 x 119	11	Bondable	Solderable	6
VS-SC180H100A5x	Low I _R	175	40	100	0.75	150 x 180	14	Bondable	Solderable	5

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(2) At I_F of discrete packaged part or based on technology. Review datasheets for details.

(3) Specs taken from datasheet of packaged part or from measurements in package.



Schottky Die/N List

Part Number ⁽¹⁾	Optimized for	T _J max (°C)	I _{F(AV)} (A) ⁽²⁾	V _R (V)	V _F at 125 °C (V) ⁽³⁾	Die Size (mils)	Die Thickness (mils)	Front Side Metal	Back Side Metal	Wafer Diameter (inches)
VS-SC180H100S5x	Low I _R	175	40	100	0.75	150 x 180	14	Solderable	Solderable	5
TY144S100A60x	Low V _F	150	40	100	0.78 at 25 °C	144 x 144	11	Bondable	Solderable	6
VS-SC200H100A5x	Low I _R	175	60	100	0.76	200 x 200	14	Bondable	Solderable	5
VS-SC200H100S5x	Low I _R	175	60	100	0.79	200 x 200	14	Solderable	Solderable	5
VS-SC275H100S5x	Low I _R	175	80	100	0.77 at 60A at 25 °C	275 x 275	14	Solderable	Solderable	5
TY080S120S6Px	Low V _F	150	8	120	0.84 at 25 °C	80 x 80	12	Solderable	Solderable	6
TY080S120A60x	Low V _F	150	10	120	0.9 at 25 °C	80 x 80	11	Bondable	Solderable	6
TY102S120S6Px	Low V _F	150	12	120	0.8 at 25 °C	102 x 102	12	Solderable	Solderable	6
TY093S120A60x	Low V _F	150	15	120	0.97 at 25 °C	93 x 93	11	Bondable	Solderable	6
TY102S120A60x	Low V _F	150	15	120	1.28 at 25 °C	102 x 102	11	Bondable	Solderable	6
TY119S120A60x	Low V _F	150	15	120	1.1 at 25 °C	119 x 119	11	Bondable	Solderable	6
VS-SC070H150A5x	Low I _R	175	5	150	0.86	70 x 92	14	Bondable	Solderable	5
SX081H150A40x	Low I _R	175	5	150	0.88 at 25 °C	81 x 81	11	Bondable	Solderable	4
TY056S150A60x	Low V _F	150	5	150	1.41 at 25 °C	56 x 56	11	Bondable	Solderable	6
TY080S150A60x	Low V _F	150	10	150	1.2 at 25 °C	80 x 80	11	Bondable	Solderable	6
VS-SC105H150A5x	Low I _R	175	15	150	0.77	105 x 125	14	Bondable	Solderable	5
TY093S150A60x	Low V _F	150	15	150	1.36 at 25 °C	93 x 93	11	Bondable	Solderable	6
TY102S150A60x	Low V _F	150	20	150	1.43 at 25 °C	102 x 102	11	Bondable	Solderable	6
VS-SC200H150A5x	Low I _R	175	60	150	0.85	200 x 200	14	Bondable	Solderable	5
TY045S200S60x	Low V _F	150	2	200	1.23 at 25 °C	45 x 45	11	Solderable	Solderable	6
TY054S200S60x	Low V _F	150	3	200	1.4 at 25 °C	54 x 54	11	Solderable	Solderable	6
TY056S200S60x	Low V _F	150	3	200	1.2 at 25 °C	56 x 56	11	Solderable	Solderable	6
TY066S200A60x	Low V _F	150	5	200	1.6 at 25 °C	66 x 66	11	Bondable	Solderable	6
TY080S200A60x	Low V _F	150	10	200	1.7 at 25 °C	80 x 80	11	Bondable	Solderable	6
TY093S200A60x	Low V _F	150	10	200	1.6 at 25 °C	93 x 93	11	Bondable	Solderable	6
TY119S200A60x	Low V _F	150	15	200	0.95 at 25 °C	119 x 119	11	Bondable	Solderable	6

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(2) At I_r of discrete packaged part or based on technology. Review datasheets for details.

(3) Specs taken from datasheet of packaged part or from measurements in package.



BARE DIE
Ultrafast



Diodes - A Wide Range of Bare Die and Wafer Form Products

Ultrafast Diode Features

These diodes are specifically designed to work in switching operations. Their silicon epitaxial planar technology features a design optimized for reliable performance. They are the best diodes for coupling with IGBTs in power supply inverter stages and for boosting the voltage in PFC stage.

Vishay Portfolio

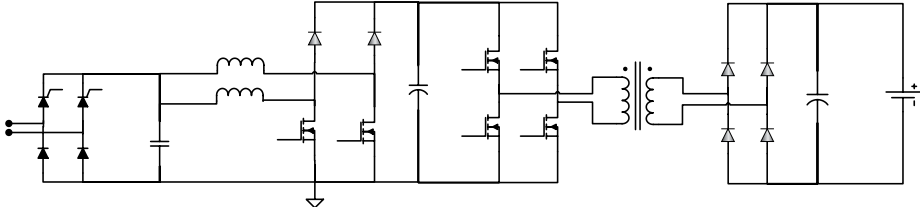
- Vishay offers the industry’s broadest range of Ultrafast diodes in the market, ranging from 200 V to 1200 V
- 150 °C (HEXFRED®) and 175 °C (FRED Pt®) maximum junction temperatures are available
- Vishay technologies include products optimized for low conduction losses as well as products for reduced switching losses, all with optimized softness to reduce EMI generation and reduce/eliminate the need for snubbers
- Our proprietary technology enables several Vf/Trr trade-offs for the same die size, enabling all possible speed requirements
- Die are available with bondable metalization

Typical Applications for Schottky Diodes

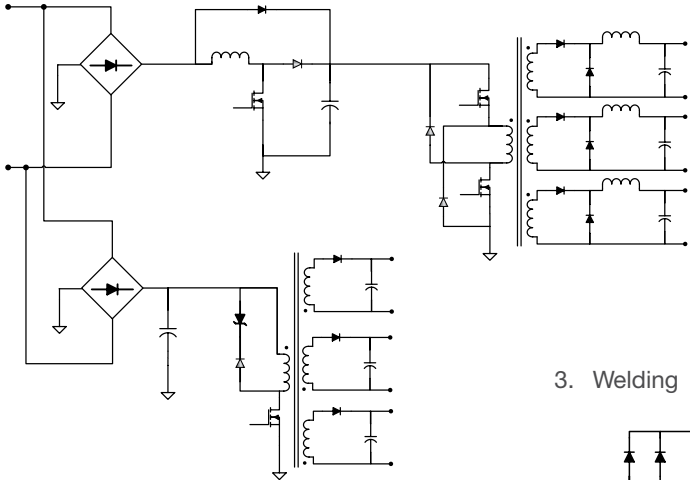
1. High-Voltage High-Frequency Power Management and Battery Chargers
2. Power Supplies
3. Welding

Typical Circuits

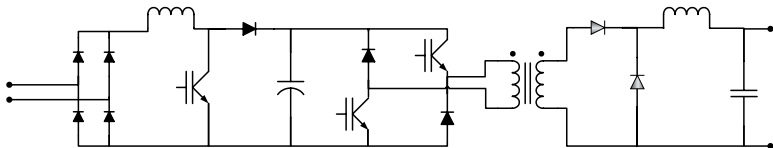
1. High-Voltage, High-Frequency Power Management and Battery Charges



2. Power Supplies



3. Welding





FRED Pt® Die P/N List

Part Number ⁽¹⁾	Optimized for	I _{F(AV)} (A) ⁽²⁾	V _R (V)	V _F max at 25 °C (V) ⁽³⁾	t _r typ at 25 °C (ns) ⁽⁴⁾	Die Size (mils ²)	Front Side Metal	Back Side Metal	Die Thickness (mils)	Wafer Diameter (inches) ⁽⁵⁾
VS-FD059H06A5x	Switching - Low Q _{rr}	1	600	1.45	28	59 x 59	Bondable	Solderable	14	5
VS-FD059U06A5x	Sw. / Cond. = 50/ 50	1	600	1.25	37	59 x 59	Bondable	Solderable	14	5
VS-FD075H06A5x	Switching - Low Q _{rr}	3	600	2.4	23	75 x 75	Bondable	Solderable	14	5
VS-FD075T06A5x	Conduction - Low V _F	3	600	0.925 at 1 A	60	75 x 75	Bondable	Solderable	14	5
VS-FD100H06A5x	Switching - Low Q _{rr}	8	600	2.4	25	100 x 100	Bondable	Solderable	14	5
VS-FD100N06A5x	Conduction - Low V _F	8	600	1.1	Not av.	100 x 100	Bondable	Solderable	14	5
VS-FD100T06A5x	Conduction - Low V _F	8	600	1.05	170	100 x 100	Bondable	Solderable	14	5
VS-FD100U06A5x	Sw. / Cond. = 50/ 50	8	600	1.9	27	100 x 100	Bondable	Solderable	14	5
VS-FD100W06A5x	Switching - Low Q _{rr}	8	600	3	17	100 x 100	Bondable	Solderable	14	5
VS-FD120H06A5x	Switching - Low Q _{rr}	15	600	2.2	29	120 x 120	Bondable	Solderable	14	5
VS-FD120T06A5x	Conduction - Low V _F	15	600	1.05	220	120 x 120	Bondable	Solderable	14	5
VS-FD120W06A5x	Switching - Low Q _{rr}	15	600	3.2	22	120 x 120	Bondable	Solderable	14	5
VS-FD160H06A5x	Switching - Low Q _{rr}	30	600	2.6	31	160 x 160	Bondable	Solderable	14	5
VS-FD200S06A5x	Sw. / Cond. = 50/ 50	60	600	1.68	81	200 x 200	Bondable	Solderable	14	5
VS-FD090U04A5x	Sw. / Cond. = 50/ 50	8	400	1.3	43	90 x 90	Bondable	Solderable	14	5
VS-FD120U04A5x	Sw. / Cond. = 50/ 50	15	400	1.25	46	120 x 120	Bondable	Solderable	14	5
VS-FD160S04A5x	Sw. / Cond. = 50/ 50	30	400	1.32	72	160 x 160	Bondable	Solderable	14	5
VS-FD200S04A5x	Sw. / Cond. = 50/ 50	60	400	1.3	87	200 x 200	Bondable	Solderable	14	5
VS-FD100H03A5x	Switching - Low Q _{rr}	8	300	1.25	27	100 x 100	Bondable	Solderable	14	5
VS-FD110H03A5x	Switching - Low Q _{rr}	10	300	1.25	31	110 x 110	Bondable	Solderable	14	5
VS-FD120H03A5x	Switching - Low Q _{rr}	15	300	1.25	32	120 x 120	Bondable	Solderable	14	5
VS-FD160H03A5x	Switching - Low Q _{rr}	30	300	1.25	38	160 x 160	Bondable	Solderable	14	5
VS-FD040H02A5x	Switching - Low Q _{rr}	0.3	200	1	22	40 x 40	Bondable	Solderable	14	5
VS-FD046H02A5x	Switching - Low Q _{rr}	3	200	1	19	46 x 60	Bondable	Solderable	14	5
VS-FD080H02A5x	Switching - Low Q _{rr}	3	200	0.9	26	80 x 80	Bondable	Solderable	14	5
VS-FD087H02A5x	Switching - Low Q _{rr}	8	200	0.975	20	87 x 87	Bondable	Solderable	14	5
VS-FD122H02A5x	Switching - Low Q _{rr}	15	200	1.05	22	122 x 122	Bondable	Solderable	14	5
VS-FD160H02A5x	Switching - Low Q _{rr}	30	200	1.09	26	160 x 160	Bondable	Solderable	14	5
VS-FD200H02A5x	Switching - Low Q _{rr}	60	200	1.13	32	200 x 200	Bondable	Solderable	14	5

(1) In the Part Number “x” stands for the delivery version. Contact Vishay to check which among Die-on-Wafer, Die-on-Film, Die-in-Tape and reel, Die-in-Waffle-Pack are available for chosen part number.

(2) Rated in discrete package or based on technology.

(3) At I_F of discrete packaged part or based on technology. Review datasheets for details.

(4) Measured in packaged part. For test setup, refer to the datasheet of packaged part.

(5) 6" wafers are available, contact Vishay.



HEXFRED® Die P/N List

Part Number ⁽¹⁾	Optimized for	$I_{F(AV)}$ (A) ⁽²⁾	V_R (V)	V_F max at 25 °C (V) ⁽³⁾	t_r typ at 25 °C (ns) ⁽⁴⁾	Die Size (mils ²)	Front Side Metal	Back Side Metal	Die Thickness (mils) (± 1 mil)	Wafer Diameter (inches) ⁽⁵⁾
VS-H3090D12A5x	APD	5	1200	1.95 at 2 A	50	90 x 91	Bondable	Solderable	11.4	5
VS-H2107H12A5x	BOOST diode	6	1200	3	not av.	107 x 130	Bondable	Solderable	14.8	5
VS-H2115H12A5x	BOOST diode	8	1200	3.3	not av.	115 x 155	Bondable	Solderable	14.8	5
VS-H3107D12A5x	APD	8	1200	1.58 at 2.5 A	51	107 x 130	Bondable	Solderable	11.4	5
VS-H3115D12A5x	APD	15	1200	2 at 5 A	52	115 x 155	Bondable	Solderable	11.4	5
VS-H2169H12A5x	BOOST diode	16	1200	3	not av.	169 x 220	Bondable	Solderable	14.8	5
VS-H3169D12A5x	APD	25	1200	1.5 at 5 A	60	169 x 220	Bondable	Solderable	11.4	5
VS-H3169E12A5x	APD	25	1200	1.8 at 5 A	54	169 x 220	Bondable	Solderable	11.4	5
VS-H2195H12A5x	APD	30	1200	3 at 16 A	not av.	195 x 340	Bondable	Solderable	14.8	5
VS-H3195D12A5x	APD	50	1200	1.3 at 5 A	72	195 x 340	Bondable	Solderable	11.4	5
VS-H3257D12A5x	APD	50	1200	1.3 at 5 A	74	257 x 257	Bondable	Solderable	11.4	5
VS-H3234D12A5x	APD	75	1200	1.2 at 5 A	82	234 x 443	Bondable	Solderable	11.4	5
VS-H2257H12A5x	APD	80	1200	3 at 16 A	not av.	257 x 257	Bondable	Solderable	14.8	5
VS-H3357D12A5x	APD	100	1200	1.2 at 5 A	85	357 x 357	Bondable	Solderable	11.4	5
VS-H3051D06A5x	APD	1	600	1.75 at 3 A	52	51 x 51	Bondable	Solderable	14.8	5
VS-H3065D06A5x	APD	3	600	1.35 at 1 A	56	65 x 66	Bondable	Solderable	14.8	5
VS-H2066H06A5x	BOOST diode	4	600	1.8	41	66 x 66	Bondable	Solderable	14.8	5
VS-H3075D06A5x	APD	5	600	1.1 at 1 A	57	75 x 76	Bondable	Solderable	14.8	5
VS-H2090H06A5x	BOOST diode	8	600	1.7	41	90 x 90	Bondable	Solderable	14.8	5
VS-H2085H06A5x	APD	12	600	1.7	47	85 x 164	Bondable	Solderable	14.8	5
VS-H2115H06A5x	BOOST diode	15	600	1.7	47	115 x 155	Bondable	Solderable	14.8	5
VS-H3085D06A5x	APD	15	600	1.15 at 3 A	61	85 x 131	Bondable	Solderable	14.8	5
VS-H2169H06A5x	BOOST diode	25	600	1.7	53	169 x 220	Bondable	Solderable	14.8	5
VS-H2195H06A5x	APD	30	600	1.2 at 12 A	62	195 x 340	Bondable	Solderable	14.8	5
VS-H3135D06A5x	APD	30	600	1.2 at 5 A	68	135 x 135	Bondable	Solderable	14.8	5
VS-H3171D06A5x	APD	50	600	1.1 at 5 A	69	171 x 171	Bondable	Solderable	14.8	5
VS-H2200H06A5x	APD	60	600	1.7 at 70 A	52	200 x 200	Bondable	Solderable	14.8	5
VS-H2257H06A5x	APD	80	600	1.2 at 10 A	62	257 x 257	Bondable	Solderable	14.8	5
VS-H3230D06A5x	APD	100	600	1 at 5 A	73	230 x 231	Bondable	Solderable	14.8	5
VS-H3356D06A5x	APD	240	600	1.1 at 5 A	90	356 x 356	Bondable	Solderable	14.8	5
VS-H2200H04A5x	APD	60	400	1.2	not av.	200 x 200	Bondable	Solderable	14.8	5

(1) In the Part Number "x" stands for the delivery version. Contact Vishay to check which among Die-on-Wafer, Die-on-Film, Die-in-Tape and reel, Die-in-Waffle-Pack are available for chosen part number.

(2) Rated in discrete package or based on technology.

(3) Review datasheets for details.

(4) Measured wafer level. For test setup, refer to the datasheet.

(5) 6" wafers are available, contact Vishay.



BARE DIE

Standard/Fast Diodes



Diodes - A Wide Range of Bare Die and Wafer Form Products

Standard/Fast Diodes Features

These diodes are specifically designed for high-power applications, such as input rectification and high-frequency welding applications. Electrical and mechanical optimized glass passivation ensures a high breakdown voltage.

Vishay Portfolio

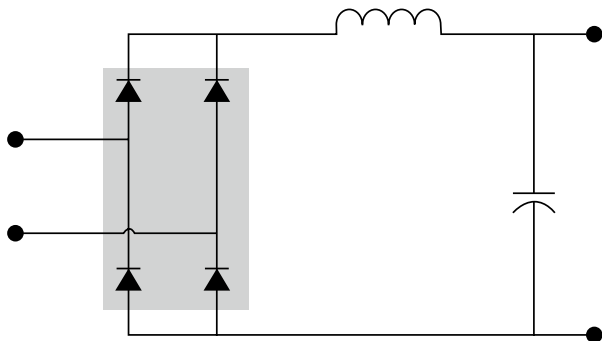
- Vishay offers standard recovery and fast recovery diodes as bare die, with ratings from 600 V to 1600 V
- T_j max is 150 °C
- Several die sizes are available with current handling to 100 A and beyond
- Available with bondable metalization

Typical Applications For Standard/Fast Diodes

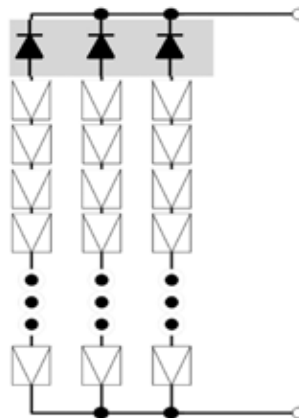
1. AC Mains Rectification
2. Blocking Diodes for Solar Cells
3. Alternator Rectification

Typical Circuits

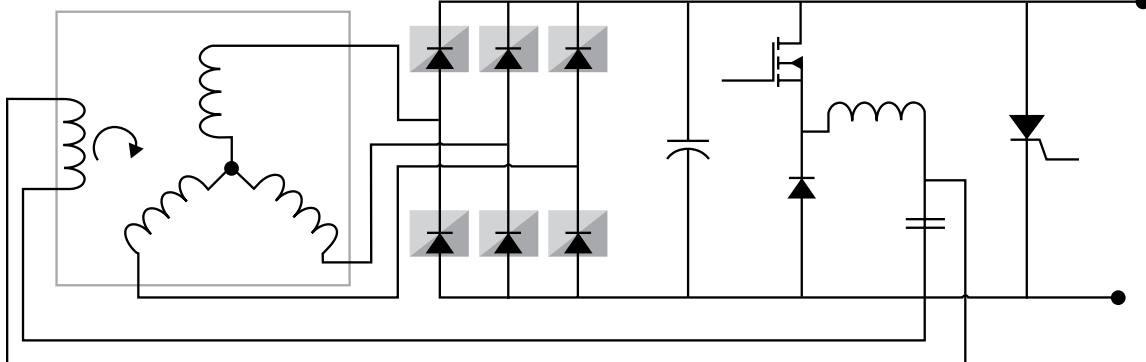
1. AC Mains Rectification



2. Blocking Diodes for Solar Cells



3. Alternator Rectification





Standard/Fast Moat Diodes Die P/N List

Part Number ⁽¹⁾	Structure	I _{F(AV)} (A) ⁽²⁾	V _R (V)	V _F max at 25 °C (V) ⁽³⁾	Die Size (mils ²)	Front side Metal Thickness (um)	Back side Metal Thickness (um)	Die Thickness (mils)	Wafer Diameter (inches)
VS-VS080DM12Cx	MOAT Standard	4	1200	1.1	80 x 80	Bondable	Solderable	11.6	4
VS-VS135DM08Cx	MOAT Standard	10	800	1.1	100 x 135	Bondable	Solderable	11.6	4
VS-VS135DM10Cx	MOAT Standard	10	1000	1.1	100 x 135	Bondable	Solderable	11.6	4
VS-VS135DM12Cx	MOAT Standard	10	1200	1.1	100 x 135	Bondable	Solderable	11.6	4
VS-VS135DM16Cx	MOAT Standard	8	1600	1.1	100 x 135	Bondable	Solderable	13.4	4
VS-VS155DM16Cx	MOAT Standard	15	1600	1.1	155 x 155	Bondable	Solderable	13.4	5
VS-VS180DM12Cx	MOAT Standard	20	1200	1.1	180 x 180	Bondable	Solderable	12	5
VS-VS180DM16Cx	MOAT Standard	20	1600	1.1	180 x 180	Bondable	Solderable	13.4	5
VS-VS207DM12Cx	MOAT Standard	20	1200	1.1	157 x 207	Bondable	Solderable	12	5
VS-VS210DM12Cx	MOAT Standard	20	1200	1.15	210 x 210	Bondable	Solderable	13.4	5
VS-VS210DM16Cx	MOAT Standard	20	1600	1.15	210 x 210	Bondable	Solderable	13.4	5
VS-VS230DM12Cx	MOAT Standard	40	1200	1.1	230 x 230	Bondable	Solderable	12	5
VS-VS230DM16Cx	MOAT Standard	40	1600	1.14	230 x 230	Bondable	Solderable	13.4	5
VS-VS340DM12Cx	MOAT Standard	60	1200	1.09	350 x 230	Bondable	Solderable	12	5
VS-VS340DM16Cx	MOAT Standard	60	1600	1.09	230 x 350	Bondable	Solderable	13.4	5
VS-VS350DM16Cx	MOAT Standard	60	1600	1.07 @ 60A	356 x 356	Bondable	Solderable	13.4	5
VS-VS390DM12Cx	MOAT Standard	80	1200	1.17	270 x 390	Bondable	Solderable	13.4	5
VS-VS480DM16Cx	MOAT Standard	100	1600	1.06 @ 60A	480 x 480	Bondable	Solderable	13.4	5
VS-VS590DM12Cx	MOAT Standard	165	1200	1.43	590 x 590	Bondable	Solderable	13.4	5
VS-VS060LM06CS02Cx	MOAT Fast	2	600	1.3	60 x 60	Bondable	Solderable	10.4	4
VS-VS135LM06CS02Cx	MOAT Fast	8	600	1.2	100 x 135	Bondable	Solderable	10.4	4
VS-VS135LM12CS05Cx	MOAT Fast	8	1200	1.3	100 x 135	Bondable	Solderable	10.4	4
VS-VS180LM06CS02Cx	MOAT Fast	20	600	1.3	180 x 180	Bondable	Solderable	10.4	5
VS-VS180LM12CS05Cx	MOAT Fast	20	1200	1.31	180 x 180	Bondable	Solderable	10.4	5
VS-VS207LM06CS02Cx	MOAT Fast	20	600	1.3	157 x 207	Bondable	Solderable	10.4	5
VS-VS230LM06CS02Cx	MOAT Fast	40	600	1.25	230 x 230	Bondable	Solderable	10.4	5
VS-VS230LM12CS05Cx	MOAT Fast	40	1200	1.4	230 x 230	Bondable	Solderable	10.4	5
VS-VS340LM06CS02Cx	MOAT Fast	60	600	1.3	230 x 350	Bondable	Solderable	10.4	5
VS-VS340LM12CS05Cx	MOAT Fast	60	1200	1.4	230 x 350	Bondable	Solderable	10.4	5
VS-VS390LM06CS02Cx	MOAT Fast	80	600	1.25	270 x 390	Bondable	Solderable	10.4	5
VS-VS390LM12CS05Cx	MOAT Fast	80	1200	1.35	270 x 390	Bondable	Solderable	10.4	5

(1) In the Part Number “x” stands for the delivery version. Contact Vishay to check which among Die-on-Wafer and Die-in-Waffle-Pack are available for chosen part number.
 (2) Rated in discrete package or based on technology.
 (3) See datasheets for details.



BARE DIE Thyristors



Diodes - A Wide Range of Bare Die and Wafer Form Products

Thyristor (SCR) Features

These are p-n-p-n devices typically utilized for switching high levels of power. Much more capable than a mechanical switch, SCRs can be switched more than 10,000 time per second and widely adopted for motor speed controllers and inverters.

Vishay Portfolio

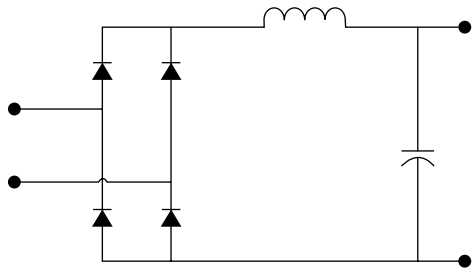
- Vishay offers SCRs with ratings from 600 V to 1600 V
- T_j max is 125 °C
- Vishay technology includes glass passivated high voltage termination
- Die are available with bondable and solderable metalization
- Contact Vishay for specific requirements on Gate Position options (Center/Corner)

Typical Applications For Standard/Fast Diodes

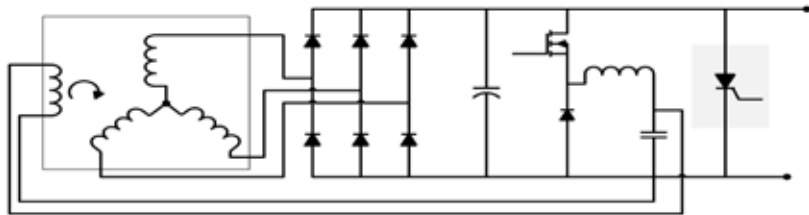
1. AC Mains Rectification
2. Crowbar Protection
3. AC Bypass Switch

Typical Circuits

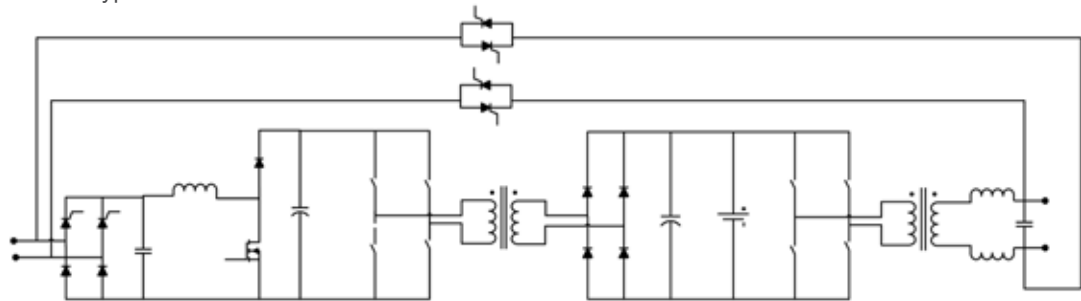
1. AC Mains Rectification



2. Crowbar Protection



3. AC Bypass Switch



**BARE DIE**
Thyristors

Thyristors Die P/N List

Part Number ⁽¹⁾	$I_{T(AV)}$ (A) ⁽²⁾	V_R (V)	$V_{TM \text{ max}}$ at 25 °C (V) ⁽³⁾	Die Size (mils ²)	Front side Metal Thickness (um)	Back side Metal Thickness (um)	Die Thickness (mils)	Wafer Diameter (inches)
VS-VS110BG12Dx	8	1200	0.95 at 6.5 Amp	110 x 110	Bondable	Solderable	11.8	4
VS-VS155BG12Dx	15	1200	1 at 10 A	150 x 150	Bondable	Solderable	13.8	5
VS-VS180SG06Hx	25	600	1,00 at 16 A	180 x 180	Solderable	Solderable	13.8	5
VS-VS180SG12Hx	25	1200	1,00 at 16 A	180 x 180	Solderable	Solderable	13.8	5
VS-VS185BG12Dx	16	1200	1,00 at 16 A	185 x 185	Bondable	Solderable	13.8	5
VS-VS185BG14Dx	16	1400	1,00 at 16 A	185 x 185	Bondable	Solderable	15.9	5
VS-VS210SG06Hx	25	600	1.1 at 25 A	210 x 210	Solderable	Solderable	14.6	5
VS-VS210SG10Hx	25	1000	1.1 at 25 A	210 x 210	Solderable	Solderable	14.6	5
VS-VS210SG12Hx	25	1200	1.1 at 25 A	210 x 210	Solderable	Solderable	14.6	5
VS-VS230SG06Hx	25	600	1.1 at 25 A	230 x 230	Solderable	Solderable	14.6	5
VS-VS230SG12Hx	25	1200	1.1 at 25 A	230 x 230	Solderable	Solderable	14.6	5
VS-VS250BG08Dx	40	800	1.1 at 25 A	250 x 250	Bondable	Solderable	14.6	5
VS-VS250BG12Dx	40	1200	1.1 at 25 A	250 x 250	Bondable	Solderable	14.6	5
VS-VS250SG12Hx	40	1200	1.1 at 25 A	250 x 250	Solderable	Solderable	14.6	5
VS-VS250BG14Dx	40	1400	1.05 at 25 A	250 x 250	Bondable	Solderable	15.9	5
VS-VS255SG06Hx	40	600	1.05 at 25 A	250 x 250	Solderable	Solderable	13.0	5
VS-VS255SG12Hx	40	1200	1.05 at 25 A	250 x 250	Solderable	Solderable	13.0	5
VS-VS255SG16Hx	40	1600	1.05 at 25 A	250 x 250	Solderable	Solderable	15.9	5
VS-VS343SG12Hx	50	1200	0.9 at 25 A	343 x 343	Solderable	Solderable	13.0	5
VS-VS350SG10Hx	50	1000	0.9 at 25 A	350 x 350	Solderable	Solderable	14.6	5
VS-VS350SG12Hx	50	1200	0.9 at 25 A	350 x 350	Solderable	Solderable	14.6	5
VS-VS370BG08Dx	70	800	0.91 at 25 A	370 x 370	Bondable	Solderable	14.6	5
VS-VS370BG12Dx	70	1200	0.91 at 25 A	370 x 370	Bondable	Solderable	14.6	5
VS-VS370SG12Hx	70	1200	0.91 at 25 A	370 x 370	Solderable	Solderable	14.6	5
VS-VS370SG16Hx	70	1600	0.93 at 25 A	370 x 370	Solderable	Solderable	15.9	5
VS-VS480SG06Hx	110	600	0.95 at 25 A	480 x 480	Solderable	Solderable	14.6	5
VS-VS480SG10Hx	110	1000	0.95 at 25 A	480 x 480	Solderable	Solderable	14.6	5
VS-VS480SG12Hx	110	1200	0.95 at 25 A	480 x 480	Solderable	Solderable	14.6	5
VS-VS480BG12Dx	110	1200	0.95 at 25 A	480 x 480	Bondable	Solderable	14.6	5
VS-VS480SG16Hx	110	1600	0.95 at 25 A	480 x 480	Solderable	Solderable	15.9	5
VS-VS590SG04Hx	180	400	0.9 at 25 A	590 x 590	Solderable	Solderable	11.8	5
VS-VS590SG06Hx	180	600	0.9 at 25 A	590 x 590	Solderable	Solderable	11.8	5
VS-VS590SG08Hx	180	800	0.9 at 25 A	590 x 590	Solderable	Solderable	11.8	5
VS-VS590SG10Hx	180	1000	0.9 at 25 A	590 x 590	Solderable	Solderable	11.8	5
VS-VS590SG12Hx	180	1200	0.9 at 25 A	590 x 590	Solderable	Solderable	14.6	5

(1) In the Part Number "x" stands for the delivery version.

Contact Vishay to check which among Die-on-Wafer and Die-in-Waffle-Pack are available for chosen part number and for Gate position options (Center/Corner)

(2) Rated in discrete or module package or based on technology

(3) Contact Vishay for additional Voltage Options (up to 1600V) for any specified die size

(4) See datasheets for details

Contact Vishay to check for specific requirement on Gate position options (Center/Corner) or for different Front Side Metal Option for a chosen part number



TVS Diode Features

Transit Voltage Suppressors (TVS) are devices used to protect vulnerable circuits from electrical overstress such as that caused by electrostatic discharge, inductive load switching, and induced lightning. Within the TVS device, damaging voltage spikes are limited by clamping or avalanche action of a rugged silicon pn junction, which reduces the amplitude of the transient to a nondestructive level.

Vishay Portfolio

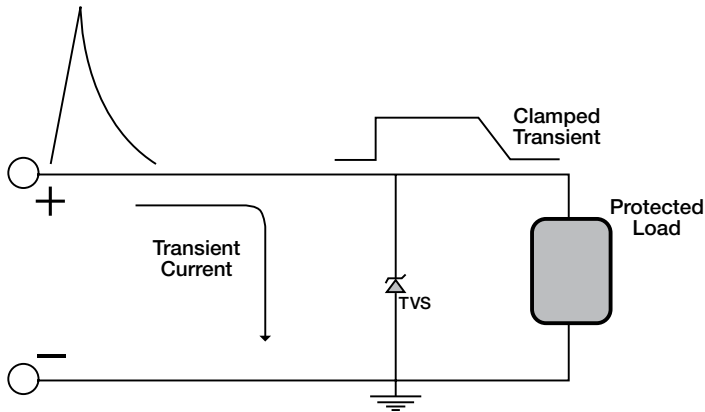
- Vishay offers PAR TVS as bare die, unidirectional polarity only
- T_j max is 150 °C
- VBR ranging from 6.8 V to 47 V with peak pulse power capability from 300 W to 6.6 kW
- Die are available with solderable metalization for optimum surge capability

Typical Applications For Standard/Fast Diodes

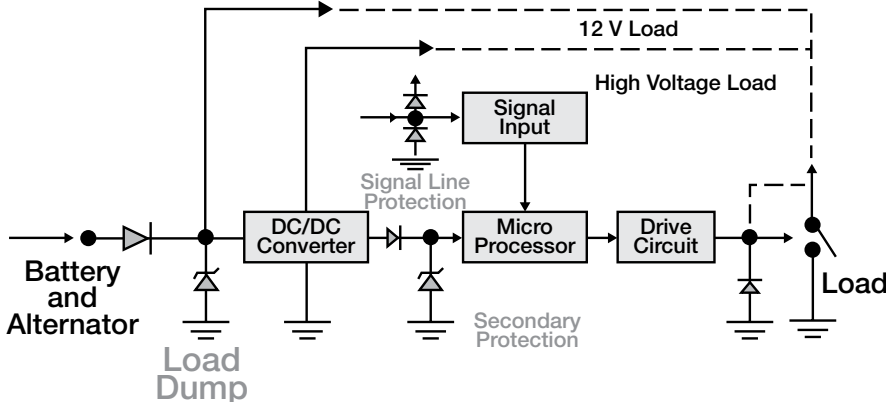
1. General Purpose Surge Protection — lightning, Inductive load, ESD...
2. Automotive Load Dump Protection

Typical Circuits

1. General Purpose Surge Protection — lightning, Inductive load, ESD...



2. Automotive Load Dump Protection





TVS Die P/N List										
Part Number ⁽¹⁾	Technology	V _{BR} min (V)	V _{BR} max (V)	Standoff Voltage V _{WM} (V)	Die Size (mils) (+ 0/- 2mil)	Recommended Solderable Dimension (mil) (+ 2/- 0 mil)	Front Side Metal	Back Side Metal	Die Thk. (mils) (± 1 mil)	Wafer Diameter (inches)
TV050B6P8S4Px	PAR [®] TVS	6.45	7.14	5.8	50	39 sq.	Solderable	Solderable	12	4
TV050B7P5S4Px	PAR TVS	7.13	7.88	6.4	50	39 sq.	Solderable	Solderable	12	4
TV050B8P2S4Px	PAR TVS	7.79	8.61	7.02	50	39 sq.	Solderable	Solderable	12	4
TV050B9P1S4Px	PAR TVS	8.65	9.55	7.78	50	39 sq.	Solderable	Solderable	12	4
TV050B010S4Px	PAR TVS	9.5	10.5	8.55	50	39 sq.	Solderable	Solderable	12	4
TV050B011S4Px	PAR TVS	10.5	11.6	9.4	50	39 sq.	Solderable	Solderable	12	4
TV050B012S4Px	PAR TVS	11.4	12.6	10.2	50	39 sq.	Solderable	Solderable	12	4
TV050B013S4Px	PAR TVS	12.4	13.7	11.1	50	39 sq.	Solderable	Solderable	12	4
TV050B015S4Px	PAR TVS	14.3	15.8	12.8	50	39 sq.	Solderable	Solderable	12	4
TV050B016S4Px	PAR TVS	15.2	16.8	13.6	50	39 sq.	Solderable	Solderable	12	4
TV050B018S4Px	PAR TVS	17.1	18.9	15.3	50	39 sq.	Solderable	Solderable	12	4
TV050B020S4Px	PAR TVS	19	21	17.1	50	39 sq.	Solderable	Solderable	12	4
TV050B022S4Px	PAR TVS	20.9	23.1	18.8	50	39 sq.	Solderable	Solderable	12	4
TV050B024S4Px	PAR TVS	22.8	25.2	20.5	50	39 sq.	Solderable	Solderable	12	4
TV050B027S4Px	PAR TVS	25.7	28.4	23.1	50	39 sq.	Solderable	Solderable	12	4
TV050B030S4Px	PAR TVS	28.5	31.5	25.6	50	39 sq.	Solderable	Solderable	12	4
TV050B033S4Px	PAR TVS	31.4	34.7	28.2	50	39 sq.	Solderable	Solderable	12	4
TV050B036S4Px	PAR TVS	34.2	37.8	30.8	50	39 sq.	Solderable	Solderable	12	4
TV050B039S4Px	PAR TVS	37.1	41	33.3	50	39 sq.	Solderable	Solderable	12	4
TV050B043S4Px	PAR TVS	40.9	45.2	36.8	50	39 sq.	Solderable	Solderable	12	4
TV060B6P8S4Px	PAR TVS	6.45	7.14	5.8	60	48 sq.	Solderable	Solderable	12	4
TV060B7P5S4Px	PAR TVS	7.13	7.88	6.4	60	48 sq.	Solderable	Solderable	12	4
TV060B8P2S4Px	PAR TVS	7.79	8.61	7.02	60	48 sq.	Solderable	Solderable	12	4
TV060B9P1S4Px	PAR TVS	8.65	9.55	7.78	60	48 sq.	Solderable	Solderable	12	4
TV070B6P8S4Px	PAR TVS	6.45	7.14	5.8	70	58 dia.	Solderable	Solderable	12	4
TV070B7P5S4Px	PAR TVS	7.13	7.88	6.4	70	58 dia.	Solderable	Solderable	12	4
TV070B8P2S4Px	PAR TVS	7.79	8.61	7.02	70	58 dia.	Solderable	Solderable	12	4
TV070B9P1S4Px	PAR TVS	8.65	9.55	7.78	70	58 dia.	Solderable	Solderable	12	4
TV070B010S4Px	PAR TVS	9.5	10.5	8.55	70	58 dia.	Solderable	Solderable	12	4
TV070B011S4Px	PAR TVS	10.5	11.6	9.4	70	58 dia.	Solderable	Solderable	12	4
TV070B012S4Px	PAR TVS	11.4	12.6	10.2	70	58 dia.	Solderable	Solderable	12	4



TVS Die P/N List										
Part Number ⁽¹⁾	Technology	V _{BR} min (V)	V _{BR} max (V)	Standoff Voltage V _{WM} (V)	Die Size (mils) (+ 0/- 2mil)	Recommended Solderable Dimension (mil) (+ 2/- 0 mil)	Front Side Metal	Back Side Metal	Die Thk. (mils) (± 1 mil)	Wafer Diameter (inches)
TV070B013S4Px	PAR® TVS	12.4	13.7	11.1	70	58 dia.	Solderable	Solderable	12	4
TV070B015S4Px	PAR TVS	14.3	15.8	12.8	70	58 dia.	Solderable	Solderable	12	4
TV070B016S4Px	PAR TVS	15.2	16.8	13.6	70	58 dia.	Solderable	Solderable	12	4
TV070B018S4Px	PAR TVS	17.1	18.9	15.3	70	58 dia.	Solderable	Solderable	12	4
TV070B020S4Px	PAR TVS	19	21	17.1	70	58 dia.	Solderable	Solderable	12	4
TV070B022S4Px	PAR TVS	20.9	23.1	18.8	70	58 dia.	Solderable	Solderable	12	4
TV070B024S4Px	PAR TVS	22.8	25.2	20.5	70	58 dia.	Solderable	Solderable	12	4
TV070B027S4Px	PAR TVS	25.7	28.4	23.1	70	58 dia.	Solderable	Solderable	12	4
TV070B030S4Px	PAR TVS	28.5	31.5	25.6	70	58 dia.	Solderable	Solderable	12	4
TV070B033S4Px	PAR TVS	31.4	34.7	28.2	70	58 dia.	Solderable	Solderable	12	4
TV070B036S4Px	PAR TVS	34.2	37.8	30.8	70	58 dia.	Solderable	Solderable	12	4
TV070B039S4Px	PAR TVS	37.1	41	33.3	70	58 dia.	Solderable	Solderable	12	4
TV070B043S4Px	PAR TVS	40.9	45.2	36.8	70	58 dia.	Solderable	Solderable	12	4
TV110B6P8S4Px	PAR TVS	6.45	7.14	5.8	110	98 dia.	Solderable	Solderable	12	4
TV110B7P5S4Px	PAR TVS	7.13	7.88	6.4	110	98 dia.	Solderable	Solderable	12	4
TV110B8P2S4Px	PAR TVS	7.79	8.61	7.02	110	98 dia.	Solderable	Solderable	12	4
TV110B9P1S4Px	PAR TVS	8.65	9.55	7.78	110	98 dia.	Solderable	Solderable	12	4
TV110B010S4Px	PAR TVS	9.5	10.5	8.55	110	98 dia.	Solderable	Solderable	12	4
TV110B011S4Px	PAR TVS	10.5	11.6	9.4	110	98 dia.	Solderable	Solderable	12	4
TV110B012S4Px	PAR TVS	11.4	12.6	10.2	110	98 dia.	Solderable	Solderable	12	4
TV110B013S4Px	PAR TVS	12.4	13.7	11.1	110	98 dia.	Solderable	Solderable	12	4
TV110B015S4Px	PAR TVS	14.3	15.8	12.8	110	98 dia.	Solderable	Solderable	12	4
TV110B016S4Px	PAR TVS	15.2	16.8	13.6	110	98 dia.	Solderable	Solderable	12	4
TV110B018S4Px	PAR TVS	17.1	18.9	15.3	110	98 dia.	Solderable	Solderable	12	4
TV110B020S4Px	PAR TVS	19	21	17.1	110	98 dia.	Solderable	Solderable	12	4
TV110B022S4Px	PAR TVS	20.9	23.1	18.8	110	98 dia.	Solderable	Solderable	12	4
TV110B024S4Px	PAR TVS	22.8	25.2	20.5	110	98 dia.	Solderable	Solderable	12	4
TV110B027S4Px	PAR TVS	25.7	28.4	23.1	110	98 dia.	Solderable	Solderable	12	4
TV110B030S4Px	PAR TVS	28.5	31.5	25.6	110	98 dia.	Solderable	Solderable	12	4
TV110B033S4Px	PAR TVS	31.4	34.7	28.2	110	98 dia.	Solderable	Solderable	12	4
TV110B036S4Px	PAR TVS	34.2	37.8	30.8	110	98 dia.	Solderable	Solderable	12	4



TVS Die P/N List

Part Number ⁽¹⁾	Technology	V _{BR} min (V)	V _{BR} max (V)	Standoff Voltage V _{WM} (V)	Die Size (mils) (+ 0/- 2mil)	Recommended Solderable Dimension (mil) (+ 2/- 0 mil)	Front Side Metal	Back Side Metal	Die Thk. (mils) (± 1 mil)	Wafer Diameter (inches)
TV110B039S4Px	PAR® TVS	37.1	41	33.3	110	98 dia.	Solderable	Solderable	12	4
TV110B043S4Px	PAR TVS	40.9	45.2	36.8	110	98 dia.	Solderable	Solderable	12	4
TV110B047S4Px	PAR TVS	44.7	49.4	40.2	110	98 dia.	Solderable	Solderable	12	4
TV134T010S4Px	PAR TVS	11.1	12.3	10	134	120 sq.	Solderable	Solderable	12	4
TV134T011S4Px	PAR TVS	12.2	13.5	11	134	120 sq.	Solderable	Solderable	12	4
TV134T012S4Px	PAR TVS	13.3	14.7	12	134	120 sq.	Solderable	Solderable	12	4
TV134T013S4Px	PAR TVS	14.4	15.9	13	134	120 sq.	Solderable	Solderable	12	4
TV134T014S4Px	PAR TVS	15.6	17.2	14	134	120 sq.	Solderable	Solderable	12	4
TV134T015S4Px	PAR TVS	16.7	18.5	15	134	120 sq.	Solderable	Solderable	12	4
TV134T016S4Px	PAR TVS	17.8	19.7	16	134	120 sq.	Solderable	Solderable	12	4
TV134T017S4Px	PAR TVS	18.9	20.9	17	134	120 sq.	Solderable	Solderable	12	4
TV134T018S4Px	PAR TVS	20	22.1	18	134	120 sq.	Solderable	Solderable	12	4
TV134T020S4Px	PAR TVS	22.2	24.5	20	134	120 sq.	Solderable	Solderable	12	4
TV134T022S4Px	PAR TVS	24.4	26.9	22	134	120 sq.	Solderable	Solderable	12	4
TV134T024S4Px	PAR TVS	26.7	29.5	24	134	120 sq.	Solderable	Solderable	12	4
TV134T026S4Px	PAR TVS	28.9	31.9	26	134	120 sq.	Solderable	Solderable	12	4
TV134T028S4Px	PAR TVS	31.1	34.4	28	134	120 sq.	Solderable	Solderable	12	4
TV134T030S4Px	PAR TVS	33.3	36.8	30	134	120 sq.	Solderable	Solderable	12	4
TV134T033S4Px	PAR TVS	36.7	40.6	33	134	120 sq.	Solderable	Solderable	12	4
TV134T036S4Px	PAR TVS	40	44.2	36	134	120 sq.	Solderable	Solderable	12	4
TV134T040S4Px	PAR TVS	44.4	49.1	40	134	120 sq.	Solderable	Solderable	12	4
TV134T043S4Px	PAR TVS	47.8	52.8	43	134	120 sq.	Solderable	Solderable	12	4
TV162T010S4Px	PAR TVS	11.1	12.3	10	162	148 sq.	Solderable	Solderable	12	4
TV162T011S4Px	PAR TVS	12.2	13.5	11	162	148 sq.	Solderable	Solderable	12	4
TV162T012S4Px	PAR TVS	13.3	14.7	12	162	148 sq.	Solderable	Solderable	12	4
TV162T013S4Px	PAR TVS	14.4	15.9	13	162	148 sq.	Solderable	Solderable	12	4
TV162T014S4Px	PAR TVS	15.6	17.2	14	162	148 sq.	Solderable	Solderable	12	4
TV162T015S4Px	PAR TVS	16.7	18.5	15	162	148 sq.	Solderable	Solderable	12	4
TV162T016S4Px	PAR TVS	17.8	19.7	16	162	148 sq.	Solderable	Solderable	12	4
TV162T017S4Px	PAR TVS	18.9	20.9	17	162	148 sq.	Solderable	Solderable	12	4
TV162T018S4Px	PAR TVS	20	22.1	18	162	148 sq.	Solderable	Solderable	12	4



TVS Die P/N List										
Part Number ⁽¹⁾	Technology	V _{BR} min (V)	V _{BR} max (V)	Standoff Voltage V _{WM} (V)	Die Size (mils) (+ 0/- 2mil)	Recommended Solderable Dimension (mil) (+ 2/- 0 mil)	Front Side Metal	Back Side Metal	Die Thk. (mils) (± 1 mil)	Wafer Diameter (inches)
TV162T020S4Px	PAR® TVS	22.2	24.5	20	162	148 sq.	Solderable	Solderable	12	4
TV162T022S4Px	PAR TVS	24.4	26.9	22	162	148 sq.	Solderable	Solderable	12	4
TV162T024S4Px	PAR TVS	26.7	29.5	24	162	148 sq.	Solderable	Solderable	12	4
TV162T026S4Px	PAR TVS	28.9	31.9	26	162	148 sq.	Solderable	Solderable	12	4
TV162T028S4Px	PAR TVS	31.1	34.4	28	162	148 sq.	Solderable	Solderable	12	4
TV162T030S4Px	PAR TVS	33.3	36.8	30	162	148 sq.	Solderable	Solderable	12	4
TV162T033S4Px	PAR TVS	36.7	40.6	33	162	148 sq.	Solderable	Solderable	12	4
TV162T036S4Px	PAR TVS	40	44.2	36	162	148 sq.	Solderable	Solderable	12	4
TV180T010S4Px	PAR TVS	11.1	12.3	10	180	166 sq.	Solderable	Solderable	12	4
TV180T011S4Px	PAR TVS	12.2	13.5	11	180	166 sq.	Solderable	Solderable	12	4
TV180T012S4Px	PAR TVS	13.3	14.7	12	180	166 sq.	Solderable	Solderable	12	4
TV180T013S4Px	PAR TVS	14.4	15.9	13	180	166 sq.	Solderable	Solderable	12	4
TV180T014S4Px	PAR TVS	15.6	17.2	14	180	166 sq.	Solderable	Solderable	12	4
TV180T015S4Px	PAR TVS	16.7	18.5	15	180	166 sq.	Solderable	Solderable	12	4
TV180T016S4Px	PAR TVS	17.8	19.7	16	180	166 sq.	Solderable	Solderable	12	4
TV180T017S4Px	PAR TVS	18.9	20.9	17	180	166 sq.	Solderable	Solderable	12	4
TV180T018S4Px	PAR TVS	20	22.1	18	180	166 sq.	Solderable	Solderable	12	4
TV180T020S4Px	PAR TVS	22.2	24.5	20	180	166 sq.	Solderable	Solderable	12	4
TV180T022S4Px	PAR TVS	24.4	26.9	22	180	166 sq.	Solderable	Solderable	12	4
TV180T024S4Px	PAR TVS	26.7	29.5	24	180	166 sq.	Solderable	Solderable	12	4
TV180T026S4Px	PAR TVS	28.9	31.9	26	180	166 sq.	Solderable	Solderable	12	4
TV180T028S4Px	PAR TVS	31.1	34.4	28	180	166 sq.	Solderable	Solderable	12	4
TV180T030S4Px	PAR TVS	33.3	36.8	30	180	166 sq.	Solderable	Solderable	12	4
TV180T033S4Px	PAR TVS	36.7	40.6	33	180	166 sq.	Solderable	Solderable	12	4
TV180T036S4Px	PAR TVS	40	44.2	36	180	166 sq.	Solderable	Solderable	12	4
TV210T010S4Px	PAR TVS	11.1	12.3	10	210	196 sq.	Solderable	Solderable	12	4
TV210T011S4Px	PAR TVS	12.2	13.5	11	210	196 sq.	Solderable	Solderable	12	4
TV210T012S4Px	PAR TVS	13.3	14.7	12	210	196 sq.	Solderable	Solderable	12	4
TV210T013S4Px	PAR TVS	14.4	15.9	13	210	196 sq.	Solderable	Solderable	12	4
TV210T014S4Px	PAR TVS	15.6	17.2	14	210	196 sq.	Solderable	Solderable	12	4
TV210T015S4Px	PAR TVS	16.7	18.5	15	210	196 sq.	Solderable	Solderable	12	4



TVS Die P/N List

Part Number ⁽¹⁾	Technology	V _{BR} min (V)	V _{BR} max (V)	Standoff Voltage V _{WM} (V)	Die Size (mils) (+ 0/- 2mil)	Recommended Solderable Dimension (mil) (+ 2/- 0 mil)	Front Side Metal	Back Side Metal	Die Thk. (mils) (± 1 mil)	Wafer Diameter (inches)
TV210T016S4Px	PAR® TVS	17.8	19.7	16	210	196 sq.	Solderable	Solderable	12	4
TV210T017S4Px	PAR TVS	18.9	20.9	17	210	196 sq.	Solderable	Solderable	12	4
TV210T018S4Px	PAR TVS	20	22.1	18	210	196 sq.	Solderable	Solderable	12	4
TV210T020S4Px	PAR TVS	22.2	24.5	20	210	196 sq.	Solderable	Solderable	12	4
TV210T022S4Px	PAR TVS	24.4	26.9	22	210	196 sq.	Solderable	Solderable	12	4
TV210T024S4Px	PAR TVS	26.7	29.5	24	210	196 sq.	Solderable	Solderable	12	4
TV210T026S4Px	PAR TVS	28.9	31.9	26	210	196 sq.	Solderable	Solderable	12	4
TV210T028S4Px	PAR TVS	31.1	34.4	28	210	196 sq.	Solderable	Solderable	12	4
TV210T030S4Px	PAR TVS	33.3	36.8	30	210	196 sq.	Solderable	Solderable	12	4
TV210T033S4Px	PAR TVS	36.7	40.6	33	210	196 sq.	Solderable	Solderable	12	4
TV210T036S4Px	PAR TVS	40	44.2	36	210	196 sq.	Solderable	Solderable	12	4
TV210T040S4Px	PAR TVS	44.4	49.1	40	210	196 sq.	Solderable	Solderable	12	4
TV210T043S4Px	PAR TVS	47.8	52.8	43	210	196 sq.	Solderable	Solderable	12	4
TV162L027S6Px	PAR TVS	24	30	22	162	148 sq.	Solderable	Solderable	12	6
TV180L027S6Px	PAR TVS	24	30	22	180	166 sq.	Solderable	Solderable	12	6
TV210L027S6Px	PAR TVS	24	30	22	210	196 sq.	Solderable	Solderable	12	6



BARE DIE Zener Diodes



Diodes - A Wide Range of Bare Die and Wafer Form Products

Zener Diodes Features

Zener diodes are designed to work in the breakdown region of the reverse current-voltage characteristic.

The technology is Silicon Epitaxial Planar. Different wafer and bare die options are available with breakdown voltages from 2 V to 200 V, with voltages graded according to the international E24 standard. The typical voltage tolerance is $\pm 5\%$, but tighter tolerances are available as well. The diodes are used as voltage regulator and voltage references or as voltage suppressors against surge and ESD events. Essential common features include low reverse leakage current levels and stable breakdown with low impedance.

Vishay Portfolio

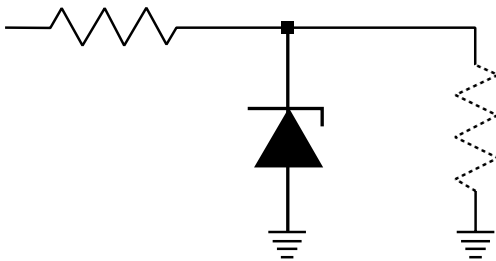
- Vishay offers 5 % tolerance Zener die in wafer or die-on-film form
- Zener voltage ratings from 3.3 V to 36 V
- 2 % V_Z tolerance is available on selected number of parts
- Die are available with bondable metalization

Typical Applications For Standard/Fast Diodes

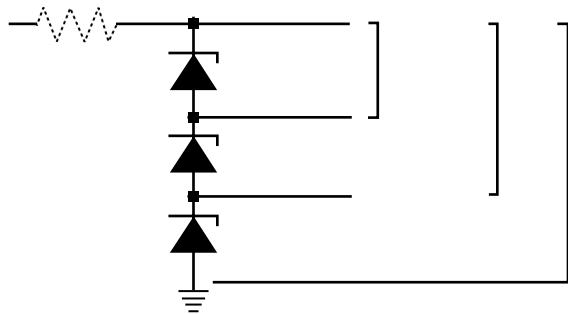
1. Voltage Regulating Diodes
2. Diode Clipper for AC Input Signal
3. Protection of Data Lines Against Voltage Transients by ESD Protection Diodes

Typical Circuits

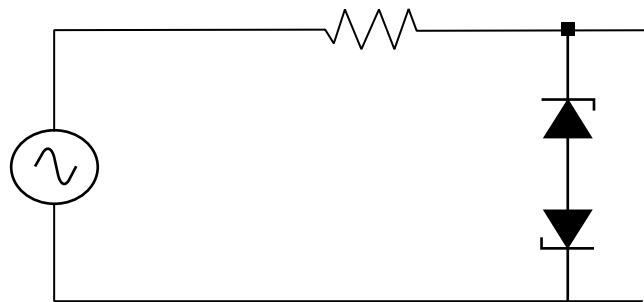
1. Voltage Regulating Diodes:
 - a) Simple (Voltage Stabilization)



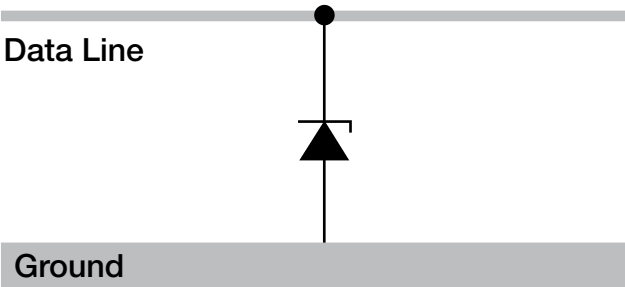
- b) Variety of Different Reference Voltage Values (Zener Diodes Connected in Series)



2. Diode Clipper for AC Input Signal



3. Protection of Data Lines Against Voltage Transients by ESD Protection Diodes



Switching Diodes Features

Switching Diodes are designed for fast switching between the on and off state, i.e. between the forward and the reverse direction of the diode. They are fast recovery diodes, the switching time is normally reduced by an additional doping process. The technology is Silicon Epitaxial Planar. Wafers and bare dies are available with different power dissipations and reverse voltage ratings. The diodes are used for general purposes and at high frequency applications. They have less reverse leakage current than Schottky diodes, but they are not as fast as Schottky diodes..

Vishay Portfolio

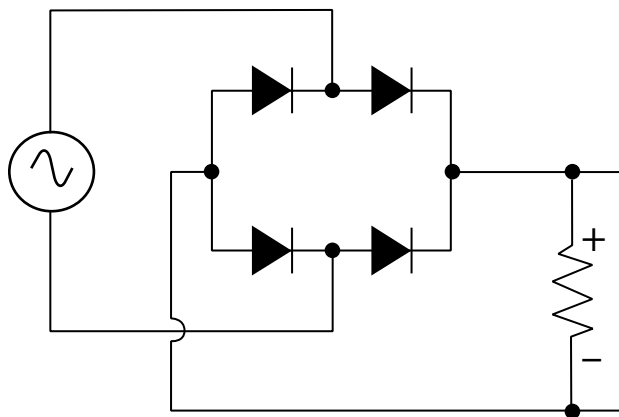
- Vishay offers 1N4148 and 1N4150 in die and wafer form
- Die are available with bondable metalization

Typical Applications For Standard/Fast Diodes

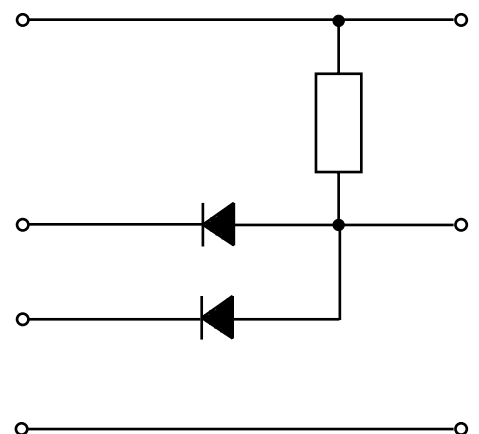
1. Full-Wave Rectification
2. Logic Circuit
3. DC/DC Converter

Typical Circuits

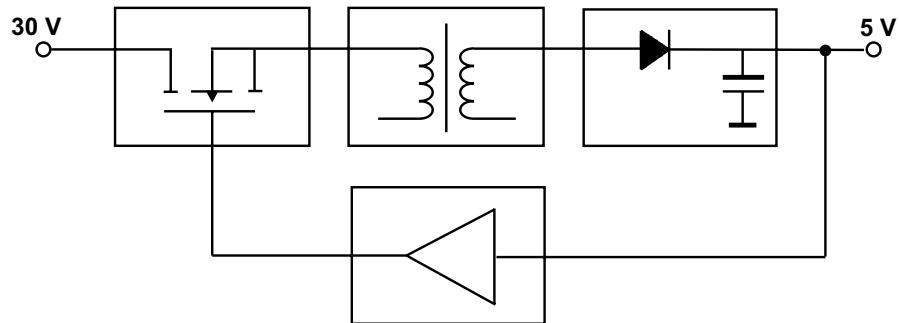
1. Full Wave Rectification



2. Logic Circuit (e.g. and Logic)



3. DC-DC Converter





BARE DIE

Zener and Switching Diodes and ESD Protection



Diodes - A Wide Range of Bare Die and Wafer Form Products

Zener and ESD Protection Die P/N List

Part Number ⁽¹⁾	Technology	Rated Nominal Zener Voltage at I _Z = 5 mA (V)	Rated Maximum Reverse Current (µA)	Temperature Coefficient of Zener Voltage at I _Z = 5 mA (mV/K)	Chip Size (µm)	Front Side Metal	Bondpad Size (µm)	Back Side Metal	Die Thickness (mm)	Wafer Diameter (inches)
BDBZX84C3V3-BDx	Znr ± 5 %	3.3	5.0 (at 1 V)	- 2.64 to - 0.99	320 x 320	Bondable	162 square	Solderable	180 ± 15	4
BDBZX84C3V9-BDx	Znr ± 5 %	3.9	3.0 (at 1 V)	- 2.73 to - 1.17	320 x 320	Bondable	162 square	Solderable	180 ± 15	4
BDBZX84C4V3-BDx	Znr ± 5 %	4.3	3.0 (at 1 V)	- 2.58 to - 0.43	320 x 320	Bondable	162 square	Solderable	180 ± 15	4
BDBZX84C4V7-BDx	Znr ± 5 %	4.7	3.0 (at 2 V)	- 2.35 to + 0.94	320 x 320	Bondable	162 square	Solderable	180 ± 15	4
BDBZX84B5V1-BDx	Znr ± 2 %	5.1	2.0 (at 2 V)	- 1.53 to + 2.04	320 x 320	Bondable	162 square	Solderable	180 ± 15	4
BDBZX84C5V1-BDx	Znr ± 5 %	5.1	2.0 (at 2 V)	- 1.53 to + 2.04	320 x 320	Bondable	162 square	Solderable	180 ± 15	4
BDBZX84C5V6-BDx	Znr ± 5 %	5.6	1.0 (at 2 V)	- 1.12 to + 3.36	320 x 320	Bondable	162 square	Solderable	180 ± 15	4
BDBZX84C6V2-BDx	Znr ± 5 %	6.2	3.0 (at 4 V)	- 0.62 to + 4.34	320 x 320	Bondable	162 square	Solderable	180 ± 15	4
BDBZX84B6V8-BDx	Znr ± 2 %	6.8	2.0 (at 4 V)	+ 1.36 to + 4.76	320 x 320	Bondable	162 square	Solderable	180 ± 15	4
BDBZX84C6V8-BDx	Znr ± 5 %	6.8	2.0 (at 4 V)	+ 1.36 to + 4.76	320 x 320	Bondable	162 square	Solderable	180 ± 15	4
BDBZX84C7V5-BDx	Znr ± 5 %	7.5	1.0 (at 5 V)	+ 1.5 to + 5.25	320 x 320	Bondable	162 square	Solderable	180 ± 15	4
BDBZX84B8V2-BDx	Znr ± 2 %	8.2	0.7 (at 5 V)	+ 3.28 to + 5.74	320 x 320	Bondable	162 square	Solderable	180 ± 15	4
BDBZX84C8V2-BDx	Znr ± 5 %	8.2	0.7 (at 5 V)	+ 3.28 to + 5.74	320 x 320	Bondable	162 square	Solderable	180 ± 15	4
BDBZX84B9V1-BDx	Znr ± 2 %	9.1	0.5 (at 6 V)	+ 4.55 to + 7.28	320 x 320	Bondable	162 square	Solderable	180 ± 15	4
BDBZX84C9V1-BDx	Znr ± 5 %	9.1	0.5 (at 6 V)	+ 4.55 to + 7.28	320 x 320	Bondable	162 square	Solderable	180 ± 15	4
BDBZX84C10-BDx	Znr ± 5 %	10	0.2 (at 7 V)	+ 5.0 to + 8.0	320 x 320	Bondable	162 square	Solderable	180 ± 15	4
BDBZX84C11-BDx	Znr ± 5 %	11	0.1 (at 8 V)	+ 5.5 to + 9.9	320 x 320	Bondable	162 square	Solderable	180 ± 15	4
BDBZX84C12-BDx	Znr ± 5 %	12	0.1 (at 8 V)	+ 7.2 to + 10.8	320 x 320	Bondable	162 square	Solderable	180 ± 15	4
BDBZX84C15-BDx	Znr ± 5 %	15	0.05 (at 10.5 V)	+ 10.5 to + 13.5	320 x 320	Bondable	162 square	Solderable	180 ± 15	4
BDBZX84C16-BDx	Znr ± 5 %	16	0.05 (at 11.2 V)	+ 12.8 to + 15.2	320 x 320	Bondable	162 square	Solderable	180 ± 15	4
BDBZX84C18-BDx	Znr ± 5 %	18	0.05 (at 12.6 V)	+ 14.4 to + 17.1	320 x 320	Bondable	162 square	Solderable	180 ± 15	4
BDBZX84C20-BDx	Znr ± 5 %	20	0.05 (at 14 V)	+ 16 to + 20	320 x 320	Bondable	162 square	Solderable	180 ± 15	4
BDBZX84C22-BDx	Znr ± 5 %	22	0.05 (at 15.4 V)	+ 17.6 to + 22	320 x 320	Bondable	162 square	Solderable	180 ± 15	4
BDBZX84C27-BDx	Znr ± 5 %	27	0.05 (at 18.9 V)	+ 21.6 to + 27.0	320 x 320	Bondable	162 square	Solderable	180 ± 15	4
BDMMBZ27V-BDx	Znr ± 5 %	27	0.08 (at 22 V)	max. 30 (at 1 mA)	500 x 500	Bondable	342 square	Solderable	180 ± 15	4
BDBZX84C33-BDx	Znr ± 5 %	33	0.05 (at 23.1 V)	+ 26.4 to + 33.0	320 x 320	Bondable	162 square	Solderable	180 ± 15	4
BDBZX84C36-BDx	Znr ± 5 %	36	0.05 (at 25.2 V)	+ 28.8 to + 36.0	320 x 320	Bondable	162 square	Solderable	180 ± 15	4
BDBZX84C39-BDx	Znr ± 5 %	39	0.05 (at 27.3 V)	+ 39 to + 46.8	320 x 320	Bondable	162 square	Solderable	180 ± 15	4
BDBZX84C47-BDx	Znr ± 5 %	47	0.05 (at 32.9 V)	+ 47 to + 56.4	320 x 320	Bondable	162 square	Solderable	180 ± 15	4

(1) In the Part Number "x" stands for the delivery version. Contact Vishay to check which among Die-on-Wafer, Die-on-Film, Die-in-Array are available for chosen part number.

**BARE DIE**

Zener and Switching Diodes and ESD Protection



ESD Protection Diodes Die P/N List

Part Number ⁽¹⁾	Technology	Rated Nominal Zener Voltage at $I_Z = 5 \text{ mA}$ (V)	Rated Breakdown Voltage Range at $I_R = 1 \text{ mA}$ (V)	Rated Maximum ESD Immunity Cont. Discharge (IEC 61000-4-2) (kV)	Chip Size (μm^2)	Front Side Metal	Bondpad Size (μm)	Back Side Metal	Die Thickness (mm)	Wafer Diameter (inches)
BDESD12D3590-BDx	ESD Protection	11.0 to 13.0	0.1 (at 8 V)	± 8	180 x 180	Bondable	70 square	Solderable	100 \pm 20	4
BDVESD05B-BDx	ESD Protection	6.0 to 7.5	0.1 (at 5 V)	± 30	260 x 260	Bondable	90 rounded	Solderable	100 \pm 5	4

(1) In the Part Number "x" stands for the delivery version. Contact Vishay to check which among Die-on-Wafer, Die-on-Film are available for chosen part number.

Switching Diodes Die P/N List

Part Number ⁽¹⁾	$I_{F(AV)}$ (A) ⁽²⁾	V_R (V)	$V_F \text{ max}$ at 25°C (V) ⁽³⁾	Chip Size (μm^2)	Front Side Metal	Bondpad Size (μm)	Back Side Metal	Die Thickness (mm)	Wafer Diameter (inches)
BD1N4148-BDx	0.15	100	1 at 10 mA	280 x 280	Bondable	108 square	Solderable	200 \pm 20	4
BD1N4150-BDx	0.2	75	0.74 at 10 mA	280 x 280	Bondable	108 square	Solderable	200 \pm 20	4

(1) In the Part Number "x" stands for the delivery version. Both Die-on-Wafer and Die-on-Film versions are available.

(2) Rated in discrete package or based on technology.

(3) See datasheets for details. Contact Vishay to check which among Die-on-Wafer and Die-on-Film are available for chosen part number.



BARE DIE Packing

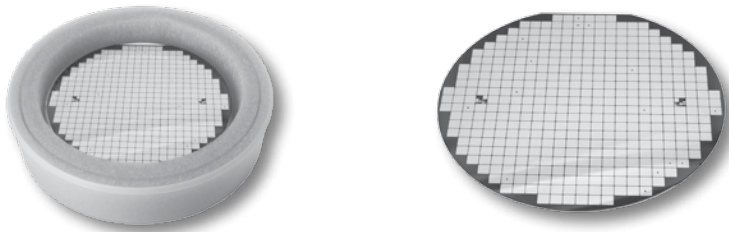


Diodes - A Wide Range of Bare Die and Wafer Form Products

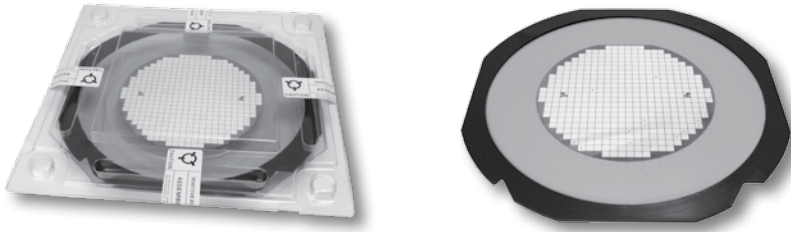
Packing Options

Vishay provides you with several packing options which can fit with virutally any assembly line. Parts are 100 % probed and inspected.

Unsawn wafer — die are not singulated, wafers are provided in box



Sawn wafer on film — wafer is provided on blue film where die are singulated, ready for pick and place



Die in tape and reel — die are located in pocket tape in several different types of reel



Die Waffle Pack — die are located in a tray with dimensions optimized for each die size



Please contact Vishay for all details related to packing options in order to best fit your requirements.



BARE DIE



Diodes - A Wide Range of Bare Die and Wafer Form Products

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