



SBR® SUPER
BARRIER
RECTIFIER

THE NEW GENERATION
OF RECTIFIERS...



diodes.com



COMPANY OVERVIEW

DIODES INCORPORATED'S PRODUCTS ARE DESIGNED FOR HIGH PERFORMANCE, ACROSS A WIDE RANGE OF EXISTING AND EMERGING APPLICATIONS

Diodes Incorporated is a leading global provider of Analog, Mixed-Signal and Logic semiconductors.

Its global footprint includes sales offices in 5 countries and manufacturing locations in China, Europe and the USA.

A focus on product innovation, cost reduction, acquisitions and customer service has made Diodes Incorporated an industry leader.

Combining leading silicon and packaging technologies, Diodes provides a broad portfolio of discrete semiconductors comprising Bipolar Transistors, MOSFETs, Schottky Diodes, SBR, Switching Diodes and Application Specific Arrays to enable our customers' next generation designs.

The Diodes' Analog IC portfolio consists of 6 main areas: Power Management ICs, Standard Linear, Lighting, Sensors, Direct Broadcast by Satellite and Applications Specific Standard Products. Diodes IC portfolio also includes Standard Logic products.

Diodes also offers a broad portfolio of vertically integrated connectivity, signal integrity, switching and timing solutions for the timing, switching, bridging and conditioning of high-speed signals required by today's ever-increasing speed and bandwidth demanding applications.

SBR is a registered trademark of Diodes Incorporated.



INNOVATIVE RECTIFIERS FOR MODERN APPLICATIONS

A FOCUS ON ADVANCEMENT OF TECHNOLOGY, INNOVATIVE PRODUCTS AND COLLABORATION WITH CUSTOMERS FROM DESIGN TO PRODUCTION HAS RESULTED IN DIODES INCORPORATED'S SBR PORTFOLIO'S CONTINUAL MARKET ADOPTION AND INCREASING MARKET SHARE.

SBR - THE NEW GENERATION OF RECTIFIERS

Super Barrier Rectifier (SBR) is a proprietary and patented Diodes Inc technology that utilizes a MOS manufacturing process (traditional Schottky uses a bipolar process) to create a superior two terminal device that has a lower forward voltage (V_F) than comparable Schottky diodes while possessing the thermal stability and high reliability characteristics of PN epitaxial diodes.

Super Barrier Rectifier (SBR) diode is designed for high power, low loss and fast switching applications. The presence of a MOS channel within its structure forms a low potential barrier for the majority carriers, thus SBR's forward bias operation at low voltage is similar to Schottky diode.

However, the leakage current is lower than Schottky diode in reverse bias due to the overlap of the P-N depletion layers and the absence of potential barrier reduction due to the image charge.

The Diodes SBR portfolio is ideally suited to meet the circuit requirements of:

- Switch Mode Power Supplies (SMPS)
- Buck/Boost Diodes for DC-DC Conversion
- Battery Chargers
- Reverse Polarity Protection
- Solar Panels
- LED Lighting
- Automotive Applications

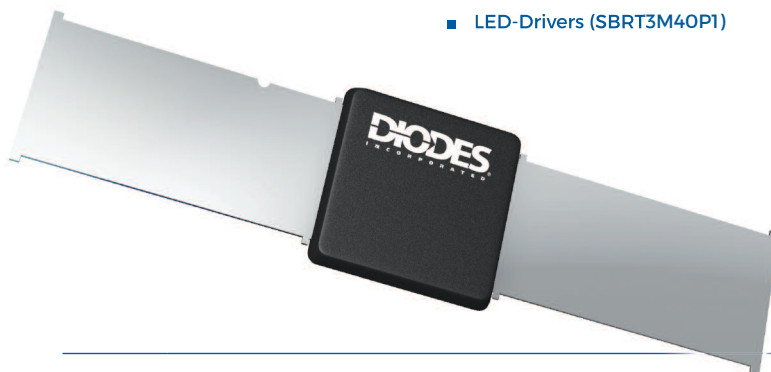
Diodes Incorporated's SBR product development strategy is focused on high performance value added products for growth market segments such as the Solar Panel, LED Lighting, High Efficiency SMPS, and automotive.

TRENCH SUPER BARRIER RECTIFIERS (SBRT)

Trench SBR is the next evolution which gives us the performance member in the SBR family. By using a highly advanced trench technology, SBRT offers an even smaller V_F for applications where ultra-low forward voltages are important. While further technology enhancements are being continually applied to the SBRT, these efforts result in the ever more advanced and power friendly member - SBRTF.

SBRT diodes, and its latest enhancement SBRTF, are designed for a wide range of high-end applications, including:

- Power Adapters (SBRT25U60SLP)
- TV-Power Supplies (SBRT40V100CT, SBRTF40U100CT)
- LED-Drivers (SBRT3M40P1)





SBR[®] SUPER BARRIER RECTIFIER

THE NEW GENERATION
OF RECTIFIERS...

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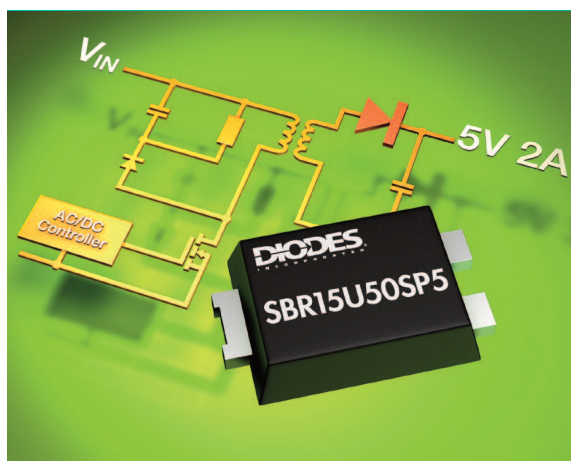
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10V – 40V SBR SUPER BARRIER RECTIFIERS

Part Number	Configuration	Qualified to AEC-Q101 (Y/N)	PPAP Capable (Y/N)	Maximum Average Rectified Current I_O (A)	Peak Repetitive Reverse Voltage V_{RRM} (V)	Forward Voltage Drop V_F at I_{MAX} (V)	Max Reverse Current I_R at V_{MAX} (μ A)	Peak Forward Surge Current I_{FSM} (A)	Package Outlines
SBR0220LP	Single	Yes	Yes	0.20	20.00	0.48	50.00	5.00	X1-DFN1006-2
SBR0220T5	Single	Yes	Yes	0.20	20.00	0.47	40.00	5.00	SOD523
SBR05U20LP	Single	Yes	Yes	0.50	20.00	0.50	50.00	5.00	X1-DFN1006-2
SBR05U20LPS	Single	Yes	Yes	0.50	20.00	0.50	50.00	6.00	X2-DFN1006-2
SBR05U20SN	Single	Yes	Yes	0.50	20.00	0.56	100.00	3.00	SC59
SBR07U20LPS	Single	Yes	Yes	0.70	20.00	0.55	50.00	7.00	X2-DFN1006-2
SBR1A20T5	Single	Yes	Yes	1.00	20.00	0.52	0.20	10.00	SOD523
SBR2U10LP	Single	Yes	Yes	2.00	10.00	0.46	2000.00	21.00	X1-DFN1411-3
SBR3U20SA	Single	Yes	Yes	3.00	20.00	0.39	500.00	66.00	SMA
SBR8U20SP5	Single	Yes	Yes	8.00	20.00	0.51	500.00	180.00	PowerDI5
SBR0230T5	Single	Yes	Yes	0.20	30.00	0.61	2.00	5.00	SOD523
SBR02M30LP	Single	Yes	Yes	0.20	30.00	0.61	0.50	5.00	X1-DFN1006-2
SBR02U30LP	Single	Yes	Yes	0.20	30.00	0.48	50.00	5.00	X1-DFN1006-2
SBR0330CW	Dual	Yes	Yes	0.30	30.00	0.58	0.30	1.00	SOT323
SBR130S3	Single	Yes	Yes	1.00	30.00	0.41	100.00	18.00	SOD323
SBR130SV	Single	Yes	Yes	1.00	30.00	0.56	100.00	2.50	SOT563
SBR1U30SV	Single	Yes	Yes	1.00	30.00	0.51	150.00	2.50	SOT563
SBR2A30P1	Single	Yes	Yes	2.00	30.00	0.45	200.00	75.00	PowerDI123
SBR2M30P1	Single	Yes	Yes	2.00	30.00	0.46	400.00	75.00	PowerDI123
SBR2U30P1	Single	Yes	Yes	2.00	30.00	0.40	400.00	75.00	PowerDI123
SBR2U30SA	Single	Yes	Yes	2.00	30.00	0.39	400.00	66.00	SMA
SBR3M30P1	Single	Yes	Yes	3.00	30.00	0.51	200.00	75.00	PowerDI123
SBR3U30P1	Single	Yes	Yes	3.00	30.00	0.40	400.00	75.00	PowerDI123
SBR15A30SP5	Single	Yes	Yes	15.00	30.00	0.59	100.00	136.00	PowerDI5
SBR15U30SP5	Single	Yes	Yes	15.00	30.00	0.49	500.00	250.00	PowerDI5
SBR30U30CT	Dual	Yes	Yes	30.00	30.00	0.45	1500.00	280.00	TO220AB
SBR0240LP	Single	Yes	Yes	0.25	40.00	0.59	10.00	5.00	X1-DFN1006-2
SBR140LP	Single	Yes	Yes	1.00	40.00	0.55	500.00	5.00	X1-DFN1411-3
SBR140S1F	Single	Yes	Yes	1.00	40.00	0.51	100.00	30.00	SOD123F

15A SUPER BARRIER RECTIFIER - HELPS REDUCE CHARGER SIZE



PowerDI is a registered trademark of Diodes Incorporated.

THE DIODES ADVANTAGE

- Ultra-Low Forward Voltage (V_F)**
 Ultra-low forward voltage minimizes conduction losses reducing power dissipation
- Low Reverse Leakage (I_R)**
 Low reverse leakage minimizes reverse leakage power losses
- Thermally Efficient Package**
 Low junction to ambient thermal resistance $R_{\theta JA}$ of 40°C/W
- Small Form Factor Package**
 The PowerDI®5 package has an off board profile of <1.1mm enabling thinner Adaptor solutions. The PowerDI5 package occupies 40% of the PCB area than the industry standard DPak (TO252) package

10V – 40V SBR SUPER BARRIER RECTIFIERS (CONTINUED)

Part Number	Configuration	Qualified to AEC-Q101 (Y/N)	PPAP Capable (Y/N)	Maximum Average Rectified Current I_O (A)	Peak Repetitive Reverse Voltage V_{RRM} (V)	Forward Voltage Drop V_F at I_{MAX} (V)	Max Reverse Current I_R at V_{MAX} (μA)	Peak Forward Surge Current I_{FSM} (A)	Package Outlines
SBR1A40S1	Single	Yes	Yes	1.00	40.00	0.55	500.00	20.00	SOD123
SBR1A40S3	Single	Yes	Yes	1.00	40.00	0.55	500.00	20.00	SOD323
SBR1A40SA	Single	Yes	Yes	1.00	40.00	0.50	500.00	25.00	SMA
SBR1U40LP	Single	Yes	Yes	1.00	40.00	0.49	50.00	5.00	X1-DFN1411-3
SBR2A40BLP	Bridge	Yes	Yes	2.00	40.00	0.50	100.00	70.00	V-DFN5060-4
SBR2A40SA	Single	Yes	Yes	2.00	40.00	0.55	100.00	25.00	SMA
SBR2A40P1	Single	Yes	Yes	2.00	40.00	0.50	100.00	75.00	PowerDI123
SBR3A40SA	Single	Yes	Yes	3.00	40.00	0.50	400.00	50.00	SMA
SBR3A40SAF	Single	Yes	Yes	3.00	40.00	0.53	400.00	50.00	SMAF
SBR3U40P1	Single	Yes	Yes	3.00	40.00	0.47	400.00	75.00	PowerDI123
SBR1040CT	Dual	Yes	Yes	10.00	40.00	0.55	500.00	120.00	TO220AB
SBR1040CTB	Dual	Yes	Yes	10.00	40.00	0.60	500.00	85.00	TO263 (D2PAK)
SBR1040CTFP	Dual	Yes	Yes	10.00	40.00	0.55	500.00	120.00	ITO220AB
SBR10U40CT	Dual	Yes	Yes	10.00	40.00	0.52	500.00	150.00	TO220AB
SBR10U40CTFP	Dual	Yes	Yes	10.00	40.00	0.44	500.00	150.00	ITO220AB
SBR2040CT	Dual	Yes	Yes	20.00	40.00	0.53	500.00	120.00	TO220AB
SBR2040CTFP	Dual	Yes	Yes	20.00	40.00	0.53	500.00	120.00	ITO220AB
SBR20A40CT	Dual	Yes	Yes	20.00	40.00	0.50	500.00	180.00	TO220AB
SBR20A40CTFP	Dual	Yes	Yes	20.00	40.00	0.50	500.00	180.00	ITO220AB
SBR20U40CT	Dual	Yes	Yes	20.00	40.00	0.47	500.00	200.00	TO220AB
SBR20U40CTFP	Dual	Yes	Yes	20.00	40.00	0.47	500.00	200.00	ITO220AB
SBR3040CT	Dual	Yes	Yes	30.00	40.00	0.55	500.00	200.00	TO220AB
SBR3040CTFP	Dual	Yes	Yes	30.00	40.00	0.55	500.00	200.00	ITO220AB
SBR30A40CT	Dual	Yes	Yes	30.00	40.00	0.50	500.00	250.00	TO220AB
SBR30A40CTFP	Dual	Yes	Yes	30.00	40.00	0.50	500.00	250.00	ITO220AB
SBR30M40CTFP	Single	Yes	Yes	30.00	40.00	0.65	75.00	250.00	ITO220AB
SBR4040CT	Dual	Yes	Yes	40.00	40.00	0.53	500.00	280.00	TO220AB
SBR4040CTFP	Dual	Yes	Yes	40.00	40.00	0.53	500.00	280.00	ITO220AB

POWERDI123 SBR PRODUCT FAMILY



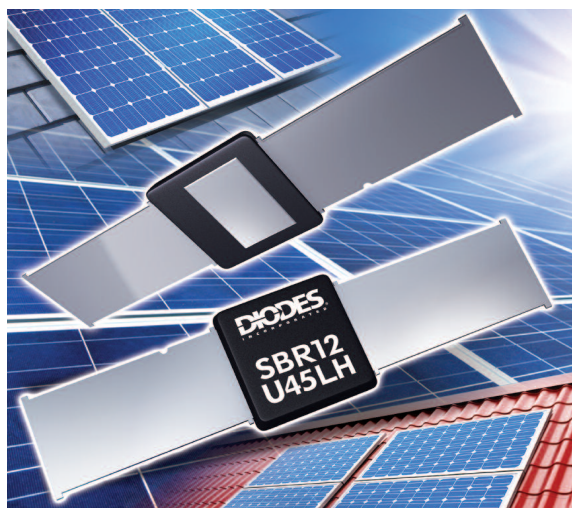
THE DIODES ADVANTAGE

- PowerDI123 is a low profile power package that delivers a superior thermal performance from a footprint that is 60% smaller than the industry standard SMA.
- Industry leading 3A current rating (SBR3U30P1) with high maximum junction temperature of 150°C in a miniature package outline.
- Highest ESD ± 16 kV HBM (Grade 3B, 16kV) rating and ± 25 kV ESD Protection (IEC61000-4-2 Level 4, Air Discharge).
- Much higher avalanche power rating for ruggedness and high reliability compared to traditional Schottky.
- Large safe operating area (SOA) with maximum junction temperature of 150°C provides extra margin for high temperature applications.
- Qualified to rigorous AEC-Q101 (automotive) standards for high reliability, compliant with RoHS environmental standards.

45V – 65V SBR SUPER BARRIER RECTIFIERS

Part Number	Configuration	Qualified to AEC-Q101 (Y/N)	PPAP Capable (Y/N)	Maximum Average Rectified Current I_O (A)	Peak Repetitive Reverse Voltage V_{RRM} (V)	Forward Voltage Drop V_F at I_{MAX} (V)	Max Reverse Current I_R at V_{MAX} (μA)	Peak Forward Surge Current I_{FSM} (A)	Package Outlines
SBR545D1	Single	No	No	5.00	45.00	0.49	500.00	90.00	SOT23
SBR5E45P5	Single	No	No	5.00	45.00	0.60	0.28	120.00	PowerDI5
SBR8A45SP5	Single	Yes	Yes	8.00	45.00	0.60	300.00	180.00	PowerDI5
SBR8E45P5	Single	No	No	8.00	45.00	0.51	0.35	140.00	PowerDI5
SBR1045CTL	Dual	Yes	Yes	10.00	45.00	0.55	500.00	90.00	TO252 (DPAK)
SBR1045D1	Single	Yes	Yes	10.00	45.00	0.58	500.00	90.00	TO252 (DPAK)
SBR1045SD1	Single	Yes	Yes	10.00	45.00	0.55	450.00	180.00	DO-201AD
SBR1045SP5	Single	Yes	Yes	10.00	45.00	0.55	450.00	180.00	PowerDI5
SBR10A45SP5	Single	Yes	Yes	10.00	45.00	0.53	400.00	180.00	PowerDI5
SBR10B45P5	Single	No	No	10.00	45.00	0.55	380.00	140.00	PowerDI5
SBR10E45P5	Single	No	No	10A	45.00	0.47	0.28	275.00	PowerDI5
SBR10U45D1	Single	Yes	Yes	10.00	45.00	0.58	300.00	125.00	TO252 (DPAK)
SBR10U45SD1	Single	Yes	Yes	10.00	45.00	0.47	300.00	200.00	DO-201AD
SBR10U45SP5	Single	Yes	Yes	10.00	45.00	0.47	300.00	275.00	PowerDI5
SBR12A45SD1	Single	Yes	Yes	12.00	45.00	0.48	300.00	200.00	DO-201AD
SBR12A45SP5	Single	Yes	Yes	12.00	45.00	0.66	300.00	280.00	PowerDI5
SBR12U45LH	Single	Yes	Yes	12.00	45.00	0.50	300.00	300.00	PowerDI5SP
SBR12U45LH1	Single	Yes	Yes	12.00	45.00	0.50	300.00	300.00	PowerDI5SP (Type B)
SBR2045CT	Dual	Yes	Yes	20.00	45.00	0.54	500.00	120.00	TO220AB
SBR2045CTFP	Dual	Yes	Yes	20.00	45.00	0.54	500.00	120.00	ITO220AB
SBR20A45CT	Dual	Yes	Yes	20.00	45.00	0.50	500.00	180.00	TO220AB
SBR20A45CTFP	Dual	Yes	Yes	20.00	45.00	0.50	500.00	180.00	ITO220AB
SBR3045CT	Dual	Yes	Yes	30.00	45.00	0.55	500.00	200.00	TO220AB
SBR3045CTB	Dual	Yes	Yes	30.00	45.00	0.70	500.00	180.00	TO263 (D2PAK)
SBR3045CTFP	Dual	Yes	Yes	30.00	45.00	0.55	500.00	200.00	ITO220AB
SBR3045SCTB	Dual	Yes	Yes	30.00	45.00	0.65	500.00	220.00	TO263 (D2PAK)
SBR30A45CT	Dual	Yes	Yes	30.00	45.00	0.50	500.00	250.00	TO220AB
SBR30A45CTB	Dual	Yes	Yes	30.00	45.00	0.55	500.00	175.00	TO263 (D2PAK)
SBR30A45CTFP	Dual	Yes	Yes	30.00	45.00	0.50	500.00	250.00	ITO220AB

SBR12U45LH - SBR FOR SOLAR PANELS



THE DIODES ADVANTAGE

- **Low profile package with maximum height of only 0.75mm**
PowerDI5SP enables integration of the bypass diode within the solar panel, which effectively removes the need for separate junction boxes.
- **Centrally mounted leads on each side of the package**
Allows the package to be mounted into recesses in the panel adding only 0.21mm to the total solar panel depth.
- **Industry's lowest forward voltage drop for 45V rectifier**
Low V_F of 0.38V at 12A and 125°C ensures negligible temperature rise during operation, resulting in more reliable operation of solar panels.
- **Fully functional over the temperature range from -65°C to 200°C**
Enables compliance with the thermal test requirement of Solar Safety Standard IEC61730-2.
- **For further information, visit Diodes.com**

45V – 65V SBR SUPER BARRIER RECTIFIERS (CONTINUED)

Part Number	Configuration	Qualified to AEC-Q101 (Y/N)	PPAP Capable (Y/N)	Maximum Average Rectified Current I_O (A)	Peak Repetitive Reverse Voltage V_{RRM} (V)	Forward Voltage Drop V_F at I_{MAX} (V)	Max Reverse Current I_R at V_{MAX} (μ A)	Peak Forward Surge Current I_{FSM} (A)	Package Outlines
SBR30E45CTB	Dual	No	No	30.00	45.00	0.55	480.00	250.00	TO263AB (D2PAK)
SBR4045CT	Dual	Yes	Yes	40.00	45.00	0.55	500.00	280.00	TO220AB
SBR4045CTFP	Dual	Yes	Yes	40.00	45.00	0.55	500.00	280.00	ITO220AB
SBR40U45CT	Dual	Yes	Yes	40.00	45.00	0.52	600.00	280.00	TO220AB
SBR60A45CT	Dual	Yes	Yes	60.00	45.00	0.60	1000.00	350.00	TO220AB
SBR15U50SP5	Single	Yes	Yes	15.00	50.00	0.52	15.00	256.00	PowerDI5
SBR20U50SLP	Single	Yes	Yes	20.00	50.00	0.52	100.00	100.00	PowerDI5060-8
SBR30A50CT	Dual	Yes	Yes	30.00	50.00	0.55	500.00	260.00	TO220AB
SBR0560S1	Single	Yes	Yes	0.50	60.00	0.50	100.00	15.00	SOD123
SBR05M60BLP	Bridge	Yes	Yes	0.50	60.00	0.49	100.00	8.00	U-DFN3030-4
SBR160S23	Single	Yes	Yes	1.00	60.00	0.60	100.00	15.00	SOT23
SBR660CTL	Dual	Yes	Yes	6.00	60.00	0.57	500.00	80.00	TO252 (DPAK)
SBR2U60S1F	Single	Yes	Yes	2.00	60.00	0.51	0.15	35.00	SOD123F
SBR3U60P1	Single	Yes	Yes	3.00	60.00	0.65	100.00	80.00	PowerDI123
SBR3U60PIQ	Single	Yes	Yes	3.00	60.00	0.62	100.00	80.00	PowerDI123
SBR3U60P5	Single	Yes	Yes	3.00	60.00	0.60	0.06	80.00	PowerDI5
SBR3U60SA	Single	No	No	3.00	60.00	0.65	100.00	60.00	SMA
SBR5E60P5	Single	No	No	5.00	60.00	0.52	220.00	170.00	PowerDI5
SBR8A60P5	Single	Yes	Yes	8.00	60.00	0.62	500.00	160.00	PowerDI5
SBR8B60P5	Single	No	No	8.00	60.00	0.60	220.00	170.00	PowerDI5
SBR8E60P5	Single	No	No	8.00	60.00	0.53	0.58	180.00	PowerDI5
SBR8U60P5	Single	Yes	Yes	8.00	60.00	0.53	500.00	280.00	PowerDI5
SBR1060CT	Dual	Yes	Yes	10.00	60.00	0.68	500.00	120.00	TO220AB
SBR1060CTFP	Dual	Yes	Yes	10.00	60.00	0.68	500.00	120.00	ITO220AB
SBR10U60CT	Dual	Yes	Yes	10.00	60.00	0.48	500.00	150.00	TO220AB
SBR10U60CTFP	Dual	Yes	Yes	10.00	60.00	0.48	500.00	150.00	ITO220AB
SBR2060CT	Dual	Yes	Yes	20.00	60.00	0.70	500.00	150.00	TO220AB
SBR2060CTFP	Dual	Yes	Yes	20.00	60.00	0.70	500.00	150.00	ITO220AB
SBR20A60CT	Dual	Yes	Yes	20.00	60.00	0.65	500.00	180.00	TO220AB
SBR20A60CTB	Dual	Yes	Yes	20.00	60.00	0.65	500.00	180.00	TO263 (D2PAK)
SBR20A60CTFP	Dual	Yes	Yes	20.00	60.00	0.65	500.00	180.00	ITO220AB
SBR20U60CT	Dual	Yes	Yes	20.00	60.00	0.57	500.00	200.00	TO220AB
SBR20U60CTFP	Dual	Yes	Yes	20.00	60.00	0.57	500.00	200.00	ITO220AB
SBR3060CT	Dual	Yes	Yes	30.00	60.00	0.70	500.00	200.00	TO220AB
SBR3060CTB	Dual	Yes	Yes	30.00	60.00	0.62	500.00	200.00	TO263 (D2PAK)
SBR3060CTFP	Dual	Yes	Yes	30.00	60.00	0.70	500.00	200.00	ITO220AB
SBR30A60CT	Dual	Yes	Yes	30.00	60.00	0.60	500.00	250.00	TO220AB
SBR30A60CTB	Dual	Yes	Yes	30.00	60.00	0.63	500.00	180.00	TO263 (D2PAK)
SBR30A60CTFP	Dual	Yes	Yes	30.00	60.00	0.60	500.00	250.00	ITO220AB
SBR4060CT	Dual	Yes	Yes	40.00	60.00	0.70	500.00	280.00	TO220AB
SBR4060CTFP	Dual	Yes	Yes	40.00	60.00	0.70	500.00	280.00	ITO220AB
SBR40U60CT	Dual	Yes	Yes	40.00	60.00	0.60	500.00	280.00	TO220AB
SBR40U60CTE	Dual	Yes	Yes	40.00	60.00	0.60	500.00	230.00	TO262
SBR60A60CT	Dual	Yes	Yes	60.00	60.00	0.62	200.00	280.00	TO220AB
SBR2065D1	Single	Yes	Yes	20.00	65.00	0.63	0.40	140.00	TO252 (DPAK)

100V – 150V SBR SUPER BARRIER RECTIFIERS

Part Number	Configuration	Qualified to AEC-Q101 (Y/N)	PPAP Capable (Y/N)	Maximum Average Rectified Current I_O (A)	Peak Repetitive Reverse Voltage V_{RRM} (V)	Forward Voltage Drop V_F at I_{MAX} (V)	Max Reverse Current I_R at V_{MAX} (μ A)	Peak Forward Surge Current I_{FSM} (A)	Package Outlines
SBR02U100LP	Single	Yes	Yes	0.25	100.00	0.80	1.00	5.00	X1-DFN1006-2
SBR05M100BLP	Bridge	Yes	Yes	0.50	100.00	0.73	25.00	8.00	U-DFN3030-4
SBR2U100LP	Single	Yes	Yes	1.50	100.00	0.85	50.00	18.00	X1-DFN1411-3
SBR3U100LP	Single	Yes	Yes	3.00	100.00	0.79	200.00	32.00	U-DFN3030-8
SBR6100CTL	Dual	Yes	Yes	6.00	100.00	0.74	200.00	78.00	TO252 (DPAK)
SBR8M100P5	Single	Yes	Yes	8.00	100.00	0.88	2.00	130.00	PowerDI5
SBR10100CT	Dual	Yes	Yes	10.00	100.00	0.80	100.00	120.00	TO220AB
SBR10100CTB	Dual	Yes	Yes	10.00	100.00	0.84	200.00	80.00	TO263 (D2PAK)
SBR10100CTFP	Dual	Yes	Yes	10.00	100.00	0.80	100.00	120.00	ITO220AB
SBR10100CTL	Dual	Yes	Yes	10.00	100.00	0.84	200.00	110.00	TO252 (DPAK)
SBR10U100CT	Dual	Yes	Yes	10.00	100.00	0.82	200.00	150.00	TO220AB
SBR10U100CTFP	Dual	Yes	Yes	10.00	100.00	0.82	200.00	150.00	ITO220AB
SBR12U100P5	Single	Yes	Yes	12.00	100.00	0.71	250.00	250.00	PowerDI5
SBR15U100CTL	Dual	Yes	Yes	15.00	100.00	0.80	80.00	100.00	TO252 (DPAK)
SBR20100CT	Dual	Yes	Yes	20.00	100.00	0.82	100.00	150.00	TO220AB
SBR20100CTE	Dual	Yes	Yes	20.00	100.00	0.82	100.00	180.00	TO262
SBR20100CTFP	Dual	Yes	Yes	20.00	100.00	0.82	100.00	150.00	ITO220AB
SBR20A100CT	Dual	Yes	Yes	20.00	100.00	0.75	100.00	250.00	TO220AB
SBR20A100CTB	Dual	Yes	Yes	20.00	100.00	0.75	0.10	250.00	TO263 (D2PAK)
SBR20A100CTE	Single	Yes	Yes	20.00	100.00	0.75	100.00	250.00	TO262
SBR20A100CTFP	Dual	Yes	Yes	20.00	100.00	0.75	100.00	250.00	ITO220AB
SBR20B100CT	Dual	No	No	20.00	100.00	0.82	95.00	220.00	TO220AB
SBR20E100CT	Dual	No	No	20.00	100.00	0.75	0.10	250.00	TO220AB
SBR20U100CT	Dual	Yes	Yes	20.00	100.00	0.70	500.00	200.00	TO220AB
SBR20U100CTE	Single	Yes	Yes	20.00	100.00	0.70	500.00	200.00	TO262
SBR20U100CTFP	Dual	Yes	Yes	20.00	100.00	0.70	500.00	200.00	ITO220AB
SBR30100CT	Dual	Yes	Yes	30.00	100.00	0.85	100.00	200.00	TO220AB

POWERDI5 PRODUCT FAMILY FOR SMPS AND SOLAR APPLICATIONS



THE DIODES ADVANTAGE

- Ultra-Low Forward Voltage (V_F)**
 Provides better efficiency and cooler operation to the device
- Lower Profile Package Height**
 PowerDI5 footprint occupies only 45% compared to SMC package, along with a package height of less than 1.1mm. The smaller footprint and profile will provide reduced PCB board for flexibility in placement and reduced cost.
- High Forward Current Rating (I_{FSM})**
 A high forward surge current rating protects against poor AC line input current, large current surges and lightning strikes.
- "Green" Antimony and Bromine-Free Mold Compound**
 Continual commitment of manufacturing environmental friendly products.

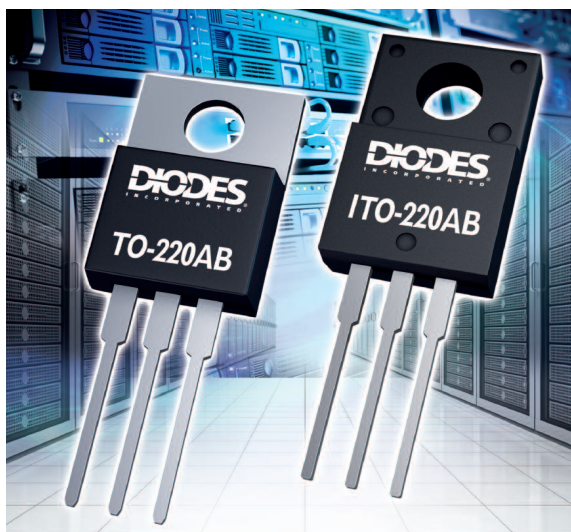
100V – 150V SBR SUPER BARRIER RECTIFIERS (CONTINUED)

Part Number	Configuration	Qualified to AEC-Q101 (Y/N)	PPAP Capable (Y/N)	Maximum Average Rectified Current I_O (A)	Peak Repetitive Reverse Voltage V_{RRM} (V)	Forward Voltage Drop V_F at I_{MAX} (V)	Max Reverse Current I_R at V_{MAX} (μ A)	Peak Forward Surge Current I_{FSM} (A)	Package Outlines
SBR30I100CTFP	Dual	Yes	Yes	30.00	100.00	0.85	100.00	200.00	ITO220AB
SBR30A100CT	Dual	Yes	Yes	30.00	100.00	0.80	100.00	250.00	TO220AB
SBR30A100CTB	Dual	Yes	Yes	30.00	100.00	0.85	100.00	180.00	TO263 (D2PAK)
SBR30A100CTE	Dual	Yes	Yes	30.00	100.00	0.80	100.00	250.00	TO262
SBR30A100CTFP	Dual	Yes	Yes	30.00	100.00	0.80	100.00	250.00	ITO220AB
SBR30E100CT	Dual	No	No	30.00	100.00	0.80	100.00	230.00	TO220AB
SBR30M100CT	Dual	Yes	Yes	30.00	100.00	0.85	12.00	250.00	TO220AB
SBR30M100CTFP	Dual	Yes	Yes	30.00	100.00	0.85	12.00	250.00	ITO220AB
SBR40I100CT	Dual	Yes	Yes	40.00	100.00	0.82	100.00	280.00	TO220AB
SBR40I100CTFP	Dual	Yes	Yes	40.00	100.00	0.82	100.00	280.00	ITO220AB
SBR40U100CT	Dual	Yes	Yes	40.00	100.00	0.72	500.00	235.00	TO220AB
SBR40U100CTE	Dual	Yes	Yes	40.00	100.00	0.78	500.00	240.00	TO262
SBR60A100CT	Dual	Yes	Yes	60.00	100.00	0.84	500.00	350.00	TO220AB
SBR10I20CTL	Dual	Yes	Yes	10.00	120.00	0.88	100.00	110.00	TO252 (DPAK)
SBR12M120P5-13	Single	No	No	12.00	120.00	0.83	200.00	300.00	PowerDI5
SBR12M120P5-13D	Single	No	No	12.00	120.00	0.83	200.00	300.00	PowerDI5
SBR12U120P5	Single	Yes	Yes	12.00	120.00	0.80	250.00	250.00	PowerDI5
SBR20A120CT	Dual	Yes	Yes	20.00	120.00	0.79	100.00	180.00	TO220AB
SBR20A120CTE	Dual	Yes	Yes	10.00	120.00	0.79	100.00	180.00	TO262
SBR20A120CTFP	Dual	Yes	Yes	20.00	120.00	0.79	100.00	180.00	ITO220AB
SBR20E120CT	Dual	No	No	20A	120.00	0.79	0.09	180.00	TO220AB
SBR30A120CT	Dual	Yes	Yes	30.00	120.00	0.88	100.00	250.00	TO220AB
SBR30A120CTFP	Dual	Yes	Yes	30.00	120.00	0.88	100.00	250.00	ITO220AB
SBR40U120CT	Dual	Yes	Yes	40.00	120.00	0.86	500.00	300.00	TO220AB
SBR40U120CTE	Dual	Yes	Yes	40.00	120.00	0.86	500.00	300.00	TO262
SBR4U130LP	Single	Yes	Yes	4.00	130.00	0.75	100.00	40.00	U-DFN3030-8
SBR1U150SA	Single	Yes	Yes	1.00	150.00	0.70	100.00	42.00	SMA
SBR2U150SA	Single	Yes	Yes	2.00	150.00	0.80	75.00	42.00	SMA
SBR3U150SB	Single	Yes	Yes	3.00	150.00	0.82	50.00	80.00	SMB
SBR3U150LP	Single	Yes	Yes	3.00	150.00	0.83	10.00	33.00	U-DFN3030-8
SBR10I150CT	Dual	Yes	Yes	10.00	150.00	0.88	250.00	120.00	TO220AB
SBR10I150CTE	Dual	Yes	Yes	10.00	150.00	0.92	250.00	100.00	TO262
SBR10I150CTFP	Dual	Yes	Yes	10.00	150.00	0.88	250.00	120.00	ITO220AB
SBR10I150CTL	Dual	Yes	Yes	10.00	150.00	0.94	100.00	100.00	TO252 (DPAK)
SBR10U150CT	Dual	Yes	Yes	10.00	150.00	0.79	200.00	150.00	TO220AB
SBR10U150CTFP	Dual	Yes	Yes	10.00	150.00	0.88	200.00	150.00	ITO220AB
SBR20I150CT	Dual	Yes	Yes	20.00	150.00	0.88	100.00	150.00	TO220AB
SBR20I150CTFP	Dual	Yes	Yes	20.00	150.00	0.88	100.00	150.00	ITO220AB
SBR20A150CT	Dual	Yes	Yes	20.00	150.00	0.82	100.00	180.00	TO220AB
SBR20A150CTFP	Dual	Yes	Yes	20.00	150.00	0.82	100.00	180.00	ITO220AB
SBR20U150CT	Dual	Yes	Yes	20.00	150.00	0.78	500.00	200.00	TO220AB
SBR20U150CTFP	Dual	Yes	Yes	20.00	150.00	0.78	500.00	200.00	ITO220AB
SBR30I150CT	Dual	Yes	Yes	30.00	150.00	0.92	100.00	200.00	TO220AB
SBR30I150CTFP	Dual	Yes	Yes	30.00	150.00	0.92	100.00	200.00	ITO220AB
SBR30A150CT	Dual	Yes	Yes	30.00	150.00	0.88	100.00	250.00	TO220AB
SBR30A150CTFP	Dual	Yes	Yes	30.00	150.00	0.88	100.00	250.00	ITO220AB
SBR40I150CT	Dual	Yes	Yes	40.00	150.00	0.90	100.00	280.00	TO220AB
SBR40I150CTFP	Dual	Yes	Yes	40.00	150.00	0.90	100.00	280.00	ITO220AB
SBR40U150CT	Dual	Yes	Yes	40.00	150.00	0.86	500.00	240.00	TO220AB
SBR60A150CT	Dual	Yes	Yes	60.00	150.00	0.93	500.00	250.00	TO220AB

200V – 400V SBR SUPER BARRIER RECTIFIERS

Part Number	Configuration	Qualified to AEC-Q101 (Y/N)	PPAP Capable (Y/N)	Maximum Average Rectified Current I_O (A)	Peak Repetitive Reverse Voltage V_{RRM} (V)	Forward Voltage Drop V_F at I_{MAX} (V)	Max Reverse Current I_R at V_{MAX} (μ A)	Peak Forward Surge Current I_{FSM} (A)	Package Outlines
SBR1U200P1	Single	No	No	1.00	200.00	0.82	50.00	40.00	PowerDI123
SBR6200CTL	Dual	Yes	Yes	6.00	200.00	0.85	100.00	80.00	TO252 (DPAK)
SBR10200CT	Dual	Yes	Yes	10.00	200.00	0.90	100.00	110.00	TO220AB
SBR10200CTB	Dual	Yes	Yes	10.00	200.00	0.92	50.00	80.00	TO263 (D2PAK)
SBR10200CTFP	Dual	Yes	Yes	10.00	200.00	0.90	100.00	110.00	ITO220AB
SBR10200CTL	Dual	Yes	Yes	10.00	200.00	0.94	100.00	110.00	TO252 (DPAK)
SBR10U200CT	Dual	Yes	Yes	10.00	200.00	0.82	200.00	150.00	TO220AB
SBR10U200CTB	Dual	Yes	Yes	10.00	200.00	0.88	200.00	150.00	TO263 (D2PAK)
SBR10U200CTFP	Dual	Yes	Yes	10.00	200.00	0.88	200.00	150.00	ITO220AB
SBR10U200P5	Single	Yes	Yes	10.00	200.00	0.88	100.00	180.00	PowerDI5
SBR20A200CT	Dual	Yes	Yes	20.00	200.00	0.86	100.00	180.00	TO220AB
SBR20A200CTB	Dual	Yes	Yes	20.00	200.00	0.84	100.00	180.00	TO263 (D2PAK)
SBR20A200CTFP	Dual	Yes	Yes	20.00	200.00	0.86	100.00	180.00	ITO220AB
SBR30200CT	Dual	Yes	Yes	30.00	200.00	0.98	100.00	200.00	TO220AB
SBR30200CTFP	Dual	Yes	Yes	30.00	200.00	0.98	100.00	200.00	ITO220AB
SBR40U200CT	Dual	Yes	Yes	40.00	200.00	0.89	200.00	240.00	TO220AB
SBR40U200CTB	Dual	Yes	Yes	40.00	200.00	0.93	200.00	240.00	TO263 (D2PAK)
SBR60A200CT	Dual	Yes	Yes	60.00	200.00	0.96	100.00	250.00	TO220AB
SBR10U300CT	Dual	Yes	Yes	10.00	300.00	0.86	200.00	150.00	TO220AB
SBR10U300CTFP	Dual	Yes	Yes	10.00	300.00	0.92	200.00	150.00	ITO220AB
SBR20A300CT	Dual	Yes	Yes	20.00	300.00	0.92	100.00	180.00	TO220AB
SBR20A300CTB	Dual	Yes	Yes	20.00	300.00	0.92	100.00	180.00	TO263 (D2PAK)
SBR20A300CTFP	Dual	Yes	Yes	20.00	300.00	0.92	100.00	180.00	ITO220AB
SBR30300CT	Dual	Yes	Yes	30.00	300.00	1.03	100.00	200.00	TO220AB
SBR30300CTFP	Dual	Yes	Yes	30.00	300.00	1.03	100.00	200.00	ITO220AB
SBR40U300CT	Dual	Yes	Yes	40.00	300.00	0.89	100.00	235.00	TO220AB
SBR40U300CTB	Dual	Yes	Yes	40.00	300.00	0.92	100.00	200.00	TO263 (D2PAK)
SBR60A300CT	Dual	Yes	Yes	60.00	300.00	0.94	100.00	235.00	TO220AB
SBR1A400P1	Single	No	No	1.00	400.00	1.10	0.05	40.00	PowerDI123
SBR1U400P1	Single	Yes	Yes	1.00	400.00	0.90	50.00	40.00	PowerDI123

300V SBR PRODUCT FAMILY



THE DIODES ADVANTAGE

- 300V SBR Ultra-Low V_F and Low V_F version packaged in standard TO220AB and ITO220AB packages with wide current offering from 10A to 60A.
- A significant 20-25% improvement in forward voltage drop (V_F) compared to Ultra-Fast rectifiers with similar switching speed.
- SBR60A300CT – the only 60A, 300V V_{RRM} rated rectifier rated to 175°C.
- Maximum junction temperature of 175°C to meet the requirements of high ambient temperature operating environments.
- Fast switching speed 50 nS (maximum value) and faster for RGI test conditions ($I_F = 0.5A$, $I_{RR} = 0.25A$, $I_R = 1A$).
- The higher V_{RRM} of 300V SBR's enable designers to simplify circuit design and reduce cost by replacing 200V V_{RRM} rectifiers and removing snubber circuits that would otherwise be required to suppress transient voltage spikes.

SBR SOLUTIONS FOR AC/DC CHARGERS AND ADAPTERS

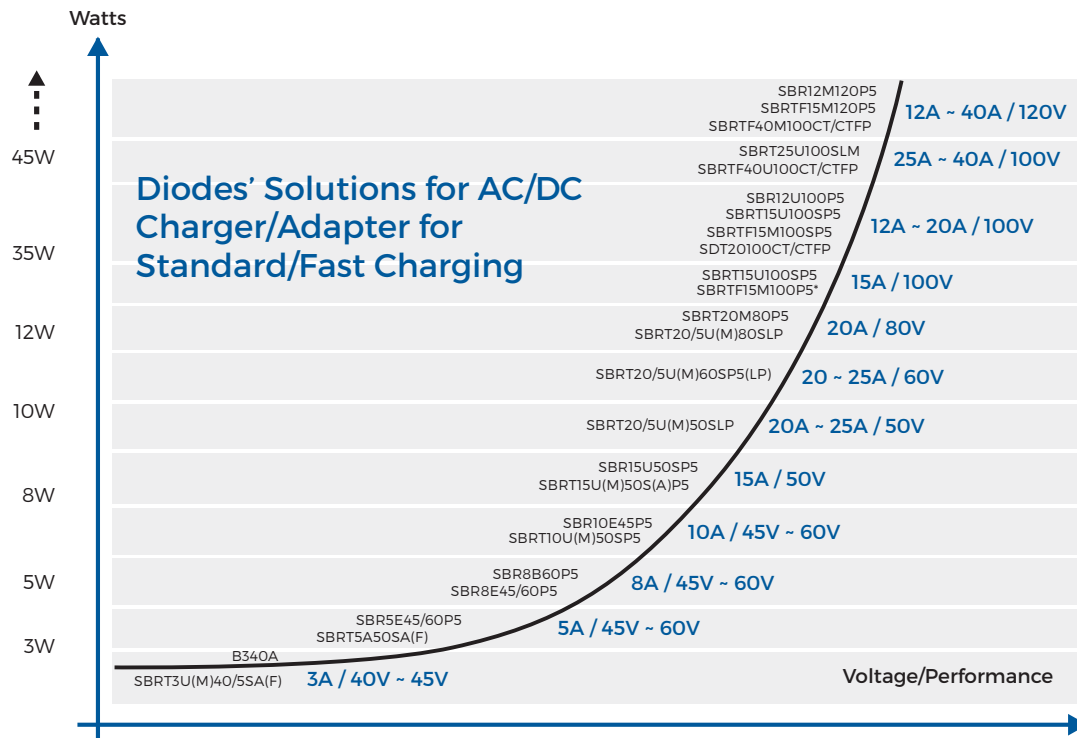
In the mobile internet life-style prevalent today, consumers and business travelers are constantly looking for a 24/7 connection to their friends or associates for updates to their personal or business data stored in the cloud for entertainment or work.

Therefore a smartphone which is always running, becomes an indispensable tool that most people will carry wherever they go.

The proliferation of an eventual universal connector like the USB Type-C, as well the fast charging technology like the USB Power Delivery, enable the end-users to re-charge the depleted battery in their smartphones to 50% or more in 30 minutes or less.

To meet different requirements across a diverse range of applications, Diodes has a wide range of SBR families: E-series for best price-performance, A-series for low- V_F , U-series for lowest V_F , M-series for low I_R , and the SBRT/TF for super performance.

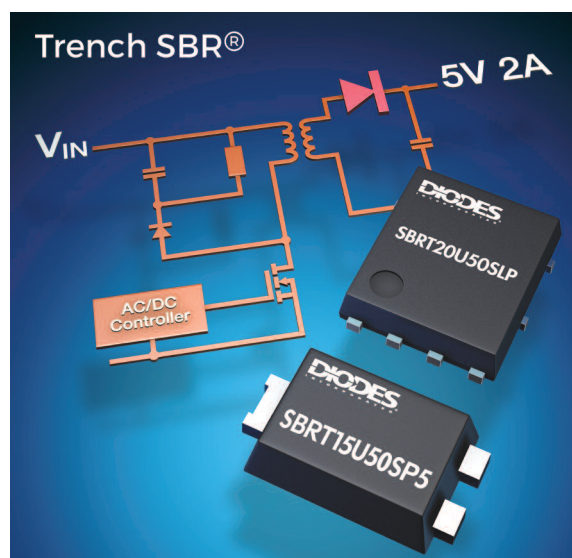
	PN Junction Diode	Schottky Barrier Diode	"Fast Recovery Diode"	SBR
Forward Voltage V_F	High	High	Very High	Low
Reverse Leakage Current, I_{RM}	Low	High	Low	Low
Breakdown Voltage, V_{RRM}	High	Medium	High	High
Surge Reliability	High	Low	High	High
Thermal Immunity	High	Low	High	High
Switching Speed, $(1/T_{RR})$	Low	High	High	High



TRENCH SUPER BARRIER RECTIFIERS

Part Number	Configuration	Qualified to AEC-Q101 (Y/N)	PPAP Capable (Y/N)	Maximum Average Rectified Current I_O (A)	Peak Repetitive Reverse Voltage V_{RRM} (V)	Forward Voltage Drop V_F at I_{MAX} (V)	Max Reverse Current I_R at V_{MAX} (μ A)	Peak Forward Surge Current I_{FSM} (A)	Package Outlines
SBRT05U10LP	Single	No	No	0.50	10.00	0.39	1000.00	5.00	X1-DFN1006-2
SBRT2M10LP	Single	Yes	Yes	2.00	10.00	0.40	250.00	25.00	X1-DFN1411-3
SBRT4U10LP	Single	Yes	Yes	4.00	10.00	0.50	200.00	35.00	U-DFN2020-2 (Type B)
SBRT6U10LP	Single	Yes	Yes	6.00	10.00	0.48	300.00	55.00	U-DFN3030-8
SBRT2U15LP	Single	Yes	Yes	2.00	15.00	0.45	100.00	25.00	X1-DFN1411-3
SBRT4U15LP	Single	Yes	Yes	4.00	15.00	0.48	100.00	35.00	U-DFN2020-2 (Type B)
SBRT05U20LP	Single	No	No	0.50	20.00	0.39	50.00	10.00	X1-DFN1006-2
SBRT05U20S3	Single	No	No	0.50	20.00	0.40	70.00	10.00	SOD323
SBRT6U20LP	Single	Yes	Yes	6.00	20.00	0.45	250.00	55.00	U-DFN3030-8
SBRT3M30LP	Single	No	No	3.00	30.00	0.49	20.00	30.00	U-DFN3030-8
SBRT4M30LP	Single	No	No	4.00	30.00	0.51	60.00	30.00	U-DFN3030-8
SBRT4U30LP	Single	Yes	Yes	4.00	30.00	0.50	100.00	45.00	U-DFN2020-2 (Type B)
SBRT3M40PI	Single	No	No	3.00	40.00	0.53	30.00	70.00	POWERDI123
SBRT3M40SA	Single	No	No	3.00	40.00	0.53	40.00	70.00	SMA
SBRT3U40PI	Single	Yes	Yes	3.00	40.00	0.49	180.00	75.00	POWERDI123
SBRT2U45LP	Single	Yes	Yes	2.00	45.00	0.55	100.00	25.00	X1-DFN1411-3
SBRT3U45SA	Single	Yes	Yes	3.00	45.00	0.48	150.00	50.00	SMA
SBRT3U45SAF	Single	Yes	Yes	3.00	45.00	0.48	150.00	50.00	SMAF
SBRT4U45LP	Single	Yes	Yes	4.00	45.00	0.52	100.00	45.00	U-DFN2020-2 (Type B)
SBRT6U45LP	Single	Yes	Yes	6.00	45.00	0.52	150.00	55.00	U-DFN3030-8
SBRT20V45CT	Dual	No	No	20.00	45.00	0.62	300.00	180.00	TO220AB
SBRT30A45CT	Dual	No	No	15.00	45.00	0.51	400.00	240.00	TO220AB

TRENCH SBR EXCEEDS CHARGER REQUIREMENTS



THE DIODES ADVANTAGE

- SBRT15U50SP5's forward voltage of 0.47V at 15A and SBRT20U50SLP's forward voltage of 0.5V at 20A, coupled with an operating temperature of +90°C, means conduction losses are minimized and charger efficiencies are increased.
- Trench SBRs meet the requirements of the charger output rectifier diode, easily coping with the shorter current pulses of 36KHz discontinuous mode charger designs.
- Trench SBR devices span a reverse voltage range from 10V to 100V and a current handling capability from 0.2A to 40A
- They come in a variety of different package options, including Diodes' space-saving PowerDI123, PowerDI5 and PowerDI5060.

TRENCH SUPER BARRIER RECTIFIERS (CONTINUED)

Part Number	Configuration	Qualified to AEC-Q101 (Y/N)	PPAP Capable (Y/N)	Maximum Average Rectified Current I_O (A)	Peak Repetitive Reverse Voltage V_{RRM} (V)	Forward Voltage Drop V_F at I_{MAX} (V)	Max Reverse Current I_R at V_{MAX} (μA)	Peak Forward Surge Current I_{FSM} (A)	Package Outlines
SBRT30A45CTFP	Dual	No	No	15.00	45.00	0.51	400.00	240.00	ITO220AB
SBRT30U45CT	Dual	No	No	15.00	45.00	0.50	400.00	250.00	TO220AB
SBRT30U45CTFP	Dual	No	No	15.00	45.00	0.50	400.00	250.00	ITO220AB
SBRT5A50SA	Single	Yes	Yes	5.00	50.00	0.53	0.15	100.00	SMA
SBRT5A50SAF	Single	Yes	Yes	5.00	50.00	0.53	150.00	100.00	SMAF
SBRT10U50SP5	Single	Yes	Yes	10.00	50.00	0.45	300.00	320.00	PowerDI5
SBRT10M50SP5	Single	No	No	10.00	50.00	0.47	150.00	300.00	PowerDI5
SBRT15M50AP5	Dual	Yes	Yes	15.00	50.00	0.54	150.00	290.00	PowerDI5
SBRT15U50SP5	Single	No	No	15.00	50.00	0.47	500.00	290.00	PowerDI5
SBRT20U50SLP	Single	Yes	Yes	20.00	50.00	0.50	500.00	200.00	PowerDI5060-8
SBRT25M50SLP	Single	Yes	Yes	25.00	50.00	0.55	120.00	220.00	PowerDI5060-8
SBRT25U50SLP	Single	Yes	Yes	25.00	50.00	0.60	150.00	220.00	PowerDI5060-8
SBRT60U50CT	Dual	No	No	30.00	50.00	0.52	50.00	350.00	TO220AB
SBRT3M60P1	Single	Yes	Yes	3.00	60.00	0.59	100.00	70.00	POWERDI123
SBRT3M60SA	Single	Yes	Yes	3.00	60.00	0.59	100.00	50.00	SMA
SBRT3U60P1	Single	Yes	Yes	3.00	60.00	0.56	150.00	70.00	POWERDI123
SBRT3U60SA	Single	Yes	Yes	3.00	60.00	0.56	500.00	60.00	SMA
SBRT3U60SAF	Single	Yes	Yes	3.00	60.00	0.53	0.50	40.00	SMAF
SBRT4U60LP	Single	Yes	Yes	4.00	60.00	0.52	150.00	20.00	U-DFN3030-8
SBRT10U60D1	Single	No	No	10.00	60.00	0.52	400.00	140.00	TO252 (DPAK)
SBRT20M60CT	Dual	Yes	Yes	10.00	60.00	0.60	150.00	210.00	TO220AB
SBRT20M60SP5	Single	Yes	Yes	20.00	60.00	0.57	180.00	320.00	PowerDI5
SBRT20U60SP5	Single	Yes	Yes	25.00	60.00	0.53	400.00	320.00	PowerDI5
SBRT20V60CT	Dual	No	No	20.00	60.00	0.69	300.00	190.00	TO220AB
SBRT25M60SLP	Single	Yes	Yes	25.00	60.00	0.60	150.00	220.00	PowerDI5060-8
SBRT25U60SLP	Single	Yes	Yes	25.00	60.00	0.55	400.00	220.00	PowerDI5060-8
SBRT30A60CT	Dual	No	No	15.00	60.00	0.56	400.00	220.00	TO220AB
SBRT30A60CTFP	Dual	No	No	15.00	60.00	0.56	400.00	220.00	ITO220AB
SBRT60U60CT	Dual	No	No	30.00	60.00	0.62	60.00	320.00	TO220AB
SBRT20M80SLP	Single	Yes	Yes	20.00	80.00	0.61	160.00	210.00	PowerDI5060-8
SBRT20M80SP5	Single	Yes	Yes	80.00	80.00	0.66	200.00	350.00	PowerDI5
SBRT25U80SLP	Single	Yes	Yes	25.00	80.00	0.61	500.00	200.00	PowerDI5060-8
SBRT40M80CTB	Dual	No	No	40.00	80.00	0.72	1.00	230.00	TO263AB (D2PAK)
SBRT10A100CTL	Dual	Yes	Yes	5.00	100.00	0.78	180.00	85.00	TO252 (DPAK)
SBRT15U100SP5	Single	Yes	Yes	15.00	100.00	0.70	250.00	250.00	PowerDI5
SBRT20U100SLP	Single	Yes	Yes	20.00	100.00	0.70	300.00	180.00	PowerDI5060-8
SBRT30A100CT	Dual	Yes	Yes	15.00	100.00	0.80	150.00	200.00	TO220AB
SBRT30A100CTFP	Dual	Yes	Yes	15.00	100.00	0.80	150.00	200.00	ITO220AB
SBRTF40U100CT	Dual	No	No	40.00	100.00	0.61	0.50	200.00	TO220AB
SBRTF40U100CTFP	Dual	No	No	40.00	100.00	0.61	0.50	200.00	ITO220AB
SBRT40V100CT	Dual	Yes	Yes	40.00	100.00	0.73	300.00	180.00	TO220AB
SBRT40V100CTE	Dual	No	No	40.00	100.00	0.73	300.00	180.00	TO262
SBRT40V100CTFP	Dual	No	No	40.00	100.00	0.73	300.00	180.00	ITO220AB
SBRT60U100CT	Dual	Yes	Yes	60.00	100.00	0.78	300.00	320.00	TO220AB

AUTOMOTIVE SUPER BARRIER RECTIFIERS

Part Number	Configuration	Qualified to AEC-Q101 (Y/N)	PPAP Capable (Y/N)	Maximum Average Rectified Current I_O (A)	Peak Repetitive Reverse Voltage V_{RRM} (V)	Forward Voltage Drop V_F at I_{MAX} (V)	Max Reverse Current I_R at V_{MAX} (μ A)	Peak Forward Surge Current I_{FSM} (A)	Package Outlines
SBR8U20SP5Q	Single	Yes	Yes	8.00	20.00	0.51	0.30	180.00	PowerDI5
SBR15U30SP5Q	Single	Yes	Yes	15.00	30.00	0.49	500.00	280.00	PowerDI5
SBR2A40P1Q-7	Single	Yes	Yes	2.00	40.00	0.50	100.00	50.00	PowerDI123
SBR3A40SAQ	Single	Yes	Yes	3.00	40.00	0.50	400.00	45.00	SMA
SBR3U40P1Q	Single	Yes	Yes	3.00	40.00	0.47	400.00	75.00	PowerDI123
SBR3U40P1Q-7	Single	Yes	Yes	3.00	40.00	0.49	180.00	75.00	PowerDI123
SBR1045CTLQ	Dual	Yes	Yes	10.00	45.00	0.55	0.30	90.00	TO252 (DPAK)
SBR1045D1Q	Single	Yes	Yes	10.00	45.00	0.58	0.30	90.00	TO252 (DPAK)
SBR1045SP5Q	Single	Yes	Yes	10.00	45.00	0.55	0.45	180.00	PowerDI5
SBR10A45SP5Q-13	Single	Yes	Yes	10.00	45.00	0.53	400.00	180.00	PowerDI5
SBR10U45D1Q	Single	Yes	Yes	10.00	45.00	0.57	0.30	125.00	TO252 (DPAK)
SBR10U45SP5Q	Single	Yes	Yes	10.00	45.00	0.47	0.30	275.00	PowerDI5
SBR20M45D1Q	Single	Yes	Yes	20.00	45.00	0.61	0.10	140.00	TO252 (DPAK)
SBR3045CTBQ	Dual	Yes	Yes	30.00	45.00	0.70	0.50	180.00	TO263 (D2PAK)
SBR30A45CTBQ	Dual	Yes	Yes	30.00	45.00	0.55	0.55	175.00	TO263 (D2PAK)
SBR20U50SLPQ	Single	Yes	Yes	20.00	50.00	0.50	500.00	200.00	PowerDI5060-8
SBR2U60S1FQ	Single	Yes	Yes	2.00	60.00	0.51	0.15	35.00	SOD123F
SBR3U60P5Q	Single	Yes	Yes	3.00	60.00	0.60	0.06	80.00	PowerDI5
SBR0560S1Q	Single	Yes	Yes	0.50	60.00	0.50	100.00	15.00	SOD123
SBR660CTLQ	Dual	Yes	Yes	6.00	60.00	0.57	0.30	80.00	TO252 (DPAK)
SBR8U60P5Q	Single	Yes	Yes	8.00	60.00	0.53	0.33	280.00	PowerDI5
SBR20A60CTBQ	Dual	Yes	Yes	1.00	150.00	0.70	100.00	42.00	TO263 (D2PAK)
SBR30A60CTBQ	Dual	Yes	Yes	30.00	60.00	0.63	0.33	180.00	TO263 (D2PAK)
SBR40U60CTBQ	Dual	Yes	Yes	40.00	60.00	0.60	0.40	320.00	TO263 (D2PAK)
SBR1U150SAQ-13	Single	Yes	Yes	1.00	150.00	0.70	100.00	42.00	SMA
SBR02U100LPQ	Single	Yes	Yes	0.25	100.00	0.80	1.00	5.00	X1-DFN1006-2
SBR6100CTLQ	Dual	Yes	Yes	6.00	100.00	0.74	0.10	78.00	TO252 (DPAK)
SBR8M100P5Q	Single	Yes	Yes	8.00	100.00	0.88	2.00	130.00	PowerDI5
SBR10U200P5Q-13	Single	Yes	Yes	10.00	200.00	0.88	0.10	180.00	PowerDI5
SBR12U100P5Q	Single	Yes	Yes	12.00	100.00	0.78	0.25	250.00	PowerDI5
SBR15U100CTLQ	Dual	Yes	Yes	15.00	100.00	0.80	0.10	100.00	TO252 (DPAK)

SBR 'Q' PORTFOLIO MEETS THE NEEDS OF AUTOMOTIVE APPLICATIONS



THE DIODES ADVANTAGE

- Automotive SBRs are qualified to the AEC-Q101 high-reliability standard and backed by PPAP level 3 documentation.
- The parts are 100% avalanche tested and proven to deliver a reverse-avalanche capability of between three to ten times greater than the competing Schottky alternatives.
- Offering current ratings up to 60A and reverse voltage ratings up to 100V, the SBR "Q" portfolio is also characterized by significantly lower reverse leakage current at higher temperatures, helping to minimize circuit losses and increasing protection against thermal runaway.
- The SBR forward voltage drop is also lower than that of the competing Schottky alternatives, meaning conduction losses are less. As a result the overall efficiency in common reverse polarity protection and free-wheeling diode circuits is improved.

FAQs SUPER BARRIER RECTIFIERS

1. How does an SBR work?

A Super Barrier Rectifier (SBR) is effectively a MOSFET with its gate and source shorted together.

With the application of forward bias, the external voltage lowers the barrier height on the semiconductor side and large current can flow through the FET channel.

In reverse bias, the opposite takes place: the barrier height increases and free charge in the semiconductor channel gets "pinched off" from the overlapping depletion layers, reducing the reverse leakage current.

2. What are the key features and benefits of a Super Barrier Rectifier (SBR)?

- Reverse voltage (V_{RRM}) up to 400V
- Lower forward voltage (V_F) than competing solution ("U" grade)
- Lower normalized reverse leakage current (I_R) than Schottky diodes
- Fast reverse recovery times (T_{RR}) matches those of the competing solutions
- Avalanche ratings up to 50% higher than competing solutions

3. Where is SBR used?

SBR can be used as:

- Output rectifier
- Free-wheeling diode
- Buck/boost diode
- Reverse polarity protection diode
- Solar application or solar by-pass diode

4. What is the difference between SBR and Ultrafast rectifiers?

SBR has switching speed and other characteristics comparable to that of an ultrafast rectifier. An added benefit is having a forward voltage (V_F) that is 20 to 25% lower, especially at high ambient temperatures.

This reduced V_F can lead to a substantial reduction in power savings, and improvement to power efficiency.

5. What does an SBR compete against?

Voltage (V)	Competing Solution	SBR Benefit
<30V	Schottky Diodes	Lower V_F , fast T_{RR} , lower reverse leakage (I_R)
>30V – 150V	Schottky Diodes	Lower V_F , fast T_{RR} , lower reverse leakage (I_R) improved ruggedness
150V to 400V	Ultrafast/Hyperfast diodes	Much Lower V_F , fast T_{RR} , improved ruggedness

6. How fast is the T_{RR} of an SBR?

A SBR has a T_{RR} comparable to that of Schottky and ultrafast rectifiers.

For SBR of rating 150V or higher (similar to Schottky), minority carriers can be injected in the drift region, resulting in a slightly slower but softer recovery.

7. How has SBR technology evolved?

Since the SBR series products were first announced in 2006, a lot of innovations have been made. Today, the trench process makes it possible to further reduce the forward voltage (V_F), T_{RR} , yet the reverse leakage current (I_R) is kept well under control.

These advancements, when combined together, result in the latest SBRT and SBRTF with even lower V_F , I_R , and T_{RR} .

Customers can be assured that the train of innovation at Diodes Incorporated continues. For example, SBR/SBRTs are now offered in the low-profile DFN package for use in the small sensor modules popular in the modern automobiles.

8. What is the latest SBR evolution?

SBRTF is the latest evolution of the SBR technology. It can significantly reduce power loss and lower operating temperature at V_{RRM} higher than 100V.

When used as output rectifiers in quick chargers and power adapters for mobile devices, SBRs can improve power efficiency up to 2% more and reduce the operating temperature by up to 10%, when compared to the competing Schottky alternatives.

In addition, the SBRTF rectifiers offer high forward surge current capability, up to 200A, enabling them to endure high, short-duration, non-repetitive peak currents.

They are also avalanche rugged with a rating of 340mJ. Consequently, they can comfortably withstand the unclamped switching events commonly found in harsh working environments.

9. Why is the SBR technology good for the automotive & industrial applications?

Several of the intrinsic characteristics make the SBR technology suitable for reliable operation in harsh environments typical of industrial and automotive applications.

For instance, at high ambient temperatures, SBR products often exhibit lower reverse current I_R and forward voltage V_F than many of the competing Schottky diodes.

As such, the junction temperature inside the product is at a considerably lower level thus leading to stable operation at high efficiency.

At Diodes Incorporated, the multiple generations of innovation developed in-house enable our SBR products to better meet the stringent requirements inherent in automotive and industrial applications.

The SBRT2U15LP, packaged in the minuscule 1.4mm x 1.1mm DFN, operates reliably under high ambient temperature typical of the solar panel. The SMA-packaged SBR3A40SAQ exhibits low manufacturing defects, which is deemed imperative in automotive applications.



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