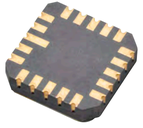
NEW PRODUCT DEVELOPMENT FOR SPACE APPLICATIONS



3.5 A Adjustable Output
Synchronous DC-DC Converter

6 A, 800 V
Solar Array Bypass Diode

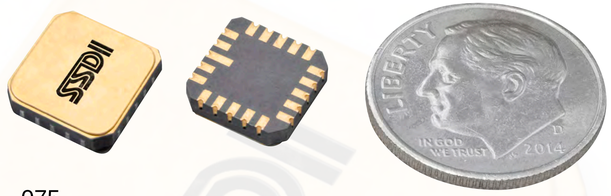
20 A, 200 V
Fast Recovery 1Φ Bridge Rectifier

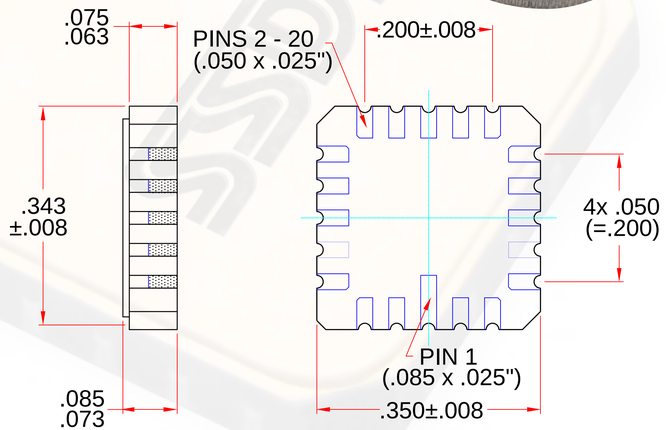
DC–DC Converter

3.5 A Adjustable Output Synchronous DC-DC Converter

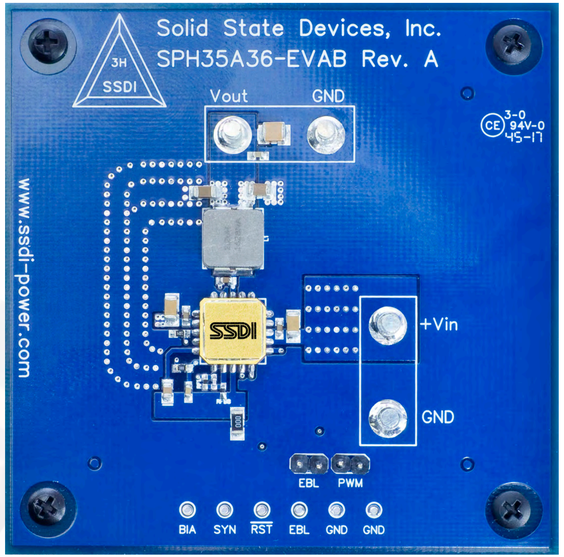
Features:

- 3.5 A, 2.1 MHz sychronous buck regulator
- ±1% output voltage tolerance, T_J = 25°C
- Input voltage range of 3.9 V to 36 V, transient up to 42 V
- Adjustable output voltage range of 3.3 V to 10 V
- 0.6 V dropout at 3.5 A & T_A of 105°C
- Low EMI and switch noise
- External frequency sychronization
- Built-in compensation, soft start, current limit, thermal shutdown and UVLO
- Isolated hermetically sealed power package
- TX, TXV, and S level screening available





V_{OUT}	I_{OUT} (A)	V_{IN} (V)	Measured V_{OUT} (V)	V_{OUT} Reg (%)[1/]
Adjusted for V_{OUT} = 5 V	No load	20	5.08	N/A
	3.09	20	4.92	
	3.16	6	4.96	0.0
	3.15	36	4.96	
Adjusted for V_{OUT} = 10 V	No load	11	10.00	N/A
	No load	36	10.00	
	3.03	11	9.96	-0.8
	3.03	36	9.88	



Additional DC-DC Converters:

- $I_{OUT\ (max)}$ from 1 - 40 Amps
- V_{IN} (after start-up) as low as 3 V min and as high as 75 V max
- V_{OUT} (adjustable) as low as 0.35 V min and as high as 70 V max
- Max Switching Frequency as low as 50 kHz and as high as 3600 kHz

Solar Array Bypass Diode

Customer Inquiry:

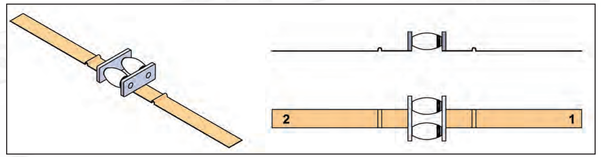
- 3 A, 400 V solar array bypass diode i.a.w. customer's drawing
- Two SMD.5 or SMD1 diodes with ribbon leads in series for redundancy
- SSDI initially offered its standard SMD devices with ribbon leads

Advantages of Ribbon Leads:

- Ribbon leads reduce risk of vibration stress and thermal fatigue
- Customizable lead dimensions available
- Facilitates lead inspection

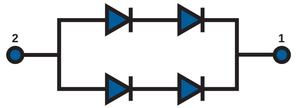
SSDI's Initial Recommended Design:

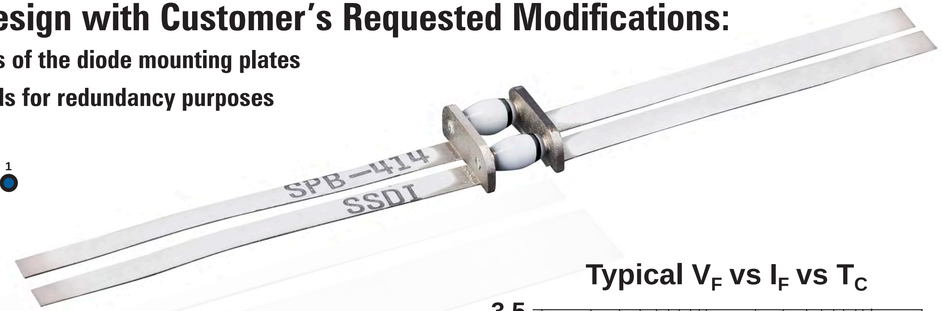
- Replace two separate diodes with two diodes in series and in parallel
- Utilize SSDI's S-level void free diodes in place of SMD cavity packages
- With void free diodes, PIND testing is no longer necessary and hermeticity concerns are mitigated
- All high-temperature construction for ultimate reliability (>600°C)
- Silver plated flat leads with Nickel underplate to facilitate welding to bus bar



SSDI's Revised Design with Customer's Requested Modifications:

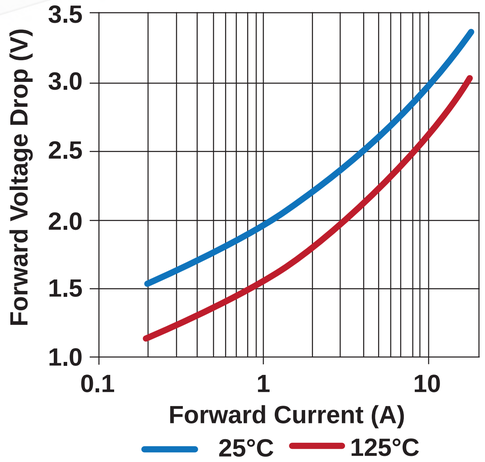
- Round the upper corners of the diode mounting plates
- Separate the ribbon leads for redundancy purposes





Ratings		SPB414
I_0		6 A
V_R		800 V
V_F	@ 3 A	2.4 V typ
	@ 18 A	3.4 V typ
I_R	@ 25°C	0.2 μA typ
	@ 125°C	5 μA typ
C_J		20 pF typ
t_{RR}		250 ns

Typical V_F vs I_F vs T_C



1Φ Bridge Rectifier

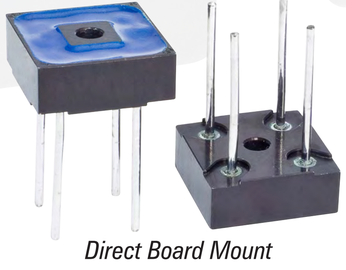
20 A, 200 V Fast Recovery 1Φ Bridge Rectifier

Features:

- Low forward voltage drop: 0.92 V typ @ 20 A, 25°C
- Low reverse leakage: 0.1 μA typ @ 25°C
- High surge current: 430 A max
- Operating / Storage Temperature: -65°C to +150°C
- Low thermal resistance: 3.0°C/W
- Aluminum case
- For high efficiency applications
- TX, TXV, and S level screening available

Turret Terminals

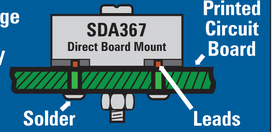
Surface Mount Terminals



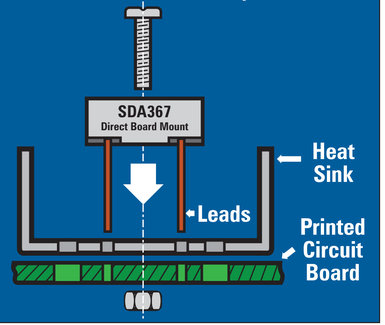
Direct Board Mount

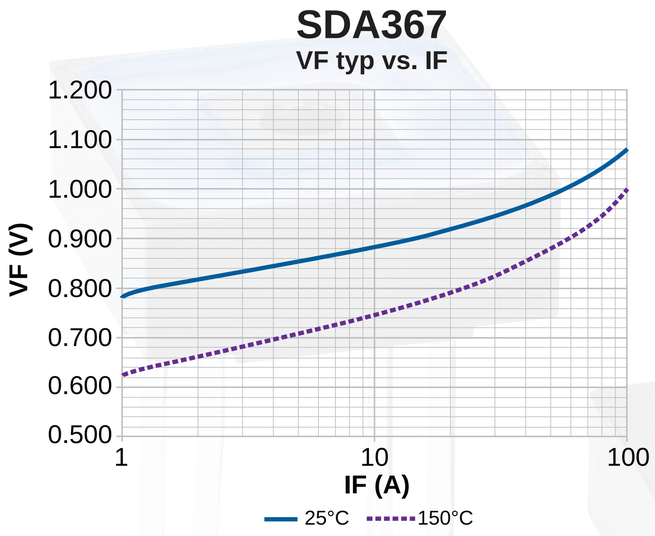
Advantages of Direct Board Mount Package Option:

- Small footprint, low profile package
- Simplifies assembly (no flying leads)



- Allows addition of heat sink between package and board for enhanced efficiency





Electrical Characteristics (per leg)		Min	Typ	Max	Unit
V_F @ 25°C	@ 5 A	-	0.85	0.89	V
	@ 10 A	-	0.88	0.92	
	@ 20 A	-	0.92	0.96	
V_F @ 125°C	@ 20 A	-	0.82	0.87	V
I_R	@ 25°C	-	0.1	1	μA
	@ 125°C	-	10	100	
BV_R	100 μA, pulse ≤ 20 ms	200	270	-	V
C_J	V_R = 10 V, f=1 MHz	-	90	110	pF
t_{RR}	I_F = 0.5 A, I_{RM} = 1 A, $I_{(REC)}$ = 0.25 A,	-	390	450	nsec

Solid State Devices, Inc.

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