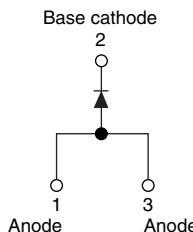


## Schottky Rectifier, 65 A



### PRODUCT SUMMARY

Package	TO-247AC
$I_{F(AV)}$	65 V
$V_R$	15 V
$V_F$ at $I_F$	0.46 V
$I_{RM}$ max.	870 mA at 100 °C
$T_J$ max.	125 °C
Diode variation	Single die
$E_{AS}$	9 mJ

### FEATURES

- 125 °C  $T_J$  operation ( $V_R < 5$  V)
- Single diode configuration
- Optimized for OR-ing applications
- Ultralow forward voltage drop
- Guard ring for enhanced ruggedness and long term reliability
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Compliant to RoHS Directive 2002/95/EC
- Designed and qualified according to JEDEC-JESD47
- Halogen-free according to IEC 61249-2-21 definition (-N3 only)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
Available

### DESCRIPTION

The VS-65PQ015... Schottky rectifier module has been optimized for ultralow forward voltage drop specifically for the OR-ing of parallel power supplies. The proprietary barrier technology allows for reliable operation up to 125 °C junction temperature. Typical applications are in parallel switching power supplies, converters, reverse battery protection, and redundant power subsystems.

### MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	65	A
$V_{RRM}$		15	V
$I_{FSM}$	$t_p = 5$ µs sine	1500	A
$V_F$	65 Apk, $T_J = 125$ °C	0.46	V
$T_J$	Range	- 55 to 125	°C

### VOLTAGE RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VS-65PQ015PbF	VS-65PQ015-N3	UNITS
Maximum DC reverse voltage	$V_R$	$T_J = 100$ °C	15	15	V
		$T_J = 125$ °C	5	5	

### ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current	$I_{F(AV)}$	50 % duty cycle at $T_C = 83$ °C, rectangular waveform	65	A
Maximum peak one cycle non-repetitive surge current	$I_{FSM}$	5 µs sine or 3 µs rect. pulse	1500	
		10 ms sine or 6 ms rect. pulse	400	
Non-repetitive avalanche energy	$E_{AS}$	$T_J = 25$ °C, $I_{AS} = 2$ A, $L = 4.5$ mH	9	mJ
Repetitive avalanche current	$I_{AR}$	Current decaying linearly to zero in 1 µs Frequency limited by $T_J$ maximum $V_A = 1.5 \times V_R$ typical	2	A

**ELECTRICAL SPECIFICATIONS**

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Forward voltage drop	$V_{FM}^{(1)}$	65 A	$T_J = 25 \text{ }^\circ\text{C}$	0.50	V	
		130 A		0.71		
		65 A	$T_J = 125 \text{ }^\circ\text{C}$	0.46		
		130 A		0.76		
Reverse leakage current	$I_{RM}^{(1)}$	$T_J = 125 \text{ }^\circ\text{C}$	$V_R = 5 \text{ V}$	1.2	A	
		$T_J = 25 \text{ }^\circ\text{C}$	$V_R = \text{Rated } V_R$	18	mA	
		$T_J = 100 \text{ }^\circ\text{C}$		870		
Threshold voltage	$V_{F(TO)}$	$T_J = T_J \text{ maximum}$		0.137	mV	
Forward slope resistance	$r_t$			4.9	$\text{m}\Omega$	
Maximum junction capacitance	$C_T$	$V_R = 5 \text{ V}_{\text{DC}}$ (test signal range 100 kHz to 1 MHz) $25 \text{ }^\circ\text{C}$		4300	pF	
Typical series inductance	$L_S$	Measured lead to lead 5 mm from package body		8	nH	
Maximum voltage rate of change	dV/dt	Rated $V_R$		10 000	$\text{V}/\mu\text{s}$	

**Note**

<sup>(1)</sup> Pulse width < 300  $\mu\text{s}$ , duty cycle < 2 %

**THERMAL - MECHANICAL SPECIFICATIONS**

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum junction temperature range	$T_J$			- 55 to 125	$^\circ\text{C}$	
Maximum storage temperature range	$T_{Stg}$			- 55 to 150		
Maximum thermal resistance, junction to case	$R_{thJC}$	DC operation		0.8	$^\circ\text{C}/\text{W}$	
Typical thermal resistance, case to heatsink	$R_{thCS}$	Mounting surface, smooth and greased		0.3		
Approximate weight				6	g	
				0.21	oz.	
Mounting torque	minimum maximum		Non-lubricated threads		$\text{kgf} \cdot \text{cm}$ (lbf · in)	
			6 (5) 12 (10)			
Marking device		Case style TO-247AC (JEDEC)		65PQ015		

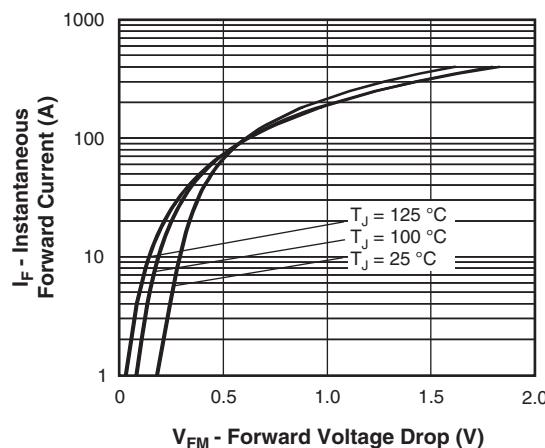


Fig. 1 - Maximum Forward Voltage Drop Characteristics

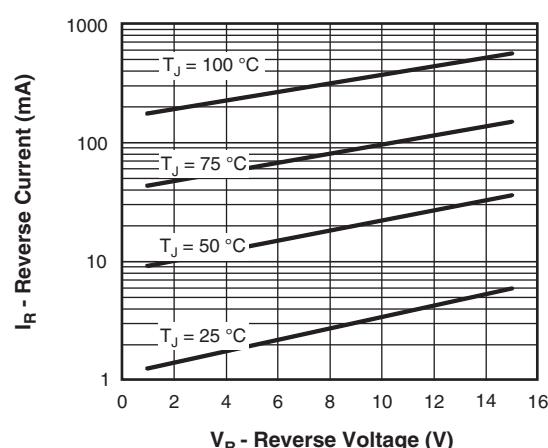


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

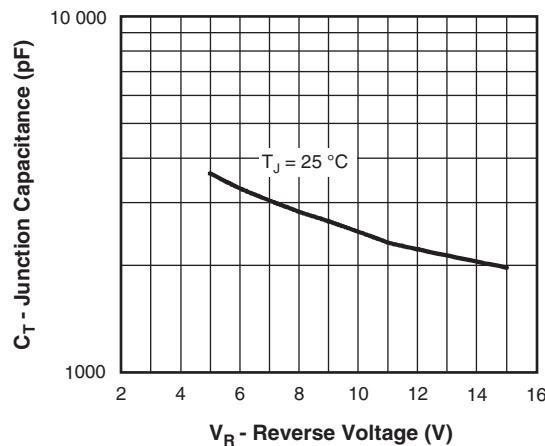


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

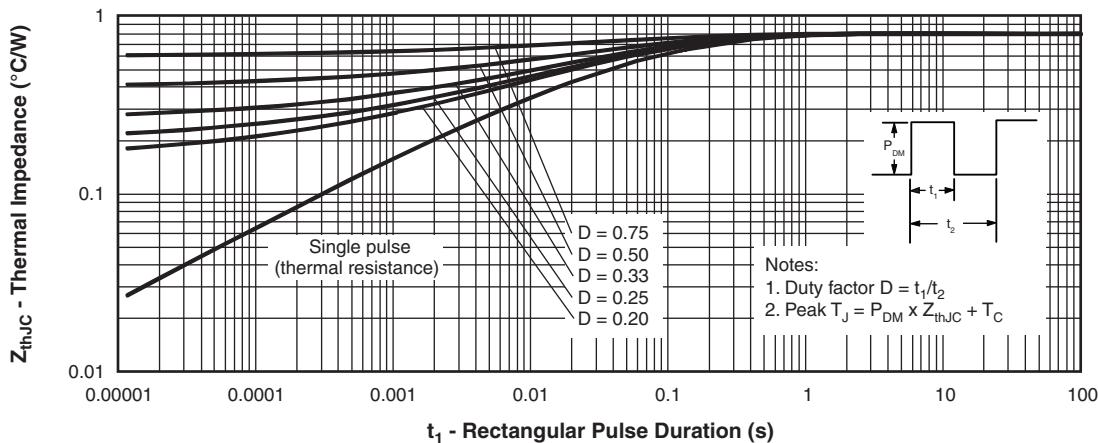


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

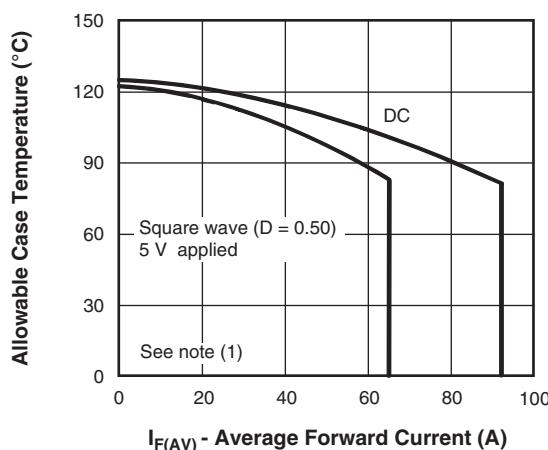


Fig. 5 - Maximum Allowable Case Temperature vs.  
Average Forward Current

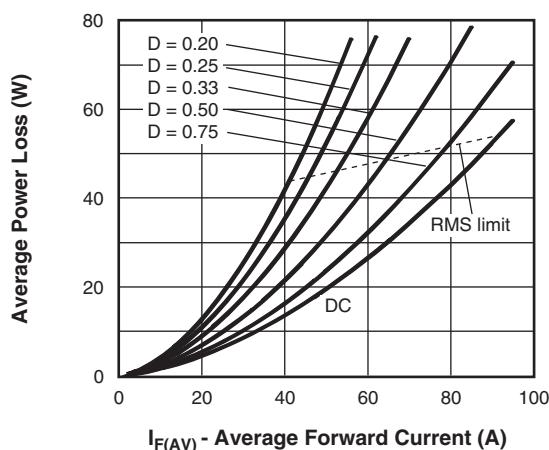


Fig. 6 - Forward Power Loss Characteristics

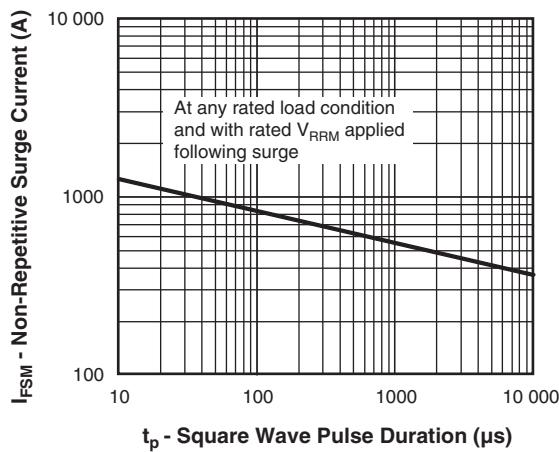


Fig. 7 - Maximum Non-Repetitive Surge Current

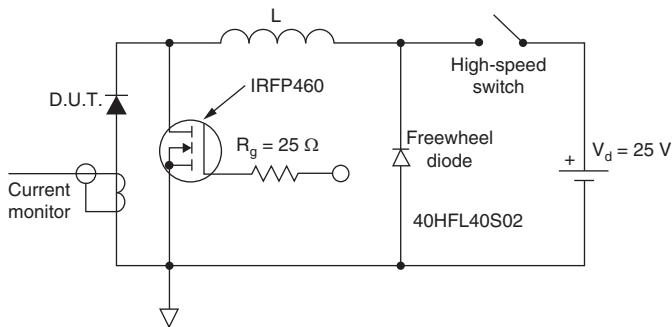


Fig. 8 - Unclamped Inductive Test Circuit

#### Note

<sup>(1)</sup> Formula used:  $T_C = T_J - (P_d + P_{d,REV}) \times R_{th,JC}$ ;  
 $P_d = \text{Forward power loss} = I_{F(AV)} \times V_{FM} \text{ at } (I_{F(AV)}/D)$  (see fig. 6);  
 $P_{d,REV} = \text{Inverse power loss} = V_{R1} \times I_R (1 - D)$ ;  $I_R$  at  $V_{R1} = 5 \text{ V}$

**ORDERING INFORMATION TABLE**

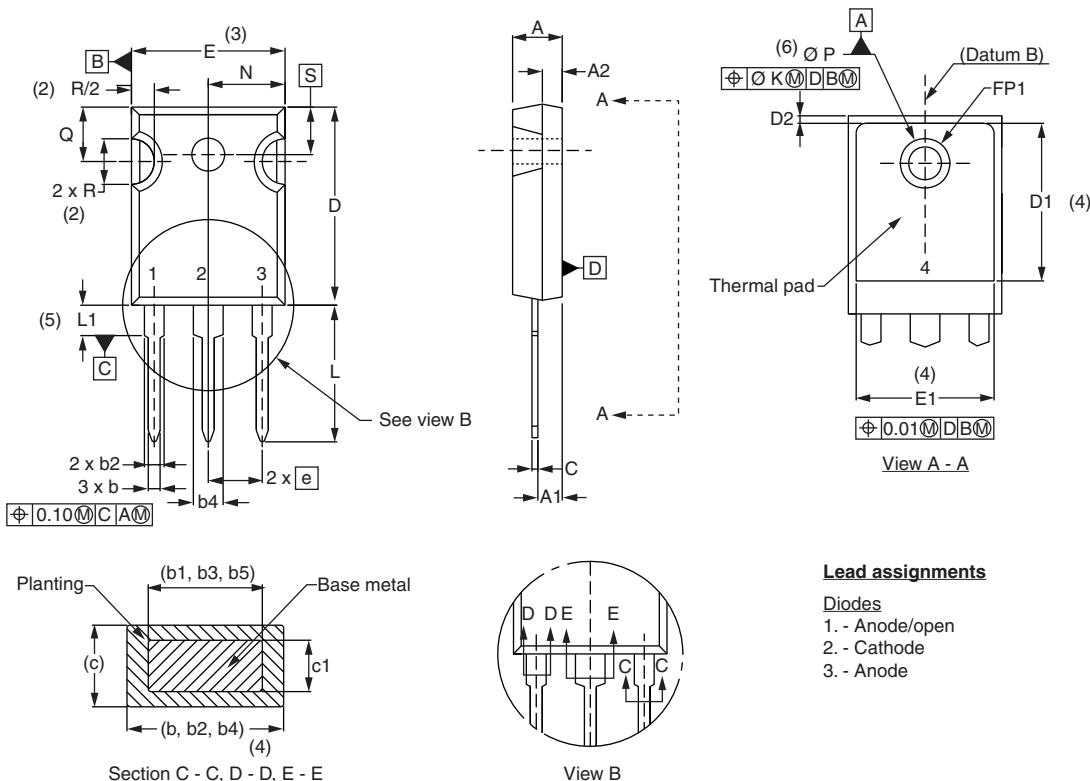
Device code	VS-	65	P	Q	015	PbF
	1	2	3	4	5	6

- 1** - Vishay Semiconductors product
- 2** - Current rating (65 = 65 A)
- 3** - Package:  
P = TO-247
- 4** - Schottky "Q" series
- 5** - Voltage code (015 = 15 V)
- 6** - Environmental digit
  - PbF = Lead (Pb)-free and RoHS compliant
  - -N3 = Halogen-free, RoHS compliant, and totally lead (Pb)-free

<b>ORDERING INFORMATION</b> (Example)			
PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-65PQ015PbF	25	500	Antistatic plastic tube
VS-65PQ015-N3	25	500	Antistatic plastic tube

<b>LINKS TO RELATED DOCUMENTS</b>	
Dimensions	<a href="http://www.vishay.com/doc?95223">www.vishay.com/doc?95223</a>
Part marking information	<a href="http://www.vishay.com/doc?95226">www.vishay.com/doc?95226</a> <a href="http://www.vishay.com/doc?95007">www.vishay.com/doc?95007</a>
SPICE model	<a href="http://www.vishay.com/doc?95306">www.vishay.com/doc?95306</a>

**DIMENSIONS** in millimeters and inches



Symbol	Millimeters		Inches		Notes		Symbol	Millimeters		Inches		Notes
	Min.	Max.	Min.	Max.				Min.	Max.	Min.	Max.	
A	4.65	5.31	0.183	0.209			D2	0.51	1.30	0.020	0.051	
A1	2.21	2.59	0.087	0.102			E	15.29	15.87	0.602	0.625	3
A2	1.50	2.49	0.059	0.098			E1	13.72	-	0.540	-	
b	0.99	1.40	0.039	0.055			e	5.46 BSC		0.215 BSC		
b1	0.99	1.35	0.039	0.053			FK	2.54		0.010		
b2	1.65	2.39	0.065	0.094			L	14.20	16.10	0.559	0.634	
b3	1.65	2.37	0.065	0.094			L1	3.71	4.29	0.146	0.169	
b4	2.59	3.43	0.102	0.135			N	7.62 BSC		0.3		
b5	2.59	3.38	0.102	0.133			ΦP	3.56	3.66	0.14	0.144	
c	0.38	0.86	0.015	0.034			ΦP1	-	6.98	-	0.275	
c1	0.38	0.76	0.015	0.030			Q	5.31	5.69	0.209	0.224	
D	19.71	20.70	0.776	0.815	3		R	4.52	5.49	1.78	0.216	
D1	13.08	-	0.515	-	4		S	5.51 BSC		0.217 BSC		

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## Notes

- (1) Dimensioning and tolerancing per ASME Y14.5M-1994
- (2) Contour of slot optional
- (3) Dimension D and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outermost extremes of the plastic body
- (4) Thermal pad contour optional with dimensions D1 and E1
- (5) Lead finish uncontrolled in L1
- (6) Ø P to have a maximum draft angle of 1.5 to the top of the part with a maximum hole diameter of 3.91 mm (0.154")
- (7) Outline conforms to JEDEC outline TO-247 with exception of dimension c

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