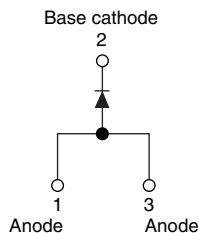


Schottky Rectifier, 65 A


TO-247AC


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

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

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}	$t_p = 5 \mu s$ 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	$V_{\text{FM}}^{(1)}$	65 A	$T_{\text{J}} = 25\text{ }^{\circ}\text{C}$	0.50	V	
		130 A		0.71		
		65 A	$T_{\text{J}} = 125\text{ }^{\circ}\text{C}$	0.46		
		130 A		0.76		
Reverse leakage current	$I_{\text{RM}}^{(1)}$	$T_{\text{J}} = 125\text{ }^{\circ}\text{C}$	$V_{\text{R}} = 5\text{ V}$	1.2	A	
		$T_{\text{J}} = 25\text{ }^{\circ}\text{C}$	$V_{\text{R}} = \text{Rated } V_{\text{R}}$	18	mA	
		$T_{\text{J}} = 100\text{ }^{\circ}\text{C}$		870		
Threshold voltage	$V_{\text{F(TO)}}$	$T_{\text{J}} = T_{\text{J}} \text{ maximum}$		0.137	mV	
Forward slope resistance	r_{t}			4.9	$\text{m}\Omega$	
Maximum junction capacitance	C_{T}	$V_{\text{R}} = 5\text{ V}_{\text{DC}}$ (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	V/ μs	

Note(1) Pulse width < 300 μs , duty cycle < 2 %**THERMAL - MECHANICAL SPECIFICATIONS**

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction temperature range	T _J		- 55 to 125	°C
Maximum storage temperature range	T _{Stg}		- 55 to 150	
Maximum thermal resistance, junction to case	R _{thJC}	DC operation	0.8	°C/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	Non-lubricated threads	6 (5)	kgf · cm (lbf · in)
	maximum		12 (10)	
Marking device		Case style TO-247AC (JEDEC)	65PQ015	

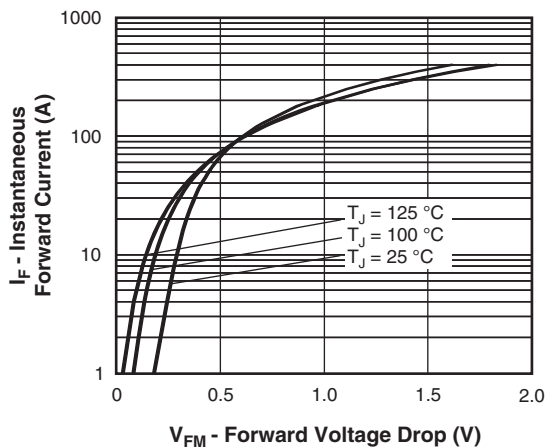


Fig. 1 - Maximum Forward Voltage Drop Characteristics

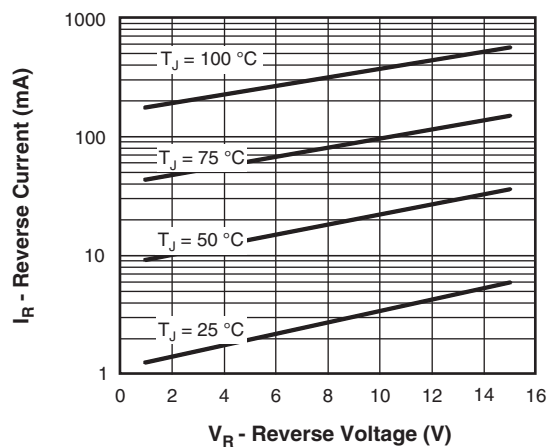


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

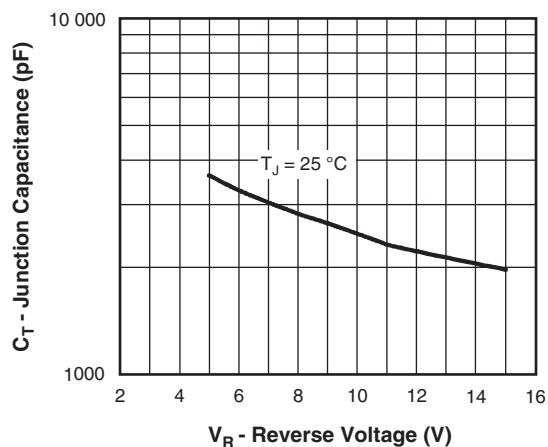
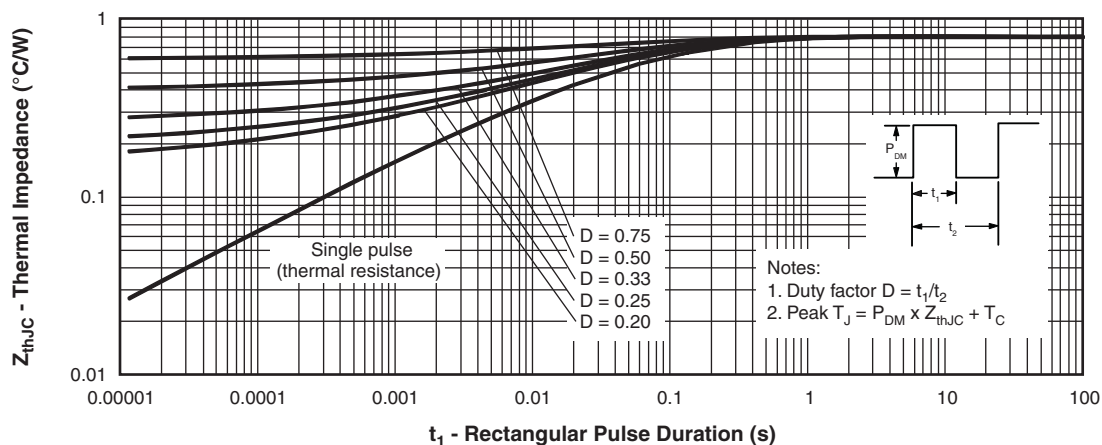


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage


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

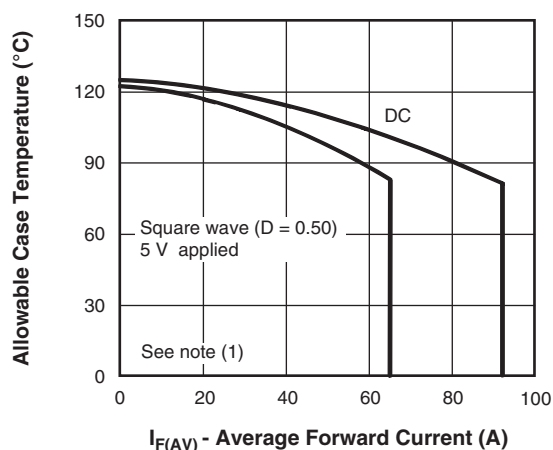


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

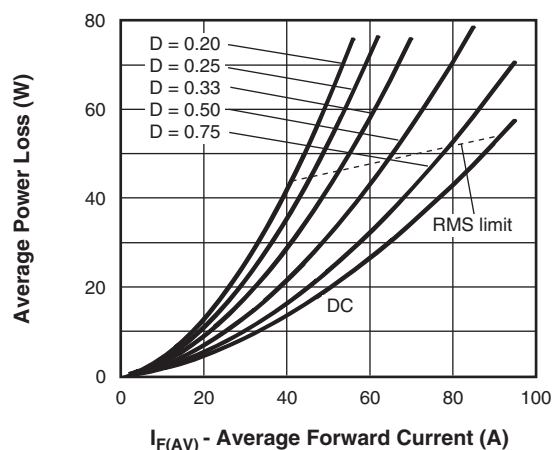


Fig. 6 - Forward Power Loss Characteristics

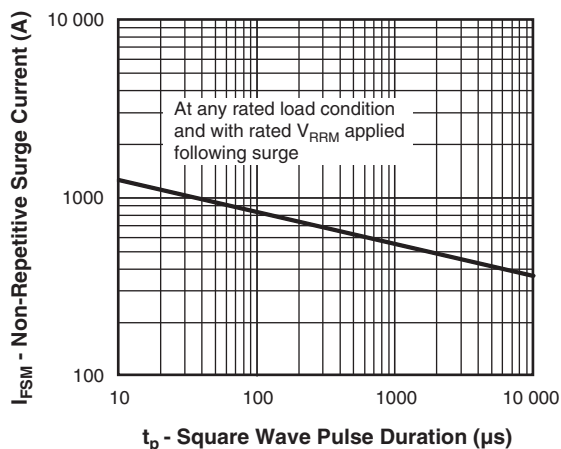


Fig. 7 - Maximum Non-Repetitive Surge Current

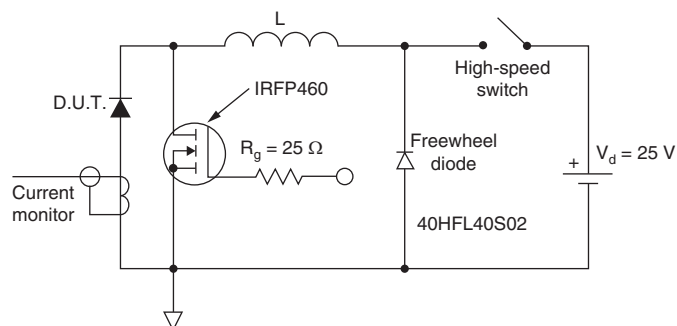


Fig. 8 - Unclamped Inductive Test Circuit

Note

- (1) Formula used: $T_C = T_J - (P_d + P_{dREV}) \times R_{thJC}$;
 P_d = Forward power loss = $I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 6);
 P_{dREV} = Inverse power loss = $V_{R1} \times I_R (1 - D)$; I_R at $V_{R1} = 5$ 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 |

ORDERING INFORMATION (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

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95223
Part marking information	TO-247AC modified PbF www.vishay.com/doc?95226
	TO-247AC modified -N3 www.vishay.com/doc?95007
SPIICE model	www.vishay.com/doc?95306



DIMENSIONS in millimeters and inches



Lead assignments

Diodes

1. - Anode/open
2. - Cathode
3. - Anode

SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	4.65	5.31	0.183	0.209	
A1	2.21	2.59	0.087	0.102	
A2	1.50	2.49	0.059	0.098	
b	0.99	1.40	0.039	0.055	
b1	0.99	1.35	0.039	0.053	
b2	1.65	2.39	0.065	0.094	
b3	1.65	2.37	0.065	0.094	
b4	2.59	3.43	0.102	0.135	
b5	2.59	3.38	0.102	0.133	
c	0.38	0.86	0.015	0.034	
c1	0.38	0.76	0.015	0.030	
D	19.71	20.70	0.776	0.815	3
D1	13.08	-	0.515	-	4

SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
D2	0.51	1.30	0.020	0.051	
E	15.29	15.87	0.602	0.625	3
E1	13.72	-	0.540	-	
e	5.46 BSC		0.215 BSC		
FK	2.54		0.010		
L	14.20	16.10	0.559	0.634	
L1	3.71	4.29	0.146	0.169	
N	7.62 BSC		0.3		
ΦP	3.56	3.66	0.14	0.144	
$\Phi P1$	-	6.98	-	0.275	
Q	5.31	5.69	0.209	0.224	
R	4.52	5.49	1.78	0.216	
S	5.51 BSC		0.217 BSC		

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) ΦP 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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