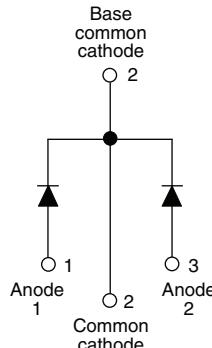


Schottky Rectifier, 2 x 15 A


TO-247AC


RoHS
COMPLIANT
HALOGEN
FREE
Available

FEATURES

- 150 °C T_J operation
- Very low forward voltage drop
- High frequency operation
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Guard ring for enhanced ruggedness and long term reliability
- 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)

DESCRIPTION

The VS-30CPQ... center tap Schottky rectifier has been optimized for very low forward voltage drop, with moderate leakage. The proprietary barrier technology allows for reliable operation up to 150 °C junction temperature. Typical applications are in switching power supplies, converters, freewheeling diodes, and reverse battery protection.

PRODUCT SUMMARY	
Package	TO-247AC
$I_{F(AV)}$	2 x 15 A
V_R	35 V, 40 V, 45 V
V_F at I_F	0.50 V
I_{RM} max.	70 mA at 125 °C
T_J max.	150 °C
Diode variation	Common cathode
E_{AS}	20 mJ

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	30	A
V_{RRM}		35 to 45	V
I_{FSM}	$t_p = 5 \mu s$ sine	1020	A
V_F	15 Apk, $T_J = 125$ °C (per leg)	0.50	V
T_J		- 55 to 150	°C

VOLTAGE RATINGS								
PARAMETER	SYMBOL	VS-30CPQ035PbF	VS-30CPQ035-N3	VS-30CPQ040PbF	VS-30CPQ040-N3	VS-30CPQ045PbF	VS-30CPQ045-N3	UNITS
Maximum DC reverse voltage	V_R	35	35	40	40	45	45	V
Maximum working peak reverse voltage	V_{RWM}							

ABSOLUTE MAXIMUM RATINGS								
PARAMETER	SYMBOL	TEST CONDITIONS			VALUES	UNITS		
Maximum average forward current See fig. 5	$I_{F(AV)}$	50 % duty cycle at $T_C = 124$ °C, rectangular waveform			30	A		
Maximum peak one cycle non-repetitive surge current per leg See fig. 7	I_{FSM}	5 μs sine or 3 μs rect. pulse	Following any rated load condition and with rated V_{RRM} applied		1020			
Non-repetitive avalanche energy per leg	E_{AS}				265			
Repetitive avalanche current per leg	I_{AR}	10 ms sine or 6 ms rect. pulse			20	mJ		
		$T_J = 25$ °C, $I_{AS} = 3$ A, $L = 4.4$ mH			3	A		
		Current decaying linearly to zero in 1 μs Frequency limited by T_J maximum $V_A = 1.5 \times V_R$ typical						

ELECTRICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum forward voltage drop per leg See fig. 1	V _{FM} ⁽¹⁾	15 A	T _J = 25 °C	0.54
		30 A		0.68
		15 A	T _J = 125 °C	0.50
		30 A		0.64
Maximum reverse leakage current per leg See fig. 2	I _{RM} ⁽¹⁾	T _J = 25 °C	V _R = Rated V _R	1.75
		T _J = 125 °C		70
Maximum junction capacitance per leg	C _T	V _R = 5 V _{DC} (test signal range 100 kHz to 1 MHz) 25 °C	900	pF
Typical series inductance per leg	L _S	Measured lead to lead 5 mm from package body	7.5	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 and storage temperature range	T _J , T _{Stg}		- 55 to 150	°C
Maximum thermal resistance, junction to case per leg	R _{thJC}	DC operation See fig. 4	2.20	°C/W
Maximum thermal resistance, junction to case per package		DC operation	1.10	
Typical thermal resistance, case to heatsink	R _{thCS}	Mounting surface, smooth and greased	0.24	
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)	30CPQ035	
			30CPQ040	
			30CPQ045	

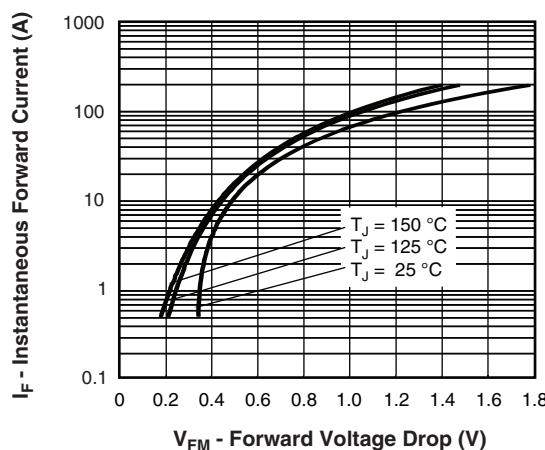


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

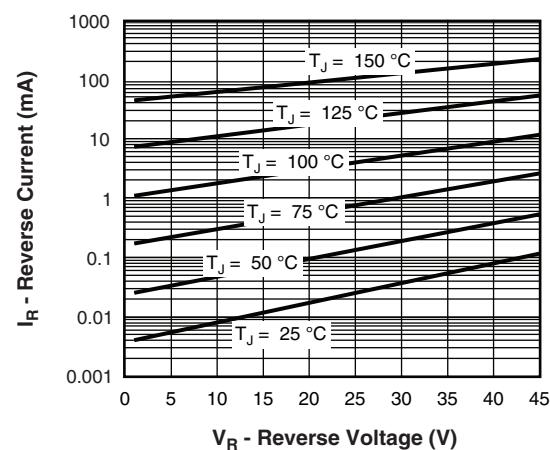


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

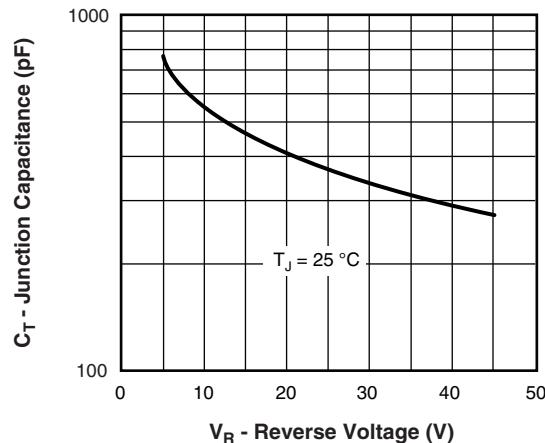


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

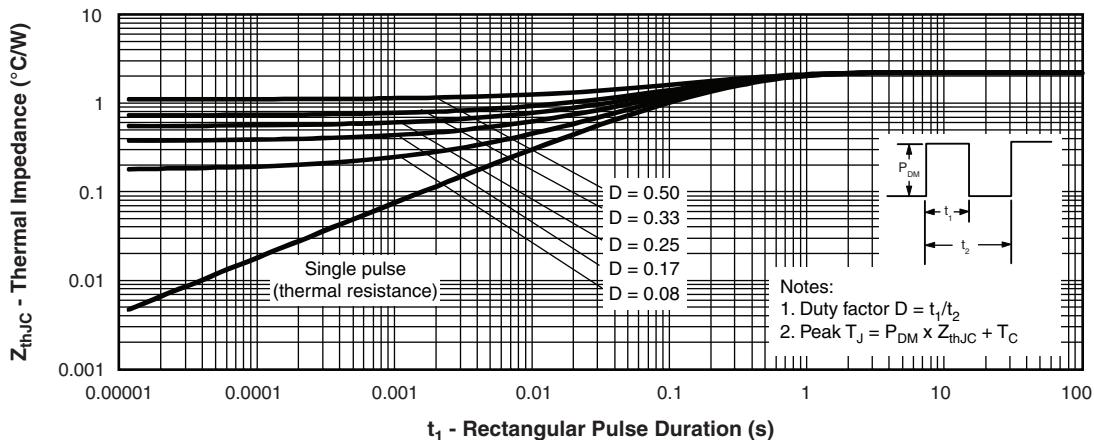


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

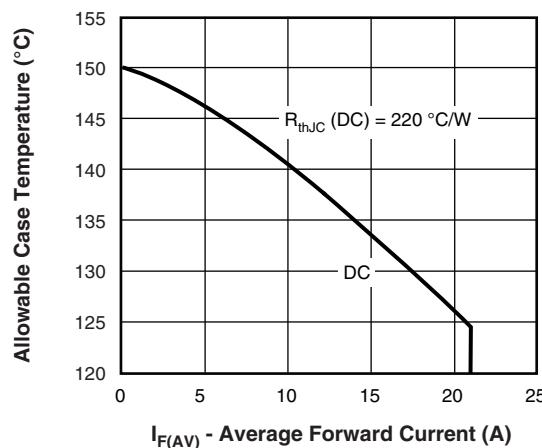


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

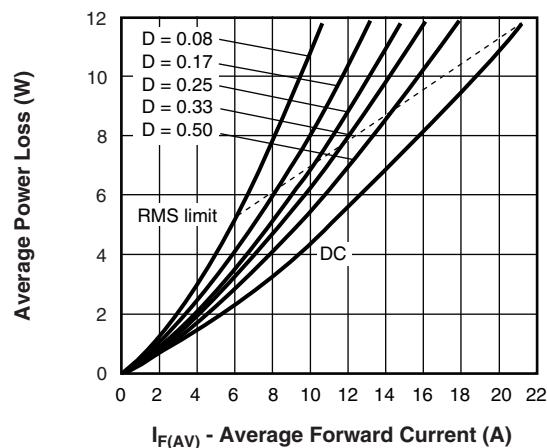


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

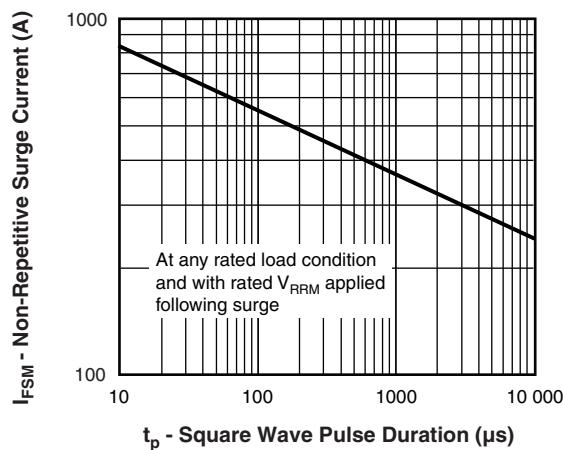


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

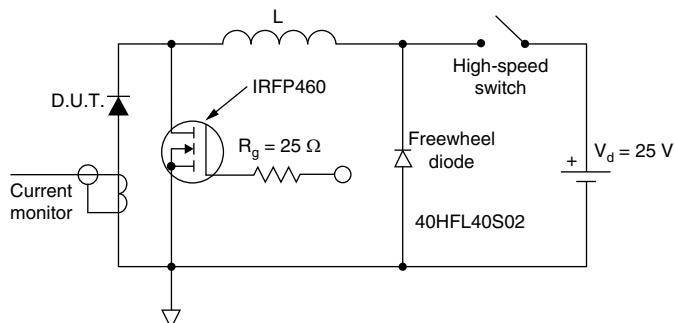


Fig. 8 - Unclamped Inductive Test Circuit

ORDERING INFORMATION TABLE

Device code	VS-	30	C	P	Q	045	PbF
	1	2	3	4	5	6	7

1	- Vishay Semiconductors product	
2	- Current rating (30 = 30 A)	
3	- Circuit configuration: C = Common cathode	
4	- Package: P = TO-247	
5	- Schottky "Q" series	035 = 35 V
6	- Voltage code	040 = 40 V
7	- Environmental digit	045 = 45 V

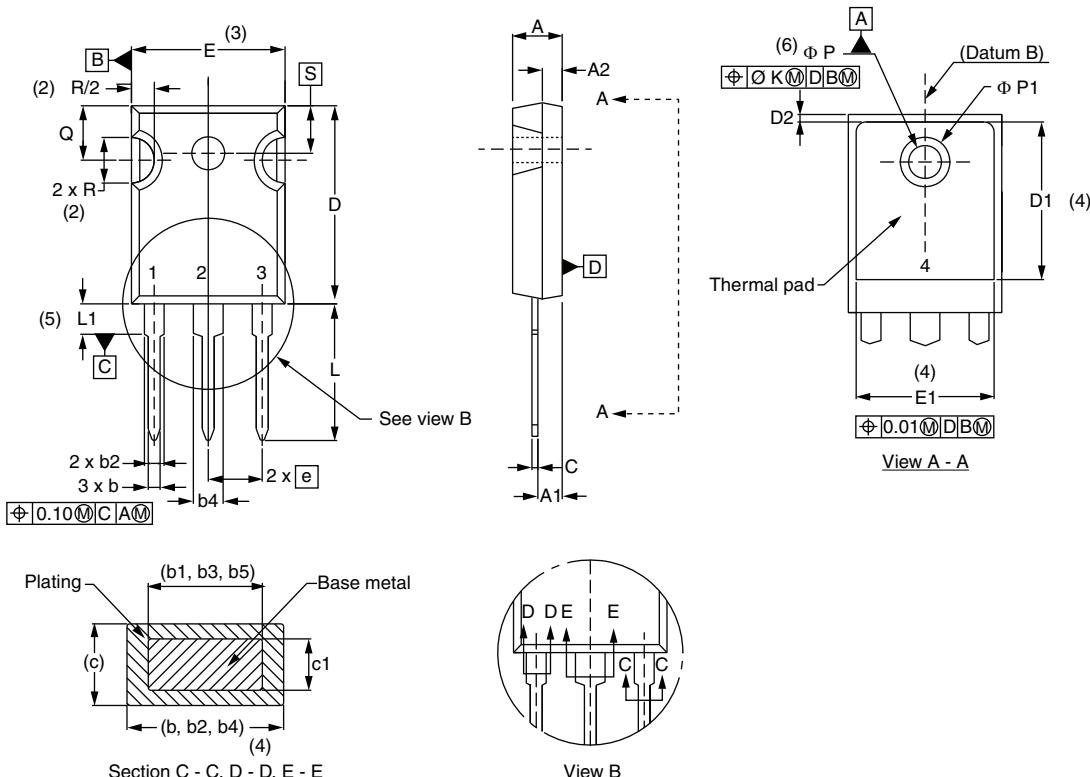
- PbF = Lead (Pb)-free and RoHS compliant
- -N3 = Halogen-free, RoHS compliant, and totally lead (Pb)-free

ORDERING INFORMATION (Example)			
PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-30CPQ035PbF	25	500	Antistatic plastic tube
VS-30CPQ035-N3	25	500	Antistatic plastic tube
VS-30CPQ040PbF	25	500	Antistatic plastic tube
VS-30CPQ040-N3	25	500	Antistatic plastic tube
VS-30CPQ045PbF	25	500	Antistatic plastic tube
VS-30CPQ045-N3	25	500	Antistatic plastic tube

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

TO-247AC

DIMENSIONS in millimeters and inches



SYMBOL	MILLIMETERS		INCHES		NOTES	View A - A	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			Ø K	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	2.34	0.065	0.092			L1	3.71	4.29	0.146	0.169	
b4	2.59	3.43	0.102	0.135			Ø P	3.56	3.66	0.14	0.144	
b5	2.59	3.38	0.102	0.133			Ø P1	-	6.98	-	0.275	
c	0.38	0.89	0.015	0.035			Q	5.31	5.69	0.209	0.224	
c1	0.38	0.84	0.015	0.033			R	4.52	5.49	0.178	0.216	
D	19.71	20.70	0.776	0.815	3		S	5.51 BSC		0.217 BSC		
D1	13.08	-	0.515	-	4							

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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