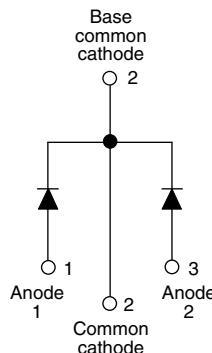


Schottky Rectifier, 2 x 30 A



TO-247AC



RoHS
COMPLIANT
HALOGEN
FREE
Available

FEATURES

- 175 °C T_J operation
- 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-63CPQ100... center tap Schottky rectifier series has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 175 °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 30 A
V _R	100 V
V _F at I _F	0.64 V
I _{RM} max.	25 mA at 125 °C
T _J max.	175 °C
Diode variation	Common cathode
E _{AS}	15 mJ

MAJOR RATINGS AND CHARACTERISTICS				
SYMBOL	CHARACTERISTICS	VALUES	UNITS	
I _{F(AV)}	Rectangular waveform	60	A	
V _{RRM}		100	V	
I _{FSM}	t _p = 5 µs sine	2200	A	
V _F	30 Apk, T _J = 125 °C (per leg)	0.64	V	
T _J	Range	- 55 to 175	°C	

VOLTAGE RATINGS				
PARAMETER	SYMBOL	VS-63CPQ100PbF	VS-63CPQ100-N3	UNITS
Maximum DC reverse voltage	V _R	100	100	V
Maximum working peak reverse voltage	V _{RWM}			

ABSOLUTE MAXIMUM RATINGS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average forward current per leg See fig. 5	I _{F(AV)}	50 % duty cycle at T _C = 153 °C, rectangular waveform		30	A
Maximum peak one cycle non-repetitive surge current per leg See fig. 7		5 µs sine or 3 µs rect. pulse	60		
Non-repetitive avalanche energy per leg	E _{AS}	Following any rated load condition and with rated V _{RRM} applied		2200	
Repetitive avalanche current per leg	I _{AR}	10 ms sine or 6 ms rect. pulse		410	
T _J = 25 °C, I _{AS} = 1 A, L = 30 mH				15	mJ
Current decaying linearly to zero in 1 µs Frequency limited by T _J maximum V _A = 1.5 x V _R typical				1	A

ELECTRICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum forward voltage drop per leg See fig. 1	$V_{FM}^{(1)}$	30 A	$T_J = 25 \text{ }^\circ\text{C}$	0.77	V	
		60 A		0.92		
		30 A	$T_J = 125 \text{ }^\circ\text{C}$	0.64		
		60 A		0.76		
Maximum reverse leakage current per leg See fig. 2	$I_{RM}^{(1)}$	$T_J = 25 \text{ }^\circ\text{C}$	$V_R = \text{Rated } V_R$	0.3	mA	
		$T_J = 125 \text{ }^\circ\text{C}$		25		
Threshold voltage	$V_{F(TO)}$	$T_J = T_J \text{ maximum}$		0.38	V	
Forward slope resistance	r_t			5.75	$\text{m}\Omega$	
Maximum junction capacitance per leg	C_T	$V_R = 5 \text{ V}_{\text{DC}}$ (test signal range 100 kHz to 1 MHz) $25 \text{ }^\circ\text{C}$		1300	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/ μ s	

Note

(1) Pulse width < 300 μ s, duty cycle < 2 %

THERMAL - MECHANICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction and storage temperature range	T_J, T_{Stg}		- 55 to 175	$^\circ\text{C}$
Maximum thermal resistance, junction to case per leg	R_{thJC}	DC operation See fig. 4	0.8	$^\circ\text{C}/\text{W}$
Maximum thermal resistance, junction to case per package		DC operation	0.4	
Typical thermal resistance, case to heatsink	R_{thCS}	Mounting surface, smooth and greased	0.25	
Approximate weight			6	g
			0.21	oz.
Mounting torque	minimum		6 (5)	$\text{k}\text{gf} \cdot \text{cm}$ (lbf · in)
	maximum		12 (10)	
Marking device		Case style TO-247AC (JEDEC)	63CPQ100	

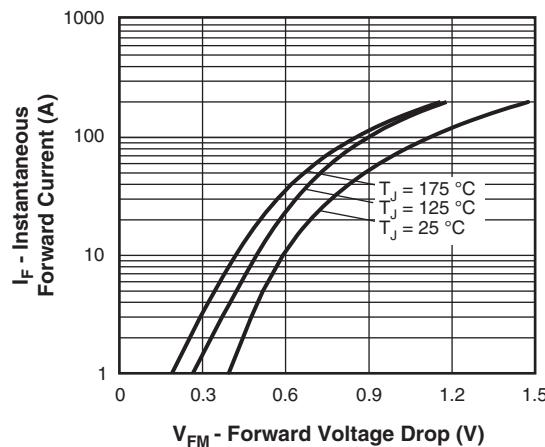


Fig. 1 - Maximum Forward Voltage Drop Characteristics

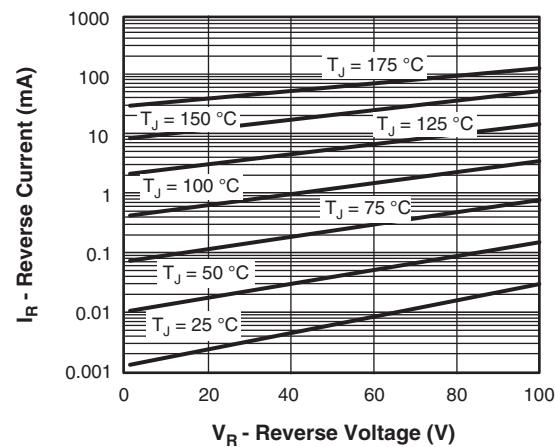


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

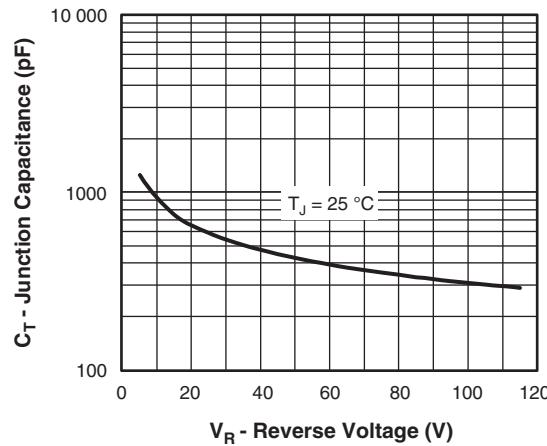


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

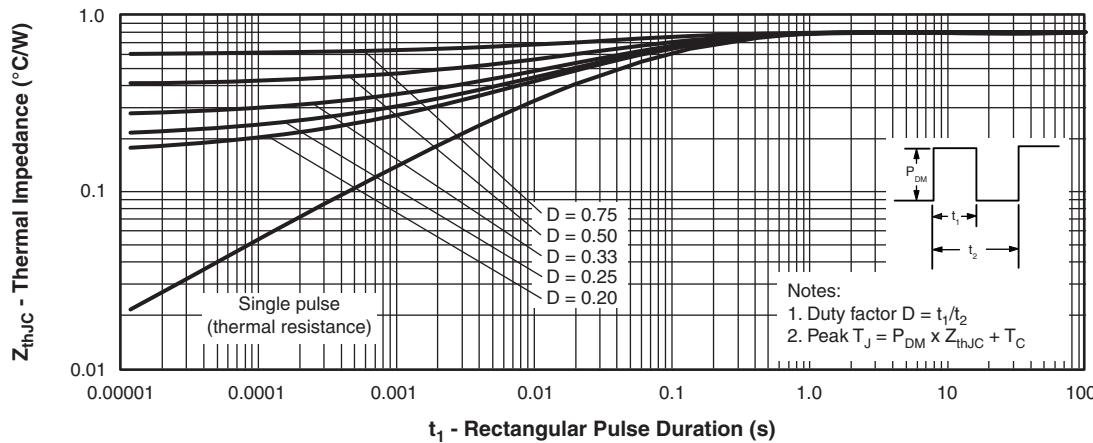


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

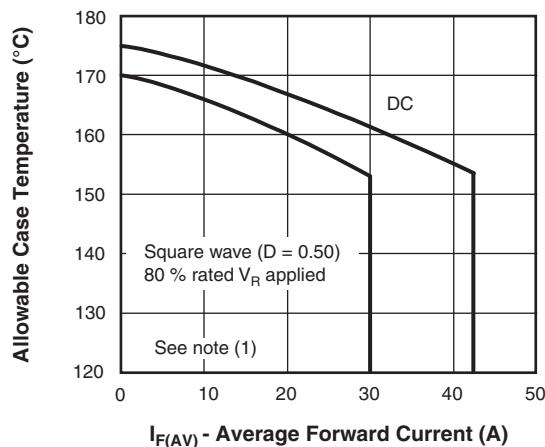


Fig. 5 - Maximum Allowable Case Temperature vs.
Average Forward Current

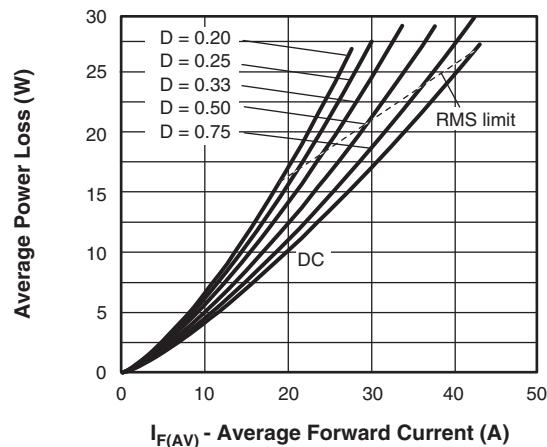


Fig. 6 - Forward Power Loss Characteristics

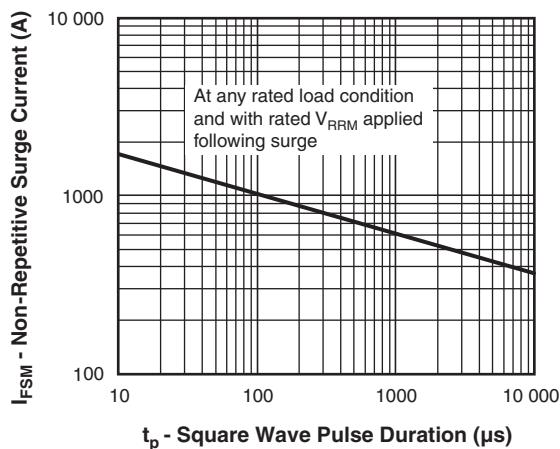


Fig. 7 - Maximum Non-Repetitive Surge Current

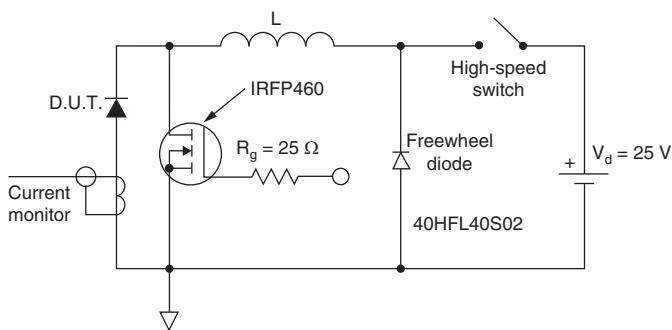


Fig. 8 - Unclamped Inductive Test Circuit

Note

- (1) Formula used: $T_C = T_J - (P_d + P_{d,REV}) \times R_{th,JC}$;
- Pd = Forward power loss = $I_F(AV) \times V_{FM}$ 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 $V_{R1} = 80\% \text{ rated } V_R$

ORDERING INFORMATION TABLE

Device code	VS-	63	C	P	Q	100	PbF
	1	2	3	4	5	6	7

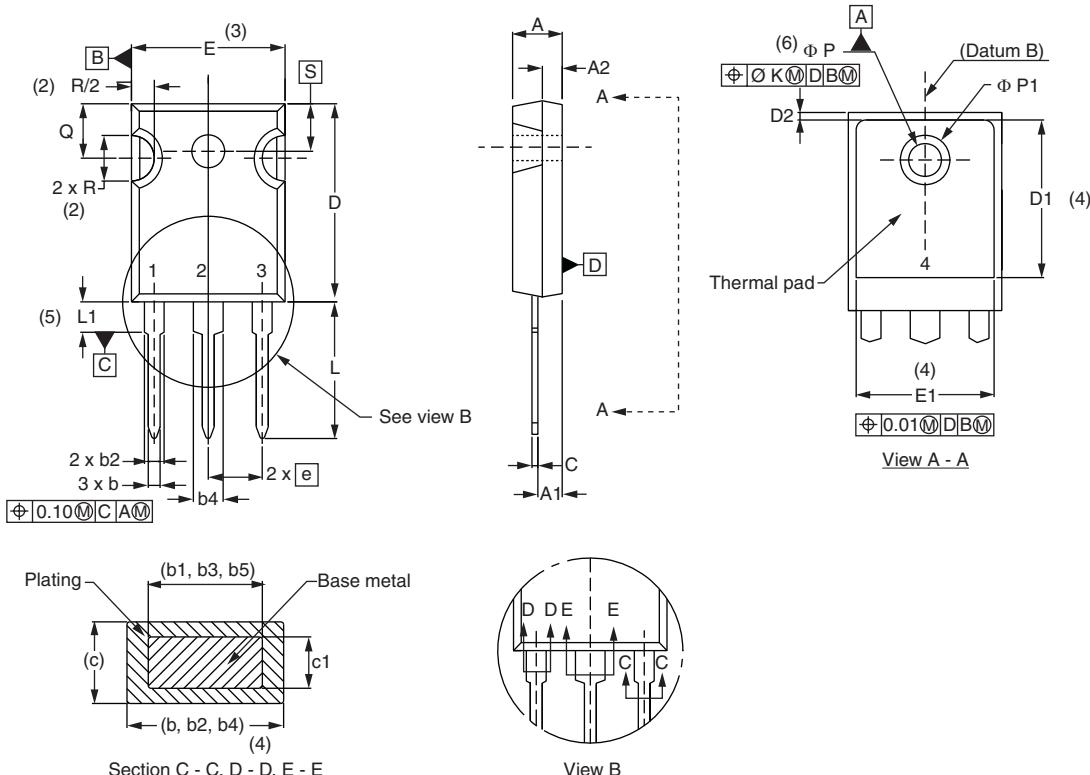
- | | |
|----------|--|
| 1 | - Vishay Semiconductors product |
| 2 | - Current rating (60 A) |
| 3 | - Circuit configuration:
C = Common cathode |
| 4 | - Package:
P = TO-247 |
| 5 | - Schottky "Q" series |
| 6 | - Voltage code |
| 7 | <ul style="list-style-type: none"> - Environmental digit <ul style="list-style-type: none"> • 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-63CPQ100PbF	25	500	Antistatic plastic tube
VS-63CPQ100-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		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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