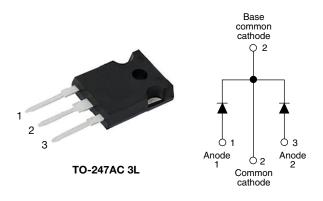
Vishay Semiconductors

High Performance Schottky Rectifier, 2 x 15 A



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PRIMARY CHARACTERISTICS								
I _{F(AV)}	2 x 15 A							
V _R	140 V, 150 V							
V _F at I _F	0.78 V							
I _{RM} max.	15 mA at 125 °C							
T _J max.	175 °C							
E _{AS}	11.25 mJ							
Package	TO-247AC 3L							
Circuit configuration	Common cathode							

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



RoHS COMPLIANT HALOGEN FREE

- Guard ring for enhanced ruggedness and long term reliability
- Designed and qualified according to JEDEC[®]-JESD 47
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

DESCRIPTION

The VS-30CPQ... 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.

MAJOR RATINGS AND CHARACTERISTICS								
SYMBOL	CHARACTERISTICS	VALUES	UNITS					
I _{F(AV)}	Rectangular waveform	30	А					
V _{RRM}		150	V					
I _{FSM}	$t_p = 5 \ \mu s \ sine$	1000	А					
VF	15 A_{pk} , T_J = 125 °C (per leg)	0.78	V					
TJ		-55 to +175	°C					

VOLTAGE RATINGS								
PARAMETER	SYMBOL	VS-30CPQ140-N3	VS-30CPQ150-N3	UNITS				
Maximum DC reverse voltage	V _R	140	150	V				
Maximum working peak reverse voltage	V _{RWM}	140	150	v				

ABSOLUTE MAXIMUM RATINGS										
PARAMETER		SYMBOL	TEST COND	VALUES	UNITS					
Maximum average forward per devic		1	50 % duty cycle at T_{C} = 135 °C	rootangular wayoform	30	A				
current, see fig. 5	per leg	I _{F(AV)}	50% duty cycle at $T_{\rm C} = 135\%$	15						
Maximum peak one cycle non-repetitive surge current per leg See fig. 7			5 µs sine or 3 µs rect. pulse	Following any rated load condition and with rated	1000					
		I _{FSM}	10 ms sine or 6 ms rect. pulse	V _{RRM} applied	340					
Non-repetitive avalanche energy per leg		E _{AS}	T _J = 25 °C, I _{AS} = 0.50 A, L = 90 mH		11.25	mJ				
Repetitive avalanche current per leg		I _{AR}	Current decaying linearly to zer Frequency limited by T _J maxim		0.50	А				

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ELI	ECTRICA	L SPECII	FICATIONS

ELECTRICAL SPECIFICATIONS										
PARAMETER	SYMBOL	TEST CO	VALUES	UNITS						
		15 A	T _{.1} = 25 °C	1.00	v					
Maximum forward voltage drop per leg	V _{FM} ⁽¹⁾	30 A	1j=25 C	1.19						
See fig. 1	VFM (")	15 A	T.I = 125 °C	0.78						
		30 A	$I_{\rm J} = 125$ C	0.93						
Maximum reverse leakage current per leg	. (1)	T _J = 25 °C	$V_{\rm B}$ = Rated $V_{\rm B}$	0.1						
See fig. 2	I _{RM} ⁽¹⁾	T _J = 125 °C	$v_{\rm R} = naleu v_{\rm R}$	15	mA					
Maximum junction capacitance per leg	CT	$V_{R} = 5 V_{DC}$ (test signal range	ge 100 kHz to 1 MHz) 25 °C	340	pF					
Typical series inductance per leg	L _S	Measured lead to lead 5 m	7.5	nH						
Maximum voltage rate of change	dV/dt	Rated V _R	10 000	V/µs						

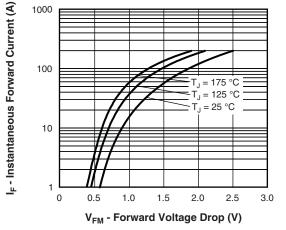
Note

 $^{(1)}\,$ Pulse width < 300 $\mu s,$ duty cycle < 2 %

THERMAL - MECHANICAL SPECIFICATIONS								
PARAMETER		SYMBOL	YMBOL TEST CONDITIONS		UNITS			
Maximum junction and storage temperature range		T _J , T _{Stg}		-55 to 175	°C			
Maximum thermal resistance, junction to case per leg		- R _{thJC}	DC operation See fig. 4	2.20				
Maximum thermal resistance, junction to case per package		⊓thJC	DC operation	1.10	°C/W			
Typical thermal resistance, case to heatsink		R _{thCS}	Mounting surface, smooth and greased	0.24				
Approximate weight				6	g			
Approximate weight				0.21	oz.			
Mounting torque	minimum			6 (5)	kgf ⋅ cm			
Mounting torque	maximum			12 (10)	(lbf · in)			
Mand the she fac				30CPQ140				
Marking device			Case style TO-247AC 3L	30CPQ150				



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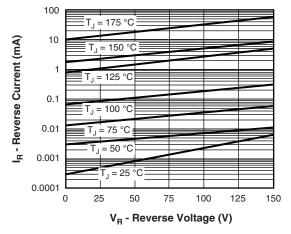


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

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

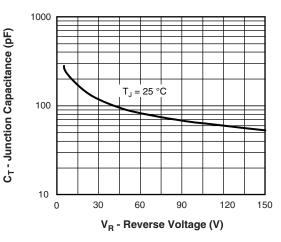


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

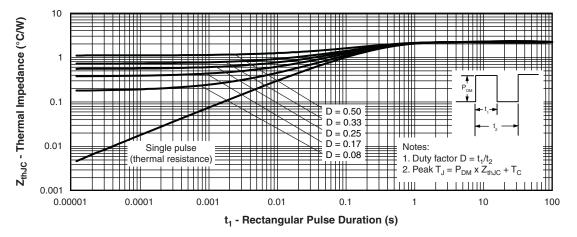


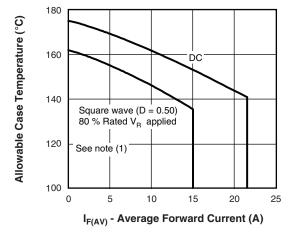
Fig. 4 - Maximum Thermal Impedance ZthJC Characteristics (Per Leg)

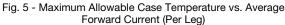
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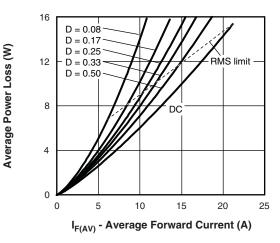


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

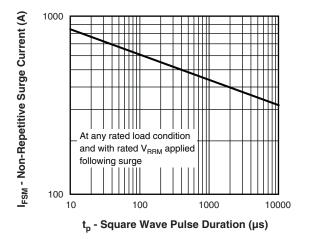


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

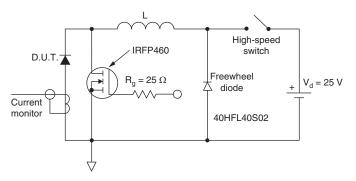


Fig. 8 - Unclamped Inductive Test Circuit

Note

⁽¹⁾ Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;

 $\begin{array}{l} \mathsf{Pd} = \mathsf{forward} \ \mathsf{power} \ \mathsf{loss} = \mathsf{I}_{\mathsf{F}(\mathsf{AV})} \ x \ \mathsf{V}_{\mathsf{FM}} \ \mathsf{at} \ (\mathsf{I}_{\mathsf{F}(\mathsf{AV})}/\mathsf{D}) \ (\mathsf{see} \ \mathsf{fig.} \ \mathsf{6}); \\ \mathsf{Pd}_{\mathsf{REV}} = \mathsf{inverse} \ \mathsf{power} \ \mathsf{loss} = \mathsf{V}_{\mathsf{R1}} \ x \ \mathsf{I}_{\mathsf{R}} \ (\mathsf{1} \ - \mathsf{D}); \ \mathsf{I}_{\mathsf{R}} \ \mathsf{at} \ \mathsf{V}_{\mathsf{R1}} = \mathsf{80} \ \% \ \mathsf{rated} \ \mathsf{V}_{\mathsf{R}} \end{array}$

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ORDERING INFORMATION TABLE

Device code	VS-	30	С	Р	Q	150	-N3	
		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 - 6 - 7 -	Volta Env		e —— ital digit			140 = 14 150 = 15	50 V
		-N3	= halog	en-free,	RoHS-	complia	nt, and	totally lead (Pb)

ORDERING INFORMATION (Example)								
PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION					
VS-30CPQ140-N3	25	500	Antistatic plastic tube					
VS-30CPQ150-N3	25	500	Antistatic plastic tube					

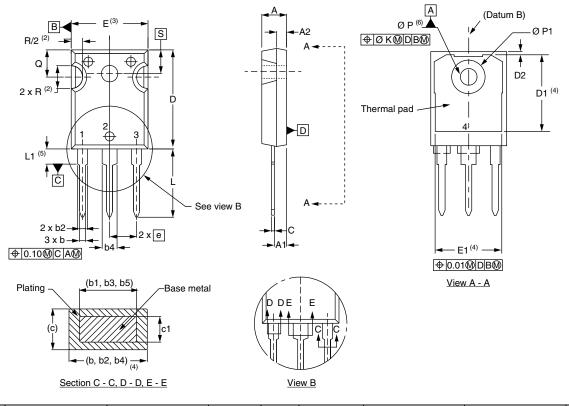
	LINKS TO RELATED DOCUMENTS
Dimensions	www.vishay.com/doc?96138
Part marking information	www.vishay.com/doc?95007



Vishay Semiconductors

TO-247AC 3L

DIMENSIONS in millimeters and inches



SYMBOL	MILLIMETERS		INC	HES	NOTES	SYMBOL	MILLIN	IETERS	INC	HES	NOTES	
STWIDOL	MIN.	MAX.	MIN.	MAX.	NOTES		STWDOL	MIN.	MAX.	MIN.	MAX.	NOTES
A	4.65	5.31	0.183	0.209			D2	0.51	1.35	0.020	0.053	
A1	2.21	2.59	0.087	0.102			E	15.29	15.87	0.602	0.625	3
A2	1.17	1.37	0.046	0.054			E1	13.46	-	0.53	-	
b	0.99	1.40	0.039	0.055			е	5.46	BSC	0.215	5 BSC	
b1	0.99	1.35	0.039	0.053			ØК	0.2	254	0.0)10	
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			ØΡ	3.56	3.66	0.14	0.144	
b5	2.59	3.38	0.102	0.133			Ø P1	-	7.39	-	0.291	
С	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 Q

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