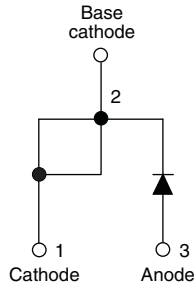


## High Voltage, Input Rectifier Diode, 40 A



TO-247AC modified



### FEATURES

- Very low forward voltage drop
- 150 °C max. operating junction temperature
- Designed and qualified according to JEDEC®-JESD47
- Material categorization:  
For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



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

### APPLICATIONS

- Input rectification
- Vishay Semiconductors switches and output rectifiers which are available in identical package outlines

### DESCRIPTION

High voltage rectifiers optimized for very low forward voltage drop with moderate leakage.

These devices are intended for use in main rectification (single or three phase bridge).

PRODUCT SUMMARY	
Package	TO-247AC modified (2 pins)
$I_{F(AV)}$	40 A
$V_R$	800 V to 1200 V
$V_F$ at $I_F$	1.1 V
$I_{FSM}$	475 A
$T_J$ max.	150 °C
Diode variation	Single die

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Sinusoidal waveform	40	A
$V_{RRM}$	Range	800/1200	V
$I_{FSM}$		475	A
$V_F$	40 A, $T_J = 25\text{ °C}$	1.1	V
$T_J$		-40 to 150	°C

VOLTAGE RATINGS			
PART NUMBER	$V_{RRM}$ , MAXIMUM PEAK REVERSE VOLTAGE V	$V_{RSM}$ , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V	$I_{RRM}$ AT 150 °C mA
VS-40EPS08PbF, VS-40EPS08-M3	800	900	1
VS-40EPS12PbF, VS-40EPS12-M3	1200	1300	

ABSOLUTE MAXIMUM RATINGS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current	$I_{F(AV)}$	$T_C = 105\text{ °C}$ , 180° conduction half sine wave	40	A
Maximum peak one cycle non-repetitive surge current	$I_{FSM}$	10 ms sine pulse, rated $V_{RRM}$ applied	400	
		10 ms sine pulse, no voltage reapplied	475	
Maximum $I^2t$ for fusing	$I^2t$	10 ms sine pulse, rated $V_{RRM}$ applied	800	A <sup>2</sup> s
		10 ms sine pulse, no voltage reapplied	1131	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	$t = 0.1\text{ ms to }10\text{ ms}$ , no voltage reapplied	11 310	A <sup>2</sup> √s



ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop	$V_{FM}$	20 A, $T_J = 25\text{ }^\circ\text{C}$		1.0	V
		40 A, $T_J = 25\text{ }^\circ\text{C}$		1.1	
Forward slope resistance	$r_t$	$T_J = 150\text{ }^\circ\text{C}$		7.16	m $\Omega$
Threshold voltage	$V_{F(TO)}$	$T_J = 150\text{ }^\circ\text{C}$		0.74	V
Maximum reverse leakage current	$I_{RM}$	$T_J = 25\text{ }^\circ\text{C}$	$V_R = \text{Rated } V_{RRM}$	0.1	mA
		$T_J = 150\text{ }^\circ\text{C}$		1.0	

THERMAL - MECHANICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction and storage temperature range	$T_J, T_{Stg}$		-40 to 150	$^\circ\text{C}$
Maximum thermal resistance, junction to case	$R_{thJC}$	DC operation	0.6	$^\circ\text{C/W}$
Maximum thermal resistance, junction to ambient	$R_{thJA}$		40	
Typical thermal resistance, case to heatsink	$R_{thCS}$	Mounting surface, flat, smooth and greased	0.2	
Approximate weight			6	g
			0.21	oz.
Mounting torque	minimum		6 (5)	kgf · cm (lbf · in)
	maximum		12 (10)	
Marking device		Case style TO-247AC modified (JEDEC)	40EPS08	
			40EPS12	

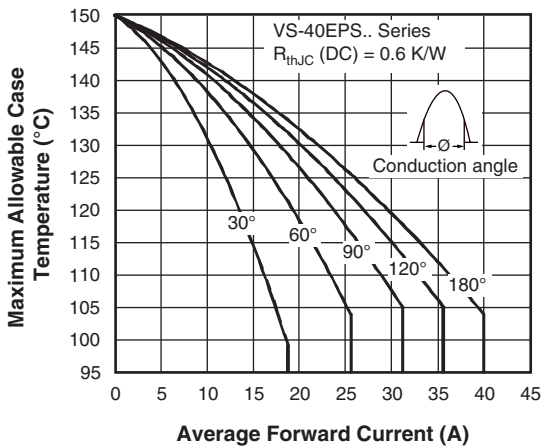


Fig. 1 - Current Rating Characteristics

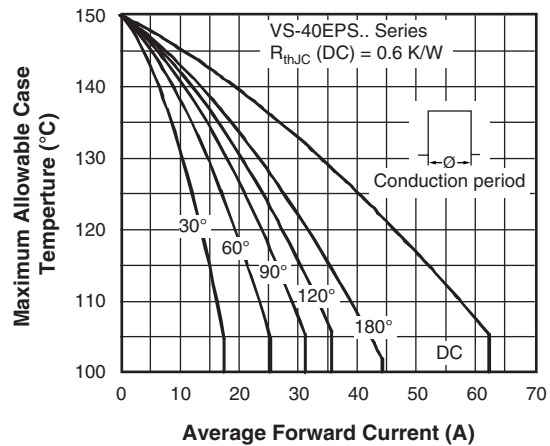


Fig. 2 - Current Rating Characteristics

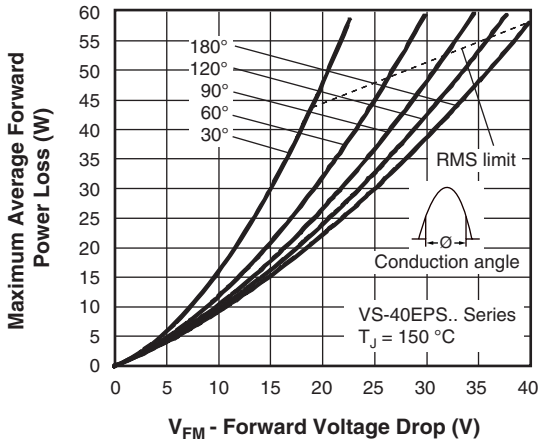


Fig. 3 - Forward Power Loss Characteristics

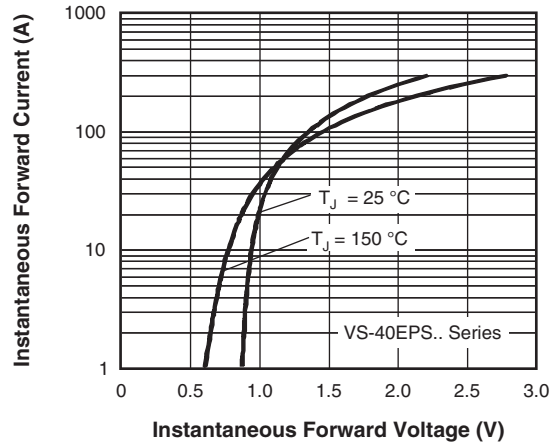


Fig. 5 - Forward Voltage Drop Characteristics

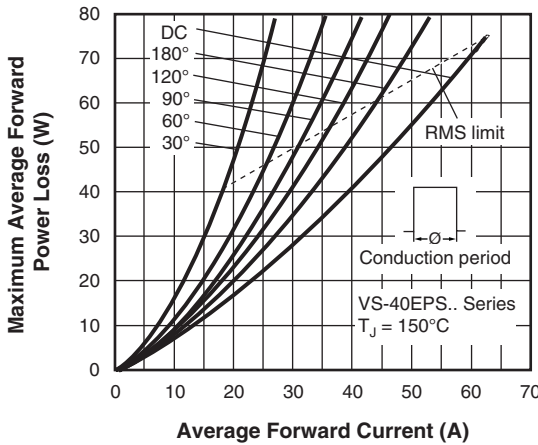


Fig. 4 - Forward Power Loss Characteristics

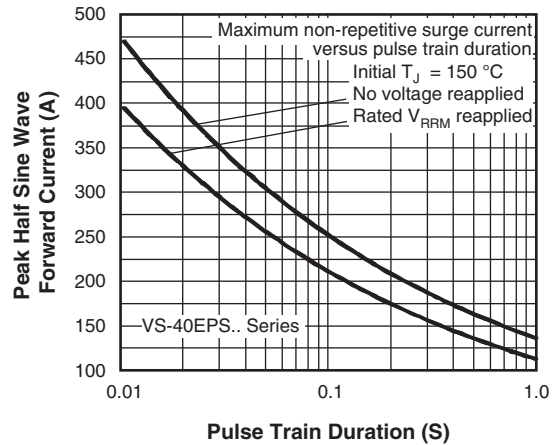


Fig. 6 - Maximum Non-Repetitive Surge Current

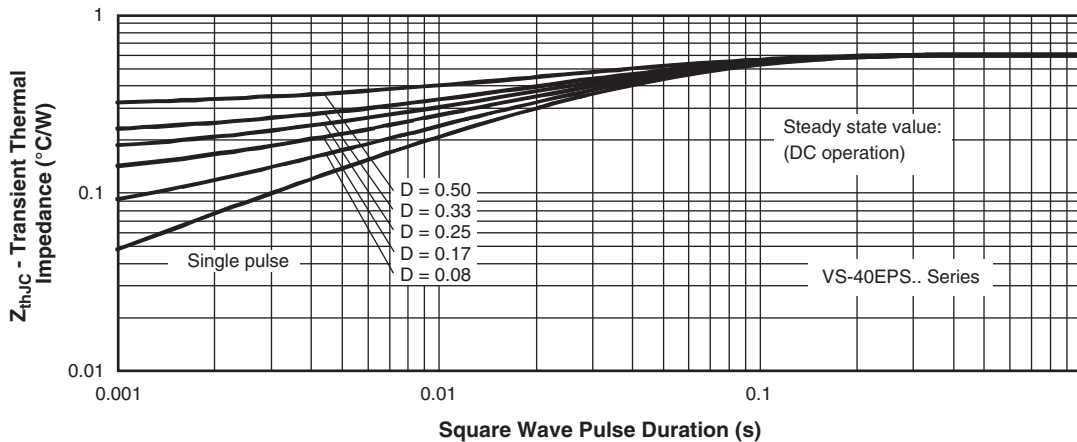
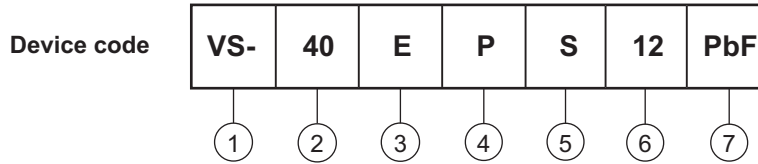


Fig. 7 - Thermal Impedance  $Z_{thJC}$  Characteristics



## ORDERING INFORMATION TABLE



- 1** - Vishay Semiconductors product
- 2** - Current rating (40 = 40 A)
- 3** - Circuit configuration:  
E = Single diode
- 4** - Package:  
P = TO-247AC modified
- 5** - Type of silicon:  
S = Standard recovery rectifier
- 6** - Voltage rating
 

08 = 800 V
12 = 1200 V
- 7** - Environmental digit:  
PbF = Lead (Pb)-free and RoHS compliant  
-M3 = Halogen-free, RoHS compliant and terminations lead (Pb)-free

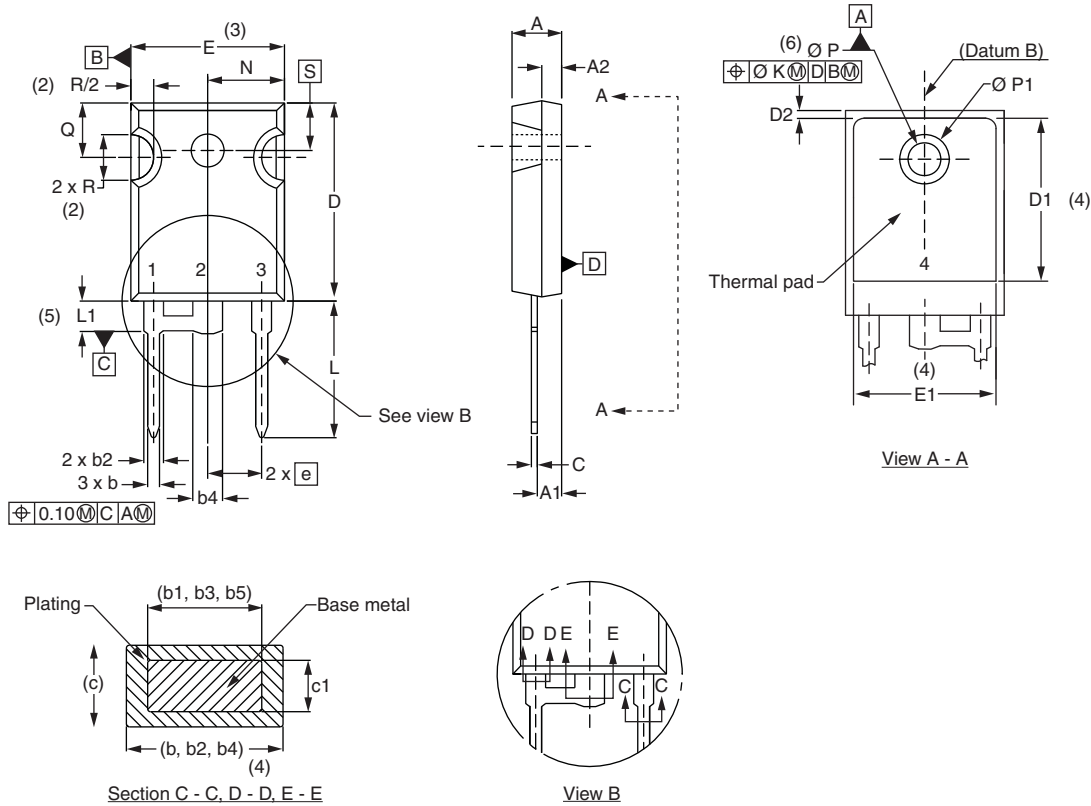
ORDERING INFORMATION (Example)			
PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-40EPS08PbF	25	500	Antistatic plastic tubes
VS-40EPS08-M3	25	500	Antistatic plastic tubes
VS-40EPS12PbF	25	500	Antistatic plastic tubes
VS-40EPS12-M3	25	500	Antistatic plastic tubes

LINKS TO RELATED DOCUMENTS		
Dimensions		<a href="http://www.vishay.com/doc?95541">www.vishay.com/doc?95541</a>
Part marking information	TO-247AC modified PbF	<a href="http://www.vishay.com/doc?95255">www.vishay.com/doc?95255</a>
	TO-247AC modified -M3	<a href="http://www.vishay.com/doc?95442">www.vishay.com/doc?95442</a>



TO-247 modified

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		N	7.62 BSC		0.3		
b5	2.59	3.38	0.102	0.133		Ø P	3.56	3.66	0.14	0.144	
c	0.38	0.89	0.015	0.035		Ø P1	-	6.98	-	0.275	
c1	0.38	0.84	0.015	0.033		Q	5.31	5.69	0.209	0.224	
D	19.71	20.70	0.776	0.815	3	R	4.52	5.49	0.178	0.216	
D1	13.08	-	0.515	-	4	S	5.51 BSC		0.217 BSC		

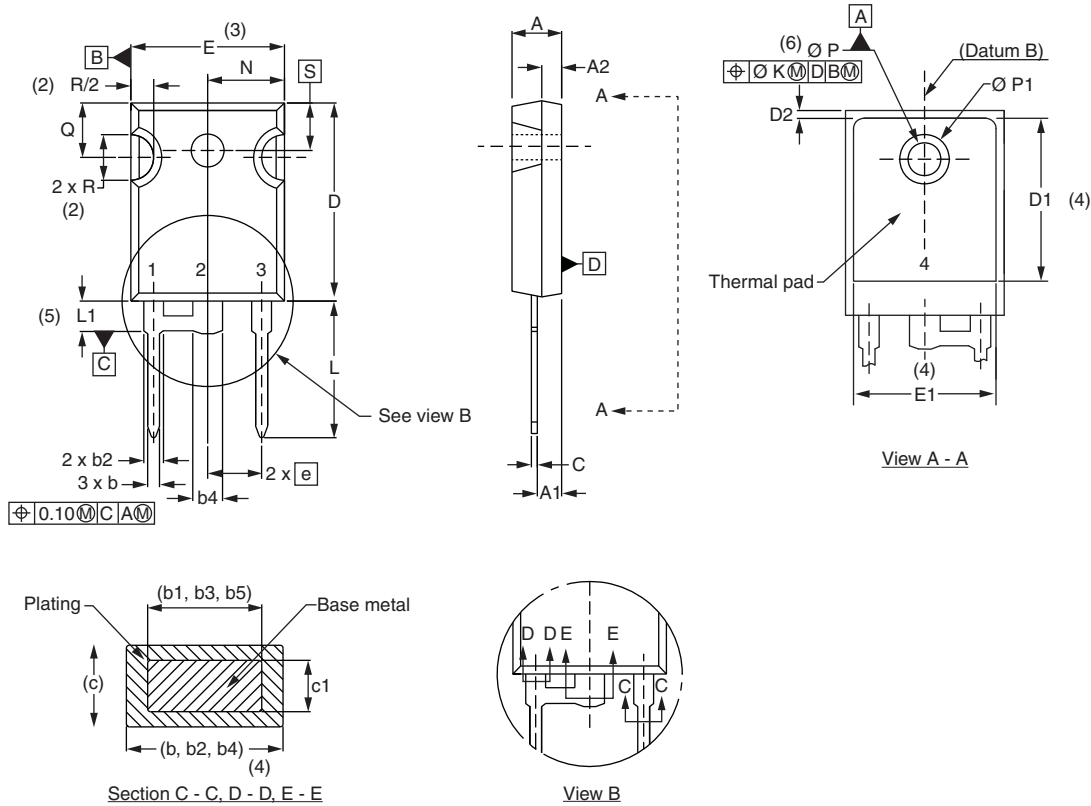
Notes

- (1) Dimensioning and tolerance 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



TO-247 - 50 mils L/F modified

**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	1.35	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		e	5.46 BSC		0.215 BSC		
b1	0.99	1.35	0.039	0.053		Ø K	0.254		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		N	7.62 BSC		0.3		
b5	2.59	3.38	0.102	0.133		Ø P	3.56	3.66	0.14	0.144	
c	0.38	0.89	0.015	0.035		Ø P1	-	7.39	-	0.291	
c1	0.38	0.84	0.015	0.033		Q	5.31	5.69	0.209	0.224	
D	19.71	20.70	0.776	0.815	3	R	4.52	5.49	0.178	0.216	
D1	13.08	-	0.515	-	4	S	5.51 BSC		0.217 BSC		

**Notes**

- (1) Dimensioning and tolerance 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
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- (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 and Q



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