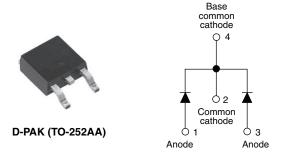
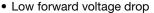


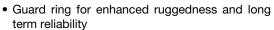
High Performance Schottky Rectifier, 2 x 3.5 A



PRODUCT SUMMARY					
Package	D-PAK (TO-252AA)				
I _{F(AV)}	2 x 3.5 A				
V_{R}	40 V				
V _F at I _F	See Electrical table				
I _{RM}	24 mA at 125 °C				
T _J max.	150 °C				
Diode variation	Common cathode				
E _{AS}	8 mJ				

FEATURES







FREE

- Popular D-PAK outline
- Center tap configuration
- · Small foot print, surface mountable
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

DESCRIPTION

The VS-6CWQ04FN-M3 surface mount, center tap, Schottky rectifier series has been designed for applications requiring low forward drop and small foot prints on PC board. Typical applications are in disk drives, switching power supplies, converters, freewheeling diodes, battery charging, and reverse battery protection.

MAJOR RATINGS AND CHARACTERISTICS							
SYMBOL	CHARACTERISTICS	VALUES	UNITS				
I _{F(AV)}	Rectangular waveform	7	A				
V _{RRM}		40	V				
I _{FSM}	t _p = 5 μs sine	500	А				
V _F	3 A _{pk} , T _J = 125 °C (per leg)	0.49	V				
TJ	Range	-40 to +150	°C				

VOLTAGE RATINGS						
PARAMETER	SYMBOL	VS-6CWQ04FN-M3	UNITS			
Maximum DC reverse voltage	V_{R}	40 V				
Maximum working peak reverse voltage	V_{RWM}	40	V			

ABSOLUTE MAXIMUM RATINGS							
PARAMETER		SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum average forward current	poi log		EO 0/ districtionals at T = 125 °C rectangular variations		3.5		
See fig. 5	per device	I _{F(AV)}	50 % duty cycle at T _C = 135 °C, rectangular waveform		7	Α	
Maximum peak one cycle			5 μs sine or 3 μs rect. pulse	Following any rated load condition and with rated	500		
non-repetitive surge current per leg See fig. 7		I _{FSM}	10 ms sine or 6 ms rect. pulse	V _{RRM} applied	80		
Non-repetitive avalanche energy per leg E_{AS} $T_{J} = 25$ °C, $I_{AS} = 1$ A		$T_J = 25 ^{\circ}\text{C}, I_{AS} = 1 \text{A}, L = 16 \text{m}$	Н	8.0	mJ		
Repetitive avalanche current per leg		I _{AR}	Current decaying linearly to zero in 1 μ s Frequency limited by T _J maximum V _A = 1.5 x V _R typical		1.0	Α	



ELECTRICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONI	VALUES	UNITS		
		3 A	T _{.I} = 25 °C	0.53	V	
Maximum forward voltage drop per leg	V _{FM} ⁽¹⁾	6 A	- IJ=25 C	0.67		
See fig. 1	VFM (1)	3 A	T _{.1} = 125 °C	0.49		
		6 A	- IJ = 125 C	0.62		
Maximum reverse leakage current per leg	I _{RM} ⁽¹⁾	T _J = 25 °C	- V _R = Rated V _R	2	mA	
See fig. 2	'RM\'	T _J = 125 °C	VR = Nated VR	24	111/4	
Threshold voltage	V _{F(TO)}	T - T movimum		0.34	V	
Forward slope resistance	r _t	ıj = ıj maximum	$T_J = T_J$ maximum		mΩ	
Typical junction capacitance per leg	C _T	V _R = 5 V _{DC} (test signal range	189	pF		
Typical series inductance per leg	L _S	Measured lead to lead 5 mm	5.0	nH		
Maximum voltage rate of change	dV/dt	Rated V _R		10 000	V/µs	

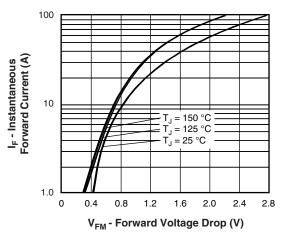
Note

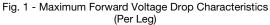
 $^{(1)}\,$ Pulse width < 300 $\mu s,$ duty cycle < 2 %

THERMAL - MECHANICAL SPECIFICATIONS						
PARAMETER		SYMBOL	TEST CONDITIONS	VALUES	UNITS	
Maximum junction and storage temperature range		T _J ⁽¹⁾ , T _{Stg}		-40 to +150	°C	
Maximum thermal resistance,	per leg	D	DC operation	4.70	°C/W	
junction to case	per device	R_{thJC}	See fig. 4	2.35	C/VV	
Approximate weight				0.3	g	
Approximate weight				0.01	OZ.	
Marking device			Case style D-PAK (similar to TO-252AA)	6CWQ	04FN	

Note

(1)
$$\frac{dP_{tot}}{dT_J} < \frac{1}{R_{thJA}}$$
 thermal runaway condition for a diode on its own heatsink





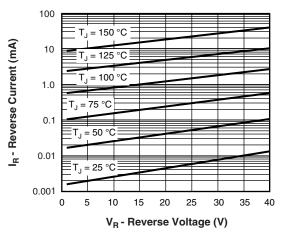


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

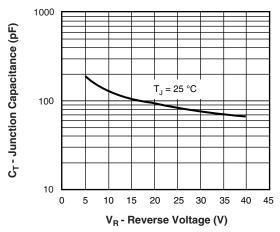


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

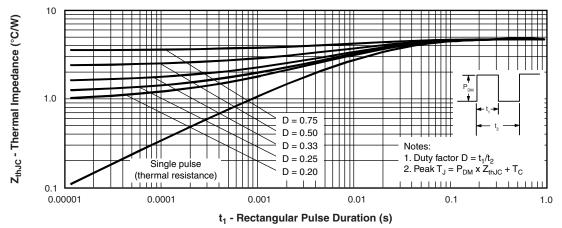


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

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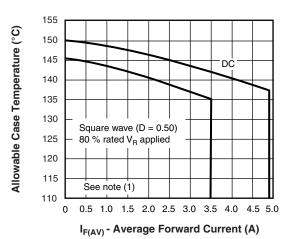


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

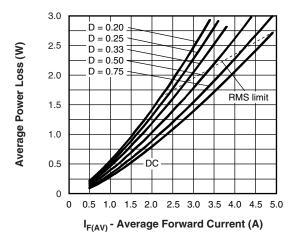


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

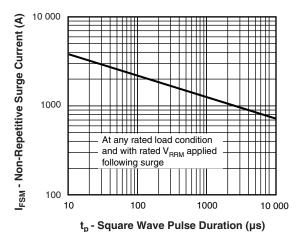


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

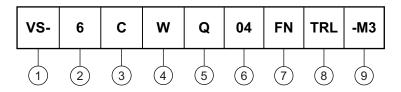
Note

 $^{(1)}$ Formula used: T_C = T_J - (Pd + Pd_{REV}) x R_{thJC}; Pd = forward power loss = I_{F(AV)} x V_{FM} at (I_{F(AV)}/D) (see fig. 6); Pd_{REV} = inverse power loss = V_{R1} x I_R (1 - D); I_R at V_{R1} = 80 % rated V_R



ORDERING INFORMATION TABLE

Device code



1 - Vishay Semiconductors product

2 - Current rating (7 A)

Center tap configuration

4 - Package identifier:

W = D-PAK

5 - Schottky "Q" series

6 - Voltage rating (04 = 40 V)

7 - FN = TO-252AA

8 - • None = tube

• TR = tape and reel

• TRL = tape and reel (left oriented)

• TRR = tape and reel (right oriented)

9 - Environmental digit:

-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-6CWQ04FN-M3	75	3000	Antistatic plastic tube			
VS-6CWQ04FNTR-M3	2000	2000	13" diameter reel			
VS-6CWQ04FNTRL-M3	3000	3000	13" diameter reel			
VS-6CWQ04FNTRR-M3	3000	3000	13" diameter reel			

LINKS TO RELATED DOCUMENTS				
Dimensions <u>www.vishay.com/doc?95627</u>				
Part marking information	www.vishay.com/doc?95176			
Packaging information	www.vishay.com/doc?95033			



D-PAK (TO-252AA) "M"

DIMENSIONS in millimeters and inches



SYMBOL	MILLIN	IETERS	INCHES		NOTES
STIVIBUL	MIN.	MAX.	MIN.	MAX.	NOTES
Α	2.18	2.39	0.086	0.094	
A1	-	0.13	-	0.005	
b	0.64	0.89	0.025	0.035	
b2	0.76	1.14	0.030	0.045	
b3	4.95	5.46	0.195	0.215	3
С	0.46	0.61	0.018	0.024	
c2	0.46	0.89	0.018	0.035	
D	5.97	6.22	0.235	0.245	5
D1	5.21	-	0.205	1	3
Е	6.35	6.73	0.250	0.265	5
E1	4.32	-	0.170	-	3

SYMBOL	MILLIN	IETERS	INC	HES	NOTES
STINIBOL	MIN.	MAX.	MIN.	MAX.	NOTES
е	2.29	BSC	0.090	BSC	
Н	9.40	10.41	0.370	0.410	
L	1.40	1.78	0.055	0.070	
L1	2.74 BSC		0.108	REF.	
L2	0.51	BSC	0.020 BSC		
L3	0.89	1.27	0.035	0.050	3
L4	-	1.02	-	0.040	
L5	1.14	1.52	0.045	0.060	2
Ø	0°	10°	0°	10°	
Ø1	0°	15°	0°	15°	
Ø2	25°	35°	25°	35°	

Notes

- (1) Dimensioning and tolerancing as per ASME Y14.5M-1994
- (2) Lead dimension uncontrolled in L5
- (3) Dimension D1, E1, L3 and b3 establish a minimum mounting surface for thermal pad
- (4) Section C C dimension apply to the flat section of the lead between 0.13 and 0.25 mm (0.005 and 0.10") from the lead tip
- (5) 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
- (6) Dimension b1 and c1 applied to base metal only
- (7) Datum A and B to be determined at datum plane H
- (8) Outline conforms to JEDEC® outline TO-252AA



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