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VS-21DQ04, VS-21DQ04-M3

Vishay Semiconductors

N Cathode Anode

DO-2	04AL

PRODUCT SUMMARY					
Package	DO-204AL (DO-41)				
I _{F(AV)}	2 A				
V _R	40 V				
V _F at I _F	0.5 V				
I _{RM} max.	10 mA at 125 °C				
T _J max.	150 °C				
Diode variation	Single die				
E _{AS}	5.0 mJ				

Schottky Rectifier, 2 A

- **FEATURES**
- · Low profile, axial leaded outline
- · High frequency operation
- · Very low forward voltage drop
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance



HALOGEN

FREE Available

- · Guard ring for enhanced ruggedness and long term reliability
- Compliant to RoHS Directive 2002/95/EC
- · Designed and qualified for commercial level
- Halogen-free according to IEC 61249-2-21 definition (-M3 only)

DESCRIPTION

The VS-21DQ04... axial leaded Schottky rectifier has been optimized for very low forward voltage drop, with moderate leakage. Typical applications are in switching power supplies, converters, freewheeling diodes, and reverse battery protection.

MAJOR RATINGS AND CHARACTERISTICS								
SYMBOL	CHARACTERISTICS	CHARACTERISTICS VALUES UNITS						
I _{F(AV)}	Rectangular waveform2							
V _{RRM}	40							
V _F	2 Apk, T _J = 125 °C	0.5	V					
TJ	Range	- 40 to 150	°C					

VOLTAGE RATINGS						
PARAMETER	SYMBOL	VS-21DQ04	VS-21DQ04-M3	UNITS		
Maximum DC reverse voltage	V _R	40	40	V		
Maximum working peak reverse voltage	V _{RWM}	40	40	v		

ABSOLUTE MAXIMUM RATINGS						
PARAMETER	SYMBOL	TEST CONDI	TIONS	VALUES	UNITS	
Maximum average forward current See fig. 4	I _{F(AV)}	$I_{F(AV)}$ 50 % duty cycle at T _C = 112 °C, rectangular waveform		2		
Maximum peak one cycle non-repetitive surge current	I	5 μs sine or 3 μs rect. pulse	Following any rated load condition and with rated	420	А	
See fig. 6		10 ms sine or 6 ms rect. pulse	V _{RRM} applied	70		
Non-repetitive avalanche energy	E _{AS}	T _J = 25 °C, I _{AS} = 1.0 A, L = 10 mH		5.0	mJ	
Repetitive avalanche current	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	А	

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ELECTRICAL SPI	ECIFICATIONS
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ELECTRICAL SPECIFICATIONS							
PARAMETER	SYMBOL	TEST CO	VAL	UNITS			
FARAMETER	STWBOL	1231 00	NDITIONS	TYP.	MAX.		
		2 A	T.I = 25 °C	0.49	0.55	v	
Maximum forward voltage drop	V _{FM} ⁽¹⁾	4 A	1j=25 C	0.60	0.65		
		2 A	T 105 %C	0.42	0.5		
		4 A	T _J = 125 °C	0.56	0.62		
	I (1)	T _J = 25 °C		0.01	0.50		
Maximum reverse leakage current	I _{RM} ⁽¹⁾	T _J = 125 °C	V _R = Rated V _R	5.2	10	mA	
Typical junction capacitance	CT	V_R = 5 V_{DC} (test signal range 100 kHz to 1 MHz) 25 °C			30	pF	
Typical series inductance	L _S	Measured lead to lead 5 mm from package body 8.0			nH		

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, junction to ambient	R _{thJA}	DC operation Without cooling fin	100	°C/W		
Typical thermal resistance, junction to lead	R _{thJL}	DC operation See fig. 4	25	0/14		
Approvimeto weight			0.33	g		
Approximate weight			0.012	oz.		
Marking device		Case style DO-204AL (D-41)	21D	Q04		

Note

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



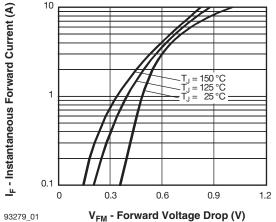
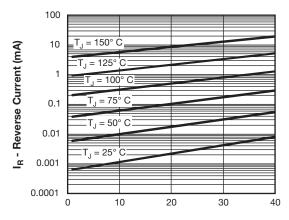
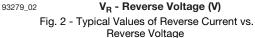
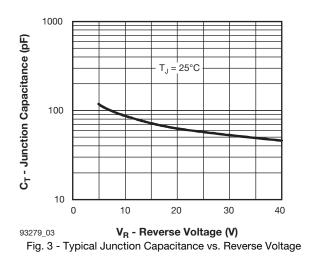


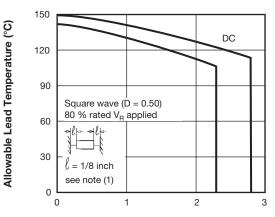
Fig. 1 - Maximum Forward Voltage Drop Characteristics



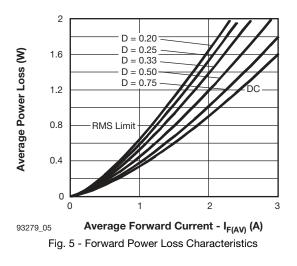


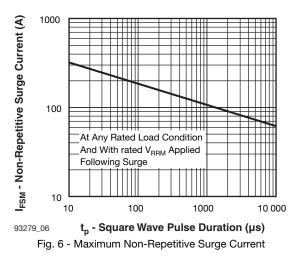


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93279_04 I_{F(AV)} - Average Forward Current (A) Fig. 4 - Maximum Allowable Lead Temperature vs. Average Forward Current





Note

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

Pd = Forward power loss = $I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 6); Pd_{REV} = Inverse power loss = $V_{R1} \times I_R$ (1 - D); I_R at V_{R1} = 80 % rated V_R

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VS-21DQ04, VS-21DQ04-M3

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ORDERING INFORMATION TABLE

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Device code	V	S-	21	D	Q	04	TR	-МЗ
	(1	$\mathbf{)}$	2	3	4	5	6	7
	1	-	Visha	ay Semi	conduct	ors prod	luct	
	2 -		21 =	Current	Rating 2	2 A		
	3	-	D = [DO-41 p	ackage			
	4 - 5 -		Q = \$	Schottky	Q seri	es		
			04 =	Voltage	rating: 4	40 V		
	6	-	TR =	Tape a	nd reel p	backage	•	
			TB =	Tape a	nd amm	o box pa	ackage	
			None	e = Bulk	package	Э		
	7	-	Envir	onment	al digit			
			• No	ne = Lea	ad (Pb)-	free and	I RoHS	complian

• -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-21DQ04	1000	1000	Bulk				
VS-21DQ04TR	5000	5000	Tape and Reel				
VS-21DQ04TB	3000	3000	Tape and ammo box				
VS-21DQ04-M3	1000	1000	Bulk				
VS-21DQ04TR-M3	5000	5000	Tape and Reel				
VS-21DQ04TB-M3	3000	3000	Tape and ammo box				

LINKS TO RELATED DOCUMENTS				
Dimensions	www.vishay.com/doc?95241			
Part marking information	www.vishay.com/doc?95304			
Packaging information	www.vishay.com/doc?95338			

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27.0 (1.06) MIN. (2 places)

1.27 (0.050) MAX.

Flash (2 places)

2.70 (0.106)

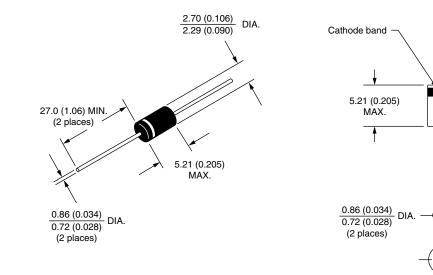
2.29 (0.090)

DIA.



Axial DO-204AL (DO-41)

DIMENSIONS in millimeters (inches)



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