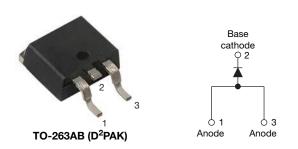
VS-20ETS08S-M3, VS-20ETS12S-M3 Series

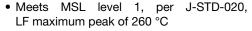
Vishay Semiconductors

High Voltage Surface Mount Input Rectifier Diode, 20 A



PRODUCT SUMMARY							
Package	TO-263AB (D ² PAK)						
I _{F(AV)}	20 A						
V_{R}	800 V, 1200 V						
V _F at I _F	1.1 V						
I _{FSM}	300 A						
T _J max.	150 °C						
Diode variation	Single die						

FEATURES





- · Glass passivated pellet chip junction
- Designed and qualified according to JEDEC®-JESD 47

ROHS COMPLIANT HALOGEN FREE

 Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

APPLICATIONS

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

DESCRIPTION

The VS-20ETS...S-M3 rectifier High Voltage Series has been optimized for very low forward voltage drop, with moderate leakage. The glass passivation technology used has reliable operation up to 150 °C junction temperature.

OUTPUT CURRENT IN TYPICAL APPLICATIONS									
APPLICATIONS SINGLE-PHASE BRIDGE THREE-PHASE BRIDGE UNITS									
Capacitive input filter T _A = 55 °C, T _J = 125 °C common heatsink of 1 °C/W	16.3	21	А						

MAJOR RATINGS AND CHARACTERISTICS								
SYMBOL	CHARACTERISTICS	VALUES	UNITS					
I _{F(AV)}	Sinusoidal waveform	20	Α					
V _{RRM}		800/1200	V					
I _{FSM}		300	Α					
V _F	20 A, T _J = 25 °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-20ETS08S-M3	800	900	1						
VS-20ETS12S-M3	1200	1300	1						



VS-20ETS08S-M3, VS-20ETS12S-M3 Series

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ABSOLUTE MAXIMUM RATINGS								
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS				
Maximum average forward current	I _{F(AV)}	T _C = 105 °C, 180° conduction half sine wave	20					
Maximum peak one cycle non-repetitive surge current		10 ms sine pulse, rated V _{RRM} applied	250	Α				
	I _{FSM}	10 ms sine pulse, no voltage reapplied	300]				
Maximum 12t for fusing	l ² t	10 ms sine pulse, rated V _{RRM} applied	316 A ² s					
Maximum I ² t for fusing	1-1	10 ms sine pulse, no voltage reapplied	442	A-S				
Maximum I²√t for fusing	I²√t	t = 0.1 ms to 10 ms, no voltage reapplied	4420	A²√s				

ELECTRICAL SPECIFICATIONS								
PARAMETER	PARAMETER SYMBOL TEST CONDITIONS							
Maximum forward voltage drop	V_{FM}	20 A, T _J = 25 °C	1.1	V				
Forward slope resistance	r _t	T _{.1} = 150 °C	10.4	mΩ				
Threshold voltage	V _{F(TO)}	1J = 150 C	0.85	V				
Maximum roverse leakage ourrent	_	T _J = 25 °C	V - Batad V	0.1	m۸			
Maximum reverse leakage current	IRM	T _J = 150 °C	V_R = Rated V_{RRM}	1.0	mA			

THERMAL - MECHANICAL SPECIFICATIONS								
PARAMETER		SYMBOL	TEST CONDITIONS	VALUES	UNITS			
Maximum junction and storage tempe	rature range	T _J , T _{Stg}		-40 to +150	°C			
Maximum thermal resistance, junction to case		R _{thJC}	DC operation	1.3				
Maximum thermal resistance, junction to ambient		R _{thJA} ⁽¹⁾	For D ² PAK version	62	°C/W			
Typical thermal resistance, case to heatsink		R _{thCS}	Mounting surface, smooth, and greased	0.5				
Approximate weight				2	g			
Approximate weight				0.07	OZ.			
minimum				6.0 (5.0)	kgf · cm			
Mounting torque -	maximum			12 (10)	(lbf \cdot in)			
Marking device			Coop at the TO 262AD (D ² DAIA)	20ETS08S				
			Case style TO-263AB (D ² PAK)		20ETS12S			

Note

 $^{^{(1)}}$ When mounted on 1" square (650 mm²) PCB of FR-4 or G-10 material 4 oz. (140 μm) copper 40 °C/W For recommended footprint and soldering techniques refer to application note #AN-994



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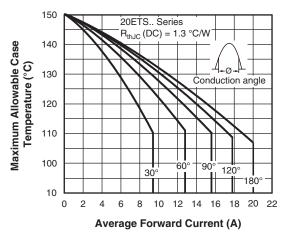


Fig. 1 - Current Rating Characteristics

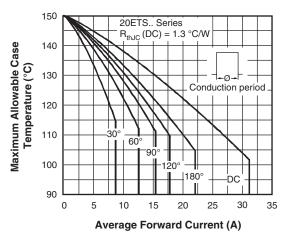


Fig. 2 - Current Rating Characteristics

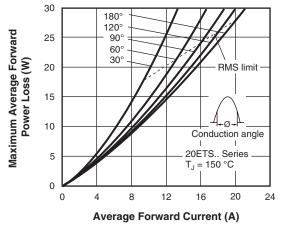


Fig. 3 - Forward Power Loss Characteristics

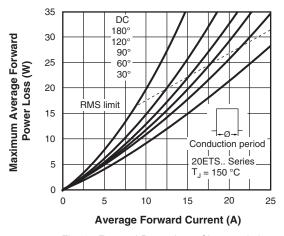
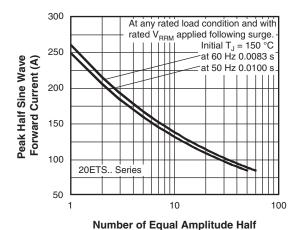
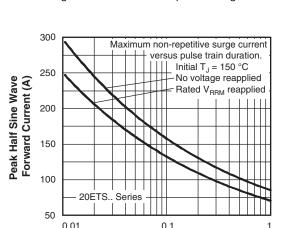


Fig. 4 - Forward Power Loss Characteristics



Cycle Current Pulse (N)
Fig. 5 - Maximum Non-Repetitive Surge Current



Pulse Train Duration (s)
Fig. 6 - Maximum Non-Repetitive Surge Current

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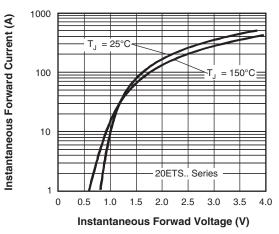


Fig. 7 - Forward Voltage Drop Characteristics

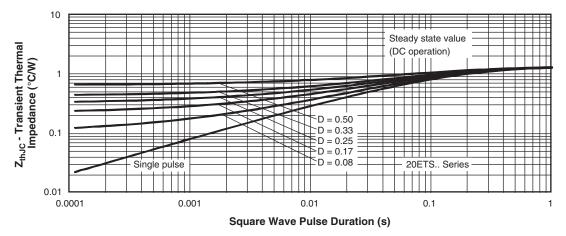


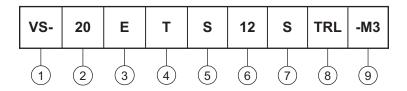
Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

VS-20ETS08S-M3, VS-20ETS12S-M3 Series

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ORDERING INFORMATION TABLE

Device code



1 - Vishay Semiconductors product

2 - Current rating (20 = 20 A)

Circuit configuration

E = single diode

4 - Package:

 $T = D^2PAK$

5 - Type of silicon:

S = standard recovery rectifier

- Voltage code x 100 = V_{RRM} - 08 = 800 V 12 = 1200 V

7 - S = surface mountable

8 - • None = tube

• TRL = tape and reel (left oriented)

• TRR = tape and reel (right oriented)

9 - -M3 = halogen-free, RoHS-compliant, and terminations lead (Pb)-free

ORDERING INFORMATION (Example)								
PREFERRED P/N	QUANTITY PER TUBE	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION					
VS-20ETS08S-M3	50	1000	Antistatic plastic tube					
VS-20ETS08STRR-M3	800	800	13" diameter reel					
VS-20ETS08STRL-M3	800	800	13" diameter reel					
VS-20ETS12S-M3	50	1000	Antistatic plastic tube					
VS-20ETS12STRR-M3	800	800	13" diameter reel					
VS-20ETS12STRL-M3	800	800	13" diameter reel					

LINKS TO RELATED DOCUMENTS						
Dimensions <u>www.vishay.com/doc?95046</u>						
Part marking information	www.vishay.com/doc?95444					
Packaging information	www.vishay.com/doc?95032					
SPICE model	www.vishay.com/doc?95409					



Vishay Semiconductors

D²PAK

DIMENSIONS in millimeters and inches



SYMBOL	MILLIMETERS		INC	INCHES		INCHES		NOTES	SYMBOL	MILLIM	ETERS	INC	HES	NOTES
STIVIBUL	MIN.	MAX.	MIN.	MAX.	NOIES	NOTES	STWIDOL	MIN.	MAX.	MIN.	MAX.	NOTES		
Α	4.06	4.83	0.160	0.190			D1	6.86	8.00	0.270	0.315	3		
A1	0.00	0.254	0.000	0.010			Е	9.65	10.67	0.380	0.420	2, 3		
b	0.51	0.99	0.020	0.039			E1	7.90	8.80	0.311	0.346	3		
b1	0.51	0.89	0.020	0.035	4		е	2.54	BSC	0.100) BSC			
b2	1.14	1.78	0.045	0.070			Н	14.61	15.88	0.575	0.625			
b3	1.14	1.73	0.045	0.068	4		L	1.78	2.79	0.070	0.110			
С	0.38	0.74	0.015	0.029			L1	-	1.65	-	0.066	3		
c1	0.38	0.58	0.015	0.023	4		L2	1.27	1.78	0.050	0.070			
c2	1.14	1.65	0.045	0.065			L3	0.25	BSC	0.010	BSC			
D	8.51	9.65	0.335	0.380	2		L4	4.78	5.28	0.188	0.208			

Notes

- (1) Dimensioning and tolerancing per ASME Y14.5 M-1994
- (2) 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 outmost extremes of the plastic body
- (3) Thermal pad contour optional within dimension E, L1, D1 and E1
- (4) Dimension b1 and c1 apply to base metal only
- (5) Datum A and B to be determined at datum plane H
- (6) Controlling dimension: inch
- (7) Outline conforms to JEDEC® outline TO-263AB



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