AUTOMOTIVE GRADE

RoHS

COMPLIANT

HALOGEN

FREE



Vishay General Semiconductor

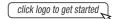
High Current Density Surface-Mount Trench MOS Barrier Schottky Rectifier

Ultra Low $V_F = 0.32 \text{ V}$ at $I_F = 2.5 \text{ A}$



1 and / or 2 o 7, 8 3 and / or 4 o 5, 6

DESIGN SUPPORT TOOLS





PRIMARY CHARACTERISTICS					
I _{F(AV)}	2 x 5 A				
V_{RRM}	45 V				
I _{FSM}	100 A				
V_F at $I_F = 5$ A $(T_A = 125 ^{\circ}\text{C})$	0.39 V				
T _J max.	150 °C				
Package	FlatPAK 5 x 6				
Circuit configuration	Separated cathode				

FEATURES

- Trench MOS Schottky technology
- · Low forward voltage drop, low power losses
- · High efficiency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C



- Automotive ordering code: base P/NHM3
- Material categorization: for definitions of compliance please see <u>www.vishav.com/doc?99912</u>

TYPICAL APPLICATIONS

For use in low voltage high frequency DC/DC converters, freewheeling diodes, and polarity protection applications.

MECHANICAL DATA

Case: FlatPAK 5 x 6

Molding compound meets UL 94 V-0 flammability rating

Base P/N-M3 - halogen-free, RoHS-compliant

Base P/NHM3 - halogen-free, RoHS-compliant, and

AEC-Q101 qualified

Terminals: matte tin plated leads, solderable per

J-STD-002 and JESD 22-B102

M3 and HM3 suffix meets JESD 201 class 2 whisker test

MAXIMUM RATINGS (T _A = 25 °C unless otherwise noted)					
PARAMETER	SYMBOL	V10KL45DU	UNIT		
Device marking code		V10L45D			
Maximum repetitive peak reverse voltage	V _{RRM}	45	V		
Maximum DC forward ourrent per diada	I _{F(AV)} (1)	5	Α		
Maximum DC forward current per diode	I _{F(AV)} (2)	3.3	А		
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I _{FSM}	100	А		
Operating junction temperature range	T _J ⁽³⁾	-40 to +150	°C		
Storage temperature range	T _{STG}	-55 to +150	°C		

Notes

- (1) With infinite heatsink
- (2) Free air, mounted on recommended pad area
- $^{(3)}$ The heat generated must be less than the thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta JA}$



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ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage per diode	I _F = 2.5 A	$T_{\Delta} = 25 ^{\circ}\text{C}$	V _F ⁽¹⁾	0.43	-	V
	I _F = 5 A			0.48	0.56	
	I _F = 2.5 A	T _A = 125 °C		0.32	-	
	I _F = 5 A			0.39	0.47	
Reverse current per diode	V _R = 45 V	T _A = 25 °C	I _R ⁽²⁾	-	0.65	- mA
	v _R = 45 v	T _A = 125 °C		8	45	
Typical junction capacitance per diode	4.0 V, 1 MHz		CJ	900	-	pF

Notes

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: pulse width $\leq 5 \text{ ms}$

THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)					
PARAMETER	SYMBOL	TYP.	MAX.	UNIT	
They may reciptored new diede	R ₀ JA (1)(2)	100	-	°C/W	
Thermal resistance per diode	R _{0JM} (3)	3.0	4.0	C/VV	

Notes

 $^{(1)}$ The heat generated must be less than thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta JA}$

 $^{(2)}$ Free air, mounted on recommended copper pad area; thermal resistance $R_{\theta JA}$ - junction-to-ambient

 $^{(3)}$ Mounted on infinite heat sink; thermal resistance $R_{\theta JM}$ - junction-to-mount

ORDERING INFORMATION (Example)						
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE		
V10KL45DU-M3/H	0.10	Н	1500	7" diameter plastic tape and reel		
V10KL45DU-M3/I	0.10	I	6000	13" diameter plastic tape and reel		
V10KL45DUHM3/H (1)	0.10	Н	1500	7" diameter plastic tape and reel		
V10KL45DUHM3/I (1)	0.10	I	6000	13" diameter plastic tape and reel		

Note

(1) AEC-Q101 qualified

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RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

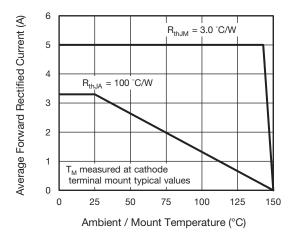


Fig. 1 - Maximum Forward Current Derating Curve

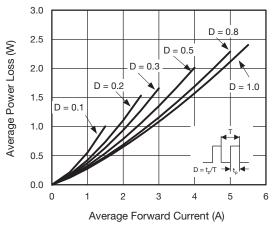


Fig. 2 - Forward Power Loss Characteristics

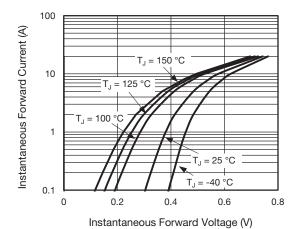


Fig. 3 - Typical Instantaneous Forward Characteristics

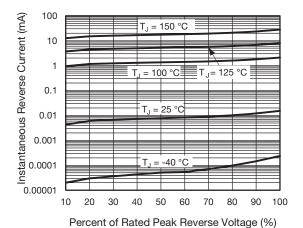


Fig. 4 - Typical Reverse Leakage Characteristics

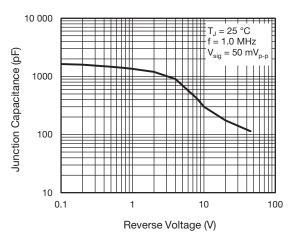


Fig. 5 - Typical Junction Capacitance

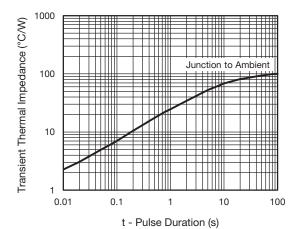
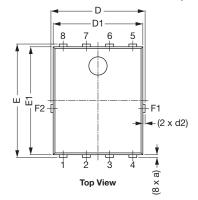


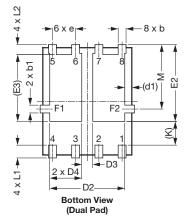
Fig. 6 - Typical Transient Thermal Impedance

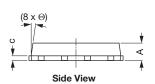


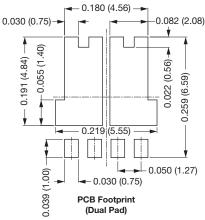
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PACKAGE OUTLINE DIMENSIONS in inches (millimeters)









DIM.		INCHES			MILLIMETERS	
DIIVI.	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
Α	0.035	0.039	0.043	0.89	0.99	1.09
(a)	-	0.006	-	-	0.15	-
b	0.013	0.017	0.020	0.32	0.43	0.52
b1	0.013	0.017	0.020	0.32	0.43	0.52
С	0.008	-	0.014	0.20	-	0.35
D	0.197	0.203	0.209	5.00	5.15	5.30
D1	0.189	0.193	0.197	4.80	4.90	5.00
D2	0.154	0.161	0.169	3.90	4.10	4.30
D3	0.020	0.024	0.031	0.50	0.60	0.80
D4	0.063	0.069	0.075	1.60	1.75	1.90
(d1)	-	0.016	-	-	0.40	-
(d2)	-	0.005	-	-	0.125	-
Е	0.238	0.244	0.250	6.05	6.20	6.35
E1	0.228	0.232	0.236	5.80	5.90	6.00
E2	0.157	0.165	0.173	4.00	4.20	4.40
(E3)	-	0.144	-	-	3.65	-
е		0.050 BSC			1.27 BSC	
(K)	0.039	-	-	1.00	-	-
L1	0.019	-	0.043	0.48	-	1.10
L2	0.012	-	0.031	0.30	-	0.80
М	0.128	0.138	0.148	3.25	3.50	3.75
Θ	0°	-	10°	0°	-	10°

Notes

- Dimensioning and tolerancing per ASME Y14.5-2009
- Dimensions D1 and E1 do not include mold flash or gate burrs
- Dimension (XX) means reference only



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