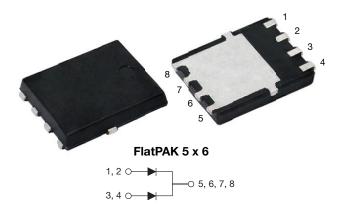
# V15KL45C

Vishay General Semiconductor

# High Current Density Surface-Mount TMBS<sup>®</sup> (Trench MOS Barrier Schottky) Rectifier

Ultra Low  $V_F = 0.32$  V at  $I_F = 5$  A



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### **DESIGN SUPPORT TOOLS AVAILABLE**

3D Models

PRIMARY CHARACTERISTICS					
I <sub>F(AV)</sub>	2 x 7.5 A				
V <sub>RRM</sub>	45 V				
I <sub>FSM</sub>	140 A				
$V_F$ at $I_F$ = 7.5 A ( $T_A$ = 125 °C)	0.36 V				
T <sub>J</sub> max.	150 °C				
Package	FlatPAK 5 x 6				
Circuit configuration	Common 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



Available

- AEC-Q101 qualified available
  Automotive ordering code: base P/NHM3
- Material categorization: for definitions of compliance please see <u>www.vishay.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

<b>MAXIMUM RATINGS</b> ( $T_A = 25 \text{ °C}$ unless otherwise noted)					
PARAMETER	SYMBOL	V15KL45C	UNIT		
Device marking code		15L45C			
Maximum repetitive peak reverse voltage	V <sub>RRM</sub>	45	V		
Maximum DC forward aureant par device	I <sub>F(AV)</sub> <sup>(1)</sup>	15 A	А		
Maximum DC forward current per device	I <sub>F(AV)</sub> <sup>(2)</sup>	5.6	А		
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I <sub>FSM</sub>	140	А		
Operating junction temperature range	T <sub>J</sub> <sup>(3)</sup>	-40 to +150	°C		
Storage temperature range	T <sub>STG</sub>	-55 to +150	°C		

Notes

<sup>(1)</sup> With infinite heatsink

<sup>(2)</sup> Free air, mounted on recommended pad area

 $^{(3)}$  The heat generated must be less than the thermal conductivity from junction-to-ambient: dP<sub>D</sub>/dT<sub>J</sub> < 1/R<sub>0JA</sub>

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V15KL45C



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ELECTRICAL CHARACTERIST	<b>ICS</b> (T <sub>A</sub> = 25	°C unless oth	erwise notec	(k		
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage per diode	I <sub>F</sub> = 5 A	т ог «О		0.43	-	
	$T_{A} = 25 \text{ °C}$	V <sub>F</sub> <sup>(1)</sup>	0.46	0.54	V	
	I <sub>F</sub> = 5 A	T <sub>A</sub> = 125 °C	VE	0.32	-	V
	I <sub>F</sub> = 7.5 A			0.36	0.44	
Deverse everent per diede		T <sub>A</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	-	2	mA
Reverse current per diode	V <sub>R</sub> = 45 V	T <sub>A</sub> = 125 °C		16	40	
Typical junction capacitance per diode	4.0 V, 1 MHz		CJ	1700	-	pF

#### Notes

 $^{(1)}\,$  Pulse test: 300  $\mu s$  pulse width, 1 % duty cycle

<sup>(2)</sup> Pulse test: pulse width  $\leq$  5 ms

<b>THERMAL CHARACTERISTICS</b> ( $T_A = 25 \text{ °C}$ unless otherwise noted)				
PARAMETER	SYMBOL	TYP.	MAX.	UNIT
Thermal resistance per device	R <sub>0JA</sub> <sup>(1)(2)</sup> 75	-	°C/W	
	R <sub>0JM</sub> <sup>(3)</sup>	2.5	3.5	0/10

#### Notes

<sup>(1)</sup> 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 INF	DERING INFORMATION (Example)					
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE		
V15KL45C-M3/H	0.10	Н	1500	7" diameter plastic tape and reel		
V15KL45C-M3/I	0.10	I	6000	13" diameter plastic tape and reel		
V15KL45CHM3/H (1)	0.10	Н	1500	7" diameter plastic tape and reel		
V15KL45CHM3/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)

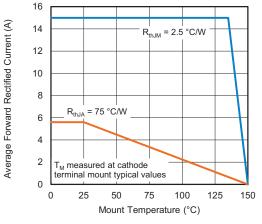


Fig. 1 - Maximum Forward Current Derating Curve

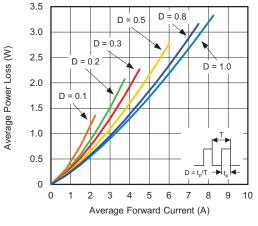


Fig. 2 - Forward Power Loss Characteristics

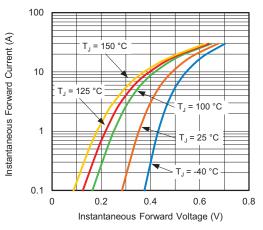


Fig. 3 - Typical Instantaneous Forward Characteristics

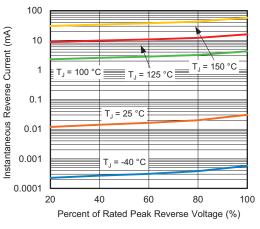


Fig. 4 - Typical Reverse Leakage Characteristics

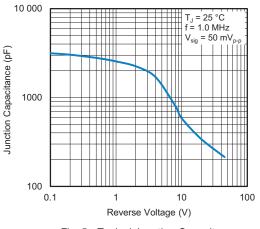


Fig. 5 - Typical Junction Capacitance

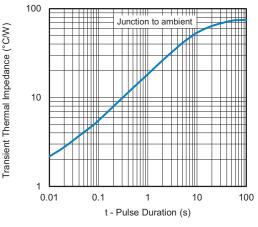


Fig. 6 - Typical Transient Thermal Impedance

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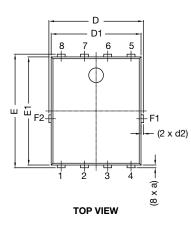
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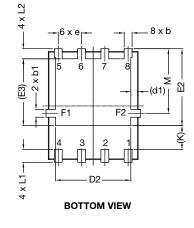


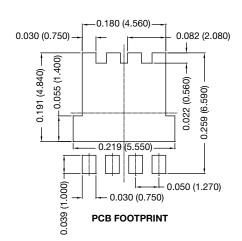
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### PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

FlatPAK 5 x 6







DIM		INCHES			MILLIMETERS			
DIM.	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.		
А	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		
(d1)	-	0.016	-	-	0.40	-		
(d2)	-	0.005	-	-	0.125	-		
E	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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