

## 40 A VRPower® Integrated Power Stage

(Datasheet in Brief)

#### **DESCRIPTION**

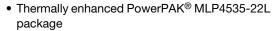
The SiC546 is an integrated power stage solution optimized for synchronous buck applications to offer high current, high efficiency, and high power density performance. Packaged in Vishay's proprietary 4.5 mm x 3.5 mm MLP package, SiC546 enables voltage regulator designs to deliver up to 40 A continuous current per phase.

The internal power MOSFETs utilize Vishay's state-of-the-art Gen IV TrenchFET technology that delivers industry benchmark performance to significantly reduce switching and conduction losses.

The SiC546 incorporates an advanced MOSFET gate driver IC that features high current driving capability, adaptive dead-time control, an integrated bootstrap Schottky diode, and zero current detection to improve light load efficiency. The driver is also compatible with a wide range of PWM controllers, supports tri-state PWM, and 5 V PWM logic.

A user selectable diode emulation mode (ZCD\_EN#) is included to improve the light load performance. The device also supports PS4 mode to reduce power consumption when system operates in standby state.

#### **FEATURES**





- Vishay's Gen IV MOSFET technology and a low-side MOSFET with integrated Schottky diode
- Delivers up to 40 A continuous current, 50 A at 10 ms peak current
- · High efficiency performance
- High frequency operation up to 2 MHz
- · Power on reset
- 5 V PWM logic with tri-state and hold-off
- Supports PS4 mode light load requirement for IMVP8 with low shutdown supply current (5 V, 3  $\mu$ A)
- Under voltage lockout for V<sub>CIN</sub>
- Material categorization: for definitions of compliance please see <a href="https://www.vishav.com/doc?99912">www.vishav.com/doc?99912</a>

### **APPLICATIONS**

- Multi-phase VRDs for computing, graphics card and memory
- Intel IMVP-8 VRPower delivery
- V<sub>CORE</sub>, V<sub>GRAPHICS</sub>, V<sub>SYSTEM AGENT</sub> Skylake, Kabylake platforms
  - $V_{\text{CCGI}}$  for Apollo Lake platforms
- Up to 24 V rail input DC/DC VR modules

### **TYPICAL APPLICATION DIAGRAM**

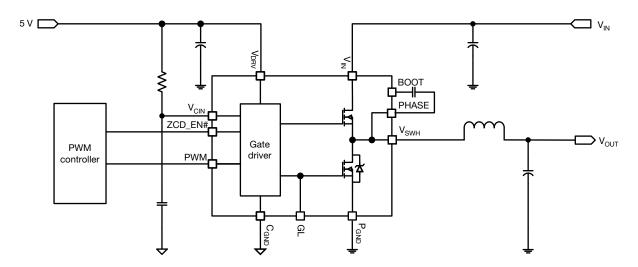


Fig. 1 - Typical Application Diagram



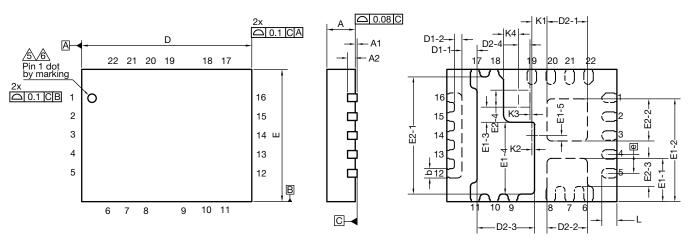
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PRODUCT SUMMARY					
Part number	SiC546				
Description	40 A power stage, 4.5 V <sub>IN</sub> to 24 V <sub>IN</sub> , 5 V PWM with ZCD, PS4 mode				
Input voltage min. (V)	4.5				
Input voltage max. (V)	24				
Continuous current rating max. (A)	40				
Switch frequency max. (kHz)	2000				
Enable (yes / no)	No				
Monitoring features	-				
Protection	UVLO				
Light load mode	ZCD, PS4				
Pulse-width modulation (V)	5				
Package type	PowerPAK MLP4535-22L				
Package size (W, L, H) (mm)	4.5 x 3.5 x 0.75				
Status code	1				
Product type	VRPower (DrMOS)				
Applications	Computer, industrial, networking				

To request the full version of the datasheet, please contact: ICmarketing@vishay.com

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### MLP 4.5 x 3.5-22L BWL Case Outline



DIM.	MILLIMETERS				INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.	
A <sup>(8)</sup>	0.70	0.75	0.80	0.027	0.0029	0.031	
A1	0.00	-	0.05	0.000	-	0.002	
A2	0.20 ref.			0.008 ref.			
b <sup>(4)</sup>	0.20	0.25	0.30	0.0078	0.0098	0.0110	
D	4.50 BSC			0.177 BSC			
е	0.50 BSC			0.019 BSC			
E	3.50 BSC			0.137 BSC			
L	0.35	0.40	0.45	0.013	0.015	0.017	
N (3)	22			22			
Nd <sup>(3)</sup>	6			6			
Ne <sup>(3)</sup>	5			5			
D1-1	0.35	0.40	0.45	0.013	0.015	0.017	
D1-2	0.15	0.20	0.25	0.005	0.007	0.009	
D2-1	1.02	1.07	1.12	0.040	0.042	0.044	
D2-2	1.02	1.07	1.12	0.040	0.042	0.044	
D2-3	1.47	1.52	1.57	0.057	0.059	0.061	
D2-4	0.25	0.30	0.35	0.009	0.011	0.013	
E1-1	1.095	1.145	1.195	0.043	0.045	0.047	
E1-2	2.67	2.72	2.77	0.105	0.107	0.109	
E1-3	0.35	0.40	0.45	0.013	0.015	0.017	
E1-4	1.85	1.90	1.95	0.072	0.074	0.076	
E1-5	0.095	0.145	0.195	0.0037	0.0057	0.0076	
E2-1	3.05	3.10	3.15	0.120	0.122	0.124	
E2-2	1.065	1.115	1.165	0.0419	0.0438	0.0458	
E2-3	0.695	0.745	0.795	0.027	0.029	0.031	
E2-4	0.40	0.45	0.50	0.015	0.017	0.019	
K1	0.40 BSC			0.015 BSC			
K2	0.07 BSC			0.002 BSC			
K3	0.05 BSC			0.001 BSC			
K4	0.40 BSC			0.015 BSC			

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# **Package Information**



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#### **Notes**

- 1. Use millimeters as the primary measurement
- 2. Dimensioning and tolerances conform to ASME Y14.5M. 1994
- 3. N is the number of terminals,

Nd is the number of terminals in X-direction and

Ne is the number of terminals in Y-direction.

- 4. Dimension b applies to plated terminal and is measured between 0.20 mm and 0.25 mm from terminal tip
- 5. The pin #1 identifier must be existed on the top surface of the package by using indentation mark or other feature of package body
- 6. Exact shape and size of this feature is optional
- 7. Package warpage max. 0.08 mm
- 8. Applied only for terminals

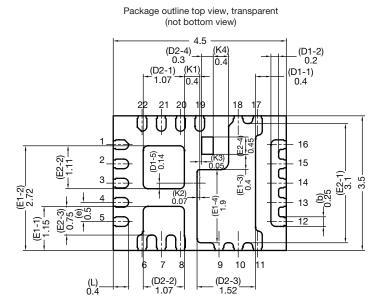
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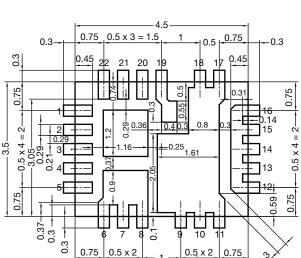
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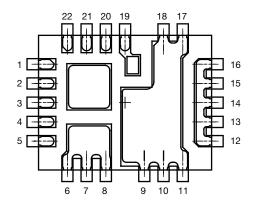
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## Recommended Land Pattern PowerPAK® MLP4535-22L





Land pattern



All dimensions in millimeters



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