DR1618B: USB TYPE-C® PORT PROTECTOR

SHORT-TO-VBUS OVERVOLTAGE AND IEC ESD PROTECTION

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General Description

DR1618B provides an integrated single-chip protection solution for USB Type-C® connector. The solution of DR1618B includes Short-to-VBUS voltage protection for 4 channels, and a plus on 6 channels ESD protection.

USB Type-C® connector is well-known as a new generation USB interface. It enables flip-ability, and adapts to various advanced application ranging from USB 3.2, USB4, DisplayPort, Thunderbolt, up to 100W USB Power Delivery, and other Quick Charge specification.

With multiply pin assignments merged in a tiny USB Type-C® connector, each pin is closed to each other. Given any of the slightly slip connection or humidity, it will result the short in VBUS, CC line, and SBU. Once the VBUS voltage exceeds 5V, it possesses highly potential to destroy CC and SBU pin on the connector, which leads the malfunction on the product. Therefore, it is important to follow the USB Power Delivery specification in having VBUS voltage tolerance to 24V so as to prevent shorting issue.

DR1618B features to work as standalone IC and will not interfere any of product functionality. Over-voltage protection will be triggered when the voltage exceeds 5V. However, with DR1618B, it will serve as a protection IC to mitigate the over-voltage situation. In addition to the voltage protection function, DR1618B is integrated with IEC 61000-4-2 ESD protection on CC1, CC2, SBU1, SBU2, DP, DM so as to avoid using additional TVS diodes on the circuit.

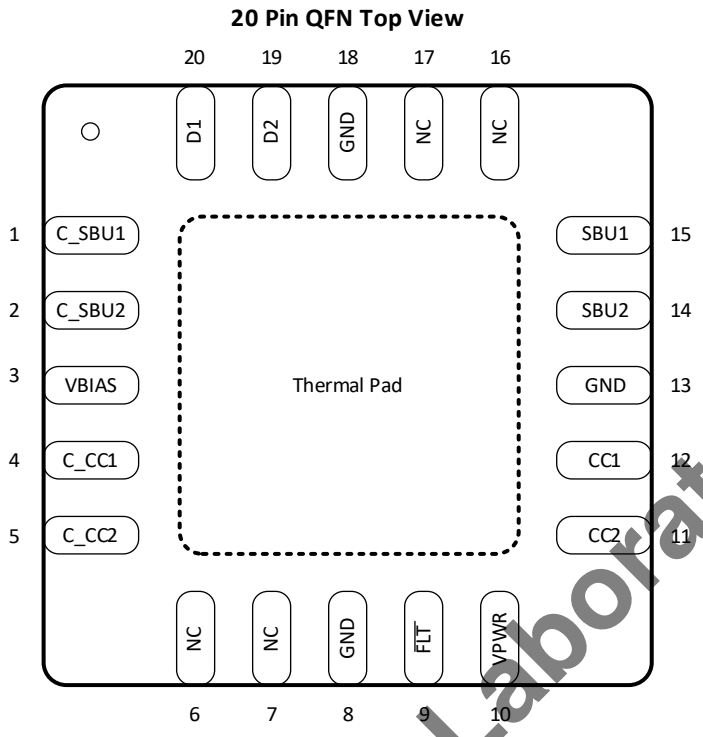
Features

- 4-Channels of SHORT-TO-VBUS Overvoltage Protections (CC1, CC2, SBU1, SBU2): 24VDC Tolerance
- IEC 61000-4-2 ESD Protection: CC1, CC2, SBU1, SBU2, DP, DM pins
  - Contact discharge 9KV: CC1/CC2
  - Contact discharge 8KV: SBU1/SBU2
- IEC 61000-4-5 ±35V Surge Protection: CC1, CC2, SBU1, SBU2 pins
- Fast OVP Turnoff Time: 60ns
- CC1/2 600mA Switches for VCONN
- 3mm×3mm QFN-20L Package

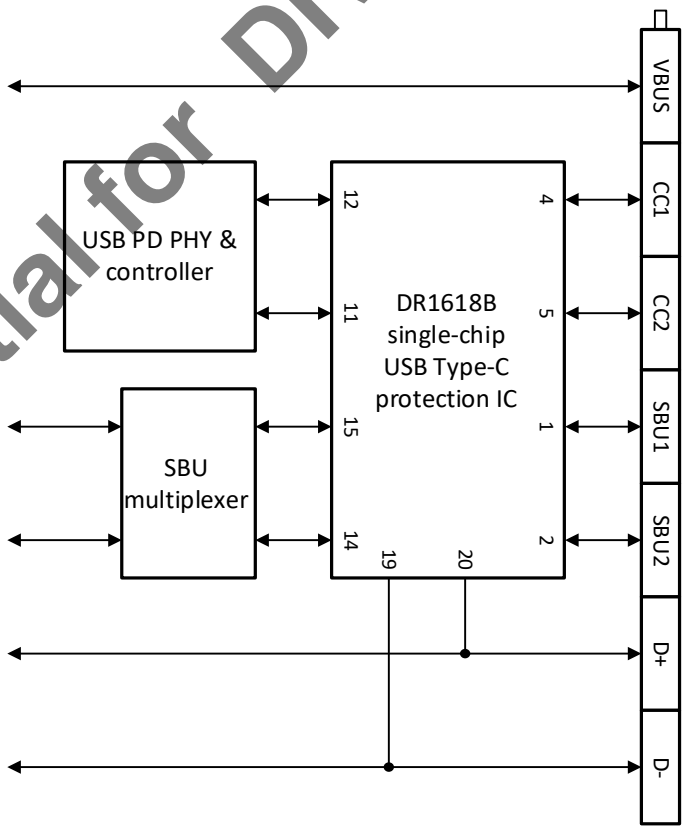
Applications

- Notebooks/Laptop PC
- Tablets
- Monitors & TVs
- Docking Stations & Dongles
- Video Conference Systems
- Gaming Headsets
- Surveillance Cam

1. Pin Configuration



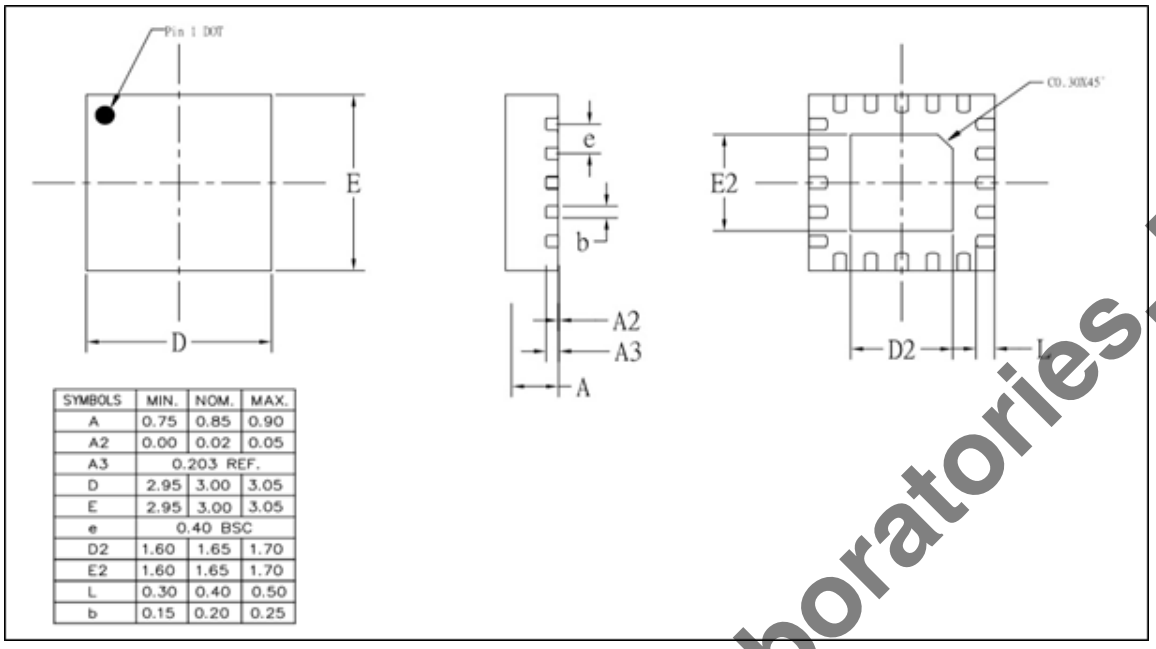
2. Simplified Application Circuit



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13. Package Outline



SYMBOLS	MIN.	NOM.	MAX.
A	0.75	0.85	0.90
A2	0.00	0.02	0.05
A3		0.203 REF.	
D	2.95	3.00	3.05
E	2.95	3.00	3.05
e		0.40 BSC	
D2	1.60	1.65	1.70
E2	1.60	1.65	1.70
L	0.30	0.40	0.50
b	0.15	0.20	0.25

14. Ordering Information

Part No.	Package	Package Type	MOQ
DR1618BQC	QFN-20L 3mm×3mm	Tape & Reel	5,000

15. Revision History

Version	Date	Revision Content
1.0	2021/6/28	Initial released
1.1	2022/7/18	Application updated

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