



Product Brief

JMS581DC USB 3.2 Gen2 to SATA 6Gb/s & PCIe Gen3 x2 Bridge Controller

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Revision History

Revision number	Effective date	Description of revision		Author
		Reference	Description of change	
1.00	11/14/2024	-	Initial release.	Kimmie Peng

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1 Overview

JMS581DC is a system on chip solution which embedded with USB 3.2 Gen 2 10Gb/s, SATA 6Gb/s and PCIe NVMe Gen3 x2. Its upstream port provides a USB which data speed can reach up to 10Gb/s. Meanwhile, its downstream port can connect to SATA, PCIe NVMe storage devices, such as a hard drive, solid-state drive, CFast / CFexpress memory card. The data speed for SATA port can reach 6Gb/s, or the data rate for the SATA III requirement. The PCIe port can reach 16Gb/s, or the data rate for PCIe Gen3 x2 requirements. It is worth to mention that JMS581DC enable to operate both PCIe and SATA channel simultaneously as two independent ports.

Moreover, JMS581DC has USB Type-C™ connectivity built in to the controller that any device using JMS581DC can have a USB Type-C™ connector without adding any additional peripheral part. It can reduce printed circuit board area for the system designs.

JMS581DC supports TRIM to the NAND flash-based storages and enable transmit and receive data by both of the USB Mass Storage Class Bulk-Only Transport (BOT) and USB Attached SCSI Protocol (UASP) to and from the host respectively. The data storage devices can achieve its summit of performance by taking advantage of these built-in unmatched features.

JMS581DC can meet a wide range of data storage application requirements, including adapter cable, external PCIe / SATA dual bay enclosure, CFexpress / CFast card reader, and other portable storage solutions.

Owing to its USB Type-C™ connectivity, JMS581DC can work with some power management controllers to a USB Power Delivery (PD) enabled data storage device. The data storage devices having SSDs of large capacity can accept the electrical power from sources of energy, such as hosts acting as a power provider of USB PD to supply sufficient electricity to the device after they negotiate with each other, without plugging in.

2 Features

2.1 General Features

- Design for Windows 7, Windows 10 and MAC 10.10.5 or later version
- Provide 8 hardware controlled PWMs
- Provide software utilities for downloading the upgraded firmware code under USB 2.0/ USB 3.2 Gen1 and USB 3.2 Gen2
- 144TFBGA (9x9mm²) package
- Support 25MHz external crystal
- Support 3.3V I/O
- 32 GPIOs for customization

2.2 Universal Serial Bus

- Comply with USB 3.2 Gen 1 and Gen 2 Specification,
- Comply with USB Mass Storage Class, Bulk-Only Transport Specification (Revision 1.0)
- Comply with USB Attached SCSI Protocol (UASP) Specification (Revision 4)
- Integrate with USB Type-C™ multiplexer & configuration channel (CC) logic
- Support USB Super-Speed/ High-Speed/ Full-Speed Operation
- Support USB 2.0/ USB 3.2 Gen1/ Gen2 power saving mode
- Support external SPI NVRAM for Vendor VID/PID of USB 2.0/USB 3.2 Gen1/2 device controller

2.3 PCI Express

- Comply with PCI Express Base Specification Revision 3.1a
- Comply with NVM Express 1.3
- Support TRIM to the SSD

2.4 Serial ATA

- Comply with SATA Specification (Revision 3.1)
- Support TRIM to SATA
- Support Native Command Queue (NCQ)

3 Block Diagram

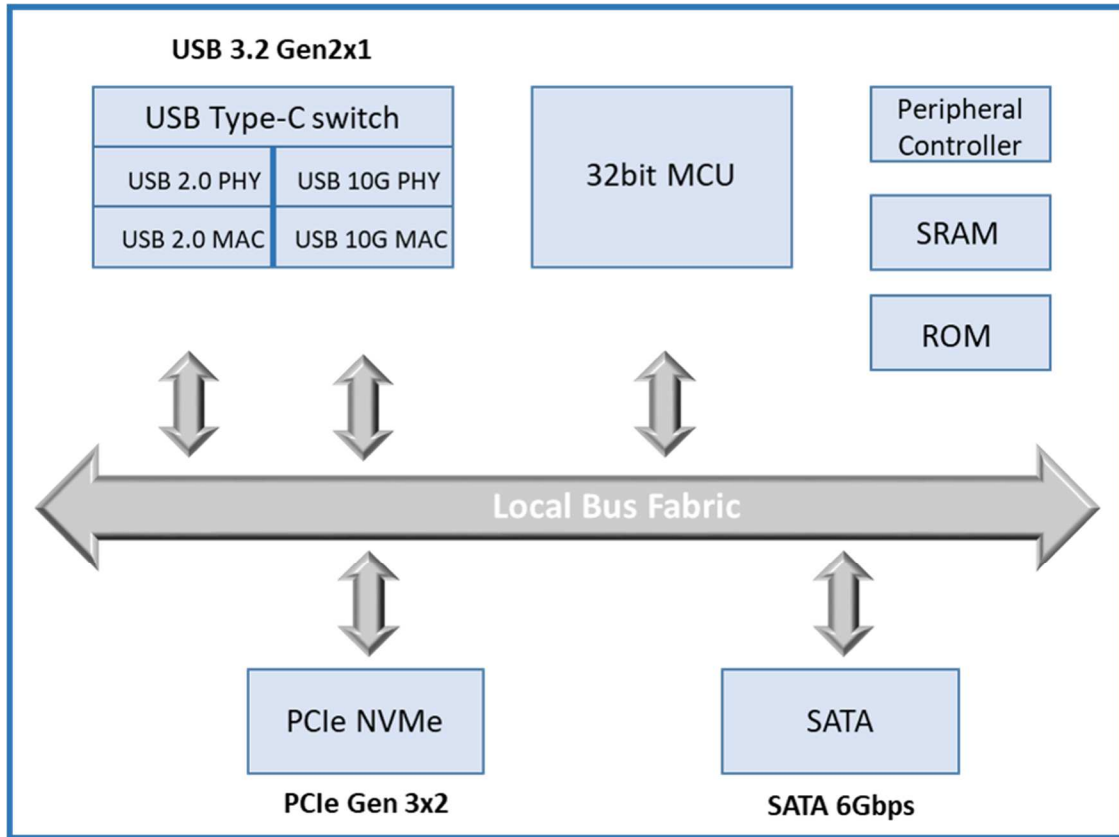


Figure 1 Block Diagram

4 Application

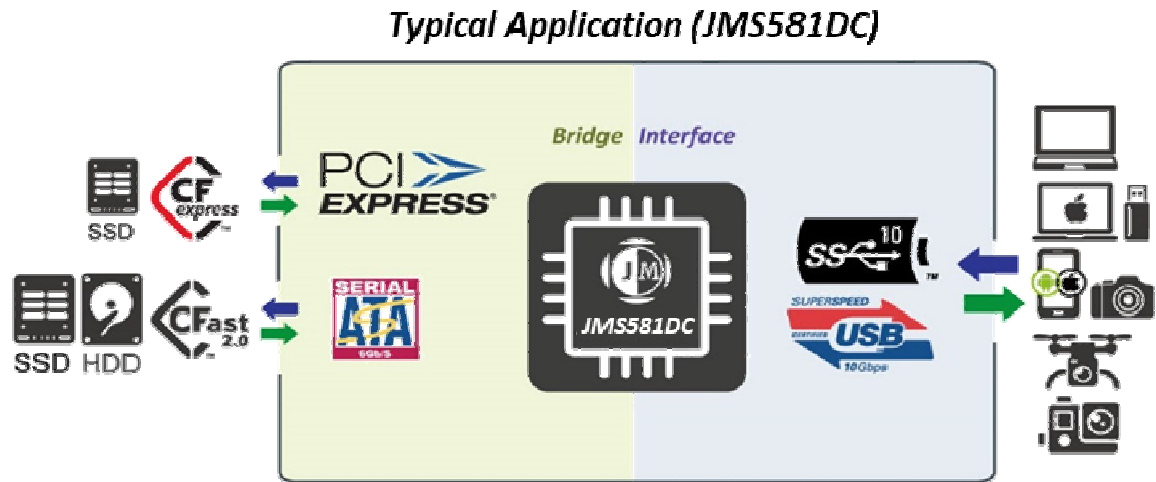


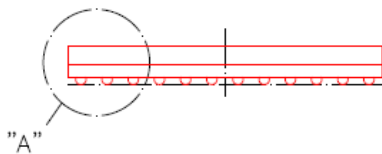
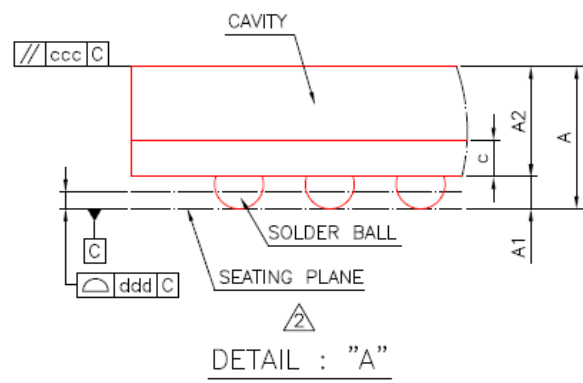
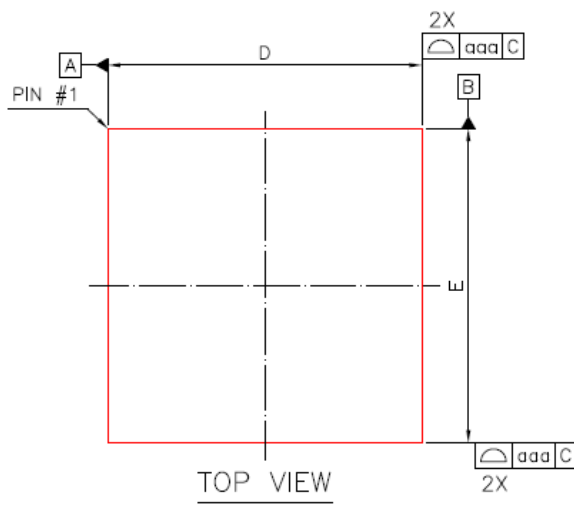
Figure 2 Application Scenario

5 Package Dimension

Symbol	Dimension in mm			Dimension in inch		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.03	1.10	1.17	0.041	0.043	0.046
A1	0.16	0.21	0.26	0.006	0.008	0.010
A2	0.84	0.89	0.94	0.033	0.035	0.037
c	0.32	0.36	0.40	0.013	0.014	0.016
D	8.90	9.00	9.10	0.350	0.354	0.358
E	8.90	9.00	9.10	0.350	0.354	0.358
D1	---	8.25	---	---	0.325	---
E1	---	8.25	---	---	0.325	---
e	---	0.75	---	---	0.030	---
b	0.25	0.30	0.35	0.010	0.012	0.014
aaa	0.15			0.006		
ccc	0.10			0.004		
ddd	0.08			0.003		
eee	0.15			0.006		
fff	0.08			0.003		
MD/ME	12/12					

NOTE :

1. CONTROLLING DIMENSION : MILLIMETER.
2. PRIMARY DATUM C AND SEATING PLANE ARE DEFINED BY THE SPHERICAL CROWNS OF THE SOLDER BALLS.
3. DIMENSION b IS MEASURED AT THE MAXIMUM SOLDER BALL DIAMETER, PARALLEL TO PRIMARY DATUM C.
4. SPECIAL CHARACTERISTICS C CLASS: ccc,ddd(SPIL STANDARD)
5. THE PATTERN OF PIN 1 FIDUCIAL IS FOR REFERENCE ONLY.
6. REFERENCE DOCUMENT : JEDEC PUBLICATION 95 DESIGN GUIDE 4.5



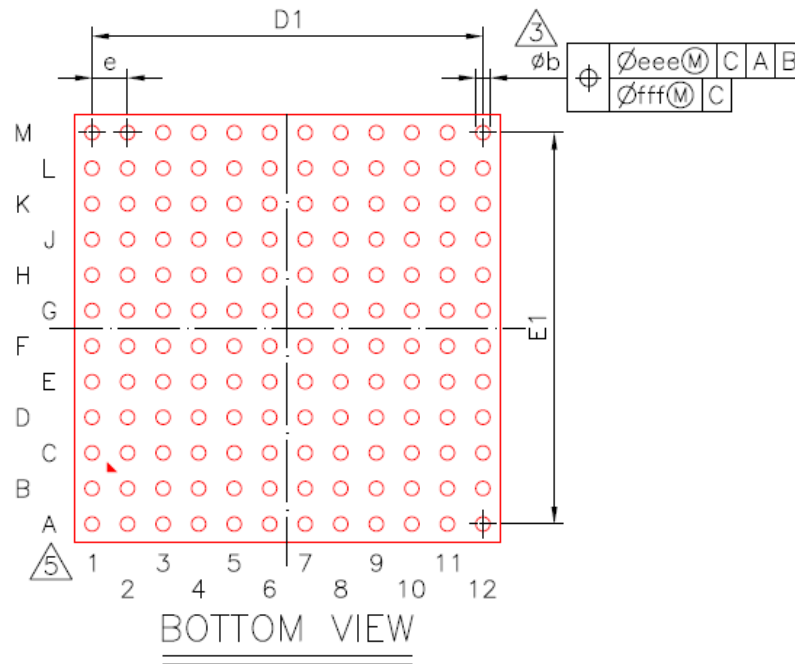


Figure 3 Package Outline Drawing of 144TFBGA 9x9mm²

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