
USC-230 USB-SPI embedded host

Features

- Friendly SPI interface with USB flash drives
- USB protocol built-in
- FAT12, FAT16 and FAT32 supported
- Low cost

Applications

- Add USB flash drive to Embedded system
- Interface USB flash drive to MCU/PLD/FPGA
- File transfer interface
- Data logging



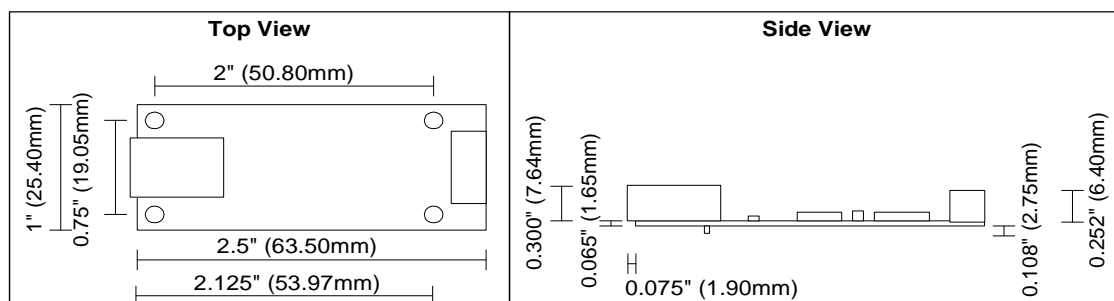
Using the USC-230 is an easy way to add a USB flash drive to any embedded system that features an SPI port. Indeed, the USC-230 automatically detects a USB flash connected and interfaces the data from the SPI port for the USB flash drive. The USC-230 can be used in various types of application where an embedded system needs to read data from a USB flash or write data in the USB flash.

The USC-230 supports USB flash formatted in FAT12, FAT16 and FAT32 file system with the sector size of 512 Bytes and the maximum volume of USB flash is 16GB. No other file system is supported.

The USC-230 has a standard SPI port set in slave mode (8 bits, Clk active low, MSB first) with 2 additional output signal to manage the SPI communication; one to indicate the detection of a disk and the other to indicate that SPI data is ready to be read. The enumeration of the USB flash drive is done automatically by the USC-230.

The USC-230 uses 16 predefined commands to manage, read, write, delete, and create and a few other operations. For more information on the protocol of the USC-230 see the User guide.

Mechanicals



Specifications

Specifications	USC-230	Unit
Performance		
File system	FAT12, FAT16 and FAT32	
Sector Size	512	Byte
USB Data rate	400	KB/s
SPI Data rate	3	Mb/s
Environment		
Operating Temp Range	-40 to 85	°C
Electrical		
Supply Voltage	3.3	V
Supply Current with USB flash drive	110 to 150*	mA
Supply Current without USB flash drive	48	mA
Physical		
Size	2.5 x 1 x 0.3	In
	63.5 x 25.4 x 7.64	mm
Weight	0.026	lbs
	12	Grams

*: Depends on the current consumption of the USB Flash drive

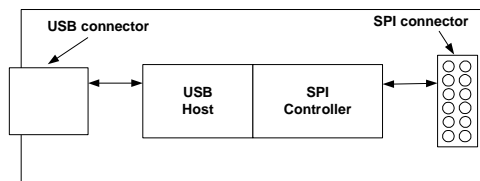
Connectors SPI (Molex 87831-1220)		
Pin	Name	Description
1	+3.3V	+3.3C supply to the device
2	MOSI	SPI data IN
3	GND	Device ground supply
4	SCLK	SPI clock
5	GND	Device ground supply
6	N-SS	Slave Select (active low)
7	GND	Device ground supply
8	MISO	SPI data OUT
9	GND	Device ground supply
10	INT	SPI data ready
11	GND	Device ground supply
12	GPX	USB Flash drive detected

File writing transfer rate = 564Kbps *

File reading transfer rate = 2.4Mbps *

*: Result based on a FAT32 formatted USB Flash drive

Principle of operation



The USC-230 integrates its own 5V regulator to power the USB flash drive. This voltage is done with the 3.3V from SPI port.

When a USB flash drive is connected, the USC-230 automatically enumerates the USB communication and reads the allocation table on the disk. If the

enumeration and the allocation table is read correctly, the USC-230 will indicate with the output signal GPX (active high), that a USB flash drive is detected. At this moment, the USC-230 is ready to be used. During the SPI exchange, the USC-230 will put low the output signal INT (active low) to indicate to the SPI master that a byte is ready to be read.

The USC-230 uses 2 circular buffers of 512 bytes to process the SPI communication. The maximum baud rate of the SPI port is 3Mb/s that is corresponding to the 400KB/s for the USB Baud rate.

Ordering Information

Part	Temperature Range
USC-230LF ⁺	-40°C ~ 85°C

⁺ Lead-free compliant

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