AZ01 USB Specification

1 Description

This is a leaf which used for serial monitor or sketching AVR MCU. This also converts USB's VBUS(5V) to 3.3V by using step-down power circuit and provide VBUS and 3.3V to each leaf.

2 Leaf specification

2.1 Block diagram

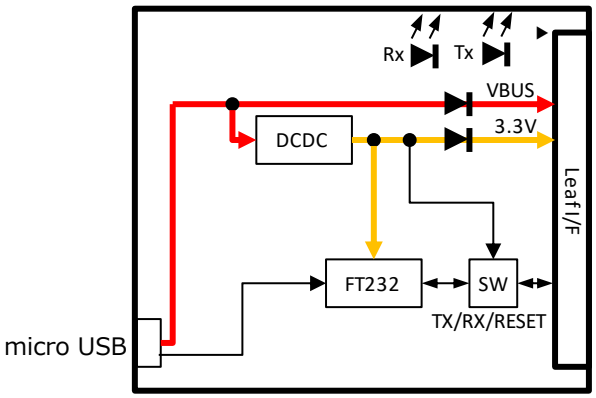


Figure.2.1 Block diagram

2.2 Power supply specification

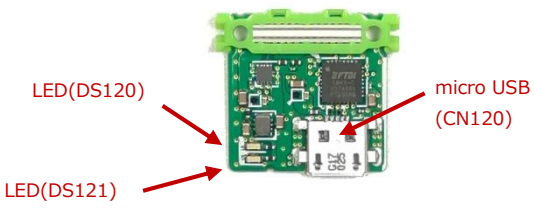
Symbol	Parameter	Condition	Min.	Typ.	Max.
Vout	Output Voltage	_	3.234V	3.3V	3.366V
Iout(max)	MaximumOutput current	_	500mA	-	-
Ilim	Current Limit	_	1.3A	1.5A	2.5A

2.3 Main parts

Reference No.	Part name	Part number	Vendor name	note
IC120	USB-UART Converter	FT232RQ	FTDI	32pin QFN
IC121	Step-down DC-DC Converter	XCL222B331ER	TOREX	VBUS→3.3V
IC124	Analog Switch	TS3A4751RUCR	Texas Instruments	_

2.4 Appearance

The looks of leaf and installed parts is down bellow.

Top Side	Back Side
	

2.5 Pin assignment

Name	Function
D0	TXD：UART TX
D1	RXD：UART RX
3V3	3.3V Vout
GND	GND

2.6 LED/Switch

Item	Reference No.	Content
LED	DS120	LED which controlled by FT232RQ. Blinks when program is written by UART TX communication.
	DS121	LED which controlled by FT232RQ. Blinks when program is written by UART TX communication.

3 USB-UART Converter (FT232RQ) Specifications

3.1 Description

Item	Content
USB	USB 2.0 Full Speed
Data transfer rates	300 baud to 3 Mbaud

3.2 Electrical characteristics

3.2.1 Absolute Maximum Ratings

Parameter	Value
Operating Temperature	-45℃ to +85℃
Maximum Operation Voltage	VCC 6.0V

3.2.2 Typical Characteristics

Symbol	Parameter	Condition	Min.	Typ.	Max.
VCC1	VCC supply voltage	Internal Oscillator	4.0V		5.25V
VCC2	VCCIO supply voltage	_	1.8V		5.25V
ICC1	Operating supply current	Normal Operation		15mA	
ICC2	Operating supply current	USB Suspend	50uA	70uA	100uA

3.3 Link destination of data sheet

https://www.ftdichip.com/Products/ICs/FT232R.htm

4 Step-Down DC-DC Converter(XCL222B331ER) Specifications

4.1 Description

Item	Description
Oscillation Frequency	1.2MHz
Cirtucit Type	PWM/PFM auto change controll
Protection circuit	Over current limit circuit/Themal shutdown/Shot-cirtuit protection

4.2 Electrical characteristics

4.2.1 Absolute Maximum Ratings

Parameter	Value
Operating Temperature	-40℃ to +105℃
Maximum Operation Voltage	Vin 6.2V
Power Dissipation	1000mW (40mm×40mm, t=1.6mm, FR-4, when mounted on a board)

4.2.2 Typical Characteristics

Symbol	Parameter	Condition	Min.	Typ.	Max.
Vin	Operating Voltage	_	2.5V		5.5V
Vout	Output Voltage	Iout =30mA	3.234V	3.3V	3.366V
Iout	Maximum Output Current	Vin =5.5V	500mA		
Iq	Quiescent Current	Vout =Vout(E) ×1.1V		15uA	25uA
Ttso	Thermal Shutdown	_		150℃	
Ilimh	Current Limit	Vout=0.6V	1.3A	1.5A	2.5A
Vshort	Short Protection Threshold Voltage	_	0.17V	0.27V	0.37V
Rdchg	CL Discharge	VCE=0V, VOUT=4.0V	50Ω	210Ω	300Ω

4.3 Link destination of data sheet

https://www.torex.co.jp/products/built-in-dcdc-converters/series/?name=xcl222

5 Analog Switch (TS3A4751RUCR) Specifications

5.1 Electrical characteristics

5.1.1 Absolute Maximum Ratings

Parameter	Value
Operating Temperature	-40℃ to +85℃
Maximum Operation Voltage	4V

5.1.2 Rated value

Symbol	Parameter	Condition	Min.	Typ.	Max.
Vdd	Supply Voltage	Internal Oscillator	1.65V	-	3.6V
Ron	ON Resistance	2.7V	-	0.7Ω	1.1Ω
Idd	supply current	3.6V	-	-	0.75uA

5.2 Link destination of data sheet

http://www.tij.co.jp/product/jp/ts3a4751

6 Install USB-serial conversion driver

Installment of driver is required when using USB serial convertion. (FT232RQ)

Download the driver from the URL bellow in order to install VCP. (Virtual COM Port)

http://www.ftdichip.com/Drivers/VCP.htm

Click the stepup executable on the comment section bellow to download VCP driver.

		Processor Architecture							
Operating System	**Release Date**	**x86 (32-bit)**	**x64 (64-bit)**	**PPC**	**ARM**	**MIPSII**	**MIPSIV**	**SH4**	**Comments**
Windows*	2017-08-30	2.12.28	2.12.28	-	-	-	-	-	WHQL Certified. Includes VCP and D2XX. Available as a setup executable Please read the Release Notes and Installation Guides.
Linux	-	-	-	-	-	-	-	-	All FTDI devices now supported in Ubuntu 11.10, kernel 3.0.0-19 Refer to TN-101 if you need a custom VCP VID/PID in Linux VCP drivers are integrated into the kernel.
Mac OS X 10.3 to 10.8	2012-08-10	2.2.18	2.2.18	2.2.18	-	-	-	-	Refer to TN-105 if you need a custom VCP VID/PID in MAC OS
Mac OS X 10.9 and above	2017-05-12	-	2.4.2	-	-	-	-	-	This driver is signed by Apple
Windows CE 4.2-5.2**	2012-01-06	1.1.0.20	-	-	1.1.0.20	1.1.0.10	1.1.0.10	1.1.0.10	
Windows CE 6.0/7.0	2016-11-03	1.1.0.22 CE 6.0 CAT CE 7.0 CAT	-	-	1.1.0.22 CE 6.0 CAT CE 7.0 CAT	1.1.0.10	1.1.0.10	1.1.0.10	For use of the CAT files supplied for ARM and x86 builds refer to AN_319
Windows CE 2013	2015-03-06	1.0.0			1.0.0				VCP Driver Support for WinCE2013

Figure.6 Install USB-serial conversion driver

7 Revision history

Rev A1.0: First edition, August 2019