™

QFN12
CASE 722AG

MARKING DIAGRAM

Description

The FUSB303B device is a fully autonomous USB Type−C™
controller optimized for 15 W or less applications. The FUSB303Baoffers CC logicdevtecion Oor 1Soure i .99 0 0 1eW nCUSB30C.078

UN = FUSB303B Device Code
KK = Lot Trace Code
_ = Pin #1 Identifier
XY = Two Digit Date Code
Z = Assembly Plant Code

- Dead Battery Support (Sink Port role when No Power Applied)
- 4 kV HBM ESD Protection for Connector Pins
- Small Packaging, 12 Lead QFN
  (1.6 mm ˛ 1.6 mm ˛ 0.375 mm)

Applications

- Smartphones
- Tablets
- Laptops
- Accessoires
- Industrial
- Power Banks

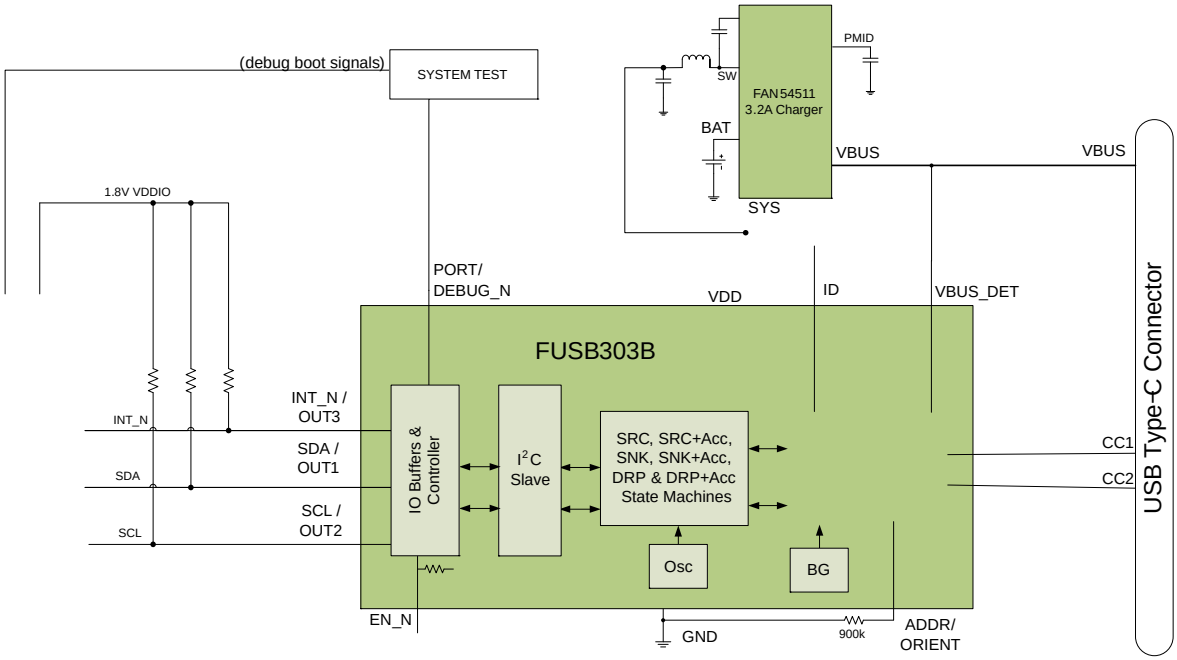

Figure 1. Typical I²C Application

BLOCK DIAGRAM

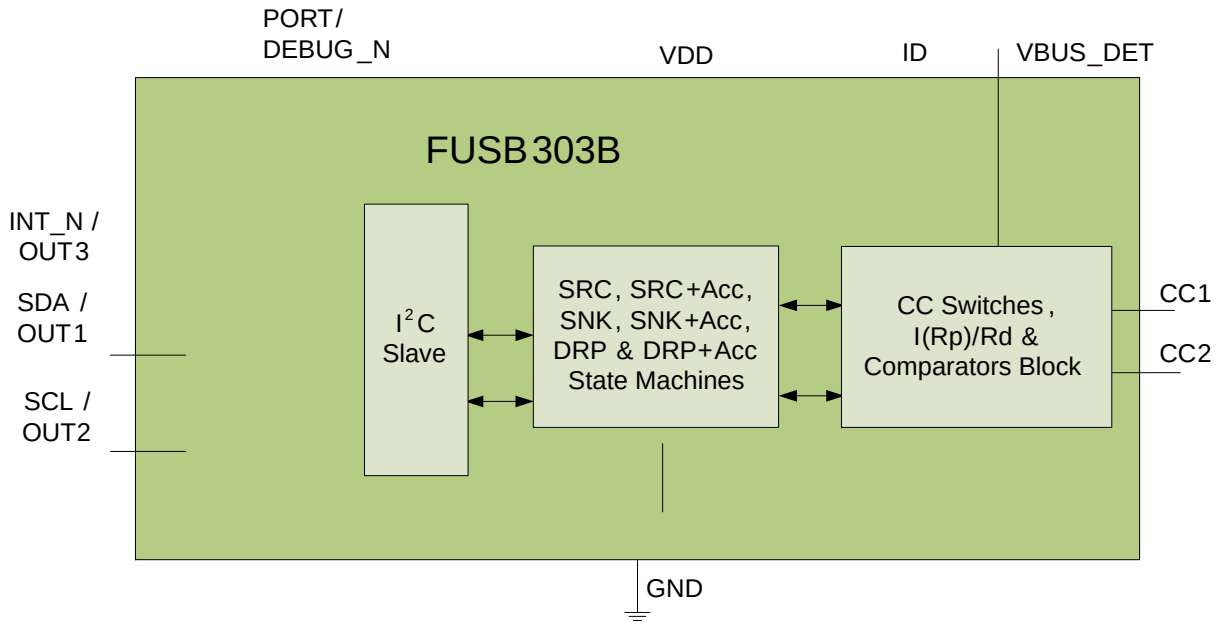

Figure 3. FUSB303B Block Diagram

PIN DESCRIPTIONS

Table 1. PIN DESCRIPTIONS

Pin #	Name	Type	Description
USB TYPE−C CONNECTOR INTERFACE			
1, 2	CC1, CC2	I/O	Type−C Configuration Channel pins used for USB−C receptacles
4	VBUS_DET	Input	VBUS input pin for attach and detach detection
POWER AND GROUND			
10	GND	Ground	Ground
12	VDD	Power	Input Supply Voltage
I^2C SIGNAL INTERFACE			
6	INT_N/OUT3	Open−Drain Output	INT_N/OUT3 is a dual function pin. When in I^2C mode (see ADDR/ORIENT pin), it is the active LOW open drain interrupt output used to prompt the processor to read the I^2

Table 2. ORIENT PIN VERSUS ORIENT [1:0] REGISTER BITS MAPPING

CC1 (A5)	CC2 (B5)	STATUS. ORIENT[1] Bit	STATUS. ORIENT[0] Bit	ADDR/ORIENT pin Output
FUSB303B CONNECTED AS A SINK				
SNK. Open	SNK. Open	0	0	LOW
SNK. Open	SNK. Rp	1	0	HIGH
SNK. Rp	SNK. Open	0	1	LOW
SNK. Rp (Note 2)	SNK. Rp	0	1	LOW
SNK. Rp	SNK. Rp (Note 2)	1	0	HIGH
FUSB303B CONNECTED AS SOURCE				
SRC. Open	SRC. Open	0	0	LOW
SRC. Open or SRC. Ra	SRC. Rd	1	0	HIGH
SRC. Rd	SRC. Open or SRC. Ra	0	1	LOW
SRC. Rd (Note 1)	SRC.Rd	0	1	LOW
SRC. Rd	SRC. Rd (Note 1)	1	0	HIGH

to a stable attached state. This functionality can be turned on

I²C Address

The ADDR/ORIENT bit HIGH or LOW is indicated in bit 5 of the slave address shown in Table 3.

Table 3. FUSB303B I²C SLAVE

Table 6. DC AND TRANSIENT CHARACTERISTICS

(Unless otherwise specified: Recommended T_A and T_J temperature ranges. All typical values are at T_A = 25°C and V_{DD} = 3.3 V unless otherwise specified.)

Symbol	Parameter	T_A = −40 to +85°C T_J=−40 to +125°C	Unit

Table 7. CURRENT CONSUMPTION

Symbol	Parameter	VDD (V)	Conditions	TA = −40 to +85°C TJ=−40 to +125°C			Unit
				Min.	Typ.	Max.	
Idisable	Disabled Current	2.85 to 4.35	Disabled State EN N = HIGH or not connected			5	μA
Istby	Unattached Sink (3.3 V I^2C mode without AUTOSNK or accessories)	2.85 to 4.35	Nothing 252 640.74SJET99.78 14.926 .90709 ected				

Table 9. TIMING PARAMETERS (continued)

Symbol	Parameter		T_A = −40 to +85°C T_J=−40 to +125°C			Unit
			Min.	Typ.	Max.	Unit
tRESET	Soft Reset Duration	2.85 to 5.5			100	ms
tAUTOSNK	Debounce time to detect Weak Battery VDD Threshold to trigger I_AUTOSNK if AUTOSNK mode enabled for both entering AUTOSNK and exiting AUTOSNK V_{DD} (V) = 2.85 to 5.5		10	15	20	ms

4. Default Value when Configured in GPIO Mode (ADDR/ORIENT = Float)

Table 10. FAST MODE I^2C TIMING SPECIFICATIONS (see Figure 7)

Symbol	Parameter	Fast Mode		
		Min.	Max.	Unit
f_{SCL}	SCL/OUT2 Clock Frequency		400	kHz
$t_{HD;STA}$	Hold Time (Repeated) START Condition	0.6		μs
t_{LOW}	Low Period of SCL/OUT2 Clock	1.3		μs
t_{HIGH}	High Period of SCL/OUT2 Clock	0.6		μs
$t_{SU;STA}$	Set−up Time for Repeated START Condition	0.6		μs
$t_{HD;DAT}$	Data Hold Time		0.9	μs
$t_{SU;DAT}$	Data Set−up Time (Note 5)	100		ns
t_r	Rise Time of SDA/OUT1 and SCL/OUT2 Signals (Note 6)	20 (V$_{DD}$/5.5 V)	250	ns
t_f	Fall Time of SDA/OUT1 and SCL/OUT2 Signals (Note 6)			

REGISTER DEFINITIONS

Table 11. REGISTER MAP

Address	Register Name	Type	Default	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
00h	Reserved	N/A	N/A	Do Not Use							
01h	Device ID	R	10h	VER_ID[3:0]				REV_ID[3:0]			
02h	Device Type	R	03h	DEVICE_TYPE[7:0]							
03h	Portrole	R/W	4nh (see below)		ORIENTDEB	TRY[1:0]		AUDIOACC	DRP	SNK	SRC
04h	Control	R/W	43h	T_DRP		DRPTOGGLE[1:0]		DCABLE_EN	HOST_CUR[1:0]		INT_MASK
05h	Control1	R/W	23h	REMEDY_EN	AUTO_SNK_TH[1:0]		AUTO_SNK_EN	ENABLE	TCCDEB[2:0]		
06h-08h	Reserved	N/A	N/A	Do Not Use							
09h	Manual	W/C & R/W	00h			FORCE_SRC	FORCE_SNK	UNATT_SNK	UNATT_SRC	DISABLED	ERROR_REC
0Ah	Reset	W/C	00h								

Table 13. DEVICE TYPE (Address: 02h, Type: Read Only)

Bit #	Name	Size (Bits)	Bit#: Default	Description
7:0	DEVICE_TYPE[7:0]	8	7:0 03h	03h: FUSB303B

Table 14. PORTROLE (See Note 9)
(Address: 03h, Reset Value: 0100_1nnnb (Reset value for bits nnn will be set by the state of the PORT/DEBUG_N pin either during power up when EN_N is LOW or when Vdd is valid and EN_N goes HIGH to LOW) or when SW_RES is set HIGH. In dead battery mode, nnn = 010 or configured as SNK) Type: Read/Write)

Bit #	Name	Size (Bits)	Bit#: Default	Description
7	Reserved	1	7 0b	Do Not Use
6	ORIENTDEB	1	6 1b	1: When a Debug Accessory is found, continue to orientation detection if CC is on CC1 or CC2 (result is in Status.Orient[1:0])
5:4	TRY[1:0]	2	5:4 00b	00: Disable (normal DRP detection for DRPs) 01: Enable Try.SNK state machine detection for DRP only 10: Enable Try.SRC state machine detection for DRP only 11: Disable (cannot have Try.SNK and Try.SRC active together)
3				

Table 19. MASK
(Address: 0Eh, Reset Value: 0000_0000b, Type: Read/Write)

Bit #	Name	Size (Bits)	Bit#: Default	Description
7	Reserved	1	7 0b	Do Not Use
6				

Table 22. STATUS1
(Address: 12h, Reset Value: 0000_0000b, Type: Read Only)

Bit #	Name	Size (Bits)	Bit#: Default	Description
7:2	Reserved	6	7:2 00h	Do Not Use
1	FAULT	1	1 0b	1: Status to indicate that as a Sink, CC has exceed the normal vRd voltage range
0	REMEDY	1	0 0b	1: Status to indicate that FUSB303B is employing internal methods to achieve a stable attach

Table 23. TYPE
(Address: 13h, Reset Value: 0000_0000b, Type: Read Only)

Bit #	Name	Size (Bits)	Bit#: Default	Description
7	Reserved	1	7 0b	Do Not Use
6	DEBUGSRC	1	6 0b	1: FUSB303B is attached as a Source Debug Accessory ([Unoriented/Oriented]DebugAccessory.SRC)
5	DEBUGSNK	1	5 0b	1: FUSB303B is attached as a Sink Debug Accessory (DebugAccessory.SNK)
4	SINK	1	4 0b	1: FUSB303B is attached as a Sink (Attached.SNK)
3	SOURCE	1	3 0b	1: FUSB303B is attached as a Source (Attached.SRC)
2	ACTIVECABLE	1	2 0b	1: FUSB303B is attached to an Active Cable (Ra detected)
1	AUDIOVBUS	1	1 0b	1: Indicates an Audio Accessory mSource Deh ETceed been42.306 .9Ce. recsa.515