

A 47: -

¥ /: 301

Description

The FUSB301 is a fully autonomous Type–C controller optimized for <15 W applications. The FUSB301 offers CC logic detection for Source Mode, Sink Mode, Dual Role Port Mode, accessory detection support, and dead battery support. The FUSB301 features an external s e≿1 T211DernapTEW) to enabt Mernal

ORDERING INFORMATION

Part Number	Top Mark	Operating Temperature Range	Package	Packing Method [†]
FUSB301TMX	NU	−40 to 85°C	10-Lead Ultra-thin Molded Leadless Package (TMLP) 1.6 mm×1.2 mm×0.375 mm	Tape and Reel

[†]For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, <u>BRD8011/D</u>.

BLOCK DIAGRAM

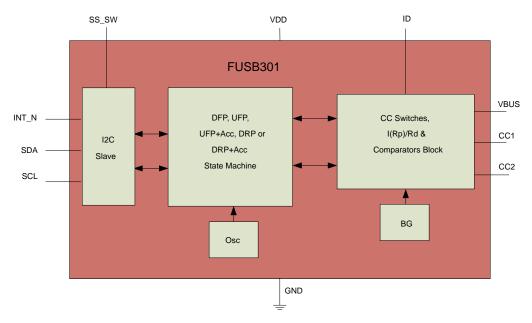


Figure 2. Block Diagram

PIN CONFIGURATION

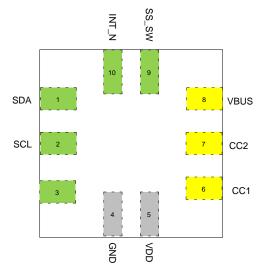


Figure 3. Pin Assignment (Top Through View)

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter			Min.	Max.	Unit
V _{DD}	Supply Voltage from V _{DD}			-0.5	6.0	V
V _{BUS}	VBUS Supply Voltage			-0.5	28	V
V _{CC_HDDRP}	CC pins when configured as Host, Device or	Dual Role Port		-0.5	6.0	V
T _{STORAGE}	Storage Temperature Range			-65	+150	°C
TJ	Maximum Junction Temperature			-	+150	°C
T _L	Lead Temperature (Soldering, 10 seconds)		-	+260	°C	
ESD	IEC 6100-4-2 System ESD	Connector Pins (VBUS, CC1	Air Gap	15	-	kV
		and CC2)	Contact	8	-	
	Human Body Model, JEDEC JESD22-A114	4	-			
		Others				
	Charged Device Model, JEDEC LESD22-C101	All Pins		1	-	

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

RECOMMENDED OPERAING CONDITIONS

Symbol	Parameter	Min.	Тур.	Max.	Unit
V _{BUS}	VBUS Supply Voltage	3.7	5.0	21	V
V_{DD}	Supply Voltage	2.8 (1)	3.3	5.5	V
T _A	Operating Temperature	-40	-	+85	°C

^{1.} This is for functional operation only and isn't the lowest limit for all subsequent electrical specifications below. All electrical parameters have a minimum of 3 V operation.

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.

			$T_A = -40 \text{ to } +85^{\circ}\text{C}$ $T_J = -40 \text{ to } +125^{\circ}\text{C}$			
Symbol	Parameter	Min.	Тур.	Max.	Unit	
ype C Specific	Parameters	•	•	•	•	
I _{80_CCX}	Source 80 μA CC Current (Default) HOST_CUR1 = 0, HOST_CUR0 = 1	64	80	96	μΑ	
I _{180_CCX}	Source 180 μA CC Current (1.5 A) HOST_CUR1 = 1, HOST_CUR0 = 0	166	180	194	μΑ	
I _{330_CCX}	•			•	•	

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. (continued)

		T _A			
Symbol	Parameter	Min.	Тур.	Max.	Unit
vRd-SRCdef	Rd Detection Threshold for Source for Default Current (HOST_CUR1/0 = 01)	1.50	1.60	1.65	V
vRd-SRC1.5A	Rd Detection Threshold for Source for 1.5 A Current (HOST_CUR1/0 = 10)	1.50	1.60	1.65	V
vRd-SRC3A	Rd Detection Threshold for Source for 3 A Current (HOST_CUR1/0 = 11)	•	•	•	·

TIMING PARAMETERS

			= -40 to +8 -40 to +1			
Symbol	Parameter		Min.	Тур.	Max.	Unit
tDRPToggle2	For DRP Operation, Time Spent in Unat-	DRPROGGLE = 00	15	_	30	ms
	tached.Source before going to Unattached.Sink State	DRPROGGLE = 01	20	_	40	
		DRPROGGLE = 10	25	_	50	
		DRPROGGLE = 11	30	_	60	

IO SPECIFICATIONS

Symbol	Parameter	V _{DD} (V)

I²C ADDRESS

Table 3. FUSB301 I²C SLAVE ADDRESS

Name	Size (Bits)	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Slave Address	8	0	1	0	0	1	0	1	R/W

REGISTER DEFINITIONS

Table 4. REGISTER MAP

Address	Register Name	Туре	RST Val	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0×01	Device ID	RO	12		Version ID [3:0]				Revision	1D [3:0]	•
0×02	Modes	R/W	04			DRP+ACC	DRP	Sink+ACC	Sink	Source+ACC	Source
0×03	Control	R/W	03		-	DRPTO	GGLE		HOST_CUR1	HOST_CUR0	INT_MASK
0×04	Manual	W/C	00					UNATT_SNK	UNATT_SRC	DISABLED	ERROR_REC
0×05	Reset	W/C	00								SW_RES
0×06-0×0F	Reserved	Х	xx					Do Not Use			
0×10	Mask	R/W	00					M_ACC_CH	M_BC_LVL	M_DETACH	M_ATTACH
0×11	Status	RO	00			ORIENT1	ORIENT0	VBUSOK	BC_LVL1	BC_LVL0	ATTACH
0×12	Туре	RO	00				Sink	Source		DEBUGACC	AUDIOACC

Table 7. CONTROL

Address: 03h

Reset Value: 0×XX00_X011

Type: Read/Write

Bit #	Name	Size (Bits)	Description
7:6	Reserved	2	Do Not Use
5:4	DRPTOGGLE	2	Selects different timing for Dual Role Port Toggle between Unattached. Sink State and Unattached.SOURCE State. 00: 35 ms min. in Unattached.Sink and 15 ms min. In Unattached.SOURCE 01: 30 ms min. In Unattached.Sink and 20 ms min. In Unattached.SOURCE 10: 25 ms min. In Unattached.Sink and 25 ms min. In Unattached.SOURCE 11: 20 ms min. In Unattached.Sink and 30 ms min. In Unattached.SOURCE
3	Reserved	1	Do Not Use
2:1	HOST_CUR [1:0]	2	1: Controls the pull–up current when device enabled as a Source 00: No Current 01: 80 μA – Default USB Power 10: 180 μA – Medium Current Mode: 1.5 A 11: 330 μA – High Current Mode: 3 A
0	INT_MASK	1	1: Global interrupt mask to mask all interrupts

Table 8. MANUAL (Note 6)

Address: 04h Reset Value: 0×

Table 10. MASK (continued)

Address: 10h

Reset Value: 0×XXXX_0000

Type: Read/Write

Bit #	Name	Size (Bits)	Description
1	M_DETACH	1	1: Mask the I_DETACH interrupt bit
0	M_ATTACH	1	1: Mask a change in the I_ATTACH interrupt bit

Table 11. STATUS

Table 13. INTERRUPT0 (continued)

Address: 13h

Reset Value: 0×XXXX_X000

Type: Write/Clear

Bit #	Name	Size (Bits)	Description
1	I_DETACH	1	1: Interrupt flagged when a device or accessory has been detached
0	I_ATTACH	1	Interrupt flagged when a device or accessory of type indicated in the Type register has been attached

onsemi t P C at t a t I^2C t .



X2QFN10 1.60x1.20x0.37, 0.40PCASE 722AC ISSUE A

DATE 15 NOV 2023

*FOR ADDITIONAL INFORMATION ON OUR PB-FREE STRATEGY AND SOLDERING DETAILS, PLEAS

