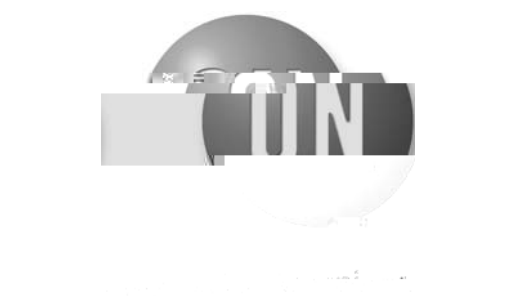
FUSB3301

USB T e-C Con olle fo Mobile Cha ge and Po e Ada e



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MARKING DIAGRAM

NZ

NZ = Specific Device Marking

Description

The FUSB3301 is an autonomous Source only Type−C controller optimized for mobile chargers and power adapters. It broadcasts the available current of the charger over CC1/CC2 using the USB Type−C standard and prevents VBUS from being asserted until a valid connection has been verified. It can be used for up to 15 W charging using Type−C protocols. The FUSB3301 has very low standby power consumption and is packaged in a 0.5 mm pitch MLP to accommodate power adapter PCBs.

Features

- Fully Autonomous Type−C Controller
- Supports Type−C Version 1.2
- Fixed Source Mode
- Low Standby Power: I_{CC} = 5 μA (Typical)
- VBUS Switch Control
- Advertises Three Standard Type−C VBUS Current Levels (900 mA, 1.5 A, 3.0 A)
- 2 kV HBM ESD Protection
- 10 Lead MLP Package
- V_{DD} Operating Range, 3.0 V − 5.5 V

Applications

- USB Type−C Power Ports
- Mobile Chargers
- Power Adapters
- AC−DC Adapters

Table 2. CONNECTION STATE TABLE

CC1	CC2	SW	Description
NC	NC	HiZ	No Attach
Rd	NC	L	Attach to UFP (Sink)
NC	Rd	L	Attach to UFP (Sink)
Rd	Rd	HiZ	No Attach
Ra	NC	HiZ	No Attach
NC	Ra	HiZ	No Attach
Ra	Ra	HiZ	No Attach

Host Current

Table 3. HOST INPUT TRUTH TABLE

HOST2

Table 4. ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter			Min	Max	Unit
V_{DD}	Supply Voltage			−0.5	6.0	V
V_{CCX}	CC pins when configured as HOST			−0.5	6.0	V
$T_{STORAGE}$	Storage Temperature Range			−65	+150	°C
T_J	Maximum Junction Temperature				+150	°C
T_L	Lead Temperature (Soldering, 10 seconds)				+260	°C
ESD	IEC 61000−4−2 System ESD	Connector Pins (VBUS, CC1 & CC2)	Air Gap	15		kV
			Contact	8		
	Human Body Model, JEDEC JESD22−A114	Connector Pins (VBUS, CC1 and CC2)		4		kV
		Others		2		
	Charged Device Model, JEDEC JESD22−C101	All Pins		1		kV

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.

Table 5. RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Min	Typ	Max	Unit
V_{DD}	Supply Voltage	3.0	5.0	5.5	V
T_A	Operating Ambient Temperature	−40		+85	°C
T_J	Operating Junction Temperature	−40		+125	°C

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied. Extended exposure to stresses beyond the Recommended Operating Ranges limits may affect device reliability.

Table 6. DC AND TRANSIENT CHARACTERISTICS All typical values are at T_A=25°C unless otherwise specified.

Symbol	Parameter	T_A = −40 to +85°C, T_J=−40 to +125°C			Unit
		Min	Typ	Max	
I_{80_CCX}	Source 80 μA CC Current (Default) HOST2=VDD, HOST1=VDD	64	80	96	μA
I_{180_CCX}	Source 180 μA CC Current (1.5 A) HOST2=VDD, HOST1=GND or HOST2=GND, HOST1=VDD	166	180	194	μA
I_{330_CCX}	Source 330 μA CC Current (3 A) HOST2=GND, HOST1=GND	304	330	356	μA
zOPEN	CC Resistance for Disabled State	126			kΩ
vRa−SRCdef	Ra Detection Threshold for CC Pin for Source for Default Current on VBUS	0.15	0.20	0.25	V

Table 7. CURRENT CONSUMPTION

Symbol	Parameter	Conditions	V_{DD} (V)	T_A = −40 to +85°C T_J=−40 to +125°C			Unit
				Min	Typ	Max	
Istby	Unattached Source	Nothing attached, Host Pins = VDD, GND, Float.	3.0 to 5.5		5	20	μA
Iattach	Attach Current (Less Host Current)	Attached, Host Pins=VDD, GND, Float.	3.0 to 5.5		10T		

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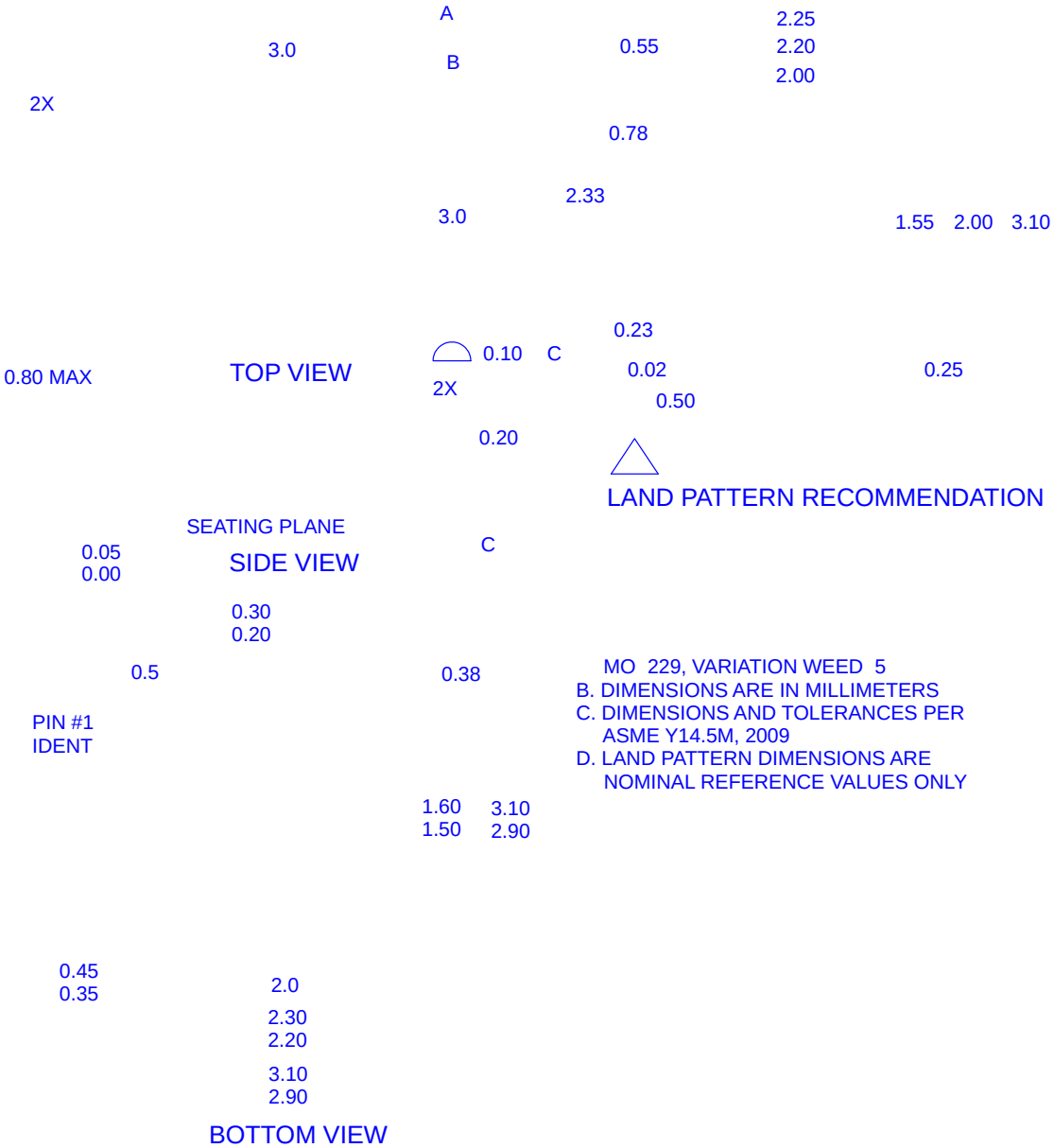

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B. DIMENSIONS ARE IN MILLIMETERS
C. DIMENSIONS AND TOLERANCES PER ASME Y14.5M, 2009
D. LAND PATTERN DIMENSIONS ARE NOMINAL REFERENCE VALUES ONLY