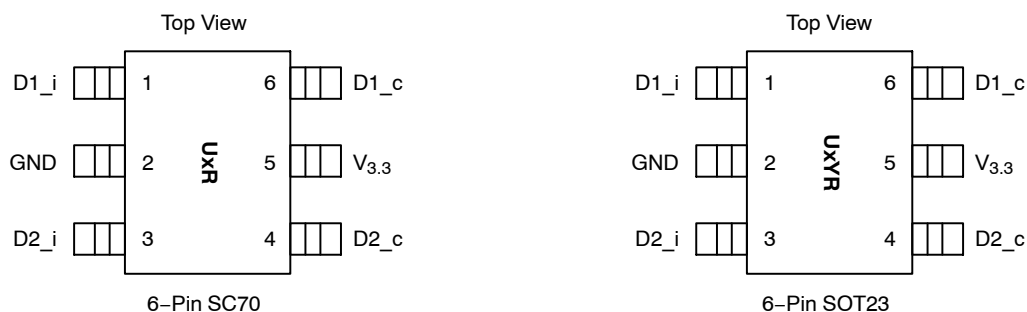


PACUSBUS

PACKAGE / PINOUT DIAGRAMS



Note 1: The "x" shown in part markings above represents either the digit "1", "2" or "3."

Note 2: SOT23 and SC70 package sizes may differ. These drawing are not in scale.

Table 1. PIN DESCRIPTIONS

Pin	Name	Description
1	D1_i	The USB Controller side of the D+ or D- bidirectional transmission line of the differential pair defined by USB standards.
2	GND	The ground reference for the PACUSBUS-U1/U2/U3 device.
3	D2_i	The USB Controller side of the D- or D+ bidirectional transmission line of the differential pair defined by USB standards.
4	D2_c	The connector side of the D- or D+ bidirectional transmission line of the differential pair defined by USB standards.
5	V _{3.3}	The 3.3 V supply voltage for the PACUSBUS-U1/U2/U3 device.
6	D1_c	The connector side of the D+ or D- bidirectional transmission line of the differential pair defined by USB standards.

SPECIFICATIONS

Table 2. ABSOLUTE MAXIMUM RATINGS

Parameter	Rating	Units
V _{3.3} (Supply Voltage)	5.5	V
Operating Temperature Range	-40 to +85	°C
Storage Temperature Range	-65 to +150	°C
DC Power to Resistor	100	mW
Package Power	200	mW

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Table 3. STANDARD OPERATING CONDITIONS

Parameter	Rating	Units
V _{3.3} (Supply Voltage)	3.3	V
Ambient Operating Temperature	-40 to +85	°C

PACUSB-S

SPECIFICATIONS (Cont'd)

Table 4. ELECTRICAL OPERATING CHARACTERISTICS

Symbol	Parameter	Conditions	Min	Typ	Max	Units
R1	Resistance R1 (PACUSB-U1 Only)	Measured at $T_A = 25^\circ\text{C}$	12	15	18	Ω
R1	Resistance R1 (PACUSB-U2 Only)	Measured at $T_A = 25^\circ\text{C}$	26	33	40	Ω
R1	Resistance R1 (PACUSB-U3 Only)	Measured at $T_A = 25^\circ\text{C}$	18	22	26	Ω
R2	Resistance R2	Measured at $T_A = 25^\circ\text{C}$	1.2	1.5	1.8	$k\Omega$
C1	Capacitance C1	Measured at 1 MHz, 2.5 V DC, $T_A = 25^\circ\text{C}$	38	47	56	pF
I_{LEAK}	Diode Leakage Current to GND	At 3.3 V DC and $T_A = 25^\circ\text{C}$		1	100	nA
V_{D1}	Diode Reverse-Biased Stand-Off Voltage	$I = 10 \mu\text{A}$, $T_A = 25^\circ\text{C}$	5.5		8.0	V
V_{D2}	Signal Clamp Voltage Positive Clamp Negative Clamp	@ 10 mA, $T_A = 25^\circ\text{C}$ @ 10 mA, $T_A = 25^\circ\text{C}$	5.6 -1.2	6.8 -0.8	8.0 -0.4	V
V_{ESD}	In-system ESD Withstand Voltage Human Body Model, MIL-STD-883, Method 3015 IEC 61000-4-2, Contact Discharge Method (I/O Pins) IEC 61000-4-2, Contact Discharge Method ($V_{3.3}$ Pin)	(Note 1) (Note 1) (Note 1)	± 30 ± 15 ± 25			kV
V_{CLAMP}	Clamping Voltage during ESD Discharge Positive Negative	MIL-STD-883, Method 3015, 8 kV (Note 1)		10 -5		V

1. ESD applied to input/output/ $V_{3.3}$ pins with respect to GND, one at a time. Clamping voltage is measured at the opposite side of the EMI filter to the ESD pin (i.e., if ESD is applied to pin 1, then clamping voltage is measured at pin 6). Unused pins are open.

APPLICATION INFORMATION

The PACUSB-U1/U2/U3 is targeted for upstream USB ports (peripherals). It provides series termination, EMI filtering, and ESD protection for the two USB data lines D+ and D-.

The USB Specification revision 1.1 provides for two data rates:

- The Full Speed signaling bit rate at 12 Mbits per second, and
- The Low Speed signaling bit rate at 1.5 Mbits per second.

The speed is selected by connecting one of the data lines (D+ or D-) to a 3.3 V supply voltage via a 1.5 $k\Omega$ pull-up resistor (R2).

Connections for Full Speed Operation

Full Speed devices have the pull-up resistor (R2) connected to the D+ data line, as shown in Figure 1. Pin1 is tied to the D+ line of the USB controller. Pin 6 is connected to the D+ line on the USB connector.

Connections for Low Speed Operation

Low Speed devices have the pull-up resistor (R2) connected to the D- data line, as shown in Figure 2. Pin 1 is tied to the D- line of the USB controller; pin 6 is connected to the D- line on the USB connector.

PACUSB-U-S

APPLICATION INFORMATION (Cont'd)

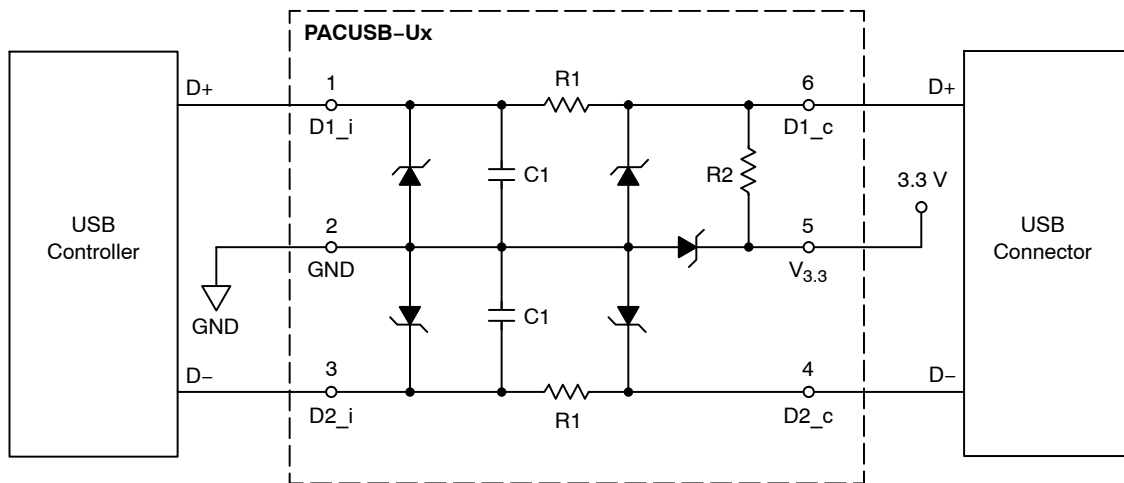


Figure 1. Full Speed Connection

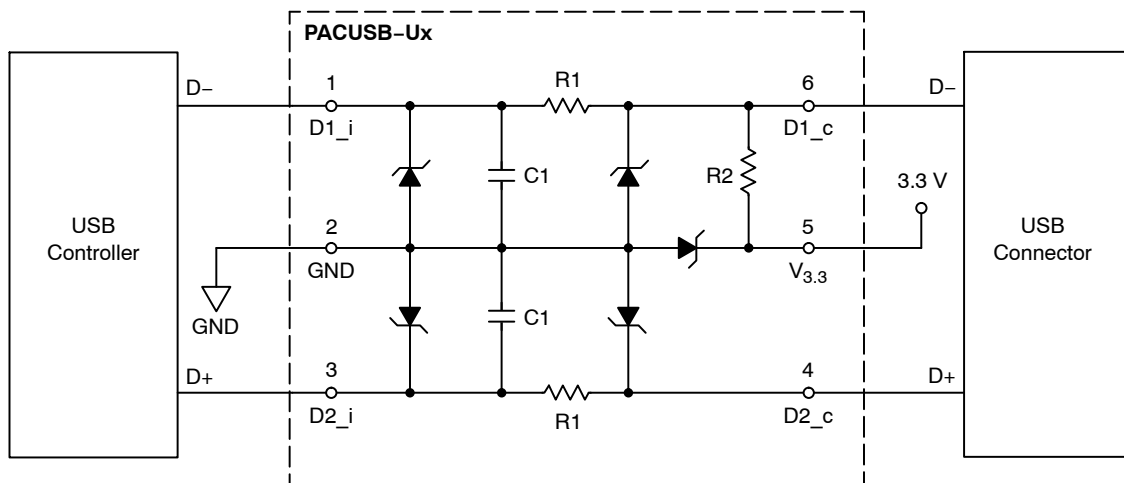
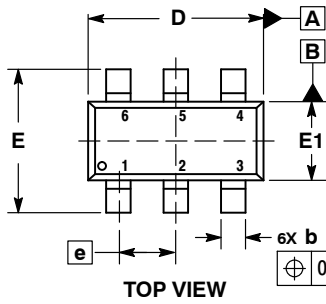


Figure 2. Low Speed Connection

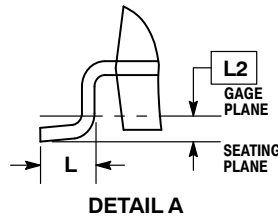
PACUSBU-S

PACKAGE DIMENSIONS

SOT-23, 6 Lead
CASE 527AJ-01
ISSUE A

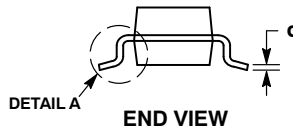
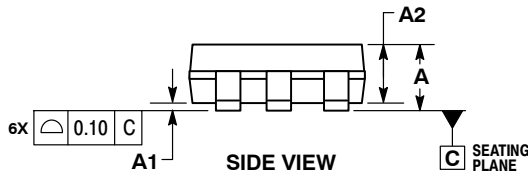


⊕ 0.20 Ⓜ C A Ⓢ B Ⓢ

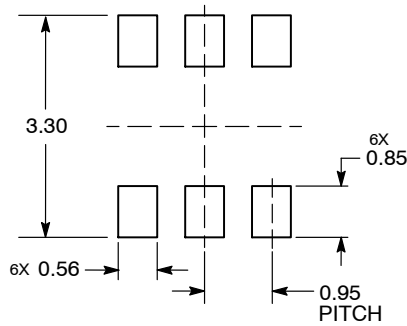


- NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
 2. CONTROLLING DIMENSION: MILLIMETERS.
 3. DATUM C IS THE SEATING PLANE.

DIM	MILLIMETERS	
	MIN	MAX
A	---	1.45
A1	0.00	0.15
A2	0.90	1.30
b	0.20	0.50
c	0.08	0.26
D	2.70	3.00
E	2.50	3.10
E1	1.30	1.80
e	0.95 BSC	
L	0.20	0.60
L2	0.25 BSC	



RECOMMENDED SOLDERING FOOTPRINT*



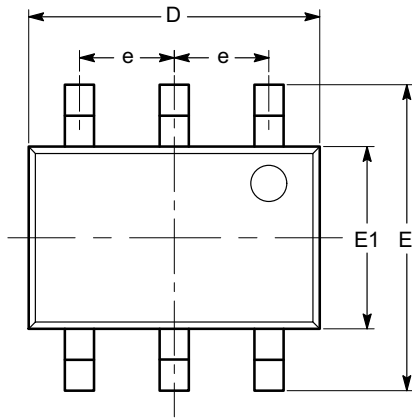
DIMENSIONS: MILLIMETERS

*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

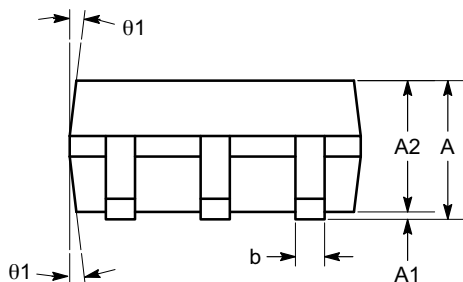
PACUSBU-S

PACKAGE DIMENSIONS

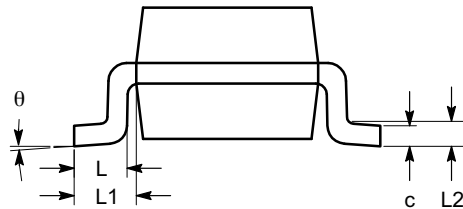
SC-88 (SC-70 6 Lead), 1.25x2
CASE 419AD-01
ISSUE A



TOP VIEW



SIDE VIEW



END VIEW

SYMBOL	MIN	NOM	MAX
A	0.80		1.10
A1	0.00		0.10
A2	0.80		1.00
b	0.15		0.30
c	0.10		0.18
D	1.80	2.00	2.20
E	1.80	2.10	2.40
E1	1.15	1.25	1.35
e	0.65 BSC		
L	0.26	0.36	0.46
L1	0.42 REF		
L2	0.15 BSC		
θ	0°		8°
θ1	4°		10°

Notes:

- (1) All dimensions are in millimeters. Angles in degrees.
- (2) Complies with JEDEC MO-203.

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