CREEKSIDE CONTROLS

Datasheet

DD-519-0

Stream UX Mid Touch Display Module

Table of Contents

Introduction

This datasheet is intended for designers using the StreamUX Mid display module. This StreamUX Mid display module enables effortless color touch screen integration into any embedded electronics product. The application's user interface is designed using the StreamUX Builder PC tool, then transferred to the module using USB. Interaction with the UI is accomplished by using one of the serial interfaces or an API library if using the module as an application host.

Features

- Full 24bit color display options:
  - 4.3" diagonal at 480 x 272 pixels
  - 5.0" diagonal at 800 x 480 pixels
  - 7.0" diagonal at 800 x 480 pixels
  - Additional display options are available
- Capacitive touch panel
- 4 interfaces for controlling and interacting with the StreamUX Mid touch screen
  - RS485
  - UART
  - SPI
  - I2C
- Wide DC power input (5V to 30Vdc)
- USB flash drive interface for screen/image transfer and further user application
- Audio output with 1.2W speaker amplifier
- 128Mbit onboard SDRAM
- 128Mbit onboard flash ROM

Connector Locations

Connector pin 1 locations are marked by a white circle on the StreamUX Mid PCB silkscreen.

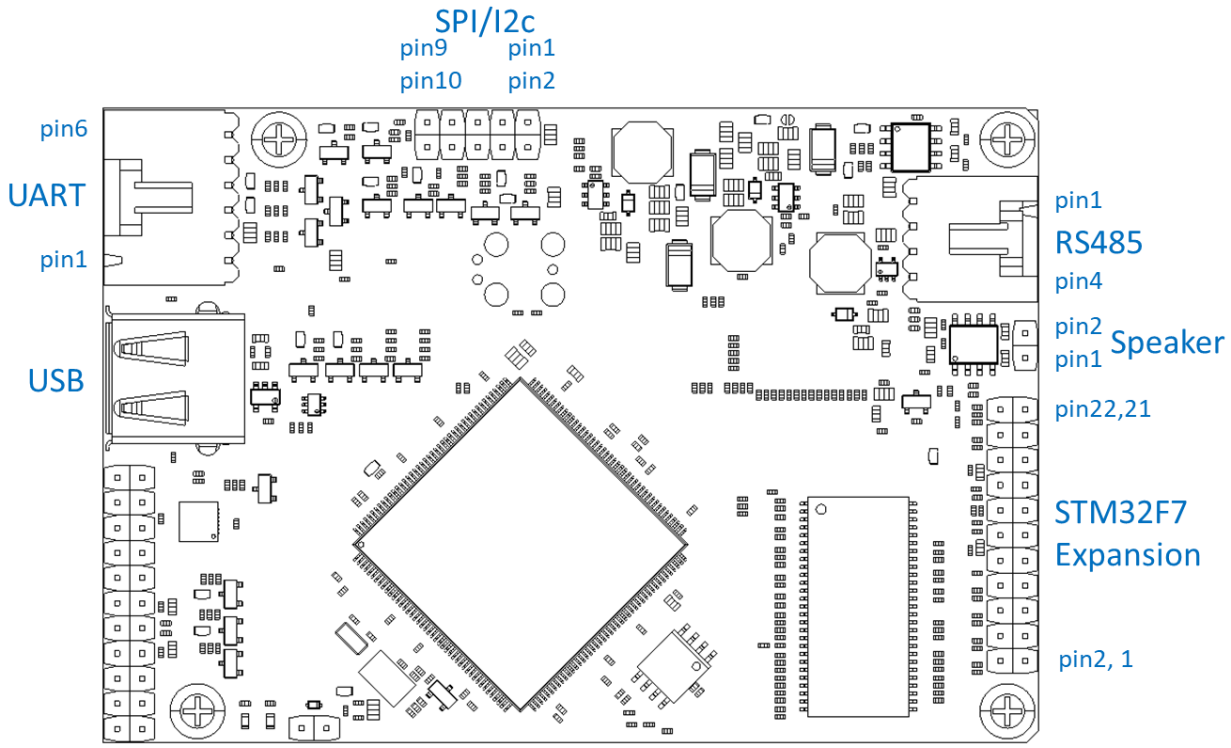
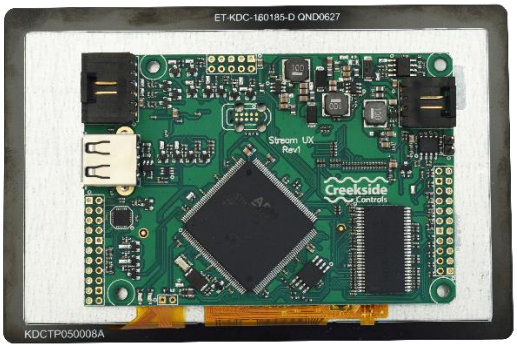


Figure 1 - Connector and pin locations

Images

The following pictures are the StreamUX Mid5 Module.



Connector Pinouts

UART

Pin	Function	Direction relative to StreamUX Mid	Description
1	Ground	Power	The ground should have a direct, non-filtered path to the control ground.
2	Reset’	Input	Used to reset StreamUX Mid Module. Reset is active low. This pin may be left unconnected if not used.
3	Vin	Power	Input supply voltage
4	UART Receive	Input	
5	UART Transmit	Output	
6	Busy / Idle indication	Output	Pin high indicates rendering is idle. Pin low indicates rendering is busy. You can use this pin to measure the time it takes to render any screen

RS485

Pin	Function	Direction relative to StreamUX Mid	Description
1	Ground	Power	The ground should have a direct, non-filtered path to the control ground.
2	RS485- Tx and Rx	Bidirectional	
3	RS485+ Tx and Rx	Bidirectional	
4	Vin	Power	Input supply voltage

SPI / I2c

Pin	Function	Direction relative to StreamUX Mid	Description
1	Ground	Power	The ground should have a direct, non-filtered path to the control ground.
2	Vin	Power	Input supply voltage
3	Reset’	Input	Used to reset StreamUX Mid Module. Reset is active low. This pin may be left unconnected if not used.
4	SPI Clock	Input	SPI clock from external SPI master
5	Interrupt’	Output	Interrupt signal output from StreamUX Mid. Interrupt is active low.
6	SPI MISO	Output	SPI data master input and slave output
7	I2c Data	Bidirectional	I2c data signal
8	SPI MOSI	Input	SPI data master output and slave input
9	I2c Clock	Bidirectional	I2c clock signal
10	SPI CS’	Input	SPI chip select from SPI master, active low

IO Expansion (STM32F7 peripherals)

Note these pins are only available when using the StreamUX Mid as an application host.

Pin	Function	Description
1	Timer 8 Channel 1	Advanced timer functions
2	ADC1	Analog to digital conversion
3	Timer 8 Channel 1’	Advanced timer functions
4	ADC2	Analog to digital conversion
5	Timer 8 Channel 2	Advanced timer functions
6	ADC3	Analog to digital conversion
7	Timer 8 Channel 2’	Advanced timer functions
8	ADC4	Analog to digital conversion
9	Timer 8 Channel 3	Advanced timer functions
10	Ground	The ground should have a direct, non-filtered path to the control ground.
11	Ground	The ground should have a direct, non-filtered path to the control ground.
12	3.3Vdc	3.3V DC supply output from StreamUX Mid
13	Timer 8 Channel 3’	Advanced timer functions
14	3.3Vanl	3.3V DC analog supply output from StreamUX Mid
15	Timer 8 Channel 4	Advanced timer functions
16	5Vdc	5V DC supply output from StreamUX Mid
17	Timer 8 Break	Advanced timer functions
18	Analog Ground	Analog ground output from StreamUX Mid
19	Timer 1 Channel 1	Advanced timer functions
20	ADC5	Analog to digital conversion
21	Timer 1 Channel 1’	Advanced timer functions
22	ADC6	Analog to digital conversion

Speaker

Pin	Function	Direction relative to StreamUX Mid	Description
1	Speaker -	Output	Negative speaker output
2	Speaker +	Output	Positive speaker output

Schematics of Connections

UART

Figure 2 shows StreamUX Mid schematic of UART pins. The sheet ports for Tx, Rx and IO connect directly to the microprocessor pins.

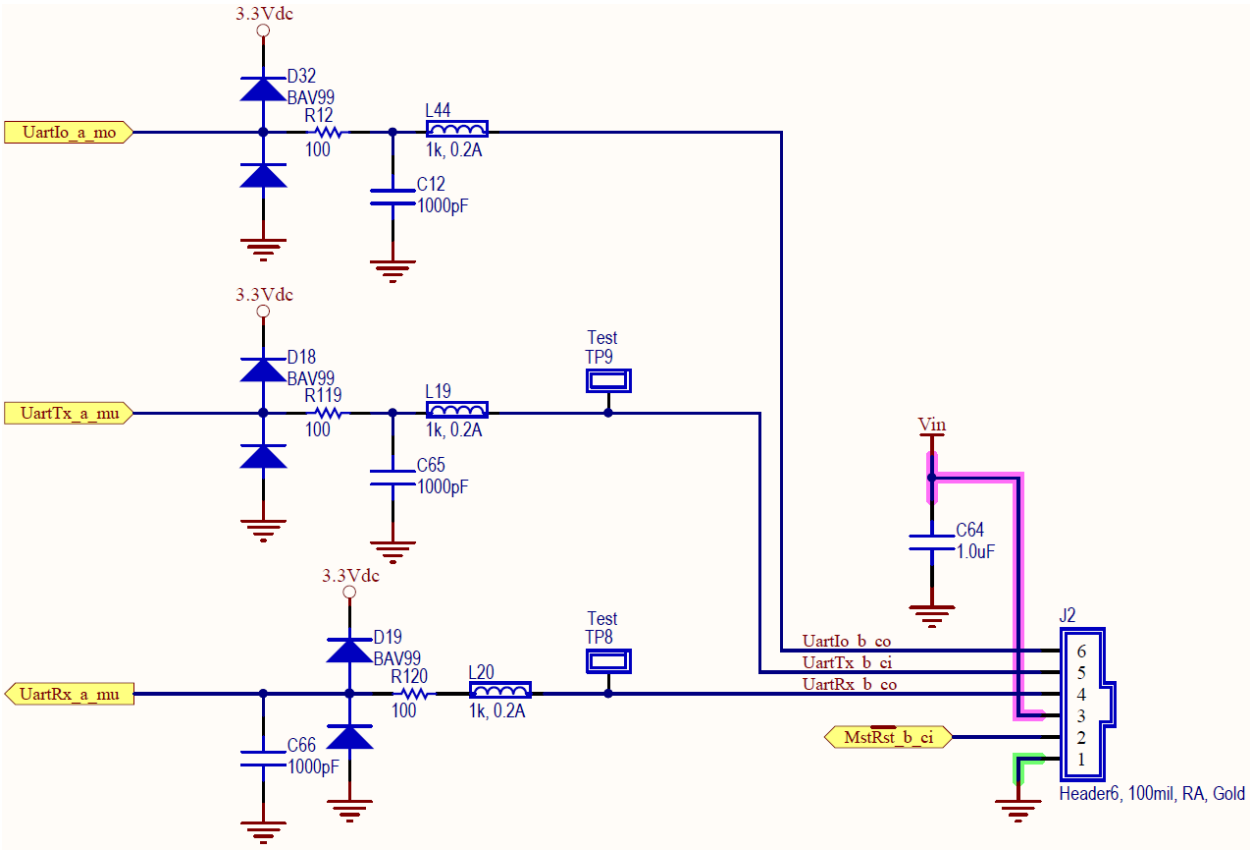


Figure 2 - UART schematic

SPI / I2c

Figure 3 shows StreamUX Mid schematic of SPI and I2c pins. All sheet ports except for the master reset signal connect directly to the microprocessor pins.

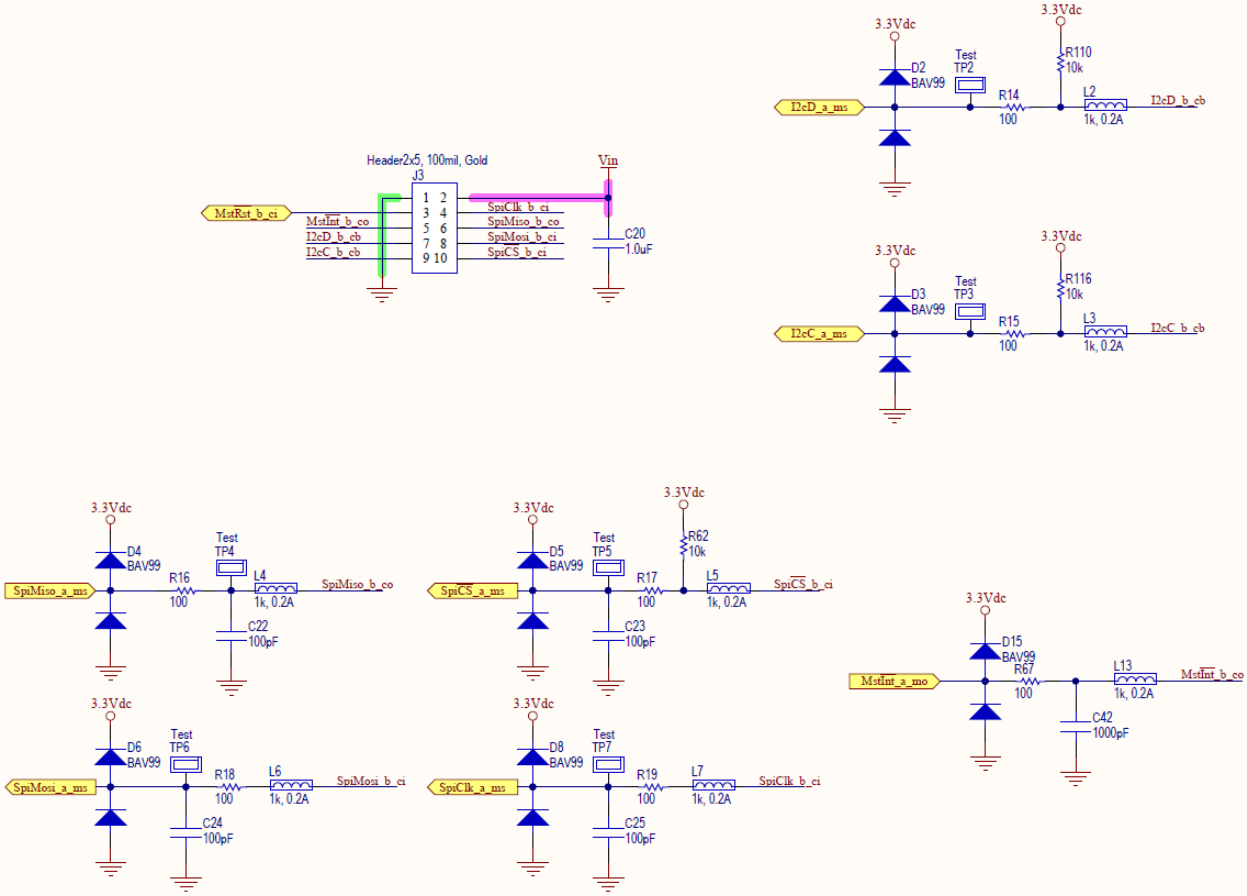


Figure 3 - SPI / I2c schematic

STM32F7 Expansion

Figure 4 shows StreamUX Mid schematic of STM32F7 expansion pins.

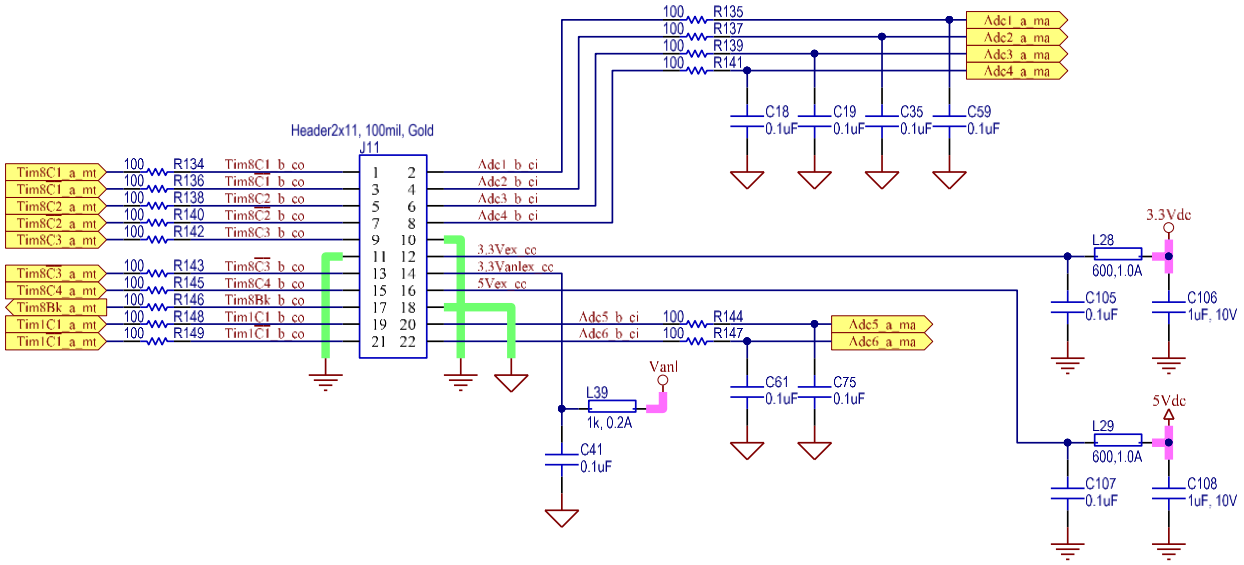


Figure 4 - STM32F7 Expansion schematic

Electrical Characteristics

Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
V_{IN}	DC Supply Voltage	0 to 31V	V
T_{STO}	Storage Temperature Range	-30 to +80	°C
V_{RSI}	RS485 +/- Data Pins Voltage Range	-14 to 14	V
V_{IO}	IO Pin Voltage Range	-0.5 to 5.2	V

Recommended Operating Conditions

(@ temperature 25°C unless otherwise specified)

Symbol	Parameter	Min	Max	Unit
V_{IN}	DC Supply Voltage	4.8	30	V
T_{OP}	Operating Temperature Range	-20	70	°C

Electrical Specifications

(@ T_{OP} = 25°C)

Symbol	Parameter	Min	Typ	Max	Unit
Voltage					
V_{IO}	Logic Level Voltage (UART, SPI, I2C, IO)	3.2	3.3	3.4	V
V_{USB}	USB output voltage	4.8	5	5.2	V
V_{5Vdc}	5V DC output on IO Expansion	4.8	5	5.2	V
$V_{3.3Vdc}$	3.3V DC output on IO Expansion	3.2	3.3	3.4	V
V_{OL}	IO Output Voltage Low Level (UART, SPI, I2C, IO)		0	0.4	V
V_{OH}	IO Output Voltage High Level (UART, SPI, I2C, IO)	2.8	3.3	3.4	V
V_{IH}	IO Input Voltage High Level (UART, SPI, I2C, IO)	2.24			V
V_{IHYS}	IO Input Voltage Hysteresis (UART, SPI, I2C, IO)	0.33			V
Current					
I_{USB}	USB output current			100	mA
I_{5Vdc}	5V DC output on IO Expansion			100	mA
$I_{3.3Vdc}$	3.3V DC output on IO Expansion			100	mA
I_{IO}	IO Output Source / Sink Current (UART, SPI, I2C, IO)			5	mA
I_{IOlkg}	IO Input Leakage Current (UART, SPI, I2C, IO)			5	µA
Speaker					
R_{SPK}	Speaker impedance		8		Ω
Power Draw					
Pspk	Power Draw, Speaker, full		1.18		W
StreamUX Mid4 Display					
	Display Area		95.04 (W) x 53.86 (H)		mm
	Touch Area		96.04 (W) x 54.86 (H)		mm
	Pixels		480 x 272 (RGB)		dots

	Pixel Arrangement		RGB vertical stripe	
	Pixel Pitch		0.198 (W) x 0.198 (H)	mm
	Viewing Angle		12:00	
Θ_L	Viewing Angle (CR >= 10, 9 o'clock)	60	70	degree
Θ_R	Viewing Angle (CR >= 10, 3 o'clock)	60	70	degree
Θ_T	Viewing Angle (CR >= 10, 12 o'clock)	60	70	degree
Θ_B	Viewing Angle (CR >= 10, 6 o'clock)	40	50	degree
CR	Contrast Ratio	400	500	
L_V	LCM Luminance	350		Cd/m2
Hr	LED Lifetime	50000		Hours
Avg	Uniformity	80%		
StreamUX Mid5 Display				
	Display Area		108 (W) x 64.8 (H)	mm
	Touch Area		109 (W) x 65.8 (H)	mm
	Pixels		800 x 480 (RGB)	dots
	Pixel Arrangement		RGB vertical stripe	
	Pixel Pitch		0.135 (W) x 0.135 (H)	mm
	Viewing Angle		12:00	
Θ_L	Viewing Angle (CR >= 10, 9 o'clock)	60	70	degree
Θ_R	Viewing Angle (CR >= 10, 3 o'clock)	60	70	degree
Θ_T	Viewing Angle (CR >= 10, 12 o'clock)	60	70	degree
Θ_B	Viewing Angle (CR >= 10, 6 o'clock)	40	60	degree
CR	Contrast Ratio	560	700	
L_V	LCM Luminance	350		Cd/m2
Hr	LED Lifetime	50000		Hours
Avg	Uniformity	80%		
StreamUX Mid7 Display				
	Display Area		154.08 (W) x 85.92 (H)	mm
	Touch Area		155.08 (W) x 86.92 (H)	mm
	Pixels		800 x 480 (RGB)	dots
	Pixel Arrangement		RGB vertical stripe	
	Pixel Pitch		0.1926 (W) x 0.179 (H)	mm
	Viewing Angle		12:00	
Θ_L	Viewing Angle (CR >= 10, 9 o'clock)	60	70	degree
Θ_R	Viewing Angle (CR >= 10, 3 o'clock)	60	70	degree
Θ_T	Viewing Angle (CR >= 10, 12 o'clock)	60	70	degree
Θ_B	Viewing Angle (CR >= 10, 6 o'clock)	40	50	degree
CR	Contrast Ratio	400	500	
L_V	LCM Luminance	450		Cd/m2
Hr	LED Lifetime	50000		Hours
Avg	Uniformity	80%		

Charts

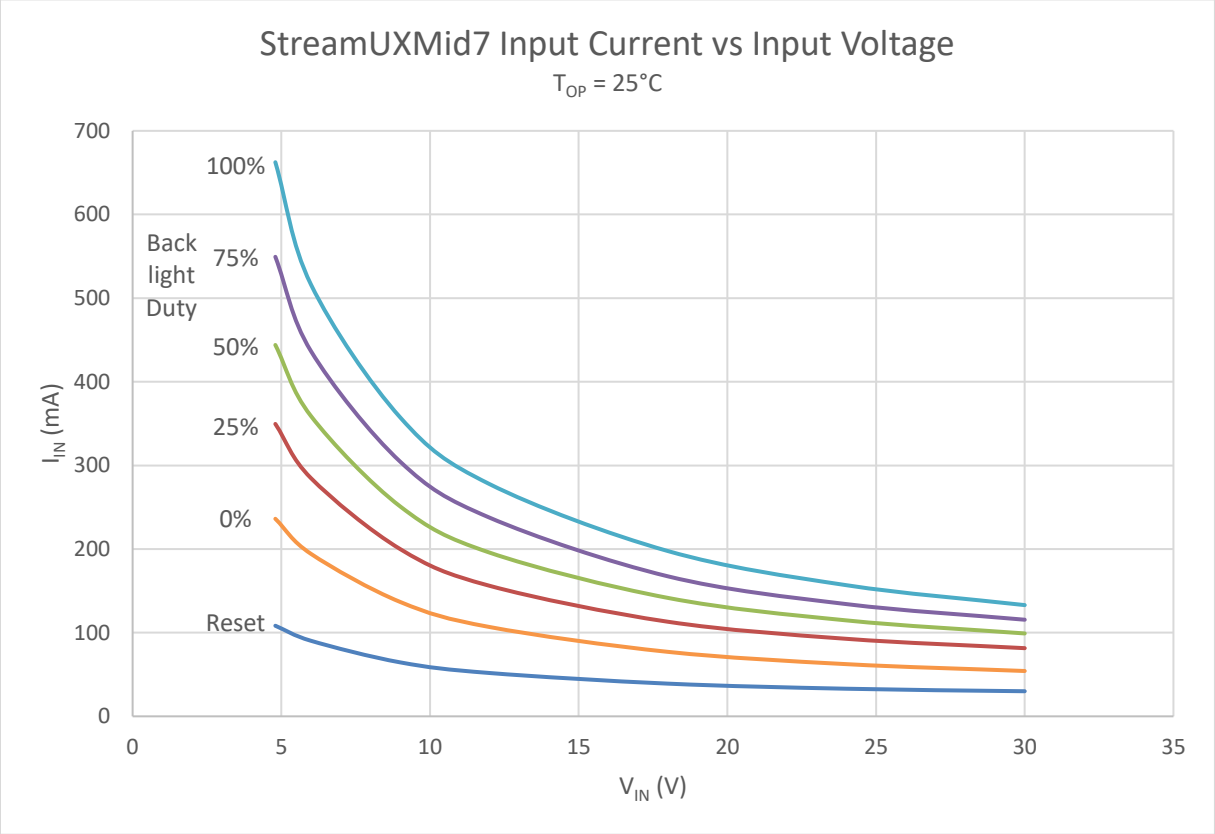


Figure 5 - StreamUX Mid7 Input Current

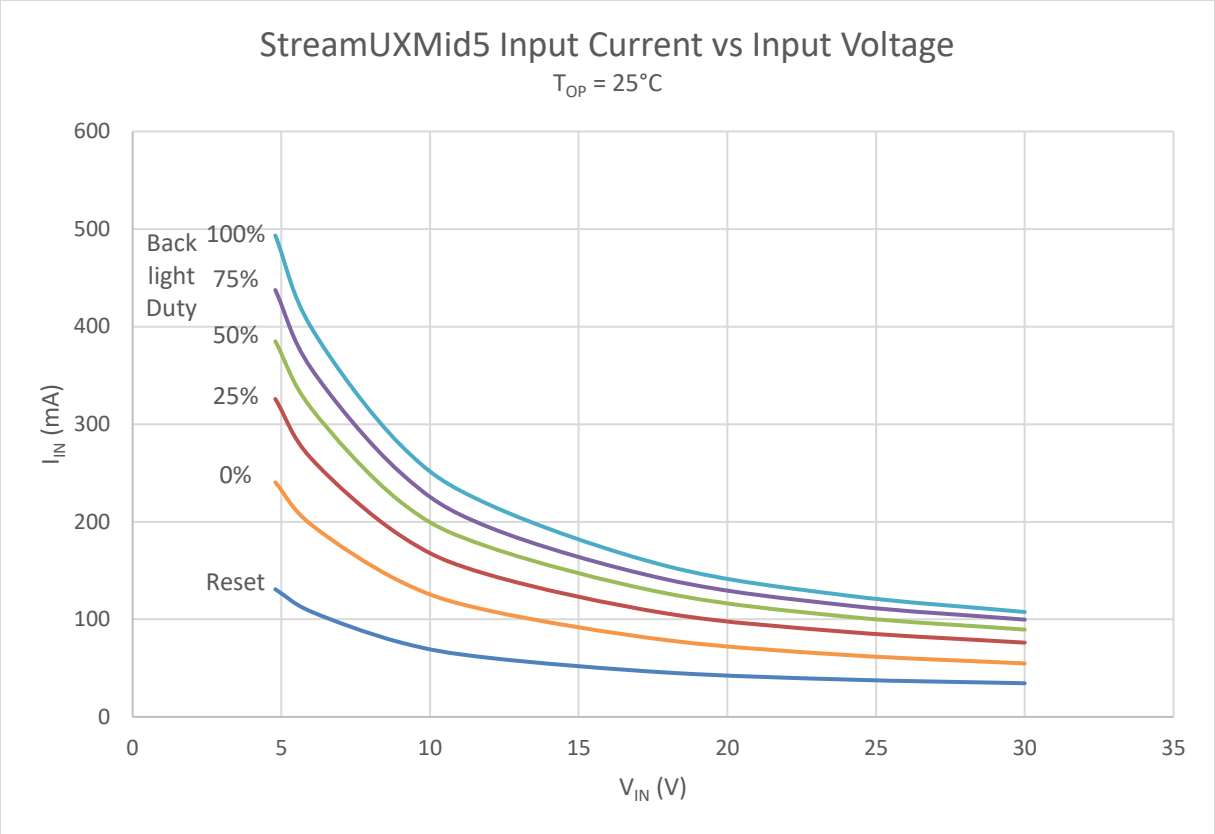


Figure 6 - StreamUX Mid5 Input Current

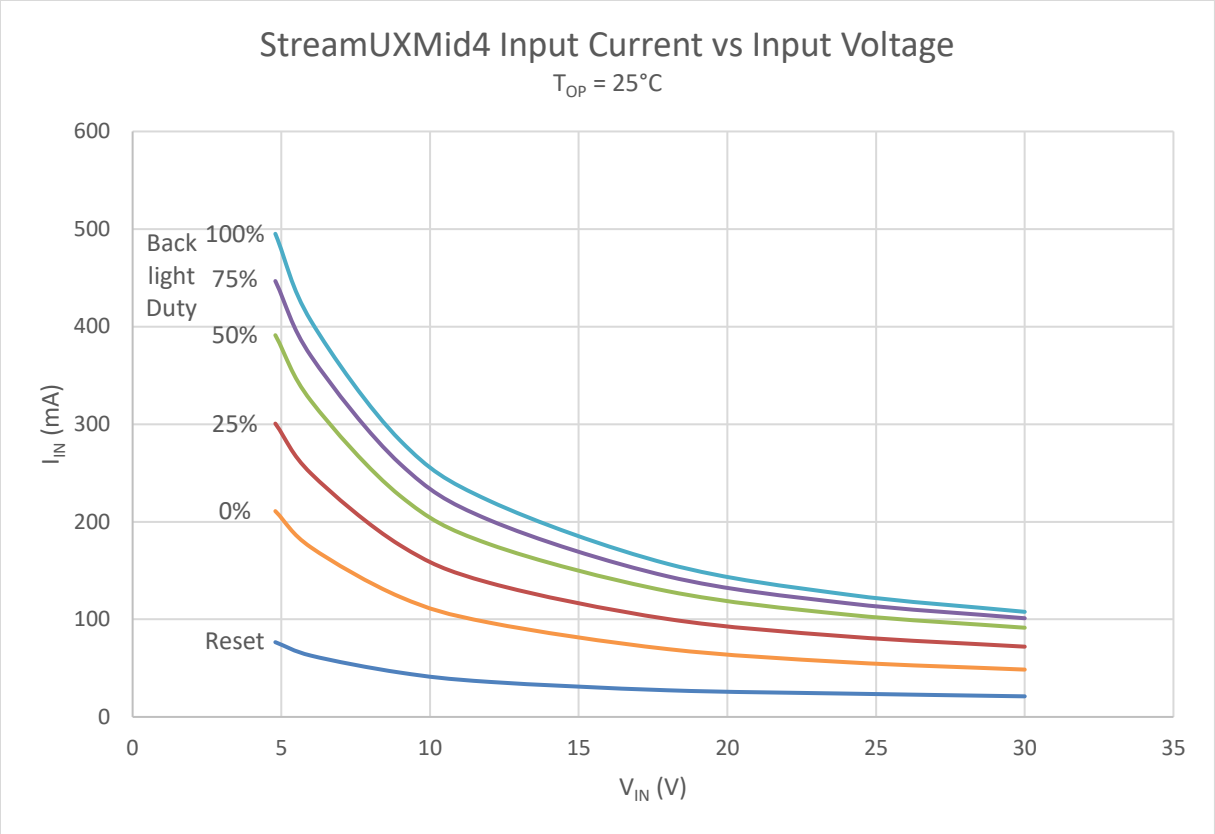


Figure 7 - StreamUX Mid4 Input Current

Revision History

Rev	Date	Changes
0	7/10/2019	Initial Release
1	9/4/2019	Added individual display optical data, backlight data
2	2/18/2021	Added “Mid” suffix to the title and through the document
3	7/20/2021	Fixed error in figure 1, StreamUX pinout of the F7 expansions header.

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