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## 1 Highlights

Chrominance multi-touch capacitive touch sensors and assemblies have the following features:

- Based on TouchNetix' aXiom controller with >80dB SNR for the best HMI performance in harsh environments.
- Low sensor drive voltage for low RF emissions and long-term sensor reliability.
- Industry-leading EMC performance.
- 16-bit XY multi-touch reporting of up to 10 concurrent touches.
- 'Dual mode' capacitive measurement for thick glove and water operation.
- Support for very thick cover lenses including non-uniform (3D) surfaces.
- Support for air gaps between the lens and sensor.
- Programmable gain per node, so no issues with edge/corner sensitivity.
- Reporting rates of up to 250Hz.
- Narrow sensor edge margins.
- Reference driver code for integration with Windows and Linux embedded systems.<sup>1</sup>
- Connection via USB mini-B connector or 10-way 1mm pitch ZIF FFC connector.
- Supported by TouchNetix' proprietary TouchHub2 tuning/evaluation software for Windows™.
- "Mouse emulation" support in legacy OS and embedded versions of Windows™.
- Bare sensor supplied as 0.7mm thick glass substrate with bonded passive FPC.
- 3D CAD STEP files available.
- Proximity and hover sensing ('Touchless UI').
- Support for 'dial on display'.
- Force/press sensing and haptics triggering - Contact TouchNetix for further information.

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<sup>1</sup>Link to TouchNetix GitHub <https://github.com/TouchNetix>

## 2 Ordering Part Numbers

### 2.1 Touch Sensor Assemblies

Name	Order code	(inches)		Orientation	LCD display AA size (mm)		Sensor size (mm)	
	Sensor & FPC Assy	Diagonal	Aspect Ratio		Long Axis	Short Axis	Long Axis	Short Axis
Fama	840-00182	5	15:9	Landscape	110.40	64.80	115.20	69.78
Sullivan	840-00127	7	15:9	Landscape	152.45	91.47	164.00	106.50
Ersa	840-00141	8	15:9	Portrait	174.00	104.40	190.00	120.00
Syn	840-00163	10.1	16:10	Landscape	216.96	135.60	228.50	150.00
Marisha	840-00061	10.4	4:3	Landscape	211.20	158.40	219.50	172.00
Elpis	840-00136	11.6	16:9	Landscape	256.32	144.18	270.00	164.50
Loa	840-00071	12.1	16:10	Landscape	261.12	163.20	274.00	187.20
Talos	840-00148	12.1	4:3	Landscape	245.76	184.32	262.00	206.00
Clio	840-00073	15.6	16:9	Landscape	344.23	193.54	355.00	210.50
Europa	840-00152	18.5	16:9	Landscape	409.80	230.40	426.75	257.72
Nomos	840-00156	19	5:4	Landscape	376.32	301.06	401.00	328.50
Rakim	840-00075	21.5	16:9	Landscape	476.64	268.11	488.00	287.00
Thrasos	840-00077	24	16:9	Landscape	518.40	324.00	543.05	353.05

Table 2.1-1: Touch Sensor Assemblies

This sensor list will be updated as new sizes are released. Please contact TouchNetix for the current Chrominance sensor road map. All sensor types can be supplied with an additional active shield layer to facilitate hover and proximity sensing.

### 2.2 Control boards

Order Code	Name	Touch Controller	Host Communications
830-00082	AX198A Chrominance Control Board	AX198-I-LQFP256	I <sup>2</sup> C and USB
830-00018	AX112A Chrominance Control Board	AX112A-I-LQFP156	I <sup>2</sup> C and USB
830-00071	AX80A Chrominance Control Board	AX80A-I-LQFP128	I <sup>2</sup> C and USB
830-00070	AX54A Chrominance Control Board	AX54A-I-QFN88	I <sup>2</sup> C and USB

Table 2.2-1: Control Board information

### 2.3 Chrominance starter kit

The following kits are available.

Order Code	Order Description	Sensor	Controller
880-00054	7.0" Chrominance starter kit	Sullivan	AX54A
880-00053	10.1" Chrominance starter kit	Syn	AX80A
880-00038	12.1" Chrominance starter kit	Loa	AX112A
880-00039	15.6" Chrominance starter kit	Clio	AX112A
880-00040	21.5" Chrominance starter kit	Rakim	AX112A
880-00062	15.6" Chrominance starter kit (supplied with FPC adaptor)	Clio	AX198A

Table 2.3-1: Chrominance start kit list

### 2.3.1 Chrominance starter kit contents

- Chrominance Sensor with shield laminated to standard lens (7", 10.1", 12.1", 15.6", 21.5" Resp.)
- Chrominance Control Board (AX198A, AX112A, AX80A, AX54A resp.)
- USB Cable (Type A Plug to Mini USB Type B Plug) 0.5m
- TouchNetix TouchHub2 evaluation and tuning software for Windows 10/11™
- FPC adaptor<sup>2</sup>
- Metal Touch probe assembly<sup>3</sup>

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<sup>2</sup>only applicable to AX198A when supplied with the Clio sensor.

<sup>3</sup>Metal touch is required when running auto-tuning algorithm in TouchHub2 software.

### 3 Mechanical Specifications

#### 3.1 Sensor / FPC Assembly

<b>Base material:</b>	DITO on Soda lime float glass.
<b>Thickness:</b>	700um typ.
<b>Dimensions:</b>	Refer to Section 9 Mechanical Drawings.
<b>Outline drawings:</b>	DXF/PDF/STP assembly drawings available on request.
<b>LCD attachment:</b>	Refer to Section 3.4
<b>Attachment to housing:</b>	See <b>TNxAN00010 Recommended Attachment Methods for Touchscreen Assemblies.</b>
<b>Max lens thickness:</b>	10mm glass.

Table 3.1-1: Sensor & FPC Assembly specifications

#### 3.2 Chrominance Control Board Assemblies

	<b>AX198A</b>	<b>AX112A</b>	<b>AX80A</b>	<b>AX54A</b>
<b>Board material</b>	FR4	FR4	FR4	FR4
<b>Board thickness</b>	1.0mm	1.0mm	1.0mm	1.0mm
<b>Length</b>	133mm	79mm	79mm	48mm
<b>Width</b>	71mm	32mm	33mm	42.5mm
<b>Connections to sensor FPC</b>	2 x Hirose FH28H-80S-0.5SH 80-way Hirose FH28-60S-0.5SH 60-way	Hirose FH28H-80S-0.5SH 80-way Hirose FH28-50S-0.5SH 50-way	Hirose FH28H-80S-0.5SH 80-way Hirose FH28-50S-0.5SH 50-way	Hirose FH28-60S-0.5SH 60-way
<b>Host Connection</b>	MOLEX 52207-1060, 10way 1mm FFC/FPC ZIF socket, top contact (SK4) USB MINI-B (SK5)	MOLEX 52207-1060, 10way 1mm FFC/FPC ZIF socket, top contact (SK4) USB MINI-B (SK3)	MOLEX 52207-1060, 10way 1mm FFC/FPC ZIF socket, top contact (SK3) USB MINI-B (SK4)	MOLEX 52207-1060, 10way 1mm FFC/FPC ZIF socket, top contact (SK4) USB MINI-B (SK3)
<b>Maximum component height</b>	3.7mm (above PCB) – SK5	3.7mm (above PCB) – SK3	3.7mm (above PCB) – SK4	3.7mm (above PCB) – SK3

Table 3.2-1: Control board assembly details

**NOTE:**

- *Components on top side of PCBs only.*
- *Rear side is suitable for adhesive tape mounting and is covered with solder resist but should not be assumed to be fully insulated.*
- *M2 mounting holes are provided, which are connected to GND on both sides of the PCB.*

**3.2.1 AX198A Control Board**

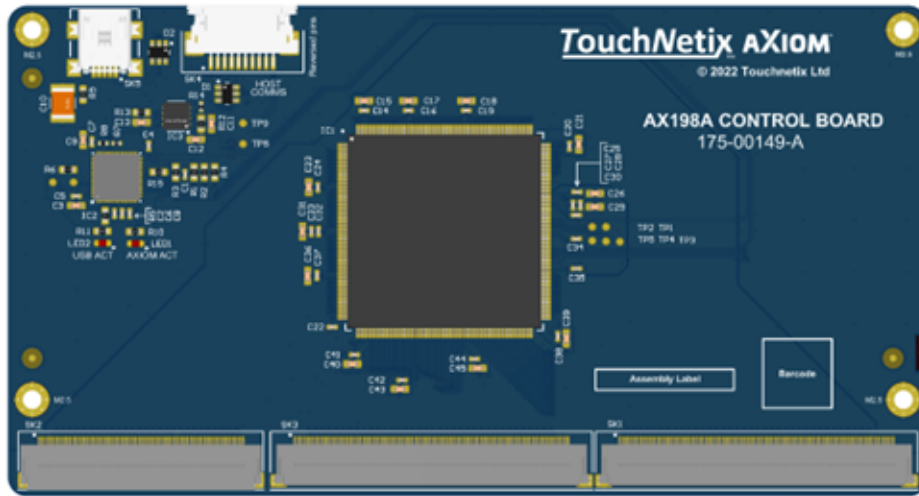


Figure 3.2.1-1: AX198A Control Board

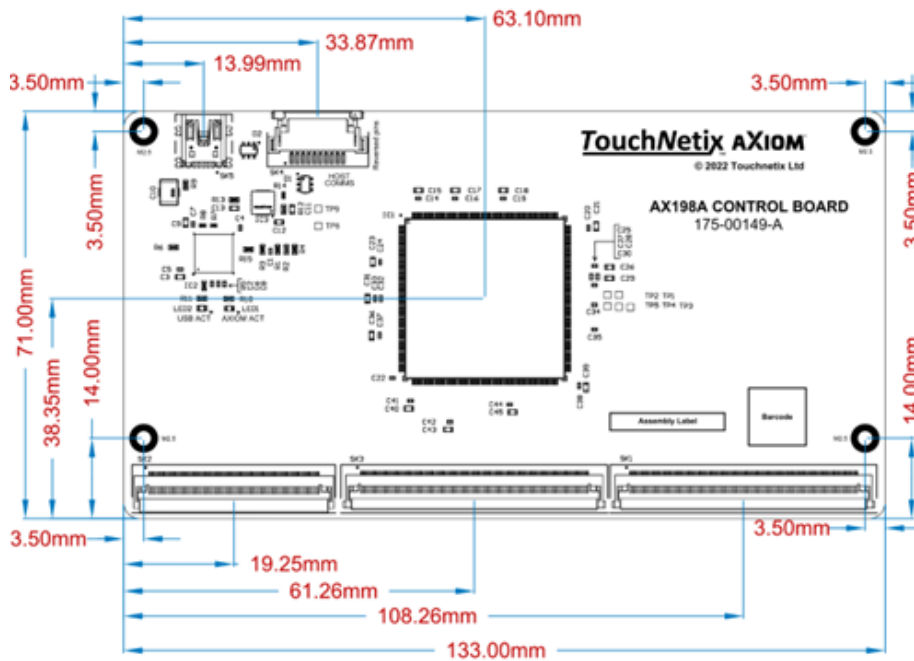


Figure 3.2.1-2: AX198A board measurements

**3.2.2 AX112A Control Board**

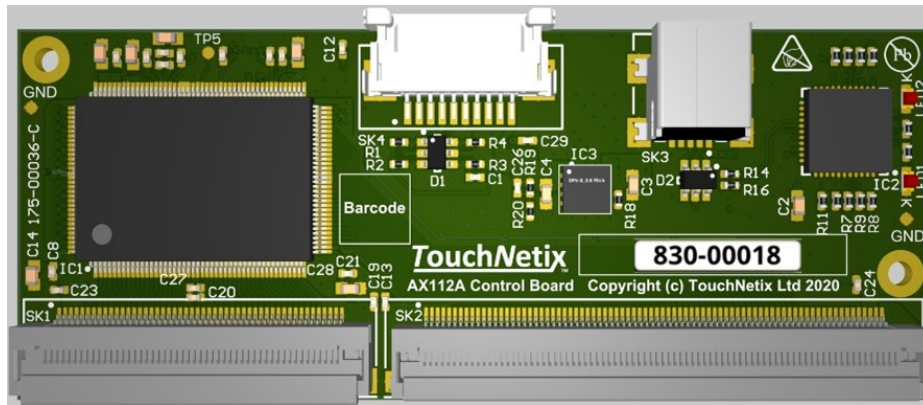


Figure 3.2.2-1: AX112A Control Board

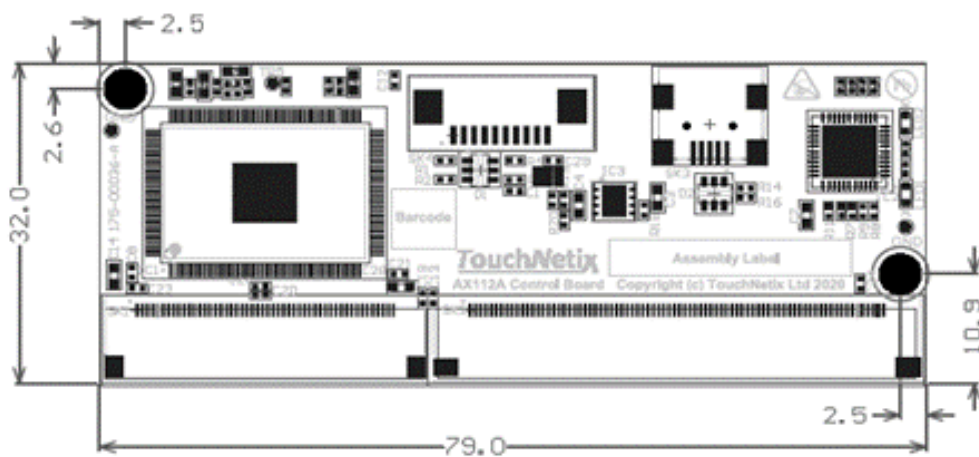


Figure 3.2.2-2: AX112A board measurements



**3.2.3 AX80A Control Board**

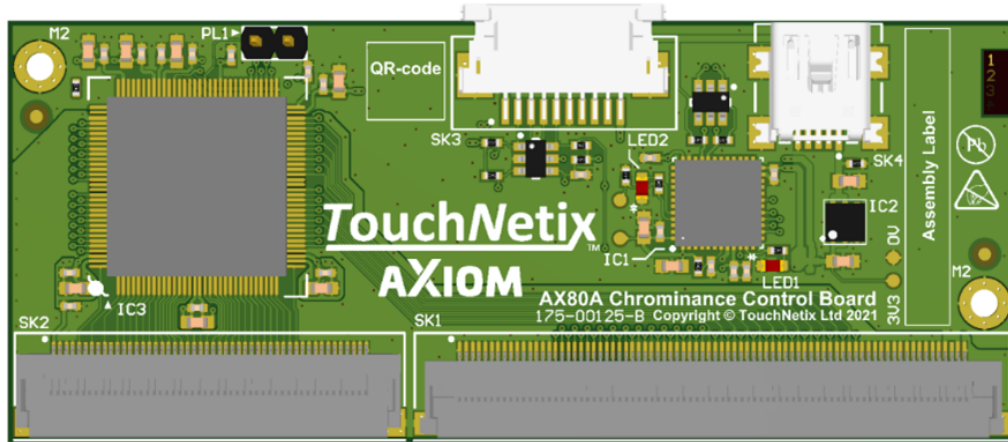


Figure 3.2.3-1: AX80A Control Board

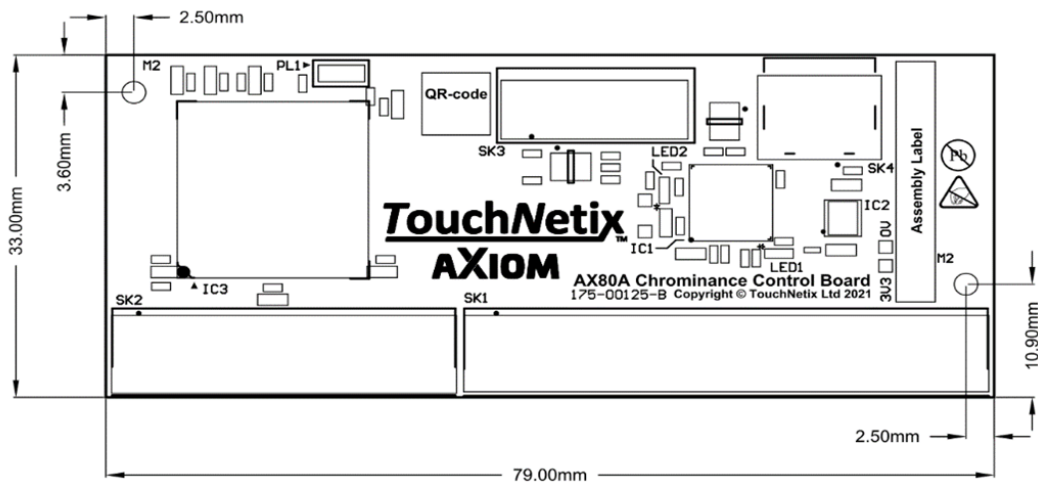


Figure 3.2.3-2: AX80A board measurements

**3.2.4 AX54A Control Board**

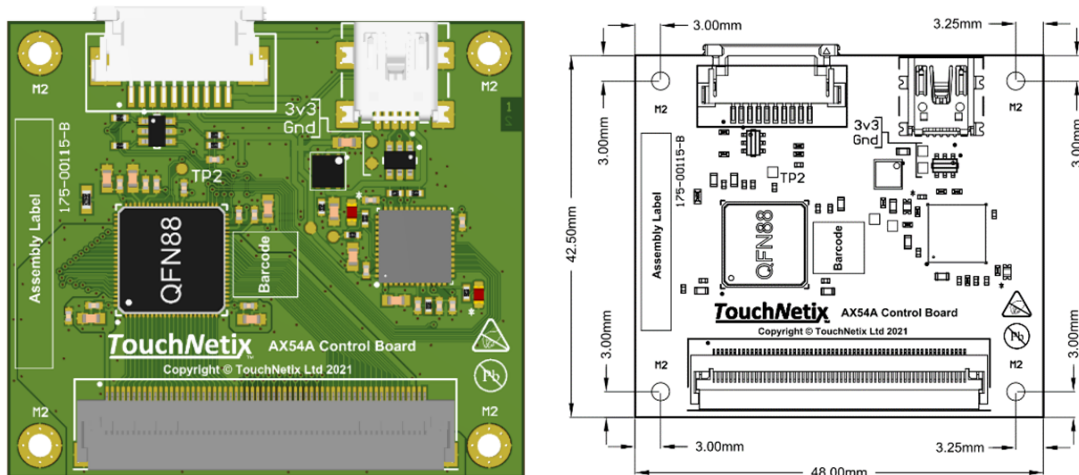


Figure 3.2.4-1: AX54 Control Board and measurements

Note: Images are representation only, not necessarily current variant.

### 3.3 FPCs

#### 3.3.1 General

<b>Material:</b>	Polyimide
<b>FPC To Sensor Bond Pads:</b>	Material: Au 0.05um / Ni 3um Length: 3mm, Width: 0.3mm, Pitch: 0.6mm
<b>Thickness at Connector:</b>	0.3mm
<b>FPC To Sensor Bond Material:</b>	ACF TOU3010CP-25 2.5mm width 25um thickness
<b>Connector Contacts:</b>	Contact side: Bottom side Material: Au 0.2um / Ni1.5um Length: 3.5mm, Width: 0.3mm, Pitch: 0.5mm
<b>FPC bend radius R:</b>	R < 2mm, not allowed. 2 ≤ R < 2.5mm, 3 cycles max 2.5 ≤ R < 4mm, 10 cycles max R ≥ 4mm, 50 cycles max
<b>Mounting:</b>	See <b>TNxAN00009-A1 FPC Considerations for Touchscreen Assemblies</b>

Table 3.3.1-1: General Specifications

### 3.4 LCD Mounting

A customer LCD can be mounted to the rear of Chrominance sensors using either a suitable pressure sensitive adhesive gasket<sup>4</sup> (3M VHB™ or equivalent<sup>5</sup>) or full optical bond using wet or dry adhesive. Contact TouchNetix for guidance.

It is strongly recommended that early testing with a target LCD is conducted to identify any incompatibilities with noisy LCD drive electronics.<sup>6</sup>

See also **TNxAN00010 Recommended Attachment Methods for Touchscreen Assemblies**.

### 3.5 Handling Chrominance sensors

Guidelines for correct handling of Chrominance sensors can be found in **TNxAN00018-A2 Handling Precautions for Glass Sensors**. It is strongly recommended that these rules are observed to avoid permanent damage to sensor glass or FPCs.

<sup>4</sup>To be fitted by customer or as part of 3rd party system integrator's responsibility.

<sup>5</sup>It is very important to conduct material compatibility trials for any adhesives that are in direct contact with any part of the sensor unless they are already proven to be non-aggressors.

<sup>6</sup>The Chrominance series is designed to be immune to most LCD noise but there are many LCD variants with radically different levels of noise emitted, that pre-testing is advised.

## 4 Electrical Specifications

### 4.1 Chrominance Control Board host connections (all variants)

All control boards have two connectors for interfacing with a host system.

1. Mini USB type B receptacle
2. 10way Molex 1mm top contact FFC/FPC receptacle

#### 4.1.1 Mini USB Type B receptacle

Pin	Name	Type <sup>7</sup>	Description	Notes
1	VDD_IN (5V)	Power	Power supply	5V +/- 5% (3.3V LDO regulator on PCB)
2	USBDM	I/O	USB Data -	
3	USBDP	I/O	USB Data +	
4	NO CONNECT			Leave open
5	GND	Power	Ground (0V)	
6	Shell			0V on PCB

Table 4.1.1-1: Mini USB connections

Allows direct connection to a host for USB2.0 HID communications.

Connecting a host to USB Mini B will automatically select USB mode.

**Do not simultaneously connect to USB Mini B and Molex 10Way FFC.**

*Note that the USB interface selects 'bridged' communications to the Axiom Controller via an additional micro-controller running TouchNetix custom firmware. The bridge IC can be configured in software to provide HID class multi-touch digitizer mode suitable for Windows7/8/10/11™, or single touch mouse emulation for legacy systems and embedded versions of Windows™.*

#### 4.1.2 10 way FFC/FPC connector

**Connector type:** Molex 52207-1060 (Typical tail layout is shown below).

Note that pin #1 location follows the PCB silk screen and not the Molex connector data sheet.

Allows for both direct I<sup>2</sup>C connection to the Axiom controller, or 'bridged' USB. Connecting via I<sup>2</sup>C provides a direct interface to the AX112 controller, the bridge IC is effectively out of circuit. Connecting USB via pins 7 and 8 will interface to the bridge and provide bridged USB communications as described in 4.1.1.

Pin	Name	Type <sup>8</sup>	Description
1	VDD IN (5V)	Power 5V ±5%	Supply from stable LDO (max ripple/noise 25mVpp) Max current 2A 3.3V LDO regulator on control board <sup>9</sup> .
2	SLVSDA	I/O	I <sup>2</sup> C serial data (3k3 pull-up on control board)
3	SLVSCL	I/O	I <sup>2</sup> C clock (3k3 pull-up on control board)
4	nRESET	I	Optional reset from host (10k pull-up on control board)
5	SLVnIRQ	O	Interrupt to host (3k3 pull-up on control board)
6	GND	Power	
7	USBDP	I/O	USB Data+
8	USBDM	I/O	USB Data-
9	NC		
10	VDDA 3V3	Power 3.3V ±5%	Supply from stable LDO (max ripple/noise 25mVpp) Max current 2A <sup>10</sup> .

Table 4.1.2-1: 10 Way FFC/FPC connections

<sup>7</sup>All I, O and I/O type signals are referenced to a 3.3V power domain.

<sup>8</sup>All I, O and I/O type signals are referenced to a 3.3V power domain.

<sup>9</sup>For I<sup>2</sup>C operation from a single 3v3 supply, connect 3v3 power to pins 1 and 10.

<sup>10</sup>For I<sup>2</sup>C operation from a single 3v3 supply, connect 3v3 power to pins 1 and 10.

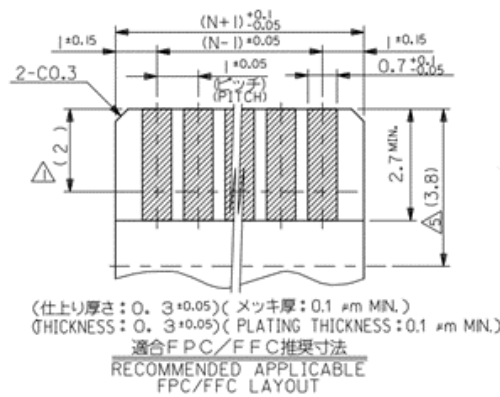


Figure 4.1.2-1: Recommended Applicable FPC/FFC Layout

## 4.2 Chrominance Control Board sensor connections

All control boards connect to the sensor FPC via Hirose FH28 series, 80, 50 or 60 circuit depending on the control board type. Refer to Section 3.2.

FPC tail contacts should be facing downwards when plugged. Contacts are gold plated and locating barbs securely engage the FPC.

Sensor-side connectors are rated for a maximum of 10 mate/de-mate cycles.

**The FPC carries sensitive driver and receiver signals. It is therefore strongly advised to avoid routing the FPC near to noise sources or within 5mm of metal surfaces.**

## 4.3 Absolute Maximum Ratings

Parameter	Description	Limits
VDDA3V3	Power supply on 10W FFC	(GND - 0.3V) min, 4V max.
VDD_IN (USB)	USB supply on Mini B or 10W FFC	(GND - 0.3V) min, 7V max.
Input or I/O Signals	Applies to any analogue or CMOS pins	(GND - 0.3V) min, VDDA3V3 ±0.5V max.

Table 4.3-1: Absolute Maximum Ratings

Stresses beyond those listed under absolute maximum ratings may cause permanent damage to the devices on the control PCB. These are stress ratings only and functional operation of devices at these or any other conditions beyond those indicated under "recommended ranges" are not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

## 4.4 Power Requirements

Parameter	Description	Recommended Ranges (min to max <sup>11</sup> ) / Performance
VDDA3V3	Power supply (3v3 nominal)	3.13V to 3.47V
VDD_IN (USB)	Power supply Mini B or 10W FFC	4.5V to 6V <sup>12</sup>
SR VDD_IN, VDDA3V3	Power-up slew rate	0.25V/uS max
N VDD_IN	Peak-to-peak noise and ripple	25mV max
Idd VDD_IN	I <sup>2</sup> C	AX198
	USB	AX112
Idd VDDA3V3	I <sup>2</sup> C	AX80
		AX54
		250mA max. (TBC)

Table 4.4-1: Power Requirements

**4.5 I/O Characteristics**

Parameter	Description	Range
VIL	Guaranteed logic low input	0.3V to 0.8V
VIH	Guaranteed logic high input	2V to 3.6V
VOL	Guaranteed low output	0.4V max.
VOH	Guaranteed high output	2.4V min.
IIL	Input leakage current	±1uA max.

Table 4.5-1: I/O Characteristics

**4.6 Communication Interfaces**

**4.6.1 Slave I<sup>2</sup>C interface**

<b>I2C Specifications:</b>	Version 6.0	
<b>Type:</b>	Supports both standard (100kHz) and fast 400KHz modes. I <sup>2</sup> C slave with active low (open drain) interrupt signal Active low master reset (optional use).	
<b>Levels:</b>	SLVSDA, SLVSCL, SLVnIRQ are open drain I/O. 3k3 pull-ups to VDDA3V3 included on the PCB. nRESET is input only with 10K pull-up to VDDA3V3 included on the PCB.	
<b>Slave address:</b>	AX54 Control Board	0x67
	AX80 Control Board	0x67
	AX112 Control Board	0x66
	AX198 Control Board	0x67

Table 4.6.1-1: Slave I<sup>2</sup>C interface

Further information can be found in the relevant aXiom datasheet.

**TNx00366-aXiom AX54A 3D Touch Controller Datasheet**

**TNx00339-aXiom AX80A 3D Touch Controller Datasheet**

**TNx00338-aXiom AX112A 3D Touch Controller Datasheet**

**TNx00376-aXiom AX198A 3D Touch Controller Datasheet**

**4.6.2 I<sup>2</sup>C protocol**

The communications protocol used to access configuration registers in the device and to receive event reports from the device, can be found in **TNxAN00035 aXiom Touch Controller Comms Protocol**. Real-time report collection from the device over the I<sup>2</sup>C interface has been optimized to work in an interrupt-driven mode rather than being polled.

**4.6.3 USB via TouchNetix bridge IC**

Chrominance Control board incorporates USB HID functionality for screen sizes up to 24". Digitizer modes suitable for multi-touch in Windows7/8/10/11™ and single touch mouse emulation for Windows XP and embedded systems are provided. All modes use HID Class communications. See [www.usb.org](http://www.usb.org) for more information on USB HID specifications.

<sup>11</sup>The range values should be treated as 0% tolerance i.e. they are lowest and highest operational limits.

<sup>12</sup>The PCB includes a linear regulator and filtering to generate Axiom supply from this power input.

## 5 Environmental (sensor in application)

<b>Operating temperature:</b>	-40°C to +85°C
<b>Operating humidity:</b>	5 to 90% RH non-condensing
<b>Storage temperature:</b>	-40°C to +85°C
<b>Storage humidity:</b>	5 to 90% RH non-condensing
<b>RoHS/Reach:</b>	Compliant
<b>Chemical resistance:</b>	Refer to "TNxAN00019 Glass Sensors"

Table 5-1: Environmental Specification

## 6 EMC (sensor in application)

The specifications in this section are provided as a reference. The actual qualification is dependent on the final customer product and assumes best system design practices for noise immunity and emissions.<sup>13</sup>

### 6.1 ESD Rating

Parameter	Description	Limit
FPC & PCB	Rating for contacts and components	2kV HBM
Touchscreen Assembly when fitted to lens and in system	Rating for ESD strikes to lens (touch side) <sup>14</sup>	EN61000-4-2 8kV contact 15kV air

Table 6.1-1: ESD Ratings

### 6.2 Immunity to Conducted RF Disturbances: EN61000 Part 4 - 6

Level 3 (10Vrms with 80% AM modulation @ 1kHz): Class A <sup>15</sup>

### 6.3 Immunity to Radiated RF disturbances: EN61000 Part 4 - 3

Level 4 (30V/m): Class A

### 6.4 Electrical Fast Transient Burst: EN61000 Part 4 - 4 <sup>TM</sup>

Level 3 (2kV to system power port, 1kV to signals): Class A

<sup>13</sup>See TNxAN00048-aXiom Touch Controller EMC Report.

<sup>14</sup>Subject to suitable design of product housing particularly near FPC exit.

<sup>15</sup>Subject to overall system design. Consult TouchNetix for details.

## 7 Touch Performance

<b>Response time:</b>	User configurable, typically 25ms from 1st touch to nIRQ=low <sup>16</sup>
<b>Reporting rate:</b>	User configurable, typically >100Hz
<b>Main area axis linearity<sup>17</sup>:</b>	+/- 1mm typ. for single 10mm diameter touch
<b>Edge area axis linearity<sup>18</sup>:</b>	+/- 2mm typ. for single 10mm diameter touch
<b>Main Area Touchdown repeatability<sup>19</sup>:</b>	+/- 1mm typ. for single 10mm diameter touch
<b>Number of touches supported:</b>	Configurable up to 10
<b>Touch sensitivity:</b>	User configurable
<b>Gloved operation<sup>20</sup>:</b>	Wide range of industrial and medical gloves supported
<b>3D lens support:</b>	Uniform sensitivity is possible with varying lens thickness across active area
<b>Air gap between lens and sensor:</b>	Supported
<b>Wipe/palm suppression:</b>	User Configurable
<b>Edge correction:</b>	User Configurable
<b>Reporting resolution:</b>	16-bits
<b>Pinch separation:</b>	User Configurable
<b>Water operation<sup>21</sup>:</b>	User Configurable False touch suppression and multi-touch operation in water is supported
<b>Hover and proximity sensing:</b>	User configurable – consult TouchNetix
<b>Dial on Display<sup>22</sup>:</b>	User configurable – consult TouchNetix

Table 7-1: Touch Performance

Note: User “tuneable” settings can affect the stated figures.

## 8 Quality

TouchNetix operates a Quality Management System that is certified to ISO9001 (certificate available on request). All manufacturing is performed by carefully selected and approved suppliers, all of which hold certification to ISO 9001 as a minimum requirement.

TouchNetix is committed to providing leading edge products to our customers, and as such invests considerable time ensuring selection of components is performed to minimise obsolescence risk of all parts. However, in the case of unavoidable obsolescence issues, our obsolescence policy is to provide an “End of Life” notification to all customers as soon as possible, but with not less than 6 months’ notice providing customers with the option for last time buy.

### Change management

In the event that TouchNetix requires to make a change to any standard product that affects form, fit, function or interchangeability at the highest level, a PCN process will be used to inform all customers of the forthcoming change to allow any impact assessment to be performed.

<sup>16</sup>Depends on application’s power requirements.

<sup>17</sup>Defined as the region 5mm inside the view (transparent) area. Quoted per axis.

<sup>18</sup>Defined as the area 5mm into the view (transparent) area. Quoted per axis.

<sup>19</sup>Variance caused by position touchdown jitter alone for a fixed XY test location. Quoted per axis.

<sup>20</sup>Glove demonstration: [Youtube link](#)

<sup>21</sup>Water demonstration: [Youtube link](#)

<sup>22</sup>DoD demonstration: [Youtube link](#)

**9 Mechanical Drawings**

**9.1 Sensor and FPC assemblies**

**9.1.1 Landscape sensors**

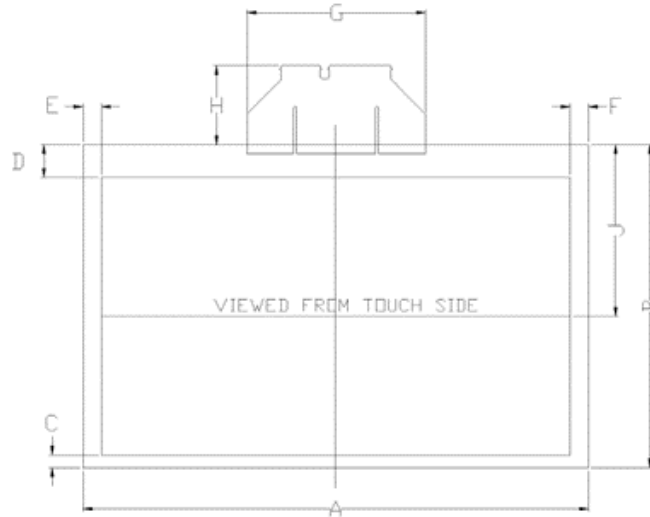


Figure 9.1.1-1: Landscape sensor Dimensions

**9.1.2 Portrait sensors**

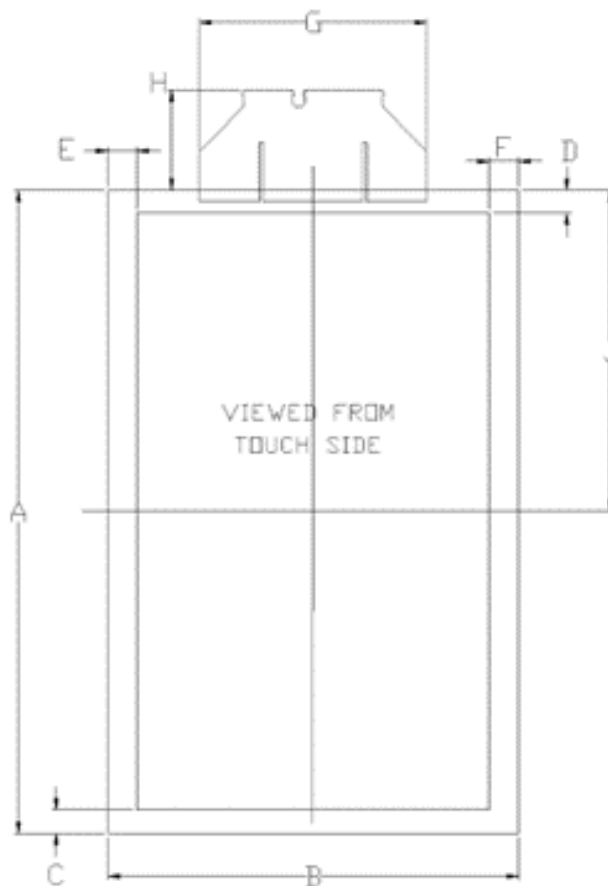


Figure 9.1.2-1: Portrait Sensor Dimensions



**9.1.3 Dimension table (typical)**

Item Name	(Inches)			Sensor size		Edges to LCD AA (mm)				Bond width	FPC length	Centre LCD AA to sensor edge
	Diagonal	Aspect Ratio	Orientation	A	B	C	D	E	F	G	H	J
Sullivan	7	15:9	Landscape	164.00	106.50	3.51	11.51	5.78	5.78	63.4	39	57.25
Ersa	8	15:9	Portrait	190.00	120.00	3.00	13.00	7.80	7.80	70.6	38	100.00
Syn	10.1	16:10	Landscape	228.50	150.00	3.30	11.10	5.77	5.77	84.2	47.30	78.90
Marisha	10.4	4:3	Landscape	219.50	172.00	3.00	10.60	4.15	4.15	103	56.45	89.80
Elpis	11.6	16:9	Landscape	270.00	164.50	8.59	11.72	6.84	6.84	103	56.45	83.81
Loa	12.1	16:10	Landscape	274.00	187.20	12.00	12.00	6.44	6.44	103	56.44	93.60
Talos	12.1	4:3	Landscape	262.00	206.00	7.84	13.84	8.12	8.12	103	56.35	106.00
Clio	15.6	16:9	Landscape	355.00	210.50	4.73	12.23	5.38	5.38	103	56.50	109.00
Europa	18.5	16:9	Landscape	426.75	257.72	11.40	15.92	8.47	8.47	103	56.95	131.12
Nomos	19	5:4	Landscape	401.00	328.50	7.51	19.93	12.34	12.34	103	52.18	170.46
Rakim	21.5	16:9	Landscape	488.00	287.00	5.95	12.95	5.68	5.68	103	56.33	147.00
Thrasos	24	16:9	Landscape	543.05	353.05	7.94	21.11	12.33	12.33	142.60	53.98	183.11

Table 9.1.3-1: Dimensions Table (typical)

**Notes**

1. The "Sensor size" defines the overall outside dimensions of the sensor glass.
2. Note that the FPC and Control Board lie centrally to the mid-line of the sensor.
3. The rectangle shown on the drawing above representing the LCD\_AA is a construction line for reference only. The transparent area of the sensor is large enough to operate with a range of vendors' LCDs for a given size (noting that there are sometimes subtle variations in the active and bezel region sizes between manufacturers for the "same" sized LCD modules).

Please consult TouchNetix for compatibility checks.

3D Step data is available on request.

## Appendix A References

TNxAN00009-A1 FPC Considerations for Touchscreen Assemblies  
TNxAN00010 Recommended Attachment Methods for Touchscreen Assemblies  
TNxAN00018-A2 Handling Precautions for Glass Sensors  
TNxAN00035 aXiom Touch Controller Comms Protocol.  
TNxAN00048-aXiom Touch Controller EMC Report..  
TNxD00366-aXiom AX54A 3D Touch Controller Datasheet.  
TNxD00339-aXiom AX80A 3D Touch Controller Datasheet.  
TNxD00338-aXiom AX112A 3D Touch Controller Datasheet.  
TNxD00376-aXiom AX198A 3D Touch Controller Datasheet.

**Note:** Release of the above documents may require a specific NDA to be in place, please contact TouchNetix for more details.

## Appendix B Legal Copyright and Disclaimer

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## Appendix C Document History

Revision	Date	Change summary
A1	13/02/2020	Initial Release
A2	01/05/2020	10-way connector table updated to reflect latest revision of 830-00018 control board. (section 4.1.1.2)
A3	31/07/2020	Correct dimensions table in section 10.1.1.
A4	14/08/2020	Corrected mounting hole DIA in section 3.5, modified sensor table in section 2.1.
A5	19/04/2021	Various changes and corrections.
A6	12/07/2021	Added MALM based sensors.
A7	21/07/2021	Added Virtus dimensions to dimensions table.
A8	22/11/2021	Added AX54A, AX80A and AX198A Control boards and updated sensor table.
A9	21/02/2024	Updated the AX198A EVK kit content, removed Thumper sensor and replaced with Thrasos sensor. Also updated spelling, grammar, special characters and punctuation.
A10	14/08/2024	Corrected spelling mistakes and Note added for single 3v3 supply operation when running I <sup>2</sup> C only.
A11	05/12/2024	Added note to highlight that reference documents may need and NDA to release.