Consult TNx prior to design-in

SHORTFORM DATASHEET

Part of the

family of touchscreens

1 Highlights

The Luminance family of multi-touch capacitive touch sensors and assemblies includes numerous models that have the following features:

- ***Up to 12-bit XY multi-touch reporting***
- ***Supports up to 16 simultaneous touches***
- ***Reporting rate typically 80 to 100Hz depending on configuration***
- ***Suitable for lens thicknesses up to 4mm glass***
- ***Robust sensor design allows operation with a wide range of displays***
- ***Industry leading conducted and radiated immunity performance***
- ***Viewing area from 7" to 24" suitable for LCD modules from LG, Sharp, AUO, Innolux etc.***
- ***Narrow edge margins, near invisible ITO pattern***
- ***FPC tail with driver PCB connects to host via low cost 10 way 1mm pitch ZIF connector or USB Mini-B connector***
- ***I2C and USB communication interfaces with auto switch-over (link free)***
- ***Allows contemporary "bezel free" designs***
- ***Supported by TouchNetix' proprietary TNxTouchHub tuning software for Windows™***
- ***Optional adapter to allow "mouse mode" support in legacy O.S.s and embedded versions of Windows™***
- ***3D CAD available on request[1]***
- ***Bare sensor supplied as 0.7mm thick glass substrate with bonded FPC and control PCB connected via multi-way FPC connectors***
- ***Also available bonded to "standard" glass cover lens if required***
- ***Options for customizable cover lens subject to quantity***

[1] STEP file

2 Ordering Part Numbers

2.1 Touchscreen Assemblies[2]

Codename	Nominal Diagonal	Touchscreen Assembly Part Number	Aspect Ratio	Standard lens material	EVK
Enki	7.0"	TNxLM-070E-A7-AB-001rr	15:9	no lens	TNxLM-EVK-070E-A7-AB-001rr
Enki	7.0"	TNxLM-070E-A7-AB-002rr	15:9	3mm	TNxLM-EVK-070E-A7-AB-002rr
Mata	8.4"	TNxLM-084A-A7-AB-001rr	4:3	no lens	TNxLM-EVK-084A-A7-AB-001rr
Mata	8.4"	TNxLM-084A-A7-AB-002rr	4:3	3mm	TNxLM-EVK-084A-A7-AB-002rr
Beli	10.1"	TNxLM-101C-A7-AB-001rr	16:10	no lens	TNxLM-EVK-101C-A7-AB-001rr
Beli	10.1"	TNxLM-101C-A7-AB-002rr	16:10	3mm	TNxLM-EVK-101C-A7-AB-002rr
Milu	10.4"	TNxLM-104A-A7-AB-001rr	4:3	no lens	TNxLM-EVK-104A-A7-AB-001rr
Milu	10.4"	TNxLM-104A-A7-AB-002rr	4:3	3mm	TNxLM-EVK-104A-A7-AB-002rr
Apis	12.1"	TNxLM-121C-A7-AB-001rr	16:10	no lens	TNxLM-EVK-121C-A7-AB-001rr
Apis	12.1"	TNxLM-121C-A7-AB-002rr	16:10	3mm	TNxLM-EVK-121C-A7-AB-002rr
Lado	12.1"	TNxLM-121A-A7-AB-001rr	4:3	no lens	TNxLM-EVK-121A-A7-AB-001rr
Lado	12.1"	TNxLM-121A-A7-AB-002rr	4:3	3mm	TNxLM-EVK-121A-A7-AB-002rr
Peko	12.3"	TNxLM-123A-A7-AB-001rr	8:3	no lens	TNxLM-EVK-123A-A7-AB-001rr
Peko	12.3"	TNxLM-123A-A7-AB-002rr	8:3	3mm	TNxLM-EVK-123A-A7-AB-002rr
Fudo	15.0"	TNxLM-150A-A7-AB-001rr	4:3	no lens	TNxLM-EVK-150A-A7-AB-001rr
Fudo	15.0"	TNxLM-150A-A7-AB-002rr	4:3	3mm	TNxLM-EVK-150A-A7-AB-002rr
Enyo	15.6"	TNxLM-156B-A7-AB-001rr	16:9	no lens	TNxLM-EVK-156B-A7-AB-001rr
Enyo	15.6"	TNxLM-156B-A7-AB-002rr	16:9	3mm	TNxLM-EVK-156B-A7-AB-002rr
Vali	18.5"	TNxLM-185B-A7-AB-001rr	16:9	no lens	TNxLM-EVK-185B-A7-AB-001rr
Vali	18.5"	TNxLM-185B-A7-AB-002rr	16:9	3mm	TNxLM-EVK-185B-A7-AB-002rr
Aray	19.0"	TNxLM-190D-A7-AB-001rr	5:4	no lens	TNxLM-EVK-190D-A7-AB-001rr
Aray	19.0"	TNxLM-190D-A7-AB-002rr	5:4	3mm	TNxLM-EVK-190D-A7-AB-002rr
Mars	21.5"	TNxLM-215B-A7-AB-001rr	16:9	no lens	TNxLM-EVK-215B-A7-AB-001rr
Mars	21.5"	TNxLM-215B-A7-AB-002rr	16:9	3mm	TNxLM-EVK-215B-A7-AB-002rr
Baku	24.0"	TNxLM-240B-A7-AB-001rr	16:9	no lens	TNxLM-EVK-240B-A7-AB-001rr
Baku	24.0"	TNxLM-240B-A7-AB-002rr	16:9	3mm	TNxLM-EVK-240B-A7-AB-002rr

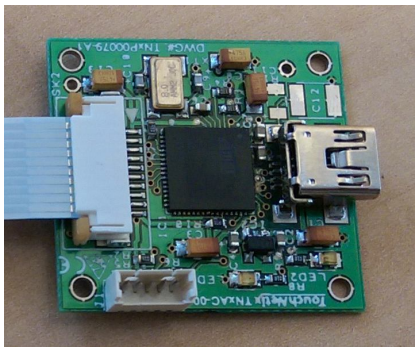
Consult TNx non-listed sizes or for custom lens requirements.

[2] Approximate dimensions and ratios

2.2 Optional Accessories

2.2.1 Mouse Mode USB Adapter

Connects to the 10-way FFC connector on the sensor control PCB and outputs to a USB Mini-B receptacle. This allows the host to treat the touch panel as a Mouse HID device in either relative (touchpad) mode or absolute (digitizer style) mode. The board measures 32x30mm[3].



2.2.2 EVK

An evaluation kit is available for each model. See 2.1 for details of part numbers.

Each kit contains the following items:

1x Sensor with lens as listed above
1x TNxAC-003
1x USB cable assembly
1x USB stick containing TNxTouchHub evaluation and tuning software for XP/Win7/8

[3] Note that J1 (rectangular 5-way B2W connector) in the picture is an optional fit and is *not* populated by default.

3 Mechanical Specifications

3.1 Sensor

Base material:	Glass ITO. Interconnects in metal
Thickness:	0.7mm typ.
Dimensions:	See Section [6 Mechanical Drawings]
Transmissivity:	88% typ. non bonded sensor only
Orientation:	Suitable for portrait or landscape use
Outline drawings:	See Section [6 Mechanical Drawings]
LCD attachment:	Refer to [3.4 LCD Mounting]
Attachment to housing:	See "TNxAN00010 Recommended Attachment Methods for Touchscreen Assemblies"
Max lens thickness:	4mm glass, 2.5mm polycarbonate, 2mm acrylic
Mass:	Consult TNx
Handling:	Refer to "TNxAN00019 Glass Sensors"

3.2 Lens for 002 Variants

Base material:	Soda-lime glass
Thickness:	3.0mm +/-0.2mm.
Treatment:	Chemically strengthened
Decoration:	Black[4] border rear printed
Outline drawing:	See [6 Mechanical Drawings]

[4] "Process black"

3.3 Controller PCB and FPC

FPC position:	Exits sensor at middle of bottom long edge
Material:	Polyimide FPC + epoxy-glass FR4 control PCB
PCB size:	79.0 x 25.6 x 1mm
Max component height:	3.9 mm above PCB top side
Components:	Top side of PCB only
Flex size:	See [6 Mechanical Drawings]
Host connectors:	10way FFC (FCI SFW10R-4STxxLF or equivalent) top contact USB Mini-B receptacle
Mounting:	See "TNxAN00009 FPC Considerations for Touchscreen Assemblies". Rear side is suitable for adhesive tape mounting and is covered with solder resist but should not be assumed to be fully insulated
FPC Min bend radius R:	R < 2mm not allowed 2 ≤ R < 2.5mm, 3 cycles max 2.5 ≤ R < 4mm, 10 cycles max R ≥ 4mm, 50 cycles max

Figure 3.3-1 Control Board Layout

3.4 LCD Mounting

A customer LCD can be mounted to the rear of the sensor using an adhesive gasket[5] using suitable pressure sensitive adhesive e.g. 3M VHB™ or equivalent[6]. The sensor is also suitable for full optical bond to the LCD using wet or dry adhesive. Contact TNx for guidance.

See "TNxAN00010-A1 Recommended Attachment Methods for Touchscreen Assemblies".

It is strongly recommended that early testing with a target LCD is conducted to identify and incompatibilities with noisy LCD drive electronics[7].

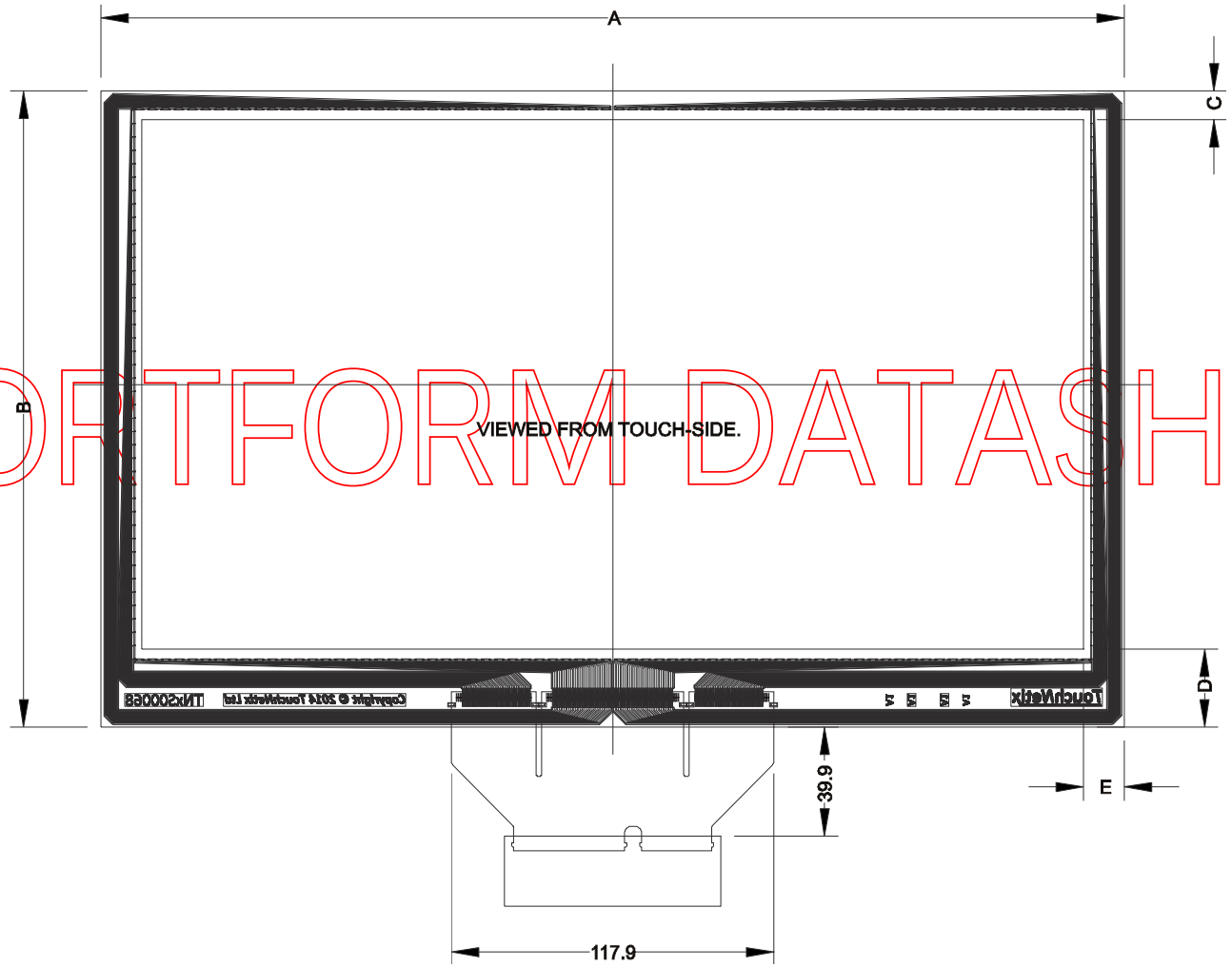
[5] To be fitted by customer or as part of 3rd party " moduler's" responsibility

[6] 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

[7] The Luminance series is designed to repel most LCD noise but there are so many LCD variants with radically different levels of noise emitted, that pre-testing is advised.

6 Mechanical Drawings

6.1 Without Lens



Specific model dimensions in mm (all +/-0.5mm unless noted):

Codename	Nominal Diagonal	Aspect Ratio	LCD-AA[28] size		Sensor size		Sensor edge to LCD-AA		
			LONG AXIS	SHORT AXIS	LONG AXIS "A"	SHORT AXIS "B"	TOP "C"	BOTTOM "D" (fpc edge)	LEFT & RIGHT "E"
Enki	7.0"	15:9	152.4	91.4	170.0	120.0	7.7	20.9	8.8
Mata	8.4"	4:3	170.4	127.8	184.0	149.4	4.7	16.9	6.8
Beli	10.1"	16:10	217.0	135.6	233.6	154.4	4.4	14.4	8.3
Milu	10.4"	4:3	211.2	158.4	233.0	188.7	7.6	22.7	10.9
Apis	12.1"	16:10	261.2	163.2	284.0	196.0	8.7	24.1	11.4
Lado	12.1"	4:3	245.8	184.3	268.0	216.8	8.5	24.0	11.1
Peko	12.3"	8:3	291.8	109.4	312.2	140.7	8.4	22.8	10.2
Enyo	15.6"	16:9	344.3	193.5	374.1	232.5	10.4	28.6	14.9
Fudo	15.0"	4:3	304.1	228.1	332.0	265.0	9.9	27.0	13.9
Vali	18.5"	16:9	409.7	230.4	440.5	271.0	11.2	29.4	15.4
Aray	19.0"	5:4	376.4	301.1	406.6	343.0	11.9	30.0	15.1
Mars	21.5"	16:9	475.2	267.3	500.0	306.0	11.2	27.5	12.4
Baku	24.0"	16:9	531.4	298.9	558.0	339.0	11.6	28.5	13.3

Table 6.1-1

[28] AA means Active Area and is the zone occupied by the LCD pixels, but excluding the narrow black non-pixelated margin before reaching the LCD metal frame edges

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 in the long axis.***
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 TNx for compatibility checks.***
4. ***3D Step data is available on request.***

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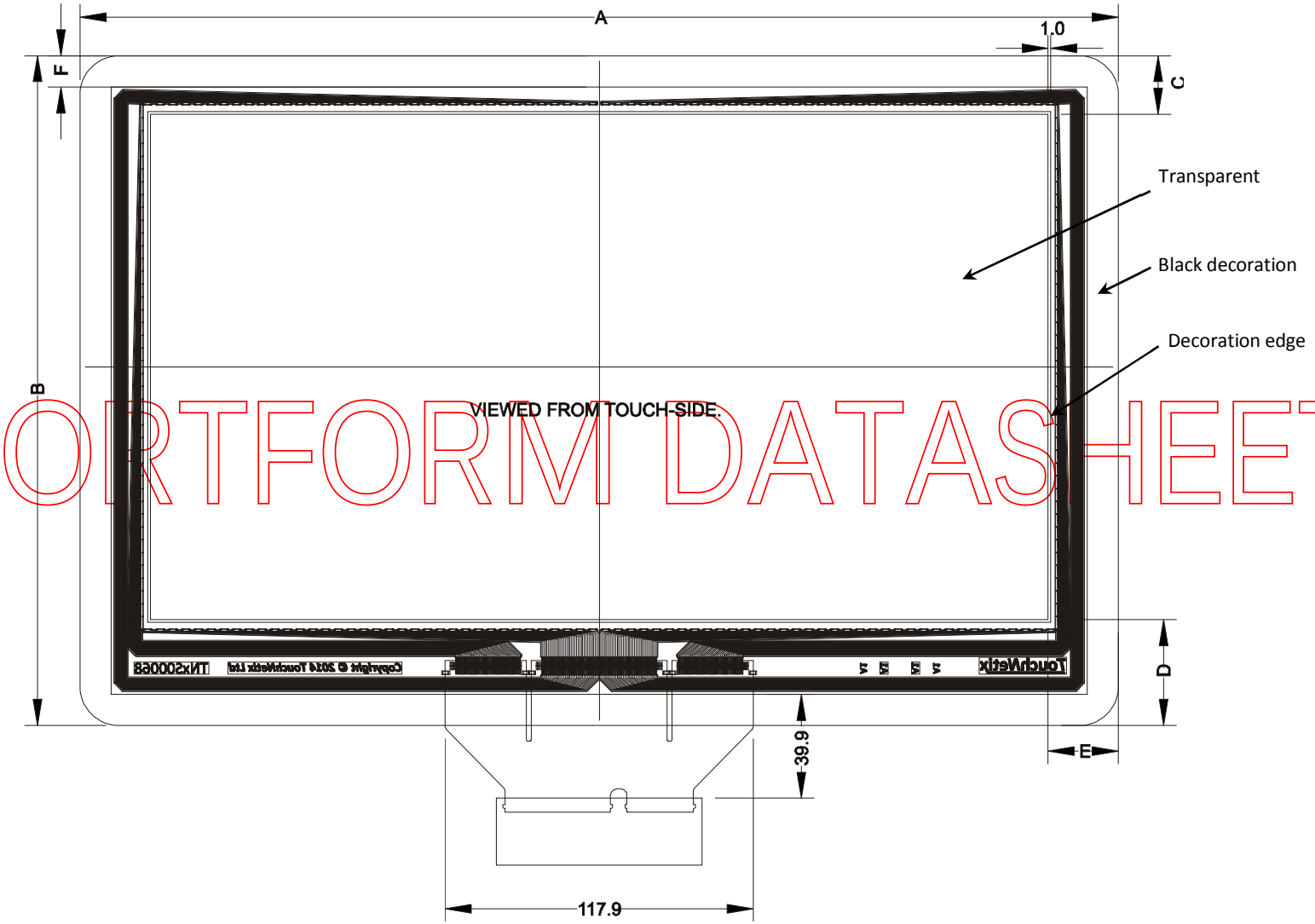
6.2 With Lens



Specific model dimensions in mm (all +/-0.5mm unless noted):

Codename	Nominal Diagonal	Aspect Ratio	Lens size	
			LONG AXIS "A"	SHORT AXIS "B"
Enki	7.0"	15:9	194.0	144.0
Mata	8.4"	4:3	213.0	180.0
Beli	10.1"	16:10	257.6	178.4
Milu	10.4"	4:3	257.0	212.7
Apis	12.1"	16:10	308.0	220.0
Lado	12.1"	4:3	292.0	240.8
Peko	12.3"	8:3	336.2	164.7
Enyo	15.6"	16:9	398.1	256.5
Fudo	15.0"	4:3	356.0	289.0
Vali	18.5"	16:9	464.5	295.0
Aray	19.0"	5:4	430.6	367.0
Mars	21.5"	16:9	524.0	330.0
Baku	24.0"	16:9	582.0	363.0

Table 6.2-1

Notes

1. ***All models: Dimension "F": the lens is 12mm larger all round than the sensor (excluding corner radii). To compute the distance from Lens edge to LCD-AA, Dimensions C, D and E, simply add 12mm to Dimensions C, D and E*** **from Table 6.1-1 "Sensor edge to LCD-AA"**
2. ***All models: The lens decoration opening is 1mm larger all round than the LCD-AA***
3. ***All models: The lens is 3mm nominal thickness with square ground edge and with nominal 0.5mm edge chamfers all round top and bottom.***
4. ***The Lens is bonded to the sensor with 0.5mm (+0.3/-0.2) optical adhesive. The adhesive may exceed the sensor glass profile by up to 1.0mm around its periphery. Take this into account when planning edge-bonded gaskets etc***
5. ***Overall assembly thickness is 4.2mm (+0.55/-0.35)***
6. ***See also 6.1 for sensor glass sizes for each model.***

7. ***Note that the FPC and Control Board lie centrally to the mid-line of the sensor in the horizontal axis.***
8. ***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 TNx for compatibility checks.***
9. ***The black region of the lens (decoration region) is shown above "non-filled" for clarity, only the decoration inner edge is shown for reference. Note that due to the above noted manufacturer-to-manufacturer variations in size, the standard lenses offered may not be perfect for some LCD modules. Consult TNx for customized options.***
10. ***3D Step data is available on request.***