

MVT-E050000	800 x 480	SPI/QSPI Interface	Aurum TFT Series
<b>Specification</b>			
Version: 1	Date: 10/12/2025		
<b>Revision</b>			
1	10/12/2025	First issue	Created By
			WE
			Checked By
			AB
			Box Quantity
			Weight / Display
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Display Features	
Display Size	5.00"
Resolution	800 x 480
Orientation	Landscape
Appearance	RGB
Supply Voltage	5-12V
Interface	SPI/QSPI
Brightness	1250 cd/m <sup>2</sup>
Touchscreen	---
Module Size	120.70 x 75.80 x 17.60mm
Operating Temperature	-30°C ~ +80°C
Pinout	N/A
Pitch	N/A



Also Available	
Part Number	Description
MVT-R050000(LCR)	5.0" RGB TFT, optional Lugs(L), CTP(C), RTP(R)
MVT-H050000(LCR)	5.0" HDMI TFT, optional Lugs(L), CTP(C), RTP(R)
MVT-E050000(LCR)	5.0" Embedded TFT, optional Lugs(L), CTP(C), RTP(R)

Display Accessories	
Part Number	Description





The Midas Embedded displays integrate a high-brightness TFT panel with a dedicated graphics controller, providing a ready-to-use display solution for embedded, industrial, and commercial applications. Designed for ease of integration, the module accepts a single 5–12 V supply and directly converts SPI and QSPI signals into full graphics.

The module is available in 4.3-inch to 10.1-inch panel sizes with brightness options up to 1250 nits, ensuring readability in outdoor and high-ambient-light environments. The touch is integrated into the graphics driver, allowing these to be read on the serial interface.

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This solution eliminates the need for costly embedded designs, allowing highly detailed interfaces to be created from cost-efficient micro-controllers. This also allows legacy applications to upgrade without needing a full design change.



# General Data

## Complete Module

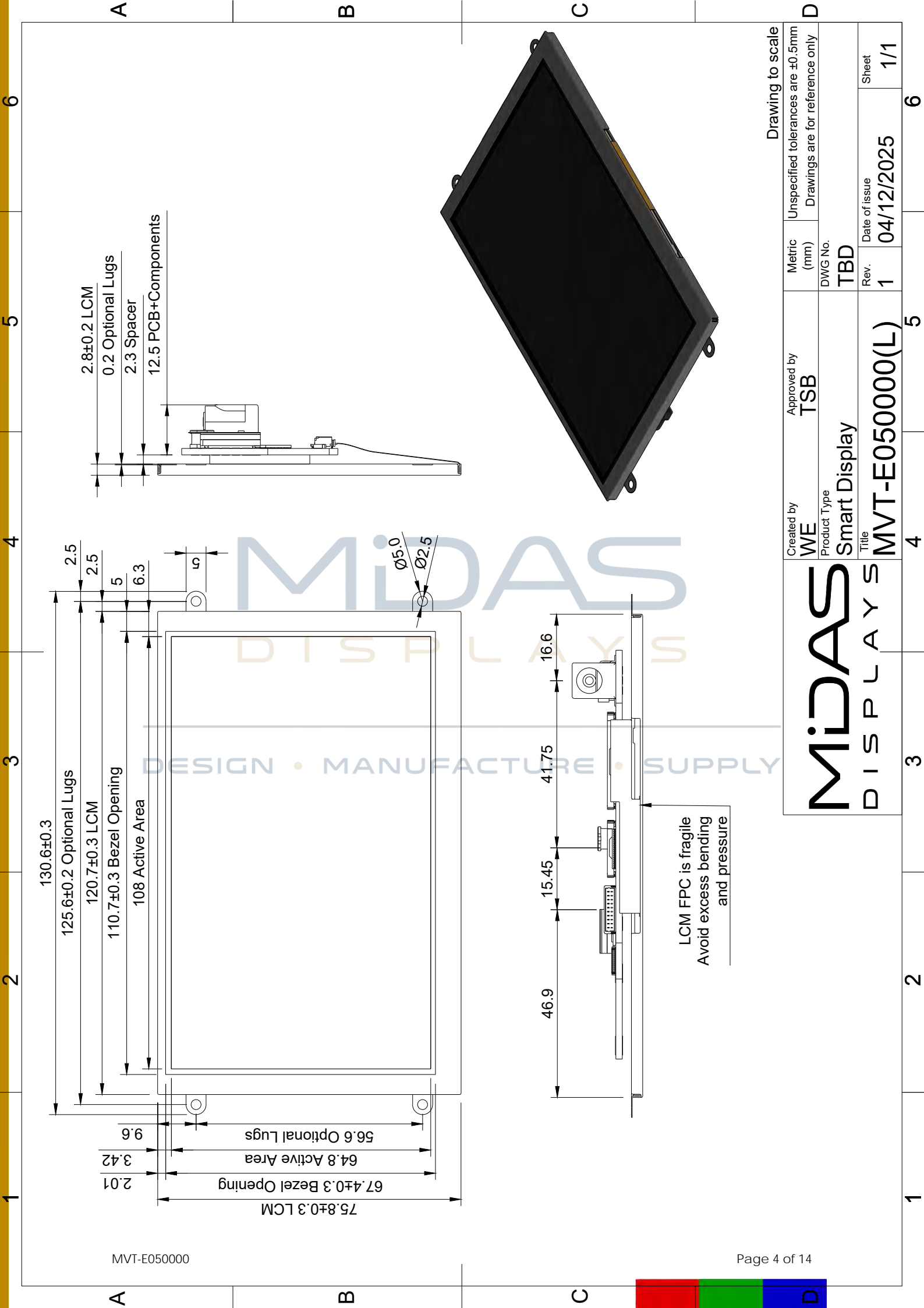
Feature	Value
Size (inch)	5.00
Resolution (pixels)	800(Horizontal) x 480(Vertical)
Type	TFT/IPS/NORMALLY BLACK/TRANSMISSIVE
Product Size (mm)	120.70 x 75.80 x 17.60
Active Area (mm)	108.00 x 64.80
Interface	SPI/QSPI
Connector type	Seeed XIAO Module/10W 1.0mm
Colour Depth	16.7 M
Pixel pitch (mm)	0.135 x 0.135
Luminance (cd/m <sup>2</sup> )	1250
Viewing Direction (O'clock)	All

## Aurum TFT Part Number Definition Example


MVT-	E	0500	00	L	C
1	2	3	4	5	6

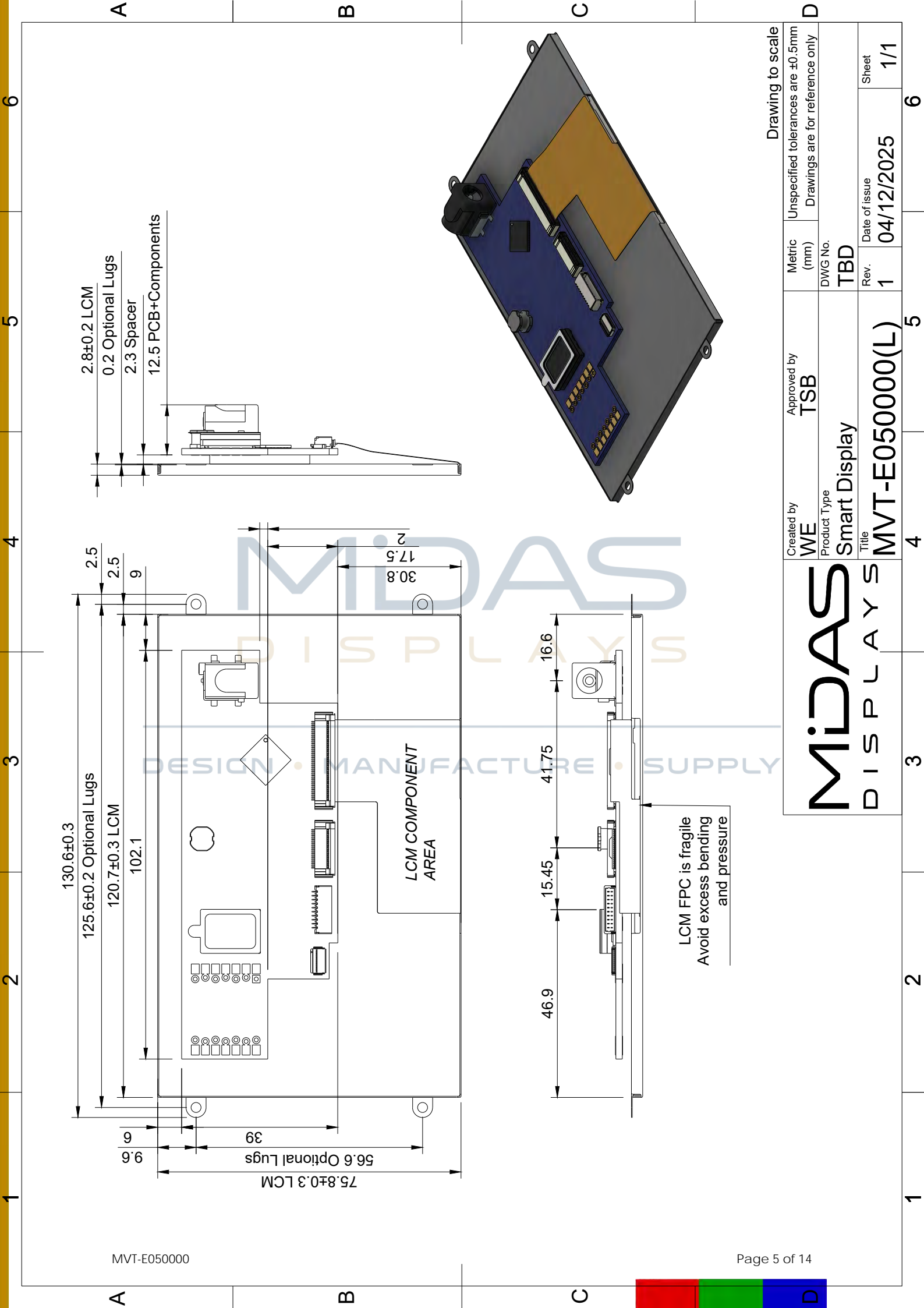
- 1 MVT: Midas Versatile TFT
- 2 Interface: R = RGB L = LVDS H = HDMI E = Embedded
- 3 Size: 4.3" = 0430 5.0" = 0500 7.0" = 0700 10.1" = 1010
- 4 Series: 00, 01, 02 etc
- 
- 5 Lugs: Blank = No Mounting Lugs L = Mounting Lugs
- 6 Touch: Blank = No Touch C = CTP R = RTP





MVT-E050000

	Created by	Approved by	Metric (mm)	Drawing to scale
	WE	TSB	(mm)	Unspecified tolerances are ±0.5mm
DESIGN • MANUFACTURE • SUPPLY	Product Type	Smart Display	DWG No.	Drawings are for reference only
	Title	MVT-E050000(L)	TBD	
	Rev.	1	Rev.	Date of issue
			1	04/12/2025
				Sheet
				1/1



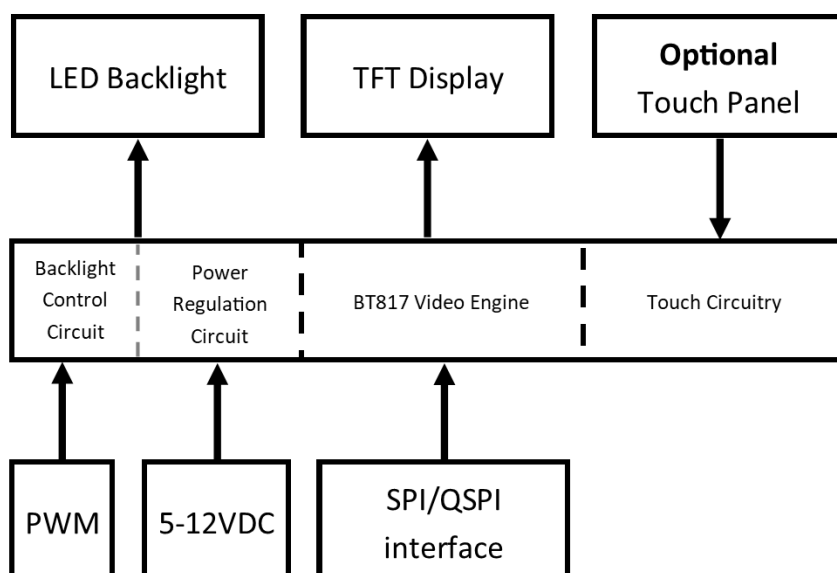
Drawing to scale

Created by <b>WE</b>	Approved by <b>TSB</b>	Metric (mm)	Unspecified tolerances are ±0.5mm
Product Type <b>Smart Display</b>	DWG No. <b>TBD</b>	Drawings are for reference only	
Title <b>MVT-E050000(L)</b>	Rev. <b>1</b>	Date of issue <b>04/12/2025</b>	Sheet <b>1/1</b>

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## Block Diagram



## Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Power Supply Voltage	VDD	+4.7	+14.5	V
Operating temperature	Top	-30	+80	°C
Storage temperature	Tst	-30	+80	°C

## Electrical Characteristics

### Operating Conditions

Item	Symbol	Min	Typ.	Max	Unit
Power Supply	VDD	4.75	-	12	V
Logic voltage	Vil	3	3.3	3.6	V
Supply Current <i>Checkerboard 100% Brightness</i>	IL	-	TBA	-	mA

### Backlight Conditions

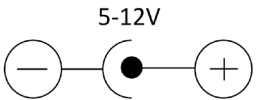
Item	Symbol	Min	Typ.	Max	Unit
PWM Backlight Control	Logic High	-	5	5.5	V
	Logic Low	-0.3	0	-	V
PWM Control Freq.	-	-	1000	-	Hz

# Pin Assignment

## XIAO Module – Optional Seed XIAO ESP32-C3/RP2040 Board

Pin No.	Symbol	Description
1	/PWDN	Power control for E-Fuse (Active Low)
2	/INT	BT817Q Interrupt Output (Active Low)
3	/PD	BT817Q Power down (Active Low)
4	/CS	BT817Q Chip select (Active Low)
5	SDA	Optional I2C Data
6	SCL	Optional I2C Clock
7	TX	Optional UART TX
8	RX	Optional UART RX
9	SCK	BT817Q SPI Serial Clock
10	MISO	BT817Q SPI MISO
11	MOSI	BT817Q SPI MOSI
12	NC	Not Connected (Isolated pad)
13	GND	Ground
14	USB 5V	5V Supply from XAIO board USB input

## CN3 – Barrel Jack

Pin No.	Symbol	Description	Note
1	GND	Ground	
2	GND	Ground	
3	VIN	5-12V Input	
4	VIN	5-12V Input	

## CN4 – Pin Header

Pin No.	Symbol	Description
1	VIN	5-12V Input
2	PWM	External backlight PWM input
3	GND	Ground

## CN5 – JST SM10B-SRSS-TB-(LF)(SN) (mating part SHR-10V-S-B)

Pin No.	Symbol	Description
1	GND	Ground
2	GND	Ground
3	/INT	BT817Q Interrupt output (Active Low)
4	/PD	BT817Q Power down (Active low)
5	IO3	QSPI D3
6	IO2	QSPI D2
7	MISO	SPI MISO
8	MOSI	SPI MOSI
9	/CS	BT817Q Chip select (Active low)
10	SCK	SPI Clock



## CN6 – 20 pin 0.5mm pitch FCC (Bottom Contact)

Pin No.	Symbol	Description
1	SCK	SPI Clock
2	/CS	BT817Q Chip select (Active low)
3	MOSI	SPI MOSI
4	MISO	SPI MISO
5	IO2	QSPI D2
6	IO3	QSPI D3
7	/PD	BT817Q Power down (Active low)
8	/INT	BT817Q Interrupt output (Active low)
9	GND	Ground
10	PW-DN	Board power down (Active low)
11	RX/SCL	Seeed XIAO RX (UART) or SCL (I2C)
12	TX/SDA	Seeed XIAO TX (UART) or SDA (I2C)
13	AUD-LN	Audio Line Out
14	SP-	Speaker Negative
15	SP+	Speaker Positive
16	GND	Ground
17	RAW VIN	5-12V input
18	RAW VIN	5-12V input
19	RAW GND	Ground input
20	RAW GND	Ground input

## Solder Links

Link	Description
60	4.3" Backlight Selection – Other backlight links must <b>NOT</b> be soldered
80	5.0" Backlight Selection – Other backlight links must <b>NOT</b> be soldered
120	7.0" Backlight Selection – Other backlight links must <b>NOT</b> be soldered
5VIN=VUSB	Power Seeed XIAO from board 5V regulator*
LK1	Link to common VIN with 5V regulator output*
LK8	Common the USB 5V with VIN to power product through USB input
UPDN	Scan from Top to Bottom
LR	Scan from Right to Left
XR	Internal use only
YD	Internal use only
XL	Internal use only
YU	Internal use only
SEL6	Internal use only
*Must not be linked when VIN > 5V	



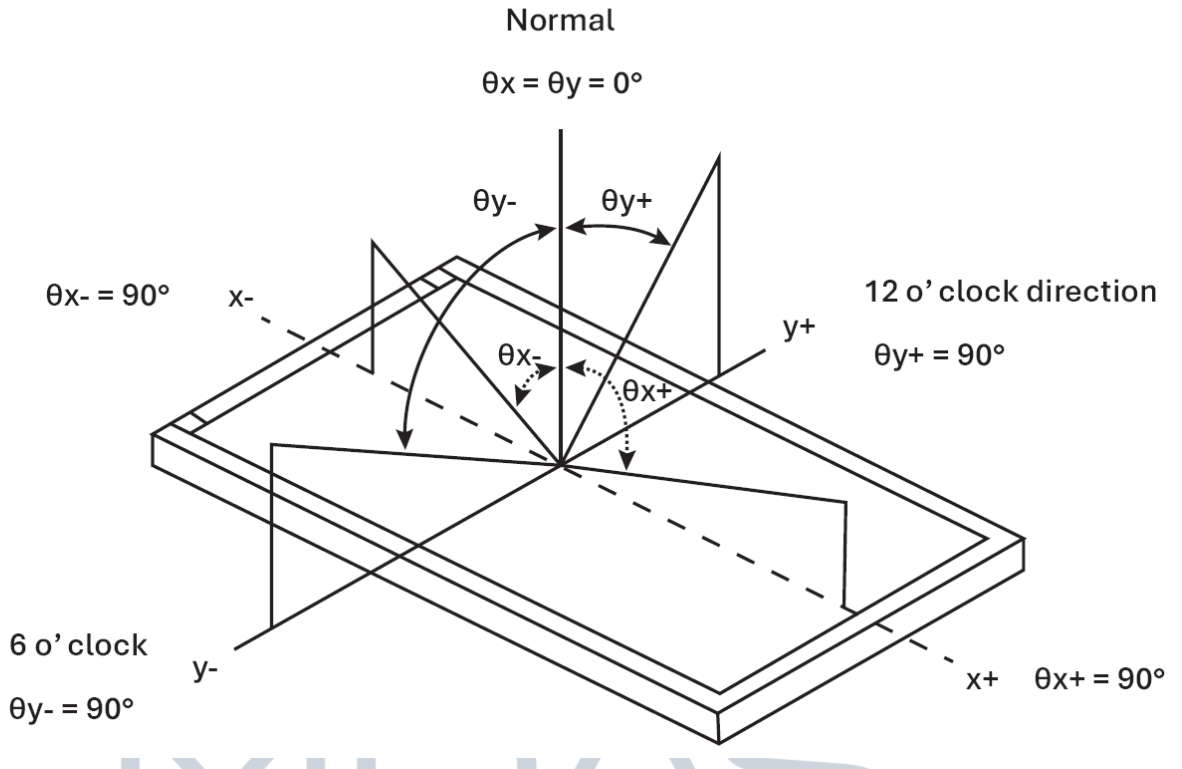
## Optical Characteristics

Item	Symbol	Conditions	Specifications			Unit	
			Min	Typ.	Max		
Luminance (Without CTP)	L		-	1250	-	cd/m <sup>2</sup>	
Contrast ratio	CR	$\theta=0^\circ$	800	1000	-		
Response time	Rising	Tr	25°C	-	30	40	ms
	Falling	Tf					
CIE Colour Coordinate	RED	XR	Normal Viewing Angle	+/-0.02	0.629	+/-0.02	
		YR			0.326		
	GREEN	XG			0.337		
		YG			0.546		
	BLUE	XB			0.136		
		YB			0.143		
	WHITE	XW			0.320		
		YW			0.345		
Viewing Angle	Hor.	$\theta_{x+}$	CR $\geq$ 10	70	80	-	Degree
		$\theta_{x-}$		70	80	-	
	Ver.	$\theta_{y+}$		70	80	-	
		$\theta_{y-}$		70	80	-	

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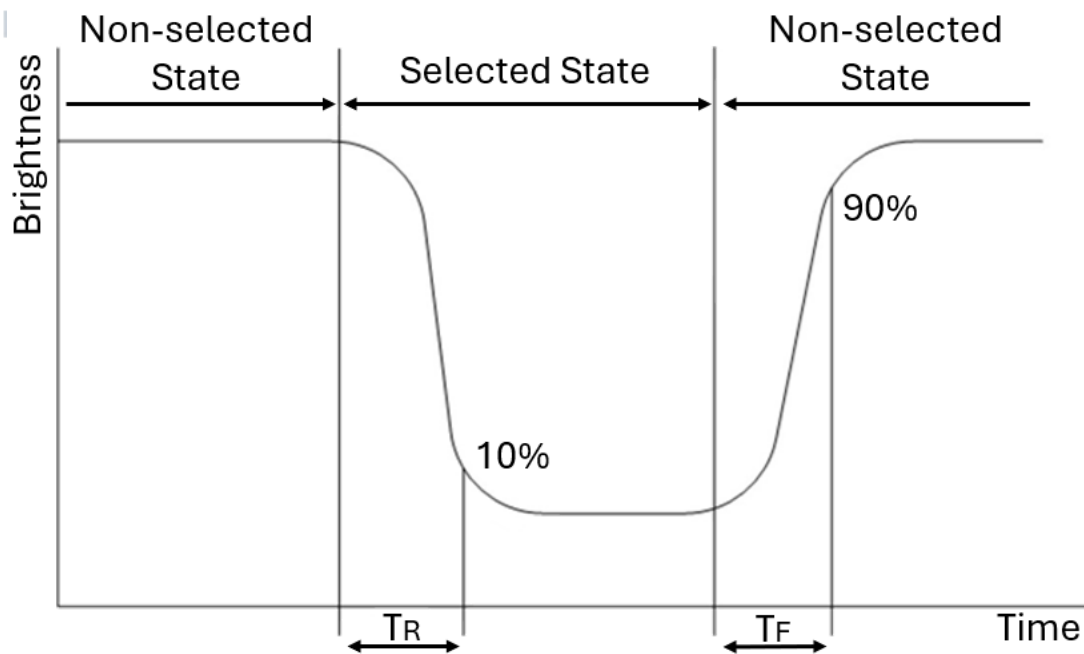
Definition of viewing angle  $\theta_x$  and  $\theta_y$ :



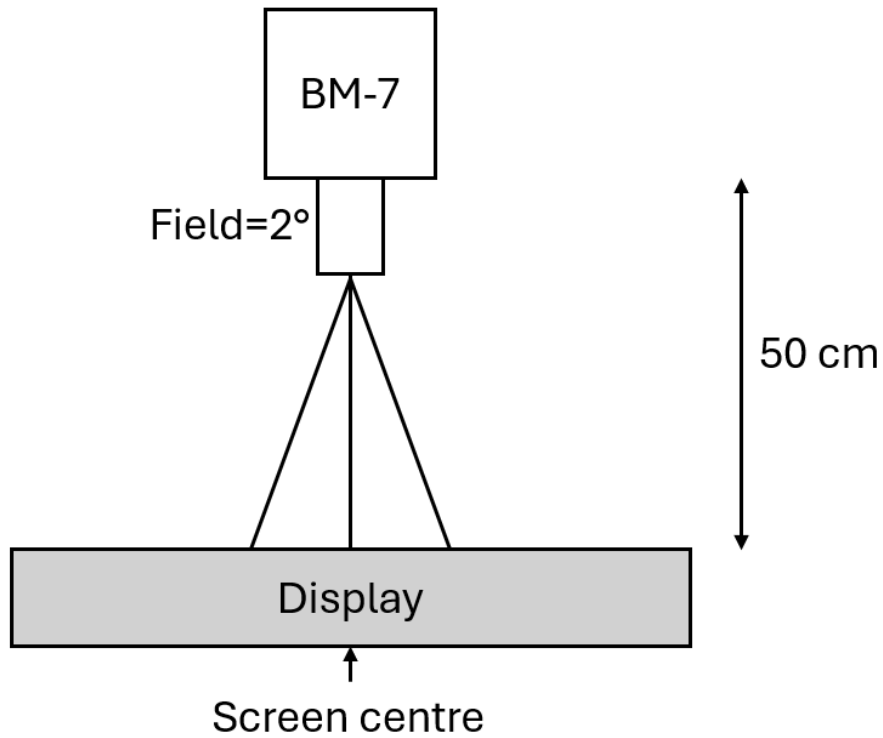
Definition of contrast ratio:

$$CR = \frac{\text{Brightness of non-selected dots (white)}}{\text{Brightness of selected dots (black)}}$$

Definition of response time:

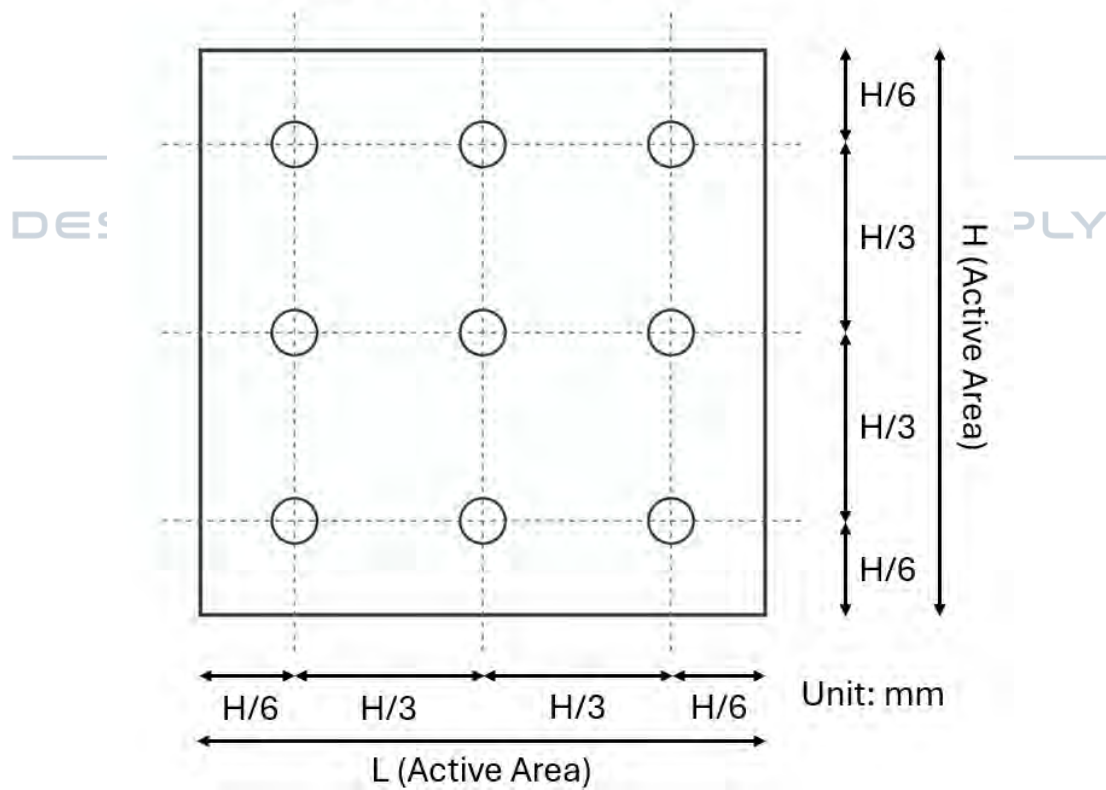


# Brightness Test Equipment Setup



Field = 2° (As measuring "black" image, field = 2° is the best testing condition)

## Brightness Test Point Setup



## Reliability Test – PENDING

Environmental Item	CONDITIONS	
High Temperature Storage	TA=80°C	96H
Low Temperature Storage	TA=-30°C	96H
High Temperature Operation	TA=80°C	96H
Low Temperature Operation	TA=-30°C	96H
High Temperature and High Humidity Operation	+60°C, 90%RH	96H
Thermal Shock	-30°C → +80°C	0.5H:5CYCLES

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## Handling Precautions

- The display panel is constructed of glass. Refrain from exposing it to mechanical shock, such as dropping it from a height.
- The display should not be disassembled as this can impact the functionality and invalidate the warranty.
- In the event of damage to the display panel resulting in leakage of the liquid crystal substance, it is imperative not to ingest the substance. If contact occurs with skin or clothing, please wash the affected area thoroughly with soap and water immediately.
- Do not apply excessive force to the display surface or adjoining areas, as this may cause colour tone variations.
- The polariser covering the display surface of the LCD module is soft and easily scratched. Handle this polariser carefully.
- To prevent damage to the elements by static electricity, observe EMI precautions.
- Ensure that the body is grounded when handling the LCD module.
- Tools required for assembly, such as soldering irons, must be properly grounded.
- To reduce the generation of static electricity, avoid conducting assembly and other work under dry conditions.
- The LCD module is coated with a film to protect the display surface. Exercise caution when peeling off this protective film, as static electricity may be generated.
- Use only specific solvents, like Isopropyl or Ethyl alcohol, for cleaning the display. Clean with a soft, clean cloth and avoid submerging the display.
- The removal of the protective tape over components may result in damage or cause detachment from their solder pads.
- To minimise potential performance degradation of the LCD modules due to static electricity or other factors, please exercise caution when handling the modules. Avoid touching the following areas:
  - The exposed sections of the printed circuit board
  - The terminal electrode sections.

## Assembly Precautions

- Do not make alterations or modifications to the display, including the glass, printed circuit board, components or FFC/FPC unless advised by Midas as this will invalidate the warranty.
- Solder should only be applied to the specified terminals. For direct solder displays, a hot bar should be used, with 250-300°C for 3-5 seconds.
- The mounting method should not add mechanical stress upon the display.
- Assembling operators should be grounded during the entire process of handling the display. Likewise, any tools, such as soldering irons, should be properly grounded.
- Avoid cleaning solutions from the assembly process, such as solder flux cleaning fluids, from getting onto the display as this can leak into the housing and cause internal damage.
- Assembly should be conducted under ESD safe conditions to reduce the risk of static electricity.
- Continuous high temperatures during assembly may cause deformation or damage.
- Care should be taken when bending the FFC/FPC, as continuous bends may wear out the circuitry.
- The plating of the FFC/FPC can be worn down by multiple insertions.
- Lead free solder should be used to adhere with RoHS



## Operation Precautions

- The maximum ratings of the display should never be exceeded, or functionality cannot be guaranteed.
- Sudden shutdown caused by forced removal of the power supply may cause damage to the electronics of the display.
- Temperature and environment can influence the display and electronics, and the display should be tested by the end customer within expected working conditions to check for satisfactory performance.
- The user should implement external over-current and over-voltage protection.
- Do not apply signals to the logic input if the display is not powered
- A constant current source is recommended for the operation of the backlight. Using a constant voltage source without adequate current limitations can permanently damage the backlights operation.
- If the LCD modules have been operating for a long time showing the same display patterns may remain on the screen as ghost images and a slight contrast irregularity may also appear. Abnormal operating status can be resumed to be normal condition by suspending use for some time. It should be noted that this phenomenon does not adversely affect performance reliability.

## Others

- Liquid crystals solidify at low temperature (below the storage temperature range) leading to defective orientation of liquid crystal or the generation of air bubbles (black or white). Air bubbles may also be generated if the module is subjected to a strong shock at a low temperature.
- When storing the LCD modules, avoid exposure to direct sunlight or light from fluorescent lamps. Keep the modules in bags designed to prevent static electricity charging under low temperature and normal humidity conditions (avoid high temperature, high humidity, and temperatures below 0°C). Whenever possible, store the LCD modules in the same packaging as when they were shipped from Midas.
- Midas maintains the right to change the passive components, and the PCB revision without informing the customer with the intent to continue supplying the product with the same or better performance.
- This display is supplied as a component for use within a completed assembly. As such it should be tested within the completed unit for suitability. Performance may vary depending on external components.
- This device will have susceptibility to external noise and interference; care should be taken to isolate or shield the product if necessary. Cables may require additional shielding or shortening.
- The disposal of a display should be handled by qualified industrial waste management and is not for standard waste disposal.
- Midas's warranty liability is strictly confined to the repair and replacement of purchased products. Midas shall not be held liable for any consequential damages.
- The warranty period for products sold from Midas Displays is 12 months from dispatch, unless otherwise stated. Terms and conditions apply.

