晶采光電科技股份有限公司
AMPIRE CO., LTD.

Specifications for LCD module

Customer	
Customer part no.	
Ampire part no.	**AM-1280720L2TZQW-A3H**
Approved by	
Date	

☐ **Preliminary Specification**
☐ **Formal Specification**

Approved by	Checked by	Organized by
Patrick	Kokai	Lawlite

This Specification is subject to change without notice.

RECORD OF REVISION

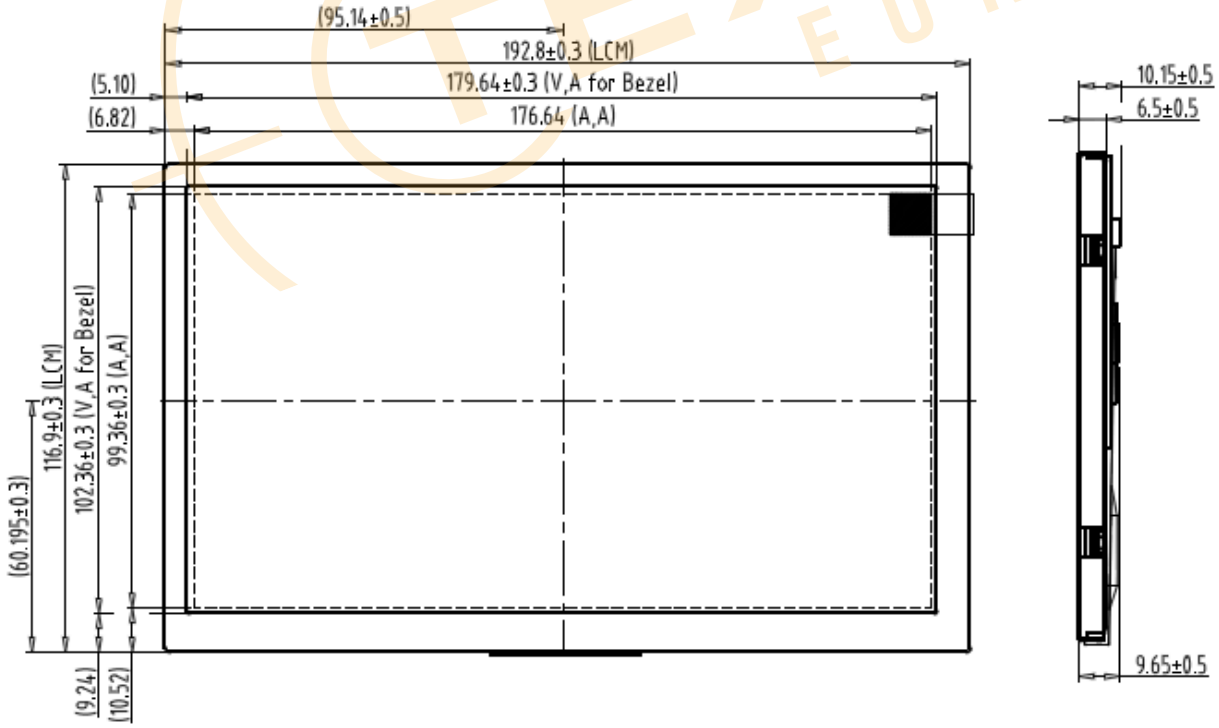
Revision Date	Page	Contents	Editor
2020/11/10	-	New Release	Lawlite

1. Features

8” TFT Liquid Crystal Display module is a color active matrix thin film transistor (TFT) liquid crystal display (LCD) that uses amorphous silicon TFT as a switching device. It is composed of a TFT LCD panel, a timing controller, voltage reference, common voltage, column driver, row driver circuit. This TFT LCD has an 8 inch diagonally measured active display area with 1280 horizontal by 720 vertical pixel array resolutions.

2. Physical Specifications

Item	Specifications	Remark
LCD size	8 inch(Diagonal)	
Driver element	a-Si TFT active matrix	
Display resolution	1280 (W) × 3(RGB) x 720(H) dots	
Display mode	Normally Black, Transmissive (IPS)	
Pixel size	0.1380 (W) x 0.1380 (H) mm	
Color arrangement	R.G.B-stripe	
Interface	LVDS	
Color Depth	16.7M	



3. Absolute Maximum Ratings

Item	Symbol	Values		Unit	Remark
		Min.	Max.		
Power Voltage	VDD	-0.3	4.0	V	GND=0V, TA=25℃
Operation Temperature	TOP	**-30**	**85**	℃	
Storage Temperature	TST	**-30**	**85**	℃	

Note(1) The absolute maximum rating values of this product are not allowed to be exceeded at any times. Should a module be used with any of the absolute maximum ratings exceeded, the characteristics of the module may not be recovered, or in an extreme case, the module may be permanently destroyed.

4. Electrical Specifications

4.1 Typical Operation Conditions

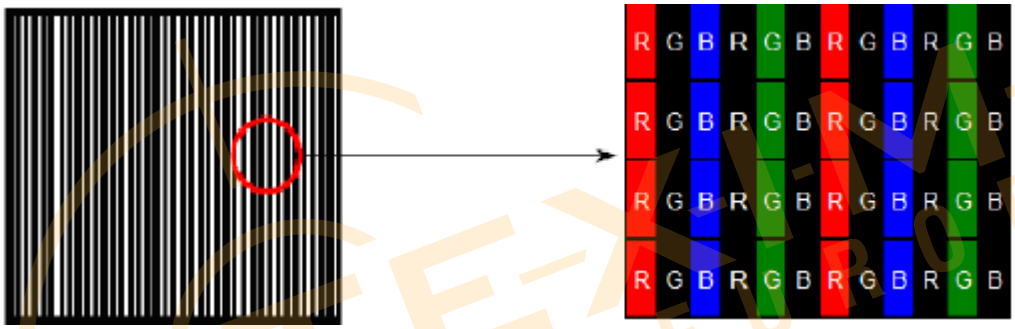
Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Power Voltage	VDD	3.0	3.3	3.6	V	Note(1),(2)
Power Consumption	IVDD	--	--	180	mA	Note (1),(2),(3) VDD=3.3V

Note(1) Value for Power Board combined panel.

Note(2) VDD setting should match the signals output voltage (refer to Note 3) of customer's system board.

Note(3) VDD current capacity >1.5A

The specified VDD current and power consumption are measured under the VDD = 3.3 V, FV= 60 Hz condition and V-Stripe pattern.



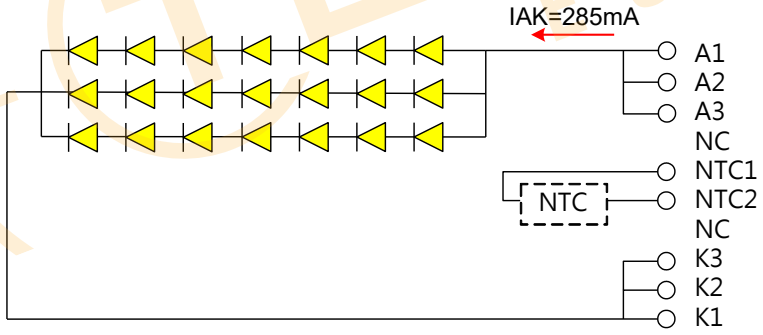
4.2 LED Driving Conditions

Item	Symbol	Min.	Typ.	Max.	Unit	Condition
LED Driver Power Supply	V_{LED}	10.5	12	12.5	V	
LED Power Supply current V_{LED}=12V	I_{VLED}		(950)	--	mA	VLED=12V
ADJ Signal Logic High	VIH	2.4	--	5.5	V	
ADJ signal logic Low	VIL	0	--	0.7	V	
ADJ Frequency	Fpwm	100		1K	Hz	
LED Backlight Voltage	VAK	19	21	23	V	IAK=285mA
LED Backlight Current	IAK	--	285	--	mA	Ta=25℃
LED Life Time		--	50	--	kHr	Note(1)

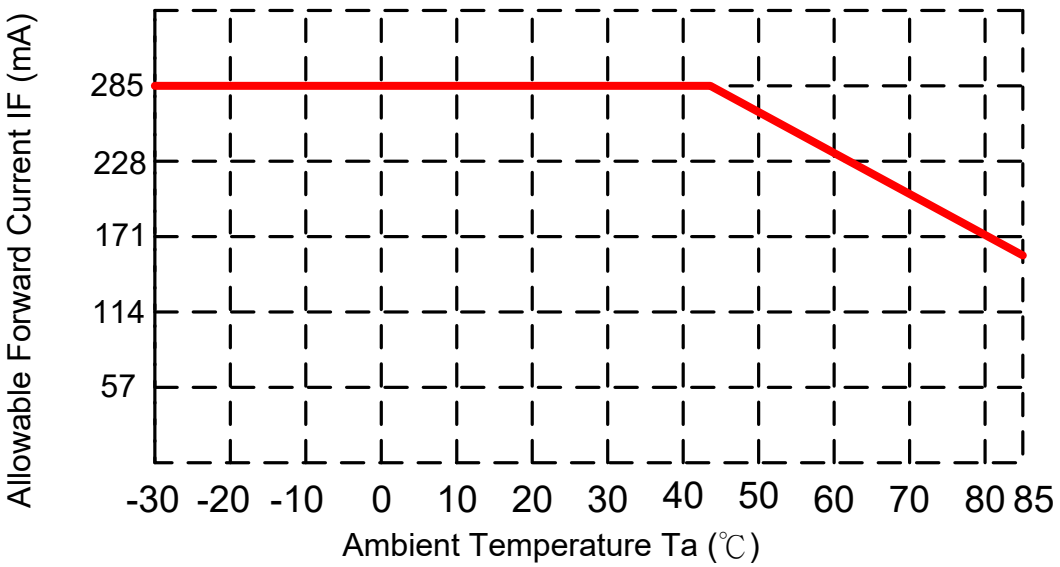
Note(1) The brightness is decreased to 50% of the initial value. Ta=25℃

Note(2) The structure of LED B/L shows as below:

- 7 Serial x 3 parallel LED.
- The default is without NTC resistor.



Note(3) When LCM is operated over 40℃ ambient temperature, the IAK should be follow :



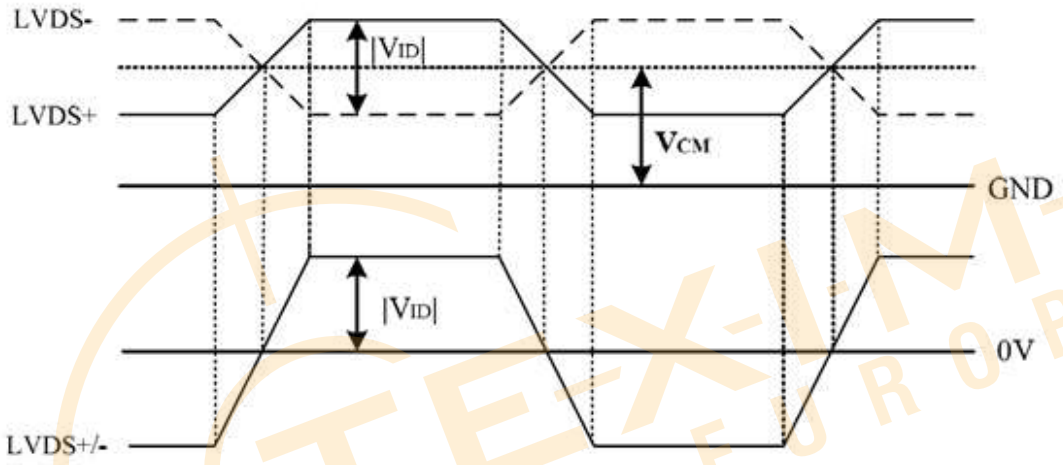
5. LVDS Signal Timing Characteristics

5.1 AC Electrical Characteristics

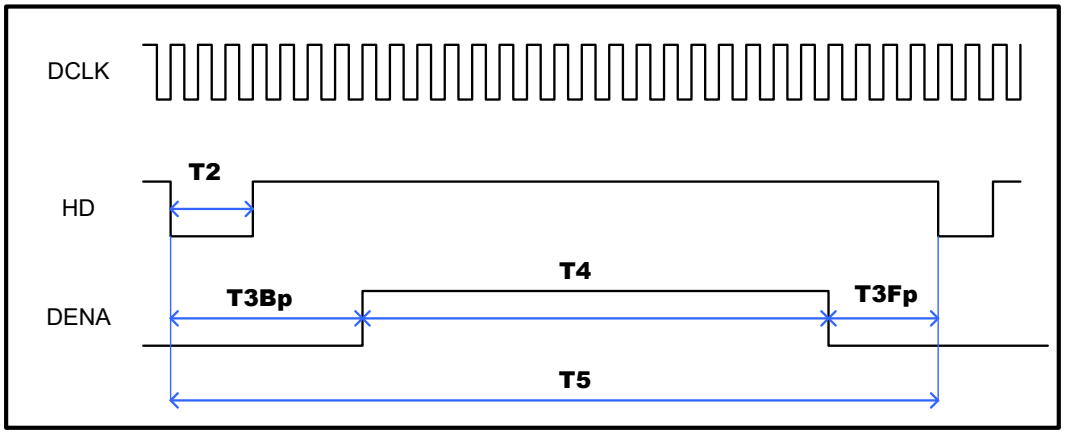
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Differential Input High	Vth	-	-	+100	mV	V_{CM}=+1.2V
Differential Input Low	Vtl	-100	-	-	mV	V_{CM}=+1.2V
Magnitude Differential Input	$\|V_{ID}\|$	200	-	400	mV	-
Common Mode Voltage	V_{CM}	0.3+(VID/2)	-	VDD-1.2-(VID/2)	V	-
Common Mode Voltage	ΔV_{CM}	-	-	50	mV	V_{CM}=+1.2V

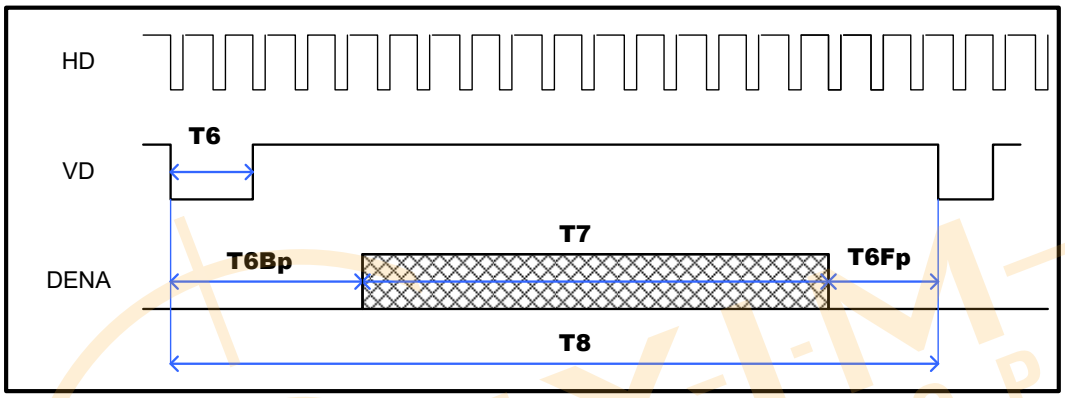
Note (1) Input signals shall be low or Hi-Z state when VDD is off.

(2) All electrical characteristics for LVDS signal are defined and shall be measured at the interface connector of LCD.



5.2 TTL Timing Table

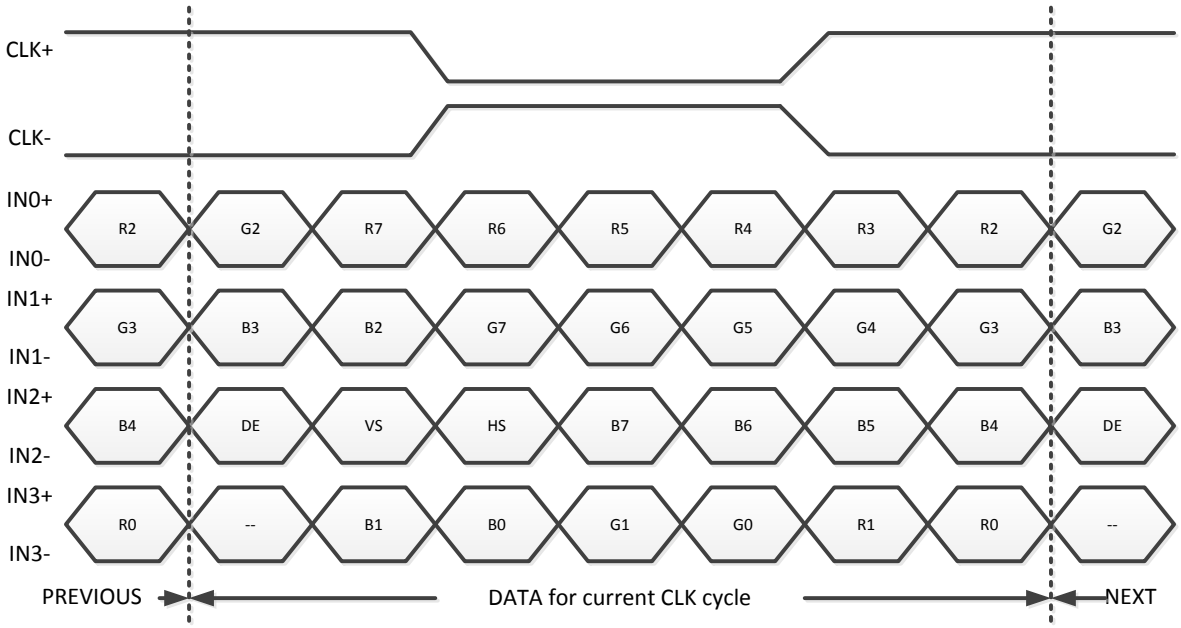




Item	Symbol	Min.	Typ.	Max.	Unit
Clock Frequency	1/T1	69.49	71.15	75.54	MHz
Horizontal Blanking	T3Fp+T3Bp	224	260	286	Clocks
Horizontal Display Period	T4	--	1280	--	Clocks
Horizontal total Period	T5	1524	1540	1566	Clocks
Vertical Blanking	T6Fp+T6Bp	40	50	84	Lines
Vertical Display Period	T7	--	720	--	Lines
Vertical total Period	T8	760	770	804	Lines

5.3 LVDS Input Data Format

JEIDA Format 24BIT LVDS



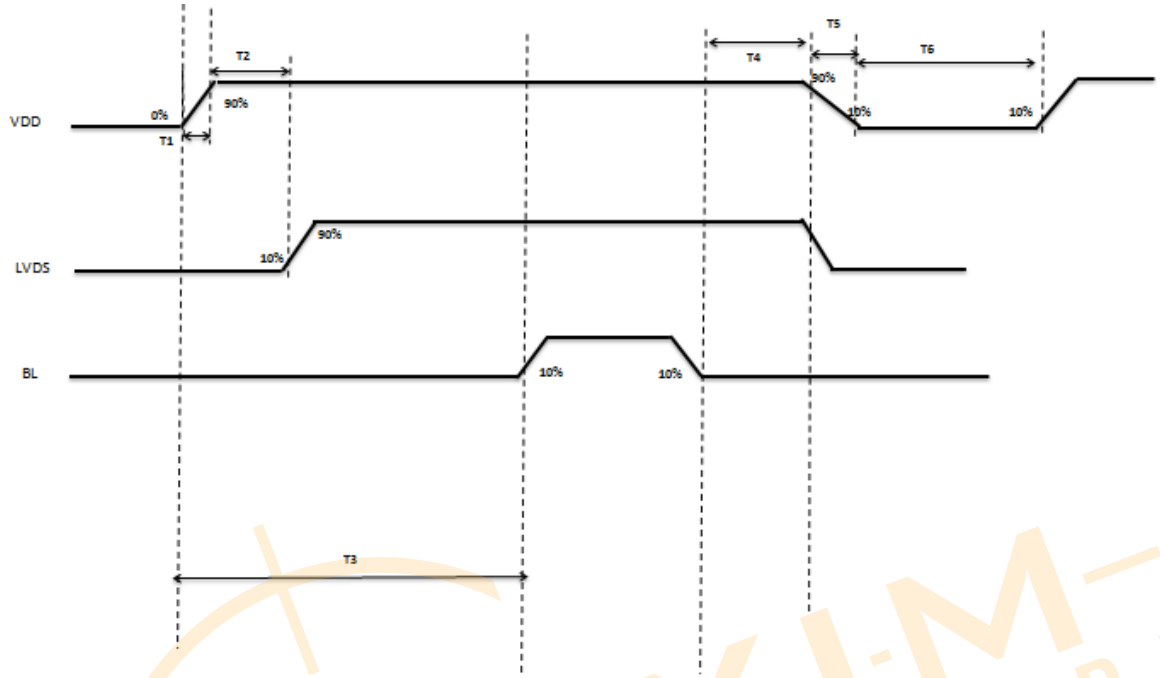
Note: R/G/B data 7: MSB, R/G/B data 0: LSB

Signal Name	Description	Remark
R7 R6 R5 R4 R3 R2 R1 R0	Red Data 7 (MSB) Red Data 6 Red Data 5 Red Data 4 Red Data 3 Red Data 2 Red Data 1 Red Data 0 (LSB)	Red-pixel Data Each red pixel's brightness data consists of these 8 bits pixel data.
G7 G6 G5 G4 G3 G2 G1 G0	Green Date 7 (MSB) Green Date 6 Green Date 5 Green Date 4 Green Date 3 Green Date 2 Green Date 1 Green Date 0 (LSB)	Green-pixel Data Each green pixel's brightness data consists of these 8 bits pixel data.
B7 B6 B5 B4 B3 B2 B1 B0	Blue Data 7 (MSB) Blue Data 6 Blue Data 5 Blue Data 4 Blue Data 3 Blue Data 2 Blue Data 1 Blue Data 0 (LSB)	Blue-pixel Data Each blue pixel's brightness data consists of these 8 bits pixel data.
CLKP CLKN	LVDS Clock Input	
DE	Display Enable	
VS	Vertical Sync Signal	
HS	Horizontal Sync Signal	

5.4 Power On/OFF Timing

(1) Interface signals are also shown in the chart. Signals from any system shall be Hi-resistance state or low level when VDD voltage is off.

(2) When system first start up, should keep the VDD high time longer than 200ms, otherwise may cause image sticking when VDD drop off.



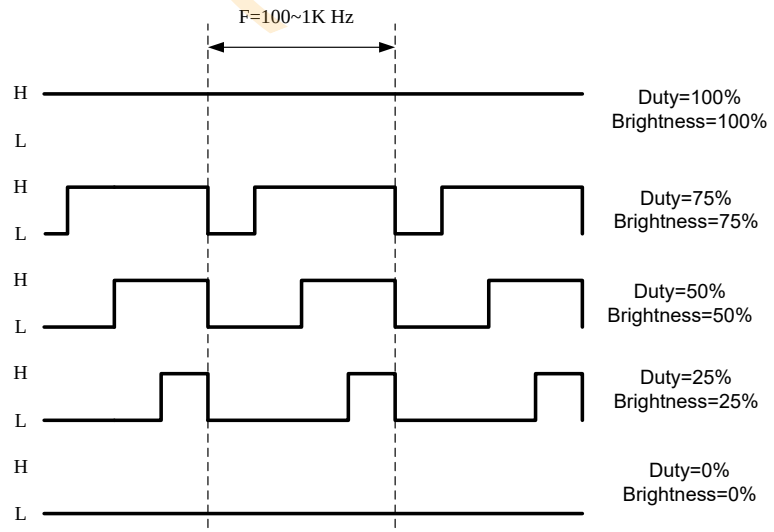
Item	Symbol	Min.	Typ.	Max.	Unit	Remark
VDD rising time 0%~90%	T1	(1)	-	(10)	ms	
VDD90% to LVDS10%	T2	(2)	-	-	ms	
VDD rising time 0%to BL10%	T3	(190)	-	-	ms	
BL Off to VDD off	T4	(90)	-	-	ms	
VDD falling time	T5	-	-	(1)	s	
VDD restart time	T6	(1)	-	-	s	

6. Interface

CN4 : P1.0 20PIN / CP100-S20G-H16 or Equivalent

Pin No.	Symbol	Function
1	VDD	POWER SUPPLY:3.3V
2	VDD	POWER SUPPLY:3.3V
3	GND	Power Ground
4	GND	Power Ground
5	IN0-	Transmission Data of Pixels
6	IN0+	Transmission Data of Pixels
7	GND	Power Ground
8	IN1-	Transmission Data of Pixels 1
9	IN1+	Transmission Data of Pixels 1
10	GND	Power Ground
11	IN2-	Transmission Data of Pixels 2
12	IN2+	Transmission Data of Pixels 2
13	GND	Power Ground
14	CLK-	Sampling Clock
15	CLK+	Sampling Clock
16	GND	Power Ground
17	IN3-	Transmission Data of Pixels 3
18	IN3+	Transmission Data of Pixels 3
19	VLED	POWER SUPPLY for Backlight : **12V**
20	ADJ	LED PWM SIGNAL (Note 1)

(Note 1)



7. Optical Specifications

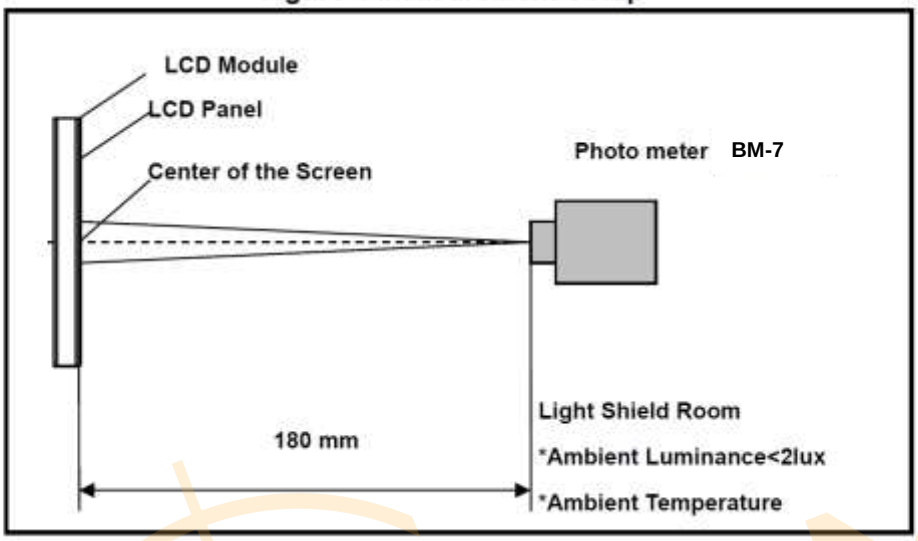
Item	Conditions		Min.	Typ.	Max.	Unit	Note
Viewing Angle (CR>10)	Horizontal	θx+	(80)	(85)	-	degree	(1),(2),(3)
		θx-	(80)	(85)	-		
	Vertical	θy+	(80)	(85)	-		
		θy-	(80)	(85)	-		
Contrast Ratio	Center		800	900	-	-	(1),(2),(4)
Response Time	Rising		-	-	-	ms	(1),(2),(5)
	Falling		-	-	-	ms	
	Rising + Falling		-	-	35	ms	
Color Chromaticity (CIE1931)	NTSC		70	75	-	%	(1),(2)
	Red	x	Typ. -0.05	0.664	Typ. +0.05	-	(1),(2)
	Red	y		0.328		-	
	Green	x		0.253		-	
	Green	y		0.601		-	
	Blue	x		0.138		-	
	Blue	y		0.093		-	
	White	x		0.299		-	
	White	y		0.323		-	
White Luminance	Center		**640**	**800**	-	cd/m^2	(1),(2),(6)
Luminance Uniformity	9Points		70	75	-	%	(1),(2),(6)

Note(1)

Measurement Setup:

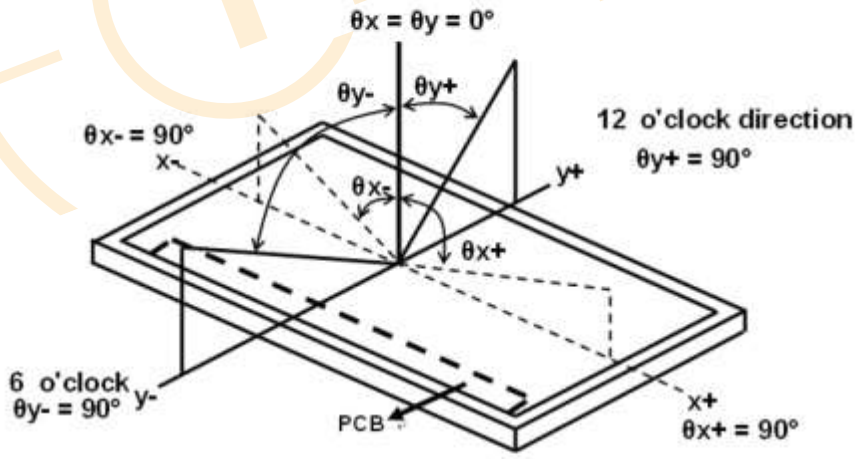
The LCD module should be stabilized at given temperature(25℃) for 15 minutes to Avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting backlight for 15 minutes in a windless room.

Figure 4 Measurement Setup



Note(2) The LED driving current IAK=540mA

Note(3) Definition of viewing angle:



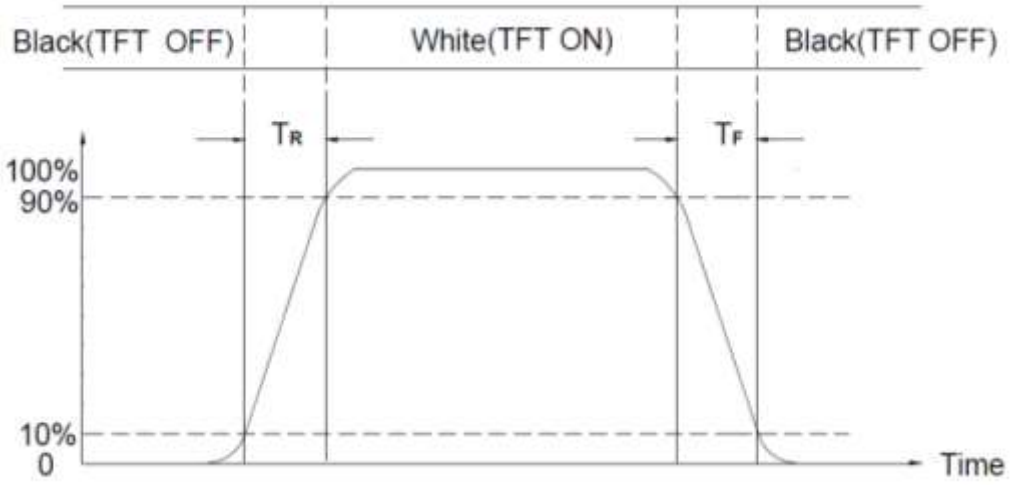
Note(4) Definition of Contrast Ratio (CR)

The contrast ratio can be calculated by the following expression

Contrast Ratio (CR) = L255 / L0

L63: Luminance of gray level 255, L0: Luminance of gray level 0

Note(5) Definition of Response Time (TR, TF)



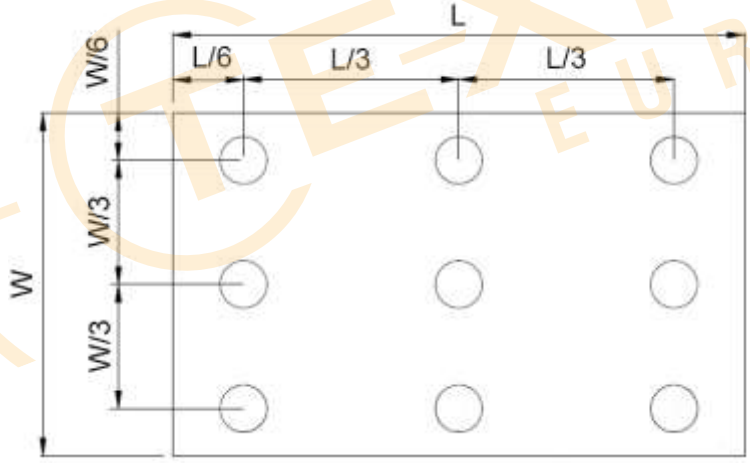
Note(6) Definition of Luminance Uniformity

Active area is divided into 9 measuring areas (Refer to bellow figure).

Every measuring point is placed at the center of each measuring area.

$$\text{Luminance Uniformity (Yu)} = \frac{Bmin}{Bmax}$$

L ----- Active area length W ----- Active area width



Bmax : The measured maximum luminance of all measurement position.

Bmin : The measured minimum luminance of all measurement position.

8. Reliability Test Conditions

Test Item		Test Conditions	Note
High Temperature Operation		85±3°C ,Dry t=240 hrs	
Low Temperature Operation		-30±3°C, Dry t=240 hrs	
High Temperature Storage		85±3°C , Dry t=240 hrs	1,2
Low Temperature Storage		-30±3°C ,Dry t=240 hrs	1,2
Storage Humidity Test		60 °C, Humidity 90%, 240 hrs	1,2
Vibration Test (Packing)		Sweep frequency : 10 ~ 55 ~ 10 Hz/1min Amplitude : 0.75mm Test direction : X.Y.Z/3 axis Duration : 30min/each axis	2
Image Sticking	Normal Temperature 25°C	chessboard 7*5 pattern, change to 50% gray pattern; Checkpoint: 1hrs,release 5min;2hrs, release 5min; ND8% invisible	5
	High Temperature 65°C	chessboard 7*5 pattern, change to 50% gray pattern; Checkpoint: 1hrs,release 5min;2hrs, release 5min; ND8% invisible	5

Note(1) Condensation of water is not permitted on the module.

Note(2) The module should be inspected after 1 hour storage in normal conditions (15-35°C, 45-65%RH).

Note(3) The module shouldn't be tested over one condition, and all the tests are independent.

Note(4) All reliability tests should be done without the protective film.

Note(5) It is recommended to follow the nominal parameter specified by AMPIRE before the Image Sticking test. Besides, Vcom must be adjusted to optimize display quality.

Definitions of life end point:

- Current drain should be smaller than the specific value.
- Function of the module should be maintained.
- Appearance and display quality should not have degraded noticeably.
- Contrast ratio should be greater than 50% of the initial value.

9. General Precaution

9.1 Safety

(1) Liquid crystal is poisonous. Do not put it your month. If liquid crystal touches your skin or clothes, wash it off immediately by using soap and water.

9.2 Handling

(1) The LCD panel is plate glass. Do not subject the panel to mechanical shock or to excessive force on its surface.
(2) The polarizer attached to the display is easily damaged. Please handle it carefully to avoid scratch or other damages.
(3) To avoid contamination on the display surface, do not touch the module surface with bare hands.
(4) Keep a space so that the LCD panels do not touch other components.
(5) Put cover board such as acrylic board on the surface of LCD panel to protect panel from damages.
(6) Transparent electrodes may be disconnected if you use the LCD panel under environmental conditions where the condensation of dew occurs.
(7) Do not leave module in direct sunlight to avoid malfunction of the ICs.
(8) Please hold the LCD module properly when you use or store it.

9.3 Static Electricity

(1) Be sure to ground module before turning on power or operation module.
(2) Do not apply voltage which exceeds the absolute maximum rating value.

9.4 Storage

(1) Store the module in a dark room where must keep at +25±10℃ and 65%RH or less.
(2) Do not store the module in surroundings containing organic solvent or corrosive gas.
(3) Store the module in an anti-electrostatic container or bag.

9.5 Cleaning

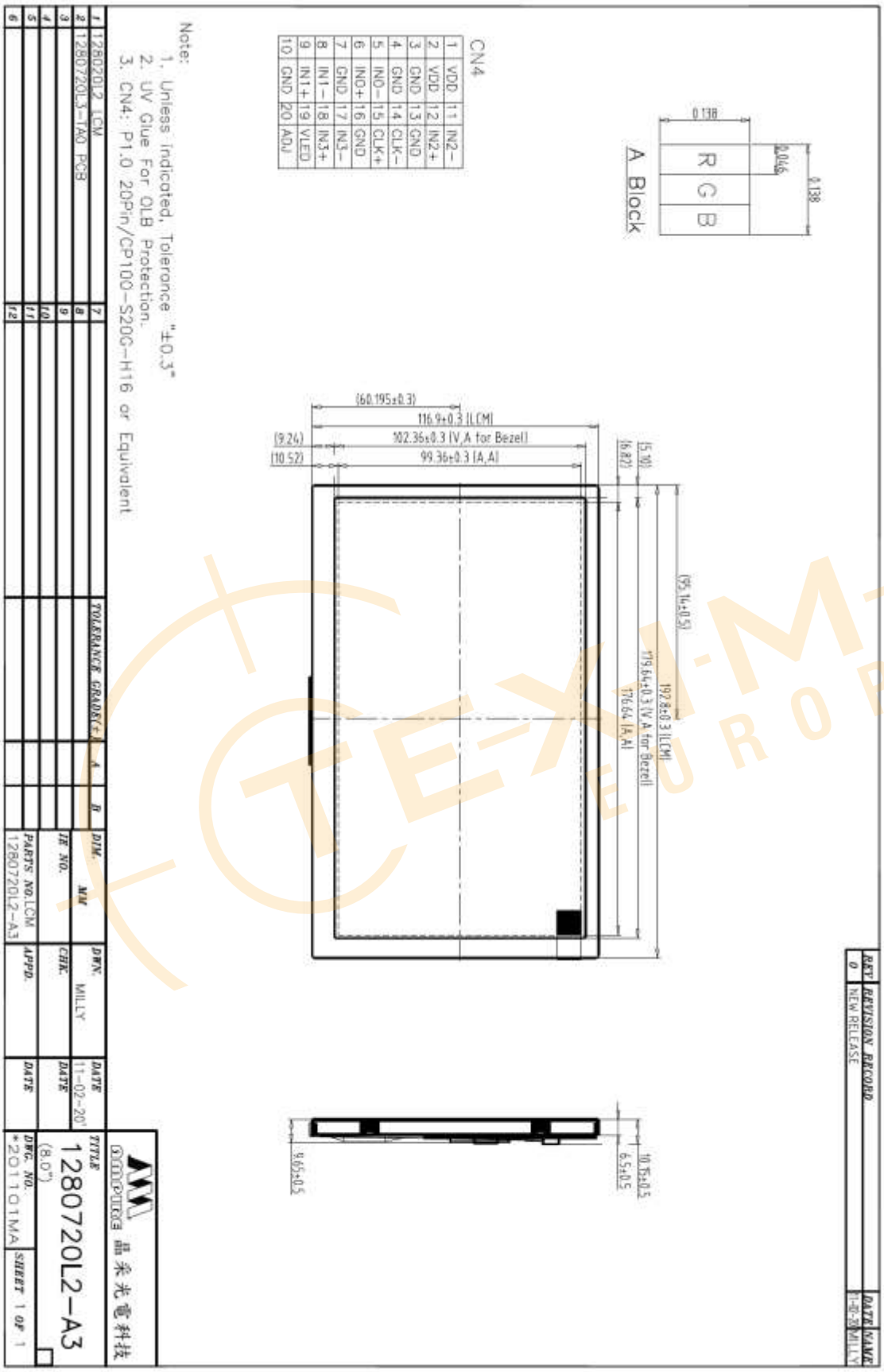
(1) Do not wipe the polarizer with dry cloth. It might cause scratch.
(2) Only use a soft sloth with IPA to wipe the polarizer, other chemicals might permanent damage to the polarizer.

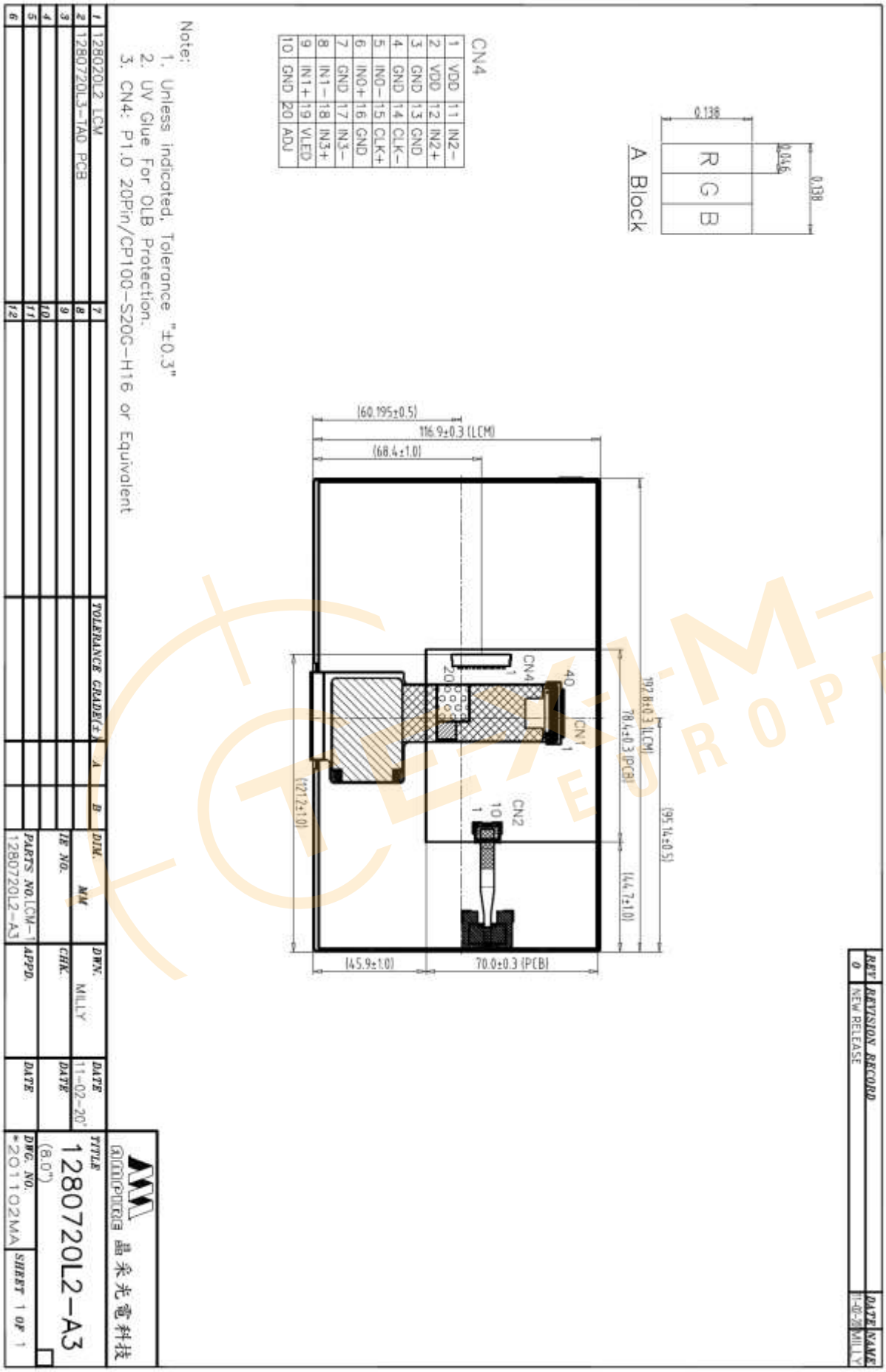
9.6 Others

(1) AMIPRE will provide one year warrantee for all products and three months warrantee for all repairing products.

(2) Do not keep the LCD at the same display pattern continually. The residual image will happen and it will damage the LCD. Please use screen saver.

10. Outline Dimension





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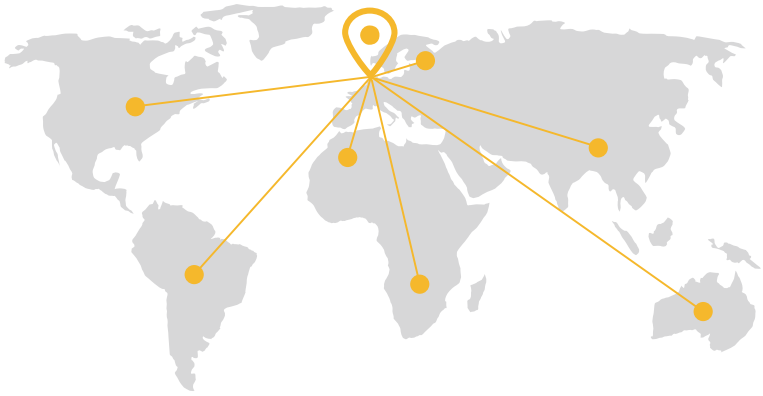
All operating parameters, including typical parameters, must be validated for each customer application by the customer’s technical experts.

Please contact us if you have any questions about the contents of the datasheet.

This may not be the latest version of the datasheet. Please check with us if a later version is available.

Texim Europe - contact details



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