

IPS TFT DISPLAY 1.44" FOR WEARABLE DEVICES



P/N: DJM-9443-S000

SPECIFICATION

Display Specification

Item	Standard Value	Unit
Display Format	128x128	Pixels
Display Connector	FPC	--
FPC Connector	26 Pin 0.5mm Pitch Top Contact ZIF Connector	--
Operating Temperature	-20 ~ +70	°C
Storage Temperature	-30 ~ +80	°C
Touch Panel Optional	Yes	--
Sunlight Readable	No	--

2.2 Mechanical Specification

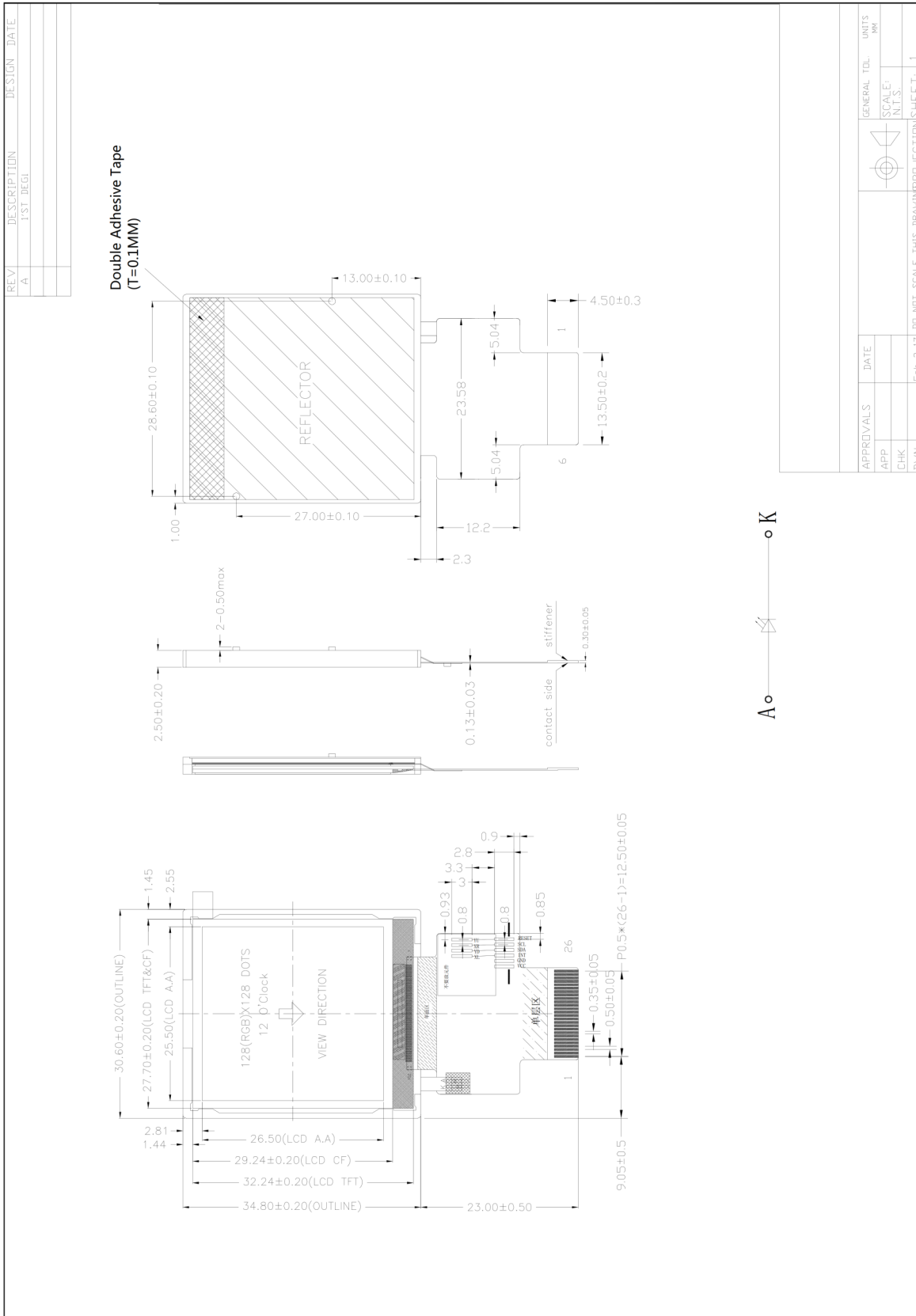
Item	Standard Value	Unit
Diagonal Size	1.44	Inch
Outline Dimension with FPC Folded	30.60(W)x34.80(H)x2.5(T)	mm
Visual Area	26.50(W)x27.50(H)	mm
Active Area	25.50(W)x26.50(H)	mm
Dot Pitch	0.199X0.207	mm

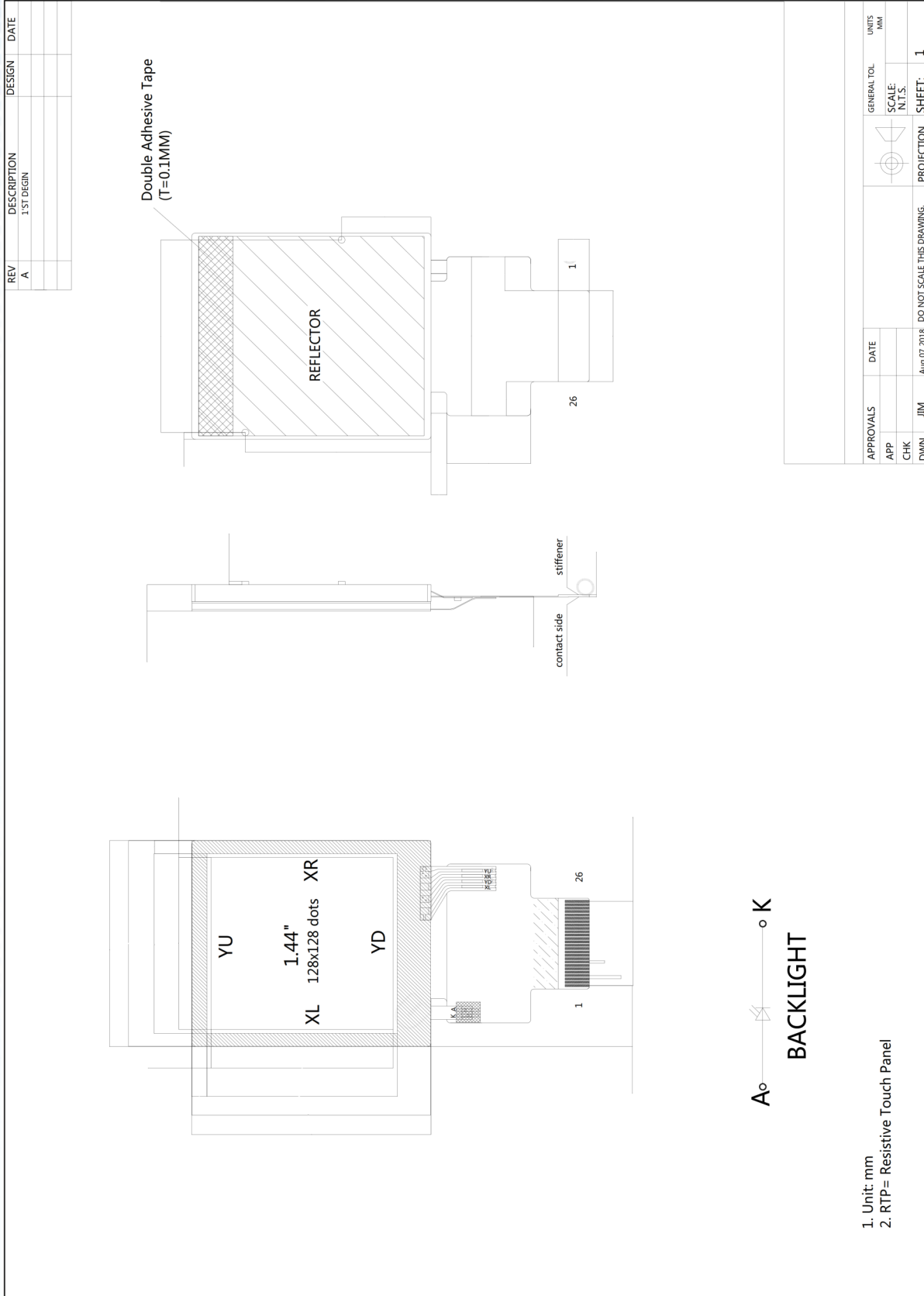
2.3 Electrical Specification

Item	Standard Value	Unit
IC Package	COG	--
Controller	ST7735S	--
Interface	8080 8-bit Parallel , 3/4-Wire Serial SPI	--
Response Time (Typ)	20	MS

2.4 Optical Specification

Item	Standard Value	Unit
LCD Type	TFT-LCD / Transmissive / TN	--
Viewing Angle Range	Left:70 , Right:70 , Up:60 , Down:70	Deg
Colors	65k/262k	--
Contrast Ratio (Typ)	500:1	--
Brightness (Typ)	180	cd/m ²







ELECTRICAL SPEC

Pin Configuration

Pin No	Pin Name	Descriptions
1	LEDA	Anode for LED backlight
2	LEDK	Cathode for LED backlight
3	GND	Ground
4	TE	Tearing effect output pin to synchronies MCU to frame writing, activated by S/W command. When this pin is not activated, this pin is low. If not used, please open this pin.
5	/CS	Chip select input pin ("Low" enable). This pin can be permanently fixed "Low" in MCU interface mode only.
6	DC/SPI SCL	Display data / Command selection pin in parallel and SCL in SPI interface. D/CX=' 1' : Display data. D/CX=' 0' : Command data. If not used, please connect this pin to VDDI or GND.
7	/WR SPI DC	Write enable in parallel interface. WR: for 8080 MCU, write enable. SPI DC: for 4-wire SPI, Data/Command selection. If not used, please connect this pin to VDDI or GND.
8	/RD	Read enable in 8080-parallel interface If not used, please connect this pin to VDDI or GND.
9	/RESET	Reset Pin. Initialize the chip with a low input.
10-17	DB0-DB7	D[7:0] are used to MCU parallel interface data bus, and D0 is also the serial input/ output signal in SPI interface mode. In serial interface, D[7:1] are not used and should be connected to VDDI or GND.
18	SPI4W	SPI interface selection pin SPI4W=' 0' : 3-wire SPI. SPI4W=' 1' : 4-wire SPI. If not used, please connect this pin to GND.
19	IM2	MCU Parallel interface bus and Serial interface select IM2=' 1' ;Parallel Interface IM2=' 0' ;Serial Interface
20	IOVCC(VDDI)	Power supply for IO system.
21	VCI	Power supply for analog circuit, booster circuit and digital system.
22	GND	Ground
23	XL(X-)/INT	Resistive touch panel output /Capacitive touch pen interrupt signal when low.
24	YU(Y-)/RST	Resistive touch panel output/ Capacitive touch reset signal when low.
25	XR(X+)/SCL	Resistive touch panel output/ Capacitive touch SCL signal, I2C interface.
26	YD(Y+)/SDA	Resistive touch panel output/ Capacitive touch SDA signal, I2C interface



Absolute Maximum Ratings

Item	Symbol	Min	Typ	Max	Unit
Power Supply Voltage	VCI	-0.3	-	+4.8	V
Logic Signal Voltage	VDDI	-0.3	-	+4.6	V
Humidity	RH	-		90%(Max60°C)	RH

Electrical Characteristics

Item	Symbol	Min.	Typ.	Max.	Unit
Power Supply Voltage	VCI	2.5	2.8	3.3	V
Power Supply for Logic	VDDI	1.65	2.8	3.3	V
Input Voltage 'H' Level	VIH	0.7VDDI	-	VDDI	V
Input Voltage 'L' Level	VIL	VSS	-	0.3VDDI	V
Output Voltage 'H' Level	VOH	0.8VDDI	-	VDDI	V
Output Voltage 'L' Level	VCL	VSS	-	0.2VDDI	V

Backlight Characteristics

Item	Symbol	Min	Typ	Max	Unit	Item
Supply Voltage	Vf	If=20mA	-	3.1	3.3	V
Forward Current	Normal Dim ming	l _{pn} l _{pd}	1-chip	18	20	MA

INSPECTION CRITERIA

Acceptable Quality Level

Each lot should satisfy the quality level defined as follows

Partition	AQL	Definition
A. Major	0.4%	Functional defective as product
B. Minor	1.5%	Satisfy all functions as product but not satisfy cosmetic standard

Definition of Lot

One lot means the delivery quantity to customer at one time.

Condition of Cosmetic Inspection

◆ INSPECTION AND TEST

- FUNCTION TEST
- APPEARANCE INSPECTION
- PACKING SPECIFICATION

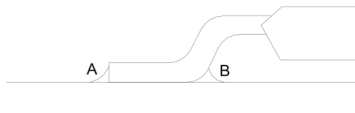
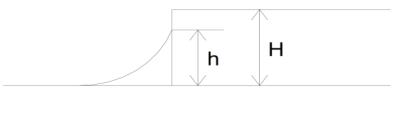
◆ INSPECTION CONDITION

- Put under the lamp (20W) at a distance 100mm from
- Tilt upright 45 degree by the front (back) to inspect LCD appearance.

◆ AQL INSPECTION LEVEL

- SAMPLING METHOD: MIL-STD-105D
- SAMPLING PLAN: SINGLE
- MAJOR DEFECT: 0.4% (MAJOR)
- MINOR DEFECT: 1.5% (MINOR)
- GENERAL LEVEL: II/NORMAL


Module Cosmetic Criteria

No.	Item	Judgment Criterion	Partition
1	Difference in Spec.	None allowed	Major
2	Pattern Peeling	No substrate pattern peeling and floating	Major
3	Soldering Defects	No soldering missing	Major
		No soldering bridge	Major
		No cold soldering	Minor
4	Resist Flaw on Substrate	Invisible copper foil(ϕ 0.5mm or more)on substrate pattern	Minor
5	Accretion of Metallic Foreign Matter	No soldering dust	Minor
		No accretion of metallic foreign matters(Not exceed ϕ 0.2mm)	
6	Stain	No stain to spoil cosmetic badly	Minor
7	Plate Discoloring	No plate fading, rusting and discoloring	Minor
8	Solder Amount 1.Lead Parts	a. Soldering side of PCB Solder to form a 'Filet' all around t Solder should not hide the lead form  b.Components side (In case of 'Through Hole PCB') Solder to reach the Components side of PCB 	Minor
	2.Flat Packages	Either 'toe' (A) or 'heel' (B) of the lead to be covered by Filet'  Lead form to be assume over solder.	Minor
	3.Chips	$(3/2) H \geq h \geq (1/2)H$ 	Minor

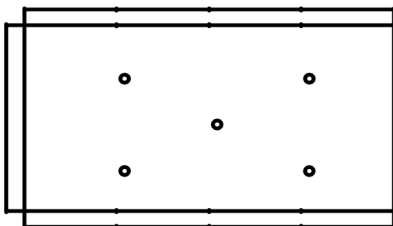
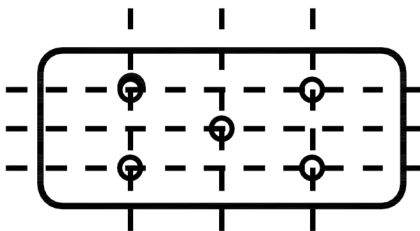
Screen Cosmetic Criteria (Operating)

No.	Defect	Judgment Criterion	Partition
1	Spots	A) Clear	Minor
		Size:d mm	
		Acceptable Qty in active area	
		$d \leq 0.1$ $0.1 < d \leq 0.2$ $0.2 < d \leq 0.3$ $0.3 < d$	
		Disregard 6 2 0	
		Note: Including pin holes and defective dots which must be within one pixel Size. Unclear	
2	Lines	A) Clear	Minor
		Note: () – Acceptable Qty in active area L - Length (mm) W -Width(mm) ∞ -Disregard	
		B) Unclear	

Clear' = The shade and size are not changed by Vo.

Unclear' = The shade and size are changed by Vo.



No.	Defect	Judgment Criterion	Partition
3	Rubbing line	Not to be noticeable.	Minor
4	Allowable density	Above defects should be separated more than 10mm each other.	Minor
5	Rainbow	Not to be noticeable.	Minor
6	Dot size	To be 95%~105% of the dot size (Typ.) in drawing. Partial defects of each dot (ex.pin-hole) should be treated as spot. (see Screen Cosmetic Criteria (Operating) No.1)	Minor
7	Brightness (only back-lit Module)	Brightness Uniformity must be $B_{MAX}/B_{MIN} \leq 2$ - B_{MAX} : Max.value by measure in 5 points - B_{MIN} : Min.value by measure in 5 points Divide active area into 4 vertically and horizontally. Measure 5 points shown in the following figure. 	Minor
8	Contrast Uniformity	Contrast Uniformity must be $B_{MAX}/B_{MIN} \leq 2$ Measure 5 points shown in the following figure. Dashed lines divide active area into 4 vertically and horizontally. Measuring points are located at the inter-sections of dashed line.  Note: B_{MAX} – Max.value by measure in 5 points. B_{MIN} – Min.value by measure in 5 points. O – Measuring points in $\phi 10\text{mm}$.	Minor

Note:

(1) Size: $d = (\text{long length} + \text{short length})/2$

(2) The limit samples for each item have priority.

(3) Complexed defects are defined item by item, but if the number of defects is defined in above table, the total number should not exceed 10.