

# Product Specifications

Model:	FSP11955-A0
Application:	India energy meter

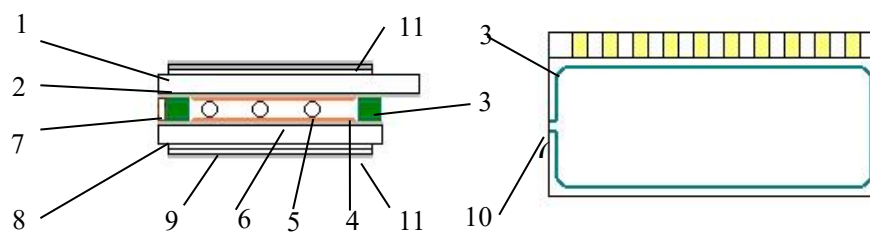
## Content

1. Product Characteristic .....	2
2. Product Basic Structure Description .....	2
3. General Specification .....	3
4. Maximum Electrical Ratings .....	3
5. Optoelectronics Characteristic .....	4
6. Reliability .....	8
7. Drawing .....	9

# 1. Product Characteristic

Display Content	Segment Code
Product Type	STN
Display Mode	Positive transfective/yellow-green
Viewing Angle	6 o'clock
Operating Environment	Indoor
Drive Parameters	1/4DUTY 1/3BIAS VOP=3.0V
Product Structure	PIN

# 2. Product Basic Structure Description



Component	Material	Component	Material
1	Top Polarizer PVA, iodine or dye	7	Conductive dot Silver paste or gold paste
2	Front glass Soda lime with SiO <sub>2</sub> barrier and ITO layer	8	Rear glass Soda lime with SiO <sub>2</sub> barrier and ITO layer
3	Sealant Epoxy resin	9	Bot Polarizer PVA, iodine or dye
4	Liquid crystal Liquid crystal fluid	10	End seal UV epoxy
5	Spacer Acrylic resin	11	Protect sheet polyethylene
6	PI Polyimide		

### 3. General Specification

Item	Length	Width	Height	Unit
Outline Dimension	80.00±0.20	24.00±0.20	2.80MAX	mm
View Area	77.00MIN	19.00MIN	-	mm

### 4. Maximum Electrical Ratings

Item	Range	Unit	Other Conditions
Operating Temp.	-20 to +85	°C	-
Storage Temp.	-30 to +85	°C	-
AC Voltage	-	Vrms	-
DC Voltage	-	V	-
Residual DC	-	mV	-

## 5. Optoelectronics Characteristic

Items		Temp.	Unit	Standard Value			Note	
				Min	Typ	Max		
Operating Voltage	Vop	25°C	V	2.8	3.0	3.2		
		0°C		-	-	-		
Drive Frequency	Fr	25°C	Hz	-	64	-	(1)	
Response Time ( $\theta=10^\circ, \phi=0^\circ, V_{op}=3.0$ )	Ton	-20°C	Msec	-	-	-	(2)	
		0°C		-	-	-		
		25°C		-	200	300		
	Toff	-20°C		-	-	-		
		0°C		-	-	-		
		25°C		-	200	300		
Dissipation Current	Iop	25°C	$\mu$ A	-	-	3.60	(3)	
Contrast Ratio ( $\theta=10^\circ, \phi=0^\circ, V_{op}=3.0$ )	Cr	25°C	-	2	5	-	(4)	
View Angle(C R>2)	$\phi=0^\circ$	$\theta$	25°C	Deg	40	45	--	(5)
	$\phi=90^\circ$	$\theta$	25°C	Deg	40	45	--	
	$\phi=180^\circ$	$\theta$	25°C	Deg	15	20	--	
	$\phi=270^\circ$	$\theta$	25°C	Deg	40	45	--	

### Measuring Method

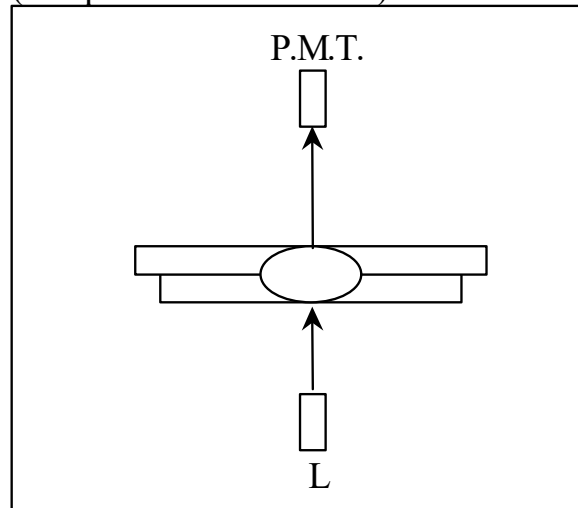
(Reflective Type)

L: Light Source

P.M.T. : Photoelectric Sensor

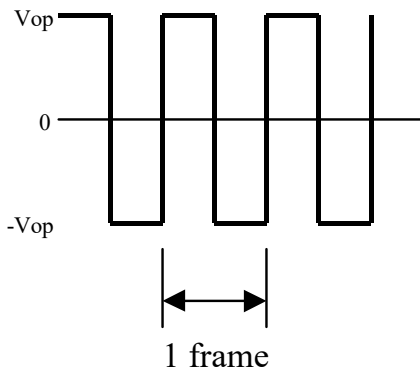
Maker : Otsuka Elec. Co., Ltd.

(Temperature Control Bath)

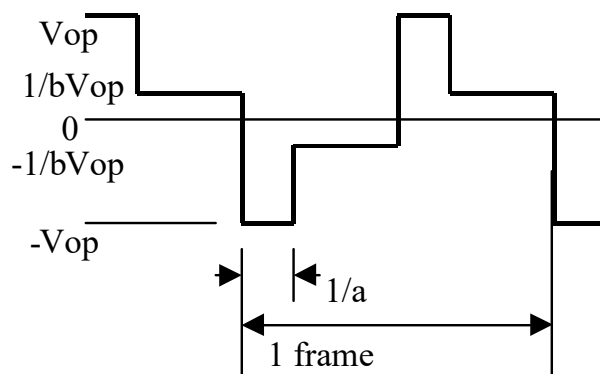


#### Note 1. Drive Waveform

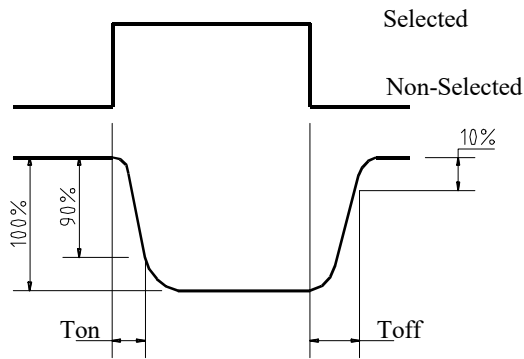
(Static)



(1/2a Duty, 1/b Bias)



**Note 2. Response Time**



Ton: Turn On Time

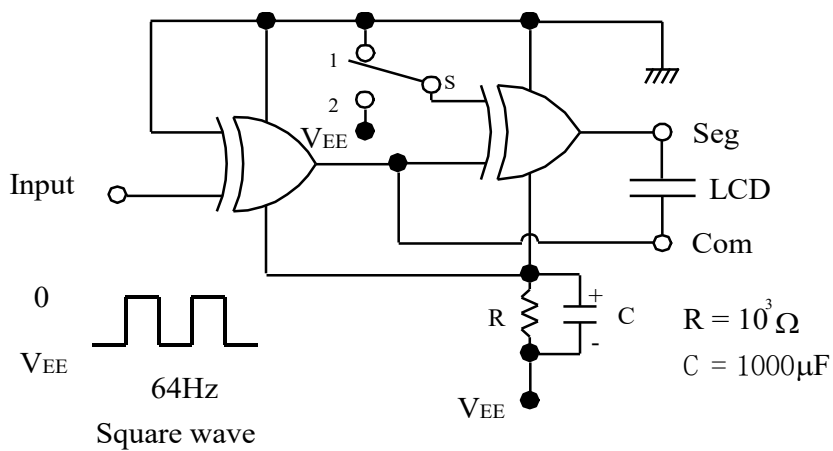
Toff: Turn Off Time

**Measuring Condition:**

1. Driving Voltage: Same as Vop
2. Driving Frequency: Same as Frame Frequency.

**Note 3. Dissipation Current (Full segment ON state)**

1. Temperature: 25°C
2. Driving Voltage: 3.0V
3. Driving Frequency: 64Hz
4. Test Circuit



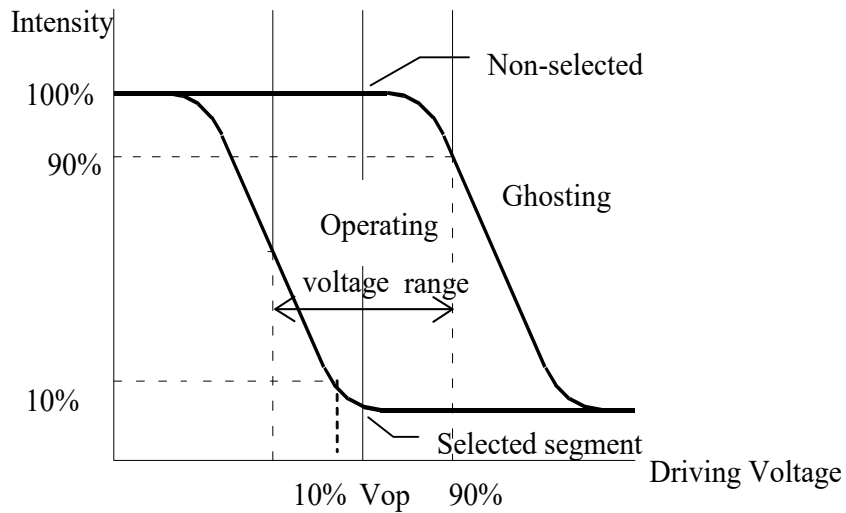
Dissipation Current :

$$I_{op} (\mu A) = \frac{(V_{EE}^{ON} - V_{EE}^{OFF}) (V) \times 10^6}{10^3 (\Omega)}$$

**Note 4. Contrast Ratio Definition**

Positive Mode: n = 1  
 Negative Mode: n = -1

$$\text{Contrast Ratio} = \left\{ \frac{\text{Non-selected segment intensity}}{\text{Selected segment intensity}} \right\}^n$$



**Note 5. Viewing Angle**

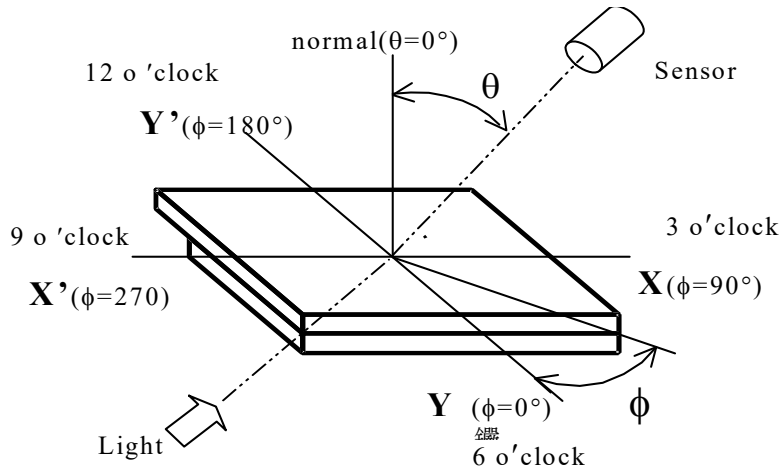
θ: Angle between Viewer Direction and Normal.

$$(-90^\circ \leq \theta \leq 90^\circ)$$

φ: Angle between Projection of Viewer Direction to X-Y plane and Y axis.

$$(0^\circ \leq \phi \leq 360^\circ)$$





Measuring Condition:

- 1、 Drive Voltage:3.0V
- 2、 Drive Frequency:64HZ

## 6. Reliability

- (1) Under operating and storage ( $25 \pm 10^\circ\text{C}$ ,  $65 \pm 20\%\text{RH}$ ) conditions a lifetime of 50,000 hours is guarantee.
- (2) Reliability test condition:

Item	Condition	Time(hrs)	Assessment
High temp. storage	+85°C	120	No abnormalities in functions and appearanc
Low temp. storage	-30°C	120	
High temp. operating	+85°C	96	
Low temp. operating	-20°C	96	
Temp & Humidity	60° C / 90%RH	500	
Change of temperature	-20°C ~25°C ~85°C (60 min ~5 min ~60min)	10 cycles	

- (3) Recovery time should be 2 hours minimum in 20C temperature.

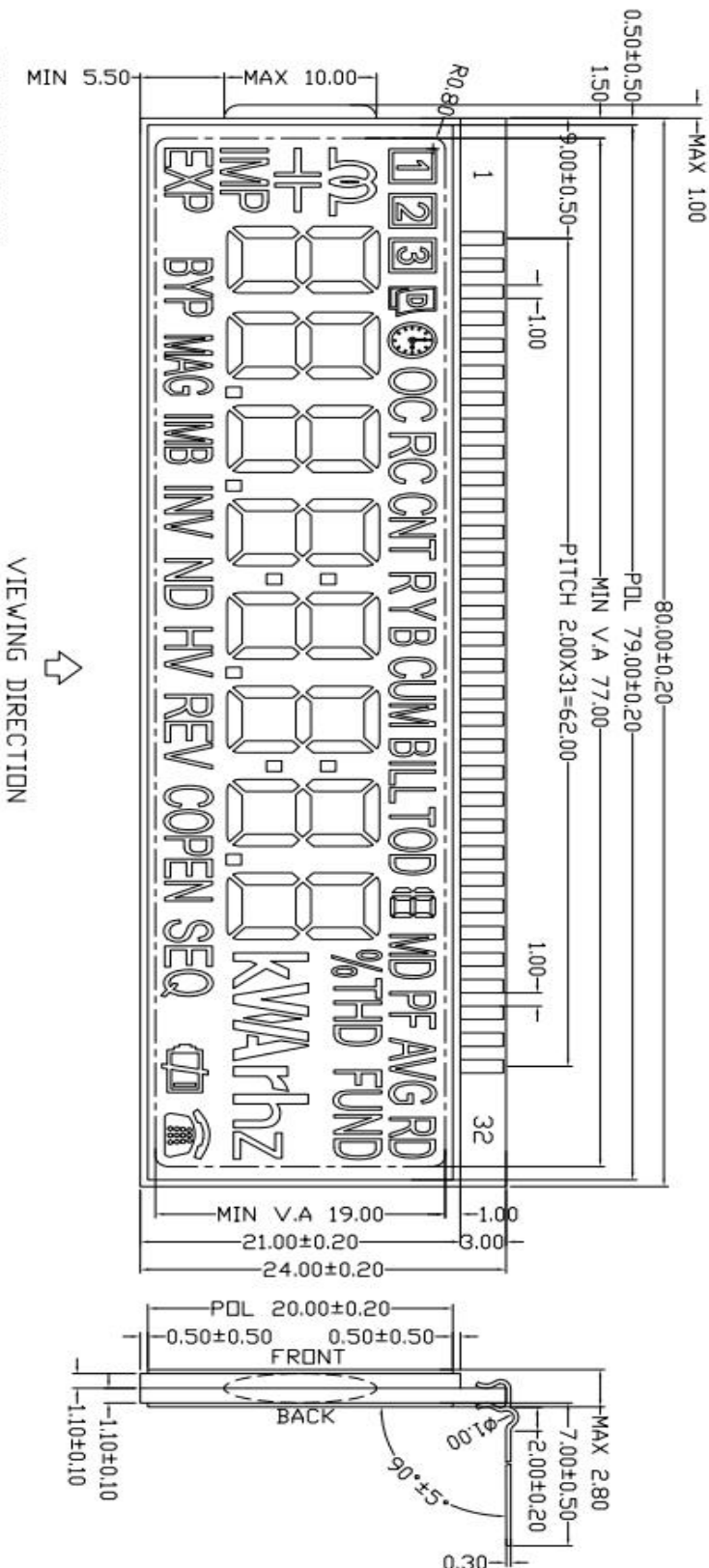


## 7. Drawing



ALL PAGES OF THIS VERSION APPROVED
SIGNATURE: _____
DATE: _____

REV.	DESCRIPTION	DATE
A0	初始版本	



**SPECIFICATIONS**

DISPLAY MODE : STKY-G, POSITIVE MODE  
 DRIVE CONDITION :1/4 DUTY, 1/3 BIAS  
 VIEWING DIRECTION : 6 O'CLOCK  
 OPERATING TEMP : -20°C TD +85°C  
 STORAGE TEMP : -30°C TD +85°C  
 OPERATING VOLTAGE: 3.0 V  
 FRAME FREQUENCY: 64 HZ  
 FRONT POLARIZER : TRANSMISSIVE,ADHESIVE  
 BACK POLARIZER : TRANSPARENT,ADHESIVE  
 CUSTOMER NO: \_\_\_\_\_  
 CONNECTORS : \_\_\_\_\_ PIN

特殊工艺:

有害物质管理:  RoHS2.0要求  REACH要求  无卤要求



GENERAL	TOTAL UNITS	DATE	MODEL NUMBER :	PROJECTION	SHEET: 1 OF 4
DWN: 0.20	CLO: 18-12	18-12	FSP11955-A0		DATE: 18-12-2023
CHK: COY	COY: 18-12	18-12			
APP: COY	COY: 18-12	18-12			

