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AMOLED

Product Specification

Model Name: E160 FOG Panel

Description: 1.60" (320 x 360) AMOLED

Doc. Version: V.01

Customer:

Approved for Preliminary Specification

Approved for Final Specification

Approved for Final Specification & Sample


Prepared	Checked	Approved
姚家夏	段钰	陈晟

Customer's Approval

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1 Scope

This Specification defines AMOLED manufactured by EverDisplay Optronics(Shanghai) Limited, from here on refer as EDO. In the case of any unspecified item, it may require both EDO and the party designs this module into its product to work out a solution.


2 Features

2.1 Product Applications

Smart watch

2.2 Product Features

- 1) Display color: 16.7M (RGB x 8bits)
- 2) Display format: 1.60"(320RGB x 360)
- 3) Pixel arrangement: Real RGB arrangement
- 4) Interface: MIPI&SPI
- 5) Driver IC: RM69090 TP IC: TMA525C

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3 Maximum Rating

Parameter	Symbol	Spec			Unit	Note
		Min.	Typ.	Max.		
Analog/boost power voltage	VCI	-0.3	-	5.5	V	-
I/O voltage	VDDIO	-0.3	-	5.5	V	-
Operating temperature	Top	-20	-	70	°C	-
Storage temperature	Tstg	-40	-	80	°C	-

4 Mechanical Specifications

Item	Specification	unit
Cover Lens outline	33.92 × 39.05	mm
LTPS Glass outline	28.92 × 33.35	mm
Number of dots	320(W) x RGB x 360(H)	dots
Active area	27.02×30.40	mm
Diagonal size	1.60	inch
Pixel pitch	84.45x84.45	μm
Glass thickness (LTPS/Encap. glass)	0.2/0.3	mm
Weight	TBD	g

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5 Electrical Specifications

5.1 Electrical Characteristics

5.1.1 Current Characteristic

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
AMOLED Power Positive	ELVDD	3.25	3.3	3.35	V	-
AMOLED power Negative	ELVSS	-3.35	-3.3	-3.25	V	Ref
Digital Power supply	VDDIO	1.65	1.8	1.95	V	Ref
Analog Power supply	VCI	3.25	3.3	3.35	V	Ref

1) Normal Mode

Power Supply: VDDIO =1.8V VCI=3.3V ELVSS=-3.3V ELVDD=3.3V

Frame Frequency: $F_{frame}=60\text{HZ}$ @ 25degC, Brightness 500 nits, Command Mode,

Display Condition	Symbol	Min.	Typ.	Max.	Unit	Remark
100% Pixel On 500nits	IELVDD /ELVSS	-	21.6	26.10	mA	Ref
	IVCI	-	5.8	6.5	mA	Ref
	IVDDIO	-	5.5	5.8	mA	Ref

2) HBM Mode

Power Supply: VDDIO =1.8V VCI=3.3V ELVSS=-3.7V ELVDD=3.3V

Frame Frequency: $F_{frame}=60\text{HZ}$ @ 25degC, Brightness 1000 nits, Command Mode,

Display Condition	Symbol	Min.	Typ.	Max.	Unit	Remark
100% Pixel On 1000nits	IELVDD /ELVSS	-	43.2	52.3	mA	Ref
	IVCI	-	5.9	6.6	mA	Ref
	IVDDIO	-	5.6	5.9	mA	Ref

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3) Idle Mode

Power Supply: VDDIO=1.8V VCI=3.3V

Frame Frequency: $F_{frame}=15\text{HZ}$ @ 25degC, Brightness 50 nits,

Display Condition	Symbol	Min.	Typ.	Max.	Unit	Remark
10% Pixel On 50 nits	IELVDD /ELVSS	-	-	-	mA	Supplied by Driver IC
	IVCI	-	3.4	4.0	mA	Ref
	IVDDIO	-	0.8	1	mA	Ref

4) Deep Standby Mode


Display Condition	Symbol	Min.	Typ.	Max.	Unit	Remark
Deep Standby	IVCI	-	-	3	uA	-
	IVDDIO	-	-	3	uA	-

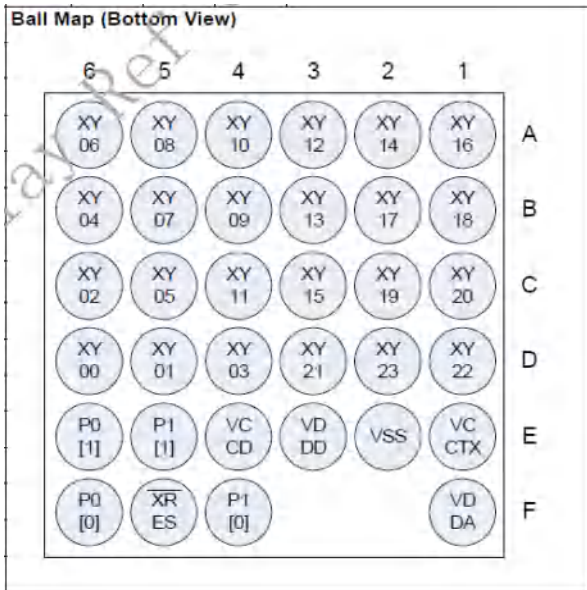
5.1.2 Driver IC RM69090 (refer to the datasheet)

5.2 TP IC Recommended Operating Conditions for whole set

Symbol	Description	Conditions	Min	Typ	Max	Units
V _{DD}	Digital supply voltage	Core LDO enabled (V _{CCD} output)	2.0	-	5.5	V
		Core LDO disabled (V _{CCD} input) ⁽¹⁷⁾	1.71	1.8	1.95	V
V _{CCD}	Digital core supply voltage	Core LDO enabled (V _{CCD} output)	-	1.8	-	V
		Core LDO disabled (V _{CCD} input) ⁽¹⁷⁾	1.71	1.8	1.95	V

Symbol	Description	Conditions	Min	Typ	Max	Units
V _{IH}	Input high voltage	CMOS mode	$0.7 \times V_{DD}$	-	-	V
		1.8-V mode, V _{EXT} = 1.8 V, V _{DD} = 1.8, 3.0, 3.3, 5.0 V	$0.7 \times V_{EXT}$	-	-	V
V _{IL}	Input low voltage	CMOS mode	-	-	$0.3 \times V_{DD}$	V
		1.8-V mode, V _{EXT} = 1.8 V, V _{DD} = 1.8, 3.0, 3.3, 5.0 V	-	-	$0.3 \times V_{EXT}$	V
V _{OH}	High output voltage	Reference to V _{DD} , I _{OH} = 1 mA, V _{DD} = 1.8 V	V _{DD} - 0.5	-	-	V
		Reference to V _{DD} , I _{OH} = 4 mA, V _{DD} = 3.0 V	V _{DD} - 0.6	-	-	V
V _{OL}	Low output voltage	V _{DD} ≥ 1.71 V, I _{OL} = 10mA	-	-	0.6	V
		V _{DD} ≥ 1.71 V, I _{OL} = 3mA	-	-	0.4	V

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Item	Specification	Remark
IC Vendor/Model	Parade/TMA525C-34FNI24ZZ	
Finger numbers	2Finger	
gesture function at screen off status	Support	
gesture style	Slide up down left right+click anywhere+Double click+Long press	
Large area contacting Operation(bigger than 50% Screen)	Screen off	
Response Time	Active < 20ms Idle < 40ms	
Linearity	Center 0.8mm; Bordering 1.2mm	
accuracy	Center 0.8mm; Bordering 1.2mm	
Precision	Center 0.4mm; Bordering 0.5mm	
Sensitivity	Without flim 5mm(floating)/with flim 6mm	
finger separation	max 2.5* pitch	
Report rate	80Hz	
SNR	SNR > 40dB	

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5.3 I/O Connection

#	Pin name	I/O	Description
1	GND	Power	GND
2	DSI_DO_P	I/O	MIPI DSI data0+
3	DSI_DO_N	I/O	MIPI DSI data0-
4	GND	Power	GND TP analog Power Supply
5	DSI_CLKP	I/O	MIPI DSI clock+
6	DSI_CLKN	I/O	MIPI DSI clock-
7	GND	Power	GND
8	VDD	Power	Driver IC analog supply
9	TP_VDD	Power	TP analog Power Supply
10	TP_VDDIO	Power	TP I/O and core Power Supply
11	TP_RESET	I	Reset pin for TP IC, Active low.
12	NC	-	-
13	NC	-	-
14	NC	-	Not connect
15	GND	Power	GND
16	NC	-	-
17	NC	-	-
18	ELVSS	Power	Power supply for OLED
19	GND	Power	GND
20	VPP(NC)	Power	Power supply for OTP. Leave the pin open when not in use.
21	ELVDD	Power	Power supply for OLED
22	TP_SWDIO (NC)	I/O	Serial wire debug input/output
23	TP_SDA	I/O	I2C Data Line
24	TP_SCL	I/O	I2C Clock Line
25	VDDIO	Power	Driver IC digital I/O supply
26	TP_INT	I/O	Interrupt to Host
27	SPI_CS	I/O	OLED SPI interface
28	SPI_SCL	I/O	OLED SPI interface
29	SPI_DCX	I/O	OLED SPI interface
30	SPI_SDI	I/O	OLED SPI interface
31	SPI_SDO	I/O	OLED SPI interface
32	RESET	I	This signal will reset the device and must be applied to properly initialize the chip. Active low.
33	TE	O	Tear effect output
34	SWIRE	O	Power IC control signal
35	GND	Power	GND

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36	GND	Power	GND
37	GND	Power	GND
38	GND	Power	GND

5.4 Graphic memory writing direction

