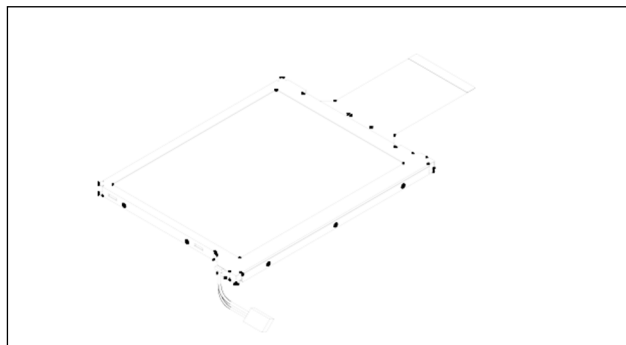


9.60cm (3.78 Type) QVGA Reflective Color LCD Module**Description**

The ACX704AKM is a 9.60cm diagonal, QVGA formatted active matrix reflective color TFT-LCD with a high performance front light unit. This panel provides ultra-high reflectivity (30% typ.) with high contrast ratio (25:1 typ.). These characteristics are realized by a newly developed reflective electrode structure. In addition, this panel provides low power consumption (20mW typ.) which is realized by built-in 4-bit digital interface circuitry addressed by low temperature polycrystalline silicon transistors.

**Features**

- Number of dots: 320 · RGB · 240
- Dot size: 80μm · 240μm
- High reflectivity: 30% (typ.)
- High contrast ratio: 25:1 (typ.)
- Number of colors: 4096
- Low power consumption: 20mW (typ.)
- Built-in 4-bit digital interface circuitry
- Compact size
- Thin and bright front light unit

Element Structure

- Active matrix TFT-LCD panel with built-in peripheral driving circuitry using low temperature polycrystalline silicon transistors
- Number of dots
 - Total number of dots: 322 · 3 (H) · 242 (V) = 233,772
 - Number of active dots: 320 · 3 (H) · 240 (V) = 230,400
- Dimensions
 - Module dimensions: 96.8 (W) · 73.0 (D) · 3.96 (H) (mm)
 - Effective display dimensions: 76.800 (H) · 57.600 (V) (mm)

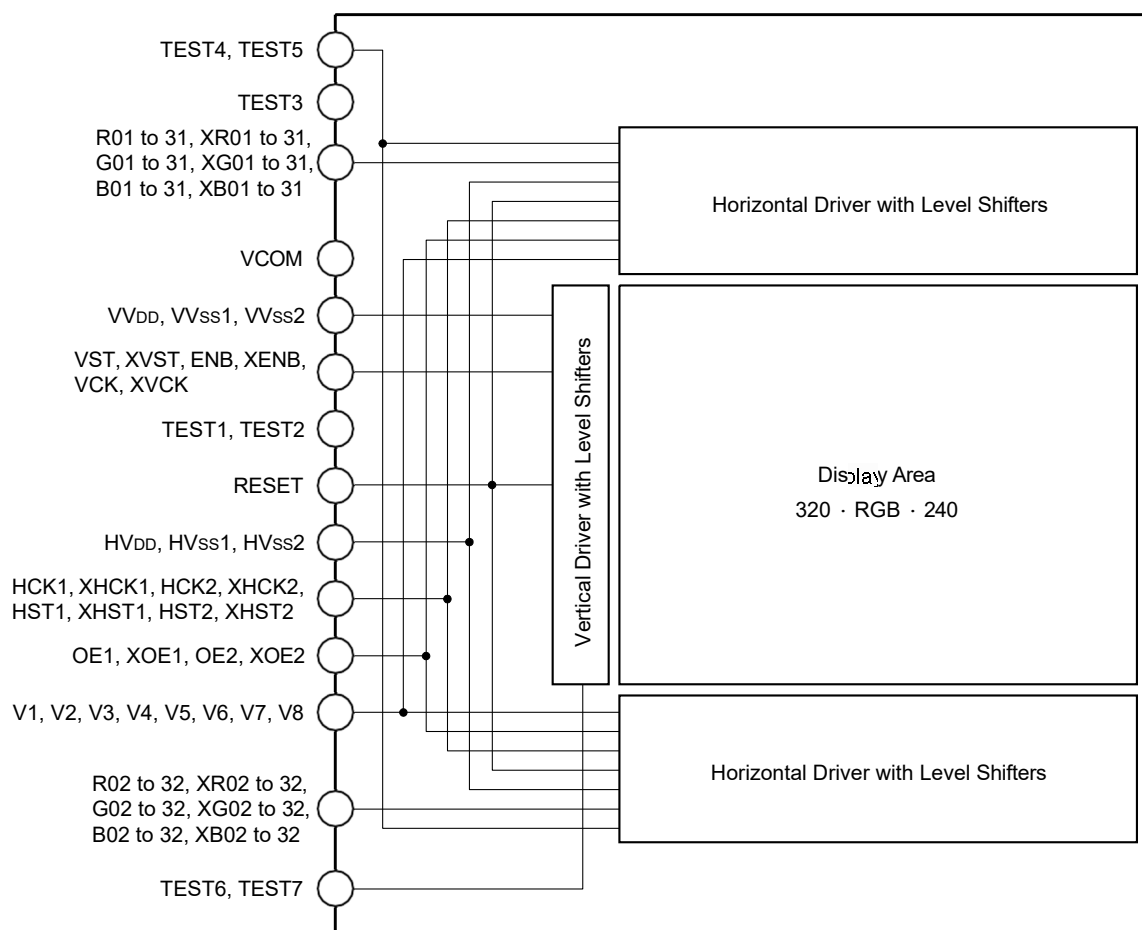
Applications

PDA, etc.

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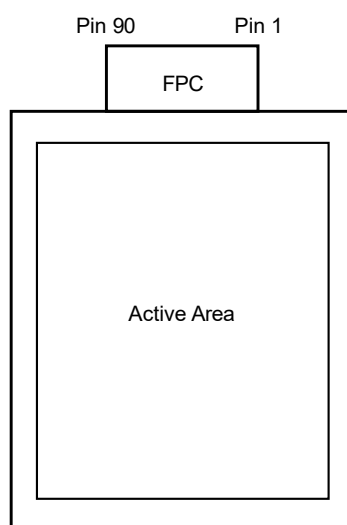
Block Diagram

The panel block diagram is shown below.



Pin Location of Panel Block

The FPC pin assignment is described in the page 4. The location of Pin 1 is shown below.



Front View

Absolute Maximum Ratings (HV_{ss1}, VV_{ss1} = 0V)

• H driver supply voltage 1	HV _{DD}	−1.0 to +10.5	V
• V driver supply voltage 1	VV _{DD}	−1.0 to +10.5	V
• H driver supply voltage 2	HV _{ss2}	−7.5 to +1.0	V
• V driver supply voltage 2	VV _{ss2}	−7.5 to +1.0	V
• Power-on reset input pin voltage	RESET	−1.0 to +10.5	V
• Vcom input pin voltage	VCOM	−1.0 to +10.5	V
• Reference voltage input pin voltage	V0, V1, V2, V3, V4, V5, V6, V7, V8	−1.0 to +10.5	V
• H driver pulse input pin voltage	HST1, XHST1, HST2, XHST2, HCK1, XHCK1, HCK2, XHCK2, OE1, XOE1, OE2, XOE2, TEST4, TEST5	−1.0 to +10.5	V
• V driver pulse input pin voltage	VST, XVST, VCK, XVCK, ENB, XENB, TEST6, TEST7	−1.0 to +10.5	V
• Data signal input pin voltage	Rnm, XRnm, Gnm, XGnm, Bnm, XBnm (n = 0, 1, 2, 3, m = 1, 2)	−1.0 to +10.5	V
• Operating temperature	Topr	−10 to +40	°C
• Storage temperature	Tstg	−30 to +60	°C

Power Consumption

Less than 35mW (typ. 20mW) excluding the front light and supporting circuitry on the typical operating condition.

Pin Description of Panel Block

Pin No.	Symbol	Description	Comment	Pin No.	Symbol	Description	Comment
1	TEST4	Test input	Connected to 0V	36	VCK	Pulse input	
2	TEST5	Test input	Connected to 3.3V	37	XVCK	Pulse input	
3	TEST3	Test output	No connection	38	TEST1	Test output	No connection
4	R31	Data input		39	TEST2	Test output	No connection
5	R21	Data input		40	RESET	Power-on reset	Connected to R/C
6	R11	Data input		41	HVDD	Power supply	
7	R01	Data input		42	HVss1	GND	
8	G31	Data input		43	HVss2	Power supply	
9	G21	Data input		44	HCK1	Pulse input	
10	G11	Data input		45	XHCK1	Pulse input	
11	G01	Data input		46	HCK2	Pulse input	
12	B31	Data input		47	XHCK2	Pulse input	
13	B21	Data input		48	HST1	Pulse input	
14	B11	Data input		49	XHST1	Pulse input	
15	B01	Data input		50	HST2	Pulse input	
16	XR31	Data input		51	XHST2	Pulse input	
17	XR21	Data input		52	OE1	Pulse input	
18	XR11	Data input		53	XOE1	Pulse input	
19	XR01	Data input		54	OE2	Pulse input	
20	XG31	Data input		55	XOE2	Pulse input	
21	XG21	Data input		56	V0	Reference voltage	
22	XG11	Data input		57	V1	Reference voltage	
23	XG01	Data input		58	V2	Reference voltage	
24	XB31	Data input		59	V3	Reference Voltage	
25	XB21	Data input		60	V4	Reference voltage	
26	XB11	Data input		61	V5	Reference voltage	
27	XB01	Data input		62	V6	Reference voltage	
28	VCOM	Common voltage		63	V7	Reference voltage	
29	VVDD	Power supply		64	V8	Reference voltage	
30	VVss1	GND		65	XB02	Data input	
31	VVss2	Power supply		66	XB12	Data input	
32	VST	Pulse input		67	XB22	Data input	
33	XVST	Pulse input		68	XB32	Data input	
34	ENB	Pulse input		69	XG02	Data input	
35	XENB	Pulse input		70	XG12	Data input	

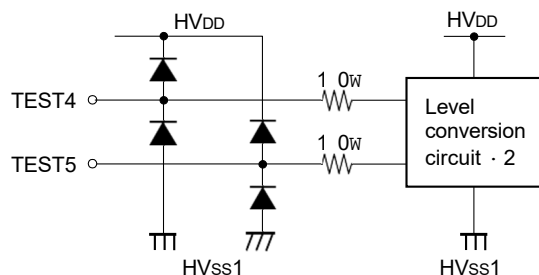
Pin No.	Symbol	Description	Comment
71	XG22	Data input	
72	XG32	Data input	
73	XR02	Data input	
74	XR12	Data input	
75	XR22	Data input	
76	XR32	Data input	
77	B02	Data input	
78	B12	Data input	
79	B22	Data input	
80	B32	Data input	
81	G02	Data input	
82	G12	Data input	
83	G22	Data input	
84	G32	Data input	
85	R02	Data input	
86	R12	Data input	
87	R22	Data input	
88	R32	Data input	
89	TEST6	Test input	Connected to 0V
90	TEST7	Test input	Connected to 3.3V

Input Equivalent Circuits of Panel Block

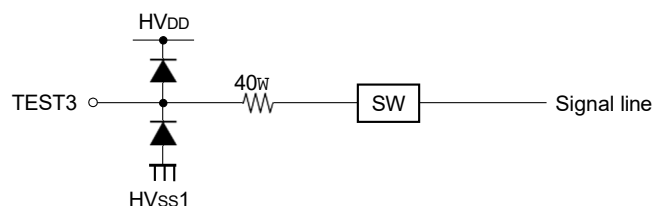
To prevent static charges, protective diodes are provided for each pin except the power supplies. In addition, protective resistors are added to all pins except the reference input pins, data input pins, HCK1, XHCK1, HCK2 and XHCK2. Reference input pins and VCOM are connected to HVss1 with a high resistance of 2M Ω (typ.). The equivalent circuit of each pin is shown below.

(Resistor value: typ.)

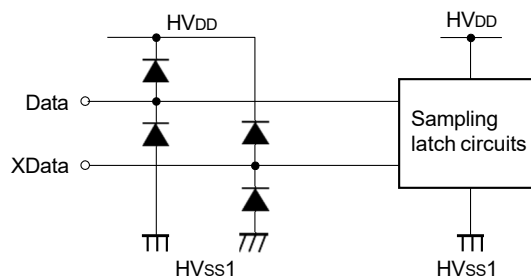
(1) TEST4, TEST5



(2) TEST3



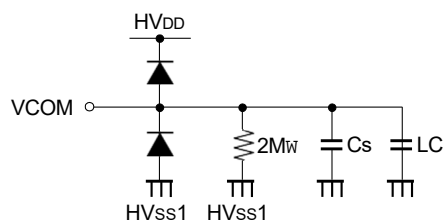
(3) Data, XData



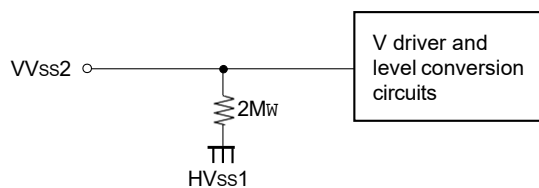
* Data means Rmn, Gmn, Bmn. (n = 0, 1, 2, 3, m = 1, 2)

XData means XRmn, XGmn, XBmn. (n = 0, 1, 2, 3, m = 1, 2)

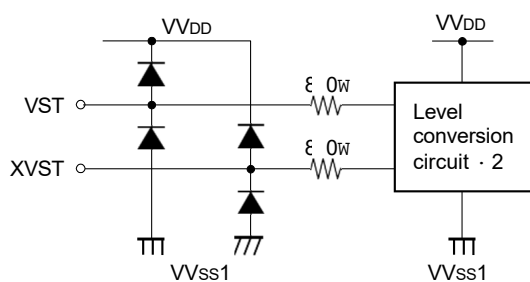
(4) VCOM



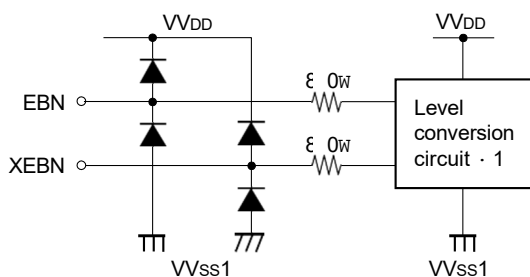
(5) VVss2



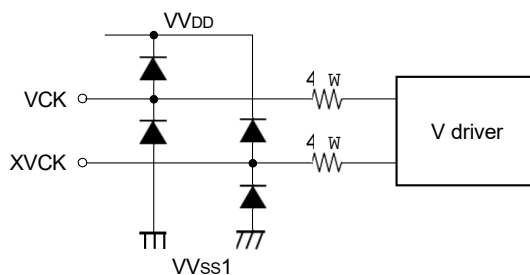
(6) VST, XVST



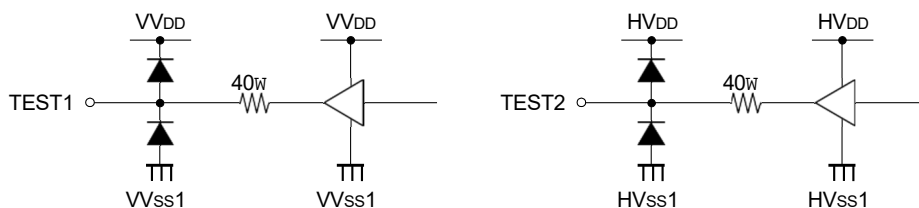
(7) ENB, XENB



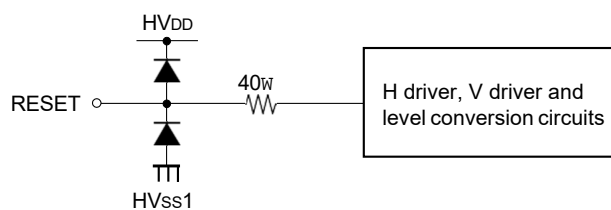
(8) VCK, XVCK



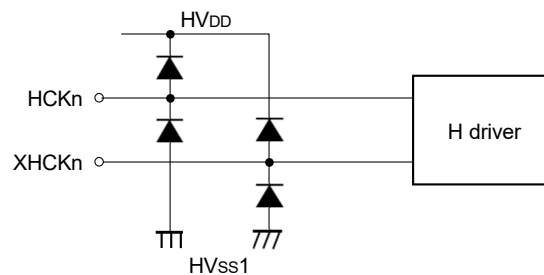
(9) TEST1, TEST2



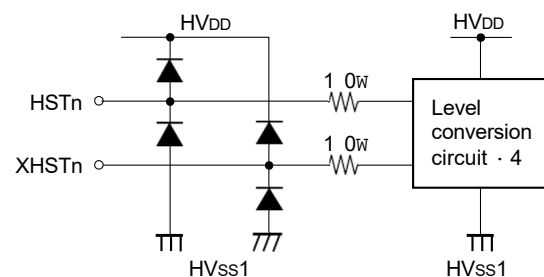
(10) RESET



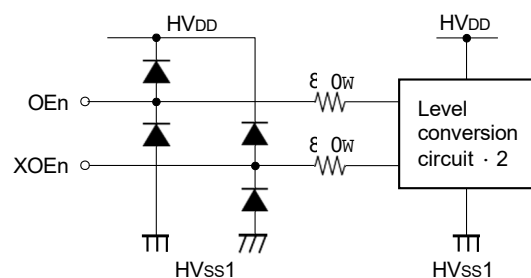
(11) HCKn, XHCKn (n = 1, 2)



(12) HSTn, XHSTn (n = 1, 2)



(13) OEn, XOEn (n = 1, 2)



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