

# P9165

The P9165 features a high performance, single chip TFT display, as well as QCIF+, offering ultra-bright and rich colours in an attractive compact module. The P9165 can be customized and offers various interconnect options, as well as excellent display performance and low power. The model includes RGB, parallel and serial interface, and can be supplied with a sub-display.



## APPLICATION INFORMATION

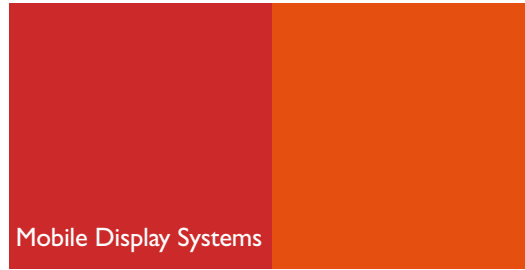
- Mobile phones (smart phones, camera phones)

## PRODUCT ADVANTAGES

- High performance single-chip TFT display
- High brightness and contrast
- Easily combined with camera sensor and graphic acceleration processor
- Low power consumption
- Small form factor

1.9" QCIF, 176 x RGB x 220

Transflective Amorphous-Silicon TFT Display Module



## SPECIFICATIONS

### Mechanical

Width	36.3 mm
Height	49.9 mm
Module Thickness	2.635 mm
Weight	13 grams
Active Area	29.83 x 37.29 mm
Dot Pitch	169.5 $\mu$ m
Resolution	176 x RGB x 220
Pixel Configuration	Vertical Stripe
Diagonal	1.88"

### Electrical

Technology	Active Matrix LCD
Supply Voltage	Logic: 1.65-1.95V Analog: 2.6-2.9V
Power Consumption	normal 5.3mA 8 color 2.4mA
Power Supply LED	14.8V-16.8V
Driver IC	uPD161952

### Temperature Conditions

Operating	-20°C to +60°C
Storage	-30°C to +80°C

### Interface

8/16/18 bit parallel, 18 bit RGB + SPI

### Optical

Image Mode	Normal White
Illumination Mode	Transflective
Backlight	4 LEDs (white)
Front Surface	Glossy
Viewing Direction	6 o'clock
Color	262k colors
Response Time	Backlight ON On : 15ms Off : 20 ms Backlight OFF On : 10ms Off : 15ms

### Backlight ON

Contrast Ratio	80:1
NTSC (u',v')	40
Luminance	150Nit (at 19mA BL)
Uniformity	1.3
Viewing Direction 180 degrees, CR>=2	55°
Viewing Direction 0 degrees, CR>=2	55°
Viewing Direction V, CR>=2	110°

### Backlight OFF

Reflectance Diffuse	4.9%
Contrast Ratio	15:1
NTSC (u',v')	10
Viewing Direction 180 degrees, CR>=2	65°
Viewing Direction 0 degrees, CR>=2	65°
Viewing Direction V, CR>=2	130°

# PHILIPS

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1.9" QCIF, 176 x RGB x 220, Transflective Amorphous-Silicon TFT display

## Pinning

PIN	SYMBOL	I/O	DESCRIPTION	REMARK
1	VSS	-	GND	
2	VCCI	-	Analog Power Supply	
3	VCC1	-	Analog Power Supply	
4	VSS	-	GND	
5	VCC2	-	Logic Power Supply	
6	VCC	-	Logic Power Supply	
7	VSS	-	GND	
8	/RES	I	Reset Signal	
9	/RD (E)	I	Read (Enable) Signal	*3
10	/WR (R/W)	I	Write (Read/Write) Signal	*3
11	SE	O	Split Effect signal	*4
12	D0	I/O	Data Bit 0 (*5 BLUE DATA B0, LSB)	For CPU and RGB Data Bus
13	D1	I/O	Data Bit 1 (*5 BLUE DATA B1)	For CPU and RGB Data Bus
14	D2	I/O	Data Bit 2 (*5 BLUE DATA B2)	For CPU and RGB Data Bus
15	D3	I/O	Data Bit 3 (*5 BLUE DATA B3)	For CPU and RGB Data Bus
16	D4	I/O	Data Bit 4 (*5 BLUE DATA B4)	For CPU and RGB Data Bus
17	D5	I/O	Data Bit 5 (*5 BLUE DATA B5, MSB)	For CPU and RGB Data Bus
18	D6	I/O	Data Bit 6 (*5 GREEN DATA G0, LSB)	For CPU and RGB Data Bus
19	D7	I/O	Data Bit 7 (*5 GREEN DATA G1)	For CPU and RGB Data Bus
20	D8	I	Data Bit 8 (*5 GREEN DATA G2)	Only for RGB Data Bus *1
21	D9	I	Data Bit 9 (*5 GREEN DATA G3)	Only for RGB Data Bus *1
22	D10	I	Data Bit 10 (*5 GREEN DATA G4, MSB)	Only for RGB Data Bus *1
23	D11	I	Data Bit 11 (*5 GREEN DATA G5, MSB)	Only for RGB Data Bus *1
24	D12	I	Data Bit 12 (*5 RED DATA R0, LSB)	Only for RGB Data Bus *1
25	D13	I	Data Bit 13 (*5 RED DATA R1)	Only for RGB Data Bus *1
26	D14	I	Data Bit 14 (*5 RED DATA R2)	Only for RGB Data Bus *1
27	D15	I	Data Bit 15 (*5 RED DATA R3)	Only for RGB Data Bus *1
28	D16	I	Data Bit 16 (*5 RED DATA R4)	Only for RGB Data Bus *1
29	D17	I	Data Bit 17 (*5 RED DATA R5, MSB)	Only for RGB Data Bus *1
30	VSS	-	GND	
31	D/C	I	Data or Command control signal	
32	/CS	I	Chip Select	
33	VSYNC	I	Vertical Sync Signal	*2
34	HSYNC	I	Horizontal Sync Signal	*2
35	DOTCLK	I	Dot Clock	*2
36	ENABLE	I	Data Enable	*2
37	SCL	I	Serial clock input	*3
38	SO	O	Serial data output	*4
39	SI	I	Serial data input	*3
40	LED-	-	LED Power Supply Cathode	
41	LED-	-	LED Power Supply Cathode	
42	LED+	-	LED Power Supply Anode	
43	LED+	-	LED Power Supply Anode	
44	TEST1	-	N.C.	Please keep Open.
45	TEST2	-	N.C.	Please keep Open.

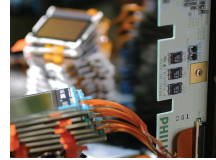
\*1: Please keep open or Vss1 for unused pin.

\*2: Please keep Vcc2 or Vss1 for unused pin.

\*3: Please keep Vcc2 for unused pin.

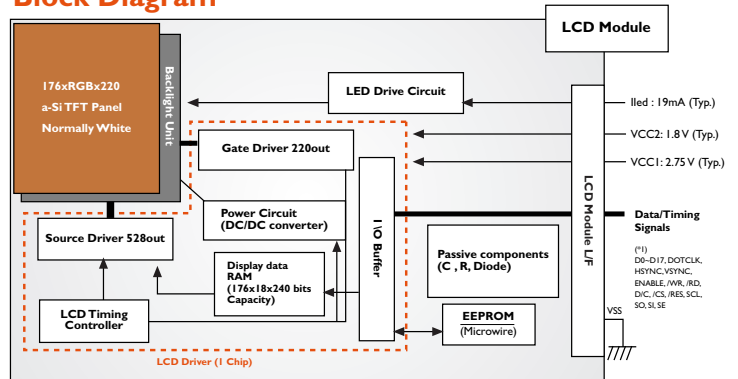
\*4: Please keep open for unused pin.

\*5: Only for RGB Interface.



www.mds.philips.com

## Block Diagram



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