1. General Description and Features

GWTQ35NPHH1R0-FC is a TM (Transmissive) type color active matrix TFT (Thin Film Transistor) liquid crystal display (LCD) that uses amorphous silicon TFT as a switching device. This model is composed of a TFT-LCD module, a driver circuit, a touch panel and a back-light unit. The resolution of a 3.5" contains 320RGBx480 dots and can display up to 262k colors. The following table described the features of GWTQ35NPHH1R0-FC.

1.1 Features

- QVGA(320 x 480 pixels) resolution.
- Display in 262k colors.
- On-chip voltage generator.
- RoHS Compliance

1.2 LCD Module

Item	Specification	Unit
Screen Size	3.5 inches	Diagonal
Display Resolution	320 x RGB x 480	Dot
Active Area	48.96 *73.44	mm
Outline Dimension	54.66x82.94x3.2	mm
Display Mode	Normally white	--
Pixel Arrangement	RGB Vertical Stripe	--
Display Color	262k	--
Viewing Direction （gray inversion）	12 o'clock	--
Input Interface	4 - line SPI+ RGB 18Bit DBO-DB17	--

2. Mechanical Information

Item		Min.	Typ.	Max.	Unit	Note
Module Size	Horizontal (H)	--	54.66	--	mm	--
	Vertical (V)	--	82.94	--	mm	(1)
	Thickness (T)	--	3.2	--	mm	(1)

Note (1) Not include FPC.
Refer to the Outline Dimension for further information.

3. Electrical Specifications

3.1 Absolute Max. Ratings

3.1.1 Absolute Ratings of Environment

If the operating condition exceeds the following absolute maximum ratings, the TFT LCD module may be damaged permanently.

(Ta=25±2°C, V_{SS}=GND=0)

Item	Symbol	Min.	Max.	Unit	Note
Storage temperature	T_{STG}	-30	+80	°C	(1)
Operating temperature	T_{OPR}	-20	+70	°C	(1,2,3)

Note (1) 95 % RH Max. (40 °C ≥ Ta). Maximum wet-bulb temperature at 39 °C or less. (Ta > 40 °C) No condensation.

Note (2) In case of below 0°, the response time of liquid crystal (LC) becomes slower and the color of panel becomes darker than normal one. Level of retardation depends on temperature, because of LC's character

Note (3) Only operation is guarantied at operating temperature. Contrast, response time, another display quality are evaluated at +25°C.

3.2 Electrical Absolute Rating

3.2.1 TFT-LCD Module

(Voltage Referenced to VSS)

Item	Symbol	Min.	Max.	Unit	Note
Supply Voltage	VSHD	-0.3	4.6	V	
Driver supply voltage	VGH-VGL	-0.3	+32	V	
Logic input voltage range	VIN	-0.3	VSHD+0.3	V	
Logic output voltage range	VO	-0.3	VSHD+0.3	V	

3.2.2 Back-Light Unit

(Ta=25±2°C)

Item	Symbol	Min.	Max.	Unit	Note
Forward current	I_f	--	(30)	mA	(1)
Reverse voltage	V_R	--	(20)	V	(1)

Note (1) Permanent damage to the device may occur if maximum values are exceeded or reverse voltage is loaded. Functional operation should be restricted to the conditions described under normal operating conditions.

6 Input Terminal Pin Assignment

6.1 Pin Assignment (LCD)

Pin No.	Symbol	Description
1	GND	Power ground
2-3	LEDA	Anode of LED backlight
4-5	LEDK	Cathode of LED backlight
6-7	GND	Power ground
8	VCC	Power voltage(2.8V)
9	IOVCC	Power voltage(1.8/2.8V)
10	RESET	Reset signal input terminal,active at"L"
11	VSYNC	Vertical sync input in RGB mode
12	HSYNC	Horizontal sync input in RGB mode
13	GND	Power ground
14	DOTCLK	Pixel clock input in RGB mode
15	GND	Power ground
16	DE	Data Enable input in RGB mode
17-34	DB17-DB0	Data bus BO-B5 (DB0-DB5), G0-G5(DB6-D11), R0-R5 (DB12-DB17)
35	SDO	Serial data output pin
36	SDI/SDA	Serial data input pin
37	RDX	Read signal
38	WRX/SCL	Write signal/ Serial clock
39	D/CX	Data/command select signal
40	CSX	Chip select signal input terminal,active at"L"
41	TE	Tearing effect output pin to synchronies MCU to frame writing
42	XR	Touch Panel Right Side
43	YD	Touch Panel Bottom Side
44	XL	Touch Panel Left Side
45	YU	Touch Panel Top Side

Note:the MPU system interface mode is selected by R1,R2,R3,R4,R5,R6 ON FPC
When R1,R4,R5=0,R2,R3,R6 NC,select 3-SPI+RGB;
When R1,R3,R5=0,R2,R4,R6 NC,use select 4-SPI+RGB;
When R2,R4,R6=0,R1,R3,R5 NC,select i80-system 18 bit interface DB0-DB17 used;
When R2,R3,R6=0,R1,R4,R5 NC,select i80-system 16 bit interface DB0-DB15 used;
When R1,R3,R6=0,R2,R4,R5 NC,select i80-system 8bit interface DB0-DB7 used;
When R1,R4,R6=0,R2,R3,R5 NC,select i80-system 9bit interface DB0-DB8 used;

The red font color is usd 4-SPI+RGB select signal data connected availably mode.

11 Dimensional outlines

