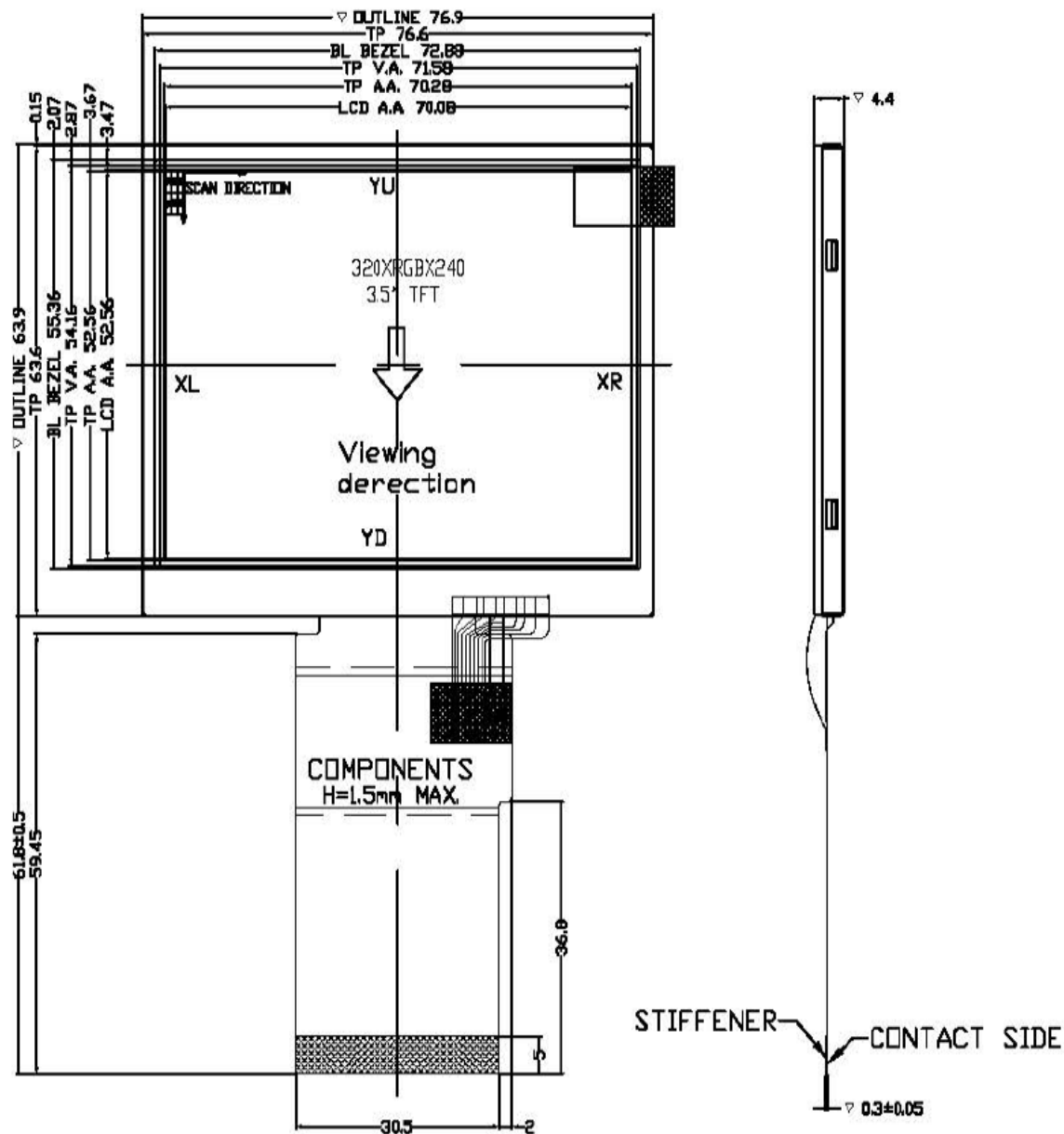


## SPECIFICATION

### **3.5" TFT display With Resistive Touch Panel**

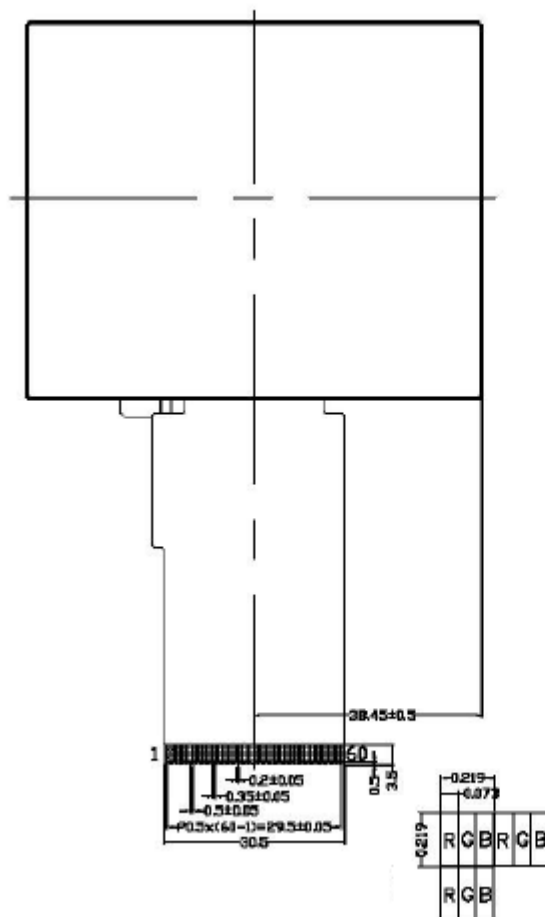
- Standard LCD Module,
- 320 x RGB x 240 Dots
- 262K Color
- Interfaces: 18 RGB, 8/16 bit CPU, 3/4 wire SPI
- Wide temperature with white LED backlight

Part Number: FDS320x240(76.9x63.9)KGE



#### Features:

1. 3.5" TFT-LCD, 262K COLOR
2. DRIVER IC: SSD2119
3. OP: -20°C~70°C / ST: -30°C~80°C
4. BACKLIGHT: 6-Chip LEDs Serial
5. ROHS Compliant



| PIN | Explanation | PIN | Explanation |
|-----|-------------|-----|-------------|
| 1   | LED_K       | 31  | G3(D9)      |
| 2   | LED_K       | 32  | G4(D10)     |
| 3   | LED_A       | 33  | G5(D11)     |
| 4   | LED_A       | 34  | NC          |
| 5   | GND         | 35  | NC          |
| 6   | XR          | 36  | R0(D12)     |
| 7   | YD          | 37  | R1(D13)     |
| 8   | XL          | 38  | R2(D14)     |
| 9   | YU          | 39  | R3(D15)     |
| 10  | GND         | 40  | R4(D16)     |
| 11  | NC          | 41  | R5(D17)     |
| 12  | NC          | 42  | HSYNC       |
| 13  | NC          | 43  | VSYNC       |
| 14  | RESET       | 44  | DCLK        |
| 15  | CS          | 45  | AVDD        |
| 16  | SPCLK       | 46  | AVDD        |
| 17  | SDA-SDI     | 47  | VCC         |
| 18  | NC          | 48  | VCC         |
| 19  | NC          | 49  | DC          |
| 20  | B0(D0)      | 50  | RD          |
| 21  | B1(D1)      | 51  | WR          |
| 22  | B2(D2)      | 52  | PS0         |
| 23  | B3(D3)      | 53  | PS1         |
| 24  | B4(D4)      | 54  | PS2         |
| 25  | B5(D5)      | 55  | PS3         |
| 26  | NC          | 56  | WSYNC       |
| 27  | NC          | 57  | NC          |
| 28  | G0(D6)      | 58  | OE          |
| 29  | G1(D7)      | 59  | GND         |
| 30  | G2(D8)      | 60  | GND         |

## GENERAL DESCRIPTION

- 3.5" (diagonal), 320xRGBx240 dots, 262k colors, Transmissive, TFT LCD module
- Viewing Direction: 12 o'clock
- Driving IC: SSD2119 or equivalent TFT controller/driver
- 18-bits/16-bit/8-bit data bus (parallel RGB interface/8080 parallel system interface)
- 4-wire/3-wire SPI interface
- With internal voltage booster
- Logic voltage: 3.3V (typ.)
- Touch panel

### General Specifications

| PARAMETER                |                     | SPECIFICATIONS                                                   | UNIT  |
|--------------------------|---------------------|------------------------------------------------------------------|-------|
| Outline dimensions       |                     | 76.9(W) x 63.9(H) x 4.4(D)<br>(Exclude FPC, cables of backlight) | mm    |
| Color TFT<br>320xRGBx240 | View area           | 72.88(W) x 55.36(H)                                              | mm    |
|                          | TP view area        | 71.58 (W) x 54.2(H)                                              | mm    |
|                          | LCD active area     | 70.08(W) x 52.56(H)                                              | mm    |
|                          | Display format      | 320 x RGB x 240                                                  | dots  |
|                          | Color configuration | RGB stripes                                                      | -     |
|                          | Dot size            | 0.219(RGB)(W) x 0.219(H)                                         | mm    |
| Weight                   |                     | ~40                                                              | grams |

### ELECTRICAL Maximum Rating

| ITEM           | SYMBOL | MIN  | MAX | UNIT | NOTE |
|----------------|--------|------|-----|------|------|
| Supply voltage | VCC    | -0.3 | 4   | V    | 1    |
| Input voltage  | AVDD   | -0.3 | 4   | V    |      |

Note 1: VCC, GND must be maintained

Note 2: The modules may be permanently destroyed if they are used beyond the absolute maximum ratings

### ELECTRICAL Specifications

| PARAMETER                                | SYMBOL  | CONDITIONS                | MIN             | TYP  | MAX  | UNIT  |
|------------------------------------------|---------|---------------------------|-----------------|------|------|-------|
| Supply voltage (logic)                   | VCC-GND |                           | 1.4             | -    | 3.6  | V     |
| Supply voltage (lcd driving)             | AVDD    |                           | 2.5 or<br>VDDIO | -    | 3.6  | V     |
| Output voltage(LCD)                      | VGH     |                           | 9               | -    | 18.0 | V     |
|                                          | VGL     |                           | -15.0           | -    | -6   | V     |
|                                          | VCOM    |                           | -1              | -    | 6    | V     |
| Supply current<br>(Logic & LCD)          | ICC     | VDD=3.3V                  | -               | -    | 10   | mA    |
| Supply voltage of white<br>LED backlight | VLED    | Forward current<br>=20 mA | -               | 19.2 | 21.6 | V     |
| Luminance<br>(on the module surface)     |         | Number of LED<br>dies = 6 | 230             | 270  | -    | cd/m2 |

At Ta = 25 °C, VCC=IOVCC= 3.3V, GND=0V.



### Interface Pin Connections

| PIN NO. | SYMBOL  | DESCRIPTION                                    |
|---------|---------|------------------------------------------------|
| 1-2     | LED_K   | Power supply for LED backlight                 |
| 3-4     | LED_A   |                                                |
| 5       | GND     | Power supply (system ground)                   |
| 6       | XR      | Terminal of touch panel                        |
| 7       | YD      |                                                |
| 8       | XL      |                                                |
| 9       | YU      |                                                |
| 10      | GND     | Power supply (system ground)                   |
| 11-13   | NC      | No connection                                  |
| 14      | RESET   | System reset pin                               |
| 15      | CS      | Chip select pin                                |
| 16      | SPCLK   | Clock pin of serial interface                  |
| 17      | SDA-SDI | Data pin of serial interface                   |
| 18-19   | NC      | No connection                                  |
| 20-25   | B[0-5]  | Blue data 6-bit/18bit bi-directional (D0-D5)   |
| 26-27   | NC      | No connection                                  |
| 28-33   | G[0-5]  | Green data 6-bit/18bit bi-directional (D6-D11) |
| 34-35   | NC      | No connection                                  |
| 36-41   | R[0-5]  | Red data 6-bit/18bit bi-directional (D12-D17)  |
| 42      | HSYNC   | Line synchronization signal input              |
| 43      | VSYNC   | Frame/Ram synchronization signal input         |
| 44      | DCLK    | Dot clock signal                               |
| 45-46   | AVDD    | Supply voltage for LCD driving                 |
| 47-48   | VCC     | Supply voltage for logic                       |
| 49      | DC      | Parallel Interface                             |
| 50      | RD      | I80 system: Serves as a read signal            |

### Interface Pin Connections (continued)

| PIN NO. | SYMBOL | DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |                                       |     |                                                       |                |   |   |   |   |                                                 |   |   |   |   |                                       |   |   |   |   |                                            |   |   |   |   |                                                       |   |   |   |   |                                               |   |   |   |   |                                             |   |   |   |   |                                         |   |   |   |   |                                       |   |   |   |   |            |
|---------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------------------------------------|-----|-------------------------------------------------------|----------------|---|---|---|---|-------------------------------------------------|---|---|---|---|---------------------------------------|---|---|---|---|--------------------------------------------|---|---|---|---|-------------------------------------------------------|---|---|---|---|-----------------------------------------------|---|---|---|---|---------------------------------------------|---|---|---|---|-----------------------------------------|---|---|---|---|---------------------------------------|---|---|---|---|------------|
| 51      | WR     | Bi-directional data bus 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     |                                       |     |                                                       |                |   |   |   |   |                                                 |   |   |   |   |                                       |   |   |   |   |                                            |   |   |   |   |                                                       |   |   |   |   |                                               |   |   |   |   |                                             |   |   |   |   |                                         |   |   |   |   |                                       |   |   |   |   |            |
| 52-55   |        | Bi-directional data bus 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     |                                       |     |                                                       |                |   |   |   |   |                                                 |   |   |   |   |                                       |   |   |   |   |                                            |   |   |   |   |                                                       |   |   |   |   |                                               |   |   |   |   |                                             |   |   |   |   |                                         |   |   |   |   |                                       |   |   |   |   |            |
|         |        | <table><tr><th>PS3</th><th>PS2</th><th>PS1</th><th>PS0</th><th>Interface Mode</th></tr><tr><td>0</td><td>0</td><td>1</td><td>0</td><td>16-bit 8080 parallel interface, D[17:10]&amp;D[8:1]</td></tr><tr><td>0</td><td>0</td><td>1</td><td>1</td><td>8-bit 8080 parallel interface, D[8:1]</td></tr><tr><td>0</td><td>1</td><td>0</td><td>0</td><td>9-bit RGB(262 colour) + 3-wire SPI, D[8:0]</td></tr><tr><td>0</td><td>1</td><td>0</td><td>1</td><td>16-bit RGB(262K colour) + 3-wire SPI, D[17:10]&amp;D[8:1]</td></tr><tr><td>0</td><td>1</td><td>1</td><td>0</td><td>18-bit RGB(262K colour) + 3-wire SPI, D[17:0]</td></tr><tr><td>0</td><td>1</td><td>1</td><td>1</td><td>6-bit RGB(262K colour) + 3-wire SPI, D[8:3]</td></tr><tr><td>1</td><td>0</td><td>1</td><td>0</td><td>18-bit 8080 parallel interface, D[17:0]</td></tr><tr><td>1</td><td>0</td><td>1</td><td>1</td><td>9-bit 8080 parallel interface, D[8:0]</td></tr><tr><td>1</td><td>1</td><td>1</td><td>0</td><td>3-wire SPI</td></tr></table> | PS3 | PS2                                   | PS1 | PS0                                                   | Interface Mode | 0 | 0 | 1 | 0 | 16-bit 8080 parallel interface, D[17:10]&D[8:1] | 0 | 0 | 1 | 1 | 8-bit 8080 parallel interface, D[8:1] | 0 | 1 | 0 | 0 | 9-bit RGB(262 colour) + 3-wire SPI, D[8:0] | 0 | 1 | 0 | 1 | 16-bit RGB(262K colour) + 3-wire SPI, D[17:10]&D[8:1] | 0 | 1 | 1 | 0 | 18-bit RGB(262K colour) + 3-wire SPI, D[17:0] | 0 | 1 | 1 | 1 | 6-bit RGB(262K colour) + 3-wire SPI, D[8:3] | 1 | 0 | 1 | 0 | 18-bit 8080 parallel interface, D[17:0] | 1 | 0 | 1 | 1 | 9-bit 8080 parallel interface, D[8:0] | 1 | 1 | 1 | 0 | 3-wire SPI |
|         |        | PS3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | PS2 | PS1                                   | PS0 | Interface Mode                                        |                |   |   |   |   |                                                 |   |   |   |   |                                       |   |   |   |   |                                            |   |   |   |   |                                                       |   |   |   |   |                                               |   |   |   |   |                                             |   |   |   |   |                                         |   |   |   |   |                                       |   |   |   |   |            |
|         |        | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0   | 1                                     | 0   | 16-bit 8080 parallel interface, D[17:10]&D[8:1]       |                |   |   |   |   |                                                 |   |   |   |   |                                       |   |   |   |   |                                            |   |   |   |   |                                                       |   |   |   |   |                                               |   |   |   |   |                                             |   |   |   |   |                                         |   |   |   |   |                                       |   |   |   |   |            |
|         |        | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0   | 1                                     | 1   | 8-bit 8080 parallel interface, D[8:1]                 |                |   |   |   |   |                                                 |   |   |   |   |                                       |   |   |   |   |                                            |   |   |   |   |                                                       |   |   |   |   |                                               |   |   |   |   |                                             |   |   |   |   |                                         |   |   |   |   |                                       |   |   |   |   |            |
|         |        | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1   | 0                                     | 0   | 9-bit RGB(262 colour) + 3-wire SPI, D[8:0]            |                |   |   |   |   |                                                 |   |   |   |   |                                       |   |   |   |   |                                            |   |   |   |   |                                                       |   |   |   |   |                                               |   |   |   |   |                                             |   |   |   |   |                                         |   |   |   |   |                                       |   |   |   |   |            |
|         |        | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1   | 0                                     | 1   | 16-bit RGB(262K colour) + 3-wire SPI, D[17:10]&D[8:1] |                |   |   |   |   |                                                 |   |   |   |   |                                       |   |   |   |   |                                            |   |   |   |   |                                                       |   |   |   |   |                                               |   |   |   |   |                                             |   |   |   |   |                                         |   |   |   |   |                                       |   |   |   |   |            |
|         |        | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1   | 1                                     | 0   | 18-bit RGB(262K colour) + 3-wire SPI, D[17:0]         |                |   |   |   |   |                                                 |   |   |   |   |                                       |   |   |   |   |                                            |   |   |   |   |                                                       |   |   |   |   |                                               |   |   |   |   |                                             |   |   |   |   |                                         |   |   |   |   |                                       |   |   |   |   |            |
|         |        | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1   | 1                                     | 1   | 6-bit RGB(262K colour) + 3-wire SPI, D[8:3]           |                |   |   |   |   |                                                 |   |   |   |   |                                       |   |   |   |   |                                            |   |   |   |   |                                                       |   |   |   |   |                                               |   |   |   |   |                                             |   |   |   |   |                                         |   |   |   |   |                                       |   |   |   |   |            |
|         |        | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0   | 1                                     | 0   | 18-bit 8080 parallel interface, D[17:0]               |                |   |   |   |   |                                                 |   |   |   |   |                                       |   |   |   |   |                                            |   |   |   |   |                                                       |   |   |   |   |                                               |   |   |   |   |                                             |   |   |   |   |                                         |   |   |   |   |                                       |   |   |   |   |            |
| 1       | 0      | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1   | 9-bit 8080 parallel interface, D[8:0] |     |                                                       |                |   |   |   |   |                                                 |   |   |   |   |                                       |   |   |   |   |                                            |   |   |   |   |                                                       |   |   |   |   |                                               |   |   |   |   |                                             |   |   |   |   |                                         |   |   |   |   |                                       |   |   |   |   |            |
| 1       | 1      | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0   | 3-wire SPI                            |     |                                                       |                |   |   |   |   |                                                 |   |   |   |   |                                       |   |   |   |   |                                            |   |   |   |   |                                                       |   |   |   |   |                                               |   |   |   |   |                                             |   |   |   |   |                                         |   |   |   |   |                                       |   |   |   |   |            |
| 56      | WSYNC  | Ram Write Synchronization output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |                                       |     |                                                       |                |   |   |   |   |                                                 |   |   |   |   |                                       |   |   |   |   |                                            |   |   |   |   |                                                       |   |   |   |   |                                               |   |   |   |   |                                             |   |   |   |   |                                         |   |   |   |   |                                       |   |   |   |   |            |
| 57      | NC     | No connection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     |                                       |     |                                                       |                |   |   |   |   |                                                 |   |   |   |   |                                       |   |   |   |   |                                            |   |   |   |   |                                                       |   |   |   |   |                                               |   |   |   |   |                                             |   |   |   |   |                                         |   |   |   |   |                                       |   |   |   |   |            |
| 58      | OE     | Display enable pin from controller                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |                                       |     |                                                       |                |   |   |   |   |                                                 |   |   |   |   |                                       |   |   |   |   |                                            |   |   |   |   |                                                       |   |   |   |   |                                               |   |   |   |   |                                             |   |   |   |   |                                         |   |   |   |   |                                       |   |   |   |   |            |
| 59-60   | GND    | Power supply (system ground)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |                                       |     |                                                       |                |   |   |   |   |                                                 |   |   |   |   |                                       |   |   |   |   |                                            |   |   |   |   |                                                       |   |   |   |   |                                               |   |   |   |   |                                             |   |   |   |   |                                         |   |   |   |   |                                       |   |   |   |   |            |

### Environmental Conditions

| ITEM                | Operating Temperature (T <sub>opr</sub> ) |       | Storage Temperature (T <sub>stg</sub> ) |       | REMARK |
|---------------------|-------------------------------------------|-------|-----------------------------------------|-------|--------|
|                     | MIN                                       | MAX   | MIN                                     | MAX   |        |
| Ambient Temperature | -20°C                                     | +70°C | -30°C                                   | +80°C | Dry    |

Note 1: Product cannot sustain at extreme storage conditions for long time.