DSM7T Series
Thin Surface Mount Single Digit 7-Segment LED Numeric Display

DSM7TA56106T - 0.56” (14.22mm) Digit Height
Emitting Color: Blue (InGaN)

Application

- People Movers
- Home Appliances
- Medical Devices
- Industrial Devices
- Automation and Controls
- Light Control
- IoT
- Transportation
- Food Service Appliances

Key features

- 1-digit seven segment led numeric display
- Includes a decimal point (DP), useful when two or more seven-segment displays are connected to each other to display decimals
- White segments and black surface
- Substrate: InGaN
- Outer dimensions: 17.0 x 12.5 x 3.85mm
- High light output
- Excellent character appearance
- Quality tested with the highest industry standard
- Side by side mounting allows space saving
- Provides the ability to reduce overall thickness of PCB, with major cost savings
- Available in 3 different digit heights and widths
- Automation-friendly tape and reel
- Technically and mechanically rugged
- Small and light, easy assembly
- Life expectancy: up to 50,000 hours
- Lower power consumption
- Allow top mount and reverse mount design
- Mechanically rugged
- Moisture Sensitive Level (MSL): 2a
- Available in blue, red and pure green
- Polarity: common anode
- Easy mounting on PC boards or sockets
- Low current operation
- Degree of protection IP50 (Dust-Protected)
Ordering Data

<table>
<thead>
<tr>
<th>Series</th>
<th>Mounting Type</th>
<th>Number of Segments</th>
<th>Thickness Type</th>
<th>Polarity: Common</th>
<th>Digit Height</th>
<th>Number of Digits</th>
<th>Color</th>
<th>Packaging</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>SM</td>
<td>7</td>
<td>T</td>
<td>A</td>
<td>28</td>
<td>1</td>
<td>01</td>
<td>Bulk**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Tape &amp; Reel</td>
</tr>
</tbody>
</table>

Series
D Display

Mounting Type
SM SMD

Number of Segments
7 7-Segments

Thickness Type
T Thin
U* Ultra Thin

Polarity: Common
A Anode

Digit Height
20** 0.20*
28 0.28*
30** 0.30*
39 0.39*
56 0.56*
70** 0.70*

Color
01 Red
05 Pure Green
06 Blue

Number of Digits
1 1 digit

*Please refer to DSM7U product datasheet for Ultra Thin Version
**Only available for DSM7U Version

Dimensions and Internal Circuit Diagram

Dimensions in millimeters
Tolerance is ±0.25mm unless otherwise noted
Internal Circuit Diagram

Pin Connections (Common Anode)

```
A B C D E F G DP
1 2 3 4 5 6 7
```

<table>
<thead>
<tr>
<th>PIN No</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CATHODE E</td>
</tr>
<tr>
<td>2</td>
<td>CATHODE D</td>
</tr>
<tr>
<td>3</td>
<td>COMMON ANODE</td>
</tr>
<tr>
<td>4</td>
<td>CATHODE C</td>
</tr>
<tr>
<td>5</td>
<td>CATHODE DP</td>
</tr>
<tr>
<td>6</td>
<td>CATHODE B</td>
</tr>
<tr>
<td>7</td>
<td>CATHODE A</td>
</tr>
<tr>
<td>8</td>
<td>COMMON ANODE</td>
</tr>
<tr>
<td>9</td>
<td>CATHODE F</td>
</tr>
<tr>
<td>10</td>
<td>CATHODE G</td>
</tr>
</tbody>
</table>

Product Specifications

Absolute Maximum Ratings while Ta=25°C

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Minimum (m)</th>
<th>Maximum (M)</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward Current I_f/Seg</td>
<td>--</td>
<td>20</td>
<td>mA</td>
</tr>
<tr>
<td>Reverse Voltage V_r/Seg</td>
<td>--</td>
<td>5</td>
<td>V</td>
</tr>
<tr>
<td>Operating Temperature T_OP</td>
<td>-30</td>
<td>85</td>
<td>°C</td>
</tr>
<tr>
<td>Storage Temperature T_STG</td>
<td>-40</td>
<td>100</td>
<td>°C</td>
</tr>
<tr>
<td>Peak Current I_P/Seg</td>
<td>--</td>
<td>60</td>
<td>mA</td>
</tr>
</tbody>
</table>

(Notice: 1/10th duty cycle, 0.1ms pulse width)

Electrical-Optical Characteristics while Ta=25°C

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Condition</th>
<th>Unit</th>
<th>Minimum</th>
<th>Typical</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward Voltage V_f/Seg</td>
<td>IF=20mA</td>
<td>V</td>
<td>2.6</td>
<td>3.0</td>
<td>3.6</td>
</tr>
<tr>
<td>Reverse Current I_r/Seg</td>
<td>VR=5V</td>
<td>μA</td>
<td>--</td>
<td>--</td>
<td>50</td>
</tr>
<tr>
<td>Wavelength λP</td>
<td>IF=20mA</td>
<td>nm</td>
<td>465</td>
<td>470</td>
<td>475</td>
</tr>
<tr>
<td>Full Width at Half λ</td>
<td>IF=20mA</td>
<td>nm</td>
<td>--</td>
<td>15</td>
<td>--</td>
</tr>
<tr>
<td>Maximum Δλ</td>
<td>IF=20mA</td>
<td>nm</td>
<td>--</td>
<td>15</td>
<td>--</td>
</tr>
<tr>
<td>Luminosity L_v/Seg</td>
<td>IF=20mA</td>
<td>mcd</td>
<td>80</td>
<td>125</td>
<td>175</td>
</tr>
<tr>
<td>Viewing angle</td>
<td></td>
<td></td>
<td>wide viewing angle</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Product Specifications

![Graphs showing Relative Spectral, Forward Current vs. Forward Voltage, Relative Luminous Intensity vs. Forward current, Forward Current Vs. Temperature, Luminous Intensity vs. Temperature.

Circuit Design Notes

- Always use current limit resistors when necessary
- LEDs could be electrically connected in parallel, with each current limiting resistor

Correct

[Diagram showing correct circuit connection]

[Diagram showing incorrect circuit connection]
Recommended Reflow Soldering Profile

- Manual soldering is suggested
  - Use soldering irons of which power is less than 30 Watt.
  - Keep the temperature of soldering irons below 360 °C
  - Only one soldering is allowed on each bonding pad.
  - The maximum time from when a soldering iron comes into contact with the parts that are to be connected until the joint is finished should not exceed three seconds.
  - Perform other procedures after the soldered pad cools down.

- Suggested storage conditions: 25°C +/-10°C (77°F +/-50°F), relative humidity 65% RH +/- 20% RH.

<table>
<thead>
<tr>
<th>Profile Feature</th>
<th>Typical Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preheat Temperature Min</td>
<td>150 °C (302°F)</td>
</tr>
<tr>
<td>Preheat Temperature Max</td>
<td>200 °C (392°F)</td>
</tr>
<tr>
<td>Preheat Time</td>
<td>60 -180 sec.</td>
</tr>
<tr>
<td>Reflow Starting Temperature</td>
<td>217 °C (423°F)</td>
</tr>
<tr>
<td>Time Spent During Reflow</td>
<td>60 -150 sec.</td>
</tr>
<tr>
<td>Reflow Peak Temperature</td>
<td>245 °C (473°F)</td>
</tr>
</tbody>
</table>

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Tape and Reel Dimensions

Carrier band

Tape

0.069 [1.75]

0.157 [4.0] 0.079 [2.0]

0.630 [16]

PCB Board

Decimal Point

Direction of the feed

Reel Dimensions

ø 0.15 [38]

900PCS/Reel

Top Mount

Reverse Mount

Electrostatic Discharge (ESD) Package

Anti Static Bags Aluminium Moisture Barrier Bag.

Dimensions in inches [millimeters]

Compliances and Approvals

REACH  RoHS COMPLIANT  RoHs-Pb Free  ESD SAFE

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