

# EB13E2G2H-1.8432M TR

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## REGULATORY COMPLIANCE (Data Sheet downloaded on Jun 14, 2020)


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## ITEM DESCRIPTION

Quartz Crystal Clock Oscillators XO (SPXO) LVC MOS (CMOS) 3.3Vdc 4 Pad 2.5mm x 3.2mm Ceramic Surface Mount (SMD) 1.8432MHz  $\pm 100$ ppm over -40°C to +85°C

## ELECTRICAL SPECIFICATIONS

|                                       |                                                                                                                                                                                                                                                             |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Nominal Frequency                     | 1.8432MHz                                                                                                                                                                                                                                                   |
| Frequency Tolerance/Stability         | $\pm 100$ ppm Maximum over -40°C to +85°C (Inclusive of all conditions: Calibration Tolerance at 25°C, Frequency Stability over the Operating Temperature Range, Supply Voltage Change, Output Load Change, First Year Aging at 25°C, Shock, and Vibration) |
| Supply Voltage                        | 3.3Vdc $\pm 5\%$                                                                                                                                                                                                                                            |
| Input Current                         | 3mA Maximum                                                                                                                                                                                                                                                 |
| Output Voltage Logic High (Voh)       | 90% of Vdd Minimum (IOH= -4mA)                                                                                                                                                                                                                              |
| Output Voltage Logic Low (Vol)        | 10% of Vdd Maximum (IOL= +4mA)                                                                                                                                                                                                                              |
| Rise/Fall Time                        | 5nSec Maximum (Measured at 20% to 80% of waveform)                                                                                                                                                                                                          |
| Duty Cycle                            | 50 $\pm 5$ (%) (Measured at 50% of waveform)                                                                                                                                                                                                                |
| Load Drive Capability                 | 15pF Maximum                                                                                                                                                                                                                                                |
| Output Logic Type                     | CMOS                                                                                                                                                                                                                                                        |
| Pin 1 Connection                      | Tri-State (High Impedance)                                                                                                                                                                                                                                  |
| Tri-State Input Voltage (Vih and Vil) | 80% of Vdd Minimum or No Connect to Enable Output, 20% of Vdd Maximum to Disable Output (High Impedance)                                                                                                                                                    |
| Standby Current                       | 10 $\mu$ A Maximum (Disabled Output: High Impedance)                                                                                                                                                                                                        |
| RMS Phase Jitter                      | 1pSec Maximum (Fj = 12kHz to 20MHz)                                                                                                                                                                                                                         |
| Start Up Time                         | 10mSec Maximum                                                                                                                                                                                                                                              |
| Storage Temperature Range             | -55°C to +125°C                                                                                                                                                                                                                                             |

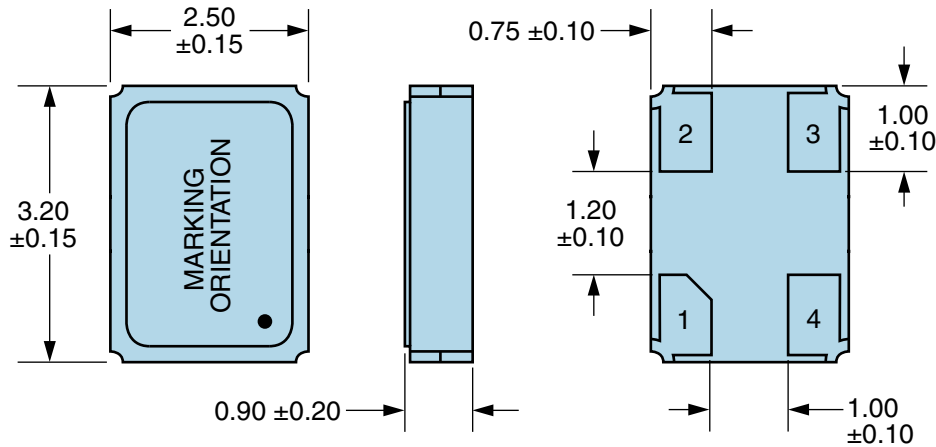
## ENVIRONMENTAL & MECHANICAL SPECIFICATIONS

|                              |                                               |
|------------------------------|-----------------------------------------------|
| ESD Susceptibility           | MIL-STD-883, Method 3015, Class 1, HBM: 1500V |
| Fine Leak Test               | MIL-STD-883, Method 1014, Condition A         |
| Flammability                 | UL94-V0                                       |
| Gross Leak Test              | MIL-STD-883, Method 1014, Condition C         |
| Mechanical Shock             | MIL-STD-883, Method 2002, Condition B         |
| Moisture Resistance          | MIL-STD-883, Method 1004                      |
| Moisture Sensitivity         | J-STD-020, MSL 1                              |
| Resistance to Soldering Heat | MIL-STD-202, Method 210, Condition K          |
| Resistance to Solvents       | MIL-STD-202, Method 215                       |
| Solderability                | MIL-STD-883, Method 2003                      |
| Temperature Cycling          | MIL-STD-883, Method 1010, Condition B         |
| Vibration                    | MIL-STD-883, Method 2007, Condition A         |

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MECHANICAL DIMENSIONS (all dimensions in millimeters)

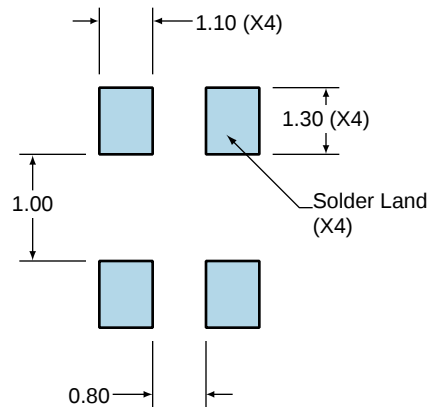


| PIN | CONNECTION     |
|-----|----------------|
| 1   | Tri-State      |
| 2   | Case/Ground    |
| 3   | Output         |
| 4   | Supply Voltage |

| LINE | MARKING                                                          |
|------|------------------------------------------------------------------|
| 1    | <b>E1.84</b><br><i>E=Ecliptek Designator</i>                     |
| 2    | <b>XXXXXX</b><br><i>XXXXXX=Ecliptek Manufacturing Identifier</i> |

Suggested Solder Pad Layout

All Dimensions in Millimeters

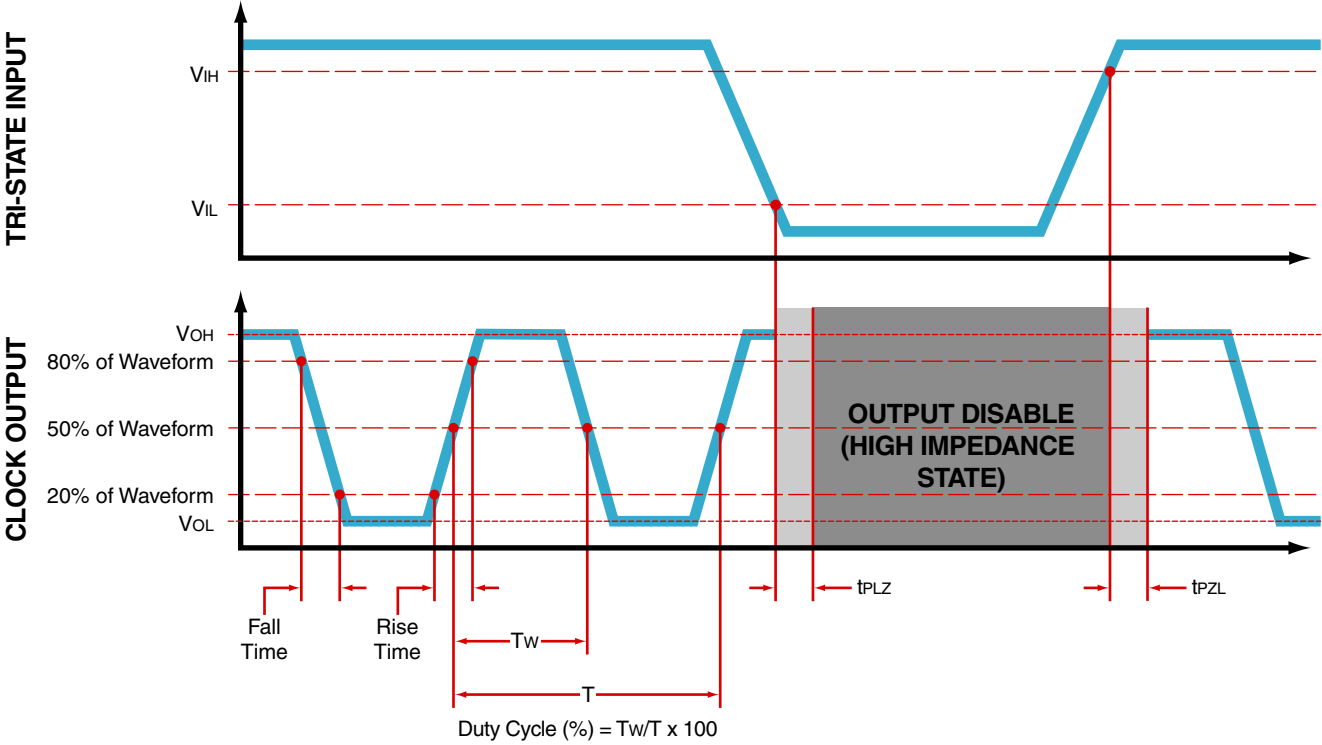


All Tolerances are ±0.1

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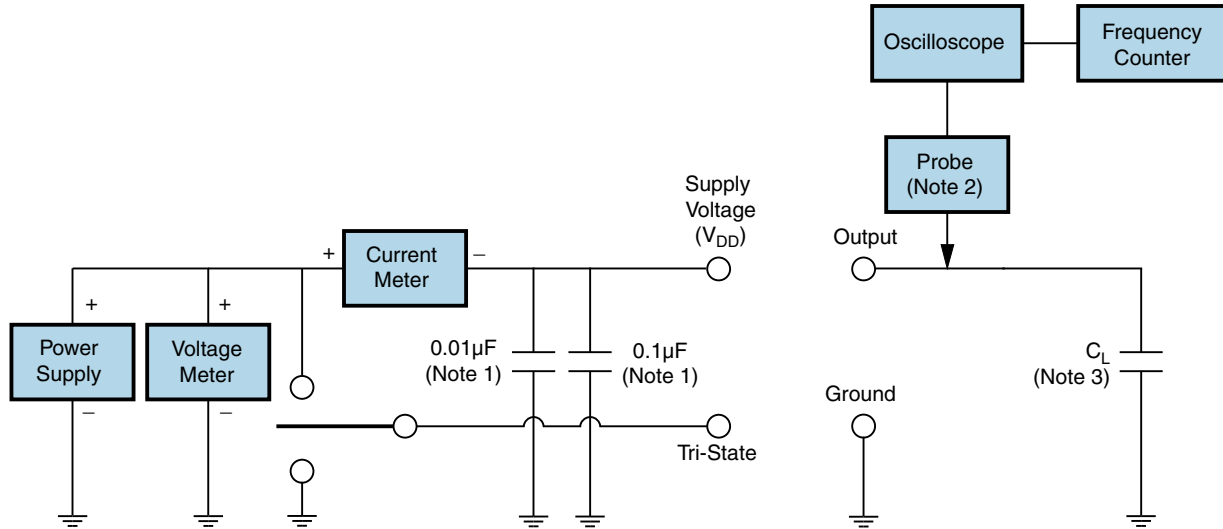
OUTPUT WAVEFORM & TIMING DIAGRAM



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## Test Circuit for CMOS Output



Note 1: An external  $0.01\mu F$  ceramic bypass capacitor in parallel with a  $0.1\mu F$  high frequency ceramic bypass capacitor close (less than 2mm) to the package ground and supply voltage pin is required.

Note 2: A low capacitance ( $<12pF$ ), 10X attenuation factor, high impedance ( $>10M\Omega$ ), and high bandwidth ( $>300MHz$ ) passive probe is recommended.

Note 3: Capacitance value  $C_L$  includes sum of all probe and fixture capacitance.

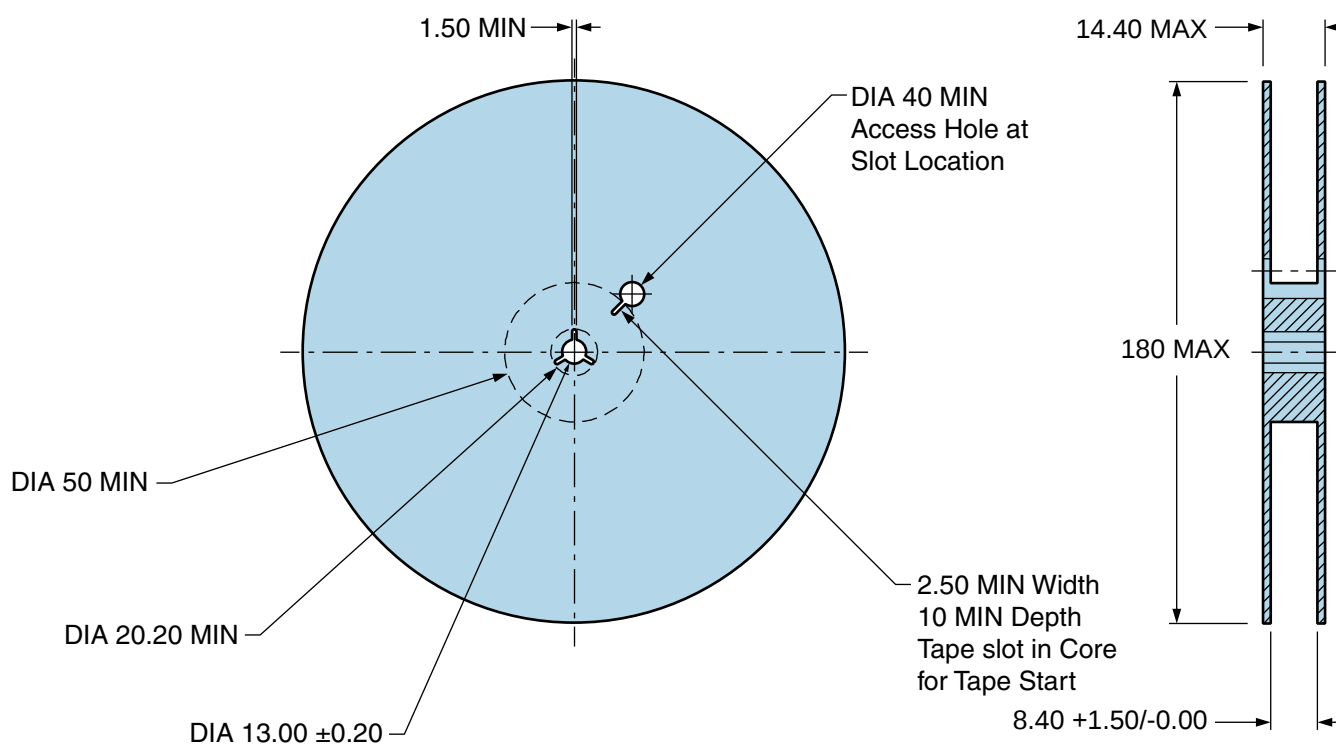
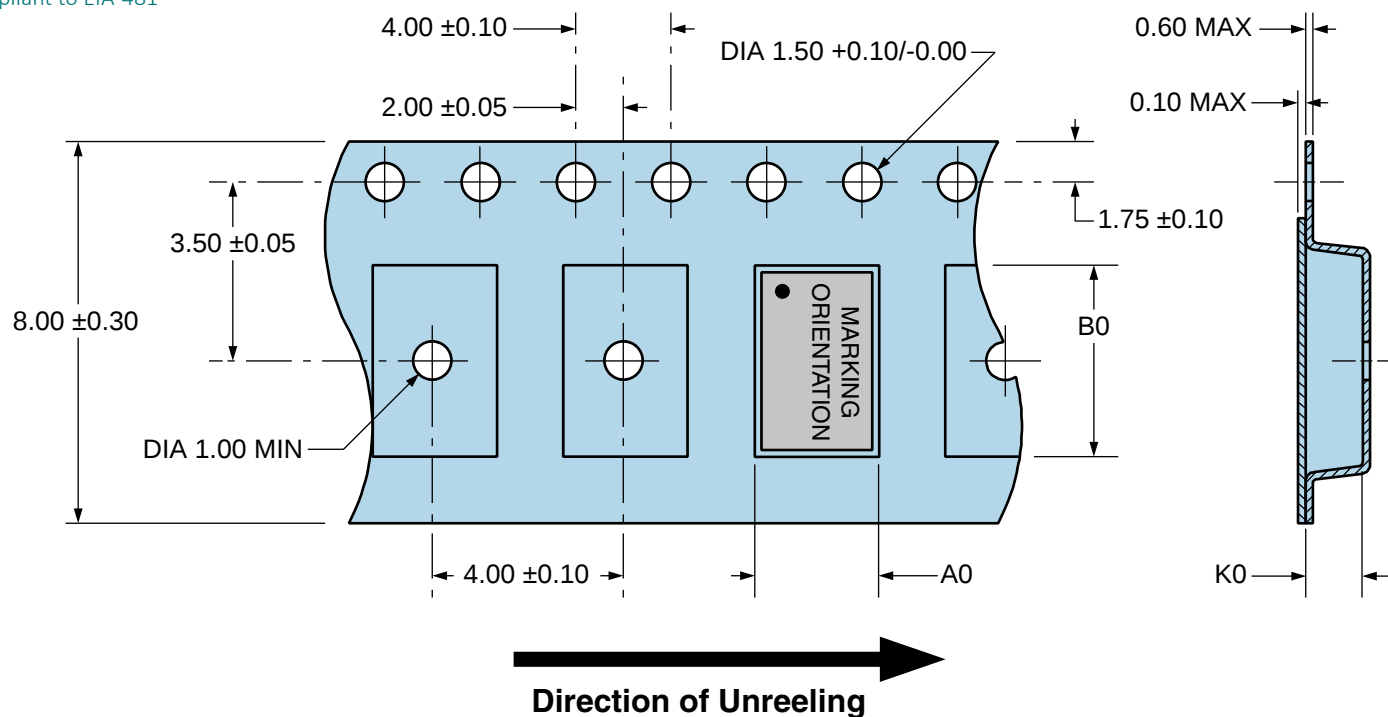
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## Tape & Reel Dimensions

Quantity Per Reel: 1,000 units

All Dimensions in Millimeters

Compliant to EIA-481



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Recommended Solder Reflow Methods



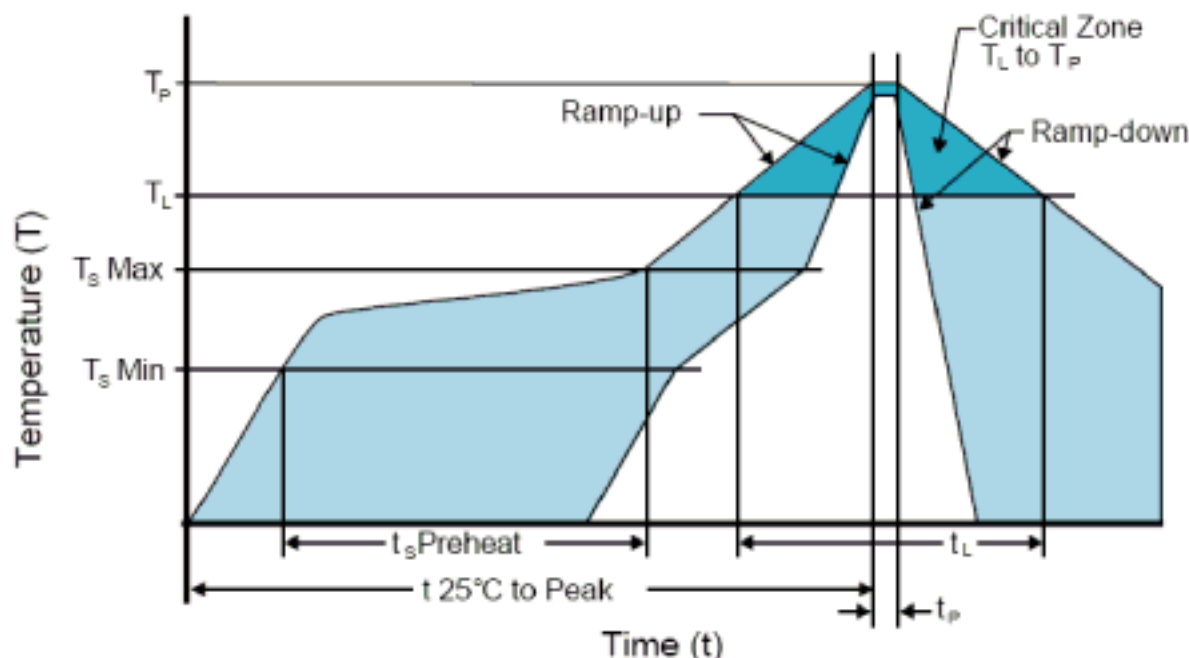
High Temperature Infrared/Convection

|                                     |                                      |
|-------------------------------------|--------------------------------------|
| Ts MAX to TL (Ramp-up Rate)         | 3°C/Second Maximum                   |
| Preheat                             |                                      |
| - Temperature Minimum (Ts MIN)      | 150°C                                |
| - Temperature Typical (Ts TYP)      | 175°C                                |
| - Temperature Maximum (Ts MAX)      | 200°C                                |
| - Time (ts MIN)                     | 60 - 180 Seconds                     |
| Ramp-up Rate (TL to TP)             | 3°C/Second Maximum                   |
| Time Maintained Above:              |                                      |
| - Temperature (TL)                  | 217°C                                |
| - Time (tL)                         | 60 - 150 Seconds                     |
| Peak Temperature (TP)               | 260°C Maximum for 10 Seconds Maximum |
| Target Peak Temperature (TP Target) | 250°C +0/-5°C                        |
| Time within 5°C of actual peak (tP) | 20 - 40 Seconds                      |
| Ramp-down Rate                      | 6°C/Second Maximum                   |
| Time 25°C to Peak Temperature (t)   | 8 Minutes Maximum                    |
| Moisture Sensitivity Level          | Level 1                              |

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## Recommended Solder Reflow Methods



## Low Temperature Infrared/Convection 240°C

|                             |                    |
|-----------------------------|--------------------|
| TS MAX to TL (Ramp-up Rate) | 5°C/Second Maximum |
|-----------------------------|--------------------|

### Preheat

|                                |                  |
|--------------------------------|------------------|
| - Temperature Minimum (TS MIN) | N/A              |
| - Temperature Typical (TS TYP) | 150°C            |
| - Temperature Maximum (TS MAX) | N/A              |
| - Time (ts MIN)                | 60 - 120 Seconds |

|                         |                    |
|-------------------------|--------------------|
| Ramp-up Rate (TL to TP) | 5°C/Second Maximum |
|-------------------------|--------------------|

### Time Maintained Above:

|                    |                     |
|--------------------|---------------------|
| - Temperature (TL) | 150°C               |
| - Time (tL)        | 200 Seconds Maximum |

|                       |               |
|-----------------------|---------------|
| Peak Temperature (TP) | 240°C Maximum |
|-----------------------|---------------|

|                                     |                                              |
|-------------------------------------|----------------------------------------------|
| Target Peak Temperature (TP Target) | 240°C Maximum 2 Times / 230°C Maximum 1 Time |
|-------------------------------------|----------------------------------------------|

|                                     |                                                        |
|-------------------------------------|--------------------------------------------------------|
| Time within 5°C of actual peak (tp) | 10 Seconds Maximum 2 Times / 80 Seconds Maximum 1 Time |
|-------------------------------------|--------------------------------------------------------|

|                |                    |
|----------------|--------------------|
| Ramp-down Rate | 5°C/Second Maximum |
|----------------|--------------------|

|                                   |     |
|-----------------------------------|-----|
| Time 25°C to Peak Temperature (t) | N/A |
|-----------------------------------|-----|

|                            |         |
|----------------------------|---------|
| Moisture Sensitivity Level | Level 1 |
|----------------------------|---------|

## Low Temperature Manual Soldering

185°C Maximum for 10 Seconds Maximum, 2 times Maximum.

## High Temperature Manual Soldering

260°C Maximum for 5 Seconds Maximum, 2 times Maximum.

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#### Как с нами связаться

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