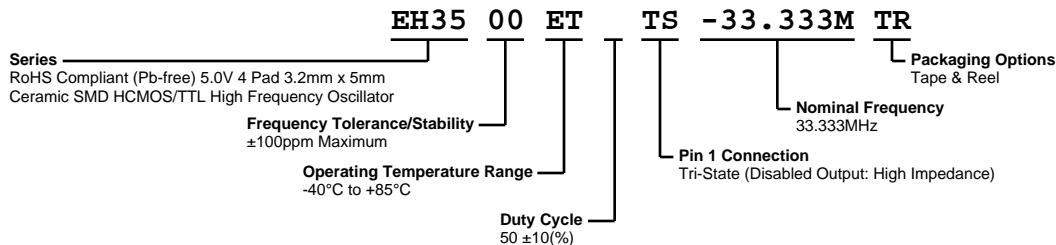


# EH3500ETTS-33.333M TR



## ELECTRICAL SPECIFICATIONS

|  |   |
|--|---|
| <b>Nominal Frequency</b>                     | 33.333MHz   |
| <b>Frequency Tolerance/Stability</b>         | ±100ppm Maximum (Inclusive of all conditions: Calibration Tolerance at 25°C, Frequency Stability over the Operating Temperature Range, Supply Voltage Change, Output Load Change, 1st Year Aging at 25°C, Shock, and Vibration) |
| <b>Aging at 25°C</b>                         | ±5ppm/year Maximum  |
| <b>Operating Temperature Range</b>           | -40°C to +85°C  |
| <b>Supply Voltage</b>                        | 5.0Vdc ±10%   |
| <b>Input Current</b>                         | 50mA Maximum (No Load)  |
| <b>Output Voltage Logic High (Voh)</b>       | 2.4Vdc Minimum with TTL Load, Vdd-0.4Vdc Minimum with HCMOS Load (IOH = -16mA)  |
| <b>Output Voltage Logic Low (Vol)</b>        | 0.4Vdc Maximum with TTL Load, 0.5Vdc Maximum with HCMOS Load (IOL = +16mA)  |
| <b>Rise/Fall Time</b>                        | 6nSec Maximum (Measured at 0.8Vdc to 2.0Vdc with TTL Load or at 20% to 80% of waveform with HCMOS Load)   |
| <b>Duty Cycle</b>                            | 50 ±10(%) (Measured at 1.4Vdc with TTL Load or at 50% of waveform with HCMOS Load)  |
| <b>Load Drive Capability</b>                 | 10TTL Load or 50pF HCMOS Load Maximum   |
| <b>Output Logic Type</b>                     | CMOS  |
| <b>Pin 1 Connection</b>                      | Tri-State (Disabled Output: High Impedance)   |
| <b>Tri-State Input Voltage (Vih and Vil)</b> | +2.2Vdc Minimum to enable output, +0.8Vdc Maximum to disable output (High Impedance), No Connect to enable output.  |
| <b>Absolute Clock Jitter</b>                 | ±250pSec Maximum, ±100pSec Typical  |
| <b>One Sigma Clock Period Jitter</b>         | ±50pSec Maximum, ±30pSec Typical  |
| <b>Start Up Time</b>                         | 10mSec Maximum  |
| <b>Storage Temperature Range</b>             | -55°C to +125°C   |

## ENVIRONMENTAL & MECHANICAL SPECIFICATIONS

|                                     |                                       |
|-------------------------------------|---------------------------------------|
| <b>Fine Leak Test</b>               | MIL-STD-883, Method 1014, Condition A |
| <b>Gross Leak Test</b>              | MIL-STD-883, Method 1014, Condition C |
| <b>Mechanical Shock</b>             | MIL-STD-202, Method 213, Condition C  |
| <b>Resistance to Soldering Heat</b> | MIL-STD-202, Method 210               |
| <b>Resistance to Solvents</b>       | MIL-STD-202, Method 215               |
| <b>Solderability</b>                | MIL-STD-883, Method 2003              |
| <b>Temperature Cycling</b>          | MIL-STD-883, Method 1010              |
| <b>Vibration</b>                    | MIL-STD-883, Method 2007, Condition A |

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## MECHANICAL DIMENSIONS (all dimensions in millimeters)



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

| LINE | MARKING  |
|------|--|
| 1    | <b>E33.333</b><br><i>E=Ecliptek Designator</i> |

## Suggested Solder Pad Layout

All Dimensions in Millimeters



All Tolerances are  $\pm 0.1$

## OUTPUT WAVEFORM & TIMING DIAGRAM



### Test Circuit for TTL Output

| Output Load Drive Capability | $R_L$ Value (Ohms) | $C_L$ Value (pF) |
|------------------------------|--------------------|------------------|
| 10TTL                        | 390                | 15               |
| 5TTL                         | 780                | 15               |
| 2TTL                         | 1100               | 6                |
| 10LSTTL                      | 2000               | 15               |
| 1TTL                         | 2200               | 3                |

Table 1:  $R_L$  Resistance Value and  $C_L$  Capacitance Value Vs. Output Load Drive Capability



- Note 1: An external 0.1μF low frequency tantalum bypass capacitor in parallel with a 0.01μF high frequency ceramic bypass capacitor close to the package ground and  $V_{DD}$  pin is required.
- Note 2: A low capacitance (<12pF), 10X attenuation factor, high impedance (>10Mohms), and high bandwidth (>300MHz) passive probe is recommended.
- Note 3: Capacitance value  $C_L$  includes sum of all probe and fixture capacitance.
- Note 4: Resistance value  $R_L$  is shown in Table 1. See applicable specification sheet for 'Load Drive Capability'.
- Note 5: All diodes are MMBD7000, MMBD914, or equivalent.

# EH3500ETTS-33.333M TR

## Test Circuit for CMOS Output



Note 1: An external  $0.1\mu\text{F}$  low frequency tantalum bypass capacitor in parallel with a  $0.01\mu\text{F}$  high frequency ceramic bypass capacitor close to the package ground and  $V_{DD}$  pin is required.

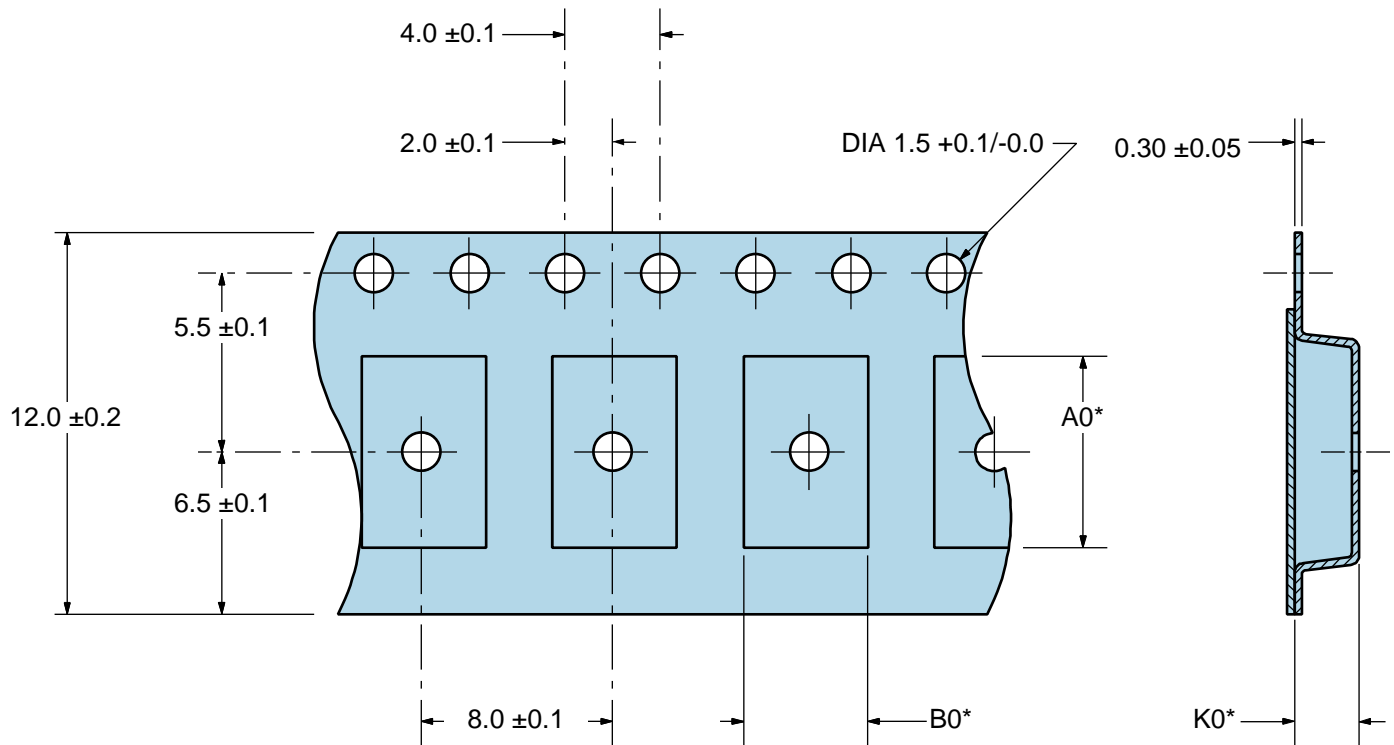
Note 2: A low capacitance ( $<12\text{pF}$ ), 10X attenuation factor, high impedance ( $>10\text{Mohms}$ ), and high bandwidth ( $>300\text{MHz}$ ) passive probe is recommended.

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

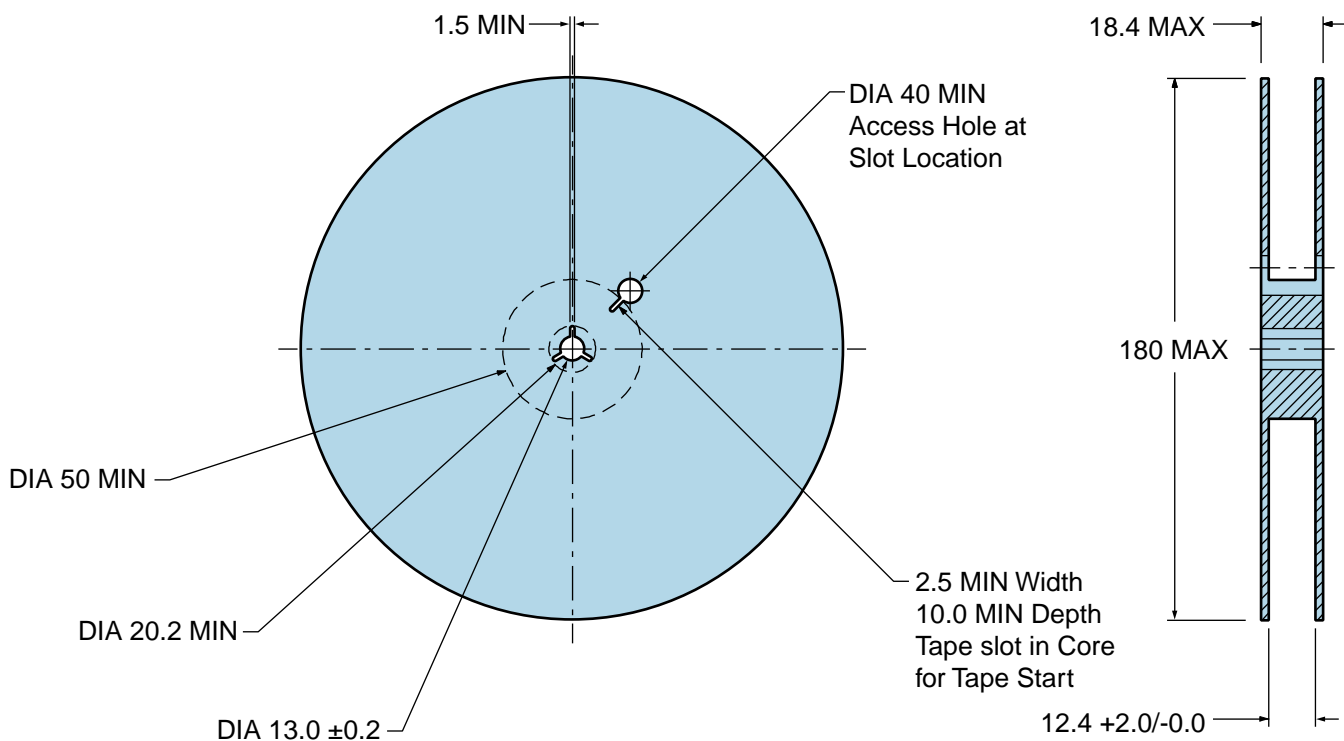
# EH3500ETTS-33.333M TR

## Tape & Reel Dimensions

Quantity Per Reel: 1,000 units



\*Compliant to EIA 481A



## Recommended Solder Reflow Methods



### High Temperature Infrared/Convection

|  |                                      |
|--|--------------------------------------|
| <b><math>T_S</math> MAX to <math>T_L</math> (Ramp-up Rate)</b> | 3°C/second Maximum                   |
| <b>Preheat</b>   |                                      |
| - Temperature Minimum ( $T_S$ MIN)                             | 150°C                                |
| - Temperature Typical ( $T_S$ TYP)                             | 175°C                                |
| - Temperature Maximum ( $T_S$ MAX)                             | 200°C                                |
| - Time ( $t_s$ MIN)  | 60 - 180 Seconds                     |
| <b>Ramp-up Rate (<math>T_L</math> to <math>T_P</math>)</b>     | 3°C/second Maximum                   |
| <b>Time Maintained Above:</b>                                  |                                      |
| - Temperature ( $T_L$ )  | 217°C                                |
| - Time ( $t_L$ )   | 60 - 150 Seconds                     |
| <b>Peak Temperature (<math>T_P</math>)</b>                     | 260°C Maximum for 10 Seconds Maximum |
| <b>Target Peak Temperature (<math>T_P</math> Target)</b>       | 250°C +0/-5°C                        |
| <b>Time within 5°C of actual peak (<math>t_p</math>)</b>       | 20 - 40 seconds                      |
| <b>Ramp-down Rate</b>  | 6°C/second Maximum                   |
| <b>Time 25°C to Peak Temperature (t)</b>                       | 8 minutes Maximum                    |
| <b>Moisture Sensitivity Level</b>                              | Level 1                              |

## Recommended Solder Reflow Methods



### Low Temperature Infrared/Convection 240°C

|  |  |
|--|--|
| <b><math>T_S</math> MAX to <math>T_L</math> (Ramp-up Rate)</b> | 5°C/second Maximum                                     |
| <b>Preheat</b>   |  |
| - Temperature Minimum ( $T_S$ MIN)                             | N/A  |
| - Temperature Typical ( $T_S$ TYP)                             | 150°C  |
| - Temperature Maximum ( $T_S$ MAX)                             | N/A  |
| - Time ( $t_s$ MIN)  | 60 - 120 Seconds                                       |
| <b>Ramp-up Rate (<math>T_L</math> to <math>T_P</math>)</b>     | 5°C/second Maximum                                     |
| <b>Time Maintained Above:</b>                                  |  |
| - Temperature ( $T_L$ )  | 150°C  |
| - Time ( $t_L$ )   | 200 Seconds Maximum                                    |
| <b>Peak Temperature (<math>T_P</math>)</b>                     | 240°C Maximum  |
| <b>Target Peak Temperature (<math>T_P</math> Target)</b>       | 240°C Maximum 1 Time / 230°C Maximum 2 Times           |
| <b>Time within 5°C of actual peak (<math>t_p</math>)</b>       | 10 seconds Maximum 2 Times / 80 seconds Maximum 1 Time |
| <b>Ramp-down Rate</b>  | 5°C/second Maximum                                     |
| <b>Time 25°C to Peak Temperature (t)</b>                       | N/A  |
| <b>Moisture Sensitivity Level</b>                              | 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.