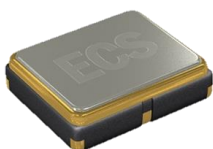


### OPERATING CONDITIONS / ELECTRICAL CHARACTERISTICS

#### ECS-2025/2033



- Low Voltage
- 2.5 x 2.0 mm Footprint
- Low Current Consumption
- PbFree/RoHS Compliant

| Parameters            | Conditions                  | ECS-2025 (+2.5V) |      |         | ECS-2033 (+3.3V) |      |         | Units |
|-----------------------|-----------------------------|------------------|------|---------|------------------|------|---------|-------|
|                       |                             | MIN              | TYP  | MAX     | MIN              | TYP  | MAX     |       |
| Frequency Range       |                             | 0.750            |      | 75.000  | 0.750            |      | 75.000  | MHz   |
| Operating Temperature | Standard                    | -10              |      | +70     | -10              |      | +70     | °C    |
|                       | Extended (N Option)         | -40              |      | +85     | -40              |      | +85     | °C    |
| Storage Temperature   |                             | -55              |      | +100    | -55              |      | +100    | °C    |
| Supply Voltage        | VDD                         | +2.375           | +2.5 | +2.625  | +3.135           | +3.3 | +3.465  | VDC   |
| Frequency Stability*  | Option A                    |                  |      | ±100    |                  |      | ±100    | PPM   |
|                       | Option B                    |                  |      | ±50     |                  |      | ±50     | PPM   |
|                       | Option C                    |                  |      | ±25     |                  |      | ±25     | PPM   |
| Input Current         | 0.75 ~ 20.0 MHz             |                  |      | 5       |                  |      | 7       | mA    |
|                       | 20.1 ~ 40.0 MHz             |                  |      | 9       |                  |      | 13      | mA    |
|                       | 40.1 ~ 60.0 MHz             |                  |      | 11      |                  |      | 19      | mA    |
|                       | 60.1 ~ 75.0 MHz             |                  |      | 14      |                  |      | 24      | mA    |
| Stand-by Current      | Pin 1 = VIL                 |                  |      | 10      |                  |      | 10      | µA    |
| Output Symmetry       | @50% VDD Level              |                  |      | 40/60   |                  |      | 45/55   | %     |
|                       | @50% VDD Level (**T Option) |                  |      | 45/55   |                  |      | -       |       |
| Rise and Fall Times   | 10% VDD to 90% Level        |                  |      | 10      |                  |      | 10      | ns    |
| "0" Level             | VOL                         |                  |      | 10% VDD |                  |      | 10% VDD | VDC   |
| "1" Level             | VOH                         | 90% VDD          |      |         | 90% VDD          |      |         | VDC   |
| Output Load           | CMOS                        |                  |      | 15      |                  |      | 15      | pF    |
| Disable Delay Time    |                             |                  |      | 150     |                  |      | 150     | ns    |
| Startup Time          |                             |                  |      | 10      |                  |      | 10      | ms    |
| Aging                 |                             |                  |      | ±5      |                  |      | ±5      | PPM   |

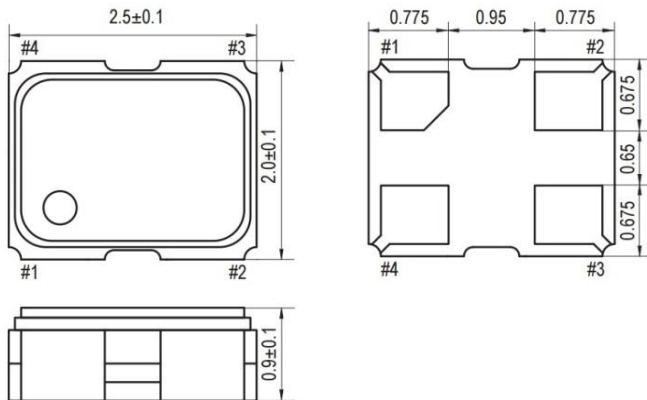
\* Note: Inclusive of 25°C tolerance, operating temperature, input voltage change, load change, shock and vibration.

\*\* Symmetry "T" option applies to ECS-2025 Series only.

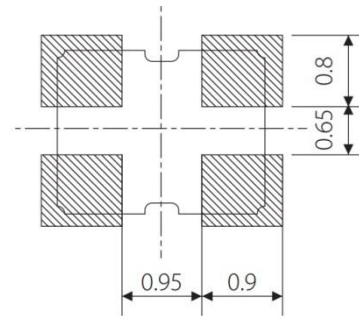
### Part Numbering Guide: Example ECS-2033-200-BN-TR

| ECS | - Series                     | - Frequency Abbreviations | - Stability Tolerance                      | - Temperature                                                                 | - Output Symmetry            | - Packaging                     |
|-----|------------------------------|---------------------------|--------------------------------------------|-------------------------------------------------------------------------------|------------------------------|---------------------------------|
| ECS | 2025 = +2.5V<br>2033 = +3.3V | 200 = 20 MHz              | A = ±100 ppm<br>B = ±50 ppm<br>C = ±25 ppm | Blank = -10 ~ +70°C<br>M = -20 ~ +70°C<br>N = -40 ~ +85°C<br>U = -55 ~ +125°C | Blank = 40/60<br>**T = 45/55 | TR = 1K<br>TR3 = 3K<br>Qty/Reel |

## Package Dimensions (mm)



**Figure 1)** Top, Side, and Bottom views



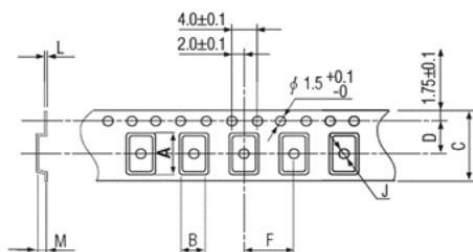
**Figure 2)** Land Pattern

| Pin Connections |           |
|-----------------|-----------|
| #1              | Tri-State |
| #2              | Ground    |
| #3              | Output    |
| #4              | VDD       |

| Tri-State Control Voltage |                |
|---------------------------|----------------|
| Pad 1                     | Pad 3          |
| Open                      | Oscillation    |
| VIH 70% VDD Min.          | Oscillation    |
| VIL 30% VDD Max.          | No Oscillation |

Note: Internal crystal oscillation to be halted (Pin #1=VIL)

## Tape Dimensions (mm)



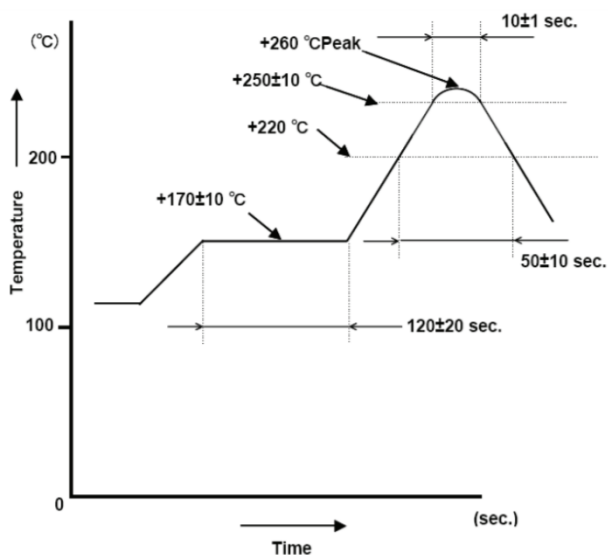
| A   | B   | C   | D   | F   | J   | L    | M   | Reel Dia. |
|-----|-----|-----|-----|-----|-----|------|-----|-----------|
| 2.8 | 2.3 | 8.0 | 3.5 | 4.0 | 1.0 | 0.25 | 1.1 | 180       |

**Figure 3)** Pocket Tape Dimensions

| Package Data |                               |
|--------------|-------------------------------|
| Item         | Description                   |
| Lid          | Metal                         |
| Base         | Ceramic                       |
| Sealing      | AuSn                          |
| Terminal     | Tungsten (metalized)          |
| Plating      | Gold/Nickel (Surface)/(Under) |
| RoHS         | Compliant (Pb Free)           |

### Frequency Abbreviations

| FREQUENCY<br>MHz | CODE  |
|------------------|-------|
| 3.579545         | 035   |
| 3.6864           | 036   |
| 4.000            | 040   |
| 6.000            | 060   |
| 7.3728           | 073   |
| 8.000            | 080   |
| 10.000           | 100   |
| 12.000           | 120   |
| 13.000           | 130   |
| 14.31818         | 143   |
| 14.7456          | 147.4 |
| 16.000           | 160   |
| 20.000           | 200   |
| 24.000           | 240   |
| 25.000           | 250   |
| 27.000           | 270   |
| 30.000           | 300   |
| 32.000           | 320   |
| 40.000           | 400   |
| 48.000           | 480   |
| 50.000           | 500   |



**Figure 4)** Suggested Reflow Profile