



**THE DATASHEET OF
ECS-2033-500-BN**



ECS-2025 (2.5V) and ECS-2033 (3.3V) subminiature SMD oscillators. Ideal for today's high density applications.

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OPERATING CONDITIONS / ELECTRICAL CHARACTERISTICS



- 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 2033 = +3.3V | 200 = 20 MHz | A = ±100 ppm B = ±50 ppm C = ±25 ppm | Blank = -10 ~ +70°C M = -20 ~ +70°C N = -40 ~ +85°C U = -55 ~ +125°C | Blank = 40/60 **T = 45/55 | TR = 1K TR3 = 3K Qty/Reel |
|-----|------------------------------|--------------|--|---|------------------------------|---------------------------------|

Package Dimensions (mm)

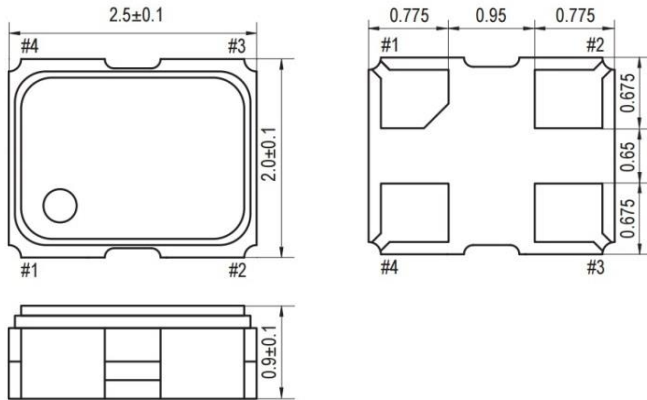


Figure 1) Top, Side, and Bottom views

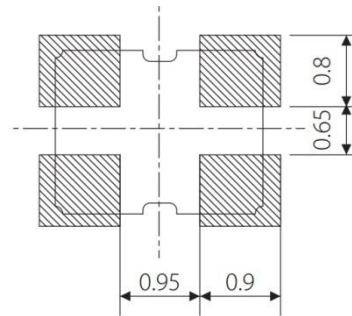


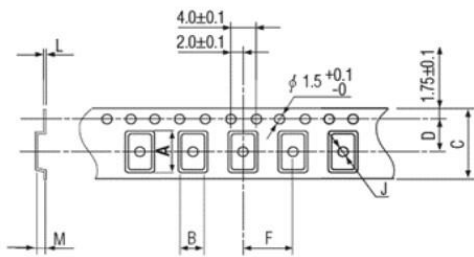
Figure 2) Land Pattern

| 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 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 |

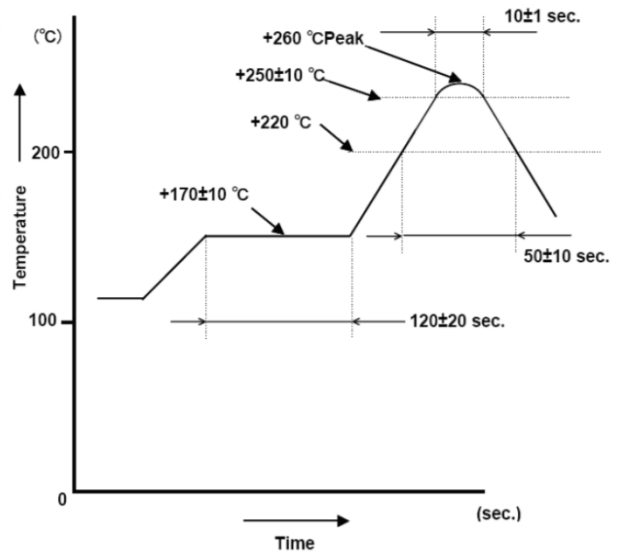


Figure 4) Suggested Reflow Profile

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