

- ▶ Low Voltage HCMOS
- ▶ 2.5 x 2.0 mm Footprint
- ▶ Low current consumption
- ▶ Pb Free/RoHS Compliant

# ECS-2018

## SMD CLOCK OSCILLATOR

ECS-2018 (1.8V) subminiature SMD oscillators. Ideal for today's high density applications.

### OPERATING CONDITIONS / ELECTRICAL CHARACTERISTICS

| PARAMETERS            | CONDITIONS           | ECS-2018 (+1.8V) |       |         | UNITS |
|-----------------------|----------------------|------------------|-------|---------|-------|
|                       |                      | MIN              | TYP   | MAX     |       |
| Frequency Range       | Primary Output       | 0.750            |       | 50.000  | MHz   |
| Operating Temperature | Standard             | -10              |       | +70     | °C    |
|                       | Extended (N Option)  | -40              |       | +85     | °C    |
| Storage Temperature   |                      | -55              |       | +100    | °C    |
| Input Voltage         | VDD                  | +1.71            | +1.80 | +1.89   | VDC   |
| Frequency Stability * | Option A             |                  |       | ± 100   | ppm   |
|                       | Option B             |                  |       | ± 50    | ppm   |
|                       | Option C             |                  |       | ± 25    | ppm   |
| Input Current         | 0.75 to 30 MHz       |                  |       | 2.5     | mA    |
|                       | 30.1 to 40 MHz       |                  |       | 3.0     | mA    |
|                       | 40.1 to 50 MHz       |                  |       | 3.5     | mA    |
| Stand-by Current      | Pin 1 = VIL          |                  |       | 10      | µA    |
| Output Symmetry       | @ 50% VDD Level      |                  |       | 45/55   | %     |
| Rise and Fall Times   | 10% VDD to 90% level |                  |       | 10      | ns    |
| "0" level             | VOL                  |                  |       | 10% VDD | VDC   |
| "1" level             | VOH                  | 90% VDD          |       |         | VDC   |
| Output Load           | CMOS                 |                  |       | 15      | pF    |
| Disable delay         |                      |                  |       | 150     | ns    |
| Startup time          |                      |                  |       | 10      | ms    |
| Aging                 |                      |                  |       | ±5      | ppm   |

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

### DIMENSIONS (mm)

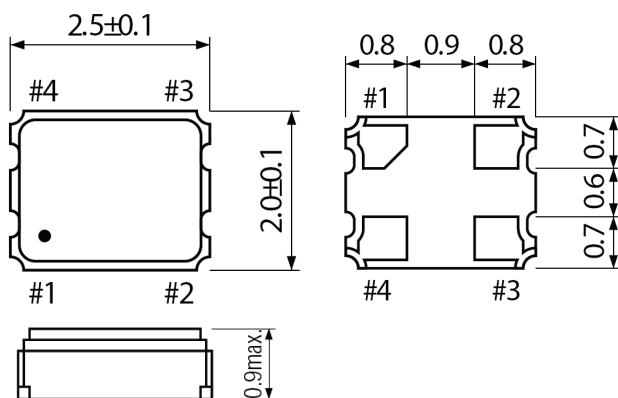


Figure 1) Top, Side and Bottom views

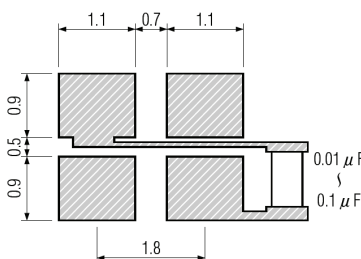


Figure 2) Suggested Land Pattern

#### Pin Connections

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

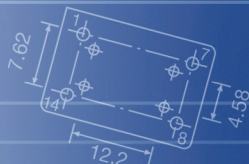
#### Tri-State Control Voltage

|                 |                |
|-----------------|----------------|
| 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)

### PART NUMBERING GUIDE: Example ECS-2018-200-BN

| ECS | - Series     | - Frequency Abbreviation                               | - Stability                                   | Temperature                                               |
|-----|--------------|--------------------------------------------------------|-----------------------------------------------|-----------------------------------------------------------|
|     | 2018 = +1.8V | 200 = 20.000 MHz<br>See Frequency Abbreviations (Pg 2) | 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 |



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### 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   |

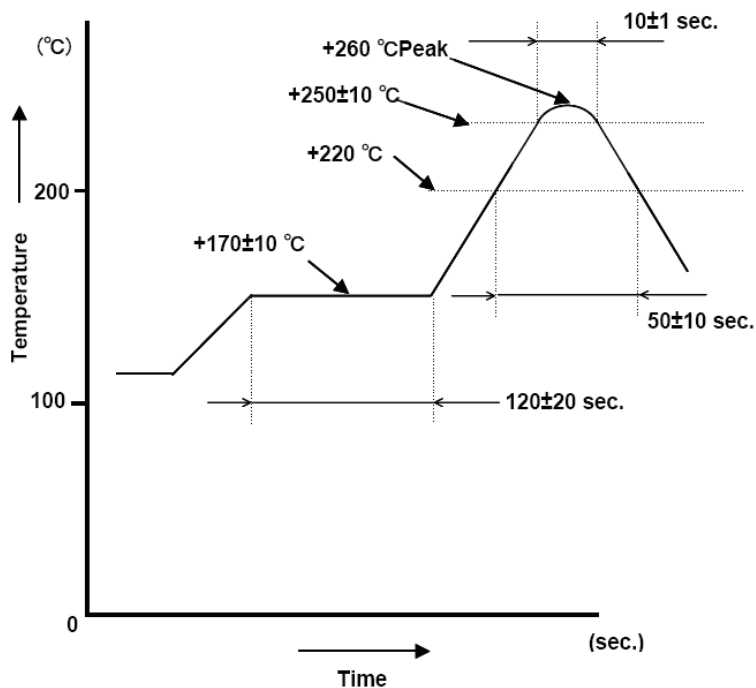
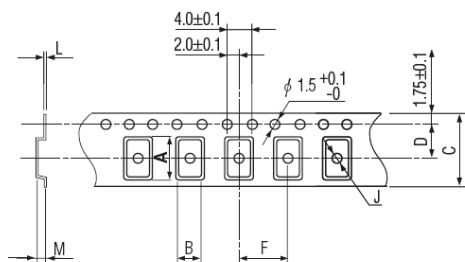


Figure 1) Suggested Reflow Profile

### TAPE DIMENSIONS (mm)



| A   | B   | C   | D   | F   | J   | L    | M   | Reel Dia. | Qty/Reel |
|-----|-----|-----|-----|-----|-----|------|-----|-----------|----------|
| 2.8 | 2.3 | 8.0 | 3.5 | 4.0 | 1.0 | 0.25 | 1.1 | 180       | 1000pcs  |

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

Figure 2) Pocket Tape Dimensions