



# 5.0x3.2mm SMD LVDS Oscillator

## O5LS

(former F530D/F540D families)

## DATASHEET

- LVDS Output
- Stabilities to  $\pm 20$  PPM
- Operating Temperature Range to  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$
- Supply Voltages: 1.8V; 2.5V; 3.3V

### 2.5V/3.3V Specifications

| PARAMETERS   | MAX (unless otherwise noted)      |
|--|-----------------------------------|
| Frequency Range  | 13.5 ~ 250MHz                     |
| Storage Temperature Range ( $T_{\text{STG}}$ )         | $-55 \sim +125^{\circ}\text{C}$   |
| Supply Voltage ( $V_{\text{DD}}$ )                     | 2.5V $\pm 10\%$   3.3V $\pm 10\%$ |
| Input Current ( $I_{\text{DD}}$ )                      | 50 mA                             |
| Standby Current  | 15 $\mu\text{A}$                  |
| Output Symmetry (50% $V_{\text{P-P}}$ )                | 45% ~ 55%                         |
| Rise Time (20%~80% $V_{\text{P-P}}$ )                  | 0.5 nS                            |
| Fall Time (80%~20% $V_{\text{P-P}}$ )                  | 0.5 nS                            |
| Differential Output Voltage ( $V_{\text{OD}}$ )        | 0.247V ~ 0.454V                   |
| Differential Offset Voltage ( $V_{\text{OS}}$ )        | 1.125V ~ 1.375V                   |
| Differential Output Voltage Swing ( $V_{\text{OPP}}$ ) | 0.25Vpp min   0.35Vpp min         |
| Output Load  | 100 Ohms Typical                  |
| Start-up Time ( $T_{\text{S}}$ )                       | 10 mS                             |
| Output Disable Time <sup>1</sup>                       | 200 nS                            |
| Output Enable Time <sup>1</sup>                        | 10 mS                             |
| Aging (per year @ 25C)                                 | $\pm 3$ PPM                       |
| Phase Jitter (12kHz~20MHz)                             | 1 pS                              |

### ENABLE / DISABLE FUNCTION

|  |                              |
|--|------------------------------|
| Pin1   | Out 1 (pin 4), Out 2 (pin 5) |
| OPEN <sup>1</sup>                                | Active                       |
| '1' Level $V_{\text{IH}} \geq 70\%V_{\text{DD}}$ | Active                       |
| '0' Level $V_{\text{IL}} \leq 30\%V_{\text{DD}}$ | High Z                       |

### • Available Options by Stability & Operating Temp

| Frequency Stability   | Operating Temperature ( $^{\circ}\text{C}$ ) | Frequency Range (MHz) |
|-----------------------|--|-----------------------|
| $\pm 100\text{PPM}^2$ | $-10 \sim +70$                               | 13.500 ~ 250.000      |
| $\pm 100\text{PPM}^2$ | $-20 \sim +70$                               | 13.500 ~ 250.000      |
| $\pm 100\text{PPM}^2$ | $-40 \sim +85$                               | 13.500 ~ 250.000      |
| $\pm 50\text{PPM}^2$  | $-10 \sim +70$                               | 13.500 ~ 250.000      |
| $\pm 50\text{PPM}^2$  | $-20 \sim +70$                               | 13.500 ~ 250.000      |
| $\pm 50\text{PPM}^2$  | $-40 \sim +85$                               | 13.500 ~ 250.000      |
| $\pm 25\text{PPM}^2$  | $-10 \sim +70$                               | 13.500 ~ 250.000      |
| $\pm 25\text{PPM}^2$  | $-20 \sim +70$                               | 13.500 ~ 250.000      |
| $\pm 25\text{PPM}^3$  | $-40 \sim +85$                               | 13.500 ~ 250.000      |
| $\pm 20\text{PPM}^3$  | $-20 \sim +70$                               | 13.500 ~ 250.000      |

<sup>1</sup> An internal pull-up resistor from pin 1 to pin 6 allows active output if pin 1 is left open

<sup>2</sup> Inclusive of  $25^{\circ}\text{C}$  tolerance, operating temperature range, input voltage change, load change, reflow, one-year aging, shock, and vibration.

<sup>3</sup> Inclusive of  $25^{\circ}\text{C}$  tolerance, operating temperature range.





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#### 1.8V Specifications

| PARAMETERS                                      | MAX (unless otherwise noted) |
|---|------------------------------|
| Frequency Range                                 | 100 ~ 170MHz                 |
| Storage Temperature Range ( $T_{STG}$ )         | -55 ~ +125°C                 |
| Supply Voltage ( $V_{DD}$ )                     | 1.8V±10%                     |
| Input Current ( $I_{DD}$ )                      | 66 mA                        |
| Standby Current                                 | 30 $\mu$ A                   |
| Output Symmetry (50% $V_{P-P}$ )                | 45% ~ 55%                    |
| Rise Time (20%~80% $V_{P-P}$ )                  | 0.7 nS                       |
| Fall Time (80%~20% $V_{P-P}$ )                  | 0.7 nS                       |
| Differential Output Voltage ( $V_{OD}$ )        | 0.33V typ                    |
| Differential Offset Voltage ( $V_{OS}$ )        | 1.125V ~ 1.375V (1.25V typ)  |
| Differential Output Voltage Swing ( $V_{OPP}$ ) | 0.25Vp-p min                 |
| Output Load                                     | 100 Ohms Typical             |
| Start-up Time ( $T_S$ )                         | 10 mS                        |
| Output Disable Time <sup>1</sup>                | 200 nS                       |
| Output Enable Time <sup>1</sup>                 | 10 mS                        |
| Aging (per year @ 25C)                          | ±3 PPM                       |
| Phase Jitter (12kHz~20MHz)                      | 1 pS (0.5pS typ)             |

#### ENABLE / DISABLE FUNCTION

|                                    |                              |
|------------------------------------|------------------------------|
| Pin1                               | Out 1 (pin 4), Out 2 (pin 5) |
| OPEN <sup>1</sup>                  | Active                       |
| '1' Level $V_{IH} \geq 70\%V_{DD}$ | Active                       |
| '0' Level $V_{IL} \leq 30\%V_{DD}$ | High Z                       |

#### • Available Options by Stability & Operating Temp

| Frequency Stability  | Operating Temperature (°C) | Frequency Range (MHz) |
|----------------------|----------------------------|-----------------------|
| ±100PPM <sup>2</sup> | -20 ~ +70                  | 100.0 ~ 170.0         |
| ±100PPM <sup>2</sup> | -40 ~ +85                  | 100.0 ~ 170.0         |
| ±50PPM <sup>2</sup>  | -20 ~ +70                  | 100.0 ~ 170.0         |
| ±50PPM <sup>2</sup>  | -40 ~ +85                  | 100.0 ~ 170.0         |
| ±25PPM <sup>2</sup>  | -20 ~ +70                  | 100.0 ~ 170.0         |
| ±25PPM <sup>3</sup>  | -40 ~ +85                  | 100.0 ~ 170.0         |

<sup>1</sup> An internal pull-up resistor from pin 1 to pin 6 allows active output if pin 1 is left open

<sup>2</sup> Inclusive of 25°C tolerance, operating temperature range, input voltage change, load change, reflow, one-year aging, shock, and vibration.

<sup>3</sup> Inclusive of 25°C tolerance, operating temperature range.





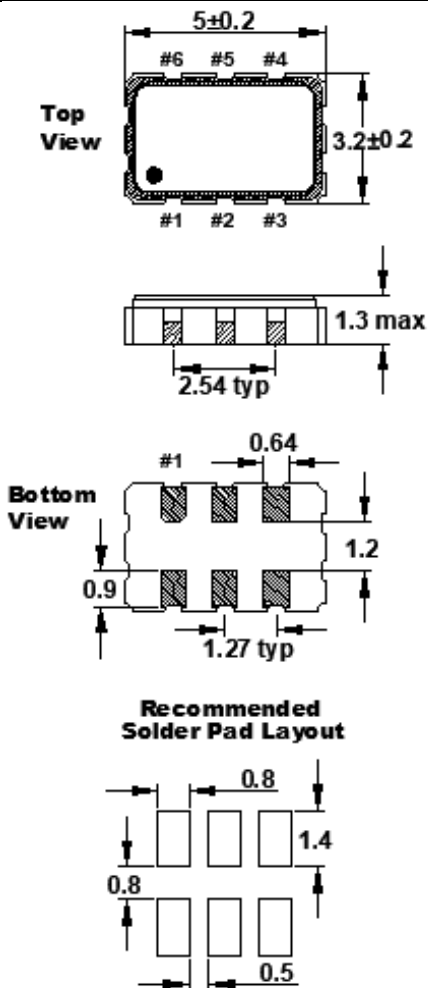
# 5.0x3.2mm SMD LVDS Oscillator

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#### DIMENSIONS / MECHANICAL SPECIFICATIONS



Dimensions in millimeters

#### Pin Connections

#6 VDD #5 OutQ<sub>N</sub> #4 OutQ<sub>P</sub>  
#1 E/D #2 N.C. #3 Gnd

|                                  |                        |
|----------------------------------|------------------------|
| Maximum Soldering Temp / Time    | 260°C / 10 Seconds x 2 |
| Moisture Sensitivity Level (MSL) | 1                      |
| Termination Finish               | Au over Ni             |
| Seal Method                      | Seam                   |
| Lead (Pb) Free                   | Yes                    |
| ROHS/REACH Compliant             | Yes                    |

#### Notes:

\*A 0.01μF capacitor should be placed between V<sub>DD</sub> (Pin 6) and GND (Pin3) to minimize power supply line noise.

\*Dimensional drawing is for reference to critical specifications defined by size measurements.

Certain non-critical visual attributes, such as side castellations, reference pin shape, etc. may vary.



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Title / Description: O5LS SERIES STANDARD SPECIFICATIONS

Drawing Number: O5LS-DOC-1

Part Number:

Draftsperson: BEC

Approved: MAJ

Size: A

Cage: 61429

Revision Date: 05/06/2020



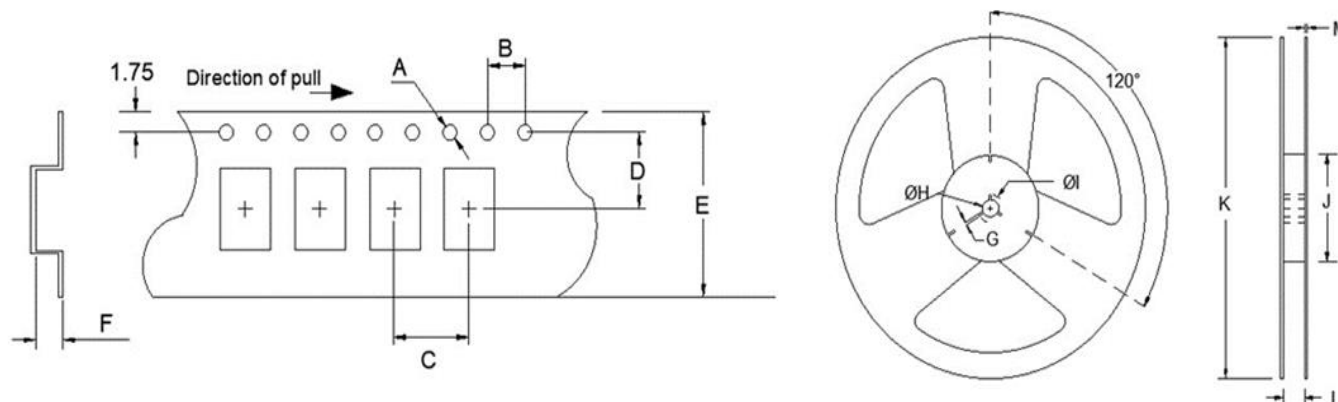
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| Tape Specifications (millimeters) |     |     |     |      |     |             | Reel Specifications (millimeters) |     |     |     |      |      |     |
|-----------------------------------|-----|-----|-----|------|-----|-------------|-----------------------------------|-----|-----|-----|------|------|-----|
| A                                 | B   | C   | D   | E    | F   | Reel Qty    | G                                 | H   | I   | J   | K    | L    | M   |
| Ø1.5                              | 4.0 | 480 | 3.5 | 16.0 | 1.4 | -T1 = 1,000 | 2.0                               | Ø13 | Ø21 | Ø60 | Ø180 | 13.0 | 2.0 |



### Available Options & Part Identification\*

Example: **F O5LS C D M 125.0**

| F   | O5LS         | C   | D  | M  | 125.0          |
|-----|--------------|---|--|--|----------------|
| Fox | Model Number | Voltage                                     | Stability  | Operating Temperature                                    | Frequency(MHz) |
|     |              | K = 1.8V±5%<br>J = 2.5V±10%<br>C = 3.3V±10% | A = ±100PPM<br>B = ±50PPM<br>D = ±25PPM<br>E = ±20 PPM | E = -10 to +70°C<br>F = -20 to +70°C<br>M = -40 to +85°C |                |

\*Not all frequencies in the frequency range, or every combination of stability, temp range, and voltage available.  
See stabilities and op temps table on page 1.



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Title / Description: O5LS SERIES STANDARD SPECIFICATIONS

Drawing Number: O5LS-DOC-1

Part Number:

Draftsperson: BEC

Approved: MAJ

Size: A

Cage: 61429

Revision Date: 05/06/2020

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Authorized Distributor

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[FO5LSCBM156.25-T1](#) [FO5LSCEF48.0-BULK](#) [FO5LSJBF72.0-BULK](#) [FO5LSCDM100.0-BULK](#) [FO5LSCDM100.0-T1](#)  
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