# CERAMIC SMD LVDS/LVPECL OUTPUT OSCILLATOR (7.0 x 5.0 x 1.6mm)

## FEATURES:
- LOW CURRENT
- ULTRA LOW <0.2pS RMS JITTER PERFORMANCE
- LOW COST

## APPLICATIONS:
- 10GbE / 40GbE Ethernet Switches and Routers
- 100GbE Ethernet Switches and Routers
- Synchronous Ethernet

## SPECIFICATION

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>MIN.</th>
<th>TYP.</th>
<th>MAX.</th>
<th>UNIT</th>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREQUENCY RANGE</td>
<td>25</td>
<td>200</td>
<td>MHz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FREQUENCY STABILITY</td>
<td>±10*</td>
<td>±50</td>
<td>±100</td>
<td>ppm</td>
<td>* Selected operating temp. only</td>
</tr>
<tr>
<td>OPERATING TEMPERATURE RANGE</td>
<td>-40</td>
<td>85</td>
<td>°C</td>
<td></td>
<td>See P/N guide for other options</td>
</tr>
<tr>
<td>STORAGE TEMPERATURE RANGE</td>
<td>-55</td>
<td>125</td>
<td>°C</td>
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</tr>
<tr>
<td>SUPPLY VOLTAGE ±10%</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>V_{DD} = 2.5V_{DC}</td>
<td>2.375</td>
<td>2.500</td>
<td>2.625</td>
<td>V</td>
<td>See P/N guide for other options</td>
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<tr>
<td>V_{DD} = 3.3V_{DC}</td>
<td>2.970</td>
<td>3.300</td>
<td>3.630</td>
<td>V</td>
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<tr>
<td>SUPPLY CURRENT</td>
<td>80</td>
<td>mA</td>
<td></td>
<td></td>
<td>(V_{DD} = 2.5V_{DC}, 3.3V_{DC})</td>
</tr>
<tr>
<td>LOAD</td>
<td>LVDS</td>
<td>100</td>
<td>Ω</td>
<td></td>
<td>Output - Complimentary Output</td>
</tr>
<tr>
<td></td>
<td>LVPECL</td>
<td>50</td>
<td>Ω</td>
<td></td>
<td>into V_{DD} - 2V_{DC}</td>
</tr>
<tr>
<td>LEVEL</td>
<td>LVDS (V_{OH})</td>
<td>1.4</td>
<td>1.6</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LVDS (V_{OL})</td>
<td>0.9</td>
<td>1.1</td>
<td>V</td>
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<tr>
<td></td>
<td>LVPECL (V_{OH})</td>
<td>V_{DD} – 1.025V</td>
<td>V</td>
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<tr>
<td></td>
<td>LVPECL (V_{OL})</td>
<td>V_{DD} – 1.62V</td>
<td>V</td>
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<td></td>
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<tr>
<td>PEAK TO PEAK</td>
<td>LVPECL</td>
<td>600</td>
<td>800</td>
<td>mV</td>
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<tr>
<td>DIFFERENTIAL OUTPUT VOLTAGE</td>
<td>LVDS</td>
<td>0.247</td>
<td>0.350</td>
<td>0.454</td>
<td>V</td>
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<tr>
<td>OFFSET VOLTAGE</td>
<td>LVDS</td>
<td>1.125</td>
<td>1.25</td>
<td>1.375</td>
<td>V</td>
</tr>
<tr>
<td>SYMMETRY (DUTY CYCLE)</td>
<td>40</td>
<td>60</td>
<td>%</td>
<td></td>
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</tr>
<tr>
<td>RISE AND FALL TIME (Tr/Tf)</td>
<td>250</td>
<td>1000</td>
<td>pS</td>
<td>@ 20% / 80%</td>
<td></td>
</tr>
<tr>
<td>START-UP TIME</td>
<td>5</td>
<td>10</td>
<td>mS</td>
<td></td>
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<tr>
<td>STAND-BY VOLTAGE</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>ENABLE (V_{IH})</td>
<td>0.7 x V_{DD}</td>
<td>V_{DD}</td>
<td></td>
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<tr>
<td>DISABLE (V_{IL})</td>
<td>0.3 x V_{DD}</td>
<td>V_{DD}</td>
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</tr>
<tr>
<td>ENABLE DELAY TIME</td>
<td>100</td>
<td>nS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DISABLE DELAY TIME</td>
<td>100</td>
<td>nS</td>
<td></td>
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<tr>
<td>AGING</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>per 1year</td>
<td>±3.0</td>
<td>ppm</td>
<td>@ 25°C ±3°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>per 10years</td>
<td>±5.0</td>
<td>ppm</td>
<td></td>
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<tr>
<td>PHASE JITTER RMS</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>LVDS</td>
<td>0.6</td>
<td>pS</td>
<td>@ 12kHz ~ 20MHz</td>
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<tr>
<td>LVPECL</td>
<td>0.2</td>
<td>pS</td>
<td>@ 12kHz ~ 20MHz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JITTER pk-pk</td>
<td>0.1</td>
<td>pS</td>
<td>@ 10kHz ~ 1MHz</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>35</td>
<td>pS</td>
<td>@ 100,000 random periods</td>
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</tbody>
</table>

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# PHASE NOISE

![Graph showing phase noise measurement](image)

# PACKAGE DIMENSIONS

![Diagram showing package dimensions](image)

**TOP**
- MARKING
- 1: En/Dis or N.C.
- 2: N.C
- 3: GND
- 4: Output
- 5: C - output
- 6: VDD

**SIDE**
- 1.6 max
- 2.54 x 2.54

**BOTTOM**
- 1.4

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# SOLDER PATTERN

**SOLDER PATTERN**
- 2.0
- 1.8
- 2.4
- 2.54
- 2.54

**Unit:** mm

# REFLOW PROFILE

![Graph showing reflow profile](image)

- Soldering: 255 ±5°C
- Pre-heating: 150 ±5°C
- 170 ±5°C
- <120 Sec
- <10 Sec

Note: Consult factory for details

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# PART NUMBERING GUIDE

<table>
<thead>
<tr>
<th>TGM</th>
<th>P</th>
<th>50</th>
<th>HM</th>
<th>33</th>
<th>S</th>
<th>T1</th>
<th>156.25M</th>
<th>TR</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

**Product series**
- TGM

**Output**
- L: LVDS
- P: PECL

**Stability**
- 00: ± 100ppm
- 50: ± 50ppm
- 25: ± 25ppm
- 15: ± 15ppm
- 10: ± 10ppm
- XX: Two digit for Stability

**Operating Temperature**
- A: -55
- B: -50
- C: -40
- D: -35
- E: -30
- F: -20
- G: -10
- H: 0
- J: 50
- K: 60
- M: 70
- N: 75
- Q: 80
- R: 90
- S: 100
- T: 115
- U: 125
- X: custom

**Supply Voltage**
- 25: 2.5 Volt
- 33: 3.3 Volt

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RoHS Compliant

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