


PERFORMANCE PLASTIC PACKAGE ULTRA MINIATURE PURE SILICON™ CLOCK OSCILLATOR

ASEMP



Life Size 
3.2 x 2.5 x 0.85 mm

ASEMP

Moisture Sensitivity Level – MSL 1



RoHS/RoHS II compliant

Low Jitter
High Performance
3G MEMS Technology!

FEATURES:

- Ultra Miniature Pure Silicon™ Clock Oscillator
- High Performance MEMS Technology by Discera
- Low Power Consumption for high speed communication
- Exceptional Stability Over Temp. at -40 to +85°C, ±15ppm
- Extended Automotive Grade Temp. stability at -55 to +125°C, ±25ppm
- MIL-STD-883 shock and vibration compliant
- Durable QFN Plastic Compact Packaging
- Standby or Disable Tri-state function
- Low jitter (Period jitter RMS and Phase jitter RMS)
- High power supply noise reduction, -50dBc

APPLICATIONS:

- Storage Area Networks (SATA, SAS, Fiber Channel)
- Passive Optical Networks (EPON, 10G-EPON, GPON, 10G-PON)
- Ethernet (1G, 10GBASE-T/KR/LR/SR, FCoE)
- PCI Express
- Display port

STANDARD SPECIFICATIONS:

Common Key Electrical Specifications – CMOS, LVPECL, LVDS, and HCSL

| Parameters | Minimum | Typical | Maximum | Units | Notes | |
|--------------------------------------|--|---------|---------|----------|--------------------------------|------------------------------------|
| Frequency Range | CMOS | 2.3000* | | 170.0000 | MHz | -20 ~ +70°C -40 ~ +85°C |
| | CMOS | 3.3000* | | 170.0000 | | -40 ~ +105°C -55 ~ +125°C |
| | LVPECL | 2.3000* | | 460.0000 | | Commercial, Industrial temp. range |
| | LVDS | 2.3000* | | 460.0000 | | Commercial, Industrial temp. range |
| | HCSL | 2.3000* | | 460.0000 | | Commercial, Industrial temp. range |
| Operating Temperature | -20 | | +70 | °C | See options | |
| Storage Temperature | -55 | | +150 | °C | | |
| Overall Frequency Stability | -50 | | +50 | ppm | See options | |
| Supply Voltage (Vdd) | +2.25 | | +3.6 | V | | |
| Startup Time | | | 5 | ms | | |
| Enable Time | | | 20 | ns | STD (Tri-state) | |
| | | | 5 | ms | PD option (Power Down) | |
| Disable Time | | | 5 | ns | | |
| Disable Current | | 20 | 22 | mA | STD (Tri-state) | |
| | | | 0.095 | | PD option (Power Down) | |
| Tri-state Function (Standby/Disable) | "1" (VIH ≥ 0.75*Vdd) or Open: Oscillation "0" (VIL < 0.25*Vdd) : Hi Z | | | V | 40kΩ pull-up resistor embedded | |
| Aging | -5.0 | | +5.0 | ppm | First year | |

* For 2.3000MHz ≤ F0 ≤ 9.9999MHz, 6-8 weeks lead-time applies

Key Electrical Specifications – CMOS

| Parameters | Minimum | Typical | Maximum | Units | Notes |
|--|-----------------|---------------------|---------------------|-------|-----------------------|
| Supply Current (I _{dd}) | | 31 | 35 | mA | CL=15pF, 125MHz |
| Output Logic Level | V _{OH} | 0.9*V _{dd} | | V | I=±6mA |
| | V _{OL} | | 0.1*V _{dd} | V | |
| Rise Time | | 1.1 | 2.0 | ns | CL=15pF |
| Fall Time | | 1.3 | 2.0 | ns | 20% to 80% |
| Duty Cycle | 45 | | 55 | % | |
| Integrated Phase Jitter (J _{PH}) | | 0.30 | 2 | ps | 200kHz ~ 20MHz@125MHz |
| | | 0.38 | 2 | | 100kHz ~ 20MHz@125MHz |
| | | 1.70 | 2 | | 12kHz ~ 20MHz@125MHz |
| Period Jitter RMS (J _{PER}) | | 3.0 | | ps | |

ABRACON IS
ISO9001:2008
CERTIFIED



2 Faraday, Suite# B | Irvine | CA 92618 Revised: 08.19.15
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Key Electrical Specifications – LVPECL

| Parameters | | Minimum | Typical | Maximum | Units | Notes |
|--|----------|---------------|---------|---------------|-------|-------------------------------|
| Supply Current (I_{dd}) | | | 56.5 | 58 | mA | RL=50Ω |
| Output Logic Level | V_{OH} | $V_{dd}-1.08$ | | | V | RL=50Ω |
| | V_{OL} | | | $V_{dd}-1.55$ | V | |
| Peak to Peak Output Swing (V_{pp}) | | | 800 | | mV | Single ended |
| Rise Time | T_r | | 250 | | ps | RL=50Ω , CL=0pF 20% to 80% |
| Fall Time | T_f | | 250 | | | |
| Duty Cycle | | 48 | | 52 | % | Differential |
| Integrated Phase Jitter (J_{PH}) | | | 0.25 | 2 | ps | 200kHz ~ 20MHz @156.25MHz |
| | | | 0.38 | 2 | | 100kHz ~ 20MHz @156.25MHz |
| | | | 1.70 | 2 | | 12kHz ~ 20MHz @156.25MHz |
| Period Jitter RMS (J_{PER}) | | | 2.5 | | ps | |

Key Electrical Specifications – LVDS

| Parameters | | Minimum | Typical | Maximum | Units | Notes |
|--|-------|---------|---------|---------|-------|-------------------------------|
| Supply Current (I_{dd}) | | | 29 | 32 | mA | RL=100Ω |
| Output Offset Voltage (V_{OS}) | | 1.125 | | 1.4 | V | RL=100Ω differential |
| Delta Offset Voltage (ΔV_{OS}) | | | | 50 | mV | |
| Peak to Peak Output Swing (V_{pp}) | | | 350 | | mV | Single ended |
| Rise Time | T_r | | 200 | | ps | RL=50Ω , CL=2pF 20% to 80% |
| Fall Time | T_f | | 200 | | | |
| Duty Cycle | | 48 | | 52 | % | Differential |
| Integrated Phase Jitter (J_{PH}) | | | 0.28 | 2 | ps | 200kHz ~ 20MHz @156.25MHz |
| | | | 0.40 | 2 | | 100kHz ~ 20MHz @156.25MHz |
| | | | 1.70 | 2 | | 12kHz ~ 20MHz @156.25MHz |
| Period Jitter RMS (J_{PER}) | | | 2.5 | | ps | |

Key Electrical Specifications – HCSL

| Parameters | | Minimum | Typical | Maximum | Units | Notes |
|--|----------|---------|---------|---------|-------|-------------------------------|
| Supply Current (I_{dd}) | | | 40 | 42 | mA | RL=50Ω |
| Output Logic Level | V_{OH} | 0.725 | | | V | RL=50Ω |
| | V_{OL} | | | 0.1 | V | |
| Peak to Peak Output Swing (V_{pp}) | | | 750 | | mV | Single ended |
| Rise Time | T_r | 200 | | 400 | ps | RL=50Ω , CL=2pF 20% to 80% |
| Fall Time | T_f | 200 | | 400 | | |
| Duty Cycle | | 48 | | 52 | % | Differential |
| Integrated Phase Jitter (J_{PH}) | | | 0.25 | 2 | ps | 200kHz ~ 20MHz @156.25MHz |
| | | | 0.37 | 2 | | 100kHz ~ 20MHz @156.25MHz |
| | | | 1.70 | 2 | | 12kHz ~ 20MHz @156.25MHz |
| Period Jitter RMS (J_{PER}) | | | 2.5 | | ps | |

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Absolute Maximum Ratings

| Item | Minimum | Maximum | Unit | Condition |
|-----------------|---------|----------------------|------|-----------|
| Supply Voltage | -0.3 | +4.0 | V | |
| Input Voltage | -0.3 | V _{dd} +0.3 | V | |
| Junction Temp. | | +150 | °C | |
| Storage Temp. | -55 | +150 | °C | |
| Soldering Temp. | | +260 | °C | 40sec max |
| ESD | | | V | |
| HBM | | 4,000 | | |
| MM | | 400 | | |
| CDM | | 1,500 | | |

OPTIONS AND PART IDENTIFICATION: (left blank if standard)

Programmed Orders (Quantity > 1,000pcs)

ASEMP - MHz - - -

| Output Type | Frequency in MHz | Operating Temp. | Overall Freq. Stability | Tri-state (Pin 1) | Packaging |
|-------------|---|--|---|------------------------------------|---|
| C: CMOS | e.g. 156.2500 MHz (Maximum 4 digits after decimal) | Blank: -20°C ~ +70°C L: -40°C ~ +85°C X: -40°C ~ +105°C Z**: -55°C ~ +125°C | Blank: ±50ppm Y: ±10ppm* R: ±25 ppm | Blank: Tri-state PD: Power Down | Blank***: Tube (110pcs / Tube) T: Tape & Reel (1kpcs / reel) T3: Tape & Reel (3kpcs / reel) T5: Tape & Reel (5kpcs / reel) |

* Temp option L, X or -20°C ~ +70°C, only

** CMOS output only

*** For Quick turn-around programmable orders < 1000pcs: Due to the immediate availability of stock and the qty of the order, the parts may be delivered as BULK: Cut Tape, Loose parts in Antistatic Bag or in Tube(s). The MOQ per the series will still apply for Tube packaging.

Un-Programmed Orders

Blank un-programmed oscillators and our low cost portable programmer are available for quick turn engineering requirements. Please call ABRACON or visit MEMSpeed Pro II site <http://www.abracon.com/memspeedpro/MEMSpeedProFlyerII.pdf> for more information.

ASEMP - BLANK - - -

| Output Type | Operating Temp. | Overall Freq. Stability | Tri-state (Pin 1) | Packaging |
|---|--|---|------------------------------------|--|
| C: CMOS LP: LVPECL LV: LVDS HC: HCSL | Blank: -20°C ~ +70°C L: -40°C ~ +85°C X: -40°C ~ +105°C Z**: -55°C ~ +125°C | Blank: ±50ppm Y: ±10ppm* R: ±25 ppm | Blank: Tri-state PD: Power Down | Blank: Tube (110pcs / Tube) T: Tape & Reel (1kpcs / reel) T3: Tape & Reel (3kpcs / reel) T5: Tape & Reel (5kpcs / reel) |

* Temp option L, X or -20°C ~ +70°C, only

** CMOS output only

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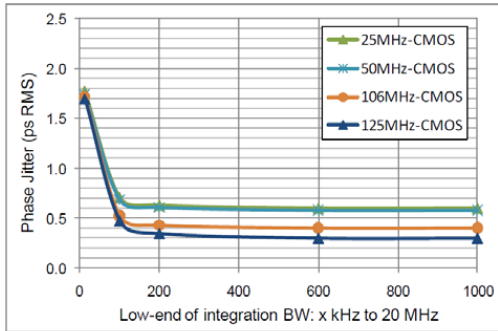


RoHS/RoHS II compliant

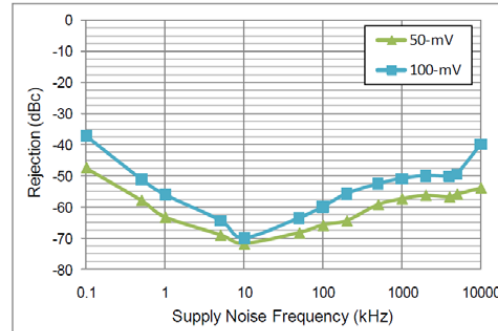
NOMINAL PERFORMANCE PARAMETERS

(Unless specified otherwise: T=25° C, VDD=3.3 V)

CMOS OUTPUT

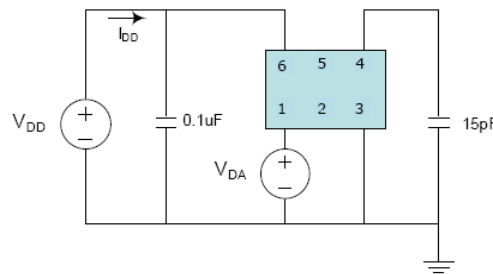


Phase jitter (integrated phase noise)

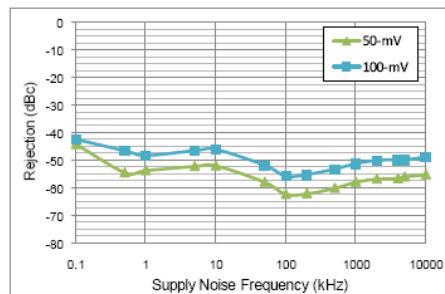


Power supply rejection ratio

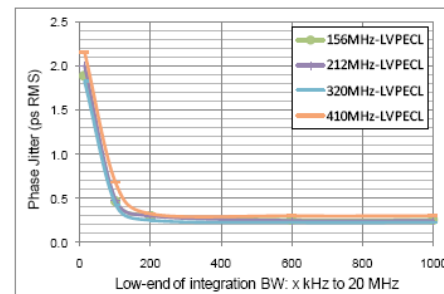
Test Circuit



LVPECL output

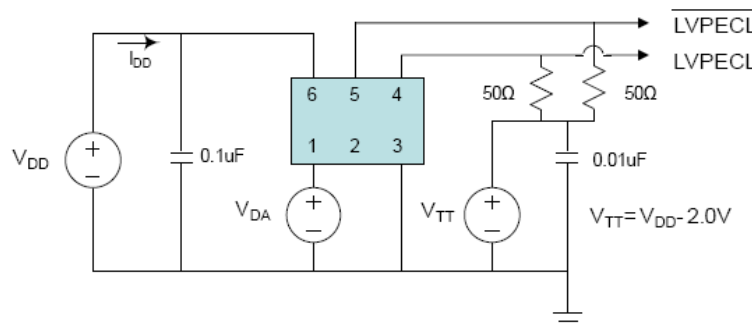


Power supply rejection ratio



Phase jitter (integrated phase noise)

Test Circuit



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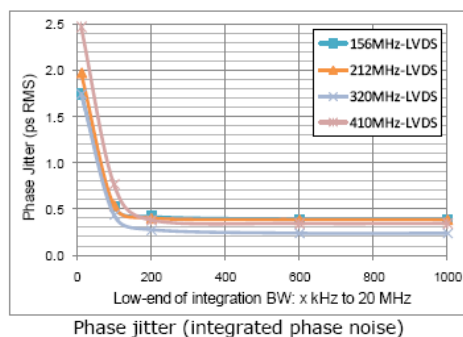
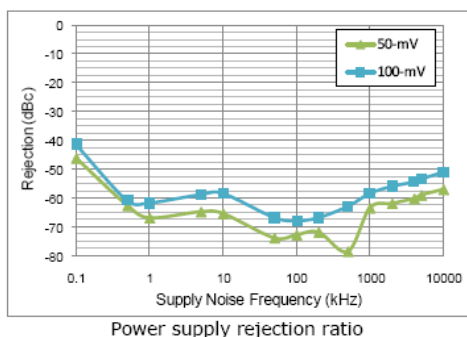
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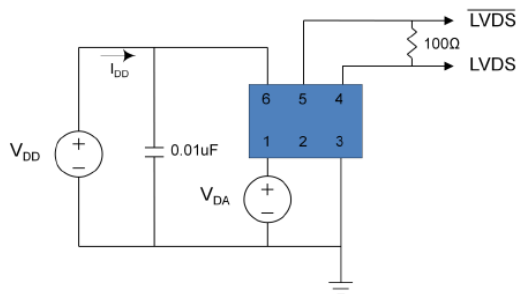


RoHS/RoHS II compliant

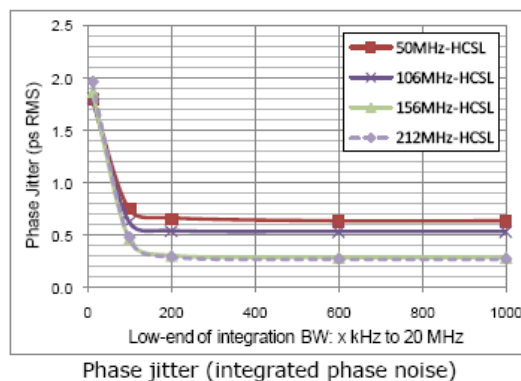
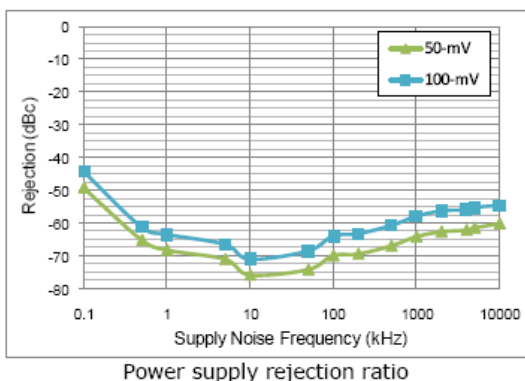
LVDS OUTPUT



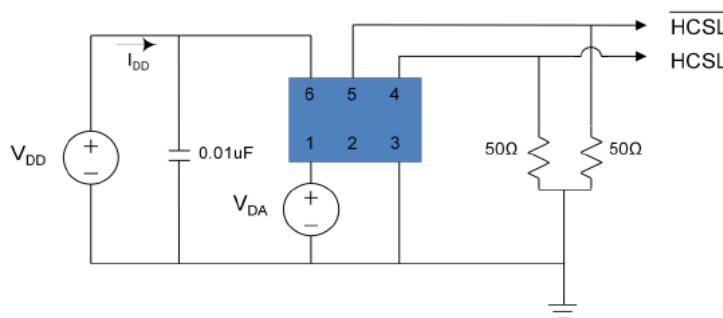
Test Circuit



HCSL OUTPUT



Test Circuit



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