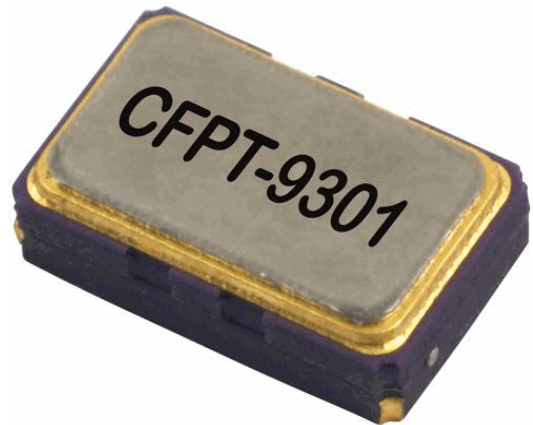


Customer Part:

Description

- Surface mount temperature compensated voltage controlled crystal oscillator.
- Freq Adj option
Option A (standard):
Ageing adjustment by means of external Control Voltage applied to pad 1
Range (frequency $\leq 20\text{MHz}$) $\geq \pm 5\text{ppm}$
Range (frequency $> 20\text{MHz}$) $\geq \pm 7\text{ppm}$
Linearity $\leq 2\%$
Slope Positive
Input resistance $\geq 100\text{k}\Omega$
Modulation bandwidth $\geq 2\text{kHz}$
Standard control voltage range $1.5\text{V} \pm 1\text{V}$
- Model CFPT-9301-A
- Model Issue number 7



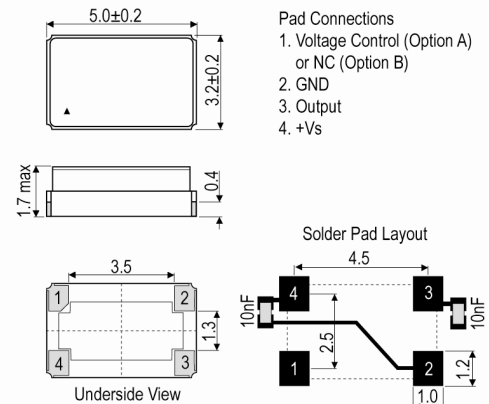
Frequency Parameters

- Frequency 16.3840MHz
- Frequency Tolerance $\pm 1.00\text{ppm}$
- Frequency Stability $\pm 1.00\text{ppm}$
- Operating Temperature Range -40.00 to 85.00°C
- Ageing $\pm 1\text{ppm}$ max in 1st year (see Note 1)
- Supply Voltage Variation (@ $\pm 5\%$ change):
Frequency $< 20\text{MHz}$: $\pm 0.1\text{ppm}$ typ
Frequency 20MHz to $< 35\text{MHz}$: $\pm 0.3\text{ppm}$ typ
Frequency 35MHz to 52MHz : $\pm 0.5\text{ppm}$ typ
- Load Variation (@ $\pm 5\text{pF}$ change):
Frequency $< 20\text{MHz}$: $\pm 0.2\text{ppm}$ typ
Frequency 20MHz to $< 35\text{MHz}$: $\pm 0.3\text{ppm}$ typ
Frequency 35MHz to 52MHz : $\pm 0.5\text{ppm}$ typ
- Note 1 Ageing:
Frequency $\leq 20\text{MHz}$: $\pm 1\text{ppm}$ max in 1st year
Frequency $\leq 20\text{MHz}$: $\pm 3\text{ppm}$ max for 10 years (including the 1st year)
Frequency $> 20\text{MHz}$: $\pm 2\text{ppm}$ max in 1st year
Frequency $> 20\text{MHz}$: $\pm 5\text{ppm}$ max for 10 years (including the 1st year)

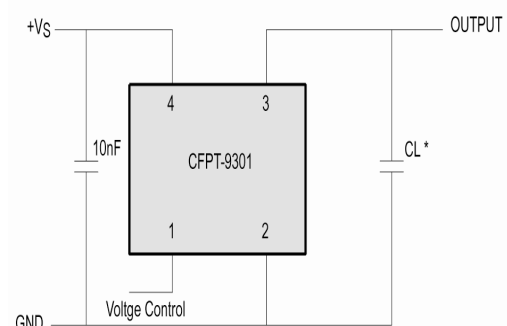
Electrical Parameters

- Supply Voltage $3.3\text{V} \pm 10\%$
- Supply Current (typical):
HCMOS: $1 + \text{Frequency}(\text{MHz}) \times \text{Supply}(\text{V}) \times \{\text{Load}(\text{pF}) + 15\} \times 1\text{E}-3\text{mA}$
i.e @ 20MHz , 3.3V , $15\text{pF} \approx 3\text{mA}$
Calculation: $1 + (20 \times 3.3 \times (15 + 15) \times 0.001) = 2.98\text{mA}$
- Supply Voltage Tolerance: Parts will operate correctly with $\pm 10\%$ supply voltage variation but supply coefficient is measured with $\pm 5\%$ variation
- Frequency Adjustment - option B
No frequency adjustment
Initial calibration: $\leq \pm 1.0\text{ppm}$
- Start Up Time: 5ms max

Outline (mm)



Test Circuit



* Load 15pF (HCMOS), inclusive of probe and jig capacitance

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Customer Part:

Frequency Adjustment

- Pulling Optional
- Frequency Adjustment - option A (standard):
Ageing adjustment by means of external Control Voltage applied to pad 1
Range (frequency $\leq$ 20MHz): $\geq \pm 5\text{ppm}$
Range (frequency $>$ 20MHz): $\geq \pm 7\text{ppm}$
Linearity: $\leq 2\%$
Slope: Positive
Input resistance: $\geq 100\text{k}\Omega$
Modulation bandwidth: $\geq 2\text{kHz}$
Standard control voltage range: $1.5\text{V} \pm 1\text{V}$

Output Details

- Output Compatibility HCMOS
- Drive Capability 15pF max
- Rise and Fall Time 8.0ns max
- Duty Cycle 45/55%

Output Levels

- Output Level:
 $VoH \geq 90\% VS$
 $VoL \leq 10\% VS$

Environmental Parameters

- Storage Temperature Range: -55 to 125°C
- Shock: IEC 60068-2-27, Test Ea: 1500G acceleration for 0.5ms, 3 shocks in each of 3 mutually perpendicular planes
- Vibration: IEC 60068-2-6, Test Fc: 10-60Hz 1.5mm displacement, 60-2000Hz at 20G, 4 hours in each of three mutually perpendicular axes at 10ct/min

Compliance

- | | |
|------------------------------|-----------|
| ■ RoHS Status (2015/863/EU) | Compliant |
| ■ REACH Status | Compliant |
| ■ MSL Rating (JDEC-STD-033): | 3 |

Packaging Details

- Pack Style: Bulk Loose in bulk pack
Pack Size: 10
- *Alternative packing option available*

Test Circuit

Typical Phase Noise at 14.4MHz

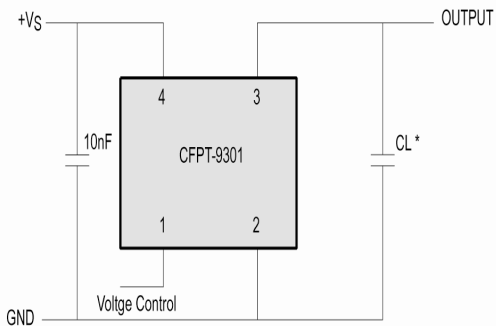
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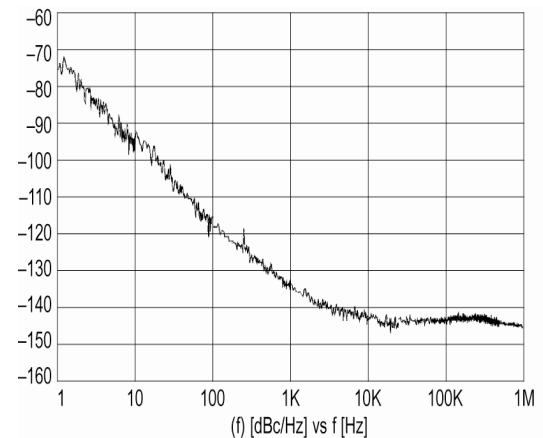
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Customer Part:


* Load 15pF (HCMOS), inclusive of probe and jig capacitance


Chipset Approval Table

Ref No.		Frequency	Chipset Type	IC Supplier	
E4190LF		12.8MHz	ACS1790T, ACS9510, ACS9520T, ACS9522T, ACS9550, ACS9593T, ACS8522BT, ACS8509, ACS8510, ACS8514, ACS8515, ACS8520, ACS8520A, ACS8522	Semtech	
E4191LF		12.8MHz	ACS1790T, ACS9510, ACS9520T, ACS9522T, ACS9550, ACS9593T, ACS8522BT, ACS8509, ACS8510, ACS8514, ACS8515, ACS8520, ACS8520A, ACS8522	Semtech	
E4437LF		12.8MHz	ACS1790T, ACS9510, ACS9520T, ACS9522T, ACS9550, ACS9593T, ACS8522BT, ACS8509, ACS8510, ACS8514, ACS8515, ACS8520, ACS8520A, ACS8522	Semtech	
E4438LF		20MHz	ZL30152, ZL30155, ZL30157, ZL30159, ZL30160, ZL30165	Microsemi	
E4439LF		20MHz	ZL30152, ZL30155, ZL30157, ZL30159, ZL30160, ZL30165	Microsemi	
E4441LF		20MHz	ZL30152, ZL30155, ZL30157, ZL30159, ZL30160, ZL30165	Microsemi	
E4698LF		12.8MHz	ACS1790T, ACS9510, ACS9520T, ACS9522T, ACS9550, ACS9593T, ACS8522BT, ACS8509, ACS8510, ACS8514, ACS8515, ACS8520, ACS8520A, ACS8522	Semtech	

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