



## Description

- Surface mount temperature compensated voltage controlled crystal oscillator.

|                    |             |
|--------------------|-------------|
| Model              | CFPT-9301-A |
| Model Issue number | 7           |

## Frequency Parameters

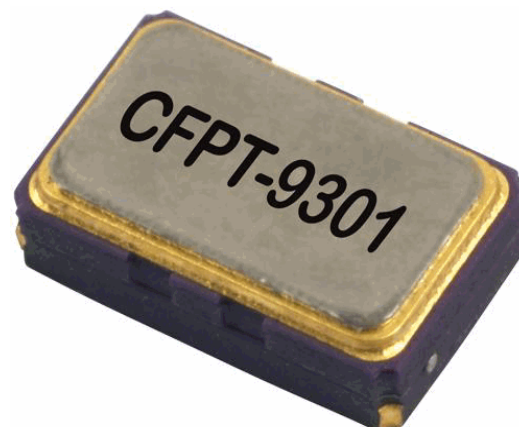
- Frequency: 24.55350MHz
- Frequency Stability:  $\pm 1.00\text{ppm}$
- Operating Temperature Range:  $-40.00$  to  $85.00^\circ\text{C}$
- Ageing  $\pm 1\text{ppm}$  max in 1st year (see Note 1)
- Supply Voltage Variation (@  $\pm 5\%$  change):
  - Frequency  $< 20\text{MHz}$ :  $\pm 0.1\text{ppm}$  typ
  - Frequency  $20\text{MHz}$  to  $< 35\text{MHz}$ :  $\pm 0.3\text{ppm}$  typ
  - Frequency  $35\text{MHz}$  to  $52\text{MHz}$ :  $\pm 0.5\text{ppm}$  typ
- Load Variation (@  $\pm 5\text{pF}$  change):
  - Frequency  $< 20\text{MHz}$ :  $\pm 0.2\text{ppm}$  typ
  - Frequency  $20\text{MHz}$  to  $< 35\text{MHz}$ :  $\pm 0.3\text{ppm}$  typ
  - Frequency  $35\text{MHz}$  to  $52\text{MHz}$ :  $\pm 0.5\text{ppm}$  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

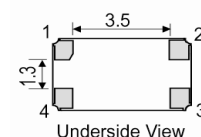
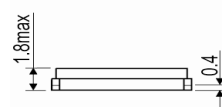
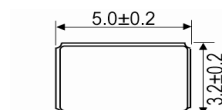
- Supply Voltage: 3.3V
- Supply Voltage Tolerance:  $\pm 10\%$
- Supply Voltage Tolerance: Parts will operate correctly with  $\pm 10\%$  supply voltage variation but supply coefficient is measured with  $\pm 5\%$  variation
- Supply Current (typical):
  - HCMOS:  $1 + \text{Frequency}(\text{MHz}) * \text{Supply}(\text{V}) * \{\text{Load}(\text{pF}) + 15\} * 10^{-3} \text{mA}$
  - e.g.  $20\text{MHz}$ ,  $3.3\text{V}$ ,  $15\text{pF} \approx 3\text{mA}$
- Frequency Adjustment - 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:  $1.5\text{V} \pm 1\text{V}$
- Frequency Adjustment - option B
  - No frequency adjustment
  - Initial calibration:  $\leq \pm 1.0\text{ppm}$

## Output Details

- Output Compatibility: HCMOS
- Output Load:  $15\text{pF}$  max
- Rise and Fall time (10% - 90%):  $8\text{ns}$  max
- Duty Cycle: 45/55% max
- Output Level:
  - VoH  $\geq 90\%$  VS
  - VoL  $\leq 10\%$  VS

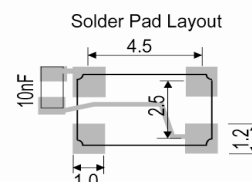


## Outline (mm)

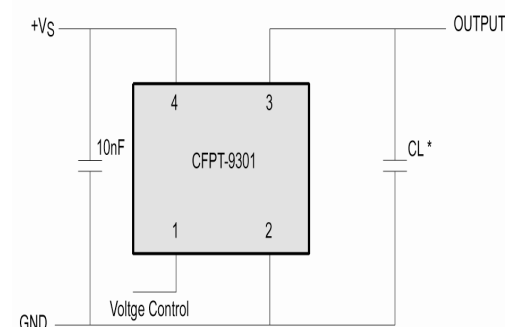


Low profile option: 1.4mm max height

- Pad Connections
1. Voltage Control / NC
  2. GND
  3. Output
  4. +VS



## Test Circuit



\* Load  $15\text{pF}$  (HCMOS), inclusive of probe and jig capacitance

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### **Environmental Parameters**

- 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 1oct/min
- Storage Temperature Range: -55 to 125°C

### **Compliance**

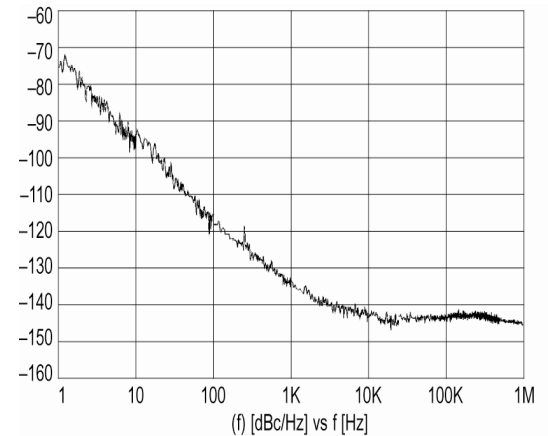
- |                |           |
|----------------|-----------|
| ■ RoHS Status  | Compliant |
| ■ REACH Status | Compliant |

### **Packaging**

- |                                        |                    |
|----------------------------------------|--------------------|
| ■ Pack Type: Bulk                      | Loose in bulk pack |
| Pack Size                              | 10                 |
| ■ Alternative packing option available |                    |

*This document is correct at the time of printing; please contact your local office for the latest version.*

**Typical Phase Noise at 14.4MHz**



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