

ISSUE 7; September 2015

Description

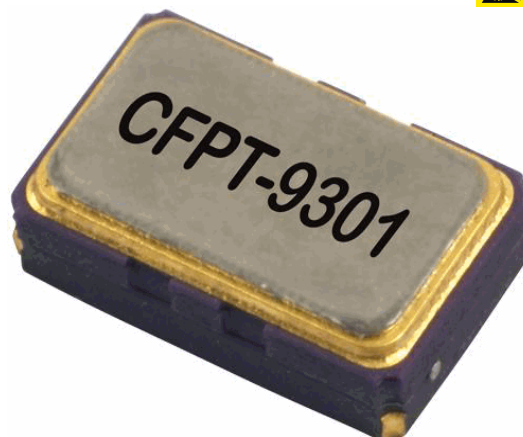
- Surface mount temperature compensated voltage controlled crystal oscillators for medium to high volume applications where small size and high performance are prerequisites. Manufactured for us by Rakon utilising their Pluto™ ASIC technology and capable of sub 0.3ppm performance over an extended temperature range. Its ability to function down to a supply voltage of 2.4V and low power consumption makes it particularly suitable for mobile applications.
- A Freq Adj option
- Option A (standard):
Ageing adjustment by means of external Control Voltage applied to pad 1
Range (frequency \leq 20MHz) \geq \pm 5ppm
Range (frequency $>$ 20MHz) \geq \pm 7ppm
Linearity \leq 2%
Slope Positive
Input resistance \geq 100k Ω
Modulation bandwidth \geq 2kHz
Standard control voltage range 1.5V \pm 1V
- B No Freq Adj
- Option B:
No frequency adjustment
Initial Calibration \leq \pm 1.0ppm

Frequency Parameters

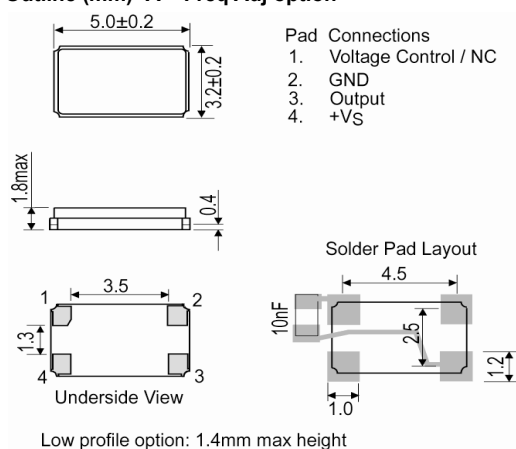
- Frequency 1.5MHz to 52.0MHz
- Frequency Tolerance \pm 0.00ppm to \pm 1.00ppm
- Frequency Stability \pm 0.20ppm to \pm 2.00ppm
- Ageing \pm 1ppm max in 1st year (see Note 1)
- Supply Voltage Variation (@ \pm 5% change):
Frequency $<$ 20MHz: \pm 0.1ppm typ
Frequency 20MHz to $<$ 35MHz: \pm 0.3ppm typ
Frequency 35MHz to 52MHz: \pm 0.5ppm typ
- Load Variation (@ \pm 5pF change):
Frequency $<$ 20MHz: \pm 0.2ppm typ
Frequency 20MHz to $<$ 35MHz: \pm 0.3ppm typ
Frequency 35MHz to 52MHz: \pm 0.5ppm typ
- Note 1 Ageing:
Frequency \leq 20MHz: \pm 1ppm max in 1st year
Frequency \leq 20MHz: \pm 3ppm max for 10 years (including the 1st year)
Frequency $>$ 20MHz: \pm 2ppm max in 1st year
Frequency $>$ 20MHz: \pm 5ppm max for 10 years (including the 1st year)

Electrical Parameters

- Supply Voltage 3.3V \pm 10%
- Supply Current (typical):
HCMOS:
 $1 + \text{Frequency(MHz)} * \text{Supply(V)} * \{ \text{Load(pF)} + 15 \} * 10^{-3} \text{mA}$
e.g. 20MHz, 3.3V, 15pF \approx 3mA
- 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 1.0ppm



Outline (mm) -A = Freq Adj option



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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): $\geq \pm 5$ ppm
Range (frequency $>$ 20MHz): $\geq \pm 7$ ppm
Linearity: $\leq 2\%$
Slope: Positive
Input resistance: $\geq 100k\Omega$
Modulation bandwidth: ≥ 2 kHz
Standard control voltage range: 1.5V \pm 1V

Operating Temperature Ranges

- -20 to 70°C
- -40 to 85°C

Output Details

- Output Compatibility HCMOS
- Drive Capability 15pF max

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 1oct/min

Ordering Information

- Frequency*
Model*
Frequency Adjustment Option*
Output
Frequency Stability (over operating temperature range)*
Operating Temperature Range*
Supply Voltage
(*minimum required)
- Example
20.0MHz CFPT-9301-A
HCMOS ± 1 ppm -20 to 70C 3.3V
- Stability/Temperature Range combinations may not be available for all frequencies, please contact our sales offices
- Supply Voltages in the range 2.4V to 6.0V are available to order, please contact our sales offices
- Low profile option (1.4mm max height) is available, please contact our sales offices
- Non standard requirements may be available upon request, please contact our sales offices

Compliance

- RoHS Status (2011/65/EU) Compliant
- REACH Status Compliant
- MSL Rating (JDEC-STD-033): Not Applicable

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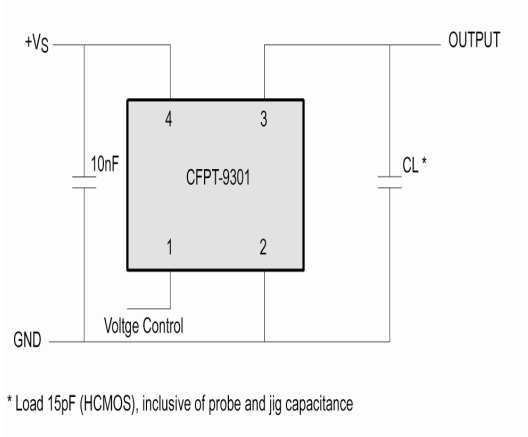
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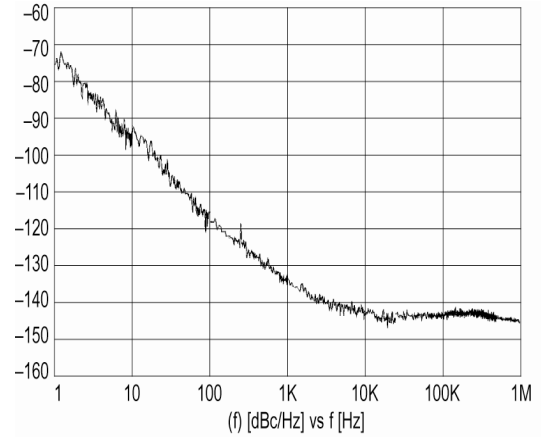
Packaging Details

- Pack Style: Reel Tape & reel in accordance with EIA-481-D
Pack Size: 1,000
- Pack Style: Bulk Loose in bulk pack
Pack Size: 10

Test Circuit



Typical Phase Noise at 14.4MHz



Electrical Specification - maximum limiting values 3.3V ±10%

Frequency Min	Frequency Max	Temperature Range	Stability (Min)	Current Draw	Rise and Fall Time	Duty Cycle
		°C	ppm	mA	ns	%
1.5MHz	52.0MHz	-20 to 70	±0.2	-	8	45/55
		-40 to 85	±0.3	-	8	45/55

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Chipset Approval Table

IQD Model	Rakon Model	Frequency	Chipset Type	IC Supplier	
E4190LF	E4190LF	12.8MHz	ACS1790T, ACS9510, ACS9520T, ACS9522T, ACS9550, ACS9593T, ACS8522BT, ACS8509, ACS8510, ACS8514, ACS8515, ACS8520, ACS8520A, ACS8522, ACS8522	Semtech	
E4191LF	E4191LF	12.8MHz	ACS1790T, ACS9510, ACS9520T, ACS9522T, ACS9550, ACS9593T, ACS8522BT, ACS8509, ACS8510, ACS8514, ACS8515, ACS8520, ACS8520A, ACS8522, ACS8522	Semtech	
E4437LF	E4437LF	12.8MHz	ACS1790T, ACS9510, ACS9520T, ACS9522T, ACS9550, ACS9593T, ACS8522BT, ACS8509, ACS8510, ACS8514, ACS8515, ACS8520, ACS8520A, ACS8522, ACS8522	Semtech	
E4438LF	E4438LF	20MHz	ZL30152, ZL30155, ZL30157, ZL30159, ZL30160, ZL30165	Microsemi	
E4439LF	E4439LF	20MHz	ZL30152, ZL30155, ZL30157, ZL30159, ZL30160, ZL30165	Microsemi	
E4441LF	E4441LF	20MHz	ZL30152, ZL30155, ZL30157, ZL30159, ZL30160, ZL30165	Microsemi	
E4698LF	E4698LF	12.8MHz	ACS1790T, ACS9510, ACS9520T, ACS9522T, ACS9550, ACS9593T, ACS8522BT, ACS8509, ACS8510, ACS8514, ACS8515, ACS8520, ACS8520A, ACS8522, ACS8522	Semtech	

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