EADED TCX0s

C-MRC MicroTechnology

CFPT-5300 SERIES

ISSUE 1; 15 OCTOBER 2004

Delivery Options

Please contact our sales office for current lead times

Description

■ The CFPT-5300 series of temperature compensated crystal oscillators (TCXOs), provide for ultra high stabilities down to ±0.3ppm and operating temperature ranges as wide as -55 to 95°C. Housed in an industry standard 4 pin DIL 14 package, the oscillator uses C-MAC's latest custom ASIC "Pluto", a single chip oscillator and analogue compensation circuit. Its wide frequency range, operating temperature range, coupled with it's high stability and linear frequency pulling make it the ideal reference oscilator. Its ability to function down to supply voltage of 2.4V and low power consumption makes it suitable for a wide range of applications

Standard Frequency

3.2, 4.096, 5.0, 6.4, 8.192, 9.6, 10.0, 12.8, 13.0, 14.4,
 14.85, 16.384, 16.8, 19.2, 19.44, 19.8, 20, 32.768, 38.88,
 40.0 MHz

Non - standard frequencies in the range 1.25MHz to 40.0MHz are available on request, please contact our sales office

Waveform

Square HCMOS 15pF load

The following non-standard outputs are available on request, contact sales office:

- Square ACMOS 50pF max load
- \blacksquare Sinewave, \geq 1.0pk-pk, 10k $\!\Omega$ // 10pF load
- \blacksquare Clipped Sinewave, ${\ge}0.8 Vpk\text{-}pk,\,10k\Omega$ // 10pF load

Sinewave and clipped sinewave signals are superimposed on a DC offset, to remove this offset insert an external coupling capacitor in series with the output

Supply Voltages

■ 3.3V or 5.0V

(non standard supply voltages in the range 2.4V to 6.0V are available on request, please contact our sales office)

Current Consumption

- HCMOS Typically »

 1+Frequency(MHz)*Supply(V)*{Load(pF)+15}*10⁻³mA
 Eg 20MHz, 5V, 15pF » 4mA
- Sinewave, ≤ 8mA
- Clipped sinewave,

1+Frequency(MHz)*1.2*{Load(pF)+30}*10⁻³mA

Package Outline

 Low Profile DIL 14 resistance welded enclosure, hermetically sealed

Ageing

- ±1ppm maximum in first year, frequency ≤ 20MHz
- ±3ppm maximum for 10 years, frequency ≤ 20MHz
- ±2ppm maximum in first year, frequency > 20MHz
- ±5ppm maximum for 10 years, frequency > 20MHz

Frequency Stability

- Temperature: see table
- Supply Voltage Variation ±10% ≤ ±0.2ppm*
- Load co-efficient 15pF ±5pF < ±0.2ppm*
- * Dependent on frequency and output type

Frequency Adjustment

■ Option A (standard):

Control Voltage 1.5V±1.0V, applied to pin 1

 $\geq \pm 5$ ppm*, frequency ≤ 20 MHz

≥ ±7ppm, frequency > 20MHz

Option B:

 \geq ±5ppm *(\geq ±7ppm if frequency >20MHz) by means of an external 100k Ω potentiometer connected as a variable resistor from pin 1 to GND

* Higher adjustment range up to ±50ppm and non standard control voltage ranges are available on request. This may not be compatible with all stability options, contact sales office

■ Option C:

No frequency adjustment, initial calibration @25°C <+1.0ppm

Storage Temperature Range

■ -55 to 95°C

Europe Tel: +44 (0)1460 270200 Fax: +44 (0)1460 72578 Americas Tel: +1 919 941 9333 Fax: +1 919 941 9371 Asia Tel: +86 755 8826 5991 Fax: +86 755 8826 5990

Website: www.cmac.com



Environmental Specification

- Bump: IEC 60068-2-29, Test Eb, 4000 ±10 bumps at 390m/s² in each of the three mutually perpendicular axes
- Shock: IEC 60068-2-27 Test Ea, 980m/s² acceleration for 6ms duration, 3 shocks in each direction along three mutually perpendicular axes
- Solderability: IEC 60068-2-20, Test T, method 1 (solder bath): Temperature 235°C
- Vibration: IEC 60068-2-6 Test Fc Procedure B4, 10-60Hz 1.5mm displacement, 60-2000Hz at 98.1 m/s², 30 minutes in each of three mutually perpendicular axes at 1 octave per minute
- Damp Heat (steady state): IEC 60068-2-3, Test Ca, Duration 56 days
- Robustness of Termination: IEC 60068-2-21, Test Ua (tensile): Force 1Kg
- Sealing: IEC 60068-2-17, Test Qc (gross) & test Qk (fine)
- Marking: Heat cured epoxy ink, engraving or label
- Immersion in Solvents: IEC 60068-2-45, Test Xa

Marking Includes

- C-MAC
- Part Number (E and four digits)
- Frequency (MHz)
- Pin 1 / Static sensitivity identified (Triangle)
- Date Code and manufacturing location code (YYWWL)

Minimum Order Information Required

Frequency + Model Number + Frequency Stability Vs
 Operating Temperature Code + Frequency Adjustment
 Code

OR

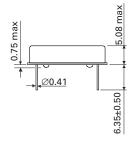
Asia

■ Discrete part number for repeat orders

Please supply full information for non-standard options, if required

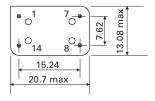


Outline in mm

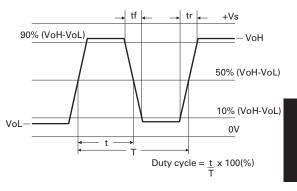


Pin Connections

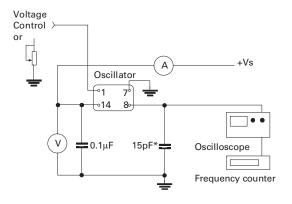
- Frequency Adjust (do not connect if Frequency Adjust option C has been selected)
- 7. GND
- 8. Output
- 14. +Vs



Output Waveform - HCMOS



Test Circuit - HCMOS



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Phase Noise (typical figures)

Frequency	Frequency offset from carrier: 10Hz	Frequency offset from carrier: 100Hz	Frequency offset from carrier: 1kHz	Frequency offset from carrier: 10kHz	Frequency offset from carrier: 100kHz	
10.0MHz	-95 dBc/Hz	-120 dBc/Hz	-135 dBc/Hz	-140 dBc/Hz	-145 dBc/Hz	
20.0MHz	-85 dBc/Hz	-110 dBc/Hz	-125 dBc/Hz	-135 dBc/Hz	-140 dBc/Hz	
40.0MHz	-75 dBc/Hz	-100 dBc/Hz	-120 dBc/Hz	-130 dBc/Hz	-135 dBc/Hz	

Electrical Specification - limiting values when measured in test circuit

Frequency Range	Supply Voltage	Output Waveform	Output levels	Rise Time(tr)	Fall Time (tf)	Duty Cycle	Model Number
1.25 to 40.0MHz	3.3V±10%	Square HCMOS	Voh \geq 90% Vs	8ns	8ns	45/55%	CFPT-5301
		15pF	$Vol \leq 10\% \ Vs$				
1.25 to 40.0MHz	5.0V±10%	Square HCMOS	Voh ≥ 90% Vs	7ns	7ns	45/55%	CFPT-5302
		15pF	Vol ≤ 10% Vs				

Frequency Stability Available Over Operating Temperature Ranges

Operating Temperature Ranges	Frequency Stabilities Vs Operating Temperature Range						
	±0.3ppm	±0.5ppm	±0.8ppm	±1.0ppm	±1.5ppm		
0 to 70°C	Code AC*	Code EC	Code BC	Code FC	Code CC		
–20 to 70°C	Code AS*	Code ES	Code BS	Code FS	Code CS		
–30 to 75°C	_	Code EU*	Code BU	Code FU	Code CU		
–40 to 85°C	_	Code EX*	Code BX	Code FX	Code CX		
–55 to 95°C		_		Code FA*	Code CA*		

Ordering Example			10.0MHz	CFPT-53	01 FX A	<u> </u>	
Frequency							
Model number							
Frequency Stability Vs (Operating Temperature Coo	le					
Frequency Adjustment (Code —						
(For frequency adjustme	ent codes see main text)						
Note:* Codes may not h	e available for all frequenc	eies					

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