ISSUE 13; April 2016

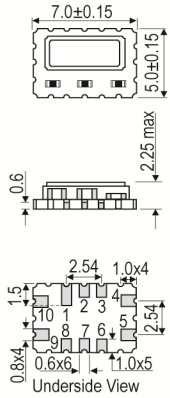
Description

- Sub 1ppm performance TCXO, a single chip oscillator and analogue compensation circuit operating over an extended temperature range. Its ability to function down to a supply voltage of 2.4V and low power consumption make it particularly suitable for mobile applications.
- -1A No ref voltage, ageing adj option
- 1 = Optional reference voltage output on pad 1, suitable for potentiometer supply or DAC reference: No output (standard option)
  A = Ageing Adjustment:
  >±5ppm, frequency <20MHz
  >±7ppm, frequency >20MHz
- -1B No ref voltage, no freq adj option
- 1 = Optional reference voltage output on pad 1, suitable for potentiometer supply or DAC reference: No output (standard option)
  B = No frequency adjustment initial calibration @ 25°C < ±1.0ppm
- -2A Ref voltage = 2.2V, ageing adj option
- 2 = Reference voltage output on pad 1, for Min. VS>2.4V, suitable for potentiometer supply or DAC reference: 2.2V
  Note: Maximum load current (mA) = Vref/10
  A = Ageing Adjustment:
  >±5ppm, frequency <20MHz
  >±7ppm, frequency >20MHz
- -3A Ref voltage = 2.7V, ageing adj option
- 3 = Reference voltage output on pad 1, for Min. VS>3.0V, suitable for potentiometer supply or DAC reference: 2.7V
  Note: Maximum load current (mA) = Vref/10
  A = Ageing Adjustment:
  >±5ppm, frequency <20MHz
  >±7ppm, frequency >20MHz

Frequency Parameters

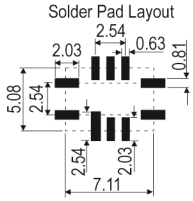
- Frequency 1.25MHz to 40.0MHz
- Frequency Tolerance ±1.00ppm
- Tolerance Condition @ 25°C
- Frequency Stability ±0.30ppm to ±2.50ppm
- Ageing:
  ±1ppm max in 1st year, frequency ≤20MHz
  ±3ppm max for 10 years (including the 1st year), frequency ≤20MHz
  ±2ppm max in 1st year, frequency >20MHz
  ±5ppm max for 10 years (including the 1st year), frequency >20MHz
- Supply Voltage Variation (±10% change): ±0.2ppm typ
- Load Variation (±5pF change): ±0.2ppm typ
- After Reflow (measured at least 60mins after reflow): ±1ppm max

Outline (mm) -1A = No ref voltage, ageing adj option



Pad Connections
1. Vref (N/C if not required)
2. N/C
3. Do not connect
4. GND
5. Output
6. N/C
7. N/C
8. Tri-state Control (Enable)
9. +V_S
10. Voltage Control or N/C

Solder Pad Layout



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Electrical Parameters

- Supply Voltage 3.3V ±10%
- Supply Current:
  1+Frequency(MHz)*Supply(V)*{Load(pF)+15}*10–3 mA
  e.g. 20MHz, 3.3V, 15pF ≈ 2mA
- Optional reference voltage output on pad 1, suitable for potentiometer supply or DAC reference:
  1. No output (standard option)
  2. 2.2V for min Vs>2.4V
  3. 2.7V for min Vs>3.0V
  Maximum load current (mA) = Vref/10
- For manual frequency adjustment connect an external 50kΩ potentiometer between pad 1 (Reference Voltage) and pad 4 (GND) with wiper connected to pad 10 (Voltage Control). Please specify reference voltage as part of the ordering code.
- Note: Supply Voltages in the range 2.4V to 6.0V are available, please contact an IQD Sales Office

Frequency Adjustment

- Slope: Positive
- Standard Voltage Control Ranges:
  Without Reference Voltage Vs=3.3V 1.65V±1.0V
  With Reference Voltage Vs=0V to Vref
- Linearity: 1% max
- Input Impedance: 100kΩ min
- Modulation Bandwidth: 2kHz min
- A. Pulling:-
  ≥±5ppm, frequency ≤20MHz
  ≥±7ppm, frequency >20MHz
- B. No frequency adjustment initial calibration @ 25°C ≤ ±1.0ppm
- C. High Pulling ±10ppm to ±50ppm can be available depending on frequency and stability options (please contact an IQD Sales Office)

Operating Temperature Ranges

- 0 to 50°C
- -20 to 70°C
- 0 to 70°C
- -30 to 75°C
- -40 to 85°C

Output Details

- Output Compatability HCMOS
- Drive Capability 15pF

Output Control

- Tri-state Operation:
  Logic ‘1’ (>60% Vs) or no connection to pad 8 enables output
  Logic ‘0’ (<20% Vs) to pad 8 disables output
  When at logic ‘0’ the output stage is disabled for all output options, but the oscillator and compensation circuit are still active (current consumption <1mA)

Output Levels

- VoL: <10% Vs
- VoH: >90% Vs

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Noise Parameters

- Phase Noise (typical for 13.0MHz @ 25°C):
  -65dBc/Hz @ 1Hz
  -95dBc/Hz @ 10Hz
  -120dBc/Hz @ 100Hz
  -135dBc/Hz @ 1kHz
  -140dBc/Hz @ 10kHz
  -145dBc/Hz @ 100kHz

Environmental Parameters

- Shock: IEC 60068-2-27, Test Ea: 1500G acceleration for 0.5ms, half sine pulse, 3 shocks in each of 3 mutually perpendicular planes
- Vibration: IEC 60068-2-6, Test Fc: 10Hz-60Hz, 1.5mm displacement, 60-2000Hz at 10G, 30mins in 3 mutually perpendicular planes at 1oct/min
- Solderability: MIL-STD-202, Method 208, Category 3
- Storage Temperature Range: –55 to 125°C

Manufacturing Details

- Pb-free Reflow Soldering: 260°C max for 30sec max

Ordering Information

- Frequency*
  Model*
  Reference Voltage + Frequency Adjustment Options*
  Output*
  Frequency Stability (over operating temperature range)*
  Operating Temperature Range*
  Supply Voltage
  (*minimum required)
- Example
  10.0MHz CFPT-9006-1A
  HCMOS ±1.0ppm -20 to 70C 3.3V
- Note: Certain frequency stability / temperature range combinations may not be available for all frequencies.

Compliance

- RoHS Status (2011/65/EU) Compliant
- REACh Status Compliant
- MSL Rating (JDEC-STD-033): 1

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

Electrical Specification - maximum limiting values 3.3V ±10%

Frequency Min	Frequency Max	Temperature Range	Stability	Current Draw	Rise and Fall Time	Duty Cycle
		°C	ppm	mA	ns	%
1.25MHz	40.0MHz	0 to 50	±0.3	-	8	45/55%
		-20 to 70	±0.5	-	8	45/55%
		-30 to 75	±1.0	-	8	45/55%
		-40 to 85	±1.0	-	8	45/55%

This document was correct at the time of printing; please contact your local sales office for the latest version.
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Chipset Approval Table

IQD Model		Frequency	Chipset Type	IC Supplier	
E2747LF		12.8MHz	ACS1790T, ACS9510, ACS9520T, ACS9522T, ACS9550, ACS9593T, ACS8522BT, ACS8509, ACS8510, ACS8514, ACS8515, ACS8520, ACS8520A, ACS8522	Semtech	
E2747LF		20MHz	ZL30152, ZL30155, ZL30157, ZL30159, ZL30160, ZL30165	Microsemi	
E2799LF		12.8MHz	ACS1790T, ACS9510, ACS9520T, ACS9522T, ACS9550, ACS9593T, ACS8522BT, ACS8509, ACS8510, ACS8514, ACS8515, ACS8520, ACS8520A, ACS8522	Semtech	
E2801LF		20MHz	ZL30152, ZL30155, ZL30157, ZL30159, ZL30160, ZL30165	Microsemi	
E2912LF		12.8MHz	ACS1790T, ACS9510, ACS9520T, ACS9522T, ACS9550, ACS9593T, ACS8522BT, ACS8509, ACS8510, ACS8514, ACS8515, ACS8520, ACS8520A, ACS8522	Semtech	
E3179LF		20MHz	ZL30152, ZL30155, ZL30157, ZL30159, ZL30160, ZL30165	Microsemi	
E3179LF		20MHz	BCM544841	Broadcom	
E3198LF		12.8MHz	ACS1790T, ACS9510, ACS9520T, ACS9522T, ACS9550, ACS9593T, ACS8522BT, ACS8509, ACS8510, ACS8514, ACS8515, ACS8520, ACS8520A, ACS8522	Semtech	
E3199LF		20MHz	ZL30152, ZL30155, ZL30157, ZL30159, ZL30160, ZL30165	Microsemi	
E3394LF		12.8MHz	ACS1790T, ACS9510, ACS9520T, ACS9522T, ACS9550, ACS9593T, ACS8522BT, ACS8509, ACS8510, ACS8514, ACS8515, ACS8520, ACS8520A, ACS8522	Semtech	
E4940LF		25MHz	ZL30152, ZL30155, ZL30157, ZL30159, ZL30160, ZL30165	Broadcom	
E5624LF		12.8MHz	82V32### WAN PLLs	IDT	

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