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This Application Note provides a list of possible oscillators for Zarlink Semiconductor timing devices which include the PDH, SONET/SDH, and SyncE (Synchronous Ethernet). This list has been categorized based on applicable standards.

Where noted below, the oscillators have been tested by Zarlink and found to be suitable for use with Zarlink's digital PLL's. However, as changes in system hardware or software or configuration may affect the overall performance of the oscillator in any customer

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system. Designers should consult with their oscillator suppliers to satisfy themselves that the oscillator they select will be suitable for their requirements and follow supplier recommendations for support components and layout.

Reference to non-Zarlink supplied products is for Customers' convenience and information only and is not an endorsement or recommendation by Zarlink of such products. Zarlink makes no representation or warranty regarding such products and accepts no responsibility for Customers' selection and use of such products. Customers' use of such products is at Customers' own risk.

## 1.0 GR1244-Core & GR-253-Core Stratum 3E

GR1244-Core Stratum 3E requirements relevant for crystal oscillators are:

- Long Term Accuracy (20 years):  $\pm 4.6$  ppm
- Short Term Stability (24 hours):  $\pm 10$  ppb
- Frequency Drift Rate:  $\pm 1.16 \times 10^{-14}$  (+/-1ppb/day @ constant temperature)

Crystal Oscillator Manufacturer	Part Number	Type	Comment
CTS (www.ctscorp.com)	1180026-xxx	OCXO	Note 2, Note 3
	1190100-xxx	OCXO	Note 2
	1380100-xxx	OCXO	Note 2
Rakon <a href="http://www.rakon.com/Products/ChipsetReferences/Pages/Telecom.aspx">http://www.rakon.com/Products/ChipsetReferences/Pages/Telecom.aspx</a>	STP2629LF	OCXO	Note 2, Note 1
	STP2885LF	OCXO	Note 2
	STP2876LF	OCXO	Note 2
	STP2846LF	OCXO	Note 2
	STP2875LF	OCXO	Note 2
Vectron (www.vectron.com)	OX-402	OCXO	Note 2
	OX-202 (formerly C4550A2)	OCXO	Note 2
	OX-222	OCXO	Note 2

Note 1: This oscillators has been tested in the lab by Zarlink.

Note 2: Consult Manufacturer's data sheet for details on temperature range and oscillator performance parameters

Note 3: This oscillators has been tested in the lab by Zarlink (1180026-018 version).

## 2.0 GR1244-Core & GR-253-Core Stratum 3

GR1244-Core Stratum 3 requirements relevant for crystal oscillators are:

- Long Term Accuracy (20 years):  $\pm 4.6$  ppm
- Short Term Stability (24 hours):  $\pm 0.37$  ppm
- Frequency Drift Rate:  $\pm 4.63 \times 10^{-13}$

Crystal Oscillator Manufacturer	Part Number	Type	Temperature Range [°C]	Comment
Rakon	E3179	TCXO	-5 to +80	Note 1
	E3199	TCXO	-40 to +85	Note 1
	E2889	TCXO	-5 to +80	
Micro-Crystal (www.microcrystal.com)	OCXOWT-BV3	OCXO	-20 to +70	Note 1
NDK (ndk.com)	NT7050BC 20M ENA3863A	TCXO	-5 to +80	
	NT7050BC 20M ENA3864A	TCXO	-40 to +85	
CTS (www.ctscorp.com)	03-42126-008	OCXO	-40 to +85	Note 1
	03-42126-007	OCXO	0 to +70	Note 1
MtronPTI (www.mtronpti.com)	M6101S006	TCXO	-40 to +85	Note 2
Vectron (www.vectron.com)	C2260A1-0233	TCXO	-40 to +85	
	TX-700-0012	TCXO	-5 to +85	Note 2
	TX-7040-EAE-2872-20M000000	TCXO	-40 to +85	

Note 1: These oscillators have been tested in the lab by Zarlink.

Note 2: These oscillators have been tested in the lab by the vendor and reviewed by Zarlink

### 3.0 ITU G.813 Option 1

ITU G.813 Option 1 requirements relevant for crystal oscillators are:

- Long Term Accuracy (20 years):  $\pm 4.6$  ppm
- Short Term Stability (24 hours):  $\pm 4.53$  ms

Crystal Oscillator Manufacturer	Part Number	Type	Temperature Range [°C]	Comment
Vectron ( <a href="http://www.vectron.com">www.vectron.com</a> )	TX-500 (formerly C2310)	TCXO	0 to +50	
	C2260A1-0233	TCXO	-40 to +85	
	TX-700-0012	TCXO	-20 to +85	Note 2
	TX-7040-EAE-2872-20M000000	TCXO	-40 to +85	
Fordahl ( <a href="http://www.fordah.com">www.fordah.com</a> )	DFA S1-LHZ-AS1001	TCXO	0 to +70	Note 1
Rakon <a href="http://www.rakon.com/Product%20s/ChipsetReferences/Pages/Telecom.aspx">http://www.rakon.com/Product s/ChipsetReferences/Pages/Telecom.aspx</a>	E3179	TCXO	-5 to +80	Note 1
	E2791	TCXO	-20 to +70	
	E2889	TCXO	-5 to +80	
	E3199	TCXO	-40 to +85	Note 1
NDK ( <a href="http://ndk.com">ndk.com</a> )	NT7050BC 20M ENA3863A	TCXO	-5 to +80	
	NT7050BC 20M ENA3864A	TCXO	-40 to +85	
Micro-Crystal ( <a href="http://www.microcrystal.com">www.microcrystal.com</a> )	OCXOWT-BV3	OCXO	-20 to +70	Note 1
CTS ( <a href="http://www.ctscorp.com">www.ctscorp.com</a> )	03-42126-008	OCXO	-40 to +85	Note 1
	03-42126-007	OCXO	0 to +70	Note 1
MtronPTI ( <a href="http://www.mtronpti.com">www.mtronpti.com</a> )	M6101S006	TCXO	-40 to +85	Note 2

Note 1: These oscillators have been tested in the lab by Zarlink.

Note 2: These oscillators have been tested in the lab by the vendor and reviewed by Zarlink

#### 4.0 ITU G.813 Option 2 and GR-253-Core SMC (SONET minimum clock)

ITU G.813 Option 2 and GR-253-Core SMC requirements relevant for crystal oscillators are:

- Long Term Accuracy (20 years):  $\pm 20$  ppm
- Short Term Stability (24 hours):  $\pm 4.6$  ppm
- Frequency Drift Rate:  $\pm 5.8 \times 10^{-12}$

Crystal Oscillator Manufacturer	Part Number	Type	Temperature Range [°C]	Comment
Rakon <a href="http://www.rakon.com/Products/ChipsetReferences/Pages/Telecom.aspx">http://www.rakon.com/Products/ChipsetReferences/Pages/Telecom.aspx</a>	E3179	TCXO	-5 to +80	Note 1
	E3199	TCXO	-40 to +85	Note 1
	E2889	TCXO	-5 to +80	
	E2791	TCXO	-20 to +70	
NDK (ndk.com)	NT7050BC 20M ENA3863A	TCXO	-5 to +80	
	NT7050BC 20M ENA3864A	TCXO	-40 to +85	
Micro-Crystal (www.microcrystal.com)	OXCOWT-BV3	OCXO	-20 to +70	Note 1
Fordahl (www.fordahl.com)	DFA S1-LHZ-AS1001	TCXO	0 to +70	
CTS (www.ctscorp.com)	03-42126-008	OCXO	-40 to +85	Note 1
	03-42126-007	OCXO	0 to +70	Note 1
MtronPTI (www.mtronpti.com)	M6101S006	TCXO	-40 to +85	Note 2
Vectron (www.vectron.com)	C2260A1-0233	TCXO	-40 to +85	
	TX-700-0012	TCXO	-20 to +85	Note 2
	TX-7040-EAE-2872-20M000000	TCXO	-40 to +85	

Note 1: These oscillators have been tested in the lab by Zarlink.

Note 2: The oscillators have been tested in the lab by the vendor and reviewed by Zarlink.

## 5.0 GR1244-Core Stratum 4 and Stratum 4E

GR1244-Core Stratum 4 and 4E requirements relevant for crystal oscillators are:

- Long Term Accuracy (20 years):  $\pm 32$  ppm

The list below does not contain temperature compensated oscillators such as TCXO-s and OCXO-s. Although these parts meet Stratum 4, they have being excluded from the list due to the higher cost.

Crystal Oscillator Manufacturer	Part Number	Temperature Range [°C]	Comment
CTS	405I33C20M0000	-40 to +85	
Micro Crystal (www.microcrystal.com)	MCS02V-B	-40 to +85	Note 1
Fordahl (www.fordahl.com)	DFN S2-LHZ20XB20C	0 to +70	Note 1
	DFN S1-LHZ20XB32D	0 to +70	
	DFN S2-LHZ20XB32D	0 to +70	
	DFN S1-LHZXE32D	-40 to +85	
	DFN S2-LHZXE32D	-40 to +85	
Vectron (www.vectron.com)	VCCI-B3F-20MO	-40 to +85	

Note 1: These oscillators have been tested in the lab by Zarlink.

## 6.0 Crystals and Oscillators for Universal Clock Translators and Universal Clock Generators

Universal Clock Translators: ZL30152, ZL30156, ZL30155, ZL30160 and Universal Clock Generators: ZL30230 and ZL30236 require 24.576 MHz Crystal or Crystal Oscillator as a master clock. Following table contains recommended crystal and crystal oscillators.

Crystal Oscillator Manufacturer	Part Number	Type	Temperature Range [°C]	Comment
CTS	406C35B24M57600	Crystal	-20 to +70	Note 1
CTS	636L3C024M57600	XO	-20 to +70	
Vectron	VCC4-B3D-24M5760000	XO	-40 to +85	Note 1

Note 1: These devices were tested in the lab by Zarlink



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