

SECTION 1.1

CRYSTAL CLOCK OSCILLATORS

CLOCK OSCILLATORS (CXO) INTRODUCTION

1. Application and Technology Notes:

Clock Oscillators (CXO) utilise a ceramic hybrid and naked blank quartz. Using this well-known and widely used method, it is achievable to reach overall stability's of $\leq \pm 25$ ppm all causes in the first year. By taking advantage of our in house crystal manufacturing ability we are able to offer competitive prices in small to medium quantities with our European based production. For serious mass production, we have fully qualified Far Eastern suppliers that produce a top quality product using the same materials and techniques.

The devices are very well suited for simple clocking and 'slave' applications where overall stability and economy are the primary requirements.

2. Code definition

DFN - 24.576 MHz

	Package Code [L x W x H mm]	Output Code	Option Code	Stability Type Code	Temperature Code	Stability [\pm ppm]
S M D	S5 = 14 x 9.8 x 4.7	B = H and T	R = tight symmetry	X = overall stability overall includes: temperature, calibration at 25°C, ageing, V _{cc} and load changes 1 st yr.	B = 0 to 70°C	25
	S11 = 7.5 x 5 x 1.8	H = HCMOS	Z = tri-state output		I = -10 to 70°C	50
T = TTL		E = -40 to 85°C	75			
L E A D E D	4 = DIL 8 x H					100
	14 = DIL 14 x H					

Some codes/options are product specific. Other codes/options also available. Please consult factory for details.

* A unique specification will be issued for custom requirements.

1. Detailed Specifications

Package	Description	Page No.
SMD	HCMOS, +5.0 V supply	10, 11
	HCMOS, +3.3 V supply	
DIL 14	HCMOS or TTL, +5.0 V supply	12
	HCMOS, +5.0 V supply	

SURFACE MOUNT CLOCK OSCILLATOR

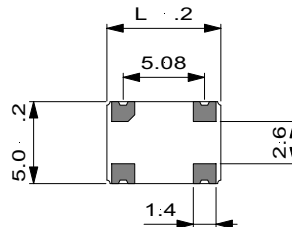
DFN S11-B/ BL

TTL AND HCMOS COMPATIBLE OUTPUT

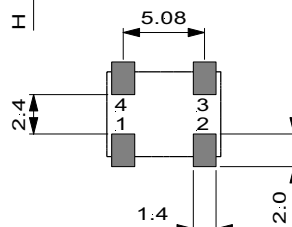
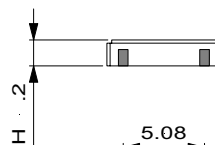
STANDARD CERAMIC PACKAGE

HIGH FREQUENCIES

LOW COST



L	7.5 mm
H	1.8 mm



PC board footprint

Function	DFN S11
NC/Enable	1
GND	2
Output	3
Vcc	4

TYPE	DFN S11-B	DFN S11-BL
Frequency Range	1.5 to 125 MHz	1.5 to 125 MHz

ELECTRICAL SPECIFICATIONS	DFN S11-B	DFN S11-BL
supply voltage	5 V ± 10 %	3.3 V ± 10 %
supply current (no load)	≤ 32 MHz ≤ 15 mA ≤ 50 MHz ≤ 30 mA ≤ 125 MHz ≤ 70 mA	≤ 10 mA ≤ 20 mA ≤ 35 mA
output load	≤ 25 MHz HCMOS 50 pF or 10 TTL ≥ 25 MHz HCMOS 15 pF or 5 TTL	HCMOS 15 pF or 10 LSTTL
duty cycle	40/60...60/40 % @ 50% level or 1.4 V	40/60...60/40 % @ 50% level
rise/fall times	10 to 90 % ≤ 5 ns	10 to 90 % ≤ 5 ns
high/low levels	≥ 4.5 V / ≤ 0.5 V	≥ 2.7 V / ≤ 0.4 V
start up	≤ 10 ms @ 4.75 V	≤ 10 ms @ 3.00 V

FREQUENCY STABILITY		stability [ppm] and temperature code			
type	temperature range	stability	code	stability	code
all types	-10 to 70°C	≤ ± 50	XI50	≤ ± 100	XI100
	-40 to 85°C	≤ ± 50	XE50	≤ ± 100	XE100
remarks		stability includes calibration at 25°C, temperature, ageing, Vcc and load changes 1 st yr.			

OPTIONS	CODE	
tight symmetry	R	45/55...55/45 %
tri-state output on pin 1	Z	high or open = enable, low = high Z

ORDERING CODE	type + option code + frequency + stability/temperature code
Example	DFN S11-BLRZ 32.000 MHz XI100

IMPORTANT NOTE THIS PRODUCT IS DESIGNED FOR VOLUME APPLICATION ONLY

SURFACE MOUNT CLOCK OSCILLATOR

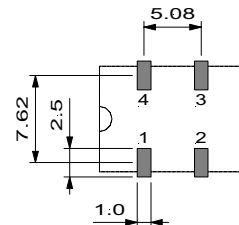
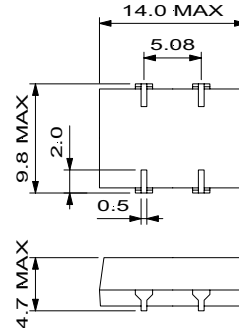
DFN S5-K (5 V) & DFN S5-L (3.3 V)

HCMOS AND TTL COMPATIBLE OUTPUT

5 V OR 3.3 V SUPPLY VOLTAGE

HIGH FREQUENCIES

LOW COST



PC board footprint

Function	DFN S5
Tri-state or N/C	1
GND	2
Output	3
Vcc	4

TYPE	DFN S5-KH	DFN S5-LH
Frequency Range	1 to 70 MHz	1 to 70 MHz

ELECTRICAL SPECIFICATIONS		
supply voltage	5 V ± 10 %	3.3 V ± 10 %
supply current (no load)	≤ 25 MHz ≤ 25 mA ≤ 50 MHz ≤ 40 mA > 50 MHz ≤ 50 mA	≤ 10 mA ≤ 20 mA ≤ 35 mA
output load	HCMOS 50 pF or 10 TTL up to 40 MHz HCMOS 15 pF or 5TTL > 50MHz	HCMOS 15 pF
duty cycle	40/60...60/40 % @ 50% level	40/60...60/40 % @ 50% level
rise/fall times (HCMOS @ 15 pF load)	20 to 80 % : ≤ 8 ns	20 to 80 % : ≤ 8 ns
high/low levels	≥ 4.5 V / ≤ 0.5 V	≥ 2.7 V / ≤ 0.4 V
start up	≤ 10 ms @ 4.5 V	≤ 10 ms @ 3.0 V

FREQUENCY STABILITY		stability [ppm] and temperature code			
types	temperature range	stability	code	stability	code
all types	0 to 70°C	≤ ± 50	XB50	≤ ± 100	XB100
	-40 to 85°C	≤ ± 50	XE50	≤ ± 100	XE100
remarks	includes calibration at 25°C, temperature, ageing, Vcc and load changes 1 st year				

OPTIONS	CODE	
tri-state output on pin 1	Z	high or open = enable, low = high Z
tight symmetry	R	45/55...55/45 % 45/55...55/45 % (f ≤ 64 MHz)

ORDERING CODE	type + option code + frequency + temperature code
Example	DFN S5-KHZ 49.152 MHz XB50

IMPORTANT NOTE **THIS PRODUCT IS DESIGNED FOR VOLUME APPLICATION ONLY**

HCMOS & TTL COMPATIBLE CLOCK OSCILLATORS

DFN 14-B, DFN 4-B, DFN 14-H & DFN 4-H

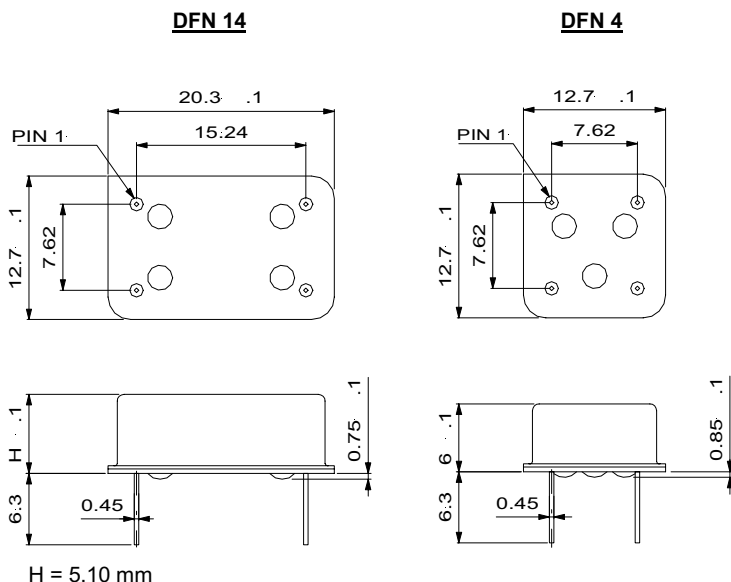
TTL AND HCMOS COMPATIBLE OUTPUT

AVAILABLE ON EXPRESS DELIVERY

SMALL QUANTITIES AVAILABLE

HIGH FREQUENCIES

Function	DFN 14	DFN 4
NC/Enable	1	1
GND	7	4
Output	8	5
Vcc	14	8



TYPE	DFN 14-B	DFN 4-B	DFN 14-H	DFN 4-H
Frequency Range	1 to 100 MHz	1 to 70 MHz	1 to 100 MHz	1 to 70 MHz

ELECTRICAL SPECIFICATIONS					
supply voltage		5 V ± 5 %		5 V ± 5 %	
supply current (no load)	≤ 20 MHz ≤ 70 MHz > 70 MHz	≤ 20 mA ≤ 40 mA ≤ 90 mA		≤ 20 mA ≤ 40 mA ≤ 90 mA	
output load		HCMOS 15 pF or 10 TTL		HCMOS 50 pF up to 25 MHz or 15 pF > 25 MHz	
duty cycle		40/60...60/40 % @ 50% level or 1.4 V		40/60...60/40 % @ 50% level	
rise/fall times		10 to 90 % ≤ 5 ns		10 to 90 % ≤ 10 ns up to 25 MHz	
high/low levels		0.4 to 2.4 V ≤ 3.5 ns		≤ 6 ns > 25MHz	
		≥ 4.5 V / ≤ 0.5 V		≥ 4.5 V / ≤ 0.5 V	
start up		≤ 10 ms @ 4.75 V		≤ 10 ms @ 4.75 V	

FREQUENCY STABILITY		stability [ppm] and temperature code					
types	temperature range	stability	code	stability	code	stability	code
all types	0 to 70°C	≤ ± 25	XB25	≤ ± 50	XB50	≤ ± 100	XB100
	-40 to 85°C	≤ ± 50	XE50	≤ ± 75	XE75	≤ ± 100	XE100
remarks	all types > 70 MHz available with XB50 or XB100 stability/temperature codes						
	stability includes calibration at 25°C, temperature, ageing, Vcc and load changes 1 st yr.						

OPTIONS	CODE		
tight symmetry	R		45/55...55/45 % available up to 25 MHz
tri-state output on pin 1	Z	high or open = enable, low = high Z	high or open = enable, low = high Z

ORDERING CODE	type + option code + frequency + stability/temperature code	
Example	DFN 14-BZ 16.000 MHz XE75	DFN 4-H 24.576 MHz XB100