PX-400

Clock Oscillator

Features

- Commercial and MIL models
- Fully RoHS Compliant *
- Temperature range from 0°C to 70°C to -55°C to +125°C
- Standard 4 and 14 pin DIP hermetic packages
- Available with Class B-Screening per MIL-PRF-55310
- Previous Model: CO-401, CO-402, CO-406, CO-441, CO-442, CO-446
  MC724, MC728, MC741, MC748
- Made in USA

* (Except parts with Sn-Pb Solder Coated Option)

Performance Specifications

Parameter	Frequency Stabilities				Condition
	Min	Typ	Max	Units	
vs. operating temperature range (referenced to +25°C)	-15 -25 -50 -100		+15 +25 +50 +100	ppm ppm ppm ppm	0… +70°C
	-25 -50 -100		+25 +50 +100	ppm ppm ppm	-40… +85°C
	-50 -100		+50 +100	ppm ppm	-55… +85°C
	-50 -100		+50 +100	ppm ppm	-55… +105°C
	-50 -100		+50 +100	ppm ppm	-55… +125°C
Initial tolerance	-15 -25 -50 -100		+15 +25 +50 +100	ppm ppm ppm ppm	@+25°C @+25°C @+25°C @+25°C

Performance Specifications

Parameter	Frequency Stabilities Min	Typ	Max	Units	Condition
Overall tolerance (Referenced to +25°C) (includes operating temperature and initial accuracy)	-20 -25 -50 -100		+20 +25 +50 +100	ppm ppm ppm ppm	0… +70°C
	-25 -50 -100		+25 +50 +100	ppm ppm ppm	-40… +85°C
	-50 -65 -100		+50 +65 +100	ppm ppm ppm	-55… +85°C
	-50 -65 -100		+50 +65 +100	ppm ppm ppm	-55… +105°C
	-65 -80 -100		+65 +80 +100	ppm ppm ppm	-55… +125°C
vs. supply voltage change vs. load change vs. aging / 1st year vs. aging / year (following years)	-2 -1 -3 -1		+2 +1 +3 +1	ppm ppm ppm ppm	VS ± 5% Load ± 5% after 30 days of operation
Supply Voltage (Vs)					
Supply voltage	4.75	5.0	5.25	VDC	
Supply voltage	3.135	3.3	3.465	VDC	
Supply voltage	2.375	2.5	2.625	VDC	
Supply voltage	1.71	1.8	1.89	VDC	
Current consumption (+5 VDC)			15 20 40	mA mA mA	ACMOS or TTL 1.0 to 23.9 MHz ACMOS or TTL 24 to 49.9 MHz ACMOS or TTL 50 to 125.00 MHz
Current consumption (+3.3 VDC or +2.5 VDC)			6 8 12 16 40	mA mA mA mA mA	ACMOS 1.0 to 14.9 MHZ ACMOS 15.0 to 39.9 MHZ ACMOS 40.0 to 59.9 MHZ ACMOS 60..0 to 84.9 MHZ ACMOS 85..0 to 125.0 MHZ
Current consumption (+1.8 VDC)			1.5 2 3 4 10	mA mA mA mA mA	ACMOS 1.0 to 14.9 MHZ ACMOS 15.0 to 39.9 MHZ ACMOS 40.0 to 59.9 MHZ ACMOS 60..0 to 84.9 MHZ ACMOS 85..0 to 125.0 MHZ
RF Output					
Signal	**HCMOS / ACMOS**				
Load		15	50	pF	
Signal Level (Vol)			0.5 0.3 0.25 0.2	VDC VDC VDC VDC	with Vs=5.0V and 15pF load with Vs=3.3V and 15pF load with Vs= 2.5V and 15pF load with Vs= 1.8V and 15pF load
Signal Level (Voh)	4.5 3.0 2.25 1.62			VDC VDC VDC VDC	with Vs=5.0V and 15pF load with Vs=3.3V and 15pF load with Vs=2.5V and 15pF load with Vs=1.8V and 15pF load
Rise and fall times for ACMOS (measured 10% to 90%)			10 6 3	ns ns ns	1.0 to 23.9 MHz 24.0 to 79.9 MHz 80.0 to 125.0 MHz
Duty cycle	45 40		55 60	% %	@ 50% < 15 MHz @ 50% => 15 MHz

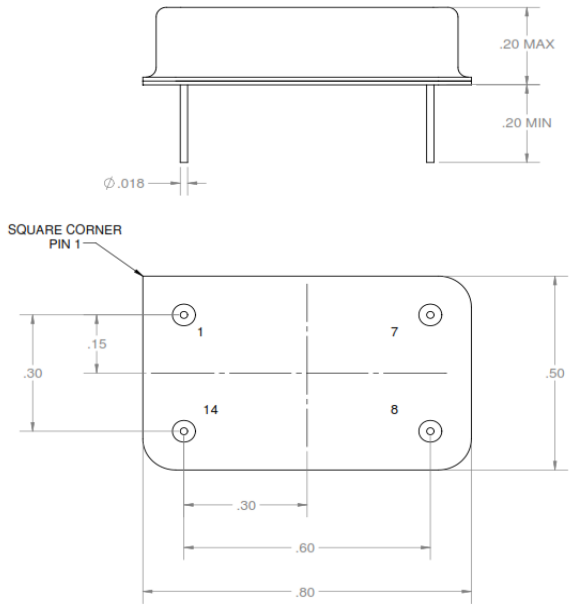
Performance Specifications

Parameter	Frequency Stabilities Min	Typ	Max	Units	Condition
Signal		**TTL**			
Load			15	pF	
Signal Level (Vol)			0.5	VDC	
Signal Level (Voh)	+4.5			VDC	
Rise and fall times for ACMOS (measured 20% to 80%)			5 3	ns ns	1.0 to 23.9 MHz 24.0 to 125 MHz
Duty cycle	45 40		55 60	% %	@ 1.4V < 15 MHz @ 1.4V >= 15 MHz
Absolute Maximum Ratings					
Supply voltage (Vs)			7.0	V	with Vs=5.0VDC and 3.3 VDC
Supply voltage (Vs)			3.6	V	with Vs=2.5VDC and 1.8 VDC
Operable temperature range	-55		+125	°C	
Storage temperature range	-62		+125	°C	

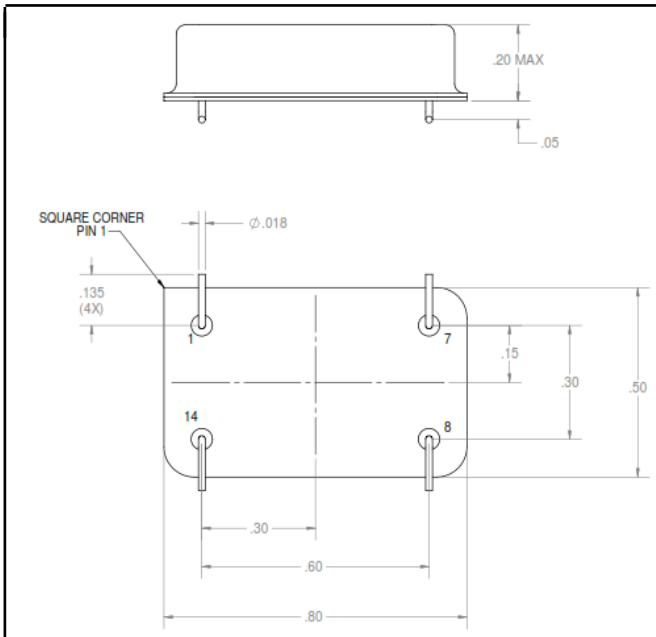
Additional Parameters		
Screening	Vectron Verification	
	Class B, MIL-PRF-55310, Rev. E	
Output Enable Hi	Logic "0" input = Outputs disabled (Tri-state) Logic "1" or floating input = Outputs enabled	
Processing & Packing	Handling & processing note	

Standard Environmentals	
Vibration	MIL-STD-202, Method 204, Condition G (30 G, 10Hz-2000Hz)
Shock	MIL-STD-202, Method 213, Condition I (100 G, 6ms, Sawtooth)
Acceleration	MIL-STD-883, Method 2001, Condition A (5000 G, Y1 Plane)
Temperature Cycling	MIL-STD-883, Method 1010, Condition B
Thermal Shock	MIL-STD-202, Method 107, Condition B
Solderability	MIL-STD-202, Method 208
Leak Test (Fine and Gross)	MIL-STD-883, Method 1014, Condition A1 and C1

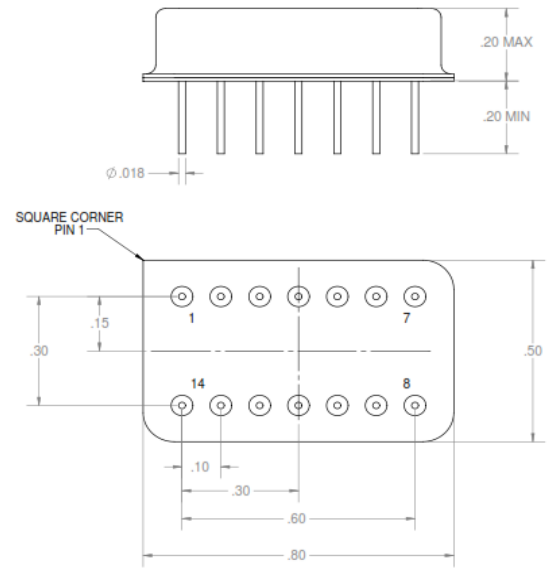
Outline Drawing / Enclosure



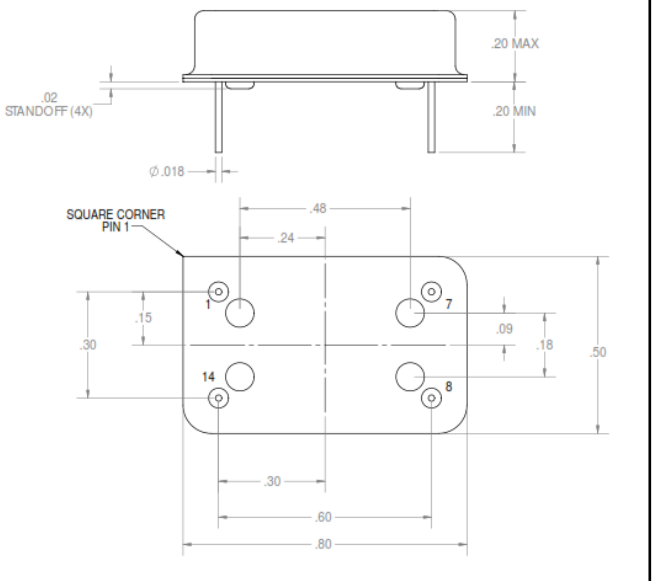
Code 0 (4 pin)		
Code	Height "H"	Pin Length "L"
0	0.2 inches	0.2 inches



Code 2 (4 pin SMD)		
Code	Height "H"	Pin Length "L"
2	0.2 inches	NA



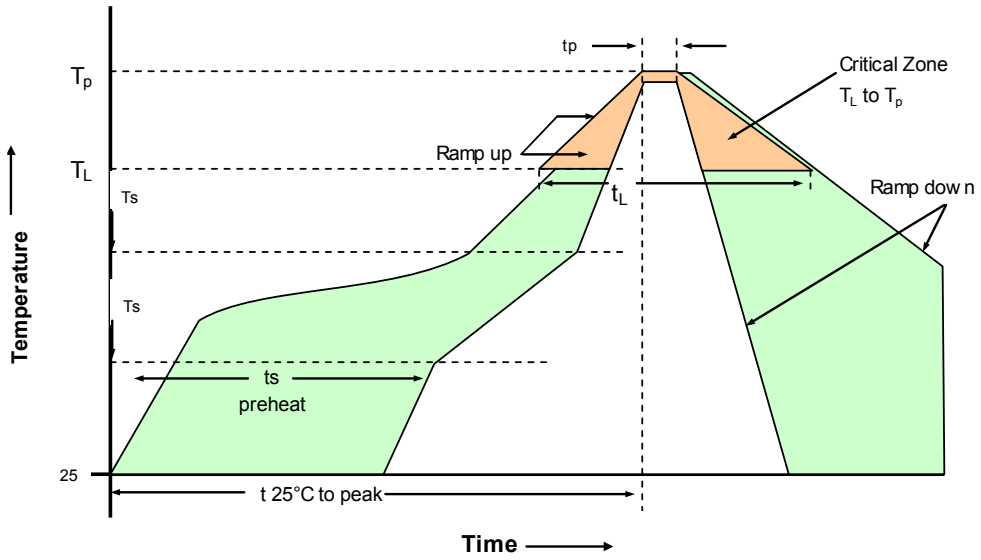
Code 1 (14 pin)		
Code	Height "H"	Pin Length "L"
1	0.2 inches	0.2 inches



Code 3 (4 pin with stand-offs)		
Code	Height "H"	Pin Length "L"
3	0.2 inches	NA

Pin Connections			
1	No Connection	14	Supply Voltage
7	Ground	8	RF Output

Recommended Reflow Profile



230°C Reflow Profile

Profile Feature	Sn-Pb Assembly	Profile Feature	Sn-Pb Assembly
Average ramp-up rate (TL to TP)	3°C/seconds max.	Time 25°C to Peak Temperature	4 minutes max.
Preheat - Temperature min Tsmin - Temperature Min Tsmax - Time (min to max) (ts)	135°C 155°C 60-90 seconds	Time maintained above - Temperature (TL) - Time (tL)	 183°C 45-60 seconds
Tsmax to TL -Ramp-up Rate	3°C/seconds max.		
Time maintained above - Temperature (TL) - Time (TL)	183°C 40-60 seconds	Time within 5°C of actual Peak Temperature (tp)	10-20 seconds max.
Peak Temperature (Tp)	max 230°C	Ramp-down Rate	6°C/seconds max.
Note: All temperatures refer to topside of the package, measured on the package body surface.			

260°C Reflow Profile

Profile Feature	Pb-Free Assembly	Profile Feature	Pb-Free Assembly
Average ramp-up rate (TL to TP)	3°C/seconds max.	Time 25°C to Peak Temperature	8 minutes max.
Preheat - Temperature min Tsmin - Temperature min Tsmax - Time (min to max) (ts)	150°C 200°C 60-180 seconds	Time maintained above - Temperature (TL) - Time (tL)	 217°C 60-150 seconds
Tsmax to TL -Ramp-up Rate	3°C/seconds max.		
Time maintained above - Temperature (TL) - Time (TL)	217°C 60-150 seconds	Time within 5°C of actual Peak Temperature (tp)	20-40 seconds max.
Peak Temperature (Tp)	max 260°C	Ramp-down Rate	6°C/seconds max.
Note: All temperatures refer to topside of the package, measured on the package body surface.			

Standard Shipping Method

NOTES:

1. MATERIAL: CLEAR R-PVC
2. ANTISTATIC TREATED/PRINTED (BLUE INK) .125" HIGH LETTERS
3. MANUFACTURER: THIELEX
4. NO HOLES
5. DIMENSIONS ARE SHOWN FOR REFERENCE ONLY.

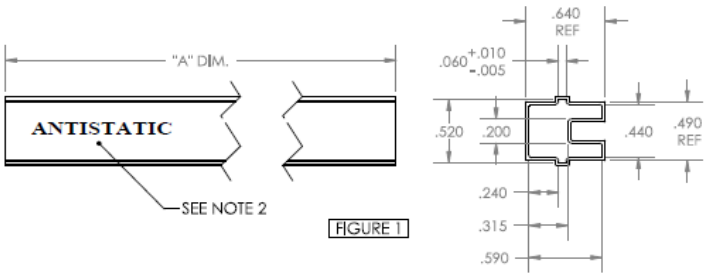


FIGURE 1

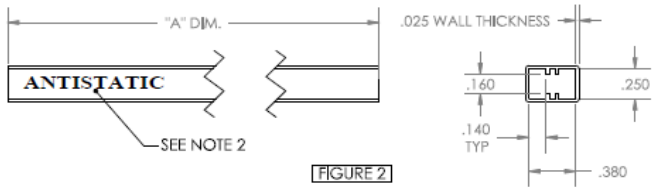
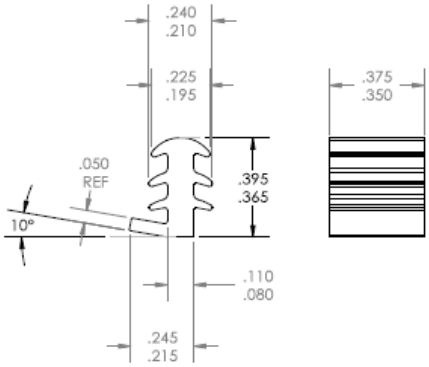


FIGURE 2

NOTES:

1. MATERIAL: KRATON (BLACK)
2. MANUFACTURER: PEAK INTERNATIONAL



Ordering Information

PX - 400 0 - D A T - F K A B - 10M0000000

Product Family
PX: PXO

Package
13 x 20 mm

Package Code
0: 0.2" (4 pin)
1: 0.2" (14 pin)
2: 0.2" (4 pin SMD)
3: 0.2" (4 pin with Stand-offs)

Supply Voltage
D: 5 Vdc ±5%
E: 3.3 Vdc ±5%
H: 2.5 Vdc ±5%

RF Output Code
A: ACMOS, HCMOS
B: TTL

Temperature Range
A: -55°C to +85°C
B: -55°C to +105°C
C: -55°C to +125°C
E: -40°C to +85°C
T: 0°C to +70°C

Accuracy Code @ 25°C or Overall Temp Stability Code
(Reference to **Table: II**)

D: ±15ppm
F: ±25ppm
K: ±50ppm
P: ±80ppm
S: ±100PPM
Z: ±65PPM

Temperature Stability Code
(Reference to **Table: I**)

D: ±15ppm
F: ±25ppm
K: ±50ppm
P: ±80ppm
S: ±100ppm
Z: ±65PPM
X: Use with Overall Tolerance Code

Enable Code
A: Enable Hi, Tristate
X: No Enable

Screening Option
B: MIL-PRF-55310 "B" level
X: No Screening

Frequency

Available Temperature Stability Code	
Temp Range	**Temp Stability**
A: -55°C to +85°C	**K**: ± 50ppm
	Z: ± 65ppm
B: -55°C to +105°C	**P**: ± 80ppm
C: -55°C to +125°C	**S**: ± 100ppm
E: -40°C to +85°C	**F**: ± 25ppm
	K: ± 50ppm
	Z: ± 65ppm
	P: ± 80ppm
	S: ± 100ppm
T: 0°C to +70°C	**D**: ± 15ppm
	F: ± 25ppm
	K: ± 50ppm
	Z: ± 65ppm
	P: ± 80ppm
	S: ± 100ppm

Table: I

Available Overall Tolerance Code		
Temp Range	**Overall Tolerance**	**Temp Stability**
A: -55°C to +85°C	**Z**: ± 65ppm	**X**
B: -55°C to +105°C	**P**: ± 80ppm	**X**
C: -55°C to +125°C	**S**: ± 100ppm	**X**
E: -40°C to +85°C	**K**: ± 50ppm	**X**
	Z: ± 65ppm	**X**
	P: ± 80ppm	**X**
	S: ± 100ppm	**X**
T: 0°C to +70°C	**F**: ± 25ppm	**X**
	K: ± 50ppm	**X**
	Z: ± 65ppm	**X**
	P: ± 80ppm	**X**
	S: ± 100ppm	**X**

Table: II

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Notes:

1. Contact factory for improved stabilities or additional product options. Not all options and codes are available at all frequencies.
2. Unless otherwise stated all values are valid after warm-up time and refer to typical conditions for supply voltage, frequency control voltage, load, temperature (25°C).
3. Subject to technical modification.

For Additional Information, Please Contact

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