

Helping Customers Innovate, Improve & Grow



PX-421

Features

- Frequency: 10 KHz to 125 MHz
- 4 Pin 1/2 DIP Package with Through Hole and SMD lead options
- Fully RoHS Compliant *
- No pure tin is used in this product
- Previous Model: CO-449, MC720, MC721, 7140, 4140, ACA1
- Made in USA

Applications

- Low voltage clock applications
- Military Portable Radios
- Avionics and Instrumentation
- Test and Measurement Equipment
- Medical Equipment
- Navigation

* (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

	Frequency Stabilities				
Parameter	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	-2		+2	ppm	VS ± 5%
vs. load change	-1		+1	ppm	Load ± 5%
vs. aging / 1st year	-3		+3	ppm	after 30 days of operation
vs. aging / year (following years)	-1		+1	ppm	
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)			1.5 4 8 12 20 30	mA 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 124.9 MHZ ACMOS 125.0 to 170.0 MHZ
Current consumption (+1.8 VDC)			1.0 2 3 4 10 15	mA 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 124.9 MHz ACMOS 125.0 to 170.0 MHz
RF Output					
Signal	HCMOS / CMOS				
Load		15		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 CMOS (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				Condition
	Min	Typ	Max	Units	
Signal	TTL				
Load			10	TTL	
Signal Level (Vol)			0.4	VDC	
Signal Level (Voh)	+2.4			VDC	
Rise and fall times for AC MOS (measured 0.8 V to 2.0 V)			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	
Output Enable Lo	Logic "1" input = Outputs disabled (Tri-state) Logic "0" or floating input = Outputs enabled	
Processing & Packing	Handling & processing note	

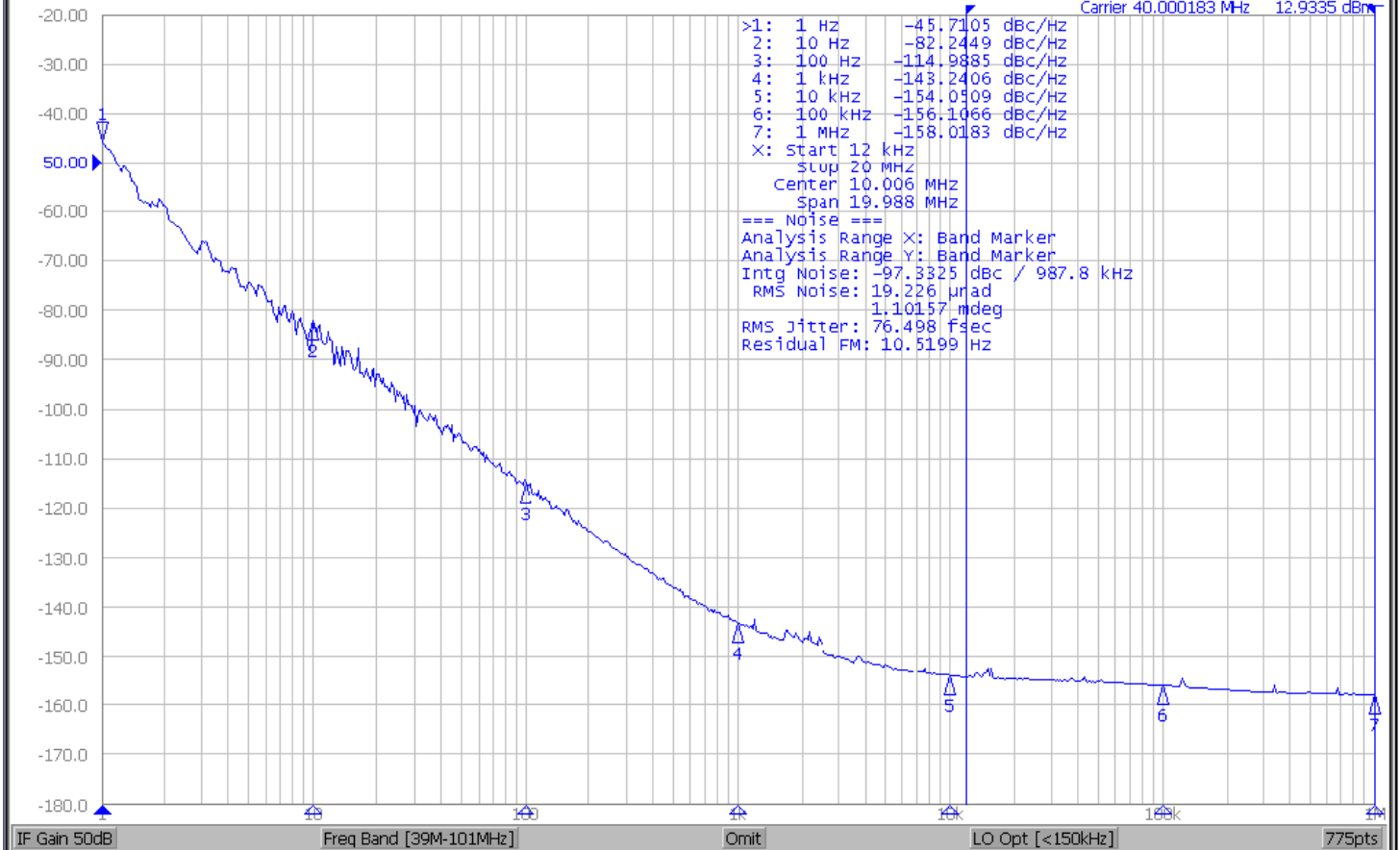
Standard Environmentals	
Vibration	MIL-STD-202, Method 204, Condition G (30 G, 10Hz-2000Hz)
Shock	MIL-STD-202, Method 213, Condition E (1000g, 0.5ms, 1/2 sine)
Acceleration	MIL-STD-883, Method 2001, Condition A (5000 G, Y1 Plane)
Temperature Cycling	MIL-STD-883, Method 1010, Condition B
Thermal Shock	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

Phase Noise Plot

Agilent E5052B Signal Source Analyzer

Resize

Phase Noise 10.00dB/ Ref -50.00dBc/Hz



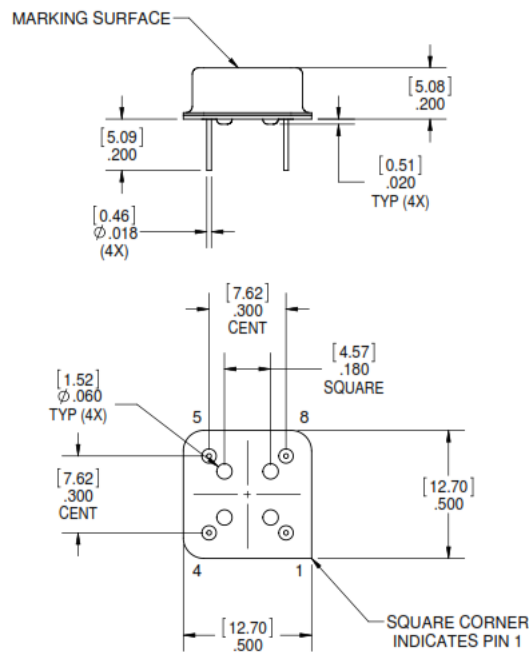
Phase Noise Start 1 Hz

Stop 1 MHz 8/8

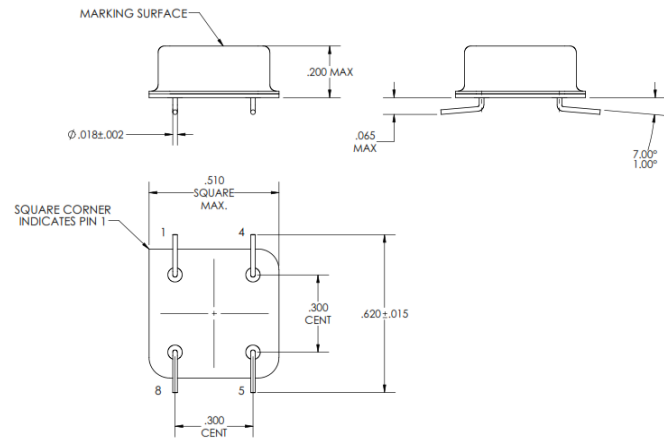
Phase Noise: Meas Cor Ctrl 5.57V Pow 3.3V Attn 10dB ExtRef1 ExtRef2 Stop Svc 2015-04-22 08:27

Outline Drawing / Enclosure

Dimensions in inches (mm)



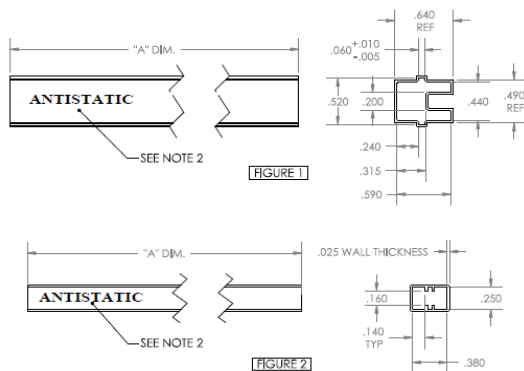
Pin Connections	
1	Enable, Disable, or No Connection
4	Case Ground
5	Output
8	B+ (+5VDC Supply Voltage)



Standard Shipping Method

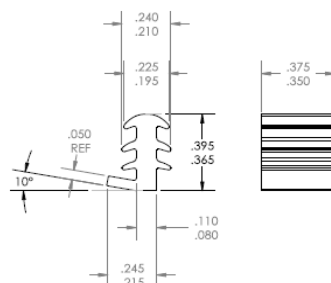
NOTES:

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.



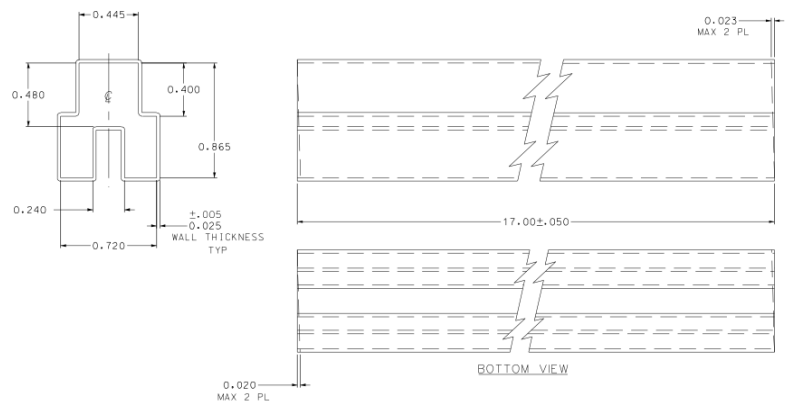
NOTES:

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

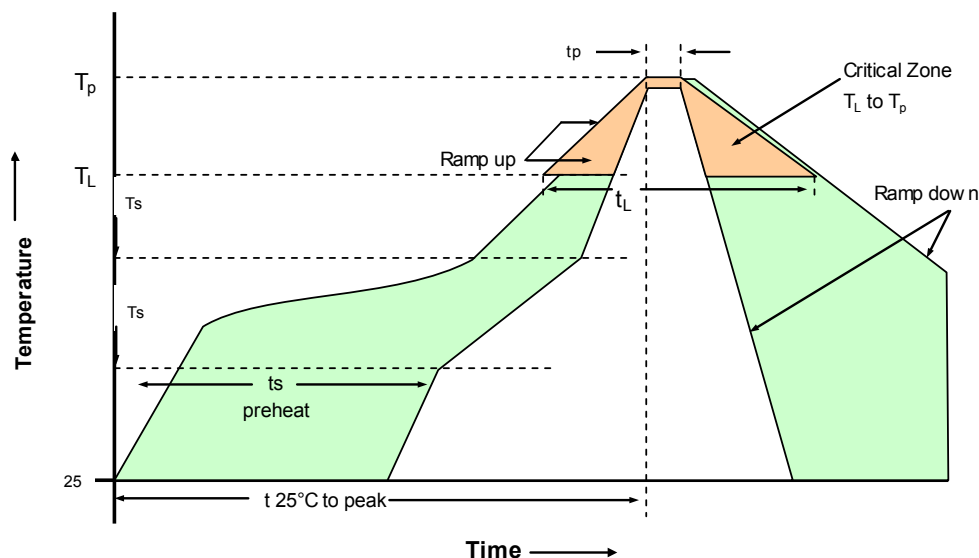


NOTES:

1. ANTISTATIC TREATED
2. RESISTIVITY: 1×10^5 TO $< 1 \times 10^{12}$ ohms/square
3. BOW (MAX. ALLOWABLE PER LENGTH): .051"
4. CUT ANGLE (MAX. ALLOWABLE, EACH END, ANY DIRECTION): 1.5°



Recommended Reflow Profiles for Pb-Free & Sn-Pb



230°C Reflow Profile

Profile Feature	Sn-Pb Assembly	Profile Feature	Sn-Pb Assembly
Average ramp-up rate (TL to TP)	3°C/secod max.	Time 25°C to Peak Temperature	4 minutes max.
Preheat - Temperature min T _{sm} - Temperature Min T _{sm} - Time (min to max) (ts)	135°C 155°C 60-90 seconds	Time maintained above - Temperature (TL) - Time (tL)	183°C 45-60 seconds
T _{sm} to TL -Ramp-up Rate	3°C/secod max.		
Time maintained above - Temperature (TL) - Time (TL)	183°C 40-60 seconds	Time within 5°C of actual Peak Temperature (tp)	10-20 seonds max.
Peak Temperature (Tp)	max 230°C	Ramp-down Rate	6°C/second max.

Note: All temperatures refer to topline 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/secod max.	Time 25°C to Peak Temperature	8 minutes max.
Preheat - Temperature min T _{sm} - Temperature min T _{sm} - Time (min to max) (ts)	150°C 200°C 60-180 seconds	Time maintained above - Temperature (TL) - Time (tL)	217°C 60-150 seconds
T _{sm} to TL -Ramp-up Rate	3°C/secod max.		
Time maintained above - Temperature (TL) - Time (TL)	217°C 60-150 seconds	Time within 5°C of actual Peak Temperature (tp)	20-40 seonds max.
Peak Temperature (Tp)	max 260°C	Ramp-down Rate	6°C/second max.

Note: All temperatures refer to topline of the package, measured on the package body surface.

Ordering Information

PX - 421 0 - D A E - F K A B - 10M0000000

Product Family

PX: PXO

Package

421: 4 pin 1/2 DIP

Configuration

0: Through Hole
1: Through Hole (with Sn/Pb coated leads)
2: Through Hole (with SAC305 coated leads)
3: SMD
4: SMD (with Sn/Pb coated leads)
5: SMD (with SAC305 coated leads)

Supply Voltage

D: 5 Vdc $\pm 5\%$
E: 3.3 Vdc $\pm 5\%$
H: 2.5 Vdc $\pm 5\%$
J: 1.8 Vdc $\pm 5\%$

RF Output Code

A: AC MOS
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

Frequency

Screening Option

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

Enable Code

A: Enable Hi, Tristate
C: Enable Lo, Tristate
X: No Enable

Temperature Stability Code

(Reference to **Table: I**)

D: $\pm 15\text{ppm}$
F: $\pm 25\text{ppm}$
K: $\pm 50\text{ppm}$
P: $\pm 80\text{ppm}$
S: $\pm 100\text{ppm}$
Z: $\pm 65\text{PPM}$
X: Use with Overall Tolerance Code

Accuracy Code @ 25°C or Overall Temp Stability Code

(Reference to **Table: II**)
D: $\pm 15\text{ppm}$
F: $\pm 25\text{ppm}$
K: $\pm 50\text{ppm}$
P: $\pm 80\text{ppm}$
S: $\pm 100\text{PPM}$
Z: $\pm 65\text{PPM}$

Available Temperature Stability Code	
Temp Range	Temp Stability
A: -55°C to +85°C	K: $\pm 50\text{ppm}$
B: -55°C to +105°C	Z: $\pm 65\text{ppm}$
	P: $\pm 80\text{ppm}$
	S: $\pm 100\text{ppm}$
E: -40°C to +85°C	F: $\pm 25\text{ppm}$
	K: $\pm 50\text{ppm}$
	Z: $\pm 65\text{ppm}$
	P: $\pm 80\text{ppm}$
	S: $\pm 100\text{ppm}$
T: 0°C to +70°C	D: $\pm 15\text{ppm}$
	F: $\pm 25\text{ppm}$
	K: $\pm 50\text{ppm}$
	Z: $\pm 65\text{ppm}$
	P: $\pm 80\text{ppm}$
	S: $\pm 100\text{ppm}$

Table: I

Available Overall Tolerance Code		
Temp Range	Overall Tolerance	Temp Stability
A: -55°C to +85°C	Z: $\pm 65\text{ppm}$	X
B: -55°C to +105°C	P: $\pm 80\text{ppm}$	X
C: -55°C to +125°C	S: $\pm 100\text{ppm}$	X
E: -40°C to +85°C	K: $\pm 50\text{ppm}$	X
	Z: $\pm 65\text{ppm}$	X
	P: $\pm 80\text{ppm}$	X
	S: $\pm 100\text{ppm}$	X
	F: $\pm 25\text{ppm}$	X
T: 0°C to +70°C	K: $\pm 50\text{ppm}$	X
	Z: $\pm 65\text{ppm}$	X
	P: $\pm 80\text{ppm}$	X
	S: $\pm 100\text{ppm}$	X
	F: $\pm 25\text{ppm}$	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 other 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. Phase noise degrades with increasing output frequency.
4. Subject to technical modification.
5. Contact factory for availability.

For Additional Information, Please Contact

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