



PLETRONICS LP49/24/21 Low Profile PTH Crystal



LP49/24/21
Metal Package

Features

- Low profile pin-thru crystals
- AT Cut Crystal
- 3.2 MHz to 70 MHz

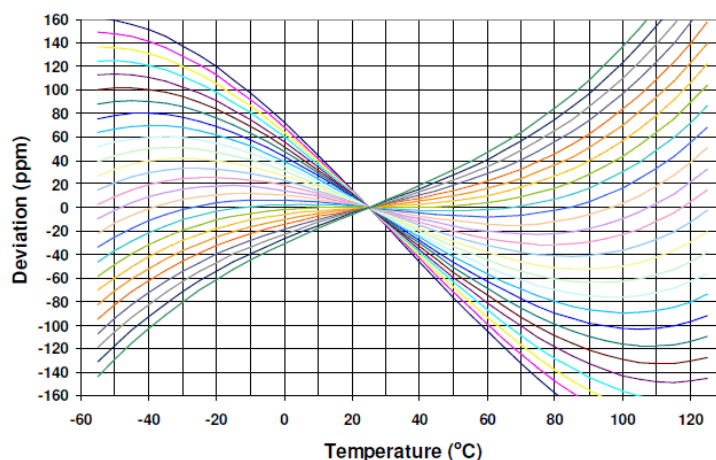
Applications

Bluetooth
WLAN
IoT
MPU

Electrical Characteristics

Parameter	Min	Typ	Max	Unit	Condition (Consult factory for other options)
Frequency Range	3.2	-	70	MHz	
Calibration Frequency Tolerance	±15	-	±50	ppm	at +25°C ± 3°C, See page 2 for available options
Frequency Stability	±10	-	±100	ppm	See page 2 for available options
Operating Temperature Range	-	-	-	°C	See page 2 for available options
Storage Temperature Range	-55	-	+125	°C	
Equivalent Series Resistance (ESR)	-	-	150 130 100 90 80 70 60 50 40 30 100 80 60	Ω	3.2 MHz ≤ Freq < 4 MHz (LP49) 4 MHz ≤ Freq ≤ 5 MHz (LP24/LP49) 5 MHz ≤ Freq < 6 MHz (LP24/LP49) 6 MHz ≤ Freq < 7 MHz (LP24/LP49) 7 MHz ≤ Freq < 9 MHz (LP24/LP49) 9 MHz ≤ Freq < 10 MHz (All versions) 10 MHz ≤ Freq < 13 MHz (All versions) 13 MHz ≤ Freq < 15 MHz (All versions) 15 MHz ≤ Freq < 27 MHz (All versions) 27 MHz ≤ Freq ≤ 36 MHz (All versions) 27 MHz ≤ Freq < 32 MHz (3rd Overtone) (All versions) 32 MHz ≤ Freq < 50 MHz (3rd Overtone) (All versions) 50 MHz ≤ Freq ≤ 70 MHz (3rd Overtone) (All versions)
Drive Level	-	-	1	mW	Use 0.1mW for testing
Shunt Capacitance (C0)	-	-	7.0	pF	Pin to Pin Capacitance
Aging at 25°C ± 3°C	-	-	±5	ppm	per year at +25°C ± 3°C

AT Cut Crystal Frequency versus Temperature Typical Performance:





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Electrical Characteristics

Series Model	Load Capacitance (C _{Load}) in pF	Frequency in MHz	Frequency Calibration Tolerance	Frequency Stability	AT Cut Crystal	Operating Temperature Range		Internal Code Or Blank
						Lowest	Highest	
LP49	-18	-25.0M	-20	H	1	G	G	-xx
LP49 LP24 LP21	Parallel Resonance from 06 to 32 pF SR = Series Resonance		(Typical Values Shown) 15 = ±15 ppm at 25°C ± 3°C 20 = ±20 ppm at 25°C ± 3°C (Standard) 25 = ±25 ppm at 25°C ± 3°C 50 = ±50 ppm at 25°C ± 3°C	See Table Below	1 = Fundamental 3 = 3rd OT	C = 0°C E = -10°C G = -20°C J = -30°C K = -35°C L = -40°C	C = +50°C E = +60°C G = +70°C H = +75°C J = +80°C K = +85°C	

Available Frequency Stability versus Temperature in ppm

Operating Temperature Range		D	E	F	G	H	J
	CODE	±10	±15	±20	±30	±50	±100
0 to +50°C	CC	•	•	•	•	•	•
0 to +60°C	CE	•	•	•	•	•	•
0 to +70°C	CG	•	•	•	•	STD	•
-10 to +50°C	EC	•	•	•	•	•	•
-10 to +60°C	EE	•	•	•	•	•	•
-10 to +70°C	EH	•	•	•	•	•	•
-20 to +70°C	GG	•	•	•	•	•	•
-20 to +75°C	GH	•	•	•	•	•	•
-30 to +75°C	JH	•	•	•	•	•	•
-30 to +85°C	JK	•	•	•	•	•	•
-35 to +80°C	KJ		△	•	•	•	•
-40 to +85°C	LK		△	•	•	•	•

• = Available

△ = Check with Pletronics

Product information is current as of publication date. The product conforms to specifications per the terms of the Pletronics standard warranty. Mar 20, 2023 Rev. F
Production processing does not necessarily include testing of all parameters.

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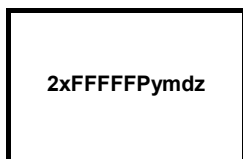
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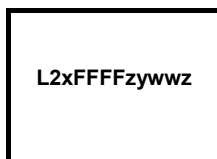
PLETRONICS LP49/24/21

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Device Marking



OR



2 = Model Code (2 = LP49, 4 = LP21, 6 = LP24)
FFFFFF = Crystal Frequency in MHz
x = Capacitance Code (See below)
P or L = Pletronics
YWW or YMD = Date code (Year-WeekWeek or Year-Month-Day; see chart below)
All other markings are internal factory codes

Specifications such as part number, frequency stability, supply voltage and operating temperature range, etc. are not identified from marking. External packaging labels and packing list will correctly identify the ordered Pletronics part number.

Codes for Date Code YMD (Year Month Day)

Code	2	3	4	5	6	Code	A	B	C	D	E	F	G	H	J	K	L	M
Year	2022	2023	2024	2025	2026	Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

Code	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	T	U	V	W	X	Y	Z
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

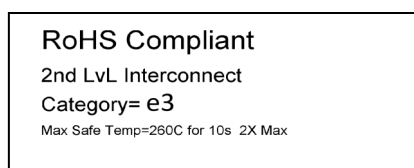
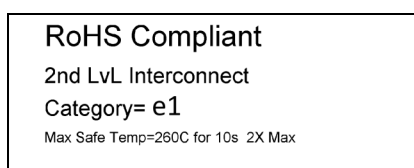
Codes for Load Capacitance

ode	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y
pF	10	12	13	8	15	18	20	22	24	26	28	30	32	34	36	27	Series	33	50	19	16	17	14

Package Labeling

P/N Label is 1" x 2.6" (25.4mm x 66.7mm)
Font is Courier New
Bar code is 39-Full ASCII

RoHS Label is 1" x 2.6" (25.4mm x 66.7mm)
Font is Arial



Standard packaging is bulk, 200pcs per bag



Pletronics Inc. certifies this device is in accordance with the RoHS and REACH directives.

Pletronics Inc. guarantees the device does not contain the following: Cadmium, Hexavalent Chromium, Lead, Mercury, PBB's, PBDE's
Weight of the Device: 0.5 grams
Moisture Sensitivity Level: 1 As defined in J-STD-020D
Second Level Interconnect code: e1 or e2 or e3

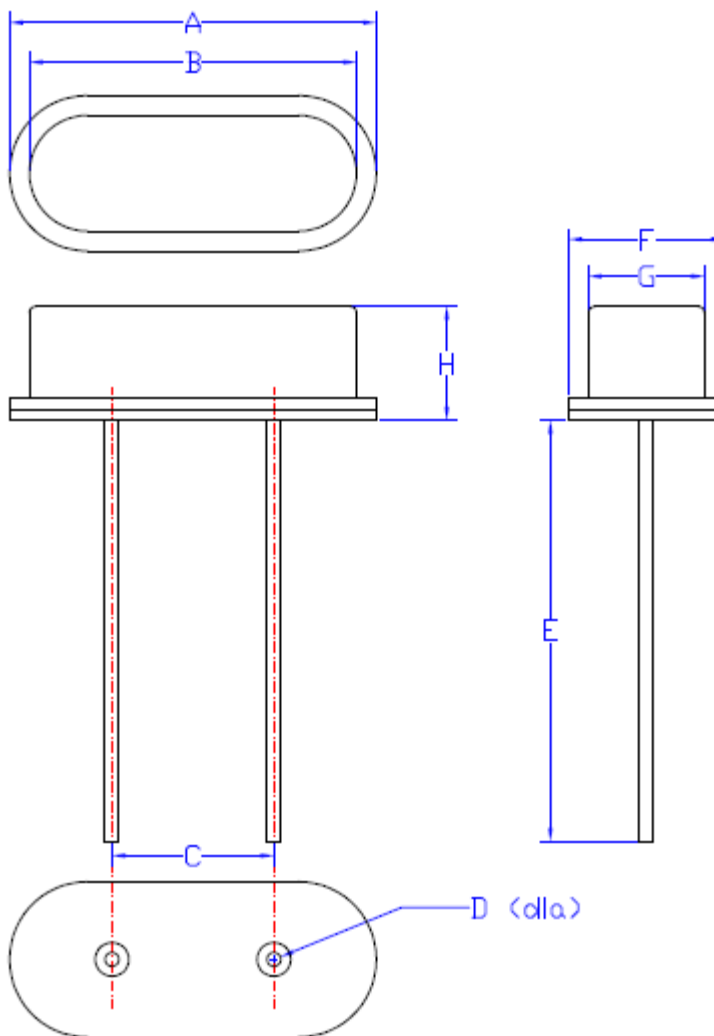
Reliability

Parameter	Condition
Mechanical Shock	MIL-STD-883, Method 2002, Condition B
Vibration	MIL-STD-883, Method 2007, Condition A
Solderability	IPC J-STD-002
Thermal Cycle	MIL-STD-883 Method 1010, Condition B

Mechanical Dimensions

	Inches	mm
A	0.425 max	10.8 max
B¹	0.404	10.26
C	0.192 ± 0.008	4.88 ± 0.2
D¹	0.017 dia	0.43 dia
E	0.50 min	12.7 min
F	0.176 max	4.47 max
G¹	0.145	3.68
H (LP49)	0.14 max	3.56 max
H (LP24)	0.10 max	2.5 max
H (LP21)	0.082 max	2.1 max

¹ Typical dimension



(Not to Scale)

Termination Coating: Three types are possible: matte Sn; SnCu; SnAgCu (SAC)

For Optimum Jitter Performance, Pletronics recommends:

- Trace lengths to the crystal should be kept as short as possible.
- The crystal connections are sensitive to noise.



Important Notice

Pletronics Incorporated (PLE) reserves the right to make corrections, improvements, modifications and other changes to this product at anytime. PLE reserves the right to discontinue any product or service without notice. Customers are responsible for obtaining the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to PLE's terms and conditions of sale supplied at the time of order acknowledgment.

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