

- Frequency range 20MHz to 54MHz, fundamental mode
- Ultra-miniature package 2.05 x 1.65 x 0.6mm
- Packaged in standard EIA tape and reel
- Ideal for PDAs, hand-held GPS, PCMCIA etc.
- Extremely low ageing and shock & vibration resistance



# 2.05 x 1.65 x 0.6mm SMD



#### **OUTLINE & DIMENSIONS**



Pad Connections

Pads 1 & 3: Crystal (in/out) Pads 2 & 4: Connected through the metal lid for grounding Chamfered pad is Pad 1.

## DESCRIPTION

X21 crystals are ultra-miniature AT-cut crystals covering the frequency range 20.0MHz to 54.0MHz in fundamental mode. The X21 crystal package is grounded via the top metal lid and two solder pads. the part exhibits very low ageing and has high shock and vibration resistance. The small size and low mass makes these crystals ideal for miniaturized hand-held equipment and similar high-density applications.

### SPECIFICATION

Frequency Range	
AT-Cut Fundamental:	20.0MHz to 54.0MHz
Calibration Tolerance at 25°C:	±10ppm, ±20ppm, ±30ppm
Frequency stability	
-10° to +60°C	from ±5ppm
-20° to +70°C	from ±10ppm
-40° to +85°C	from ±15ppm
Storage Temperature:	-50°~+105°C
Equivalent Series Resistance:	See table
Shunt Capacitance (C0):	2pF to 4pF typical, 5pF maximum
Load Capacitance (CL):	Series or from 8pF to 32pF
Ageing:	<±3ppm per year at +25°C
Drive level:	10μW typical, 100μW max.
Reflow Soldering:	10s maximum at 260°C twice
-	or once 180s at 230°C.
Packaging:	EIA tape and reel

### FREQUENCY STABILITY vs. OPERATING TEMPERATURE RANGE

Carlellan Tomo	erature	C.	tability				
		5 ±10	±15			+ 20	PART NUMBER FORMAT
			<u>⊥</u> 13	✓	<u>-</u> ∠5 ✓	√	Example: X21 - 22.000 - 12 - 15/20/-20+70/10
Y -20 to	o +70°C ∎	∎ ✓	✓	✓	✓	$\checkmark$	Example: $\frac{12}{12} = \frac{12}{12} = \frac{13}{20} = \frac{12}{10} = \frac{13}{20} = \frac{10}{10} = \frac{10}{1$
I -40 to	o +85°C		✓	✓	✓	✓	Package X21
✓ = available, ■		orcupy					
		ercory					Frequency in MHz
							Load Capacitance
							(Either SR for series or CL in pF)
IVALENT SERIES	RESISTANC	E					
							Calibration tolerance
Frequency	ESR						at 25°C (±ppm)
Range MHz	Ohms Max.						
20.0~30.0	120						Temperature Stability
30.1~54.0	80						over temp. range (±ppm)
· · · · · · · · · · · · · · · · · · ·							
							Operating Temp. Range (°C)
							(Lower and upper limits) Or use
							'X' for -10 to +60°C
							'Y' for -20 to +70°C
							'l' for -40 to +85°C
							Equivalent Series Resistance
							(Optional - use when special
							value is required)