

# E3XA

## Automotive surface mount crystal resonator MHz

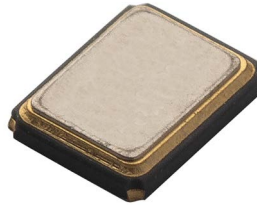


Photo is representative

### Product features

- 1210 (3225 metric) package
- Moisture sensitivity level (MSL): 1
- AEC-Q200
- Frequency range 12 MHz to 48 MHz
- Variety of frequency tolerance and stability options

### Applications

- Tire-pressure monitoring system (TPMS)
- Remote keyless entry (RKE)
- Front lighting system
- ADAS
- Camera/radar system
- In-vehicle infotainment (IVI)
- Car audio
- Battery management systems (BMS)

### Environmental compliance and general specifications

- Operating temperature range: -40 °C to +125 °C
- Storage temperature range (component): -40 °C to +125 °C



**Part number system**

<b>E</b>	<b>3</b>	<b>X</b>	<b>260</b>	<b>08</b>	<b>1</b>	<b>Z</b>	<b>A1</b>
	<b>Size code</b>	<b>Product category</b>	<b>Frequency</b>	<b>Load capacitance</b>	<b>Frequency tolerance</b>	<b>Frequency stability</b>	<b>Internal code</b>
E = Eaton	3 = 3225 metric, 1210 imperial	X = crystal	260 = 26 MHz	08 = 8 pF 10 = 10 pF 12 = 12 pF	1 = ±10 ppm 7 = ±15 ppm 2 = ±20 ppm 4 = ±30 ppm 5 = ±50 ppm	Z = ±50 ppm Q = ±100 ppm	(A1 - A9, AA - AZ without I&O) for automotive

**Electrical specifications**

<b>Items</b>	<b>Parameters</b>
Frequency range	12 MHz to 48 MHz
Oscillation mode	Fundamental
Frequency tolerance at +25 °C	±10, ±15, ±20, ±30, ±50 ppm
Frequency stability vs. operating temperature range	See table below
Equivalent series resistance	See table below
Drive level	10, 100, 200 µW or specify
Insulation resistance	500 MΩ minimum at 100 Vdc
Load capacitance	8, 10, 12 pF or specify
Shunt capacitance (C0)	3 pF maximum or specify
Aging at +25 °C	±3 ppm (first year)

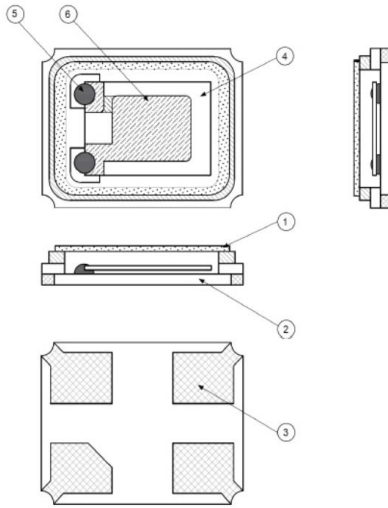
**Frequency stability vs. operating temperature range table**

<b>ppm</b>	<b>±50</b>	<b>±100</b>
Operating temperature -40 °C to +125 °C	x	x

**Equivalent series resistance table**

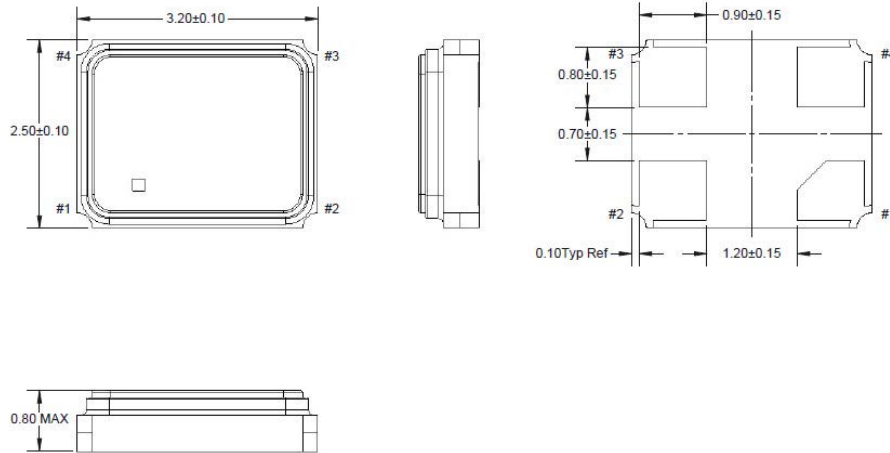
<b>Frequency (MHz)</b>	<b>ESR (Ω) maximum</b>	<b>Oscillation mode</b>
12 ≤ f < 16	80	Fundamental
16 ≤ f < 32	50	
32 ≤ f ≤ 48	30	

**Construction**

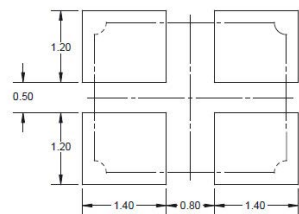


Item number	Component	Description
1	Cap (lid)	Kovar (Fe-Ni-Co)
2	Base (package)	Almina Ceramic ( $Al_2O_3$ )
3	Pad (package)	Ni + Au
4	Crystal blank	$SiO_2$
5	Conductive adhesive	Ag
6	Electrode	Cr + Au

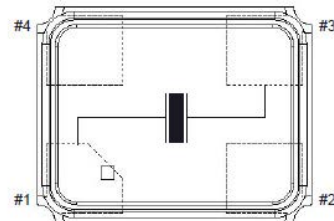
**Dimensions -mm**



**Pad layout -mm**



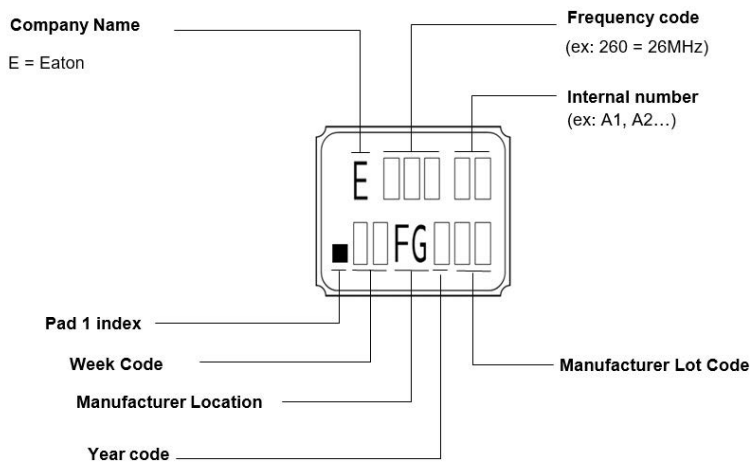
**Function diagram**



Pad	Function
1	In / out
2	Ground
3	Out / in
4	Ground

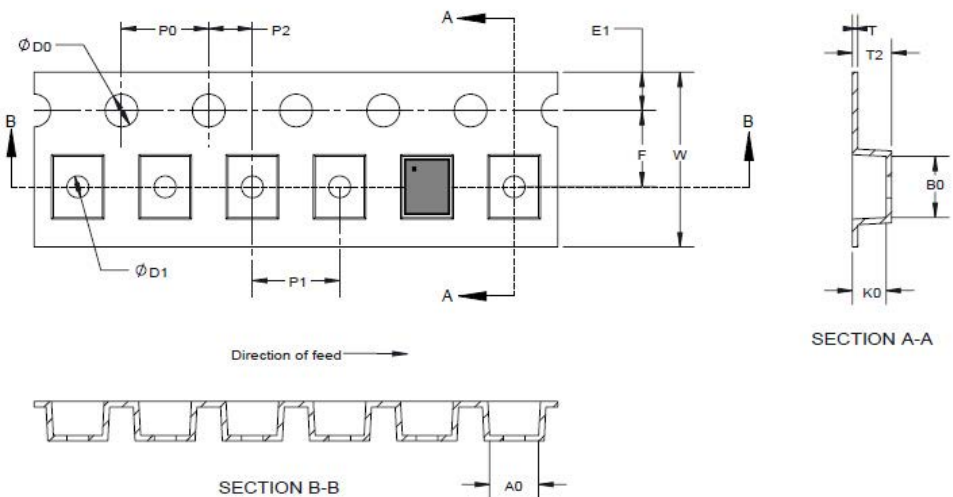
Tolerance unless otherwise specified:  $\pm 0.1$  mm

### Part marking



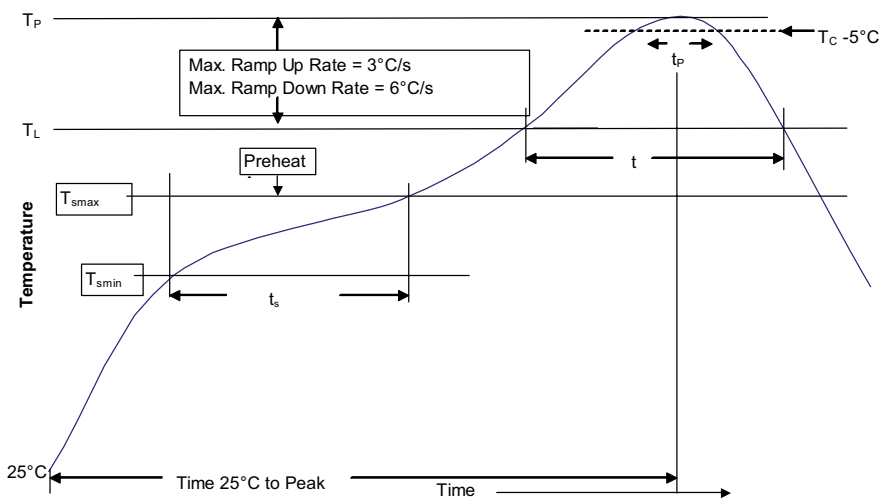
### Packaging information - mm

3,000 parts on a 7 inch tape and reel (Drawing not to scale)



Dimension	Millimeter
W	8.00 ± 0.30
F	3.50 ± 0.05
E1	1.75 ± 0.10
P0	4.00 ± 0.10
P1	4.00 ± 0.10
P2	2.00 ± 0.05
D0	1.55 ± 0.05
D1	1.00 minimum
A0	2.70 ± 0.10
B0	3.40 ± 0.10
K0	1.40 ± 0.10
T	0.25 ± 0.05
T2	1.9 maximum

**Solder reflow profile**



**Table 1 - Standard SnPb solder (T<sub>C</sub>)**

Package thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> ≥350
<2.5 mm	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

**Table 2 - Lead (Pb) free solder (T<sub>C</sub>)**

Package thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> 350 - 2000	Volume mm <sup>3</sup> >2000
<1.6 mm	260 °C	260 °C	260 °C
1.6 – 2.5 mm	260 °C	250 °C	245 °C
>2.5 mm	250 °C	245 °C	245 °C

**Reference J-STD-020**

Profile feature	Standard SnPb solder	Lead (Pb) free solder
Preheat and soak	<ul style="list-style-type: none"> <li>Temperature min. (T<sub>smin</sub>) 100 °C</li> <li>Temperature max. (T<sub>smax</sub>) 150 °C</li> <li>Time (T<sub>smin</sub> to T<sub>smax</sub>) (t<sub>s</sub>) 60-120 seconds</li> </ul>	<ul style="list-style-type: none"> <li>150 °C</li> <li>200 °C</li> <li>60-120 seconds</li> </ul>
Ramp up rate T <sub>L</sub> to T <sub>p</sub>	3 °C/ second max.	3 °C/ second max.
Liquidous temperature (T <sub>L</sub> )	183 °C	217 °C
Time (t <sub>L</sub> ) maintained above T <sub>L</sub>	60-150 seconds	60-150 seconds
Peak package body temperature (T <sub>p</sub> )*	Table 1	Table 2
Time (t <sub>p</sub> )* within 5 °C of the specified classification temperature (T <sub>C</sub> )	20 seconds*	30 seconds*
Ramp-down rate (T <sub>p</sub> to T <sub>L</sub> )	6 °C/ second max.	6 °C/ second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

\* Tolerance for peak profile temperature (T<sub>p</sub>) is defined as a supplier minimum and a user maximum.

**Manual solder**

+350 °C maximum, 4 seconds maximum by soldering iron, 2 times maximum, generally manual, hand soldering is not recommended

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