E5X

Surface mount crystal resonator MHz

Photo is representative

Product features

- 2012 (5032 metric) package
- Moisture sensitivity level (MSL): 1
- Frequency range 8 MHz to 48 MHz
- Variety of frequency tolerance and stability options

Applications

- Wireless applications
- Cell phone
- Modems
- Wireless LAN
- Communication and test equipment
- Laptop
- Network cameras
- Frequency converters

Environmental compliance and general specifications

- Operating temperature range: -40 °C to +85 °C
- Storage temperature range (component): -40 °C to +105 °C

Powering Business Worldwide

Part number system

E	5	X	260	08	1	G	01
	Size code	**Product category**	**Frequency**	**Load capacitance**	**Frequency tolerance**	**Frequency stability**	**Internal code**
E = Eaton	5 = 5032 metric, 2012 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	G = ±15 ppm X = ±20 ppm Z = ±50 ppm	01 - 99

Electrical specifications

Items	Parameters
Frequency range	8 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)

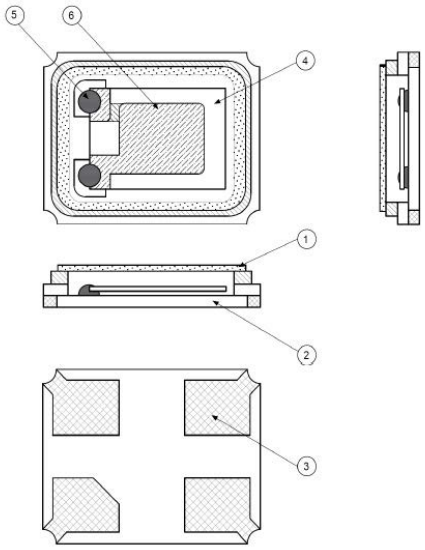
Frequency stability vs. operating temperature range table

ppm	±15	±20	±50
Operating temperature -40 °C to +85 °C	x	x	x

Equivalent series resistance table

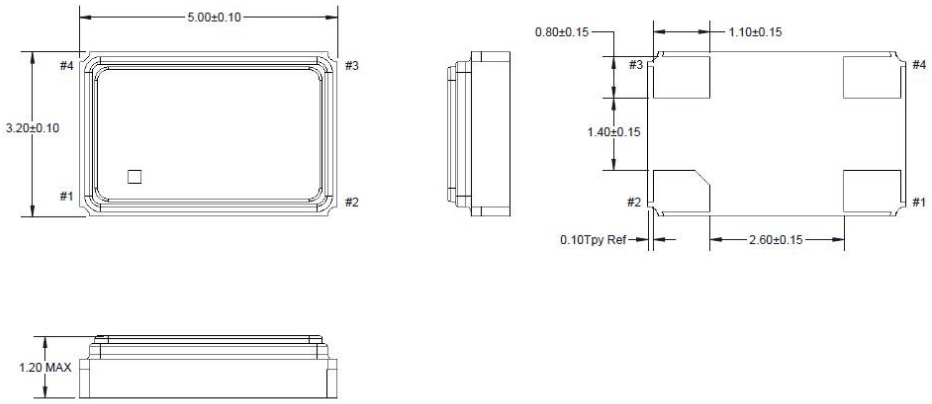
Frequency (MHz)	ESR (Ω) maximum	Oscillation mode
8 to 10	60	Fundamental
10 to 20	40	
20 to 40	30	
40 to 48	20	

Construction

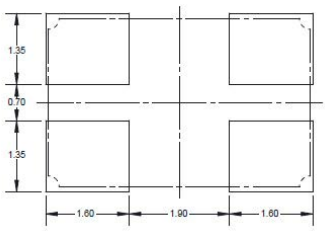


Item number	Component	Description
1	Cap (lid)	Kovar (Fe-Ni-Co)
2	Base (package)	Almina Ceramic (Al_2O_3)
3	Pad (package)	Ni + Au
4	Crystal blank	SiO_2
5	Conductive adhesive	Ag
6	Electrode	Cr + Ag

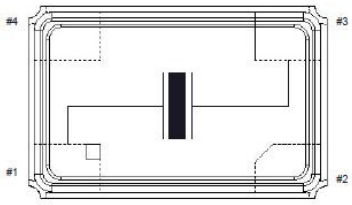
Dimensions -mm



Pad layout -mm



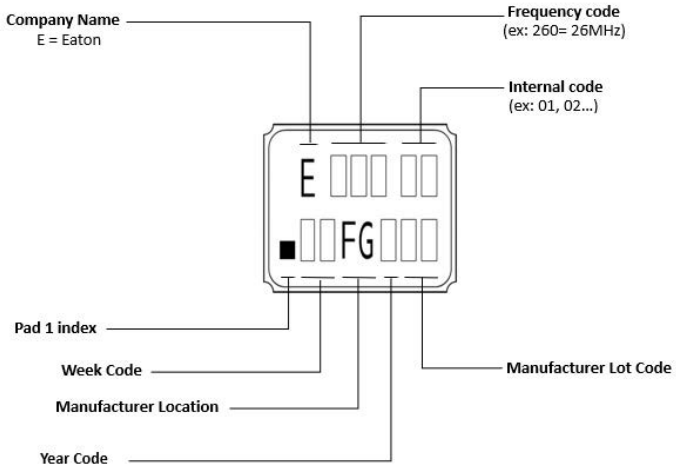
Function diagram



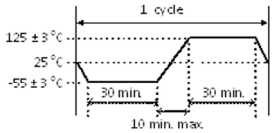
Pad	Function
1	In / out
2	Ground
3	Out / in
4	Ground

Tolerance unless otherwise specified: ±0.1 mm

Part marking

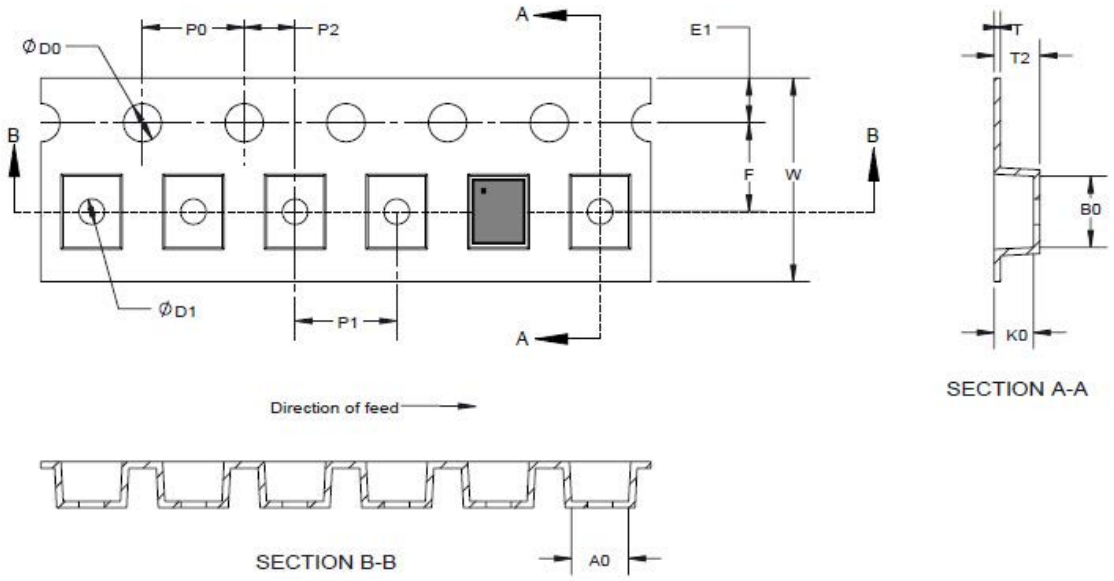


General specifications

Test item	According to	Test specification
Gross leak	MIL-STD-883 method 1014	Standard sample for automatic gross leak detector, test pressure: 2 kg/cm^2
Fine leak	MIL-STD-883 method 1014	Helium bombing 5.0 kg/cm^2 for 2 hours
Drop test	JIS C6701	150 cm height, free fall onto stainless plate 3 times
Vibration	MIL-STD-202 method 201	Frequency range = 10 to 55 Hz Amplitude = 1.52 mm Test time of each perpendicular axis = 2 hours (x, y, z axis) Total test time = 6 hours
Mechanical shock	MIL-STD-202 method 213	Half sine wave, 1000 g, 0.5 ms duration along three mutually perpendicular axes (±X, ±Y, and ±Z). Each direction for 3 shocks (total 18 shocks)
Resistance to soldering heat	MIL-STD-202 method 210	Test temperature: +260 °C ±5 °C Test time: 10 seconds ±1 second
Solderability	J-STD-002	Temperature: +245 °C ± 5 °C Immersing depth: 0.5 mm minimum Immersion time: 5 ± 1 seconds Flux: rosin resin methyl alcohol solvent (1:4)
High temperature storage	MIL-STD-202 method 108	+125 °C ± 3 °C for 500 hours
Low temperature storage	IEC 60068-2-1	-40 °C ± 3 °C for 500 hours
Thermal shock	MIL-STD-883 method 1011.9	Total 100 cycles of the following temperature cycle. 
High temperature & humidity	JIS C5023	+85 °C ±3 °C, RH 85%, 500 hours
High temperature operating life	MIL-STD-202 method 108	1000 hours at +85 °C with VDD applied

Packaging information - mm

1,000 parts on a 7 inch tape and reel (Drawing not to scale)



Dimension	Millimeter
W	12.0 ± 0.20
F	5.50 ± 0.05
E1	1.75 ± 0.10
P0	4.00 ± 0.10
P1	8.00 ± 0.10
P2	2.00 ± 0.05
D0	1.55 ± 0.05
D1	1.5 minimum
A0	3.60 ± 0.10
B0	5.40 ± 0.10
K0	1.40 ± 0.10
T	0.30 ± 0.05
T2	1.95 maximum

Solder reflow profile

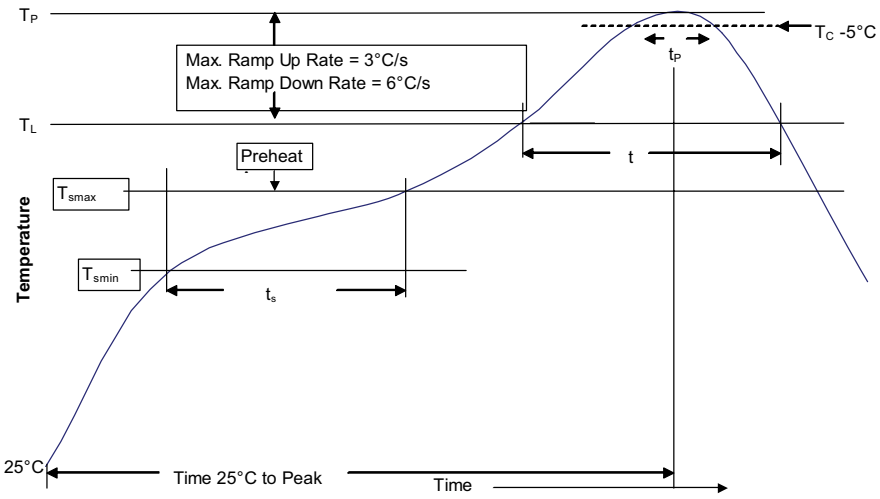


Table 1 - Standard SnPb solder (T_C)

Package thickness	Volume mm3 <350	Volume mm3 ≥350
<2.5 mm	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

Table 2 - Lead (Pb) free solder (T_C)

Package thickness	Volume mm³ <350	Volume mm³ 350 - 2000	Volume mm³ >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	• Temperature min. (T_{smin})	100 °C	150 °C
	• Temperature max. (T_{smax})	150 °C	200 °C
	• Time (T_{smin} to T_{smax}) (t_s)	60-120 seconds	60-120 seconds
Ramp up rate T_L to T_p		3 °C/ second max.	3 °C/ second max.
Liquidous temperature (T_L) Time (t_L) maintained above T_L		183 °C 60-150 seconds	217 °C 60-150 seconds
Peak package body temperature (T_P)*		Table 1	Table 2
Time (t_p)* within 5 °C of the specified classification temperature (T_C)		20 seconds*	30 seconds*
Ramp-down rate (T_p to T_L)		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_p) 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

Eaton
Electronics Division
1000 Eaton Boulevard
Cleveland, OH 44122
United States
Eaton.com/electronics

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