

The miniature ECS-33B is a compact SMD Crystal that offers low aging of  $\pm 1$  ppm first year. The industry standard 3.2 x 2.5 x 0.8 mm ceramic package is ideal for today's wireless applications.

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- IOT/Wearable applications
- SmartHome Sensors
- BTLE, Wi-Fi wireless
- Low Aging

## OPERATING CONDITIONS / ELECTRICAL CHARACTERISTICS

PARAMETERS	CONDITIONS	ECS-33B			UNITS
		MIN	TYP	MAX	
Frequency		10.000		54.000	MHz
Mode of Oscillation	Fundamental				
Frequency Tolerance* (C)	@ +25°C			$\pm 10$	ppm
Frequency Stability* (WN)	-40 ~ +85°C			$\pm 15$	ppm
Shunt Capacitance	Co			3	pF
Load Capacitance	Specify in P/N		8		pF
Drive Level	DL			200	$\mu$ W
Operating Temperature*	T <sub>opr</sub>	-40		+85	°C
Storage Temperature	T <sub>stg</sub>	-40		+125	°C
Aging (First Year)	@ +25°C $\pm 3$ °C			$\pm 1$	ppm

## DIMENSIONS (mm)

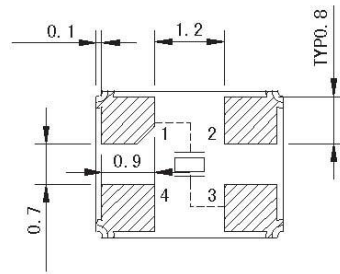
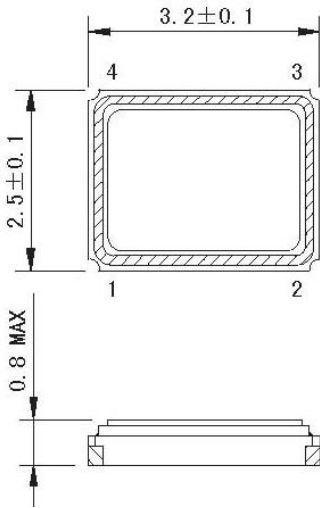
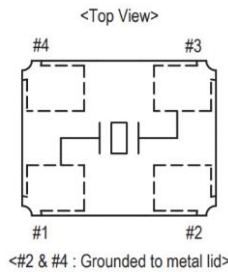


Figure 1) Top, Side, and Bottom

Crystal is symmetrical, pad 1 & 3 are interchangeable. Chamfer on the bottom pad has no electrical significance.



Pad Connections	
1	In/Out
2	Gnd
3	Out/In
4	Gnd

Frequency (MHz)	ESR $\Omega$ Max.
10.000 ~ 15.999	100
16.000 ~ 20.999	60
21.000 ~ 54.000	40

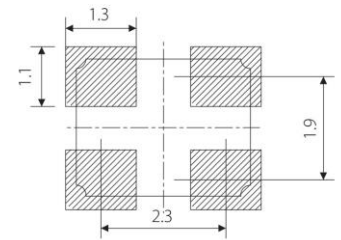


Figure 2) Suggested land

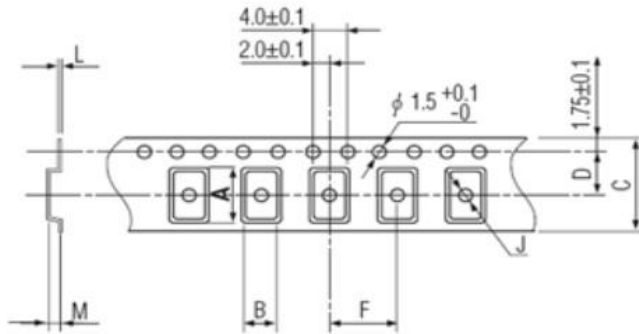
## PART NUMBERING GUIDE: Example ECS-160-9-33B-CWN-TR

ECS - FREQUENCY ABBREVIATION	LOAD CAPACITANCE	PACKAGE	AVAILABLE OPTIONS		PACKAGING	
			Tolerance	Stability		
ECS	160 = 16.000 MHz See P/N Guide	-33B = ECS-33B	A = $\pm 25$ ppm J = $\pm 20$ ppm R = $\pm 15$ ppm C = $\pm 10$ ppm 7 = $\pm 7$ ppm	D = $\pm 100$ ppm E = $\pm 50$ ppm G = $\pm 30$ ppm H = $\pm 25$ ppm T = $\pm 20$ ppm † W = $\pm 15$ ppm † K = $\pm 10$ ppm †	L = -10 ~ +70°C M = -20 ~ +70°C Y = -30 ~ +85°C N = -40 ~ +85°C P = -40 ~ +105°C S = -40 ~ +125°C	TR = 1K TR3 = 3K Qty/Reel

\* Specify available options in P/N.

† Contact ECS for availability over extended temp range.

**POCKET TAPE DIMENSIONS (mm)**



A	B	C	D	F	J	L	M	Reel Dia.
3.5	2.8	8.0	3.5	4.0	1.1	0.25	1.0	180

SOLDER PROFILE	
Peak solder Temp +260°C Max 10 sec Max.	
2 Cycles Max.	
MSL 1, Lead Finish Au	

DEVELOPED FREQUENCIES	
Abbreviation	Frequency (MHZ)
120	12.000
160	16.000
192	19.200
200	20.000
240	24.000
245.7	24.576
250	25.000
260	26.000
270	27.000
300	30.000
320	32.000
360	36.000
400	40.000
480	48.000
500	50.000

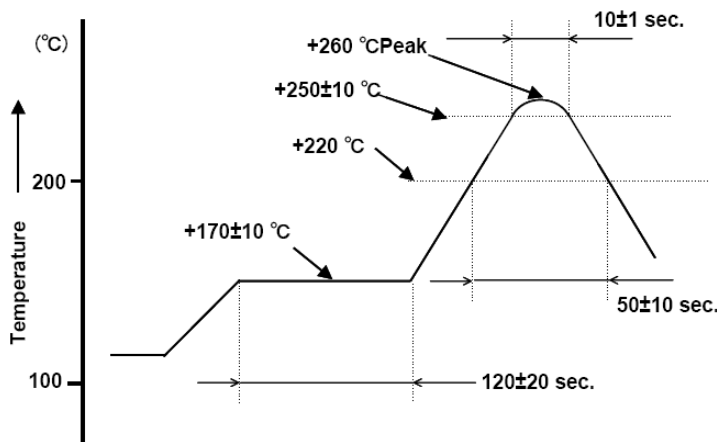


Figure 1) Suggested Reflow Profile

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