

The ECS-2016MV is a miniature SMD HCMOS Oscillator with MultiVolt™ capability of 1.6 ~ 3.6 V. The 2.0 x 1.6 x 0.85 mm ceramic package is ideal for LoRa WAN, Low Power/Portable, Industrial and IoT applications.

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## OPERATING CONDITIONS / ELECTRICAL CHARACTERISTICS



- 2.0 x 1.6 mm Footprint
- Extended Temp Range
- RoHS Compliant
- Wide Supply Voltage
- Low Jitter
- Compatible with 1.8V, 2.5V or 3.3V Power Supply

PARAMETERS	CONDITIONS	ECS-2016MV			UNITS
		MIN	TYP	MAX	
Frequency Range		1.500		54.000	MHz
* Frequency Stability	-40 ~ +85°C (CN Opt)			±25	ppm
Supply Voltage		1.6		3.6	V
Output Load	CMOS			15	pF
Output voltage Level	VOL: 10% Vdd max. / VOH: 90% Vdd min.V DC				
Rise & Fall time	10% Vdd – 90% Vdd			6.5	ns
Start Up Time	@ 90% Vdd			5	mS
Phase Jitter	12 kHz to 5 MHz			1	pS
Duty Cycle	@ ½ Vdd			45/55	%
Standby Current				10	µA
Operating Temp*		-40		+85	°C
Storage Temp		-55		+125	°C

### DIMENSIONS (mm)

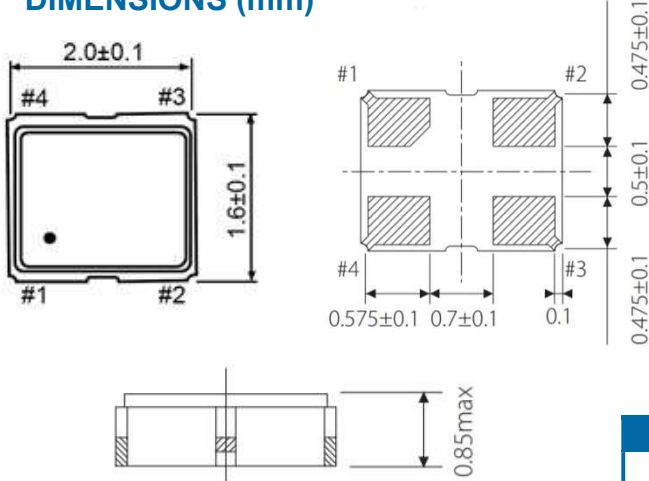


Figure 1) Top, Side, and Bottom views

### CURRENT CONSUMPTION mA Max

FREQ.	~ 19 MHz	~ 39.9 MHz	~ 50 MHz	~ 60 MHz
+1.8V	2.5	3.0	3.5	4.0
+2.5V	4.5	5.5	6.5	7.0
+3.3V	6.0	7.0	8.0	8.5

PAD CONNECTIONS	
1	Tri-state
2	Gnd
3	Output
4	Vdd

Tri State Function	
Pin 1	Output
0.7 * Vdd Min or NC	Active
0.3 * Vdd Max.	High Impedance

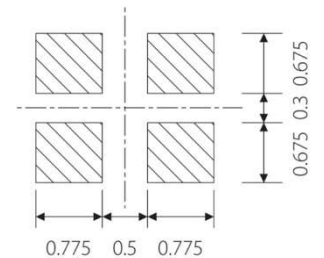


Figure 2) Suggested Land Pattern

### PART NUMBERING GUIDE: Example ECS-2016MV-250-BN-TR

ECS	SERIES	FREQUENCY ABBREVIATION	* STABILITY	TEMP RANGE -	PACKAGING
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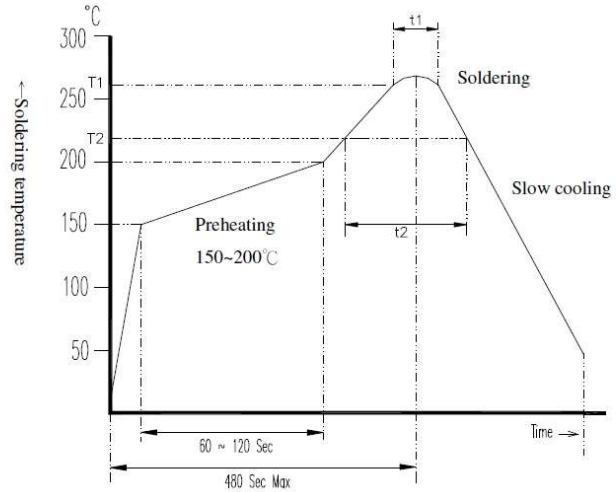
ECS	2016MV 2.0 x 1.6 mm Multi Volt Oscillator	250 = 25.000 MHz See Developed Frequencies Pg.2	A = ±100 ppm B = ±50 ppm C = ±25 ppm D = ±20 ppm	M = -20 ~ +70°C N = -40 ~ +85°C	-TR = 1K -TR3=3K Qty/Reel
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\* Frequency Stability includes initial tolerance, temperature, supply voltage and load change reflow frequency shift, and aging.

**DEVELOPED FREQUENCIES**

FREQUENCY MHz	CODE
8.000	080
10.000	100
12.000	120
16.000	160
24.000	240
25.000	250
26.000	260
33.3333	333.3
48.000	480
50.000	500

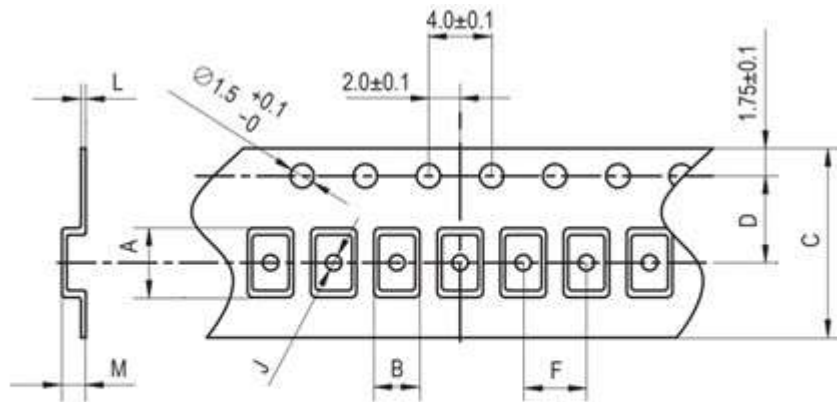
SOLDER PROFILE
Peak solder Temp +260°C ±5°C 10 ±5 Sec Max.
2 Cycles Max.
MSL 1, Lead Finish Au



Application / Temperature Time	T1 / t1	T2 / t2
Lead Free	260 ± 5°C / 10 ± 5 Sec Max.	217°C Min / 60 ~ 150 Sec
Non-Lead Free	260 ± 5°C / 10 ± 5 Sec Max.	183°C Min / 60 ~ 150 Sec

Figure 3) Suggested Reflow Profile

**POCKET TAPE DIMENSIONS (mm)**



A	B	C	D	F	J	L	M	Reel Dia.
2.2	1.8	8.0	3.5	4.0	1.0	0.25	1.0	180

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