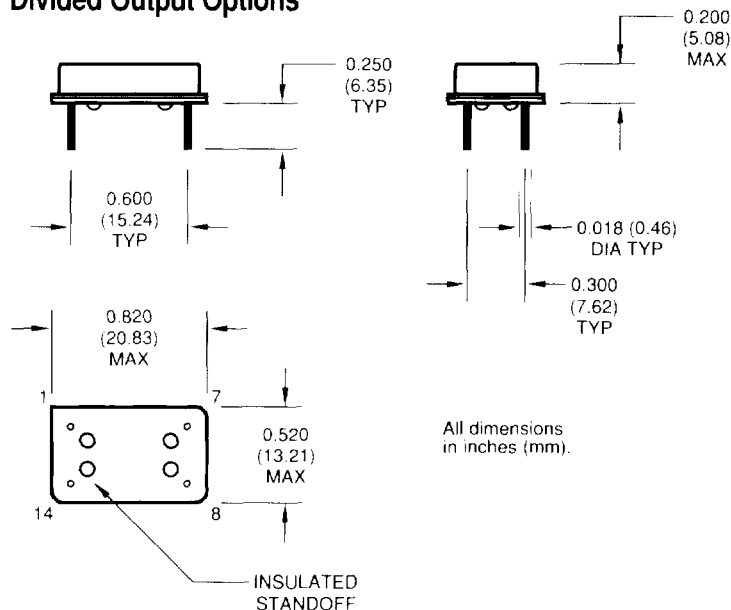


# ML Series Micropower CMOS Oscillators

## Low Power (32.768 kHz) Realtime CMOS Oscillators With Divided Output Options



| Part Marking and Numbering  | ML                                                                          | 1 | 3 | F | A | D |
|-----------------------------|-----------------------------------------------------------------------------|---|---|---|---|---|
| Product Series              | ML                                                                          |   |   |   |   |   |
| Temperature Range           | 1: 0°C to +70°C                                                             |   |   |   |   |   |
| Stability                   | 3: ±100 ppm                                                                 |   |   |   |   |   |
| Output Type                 | F: Fixed                                                                    |   |   |   |   |   |
| Symmetry                    | A: 40/60 C: 45/55 CMOS (only on divider Freq.)                              |   |   |   |   |   |
| Package/Lead Configurations | A: Dip; Gold Flash Header D: Dip; Nickel Header G: Gull Wing; Nickel Header |   |   |   |   |   |

## Divider Output Frequencies

|         |        |      |
|---------|--------|------|
| 2048 Hz | 128 Hz | 4 Hz |
| 1024 Hz | 64 Hz  | 2 Hz |
| 512 Hz  | 32 Hz  |      |
| 256 Hz  | 8 Hz   |      |

## Pin Connections

| Pin | Function(s) (Model Dependent) |
|-----|-------------------------------|
| 1   | N/C                           |
| 7   | Circuit/ Case Ground          |
| 8   | Output                        |
| 14  | +V <sub>dd</sub>              |

## Electrical Specifications

(Standard Operating Conditions 0°C to +70°C; V<sub>dd</sub> = 5.0 V DC, except as noted)

| PARAMETERS                        | MIN.                 | TYP.       | MAX.                 | UNITS  |
|-----------------------------------|----------------------|------------|----------------------|--------|
| Frequency Range                   | 2 Hz                 | 32.768 kHz | 32.768 kHz           | Hz/kHz |
| Output Load                       |                      |            | 15                   | pF     |
| Symmetry                          |                      |            |                      |        |
| 32.768 kHz                        | 40/60                | 45/55      | 60/40                | %      |
| divider output                    | 45/55                | 50/50      | 55/45                | %      |
| Logic "0" Level                   |                      |            | .2 x V <sub>dd</sub> | V      |
| Logic "1" Level                   | .8 x V <sub>dd</sub> |            |                      | V      |
| Rise/Fall Time                    |                      |            | 150                  | ns     |
| *Supply Current (32.768 kHz only) |                      |            |                      |        |
| V <sub>dd</sub> = 3.0 V           |                      | 10         | 15                   | μA     |
| V <sub>dd</sub> = 5.0 V           |                      | 15         | 25                   | μA     |
| V <sub>dd</sub> = 6.0 V           |                      | 25         | 35                   | μA     |

\*Supply current for divided output is slightly higher than listed.

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