RALTRON
A RAMI TECHNOLOGY Company

# Temperature Compensated Crystal Oscillator

## TV2914A-LZ-0.28-16.384-5

### Features:

- 16.384MHz
- Low Phase Noise
- Small Package( SMD 9 x 14 mm)

RoHS Compliant

## ELECTRICAL SPECIFICATIONS

| PARAMETER | SYMBOL | CONDITION | VALUE | | | UNIT |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| Nominal Frequency | $f_o$ | | | 16.384 | | MHz |
| Supply Voltage | $V_s$ | Ta=25°C | | 5.0 | ±5% | V |
| Supply Current | I | Ta=25°C | | | 20 | mA |
| Frequency Calibration | $\Delta f/f_0$ | Vs nom. @25°C, Vc=2.5V | -1.0 | | +1.0 | ppm |
| Frequency Stability vs. Temperature | $\Delta f/f_0$ ($T_a$) | 0 to +70 °C | -0.28 | | +0.28 | ppm |
| Frequency Stability vs. Supply Voltage | $\Delta f/f_0$ ($\Delta V_{CC}$) | $V_s$ ±5% | -0.2 | | +0.2 | ppm |
| Frequency Stability vs. Load Change | $\Delta f/f_0$ ($\Delta l$) | Load ±10% | -0.2 | | +0.2 | ppm |
| Aging | $\Delta f/\Delta t_y$ | 20 years | -3.5 | | +3.5 | ppm |
| Enable /Disable ( Pin 2 ) | | High or open = Enable<br>Low = high Z | | | | |
| Start-up time | ts | Output level to 90% | | | 10 | ms |
| Sub harmonics and spurious | | | | | -80 | dBc |
| Overall stability | $\Delta f/\Delta t_y$ | All conditions included, 20 years aging | -4.6 | | +4.6 | ppm |
| 24 hours stability ( holdover mode ) | | Over 24 hours, Ta= 0 to 70°C | -0.37 | | +0.37 | ppm |
| Operating Temperature | $T_a$ | | -0 | | 70 | °C |
| Storage Temperature | $T_{(stg)}$ | Absolute max | -40 | | 105 | °C |

RALTRON
A RAMI TECHNOLOGY Company

# Temperature Compensated Crystal Oscillator

## TV2914A-LZ-0.28-16.384-5

### VOLTAGE CONTROL CHARACTERISTICS

| PARAMETER | SYMBOL | CONDITION | VALUE | | | UNIT |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. / Nom.* | Max. | |
| Control Voltage Range | Vc | | 0.5 | | 4.5 | V |
| Frequency Tuning Range | | Vc=0.5V | -15.0 | | -10.0 | ppm |
| | | Vc=4.5V | +10.0 | | +15.0 | ppm |
| | | Vc=2.5V | -1.0 | | +1.0 | ppm |
| Slope | | Positive | | | | |
| Linearity | | | | | 10 | % |
| Input Impedance | | | 100 | | | KΩ |

### PHASE NOISE

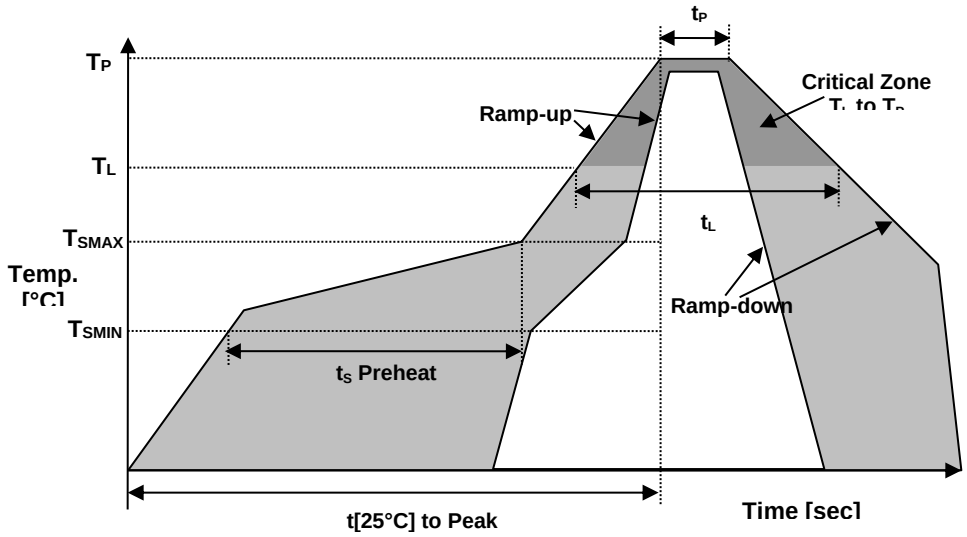
| PARAMETER | SYMBOL | CONDITION | VALUE | | | UNIT |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| @10 Hz Offset | £ (Δf) | | | -90 | | dBc/Hz |
| @100 Hz Offset | £ (Δf) | | | -117 | | dBc/Hz |
| @1 kHz Offset | £ (Δf) | | | -137 | | dBc/Hz |
| @10 kHz Offset | £ (Δf) | | | -150 | | dBc/Hz |
| @100 kHz Offset | £ (Δf) | | | -152 | | dBc/Hz |

### OUTPUT CHARACTERISTICS

| | PARAMETER | SYMBOL | CONDITION | VALUE | | | UNIT |
|---|---|---|---|---|---|---|---|
| | | | | Min. | Typ. | Max. | |
| HCMOS | Output Levels | VOH/VOL | $V_s$ nominal, load = 15pF | | 4.5/0.5 | | V |
| | Duty Cycle | DC | @50% level | | 45/55 | | % |
| | Rise/Fall time | Tr/Tf | 10 to 90% | | | 5 | ns |
| | Load | | | | 15 | ±10% | pF |

# TV2914A-LZ-0.28-16.384-5

■ **REFLOW PROFILE**

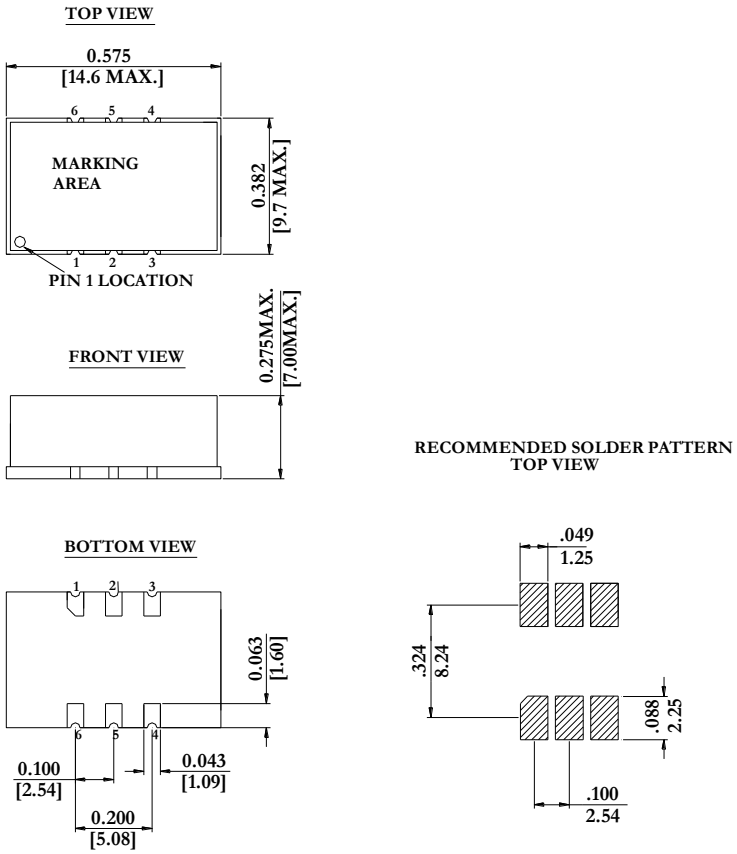



| Reflow profile IPC/JEDEC J-STD-020 REV. C | | |
|---|---|---|
| Temperature Min Preheat | $T_{SMIN}$ | 150°C |
| Temperature Max Preheat | $T_{SMAX}$ | 200°C |
| Time ($T_{SMIN}$ to $T_{SMAX}$) | $t_S$ | 60-180 sec. |
| Temperature | $T_L$ | 217°C |
| Peak Temperature | $T_P$ | 260°C |
| Ramp-up rate | $R_{UP}$ | 3°C/sec max. |
| Ramp-down rate | $R_{DOWN}$ | 6°C/sec max. |
| Time within 5°C of Peak Temperature | $t_P$ | 20 sec. |
| Time t[25°C] to Peak Temperature | t[25°C] to Peak | 480 sec. |
| Time | $t_L$ | 60-150 sec. |

Note: This SMD TCXO is designed for pick and place reflow soldering process and must be on the top side of the PCB during reflow process.

# TV2914A-LZ-0.28-16.384-5

## MECHANICAL DIMENSIONS AND PIN FUNCTIONING




| PIN | SYMBOL | FUNCTION |
|---|---|---|
| 1 | Vc | Control Voltage |
| 2 | E/D | Enable / Disable |
| 3 | GND | Case/Ground |
| 4 | OUTPUT | RF Output |
| 5 | N/C | No connect |
| 6 | Vs | Supply Voltage |

| RALTRON | Signed | Date |
|---|---|---|
| **Created** | SP | June 23, 2016 |
| **Eng. approved** | SP | Sept 26, 2016 |
| **REV A** | **Start up time added** | |