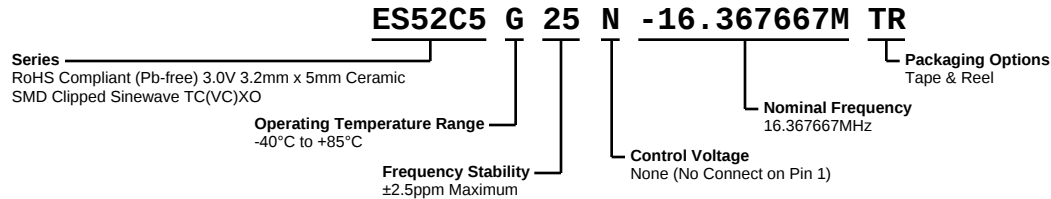


# ES52C5G25N-16.367667M TR



## ELECTRICAL SPECIFICATIONS

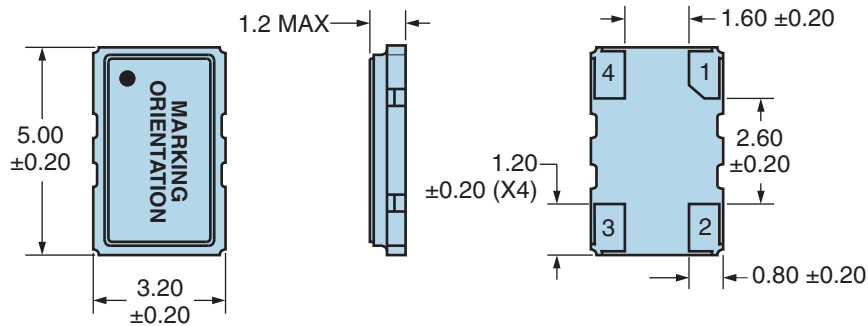
|                                             |                                                                                                                                               |
|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Nominal Frequency                           | 16.367667MHz                                                                                                                                  |
| Frequency Stability vs. Frequency Tolerance | ±1.0ppm Maximum (at 25°C ±2°C, at Vdd=3.0Vdc, and Vc=1.5Vdc)                                                                                  |
| Frequency Stability                         | ±2.5ppm Maximum (Inclusive of Operating Temperature Range, at Vdd=3.0Vdc and Vc=1.5Vdc)                                                       |
| Frequency Stability vs. Input Voltage       | ±0.3ppm Maximum (±5%)                                                                                                                         |
| Frequency Stability vs. Aging               | ±1ppm/year Maximum (at 25°C)                                                                                                                  |
| Frequency Stability vs. Load                | ±0.2ppm Maximum (±1kOhm//±1pF)                                                                                                                |
| Operating Temperature Range                 | -40°C to +85°C                                                                                                                                |
| Supply Voltage                              | +3.0Vdc ±5%                                                                                                                                   |
| Input Current                               | 2.0mA Maximum                                                                                                                                 |
| Output Voltage                              | 0.7Vp-p Clipped Sinewave Minimum (External DC-Cut capacitor required, 1000pF recommended)                                                     |
| Load Drive Capability                       | 10kOhms//10pF                                                                                                                                 |
| Output Logic Type                           | Clipped Sinewave                                                                                                                              |
| Control Voltage                             | None (No Connect on Pin 1)                                                                                                                    |
| Phase Noise                                 | -80dBc/Hz at 10Hz Offset, -115dBc/Hz at 100Hz Offset, -135dBc/Hz at 1kHz Offset, and -148dBc/Hz at 10kHz Offset (Typical Values at 12.800MHz) |
| Start Up Time                               | 5mSec Maximum                                                                                                                                 |
| Storage Temperature Range                   | -40°C to +85°C                                                                                                                                |

## ENVIRONMENTAL & MECHANICAL SPECIFICATIONS

|                              |                                               |
|------------------------------|-----------------------------------------------|
| ESD Susceptibility           | MIL-STD-883, Method 3015, Class 1, HBM: 1500V |
| Fine Leak Test               | MIL-STD-883, Method 1014, Condition A         |
| Flammability                 | UL94-V0                                       |
| Gross Leak Test              | MIL-STD-883, Method 1014, Condition C         |
| Mechanical Shock             | MIL-STD-883, Method 2002, Condition B         |
| Moisture Resistance          | MIL-STD-883, Method 1004                      |
| Moisture Sensitivity         | J-STD-020, MSL 1                              |
| Resistance to Soldering Heat | MIL-STD-202, Method 210, Condition K          |
| Resistance to Solvents       | MIL-STD-202, Method 215                       |
| Solderability                | MIL-STD-883, Method 2003                      |
| Temperature Cycling          | MIL-STD-883, Method 1010, Condition B         |
| Vibration                    | MIL-STD-883, Method 2007, Condition A         |

# ES52C5G25N-16.367667M TR

## MECHANICAL DIMENSIONS (all dimensions in millimeters)

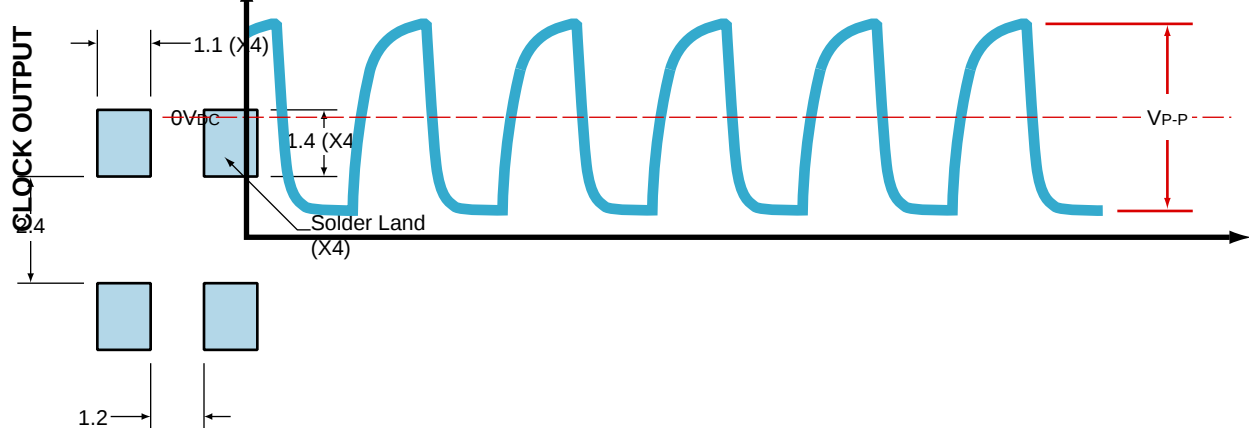


| PIN | CONNECTION     |
|-----|----------------|
| 1   | No Connect     |
| 2   | Ground         |
| 3   | Output         |
| 4   | Supply Voltage |

| LINE | MARKING                                                                                           |
|------|---------------------------------------------------------------------------------------------------|
| 1    | <b>E16.367</b><br>E=Ecliptek Designator                                                           |
| 2    | <b>XXYYZ</b><br>XX=Ecliptek Manufacturing Code<br>Y=Last Digit of the Year<br>ZZ=Week of the Year |

## OUTPUT WAVEFORM

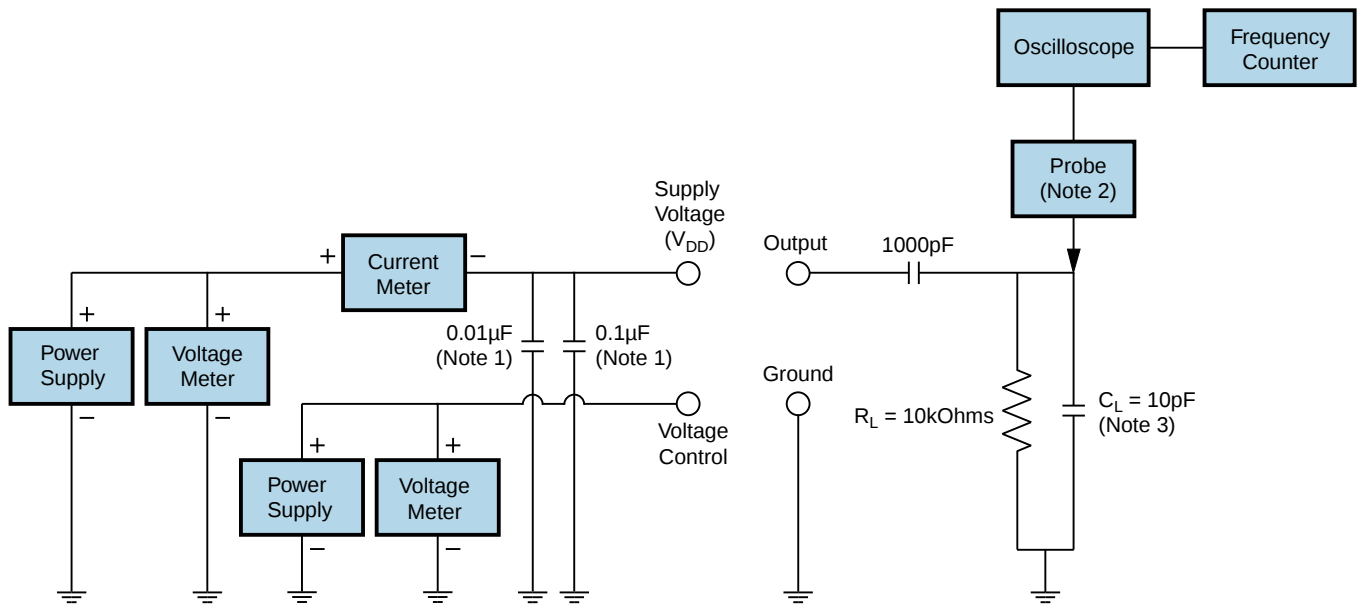
All Dimensions in Millimeters



All Tolerances are  $\pm 0.1$

# ES52C5G25N-16.367667M TR

## Test Circuit for Voltage Control Option



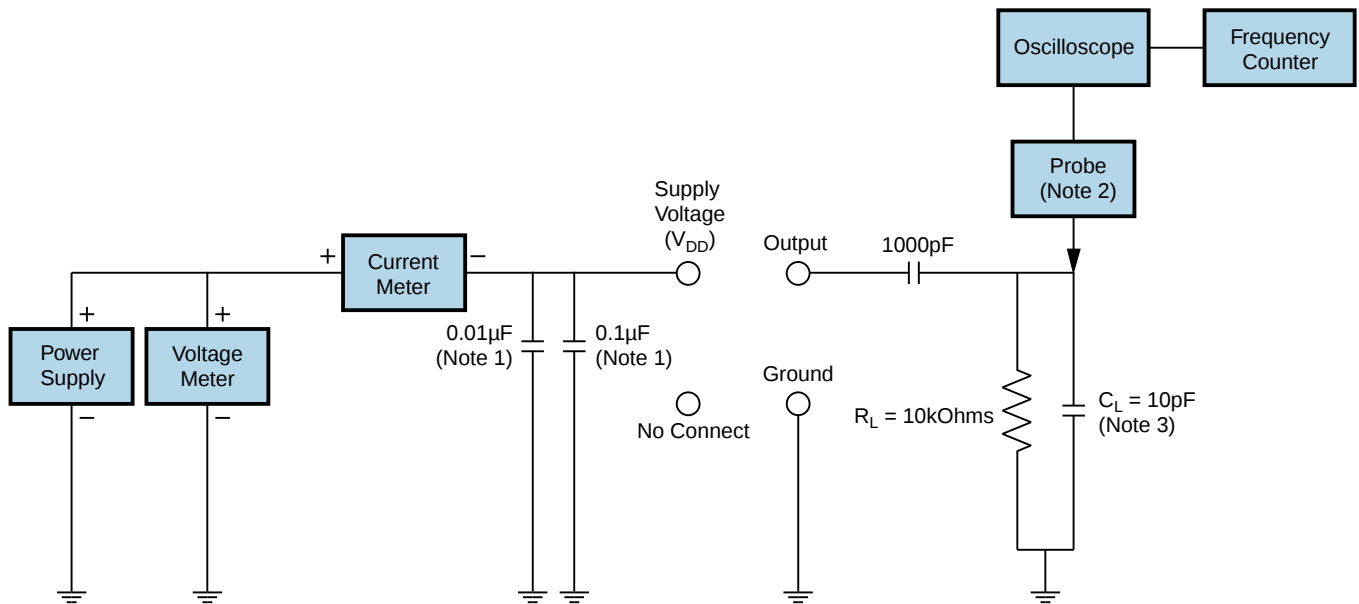
Note 1: An external  $0.1\mu F$  low frequency tantalum bypass capacitor in parallel with a  $0.01\mu F$  high frequency ceramic bypass capacitor close to the package ground and  $V_{DD}$  pin is required.

Note 2: A low capacitance ( $<12pF$ ), 10X attenuation factor, high impedance ( $>10M\Omega$ ), and high bandwidth ( $>300MHz$ ) passive probe is recommended.

Note 3: Capacitance value  $C_L$  includes sum of all probe and fixture capacitance.

# ES52C5G25N-16.367667M TR

## Test Circuit for No Connect Option

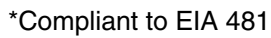


Note 1: An external 0.1µF low frequency tantalum bypass capacitor in parallel with a 0.01µF high frequency ceramic bypass capacitor close to the package ground and  $V_{DD}$  pin is required.

Note 2: A low capacitance (<12pF), 10X attenuation factor, high impedance (>10Mohms), and high bandwidth (>300MHz) passive probe is recommended.

Note 3: Capacitance value  $C_L$  includes sum of all probe and fixture capacitance.

Quantity Per Reel: 1,000 units



## Recommended Solder Reflow Methods



### High Temperature Infrared/Convection

|                                   |                    |
|-----------------------------------|--------------------|
| $T_s$ MAX to $T_L$ (Ramp-up Rate) | 3°C/second Maximum |
|-----------------------------------|--------------------|

#### Preheat

|                                    |                  |
|------------------------------------|------------------|
| - Temperature Minimum ( $T_s$ MIN) | 150°C            |
| - Temperature Typical ( $T_s$ TYP) | 175°C            |
| - Temperature Maximum ( $T_s$ MAX) | 200°C            |
| - Time ( $t_s$ MIN)                | 60 - 180 Seconds |

|                                 |                    |
|---------------------------------|--------------------|
| Ramp-up Rate ( $T_L$ to $T_P$ ) | 3°C/second Maximum |
|---------------------------------|--------------------|

#### Time Maintained Above:

|                         |                  |
|-------------------------|------------------|
| - Temperature ( $T_L$ ) | 217°C            |
| - Time ( $t_L$ )        | 60 - 150 Seconds |

|                            |                                      |
|----------------------------|--------------------------------------|
| Peak Temperature ( $T_P$ ) | 260°C Maximum for 10 Seconds Maximum |
|----------------------------|--------------------------------------|

|                                         |               |
|-----------------------------------------|---------------|
| Target Peak Temperature ( $T_P$ Target) | 250°C +0/-5°C |
|-----------------------------------------|---------------|

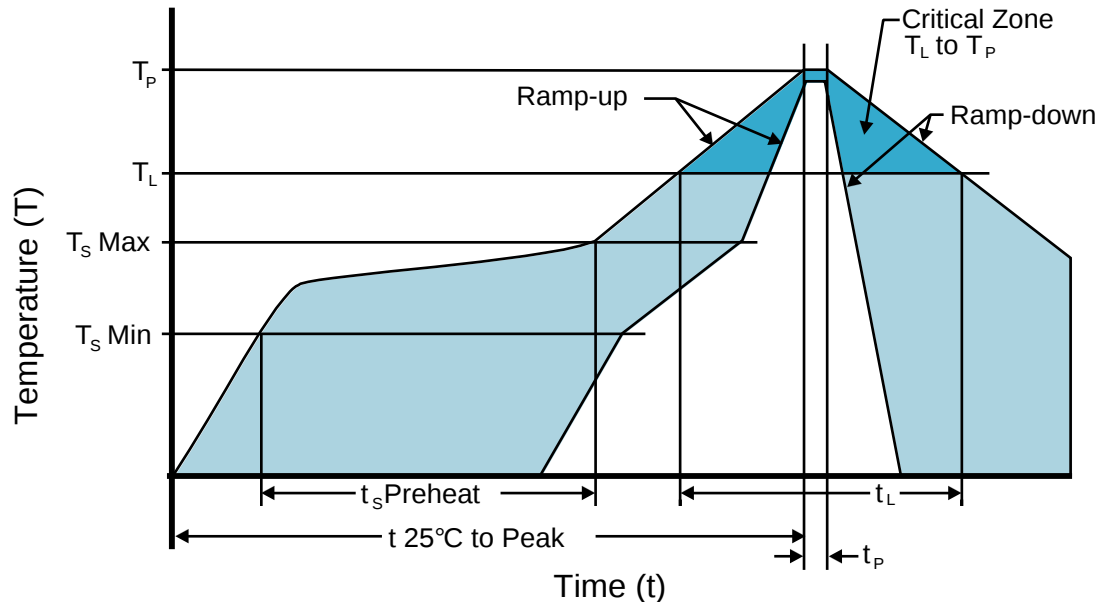
|                                          |                 |
|------------------------------------------|-----------------|
| Time within 5°C of actual peak ( $t_p$ ) | 20 - 40 seconds |
|------------------------------------------|-----------------|

|                |                    |
|----------------|--------------------|
| Ramp-down Rate | 6°C/second Maximum |
|----------------|--------------------|

|                                   |                   |
|-----------------------------------|-------------------|
| Time 25°C to Peak Temperature (t) | 8 minutes Maximum |
|-----------------------------------|-------------------|

|                            |         |
|----------------------------|---------|
| Moisture Sensitivity Level | Level 1 |
|----------------------------|---------|

## Recommended Solder Reflow Methods



### Low Temperature Infrared/Convection 240°C

**TS MAX to TL (Ramp-up Rate)** 5°C/second Maximum

#### Preheat

- Temperature Minimum (TS MIN) N/A
- Temperature Typical (TS TYP) 150°C
- Temperature Maximum (TS MAX) N/A
- Time (ts MIN) 60 - 120 Seconds

**Ramp-up Rate (TL to TP)** 5°C/second Maximum

#### Time Maintained Above:

- Temperature (TL) 150°C
- Time (tL) 200 Seconds Maximum

**Peak Temperature (TP)** 240°C Maximum

**Target Peak Temperature (TP Target)** 240°C Maximum 2 Times / 230°C Maximum 1 Time

**Time within 5°C of actual peak (tp)** 10 seconds Maximum 2 Times / 80 seconds Maximum 1 Time

**Ramp-down Rate** 5°C/second Maximum

**Time 25°C to Peak Temperature (t)** N/A

**Moisture Sensitivity Level** Level 1

### Low Temperature Manual Soldering

185°C Maximum for 10 seconds Maximum, 2 times Maximum.

### High Temperature Manual Soldering

260°C Maximum for 5 seconds Maximum, 2 times Maximum.