

# Programmable - High Performance SMD Crystal Oscillator

## ASG-C Series

**Moisture Sensitivity Level (MSL) - This product is Hermetically Sealed and not Moisture Sensitive; therefore MSL = N/A (Not Applicable)**



**RoHS**  
Compliant



7.0 x 5.0 x 2.0mm

### FEATURES:

- ASG series is a High Performance crystal based oscillator; available either as an XO or a VCXO
- Frequency range from 10MHz to 250MHz with LVCMOS output
- Available from 10MHz to 1.50GHz with LVDS or LVPECL output
- Offered with either 2.50V or 3.30V bias voltage
- Quick turn, 1~5 business days for small quantity orders

### APPLICATIONS:

- Networking, SONET/SDH
- WiMax / WLAN
- Computing
- Phase Locked Loops
- Direct Digital Synthesis (DDS)
- DSL/ADSL
- Base Terminal Stations

### STANDARD SPECIFICATIONS:

| Parameters                                                      |                        | Minimum                                                                                                                    | Typical  | Maximum                | Units | Notes                |
|-----------------------------------------------------------------|------------------------|----------------------------------------------------------------------------------------------------------------------------|----------|------------------------|-------|----------------------|
| Frequency Range:                                                | V <sub>dd</sub> = 3.3V | 10                                                                                                                         |          | 250                    | MHz   |                      |
|                                                                 | V <sub>dd</sub> = 2.5V | 10                                                                                                                         |          | 250                    | MHz   |                      |
| Operating Temperature:                                          |                        | -40                                                                                                                        |          | +85                    | °C    |                      |
| Storage Temperature:                                            |                        | -55                                                                                                                        |          | +125                   | °C    |                      |
| Overall Frequency Stability:                                    |                        | -50                                                                                                                        |          | +50                    | ppm   | <i>See Note # 1</i>  |
| Initial Set Tolerance                                           |                        | -5.00                                                                                                                      | ≤ ±1.00  | +5.00                  | ppm   |                      |
| Stability over operating temperature                            |                        | -35.00                                                                                                                     | ≤ ±20.00 | +35.00                 | ppm   |                      |
| Aging @ 25°C over 10-years                                      |                        | -7.00                                                                                                                      |          | +7.00                  | ppm   |                      |
| Frequency variation over supply voltage change (±5%)            |                        | -2.00                                                                                                                      |          | +2.00                  | ppm   |                      |
| Frequency variation over load variation (15pF ± 5%)             |                        | -1.00                                                                                                                      |          | +1.00                  | ppm   |                      |
| Supply Voltage (V <sub>dd</sub> ):                              | V <sub>dd</sub> = 3.3V | 3.135                                                                                                                      | 3.300    | 3.465                  | V     |                      |
|                                                                 | V <sub>dd</sub> = 2.5V | 2.375                                                                                                                      | 2.500    | 2.625                  | V     |                      |
| Input Current:                                                  | V <sub>dd</sub> = 3.3V |                                                                                                                            |          | 45                     | mA    | Frequency dependent  |
|                                                                 | V <sub>dd</sub> = 2.5V |                                                                                                                            |          | 35                     | mA    | Frequency dependent  |
| Symmetry:                                                       |                        | 48                                                                                                                         | 50       | 52                     | %     | @ 1/2V <sub>dd</sub> |
| Rise and Fall Time (Tr/Tf):                                     |                        |                                                                                                                            | ≤ 450    | 1000                   | ps    |                      |
| Output Load:                                                    |                        |                                                                                                                            |          | 15                     | pF    | CMOS                 |
| Output Voltage:                                                 | VOH                    | V <sub>dd</sub> * 0.90                                                                                                     |          |                        | V     |                      |
|                                                                 | VOL                    |                                                                                                                            |          | V <sub>dd</sub> * 0.10 | V     |                      |
| Start-up Time:                                                  |                        |                                                                                                                            | ≤ 2.0    | 3.0                    | ms    |                      |
| Enable/Disable Function :                                       |                        | "1" (V <sub>IH</sub> ≥ 0.7*V <sub>dd</sub> ) or Open: Oscillation<br>"0" (V <sub>IL</sub> < 0.3*V <sub>dd</sub> ) : High Z |          |                        |       |                      |
| V <sub>control</sub> Range                                      |                        | 0.00                                                                                                                       |          | V <sub>dd</sub>        | Volts |                      |
| Frequency Pull                                                  |                        | ±50                                                                                                                        |          |                        | ppm   |                      |
| Control Port Bandwidth                                          |                        | 10                                                                                                                         |          |                        | kHz   |                      |
| Phase jitter RMS [ t <sub>jitt(φ)</sub> ]<br><i>See Note #2</i> | Integer Mode           |                                                                                                                            | < 0.60   | 1.60                   | ps    | 12kHz to 20MHz       |
|                                                                 | Fractional Mode        |                                                                                                                            | < 0.90   | 1.60                   | ps    | 12kHz to 20MHz       |

**Note #1:** Inclusive of initial tolerance at 25°C±3°C, operating temperature range, input voltage variation, load variation & aging.

**Note #2:** The rms jitter over 12kHz to 20MHz Bandwidth is dependent on the carrier and whether or not the final frequency is achieved without engaging the Fractional Mode



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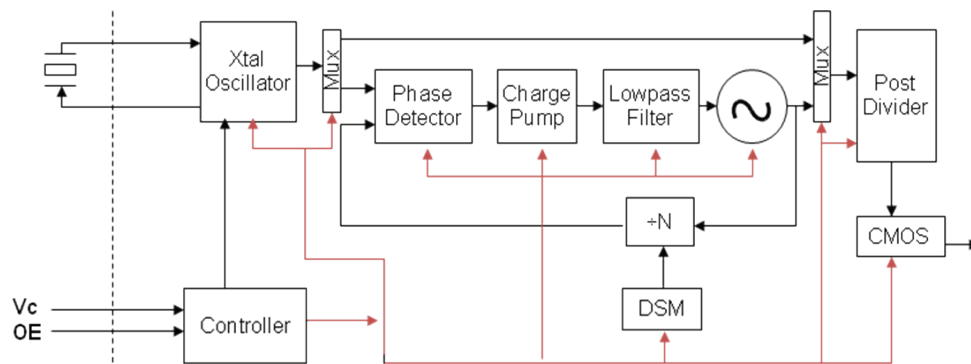


RoHS  
Compliant



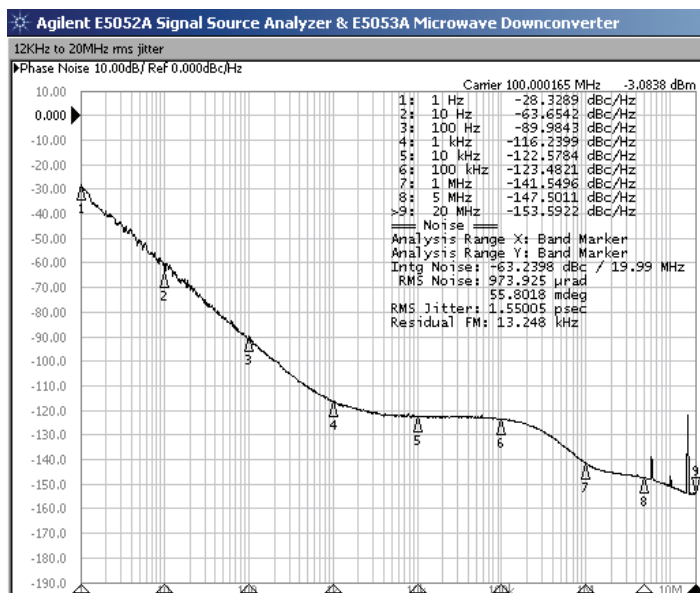
7.0 x 5.0 x 2.0mm

## OVERALL SYSTEM BLOCK DIAGRAM

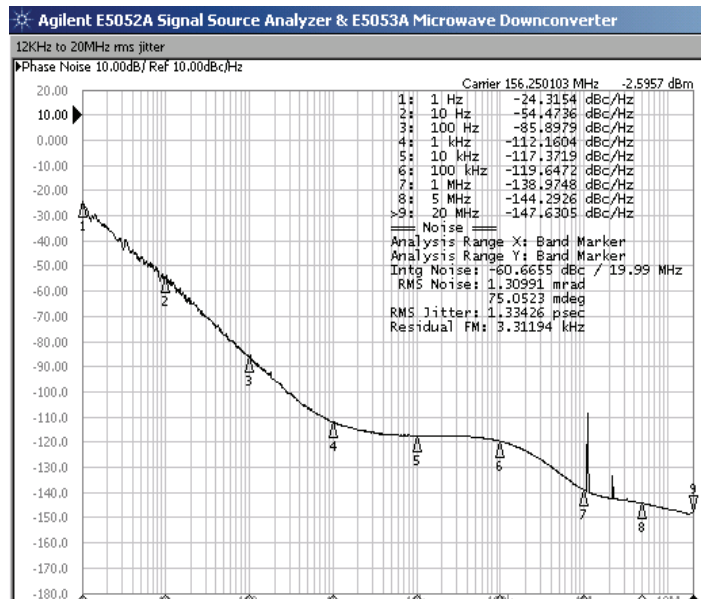


## PHASE NOISE & JITTER CHARACTERISTICS

### 100MHz Carrier



### 156.25MHz Carrier



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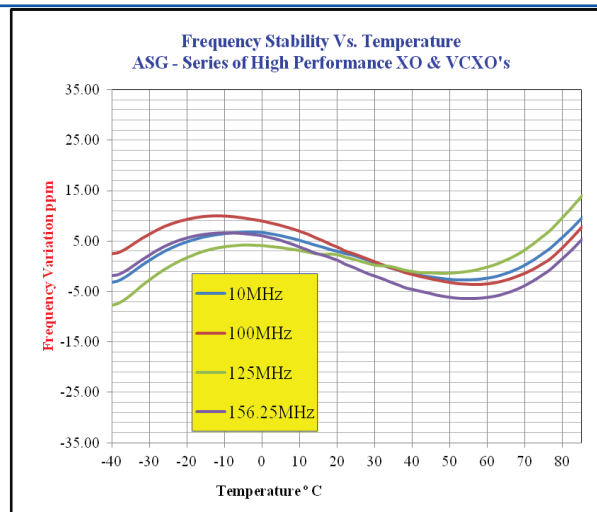


RoHS  
Compliant

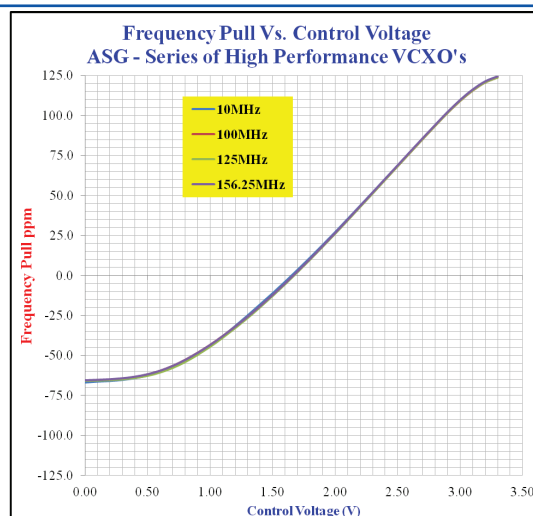


7.0 x 5.0 x 2.0mm

## FREQUENCY STABILITY VS. TEMPERATURE



## FREQUENCY PULLING VS. CONTROL VOLTAGE (VCXO MODE)



## PART IDENTIFICATION:

ASG - C -  -  -  MHz -

| Fixed or Pull-able   |
|----------------------|
| X = Fixed Oscillator |
| V = VCXO             |

| Operating Voltage |
|-------------------|
| 3.30V = A         |
| 2.50V = B         |

| Frequency in MHz                                     |
|------------------------------------------------------|
| Please specify the Frequency in MHz e.g. 100.000 MHz |

| Packaging       |
|-----------------|
| Blank = Bulk    |
| T = Tape & Reel |

## MARKING:

Top Line:  
Bottom Line:

Pin# 1 Identifier

ASG  
GYWW

WW = Work Week

Year Code (B=2011, C=2012, etc.)

Internal Tracking Code

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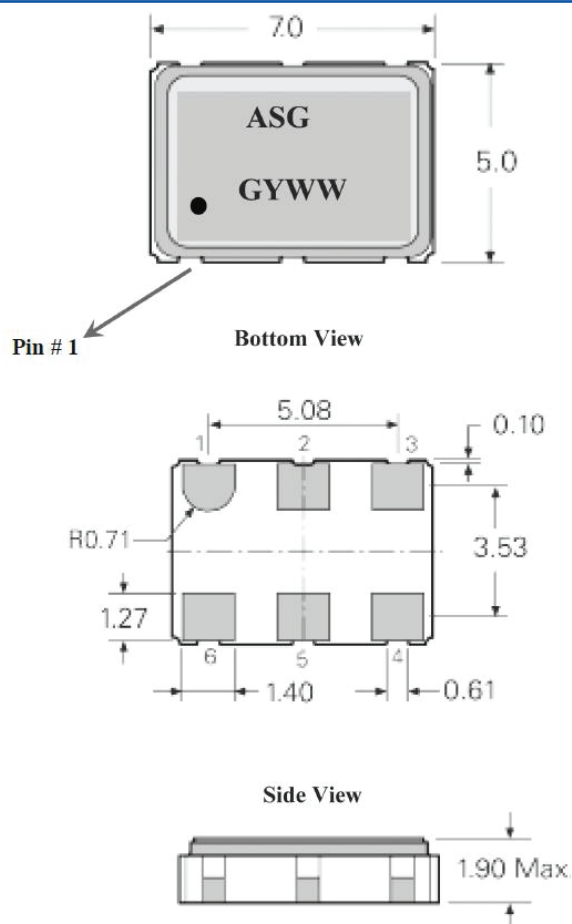


7.0 x 5.0 x 2.0mm

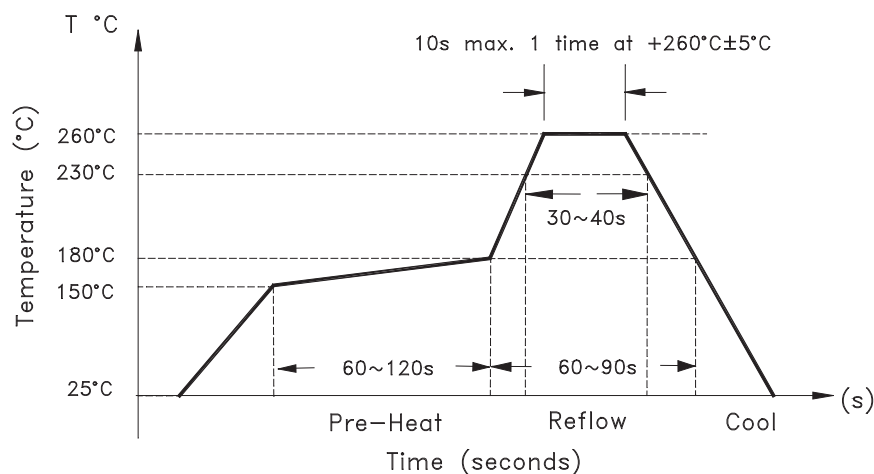
## OUTLINE DIMENSIONS:

| Pin # | Pin Description<br>For VCXO configuration |
|-------|-------------------------------------------|
| 1     | Voltage Control for VCXO                  |
| 2     | Output Enable (OE)                        |
| 3     | GND                                       |
| 4     | RF Output                                 |
| 5     | N/C                                       |
| 6     | Vdd                                       |

| Pin # | Pin Description<br>For XO configuration |
|-------|-----------------------------------------|
| 1     | Output Enable (OE)                      |
| 2     | N/C for XO                              |
| 3     | GND                                     |
| 4     | RF Output                               |
| 5     | N/C                                     |
| 6     | Vdd                                     |



## REFLOW PROFILE:



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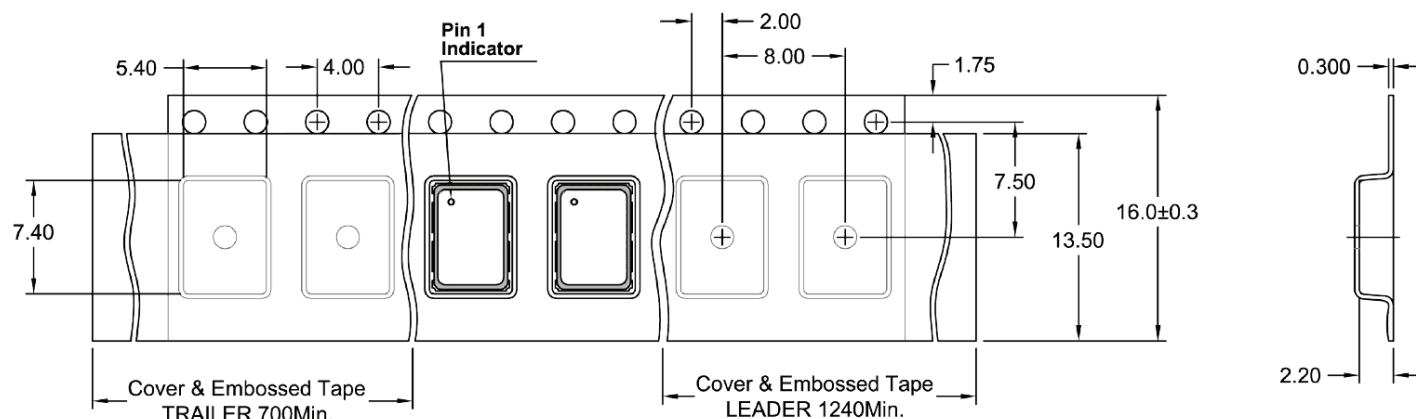


7.0 x 5.0 x 2.0mm

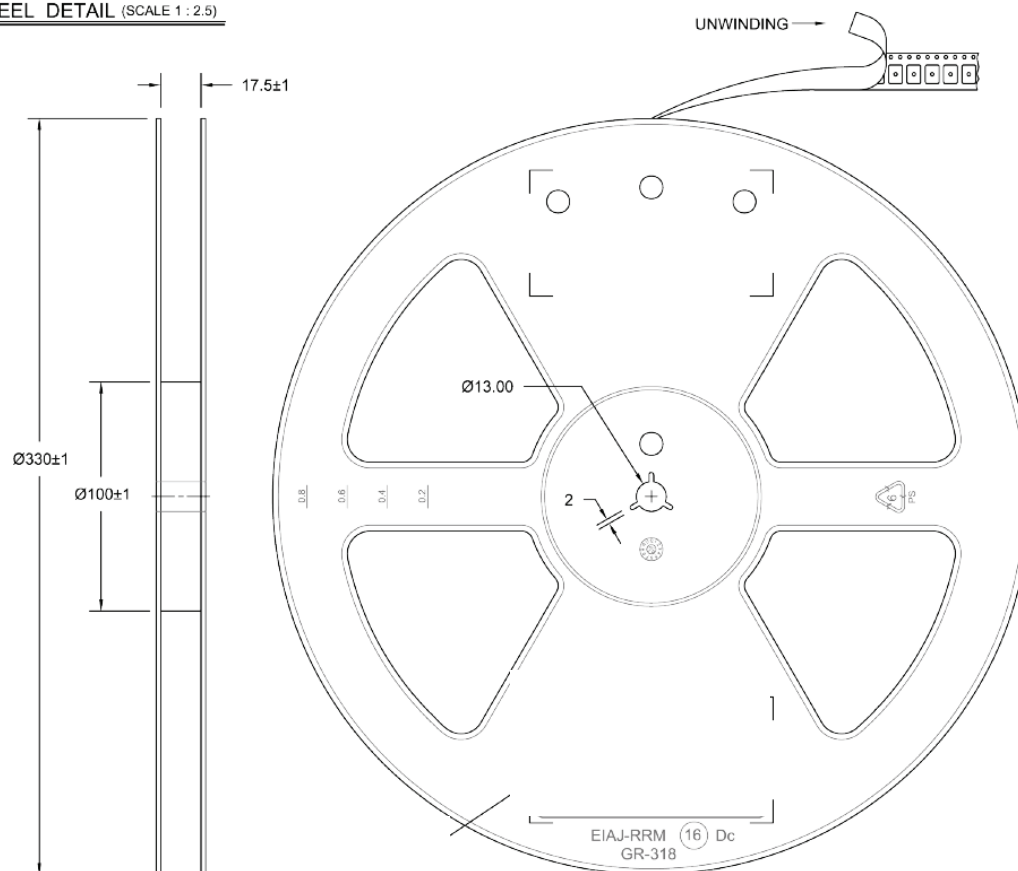
## TAPE & REEL:

T= Tape and reel (2,000pcs/reel)

### TAPE DETAIL (SCALE 2 : 1)



### REEL DETAIL (SCALE 1 : 2.5)



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