

# Programmable - High Performance SMD XO & VCXO

ASG-D Series



RoHS  
Compliant



7.0 x 5.0 x 1.9mm

## 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

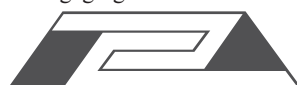
## STANDARD SPECIFICATIONS:

| Parameters                                               |                                  | Minimum                                                                                                                    | Typical  | Maximum         | Units | Notes               |
|----------------------------------------------------------|----------------------------------|----------------------------------------------------------------------------------------------------------------------------|----------|-----------------|-------|---------------------|
| Frequency Range:                                         | V <sub>dd</sub> = 3.3V           | 10                                                                                                                         |          | 1500            | MHz   |                     |
|                                                          | V <sub>dd</sub> = 2.5V           | 10                                                                                                                         |          | 1500            | MHz   |                     |
| Operating Temperature:                                   |                                  | -40                                                                                                                        |          | +85             | °C    |                     |
| Storage Temperature:                                     |                                  | -55                                                                                                                        |          | +125            | °C    |                     |
| Overall Frequency Stability:                             |                                  | -50                                                                                                                        |          | +50             | ppm   | See Note # 1        |
| 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           |                                                                                                                            | < 25     | 40              | mA    | Frequency dependent |
|                                                          | V <sub>dd</sub> = 2.5V           |                                                                                                                            | < 25     | 35              | mA    | Frequency dependent |
| LVDS Output<br>(Out & $\overline{\text{Out}}$ ):         | Differential Output Voltage      | 175                                                                                                                        | 350      |                 | mV    | V <sub>OD</sub>     |
|                                                          | V <sub>OD</sub> Magnitude Change |                                                                                                                            |          | 50              | mV    | ΔV <sub>OD</sub>    |
|                                                          | Offset Voltage                   |                                                                                                                            | 1.25     |                 | V     | V <sub>OS</sub>     |
|                                                          | V <sub>OS</sub> Magnitude Change |                                                                                                                            |          | 50              | mV    | ΔV <sub>OS</sub>    |
|                                                          | Duty Cycle                       | 45                                                                                                                         | 48/52    | 55              | %     | ODC <sub>LVDS</sub> |
|                                                          | Rise Time                        | 125                                                                                                                        |          | 350             | ps    | t <sub>R</sub>      |
|                                                          | Fall Time                        | 150                                                                                                                        |          | 450             | ps    | t <sub>F</sub>      |
| 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 |          |                 |       |                     |
| Vcontrol Range                                           |                                  | 0.00                                                                                                                       |          | V <sub>dd</sub> | Volts | For VCXO            |
| Frequency Pull                                           |                                  | ±50                                                                                                                        |          |                 | ppm   |                     |
| Control Port Bandwidth                                   |                                  | 10                                                                                                                         |          |                 | kHz   |                     |
| Phase jitter RMS [ t <sub>jitt(φ)</sub> ]<br>See Note #2 | 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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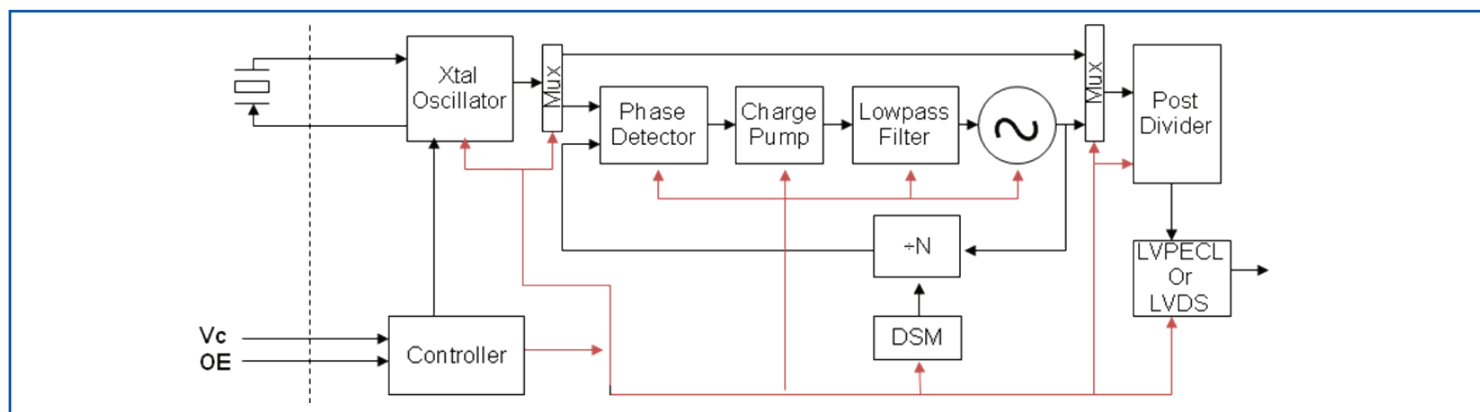


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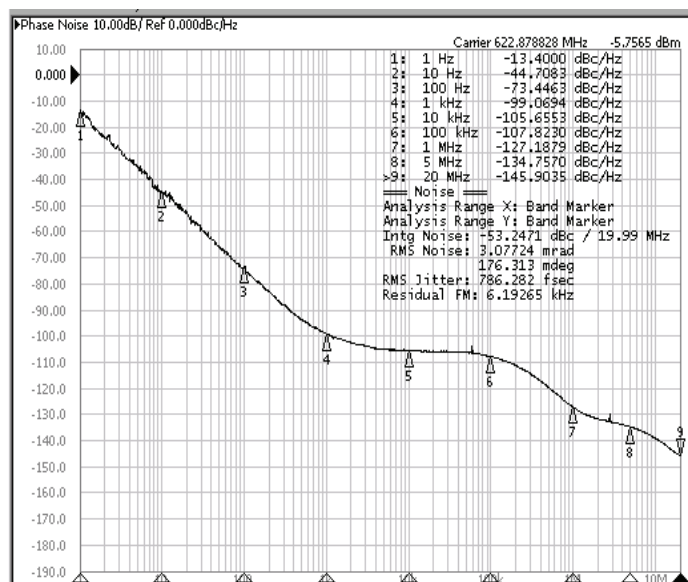
7.0 x 5.0 x 1.9mm

## OVERALL SYSTEM BLOCK DIAGRAM

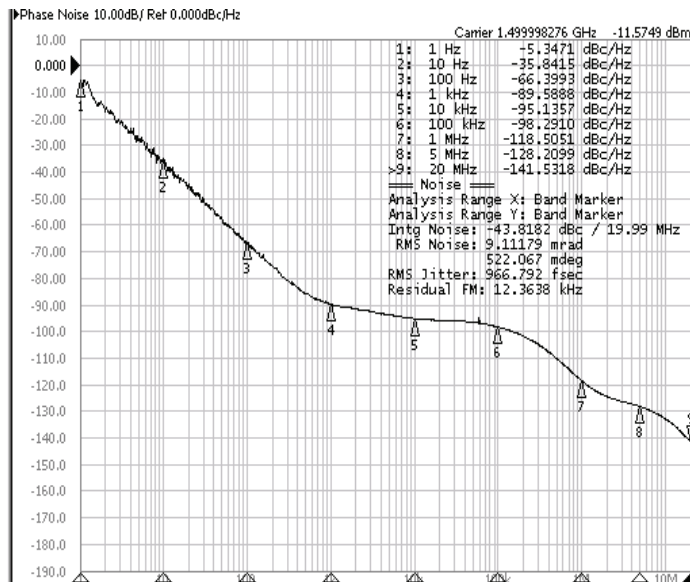


## PHASE NOISE & JITTER CHARACTERISTICS

622.88MHz Carrier



1.50GHz Carrier



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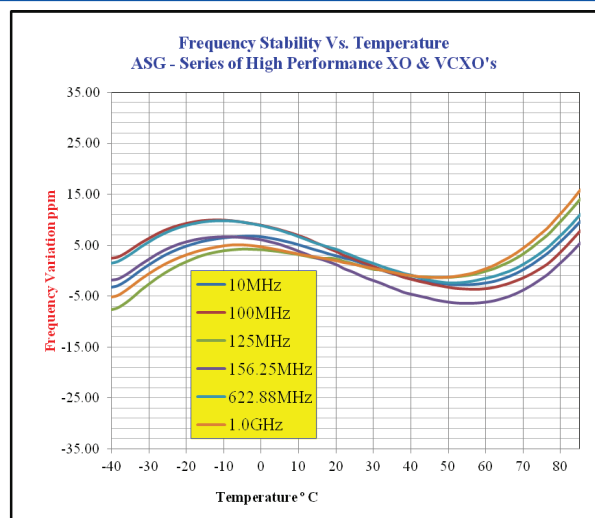


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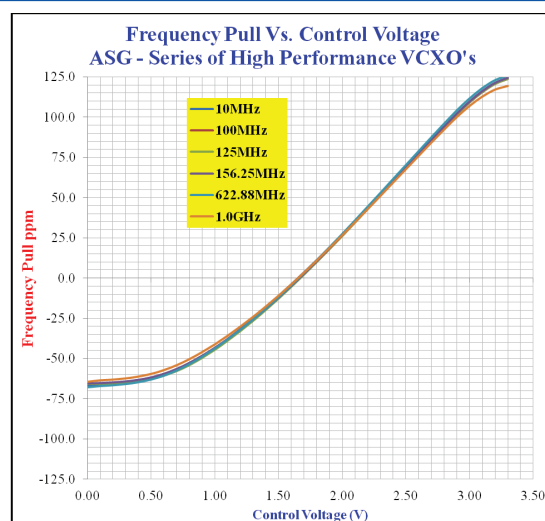


7.0 x 5.0 x 1.9mm

## FREQUENCY STABILITY VS. TEMPERATURE



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



## PART IDENTIFICATION:

ASG - D -  -  -  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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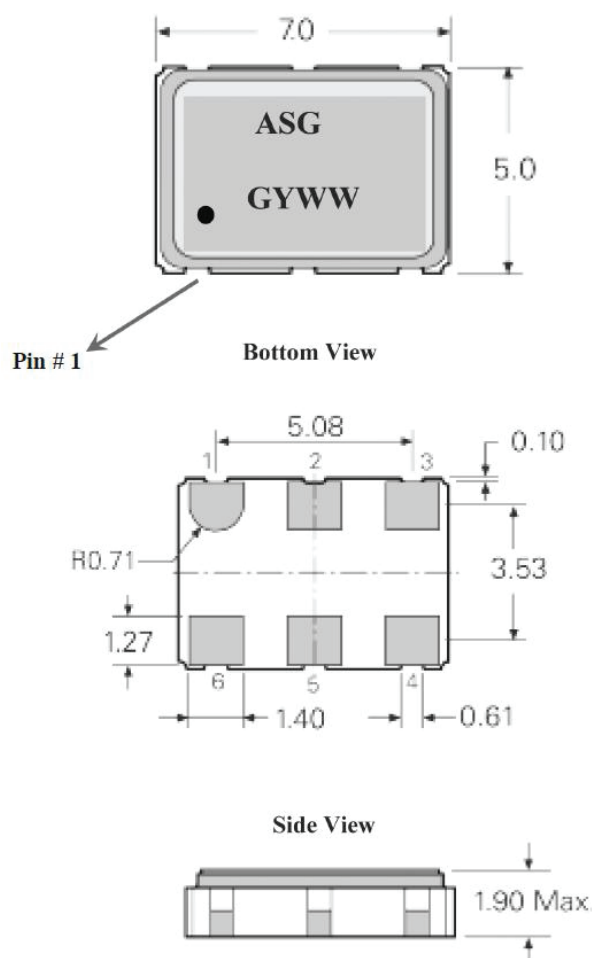


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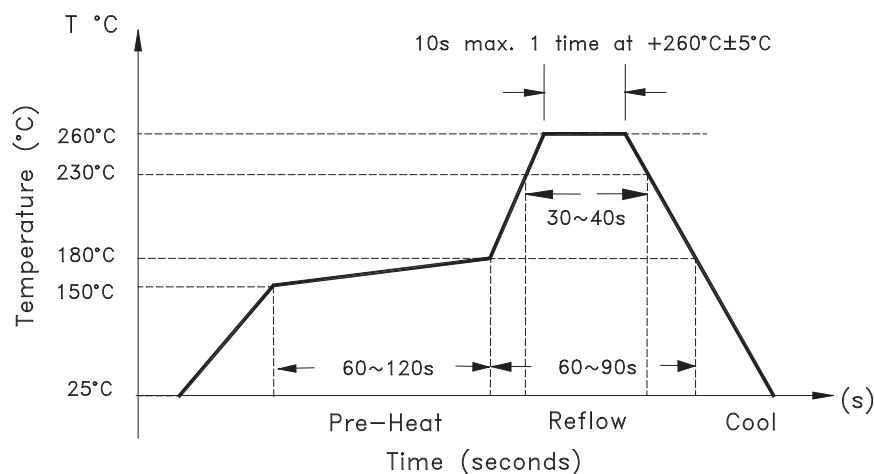
## OUTLINE DIMENSIONS:

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

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



## REFLOW PROFILE:



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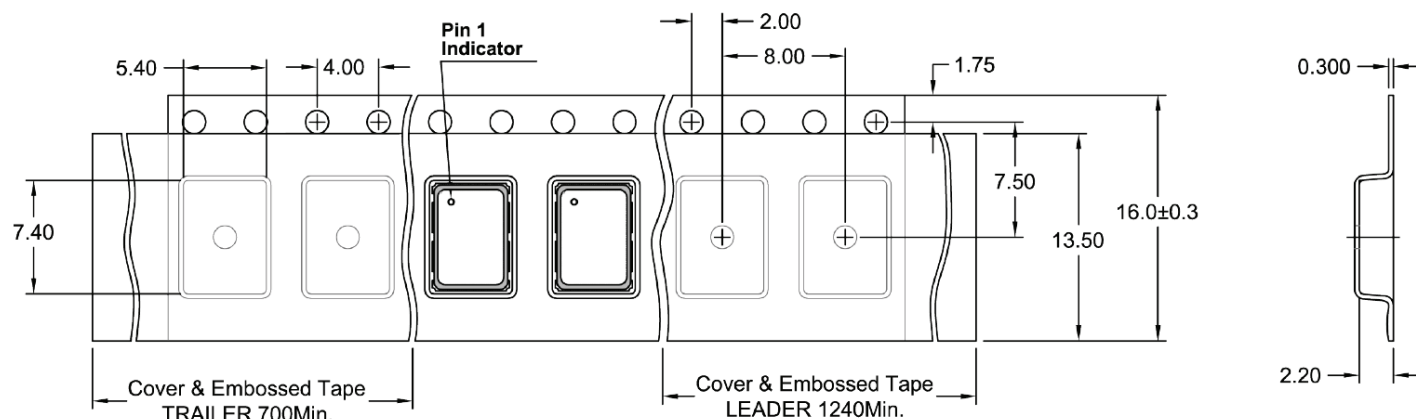


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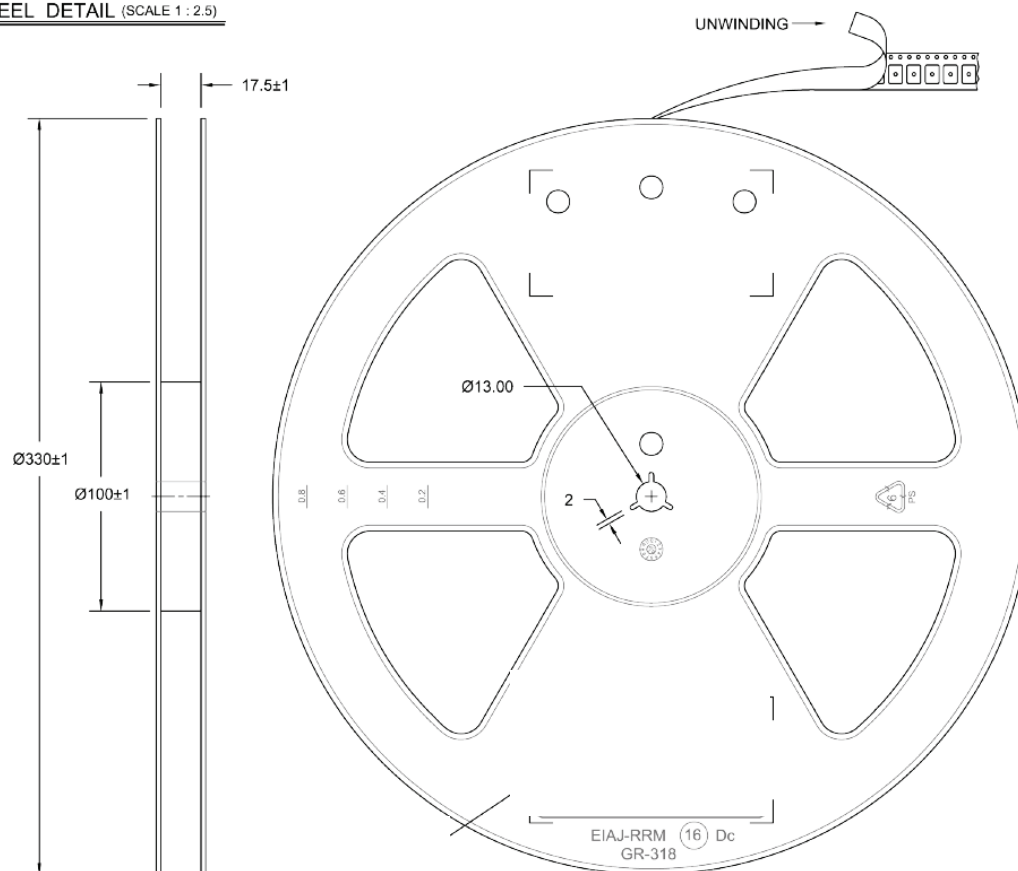
## TAPE & REEL:

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

TAPE DETAIL (SCALE 2 : 1)



REEL DETAIL (SCALE 1 : 2.5)



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