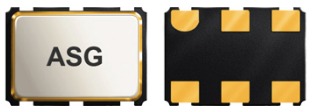
# Programmable - High Performance SMD XO & VCXO

## 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: | $V_{dd}$ = 3.3V | 10 | | 1500 | MHz | |
| | $V_{dd}$ = 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 @ 25ºC 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 (Vdd): | $V_{dd}$ = 3.3V | 3.135 | 3.300 | 3.465 | V | |
| | $V_{dd}$ = 2.5V | 2.375 | 2.500 | 2.625 | V | |
| Input Current: | $V_{dd}$ = 3.3V | | < 25 | 40 | mA | Frequency dependent |
| | $V_{dd}$ = 2.5V | | < 25 | 35 | mA | Frequency dependent |
| LVDS Output (Out & $\overline{Out}$): | Differential Output Voltage | 175 | 350 | | mV | $V_{OD}$ |
| | $V_{OD}$ Magnitude Change | | | 50 | mV | $\Delta V_{OD}$ |
| | Offset Voltage | | 1.25 | | V | $V_{OS}$ |
| | $V_{OS}$ Magnitude Change | | | 50 | mV | $\Delta V_{OS}$ |
| | Duty Cycle | 45 | 48/52 | 55 | % | $ODC_{LVDS}$ |
| | Rise Time | 125 | | 350 | ps | $t_R$ |
| | Fall Time | 150 | | 450 | ps | $t_F$ |
| Start-up Time: | | | ≤ 2.0 | 3.0 | ms | |
| Enable/Disable Function : | | "1" ($V_{IH}$ ≥ 0.7*Vdd) or Open: Oscillation<br>"0" ($V_{IL}$ < 0.3*Vdd) : High Z | | | | |
| Vcontrol Range | | 0.00 | | Vdd | Volts | For VCXO |
| Frequency Pull | | ±50 | | | ppm | |
| Control Port Bandwidth | | 10 | | | kHz | |
| Phase jitter RMS [ tjit(ϕ) ] *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 25ºC±3ºC, 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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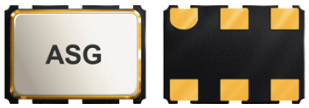
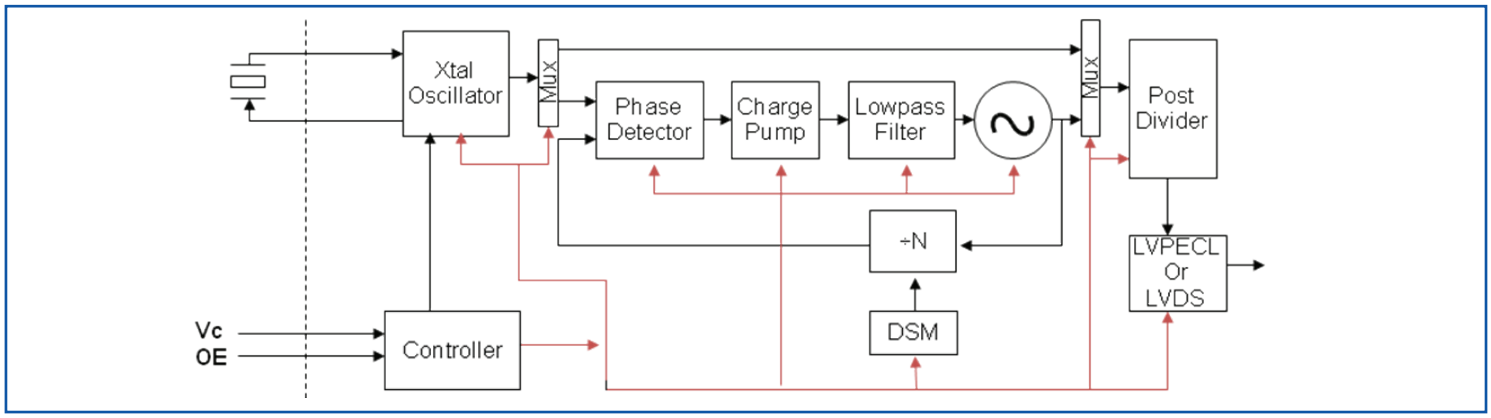


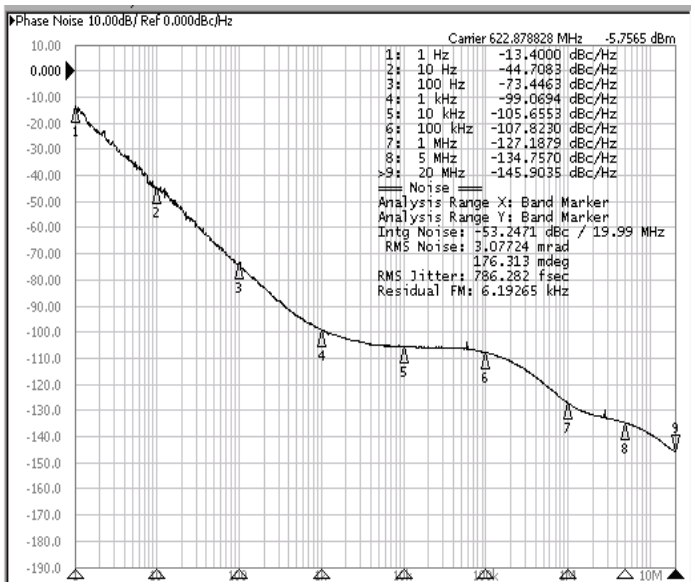

7.0 x 5.0 x 1.9mm

## OVERALL SYSTEM BLOCK DIAGRAM

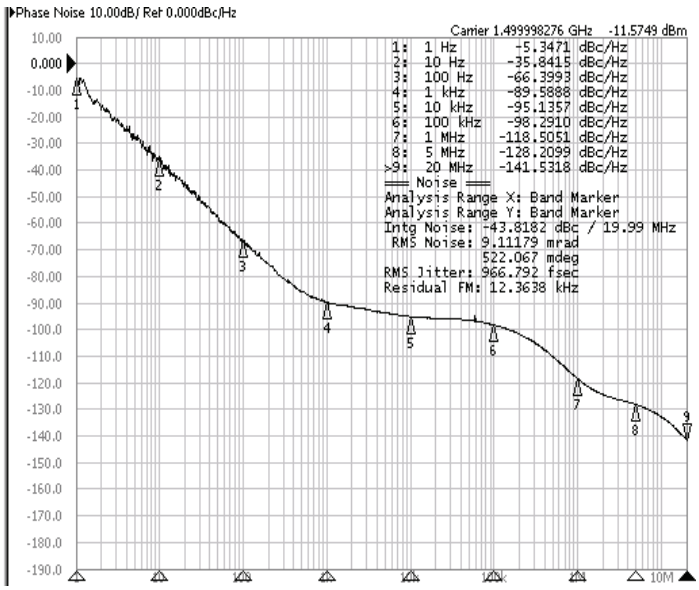



## PHASE NOISE & JITTER CHARACTERISTICS

### 622.88MHz Carrier




### 1.50GHz Carrier





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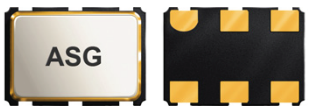
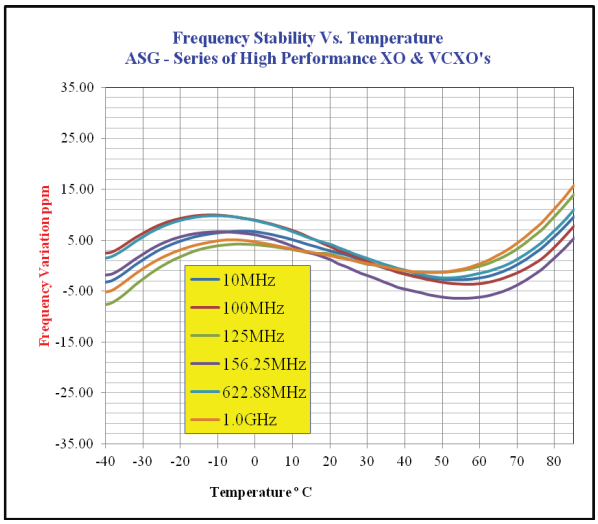
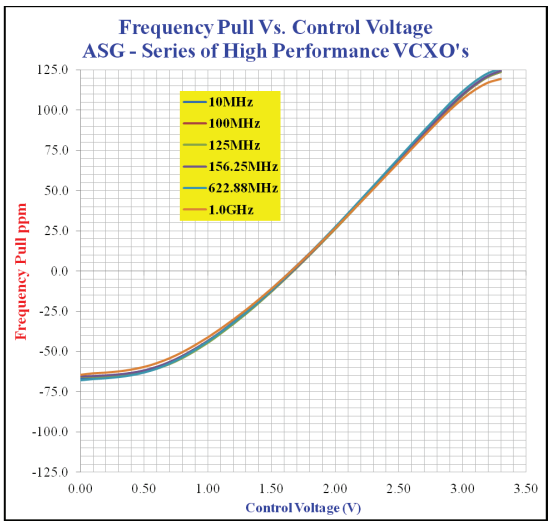



7.0 x 5.0 x 1.9mm

## FREQUENCY STABILITY VS. TEMPERATURE




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




## PART IDENTIFICATION:

ASG - D - ☐ - ☐ - ☐ MHz - ☐

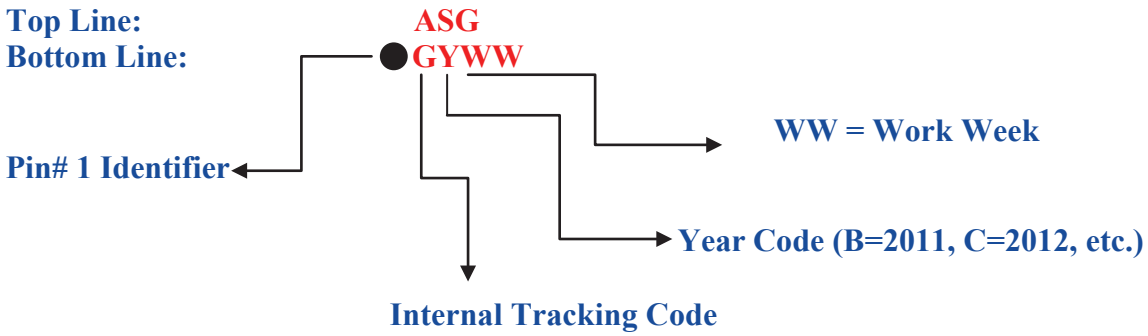
| Fixed or Pull-able |
|---|
| X = Fixed Oscillator |
| V = VCXO |

| 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:





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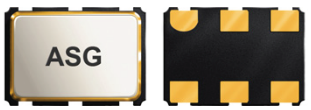
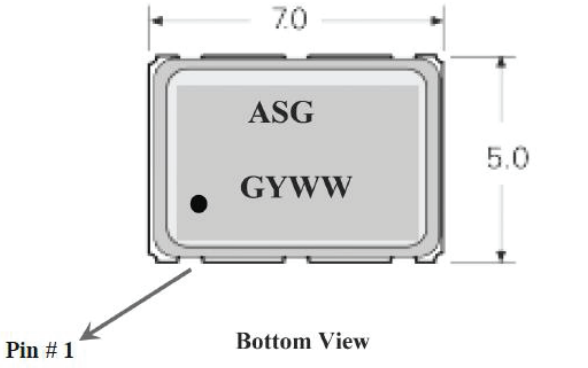



7.0 x 5.0 x 1.9mm

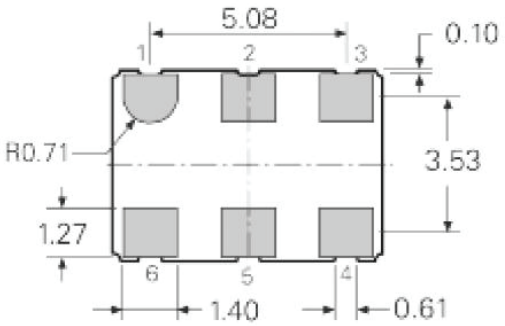
## OUTLINE DIMENSIONS:

| Pin # | Pin Description For VCXO configuration |
|---|---|
| 1 | Voltage Control for VCXO |
| 2 | Output Enable (OE) |
| 3 | GND |
| 4 | RF Output |
| 5 | RF $\overline{Output}$ |
| 6 | Vdd |

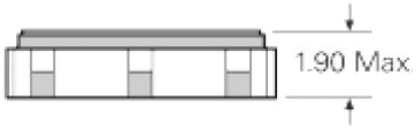
| Pin # | Pin Description For XO configuration |
|---|---|
| 1 | Output Enable (OE) |
| 2 | N/C for XO |
| 3 | GND |
| 4 | RF Output |
| 5 | RF $\overline{Output}$ |
| 6 | Vdd |



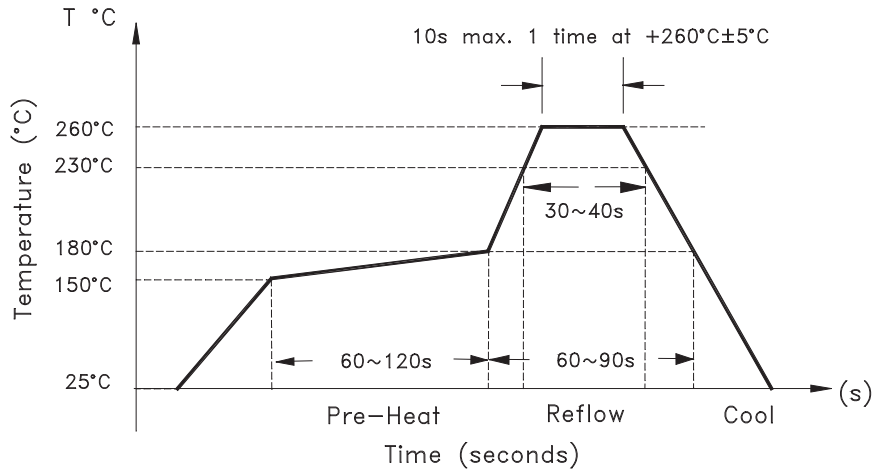

Bottom View




Side View




## REFLOW PROFILE:





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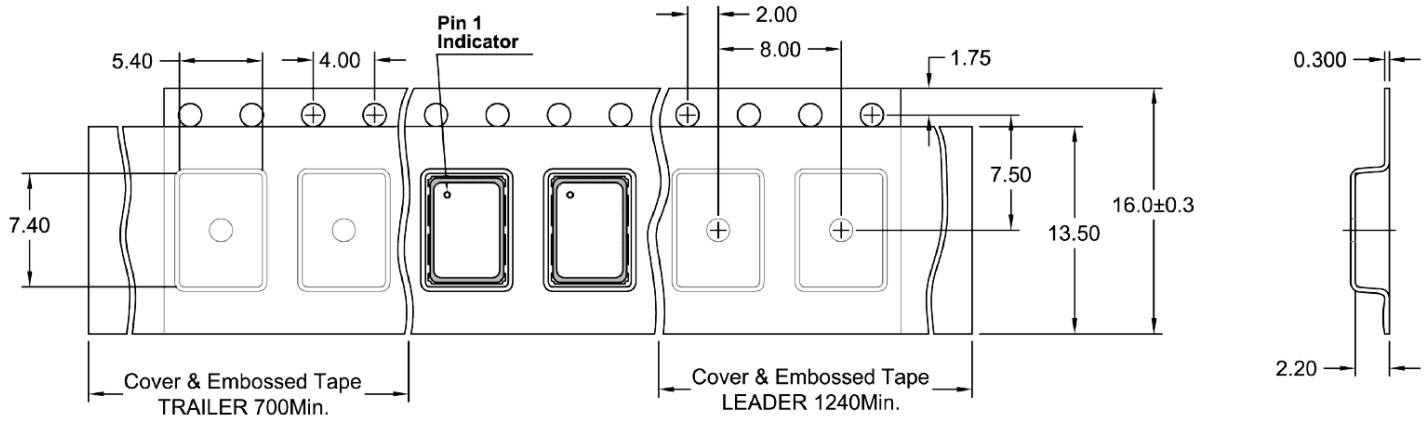
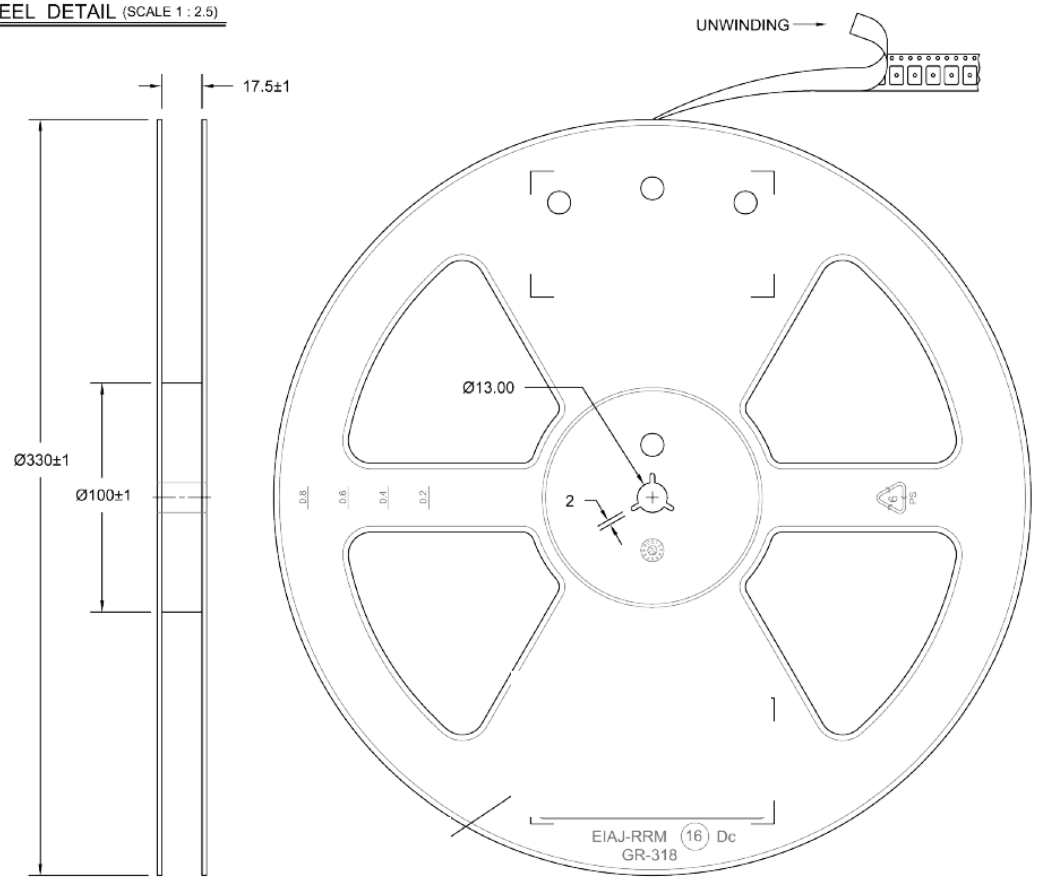
## TAPE & REEL:

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

TAPE DETAIL (SCALE 2 : 1)




REEL DETAIL (SCALE 1 : 2.5)





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