

|  |                   |         |                  |
|--|-------------------|---------|------------------|
| <b>Specification</b>   | <b>AXIOM35ULN</b> | Rev.: 3 | Date: 2019-08-19 |
| <b>Oscillator type: Ultra Low Phase Noise Miniature OCXO with Sine Wave Output</b> |                   |         |                  |

| Parameter                                     | min.                             | typ. | max. | Unit  | Condition                                      |
|---|----------------------------------|------|------|-------|--|
| <b>Frequency range</b>                        | 80                               |      | 125  | MHz   |  |
| <b>Standard frequencies</b>                   | 100.000 / 120.000                |      |      | MHz   |  |
| <b>Frequency stability</b>                    |                                  |      |      |       |  |
| Initial tolerance @ +25°C                     |                                  | ±100 | ±200 | ppb   | V <sub>c</sub> @ VREF/2                        |
| vs. operating temperature range               | Option 2 & 3<br>See tables 2 & 3 |      |      |       | steady state                                   |
| vs. supply voltage variation (pushing)        |                                  |      | ±10  | ppb   | V <sub>s</sub> ±5%                             |
| vs. load change (pulling)                     |                                  |      | ±5   | ppb   | R <sub>L</sub> ±5%                             |
| Long term (aging) per day                     |                                  |      | ±2   | ppb   | after 30 days operation                        |
| Long term (aging) 1 <sup>st</sup> year        |                                  |      | ±200 | ppb   | after 30 days operation                        |
| <b>Frequency adjustment range</b>             |                                  |      |      |       |  |
| Electronic Frequency Control (EFC)            | ±1                               | ±2   |      | ppm   |  |
| EFC voltage V <sub>c</sub>                    | 0                                |      | VREF | V     |  |
| EFC slope (Δf / ΔV <sub>c</sub> )             | Positive                         |      |      |       |  |
| EFC input impedance                           | 100                              |      |      | kΩ    |  |
| <b>RF output</b>                              |                                  |      |      |       |  |
| Signal waveform                               | Sine wave                        |      |      |       |  |
| Load R <sub>L</sub>                           | 50                               |      |      | Ω     | ±5%  |
| Output level (Note 2)                         | +7                               |      |      | dBm   |  |
| Harmonics                                     |                                  |      | -30  | dBc   |  |
| Warm-up time                                  |                                  |      | 3    | min   | Δf <sub>final</sub> /f <sub>0</sub> < ±0.1 ppm |
| Phase noise                                   | See table 1                      |      |      |       | Option 1                                       |
| G-Sensitivity                                 |                                  |      | 1.0  | ppb/g | per axis                                       |
| <b>Reference voltage VREF output (Note 3)</b> |                                  | 10.0 |      | V     |  |
| <b>Supply voltage V<sub>s</sub> (Note 3)</b>  | 11.4                             | 12.0 | 12.6 | V     |  |
| <b>Current consumption (steady state)</b>     |                                  |      | 100  | mA    | @ +25°C (Note 4)                               |
| <b>Current consumption (warm-up)</b>          |                                  |      | 300  | mA    | (Note 4)                                       |
| <b>Enclosure (see drawing) (LxWxH)</b>        | 20.5x20.5x12 max.                |      |      | mm    | IEC 60679-3 CO 41                              |
| <b>Weight</b>                                 |                                  |      | 10   | g     |  |
| <b>Packing</b>                                | Palette                          |      |      |       |  |

**Notes:**

1. Terminology and test conditions are according to IEC60679-1 and MIL-PRF-55310, unless otherwise stated
2. Other output level on request
3. Other supply and reference voltage on request
4. May be higher for wide operating temperature range

**Absolute Maximum Ratings**

| Parameter                      | min. | max.                 | Unit | Condition             |
|--------------------------------|------|----------------------|------|-----------------------|
| Supply Voltage V <sub>s</sub>  | -0.5 | V <sub>s</sub> + 10% | V    | V <sub>s</sub> to GND |
| Control Voltage V <sub>c</sub> | -0.5 | 15                   | V    | V <sub>c</sub> to GND |
| Storage Temperature            | -55  | +105                 | °C   |                       |

**Phase Noise – Option 1:**

| Offset   | 80~110 MHz |      |      |      |      | >110~125 MHz |      |      |      |      | Unit   |
|----------|------------|------|------|------|------|--------------|------|------|------|------|--------|
|          | A          | B    | C    | D    | E    | A            | B    | C    | D    | E    |        |
| 10 Hz    | -90        | -95  | -100 | -103 | -105 | -85          | -90  | -95  | -97  | -100 | dBc/Hz |
| 100 Hz   | -120       | -125 | -130 | -135 | -137 | -115         | -120 | -125 | -127 | -130 | dBc/Hz |
| 1 kHz    | -150       | -155 | -160 | -162 | -164 | -147         | -150 | -153 | -155 | -157 | dBc/Hz |
| 10 kHz   | -165       | -165 | -165 | -168 | -170 | -165         | -165 | -165 | -165 | -168 | dBc/Hz |
| ≥100 kHz | -170       | -170 | -170 | -170 | -170 | -170         | -170 | -170 | -170 | -170 | dBc/Hz |

Table 1

Note: Other phase noise parameters on request

**Frequency stability vs. temperature**

| Option 2 | Stability [ppb] |
|----------|-----------------|
| 25       | ±25             |
| 50       | ±50             |
| 100      | ±100            |
| 200      | ±200            |
|          |                 |
|          |                 |

Table 2

| Lower Temperature |        | Upper Temperature |        |
|-------------------|--------|-------------------|--------|
| Option 3          | T [°C] | Option 3          | T [°C] |
| 0                 | 0      | A                 | +50    |
| 1                 | -10    | B                 | +60    |
| 2                 | -20    | C                 | +70    |
| 3                 | -30    | D                 | +75    |
| 4                 | -40    | E                 | +80    |
| 5                 | -55    | F                 | +85    |

Table 3

Standard: "1B" = -10°C to +60°C

| Temperature range [°C] | Frequency stability [Option 2] |    |     |     |
|------------------------|--------------------------------|----|-----|-----|
|                        | 25                             | 50 | 100 | 200 |
| 0 ~ +50                | X                              | X  | X   | X   |
| -10 ~ +60              | X                              | X  | X   | X   |
| -20 ~ +70              | X                              | X  | X   | X   |
| -30 ~ +70              | X                              | X  | X   | X   |
| -40 ~ +75              | O                              | X  | X   | X   |
| -40 ~ +85              | -                              | O  | X   | X   |
| -55 ~ +85              | -                              | -  | O   | X   |

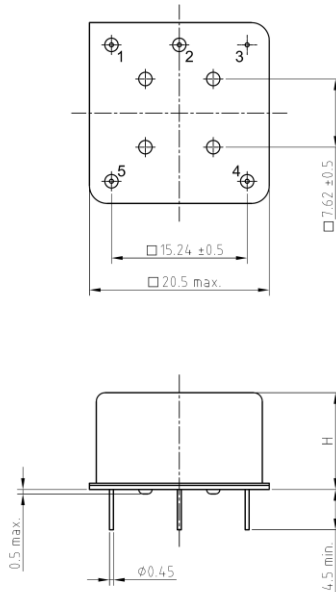
Table 4 "Availability" X = available, O = available on request, - not available

**Ordering Code**

| Model      | Option 1 [Phase noise] | Option 2 [Stability] | Option 3 [Temperature range] | Revision | Frequency [MHz] |
|------------|------------------------|----------------------|------------------------------|----------|-----------------|
| AXIOM35ULN | Table 1                | Table 2              | Table 3                      | Rev.3    | 100.000         |

Example: AXIOM35ULN-C-25-1B\_Rev.3 – 100.000 MHz

**Enclosure drawing**



**Pin connections**

| Pin # | Symbol         | Function              |
|-------|----------------|-----------------------|
| 1     | V <sub>s</sub> | Supply Voltage        |
| 2     | RF OUT         | RF Output             |
| 3     | GND            | Ground                |
| 4     | V <sub>c</sub> | Control Voltage (EFC) |
| 5     | VREF           | Reference Voltage     |

**Handling and Testing**

| Parameter                     | Procedure   |     | Source        |
|-------------------------------|---|-----|---------------|
| Handling and Testing          | Application Note AXAN-011   |     | www.axtal.com |
| Processing                    | Application Note AXAN-012   |     | www.axtal.com |
| Parameter                     | Procedure   |     | Condition     |
| Electrostatic discharge (ESD) |   |     |               |
| THD devices                   | IEC60749-26   | HBM | 2000 V        |
| SMD devices                   | IEC60749-27   | MM  | 200 V         |
| Washable                      | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |     |               |
| RoHS- Compliant               | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |     |               |

### Environmental conditions

| Test   | IEC<br>60068<br>Part ... | IEC<br>60679-1<br>Clause | MIL-STD-<br>202G<br>Method | MIL-STD-<br>810F<br>Method | MIL-PRF-<br>55310D<br>Clause | Test conditions (IEC)  |
|--|--------------------------|--------------------------|----------------------------|----------------------------|------------------------------|--|
| Sealing tests<br>(if applicable)                 | 2-17                     | 5.6.2                    | 112E                       |                            | 3.6.1.2                      | Gross leak: Test Qc,<br>Fine leak: Test Qk   |
| Solderability<br>Resistance to<br>soldering heat | 2-20<br>2-58             | 5.6.3                    | 208H<br>210F               |                            | 3.6.52<br>3.6.48             | Test Ta Method 1<br>Test Td <sub>1</sub> Method 2<br>Test Td <sub>2</sub> Method 2 |
| Shock  | 2-27                     | 5.6.8                    | 213B                       | 516.4                      | 3.6.40                       | Test Ea, 3 x per axes 100g,<br>6 ms half-sine pulse                                |
| Vibration,<br>sinusoidal                         | 2-6                      | 5.6.7.1                  | 201A<br>204D               | 516.4-4                    | 3.6.38.1<br>3.6.38.2         | Test Fc, 30 min per axes,<br>10 Hz - 55 Hz 0,75mm;<br>55 Hz - 2 kHz, 10g           |
| Vibration, random                                | 2-64                     | 5.6.7.3                  | 214A                       | 514.5                      | 3.6.38.3<br>3.6.38.4         | Test Fdb   |
| Endurance tests<br>- ageing<br>- extended aging  |                          | 5.7.1<br>5.7.2           | 108A                       |                            | 4.8.35                       | 30 days @ 85°C, OCXO @25°C<br>1000h, 2000h, 8000h @85°C                            |

Other environmental conditions on request

Data sheet is for information purposes only and may be subject to modifications or may be discontinued without notice.

### Revision History

| Rev. | Drawing | Date<br>[dd.mm.yyyy] | Remarks   | Author | Checked |
|------|---------|----------------------|---|--------|---------|
| 1    | D1      | 01.10.2012           | Editorial changes   | BN     | BN      |
| 2    | D0      | 08.05.2014           | Various parameters updated, G-Sensitivity added,<br>environmental conditions updated, editorial changes | HH     | HH      |
| 3    | D0      | 19.08.2019           | Frequency range extended, phase noise & stability<br>options updated, editorial changes                 | HH     | HH      |