

FEATURES

- ISO/TS 16949 CERTIFIED FACILITY
- RELIABILITY TESTING PER AEC-Q200
- PPAP DOCUMENTATION AVAILABLE
- EXCELLENT TOLERANCE AND STABILITY
- CUSTOM SPECIFICATIONS AVAILABLE



SPECIFICATIONS

| PARAMETER | | VALUE |
|--|----------------|---|
| FREQUENCY RANGE | | 3.000 MHz to 80.000 MHz |
| MODE OF OSCILLATION | FUNDAMENTAL | 3.000 MHz to 48.000 MHz |
| | THIRD OVERTONE | 30.000 MHz to 80.000 MHz |
| FREQUENCY TOLERANCE AT 25°C | | ±50 ppm max (±10 ppm, ±15 ppm, ±20 ppm and ±30 ppm available) |
| FREQUENCY STABILITY OVER TEMPERATURE ‡ | | ±50 ppm max (±10 ppm, ±15 ppm, ±20 ppm and ±30 ppm available, see Table 2) |
| OPERATING TEMPERATURE RANGE ‡ | | -20°C to +70°C Standard -40°C to +85°C Extended -40°C to +105°C Extended6 |
| STORAGE TEMPERATURE RANGE | | -55°C to +125°C |
| AGING | | ±3 ppm per year max |
| LOAD CAPACITANCE | | 8 pF to 32 pF or Series |
| EQUIVALENT SERIES RESISTANCE | | See Table 1 |
| SHUNT CAPACITANCE | | 7.0 pF max |
| DRIVE LEVEL | | 100 µW typ, 500 µW max |
| INSULATION RESISTANCE | | 500 MΩ min |
| SHOCK RESISTANCE | | ±5 ppm max 75 cm drop test in 3 axes onto a hard wood surface |
| REFLOW CONDITIONS | | 260°C for 10 s max |



‡ Not all combinations of temperature and frequency stability available, consult factory.

TABLE 1

| FREQUENCY (MHz) | MODE | ESR MAX (Ω) |
|-----------------|------|-------------|
| 3 ≤ F0 < 4 | FUND | 150 |
| 4 ≤ F0 < 6 | FUND | 100 |
| 6 ≤ F0 < 10 | FUND | 70 |
| 10 ≤ F0 < 12 | FUND | 60 |
| 12 ≤ F0 < 16 | FUND | 50 |
| 16 ≤ F0 < 24 | FUND | 40 |
| 24 ≤ F0 < 30 | FUND | 30 |
| 30 ≤ F0 ≤ 48 | FUND | 20 |
| 30 ≤ F0 < 36 | 3OT | 80 |
| 36 ≤ F0 ≤ 80 | 3OT | 60 |

TABLE 2

| TEMP RANGE (°C) | STABILITY (ppm) | | | | |
|-----------------|-----------------|-----|-----|-----|-----|
| | ±10 | ±15 | ±20 | ±30 | ±50 |
| -20 to +70 | O | O | O | O | O |
| -40 to +85 | × | △ | △ | O | O |
| -40 to +105 | × | × | × | × | O |

Note: O: Available, △: Conditional, ×: Not available

■ PART NUMBERING SYSTEM

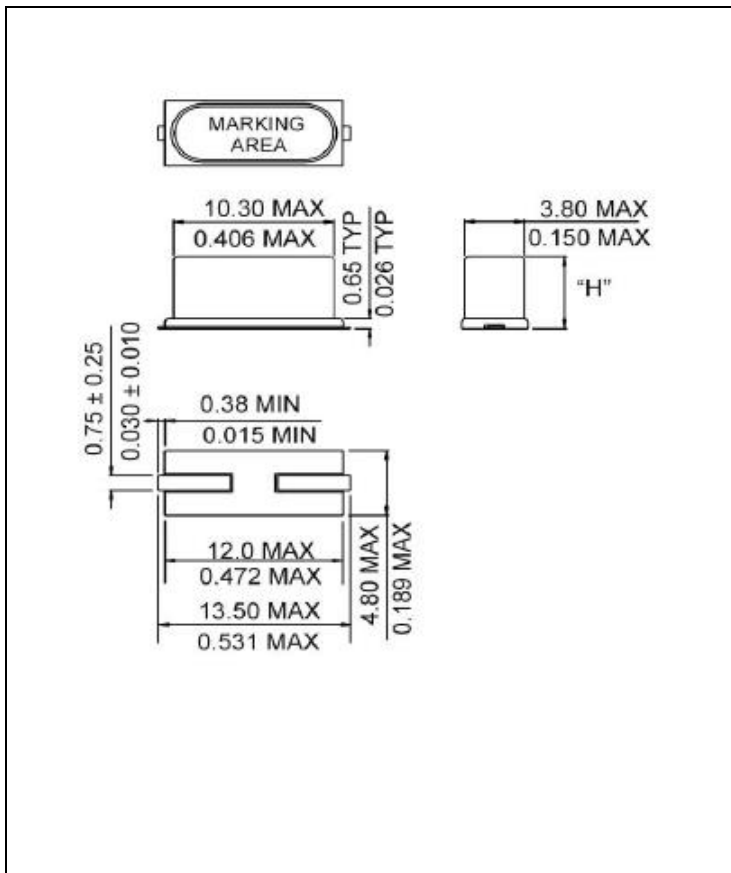
| TYPE | FREQUENCY | LOAD CAPACITANCE | MODE | TOLERANCE/STABILITY (PPM/PPM) |
|------|-----------|---|--|---|
| ASA | in MHz | 8 to 32 pF for Parallel S for Series | Blank for < 24.576 MHz F for ≥ 24.576 MHz | Blank for max ppm Example: 1020, 2050 |

| EXTENDED TEMPERATURE | CONFIGURATION | TAPE & REEL |
|--|---------------|-------------|
| Blank for Standard EXT for Extended EXT6 for Extended6 | SMD | TR |

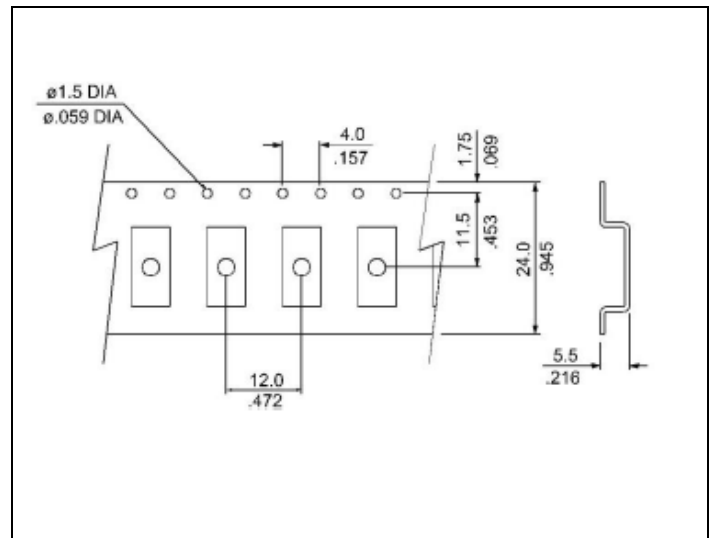
EXAMPLE: ASA-24.000-18-3050-EXT-SMD-TR

AUTOMOTIVE GRADE Surface Mount Microprocessor Crystal, HC-49S SMD package, 24.000 MHz, Fundamental mode, 18 pF Load, ±30 ppm Tolerance, ±50 ppm Stability from -40°C to +85°C, Tape and Reel packaging

■ MECHANICAL SPECIFICATION



■ CARRIER TAPE DIMENSIONS

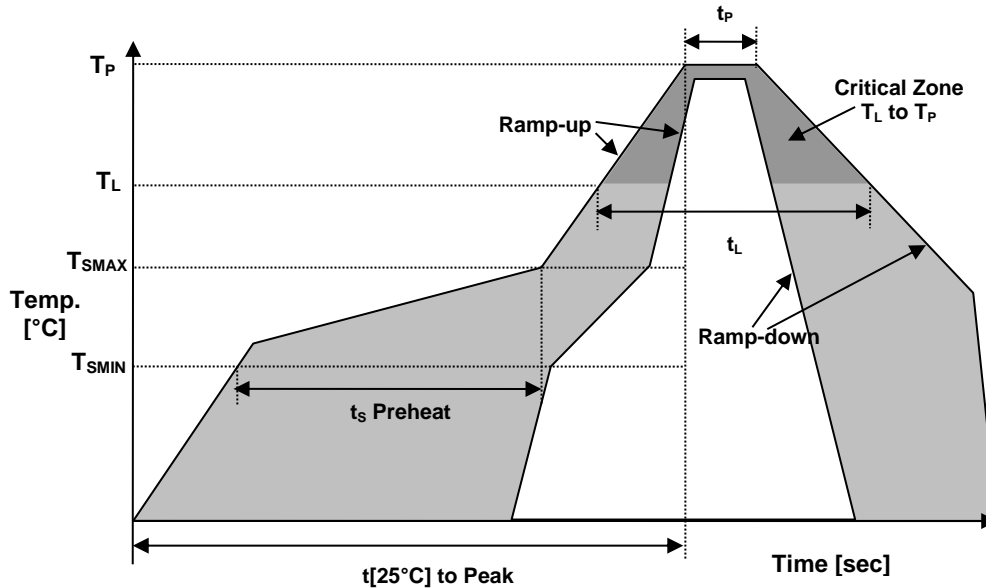


NOTE: REFER TO EIA-481 FOR NON-SPECIFIED DIMENSIONS

■ PACKAGING

330 mm REEL DIAMETER
24 mm TAPE WIDTH, 12 mm PITCH
QUANTITY: 1000 PIECES PER REEL

REFLOW PROFILE



| Reflow profile (Reference IPC/JEDEC J-STD-020) | | |
|---|----------------------------------|--------------|
| Temperature Min Preheat | T_{SMIN} | 150°C |
| Temperature Max Preheat | T_{SMAX} | 200°C |
| Time (T_{SMIN} to T_{SMAX}) | t_s | 60-180 sec. |
| Temperature | T_L | 217°C |
| Peak Temperature | T_P | 260°C |
| Ramp-up rate | R_{UP} | 3°C/sec max. |
| Ramp-down rate | R_{DOWN} | 6°C/sec max. |
| Time within 5°C of Peak Temperature | t_p | 10 sec. |
| Time $t_{[25^\circ\text{C}]}$ to Peak Temperature | $t_{[25^\circ\text{C}]}$ to Peak | 480 sec. |
| Time | t_L | 60-150 sec. |

ENVIRONMENTAL

| PARAMETER | VALUE |
|----------------------------|-----------|
| MOISTURE SENSITIVITY LEVEL | 1 |
| RoHS | Compliant |
| REACH SVHC | Compliant |
| HALOGEN-FREE | Compliant |
| ESD CLASSIFICATION LEVEL | N/A |
| TERMINATION FINISH | Au |
| UNIT WEIGHT | 0.585 g |



The process of manufacturing ASA-SMD series of Automotive Grade Surface Mount Microprocessor Crystals is performed by using **Advanced Product Quality Planning (APQP)**. This technique defines and establishes the following actions:

- Product design activities communicating special characteristics to the process design activity, prior to design release, linking the DFMEA to PFMEA.
- Plan, acquire and install appropriate process equipment and tooling based on design tolerances provided by the customer. – CPPD (Collaborative Product Process Design)
- Assembly personnel communicating suggestions on better ways to assemble a product prior to the completion of the design of the product. – DFA/M (Design for Assembly and Manufacturing)
- Manufacturing or Process Engineering establishing adequate Quality Controls for features of a product or parameters of a process, which still risk potential failure. – Control Plan Methodology
- Performing Stability and Capability studies on special characteristics to understand the variation present and predict future performance. – SPC (Statistical Process Control and Process Capability)

Request for **Production Part Approval Process (PPAP)** documentation must be requested at time of order placement. Requests for part approval will be supported in official PPAP format and with documented results as requested at time of order placement. Actual measurements are taken of the parts produced and are used to complete the various test sheets of PPAP.

■ NOTICE

If you intend to use our product referenced above in an automotive application that may result in loss of life or assets, please do not fail to advise us of your intention beforehand. The use of the listed part in those applications is not covered by warranty, and we will not be held accountable for any liability claims. We reserve the right to not supply parts in those circumstances.

NOVEMBER 2016