

**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

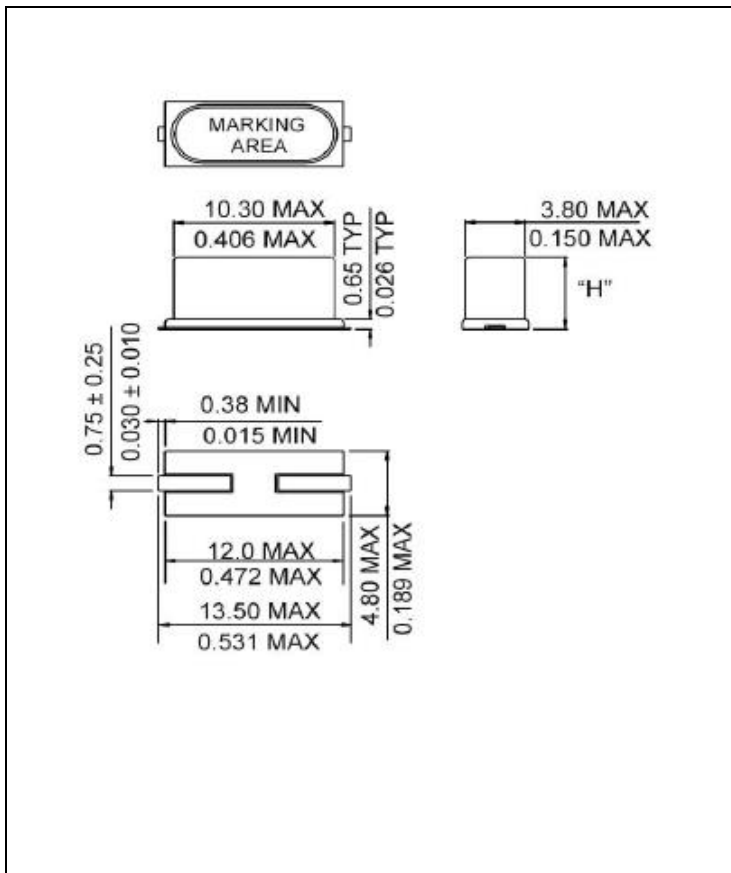
TYPE	FREQUENCY	LOAD CAPACITANCE	MODE	TOLERANCE/STABILITY (PPM/PPM)
ASA	in MHz	8 to 32 pF for Parallel S for Series	Blank for < 24.576 MHz F for ≥ 24.576 MHz	Blank for max ppm/ppm Example: 1020, 2050

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

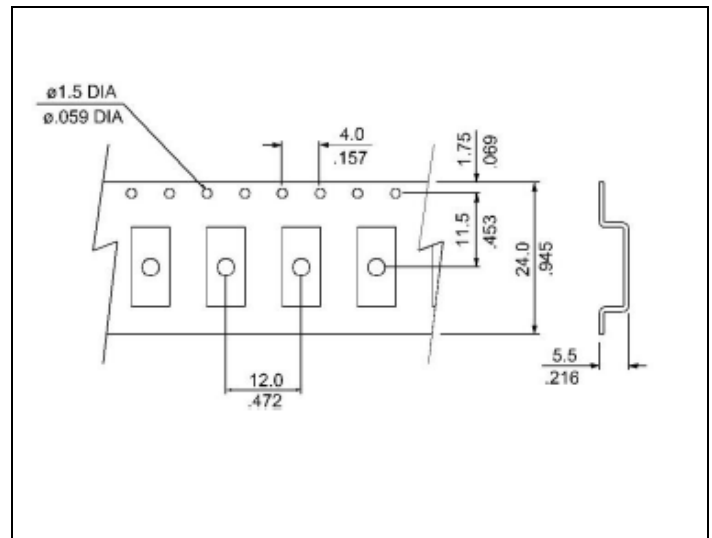
### EXAMPLE: ASA-24.000-18-3050-EXT-SMD-TR

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

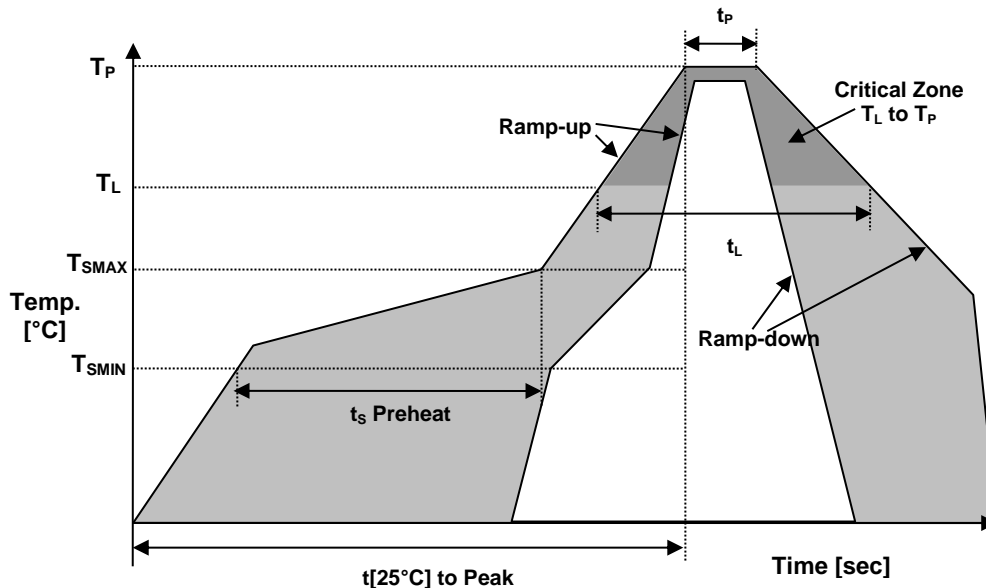


NOTE: REFER TO EIA-481 FOR NON-SPECIFIED DIMENSIONS

## ■ 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 $t_{[25^{\circ}\text{C}] \text{ to Peak Temperature}}$	$t_{[25^{\circ}\text{C}] \text{ to Peak}}$	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