



## FEATURES:

- Standard available frequencies: 10.00, 12.80, 19.20, 20.00, 25.00, 26.00, 30.72, 40.00, 50.00MHz
- Standard LVC MOS Output
- Frequency stabilities to include  $\pm 100$ ppb over  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ ,  $\pm 280$ ppb over  $-50^{\circ}\text{C}$  to  $+90^{\circ}\text{C}$  and  $\pm 500$ ppb over  $-55^{\circ}\text{C}$  to  $+95^{\circ}\text{C}$  operating temperature range
- Excellent Phase Noise, Harmonics and Spurious content
- Typical rms jitter of 400fs @ 40MHz carrier & 1.0ps @ 10MHz carrier over 12kHz to 20MHz BW

## APPLICATIONS:

- COTS Military Radios & other Communication Hardware
- WiMax,
- LTE, BTS
- CATV, LAN, LMDS
- GPS Tracking with Hold-Over accuracy
- Test & Measurement Equipment
- Point-to-Point communication networks

## STANDARD SPECIFICATIONS:

Maximum Rating

| Parameters                | Rating                              |
|---------------------------|-------------------------------------|
| Storage Temperature Range | $-55$ to $+125^{\circ}\text{C}$     |
| Supply Voltage            | $-0.5$ to $6\text{V}$               |
| ESD, HBM/CDM/MM           | $4\text{kV}/2\text{kV}/200\text{V}$ |

| Parameters                                              | Minimum                                                       | Typical | Maximum | Units  | Notes                                   |
|---------------------------------------------------------|---------------------------------------------------------------|---------|---------|--------|-----------------------------------------|
| Frequency Range                                         | 10                                                            |         | 51.2    | MHz    |                                         |
| Standard Frequencies:                                   | 10.00, 12.80, 19.20, 20.00, 25.00, 26.00, 30.72, 40.00, 50.00 |         |         | MHz    |                                         |
| Initial Frequency Tolerance (@+25°C) at shipping        |                                                               |         | ±0.3    | ppm    | Relative to carrier                     |
| Frequency Stability Options                             |                                                               |         |         |        |                                         |
| -40°C to +85°C                                          |                                                               |         | ±100    | ppb    | Option “1”                              |
| -50°C to +90°C                                          |                                                               |         | ±280    | ppb    | Option “2” <b>*Note 1</b>               |
| -55°C to +95°C                                          |                                                               |         | ±500    | ppb    | Option “5” <b>*Note 2</b>               |
| Frequency Stability vs. Supply Voltage Change (Vdd±5%): |                                                               |         | ±100    | ppb    |                                         |
| Frequency Stability vs. Load Change (Load±5%):          |                                                               |         | ±200    | ppb    |                                         |
| Supply Voltage (Vdd):                                   | +3.135                                                        | +3.3    | +3.465  | V      |                                         |
| Aging (first year @+25°C):                              |                                                               |         | ±1.0    | ppm    |                                         |
| Aging (20 years @+25°C):                                |                                                               | ±3.0    | ±4.6    | ppm    |                                         |
| Supply Current (Icc) (into 15pF load):                  |                                                               | 7.8     | 8.5     | mA     | @10MHz carrier                          |
|                                                         |                                                               | 8.7     | 9.5     |        | @16.384MHz carrier                      |
|                                                         |                                                               | 13.7    | 14.5    |        | @51.2MHz carrier                        |
| CMOS Output                                             |                                                               |         |         |        |                                         |
| V <sub>OH</sub> :                                       | 2.4                                                           |         |         | V      | Load=15pF                               |
| V <sub>OL</sub> :                                       |                                                               |         | 0.4     | V      | Load=15pF                               |
| Load:                                                   |                                                               |         | 15      | pF     |                                         |
| Duty Cycle:                                             | 45                                                            |         | 55      | %      | @(V <sub>OH</sub> - V <sub>OL</sub> )/2 |
| Rise/Fall Time:                                         |                                                               |         | 4       | ns     | Load=15pF                               |
| Waveform:                                               | Square Wave                                                   |         |         |        |                                         |
| RMS Jitter (12kHz to 20MHz BW)                          | 0.4                                                           |         | 1.3     | ps     | Carrier dependent                       |
| Phase Noise<br>(10MHz carrier frequency @25 °C):        |                                                               |         | -95     | dBc/Hz | Offset @10Hz                            |
|                                                         |                                                               |         | -120    |        | Offset @100Hz                           |
|                                                         |                                                               |         | -140    |        | Offset @ 1k Hz                          |
|                                                         |                                                               |         | -145    |        | Offset @10 kHz                          |
|                                                         |                                                               |         | -150    |        | Offset @100kHz                          |

\*Note 1: For 10.000MHz carrier, frequency stability of  $\pm 280$ ppb is only guaranteed over  $-45^{\circ}\text{C}$  to  $+90^{\circ}\text{C}$  operating temperature range.

\*Note 2: For 10.000MHz carrier, option "5" is not available.



### OPTIONS & PART IDENTIFICATION: (left blank if standard)

AST3TQ -  MHz -  -

**Frequency in MHz**  
Please specify the frequency in MHz.  
e.g. 19.200MHz

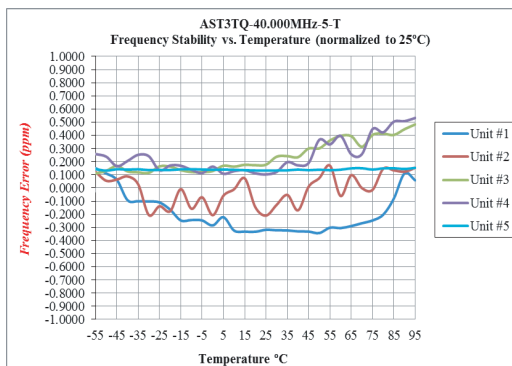
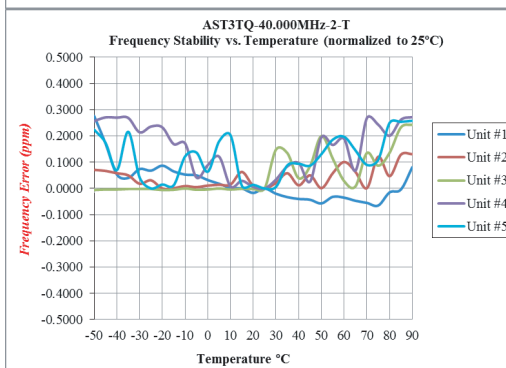
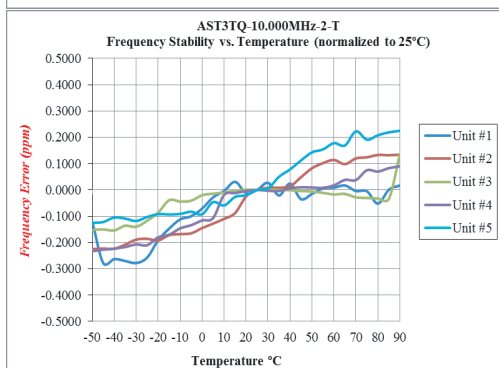
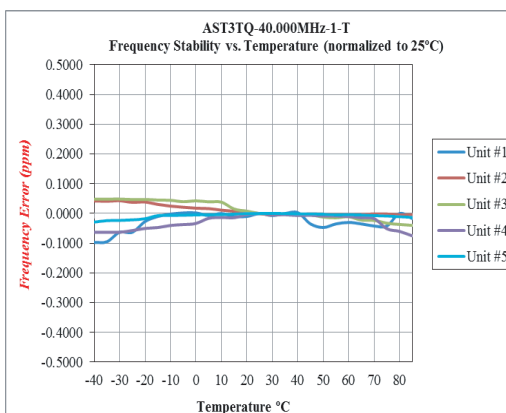
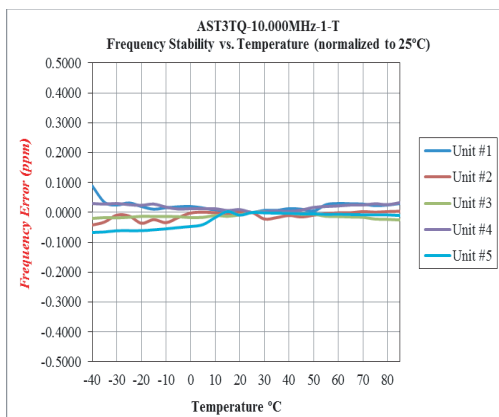
**Freq. Stability vs. Operating Temp.**  
1:  $\pm 100$ ppb over -40 to +85°C  
2:  $\pm 280$ ppb over -50 to +90°C \*  
5:  $\pm 500$ ppb over -55 to +95°C \*\*

**Packaging**  
Blank: Bulk  
T: 500pcs/reel  
T2: 2000pcs/reel

\* Note 1: For 10.000MHz carrier, frequency stability of  $\pm 280$ ppb is only guaranteed over -45°C to +90°C operating temperature range.

\*\*Note 2: For 10.000MHz carrier, option "5" is not available.

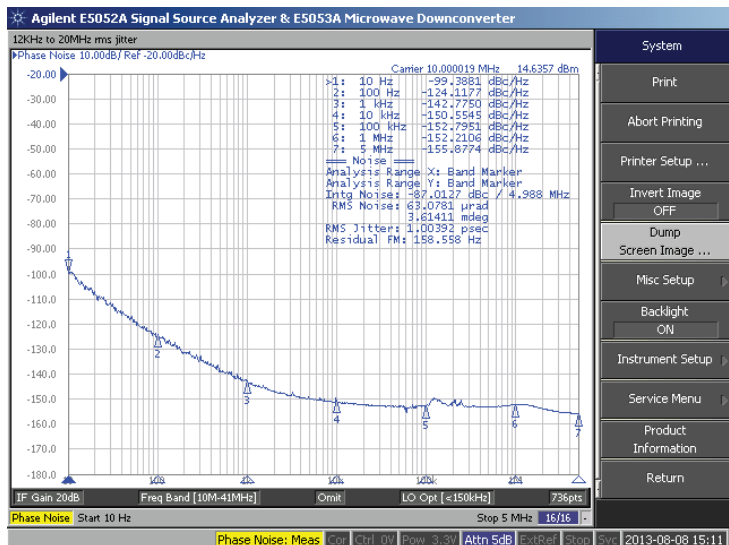
### FREQUENCY STABILITY VS. TEMPERATURE



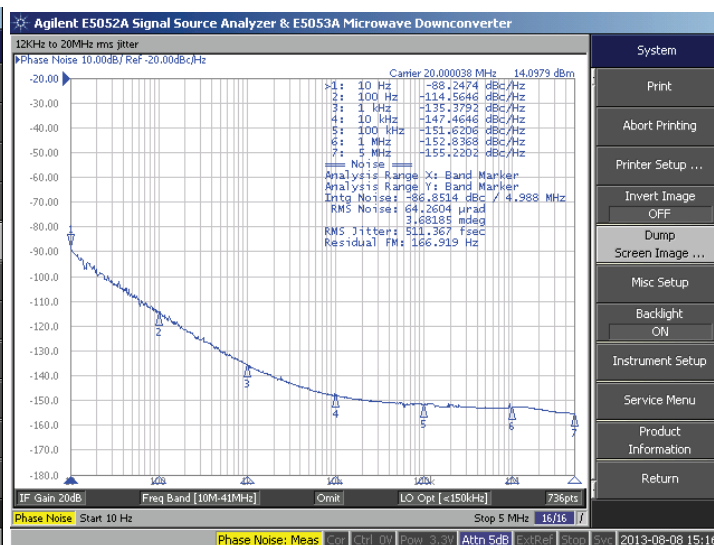


### TYPICAL PHASE NOISE

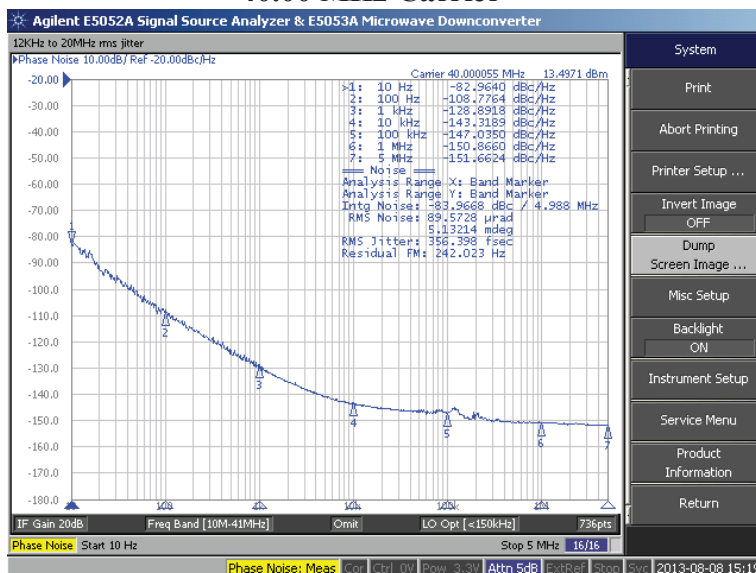
#### 10.00 MHz Carrier



#### 20.00 MHz Carrier



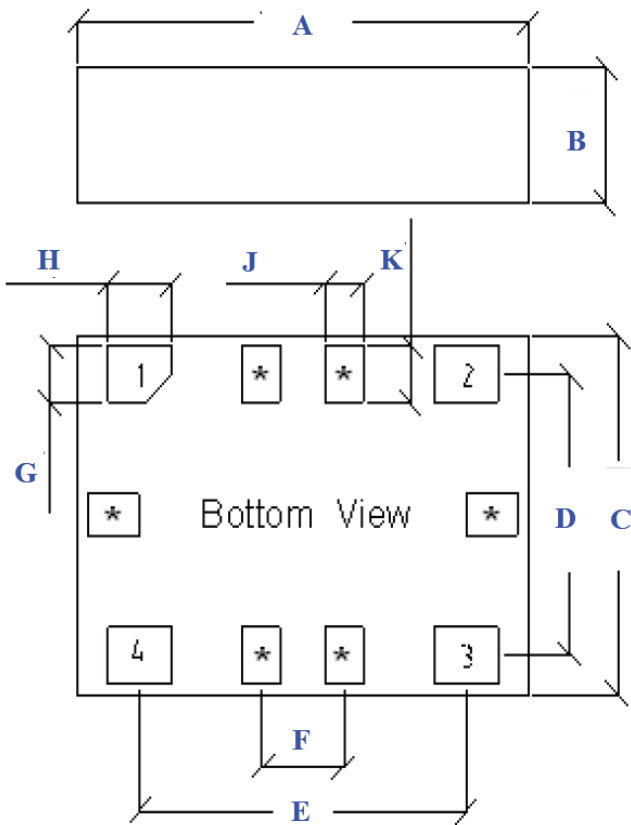
#### 40.00 MHz Carrier





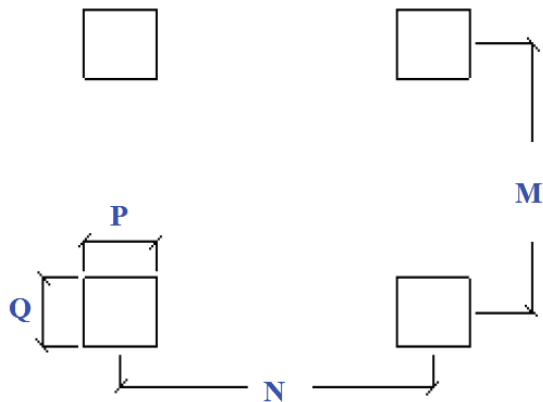
7.0 x 5.0 x 1.9mm

➤ **OUTLINE DIMENSION:**



| Letter | Dimension |
|--------|-----------|
| A      | 7.1±0.2   |
| B      | 1.9±0.2   |
| C      | 5.0±0.2   |
| D      | 3.90      |
| E      | 5.08      |
| F      | 1.27      |
| G      | 1.00      |
| H      | 1.50      |
| J      | 0.60      |
| K      | 1.00      |
| M      | 3.90      |
| N      | 5.08      |
| P      | 4-1.2     |
| Q      | 4-1.0     |

**Recommended Land Pattern**



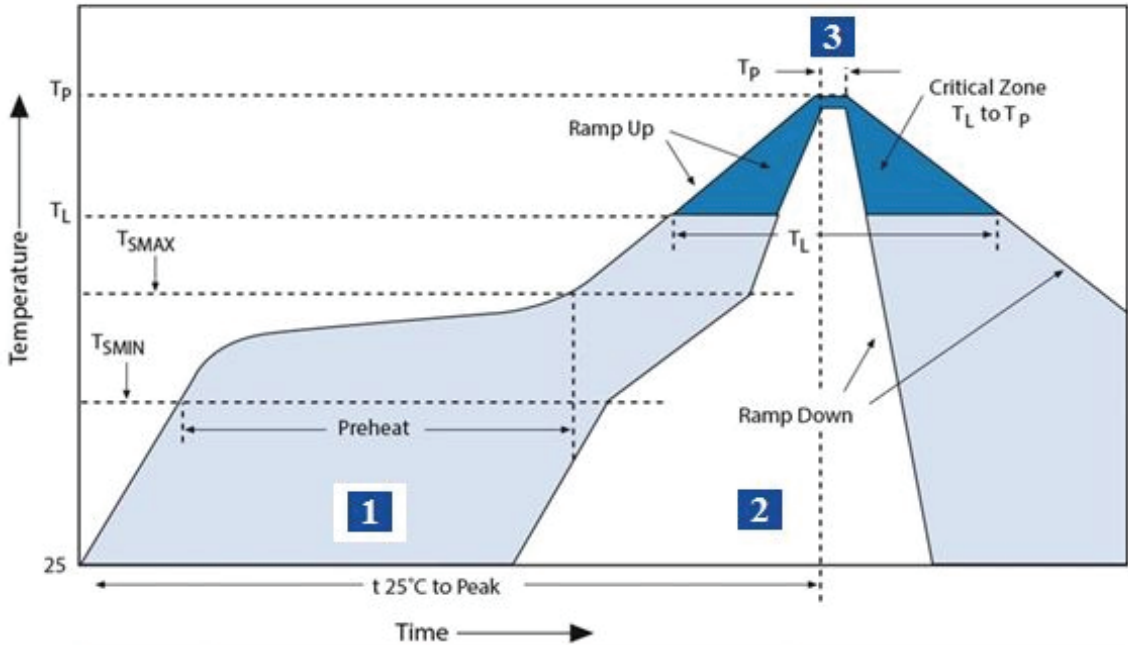
| Pin | Function              |
|-----|-----------------------|
| 1   | NC                    |
| 2   | GND                   |
| 3   | Output                |
| 4   | Vdd                   |
| *   | For factory test only |

**Dimensions: mm**



7.0 x 5.0 x 1.9mm

➤ REFLOW PROFILE:



| Zone | Description | Temperature                                     | Times         |
|------|-------------|-------------------------------------------------|---------------|
| 1    | Preheat     | $T_{S_{MIN}} \sim T_{S_{MAX}}$<br>150°C ~ 200°C | 60 ~ 120 sec. |
| 2    | Reflow      | $T_L$<br>220°C                                  | 60 ~ 150 sec. |
| 3    | Peak heat   | $T_P$<br>260°C                                  | 25 sec. MAX   |



7.0 x 5.0 x 1.9mm

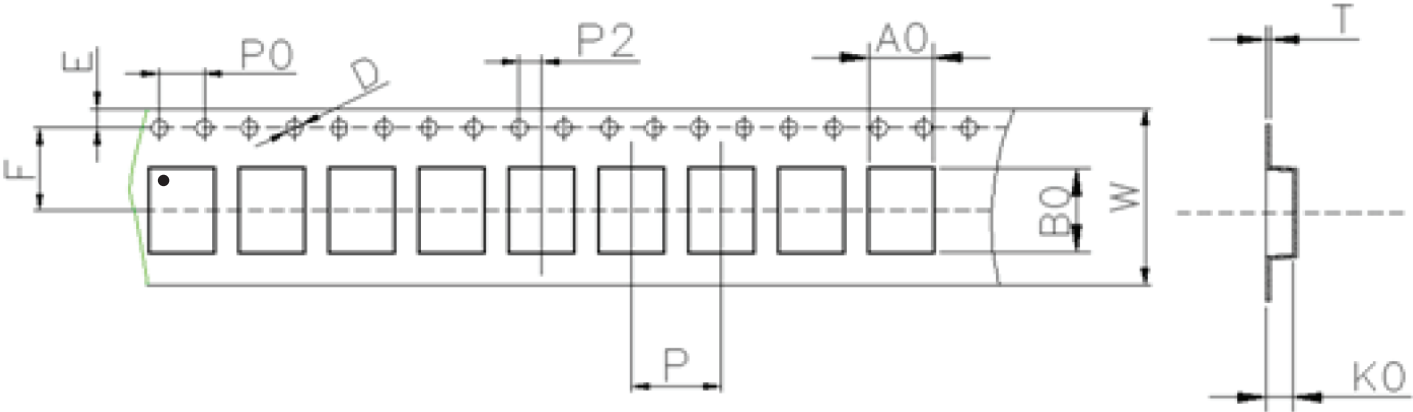
TAPE & REEL:

Packaging:

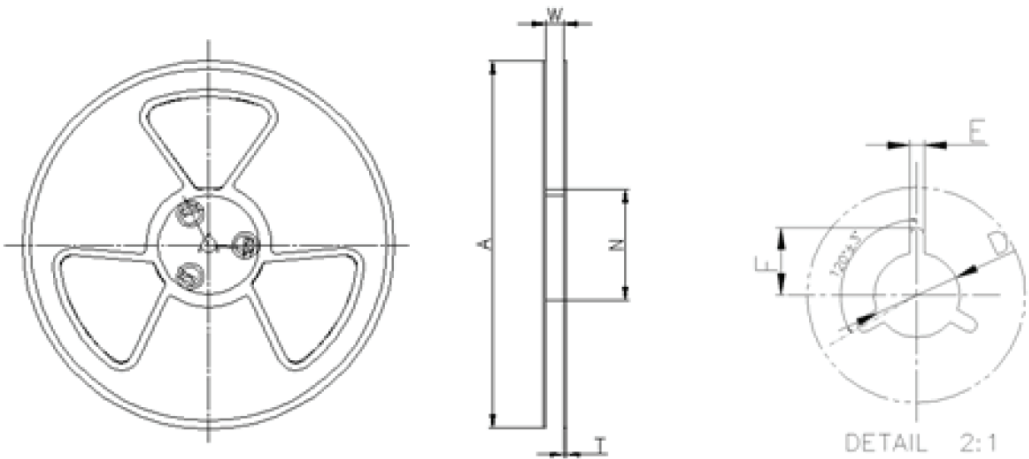
T: 500pcs/reel

T2: 2000pcs/reel

MSL-3 packaging applies to MOQ=25 units (cut tape) & T and T2.



| W        | A0           | B0       | K0       | P        | F       |
|----------|--------------|----------|----------|----------|---------|
| 16.0±0.3 | 5.7±0.15     | 7.6±0.15 | 2.4±0.15 | 8.0±0.1  | 7.5±0.1 |
| E        | D            | P0       | P2       | T        |         |
| 1.75±0.1 | 1.5+0.1/-0.0 | 4.0±0.1  | 2.0±0.1  | 0.3±0.05 |         |



| W        | A       | N       | T       | E       | F         | D             |
|----------|---------|---------|---------|---------|-----------|---------------|
| 16.5±0.4 | 330±0.5 | 100±0.3 | 1.8±0.2 | 2.1±0.3 | 10.75±0.3 | 13.5+0.5/-0.2 |

Dimensions: mm

**ATTENTION:** Abracon LLC products are COTS – Commercial-Off-The-Shelf products; suitable for Commercial, Industrial and, where designated, Automotive Applications. Abracon’s products are not specifically designed for Military, Aviation, Aerospace, Life-dependant Medical applications or any application requiring high reliability where component failure could result in loss of life and/or property. For applications requiring high reliability and/or presenting an extreme operating environment, written consent and authorization from Abracon LLC is required. Please contact Abracon LLC for more information.