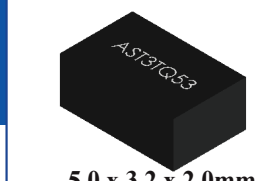
# Precision SMD TCXO/VCTCXO




5.0 x 3.2 x 2.0mm

**AST3TQ53**

ESD Sensitive

RoHS/RoHS II Compliant

**Moisture Sensitivity Level (MSL) – 3**

## FEATURES:

- Standard available frequencies: 10.00, 12.80, 16.384, 19.20, 19.44, 20.00, 24.576, 25.00, 26.00, 30.72, 40.00 MHz
- LVCMOS Output or Clippled Sine Wave output
- Frequency stabilities to include ±50ppb, ±100ppb and ±280ppb over -40ºC to +85ºC 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°C |
| Supply Voltage | -0.5 to 6V |
| Control Voltage | 0 to 3V |
| ESD, HBM/CDM/MM | 4kV/2kV/200V |

### Key Electrical Specifications

| Parameters | Minimum | Typical | Maximum | Units | Notes |
|---|---|---|---|---|---|
| Frequency Range | 10 | | 40 | MHz | |
| Standard Frequencies | 10.00, 12.80, 16.384, 19.20, 19.44, 20.00, 24.576, 25.00, 26.00, 30.72, 40.00 | | | MHz | |
| Initial Frequency Tolerance (@+25°C) at shipping | | | ±0.5 | ppm | Relative to carrier |
| **Frequency Stability Options (Ref. to Frequency @+25°C)** | | | | | |
| -40°C to +85°C | | | ±50 | ppb | Option "5" |
| -40°C to +85°C | | | ±100 | ppb | Option "1" |
| -40°C to +85°C | | | ±280 | ppb | Option "2" |
| Frequency Stability vs. Supply Voltage Change (Vdd±5%) | | | ±100 | ppb | |
| Frequency Stability vs. Load Change (Load±5%) | | | ±200 | ppb | |
| Aging (first year @+25°C) | | | ±1.0 | ppm | |
| Aging (20 years @+25°C) | | ±3.0 | ±4.6 | ppm | |
| Supply Voltage (Vdd) | +3.135 | +3.3 | +3.465 | V | |
| Supply Current (Icc) | | | 6.0 | mA | No load |
| **Control Port ( *Applicable for VCTCXO only*)** | | | | | |
| Control Voltage Range (Vc) | +0.5 | +1.5 | +2.5 | V | |
| Center Control Voltage (Vc) | | +1.5 | | V | To be with-in ±500 ppb of Fc @ 25°C (at shipping) |
| Frequency Tuning Range | ±5 | ±7 | <±13 | ppm | |
| Tuning Slope | | Positive | | | |
| Linearity | | | ±1 | % | |
| Port Impedance | 100 | | | kΩ | |



2 Faraday, Suite# B | Irvine | CA 92618 **Revised: 04.02.15**
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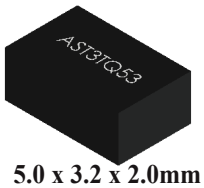


5.0 x 3.2 x 2.0mm

## STANDARD SPECIFICATIONS:

**(Continued)**

| Parameters | Minimum | Typical | Maximum | Unites | Notes |
|---|---|---|---|---|---|
| Phase Noise (10MHz carrier frequency @25℃): | | | -95 | dBc/Hz | Offset @10Hz |
| | | | -120 | | Offset @100Hz |
| | | | -140 | | Offset @1kHz |
| | | | -145 | | Offset @10kHz |
| | | | -150 | | Offset @100kHz |
| RMS Jitter (@12kHz~5MHz BW) | 0.4 | | 1.3 | ps | Carrier Dependent |
| **Clipped Sine Wave** | | | | | |
| Output Level | 0.8 | | | Vp-p | |
| Output Load | | 10kΩ//10pF | | | |
| **LVCMOS Output (Square Wave)** | | | | | |
| $V_{OH}$ | 2.4 | | | V | Output Load=15pF |
| $V_{OL}$ | | | 0.4 | V | Output Load=15pF |
| Output Load | | | 15 | pF | |
| Duty Cycle | 45 | | 55 | % | @( $V_{OH}$ - $V_{OL}$)/2 |
| Rise/Fall Time | | | 6 | ns | Output Load=15pF |

## PART IDENTIFICATION:

AST3TQ53 - ☐ - ☐☐☐☐☐☐ MHz - ☐ - ☐ - ☐

| Pullability |
|---|
| T = TCXO |
| V = VCTCXO |

| Frequency in MHz |
|---|
| Please specify the frequency in MHz. e.g. 19.200MHz |

| Freq. Stability over Operating Temp. |
|---|
| 5: ±50ppb |
| 1: ±100ppb |
| 2: ±280ppb |

| Output Type |
|---|
| C: LVCMOS |
| SW: Clipped Sine Wave |

| Packaging |
|---|
| Blank: Bulk |
| T5: 500pcs/reel |
| T2: 2000pcs/reel |

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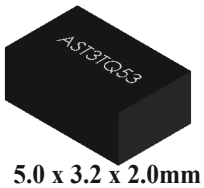
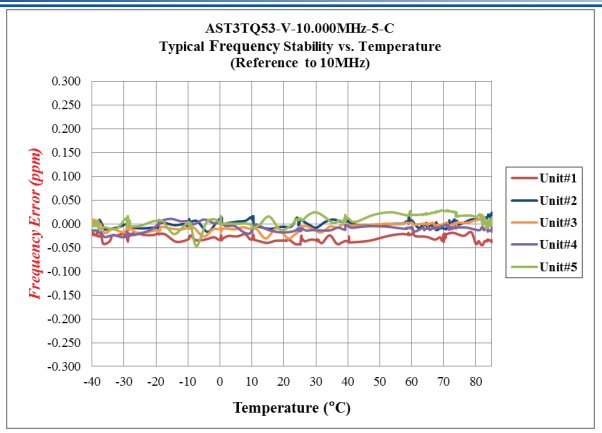
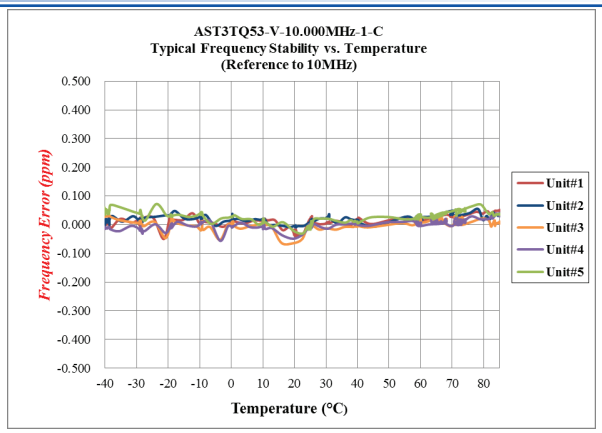
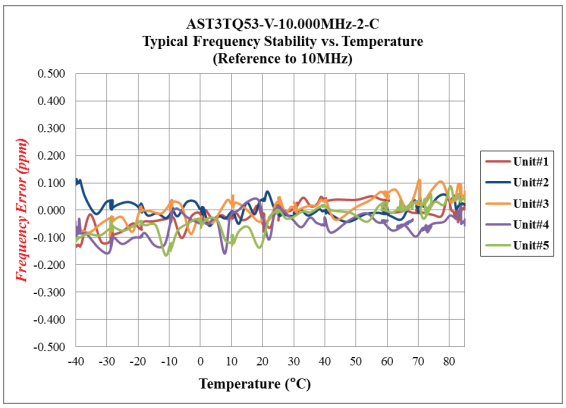



5.0 x 3.2 x 2.0mm

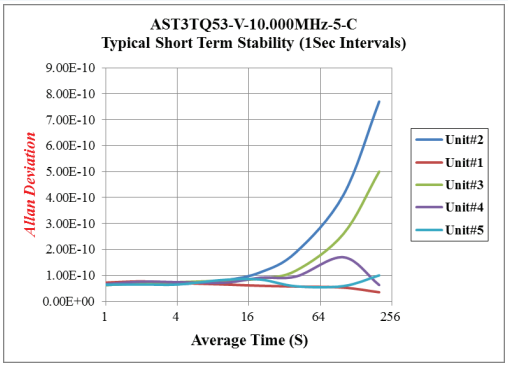
## TYPICAL FREQUENCY STABILITY VS. TEMPERATURE

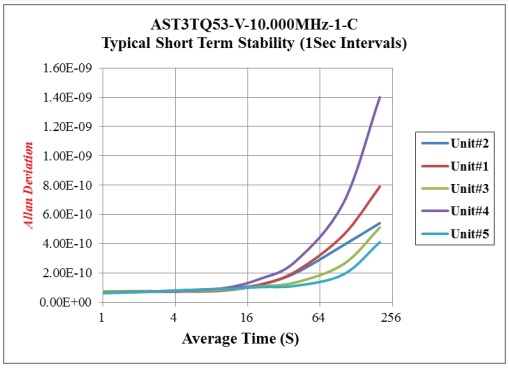


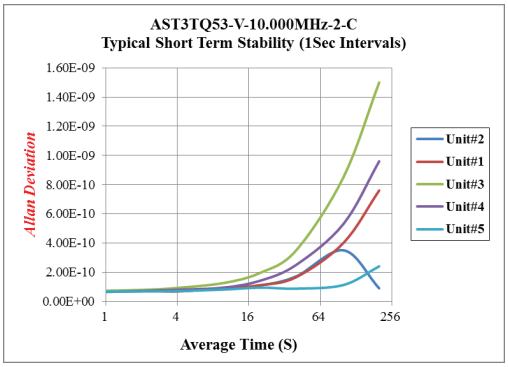




## TYPICAL SHORT TERM STABILITY



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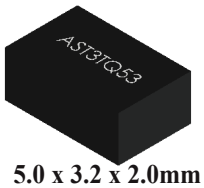
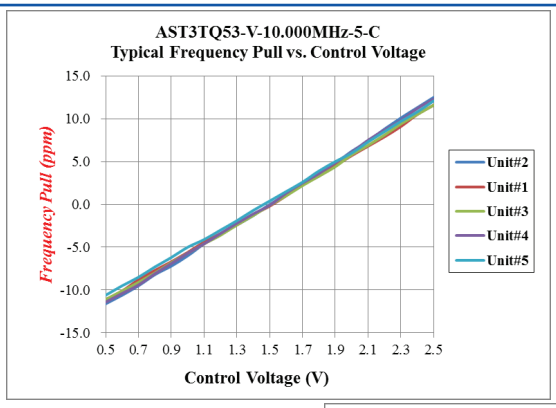
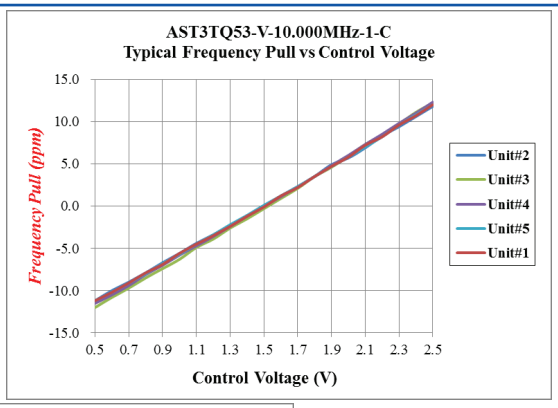
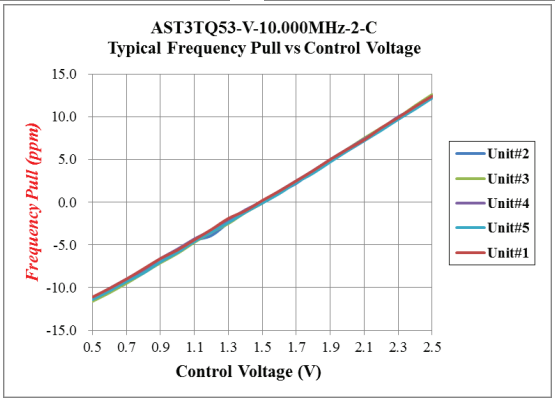



5.0 x 3.2 x 2.0mm

## TYPICAL FREQUENCY PULL VS. CONTROL VOLTAGE

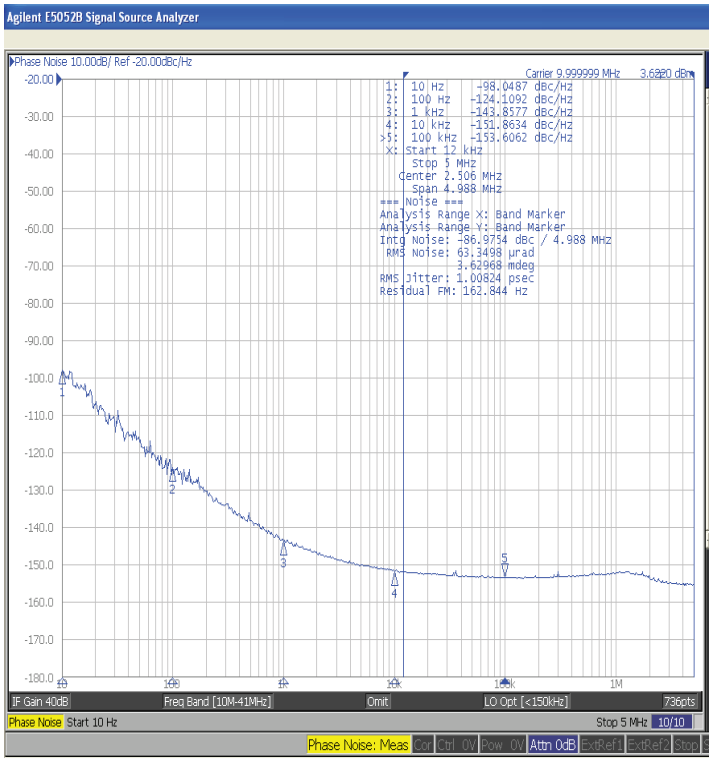



## TYPICAL PHASE NOISE

**10.00 MHz Carrier**



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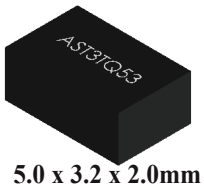
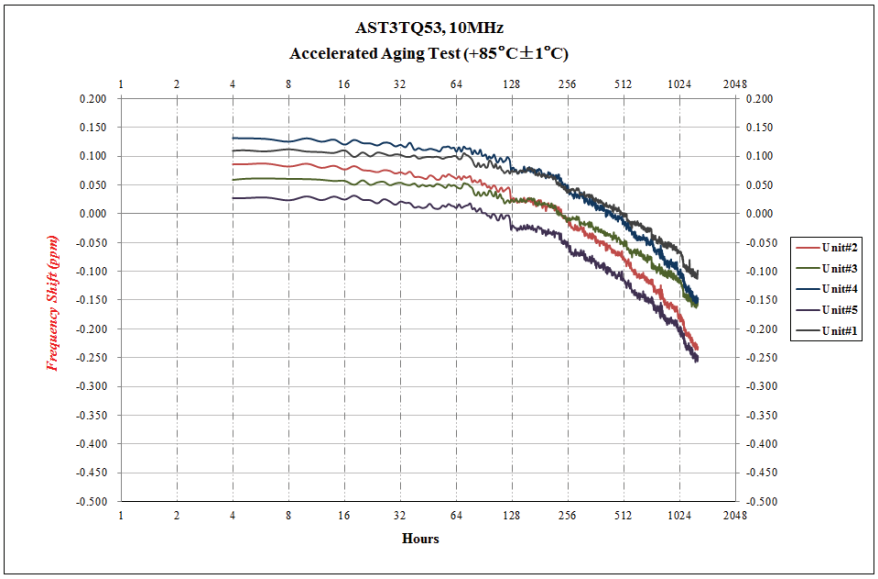



5.0 x 3.2 x 2.0mm

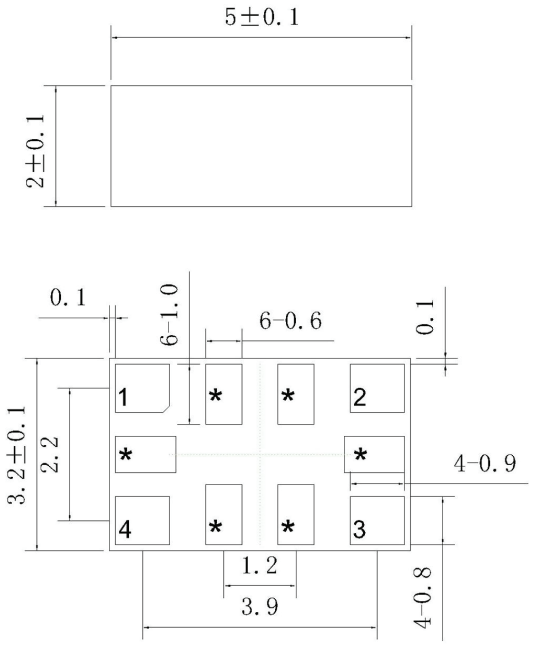
## TYPICAL AGING:



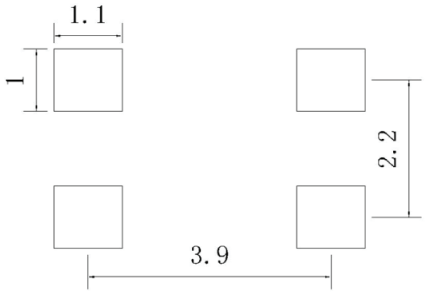

| Aging Test Conditions | |
|---|---|
| Series | AST3TQ53 |
| Frequency | 10MHz |
| Acquisition Mode | Cycle |
| Acquisition Time | 1129 hours |
| Test Temperature | +85°C ± 1°C |
| Number of Samples | 5pcs |

| Aging Data | | | |
|---|---|---|---|
| No. | Aging Time (hrs) | Aging/Day (ppm) | Projected Aging/year (ppm) |
| #1 | 1129 | -0.0039 | -0.3896 |
| #2 | 1129 | -0.0059 | -0.5925 |
| #3 | 1129 | -0.0042 | -0.4202 |
| #4 | 1129 | -0.0056 | -0.5555 |
| #5 | 1129 | -0.0055 | -0.5492 |

## OUTLINE DIMENSION:




Recommended Land Pattern




| Pin | Function |
|---|---|
| 1 | NC *(for TCXO)*<br>Vc (*for VCTCXO*) |
| 2 | GND |
| 3 | Output |
| 4 | Vdd |
| * | For factory test only |

**Dimensions: mm**

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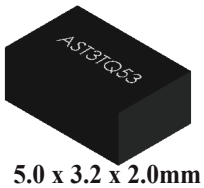


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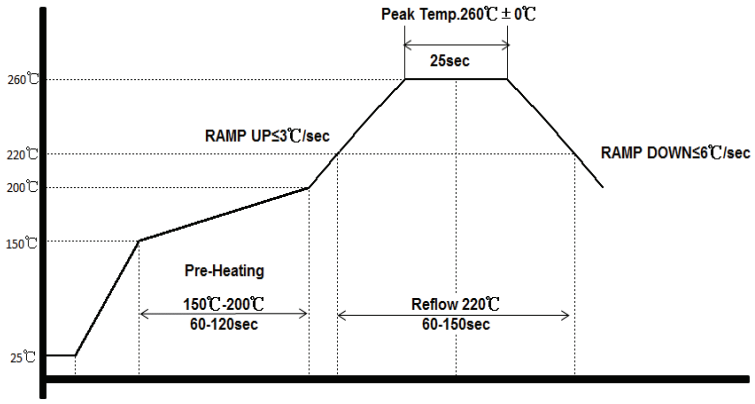
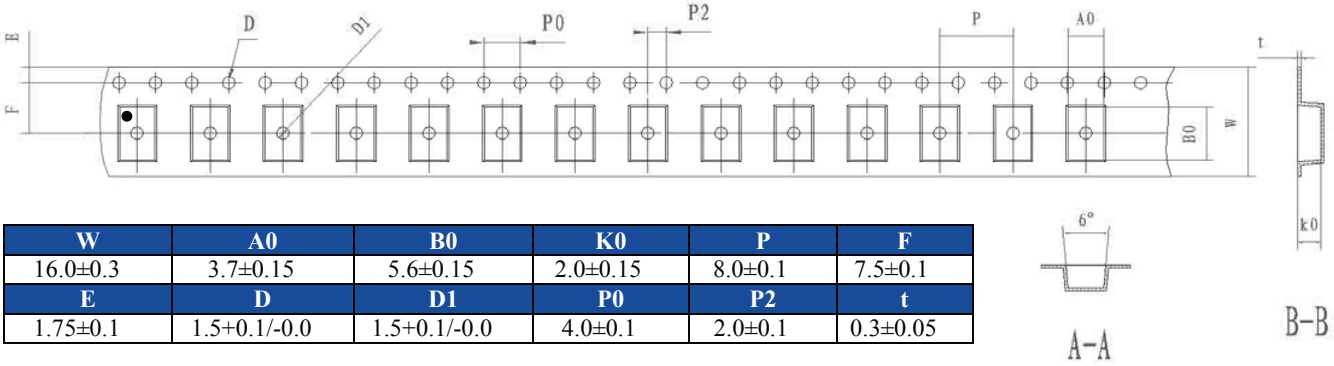
## REFLOW PROFILE:



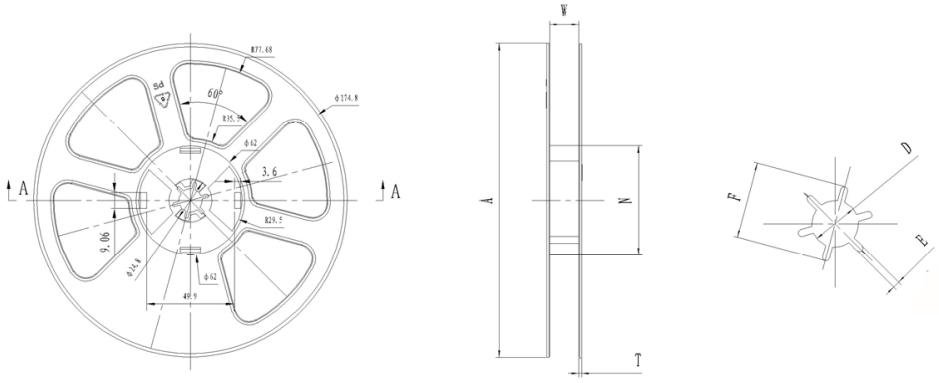

## TAPE & REEL:

**T5: 500pcs/reel; T2: 2000pcs/reel**

**MSL-3 packaging applies to MOQ=25 units (cut tape), T5 & T2.**




| W | A0 | B0 | K0 | P | F |
|---|---|---|---|---|---|
| 16.0±0.3 | 3.7±0.15 | 5.6±0.15 | 2.0±0.15 | 8.0±0.1 | 7.5±0.1 |
| **E** | **D** | **D1** | **P0** | **P2** | **t** |
| 1.75±0.1 | 1.5+0.1/-0.0 | 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 |
|---|---|---|---|---|---|---|
| 16.4±0.3 | 178±0.5 | 62±0.4 | 1.8±0.2 | 2.0±0.5 | 21.8±0.8 | 13.5±0.3 |

**Dimensions: mm**

**ATTENTION:** Abracon Corporation's 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 Corporation is required. Please contact Abracon Corporation for more information.

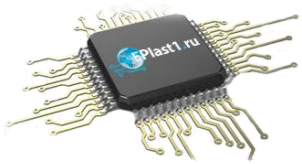
Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.




**Как с нами связаться**

**Телефон:** 8 (812) 309 58 32 (многоканальный)
**Факс:** 8 (812) 320-02-42
**Электронная почта:** org@eplast1.ru
**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.