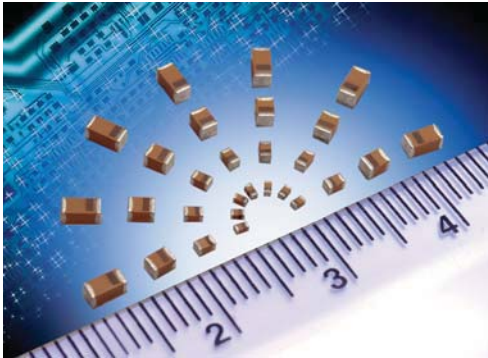


Standard Microchip



- The world's smallest surface mount tantalum capacitor
- CV range: 0.10-150µF / 2-25V
- 5 case sizes available
- Low profile options available
- Industrial and hi-rel medical applications



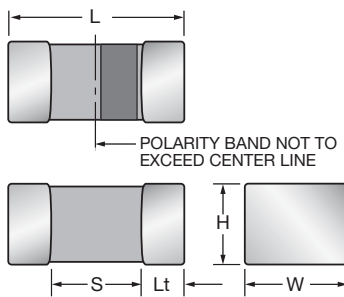
LEAD-FREE

LEAD-FREE COMPATIBLE COMPONENT



RoHS COMPLIANT

CASE DIMENSIONS: millimeters (inches)



| Code | EIA Code | EIA Metric | Length (L) | Width (W) | Height (H) | Termination Spacing(S) | Minimum Termination Length (Lt) | Average Mass |
|------|----------|------------|---|---|---|---------------------------|---------------------------------|--------------|
| A | 1206 | 3216-18 | 3.20±0.20 (0.126±0.008) | 1.60±0.20 (0.063±0.008) | 1.60±0.20 (0.063±0.008) | 1.80 min. (0.071 min.) | 0.15 (0.006) | 44.6mg |
| B | 1210 | 3528-15 | 3.50 ^{+0.20} _{-0.20} ^{+0.008} _{-0.008} (0.138 -0.008) | 2.80 ^{+0.20} _{-0.10} ^{+0.008} _{-0.004} (0.110 -0.004) | 1.50 max. | 2.00 min. | 0.15 min. | 90.0mg |
| K | 0402 | 1005-07 | 1.00 ^{+0.20} _{-0.00} ^{+0.008} _{-0.000} (0.039 -0.000) | 0.50 ^{+0.20} _{-0.00} ^{+0.008} _{-0.000} (0.020 -0.000) | 0.50 ^{+0.20} _{-0.00} ^{+0.008} _{-0.000} (0.020 -0.000) | 0.40 min. (0.016 min.) | 0.10 (0.004) | 2.8mg |
| L | 0603 | 1608-10 | 1.60 ^{+0.20} _{-0.00} ^{+0.008} _{-0.000} (0.063 -0.000) | 0.85 ^{+0.15} _{-0.00} ^{+0.006} _{-0.000} (0.033 -0.000) | 0.85 ^{+0.15} _{-0.00} ^{+0.006} _{-0.000} (0.033 -0.000) | 0.55 min. (0.022 min.) | 0.15 (0.006) | 8.6mg |
| R | 0805 | 2012-15 | 2.00 ^{+0.20} _{-0.00} ^{+0.008} _{-0.000} (0.079 -0.000) | 1.35 ^{+0.15} _{-0.00} ^{+0.006} _{-0.000} (0.053 -0.000) | 1.35 ^{+0.15} _{-0.00} ^{+0.006} _{-0.000} (0.053 -0.000) | 0.70 min. (0.027 min.) | 0.15 (0.006) | 29.9mg |

HOW TO ORDER

| | | | | | | |
|------------------------------|-------------------------------------|---|--------------------------------------|---|--|--|
| TAC | L | 226 | M | 004 | R | TA |
| Type TACmicrochip® | Case Size See table above | Capacitance Code pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow) | Tolerance K=±10% M=±20% | Rated DC Voltage 002=2Vdc 003=3Vdc 004=4Vdc 006=6.3Vdc 010=10Vdc 016=16Vdc 020=20Vdc 025=25Vdc 035=35Vdc 050=50Vdc | Packaging R, P = 7" Standard Tin Termination Plastic Tape X, Q = 4 1/4" Standard Tin Termination Plastic Tape A = 7" Gold Termination Plastic Tape F = 4 1/4" Gold Termination Plastic Tape | Alternative characters may be used for special requirements |

TECHNICAL SPECIFICATIONS

| | | | | | | | | | | | |
|------------------------------------|--|-----|-----|-----|-----|----|----|----|----|----|----|
| Technical Data: | All technical data relate to an ambient temperature of +25°C | | | | | | | | | | |
| Capacitance Range: | 0.10 µF to 150 µF | | | | | | | | | | |
| Capacitance Tolerance: | ±10%; ±20% | | | | | | | | | | |
| Leakage Current DCL: | 0.01CV or 0.5µA whichever is the greater | | | | | | | | | | |
| Rated Voltage (V _R) | ≤ +85°C: | 2 | 3 | 4 | 6.3 | 10 | 16 | 20 | 25 | 35 | 50 |
| Category Voltage (V _C) | ≤ +125°C: | 1.3 | 2 | 2.7 | 4 | 7 | 10 | 13 | 17 | 23 | 33 |
| Surge Voltage (V _S) | ≤ +85°C: | 2.7 | 3.9 | 5.2 | 8 | 13 | 20 | 26 | 32 | 46 | 65 |
| Surge Voltage (V _S) | ≤ +125°C: | 1.7 | 2.6 | 3.2 | 5 | 8 | 12 | 16 | 20 | 28 | 40 |
| Temperature Range: | -55°C to +125°C | | | | | | | | | | |
| Reliability: | 1% per 1000 hours at 85°C, V _R with 0.1Ω/V series impedance, 60% confidence level | | | | | | | | | | |
| Termination Finish: | Nickel and Tin Plating (standard), Nickel and Gold Plating option available upon request | | | | | | | | | | |

Standard Microchip

STANDARD COMMERCIAL RANGE (EIA SIZES) (LETTER DENOTES CASE SIZE)

| Capacitance | | Voltage Rating DC (V _R) at 85°C | | | | | | | | | |
|-------------|------|---|------------------------------------|------------------------------------|---------------------|--|---|------------------|-----|-----|-----|
| µF | Code | 2.0V | 3.0V | 4.0V | 6.3V | 10V | 16V | 20V | 25V | 35V | 50V |
| 0.10 | 104 | | | | | | K ^(M) | K* | | L* | |
| 0.15 | 154 | | | | | | K ^(M) | | | L* | |
| 0.22 | 224 | | | | | | K ^(M) | | | L* | |
| 0.33 | 334 | | | | | | K ^(M) | | | | |
| 0.47 | 474 | | | | | | K(15) ^(M) /K(25) ^(M) /L | | | | |
| 0.68 | 684 | | | | | | K ^(M) /L | | | | |
| 1.0 | 105 | | | | K/L | K/L | L | | R | | A* |
| 1.5 | 155 | | | L | L | L | L | | | | |
| 2.2 | 225 | | K ^(M) /L | L | K ^(M) /L | L | L | | | | |
| 3.3 | 335 | K ^(M) /L | K ^(M) /L | L | L | L/R | R* | R ^(M) | | | |
| 4.7 | 475 | K ^(M) /L | K ^(M) /L | L | L | L/R | | R ^(M) | A* | | |
| 6.8 | 685 | K ^(M) /L | L | L | L/R | L/R | | | | | |
| 10 | 106 | K ^(M) /L | L | L/R | L ^(M) /R | L/R | R | | | | |
| 15 | 156 | | R | L ^(M) /R | L ^(M) /R | R | | | | | |
| 22 | 226 | R | L ^(M) /R | L ^(M) /R | R | R | | | | | |
| 33 | 336 | R | R | R | R | A ^(M) /B ^(M) /R ^(M) | | | | | |
| 47 | 476 | R | R | R | R | B | | | | | |
| 68 | 686 | R ^(M) | R ^(M) | A ^(M) | A ^{(M)*} | | | | | | |
| 100 | 107 | | A ^(M) /R ^(M) | A ^(M) /R ^(M) | A ^(M) | | | | | | |
| 150 | 157 | A ^(M) | | | | | | | | | |
| 220 | 227 | | | | | | | | | | |

ESR limits quoted in brackets (Ohms)

Released codes ^(M tolerance only)

Engineering samples - please contact manufacturer

*Codes under development - subject to change.

Standard Height Profile: A, B, K, L, R Case

Low Profile: H, J, T, U, V Case

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

RATINGS & PART NUMBER REFERENCE

| AVX Part No. | EIA Code | EIA Metric | Case Size | Cap (µF) | Rated Voltage (V) | DCL (µA) Max. | DF % Max. | ESR Max. (Ω) @100kHz | MSL |
|---|----------|------------|-----------|----------|-------------------|---------------|-----------|----------------------|-----|
| 2 Volt @ 85°C (1.3 Volt @ 125°C) | | | | | | | | | |
| TACK335M002#TA | 0402 | 1005-07 | K | 3.3 | 2 | 0.5 | 8 | 15 | 1 |
| TACL335*002#TA | 0603 | 1608-10 | L | 3.3 | 2 | 0.5 | 6 | 7.5 | 1 |
| TACK475M002#TA | 0402 | 1005-07 | K | 4.7 | 2 | 0.5 | 12 | 15 | 1 |
| TACL475*002#TA | 0603 | 1608-10 | L | 4.7 | 2 | 0.5 | 6 | 7.5 | 1 |
| TACK685M002#TA | 0402 | 1005-07 | K | 6.8 | 2 | 0.5 | 20 | 15 | 1 |
| TACL685*002#TA | 0603 | 1608-10 | L | 6.8 | 2 | 0.5 | 6 | 7.5 | 1 |
| TACK106M002#TA | 0402 | 1005-07 | K | 10 | 2 | 0.5 | 15 | 15 | 1 |
| TACL106*002#TA | 0603 | 1608-10 | L | 10 | 2 | 0.5 | 10 | 7.5 | 1 |
| TACK226*002#TA | 0805 | 2012-15 | R | 22 | 2 | 0.5 | 8 | 5 | 1 |
| TACR336*002#TA | 0805 | 2012-15 | R | 33 | 2 | 0.7 | 10 | 5 | 1 |
| TACR476*002#TA | 0805 | 2012-15 | R | 47 | 2 | 0.9 | 10 | 5 | 1 |
| TACR686M002#TA | 0805 | 2012-15 | R | 68 | 2 | 1.4 | 14 | 5 | 1 |
| TACA157M002#TA | 1206 | 3216-18 | A | 150 | 2 | 3 | 20 | 1 | 1 |
| 3 Volt @ 85°C (2 Volt @ 125°C) | | | | | | | | | |
| TACK225M003#TA | 0402 | 1005-07 | K | 2.2 | 3 | 0.5 | 6 | 15 | 1 |
| TACL225*003#TA | 0603 | 1608-10 | L | 2.2 | 3 | 0.5 | 6 | 7.5 | 1 |
| TACK335M003#TA | 0402 | 1005-07 | K | 3.3 | 3 | 0.5 | 8 | 15 | 1 |
| TACL335*003#TA | 0603 | 1608-10 | L | 3.3 | 3 | 0.5 | 6 | 7.5 | 1 |
| TACK475M003#TA | 0402 | 1005-07 | K | 4.7 | 3 | 0.5 | 12 | 15 | 1 |
| TACL475*003#TA | 0603 | 1608-10 | L | 4.7 | 3 | 0.5 | 6 | 7.5 | 1 |
| TACK685*003#TA | 0603 | 1608-10 | L | 6.8 | 3 | 0.5 | 6 | 7.5 | 1 |
| TACL106*003#TA | 0603 | 1608-10 | L | 10 | 3 | 0.5 | 10 | 7.5 | 1 |
| TACR156*003#TA | 0805 | 2012-15 | R | 15 | 3 | 0.5 | 8 | 5 | 1 |
| TACK226M003#TA | 0603 | 1608-10 | L | 22 | 3 | 0.7 | 20 | 7.5 | 1 |
| TACR226*003#TA | 0805 | 2012-15 | R | 22 | 3 | 0.7 | 8 | 5 | 1 |
| TACR336*003#TA | 0805 | 2012-15 | R | 33 | 3 | 1 | 10 | 5 | 1 |
| TACR476*003#TA | 0805 | 2012-15 | R | 47 | 3 | 1.5 | 10 | 5 | 1 |
| TACR686M003#TA | 0805 | 2012-15 | R | 68 | 3 | 2 | 14 | 5 | 1 |
| TACA107M003#TA | 1206 | 3216-18 | A | 100 | 3 | 3 | 15 | 1 | 1 |
| TACR107M003#TA | 0805 | 2012-15 | R | 100 | 3 | 3 | 30 | 5 | 1 |
| 4 Volt @ 85°C (2.7 Volt @ 125°C) | | | | | | | | | |
| TACL155*004#TA | 0603 | 1608-10 | L | 1.5 | 4 | 0.5 | 6 | 7.5 | 1 |
| TACL225*004#TA | 0603 | 1608-10 | L | 2.2 | 4 | 0.5 | 6 | 7.5 | 1 |
| TACL335*004#TA | 0603 | 1608-10 | L | 3.3 | 4 | 0.5 | 6 | 7.5 | 1 |
| TACL475*004#TA | 0603 | 1608-10 | L | 4.7 | 4 | 0.5 | 6 | 7.5 | 1 |
| TACL685*004#TA | 0603 | 1608-10 | L | 6.8 | 4 | 0.5 | 8 | 7.5 | 1 |
| TACL106*004#TA | 0603 | 1608-10 | L | 10 | 4 | 0.5 | 10 | 7.5 | 1 |
| TACR106*004#TA | 0805 | 2012-15 | R | 10 | 4 | 0.5 | 8 | 5 | 1 |
| TACL156M004#TA | 0603 | 1608-10 | L | 15 | 4 | 0.6 | 20 | 7.5 | 1 |
| TACR156*004#TA | 0805 | 2012-15 | R | 15 | 4 | 0.6 | 8 | 5 | 1 |
| TACL226M004#TA | 0603 | 1608-10 | L | 22 | 4 | 0.9 | 20 | 7.5 | 1 |
| TACR226*004#TA | 0805 | 2012-15 | R | 22 | 4 | 0.9 | 8 | 5 | 1 |
| TACR336*004#TA | 0805 | 2012-15 | R | 33 | 4 | 1.3 | 10 | 5 | 1 |
| TACR476*004#TA | 0805 | 2012-15 | R | 47 | 4 | 1.9 | 14 | 5 | 1 |
| TACA686M004#TA | 1206 | 3216-18 | A | 68 | 4 | 2.7 | 15 | 1 | 1 |
| TACA107M004#TA | 1206 | 3216-18 | A | 100 | 4 | 4 | 20 | 1 | 1 |
| TACR107M004#TA | 0805 | 2012-15 | R | 100 | 4 | 4 | 30 | 5 | 1 |
| 6.3 Volt @ 85°C (4 Volt @ 125°C) | | | | | | | | | |
| TACK105*006#TA | 0402 | 1005-07 | K | 1 | 6.3 | 0.5 | 6 | 15 | 1 |
| TACL105*006#TA | 0603 | 1608-10 | L | 1 | 6.3 | 0.5 | 6 | 7.5 | 1 |
| TACL155*006#TA | 0603 | 1608-10 | L | 1.5 | 6.3 | 0.5 | 6 | 7.5 | 1 |
| TACK225M006#TA | 0402 | 1005-07 | K | 2.2 | 6.3 | 0.5 | 8 | 15 | 1 |
| TACL225*006#TA | 0603 | 1608-10 | L | 2.2 | 6.3 | 0.5 | 6 | 7.5 | 1 |
| TACL335*006#TA | 0603 | 1608-10 | L | 3.3 | 6.3 | 0.5 | 6 | 7.5 | 1 |
| TACL475*006#TA | 0603 | 1608-10 | L | 4.7 | 6.3 | 0.5 | 8 | 7.5 | 1 |
| TACL685*006#TA | 0603 | 1608-10 | L | 6.8 | 6.3 | 0.5 | 10 | 7.5 | 1 |
| TACR685*006#TA | 0805 | 2012-15 | R | 6.8 | 6.3 | 0.5 | 8 | 5 | 1 |

| AVX Part No. | EIA Code | EIA Metric | Case Size | Cap (µF) | Rated Voltage (V) | DCL (µA) Max. | DF % Max. | ESR Max. (Ω) @100kHz | MSL |
|---|----------|------------|-----------|----------|-------------------|---------------|-----------|----------------------|-----|
| TACL106M006#TA | 0603 | 1608-10 | L | 10 | 6.3 | 0.6 | 10 | 6 | 1 |
| TACR106*006#TA | 0805 | 2012-15 | R | 10 | 6.3 | 0.6 | 8 | 5 | 1 |
| TACL156M006#TA | 0603 | 1608-10 | L | 15 | 6.3 | 0.9 | 20 | 7.5 | 1 |
| TACR156*006#TA | 0805 | 2012-15 | R | 15 | 6.3 | 0.9 | 8 | 5 | 1 |
| TACR226*006#TA | 0805 | 2012-15 | R | 22 | 6.3 | 1.4 | 10 | 5 | 1 |
| TACR336*006#TA | 0805 | 2012-15 | R | 33 | 6.3 | 2.1 | 12 | 5 | 1 |
| TACA476*006#TA | 1206 | 3216-18 | A | 47 | 6.3 | 3 | 15 | 1 | 1 |
| TACR476M006#TA | 0805 | 2012-15 | R | 47 | 6.3 | 3 | 20 | 5 | 1 |
| TACA686M006#TA | 1206 | 3216-18 | A | 68 | 6.3 | 4.3 | 15 | 1 | 1 |
| TACA107M006#TA | 1206 | 3216-18 | A | 100 | 6.3 | 6.3 | 20 | 1 | 1 |
| 10 Volt @ 85°C (7 Volt @ 125°C) | | | | | | | | | |
| TACK154M010#TA | 0402 | 1005-07 | K | 0.15 | 10 | 0.5 | 6 | 40 | 1 |
| TACK224M010#TA | 0402 | 1005-07 | K | 0.22 | 10 | 0.5 | 6 | 30 | 1 |
| TACK334M010#TA | 0402 | 1005-07 | K | 0.33 | 10 | 0.5 | 6 | 20 | 1 |
| TACK474M010#TA | 0402 | 1005-07 | K | 0.47 | 10 | 0.5 | 6 | 15 | 1 |
| TACK474M010#FM | 0402 | 1005-07 | K | 0.47 | 10 | 0.5 | 6 | 25 | 1 |
| TACL474*010#TA | 0603 | 1608-10 | L | 0.47 | 10 | 0.5 | 6 | 7.5 | 1 |
| TACK684M010#TA | 0402 | 1005-07 | K | 0.68 | 10 | 0.5 | 8 | 15 | 1 |
| TACL684*010#TA | 0603 | 1608-10 | L | 0.68 | 10 | 0.5 | 6 | 7.5 | 1 |
| TACK105*010#TA | 0402 | 1005-07 | K | 1 | 10 | 0.5 | 6 | 15 | 1 |
| TACL105*010#TA | 0603 | 1608-10 | L | 1 | 10 | 0.5 | 6 | 7.5 | 1 |
| TACL155*010#TA | 0603 | 1608-10 | L | 1.5 | 10 | 0.5 | 6 | 7.5 | 1 |
| TACL225*010#TA | 0603 | 1608-10 | L | 2.2 | 10 | 0.5 | 6 | 7.5 | 1 |
| TACL335*010#TA | 0603 | 1608-10 | L | 3.3 | 10 | 0.5 | 8 | 7.5 | 1 |
| TACR335*010#TA | 0805 | 2012-15 | R | 3.3 | 10 | 0.5 | 8 | 5 | 1 |
| TACL475*010#TA | 0603 | 1608-10 | L | 4.7 | 10 | 0.5 | 10 | 6 | 1 |
| TACR475*010#TA | 0805 | 2012-15 | R | 4.7 | 10 | 0.5 | 8 | 6 | 1 |
| TACL685*010#TA | 0603 | 1608-10 | L | 6.8 | 10 | 0.7 | 20 | 7.5 | 1 |
| TACR685*010#TA | 0805 | 2012-15 | R | 6.8 | 10 | 0.7 | 8 | 5 | 1 |
| TACL106*010#TA | 0603 | 1608-10 | L | 10 | 10 | 1 | 20 | 7.5 | 1 |
| TACR106*010#TA | 0805 | 2012-15 | R | 10 | 10 | 1 | 8 | 5 | 1 |
| TACR156*010#TA | 0805 | 2012-15 | R | 15 | 10 | 1.5 | 10 | 5 | 1 |
| TACR226*010#TA | 0805 | 2012-15 | R | 22 | 10 | 2.2 | 14 | 5 | 1 |
| TACA336*010#TA | 1206 | 3216-18 | A | 33 | 10 | 3.3 | 12 | 1 | 1 |
| TACB336*010#TA | 1210 | 3528-15 | B | 33 | 10 | 3.3 | 15 | 1 | 1 |
| TACR336M010#TA | 0805 | 2012-15 | R | 33 | 10 | 3.3 | 20 | 5 | 1 |
| TACB476*010#TA | 1210 | 3528-15 | B | 47 | 10 | 4.7 | 15 | 1 | 1 |
| 16 Volt @ 85°C (10 Volt @ 125°C) | | | | | | | | | |
| TACK104M016#TA | 0402 | 1005-07 | K | 0.1 | 16 | 0.5 | 6 | 40 | 1 |
| TACK154M016#TA | 0402 | 1005-07 | K | 0.15 | 16 | 0.5 | 6 | 30 | 1 |
| TACK224M016#TA | 0402 | 1005-07 | K | 0.22 | 16 | 0.5 | 6 | 20 | 1 |
| TACK334M016#TA | 0402 | 1005-07 | K | 0.33 | 16 | 0.5 | 6 | 20 | 1 |
| TACL474*016#TA | 0603 | 1608-10 | L | 0.47 | 16 | 0.5 | 6 | 7.5 | 1 |
| TACL684*016#TA | 0603 | 1608-10 | L | 0.68 | 16 | 0.5 | 6 | 7.5 | 1 |
| TACL105*016#TA | 0603 | 1608-10 | L | 1 | 16 | 0.5 | 6 | 7.5 | 1 |
| TACL225*016#TA | 0603 | 1608-10 | L | 2.2 | 16 | 0.5 | 10 | 7.5 | 1 |
| TACR335*016#TA | 0805 | 2012-15 | R | 3.3 | 16 | 0.5 | 8 | 5 | 1 |
| TACR106*016#TA | 0805 | 2012-15 | R | 10 | 16 | 1.6 | 10 | 5 | 1 |
| 20 Volt @ 85°C (13 Volt @ 125°C) | | | | | | | | | |
| TACK104*020#TA | 0402 | 1005-07 | K | 0.10 | 20 | 0.5 | 6 | 40 | 1 |
| TACR335M020#TA | 0805 | 2012-15 | R | 3.3 | 20 | 0.7 | 8 | 5 | 1 |
| TACR475M020#TA | 0805 | 2012-15 | R | 4.7 | 20 | 0.9 | 8 | 5 | 1 |
| 25 Volt @ 85°C (17 Volt @ 125°C) | | | | | | | | | |
| TACR105*025#TA | 0805 | 2012-15 | R | 1 | 25 | 0.5 | 8 | 5 | 1 |
| TACA475*025#TA | 1206 | 3216-18 | A | 4.7 | 25 | 1.2 | 8 | 1 | 1 |
| 50 Volt @ 85°C (33 Volt @ 125°C) | | | | | | | | | |
| TACA105*050#TA | 1206 | 3216-18 | A | 1.0 | 50 | 0.5 | 6 | 1 | 1 |

Moisture Sensitivity Level (MSL) is defined according to J-STD-020.

All technical data relates to an ambient temperature of +25°C. Capacitance and DF are measured at 120Hz, 0.5V RMS with a maximum DC bias of 2.2 volts. DCL is measured at rated voltage after 5 minutes.

For typical weight and composition see page 123.

NOTE: AVX reserves the right to supply a higher voltage rating or tighter tolerance part in the same case size, to the same reliability standards.

Данный компонент на территории Российской Федерации

Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru

moschip.ru_4

moschip.ru_6

moschip.ru_9