# Passive Components

Tyco Electronics

Our commitment. Your advantage.

## Introduction

Tyco Electronics is one of the major business units of Tyco International Ltd. (NYSE:TYC, LSE:TYI, BSX:TYC). Headquartered in Harrisburg, Pennsylvania, USA, Tyco Electronics is the world's largest passive electronic components manufacturer, and a world leader in cutting-edge wireless technologies, fibre optic active components, and complete power systems. The company has facilities located in 51 countries serving customers in the aerospace, automotive, computer, communications, consumer electronics, industrial and power industries.

Tyco Electronics provides advanced technology products from over thirty well-known and respected product brands, including Agastat, Alcoswitch, AMP, AMP NETCONNECT, Buchanan, CII, CoEv, Critchley, Elcon, Elo Touch Systems, HTS, M/A-COM, Madison Cable, OEG, Potter & Brumfield, Raychem, Schrack, Simel and TDI Batteries.

Tyco Electronics' product portfolio now includes a comprehensive range of passive components, including surface mount and leaded resistors, trimmers, potentiometers, PTC and NTC surface mount thermistors, as well as a wide range of inductive products covering wirewound, metal film surface mount, ceramic and ferrite bead.

A range of SMD Capacitors, including Multi Layer Ceramic (MLCC), Tantalum and Aluminium Electrolytic completes the Passive Components product portfolio.

The Holsworthy range of precision resistors meets the requirement for economically priced components for both industrial and military applications. In SMD and leaded packages, with tolerances down to 0.05% and TCRs as low as 5ppm, the Holsworthy range from Tyco Electronics delivers the "Complete Precision Portfolio".

For all trimming solutions, the Citec brand is the ideal design partner where your circuit requires sealed or unsealed trimmers from just 2mm square. Multiturns for precision trimming are available with 11 or 12 turn setability. Further, Citec offers a prestigious range of potentiometers, from single and multiturn versions with cermet or carbon elements, through to switched options with shafts in either plastic or metal.

Sigma noise suppression and protection inductor chips from Tyco Electronics can help protect circuits in a variety of ways. The range offers solutions for high power, high speed, low frequency noise impedance as well as temperature responsive resistors in PTC and NTC. Sigma also encompasses a wide range of wound, multilayered and printed inductors in addition to noise reduction bead inductors and through-hole RF chokes.

CGS high power and high voltage resistors are rated up to 100W with voltage proof to 50kV and are available in a wide variety of package styles. High power and pulse resistors in the CGS range are capable of dissipating up to 25,000 Watts for applications such as regenerative braking and power supplies.

The Neohm range of commodity resistors are available with SMD and Leaded devices. This wide range of products compliments and supports the Passives range available from the Tyco Electronics portfolio.

## Contents


| Resistive Products | Page |
|---|---|
| Fixed - Surface Mount | 3 |
| Fixed - Leaded | 4-5 |
| Trimmers - Surface Mount | 6 |
| Trimmers - Leaded | 7 |
| Potentiometers - Leaded | 8 |
| Encoders - Leaded | 9 |
| Thermistors and Varistors | 9 |
| **Inductive Products** | |
| Moulded | 10 |
| High Frequency | 10 |

| Inductive Products (cont) | Page |
|---|---|
| Ferrite Beads | 10 |
| Power - Surface Mount - Unshielded | 11 |
| Leaded - Unshielded | 11 |
| Power - Surface Mount - Shielded | 12 |
| **Capacitive Products** | |
| Ceramic - Surface Mount | 13 |
| Tantalum - Surface Mount | 13 |
| Aluminium Electrolytic - Surface Mount | 13 |
| Colour Codes and E-Series Grid | 14 |
| Associated Products | 15 |

## Resistive Products, Fixed - Surface Mount

| Product Type | Commodity CRG / 3520 | High Ohmic RH73 | Fusible FCR | Trimmable TCR | Commodity MCN |
|---|---|---|---|---|---|
| | | | | | |
| Features | 0201 to 2512 Package Sizes | 0402 to 2512 Package Sizes | 0805 and 1206 Package Sizes | 0805 and 2512 Package Sizes | 2, 4, or 8 x 0603 Resistors |
| | 1R0 to 10M Value Range | 10M to 100G Value Range | 1R0 to 5IR Value Range | 1R0 to 10M Value Range | 10R to 1M Value Range |
| | Tolerances down to 1% and 5% | Tolerances down to 2% | 5% Tolerance | Trimming Ratios up to 3 Times | ±1%, ±2% ±5% Tolerances |
| | TCR ±200ppm/°C max. | TCR's down to 100ppm/°C | 2.0W or 2.5W Fusing Power | TCR's down to 100ppm/°C | TCR ±200ppm/°C max. |
| | 500 Volt Maximum Overload | Special Values Possible | 30 Seconds Fusing Time | Up to 1W Dissipation | Concave or Convex Terminals |

| Product Type | Ultra Precision RN73 | Precision CPF | Precision Thick Film CPG | Precision MRS | Precision SU |
|---|---|---|---|---|---|
| | | | | | |
| Features | 0402 to 1210 Package Sizes | 0402 to 1206 Package Sizes | 0603 to 1206 Package Sizes | 4 x 0603 Resistors | 0.125W to 0.50W |
| | 5R0 to 1M Value Range | 5R1 to 1M Value Range | 10R to 4M7 Value Range | 10R to 330K Value Range | 1R0 - 2M0 Value Range |
| | 0.01% Tolerance | Tolerances down to 0.1% | Tolerances down to 0.5% | Tolerances down to 0.1% | Tolerances down to 0.005% |
| | TCR 10ppm/°C max. | TCR's down to 25ppm/°C | TCR's down to 50ppm/°C | TCR's down to 25ppm/°C | TCR's down to 10ppm/°C |
| | 0805-E96 Values in Distribution | E24 and E96 Value Grid | E24 and E96 Value Grid | 1206 Real Estate | Available in E192 Value grid |

| Product Type | Low Ohmic RL73 | Low Ohmic TL / HL | Low Ohmic SL | Power Wirewound SP | Power SM |
|---|---|---|---|---|---|
| | | | | | |
| Features | 0402 to 2512 Package Sizes | 0.25W to 2.0W Dissipation | 0.5W& 3.0W Dissipation | 0.75W to 3.5W @ 25°C Dissipation | 1W to 5W Dissipation |
| | Values down to R10 | R001 to 1R0 Value Range | R01 to R011 Value Range | R06 to 45K Value Range | R10 to 2M Value Range |
| | Tolerances down to 1% | 1% Tolerance | 1% - 5% Tolerance | Tolerances down to 0.1% | 1% or 5% Tolerances |
| | TCR 100ppm/°C or 200ppm/°C | Down to TCR +50ppm/°C | Down to 4.7nH Inductance | TCR's down to 20ppm/°C | 200ppm/°C Wire / 100ppm/°C Film |
| | 2512 E12 Grid in Distribution | Non Inductive Foil Element | 4 Package Sizes | Suited to Pulse Applications | True Pick and Place Body Style |

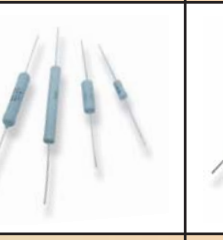
## Resistive Products, Fixed - Leaded

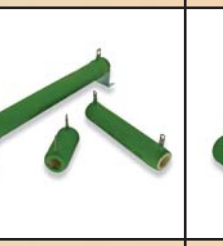
| Product Type | Metal Film Precision H4P / H4 / H8 | Metal Film Semi Precision R | Standard Metal Film LR | Precision Wirewound UPW |
|---|---|---|---|---|
| | | | | |
| **Features** | 0.25W to 1.0W Dissipation | 0.25W Dissipation | 0.25W to 0.75W Dissipation | 0.15W to 0.5W Dissipation |
| | 1R0 to 10M Value Range | 4R02 to 1M Value Range | R10 to 10M Value Range | R10 to 2M Value Range |
| | Tolerances down to 0.05% | 0.1% to 1% Tolerance | 1%, 2% or 5% Tolerance | Tolerances down to 0.005% |
| | TCR's down to 5ppm/°C | TCR's down to 15ppm/°C | TCR's down to 10ppm/°C | TCR's down to 1ppm/°C |
| | Released to BS/CECC | E96 Value Grid | Taped Ammo Pack to IEC286-1 | Low Inductance |

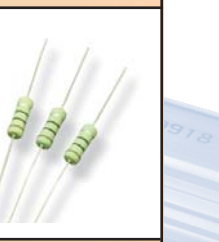
| Product Type | Carbon Film CFR | Metal Oxide RSS / ROX | Fusible FRN / SQF / FKN | Metal Glaze RGP | High Voltage Thick Film HH / HJ |
|---|---|---|---|---|---|
| | | | | | |
| **Features** | 0.25W to 2.0W Dissipation | 0.5W to 7.0W Dissipation | 1W to 10W Dissipation | 0.25W to 4.0W Dissipation | 0.5W to 6.0W Dissipation |
| | 1R0 to 10M Value Range | 1R0 to 200K Value Range | R10 to 150R Value Range | 1M to 10G Value Range | 100K to 50G Value Range |
| | 2% or 5% Tolerance | ±5% Tolerance | Axial or Radial Leaded | 5% or 10% Tolerance | Tolerances down to 0.5% |
| | Small Body Sizes Available | Axial Leaded | 5% Tolerance | ±0.005%/V Voltage Coefficient | TCR's down to 25ppm/°C |
| | Taped Ammo Pack to IEC286-1 | Ammo Packed or Reeled | TCR 300ppm/°C max. | TCR 350ppm/°C max. | Axial Leaded |

| Product Type | High Voltage Thick Film HB | High Voltage Thick Film HVR | High Power Thick Film BDS | High Power Thick Film MPC | Thin Film Power MPR |
|---|---|---|---|---|---|
| | | | | | |
| **Features** | Dissipation up to 2W @ 70°C | Up to 100 W Dissipation (in oil) | 100W to 600W Dissipation | 3W to 10W Dissipation | 20W Dissipation (Heatsink) |
| | 1K to 1G Value Range | 2K to 1G Value Range | R20 to 1M Value Range | 1R0 to 200K Value Range | R22 to 51K Value Range |
| | Tolerance down to 1% | Tolerances down to 1% | 5% or 10% Tolerance | 1% or 5% Tolerance | TO220 Package |
| | Up to 15kV Voltage Rating | Up to 50KV Voltage Rating | TCR 150ppm/°C max. | TCR ±100ppm/°C max. | 1% (E24), 5% (E12) Tolerances |
| | Axial / Radial Options | Various Mounting Styles | Customised as Required | Radial Leads | TCR down to ±50ppm/°C |

## Resistive Products, Fixed - Leaded

| Product Type | Power Wirewound SBC / SBCHE | Power Wirewound SQP / SQM / SQZ | Power Wirewound C3A / C7 / C10 / C14 | Power Wirewound ER | Power Wirewound ES |
|---|---|---|---|---|---|
| | | | |  | |
| Features | 3W to 40W Dissipation | 2W to 25W Dissipation | 3W to 14W Dissipation | 3W to 14W Dissipation | 0.5W to 10W Dissipation |
| | R10 to 22K Value Range | R10 to 150K Value Range | R10 to 100K Value Range | R01 to 100K Value Range | R10 to 3K3 Value Range |
| | 10% or 5% Tolerance | 5% Tolerance | 10%, 5% or 2% Tolerance | Tolerances down to 0.5% | 5% Tolerance |
| | Radial and Axial Styles | Radial and Axial Styles | Axial Leaded | Axial and Radial Types | Super Small Size available |
| | 2000V Dielectric Strength | Wire or Power Oxide | 3W and 7W Ammo Packed | Custom Designs as Required | Taped and Ammo Packed |

| Product Type | Power Wirewound HS / THS | Power Wirewound FC | Power Wirewound ME | Power Wirewound TG | Power Wirewound TT / TK |
|---|---|---|---|---|---|
| | | | |  | |
| Features | 5W to 300W Dissipation | 2W to 8W Dissipation | Up to 500W Dissipation | Up to 293W Dissipation | 10W to 1000W Dissipation |
| | R01 to 82K Value Range | R20 to 22K Value Range | R02 to 22K Value Range | R24 to 100K Value Range | R20 to 70K Value Range |
| | Tolerances down to 0.25% | 5% or 10% Tolerance | 5% or 10% Tolerance | 5% or 10% Tolerance | 5% or 10% Tolerance |
| | High Voltage Versions | Radial Leads | Fixed or Adjustable | Glass Bond Coated | Fixed or Adjustable |
| | Low Inductance Styles | Two Height Profiles | Range of Terminal Style | 6000J Pulse Energy | Range of Mounting Styles |

| Product Type | Foil Low Ohmic SBL | Wire Shunt OS / OP | Zerohm Link ZR | Carbon Moulded CBT | Ceramic Composition CCR |
|---|---|---|---|---|---|
| | | | | |  |
| Features | 4W and 5W Dissipation | Values from R003 to R150 | Two Case Sizes | 0.25W, 0.5W Dissipation | 0.5, 1.0, 2.0W Power Dissipation |
| | R005 to R051 Value Range | 2 Different Styles | < 2 milliohm Resistance | 2R2 to 22M Value range | Up to 20kV Impulse Withstand |
| | 1% or 5% Tolerance | Current Rating to 21A | Dielectric Strength - 500V | E24 - 5% E12 - 10% Tolerance | Tolerance 10% |
| | 2KV Dielectric Strength | 5% Tolerance as Standard | > 10G Insulation Resistance | Up to 750V Overload | Up to 400V Working Voltage |
| | Essentially Non Inductive | Custom Designs Available | Taped Ammo Pack to IEC286-1 | Low Inductance | 3R3 to 390K Value Range |

## Resistive Products, Trimmers - Surface Mount

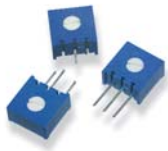
| Product Type | Open Frame 3121 | Open Frame 3130 | Open Frame 3135 | Open Frame 3142 | Open Frame 3150 / 3165 |
|---|---|---|---|---|---|
| | | | | | |
| Features | Board Area - 2.2mm x 2.75mm | Board Area - 3.75mm x 3mm | 3mm Square Nominal | 4mm Square Nominal | 4mm Square Nominal |
| | Height 1.8mm | Height 1.85mm Max. | Height 1.2mm Max. | Height 2.4mm | Lightweight - 0.2 Grams |
| | 200R to 1M Value Range | 100R to 1M Value Range | 100R to 1M Value Range | 100R to 1M Value Range | 100R to 1M Value Range |
| | 25% Tolerance | Auto Adjust Version | Delta Terminals | Delta Terminals | In-line or Delta Terminals |
| | 50V DC Operating Voltage | 50V DC Operating Voltage | Integrated End Stop | 50V DC Operating Voltage | Underside Adjust Version |

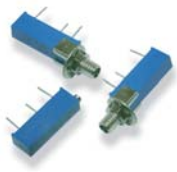
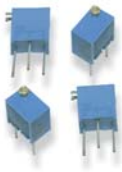
| Product Type | Semi Sealed 3103 | Semi Sealed 3203 | Semi Sealed 3204 |
|---|---|---|---|
| | | | |
| Features | Board Area - 3.6mm x 3.1mm | Board Area - 3.4mm x 3.4mm | Board Area - 4mm x 4.5mm |
| | Height < 1.8mm | Height < 2.1mm | Height 2.4mm |
| | 500R to 1M Value Range | 100R to 1M Value Range | 100R to 1M Value Range |
| | 0.05W Dissipation @ 50°C | 0.05W Dissipation | 0.1W Dissipation |
| | Sealed for Processing | Sealed for Processing | Sealed for Processing |

| Product Type | Sealed 3212 | Sealed 3213 | Sealed 3315 | Multiturn 3240 | Multiturn 3270 |
|---|---|---|---|---|---|
| | | | | | |
| Features | Board Area - 2.4mm x 2.8mm | Board Area - 3.4mm x 3.4mm | Board Area - 5mm x 5mm | 4mm Square Nominal | 6mm Square Nominal |
| | Height 1.7mm | Height 2.0mm | Height 2.5mm | Top and Side Adjust Styles | Top and Side Adjust Styles |
| | 100R to 1M0 Value Range | 10R to 1M0 Value Range | 10R to 2M Value Range | 10R to 2M Value Range | 10R to 1M Value Range |
| | 20% Tolerance | 20% Tolerance | 20% Tolerance | 10% Tolerance | 10% Tolerance |
| | O-ring Sealed | O-ring Sealed | O-ring Sealed | 11 Turns | 12 Turns |

## Resistive Products, Trimmers - Leaded

| Product Type | Economy CT6 | Economy 416 | Economy 409 | Economy CB10 | Economy CB15 / CT15 |
|---|---|---|---|---|---|
| | | | | | |
| Features | 6mm Single Turn | 6mm Single Turn | 10mm Single Turn | Carbon Element | Carbon Element |
| | 200R to 1M Value Range | 100R to 1M Value Range | 100R to 1M Value Range | 100R to 10M Value Range | 100R to 4M7 Value Range |
| | 0.1W Dissipation | 0.2W Dissipation | 0.5W Dissipation | 0.15W Log /0.25W Lin Dissipation | 0.15W Log /0.25W Lin Dissipation |
| | Top and Side Adjust Versions | Top and Side Adjust Versions | 100 Cycles Maximum | Long Life Version (>10,000 cycles) | Long Life (>10,000 cycles) |
| | Resin Moulded Technology | Dust and Splash Proof | Dust and Splash Proof | Enclosed Package | Plug in Shaft Available |

| Product Type | Professional 470 | Professional 4265 | Professional 4275 | Professional 4295 |
|---|---|---|---|---|
| | | | |  |
| Features | 6mm Single Turn | 6mm Single Turn Sealed | 6mm Single Turn Sealed | 10mm Single Turn Sealed |
| | 10R to 1M Value Range | 10R to 2M Value Range | 10R to 2M Value Range | 10R to 2M Value Range |
| | 10% Tolerance | 0.5W Dissipation | 0.5W Dissipation | 0.5W Dissipation |
| | 0.5W Dissipation | 20% Tolerance Standard | 10% Tolerance Standard | TCR ±100ppm/°C |
| | Fully Sealed | Three Pin Layouts/Taped Versions | Three Pin Layouts/Taped Versions | Five Pin Layouts |

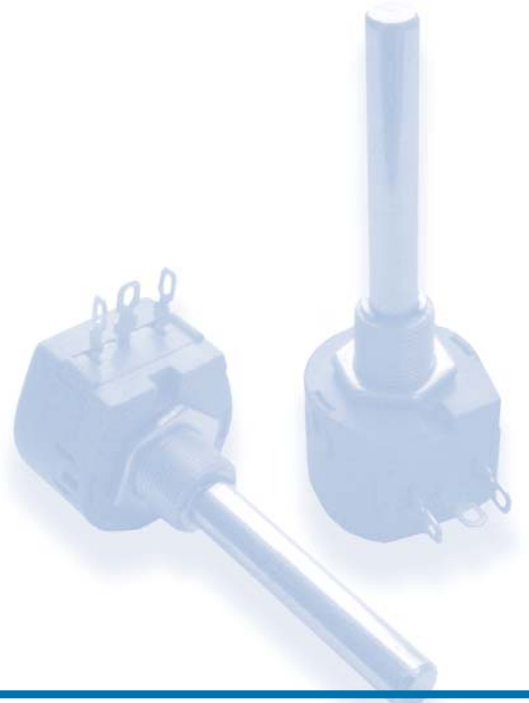
| Product Type | Multiturn 433 | Multiturn 4270 | Multiturn 4290 |
|---|---|---|---|
| |  |  | |
| Features | 19mm Multiturn Sealed | 6mm Multiturn Sealed | 10mm Multiturn Sealed |
| | 10R to 2M Value Range | 50R to 2M Value Range | 50R to 2M Value Range |
| | 0.75W Dissipation | 0.25W Dissipation | 0.5W Dissipation |
| | 15 Electrical Turns | 12 Electrical Turns | 25 Electrical Turns |
| | Panel Mount Available | Wide Variety of Styles | Wide Variety of Styles |

## Resistive Products, Potentiometers - Leaded

| Product Type | Economy PC610 | Economy 31 / 23 | Economy 51 / 54 / 56 | Economy 17P | Economy CP16 |
|---|---|---|---|---|---|
| | | | | | |
| Features | 9mm Square Pluggable | 20mm/16mm Round Body | 16mm Package | 16mm Square all Plastic Body | 16mm Square Package |
| | Polymer Element | Printed Carbon Element | Polymer Element | Polymer Thick Film Element | Polymer Thick Film Element |
| | 500R to 500K Value Range | 1K to 1M Value Range (Linear) | 470R to 2M2 Value Range | 1K to 1M Value Range (Lin) | 100R to 4M7 Value Range |
| | 0.05W Dissipation | 0.25W Log/0.4W Lin Dissipation | 0.25W Dissipation | 0.25W Dissipation | 0.1W Log/0.2W Lin Dissipation |
| | Non Linear Laws Available | Non Linear Laws Available | Non Linear Laws Available | Non Linear Laws Available | Non Linear Laws Available |
| | 10,000 Operations minimum | Dual Gang & Switched Styles | Switched Version | Multigangs, Switches Available | Switches Available |

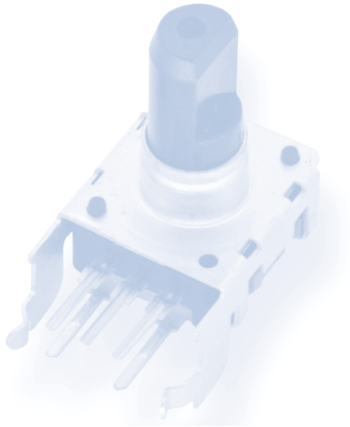
| Product Type | Professional CS9 | Professional TW | Professional 5930 / 5940 | Professional LC | Professional MC |
|---|---|---|---|---|---|
| | | | | | |
| Features | 9mm Square Body | 265° Travel | 10 Turn Multiturn | 13mm Round Body | 19mm Round Body |
| | Polymer Element | Wirewound Element | Wirewound Element | Cermet Element | Cermet Element |
| | 5K to 250K Value Range | 5R to 22K Value Range | 200R to 100K Value Range | 100R to 2M2 Value Range | 100R to 2M2 Value Range |
| | 0.05W Dissipation | 1 Watt @ 40°C | 2W Dissipation | 1W Dissipation | 2W Dissipation |
| | Linear or Logarithmic Laws | TCR - 100 ppm | <0.25% Linearity | O-ring Spindle Sealed | O-ring Spindle Sealed |
| | Multigangs, Switches Available | 5000 Operations | Range of Dials Available | 25,000 Operations minimum | 25,000 Operations minimum |

| Product Type | Economy RW | Rheostats BFA |
|---|---|---|
| | | |
| Features | 40mm Enclosed Body | Wirewound Variable Load |
| | Wirewound Element | Up to 811W Dissipation |
| | 10R to 100K Value Range | Current up to 10 Amps |
| | 1W (RW1), 3W (RW3) Dissipation | 5 Case Sizes |
| | Linear Laws Only | Operates up to 400°C |
| | Excellent Linearity | Protective Case |



## Encoders - Leaded

| Product Type | Contact Encoder DP(S) 9 | Contact Encoder DP(S) 12 | Contact Encoder DP(S) 15 |
|---|---|---|---|
| | | | |
| Features | 9mm Square | 12mm Square | 12mm Square |
| | Switch / Detent Options | Switch / Detent Options | Switch / Detent Options |
| | Vertical / Horizontal Mounting | Vertical / Horizontal Mounting | Vertical / Horizontal Mounting |
| | Various Shaft Configurations | Various Shaft Configurations | Various Shaft Configurations |
| | 12 / 24 Pulses | 12 / 24 Pulses | 12 / 24 Pulse |



## Encoders - Leaded, with Illuminated Shaft

| Product Type | Contact Encoder with LED DPSL 12 |
|---|---|
| | |
| Features | Integrated Colour LED's (Yellow / Blue / Red / Orange / Green) |
| | Switch / Detent Options |
| | Vertical / Horizontal Mounting |
| | Various Shaft Configurations |
| | 12 / 24 Pulses - 5V 0.5mA Rating |

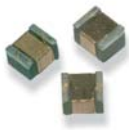
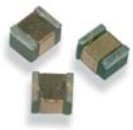
## Resistive Products, Thermistors and Varistors

| Product Type | Temperature Sense 8158 | Temperature Sense NTC | Temperature Sense LT73 | PTC Thermistor LT |
|---|---|---|---|---|
| | | | | |
| Features | 0402 to 1206 Package Sizes | 0603 and 0805 Case Size | 0805 and 1206 Package Styles | Axial Leaded |
| | 40R to 500K Value Range | 100R to 150K Value Range | 510R to 6K2 Value Range | 0.16W or 0.25W |
| | Tolerances down to 5% | 5% or 10% Tolerance | 5% Tolerance | Wide Temperature Range |
| | ß Values - 2800 to 4350 (NTC) | ß Values -2700 to 4100 | TCR 3900ppm/°C max (PTC) | Values from 10R to 10K |
| | ß Value Tolerances down to 1% | 5% Tolerance on B Value | Operating Temp. -40°C to 150°C | Insulated Package Style |

## Inductive Products, Moulded

| Product Type | Moulded 3610 | Moulded 3611 | Moulded 3612 | Moulded 3613 | Moulded 3615 |
|---|---|---|---|---|---|
| | | | | | |
| Features | 0805, 1008, 1210, 1812 Packages | 0805, 1008, 1210, 1812 Packages | 0805, 1008, 1210, 1812 Packages | 0805, 1008, 1210, 1812 Packages | Board Area 13mm x 5mm |
| | 10µH to 1mH Value Range | 10µH to 1mH Value Range | 10µH to 1mH Value Range | 10µH to 1mH Value Range | 0.1µH to 1mH Value Range |
| | Temp.Range -25°C to 100°C | Temp.Range -25°C to 100°C | Temp.Range -25°C to 100°C | Temp.Range -25°C to 100°C | High Current (3.5A) |
| | Moulded Package | Moulded Package | Moulded Package | Moulded Package | Moulded Package |
| | Dip and Wave Solderable | Dip and Wave Solderable | Dip and Wave Solderable | Dip and Wave Solderable | Dip and Wave Solderable |

## Inductive Products, High Frequency

| Product Type | High Frequency 3640 | High Frequency 3650 | High Frequency 3651 / 52 / 53 | High Frequency 3670 | High Frequency 3680 |
|---|---|---|---|---|---|
| | |  |  | | |
| Features | 0402 to 1206 Package Sizes | 0603 to 1008 Package Sizes | 0805 & 1008 Low Profile (3651) | 0603 to 1206 Package Sizes | 0402, 0603, 0805 Package Sizes |
| | 1µH to 100mH Value (E12 Grid) | 1.8nH to 4.7µH Value Range | 0603 High Current (3652) | Low DC Resistance | 1nH to 470nH Value Range |
| | DC Current 1200mA | DC Current up to 1Amp | 0805 & 1008 High Q (3653) | Low Q Factor | DC Current 0.3 Amps |
| | Tolerances down to ±0.2µH | Tolerances down to 2% | Tolerances Down to 2% | High Reliability | Tolerances down to ±0.3 nH |
| | High Self Resonant Frequency | -40°C to 125°C Temp. Range | Up to 2.4A IDC | Range of Tolerances | E12 Value Grid |

## Inductive Products, Ferrite Beads

| Product Type | BMB A & B Series | BMB R Series | BMB L Series | BMB P & S Series | BMB W Series |
|---|---|---|---|---|---|
| | | | | | |
| Features | 0402 to 1812 Package Sizes | 0603 to 1206 Package Sizes | 0603 to 0805 Package Sizes | 0603 to 1812 Package Sizes | 0603 Size |
| | 10R to 2K7 Impedance | 26R to 600R Impedance | 30R to 1K5 Impedance | 10R to 600R Impedance | 120R to 1K0 Impedance |
| | General Purpose Applications | Low Frequency Applications | High Current | High Current | Minimal Electromagnetic Interference |
| | High Frequency Applications | Prevents Signal Ringing | Signal Line Applications | Noise Filtering Applications | Minimises Stray Capacitance |
| | DC Current to 0.6A | DC Current to 0.4A | DC Current to 1A | DC Current to 6A | DC Current to 0.2A |

## Inductive Products, Power, Surface Mount - Unshielded

| Product Type | Power Chokes 3621 | Power Chokes 3622 | Power Chokes 3623 | Power Chokes 3624 | Power Chokes 3625 |
|---|---|---|---|---|---|
| | | | | | |
| Features | Board Area from 3mm x 2.8mm | Board Area from 6.6mm x 4.5mm | Board Area from 22mm x 15mm | Board Area from 3.2mm x 1.6mm | Board Area from 6mm x 6mm |
| | Values 1µH to 15,000µH | Values 1µH to 10,000 µH | Values 0.8µH to 1,000µH | Values 0.12µH to 3,300µH | Values 1.5µH to 1,000µH |
| | Current up to 9.5 Amps | Current up to 10 Amps | Current up to 16 Amps | Current up to 9 Amps | Current up to 7.2 Amps |
| | Only 1.5mm Height | Less than 3mm Height | Less than 7mm Height | Less than 2mm Height | Less than 3mm Height |
| | 12 Package Styles | 4 Package Sizes | 2 Package Sizes | 8 Package Sizes | 3 Package Sizes |

| Product Type | Power Chokes 3626 |
|---|---|
| | |
| Features | Board Area from 7.5mm x 7.5mm |
| | Values 10µH to 5,000µH |
| | Current up to 4 Amps |
| | Less than 4mm Height |
| | 2 Package Sizes |

## Inductive Products, Leaded - Unshielded

| Product Type | Insulated SC 10 / 20 / 30 | Leaded Axial SC | Leaded Radial SC | Moulded MSC |
|---|---|---|---|---|
| | | | | |
| Features | 0402 to 1812 and Arrays | 4 Package SIzes | 4 Package SIzes | 2 Case Sizes |
| | 5R to 2K ohms impedance | Suited to Power Circuits | Suited to Power Circuits | 0.1µH to 10mH Value (E12 Grid) |
| | DC Current up to 6 Amps | Wide Value Range | Wide Value Range | DC Current up to 1.79 Amps |
| | HS Signal Line, Digital Sound, | E12 Series Values | E12 Series Values | 5% or 10% Tolerance |
| | High Current, High Loss, etc | DC Current to 1.7A | DC Current to 5.6A | Dielectric Strength up to 1KV |

## Inductive Products, Power, Surface Mount - Shielded

| Product Type | Shielded Power Chokes 3630 | Shielded Power Chokes 3631 | Shielded Power Chokes 3632 | Shielded Power Chokes 3633 | Shielded Power Chokes 3634 |
|---|---|---|---|---|---|
| | | | | | |
| Features | Board Area from 6.5mm x 4.4mm | Board Area from 12.5mm x 12.5mm | Board Area from 10.5mm x 9.5mm | Board Area from 3.3mm x 3.5mm | Board Area from 3.8mm x 3.8mm |
| | Values 1µH to 10,000µH | Values 1.1µH to 1,500µH | Values 1.5µH to 15,000µH | Values 1µH to 220µH | Values 0.9µH to 1,000µH |
| | Current up to 4.5 Amps | Current up to 10.2 Amps | Current up to 5.6 Amps | Current up to 3.5 Amps | Current up to 4.6 Amps |
| | Less than 3mm Height | From 4mm Height | From 6mm Height | From less than 1mm Height | From less than 1.2mm Height |
| | 6 Package Sizes | 6 Package Sizes | 2 Package Sizes | 7 Package Sizes | 9 Package Sizes |

| Product Type | Shielded Power Chokes 3635 | Shielded Power Chokes 3636 | Shielded Power Chokes 3637 | Shielded Power Chokes 3638 | Shielded Power Chokes 3639 |
|---|---|---|---|---|---|
| | | | | | |
| Features | Board Area from 6.6mm x 6.6mm | Board Area 7.8mm x 7.5mm | Board Area from 7.5mm x 7.5mm | Board Area from 6mm x 6mm | Board Area from 8mm x 8mm |
| | Values .054µH to 7.4µH | Values 1.2µH to 5,600µH | Values 10µH to 1,500µH | Values 1µH to 1,000µH | Values 0.8µH to 330µH |
| | Current up to 38 Amps | Current up to 2.6 Amps | Current up to 4.6 Amps | Current up to 3.8 Amps | Current up to 7.8 Amps |
| | From 4.5mm Height | Less than 2.5mm Height | From 4mm Height | From less than 3mm Height | From less than 3mm Height |
| | 2 Package Sizes | 1 Package Size | 3 Package Sizes | 3 Package Sizes | 5 Package Sizes |

## Capacitive Products, Ceramic - Surface Mount

| Product Type | NPO Dielectric TYC | X7R / X5R Dielectric TYC | Y5V Dielectric TYC |
|---|---|---|---|
| | | | |
| Features | Ultra Stable | Semi Stable and High K | General Purpose, High K |
| | Low ESR | High Volumetric Efficiency | High Volumetric Efficiency |
| | No Ageing of Capacitance | Extended Voltage Ratings | Non Polar Construction |
| | 0201 to 1206 Sizes | 0402 to 1206 Sizes | 0402 - 1206 Sizes |
| | Tolerances down to ±1% | 5% Tolerance Available | 20% Tolerance Available |

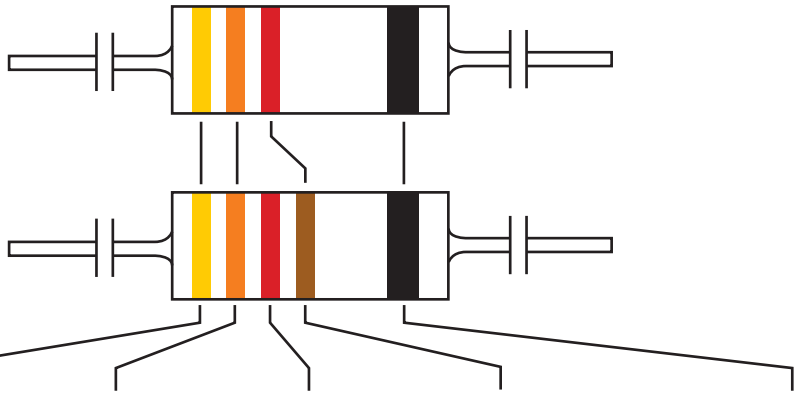
## Capacitive Products, Tantalum - Surface Mount

| Product Type | Standard TYTS | Extended Range TYTM | 0805 Case Size TYTP | Low ESR TYTR |
|---|---|---|---|---|
| | | | | |
| Features | Full Value Range | Super Compact Size | Super Compact Size | Suited to High Frequency |
| | A, B, C & D Case Sizes | A, B, C & D Case Sizes | Suited to High Density PCB's | B, C & D Case Sizes |
| | 4V to 50V Ratings | 2.5V to 50V Ratings | 2.5V to 25V Ratings | 6V to 35V Ratings |
| | 10% / 20% Tolerance | 10% or 20% Tolerance | 10% or 20% Tolerance | 10% or 20% Tolerance |
| | RoHS Compliant | RoHS Compliant | RoHS Compliant | RoHS Compliant |

## Capacitive Products, Aluminium Electrolytic - Surface Mount

| Product Type | 85°C TYEV | 105°C TYEH | Long Life TYEL | Low Impedance TYEE | Organic Conductive Polymer TYOH |
|---|---|---|---|---|---|
| | | | | | |
| Features | -40°C to +85°C | -40°C to +105°C | -40°C to +105°C | -55°C to +105°C | -55°C to +105°C |
| | 4.0V to 100V DC | 6.3V to 100V DC | 6.3V to 50V DC | 6.3V to 50V DC | 2.5V to 25V DC |
| | 2000 Hours Load Life | Up to 3000 Hours Load Life | 3000 Hours Load Life | 1000 Hours Load Life | 2000 Hours Load Life |
| | 0.1 to 6800µF Capacitance Range | 0.1 to 6800µF Capacitance Range | 0.1 to 1000µF Capacitance Range | 1.0 to 220µF Capacitance Range | 22 to 2700µF Capacitance Range |
| | 7 Case Sizes | 7 Case Sizes | 6 Case Sizes | 4 Case Sizes | 7 Case Styles |

## Colour Code in Accordance with IEC 62



| Colour | 1st Figure | 2nd Figure | 3rd Figure | Multiplier | Tolerance | |
|---|---|---|---|---|---|---|
| | | | | | Letter | Percent |
| Black | 0 | 0 | 0 | 1 | | |
| Brown | 1 | 1 | 1 | 10 | F | ±1% |
| Red | 2 | 2 | 2 | 100 | G | ±2% |
| Orange | 3 | 3 | 3 | 1,000 | | |
| Yellow | 4 | 4 | 4 | 10,000 | | |
| Green | 5 | 5 | 5 | 100,000 | D | ±0.5% |
| Blue | 6 | 6 | 6 | 1,000,000 | C | ±0.25% |
| Violet | 7 | 7 | 7 | 10,000,000 | B | ±0.1% |
| Grey | 8 | 8 | 8 | 100,000,000 | | |
| White | 9 | 9 | 9 | 1,000,000,000 | | |
| Gold | | | | 0.1 | J | ±5% |
| Silver | | | | 0.01 | K | ±10% |
| None | | | | | M | ±20% |

## E Series Value Grid

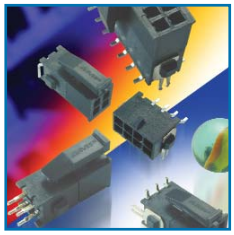
E Series in accordance with IEC 63

| E6 | E12 | E24 | E96 | E6 | E12 | E24 | E96 | E6 | E12 | E24 | E96 | E6 | E12 | E24 | E96 | E6 | E12 | E24 | E96 | E6 | E12 | E24 | E96 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 100 | 100 | 100 | 100 | | | | 147 | 220 | 220 | 220 | 215 | | | | 316 | 470 | 470 | 470 | 464 | 680 | 680 | 680 | 681 |
| | | | 102 | 150 | 150 | 150 | 150 | | | | 221 | 330 | 330 | 330 | 324 | | | | 475 | | | | 698 |
| | | | 105 | | | | 154 | | | | 226 | | | | 332 | | | | 487 | | | | 715 |
| | | | 107 | | | 160 | 158 | | | | 232 | | | | 340 | | | | 499 | | | | 732 |
| | | 110 | 110 | | | | 162 | | | 240 | 237 | | | | 348 | | | 510 | 511 | | | 750 | 750 |
| | | | 113 | | | | 165 | | | | 243 | | | 360 | 357 | | | | 523 | | | | 768 |
| | | | 115 | | | | 169 | | | | 249 | | | | 365 | | | | 536 | | | | 787 |
| | 120 | 120 | 118 | | | | 174 | | | | 255 | | | | 374 | | | | 549 | | 820 | 820 | 806 |
| | | | 121 | | 180 | 180 | 178 | | | | 261 | | 390 | 390 | 383 | | 560 | 560 | 562 | | | | 825 |
| | | | 124 | | | | 182 | | 270 | 270 | 267 | | | | 392 | | | | 576 | | | | 845 |
| | | | 127 | | | | 187 | | | | 274 | | | | 402 | | | | 590 | | | | 866 |
| | | 130 | 130 | | | | 191 | | | | 280 | | | | 412 | | | | 604 | | | | 887 |
| | | | 133 | | | | 196 | | | | 287 | | | | 422 | | | 620 | 619 | | | 910 | 909 |
| | | | 137 | | | 200 | 200 | | | | 294 | | | 430 | 432 | | | | 634 | | | | 931 |
| | | | 140 | | | | 205 | | | 300 | 301 | | | | 442 | | | | 649 | | | | 953 |
| | | | 143 | | | | 210 | | | | 309 | | | | 453 | | | | 665 | | | | 976 |

## Associated Products

Alcoswitch Switches

Schrack PCB Relays



Amp Connectors

Power Resistors

Microdot
Connectors and Cables

## Notes

## Contacts


**Austria** – Vienna
Phone: +43-1-905-60-0
Fax: +43-1-905-60-1333
Product Information Center:
Phone: +43-1-905-60-1249
Fax: +43-1-905-60-1251

**Belgium** – Kessel-Lo
Phone: +32-16-352-300
Fax: +32-16-352-352

**Bulgaria** – Sofia
Phone: +359-2-971-2152
Fax: +359-2-971-2153

**Czech Republic and Slovakia**
**Czech Republic**– Kurim
Phone: +420-541-162-111
Fax: +420-541-162-223
Product Information Center:
Phone: +420-541-162-113
Fax: +420-541-162-132

**Denmark** – Glostrup
Phone: +45-43-48-04-00
Fax: +45-43-44-14-14

**Egypt** – Cairo
Phone: +202-419-2334
Fax: +202-417-7647

**Estonia**– Tartu
Phone: +372-5138-274
Fax: +372-7400-779

**Finland** – Helsinki
Phone: +358-95-12-34-20
Fax: +358-95-12-34-250

**France** – Cergy-Pontoise Cedex
Phone: +33-1-3420-8888
Fax: +33-1-3420-8600
Product Information Center:
Phone: +33-1-3420-8686
Fax: +33-1-3420-8623

**France Export Divisions** –
Cergy-Pontoise Cedex
Phone: +33-1-3420-8804
Fax: +33-1-3420-8699

**Germany** – Bensheim
Phone: +49-6251-133-0
Fax: +49-6251-133-1600
Product Information Center:
Phone: +49-6251-133-1999
Fax: +49-6251-133-1988

**Greece** – Athens
Phone: +30-210-9370-396/397
Fax: +30-210-9370-655

**Hungary** – Budapest
Phone: +36-1-289-1000
Fax: +36-1-289-1010
Product Information Center:
Phone: +36-1-289-1016
Fax: +36-1-289-1017

**Ireland** – Dublin
Phone: +353-1-866-5612
Fax: +353-1-866-5714

**Israel** – Petach–Tikva
Phone: +972-3-929-0999
Fax: +972-3-919-1088

**Italy** – Collegno (Torino)
Phone: +39-011-4012-111
Fax: +39-011-4031-116
Product Information Center:
Phone: +39-011-4012-428
Fax: +39-011-4028-7428

**Lithuania and Latvia**
**Lithuania** – Vilnius
Phone: +370-5-213-1402
Fax: +370-5-213-1403
Product Information Center:
Phone: +370-5-211-3016
Fax: +370-5-213-1403

**Netherlands** – 's-Hertogenbosch
Phone: +31-73-6246-246
Fax: +31-73-6212-365
Product Information Center:
Phone: +31-73-6246-999
Fax: +31-73-6246-998

**Norway** – Nesbru
Phone: +47-66-77-88-50
Fax: +47-66-77-88-55

**Poland** – Warsaw
Phone: +48-22-4576-700
Fax: +48-22-4576-720
Product Information Center:
Phone: +48-22-4576-704
Fax: +48-22-4576-720

**Romania** – Bucharest
Phone: +40-21-311-3479/3596
Fax: +40-21-312-0574

**Russia** – Moscow
Phone: +7-495-790-7902
Fax: +7-495-721-1893
Product Information Center:
Phone: +7-495-790-7902-404
Fax: +7-495-790-7902-401

**Russia** – St.Petersburg
Phone: +7-812-718-8192
Fax: +7-812-718-8193

**Slovenia** – Ljubljana
Phone: +386-1561-3270
Fax: +386-1561-3240

**South Africa** – Port Elizabeth
Phone: +27-41-503-4500
Fax: +27-41-581-0440

**Spain** – Barcelona
Phone: +34-93-291-0330
Fax: +34-93-201-7879

**Sweden** – Upplands Väsby
Phone: +46-8-50-72-50-00
Fax: +46-8-50-72-50-01

**Switzerland** – Steinach
Phone: +41-71-447-0447
Fax: +41-71-447-0444

**Turkey** – Istanbul
Phone: +90-212-281-8181/2/3
+90-212-282-5130/5430
Fax: +90-212-281-8184

**Ukraine** – Kiev
Phone: +380-44-206-2265
Fax: +380-44-206-2264
Product Information Center:
Phone: +380-44-206-2265
Fax: +380-44-206-2264

**United Kingdom** –
Stanmore, Middlesex
Phone: +44-8706-080208
Fax: +44-208-954-6234
Product Information Center:
Freephone (UK only):
0800-267-666
Phone: +44-8706-080208
Fax: +44-208-420-8095


**tycoelectronics.com**
**passives.tycoelectronics.com**


Catalogue No: 1309350. Revise August 2007



TE Logo and Tyco Electronics are trademarks


Tyco Electronics
Our commitment. Your advantage.