

RoHS  
Ready 



# Passive Components

## 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	Inductive Products (cont)	Page
Fixed - Surface Mount	3	Ferrite Beads	10
Fixed - Leaded	4-5	Power - Surface Mount - Unshielded	11
Trimmers - Surface Mount	6	Leaded - Unshielded	11
Trimmers - Leaded	7	Power - Surface Mount - Shielded	12
Potentiometers - Leaded	8	<b>Capacitive Products</b>	
Encoders - Leaded	9	Ceramic - Surface Mount	13
Thermistors and Varistors	9	Tantalum - Surface Mount	13
<b>Inductive Products</b>		Aluminium Electrolytic - Surface Mount	13
Moulded	10	Colour Codes and E-Series Grid	14
High Frequency	10	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 51R 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. 500 Volt Maximum Overload	TCR's down to 100ppm/°C Special Values Possible	2.0W or 2.5W Fusing Power 30 Seconds Fusing Time	TCR's down to 100ppm/°C Up to 1W Dissipation	TCR ±200ppm/°C max. 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. 0805-E96 Values in Distribution	TCR's down to 25ppm/°C E24 and E96 Value Grid	TCR's down to 50ppm/°C E24 and E96 Value Grid	TCR's down to 25ppm/°C 1206 Real Estate	TCR's down to 10ppm/°C 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 2512 E12 Grid in Distribution	Down to TCR +50ppm/°C Non Inductive Foil Element	Down to 4.7nH Inductance 4 Package Sizes	TCR's down to 20ppm/°C Suited to Pulse Applications	200ppm/°C Wire / 100ppm/°C Film 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 1R0 to 10M Value Range Tolerances down to 0.05% TCR's down to 5ppm/°C Released to BS/CECC	0.25W Dissipation 4R02 to 1M Value Range 0.1% to 1% Tolerance TCR's down to 15ppm/°C E96 Value Grid	0.25W to 0.75W Dissipation R10 to 10M Value Range 1%, 2% or 5% Tolerance TCR's down to 10ppm/°C Taped Ammo Pack to IEC286-1	0.15W to 0.5W Dissipation R10 to 2M Value Range Tolerances down to 0.005% TCR's down to 1ppm/°C 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 1R0 to 10M Value Range 2% or 5% Tolerance Small Body Sizes Available Taped Ammo Pack to IEC286-1	0.5W to 7.0W Dissipation 1R0 to 200K Value Range ±5% Tolerance Axial Leaded Ammo Packed or Reeled	1W to 10W Dissipation R10 to 150R Value Range Axial or Radial Leaded 5% Tolerance TCR 300ppm/°C max.	0.25W to 4.0W Dissipation 1M to 10G Value Range 5% or 10% Tolerance ±0.005%/V Voltage Coefficient TCR 350ppm/°C max.	0.5W to 6.0W Dissipation 100K to 50G Value Range Tolerances down to 0.5% TCR's down to 25ppm/°C 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 1K to 1G Value Range Tolerance down to 1% Up to 15kV Voltage Rating Axial / Radial Options	Up to 100 W Dissipation (in oil) 2K to 1G Value Range Tolerances down to 1% Up to 50KV Voltage Rating Various Mounting Styles	100W to 600W Dissipation R20 to 1M Value Range 5% or 10% Tolerance TCR 150ppm/°C max. Customised as Required	3W to 10W Dissipation 1R0 to 200K Value Range 1% or 5% Tolerance TCR ±100ppm/°C max. Radial Leads	20W Dissipation (Heatsink) R22 to 51K Value Range TO220 Package 1% (E24), 5% (E12) Tolerances 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 Resin Moulded Technology	Top and Side Adjust Versions Dust and Splash Proof	100 Cycles Maximum Dust and Splash Proof	Long Life Version (>10,000 cycles) Enclosed Package	Long Life (>10,000 cycles) 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 $\pm 100$ ppm/ $^{\circ}$ 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 40R to 500K Value Range Tolerances down to 5%	0603 and 0805 Case Size 100R to 150K Value Range 5% or 10% Tolerance	0805 and 1206 Package Styles 510R to 6K2 Value Range 5% Tolerance	Axial Leaded 0.16W or 0.25W Wide Temperature Range Values from 10R to 10K
	$\beta$ Values - 2800 to 4350 (NTC)	$\beta$ Values -2700 to 4100	TCR 3900ppm/°C max (PTC)	Insulated Package Style
	$\beta$ Value Tolerances down to 1%	5% Tolerance on B Value	Operating Temp. -40°C to 150°C	



### Inductive Products, Moulded

Product Type	Moulded 3610	Moulded 3611	Moulded 3612	Moulded 3613	Moulded 3615
					
<b>Features</b>	0805, 1008, 1210, 1812 Packages 10µH to 1mH Value Range Temp.Range -25°C to 100°C Moulded Package Dip and Wave Solderable	0805, 1008, 1210, 1812 Packages 10µH to 1mH Value Range Temp.Range -25°C to 100°C Moulded Package Dip and Wave Solderable	0805, 1008, 1210, 1812 Packages 10µH to 1mH Value Range Temp.Range -25°C to 100°C Moulded Package Dip and Wave Solderable	0805, 1008, 1210, 1812 Packages 10µH to 1mH Value Range Temp.Range -25°C to 100°C Moulded Package Dip and Wave Solderable	Board Area 13mm x 5mm 0.1µH to 1mH Value Range High Current (3.5A) Moulded Package 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
					
<b>Features</b>	0402 to 1206 Package Sizes 1µH to 100mH Value (E12 Grid) DC Current 1200mA Tolerances down to ±0.2µH High Self Resonant Frequency	0603 to 1008 Package Sizes 1.8nH to 4.7µH Value Range DC Current up to 1Amp Tolerances down to 2% -40°C to 125°C Temp. Range	0805 & 1008 Low Profile (3651) 0603 High Current (3652) 0805 & 1008 High Q (3653) Tolerances Down to 2% Up to 2.4A IDC	0603 to 1206 Package Sizes Low DC Resistance Low Q Factor High Reliability Range of Tolerances	0402, 0603, 0805 Package Sizes 1nH to 470nH Value Range DC Current 0.3 Amps Tolerances down to ±0.3 nH 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
					
<b>Features</b>	0402 to 1812 Package Sizes 10R to 2K7 Impedance General Purpose Applications High Frequency Applications DC Current to 0.6A	0603 to 1206 Package Sizes 26R to 600R Impedance Low Frequency Applications Prevents Signal Ringing DC Current to 0.4A	0603 to 0805 Package Sizes 30R to 1K5 Impedance High Current Signal Line Applications DC Current to 1A	0603 to 1812 Package Sizes 10R to 600R Impedance High Current Noise Filtering Applications DC Current to 6A	0603 Size 120R to 1K0 Impedance Minimal Electromagnetic Interference Minimises Stray Capacitance 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, High Current, High Loss, etc	E12 Series Values	E12 Series Values	5% or 10% Tolerance
		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
					
<b>Features</b>	Board Area from 6.5mm x 4.4mm Values 1 $\mu$ H to 10,000 $\mu$ H Current up to 4.5 Amps Less than 3mm Height 6 Package Sizes	Board Area from 12.5mm x 12.5mm Values 1.1 $\mu$ H to 1,500 $\mu$ H Current up to 10.2 Amps From 4mm Height 6 Package Sizes	Board Area from 10.5mm x 9.5mm Values 1.5 $\mu$ H to 15,000 $\mu$ H Current up to 5.6 Amps From 6mm Height 2 Package Sizes	Board Area from 3.3mm x 3.5mm Values 1 $\mu$ H to 220 $\mu$ H Current up to 3.5 Amps From less than 1mm Height 7 Package Sizes	Board Area from 3.8mm x 3.8mm Values 0.9 $\mu$ H to 1,000 $\mu$ H Current up to 4.6 Amps From less than 1.2mm Height 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
					
<b>Features</b>	Board Area from 6.6mm x 6.6mm Values .054 $\mu$ H to 7.4 $\mu$ H Current up to 38 Amps From 4.5mm Height 2 Package Sizes	Board Area 7.8mm x 7.5mm Values 1.2 $\mu$ H to 5,600 $\mu$ H Current up to 2.6 Amps Less than 2.5mm Height 1 Package Size	Board Area from 7.5mm x 7.5mm Values 10 $\mu$ H to 1,500 $\mu$ H Current up to 4.6 Amps From 4mm Height 3 Package Sizes	Board Area from 6mm x 6mm Values 1 $\mu$ H to 1,000 $\mu$ H Current up to 3.8 Amps From less than 3mm Height 3 Package Sizes	Board Area from 8mm x 8mm Values 0.8 $\mu$ H to 330 $\mu$ H Current up to 7.8 Amps From less than 3mm Height 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 $\pm 1\%$	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 6800 $\mu$ F Capacitance Range	0.1 to 6800 $\mu$ F Capacitance Range	0.1 to 1000 $\mu$ F Capacitance Range	1.0 to 220 $\mu$ F Capacitance Range	22 to 2700 $\mu$ F 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



## 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