

# PRODUCTS & Solutions

April 2019



EXXELIA 

## INDUSTRY SPECIALIST

EXXELIA is a manufacturer of Hi-Rel passive components and precision subsystems focusing on demanding end-markets, applications and functions.

EXXELIA is valued for its ability to meet complex specifications and develop standard and custom products complying with the most demanding qualification criteria intended to critical functions (MIL, ESA...). Products are commonly used for power electronics, power generation, energy storage, and signal filtering functions.

EXXELIA offers state-of-the-art custom designs in terms of compactness, packaging and performance.



## EXTENSIVE HIGH-REL COMPONENTS PORTFOLIO

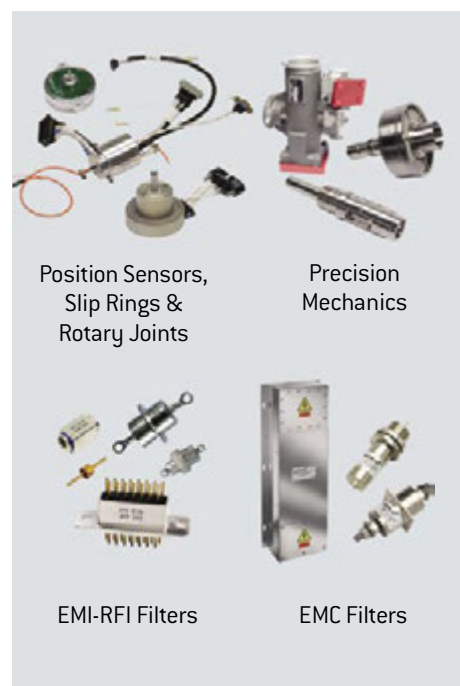
### CAPACITORS



### MAGNETICS



### ELECTROMECHANICAL



## 7 DEMANDING MARKETS



Civil aviation



Space



Defense



Transport & Energy



Telecom



Medical



Industry

## EXXELIA AT A GLANCE



**1900**   
Employees

ISO 9001  
EN 9100  
AS 9100  
**Certified** 

**13**   
Manufacturing  
Locations



In more than  
**30 countries**

**1**   
Stop Shopping

## EXXELIA WORLDWIDE

EXXELIA is a global company with manufacturing sites strategically located to cover all continents. Two assembly plants are established in competitive manufacturing countries, enabling the group to provide cost-effective solutions.

Thanks to an extensive sales network covering more than 30 countries, EXXELIA is able to provide prompt in-depth technical expertise throughout a project and remain close to its clients at all stages from design to production.

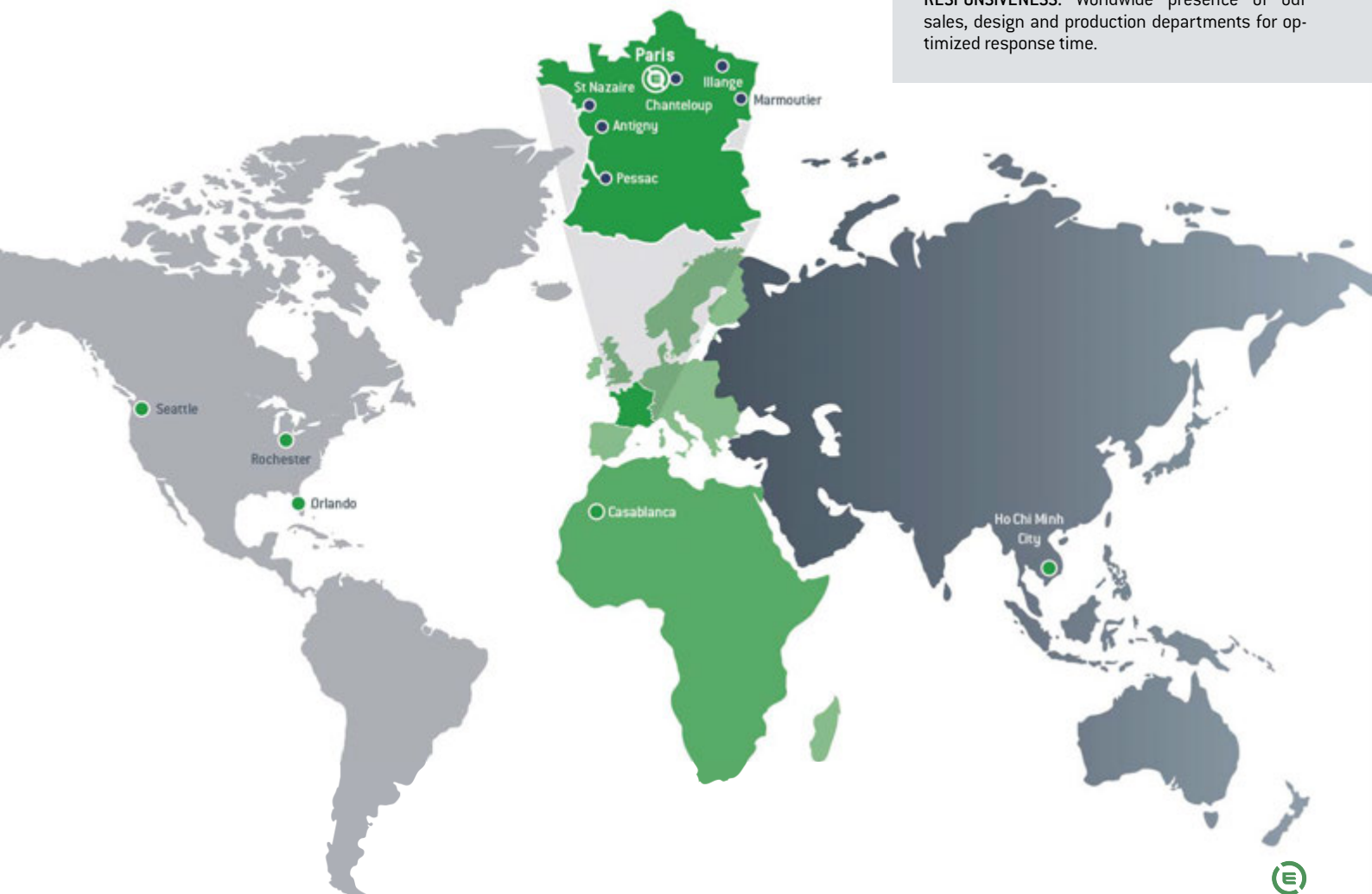
## OUR APPROACH

EXXELIA focuses its know-how on challenging markets that require high level of technicity and reliability. Our approach is based on three key principles:

**FOCUS:** serving a limited number of defined markets to better serve our customers.

**INNOVATION:** Provide new and creative value propositions to positively impact our customers' growth.

**RESPONSIVENESS:** Worldwide presence of our sales, design and production departments for optimized response time.

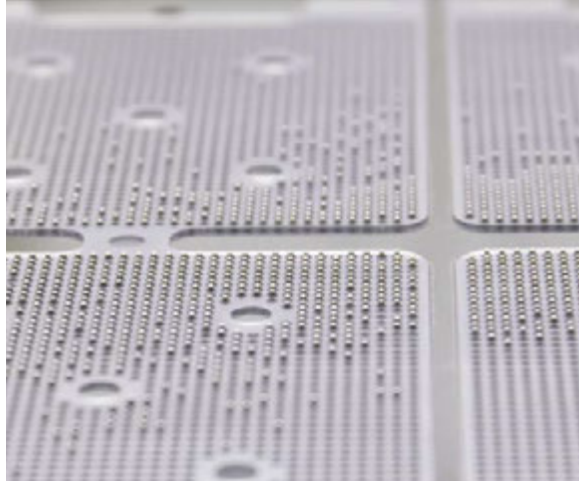


# CERAMIC CAPACITORS

EXXELIA multi-layer ceramic capacitors offer excellent temperature resistance, high volume/capacitance ratio, and high reliability. With over 50 years experience, EXXELIA has acquired a comprehensive knowledge of the materials properties and performances enabling the company offer porcelain, NP0, BX, 2C1, X7R, C4xx and -2200 ppm/°C dielectrics.

Their excellent properties make EXXELIA MLCCs ideal for a wide range of applications including aircraft flight controls, switch-mode power supply in harsh environments, charge/discharge applications, medical implants, drilling tools for oil exploration and satellite platforms.

EXXELIA can quickly evaluate application specific design challenges and provide efficient solutions. For requirements that cannot be met by catalog products, EXXELIA offers state-of-the-art custom designs in terms of compactness, packaging and performance.



T°	Product range (space grade available in green)	Size	Dielectric material	Capa.	Voltage	For space grade		Tolerance	Use
						Capa.	Voltage		
Standard -55°C+125°C	CEC / CNC Series 	0402 ⇄ 3040	NP0 BX 2C1 X7R	1 pF ⇄ 12 µF	10 V ⇄ 1 000 V	1 pF ⇄ 3.9 µF	10 V ⇄ 1 000 V	±0,25 ⇄ ±1 pF ±1% ⇄ ±20%	Precision, stability, decoupling.
	NON MAGNETIC Series 	0603 ⇄ 2220	NP0 X7R	10 pF ⇄ 1 µF	63 V ⇄ 500 V	—	—	±1% ⇄ ±20%	
	OP Series 	0805 ⇄ 2220	NP0 X7R	1 pF ⇄ 4.7 µF	10 V ⇄ 100 V	—	—	±0,25 ⇄ ±1 pF ±1% ⇄ ±20%	Precision, stability, decoupling. Significantly reduce risk of short circuit.
	CER / CNR Series 	0306 ⇄ 0612	NP0 X7R	1 pF ⇄ 270 nF	16 V ⇄ 100 V	—	—	±1% ⇄ ±20%	Decoupling, low ESL, medical embedded.
	C3N - C4N - C3E - C4E Series 	—	NP0 X7R	4.7 pF ⇄ 33 nF	25 V ⇄ 200 V	—	—	±0,25 ⇄ ±1 pF ±1% ⇄ ±20%	Medical embedded, miniaturization.
	30 S4 Series 	—	NP0 X7R	470 pF ⇄ 820 nF	40 V ⇄ 100 V	—	—	±1% ⇄ ±20%	Railway.
	TCE / TCX / TCN / TXR Molded Series 	—	NP0 BX 2C1 X7R	1 pF ⇄ 4.7 µF	25 V ⇄ 500 V	—	—	±0,25 ⇄ ±1 pF ±1% ⇄ ±20%	Precision, stability, decoupling.
	LA Series 	—	NP0 Temp. coeff.	1 pF ⇄ 680 nF	25 V ⇄ 63 V	—	—	±0,25 ⇄ ±1 pF ±1% ⇄ ±20%	Decoupling.
	TCE / TCX / TCN / TXR Axial Series 	—	NP0 BX 2C1 X7R	1 pF ⇄ 3.9 µF	25 V ⇄ 500 V	—	—	±0,25 ⇄ ±1 pF ±1% ⇄ ±20%	Precision, stability, decoupling.
	TCE / TCX / TCN / TXR Conformal Coated Series 	—	NP0 BX 2C1 X7R	1 pF ⇄ 6.8 µF	25 V ⇄ 500 V	—	—	±0,25 ⇄ ±1 pF ±1% ⇄ ±20%	Precision, stability, decoupling.
	NON MAGNETIC Conformal Coated Series 	—	NP0 X7R	180 pF ⇄ 1 µF	63 V ⇄ 500 V	—	—	±1% ⇄ ±20%	Precision, stability, decoupling.
	CK Series 	—	BX	10 pF ⇄ 1.5 µF	25 V ⇄ 250 V	—	—	±10% ⇄ ±20%	Decoupling.



	T°	Product range (space grade available in green)	Size	Dielectric material	Capa.	Voltage	For space grade		Tolerance	Use
							Capa.	Voltage		
High voltage	-55°C +125°C	C series 	1515 ⇕ 16080	NPO C4xx X7R	10 pF ⇕ 39 µF	200 V ⇕ 10 000 V	10 pF ⇕ 6.8 µF	250 V ⇕ 10 000 V	±1% ⇕ ±20%	Power supply, voltage multiplier, radars. • aeronautic • space • defense • railways
		TCK Series 	—	NPO C4xx X7R	10 pF ⇕ 39 µF	200 V ⇕ 10 000 V	10 pF ⇕ 6.8 µF	250 V ⇕ 10 000 V	±1% ⇕ ±20%	
		VM Series 	—	—	—	—	—	—	—	
		TCL Series 	—	NPO C4xx X7R	10 pF ⇕ 39 µF	200 V ⇕ 10 000 V	—	—	±1% ⇕ ±20%	
		TCF Series 	—	NPO C4xx X7R	10 pF ⇕ 39 µF	200 V ⇕ 10 000 V	10 pF ⇕ 6.8 µF	250 V ⇕ 5 000 V	±1% ⇕ ±20%	
		TKD Series 	—	NPO C4xx X7R	10 pF ⇕ 39 µF	200 V ⇕ 10 000 V	10 pF ⇕ 2.7 µF	250 V ⇕ 5 000 V	±1% ⇕ ±20%	
		CS Series 	2020 ⇕ 16080	NPO C4xx X7R	220 pF ⇕ 15 µF	1 000 V ⇕ 10 000 V	—	—	±1% ⇕ ±20%	
High capacitance	-55°C +125°C	R Series (chips) 	2225 ⇕ 45107	X7R	47 nF ⇕ 27 µF	50 V ⇕ 500 V	—	—	±10% ⇕ ±20%	Switch Mode Power Supply, filtering, smoothing, decoupling. • aeronautic • space • defense
		R Series (leaded) 	—	X7R	47 nF ⇕ 27 µF	50 V ⇕ 500 V	—	—	±10% ⇕ ±20%	
		TEF series 	—	NPO	10 nF ⇕ 680 nF	63 V ⇕ 500 V	—	—	±1% ⇕ ±20%	
		SV / SC Series 	2225 ⇕ 125205	X7R	47 nF ⇕ 390 µF	50 V ⇕ 500 V	—	—	±10% ⇕ ±20%	
		CNC3X Series 	2220 ⇕ 4040	X7R	1.2 µF ⇕ 68 µF	16 V ⇕ 25 V	1.2 µF ⇕ 68 µF	16 V ⇕ 25 V	±10% ⇕ ±20%	
		CNC5X Series 	—	—	—	—	100 nF ⇕ 180 µF	50 V ⇕ 500 V	—	
		CEC5X Series 	3033 ⇕ 80150	NPO	10 nF ⇕ 6.8 µF	63 V ⇕ 500 V	—	—	±1% ⇕ ±20%	
		TEP / TEV series 	—	NPO	10 nF ⇕ 6.8 nF	63 V ⇕ 500 V	—	—	±1% ⇕ ±20%	
High temperature	-55°C +220°C -55°C +250°C	TCN8X Series 	—	X7R	0.47 µF ⇕ 120 µF	63 V ⇕ 500 V	—	—	±10% ⇕ ±20%	Oil drilling, motor control, braking systems.
		CE / CN Series 	0402 ⇕ 3040	NPO X7R	1 pF ⇕ 8.2 µF	16 V ⇕ 100 V	—	—	±0,25 ⇕ ±1pF ±1% ⇕ ±20%	
		SCT Series 	2225 ⇕ 25205	X7R	47 nF ⇕ 390 µF	50 V ⇕ 500 V	—	—	±10% ±20%	
		TCE/TCN Molded Series HT 	—	NPO X7R	1 pF ⇕ 10 µF	16 V ⇕ 100 V	—	—	±0,25 ⇕ ±1pF ±1% ⇕ ±20%	
		TCE / TCN Self protected Series 	—	NPO X7R	10 pF ⇕ 3.9 µF	25 V ⇕ 500 V	—	—	±0,25 ⇕ ±1pF ±1% ⇕ ±20%	
Feed-thru	-55°C +125°C	TCH Series 	—	NPO X7R	10 pF ⇕ 15 µF	200 V ⇕ 10 000 V	—	—	±1% ⇕ ±20%	Very low ESL  Very low ESL, miniaturization
		TBC series 	—	NPO X7R	10 pF ⇕ 5600 pF	25 V ⇕ 1 000 V	—	—	±1% ⇕ ±20%	
		BPM Series 	—	X7R	330 pF ⇕ 68 nF	25 V ⇕ 200 V	—	—	±10% ⇕ ±20%	

# RF CAPACITORS

## High-Q CAPACITORS:

EXXELIA High-Q MLCC capacitors are designed to handle high power and high voltage ratings (from 1000 V to 7000 V) for applications in RF power amplifiers, base stations, filters, broadcasting, medical MRIs and industrial electronics. All series are RoHS with non-magnetic terminations available.

## BROADBAND CAPACITORS:

EXXELIA Broadband capacitors allow a flat insertion loss up to 35 GHz, ideal for high-end optical network infrastructure.

		T°	Product range (space grade available in green)	Size	Dielectric material	Capacitance	Voltage	For space grade		Tolerance	Use
								Capacitance	Voltage		
High Q	Classic	-55°C +175°C	CH Series	0505 ⇕ 1111	P100	0.1 pF ⇕ 1 nF	50 V ⇕ 1 500 V	0.1 nF ⇕ 1 nF	50 V ⇕ 1 500 V		Cellular base station amplifier, MRI.
	Super	-55°C +150°C	SH series	0402 ⇕ 1210	NPO	0.2 pF ⇕ 1 nF	25 V ⇕ 1 500 V	—	—		Cellular base station equipment Broadband Point to point/ multi-point radios RF generators
	reverse geometry	-55°C +175°C	SHD / SHR-Series	0709 ⇕ 0711	NPO	0.5 pF ⇕ 100 pF	500 V	—	—	±0.05 pF ⇕ ±0.5 pF	
	HSRF	-55°C +175°C	NHB Series	1111	NPO	0.3 pF ⇕ 100 pF	500 V	—	—	±1% ⇕ ±10%	
	High Power	-55°C +125°C	CP Series	2225 ⇕ 4040	P100	1 pF ⇕ 10 nF	200 V ⇕ 7 000 V	—	—		RF power amplifier Plasma chamber MRI coils
			CL Series	2225 ⇕ 7065	NPO	1 pF ⇕ 10 nF	200 V ⇕ 7 000 V	—	—		
Broadband	eXtra	-55°C +125°C	XBL Series NEW	EIA 0402	X7R	100 nF	16 V	—	—	±10%	Optoelectronics / High-speed data Broadband test equipment & applications Broadband microwave/ millimeter wave amplifiers & oscillators
	Ultra	-55°C +125°C	UBL Series NEW	EIA 0402	X7R	100 nF	16 V	—	—	±10%	
		-55°C +105°C	UBZ Series NEW	EIA 0201	X5R X6T	100 nF	10 V	—	—	±10%	

# MICROWAVE COMPONENTS

## TRIMMER CAPACITORS

EXXELIA is one of the few suppliers in the world able to offer a wide range of RoHS trimmer capacitors using ceramic, air or sapphire as dielectrics. A broad range of capacitances, voltages and temperature coefficients are available.



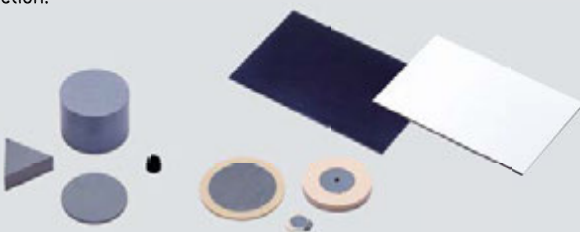
## TUNING ELEMENTS

Frequency Tuning Elements with self locking mechanism are high precision crews for cavity filter tuning. INVAR versions are available (space applications).



## FERRITE MATERIALS

Mostly intended for isolators and circulators sub-systems used in radiocommunication systems, ferrite materials from EXXELIA are offered in disks, triangles and special custom designed dimensions. They are all based on EXXELIA own fomulation providing low ΔH propitious to IMD reduction.



## DIELECTRIC & COAXIAL RESONATORS

EXXELIA offers a wide range of dielectric resonators with high "Q" factor and dielectric constant from 24 to 78. The coaxial resonators products can be used between 300 MHz and 6 GHz and are available in dimensions from 2 x 2 to 12 x 12 mm, allowing the best compromise between impedance, "Q" factor and resonant frequency.



# TANTALUM CAPACITORS

## CAPACITORS

Tantalum capacitors offer the highest charge per unit of volume combined with extremely high reliability and durability. EXXELIA manufactures an extensive range of solid (MnO<sub>2</sub> and polymer technologies) and wet tantalum capacitors for demanding applications such as satellites, aircraft

and defense electronics through MIL and DSCC-qualified series.

Specific interfaces, package size and characteristics are available upon request.

	Product range		Detail specification	Capacitance	Voltage	Operating Temperature	Main features
Wet tantalum capacitors	CT79 / CT79 SMD CT79E / CT79E SMD		CECC 30202-005/001/801 ESCC 3003/005	1.7 µF ⇒ 2 200 µF	6 V ⇒ 150 V	–55°C+125°C	Reverse voltage - High ripple current
	ST79 / ST79 SMD		According to DSCC 93026 ESCC 3003/006	10 µF ⇒ 1 800 µF	25 V ⇒ 125 V	–55°C+125°C	High capacitance
	CT79 HT200 - CT79E HT200 ST79 HT200		According to CECC 30202-005/001/801	1.7 µF ⇒ 2 200 µF	6 V ⇒ 150 V	–55°C+200°C	High capacitance. High Temperature.
	WT83 / WS83		According to DSCC 10004	150 µF ⇒ 10 000 µF	10 V ⇒ 125 V	–55°C+125°C	Very high capacitance Enhanced performances
	DSCC 10004 <b>NEW</b>		DWG N°10004	220 µF ⇒ 10 000 µF	10 V ⇒ 125 V	–55°C+125°C	Very high capacitance Enhanced performances
	DSCC 93026 <b>NEW</b>		DWG N°93026	10 µF ⇒ 1 800 µF	6 V ⇒ 125 V	–55°C+125°C	Very high capacitance
	MIL 39006/22 <b>NEW</b>		MIL-PRF-39006/22 Failure rate Level M	1.7 µF ⇒ 1 200 µF	6 V ⇒ 125 V	–55°C+125°C	MIL OPL Reverse voltage - High ripple current
	MIL 39006/25 <b>NEW</b>		MIL-PRF-39006/25 Failure rate Level M	6.8 µF ⇒ 680 µF	25 V ⇒ 125 V	–55°C+125°C	MIL OPL Reverse voltage - High ripple current Extended range
	CT9 / CT9E		According to CECC 30202-004	3 µF ⇒ 2 200 µF	6.3 V ⇒ 150 V	–55°C+125°C	Silver case. Glass metal seal. Hermetical Extended range (CT9E)
	CT4 / CT4E		CECC 30202-003 (CT4) According to BS 9073 F008/F032 (CT 4E)	1.7 µF ⇒ 2 200 µF	6 V ⇒ 150 V	–55°C+125°C	Silver case. Seal and resin sealing Extended range (CT4E)
Polymer caps.	SPE0844 / SPE0844S		–	27 µF ⇒ 6 000 µF	6 V ⇒ 375 V	–55°C+125°C	Parallel and serial assemblies of capacitors Reverse voltage - High ripple current
	AP31 / AP41 / AS31		–	27 µF ⇒ 40 000 µF	10 V ⇒ 450 V	–55°C+125°C	Parallel and serial assemblies of capacitors Very High Capa/Voltage. High reliability design
Moulded cases - SMD	CTP21		–	47 µF ⇒ 560 µF	16 V ⇒ 75 V	–55°C+105°C	Very low ESR. High ripple current High surge current
	CTP42		–	68 µF ⇒ 1 200 µF	16 V ⇒ 75 V	–55°C+105°C	Assembly of 2 CTP21 in parallel Ultra low ESR. Extended Capacitance
Solid tantalum capacitors	CTS1 / CTS1M		CECC 30201-001/002/801 MIL-PRF 39003/01 (CTS1M)	0.1 µF ⇒ 330 µF	6.3 V ⇒ 125 V	–55°C+125°C	Standard range. General purpose +125°C
	CTS13		CECC 30201-005	0.1 µF ⇒ 330 µF	6.3 V ⇒ 63 V	–55°C+85°C	Standard range. General purpose +85°C
	CTS32		CECC 30201-019	1 µF ⇒ 330 µF	6.3 V ⇒ 63 V	–55°C+125°C	Standard range. High surge current Reverse voltage
	CTS23		–	0.1 µF ⇒ 1 200 µF	6.3 V ⇒ 63 V	–55°C+125°C	Extended range. General purpose
	CTS33		–	0.1 µF ⇒ 1 000 µF	6.3 V ⇒ 63 V	–55°C+125°C	Extended range. Low leakage current
	CTS21 / CTS21E / CTS1M		CECC 30201-040 According to MIL-PRF 39003/09 (CTS21M)	5.6 µF ⇒ 1 000 µF	6.3 V ⇒ 63 V	–55°C+125°C	Low ESR. High ripple current High surge current
	CTS41 / CTS41RSE		CECC 30201-037	0.1 µF ⇒ 150 µF	6.3 V ⇒ 50 V	–55°C+125°C	High surge current. Reverse voltage Low ESR (CTS41 RSE)
	CTS4		CECC 30201-003	0.1 µF ⇒ 150 µF	6.3 V ⇒ 50 V	–55°C+85°C	General purpose
	CTC3 / CTC3E		–	0.1 µF ⇒ 680 µF	4 V ⇒ 50 V	–55°C+125°C	Standard chip size. General purpose Extended range (CTC3E)
	CTC4		–	0.1 µF ⇒ 100 µF	6.3 V ⇒ 50 V	–55°C+125°C	Standard chip size. General purpose High surge current
	CTC4RSE		–	4.7 µF ⇒ 1 000 µF	6.3 V ⇒ 50 V	–55°C+125°C	Low ESR. High ripple current High surge current
	CTC21 / CTC21E		CECC 30801-013 ESCC 3012/002 (CTC 21) ESCC 3012/003 (CTC 21E)	5.6 µF ⇒ 680 µF	6.3 V ⇒ 100 V	–55°C+125°C	Low ESR. High ripple current High surge current
	SMT47 <b>NEW</b>		–	47 µF ⇒ 1 500 µF	6.3 V ⇒ 63 V	–55°C+125°C	Extended Capacitance - Low ESR Enhanced performance
	CTC42 / CTC42E		–	12 µF ⇒ 1 500 µF	6.3 V ⇒ 80 V	–55°C+125°C	Assembly of 2 CTC21 / CTC21E in parallel.

# FILM CAPACITORS

## FILM CAPACITORS:

EXXELIA manufactures a versatile range of rugged, metalized film and film foil capacitors with high-temperature, low-loss, long life and stability characteristics.

By using a wide range of dielectrics (PET, PPS, PP, reconstituted mica...) EXXELIA is able to cover the majority of technical needs.

Most common configurations are available (wrap & fill, axial, hermetic tubular, radial, bath tub, lugs, brackets, feed through, glass tube...) and custom designs is one of EXXELIA's recognized strengths.

## MICA CAPACITORS:

Capacitors with mica dielectric are noted for their excellent temperature performance, low loss at all frequencies and high dielectric strength and stability over time. They are particularly recommended for use in filtering circuits, delay line circuits, oscillators, pulse circuits etc...

	T (°C)	Product range [space grade available in green]	Dielectric	Capacitance	Tolerance	Voltage	Qualification	Use
Polyester for or S.M.P.S.	-55°C +125°C (+155°C)	PM 90 [S] PM 94 [S] 	Metalized polyester (P.E.T.)	8.2 nF ⇄ 150 µF	± 5 % ⇄ ± 20 %	50 V ⇄ 630 V	ESA/ESCC (EPPL, QPL)	High frequency switch mode power supplies, SMD. • defense • aeronautic • space
		PM 96 [S] PM 96 T [S] MKT [S] 		33 nF ⇄ 100 µF	± 5 % ⇄ ± 20 %	25 V ⇄ 630 V	Acc. ESA	
		PM 948 [S] PM 907 [S] 		22 nF ⇄ 180 µF	± 10 % ± 20 %	63 V ⇄ 1250 V	ESA / ESCC	
		PHM 912 PHM 912 S [on going] <b>NEW</b> 	Metalized plastic film	1.8 µF ⇄ 68 µF	± 10 % ± 20 %	250 V ⇄ 1000 V	in house	
Polyester	-55°C +125°C	PM 50 - PM 60 	Metalized polyester	1 nF ⇄ 22 µF	± 5 % ⇄ ± 20 %	40 V ⇄ 630 V	CECC / IEC	Standard applications.
		PM 7 - PM 12 PM 720 - PM 730 		82 pF ⇄ 10 µF	± 5 % ⇄ ± 20 %	63 V ⇄ 630 V	CECC / IEC	
		MPA HT MRA HT 		1 nF ⇄ 4.7 µF	± 5 % ⇄ ± 20 %	1000 V ⇄ 15000 V	in house	
		BIK-X2/Y BIK P-X/Y BIK CR 	Metalized polyester. Metalized polypropylene	1 nF ⇄ 6.8 µF	± 5 % ⇄ ± 20 %	400 V <sub>DC</sub> 250 V <sub>AC</sub>	in house	
	-55°C +125°C	218P 	Polyester (P.E.T.)	1 nF ⇄ 12.0 µF	± 20% ⇄ ± 5%	100 ⇄ 400 V	MIL QPL	High Voltage
		410P 		1 nF ⇄ 5.0 µF	+20% -10% ⇄ ± 10%	50 ⇄ 600 V	—	
		430P 		1 nF ⇄ 10.0 µF	± 20% ⇄ ± 5%	63 ⇄ 16 000 V	—	
		431P 		10 nF ⇄ 15.0 µF	± 20% ⇄ ± 5%	63 ⇄ 630 V	—	
		442P 		10 nF ⇄ 10.0 µF	± 20% ⇄ ± 5%	63 ⇄ 400 V	—	
	-65°C +125°C	132P 		1 nF ⇄ 1.0 µF	+20% -10% ⇄ ± 10%	100 ⇄ 1 000 V	MIL QPL	AC / DC Current



	T (°C)	Product range (space grade available in green)	Dielectric	Capacitance	Tolerance	Voltage	Qualification	Use
Polycarbonate / Polyphenylene Sulfide (P.P.S. suffix T)	-55°C +125°C	A 64 S4 (T) - A 74 S4 (T) PMR 4 (T)	Metalized polycarbonate P.P.S.	1 nF ⇔ 33 µF	± 1 % ⇔ ± 20 %	40 V ⇔ 630 V	NF F 62 102	Safety capacitors for signalling and others railways applications.
		KCP 4 UA T	Film-foil P.P.S.	7.5 nF ⇔ 727 nF	± 2 % ± 5 %	630 V ⇔ 1000 V	Acc. NF F 62 102	
		K1PE T	Metalized P.P.S.	10 nF ⇔ 3.3 µF	± 1 % ⇔ ± 20 %	400 V ⇔ 630 V	NF F 62 102	
		KM 501-601(T) KM 50-60(T)	Metalized polycarbonate P.P.S.	1 nF ⇔ 22 µF	± 1 % ⇔ ± 20 %	40 V ⇔ 630 V	CECC	Precision capacitors (Capacitance stability, low tolerance) Measurement, control electronics.
		KM 111 (T)(S)		1 nF ⇔ 10 µF	± 1 % ⇔ ± 20 %	40 V ⇔ 400 V	ESA (EPPL) / CECC	
		KM 311-KM 21 (T) KM 711-KM 7 (T)		1 nF ⇔ 22 µF	± 1 % ⇔ ± 20 %	40 V ⇔ 630 V	CECC	
		KM 78 - 82 - 90 - 97 (T)		1 nF ⇔ 10 µF	± 1 % ⇔ ± 20 %	40 V ⇔ 208 V	in house	
		PMR 64 (T) PMA 64 (T)		470 pF ⇔ 22 µF	± 1 % ⇔ ± 20 %	40 V ⇔ 630 V	in house	
		PM 67 (T) PM 72 (T)		1 nF ⇔ 15 µF	± 1 % ⇔ ± 20 %	40 V ⇔ 208 V	in house	AC filtering (400 Hz and others).
		KM 94 (S)	Metalized P.P.S.	1 nF ⇔ 1.2 µF	± 1 % ⇔ ± 20 %	40 V ⇔ 100 V	ESA/ESCC (EPPL)	High stability, SMD.
		KM 915		1.5 nF ⇔ 2.7 µF	± 5 % ⇔ ± 20 %	250 V <sub>DC</sub> ⇔ 630 V <sub>DC</sub> 150 V <sub>AC</sub> ⇔ 400 V <sub>AC</sub>	—	AC Filtering (400 Hz)
Polyphenylene Sulfide (P.P.S.)	-55°C +125°C	810P	Polyphenylene Sulfide (P.P.S.)	1 nF ⇔ 1.0 µF	± 20 % ⇔ ± 5 %	50 ⇔ 400 V	—	Precision capacitors Low TCC
		820P		10 nF ⇔ 15.0 µF	± 10 % ⇔ ± 1 %	50 ⇔ 400 V	MIL QPL	
		832P		1 nF ⇔ 10.0 µF	± 10 % ⇔ ± 2 %	63 ⇔ 400 V	—	
		842P		10 nF ⇔ 15.0 µF	± 10 % ⇔ ± 2 %	50 ⇔ 200 V	—	
		859P		10 nF ⇔ 10.0 µF	± 20 % ⇔ ± 5 %	80 ⇔ 440 V <sub>RMS</sub>	MIL QPL	
		860P		10 nF ⇔ 10.0 µF	± 20 % ⇔ ± 5 %	126 ⇔ 250 V <sub>RMS</sub>	MIL QPL	
		882P		1 nF – 0.22 µF	± 10 % ⇔ ± 2 %	200 V	—	
		PRF-83421/06		1 nF ⇔ 22 µF	± 10 % ⇔ ± 0.25 %	30 ⇔ 400 V	MIL QPL	
		880P		4.7 nF ⇔ 10.0 µF	± 10 % ⇔ ± 2 %	50 ⇔ 400 V	—	
polystyrene	-55°C +85°C	PLS 3 - PLS 5 PLS 7 - PLS 8	Polystyrene + foil	10 pF ⇔ 1 µF	± 1 % ⇔ ± 5 %	63 V ⇔ 500 V	CCTU/CECC	Filtering, frequency tuning.
High voltage	-55°C +125°C	HT 72	Reconstituted mica, resin impregnated	100 pF ⇔ 4.7 µF	± 5 % ⇔ ± 20 %	630 V ⇔ 25 000 V	in house	High voltage filtering, (defense, aeronautic, space) TWT Radar, Ignition System, Firing Capacitors, Oil and Gaz.
		HT 96 HT 78(P/S) - HT 86 (P/S) HT 97(P/S)		100 pF ⇔ 2.2 µF	± 5 % ⇔ ± 20 %	630 V ⇔ 20 000 V	ESA/ESCC (QPL HT96) Acc. ESA/ESCC (HT97)	
Metalized polypropylene	(-55) - 40°C +85°C (+105)	PRA HT	Metalized polypropylene	1 nF ⇔ 10 µF	± 5 % ± 10 %	1000 V ⇔ 30 000 V	in house	High voltage
		PP 3 A - PP 3 M PR 3 A - PR 3 M	Metalized polypropylene +foil	680 pF ⇔ 1 µF	± 5 % ⇔ ± 20 %	630 V ⇔ 3 500 V 350 V <sub>AC</sub> ⇔ 1 400 V <sub>AC</sub>	in house	AC and pulse current
		PM 98 - PM 980	Metalized plastic film	25 µF ⇔ 1 600 µF	± 10 % ± 20 %	300 V ⇔ 1 200 V	in house	Filtering, energy storage, flash
		PP 78 A - PP 78 R PP 78 S	Metalized polypropylene	1 nF ⇔ 10.2 µF	± 1 % ⇔ ± 20 %	160 V ⇔ 630 V	UTEC/NFC	AC/DC current, standard applications
		PPS 13 PPS 16 A - PPS 16 R PP 318 - PP 418	Polypropylene + foil	100 pF ⇔ 603 nF	± 1 % ⇔ ± 20 %	63 V ⇔ 1000 V	in house	AC/DC and pulse current
		RA ... - PS ...	Metalized polypropylene +foil	100 pF ⇔ 1 µF	± 1 % ⇔ ± 20 %	630 V ⇔ 2 000 V	in house	AC and pulse current

# FILM CAPACITORS

		Product range (space grade available in green)	Dielectric	Capacitance	Tolerances	Voltage range	Qualification	Use
Polypropylene (P.P)	0 +40°C	682P 	Polypropylene (P.P)	5.0 µF ⇔ 100 µF	+20% -10%, ±10%	800 ⇔ 1 200 V	—	Energy storage
		684P 		5.0 µF ⇔ 175 µF	+20% -10%, ±10%	400 ⇔ 1 000 V	—	
	-55°C +70°C	730G 		0.01 µF ⇔ 2.5 µF	±20% ⇔ ±5%	850 ⇔ 3 000 V	—	AC / & Snubber
	-55°C +85°C	781P 		18.0 µF ⇔ 400.0 µF	±20% ⇔ ±10%	600 ⇔ 1 800 V	—	
	-55°C +105°C	700P 		0.01 µF ⇔ 1.0 µF	±20% ⇔ ±5%	200 ⇔ 800 V	—	
		709G 		1 nF ⇔ 4.7 µF	±20% ⇔ ±5%	160 ⇔ 2 000 V	—	AC / DC & Pulse current
		710P 		1 nF ⇔ 1.0 µF	±20% ⇔ ±5%	200 ⇔ 800 V	MIL QPL	
		730P / 731P 		22 nF ⇔ 10.0 µF	±20% ⇔ ±5%	160 ⇔ 630 V	—	AC / DC & Pulse current
		734G 		0.47 µF ⇔ 10.0 µF	±20% ⇔ ±5%	400 ⇔ 600 V	—	Low inductance
		735P 		1.0 µF ⇔ 30.0 µF	±20% ⇔ ±5%	100 ⇔ 400 V	MIL QPL	SMPS
		744G 		0.47 µF ⇔ 3.5 µF	±20% ⇔ ±5%	600 V	—	
		752P 		0.10 µF ⇔ 2.5 µF	±20% ⇔ ±5%	800 ⇔ 3 000 V	—	IGBT Snubber
Paper / Foil	-55°C +125°C	118P 	Paper / Foil	1 nF ⇔ 12.0 µF	±20% to ±5%	200 ⇔ 1 000 V	MIL QPL	Bypass, coupling
		103P 		1 nF ⇔ 1.0 µF	±20% to ±10%	200 ⇔ 600 V	MIL QPL	RFI
		911P 		0.10 µF ⇔ 2.7 µF	10%	400 V	—	
		CP53/54/55 		0.05 µF ⇔ 10 µF	+20% -10%, ±10%	100 ⇔ 1 000 V	MIL QPL	Bypass, coupling, filtering High temperature +200°C
	-65°C +125°C	131P 		1 nF ⇔ 1.0 µF	±20% to ±5%	200 ⇔ 1 000 V	MIL QPL	
		CQ72 		0.10 µF ⇔ 15.0 µF	±20% ⇔ ±10%	400 ⇔ 12 500 V	MIL QPL	High Voltage
	0 +40°C	282P 		10.0 µF ⇔ 200 µF	+20% -10%, ±10%	2 000 ⇔ 4000 V	—	Energy storage
Power electronics	(-55°C) -40°C +85°C (+100°C)	PPA - PPA FR PPA M 	Metalized polypropylene	1.5 µF ⇔ 260 µF	±5% ⇔ ±20%	260 V <sub>AC</sub> ⇔ 900 V <sub>AC</sub>	in house	Motor run, fluorescence, compensation
		PP 44 A2 PP 44 R5 		0.1 µF ⇔ 300 µF	±5% ⇔ ±20%	300 V ⇔ 2 400 V 250 V <sub>AC</sub> ⇔ 1 200 V <sub>AC</sub>	in house	Medium power capacitor, semi-conductor protection, high current filtering, medium frequency tuning, decoupling.
		PP 88 - IGB 99 		47 nF ⇔ 7.5 µF	±5% ⇔ ±20%	800 V ⇔ 3 000 V 1.5kV <sub>GTO</sub> ⇔ 5.6kV <sub>GTO</sub>	in house	IGBT capacitors, protection / turn off thyristors GTO, medium frequency tuning.
		BI 73 A - BI 73 R R 73 A - R 73 R 	Bi-film Polyester + foil	1 nF ⇔ 2.2 µF	±5% ⇔ ±20%	1 000 V ⇔ 2 200 V Ucrete ⇔ 5 000 V	in house	Filtering, protection
Mica	-55°C +125°C	CA 1 - CA 2 CA 17 to CA 19 	Silvered mica	4.7 pF ⇔ 100 nF	±0.5 pF or ±1% ⇔ ±10%	500 V ⇔ 5 000 V	CECC Acc. MIL C 5	Filtering circuits, delay line circuits, oscillators, pulse circuits, H.F. generators, emission lines, D.C. blocking circuits, coupling, measurement...
		CA 15 - 20 - 30 - 40 CA 152 to 158 		4.7 pF ⇔ 15 nF	±1 pF or ±1% ⇔ ±10%	63 V ⇔ 500 V		
		CM 04 to CM12 CMR 04 to CMR 07 		200 pF ⇔ 1200 pF	±0.5 pF or ±1% ⇔ ±5%	100 V ⇔ 500 V		

# ELECTROLYTIC ALUMINUM CAPACITORS

EXXELIA is the only manufacturer who develops its own electrolytes, enabling to achieve the longest lifetime of the market. EXXELIA aluminum electrolytic capacitors provide high capacitance values (up to 2.2 F), long lifetime and can support extreme temperatures.

They are particularly suitable for D.C voltage applications in energy storage (lighting flash lamps, welding machines, radiology, radars) and time delay devices.

		Product range	Sizes Ø x h (mm)	Capacitance	Voltage	Main characteristics
Screw terminals	-55°C +125°C	FELSIC 125FRS	36x52 to 90x145	220 µF to 150 000 µF	16 V to 350 V	Low ESR, +125°C
		FELSIC 105FRS	36x47 to 77x144	470 µF to 68 000 µF	10 V to 100 V	Very low ESR
	-55°C +105°C	FELSIC HV	51x81 to 90x200	1 000 µF to 47 000 µF	160 V to 450 V	Extreme Long life, High ripple
		FELSIC 105	36x52 to 90x200	100 µF to 470 000 µF	16 V to 450 V	Extreme Long life
		FELSIC 105 LP	90x67	1 500 µF to 220 000 µF	10 V to 450 V	105 with Low Profile can
	-55°C +85°C	FELSIC HC <b>NEW</b>	36x44 to 90x220	100 µF to 2.7 F	10 V to 500 V	High energy density
		FELSIC 85	36x52 to 90x200	68 µF to 680 000 µF	10 V to 630 V	Standard 85°C
		FELSIC 85M	36x52 to 90x200	68 µF to 680 000 µF	10 V to 630 V	Standard 85°C ±20% tolerance
		FELSIC 039 FELSIC 037	36x47 to 77x144	100 µF to 150 000 µF	10 V to 400 V	Standard C039 type (railway maintenance standard)
Radial leaded type	-55°C +105°C	CUBISIC	35x35x16. 35x50x16	100 µF to 33 000 µF	10 V to 450 V	Non cylindrical case, Withstand 20 g vibrations, High energy density
		CUBISIC LP	45x35x12 to 45x75x12	220 µF to 68 000 µF	10 V to 400 V	Non cylindrical case, Withstand 20 g vibrations, High energy density
	-55°C +145°C	ALSIC 20g	18x20 to 35.5x25	33 µF to 80 000 µF	10 V to 500 V	Withstand 20 g vibrations
		ALSIC 145 20g	18x20 to 22.5x25	470 µF to 2 200 µF	10 V to 115 V	High temp. range, Long life, withstand 20 g vibrations
Snap in type	-55°C +125°C	Snapsic 125	22x25 to 35x50	470 µF to 47 000 µF	16 V to 100 V	High temperature range, Long Life
		Snapsic HV	22x25 to 35x50	47 µF to 2 200 µF	160 V to 500 V	Long Life, High ripple current
	-55°C +105°C	Snapsic 105	22x25 to 35x50	22 µF to 68 000 µF	16 V to 500 V	Standard 105°C type
		Snapsic HC <b>NEW</b>	22x25 to 35x50	47 µF to 47 000 µF	25 to 450 V	High energy density
	-55°C +85°C	Snapsic	22x25 to 35x50	22 µF to 47 000 µF	16 V to 500 V	Standard 85°C type
	-55°C +105°C	Snapsic 105 4P	35x50 to 45x75	330 µF to 150 000 µF	16 V to 550 V	Standard 105°C type with 4 Pins
	-55°C +105°C	Snapsic 105 LP	45x21 to 45x40	150 to 68 000 µF	16 V to 500 V	Low Profile 105°C with 4 Pins
	-55°C +85°C	Snapsic 4P	35x50 to 45x100	330 to 150 000 µF	16 V to 500 V	Standard 85°C type with 4 Pins
Axial type	-55°C +150°C	Prorelsic 145	14x30 to 25x75	6.8 to 10 000 µF	16 V to 450 V	High temperature Long life
	-55°C +105°C	Vacsic 150	14x30 to 16x30	6.8 to 3 300 µF	16 V to 450 V	High temperature Long life, Withstand 45 g vibrations
	-55°C +125°C	Prorelsic 125	12x25 to 25x75	1 to 15 000 µF	10 V to 350 V	125°C Long life
	-55°C +105°C	Vacsic 105	12x25 to 16x30	15 to 4 700 µF	10 V to 450 V	Standard 105°C type; Withstand 45 g vibrations.
	-55°C +85°C	Sical /Sical C042	6.5x19 to 25x75	6.8 to 47 000 µF	10 V to 630 V	Standard 85°C type

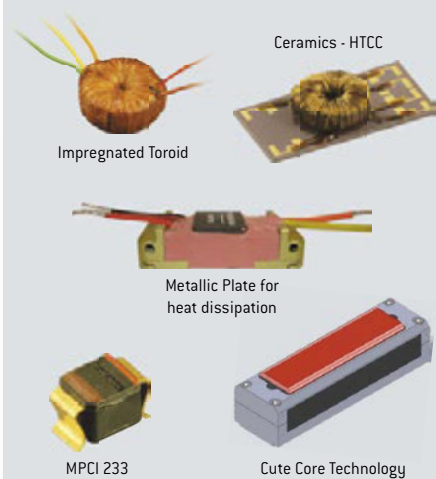
# WOUND MAGNETICS COMPONENTS

EXXELIA designs and manufactures magnetic components including wound magnetics, inductors, transformers, motors, sensors and actuators for high voltage, high temperature and power applications.

Products are optimized to meet the most demanding applications requirements thanks to a strong design expertise, Exxelia masters High Grade technologies: Chameleon Concept Magnetics (CCM), standard linear and toroidal, toroidal transfer molded technology (TT), SESI planar / low profile and aluminum foil winding.

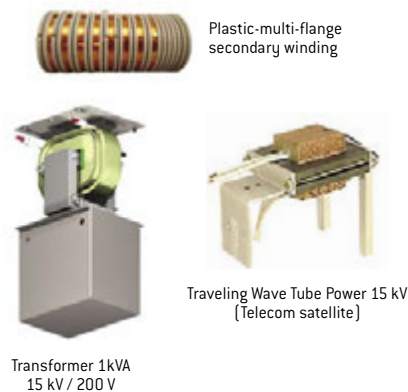
	Series	Current	Inductance	Temperature Range	Frequency	Notes
Chip Inductor	MPCI 10000, 12000, 20000	15 mA $\Rightarrow$ 1 000 mA	0.010 $\mu$ H $\Rightarrow$ 1 000 $\mu$ H	-55°C $\Rightarrow$ +125°C	7.9 MHz $\Rightarrow$ 500 MHz	QPL, Space Qualified
	MPCI H01	100 mA $\Rightarrow$ 1 500 mA	0.38 $\mu$ H $\Rightarrow$ 100 $\mu$ H	-55°C $\Rightarrow$ +125°C	—	QPL, Space Qualified
	MPCI 233 H01	100 mA $\Rightarrow$ 1 500 mA	0.38 $\mu$ H $\Rightarrow$ 100 $\mu$ H	up to +175°C	—	High Temperature
C-Mode Choke	CMC 15, CMC 18, CMC 22	0.55 A $\Rightarrow$ 14.3 A	60 $\mu$ H $\Rightarrow$ 4 900 $\mu$ H	-55°C $\Rightarrow$ +125°C	—	QPL, Space Qualified
	CMC 14, CMC 17	1.1 A $\Rightarrow$ 11.7 A	140 $\mu$ H $\Rightarrow$ 69 200 $\mu$ H	-55°C $\Rightarrow$ +125°C	—	ESA Generic Specification
Inductor	SESI 9.1	0.045 A $\Rightarrow$ 6 A	1 $\mu$ H $\Rightarrow$ 6 800 $\mu$ H	-55°C $\Rightarrow$ +125°C	Up to 1 MHz	QPL, Space Qualified
	SESI 14, 15	0.28 A $\Rightarrow$ 14 A	1.5 $\mu$ H $\Rightarrow$ 2 290 $\mu$ H	-55°C $\Rightarrow$ +125°C	Up to 1 MHz	QPL, Space Qualified
	SESI 18, 22, 32	0.8 A $\Rightarrow$ 24 A	4.9 $\mu$ H $\Rightarrow$ 4 709 $\mu$ H	-55°C $\Rightarrow$ +125°C	Up to 1 MHz	QPL, Space Qualified
	Series	ET	Turn Ratio	Temperature Range	Frequency (duty cycle 50%)	Notes
Gate drive transfo.	GTD 15	60/80 V $\mu$ s	1 : 1.52/1 : 1 : 1	-55°C $\Rightarrow$ +125°C	up to 500 kHz	Aeronautic, Space
	GTD 91	50/135 V $\mu$ s	1 : 1/1 : 1 : 1	-55°C $\Rightarrow$ +125°C	up to 500 kHz	Aeronautic, Space
	Series	Current	Turn Ratio	Temperature Range	Frequency (Triangle Waveform)	Notes
Current transfo.	CT 15	17 A pk max.	1 : 50/1 : 200	-55°C $\Rightarrow$ +125°C	6 kHz $\Rightarrow$ 100 kHz	Aeronautic, Space
	CT 91	10 A pk max.	1 : 50/1 : 200	-55°C $\Rightarrow$ +125°C	6 kHz $\Rightarrow$ 500 kHz	Aeronautic, Space
	DBIT / SBIT	MIL-STD-1553 Data Bus Transformer		-55°C $\Rightarrow$ +125°C	75 kHz $\Rightarrow$ 1 MHz	Aerospace, ESA / EPPL

## HIGH TEMPERATURE (up to 240°C)

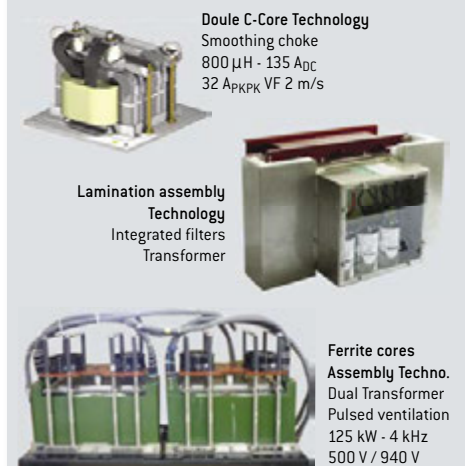


## HIGH VOLTAGE PRODUCTS

EXXELIA manufactures transformers up to 100 kV<sub>DWV</sub>. This know-how ensures the right choice of materials, winding and molding processes.

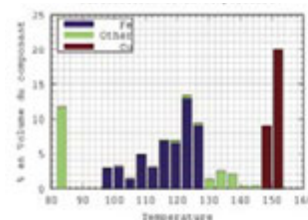
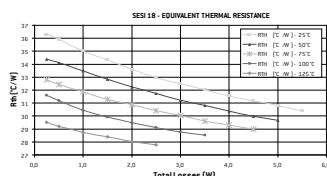
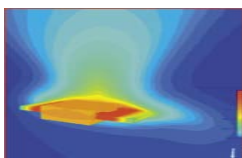


## POWER (up to 300 kVA)



## THERMAL MANAGEMENT

EXXELIA invests in R&D and makes extensive studies on the thermal management of magnetics, including loss calculations, design rules, thermal resistance and thermal modeling. We have available, a complete database of thermal resistances for all standard magnetics packages and have developed specific software for designing optimized compact components.





CATALOG PRODUCTS		HIGH GRADE TECHNOLOGIES	STANDARD TECHNOLOGIES
	Power Magnetics	Power inductors Common mode Choke (CMC) Gate drive Transformers (GDT) Current Transformers (CT)  CMC17/14 CT01 to CT15 SESI 9.1 to 32	CMESC17 CT05 
	Signal & Data, RF	Chip inductors Wide Band transformers Data Interface Bus Transformers Line matching transformers Common mode chokes  MIL STD 1553 DBIT(A) series MPC1 series WRFT HCESC, DLEF42 MTLM1234 mil	MTLM series 
	Switching < 500W	Power Transformers Power inductors Common mode Choke (CMC) Gate drive Transformers (GDT) Current and Voltage measurement transformers High temperature designs Up to 240°C  SESI technology HXMT TT technology molded toroids CCM technology PCB planar magnetics	FSIT ETD EFD Core P Core Toroids on plastic baseplate RM Resin encapsulation 
	Medium Power	Power Transformers Power inductors Up to 5 000 A Common mode Choke (CMC)  Foil winding Triple winding inductors Toroidal inductors	Copper plates assembly Ferrite Transformer 100kVA-20kHz 
	50-400Hz	12 pulse transformers interphase inductors current transformers  Aluminum Foil winding	Double C laminated steel cores Amorphous C core 
	Measurement transfo.	Current transformer Voltage transformer  Openable	
	BOBBIN / MOTOR	Bobbin actuators Stators/rotors Antennas Position sensors 	
	Design & Built-to-Print		
	WATER COOLING	Direct water cooling  Inductance 0.82 mH	Indirect water cooling / cold plate 



# POSITION SENSORS & SLIP RINGS

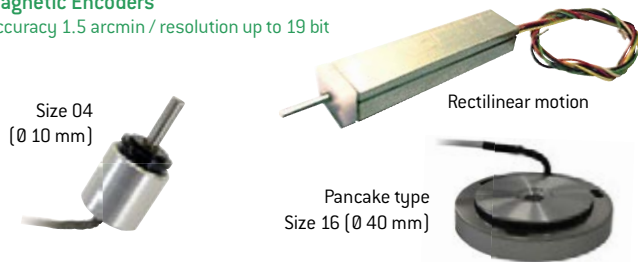
EXXELIA designs and manufactures contact and contactless Position Sensors, Slip Rings and Hybrid Systems.

## HIGH PERFORMANCE CONTACTLESS POSITION SENSORS

**High accurate Optical Encoders**  
Accuracy 20 arcsec / resolution 21 bit



**Magnetic Encoders**  
Accuracy 1.5 arcmin / resolution up to 19 bit



## SLIP RINGS

Diameter from 20 mm to 1 200 mm  
and more on request



## FORJ's

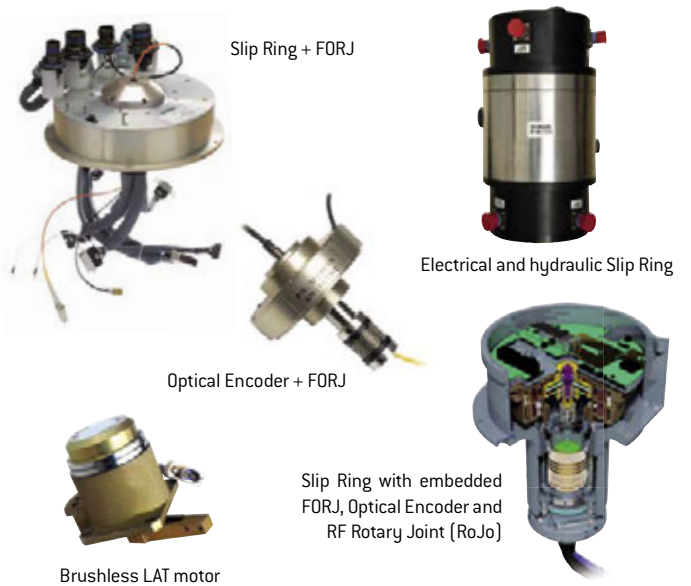


## PRECISION POTENTIOMETERS

Linearity 0.01%



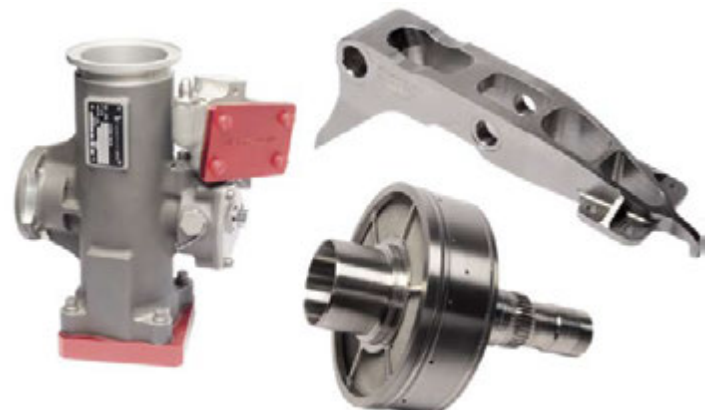
## HYBRID SYSTEMS



# PRECISION MECHANICS

EXXELIA's Precision Mechanics division specializes in machining complex parts, from prototypes to medium series. Our best-in-class palletized-5-axis turning and milling equipment enable us to work with all types of material including titanium, inconel, 35NCD4 etc...

Assembly, high precision manual deburring and hydraulic tests can be carried out in our workshop.

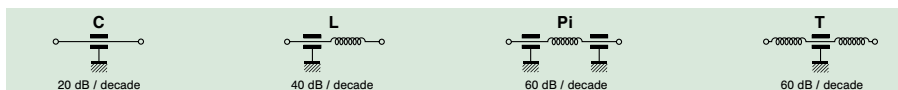


# EMI-RFI FILTERS



EXXELIA, is the only manufacturer in the world of ESA QPL EMI-RFI filters in different low pass configurations [C, L, Pi, T, 2 x Pi, 2 x L and 2 x T] intended to protect electronic equipment from interferences for aerospace, telecom and medical markets..

Capacitors are a key components in a filter and thanks to its expertise in the field, EXXELIA is able to manufacture high-end solutions combining performance and reliability.



	T*	Model	Current	Voltage	Performance	Qualification	Use
EMI-RFI Filters	-55°C +125°C (up to 175°C)	Feed through Ø 3 - Ø 4 - Ø 6 - Ø 10 (mm)	Up to 15 A	Up to 500 V <sub>DC</sub> and 115 V <sub>AC</sub> 400 Hz	Up to 80dB from 10 kHz to 10 GHz	ESA QPL, AIR Qualified Compliant MIL 461, D0160	Space, Aeronautic, Defense, Industry.
		Feed through Ø 17 (mm)	Up to 30 A	Up to 3 000 V <sub>DC</sub> and 200 V <sub>AC</sub> 400 Hz	Up to 80dB from 10 kHz to 10 GHz	AIR qualified, Compliant MIL 461, D0160	Aeronautic, Defense, Industry.
		Multi ways Filters	Up to 15 A	Up to 500 V <sub>DC</sub> and 115 V <sub>AC</sub> 400 Hz	Up to 80dB from 10 kHz to 10 GHz	in house	Aeronautic, Defense, Industry.
		Surface mount FCMS - CFCMS	10 A (20 A for HI version)	Up to 500 V <sub>DC</sub> and 115 V <sub>AC</sub> 400 Hz	Up to 70 dB from 10 kHz to 10 GHz	ESA EPPL	Space, Aeronautic, Defense, Industry.
		SPF...	Up to 500 A	Up to 3 000 V eff.	Up to 10 GHz	in house	Custom design

# ENERGY FILTERS

Following 50 years heritage in Defense market, EXXELIA offers highly performant, robust and reliable solutions to protect from different EMC phenomenon all kind of signal such as:

- Power supply,
- Control lines,
- Data communication...

Asymmetric design available for optimized leakage current and size.



	T*	Model	Current	Voltage	Performance	Qualification	Use
EMC Filters	-55°C +85°C	Feedthrough Tube filters	Up to 500 A	Up to 1 000 V <sub>DC</sub> and 400 V <sub>AC</sub>	Up to 100 dB Up to 18 GHz*	—	Single lines power supply.
		Power cabinets	Up to 2 500 A	Up to 440 V <sub>AC</sub> (50-800Hz)	Up to 100 dB from 10 kHz to 18 GHz*	<b>TEMPEST:</b> MIL-HDBK-1195 <b>HEMP:</b> MIL-STD-188-125-1 & 2	Three or single phase power supply for <b>TEMPEST</b> and <b>HEMP</b>
		Data communication	Up to 1A	—	Up to 100 dB Up to 18 GHz*	<b>TEMPEST:</b> MIL-HDBK-1195 <b>HEMP:</b> MIL-STD-188-125-1 & 2	Up to 100 MHz bandwidth data signal for <b>TEMPEST</b> and <b>HEMP</b>
		Custom filters	Additional protection for energy and signal filtering.				

\* Up to 40 GHz on request.

# COMPONENTS & SUB-ASSEMBLIES MANUFACTURING



With two production units located in competitive manufacturing countries, EXXELIA can provide cost-effective sub-assembly capabilities with high technology processes: wire bonding, vacuum metallization, overmolding, harnessing, RF tests, reliability tests.

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