Aerospace & Defence | Lighting | Power Management | Internet of Things | Transportation

Components – EMEA

Battery Guide

Five Years Out

arrow.com

CONTENT

Batteries | Chemistry by Supplier

	 Li-Ion	 Ni-MH	 Lead Acid	 Lithium Coin	 Lithium 3,6/4 V	 Lithium 3,0 V	 Alkaline	 Silver Oxide	 Zinc Air
Ansmann	•	•		•		•	•	•	•
FDK		•		•		•	•		
Murata				•		•	•		
Panasonic	•	•	•	•		•	•		
Seiko				•				•	
Tadiran	•				•				
Varta	•	•		•		•	•	•	•

Batteries | Associated and Complementary Products by Supplier

	Connectors	Contacts	Terminals	Cable Lugs	Holders	Breakers	Temperature Sensors	Protection Devices	Battery Management Devices	Chargers	Battery Testers
Amphenol/FCI	•	•	•	•	•						
Ansmann										•	•
AVX	•						•	•	•		
Bourns		•				•		•	•		
Keystone	•	•	•	•	•						
Littelfuse						•	•	•	•		
Molex	•			•							
Panasonic	•				•						
TE Connectivity	•	•	•		•		•				
Vishay							•	•	•		

Lithium-Ion Technology allows us to be mobile

Primary and rechargeable batteries belong to our everyday life, as growing mobility requires the availability of energy everywhere and anytime.

Batteries can be rechargeable or non-rechargeable energy storages. The latter are called primary batteries. They provide many consumer products with energy, like remote controls, flashlights, toys, watches or smoke detectors for homes.
A much larger sales proportion is recorded for rechargeable batteries, also known as secondary batteries, due to their growing share in consumer applications, for example mobile phones, laptops, but also tools and household devices.

Rechargeable batteries now experience the highest burst of growth due to their use in motor vehicles. They also represent the largest share of total revenues in the industry segment and other markets. In comparison to other rechargeable batteries, the lithium-ion technology has a high specific energy and is therefore preferred.

Nevertheless, older technologies, which are all on the retreat, are still used. Lead-acid batteries for example are employed in medical devices. They are reliable, less expensive in production and easily recycled. On the downside, lead products are usually having only a low energy density and a short lifespan, in addition they are toxic. There are other types of batteries, like nickel cadmium (NiCd) and nickel-metal hydride (NiMH). Both are discontinued models in medium term.

Besides the automobile industry as main driver of the massive production increase of lithium-ion batteries, there are other vast growing markets in industry and consumer goods. However, the star - lithium-ion technology - doesn't light up as brightly anymore. Many scientists think the technology is largely exhausted. In addition, the lithium-ion batteries are using the expensive metal cobalt. A major cost factor also known for being environmentally harmful during mining and extraction.

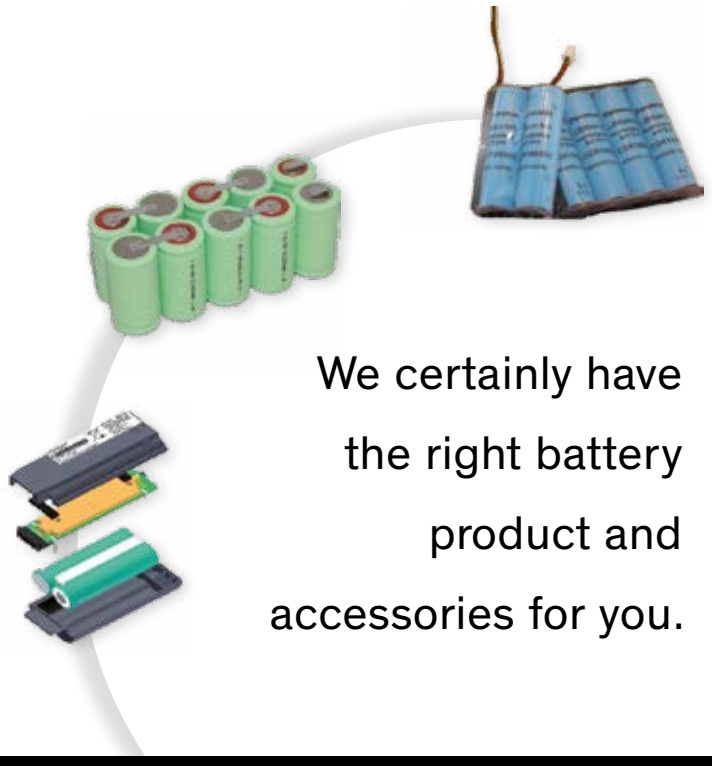
The search for technologies which are sustainable and based on available resources continues. Always on the lookout for longest possible charging intervals, short charging times and many charging cycles – and therefore a long battery life. Since as early as the 1950s all-solid-state batteries are being researched. They are characterized by solid electrolytes,

replacing the liquid, highly flammable form. Very visionary are energy storage systems made out of apples and their leftovers, from which carbon-based active material can be extracted. Other research is focusing on manganese cathodes, for example.

Until the new approaches are suitable for economical use, the lithium-ion technology will continuously be improved. More than anything the share of cobalt needs to be reduced or completely replaced for cost and environmental reasons. Work is in hand to replace the currently used liquid electrolytes, which are even known for spontaneous self-igniting, but also on fuel cells which could be interesting for vehicles in the future.

Arrow offers packs of lithium-ion batteries, including battery management systems (BMS), for safety and quality reasons. Due to close working relationships with leading manufacturers of batteries, Arrow has a permanent focus on cutting-edge technology and is always your professional point of contact for batteries.

Please feel free to contact us.



We certainly have the right battery product and accessories for you.

Arrow Battery Portfolio

PRIMARY BATTERIES

Alkaline
Round & Button
1.5 V

Silver Oxide
1.55 V

Lithium Round
3.0 V
3.6 V
4.0 V

Zinc Carbon
1.5 V

Lithium Button/
Ultra Thin
3.0 V
3.6 V

SECONDARY BATTERIES

Lithium Button
1.5, 3 V

Ni-MH Round
1.2 V

Ni-MH Button
1.2 V

Lead Acid
6, 12 V

Li-Ion, Li-Polymer, Li-Fe
Round, Button & Prismatic
3.2–4.1 V

Customized Battery Solutions

Standard battery packs are not suitable for all applications.
We offer full customized packs including soft pack, hard pack, protection, communication, and battery management system.

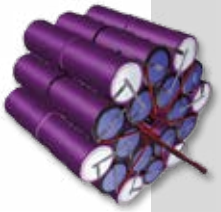
CAPABILITIES

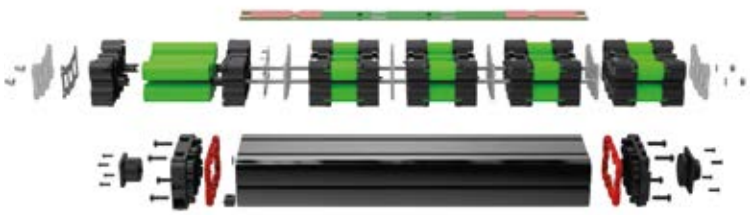
> Assembling with wire & cable
> Fully customized including housing
> Safety device included
> Custom label
> Customer-specific developed BMS, in form and requirement of the technical values incl. communication
> Customer-specific housing development/design
> Ultrasonic-welded, glued or screwed housings












Arrow Services and Capabilities

> Battery testing and evaluation
> Life-time calculations
> On-Site technical consultation and advice
> Battery cell and chemistry selection based on customer requirements
> Support in compliance with standards and certification
> Certification according UN38.3
> Battery end of line test with documentation of measured values
> Certification according to ISO 13485 (medicine)
> Safety certifications (such as UL2054 and IEC62133)
> Fully customized, single-customer battery development (custom plastics, cell selection and full electronics development)

Common Battery Applications

	 Li-Ion	 Ni-MH	 Lead Acid	 Lithium	 Alkaline	 Silver Oxide
Tracking, Wireless, RFID, IoT	•	•		•	•	
Automotive	•	•	•	•		
Back-Up		•	•	•		
Emergency Lighting		•	•			
Fire & Security	•	•	•	•	•	
Key Locks				•	•	•
Medical	•	•	•	•	•	•
Metering				•	•	
POS Terminals	•	•			•	
RTC		•		•	•	
Test & Measurement	•	•		•		
Watches, Calculators				•	•	•
Wearables	•			•	•	
Wheelchairs	•		•			

Panasonic INDUSTRY

Lithium Batteries:

State-of-the-Art Lithium Technology Batteries

> Low self-discharge
> Decades of mass production experience
> Superior designed battery ranges
> Proven reliability

Ni-MH Batteries:

Designed for Less Complex and Wide Operating Temperature Applications

> High charge efficiency at elevated temperatures
> Small size and light weight
> Long lifetime when using intermittent charge
> Most suitable to replace nickel-cadmium batteries
> Long-life and excellent charging performance at 75 °C (U-Series)

Alkaline Batteries:

Ideal For High-Performance Standard Applications

> Continuously reliable energy provision
> Long shelf-life
> High and medium drain applications
> Superior low temperature behavior

Li Ion 18650 Akkupacks/battery packs

Type	Configuration	Arrow Part Number	Voltage (V)	Capacity (Ah)	Dimensions (mm)	Weight (g)
1S1P	o	1/1S1P-INR18650-M26	3.7	2.60	68 × 19	48
		1/1S1P-INR18650-MJ1	3.7	3.45	68 × 19	48
		1/1S1P-INR18650-M26-NTC	3.7	2.60	68 × 19	48
		1/1S1P-INR18650-M29	3.7	2.90	68 × 19	48
1S2P	8	2/1S2P-INR18650-M26	3.7	5.20	40 × 72 × 19	100
		2/1S2P-INR18650-MJ1	3.7	7.80	40 × 72 × 19	100
1S3P	ooo	3/1S3P-INR18650-M26	3.7	7.80	56 × 68 × 20	140
		3/1S3P-INR18650-MJ1	3.7	10.50	56 × 68 × 20	140
2S1P	8	2/2S1P-INR18650-M26	7.4	2.60	40 × 72 × 19	100
		2/2S1P-INR18650-MJ1	7.4	3.45	40 × 72 × 19	100
		2/2S1P-INR18650-M26-NTC	7.4	2.60	40 × 72 × 19	100
		2/2S1P-INR18650-M29	7.4	2.90	40 × 72 × 19	100
2S2P	88	4/2S2P-INR18650-M26-BLOCK	7.4	5.20	70 × 38 × 38	200
		4/2S2P-INR18650-MJ1-BLOCK	7.4	6.90	70 × 38 × 38	200
	oooo	4/2S2P-INR18650-M26	7.4	5.20	74 × 68 × 22	190
3S1P	ooo	3/3S1P-INR18650-M26	11.1	2.60	57 × 70 × 19	150
		3/3S1P-INR18650-MJ1	11.1	3.45	57 × 70 × 19	150
		3/3S1P-INR18650-M26-NTC	11.1	2.60	57 × 70 × 19	150
3S2P	888	6/3S2P-INR18650-M26-BLOCK	11.1	5.20	70 × 57 × 37	280
4S1P	oooo	4/4S1P-INR18650-M26	14.8	2.60	74 × 68 × 22	190
		4/4S1P-INR18650-MJ1	14.8	3.45	74 × 68 × 22	190
		4/4S1P-INR18650-M26-NTC	14.8	2.60	74 × 68 × 22	190
		4/4S1P-INR18650-M29	14.8	2.90	74 × 68 × 22	190
	88	4/4S1P-INR18650-M26-BLOCK	14.8	2.60	70 × 38 × 38	200
		4/4S1P-INR18650-MJ1-BLOCK	14.8	3.50	70 × 38 × 38	200
4S2P	8888	8/4S2P-INR18650-M26-BLOCK	14.8	5.20	74 × 68 × 34	370
		8/4S2P-INR18650-MJ1-BLOCK	14.8	6.90	74 × 68 × 34	370
4S4P	oooo oooo oooo oooo	16/4S4P-INR18650-MJ1-BLOCK	14.8	13.80	75 × 75 × 72	800
4S6P	ooooooo ooooooo ooooooo	24/4S6P-INR18650-M26	14.8	15.60	141 × 70 × 66	1,192
7S1P	ooooooo	on request	25.4	3.50	150 × 70 × 35	TBA
		on request	25.6	2.80	150 × 70 × 35	TBA
7S3P	Softpack	21/7S3P-INR18650-M26	25.9	7.80	129 × 74 × 67	1,045
7S4P	Housing	28/7S4P-INR18650-M26	25.9	10.40	127 × 127 × 74	1,450
		on request	TBA	TBA	TBA	TBA
10S2P	„Corepack E-Bike (incl. LED indicator)“	on request	37.0	5.70	75 × 79 × 158	TBA
10S2P	8888888888	on request	36.3	7.00	210 × 70 × 55	TBA
		on request	36.7	5.60	210 × 70 × 55	TBA

ANSMANN Rechargeable Battery Packs – Standard Rechargeable Battery Configurations

A customer-specific new development is often not necessary. You can rely on our comprehensive standard range where you can select freely from over 20 pre-configured rechargeable battery variants. You can also select from our matching mature charge technology, which is available in the form of universal mains adapters in various power classes. This way you can use our modular principle to construct your optimum energy solution, without needing to plan for tooling costs or development costs.

Charging possibilities

Lithium

IPC12		IPC30		IPC50		IPC80	
Number of celles	Max. charge current	Number of celles	Max. charge current	Number of celles	Max. charge current	Number of celles	Max. charge current
1	2A	1	2A	3	1.7A	5	2A
2	1.4A	2	2A	4	1.7A	6	2A
3	1A	3	2A	5	1.7A	7	2A
4	0.7A	4	2A	6	1.7A	8	2A
				7	1.7A	9	2A
				8	1.2A	10	2A
				9	1.2A		
				10	1.2A		

NiMh

IPC12		IPC30		IPC50		IPC80	
Number of celles	Max. charge current	Number of celles	Max. charge current	Number of celles	Max. charge current	Number of celles	Max. charge current
3–8	1.5A	1–10	2A	8–22	1.5A	11–24	2A

Lead Acid

IPC12		IPC30		IPC50		IPC80	
Number of celles	Max. charge current	Number of celles	Max. charge current	Number of celles	Max. charge current	Number of celles	Max. charge current
6	1A	6	2A	6–12	1.5A	6–18	2A

IPC Series Charge technology for every application

The all new IPC universal charger series from ANSMANN. Universal charger series for any application and battery type (Li-Ion/LI-FE/NiMH/Lead Acid)

- Using our own designed software a customized configuration (charge current, cut-off voltage, etc) is quickly available
- Wide range input 100–240V/50–60Hz
- Traveller system with different country version mains plugs available for UK, Euro, US, Australia as well as IEC320
- Electronic protection against short circuit and reverse polarity
- Secondary plugs with variable configuration
- High stock levels in Europe mean quick deliveries
- Other configurations available on request

Ready to order:
- IPC80
- IPC50
- IPC30
- IPC12

Coming soon:
- IPC120
- IPC160
- IPC200
- IPC300

High performance and reliable primary micro batteries, taking the advantage of 40+ years technology development

Manufacturing excellence

> Acquisition of ISO 9001/14001 certification
> Full automated assembling lines with high productivity

Coin Manganese Dioxide Lithium Batteries (CR Batteries)

Wide range of CR batteries including heat-resistant type and high drain type

> High voltage, high energy density and excellent self-discharge performance
> Outstanding temperature characteristics
> UL Recognized Component (UL1642 File No.MH12566)
> Acquisition of ISO/TS16949 Certification

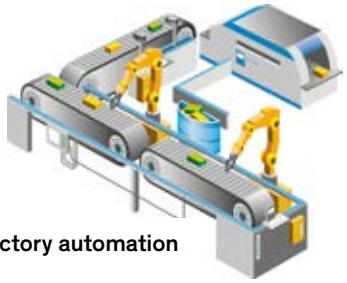
Battery types	CR (Standard)	CR (Extended temprature)	CR (Heat-resistant)	CR (High drain)
Nominal voltage	3.0 V	3.0 (V)	3.0 V	3.0 V
Operating temp.	-30 to +70 °C	-40 to +85 °C	-40 to +125 °C	-30 to +70 °C
Nominal capacity	30–1000 mAh	220–2000 mAh	210–1000 mAh	200–500 mAh
Diameter	12.5–24.5 mm	20.0–36.5 mm	20.0–24.5 mm	20.0–24.5 mm
Thickness	1.6–7.7 mm	3.2–7.7 mm	3.2–7.7 mm	3.2–5.0 mm
Weight	0.67–11 g	3.0–20 g	3.1–11 g	3.0–6.2 g
Max plus discharge*1	30 mA	30 mA*2	30 mA	50 mA

*1) 50 % depth of discharge battery's maximum pulse discharge current over 2 V for 3 s (23 °C)
*2) CR3677X max plus discharge is 80 mA

Applications

> Tire pressure monitoring system
> Keyless entry/Smart key
> Factory automation
> Smart meters
> Tracking devices
> Sensors

Keyless entry



Factory automation

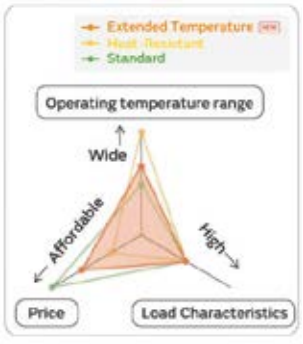
New products

In response to the expansion of IoT applications and increasing demand for small, reliable power sources, Murata developed two types of coin manganese dioxide lithium batteries; High drain type and Extended temperature type.

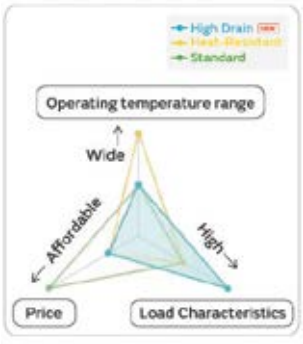
LoRa Alliance Member

Coin manganese dioxide lithium batteries selection guide

High drain



Extended temperature

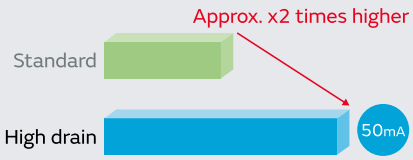


High drain

The High Drain lithium coin batteries are ideal for tracking devices for logistics and asset management by adopting Low Power Wide Area (LPWA) networks such as LoRa and SIGFOX as well as for outdoor infrastructures, FA control systems and environment monitoring sensors.

Tracking devices

Max. pulse discharge current



*50% depth of discharge battery's maximum pulse discharge current over 2V for 3s (23°C)

Discharge time (45mA pulse discharge)

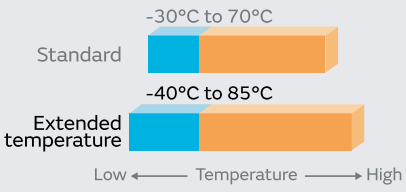
*Pulse discharge condition:
45mA x 3s, 33s off, 2V cut off (23°C)

Extended temperature

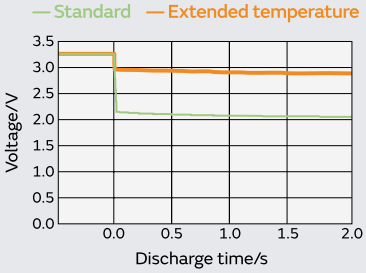
The Extended Temperature lithium coin batteries are designed mainly for automotive devices and outdoor IoT systems (including smart meters and FA control systems) and can also be used as an alternative smaller and thinner solution to conventional lithium cylindrical batteries.

Smart meters

Operating temperature



Voltage comparison after 85°C storage



Orderable Parts

Extended Temperature
- > CR2032X
- > CR2450X
- > CR2477X
- > CR3677X

High Drain
- > CR2032R
- > CR2450R

Lithium Rechargeable Coin Cells

Seiko Instruments offers rechargeable Lithium coin batteries, chip capacitors and non-rechargeable Silver Oxide batteries, for use in a variety of commercial and consumer applications.

Large discharge capacity

For high operational voltage range of 2.0 to 3.3 V.

Long cycle life

Cycle life of over 100 cycles (over 50 cycles for MS414GE) under charge/discharge conditions of 3.1 to 2.0 V (D.O.D.100 %).

Excellent overdischarge characteristics

Continued stable capacity characteristics even after the battery is overdischarged down to 0.0 V.

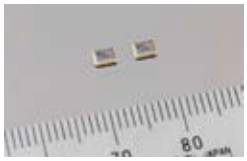
Operation over a wide temperature range

- Operating temperature range: -20 to +60 °C
- Consult us for using the battery at a temperature beyond the above temperature range
- Operating temperature range of the new product MS920T/MS621T is -40 to +85 °C
- Approved by UL (Underwriters Laboratories Inc.) UL File No. MH15628
- Our battery products do not contain any substances restricted by RoHS Directive.

Applications

- Backup power supply for memory or clock function in various types of electronic equipment for mobile communication, office automation, audio-visual equipment, mobile information equipment, etc. (cellphone, PHS, cordless phone, pager, memory card, fax machine, PC, video camera, digital camera, tuner, handy terminal, PDA, etc.)
- Hybrid power supply in combination with solar cells
- Main power supply for small and slim portable equipment

EDLC Chip Capacitor



EDCL Chip Capacitor, CPM CPH and CPX type

Rechargeable and Reflowable Lithium Coin Cells

Reflowable Lithium Coin Cells, ML414 and the new MS-R types

Rechargeable Lithium Coin Cells for hand soldering

Lithium Coin Cell for hand soldering, MS412FE type

Lithium Coin Cell for hand soldering, MS920SE type

Lithium Coin Cell for hand soldering, MS414GE type

Lithium Coin Cell for hand soldering, MS516SE type

Lithium Coin Cell for hand soldering, MS614SE type

Lithium Coin Cell for hand soldering, MS621FE type

Lithium Coin Cell for hand soldering, High Temperature MS621T type

Lithium Coin Cell for hand soldering, High Temperature MS920T type

Lithium Coin Cell for hand soldering, TS920E and TS621E type

Silver Oxide non Rechargeable Coin Cells

Silver Oxide non rechargeable Coin Cell, SR920, SR621 and SR626 type

Silver Oxide non rechargeable Coin Cell, SR721 type

Silver Oxide non rechargeable Coin Cell, SR920 type

Silver Oxide non rechargeable Coin Cell, SR1120 type

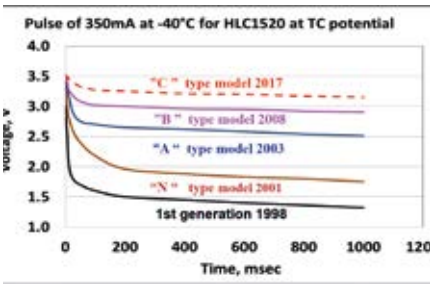
The “best-fit” Approach for Batteries

The only possible energy source for most IoT and outdoor applications such as utility meters or tracking devices is a battery. Carrying a fundamental responsibility for system’s lifetime we at Tadiran call it the “Heart of your Device”. Do you really want to risk a heart attack? With a lifetime of up to 25 years Tadiran solutions keep what they promise – supplying a “best-fit” and not a “one fits all” solution as proven in hundreds of millions of applications worldwide. Your advantages: cost reduction and highest system reliability with direct effects on your company reputation.

Serie	Applications
SL-300 series for standard use and stand-by	> Excellent shelf life > Low self-discharge > Suited for long-term use with low current > For operation at low current levels with long stands > Intermittent discharge with medium current level > Temperature range from -55 to +85 °C
SL-500 series for extended temperature range	> Extension of temperature range up to +130 °C > Slightly smaller capacity > Otherwise like the SL-700 series
SL-700/SL-2700 (iXtra) series for enhanced start/fast voltage recovery	> Major improvement of voltage delay at start of discharge at ambient or elevated temperatures > Higher voltage under pulse load even with low background currents > Fast voltage recovery after long term storage > Higher discharge rate
SL-800/2800 series (XOL) Keywords: for eXtended operation life	> More capacity > Extra low self-discharge > Extra low passivation during long term use

Tadiran’s 5th Generation HLC again Doubles Power

Requirements for energy sources in Internet of Things (IoT) are demanding. Despite a long lifetime of up to 20 years these decentralized systems have the need to cover high current peaks of various radio protocols. Tadiran invented the PulsesPlus technology around the Millennium. This product combines an ultra-low self-discharge lithium thionyl chloride battery with a hybrid layer capacitor (HLC). The battery stores the energy while the HLC is providing the power for pulses.



The task exploring new HLC generations was to gather more power capability into a given form factor. This was achieved by optimizing the inner components. The new HLC-1020 P6 will be able to substitute the HLC-1530A.

At the same time the other advantages maintain:

> Just one component up to 3.9 V level
> No balancing needed
> Extra low self-discharge over entire lifetime
> High equivalent capacity for long pulses

VARTA Expands Range with Introduction of 24 V and 48 V Lithium Ion Batteries

VARTA Storage, the German manufacturer of lithium-ion battery packs, will expand its range in 2020 to enter into new key markets with a range of lithium ion batteries starting with 24 V and 48 V versions. VARTA is already well known for their high quality portable packs within the CellPac LITE range which provides batteries mainly within 3.6 V and 7.2 V at capacities up to 5200 mAh. The company will present its bold new line-up for 2020 „Application Specific Batteries“:

VARTA ASB (Application Specific Batteries) for:

> AGV – Automated Guided Vehicles
> Intralogistics Robots
> Agricultural Robots
> Light Electric Vehicles

Customisation possible for demand of 2,000 pcs per year or more through Arrow such as tailored CAN Bus protocols, mechanical changes, specific connectors, negotiated warranties in specific environments and more. Contact your Arrow representative today to discuss your requirements!

New Easy Block (ASB)

> Lithium Iron Phosphate Design
> Module available in 24 V (22 Ah) and 48 V (11 Ah) versions
> Extra-long life module with 4,000 cycles to 80 %

New Easy Blade (ASB)

> High Capacity Module available in 24 V (60 Ah) and 48 V (30 Ah) versions
> Lithium Ion (NMC) Design
> Active Cooling for demanding applications
> 1,000 cycles to 80 %

Shared Features

> Connect up to 24 modules in parallel for huge capacities
> Automatic Master/Slave system eliminates need for external BMS or complex modular management
> CAN BUS (CANopen) for smart functionality
> The highest safety with four levels of safety integrated into every pack, your brand relies on VARTA
> Engineered by VARTA in Germany for leading quality and reliability
> Zero maintenance
> 2-year limited warranty
> Prototypes available from Arrow starting January 2020 (limited availability)
> Mass production deliveries from April 2020

Orderable Parts at Arrow

> EasyBlock 24V 56657 716 099
> EasyBlock 48V 56657 908 099
> EasyBlade 24V 56654 716 099
> EasyBlade 48V 56654 908 099

VARTA EasyPacks

VARTA EasyPacks

VARTA's popular range of small, standard lithium-ion batteries in plastics:

> User removable
> Flexible mating contact design
> Standard charger solutions
> Certified to UL2054 and IEC62133 ed. 2
> Design-in library available for download at
www.varta-storage.com/products/power/cellpac-lite/?lang=en
  > 3D models
  > Certifications (UL2054 and IEC62133 ed 2)
  > Technical Documentation
  > Compliance Materials (MSDS etc.)

Orderable Parts at Arrow

> Easy Pack S 56455 701 099
> Easy Pack L 56456 701 099
> Easy Pack XL 56456 702 099
> Easy Pack PLUS 56653 702 099

VARTA CoinPower Series – Rechargeable Lithium-Ion Button Cells

The CoinPower series stand out for their small size, outstanding mechanical stability and the highest energy density on the Lithium-Ion cell market. The energy density is up to 30% higher than comparable batteries on the market. The premium cells are made in Germany using a fully automated production process in one of the state-of- the-art production facilities in Europe.

The CoinPower range is the perfect energy solution for modern electronic applications such as true-wireless bluetooth headsets, wearable technologies, medical applications and many more.

> Best-in-class product life to benefit your customers.
Exceptional life time >>500 FULL cycles @ 80% of initial capacity.
> Maximum design freedom for new application designs.
Small button cell form factor in Lithium-Ion technology (3.7 V and up to 120 mAh).
> Simplified design process saves time and money.
Steel Case Design also means practically ZERO swelling over lifetime compared to pouch cell equivalents.

VARTA Microbattery shapes the future of the battery technology with their products

The VARTA brand stands for the highest quality and reliability worldwide. Founded under the roof of VARTA AG, the subsidiary VARTA Microbattery produces more than 1 billion batteries a year. In the area of microbatteries they offer high-tech energy solutions in the fields of Wearables, Hearables, Medical, as well as IoT, IT / Communications, Industrial, Automotive and Consumer.

Product Overview

Rechargeable Batteries

> Lithium-Ion Button Cells CoinPower
> NiMH Button Cells
> NiMH Cylindrical Cells

Primary Batteries

> Lithium Button Cells
> Lithium Cylindrical Cells
> Alkaline Batteries
> Silver Oxide Button Cells
> Hydrogen Gas Generating Cells

Would you like to see more? Watch our clip with energy solutions for wearables

www.youtube.com/watch?v=zPdarmuJnT0

Setting measures with Rechargeable NiMH Button Cells

Four button cell families with specific strengths and features provide the ideal battery solution for IoT, Industry 4.0 and Intelligent Home. Each family has its specialty to provide an optimum solution for your application. With a Capacity Range from 6 mAh up to 600 mAh VARTA provides a full programme of rechargeable button cells for high-performance backup systems.

> Standard and customized battery assemblies available
> Safety: built-in pressure vent guarantees safety in case of mistreatment
> Long shelf life: ready to use after storage due to superior self discharge performance
> Cycle Life: extended product life time of more than 1000 cycles (IEC)
> Overcharge capability: cost effective charging system with no need for special components due to patented GCE electrode in the “Robust family”
> No leakage: direct mounting on PCB possible due to sophisticated crimp sealing system
> Fully automated cell production Made in Germany which means highest reliability for your product

Bourns® Modular Contact Battery Connectors

Bourns® Modular Contacts are spring connectors typically used as electrical connections between a battery pack and a PCB on any device where a rechargeable battery pack is required. Offering an industry-leading design, they are the preferred solution due to their low profile, low cost and floating contact points. Giving designers additional flexibility in a wide range of applications, Bourns® Modular Contacts feature a symmetrical pad layout, auto-centering, end-to-end stability, pick and place compatibility and an extended cycle life of at least 50,000 cycles.

Features and Benefits

> Stackable Pitch Design
> Low Profile
> Long Lifespan
> Pick and Place Compatible
> Precious Metal Contacts
> RoHS compliant and Halogen Free

Register for your free design kit and application note.
www.bourns.com/support/request-trimpot-samples

Applications

> Rechargeable Batteries
> Portable Medical Devices (Low/Medium Risk)
> Mobile Phones
> Notebook and Tablet PCs
> Barcode Scanners
> Removeable Panels/Displays

Orderable Part Numbers

(X = Number of contacts)

> 70AAJ-X-M0G
> 70AAJ-X-F0G
> 70ABJ-X-M0E
> 70ABJ-X-F0E
> 70ADJ-X-ML0G
> 70ADJ-X-FL0G
> H-866 Design Kit

TE Battery Connector Application

AUTHORIZED DISTRIBUTOR

TE offers different battery connectors which cover many segments, such as consumer, medical, and industrial device.

Product focus areas are:

> Low profile battery interconnect
> FBIS (floating battery interconnect system)
> Leaf spring battery interconnect
> Coin-cell/Button battery holders
> Battery pack connectors

Applications

> Camera
> Feature phone
> Industrial machine
> Rugged phone
> Industrial tablet
> PDA
> Patient monitor

TE Connectivity offers CR 2032/ML621 coin cells battery holder for devices require long service life, like BIOS in computer.

Applications

> PC, Laptop, Server
> Industrial machine
> Switch
> Wireless printer

Battery Management Solution for E-Mobility

Littelfuse Technology	Product Series	Features	Function/Application
Fuse (battery protection)	881A, 501A	Third party compliance UL/IEC, low internal resistance, Surface mountable, compatible with lead-free solder process per IEC standards	Protects cells and downstream BMS components from high fault currents due to external shorts
Fuse (sense line protection)	885, 437A	Surface mountable, compatible with lead-free solder process per IEC standards	Protect harness between cell and BMS from over current
TVS Diode Arrays	AQ24CAN, AQ24CANFD-02HTG	AECQ-101 qualified, low capacitance, low leakage current	Protect can bus sensitive electronic ICs from ESD, EFT and voltage transient
TVS Diode	TPSMB, TPSMC	Automotive grade AEC-Q101 qualified, fast response time < 1pS, 1500W peak pulse power capability	Protect sensitive electronic components from voltage transients
SSR	CPC1009N	Extremely low leakage (20nA), wave solderable, arc-free with no snubbing circuit	Provides isolation for cell monitoring from BMS electronics
NTC	KC Series	Kynar insulated lead wires, small form factor, fast thermal response, surface mountable	Provides an interlock by isolating battery when lid is open
Reed switch	59166	Hermetically sealed, custom designed sensitivity	Provides an interlock by isolating battery when lid is open

Battery Management Solutions for Power Tools and Robotic Appliances

Littelfuse Technology	Product Series	Features	Function/Application
Fuses	881	Third party compliance UL/IEC, low internal resistance, shock safe, vibration resistant	Protect cells from high currents due to external shorts
PPTC	nanoSMD	Surface mountable, resettable (PPTC), compatible with lead-free solder process per IEC standards	Protect cells and BMS MOSFET from high currents due to external shorts
NTC	KC series	Kynar insulated lead wires, small form factor, fast thermal response, surface mountable	Provides an interlock by isolating battery when lid is open
TVS Diode	SMF	200W peak pulse capability; compatible with the lead-free solder reflow temperature profile	Protects sensitive electronic components from voltage transients

Battery Management Unit
> Fuse
> TVS diode
> PPTC sensing/balancing cells

Cell Protection Module
> NTC sensors

Bluetooth Module
> ESD protection

Hand-held Appliances

Battery-powered Appliances

Battery Management Solutions for Mobile and Wearables

User input controls
> TVS Diode Array
> EMI Filter

Power control module
> Power Inductor

Charge & Sync Input
> TVS Diode Array
> EMI Filter

Cellular Antenna
> Polymer ESD suppressor

Wi-Fi and Bluetooth
> Polymer ESD suppressor

Charging Port
> setP

Li-ion battery
> Resettable PPTC
> TVS Diode Array
> Mini-Breaker

Littelfuse Technology	Product Series	Features	Function/Application
Polyswitch resettable PPTC	LoRho	Ultra-low resistance; compact design with a wide range of form factors; compatible with high-volume electronics assembly	Protects the Li-ion battery from over-current events
TVS Diode Array	SP11xx	30 kV ESD contact, Standoff voltage ratings of 5 to 24 Vdc	ESD and surge protection
Mini-Breaker	MHP-TAC	I_{hold} up to 15 A, milliohm resistance, 72 to 90 °C cutoff temperature	Secondary over-temperature and overcurrent protection
setP™	SETP0805-100-CC	Fast response to thermal events; small form factor; zero IR loss contribution; protects systems with a 100 W or higher power rating	Provides an indication signal to help protect USB-C plugs and receptacles from overheating

Battery Management System for Mobility

Vishay offers a broad range of high efficiency semiconductor and passive components for high performance battery management systems. Take a look at the following components:

Features
> Very good performance
> High transient resistivity
> Ultra high stability
> Long live

SMD high power and high voltag resistors for pre-charge and discharge

Power Metal Strip® battery shunt resistor with very low ohmic values

Dual MOSFETs optimized for high frequency DC/DC

NTC thermistors for cell and coolant temperature detection

High power long-side termination thick film resistors for balancing

Low profile Zener diodes in MicroSMF package

PAR® TVS diodes for transient protection

P-channel MOSFETs with ultra low $R_{DS(on)}$ and small packages

Thin film MELF resisstors for precision amplifiers and voltage detectors

Ultra-Low Profile Retainers for 20 mm Coin Cell Batteries

20mm Ultra-Low Profile Retainers

Retainers accept the popular 2012, 2016, 2020, 2025 and 2032 coin cell batteries from all major manufacturers.

> Slim design - saves valuable board space
> Narrow face allows for quick and easy battery replacement
> Designed for specific batteries - lowest heigh design
> Material: Phosphor Bronze, Tin-Nickel plate

Orderable Part Numbers

> 3028	> 3034
> 3028TR	> 3034TR
> 3029	> 3035
> 3038	> 3044
> 3038TR	> 3044TR

Polarized Holders for High Energy Lithium-Ion Batteries

Polarized Li-Ion Holders

Ruggedly built and durable, these compact holders feature low profile, heat resistant Nylon housings and Gold plated/Tin Nickel Stainless Steel contacts. Versatile design accommodates lead free solder and traditional reflow processes and accept all major manufacturers' of these Li-Ion batteries.

Available in single and dual cell configurations for both THM and SMT use.

Orderable Part Numbers

> 1042P	> 1098P	> 1130
> 1043P	> 1110	> 1131
> 1048P	> 1111	> 1134
> 1049P	> 1121	> 1135
> 1095P	> 1122	> 1136
> 1096P	> 1123	> 1137
> 1097P	> 1124	

PCB Battery Clips for Cylindrical Battery Cells

An updated serie of SMT and THM Batteries Clips

Manufactured using Spring Steel, these clips are designed to securely retain cells and withstand shock and vibration. Tin-Nickel or Matte Tin plate. SMT clips feature a "Flow Hole" SMT solder tail designed to increase joint strength. Available for AAAA, AAA, 12 Volt, N, AA, CR2, A, C & D size battery. In bulk or in Tape & Reel.

Orderable Part Numbers

> 50	> 86	> 550
> 50TR	> 87	> 550TR
> 51	> 88	> 553
> 53	> 89	> 553TR
> 53TR	> 92	> 555
> 54	> 99	> 555TR
> 55	> 100	> 2915
> 55TR	> 254	
> 82	> 54TR	

PEMCO Linecard

Please visit **www.arrow.com/en/ipe** and download the complete overview of PEMCO products and suppliers.

Antenna Guide

Antennas play an important role in the operation of all radio equipment. They are used in wireless local area networks, mobile telephony and satellite communication.

To receive your copy of the Antenna Guide please contact your Arrow sales representative.

Cable and Wire

Wires and cables are an omnipresent part of computing and electronics. They provide power and signal connectivity between systems or within a system.

To receive your copy of the Cable and Wire please contact your Arrow sales representative.

AVX INTERCONNECT

SERIES 9155
COMPRESSION CONTACT TECHNOLOGY:
BATTERY PACKS / REMOVABLE MODULES

KEY FEATURES:

High Reliable, Fatigue Resistant Gold Plated Beryllium Copper Contacts

Enhanced Deflection Capabilities to Absorb Assembly Tolerances

Maximized Contact Forces to Meet High Reliability / Harsh Environment Applications

EXAMPLES:

Parallel/Stacking Applications
Reduced 9155-200

Pitch	2.5mm
# of Positions	2, 3, 4, 5
Current Rating	3 amps/contact
Durability	5000 cycles

Right Angle/ Perpendicular Applications
9155-800

Pitch	2.0mm
# of Positions	2, 3, 4, 5, 6
Current Rating	2p-4p: 2.0 amps, 5p-6p: 1.5 amps
Durability	5000 cycles

Are You Five Years Out?

Most people live in the present. The world of now. But a handful of us work in a unique world that doesn't quite exist yet – the world of Five Years Out.

Five Years Out is the tangible future. And the people who live and work there know that new technologies, new materials, new ideas and new electronics will make life not only different, but better. Not just cheaper, but smarter. Not just easier, but more inspired.

Five Years Out is an exciting place to be. So exciting that, once you've been there, it's hard to get excited about the present. Because we know what's coming is going to be so much better.

Five Years Out is a community of builders, designers, engineers and imaginers who navigate the path between possibility and practicality. Creating the future of everything from cars to coffeemakers.

Are you one of them? Then you're probably working with us.

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Five Years Out

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