

# U9VL-J-P

## The Longest Lasting 9V Battery



## Start of an Era

The Ultralife Lithium 9V battery was launched in 1991 as the world's longest lasting lithium 9V battery.



The battery is based on lithium-manganese dioxide chemistry which leads to high energy density and voltage that remains very stable throughout the discharge.

Since the initial launch, there have been over 100 million units sold worldwide. The battery immediately gained acceptance into critical markets such as smoke detectors, security sensors, and medical telemetry.

## The Next Generation

Twenty years later, Ultralife has launched a new version of the product, with enhanced features and improvements over the original version.

## ThinCell™ Technology

The redesigned 9V battery utilizes the Ultralife ThinCell™ technology, where three individual thin foil cased cells are combined to create a 9V battery. Ultralife has been producing ThinCell™ technology cells for over 15 years.

## New Size

The first major improvement was dimensionally. The U9VL-J-P is smaller than the predecessor and is equivalent to size as a standard carbon zinc or alkaline size battery and conforms to the ANSI 1604 specification.

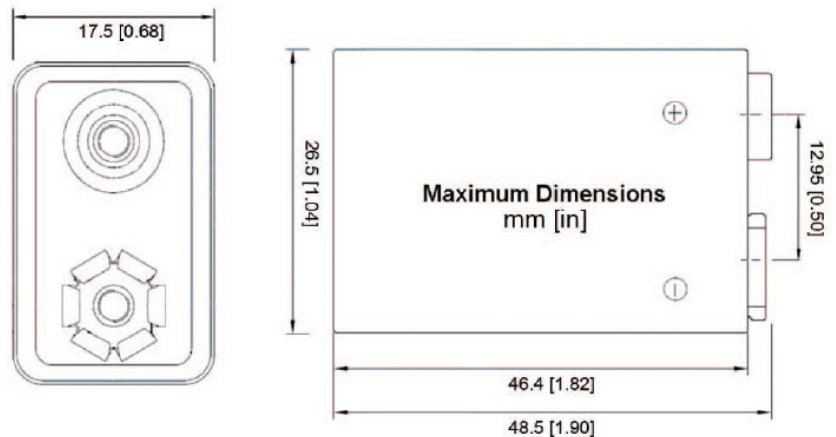


Figure 1: U9VL-J-P Dimensions

## Higher Pulse Capability

The internal impedance of the battery was reduced by enhancing the design characteristics, increasing the ability for the battery to supply higher power output with a stable voltage for demanding applications.

## Added Safety

The U9VL-J-P is constructed with a shutdown separator internal to each of the 3 cells. If internal temperature of the cell is excessive, the normally porous separator closes the pores, permanently disabling the battery.

With the increased ability to supply higher pulse and continuous current, a Polymer Positive Temperature Coefficient (PPTC) was added for increased safety. This resettable fuse type device limits pulse current to 1.5A maximum or a 0.7A continuous hold current.

The Ultralife ThinCell™ used within the U9VL-J-P has been qualified and is recognized under Underwriters Laboratories UL1642 specification. The U9VL-J-P has been qualified and is recognized under UL2054 for safety. It also has completed the UL217 smoke detector test compliance testing successfully.

## Non-Magnetic

The new lithium 9V has very little magnetic signature, with the outer container being constructed of stainless steel and the cells having non-magnetic construction.

## Light Weight

U9VL-J-P is extremely lightweight, weighing 37 grams, approximately 12% lighter than the original Ultralife Lithium 9V battery. The combination of low weight and high energy results in the highest energy density among all brand name 9V batteries.

## Alkaline is No Match

The Ultralife Lithium 9V easily outlasts the worlds most advanced alkaline batteries. Depending on use and device cutoff voltage, the Ultralife Lithium 9V battery can offer up to five times the capacity of a leading alkaline 9V. Figure 2 illustrates Ultralife's 9V service life in alarm simulation when compared to alkaline competitors.

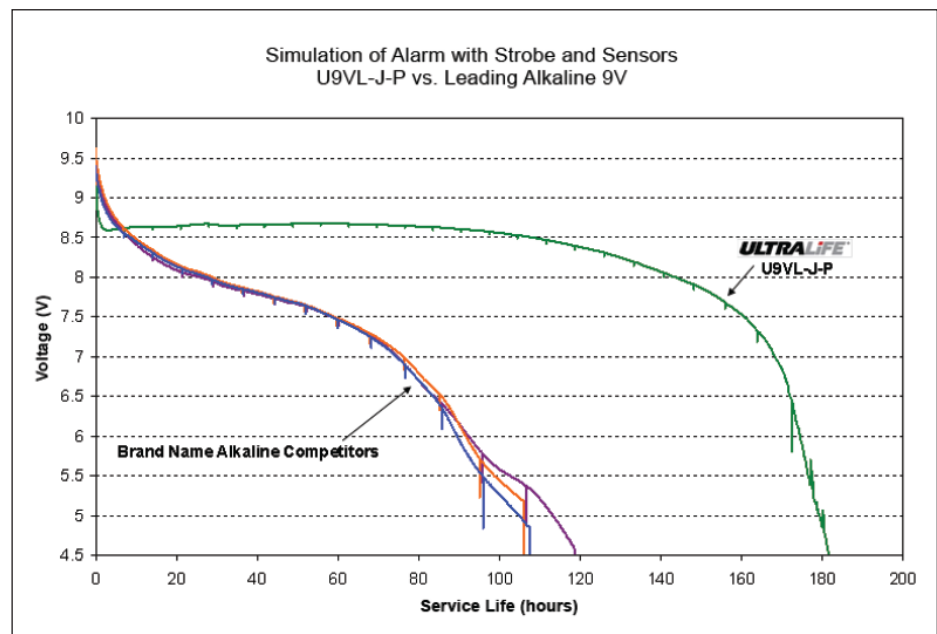


Figure 2: Continuous Discharge of 1200 ohms at 23°C with Regular 20mA pulses

## No Bunnies Here

Don't let the competitor's lithium 9V products fool you. The Ultralife Lithium 9V has the highest energy available from leading brand names. Where the competition offers lithium 9V products that boast 800mAh of capacity, the Ultralife Lithium 9V battery offers 1200mAh or 50% more energy than the nearest brand name competitor! Figure 3 compares Ultralife 9V to other lithium 9V performances.

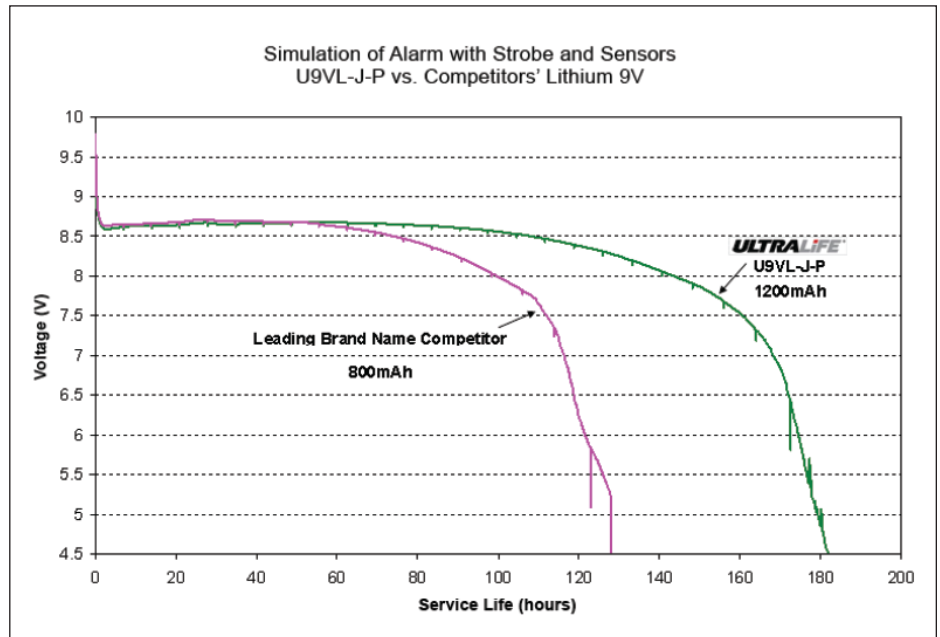


Figure 3: Continuous Discharge of 1200 ohms at 23°C with Regular 20mA pulses

## Long Storage Life

The lithium technology used in the Ultralife Lithium 9V has been shown to offer shelf life in excess of 10 years with little loss of performance. The new lithium 9V has improved construction and technology that assures the battery survives even the harshest of environments. Actual 5 year shelf life data at various capacities and rates is given in figure 4a. The U9VL-J-P impedance after 5 years of casual storage remains very low, leading to great rate capability and lower power losses in everyday use. A comparison between fresh and 5 year aged U9VL-J-P batteries impedance and closed circuit voltage is contained in figure 4b (40 samples).

Discharge Temp	Discharge Rate	Temp/ Load	Data to 5.4V cutoff			
			D0 (Ahrs)		DW0 (Whrs)	Load Time (hours)
			Avg	% Rated	Avg	Avg
(-20C)	900Ω	(-20C) / 900Ω	0.8	70%	5.7	110.3
(-20C)	300Ω	(-20C) / 300Ω	0.6	47%	3.6	26.5
23C	900Ω	23C / 900Ω	1.2	98%	9.8	128.3
23C	300Ω	23C / 300Ω	1.1	94%	9.2	42.2
23C	60Ω	23C / 60Ω	1.0	85%	7.7	8.2
60C	900Ω	60C / 900Ω	1.2	101%	10.5	126.7
60C	300Ω	60C / 300Ω	1.2	99%	10.2	42.1
60C	60Ω	60C / 60Ω	1.1	94%	9.3	8.4

Figure 4a: Actual 5 Year Storage Capacity Retention

	OCV	CCV 5.1Ω / 3Sec	1kHz Impedance
<b>Fresh Batteries Summary from QTR-E3668</b>			
<b>Min</b>	9.335	5.714	1.615
<b>Max</b>	9.424	6.606	2.132
<b>Average</b>	9.36866	6.34318	1.89049
<b>StDev</b>	0.022214	0.111529	0.0998112
<b>Aged Batteries Summary</b>			
<b>Min</b>	9.418	6.032	2.049
<b>Max</b>	9.562	6.389	2.583
<b>Average</b>	9.5503	6.2118	2.312675
<b>StDev</b>	0.0217	0.0894	0.1239016

Figure 4b: Fresh and 5 Year OCV, CCV, Impedance

## Trusted Brand

Ultralife has been producing lithium 9V batteries for critical and hard to service applications for over 20 years, with over 100 Million produced. We are lithium battery experts and provide the highest energy density 9V product available worldwide.

## Temperature Performance

The U9VL-J-P offers improved operational performance versus temperature (see figure 5.) The battery can be discharged from -40°C to 60°C at the 900 Ohm rate, making it a good battery alternative for a variety of outdoor applications, including security sensors and invisible fence applications.

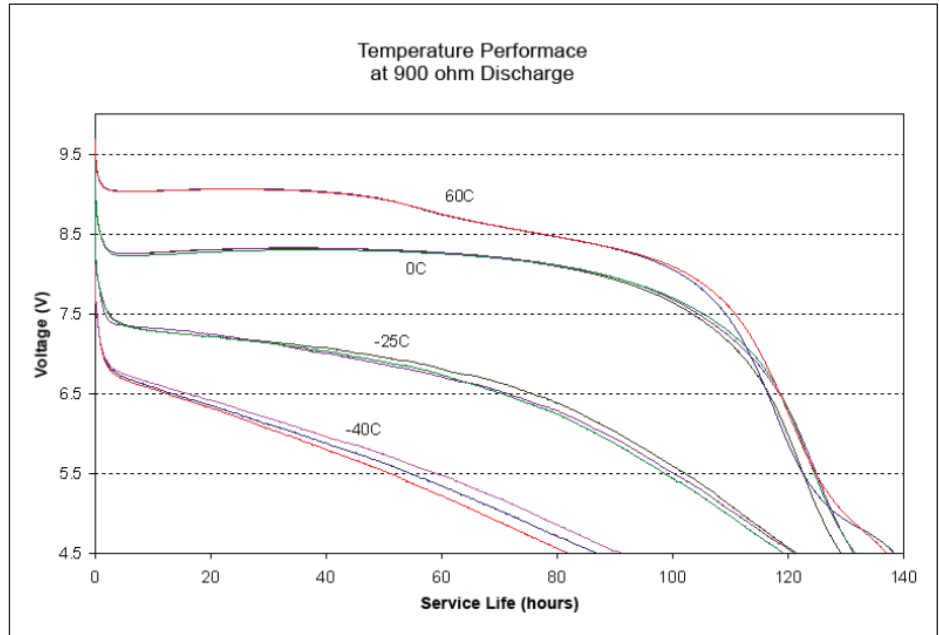


Figure 5: 900 Ohm Discharge at Various Temperatures

## Excepted Shipment

The Ultralife Lithium 9V qualifies for several exceptions from Class 9 shipping requirements, and can be shipped as Excepted material under lithium battery transportation regulations.

## Superior Support

Ultralife has a technical staff available to help with applications development, specialized testing, or general questions. Contact Ultralife today for assistance at 315-332-7100 or visit our website for additional information.