

# SPA 4 - 9.5 | VRLA Battery



## Applications

- Uninterruptible Power Supplies (UPS)
- Electric Power Systems (EPS)
- Emergency backup power supplies
- Electronic apparatus and equipment
- Communication power supplies
- DC power supplies
- Auto control system

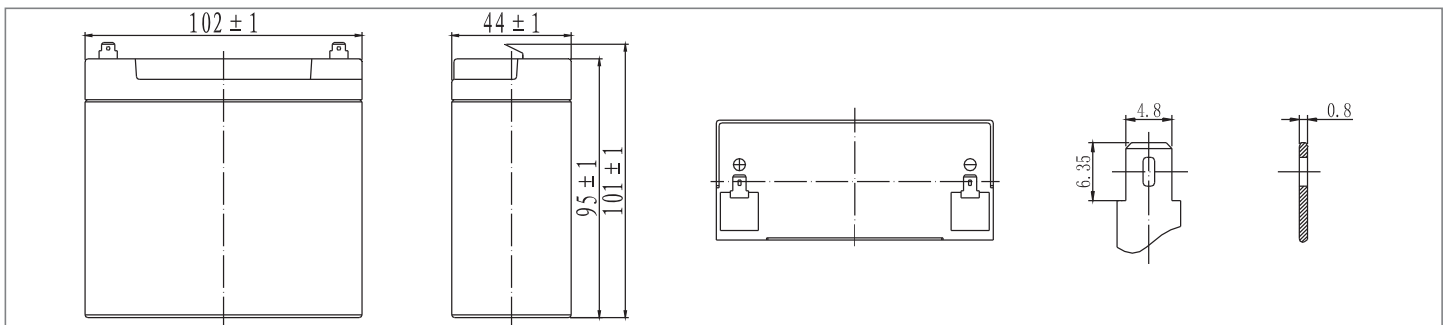
## Specifications

Nominal Voltage	4 V	
Number of cells	2	
Design Life	10 years	
Dimensions	Length	102 mm
	Width	44 mm
	Height	95 mm
	Total Height	101 mm
Approx. Weight	1.05 kg	
Nominal Capacity (25°C)	20 hours rate (0.475 A, 3.5 V)	9.50 Ah
	10 hours rate (0.884 A, 3.5 V)	8.84 Ah
	5 hours rate (1.620 A, 3.5 V)	8.10 Ah
	1 hour rate (6.180 A, 3.2 V)	6.18 Ah
Max. Discharge Current (25°C)	150 A (5s)	
Max. Charging Current (25°C)	3.0 A	
Internal Resistance	8 mOhms	
Fully Charged battery (25°C)		
Self-Discharge (25°C)	3% of capacity declined per month (average)	
Operating Temperature Range	Discharge	-15~50°C
	Charge	-10~50°C
	Storage	-20~50°C
Short Circuit Current	265 A	
Charge Methods:	Cycle use	2.40-2.45 Vpc
	Temperature compensation	-30 mV/°C
Constant Voltage Charge (25°C)	Standby use	2.25-2.30 Vpc
	Temperature compensation	-18 mV/°C

## Battery Construction

Component	Positive Plate	Negative Plate	Container	Cover	Safety Valve	Terminal	Separator	Electrolyte
Raw material	Lead dioxide	Lead	ABS	ABS	Rubber	Copper	Fiberglass	Sulfuric acid

## Dimensions



## Constant Current Discharge (Amperes) at 25°C

End Voltage (Volts/Cell)	5 min	10 min	15 min	30 min	1 h	2 h	3 h	4 h	5 h	10 h	20 h
1.60 V	22.8	18.1	10.1	6.18	3.37	2.42	1.94	1.65	1.07	0.897	0.482
1.65 V	22.1	17.6	9.87	6.08	3.35	2.41	1.93	1.64	1.06	0.893	0.480
1.70 V	21.2	17.0	9.57	5.93	3.33	2.39	1.91	1.63	1.05	0.889	0.478
1.75 V	20.3	16.4	9.33	5.81	3.28	2.38	1.90	1.62	1.05	0.884	0.475
1.80 V	19.2	15.5	8.99	5.63	3.19	2.30	1.84	1.57	1.01	0.866	0.466

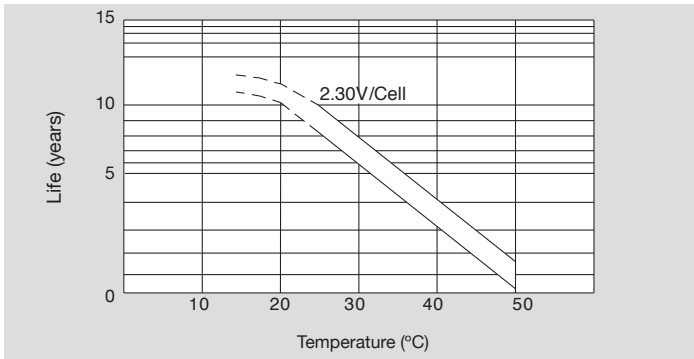
## Constant Power Discharge (Watts) at 25°C

End Voltage (Volts/Cell)	5 min	10 min	15 min	30 min	1 h	2 h	3 h	4 h	5 h	10 h	20 h
1.60 V	85.7	68.6	38.5	23.8	13.2	9.59	7.69	6.56	4.26	3.59	1.93
1.65 V	83.2	66.9	37.7	23.5	13.1	9.54	7.65	6.52	4.24	3.57	1.92
1.70 V	79.7	64.5	36.5	22.9	13.0	9.47	7.60	6.47	4.21	3.56	1.91
1.75 V	76.3	62.3	35.7	22.4	12.8	9.41	7.54	6.43	4.18	3.53	1.90
1.80 V	72.0	59.0	34.4	21.7	12.4	9.12	7.32	6.23	4.05	3.46	1.86

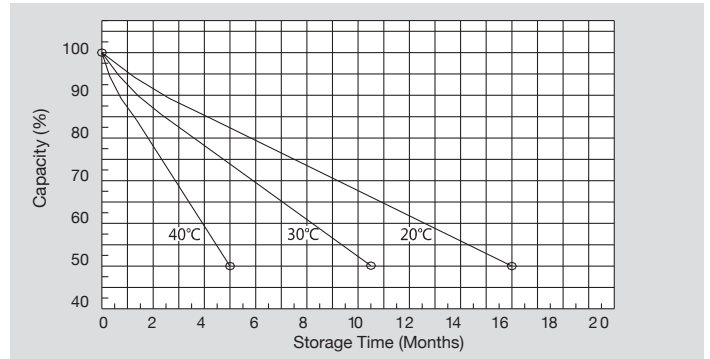
(Note) The above characteristics data are average values obtained within three charge/discharge cycles.

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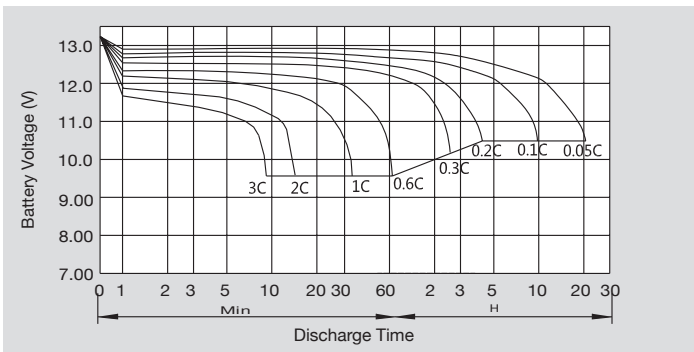
## Temperature Effects on Float Life



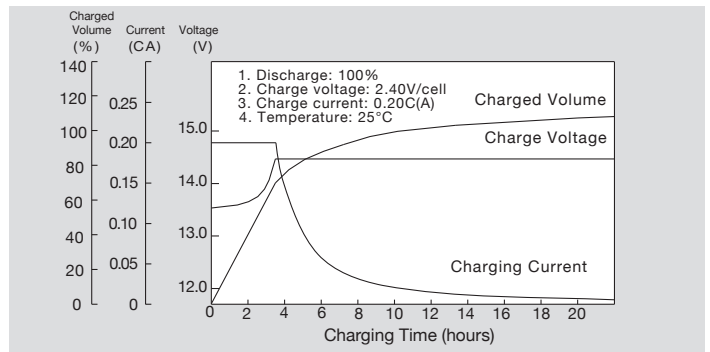
## Self Discharge Characteristics



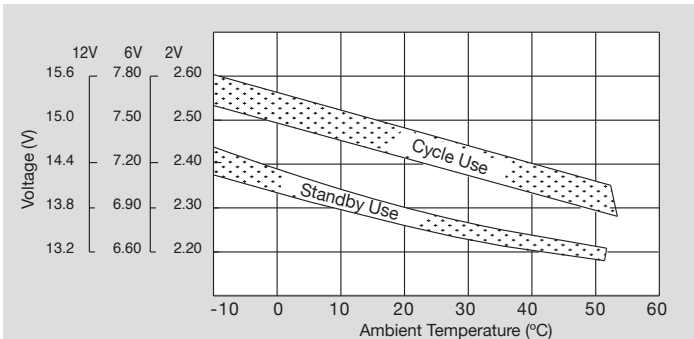
## Discharge Characteristics (25°C)



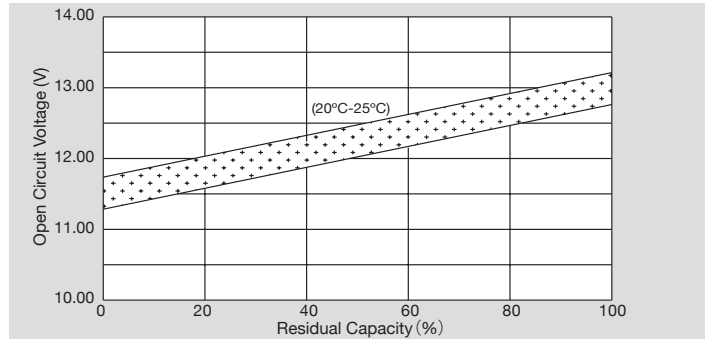
## Constant Voltage Charging Characteristic 25°C



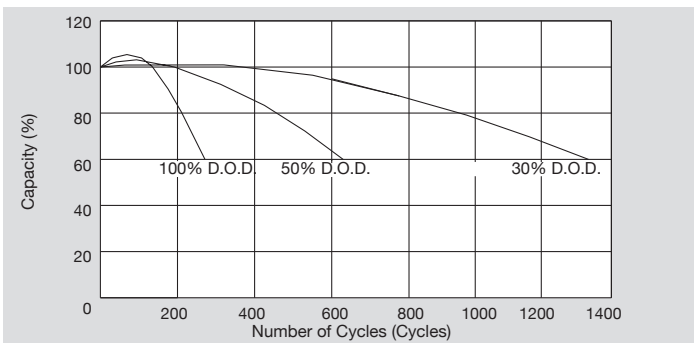
## Relationship Between Charging Voltage and Temperature



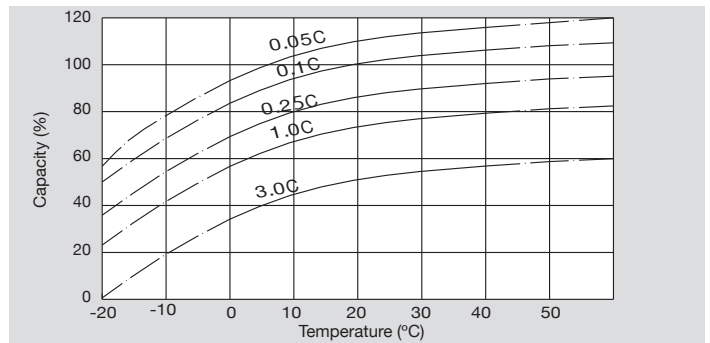
## Relationship Between Open Circuit Voltage and Residual Capacity (25°C)



## Cycle Service Life in Relation to Depth of Discharge



## Temperature Effects on Capacity



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