



# Sigma Power Systems

## SG645T1 (6V 4.5Ah T1 or F1)

This product is a general purpose rechargeable Sealed Lead Acid (SLA) battery. It is also called Valve Regulated Lead Acid (VRLA) battery. The design life is 5 years at 25°C (77°F) when used under normal operating conditions. Higher temperatures, higher charging voltage, storing at lower state of charge repeated cycle are some of the factors affect the life of the SLA battery. Capacity will vary depending on the temperature. Check the graphs below for details. Always follow the safety instructions while handling the battery.

### Specification

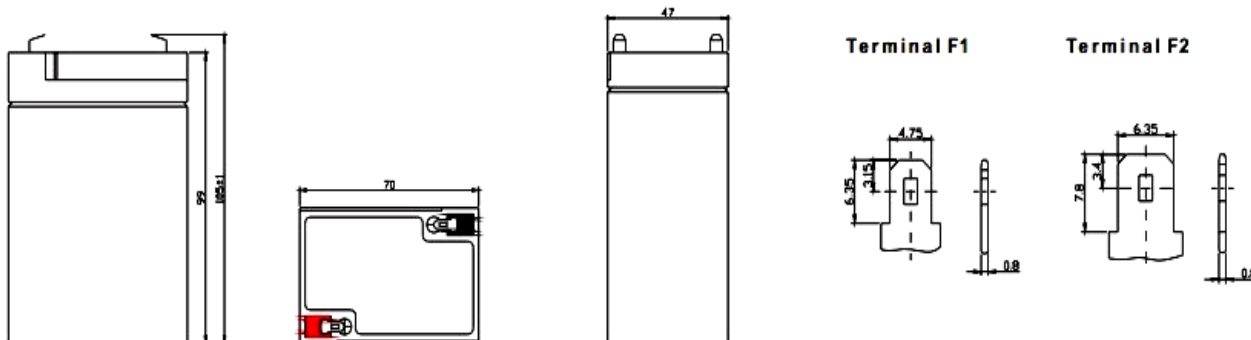
<b>Cells per Unit</b>	3
<b>Nominal Voltage per cell/battery</b>	2/6 V
<b>Capacity</b>	4.5 Ah at 20 hr.-rate to 1.75V per cell at 25°C
<b>Weight</b>	Approximately 0.72 KG/1.59 lbs. (Tolerance ± 3%)
<b>Maximum Charge Current</b>	1.35 A
<b>Operating Temperature Range</b>	Discharge: -20°C ~ 60°C Charge: 0°C ~ 50°C Storage: -20°C ~ 60°C
<b>Nominal Operating Temperature Range</b>	25 ± 5°C
<b>Float Charge Voltage</b>	6.8 to 6.9 VDC/unit Average at 25°C
<b>Maximum Discharging Current Limit</b>	45 Amp (5 seconds)



<b>Equalization and Cycle Service</b>	7.3 to 7.4 VDC/unit Average at 25°C
<b>Self Discharge</b>	Self-discharge rate less than 3% per month at 25°C. Please charge batteries before using.
<b>Terminals</b>	F1 (0.187)
<b>Jar Material</b>	A.B.S UL94-HB

### Physical Dimensions: in (mm)

**Unit: mm** Dimension: 70(L)×47(W)×105(H)





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Use this chart to estimate the current for various times and end of discharge of voltages (EDV)

## Constant Current Discharge Characteristics: Amp (25°C)

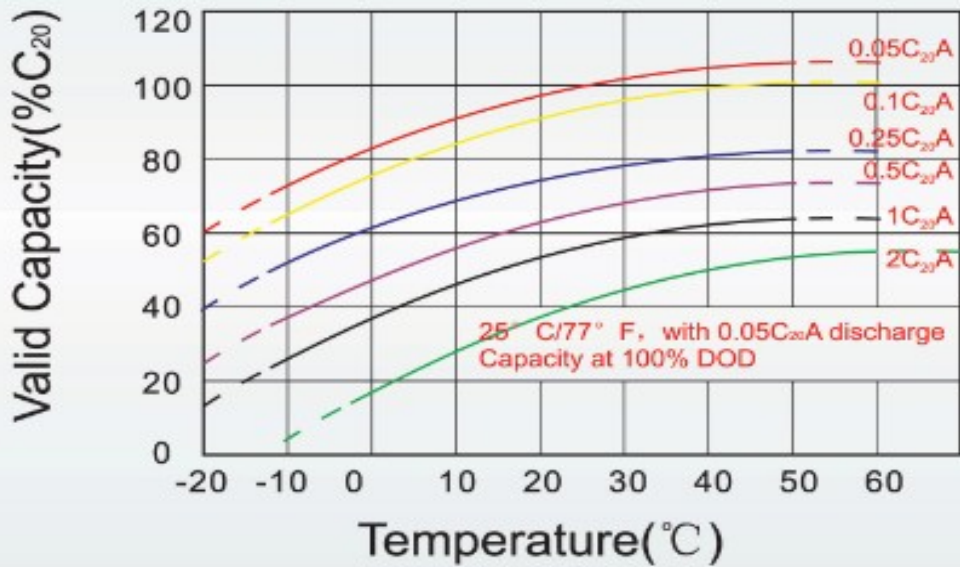
EDV	5 Min.	10 Min.	15 Min.	30 Min.	1 Hr.	2 Hr.	3 Hr.	5 Hr.	8 Hr.	10 Hr.	20 Hr.
4.80 V	18.30	12.00	9.40	5.28	3.14	1.81	1.23	0.816	0.520	0.450	0.252
5.00 V	17.64	11.70	9.10	5.21	3.05	1.77	1.20	0.802	0.518	0.445	0.243
5.10 V	16.60	11.12	8.85	5.13	3.02	1.75	1.19	0.793	0.513	0.438	0.239
5.25 V	14.92	10.40	8.35	4.99	2.96	1.73	1.18	0.784	0.508	0.436	0.232
5.40 V	13.37	9.70	7.87	4.83	2.91	1.71	1.17	0.775	0.506	0.429	0.218
5.55 V	11.70	8.89	7.27	4.64	2.83	1.65	1.15	0.768	0.502	0.422	0.215

Use this chart to estimate the power for various times and end of discharge voltages (EDV)

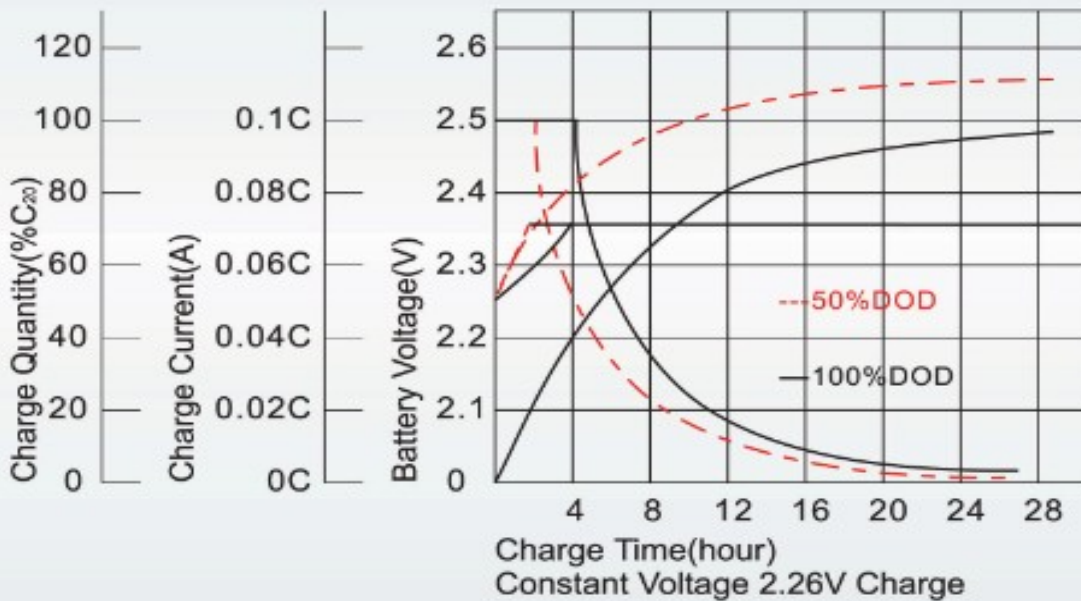
## Constant Power Discharge Characteristics: Watt (25°C)

EDV	5 Min.	10 Min.	15 Min.	30 Min.	1 Hr.	2 Hr.	3 Hr.	5 Hr.	8 Hr.	10 Hr.	20 Hr.
4.80 V	96.25	63.80	50.33	30.21	18.21	10.54	7.174	4.829	3.111	2.694	1.513
5.00 V	93.74	62.48	49.61	29.90	17.94	10.45	7.160	4.804	3.099	2.669	1.459
5.10 V	89.16	60.00	48.96	29.64	17.81	10.38	7.133	4.757	3.076	2.644	1.432
5.25 V	81.38	57.53	46.41	29.03	17.57	10.30	7.104	4.701	3.050	2.616	1.392
5.40 V	73.42	53.82	43.85	28.35	17.28	10.21	7.021	4.652	3.036	2.577	1.311
5.55 V	64.75	50.10	41.30	27.57	16.96	10.13	7.002	4.603	3.011	2.538	1.234

Temperature and Valid Capacity



Charge Characteristics for Float Use @ 25°C/77°F

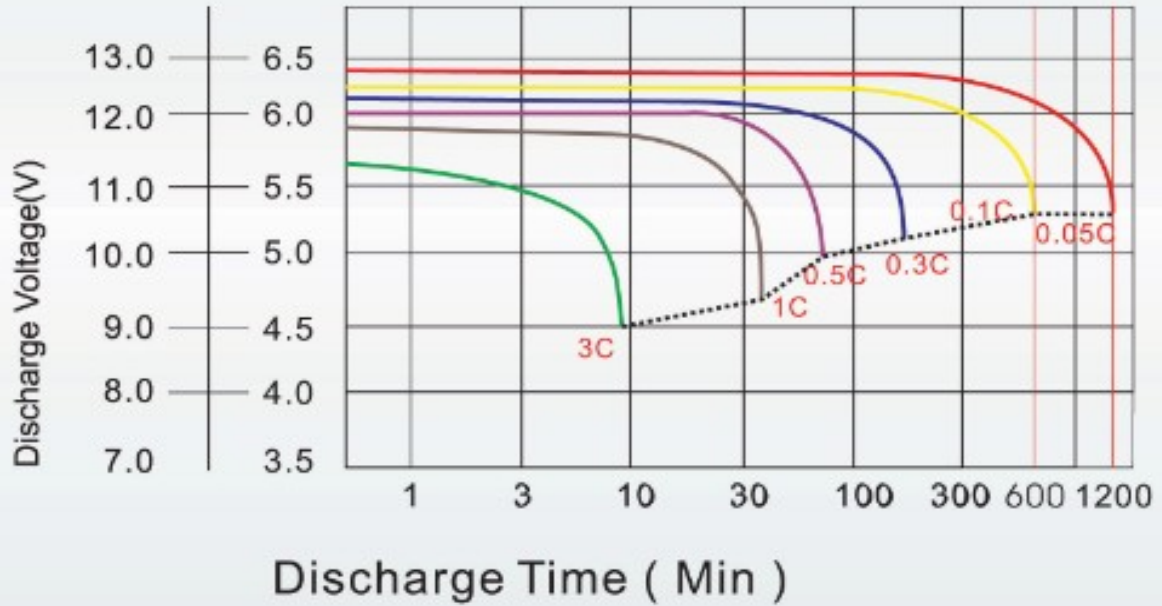




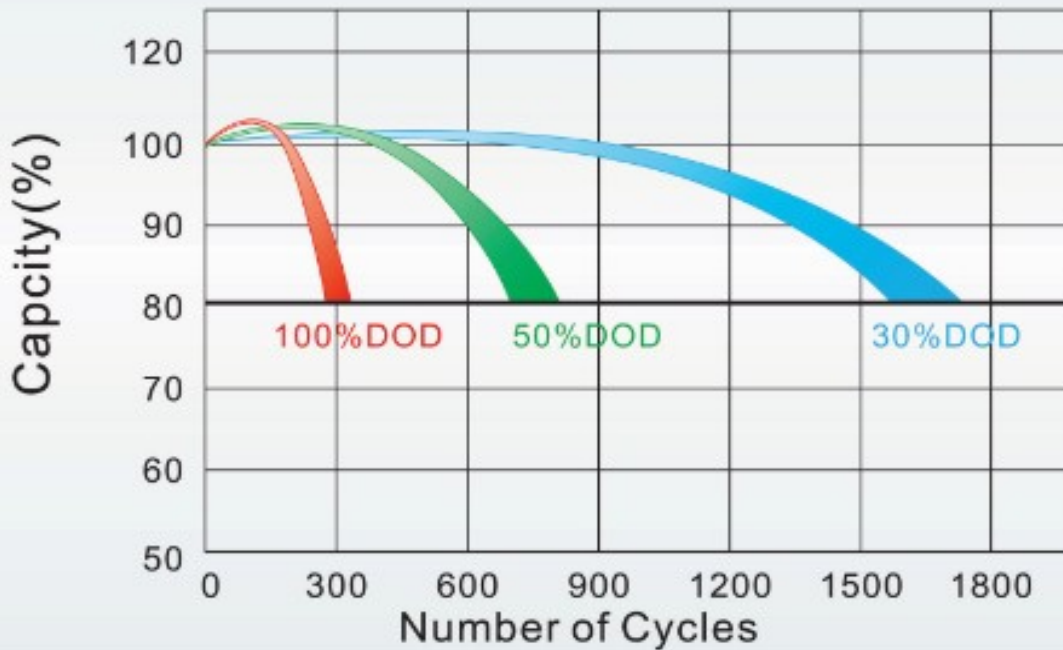
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## Discharge Characteristics at Various Rates @ 25°C/77°F



## Cycle Life in Relation to Depth of Discharge





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## Capacity at Different Temperatures

Battery Type		-20°C	-10°C	0°C	5°C	10°C	20°C	25°C	30°C	40°C	45°C
GEL Battery	6V & 12V	50%	70%	83%	85%	90%	98%	100%	102%	104%	105%
	2V	60%	75%	85%	88%	92%	99%	100%	103%	105%	106%
AGM Battery	6V & 12V	46%	66%	76%	83%	90%	98%	100%	103%	107%	109%
	2V	55%	70%	80%	85%	92%	99%	100%	104%	108%	110%

## Discharge Current Vs. Discharge Voltage

Final Discharge Voltage V/cell	1.75V	1.70V	1.60V
Discharge Current (A)	$A \leq 0.2C$	$0.2C \leq A \leq 1.0C$	$\geq 1.0C$

## Safety & Maintenance Tips

<ul style="list-style-type: none"> <li>☒ Do not charge the battery in air tight atmosphere.</li> <li>☒ Do not short the terminals.</li> <li>☒ Avoid leaving them in hot environment.</li> <li>☒ Charge the batteries at least once in 6 months when the batteries are at 77F</li> <li>☒ Max. charge current 0.3CA, constant voltage 2.4-2.45V/Cell charge 24h</li> <li>☒ Effect of temperature on float charge voltage: -3mV/Cell.</li> <li>☒ Life will be reduced by number and depth of discharge.</li> <li>☒ Do not discharge below the minimum recommended voltage.</li> <li>☒ Leaving a discharged battery without charge for a long period of time will affect the life of the batteries.</li> </ul>
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## Charging Method

Constant Voltage	$-0.2C * 2h + 2.4 - 2.45V/cell * 24h$ , Max. Current 0.3CA
Constant Current	$-0.2C * 2h + 0.1CA * 12h$
Fast	$-0.2C * 2h + 0.3CA * 4.0h$

General applications – Emergency lights, solar, UPS, Alarm systems, Security systems, wheelchairs, flash lights, toys etc.

Charge the batteries at least once every six months, if they are stored at 25°C

[www.sigmapowersystems.com](http://www.sigmapowersystems.com)



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