Datasheet

GSE SERIES SUPERCAPACITOR CELL

(1-22 F)

FEATURES AND BENEFITS	TYPICAL APPLICATIONS
➢ High energy density	➢ Consumer electronics
➢ Light weight and Small in volume	➢ Smart meters
➢ -40° to 65°C operating temperature range	➢ Automotive
➢ RoHS compliant	➢ Wireless transmitters

ELECTRICAL	UNIT	GSE-2R7105	GSE-2R7305	GSE-2R7505	GSE-2R7106	GSE-2R7186	GSE-2R7226
Rated Capacitance[1]	F	1	3	5	10	18	22
Rated Voltage	V	2.7					
Absolute Maximal Voltage	V	2.85					
Rated (Maximum) ESR_{DC}[2]	mΩ	500	250	120	90	50	35
Absolute Maximum Current[3]	A	0.9	2.31	4.22	7.11	12.79	16.78
Leakage Current[4]	μA	5	10	15	30	60	100

ENERGY AND POWER

Energy Stored	Wh	0.001	0.003	0.005	0.01	0.018	0.022
Specific Energy, Gravimetric[5]	Wh/kg	1.05	2.50	3.33	3.51	4.50	4.58
Specific Power, Gravimetric[5]	kW/kg	3.84	6.08	10.13	7.11	9.11	10.85
Specific Energy, Volumetric[5]	Wh/L	2.67	4.98	4.98	5.10	5.87	5.98
Specific Power, Volumetric[5]	kW/L	9.75	12.09	15.11	10.32	11.89	14.15

LIFETIME

Operating Temperature Range:		
Minimum	°C	-40
Maximum	°C	65
Storage Temperature Range:		
Minimum	°C	-40
Maximum	°C	65
Lifetime at RT[6]	Years	10
Capacitance Change		≤30%
ESR Change		≤200%
Lifetime at High Temperature (65°C)[6]	Hours	1000
Capacitance Change		≤20%
ESR Change		≤100%
Cycle Life at RT[6]	Cycles	500,000
Capacitance Change		≤20%
ESR Change		≤100%

SAFETY

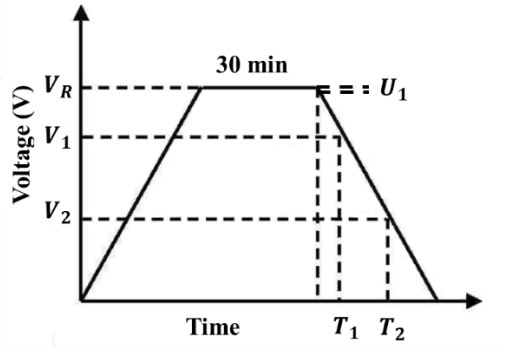
Certifications	RoHS

PHYSICAL

Size (D*L)	mm	6.3*12	8*12	8*20	10*25	12.5*25	12.5*30
Mass	g	0.95	1.20	1.50	2.85	4.00	4.80
Terminal				Wire lead			

NOTES:

1. Measurement of capacitance and ESR_{DC}:
   Constant current ($4 \times C \times V_R$) is used to charge the cell/module to rated voltage, and the voltage is held for 30 mins, before constant current ($4 \times C \times V_R$) discharge to 0.1 V.



$$C = I \times \frac{T_2 - T_1}{V_1 - V_2}$$

$$ESR_{DC} = U_1/I$$

Where V_R is the rated voltage;
V_1 is 80% of V_R; V_2 is 40% of V_R;
T_1 and T_2 are the corresponding time for V_1 and V_2, respectively;
U_1 is the voltage drop over the first 10 ms of discharge;
I is the applied current.

2. Absolute maximal current: Current needed to discharge the module to half of its rated voltage within 1 s.
3. $I_{max} = \frac{{}^1/_2 V_R}{1/C + ESR_{DC}}$
   ∗Number is provided for reference only. Do not use it as operating current.
4. Leakage current was measured after 72 hrs of holding at rated voltage at 25 °C.
5. Power density and energy density:

   Energy density $E = \frac{CV_R{}^2}{2 \times 3600 \times (Mass/Volume)}$
   Power density $P = \frac{V_R{}^2}{4 \times ESR_{DC} \times (Mass/Volume)}$

6. Lifetime will vary depends on applications.