



**Shanghai Green Tech Co.,Ltd.**

**Specification of Super Capacitor**

Part Number: GTSP-2R7-357UN4

Prepared	Checked	Approved
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**Specification Approval Sheet**

Dear value customers,

Please confirm the specification approval of GTCAP super capacitor in document number of SP181215E.

Customer Approval	
Company name	
Signature	
Company Stamp	
Date	

**2.7V 350F  
(Snap in 4 pins)**

❖ **Features:**

- ❖ Large power density
- ❖ Ultra-low ESR
- ❖ Wide temperature range
- ❖ Long life over **500,000** times duty cycles
- ❖ Quality guaranteed
- ❖ Environment friendly **RoHS** compliant
- ❖ Maintenance free

❖ **Applications:**

- ❖ EV/HEV
- ❖ Power compensation
- ❖ Back-up power for lighting
- ❖ Smart grid
- ❖ Solar energy street light
- ❖ Mass transportation braking energy recovery system
- ❖ UPS
- ❖ Electric tool
- ❖ Solar glare flashlight
- ❖ Renewable energy

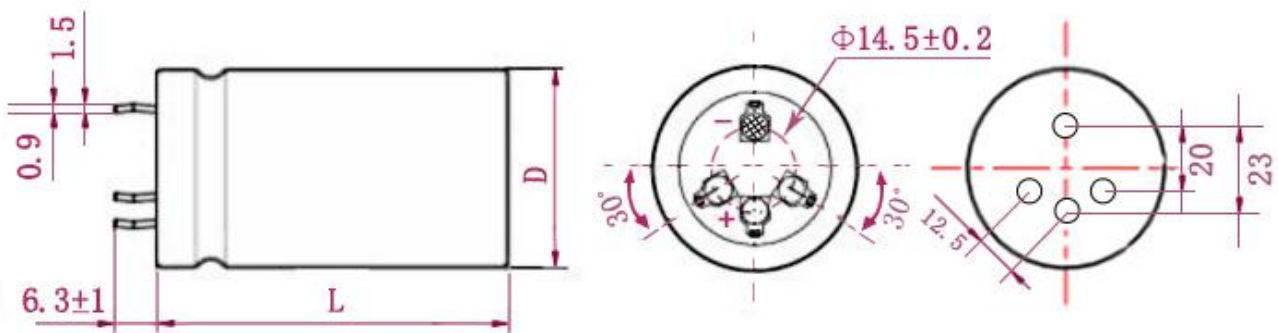


Terminals



Part ID code

❖ **Product Dimensions (Unit:mm)**



Dimension(mm)				
GT Part Number	Voltage	Capacitance	D (±1.0)	L1(±0.5)
GTSP-2R7-357UN4	2.7V	350F	35	62

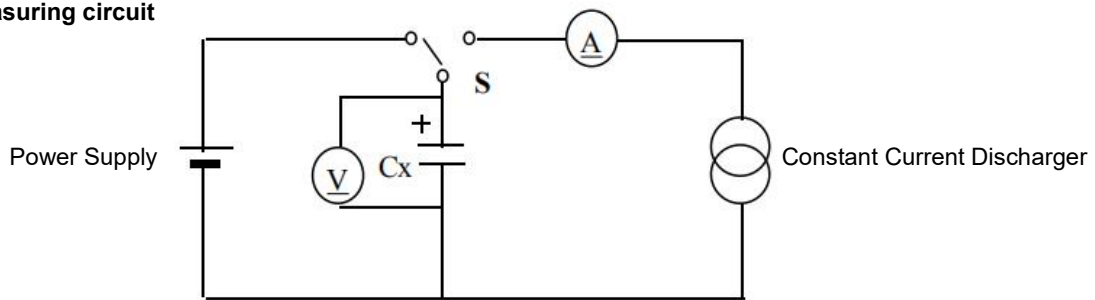
❖ **General Characteristics**



No.	Part Number	GTSP-2R7-357UN4
1	Rated Voltage	2.7V/DC
2	Surge Voltage	2.85V/DC
3	Capacitance	350F
4	Capacitance Tolerance	-10% to +20%
5	ESR/AC @1KHz	<2.8mΩ
6	ESR/DC	<3.2mΩ
7	Max. Working Current	24A
8	Max. Peak Current 1s	195A
9	Max. Leakage current 25°C,After 72 hours	0.85mA
10	Voltage Holding 25°C,After 72 hours	≥80%
11	Operating Temperature	-40°C~+70°C
12	Storage Temperature	-20°C~+50°C
13	Power Density	3125W/kg
14	Energy Storage	0.36Wh
15	Weight	70g
16	Cycle Life (25°C)	500,000 times Constant current charging to $U_R$ , constant current discharging to $1/2U_R$ $\Delta C/C \leq 30\%$ ; $ESR \leq 2 * ESR_{25^\circ C}$
17	Load Life(65+2°C)	1500 hours Under the rated voltage at $65 + 2^\circ C$ under the condition of storage of 1500 +48 / - 0 h, satisfy the standard of capacity and ESR, and no visible damage at the same time, no electrolyte leakage. $\Delta C/C \leq 30\%$ ; $ESR \leq 2 * ESR_{25^\circ C}$
18	Temperature Characteristics	-40°C $\Delta C/C \leq 30\%$ ; $ESR \leq 2 * ESR_{25^\circ C}$ +65°C $\Delta C/C \leq 30\%$ ; $ESR \leq 2 * ESR_{25^\circ C}$

## ❖ Test Methods

### 1) Constant current discharge method

**Figure 1: Measuring circuit**



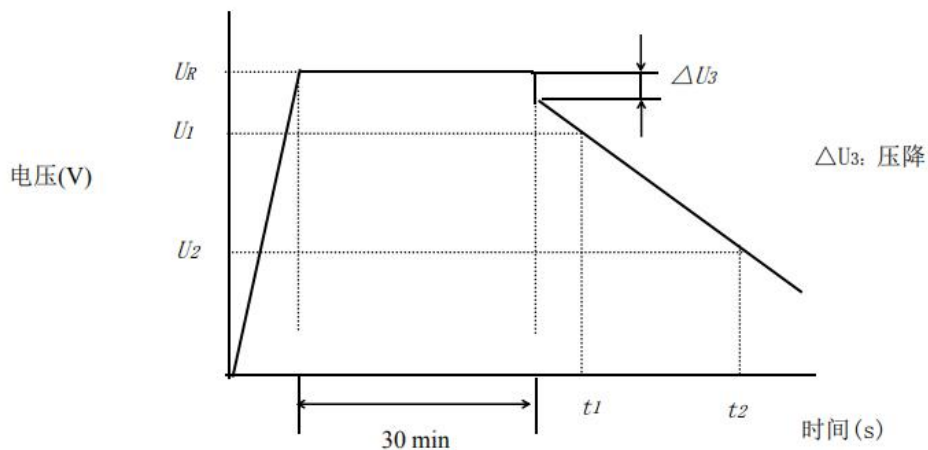
-  D.C. Ammeter
-  D.C. Voltmeter
- S Change-over Switch
- Cx Capacitor under Test

Measuring method:

- A) Set the D.C. voltage at the rated voltage ( $U_R$ ).
- B) Set the discharge current of the load meter according to the requirements in table 1
- C) Set the change-over switch to the constant current source charging end. After the constant current charging reaches the rated voltage value, the battery will be charged for another 30 minutes at constant voltage.
- D) After 30 minutes of charging, the transfer switch is moved to the load meter end for constant current discharge.

As shown in figure 2, the  $t_1$ ,  $t_2$  values of the voltage at  $U_1$ ,  $U_2$  at the time of discharge are recorded, and the capacity is calculated by the following formula.

**Figure 2: Voltage Characteristics between Capacitor Terminals**



$$C = \frac{I \times (t_2 - t_1)}{U_1 - U_2}$$

- C* the capacitance (F);
- I* the discharge current (A);
- U<sub>1</sub>* the measurement starting voltage (V);
- U<sub>2</sub>* the measurement end voltage (V);
- t<sub>1</sub>* the time from discharge start to reach *U<sub>1</sub>* (s);
- t<sub>2</sub>* the time from discharge start to reach *U<sub>2</sub>* (s);
- U<sub>R</sub>* the rated voltage(V);

Discharge current and U1, U2 are set according to table 1.

**Table 1: Discharge Conditions**

<b><i>I</i> (A)</b>	3.8A
<b><i>U<sub>1</sub></i></b>	80% of rated voltage
<b><i>U<sub>2</sub></i></b>	50% of rated voltage
Remark: C <sub>R</sub> is the rated capacitance in F (Farad), and U <sub>R</sub> is the rated voltage in V (Volt).	

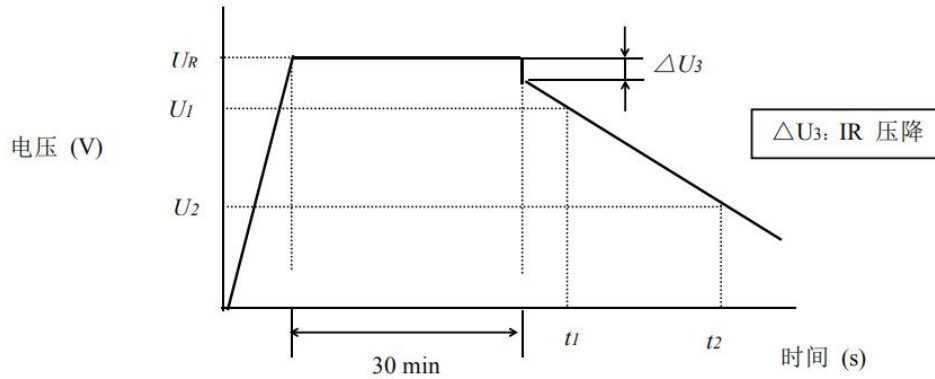
❖ **Product Reliability**

No.	Item	Standard	Test Method
1	Steady state humidity and heat test	ΔC/C≤10% ESR≤2*ESR <sub>25℃</sub>	Capacitor in humidity 90 ~ 95% RH, 40±2 °C temperature is placed under the conditions of 240±48 hours, satisfy the standard of capacity and ESR, and no visible damage at the same time, no electrolyte leakage.
2	Vibration test	ΔC/C≤10%	Frequency:10~55Hz      Amplitude:1.5mm Temperature:15℃~35℃      Vibration time:2H*3 (Three directions)
3	Puncture	No fire, no explosion	A pair of capacitor monomers are charged to the rated voltage with a constant current I, the high-temperature resistant steel needle with a diameter of 8mm and a speed of 10mm/s to 40mm/s, which runs through the direction of the capacitor plate (the steel needle stays in the capacitor).

### ❖ Charge/Discharge Characteristics

Charge: Charge at 3.8(A) constant current to 2.7V, then constant voltage charging for 30 minutes.

Discharge: Discharge at 3.8(A) constant current to 1.35V.



### ❖ Notice

- ❖ Supercapacitors have a fixed polarity.
- ❖ Supercapacitors should be used at nominal voltage.
- ❖ Ambient temperature affects the life of the supercapacitor.
- ❖ Do not reverse charge.
- ❖ After installation, do not force or tilt capacitors.
- ❖ After welding, the circuit board and capacitor should be cleaned.
- ❖ When the supercapacitors are used in series, there exists the problem of voltage balance between the monomers.

### ❖ Storage

Products should not be stored in areas where humidity exceeds 85 percent, or where toxic gases are present.  
Product is best stored in a temperature of  $-20^{\circ}\text{C}\sim+50^{\circ}\text{C}$ , 60% humidity environment.

### ❖ Disposal

Do not dispose of module in trash. Dispose of according to local regulations.  
Please contact us when you meet any question with GTCAP products.

❖ How to Order

GTSP-2R7-357UN4 1000pcs

GT	S											
Brand	Super	Series		Rated Voltage		Capacitance		Tolerance		Terminal Type		Status
GTCAP	capacitor	Code	Series	Code	Voltage	Code	Value(F)	Code	Tolerance	Code	Terminal	Code
		P	Power	2R5	2.5V	104	0.1	J	±5%	A	Cable	S=Standard
		E	Energy	2R7	2.7V	224	0.22	K	±10%	B	Bar	C=Customized
		M	Module	3R3	3.3V	474	0.47	M	±20%	C	Coin	P=Prismatic
		PP	Big Power	3R6	3.6V	105	1.0	U	-10%~20%	H	Horizontal	S=Soft roll
		PH	Hi-Temp P	3R8	3.8V	205	2.0	V	10%~30%	L	Lug	4=4Pins
		EH	Hi-Temp E	4R0	4.0V	475	4.7	Z	-20%~80%	N	Snap in	
		MH	Hi-temp M	5R0	5.0V	106	10			P	Pillar	
		ML	Military	5R5	5.5V	206	20			R	Radial Wire	
		PL	Hybrid	6R3	6.3V	506	50			S	Screw in	
		MG	Graphene	012	12V	107	100			T	Threaded	
				016	16V	367	360			V	Vertical	
				024	24V	407	400			W	Weldable	
				036	36V	657	650					
				048	48V	158	1500					
				056	56V	308	3000					
				075	75V	328	3200					
				100	100V	608	6000					
				120	120V	109	10000					
				240	240V	609	60000					
						909	90000					
						1010	100000					
						3010	300000					

Customer inquiry

No.	Requirement details	Quantity
1		
2		
3		
4		
5		

The customer requested to offer the company name and contact information, If the customer needs applications or operating conditions other than these described in this document, please contact GTCAP in advance, GTCAP could design and build such products according to your special request.