



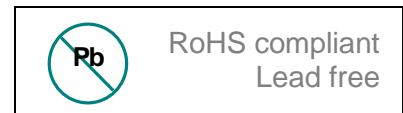
G Series Supercapacitors Product Bulletin

CAP-XX supercapacitors deliver outstanding power and energy performance in a number of footprints, configurations, voltage ratings and environmental specifications.

They are ideally suited to meet the peak power demands of pulsed loads in battery-powered electronics and many other consumer and industrial devices with a current-limited energy source.

Key benefits:

- Exceptional power density (~90kW/litre)
- High power to support large peak loads (low ESR)
- High energy to sustain long power surges (high C)
- Very low leakage current to extend battery life
- Low ESR rise rate to ensure a long operational life
- Environmentally friendly, RoHS compliant and lead-free
- Thin, prismatic packaging for space-constrained applications



RoHS

CAP-XX **G series** (General Purpose) supercapacitors are rated at either **4.5V** or **2.3V** and operate across a temperature range of **-40°C to +70°C**. The 4.5V dual cell devices are ideal for use with a lithium-ion battery pack, while the 2.3V single cell devices offer a very high power and high energy solution for lower voltage applications. The single cells can also be connected in series and mounted side by side to offer industrial designers the thinnest supercapacitor solution available. The G series is available in three footprints:

The **GS** range (39.0 x 17.0mm) delivers ultra-high performance in a cost-effective package, supporting both the peak power and interim power demands of the most demanding electronic products, in which high C, low ESR and a long life are essential to meet performance targets.

GW products (28.5 x 17.0mm) offer a more compact solution for handheld devices such as PDAs and small electronic products like PCMCIA and ExpressCard 54 modems, while still delivering outstanding power and energy performance.

The ultra-small **GZ** series (20.0 x 15.0mm) offers best-in-class performance despite their diminutive size. They are ideal for use in the latest USB and ExpressCard 34 modems, in which they meet the peak power requirements of Class 12 GPRS radio frequency communication with minimal voltage ripple and low source current loads.



Reduce voltage drops and DC/DC requirements in consumer and industrial devices

Extend battery life, battery run-time and stand-by time, particularly at low temperatures

Protect against voltage transients (e.g., drop test) and short-term interruptions (e.g., last gasp, hot-swap, etc.)

Solve the current limitations of USB, PCI, PCMCIA & CF ports, and of long-life batteries, fuel cells, solar cells, etc.

G Series Dual Cell Modules: Product Specifications

Operating Voltage	Body Size	Product Name	Capacitance ¹ (± 20%) ²	ESR ¹ (± 20%) ²	Maximum Thickness
4.5V nominal (5.0V maximum)	20.0 x 15.0mm	GZ 215F	75 mF	150 mΩ	2.60 mm
	28.5 x 17.0mm	GW 209F	140 mF	70 mΩ	2.20 mm
		GW 202F	220 mF	50 mΩ	3.00 mm
		GW 201F	350 mF	70 mΩ	2.50 mm
		GW 203F	550 mF	50 mΩ	3.50 mm
	39.0 x 17.0mm	GS 203F	250 mF	40 mΩ	2.20 mm
		GS 211F	370 mF	28 mΩ	3.00 mm
		GS 206F	600 mF	40 mΩ	2.50 mm
		GS 208F	900 mF	28 mΩ	3.50 mm
			GS 230F	1200 mF	28 mΩ

G Series Single Cell Supercapacitors: Product Specifications⁴

Operating Voltage	Body Size	Product Name	Capacitance ¹ (± 20%) ²	ESR ¹ (± 20%) ²	Maximum Thickness
2.3V nominal (2.5V maximum)	20.0 x 15.0mm	GZ 115F	150 mF	75 mΩ	1.25 mm
	28.5 x 17.0mm	GW 109F	280 mF	36 mΩ	1.10 mm
		GW 102F	440 mF	26 mΩ	1.45 mm
		GW 101F	700 mF	36 mΩ	1.20 mm
		GW 103F	1100 mF	26 mΩ	1.70 mm
	39.0 x 17.0mm	GS 103F	500 mF	20 mΩ	1.10 mm
		GS 111F	740 mF	14 mΩ	1.45 mm
		GS 106F	1200 mF	20 mΩ	1.20 mm
		GS 108F	1800 mF	14 mΩ	1.70 mm
			GS 130F	2400 mF	14 mΩ

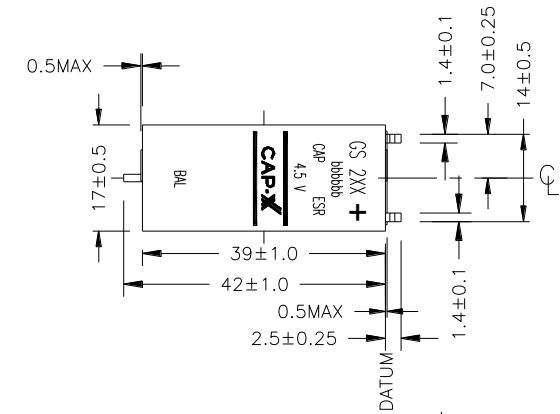
Parameter	Minimum	Nominal	Maximum
Operating Temp	-40°C	+25°C	+70°C
Storage Temp	-40°C	+25°C	+70°C
Leakage Current ³		1µA	2µA
Pulse Current	30A (single pulse. +ve & -ve terminal short circuited)		
ESR change with Temp	75% of nominal @ +70°C		150% of nominal @ -20°C

Notes

1. Capacitance will decline and ESR will rise over time, at a rate which depends on both voltage and temperature. Operation at maximum voltage and temperature will shorten life and is not recommended.
2. DC capacitance and ESR tolerance are measured at +25°C
3. Leakage current is measured after 72h at voltage at +25°C
4. Single cell products are special order. Longer lead times, minimum order quantities & other conditions of sale apply.

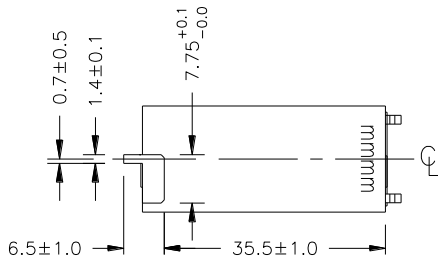
For more on CAP-XX products, go to www.cap-xx.com or contact us by email at sales@cap-xx.com.

GS Dual Cell Devices - Mechanical & Electrical Drawings

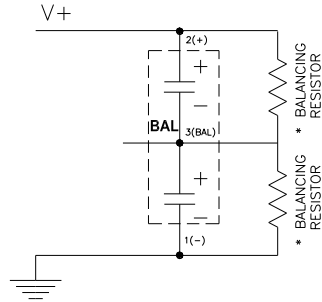


THICKNESS

ADHESIVE/INSULATING TAPE FLUSH WITH EDGE OF DEVICE
(OPTIONAL - ADD 0.1mm THK)

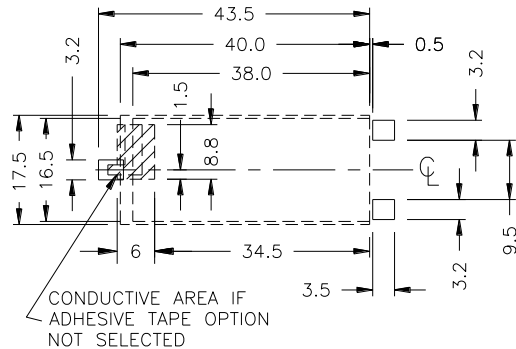


UNDERSIDE VIEW



PLEASE CONTACT CAP-XX FOR FURTHER INFORMATION

SUGGESTED CONNECTION DETAILS FOR 2 - CELL SUPERCAP

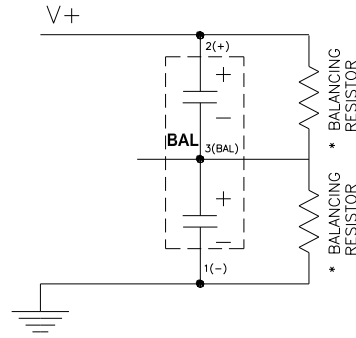
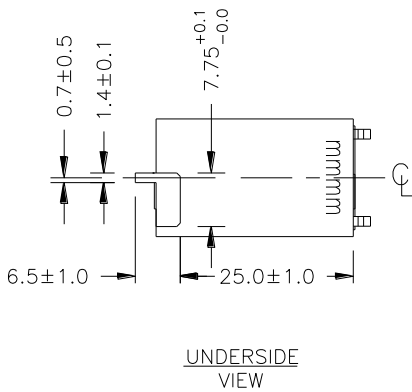
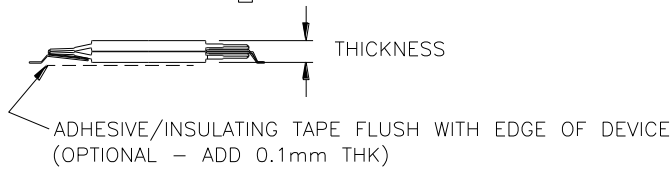
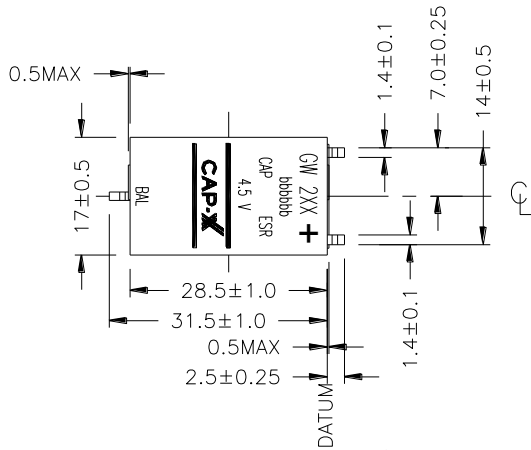


CONDUCTIVE AREA IF ADHESIVE TAPE OPTION NOT SELECTED

SUGGESTED PAD LAYOUT

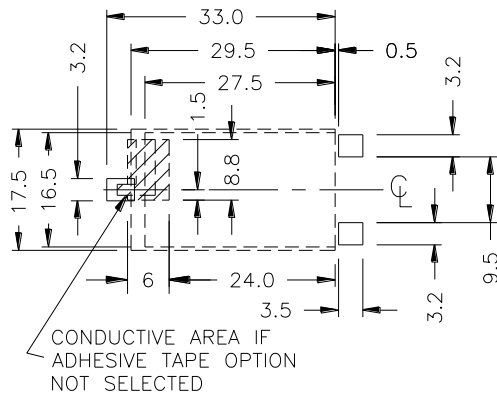
THE PAD SIZE SHOWN IS BASED ON CAP-XX MANUFACTURING TOLERANCES. THE FINAL PAD SIZE SHOULD ALLOW FOR CUSTOMER MANUFACTURING (PLACEMENT) TOLERANCES.

GW Dual Cell Devices - Mechanical & Electrical Drawings



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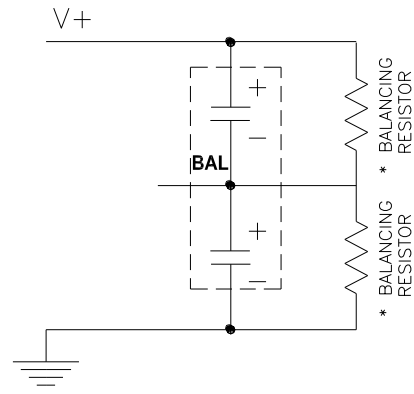
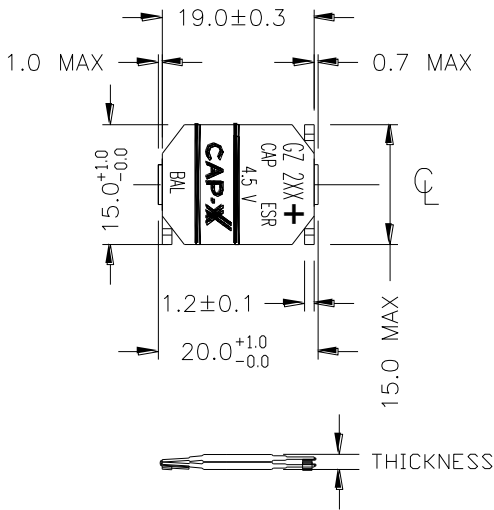


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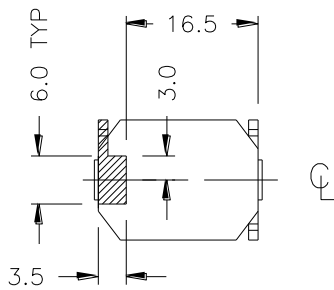
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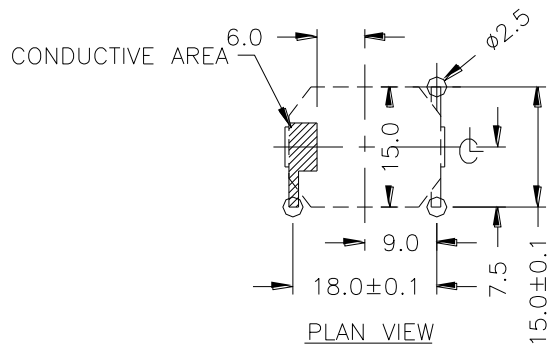


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UNDERSIDE VIEW

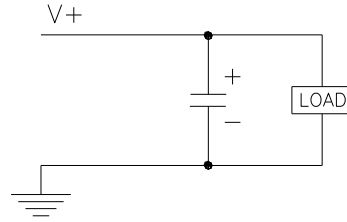
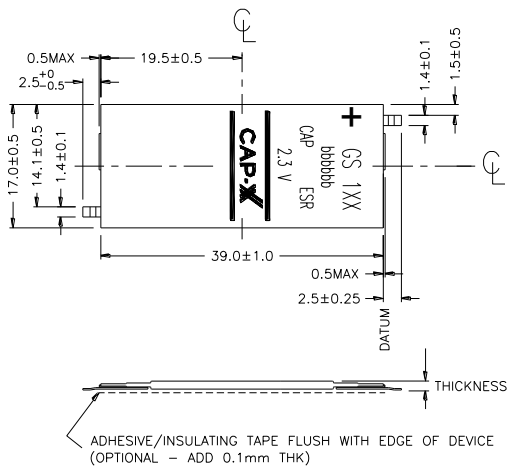


PLAN VIEW

SUGGESTED PAD LAYOUT

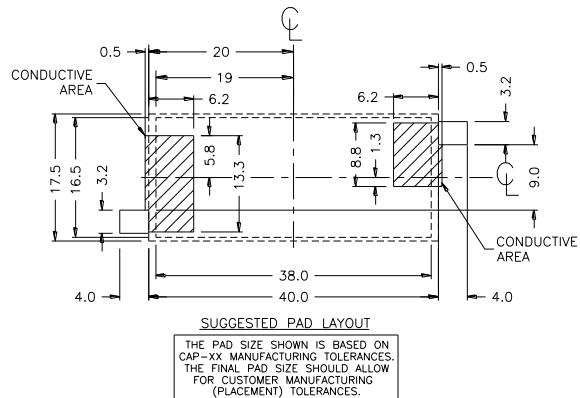
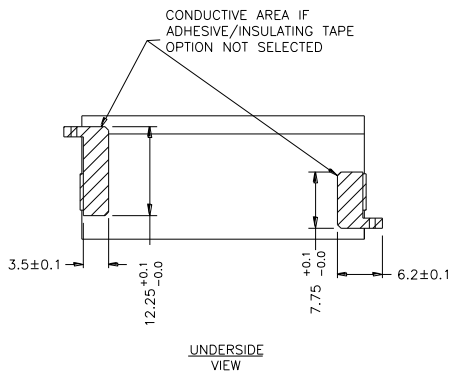
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GS Single Cell Devices - Mechanical & Electrical Drawings

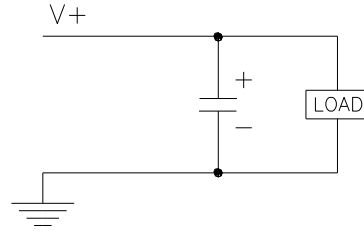
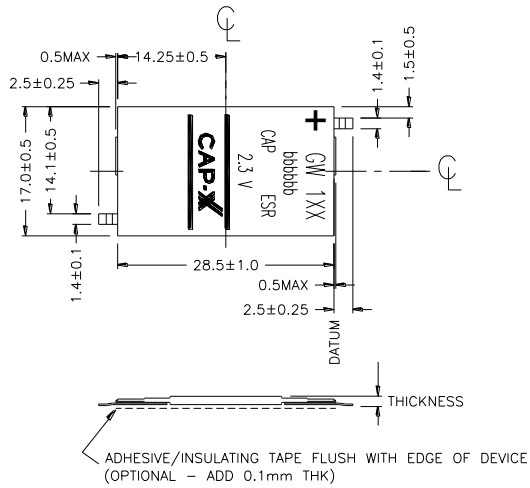


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SUGGESTED CONNECTION DETAILS FOR SINGLE CELL SUPERCAP

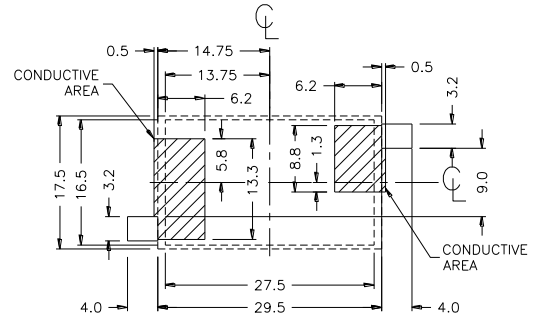
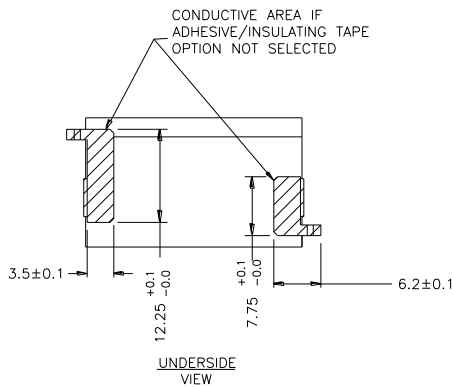


GW Single Cell Devices - Mechanical & Electrical Drawings



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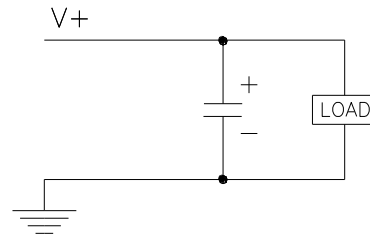
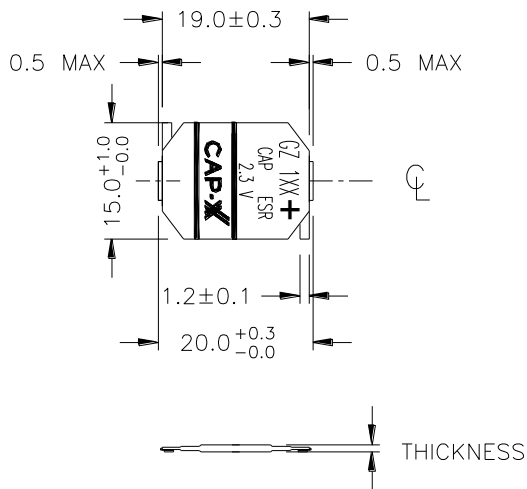
SUGGESTED CONNECTION
DETAILS FOR SINGLE CELL
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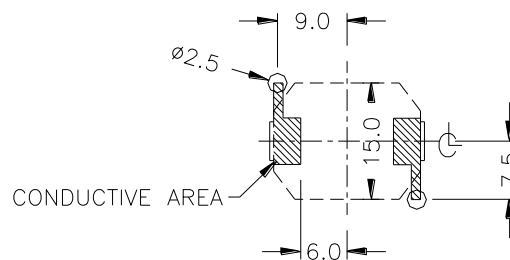
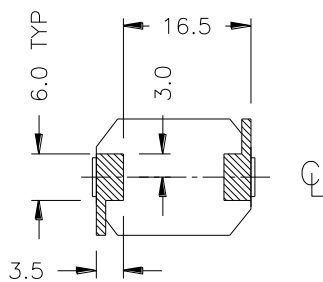
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