# 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 compliant
Lead free

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 Supercapacitors

| G Series Supercapacitors - 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 |
| | 20.0 x 18.0mm | **GA 209F** | 80mF | 130mΩ | 2.20mm |
| | 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 207F** | 450 mF | 55 mΩ | 3.00 mm |
| | | **GW 203F** | 550 mF | 50 mΩ | 3.50 mm |
| | 39.0 x 17.0mm | **GS 203F** | 250 mF | 45 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 | 3.80 mm |
| **2.3V nominal** (2.5V Maximum) | 20.0 x 15.0mm | **GZ 115F** | 150 mF | 75 mΩ | 1.25 mm |
| | 20.0 x 18.0mm | **GA 109F** | 160mF | 65mΩ | 1.10mm |
| | 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 107F** | 900 mF | 28 mΩ | 1.45 mm |
| | | **GW 103F** | 1100 mF | 26 mΩ | 1.70 mm |
| | 39.0 x 17.0mm | **GS 103F** | 500 mF | 22 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 | 1.85 mm |

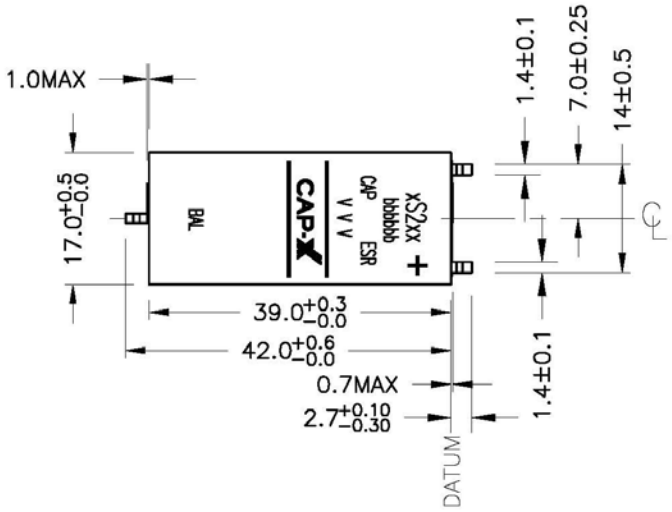
| Parameter | Minimum | Nominal | Maximum |
|---|---|---|---|
| **Operating Temp** | -40°C | **+25°C** | +70°C |
| **Storage Temp** | -40°C | **+25°C** | +70°C |
| **Leakage Current[3]** | | **1µA** | 2µA |
| **Pulse Current** | **30A** (single pulse. +ve & -ve terminal short circuited) | | |
| **ESR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

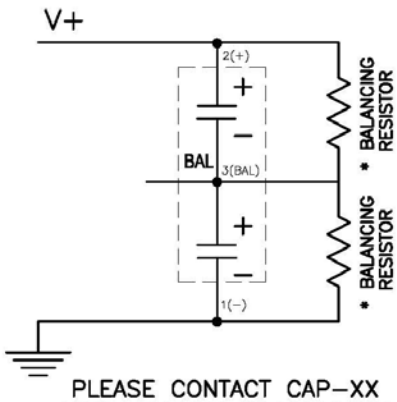
**Notes**

1. Capacitance will decline and ESR will rise over time, at a rate which depends on both voltage and temperature. Operation at +70°C and 4.5V concurrently will shorten life and is not recommended for extended periods. Contact CAP-XX for more.
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.

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

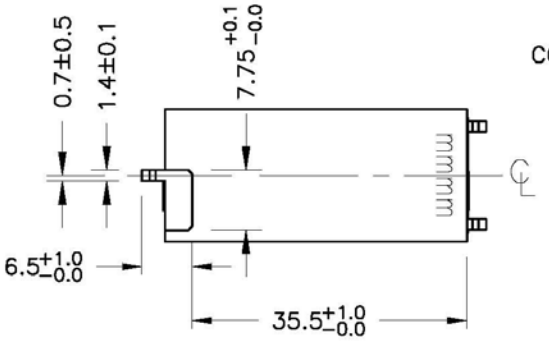
## GS Dual Cell Devices - Mechanical & Electrical Drawings



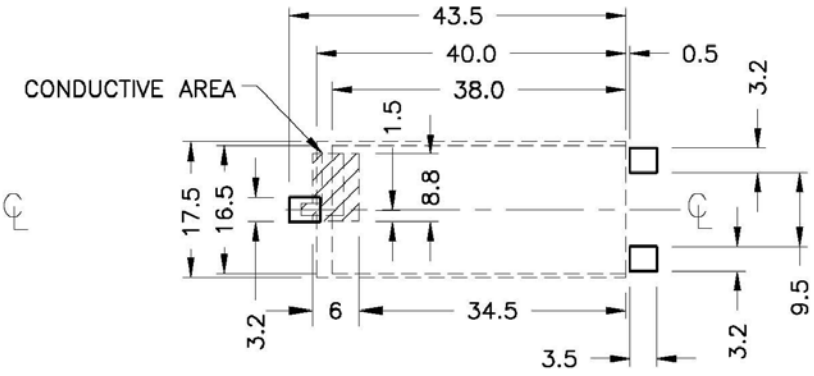




PLEASE CONTACT CAP–XX FOR FURTHER INFORMATION

SUGGESTED CONNECTION DETAILS FOR 2 – CELL SUPERCAP


UNDERSIDE VIEW




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.

Note: Refer Product Specification for thickness and print values XX, bbbbbb, CAP, ESR, mmmm

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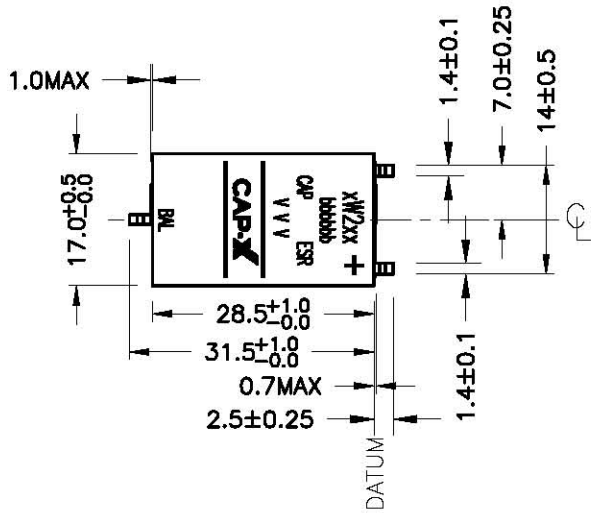


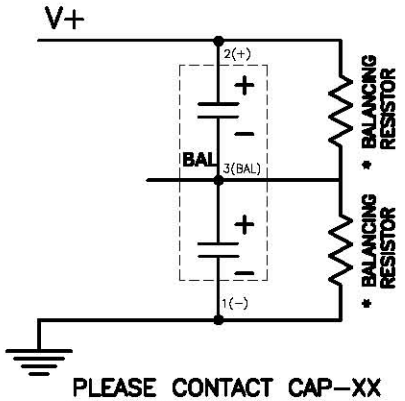


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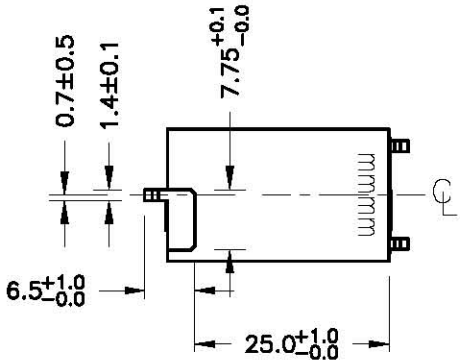


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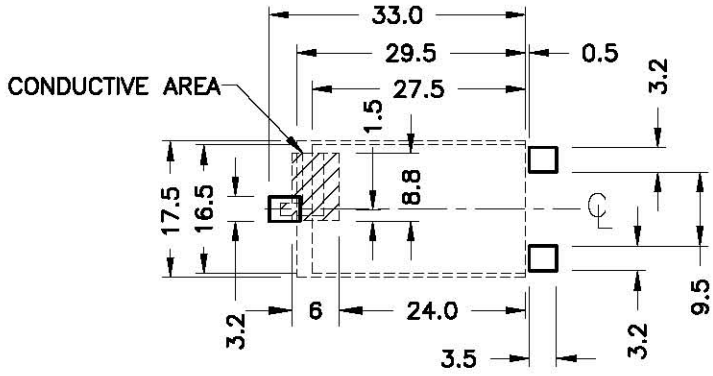


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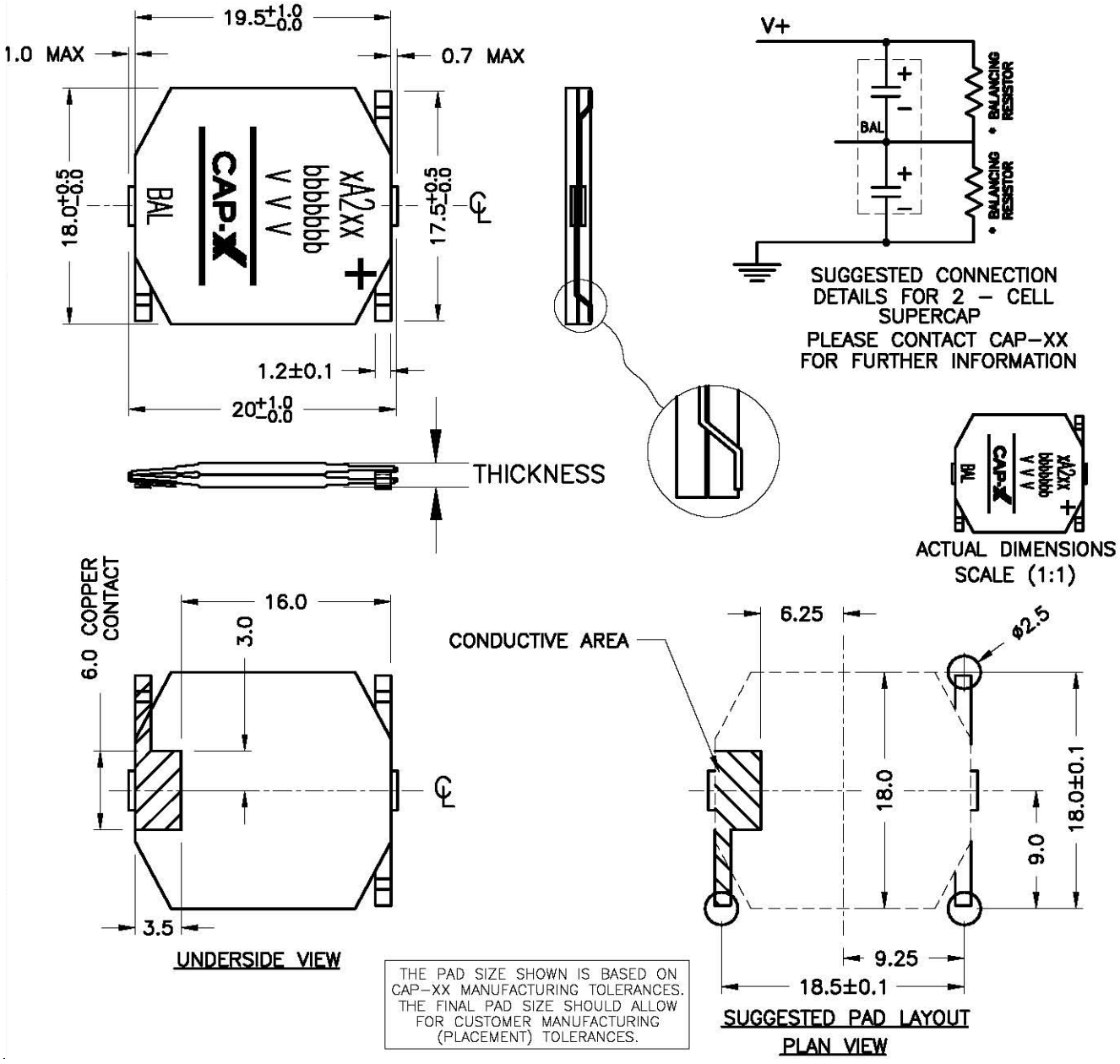

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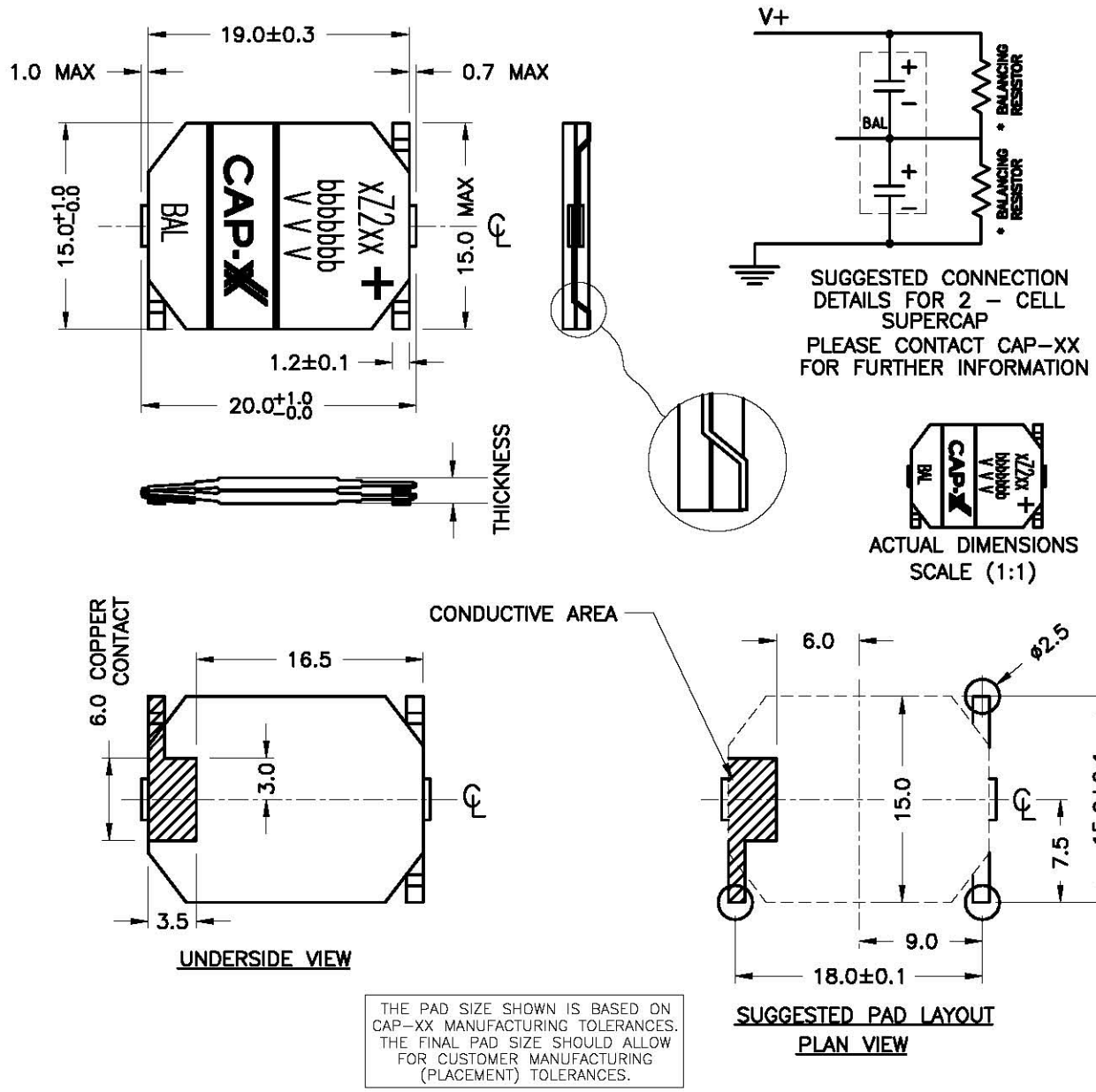

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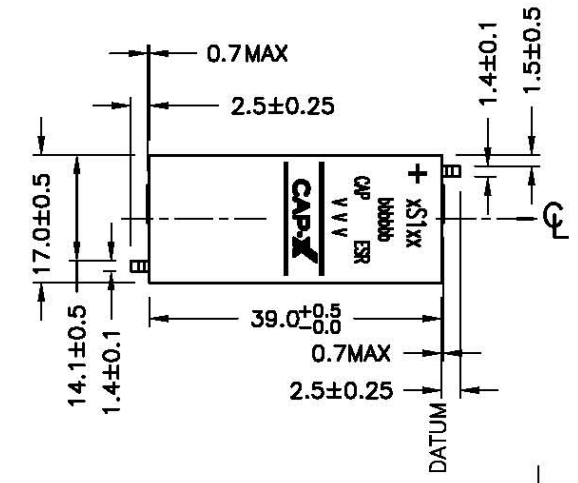


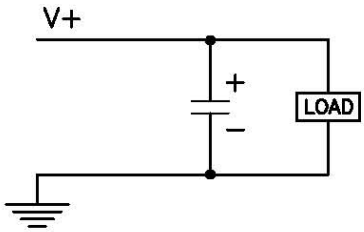


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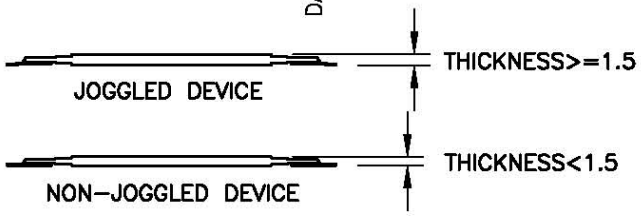
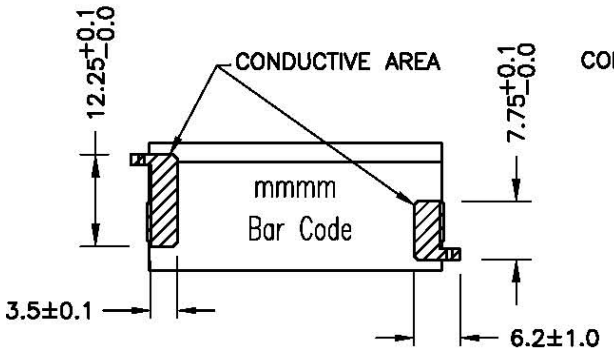
SUGGESTED CONNECTION DETAILS FOR SINGLE CELL SUPERCAP

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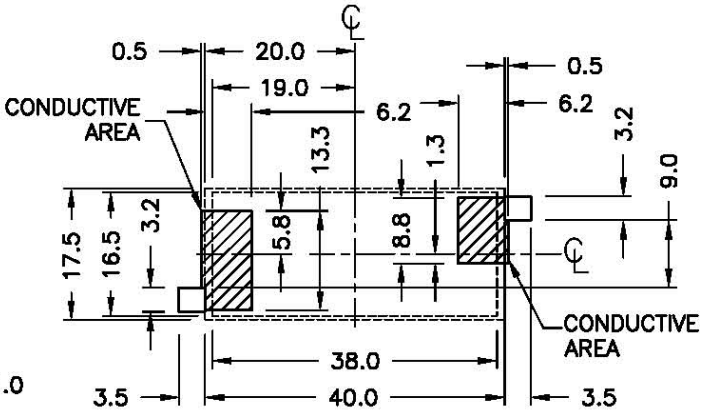


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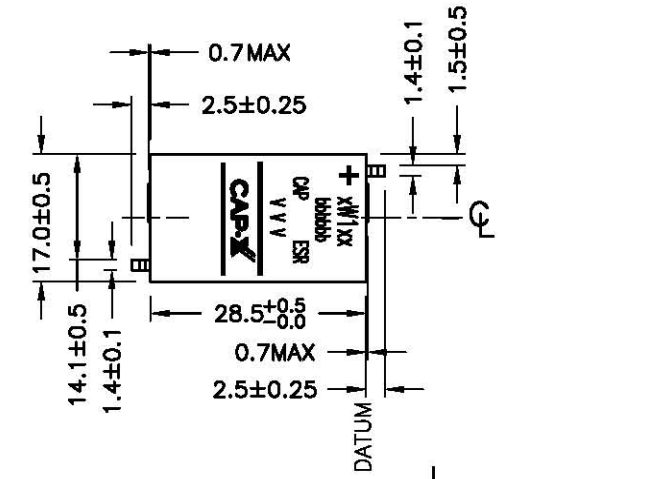


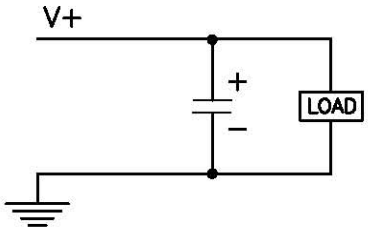


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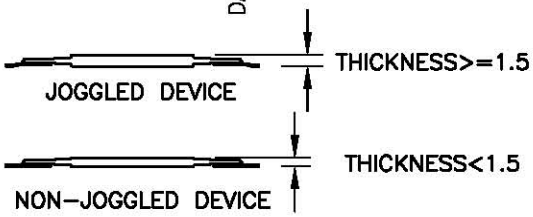


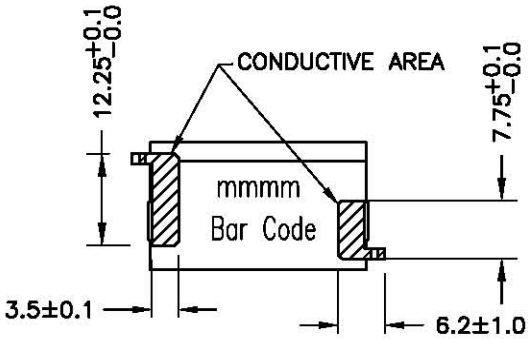


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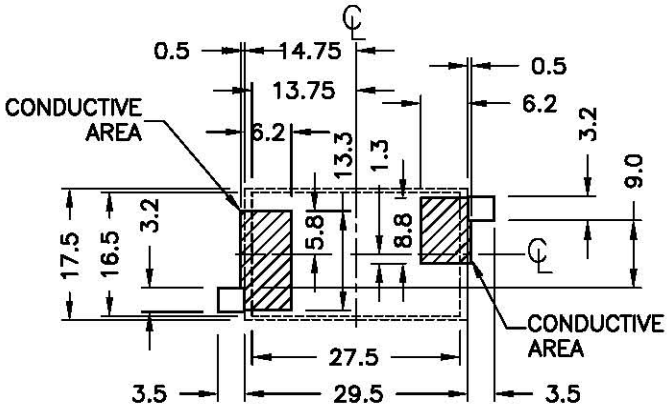


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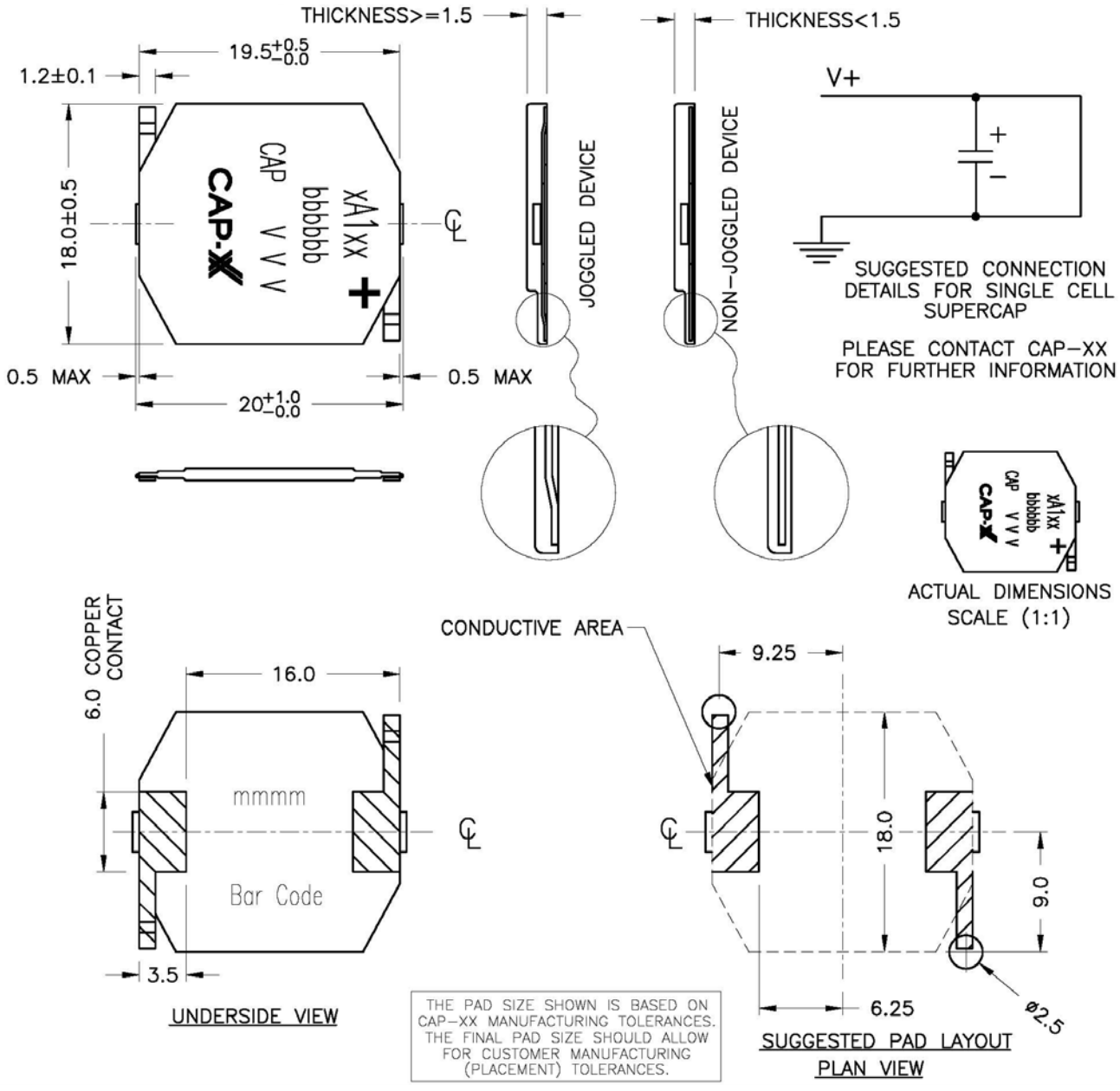

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