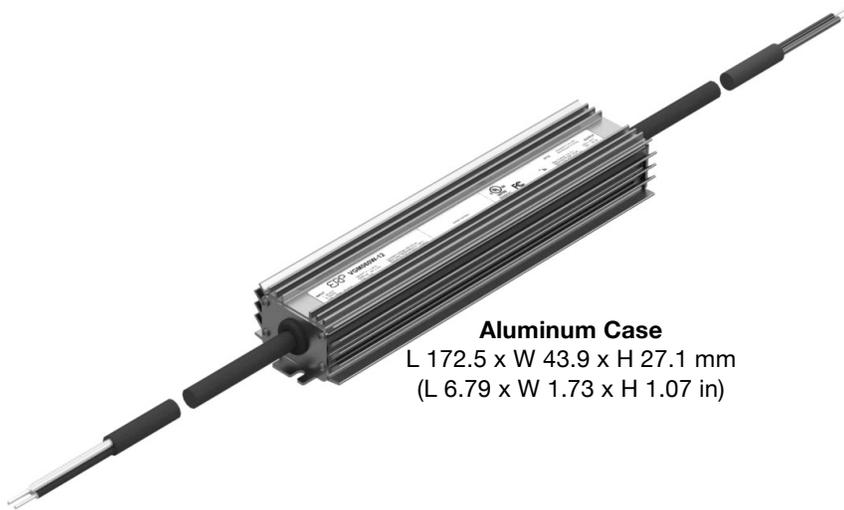
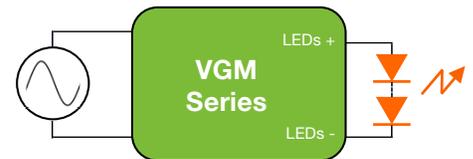


100 & 60 W, Efficient, CV Class 2 LED Drivers for Signage Applications

| Nominal Input Voltage | Max. Output Power | Nominal Output Voltage | Max. Output Current | Efficiency | Max. Case Temperature | THD | Power Factor |
|-----------------------|-------------------|------------------------|---------------------|-------------------|---------------------------------|-------|--------------|
| 120 & 277 Vac | 90 W | 12, 24 Vdc | 5, 3.75 A | up to 85% typical | 90°C (measured at the hot spot) | < 20% | > 0.9 |



Aluminum Case
 L 172.5 x W 43.9 x H 27.1 mm
 (L 6.79 x W 1.73 x H 1.07 in)



Typical Application Diagram



Wiring Diagram

ORDERING INFORMATION

| ERP Part Number | Nominal Input Voltage (Vac) | Pout Max (W) | Vout Nom (Vdc) | Iout Min (A) | Iout Max (A) | Open Loop Voltage (No Load Vout Max) (Vdc) |
|-----------------|-----------------------------|--------------|----------------|--------------|--------------|--|
| VGM060W-12 | 120 & 277 | 60 | 12 | 0.1 | 5 | 12.84 |
| VGM100W-24 | 120 & 277 | 90 | 24 | 0.2 | 3.75 | 25.68 |

TYPICAL APPLICATIONS

- Signage
- Strip lights

FEATURES

- Class 2 power supply
- IP66-rated case with silicone-based potting
- Surge protection:
 - IEC61000-4-5: 6 kV line to line/6 kV line to earth
 - 2.5 kV ring wave: ANSI/IEEE c62.41.1-2002 & c62.41.2-2002 category A
- Complies with ENERGY STAR®, DLC (DesignLight Consortium®) and CA Title 24 technical requirements
- Lifetime: 50,000 hours min at 50° C ambient temperature
- UL879 SAM (Sign Component Manual) listing
- Worldwide safety approvals



100 & 60 W, Efficient, CV Class 2 LED Drivers for Signage Applications

1 - INPUT SPECIFICATION (@25° C ambient temperature)

| | Units | Minimum | Typical | Maximum | Notes |
|---|--|-----------------------------|-----------|--------------------------------------|--|
| Input Voltage Range (Vin) | Vac | 90 | 120 & 277 | 305 | <ul style="list-style-type: none"> The rated output voltage for each model is achieved at $V_{in} \geq 105$ Vac & at $V_{in} \geq 249$ Vac At maximum load |
| Input Frequency Range | Hz | 47 | 50/60 | 63 | |
| Input Current (Iin) | A | | | 1.05 A @ 120 Vac 0.48 A @ 277 Vac | |
| Power Factor (PF) | | 0.9 | > 0.9 | | <ul style="list-style-type: none"> At nominal input voltage From 100% to 60% of rated power |
| Inrush Current | A | Meets NEMA-410 requirements | | | At any point on the sine wave and 25°C |
| Leakage Current | µA | | | 400 µA @ 120 Vac 920 µA @ 277 Vac | Measured per IEC60950-1 |
| Input Harmonics | Complies with IEC61000-3-2 for Class C equipment | | | | |
| Total Harmonics Distortion (THD) | | | | 20% | <ul style="list-style-type: none"> At nominal input voltage From 100% to 60% of rated power Complies with DLC (Design Light Consortium) technical requirements |
| Efficiency | % | - | up to 85% | - | Measured with nominal input voltage |
| Isolation | The AC input to the main DC output is isolated. | | | | |

2 - MAIN OUTPUT SPECIFICATION (@25° C ambient temperature)

| | Units | Minimum | Typical | Maximum | Notes |
|----------------------------------|---|---------|---------|---------------------------------|---|
| Output Voltage (Vout) | Vdc | | 12, 24 | | See ordering information for details |
| Output Current (Iout) | A | | | 12 Vdc: 5.0 A 24 Vdc: 3.75 A | The rated output voltage for each model is achieved at $V_{in} \geq 105$ Vac & at $V_{in} \geq 249$ Vac. |
| Output Voltage Regulation | % | -5 | | 5 | <ul style="list-style-type: none"> At nominal AC line voltage Includes load and current set point variations. |
| Output Voltage Overshoot | % | - | - | 10 | The driver does not operate outside of the regulation requirements for more than 500 ms during power on with maximum load. |
| Ripple Voltage | ≤ 5% of rated output voltage for each model | | | | <ul style="list-style-type: none"> Measured at maximum load and nominal input voltage Calculated in accordance with the IES Lighting Handbook, 9th edition |
| Start-up Time | ms | | | 500 | <ul style="list-style-type: none"> Measured from application of AC line voltage to 100% light output Measured at nominal AC input voltage and with maximum loading Complies with ENERGY STAR® luminaire specification. |

100 & 60 W, Efficient, CV Class 2 LED Drivers for Signage Applications

3 - ENVIRONMENTAL CONDITIONS

| | Units | Minimum | Typical | Maximum | Notes |
|------------------------------------|---|---------|---------|---------|---|
| Operating Ambient Temperature (Ta) | °C | -40 | | +50 | |
| Maximum Case Temperature (Tc) | °C | | | +90 | Case temperature measured at the hot spot •tc (see label in page 9) |
| Storage Temperature | °C | -40 | | +85 | |
| Humidity | % | 5 | - | 95 | Non-condensing |
| Cooling | Convection cooled | | | | |
| Acoustic Noise | dBA | | | 24 | Measured at a distance of 1 meter |
| Mechanical Shock Protection | per EN60068-2-27 | | | | |
| Vibration Protection | per EN60068-2-6 & EN60068-2-64 | | | | |
| MTBF | > 200,000 hours when operated at nominal input and output conditions, and at Ta ≤ 50°C | | | | |
| Lifetime | 50,000 hours at Ta ≤ 50°C ambient temperature and at a 50% duty cycle (this assumes the VGM driver is turned on for 12 hours per day) | | | | |

4 - EMC COMPLIANCE AND SAFETY APPROVALS

| EMC Compliance | | | | | |
|---|--|--|---------|---------|---|
| Conducted and Radiated EMI | FCC CFR Title 47 Part 15 Class A at 120 Vac and at 277 Vac | | | | |
| Harmonic Current Emissions | IEC61000-3-2 For Class C equipment | | | | |
| Voltage Fluctuations & Flicker | IEC61000-3-3 | | | | |
| Immunity Compliance | ESD (Electrostatic Discharge) | IEC61000-4-2 6 kV contact discharge, 8 kV air discharge, level 3 | | | |
| | RF Electromagnetic Field Susceptibility | IEC61000-4-3 3 V/m, 80 - 1000 MHz, 80% modulated at a distance of 3 meters | | | |
| | Electrical Fast Transient | IEC61000-4-4 ± 2 kV on AC power port for 1 minute, ±1 kV on signal/control lines | | | |
| | Surge | IEC61000-4-5 •± 6 kV line to line (differential mode) /± 6 kV line to common mode ground (tested to secondary ground) on AC power port, ±0.5 kV for outdoor cables ANSI/IEEE c62.41.1-2002 & c62.41.2-2002 category A, 2.5 kV ring wave | | | |
| | Conducted RF Disturbances | IEC61000-4-6 3V, 0.15-80 MHz, 80% modulated | | | |
| | Voltage Dips | IEC61000-4-11 >95% dip, 0.5 period; 30% dip, 25 periods; 95% reduction, 250 periods | | | |
| Safety Agency Approvals | | | | | |
| UL | UL8750 recognized Class 2, UL879 SAM (Sign Component Manual) listing | | | | |
| cUL | CAN/CSA C22.2 No. 250.13-14 LED equipment for lighting applications | | | | |
| Safety | | | | | |
| | Units | Minimum | Typical | Maximum | Notes |
| Hi Pot (High Potential) or Dielectric voltage-withstand | Vdc | 2500 | | | <ul style="list-style-type: none"> Insulation between the input (AC line and Neutral) and the output Tested at the RMS voltage equivalent of 1767 Vac |



VGM Series

VGM060W-12 60 W
VGM100W-24 90 W

100 & 60 W, Efficient, CV Class 2 LED Drivers for Signage Applications

5 - PROTECTION FEATURES

Under-Voltage (Brownout)

The VGM series provides protection circuitry such that an application of an input voltage below the minimum stated in section 1 (Input Specification) shall not cause damage to the driver.

Internal Over temperature Protection

The VGM is equipped with an internal temperature sensor on the primary power train. Failure to stay within the convection power rating will cause the driver to shut down. The main output current will be resumed when the temperature of the built-in temperature sensor cools adequately.

Output Open Load

A no load condition will not damage the VGM or cause a hazardous condition. The driver will remain stable and operate normally after application of a load. When the LED load is removed, the output voltage of the VGM series is limited to 7% about the output voltage of each model.

Over Power Protection

The VGM will shut down and auto recover in an over power condition. This condition will cause no damage to the power supply.

Input Over Current Protection

The VGM series incorporates a primary AC line fuse for input over current protection.

Short Circuit and Over Current Protection

The VGM series is protected against short-circuit such that a short from any output to return shall not result in a fire hazard or shock hazard. The driver shall hiccup as a result of a short circuit or over current fault. Removal of the fault will return the driver to within normal operation. The driver shall recover, with no damage, from a short across the output for an indefinite period of time.

100 & 60 W, Efficient, CV Class 2 LED Drivers for Signage Applications

7 - PREDICTED LIFETIME VERSUS CASE AND AMBIENT TEMPERATURE

Lifetime is defined by the measurement of the temperatures of all the electrolytic capacitors whose failure would affect light output under the nominal LED load and worst case AC line voltage. The graph in figure 1 are determined by the electrolytic capacitor with the shortest lifetime, among all electrolytic capacitors. It represents a worst case scenario in which the LED driver is powered 12 hours/day, 7 days/week. The lifetime of an electrolytic capacitor is measured when any of the following changes in performance are observed:

- 1) Capacitance changes more than 20% of initial value
- 2) Dissipation Factor ($\tan \delta$): 150% or less of initial specified value
- 3) Equivalent Series Resistance (ESR): 150% or less of initial specified value
- 4) Leakage current: less of initial specified value

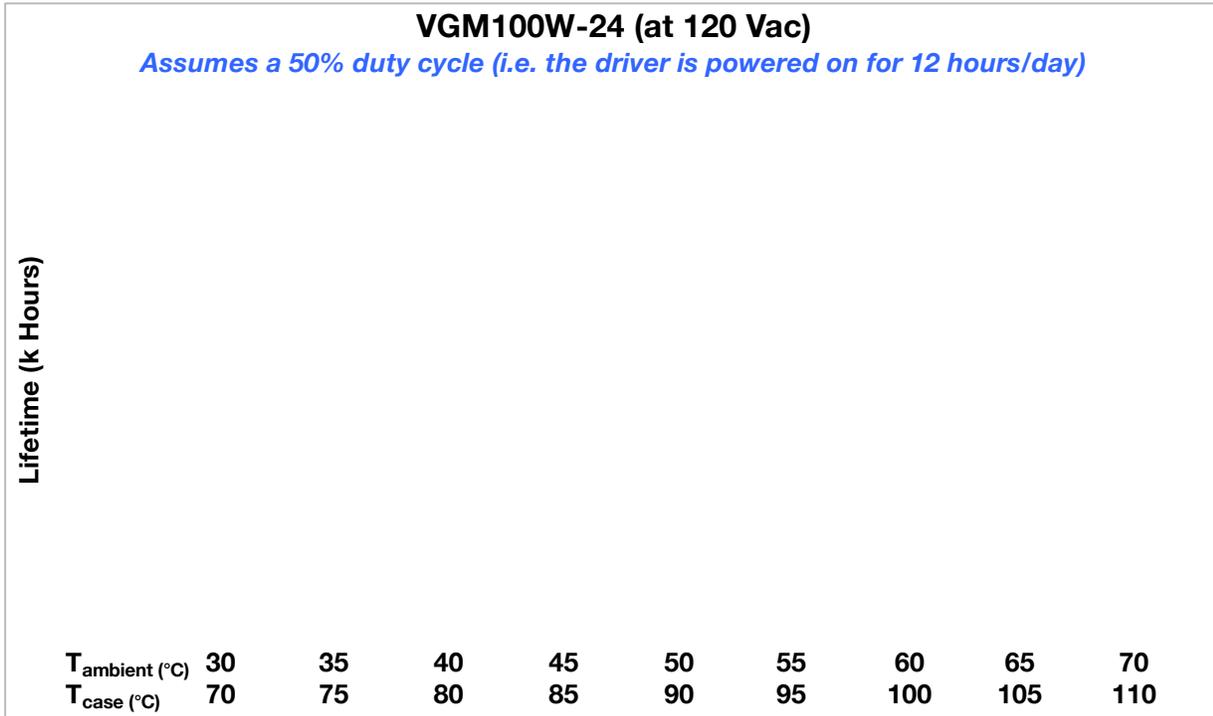


Figure 1

Notes:

- The ambient temperature T_{ambient} and the differential between T_{ambient} and T_{case} mentioned in the above graphs are relevant only as long as both the driver and the light fixture are exposed to the same ambient room temperature. If the LED driver is housed in an enclosure or covered by insulation material, then the ambient room temperature is no longer valid. In this situation, please refer only to the case temperature T_{case} .
- It should be noted the graph "Lifetime vs. Ambient Temperature" may have an error induced in the final application if the mounting has restricted convection flow around the case. For applications where this is evident, the actual case temperature measured at the Tc point in the application should be used for reliability calculations.

100 & 60 W, Efficient, CV Class 2 LED Drivers for Signage Applications

8 – EFFICIENCY VERSUS LOAD

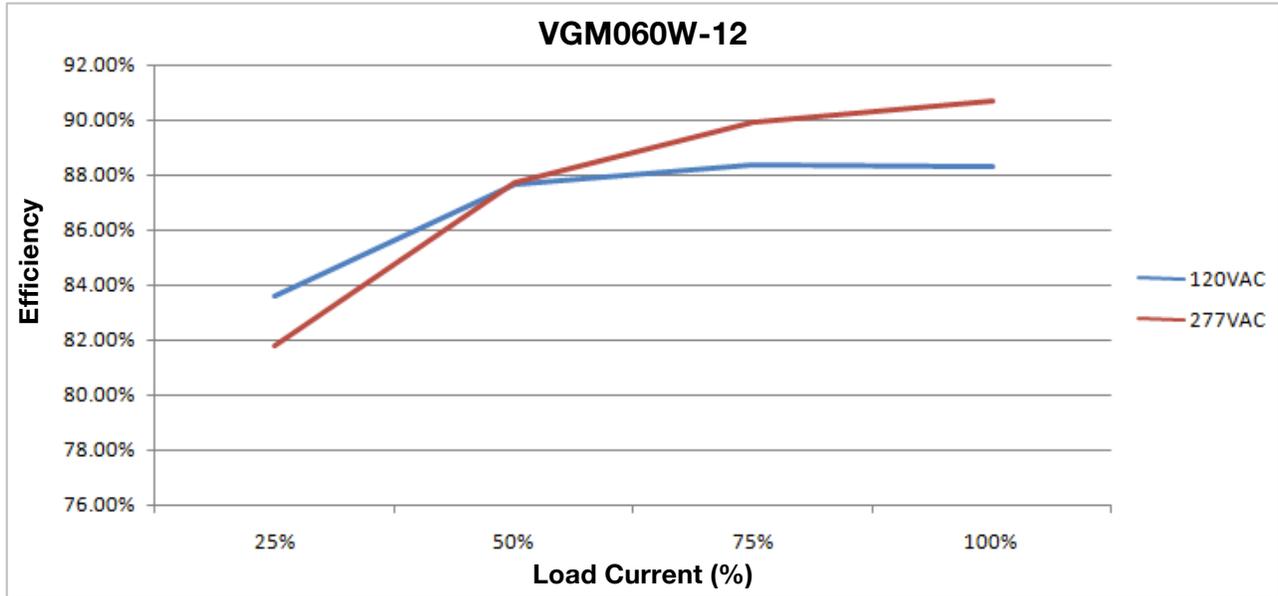


Figure 2

9 – POWER FACTOR VERSUS LOAD

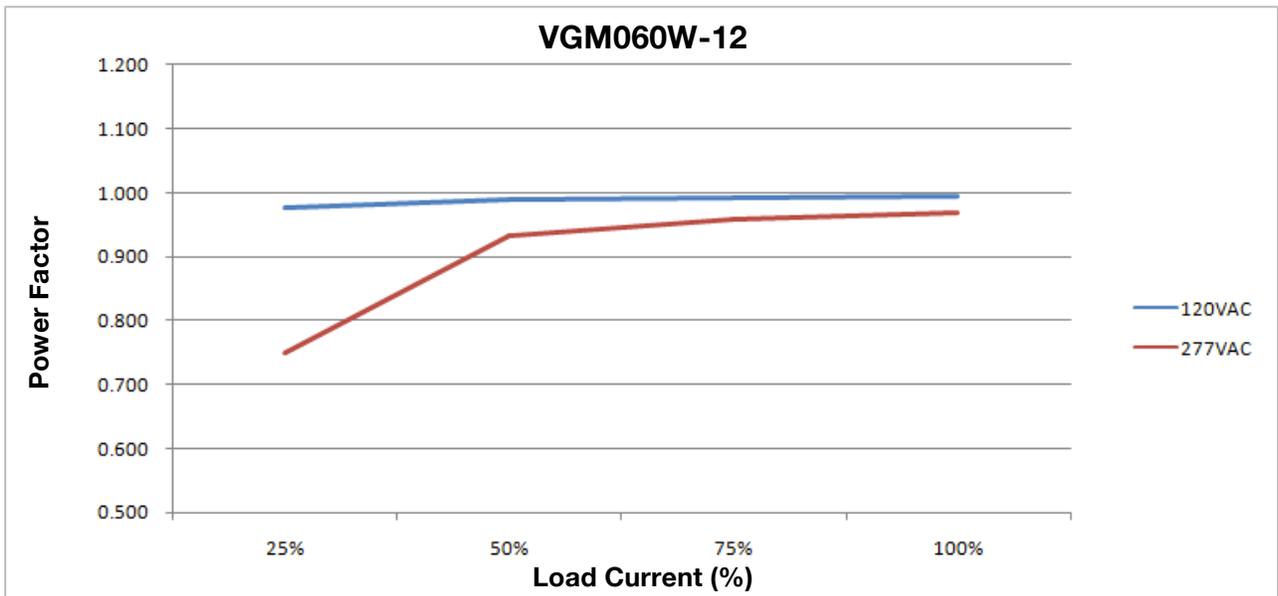


Figure 3

100 & 60 W, Efficient, CV Class 2 LED Drivers for Signage Applications

■ 10 – THD VERSUS LOAD

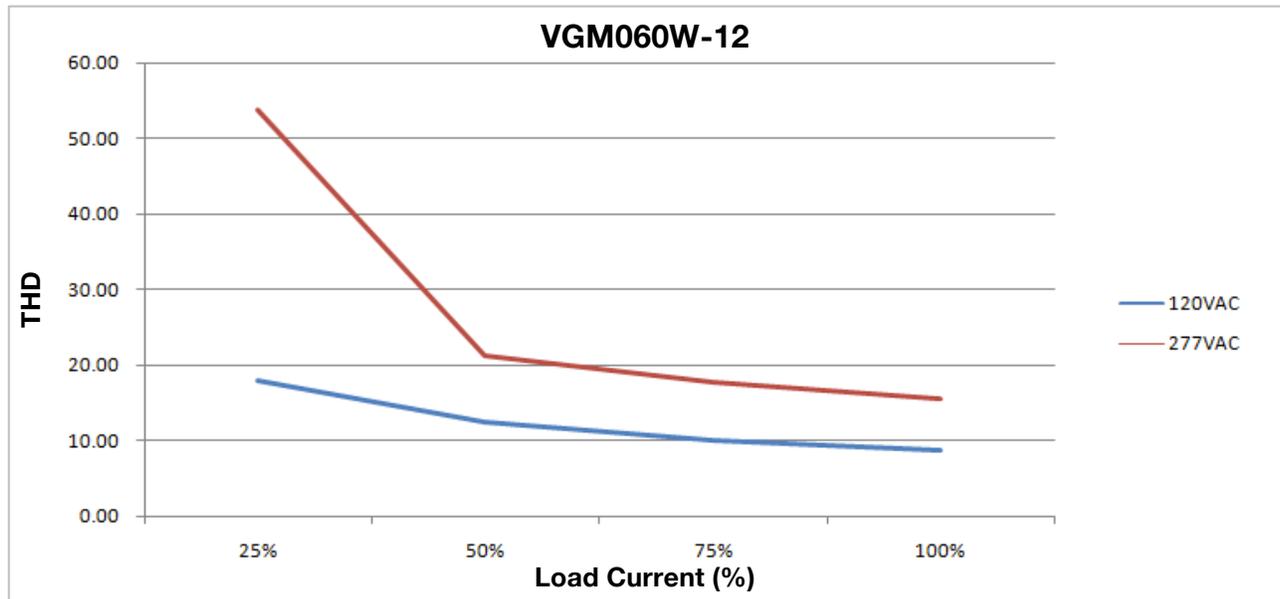


Figure 4

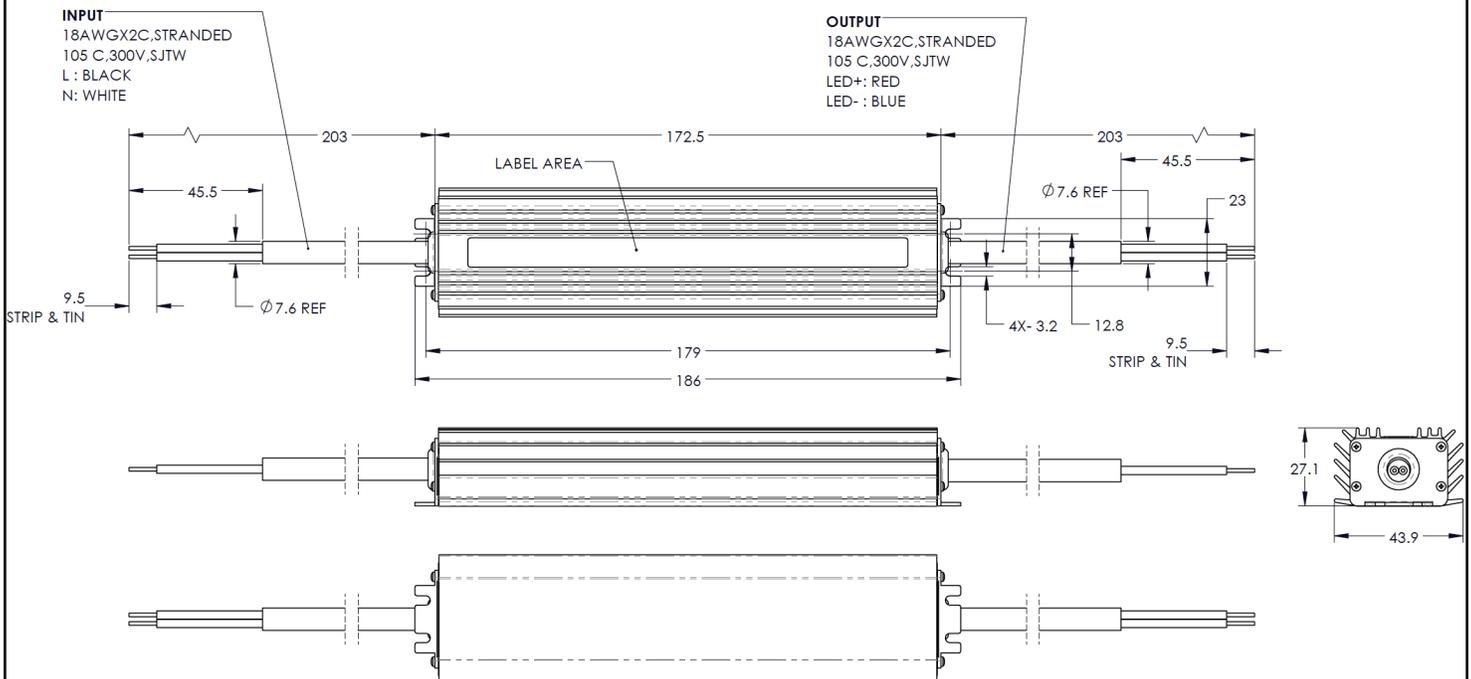
100 & 60 W, Efficient, CV Class 2 LED Drivers for Signage Applications

11 - MECHANICAL DETAILS

- Packaging Options:** Aluminum case
- I/O Connections:** Jacketed wires, 18 AWG on all leads, 203mm (8 in) long, 105°C rated, stranded, stripped by approximately 5mm, and tinned. All the wires, on both input and output, have a 300 V insulation rating.
- Ingress Protection:** IP66 rated
- Mounting Instructions:** The VGM driver case must be secured on a flat metal baseplate or surface.

12 - OUTLINE DRAWINGS

- Dimensions:** L 172.5 x W 43.9 x H 27.1 mm (L 6.79 x W 1.73 x H 1.07 in)
- Volume:**
- Weight:**



All dimensions are in mm
Figure 5



VGM Series

VGM060W-12 60 W
VGM100W-24 90 W

100 & 60 W, Efficient, CV Class 2 LED Drivers for Signage Applications

13 - LABELING

| | | | |
|--|------------------------|--|---|
| <p>INPUT</p> <p>ERP VGM100W-24</p> <p>L: BLACK N: WHITE</p> <p>120/277 V ~ 1.05 A 50/60 Hz PF ≥ 0.9 THD ≤ 20%</p> <p>Constant Voltage LED Driver Max Case Temperature $t_c = 90^{\circ}\text{C}$ Suitable for Dry or Damp Locations</p> | <p>(serial number)</p> | <p>Class 2</p> <p>   </p> | <p>IP66</p> <p>Designed in the USA Manufactured in China</p> <p>Max Current 3.92 A --- Maximum Power 94 W Regulated Voltage 24 Vdc</p> <p>OUTPUT</p> <p>LED +: RED LED -: BLUE</p> |
|--|------------------------|--|---|

Figure 6

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