



ENERGY RECOVERY PRODUCTS™



SLM Series 90-160 W

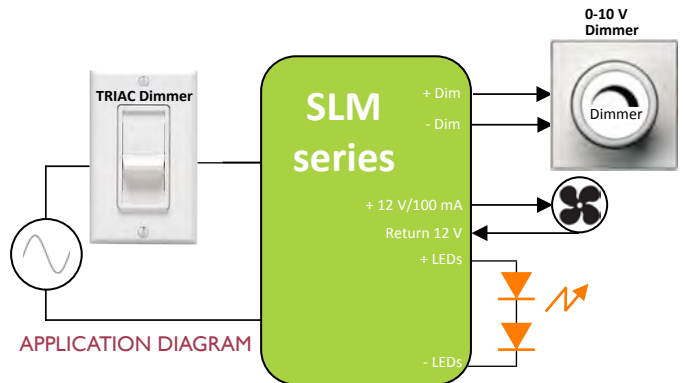
Tri-Mode Dimming (TRIAC, ELV & 0-10 V) High Power CC LED Drivers with 0.01-100% Dimming Range

| Input Voltage | Max. Output Power | Output Voltage | Output Current | Efficiency | Max. Case Temperature | THD | Power Factor | Dimming Method | Dimming Range | Startup Time |
|------------------------|-------------------|----------------|-------------------|---------------|---------------------------------|-------|--------------|-------------------------|-------------------------|--------------|
| 120 to 277 Vac typical | 160 W | 21 to 85 Vdc | 1.8 A to 3.9 A CC | ≥ 90% typical | 90°C (measured at the hot spot) | < 20% | > 0.9 | Reverse-Phase & 0 - 10V | 0.01 - 100% (% of lout) | 0.5 sec |

CC: Constant Current

PRODUCT DESCRIPTION

The SLM series of LED drivers is ideally suited for LED lighting applications in stage and studio environments. These devices are compatible with most industry standard, reverse-phase (trailing edge) wall-based dimmers, and 0-10V wall-based dimmers and offer deep dimming from 100% down to 0.01%.



FEATURES

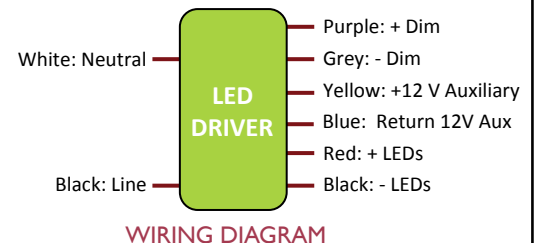
- Compatible with ELV (reverse-phase or trailing-edge) and 0-10 V dimmers
- TRIAC and ELV dimming only at 120 Vac
- 12 V/100 mA auxiliary output
- Protections: output open load, short-circuit (latch-off), and over-temperature with auto recovery
- Conducted and radiated EMI: Compliant with FCC CFR Title 47 Part 15 Class A (120 and 277 Vac) and EN55015 (CISPR 15) at 220/230/240 Vac
- Enables ENERGY STAR® and DLC (DesignLight Consortium®) luminaire compliance
- IP64-rated case with silicone-based potting
- 90°C maximum case hot spot temperature
- Double-insulated power supply between input and output (class II)
- Worldwide safety approvals



ALUMINUM CASE:
L 101.6 x W 50.8 x H 38.5mm
(L 4 x W 2 x H 1.52 in)

APPLICATIONS

- Stage lighting
- Studio lighting
- LED display signage





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

| | Units | Minimum | Typical | Maximum | Notes |
|---|---|---------|-------------------------|---------|--|
| Input Voltage Range (Vin) | Vac | 90 | 120/220/230/ 240/277 | 305 | The rated output current for each model is achieved at Vin ≥ 115 Vac and at Vin ≥ 209 Vac, at nominal load. |
| Input Frequency Range | Hz | 47 | 60 | 63 | |
| Power Factor (PF) | | 0.9 | > 0.9 | | At nominal input voltage and with nominal LED voltage |
| Inrush Current | Meets NEMA-410 requirements | | | | At any point on the sine wave and 25°C |
| Leakage Current | µA | | | 500 µA | Measured at nominal input voltage 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 and nominal LED voltage •Complies with DLC (DesignLight Consortium) technical requirements v2.1 |
| Efficiency | % | - | 90% | - | Measured with nominal input voltage, a full sinusoidal wave form and without dimmer connected |
| Isolation | Meets UL60950-1 for class II reinforced/double insulation power supply <input type="checkbox"/> | | | | |

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

| | Units | Minimum | Typical | Maximum | Notes |
|---|---|---------|---------|---------|---|
| MAIN CONSTANT CURRENT OUTPUT | | | | | |
| Output Voltage (Vout) | Vdc | 21 | | 85 | See ordering information for details |
| Output Current (Iout) | mA | 1800 | | 3900 | <ul style="list-style-type: none"> •See ordering information for details •The rated output current for each model is achieved at Vin ≥ 115 Vac and at Vin ≥ 209 Vac, at nominal load. |
| Output Current Regulation | % | -5 | ±2.5 | 5 | <ul style="list-style-type: none"> •At nominal AC line voltage •Includes load and current set point variations |
| Output Current Overshoot | % | - | - | 10 | The driver does not operate outside of the regulation requirements for more than 500 ms during power on with nominal LED load and without dimmer. |
| Ripple Current | ≤ 40% of rated output current for each model ≤ 45% for SLM160W-3.9-40 ≤ 50% for SLM160W-1.8-85 | | | | <ul style="list-style-type: none"> •Measured at nominal LED voltage and nominal input voltage without dimming. •Calculated in accordance with the IES Lighting Handbook, 9th edition. |
| Dimming Range (% of Iout) | % | 0.1 | | 100 | The dimming range will be dependent on each specific dimmer. |
| Start-up Time | s | | 0.5 | | With nominal LED voltage, nominal AC line voltage and without dimmer attached |
| 12 V AUXILIARY CONSTANT VOLTAGE OUTPUT | | | | | |
| Output Voltage (Vout) | Vdc | 10.2 | 12 | 13.2 | The voltage regulation is +10%/-15% and the ripple voltage shall be ≤ 0.4V. |
| Output Current (Iout) | mA | | 100 | | |
| OUTPUT CONTROLS | | | | | |
| +Dim Signal, -Dim Signal | The +Dim/-Dim signal pins can be used to adjust the output setting via a standard commercial wall dimmer, an external control voltage source (0 to 10 Vdc), or a variable resistor when using the recommended number of LEDs. The dimming input permits 0.1% to 100% dimming. | | | | |



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3 - ENVIRONMENTAL CONDITIONS

| | Units | Minimum | Typical | Maximum | Notes |
|--|---|---------|---------|---------|--|
| Operating Case Temperature (Tc) | °C | -20 | | +90 | Case temperature measured at the hot spot •tc (see label in page) |
| Storage Temperature | °C | -40 | | +85 | |
| Humidity | % | 5 | - | 95 | Non-condensing |
| Cooling | Forced air cooling is required for continuous power exceeding 120 W | | | | |
| Acoustic Noise | dBA | | | 24 | Measured at a distance of 1 foot (30 cm) without and with approved dimmers |
| 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 Tc ≤ 70°C | | | | |
| Lifetime (See graphs "Lifetime vs. Case and Ambient Temperature" in section) | <ul style="list-style-type: none"> •50,000 hours at Tc = 70°C •Measured at the hot spot (see hot spot •tc on label in page) | | | | |

4 - EMC COMPLIANCE AND SAFETY APPROVALS

| EMC Compliance | | | | | |
|---|---|--|---|--|--|
| Conducted and Radiated EMI | <ul style="list-style-type: none"> •FCC CFR Title 47 Part 15 Class A at 120 Vac and Class A at 277 Vac •EN55015 (CISPR 15) at 220/230/240 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 | ± 2 kV line to line (differential mode) / ± 4 kV line to common mode ground (tested to secondary ground) on AC power port, ±0.5 kV for outdoor cables | | |
| | Conducted RF Disturbances | IEC61000-4-6 | 3 V, 0.15-80 MHz, 80% modulated | | |
| | Voltage Dips | IEC61000-4-11 | >95% dip, 0.5 period; 30% dip, 25 periods; 95% reduction, 250 periods | | |
| Transient Protection | Ring Wave | ANSI/IEEE c62.41.1-2002 & c62.41.2-2002 category A, 2.5 kV ring wave | | | |

| Safety Agency Approvals | | |
|-------------------------|------------------------|--|
| UL | UL8750 recognized | |
| cUL | CSA C22.2 No.250.13-14 | |

| Safety | | | | | |
|--------------------------------|-------|---------|---------|---------|---|
| | Units | Minimum | Typical | Maximum | Notes |
| Hi Pot (High Potential) | 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 1768 Vac |



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■ 5 - PROTECTION FEATURES

Under-Voltage (Brownout)

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

Short Circuit

The SLM series is protected such that a short from any output to return shall not result in a fire hazard or shock hazard. In the event of a short, the driver shuts down and latches off as a result of short circuit fault for main output. Removal of fault and AC recycling returns the driver to normal operation.

Internal Over temperature Protection

The SLM series incorporates circuitry that prevents internal damage due to an over temperature condition. An over temperature condition may be a result of an excessive ambient temperature or as a result of an internal failure. When the over temperature condition is removed, the driver shall automatically recover.

Output Open Load

When the LED load is removed, the output voltage of the SLM series is limited to 1.3 times the maximum output voltage of each model.

230 Vac Protection

The SLM series is compatible with ELV dimming only at 120 Vac. 230 Vac ELV dimming is not supported in the SLM series. However, in the event that someone tries to TRIAC-dim or ELV-dim the SLM series at 230 Vac, it has been added a protection to clamp the internal bus and keep it in safe operating mode.



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6 - PHASE-CUT DIMMING

The SLM series offers dual dimming compatibility with reverse-phase (trailing-edge) phase-cut ELV dimmers and 0–10V dimmers. ELV dimming is only offered at 120 Vac.

Figures 1 and 2 show the typical output current versus conduction angle at nominal input voltage.

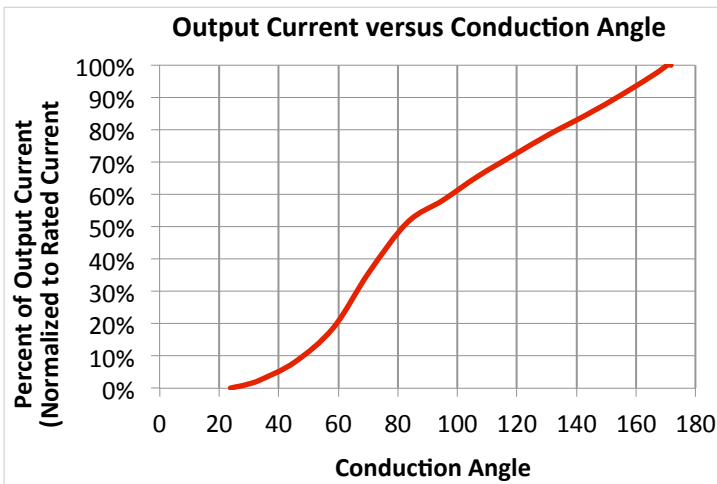


Figure 1

7 - COMPATIBLE PHASE-CUT ELV DIMMERS

- Leviton: Vizia VPE06
- Leviton: IllumaTech IPE04
- Lutron: Diva DVELV-303P
- Lutron: Skylark SELV-300P
- Lutron: Mestro MAELV-600
- Lutron: Faedra FAELV-500
- Lightolier: Sunrise ZP260QE

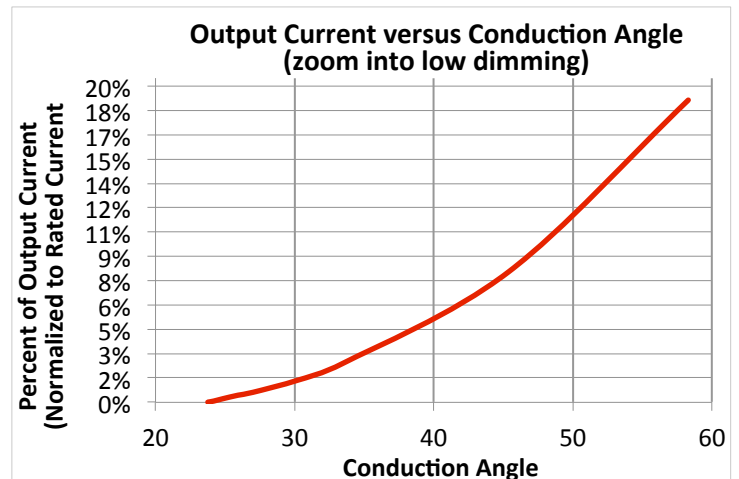


Figure 2



Tri-Mode Dimming (TRIAC, ELV & 0-10 V) High Power CC LED Drivers with 0.01-100% Dimming Range

8 - 0-10V DIMMING

The SLM drivers operate only with 0-10V dimmers that sink current. They are not designed to operate with 0-10V control systems that source current, as used in theatrical/entertainment systems. Developed in the 1980's, the 0-10V sinking current control method is adopted by the International Electrotechnical Commission (IEC) as part of their IEC Standard 60929 Annex E.

The method to dim the output current of the driver is done via the +Dim/-Dim Signal pins. The +Dim/-Dim Signal pins respond to a 0 to 10 V signal, delivering 1% to 100% of the output current based on rated current for each model. A pull-up resistor is included internal to the driver. When the +Dim input (purple) is short circuited to the -Dim wire (grey) or to the -LED wire (black), there is no output current. When the +Dim input (purple) is ≤ 1 V, the output current is programmed to $\leq 10\%$ of rated current. If the +Dim input is >10 V or open circuited, the output current is programmed to 100% of the rated current.

When not used, the -Dim wire (grey) and to the +Dim wire (purple) can be capped or cut off. In this configuration, no dimming is possible and the driver delivers 100% of its rated output current.

The maximum source current (flowing from the driver to the 0-10V dimmer) supplied by the +Dim Signal pin is ≤ 2.5 mA. The tolerance of the output current while being dimmed shall be $\pm 8\%$ typical until down to 2V.

Figure 3 shows the 0-10V dimming transfer function.

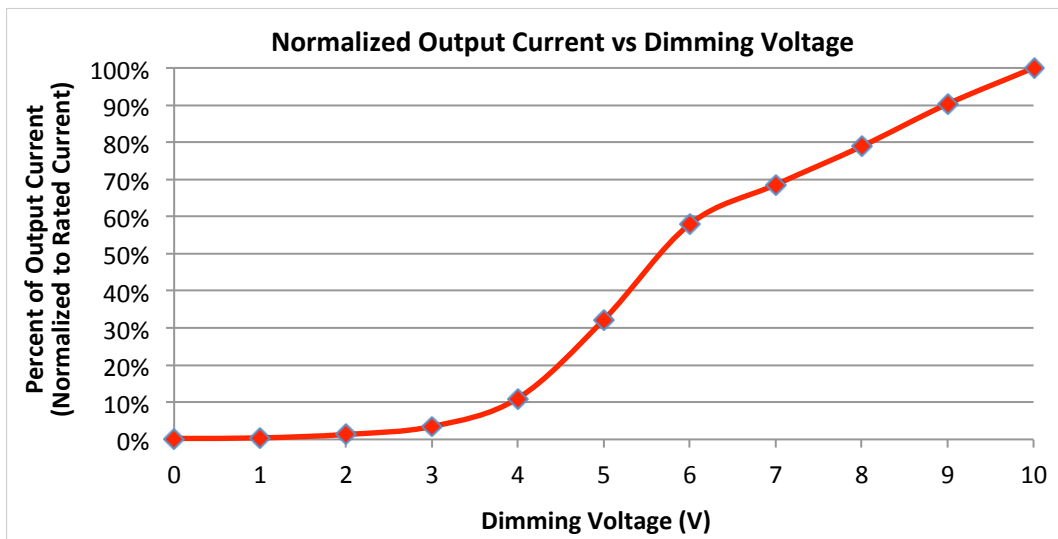


Figure 3

9 - COMPATIBLE 0-10V DIMMERS

- Lutron, Nova series (part number NFTV)
- Lutron, Diva series (part number DVTV)
- Leviton: IllumaTech IP710-DL



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I0 - MECHANICAL DETAILS

- Packaging Options:** Aluminum extruded case
- I/O Connections:** Flying leads, 18 AWG on power leads, 18 AWG on control leads, 203 mm (8 in) long, 105°C rated, stranded, stripped by approximately 9.5mm, and tinned. All the wires, on both input and output, have a 300 V insulation rating.
- Ingress Protection:** IP64 rated
- Mounting Instructions:** The driver must be secured on a flat surface through the four mounting tabs, shown here below in the case outline drawings

II - OUTLINE DRAWINGS

- Dimensions:** L 101.6 x W 50.8 x H 38.5 mm (L 4.0 x W 2.0 x H 1.52 in)
- Volume:** 198.7 cm³ (12.13 in³)
- Weight:**

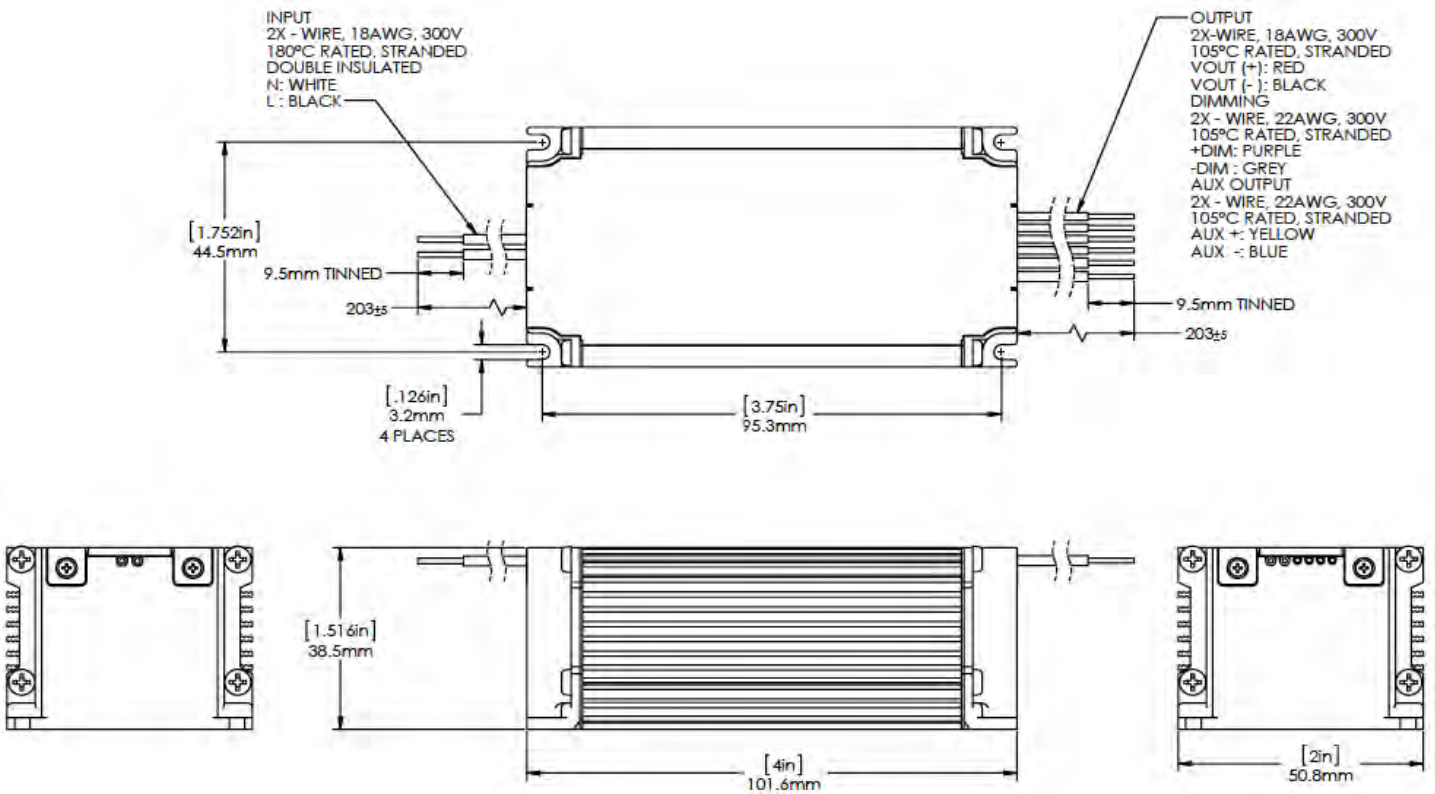


Figure 4



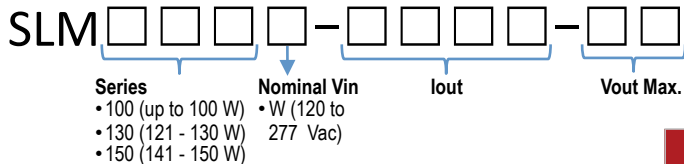
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12 - ORDERING INFORMATION - MODEL DESCRIPTION



Notes:

- Forced air cooling is required for total continuous power exceeding 120 W
- For additional options of output current and output voltage, contact your sales representative or send an email to: SaveEnergy@ERPPowerLLC.com

| | Ordering Part Number | Input Voltage Range (Vac) | Max Output Power (W) | Iout (A) | Vout min (Vdc) | Vout Nom (Vdc) | Vout Max (Vdc) | No Load Voltage (Vdc) |
|--------------------|--|---------------------------|----------------------|----------|----------------|----------------|----------------|-----------------------|
| 120 VAC | SLM100W: 90 to 100 W (1%-100% dimming) | | | | | | | |
| | SLM100W-2.8-34 | 120 to 277 | 95.2 | 2.8 | 27 | 30.6 | 34 | 44.2 |
| | SLM140W: 131 to 140 W (1%-100% dimming) | | | | | | | |
| | SLM140W-2.8-50 | 120 to 277 | 140.0 | 2.8 | 40 | 45.0 | 50 | 60 |
| | SLM150W: 141 to 150 W (1%-100% dimming) | | | | | | | |
| | SLM150W-3.0-48 | 120 to 277 | 144.0 | 3 | 38.4 | 43.2 | 48 | 60 |
| | SLM160W: 151 to 160 W (1%-100% dimming) | | | | | | | |
| | SLM160W-1.8-85 | 120 to 277 | 153.0 | 1.8 | 68 | 76.5 | 85 | 100 |
| | SLM160W-3.7-42 | 120 to 277 | 155.4 | 3.7 | 30 | 37.8 | 42 | 50 |
| | SLM160W-3.9-40 | 120 to 277 | 156.0 | 3.9 | 30 | 36.0 | 40 | 50 |
| | SLM160W-4.4-36 | 120 to 277 | 158.4 | 4.4 | 28 | 32.4 | 36 | 46.8 |
| | SLM100W: 90 to 100 W (0.01%-100% dimming) | | | | | | | |
| | SLM100W-2.8-34-P01 | 120 to 277 | 95.2 | 2.8 | 27 | 30.6 | 34 | 44.2 |
| | SLM140W: 131 to 140 W (0.01%-100% dimming) | | | | | | | |
| | SLM140W-2.8-50-P01 | 120 to 277 | 140.0 | 2.8 | 40 | 45.0 | 50 | 60 |
| | SLM160W: 151 to 160 W (0.01%-100% dimming) | | | | | | | |
| | SLM160W-1.8-85-P01 | 120 to 277 | 153.0 | 1.8 | 68 | 76.5 | 85 | 100 |
| | SLM160W-4.4-36-P01 | 120 to 277 | 158.4 | 4.4 | 28 | 32.4 | 36 | 46.8 |
| 220-240 VAC | SLM100E: 90 to 100 W (1%-100% dimming) | | | | | | | |
| | SLM100E-2.8-34 | 220 to 240 | 95.2 | 2.8 | 27 | 30.6 | 34 | 44.2 |
| | SLM140E: 131 to 140 W (1%-100% dimming) | | | | | | | |
| | SLM140E-2.8-50 | 220 to 240 | 140.0 | 2.8 | 40 | 45.0 | 50 | 60 |
| | SLM160E: 151 to 160 W (1%-100% dimming) | | | | | | | |
| | SLM160E-1.8-85 | 220 to 240 | 153.0 | 1.8 | 68 | 76.5 | 85 | 100 |
| | SLM160E-3.9-42 | 220 to 240 | 163.8 | 3.9 | 30 | 37.8 | 42 | 50 |
| | SLM160E-4.4-36 | 220 to 240 | 158.4 | 4.4 | 28 | 32.4 | 36 | 46.8 |
| | SLM140E: 131 to 140 W (0.01%-100% dimming) | | | | | | | |
| | SLM140E-2.8-50-P01 | 220 to 240 | 140.0 | 2.8 | 40 | 45.0 | 50 | 60 |
| | SLM160E: 151 to 160 W (0.01%-100% dimming) | | | | | | | |
| | SLM160E-1.8-85-P01 | 220 to 240 | 153.0 | 1.8 | 68 | 76.5 | 85 | 100 |
| SLM160E-4.4-36-P01 | 220 to 240 | 158.4 | 4.4 | 28 | 32.4 | 36 | 46.8 | |



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■ I3 - LABELING

Figure 5

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Благодаря сотрудничеству с мировыми поставщиками мы осуществляем комплексные и плановые поставки широчайшего спектра электронных компонентов.

Собственная эффективная логистика и склад в обеспечивает надежную поставку продукции в точно указанные сроки по всей России.

Мы осуществляем техническую поддержку нашим клиентам и предпродажную проверку качества продукции. На все поставляемые продукты мы предоставляем гарантию .

Осуществляем поставки продукции под контролем ВП МО РФ на предприятия военно-промышленного комплекса России , а также работаем в рамках 275 ФЗ с открытием отдельных счетов в уполномоченном банке. Система менеджмента качества компании соответствует требованиям ГОСТ ISO 9001.

Минимальные сроки поставки, гибкие цены, неограниченный ассортимент и индивидуальный подход к клиентам являются основой для выстраивания долгосрочного и эффективного сотрудничества с предприятиями радиоэлектронной промышленности, предприятиями ВПК и научно-исследовательскими институтами России.

С нами вы становитесь еще успешнее!

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