# LUXdrive®
by LEDdynamics®

Product Overview

The MiniPuck™ is a highly efficient step down converter designed for driving high-powered LEDs. With a form factor of only 0.79" x 0.66" x 0.43" it is ideal for many applications where size and efficiency is essential. Various output currents are available: 350mA, 500mA, 700mA, and 1000mA. Applying a square wave to the dim pin with voltages ranging from 1V – 30V can dim the Minipuck™ down to 5%. Available in both a surface mount and a pinned version the MiniPuck™ can be used for both prototyping and final product designs.

MiniPuck™ Pinned Version

Features

➢ Small Form Factor (0.79" x 0.66" x 0.43")
➢ High Efficiency
➢ Broad Input and Output Range
➢ Up to 1000mA Constant Current Output
➢ SMD (Surface Mounted Device) or Pinned
➢ UVLO (Under-Voltage Lockout), and
    Over-temperature Protection
➢ PMW (Pulse-Width Modulation) Dimming
    with 1000:1 Dimming Resolution
➢ UL Recognized Component
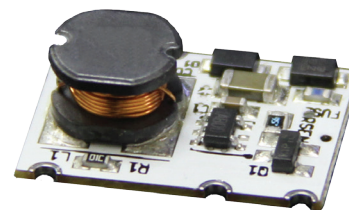
MiniPuck™ Surface Mount Version

Typical Applications

➢ Landscape Lighting
➢ Architectural Lighting
➢ Track Lighting
➢ Portable Lighting
➢ Point of Purchase Lighting
➢ Automative Lighting
➢ Sign and Channel Lighting
➢ Arduino Controlled LED Lighting
➢ Solar Lighting
➢ Flashing & Strobe Lighting
➢ Cabinet & Display Case Lighting
➢ And Many More

MADE IN U.S.A.

RoHS Compliant 2002/95/EC

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Product Selections

Part Number	DC Input	Control/Dimming	Current	Mounting
G031-D-P-350	6 - 30V	PWM	350mA	5 Pin
G031-D-P-500	6 - 30V	PWM	500mA	5 Pin
G031-D-P-700	6 - 30V	PWM	700mA	5 Pin
G031-D-P-1000	6 - 30V	PWM	1000mA	5 Pin
G032-D-P-350	6 - 30V	PWM	350mA	Surface Mount
G032-D-P-500	6 - 30V	PWM	500mA	Surface Mount
G032-D-P-700	6 - 30V	PWM	700mA	Surface Mount
G032-D-P-1000	6 - 30V	PWM	1000mA	Surface Mount

Table 1. Product Selection

Specifications

Input Voltage.................................... 6VDC - 30VDC
Output Current Accuracy............ +/- 10%
Efficiency... Up to 96%
Storage Temperature.................... -40°C - 125°C
Pinned Dimensions................................. 16.0mm x 18.2mm x 10.4mm
Surface Mounted Dimensions.............. 12.9mm x 14.4mm x 5.8mm
Weight.. 1.5 grams
Packaging... Bagged with options for Tape / Tube
Quiescent Current......................... 700 µA
Input Voltage Minimum... 6VDC
Input Margin (350mA unit, add to LED Vf MAX)......... 2.5VDC
Control Pin Voltage .... 1VDC - 30VDC

Absolute Maximum Ratings

Input Voltage.................................... 30VDC
Output Voltage............................. 27.5VDC
Control Pin Voltage........................ 30VDC
Control Pin Frequency................... 2KHz

Electrical Characteristics

Parameter	Symbol	Condition	MIN	TYP	MAX	UNIT
VIN Under-Voltage Lockout	$V_{IN\ UVLO}$	V_{IN} Rising		5.3	5.9	V
Under-Voltage Lockout Hysteresis				700		mV
Quiescent Supply Current	I_Q	No Switching		0.7	1	mA
Minimum On Time	$t_{ON\ MIN}$			100		ns
Minimum Off Time	$t_{OFF\ MIN}$			100		ns
Recommended Duty Cycle Range	D		30		70	%

Table 2. Electrical Characteristics

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Fixed Current Drive

All MiniPuck™ versions are designed to supply their rated current to one or more LEDs, independent of input voltage. For example, a 350mA Minpuck™ will drive up to six series LEDs, with a 3V forward voltage per LED totaling 18V, with a VIN of 24VDC. Due to the nature of a buck regulator, the input voltage must always be higher than the forward voltage of the LEDs.
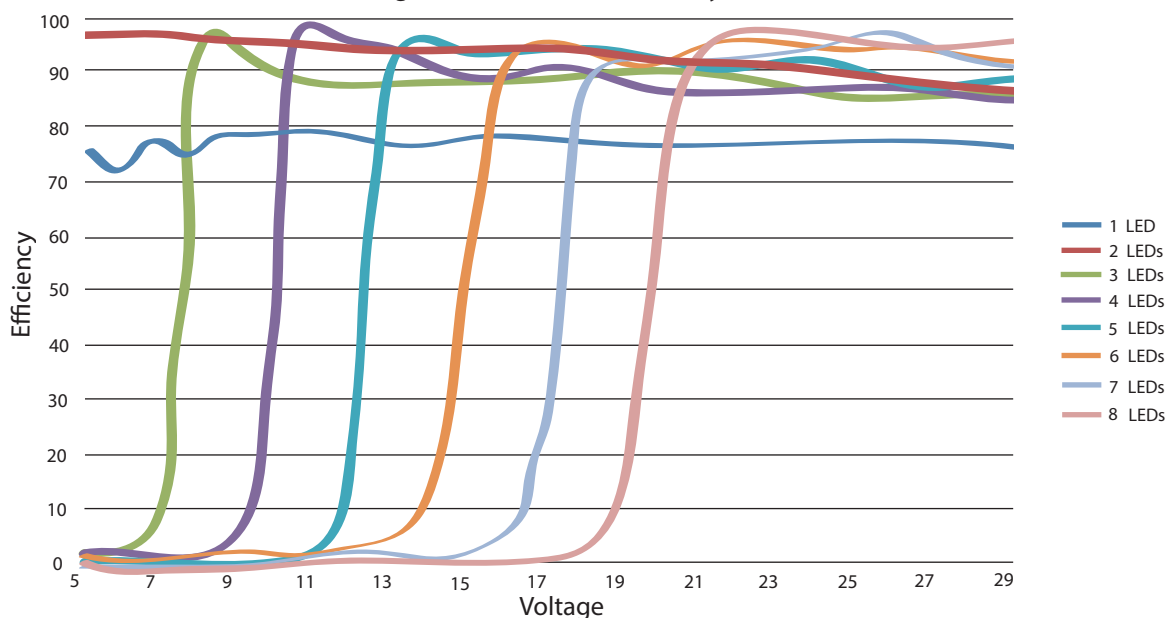
Figures 2-4 show various drive current Minipucks driving multiple LED configurations. Note the parallel strings of LEDs can be driven directly with no additional circuitry required to ensure current sharing. The nature of LEDs themselves will provide sufficient current sharing if the parallel strings are comprised of three or more series LED strings.

Dim Pin

The Minipuck™ can be turned on and off by applying voltage to the PWM Control Pin with a voltage range of 1-30VDC. Figure 4 depicts a microcontroller such as an Arduino used to dim the Minipuck™.
In this case a logic high signal will cause the output of the Minipuck™ to be "off", and a logic low signal will cause the output to be "on". A square wave frequency of 100Hz -2KHz should be used with a minimum of 100ns on-time and 100ns off-time. Note frequencies above 2KHz should not be used as the internal capacitance of the circuitry may give unexpected results.

MiniPuck Efficiency

Figure 1. MiniPuck™ Efficiency

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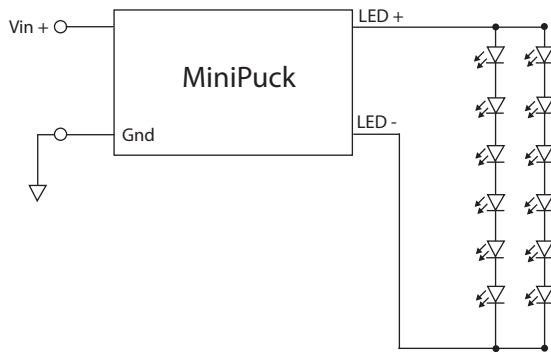802.728.4533 P
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Application Figures

Figure 2. 700mA MiniPuck driving 12 high power LEDs
Vin ≥ 24VDC
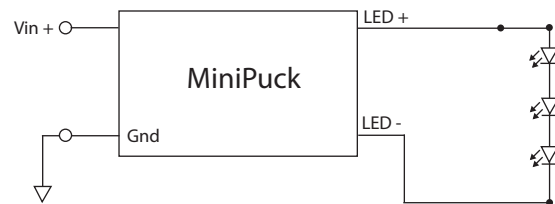
Figure 3. 350 mA MiniPuck driving 3 high power LEDs
Vin ≥ 12VDC

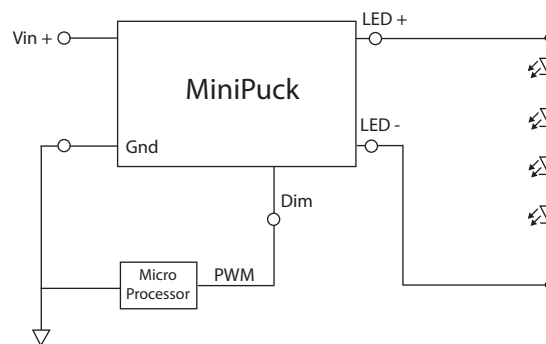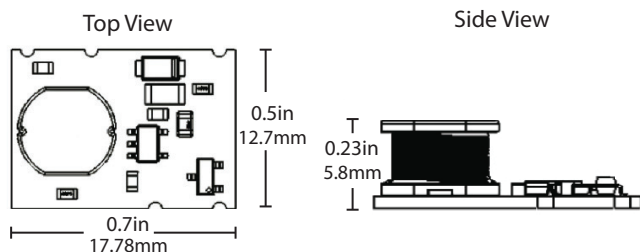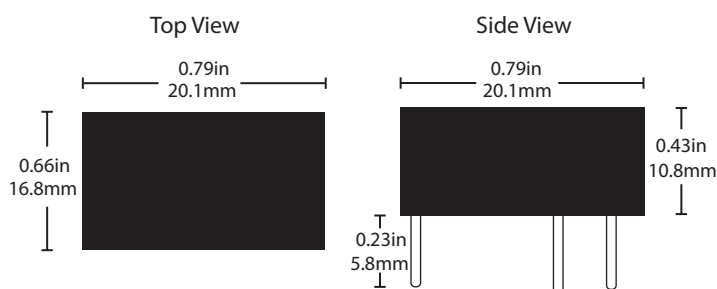Figure 4. 700 mA MiniPuck driving 4 high power LEDs
controlled by a microprocessor
Vin ≥ 15VDC

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Physical Dimensions

Surface Mounted Version

Top View

0.5in
12.7mm

0.7in
17.78mm

Side View

0.23in
5.8mm

Pinned Version

Top View

0.79in
20.1mm

0.66in
16.8mm

Side View

0.79in
20.1mm

0.43in
10.8mm

0.23in
5.8mm

Pin/Pad Connection

	Connection
1	Vin
2	Gnd
3	PWM Control Pin
4	LED +
5	LED -

Recommended Hole Pinned Layout

0.2in
5.08mm

0.7in
17.78mm

0.5in
12.7mm

RECOMMENDED
PCB DRILL SIZE
0.04in x5
1.12mm x5

0.79in
20.1mm

keep out area
0.5in
1.27mm

0.2in
5.08mm
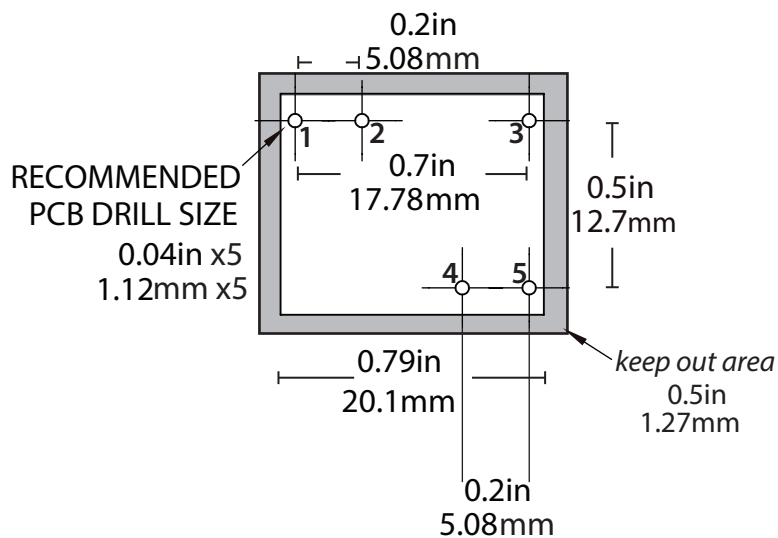
Recommended Pad Layout Surface Mount

0.7in
17.78mm

0.25in
6.35mm

0.5in
1.20mm

0.15in
3.9mm

keep out area
0.5in
1.27mm

0.5in
12.7mm

0.9in
2.4mm

0.42in
10.75mm

0.8in
1.95mm

0.45in
11.43mm

0.65in
16.51mm

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