

EPMLE- 24 SERIES–Constant Current LED Driver

DC-DC Converter

Features

EFFICIENCY UP TO 95%
 CONSTANT CURRENT LED DRIVER
 WIDE INPUT AND OUTPUT VOLTAGE RANGE
 INPUT VOLTAGE UP TO 36V
 PWM DIMMING CONTROL
 SHORT CIRCUIT AND OVER TEMPERATURE PROTECTED
 INTERNAL SMD TECHNOLOGY
 FULLY ISOLATED PLASTIC CASE WITH IP67 LEVEL
 UL 94V-0 PACKAGE MATERIAL
 RoHS COMPLIANT

Description

EPMLE-24 series is a high efficiency, constant current and step-down DC/DC converter. The LED DRIVER operates from an input voltage 9Vdc to 36Vdc and provides an externally adjustable output current of up to 700mA and output power up to 22 watts. It is able to include the function of Over temperature protection(OTP), Over current protection(OCP), PWM/Digital Dimming and ON/OFF.
 The device can extensively be used for Landscape illumination, Special illumination, Back light source, Commercial illumination, Street light illumination, Home use illumination and Automobile illumination etc.

Selection Guide

| MODEL NUMBER | INPUT NOMINAL VOLTAGE (VDC) | INPUT VOLTAGE RANGE (VDC) | OUTPUT VOLTAGE RANGE (VDC) | OUTPUT CURRENT RANGE (mA) | DIMMING CONTROL | EFF (% , typ.) |
|-------------------|-----------------------------|---------------------------|----------------------------|---------------------------|-----------------|----------------|
| EPMLE2430D(W)(N) | 24 | 9-36 | 2-32 | 0-300 | PWM | 95 |
| EPMLE2435D(W) (N) | 24 | 9-36 | 2-32 | 0-350 | PWM | 95 |
| EPMLE2450D(W) (N) | 24 | 9-36 | 2-32 | 0-500 | PWM | 95 |
| EPMLE2460D(W) (N) | 24 | 9-36 | 2-32 | 0-600 | PWM | 95 |
| EPMLE2470D(W) (N) | 24 | 9-36 | 2-32 | 0-700 | PWM | 95 |
| EPMLE2430S | 24 | 9-32 | 2-28 | 0-300 | PWM | 95 |
| EPMLE2435S | 24 | 9-32 | 2-28 | 0-350 | PWM | 95 |
| EPMLE2450S | 24 | 9-32 | 2-28 | 0-500 | PWM | 95 |
| EPMLE2460S | 24 | 9-32 | 2-28 | 0-600 | PWM | 95 |
| EPMLE2470S | 24 | 9-32 | 2-28 | 0-700 | PWM | 95 |

Partnumbers Structure

Series

Coding Scheme

EPMLE-24 Series EPMLE-x1-x2-y1

EPMLE =Series Name

x1 = Input Voltage

x2 = Output Current

y1 = Package Style(D=PINS,W=WIRED,S=SMD,N=NO DIM)

zzz = 0~9, A~Z or blank for market purpose.

Specifications

(Typical at 25°C, nominal input voltage, rated output current unless otherwise specified)

| Project | Working Condition | Min. | Typ. | Max. | Unit |
|--|----------------------------|------|------------------------|------------|-------|
| Input Voltage(absolute maximum) | | | | 36 | VDC |
| Input Voltage(absolute maximum) For (S) | | | | 32 | VDC |
| Recommended Input Voltage | | 9 | 24 | 36 | VDC |
| Recommended Input Voltage(S) | | 9 | 24 | 32 | VDC |
| Input Filter | | | Capacitor | | |
| Output Voltage range | Vin=36V | 2 | | 32 | VDC |
| Output Voltage range(S) | Vin=32V | 2 | | 28 | VDC |
| Output Current Accuracy | Vin=24V,6LEDS | | ±4 | ±6 | % |
| Output Current Stability | Vin=24V,1LED to 6LEDS | | ±4 | ±6 | % |
| Humidity | PINS, WIRE | 20 | | 95 | % |
| Humidity | SMD | 20 | | 85 | |
| Maximum Capacitive Load | | | | 2.2 | uF |
| Operating Frequency | | 40 | | 1000 | KHz |
| Short Circuit Protection | | | | Continuous | |
| Temperature Coefficient | -40°C~+71°C ambient | | | ±0.03 | °C |
| Operating Temperature | 300mA/350mA/500mA | -40 | | 85 | °C |
| | 600mA/700mA | -40 | | 71 | °C |
| Storage Temperature | | -55 | | 125 | °C |
| Overtemperature Shutdown (Auto-restart after cool down) | Internal IC Temperature | | | 150 | °C |
| | Temperature Hysteresis | | | 20 | °C |
| Maximum Case Temperature | | | | 100 | °C |
| MTBF (using MIL-HDBK 217F) | Operating Temperature 25°C | | 2000000 | | Hours |
| Case Material | | | Non Conductive plastic | | |
| Potting Material | | | Epoxy (UL94V-0) | | |
| Case Size | | | 22.6*9.9*8.9 | | mm |
| Case Size(S) | | | 25.4*10.5*9.3 | | mm |
| Weight(P) | | | 4 | | g |
| Weight (W) | | | 7.3 | | g |
| Weight(S) | | | 3.4 | | g |
| EMI Radiated Emissions | | | EN55015 | | |
| Dust Test & Waterproof Test(D) (W) | | | IP67 | | |

PWM Dimming and ON/OFF Control (Leave open if not use)

| Project | Working Condition | Min. | Typ. | Max. | Unit |
|--|--|------|------|------|------|
| ON/OFF Control | ON (DIM~VIN) | 3.5 | | 10 | VDC |
| | OFF (DIM~VIN) | 0 | | 0.5 | VDC |
| Quiescent Input Current in Shutdown Mode | Vin=24 | | | 1 | mA |
| PWM Frequency | For Linear Operation (measured 1%~100% Dimming) | 100 | | 1K | Hz |

PWM Dimming and ON/OFF Control (measured 1%~100% Dimming)

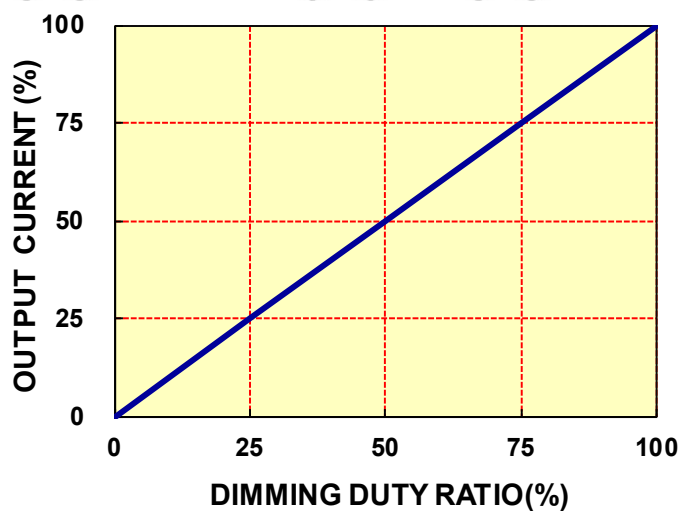
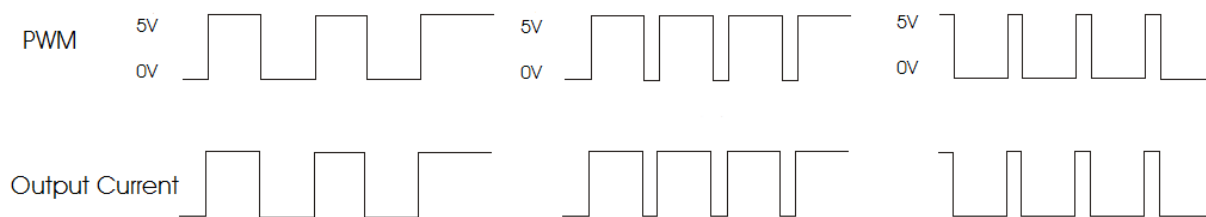


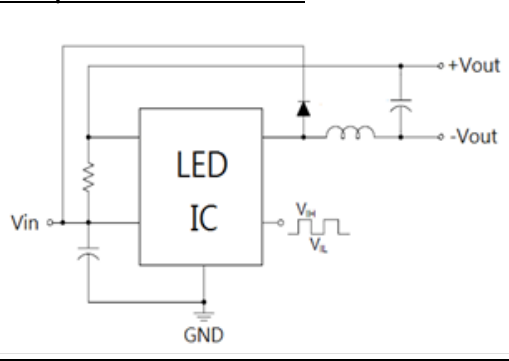
Fig.1 Dimming Duty Cycle: 1%-100%

The dimming of LEDs can be performed by applying PWM signals to DIM pin.

The above Fig.1 show good linearity in dimming application of EPMLE-24.

A logic low (below 0.5V) at DIM PIN will disable the device and shut off the current flow to the LED array.

Simplified Schematic



Typical Application

PWM Dimming control circuit

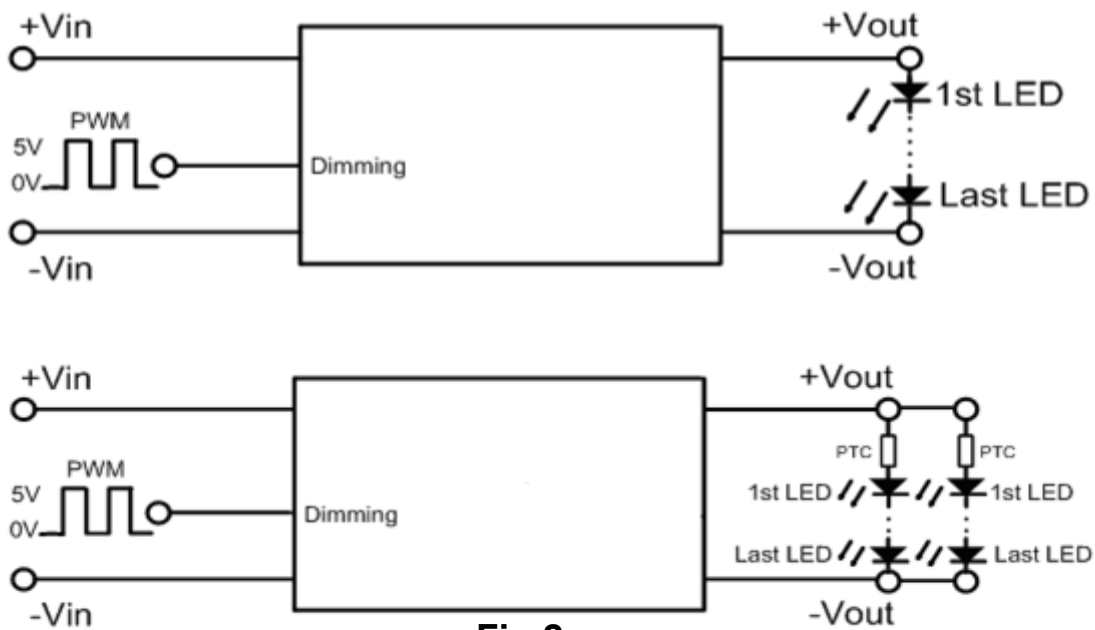


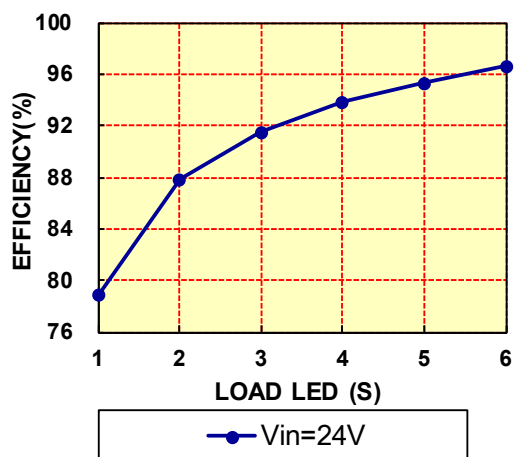
Fig.2

In actual use, if necessary to protect LED, a PTC of positive temperature coefficient may be connect to the input end of every channel or all channels, as shown in Fig.2.

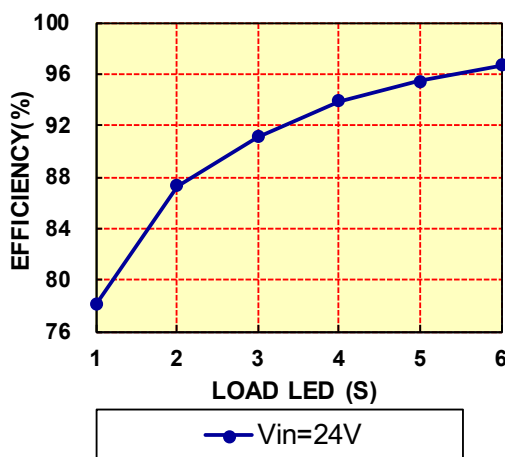
Efficiency vs. load LED $T_A=25^\circ\text{C}$

1-LED $V_F=3.6\text{V}$; 2-LED $V_F=7.2\text{V}$; 3-LED $V_F=10.8\text{V}$

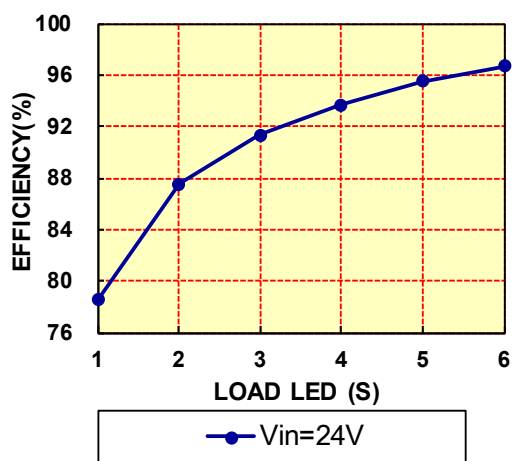
OUTPUT CURRENT 0.30A



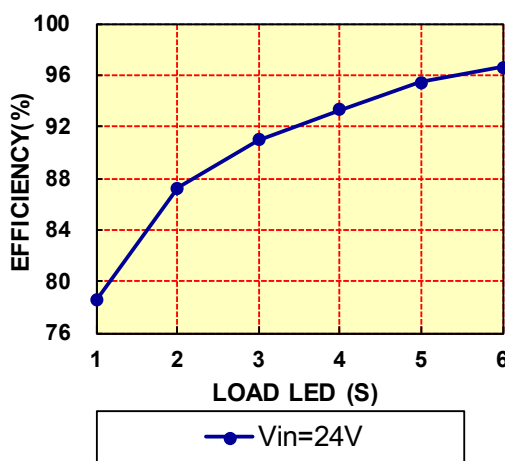
EFFICIENCY VS. LOAD LED 0.35A



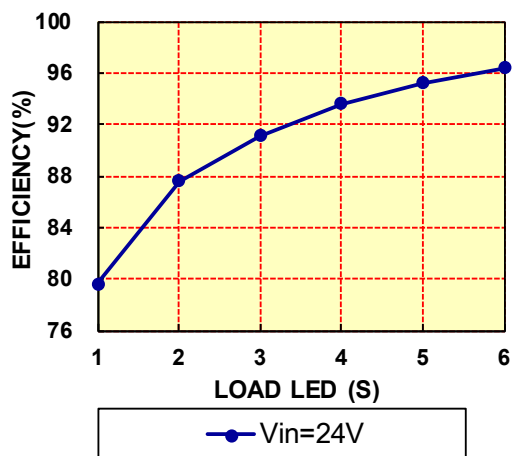
OUTPUT CURRENT 0.50A



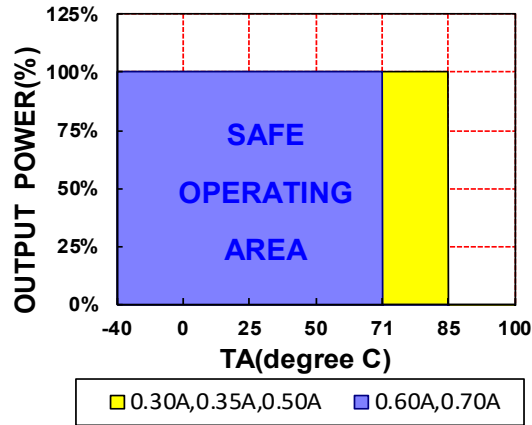
OUTPUT CURRENT 0.60A



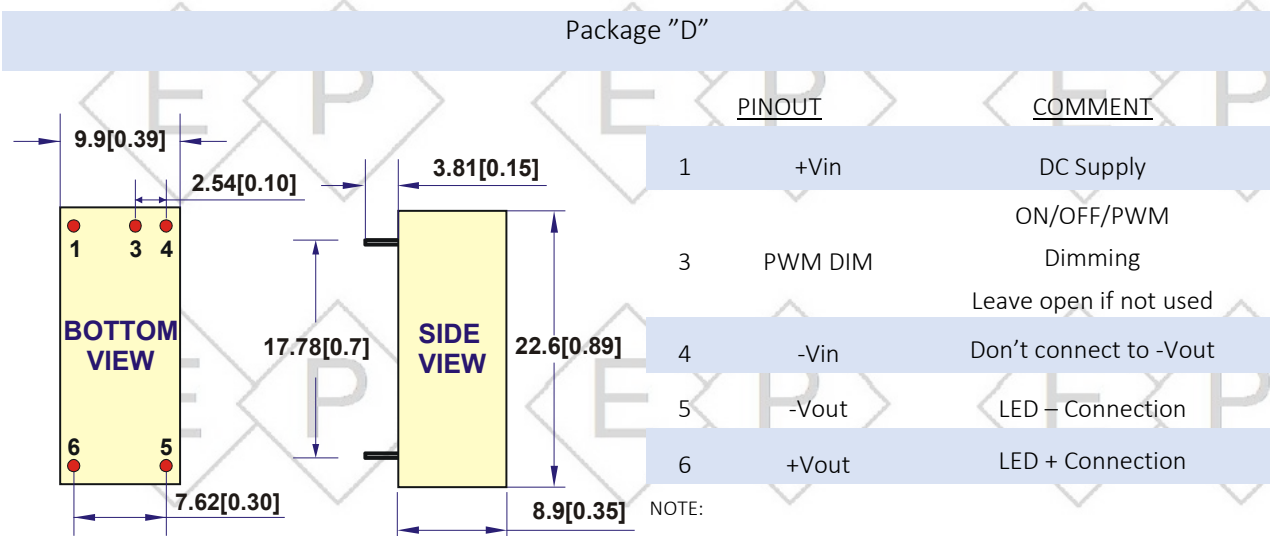
OUTPUT CURRENT 0.70A



Derating Curve



Mechanical Dimensions & Recommended Footprint Details



NOTE:

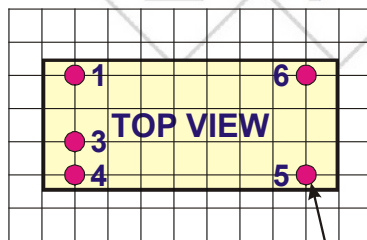
Pin Size is Tolerance $0.60\Phi \pm 0.05\text{mm}$

All dimensions are in mm [inches]

Tolerance .X or .XX= $\pm 0.5\text{mm}$

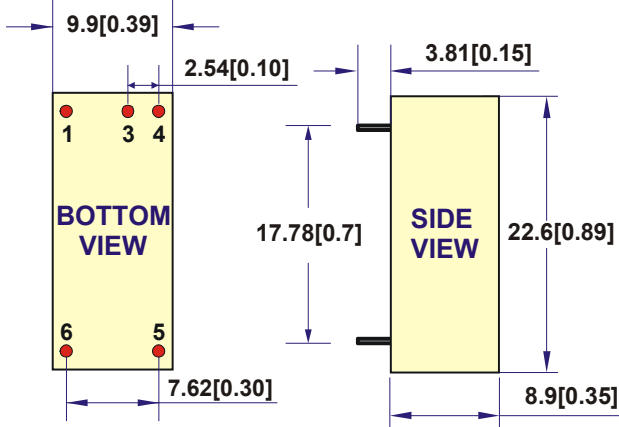
All dimensions are in mm[inches]

GRID: 2.54 mm



$0.8\Phi \pm 0.2/-0$

Package "DN"

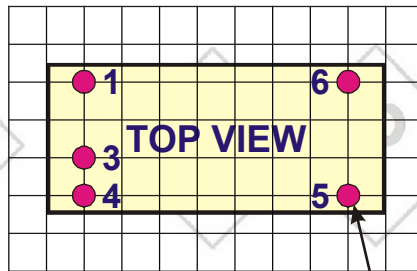


| PINOUT | COMMENT |
|---------|------------------------|
| 1 +Vin | DC Supply |
| 3 NP | NP |
| 4 -Vin | Don't connect to -Vout |
| 5 -Vout | LED - Connection |
| 6 +Vout | LED + Connection |

NOTE:
 Pin Size is Tolerance 0.60Φ ±0.05mm
 All dimensions are in mm [inches]
 Tolerance .X or .XX= ±0.5mm

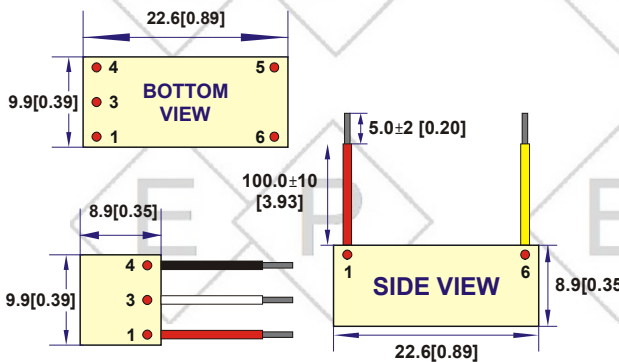
All dimensions are in mm[inches]

GRID:2.54 mm



0.8Φ+0.2/-0

Package "W"

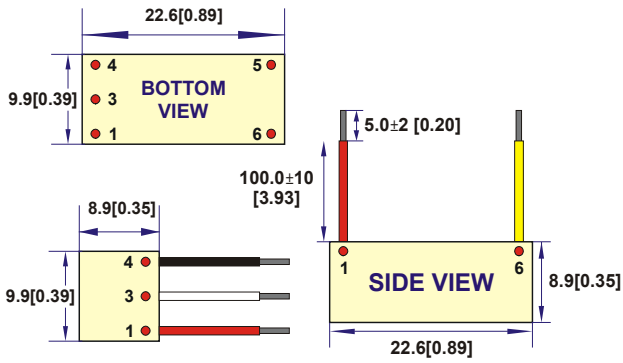


| PINOUT | COMMENT |
|----------------------|------------------------|
| 1 (Red) +Vin | DC Supply |
| 2 (Black) ON/OFF/PWM | ON/OFF/PWM |
| 3 (White) PWM DIM | Dimming |
| 4 (Black) -Vin | Don't connect to -Vout |
| 5 (Blue) -Vout | LED - Connection |
| 6 (Yellow) +Vout | LED + Connection |

NOTE:
 All dimensions are in mm [inches]
 1.Case Tolerance .X or .XX=±0.5mm
 2.Wire outside diameter=1.6mm ±0.1
 3.Wire core diameter= 0.75mm ±0.1
 4.Wire is UL 3385/CAS TEM listed #22AWG /300V /105°C Rated

All dimensions are in mm[inches]

Package "WN"



All dimensions are in mm[inches]

| PINOUT | COMMENT |
|------------------|------------------------|
| 1 (Red) +Vin | DC Supply |
| 4 (Black) -Vin | Don't connect to -Vout |
| 5 (Blue) -Vout | LED - Connection |
| 6 (Yellow) +Vout | LED + Connection |

NOTE:

All dimensions are in mm [inches]

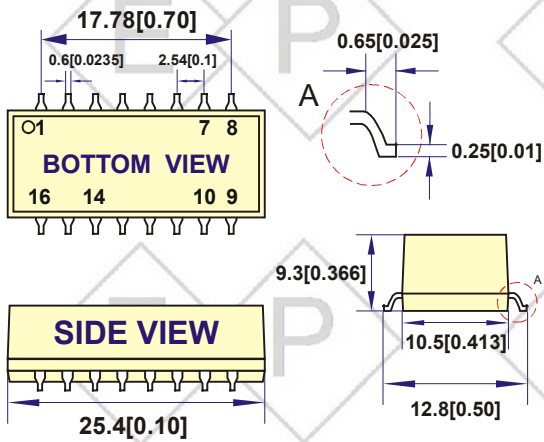
1. Case Tolerance .X or .XX = ±0.5mm

2. Wire outside diameter = 1.6mm ±0.1

3. Wire core diameter = 0.75mm ±0.1

4. Wire is UL 3385/CAS TEM listed #22AWG /300V /105°C Rated

Package "S"



All dimensions are in mm[inches]

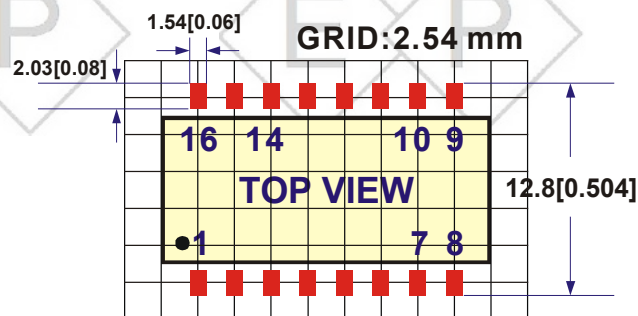
| PINOUT | COMMENT |
|--------------|------------------------|
| 1 +Vin | DC Supply |
| 14 PWM DIM | ON/OFF/PWM Dimming |
| 16 -Vin | Don't connect to -Vout |
| 9 & 10 -Vout | LED - Connection |
| 7 & 8 +Vout | LED + Connection |

NOTE:

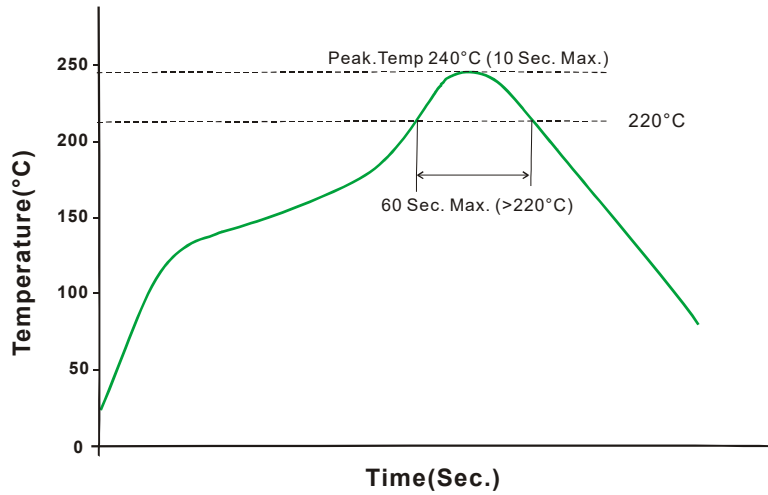
Pin Size is Tolerance 0.6Φ ±0.05mm

All dimensions are in mm [inches]

Tolerance .X or .XX = ±0.5mm



Reflow Soldering Curve



Remark: The curve applies only to the hot air reflow soldering.



Spezifikationen können sich ohne Vorankündigung ändern.
Für etwaige fehlerhafte Angaben oder unvollständige Bezeichnungen kann keine Haftung übernommen werden.