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RoHS 2002/95/EC

NTE7208
Integrated Circuit
Constant Current Single Output LED Driver

Description:

The NTE7208 is a step–down constant current source designed for driving high power white LEDs. A standard output current of 350mA makes this driver compatible with a wide range of LEDs from many different manufacturers without the need for any external components. Despite its compact size, the NTE7208 is fully featured with very high efficiency, wide input voltage range, high ambient operating temperature and two means of LED dimming: PWM/digital control and analog voltage dimming. Both dimming controls are independent and can be combined. The driver is also designed to be as reliable as the LEDs it is driving, even at the full operating temperature of +85°C.

Features:

- Constant Current Output
- Power LED Driver
- Wide Input Voltage Range
- PWM/Digital Dimming and Analog Voltage Dimming
- Short Circuit Protected
- 96% Efficiency

Electrical Specifications: (Typical at T_A = +25°C, nominal input voltage, rated output current unless otherwise specified.

Input Voltage (Absolute Maximum) 36V
Recommended Input Voltage
  Minimum 5V
  Typical 24V
  Maximum 36V
Input Filter . . . . . Capacitor
Output Voltage Range (V_{in} = 36V) . . . . . 2V to 32V
Output Current Range (V_{in} – V_{out} > 1.5V to 4V) 350mA
Typical Output Current Accuracy (I_O = 350mA) . . . . . ±2%
Internal Power Dissipation, (Load of 5 LEDs) 700mW
Maximum Output Current Stability (V_{in} = 36V, V_{out} =2V to 32V) . . . . . ±1%
Maximum Output Ripple and Noise, (20MHz limited, V_{in} = 36V, V_{out} = 2V to 32V) . . . . . $120mV_{p-p}$
Maximum Temperature Coefficient (T_A = –40° to +85°C) . . . . . ±0.015%/°C
Maximum Capacitive Load, ... 100µF
Operating Frequency
  Minimum 210kHz
  Typical 260kHz
  Maximum 300kHz
Maximum Effieciency at Full Load 96%
Short Circuit Protection . . . . . Regulated at Rated Output Current
Operating Temperature Range, T_A . . . . . –40° to +85°C
Storage Temperature Range, T_{stg} . . . . . –55° to +125°C

Electrical Specifications (Cont'd): (Typical at T_A = +25°C, nominal input voltage, rated output current unless otherwise specified.

Maximum Case Tempeature, T_C . . . . . +100°C
Thermal Impedance (Nature Convection) . . . . . +55°C/W
Case Material . . . . . Non Conductive Black Plastic
Potting Material . . . . . Epoxy (UL94−V0)
Maximum Wave Soldering Profile (10 seconds) . . . . . +235°C

PWM Dimming and ON/OFF Control (Leave Open if Not Used)**:**

Remote ON/OFF
- DC/DC ON, ... Open or 0V < V_r < 0.6V
- DC/DC OFF (Standby) . . . . . 0.6 < V_r < 2.9V
- DC/DC OFF (Shutdown), ... 2.9 < V_r < 6V

Maximum Remote Pin Drive Current (V_r = 5V) 1mA
Maximum Quiescent Input Current in Shutdown Mode (V_{in} = 36V, V_r > 2.9V) 200μA
Maximum PWM Frequency for Linear Operation (measured 10% to 90% Dimming) 200Hz

Analog Dimming Control (Leave Open if Not Used)**:**

Input Voltage Range . . . . . 0 to 15V
Control Voltage Range Limits
- Full On . . . . . 0.13V ± 50mV
- Full Off . . . . . 4.5V ± 50mV

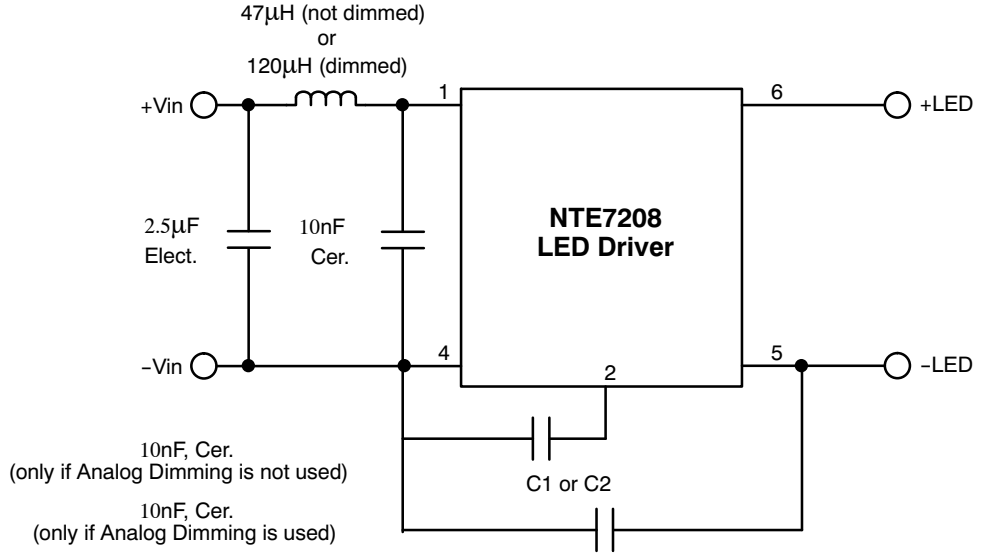
Maximum Analog Pin Drive Current (V_c = 5V) 0.2mA

Environmental:

Relative Humidity (See Note) . . . . . 5% to 95% RH, non−condensing
Conducted Emissions . . . . . EN55022, Class B
Radiated Emissions . . . . . EN55022, Class B
ESD . . . . . EN61000−4−2, Class A
Radiated Immunity . . . . . EN61000−4−3, Class A
Fast Transient . . . . . EN61000−4−4, Class A
Conducted Immunity . . . . . EN61000−4−6, Class A
MTBF (RCD−24−0.70, Nominal V_{in}, Full Load)
- +25°C . . . . . 605 x 10^3 hours
- Using MIL−HDBK 217F, +71°C . . . . . 516 x 10^3 hours

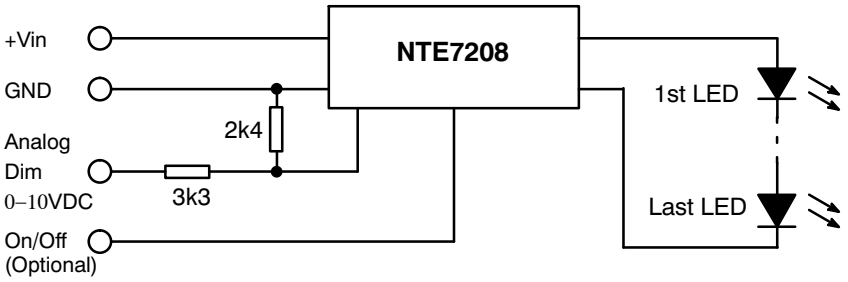
Note: Requires an input filter to meet EN55022 Class B conducted emissions, see below.

Class B Filter Suggestion

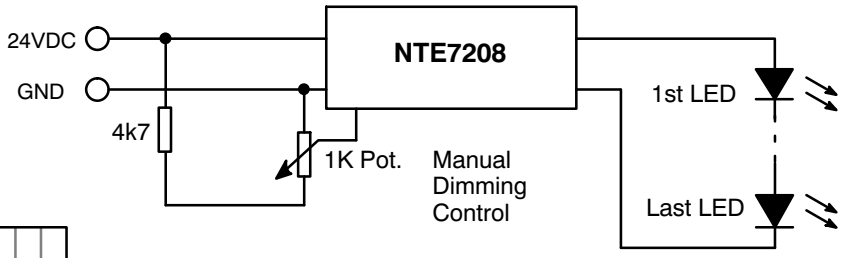


Analog Dimming Control and Application Circuit Examples

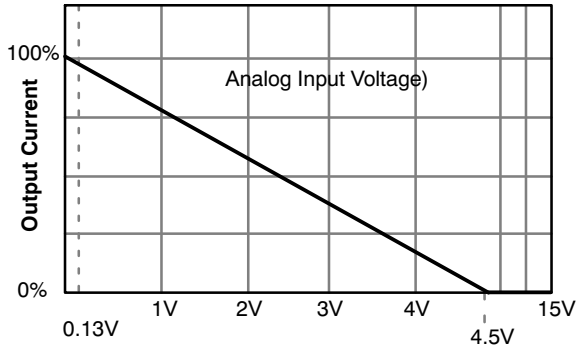
LED Driver with 0−10V Interface



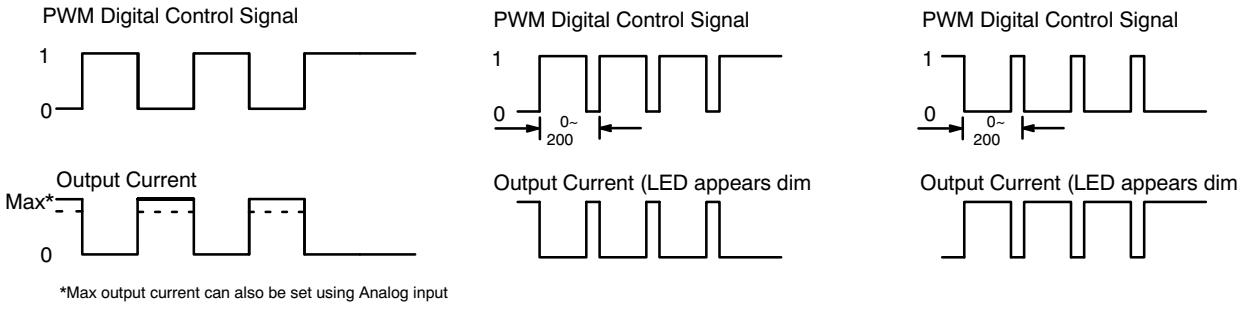
LED DIMMER for up to 7 white LEDs



Voltage Control (0−15V max)

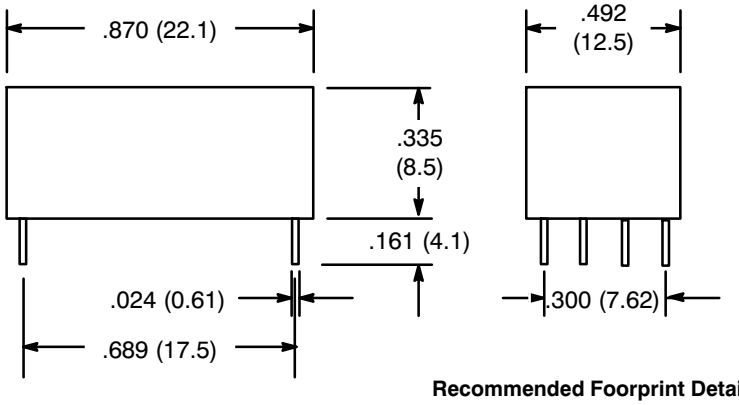


Digital Dimming Control



*Max output current can also be set using Analog input

Package Style and Pinning



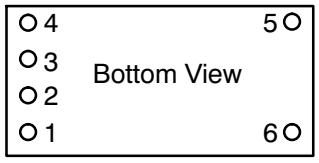
Pin Connections

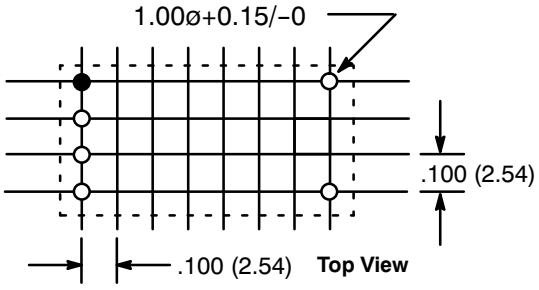
Pin #	Out	Comments
1	+Vin	DC Suplly
2	Analog Dimming	Leave open if not used
3	PWM/ON/OFF	Leave open if not used
4	GND	Do not connect to −Vout
5	−Vout	LED Cathode Connection
6	+Vout	LED Anode Connection

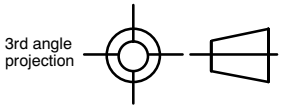
xx.x ±0.5mm
xx.xx ±0.25mm
Pin Tolerance
0.1mm

Recommended Foorprint Details

Leave 1mm space around case pcb







Analog Dimming Control and Application Circuit Examples

LED Driver