



FEATURES:

- Step Up DC/DC LED Driver
- Constant Current Output
- High Efficiency up to 95%
- Soft Start
- 2"x1" Case Package
- Operating Temperature -40°C to +85°C
- Open and Short Circuit LED Protection
- PWM / Digital & Analog Voltage Dimming
- Drives LED Strings of up to 48V

Models Single output



| Model | Input Voltage (V) | Output Voltage (V) Vo-Vin≥5V | Maximum Rated Current (mA) | Max Capacitive Load (µF) | Efficiency (%) | Ripple & Noise (mV p-p) |
|------------|-------------------|---------------------------------|----------------------------|--------------------------|----------------|-------------------------|
| AMLB-3615Z | 9-36 | 14-48 | 150 | 100 | 91 | 350 |
| AMLB-3625Z | 9-36 | 14-48 | 250 | 100 | 93 | 450 |
| AMLB-3630Z | 9-36 | 14-48 | 300 | 100 | 94 | 450 |
| AMLB-3635Z | 9-36 | 14-48 | 350 | 100 | 94 | 600 |
| AMLB-3650Z | 9-36 | 14-45 (Vin:9V-18V) | 500 | 47 | 95 | 650 |
| | | 23-48 (Vin: 18V-36V) | | | | |
| AMLB-3660Z | 9-36 | 14-38 (Vin:9V-18V) | 600 | 47 | 95 | 650 |
| | | 23-48 (Vin: 18V-36V) | | | | |
| AMLB-3670Z | 9-36 | 14-32 (Vin:9V-18V) | 700 | 47 | 95 | 700 |
| | | 23-48 (Vin: 18V-36V) | | | | |
| AMLB-3690Z | 20-30 | 25-48 | 900 | 47 | 95 | 400 |

NOTE: All specifications in this datasheet are measured at an ambient temperature of 25°C, humidity<75%, nominal input voltage and at rated output load unless otherwise specified.

Input Specifications

| Parameters | Nominal | Typical | Maximum | Units |
|---------------------------------|---|------------|---------|-------|
| Voltage range | 900mA model | 20-30 | | VDC |
| | Other models | 9-36 | | VDC |
| Filter | Capacitor | | | |
| Absolute Maximum Rating | | | 38 | VDC |
| Peak Input Voltage time | | | 100 | ms |
| EN Pin DC/DC ON | Leave open if unused, ON – Open | | | |
| EN Pin DC/DC OFF | OFF(shutdown) – 0V | | | |
| EN Pin Drive Current | $V_{EN} \leq 3V$ | | 1.5 | µA |
| Quiescent Current in Shutdown | (Vin : 9V-32V) | | 1.3 | mA |
| | (Vin : 32V-36V) | | 8 | mA |
| DIM Pin Input Voltage Range | Leave open if unused | 0 to 5 | | VDC |
| DIM Pin Absolute Maximum Rating | | | 8 | VDC |
| DIM Pin Peak Input Voltage time | | | 100 | ms |
| Analog Dimming ON (DIM Pin) | 0.4V < V _{DIM} < 1.7V to adjust the output current from 0% to 100%, 1.7V < V _{DIM} < 5V to maintain the output current at 100% | | | |
| Analog Dimming OFF (DIM Pin) | | 0 to 0.3 | | VDC |
| DIM Pin Drive Current | $0.4 \leq V_{DIM} \leq 1.7V$ | | 1.5 | µA |
| PWM Dimming ON (DIM Pin) | | 0.4 to 5.0 | | VDC |
| PWM Dimming OFF (DIM Pin) | | 0 to 0.3 | | VDC |
| PWM Dimming (DIM Pin) | PWM Frequency 100Hz-100KHz to adjust the output current from 0% to 100% | | | |

Output Specifications

| Parameters | Conditions | Typical | Maximum | Units |
|--------------------------|-------------------------------------|---------|-----------------|-------|
| Current Accuracy | | | ±5 | % |
| Output Voltage Range | See model table | 14-48 | | VDC |
| Output Current | Vout-Vin ≥ 5V | | See model table | |
| Short Circuit Protection | Automatic Recovery (Cut-off Output) | | | |
| Over Voltage Protection | | | 52.5 | VDC |

Output Specifications (continued)

| Parameters | Conditions | Typical | Maximum | Units |
|--------------------------|----------------------|-------------|-----------------|-------|
| Under Voltage Protection | Cool Start | ≤7.6 | | VDC |
| Soft Start Time | | | 50 | ms |
| Under Voltage Lock Out | 900mA model, ON/OFF | 15.6 / 14.6 | | VDC |
| | Other models, ON/OFF | 7.6 / 6.8 | | VDC |
| Temperature Coefficient | | | ±0.03 | %/°C |
| Ripple & Noise | 20MHz Bandwidth | | See model table | |

General Specifications

| Parameters | Conditions | Typical | Maximum | Units |
|-------------------------------|--|--------------------------|---------|-------|
| Operating Frequency | | 370 | | KHz |
| Operating Temperature | AMLB-3615Z, Vin 9-36V | -40 to +85 | | °C |
| | AMLB-3625Z; AMLB-3630Z, Vin 9-18V | -40 to +80 | | °C |
| | AMLB-3625Z; AMLB-3630Z, Vin 18-36V | -40 to +85 | | °C |
| | AMLB-3635Z, Vin 9-18V | -40 to +75 | | °C |
| | AMLB-3635Z, Vin 18-36V | -40 to +85 | | °C |
| | AMLB-3650Z, Vin 9-18V | -40 to +70 | | °C |
| | AMLB-3650Z, Vin 18-36V | -40 to +80 | | °C |
| | AMLB-3660Z; AMLB-3670Z, Vin 9-18V | -40 to +70 | | °C |
| | AMLB-3660Z; AMLB-3670Z, Vin 18-36V | -40 to +75 | | °C |
| | AMLB-3690Z, Vin 9-36V | -40 to +65 | | °C |
| Storage Temperature | | -55 to +125 | | °C |
| Maximum Case Temperature | | | 105 | °C |
| Cooling | Free air convection | | | |
| Humidity | | | 95 | % RH |
| Case material | Non-Conductive Black Plastic (UL94-V0 rated) | | | |
| Weight | | 38 | | g |
| Dimensions (L x W x H) | 2.03 x 1.03 x 0.62 inches | 51.50 x 26.10 x 15.80 mm | | |
| MTBF | > 838 000 hrs (MIL-HDBK-217 F at +25 °C) | | | |
| Maximum Soldering Temperature | 1.5mm from case for 10sec. | | 260 | °C |

NOTES:

- To prevent burning out the driver, the output voltage must be 5.0VDC higher than the input voltage.
- Do NOT exceed the maximum power ratings on each model.
- With output ripple being rather low, it is recommended not to increase the additional output capacitor as this will increase the delay while starting up under cool start conditions.
- This series offers protection in case the output is shorted. After the short occurs, the input current will be cut off and recovers when the short is removed.
- The reference value of under voltage protection (7.6V) means that under the condition of cool start and full discharge of output, the protection starts when input voltage is lower than 7.6V.
- Note: PWM dimming means PWM signals are converted into mimic analog voltage by internal circuits and then do the dimming. The advantage of this approach is to reduce the EMI.

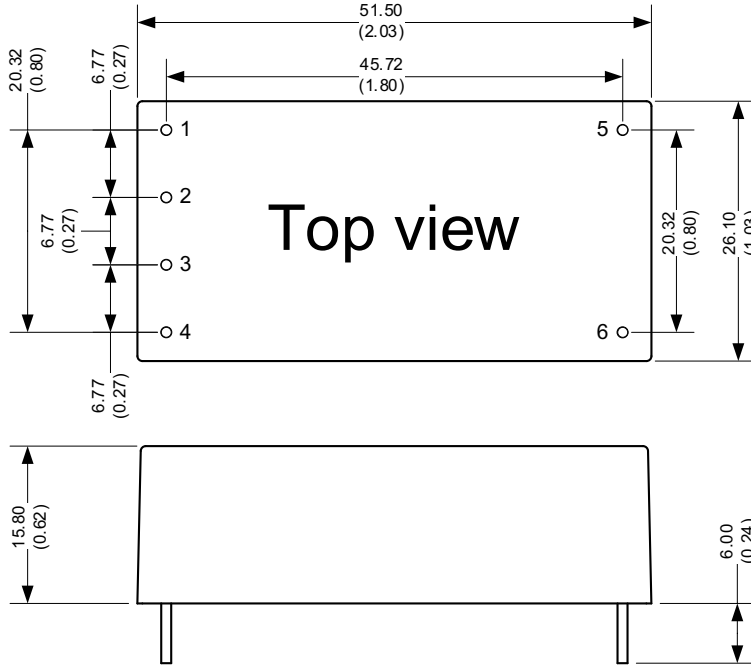
Safety Specifications

| Parameters | | |
|------------------|--|--------------------------------|
| Agency approvals | CE | |
| Standards | Designed to meet IEC/EN 60950-1, UL8750, IEC/EN 61347-2-13 | |
| | EMI | EN 55015 (CISPR22) |
| | EMC immunity | EN 61547 |
| | Electrostatic Discharge Immunity | IEC 61000-4-2 Perf. Criteria A |
| | RF, Electromagnetic Field Immunity | IEC 61000-4-3 Perf. Criteria A |
| | Electrical Fast Transient/Burst Immunity | IEC 61000-4-4 Perf. Criteria A |
| | Surge Immunity | IEC 61000-4-5 Perf. Criteria A |
| | RF, Conducted Disturbance Immunity | IEC 61000-4-6 Perf. Criteria A |
| | Power frequency Magnetic Field Immunity | IEC 61000-4-8 Perf. Criteria A |

Pin Out Specifications

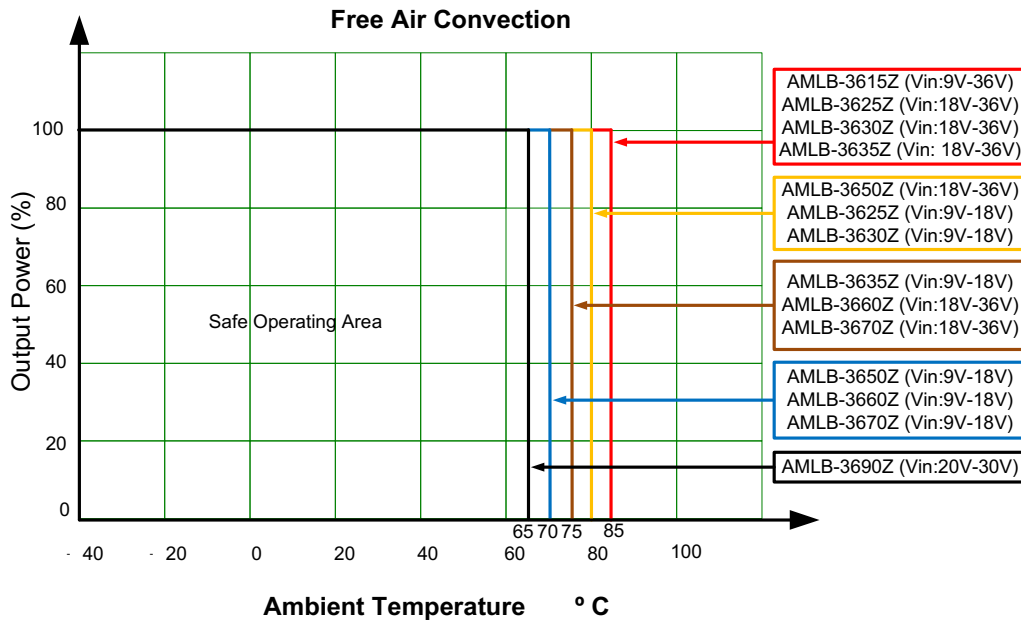
| Pin | Single | Description |
|-----|--------|----------------------------|
| 1 | +Vi | + DC Supply |
| 2 | DIM | PWM/Analog Dimming Control |
| 3 | EN | Remote ON/OFF |
| 4 | -Vi | -DC Supply |
| 5 | +LED | LED Anode connection |
| 6 | -LED | LED Cathode connection |

Dimensions

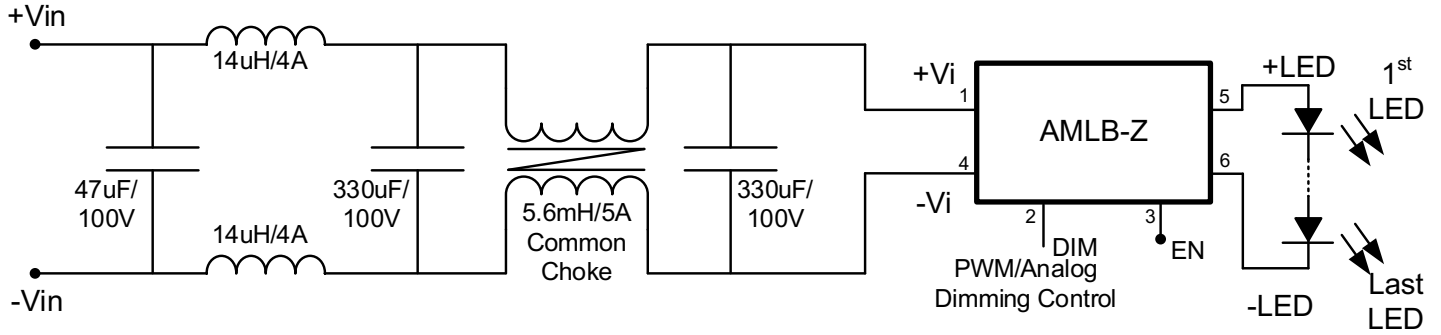


Unit: mm(inch)
 Case tolerance: $\pm 0.5(0.02)$
 Pin diameter: $1.0 \pm 0.05(0.04 \pm 0.002)$
 Pin pitch and length tolerance: $\pm 0.35(0.014)$

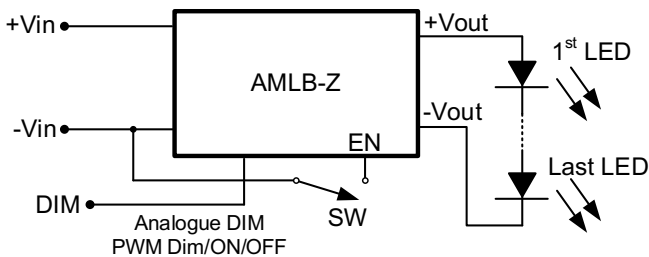
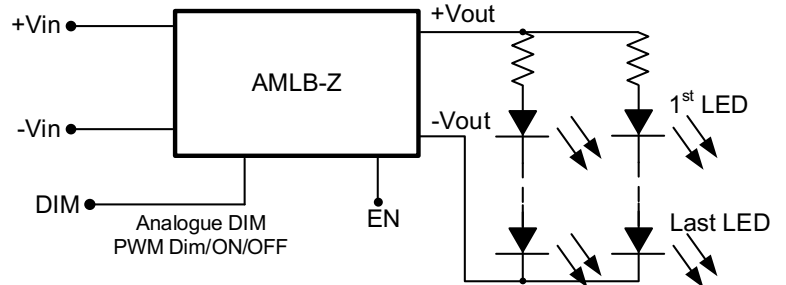
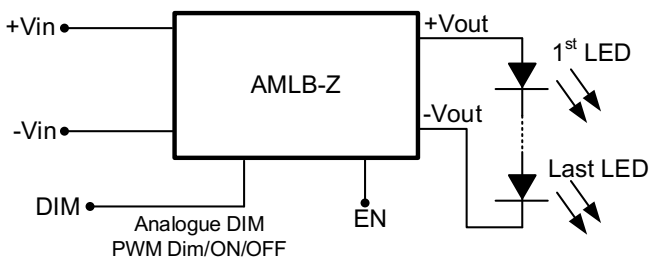
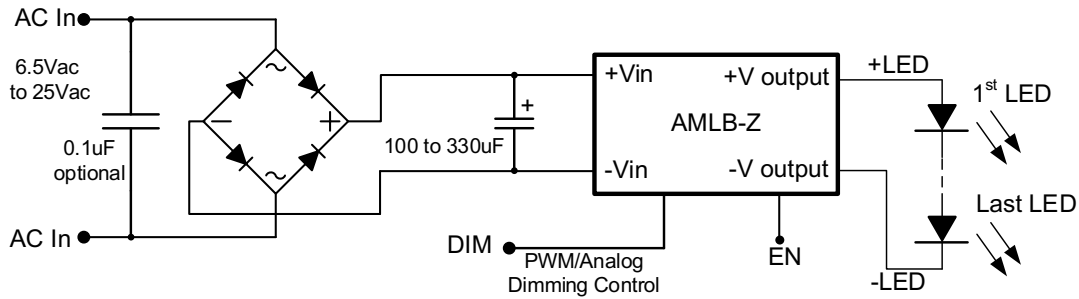
Operating Temperature



EMC recommended circuit:

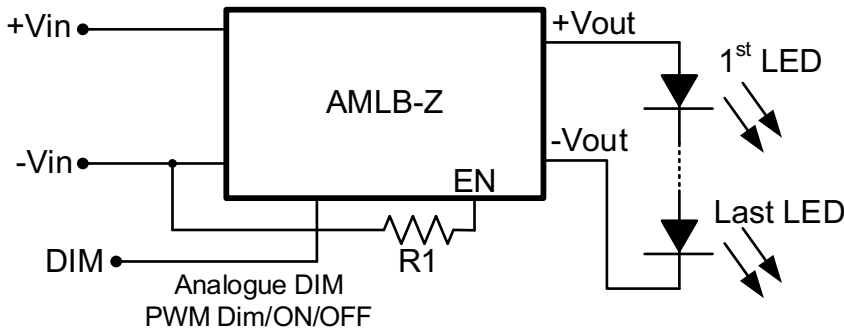


Application circuit examples:



| SW | Vout |
|-----|--------|
| ON | 0V |
| OFF | normal |

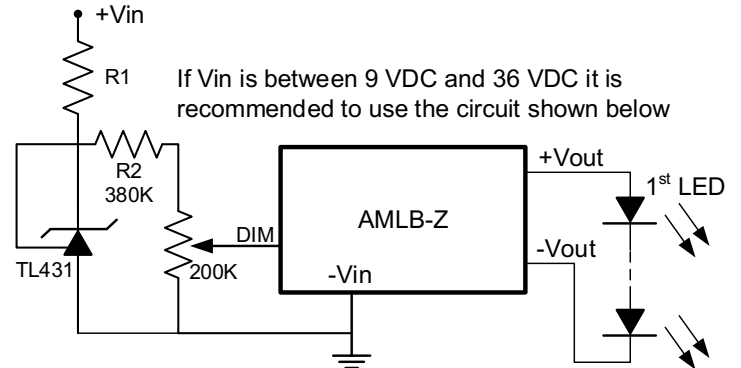
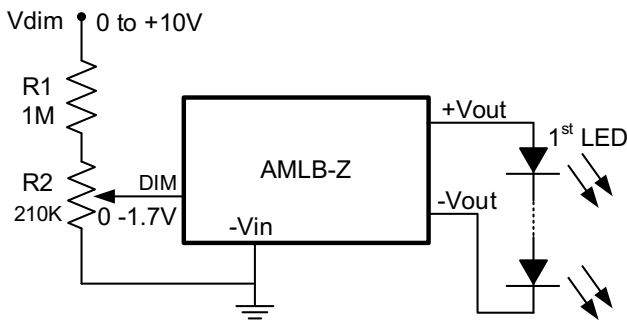
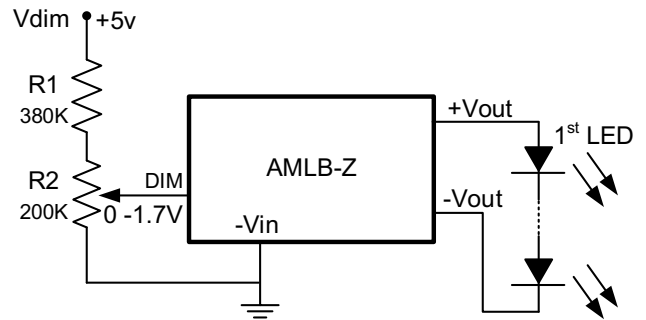
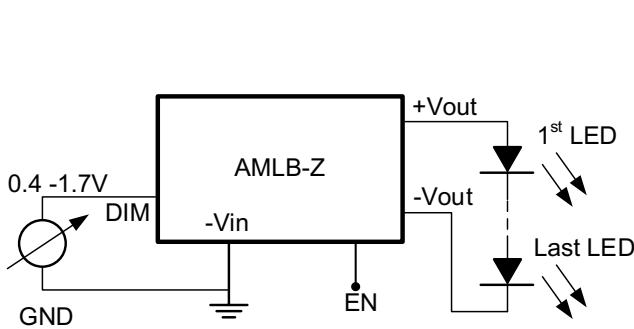
Under Voltage Protection



| Under Voltage Protection | | | | |
|--------------------------|-------------|---------|--------------|---------|
| R1 | 900mA model | | Other models | |
| | On (V) | Off (V) | On (V) | Off (V) |
| X | 15.6 | 14.6 | 7.6 | 6.8 |
| 12K | 21.5 | 19.7 | 11.0 | 10.2 |
| 10K | 22.5 | 20.7 | 11.5 | 10.7 |
| 7.5K | 25.0 | 22.5 | 13.0 | 12.2 |
| 4.7K | - | - | 16.2 | 15.4 |
| 3.3K | - | - | 20.5 | 19.7 |
| 2.7K | - | - | 23.2 | 22.2 |
| 2.4K | - | - | 25.0 | 24.0 |
| 2.0K | - | - | 28.5 | 27.5 |
| 1.8K | - | - | 30.8 | 29.8 |

*R1 Value only supplies the reference

Output Current Adjustment by External DC Control Voltage (DIM):

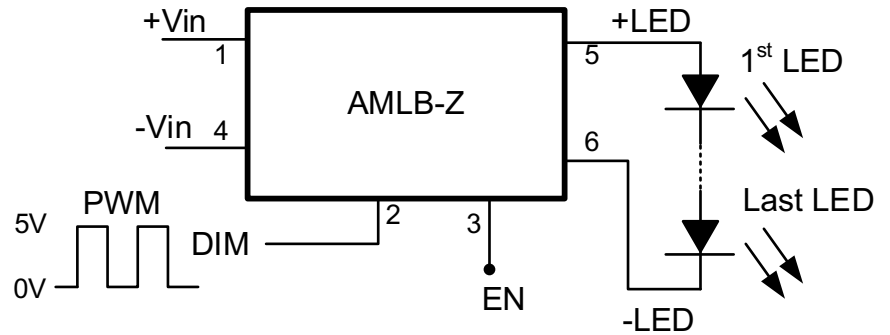


If Vin is between 9 VDC and 36 VDC it is recommended to use the circuit shown below

| Vin | R1 |
|-----|------|
| 5V | 4.7K |
| 12V | 18K |
| 24V | 43K |
| 36V | 62K |

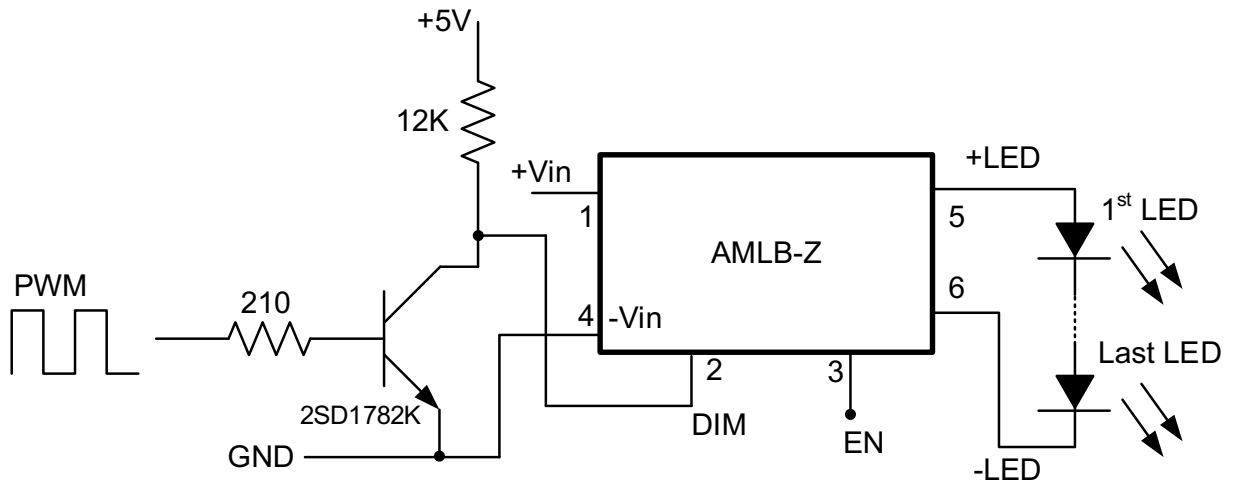
Output Current Adjustment by PWM Control:

A Pulse Width Modulation (PWM) signal with a duty cycle DPWM can be applied to the DIM pin as shown below.



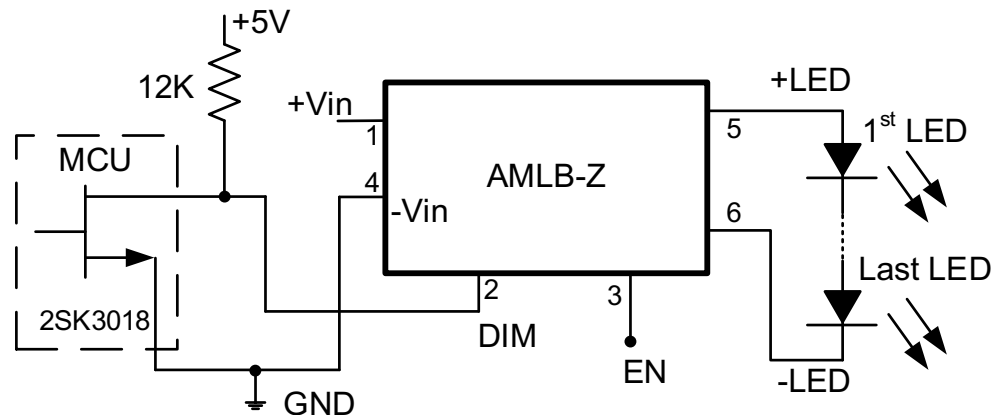
Driving DIM Via Open Collector Transistor

The DIM pin can also be driven via an open collector transistor as shown below.



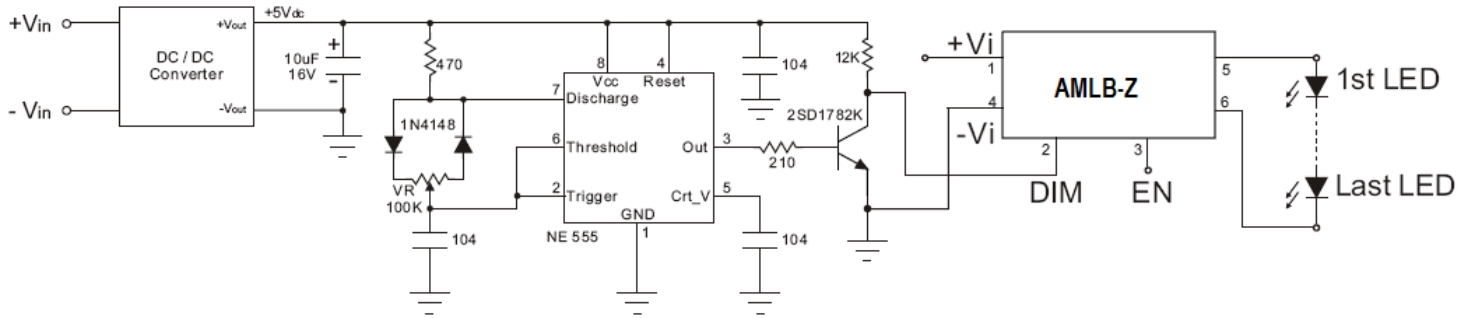
Driving the DIM from a Microcontroller

The DIM can be driven from an open drain output of a microcontroller as shown below.

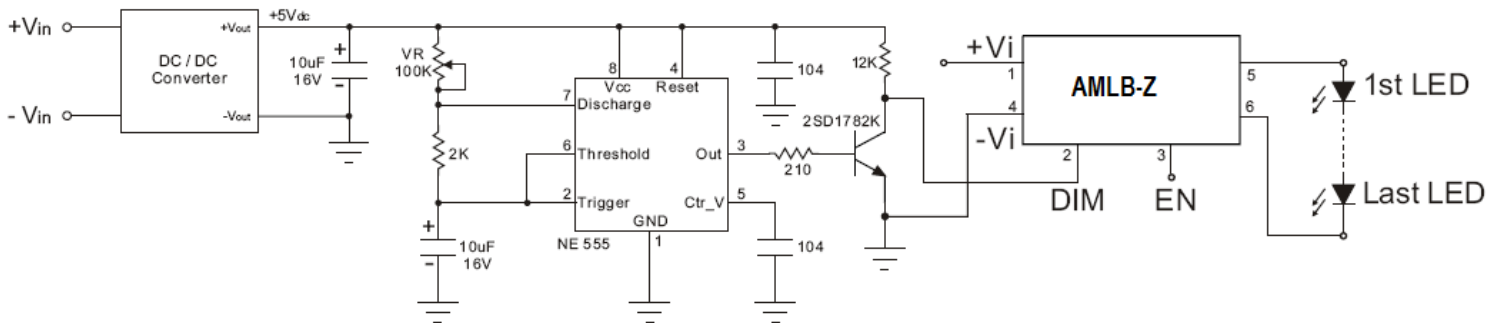


Output Current Adjustment by PWM Control (Dimming):

A PWM signal must have a frequency of greater than 100Hz to prevent any visible flicker.



Output Current Adjustment by PWM Control (Flash):



Output Current vs DIM Voltage

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