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Your Power Partner

Series AMLB-Z

Up to 900mA | Step Up LED Driver

FEATURES:

- Step Up DC/DC LED Driver
- Constant Current Output
- High Efficiency up to 95%
- Soft Start
- 2"x1" Case Package

- Operating Temperature -40ºC to +85ºC
- Open and Short Circuit LED Protection
- PWM / Digital & Analog Voltage Dimming
- Drives LED Strings of up to 48V

RoHS CE

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) 23-48 (Vin: 18V-36V)	500	47	95	650
AMLB-3660Z	9-36	14-38 (Vin:9V-18V) 23-48 (Vin: 18V-36V)	600	47	95	650
AMLB-3670Z	9-36	14-32 (Vin:9V-18V) 23-48 (Vin: 18V-36V	700	47	95	700
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} ≤ 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≤ V_{DIM} ≤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

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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:
1. To prevent burning out the driver, the output voltage must be 5.0VDC higher than the input voltage.
2. Do NOT exceed the maximum power ratings on each model.
3. 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.
4. 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.
5. 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.
6. 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.
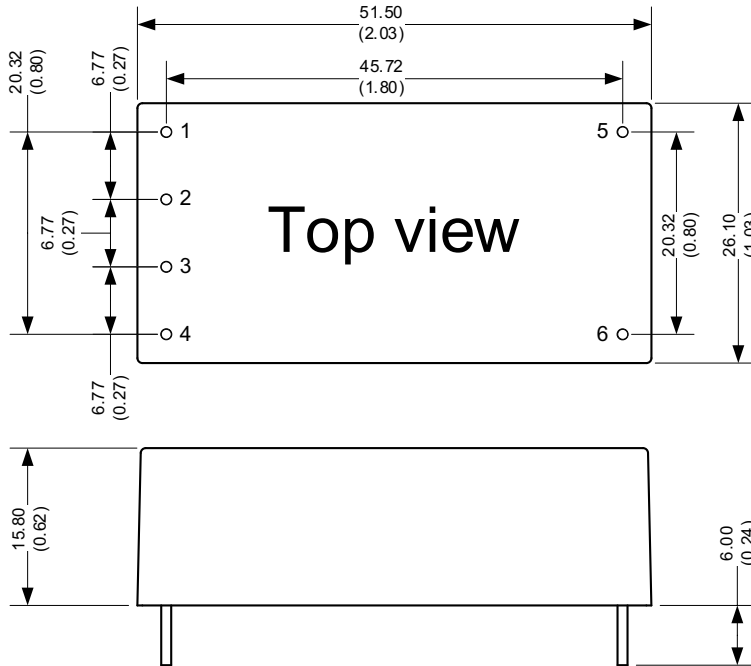
Safety Specifications

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

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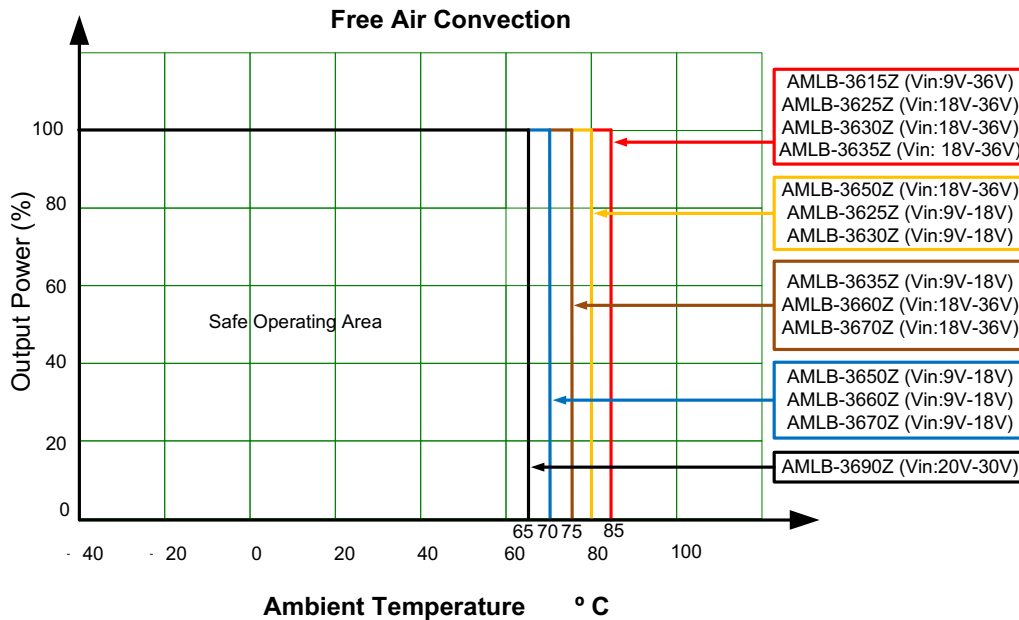F 051e R12.F
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Pin Out Specifications

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

Top view

51.50
(2.03)

45.72
(1.80)

20.32
(0.80)

6.77
(0.27)

6.77
(0.27)

6.77
(0.27)

20.32
(0.80)

26.10
(1.03)

15.80
(0.62)

6.00
(0.24)

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

Operating Temperature

Free Air Convection

Output Power (%)

Safe Operating Area

AMLB-3615Z (Vin:9V-36V)
AMLB-3625Z (Vin:18V-36V)
AMLB-3630Z (Vin:18V-36V)
AMLB-3635Z (Vin: 18V-36V)

AMLB-3650Z (Vin:18V-36V)
AMLB-3625Z (Vin:9V-18V)
AMLB-3630Z (Vin:9V-18V)

AMLB-3635Z (Vin:9V-18V)
AMLB-3660Z (Vin:18V-36V)
AMLB-3670Z (Vin:18V-36V)

AMLB-3650Z (Vin:9V-18V)
AMLB-3660Z (Vin:9V-18V)
AMLB-3670Z (Vin:9V-18V)

AMLB-3690Z (Vin:20V-30V)

Ambient Temperature   ° C

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EMC recommended circuit:
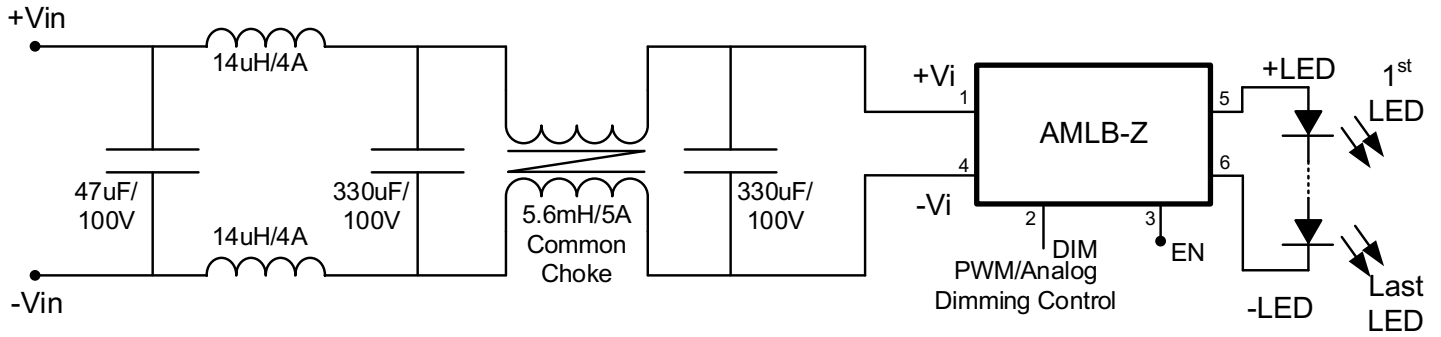
Application circuit examples:

SW	Vout
ON	0V
OFF	normal

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Under Voltage Protection

Analogue DIM
PWM Dim/ON/OFF

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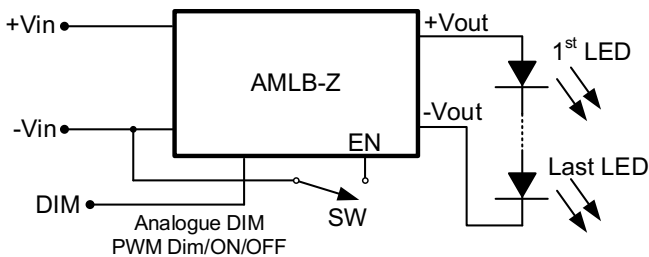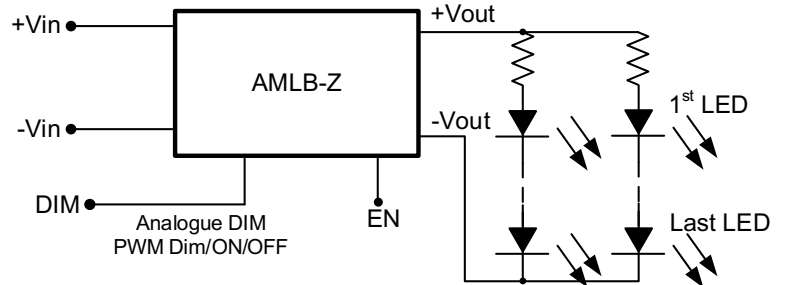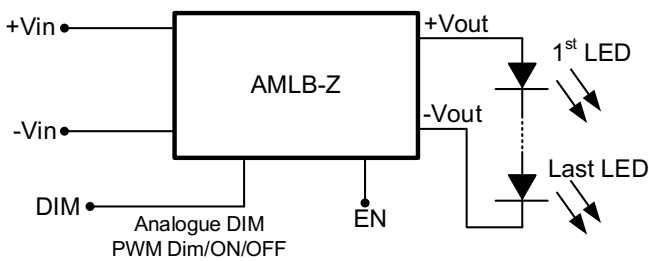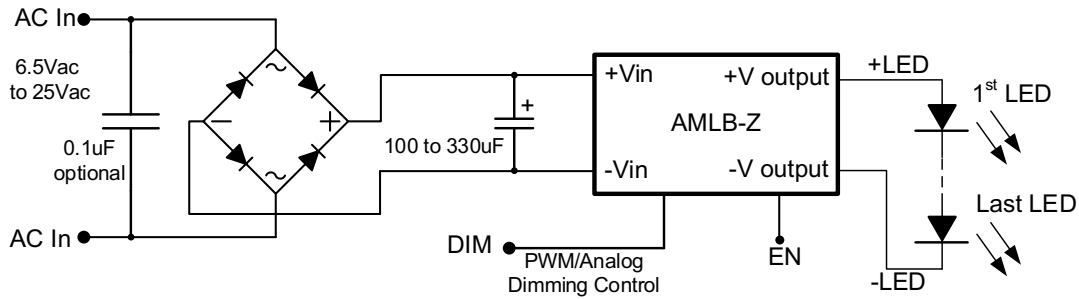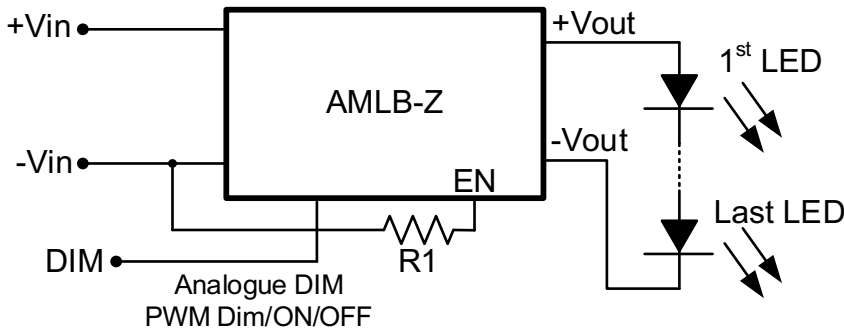
	Under Voltage Protection			
R1	**900mA model**		**Other models**	
	On (V)	Off (V)	On (V)	Off (V)
X	15.6	14.6	7.6	6.8
12K	21.5	19.7	11.0	10.2
10K	22.5	20.7	11.5	10.7
7.5K	25.0	22.5	13.0	12.2
4.7K	-	-	16.2	15.4
3.3K	-	-	20.5	19.7
2.7K	-	-	23.2	22.2
2.4K	-	-	25.0	24.0
2.0K	-	-	28.5	27.5
1.8K	-	-	30.8	29.8

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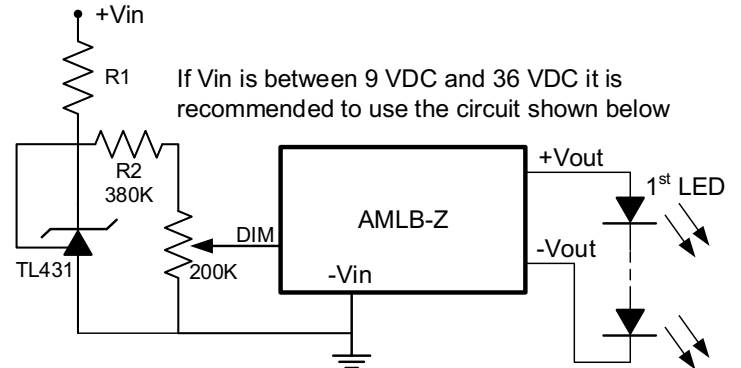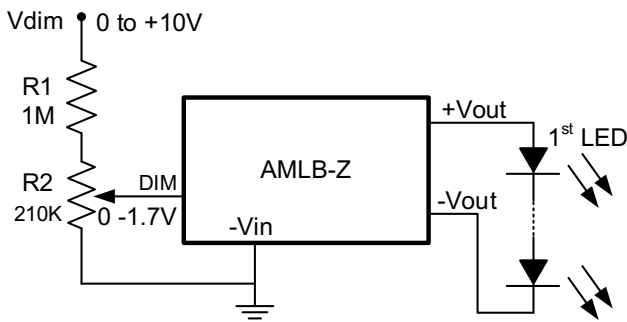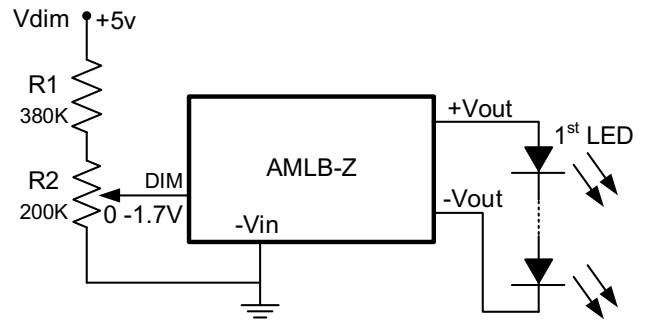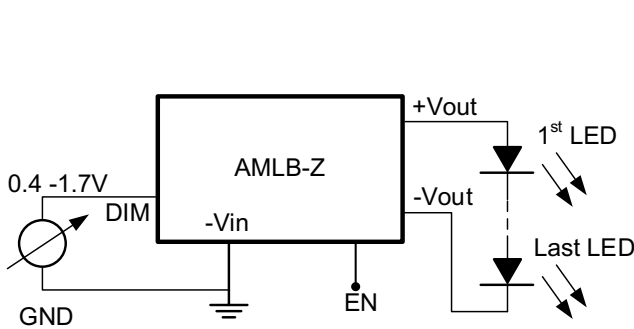
Vin	R1
5V	4.7K
12V	18K
24V	43K
36V	62K

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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.
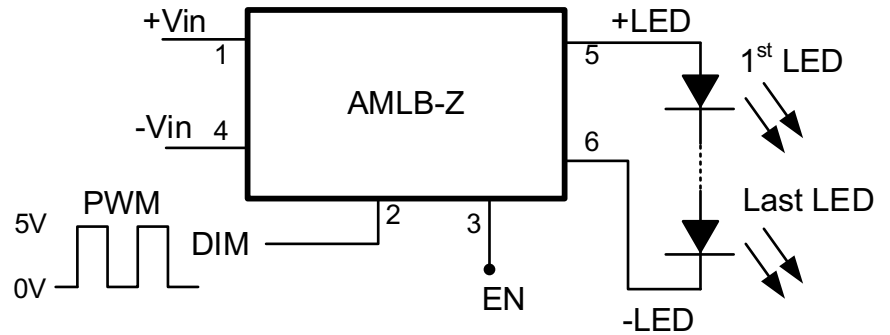
Driving DIM Via Open Collector Transistor

The DIM pin can also be driven via an open collector transistor as shown below.
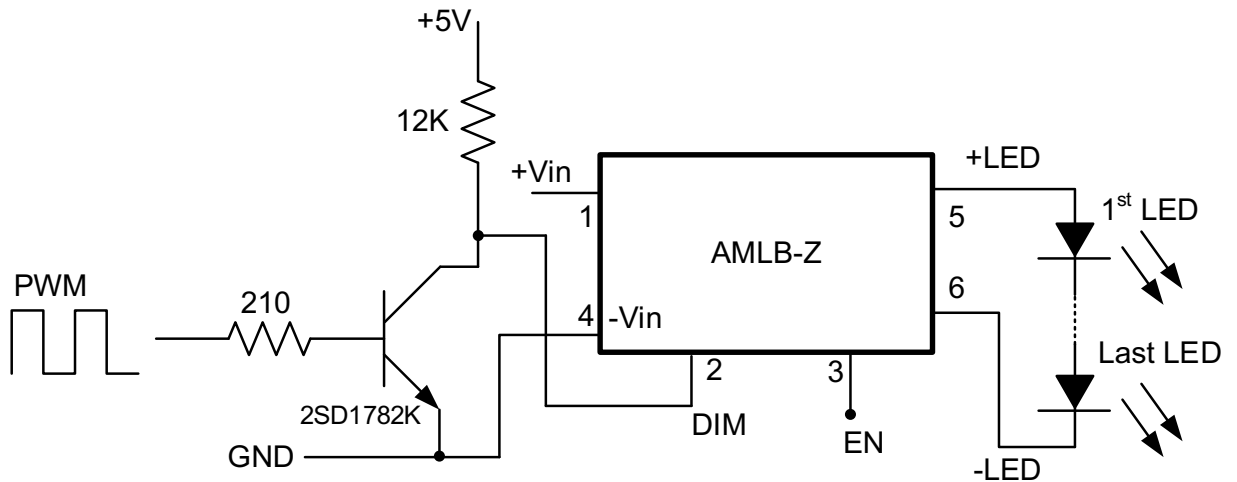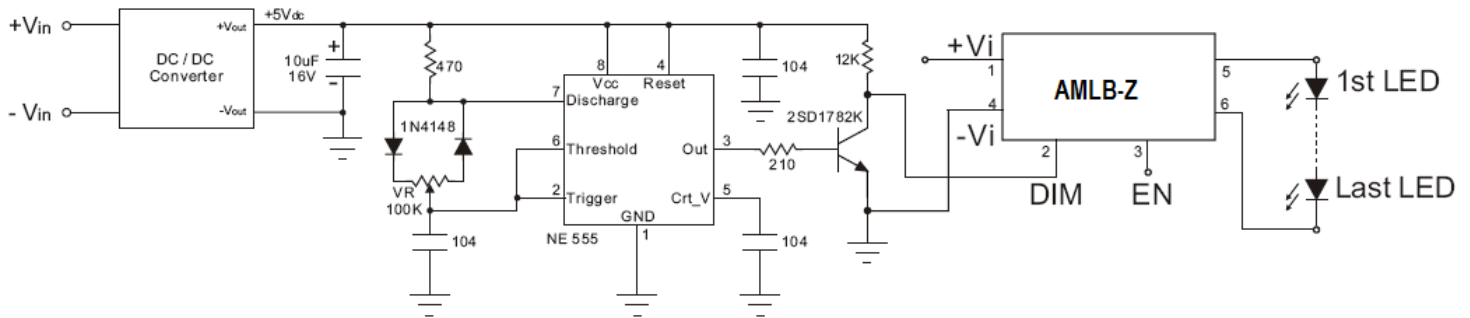
Driving the DIM from a Microcontroller

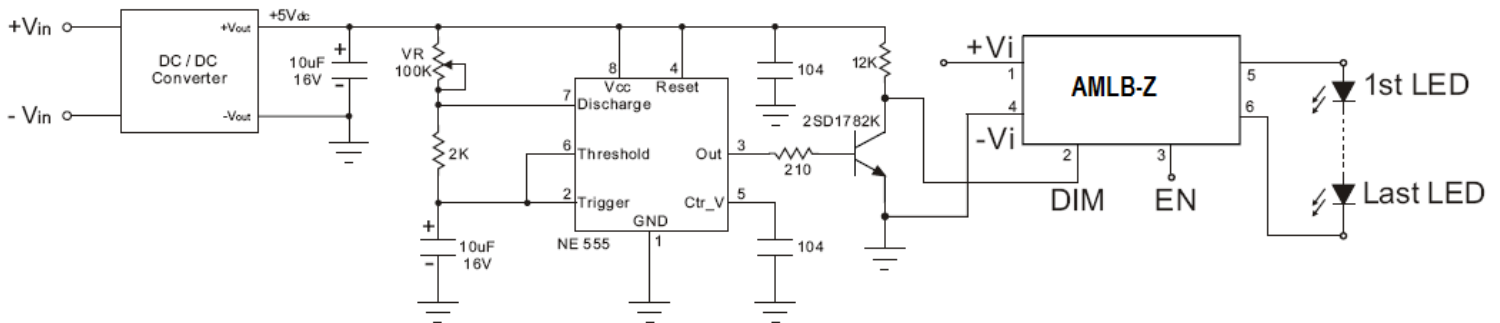The DIM can be driven from an open drain output of a microcontroller as shown below.

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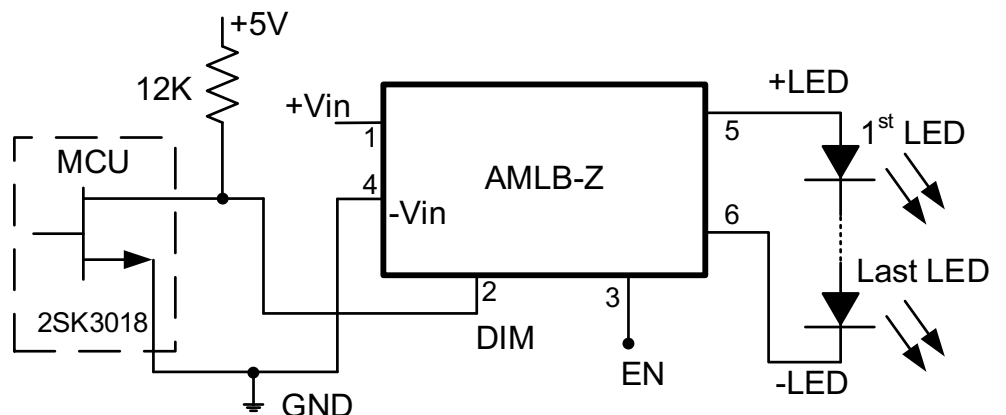
Output Current Adjustment by PWM Control (Dimming):

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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