

Series AMLBW-Z

Up to 700mA | Step Up LED Driver



FEATURES:

- Step UP DC/DC LED driver
- Constant current output
- High efficiency up to 95%
- Soft Start
- IP67 Case
- Operating Temperature 40°C to +85°C
- Open and Short circuit LED Protection
- 2"x1" case package
- Drives LED strings of up to 48V
- PWM/Digital and Analog Voltage dimming

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)
AMLBW-3615Z	9-36	14-48	150	100	91	350
AMLBW-3625Z	9-36	14-48	250	100	93	450
AMLBW-3630Z	9-36	14-48	300	100	94	450
AMLBW-3635Z	9-36	14-48	350	100	94	600
AMLBW-3650Z	9-36	14-45 (Vin:9V-18V) 23-48 (Vin: 18V-36V)	500	47	95	650
AMLBW-3660Z	9-36	14-38 (Vin:9V-18V) 23-48 (Vin: 18V-36V)	600	47	95	650
AMLBW-3670Z	9-36	14-32 (Vin:9V-18V) 23-48 (Vin: 18V-36V)	700	47	95	700
AMLBW-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	AMLBW-3615Z, Vin 9-36V	-40 to +85		°C
	AMLBW-3625Z; AMLBW-3630Z, Vin 9-18V	-40 to +80		°C
	AMLBW-3625Z; AMLBW-3630Z, Vin 18-36V	-40 to +85		°C
	AMLBW-3635Z, Vin 9-18V	-40 to +75		°C
	AMLBW-3635Z, Vin 18-36V	-40 to +85		°C
	AMLBW-3650Z, Vin 9-18V	-40 to +70		°C
	AMLBW-3650Z, Vin 18-36V	-40 to +80		°C
	AMLBW-3660Z; AMLBW-3670Z, Vin 9-18V	-40 to +70		°C
	AMLBW-3660Z; AMLBW-3670Z, Vin 18-36V	-40 to +75		°C
	AMLBW-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		44.2		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.

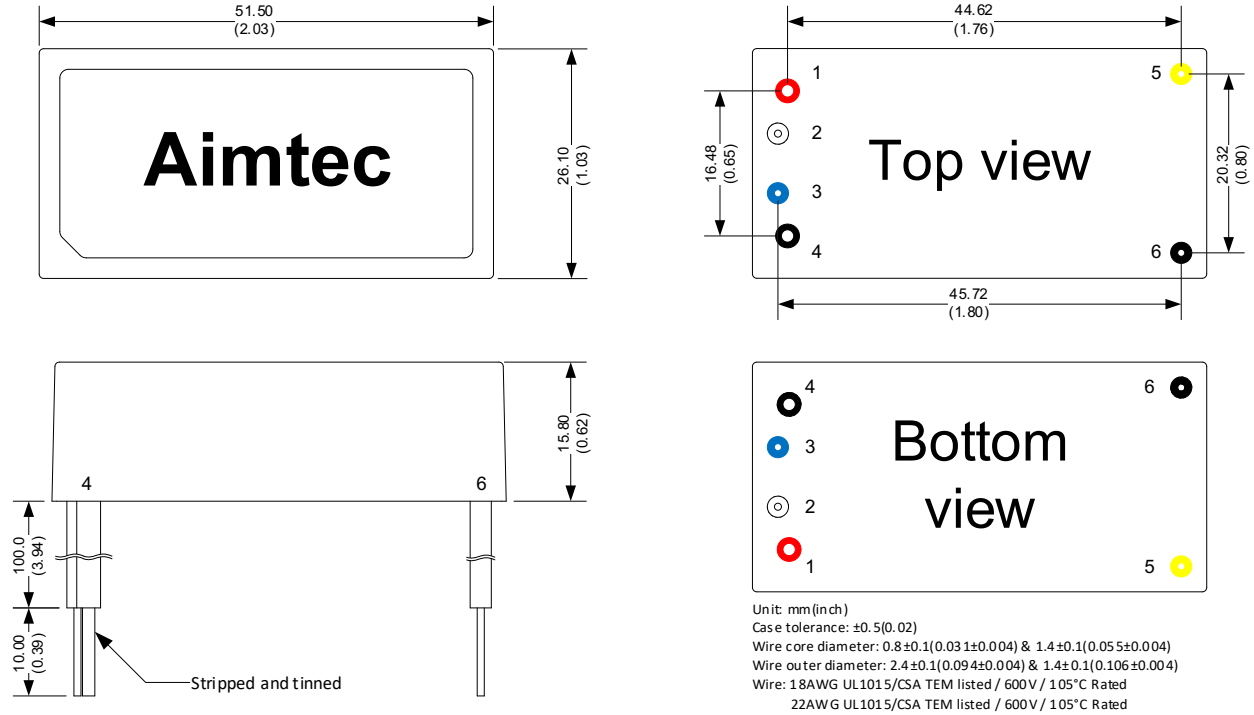
Safety Specifications

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

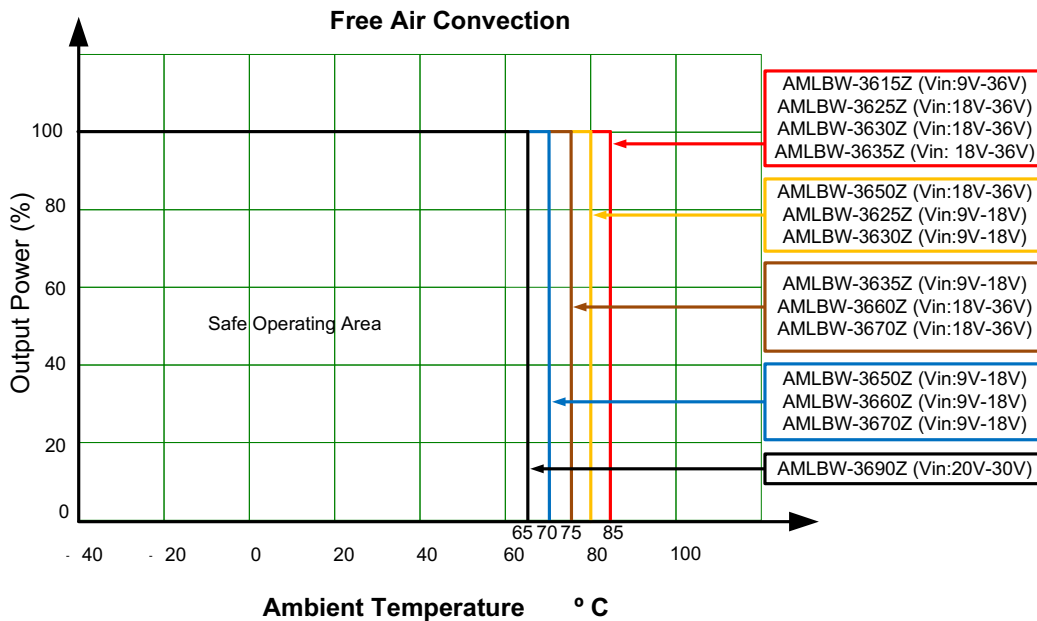
Pin Out Specifications

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

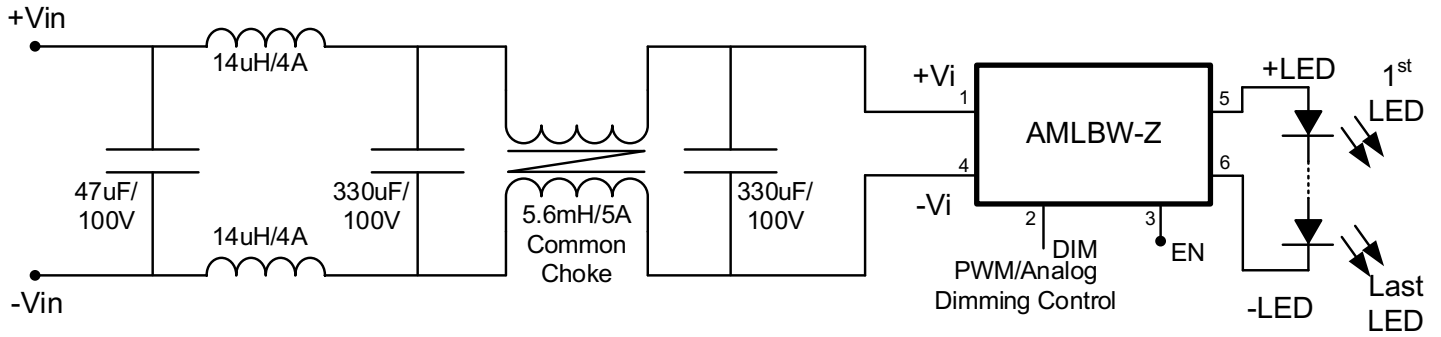
Dimensions



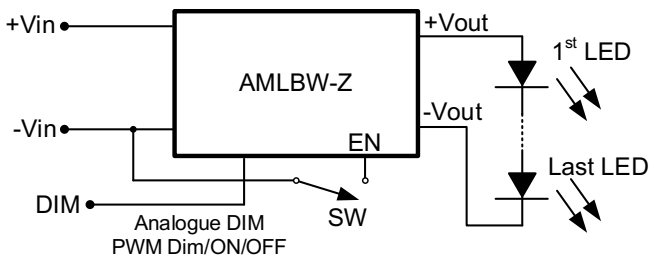
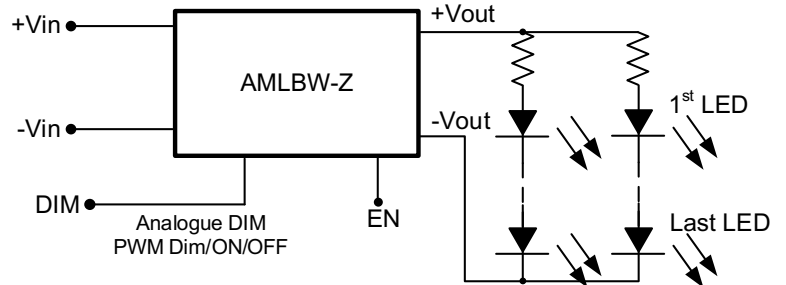
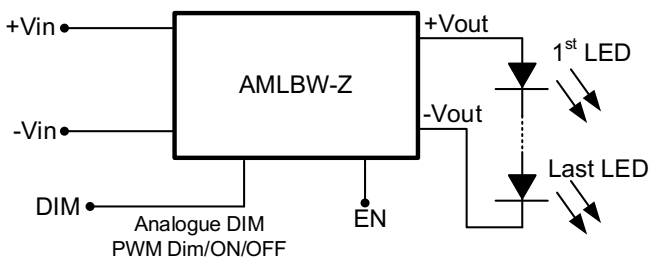
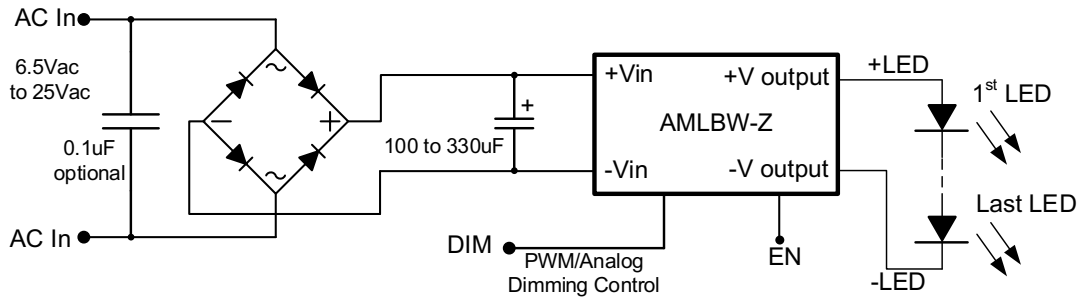
Operating Temperature



EMC recommended circuit:

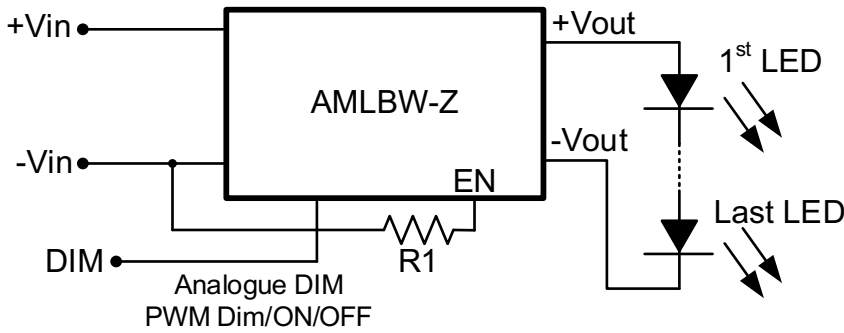


Application circuit examples:



SW	Vout
ON	0V
OFF	normal

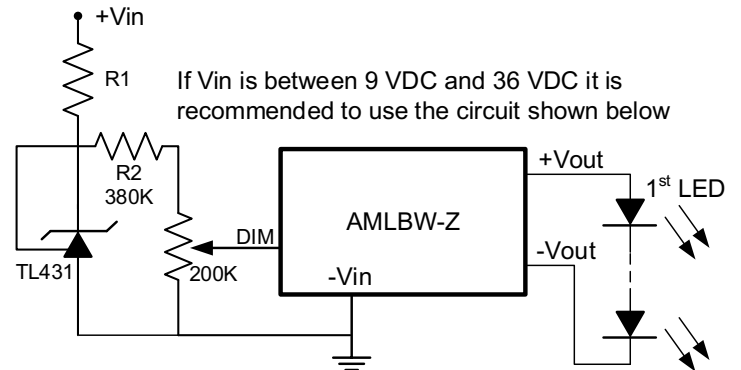
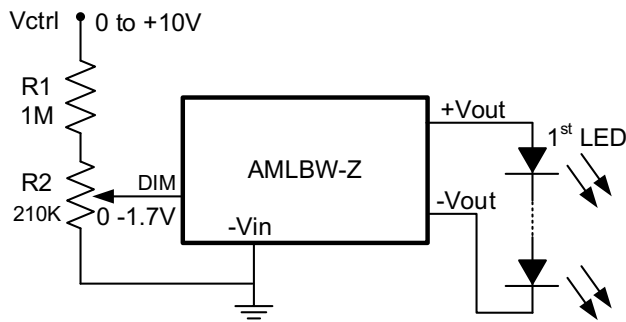
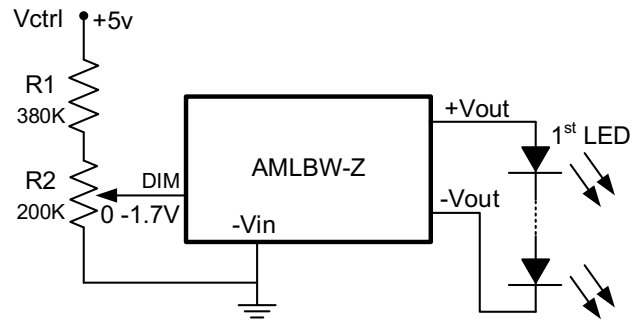
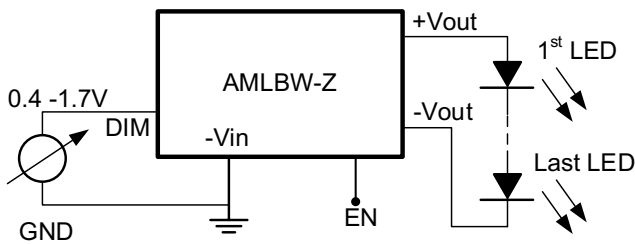
Under Voltage Protection



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):

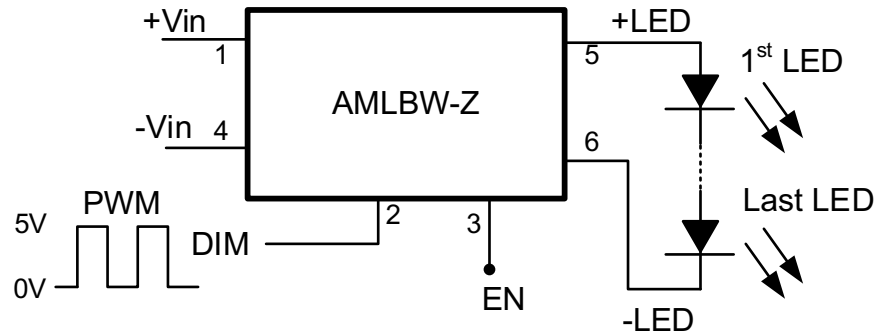


If Vin is between 9 VDC and 36 VDC it is recommended to use the circuit shown below

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

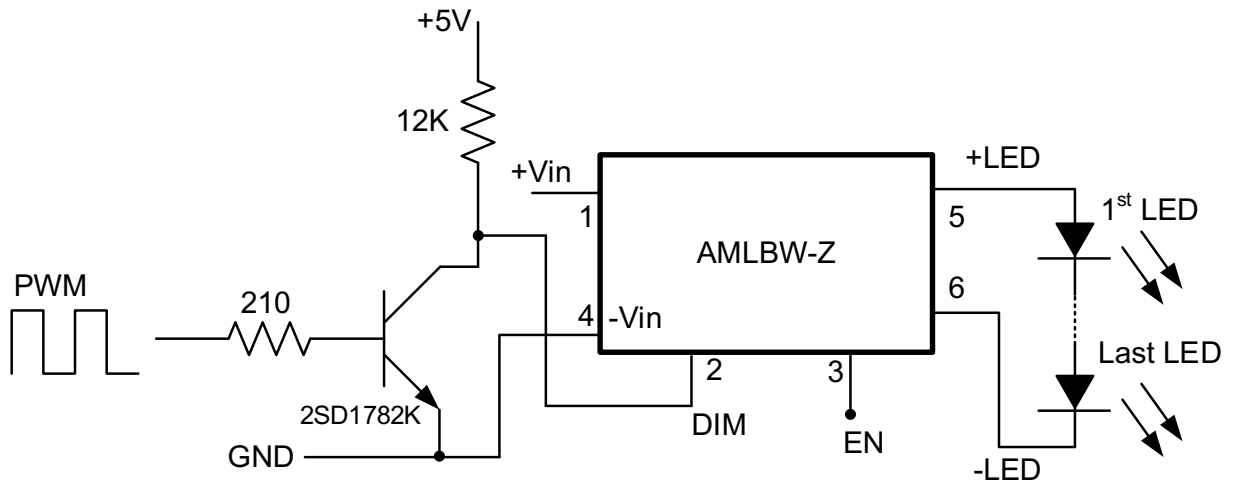
Output Current Adjustment by PWM Control:

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



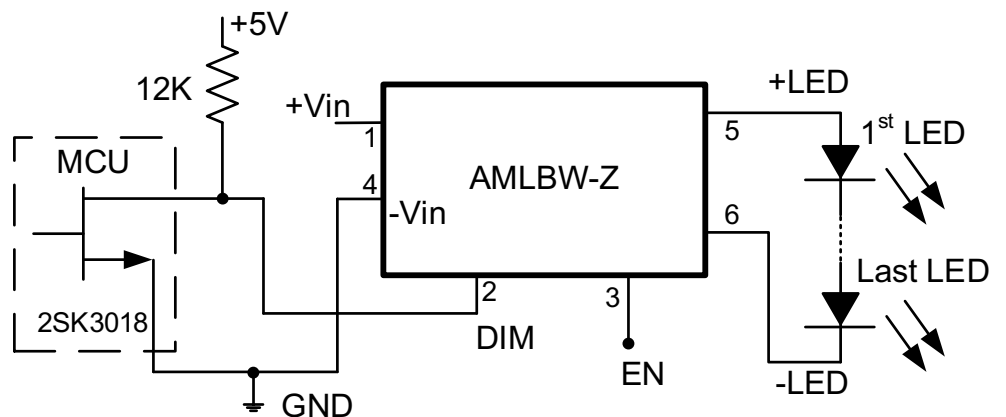
Driving DIM Via Open Collector Transistor

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



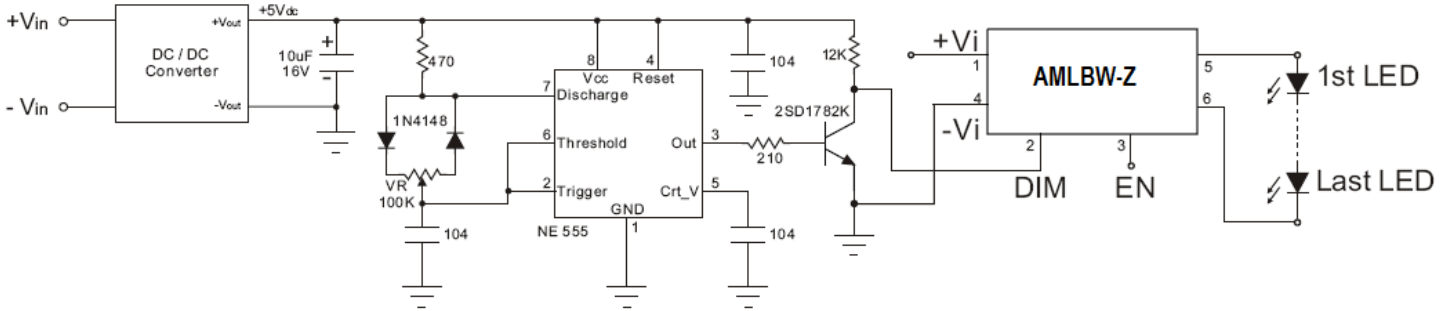
Driving the DIM from a Microcontroller

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

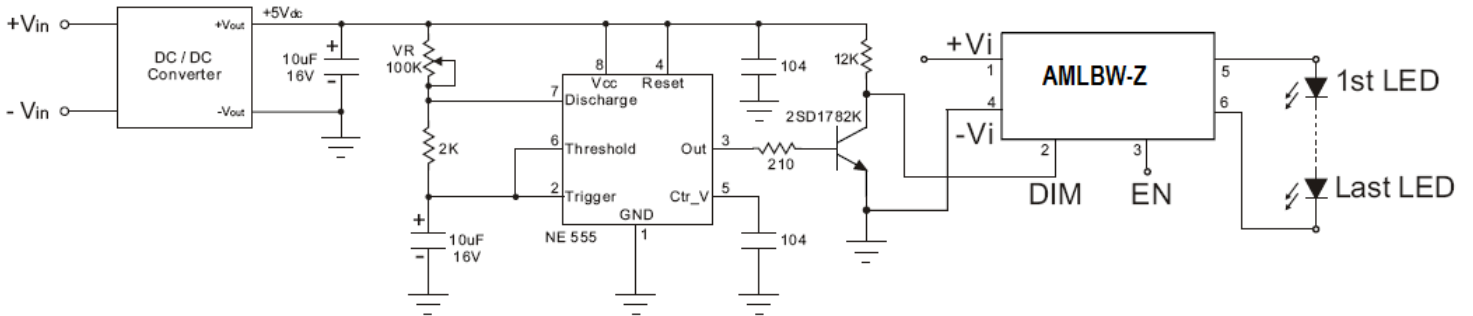


Output Current Adjustment by PWM Control (Dimming):

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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