Series AMLB-Z

Up to 700mA | Step Up LED Driver



FEATURES:

- Step UP DC/DC LED driver
- Constant current output
- High efficiency up to 94%
- Soft Start
- PWM/Digital & Analog Voltage dimming
- Operating Temperature -40ºC to +85ºC
- Open and Short circuit LED Protection
- 2”x1” case package
- 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	90	350
AMLB-3625Z	9-36	14-48	250	100	92	450
AMLB-3630Z	9-36	14-48	300	100	92	450
AMLB-3635Z	9-36	14-48	350	100	92	600
AMLB-3650Z	9-36	14-45 (Vin:9V-18V) 23-48 (Vin: 18V-36V)	500	47	93	650
AMLB-3660Z	9-36	14-38 (Vin:9V-18V) 23-48 (Vin: 18V-36V)	600	47	93	650
AMLB-3670Z	9-36	14-32 (Vin:9V-18V) 23-48 (Vin: 18V-36V	700	47	94	700

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		9-36		VDC
Filter		Capacitor		
Absolute Maximum Rating			38	VDC
Peak Input Voltage time			100	ms
DC/DC ON (Leave open if not used)		ON –Open		
DC/DC OFF		OFF(shutdown) – 0V		
Remote pin drive current	$V_{ON/OFF}$ ≤ 3V		<1.5	µA
Quiescent Input Current in Shutdown mode	(Vin : 9V-32V) (Vin : 32V-36V)		1.3 8	mA
Analog and PWM Dimming Control(Leave open if unused) (DIM)		Absolute Maximum Ratings: 8V		
Analog DIM input voltage rang		0.4 to 1.7		V
Analog Adjust Output Current		0-100		%
DIM Pin Drive Current	0.3≤Vdim≤1.3V	<1.5		µA
PWM Control Voltage Range Limits		1.7≤Vdim≤5.0		V
PWM Recommended Operating Frequency		100Hz-100KHz		
PWM Adjust Output Current		1 – 100 (see graph)		%

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
Under Voltage Protection	Cool Start	≤7.6		V
Soft Start Time			50	ms
Temperature coefficient		±0.03		%/°C
Ripple & Noise	20MHz Bandwidth	See model table		

General Specifications

Parameters	Conditions	Typical	Maximum	Units
Operating frequency	Depending on the model	360-380		KHz
Operating temperature	AMLB-3615Z	-40 to +85		°C
	AMLB-3625Z; AMLB-3630Z	-40 to +80 (Vin 9-18V) / -40 to +85 (Vin 18-36V)		
	AMLB-3635Z	-40 to +75 (Vin 9-18V) / -40 to +85 (Vin 18-36V)		
	AMLB-3650Z	-40 to +70 (Vin 9-18V) / -40 to +80 (Vin 18-36V)		
	AMLB-3660Z; AMLB-3670Z	-40 to +70 (Vin 9-18V) / -40 to +75 (Vin 18-36V)		
Storage temperature	-55 to +125			°C
Maximum case temperature			100	°C
Thermal Impedance	Depending on the model	+13.7 to +17		°C/W
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	> 1 290 000 hrs (MIL-HDBK-217 F at +25 °C/Vin=9V,Vout=38V)			
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 so s not to 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

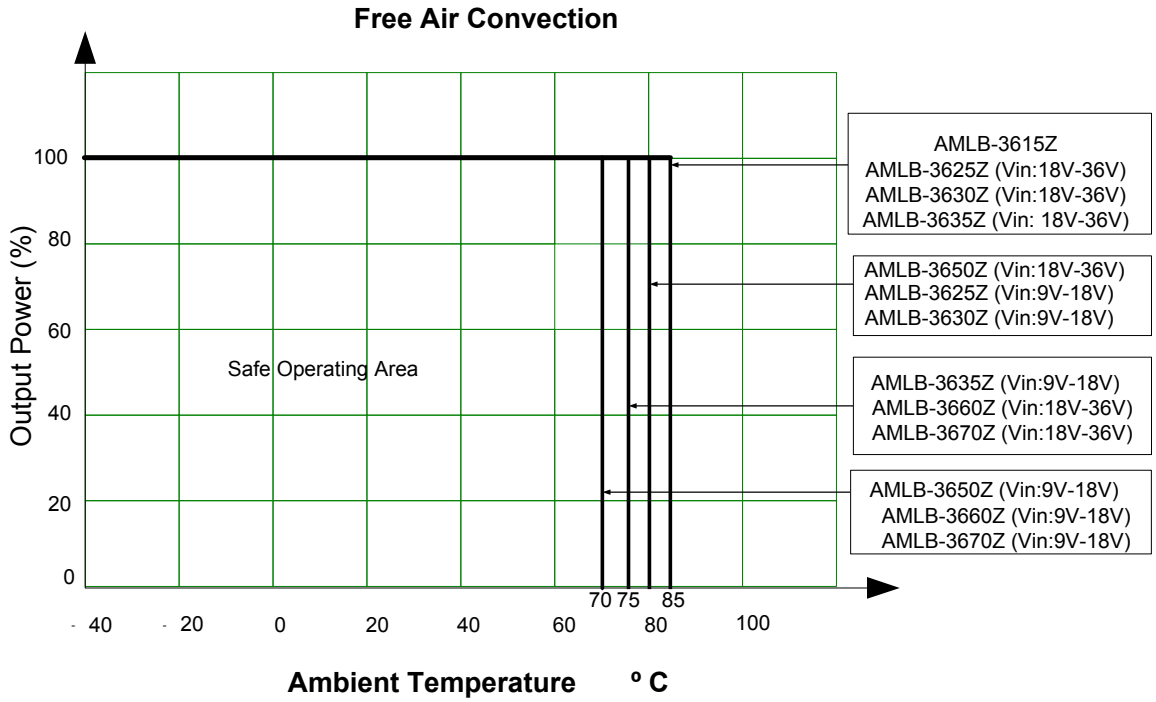
Safety Specifications

Parameters		
Agency approvals	CE, EN 55015, EN 61547, NOTE: Designed to meet EN 55022 Class B, IEC/EN 60950-1 , UL8750, IEC/EN 61347-2-13	
Standards	Electrostatic Discharge Immunity	IEC 61000-4-2
	RF, Electromagnetic Field Immunity	IEC 61000-4-3
	Electrical Fast Transient/Burst Immunity	IEC 61000-4-4
	Surge Immunity	IEC 61000-4-5
	RF, Conducted Disturbance Immunity	IEC 61000-4-6
	Power frequency Magnetic Field Immunity	IEC 61000-4-8
	Voltage dips, Short Interruptions Immunity	IEC 61000-4-11

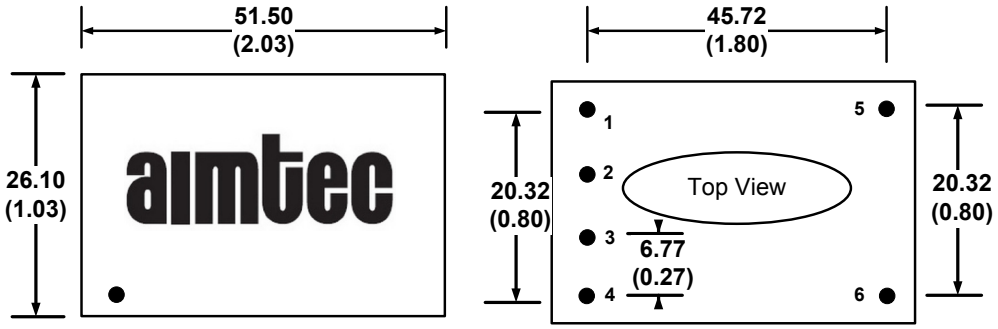
Pin Out Specifications

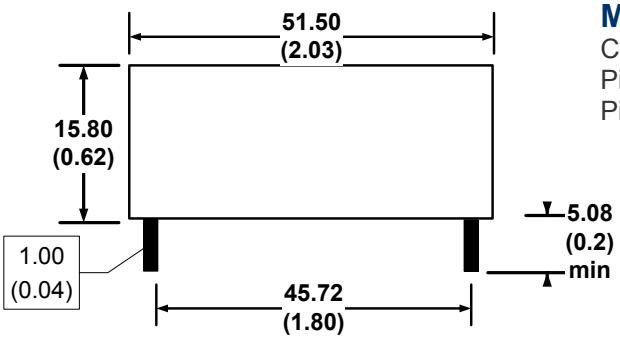
Pin	Single	
1	+Vi	+ DC Supply
2	DIM	PWM/Analog Dimming Control
3	ON/OFF	Remote ON/OFF
4	-Vi	-DC Supply
5	+LED	LED Anode connection
6	-LED	LED Cathode connection

Operating Temperature



Dimensions

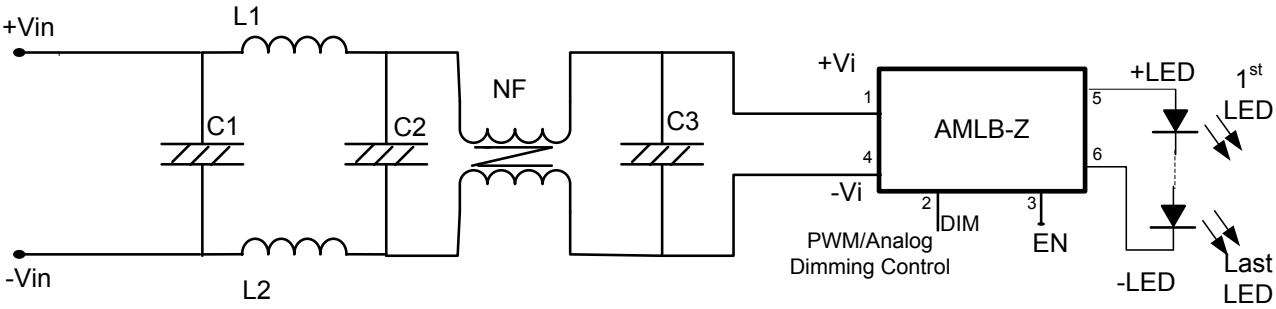




Mechanical Tolerances

Case tolerance ± 0.5mm or ± 0.02 inches
Pin diameter 1.0 ± 0.05mm or 0.04 ± 0.002 inches
Pin Pitch tolerance: ± 0.35 or ± 0.014

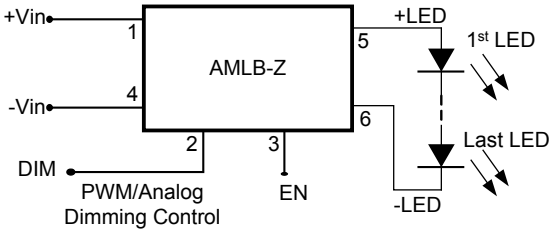
EN55022 Class B Filter Suggestion:

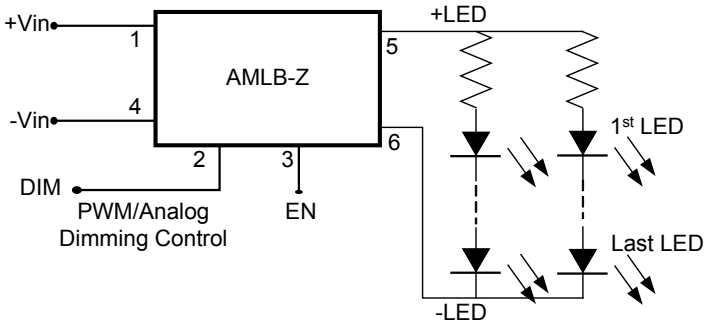


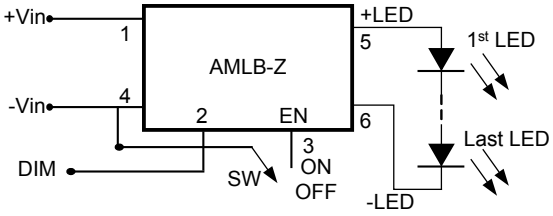
C1→47uF/100V
C2→330uF/100V
C3→330uF/100V

L1→14uH/4A
L2→14uH/4A
NF→5.6mH/5A(Command Choke)

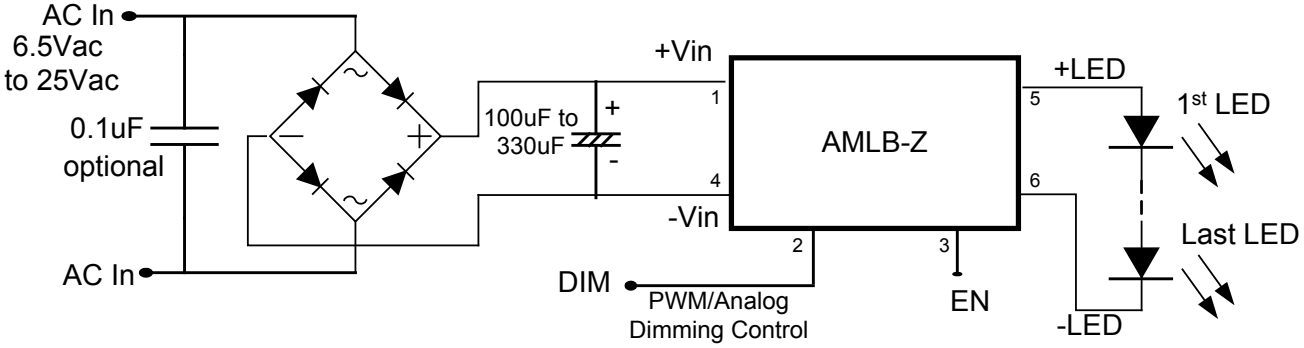
Application circuit examples:



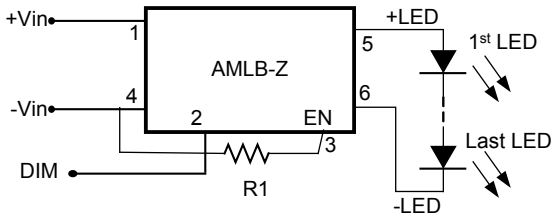




SW	Vout
ON	0V
OFF	normal



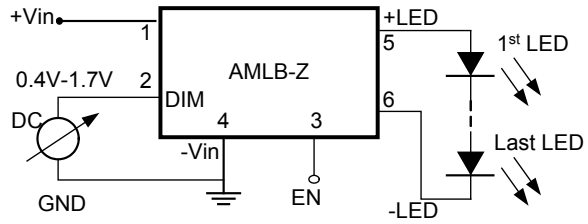
Under Voltage Protection

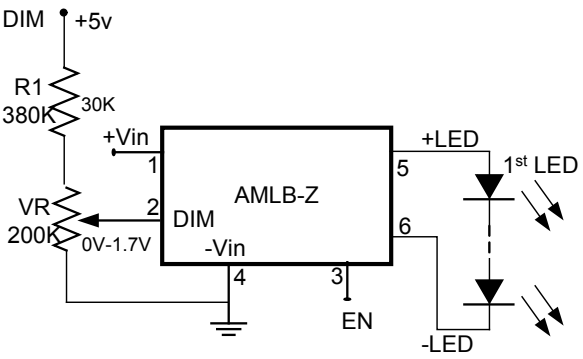


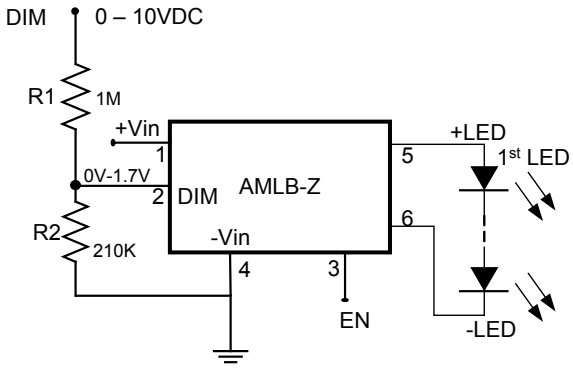
*R1 Value only supplies the reference

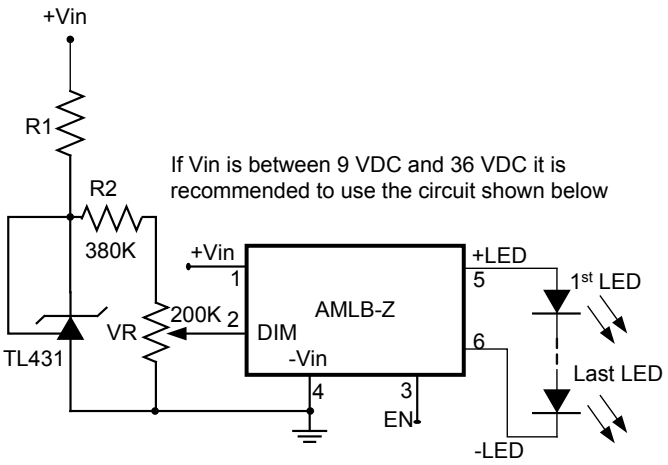
R1	Under Voltage Protection
X	7.6V
12K	10.8V
10K	11.6V
7.5K	13.0V
4.7K	16.5V
3.3K	21.0V
2.7K	24.1V
2.4K	26.2V
2.0K	29.8V
1.8K	32.4V

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







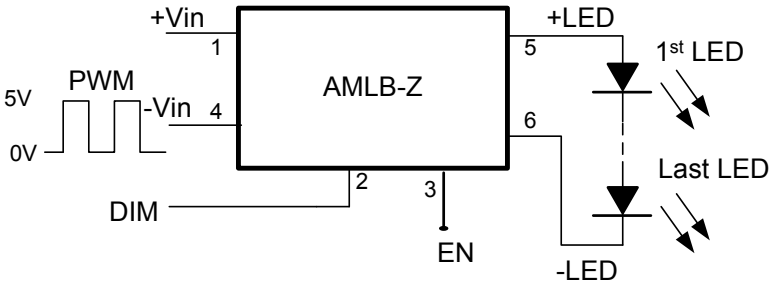


If Vin is between 9 VDC and 36 VDC it is recommended to use the circuit shown below

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

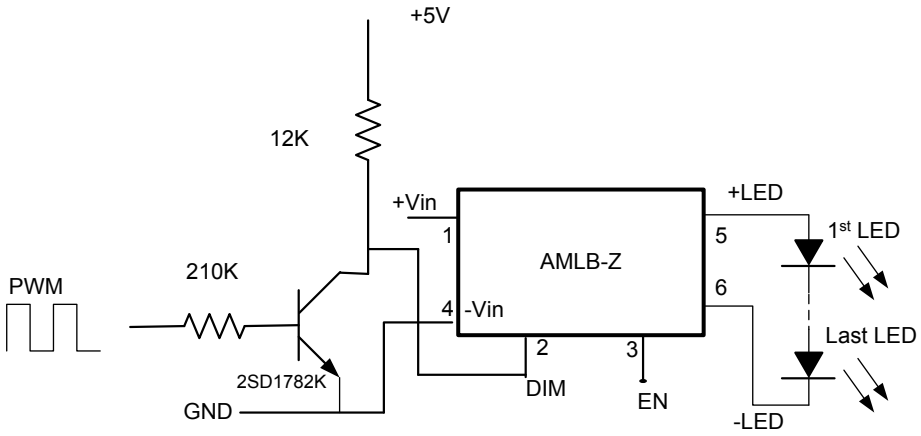
Output Current Adjustment by PWM Control:

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



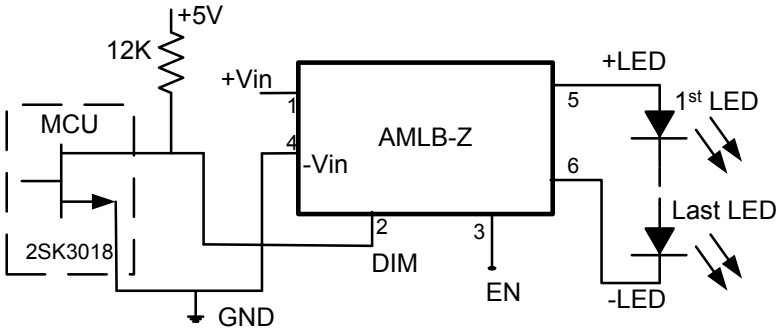
Driving DIM Via Open Collector Transistor

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



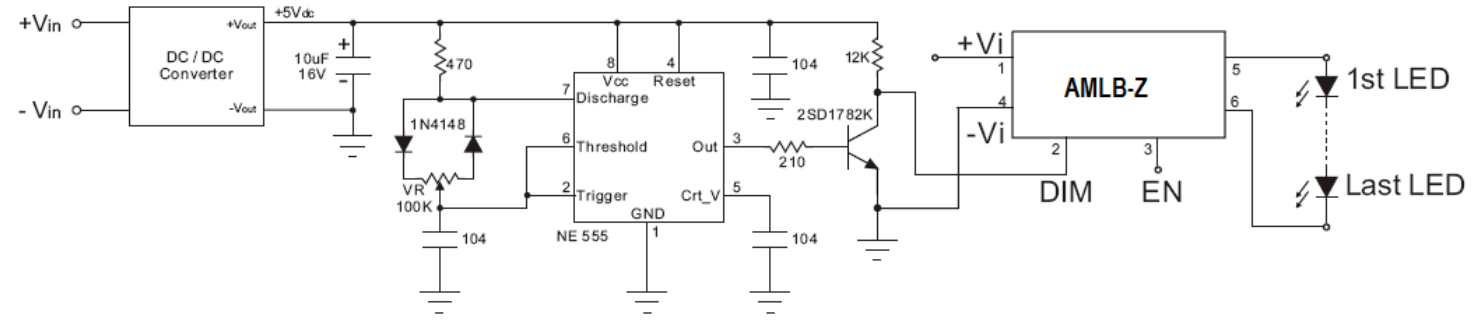
Driving the VADJ from a Microcontroller

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

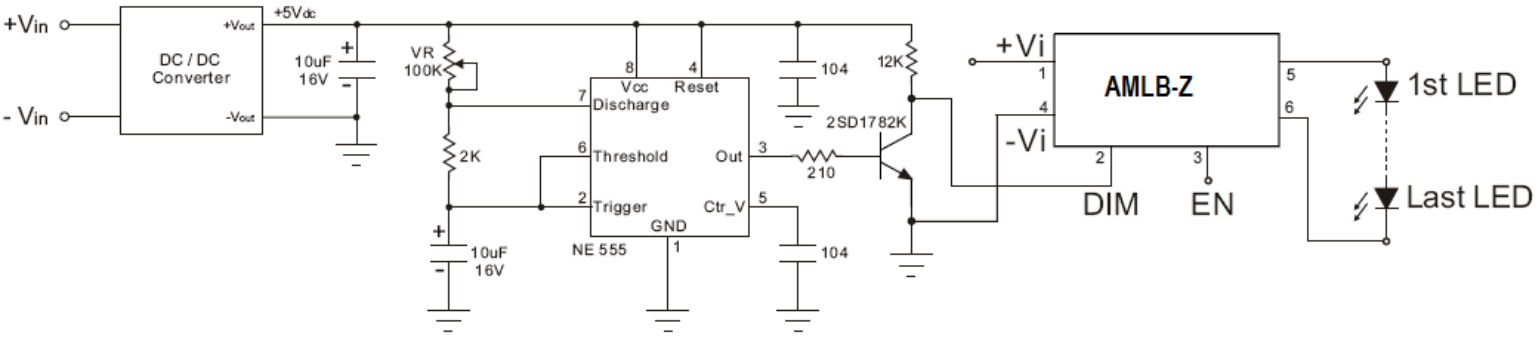


Output Current Adjustment by PWM Control (Dimming):

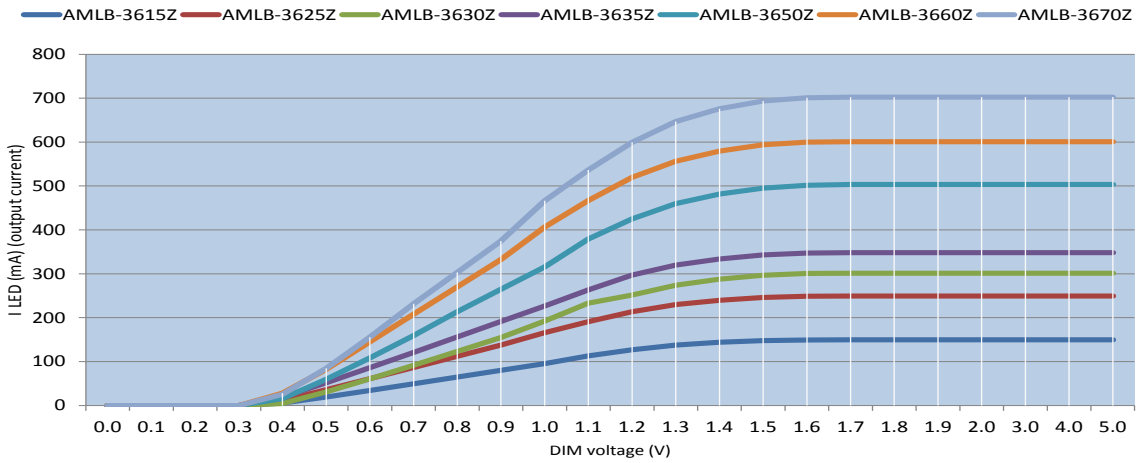
A PWM signal must have a frequency of greater than 100Hz to prevent any visible flicker.



Output Current Adjustment by PWM Control (Flash):



Output Current vs DIM Voltage:



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