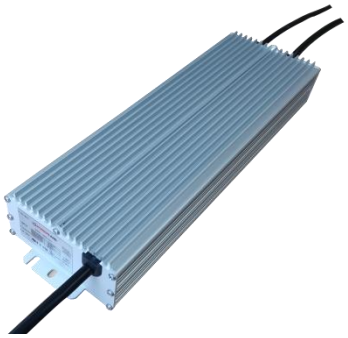
POWERLAND 500W Single Output Programmable LED Driver

Features

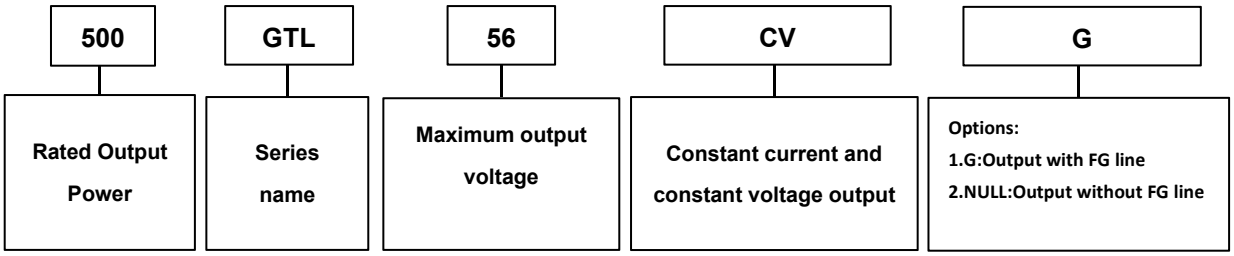


- Dimming port programming without driver power on
- CC/CV hybrid output
- High efficiency (Max 95%), active power factor correction
- Ultra low THD at light load
- Isolated 0~10V/ PWM/Rset dimming, Dim to off option
- 12V/200mA AUX Output
- UL listed with Class P
- IP65

Description

500W LED Drivers offers digital programmable drivers with wide-range adjustable output current, together with 12V/200mA auxiliary output (optional) for smart lighting.
The output current of this series are programmable, and designed for 0-10V/PWM/Rset dimming applications.

Model Name Definition



Specifications

Part Number	Max. Output Power	Programmable Current Region@CC	Output Voltage Range	Programmable Voltage Region@CV	Efficiency @277VAC
500GTL48CV	500W	4.76-11.90A	25-48V	42-48 V	95%
500GTL56CV	500W	4.17-10.42A	28-56V	48-56 V	95%
500GTL80CV	500W	3.13-7.81A	38-80V	64-80 V	95%
500GTL140CV	500W	1.79-4.46A	67-140V	112-140V	95%
500GTL180CV	500W	1.43-3.57A	84-180V	140-180 V	95%
500GTL240CV	500W	1.04-2.60A	115-240V	192-240 V	95%
500GTL300CV	500W	0.83-2.08A	144-300V	240-300V	95%
500GTL375CV	500W	0.67-1.67A	180-375V	300-375V	95%
500GTL460CV	500W	0.53-1.33A	225-460V	375-460V	95%

Note: Efficiency value is typical value.

Input Specifications

Parameter	Min.	Typ.	Max.	Notes
Rated Input AC Voltage	120 Vac	-	277 Vac	
Limit Input AC Voltage	90 Vac	-	305 Vac	
Input DC Voltage	127 Vdc	-	300 Vdc	
Input Frequency	47 Hz	-	63 Hz	
Leakage Current	-	-	0.75 mA	At 277Vac / 60Hz input , grounding effectively
Input AC Current	-	-	2.1A	Measured at 25°C, full load and 277 Vac input.
	-	-	4.8A	Measured at 25°C, full load and 120 Vac input.
Inrush Peak Current	-	-	65A	At 220Vac input, 25℃ cold start,
PF	0.9	-	-	At 120-277Vac, full load, 25°C and 50Hz
THD	-	-	20%	
Efficiency	94%	95%	-	Measured at 277Vac input、100% load and steady-state temperature in 25°C ambient

Output Specifications

Parameter	Min.	Typ.	Max.	Notes
Output Current Tolerance	-5%Io set	-	5%Io set	At 25℃ and full load condition
Total Output Current Ripple (pk-pk)	-	-	10%Io max	At 25°C and full load condition, 8kHz BW.
Startup Overshoot Current	-	-	20%Io max	At 25°C and full load condition, 8kHz BW.
No Load Output Voltage	-	-	59V	500GTL56CV only
Line Regulation	-	-	±1%	Measured at 25℃ and full load
Load Regulation	-	-	±1%	
Turn-on Delay Time	-	0.8 s	1.5 s	Measured at 120Vac input.
Temperature Coefficient of Io set	-0.03%/°C	-	0.03%/°C	Case temperature = 0°C ~Tc max
12V Auxiliary Output Voltage	11V	12 V	15 V	
12V Auxiliary Output Source Current	0 mA	-	200 mA	Return terminal is “Dim−“
OTP Tc(Note1)	85°C	90°C	100°C	Output current will drop to 50% lowest, or shut down.
SCP				Hiccup mode, Auto recover

General Specifications

Parameter	Min.	Typ.	Max.	Notes
Standby power	-	-	1.5 W	Measured at 220Vac/50Hz; Dimming off
MTBF	234,000 Hours	-	-	Measured at 220Vac input, 80%Load and 25°C ambient temperature (MIL-HDBK-217F)
Lifetime	60,000 Hours	80,000 Hours	-	Measured at 220Vac input, 80%Load and 75°C case temperature; See lifetime vs. Tc curve for the details
Operating Case Temperature	-40°C	-	90°C	

Tc(Note1)				
Operating Ambient Temperature Ta	-40°C	-	50°C	At 220-277Vac input.
Storage Temperature	-40°C	-	+85°C	Humidity: 5%RH to 100%RH
IP Grade	IP65			
Dimensions Inches (L × W × H) Millimeters (L × W × H)	 12.05 × 3.89 × 1.81 306 × 98.8 × 46.1			
Net Weight/pcs	-	2.4kg	-	
Package	L382 x W277 x H141 4PCS/Ctn			

Note1:There are three points could be maximum Tc point, depending on different Vac input and Vdc output.These three points(Tc,Tc1,Tc2) position are shown in below mechanical drawing.

Dimming Specifications

Parameter	Min.	Typ.	Max.	Notes
Absolute Maximum Voltage on the Vdim (+) Pin	-1 V	-	12 V	
Source Current on Vdim (+)Pin	90 uA	100 uA	110 uA	
Dimming Output Range	10%Io set	-	Io set	80%Io max ≤ Io set ≤ 100%Io max
	8%Io max	-	Io set	Io set ＜80%Io max
Recommended Dimming Input Range	0 V	-	10 V	Default 0-10V dimming mode.
Dim off Voltage	0.3 V	0.5 V	0.8V	
Dim on Voltage	0.5V	0.7 V	1 V	
Hysteresis	-	0.2 V	-	
PWM_in High Level	9.8 V	10V	10.2 V	PWM is disabled default, please inform us if need this function enable.
PWM_in Low Level	-0.3 V	-	0.6 V	
PWM_in Frequency Range	200 Hz	-	3 KHz	
PWM_in Duty Cycle	1%	-	100%	
PWM Dimming off	3%	5%	7%	
PWM Dimming on	5%	7%	9%	

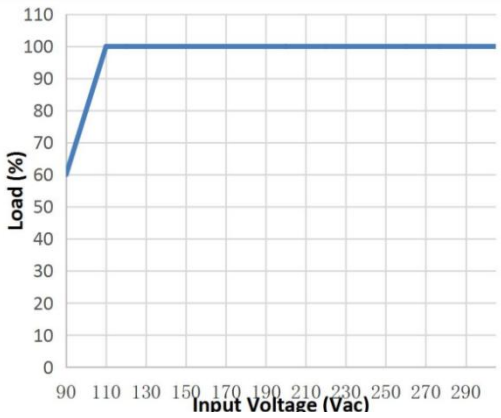
Safety &EMC Compliance

Safety Category	Standard
UL/CUL	UL8750,CAN/CSA-C22.2 No. 250.13-12
Dielectric Strength(Hi-pot)	Primary to Secondary: 3150Vac 10mA max.(500GTL56CV)
	Primary to Earth: 1600Vac 10mA max.(500GTL56CV)
	Secondary to Earth: 500Vac 10mA max.(500GTL56CV)
	Dimming to Output: 500Vac 10mA max.(500GTL56CV)
Insulation Resistance	50Mohm min.@ primary to secondary add 500Vdc test voltage
Grounded Resistance	0.1Ω max. @ 25A, 1 minute
EMI Standards	Notes
	ANSI C63.4:2009 Class B

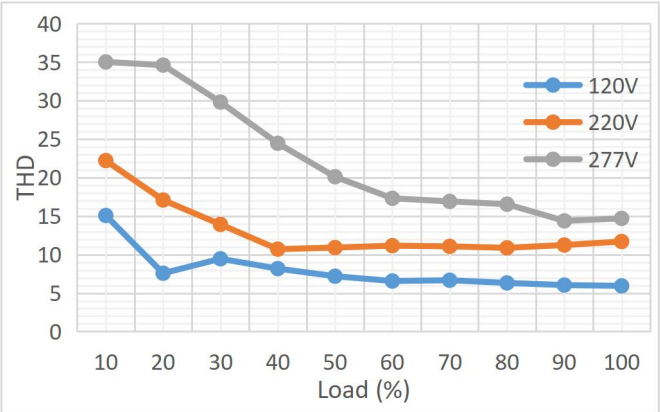
FCC Part 15	This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired Operation.
EMS Standards	Notes
EN 61000-4-2	Electrostatic Discharge (ESD): 8 kV air discharge, 4 kV contact discharge
EN 61000-4-3	Radio-Frequency Electromagnetic Field Susceptibility Test-RS
EN 61000-4-4	Electrical Fast Transient / Burst-EFT: level 3, criteria A
EN 61000-4-5	Surge Immunity Test: AC Power Line: line to line 4 kV, line to earth 6 kV
EN 61000-4-6	Conducted Radio Frequency Disturbances Test-CS
EN 61000-4-8	Power Frequency Magnetic Field Test
EN 61000-4-11	Voltage Dips
EN 61547	Electromagnetic Immunity Requirements Applies To Lighting Equipment

Performance Curve

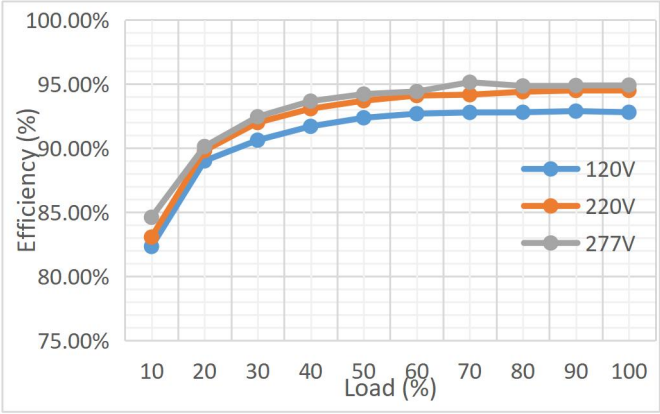
Input Voltage Derating Curve



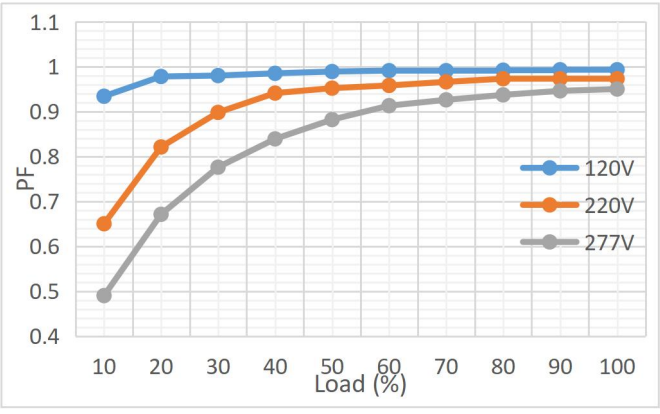
Total Harmonics Vs Different Loads

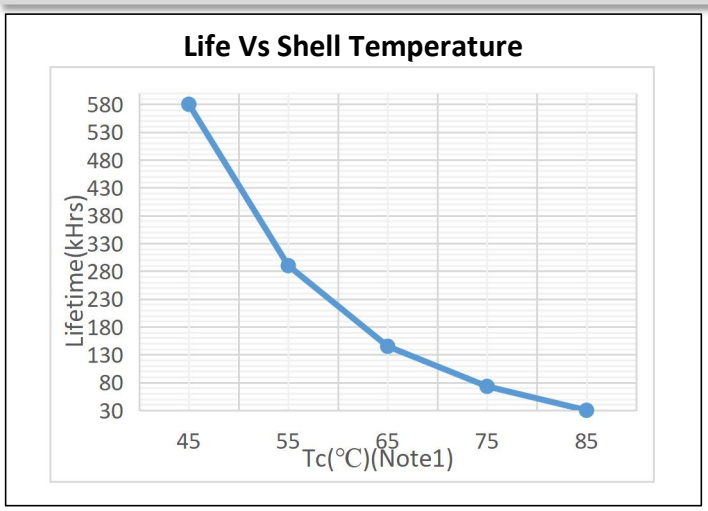


Efficiency Vs Different Loads

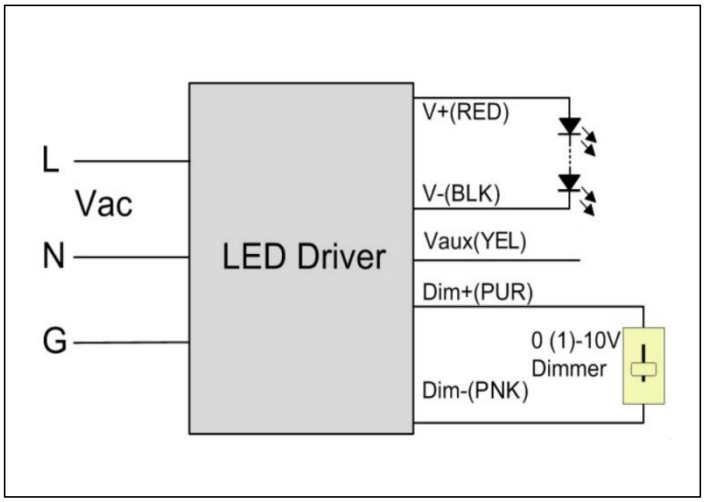


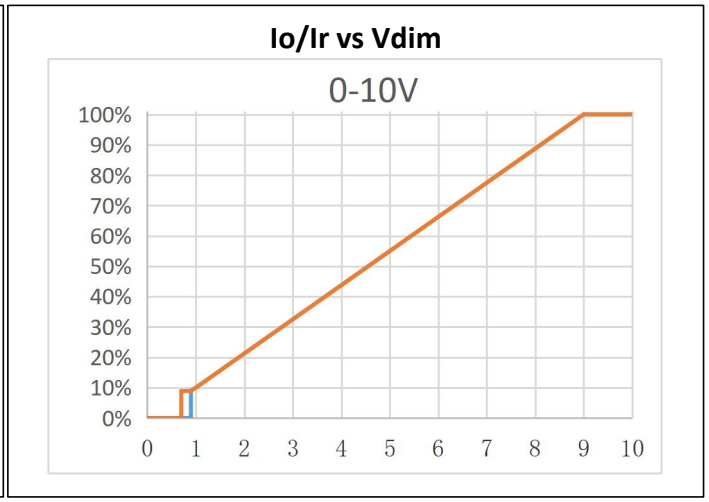
Power Factor Vs Different Loads

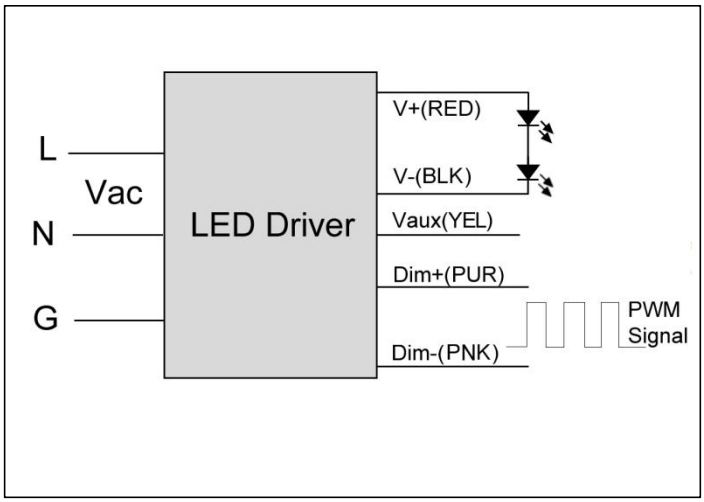


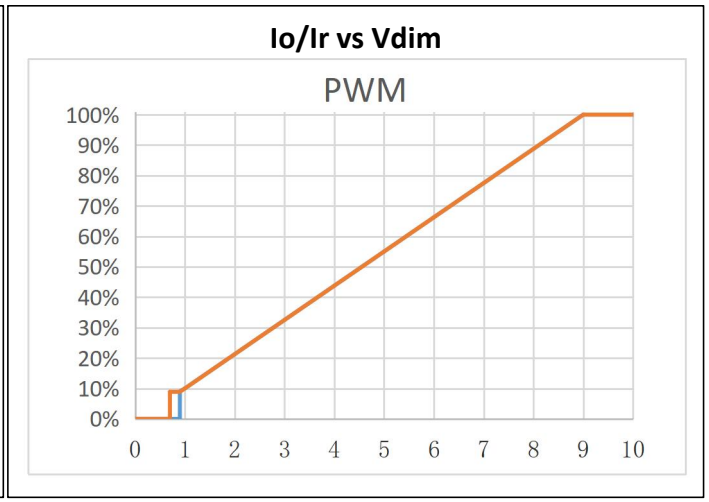


0-10V Analog Dimming &PWM Dimming



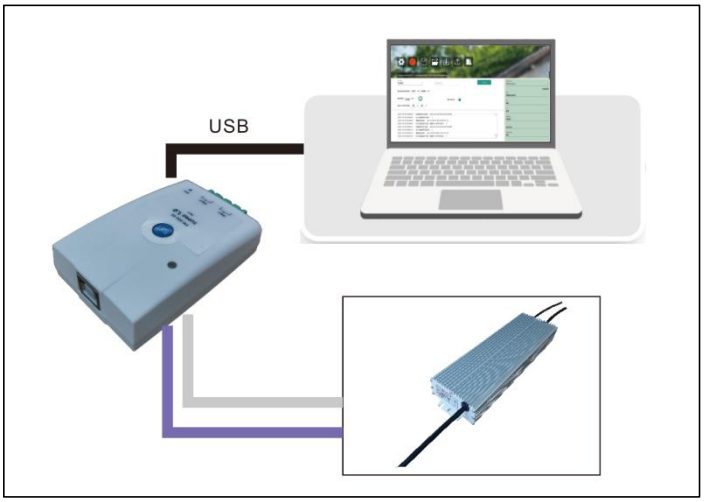




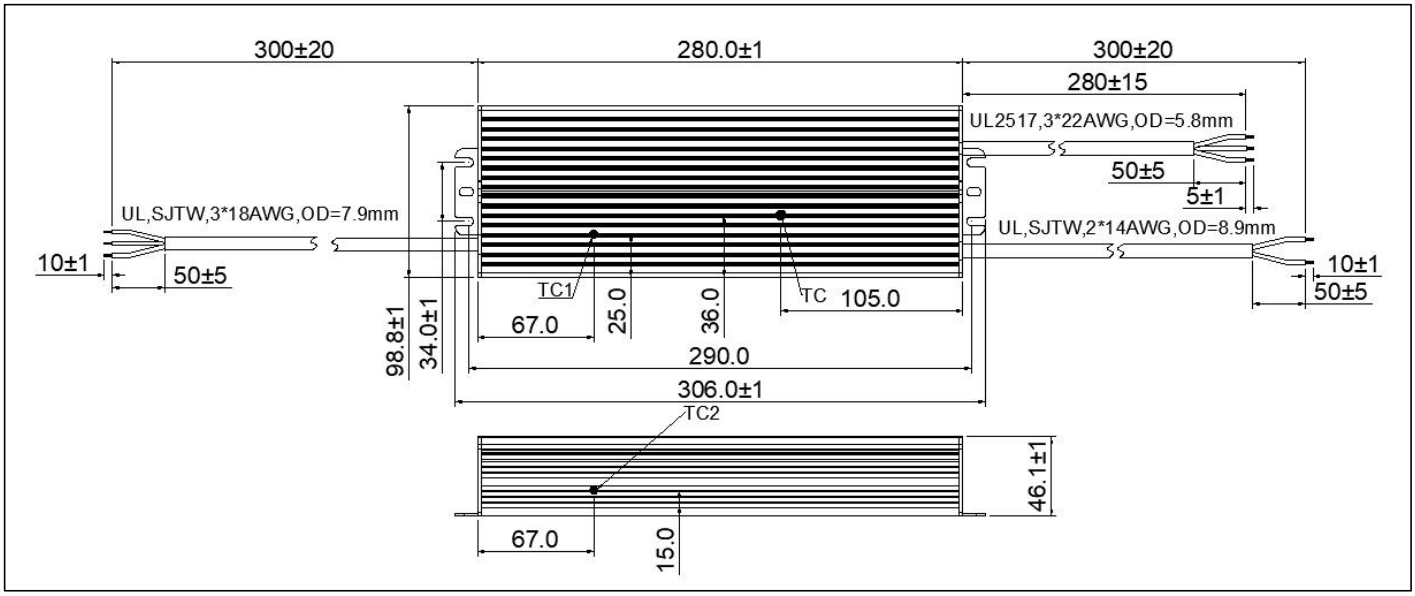


Note: The gray line in the dimming line will be changed to pink from January 1, 2022.

Programming wiring diagram



Mechanical Specification



Ordering information

Part Number	Rated Input AC Voltage	Channels output	Output whether with FG line	Dimming
500GTL48CV	120-277Vac	1	Without	0-10V
500GTL48CVG	120-277Vac	1	With	0-10V
500GTL56CV	120-277Vac	1	Without	0-10V
500GTL56CVG	120-277Vac	1	With	0-10V
500GTL80CV	120-277Vac	1	Without	0-10V
500GTL80CVG	120-277Vac	1	With	0-10V
500GTL140CV	120-277Vac	1	Without	0-10V
500GTL140CVG	120-277Vac	1	With	0-10V
500GTL180CV	120-277Vac	1	Without	0-10V
500GTL180CVG	120-277Vac	1	With	0-10V
500GTL240CV	120-277Vac	1	Without	0-10V
500GTL240CVG	120-277Vac	1	With	0-10V
500GTL300CV	120-277Vac	1	Without	0-10V
500GTL300CVG	120-277Vac	1	With	0-10V
500GTL375CV	120-277Vac	1	Without	0-10V
500GTL375CVG	120-277Vac	1	With	0-10V
500GTL460CV	120-277Vac	1	Without	0-10V
500GTL460CVG	120-277Vac	1	With	0-10V

Revision History

Change Date	Rev.	Description of Change		
		Item	From	To
2021.7.30	V1.0			
2021.10.17	V1.1	Update Performance Curve		
2022.1.2	V1.2	Dimming line	gray	pink
2022.8.26	V1.3	Update company logo		
		Update Performance Curve		
		Update Mechanical Specification		Add Tc1 ahd Tc2 point
2025.11.6	V1.4	Input AC Voltage	Input AC Voltage: 90-305Vac	Add Rated Input AC Voltage: 120-277Vac Mod Limit Input AC Voltage: 90-305Vac
		Input Specifications		Add Efficiency
		General Specifications		Add IP Grade
		PF/THD	At 100-277Vac, full load	At 120-277Vac, full load, 25°C and 50Hz
		Total Output Current Ripple (pk-pk)	At 25℃ and full load condition, 20 MHz BW	At 25°C and full load condition, 8kHz BW
		Startup Overshoot Current	At 25°C and full load condition	At 25°C and full load condition, 8kHz BW
		Safety &EMC Compliance		Add Dielectric Strength(Hi-pot) &Insulation Resistance &Grounded Resistance
		Mod Programming wiring diagram		
		Add ordering information		
		No Load Output Voltage	Typ: 57V Max: -	Typ: - Max: 59V
		MTBF	Typ: 234000 Hours Min: -	Typ: - Min: 234000 Hours
		Lifetime	Typ: 80,000 Hours Min: -	Typ: 60,000 Hours Min: 80,000 Hours
		Line Regulation	Measured at full load	Measured at 25°C and full load
		Absolute Maximum Voltage on the Vdim (+) Pin	Max: 15V	Max: 12V