20 Watt — LBS20W V2.0

Third Generation: class 2 dimming, dim-to-1%-to-off, standby power <0.5W

CONSTANT CURRENT LED DRIVER WITH 0-10V DIMMING.

US & CN, LED Driver Class 2

LBS Series Driver is a high-performance LED driver that provides smooth, continuous 1% dimming for virtually any LED fixture, whether it requires constant current. It provides the performance of class 2 isolating dimming and dim to off. It is the most versatile LED driver offered today due to its compatibility with a wide variety of LED arrays, multiple form factors, and numerous control options.

Enclosure

Notice of use:
1. The DIM+ line can't touch the DC+ line and AC line.
2. DC- cannot be shorted with the DIM-.

Size \ Unit	Inch	Millimeter
Case Length	3.37	85.5
Case Width	1.40	35.5
Case Height	0.91	23.0
Mounting Length	3.07	78.0

LED wiring distance

Recommended maximum wiring distance at full load.

AWG	#20	#19	#18	#17	#16
Distance (m)	14	18	22	28	36
Distance (ft)	45.9	59	72.2	91.9	118.1

Key Features

- Drive Mode: Constant Current, Dimming, Standby.
- Technology: Active PFC 1-Stage Switch Mode.
- Input Voltage: 120 to 277 Vac (UL), 100 to 240 Vac (ENEC).
- Output Power: 20 Watt Max.
- Dimming: Smooth & Continuous Dimming from 1% to 100%, dim-to-off.
  LEDs turn on to any dimmed level without going to full brightness.
  Constant Current Reduction (CCR) dimming methods.
  0-10V: 2 or 3-wire Analog / Digital Control Dimming (Isolated type).
- Output Voltage: 12 Vdc to 57 Vdc.
- Output Current: 350 mA to 700 mA (100% load).
- Efficiency: Up to 86%.
- Warranty: 5 years.

Special Features

- Continuous dimming from 1% to 100%, dim to off.
- Safety isolation between primary and secondary.
- Dimming control is class 2 isolated from AC input and DC output.
- Standby power <0.5W (when dim to off).
- The dimming curve is linear.
- A rated lifetime of 50,000 hours @ Tc = 85°C.
- Safety: UL8750, 2nd Edition, UL1310 Class 2, CSA22.2, EN61347.
- EMC: FCC 47CFR Part 15, Class B @120V & Class A @277V, EN55015.
- Inrush current limiting circuitry: AC power line: line to line 2 kV, eliminates circuit breaker tripping, switch arcing and relay failure.
- Plastic shell used with silicone potting. Meet the RoHs directive.
- IP65, NEMA4 compliant for dry, damp.
- 100% performance tested with CHROMA 8000 system at YG factory.
- 100% burned in with program-control test system at YG factory, at 50 degrees ambient temperature.

20W 0-10V Dimming Part List

No.	Part Number	US Class 2	CN Class 2	Output Voltage Range	Output Current Range	Current Accuracy (typ.)	Power Factor	Output Power	Max. Eff.	UL	cUL	ENEC	CB
1	LBS20W-57-C0350-RD	Yes	Yes	28~57 Vdc	3.5 – 350 mA	±5%	0.90	20W	86%	√	√	√	√
2	LBS20W-48-C0350-RD	Yes	Yes	24~48 Vdc	3.5 – 350 mA	±5%	0.90	16.8W	86%	√	√	√	√
3	LBS20W-43-C0460-RD	Yes	Yes	21~43 Vdc	5.0 – 460 mA	±5%	0.90	20W	85%	√	√	√	√
4	LBS20W-42-C0500-RD	Yes	Yes	21~42 Vdc	5.0 – 500 mA	±5%	0.90	20.5W	85%	√	√	√	√
5	LBS20W-40-C0430-RD	Yes	Yes	20~40 Vdc	5.0 – 430 mA	±5%	0.90	17.2W	85%	√	√	√	√
6	LBS20W-36-C0550-RD	Yes	Yes	18~36 Vdc	6.0 – 550 mA	±5%	0.90	20W	84%	√	√	√	√
7	LBS20W-28-C0700-RD	Yes	Yes	14~28 Vdc	7.0 – 700 mA	±5%	0.90	20W	83%	√	√	√	√
8	LBS20W-24-C0830-RD	Yes	Yes	12~24 Vdc	8.3 – 830 mA	±5%	0.90	20W	83%	√	√	√	√

Address: No. 575, 9F Gushu Road, Bao'an District, Shenzhen, Guangdong Province, China
Phone: +86 755 27850656, +86 13501598118 Mr. Wu Fax: +86 755 23289631
+86 755 27850525, +86 13602603460 Miss Joy
Email: wgm@yg-driver.com Skype: yg-wgm Web: www.yg-driver.com

Product Release Date: 2019.06.26
Product Updates Date: 2020.06.22

20W Constant Current Part List

No.	Part Number	US Class 2	CN Class 2	Output Voltage Range	Output Current	Current Accuracy (typ.)	Power Factor	Output Power	Max. Eff.	UL	cUL	ENEC	CB
1	LBS20W-57-C0350	Yes	Yes	28~57 Vdc	350 mA	±5%	0.90	20W	86%	√	√	√	√
2	LBS20W-48-C0350	Yes	Yes	24~48 Vdc	350 mA	±5%	0.90	16.8W	86%	√	√	√	√
3	LBS20W-43-C0460	Yes	Yes	21~43 Vdc	460 mA	±5%	0.90	20W	85%	√	√	√	√
4	LBS20W-42-C0500	Yes	Yes	21~42 Vdc	500 mA	±5%	0.90	20.5W	85%	√	√	√	√
5	LBS20W-40-C0430	Yes	Yes	20~40 Vdc	430 mA	±5%	0.90	17.2W	85%	√	√	√	√
6	LBS20W-36-C0550	Yes	Yes	18~36 Vdc	550 mA	±5%	0.90	20W	84%	√	√	√	√
7	LBS20W-28-C0700	Yes	Yes	14~28 Vdc	700 mA	±5%	0.90	20W	83%	√	√	√	√
8	LBS20W-24-C0830	Yes	Yes	12~24 Vdc	830 mA	±5%	0.90	20W	83%	√	√	√	√

Input Specifications

Parameter	Min.	Typ.	Max.	Notes / Conditions
Input Voltage	100 Vac	---	277 Vac	100, 120, 230, 240, 277 Vac Nominal Values
Input Frequency	47 Hz	50/60 Hz	63 Hz	50/60 Hz Nominal
Input AC Current	---	---	0.20 A	Measured at 120 Vac / 60Hz Input, Output Full Load.
	---	---	0.10 A	Measured at 230 Vac / 50Hz Input, Output Full Load.
	---	---	0.09 A	Measured at 277 Vac / 60Hz Input, Output Full Load.
Inrush Current (Peak)	---	6.8 A / 10uS	7.5 A / 10uS	Measured at 120 Vac / 60Hz Input, Output Full Load.
	---	15.5 A / 10uS	16.5 A / 10uS	Measured at 277 Vac / 60Hz Input, Output Full Load.
Leakage Current	---	---	300 μA	Measured at 120 Vac / 60Hz Input, Output Full Load.
	---	---	700 μA	Measured at 277 Vac / 60Hz Input, Output Full Load.
THD	---	12%	20%	Measured at 120, 230 Vac Input, ≥ 50% Load. 277 Vac Input, ≥ 80% Load.
Power Factor (PF)	0.90	---	0.99	
Standby Power	0.1 W	0.2 W	0.5 W	Measured at 120, 230, 277 Vac Input, when dim to off (V_{dim} < 1.0V).

Output Specifications

Parameter		Min.	Typ.	Max.	Notes / Conditions
DC Output Voltage		Per Table	Per Table	Per Table	Per Tables on Page 1, The voltage is DC+ to DC-.
Constant Current Accuracy		---	+/-5%	---	Per Tables on Page 1. +/-7.5% @<83% load
Flickering Index (Vpk-pk)		---	---	25% Vo	20MHz BW, output in parallel with 0.1uF & 10uF CAP. Output power > 83% Po, current of each LED lamp > 75% Io max. Flickering Index is defined as [(Ymax-Ymin)/(Ymax+Ymin)] * 100%. Y may be V or I
Flickering Index (Ipk-pk)		---	---	30% Io	
Line Regulation		-3%	---	+3%	Measured at 120-277 Vac Input, Output Full Load
Load Regulation		-4%	---	+4%	Measured at 120-277 Vac Input
Start-up Time		---	330ms	500ms	Measured at 120-277 Vac Input, Output Full Load
		---	460ms	500ms	Measured at 120-277 Vac Input, Dimming set at 50%
		---	1.0 s	1.3 s	Measured at 120-277 Vac Input, Dimming set at 10%
Output Overshoot		-5%	---	+10%	Measured at 120-277 Vac Input, When power on or off
Dim to Off Time	nc	---	0.4 s	---	Normal off. (default)
	-S	---	2.0 s	---	Soft off (Pending)

Protection Specifications

Parameter	Min.	Typ.	Max.	Notes / Conditions
Output Short Circuit (SCP)	---	---	---	No Damage. Auto recovery after short is removed.

Output Over Current (OCP)	---	---	+10% Io	Constant Current Limiting circuit.
Output Over Voltage (OVP)	---	---	+20% Vo	No Damage. Auto recovery after short is removed.

Dimming Specifications

Items	Parameter		Min.	Typ.	Max.	Notes / Conditions
0-10V Dimming (Compatible PWM, Rset Dimming, Additional datasheet)	Input Absolute Voltage		-2.0 V	10 V	15 V	Purple Wire
	Output Source Current (Customizable)		---	---	0.56 mA	Purple Wire
	Output Current Range in 0-10V Dimming (This note is in the case of linear dimming)	nc	0%	---	100%	Dim-to-off @ Vdim < 1.0V, 100% @ Vdim > 8.5V
		-A	1%	---	100%	1% @ Vdim < 1.2V, 100% @ Vdim > 8.5V
		-B	5%	---	100%	5% @ Vdim < 1.2V, 100% @ Vdim > 8.5V
		-C	10%	---	100%	10% @ Vdim < 1.2V, 100% @ Vdim > 8.5V
	Output Current in 0-10V Pin Open		---	Normal	---	Maximum output
	Output Current in 0-10V Pin Short Circuit		---	Dim to Off	---	Into standby
Output Current Delay	Transient Response of Dimming		---	600ms	---	Delay time, when Vdim steps from 0V to 10V

General Specifications

Parameter	Min.	Typ.	Max.	Notes / Conditions
Cooling	Convection			
MTBF	450,000 hours			Measured at 120 Vac input, 100% Load and Tc=85° C (MIL-HDBK-217F).
Lifetime	50,000 hours			
Acoustic Noise	< 24 dB Class A			Not to exceed at 1 meter at any dim level.

Environmental Specifications

Parameter	Min.	Typ.	Max.	Notes / Conditions
Case Temperature (Tc)	-40 °C	---	+90 °C	Measured at location specified on case.
Operating Temperature (Ta)	-40 °C	---	+50 °C	This is a reference range. Tc controls temperature range.
Storage Temperature (Ts)	-40 °C		+85 °C	Non-operating temperature range.
Operating Humidity	---	---	95% RH	Relative Humidity. Non-condensing.
Vibration	5 Hz	---	55 Hz	2G, 10 minutes / 1 cycle, period 30 minutes, each along X, Y, Z axis.

Safety Compliance

Safety Category	Standards / Notes
UL / cUL	UL8750, UL1310 Class 2, UL1012 Non Class 2, CSA-C22.2 No. 107.1
CE	EN 61347-1:2007+A1:2010+A2:2012, EN61347-2-13:2014, EN 62493:15
Withstand Voltage	Input to Output: 2000 Vac (UL), 3750 Vac (CE, ENEC)
	Output to Dim: 2500 Vac
Isolation Resistance	Input to Output: >10MΩ, 500Vdc @ 25°C, 70% RH
0-10V Class 2 Isolated Dimming	DIM+ (Purple) / DIM- (Grey) are Class 2 Isolated from AC Input and DC Output.

EMC Compliance

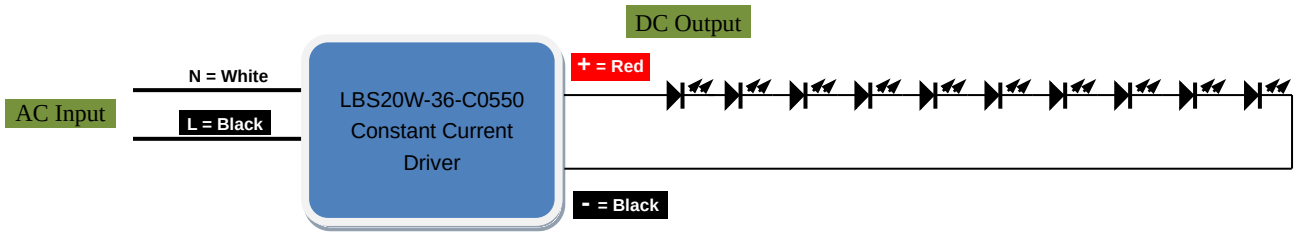
EMI Category	Standards
FCC	FCC 47CFR Part 15, ANSI C63.4: 2009
CE	EN55015:2013+A1:2015, EN 61000-3-2:2014, EN 61000-3-3:2013

Energy Star	Energy Star transient protection: Ballast or driver shall comply with ANSI/IEEE C62.41.1-2002 and ANSI/IEEE C62.41.2-2002, Category A operation. The line transient shall consist of seven strikes of a 100KHZ ring wave, 2.5KV level, for both common mode and differential mode.
EMS Category	**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
EN 61000-4-5	Surge Immunity Test: AC Power Line: line to line 2 kV
EN 61000-4-6	Conducted Radio Frequency Disturbances Test-CS
EN 61000-4-11	Voltage Dips
EN 61547	Electromagnetic Immunity Requirements Applies to Lighting Equipment

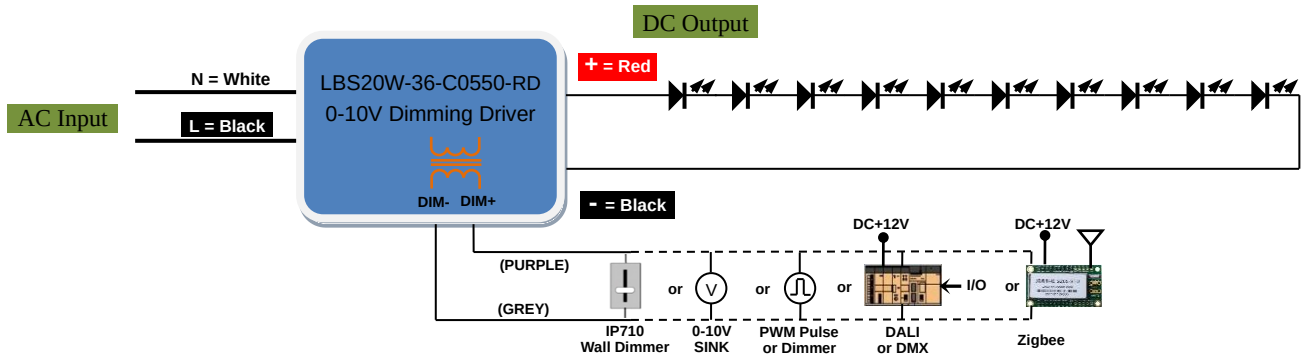
Note: the above test data are in the condition of 25 C ambient temperature, except for the marked temperature.

Typical Applications

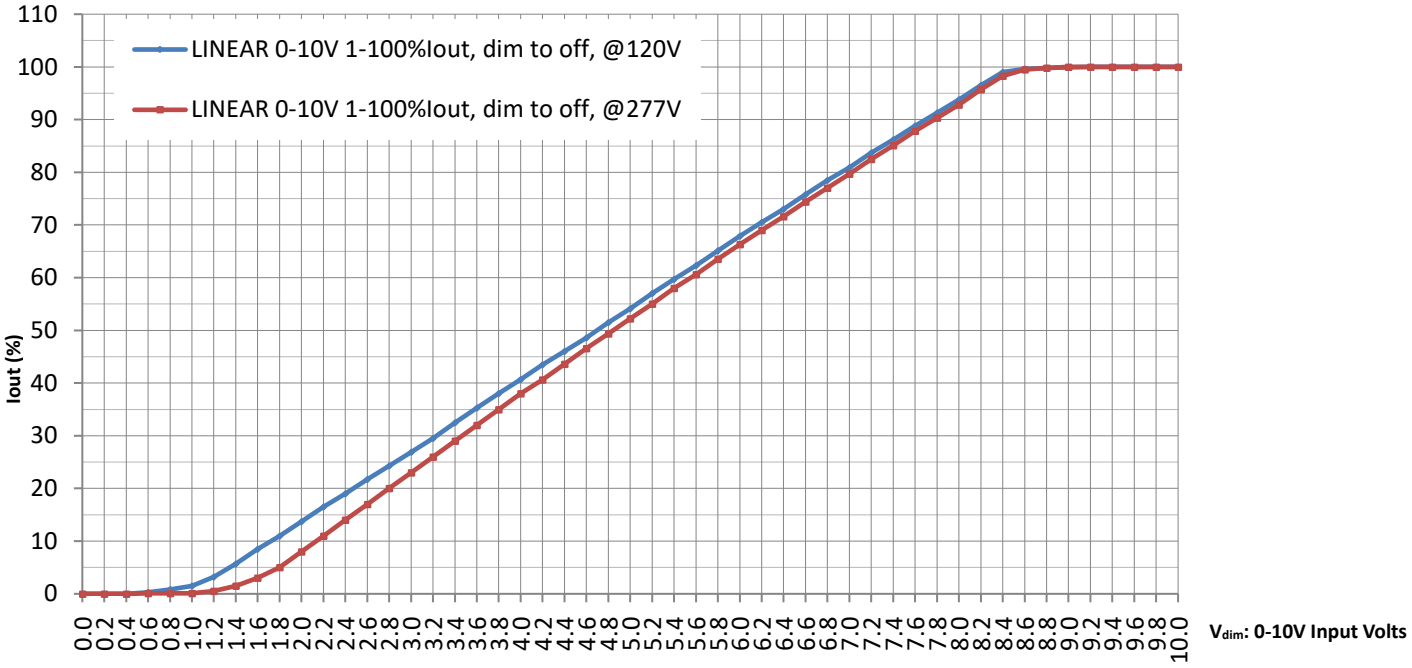
■. Constant Current Driver



■. 0-10V Dimming Driver



Dimming Curve

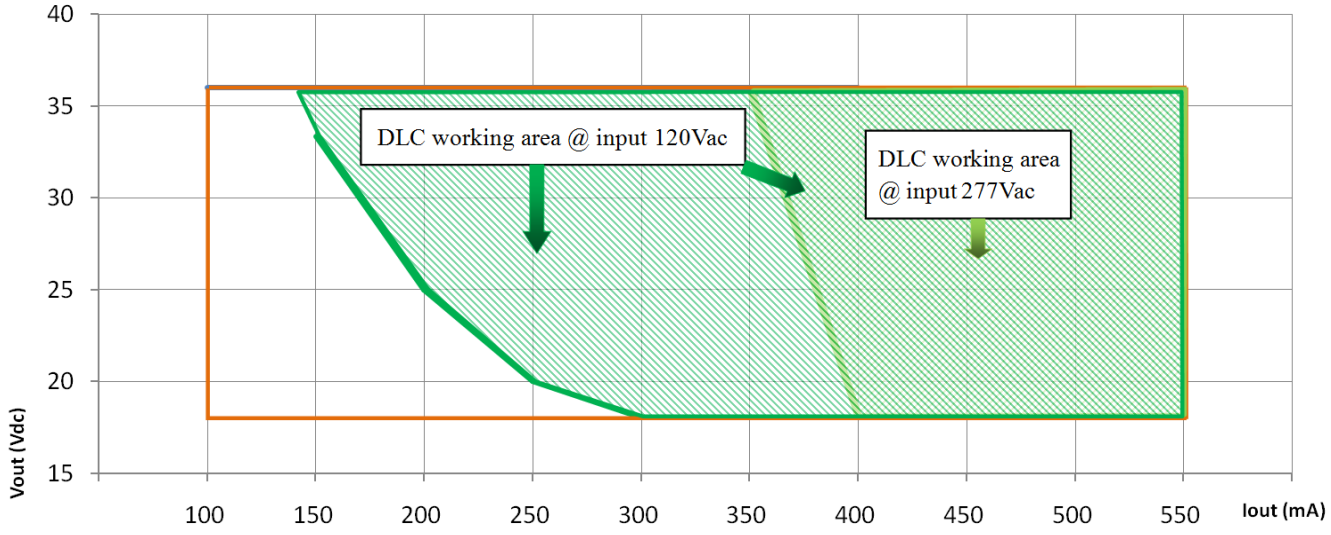


Note:

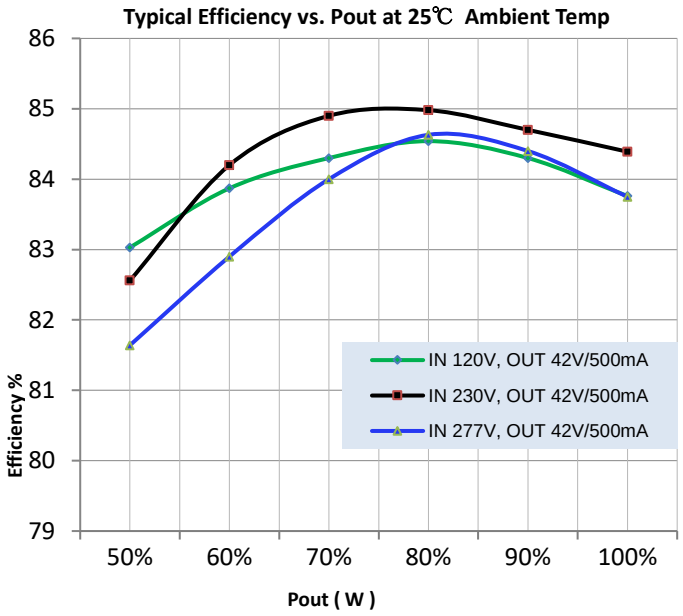
1. The dimming curve is linear.
2. V_{dim_ON} is 1.2V, V_{dim_OFF} is 1.0V. Driver goes into standby state, when V_{dim} is less than 1.0V.

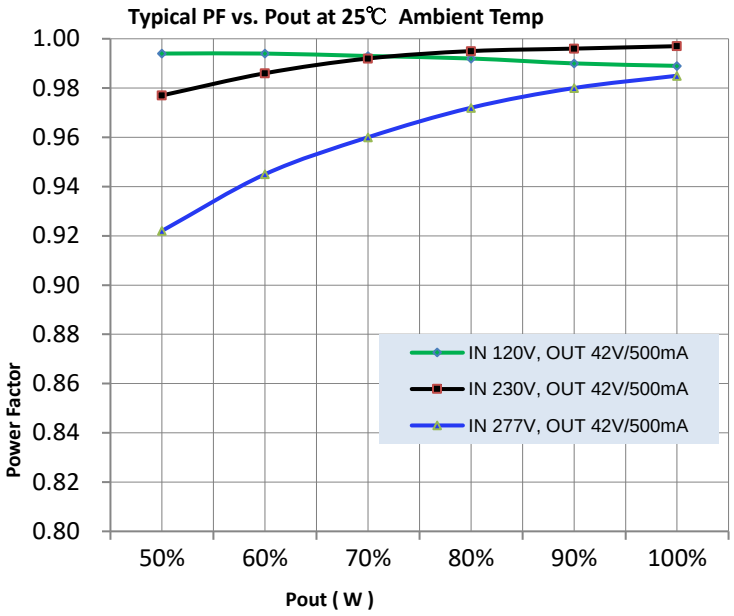
Power Operating Window

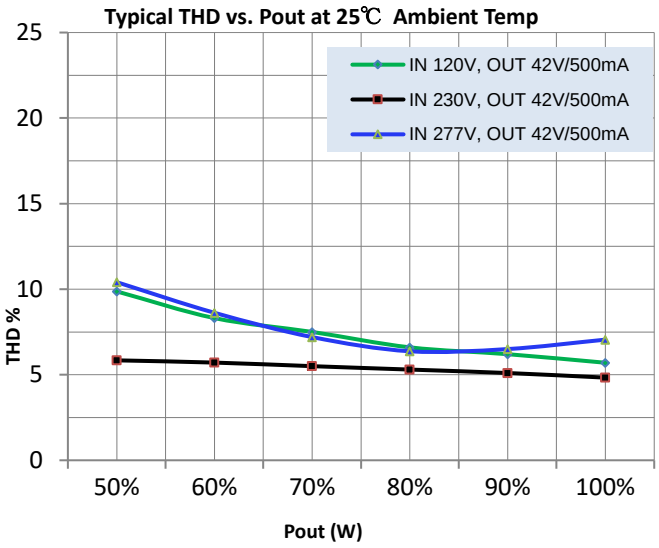
The DLC working area of output 36V/550mA.

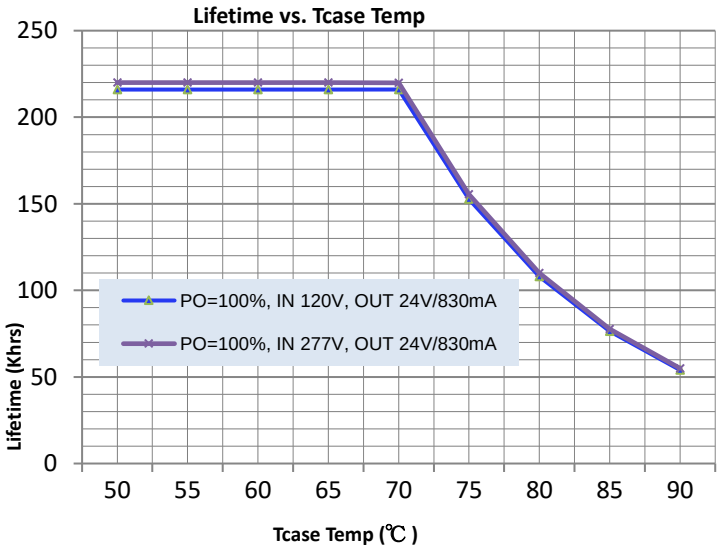


Characteristic Curve









Installation

AC input for connection the two core ANSI/UL1015/AWG18 temperature 105 °C core copper wire connection.
Cable Length: 150mm, stripping on the tin: 10mm.
Where: L — Black wire, N — White wire.

DC output for connection the two core ANSI/UL1569/AWG18 temperature 105 °C core copper wire.
Cable Length: 150mm, stripping on the tin: 10mm.
Where: DC+ — Red, DC- — Black.

The dimmer control input is the two copper wires, ANSI/UL1569/AWG22 & temperature 105 °C.
Cable Length: 150mm, stripping on the tin: 10mm.
Where: DIM+ (0-10V) input — Purple wire, DIM- — Grey wire.

This product has two Φ3.5mm mounting holes.

Order ID

P/N: LBS20W - 36 - C0550 - RDL - A

RDL	A
-NC	-A
-RD	-B
	-C

Note:
-RD Linear dimming curve

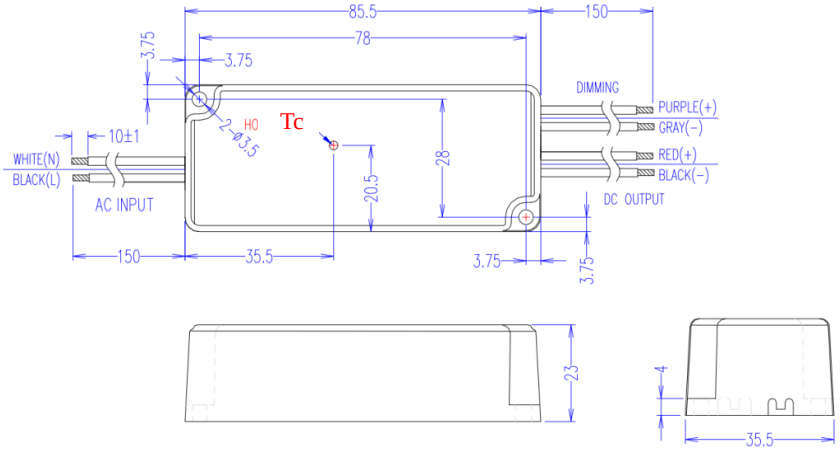
P/N 1: LBS20W-36-C0550
Description: 20W, 36Vdc voltage max, constant current 550mA, constant current mode.

P/N 2: LBS20W-36-C0550-RD
Description: 20W, 36Vdc voltage max, current 550mA max, minimum dimming to 1%, dim-to-off, 0-10V dimming mode.

P/N 3: LBS20W-36-C0550-RD-B
Description: 20W, 36Vdc voltage max, current 550mA max, minimum dimming to 5%, 0-10V dimming mode.

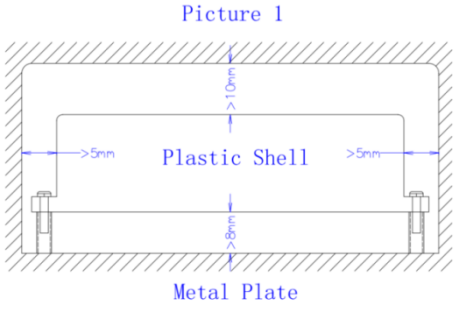
P/N 4: LBS20W-36-C0550-RD-C
Description: 20W, 36Vdc voltage max, current 550mA max, minimum dimming to 10%, 0-10V dimming mode.

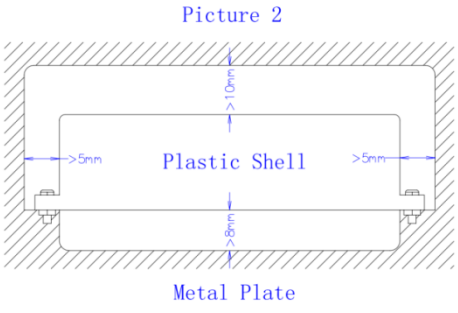
Product size



Notes: The Driver Tc should be located at top of case.

Application note





In Picture 1 and Picture 2, EMC has the best.

Note :

- The independent LED drive conforms to the EMC standard.
  But it is not guaranteed to be qualified when the drive is mounted in the LED lamp.
- Please forgive us for any discrepancy due to the update of the specifications or the upgrade of the product.
  If you need the latest information, please contact our marketing department.

Address: No. 575, 9F Gushu Road, Bao'an District, Shenzhen, Guangdong Province, China
Phone: +86 755 27850656, +86 13501598118 Mr. Wu Fax: +86 755 23289631
+86 755 27850525, +86 13602603460 Miss Joy
Email: wgm@yg-driver.com Skype: yg-wgm Web: www.yg-driver.com

Product Release Date: 2019.06.26
Product Updates Date: 2020.06.22