20 Watt — LB20W V1.0

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

CONSTANT CURRENT LED DRIVER WITH 0-10V DIMMING.

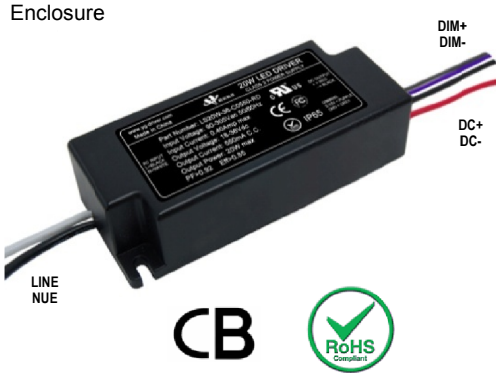
US & CN, LED Driver Class 2

LB 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.

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 830 mA (100% load).
- Efficiency: Up to 87%.
- Warranty: 5 years.

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	3.74	95.00
Case Width	1.61	41.00
Case Height	0.98	25.00
Mounting Length	3.35	85.00

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

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 optional (linear or logarithmic, default: 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.
- IP66, 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	Power Factor	Output Power	Max. Eff.	UL	cUL	ENEC	CB
1	LB20W-57-C0350-RD	Yes	Yes	28~57 Vdc	3.5 – 350 mA	±5%	0.90	20W	87%	√	√	√	√
2	LB20W-48-C0350-RD	Yes	Yes	24~48 Vdc	3.5 – 350 mA	±5%	0.90	16.8W	87%	√	√	√	√
3	LB20W-43-C0460-RD	Yes	Yes	21~43 Vdc	5.0 – 460 mA	±5%	0.90	20W	86%	√	√	√	√
4	LB20W-40-C0500-RD	Yes	Yes	20~40 Vdc	5.0 – 500 mA	±5%	0.90	20W	86%	√	√	√	√
5	LB20W-40-C0430-RD	Yes	Yes	20~40 Vdc	5.0 – 430 mA	±5%	0.90	17.2W	86%	√	√	√	√
6	LB20W-36-C0550-RD	Yes	Yes	18~36 Vdc	6.0 – 550 mA	±5%	0.90	20W	85%	√	√	√	√
7	LB20W-28-C0700-RD	Yes	Yes	14~28 Vdc	7.0 – 700 mA	±5%	0.90	20W	84%	√	√	√	√
8	LB20W-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: 2019.06.07
Product Updates Date:

20W Constant Current Part List

No.	Part Number	US Class 2	CN Class 2	Output Voltage Range	Output Current	Current Accuracy	Power Factor	Output Power	Max. Eff.	UL	cUL	ENEC	CB
1	LB20W-57-C0350	Yes	Yes	28~57 Vdc	350 mA	±5%	0.90	20W	87%	√	√	√	√
2	LB20W-48-C0350	Yes	Yes	24~48 Vdc	350 mA	±5%	0.90	16.8W	87%	√	√	√	√
3	LB20W-43-C0460	Yes	Yes	21~43 Vdc	460 mA	±5%	0.90	20W	86%	√	√	√	√
4	LB20W-40-C0500	Yes	Yes	20~40 Vdc	500 mA	±5%	0.90	20W	86%	√	√	√	√
5	LB20W-40-C0430	Yes	Yes	20~40 Vdc	430 mA	±5%	0.90	17.2W	86%	√	√	√	√
6	LB20W-36-C0550	Yes	Yes	18~36 Vdc	550 mA	±5%	0.90	20W	85%	√	√	√	√
7	LB20W-28-C0700	Yes	Yes	14~28 Vdc	700 mA	±5%	0.90	20W	84%	√	√	√	√
8	LB20W-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)	---	20 A / 2uS	25 A / 3uS	Measured at 120 Vac / 60Hz Input, Output Full Load.
	---	30 A / 2uS	35 A / 3uS	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, 277 Vac Input, ≥ 70% 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-.
Output Constant Current		-5%	Per Table	+5%	Per Tables on Page 1
Flickering Index (Vpk-pk)		---	---	25% Vo	20MHz BW, 1-100% dimming output in parallel with 0.1uF & 10uF CAP. Flickering Index is defined as [(Ymax-Ymin)/(Ymax+Ymin)] * 100%. Y may be V or I
Flickering Index (Ipk-pk)		---	25% Io	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%
		---	1.8 s	2.1 s	Measured at 120-277 Vac Input, Dimming set at 1%
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.
Temperature Protection (OTP)	95°C		110°C	At Tc from 95 to 110, the output current decreases linearly from maximum to zero.

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	550,000 hours			Measured at 120 Vac input, 100% Load and Tc=85° C (MIL-HDBK-217F).
Life Time	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	---	+60 °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

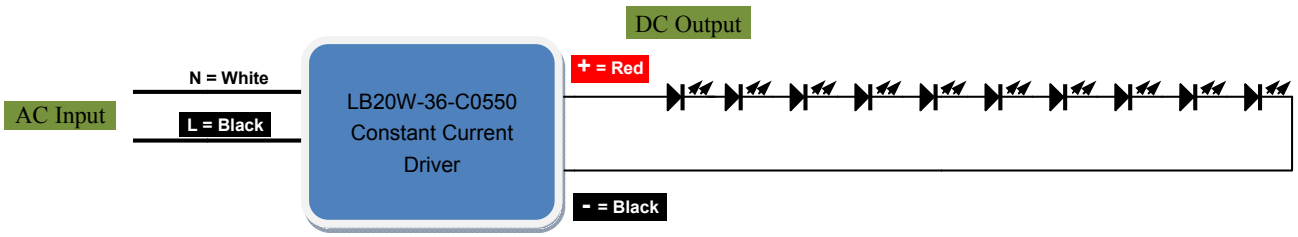
EMI Category	Standards
FCC	FCC 47CFR Part 15, ANSI C63.4: 2009
CE	EN55015:2013+A1:2015, EN 61000-3-2:2014, EN 61000-3-3:2013

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

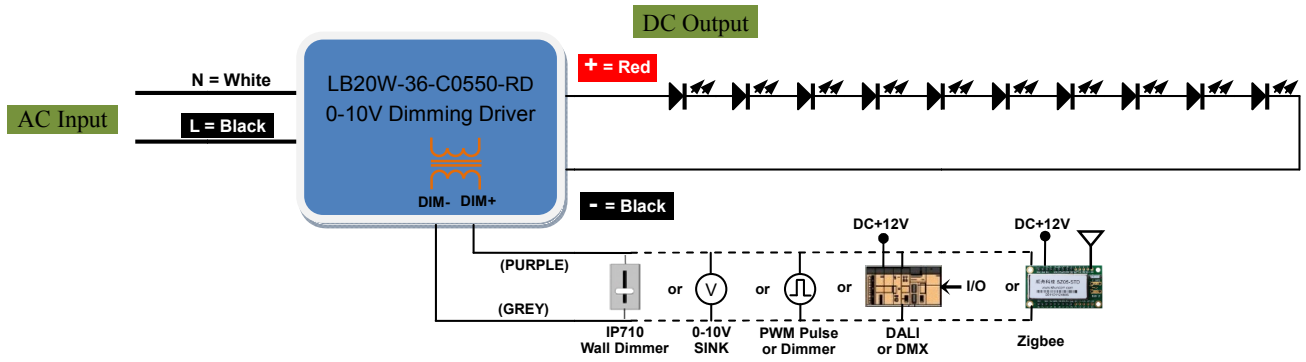
Note: the above test data are in the condition of 25 C ambient temperature, except for the marked temperature.

Typical Applications

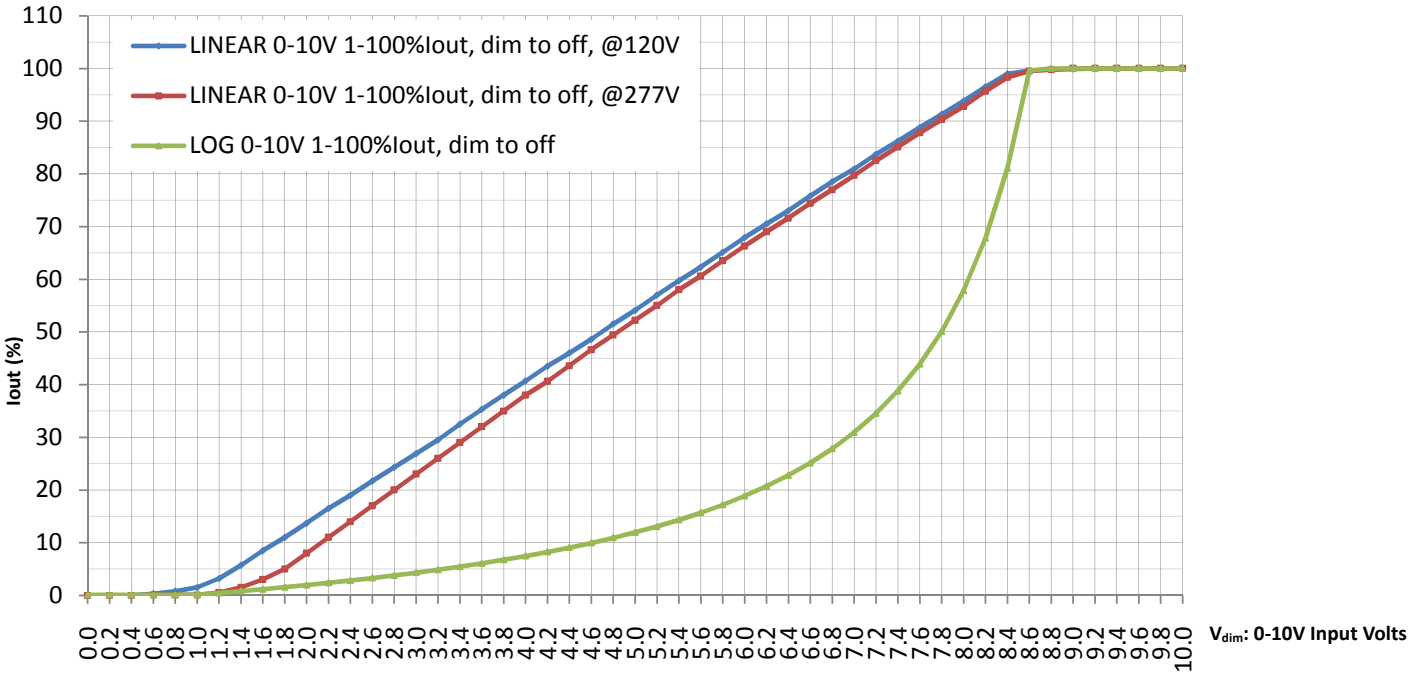
■. Constant Current Driver



■. 0-10V Dimming Driver

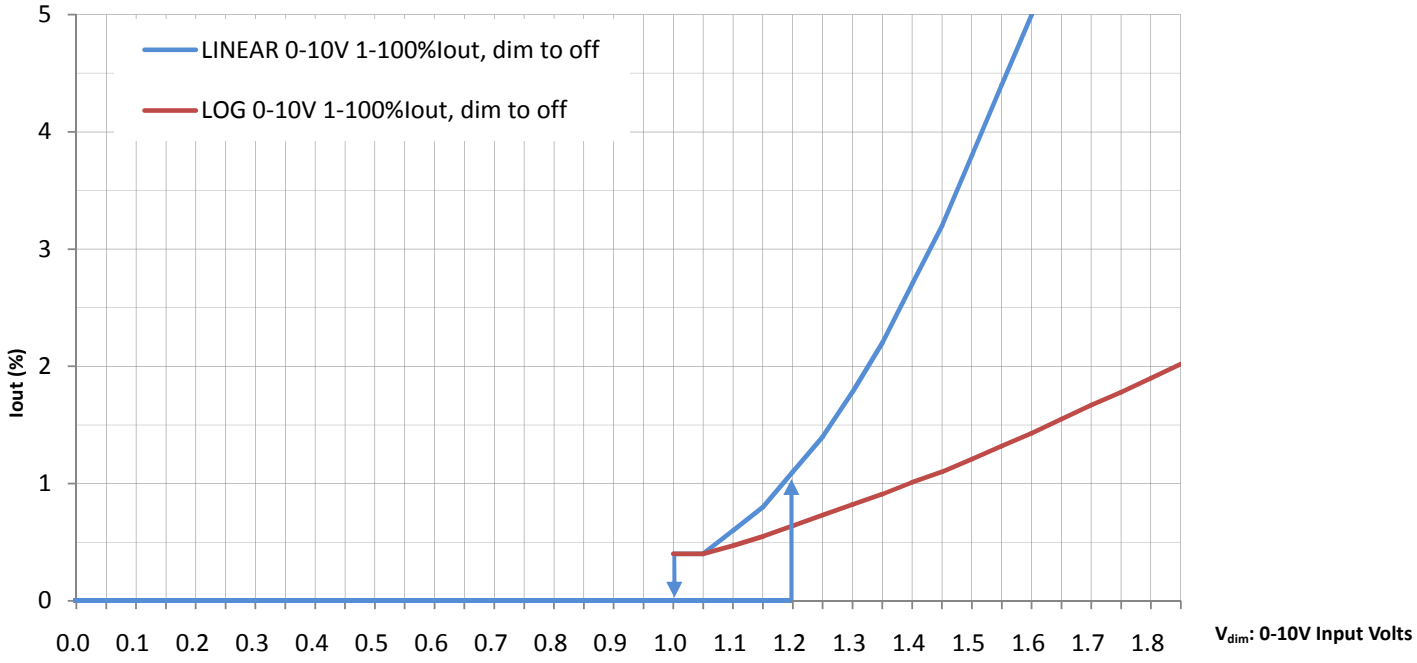


Dimming Curve



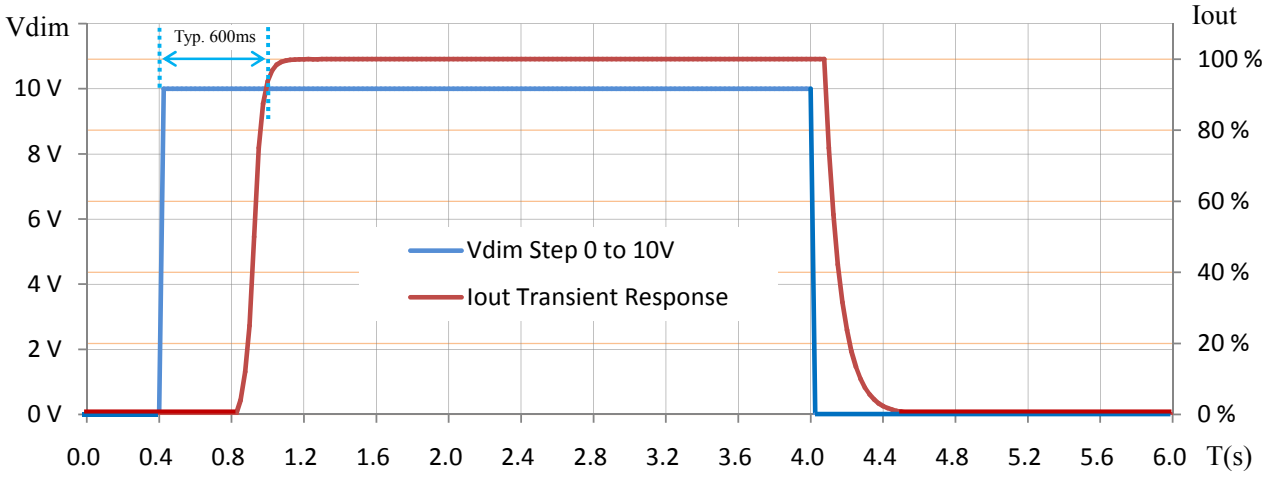
Note:

1. The dimming curve is optional (linear or logarithmic, default: linear).
2. The logarithmic curve needs to be specified.

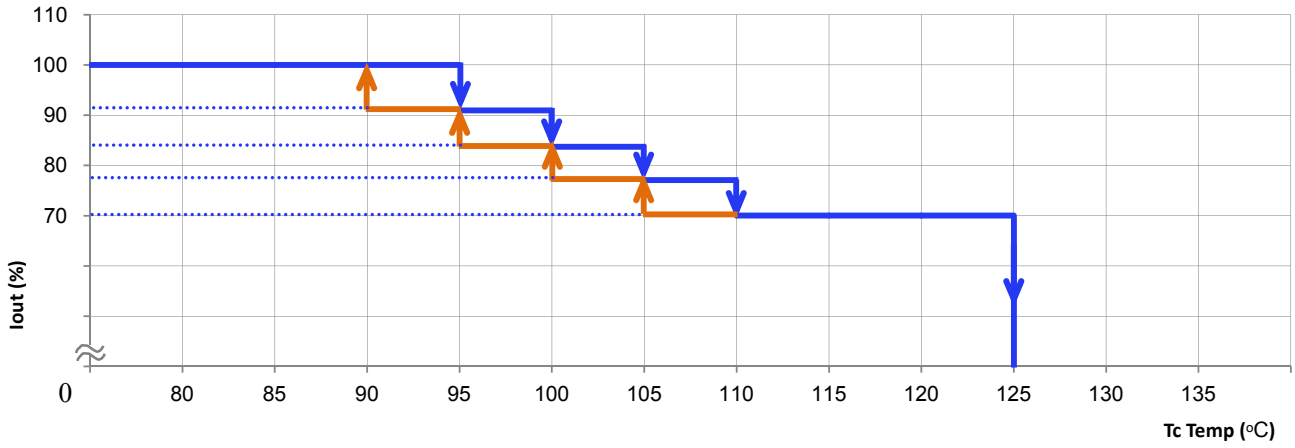


Note: V_{dim_ON} is 1.2V, V_{dim_OFF} is 1.0V. Driver goes into standby state, when V_{dim} is less than 1.0V.

Iout Transient Response vs Vdim Step

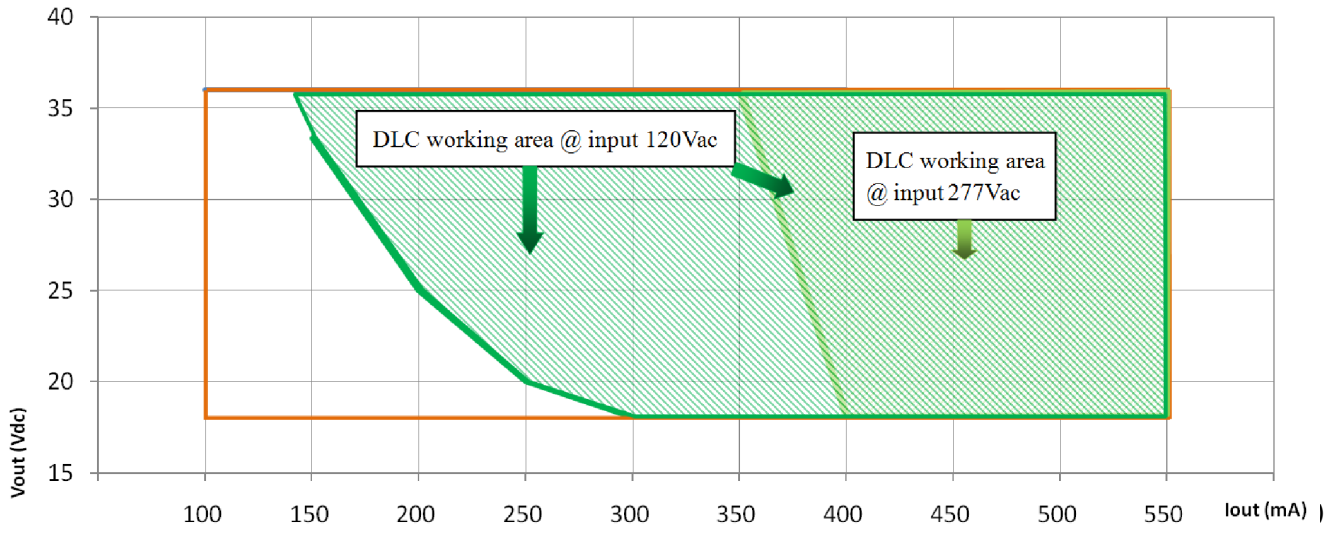


Output current decreases linearly vs.Tc temperature

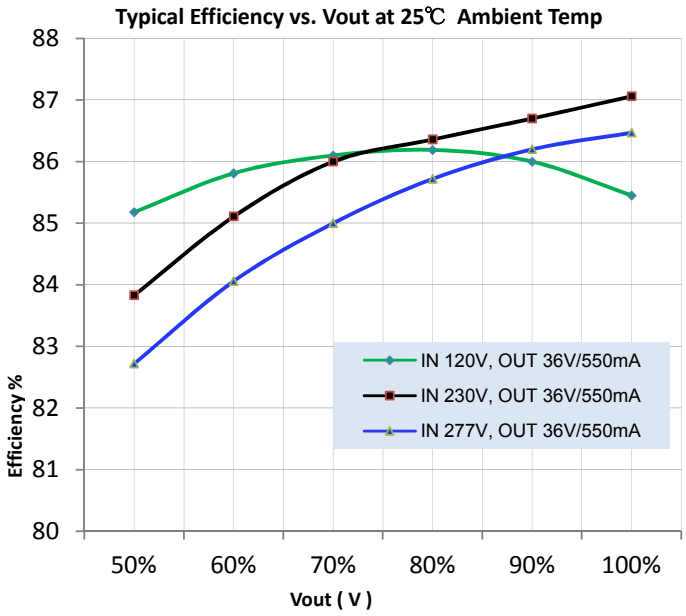


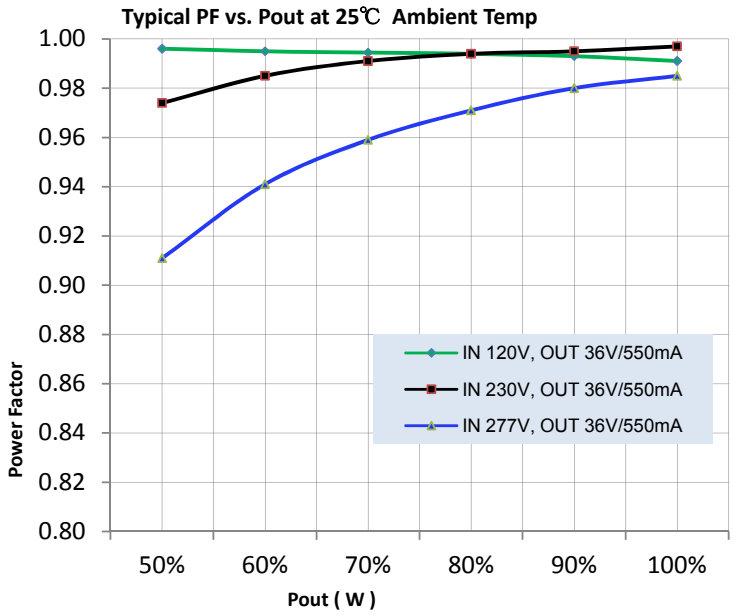
Power Operating Window

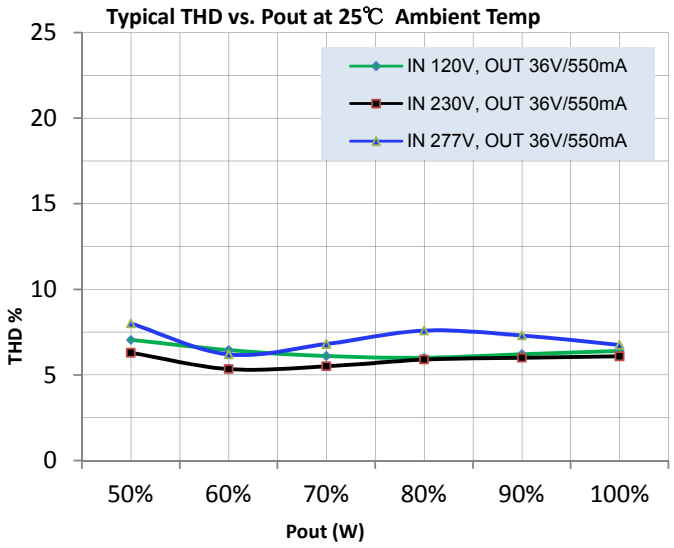
The DLC working area of output 36V/550mA.

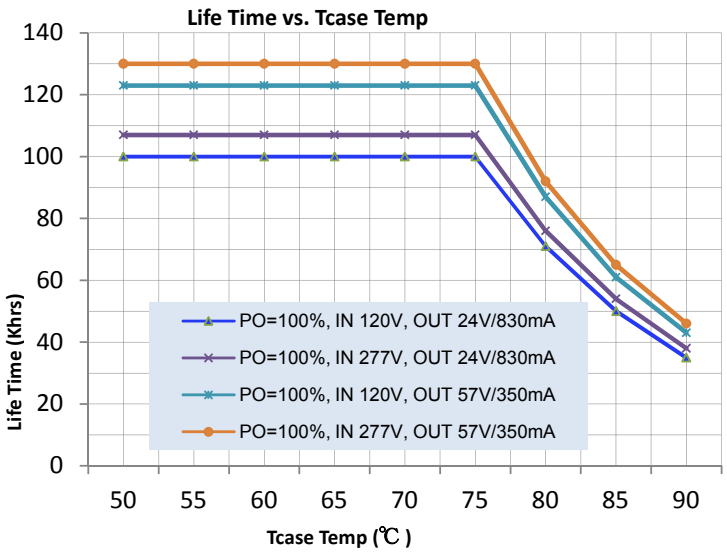


Characteristic Curve









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 Φ4.0mm mounting holes.

Order ID

P/N: LB20W - 36 - C0550 - RDL - A

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

Note:
-RD Linear dimming curve
-RDL Logarithmic dimming curve

P/N 1: LB20W-36-C0550
Description: 20W, 36Vdc voltage max, constant current 550mA, constant current mode.

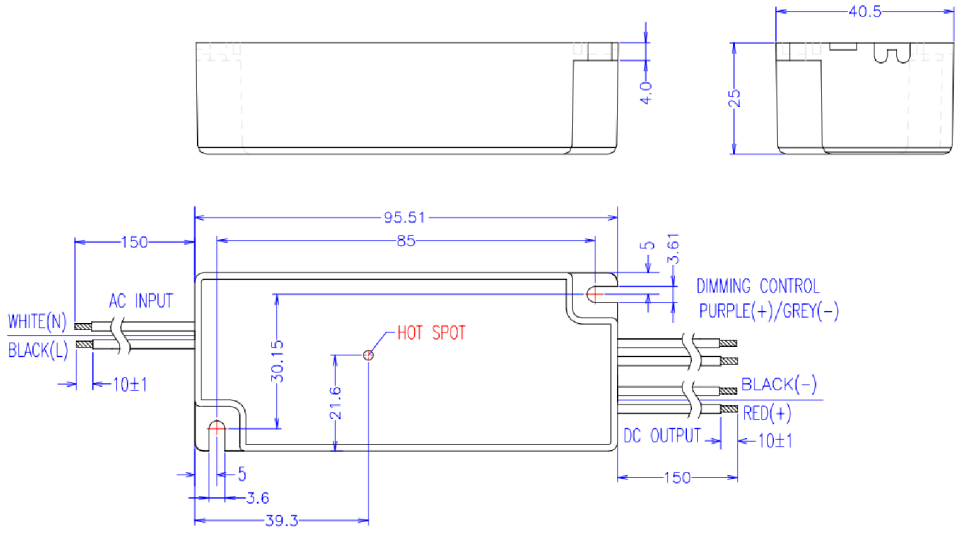
P/N 2: LB20W-36-C0550-RD
Description: 20W, 36Vdc voltage max, current 550mA max, minimum dimming to 1%, dim-to-off, normal off, 0-10V dimming mode.

P/N 3: LB20W-36-C0550-RD-A
Description: 20W, 36Vdc voltage max, current 550mA max, minimum dimming to 1%, 0-10V dimming mode.

P/N 4: LB20W-36-C0550-RD-B
Description: 20W, 36Vdc voltage max, current 550mA max, minimum dimming to 5%, 0-10V dimming mode.

P/N 5: LB20W-36-C0550-RD-C
Description: 20W, 36Vdc voltage max, current 550mA max, minimum dimming to 10%, 0-10V dimming mode.

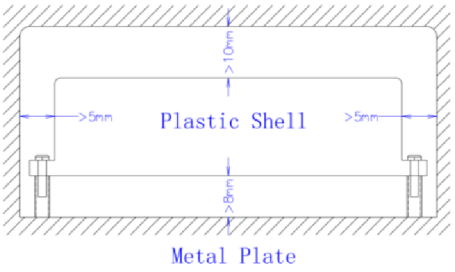
Product size



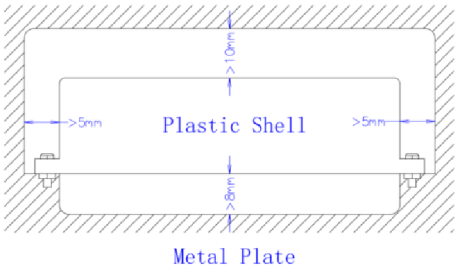
Notes: The Driver Tc (HOT SPOT) should be located at side of case.

Application note

Picture 1



Picture 2



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.