

PRODUCT SPECIFICATION

Product Model: LBS20W

Version Number: V3.0

Created	Validated	Approved
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Version	Description of change	Date
V3.0	Final version	2021-06-30

20 Watt — LBS20W V3.0

CONSTANT CURRENT LED DRIVER WITH 0-10V DIMMING.

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

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.

Key Features

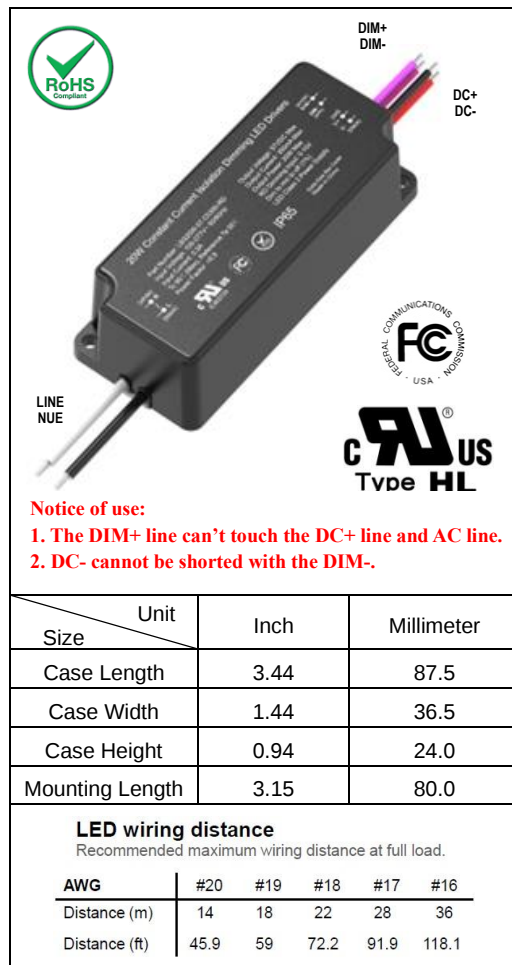
- Drive Mode: Constant Current, Dimming, Standby.
- Technology: Active PFC 1-Stage Switch Mode.
- Input Voltage: 100 to 277Vac (UL).
- Output Power: 20Watt Max.
- Dimming: Smooth & Continuous Dimming from 1% to 100%, dim-to-off. LEDs turn on to any dimmed level without going to full brightness. Constant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

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
1	LBS20W-57-C0350-RD	Yes	Yes	28~57Vdc	3.5 – 350mA	±5%	0.90	20W	86%	✓	✓
2	LBS20W-48-C0350-RD	Yes	Yes	24~48Vdc	3.5 – 350mA	±5%	0.90	16.8W	86%	✓	✓
3	LBS20W-43-C0460-RD	Yes	Yes	21~43Vdc	5.0 – 460mA	±5%	0.90	20W	85%	✓	✓
4	LBS20W-42-C0500-RD	Yes	Yes	21~42Vdc	5.0 – 500mA	±5%	0.90	21W	85%	✓	✓
5	LBS20W-40-C0430-RD	Yes	Yes	20~40Vdc	5.0 – 430mA	±5%	0.90	17.2W	85%	✓	✓
6	LBS20W-36-C0550-RD	Yes	Yes	18~36Vdc	6.0 – 550mA	±5%	0.90	20W	84%	✓	✓





Excellent LED Drivers

7	LBS20W-28-C0700-RD	Yes	Yes	14~28Vdc	7.0 – 700mA	±5%	0.90	20W	83%	✓	✓
8	LBS20W-24-C0830-RD	Yes	Yes	12~24Vdc	8.3 – 830mA	±5%	0.90	20W	83%	✓	✓

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
1	LBS20W-57-C0350	Yes	Yes	28~57Vdc	350mA	±5%	0.90	20W	86%	✓	✓
2	LBS20W-48-C0350	Yes	Yes	24~48Vdc	350mA	±5%	0.90	16.8W	86%	✓	✓
3	LBS20W-43-C0460	Yes	Yes	21~43Vdc	460mA	±5%	0.90	20W	85%	✓	✓
4	LBS20W-42-C0500	Yes	Yes	21~42Vdc	500mA	±5%	0.90	20.5W	85%	✓	✓
5	LBS20W-40-C0430	Yes	Yes	20~40Vdc	430mA	±5%	0.90	17.2W	85%	✓	✓
6	LBS20W-36-C0550	Yes	Yes	18~36Vdc	550mA	±5%	0.90	20W	84%	✓	✓
7	LBS20W-28-C0700	Yes	Yes	14~28Vdc	700mA	±5%	0.90	20W	83%	✓	✓
8	LBS20W-24-C0830	Yes	Yes	12~24Vdc	830mA	±5%	0.90	20W	83%	✓	✓

Input Specifications

Parameter	Min.	Typ.	Max.	Notes / Conditions
Input Voltage	100Vac	---	277Vac	100, 120, 230, 240, 277Vac Nominal Values
Input Frequency	47Hz	50/60Hz	63Hz	50/60Hz Nominal
Input AC Current	---	---	0.20A	Measured at 120Vac / 60Hz Input, Output Full Load.
	---	---	0.10A	Measured at 230Vac / 50Hz Input, Output Full Load.
	---	---	0.09A	Measured at 277Vac / 60Hz Input, Output Full Load.
Inrush Current (Peak)	---	6.8A / 10us	7.5A / 10us	Measured at 120Vac / 60Hz Input, Output Full Load.
	---	15.5A / 10us	16.5A / 10us	Measured at 277Vac / 60Hz Input, Output Full Load.
Leakage Current	---	---	300μA	Measured at 120Vac / 60Hz Input, Output Full Load.
	---	---	700μA	Measured at 277Vac / 60Hz Input, Output Full Load.
THD	---	12%	20%	Measured at 120, 230Vac Input, ≥ 50% Load. 277Vac Input, ≥ 80% Load.
Power Factor (PF)	0.90	---	0.99	
Standby Power	0.1W	0.2W	0.5W	Measured at 120, 230, 277Vac 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 $[(Y_{max}-Y_{min})/(Y_{max}+Y_{min})] * 100\%$. Y may be V or I
Flickering Index (Ipk-pk)	---	---	30% Io	
Line Regulation	-3%	---	+3%	Measured at 120-277Vac Input, Output Full Load
Load Regulation	-4%	---	+4%	Measured at 120-277Vac Input
Start-up Time	---	330ms	500ms	Measured at 120-277Vac Input, Output Full Load
	---	460ms	500ms	Measured at 120-277Vac Input, Dimming set at 50%
	---	1.0s	1.3s	Measured at 120-277Vac Input, Dimming set at 10%
Output Overshoot	-5%	---	+10%	Measured at 120-277Vac Input, When power on or off
Dim to Off Time	nc	---	0.4s	Normal off. (default)
	-S	---	2.0s	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		-2.0V	10V	15V	Purple Wire
	Output Source Current (Customizable)		---	---	0.56mA	Pink 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 < 1.6V, 100% @ Vdim > 8.5V
		-B	5%	---	100%	5% @ Vdim < 1.6V, 100% @ Vdim > 8.5V
		-C	10%	---	100%	10% @ Vdim < 1.6V, 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 120Vac 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: 2000Vac (UL), 3750Vac (CE, ENEC) Output to Dim: 2500Vac
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.

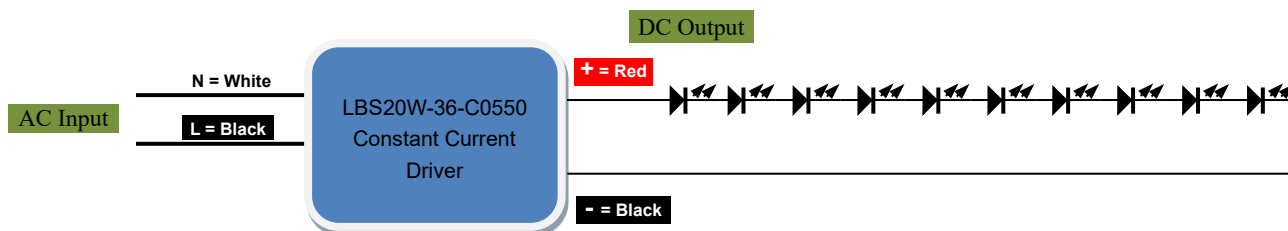
EMC Compliance

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): 8KV air discharge, 4KV 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 2KV
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

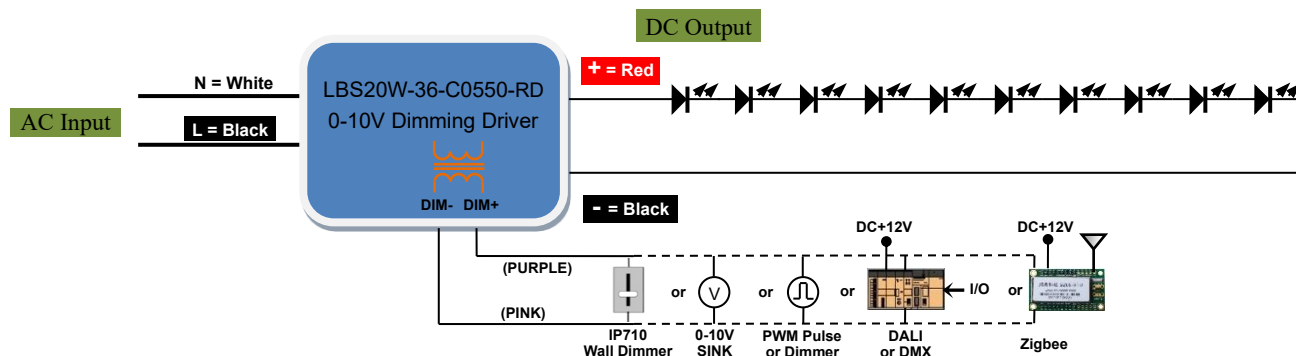
Note: the above test data are in the condition of 25℃ ambient temperature, except for the marked temperature.

Typical Applications

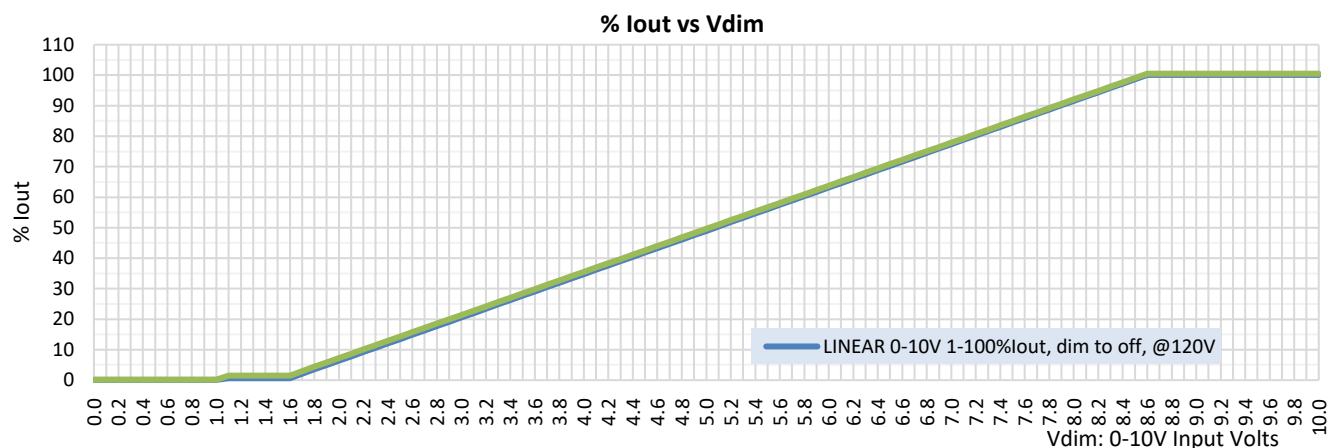
■. Constant Current Driver



■. 0-10V Dimming Driver



Dimming Curve

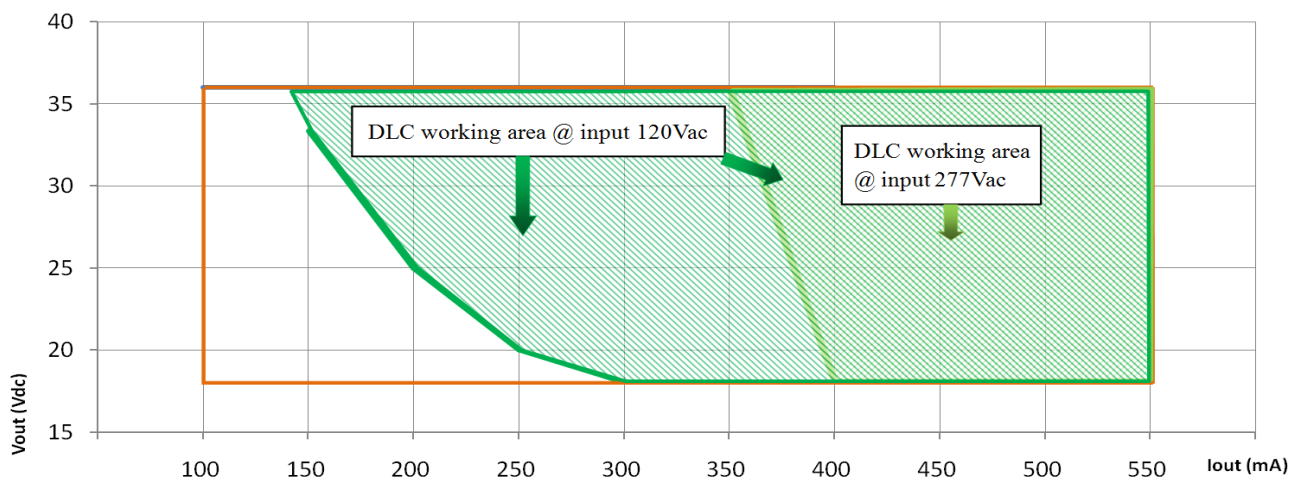


Note:

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.

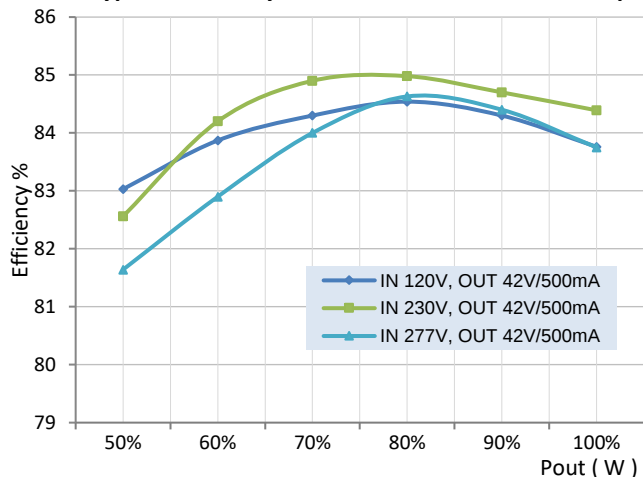
Power Operating Window

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

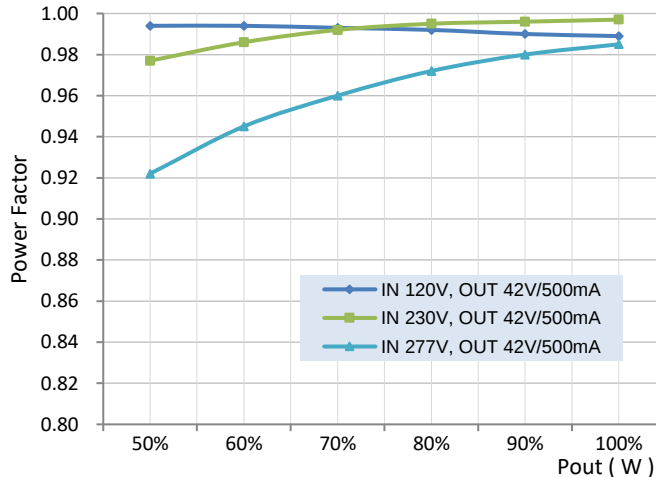


Characteristic Curve

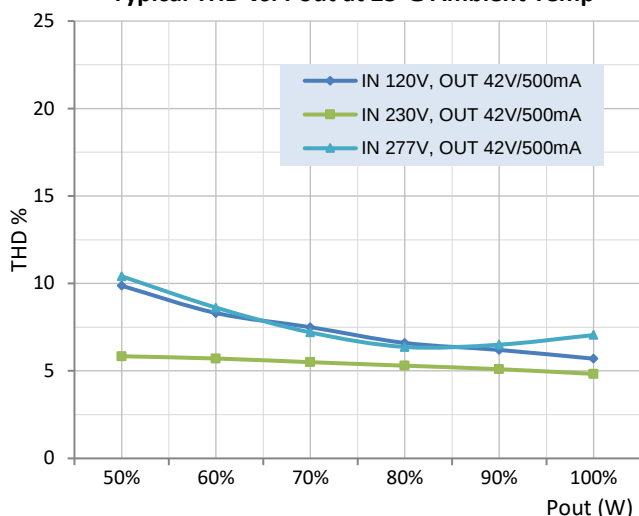
Typical Efficiency vs. Pout at 25°C Ambient Temp



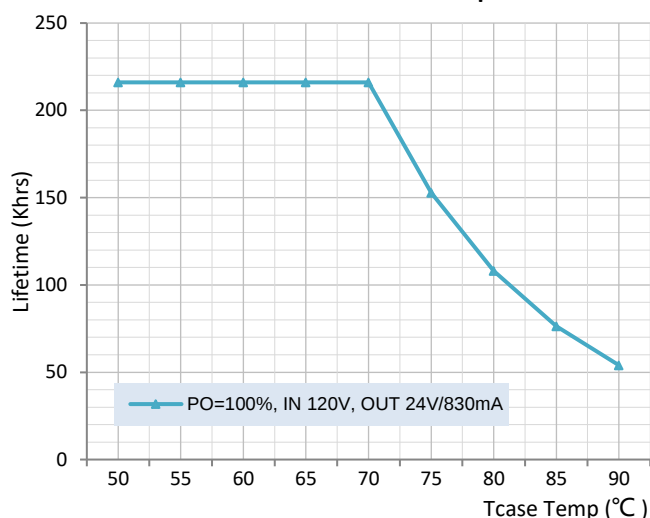
Typical PF vs. Pout at 25°C Ambient Temp



Typical THD vs. Pout at 25°C Ambient Temp



Lifetime vs. Tcase Temp



Installation

AC input for connection the two core ANSI/UL1015/AWG18 temperature 105 °C core copper wire connection.

Cable Length: 160mm, 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: 160mm, 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: 160mm, stripping on the tin: 10mm.

Where: DIM+ (0-10V) input — Purple wire, DIM- — Pink wire.

This product has two $\Phi 3.5$ mm mounting holes.

Order ID

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

-NC
-RD

-A
-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.

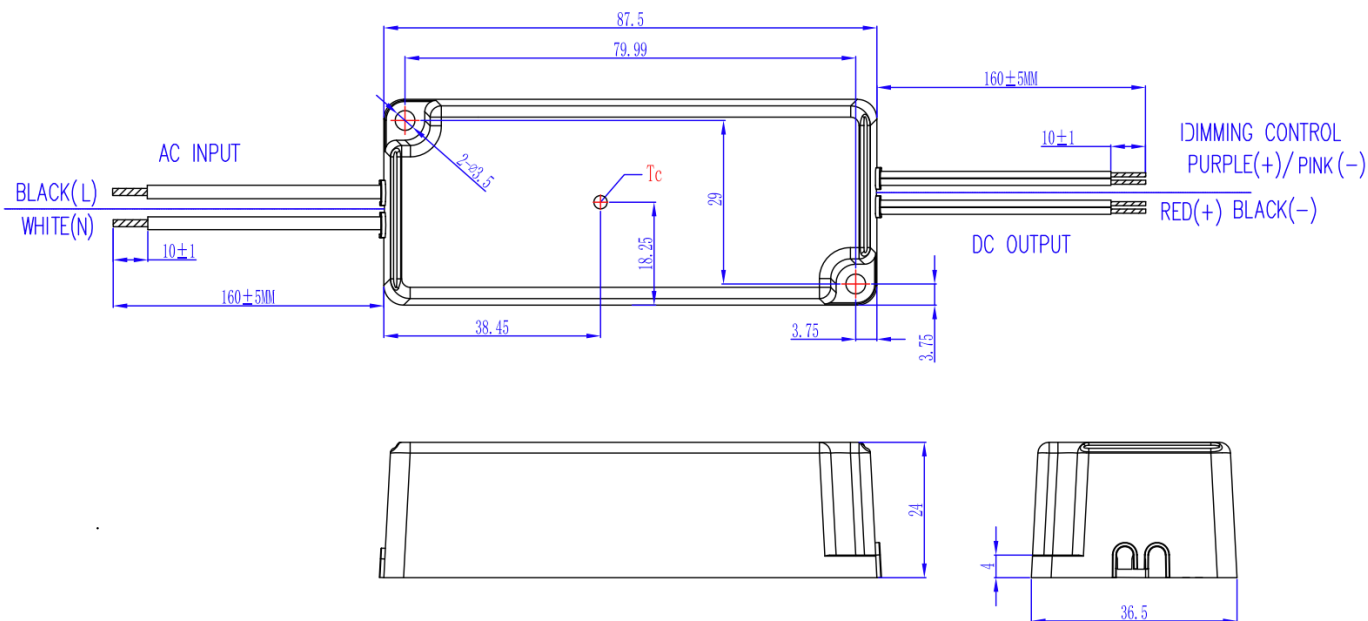
P/N 3: LBS20W-36-C0550-RD-B

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.

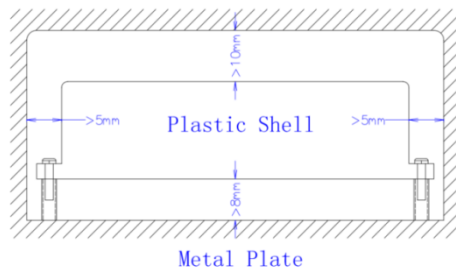
Product size



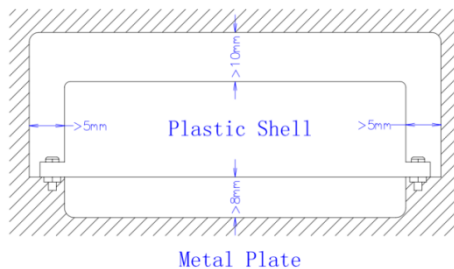
Notes: The Driver Tc should be located at top of case.

Application note

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 fixture.
- 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.