



Dongwoon Anatech

TOP IN ANALOG/POWER

Advantages of LED Driver IC

Constant Driving

Life Time ↑

- Output Accuracy (2%↓)
- Low Drop Voltage
- Efficiency (90%↑)

Protections

Reliability ↑

- Thermal Shut Down/ Derating
- LED Fault (Open/Short)
- OVP/OCP/SCP, Soft Start
- ESD/EMI

Dongwoon Anatech
(DW85xx)

Conversion ↑

Functions

- Dimming (PWM/Analog)
- Triac Driving
- Embedded MCU/Memory

Expansion ↑

Expansibility

- Wide Input Driving (~DC400V)
- Topology (Boost/ Buck/ B-Boost)
- Multi Output Channel (Parallels)

Reduce Area ↓

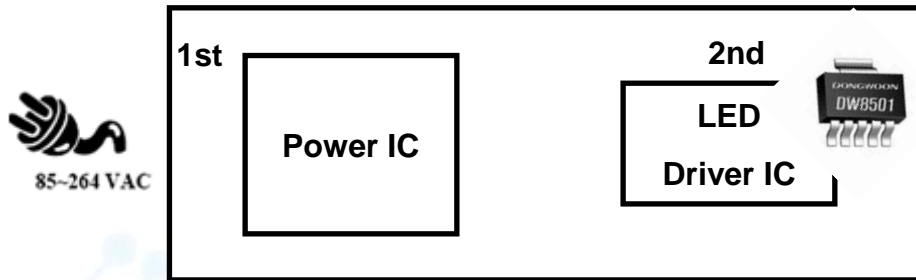
Optimize

- Reduce External Components

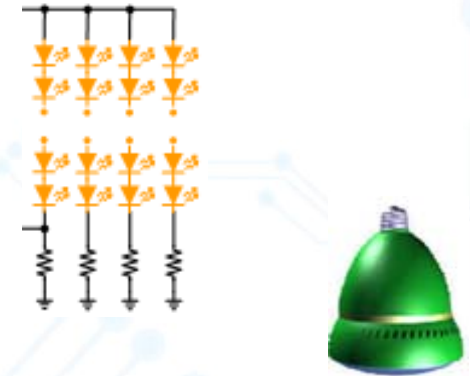


Why we have to use LED Driver IC

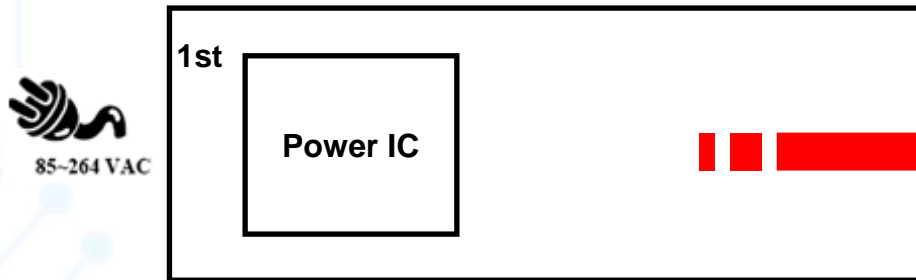
Power Supply Units (CC-Mode)



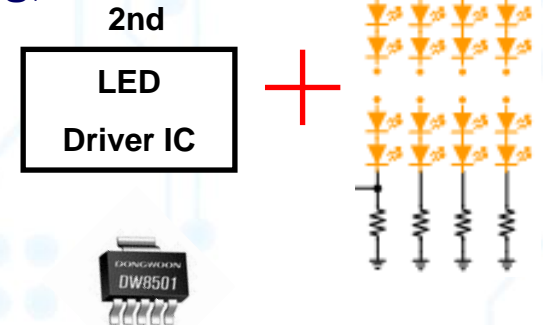
LED Applications



Power Supply Units (CV-Mode)



- * Expansion
- * Cost Save (인증)



Linear Drivers for LED Lighting – DW850X

The DW850X series are linear LED drivers for low/medium/high power LEDs. The DW850X series realize constant current driver ICs with simple circuit design. The DW850X provide cost-effective solutions for LED light bulbs, fluorescent lamp, street light, signage and decorative LED lighting, general lighting of flat panel displays, RGB backlighting, current stabilizer with DC/DC or AC/DC, general purpose constant current source

	DW8500	DW8501	DW8502	DW8505A
Vin (min/max(V))	5V to 40V	5V to 40V	5V to 40V	5V to 40V
Output Current(mA)	300mA fixed	Up to 1.5A adjustable	Up to 2.5A adjustable	Up to 100mA adjustable
Dropout Voltage	Max. 0.3V @ I _{LED} =300mA	Max.0.3V @ I _{LED} =300mA	Max. 1V @ I _{LED} =1A	Max. 0.2V @ I _{LED} =60mA
Dimming	-	PWM	PWM	PWM
Protection Function	Thermal derating	Thermal derating	Thermal derating	Thermal derating
Package Options	SOT89-3L (4.5 x 2.45 x 1.5)	SOT223-5L(6.5 x 3.5 x 1.8) TO252-5L(6.5 x 5.5 x 2.3)	TO263-5L (10.16x15.35x4.57)	SOT23-5L (2.9 x 2.8 x 1.45)
Typical application circuit				

DW8500 Linear type, Middle power LED driver

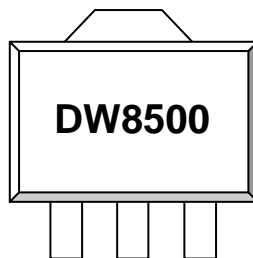
Features & Benefits

- 5V to 40V Supply voltage
- Regulated output current 300mA fixed
- Low dropout voltage : Max. 0.3V @ $I_{LED}=300mA$
- Reduction of output current at high temperatures contributing to long lifetime of LEDs
- Built-in thermal derating circuit
- Easy to use / Simple circuit design

Applications

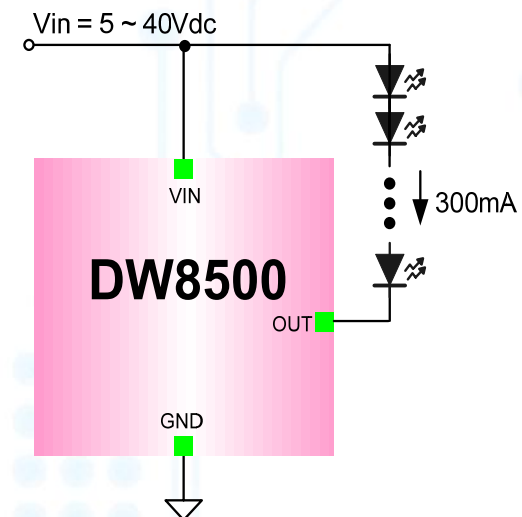
- LED light bulbs, Fluorescent lamp, Street light
- Signage and decorative LED lighting
- General lighting of flat panel displays
- RGB backlighting LED driver
- Current stabilizer with DC/DC or AC/DC
- General purpose constant current source

Package



SOT-89
(4.5 x 2.45 x 1.5)

Typical Application Circuit



DW8501 Linear type, High power LED driver

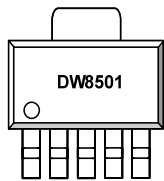
Features & Benefits

- 5V to 40V Supply voltage
- Regulated output current up to 1.5A adjustable
- Low dropout voltage : Max. 0.3V @ $I_{LED}=0.3A$
- Reduction of output current at high temperatures contributing to long lifetime of LEDs
- High Accuracy
- Available PWM dimming control
- Built-in thermal derating circuit
- Easy to use / Simple circuit design

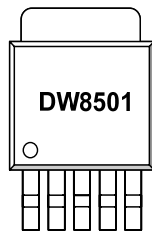
Applications

- LED light bulbs, Fluorescent lamp, Street light
- Signage and decorative LED lighting
- General lighting of flat panel displays
- RGB backlighting LED driver
- Current stabilizer with DC/DC or AC/DC
- General purpose constant current source

Package

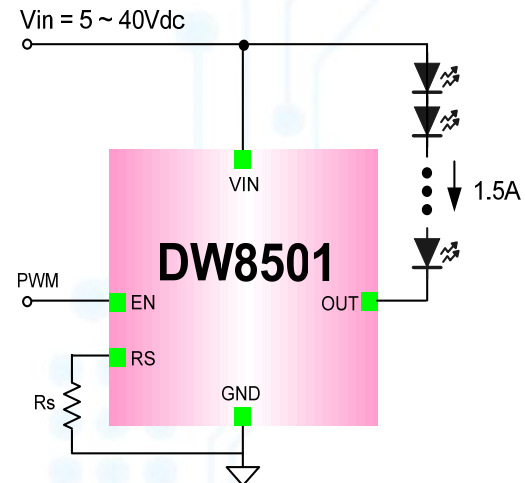


SOT-223
(6.5 x 3.5 x 1.8)



TO-252
(6.5 x 5.5 x 2.3)

Typical Application Circuit

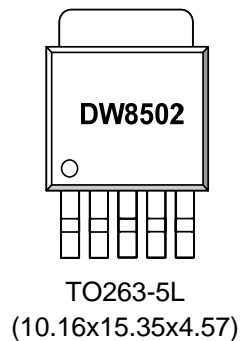


DW8502 Linear type, High power LED driver

Features & Benefits

- 5V to 40V Supply voltage
- Regulated output current up to 2.5A adjustable
- Low dropout voltage : Max. 1V @ $I_{LED}=1A$
- Reduction of output current at high temperatures contributing to long lifetime of LEDs
- High Accuracy
- Available PWM dimming control
- Built-in thermal derating circuit
- Easy to use / Simple circuit design

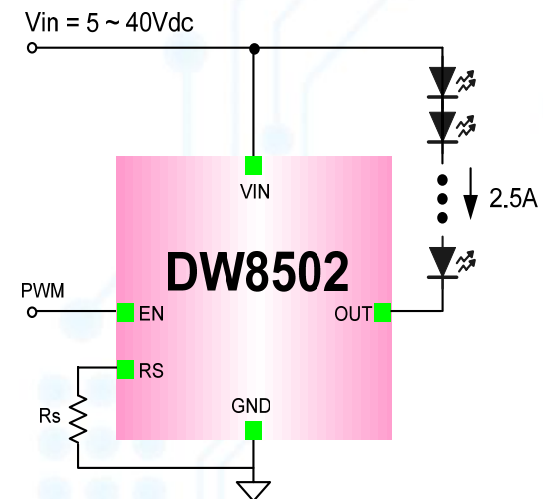
Package



Applications

- LED light bulbs, Fluorescent lamp, Street light
- Signage and decorative LED lighting
- General lighting of flat panel displays
- RGB backlighting LED driver
- Current stabilizer with DC/DC or AC/DC
- General purpose constant current source

Typical Application Circuit

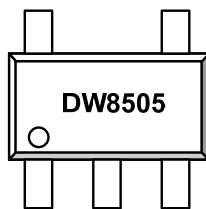


DW8505A Linear type, Low power LED driver

Features & Benefits

- 5V to 40V Supply voltage
- Regulated output current up to 100mA adjustable
- Low dropout voltage : Max. 0.2V @ $I_{LED}=60mA$
- Reduction of output current at high temperatures contributing to long lifetime of LEDs
- High Accuracy
- Available PWM dimming control
- Built-in thermal derating circuit
- Easy to use / Simple circuit design

Package

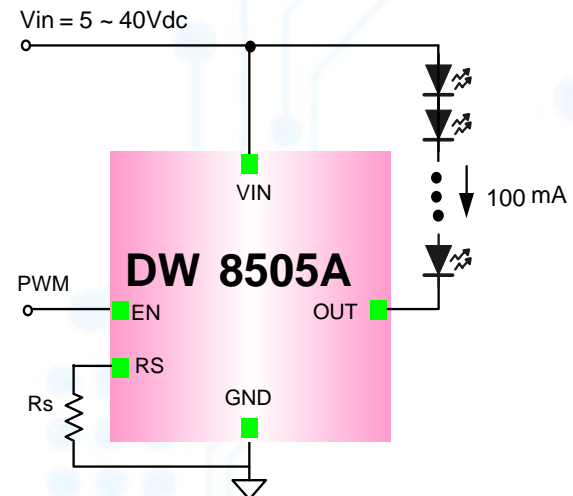


SOT23-5
(2.9x2.8x0.7)

Applications

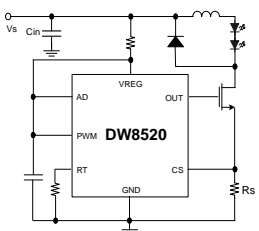
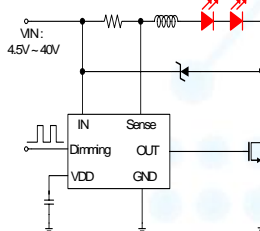
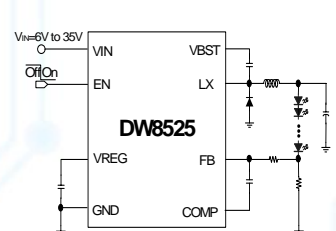
- LED light bulbs, Fluorescent lamp, Street light
- Signage and decorative LED lighting
- General lighting of flat panel displays
- RGB backlighting LED driver
- Current stabilizer with DC/DC or AC/DC
- General purpose constant current source

Typical Application Circuit



DC/DC LED Drivers

The DW8520/22/25 series are the step-down constant-current high-brightness LED drivers.

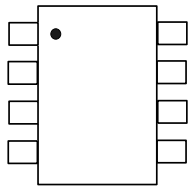
	DW8520	DW8522	DW8525
Topology	Buck	Hysteretic buck	Buck
Efficiency	up to 90%	up to 97%	up to 96%
Input Voltage	9V~450V	4.5~40V	6V~35V
Quiescent Current	Typical 0.5mA	Typical 1.0mA	Typical 1.2mA
Switching Frequency	Constant frequency or constant off-time operation	Up to 2MHz	Fixed 300kHz
Dimming	PWM and Analog	PWM and Analog	-
Protection Function	Thermal shutdown	Thermal derating, Thermal shutdown	Thermal derating, Thermal shutdown
Accuracy	10%	5%	5%
FET	External		Internal
Package Option	8 SOIC(4.9 x 6.0 x 1.4)	6 TDFN(3.0 x 3.0 x 0.75)	8 SOIC(4.9 x 6.0 x 1.4)
Typical application circuit	 <p>The DW8520 circuit diagram shows an input voltage V_s connected to the IN pin through a capacitor C_{in}. The IN pin is also connected to the AD pin. The VREG pin is connected to the output of a voltage divider. The OUT pin is connected to the output of the driver, which is a buck converter. The output is connected to the LED load through a sense resistor R_s. The CS pin is connected to the sense resistor. The RT pin is connected to a resistor. The GND pin is connected to ground.</p>	 <p>The DW8522 circuit diagram shows an input voltage V_{IN} (4.5V~40V) connected to the IN pin. The IN pin is also connected to the Sense pin. The OUT pin is connected to the output of the driver, which is a hysteretic buck converter. The output is connected to the LED load through a sense resistor. The VDD pin is connected to the input voltage. The GND pin is connected to ground.</p>	 <p>The DW8525 circuit diagram shows an input voltage V_{in} (6V to 35V) connected to the VIN pin. The EN pin is connected to the output of a voltage divider. The VREG pin is connected to the output of a voltage divider. The FB pin is connected to the output of a feedback network. The COMP pin is connected to the output of a compensation network. The LX pin is connected to the output of the driver, which is a buck converter. The output is connected to the LED load through a sense resistor. The GND pin is connected to ground.</p>

DW8520 Universal High Power LED Driver

Features & Benefits

- Topology : Buck
- Efficiency : Up to 90%
- Input Voltage : 9V ~ 450V
- Quiescent Current : Typical 0.5mA
- Switching Frequency : Constant frequency or
Constant off-time operation
- Dimming : PWM & Analog
- Wide operating range
- Built in protection circuit (Thermal shutdown)
- Stable output current

Package

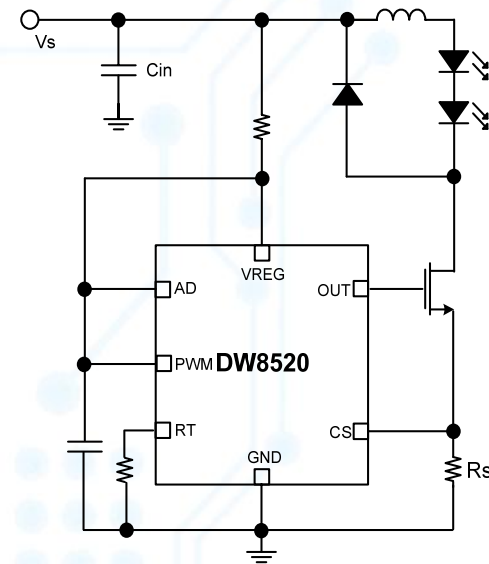


8Lead SOIC
(4.9 x 6.0 x 1.4)

Applications

- LED Bulbs, MR16, PAR etc.
- LED desk lamp, Sensor lamp, Inducement light
- LED Backlight and High Power LED Application
- General purpose constant current Application

Typical Application Circuit



DW8522 High Speed/Performance LED driver

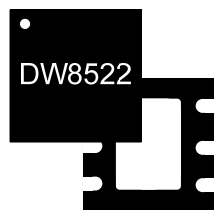
Features & Benefits

- Topology : Hysteretic buck
- Efficiency : Up to 97%
- Input Voltage : 4.5V ~ 40V
- Quiescent Current : Typical 1.0mA
- Switching Frequency : Up to 2MHz
- Dimming : PWM & Analog
- Accuracy : 5%
- Built in protection circuit (Thermal derating/shutdown)
- Stable output current

Applications

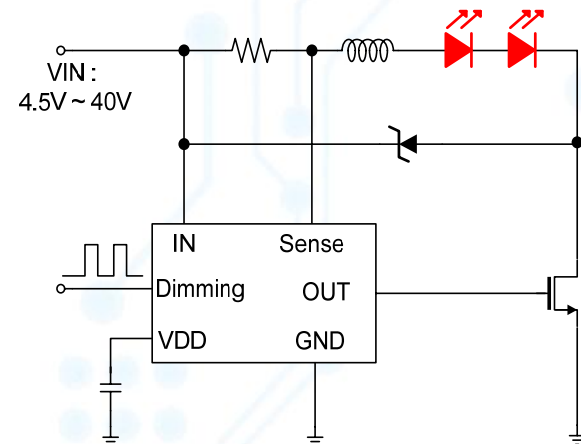
- LED Bulbs, MR16, PAR etc.
- LED desk lamp, Sensor lamp, Inducement light
- Offline LED lamps and fixtures
- Signage and Decorative lighting
- LED Backlight and High Power LED Application
- General purpose constant current Application

Package



8 TDFN
(3 × 3 × 0.75)

Typical Application Circuit



DW8525 Buck Converter LED driver

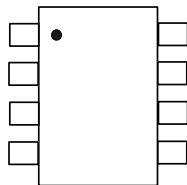
Features & Benefits

- Topology : Buck
- Efficiency : Up to 96%
- Input Voltage : 6V~35V
- Quiescent Current : Typical 1.2mA
- Switching Frequency : Fixed 300kHz
- Accuracy : 5%
- Internal FET
- Built in protection circuit (Thermal derating/shutdown)
- Stable output current

Applications

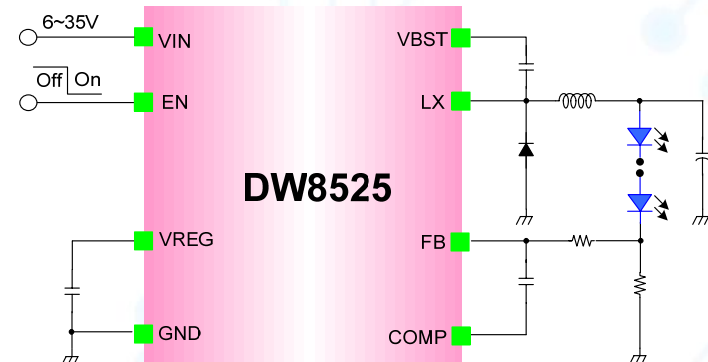
- LED Bulbs, MR16, PAR etc.
- LED desk lamp, Sensor lamp, Inducement light
- Offline LED lamps and fixtures
- Signage and Decorative lighting
- LED Backlight and High Power LED Application
- General purpose constant current Application

Package



8Lead SOIC
(4.9 x 6.0 x 1.4)

Typical Application Circuit



DW8527 Transition mode PFC controller

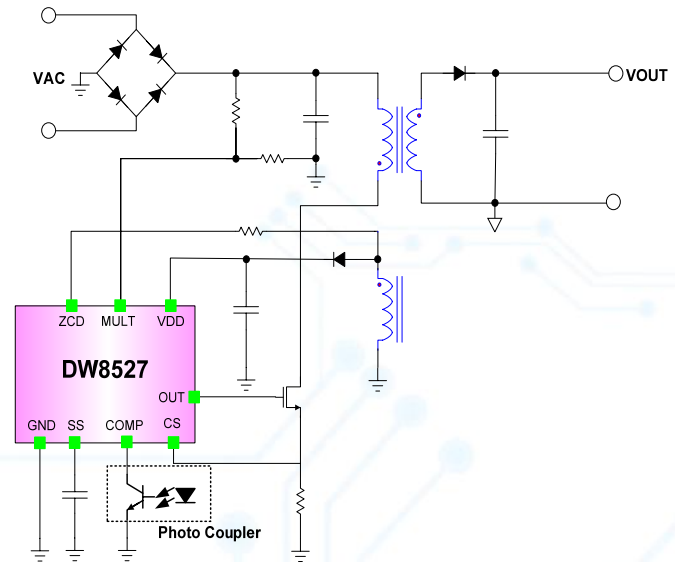
Features & Benefits

- Low quiescent current (2.5mA)
- 600mA/+800mA totem pole gate driver
- 2nd detect by comp voltage
 - Vcomp=low : No load, OVP
 - Vcomp>4V : Load open, FB-GND short
- On chip filter on current sense
- Built in soft start function.
- 8SOIC package(4.9 x 6.0 x 1.4mm)
- Wide range operation (AC85~AC270)
- Multiplier with improved power factor and THD
- Ultra Low Start-up(30uA)
- Open Load Regulation
- Low current sense reference voltage(Typ. 1.1V)
- Built in thermal protection circuit.
- Zero current switching for low power consumption

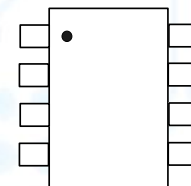
Applications

- All of LED lighting applications
- AC input LED lighting applications
- In / outdoor lighting, street, roadway,
- Parking, construction lamp

Typical Application Circuit



Package



8Lead SOIC
(4.9 x 6.0 x 1.4)

DW8507 Dimmable CCCV controller

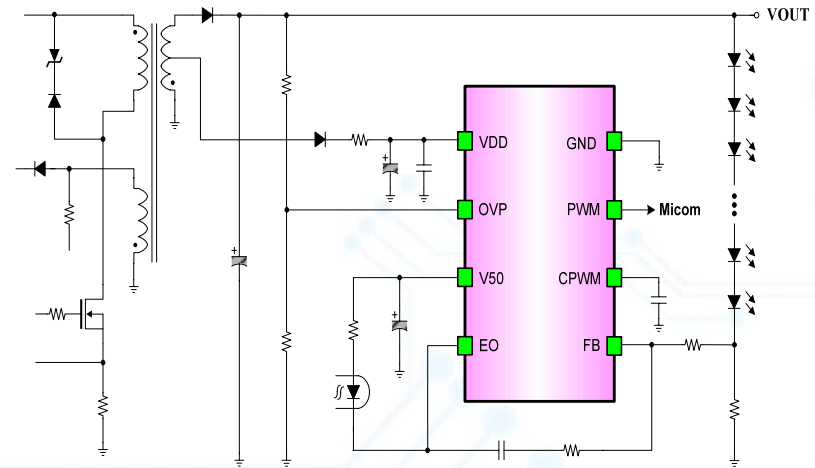
Features & Benefits

- Constant current & constant voltage
- Wide range output voltage (max 36V)
- Built-in 5V regulator
- Low feedback voltage(0.3V)
- 8SOIC package(4.9 x 6.0 x 1.4mm)
- Available PWM and Analog (0~10) dimming control
- Built-in protection circuit
(LED Short/Open, FB Short/ Open)
- Built-in Thermal Protection
(Thermal derating/shutdown)
- Built-in Soft start function.

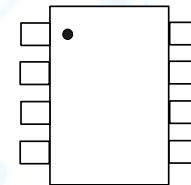
Applications

- All of LED lighting applications
- AC input LED lighting applications
- In / outdoor lighting, street, roadway,
- Parking, construction lamp

Typical Application Circuit



Package



8 pin SOIC (4.9 x 6.0 x 1.4)

DW8540 PFC & 2ndary CC-CV with PWM Dimming

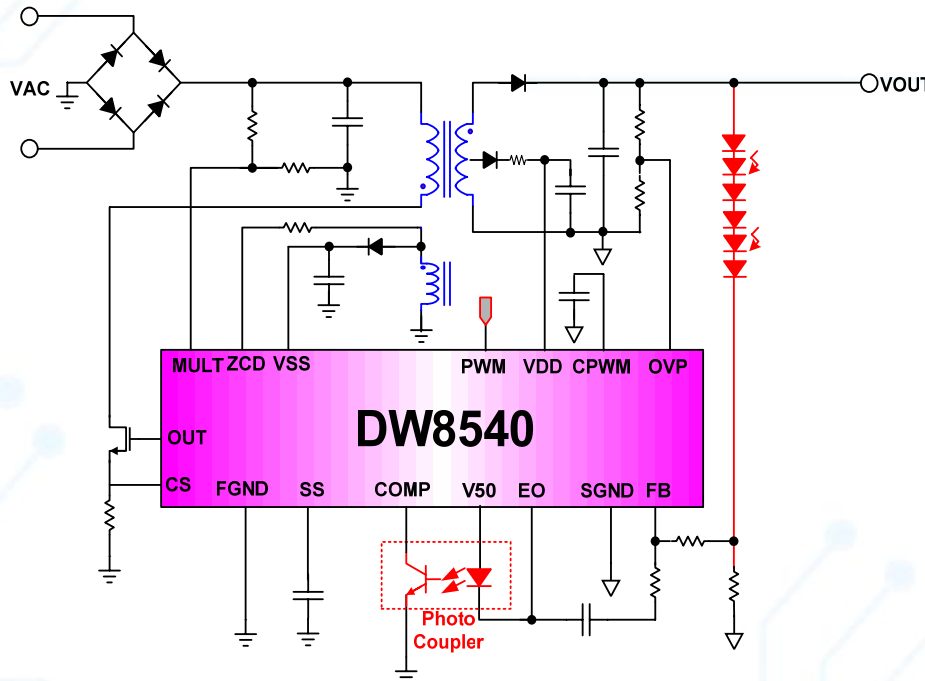
Features

- Transition Mode Control of PFC
- Available PWM dimming control
- Wide range input application : AC80~AC300
- Built-in Protection circuit : TSD,SCP,OVP
- Available 2nd PWM dimming control
- Thermal enhanced package : 16QFN

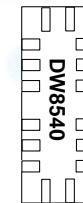
Applications

- All of LED lighting Applications
- AC Input LED Lighting Applications
- In / Outdoor Lighting, Street, Roadway, Parking, Construction Lamp

Typical Application



Package Information



16pin
QFN

LED Lighting Solution (8/14W Bulb)

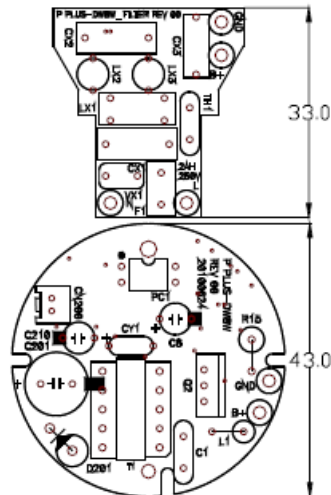
Absolute maximum ratings

Lower Input supply voltage (V_{IN})-----	90V
Higher Input supply voltage (V_{IN})-----	260V
Output voltage (V_o)-----	24.0V
Input power-----	9W
Ambient operating temperature-----	-10 °C to 50 °C
Storage temperature range-----	-30 °C to 80 °C
Operating & storage humidity-----	10 % to 85 %

Connector and functional pin description

N,L Connector	: Wire insert Type (1.6Phi Hole)
N,L	: AC Input :100V~260V
CN200 Out Connector	: SMW200-02 (YEON HO)
CN200-1	: GND
CN200-2	: 24V

Mechanical dimensions



Tolerance : ± 0.1
Unit : mm

High=25mm



Features

- Compact size (Circle Type)
- Universal input
(AC 90-260V Wide input voltage range)
- Constant output current
- Isolated Input-Output
- PF>0.9
- Fixed output voltage
- Low output ripple & noise
- RoHS compatible design

Applications

- LED Bulb, LED Down Lighting

Electrical characteristics

Parameter	Symbol	Conditions	Specification			Unit
			Min	Typ	Max	
Input supply voltage	V_{in}		90	220	260	V _{ac}
Power consumption	P_{in}	$V_{in}=220V$	8.0	9.0	10.0	W
Power factor	$\cos\theta$	$V_{in}=220V$		0.96		%
Output supply voltage 1	V_O	$V_{in}=220V$	22.6	24.0	26.6	V
Output current 1	I_O	$V_{in}=220V$		0.3		A
Total harmonic distortion	THD	90~260V			20	%
Efficiency	η	$V_{in}=90V$		86.0		%

LED Lighting Solution (15/20W Down Light)

Absolute maximum ratings

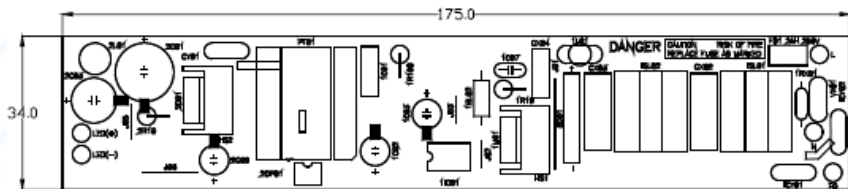
Lower Input supply voltage (V_{IN})-----	90V
Higher Input supply voltage (V_{IN})-----	250V
Output voltage (V_o)-----	24.0V
Input power -----	30W
Ambient operating temperature -----	-10 °C to 50 °C
Storage temperature range -----	-30 °C to 80 °C
Operating & storage humidity-----	10 % to 85 %

Connector and functional pin description

L,N Connector	: Wier insert Type (1.8Phi Hole)
L,N	: AC Input :100V-240V
Out Connector	: Wier insert Type (1.8Phi Hole)
LED+	: LED+(24V)
LED-	: LED-

Mechanical dimensions

Tolerance : ± 0.1
Unit : mm
High=23mm



Features

- Compact size
- Universal input
(AC 90-242V Wide input voltage range)
- Constant output Current
- Isolated Input-Output
- PF>0.9
- Fixed output voltage
- Low output ripple & noise
- RoHS compatible design



Applications

- LED Down Light

Electrical characteristics

Parameter	Symbol	Condition s	Specification			Unit
			Min	Typ	Max	
Input supply voltage	V_{in}		90	220	242	V _{ac}
Power consumption	P_{in}	$V_{in}=220V$	25.0	27.0	30.0	W
Power factor	$\cos\theta$	$V_{in}=100V$		0.95		%
Output supply voltage 1	V_O	$V_{in}=220V$	21.5	24.0	26.5	V
Output current 1	I_O	$V_{in}=220V$		1.10		A
Efficiency	η	$V_{in}=220V$		85.0		%

LED Lighting Solution (30W 2CH Fluorescent Lamp)

Absolute maximum ratings

Lower Input supply voltage (V_{IN})-----	90V
Higher Input supply voltage (V_{IN})-----	250V
Output voltage1,2 (V_o) -----	24.0V
Input power -----	30W
Ambient operating temperature -----	-10 °C to 50 °C
Storage temperature range -----	-30 °C to 80 °C
Operating & storage humidity-----	10 % to 85 %

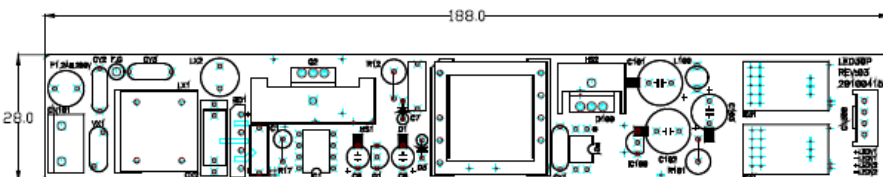
Connector and functional pin description

CN101 Connector	: YW396-03AV (YEON HO)
CN101-1,2	: AC Input :100V-240V
CN300 Out Connector	: SMW200-04 (YEON HO)
CN301-1	: 1LED+(24V)
CN301-2	: 1LED-
CN301-3	: 2LED+(24V)
CN301-4	: 2LED-

Mechanical dimensions

Tolerance : ± 0.1
Unit : mm

High=18mm



Features

- Compact size (T8)
- Universal input
(AC 90-242V Wide input voltage range)
- Constant output Current
- Isolated Input-Output
- PF>0.9
- Fixed output voltage
- Low output ripple & noise
- RoHS compatible design



Applications

- LED Down Light

Electrical characteristics

Parameter	Symbol	Conditions	Specification			Unit
			Min	Typ	Max	
Input supply voltage	V_{in}		100	220	240	Vac
Power consumption	P_{in}	$V_{in}=220V$	20	25	30	W
Power factor	$\cos\theta$	$V_{in}=100V$		0.95		%
Output supply voltage	V_o	$V_{in}=220V$	22.5	24.0	25.5	V
Output current 1	I_o	$V_{in}=220V$.	0.5	.	A
Output supply voltage	V_o	$V_{in}=220V$	22.5	24.0	25.5	V
Output current 2	I_o	$V_{in}=220V$.	0.5	.	A
Efficiency	η	$V_{in}=220V$		85.0		%

LED Lighting Solution (200W Street Light)

Absolute maximum ratings

Lower Input supply voltage (V_{IN})	90V
Higher Input supply voltage (V_{IN})	250V
Output voltage (V_o)	30.0V
Input power	150W
Ambient operating temperature	-10 °C to 50 °C
Storage temperature range	-30 °C to 80 °C
Operating & storage humidity	10 % to 85 %

Connector and functional pin description

CN101 Connector	: (KOREA ET Connector or Equivalent)
CN011-1,2	: AC Input :100V-240V
CN201 Connector	: YW396-03 (YENHO)
CN201-1	: Output voltage(30V)
CN201-2	: GND

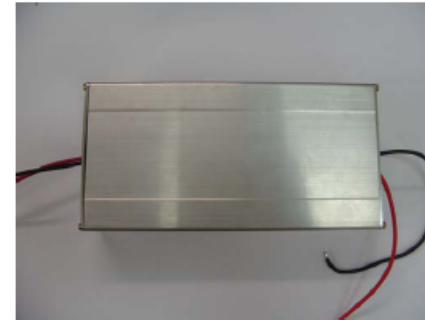
Mechanical dimensions

Tolerance : ± 0.1
Unit : mm
High=55mm



Features

- General size
- Universal input
(AC 90-242V Wide input voltage range)
- Constant output current
- Isolated Input-Output
- PF>0.9
- Fixed output voltage
- Low output ripple & noise
- RoHS compatible design



Applications

- LED 가로등

Electrical characteristics

Parameter	Symbol	Condition s	Specification			Unit
			Min	Typ	Max	
Input supply voltage	V_{in}		90	220	242	Vac
Power consumption	P_{in}	$V_{in}=220V$	140.0	160.0	160.0	W
Power factor	$\cos\theta$	$V_{in}=100V$		0.95		%
Output supply voltage 1	V_O	$V_{in}=220V$	28.0	30.0	32.0	V
Output current 1	I_O	$V_{in}=220V$		4.0		A
Efficiency	η	$V_{in}=220V$		85.0		%