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Future of Power Electronics and the Earth



Selection Guide of LED Driver



All information in this guide is as of the date of publication. Please make sure that you are using the latest version of the guide.
If you need more product information, please refer to our data sheets.

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Downsized PCB

High Power and Smart Lighting

Down light

LED fluorescent lamp

Ceiling light

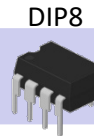
Street light



Isolated Flyback Convertor

- No PFC Circuit Required
- High Power Factor in Light Load (Class-C)

LC5546AD, LC5546LD
(Internal Power MOSFET)

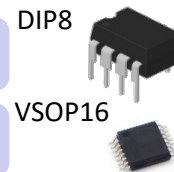


Non-isolated and Buck-boost Convertor

- Low Component Count
- High Power Factor
- High Power Factor (Class-C)

LC5566LD (Internal Power MOSFET)

LC5581AS, LC5581LS (Controller)



High Power and Smart Application

PFC IC: SSC2016S (CRM Type)

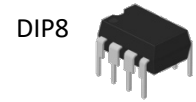
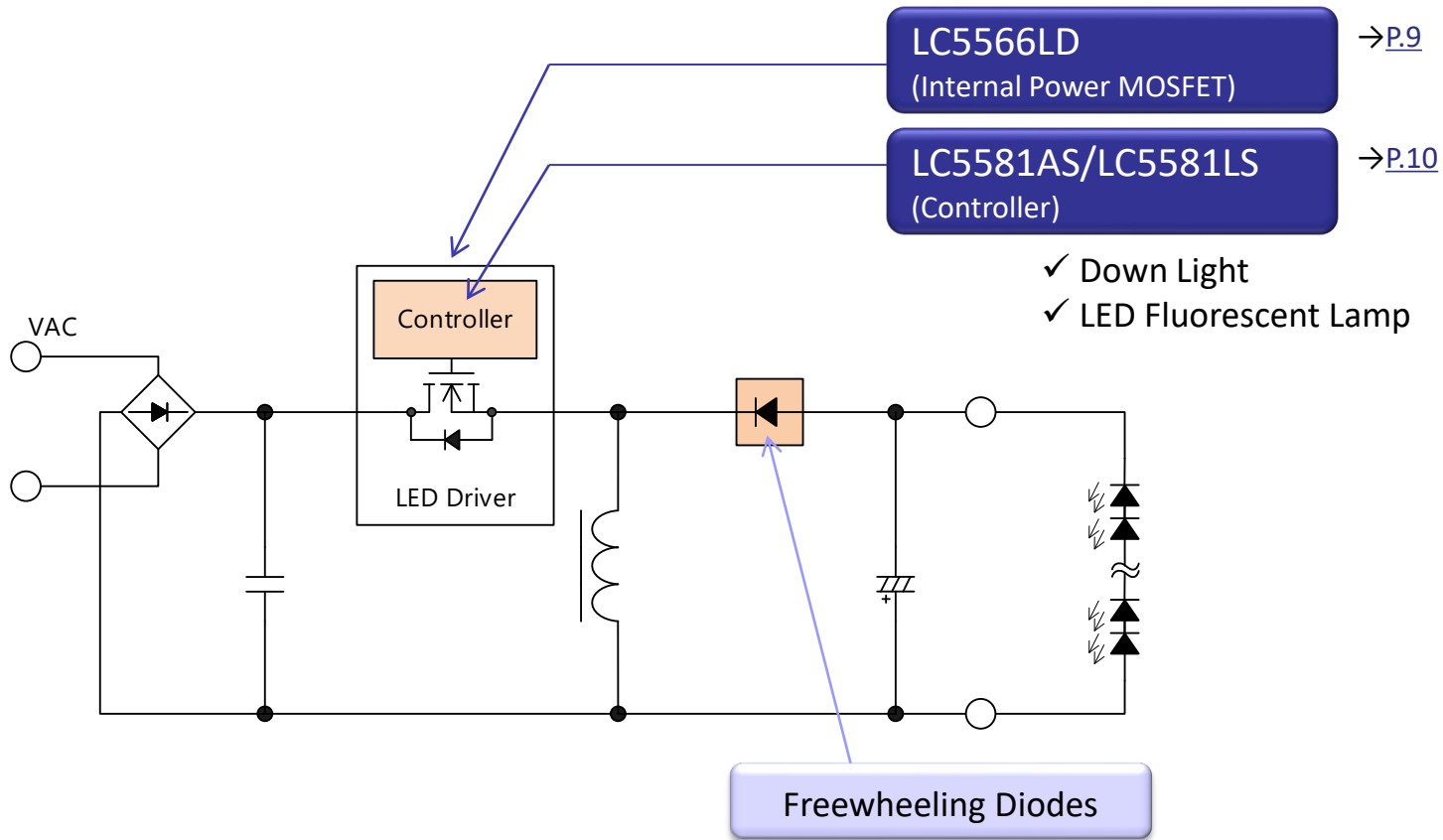
Main Converter: LLC Type

DC/DC LED Driver IC

LC101N (1ch)
Balancer

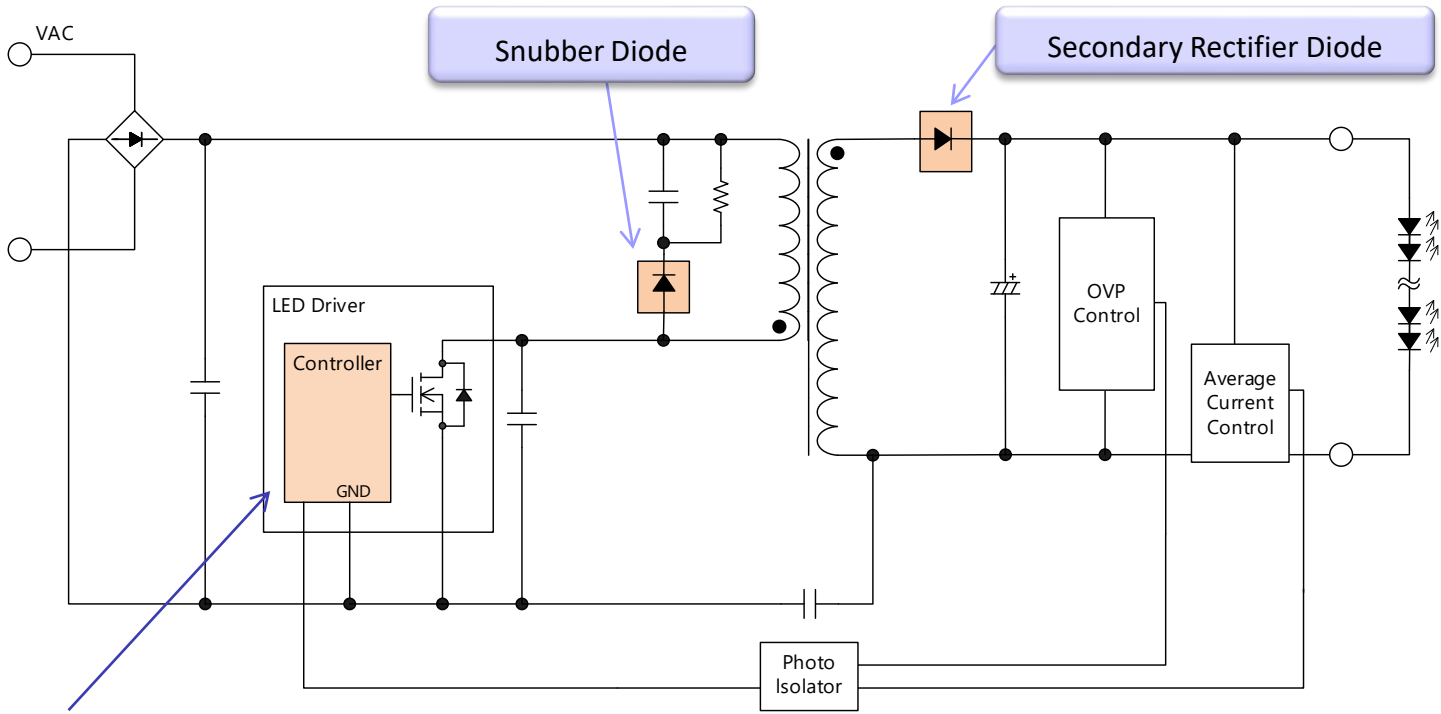
Products offers to meet various needs such as various form and loads of the lamp.

Buck-boost Converter



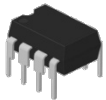
Note:
Refer to the selection guide of diode about peripheral diodes.

Off-line Flyback Type (Low to Middle Power Application)



LED Driver

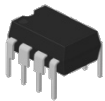
DIP8



LC5546AD, LC5546LD (Non-isolated, Internal Power MOSFET)

- ✓ No Dimming
- ✓ Down Light → [P.8](#)

DIP8



LC5566LD (Isolated, Internal Power MOSFET)

- ✓ Dimming
- ✓ LED Bulb, Down Light → [P.9](#)

VSOP16



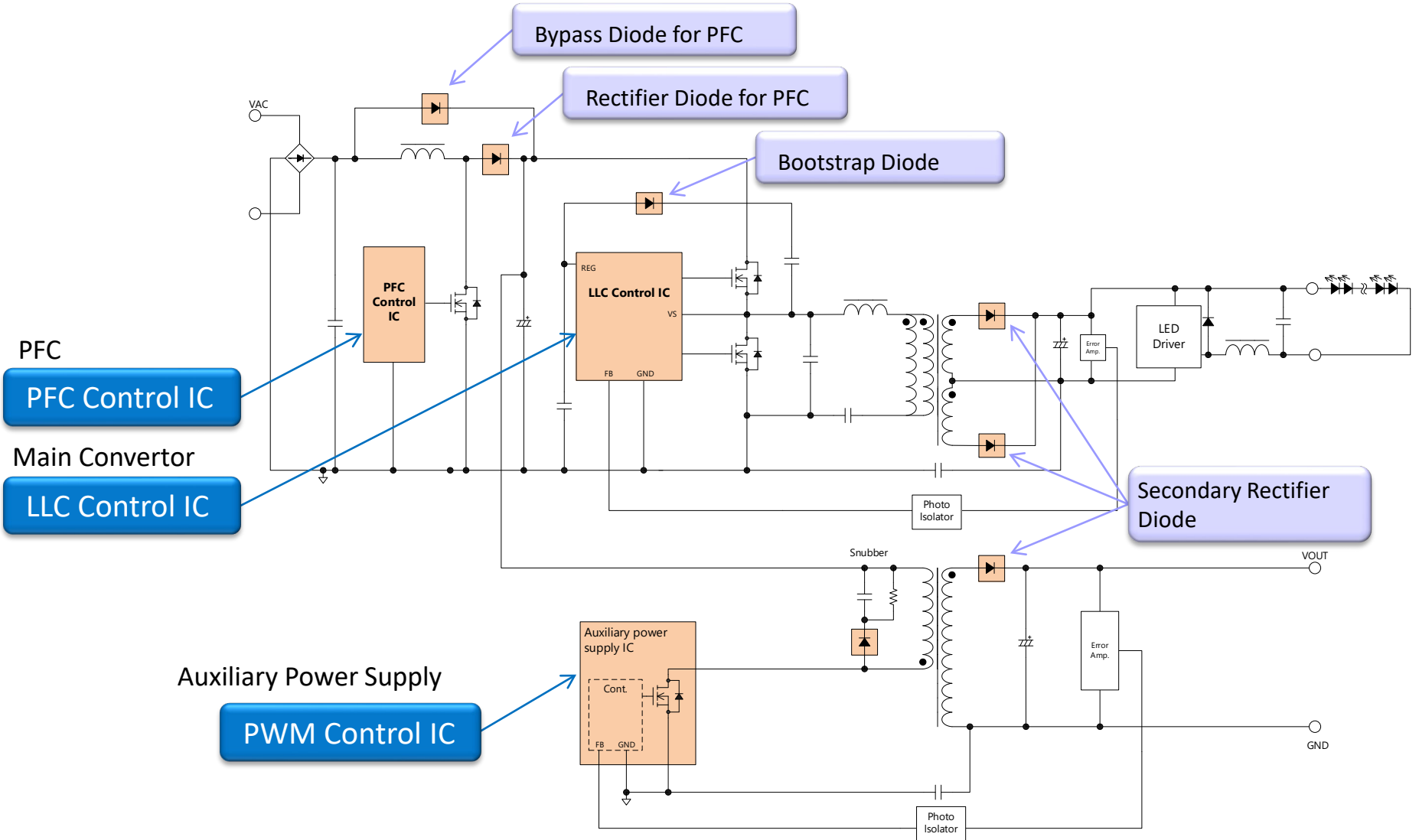
LC5581AS, LC5581LS (Isolated, Controller)

- ✓ Dimming
- ✓ Down Light, LED Fluorescent Lamp → [P.10](#)

Note:

Peripheral diodes are shown in the selection guide of diode.

High Power and Smart Application



Notes:

- Peripheral diodes are shown in the selection guide of diode.
- PFC, LLC and PWM ICs are shown in selection guide of AC/DC Converter and PFC.

Off-line LED Driver IC Selection Guide

- High Power Factor in Light Load (Class-C)
- No Input Electrolytic Capacitor Required
- Light Load High Efficiency
- Isolated and Non-isolated Type

LED bulb

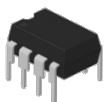



Down light



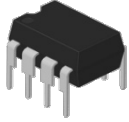
LED fluorescent lamp



Series	Package	Applications	Features	P _{OUT}		Operation Mode	Protections	Page
				AC230V	Universal			
LC5546AD	<ul style="list-style-type: none"> • DIP8 • 2.54mm pitch • Flow 	<ul style="list-style-type: none"> • Down light • LED fluorescent lamp 	<ul style="list-style-type: none"> • 650 V power MOSFET • Startup circuit • Isolated flyback 	16W	20W	PMW (72kHz) / QR	<ul style="list-style-type: none"> • OLP (Auto-restart) • OVP (Auto-restart) • TSD (Auto-restart) • OCP (Pulse-by-pulse) 	P.8
LC5546LD				16W	20W	PMW (60kHz) / QR	<ul style="list-style-type: none"> • OLP (Latched) • OVP (Latched) • TSD (Latched) • OCP (Pulse-by-pulse) 	P.8
LC5566LD		<ul style="list-style-type: none"> • LED bulb • Down light 	<ul style="list-style-type: none"> • 650 V power MOSFET • Startup circuit • Non-isolated flyback/buck-boost • Analog dimming • Built-in error amplifier 	16W	20W	PMW (60kHz) / QR	<ul style="list-style-type: none"> • OLP (Latched) • OVP (Latched) • TSD (Latched) • OCP (Pulse-by-pulse) 	P.9
LC5581AS	<ul style="list-style-type: none"> • VSOP16 • 0.65mm pitch • Flow / Reflow 	<ul style="list-style-type: none"> • Down light • LED fluorescent lamp 	<ul style="list-style-type: none"> • Controller type (external power MOSFET) • 800 V startup circuit • Non-isolated flyback/buck-boost • Analog dimming • Shorter time from startup to LED lighting 	30W	50W	PMW (60kHz) / QR	<ul style="list-style-type: none"> • OLP (Auto-restart) • OVP (Auto-restart) • OCP (Pulse-by-pulse) 	P.10
LC5581LS				30W	50W	PMW (60kHz) / QR	<ul style="list-style-type: none"> • OLP (Auto-restart) • OVP (Latched) • OCP (Pulse-by-pulse) 	P.10

No Input Electrolytic Capacitor Required, IEC61000-3-2 class-C Isolated LED Driver IC LC5546AD, LC5546LD

Package
DIP8



Selection Guide

Part Number	Operation Mode	MOSFET		P _{OUT}		OLP, OVP, TSD
		V _{DSS}	R _{DS(ON)}	AC230V	Universal	
LC5546AD	72 kHz PWM/ Quasi-resonant	650 V	1.9 Ω	20 W	16 W	Auto-restart
LC5546LD	60 kHz PWM/ Quasi-resonant					Latched Shutdown

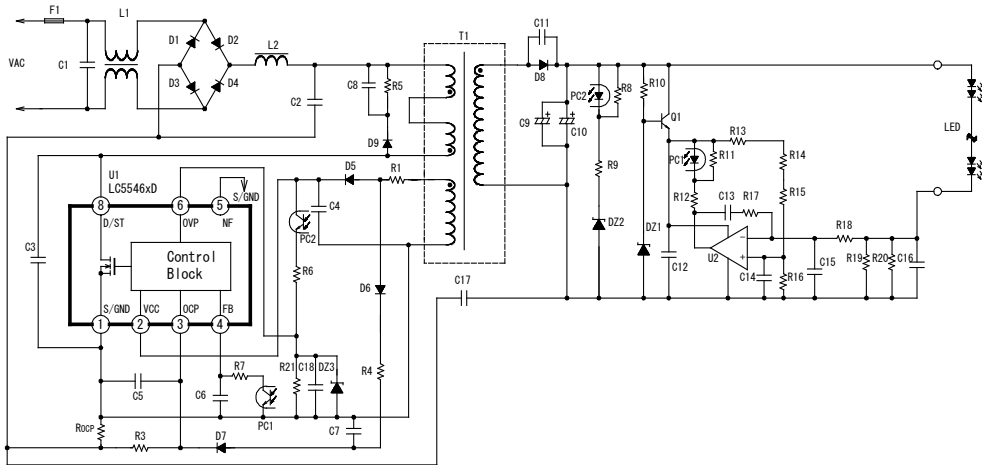
Features

- 650 V Startup Circuit
- One-converter PFC Operation
- Selectable Operation Mode from PWM or Quasi-resonant Operation
- High Power Factor in Light Load (IEC61000-3-2 class C)
- Protections
OCP: Pulse-by-Pulse
OLP, OVP, and TSD: Auto-restart or Latched Shutdown

Pin Configuration Definitions

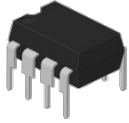
Pin Number	Symbol	Functions
1	S/GND	Power MOSFET source and ground
2	VCC	Supply voltage input and OVP signal input
3	OCP	OCP and QR signal input, and OVP signal input
4	FB	Feedback signal input and OLP signal input
5	NF	No function
6	OVP	OVP signal input
7	—	Pin removed
8	D/ST	Power MOSFET drain and startup current input

Typical Application



No Input Electrolytic Capacitor Required, IEC61000-3-2 Class-C Non-isolated LED Driver IC LC5566LD

Package
DIP8



Selection Guide

Part Number	Operation Mode	Power MOSFET		P _{OUT}	
		V _{DSS}	R _{DS(ON)}	AC230V	Universal
LC5566LD	60 kHz PWM/ Quasi-resonant	650V	1.9 Ω	20 W	16 W

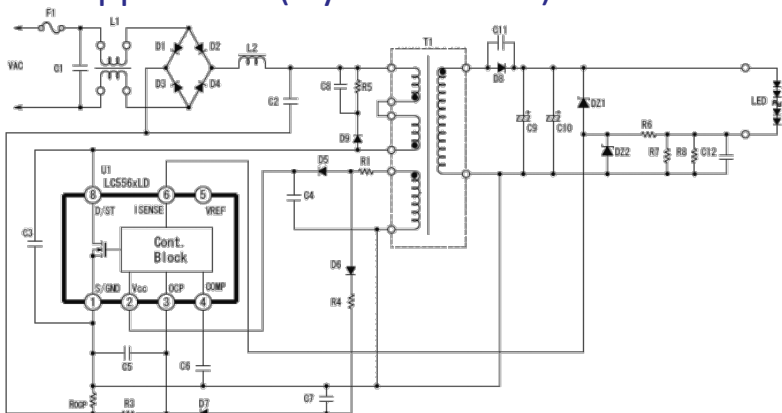
Features

- 650 V Startup Circuit
- One-converter PFC Operation
- Selectable Operation Mode from 60 kHz PWM or Quasi-resonant Operation
- High Power Factor in Light Load (IEC61000-3-2 class C)
- Built-in Error Amplifier (Adjustable Reference Voltage)
- Protections
OCP: Pulse-by-Pulse
OLP, OVP, and TSD: Latched Shutdown

Pin Configuration Definitions

Pin Number	Symbol	Functions
1	S/GND	Power MOSFET source and ground
2	VCC	Supply voltage input and OVP signal input
3	OCP	OCP and QR signal input, and OVP signal input
4	COMP	Feedback phase-compensation input
5	VREF	Dimming control signal input
6	ISENSE	Output current sensing voltage input
7	—	Pin removed
8	D/ST	Power MOSFET drain and startup current input

Typical Application (Flyback Circuit)



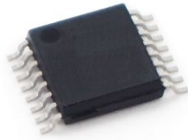
No Input Electrolytic Capacitor Required, IEC61000-3-2 Class-C

Non-isolated LED Driver IC

LC5581AS, LC5581LS

Package

VSOP16



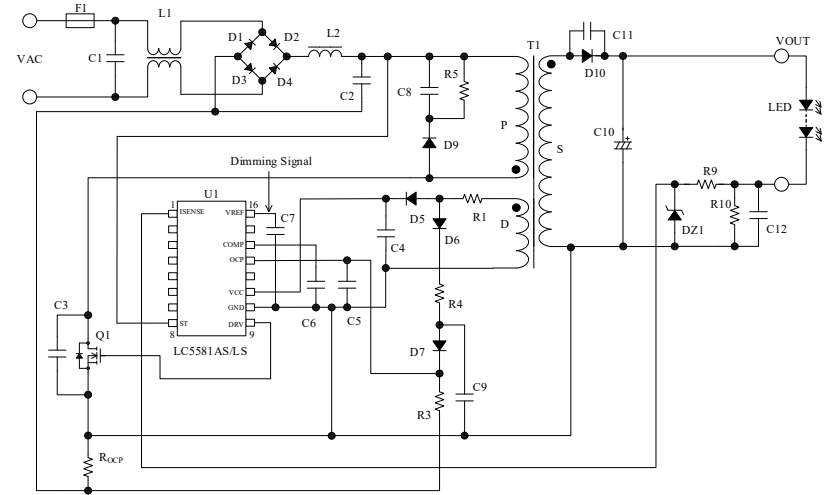
Features

- 800 V High Voltage Startup Circuit
- Shorter Time from Startup to LED Lighting
 - COMP Pin Fast Charging Function
 - Two Types Bias Assist (Smaller Capacitance of the VCC Pin)
- Selectable Operation Mode from 60 kHz PWM or Quasi-resonant Operation
- Standby Function
- Analog Dimming Function
- Protections
 - OCP: Pulse-by-pulse
 - OLP: Auto-restart
 - OVP: Latched Shutdown/Auto-restart

Selection Guide

Part Number	Operation Mode	Protection Operation	
		OLP	OVP
LC5581AS	60 kHz PWM/ Quasi-resonant	Auto-restart	Auto-restart
LC5581LS		Auto-restart	Latched Shutdown

Typical Application (Flyback Circuit)



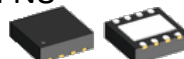
Pin Configuration Definitions

Pin Number	Symbol	Functions
1	ISENSE	Feedback current detection
2 - 7	(NC)	No connection
8	ST	Startup current input
9	DRV	Drive output
10	GND	Ground
11	VCC	Power supply voltage input for control part and OCP pin overvoltage protection signal input
12	(NC)	No connection
13	OCP	Input for overcurrent protection and quasi-resonant signal
14	COMP	Feedback Phase compensation
15	(NC)	No connection
16	VREF	Dimming signal input and standby signal input

DC/DC LED Driver IC Selection Guide

- For Intelligent LED Lighting Application
- For LED Back Light Application
- Individual Channels Control



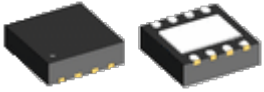
Series	Output Count	$V_{IN(MAX)}$	I_O	$V_{LED(MAX)}$	Package	Features	Page
LC101N (Current Balancer)	1	35 V	150 mA	35 V	DFN8 	Balancer	P.12

$I_{LED} = 150 \text{ mA}$
LED Current Balancer

LC101N

Package

DFN8



Features

- Current Balancer Across LED String
- Small Package (DFN8)
- Power Dissipation, P_D : 1.3 W
- No Input and Output Capacitor Required
- Maximum Dropout Voltage, ΔV_{DIF} : 350 mV
- Protections
 - OCP
 - TSD: Activation Temperature is 130 °C without Hysteresis

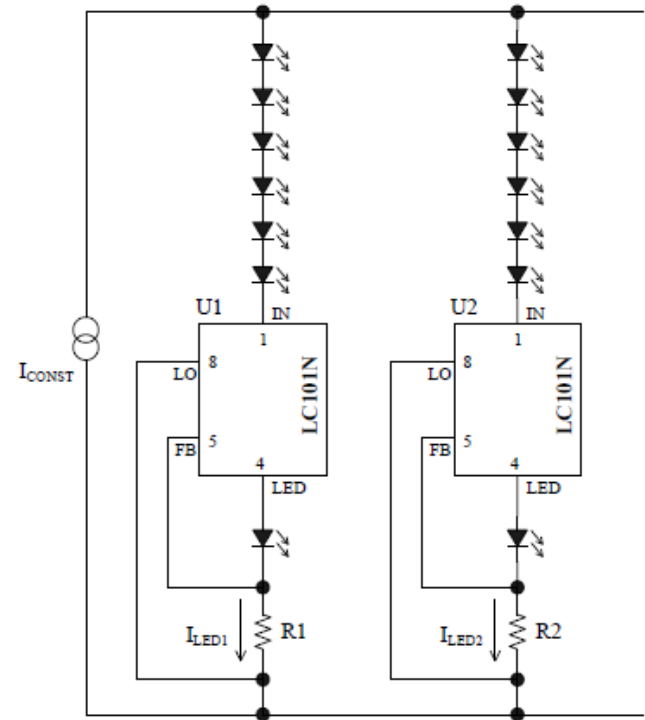
Pin Configuration Definitions

Pin Number	Symbol	Functions
1	IN	Input
2, 3	NC	—
4	LED	Output
5	FB	LED current detection signal input (positive side)
6, 7	NC	—
8	LO	LED current detection signal input (negative side)

Selection Guide

Part Number	$I_{LED(MAX)}$	$V_{LED MAX}$	V_{IN}	V_{FB}
LC101N	15 mA to 150 mA	35 V	2.4 V to 35 V	200 mV \pm 3%

Typical Application



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