

TI LED General Lighting Driver Solutions

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LED General Illumination Applications

LED Lighting

Residential
< 25W or 3,000 lm

Commercial
20W – 75W or
2000 lm - 10000 lm

Outdoor and Infrastructure
65W – 500W
8000 lm - 60,000 lm

Characteristics
 Cost PFC (10W) soft white
 Efficiency Safety color changing
 Reliability Dimming

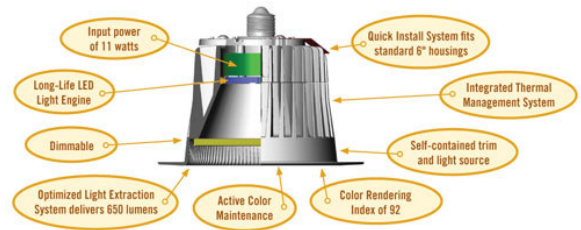
Characteristics
 Efficiency PFC cool whites
 PLC
 Low maintenance Safety Color washing
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Light Bulb Replacement (A19: E26/27, E14, GU10, MR16, PAR30/38) Task, Desk, Wall Accent lighting, down lights display, retail, emergency, safety, medical, garden patio, pathway, handrail lighting

Area, Parking, Street, Roadway, Ornamental, Pathway, Signage, Contour, Architectural, Letter, Medical, Monitors, Displays

High Bay, Stadium, Airport, Street, Roadway, Large Display, Sports Field, Construction, Search Lights, Temporary

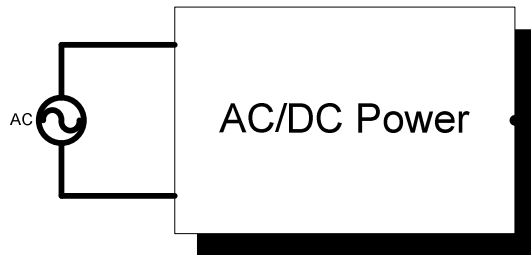




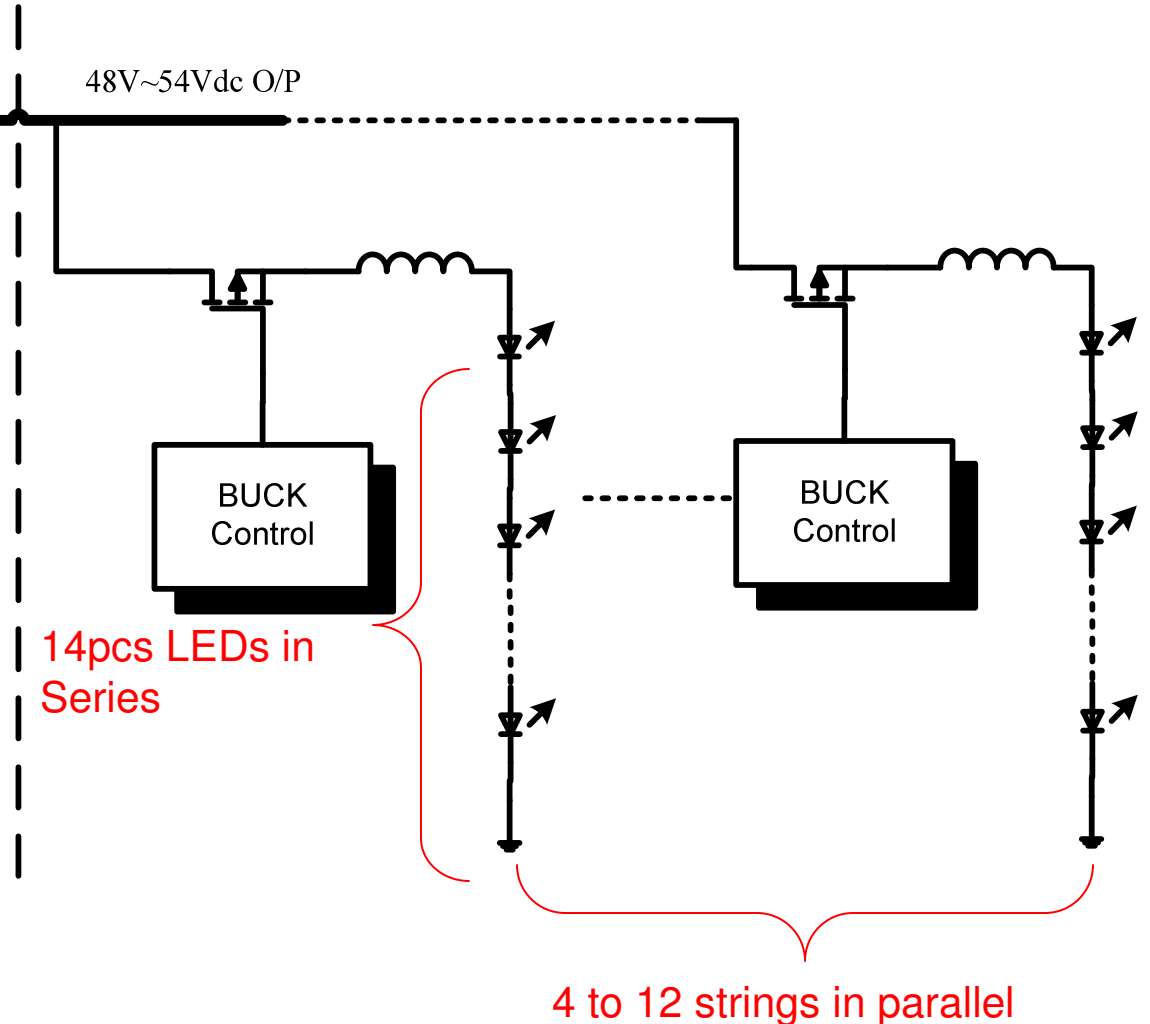
TEXAS INSTRUMENTS

LED Lighting Topology in China

AC/DC Power Stage



Constant Current Driver Stage



Outdoor & Infrastructure (>60W):

(GB17625.1-1998 for hamonicis)

(GB7001-1986 for electric protect)

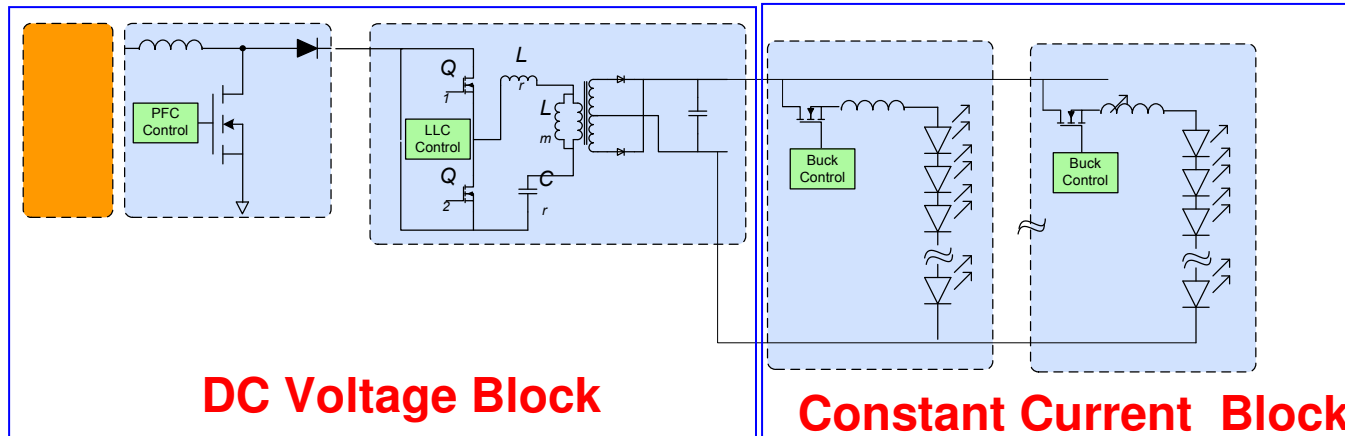
- Input: 220Vac(+/-10%)
- Freq.: 50+/-0.5HZ
- PF>=0.95
- THD<=20%
- Eff.>=85%, Target to >90% (ACDC+CC Driver)
- Thermal:-5~50degC
- Current balance<=+/-5%
- Life Time>=50K hr
- Waterproof Stand. IP67
- Antisepsis Stand. II



LED Lighting Block Diagrams

Outdoor & Infrastructure

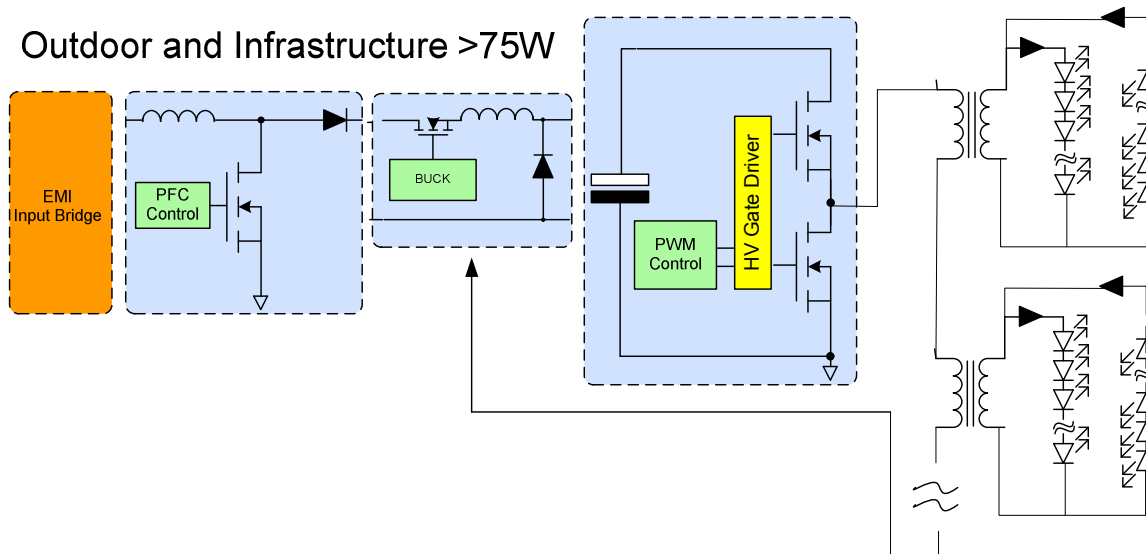
Outdoor and Industrial >60W



Typical Controllers

- UCC25600
- UCC28061
- UCC28810
- UCC28811
- TPS40211
- TPS40200
- TPS54160

Outdoor and Infrastructure >75W



AC input 150W Single stage AC/DC for street LED lighting

Reference Design	TI Parts	V_{in}	P_o	V_o	Topology	Eff.	PF
AC Input UCC28061 single stage AC/DC LED lighting power supply	UCC28061	90-264 Vac	150W	48V or 54V	Single Stage Interleaved QR-Flyback with power factor correction	>90%	>0.95



Features

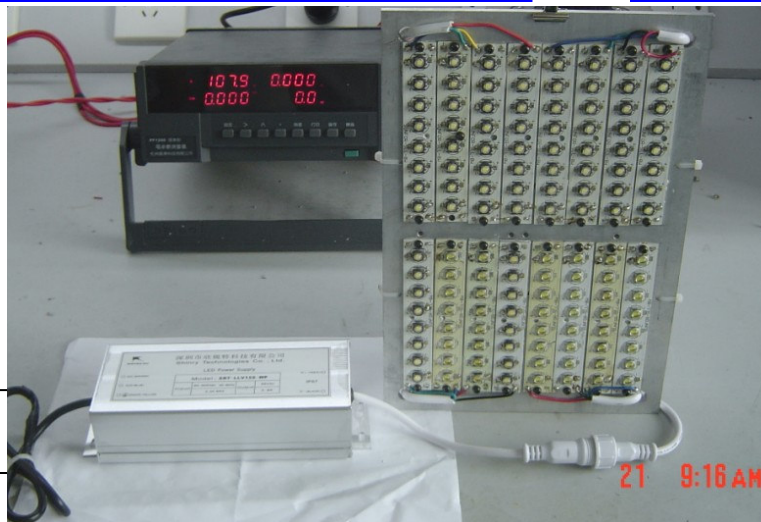
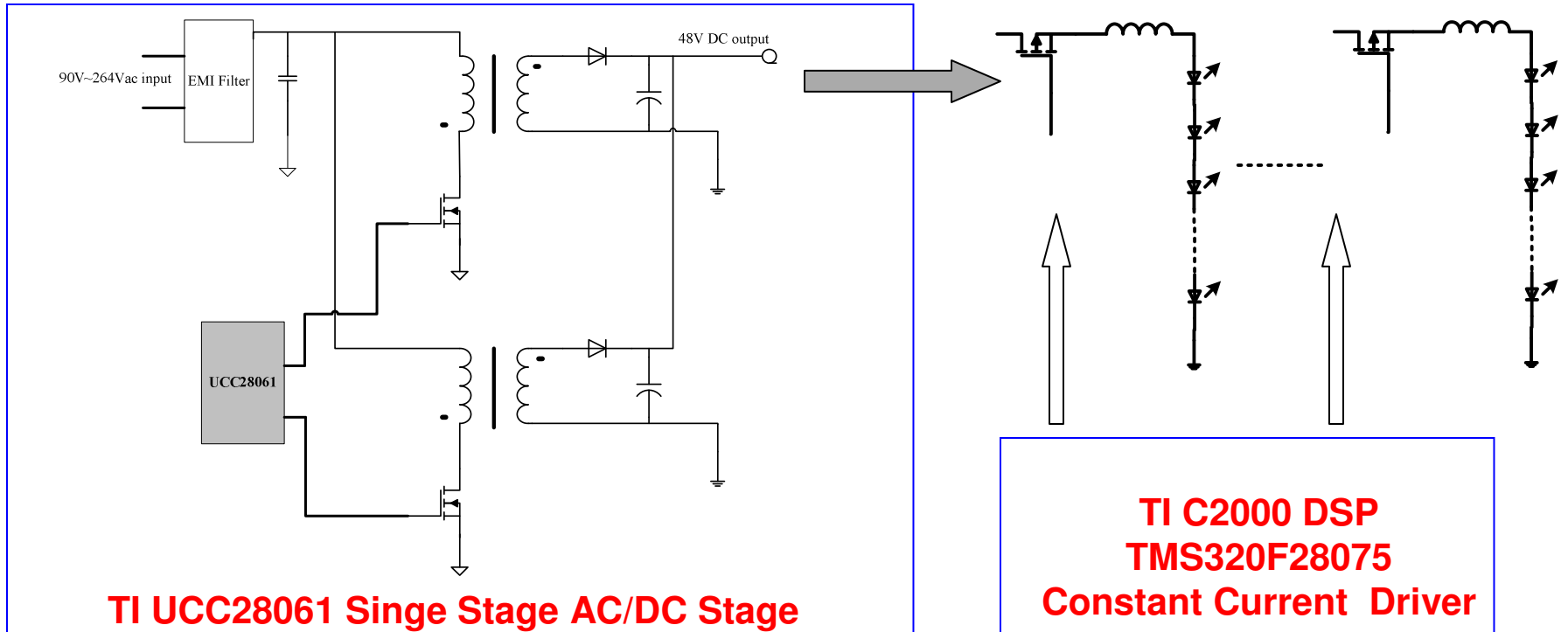
- Single stage with high PF>0.95, THD<20%
- Low cost for LED lighting AC/DC stage
- No 450V bulk capacitor with high reliability and long life time
- Interleaved QR-Flyback with ripple cancellation
- Single chip solution and easy design
- High efficiency >90%
- Low inrush current
- Turn key Solutions

Applications

- Street & Roadway LED Lighting



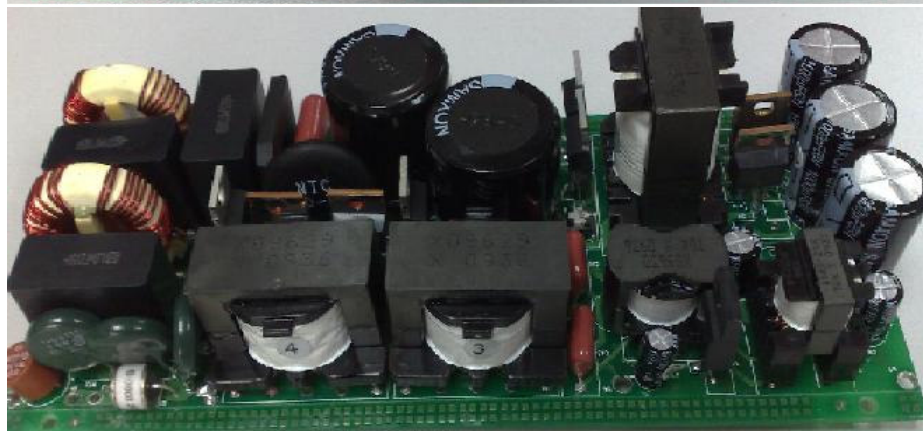
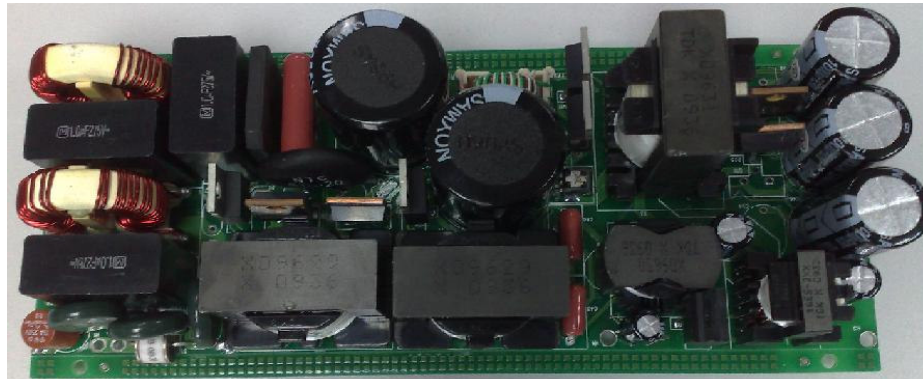
AC Input 150W Street LED Lighting Block Diagram



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AC Input 200W Two Stage AC/DC for Street LED Lighting

Reference Design	TI Parts	V_{in}	P_o	V_o I_o	Topology	Eff.	PF
PMP4288: AC Input 200W AC/DC Power supply for Street LED lighting	UCC28061 UCC25600 UCC3813	90-305 Vac	200W	54V 3.7A	Interleaved TM PFC+ LLC control with high eff.	>93%	>0.95



Features

- Interleaved TM PFC + LLC control with high efficiency >93%
- Safety UL8750
- PCB size: 168mm * 65mm * 37mm

Applications

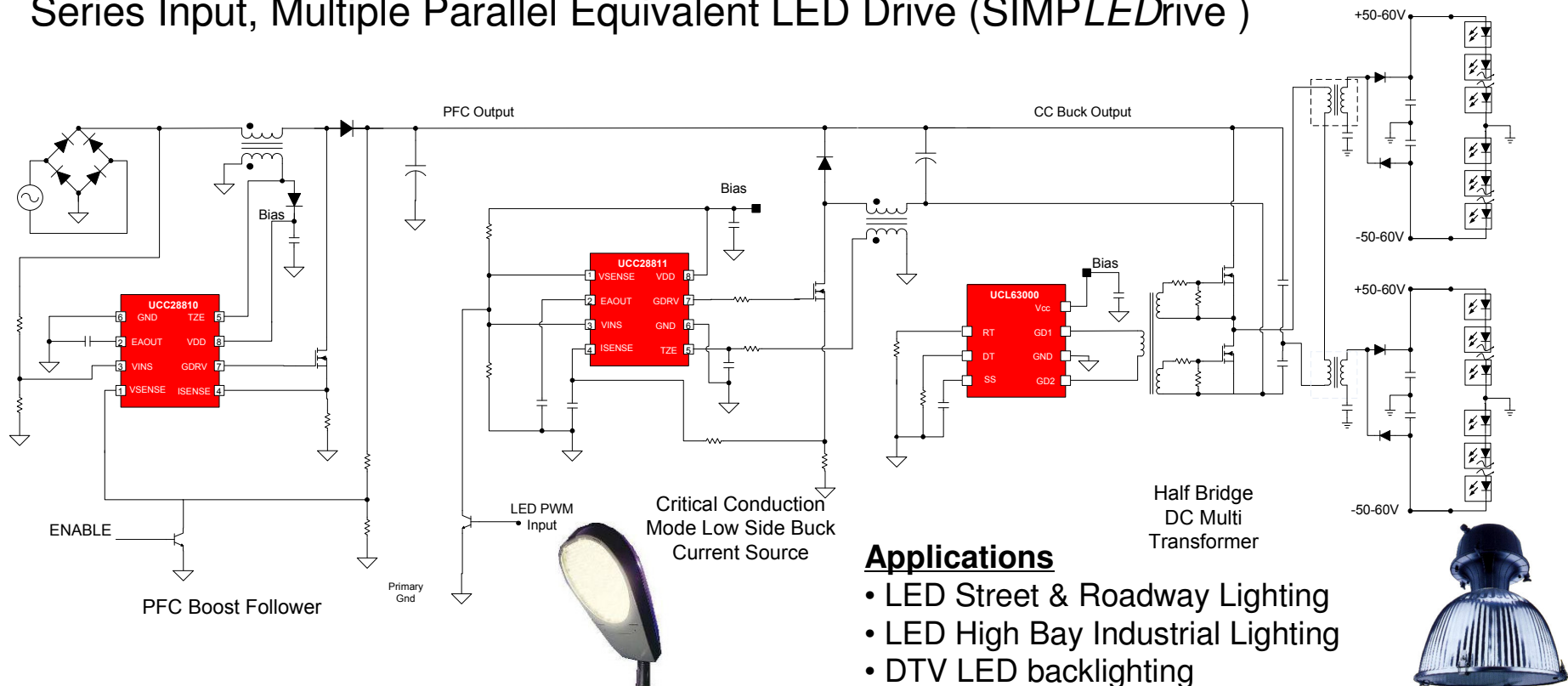
- High Way LED Lighting
- High Bay Industrial LED Lighting



UCC28810 EVM003 - SIMPLEDriVe

Description	Parts	Vin (AC) Range	Vout (DC) Range	# of LEDs	Iout max.	Pout (max)	Eff.	PFC	ISO	Dimming In	Dimming Out	Contact	EVM
UCC28810 EVM003 100W Isolated Multi-string LED lighting driver w/ multiple transformers	UCC28810 UCC28811 UCC25600	90 265	22 60V	4X (7-15)	500 mA	100W	91%	Y	Y	PWM	PWM	Jim Aliberti	Nov-09

Series Input, Multiple Parallel Equivalent LED Drive (SIMPLEDriVe)

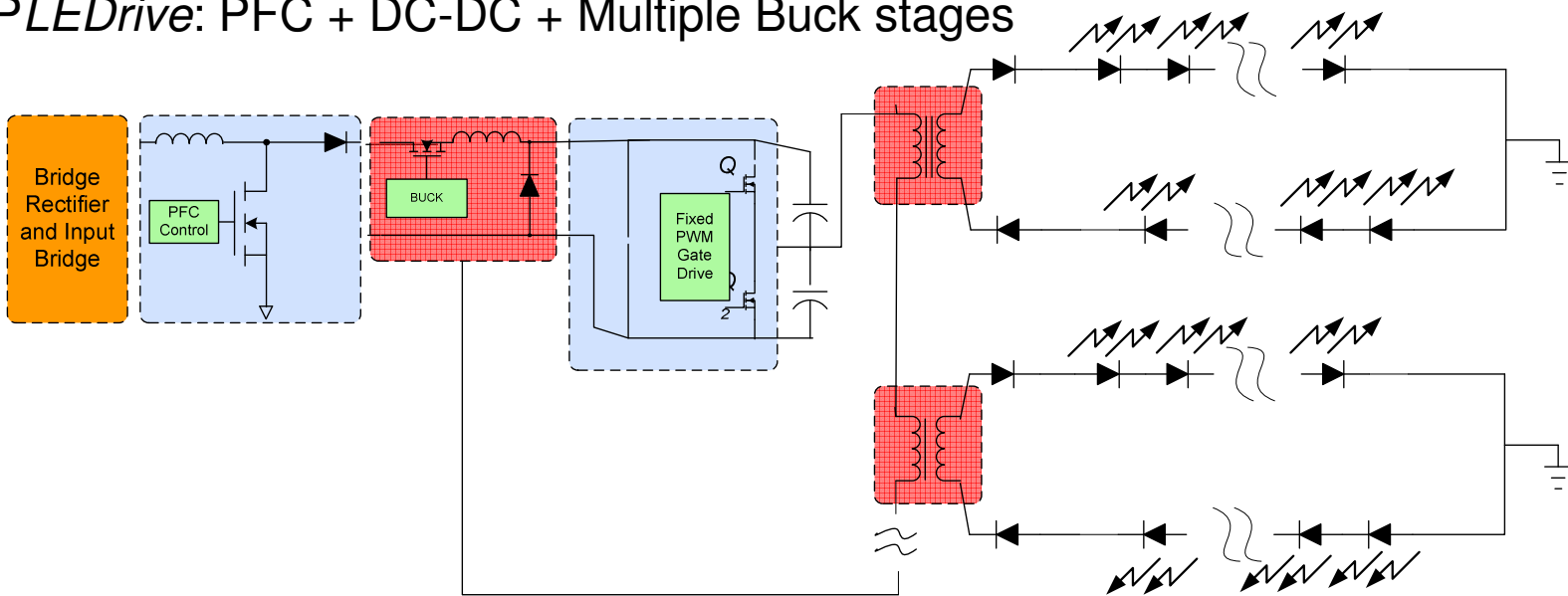


<http://focus.ti.com/docs/toolsw/folders/print/ucc28810evm-003.html>



High Light Output Drivers – PFC + Buck + Multiple

SIMPLEDrive: PFC + DC-DC + Multiple Buck stages



PFC Stage

- Required in any implementation

Low Side Buck

- Provides constant LED Current and main control

Series Transformers

- Provides constant current to each LED string

Benefit:

- One control section for all string currents,
- lower part count, higher reliability and lower cost

Drawback:

- All strings will be dimmed simultaneously (if individual dimming is required)