

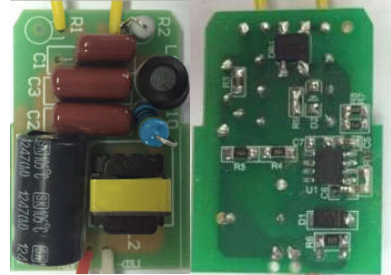


Silergy LED Lighting Product Selection Guide

2016. Sept



Silergy driver solutions for phase cut dimmable LED applications

Phase cut dimmable application			
Lamp Type	NA market (120 Vac)	EU Market (230 Vac)	
Candle / GU10 Filament Lamp A/ PAR BR / Downlight	NEW SY58361/SY58362 Buck-Boost / Low BOM cost/ PF > 0.9 / 5~12W	SY58652F/SY58658F Buck-Boost / SO8/ especially for 3-10W filament lamp	
		SY5865X Series Buck-Boost/Flyback/SO8 Single winding	
	NEW SY58561/SY58563 Buck / Low BOM cost/ PF > 0.9 / 5~16W		
		SY58652	SY58653
		5~6W/470Lm	8~12W/1000Lm 15W
12-40 W PAR / BR Downlight / Spot	Coming SY5852 Buck-Boost / Flyback / Controller / SO8 No external bleeder / No HV starter / single winding PF > 0.9 / <40W		
	SY5859B Buck / Controller /SO10 PF > 0.9 / <60W	SY5850D Buck-Boost / Flyback / Controller /SO10 PF > 0.9 / <60W	



Silergy driver solutions for non-dimmable LED applications

App. Demand	Silergy driver solutions for non-dimmable LED applications							
PF>0.5	SY5858X series Buck, Int FET, 500V BV Thermal Foldback low BOM cost, 3-pin,			SY58581	SY58582	SY58584	SY58585	
		Package		SOT23-3	SOT23-3	TO92	SO8	
		Max current		150mA	240mA	240mA	240mA	
PF>0.5	SY5818XN series, 350V BV SY5828XN series, 500V BV Buck, Int FET Reliable OLP/SLP, Thermal Foldback	App range	120Vac app.			230Vac app.		
		Part No.	SY58181N	SY58182N	SY58183N	SY58281N	58282N	SY58283N
		Package	SOT23-5	SO8	SO8	SOT23-5	SO8	SO8
		Max Power	12W	16W	20W	18W	24W	30W
PF>0.5	SY5812X series Buck-Boost / Flyback Int 600V FET Reliable OLP/SLP, Thermal Foldback especially for filament lamp	Part No.	SY58120	SY58121	SY58122			
		Package	SOT23-5	SO8	SO8			
		Max Power	5W	10W	15W			
PF>0.7	SY58X7XQ series Buck, Int FET Reliable OLP/SLP, thermal foldback low output cap volume	App range	120Vac app.			230Vac app.		
		Part No.	SY58271Q	SY58272Q	SY58273Q	SY58573Q		
		Package	SOT23-5	SO8	SO8	SO8		
		Max Power	80V/140mA	80V/180mA	80V/220mA	80V/180mA		
PF>0.9	SY58X7X series Buck, Int FET Reliable OLP/SLP, thermal foldback	Part No.	120Vac app.			230Vac app.		
		Part No.	SY58272	SY58273	SY58572	SY58573	SY58574	SY58575
		Package	SO8	SO8	SO8	SO8	SO8	SO8
		Max Power	80V/180mA	80V/220mA	80V/140mA	80V/180mA	80V/220mA	80V/250mA



Silergy driver solutions for High power and MR16 applications

App. Demand	High power application AC/DC CC controller and AC current ripple remover					
High power AC/DC CC controller	SY5830B Buck-Boost /Flyback controller, SOT23-6, PF>0.9, THD<10%, Reliable OLP/SLP		SY5839 Buck controller, SOT23-6 PF>0.9, THD<20%, Reliable OLP/SLP,			
AC current ripple remover	SY586X series AC current ripple remover less external components	Part No.	SY5861B	SY5862	SY5863	SY5864
		BV (V)	100V	60V	60V	60V
		current range	50~200mA	0.2~0.6A	0.3~1.0A	0.3~1.2A
		package	SO8	SO8	TO-252	TO-220

App. Demand	MR16 Application							
	PF	Feature	P/N	Dim Range	Vout	Pout	Package	Comment
MR16	PF>0.9	Non-dim	SY8722A	NA	<18V	<8W	SO8E	Boost+Buck , 2-stage
			SY7305	NA	18~30V	<6W	SO8E	Boost, Single-stage
			SY7306	NA	18~30V	<8W	SO8E	Boost, Single-stage
	PF>0.9	Dim	SY8726B	0%~100%	<18V	<8W	TSSOP16E	Boost+Buck, 2-stage
			SY8727	0%~100%	18~30V	<8W	SO8E	Boost+LDO, 2-stage
			SY7400	1%~100%	18~48V	<12W	SO8E	Boost, 2 nd stage
			SY7400L	1%~100%	18~48V	<7W	SOT23-6	Boost, 2 nd stage



Silergy driver solutions for Smart Lighting applications

App. Demand	Smart Lighting and Fixture			
Smart Lighting and Fixture	One-stage	One channel	SY5881	Buck controller/PF>0.9/0~10V&PWM dim, 5%~100% dim range/ 80W
			SY5882	Flyback/Buck-boost controller/PF>0.9/0~10V&PWM dim, 5%~100% dim range/ 80W
		Dual channel	SY5883	Flyback controller/PF>0.9/PWM dim, 5%~100% dim range/warm&cold white LED bulb/12W
	Two-stage	1st-stage	SY5018B	Flyback CV controller/PF>0.9/100W
			SY50183	Buck/Flyback CV regulator INT. 500V MOS/PF>0.9/10W
		2nd-stage	SY8702A	350kHz, 30V / 0.8A Buck regulator, SOT23-6 Compatible with PWM dimming, 2%~100% dim range
			SY8745	500kHz, 60V / 2A Buck regulator, SO8E Compatible with Analog/PWM dimming, 2%~100% dim range
			SY8750	500kHz, 100V / 1A Buck regulator, SO8E Compatible with Analog/PWM dimming, 5%~100% dim range
			SY8755	300kHz, 80V / 1A Dual Channel Buck regulator, TSSOP20E Analog/PWM dimming, 1%~100% dim range



Silergy driver solutions for Linear AC/DC applications

App. Demand	High Eff. Linear AC/DC							
Linear AC/DC	PF	Feature	P/N	Vac App	Vout/V	Pout/W	Package	Comment
	PF>0.5	Non-dim	SY59002	120	100-140	10	SO8	
			SY59012	230	100-140	10	SO8	



Silergy LED Lighting Product

2016. Sept



Part I General Lighting Product

- Non-dimmable, Non-isolation, Low PF
- Non-dimmable, Non-isolation, High PF
- Dimmable, Phase-Cut Dimming
- MR16, Non-dimmable & Dimmable
- Ripple Remover



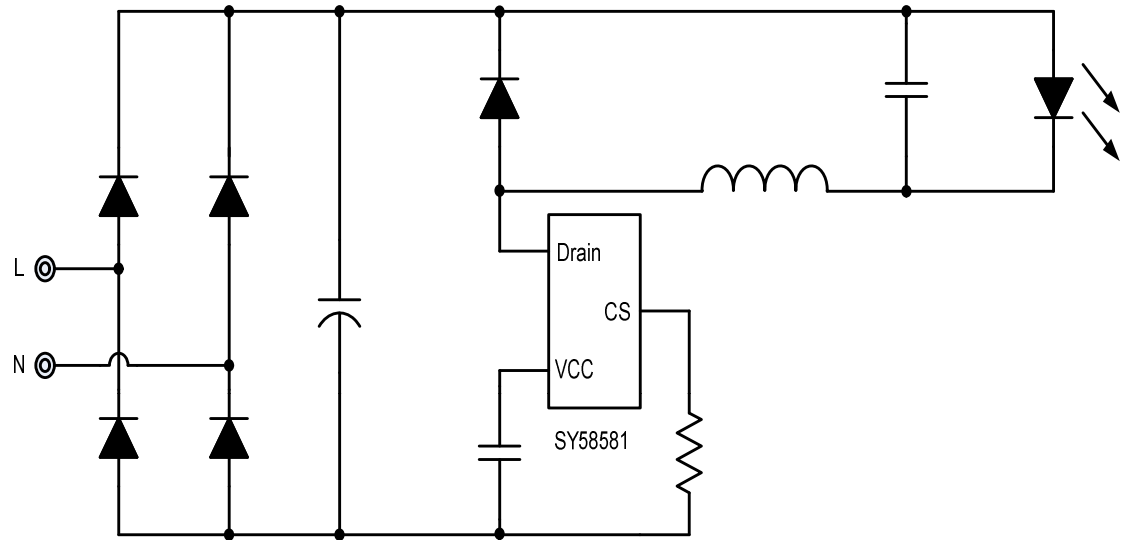
Non-dimmable, Non-isolation, Low PF

PF	Feature	P/N	Input Voltage	Max Power/Current	Package	Comment
PF>0.5	PSR,QR Buck 3-pin	SY58581	universal	150mA	SOT-23	
		SY58582	universal	240mA	SOT23-3	
		SY58584	universal	240mA	TO92	
		SY58585	universal	240mA	SO8	
PF>0.5	PSR,QR Buck Reliable OLP & SLP	SY58281N	High line	18W	SOT23-5	
		SY58282N	High line	24W	SO8	
		SY58283N	High line	30W	SO8	
		SY58181N	Low line	12W	SOT23-5	
		SY58182N	Low line	16W	SO8	
		SY58183N	Low line	20W	SO8	



Non-dimmable, PF>0.5, Buck -- SY5858x

- PF>0.5
- Source Driver structure
- Quasi-Resonant (QR) mode
- Integrated 500V MOSFET
- Thermal foldback function
- **Low BOM Solution for Low PF**
- Package: SOT23-3, TO92, SO8



IC	SY58581	SY58582	SY58584	SY58585
Rdson (Ω)	20	12	12	12
Package	SOT23-3	SOT23-3	TO92	SO8
Max Current	150mA	240mA	240mA	240mA

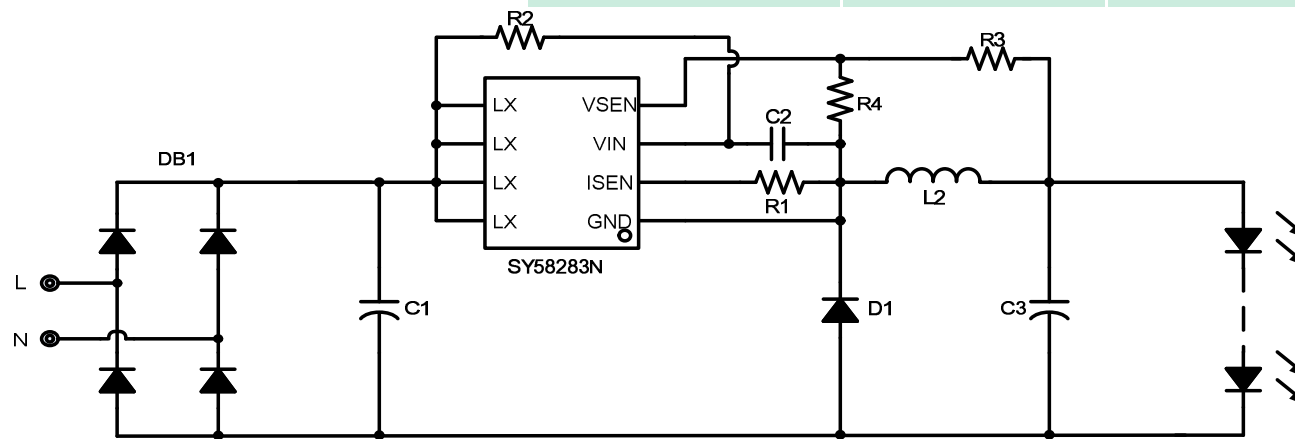


Non-dimmable, PF>0.5, Buck -- SY5818xN/SY5828xN

- High efficiency, QR mode
- Int. 350V / 500V MOSFET
- Thermal Fold-back Function
- 4-Drain Package for Heatsink (SO8)
- Reliable short-LED/Open-LED protection
- Self bias supply , less external components

IC	SY58181N	SY58182N	SY58183N
Rdson(Ω)	6 (350V)	6 (350V)	4 (350V)
Input Voltage (V)	120	120	120
Package	SOT23-5	SO8	SO8
Max Power (W)	12	16	20

IC	SY58281N	SY58282N	SY58283N
Rdson(Ω)	13 (500V)	13 (500V)	8 (500V)
Input Voltage (V)	230	230	230
Package	SOT23-5	SO8	SO8
Max Power (W)	18	24	30





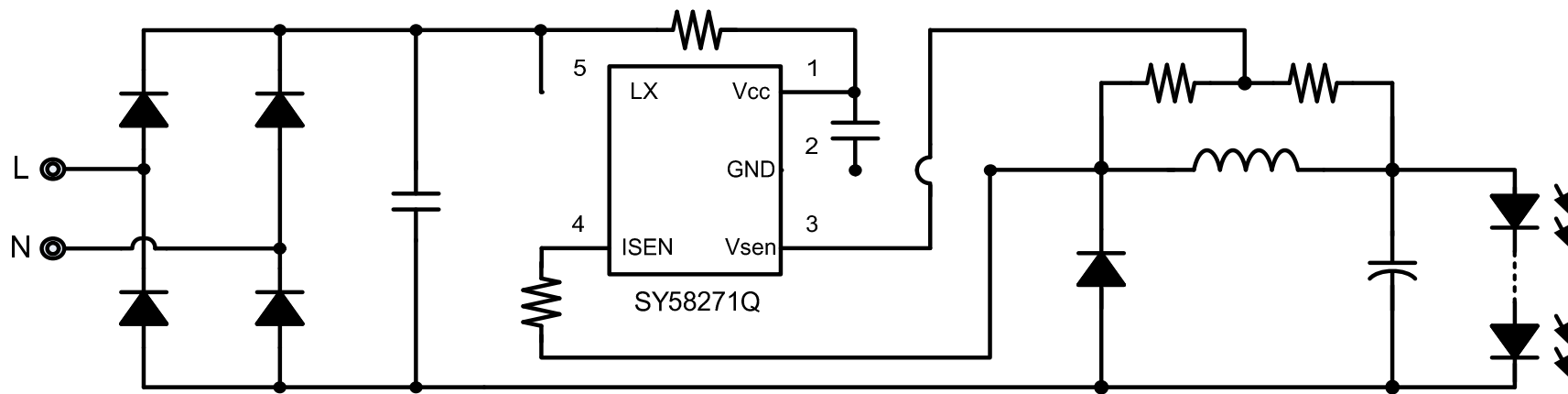
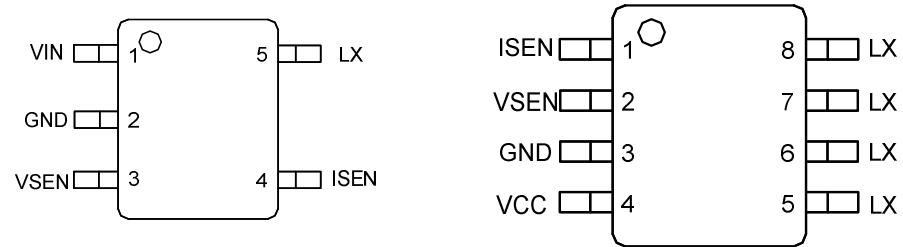
Non-dimmable, Non-isolation, High PF

PF	Feature	P/N	MOS_BV	MOS_Ron	Package	Comment
PF>0.7	Dual-Die	SY58271Q	500V	7.5 Ω	SOT23-5	80V140mA
	PSR,QR, Buck	SY58272Q	500V	7.5 Ω	SO8	80V180mA
	Constant IPK	SY58273Q	500V	5 Ω	SO8	80V220mA
	Int. Comp 4-Drain SO8	SY58573Q	600V	7 Ω	SO8	80V/180mA
PF>0.9	Dual-Die	SY58572	600V	11 Ω	SO8	80V140mA
	PSR,QR, Buck	SY58573	600V	7 Ω	SO8	80V180mA
	Constant TON	SY58574	600V	5 Ω	SO8	80V220mA
	Int. Comp 4-Drain SO8	SY58575	600V	3.5 Ω	SO8	80V250mA



Non-dimmable, PF>0.7/0.9, Buck -- SY5857x

- PF>0.7, constant IPK, SY5827xQ
- PF>0.9, constant TON, SY5857x
- Source Driver structure, QR mode
- Integrated Comp. Pin
- Integrated 500V/600V MOSFET
- Thermal foldback function
- **Low BOM Solution for High PF**
- Package: SOT23-5, SO8(4-Drain for Heatsink)





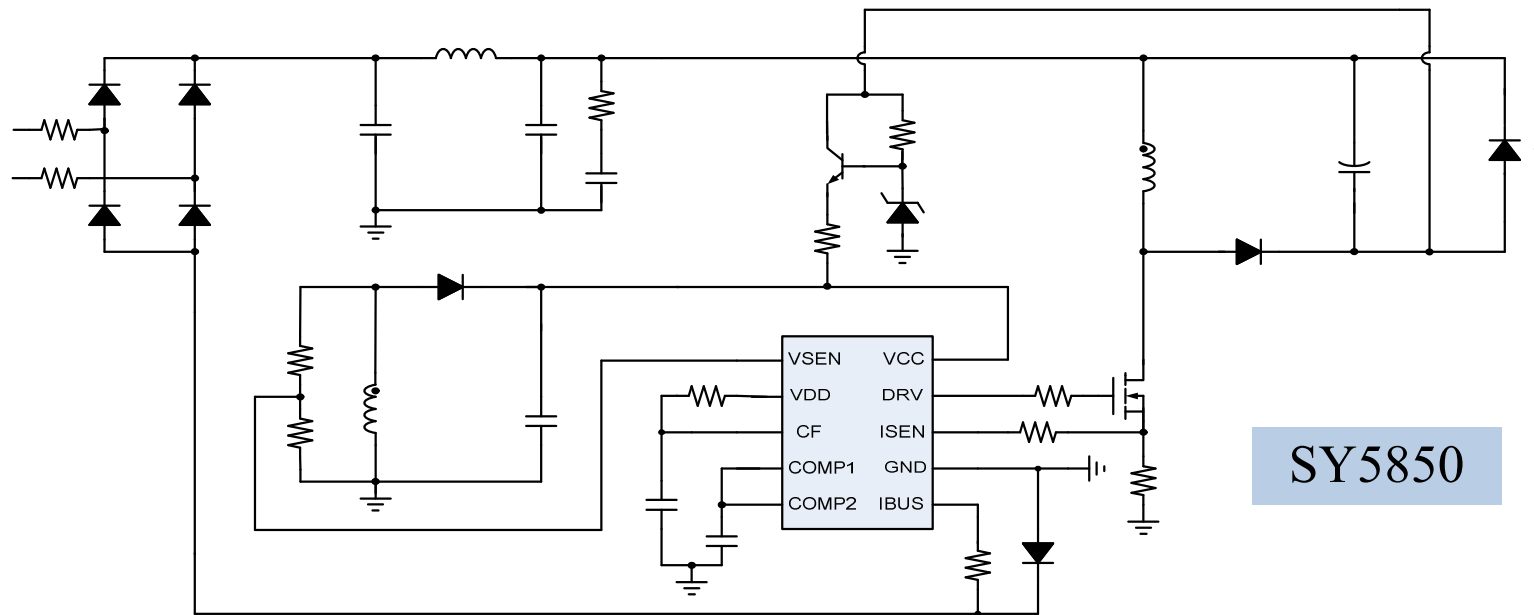
Dimmable, Phase-cut Dimming

P/N	Feature	Type	AC Line	Max Pout	Application
SY5859B	Controller High-Power/PF>0.9	Buck	Low-Line	60W	
SY5850D		Buck-Boost/Flyback	High-Line	60W	
SY5852	Controller Single-Winding/PF>0.9	Buck-Boost/Flyback	Low-Line	25W	
			High-Line	40W	
SY58652	Int MOS Single-Winding PF>0.9 No bleeder/HV starter	Buck Buck-Boost/Flyback	High-Line	6W	
SY58653			High-Line	12W	
SY58654			High-Line	15W	
SY58652F			High-Line	10W	Filament Lamp
SY58658F			High-Line	10W	Filament Lamp
SY58561	Int MOS Single-Winding PF>0.9 No bleeder/HV starter Low BOM cost	Buck	Low-Line	10W	
SY58563			Low-Line	16W	
SY58361		Buck-Boost/Flyback	Low-Line	8W	
SY58362			Low-Line	12W	



Phase-Cut Dimming -- SY5850/9

- Compatible with leading edge/trailing edge/no dimmer application
- Dimmer Type Detection, Excellent compatibility, High PF & Low THD w/o dimmer.
- No any bleeder is needed.
- Dimming range: 10%~100%
- Excellent compatibility, up to 60W design power
- SY5859B (Buck), SY5850D (Flyback / Buck-Boost)

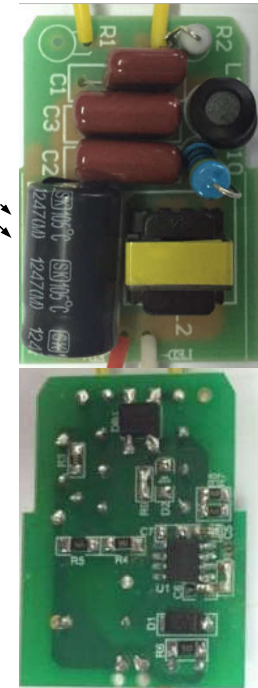
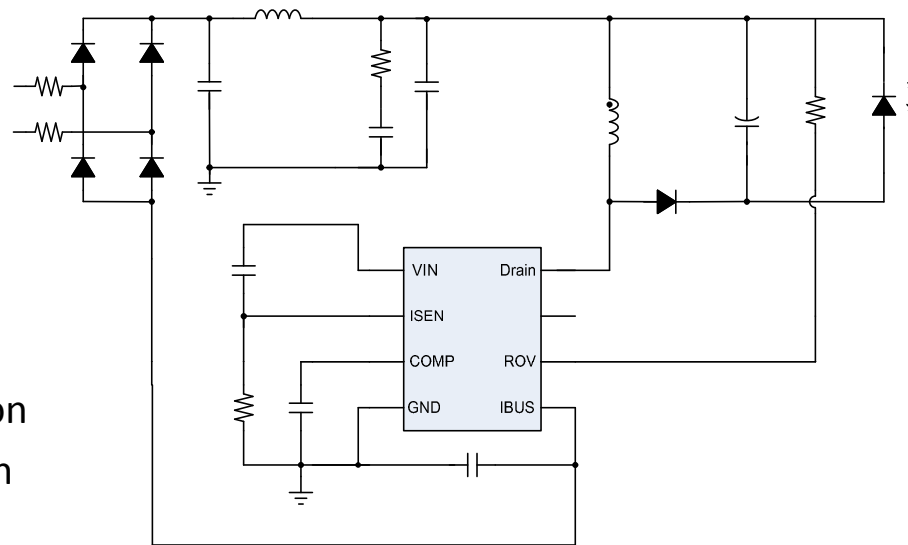




Phase Cut Dimming -- SY58x5x

Key Features:

- Non-dimming/Leading/Trailing
- Int. 600V/700V FET
- Single-winding application
- PF >0.9 without dimmer
- No additional dummy load/FET
- Dimming range 5%~100%
- Less BOM cost
- Good line regulation/load regulation
- Reliable Short/Open LED protection
- Suitable for >3W@230Vac



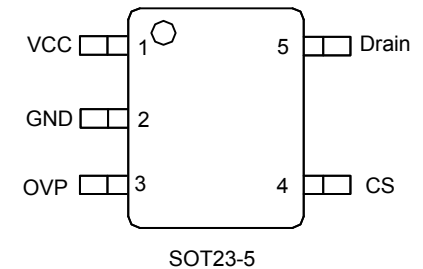
SY58652
5W EVB

IC	SY58652	SY58653	SY58654	SY58652F	SY58658F
Input Voltage	230Vac	230Vac	230Vac	230Vac	230Vac
BV/Rdson	600V/16	600V/7	600V/5	600V/16	700V/14
Power	6W	12W	15W	10W	10W

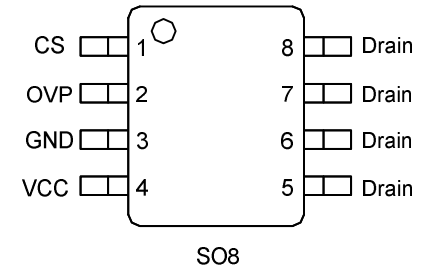


Phase-Cut Dimming -- SY58x6x

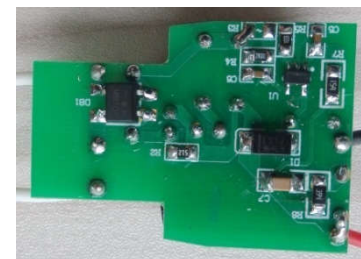
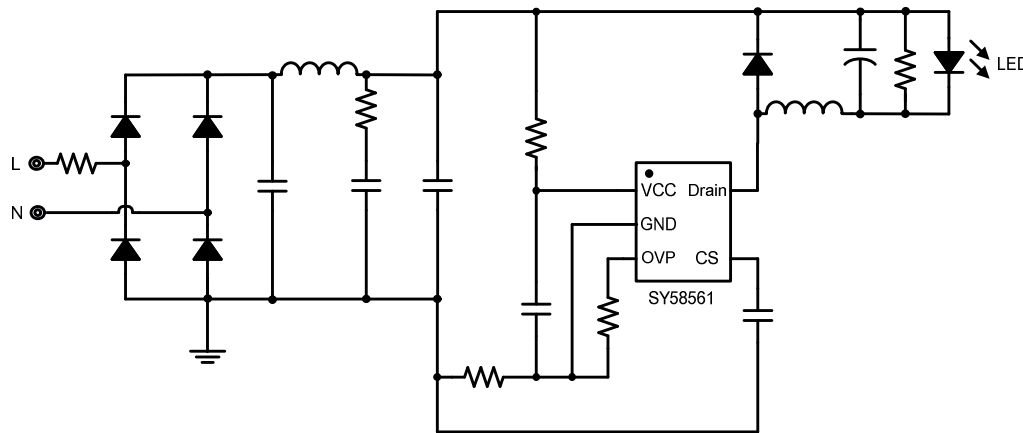
- suitable for 110/120Vac Market
- Compatible with Leading edge/Trailing edge dimmer
- High PF without any dimmer, PF>0.9
- Reliable Open/Short LED protection
- Thermal fold back
- Low BOM cost(lower than 1.8RMB)
- SY5856x(Buck), SY5836x(Buck-Boost)



SY58561
(10W max)



SY58563
(16W max)



8W EVB



Middle/High Power

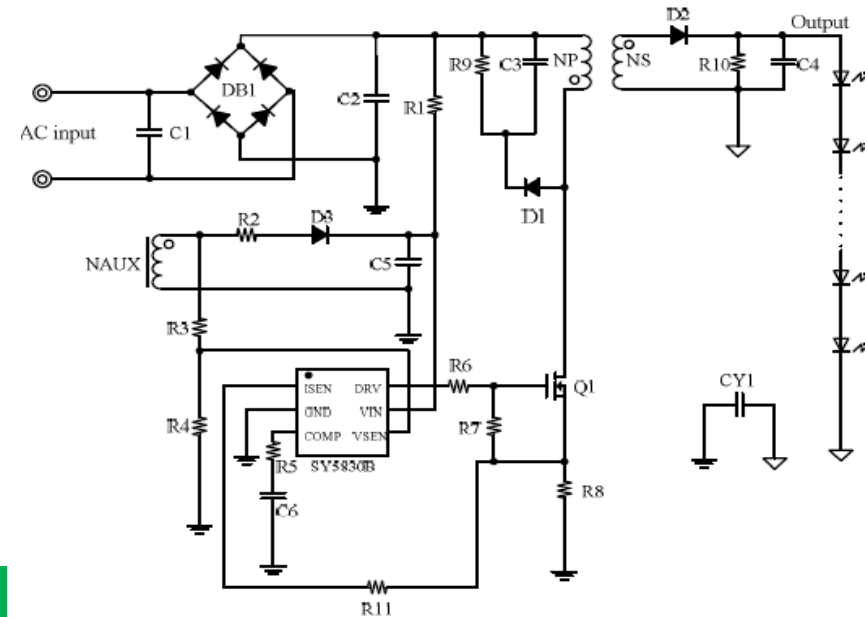
App.	P/N	Feature	Package
Mid/High Power AC/DC CC controller	SY5830B	Buck-Boost /Flyback controller PF>0.9, THD<10%, Reliable OLP/SLP	SO23-6
	SY5839	Buck controller PF>0.9, THD<20%, Reliable OLP/SLP,	SOT23-6

App.	Feature	P/N	MOS_BV	Max Current	Package
Ripple Remover	Follow with high PF CC Driver. Lest external component. Int. MOS.	SY5861B	100	250mA	SO8
		SY5862	60	600mA	SO8
		SY5863	60	1000mA	TO252
		SY5864	60	1200mA	TO220

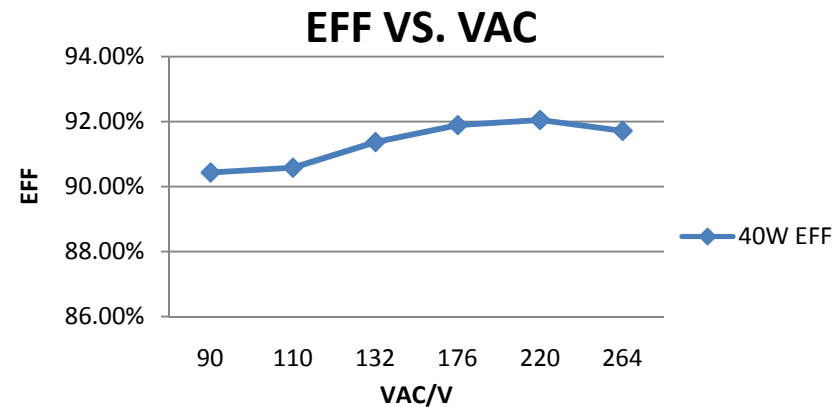
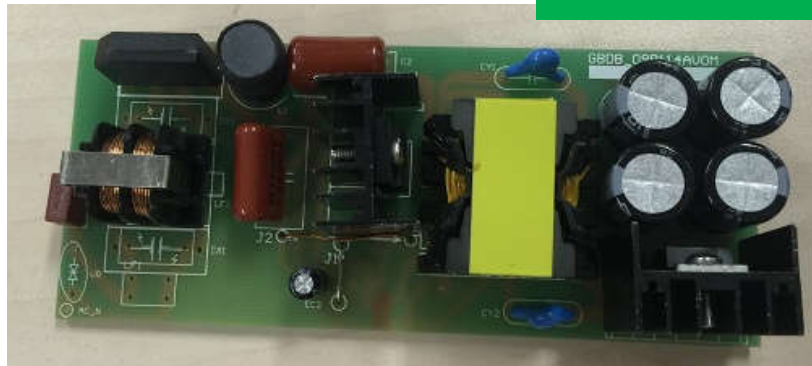


AC/DC, PF>0.9, Flyback—SY5830B

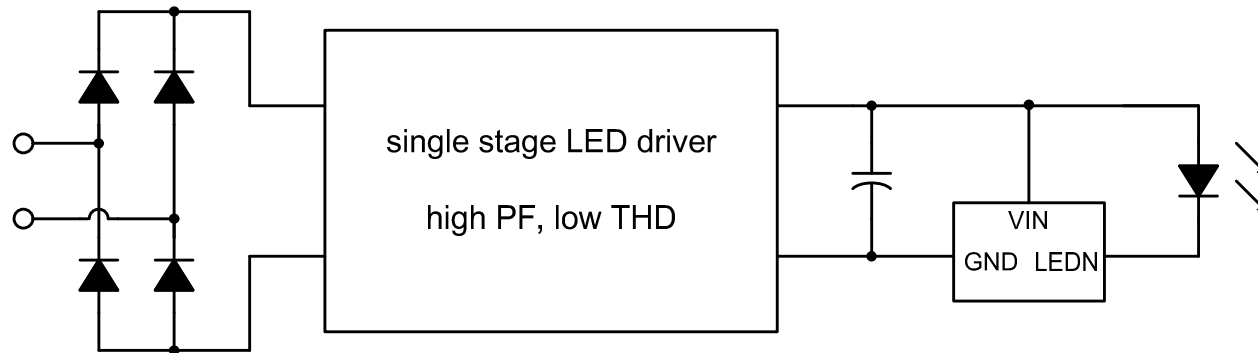
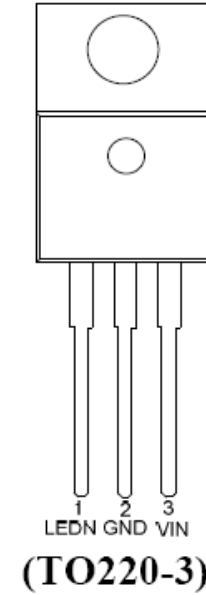
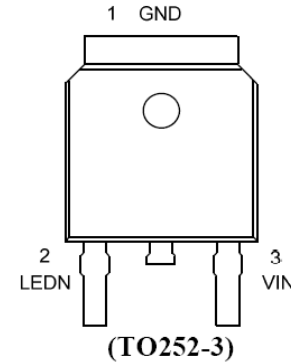
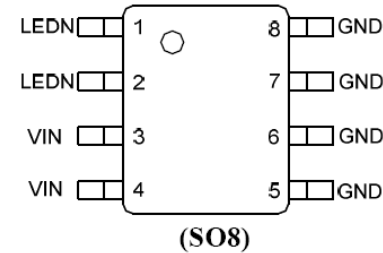
- PSR CC eliminating opto-coupler
- QR-mode operation
- Power factor >0.9 with single-stage conversion.
- Reliable protections for OLP
- Special design on fast start up (<500ms)
- Special design for single-fault test



**SY5830B
40W EVB**



- Ripple Remover Following with 1st-stage CC Driver
- No Any Change is Needed for 1st-stage.
- Simple, Less External Component
- ~2.5% Power Loss (Linear Solution)
- Package: SO8, TO252, TO220



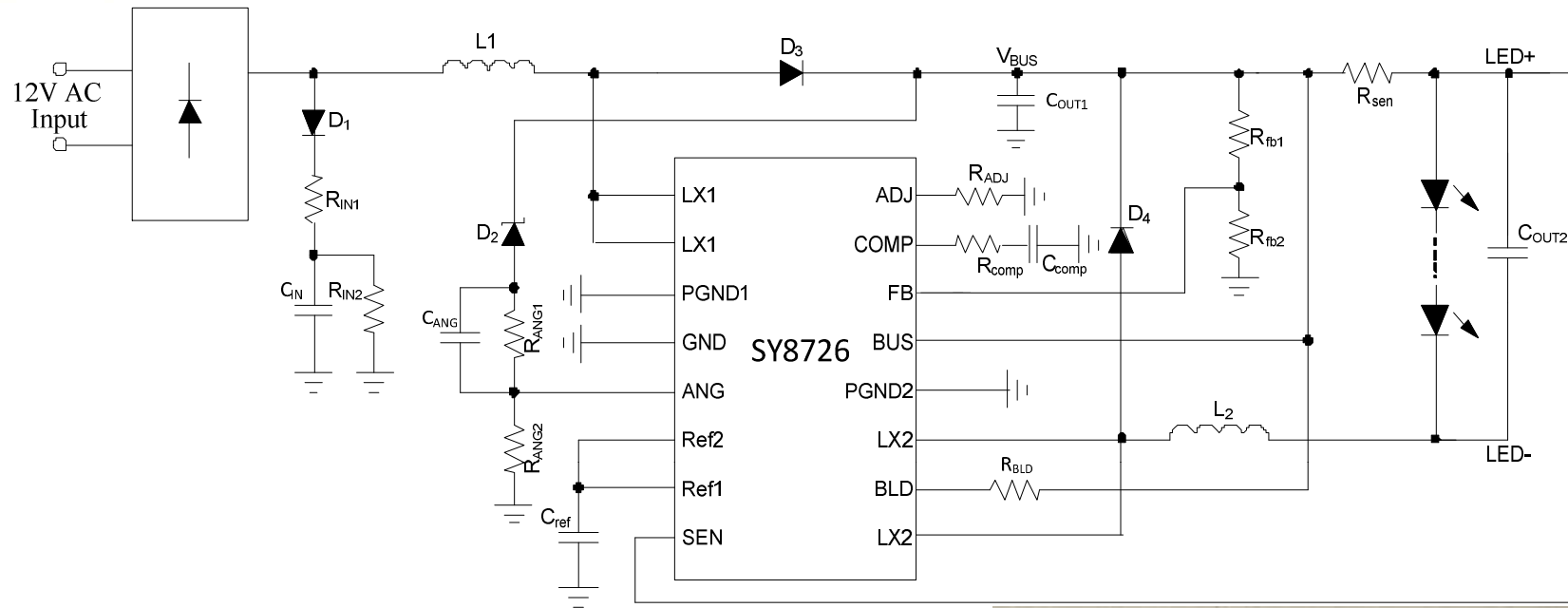


MR16, Non-dimmable & Dimmable

App. Demand	MR16 Application							
	PF	Feature	P/N	Dim Range	Vout	Pout	Package	Comment
MR16	PF>0.9	Non-dim	SY8722A	NA	<18V	<8W	SO8E	Boost+Buck , 2-stage
			SY7305	NA	18~30V	<6W	SO8E	Boost, Single-stage
			SY7306	NA	18~30V	<8W	SO8E	Boost, Single-stage
	PF>0.9	Dimmable	SY8726B	0%~100%	<18V	<8W	TSSOP16E	Boost+Buck, 2-stage
			SY8727	0%~100%	18~30V	<8W	SO8E	Boost+LDO, 2-stage
			SY7400	1%~100%	18~48V	<12W	SO8E	Boost, 2 nd stage
			SY7400L	1%~100%	18~48V	<7W	SOT23-6	Boost, 2 nd stage



MR16, Dimming, Boost+Buck– SY8726B

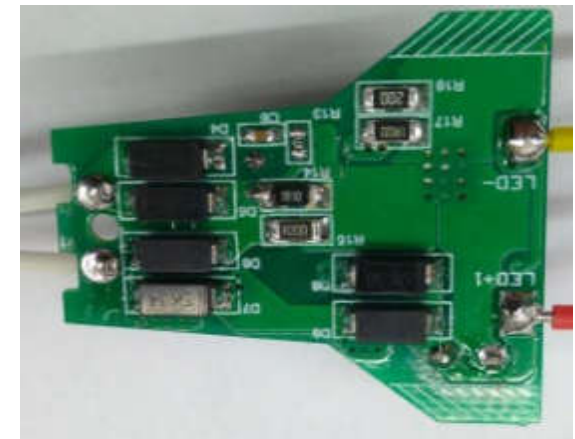
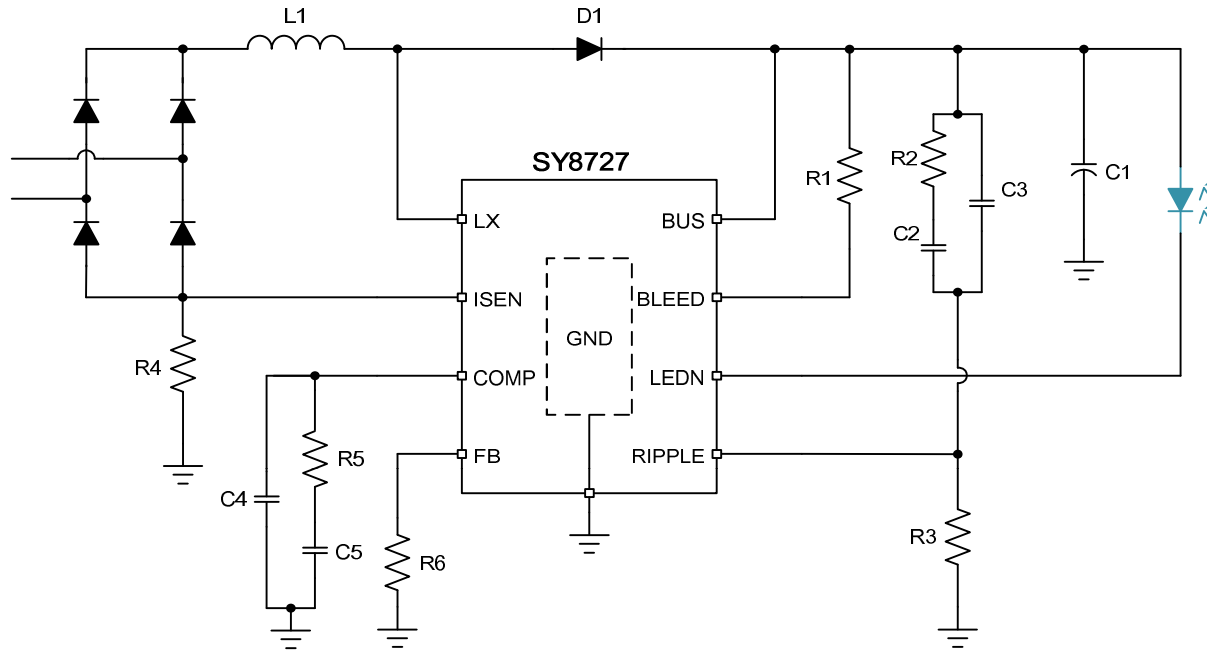


- Boost+Buck 2-stage constant current output.
- Integrated low RON 40V FET:
- Compatible with Leading-edge and Trailing-edge Dimmers.
- Variable switching frequency for reduced EMI emission
- Package: TSSOP16E





MR16, Dimming, Boost – SY8727 (New)



- Built-in bleeding circuit for flicker-free
- Built-in ripple remover for flicker-free & stroboflash-free
- Keep constant average input current at any time
- Minimized external circuits
- SO8E package



Part II

➤ Smart Lighting Product



Smart Lighting Product

Smart Lighting and Fixture			
One-stage	One channel	SY5881	Buck controller/PF>0.9/0~10V&PWM dim, 5%~100% dim range/ 80W
		SY5882	FLYBACK/Buck-Boost controller/PF>0.9/0~10V&PWM dim, 5%~100% dim range/ 80W
	Dual channel	SY5883	Flyback controller/PF>0.9/PWM dim, 5%~100% dim range/warm&cold white LED bulb/12W
Two-stage	1st-stage	SY5018B	Flyback CV controller/PF>0.9/100W
		SY50183	Buck CV Regulator/PF>0.9/INT. 500V MOS/10W
	2nd-stage	SY8702A	350kHz, 30V / 0.8A Buck regulator, SOT23-6 Compatible with PWM dimming, 2%~100% dim range
		SY8745	500kHz, 60V / 2A Buck regulator, SO8E Compatible with Analog/PWM dimming, 2%~100% dim range
		SY8750	500kHz, 100V / 2A Buck regulator, SO8E Compatible with Analog/PWM dimming, 5%~100% dim range
		SY8755	300kHz, 80V /1A Dual Channel Buck regulator, TSSOP20E Analog/PWM dimming, 1%~100% dim range/Warm Cold Dimming Application



Smart Lighting Product

Product for Smart Lighting Driver				
Bias Supply	AC/DC	SY50281	HV Buck, int. MOS, 250mA, CV	
Light Sensor	ALS	SY3013	Analog output ALS (Ambient Light Sensor)	
	PXS	SY3086	Proximity sensor	



Product for Smart Lighting

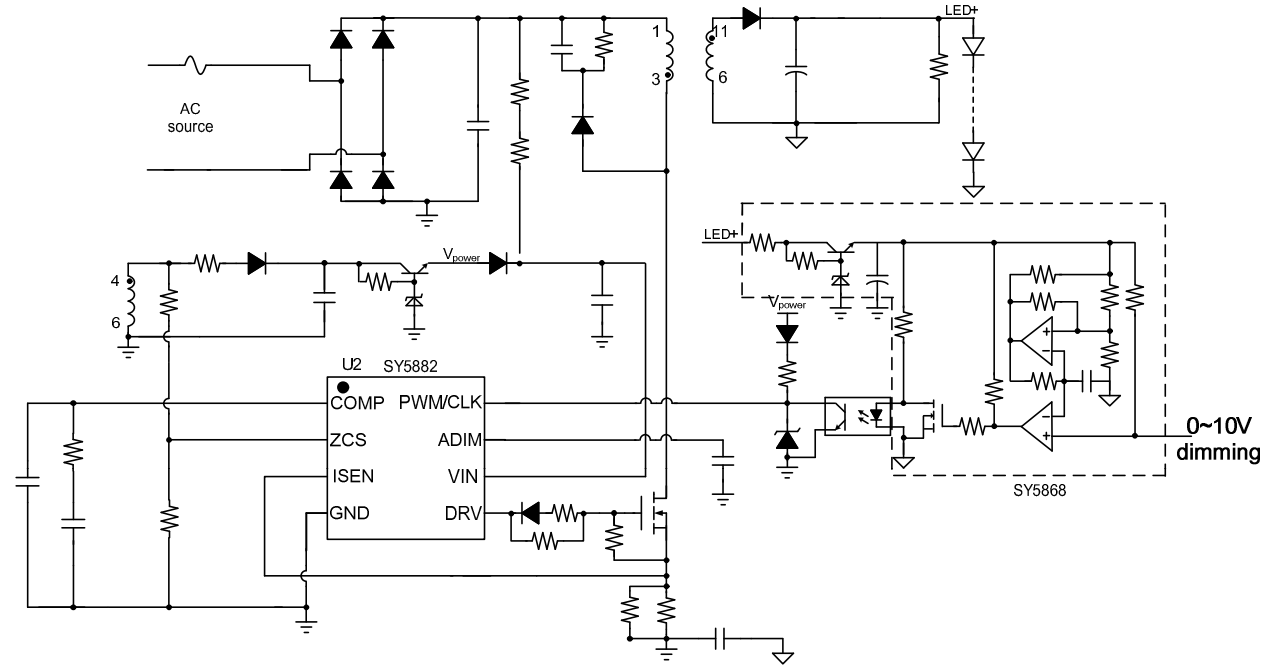
1. 1-stage

Buck/Flyback (PFC, CC)

2. 2-stage

Flyback (PFC, CV) + Buck (HF, CC)

Dimmable AC/DC, PF>0.9, Flyback--SY5882



Key Features:

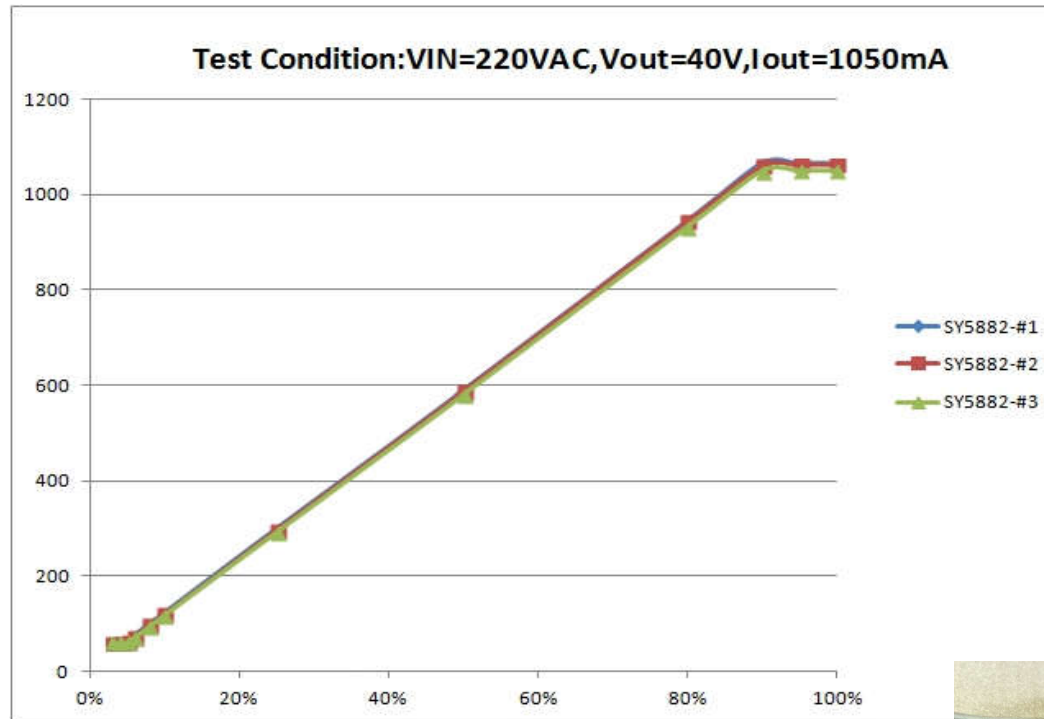
- PFC, QR, PSR, CC
- 5% Deep Dimming Level
- Excellent Dimming Consistency: +/-1.5%
- Excellent Dimming Linear Curve
- CV mode for MCU power supply, More Convenient Standby Design
- Compatible with SY5802A/B

0/1~10V dimming driver application

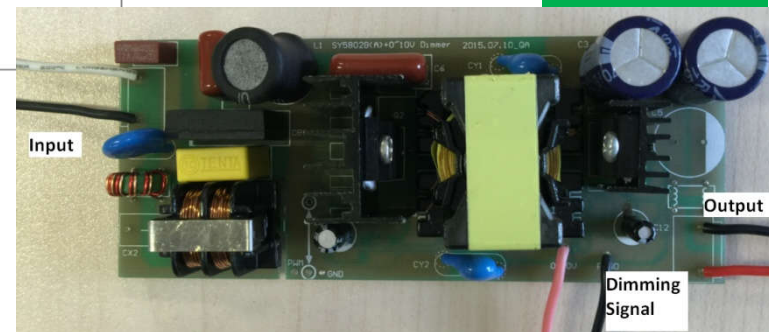


Dimmable AC/DC, PF>0.9, Flyback--SY5882

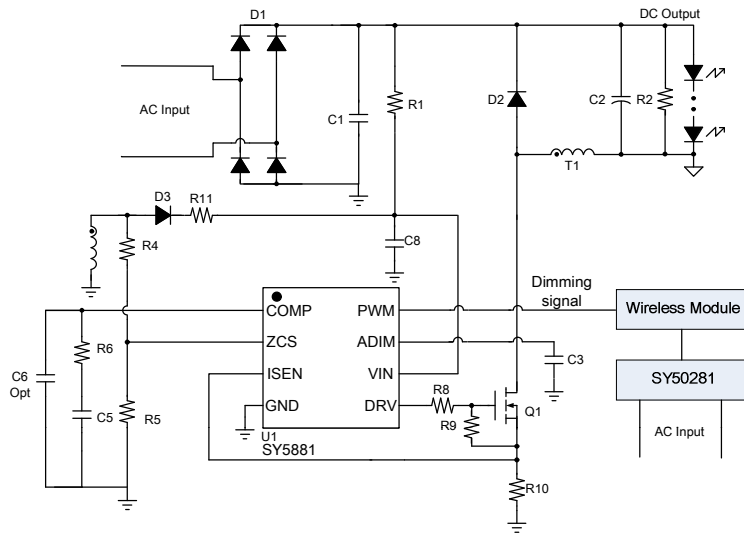
PWM Dimming Curve



**SY5882
40W EVB**



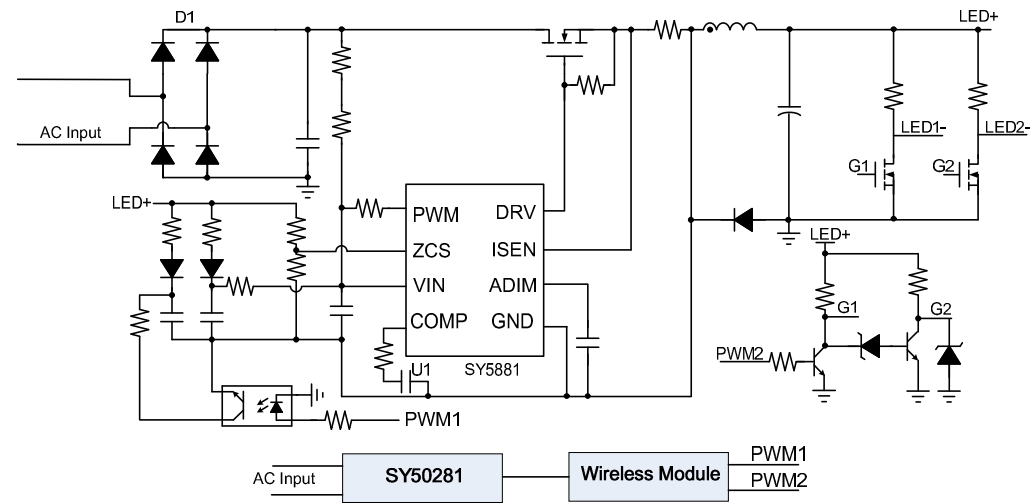
Dimmable AC/DC, PF>0.9, Buck--SY5881



PWM dimming application with SY5881

Key Features:

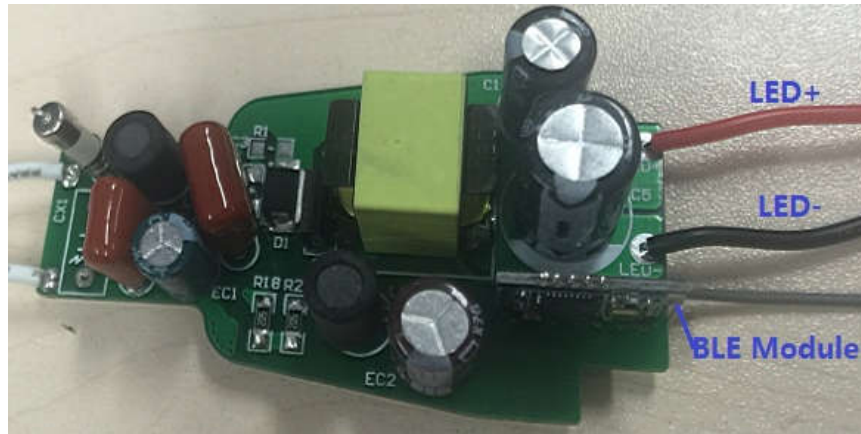
- PFC, QR, CC
- 5% Deep Dimming Level
- Excellent Dimming Consistency: +/-1.5%
- Excellent Dimming Linear Curve
- CV mode for fast start up, More Convenient Standby Design
- Compatible with SY5806



Warm/cold dimming with SY5881



Dimmable AC/DC, PF>0.9, Product Maps



SY5881
10W EVB with PWM dimming



SY5881
25W Warm/Cold dimmable Fixture EVB

Dimmable AC/DC Controller

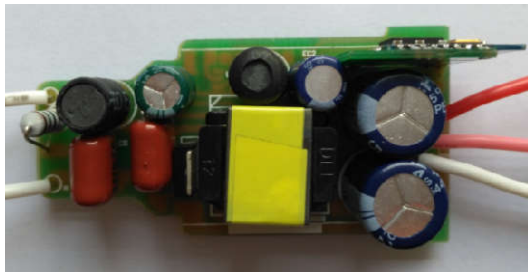
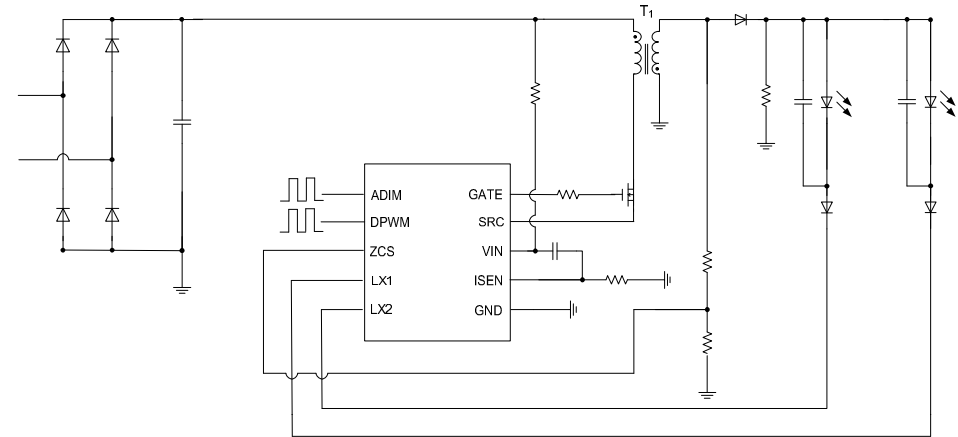
Part No.	Package	Description	Note
SY5881	SO8	Upgraded of SY5806, up to 5% dimming level	Buck
SY58813	SO8	Int. Mos, BV 600V, 10W design Power	Buck
SY5882	SO8	Upgraded of SY5802A, up to 5% dimming level	Flyback



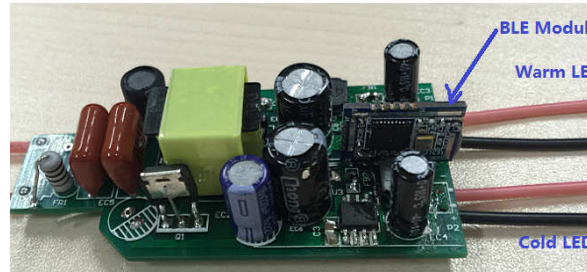
Low Cost Warm/Cold Dimming– SY5883 (coming)

- PF>0.9
- QR mode, High efficiency and better EMI
- Source drive technology
- Dimmable and adjustable CCT
- Analog Dimming Range: 10%~100%
- Color mixing Range:0%~100%
- Compact package: SSOP10
- Low BOM Cost

Patent Pending

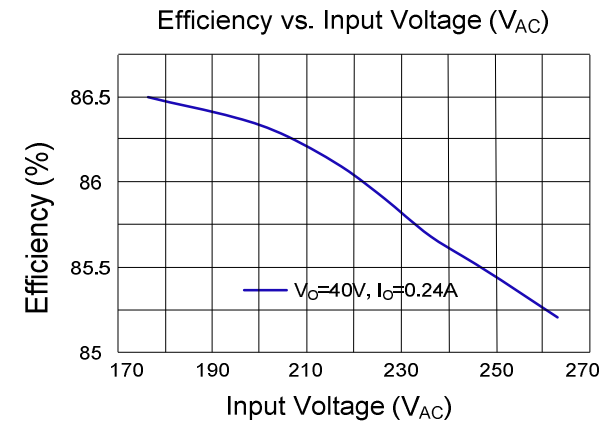


SY5883



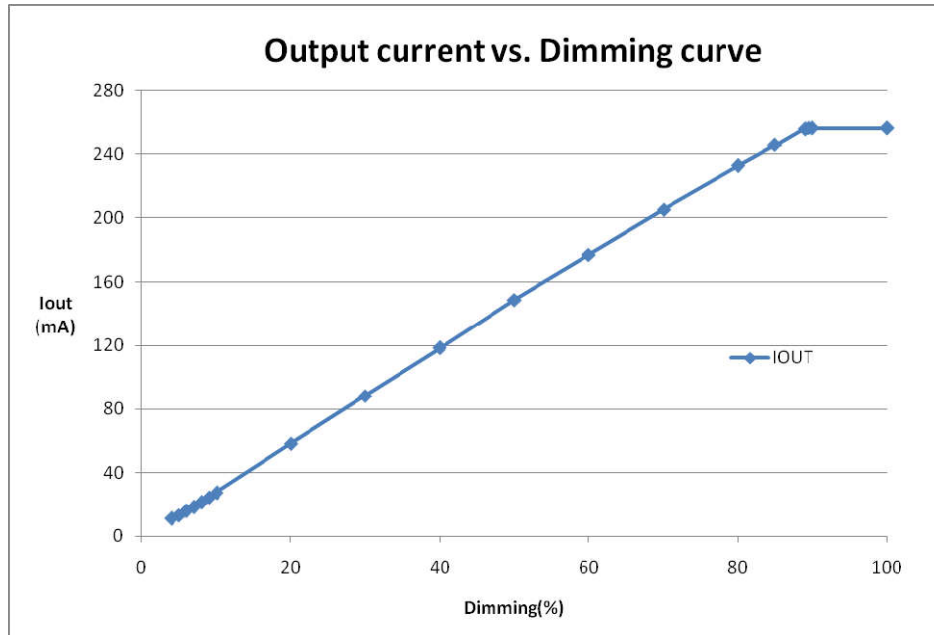
SY5018+2pcs SY8745

Sample/EVB are ready.

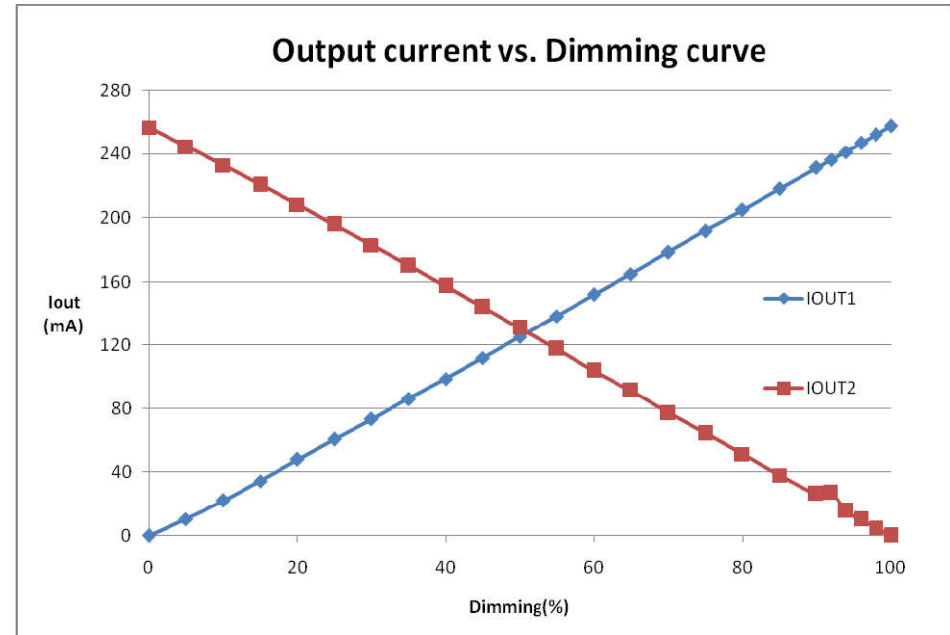




Low Cost Warm/Cold Dimming– SY5883 (coming)



ADIM Dimming Curve



DPWM Dimming Curve



Product for Smart Lighting

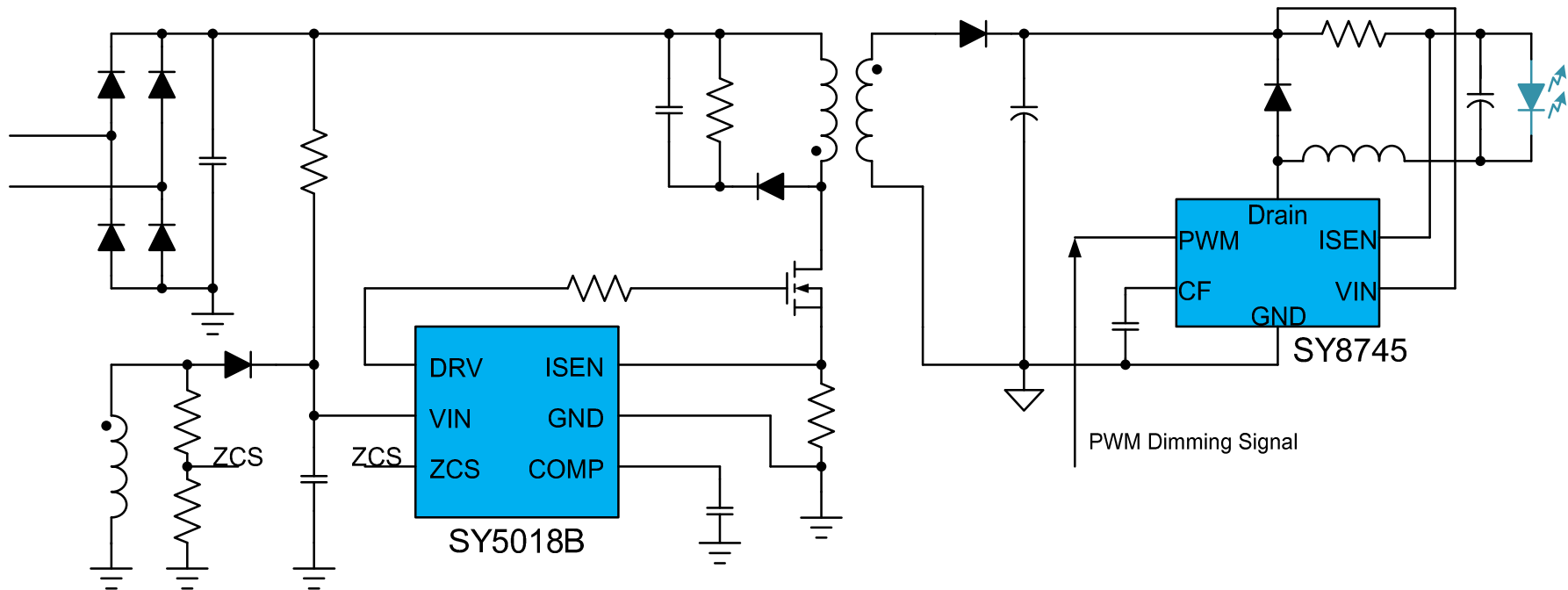
1.1-stage

Buck/Flyback (PFC, CC)

2.2-stage

Flyback (PFC, CV) + Buck (HF, CC)

Flyback, PFC, PSR CV + HF Buck CC



Flyback PFC

Simple, PSR CV, Industrial First

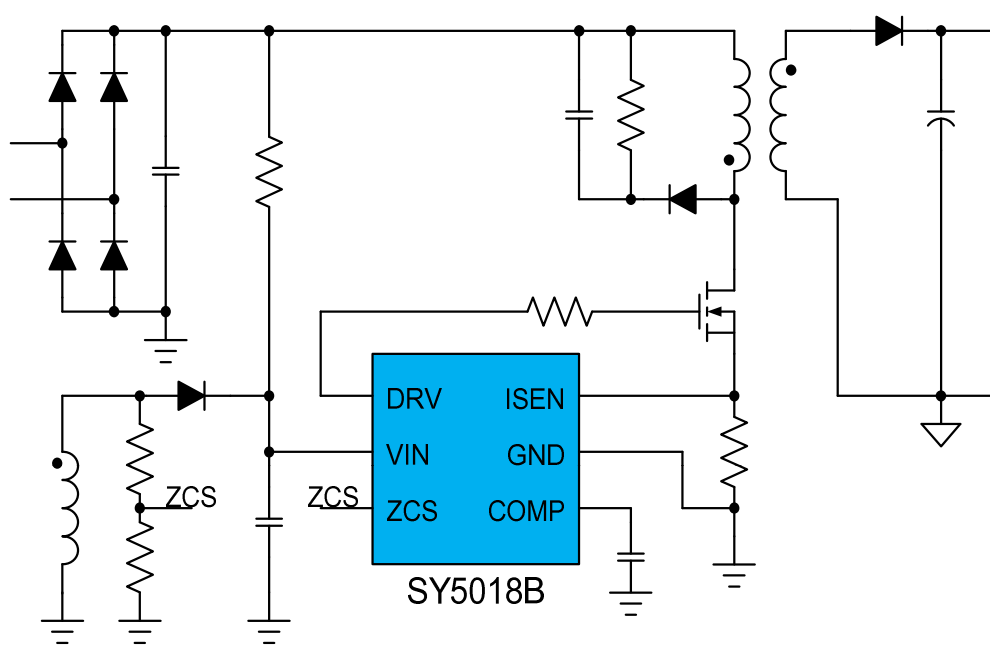
Good line regulation, load regulation

Buck, HF, CC

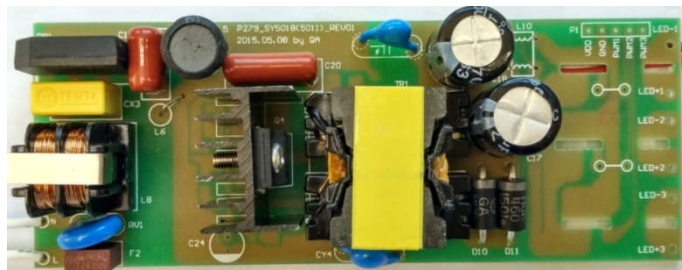
Small footprint, High Efficiency

Easy to achieve PWM/Analog Dimming

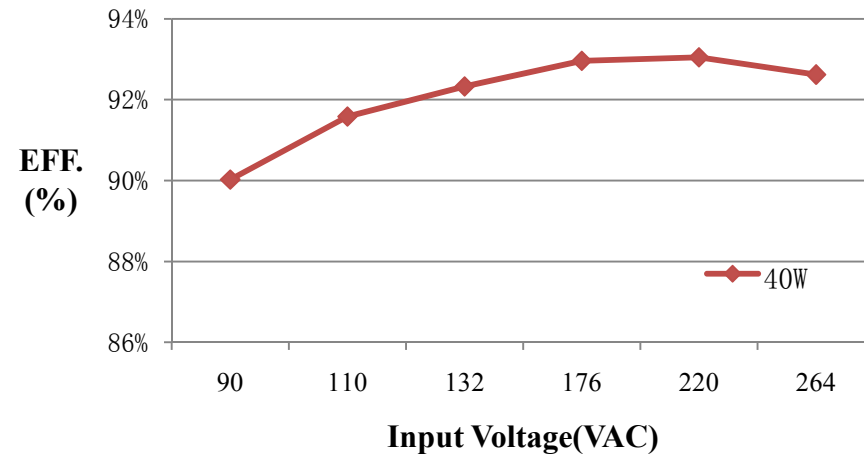
1st stage : Flyback, PFC, PSR, CV



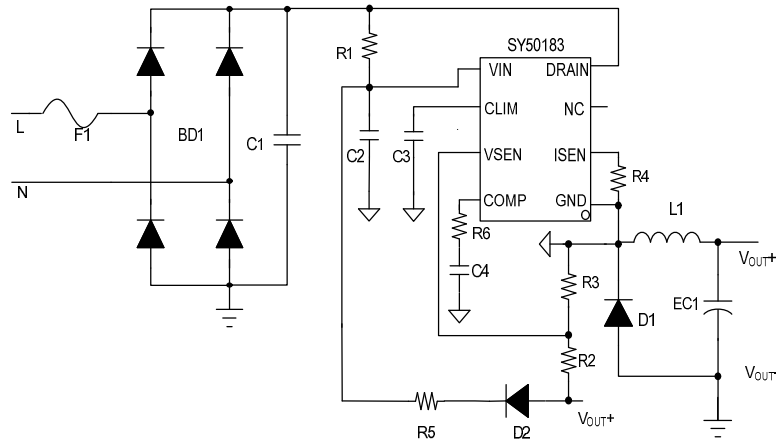
- Constant ON time to achieve high PF
- PSR CV/CC for single-stage PFC
- Excellent short output protection
- Advanced design on fast start up
- Up to 100W design power
- SO8 package



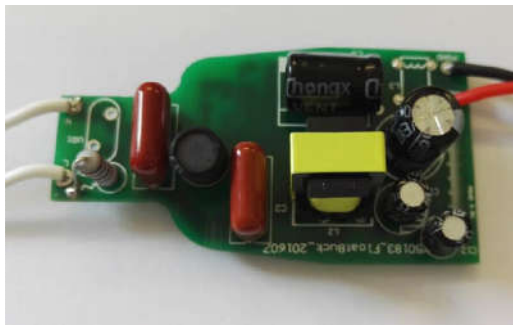
EFF. vs. Input voltage



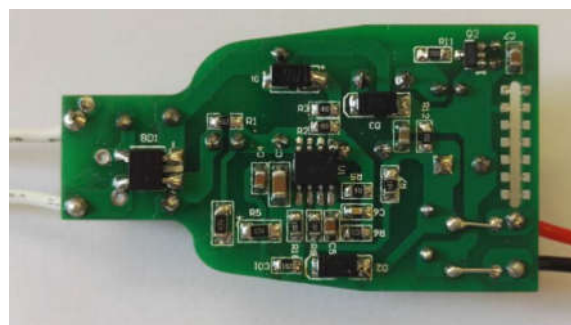
1st stage : Buck, PFC, CV



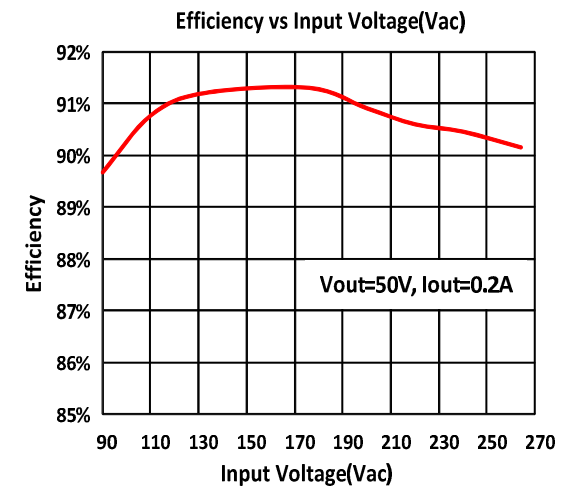
- Integrated 500V MOSFET
- Valley turn-on to achieve low switching losses
- Power factor >0.9 with single-stage conversion
- Excellent line regulation and load regulation
- Up to 12W design Power
- Compact package: SO8



Top



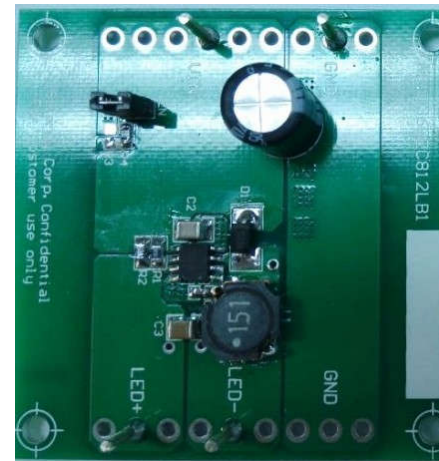
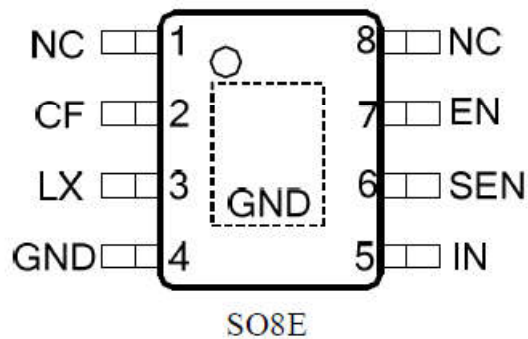
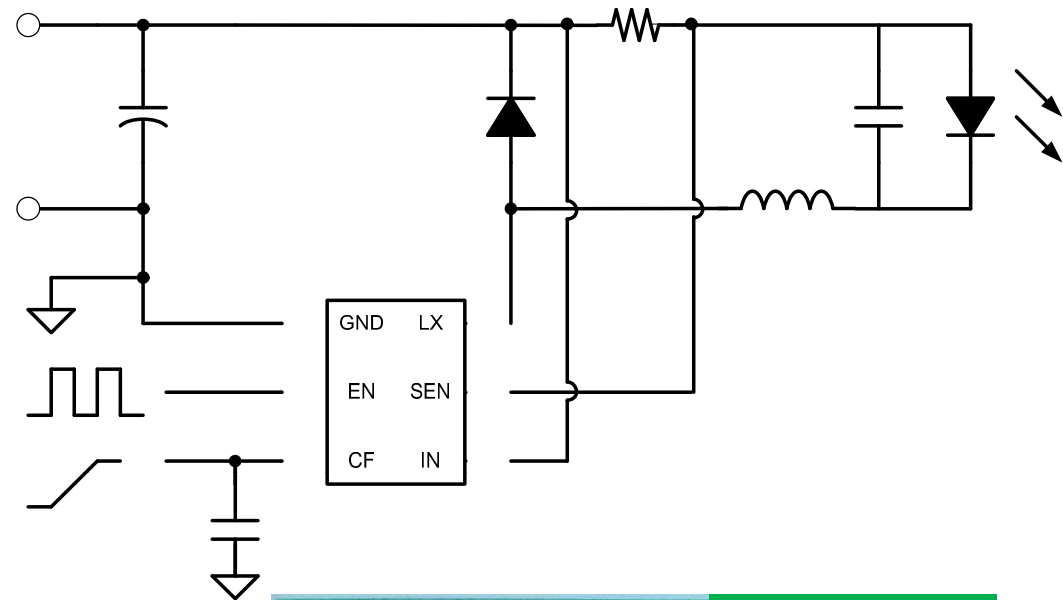
Bottom





2nd stage : Dimmable HF Buck CC Regulator

- 60V step-down regulator
- 0.16 Ohm R_{dson}
- 500kHz switching frequency
- PWM dimming/Analog dimming
- Hard short protection
- SO8E package



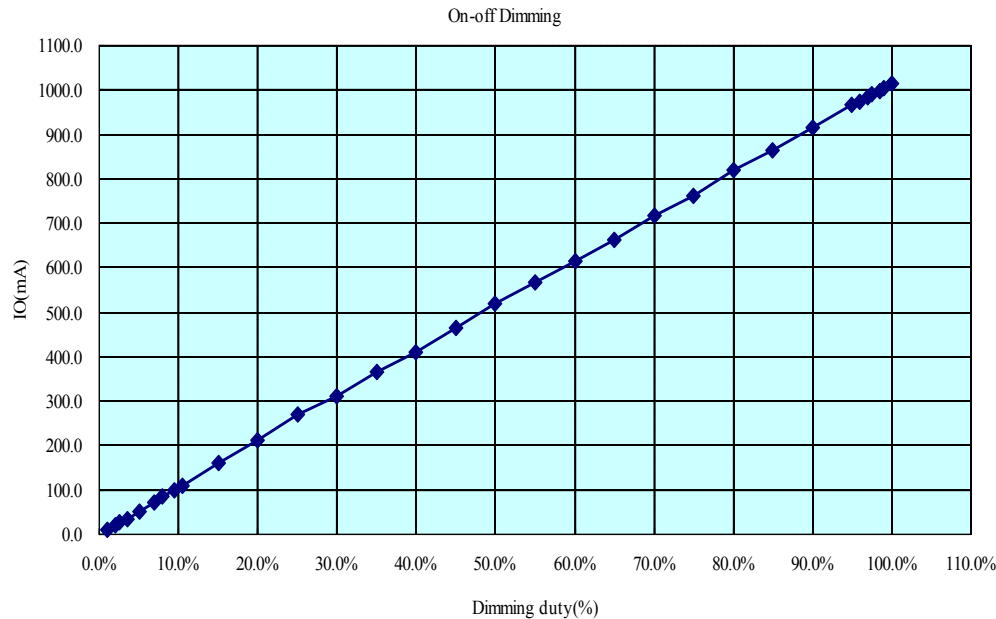
**SY8745
60W EVB**

Tr=30degC
@ 40V1.5A



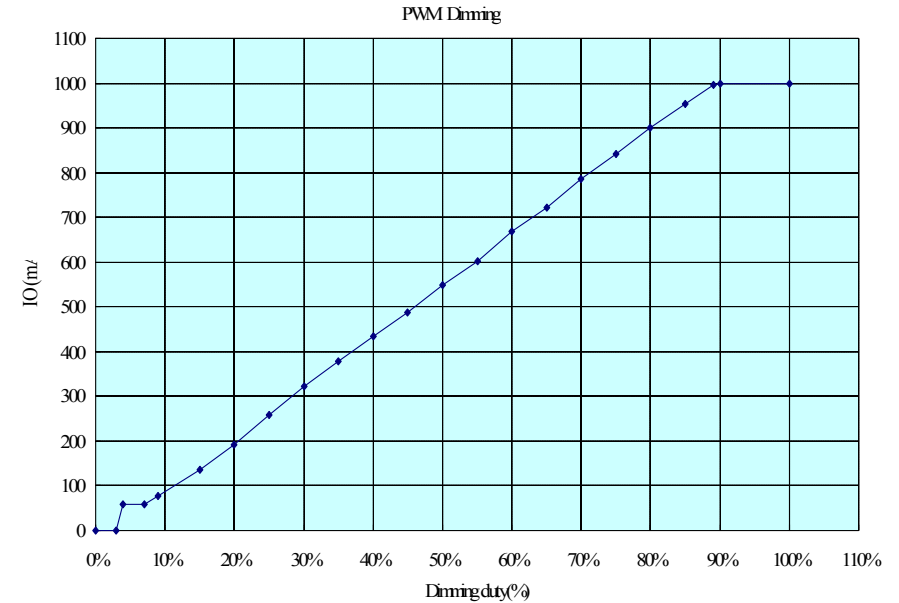
2nd stage: Dimming Performance

SY8745 PWM dimming curve



Connect EN and CF PIN to dimming signal

SY8745 Analog dimming curve

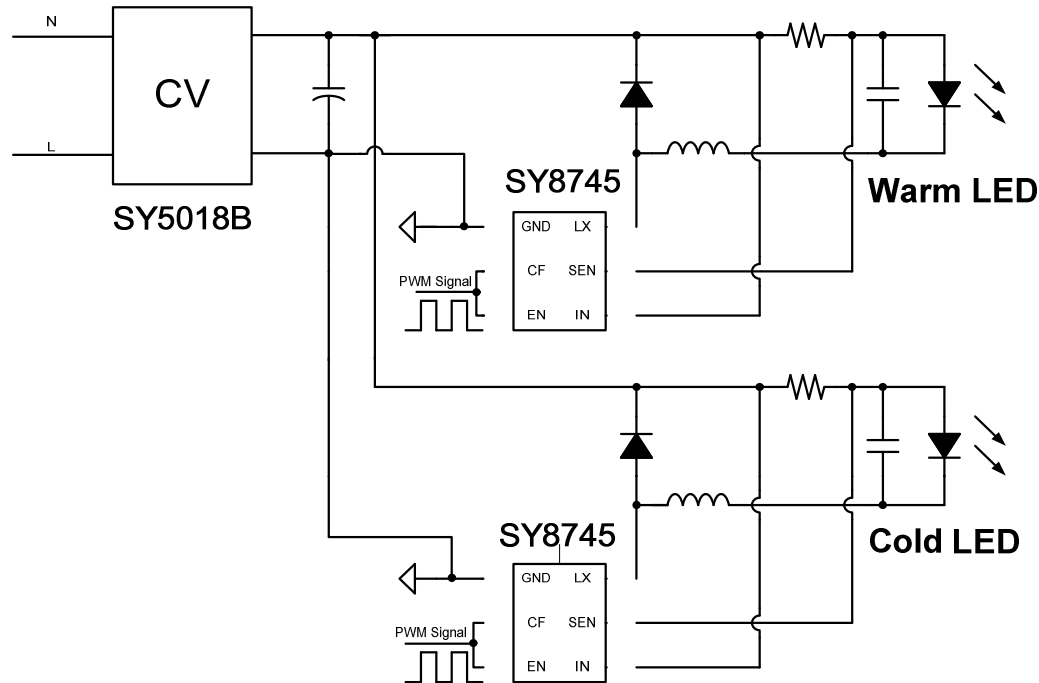


Add 1k~10KHz dimming signal to EN PIN, and connect 10nF to CF

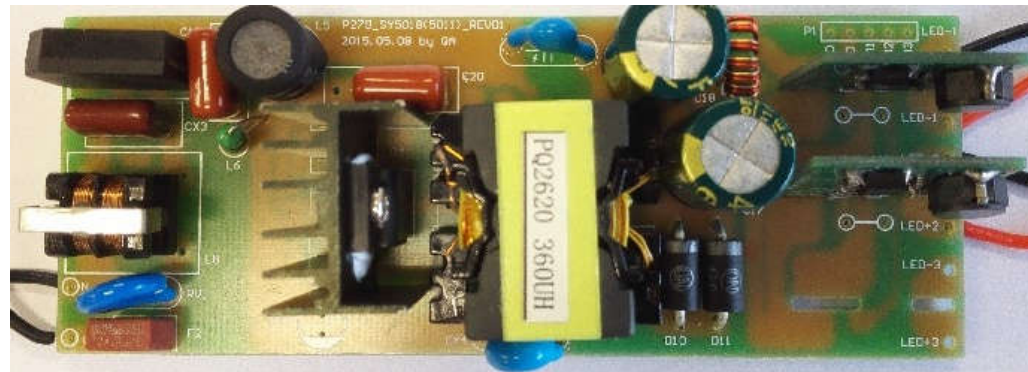
$V_{IN}=60V, V_{O}=50V, I_{O}=1A$



2-stage Solution for Dual Outputs



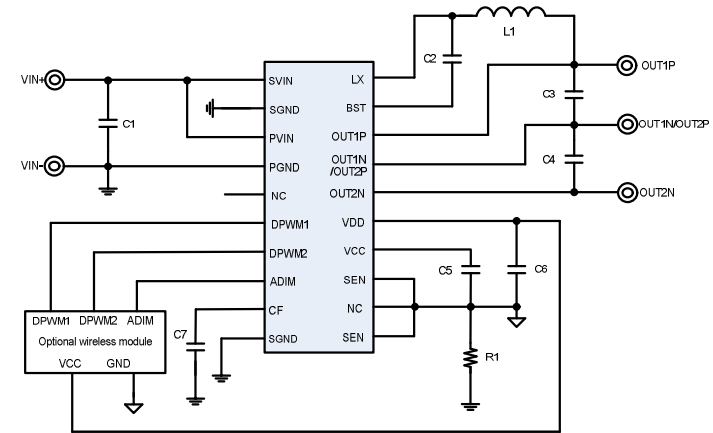
SY5018B+ 2*SY8745
40W dimmable
warm/cold LED EVB



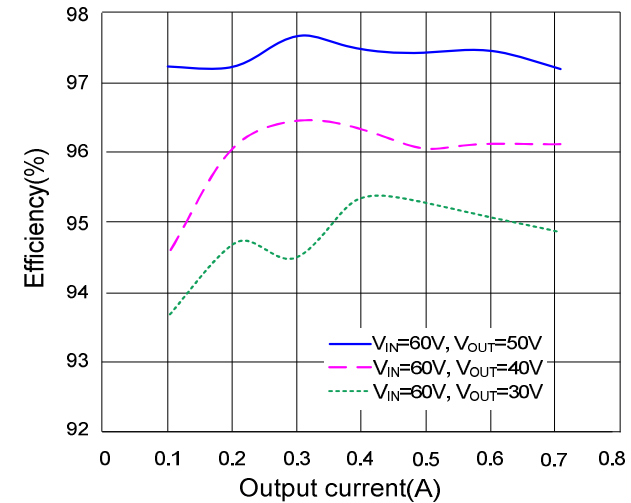


Two-stage Warm/cold dimming solution (Coming)

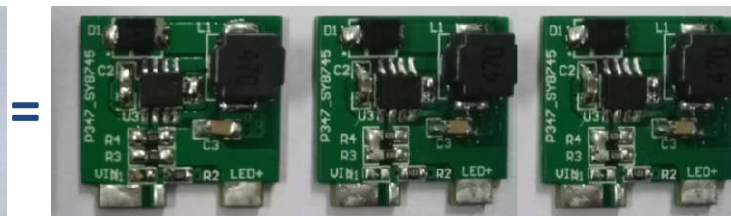
- 80V SR BUCK
- 2 channel output (45V/1A)
- 300kHz switching frequency
- 3.3V/300mA auxiliary power for MCU
- Analog Dimming Range: 10%~100%
- Color mixing Range:0%~100%
- Compact package: TSSOP20E



Efficiency vs. Output current



SY8755



SY8745

SY8745

3.3V PSU

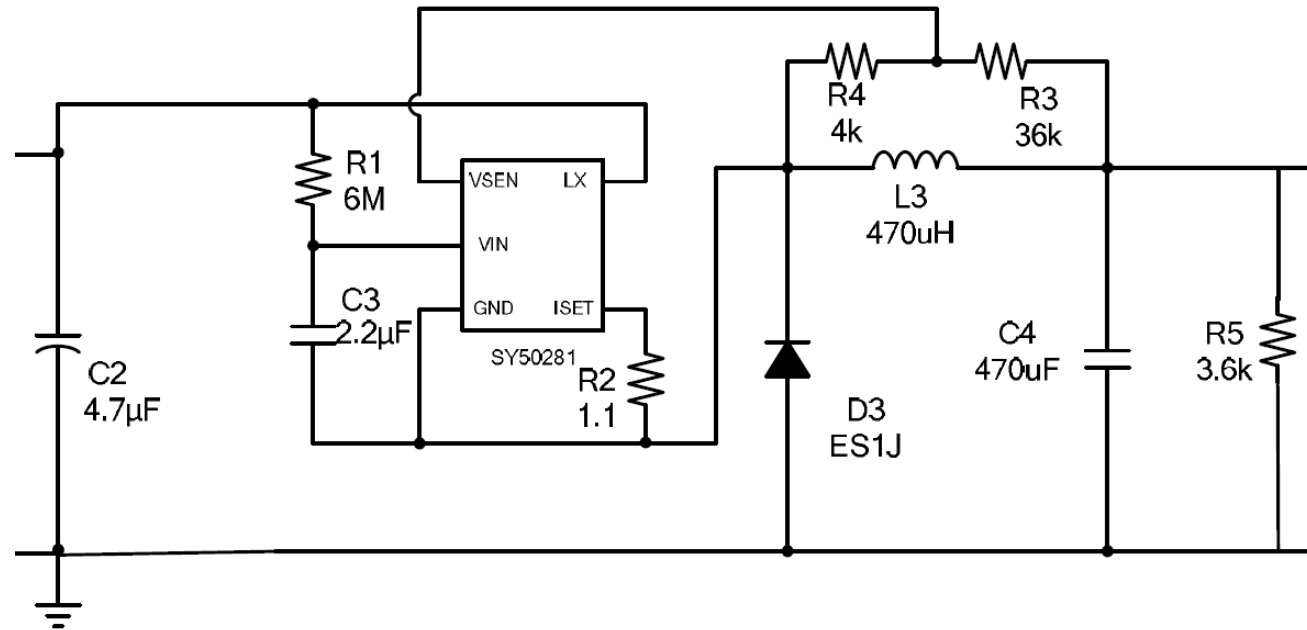


2nd – Stage : Single Channel DCDC Solutions

Item	SY8702A	SY8745	SY8750
BV Of In FET (V)	30	60	100
Rds(on) Of In FET (mΩ)	200	160	200
Switching Frequency (KHz)	300	500	500
PWM Dimming	√	√	√
Analog Dimming	×	√	√
Dim Range (PWM)	2%~100%	2%~100%	5%~100%
Dim Range (Analog)	X	5%~100%	5%~100%
Short LED Protection	√	√	√
Auto Zero Tech	×	√	√
Package	SOT23-6	SO8E	SO8E

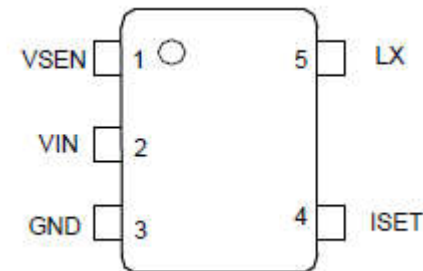


Bias Supply, 500V HV Buck -- SY50281



Key Features:

- CV control
- int. 500V MOS
- QR mode
- Max. 45kHz frequency
- Low startup current, 15uA
- Compact package: SOT23-5



SY50281 is used as a power supply for wireless module



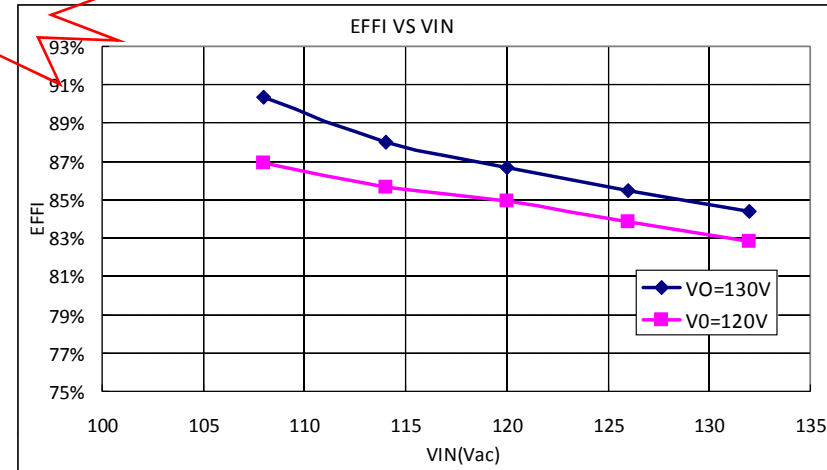
Linear AC/DC Solution



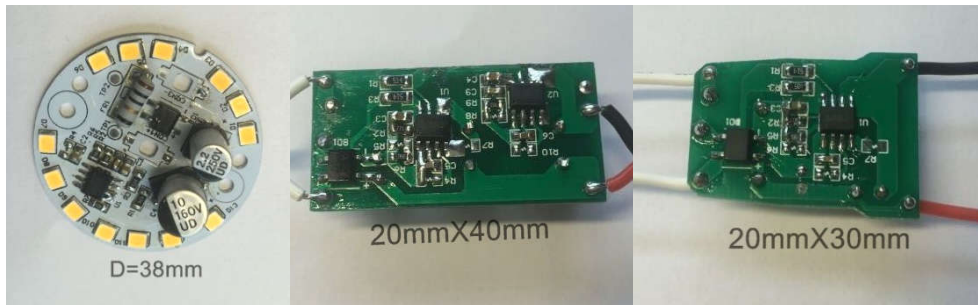
Non-dim Linear AC/DC_SY590X2

New

- Integrated 500V/600V MOSFET
- Power factor >0.5 or >0.7
- Up to 12W design capability
- Up to 87% High efficiency
- Excellent EMC performance
- Adjustable thermal fold back
- $\pm 3\%$ output current precision



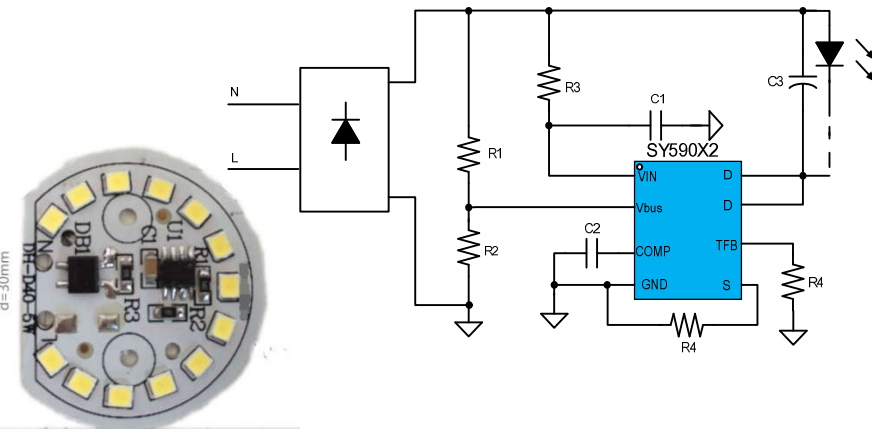
Applications:



10W DOB

18W Tube

10W Blub



5W DOBE-cap free



Thanks!