

RICHTEK

SG013 AUG 2018



RICHTEK
POWER SOLUTIONS
FOR LED LIGHTING APPLICATIONS

1-Stage FLT Buck C.C

Non-Dimmable: RT8487/RT8497series

1-Stage FLT Buck C.V. + 2nd Stage Buck C.C.

RT8432 + RT8420/RT8406

Boost PFC C.V. + HV Buck C.C.

RT7300AD + RT8458A

Boost PFC C.V. + Flyback C.C.

RT7300AD + RT7306S/RT7331S

1-Stage Flyback C.V. + 2nd Stage Buck C.C.

RT7313 or RT7339P/S + RT8420/RT8406/RT8458A

1-Stage Flyback C.C.

Non-Dimmable: RT7304A/RT7330 / Dimmable: RT7306D/RT7331

Non-Isolated Solution

Isolated Solution

3W-24W

40W-100W

100W-150W

OVERVIEW

HIGH POWER FACTOR AC/DC ISOLATED SOLUTIONS FOR LED LIGHTING DRIVERS

P/N	Topology	MOSFET BVDSS	MOSFET Ron	Dimmable	Package	Key features	Status
RT7304	Gen I Primary-Side-Regulation Flyback/Buck-Boost, C.C			✗	SOT-26	<ul style="list-style-type: none"> Tight current regulation $\pm 3\%$ Quasi-Resonant operation 	Mass Production
RT7304A	Gen II Primary-Side-Regulation Flyback/Buck-Boost, C.C			✗	SOT-26	<ul style="list-style-type: none"> Tight current regulation $\pm 1.5\%$ Quasi-Resonant operation THD optimization, THD <10% Vin feed-forward compensation 	Mass Production
RT7330	Gen III Primary-Side-Regulation Flyback/Buck-Boost, C.C			✗	SOT-26	<ul style="list-style-type: none"> Tight current regulation $\pm 1.5\%$ Advanced Quasi-Resonant operation Fast startup time <0.5s THD optimization, THD <10% Soft drive for better EMI performance Equip Vin UVP/OVP, external OTP 	Sampling
RT7306D	Gen II Primary-Side-Regulation Flyback/Buck-Boost, C.C			Analog PWM	SOP-8	<ul style="list-style-type: none"> Tight current regulation $\pm 1.5\%$ Quasi-Resonant operation Built-in HV startup device THD optimization, THD <10% Vin feed-forward compensation VDD hold-up mode for standby power 	Mass Production
RT7331	Gen III Primary-Side-Regulation Flyback/Buck-Boost, C.C			Analog PWM	SOP-8	<ul style="list-style-type: none"> Tight current regulation $\pm 1.5\%$ Advanced Quasi-Resonant operation Smart CC/CV mode (Adjustable CV Level) Wide dimming range (1%~100%) Fast startup time <0.5s THD optimization, THD <10% Vin feed-forward compensation Low standby power consumption Soft drive for better EMI performance Equip Vin UVP/OVP, external OTP 	Mass Production

P/N	Topology	MOSFET BVDSS	MOSFET Ron	Dimmable	Package	Key features	Status
RT7310	Primary-Side-Regulation Flyback/Buck-Boost, C.C			Phase-Cut	SOT-26	<ul style="list-style-type: none"> • High dimmer compatibility • No extra bleeder circuit needed • Support low percentage dimming angle 	Mass Production
RT7311B	Primary-Side-Regulation Flyback/Buck-Boost, C.C	620V	4.8Ω		SOP-8		
RT7313	Gen II PSR/SSR Flyback C.V. Controller			×	SOP-8	<ul style="list-style-type: none"> • Quasi-Resonant operation • THD optimization, THD<10% • Vin feed-forward compensation • Fast dynamic response • Disable function for good power saving 	Mass Production
RT7339P RT7339S	Gen III PSR/SSR Flyback C.V. Controller			×	SOT-26	<ul style="list-style-type: none"> • Tight voltage regulation $\pm 1.5\%$ • Quasi-Resonant operation • Excellent dynamic load transient response • THD optimization, THD<10% • Vin feed-forward compensation • Fast startup time <0.5s • Ultra-low standby power consumption • Soft drive for better EMI performance • Equip Vin UVP/OVP, external OTP • Wide VDD range (Up to 34V) 	Sampling
RT7300AD	Boost PFC Controller			×	SOP-8	<ul style="list-style-type: none"> • Tight voltage regulation $\pm 1\%$ • Quasi-Resonant operation • THD optimization, THD<10% • Vin feed-forward compensation • Fast dynamic response • Brown in/out function • Disable function for good power saving 	Mass Production

SECONDARY-SIDE CONTROLLERS

P/N	Topology	MOSFET BVDSS	MOSFET Ron	Dimmable	Package	Key features	Status
RT8481/A	Secondary-Side, C.C./C.V. Regulator			✗	SOT-26	<ul style="list-style-type: none"> • Wide input range 4.75V to 50V • Precise CV Ref. $\pm 1\%$ and CC Ref. $\pm 3\%$ • Smooth transient between CV/CC control loops • Low operating current 0.6mA 	Mass Production
RT8457A	Secondary-Side, Dimmable C.C. Regulator			Analog	SOP-8	<ul style="list-style-type: none"> • High precise ref. $\pm 5\%$ • Precise analog dimming performance • Low operating current 0.5mA 	Mass Production

AC/DC NON-ISOLATED SOLUTIONS FOR LED LIGHTING DRIVERS

P/N	Topology	MOSFET BVDSS	MOSFET Ron	Dimmable	Package	Key features	Status
RT8458A	Floating Buck C.C. Controller			Analog PWM	TSOT-26	<ul style="list-style-type: none"> Support both universal or DC input Support Analog/PWM dimming control and share the same pin 	Mass Production
RT8487	HPFC Floating Buck C.C. Controller			✗	TSOT-26	<ul style="list-style-type: none"> THD optimization and meet IEC-61000-3-2 Class C requirement High precise Ref. $\pm 3\%$ Low quiescent and shut down current Programmable ZVS setting Quickly charge for shortening startup time 	Mass Production
RT8497	HPFC Floating Buck C.C. Converter	500V	5.2 Ω	✗	SOP-8	<ul style="list-style-type: none"> THD optimization and meet IEC-61000-3-2 Class C Requirement High precise Ref. $\pm 3\%$ Low quiescent and shut down current Programmable ZVS setting Quickly charge for shortening startup time A few external components High quality and reliability 	Mass Production
RT8497A		500V	2 Ω				
RT8497B		600V	4.2 Ω				
RT8497C		600V	7 Ω				
RT8497D		600V	3.2 Ω				

P/N	Topology	MOSFET BVDSS	MOSFET Ron	Dimmable	Package	Key features	Status
RT8402	HPFC Floating Buck C.C. Controller			Phase-Cut	TSOT-26	<ul style="list-style-type: none"> • High dimmer compatibility • Support low percentage dimming angle • No extra bleeder circuit needed • Support single winding inductor • Excellent Line/Load regulation 	Mass Production
RT8413	HPFC Floating Buck C.C. Converter	500V	5.5Ω	Phase-Cut	SOP-8	<ul style="list-style-type: none"> • High dimmer compatibility • Support low percentage dimming angle • No extra bleeder circuit needed • Support single winding inductor • Excellent Line/Load regulation • A few external components 	Mass Production
RT8413E		300V	2.85Ω				
RT8409	Floating Buck C.V. Converter	600V	6Ω	✘	SOP-8	<ul style="list-style-type: none"> • High precise Ref. ±3% • Low quiescent and shut down current • Ultra-low standby power consumption 	Mass Production
RT8432	HPFC Floating Buck C.V. Controller			✘	SOT-26	<ul style="list-style-type: none"> • Tight voltage regulation ±1.5% • Quasi-Resonant operation • Excellent dynamic load transient response • THD optimization and meet IEC 61000-3-2 Class C requirement • Vin feed-forward compensation • Fast startup time <0.5s • Soft drive for better EMI performance • Equip External OTP • Wide VDD range (Up to 34V) 	Sampling

DC/DC SOLUTIONS FOR LED LIGHTING DRIVERS

P/N	Topology	MOSFET BVDSS	MOSFET Ron	Dimmable	Package	Key features	Status
RT8471	1.2A/1A Hysteretic Control Buck C.C. Converter	36V	350mΩ	Analog PWM	TSOT-25	<ul style="list-style-type: none"> • Fast response w/o compensation • A few external components • Tight current regulation ±5% 	Mass Production
					PSOP-8 MSOP-8		
RT8420	1.2A Hysteretic Control Buck C.C. Converter	50V	350mΩ	Analog PWM	PSOP-8 MSOP-8	<ul style="list-style-type: none"> • Fast response w/o compensation • A few external components • Tight current regulation ±5% • 1MHz frequency limited at low percentage dimming • Adjustable MOSFET rising/falling speed 	Mass Production
RT8477A	Average Sensing Control C.C. Controller			Analog PWM	PSOP-8	<ul style="list-style-type: none"> • Wide input range 4.5V to 50V • Support Buck/Boost/Buck-Boost topology • Tight current regulation ±3% 	Mass Production
RT8474A	Floating Buck C.V. Convertor	50V	150Ω	Analog PWM	PSOP-8	<ul style="list-style-type: none"> • Support Buck/Boost/Buck-Boost topology • Tight current regulation ±3% • Adjustable OVP level 	Mass Production
RT8406	Average Sensing Control C.C. Controller			Analog PWM	SOP-8	<ul style="list-style-type: none"> • Tight current regulation ±3% • 1% low dimming precision • Low standby power consumption • High input range (Up to 65V) • High efficiency over 97% • Adjustable switching frequency 	Mass Production

P/N	Topology	MOSFET BVDSS	MOSFET Ron	Dimmable	Package	Key features	Status
RT8480	Average Sensing Control Boost C.C. Controller			Analog PWM	SOP-16	<ul style="list-style-type: none"> • V_{out} is limited by external MOSFET switch • Support pure PWM dimming 	Mass Production
RT8462	Average Sensing Control C.C. Controller			Analog PWM	SOP-14	<ul style="list-style-type: none"> • Support Buck/Boost/Buck-Boost topology • Programmable switching frequency • Programmable soft-start/OVP • Support output up to 60V (RT8462), 90V (RT8475 and RT8494) • Automotive grade 1 AEC-Q100 qualified (RT8494) 	Mass Production
RT8475							
RT8494 (Automotive grade)							

LIGHT QUALITY SOLUTIONS FOR LED LIGHTING DRIVERS

P/N	Topology	MOSFET BVDS	MOSFET Ron	Dimmable	Package	Key features	Status
RT7315A	Adaptive 100Hz/120Hz Current Ripple Regulator			×	SOT-26	<ul style="list-style-type: none"> • Suitable for dimmable LED lighting system • Support wide LED voltage range • Adjustable ripple ratio for high efficiency • Support electronic-load test/development 	Mass Production

MR16 SOLUTIONS FOR LED LIGHTING DRIVERS

P/N	Topology	MOSFET BVDS	MOSFET Ron	Dimmable	Package	Key features	Status
RT8479C	2-Stage Hysteretic Control C.C. Converter	36V	150mΩ 200mΩ	Analog PWM	PSOP-8	<ul style="list-style-type: none"> • Wide Vin range 4.5V to 36V • Excellent power factor • Tight current regulation ±5% • High ET compatibility and flicker free • Independent dual stage function • Integrated dual MOSFET 	Mass Production
RT8495	2-Stage Hysteretic Control C.C. Converter	36V	200mΩ	Phase-Cut	WDFN3x3	<ul style="list-style-type: none"> • Wide Vin range 4.5V to 36V • Excellent power factor • Equip internal active bleeder • High ET/Dimmer compatibility • Flicker free in dimming process 	Mass Production

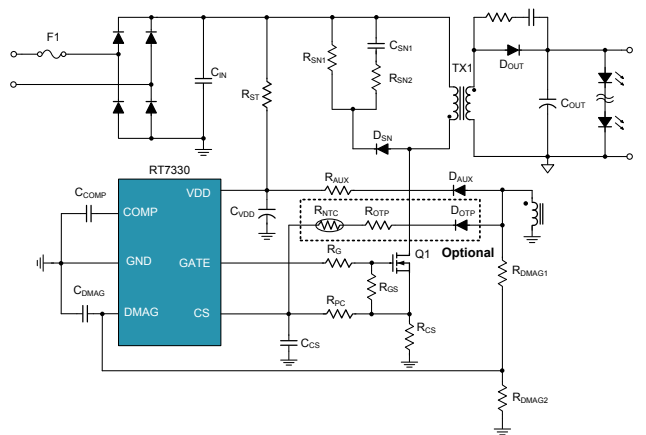
RT7330

Primary-Side Regulation LED Driver Controller with Active-PFC

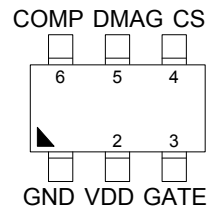
KEY FEATURES

- Tight LED Current Regulation
- Power Factor Correction
- THD Optimization (THD<10%)
- Fast Startup
- Soft Drive for Better EMI performance
- Vin Feed-Forward Compensation
- Equip Vin UVP/OVP, External OTP
- Support Wide Output Range
- Maximum Frequency Limitation (117KHz)
- Robust System Failure Protection
- Design Tool Available
- Available in SOT-26 package

TYPICAL APPLICATION CIRCUIT



PIN CONFIGURATION



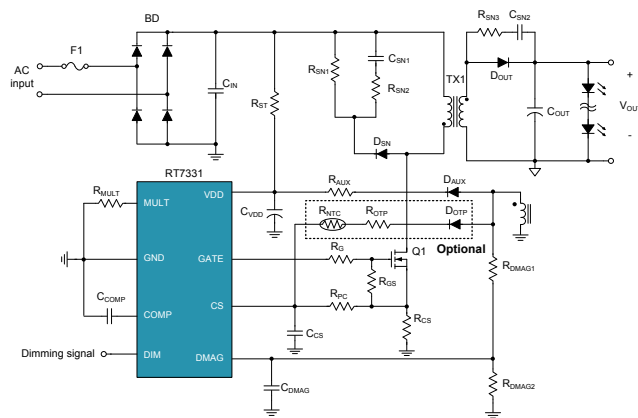
RT7331

Primary-Side Regulation Dimmable LED Driver Controller with Active-PFC

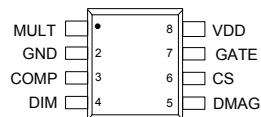
KEY FEATURES

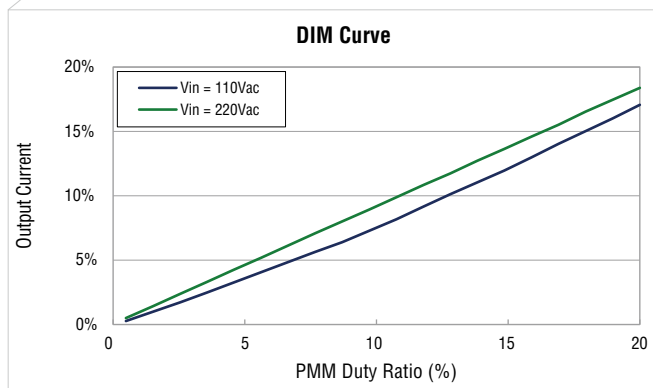
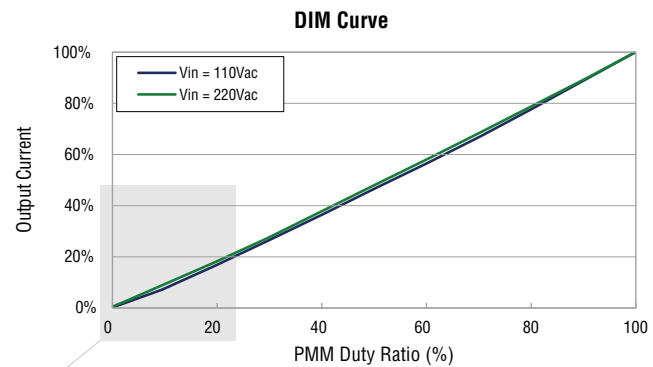
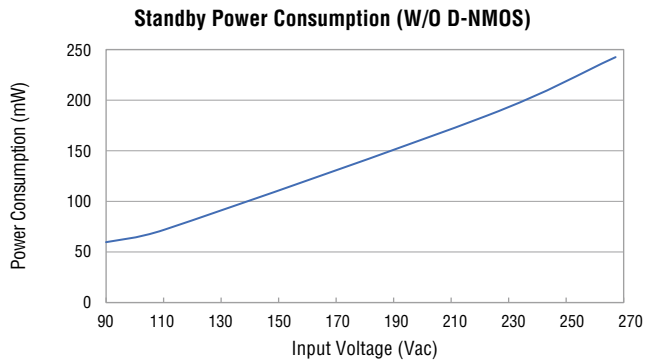
- Tight LED Current Regulation
- Smart CC/CV Mode Control
- Wide Dimming Range (1%~100%)
- Power Factor Correction
- THD Optimization (THD<10%)
- Advanced Quasi-Resonant Operation
- Fast Startup
- Adjustable CV Level
- Soft Drive for Better EMI performance
- Vin Feed-Forward Compensation
- Low Standby Power Consumption
- Equip Vin UVP/OVP, External OTP
- Support Wide Output Range
- Maximum Frequency Limitation (117KHz)
- Green Mode for Excellent Power Saving
- Robust System Failure Protection
- Design Tool Available
- Available in SOP-8 package

TYPICAL APPLICATION CIRCUIT



PIN CONFIGURATION





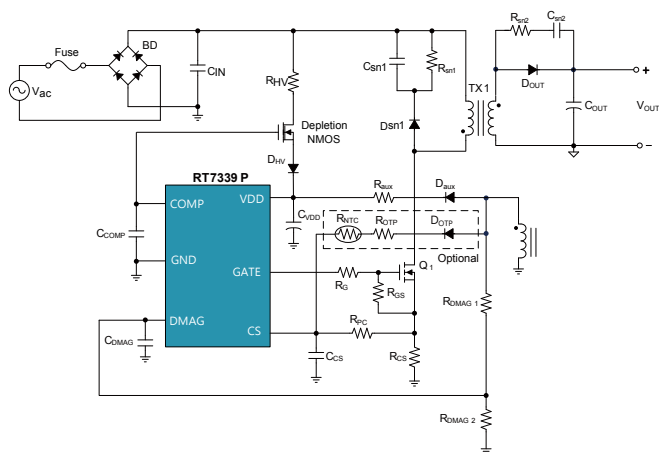
RT7339P

Primary-Side Regulation Constant Voltage Controller with Active-PFC

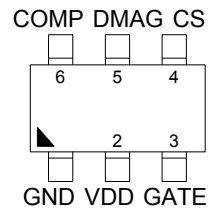
KEY FEATURES

- Tight Voltage Regulation
- Power Factor Correction
- THD Optimization (THD<10%)
- Quasi-Resonant Operation
- Fast Startup
- Ultra-Low Standby Power Consumption
- Excellent Dynamic Load Transient Response
- Soft Drive for Better EMI performance
- Vin Feed-Forward Compensation
- Equip Vin UVP/OVP, External OTP
- Wide Supply Voltage Range (Up to 34V)
- Maximum Frequency Limitation (117KHz)
- Robust System Failure Protection
- Design Tool Available
- Available in SOT-26 Package

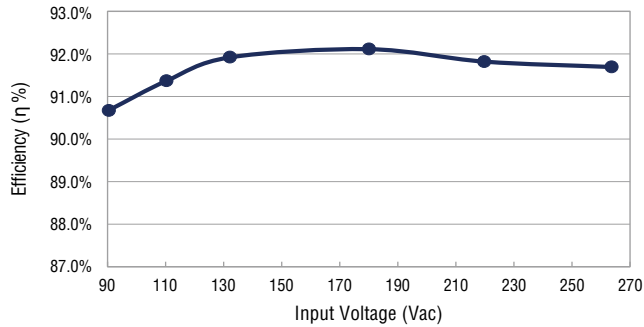
SIMPLIFIED SCHEMATIC



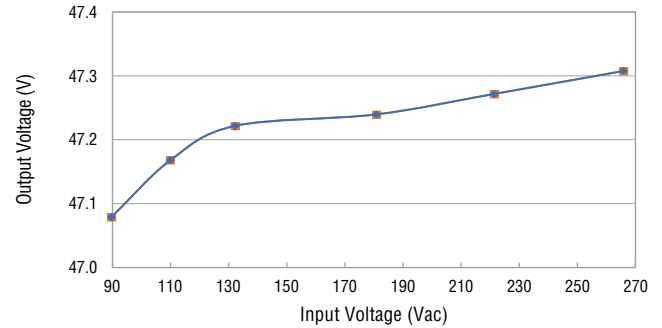
PIN CONFIGURATION



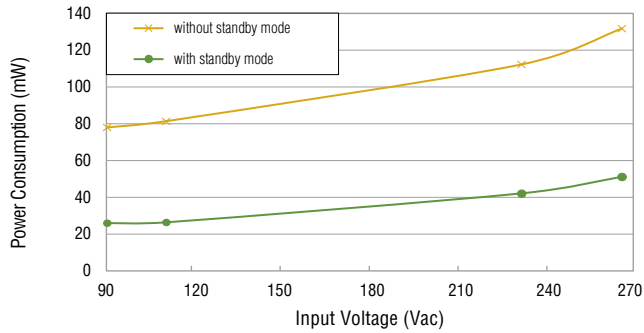
Efficiency vs. Input Voltage



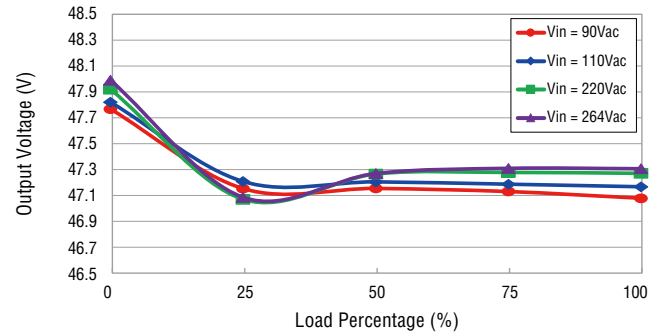
Line Regulation



Standby Power Consumption



Load Regulation



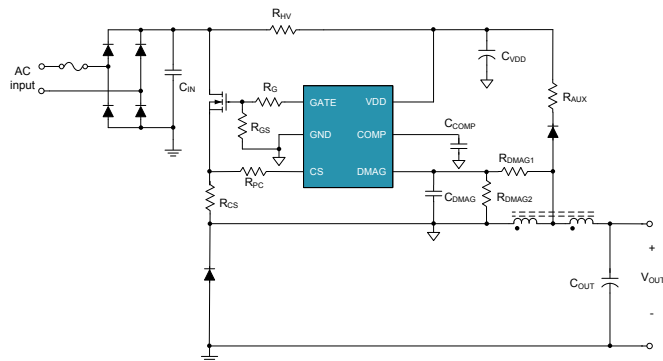
RT8432

Constant Voltage Buck Controller with Active-PFC

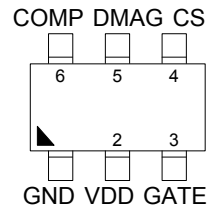
KEY FEATURES

- Tight Voltage Regulation
- Power Factor Correction
- THD Optimization
- Quasi-Resonant Operation
- Fast Startup
- Ultra-Low Standby Power Consumption
- Excellent Dynamic Load Transient Response
- Soft Drive for Better EMI performance
- Vin Feed-Forward Compensation
- Equip External OTP
- Wide Supply Voltage Range (Up to 34V)
- Maximum Frequency Limitation (117KHz)
- Robust System Failure Protection
- Design Tool Available
- Available in SOT-26 package

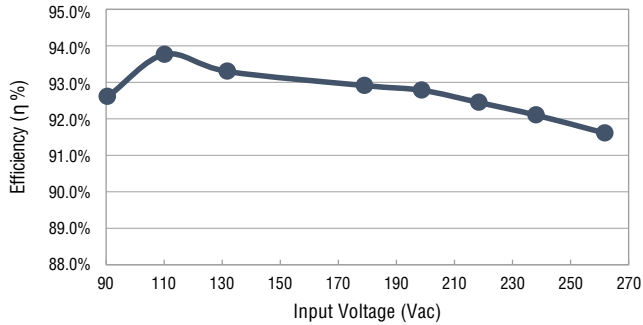
TYPICAL APPLICATION CIRCUIT



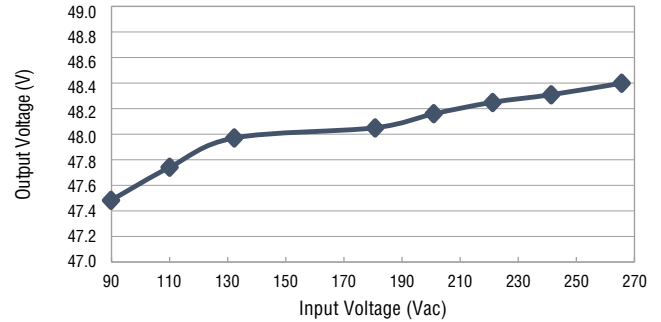
PIN CONFIGURATION



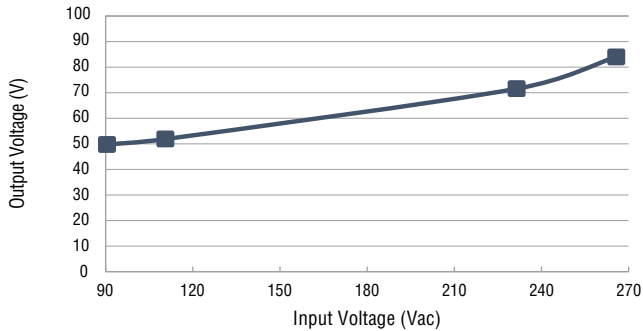
Efficiency vs. Input Voltage



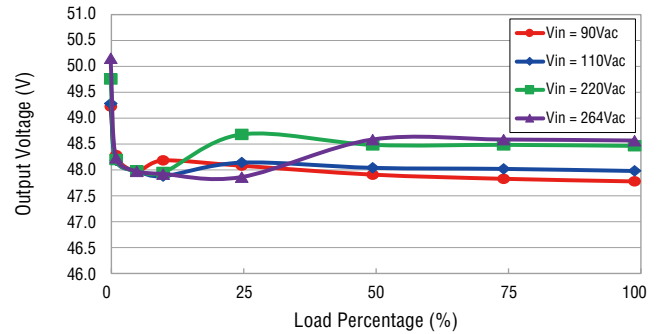
Line Regulation



Standby Power Consumption



Load Regulation



RT8406

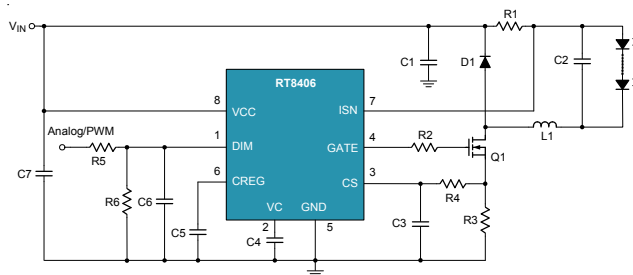
High Voltage Buck LED Driver with Dimming Control

[Read more -](#)

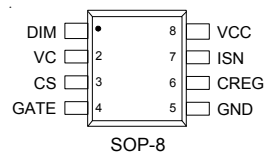
KEY FEATURES

- Tight LED Current Regulation over Wide LED Voltage Range
- 1% Low Dimming Precision
- Low Standby Power Consumption
- High Input Range: Vin up to 65V
- 65KHz/130KHz Adjustable Switching Frequency
- Support Analog/PWM Dimming Control and Share the Same Pin
- Design Tool Available
- Available in SOP-8 package

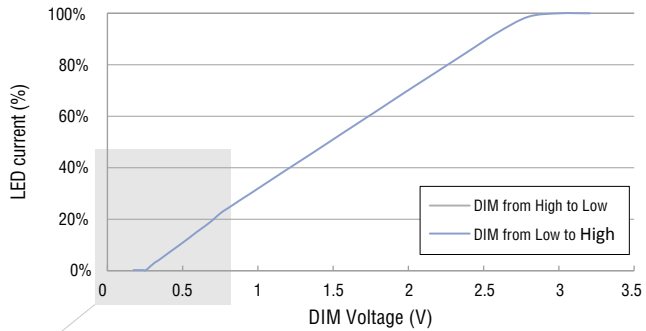
TYPICAL APPLICATION CIRCUIT



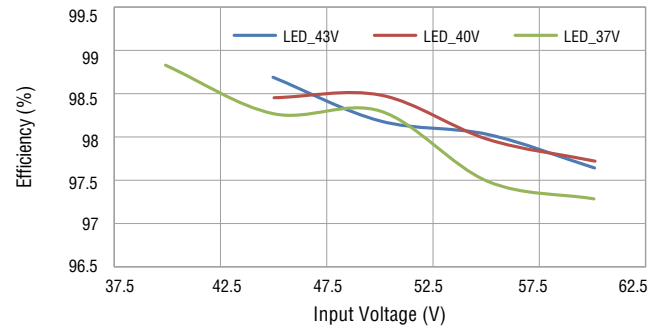
PIN CONFIGURATION



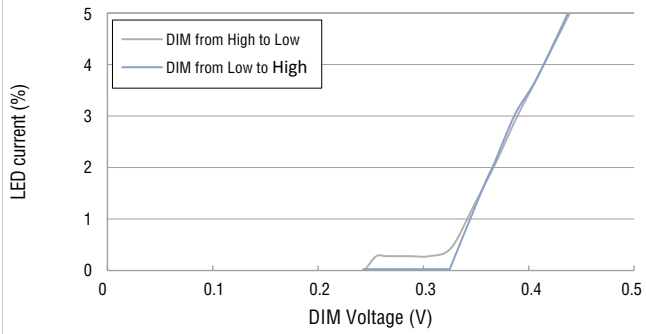
DIM Curve



Efficiency vs. Input Voltage



DIM Curve



RT7315A

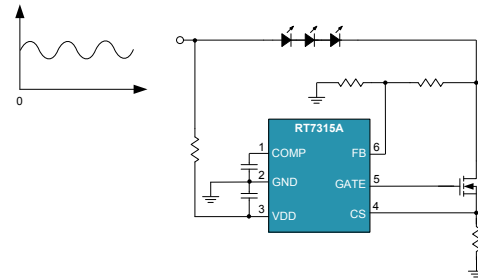
Flicker-Filter for LED Lighting

[Read more ->](#)

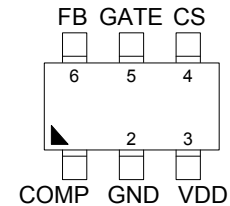
KEY FEATURES

- Adaptive 100Hz/120Hz LED Current Ripple Regulator
- Suitable for Dimmable LED Lighting System
- Support Wide LED Voltage Range
- Adjustable Ripple Ratio for Higher Efficiency
- Support Electronic-Load Test/Development
- Design Tool Available
- Available in SOT-23-6 package

TYPICAL APPLICATION CIRCUIT



PIN CONFIGURATION



RICHTEK



Richtek Technology Corporation is one of the world's leading analog IC companies. The company consistently delivers inventive power management solutions that improve the performance of consumer electronics, computers, and communications equipment. Richtek adds value to end equipment by synthesizing technological innovation, uncompromised quality, and devotion to customer service. Founded in 1998, the Company is headquartered in Taiwan with additional offices in Asia, the U.S., and Europe. For more information about Richtek and its analog IC solutions, please visit the Company's website at www.richtek.com.



JOIN MYRICHTEK

Creating an account with us is easy!



RICHTEK DESIGNER

Online simulation tool



SUBSCRIBE OUR NEWSLETTERS

Please subscribe to our e-newsletters today to receive updates on the latest information!



FOLLOW US ON FACEBOOK

Connect with Richtek and stay tuned with us!



FOLLOW US ON WECHAT

Connect with us and stay informed!



RICHTEK

www.richtek.com

Richtek Technology Corporation

TEL: 886-3-5526789 / FAX: 886-3-5526611(Headquarters)

Taipei Office

TEL: 886-2-86672399
FAX: 886-2-89191465

Shanghai Office

TEL: 86-21-50277077
FAX: 86-21-68798699

Shenzhen Office

TEL: 86-755-88353955
FAX: 86-755-88353947

Beijing Office

TEL: 86-10-57077365
FAX: 86-10-64742615

Suzhou Office

TEL: 86-512-68784656
FAX: 86-512-62993675

Gyeonggi-do

TEL: 82-31-718-5703
FAX: 82-31-718-5743

San Jose

TEL: 1-408-340-4840
FAX: 1-408-340-4836

Tokyo

TEL: 81-3-54797241
FAX: 81-3-54797242

The Netherlands

TEL: +31-40-8515520