

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 $\pm 5\%$ 	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 $\pm 5\%$ • 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 $\pm 3\%$ 	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 $\pm 3\%$ • 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 $\pm 3\%$ • 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

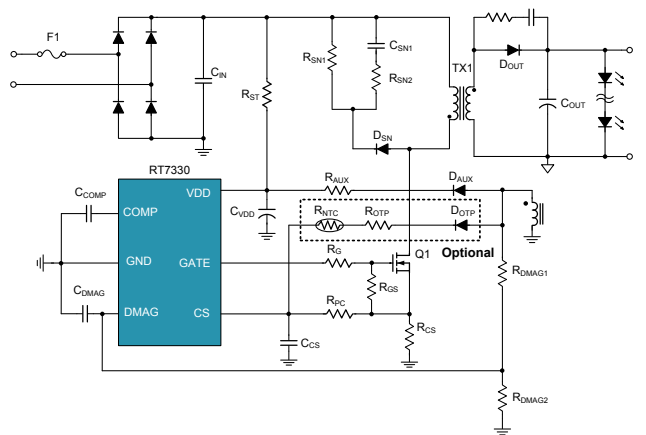
RT7330

Primary-Side Regulation LED Driver Controller with Active-PFC

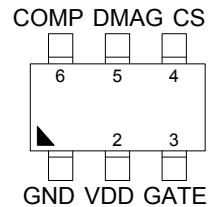
KEY FEATURES

- 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



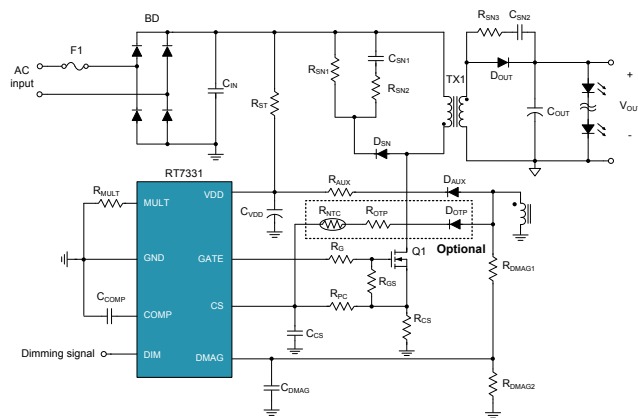
RT7331

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

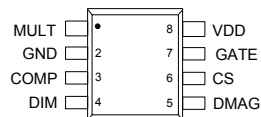
KEY FEATURES

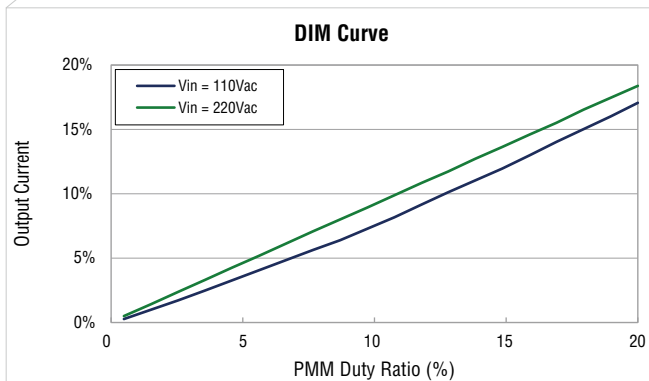
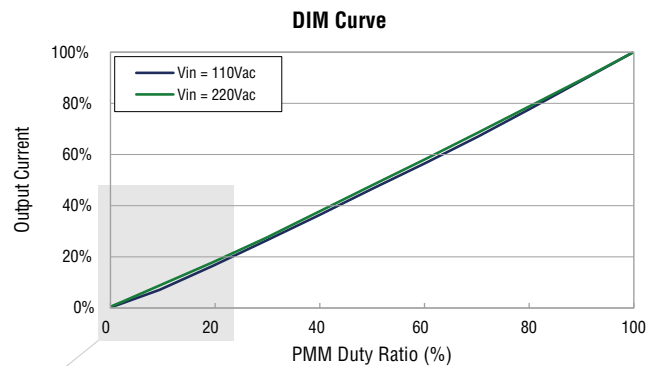
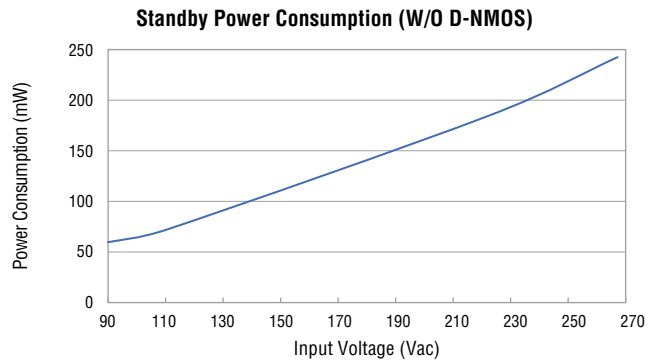
- Tight LED Current Regulation
- Smart CC/CV Mode Control
- Wide Dimming Range (1%~100%)
- Power Factor Correction
- THD Optimization (THD<10%)
- Advanced Quasi-Resonant Operation
- Fast Startup
- Adjustable CV Level
- Soft Drive for Better EMI performance
- Vin Feed-Forward Compensation
- Low Standby 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





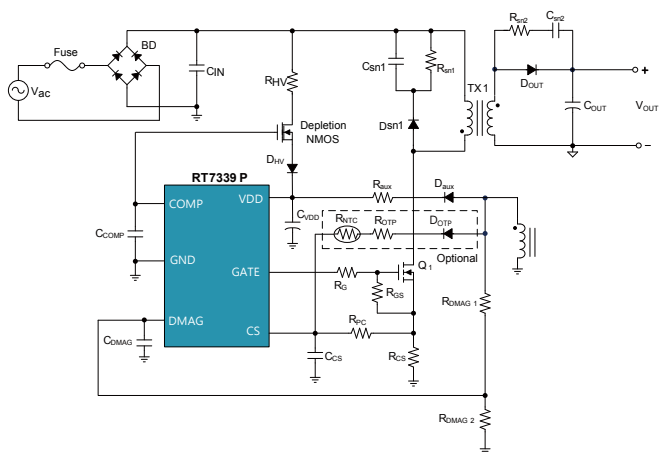
RT7339P

Primary-Side Regulation Constant Voltage Controller with Active-PFC

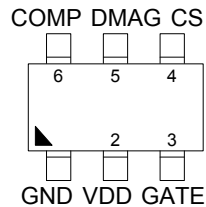
KEY FEATURES

- 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

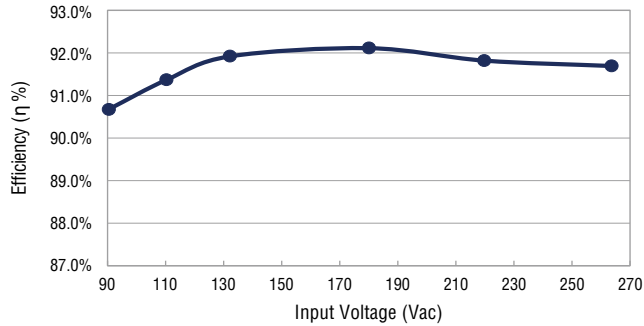
SIMPLIFIED SCHEMATIC



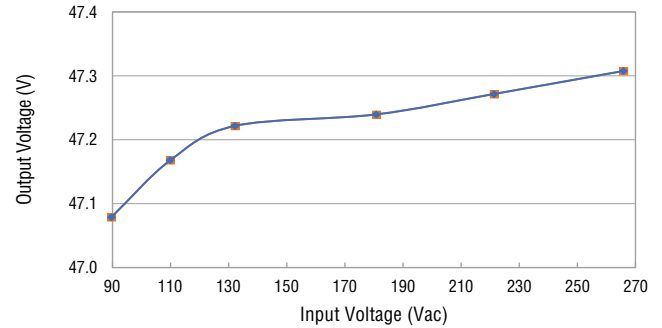
PIN CONFIGURATION



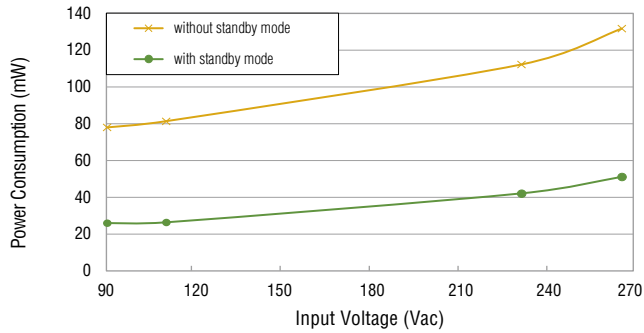
Efficiency vs. Input Voltage



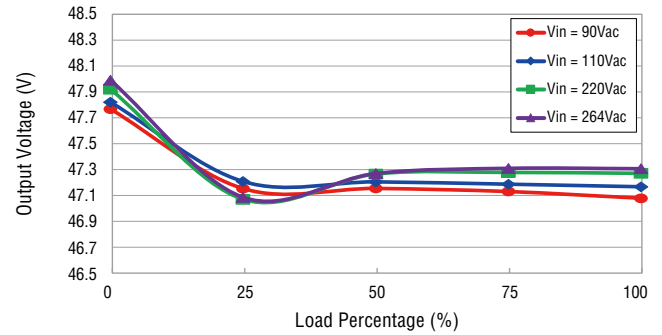
Line Regulation



Standby Power Consumption



Load Regulation



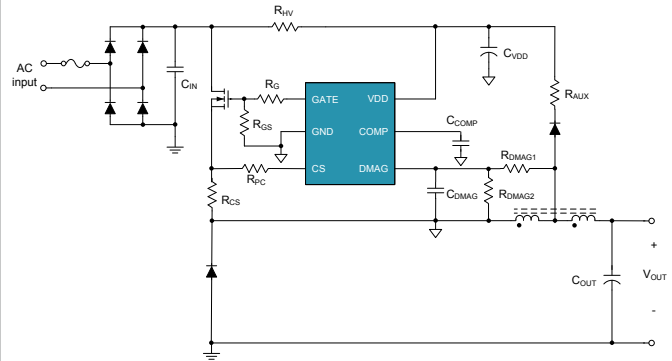
RT8432

Constant Voltage Buck Controller with Active-PFC

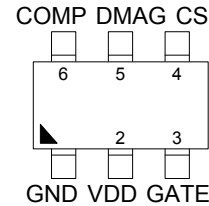
KEY FEATURES

- 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

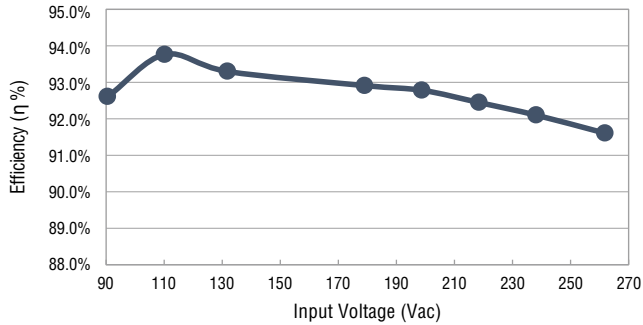
TYPICAL APPLICATION CIRCUIT



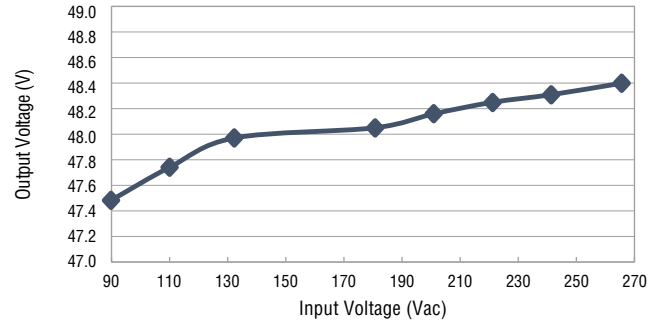
PIN CONFIGURATION



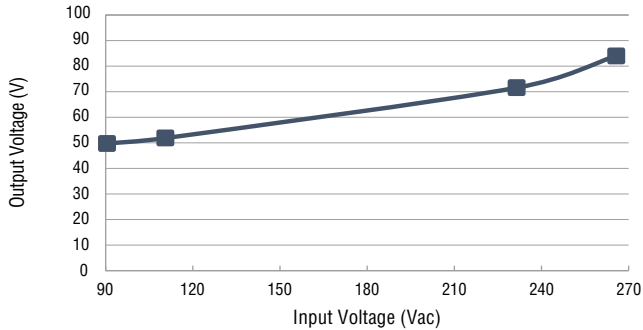
Efficiency vs. Input Voltage



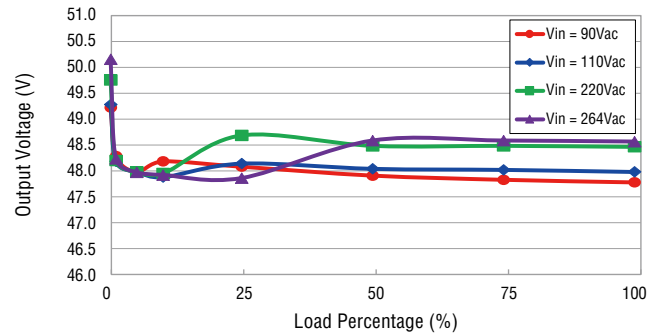
Line Regulation



Standby Power Consumption



Load Regulation



RT8406

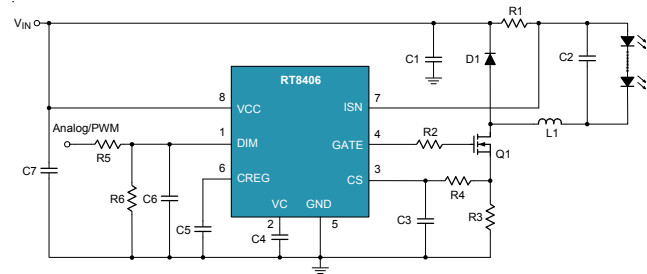
High Voltage Buck LED Driver with Dimming Control

[Read more -](#)

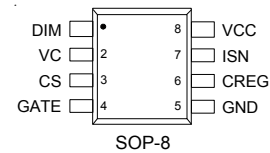
KEY FEATURES

- 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

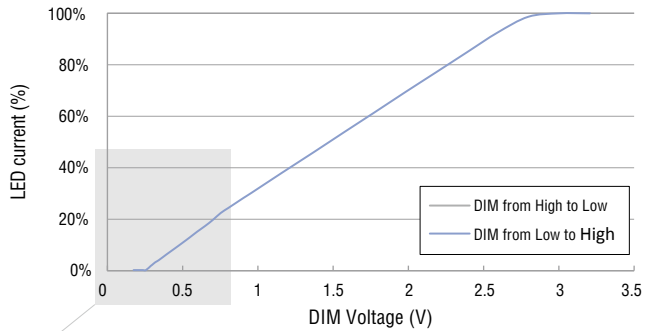
TYPICAL APPLICATION CIRCUIT



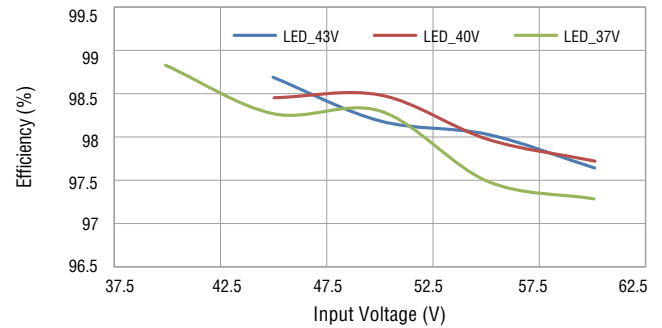
PIN CONFIGURATION



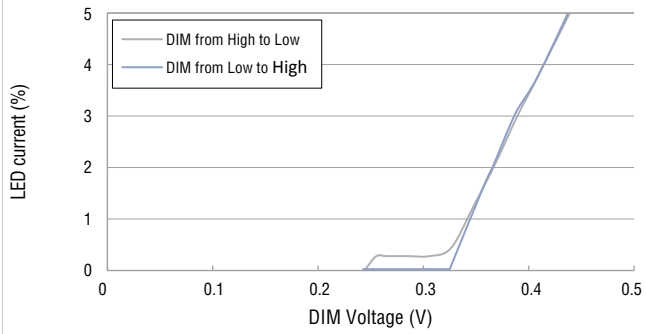
DIM Curve



Efficiency vs. Input Voltage



DIM Curve



RT7315A

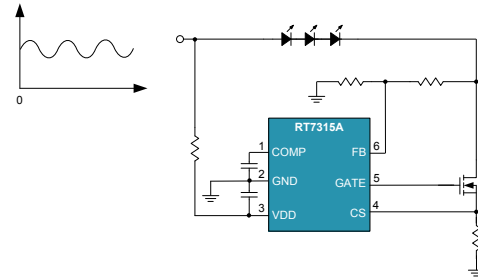
Flicker-Filter for LED Lighting

[Read more ->](#)

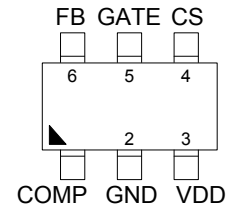
KEY FEATURES

- 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



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