

Richtek Wide Input Voltage Range DC/DC Power Solution

立錡科技拥有各种各样的电源转换方案，其输入电压范围涵盖 1.4V 至 80V 的宽阔空间，可供工业、汽车和专业照明等广泛的领域使用。

RICHTEK 立錡科技

针对工业、汽车 和 LED 照明应用的 宽输入电压范围电 源转换器

立锜科技拥有各种各样的电源转换方案，其输入电压范围涵盖 1.4V 至 80V 的广阔空间，可供工业、汽车和专业照明等广泛的领域使用。这本小册子将立锜科技的部分线性和开关模式转换器列入其中，内容涵盖低耗电线性稳压器（LDO）、高效率升压 / 降压 DC/DC 转换器和控制器、LED 驱动器、功率开关和 DDR 存储器总线终端调节器。

- 列入其中的很多器件具有特别的性能，有的具有 PGOOD 信号，有的具有可编程的软起动特性。
- 立锜科技的很多 Buck 转换器采用了鲁棒性极高的控制架构，ACOT™就是其中之一，利用这种特殊的控制架构，补偿电路不再被需要，使用起来也特别简单。
- 很多器件采用了热性能得到强化的封装，容许使用在较高的温度环境之下。
- 所有器件都可使用陶瓷电容作为输入、输出电容，可以大大延长产品使用寿命。
- 针对工业和汽车应用，立锜科技提供经过三温（3T）测试和 AEC-Q100 认证的产品，它们可在 $-40^{\circ}\text{C} \sim 85^{\circ}\text{C}$ 工业温度范围内稳定工作并确保相应的性能。

由于具有这些特性，这些器件可以满足如右应用场合的需要，但又绝不仅限于此。



工业

- 电表
- 嵌入式计算
- 工业控制系统
- 便携式设备
- 测试仪器
- 工业摄像机



汽车

- 车载信息、娱乐设备
- USB 电源



通讯

- 网络设备
- 服务器
- 数据存储设备



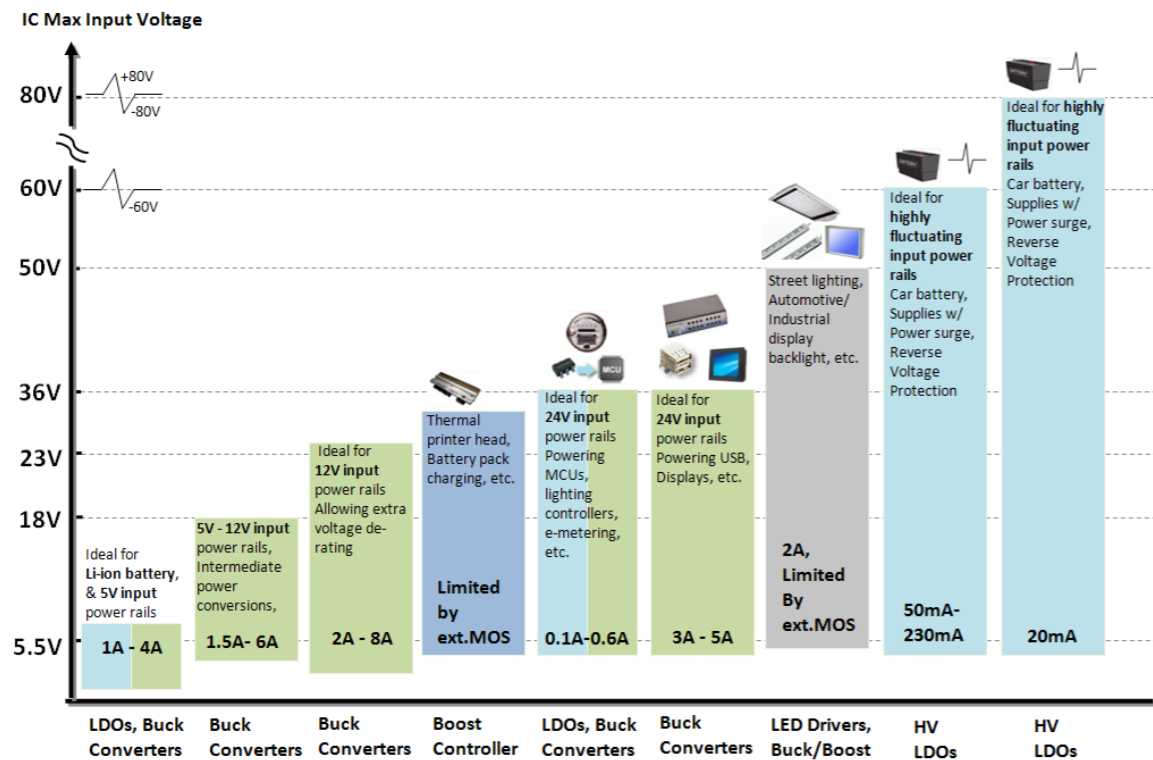
专业 LED 照明

- 汽车照明
- 路灯
- 显示照明
- 照明控制系统



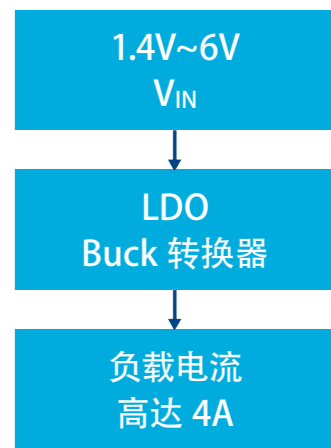
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工业、汽车和 LED 照明应用选型概要

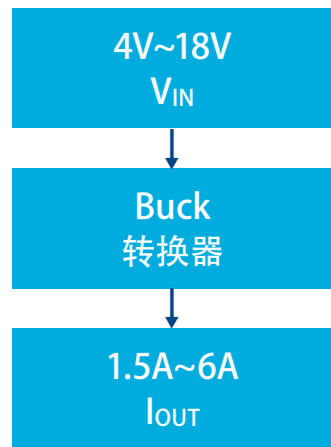


P/N	Description	I _{OUT}	V _{IN}	V _{OUT}	f _{sw}	Key features	Package
RT2657BQ	Synchronous Buck converter	0.6A	2.7V~5.5V	0.6V~5.5V	2.25MHz	→ AEC-Q100 Compliance → Built-in Soft-Start → 1.5A Current limit peak	WDFN-8L 3x3
RT5712A		2A	2.7V~5.5V	0.6V~3.4V	1MHz	→ R _{ON} 100mΩ HS / 70mΩ LS → 1.2ms fixed Soft-Start → CMCOT topology: good transient response, stable with MLCC → Hiccup or Latch off UVP	WDFN-6L-2x2
RT8079		3A	2.95V~6V	V _{REF} : 0.827V	300kHz-2MHz	→ R _{ON} 45mΩ HS / 45mΩ LS → Power Good → Adjustable Soft-Start	WQFN-16L-3x3
RT8086B		3.5A	2.8V~5.5V	0.6V~3.3V	1.2MHz	→ R _{ON} 50mΩ HS / 40mΩ LS → CMCOT topology: good transient response, stable with MLCC → Power Good → Built-in Soft-Start → Hiccup UVP	UQFN-12L-2x2 (FC)
RT8074		4A	2.7V~5.5V	0.8V~5V	200kHz-2MHz	→ Built-in Soft-Start	PSOP-8

P/N	Description	I _{OUT}	V _{IN}	V _{OUT}	f _{sw}	Key features	Package
RT2517B	LDO	1A	2.2V~6V	1.2V~V _{IN}	200mV@1A	→ AEC-Q100 Compliance → Low Quiescent 1.5μA in Shutdown Mode	PSOP-8
RT2517C		1A	2.2V~6V	1.2V~V _{IN}	150mA@1A	→ 3T Grade → Low Quiescent 0.1μA in Shutdown Mode	VDFN-8AL-3x3
RT2518	LDO with EN	1A	1.4V~6V	0.5V~V _{IN}	200mV@1A	→ 3T Grade → EN control	WDFN-8L-3x3
RT2515H		2A	1.4V~6V	0.5V~V _{IN}	400mV@2A	→ 3T Grade → EN control	PSOP-8



输入电压 1.4V~6V、电流高达 4A 的 Buck 转换器或 LDO 是最适合以锂离子电池为电源的应用需要的产品，5V 供电场合的需要也被涵盖其中。



4V~18V 输入、负载电流能力达 6A 的 Buck 转换器，最适合 5V~12V 输入电压范围的应用。

P/N	Description	I _{OUT}	V _{IN}	V _{OUT}	f _{sw}	Key features	Package
RT8297B	Current Mode Synchronous Buck converter	1.5A	4V~17V	0.8V~12V	800kHz	→ Power Good	WDFN-8L-2x2
RT6232/33/A/B A:PSM B:PWM	ACOT™ Synchronous Buck converter	2A/3A	4.5V~18V	0.765V~8V	500kHz	→ ACOT™ topology for ultra-fast transient response and MLCC Cout stable → Adjustable Soft-Start → Power Good → Force PWM or PSM (enhanced light load efficiency)	WDFN-8L-2x3
RT7275/76 75:PWM 76:PSM		3A			700kHz		WDFN-10L-3x3 PTSSOP-14
RT7231/32 31:PWM 32:PSM		4A			650kHz		WDFN-10L-3x3 PTSSOP-14
RT6206B PSM		5.5A			650kHz		WDFN-10L-3x3 PSOP-8
RT2859A/B A:PSM B:PWM	ACOT™ Synchronous Buck converter	3A	4.5V~18V	0.765V~7V	650kHz	→ 3T Grade → ACOT™ topology for ultra-fast transient response and MLCC Cout stable → Adjustable Soft-Start → Power Good → Hiccup or Latch off UVP	WDFN-16L-3x3
RT2855A/B A:PSM B:PWM		4A			650kHz		WDFN-16L-3x3
RT2856	Current Mode Synchronous Buck converter	6A	4.5V~18V	V _{REF} : 0.8V	200kHz-1.6MHz	→ 3T Grade → R _{ON} 26mΩ HS / 19mΩ LS → Adjustable Soft-Start → Power Good → V _{REF} : 0.8V ±1% over -40° ~ 85°	WQFN-14AL-3.5x3.5

P/N	Description	I _{OUT}	V _{IN}	V _{OUT}	f _{sw}	Key features	Package
RT7262/63/64	Current Mode Synchronous Buck converter	2A/3A/4A	4.5V~21V	0.808V~15V	500kHz	→ Synchronized external clock from 300kHz~2MHz → Adjustable Soft-Start → Low LS R _{ON} ideal for low V _{OUT}	WDFN-14L-4x3 PSOP-8
RT8299		3A	3V~24V	0.8V~15V	500kHz		→ Power Good
RT6220	ACOT™ Synchronous Buck converter	6A	4.5V~23V	0.6V~5V	500kHz	→ ACOT™ topology for ultra-fast transient response and MLCC COUT stable → R _{ON} 31mΩ HS / 20mΩ LS → Power Good	UQFN-16L-3x3(FC)
RT7238	ACOT™ Synchronous Buck converter with 3.3V/5V LDO	8A	8V~23V	0.9V~5V Adj. 3.35V fixed 5.5V fixed	500kHz	→ ACOT™ topology for ultra-fast transient response and MLCC COUT stable → R _{ON} 27mΩ HS / 10mΩ LS → With fixed 70mA 3.3V/5V LDO	UQFN-10L-3x3(FC)

相关阅读：



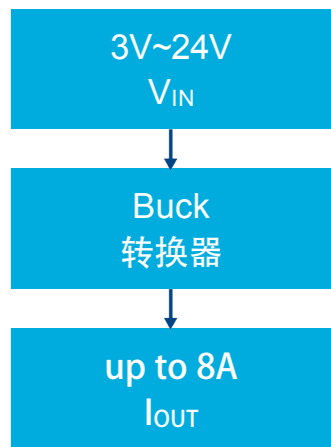
应用笔记：

Buck converter selection criteria

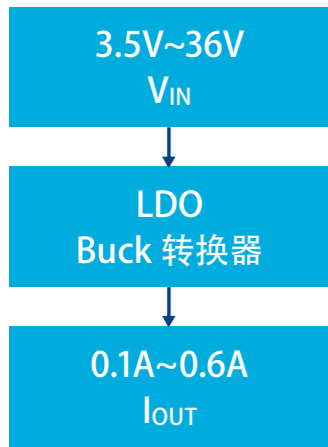


应用笔记：

降压转换器架构之比较



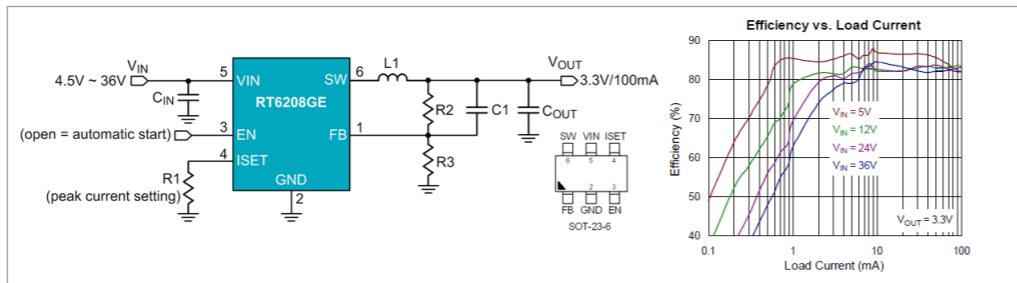
3V~24V 输入、负载电流能力高达 8A 的 Buck 转换器，非常适合 12V 输入电压的应用，容许输入电压在较宽的范围内变化。



3.5V~36V 输入电压、负载电流高达 0.6A 的 Buck 转换器 / 低功耗 LDO 是 24V 电源供电的低功耗应用的理想选择，可用于电表、照明控制、传感器应用等场合。

P/N	Description	I_{OUT}	V_{IN}	V_{OUT}	fsw	Key features	Package
RT6208	Buck converter	0.1A	4.5V~36V	Adj. V_{OUT} $V_{REF} = 0.8V$		→ Synchronous → Adjustable current limit → 25 μ A I_Q → Very high efficiency at low load	SOT-23-6 PSOP-8(w/PG) SOT-23-8(w/PG)
RT6200		0.6A	4.5V~36V	0.8V~15V \pm 2%	1.2MHz	→ Asynchronous with internal 0.3 Ω HS MOSFET	SOT-23-6

P/N	Description	I_{OUT}	V_{IN}	V_{OUT}	fsw	Key features	Package
RT9058 RT2560Q	LDO	100mA	3.5V~36V	2.5V, 3.3V, 5V, 12V fixed	550mV@10mA	→ AEC-Q100 Grade (RT2560Q) → 2 μ A ultra low I_Q	SOT-23-3 SOT-89 PSOP-8

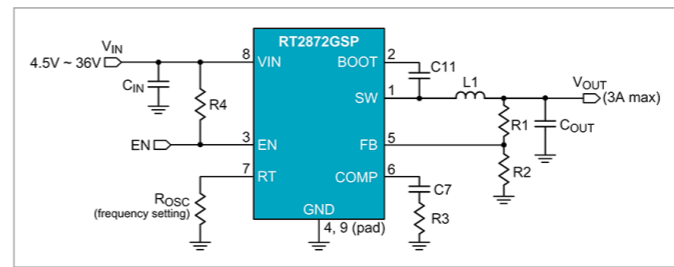


低功率 Buck 可在所有负载条件下获得高转换效率

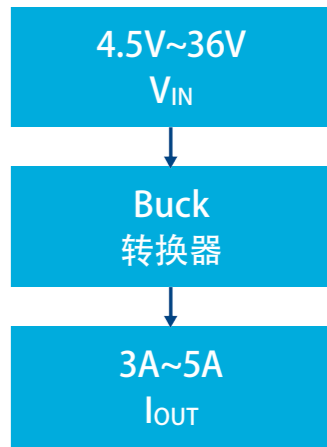
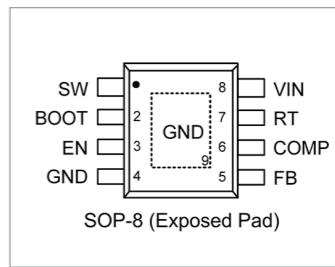


参考阅读：
应用笔记：
"在工业场合为 MCU 供电"

P/N	Description	I_{OUT}	V_{IN}	V_{OUT}	fsw	Key features	Package
RT7272A/B (PWM/PSM)	Current Mode	3A	4.5V~36V	0.8V~30V	500kHz	→ Adjustable current limit: 2.5A~5.5A → Integrated 150/80m Ω HS/LS MOSFET	PSOP-8
RT2872	Buck converter	3A	4.5V~36V	0.8V~30V	300kHz~1MHz	→ AEC-Q100 Grade 3 → 105/80m Ω HS/LS MOSFET → Ext.compensation	PSOP-8
RT2875A/B (latch UV/hiccup UV)		3A	4.5V~36V	0.6V~24V	300kHz~2.1MHz	→ AEC-Q100 Grade 2 → 95/70m Ω HS/LS MOSFET → Ext.compensation → Adjustable current limit: 1.5A~6A	PTSSOP-14
RT8289		5A	5.5V~32V	1.222V~26V	500kHz	→ Asynchronous with integrated 100m Ω HS MOSFET → Internal compensation & Soft-Start	PSOP-8
RT2805A		5A	5.5V~36V	1.222V~26V	500kHz	→ 3T Grade → Asynchronous with integrated 110m Ω HS MOSFET → Internal compensation & Soft-Start	PSOP-8
RT8279		5A	5.5V~36V	1.222V~26V	500kHz	→ Internal compensation	PSOP-8



适合汽车应用的 36V/3A Buck 转换器



4.5V~36V 输入、负载能力高达 5A 的 Buck 转换器是 24V 供电的 USB 电源、显示装置、中功率 MCU、仪器仪表等应用的理想选择。

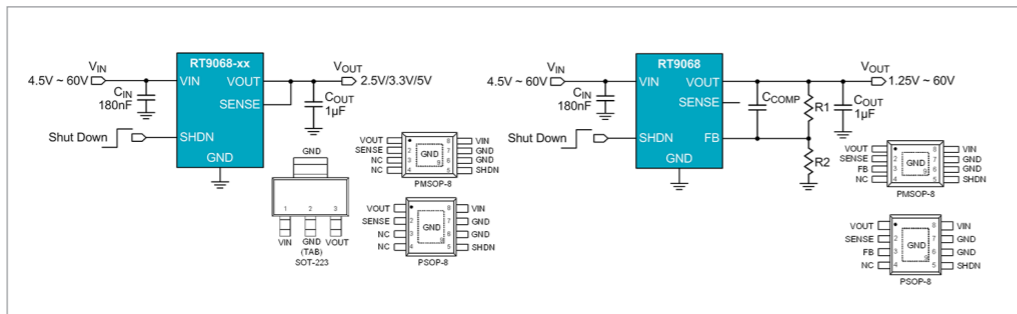
4.5V~80V
 V_{IN}

LDOs

20mA~230mA
 I_{OUT}

4.5V~80V 输入、负载能力高达 230mA 的 LDO，特别适合使用在存在大范围电压波动的场合，它们能承受 $\pm 60 / \pm 80V$ 的电压冲击，可为汽车应用提供高可靠的电源供应解决方案，满足传感器、低功耗 MCU 等应用需要。

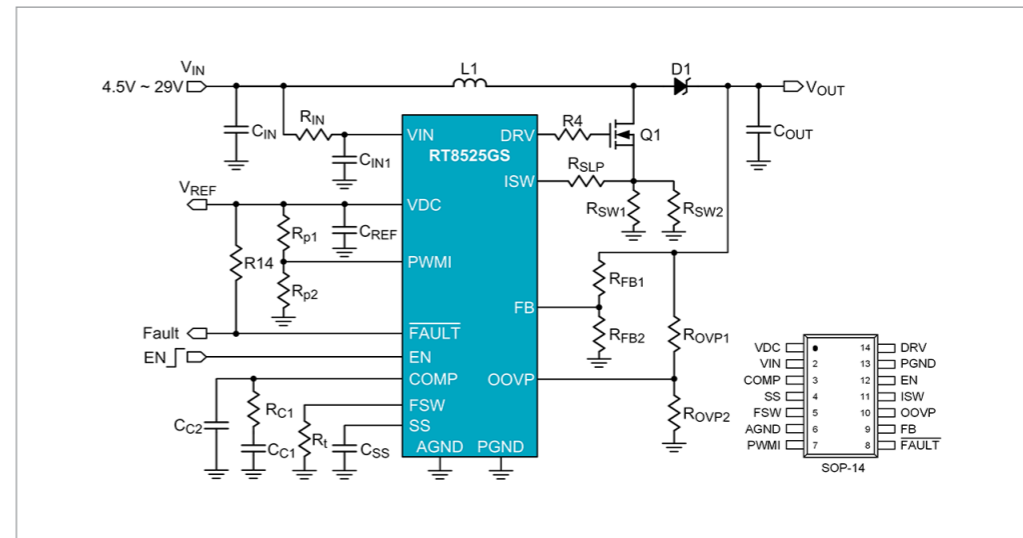
P/N	Description	I_{OUT}	V_{IN}	V_{OUT}	$V_{Dropout}$	Key features	Package
RT2571	LDO	50mA	4.5V~60V	2.5V, 3.3V, 5V Fixed 1.25~60V Adj.	250mV@50mA	→ 30 μ A low I_O → -60V reverse protection	PSOP-8, PMSOP-8, SOT-223
RT9074		100mA	4.5V~60V	2.5V, 3.3V, 5V Fixed 1.25~60V Adj.	300mV@100mA	→ 30 μ A low I_O → -60V reverse protection	PSOP-8, PMSOP-8, SOT-223
RT9068		230mA	4.5V~60V	2.5V, 3.3V, 5V fixed 1.25V~60V Adj.	230mV@50mA	→ 30 μ A low I_O → -60V reverse protection	PSOP-8, PMSOP-8, SOT-223
RT9072A/B		20mA	4.5V~80V	1.25V~60V Adj.	180mV@20mA	→ 23 μ A low I_O → -80V reverse protection	SOT-23-5, WDFN-8L 3x3



RT9068 具有多种可选封装，输出电压可有固定和可调版本

Boost 控制器

P/N	Description	I_{OUT}	V_{IN}	V_{OUT}	fsw	Key features	Package
RT8525	Boost controller	Limited by ext. MOSFET	4.5V~29V	Limited by MOSFET	50K-600kHz	→ Programmable Soft-Start Time → Programmable Boost SW Frequency	SOP-14



Boost 控制器 RT8525 可用于高压、大功率应用中

4.5V~29V
 V_{IN}

Boost 控制器

I_{OUT}
受限于外接元件

4.5V~29V 输入的 Boost 控制器是高压大功率应用的理想选择，可满足诸如 24V 转 48V 之类应用的需要，可用于显示器背光系统、热敏打印机、电池充电等应用中。

LED 驱动器

4.5V~150V
 V_{IN}

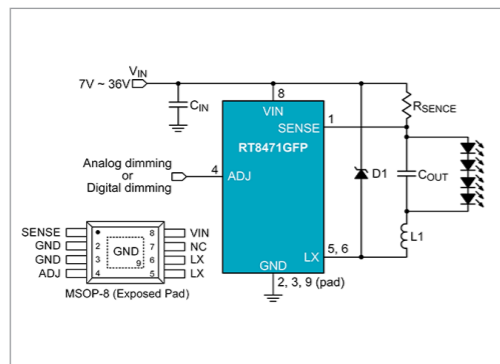
各种架构的
LED 驱动器

2A/ I_{OUT} limited by
ext. MOSFET

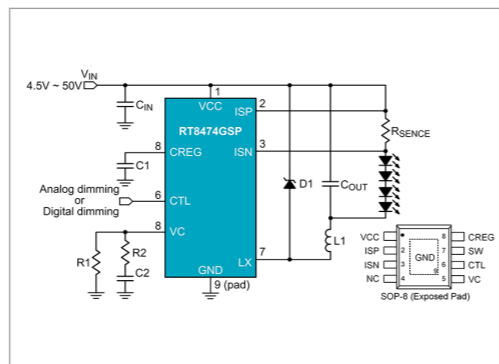
4.5V~150V 输入、输出电流
可达 2A 的恒流 LED 驱动器 /
Buck-Boost 控制器是工业照明
/ 汽车照明的理想选择, 可满足
多颗 LED 串联应用、路灯、显
示器背光等应用的需要。

Buck 架构 LED 恒流驱动转换器

P/N	Description	I_{OUT}	V_{IN}	Key features	Where to use (application examples)	Package
RT8471	Hysteretic control, high brightness LED driver	1/1.2A	7V~36V	→ Simple application: no COUT needed → Analog or digital dimming control → Ultra-fast response → Colour control for single string	→ LED strips, signage, < 15W → MR-16 ≤ 4W Single string buck with color control via LED gating	TSOT-23-5 PMSOP-8 PSOP-8
RT8474/A (A:OVP for hot swap function)	50V high voltage LED driver	2A	4.5V~50V	→ Analog or digital dimming control → Low R_{ON}	→ LED strips, signage, LED engines, $POUT < 30W$ → RT8474A with special open string protection is ideal for hot-swap LED string	PSOP-8



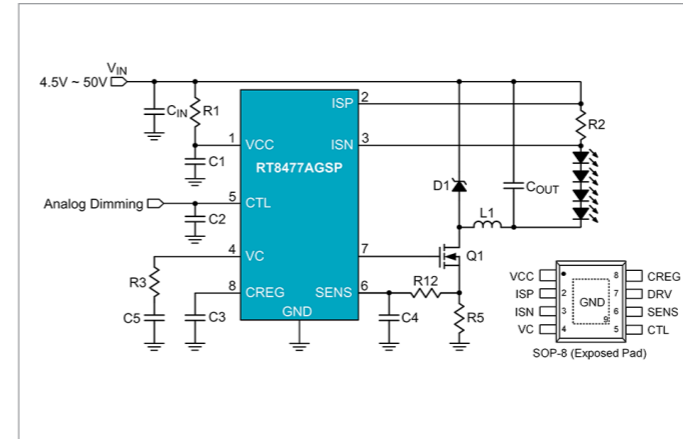
36V / 1A LED 驱动器



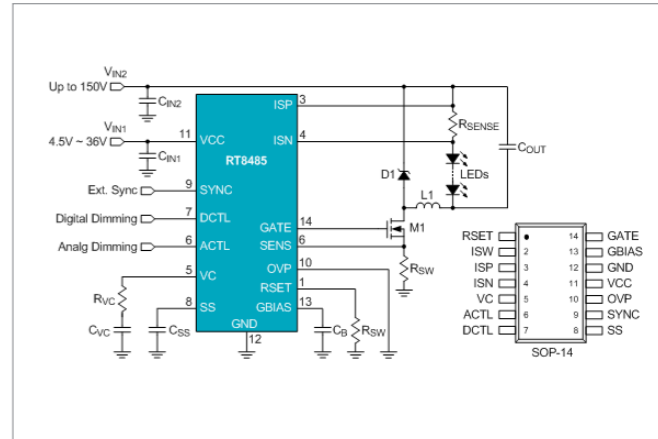
50V / 2A LED 驱动器

Buck/Boost/Buck-Boost 恒流 LED 驱动控制器

P/N	Description	I_{OUT}	V_{IN}	V_{LED}	Key features	Where to use (application examples)	Package
RT8477A	Buck / Boost controller	Limited by external MOSFET	4.5V~50V	up to 50V	→ low component count → Analog or PWM Dimming control	→ Wide input / output range with medium power: LED modules, down-light, emergency lighting → Buck ≤ 60W, Boost ≤ 40W	PSOP-8
RT8475 / RT8494	LED Driver Controller for Buck / Boost / Buck-Boost Topologies		4.5V~36V (IC V_{IN})	up to 90V	→ Programmable Fsw 100kHz to 1MHz → Analog or Digital to Analog Dimming control	→ Industrial Display Backlight → AEC-Q100 Compliance (RT8494)	SOP-14, WQFN-16L 3x3
RT8485	LED Driver controller for Buck / Boost / Buck-Boost topologies		4.5V~36V (IC V_{IN})	up to 150V	→ Programmable switching frequency → Analog, Digital or Digital to Analog Dimming control	→ Street lighting → High power, high LED string application → Buck ≤ 100W, Boost ≤ 80W	SOP-14



50V 高压、大电流 LED 驱动器



150V 高压 LED 驱动器



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功率开关和 DDR 存储器总线终端调节器

P/N	Description	I _{OUT}	V _{IN}	Key features	Package
RT2528	Power Switch with adj. Ilim	0.5A~2.5A	2.5V~5.5V	<ul style="list-style-type: none">→ AEC-Q100 Grade 3→ Adjustable current limit: 0.5A~2.5A via an ext. resistance→ 120mΩ P-MOSFET→ Built-in Soft-Start→ Low supply current: 120μA→ Reverse input-out voltage	PSOP-8
RT2526Q	DDR Termination regulator	DDRII/III: 2A	V _{IN} : 3.1V~3.6V VLDOIN: 1.2V~1.8V	<ul style="list-style-type: none">→ 3T Grade→ S3, S5 off modes→ MLC stable→ Remote sense	PSOP-8

RICHTEK

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