# DC/DC PRODUCTS

Nov 2022

# LOW DROPOUT REGULATORS (LDO)

# LDO VALUES PROPOSITION

- Renesas single and dual LDO’s options
- Ultra High PSRR up to 3Mhz & low o/p noise spectral density
- Up to 3A capability
- Small packaging options
- Lowest Dropout voltage in their class
- Low to wide Vin with low Iq options
- Perfect mapping for our MCUs and Timing products to cover very wide broad base applications

# LDO QUICK SELECTION GUIDE

| RELEASED |
|---|
| SAMPLING |
| IN DESIGN |
| CONCEPT |

| | Load Current | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rail Voltage** | **50mA** | **100mA** | **150mA** | **200mA** | **250mA** | **300mA** | **500mA** | **1A** | **2A** | **3A** | **4A** |
| 1.8V | ISL80505 / ISL80111 (split) | ISL80505 / ISL80111 (split) | ISL80505 / ISL80111 (split) | ISL80505 / ISL80111 (split) | ISL80505 / ISL80111 (split) | ISL80505 / ISL80111 (split) | ISL80505 / ISL80111 (split) | ISL80510 / ISL80111 (split) | RAA214020 / RAA214023 / RAA214025 | ISL80113 / RAA214035 | RAA214045 |
| 3.3V | ISL80505 / ISL80111 (split) | ISL80505 / ISL80111 (split) | ISL80505 / ISL80111 (split) | ISL80505 / ISL80111 (split) | ISL80505 / ISL80111 (split) | ISL80505 / ISL80111 (split) | ISL80505 / ISL80111 (split) | ISL80510 / ISL80111 (split) | RAA214020 / RAA214023 / RAA214025 | ISL80113 / RAA214035 | RAA214045 |
| 5V | ISL80505 / ISL80111 (split) | ISL80505 / ISL80111 (split) | ISL80505 / ISL80111 (split) | ISL80505 / ISL80111 (split) | ISL80505 / ISL80111 (split) | ISL80505 / ISL80111 (split) | ISL80505 / ISL80111 (split) | ISL80510 / ISL80111 (split) | RAA214020 / RAA214023 / RAA214025 | ISL80113 / RAA214035 | RAA214045 |
| 12V | RAA214220 | RAA214220 | RAA214220 | RAA214220 | RAA214250 | RAA214250 | RAA214250 | RAA214290 | N/A | N/A | N/A |
| 24V | RAA214401 / ISL80410 / RAA21440x | RAA214401 / ISL80410 / RAA21440x | RAA214401 / ISL80410 / RAA21440x | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 48V | RAA21480x | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

# E.G. LOW NOISE LDOS COMPETITIVE ANALYSIS

| | RAA214023 | RAA214020 | TPS7A8300 | LT3045A | LP38798 |
|---|---|---|---|---|---|
| **Max input voltage** | 2.7V to 5.5V | 2.7V to 5.5V | 1.4V to 6.5V | 1.8V to 20V | 3V to 20V |
| **Current rating** | 2A | 2A | 2A | 500mA | 800mA |
| **VOUT range** | 0.8V to 5V | 0.9V to 5V | 0.8V to 5V | 0V to 15V | 1.2V to 18.8V |
| **Output Voltage Accuracy** | +/-1.75% (LLT) | +/-1.5% (LLT) | +/-1% (LLT) | +/-1% | +/-1% (Initial 25C) |
| **Dropout Voltage** | 570mV max @2A | 540mV max @2A | 125mV max @ 2.0A | 260mV max @ 0.5A | 200mV max @ 0.8A |
| **Output Current Limit** | 3.3A | 3A | 2.1 to 4.2A | 0.85A max | 1.2A |
| **Enable pin** | EN | EN | EN | EN | EN |
| **Feedback pin** | Yes, SNS | Yes | Yes, SNS with FF Cap | Yes, OUTS | FB |
| **PGOOD pin** | Yes | Yes | Yes | Yes, Programmable | N/A |
| **Band gap filtering resistor** | No need | No need | value not shown | internal current source, external resistor | internal filter |
| **Startup time** | 200µs | 200µs | 80µs | 10ms+ | 155µs |
| **Low RMS o/p noise** | 6.5µVrms (10Hz to 100kHz) @2A | 6.3µVrms (10Hz to 100kHz) @2A | 6µVrms(10Hz to 100kHz) @1.5A | 2.5µVrms(10Hz to 100kHz) @0.5A | 5.43µVrms(10Hz to 100kHz) @0.8A |
| **O/p noise Spectral Density** | 226nV/√Hz @ 10Hz<br>77nV/√Hz @10kHz | 184nV/√Hz @ 10Hz<br>20nV/√Hz @10kHz | 1000nV/√Hz @ 10Hz<br>120nV/√Hz @ 10kHz | 500nV/√Hz @ 10Hz<br>2nV/√Hz @10kHz | 250nV/√Hz @ 10Hz<br>18.5nV/√Hz @ 10kHz |
| **PSRR** | 52dB @ 1MHz (2A) | 50dB @ 1MHz (2A) | 40dB @ 1MHz (2A) | 76dB @ 1MHz (0.5A) | 60dB @ 1MHz (0.8A) |
| **Package** | QFN 20-Ld 5x5mm, QFN 20-Ld 3.5x3.5mm<br>P2P with TPS7A8300 | DFN 10-Ld 3x3mm<br>P2P with LT3045 | QFN 20-Ld 5x5mm, QFN 20-Ld 3.5x3.5mm | DFN 10-Ld 3x3mm, MSOP 12-Ld | WSON4x4 |
| **Over Temperature Trip** | 155 °C typ. | 155 °C typ. | 160 °C typ. | 165 °C typ. | 170 °C typ |

# LDO - PRODUCT SELECTION TABLE

## Linear Regulators (LDO)

Product Selection Table | Documentation | Videos & Training | Tools & Resources

### Product Selection Table

Hide Filters | Reset | Full Screen | Export | Tips

| Part Number | Input Voltage (Min) (V) | Input Voltage (Max) (V) | Output Voltage (Min) (V) | Output Voltage (Max) (V) | Output Current 1 (Max) (A) | Output Current 2 (Max) (A) | Drop Out Voltage (Typical) | Fixed Output Voltage Option | PSRR (db) | IQ | Noise (10Hz to 100kHz) (µVrms) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Part Count: 33**<br>☑ (33) Featured Products<br>☐ (0) Additional Products<br>Filter Parts | ≤ 6<br>≥ 0.7 | ≤ 40<br>≥ 3.6 | ≤ 3.2<br>≥ 0.5 | ≤ 18<br>≥ 2.8 | ≤ 3<br>≥ 0.15 | ≤ 0.3<br>≥ 0.15 | ☐ 0.22<br>☐ 0.27<br>☐ 1.37V @ 150mA<br>☐ 115 @ 150mA<br>☐ 120 (@3A,Vout=2.5V)<br>☐ 130 @ 1A<br>OR | ☐ No<br>☐ Yes<br>OR | ≤ 92<br>≥ 40 | ☐ 18 µA<br>☐ 195<br>☐ 2200 µA<br>☐ 25 µA<br>☐ 29 µA<br>☐ 3.6 µA<br>OR | ≤ 237<br>≥ 5.7 |
| ☐ RAA214020<br>5.5V 2A Ultra Low Noise, High PSR... | 2.7 | 5.5 | 0.9 | 5 | 2 | | 500mV | No | 81 | 195 | 5.7 |
| ☐ ISL78301<br>40V, Low Quiescent Current, 150m... | 6 | 40 | 2.5 | 12 | 0.15 | | 295 @ 150mA | Yes | 66 | 18 µA | |
| ☐ ISL78302 | 2.3 | 6.5 | 1.2 | 3.3 | 0.3 | 0.3 | 150 @ 150mA | Yes | 64 | 47 µA | 37 |

renesas.com/br/en/products/power-power-management/linear-regulators-ldo#parametric_options

# SWITCHING REGULATORS (POLS)

# SWITCHING REGULATOR VALUES PROPOSITION

- Renesas offers wide Vin & Vout ranges of Async and Sync Int-FETs Switching regulators options
- Iout ranges as low as 150mA to 14A now and near future up to 40A POLs with PMBus options
- Support different topologies from buck to boost to buck-boost to low-noise switchers
- Offers high Fsw options to help shrinks overall solution size
- Integrated advance modulation control scheme that eliminate external compensation and have good transient responses with low output caps.
- Support low Iq option
- Offers single and multiple outputs option
- Offers user friendly PowerCompass tools to easily pick regulators that map with Renesas MCUs families

# SWITCHING REGULATOR QUICK SELECTION GUIDE

| | Load Current | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DCDC rating | 0.5A & Below | 1A | 2A | 3A | 5A | 8A | 9A | 12A | 14A | 20A | 30A | 40A |
| 6V+ | ISL80019(A) / RAA808013 | ISL80019(A) / RAA808013 | ISL800xx / RAA808013 | ISL800xx / RAA808013 | ISL8025(A) / RAA808015 | ISL8018 | ISL85009 | ISL85012 | ISL85014 | RAA80802x / ISL8117 / ISL812x | RAA80802x / ISL812x | RAA80802x / ISL812x |
| 18V+ | ISL8541x / RAA21123x / RAA211320 | RAA21123x / RAA211320 | RAA21123x / RAA211320 | RAA21123x / RAA211320 | RAA211250 / RAA211260 | ISL85009 / RAA808020 | ISL85009 | ISL85014 / RAA808021 | ISL85014 / RAA808021 | RAA80802x / ISL8117 / ISL812x | RAA80802x / ISL812x | RAA80802x / ISL812x |
| 36V+ | ISL8541x / RAA21140x, RAA211412 | RAA211412 / RAA808053 | RAA211430 / RAA211432 / RAA808053 | RAA211430 / RAA211432 / RAA808053 | RAA211450 | ISL8117 / ISL81401 | ISL8117 /ISL8180x | ISL8117 /ISL8180x | ISL8117 /ISL8180x | ISL8117 /ISL8180x | ISL8180x | ISL8180x |
| 60V+ | RAA211605 | RAA211630 | RAA211630 | RAA211630 | RAA21165x | ISL8117 / ISL81601 | ISL8117 / ISL81601 | ISL8117 /ISL8180x | ISL8117 /ISL8180x | ISL8117 /ISL8180x | ISL8117 /ISL8180x | ISL8180x |
| 80V+ | RAA21180x / RAA21283x | RAA21191x / RAA211820 | RAA211820 / RAA211930 | RAA211835 / RAA211930 | ISL8180x | ISL8180x | ISL8180x | ISL8180x | ISL8180x | ISL8180x | ISL8180x | ISL8180x |
| 100V+ | TBD | | | | | ISL81100 / ISL81110 | ISL81100 / ISL81110 | ISL81100 / ISL81110 | ISL81100 / ISL81110 | ISL81102 / ISL81106 | ISL81102 / ISL81106 | ISL81102 / SL81106 |
| 700V+ | RAA223010_011_012_021 / RAA223181_182 | RAA223010_011_012_021 / RAA223181_182 | RAA22388x / ISL884x / ISL672x | | | ISL6726 (isolated) | ISL6726 (isolated) | ISL6726 (isolated) | ISL6726 / ISL674x (isolated) | ISL674x / ISL675x (isolated) | ISL674x / ISL675x (isolated) | ISL674x / ISL675x (isolated) |

| | |
|---|---|
| | Integrated FET/s |
| | External FET/s |
| | Int or Ext FET option |

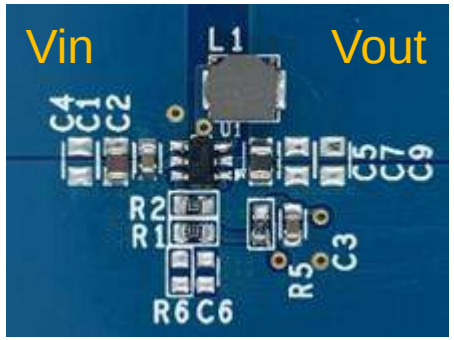
Focus POLs parts

| |
|---|
| RELEASED |
| SAMPLING |
| IN DESIGN |
| CONCEPT |

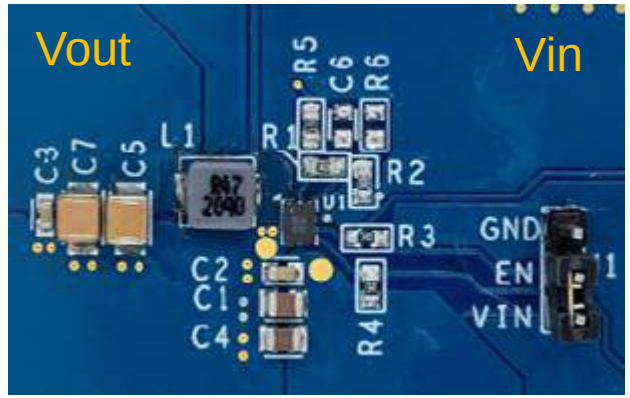
# 5V, 3A/5A SYNC BUCKS: RAA808013/15A

## KEY FEATURES & BENEFITS

- 2.7~5.5V (6V abs max) input 3A/5A COT sync buck
- For simple low BOM count design
- CoT modulator provides excellent transient response, minimizing output capacitor size and cost
- PFM mode for improved light load efficiency
- First 2 EarFree Switch Bucks
- 100% duty cycle operation less dropout
- Relatively low Iq ~55uA at no load
- RAA808013 has CFP with TI, Richtek, Diode




CFP RAA808013 – 3A

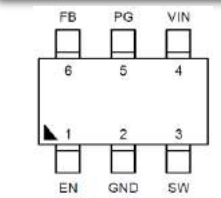



RAA808015A – 5A

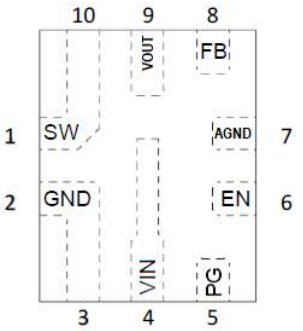
MP Now

| Rdson (P-Fet/N-Fet) | Max Continuous Load Current | Fsw | Package | Part Number |
|---|---|---|---|---|
| 77mΩ/46mΩ | 3A | 1.5MHz | TSOT23-6 | RAA808013 |
| 20mΩ/16mΩ | 5A | 1.8MHz | 2.5x2 QFN | RAA808015A |

**TSOT23-6**




**2.5x2 QFN**





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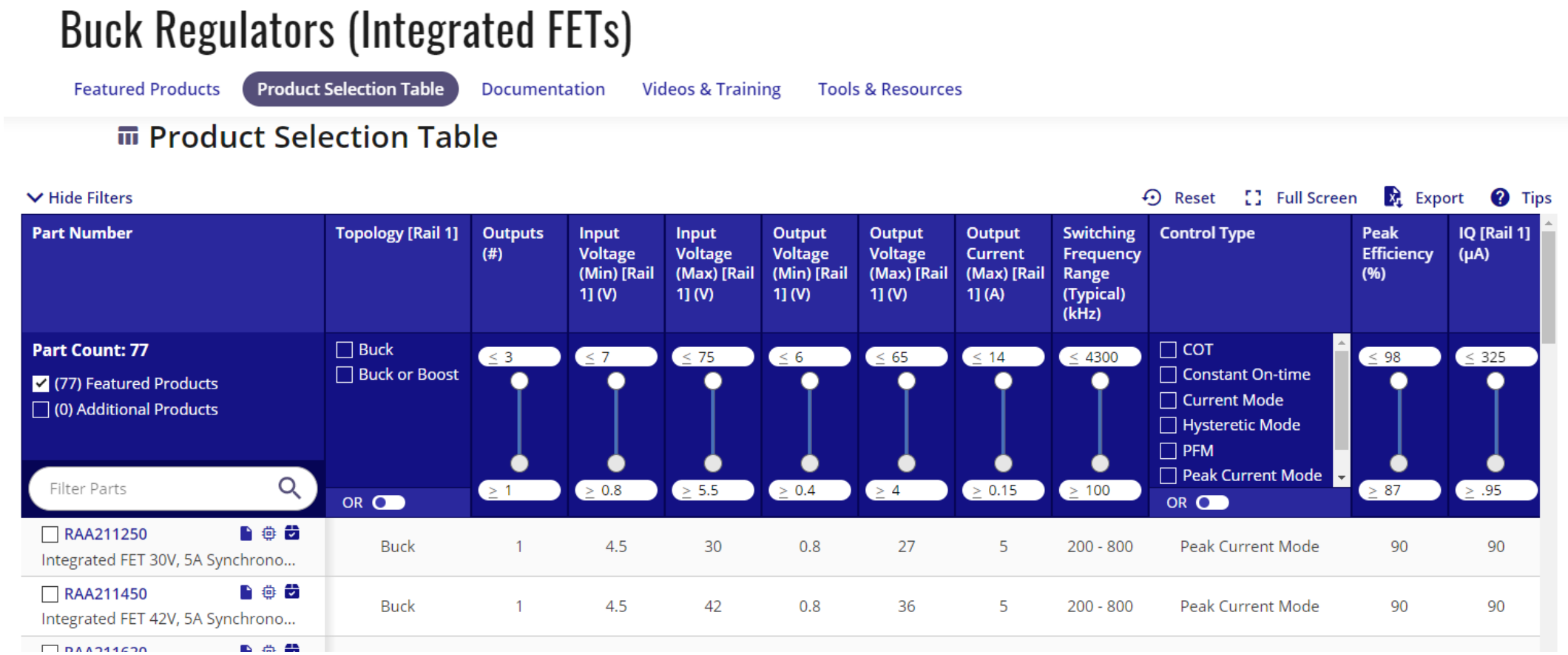
# E.G. RAA211630 COMPETITIVE ANALYSIS

| | RAA211630 | TPS54260 (Async) | LM76003 | MIC28511 | MAX17504 | MP4573 |
|---|---|---|---|---|---|---|
| Input voltage | 4.5-60 V | 3.5-60V | 3.5-60 V | 4.6-60V | 4.5-60 V | 4.5-60V |
| Integrated Device | 110/40 mohm | 200mohm (single) | 95/45 mohm | 51/28 mohm | 165/80 mohm | 250m/45m |
| Nominal current rating | 3A | 2.5A | 3.5A | 3A | 3.5A | 2.5A |
| Quiescent current | 90uA typ | 138uA typ | 15 uA max | 400-700 uA typ | 162uA typ | 40u |
| Vref (over temp ) | 0.8V +/-1% | 0.8V +/-2% | 1.006V +/-2% | 0.8V +/-2% | 0.9V +/-2% | 0.8V +/-2% |
| Switching frequency | 200 kHz to 800 kHz | 100k to 2.5MHz | 300kHz-2.2MHz | 200k-680kHz | 100kHz-2.2MHz | 100kHz-2.2MHz |
| Bootstrap Diode integrated | YES | YES | YES | NO | Yes | YES |
| Control Scheme & Modulator | Peak Current Mode with PFM | Peak Current Mode with PFM | Peak Current Mode with PFM | CCM/DCM, no mode pin | PFM or Forced PWM | Adv Asynch modulation or FCCM |
| Protections | OCP (HS & LS), output UVP, UVLO, OTP | OCP (HS), UVLO, OTP | OCP (HS and LS), UVP, UVLO, OTP, SCP | programmable OCP, UVP, UVLO, OTP | OCP(with current run-away protection), OTP, UVLO, UVP, NOCP | OCP (HS and LS), OVP, OTP, UVLO |
| External bias | Yes | No | Yes | Yes | No | No |
| Power Good | Yes | Yes | Yes | Yes | Yes | Yes |
| Compensation | Internal | External | Internal | Internal | Internal, and extra cap pin for low freq compensation | Internal |
| Package | 20ld QFN 3.5x4<br>HTSSOP-16 | HVSSOP-10EP (3x3), VSON-10EP (3x3) | 30ld QFN 6x4 | 24ld QFN 3x4 | 20ld QFN 5x5 | 12ld QFN 2.5x3 |

# BUCK REGULATORS (INTEGRATED FETS)



Buck Regulators (Integrated FETs)

Featured Products | Product Selection Table | Documentation | Videos & Training | Tools & Resources

Product Selection Table

Hide Filters | Reset | Full Screen | Export | Tips

| Part Number | Topology [Rail 1] | Outputs (#) | Input Voltage (Min) [Rail 1] (V) | Input Voltage (Max) [Rail 1] (V) | Output Voltage (Min) [Rail 1] (V) | Output Voltage (Max) [Rail 1] (A) | Output Current (Max) [Rail 1] (A) | Switching Frequency Range (Typical) (kHz) | Control Type | Peak Efficiency (%) | IQ [Rail 1] (µA) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Part Count: 77<br>(77) Featured Products<br>(0) Additional Products<br>Filter Parts | Buck<br>Buck or Boost<br>OR | ≤ 3<br>≥ 1 | ≤ 7<br>≥ 0.8 | ≤ 75<br>≥ 5.5 | ≤ 6<br>≥ 0.4 | ≤ 65<br>≥ 4 | ≤ 14<br>≥ 0.15 | ≤ 4300<br>≥ 100 | COT<br>Constant On-time<br>Current Mode<br>Hysteretic Mode<br>PFM<br>Peak Current Mode<br>OR | ≤ 98<br>≥ 87 | ≤ 325<br>≥ .95 |
| RAA211250<br>Integrated FET 30V, 5A Synchrono... | Buck | 1 | 4.5 | 30 | 0.8 | 27 | 5 | 200 - 800 | Peak Current Mode | 90 | 90 |
| RAA211450<br>Integrated FET 42V, 5A Synchrono... | Buck | 1 | 4.5 | 42 | 0.8 | 36 | 5 | 200 - 800 | Peak Current Mode | 90 | 90 |

renesas.com/br/en/products/power-power-management/dc-dc-converters/step-down-buck/buck-regulators-integrated-fets#parametric_options

# ANALOG CONTROLLERS (POLS)

# ANALOG CONTROLLERS VALUES PROPOSITION

- Renesas offers wide Vin (upto 100Vdc) of analog controllers targeting 100W and above systems
- Support traditional Silicon or Space constraint e-mode GaN FETs power system requirement
- Support different topologies from buck to boost to buck-boost to invert-boost
- Support current sharing capabilities with cascade phase interleaving with multiple controllers
- Programmable Fsw up to 2MHz give flexibility to strike balance between optimizing solution size & efficiency
- No programming needed and our extensive design supporting tools help make analog power design simple
- Our advance analog controllers support bot constant voltage & current loop to address very wide applications
- Offer very comprehensive reference design demo boards (wide Vin and Vout of up to 650W) tailor to industries commonly use 3V3/5V/12V/24V/48V power system

# ANALOG CONTROLLERS QUICK SELECTION GUIDE

| | | Load Current | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rail Voltage | DCDC rating | 0.5A & Below | 1A | 2A | 3A | 5A | 8A | 9A | 12A | 14A | 20A | 30A | 40A |
| 5V | 6V+ | | | | | | | | | | ISL8117 / ISL812x | ISL812x | ISL812x |
| 12V | 18V+ | | | | | | | | | | ISL8117 / ISL812x | ISL812x | ISL812x |
| 24VDC | 36V+ | | | | | | ISL8117 / ISL81401 | ISL8117 /ISL8180x | ISL8117 /ISL8180x | ISL8117 /ISL8180x | ISL8117 /ISL8180x | ISL8180x | ISL8180x |
| 24VDC or 24VAC | 60V+ | | | | | | ISL8117 / ISL81601 | ISL8117 / ISL81601 | ISL8117 /ISL8180x | ISL8117 /ISL8180x | ISL8117 /ISL8180x | ISL8117 /ISL8180x | ISL8180x |
| 48V | 80V+ | | | | | ISL8180x | ISL8180x | ISL8180x | ISL8180x | ISL8180x | ISL8180x | ISL8180x | ISL8180x |
| | 100V+ | | | | | | ISL81100 / ISL81110 | ISL81100 / ISL81110 | ISL81100 / ISL81110 | ISL81100 / ISL81110 | ISL81102 / ISL81106 | ISL81102 / ISL81106 | ISL81102 / SL81106 |
| AC or DC | | | | | | | | | | | | | |

Less Relevant in the low current zone for Analog Controllers that use external FETs

| | |
|---|---|
| | Integrated FET/s |
| | External FET/s |
| | Int or Ext FET option |

| |
|---|
| **RELEASED** |
| SAMPLING |
| IN DESIGN |
| CONCEPT |

# ISL8117/A: UP TO 60V SIMPLE TO USE BUCK CONTROLLER

## FEATURES

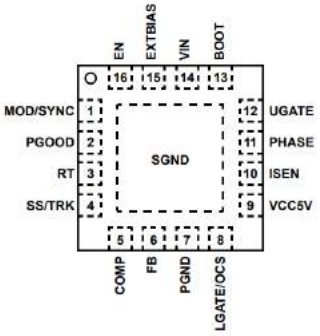
- Wide VIN: 4.5V to 60V
- 5uA shutdown current
- Wide switching frequency (100K~2Mhz )
- Small duty cycle ( 40nS min On time )
- DEM with pulse skipping for best light load efficiency
- Complete protection with UVP, OVP, OCP and OTP

## APPLICATIONS

- 12V/ 24V/48V telecom power supplies
- Industrial power supplies

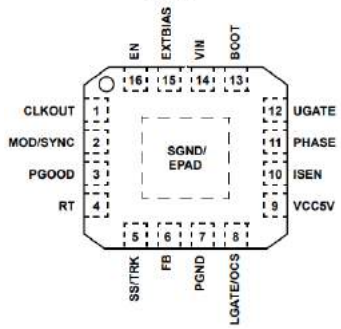
MP

ISL8117A
(16 LD 4x4 QFN)
TOP VIEW

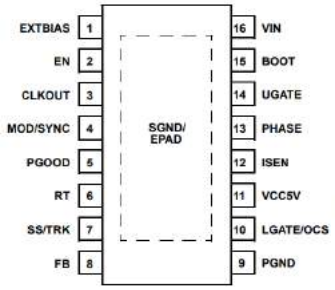


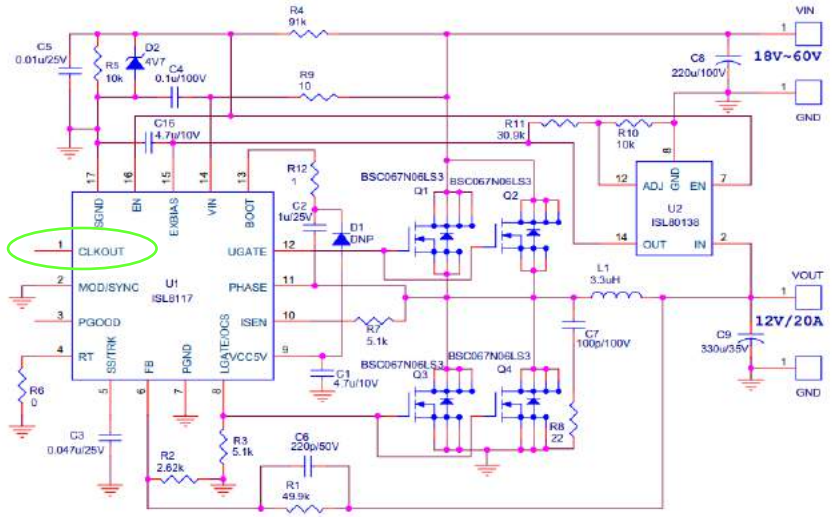

ISL8117

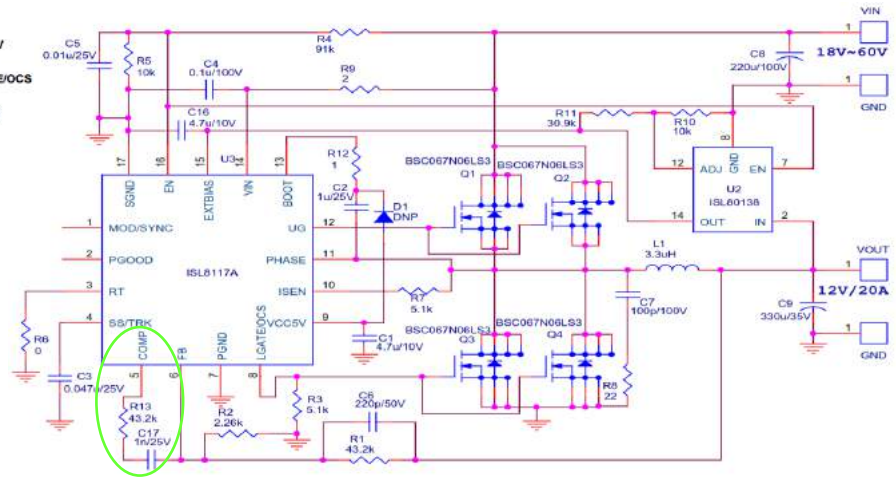
16 LD 4x4 QFN
Top View




16 LD HTSSOP
Top View




| PART NUMBER | LOOP COMPENSATION | CLOCK OUTPUT SIGNAL | PACKAGE |
|---|---|---|---|
| ISL8117 | Internal compensation without COMP pin | Clock Output Signal on CLKOUT pin | 16 Ld 4x4 QFN ,16 Ld HTSSOP |
| ISL8117A | External compensation with COMP pin | No clock output signal | 16 Ld 4x4 QFN |



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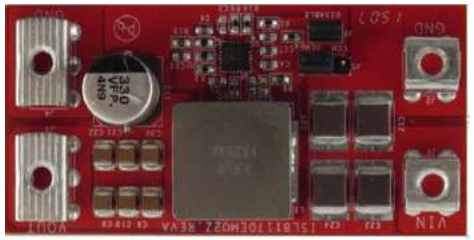
# ISL8117/A: BEST-IN-CLASS HIGH VOLTAGE CONTROLLER

| Functions | ISL8117/A | LTC3891 | TPS40170 | MIC2104 |
|---|---|---|---|---|
| $V_{IN}$ Range | 4.5V~60V | 4.0V - 60V | 4.5V~60V | 4.5~75 |
| $V_{OUT}$ Range | 0.6V~54V | 0.8V~24V | 0.5V~57V | 0.8V~24V |
| Fsw | 100-2000kHz | 50-900kHz | 100-600KHz | 200-600KHz |
| Min On time | 40ns | 95ns | 50ns | - |
| $I_q$ (typical) | 2.5mA | 2.0mA | 4.5mA | 2.1mA |
| Shutdown Current | 5uA | 14uA | 1uA | .1uA( max10uA) |
| Control Mode | Valley Current Mode | Current Mode | Voltage Mode/WFF | Adaptive on time |
| Compensation | Int./Ext. | External | External | Internal |
| Current Sensing | Rdson | Rsense | Rdson | Rdson |
| Gate Drive | 1.0Ω/0.8Ω | 2.5Ω/1.5Ω | 2.5Ω/1Ω | 2.1Ω/1.8Ω |
| Light Load Eff. | DEM w Skip Mode | Burst/Skip | No | DCM |
| Boot Diodes | Internal | External | External | External |
| Pin Count | 16 | 20 | 20 | 16 |
| Package | QFN(4x4) HTSSOP | QFN(3x4) HTSSOP | QFN(3.5x4.5) | QFN(3x3) |

- High switching frequency ✓
- Small minimum on time ✓
- Low pin count ✓
- Fewer external components ✓
- Easy layout design ✓
- Strong gate drive ✓

# ISL81601/801: 60V/80V BUCK-BOOST CONTROLLERS

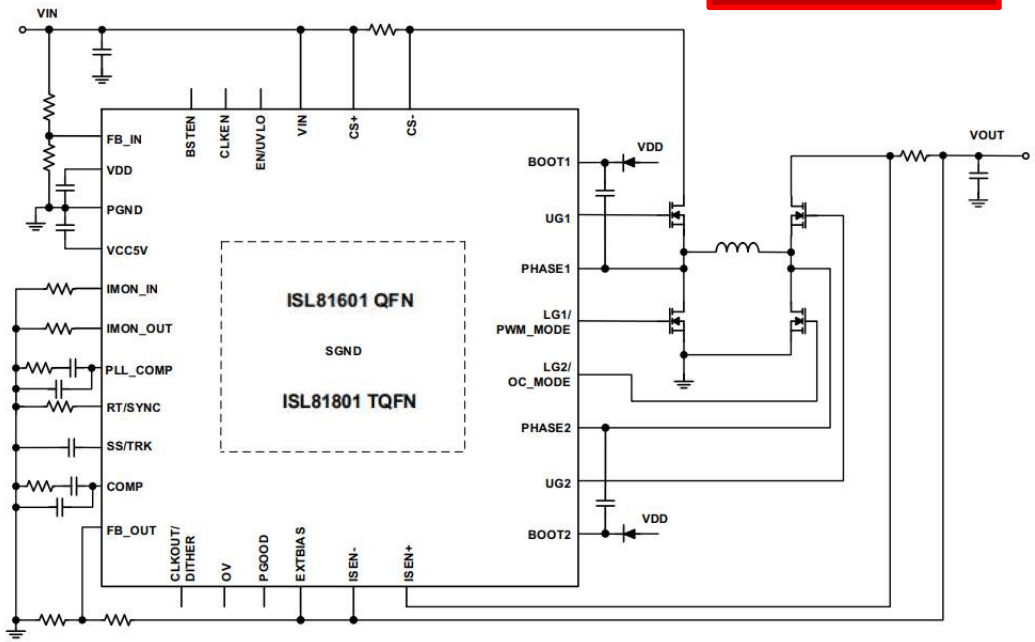
MP

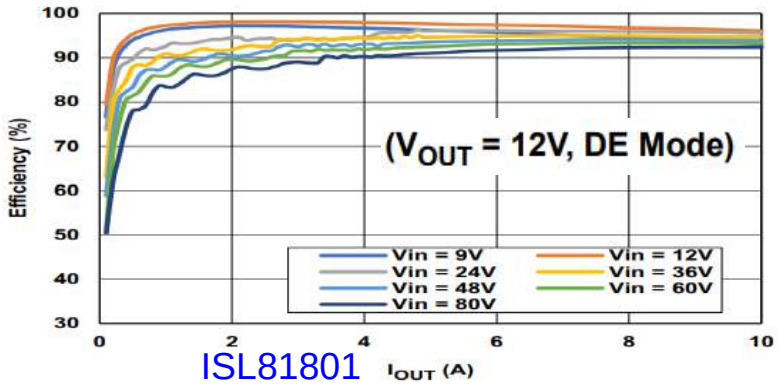
## FEATURES

- Bi-directional buck-boost controller with dual feedback loop
  - Both voltage and current feedback loop control
  - Supports Buck mode and Boost mode
  - CV/CC control for both input and output
- DE/Burst mode for best light load efficiency
- Current sharing and cascade phase interleaving
- Wide Vin range: 4.5V to 60V/80V
- Wide Vout range:0.8V to 60V/80V ( 100% Duty)
- Wide programmable switching frequency: 100Khz to 600Khz
- 5x5 QFN and 38TSSOP

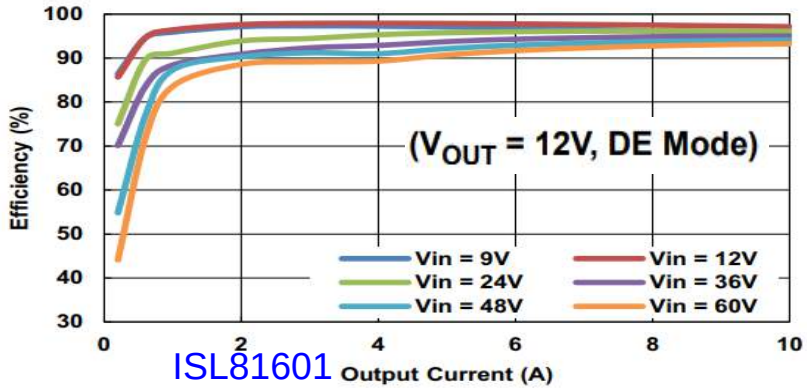
## APPLICATIONS

- Industrial battery chargers
- Power back up systems
- 48V telecom supply
- Wind power generator
- Solar power generator/Solar repeaters




ISL81801




ISL81601



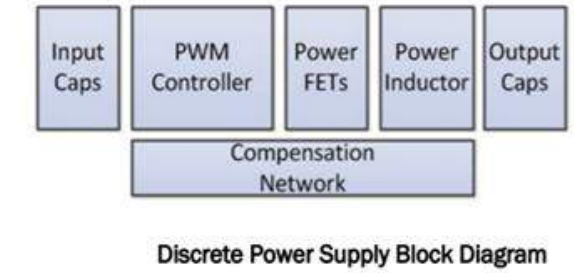
RENESAS

# POWER MODULES

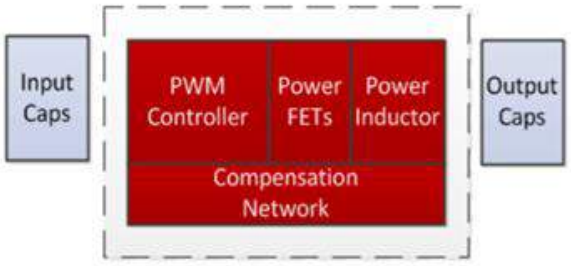
# POWER MODULE VALUE PROPOSITION
## FULLY INTEGRATED POWER SUPPLY

**Where highly efficient, compact power solutions are needed!**

- *Provides high complexity power designs*
- *Effectively addresses applications with stringent space limitations*
- *Ease-of-use and fast time-to-market result in first time success*




Discrete Power Supply Block Diagram

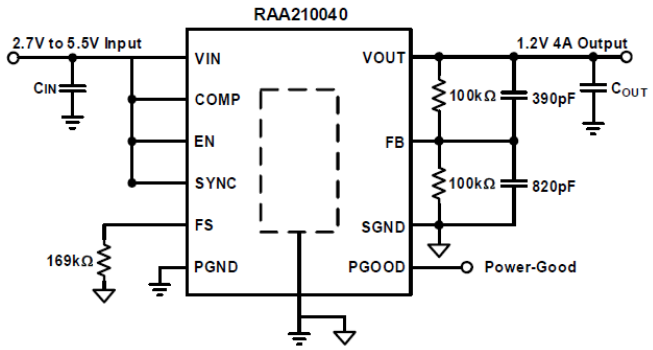



Power Module Implementation

**Power Module**

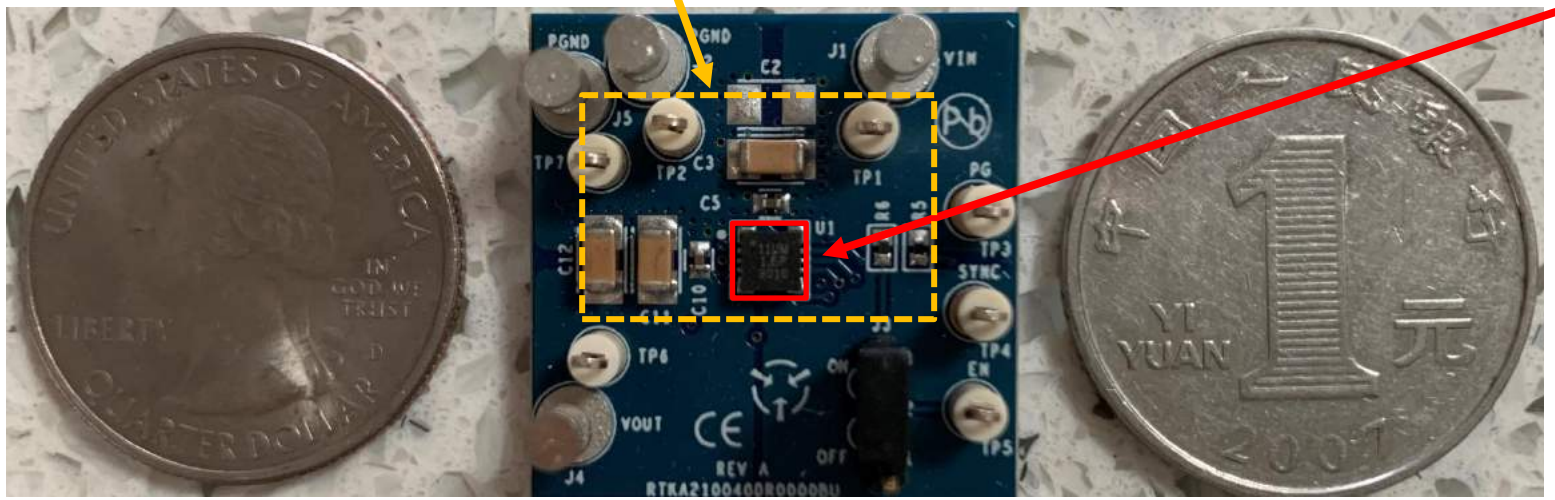
# INDUSTRY'S SMALLEST OVER-MOLDED 4A MODULE: RAA210040

## *Tiny 3x3mm module supports 2.7 to 5.5V input*




**Total solution,** including all passives, is smaller than a US quarter coin or 1 Chinese Yuan. Capable of 4A output current

***Released to Production!***




**RAA210040**

3x3 mm$^2$, including controller, MOSFETs, and inductor

**Fully over-molded for easy SMT assembly and environmental protection**

# ANALOG MINI MODULES

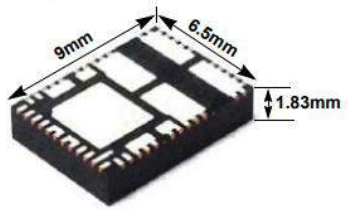
Output Current

8A

5A

2A

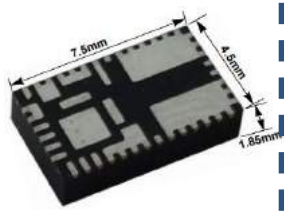
## 3.3V/5V VIN BUS

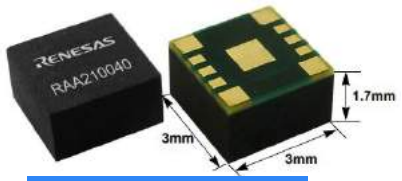



★ **ISL8203M**
2.85-6V input
0.8V~5V output
Dual 3A or Single 6A

**ISL8205M**
2.6-5.5V input
0.6V~5V output
5A, 22QFN

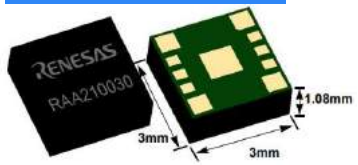
**ISL8202M**
2.6-5.5V input
0.6V~5V output
3A, 22QFN




**RAA210040**
2.7-5.5V input
0.6V~5V output
4A, 10DFN

**RAA210030**
2.7-5.5V input
0.6V~5V output
3A, 10DFN




**RRM05060**
2.7-5.5V input
>0.6V output
Dual 3A, 10DFN

**RRM05050**
2.7-5.5V input
>0.6V output
5A, 10DFN

## 12V VIN BUS

**RRM24080**
12V input
>0.6V output
8A, DFN

**RRM24030**
12V input
>0.6V output
3A, DFN

## 24V VIN BUS

**RRM42050**
24V input
5A, DFN

**RRM40010**
24V input
1A, DFN

## 48V VIN BUS

**RRM75020**
48V input
2A, DFN

Released | Sampling | Under Design | Concept

★ Popular Legacy Parts

# COMPETITIVE LANDSCAPE – OUR STRENGTHS & ADVANTAGE

| | Renesas | MPS | ADI/LTC | ADI/LTC | TI |
|---|---|---|---|---|---|
| **Part Number** | **RAA210130** | **MPM3695-25** | **LTM4676A** | **LTM4647** | **LMZ31530** |
| **Input Voltage (V)** | 4.5 to 14 | 3 to 16 | 4.5 to 26.5 | 4.7 to 15 | 3 to 14.5 |
| **Output Voltage (V)** | 0.45 to 3.3 | 0.5 to 5.5 | 0.5 to 5.5 | **0.6 to 1.8** | **0.6 to 3.6** |
| **Output Current (A)** | 30 | **25** | **13 / 26** | 30 | 30 |
| **# of Output** | 1 | 1 | 2 | 1 | 1 |
| **Digital Interface** | Yes, PMBUS/I2C | Yes, PMBUS/I2C | Yes, PMBUS/I2C | **No** | **No** |
| **Efficiency at 1.8Vout** | **91.10%** | **89%** | 90% | **87%** | **89%** |
| **Vout Accuracy** | 0.7% | 1% | 0.5% | 1.2% | 0.5% |
| **Dimension (mmxmm)** | **10 x 13** | **10 x 12** | **16 x 16** | **9 x 15** | **15 x 16** |
| **Height (mm)** | **7.8** | **4** | 5.01 | 5.01 | 5.8 |
| **Package** | BGA + POP | QFN | BGA | BGA | QFN |
| **θJA (°C/W)** | 12 | **17** | 10.6 | 9.5 | 8.6 |
| **Programmable** | VOUT, Margining, UV/OV, IOUT Limit, Soft-Start/Stop, Sequencing, and External Synchronization | Current Limit, Selection of Pulse-Skip Mode or Continuous Conduction Mode (CCM), Soft-Start Time, Switching Frequency, Fault Limits | Output Voltage, Voltage Sequencing and Margining, Soft-Start/Stop Ramp OV/UV/OT, UVLO, Frequency and Phasing | VOUT, OCP/OVP, soft-start | Temperature, UV/OV, IOUT limit, Protection and Fault Response, UVLO, Soft Start/Stop, Delays |
| **Monitoring** | VIN, VOUT, IOUT, Temperature, Duty Cycle, Switching Frequency, and Faults | VIN, VOUT, IOUT, Temperature, and Faults | Input and Output Voltages, Currents, and Temperatures Running Peak Values, Uptime, Faults and Warnings Onboard EEPROM Fault Log Record with ECC | NA | VOUT, IOUT, Temperature1 |

# BIG IDEAS FOR EVERY SPACE