

# GreenFET

## Product Selector Guide



# GreenFET

## ULTRA-LOW RDS<sub>ON</sub> LOAD SWITCH SELECTOR GUIDE

Renesas' GreenFET family of high-performance load switches are designed and optimized for all high-side power rail control applications from 0.25 V to 5.5 V where the load currents range from 1 A to 9 A. Using Renesas' proprietary MOSFET design, all GreenFET load switches achieve ultra-stable RDS<sub>ON</sub> across wide input and supply voltage ranges. Combining Renesas' proprietary MOSFET IP and advanced assembly techniques, these advanced state-of-the-art products are available in ultra-small pcb footprints from 0.56 mm<sup>2</sup> to 4 mm<sup>2</sup> and exhibit low thermal resistances for high-current operation.

Compared to discrete GreenFET circuit implementations, Renesas' GreenFET products combine high-performance nFET or pFET structures, high-current handling capability, charge pumps, as well as multiple protection and control circuits into space-efficient single-and dual-channel products. The combination of all these advanced features directly results in BOM (bill-of-material) component and cost reductions as well as increasing system reliability and reduced board size.

All of Renesas' GreenFET low-voltage load switches are designed and fully characterized over the commercial (0 °C to 70 °C), extended commercial (-20 °C to 70 °C), industrial (-40 °C to 85 °C), or extended industrial (-40 °C to 125 °C) temperature range. Consistent with generating very low thermal gradients, Renesas integrated power control switches are available in low thermal resistance, STDFN/STQFN RoHS-compliant packaging or wafer-level chip scale packaging (WLCSP).

### Key features in the GreenFET family of high-performance load switches products include:

- High-performance Low RDS<sub>ON</sub> nFET & pFET MOSFETs
- From as low as 4 mΩ
- Internal protection features:
  - Built-in supply undervoltage lockout protection
  - Fixed and capacitor/resistor-adjustable inrush current control
  - Fixed and resistor-adjustable current limit protection
  - Built-in short-circuit current protection
  - Built-in thermal shutdown protection with auto restart
  - Reverse-current blocking using bulk wwitch or back-to-back FETs
  - Reverse-voltage detection (selected part numbers)
  - Fast VOUT discharge (VOUT discharge delete options available)
- Active HIGH ON-OFF control (Active-LOW ON-OFF control available)
- Open-drain signaling (selected part numbers)
- Open-drain power good signaling (selected part numbers)
- Wafer-level chip-scale packaging (selected part numbers)
- UL2367 certified (selected part numbers)

### Applications:

- Smartphones and fitness bands
- Notebook and tablet PCs
- Enterprise networking
- Enterprise multifunction copiers/printers
- Enterprise computing
- Set-top boxes
- HDDs and SSDs
- PCIe/PCI adapter cards
- Portable consumer electronics
- General-purpose, high-side power-rail switching/control

### Single N-Channel Load Switches

Part Number	Description	Max IDS (A)	RDS <sub>ON</sub> (mΩ)	VD/VIN Min (V)	VD/VIN Max (V)	Power Supply (VDD) Voltage Range (V)	Output Voltage Slew Rate set by	Protection Features*	Current/Power Monitor Output	Power Good, FAULT indicator	Output Discharge Circuit	Operating Temperature Range, (°C)	Package Size (mm)
SLG59M1717V	4 mm <sup>2</sup> load switch with charge pump, ramp control, output discharge, protection, and PG signal output	5	4	0	VDD	2.5 – 5.5	Capacitor	UVLO, ACL(R), SCL, TSD	No	PG	Yes	-40 to +85	STQFN-16 (1.6 x 2.5)
SLG59M1709V	4 mm <sup>2</sup> load switch with charge pump, ramp control, and protection	4	4	0	VDD	2.5 – 5.5	Capacitor	UVLO, ACL, SCL, TSD	No	No	No	-40 to +85	STQFN-16 (1.6 x 2.5)
SLG59M1713V	4 mm <sup>2</sup> load switch with charge pump, ramp control, output discharge, and protection	2	4	0	VDD	2.5 – 5.5	Capacitor	UVLO, ACL, SCL, TSD	No	No	Yes	-40 to +85	STQFN-16 (1.6 x 2.5)
SLG59M1568V	3 mm <sup>2</sup> load switch with charge pump, ramp control, output discharge, and protection	9	7	1	VDD	2.5 – 5.5	Capacitor	ACL, SCL, TSD	No	No	Yes	-40 to +85	STDFN-14 (1.0 x 3.0)
SLG59M1456V	3 mm <sup>2</sup> load switch with charge pump, ramp control, output discharge, and protection	5	8	1	VDD	2.5 – 5.5	Capacitor	ACL, SCL, TSD	No	No	Yes	-20 to +70	TDFN-8 (1.5 x 2.0)
SLG59M1457V	3 mm <sup>2</sup> load switch with charge pump, output discharge, and protection	6	8	0	VDD	2.5 – 5.5	Capacitor	ACL, SCL, TSD	No	No	Yes	-40 to +85	TDFN-8 (1.5 x 2.0)
SLG59M1496V	3 mm <sup>2</sup> load switch with charge pump, ramp control, output discharge, and protection	5	8	0	VDD	2.5 – 5.5	Capacitor	ACL, SCL, TSD	No	No	Yes	-40 to +85	TDFN-8 (1.5 x 2.0)
SLG59M1600V	3 mm <sup>2</sup> load switch with reverse-current blocking, charge pump, ramp control, output discharge, and protection	9	8	0	VDD	2.5 – 5.5	Capacitor	TSD, RCB	No	No	Yes	-40 to +85	STDFN-14 (1.0 x 3.0)
SLG59M1655V	3 mm <sup>2</sup> load switch with reverse-current blocking, charge pump, ramp control and protection	9	8	0	VDD	2.5 – 5.5	Capacitor	TSD, RCB	No	No	No	-40 to +85	STDFN-14 (1.0 x 3.0)

# GreenFET

## ULTRA-LOW RDS<sub>ON</sub> LOAD SWITCH SELECTOR GUIDE

### Single N-Channel Load Switches (continued)

Part Number	Description	Max IDS (A)	RDS <sub>ON</sub> (mΩ)	VD/VIN Min (V)	VD/VIN Max (V)	Power Supply (VDD) Voltage Range (V)	Output Voltage Slew Rate set by	Protection Features*	Current/Power Monitor Output	Power Good, FAULT indicator	Output Discharge Circuit	Operating Temperature Range, (°C)	Package Size (mm)
SLG59M301V	3 mm <sup>2</sup> load switch with charge pump, ramp control, output discharge, and protection	4	9	0	VDD	2.5 – 5.5	Capacitor	ACL, SCL, TSD	No	No	Yes	-40 to +85	STDFN-14 (1.0 x 3.0)
SLG59M307V	3 mm <sup>2</sup> load switch with charge pump, ramp control, and output discharge	4	8	0	VDD	1.5 – 5.5	Capacitor	No	No	No	Yes	-20 to +85	TDFN-8 (1.5 x 2.0)
SLG59M308V	3 mm <sup>2</sup> load switch with charge pump, ramp control, output discharge, and protection	3	8	1	VDD	2.5 – 5.5	Capacitor	ACL, SCL, TSD	No	No	Yes	-40 to +70	TDFN-8 (1.5 x 2.0)
SLG59M309V	3 mm <sup>2</sup> load switch with charge pump, ramp control, and protection	4	8	1	VDD	2.5 – 5.5	Capacitor	ACL, SCL, TSD	No	No	No	-40 to +85	TDFN-8 (1.5 x 2.0)
SLG59M1657V	3 mm <sup>2</sup> load switch with charge pump, ramp control, and protection	4	8	0	VDD	2.5 – 5.5	Capacitor	ACL, SCL, TSD	No	No	No	-40 to +125	TDFN-8 (1.5 x 2.0)
SLG59M1614V	3 mm <sup>2</sup> load switch with charge pump, ramp control, and output discharge	4	9	0	VDD	2.5 – 5.5	Capacitor	ACL, SCL, TSD	No	No	Yes	-40 to +85	TDFN-8 (1.5 x 2.0)
SLG59M1470V	3 mm <sup>2</sup> fast turn on, nano-power current consumption load switch	6	10	0	VDD – 1.5 V	3.0 – 5.25	No	No	No	No	Yes	-40 to +85	TDFN-9 (1.5 x 2.0)
SLG59M1685C	0.82 mm <sup>2</sup> load switch with charge pump, ramp control, output discharge, and protection	2	10	1	4	–	Internally Fixed	UVLO, ACL, SCL, TSD	No	No	Yes	-40 to +85	WLCSP-6L (0.71 x 1.16)
SLG59M1707V	4 mm <sup>2</sup> load switch with charge pump, IDS current monitor output, output discharge, and protection	4	13	0	VDD	2.5 – 5.5	Internally Fixed	UVLO, ACL(R), SCL, TSD	Current	FAULT	Yes	-40 to +125	STQFN-16 (1.6 x 2.5)
SLG59M1571V	1 mm <sup>2</sup> low-voltage load switch with reverse-current blocking, charge pump, output discharge, protection, and 4-pin package	1	15	0	2	–	No	TSD, RCB	No	No	Yes	-40 to +85	STDFN-4 (1.0 x 1.0)
SLG59M1714V	4 mm <sup>2</sup> load switch with reverse-current blocking, charge pump, IDS current monitor output, output discharge, and protection	4	15	0	VDD	2.5 – 5.5	Internally Fixed	UVLO, ACL(R), SCL, TSD, RCB	Current	FAULT	Yes	-40 to +85	STQFN-16 (1.6 x 2.5)
SLG59M1551V	1 mm <sup>2</sup> low voltage load switch with charge pump, output discharge, protection, and 4-pin package	2	16	0	2	–	No	TSD	No	No	Yes	-40 to +85	STDFN-4 (1.0 x 1.0)
SLG59M1556V	1 mm <sup>2</sup> low voltage load switch with charge pump, protection, and 4-pin package	2	16	0	2	–	No	TSD	No	No	No	-40 to +85	STDFN-4 (1.0 x 1.0)
SLG59M1658V	1.6 mm <sup>2</sup> load switch with charge pump, ramp control, output discharge, and protection	3	17	0	VDD	2.5 – 5.5	Capacitor	UVLO, ACL, SCL, TSD	No	No	Yes	-40 to +125	STDFN-8 (1.0 x 1.6)
SLG59M1448V	1.6 mm <sup>2</sup> load switch with charge pump, ramp control, output discharge, and protection	3	17	0	VDD	2.5 – 5.5	Capacitor	ACL, SCL, TSD	No	No	Yes	-40 to +85	STDFN-8 (1.0 x 1.6)
SLG59M1545V	1.6 mm <sup>2</sup> load switch with charge pump, ramp control, and protection	3	17	0	VDD	2.5 – 5.5	Capacitor	ACL, SCL, TSD	No	No	No	-20 to +70	STDFN-8 (1.0 x 1.6)
SLG59M1598V	1.6 mm <sup>2</sup> load switch with charge pump, ramp control, output discharge, and protection	3	17	0	VDD	2.5 – 5.5	Capacitor	ACL, SCL, TSD	No	No	Yes	-40 to +85	STDFN-8 (1.0 x 1.6)
SLG59M1746C	0.82 mm <sup>2</sup> load switch with output discharge	1	18	0	2	2.7 – 3.6	Internally Fixed	No	No	No	Yes	-40 to +85	WLCSP-6L (0.71 x 1.16)
SLG59M1515V	1.6 mm <sup>2</sup> fast turn on load switch with ramp control, and output discharge	2	20	0	VDD – 1.5 V	2.5 – 5.5	Capacitor	TSD	No	No	Yes	-40 to +85	STDFN-8 (1.0 x 1.6)
SLG59M610V	3 mm <sup>2</sup> load switch with reverse-current blocking, charge pump, ramp control, output discharge, and protection	4	22	1	VDD	2.5 – 5.5	Capacitor	ACL, SCL, TSD, RCB	No	No	Yes	-40 to +85	TDFN-8 (1.5 x 2.0)

# GreenFET

## ULTRA-LOW $R_{DS(on)}$ LOAD SWITCH SELECTOR GUIDE

### Single N-Channel Load Switches (continued)

Part Number	Description	Max IDS (A)	R <sub>DS(on)</sub> (mΩ)	VD/VIN Min (V)	VD/VIN Max (V)	Power Supply (VDD) Voltage Range (V)	Output Voltage Slew Rate set by	Protection Features*	Current/Power Monitor Output	Power Good, FAULT indicator	Output Discharge Circuit	Operating Temperature Range, (°C)	Package Size (mm)
SLG59M611V	3 mm <sup>2</sup> load switch with reverse-current blocking, charge pump, ramp control, and protection	4	22	1	VDD	2.5 – 5.5	Capacitor	ACL, SCL, TSD, RCB	No	No	No	-40 to +85	TDFN-8 (1.5 x 2.0)
SLG59M1563V	1.6 mm <sup>2</sup> load switch with reverse-current blocking, charge pump, and PG signal output	3	23	1	VDD	1.5 – 5.5	Internally Fixed	TSD, RCB	No	PG	No	-40 to +85	STDFN-8 (1.0 x 1.6)
SLG59M1460V	1.6 mm <sup>2</sup> fast turn on and nano-power current consumption load switch	2	30	0	VDD - 1.5 V	2.5 – 5.25	No	No	No	No	Yes	-20 to +70	STDFN-8 (1.0 x 1.6)
SLG59M1440V	1 mm <sup>2</sup> load switch with charge pump, ramp control, output discharge, protection, and 4-pin package	1	40	3	6	–	Resistor	TSD	No	No	Yes	-40 to +85	STDFN-4 (1.0 x 1.0)
SLG59M1495V	1 mm <sup>2</sup> load switch with charge pump, ramp control, output discharge, protection, and 4-pin package	1	80	3	6	–	Resistor	TSD	No	No	Yes	-20 to +70	STDFN-4 (1.0 x 1.0)
SLG59M1780V	4 mm <sup>2</sup> load switch with charge pump, ramp control, output discharge, and protection	4	4	0	VDD	2.5 – 5.5	Capacitor	UVLO, ACL, SCL, TSD	No	No	Yes	-40 to +85	STQFN-16 (1.6 x 2.5)

### Single P-Channel Load Switches

Part Number	Description	Max IDS (A)	R <sub>DS(on)</sub> (mΩ)	VD/VIN Min (V)	VD/VIN Max (V)	Power Supply (VDD) Voltage Range (V)	Output Voltage Slew Rate set by	Protection Features*	Current/Power Monitor Output	Power Good, FAULT indicator	Output Discharge Circuit	Operating Temperature Range, (°C)	Package Size (mm)
SLG59M1649V	1.6 mm <sup>2</sup> load switch with reverse-current blocking, reverse-voltage detection, and output discharge	4	23	2	6	–	No	UVLO, RCB, RVD	No	FAULT	Yes	-40 to +85	STDFN 8 (1.0 x 1.6)
SLG59M1557V	1 mm <sup>2</sup> load switch with output discharge	1	29	2	6	–	Internally Fixed	No	No	No	Yes	-40 to +85	STDFN-4 (1.0 x 1.0)
SLG59M1558V	1 mm <sup>2</sup> load switch without output discharge	1	29	2	6	–	Internally Fixed	No	No	No	No	-40 to +85	STDFN-4 (1.0 x 1.0)
SLG59M1736C	0.64 mm <sup>2</sup> load switch with controlled inrush current, and output discharge	2	33	3	6	–	No	Fixed ICL	No	No	Yes	-40 to +85	WLCSP-4 (0.8 x 0.8)
SLG59M1730C	0.64 mm <sup>2</sup> load switch with controlled inrush current, and output discharge	1	33	3	6	–	No	Fixed ICL	No	No	Yes	-40 to +85	WLCSP-4 (0.8 x 0.8)
SLG59M1748C	0.64 mm <sup>2</sup> load switch with reverse-current blocking, reverse-voltage detection, and ramp control	2	36	2	5	–	Internally Fixed	RCB, RVD	No	No	No	-40 to +85	WLCSP-4 (0.8 x 0.8)

# GreenFET

## ULTRA-LOW $R_{DS(ON)}$ LOAD SWITCH SELECTOR GUIDE

### Dual N-Channel Load Switches

Part Number	Description	Max IDS (A)	R <sub>DS(ON)</sub> (mΩ)	VD/VIN Min (V)	VD/VIN Max (V)	Power Supply (VDD) Voltage Range (V)	Output Voltage Slew Rate set by	Protection Features*	Current/Power Monitor Output	Power Good, FAULT indicator	Output Discharge Circuit	Operating Temperature Range, (°C)	Package Size (mm)
SLG59M1804V	3 mm <sup>2</sup> UL2367-certified, dual-channel load switch with charge pump, ramp control, output discharge, and protection	5	15	0	VDD	2.5 – 5.0	Capacitor	ACL, SCL, TSD	No	No	Yes	-40 to +85	STDFN-14 (1.0 x 3.0)
SLG59M1527V	3 mm <sup>2</sup> dual-channel load switch with charge pump, ramp control, output discharge, and protection	5	15	0	VDD	2.5 – 5.5	Capacitor	ACL, SCL, TSD	No	No	Yes	-40 to +85	STDFN-14 (1.0 x 3.0)
SLG59M1603V	3 mm <sup>2</sup> dual-channel load switch with reverse-current blocking, charge pump, ramp control, output discharge, and protection	5	16	0	VDD	2.5 – 5.5	Capacitor	TSD, RCB	No	No	Yes	-40 to +85	STDFN-14 (1.0 x 3.0)
SLG59M1606V	3 mm <sup>2</sup> dual-channel load switch with reverse-current blocking, charge pump, ramp control, and protection	5	16	0	VDD	2.5 – 5.5	Capacitor	TSD, RCB	No	No	No	-40 to +85	STDFN-14 (1.0 x 3.0)
SLG59M1446V	1 mm <sup>2</sup> load switch with charge pump, ramp control, output discharge, and 4-pin package	1	40	0	VDD	2.5 – 5.5	Resistor	TSD	No	No	Yes	-40 to +85	STDFN 8 (1.0 x 1.6)
SLG59M1599V	1.6 mm <sup>2</sup> dual-channel load switch with charge pump, ramp control, and protection	1	40	0	VDD	2.5 – 5.5	Resistor	TSD	No	No	No	-40 to +85	STDFN 8 (1.0 x 1.6)
SLG59M1512V	1.6 mm <sup>2</sup> dual-channel load switch with charge pump, ramp control, output discharge, and protection	1	80	0	VDD	2.5 – 5.5	Resistor	TSD	No	No	Yes	-40 to +85	STDFN 8 (1.0 x 1.6)

### Dual P-Channel Load Switches

Part Number	Description	Max IDS (A)	R <sub>DS(ON)</sub> (mΩ)	VD/VIN Min (V)	VD/VIN Max (V)	Power Supply (VDD) Voltage Range (V)	Output Voltage Slew Rate set by	Protection Features*	Current/Power Monitor Output	Power Good, FAULT indicator	Output Discharge Circuit	Operating Temperature Range, (°C)	Package Size (mm)
SLG59M1639V	1.6 mm <sup>2</sup> dual-channel load switch with reverse-current blocking, reverse-voltage detection, and active high ON-OFF control	2	45	2	6	–	No	UVLO, RCB, RVD	No	No	No	-40 to +85	STDFN 8 (1.0 x 1.6)
SLG59M1641V	1.6 mm <sup>2</sup> dual-channel load switch with reverse-current blocking, reverse-voltage detection, and active low ON-OFF control	2	45	2	6	–	No	UVLO, RCB, RVD	No	No	No	-40 to +85	STDFN 8 (1.0 x 1.6)

# GreenFET

## ULTRA-LOW $R_{DS(ON)}$ LOAD SWITCH SELECTOR GUIDE

### Reverse-Current Blocking Load Switches

Part Number	Description	Max IDS (A)	RDS(ON) (mΩ)	VD/VIN Min (V)	VD/VIN Max (V)	Power Supply (VDD) Voltage Range (V)	Output Voltage Slew Rate set by	Protection Features*	Current/Power Monitor Output	Power Good, FAULT indicator	Output Discharge Circuit	Operating Temperature Range, (°C)	Package Size (mm)
SLG59M1600V	3 mm <sup>2</sup> load switch with reverse-current blocking, charge pump, ramp control, output discharge, and protection	9	8	0	VDD	2.5 – 5.5	Capacitor	TSD, RCB	No	No	Yes	-40 to +85	STDFN-14 (1.0 x 3.0)
SLG59M1655V	3 mm <sup>2</sup> load switch with reverse-current blocking, charge pump, ramp control and protection	9	8	0	VDD	2.5 – 5.5	Capacitor	TSD, RCB	No	No	No	-40 to +85	STDFN-14 (1.0 x 3.0)
SLG59M1571V	1 mm <sup>2</sup> low-voltage load switch with reverse-current blocking, charge pump, output discharge, protection, and 4-pin package	1	15	0	2	–	No	TSD, RCB	No	No	Yes	-40 to +85	STDFN-4 (1.0 x 1.0)
SLG59M1714V	4 mm <sup>2</sup> load switch with reverse-current blocking, charge pump, IDS current monitor output, output discharge, and protection	4	15	0	VDD	2.5 – 5.5	Internally Fixed	UVLO, ACL(R), SCL, TSD, RCB	Current	FAULT	Yes	-40 to +85	STQFN-16 (1.6 x 2.5)
SLG59M1603V	3 mm <sup>2</sup> dual-channel load switch with reverse-current blocking, charge pump, ramp control, output discharge, and protection	5	16	0	VDD	2.5 – 5.5	Capacitor	TSD, RCB	No	No	Yes	-40 to +85	STDFN-14 (1.0 x 3.0)
SLG59M1606V	3 mm <sup>2</sup> dual-channel load switch with reverse-current blocking, charge pump, ramp control, and protection	5	16	0	VDD	2.5 – 5.5	Capacitor	TSD, RCB	No	No	No	-40 to +85	STDFN-14 (1.0 x 3.0)
SLG59M610V	3 mm <sup>2</sup> load switch with reverse-current blocking, charge pump, ramp control, output discharge, and protection	4	22	1	VDD	2.5 – 5.5	Capacitor	ACL, SCL, TSD, RCB	No	No	Yes	-40 to +85	TDFN-8 (1.5 x 2.0)
SLG59M611V	3 mm <sup>2</sup> load switch with reverse-current blocking, charge pump, ramp control, and protection	4	22	1	VDD	2.5 – 5.5	Capacitor	ACL, SCL, TSD, RCB	No	No	No	-40 to +85	TDFN-8 (1.5 x 2.0)
SLG59M1563V	1.6 mm <sup>2</sup> load switch with reverse-current blocking, charge pump, and PG signal output	3	23	1	VDD	1.5 – 5.5	Internally Fixed	TSD, RCB	No	PG	No	-40 to +85	STDFN-8 (1.0 x 1.6)
SLG59M1649V	1.6 mm <sup>2</sup> load switch with reverse-current blocking, reverse-voltage detection, and output discharge	4	23	2	6	–	No	UVLO, RCB, RVD	No	FAULT	Yes	-40 to +85	STDFN 8 (1.0 x 1.6)
SLG59M1748C	0.64 mm <sup>2</sup> load switch with reverse-current blocking, reverse-voltage detection, and ramp control	2	36	2	5	–	Internally Fixed	RCB, RVD	No	No	No	-40 to +85	WLCSP-4 (0.8 x 0.8)
SLG59M1639V	1.6 mm <sup>2</sup> dual-channel load switch with reverse-current blocking, reverse-voltage detection, and active high ON-OFF control	2	45	2	6	–	No	UVLO, RCB, RVD	No	No	No	-40 to +85	STDFN 8 (1.0 x 1.6)
SLG59M1641V	1.6 mm <sup>2</sup> dual-channel load switch with reverse-current blocking, reverse-voltage detection, and active low ON-OFF control	2	45	2	6	–	No	UVLO, RCB, RVD	No	No	No	-40 to +85	STDFN 8 (1.0 x 1.6)

\* Notes (Please consult product specifications for additional information):

1. ACL - Internally Fixed Active Current Limit
2. ACL(R) - External resistor-adjustable Active Current Limit
3. SCL - Internally Fixed Short-circuit Current Limit
4. Fixed ICL – Internally Fixed Inrush Current Limit
5. RVD – Reverse-voltage Detection

6. RCB – Reverse-current Blocking
7. TSD – Overtemperature protection (Thermal Shutdown)
8. UVLO – Undervoltage Protection
9. OVLO – Overvoltage protection
10. TVS – Internal Transient Voltage Suppressor

# HIGH VOLTAGE GreenFET

## HIGH-VOLTAGE, HIGH CURRENT, ULTRA LOW RDS<sub>ON</sub> LOAD SWITCHES SELECTOR GUIDE

Renesas' family of high-performance load switches include high-voltage capability for all high-side, 4.5 V to 24 V power rail applications up to 6 A. Using Renesas' proprietary MOSFET design, this new family of power control switches achieves ultra-stable and low RDS<sub>ON</sub> across a wide input voltage range. Combining Renesas' proprietary MOSFET IP and advanced assembly techniques, these products are available in very pcb space-efficient footprints and exhibit low thermal resistance for high-current operation. Compared to discrete FETs currently used in high-voltage applications, Renesas' High Voltage GreenFET products combine high-performance nFET structures, charge pumps, multiple protection, and control circuits into feature-rich products. For products rated to operate over the industrial (-40 °C to 85 °C) or extended industrial temperature (-40 °C to 125 °C) range, these high-voltage load switches are available in low thermal resistance, RoHS-compliant packaging or wafer level chip scale packaging (WLCSP).

### Featured Products

Part Number	Description	Max IDS (A)	RDS <sub>ON</sub> (mΩ)	VD/VIN Min (V)	VD/VIN Max (V)	Power Supply (VDD) Voltage Range (V)	Output Voltage Slew Rate set by	Protection Features*	Current/Power Monitor Output	Power Good, FAULT indicator	Output Discharge Circuit	Operating Temperature Range, (°C)	Package Size (mm)
SLG59H1302C	5.04 mm <sup>2</sup> surge-protected, 28V tolerant USB Type C Power Splitter/Switch with charge pump, LDO and PG signal output	OUT: 6 SYS: 6	OUT: 12 SYS: 24	3	13	–	No	OVLO, UVLO, TVS, SYS: RCB	No	OUT: no SYS: PG	No	-40 to +85	WLCSP-28 (2.98 x 1.69)
SLG59H1313C	2.34 mm <sup>2</sup> surge-protected, 29V tolerant nFET load switch with Internal 100V TVS and Adjustable OVP in WLCSP	5	23	3	20	–	No	OVLO, ACL, SCL, TSD, TVS	No	PG	No	-40 to +85	WLCSP-12 (1.3 x 1.8)
SLG59H1341C	1.46 mm <sup>2</sup> load switch with VIN undervoltage protection, VOUT overvoltage protection, reverse-current blocking, reverse-voltage detection, and FLT Output	1	70	3	6	–	No	OVLO, UVLO, RCB, RVD, ACL(R), TSD	No	FLT	No	-40 to +85	WLCSP-9 (1.21 x 1.21)
SLG59H1343C	1.46 mm <sup>2</sup> load switch with VIN undervoltage and overvoltage protection, reverse-current blocking, reverse-voltage detection, and FLT Output	2	70	3	6	–	No	OVLO, UVLO, RCB, RVD, ACL(R), TSD	No	FLT	No	-40 to +85	WLCSP-9 (1.21 x 1.21)
SLG59H1401C	3.15 mm <sup>2</sup> power multiplexer with VIN[1,2] undervoltage protection, resistor-adjustable overvoltage protection, true reverse-current blocking, and channel status indication	3	52	3	6	–	Capacitor	OVLO, UVLO, RCB, RVD, ACL(R), SCL, TSD	No	No	No	-40 to +85	WLCSP-20 (1.585 x 1.985)
SLG59H1403C	3.15 mm <sup>2</sup> power multiplexer with VIN[1,2] undervoltage protection, resistor-adjustable overvoltage protection, true reverse-current blocking, and channel status indication	3	52	3	22	–	Capacitor	OVLO, UVLO, RCB, RVD, ACL(R), SCL, TSD	No	No	No	-40 to +85	WLCSP-20 (1.585 x 1.985)
SLG59H1405V	5 mm <sup>2</sup> power multiplexer with VIN[1,2] undervoltage and overvoltage protection, Channel 1 true reverse-current blocking, and FLAG Output	Channel 1: 3 Channel 2: 1.25	Channel 1: 50 Channel 2: 80	4	Channel 1: 5.5 Channel 2: 13.2	–	Internally Fixed	OVLO, UVLO, RCB, RVD, ACL(R), SCL, TSD	No	FLAG	Yes	-20 to +85	FC-QFN-12 (2.0 x 2.5)

\* Notes (Please consult product specifications for additional information):

1. ACL - Internally Fixed Active Current Limit
2. ACL(R) - External resistor-adjustable Active Current Limit
3. SCL - Internally Fixed Short-circuit Current Limit
4. Fixed ICL - Internally Fixed Inrush Current Limit
5. RVD - Reverse-voltage Detection
6. RCB - Reverse-current Blocking
7. TSD - Overtemperature protection (Thermal Shutdown)
8. UVLO - Undervoltage Protection
9. OVLO - Overvoltage protection
10. TVS - Internal Transient Voltage Suppressor

### For Applications up to 13.2 V

Part Number	Description	Max IDS (A)	RDS <sub>ON</sub> (mΩ)	VD/VIN Min (V)	VD/VIN Max (V)	Power Supply (VDD) Voltage Range (V)	Output Voltage Slew Rate set by	Protection Features*	Current/Power Monitor Output	Power Good, FAULT indicator	Output Discharge Circuit	Operating Temperature Range, (°C)	Package Size (mm)
SLG59H1127V	4.8 mm <sup>2</sup> load switch with pin-selectable VIN overvoltage protection, internal 5W nFET SOA protection, and Power Good Output	4	15	5	13	–	Capacitor	OVLO, UVLO, ACL(R), SCL, TSD	No	PG, FAULT	Yes	-40 to +85	STQFN-18 (1.6 x 3.0)
SLG59H1120V	4.8 mm <sup>2</sup> load switch with pin-selectable VIN overvoltage protection, internal 5W nFET SOA protection, and DS current monitor output	5	18	5	13	–	Capacitor	OVLO, UVLO, ACL(R), SCL, TSD	Current	FAULT	Yes	-40 to +85	STQFN-18 (1.6 x 3.0)
SLG59H1126V	4.8 mm <sup>2</sup> load switch with pin-selectable VIN overvoltage protection, internal 5W nFET SOA protection, and IDS current monitor output	6	18	5	13	–	Capacitor	OVLO, UVLO, ACL(R), SCL, TSD	Current	FAULT	Yes	-40 to +85	STQFN-18 (1.6 x 3.0)

# HIGH VOLTAGE GreenFET

## HIGH-VOLTAGE, HIGH CURRENT, ULTRA LOW $R_{DS(ON)}$ LOAD SWITCHES SELECTOR GUIDE

For Applications up to 25.2 V

Part Number	Description	Max IDS (A)	R <sub>DS(ON)</sub> (mΩ)	VD/VIN Min (V)	VD/VIN Max (V)	Power Supply (VDD) Voltage Range (V)	Output Voltage Slew Rate set by	Protection Features*	Current/Power Monitor Output	Power Good, FAULT indicator	Output Discharge Circuit	Operating Temperature Range, (°C)	Package Size (mm)
SLG59H1013V	4.8 mm <sup>2</sup> load switch with pin-selectable VIN lockout protection, internal 5W nFET SOA protection, and IDS current monitor output for enterprise printer/copier applications	4	13	11	25	–	Capacitor	OVLO, UVLO, ACL(R), SCL, TSD	Current	FAULT	Yes	-40 to +125	STQFN-18 (1.6 x 3.0)
SLG59H1017V	4.8 mm <sup>2</sup> load switch with pin-selectable VIN lockout protection, internal 10W nFET SOA protection, and IDS current monitor output for enterprise printer/copier applications	4	13	11	25	–	Capacitor	OVLO, UVLO, ACL(R), SCL, TSD	Current	FAULT	Yes	-40 to +85	STQFN-18 (1.6 x 3.0)
SLG59H1008V	4.8 mm <sup>2</sup> load switch with pin-selectable VIN lockout protection, internal 5W nFET SOA protection, and IDS current monitor output for enterprise printer/copier applications	4	13	11	25	–	Capacitor	OVLO, UVLO, ACL(R), SCL, TSD	Current	FAULT	Yes	-40 to +85	STQFN-18 (1.6 x 3.0)
SLG59H1010V	4.8 mm <sup>2</sup> load switch with pin-selectable VIN lockout protection, internal 5W nFET SOA protection, and IDS current monitor output for enterprise printer/copier applications	5	13	11	25	–	Capacitor	OVLO, UVLO, ACL(R), SCL, TSD	Current	FAULT	Yes	-40 to +85	STQFN-18 (1.6 x 3.0)
SLG59H1019V	4.8 mm <sup>2</sup> load switch with VIN OVLO disabled, internal 10W nFET SOA protection, and IDS current monitor output	5	13	5	25	–	Capacitor	UVLO, ACL(R), SCL, TSD	Current	FAULT	Yes	-40 to +85	STQFN-18 (1.6 x 3.0)
SLG59H1016V	4.8 mm <sup>2</sup> load switch with pin-selectable VIN overvoltage protection, internal 5W nFET SOA protection, and IDS current monitor output	4	13	5	22	–	Capacitor	OVLO, UVLO, ACL(R), SCL, TSD	Current	FAULT	Yes	-40 to +125	STQFN-18 (1.6 x 3.0)
SLG59H1009V	4.8 mm <sup>2</sup> load switch with pin-selectable VIN overvoltage protection, internal 5W nFET SOA protection, and IDS current monitor output	4	13	5	22	–	Capacitor	OVLO, UVLO, ACL(R), SCL, TSD	Current	FAULT	Yes	-40 to +85	STQFN-18 (1.6 x 3.0)
SLG59H1128V	4.8 mm <sup>2</sup> load switch with pin-selectable VIN overvoltage protection, internal 10W nFET SOA protection, and IDS current monitor output	5	13	5	22	–	Capacitor	OVLO, UVLO, ACL(R), SCL, TSD	Current	FAULT	Yes	-40 to +85	STQFN-18 (1.6 x 3.0)
SLG59H1006V	4.8 mm <sup>2</sup> load switch with pin-selectable VIN overvoltage protection, internal 5W nFET SOA protection, and IDS current monitor output	5	13	5	22	–	Capacitor	OVLO, UVLO, ACL(R), SCL, TSD	Current	FAULT	Yes	-40 to +85	STQFN-18 (1.6 x 3.0)
SLG59H1012V	4.8 mm <sup>2</sup> load switch with pin-selectable VIN overvoltage protection, internal 5W nFET SOA protection, and IDS current monitor output	6	13	5	22	–	Capacitor	OVLO, UVLO, ACL(R), SCL, TSD	Current	FAULT	Yes	-40 to +85	STQFN-18 (1.6 x 3.0)
SLG59H1005V	4.8 mm <sup>2</sup> back-to-back reverse-current blocking load switch with pin-selectable VIN overvoltage protection, internal 5W nFET SOA protection, and IDS current monitor output	3	50	5	22	–	Capacitor	OVLO, UVLO, ACL(R), SCL, TSD, RCB	Current	FAULT	No	-40 to +85	STQFN-18 (1.6 x 3.0)
SLG59H1020V	4.8 mm <sup>2</sup> back-to-back reverse-current blocking load switch with pin-selectable VIN overvoltage protection, internal 5W nFET SOA protection, and IDS current monitor output	3	50	5	20	–	Capacitor	OVLO, ACL(R), SCL, TSD, RCB	Current	FAULT	No	-40 to +85	STQFN-18 (1.6 x 3.0)

\* Notes (Please consult product specifications for additional information):

1. ACL - Internally Fixed Active Current Limit
2. ACL(R) - External resistor-adjustable Active Current Limit
3. SCL - Internally Fixed Short-circuit Current Limit
4. Fixed ICL – Internally Fixed Inrush Current Limit
5. RVD – Reverse-voltage Detection

6. RCB – Reverse-current Blocking
7. TSD – Overtemperature protection (Thermal Shutdown)
8. UVLO – Undervoltage Protection
9. OVLO – Overvoltage protection
10. TVS – Internal Transient Voltage Suppressor



# GreenFET SELECTOR GUIDE

Visit [renesas.com/load-switches](https://renesas.com/load-switches) for more details on the complete portfolio of products, including the product guide, eval boards and samples.

**GreenFET™**  
Robust Load Switches

HOME NETWORK SYSTEM  
Calendar  
22°F 40%  
Setting  
-9°C  
News

renesas.com/greenfet

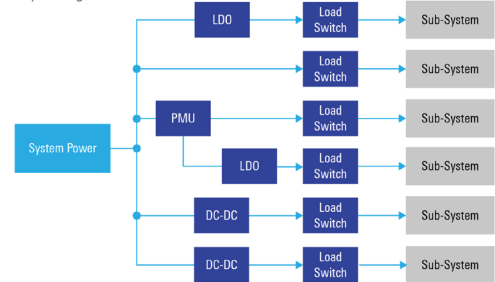
RENESAS

## GreenFET LOAD SWITCH USAGE EXAMPLES

04-05

### Power Distribution Application

Load Switch Example Usage



### Power Control Application

02-03

## GreenFET Load Switch Portfolio

### GreenFET

- Single-channel nFET & pFET in STDFN & STDFN (1 mm<sup>2</sup> to 4 mm<sup>2</sup>)
- Single-channel in WLCSF (1 A to 4 A, 0.66 mm<sup>2</sup> to 1.5 mm<sup>2</sup>)
- Dual-channel nFET and pFET in STDFNs (3 mm<sup>2</sup>)

### Operating input voltage range

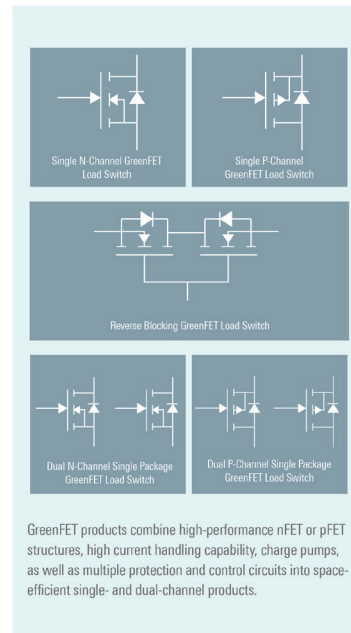
- Maximum  $V_{DD}$  Voltage Ranges: 2 V, 3.6 V & 5.5 V
- FET  $V_{th}$  Range: 0.25 V to  $V_{DD}$
- $R_{DS(on)}$  Range: 4 mΩ to 45 mΩ
- $I_{DS}$  Current Range: 1 A to 9 A
- UL2367 Current-Limiter Certified (select parts)

### High voltage GreenFET

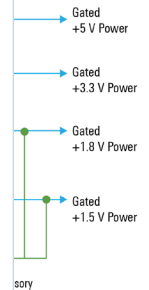
- Single-channel (2.3 mm<sup>2</sup> to 5 mm<sup>2</sup>)
- Power-supply/FET Input Voltage Ranges: 4.5 V to 25.2 V
- $R_{DS(on)}$  Range: 13.3 mΩ to 50 mΩ
- IDS Current Range: 3 A to 6 A
- WLCSF for Space-Constrained Applications
- UL2367 Current-Limiter Certified (select parts)

### High Side Gate Drivers

- N-Channel MOSFET Drivers



GreenFET products combine high-performance nFET or pFET structures, high current handling capability, charge pumps, as well as multiple protection and control circuits into space-efficient single- and dual-channel products.



RENESAS

Renesas Electronics America Inc. | [renesas.com](https://renesas.com)  
915 Murphy Ranch Road, Milpitas, CA 95035 | Phone: 1-888-468-3774

© 2023 Renesas Electronics America Inc. (REA). All rights reserved. All trademarks are the property of their respective owners. REA believes the information herein was accurate when given but assumes no risk as to its quality or use. All information is provided as-is without warranties of any kind, whether express, implied, statutory, or arising from course of dealing, usage, or trade practice, including without limitation as to merchantability, fitness for a particular purpose, or non-infringement. REA shall not be liable for any direct, indirect, special, consequential, incidental, or other damages whatsoever, arising from use of or reliance on the information herein, if advised of the possibility of such damages. REA reserves the right, without notice, to discontinue products or make changes to the design or specifications of its products or other information herein. All contents are protected by U.S. and international copyright laws. Except as specifically permitted herein, no portion of this material may be reproduced in any form, or by any means, without prior written permission from Renesas Electronics America Inc. Visitors or users are not permitted to modify, distribute, publish, transmit or create derivative works of any of this material for any public or commercial purposes.

Document No.: R11CP0003EU0000