SILEGO TECHNOLOGY

GreenFET3™

Ultra Low R_{DSON} Integrated Power Switch Selector Guide

Silego's GFET3 family of high-performance integrated power switches are designed and optimized for all high-side power rail control applications from 0.8 V to 5.5 V where the load currents range from 1 A to 9 A. Using Silego's proprietary MOSFET design, all GFET3 integrated power switches achieve ultra-stable R_{DSON} across wide input and supply voltage ranges. Using Silego's proprietary CuFET™ technology, these advanced state-of-the-art products are available in ultra-small pcb footprints from 1 mm^2 to 4 mm^2 and exhibit low thermal resistances for high-current operation.

Compared to discrete FET circuit implementations, Silego's GFET3 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 Silego's GFET3 low-voltage integrated power 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, all Silego integrated power control switches are manufactured in low thermal resistance, STDFN/STQFN RoHS-compliant packaging.

Key **features** in the GFET3 family of high-performance, integrated power control products include:

- High-performance Low R_{DSON} 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 Switch 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 $\overline{\text{FAULT}}$ Signaling (selected part numbers)
- Open-drain Power Good Signaling (selected part numbers)

Applications:

- Notebook and Tablet PCs
- Enterprise Networking
- Enterprise Multifunction Copiers/Printers
- Enterprise Computing
- Set-top Boxes
- HDDs and SSDs
- PCIe/PCI Adapter Cards
- Portable POS Terminals
- Portable Consumer Electronics
- General-purpose, High-side Power-Rail Switching/Control

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Single N-Channel Integrated Power Switches

Part Number	Description	Cont. IDS (A)	R_{DSON} (mΩ)	VDDl (V)	VDDh (V)	VD/VIN Min (V)	VD/VIN Max (V)	External Ramp Control	Protection Features*	Discharge Circuit	Package Size (mm)
NEW SLG59M1717V	A 4 mm², 5 A nFET integrated power switch with 0.8 V to VDD input range, multiple protection features, fast VOUT discharge, and open-drain Power Good output signaling	5	4	2.5	5.5	0.8	VDD	Capacitor	CL (R), TSD	Yes	1.6 x 2.5 x 0.55
SLG59M1709V	A 4 mm², 4 A nFET power control switch with 0.8 V to VDD input range and multiple protection features	4	4	2.5	5.5	0.8	VDD	Capacitor	Fixed CL, TSD	No	1.6 x 2.5 x 0.55
SLG59M1710V	A 4 mm², 2 A nFET power control switch with 0.8 V to VDD input range and multiple protection features	2	4	2.5	5.5	0.8	VDD	Capacitor	Fixed CL, TSD	No	1.6 x 2.5 x 0.55
SLG59M1713V	A 4 mm², 2 A nFET power control switch with 0.8 V to VDD input range, multiple protection features, and fast VOUT discharge	2	4	2.5	5.5	0.8	VDD	Capacitor	Fixed CL, TSD	Yes	1.6 x 2.5 x 0.55
NEW SLG59M1707V	A 4 mm², 125°C-rated, 4 A Integrated Power Switch with Analog Current Monitor Output	3.5	13	2.5	5.5	0.8	VDD	Internally Fixed	CL (R), TSD	Yes	1.6 x 2.5 x 0.55
NEW SLG59M1568V	A 3 mm² power switch with charge pump, ramp control, output discharge, and protection	9	7.3	2.5	5.5	1.0	VDD	Capacitor	Fixed CL, TSD	Yes	1.0 x 3.0 x 0.55
SLG59M1496V	A 3 mm² integrated power switch with charge pump, 0.85 VD, ramp control, output discharge, and protection	5.3	7.8	2.5	5.5	0.85	VDD	Capacitor	Fixed CL, TSD	Yes	1.5 x 2.0 x 0.75
SLG59M1457V	Ultra-small 7.8 mΩ, 6 A 3 mm² power switch with 0.85 VD, discharge, and two-level current-limit	6	7.8	2.5	5.5	0.85	VDD	Capacitor	Fixed CL, TSD	Yes	1.5 x 2.0 x 0.75
SLG59M1600V	A 3 mm² reverse blocking power switch with charge pump, 0.85 VD, ramp control, output discharge, and protection	9	7.8	2.5	5.5	0.85	VDD	Capacitor	TSD	Yes	1.0 x 3.0 x 0.55
SLG59M1614V	A 3 mm² integrated power switch with charge pump, 0.85 VD, ramp control, and output discharge	4	7.8	2.5	5.5	0.85	VDD	Capacitor	Fixed CL, TSD	Yes	1.5 x 2.0 x 0.75
SLG59M301V	A 3 mm² integrated power switch with charge pump, ramp control, output discharge, and protection	4	7.8	2.5	5.5	1.0	VDD	Capacitor	Fixed CL, TSD	Yes	1.5 x 2.0 x 0.75
SLG59M307V	A 3 mm² integrated power switch with charge pump, 0.85 VD, ramp control, and output discharge	4	7.8	1.5	5.5	0.85	VDD	Capacitor	No	Yes	1.5 x 2.0 x 0.75
SLG59M308V	A 3 mm² integrated power switch with charge pump, ramp control, output discharge, and protection	3	7.8	2.5	5.5	1.0	VDD	Capacitor	Fixed CL, TSD	Yes	1.5 x 2.0 x 0.75
SLG59M309V	A 3 mm² integrated power switch with charge pump, ramp control, and protection	4	7.8	2.5	5.5	1.0	VDD	Capacitor	Fixed CL, TSD	No	1.5 x 2.0 x 0.75
SLG59M1456V	A 3 mm² integrated power switch with charge pump, ramp control, output discharge, and protection	5	7.8	2.5	5.5	1.0	VDD	Capacitor	Fixed CL, TSD	Yes	1.5 x 2.0 x 0.75
NEW SLG59M1657V	A 3 mm², 125°C-rated, 4 A integrated power switch with 0.9 V to VDD input range, adjustable ramp control, and multiple protection features	4	8.4	2.5	5.5	0.9	VDD	Capacitor	CL,TSD	No	1.5 x 2.0 x 0.75
SLG59M1470V	**NanopowerFET™:** A 3 mm² fast turn on, 0.95 VD nano-power consumption power switch	6	9.8	3.0	5.25	0.95	VDD - 1.5 V	No	No	Yes	1.5 x 2.0 x 0.75
SLG59M1571V	A 1 mm², low-voltage, 0.85 VD, reverse blocking power switch with charge pump, output discharge and protection, and 4-pin package	1	14.6	-	-	0.85	1.9	No	TSD	Yes	1.0 x 1.0 x 0.55
SLG59M1714V	A 4 mm², 4 A back-to-back nFET reverse blocking power control switch with Analog current-monitor output, fast VOUT discharge, and open-drain $\overline{FAULT}$ signaling output	4	15	2.5	5.5	0.8	VDD	Internally Fixed	CL (R), TSD	Yes	1.6 x 2.5 x 0.55

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Single N-Channel Integrated Power Switches (continued)

Part Number	Description	Cont. IDS (A)	R_{DSON} (mΩ)	VDDl (V)	VDDh (V)	VD/VIN Min (V)	VD/VIN Max (V)	External Ramp Control	Protection Features	Discharge Circuit	Package Size (mm)
SLG59M1551V	A 1 mm², low voltage power switch with charge pump, 0.85 VD, fixed ramp control, output discharge, protection, and 4-pin package	2	15.5	-	-	0.85	1.9	Internally Fixed	TSD	Yes	1.0 x 1.0 x 0.55
SLG59M1556V	A 1 mm², low voltage power switch with charge pump, 0.85 VD, output discharge, protection, and 4-pin package	2	15.5	-	-	0.85	1.9	No	TSD	No	1.0 x 1.0 x 0.55
SLG59M1658V	A 1.6 mm², 125°C-rated, 2.5 A integrated power switch 0.9 V to VDD input range, adjustable ramp control, fast VOUT discharge, and multiple protection features	2.5	17	2.5	5.5	0.9	VDD	Capacitor	CL, TSD	Yes	1.0 x 1.6 x 0.55
SLG59M1493Z	**Lo-Z™ Packaging:** A 1.6 mm² integrated power switch with charge pump, ramp control, output discharge, and protection	2.5	17	2.5	5.25	1.0	VDD	Capacitor	Fixed CL, TSD	Yes	1.0 x 1.6 x 0.27
SLG59M1448V	A 1.6 mm² integrated power switch with charge pump, 0.9 VD, ramp control, output discharge, and protection	2.5	17	2.5	5.5	0.9	VDD	Capacitor	Fixed CL, TSD	Yes	1.0 x 1.6 x 0.55
SLG59M1598V	A 1.6 mm² integrated power switch with charge pump, 0.85 VD, ramp control, output discharge, and protection	2.5	17	2.5	5.5	0.85	VDD	Capacitor	Fixed CL, TSD	Yes	1.0 x 1.6 x 0.55
SLG59M1545V	A 1.6 mm² integrated power switch with charge pump, 0.85 VD, ramp control, and protection	2.5	17	2.5	5.5	0.85	VDD	Capacitor	Fixed CL, TSD	No	1.0 x 1.6 x 0.55
SLG59M1720V	A 1.4 mm², 18 mΩ, 2 A Integrated Power Switch with VS Slew-rate Control, Current-Limiting, and Thermal Protection	2	18	2.5	3.6	0.85	VDD	Capacitor	Fixed CL, TSD	Yes	1.0 x 1.4 x 0.55
SLG59M1721V	A 1.4 mm², 18 mΩ, 2 A Integrated Power Switch with VS Slew-rate Control, Current-Limiting, and Thermal Protection	2	18	2.5	3.6	0.85	VDD	Capacitor	Fixed CL, TSD	No	1.0 x 1.4 x 0.55
NEW SLG59M1618V	A 1.4 mm², 19 mΩ, 2 A Integrated Power Switch with VS Slew-rate Control and Thermal Protection	2	19	2.5	5.5	0.85	VDD	Capacitor	TSD	No	1.0 x 1.4 x 0.55
SLG59M1515V	A 1.6 mm² fast turn on power switch with charge pump, 0.85 VD, ramp control, and output discharge	2	20	2.5	5.5	0.85	VDD - 1.5 V	Capacitor	TSD	Yes	1.0 x 1.6 x 0.55
SLG59M610V	Single 3 mm² power switch with reverse blocking, charge pump, ramp control, output discharge, and protection	4	22	2.5	5.5	1.0	VDD	Capacitor	Fixed CL, TSD	Yes	1.5 x 2.0 x 0.75
SLG59M611V	Single 3 mm² power switch with reverse blocking, charge pump, ramp control, and protection	4	22	2.5	5.5	1.0	VDD	Capacitor	Fixed CL, TSD	No	1.5 x 2.0 x 0.75
SLG59M1563V	Single 1.6 mm² power switch with reverse blocking, charge pump, and PG signal output	2.5	22.5	1.5	5.5	1.0	VDD	No	TSD	No	1.0 x 1.6 x 0.55
SLG59M1460V	**NanopowerFET™:** A 1.6 mm² fast turn on and nano-power consumption power switch	2	30	2.5	5.25	0.85	VDD - 1.5 V	No	No	Yes	1.0 x 1.6 x 0.55
SLG59M1466V	A 1 mm² power switch with charge pump, fixed ramp control, output discharge, and 4-pin package	1	40	-	-	2.5	5.5	Internally Fixed	No	Yes	1.0 x 1.0 x 0.55
SLG59M1442V	A 1 mm² power switch with charge pump, ramp control, protection, and 4-pin package	1	40	-	-	2.5	5.5	Resistor	TSD	No	1.0 x 1.0 x 0.55
SLG59M1440V	A 1 mm² power switch with charge pump, ramp control, output discharge, protection, and 4-pin package	1	40	-	-	2.5	5.5	Resistor	TSD	Yes	1.0 x 1.0 x 0.55
SLG59M1495V	A 1 mm² power switch with charge pump, ramp control, output discharge, protection, and 4-pin package	1	80	-	-	2.5	5.5	Resistor	Fixed CL, TSD	Yes	1.0 x 1.0 x 0.55

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Single P-Channel Integrated Power Switches

Part Number	Description	Cont. IDS (A)	R_{DSON} (mΩ)	VDDI (V)	VDDh (V)	VD/VIN Min (V)	VD/VIN Max (V)	External Ramp Control	Protection Features	Discharge Circuit	Package Size (mm)
SLG59M1649V	A 1.6 mm², 23 mΩ, 4 A Power Switch with Reverse-Current Blocking, VOUT discharge, and Active HIGH ON-OFF Control	4	23	-	-	1.5	5.5	No	No	Yes	1.0 x 1.6 x 0.55
SLG59M1557V	A 1 mm^2 power switch with output discharge	1	28.5	-	-	1.5	5.5	No	No	Yes	1.0 x 1.0 x 0.55
SLG59M1558V	A 1 mm^2 power switch without output discharge	1	28.5	-	-	1.5	5.5	No	No	No	1.0 x 1.0 x 0.55

Dual N-Channel Integrated Power Switches

Part Number	Description	Cont. IDS (A)	R_{DSON} (mΩ)	VDDI (V)	VDDh (V)	VD/VIN Min (V)	VD/VIN Max (V)	External Ramp Control	Protection Features	Discharge Circuit	Package Size (mm)
SLG59M1526V	In a single 6 mm^2 package, a 9 A dual-channel power switch with charge pump, ramp control, output discharge, and protection	4.5	14.5	2.5	5.5	0.9	VDD	Capacitor	Fixed CL, TSD	Yes	2.0 x 3.0 x 0.55
SLG59M1527V	In a single 3 mm^2 package, a 9 A dual-channel power switch with charge pump, ramp control, output discharge, and protection	4.5	14.5	2.5	5.5	0.9	VDD	Capacitor	Fixed CL, TSD	Yes	1.0 x 3.0 x 0.55
SLG59M1603V	In a single 3 mm^2 package, a 9 A dual-channel reverse blocking power switch with charge pump, 0.85 VD, ramp control, output discharge, and protection	4.5	16	2.5	5.5	0.85	VDD	Capacitor	TSD	Yes	1.0 x 3.0 x 0.55
SLG59M1606V	In a single 3 mm^2 package, a 9 A dual-channel reverse blocking power switch with charge pump, ramp control, and protection	4.5	16	2.5	5.5	0.85	VDD	Capacitor	TSD	No	1.0 x 3.0 x 0.55
SLG59M1612V	In a single 3 mm^2 package, a 9 A dual-channel reverse blocking power switch with charge pump, ramp control, one-channel output discharge, and protection	4.5	16	2.5	5.5	1.0	VDD	Capacitor	TSD	CH1: Yes CH2: No	1.0 x 3.0 x 0.55
SLG59M1446V	In a single 1.6 mm^2 package, a 2 A dual-channel power switch with charge pump, 0.85 VD, ramp control, output discharge, and protection	1	40	2.5	5.5	0.85	VDD	Resistor	TSD	Yes	1.0 x 1.6 x 0.55
SLG59M1599V	In a single 1.6 mm^2 package, a 2 A dual-channel power switch with charge pump, ramp control, and protection	1	40	2.5	5.5	1.0	VDD	Resistor	TSD	No	1.0 x 1.6 x 0.55
SLG59M1512V	In a single 1.6 mm^2 package, a 2 A dual-channel power switch with charge pump, 0.85 VD, ramp control, output discharge, and protection	1	80	2.5	5.5	0.85	VDD	Resistor	Fixed CL, TSD	Yes	1.0 x 1.6 x 0.55

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Dual P-Channel Integrated Power Switches

Part Number	Description	Cont. IDS (A)	R_{DSON} (mΩ)	VDDl (V)	VDDh (V)	VD/VIN Min (V)	VD/VIN Max (V)	External Ramp Control	Protection Features	Discharge Circuit	Package Size (mm)
SLG59M1638V	A 1.6 mm², Dual-channel 45 mΩ, 2 A Power Switch with Reverse-Current Blocking, VOUT discharge, and Active HIGH ON-OFF Control	2	45	-	-	1.5	5.5	No	No	Yes	1.0 x 1.6 x 0.55
SLG59M1639V	A 1.6 mm², Dual-channel 45 mΩ, 2 A Power Switch with Reverse-Current Blocking and Active HIGH ON-OFF Control	2	45	-	-	1.5	5.5	No	No	No	1.0 x 1.6 x 0.55
SLG59M1640V	A 1.6 mm², Dual-channel 45 mΩ, 2 A Power Switch with Reverse-Current Blocking, VOUT discharge, and Active LOW ON-OFF Control	2	45	-	-	1.5	5.5	No	No	Yes	1.0 x 1.6 x 0.55
SLG59M1641V	A 1.6 mm², Dual-channel 45 mΩ, 2 A Power Switch with Reverse-Current Blocking and Active LOW ON-OFF Control	2	45	-	-	1.5	5.5	No	No	No	1.0 x 1.6 x 0.55

Reverse Blocking Integrated Power Switches

Part Number	Description	Cont. IDS (A)	R_{DSON} (mΩ)	VDDl (V)	VDDh (V)	VD/VIN Min (V)	VD/VIN Max (V)	External Ramp Control	Protection Features	Discharge Circuit	Package Size (mm)
SLG59M1600V	A 3 mm² reverse blocking power switch with charge pump, 0.85 VD, ramp control, output discharge, and protection	9	7.8	2.5	5.5	0.85	VDD	Capacitor	TSD	Yes	1.0 x 3.0 x 0.55
SLG59M1571V	A 1 mm2, low-voltage, 0.85 VD, reverse blocking power switch with charge pump, output discharge, protection, and 4-pin package	1	14.6	-	-	0.85	1.9	No	TSD	Yes	1.0 x 1.0 x 0.55
SLG59M1714V	A 4 mm², 4 A back-to-back nFET reverse blocking power control switch with Analog current-monitor output, fast VOUT discharge, and open-drain $\overline{FAULT}$ signaling output	4	15	2.5	5.5	0.8	VDD	Internally Fixed	CL (R), TSD	Yes	1.6 x 2.5 x 0.55
SLG59M1603V	In a single 3 mm² package, a 9 A dual-channel reverse blocking power switch with charge pump, 0.85 VD, ramp control, output discharge, and protection	4.5	16	2.5	5.5	0.85	VDD	Capacitor	TSD	Yes	1.0 x 3.0 x 0.55
SLG59M1606V	In a single 3 mm² package, a 9 A dual-channel reverse blocking power switch with charge pump, ramp control, and protection	4.5	16	2.5	5.5	0.85	VDD	Capacitor	TSD	No	1.0 x 3.0 x 0.55
SLG59M1612V	In a single 3 mm² package, a 9 A dual-channel reverse blocking power switch with charge pump, ramp control, one-channel output discharge, and protection	4.5	16	2.5	5.5	1.0	VDD	Capacitor	TSD	CH1: Yes CH2: No	1.0 x 3.0 x 0.55
SLG59M610V	Single 3 mm² power switch with reverse blocking, charge pump, ramp control, output discharge, and protection	4	22	2.5	5.5	1.0	VDD	Capacitor	Fixed CL, TSD	Yes	1.5 x 2.0 x 0.75
SLG59M611V	Single 3 mm² power switch with reverse blocking, charge pump, ramp control, and protection	4	22	2.5	5.5	1.0	VDD	Capacitor	Fixed CL, TSD	No	1.5 x 2.0 x 0.75

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Reverse Blocking Integrated Power Switches (continued)

Part Number	Description	Cont. IDS (A)	R_{DSON} (mΩ)	VDDl (V)	VDDh (V)	VD/VIN Min (V)	VD/VIN Max (V)	External Ramp Control	Protection Features	Discharge Circuit	Package Size (mm)
SLG59M1563V	Single 1.6 mm² power switch with reverse blocking, charge pump, and PG signal output	2.5	22.5	1.5	5.5	1.0	VDD	No	TSD	No	1.0 x 1.6 x 0.55
SLG59M1649V	A 1.6 mm², 23 mΩ, 4 A Power Switch with Reverse-Current Blocking, VOUT discharge, and Active HIGH ON-OFF Control	4	23	-	-	1.5	5.5	No	No	Yes	1.0 x 1.6 x 0.55
SLG59M1639V	A 1.6 mm², Dual-channel 45 mΩ, 2 A Power Switch with Reverse-Current Blocking and Active HIGH ON-OFF Control	2	45	-	-	1.5	5.5	No	No	No	1.0 x 1.6 x 0.55
SLG59M1641V	A 1.6 mm², Dual-channel 45 mΩ, 2 A Power Switch with Reverse-Current Blocking and Active LOW ON-OFF Control	2	45	-	-	1.5	5.5	No	No	No	1.0 x 1.6 x 0.55
SLG59M1638V	A 1.6 mm², Dual-channel 45 mΩ, 2 A Power Switch with Reverse-Current Blocking, VOUT discharge, and Active HIGH ON-OFF Control	2	45	-	-	1.5	5.5	No	No	Yes	1.0 x 1.6 x 0.55
SLG59M1640V	A 1.6 mm², Dual-channel 45 mΩ, 2 A Power Switch with Reverse-Current Blocking, VOUT discharge, and Active LOW ON-OFF Control	2	45	-	-	1.5	5.5	No	No	Yes	1.0 x 1.6 x 0.55

Notebook PC Reference Design Integrated Power Switches

Part Number	Description	Cont. IDS (A)	R_{DSON} (mΩ)	VDDl (V)	VDDh (V)	VD/VIN Min (V)	VD/VIN Max (V)	External Ramp Control	Protection Features	Discharge Circuit	Package Size (mm)
SLG5NT1533V	A 1.6 mm² fast turn on power switch with charge pump, 0.85 VD, ramp control, and output discharge for 1 V processor power control	2	20	2.5	5.25	0.85	VDD - 1.5V	Capacitor	No	Yes	1.0 x 1.6 x 0.55
SLG5NT1477V	NanopowerFET™: A 3 mm² fast turn on, 0.85 VD nano-power consumption power switch	6	9.8	3.0	5.25	0.85	VDD - 1.5V	No	No	Yes	1.5 x 2.0 x 0.75

* Notes:
1. Fixed CL – Two-stage Current-limit:
   a) Internally Fixed Active Current Limit and
   b) Internally Fixed Short-circuit Current Protection
2. CL(R)-Two-stage Current-limit:
   a) External resistor-adjustable Active Current Limit and
   b) Internally Fixed Short-circuit Current Protection
3. TSD - Thermal shutdown protection with 25°C hysteresis and automatic restart

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