PRECISION ANALOG ICs

Analog Switches and Multiplexers

Product Guide for High Precision, Low Power Signal Switches in Industrial, Instrumentation, Healthcare, and Communication Applications

Low and Flat Switch On-Resistance

Low Power Consumption

Low Leakage and Charge Injection

Low Parasitic Capacitance

High Bandwidth

Wide Operation Voltage Range

APPLICATIONS

- Audio and video signal switching
- Force and sense
- Sample and hold
- Programmable gain control and filtering
- Test calibration
- Precision ADC input mux
- Signal port isolation
- Relay replacement

END PRODUCTS

- Audio and video system
- Control and automation
- Data acquisition
- Data storage
- Network and telecommunication
- Modems and routers
- Medical and healthcare devices
- Instruments
- Test equipment
- Consumer electronics

RESOURCES:

- Product web tables: http://www.vishay.com/analog-switches/
- For technical questions, contact AnalogSwitchtechsupport@vishay.com
- Part number nomenclature
- Package options

A WORLD OF SOLUTIONS

Vishay Siliconix Analog Switches and Multiplexers

For more than 40 years, Vishay Siliconix analog switches and multiplexers have been providing benchmark performance in a broad array of end products, including multi-channel data acquisition systems, process control and automation, instrumentation, video systems, healthcare, and portable consumer electronics. To meet specific application requirements, the devices are offered in a number of package options, including the TSSOP, SOIC, miniQFN, and more. The devices support both single- and dual-supply operation. On-resistance values range from below 1 Ω to 10 Ω and above. Switch configurations include SPST, SPDT, DPST, DPDT, and bus switches, while multiplexers include 2:1, 4:1, 8:1, and 16:1, as well as differential configurations.

Vishay has made many recent additions to its lines with products that extend the operation voltage range down to 1.6 V, bring ± 15 V switches on-resistance to 1.5 Ω, lower the charge injection to the sub-picocoulomb range, and offer signal bandwidth up to 1 GHz.

The new enhanced family of analog switches and multiplexers introduced by Vishay Siliconix is designed on a high density 18 V process. The process not only offers an upgrade path for customers using Vishay's current 12 V series products, but also enables Vishay to develop new precision analog products with higher complexity for sensitive analog designs.

Key improvements to device specifications include an increase of the operating voltage from 12 V to 16 V; lower leakage, reduced parasitic capacitance, and faster switching speeds; and enhanced ruggedness, with higher latch-up current and ESD protection ratings.

The devices have been designed to meet the requirements of a variety of applications and can be categorized as follows:

- **Low Charge Injection Devices**
  These devices are optimized for precision switching applications with minimal charge injection during both ON and OFF transitions. The low switching glitches and fast settling times make these devices ideal in sample and hold applications, data acquisition, and precision ADC input multiplexing

- **Low On-Resistance Devices**
  Devices in this family have a low on-resistance (typically 0.3 Ω to 8 Ω). A wide range of operating voltages is available for various applications such as audio and video switching, programmable gain control, power routing, and mechanical relay replacement

- **High Bandwidth Devices**
  This category of devices is optimized for high bandwidth applications, such as high speed mixed-signal switching and filtering. The devices support frequencies up to 1 GHz. Devices optimized for this application require moderately low on-resistance to reduce signal insertion losses, low parasitic capacitance, high cross talk rejection, and high off isolation

- **Low Voltage Devices for Consumer Handheld and Portable Instrumentation**
  Vishay's family of low voltage devices are optimized for low and flat resistances down to a supply voltage of 1.6 V. This family of devices includes specialized devices for high bandwidth USB applications, audio applications requiring negative voltage swings, and fault-protected switches designed to offer overcurrent, break before make, make before break, or power down protection

Applications

Analog switches and multiplexers are used in electronic systems to control and select a specific transmission path for an analog signal. However, every specific sub circuit requires the switch to be optimized for different parameters. The following pages explore several applications and sub systems in a variety of end applications such as industrial process control, instrumentation, multi-channel data acquisition systems, vehicular diagnostics, and medical and chemical analyzers.

PRECISION ANALOG ICs

Analog Switches and Multiplexers

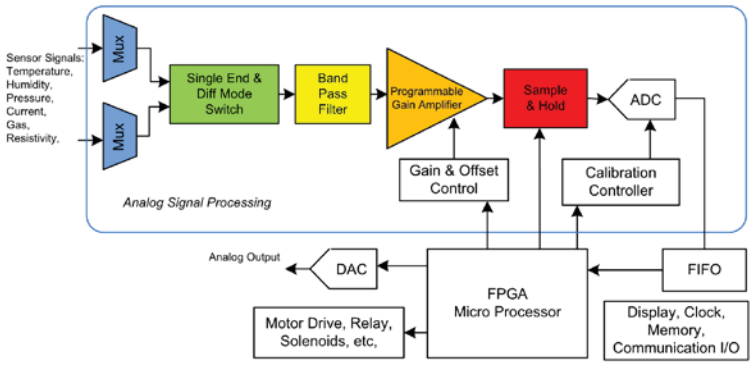
Data Acquisition

Data acquisition is the process of sampling signals that measure real-world physical conditions and converting the resulting samples into digital numeric values. Data acquisition circuitry includes sensors that convert physical parameters to electrical signals, signal conditioning circuitry, and analog to digital converters.

Key Performance Parameters and Vishay Advantages

Data acquisition applications require analog switch and multiplexer products with low charge injection and parasitic capacitance to minimize switching errors and settling time in the input multiplexer and sample and hold circuits. Vishay offers industry-leading performance for these parameters, enabling high sampling rates and accuracy. In addition, Vishay also offers families with low switch on-resistance that are suitable for mode switch, filtering, and precision programmable gain control applications.

Block Diagram



Part Number	Power Supply	Configuration	r_{ON} (Ω) typ	$I_{COM(ON)}$ (nA) max	Charge Injection (pC) typ	$C_{S(OFF)}$ (pF) typ	$C_{D(ON)}$ (pF) typ	Package							Functional Blocks				
								Pin Count	mQFN	QFN	TSSOP / TSOP	SOIC	MSOP	DIP	PLCC	Input Mux	Mode Switch	Filter	Programmable Gain Amp.	Sample & Hold
DG408LE	3 V ~ 16 V, ± 3 ~ ± 8 V	8:1 mux	17	1	-11	5.5	35	16		√	√	√				√				
DG409LE	3 V ~ 16 V, ± 3 ~ ± 8 V	Dual 4:1 mux	15	1	-10	5.5	23.5	16		√	√	√				√				
DG411LE, DG412LE, DG413LE	3 V ~ 16 V, ± 3 ~ ± 8 V	Quad SPST	16	10	6.6	5	15	16			√	√		√			√	√	√	√
DG9424E, DG9425E, DG9426E	3 V ~ 16 V, ± 3 ~ ± 8 V	Quad SPST	1.6	10	38	37	89	16			√						√	√	√	√
DG4051E	3 V ~ 16 V, ± 3 ~ ± 8 V	8:1 mux	68	1	0.3	2.2	15	16	√		√	√				√				
DG4052E	3 V ~ 16 V, ± 3 ~ ± 8 V	Dual 4:1 mux	68	1	0.3	2.1	10	16	√		√	√				√				
DG4053E	3 V ~ 16 V, ± 3 ~ ± 8 V	Triple 2:1 mux	68	1	0.3	2	8.5	16	√		√	√				√				
DG1411E, DG1412E, DG1413E	4.5 V ~ 24 V, ± 4.5 V ~ ± 16.5 V	Quad SPST	1.5	1	-41	24	87	16		√	√						√	√	√	√
DG1408E	4.5 V ~ 24 V, ± 4.5 V ~ ± 16.5 V	8:1 mux	3.9	1.5	-31	13	104	16		√	√					√				
DG1409E	4.5 V ~ 24 V, ± 4.5 V ~ ± 16.5 V	Dual 4:1 mux	3.9	1.5	-103	13	70	16		√	√					√				
DG211B, DG212B	5 V ~ 36 V, ± 5 V ~ ± 20 V	Quad SPST	45	10	1	5	16	16			√	√		√			√	√	√	√
DG411, DG412, DG413	5 V ~ 36 V, ± 5 V ~ ± 20 V	Quad SPST	25	10	5	9	35	16			√	√		√			√	√	√	√
DG406	5 V ~ 36 V, ± 5 V ~ ± 20 V	16:1 mux	45	20	11	6	114	28				√		√	√	√				
DG408	5 V ~ 36 V, ± 5 V ~ ± 20 V	8:1 mux	40	20	20	3	37	16			√	√		√		√				
DG409	5 V ~ 36 V, ± 5 V ~ ± 20 V	Dual 4:1 mux	40	10	20	3	25	16			√	√		√		√				
DG506B	5 V ~ 36 V, ± 5 V ~ ± 20 V	16:1 mux	170	50	1	3	38	28			√	√			√	√				
DG508B	5 V ~ 36 V, ± 5 V ~ ± 20 V	8:1 mux	180	50	2	3	18	16								√				
DG509B	5 V ~ 36 V, ± 5 V ~ ± 20 V	Dual 4:1 mux	180	50	2	3	11	16	√		√	√		√		√				

PRECISION ANALOG ICs

Analog Switches and Multiplexers

Vortex Flow Sensors

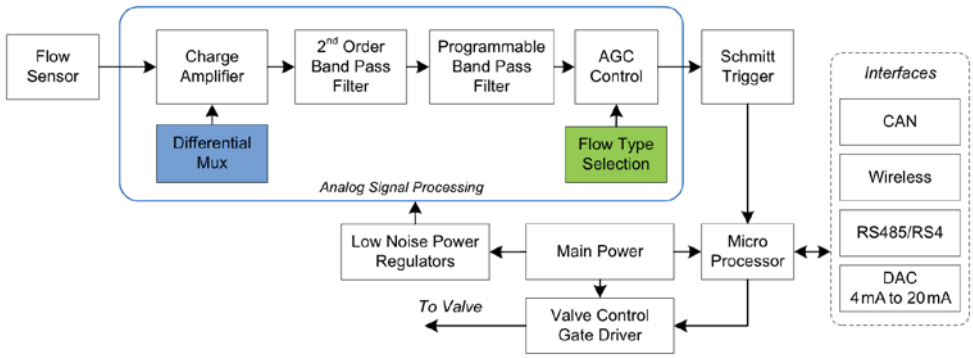
Vortex flow sensors are used in industrial applications including water management, air conditioning, and chemical production.

The vortex sensor is often a piezoelectric crystal, which produces a small voltage pulse every time a vortex is created. Analog multiplexers are used in the charge amplifier.

Key Performance Parameters and Vishay Advantages

Ideal for charge amplifiers, Vishay precision multiplexers provide ultra low leakage, low switching charge injection, and low parasitic capacitance. Since the vortex flow sensor is typically located remotely and is a space-constrained application, Vishay offers products that integrate the VL regulator and thus eliminate the need for an auxiliary voltage supply. Several device families are also available in space-saving miniQFN packages, allowing the customer to further shrink the solution size if needed.

Block Diagram



Part Number	Power Supply	Configuration	r_{ON} (Ω) typ	$I_{COM(ON)}$ (nA) max	Charge Injection (pC) typ	$C_{S(OFF)}$ (pF) typ	$C_{D(ON)}$ (pF) typ	Integrated VL	Package								Functional Blocks	
									Pin Count	mQFN	QFN	TSSOP / TSOP	SOIC	MSOP	DIP	PLCC	Differential Mux	Flow Type Selection
DG408LE	3 V ~ 16 V, ± 3 ~ ± 8 V	8:1 mux	17	1	-11	5.5	35	√	16		√	√	√				√	
DG409LE	3 V ~ 16 V, ± 3 ~ ± 8 V	Dual 4:1 mux	15	1	-10	5.5	23.5	√	16		√	√	√				√	
DG4051E	3 V ~ 16 V, ± 5 ~ ± 8 V	8:1 mux	68	1	0.3	2.2	15	√	16	√		√					√	
DG4052E	3 V ~ 16 V, ± 5 ~ ± 8 V	Dual 4:1 mux	68	1	0.3	2.1	10	√	16	√		√					√	
DG411LE, DG412LE, DG413LE	3 V ~ 16 V, ± 3 ~ ± 8 V	Quad SPST	16	10	6.6	5	15		16			√	√					√
DG406	5 V ~ 36 V, ± 5 V ~ ± 20 V	16:1 mux	45	20	11	6	114	√	28				√		√	√	√	
DG407	5 V ~ 36 V, ± 5 V ~ ± 20 V	Dual 8:1 mux	45	20	11	6	57	√	28				√		√	√	√	
DG408	5 V ~ 36 V, ± 5 V ~ ± 20 V	8:1 mux	40	20	20	3	37	√	16			√	√		√		√	
DG409	5 V ~ 36 V, ± 5 V ~ ± 20 V	Dual 4:1 mux	40	10	20	3	25	√	16			√	√		√		√	
DG506B	5 V ~ 36 V, ± 5 V ~ ± 20 V	16:1 mux	170	50	1	3	38	√	28				√		√	√	√	
DG507B	5 V ~ 36 V, ± 5 V ~ ± 20 V	Dual 8:1 mux	170	50	1	3	24	√	28				√		√	√	√	
DG508B	5 V ~ 36 V, ± 5 V ~ ± 20 V	8:1 mux	180	50	2	3	18	√	16	√		√	√		√		√	
DG509B	5 V ~ 36 V, ± 5 V ~ ± 20 V	Dual 4:1 mux	180	50	2	3	11	√	16	√		√	√		√		√	
DG467, DG468	5 V ~ 36 V, ± 5 V ~ ± 20 V	SPST	7	5	21	30	76	√	6			√						√
DG469, DG470	5 V ~ 36 V, ± 5 V ~ ± 20 V	SPDT	3.6	5	58	37	125	√	8				√	√				√

PRECISION ANALOG ICs

Analog Switches and Multiplexers

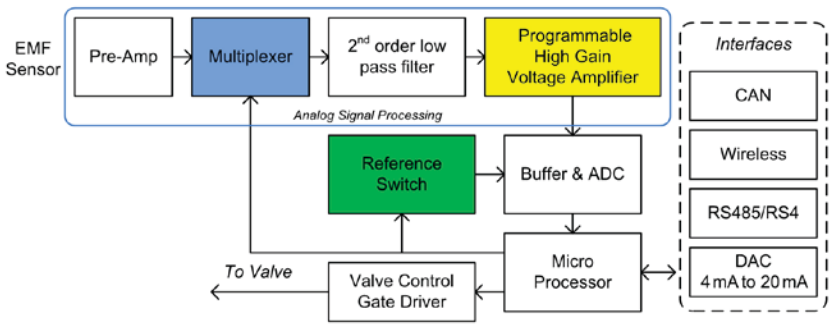
Magnetic Flow Sensors

Magnetic flow sensors are used to measure flow rates for combustible or explosive liquids, often under hazardous conditions. They are mechanically obstruction-free and can be equipped with abrasion-resistant liners, making them effective for measuring slurries and other erosive fluids.

Key Performance Parameters and Vishay Advantages

The signals developed at the EMF sensor can be in the range from tens of microvolts to millivolts, while the output impedance of the sensor is normally in the megohm range. In such applications, Vishay offers a range of ultra low leakage and parasitic capacitance devices that prevent signal distortion in the analog front end while dealing with weak signals from a high impedance source. In the programmable gain and reference signal switching blocks, low on-resistance is also advantageous and is offered in some of the device families. The products also integrate the VL regulator.

Block Diagram



Part Number	Power Supply	Configuration	r_{ON} (Ω) typ	$I_{COM(ON)}$ (nA) max	Charge Injection (pC) typ	$C_{S(OFF)}$ (pF) typ	$C_{D(ON)}$ (pF) typ	Integrated VL	Package								Functional Blocks		
									Pin Count	mQFN	QFN	TSSOP / TSOP	SOIC	MSOP	DIP	PLCC	Multiplexer	Reference Switch	Programmable Gain Amp.
DG408LE	3 V ~ 16 V, ± 3 ~ ± 8 V	8:1 mux	17	1	-11	5.5	35	√	16		√	√	√				√		
DG409LE	3 V ~ 16 V, ± 3 ~ ± 8 V	Dual 4:1 mux	15	1	-10	5.5	23.5	√	16		√	√	√				√		
DG411LE, DG412LE, DG413LE	3 V ~ 16 V, ± 3 ~ ± 8 V	Quad SPST	16	10	6.6	5	15		16			√	√					√	√
DG9424E, DG9425E, DG9426E	3 V ~ 16 V, ± 3 ~ ± 8 V	Quad SPST	1.6	10	38	37	89	√	16			√							√
DG1408E	4.5 V ~ 24 V, ± 4.5 V ~ ± 16.5 V	8:1 mux	3.9	1.5	-31	13	104	√	16		√	√					√		
DG406	5 V ~ 36 V, ± 5 V ~ ± 20 V	16:1 mux	45	20	11	6	114	√	28				√		√	√	√		
DG407	5 V ~ 36 V, ± 5 V ~ ± 20 V	Dual 8:1 mux	45	20	11	6	57	√	28				√		√	√	√		
DG408	5 V ~ 36 V, ± 5 V ~ ± 20 V	8:1 mux	40	20	20	3	37	√	16			√	√		√		√		
DG409	5 V ~ 36 V, ± 5 V ~ ± 20 V	Dual 4:1 mux	40	10	20	3	25	√	16			√	√		√		√		
DG506B	5 V ~ 36 V, ± 5 V ~ ± 20 V	16:1 mux	170	50	1	3	38	√	28	√		√	√				√		
DG508B	5 V ~ 36 V, ± 5 V ~ ± 20 V	8:1 mux	180	50	2	3	18	√	16	√		√	√		√		√		
DG467, DG468	5 V ~ 36 V, ± 5 V ~ ± 20 V	SPST	7	5	21	30	76	√	6			√						√	√
DG469, DG470	5 V ~ 36 V, ± 5 V ~ ± 20 V	SPDT	3.6	5	58	37	125	√	8				√	√				√	√
DG411, DG412, DG413	5 V ~ 36 V, ± 5 V ~ ± 20 V	Quad SPST	25	10	5	9	35		16			√	√		√			√	√

PRECISION ANALOG ICs

Analog Switches and Multiplexers

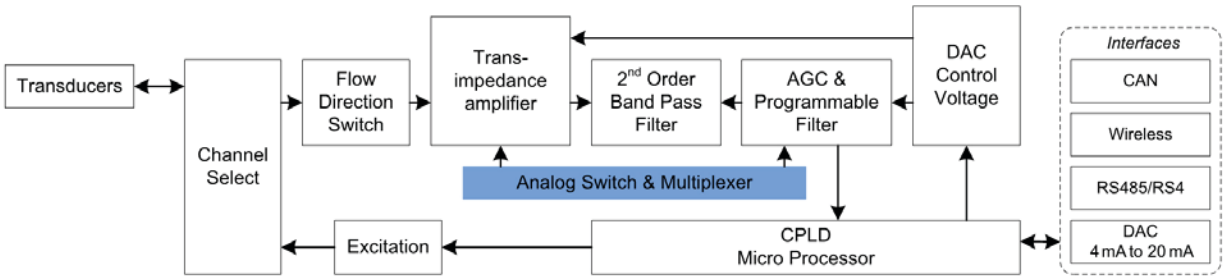
Ultrasonic Flow Sensors

An ultrasound sensor measures and averages the difference in transit time between the pulses of ultrasound propagating or the frequency shift. This data is then used to determine the flow velocity.

Key Performance Parameters and Vishay Advantages

Since the channel select and flow direction switches require very high voltages and use mechanical relays, Vishay analog switches and multiplexers are typically used in the signal conditioning stages where low parasitic capacitance and low leakage are the critical parameters. These performance characteristics of the Vishay devices result in minimal distortion of the weak analog signal as it is conditioned in the transimpedance amplifier, filtering, and gain control sub circuits.

Block Diagram



Part Number	Power Supply	Configuration	r_{ON} (Ω) typ	$I_{COM(ON)}$ (nA) max	Charge Injection (pC) typ	$C_{S(OFF)}$ (pF) typ	$C_{D(ON)}$ (pF) typ	Integrated VL	Package							
									Pin Count	mQFN	QFN	TSSOP / TSOP	SOIC	MSOP	DIP	PLCC
DG408LE	3 V ~ 16 V, ± 3 ~ ± 8 V	8:1 mux	17	1	-11	5.5	35	√	16		√	√	√			
DG409LE	3 V ~ 16 V, ± 3 ~ ± 8 V	Dual 4:1 mux	15	1	-10	5.5	23.5	√	16		√	√	√			
DG411LE, DG412LE, DG413LE	3 V ~ 16 V, ± 3 ~ ± 8 V	Quad SPST	16	10	6.6	5	15		16			√	√		√	
DG1408E	4.5 V ~ 24 V, ± 4.5 V ~ ± 16.5 V	8:1 mux	3.9	1.5	-31	13	104	√	16		√	√				
DG408	5 V ~ 36 V, ± 5 V ~ ± 20 V	8:1 mux	40	20	20	3	37	√	16			√	√		√	
DG409	5 V ~ 36 V, ± 5 V ~ ± 20 V	Dual 4:1 mux	40	10	20	3	25	√	16			√	√		√	
DG508B	5 V ~ 36 V, ± 5 V ~ ± 20 V	8:1 mux	180	50	2	3	18	√	16	√		√	√		√	
DG406	5 V ~ 36 V, ± 5 V ~ ± 20 V	16:1 mux	45	20	11	6	114	√	28				√		√	√
DG407	5 V ~ 36 V, ± 5 V ~ ± 20 V	Dual 8:1 mux	45	20	11	6	57	√	28				√		√	√
DG506B	5 V ~ 36 V, ± 5 V ~ ± 20 V	16:1 mux	170	50	1	3	38	√	28			√	√			√

PRECISION ANALOG ICs

Analog Switches and Multiplexers

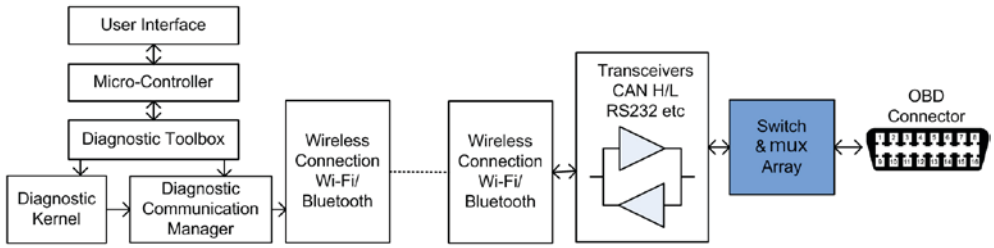
Vehicle Diagnostics

Vehicle diagnostic systems are now increasingly sophisticated and allow a technician to quickly ascertain the health of a vehicle with minimal effort. Analog switches and mutiplexers allow a single system to be used for multiple vehicle brands and types by switching the on-board diagnostic (OBD) connector to the desired protocol and the correct transceiver interface.

Key Performance Parameters and Vishay Advantages

Vishay analog switches and multiplexers provide a broad array of solutions for vehicle diagnostic applications, with features such as wide operating voltage ranges, low switch resistance and parasitic capacitance, and compact package options. The operating voltage range for diagnostic systems is generally 5 V to 24 V for cars and up to 32 V for trucks. The low switch on-resistance and low parasitic capacitance of Vishay analog switches and multiplexers minimize signal insertion loss and distortion. They are also important for communication line impedance matching.

Block Diagram



Part Number	Single Rail V+ Range	Configuration	r_{ON} (Ω) typ	Charge Injection (pC) typ	$C_{S(OFF)}$ (pF) typ	$C_{D(ON)}$ (pF) typ	Integrated VL	Package						
								Pin Count	mQFN	QFN	TSSOP / TSOP	SOIC	MSOP	DIP
DG1408E	4.5 V ~ 24 V	8:1 mux	3.9	-31	13	104	√	16		√	√			
DG1409E	4.5 V ~ 24 V	Dual 4:1 mux	3.9	-103	13	70	√	16		√	√			
DG1411E, DG1412E, DG1413E	4.5 V ~ 24 V	4 x SPST	1.5	-41	24	87	√	16		√	√			
DG408	5 V ~ 36 V	8:1 mux	40	20	3	37	√	16			√	√		√
DG409	5 V ~ 36 V	Dual 4:1 mux	40	20	3	25	√	16			√	√		√
DG451, DG452, DG453	5 V ~ 36 V	4 x SPST	3.8	22	31	103		16			√	√		√
DG454, DG455, DG456	5 V ~ 36 V	4 x SPST	3.8	22	31	103	√	16			√	√		√
DG411, DG412, DG413	5 V ~ 36 V	4 x SPST	25	5	9	35		16			√	√		√

PRECISION ANALOG ICs

Analog Switches and Multiplexers

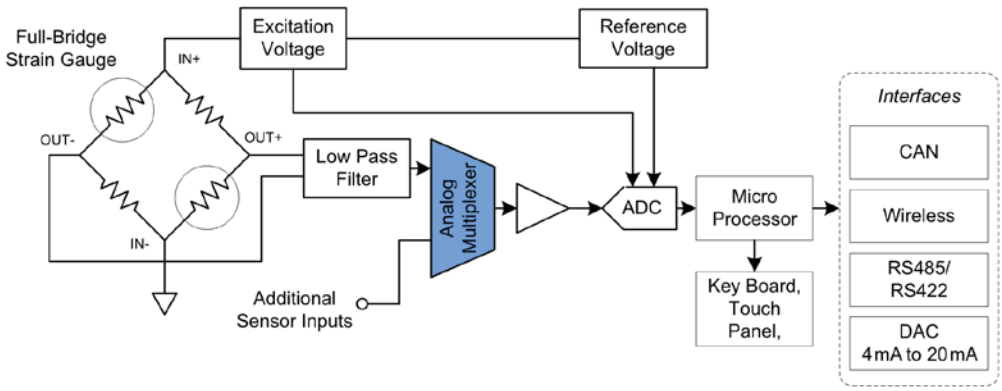
Industrial Weighing Scales

Industrial scales are used in a variety of applications, from weighing entire trucks down to high precision scales capable of weighing substances at the atomic / molecular level. Accuracy is very important and the analog multiplexer plays an important role in the overall system accuracy and measurement repeatability.

Key Performance Parameters and Vishay Advantages

In the weighing scale system, the analog multiplexer is used to switch the input of the ADC between the constant voltage source, the output terminals of the bridge, and the reference voltage. The multiplexer can also be used to switch between additional strain gauge inputs. In this application, matching between channels is very important, and so is a low and flat switch resistance over the signal range. Vishay has several families of devices optimized for these performance characteristics to enable better measurement accuracy.

Block Diagram



Part Number	Power Supply	Configuration	r_{ON} (Ω) typ	$I_{COM(ON)}$ (nA) max	Charge Injection (pC) typ	$C_{S(OFF)}$ (pF) typ	$C_{D(ON)}$ (pF) typ	Package						
								Pin Count	mQFN	QFN	TSSOP / TSOP	SOIC	MSOP	DIP
DG408LE	3 V ~ 16 V, ± 3 ~ ± 8 V	8:1 mux	17	1	-11	5.5	35	16		√	√	√		
DG409LE	3 V ~ 16 V, ± 3 ~ ± 8 V	Dual 4:1 mux	15	1	-10	5.5	23.5	16		√	√	√		
DG411LE, DG412LE, DG413LE	3 V ~ 16 V, ± 3 ~ ± 8 V	Quad SPST	16	10	6.6	5	15	16			√	√		
DG9424E, DG9425E, DG9426E	3 V ~ 16 V, ± 3 ~ ± 8 V	Quad SPST	1.6	10	38	37	89	16		√	√			
DG1408E	4.5 V ~ 24 V, ± 4.5 V ~ ± 16.5 V	8:1 mux	3.9	1.5	-31	13	104	16		√	√			
DG1411E, DG1412E, DG1413E	4.5 V ~ 24 V, ± 4.5 V ~ ± 16.5 V	Quad SPST	1.5	1	-41	24	87	16		√	√			
DG408	5 V ~ 36 V, ± 5 V ~ ± 20 V	8:1 mux	40	20	20	3	37	16			√	√		√
DG409	5 V ~ 36 V, ± 5 V ~ ± 20 V	Dual 4:1 mux	40	10	20	3	25	16			√	√		√
DG411, DG412, DG413	5 V ~ 36 V, ± 5 V ~ ± 20 V	Quad SPST	25	10	5	9	35	16			√	√		√
DG454, DG455, DG456	5 V ~ 36 V, ± 5 V ~ ± 20 V	Quad SPST	3.8	2.5	22	31	103	16			√	√		
DG469, DG470	5 V ~ 36 V, ± 5 V ~ ± 20 V	SPDT	3.6	5	58	37	125	16				√	√	

PRECISION ANALOG ICs

Analog Switches and Multiplexers

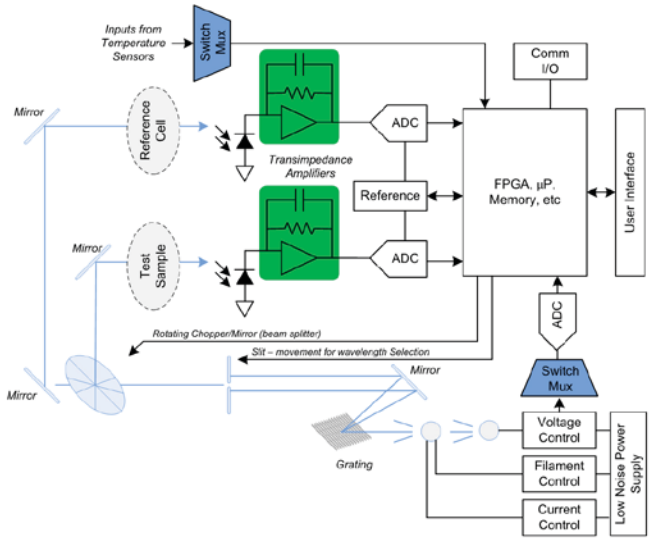
UV / Vis Spectrophotometers

Ultraviolet–visible spectroscopy or ultraviolet-visible spectrophotometry is routinely used for the quantitative determination of different substances, making it a useful tool in analytic chemistry and medical applications.

Key Performance Parameters and Vishay Advantages

Vishay provides precision analog switches and multiplexers optimized for both low on-resistance and excellent switching characteristics as required by the signal pre-amplifier and gain control blocks in the circuits that convert light to electrical signals and compare the signals from the test sample to a reference cell. Analog switches and multiplexers are also used to switch the inputs of temperature sensing and other signals that determine the test conditions.

Block Diagram



Part Number	Power Supply	Configuration	r_{ON} (Ω) typ	$I_{COM(ON)}$ (nA) max	Charge Injection (pC) typ	$C_{S(OFF)}$ (pF) typ	$C_{D(ON)}$ (pF) typ	Package: Pin Count	Package: mQFN	Package: QFN	Package: TSSOP / TSOP	Package: SOIC	Package: MSOP	Package: TDFN	Functional Blocks: Switch Mux	Functional Blocks: Transimpedance Amplifier
DG9233E	2.7 V ~ 5 V	Dual SPST, NO	17	0.2	-78	3.8	7.8	8				√	√		√	√
DG9232E	2.7 V ~ 5 V	Dual SPST, NC	17	0.2	-78	3.8	7.8	8				√	√		√	√
DG9234E	2.7 V ~ 5 V	Dual SPST, NC/NO	17	0.2	-78	3.8	7.8	8				√	√		√	√
DG9431E	2.7 V ~ 5 V	SPDT	17	0.2	-0.78	3.8	7.8	8			√	√			√	√
DG2523, DG2524	1.8 V ~ 5.5 V	Quad SPST	0.4	5	-19	14.5	26	16		√					√	√
DG2525	1.8 V ~ 5.5 V	Quad SPST	0.37	5	-19	14.5	26	16	√						√	√
DG408LE	3 V ~ 16 V, ± 3 ~ ± 8 V	8:1 mux	17	1	-11	5.5	35	16		√	√	√			√	
DG409LE	3 V ~ 16 V, ± 3 ~ ± 8 V	Dual 4:1 mux	15	1	-10	5.5	23.5	16		√	√	√			√	
DG9424E, DG9425E, DG9426E	3 V ~ 16 V, ± 3 ~ ± 8 V	Quad SPST	1.6	10	38	37	89	16			√				√	√
DG411LE, DG412LE, DG413LE	3 V ~ 16 V, ± 3 ~ ± 8 V	Quad SPST	16	10	6.6	5	15	16			√	√			√	√
DG1411E, DG1412E, DG1413E	4.5 V ~ 24 V, ± 4.5 V ~ ± 15 V	Quad SPST	1.5	1	-41	24	87	16		√	√				√	
DG1408E	4.5 V ~ 24 V, ± 4.5 V ~ ± 16.5 V	8:1 mux	3.9	1.5	-31	13	104	16		√	√				√	
DG467, DG468	5 V ~ 36 V, ± 5 V ~ ± 20 V	SPST	7	10	21	30	76	6			√				√	
DG469, DG470	5 V ~ 36 V, ± 5 V ~ ± 20 V	SPDT	3.6	5	58	37	125	8				√	√		√	

PRECISION ANALOG ICs

Analog Switches and Multiplexers

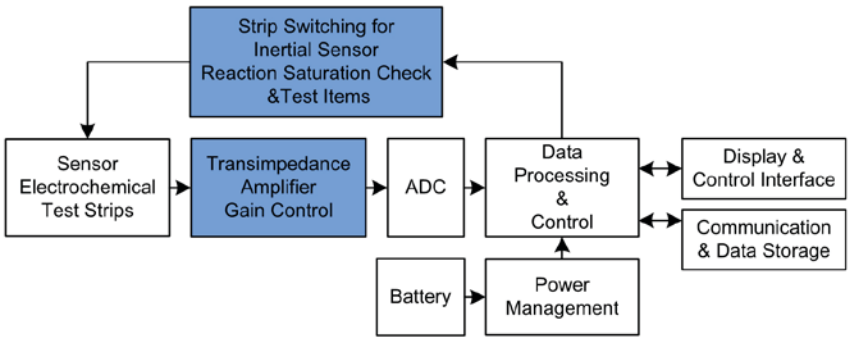
Glucose Meters

A glucose meter is just one example of a portable meter that plays an important role in health monitoring. Devices such as these play a critical role in reducing the occurrence rate and severity of long term complications from progressive diseases.

Key Performance Parameters and Vishay Advantages

In portable metering applications, Vishay offers low voltage analog switches with low resistance, low switching noise, and ultra low leakage levels. The devices are used in the input multiplexer (strip switching), transimpedance amplifier gain control, precision amplification, and bias control. Compact device packages help to enable space-constrained portable designs.

Block Diagram



Part Number	Power Supply	Configuration	r_{ON} (Ω) typ	$I_{COM(ON)}$ (nA) max	Charge Injection (pC) typ	$C_{S(OFF)}$ (pF) typ	$C_{D(ON)}$ (pF) typ	Package							
								Pin Count	mQFN	QFN	TSSOP / TSOP	SOIC	MSOP	DIP	TDFN
DG9424E, DG9425E, DG9426E	3 V ~ 16 V, ± 3 ~ ± 8 V	Quad SPST	1.6	10	38	37	89	16			√				
DG408LE	3 V ~ 16 V, ± 3 ~ ± 8 V	8:1 mux	17	1	-11	5.5	35	16		√	√	√			
DG9233E	2.7 V ~ 5 V	Dual SPST, NO	17	10	-28	3.8	7.8	8				√	√		
DG9232E	2.7 V ~ 5 V	Dual SPST, NC	17	10	-28	8	22	8				√	√		
DG9234E	2.7 V ~ 5 V	Dual SPST, NC/NO	17	10	-28	8	22	8				√	√		

Low Charge Injection Devices

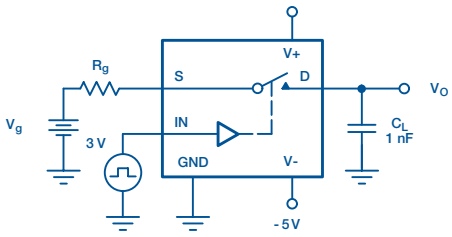
Devices in this family are optimized for precision switching applications with minimal charge injection during both ON and OFF transitions. The devices demonstrate superior low switching glitches and fast settling time. They are ideal for circuits such as sample and hold, data acquisition, and precision ADC input multiplexing that are commonly seen in industrial control and automation, medical healthcare, and instruments.

The DG506B / 507B and DG508B / 509B stand for the best in class high voltage precision multiplexers. The devices feature low leakage, 3 pF switch off source capacitance, and 1 pC charge injection.

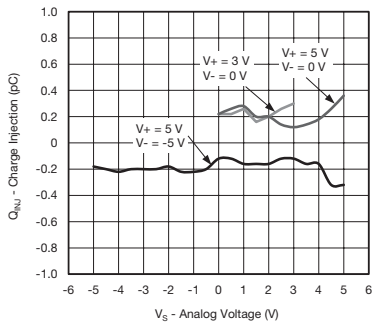
New low leakage, high precision analog multiplexers (DG408LE and DG4051E series) and switches (DG9232E series) feature low charge injection (< 1 pC) and low switch capacitance (< 3 pF). They are ideal for +5 V, ± 5 V, and +12 V operation.

The new products come in SOIC, TSOP, and miniQFN packages.

Charge Injection Test Circuit



DG4051A Charge Injection vs. Analog Voltage



Part Number	Configuration	Basic Parameters			Characterization Voltages							Dynamic Performance				Package Option						
		r_{ON} (Ω) typ	Charge Injection (pC) typ	C_{OFF} (pF) typ	± 2.5 V	≤ 3 V	5 V	± 5 V	12 V	16 V	± 15 V	t_{ON} Max. (ns)	Crosstalk @ 1 MHz (dB)	Off Isolation @ 1 MHz (dB)	BW (MHz)	TSSOP	SOIC	SOT-23 / TSOP	MSOP	QFN/DFN	Mini QFN	DIP
DG9232E, DG9233E, DG9234E	2 x SPST	17	-0.28	4		√	√					150	-80	-108			√		√			
DG4051E	8:1 mux	68	0.38	2.2		√	√	√	√			80	-68	-62	308	√	√				√	
DG4052E	Dual 4:1 mux	68	0.38	2.1		√	√	√	√			80	-68	-62	353	√	√				√	
DG4053E	Triple 2:1 mux	68	0.38	2		√	√	√	√			80	-68	-62	930	√	√				√	
DG441B, DG442B	4 x SPST	45	1	4				√	√	√	√	220	-90 @ 100 KHz	-95 @ 100 KHz	--	√	√			√		√
DG444B, DG445B	4 x SPST	45	1	5				√	√	√	√	250	-90 @ 100 KHz	-95 @ 100 KHz	--		√			√		√
DG506B	16:1 mux	170	1	3					√	√	√	190	-85	-84	114	√	√					
DG507B	Dual 8:1 mux	170	1	3					√	√	√	190	-85	-84	217	√	√					
DG201B	4 x SPST	45	1	5				√	√	√	√	300	-90 @ 100 KHz	-95 @ 100 KHz	--	√	√					
DG211B, DG212B	4 x SPST	45	1	5				√	√	√	√	300	-70	-75	--	√	√					√
DG213	4 x SPST	45	1	5				√	√	√	√	130	-90 @ 100 KHz	-95 @ 100 KHz	--	√	√					√
DG508B	8:1 mux	180	2	3				√	√	√	√	250	-81	-88	200	√	√				√	
DG509B	Dual 4:1 mux	180	2	3				√	√	√	√	250	-81	-88	200	√	√				√	

Note: Products in the tables of this document are sorted in the order of increasing operating voltage range followed by configuration

Low Charge Injection Devices (cont.)

Part Number	Configuration	Basic Parameters			Characterization Voltages							Dynamic Performance				Package Option						
		r_{ON} (Ω) typ	Charge Injection (pC) typ	C_{OFF} (pF) typ	± 2.5 V	≤ 3 V	5 V	± 5 V	12 V	16 V	± 15 V	t_{ON} Max. (ns)	Crosstalk @ 1 MHz (dB)	Off Isolation @ 1 MHz (dB)	BW (MHz)	TSSOP	SOIC	SOT-23 / TSOP	MSOP	QFN/DFN	Mini QFN	DIP
DG333A, DG333AL	4x SPDT	25	2	8			√	√	√	√	√	175	-72	-80	--					√		
DG2034E	4:1 mux	2.5	-2	27		√	√					34	-67	-71	166	√	√					√
DG2723	2 x SPDT	5.5	3	2.5		√						30	-29 @ 240 Mhz	-36 @ 240 Mhz	700			√				
DG3257	1 x SPDT	5	4	3		√						27	-33 @ 240 Mhz	-32 @ 240 Mhz	714	√	√					√
DG411, DG412, DG413	4 x SPST	25	5	9				√	√		√	175	-68	-85	--			√				
DG449	1 x SPDT	38	5	8				√	√		√	146	-69	-80	--	√	√			√		
DG411LE, DG412LE, DG413LE	4 x SPST	16	6.6	5		√	√	√	√			110	68	107	--	√	√			√		
DG447, DG448	1 x SPST	17	10	8			√	√	√	√	√	130	-72	N/A	--					√		
DG408LE	8:1 mux	17	-11	5.5		√	√	√	√			82	-99	-99						√	√	
DG409LE	Dual 4:1 mux	15	-10	5.5		√	√	√	√			82	-87	-109		√	√					
DG2523	4 x SPDT	0.4	-19	14.5		√						60000	-55	-61	310	√	√					

Note: Products in the tables of this document are sorted in the order of increasing operating voltage range followed by configuration

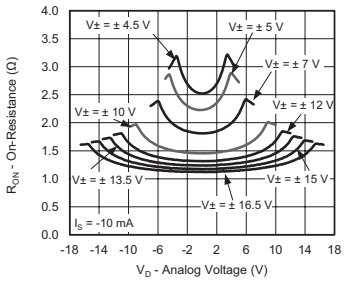
Low On-Resistance Devices

Devices in this family have a low on-resistance (typically 0.3 Ω to 8 Ω). A wide range of operating voltages is available for various applications such as audio and video switching, programmable gain control, power routing, and mechanical relay replacement.

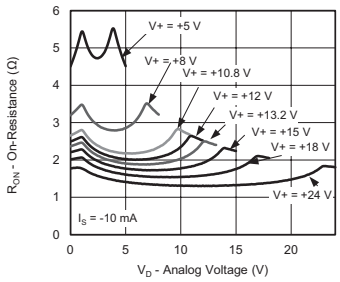
The parts achieve low on-resistance levels while maintaining low leakage, parasitic capacitance, charge injection, and fast switching speeds. The minimized parasitic reduces signal distortion. It minimizes the capacitive load at the operational amplifier output in programmable gain circuits, thus improving response time and signal fidelity.

The DG1411E / 1412E / 1413E series of quad 1.5 Ω SPST ± 15 V switches have a flatness of 0.2 Ω, precise channel matching of 0.04 Ω, switch ON and OFF leakage of 50 pA and 10 pA, respectively, and low parasitic capacitances of 24 pF in the OFF state and 87 pF in the ON state. The devices, -3 dB bandwidth is 150 MHz. The DG1411E / 1412E / 1413E are ideal for low distortion audio and video switching, wide dynamic programmable gain control, relay replacement, and high end data acquisition systems.

DG1411E, DG1412E, DG1413E
r_{ON} vs. Analog Input Voltage
When Powered With Dual Rails



DG1411E, DG1412E, DG1413E
r_{ON} vs. Analog Input Voltage
When Powered With Single Rails



Part Number	Config	Basic Parameters		Characterization Voltage								Dynamic Performance				Package Options						Current
		r_{ON} (Ω) typ	C_{OFF} (pF) typ	1.8 V	± 2.5 V	3 V	4.3V / 5 V	± 5 V	12 V	16 V	± 15 V	t_{ON} Max. (ns)	Off Isolation @ 1 MHz (dB)	Cross- talk @ 1 MHz (dB)	BW (MHz)	TSSOP	SOIC	TSOP	MSOP	QFN / DFN	Mini QFN	I_{OUT} (mA)
DG2535E	2 x SPDT	0.3	40			√						80	-70	-90	120				√	√		300
DG2733E	2 x SPDT	0.3	40			√						80	-70	-90	120				√	√		300
DG2525	2 x DPDT	0.37	14.5			√						70000	-55	-61	310						√	300
DG2788A	2 x DPDT	0.37	14.5			√						150000	-56	-61	338						√	300
DG2523	4 x SPDT	0.4	14.5			√						60000	-55	-61	310					√		300
DG2750	2 x SPDT	0.45	36			√						2500	-54 @ 300 KHz	-60 @ 300 KHz	49						√	250
DG2735A	4 x SPDT	0.5	40			√						80	-70	-90	120						√	300
DG1411E, DG1412E, DG1413E	4 x SPST	1.5	24					√	√		√	140	-78	-104	150	√				√		250
DG9424E, DG9425E, DG9426E	4 x SPST	1.6	37			√	√	√	√			65	-56	-77		√						100
DG2034E	4:1 mux	2.5	27			√	√					34	-67	-71	166				√	√		50
DG9408E	8:1 mux	3.2	17			√	√	√	√			75	-83	-89	--					√		100
DG9409E	Dual 4:1 mux	3.2	16			√	√	√	√			75	-83	-89	--					√		100
DG1408E	8:1 mux	3.9	13					√	√		√	185	-58	-64	55					√		250
DG1409E	Dual 4:1 mux	3.9	13					√	√		√	185	-58	-64	90					√		250

Low On-Resistance Devices (cont.)

Part Number	Config	Basic Parameters		Characterization Voltage								Dynamic Performance				Package Options									Current
		r_{ON} (Ω) typ	C_{OFF} (pF) typ	1.8 V	± 2.5 V	3 V	4.3V / 5 V	± 5 V	12 V	16 V	± 15 V	t_{ON} Max. (ns)	Off Isolation @ 1 MHz (dB)	Crosstalk @ 1 MHz (dB)	BW (MHz)	TSSOP	SOIC	SOT-23	TSOP	MSOP	QFN / DFN	Mini QFN	SC-70 / SC89	MICRO FOOT	I_{OUT} (mA)
DG1408E	8:1 mux	3.9	13					√	√		√	185	-58	-64	55						√				250
DG1409E	Dual 4:1 mux	3.9	13					√	√		√	185	-58	-64	90						√				250
DG3257	2 x SPDT	5	3			√						27	-33 @ 240 Mhz	-32 @ 240 Mhz	714						√				50
DG2723	2 x SPST	5.5	2.5			√						30	-29 @ 240 Mhz	-36 @ 240 Mhz	700							√			250
DG467, DG468	1 x SPST	7	30					√	√	√	√	140	-61	--	100				√						100
DG9232E, DG9233E, DG9234E	2 x SPST	17	4			√	√					150	-80	-108			√			√					20

PRECISION ANALOG ICs

Analog Switches and Multiplexers

Application Spotlight: Mechanical Relay Replacement

Many electronic designs can benefit from the replacement of mechanical relays with analog switches. The following devices feature low switch resistance and are bi-directional.

Typically, these devices can handle from 50 mA to 300 mA of current and are suitable for both signal and power routing, and relay replacement.

The DG469 and DG470 high voltage, single- and dual-supply SPDT analog switches offer 4.2 Ω maximum on-resistance with a typical flatness of 0.4 Ω. Both devices are rated for 120 mA continuous current, making them ideal for relay replacement and power routing.

Mechanical vs. Electronic Switches

	Mechanical	Electronic
Advantages	• High current • High voltage • High off isolation • Zero on-resistance • Low capacitance	• No switch bounce • Reliability • Low power consumption • Low cost • Miniature size
Disadvantages	• Wear and tear • Contact bounce • Slow • High power consumption • Bulky	• Low current: < 500 mA / switch • Limited voltage range: < 44 V • Off isolation • On-resistance

Part Number	Config	Basic Parameters			Characterization Voltages							Dynamic Performance				Package Options						Current
		r_{ON} (Ω) typ	Charge Injection (pC) typ	C_{OFF} (pF) typ	≤ 1.8 V	3 V	5 V	± 5 V	12 V	16 V	± 15 V	t_{ON} Max. (ns)	Off Isolation @ 1 MHz (dB)	Crosstalk @ 1 MHz (dB)	BW (MHz)	TSSOP	SOIC	SOT-23	MSOP	QFN / DFN	Mini QFN	I_{OUT} (mA)
DG2523	4 x SPDT	0.4	-19	14.5		√						60000	-55	-61	310					√		300
DG2525	2 x DPDT	0.37	-19	14.5		√						70000	-55	-61	310						√	300
DG2535E	2 x SPDT	0.3		40		√						80	-70	-90	120				√	√		300
DG2735A	4 x SPDT	0.5		40		√						80	-70	-90	120						√	300
DG2535E, DG2733E	2 x SPDT	0.3		40		√						80	-70	-90	120				√	√		300
DG2788A	2 x DPDT	0.37	-245	14.5		√						150000	-56	-61	338						√	300
DG1408E	8:1 mux	3.9	-31	13				√	√		√	185	-58	-64	55					√		250
DG1409E	Dual 4:1 mux	3.9	-103	13				√	√		√	185	-58	-64	90					√		250
DG1411E, DG1412E, DG1413E	4 x SPST	1.5	-41	24				√	√		√	140	-78	-104	150	√				√		250
DG2730	1 x DPDT	5.5	3	2.2		√						30	-29 @ 240 KHz	-36 @ 240 KHz	900						√	250
DG2750	2 x SPDT	0.45	4	36		√						2500	-54 @ 300 KHz	-60 @ 300 KHz	49						√	250
DG9408E	8:1 mux	3.2	4.5	21		√	√	√	√			75	-83 @ 100 KHz	-89 @ 100 KHz	--					√		100

High Current Switch Devices (cont.)

Part Number	Config	Basic Parameters			Characterization Voltages							Dynamic Performance				Package Options						Current
		r_{ON} (Ω) typ	Charge Injection (pC) typ	C_{OFF} (pF) typ	≤ 1.8 V	3 V	5 V	± 5 V	12 V	16 V	± 15 V	t_{ON} Max. (ns)	Off Isolation @ 1 MHz (dB)	Crosstalk @ 1 MHz (dB)	BW (MHz)	TSSOP	SOIC	SOT-23	MSOP	QFN / DFN	Mini QFN	I_{OUT} (mA)
DG9409E	Dual 4:1 mux	3.2	4.5	23		√	√	√	√			75	-83 @ 100 KHz	-89 @ 100 KHz	--					√		100
DG9424E, DG9425E, DG9426E	4 x SPST	1.6	112	37		√	√	√	√			65	-56	-77		√						100
DG451, DG452, DG453	4 x SPST	3.8	22	31			√	√	√	√	√	118	-60	-85	--	√	√					100
DG454, DG455, DG456	4 x SPST	3.8	22	31			√	√	√	√	√	118	-60	-85	--	√	√					100
DG2034E	4:1 mux	2.5	-2	27		√	√					34	-67	-71	166				√	√		50

High Bandwidth Devices

This category of devices is optimized for high bandwidth applications, such as high speed, mixed-signal switching and filtering. The devices support frequencies up to 1 GHz. Devices optimized for this application require moderately low on-resistance to reduce signal insertion losses, low parasitic capacitance, high cross talk rejection, and high off isolation.

The DG4053E multiplexer, which operates from ± 3 V to ± 8 V or single 3 V to 16 V supplies, offers -3 dB bandwidth of 930 MHz.

Part Number	Config	Basic Parameters			Characterization Voltage								Dynamic Performance				Package Options					
		r_{ON} (Ω) typ	Charge Injection (pc) typ	C_{OFF} (p_f) typ	1.8 V	≤ 3 V	4.3V / 5 V	± 5 V	12 V	16 V	± 15 V	± 15 V	t_{ON} Max. (ns)	Off Isolation @ 1 MHz (dB)	Crosstalk @ 1 MHz (dB)	BW (MHz)	TSSOP	SOIC	SOT-23	MSOP	QFN / DFN	Mini QFN
DG4053E	Triple 2:1 mux	68	0.38	2		√	√	√	√				80	-68	-62	930	√	√				√
DG4052E	Dual 4:1 mux	68	0.38	2.1		√	√	√	√				80	-68	-62	353	√	√				√
DG4051E	8:1 mux	68	0.38	2.2		√	√	√	√				80	-68	-62	308	√	√				√
DG2730	1 x DPDT	5.5	3	2.2		√							30	-29 @ 240 KHz	-36 @ 240 KHz	900						√
DG3257	2 x SPDT	4.2	4	3		√							27	-33 @ 240 Mhz	-32 @ 240 Mhz	714					√	
DG2723	2 x SPST	5.5		2.5		√							30	-29 @ 240 Mhz	-36 @ 240 Mhz	700						√
DG9454E	3 x SPDT	85	5.8	3.1		√	√	√	√				130	-85	-73	356						√
DG2523	4 x SPDT	0.4	-19	14.5		√							60000	-55	-61	310					√	
DG2525	2 x DPDT	0.37	-19	14.5		√							70000	-55	-61	310						√
DG507B	Dual 8:1 mux	170		3					√	√	√		190	-85	-84	217	√	√				
DG508B	8:1 mux	180		3					√	√	√		250	-81	-88	200	√	√				√
DG509B	Dual 4:1 mux	180		3					√	√	√		250	-81	-88	200	√	√				√
DG1411E, DG1412E, DG1413E	4 x SPST	1.5	-41	24				√	√		√		140	-78	-104	150	√				√	
DG506B	16:1 mux	170		3					√	√	√		190	-85	-84	114	√	√				
DG9232E, DG9233E, DG9234E	2 x SPST	17		4		√	√						150	-80	-108			√		√		

PRECISION ANALOG ICs

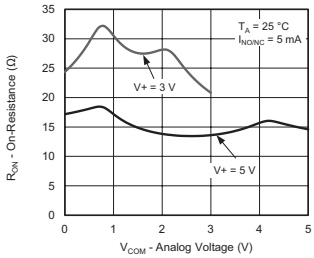
Analog Switches and Multiplexers

Low Voltage Devices for Consumer Handheld and Portable Instrumentation

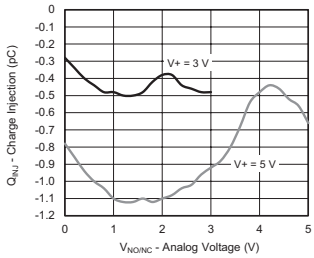
This family is designed for operation voltages from 5.5 V down to 1.6 V. The devices are optimized for low and flat resistances. Devices come in a variety of compact packages, including TSSOP, MSOP, TDFN, and mQFN, to address the requirements of space-constrained applications. This family of devices includes specialized devices for high bandwidth USB applications, audio applications requiring negative voltage swings, and fault-protected switches designed to offer power down protection.

The DG9232E series consists of 5 V dual SPST switches. The parts are optimized for flat switch on-resistance together with low leakage and parasitic capacitance. They are ideal for low voltage analog front end and sensor signal switching in portable healthcare devices and instruments.

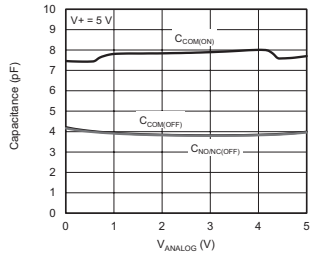
DG9232E
On-Resistance vs Analog Voltage



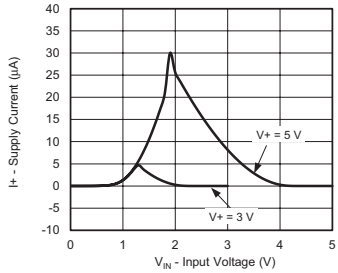
DG9232E
Charge Injection vs Analog Voltage



DG9232E
Capacitance vs Analog Voltage



DG9232E
Supply Current vs Input Voltage



Part Number	Config	Basic Parameters			Characterization Voltages					Dynamic Performance				Package Options					
		r_{ON} (Ω) typ	Charge Injection (pC) typ	C_{OFF} (pF) typ	1.8 V	3 V	4.3 V / 5 V	± 5 V	12 V	t_{ON} Max. (ns)	Off Isolation @ 1 MHz (dB)	Crosstalk @ 1 MHz (dB)	BW (MHz)	TSSOP	SOIC	MSOP	QFN / DFN	Mini QFN	MICRO FOOT
DG2034E	4:1 mux	2.5		27		√	√			34	-67	-71	166			√	√		
DG2523	4 x SPDT	0.4	-19	14.5		√				60000	-55	-61	310				√		
DG2525	2 x DPDT	0.37	-19	14.5		√				70000	-55	-61	310					√	
DG2535E, DG2733E	2 x SPDT	0.3		40		√				80	-70	-90	120			√	√		
DG2723	2 x SPST	5.5		2.5		√				30		-36 @ 240 KHz	700					√	
DG2730	1 x DPDT	5.5	3	2.2		√				30	-29 @ 240 KHz	-36 @ 240 KHz	900					√	
DG2735A	4 x SPDT	0.5		40		√				80	-70	-90	120					√	
DG2750	2 x SPDT	0.45	4	36		√				2500	-54 @ 300 KHz	-60 @ 300 KHz	49					√	
DG2788A	2 x DPDT	0.37	-245	14.5		√				150000	-56	-61	338					√	
DG3257	2 x SPDT	4.2	4	3		√				27	-33 @ 240 Mhz	-32 @ 240 Mhz	714				√		
DG4051E	8:1 mux	68	0.38	2.2		√	√	√	√	80	-68	-62	308	√	√			√	
DG4052E	Dual 4:1 mux	68	0.38	2.1		√	√	√	√	80	-68	-62	353	√	√			√	
DG4053E	Triple 2:1 mux	68	0.38	2		√	√	√	√	80	-68	-62	930	√	√			√	
DG408LE	8:1 mux	17	-11	5.5		√	√	√	√	82	-99	-99		√	√		√		
DG409LE	Dual 4:1 mux	15	-10	5.5		√	√	√	√	82	-87	-109		√	√		√		
DG2751	DPDT	0.39	18.9	30		√				95	-106 @ 240 Mhz	-1067 @ 240 Mhz							√
DG411LE, DG412LE, DG413LE	@20 KHz"	"-1067	6.6	5		√	√	√	√	110	68	107	--	√	√				

Low Voltage Devices (cont.)

Part Number	Config	Basic Parameters			Characterization Voltages					Dynamic Performance				Package Options					
		r_{ON} (Ω) typ	Charge Injection (pC) typ	C_{OFF} (pF) typ	1.8 V	3 V	4.3V / 5 V	± 5 V	12 V	t_{ON} Max. (ns)	Off Isolation @ 1 MHz (dB)	Crosstalk @ 1 MHz (dB)	BW (MHz)	TSSOP	SOIC	MSOP	QFN / DFN	Mini QFN	SC-70 / SC89
DG441LE, DG442LE	@ 20 KHz"	290						√	√	70	68	114		√	√				
DG9232E, DG9233E, DG9234E	2 x SPST	17		4		√	√			150	-80	-108			√	√			
DG9408E	8:1 mux	3.2	4.5	21		√	√	√	√	75	-83 @ 100 KHz	-89 @ 100 KHz	--				√		
DG9409E	Dual 4:1 mux	3.2	4.5	23		√	√	√	√	75	-83 @ 100 KHz	-89 @ 100 KHz	--				√		
DG9424E, DG9425E, DG9426E	4 x SPST	1.6	112	37		√	√	√	√	65	-56	-77		√					

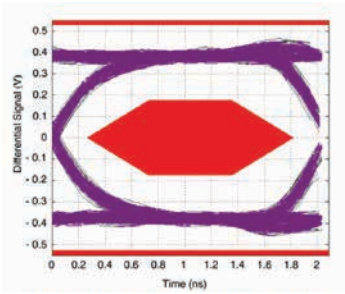
USB Signal Switches

The DG2730 is a dual SPDT / DPDT switch that supports USB 2.0 high speed data line switching. It offers 900 MHz 3 dB bandwidth, 5.8 pF ON capacitance, and 7 kV ESD / HBM.

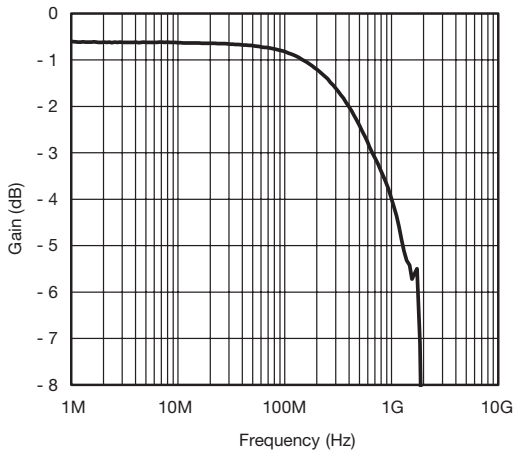
USB 2.0 Analog DPDT Switch for Two-Port Switching

- 900 MHz, 3 dB bandwidth
- Fast switching T_{ON} = 30 ns/max, T_{OFF} = 25 ns/max @ 2.7 V
- Opposite transition skew: 20 ps (typ.)
- Low on-resistance, 5.5 Ω (typ.)
- Low ON capacitance, 5.8 pF (typ.)
- Low voltage logic compatible VINH = 1.3
- 7 kV ESD protection (HBM)
- miniQFN-10 (1.4 mm x 1.8 mm x 0.55 mm)
- Power down protection

miniQFN10,
1.4 mm x 1.8 mm



DG2730, USB2.0 high speed eye diagram test, with V+ = 3.3 V

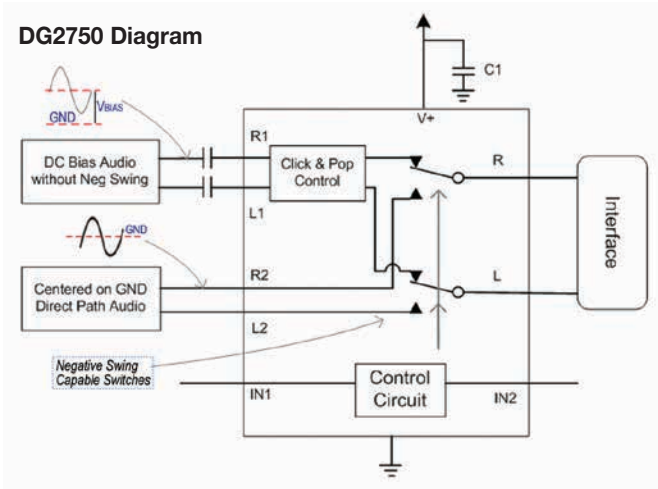


		Basic Parameters		Characterization on Voltages (V)	Dynamic Performance				Package Options	
Part Number	Config	r_{ON} (Ω) typ	C_{OFF} (pF) typ	≤ 3 V	t_{ON} Max. (ns)	Off Isolation @ 1 MHz (dB)	Crosstalk @ 1 MHz (dB)	BW (MHz)	UDFN	Mini QFN
DG3257	2 x SPDT	4.2	3	√	27	-33 @ 240 Mhz	-32 @ 240 Mhz	714	√	

Negative Swing Audio Switch Devices

The following devices are designed to switch audio signals with or without DC bias. Without a DC bias, the signal can swing negative. The devices in this family can handle such negative swing signals.

DG2750 Diagram



Part Number	Config	Basic Parameters		Characterization on Voltages (V)	Dynamic Performance				Package Option
		r_{ON} (Ω) typ	Charge Injection (pC) typ		t_{ON} Max. (ns)	Off Isolation @ 1 MHz (dB)	Crosstalk @ 1 MHz (dB)	BW (MHz)	
DG2750	Dual SPDT	0.6	4	2.7	1700	-55	-61	34	mQFN10
DG2751	DPDT	0.39	18.9	3.3	95	-106	-107	290	WCSP9

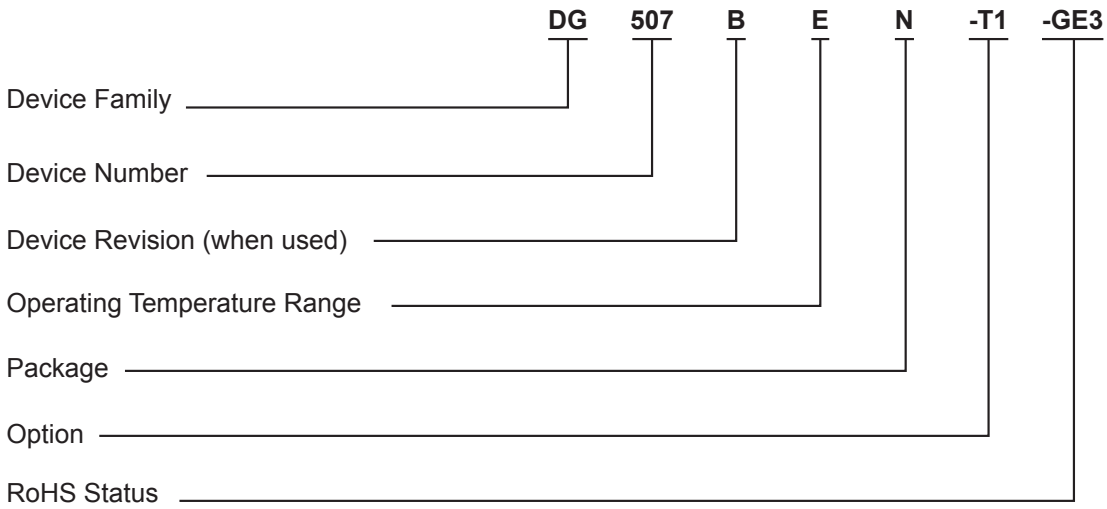
Note: DG2750, 0.6 Ω dual SPDT in mQFN10

Fault-Protected Switch

Special circuits are integrated to protect the devices from various fault conditions. Power down protection blocks the current flow from signal ports to the power pin when the power supply is down. This is important for the devices used in interfaces where the connected circuits use different power sources that may not be correctly sequenced.

Part Number	Config	r_{ON} (Ω) typ	Characterization Voltages (V)				Dynamic Performance				Feature and Protection
			1.8	3	4.3	5	t_{ON} Max. (ns)	Off Isolation @ 1 MHz (dB)	Crosstalk @ 1 MHz (dB)	BW (MHz)	
DG2723	2 x SPDT	5.5		√			30	-29 @ 240 Mhz	-36 @ 240 Mhz	700	
DG2730	2 x SPDT	5.5		√			30	-29 @ 240 Mhz	-36 @ 240 Mhz	900	Power down protection

Part Nomenclature



Device Family (1 to 3 Letters)

DG - Analog Switches and Analog Multiplexers

Device Number (3- to 5-Digit Numbers)

Operating Temperature Range (1 Letter)

A - **-55 ºC to 125 ºC**
B - **-25 ºC to 85 ºC**
C - **0 ºC to 70 ºC**
D - **-40 ºC to 85 ºC**
E - **-40 ºC to 125 ºC**

Package (1 Letter)

A - Metal can
B - Wafer level CSP (MicroFOOT, WCSP)
J - Dual in line package – (plastic DIP)
K - Dual in line package – (ceramic DIP)
L - SC70 (-5ld, -6ld) package
M - CerQuad J-leaded chip carrier
N - Quad flat no-lead – (QFN, miniQFN)
- Dual flat no-lead – (DFN, TDFN, uDFN)
- Plastic J-leaded chip carrier – (PLCC)
P - Dual in line package – SideBraze
Q - Thin shrink small outline package (TSSOP, MSOP)
R - Dual in line package – SideBraze
S - SOT23-8ld package
V - Thin shrink small outline package (TSOP)
W - Wide-body small outline package (SOIC)
X - SC89 package
Y - Narrow-body small outline package (SOIC)
Z - Leadless chip carrier – (LCC)

Process Option

/883 - Processing to the current revision of MIL-STD-883, Level B. Compliant Non-JAN

-Tx - Tape and reel options, “x” is a number that represents taping orientation; the absence of tape and reel option indicates that the devices are shipped in tubes

RoHS Status

G RoHS “Green” Compliant*
*Some devices might be RoHS-complaint, although the part number is missing the G suffix. Please check with the factory

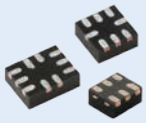
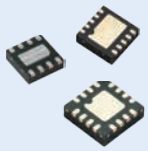
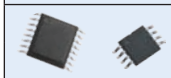
Ex There are 3 “E” numbers that represent the different lead-free finishes:
- E1 = Tin / silver / copper
- E3 = 100 % matte tin
- E4 = Nickel / palladium / gold
The absence of “-Ex” indicates that the devices are not (Pb) lead-free

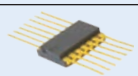
PRECISION ANALOG ICs

Analog Switches and Multiplexers

Packages

A wide selection of packages to fit your requirements

Package Type		Dimensions (mm) W x L x H
	MICRO FOOT® 3 x 2	1.5 x 1.0 x 0.65
	MICRO FOOT 3 x 3	1.5 x 1.5 x 0.65
	MICRO FOOT 4 x 3	2.0 x 1.5 x 0.65
	MICRO FOOT 4 x 4	2.0 x 2.0 x 0.65
	miniQFN-6	1.2 x 1.0 x 0.55
	miniQFN-8	1.4 x 1.4 x 0.55
	miniQFN-10	1.8 x 1.4 x 0.55
	miniQFN-16	2.6 x 1.8 x 0.75
	DFN-10	3.0 x 3.0 x 0.9
	QFN-12	3.0 x 3.0 x 0.9
	QFN-16	3.0 x 3.0 x 0.9
	QFN-16	4.0 x 4.0 x 0.9
	TDFN-8	2.0 x 2.0 x 0.55
	MSOP-8	3.0 x 4.9 x 1.0
	MSOP-10	3.0 x 4.9 x 1.0
	SC89-6	1.65 x 1.65 x 0.55
	SC70-5/6	2.0 x 2.1x 1.0
	TSOP-6	2.9 x 3.0 x 1.0
	SOT23-8	2.9 x 2.8 x 1.3
	SOIC-8 (narrow)	6.0 x 4.9 x 1.6
	SOIC-14 (narrow)	6.0 x 8.6 x 1.6
	SOIC-16 (narrow)	6.0 x 9.9 x 1.6
	SOIC-18 (wide)	10.2 x 7.6 x 2.4
	SOIC-20 (wide)	10.3 x 12.8 x 2.5
	SOIC-28 (wide)	10.3 x 17.9 x 2.5

Package Type		Dimensions (mm) W x L x H
	TSSOP-14	5.0 x 6.4 x 1.2
	TSSOP-16	5.0 x 6.4 x 1.1
	TSSOP-28	6.4 x 9.7 x 1.0
	PLCC-20	9.9 x 9.9 x 4.4
	PLCC-28	12.4 x 12.4 x 4.4
	PLCC-44	17.5 x 17.5 x 4.4
	LCC-20	8.9 x 8.9 x 1.8
	LCC-28	11.4 x 11.4 x 1.8
	CERQUAD-44	17.5 x 17.5 x 3.1
	FLAT PACK-14	22.9 x 8.9 x 2.3
	FLAT PACK-16	23.4 x 10.2 x 2.1
	CERDIP-8	7.9 x 9.8 x 4.6
	CERDIP-14	7.9 x 19.3 x 4.6
	CERDIP-16	7.9 x 19.3 x 4.5
	CERDIP-28	36.8 x 15.5 x 5.0
	PDIP-14	7.9 x 18.3 x 4.4
	PDIP-16	7.9 x 21.1 x 4.4
	PDIP20	7.9 x 25.9 x 4.4
	PDIP28	15.5 x 37.3 x 3.7
	SideBraze DIP-14	7.6 x 18.5 x 3.6
	SideBraze DIP-16	7.6 x 20.5 x 3.6
	SideBraze DIP-20	7.6 x 25.5 x 3.6
	SideBraze DIP-28	15.3 x 37.4 x 3.6

WORLDWIDE SALES CONTACTS

THE AMERICAS

UNITED STATES
VISHAY AMERICAS
ONE GREENWICH PLACE
SHELTON, CT 06484
UNITED STATES
PH: +1-402-563-6866
FAX: +1-402-563-6296

ASIA

SINGAPORE
VISHAY INTERTECHNOLOGY ASIA PTE LTD.
37A TAMPINES STREET 92 #07-00
SINGAPORE 528886
PH: +65-6788-6668
FAX: +65-6788-0988

P.R. CHINA
VISHAY CHINA CO., LTD.
15D, SUN TONG INFOPORT PLAZA
55 HUAI HAI WEST ROAD
SHANGHAI 200030
P.R. CHINA
PH: +86-21-5258 5000
FAX: +86-21-5258 7979

JAPAN
VISHAY JAPAN CO., LTD.
SHIBUYA PRESTIGE BLDG. 4F
3-12-22, SHIBUYA
SHIBUYA-KU
TOKYO 150-0002
JAPAN
PH: +81-3-5466-7150
FAX: +81-3-5466-7160

EUROPE

GERMANY
VISHAY ELECTRONIC GMBH
DR.-FELIX-ZANDMAN-PLATZ 1
95100 SELB
GERMANY
PH: +49-9287-71-0
FAX: +49-9287-70435

FRANCE
VISHAY S.A.
199, BD DE LA MADELEINE
06003 NICE, CEDEX 1
FRANCE
PH: +33-4-9337-2727
FAX: +33-4-9337-2726

UNITED KINGDOM
VISHAY LTD.
SUITE 6C, TOWER HOUSE
ST. CATHERINE'S COURT
SUNDERLAND ENTERPRISE PARK
SUNDERLAND SR5 3XJ
UNITED KINGDOM
PH: +44-191-516-8584
FAX: +44-191-549-9556