



ACS series

Overvoltage-protected AC switches



ST ACS™ series combines robustness, reliability, and straightforward design

ST ACS™ series AC switches designers the ability to improve system reliability and compactness.

They are ideal replacements for relays used to control water valves and other devices with loads connected to AC mains 24 hours a day.

These AC switches provide high voltage robustness along with transient voltage protection, and due to their low gate current, they can be controlled directly by an appropriate microcontroller.

KEY FEATURES

- Auto protected against AC line overvoltage surges
- Symmetrical blocking voltage up to 800 V
- 0.2 to 2 A current range
- 5 and 10 mA gates, only one resistor in series with the microcontroller port
- High inductive load switch-off capability
- Configurable phase shedding for wide load range high efficiency conversion

KEY BENEFITS

- RoHS and halogen-free compliant
- Easy compliance with safety standards on creepage thanks to SOT223-2L SMD package option

- Enables compliance with IEC 61000-4-4 and -4-5 disturbances
- No need for additional components (eliminates RC high-voltage network, MOV)
- Direct drive ensures simple low-power gate control board design

KEY APPLICATIONS

- Washing machines
 - Water valves
 - Water pumps
 - Solenoids
- Refrigerators
 - Water valves
- Dryers
 - Water pumps

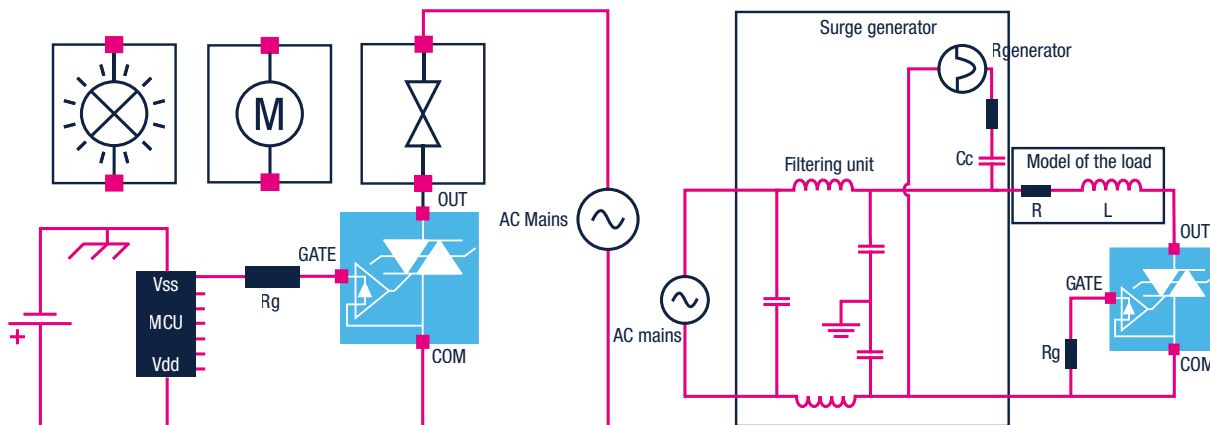
AC mains transient voltage ruggedness

ST AC switches can safely withstand AC mains transients by clamping the low energy spikes or by folding back when subjected to high energy shocks. The test circuit below shows an AC

switch application, which is also used to test these AC switches according to the conditions specified by the IEC 61000-4-5 standard. The AC switch implements an overvoltage crowbar technology to withstand voltage spikes up to 2 kV above the peak mains voltage while the load limits the current.

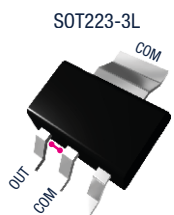
In fact, the ACS is triggered when the breakover voltage of the device is reached. The AC switch recovers its blocking voltage capability after the surge and the next current zero crossing. Such non-repetitive tests can be performed 10 times on each AC mains voltage polarity.

Simplified connection and surge test diagram



Part number	Current (A)	Voltage (V)	Gate current (mA)	Static immunity dV/dt (V/μs)	Switch-off (di/dt) _c (A/ms)	Package
ACS102-6T1	0.2	600	5	300	0.15	SO-8
ACS108-8TN	0.8	800	5	300	0.8	SOT223-3L
ACS108-8SA	0.8	800	10	400	2	T0-92
ACS108-8SN	0.8	800	10	400	2	SOT223-3L
ACS108-8SP	0.8	800	10	400	2	SOT223-2L HC
ACS110-7N	1	700	10	500	0.5	SOT223-3L
ACS120-7B	2	700	10	500	1	DPAK

Introduction to the new SOT223-2L package



Creepage = 1.5 mm

Comply with IEC60730 @ 200 V pollution degree 2



Creepage = 3.7 mm

Comply with IEC60730 @ 250 V pollution degree 3

3.7 mm CREEPAGE for wet environment

Simplify assembly process: no PCB holes

Standard SOT223 Footprint

Pollution degree 2: Only non-conductive pollution occurs, except that occasionally a temporary conductivity caused by condensation is to be expected.

Pollution degree 3: Conductive pollution occurs or dry non-conductive pollution occurs that becomes conductive due to condensation that is to be expected.



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