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ACST series

Overvoltage protected AC switches



ACST series combine robustness, reliability and straightforward design

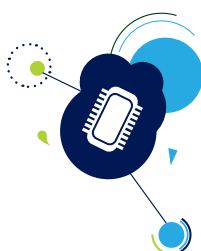
The home appliance industry is shifting to electronic control worldwide. Together with this trend, electronics can now handle AC mains constraints where high voltage robustness, and surge and transient voltage compatibility are the key challenges.

ST has introduced a new 800 V ACST series to control the numerous AC loads necessary for appliances. These AC switches meet the requirements for system reliability and compactness.

They are the perfect solution to replace relays, in refrigeration compressor control, for example, where they are connected to the AC mains 24 hours a day and are directly controlled by a microcontroller

KEY FEATURES

- Auto protected against AC line overvoltage surges
- 150 °C operating temperature range
- Symmetric blocking voltage at 800 V
- 2 to 16 A current range
- 2 ranges of I_{GT}
 - 35 mA high immunity series ($dV/dt \geq 2000 \text{ V}/\mu\text{s}$)
 - 10 mA sensitive series defined at $T_j = 125 \text{ }^\circ\text{C}$.



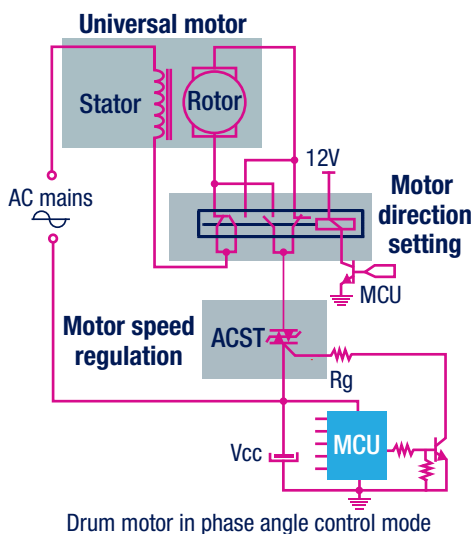
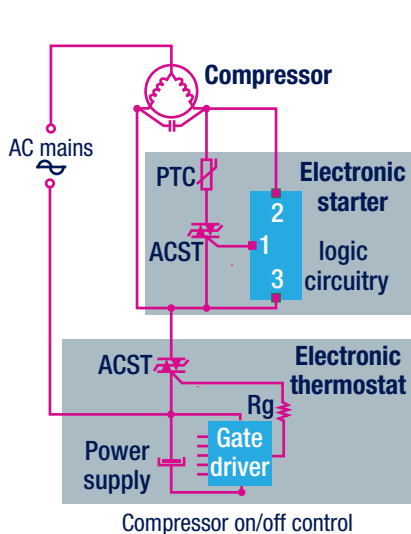
KEY BENEFITS

- Enables compliance with IEC 61000-4-4 and -4-5 disturbances
- No need for additional components (RC network, MOV)
- Easy control board design
- Sensitive series allows direct drive from a MCU

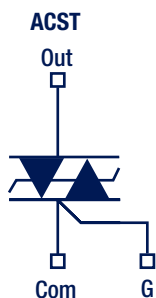
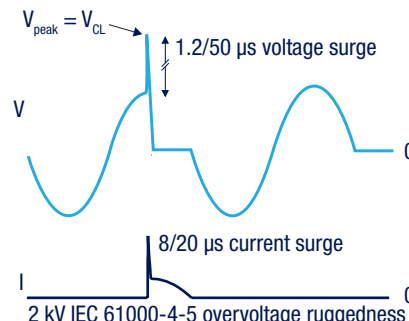
TARGET APPLICATIONS

- Compressor control
 - Refrigeration
 - Air conditioning
- Drum motor control
 - Washing machines
 - Dryers
- Heating element in printers
- Medium-power motor and heater control in industrial systems

APPLICATION DIAGRAM EXAMPLES



TYPICAL IEC 61000-4-5 SURGE VOLTAGE WAVEFORMS



ACST – ROBUSTNESS MADE EASY

Technical and standards requirements have led the design of ACST switches, and their parameters are now suitable for refrigeration compressor control and drum motor drives. Their performances have been validated through stringent structural reliability tests and specific functional reliability tests.

As a result, ACST switches are now recognized as the best-in-class AC switches for long-life home appliance or industrial control applications.

ACST SERIES PRODUCT TABLE

| AC switch | $I_{T(RMS)}$ (A) | V_{DRM} / V_{RRM} (V) | I_{GT} (mA) | dV/dt (V/μs) | (dI/dt) _c (A/ms) | T_J max (°C) | Package ⁵ |
|---|------------------|-------------------------|---------------|------------------------|-----------------------------------|----------------|----------------------|
| Overvoltage self-protected switch, $V_{CL} = 850$ V | | | | | | | |
| ACST210-8x ⁴ | 2 | 800 | 10 | 500 | 0.5 ² | 125 | 8, 4 |
| ACST410-8x ⁴ | 4 | 800 | 10 | 500 | 2 ² | 125 | 8, 4 |
| ACST435-8x ⁴ | 4 | 800 | 35 | 1000 | 5 ³ | 125 | 8, 4 |
| ACST610-8x ⁴ | 6 | 800 | 10 | 500 | 3.5 ² | 125 | 4, 5, 6, 7 |
| ACST830-8x ⁴ | 8 | 800 | 30 | 2000 | 8 ³ | 125 | 4, 5, 6 |
| ACST1010-7x ⁴ | 10 | 700 | 10 | 200 | 4.4 ² | 125 | 4, 5 |
| ACST1210-7x ⁴ | 12 | 700 | 10 | 200 | 5.3 | 125 | 4, 5 |
| ACST1035-8FP | 10 | 800 | 35 | 4000/2000 ¹ | 10 ³ /5 ^{1,3} | 150 | 4 |
| ACST1235-8FP | 12 | 800 | 35 | 4000/2000 ¹ | 12 ³ /6 ^{1,2} | 150 | 4 |
| ACST1635-8FP | 16 | 800 | 35 | 1000/300 ¹ | 12 ³ /4 ^{1,3} | 150 | 4 |

Notes::

- Specified at 125/150 °C
- Snubber @ 15 V/μs
- Without snubber
- Suffix x is related to the package; see package column : 4 = FP, 5 = T, 6 = G, 7 = R, 8 = B
- Package: 4 = TO-220FPAB (Fullpack 1500 V_{RMS} isolated, UL 1557 certified), 5 = TO-220AB, 6 = D2PAK, 7 = I2PAK, 8 = DPAK

