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Octal ultrasound pulser
High-voltage, high-speed

STHV800 highly-integrated octal ultrasound pulser with T/R switch simplifies design for ultrasound equipment

The cost and size of ultrasound imaging machines can be reduced with the new STHV800 octal ultrasound pulser from STMicroelectronics.
ST's proprietary BCD6s-SOI and BCD8s-SOI process technologies enable the combination of low-voltage CMOS logic, precise analog circuitry and robust power stages on the same chip, offering an unprecedented level of integration.

KEY BENEFITS

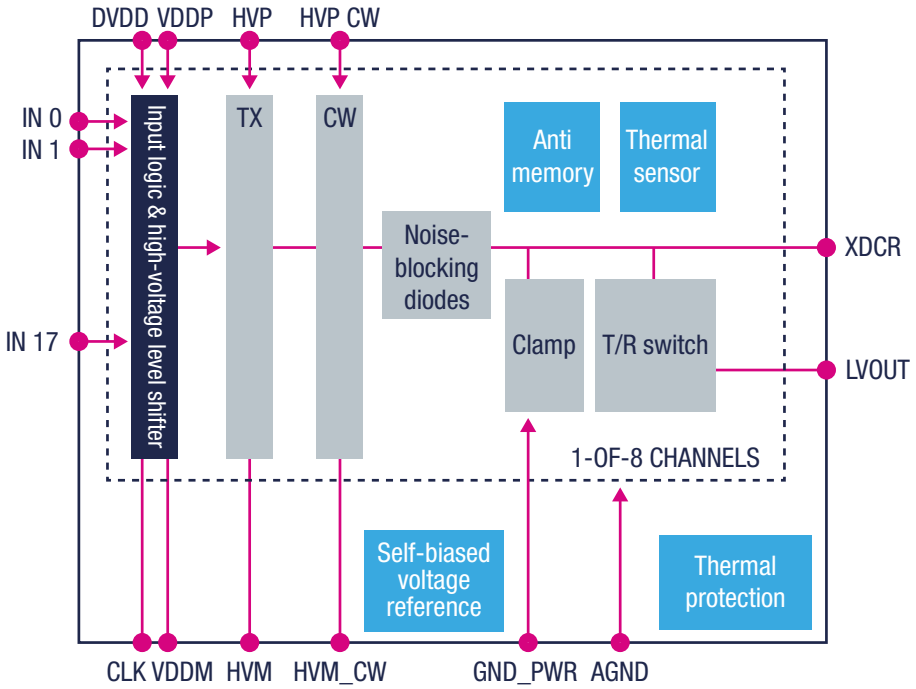
- 8 channels
- 0 to ± 90 V output voltage
- 2 A @ Vds = 60 V
- Integrated T/R switch
- Integrated clamping-to-ground function
- Anti-memory function
- 2 independently supplied half-bridges per channel (pulsed wave/continuous wave)
- Up to 20 MHz operating frequency
- Low power consumption
- 56-lead TFLGA (8 x 8 mm) package

KEY FEATURES

- Medical ultrasound imaging
- Point-of-care ultrasound imaging
- Pulse waveform generator
- Non-destructive testing equipment
- Sonar and radar systems
- Piezoelectric transducer drivers

The STHV800 is an octal, monolithic, high-voltage and high-speed pulse generator. The device integrates a controller logic interface circuit (compatible with both 1.8 V and 3.3 V input signals), level translators, MOSFET gate drivers, noise-blocking diodes, and high-power P-channel and N-channel MOSFETs as the output stage for each channel.
Each channel consists of active clamping to ground circuitry (RTZ), an anti-leakage and anti-memory block, a thermal sensor to protect the device and an integrated T/R switch (just 8 ohms as equivalent resistor) to connect the HV output to its LV output, guaranteeing strong decoupling during the transmission phase. The eight independent T/R switches can be used in both a dedicated RX chain per channel or in a multiplexing configuration. In addition, the STHV800 includes self-biasing circuitry which allows very low power consumption.

STHV800 BLOCK DIAGRAM



Partnumber	Channels	Output level	Output voltage (V)	Output current (A)	T/R switch impedance (Ω)	Package	
STHV800L	8	3	± 90 V	± 2	8.5	TFLGA-56LD	8 x 8 x 0.9 mm

The STHV800 device is supported by STEVAL-IME009V1 and STEVAL-IME013V1 evaluation boards. More on www.st.com/ultrasound

2D images produced by a 1D probe (left) and
3D images produced by a 2D probe (right)

Today, processes like 0.16 µm 200 V BCD8s-SOI and 0.32 µm BCD6s-SOI from STMicroelectronics are making transmit, receive, digital control logic, and beamforming functions easier to integrate into a single IC. The higher integration between ultrasound transducer and advanced semiconductor technology is greatly improving the effectiveness of ultrasound imaging, adding real-time 3D imaging capabilities.
Ultrasound is finding new uses such as 3D breast scans to replace or augment mammography exams, complete heart exams in real-time, and for determining whether a tumor is cancerous our not without a biopsy.