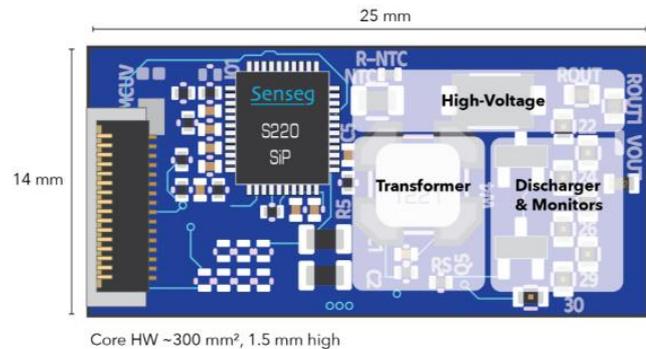
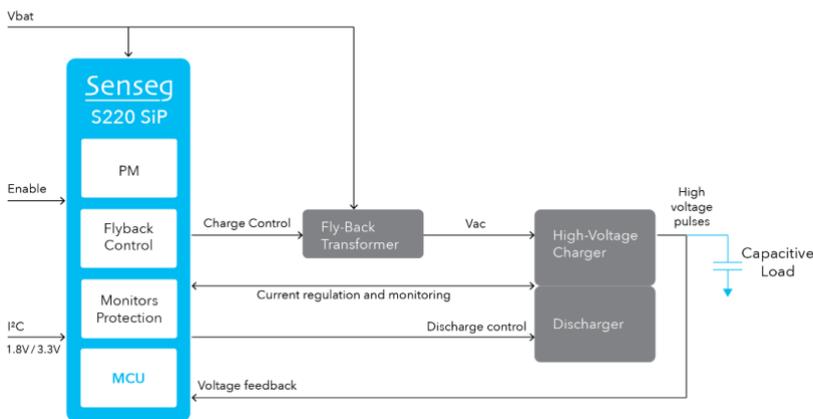


SENSEG HIGH VOLTAGE DRIVER - C1

Senseg High Voltage Driver C1 is a highly compact accurately controlled high voltage driver that is suitable for low current demand use typical for consumer applications of high voltage. It is built around Senseg S220 SiP (system-in-package) which uses flyback topology to generate high voltage, and it has been specifically designed for implementing the high voltage driver circuit using minimal number of external components. With the selection of externals, the maximum output voltage can be set to anything from a few hundred volts up to 2.5kV. Depending on application needs, board area of only 20x10 mm with 2 mm height can be achieved.



Block Diagram



For ease of use, the C1 Driver has I2C to USB converter inbuilt. After software installation, the system is plug and play via USB connection, which also provides power for the system. The requested signal waveform is written by the user in a high-level custom description language (example waveforms are provided), which S220 executes and maps to the non-linear properties of the high voltage part of the electronics. In case of driving larger loads with high frequency signals it is recommended to use a USB port capable of at least 900 mA. Senseg software allows real-time control of the output signal.

The system operation can be divided into two major processes: 1) load *charging* through flyback circuit and a cascade of voltage multipliers (upslope part of the signal) and 2) load *discharging* through “transistor ladder” discharger (downslope part of the signal). During both stages, S220 continuously compares the actual output voltage with the intended one and introduces corrections to the charge/discharge rate if needed.

POWER REQUIREMENTS AND MAXIMUM RATINGS

	MIN	MAX	UNIT
Supply voltage	3.3	5	V
Output power		1	W_{RMS}
Output voltage @500 Hz, 470 pF		1200	V_{peak}
Output voltage @125 Hz, 11 nF		1100	V_{peak}
Output voltage @50 Hz, 28 nF		950	V_{peak}
Frequency		1500	Hz
Load		50	nF

FEATURES

- Cost-efficient pricing vs. performance at high volumes
- Plug and play via USB
- Voltage range from 0V up to +2.5 kV* (depending on the HW version)
- Maximum load up to 50 nF*
- Maximum frequency up to 1500 Hz*
- Continuous use capability due to minor heat emission
- Complete control of the waveform by easy-to-use custom description language
- Converter efficiency around 25%
- SiP in VFQFPN 5x6 mm 44 leads 0.4 mm pitch
- FW and HW safety features
- Sheathed output connectors

*There is a natural tradeoff between the output signal amplitude, frequency and the load driven. If one of the parameters is maximized, the other two are not able to reach their maximum. NOTE: It is also possible to make HW versions with higher power output by changing the transformer and tuning the flyback operation.

APPLICATIONS

- Dedicated HV driver for ELFIAC
- Compact laboratory HV source
- Electroactive polymers
- Piezos with high voltage but low current requirements (typically below 50nF load)
- Electro vibration
- MEMS devices
- Electrostatic chucks
- Electrophoresis

For more information:

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