RF Power MOSFETs Enable Longer-Lasting Broadcast and Medical-Imaging Equipment

High-power radio-frequency devices such as medical scanners and plasma generators will offer improved uptime for owners, as well as increased performance and lower costs, by using the latest generation of high-frequency power transistors introduced today by STMicroelectronics, a global leader serving customers across the spectrum of electronics applications and a world leader in power semiconductors.

Upgrades to ST's production process allow its latest RF power MOSFETs to withstand peak voltages up to 200V, which is at least 20% more than competing devices. This increased ruggedness helps extend the operating lifetime of the power transistor, thereby reducing equipment downtime and ownership costs. The advanced process also improves the MOSFET's gain, efficiency and high-power characteristics, which can help improve equipment performance and simplify design.

In addition, the new devices feature the latest generation sealed-ceramic and ST Air Cavity (STAC®) package technologies, which speed-up removal of thermal energy from the die, increasing reliability. This helps further to reduce equipment servicing costs.

The SD4931 and SD4933 are 150W and 300W N-channel RF power MOSFETs for 50V DC large-signal applications up to 250MHz. The devices deliver the advantages of ST's enhanced vertical silicon process in a sealed ceramic package featuring flanges for bolt-down mounting.

The STAC4932B and STAC4932F utilize ST's STAC package in bolt-down and flangeless variants, and target 100V pulse applications at power ratings over 1000W, such as laser driving and Magnetic Resonance Imaging (MRI). The high thermal and electrical efficiency of the STAC package, which has a thermal base for direct soldering to a heatsink, enables the MOSFETs to produce high signal power at

high frequencies while maximizing reliability throughout an extended operating lifetime.

Major features:

- Breakdown voltage ($V_{(BR)DSS}$) > 200V
- 200°C maximum junction operating temperature
- 20:1 all phases load mismatch capability (SD4931/4933)
- Output power (P_{OUT}):
    - 150W min. with 14.8dB gain @ 175MHz (SD4931)
    - 300W min. with 24dB gain @ 30MHz (SD4933)
    - 1000 W min. (1200W typ.) with 26dB gain @ 123MHz (STAC4932B/F)

Devices in the ceramic package are already in production and are priced, in quantities of 1000 units, at $43.65 for the SD4931 and $77.60 for the SD4933. The STAC4932B (now in production) and the STAC4932F (production in June 2011) devices in the STAC package are priced at $67.90. Alternative pricing options are available for larger quantities.

For further information, please visit www.st.com/rf [1]

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