TrenchFET MOSFETs

A series of new TrenchFETs that set records for on-resistance in the tiny LITTLE FOOT&reg SC-89 and SC-75 packages were announced by Siliconix incorporated, a subsidiary of Vishay Intertechnology. The smallest MOSFETs on the market, the new devices will serve as a power-efficient replacement for the digital bipolar transistors used for simple or light-load switching in portable communications systems, computer motherboards, power supply converter circuits, and battery-operated equipment.

Devices in the 3-pin LITTLE FOOT SC-89, with a footprint area measuring 1.6 mm by 1.6 mm and a height profile of just 0.6-mm, include the Si1012X, a single n-channel 20-V TrenchFET with on-resistance of just 1.25 ohms at a 1.8-V gate drive-76% lower than any competing device in the same package.

Fully on at a gate-source voltage of 1.8 V, the Si1012X requires significantly less power to operate than the digital bipolar transistors it will replace. The new device further improves on existing industry standards with a 500-mA steady state continuous drain current (TA=25&#176C) that offers an improvement of as much as 66% over competing devices, making it suitable for a wide range of low supply voltage applications. A 5-ns turn-on time, which lowers circuit timing delays, also sets a record for this package type and is nearly four times faster than the nearest competitor.

Also released today was a dual-channel version of the same device. The new Si1024X combines two MOSFETs in a 6-pin LITTLE FOOT SC-89 package with the same specifications per channel as the Si1012X and the same footprint and height profile as the 3-pin SC-89.

With a height profile that is 45% thinner than the SOT-23 and SC-70 formats, the new SC-89 LITTLE FOOT MOSFETs allow small to medium loads to be switched with maximum efficiency in even the thinnest mobile communications and computing products.

Along with the Si1012X and Si1024X, Vishay Siliconix will soon release more than a dozen additional 20-V MOSFETs in the SC-89 and SC-75 packages, including n- and p-channel devices. Maximum on-resistance ratings for these devices will range from 0.7 W to 9 W at a gate-source voltage of &#177 4.5 V. All devices in both package types feature ESD protection to reduce the risk of electrostatic damage during handling.

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