

Epson Selling DMOS-ASICs that Support High Voltage and High Current

Epson to begin by accepting domestic orders for DMOS-ASICs in the S1X8H000 and S1K8H000 series

Seiko Epson Corporation (TSE: 6724, "Epson") is now selling single-chip DMOS-ASIC¹ products that integrate IP cores² for specific applications and a logic circuit on a DMOS (double-diffused MOSFET)³ that supports high voltage and high current. Epson has begun by accepting domestic orders for DMOS-ASICs in the S1X8H000 and S1K8H000 series.



S1X8H000

Meanwhile, with the world increasingly turning its attention to efforts to address global warming and other environmental problems in order to achieve sustainability, the semiconductor market is looking to address the problem of power loss. Demand is rising for semiconductor components that use electrical power efficiently even if they are compatible with high voltage and high current. Furthermore, demand for low-power semiconductor components that mitigate power loss is accelerating due to the continued expansion of the home appliances and electronics markets in emerging countries and the growth of electric vehicles, hybrid vehicles, and other next-generation vehicles.

To meet this demand and address environmental problems, Epson decided to enter the market for DMOS-ASICs that support high voltage and high current. This is an area where the company can capitalize on the low-power CMOS process and the DMOS process technology that it accumulated during internal development and production of chips for internal use.

Epson has accumulated a lineup of IP cores based on intellectual property that the company developed for its own finished products. Epson will commercialize products using ASIC development methods based on four decades' worth of experience supporting industry with

long-term stable supply and flexible designs.

Epson will start by offering products in the S1X8H000 and S1K8H000 series, low-power ASICs (embedded arrays and standard cells) that combine 0.15-micron CMOS and DMOS technology to support high voltage and high current and that can also integrate control logic circuits to achieve low power consumption.

Epson uses its unique circuit engineering technology to tackle the previously difficult problem of integrating analog control elements. Power semiconductor elements, dedicated ICs, and high voltage and high-current components that occupy board space are provided in advance as IP cores, and even logic circuits designed by customers are integrated to create single-chip DMOS-ASICs. This alleviates the need to procure multiple parts, reduces the number of parts, and saves power by optimally controlling current consumption, which helps customers make their products smaller, reduce their power consumption, and lower their development costs.

These products are ideal for a wide range of applications in, among other things, bi-directional communications network circuits such as IO-Link, high-voltage switches, switching power supplies, motor drivers with built-in control functions, and H-bridges for driving motors.

Product Features

- DMOS transistors reduce on-resistance by 50% or more compared to the conventional high-voltage MOS process, reduce power loss, and achieve high efficiency while maintaining high voltage.
- A 0.15-micron CMOS logic circuit, DMOS process, non-volatile memory, and more can be integrated on a chip.
- A host of functions can be provided as IP cores.

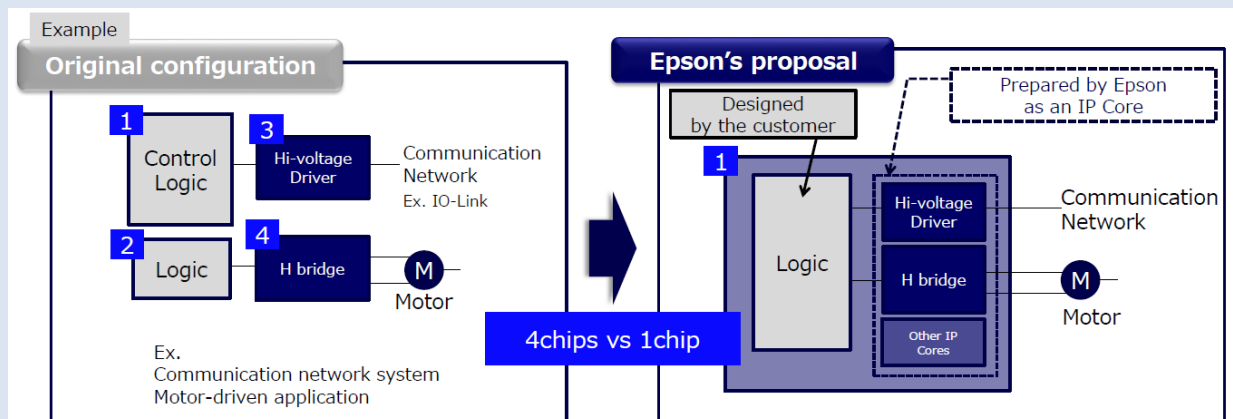
Examples of IP cores*: DMOS transistor with overcurrent detection function, H-bridge circuit, LDO, EEPROM, SRAM, safety function-undervoltage detection, overvoltage detection, heating detection

* Epson plans to develop a succession of additional IP cores.

Outline Specifications

Model No.	S1X8H000 / S1K8H000
Supply voltage	I/O 2.7 V to 5.5 V
DMOS withstand voltage	PMOS 40 V NMOS 60 V
DMOS current	2 A (reference value)
I/O driving capability	2, 4, 8, 12 mA / 3.3 V
Logic circuit	High integration using five interconnect layers
Package	QFP48 to 256 pins, QFN, PBGA, PFBGA
Temperature range	Ta = -40°C to 105°C (Tjmax = 150°C)

System Architecture



Information

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- 1 ASIC: An application-specific integrated circuit. A type of electronic component, an ASIC is any integrated circuit that combines the circuits for multiple functions for a specific application into a single package. Epson's lineup of ASICs includes multiple series of gate arrays, embedded arrays, and standard cells, depending on the extent of customization.
- 2 IP core (intellectual property core): A block of circuit information for configuring an LSI, especially one that provides a particular function.
- 3 DMOS (double-diffused MOSFET): A transistor that uses a large amount of electric power from the surface to the bottom of the wafer and has a structure that achieves high withstand voltage by passing a large current in the vertical direction of the wafer. DMOS are commonly used in the withstand voltage range between several 10s and several 100s of volts.
- 4 CMOS (complementary MOS): A logic circuit that uses complementary pairs of n-type MOS transistors and p-type MOS transistors, which can be created by changing the impurities added to the semiconductor. The power consumption of CMOS semiconductors can be made far lower than that of semiconductors composed of only n-type or only p-type MOS transistors.