

Another Source For Automotive LDOs With Options For Higher Integration

[Taiwan Semiconductor's](#) TQL8xx family of automotive-grade (AEC-Q101 qualified), low-dropout regulators (LDOs) offers manufacturers a reliable alternative source for the critically important linear regulators utilized in numerous battery-driven automotive functions, including dashboard, cluster, climate control, fuel pump and advanced driver-assistance systems (ADASs). They are also well suited for secondary supply applications where a regulated output is essential during very low-cranking voltage conditions.

Designed for stability in automotive battery-connect applications, the TQL8xx LDOs maintain 2% accuracy over a wide range of input voltages and a full operating temperature range of -40°C to +125°C. They are offered in models with fixed outputs of 3.3 V or 5 V and feature typical dropout voltages of 70 to 80 mV at $I_O = 100$ mA.

With many customers facing long lead times on sole-sourced components, the availability of automotive-grade LDOs required in critical applications is welcome news, says Kevin Parmenter, FAE director Americas for Taiwan Semiconductor. And while some parts are drop-in replacements for LDOs offered by other vendors, the family also includes models with additional features (such as power-on reset and watch dog timers) not found on the existing LDOs.

"There are a lot of things to like about these new LDOs," says Parmenter who adds "they offer automotive quality and reliability—even for industrial applications—at value pricing and compelling delivery (lead times)." According to Parmenter some of the new family members are already being designed into engine control systems, aftermarket automotive applications, and heavy machinery such as trucks, buses, and farm and construction equipment.

The TQL8xx family's four package configurations offer a choice of functions:

- SOP-8EP package: Ignition enable pin (only)
- SOP-8EP-package: Enable, reset and watchdog output; and reset threshold adjustment
- TSSOP-14EP package: Enable, reset and watchdog output; and reset threshold adjustment
- TSSOP-14EP package: Enable, watchdog monitor input; watchdog output, reset threshold adjustment; and program timing adjustment.

"These reliable, in-house-manufactured AEC-qualified LDO devices provide a viable alternate source for high-demand devices used in myriad automotive battery circuit applications," said vice president, TSC Products, Sam Wang. "They also provide a high-performance option in industrial and high-reliability applications."

Design resources include comprehensive datasheets and Spice models for each component in the series. The devices are priced from \$1.41 in OEM quantities. Samples are in-stock at Digi-Key and Mouser. For more information, see the [website](#) or click on the links in the table.

Table. Key specifications and features for members of the TQL8xx family of AEC-Q101 qualified (LDOs).

Model	I_{OUT}	I_Q	V_{OUT}	Features	Packaging
TQL820CA14V33	200 mA	40 μ A	3.3 V	Enable, reset, watchdog functions	TSSOP-14EP
TQL820CA14V50	200 mA	40 μ A	5 V	Enable, reset, watchdog functions	TSSOP-14EP
TQL821CSV33	200 mA	30 μ A	3.3 V	Enable	SOP-8EP
TQL821CSV50	200 mA	30 μ A	5 V	Enable	SOP-8EP
TQL850CSV33	500 mA	40 μ A	3.3 V	Enable, reset, watchdog functions	SOP-8EP
TQL850CSV50	500 mA	40 μ A	5 V	Enable, reset, watchdog functions	SOP-8EP
TQL851CSV33	500 mA	30 μ A	3.3 V	Enable	SOP-8EP
TQL851CSV50	500 mA	30 μ A	5 V	Enable	SOP-8EP