



Eaton's Current sensing transformers (ECST) for 5G applications

Offering faster data transmission, increased capacity, lower latency, and higher bandwidth than existing communication protocols, 5G technology will have profound effects on how people live, work, and play across the world. According to Gartner, 840 million 5G-enabled smartphones will be sold globally by 2023.¹

Due to higher frequency levels for 5G connectivity, 5G base stations consume significantly more power than 4G base stations, which, in turn, makes power optimization more critical to reduce operating costs for asset owners. Power supply system design has evolved into high-voltage DC systems comprising the latest switched-mode power supplies (SMPS) and high energy density batteries for increased backup

power storage capacity. 5G base stations require current sensing to detect and measure current in power supply circuits. Current sense transformers (CSTs) provide an electrically-isolated sensing solution for high-frequency communications.

CSTs are electronic components designed to sense and measure current flow in power supply circuits in a non-invasive way. Their mode of operation is shunting a small sample current and measuring it while dissipating minimal energy. CSTs typically produce an alternating current in the secondary winding that is proportional to the current being measured in the primary winding. The sensed current is then used to prevent overcurrent and monitor or control circuits in power supplies and other powered applications. CSTs also

enable 5G system designers to comply with the applicable safety standards while minimizing power consumption.

Notably, a lower DC resistance minimizes power dissipated due to heat. CSTs must also have a small footprint to fit into space-constrained and component-dense circuit boards. Other essential considerations for selecting CSTs for 5G applications include maximum current to be sensed, frequency of the current waveform, duty cycle of the current waveform, and the desired output voltage across the terminating resistor.

Eaton's current sense transformers (ECST) are suitable for high-reliability commercial applications. The ECST provides accurate sensing and measurement of current levels

in power circuits and comes with a very low DC resistance coil that can sense current levels and current direction changes with minimal energy dissipation.

Eaton's ECST helps prevent overcurrent conditions and other current fault conditions in powered circuits. They feature a single-turn, low-resistance winding, and a rugged bobbin secondary winding ideal for use in harsh operating conditions. Applications of Eaton's ECST include improving the efficiency of high-frequency switched-mode power supplies, AC detection, load drop or shutdown detection, as well as system tampering detection, load measuring, and high-frequency current sensing.

[15G is the Backbone of Future Technology Innovation](#)

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