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C4Or1D-08: Next Generation Space Cryocooler Electronics Products

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The explosion in earth and space observing satellite developments has led to a need for a broad range of cooling solutions for the associated imaging sensors. Cooling is generally provided by thermo-mechanical cryocoolers. Driving and controlling cryocoolers requires specialized power electronics that provide both power and control to the cryocooler, these electronics are called Cryocooler Control Electronics (CCE).

Since the cooling power the cryocoolers are required to provide varies over a large range, the requirements of the associated CCEs also vary widely. For instance, CCEs supporting this range of missions vary in output power from 30 watts to more than 500 watts.

In this presentation, Iris Technology will discuss our ICE-G (Iris Control Electronics with GaN FETs) series of CCEs. The ICE-Gs all share the same processing core but have specialized power handling circuits depending on the output power required. Using GaN FETs increases CCE efficiency, decreases CCE cost, and reduces CCE weight when compared to MOSFET solutions.

For several years Iris Technology has been developing a new line of cryocooler electronics (CCE) based on higher-efficiency GaN FET power transistors and reprogrammable microcontrollers. This product line has been growing, starting with a 30-watt unit several years ago, then the 60-watt version, and last year extending to a 200-watt model. In this presentation, we will introduce a new model that addresses the up to 600-watt class of cryocoolers.

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