



News Release

Patent Announcement: Galvanic Isolated Based Voltage Sensors

QorTek Inc., a developer of advanced electronics, materials, and devices, announced today a new achievement in radiation tolerant voltage sensors and voltage isolators: *Sense-V* devices. These devices considerably strengthen the company's portfolio in power sensing and isolation mechanisms and rad-hard electronics. QorTek has been awarded patent Ser. No. EP3127172B1 by the European Patent Office (EPO) that introduces an entirely new method for enabling electrically (galvanic) isolated voltage subcompact-scale to micro-scale (thin film) sensors and isolators based on piezoceramics technology.

A fundamental requirement for nearly all electronics subsystems and equipment is that the electrical circuits with highly diverse voltage levels and currents be capable of working together as a system and can be coupled while remaining electrically isolated or galvanically separated from one another. Applications requiring galvanic isolation include industrial sensors, medical transducers, auxiliary converters, battery chargers, choppers, and mains powered switch mode power supplies. Operator safety and signal quality are insured with isolated interconnections. For some instruments and sensors, low-level DC and AC voltage levels must be accurately monitored even in the presence of high common-mode noise. Voltage sensors are key to facilitating monitoring of voltage levels within an electrical system. These devices identify undervoltage or overvoltage concerns and their isolation capability can be used to protect other parts of the electronics that are connected to the voltage level being monitored. Patent EP3127172B1 discloses *Sense-V* devices that introduce a new class of subcompact sized to micro-sized voltage monitors and (very high) galvanic isolators. These new ceramic *Sense-V* voltage monitoring/isolation devices can replace legacy opto-isolators, Hall-effect, and magnetic transformer voltage isolators and voltage monitors.

Importantly, *Sense-V* devices eliminate need for any signal conditioning and processor electronics. As such, these new devices offer large advantages over existing sensing and isolation products in that they are inherently highly radiation immune and exhibit very low EM radiation/susceptibility (nearly none). A further large advantage over existing products is that these can function equally well over a large range of temperatures, providing voltage sensing over a -55°C to 200°C range. *Sense-V* technology provides superior voltage isolation (ground loop elimination) in a subcompact or micro-scale package size that largely reduces the size/weight penalty for such electronics components.

Funded by NASA, this technology development is aimed at space system power monitoring and ground loop elimination of on-board electronics for which wide temperature range operating power flow monitoring devices simply did not exist. The new ceramic-based devices address space equipment and electronics needs to handle on-board electronic circuitry, power distribution, and data transfer interfaces that are all operating at different current/voltage levels. Of particular interest is for *Sense-V* technology to replace isolation amplifiers widely used in space mission designs. The small size and high temperature withstanding of the *Sense-V* analog ceramic sensors have attractive application to high-pressure and high-temperature (HPHT) oil & gas wells offering to eliminate very expensive dewar packaging presently required for legacy sensors.

The *Sense-V* (high galvanic) voltage isolation and voltage measurement patent details may be accessed at: <https://patents.google.com/patent/EP3127172B1/en>

About QorTek Inc.

With over 60 employees, including 35 Engineers (EE, ME, MatSE) and 5 PhDs, QorTek is a world leader in smart material devices and high-density power electronics, innovating, developing, and providing quality solutions to a diverse array of industries including underwater systems, land & air systems, military & commercial space systems, medical, and industrial. The dedicated and experienced team is committed to creatively advancing technology to promote sustainable business growth, driven by dynamic engineering enabled by advanced science and technology.

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