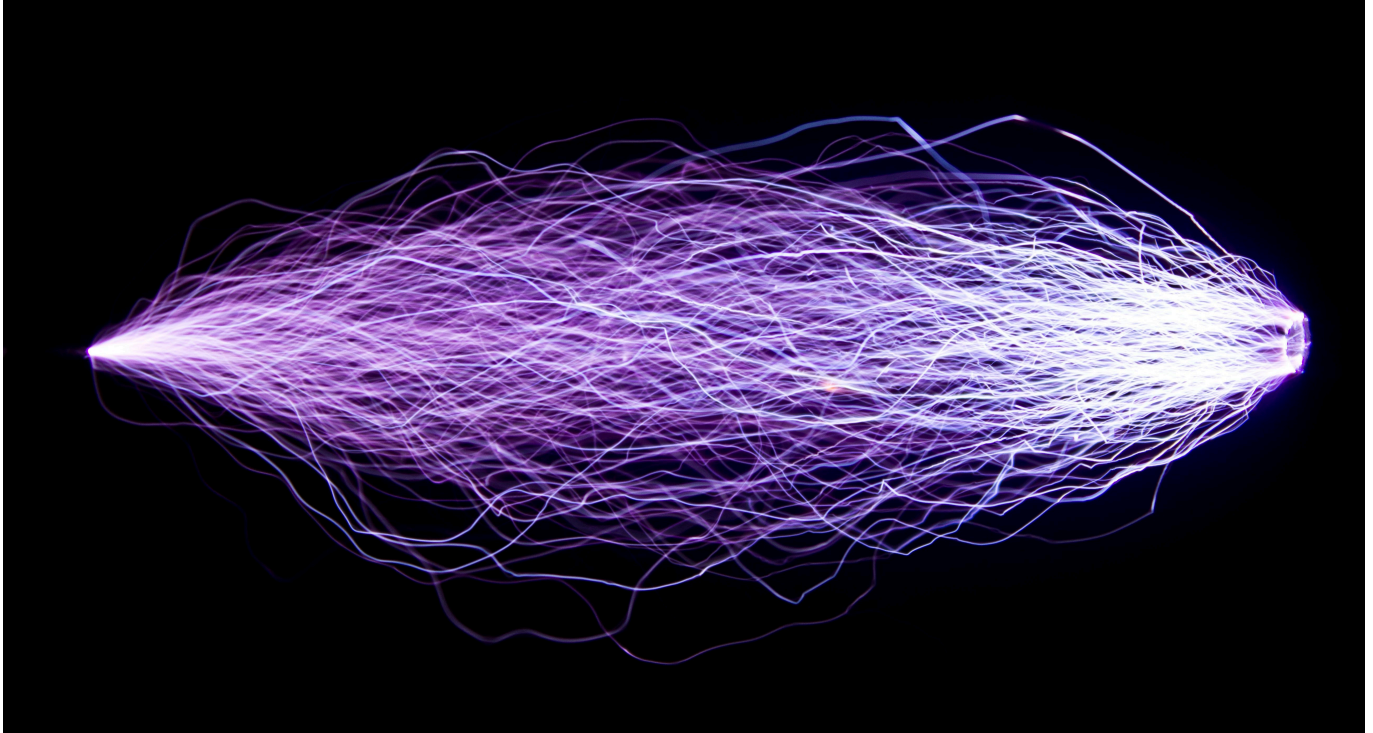


TECH OFFER

Remote Partial Discharge Detection, Monitoring, and Identification System



KEY INFORMATION

TECHNOLOGY CATEGORY:

Electronics - Sensors & Instrumentation

Energy - Sensor, Network, Power Conversion, Power
Quality & Energy Management

TECHNOLOGY READINESS LEVEL (TRL): **TRL6**

COUNTRY: **SINGAPORE**

ID NUMBER: **TO174953**

OVERVIEW

Partial discharges (PDs) are early indicators of the deteriorating health condition of high-voltage electrical assets in power distribution networks. PDs are caused by localised dielectric breakdowns within assets such as generators, transformers, and switchgears. Left undetected, the health of the assets can deteriorate and lead to irreversible damage, posing safety hazards such as fire and explosion. Therefore, there is a need to detect and monitor PD events to ensure asset health and safety to extend the life time.

This technology offer is a compact PD sensor equipped with a fast detector which can be mounted on assets to detect and monitor PD events 24/7. The system integrates a wireless platform, allowing remote retrieval of information about the times of PD occurrences and source identifications (IDs). This information can be used to trace and identify PD emitting sources.

By using the proposed technology to detect and monitor PD events, early signs of asset degradation can be identified. This

allows necessary preventive measures to be taken to avoid unexpected failures and damages, saving costs associated with repair or replacement. Additionally, the technology enhances safety by minimizing the risk of fire and explosion caused by PD-related damages. Overall, the proposed technology helps ensure the health and safety of high-voltage electrical assets, while reducing costs and downtime associated with unexpected failures and damages.

TECHNOLOGY FEATURES & SPECIFICATIONS

The main features of the technology offer are:

- A highly innovative solution that consists of a patented near-field PD sensor integrated with a high-speed detector.
- Can be powered by either a battery or an external power source, providing maximum convenience and versatility.
- Designed to work seamlessly with a wireless platform, enabling measurement data to be stored either on premises or in the cloud.
- Remote monitoring and data analytics capabilities allow users to quickly identify and troubleshoot issues in real-time, minimizing downtime and maximizing asset health and performance.

The system's patented near-field PD sensor, high-speed detector/processing unit, and versatile power options make it the ideal choice for users seeking the highest levels of performance, reliability, and flexibility. The system can be further customised to monitor the health and performance of high-voltage electrical assets such as generators, transformers, and switchgears.

- Minimum size of sensor is 150mm * 150mm * 8mm
- Size of the processing unit is 150mm * 90mm * 45mm
- Maximum power required by the system is 2W; it can be powered by a battery or adapter which can provide 5V voltage through USB type-C interface

POTENTIAL APPLICATIONS

This technology offer is versatile and can be deployed in a wide range of different applications, such as, in high-voltage power transmission and distribution industries, especially for owners of high-voltage electrical machines and equipment providing critical services. The technology benefits:

- Semiconductor fabrication plants to ensure high-voltage electrical assets remain in peak condition, minimizing downtime and financial losses.
- Data centres to ensure reliable and efficient power supplies to operate effectively and deliver uninterrupted services to clients
- Public transportation systems such as, trains and subways, to ensure their safe and efficient operation.
- Hospital environments to provide reliable and efficient electrical assets that are critical for patient care and treatment

UNIQUE VALUE PROPOSITION

Existing PD measurement systems in the market are deployed for periodic PD measurements, which is not real-time and may miss out early signs of insulation degradation of high-voltage equipment. These systems are sophisticated and good for comprehensive diagnostic and analysis, but they are too costly for large-scale deployment to provide 24/7 PD monitoring of multiple assets simultaneously.

This technology offer is a low-cost, non-intrusive method which is scalable for deployment in a large-scale environment. The

wireless platform allows remote monitoring of multiple assets at multiple sites from a dashboard. The data will be automatically collected and stored in the cloud for long-term analysis. Hence, this technology serves as a first-level PD detection and monitoring to identify a specific asset with degraded insulation issue and a more sophisticated PD measurement system can then be deployed for diagnostic purposes.

The technology owner is keen to do R&D collaboration and licensing to high-voltage equipment manufacturers, and power system maintenance service providers.