Quantum Fingerprint™ (Charge Based Transient Level Spectroscopy Analysis) trace chemical detectors are desirable due to their high sensitivity, high selectivity, rapid acquisition and response rates, and robustness. These detectors are able to detect trace amounts of the target species (less than ppb denominations). High sensitivity is a desired feature in the field; most situations call for foreign environments and samples of mixed species. The detector’s ability to function with minimum delays allows for rapid sampling and data processing. Quantum Fingerprint™ detectors are promising due to its long operating life, low maintenance costs, and resilience to rugged environments.

Undoped Gallium Arsenide served as the base material for the Quantum Fingerprint™ sensor’s metal-semiconductor interface. This report elaborates on the importance of Ohmic and Schottky contacts for the viability of a semiconductor-based device and the preparation of metal-semiconductor interfaces. The interface is centered on a Gallium Arsenide (1 cm x 1 cm) square wafer. A (Nickel/ Germanium/ Gold/ Nickel/ Gold/ Nickel) deposition is placed on one side of the Gallium Arsenide Wafer. The other side of the interface is undoped Gallium Arsenide. Gallium Arsenide served as a viable semiconductor base material, since water vapor was detected in both open-air and deionized water modules.