AKM AK09919 :: Magnetometer

th muda engineering

The AKM AK09919C is a 3-axis magnetometer with highly sensitive Hall sensor technology that detects the earth's magnetism with a resolution of 0.15 μT and outputs the magnitude of the magnetic field in each of the X, Y and Z axes as a digital value.

The primary strength of the AK09919C lies in its high sensitivity and accurate three-dimensional magnetic field measurement capability. By providing independent digital measurements for all three axes, it enables reliable electronic compass functionality, tilt-compensated heading calculations, and motion tracking when combined with accelerometers and gyroscopes.

The software is architected with long-term maintainability, portability across MCU platforms, and adherence to high software quality standards as core design principles.

✅ Layered architecture with clear HAL abstraction
✅ Conforms to ISO C99 standard
✅ Portable across multiple MCU platforms
✅ Supports both RTOS and bare-metal environments
✅ CMake build system for scalable integration
✅ Seamless integration with GCC toolchain
✅ Statically analyzed for MISRA, CERT, and CWE compliance

Initialization Interface

```
ak09919_result_t ak09919_init( ak09919_handle_t*, ak09919_attr_t )
```

Configuration Interface

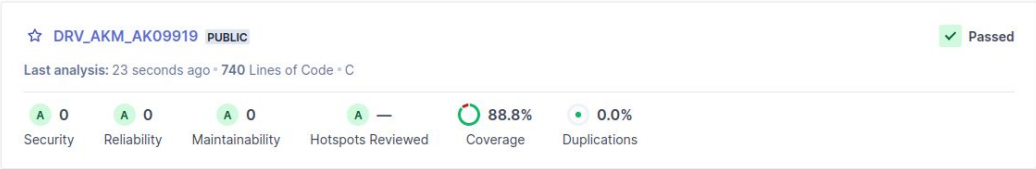
```
ak09919_result_t ak09919_set_config( ak09919_handle_t*, ... )
ak09919_result_t ak09919_set_power_mode( ak09919_handle_t*, ... )
ak09919_result_t ak09919_set_mode( ak09919_handle_t*, ... )
```

Data Retrieval Interface

```
ak09919_result_t ak09919_get_device_info( ak09919_handle_t*, ... )
ak09919_result_t ak09919_get_status( ak09919_handle_t*, ... )
ak09919_result_t ak09919_get_config( ak09919_handle_t*, ... )
ak09919_result_t ak09919_mag_read( ak09919_handle_t*, ... )
```

Self-Test Interface

```
ak09919_result_t ak09919_mag_self_test( ak09919_handle_t* )
```



Communication Interface: I²C