

Date: February 08, 2007**Saturn 6000 Operational Description for FCC**

The SAT6000 is a Contactless Smart Card Interface. It acts as a reader for ISO14443 Proximity cards.

As common to such readers, card operation (as the card has no battery) and data reception requires constant carrier transmission where Card to Reader data modulation is performed by the card modulating the load it represents to the reader antenna.

Reader to Card data transmission is achieved using AM technique.

The carrier frequency is 13.56MHz. Transmission power is about 450mW over 50 ohm.

The antenna is a small loop antenna (L8 shown in schematic diagram is the actual antenna loop).

It should be noted that very little of the antenna magnetic field is actually transmitted away from the antenna. This is due to the use of a very small loop antenna, which makes it a very inefficient radiator, or in other words antenna which has a very low Radiation Resistance so the radiated power is actually spent as heat in the antenna ohmic resistance, and the magnetic field around the antenna is of reactive type where energy is exchanged back and forth between the current in the antenna and the small volume around it during each carrier cycle.

Radiation resistance of small loop is $R_r = 31200A^2/\lambda^4$ where A is the loop antenna area.

This formula yields an extremely small radiation resistance (less than 10^{-7} ohm). This resistance may be considered as if connected in series with the antenna ohmic resistance (and the driver output resistance). This explains why only a minute fraction of the magnetic field energy actually propagates away from the antenna.

Four signaling LEDs are used to indicate the transaction status.

The host communication is via RS232 or USB. An on board SMPS regulate the input DC supply down to 5VDC.

A transformer based wall mount 120VAC/12VDC non regulated power supply is usually used.

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