

Applicant: UNION COMMUNITY co.,Ltd.

Model Name: V-RF32B

1. Operation Description

1) General Description

The eProx MCM is supplied by means of an electromagnetic field induced on the attached coil. The AC voltage is rectified in order to provide a DC internal supply voltage. When the last bit is sent, the chip will continue with the first bit until the power goes off.

2) Radio Architecture

(1) Transmitter Architecture

The circuit performs the two functions of an RFID basestation, namely: transmission and reception.

Transmission involves antenna driving and AM modulation of the RF field. The antenna drivers deliver a current into the external antenna to generate the magnetic field. Reception involves the AM demodulation of the antenna signal modulation induced by the transponder. This is achieved by sensing the absorption modulation applied by the tag (transponder).

The antenna drivers supply the reader basestation antenna with the appropriate energy. They deliver current at the resonant frequency which is typically 125 kHz. Current delivered by drivers depends on Q of external resonant circuit. It is strongly recommended that design of antenna circuit is done in a way that maximum peak current of 250 mA is never exceeded (see Typical Operating Configuration for antenna current calculation). Another limiting factor for antenna current is Thermal Convection of package. Maximum peak current should be designed in a way that internal junction temperature does not exceed maximum junction temperature at maximum application ambient temperature. 100% modulation (field stop) is done by switching OFF the drivers. The ANT drivers are protected against antenna DC short circuit to the power supplies.

(2) Receiver Architecture

The demodulation input signal for the reception block is the voltage sensed on the antenna. DEMOD_IN pin is also used as input to Reception chain. The signal level on the DEMOD_IN input must be lower than $VDD-0.5V$ and higher than $VSS+0.5V$. The input level is adjusted by the use of an external capacitive divider. Additional capacitance of divider must be compensated by accordingly smaller resonant capacitor. The AM demodulation scheme is based on the "AM Synchronous Demodulation" technique. The reception chain is composed of sample and hold, DC offset cancellation, bandpass filter and comparator. DC voltage of signal on DEMOD_IN is set to AGND by internal resistor. The AM signal is sampled, the sampling is synchronised by a clock from VCO. Any DC component is removed from this signal by the CDEC capacitor.