

# 1 TOYOTA 500N RECEIVER DESCRIPTION

The module is a Super-heterodyne Radio Frequency receiver used to receive transmissions from automotive Remote Keyless Entry transmitters. It consists of a super-heterodyne ASIC, a Microchip PIC16F76 microcomputer, a stamped wire antenna, discrete components, a single piece polypropylene housing with a living hinge cover, and a Zinc plated bracket. All of the electronics are mounted on a FR4 double-sided PCB. All components except two screws are mounted on the topside of the PCB. All of the electrical components except the connector and antenna utilize surface mount packaging and are placed on the topside of the PCB and reflow soldered.

## CIRCUIT DESCRIPTION

The antenna signal is fed through an impedance matching network into a SAW filter that prevents the receiver from being overloaded by interference signals. Then it goes into another matching network, and then into a superhet chip made by Infineon which converts the RF signal into a demodulated data signal which is output to a microprocessor. A surface mount crystal is connected to the superhet chip to provide a reference frequency for the local oscillator, and a 10.7 MHz surface mount IF filter determines system bandwidth. Additional components (resistors, capacitors) are connected to the ASIC (U2) to set up the data slicer.

## MODULE OPERATION

The normal receiver state is the “sleep” mode. In this state the RF section is disabled. Approximately every 38 ms the receiver will wake up, enable the RF section and check for valid data. If no data is found, the receiver returns to sleep mode. If valid data is detected, the receiver decodes the transmission and sends the appropriate message to the vehicle's Body Control Module over a USART serial data line, RDA. The module can also receive programming or diagnostic messages from the Body Control Module over a separate USART serial data line, PRG.

## SIGNAL DEFINITIONS

+B - Connects to vehicle positive battery power.

RDA – Active Low, pulled high inside Body Computer. This serial data link is a single direction data channel (receiver to body module) that communicates received remote commands to the body module for execution. It also provides feedback during programming and diagnostics for service or plant use.

PRG – Active Low, pulled high inside receiver module. This serial data link is a single direction data channel (body module to receiver) that communicates commands to the receiver to enter programming or diagnostic modes.

GND - Connects to vehicle ground.