TECHNICAL DESCRIPTION (SHL IVU Receiver)

SYSTEM DESCRIPTION

The SHL IVU receiver module is single-conversion, super-heterodyne receiver used to receive command data for a low-cost Car Starter.
The operating frequency is 433.920MHz, and uses OOK modulation. The Car Starter module decodes the Remote data word and performs the required task.

This module mounts near the rear-view mirror with double-sided tape.

CIRCUIT DESCRIPTION

Receiver Section

The design is achieved with a single conversion super-heterodyne integrated receiver IC with a post 3-pole band-pass filter and trap.

The signal enters via J2 and via a 3pole (C16, 17, 19, 20 and L3) band pass filter.
Signal is forwarded to U1 pin9 thru C13. (LNA input) The output is at pin 7 and then forwarded to the IC mixer. (Pin6)
Internal to the IC is a PLL-based VCO fixed-divider (/64) reference crystal oscillator phase-frequency detector and charge pump. Y1 C3/C4 will oscillate at 6.77475MHz for the reference.
L2, C11, C18, C14 and D1 oscillate about 330KHz lower than 433.92MHz.(433.590MHz)
The charge pump output (pin19) is filtered by 3-pole LPF, C10, C12 and R3.
TP3 reference voltage is 2.5V nominal.
The output of the mixer (pin4) is forwarded to the internal 80dB logarithmic amplifier/data filter.
The linear data output is filtered and compared by an integrated 1-bit comparator.
The reference signal is derived by R8/C23. R7 provides a DC offset. This reduces the noise output on the data line.(J6, pin2)

LED, D2 shows system activity. (The cathode is grounded via the Car module)

INTERNAL CIRCUIT VOLTAGES

A reference schematic is provided for in circuit voltages. These voltages are provided to help trouble-shoot defective circuit boards. The values may vary ±10%.

PRODUCT TECHNICAL SPECIFICATION

SHL IVU
RECEIVER SPECIFICATION

RECEIVER	Design Requirement	Actual
Nominal Receiver Frequency	433.920 MHz	
Receiver Sensitivity	-101 dBm min	Typ –103 dBm
Receiver IF Bandwidth	500KHz total DSB	By design only
Receive Data Rate Data Format Data short bit Data long bit	1.0Kbit/sec max. Nutek Code 500us 1000us	
Pulse distortion 33/66% duty cycle	Worst case <5% First received bit <10%	
Modulation	OOK	
Rx Data Out	0.2V Low data 4.3V min High data	
Voltage (neg. Gnd.) Tolerance	4.8V min, +5.25max	
Module current @5.0V(Not incl. the LED)	3.5mA max	
Temperature range	-30°C to +60°C	
TP3	1.5V min, 3.5V max	2.5V typical

SPECIAL SYSTEM REQUIREMENTS

Polling interval	N/A	
RCV ON time during polling	N/A	
Time to achieve good data	N/A	
Data distortion after 1 bit	<5%	
Preamble lost due to turn-ON delay(XCVR)	N/A	
Idle current (for remotes)	N/A	
Calculated battery life (for remotes)	N/A	

UNIT Case Size

35.0W X 84.0H X 17.5T (mm)