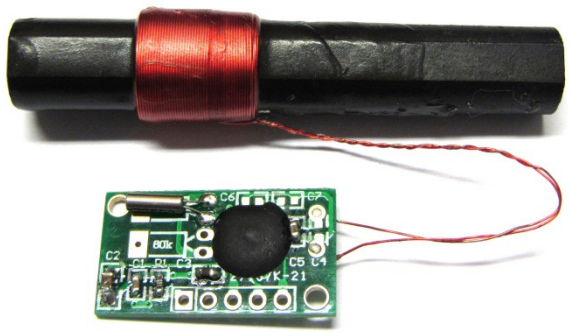
# TIME SIGNAL RECEIVER MODULE



- **Tuned ferrite antenna**
- **AM receiver IC board**
- **Reception of:**
  - German DCF77
  - US WWVB
  - British MSF
  - Japanese JJY60

## INTRODUCTION

The time signal receiver module comprises of a ferrite antenna and an AM receiver IC printed circuit board. The board includes a MAS6180B1 AM receiver IC accompanied with necessary filter crystal and capacitor components. The circuitry includes also an RC-filter for the supply voltage. The EB6180B1COB77K5A1 module is tuned for 77.5 kHz and suitable for receiving German DCF77 time signal transmission whereas the EB6180B1COB60K0A1 and A2 modules are tuned for 60 kHz suitable for receiving US WWVB, British MSF and Japanese JJY60 time signal transmissions. The A2 module with 100mm antenna bar is especially suited for WWVB to cover the weak signal areas.

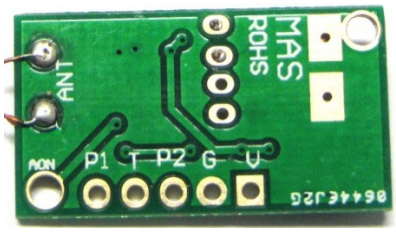
The MAS6180B1 AM receiver IC includes amplifier, demodulator and comparator blocks that transforms the received AM transmission into series of pulse width coded digital pulses which can be directly processed by an appropriate digital circuitry such as a micro controller unit (MCU).

## PIN DESCRIPTION

| Pin ID | Type | Function | Note |
|---|---|---|---|
| P1 | DI | PDN (power down) control pin | HIGH = receiver off<br>LOW = receiver on |
| T | DO | Time pulse output | |
| P2 | NC | - | Leave unconnected |
| G | G | Supply ground | |
| V | P | Supply voltage | |
| AON | DI | AGC on/off control (optional) | Leave unconnected when not used |

D = Digital, P = Power, G = Ground, I = Input, O = Output, NC = Not Connected

**PCB backside pin marking**



## ELECTRICAL CHARACTERISTICS

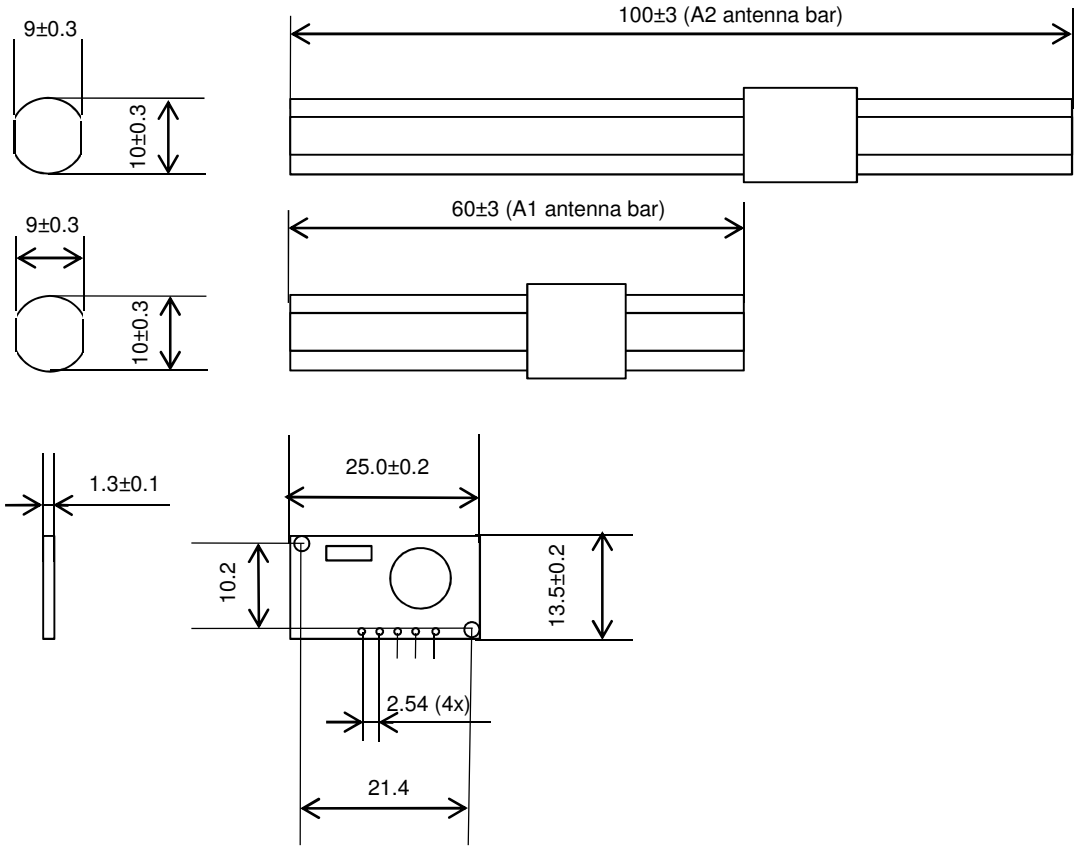
Operating Conditions: VDD = 1.5V, Temperature = 27°C, unless otherwise specified.

| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Operating Voltage | $V_{DD}$ | | 1.1 | 1.5 | 3.6 | V |
| Current Consumption | $I_{DD}$ | VDD=1.5 V, weak signal<br>VDD=1.5 V, strong signal<br>VDD=3.6 V, weak signal<br>VDD=3.6 V, strong signal | <br><br>31<br>24 | 66<br>40<br>68<br>42 | <br><br>85<br>65 | µA |
| Stand-By Current | $I_{DDoff}$ | | | | 0.1 | µA |
| Receiving Frequency | $f_{IN}$ | module EB6180B1COB77K5A1<br>module EB6180B1COB60K0A1<br>module EB6180B1COB60K0A2<br>See ordering information below. | | 77.5<br>60<br>60 | | kHz |
| Sensitivity | $E_{MIN}$ | | | 25 | | µV/m |

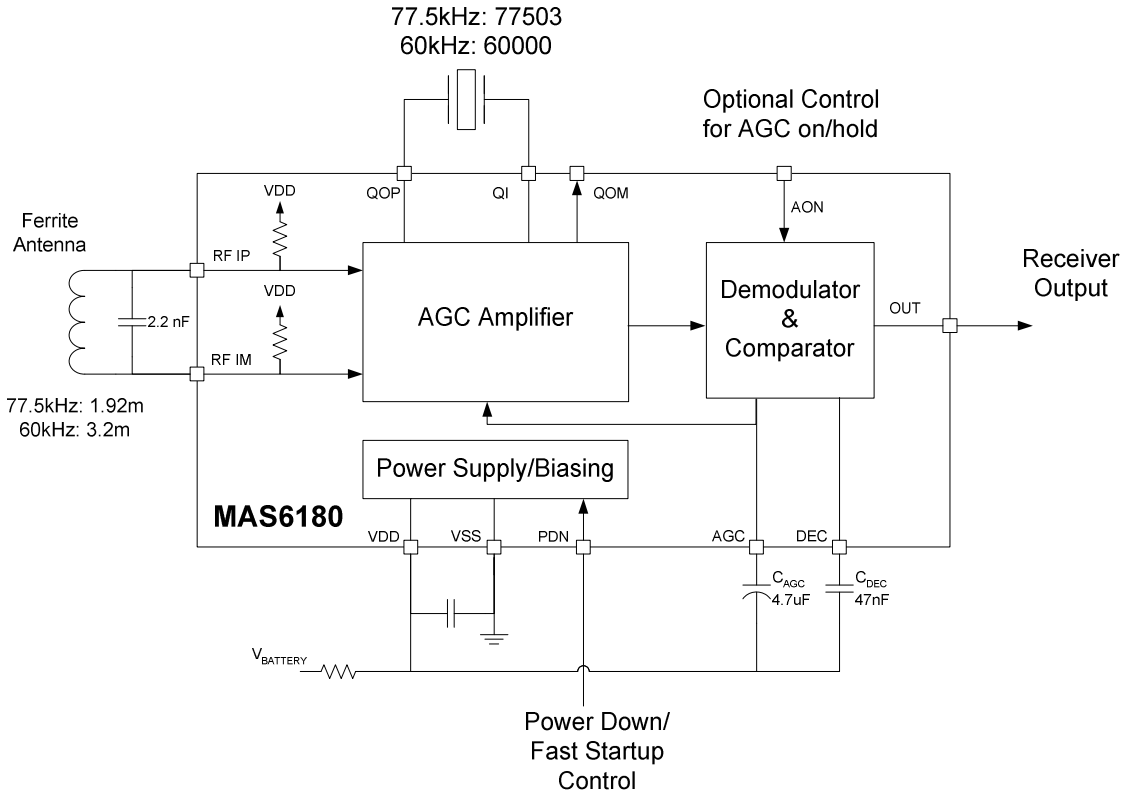
Note: For more detailed electrical characteristics see MAS6180B1 AM receiver IC datasheet

## MECHANICAL DIMENSIONS

| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Antenna | | | | | | |
| length | $L_A$ | A1 antenna bar<br>A2 antenna bar | -3<br>-3 | 60<br>100 | +3<br>+3 | mm |
| width | $W_A$ | | -0.3 | 10 | +0.3 | |
| height | $H_A$ | | -0.3 | 9 | +0.3 | |
| PCB | | | | | | |
| length | $L_{PCB}$ | | -0.2 | 25.0 | +0.2 | mm |
| width | $W_{PCB}$ | | -0.2 | 13.5 | +0.2 | |
| thickness | $T_{PCB}$ | | -0.1 | 1.3 | +0.1 | |



## CIRCUIT SCHEMATIC




**Note:** The two attachment holes on the PCB corners have electrical connection to AON and GND. Ensure proper isolation when attaching to conductive enclosure.

## ORDERING INFORMATION

| Product Code | Product | Antenna |
|---|---|---|
| EB6180B1COB77K5A1 | 77.5kHz DCF77 receiver module | A1: 60x10x9 mm |
| EB6180B1COB60K0A1 | 60kHz WWVB/MSF/JJY60 receiver module | A1: 60x10x9 mm |
| EB6180B1COB60K0A2 | 60kHz WWVB/MSF/JJY60 receiver module | A2: 100x10x9 mm |

## MICRO ANALOG SYSTEMS OY CONTACTS

| | |
|---|---|
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