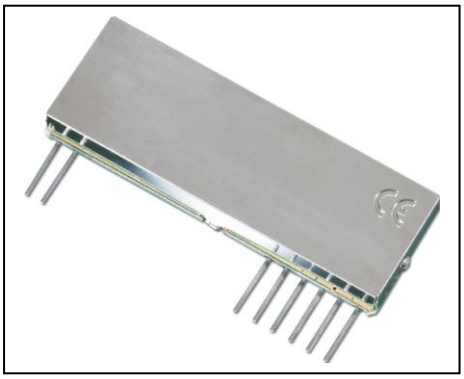
General Description

The Genesis 'wireless connector' receiver module that complements the GT2 transmitters is again a remarkable product that has evolved over the past couple of years into an industry standard form factor but with exceptional performance compared to the price and size of the module.

Using narrow band FM technology, these modules offer the best possible range (due to its high sensitivity of –118dBm) that can be achieved with the GT2/GT2HP 10 and 200mW transmitters. Coupled with high blocking immunity, a very high integrity link can be competitively established.

Fully shielded and measuring just 17 x 48mm, Genesis provides a superior route to enhancing the performance of current and future wireless enabled devices.



Applications

- Telemetry systems
- Remote switching applications
- Paging systems
- Domestic and commercial security

Compatible Transmitter Modules

- GT2 (10mW transmitter module)
- GT2HP (VHF 200mW tx module)
- GT2HP-UHF (UHF 250mW tx module)

Features

- Miniature SIL package
- Switchable data rate filter offers;
  2400 baud with –119dBm sensitivity
  9600 baud with –114dBm sensitivity
- Fully shielded
- Single 2.7 to 10v operation
- Analogue, Digital and true RSSI outputs
- Common genesis footprint
- Operation on any VHF/UHF band
- Other channels available on request
- High blocking immunity in miniature package
- Channel spacing 25 KHz

Absolute Maximum Ratings: Receiver

Operating temperature:	-10°C to +55°C
Storage temperature:	-40°C to +100°C
Supply Voltage (pin 5)	10V
RF Input (pin 1)	10mW

Electrical Characteristics: Receiver (All frequency versions at 25degC & 2400 baud)

	pin	min.	typ.	max.	units	notes
DC LEVELS						0
Supply voltage		2.7		10	V	
Supply current			14	16	mA	
Supply ripple		-	-	10	mV_{P-P}	
Leakage current with Rx in sleep mode				1	uA	
RF						
RF sensitivity			-118		dBm	1
IF Bandwidth			+/-12		KHz	
Initial frequency accuracy			±25		Hz	
Max R.F. input			20		dBm	
Blocking			85		dB	
E.M.C.						
Spurious responses upto 1GHz			<60		dB	
LO leakage, conducted			<70		dBm	
LO leakage, radiated			<70		dBm	
Image rejection			65		dB	2
Adjacent channel rejection			50		dB	
DYNAMIC TIMING						
Power up to stable data (With RF signal present			25	30	mS	
Signal to stable data (With power supply already on)				3.0	mS	
Power up to valid RSSI (with RF signal present)			3.5	4.5	mS	
Mark:space ratio			50		%	
Bit rate		100		9600	bps	3

Notes

0) Supply voltage = 2.7v
1) For 12 dB SINAD from the AF output with 2400 baud data filter selected
2) 65dB for vhf versions. For uhf versions image rejection is 50dB
3) Note 1Hz = 2 bps

Connection Details

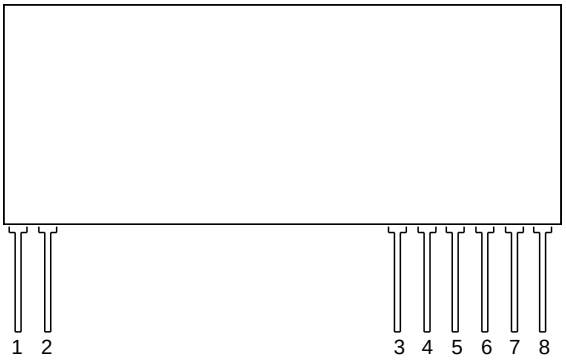


Figure 1: GR2 Receiver

Pin Description

RF IN *(pin 1)*
50Ω RF input from antenna, connect using shortest possible route. This input is isolated from the internal circuit using the air gap of the front end SAW RF filter.

RF GND *(pin 2)*
RF ground connection, preferably connected to a solid ground plane.

Enable *(pin 3)*
Active high. A low on this pin disables the receiver.

RSSI / Carrier Detect *(pin 4)*
The Received Signal Strength Indicator provides a DC output voltage proportional to the RF input signal. The amplitude of the RSSI voltage increases with increasing RF signal strength. A simple transistor interface can yield a carrier detect logic output.

Gnd *(pin 5)*
Connect to power supply ground

V_{cc} *(pin 6)*
+Ve supply pin. A 100nF decoupling cap as close as possible to this pin and ground is recommended.

AF *(pin 7)*
Audio frequency output 100mV p-p.(max 40uA source)

DATA OUT *(pin 8)*
CMOS compatible output. This may be used to drive external decoders. (Internal 10k pull up)

Baud Rate Selection

The module is supplied set to 2400 baud. The 9600 baud data rate can be selected by soldering the 2 sets of solder blob pads on the reverse side of the pcb.

Application Information

Antenna Design

The design and positioning of the antenna is as crucial as the module performance itself in achieving a good wireless system range. The following will assist the designer in maximising system performance.

The antenna should be kept as far away from sources of electrical interference as physically possible. If necessary, additional power line decoupling capacitors should be placed close to the module.

The antenna 'hot end' should be kept clear of any objects, especially any metal as this can severely restrict the efficiency of the antenna to receive power. Any earth planes restricting the radiation path to the antenna will also have the same effect.

Best range is achieved with either a straight piece of wire, rod or PCB track @ ¼ wavelength (43cm @ 173MHz). Further range may be achieved if the ¼ wave antenna is placed perpendicular in the middle of a solid earth plane measuring at least 50cm radius. In this case, the antenna should be connected to the module via some 50 ohm characteristic impedance coax.

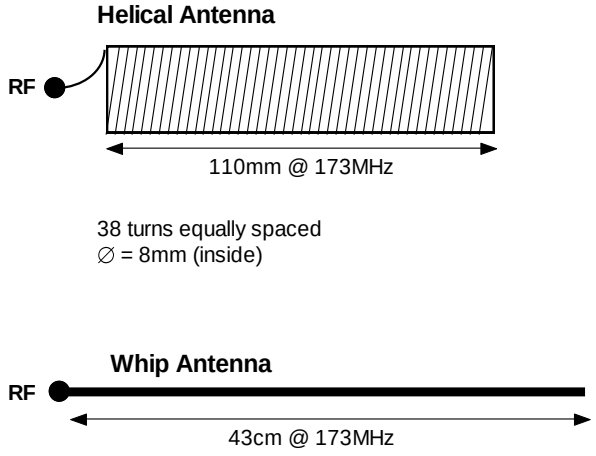


Figure 2: Antenna Configurations To Be Used With The Genesis receiver Module

Application Circuit

The application circuit shows how the GR1 Receiver can easily be integrated into a system to form a wireless link.

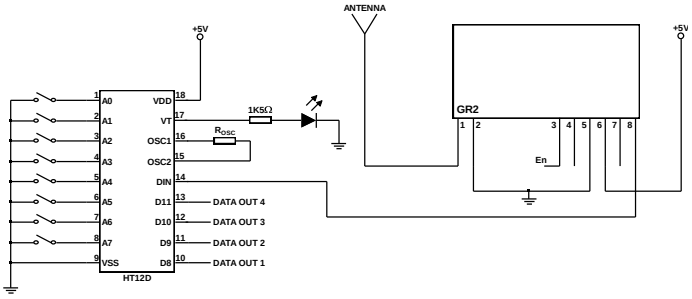


Figure 3: Genesis Receiver Application Circuit

RSSI Values

The GR2 RSSI output provides a DC output proportional to the RF input signal. The table below shows the typical RSSI value depending on the RF signal strength.

RF Signal Strength / dBm	RSSI / V
-130	0.48
-120	0.61
-110	0.85
-100	1.16
-90	1.43
-80	1.64
-70	1.94
-60	2.20
-50	2.34
-40	2.35

Please note that in your application the above values could be offset however the general curve will remain similar.

Mechanical Dimensions

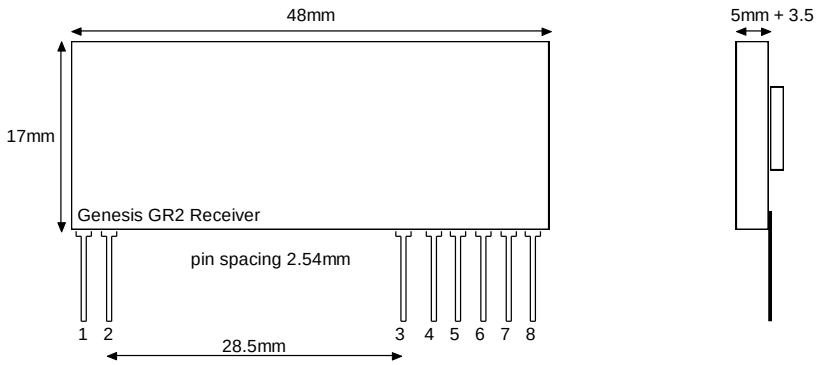


Figure 4: Genesis Receiver

Ordering Information

Part No	Description
GR2-173.225	173.225 MHz receiver module
GR2-173.250	173.250 MHz receiver module
GR2-433.720	433.720 MHz receiver module
GR2-433.920	433.920 MHz receiver module
GR2-434.075	434.075 MHz receiver module
GR2-434.275	434.275 MHz receiver module
GR2-434.475	434.475 MHz receiver module
GR2-458.850	458.850 MHz receiver module
GR2-869.2125	869.21250 MHz receiver module
GR2-869.750	869.750 MHz receiver module
GR2-914.50	914.50 MHz receiver module

Other frequencies possible

Please consult our sales department for further information.

M.K.Consultants (UK) Ltd
288a – 290 Queens Road
HALIFAX
West Yorkshire
HX1 4NS
England

Tel +44 (0) 1422 329002
Fax +44 (0) 1422 353153

Email: Sales@mkconsultants.eu
Web: www.mkconsultants.eu