muRata

Product Specification for Reference Only

Issued Date: Mar 14 ,2003

Rev. : 2

Part Description: Rate Sensor

MURATA Part No.: ENV-05G

The product specification in this sheet is for reference only.
The contents of this specification is subject to change.

You are requested to receive the latest specification and to return one copy of the specification to us with your receipt signature before going into mass production.

Product engineering section
Sensor module department
Circuit module products division
Murata MFG. Co.,Ltd.

Approved by	Checked by	Issued by	Issued Date	Drawing No.
Y.Atsuta	M.Ogiura	M.Ogiura	Mar 14, 2003	reference only

GYROATAR® SPECIFICATION

Mar. 14 / 2003	Product engineering section Sensor module department Circuit module products division	Approved by	Confirmed by	Issued by

1. Scope

This product specification is applied to gyro sensor used for car-navigation systems.
Please contact us before using any of the products in the applications not described above.

2. Description

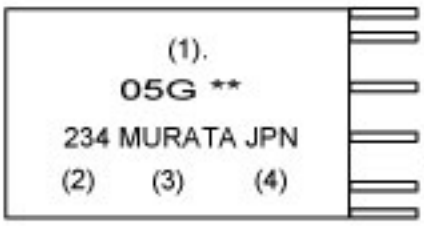
Customer Part No. :
Murata part No. : ENV-05G

3. Structurally characteristics

3-1 External dimension : shown in 8. Dimension.

3-2 Weight : 3.2g ± 1g

4. Marking



(1) Supplier's part number
(2) Lot number
(3) Manufacturing company
(4) Country of origin

5. Maximum ratings (Unless otherwise specified, ambient temp. = 25±5°C)

Characteristic	Symbol	Condition	MIN.	STD.	MAX.	Unit
Max. angular velocity	Omax		-70	-	+70	deg/s
Supply voltage	Vcc		+4.75	+5.0	+5.25	VDC
Current consumption	Icc	at Vcc=5.0VDC	-	-	15	mA
Operating temp. range	Topr		-40	-	85	°C
Storage temp. range	Tstg		-40	-	85	°C

6. Specifications

Unless otherwise specified, ambient temperature Ta = 25±5deg C, Vcc = 5.0 VDC

Use a sensor output load resistance of 100k ohm or more.

Characteristic	Symbol	Condition	MIN.	STD.	MAX.	Unit
Output	Vo	angular velocity = 0 at –40~85°C	2.20	2.50	2.80	VDC
Scale factor	Sv	at –40~85°C	23.25	25.0	26.75	mV/deg/s
Temp. coefficient Scale factor		reference : Ta at –40~85°C	-	-	±4	%FS
Drift		at –10~60°C at –40~85°C	-	-	5 9	deg/s
Drift gradient		at –10~60°C at –40~85°C	-	-	0.6 1.6	deg/sec/2°C deg/sec/8°C
Start up Drift		Measure Vo after 1s	-	-	±1	deg/s/10min
Noise level			-	-	10	mVp-p
Linearity			-	-	±0.5	%FS
Cut-off freq.		-3dB point	8	10	12	Hz

7.Reliability test

7-1. Test condition

Standard test condition: ambient temp. = 25±5°C, relative humidity = 10 to 85 %

7-2 Mechanical test

7-2-1.Vibration test

Samples are tested under the following test conditions.

Frequency: 8 to 200Hz,

Acceleration: 4.4G,

Sweeping period: 20min.

Test time: 4 hours each directions

7-2-2.Shock test

Shock is applied to the samples with 3 times of 100G MAX. 6ms, half sin wave for each 6 directions of X,Y,Z axis.

7-3 Environment test

7-3-1.Low temperature expose test

Samples are kept in -40±4°C chamber for 500 hours. Then stored at room condition for minimum 2 hours.

7-3-2.Low temperature operation test

Samples are kept in –40±4°C chamber for 500 hours. Then stored at room condition for minimum 2 hours.

7-3-3.High temperature expose test

Samples are kept in +85±4°C chamber for 500 hours. Then stored at room condition for minimum 2 hours.

7-3-4.High temperature operation test

Samples are kept in +85±4°C chamber for 500 hours. Then stored at room condition for minimum 2 hours.

7-3-5.High temperature and high humid expose test

Sample are kept in +60±4°C, 90~95%RH chamber for 500 hours. Then stored at room condition for minimum 2 hours.

7-3-6.High temperature and high humid operation test

Sample are loaded and kept in +60±4°C, 90~95%RH chamber for 500 hours.

Then stored at room condition for minimum 2 hours.

7-3-7.Heat shock test

Samples are subjected to 500 cycles as shown in Table 1.Then stored at room condition for minimum 2 hours.

Table.1 Temp. pattern

Step	Temperature (°C)	Time(min.)
1	Room Temp.	5
2	+85±5°C	30
3	Room Temp.	5
4	-40±5°C	30

7-3-8.Temperature cycling test

Samples are subjected to 5 cycles as shown in Fig 1.Then stored at room condition for minimum 2 hours.

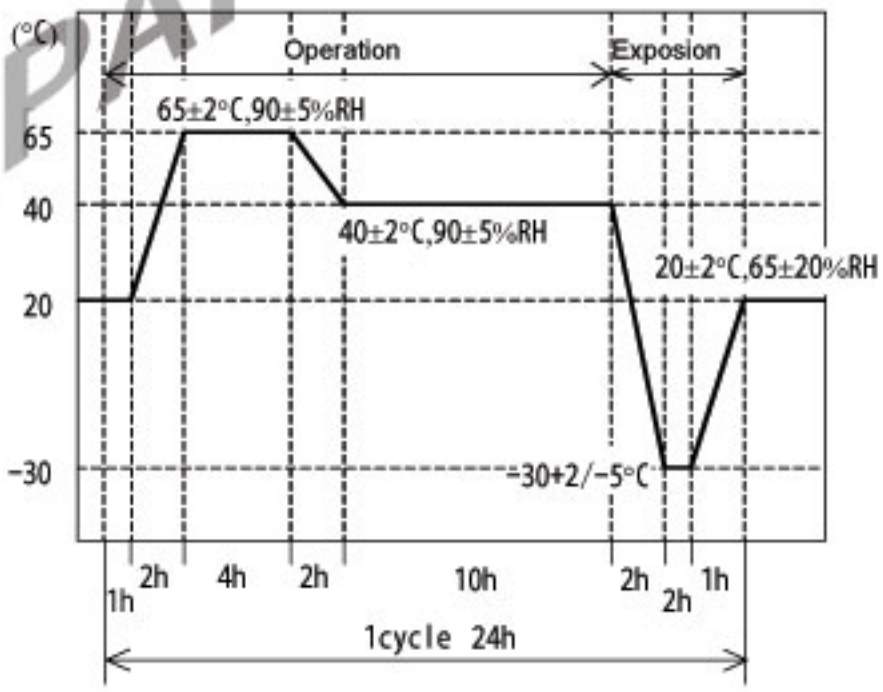


Fig.1

7-3-9.Humidity test (composite humidity)

Samples are subjected to 10 cycles as shown in Fig 2.Then stored at room condition for minimum 2 hours.

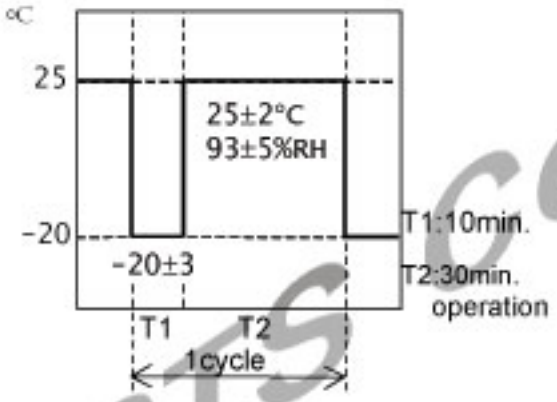
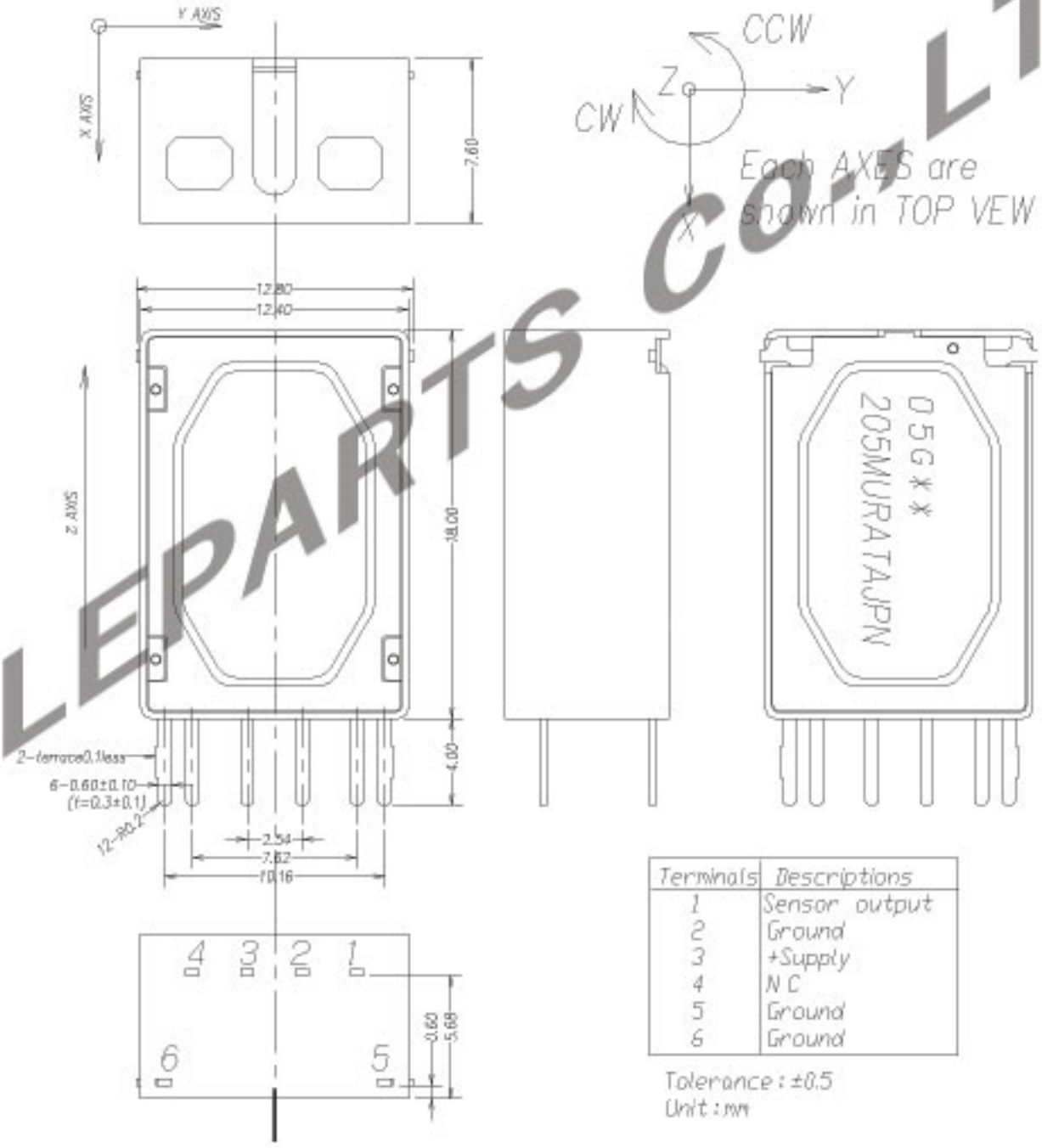


Fig.2

Judgement criteria of reliability test

Item	Judgement criteria
Output V0 (–40~85°C)	2.5±0.5V
Scale factor (–40~85°C)	25.0±2.5mV/(deg/s)
Temp. coefficient of Scale factor (–40~85°C)	±5%
Drift (–40~85°C)	9deg/s
Drift gradient (–40~85°C)	2(deg/sec)/8°C
Start up Drift Noise level Linearity Cut-off freq.	Shall meet table in 6.Specification

8. Dimensions



Terminals	Descriptions
1	Sensor output
2	Ground
3	+Supply
4	N C
5	Ground
6	Ground

Tolerance : ±0.5
Unit : mm

9.⚠CAUTION

9-1. Incorrect handling may affect the sensor characteristics. Please note the following precautions;

A. Do not subject the sensor to shocks which exceed the rated limit.

B. Do not install or store the sensor in a location where condensation is likely to form on it.

C. Do not install or store the sensor in a location where water may splash directly on it.

D. Do not install or store the sensor in a location in which it is likely to be exposed to salt water or corrosive vapor.

9-2. Precision electronic parts, such as ICs, are used for the sensor; therefore, it is necessary to take anti-static precautions when handling.

9-3. Do not wash the sensor, as it is not water-resistant.

9-4. Do not disassemble.

9-5. Limitation of Applications

Please contact us before using our products for the applications listed below which require especially high reliability for the prevention of defects which might directly cause damage to the third party's life, body or property.

1) Aircraft equipment
2) Aerospace equipment
3) Undersea equipment
4) Power plant control equipment
5) Medical equipment
6) Traffic signal equipment
7) Disaster prevention / crime prevention equipment
8) Data-processing equipment
9) Application of similar complexity and/or reliability requirements to the applications listed in the above.

9-6. Fail-safe

Be sure to provide an appropriate fail-safe function on your product to prevent a second damage that may be caused by the abnormal function or the failure of our product.

10 ⚠Note

10-1. Please make sure that your product has been evaluated and confirmed against your specifications when our product is mounted to your product.

10-2. All the items and parameters in this approval sheet for product specification have been prescribed on the premise that our product is used for the purpose, under the condition and in the environment agreed upon between you and us. You are requested not to use our product deviating from such agreement.

10-3. Please return one duplicate of this approval sheet for product specification to us upon approval.

If the duplicate is not returned by 3 months after our submission, this approval sheet for