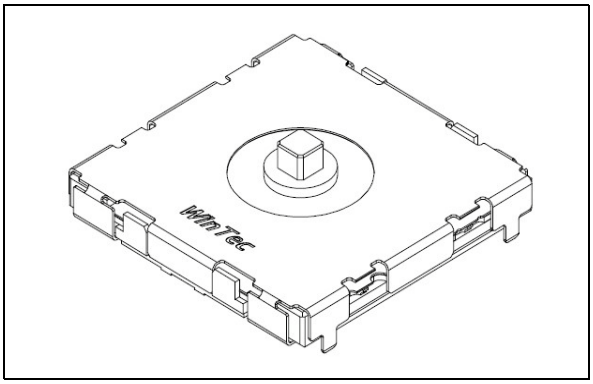
EasyPoint™ N50P105

Single Module (without IC, with push button)

1 General Description

EasyPoint™ N50P105 is a miniature joystick module concept based on contact-less, magnetic movement detection. The two-dimensional linear encoder IC AS5013 is mounted on the bottom side of the application's PCB, and monitors the movement of the magnet incorporated into the knob and provides directly the x and y coordinates via I²C output. An integrated mechanical push button built in the module provides a "select" function.

Figure 1. N50P105-xxxxx-H



2 Key Features

- Small form factor
- Lateral magnet movement radius up to ±2mm
- Direct knob force feedback
- Push button output
- SMD mounting

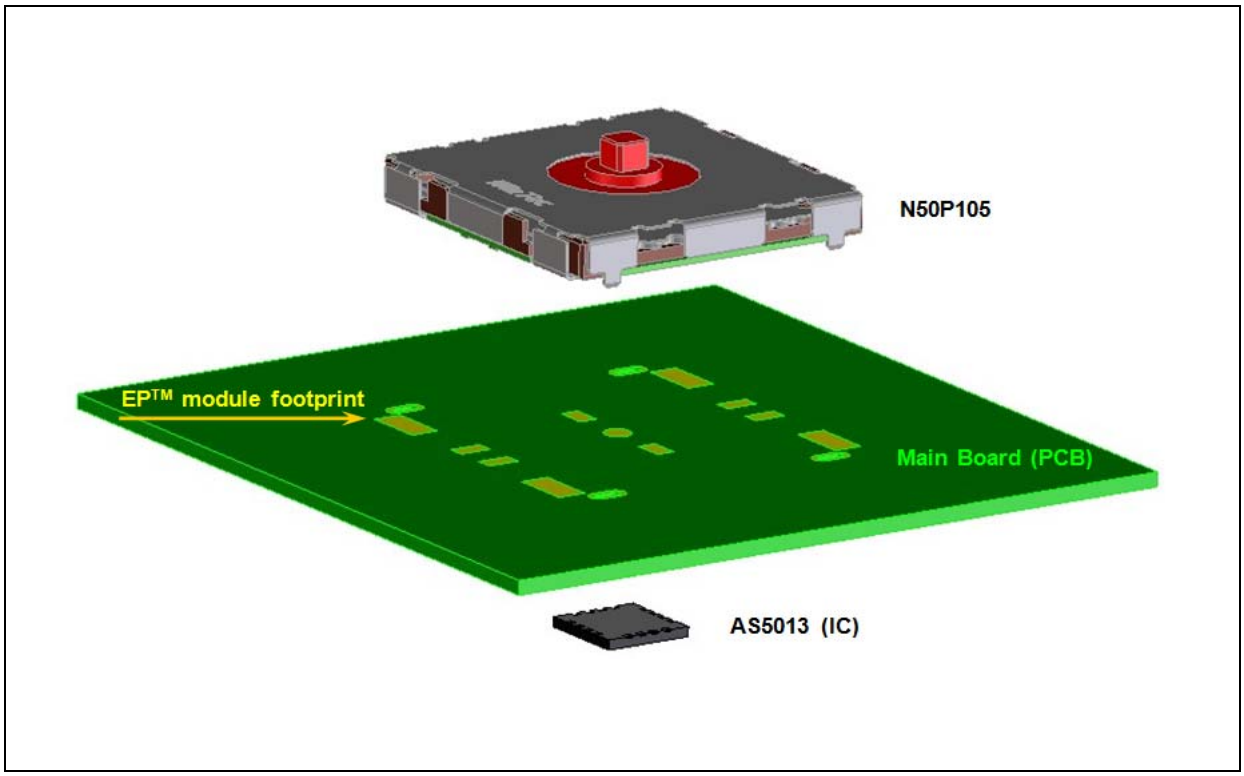
3 Applications

The EasyPoint™ N50P105 in combination with the AS5013 is ideal for small form factor navigation user interfaces in battery driven portable devices, such as - Mobile phones (especially for gaming), Remote Controls, Gaming Consoles, Analog joysticks(360 degree), MP3 players, PDAs, PND, MID and GPS

4 Benefits

- High reliability due to magnetic contact-less sensing
- Easy to use and fast integration

Figure 2. Typical Application Diagram



5 Electrical Characteristics

5.1 Mechanical Specifications

Table 1. Mechanical Specifications

Parameter	Note
Number of operating shafts	Single shaft
Shaft material	LPC
Housing material	LPC & PA46
Shell material	Stainless Steel or Copper alloy
Travel (XY operation)	±2.0mm (±10%)
Travel (Z push operation)	0.22mm (±0.05mm)
Directional operating force (XY direction)	0.70N (±0.15N)
Push operating force (Z direction)	1.80N (±15%)
Vibration	10-500-10Hz 15 minutes, 12 cycles, 3 axes (total 36 cycles)
Operating life – XY direction	Each direction > 1 million cycles
Operating life – Push Z direction	> 1 million cycles
Shaft strength (XYZ direction)	> 3.5kgf
Over force	1.5kgf > 100k cycles

5.2 Electrical Specifications

Table 2. Electrical Specifications

Parameter	Min	Max	Unit	Note
Contact resistance		750	mΩ	Norm: EIA-364-23
Dielectric withstanding voltage	100		Vac	Norm: EIA-364-20
Insulation resistance	100		MΩ	Norm: EIA-364-21, 100Vdc
Bouncing (On/Off)		5	ms	Rate: 2 times/sec.

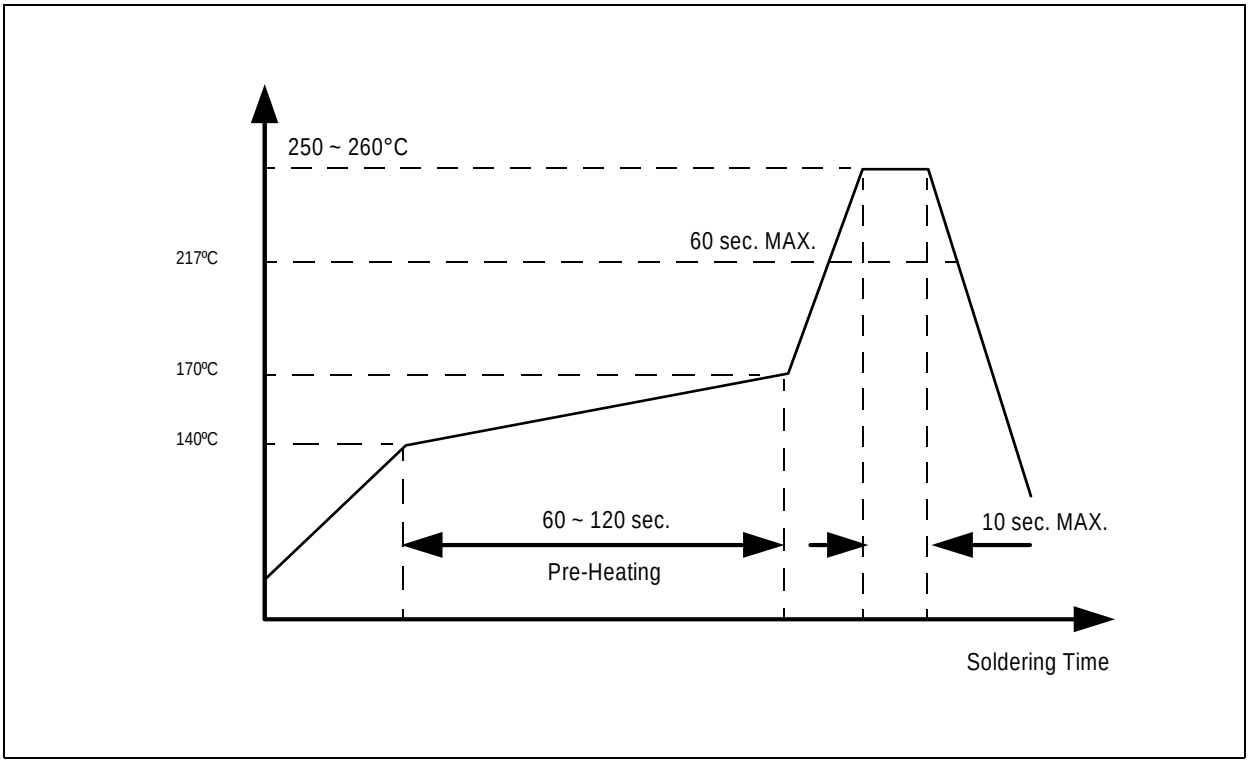
5.3 Environmental Specifications

Table 3. Environmental Specifications

Parameter	Note
Operating temperature range	-20 ~ +70ºC
Storage temperature range	-40 ~ +85ºC
Humidity non-condensing	5 ~ 85% RH
Degrees of protection	IP 5X

5.4 Recommended Reflow Temperature Profile

Figure 3. Reflow Temperature Profile

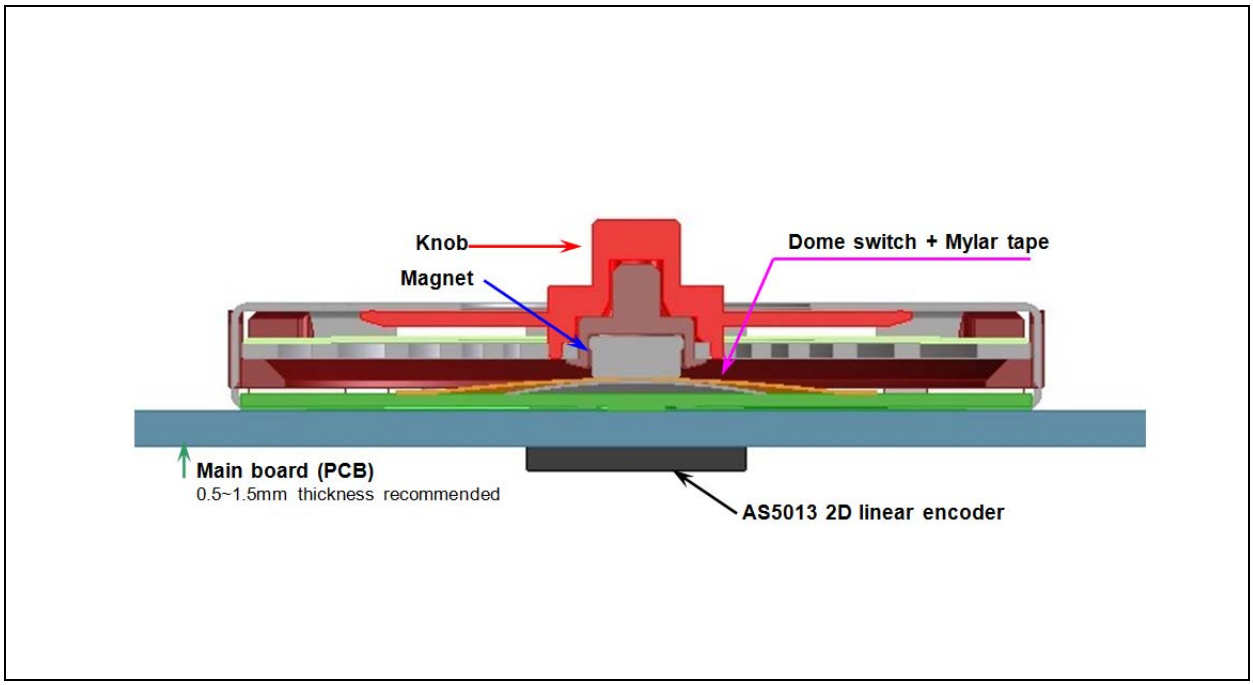


Notes:

1. Do not wash the module! Do not use flux cleaner or solder paste remover!
2. Maximum 3 passes through reflow oven.

6 Application Using AS5013 2D Linear Encoder

Figure 4. Application Diagram



For further information, please refer to the *ams* AS5013 encoder application note AN5013-20:

http://www.ams.com/eng%29/Products/Position-Sensors/EasyPoint-Joystick-Position-Sensor/AS5013/Technical-Documents/EasyPoint-AS5013-Downloads

7 Package Drawings and Markings

Figure 5. N50P105 Dimensions (mm ±0.15))

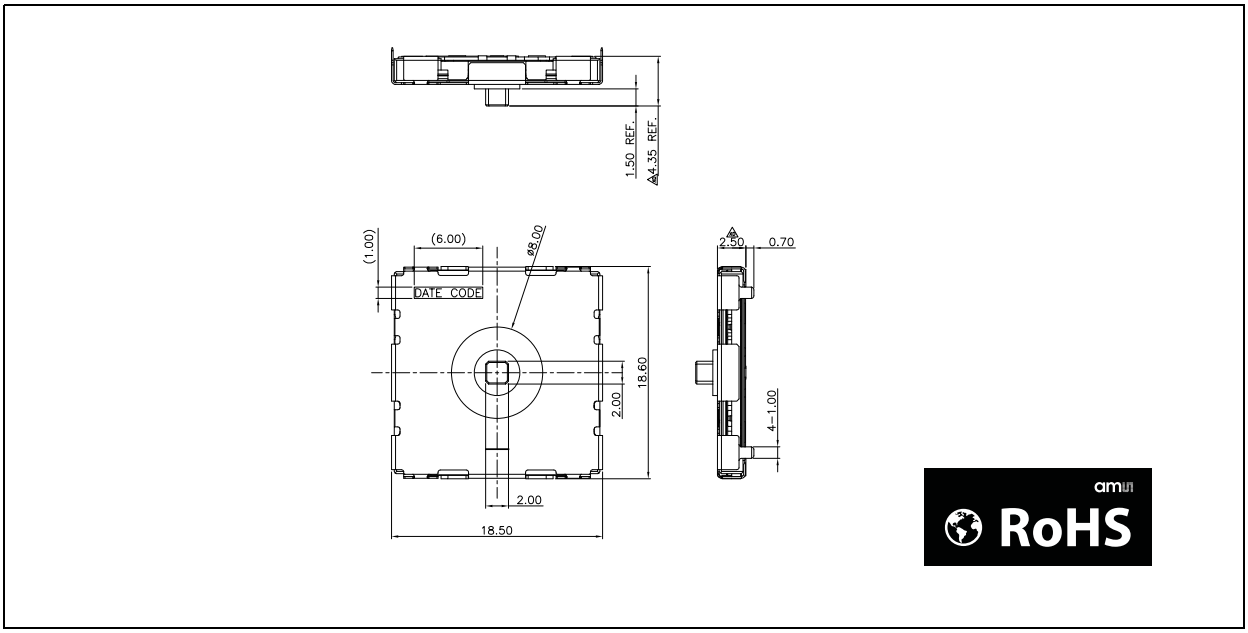


Figure 6. Recommended PCB Layout (mm ±0.05) & Circuit Diagram

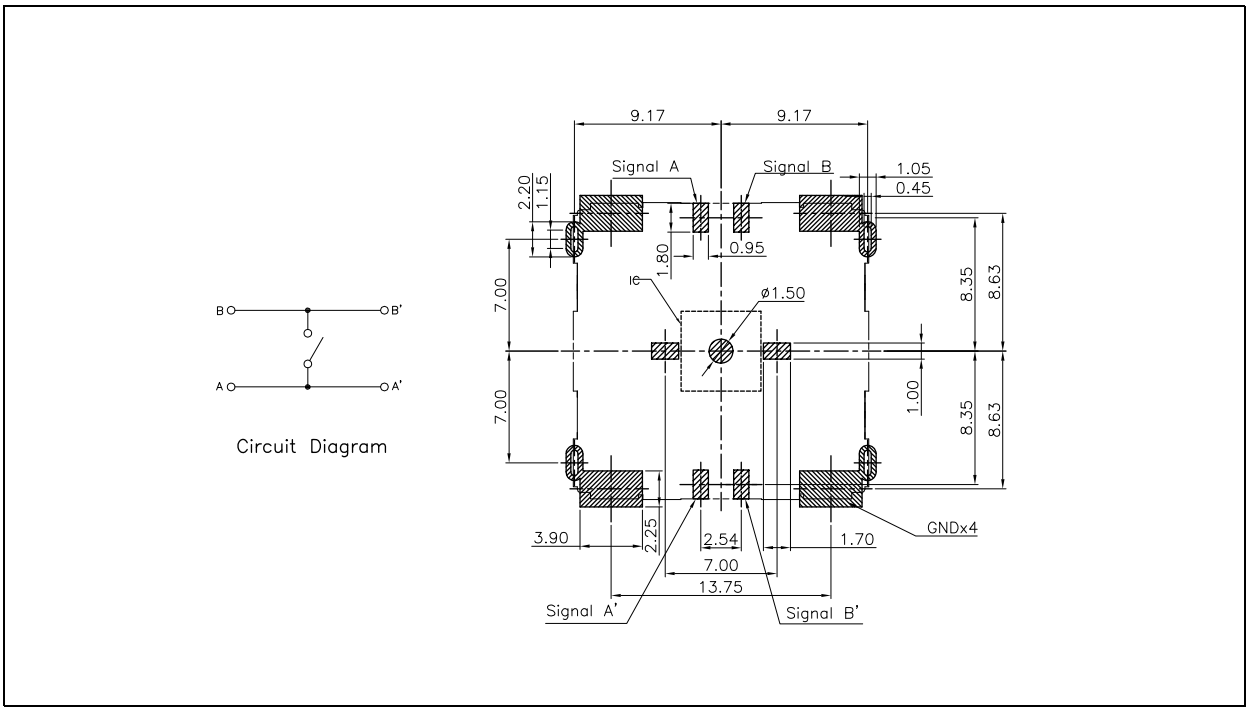


Figure 7. Recommended on Casing Design

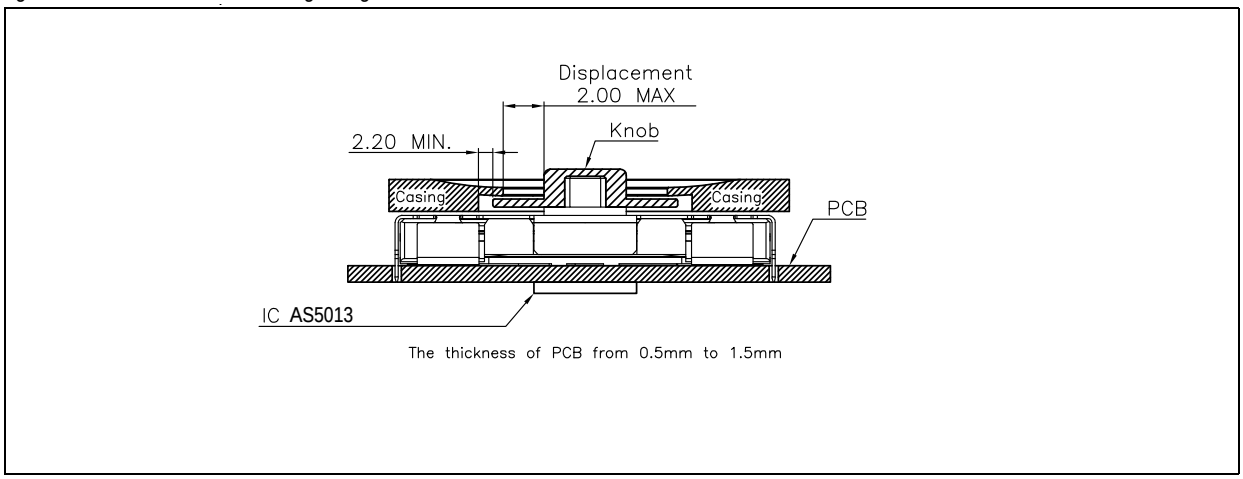
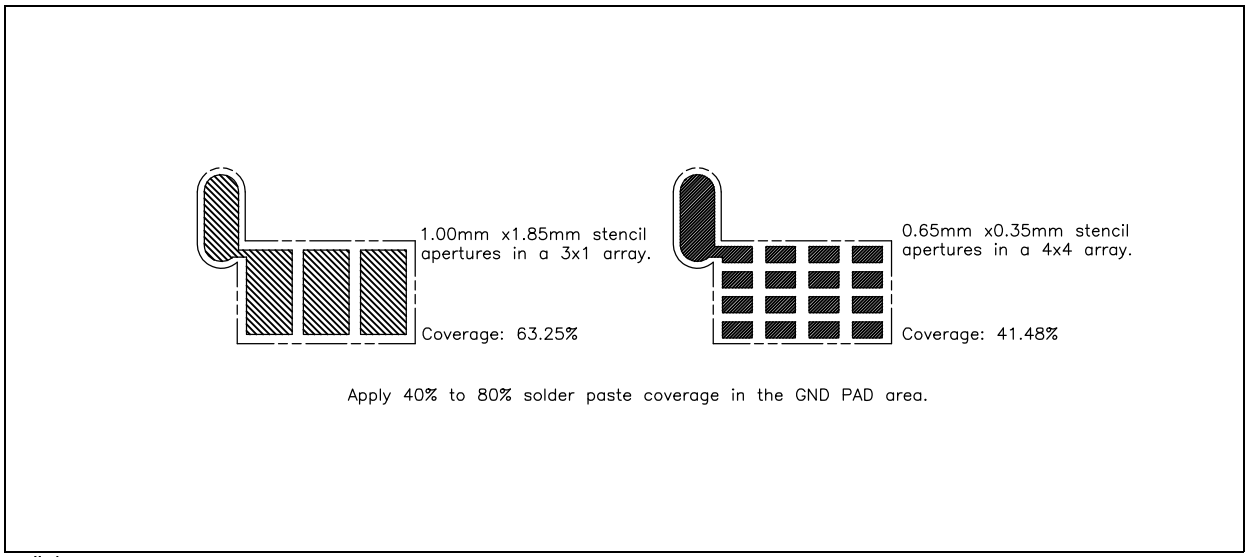


Figure 8. Recommended Stencil Design for 4 GND-Pads



Revision History

Revision	Date	Owner	Description
1.0	25 May, 2011	abi	Initial release
1.1	21 Jun, 2011		Minor changes on text and format
1.2	19 Oct, 2011	rph	Added logos to Package Drawings and Markings on page 5
1.3	06 Jan, 2012		Changed logos in Package Drawings and Markings on page 5
1.4	17 Jan, 2012		Added note to Recommended Reflow Temperature Profile on page 3
1.5	19 Jun 2012		Updated Key Features on page 1 and Figure 4
	23 Apr 2014		Updated link under Figure 4

Note: Typos may not be explicitly mentioned under revision history.

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