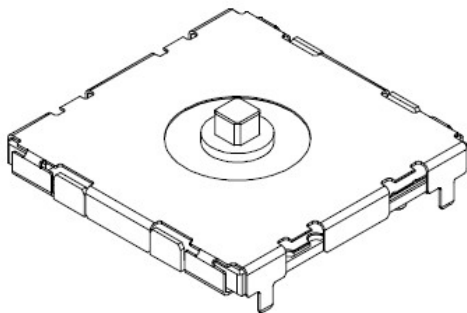


# EasyPoint™ N50P104 Navigation Module

## 1 General Description

EasyPoint™ N50P104 is a miniature joystick module concept based on contact-less, magnetic movement detection. The two-dimensional linear encoder IC AS501x (e.g. AS5011, AS5013, ...) is mounted on the bottom side of the application's PCB, and monitors the movement of the magnet incorporated in the knob and provides directly the x and y coordinates via I<sup>2</sup>C output. A mechanical push button (dome switch) can be added to provide a "select" function.

Figure 1. N50P104-xxxxx-H



## 2 Key Features

- Lateral magnet movement radius up to 2.0mm
- Low profile
- Push button feature
- SMD mounting

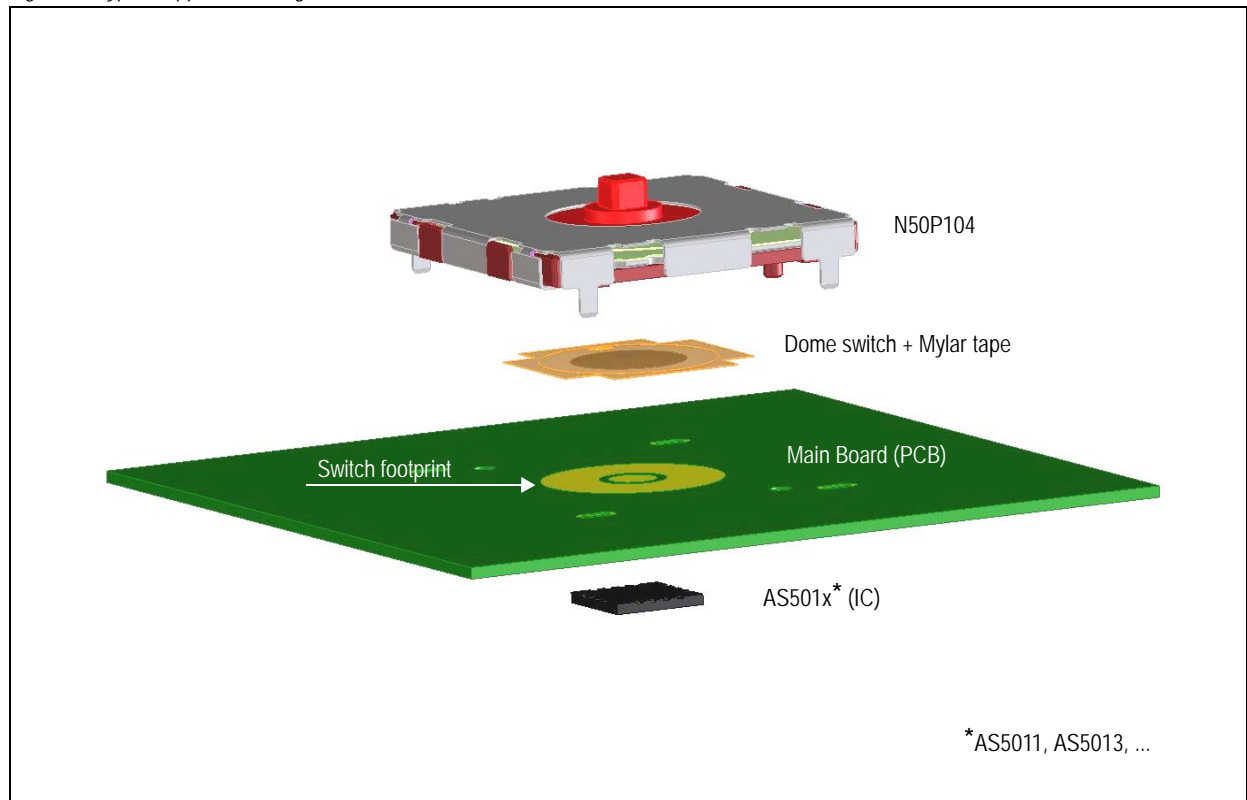
## 3 Applications

The EasyPoint™ N50P104 in combination with the AS501x is ideal for small factory manual input devices in battery operated equipment, such as Mobile phones, MP3 players, PDAs, GPS receivers, Gaming consoles and Analog joystick replacement.

## 4 Benefits

- High reliability due to magnetic non-contact sensing
- Thin size

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                             | LCP   |
| Housing material                           | LCP and 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)         | 2.00N (±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)             | > 3.5 kgf   |
| Over force                                 | 1.5kgf, > 100k cycles                                       |

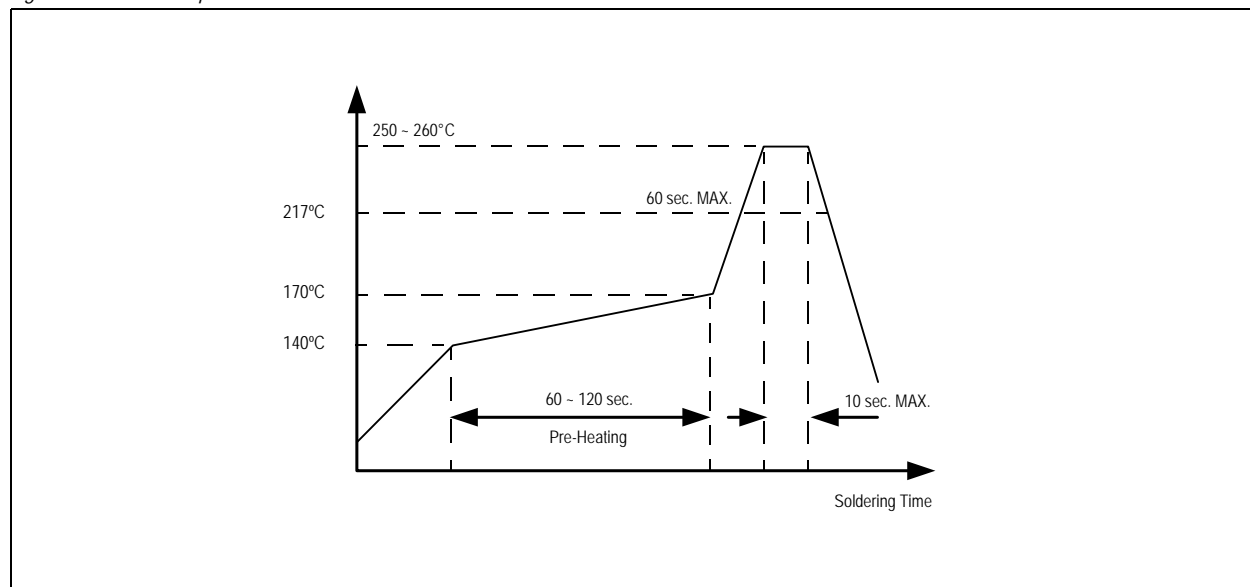
### 5.2 Environmental Specifications

Table 2. Environmental Specifications

| Parameter                   | Note        |
|-----------------------------|-------------|
| Operating temperature range | -20 ~ +70°C |
| Storage temperature range   | -40 ~ +85°C |
| Degrees of protection       | IP 5X       |

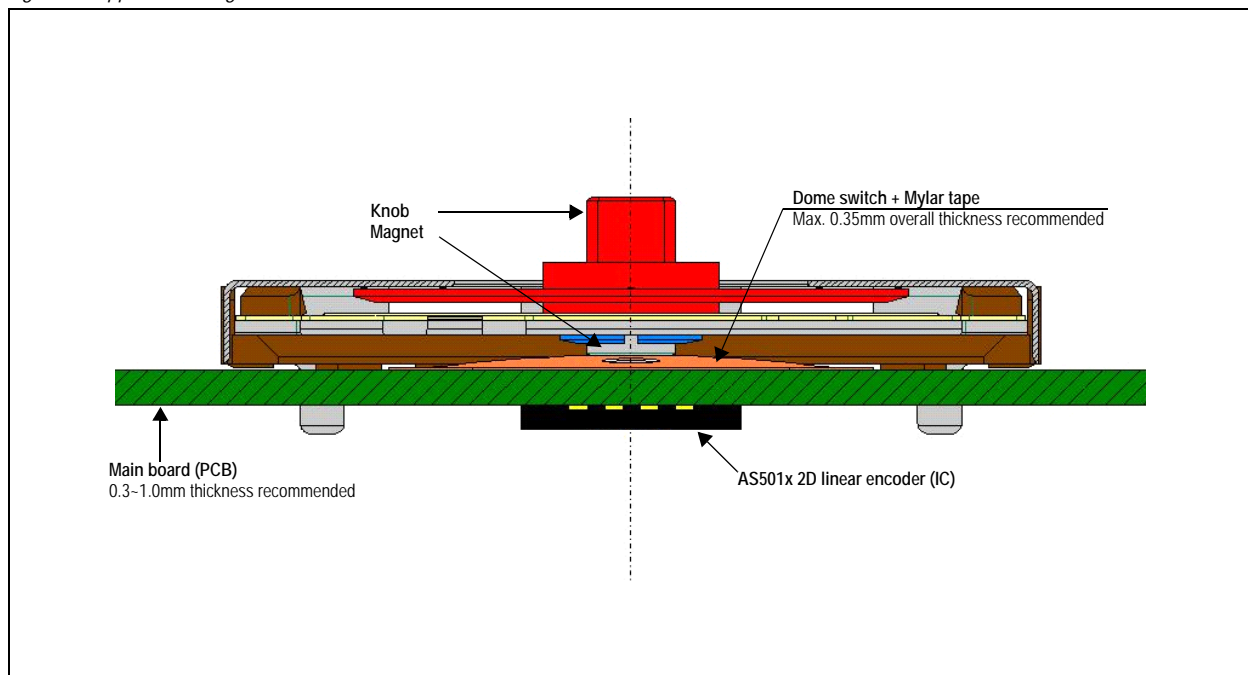
### 5.3 Recommended Reflow Temperature Profile

Figure 3. Reflow Temperature Profile



## 6 Application Using the AS501x 2D Linear Encoder

Figure 4. Application Diagram



For further information, please refer to the N50P111 EasyPoint datasheet:

<http://www.austriamicrosystems.com/eng/Products/Magnetic-Encoders/EasyPoint-Joystick-Encoder/EasyPoint-Joystick-Modules>

For firmware programming support, please download the austriamicrosystems AS5013 encoder application note AN5013-20:

<http://www.austriamicrosystems.com/eng/Products/Magnetic-Encoders/EasyPoint-Joystick-Encoder/AS5013/EasyPoint-AS5013-Downloads/EasyPoint-AS5013-Downloads>



## Revision History

| Revision | Date         | Owner | Description     |
|----------|--------------|-------|-----------------|
| 1.0      | 30 Apr, 2010 |       | Initial Release |
|          |              |       |                 |
|          |              |       |                 |

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

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