

# Smartcoder AU6803

*Twin-PLL method (Real Time Absolute Resolver to Digital Conversion ), Small size, Low Cost High Speed 12Bit R/D Conversion IC, For Automotive Application*

## ■ Features

### 1 . Advanced R/D Conversion method ☆*Twin-PLL* < Patent pending > ☆

☆ **What is *Twin-PLL method*.....**Treating Resolver Signals in complex number, the Signal of Phase lock on one of plus or minus frequencies is converted into angular data. There are two PLLs.

- ☆ **Consequently**
  - **Stable and Continuous Real Time Angular Data can be obtained !**
  - **Small Size, Light weight and Low cost.....Package size: one half**

( V.S. Tamagawa R/D IC : AU6802N1 )

### 2 . Fail check and Built-In Self Test functions < Patent pending >

- **Detection of abnormality** ( ①RMS + ②Wire cut + ③PLL Un-Lock + ④High Temp.)
- **Built-In Self Test** R/D conversion , Abnormality detection circuit self check monitor !

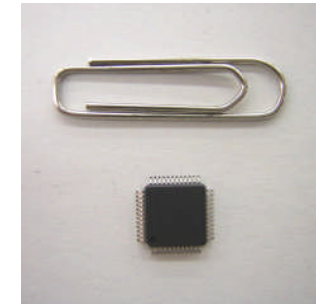
### 3 . Built-in exciter amplifier ( Current control type)

- **All In One** Concept Realizing System Cost Down!

### 4 . No external phase adjustment ( Range of the adjustable phase :±45° max. )

## ■ Specifications

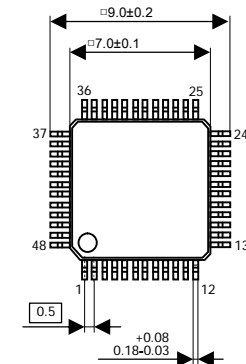
Resolution	4,096 ( =2 <sup>12</sup> )	
Tracking speed	240,000 rpm ( CLK > 10MHz )	180,000 rpm ( Except left column )
Conversion Time	±4 LSB	
Acceleration	1,000,000 rad / sec <sup>2</sup>	
Settling Time	4.0 ms ( 180°Step Input )	
Output Response	±0.3° / 10,000 rpm	
Output Form	12 Bit Binary code True Logic Parallel + A,B,Z + Serial I/F	
DC Power Supply	+5V±10% ( 40mA max. )	
Exciter Power Supply	10 mA rms, 10 kHz Current control Buffer Amplifier	
Outline	48 pin LQFP ( 7×7×1.5t ) , Pin to Pin : 0.5 mm	
Operational Temperature	-40°C ~ +125°C	



**BOMATEC AG**

BOMATEC AG • Hofstrasse 1 • CH-8181 Höri  
 Fon: +41-44-872 10 00 • Fax: +41-44-872 10 01  
 e-mail: contact@bomatec.ch • www.bomatec.ch

## ■ Outline



## PERFORMANCE COMPARISON of R/D CONVERTER

	Unit	Next Generation <b>Twin-PLL</b> type (Smartcoder <sup>R</sup> /AU6803)	Smartcoder <sup>R</sup> (AU6802N1)	SMRD1000 (by NMB) AD2S1000 (by AD) AD2S1200 (by AD)
<b>Resolution</b>	bit	○ 12	○ 10/12	○ 12
<b>Tracking rate</b>	rpm	⊙ 240,000 (CLK > 10 MHz) 180,000 (CLK < 10 MHz)	○ 240,000 (10 bits) 60,000 (12 bits)	△ 60,000
<b>Conversion accuracy</b>	arc min	○ ±4 LSB	○ ±4 LSB	⊙ ±22 +1 LSB ±11 (AD2S1200)
<b>Settling time (180° step)</b>	ms	○ 4.0	⊙ 1.0 (10 bits)/2.5 (12bits) (For ACMD = "H") △ 15 (10 bits)/60 (12 bits) (For ACMD = "L")	△ 5.0 (179° step)
<b>Acceleration</b>	rad/sec <sup>2</sup>	⊙ 1,000,000	○ 256,000 (10 bits) 64,000 (12 bits)	---
<b>Out. -response</b>	deg/rpm	○ ±0.3/10,000	○ ±0.2/10,000 (10 bits) ±0.4/10,000 (12 bits)	---
<b>Power supply (DC)</b>	V	○ +5 (±10 %, 40 mA)	△ +5 (±5 %, 30 mA)	⊙ +5 (±10 %, 18 mA) (±5 %, 18 mA/ AD2S1200)
<b>Exciting power supply</b>	---	⊙ Built-in amplifier (10 KHz ,10 mA)	○ Built-in signal source (10/20 KHz)	○ Built-in signal source (10/12/15/20 KHz)
<b>Output format</b>	---	⊙ Parallel, 12 bits/ A, B, Z, U, V & W + Serial + A, B & Z	○ Parallel, 12 bits/ A, B, Z, U, V & W + Serial	○ Parallel, 12 bits/ Serial (Option) + A, B & NM
<b>Package</b>	---	⊙ 48-pins LQFP (7 ×7 ×1.5t) mm	○ 52-pins TQFP (10 ×10 ×1t) mm	○ 44-pins LQFP (10 ×10 ×1.4t) mm
<b>Others</b>	---	⊙ ■ Built-in self test(BIST) ■ Fault detection function ■ Error detection: Parity ■ Vehicle-mount quality ■ No external phase adjustment ■ Analog velocity output	○ ■ Faultdetection function ■ Error detection: Parity ■ Vehicle-mount quality ■ (VEL mode incorporated)	△ ■ Fault detection function ■ Breaking wire during rotation only ■ No error detection ■ 0/180° discrimination?
<b>Operating temperature</b>	°C	⊙ -40~ +125	⊙ -40~ +125	⊙ -40~ +125
<b>Total evaluation</b>		⊙	○	△