

**İMAJ TEKNİK**  
ELEKTRİK ELEKTRONİK MALZ. SAN. VE TİC. LTD. ŞTİ.

# Smart Abs<sup>®</sup>

## APPLICATION

- Machine Tools
- Robots
- Measuring Instruments
- High-accuracy Angular indexing Equipment
- Semiconductor Manufacturing Equipment

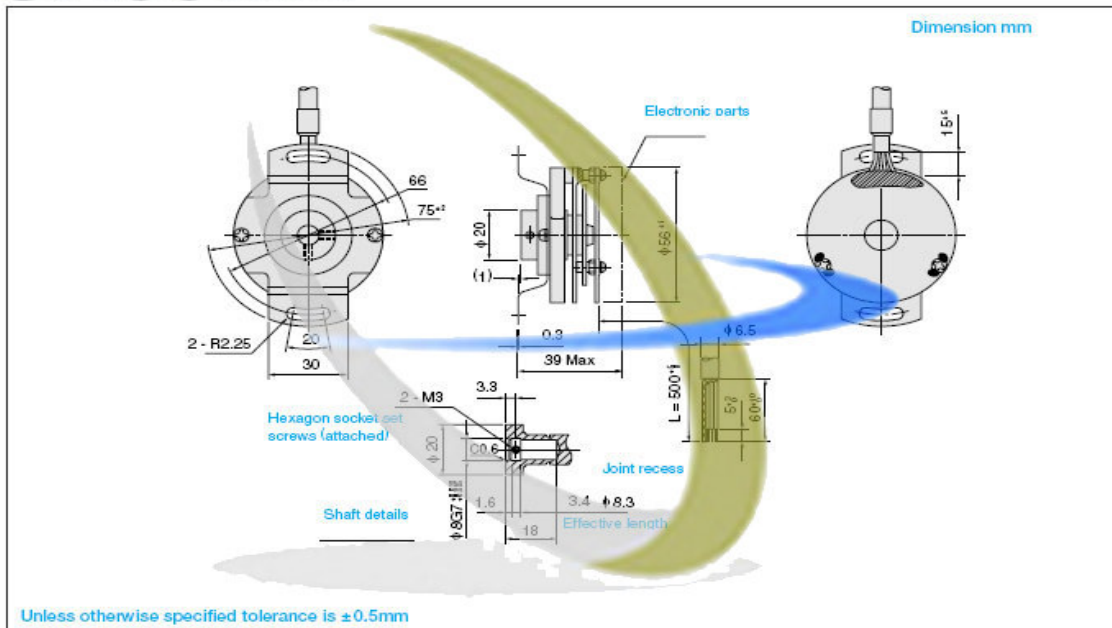
TS5647 TS5648

## FEATURES

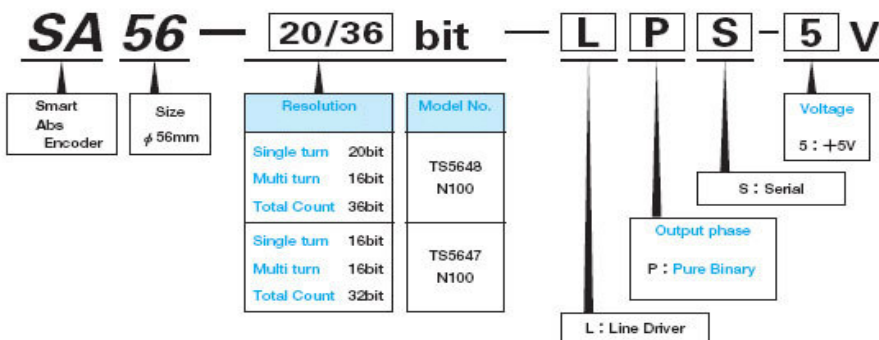
- 16bit.20bit IN A SMALL PACKAGE
- Serial Data Transmission (Bi-direction Serial Communication)
- 20, 16bit/ 1 Turn, Multi-Turn, 16bit.
- Fail-Check Operation
- Even during power outage. Multi-Turn data are backed up by external battery and built-in capacitor



# SA56Series



## DESIGNATE THE NAME OF FUNCTION WHEN ORDERING



○ For special cases, please consult us.

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## SPECIFICATIONS

20 or 16bit/turn and 16bit/65,536 turns  
(total 36 or 32 bit)  
(Before the shaft turned by about 0.6° after power supplied,  
effective resolution remains 5bit only.)

Electrical Spec.		Mechanical Spec.		
Resolution	Absolute Signal	Starting Torque	$4.9 \times 10^{-3} \text{ N} \cdot \text{m}$ (50gf · cm) Max	
	Outout Phase	Pure Binary Code	Moment of Inertia	$1 \times 10^{-5} \text{ kg} \cdot \text{m}^2$ (100g · cm <sup>2</sup> ) Max
Supply Voltage	DC+5V <sup>+5%</sup> -10%	Maximum Rotating Speed	$5,000 \text{ min}^{-1}$ (5,000rpm) Max	
Consumption Current	250mA Max Battery Operation	Mounting Tolerances	Radial Play	0.05mm TIR Max
Output Form	Line Driver Source Current SN65C1168 20mA Max Sink Current 20mA Max		Axial End Play	0.2mm Max
			Shaft Inclination	0.1° Max
Max. Response Frequency	Absolute Signal 52MHz (TS5648) 3.2MHz (TS5647)	Operating Temp. Range	-10~+70°C	
Serial Data Transfer Cycle	38.4μs~66.4μs (Note) Including time for a request. Time depends on the ID Codes. 2.5Mbit/sec Start-Stop transmission.	Storage Temp. Range	-20~+85°C	
		Protective Construction	Not Enclosed	
		Vibration	49m/s <sup>2</sup> (5G) (5-2,000Hz) for 9hours 49m/s <sup>2</sup> (5G) (5-2,000Hz)	
		Shock	980m/s <sup>2</sup> (100G) 11msec, 18times 980m/s <sup>2</sup> (100G) 11msec, 18回	
		Mass	0.6kg Max	

●External Battery (VB) recommended : TOSHIBA Lithium Battery ER6V

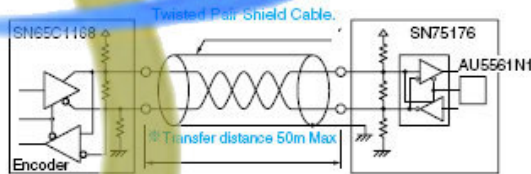
●Fully absolute data of 20 or 16bit shall be output by turning the input shaft by about 0.6° after the power supplied.

## OTHER FUNCTIONS

Data Output according to Request Codes	Following data are serially output in accordance with the Request Codes ID0~ID7. Single-turn Multi-turn
Reset	<ul style="list-style-type: none"> <li>10 consecutive requests of ID7 shall reset error signals.</li> <li>3 consecutive requests of ID0 shall clear Multi-turn data and reset error signals.</li> </ul>
Battery Error	Error signals to notify data destruction due to malfunction of battery, etc.
External Battery Alarm	Error signal to notify external battery's voltage gets below $3.25 \pm 0.15\text{V}$
Data Error Check	Error signal to notify single turn or multi turn data has been abnormal.

## CIRCUIT AT OUTPUT STAGE (EXAMPLE)

### Line Driver Output



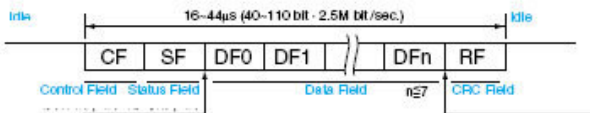
※Note that transfer distance depends much on ambient condition.

※Receiving IC AU5561N1 is separately necessary.  
Please refer to the operation manual for AU5561N1.

## CONNECTION TABLE

COLOR	FUNCTION
BEIGE	VB (Battery)
LIGHT BLU	SD (Serial Data)
GRY	CASE GND
BLK	GND
WHT	DC+5V
BRN	GND
VLT	SD (Serial Data)

## SERIAL DATA (EXAMPLE)



データID	DF 0	DF 1	DF 2	DF 3	DF 4	DF 5	DF 6	DF 7
データID0	ABS 0	ABS 1	ABS 2					
データID1	ABM 0	ABM 1	ABM 2					
データID2	ENID							
データID3	ABS 0	ABS 1	ABS 2	ENID	ABM 0	ABM 1	ABM 2	ALM C

ENID : Encoder ID ABS : Single Turn Data ABM : Multi-Turn Data

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