Customer: ALGE DISTRIBUTOR

No. ECR2005-6189

Date: Aug. 30, 2005

Attention:

Your ref. No.: 21 8015

Your Part No.: STEC11B03 PROMOTION

SPECIFICATIONS

ALPS' ;

MODEL EC11B15244

Spec. N

Sample No.: F 2 5 8 3 8 2 4 M

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ALPS

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01003#03A (EA)

No. ECR2005-6189

SPECIFICATIONS

1. THIS SPECIFICATIONS APPLY TO EC11B152442D ROTARY ENCODERS.

2. CONTENTS OF THIS SPECIFICATIONS.

F2583824M
LA211446S

3. MARKING

- MARKING ON ALL UNITS
  EIA DATE CODE

4. REMARKS

- FURNUSH PACKAGE
  NUT:1 WASHER:1

- CAUTION

Regardless of the suggested applications of these products being introduced in the specifications, when using them for equipment and devices requiring a high degree of safety, respective manufacturers will please preserve safety of the planned equipment and devices by providing necessary protectve circuits and redundancy circuits and reconfirm if safety is being duly preserved.

Products being introduced in the specifications have been designed and manufactured for applications to ordinary electronic equipment and devices such as the AV equipment, electric home appliances, office machines and communications equipment. Consequently, when employing these products for applications requiring a high degree of safety and reliability such as the medical equipment, aviation and aircraft equipment, space equipment and burglar alarm equipment, the using manufacturers will please thoroughly study the proprieties of these products for the planned applications.

Although we are exerting our best efforts to maintain the quality of these products, we cannot guarantee that they will never cause short circuiting and open circuitry.
Therefore, when designing an equipment or device with which the priority is given to the safety, you will please carefully study the influences to the whole equipment of a single function failure of Potentiometers and Encoders in advance to make out a fail-safe design providing.

CLASS NO.	TITLE 11形回転形エンコーダ仕様書 11mm Size Rotary Encoder Specification	

1. 一般事項 General (SW01).(SW02)

1-1 適用範囲 Scope

[illegible]

This specification applies to 11mm size low-profile rotary encoder (incremental type) for microscopic current circuits. used in electronic equipment.

1-2 標準状態 Standard atmospheric conditions

[illegible]

Unless otherwise specified. the standard range of atmospheric conditions for making measurements and tests is as follows:

温度 Ambient temperature : 15°C to 35°C
相対湿度 Relative humidity : 25% to 85%
気圧 Air pressure : 86kPa to 106kPa

[illegible]

If there is any doubt about the results. measurements shall be made within the following limits:

温度 Ambient temperature : 20 ± 1°C
相対湿度 Relative humidity : 63% to 67%
気圧 Air pressure : 86kPa to 106kPa

1-3 使用温度範囲
Operating temperature range : -40°C to +85°C

1-4 保存温度範囲
Storage temperature range : -40°C to +85°C

2. 構造 Construction

2-1 寸法 Dimensions

[illegible]
Refer to attached drawing.

3. 定格 Rating

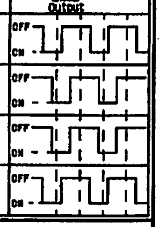
3-1 定格電流(SW01)
Rating : D.C. 5V 10mA (1mA MIN)

4. 電気的性能 Electrical characteristics(SW01)

	項目 Item	条件 Conditions	規格 Specifications
4-1	出力信号 Output signal format	<Fig 1>	A, B2信号の[illegible] <fig. 1>[illegible] ([illegible]) 2 Phase-different signals (SignalA. signalB) Details shown in <fig. 1>. (The broken line shows detent position of with-detent type.)

<Fig 1>

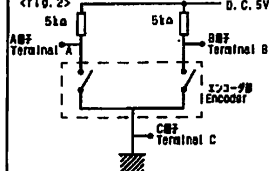
軸回転方向 Shaft rotational direction	信号 Signal	出力波形 Output
時計方向 C.W.	A(A-C端子間) A(Terminal A-C)	OFF / ON
	B(B-C端子間) B(Terminal B-C)	OFF / ON
反時計方向 C.C.W.	A(A-C端子間) A(Terminal A-C)	OFF / ON
	B(B-C端子間) B(Terminal B-C)	OFF / ON



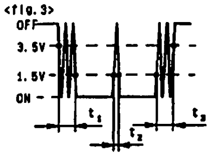
CLASS NO.	TITLE 11形回転形エンコーダ仕様書 11mm Size Rotary Encoder Specification	

	項目 Item	条件 Conditions	規格 Specifications
4-2	分解能 Resolution	[illegible] Number of pulses in 360° rotation.	[illegible] 15パルス/360° 15 pulses/360° for each phase (2クリック 1パルス) (2Click 1Pulse)
4-3	スイッチング特性 Switching characteristics	[illegible]<fig. 2>[illegible]360°·S⁻¹[illegible] Measurement shall be made under the condition as follows. 1)Shaft rotational speed : 360°·S⁻¹ 2)Test circuit : <fig. 2>	

<fig. 2>



<fig. 3>



(注記) コードOFF状態 :[illegible]3.5V以上[illegible]
コードON状態 :[illegible]1.5V以下[illegible]

(note) Code-OFF area : The area which the voltage is 3.5V or more.
code-ON area : The area which the voltage is 1.5V or less.

	項目 Item	条件 Conditions	規格 Specifications
1)	チャタリング Chattering	[illegible] Specified by the signal's passage time from 3.5V to 1.5V or from 1.5V to 3.5V of each switching position (code OFF→ON or ON→OFF).	t_1, t_3 ≦ 2ms
2)	摺動ノイズ (バウンス) Sliding noise (Bounce)	[illegible] Specified by the time of voltage change exceed 1.5V in code-ON area. When the bounce has code-ON time less than 1mS between chatterings (t_1 or t_3). the voltage change shall be regarded as a part of chattering. When the code-ON time between 2 bounces is less than 1mS. they are regarded as 1 linked bounce.	t_2 ≦ 2mS
3)	摺動ノイズ Sliding noise	[illegible] The voltage change in code-OFF area.	3.5V以上 3.5V MIN

CLASS NO.

TITLE 11mm Size Rotary Encoder Specification

	Item	Conditions	Specifications
4-4	Phase-difference	360°±5° (constant speed). <fig. 4> ΔT	<fig. 4> ΔT≧6msec in <fig. 4>
		Note : Above specification (4-4) is changeable. When operate by manual. Please check performance using actual circuit and knob.	
4-5	Insulation resistance	Between individual terminals and bushing. D. C. 250V 10mA	Between individual terminals and bushing: 100MΩ MIN.
4-6	Dielectric strength	Between individual terminals and bushing. A. C. 300V for 1min or A. C. 360V for 2sec. (Leak current: 1mA)	No damage to parts, arcing or breakdown.

5. Mechanical characteristics

	Item	Conditions	Specifications
5-1	Total rotational angle		360° (Endless)
5-2	Detent torque		12±7mN·m
5-3	Number and position of detents		30 detents (Step angle: 12°±3°)
5-4	Terminal strength	A static load of 5N be applied to the tip of terminals for 1minute in any direction.	No damage or excessive looseness of terminals. Terminal bend is permitted.
5-5	Push-pull strength of shaft	Push and pull static load of 10N shall be applied to the shaft in the axial direction for 10s. (After installing)	No damage, no excessive play in shaft, no excessive abnormality in rotational feeling.

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APPD.	CHKD.	DSGD.	TITLE	DOCUMENT NO.
Mar. 22. '96 Y. YOSHIOKA	Mar. 22. '96 M. SATOH	Mar. 22. '96 Y. ISAWA	11mm Size Rotary encoder	F2583824M (3/6)

SYMB | DATE | APPD | DSGD

CLASS NO.

TITLE 11mm Size Rotary Encoder Specification

	Item	Conditions	Specifications
5-6	Bushing nut tightening strength	Tighten the nut according to <fig. 5> <fig. 5> Chassis, Nut, 1mm MIN	1N·m No damage, looseness, etc. Tightening torque to be no greater than 1N.m.
5-7	Shaft wobble	A momentary load of 50mN·m shall be applied at the point 5mm from the tip of the shaft in a direction perpendicular to the axis of shaft.	Wobble MT (mm-p less) 0.7×L/30 L: Measurement point from mounting surface of bushing.
5-8	Shaft play in axial direction		0.4mm-p MIN 0.4mm-p MAX.
5-9	Rotation play at the click position	Measure with jig for rotational angle.	5 MIN. 5 MAX.
5-10	Resistance to soldering heat	Specified by the clause 7 "Soldering conditions".	No deformation or cracks in molded part. No excessive abnormality in rotational feeling.
5-11	Notice for mounting	Hold the bushing use front panel or light pipe. Because this switch not has thread. If don't hold the bushing, the switch maybe become intermittent or rough mounting after soldering by knob stopper force.	SWITCH, MOUNTING DETAIL, FRONT PANEL OR LIGHT PIPE

8. Endurance characteristics

	Item	Conditions	Specifications
8-1	Rotational life	The shaft of encoder shall be rotated to 15,000 cycles at a speed of 60cycles per hour without electrical load. After which measurements shall be made. However, an interim measurement shall be made immediately after 5,000 cycles. (1 cycle: rotate 360° CCW rotate 360° CW)	Detent torque: Relative to the previously specified value. Except above items, specifications in clause 4, 5-6 and 6, 7, 8, 9 shall be satisfied.

ALPS ELECTRIC CO., LTD.

APPD.	CHKD.	DSGD.	TITLE	DOCUMENT NO.
Mar. 22. '96 Y. YOSHIOKA	Mar. 22. '96 M. SATOH	Mar. 22. '96 Y. ISAWA	11mm Size Rotary encoder	F2583824M (4/6)

SYMB | DATE | APPD | CHKD | DSGD

CLASS No.	TITLE 11φ回転形エンコーダ仕様書 11mm Size Rotary Encoder Specification	

7. はんだ付け条件 Soldering conditions (SW01), (SW02)

7-1 手はんだ付け条件 Manual soldering

こて先温度350°C以下、はんだ付け時間3秒以内
Bit temperature of soldering iron : 350°C or less.
Application time of soldering iron : within 3s.

7-2 ディップはんだ付け条件 Dip soldering

プリント基板 : 板厚1.6mmの両面銅張積層板
Printed wiring board: Both-sided copper clad laminate board with thickness of 1.6mm.

フラックス : 比重0.82以上のフラックスを発泡式フラクサーにて塗布基板厚の2/3まで。
Flux:
- Specific gravity: 0.82 or more.
- Flux shall be applied to the board using a bubble foaming type fluxer.
- The board shall be soaked in the flux bubble only to the 2/3 of its thickness.

プリヒート : 基板表面温度100°C以下、時間2分以内
Preheating:
- Surface temperature of board: 100°C or less.
- Preheating time: within 2 min.

はんだ : 260±5°C、時間5±1秒
Soldering:
- Solder temperature: 260±5°C.
- Immersion time: 5±1 sec.

上記条件を1回または2回実施する。
Apply the above soldering process for 1 or 2 times.

	ALPS ELECTRIC CO., LTD.				
SYMB.	DATE	APPD.	CHKD.	DSGD.	TITLE 11φ回転形エンコーダ 11mm Size Rotary encoder
APPD	Mar. 22. '96	Y. YOSHIOKA	M. SATOH	Y. ISAWA	DOCUMENT NO. F2583824M (5/6)
CHKD	Mar. 22. '96				
DSGD	Mar. 22. '96				

CLASS No.	TITLE プッシュモーメンタリスイッチ仕様書 PUSH MOMENTARY SWITCH SPECIFICATION	(SW02)

1. 定格容量(抵抗負荷) D.C. 16V3A (10mA MIN)
Switch rating (Resistor load)

2. 電気的特性 Electrical characteristics

	項目 Item	条件 Conditions	仕様 Specifications
2-1	接触抵抗 Contact resistance	D.C. 5V10mA電圧降下方式で測定する。 Measured by the 10mA 5V D.C. voltage drop method.	100mΩMAX. 100mΩ MAX.
2-2	チャタリング Chattering	1サイクル (OFF-ON-OFF)1秒で動作させる。 Switch is operated at the rate of 1 cycle 1 sec. The 1 cycle shall be OFF-ON-OFF.	10msecMT Less than 10msec
2-3	絶縁抵抗 Insulation resistance	端子-取付金具間D.C. 250V1mA印加する。 Measurement shall be made under the condition which a voltage of 250VD.C. 1mA is applied between individual terminals and bushing.	端子-取付金具間で100MΩ以上 Between individual terminals and bushing: 100MΩ MIN.
2-4	耐電圧 Dielectric strength	端子-取付金具間A.C. 300V1分間印加、A.C. 360V2秒間印加する。(リーク電流1mA) A voltage of 300VA.C. shall be applied for 1min or a voltage of 360VA.C. shall be applied for 2sec between individual terminals and bushing. (Leak current:1mA)	端子-アース-取付金具間がないこと。 Without damage to parts arcing or breakdown.

注記: 軸・スイッチ端子間は絶縁されております。
Note: Shaft is insulated from switch terminal.

3. 機械的特性 Mechanical characteristics

	項目 Item	条件 Conditions	仕様 Specifications
3-1	スイッチ構成・接点配置 Contact arrangement		単接点(Push on) S.P.S.T. (Push on)
3-2	スイッチ作動量 Switching stroke		0.5 +0.4 -0.3 mm
3-3	スイッチ作動力 Switch operation force		8±3N

4. 耐久性 Endurance characteristics.

	項目 Item	条件 Conditions	仕様 Specifications
4-1	動作寿命特性 Operating life	定格負荷にて毎時500回の速度で25,000回動作させる。 但し、途中5,000で中間測定を行う。 The shaft of switch shall be 25,000 times at a speed of 500times per hour without electrical load. After which measurements shall be made. However, an interim measurement shall be made immediately after 5,000 times.	接触抵抗:200mΩMT その他、規格値を満足すること。 Switch contact resistance:200mΩMAX. Except above items, specifications in clause 2.2~4. and 3.1~3 shall be satisfied.

	ALPS ELECTRIC CO., LTD.				
SYMB.	DATE	APPD.	CHKD.	DSGD.	TITLE
APPD	Mar. 22. '96	Y. YOSHIOKA	M. SATOH	Y. ISAWA	DOCUMENT NO. F2583824M (6/6)
CHKD	Mar. 22. '96				
DSGD	Mar. 22. '96