

Customer: ALPS EUROPE DISTRIBUTION

No. SS-2009-7221

Date: Jan. 16, 2009

Attention:

Your ref. No.:

Your Part No.: ALBS 12086 AUDIO-TECHNIC

SPECIFICATIONS

ALPS' ;

MODEL: RS60K12A1
(10kBX2)

Spec. No.:

Sample No.: F 7 2 3 7 2 1 5 M

RECEIPT STATUS

RECEIVED

By Date

Signature

Name

Title

ALPS
ALPS ELECTRIC CO., LTD.

DSG'D

y. Tamada

APP'D

y. Koto

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B6523

Q1003#03A (EA)

S P E C I F I C A T I O N S

1. THIS SPECIFICATIONS APPLY TO RS60K12A1 POTENTIOMETER.

2. CONTENTS OF THIS SPECIFICATIONS.

5S602M0002

5S60M-02

4S0001-200

4S0001-203

S602MA102

3. MARKING

• MARKING ON ALL UNITS

DATE CODE, RESIST. VALUE, TAPER

Marking  in specifications shows
standard and condition for application

• CAUTION

1. For the export of products which are controlled items subject to foreign and domestic export laws and regulations, you must obtain approval and/or follow the formalities of such laws and regulations.

2. Products must not be used for military and/or antisocial purposes such as terrorism, and shall not be supplied to any party intending to use the products for such purposes.

3. Unless provided otherwise, the products have been designed and manufactured for application to equipment and devices which are sold to end-users in the market, such as AV (audio visual) equipment, home electric equipment, office and commercial electronic equipment, information and communication equipment or amusement equipment. The products are not intended for use in, and must not be used for, any application of nuclear equipment, driving control equipment for aerospace or any other unauthorized use.

With the exception of the above mentioned banned applications, for applications involving high levels of safety and liability such as medical equipment, burglar alarm equipment, disaster prevention equipment and undersea equipment, please contact an Alps sales representative and/or evaluate the total system on the applicability. Also, implement a fail-safe design, protection circuit, redundant circuit, malfunction protection and/or fire protection into the complete system for safety and reliability of the total system.

4. Before using products which were not specifically designed for use in automotive applications, please contact an Alps sales representative.

5. The products shall be stored in the original packaging and kept at room temperature and humidity, out of direct sunlight, and away from any and all corrosive gas. The products shall be completely used as soon as possible, but no later than 6 months from the date of delivery.

Once product packaging is opened, the complete quantity of such products shall be promptly used.

CLASS No.	TITLE MASTER TYPE POTENTIOMETER(SLIDE)	
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1. Environment 一般事項

1. 1 Operating temperature range 使用温度範囲 : $-10\sim 60^{\circ}\text{C}$
 1. 2 Storage temperature range 保存温度範囲 : $-30\sim 70^{\circ}\text{C}$
 1. 3 Test conditions 試験条件

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

Ambient temperature : 5°C to 35°C
 Relative humidity : 45% to 85%
 Air pressure : 86kpa to 106kpa.

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

Ambient temperature : $20\pm 2^{\circ}\text{C}$
 Relative humidity : 60% to 70%
 Air pressure : 86kpa to 106kpa.

試験及び測定は特に規定がない限り温度 $5\sim 35^{\circ}\text{C}$, 相対湿度45~85%, 気圧86~106kpaの標準状態のもとで行う。

ただし, 判定に疑義を生じた場合は温度 $20\pm 2^{\circ}\text{C}$, 相対湿度60~70%, 気圧86~106kpaにて行う。

2. Appearance 外観

The potentiometer shall be well done and not have any excessive rust, crack, split, poor plating and discolor in any portion.

各部の仕上げは良好で機能上有害なサビ、キズ、ワレ、メッキ不良及び剥離などがあってはならない。

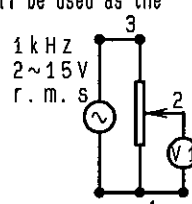
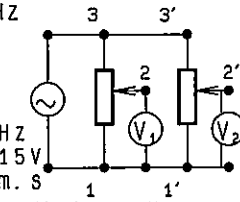
3. Electrical characteristics 電気的性能

	Item 項 目	Conditions 条 件	Specifications 規 格
3. 1	Nominal total resistance and tolerance 公称全抵抗値および許容差	Measurement shall be made by the resistance between terminal 1 and 3 with lever set at terminal 1 or 3. レバーを端子1又は、3の終端におき、抵抗器の端子1-3間の抵抗値を測定する。	$10\text{ k}\Omega \pm 20\%$
3. 2	Power rating 定格電力	Power rating is based on continuous full load operation at the maximum voltage between terminals 1 and 3. Power rating vs. ambient temperature shall be denoted on the following graph. 端子1と3の間に連続負荷することが出来る最大電力。 周囲温度に対する、電力軽減曲線は右図とする。 Power rating ratio (%) Ambient temperature (°C)	0.5W
3. 3	Rated voltage 定格電圧	Rated voltage $E = \sqrt{PR}$ (V) P: Power rating 定格電力 (W) R: Nominal total resistance 公称全抵抗値 (Ω) When the rated voltage exceeds the maximum operating voltage, the maximum operating voltage shall be the rated voltage. ただし, 定格電圧が最高使用電圧を超える場合は, この最高使用電圧を定格電圧とする。	Maximum operating voltage 最高使用電圧 D. C. 20V A. C. 500V
3. 4	Resistance law (Taper) 抵抗変化特性	Measurement shall be made by the resistance law method. 電圧法にて測定する。 Measurement shall be made at the position of right diagram from the edge at the side of terminal 1. When based on terminal 3, from the edge at the side of terminal 3. Output voltage between terminals 1 and 2 X100(%) Applied voltage between terminals 1 and 3 1-2端子間出力電圧 X100(%) 1-3端子間面電圧 X100(%) Output voltage between terminals 1 and 2 (dB) Applied voltage between terminals 1 and 3 $20\log \frac{1-2\text{端子間出力電圧}}{1-3\text{端子間面電圧}}$ (dB)	Unit (単位) ☒ % ☐ dB TAPERED CURVE ALPS "B" (SBS80)

	ALPS ELECTRIC CO., LTD.				
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	S. A. B. A. W.	J. Yashino	Y. TAMADA	DOCUMENT NO.	
SYMB	DATE	APPD	CHKD	DSGD	5S602M0002 (1/2)

FOR

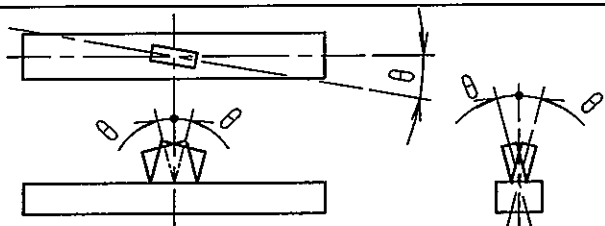
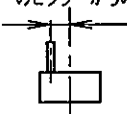
CLASS No.	TITLE MASTER TYPE POTENTIOMETER(SLIDE)	
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	Item 項 目	Conditions 条 件	Specifications 規 格
3. 5	Attenuation and insertion loss 最大減衰量と 挿入損失	The attenuation and insertion loss at each end of lever travel shall be measured. しゅう動子を移動距離の各終端に置いたとき 最大減衰量、挿入損失を測定する。 The voltage of 2V r.m.s. to 15V r.m.s shall be applied between terminal 1 and 3 by measuring frequency at 1kHz. The output voltage shall be measured between terminals 1 and 2, and terminals 2 and 3. If there is not any doubt about the results. D.C. voltage shall be used as the test voltage. 端子1-3間に1kHzで2~15V (正弦波実効値)の電圧を加え、端子1-2間、端子2-3間の出力電圧を測定する。なお、判定に疑義が生じなければ、試験電圧として直流を用いても良い。 Input impedance of the voltmeter : 10MΩ or more. 電圧計の入力インピーダンスは10MΩ以上 	Attenuation 70dB or more 最大減衰量 Insertion loss 挿入損失 within 0.1dB 以内
3. 6	Noise しゅう動雑音	20 V d.c., when the rated voltage is 20 V or less, its rated voltage shall be applied to the terminals between 1 and 3. And then the noise shall be measured by the specified speed. For other procedures, refer to IEC 393-1-4.15 . Traveling speed:20 mm/sec. 端子1-3間に直流電圧20V (定格が20V以下の時は、その電圧)を加え、レバーを20mm/秒の速さで移動させ、このときに発生する雑音電圧を測定する。その他 JIS C 5261 A 法による。	Less than 47 mV p-p 未満
3. 7	Insulation resistance 絶縁抵抗	A voltage of 250 V d.c. shall be applied for 1 min., after which measurement shall be made. D. C. 250Vの電圧を1分間印加して測定。	Between individual terminals and frame/lever Between adjacent terminals 100 MΩ or more. 端子-レバー間、端子-枠間 独立した抵抗素子の端子間 100 MΩ 以上
3. 8	Dielectric strength 耐電圧	Trip current : 2 mA Measuring frequency : 50/60 Hz 250 V a.c. r.m.s. for 1 min. A. C. 250Vr. m. s. 1分間。 感度電流 : 2 mA (周波数 : 50/60 Hz)	Between individual terminals and frame/lever Between adjacent terminals Without damage to parts, arcing or breakdown etc. 端子-レバー間、端子-枠間 独立した抵抗素子の端子間 損傷、アークおよび絶縁破壊を生じないこと。
3. 9	Tracking error 相互偏差	The voltage of 2 to 15V r.m.s. shall be applied between terminals 1 and 3 and between terminals 1' to 3' by measuring frequency at 1 kHz. The output voltage shall be measured between terminals 1 and 2 and between terminal 1' and 2' units the first of these shall be the standard one. If there is not any doubt about the results. d.c. voltage shall be used as the test voltage. 端子1-3間、端子1'-3' 間にそれぞれ1kHzで2~15V (正弦波実効値)の電圧を加え、前段を基準として端子1-2間、端子1'-2'間の出力電圧を測定する。 なお、判定に疑義が生じなければ、試験電圧として直流を用いてもよい。  Input impedance of the voltmeter : 10MΩ or more. 電圧計の入力インピーダンスは10MΩ以上	At 50% of lever travel 移動距離の50%の位置 $\pm 2dB$

					ALPS ALPS ELECTRIC CO., LTD.			
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					Apr. 17, 2002	Apr. 17, 02	APR. 16, 02	SPECIFICATIONS
					SAZAWA	J. Yashiro	Y. TAMADA	DOCUMENT NO.
SYMB	DATE	APPD	CHKD	DSGD	5S602M0002			(2/2)

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4. Mechanical characteristics 機械的性能

Item 項 目	Conditions 条 件	Specifications 規 格
4. 1 Lever travel レバ - 移動距離		60 ± 1 mm
4. 2 Operating force 作動力	Traveling speed : 20mm/s. Operating position : Tip of the lever 移動速度は20mm/秒とする。 操作位置はレバ - 先端部とする。	0.4 ± 0.3 N
4. 3 Lever travel stop strength レバ - の移動止強度	A static load of 100N shall be applied at the point 10mm from the mounting plate for both ends in the direction of lever travel for 10s. If the lever height is less than 10mm, it shall be measured at the top of the lever. しゅう動距離の両末端において、取付面より10mmの位置に100Nの力を10秒間加える。 但し、レバ - 長さ10mm未満の場合は、レバ - の先端で測定する。	Without excessive play or poor contact. 著しいカ - タ及び接触不良を生じない事。
4. 4 Side thrust of the lever レバ - の横押し強度	A static load of 20N shall be applied at the point 5mm from the mounted plate in a direction perpendicular to the axial direction for 10s, with the potentiometer mounted in assembly conditions. 本体をシャーシに固定し、取付面より5mmの位置にレバ - 移動方向に対して直角方向に20Nの力を10秒間加える。	Without deformation or breaks in the sliding part and contact part. 操作部及び関連部品に変形、破損がない事。
4. 5 Thrust and tensile lever レバ - の押し引き強度	Thrust and tensile static load of 100N shall be applied to the potentiometer in the lever direction for 10s. レバ - の押し方向及び引き方向に、100Nの力を10秒間加える。	Without damage such as bad sliding and braking or play in the lever. Electrical characteristics shall be satisfied. レバ - のカ - タ及び破損、しゅう動ムラ等がなく、電気的性能を満足する事。
4. 6 Displacement of lever レバ - の横振れ	A torsion moment of 25mN·m shall be applied at the lever in a direction perpendicular to the axial direction and then the displacement shall be measured. レバ - に25mN·mの曲げモーメントを、移動方向に対して直角に加えレバ - 先端で測定する。	1.6mmP-P or less 以下
4. 7 Lever inclination and torsion レバ - の傾き及びねじれ		θ shall be 2° or less. θ は2度以下。
4. 8 Distance from the center of the lever レバ - のセンターズレ	After sliding lever as far as it will go in each direction, the distance from the center of the lever to the middle of the mounting screw hole shall be measured at the both ends. 取付けネジ - 穴中心に対するレバ - のセンターからのずれを、片側ごとに測定する。 	0.5mm or less on each end. 片側 0.5mm以下
4. 9 Resistance to soldering heat はんだ耐熱	Bit temperature : 350°C or less Application time of soldering iron : 5 s or less 温度350°C以下、時間5秒以内。 但し、端子に異常加圧のない事。	Change in total resistance is relative to the value before test: 5% without excessive looseness of terminals and failure contact 全抵抗値の変化は初期値の±5%以内。 著しいカ - タ、接触不良を生じない事。



ALPS ELECTRIC CO., LTD.

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CHKD

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DSGD

1技-2G
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渡 邊

TITLE

SPECIFICATIONS

DOCUMENT NO.

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印刷用
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5. Endurance 耐久性能

Item 項 目	Conditions 条 件	Specifications 規 格
5.1 Endurance without load 無負荷 しゅう動寿命	The moving contact, without electrical load, shall be slid from one end stop to the other and returned to its original position extended over 90% or more effective distance. This procedure constitutes 1 cycle. And the moving contact shall be subjected to 600 cycles per hour, a total of 100000±200 cycles (5000 to 8000 continuous cycles for 24 hours.) 無負荷にてレハ - を600サイクル/時の速さで有効移動距離の90%以上にわたり、1日連続5000~8000サイクル、合計100000±200サイクル移動させる。	Change in total resistance is relative to the value before test: ±15% Noise: Refer to Note 1) Operating force: 0.1N~0.8N Clause (3), (4) shall be satisfied. 全抵抗値の変化は、初期値の±15%以内 しゅう動雑音は、注記 1) による。 作動力は、0.1N~0.8N その他は、(3項) (4項) を満足すること。
5.2 Cold 耐寒性	The potentiometer shall be stored at a temperature of -30±2°C for 96 hours in a thermostatic chamber. Then the potentiometer shall be taken out of the chamber and its surface moisture shall be removed. And then the potentiometer shall be subjected to standard atmospheric conditions for 1 hour, after which measurement shall be made. -30±2°Cの恒温槽中にて96時間放置し、常温常湿中に1時間放置後1時間以内に測定する。 但し水滴は、取り除くものとする。	Change in total resistance is relative to the value before test: ±20% Clause (3), (4) shall be satisfied. 全抵抗値の変化は、初期値の±20%以内 その他は、(3項) (4項) を満足すること。
5.3 Dry heat 耐熱性	The potentiometer shall be stored at a temperature of 70±2°C for 240±8 hours in a thermostatic chamber. Then the potentiometer shall be maintained at standard atmospheric conditions for 1 hour, after which measurements shall be made. 70±2°Cの恒温槽中にて240±8時間放置し、常温常湿中に1時間放置後1時間以内に測定する。	Change in total resistance is relative to the value before test: +5/-30% Noise: Refer to Note 1) Operating force: 0.1N~0.8N Clause (3), (4) shall be satisfied. 全抵抗値の変化は、初期値の+5~-30%以内 しゅう動雑音は、注記 1) による。 作動力は、0.1~0.8N その他は、(3項) (4項) を満足すること。
5.4 Damp heat 耐湿性	The potentiometer shall be stored at a temperature of 40±2°C with relative humidity of 90% to 95% for 96±4 hours in a thermostatic chamber. And its surface moisture shall be removed. And then the potentiometer shall be subjected to standard atmospheric conditions for 1 hour, after which measurement shall be made. 40±2°C相対湿度90~95%の恒温恒湿槽中にて96±4時間放置し、常温常湿中に1時間放置後1時間以内に測定する。 但し水滴は、取り除くものとする。	Change in total resistance is relative to the value before test: +35/-5% Noise: Refer to Note 1) Operating force: 0.1~0.8N Clause (3), (4) shall be satisfied. 全抵抗値の変化は、初期値の+35~-5%以内 しゅう動雑音は、注記 1) による。 作動力は、0.1~0.8N その他は、(3項) (4項) を満足すること。

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					APPD.	CHKD.	DSGD.	TITLE	
					1枝-2G	1枝-2G	1枝-2G	SPECIFICATIONS	
					'99.12.24	'99.12.22	'99.12.22	DOCUMENT NO.	
初設	1999.12.16	相沢	阿部	渡辺	相沢	八代	渡辺	5S60M-02 (2/3)	
SYMB	DATE	APPD	CHKD	DSGD					

Item 項目	Conditions 条件	Specifications 規格															
5.5 Change of temperature 温度サイクル	The potentiometer shall be subjected to 5 successive change of temperature cycles, each as shown in table below. Then its surface moisture shall be removed. And then the potentiometer shall be subjected to standard atmospheric conditions for 1 hour, after which measurements shall be made. 下記条件で5サイクル試験後、常温常湿中に1時間放置後1時間以内に測定する。但し水滴は、取り除くものとする。 <table border="1"> <thead> <tr> <th>Step 段階</th><th>Temperature 温度</th><th>Duration 時間</th></tr> </thead> <tbody> <tr> <td>1</td><td>-10±3°C</td><td>30 min. 30分</td></tr> <tr> <td>2</td><td>Standard atmospheric conditions 常温</td><td>10~15 min. 10~15分</td></tr> <tr> <td>3</td><td>70±2°C</td><td>30 min. 30分</td></tr> <tr> <td>4</td><td>Standard atmospheric conditions 常温</td><td>10~15 min. 10~15分</td></tr> </tbody> </table>	Step 段階	Temperature 温度	Duration 時間	1	-10±3°C	30 min. 30分	2	Standard atmospheric conditions 常温	10~15 min. 10~15分	3	70±2°C	30 min. 30分	4	Standard atmospheric conditions 常温	10~15 min. 10~15分	Change in total resistance is relative to the value before test: ±20% Noise: Refer to Note 1) Operating force: 0.1N~0.8N Clause (3), (4) shall be satisfied. 全抵抗値の変化は、初期値の±20%以内 しゅう動雑音は、注記 1) による。 作動力は、0.1N~0.8N その他は、(3項) (4項) を満足すること。
Step 段階	Temperature 温度	Duration 時間															
1	-10±3°C	30 min. 30分															
2	Standard atmospheric conditions 常温	10~15 min. 10~15分															
3	70±2°C	30 min. 30分															
4	Standard atmospheric conditions 常温	10~15 min. 10~15分															

Note 1) For noise specification after the test, refer to the list below.

注 記 1) 試験後のしゅう動雑音規格は、下表による。

Nominal total resistance 公称全抵抗値 (kΩ) $5 \leq R_a < 500$	Nominal total resistance 公称全抵抗値 (kΩ) $R_a \leq 500$
Less than 150mVp-p未満	Less than 200mVp-p未満

					ALPS ELECTRIC CO., LTD.				
APPD.		CHKD.		DSGD.		TITLE			
1枚-2G '99.12.24 相沢		1枚-2G '99.12.22 八代		1枚-2G '99.12.22 渡邊		SPECIFICATIONS			
SYMB		DATE		APPD		CHKD		DSGD	
新設		1999.12.16		相沢		阿部		渡辺	
								DOCUMENT NO.	
								5S60M-02 (3/3)	

ご使用上の注意

PRECAUTION IN USE

1. 偏心ツマミをご使用になる場合

レハ-の中心より離れたところを作用点としてご使用になる場合、可能な限り

下図A寸法を短くしてご使用下さい。

If it will be used the operating point away from the center line of the lever, it should be shorter as possible.

2. レハ-長さについて

レハ-長さについては、ツマミを含めて、下図B面より極力短いものを

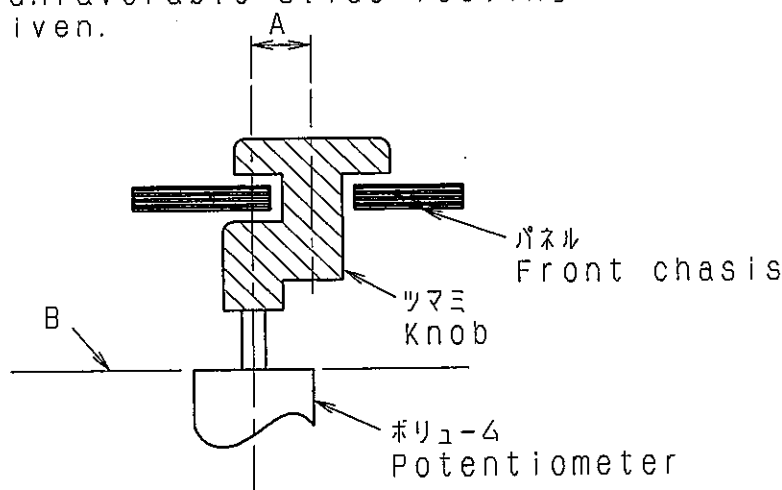
ご使用願います。レハ-長さについては、作用点までの距離が短いほど

しゅう動感触が良好となり、長いほど好ましくない感触になります。

About the length of lever

If conditions permit, it is advisable to use the shortest possible lever.

The longer the length up to operating point, the more unfavorable slide feeling will be given.



3. レハ-の駆動に関しては上記内容を考慮の上、セッ実装を行い

あらかじめ異常のないことをご確認願います。

Regarding the operation of the lever, please consider the above mentioned, and make sure nothing is wrong with the operation under installing in your appliance that you plan to use our products actually.

4. ツマミ挿入及びレハ-操作は、ホ-リウムマウント基板に

ソリ(曲がり)のない状態で行って下さい。

Knob assembly on the lever and functioning the lever to be performed under the condition of P.C.B. without warp.

5. 電圧調整形回路において出力側のインピーダンスが低い場合には抵抗体と摺動子間の接触抵抗の影響を受けることがありますのでインピーダンスを公称全抵抗値の100倍以上に設定願います。

There is a possibility that might be affected by contact resistance of resistive element and wiper in case of low impedance of output side in voltage regulation circuit. for this reason, we require that you adjust to impedance of output side more than 100 times of total resistance.

					ALPS ELECTRIC CO., LTD.				
					APPRO. 通設計試作 07.4.5 池之上	CHKD. 通設計試作 07.4.5 大矢	DSGD. 通設計試作 07.4.5 玉田	TITLE スライト・ホ-リウム 仕様書 SPECIFICATIONS	
ORIGINAL	1991-07-03	Y・Y	K・N	S・A	DOCUMENT NO. 450001-200				
SYMB	DATE	APPD	CHKD	DSGD					

FOLLOW THE NEXT CONDITIONS FOR SOLDERING

[illegible]

