Farnell InOne 733258

Customer:

No. SW044550A

Date : 2004 - 05 - 20

ALGE GERMAN DISTRIBUTER

Attention:

Your ref. No. :

Your Part No. : SDDFA32100*10 1026*

SPECIFICATION

ALPS' ;

MODEL : SDDFA32100

Spec. No. : SDDF-S-501

Sample No. : F1498556M

RECEIPT STATUS

RECEIVED

By Date

Signature

Name

Title

ALPS®

ALPS ELECTRIC CO., LTD.

DSG' D S. Takahashi

APP' D K.ITO

ENG. DEPT. DIVISION

Sales

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Test Certificate

Electronic components

Product Services

Certificate No	6693
This is to certify that	Mains switch type as listed in the schedule to this certificate
Submitted by	Alps Electric Co Ltd Mechatronic Devices Division 6-3-36 Nakazato Furukawa-shi Miyagi-ken 989-6181 Japan
	have been tested and certified by BSI in accordance with Test Leaflets 1 and 5 to BS EN 60065:1998 (BS 415:1998) and IEC 60065 Sixth edition:1998 Sub-clauses 13.1.1 and 14.6.6 a)
	Details of the scope of the certification are given in BSI Report No 116901 and any addenda thereto.
Signed	Houston
Issue date	18 September 2002
Expiry Date	17 September 2004

Attention is drawn to the conditions under which this certificate is issued, namely:

1. The general conditions relating to acceptance of testing (Testing Leaflet No. TL1) and the specific conditions (Test Leaflet No. TL5 or TL22 as stated above) apply in all respects.
2. This certificate may not be published except in full including any schedule unless permission for the publication of an approved extract has been obtained in writing from the General Manager of BSI Product Services.
3. This certificate is valid until the expiry date shown above. It shall then be considered cancelled and withdrawn and shall not be used in any way whatsoever.
4. If the BSI is satisfied that the manufacturer is marketing what is purporting to be the same model of component but which has been altered or modified or is in any material aspect different from the item tested or is satisfied in respect of evidence discovered by or submitted to it that components purported to be identical to that originally certified are no longer meeting any part of the requirements of the original examination and tests then the certificate will be immediately withdrawn and shall not be used in any way whatsoever.

UKAS TESTING 0135

Prepared by: BSI Product Services Maylands Avenue Hemel Hempstead Hertfordshire HP2 4SQ

Schedule to Test Certificate No 6693
Schedule issue date 18 September 2002
Test Certificate expiry date 17 September 2004

Product Services

Mains switch type SDDF series:

SDDF-2 SPST (single-pole, single-throw)
SDDF-3 DPST (double-pole, single-throw)
rated at 4 A/128 A 250 V a.c. and 8 A/128 A 250 V a.c.

The above SDDF series with added solenoid unit and extra low voltage switch.

The above SDDF series with alternative construction for solenoid unit and extra low voltage switch with a 35 % reduced load coil spring and a change of position of solenoid terminals.

In respect of BS EN 60065:1998 Sub-clause 14.6.6 a) the samples achieved a flammability category of FV 0 in accordance with Clause G.1.1 of Annex G

This schedule must be read in conjunction with the test certificate identified above and may not be published except in full including the certificate.

Prepared by: BSI Product Services Maylands Avenue Hemel Hempstead Hertfordshire HP2 4SQ

(Power)

SDDF-S-501	SDDF PRODUCT SPECIFICATIONS	

1. General
1.1 Application This specification is applied to power switches used for electronic equipment.
1.2 Operating temperature range : −10 ~ 55 ℃
1.3 Test conditions The standard test conditions shall be 5~35℃ in temperature, 45~85% RH and 86~106kPa ~~{860~1060mbar}~~ in atmospheric pressure. Should any doubt arise in judgement, tests shall be conducted at 20±2℃, 65±5% RH and 86~106kPa ~~{860~1060mbar}~~
2. Appearance, construction and dimensions
2.1 Appearance Switch shall have good finishing, and shall have no rust, crack or plating failures.
2.2 Construction and dimensions Per individual product drawing
2.3 Markings Per individual product drawing
3. Ratings 250V10A*.125V5A*E (According to Electrical Appliance and Material Control Law)
TV-8 (UL.CSA) 4A/128A250V~ (CEE)
4. Electrical performance (Micro gap)

	Items	Test conditions	Criterion
4.1	Contact resistance	Shall be measured at 1A, 5V DC by voltage drop method.	100 mΩ MAX
4.2	Insulation resistance	Test voltage : 500 V DC, measured after 1 minute±5 seconds. Applied position : Between all terminals Between terminals and ground (frame)	500 MΩ MIN
4.3	Voltage proof	Following test voltages shall be applied for 1 minute. (cut-off current 2mA) Between terminals of open contacts : 2000 V AC (50~60Hz) Between terminals of opposite polarity : 2000 V AC (50~60Hz) Between terminals and ground (frame) : 4000 V AC (50~60Hz)	No dielectric breakdown shall occur.

5. Mechanical performance

	Items	Test conditions	Criterion
5.1	Operating force	A static load shall be applied to the tip of actuator in operating direction.	As per individual product drawing.
5.2	Terminal strength	A static load of 10N ~~{1.02kgf)}~~ shall be applied to the tip of terminal in a desired direction for 1 minute. The number of test shall be once per terminal.	Shall be free from terminal looseness and damage and breakage of terminal holding portion. Terminals may be bent after test, electrical performance requirement specified in item 4 shall be satisfied.
5.3	Mounting strength of thread portion	Thread shall be mounted at 0.6N·m ~~{6.12kgf·cm}~~ by normal mounting method.	Shall be free from damage of thread portion.
5.4	Control strength 5.4.1 Control strength	(1) A static load of 100N ~~{10.2kgf)}~~ shall be applied in the operating direction of actuator for 15 seconds. (2) A static load of 20N ~~{2.04kgf)}~~ shall be applied in the vertical direction of operation at the tip of actuator for 15 seconds. (3) A static load of 50N ~~{5.1kgf)}~~ shall be applied in the pull direction of operation at the condition of releasing self-lock for 15 seconds.	Shall be free from pronounced wobble, bending and mechanical abnormalities.
	5.4.2 locking strength (Applied to the self-lock mechanism)	(1) A static load of 5N ~~{510gf)}~~ shall be applied in the pull direction of operation at the condition of locking actuator.	Shall be locking actuator after test. Shall be free from pronounced wobble, and operational abnormalities.
5.5	Control Wobble	Run-out(P-P) shall be measured by applying a static load of 1N ~~{102gf)}~~ in the vertical direction of operation at the tip of actuator.	P-P : 1 mm MAX
5.6	Vibration-proof	Switch shall be secured to a testing machine by a regular mounting device and method. (1) Vibration frequency range : 10~55Hz (2) Total amplitude : 1.5mm (3) Sweep ratio : 10-55-10(Hz) Approx. 1 minute (4) Method of changing the sweep vibration frequency : Logarithmic or linear (5) Direction of vibration : Three vertical directions including actuator. (6) Time : 2 hours each (6 hours in total)	Contact resistance (Item 4.1) : 100 mΩ MAX Insulation resistance (Item 4.2) : 100 MΩ MIN Voltage proof (Item 4.3) : No dielectric breakdown shall occur. Operating force (Item 5.1) : As per individual product drawing. No abnormalities shall be recognized in appearance and construction.
5.7	Mechanical shock 5.7.1 Mechanical shock	(1) Acceleration : 490m/s² ~~{50G)}~~ (2) Duration : 11ms (3) Test direction : 6 directions (4) Number of shock : 3 times per direction (18 times in total)	Contact resistance (Item 4.1) : 100 mΩ MAX Operating force (Item 5.1) As per individual product drawing. Shall be free from mechanical abnormalities.
	5.7.2 Shock in locking (Applied to the self-lock mechanism)	The test shall be conducted at the condition of locking actuator. (1) Acceleration : 147m/s² ~~{15G)}~~ (2) Duration : 11ms (3) Test direction : 6 directions (4) Number of shock : 3 times per direction (18 times in total)	Shall be locking actuator after test. Shall be free from operational abnormalities.

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OR

	Items	Test conditions	Criterion
5.8	Solderability	(1) Solder : H63A (JIS Z 3282) (2) Flux : Rosin flux (JIS K 5902) having a nominal composition of 25% solids by mass of water white rosin in methyl alcohol (JIS K 1501) solution. (3) Soldering temperature : 230±5℃ Immersing time : 3±0.5 s Flux immersing time shall be 5～10 seconds in normal temperature. (4) Immersion depth : Immersion depth shall be at wiring portion of lead wire for lead wire terminal. Immersion depth shall be at copper plating portion for P.C.B. terminal after mounting. Thickness of P.C. board : 1.6 mm	More than 75% of immersed part shall be covered with solder. If frame is made of tin plate, cutting section shall not be applied.
5.9	Soldering heat resistance	(1) Solder : H63A (JIS Z 3282) (2) Flux : Rosin flux (JIS K 5902) having a nominal composition of 10% solids by mass of water white rosin in methyl alcohol (JIS K 1501) solution. (3) Temperature and immersing time Dip soldering: Temperature (℃) 260± 5, Time (s) 10±1 Manual soldering: Temperature (℃) 350±10, Time (s) 3±0.5 (4) Immersion depth : Immersion depth shall be at wiring portion of lead wire for lead wire terminal. Immersion depth shall be at copper plating portion for P.C.B. terminal after mounting. Thickness of P.C. board (Single sided copper clad P.C.B.) : 1.6mm	No abnormalities shall be recognized in appearance and operation. The electrical performance requirements specified in item 4 shall be satisfied

6. Durability

	Items	Test conditions	Criterion
6.1	Endurance (A) According to Electrical Appliance and Material Control Law	250V 10 A ≒ Switch shall be operated according to following sequence. Test 1, Test 2 and Test 3.	Switch shall function properly at rated current. Insulation resistance (Item 4.2): 100 MΩ MIN Voltage proof: No electric breakdown shall occur. Operating force (Item 5.1): Within ±10 % of specified value. Shall be free from abnormalities in appearance and construction. Temperature rise: 60 ℃ MAX

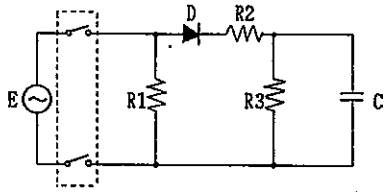
	Voltage	Current	Power factor	Operation rate	Number of operation
Test 1	250 V	10 A	0.75 MIN 0.8 MAX	20 cycles /min	5,000 cycles
Test 2	250 V	10 A	0.95 MIN 1 MAX	3 cycles /min	100 cycles
Test 3	250 V	15 A	0.75 MIN 0.8 MAX	20 cycles /min	100 cycles

Temperature rise
Difference between temperature rise and ambient temperature shall be measured at steady terminal temperature after conducting the rated current.
Voltage proof
Following test voltages shall be applied for 1 minute.
(cut-off current 2mA)
Between terminals of open contacts : 1500 V AC (50～60Hz)
Between terminals of opposite polarity : 1500 V AC (50～60Hz)
Between terminals and ground (frame) : 1500 V AC (50～60Hz)

125V 5 A≒E (Tungsten, filament electric lamp load)
Switch shall be operated according to folllowing sequence.
Test 1 and Test 2.

	Voltage	Current	Inrush current	Operation rate	Number of operation
Test 1	125 V	7.5 A	111 A	10 cycles /min	100 cycles
Test 2	125 V	5 A	78 A	10 cycles /min	10,000 cycles

Switch shall function properly at rated current.
Insulation resistance (Item 4.2):
100 MΩ MIN
Voltage proof :
No electric breakdown shall occur.
Operating force (Item 5.1):
Within ±10 % of specified value.
Shall be free from abnormalities in appearance and construction.
Temperature rise: 60 ℃ MAX

	Items	Test conditions	Criterion
		Temperature rise Difference between temperature rise and ambient temperature shall be measured at steady terminal temperature after conducting the rated current. Voltage proof Following test voltages shall be applied for 1 minute. (cut-off current 2mA) Between terminals of open contacts : 1000 V AC (50~60Hz) Between terminals of opposite polarity : 1000 V AC (50~60Hz) Between terminals and ground (frame) : 1000 V AC (50~60Hz)	
	Endurance (B) According to CEE standards	4A/128A 250V~ Switch shall be operated 10,000 cycles at 7 cycles per minute with following test circuit.  E : 250 V R1: 62.5 Ω R2: 2.76 Ω R3: 1562 Ω C : 905 μF Temperature rise Difference between temperature rise and ambient temperature shall be measured after conducting the rated current for 1 hour. Voltage proof Following test voltages shall be applied for 1 minute. (cut-off current 2mA) Between terminals of open contacts : 1500 V AC (50~60Hz) Between terminals of opposite polarity : 1500 V AC (50~60Hz) Between terminals and ground (frame) : 3000 V AC (50~60Hz)	Switch shall function properly at rated current. Insulation resistance (Item 4.2): 100 MΩ MIN Voltage proof : No electric breakdown shall occur. Operating force (Item 5.1): Within $^{+10}_{-30}$ % of specified value. Shall be free from abnormalities in appearance and construction. Temperature rise: 55 ℃ MAX
	Endurance (C) According to UL and CSA standards	TV-8 (Tungsten, filament electric lamp load) Switch shall be operated according to following sequence. Test 1, Test 2 and Test 3.

	Voltage	Current	Inrush current	Operation rate	Number of operation
Test 1	120 V	12 A	163 A	6 to 10 cycles/min	50 cycles
Test 2	120 V	8 A	117 A	6 to 10 cycles/min	10,000 cycles
Test 3	120 V	8 A	117 A	6 to 10 cycles/min	15,000 cycles

Temperature rise
Difference between temperature rise and ambient temperature shall be measured at steady terminal temperature after conducting the rated current.
Voltage proof
Following test voltages shall be applied for 1 minute. (cut-off current 2mA)
Between terminals of open contacts : 1000 V AC (50~60Hz)
Between terminals of opposite polarity : 1000 V AC (50~60Hz)
Between terminals and ground (frame) : 1000 V AC (50~60Hz)

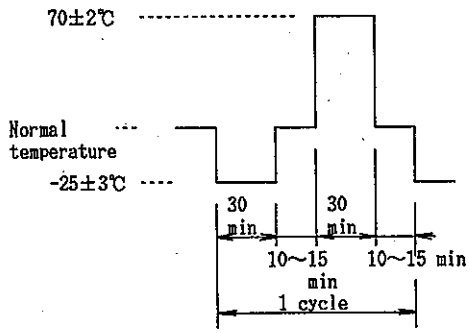
After test 2,
Switch shall function properly at rated current.
Insulation resistance (Item 4.2):
100 MΩ MIN
Voltage proof :
No electric breakdown shall occur.
Operating force (Item 5.1):
Within $^{+10}_{-30}$ % of specified value.
Shall be free from abnormalities in appearance and construction.
Temperature rise: 30 ℃ MAX

After test 3,
Switch shall function properly at rated current.
Insulation resistance (Item 4.2):
100 MΩ MIN
Voltage proof :
No electric breakdown shall occur.
Operating force (Item 5.1):
Within $^{+10}_{-30}$ % of specified value.
Shall be free from abnormalities in appearance and construction.

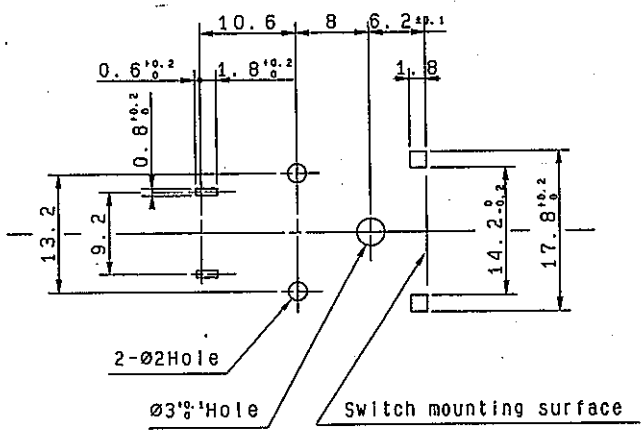
7. Weather proof

	Items	Test conditions	Criterion
7.1	Cold proof	After testing at -20±2℃ for 96 hours, the switch shall be allowed to stand under normal temperature and humidity conditions for 1 hour, and then measurement shall be made within 1 hour. Water drops shall be removed.	Contact resistance (Item 4.1) : 100 mΩ MAX Insulation resistance (Item 4.2) : 100 MΩ MIN Voltage proof (Item 4.3) : No dielectric breakdown shall occur. Operating force (Item 5.1) : Within $^{+10}_{-30}$ % of specified value. No abnormalities shall be recognized in appearance and construction.

SDDF-S-501	SDDF PRODUCT SPECIFICATIONS	

	Items	Test conditions	Criterion
7.2	Dry heat	After testing at 85±2℃ for 96 hours, the switch shall be allowed to stand under normal temperature and humidity conditions for 1 hour, and then measurement shall be made within 1 hour.	Contact resistance (Item 4.1) : 100 mΩ MAX Insulation resistance (Item 4.2) : 100 MΩ MIN Voltage proof (Item 4.3) : No dielectric breakdown shall occur. Operating force (Item 5.1) : Within $^{+10}_{-30}$ % of specified value. No abnormalities shall be recognized in appearance and construction.
7.3	Damp heat	After testing at 40±2℃ and 90~95%RH for 96 hours, the switch shall be allowed to stand under normal temperature and humidity conditions for 1 hour, and measurement shall be made within 1 hour after that. Water drops shall be removed.	Contact resistance (Item 4.1) : 100 mΩ MAX Insulation resistance (Item 4.2) : 100 MΩ MIN Voltage proof (Item 4.3) : No dielectric breakdown shall occur. Operating force (Item 5.1) : Within $^{+10}_{-30}$ % of specified value. No abnormalities shall be recognized in appearance and construction.
7.4	Salt mist	(1) Temperature : 35±2℃ (2) Salt solution : 5±1% (mass) (3) Duration : 24±1 hours After the test, salt deposit shall be removed in running water.	No remarkable corrosion shall be recognized in metal part.
7.5	Temperature cycling	After 5 cycles of following conditions, the switch shall be allowed to stand under normal temperature and humidity conditions for 1 hour, and measurement shall be made within 1 hour after that. Water drops shall be removed. 	Contact resistance (Item 4.1) : 100 mΩ MAX Insulation resistance (Item 4.2) : 100 MΩ MIN Voltage proof (Item 4.3) : No dielectric breakdown shall occur. Operating force (Item 5.1) : Within $^{+10}_{-30}$ % of specified value. No abnormalities shall be recognized in appearance and construction.

※ Precaution in use
1. Unstable contact may occur if the switch current is lower than 500 mA. Please consult for special applications.
2. Power switches are applied for alternating current. Please consult us if these are applied for direct current.
3. Use of water-soluble soldering flux be avoided because it may cause corrosion of the switch.
4. In case of Snap-in type frame,Please refer to following dimension of P.C.Board mounting hole.



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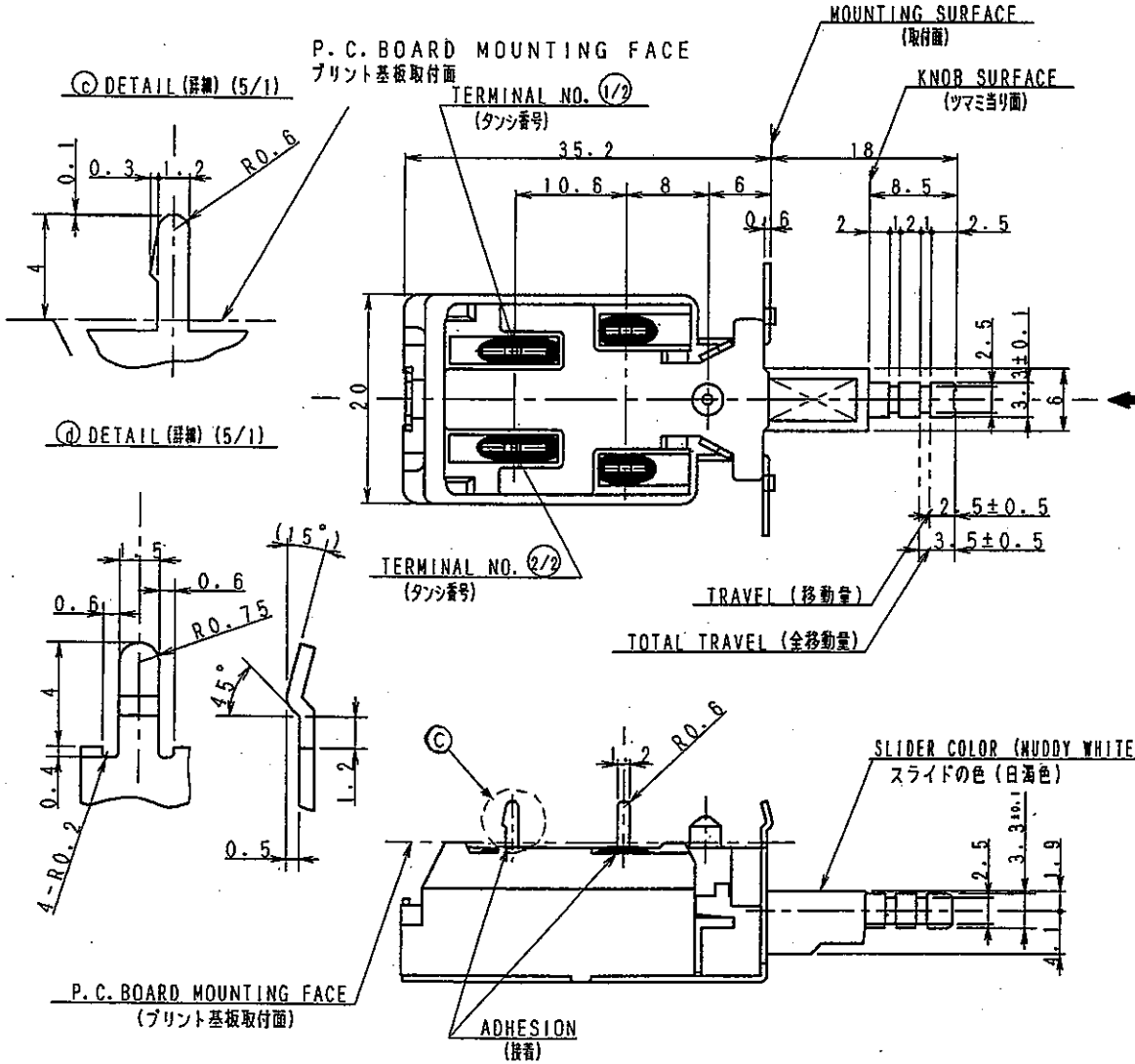
									May. 21 '93	DRAWING NO. (4/4)

OR



THE FOLLOWING SAFETY STANDARD MARKS SHALL BE MARKED ON THE SWITCH BODY. BUT, THE UL, CSA AND OTHER MARKINGS SHALL BE MARKED ON DIFFERENT SURFACE, OR SEPARATE PORTION.

(スイッチ本体に以下の安全規格マークを表示する。
但し、UL、CSAとこれ以外の安全規格マークは異なる面、もしくは分離表示を行う。)

MODEL (認可型式)	SDDF-3		SDDF-3		
RATING (定格)	TV-8		4A/128A 250V ~ ⏦		
STANDARD (規格名)	UL	CSA	SEMKO	BS	VDE
MARK (マーク)				—	
⚠			SEV	DEMKO	NEMKO

* BS REQUIREMENTS TO BE GUARANTEED BY THE APPROVAL SHEET.
(BSについては認定書で保証します。)

CIRCUIT DIAGRAM
(回路図)

背景
BACK GROUND
⚠ No98AE019

4. THE ALPS MARK AND DATE CODE SHALL BE MARKED ON THE SWITCH BODY.
(スイッチ本体にALPSマーク、製造密番を表示すること。)
3. THIS SWITCH IS MICRO-GAP CONSTRUCTION IN CEE STANDARDS.
(本スイッチはCEE規格におけるマイクロギャップ構造とする。)
2. OPERATING FORCE : 4.5 ± 1.5 N {459 ± 153 gf}
(作動力)
1. THIS SWITCH IS AVAILABLE ONLY FOR 1.6mm THICK P.C. BOARD.
(本スイッチはプリント基板板厚1.6mm専用です。)

NOTES (注記)

TOLERANCES UNLESS OTHERWISE SPEC.	
BASIC DIMENSIONS	TOLERANCES
UP TO 4	±0.2
OVER 4 UP TO 16	±0.3
OVER 16 UP TO 63	±0.4
ABOVE 63 TO 250	±0.5
ABOVE 250	±0.7
ANGULAR DIMENSIONS	±3°

ZONE	SYMB	DATE	APPD	CHKD	DSGD
	△2	May 30.'98	M.K	M.K	S.C

ALPS ELECTRIC CO., LTD.

UNIT	SCALE	MODEL NO. (機種番号)
mm	½	SDDFA32100

APPD.	CHKD.	DSGD.	TITLE
Mar. 20'98 H. Yoshizawa	Mar. 20'98 M. Kise	Mar. 20'98 S. Chiba	PRODUCT DRAWING (製品図)

DOCUMENT NO.

AEM

FURUKAWA DIV.