CODE No.								Total Pages	16	Page	1

PRODUCT STANDARDS

PART No. :	AN4801SB
PACKAGE CODE No.	HSOP042-P-0400B

IC DIVISION

SEMICONDUCTOR COMPANY

MATSUSHITA ELECTRONICS CORPORATION

———	CHECKED BY	CHECKED BY	PREPARED BY
	Y. Fujita	M. Mamei	M. Komatsu
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DATE PREPARED					
Nov. 2, 2000					

Type	Silicon Monolithic Bipolar IC
Package	DIL 26-Pin Plastic Package (USOF Type)
Application	Driver for CD/MD
Function	4-channel Power OP Amp System Driver

A	Absolute Maximum Ratings				
No.	Parameter	Symbol	Rating	Unit	Note
1	Storage temperature	Tstg	-55 to +150	℃	1
2	Operating ambient temperature	Topr	-30 to +85	℃	1
3	Operating ambient atmospheric pressure	Popr	$1.013\times10^5\pm0.61\times10^5$	Pa	
4	Operating constant gravity	Gopr	9810	m/s^2	
5	Operating shock	Sopr	4900	m/s^2	
6	Supply voltage	SVCC PVCC1, 2	14	V	
7	Supply current	ISVCC IPVCC1 IPVCC2	0.1 1.3 1.3	A	2
8	Supply voltage applicable range	SVCC PVCC1, 2	-0.3 to 14.0	V	
9	Power dissipation	PD	537	mW	3

Operating supply voltage range	SVCC	4.5 V to 13.5 V	Operate on condition that PVCC1 and PVCC2 are the same or less than SVCC.
	PVCC1	3.0 V to 13.5 V	
	PVCC2	3.0 V to 13.5 V	

Note 1) Ta=25℃ except storage temperature and operating ambient temperature.

Note 2) Make sure that channels 1 to 4 do not have a current flow exceeding 800 mA.

Note 3) When using this IC, referring to the TECHNICAL DATA (G-1), observe the power dissipation characteristic curve. Be sure to use the IC so that the power dissipation of the IC without heat sink will not exceed 537 mW at Ta=85℃.

A	Absolute Maximum Ratings				
No.	Parameter	Symbol	Rating	Unit	Note
10	Driver output current	Io(n)	±800	mA	n=10, 11, 12, 13, 14 15, 16, 17
11	Control signal input voltage	Vn	0 to SVCC	V	n=1, 2, 3, 4, 20, 24, 25, 26

Note) Do not apply current or voltage from external source to any pin not listed above.
In the circuit current, (+) means the current flowing into IC and (−) means the current flowing out of IC.

B	Electrical Characteristics (Ta=25℃±2℃ unless otherwise specified)								
No.	Parameter	Symbol	Test Circuit	Conditions	Limits			Unit	Note
					Min	Typ	Max		
	< Current Consumption >								
1	Current consumption at no load	Itot	1	VCC=8 V VREF=VIN=1.65 V	-	10	20	mA	
2	Current consumption in standby mode	ISTBY	1	VCC=8 V VREF=VIN=1.65 V VSTBY=0 V	-	-	1	mA	
	< Motor Driver >								
3	Output offset voltage	VOFS	1	VCC=8 V VIN=VREF	-50	0	50	mV	
4	+ Gain	G+	1	VCC=8 V VIN=VREF+0.15 V/0.25 V	13	15	17	dB	
5	Relative gain (+/-)	G	1		-2.0	0	2.0	dB	
6	ch1 & ch4 Max. output amplitude (+)	VL+	1	VIN=3.3 V	4.9	5.4	-	V	
7	ch1 & ch4 Max. output amplitude (-)	VL-	1	VIN=0 V	-	-5.4	-4.9	V	
8	ch2 & ch3 Max. output amplitude (+)	VL+	1	VIN=3.3 V	5.1	5.6	-	V	
9	ch2 & ch3 Max. output amplitude (-)	VL-	1	VIN=0 V	-	-5.6	-5.1	V	
	< Standby Operation >			H: Active L or Hi-Z: Standby					
10	High-level STBY threshold voltage	VSTBH	1	VCC=8 V	2.2	-	-	V	
11	Low-level STBY threshold voltage	VSTBL	1	VCC=8 V	-	-	0.7	V	
12	Input current in STBY (standby) mode	ISTBY	1	VSTBY=3.3 V	-	30	70	μA	
	< Reset Circuit >								
13	Reset operation clearing supply voltage	VRST	1		-	-	4.3	V	
14	VREF detecting voltage	VR	1		1.2	-	-	V	

Note) VCC=8 V, VREF=1.65 V, RL=8Ω, and VSTBY=3.3 V unless otherwise specified.

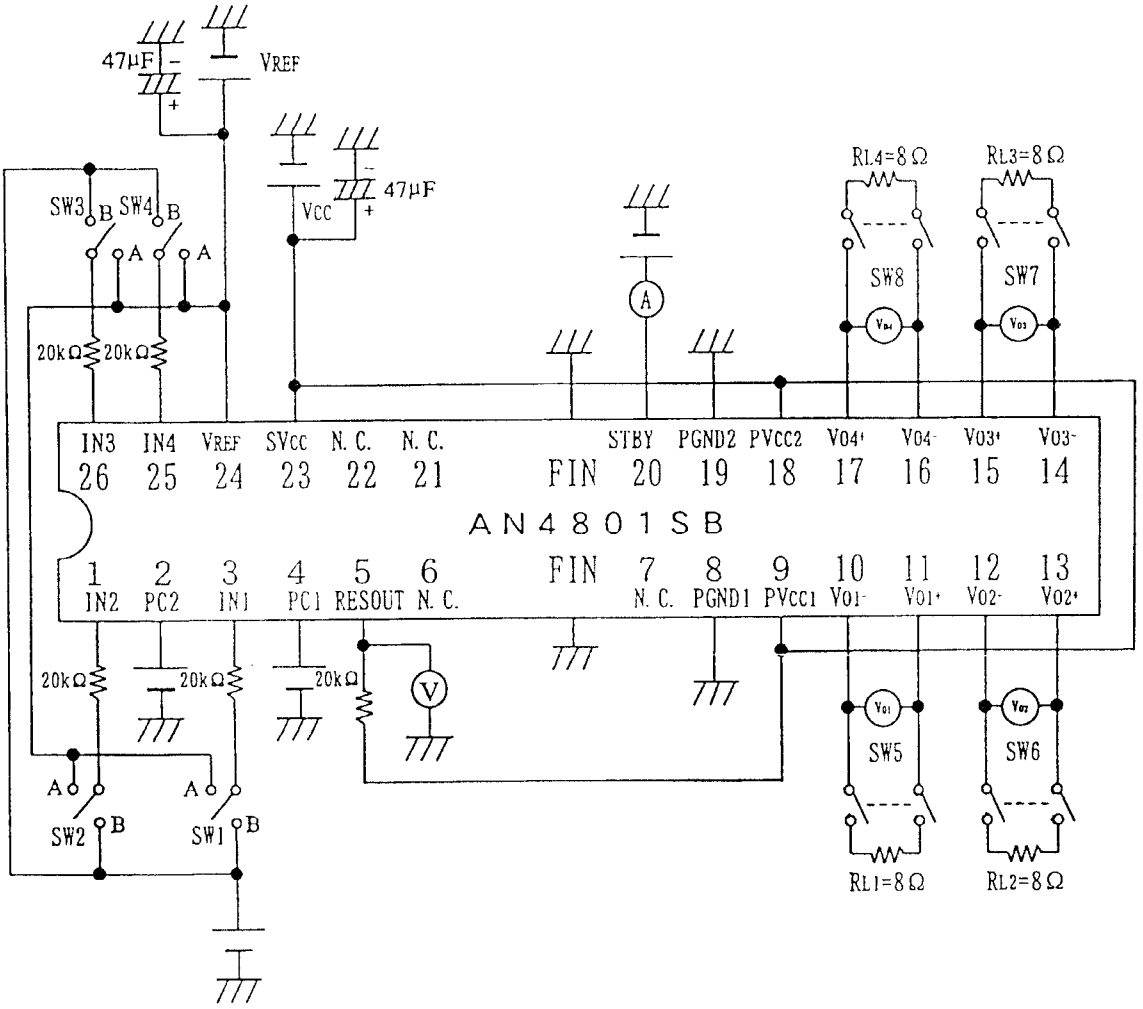
B	Electrical Characteristics (Ta=25℃±2℃ unless otherwise specified)								
No.	Parameter	Symbol	Test Circuit	Conditions	Limits			Unit	Note
					Min	Typ	Max		
	< Power Cut Operation >			H: Power Cut L or Hi-Z: Active					
15	High-level PC1 threshold voltage	VPC1H	1	VCC=8 V	2.2	-	-	V	
16	Low-level PC1 threshold voltage	VPC1L	1	VCC=8 V	-	-	0.7	V	
17	High-level PC2 threshold voltage	VPC2H	1	VCC=8 V	2.2	-	-	V	
18	Low-level PC2 threshold voltage	VPC2L	1	VCC=8 V	-	-	0.7	V	
19	PC1 input current	IPC1	1	VPC1=3.3 V	-	40	80	μA	
20	PC2 input current	IPC2	1	VCC2=3.3 V	-	40	80	μA	

Note) VCC=8 V, VREF=1.65 V, RL=8Ω, and VSTBY=3.3 V unless otherwise specified.

B	Electrical Characteristics (Ta=25℃±2℃ unless otherwise specified)								
No.	Parameter	Symbol	Test Circuit	Conditions	Limits			Unit	Note
					Min	Typ	Max		
	< Thermal Shutdown Circuit >								
21	Operating temperature balancing value	TTHD	-		-	150	-	℃	
22	Operating temperature hysteresis width	ΔTTHD	-		-	45	-	℃	
23	Supply voltage detection hysteresis width	ΔVHD	-		-	0.2	-	V	

Note) V_{CC}=8 V, V_{REF}=1.65 V, R_L=8Ω, and V_{STBY}= 3.3 V unless otherwise specified.

(Description of Test Circuit and Test Method)



(Description of Test Circuit and Test Method)

Relay Table for Test Circuit

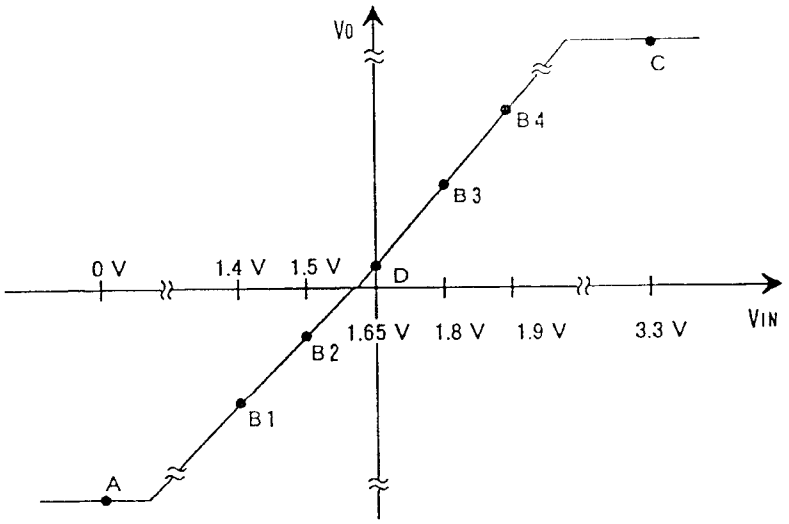
SW / Parameter No.	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
1, 2	open	open	open	open	open	open	open	open
Driver channel 1 3	A	open	open	open	on	open	open	open
Driver channel 2 3	open	A	open	open	open	on	open	open
Driver channel 3 3	open	open	A	open	open	open	on	open
Driver channel 4 3	open	open	open	A	open	open	open	on
Driver channel 1 4 to 7	B	open	open	open	on	open	open	open
Driver channel 2 4, 5, 8, 9	open	B	open	open	open	on	open	open
Driver channel 3 4, 5, 8, 9	open	open	B	open	open	open	on	open
Driver channel 4 4 to 7	open	open	open	B	open	open	open	on
10, 11	B	B	B	B	on	on	on	on
12	open	open	open	open	open	open	open	open
13, 14	B	B	B	B	on	on	on	on
15, 16	B	open	open	open	on	open	open	open
17, 18	open	B	open	open	open	on	open	open
19, 20	open	open	open	open	open	open	open	open

(Description of Test Circuit and Test Method)

Nos. 3 to 7 (Motor Driver)

Measure the voltage difference (Vo) between pins 10 and 11, pins 12 and 13, pins 14 and 15, or pins 16 and 17 following the description below.

No.	Parameter	Symbol	Note
3	Motor driver output offset voltage	V_{OFS}	Value D
4	Motor driver gain	G+	20 log10{(B4−B3)／100 mV}
5	Motor driver +/- relative gain	G	(G+) - (G-) G-=20 log10{(B2-B1)／100 mV}
6, 8	Motor driver max. output amplitude (+)	V_{L+}	Value C
7, 9	Motor driver max. output amplitude (-)	V_{L-}	Value A



(Description of Test Circuit and Test Method)

1. Current consumption at no load

Measure the current flowing into IC through the V_{CC} voltage supply pin when V_{CC} is set to 8 V.

2. Current consumption in standby mode

Measure the current flowing into IC through the V_{CC} voltage supply pin when V_{CC} is set to 8 V and V_{STBY} is set to 0 V.

10. High-level STBY threshold voltage

Check that the voltage difference Vo is 100 mV or more under the following conditions.
V_{CC} = 8 V, V_{IN} = V_{REF} ± 0.05 V, V_{STBY} = 2.2 V

11. Low-level STBY threshold voltage

Check that the voltage difference Vo is 50 mV or less under the following conditions.
V_{CC} = 8 V, V_{IN} = V_{REF} ± 0.05 V, V_{STBY} = 0.7 V

12. Input current in STBY (standby) mode

Measure the current flowing into IC through the STBY pin when V_{CC} is set to 8 V and V_{STBY} is set to 3.3 V.

13. Reset operation clearing supply voltage

Measure the V_{CC} at the moment the voltage difference Vo reaches or exceeds 100 mV while increasing the V_{CC} gradually from 2 V under the following condition.
V_{IN} = V_{REF} + 0.05 V

14. V_{REF} detecting voltage

Measure the V_{REF} at the moment the voltage difference Vo reaches or exceeds 100 mV while increasing the V_{REF} gradually from 0.7 V under the following condition.
V_{IN} = V_{REF} + 0.05 V

15. High-level PC1 threshold voltage

Check that the voltage difference V_{O1} is 50 mV or less under the following conditions.
V_{CC} = 8 V, V_{IN} = V_{REF} + 0.05 V, V_{PC1} = 2.2 V

16. Low-level PC1 threshold voltage

Check that the voltage difference V_{O1} is 100 mV or more under the following conditions.
V_{CC} = 8 V, V_{IN} = V_{REF} + 0.05 V, V_{PC1} = 0.7 V

17. High-level PC2 threshold voltage

Check that the voltage difference V_{O2} is 50 mV or less under the following conditions.
V_{CC} = 8 V, V_{IN} = V_{REF} + 0.05 V, V_{PC2} = 2.2 V

18. Low-level PC2 threshold voltage

Check that the voltage difference V_{O2} is 100 mV or more under the following conditions.
V_{CC} = 8 V, V_{IN} = V_{REF} + 0.05 V, V_{PC2} = 0.7 V

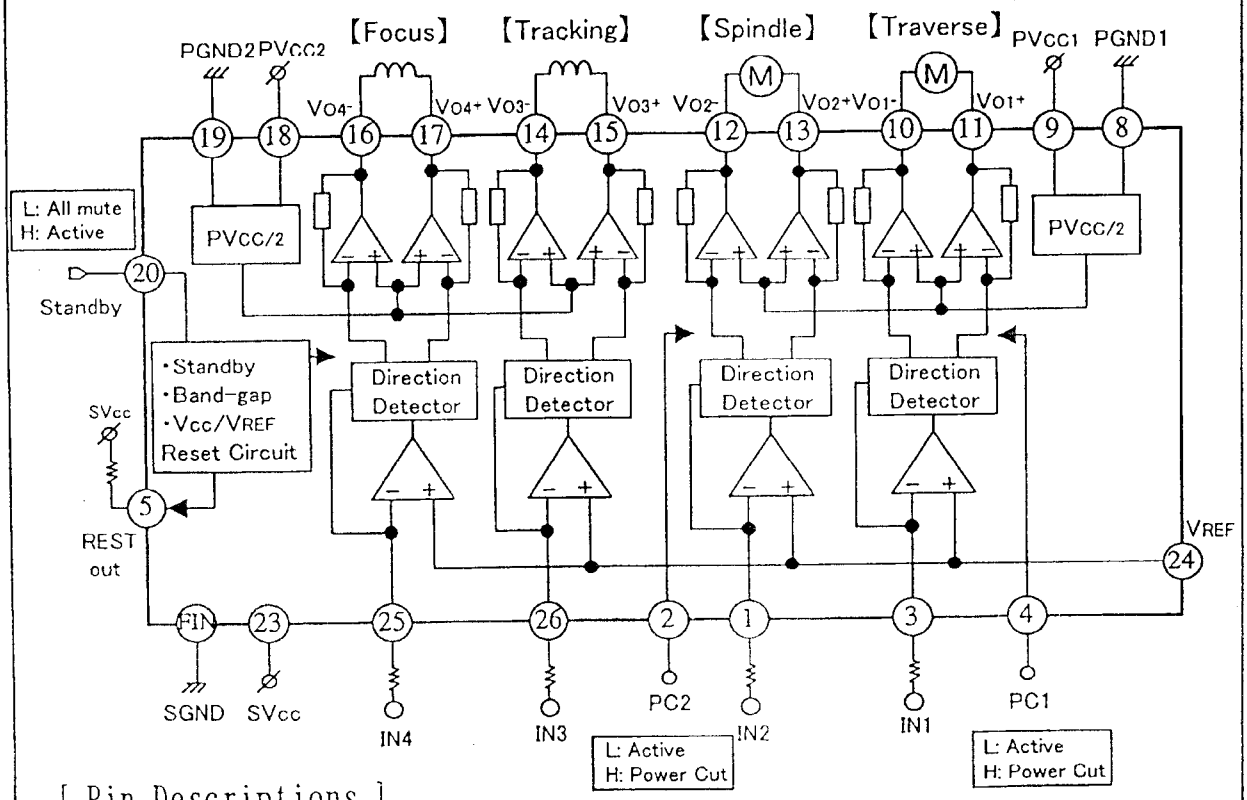
19. PC1 input current

Measure the current flowing into IC through the PC1 pin when V_{CC} is set to 8 V and V_{PC1} is set to 3.3 V.

20. PC2 input current

Measure the current flowing into IC through the PC2 pin when V_{CC} is set to 8 V and V_{PC2} is set to 3.3 V.

[Block Diagram]

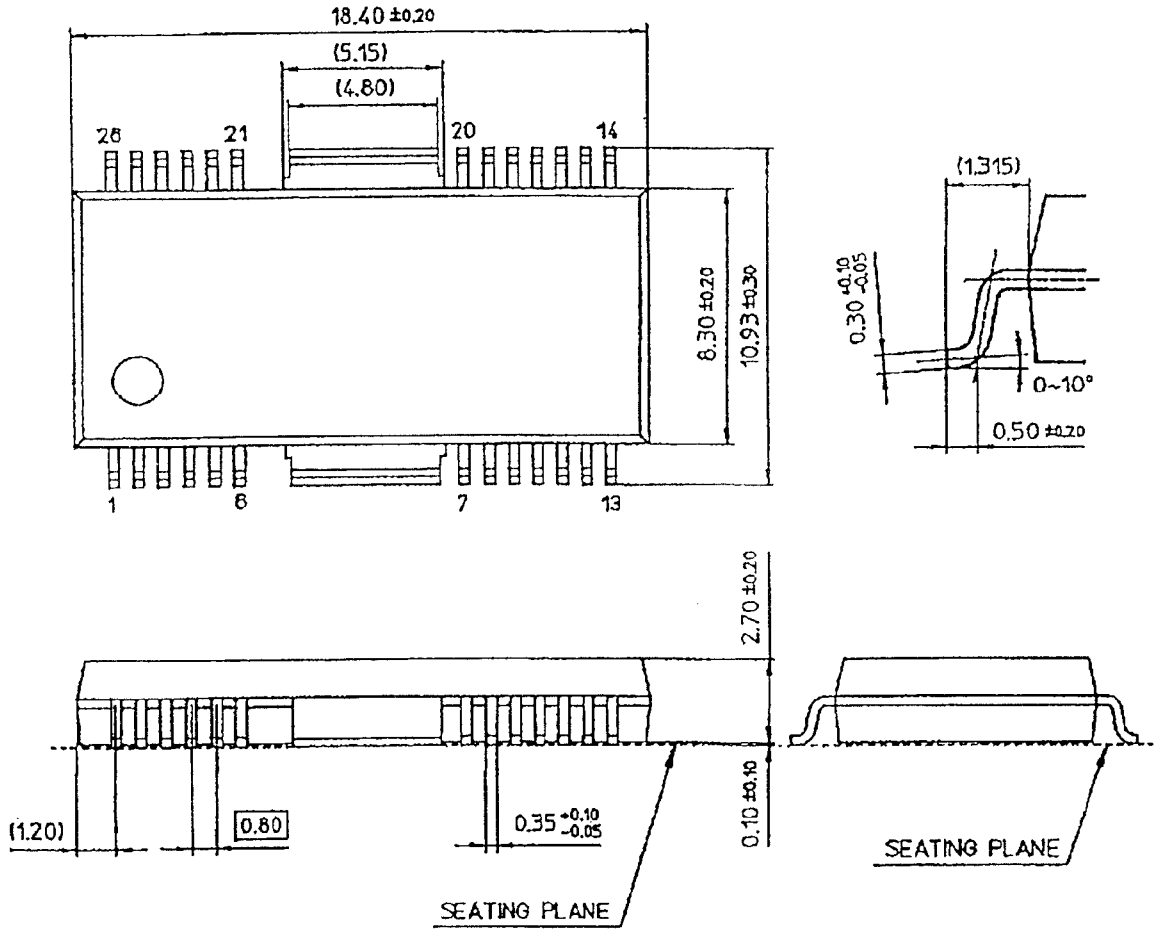


[Pin Descriptions]

Pin No.	Function	Pin No.	Function
1	Driver 2 input	16	Driver 4 inverted output
2	Power Cut input (Channel 2 mute)	17	Driver 4 forward output
3	Driver 1 input	18	Power supply 2 for driver
4	Power Cut input (Channel 1 mute)	19	Ground 2 for driver
5	Reset output	20	Standby input
6	N. C.	21	N. C.
7	N. C.	22	N. C.
8	Ground 1 for driver	23	Power supply
9	Power supply 1 for driver	24	VREF input
10	Driver 1 inverted output	25	Driver 4 input
11	Driver 1 forward output	26	Driver 3 input
12	Driver 2 inverted output	FIN	Ground
13	Driver 2 forward output		
14	Driver 3 inverted output		
15	Driver 3 forward output		

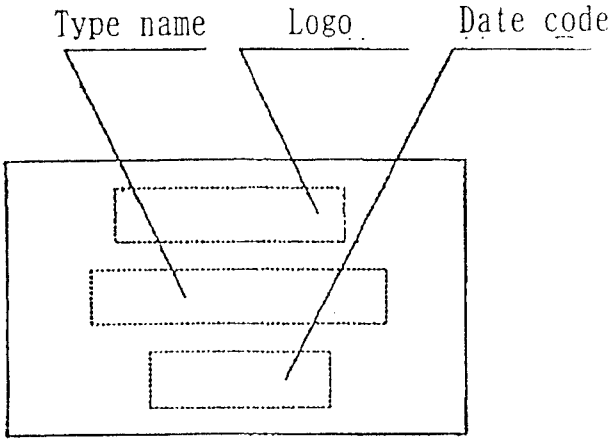
Package Code	HSOP042-P-0400B
Package Name	USOF-26D

Unit : mm



( ) : Reference value

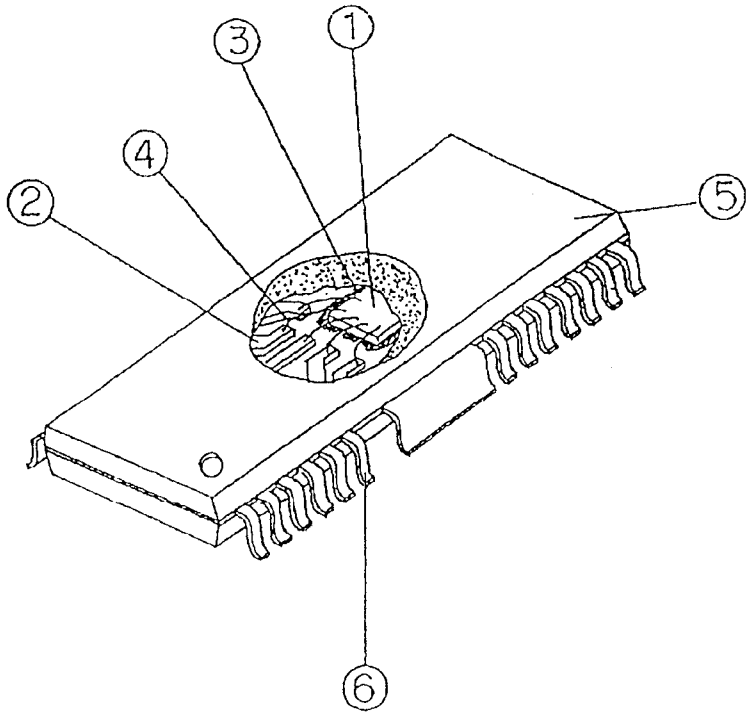
Package : USOF-26D
Method : ~~Ink Marking~~ Laser Marking
Layout : Standard ~~Special <Designated/Rank/Customer Code>~~



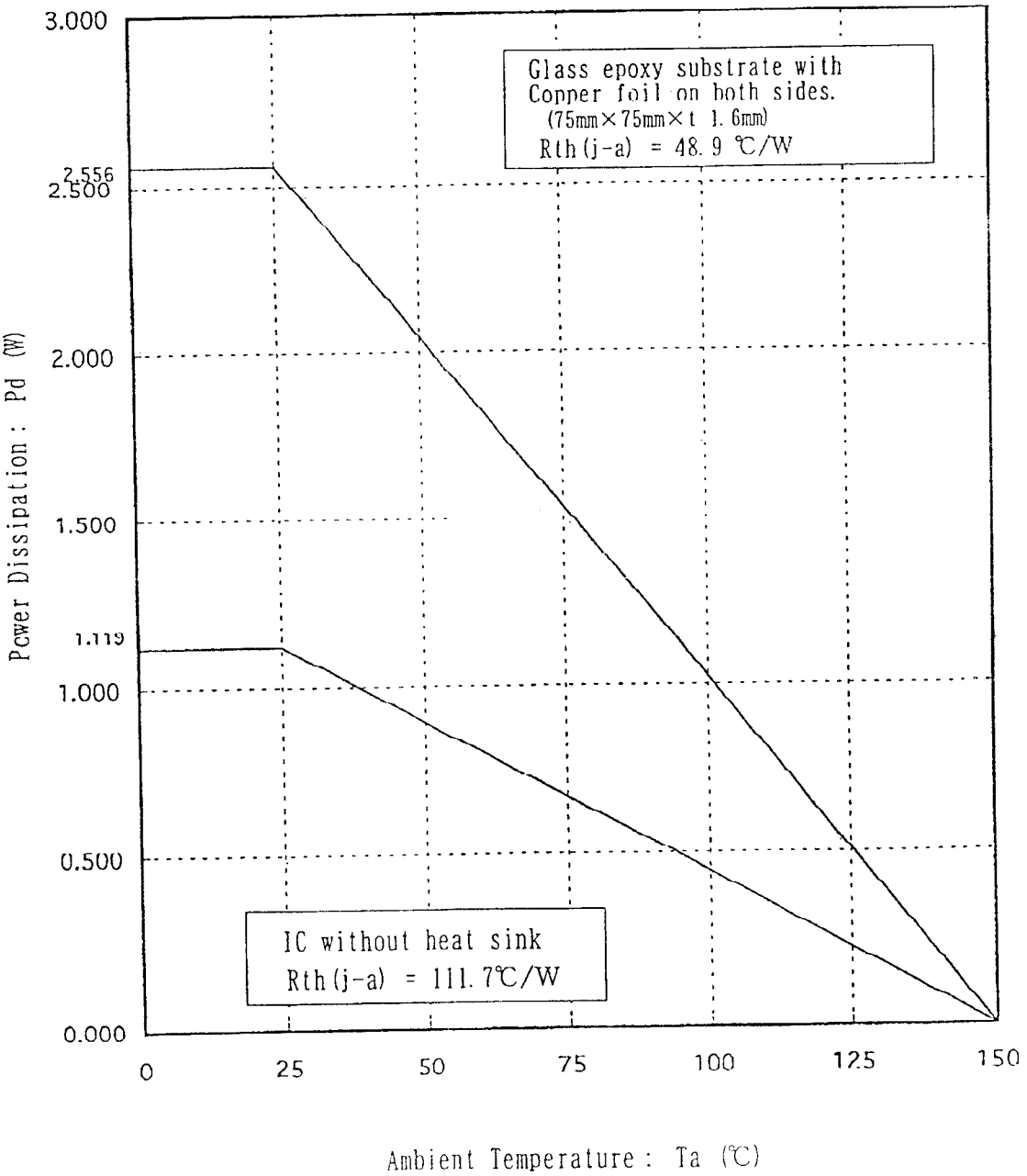
[Structure]

Chip surface passivation	SiN	①
Lead frame material	Cu group	②, ⑥
Internal lead surface treatment	Ag plating	②
External lead surface treatment	Solder dipping	⑥
Chip mounting method	Soldering	③
Wire bonding method	Thermosonic bonding	④
Wire material, diameter	Au, Diameter: 30 μm	④
Mold material	Epoxy	⑤
Molding method	Multiplunger mold	⑤

< Package >
USOF-26D



USOF-26D Package Power Dissipation



<Precautions>

- Make sure that the SVCC of the IC in operation is at its maximum potential, otherwise the IC may malfunction.

- PVCC1 and PVCC2 pins should not be used under the following conditions,
  - voltage applied (3V or less)
  - high impedance state.

- None of the PV_{CC1} and PV_{CC2} can be at 3.0 V or less or in Hi-Z state while the IC is in operation.

- Fully check the characteristics of the IC before use. The user may change the constants of the external components of the IC on condition that enough margins are provided by considering the dispersion of the transient as well as static characteristics of the IC and external components.

- Do not short-circuit the following pins, otherwise the IC may break or give off smoke.
  Output pin and V_{CC}.
  Output pin and ground.
  Output pins together (load short-circuiting).

- Before applying solder dipping to the IC, carefully take into consideration all conditions involved.