DATA SHEET

Part No.	AN15524A
Package Code No.	T0220-7A

SEMICONDUCTOR COMPANY
MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.

Contents

AN15524A

Silicon Monolithic Bipolar IC

■ Overview

AN15524A are ICs for CRT vertical deflection output. AN15524A can directly drive a deflection coil with saw wave output from a signal processing IC.

With its maximum output current of 1.6 A[p-p], AN15524A are suitable for the use of driving of 14 inch to 21 inch monitors.

■ Features

- Vertical output circuit
- Built-in pump up circuit
- Built-in thermal protection circuit
- Absolute maximum rating 70 V
- Maximum output current 1.6 A[p-p]

■ Applications

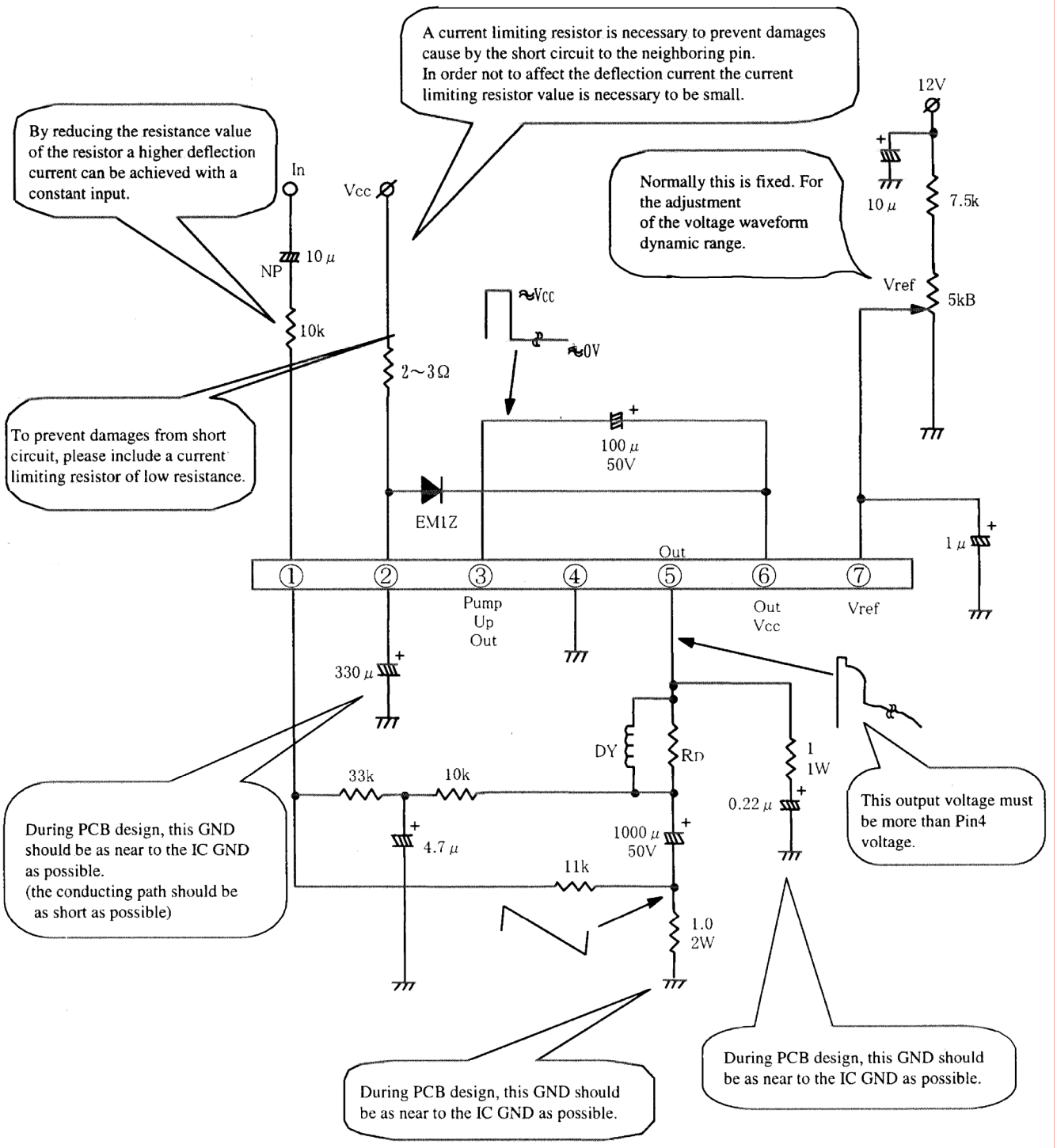
- CRT vertical output
- TV sets and displays

■ Package

- T0220-7pin Plastic Package with Fin

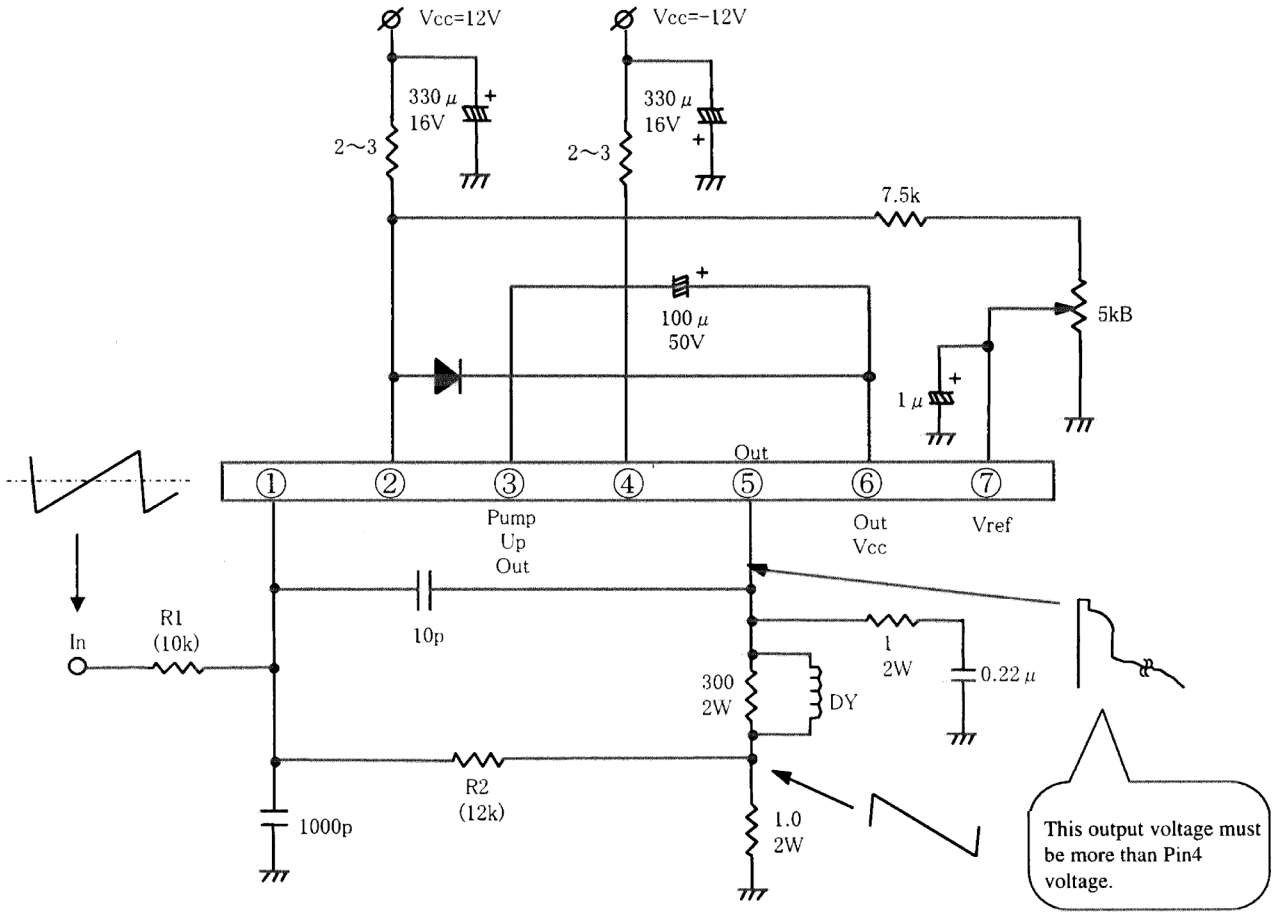
■ Application Circuit Example

•AC Coupling



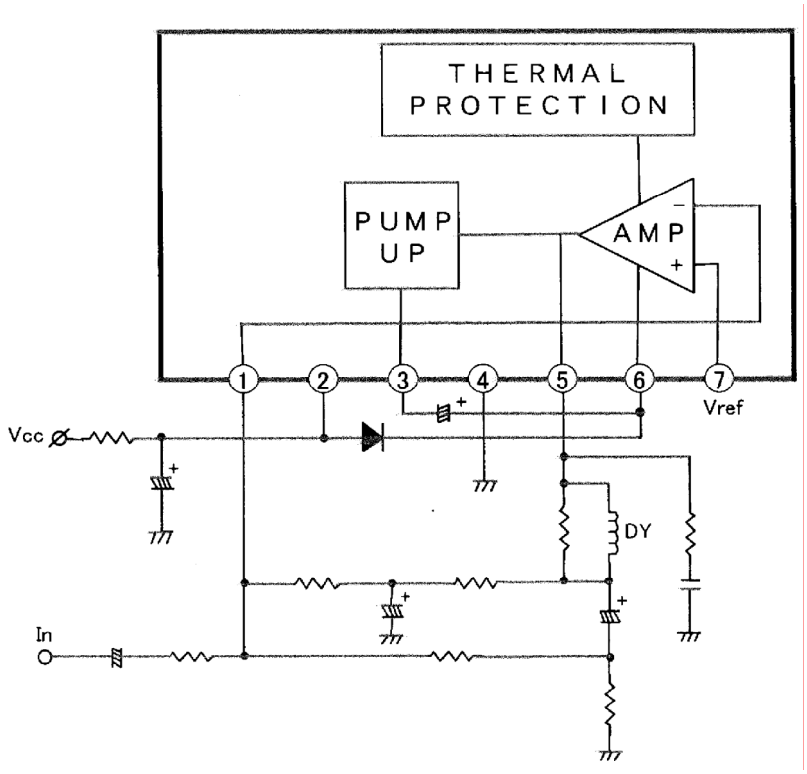
■ Application Circuit Example (continued)

•DC Coupling



In order to get required gain, it is necessary to adjust the R1 and R2.

■ Block Diagram



■Pin Descriptions

Pin No.	Pin name
1	Inverting input
2	Power supply
3	Pump-up output
4	GND
5	Vertical output
6	Vertical output power supply
7	Non-inverting input

■ Absolute Maximum Ratings

A	Absolute Maximum Ratings					
No.	Parameter	Symbol	Rating		Unit	Note
1	Storage temperature	T_{stg}	– 55 to +150		°C	* 1
2	Operating ambient temperature	T_{opr}	– 20 to +70		°C	* 1
3	Operating ambient atmospheric pressure	P_{opr}	$1.013 \times 10^5 \pm 0.61 \times 10^5$		Pa	
4	Operating constant gravity	G_{opr}	9 810		m/S^2	
5	Operating shock	S_{opr}	4 900		m/S^2	
6	Supply voltage	V_{CC2}	35		V	
7	Supply current	I_{CC2}	360		mA	
8	Power dissipation	P_D	1.5		W	* 2
9	Circuit voltage	V_{5-4} , V_{6-4}	0	70	V	
10	Circuit voltage	V_{7-4} , V_{1-4}	0	V_{2-4}	V	
11	Circuit current	I_5 , I_3	– 1.5	1.5	A[o-p]	

Note) *1: Expect for the operating ambient temperature and storage temperature , all ratings are for Ta = 25°C.

Note) *2: The power dissipation shall be at Ta = 70°C in free air, without heat sink. (refer to sheet no. 13)

■ Operating Supply Voltage Range

Parameter	Symbol	Range	Unit	Note
Operating supply voltage range	V_{CC2}	12 to 30	V	
Deflection output current	I_{5p-p}	to 1.6	A [p-p]	

■ Electrical Characteristics at 25°C ± 2°C

B No.	Parameter	Symbol	Test circuits	Conditions	Limits			Unit	Note
					Min	Typ	Max		
1	Mid-point current	V_{MID}	2	V_{CC} = 24 V	11.5	12	12.5	V	
2	Output saturation voltage (Lower)	V_{5-4}	3	V_{CC} = 24 V I5 = 0.8 A	—	1.5	2.5	V	
3	Output saturation voltage (Upper)	V_{6-5}	4	V_{CC} = 24 V I5 = – 0.8 A	—	2.4	3.4	V	
4	Pump-up charge saturation voltage	V_{3-4}	5	V_{CC} = 24 V I3 = 20 mA	—	0.8	1.2	V	
5	Pump-up discharge saturation voltage	V_{2-3}	6	V_{CC} = 24 V I3 = – 0.8 A	—	1.8	2.8	V	

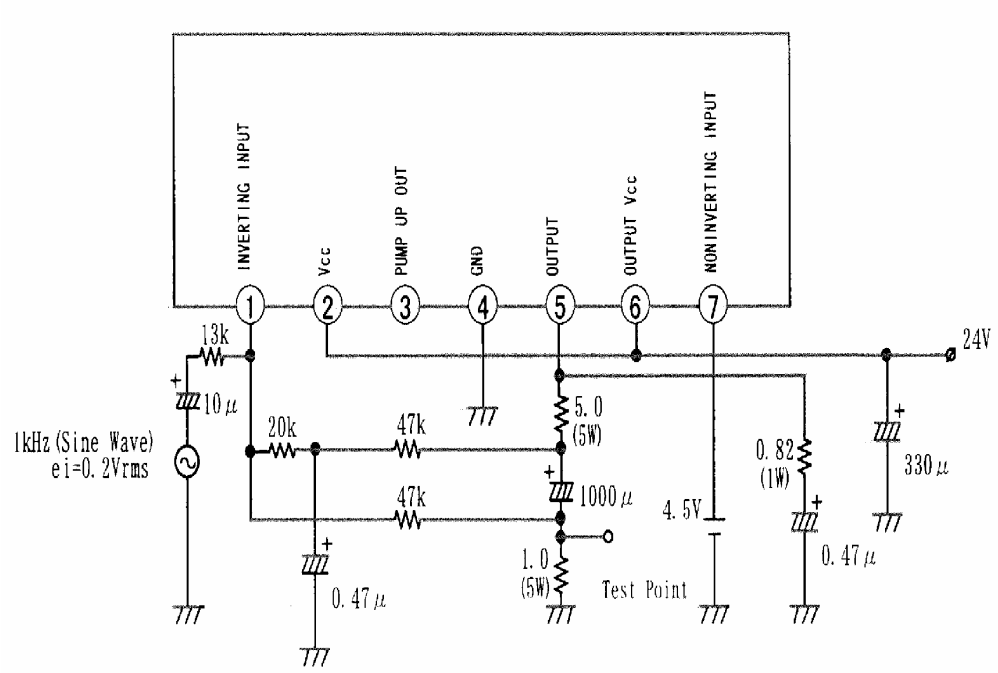
• Design reference data

b No.	Parameter	Symbol	Test circuits	Conditions	Reference			Unit	Note
					Min	Typ	Max		
1	Idling current	I_6	2	V_{CC} = 24 V	5	—	50	mA	
2	Thermal protection operating temperature	T_t	1	V_{CC} = 24 V Temperature at output shutdown	150	—	—	°C	

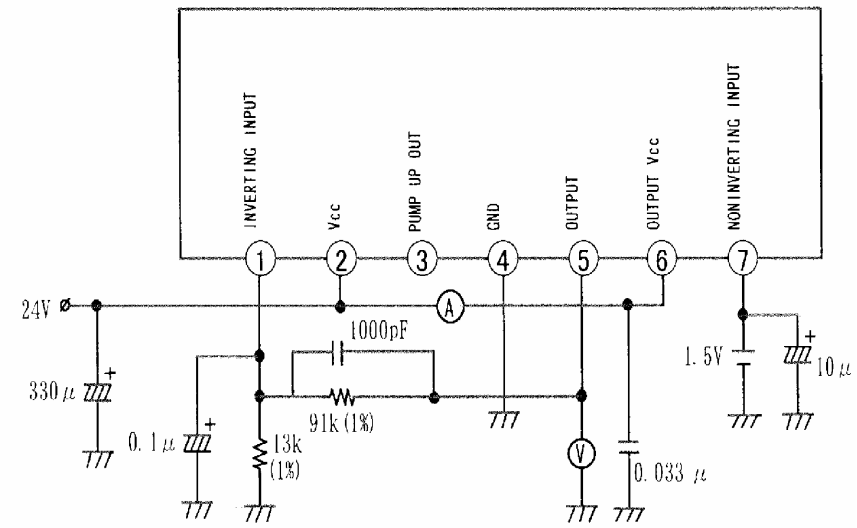
Note) The above characteristics are theoretical values for designing and not guarantee by 100% inspection.

■ Description of Test Circuits Test Methods

Test Circuit – 1 (Thermal Production Operating Temperature)

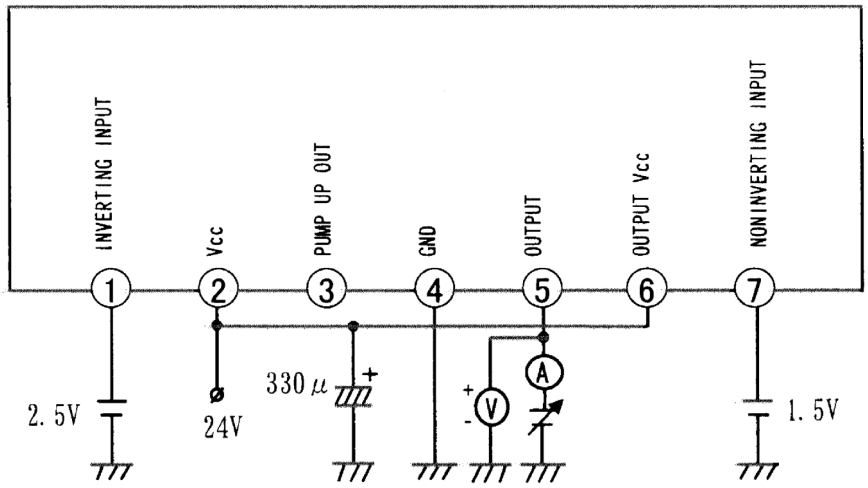


Test Circuit – 2 (Mid-point Voltage, Idling Current)



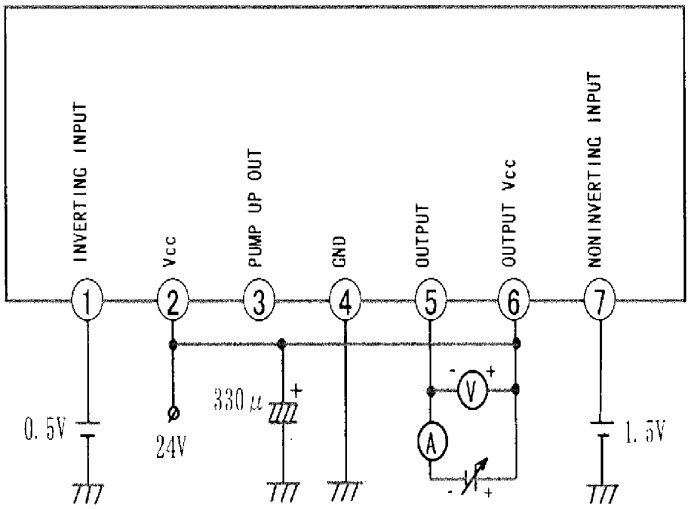
■ Description of Test Circuits Test Methods (continued)

Test Circuit – 3 (Output Saturation Voltage (Lower))



Monitor the voltage when the current is 0.8 A.

Test Circuit – 4 (Output Saturation Voltage (Upper))

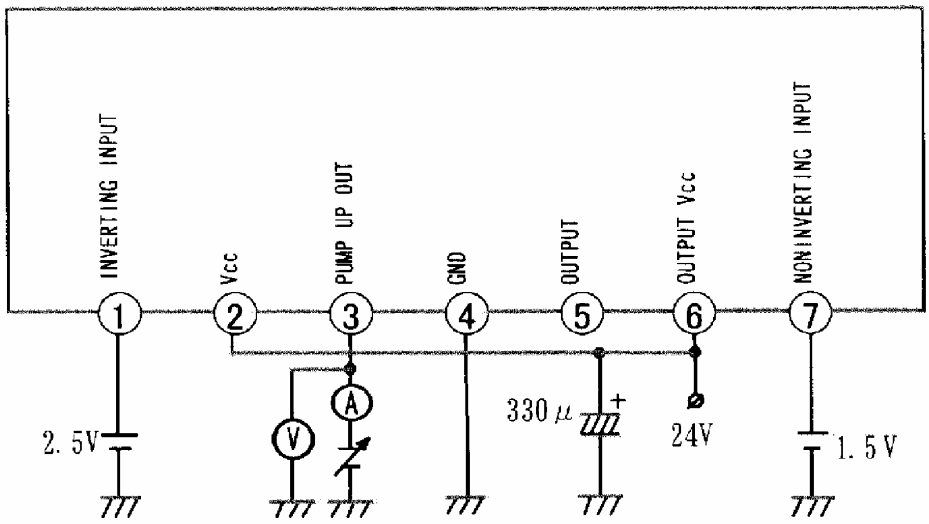


Monitor the voltage when the current is 0.8 A.

Note) : In case an external power supply is used. set the GND terminal open (floating).

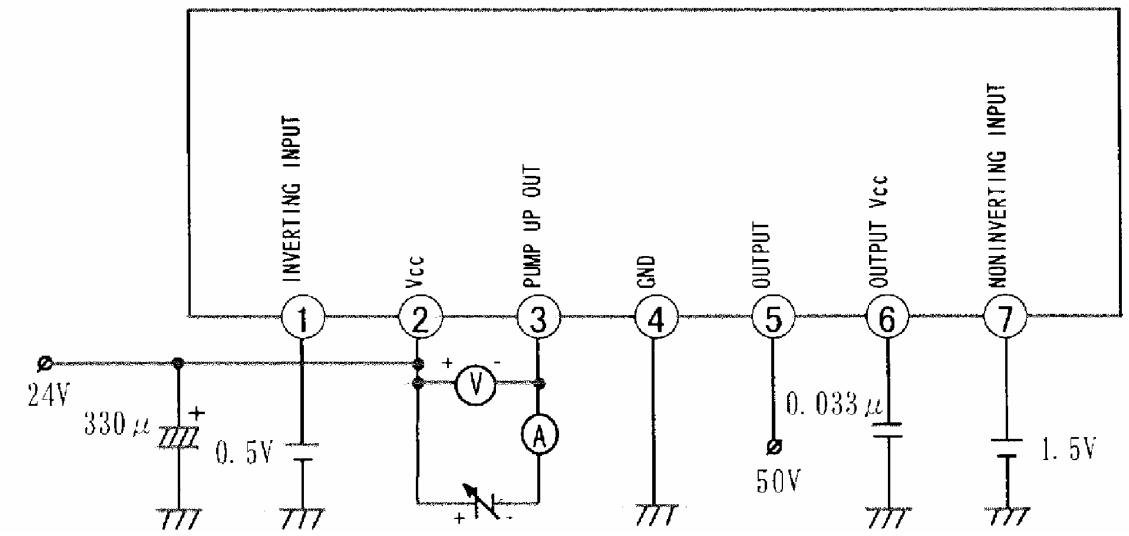
■ Description of Test Circuits Test Methods (continued)

Test Circuit – 5 (Pump-up Charge Saturation Voltage)



Monitor the voltage when the current is 20 mA.

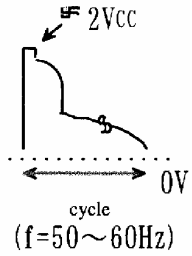
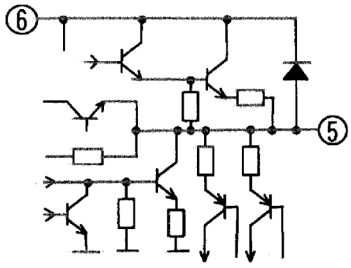
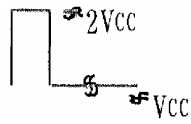
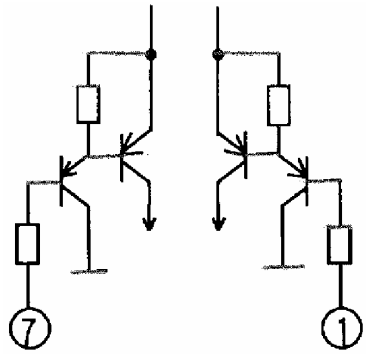
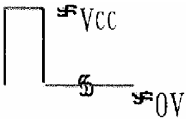
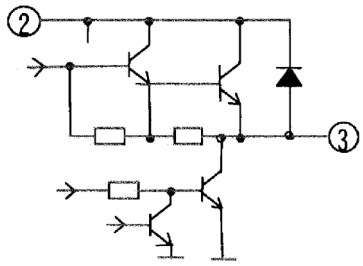
Test Circuit – 6 (Pump-up Discharge Saturation Voltage)



Monitor the voltage when the current is 0.8 A.

Note) : In case an external power supply is used. set the GND terminal open (floating).

■ Technical Data

Pin No.	Pin name	Pin voltage (V)	Function	Equivalent circuit
4	GND	DC	—	—
5	Vertical output		A vertical deflection coil is connected and 1 A to 2 A of deflection current is provided through the pin. At this time, output voltage must be more than Pin 4 voltage.	
6	Vertical output power supply		About $V_{CC} \times 2$ for flyback period and $V_{CC} - V_D$ for the other period are supplied.	—
7	Non inverting input	DC External bias	About 2 V is supplied. Very high sensitivity may cause abnormal oscillation.	
1	Inverting input		Input signal and CR network for feedback are connected. Very high sensitivity.	
2	Power supply	DC	10 V to 29 V is supplied.	—
3	Pump-up output		A capacitor connected between this pin and pin 6 is charged and discharge during fryback pulse in order to supply about $V_{CC} \times 2$ to pin 6.	

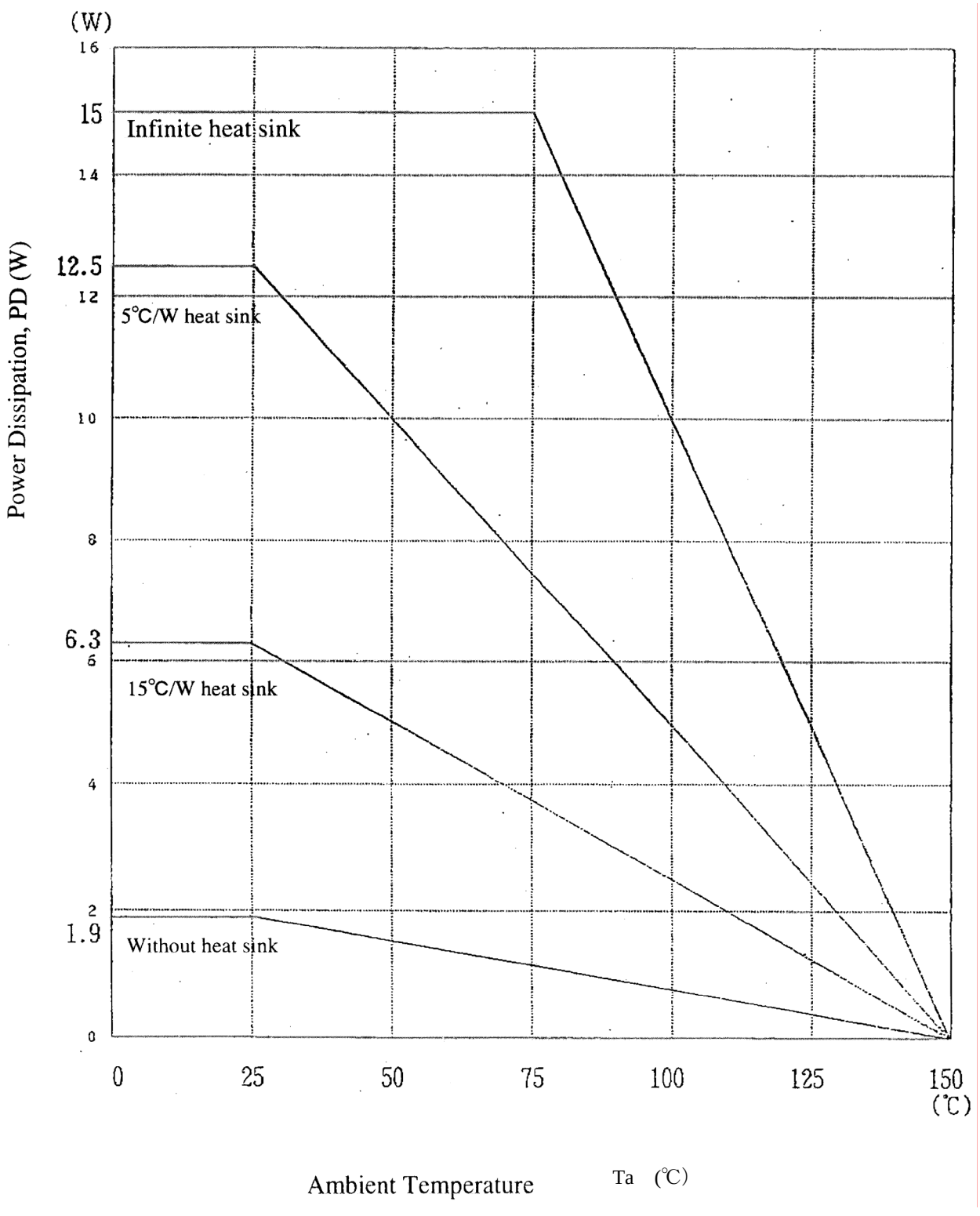
■ Technical Data (continued)

•Package Power Dissipation

P_D-T_a

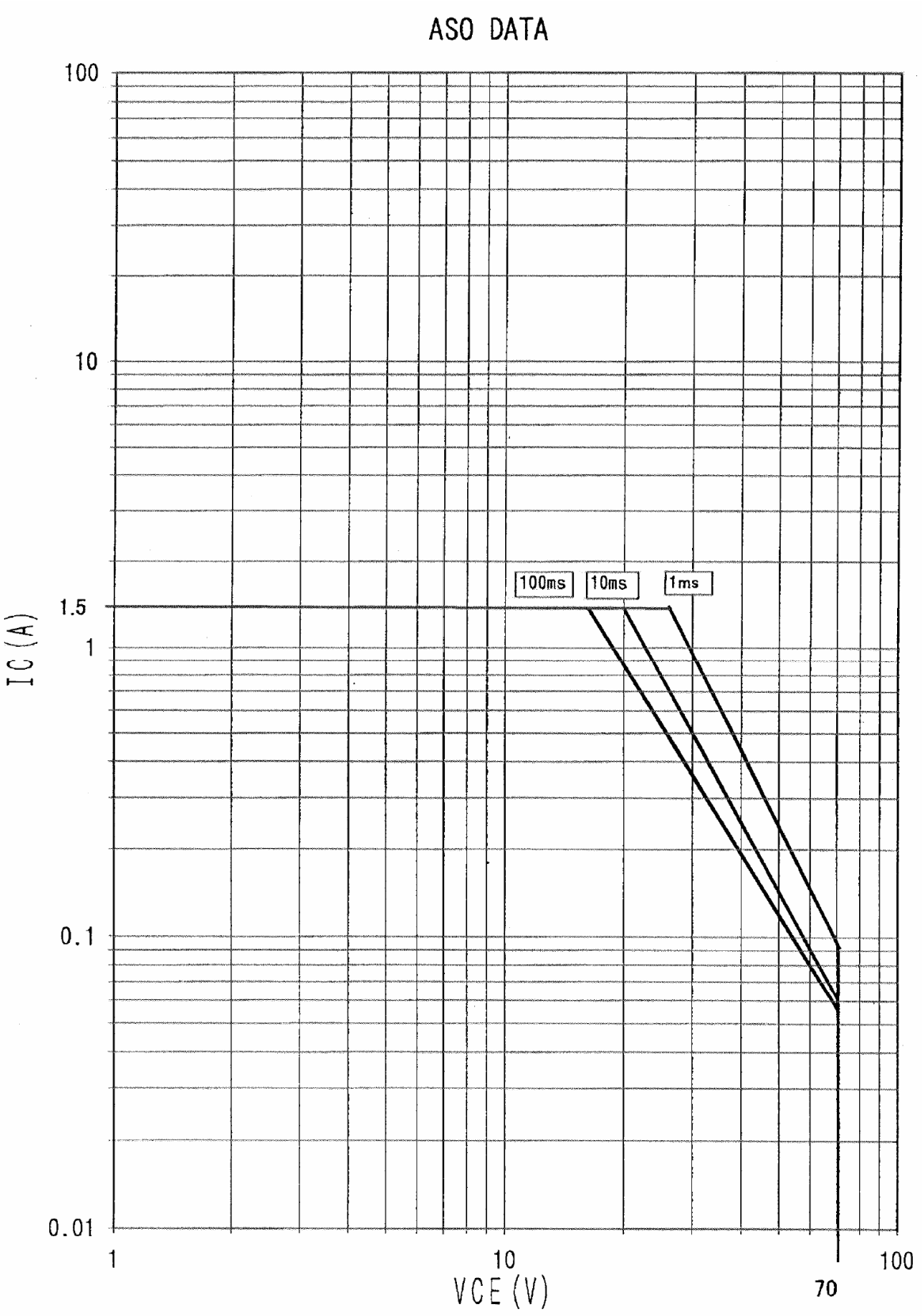
$R_{th\,(j-c)}$ = 5°C/W

$R_{th\,(j-a)}$ = 65°C/W



■ Technical Data (continued)

•Safe Operation Area



■ Precautions for Application

Test result of short between pins

Test condition : V_{CC} = 30 V

DC power supply (30 V , 5 A)

Pin No.	1	2	3	4	5	6	7
	INVERTING INPUT	Vcc	PUMP UP OUT	GND	OUTPUT	OUTPUT Vcc	NONINVERTING INPUT
1							
2	○						
3	○	○					
4	○	×	○				
5	○	○	○	×			
6	○	○	○	×	○		
7	○	○	○	○	○	○	

○: No destruction of IC for pins short for 3secs.

×: Destruction of IC for pins short for 1second.

After destruction, continuous supply of V_{CC} may cause IC package to crack.

To prevent this problem, insert resistance (2 Ω to 3 Ω) for over current limited in V_{CC} line.

■ Precautions for Application (continued)

Maximum Current at Pin 3

This is a regulation of output peak current during the flyback period.

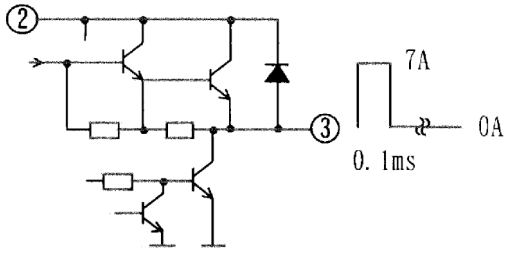
Operating Conditions

V_{CC} = 30 V

$I_{5p\text{-}p}$ = 1.6 A[p-p]

In case of using external component shown in application circuit (page 4),

I_3 is tolerated up to 7 A ($I_3 \leq 7$ A) with 0.1 m sec single pulse on condition that $V_{2\text{-}3}$ is less than 30 V ($V_{2\text{-}3} \leq 30$ V).



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