

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

# TA1241AN

## DEFLECTION PROCESSOR IC FOR TVs

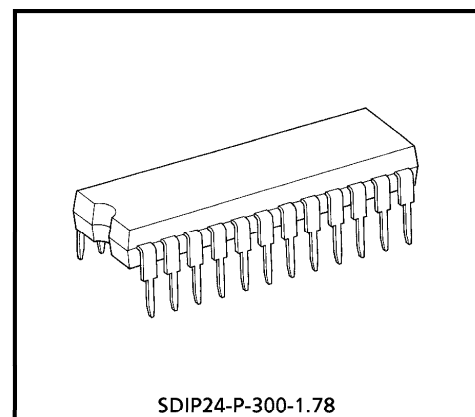
Ideal for large-inch CRT, the TA1241AN is an IC for deflection correction and vertical/horizontal picture size adjustment, with a 24-pin plastic package.

The TA1241AN can control all kinds of picture adjustment functions through I<sup>2</sup>C-bus communications.

### FEATURES

#### BUS write mode

- Vertical amplitude adjustment
- Vertical position adjustment
- Vertical linearity correction
- Vertical S correction
- Vertical  $f$  correction
- Vertical EHT correction
- Trapezium correction
- Horizontal amplitude correction
- Horizontal EHT correction
- Parabola correction
- Corner correction
- Center curve correction (SAW, PAR)



Weight : 1.22 g (Typ.)

#### BUS read mode

- V-guard detection
- LVP detection
- V output detection
- E/W output detection

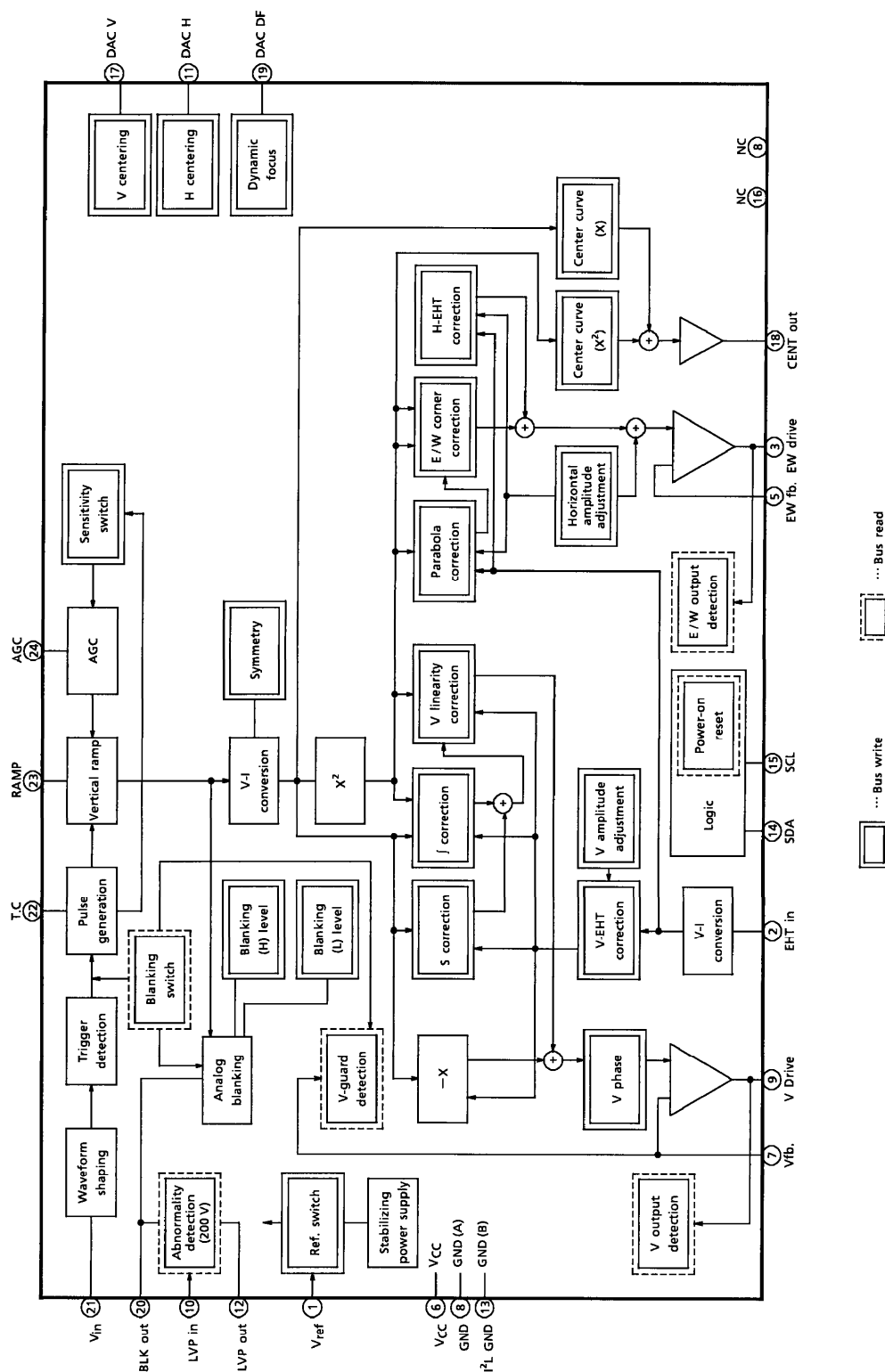
#### Pin output

- V centering (DAC)
- H centering (DAC)
- Dynamic focus (DAC)
- Analog blanking
- LVP detection

980910EBA1

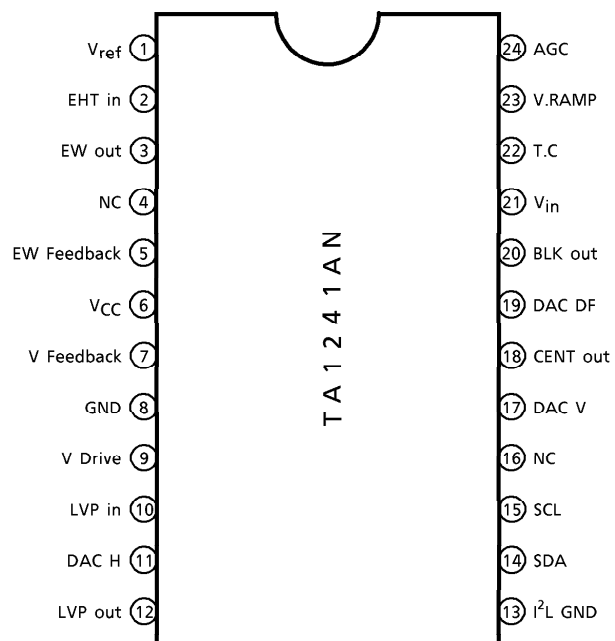
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BLOCK DIAGRAM

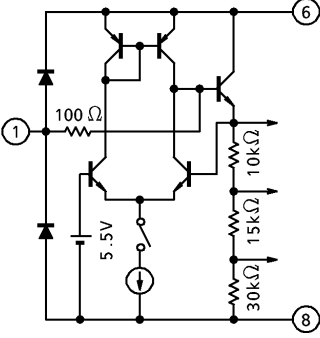
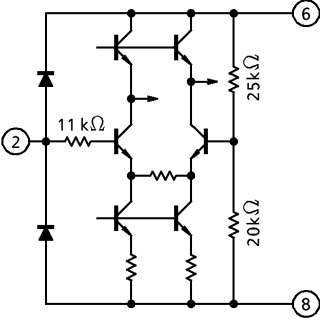
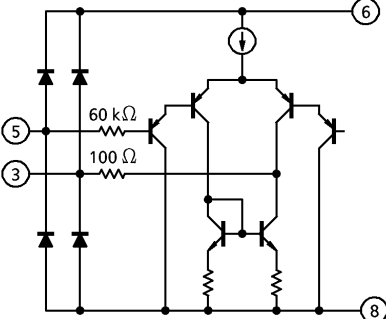


TA1241AN-2

## PIN CONNECTION

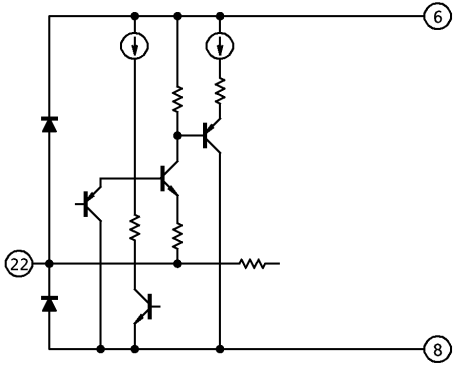
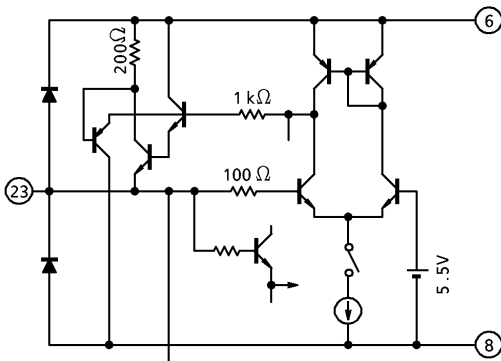
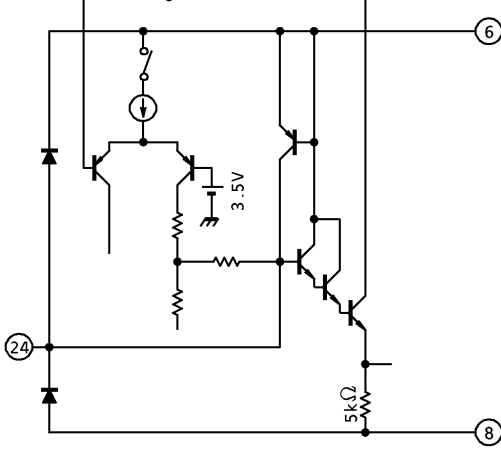


**PIN FUNCTION**

| PIN No. | PIN NAME         | FUNCTION                                                                                         | INTERFACE                                                                            | INPUT / OUTPUT SIGNAL                                                                 |
|---------|------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 1       | V <sub>ref</sub> | Bias voltage external input pin for the V and E/W blocks. BUS write mode controls the switching. |    | —                                                                                     |
| 2       | EHT in           | EHT input pin.                                                                                   |   | —                                                                                     |
| 3       | EW Drive         | E/W drive output pin. Also performs E/W detection in BUS read mode.                              |  |  |
| 5       | EW Feedback      | E/W feedback pin.                                                                                |                                                                                      | —                                                                                     |
| 4       | NC               | —                                                                                                | —                                                                                    | —                                                                                     |
| 6       | V <sub>CC</sub>  | V <sub>CC</sub> pin. Connect 9 V (Typ.).                                                         | —                                                                                    | —                                                                                     |

| PIN No. | PIN NAME             | FUNCTION                                                                                                                                                                        | INTERFACE | INPUT / OUTPUT SIGNAL        |
|---------|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------------------------------|
| 7       | V Feedback           | Vertical negative feedback input pin. When voltage on this pin equals or exceeds 6 V, the device outputs a blanking signal to pin 20 and sends discriminating data to BUS read. |           | —                            |
| 9       | V Drive              | Vertical signal output pin. Also performs vertical output detection in BUS read mode.                                                                                           |           |                              |
| 8       | GND                  | GND pin.                                                                                                                                                                        |           | —                            |
| 10      | LVP in               | Used to connect reference voltage to protect the deflection block from a low-voltage.                                                                                           |           | —                            |
| 12      | LVP out              | Outputs abnormal power supply detection result. Also performs LVP detection in BUS read mode.                                                                                   |           | OK : DC0.7 V<br>NG : DC5.0 V |
| 11      | DAC H                | DAC output pin for horizontal centering.                                                                                                                                        |           | —                            |
| 17      | DAC V                | DAC output pin for vertical centering.                                                                                                                                          |           | —                            |
| 19      | DAC DF               | DAC output pin for dynamic focus.                                                                                                                                               |           | —                            |
| 13      | I <sup>2</sup> L GND | GND pin for the I <sup>2</sup> L block.                                                                                                                                         | —         | —                            |
| 14      | SDA                  | SDA pin for the I <sup>2</sup> C BUS.                                                                                                                                           |           | —                            |

| PIN No. | PIN NAME | FUNCTION                                                                                                                        | INTERFACE | INPUT / OUTPUT SIGNAL |
|---------|----------|---------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------|
| 15      | SCL      | SCL pin for the I <sup>2</sup> C BUS.                                                                                           |           | —                     |
| 16      | NC       | —                                                                                                                               | —         | —                     |
| 18      | CENT out | Outputs center curve correction waveform.                                                                                       |           | —                     |
| 20      | BLK out  | Analog blanking output pin. Open collector output. In BUS write mode, outputs a vertical blanking signal for the vertical RAMP. |           |                       |
| 21      | V in     | Inputs trigger pulse. Detects the falling edge of the input pulse and generates a trigger pulse to the next-stage circuit.      |           |                       |

| PIN No. | PIN NAME | FUNCTION                                                                                  | INTERFACE                                                                            | INPUT / OUTPUT SIGNAL                                                                 |
|---------|----------|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 22      | T.C      | This pin connects a pulse-shaping filter.                                                 |    | —                                                                                     |
| 23      | V RAMP   | Used to connect a capacitor to generate a vertical RAMP signal.                           |   |  |
| 24      | AGC      | Used to connect a filter to automatically adjust the vertical RAMP oscillation amplitude. |  |                                                                                       |

I<sup>2</sup>C BUS MAP

Write data map

IC address : 10001100 (8CH)

| FUNCTION           | SUB ADDRESS |         | DATA                                                                                                 |   |   |     | PRESET  |         | RANGE                     |
|--------------------|-------------|---------|------------------------------------------------------------------------------------------------------|---|---|-----|---------|---------|---------------------------|
|                    | MSB         | LSB     | MSB                                                                                                  |   |   | LSB | MSB     | LSB     |                           |
| PICTURE HEIGHT     | 0 0 0 0     | 0 0 0 0 | x                                                                                                    | ○ | ○ | ○   | ○       | ○       | - 48~ + 48%               |
| V-LINIARITY        | 0 0 0 0     | 0 0 0 1 | x                                                                                                    | x | x | ○   | ○       | ○       | - 13~ + 13%               |
| V-S CORRECTION     | 0 0 0 0     | 0 0 1 0 | x                                                                                                    | x | ○ | ○   | ○       | ○       | - 24~ + 24%               |
| V-SHIFT. AGC, REG  | 0 0 0 0     | 0 0 1 1 | x                                                                                                    | v | x | A   | x       | ○       | - 570~ + 570 mV           |
| v-COMPENSATION     | 0 0 0 0     | 0 1 0 0 | x                                                                                                    | x | x | x   | x       | ○       | 0~9%                      |
| PICTURE WIDTH      | 0 0 0 0     | 0 1 0 1 | x                                                                                                    | x | ○ | ○   | ○       | ○       | 1.7~6.5 V                 |
| E-W PARABORA       | 0 0 0 0     | 0 1 1 0 | x                                                                                                    | x | ○ | ○   | ○       | ○       | 0~4.4 V                   |
| E-W CORNER         | 0 0 0 0     | 0 1 1 1 | x                                                                                                    | x | x | ○   | ○       | ○       | - 3.2~ + 3.2%             |
| TRAPEZIUM          | 0 0 0 0     | 1 0 0 0 | x                                                                                                    | ○ | ○ | ○   | ○       | ○       | 0~2.4 V                   |
| H-COMP, H-CENT DAC | 0 0 0 0     | 1 0 0 1 | <div style="text-align: center;">           H-CENT DAC<br/>           x ○ ○ ○ x ○ ○ ○         </div> |   |   |     | 0 0 0 0 | 0 0 0 0 | 0~9%, 1~5 V               |
| V-fCORRECT, BLK-SW | 0 0 0 0     | 1 0 1 0 | x                                                                                                    | x | B | x   | ○       | ○       | 0~4%                      |
| V CENT DAC         | 0 0 0 0     | 1 0 1 1 | x                                                                                                    | ○ | ○ | ○   | ○       | ○       | 0.5~5 V                   |
| ANAROG BLK-VH      | 0 0 0 0     | 1 1 0 0 | x                                                                                                    | x | x | ○   | ○       | ○       | - 640~ + 640 mV           |
| ANAROG BLK-VL      | 0 0 0 0     | 1 1 0 1 | x                                                                                                    | x | x | ○   | ○       | ○       | - 640~ + 640 mV           |
| CENT PAR, SAW      | 0 0 0 0     | 1 1 1 0 | x                                                                                                    | ○ | ○ | ○   | x       | ○       | - 4~ + 4 V,<br>- 2~ + 2 V |
| DYNAMIC FORCUS     | 0 0 0 0     | 1 1 1 1 | x                                                                                                    | x | ○ | ○   | ○       | ○       | - 0.5~5 V                 |

(Note) ○ : Used bit, x : Unused bit

A : AGC switching (DATA = 0...HIGH response, DATA = 1...LOW response)

V : Power supply switching

(DATA = 0...Stabilization power supply, DATA = 1...External power supply)

B : Blanking switch (DATA = 0...Enabled, DATA = 1...Disabled)

When the uppermost bit of the subaddress is high, auto-increment mode is set.

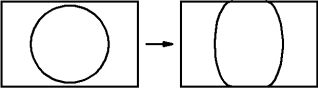
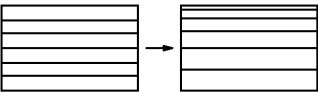
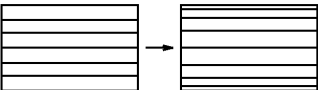
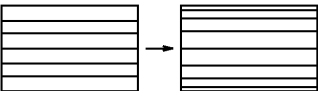
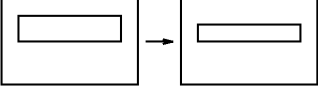
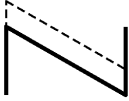
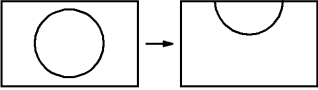
Read data map

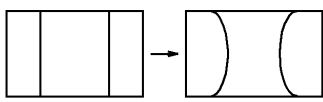
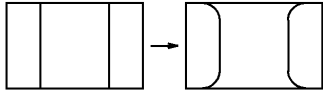
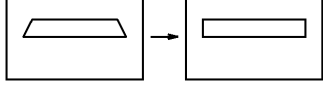
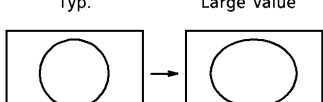
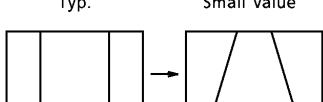
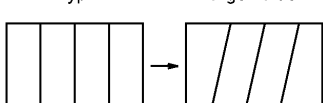
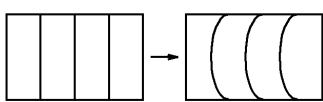
IC address 10001101 (8DH)

| FUNCTION<br>DATA | MSB |     |     |     | LSB    |           |           |                            |
|------------------|-----|-----|-----|-----|--------|-----------|-----------|----------------------------|
|                  | NON | NON | NON | LVP | V-GUAD | E-Wout    | Vout      | POW<br>DISCRIMI-<br>NATION |
| 0                | —   | —   | —   | OFF | OFF    | No signal | No signal | OFF                        |
| 1                | —   | —   | —   | ON  | ON     | Signal    | Signal    | ON                         |



DEFLECTION CORRECTION TABLE

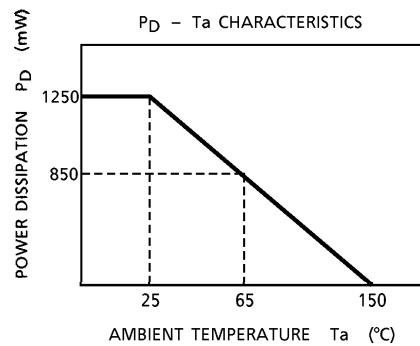
| FUNCTION                                          | OUTPUT WAVEFORM                                                                     | PICTURE CHANGE                                                                                                                                                             | VARIABLE RANGE  |
|---------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| Vertical Amplitude Adjustment<br>[PICTURE HEIGHT] |    | <p>Typ. Large value</p>  <p>(Solid line at left) (Dotted line at left)</p>               | - 48~ + 48%     |
| Vertical Linearity Correction<br>[V-LINEARITY]    |    | <p>Typ. Large value</p>  <p>(Solid line at left) Lower stretching, upper compression</p> | - 13~ + 13%     |
| Vertical S Correction<br>[V-S CORRECTION]         |   | <p>Typ. Large value</p>  <p>(Solid line at left) Upper and lower compression</p>        | - 24~ + 24%     |
| Vertical f Correction<br>[V-f CORRECTION]         |  | <p>Typ. Large value</p>  <p>(Solid line at left) Upper and lower compression</p>       | 0~4%            |
| Vertical EHT Correction<br>[V-COMPENSATION]       |  | <p>Typ. Large value</p>  <p>(Solid line at left) (Dotted line at left)</p>             | 0~9%            |
| Vertical Phase Correction<br>[V-SHIFT]            |  | <p>Typ. Large value</p>  <p>(Solid line at left) (Dotted line at left)</p>             | - 800~ + 800 mV |

| FUNCTION                                           | OUTPUT WAVEFORM                                                                     | PICTURE CHANGE                                                                                                                                                 | VARIABLE RANGE |
|----------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| Parabola Amplitude Adjustment<br>[E-W PARABOLA]    |    | <p>Typ. Small value</p>  <p>(Solid line at left) (Dotted line at left)</p>   | 0~5.6 V        |
| Corner Correction<br>[E-W CORNER]                  |    | <p>Typ. Large value</p>  <p>(Solid line at left) (Dotted line at left)</p>   | - 3.2~ + 3.2 V |
| Horizontal EHT Correction<br>[H-COMPENSATION]      |    | <p>Typ. Large value</p>  <p>(Solid line at left) (Dotted line at left)</p>   | 0~ + 9%        |
| Horizontal Amplitude Adjustment<br>[PICTURE WIDTH] |  | <p>Typ. Large value</p>  <p>(Solid line at left) (Dotted line at left)</p> | 1.6~7.3 V      |
| Parabola Symmetry Correction<br>[TRAPEZIUM]        |  | <p>Typ. Small value</p>  <p>(Solid line at left) (Dotted line at left)</p> | - 9~ + 9%      |
| Center Curve SAW Correction<br>[CENT SAW]          |  | <p>Typ. Large value</p>  <p>(Solid line at left) (Dotted line at left)</p> | - 2~ + 2 V     |
| Center Curve Parabola Correction<br>[CENT PAR]     |  | <p>Typ. Large value</p>  <p>(Solid line at left) (Dotted line at left)</p> | - 1~ + 1 V     |

**MAXIMUM RATINGS** ( $T_a = 25^\circ\text{C}$ )

| CHARACTERISTICS       | SIGNAL    | RATING      | UNIT             |
|-----------------------|-----------|-------------|------------------|
| Power Supply Voltage  | $V_{CC}$  | 12          | V                |
| Power Dissipation     | $P_D$ MAX | 1250 (Note) | mW               |
| Input Signal Voltage  | $e_{in}$  | 9           | $V_{p-p}$        |
| Operating Temperature | $T_{opr}$ | - 20 to 65  | $^\circ\text{C}$ |
| Storage Temperature   | $T_{stg}$ | - 55 to 150 | $^\circ\text{C}$ |

(Note) When using at temperatures higher than  $25^\circ\text{C}$ , decrease maximum power dissipation by 10 mW for every  $1^\circ\text{C}$  over  $25^\circ\text{C}$ .

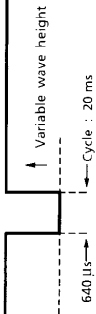
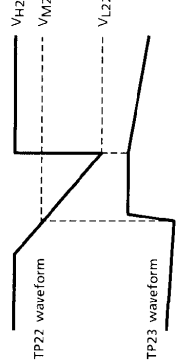
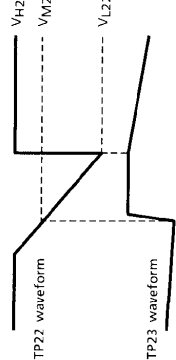
**RECOMMENDED POWER SUPPLY VOLTAGE**

| CHARACTERISTICS      | SYMBOL   | MIN | TYP. | MAX. | UNIT |
|----------------------|----------|-----|------|------|------|
| Power Supply Voltage | $V_{CC}$ | 8.5 | 9.0  | 9.5  | V    |

ELECTRICAL CHARACTERISTICS  
DC ELECTRICAL CHARACTERISTICS (Test circuit 1)

| PIN No.                                        | PIN NAME         | SYMBOL          | UNIT | ELECTRICAL CHARACTERISTICS |           | TEST METHOD (CONDITIONS $V_{CC} = 9\text{ V}$ , $T_a = 25 \pm 3^\circ\text{C}$ ) |                                                                                        |
|------------------------------------------------|------------------|-----------------|------|----------------------------|-----------|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
|                                                |                  |                 |      |                            |           |                                                                                  |                                                                                        |
|                                                |                  |                 |      | LIMITS                     |           | BUS DATA AND SWITCHING MODE<br>[ ] ; SUBADDRESS, ( ) ; DATA                      | TEST METHOD                                                                            |
|                                                |                  |                 |      | MIN                        | TYP. MAX  |                                                                                  |                                                                                        |
| 1                                              | V <sub>ref</sub> | V <sub>1</sub>  | V    | 6.0                        | 6.3 6.6   | No bus input                                                                     | Measure the DC voltage of each pin.                                                    |
| 2                                              | EHT              | V <sub>2</sub>  |      | 5.7                        | 6.2 6.7   |                                                                                  |                                                                                        |
| 3                                              | EW Drive         | V <sub>3</sub>  |      | 5.2                        | 5.5 5.8   |                                                                                  |                                                                                        |
| 5                                              | EW Feedback      | V <sub>5</sub>  |      | 8.7                        | 9.0 9.3   |                                                                                  |                                                                                        |
| 7                                              | V Feedback       | V <sub>7</sub>  |      | 2.0                        | 2.4 2.8   |                                                                                  |                                                                                        |
| 9                                              | V Drive          | V <sub>9</sub>  |      | 0.5                        | 0.8 3.4   |                                                                                  |                                                                                        |
| 10                                             | LVP in           | V <sub>10</sub> |      | 8.85                       | 8.95 9.05 |                                                                                  |                                                                                        |
| 11                                             | DAC H            | V <sub>11</sub> |      | 0.5                        | 1.3 2.1   |                                                                                  |                                                                                        |
| 12                                             | LVP out          | V <sub>12</sub> |      | 0.0                        | 0.8 1.6   |                                                                                  |                                                                                        |
| 14                                             | SDA              | V <sub>14</sub> |      | 4.8                        | 5.1 5.4   |                                                                                  |                                                                                        |
| 15                                             | SCL              | V <sub>15</sub> |      | 4.8                        | 5.1 5.4   |                                                                                  |                                                                                        |
| 17                                             | DAC V            | V <sub>17</sub> |      | 0.0                        | 0.8 1.6   |                                                                                  |                                                                                        |
| 18                                             | GENT out         | V <sub>18</sub> |      | 5.5                        | 6.0 6.5   |                                                                                  |                                                                                        |
| 19                                             | DAC DF           | V <sub>19</sub> |      | 0.0                        | 0.8 1.6   |                                                                                  |                                                                                        |
| 20                                             | BLK out          | V <sub>20</sub> |      | 0.0                        | 0.0 1.0   |                                                                                  |                                                                                        |
| 21                                             | V <sub>in</sub>  | V <sub>21</sub> |      | —                          | 0.0 —     |                                                                                  |                                                                                        |
| 22                                             | T.C              | V <sub>22</sub> |      | 3.7                        | 4.0 4.3   |                                                                                  |                                                                                        |
| 23                                             | V.RAMP           | V <sub>23</sub> |      | 2.2                        | 2.5 2.8   |                                                                                  |                                                                                        |
| 24                                             | AGC              | V <sub>24</sub> |      | —                          | 0.0 —     |                                                                                  |                                                                                        |
| Power Supply Current ( $V_{CC} = 9\text{ V}$ ) |                  |                 | mA   | 31.0                       | 47.0 63.0 | No bus input                                                                     | Open openland, connect an ammeter between TP4A and TP4B, and measure the sink current. |

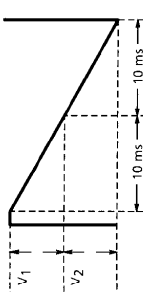
AC ELECTRICAL CHARACTERISTICS (Test circuit 2)

| No. | CHARACTERISTIC                            | SYMBOL     | UNIT     | ELECTRICAL CHARACTERISTICS |      |     | TEST METHOD (CONDITIONS $V_{CC} = 9\text{ V}$ , $T_a = 25 \pm 3^\circ\text{C}$ ) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----|-------------------------------------------|------------|----------|----------------------------|------|-----|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                                           |            |          | LIMITS                     |      |     | BUS DATA AND SWITCHING MODE<br>[ ] ; SUBADDRESS, ( ) ; DATA                      | TEST METHOD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|     |                                           |            |          | MIN                        | TYP. | MAX |                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 1   | Vertical Trigger Input Shaping Voltage    | $V_{TH21}$ | V        | 0.7                        | 1.0  | 1.4 | All PRESET values, all SW-A                                                      | <p>(1) TP21 input : The following symbols (trigger pulse)</p>  <p>(2) Change the wave height of the trigger pulse on TP21. Then read the wave height of the trigger pulse when a timing pulse is output to TP22.</p> <p>(1) TP21 input : The above trigger pulse<br/>Wave height = 3 V</p> <p>(2) Observe the TP22 and TP23 waveforms with an oscilloscope. Measure the following <math>V_{H22}</math> voltage:</p>  |
| 2   | Pulse Generator Circuit Clamping Voltage  | $V_{H22}$  | V        | 3.8                        | 4.0  | 4.2 | All PRESET values, all SW-A                                                      | <p>(1) TP21 input : The above trigger pulse<br/>Wave height = 3 V</p> <p>(2) Observe the TP22 and TP23 waveforms with an oscilloscope. Measure the following <math>V_{H22}</math> voltage:</p>                                                                                                                                                                                                                                                                                                        |
| 3   | Pulse Generator Circuit Shaping Voltage 1 | $V_{M22}$  | V        | 2.8                        | 3.0  | 3.2 | All PRESET values, all SW-A                                                      | Measure $V_{M22}$ as above.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 4   | Pulse Generator Circuit Shaping Voltage 2 | $V_{L22}$  | V        | 0.9                        | 1.0  | 1.1 | All PRESET values, all SW-A                                                      | Measure $V_{L22}$ as above.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 5   | Vertical Ramp Amplitude                   | $V_{P23}$  | $V_{pp}$ | 1.9                        | 2.0  | 2.1 | All PRESET values, all SW-A                                                      | <p>(1) TP21 input : Same as 2 above (trigger pulse).</p> <p>(2) Measure the TP23 waveform (vertical ramp) amplitude.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

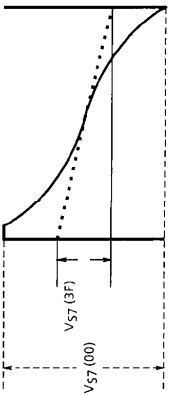
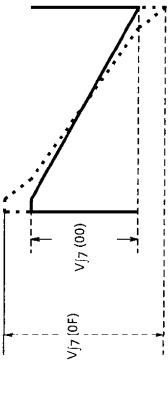
(Note) Unless otherwise specified in the bus data and SW mode column, use PRESET values and SW-A.

| No. | CHARACTERISTIC                      | SYMBOL            | UNIT             | ELECTRICAL CHARACTERISTICS |       |       | TEST METHOD (CONDITIONS $V_{CC} = 9\text{ V}$ , $T_a = 25 \pm 3^\circ\text{C}$ ) |                                                                                                                                                                                                                                                                                                                                                     |
|-----|-------------------------------------|-------------------|------------------|----------------------------|-------|-------|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                                     |                   |                  | LIMITS                     |       |       | BUS DATA AND SWITCHING MODE                                                      | TEST METHOD                                                                                                                                                                                                                                                                                                                                         |
|     |                                     |                   |                  | MIN                        | TYP.  | MAX   | [ ] ; SUBADDRESS, ( ) ; DATA                                                     |                                                                                                                                                                                                                                                                                                                                                     |
| 6   | Vertical AMP Amplification          | GV                | dB               | 20                         | 23    | 26    | All PRESET values, all SW7-B                                                     | <p>(1) No TP21 input</p> <p>(2) V<sub>DC</sub> input : DC voltage is variable (0 to 6 V)</p> <p>(3) Measure the TP9 voltage change in relation to the change in the TP7 voltage and calculate the following G<sub>V</sub>.</p>                                                                                                                      |
| 7   | Vertical AMP Maximum Output Voltage | V <sub>H9</sub>   | V                | 1.80                       | 2.60  | 3.40  | All PRESET values, SW7-B                                                         | Measure V <sub>H9</sub> as above.                                                                                                                                                                                                                                                                                                                   |
| 8   | Vertical AMP Minimum Output Voltage | V <sub>L9</sub>   | V                | 0                          | 0     | 0.3   | All PRESET values, SW7-B                                                         | Measure V <sub>L9</sub> as above.                                                                                                                                                                                                                                                                                                                   |
| 9   | Vertical AMP Maximum Output Current | I <sub>max9</sub> | mA               | 18.0                       | 25.0  | 32.0  | All PRESET values, SW7-B                                                         | <p>(1) Set V<sub>DC</sub> to 6V as above.</p> <p>(2) Connect an ammeter between TP9 and GND and measure the current.</p>                                                                                                                                                                                                                            |
| 10  | Vertical NF Saw Wave Amplitude      | V <sub>P7</sub>   | V <sub>p-p</sub> | 1.40                       | 1.60  | 1.80  | All PRESET values, all SW-A                                                      | <p>(1) TP21 input : Same as 2 above (trigger pulse).</p> <p>(2) Measure the TP7 vertical saw wave amplitude.</p>                                                                                                                                                                                                                                    |
| 11  | Vertical Amplitude Variable Range   | V <sub>PH</sub>   | %                | ±45.0                      | ±48.0 | ±51.0 | [00] (00) (7F), all SW-A                                                         | <p>(1) TP21 input : Same as 2 above (trigger pulse).</p> <p>(2) Measure the TP7 amplitude V<sub>P7</sub> (00) when set the subaddress [00] to (00).</p> <p>(3) Next, measure the TP7 amplitude V<sub>P7</sub> (7F) when set the subaddress [00] to (7F).</p> $V_{PH} = \pm \frac{V_{P7}(7F) - V_{P7}(00)}{V_{P7}(7F) + V_{P7}(00)} \times 100 (\%)$ |

(Note) Unless otherwise specified in the bus data and SW mode column, use PRESET values and SW-A.

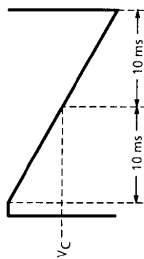
| No. | CHARACTERISTIC                           | SYMBOL | UNIT | ELECTRICAL CHARACTERISTICS |       |       | TEST METHOD (CONDITIONS VCC = 9 V, Ta = 25±3°C)             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----|------------------------------------------|--------|------|----------------------------|-------|-------|-------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                                          |        |      | LIMITS                     |       |       | BUS DATA AND SWITCHING MODE<br>[ ] ; SUBADDRESS, ( ) ; DATA | TEST METHOD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|     |                                          |        |      | MIN                        | TYP.  | MAX   |                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 12  | Vertical Linearity<br>Maximum Correction | VL     | %    | ±10.0                      | ±12.5 | ±15.0 | [08] adjustment, all SW-A<br>[01] (00) (10) (1F)            | (1) Set the data of subaddress [06] to (3F). Set the data of subaddress [05] to (3F). Change the subaddress [08] data so that the TP5 parabola waveform is symmetrical.<br>(2) Set the data of subaddress [06] to (00). Set the data of subaddress [05] to (20).<br>(3) When set the data of subaddress [01] to (10), measure the TP7 waveform V1 (10) and V2 (10).<br>(4) Likewise, when set the data of subaddress [01] to (00) and (1F), measure V1 (00), V2 (00), V1 (1F), and V2 (1F). |
|     |                                          |        |      |                            |       |       |                                                             |  $V_L = \pm \frac{V_1(00) - V_1(1F) + V_2(1F) - V_2(00)}{2 \times [V_1(10) + V_2(10)]} \times 100$                                                                                                                                                                                                                                                                                                         |

(Note) Unless otherwise specified in the bus data and SW mode column, use PRESET values and SW-A.

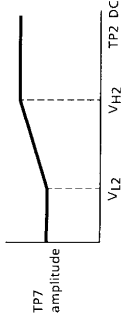
| No. | CHARACTERISTIC                   | SYMBOL | UNIT | ELECTRICAL CHARACTERISTICS |            |            | TEST METHOD (CONDITIONS $V_{CC} = 9\text{ V}$ , $T_a \approx 25 \pm 3^\circ\text{C}$ ) |                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----|----------------------------------|--------|------|----------------------------|------------|------------|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                                  |        |      | LIMITS                     |            |            | BUS DATA AND SWITCHING MODE<br>[ ] ; SUBADDRESS, ( ) ; Data                            | TEST METHOD                                                                                                                                                                                                                                                                                                                                                                                                                   |
|     |                                  |        |      | MIN                        | TYP.       | MAX        |                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 13  | Vertical S<br>Maximum Correction | $V_S$  | %    | $\pm 20.0$                 | $\pm 24.0$ | $\pm 28.0$ | [08] adjustment, all SW-A<br>[02] (00) (3F)                                            | <p>(1) Same as 12 above.</p> <p>(2) Measure the amplitude <math>V_{S7}</math> (00) of TP7 when set the data of subaddress [02] to (00).</p> <p>(3) Measure the amplitude <math>V_{S7}</math> (3F) of TP7 when set the data of subaddress [02] to (3F).</p>  $V_S = \pm \frac{V_{S7}(00) - V_{S7}(3F)}{V_{S7}(00) + V_{S7}(3F)} \times 100\%$ |
| 14  | Vertical j<br>Maximum Correction | $V_j$  | %    | 3.0                        | 5.0        | 7.0        | [08] adjustment, all SW-A<br>[0A] (00) (0F)                                            | <p>(1) Same as 13 above.</p> <p>(2) Measure the amplitude <math>V_{j7}</math> (00) of TP7 when set the data of subaddress [0A] to (00).</p> <p>(3) Measure the amplitude <math>V_{j7}</math> (0F) of TP7 when set the data of subaddress [0A] to (0F).</p>  $V_j = \frac{V_{j7}(0F) - V_{j7}(00)}{V_{j7}(00)} \times 100\%$                 |

(Note) Unless otherwise specified in the bus data and SW mode column, use PRESET values and SW-A.

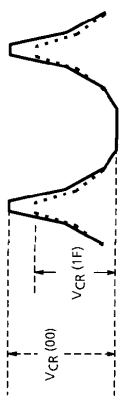


| No. | CHARACTERISTIC             | SYMBOL   | UNIT | ELECTRICAL CHARACTERISTICS |           |           | TEST METHOD (CONDITIONS $V_{CC} = 9V$ , $T_a = 25 \pm 3^\circ C$ ) |                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----|----------------------------|----------|------|----------------------------|-----------|-----------|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                            |          |      | LIMITS                     |           | MAX       | BUS DATA AND SWITCHING MODE<br>[ ] ; SUBADDRESS, ( ) ; DATA        | TEST METHOD                                                                                                                                                                                                                                                                                                                                                                                                  |
|     |                            |          |      | MIN                        | TYP.      |           |                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                              |
| 15  | Vertical NF Center Voltage | $V_C$    | V    | 3.8                        | 4.0       | 4.2       | [08] adjustment, all SW-A                                          | <p>(1) Same as 12 above.</p> <p>(2) Observe the TP7 waveform and measure the <math>V_C</math> shown below.</p>                                                                                                                                                                                                              |
| 16  | Vertical NF DC Change      | $V_{DC}$ | mV   | $\pm 480$                  | $\pm 560$ | $\pm 640$ | [08] adjustment, all SW-A<br>[03] (00) (06)                        | <p>(1) Same as 15 above.</p> <p>(2) Measure the vertical NF center voltage <math>V_C</math> (00) when set the data of subaddress [03] to (00).</p> <p>(3) Measure the vertical NF center voltage <math>V_C</math> (06) when set the data of subaddress [03] to (06).</p> $V_{DC} = \pm \frac{V_C(06) - V_C(00)}{2} (mV)$                                                                                     |
| 17  | Vertical NF EHT Correction | $VEHT$   | %    | 8                          | 9         | 10        | [08] adjustment, SW <sub>2</sub> -B<br>[04] (00) (07)              | <p>(1) Same as 12 above.</p> <p>(2) <math>V_{DC}</math> input : DC voltage = 0V</p> <p>(3) Observe TP7 waveform.</p> <p>(4) Measure the amplitude <math>VEHT</math> (00) of TP7 when set the data of subaddress [04] to (00).</p> <p>(5) Measure the amplitude <math>VEHT</math> (07) of TP7 when set the data of subaddress [04] to (07).</p> $VEHT = \frac{VEHT(00) - VEHT(07)}{VEHT(00)} \times 100 (\%)$ |

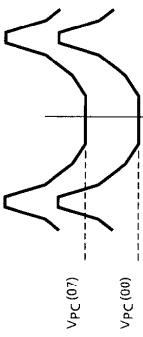
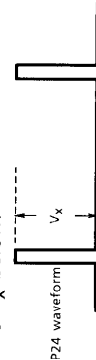
(Note) Unless otherwise specified in the bus data and SW mode column, use PRESET values and SW-A.

| No. | CHARACTERISTIC                   | SYMBOL   | UNIT      | ELECTRICAL CHARACTERISTICS |      |     | TEST METHOD (CONDITIONS $V_{CC} = 9V$ , $T_a = 25 \pm 3^\circ C$ ) |                                                                                                                                                                                                                                                          |
|-----|----------------------------------|----------|-----------|----------------------------|------|-----|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                                  |          |           | LIMITS                     |      |     | BUS DATA AND SWITCHING MODE<br>[ ] ; SUBADDRESS, ( ) ; DATA        | TEST METHOD                                                                                                                                                                                                                                              |
|     |                                  |          |           | MIN                        | TYP. | MAX |                                                                    |                                                                                                                                                                                                                                                          |
| 18  | EHT Input<br>D Range 1           | $V_{H2}$ | V         | 5.7                        | 6.2  | 6.7 | [08] adjustment, SW <sub>2</sub> -B<br>[04] (07)                   | (1) Same as 17 above.<br>(2) Change the VDC voltage from 1V to 7V.<br>(3) Measure the change in the TP7 voltage at this time and measure the TP2 voltage $V_{H2}$ .<br> |
| 19  | EHT Input<br>D Range 2           | $V_{L2}$ | V         | 1.3                        | 1.8  | 2.3 | [08] adjustment, SW <sub>2</sub> -B<br>[04] (07)                   | Measure the TP2 voltage $V_{L2}$ as above.                                                                                                                                                                                                               |
| 20  | E/W NF<br>Maximum DC Value       | $V_{H5}$ | V         | 5.5                        | 6.2  | 6.9 | [08] adjustment, SW-A<br>[05] (00)                                 | (1) Same as 12 above.<br>(2) Measure the TP5 voltage.                                                                                                                                                                                                    |
| 21  | E/W NF<br>Minimum DC Value       | $V_{L5}$ | V         | 1.5                        | 1.7  | 1.9 | [08] adjustment, all SW-A<br>[05] (3F)                             | (1) Same as 12 above.<br>(2) Measure the TP5 voltage.                                                                                                                                                                                                    |
| 22  | E/W NF<br>Maximum Parabola Value | $V_{PB}$ | $V_{p-p}$ | 3.0                        | 3.9  | 4.8 | [08] adjustment, SW <sub>2</sub> -B<br>[05] (3F)<br>[06] (3F)      | (1) VDC input : 7V.<br>(2) Measure the TP5 parabola amplitude.<br>                                                                                                     |

(Note) Unless otherwise specified in the bus data and SW mode column, use PRESET values and SW-A.

| No. | CHARACTERISTIC                         | SYMBOL    | UNIT      | ELECTRICAL CHARACTERISTICS |            |            | TEST METHOD (CONDITIONS $V_{CC} = 9V$ , $T_a = 25 \pm 3^\circ C$ )              |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----|----------------------------------------|-----------|-----------|----------------------------|------------|------------|---------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                                        |           |           | MIN                        | TYP.       | MAX        | BUS DATA AND SWITCHING MODE<br>[ ] ; SUBADDRESS, ( ) ; DATA                     | TEST METHOD                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 23  | E / W NF<br>Corner Correction 1        | $V_{CR1}$ | $V_{p-p}$ | 1.80                       | 2.50       | 3.20       | [08] adjustment, SW <sub>2</sub> -B<br>[05] (3F)<br>[06] (3F)<br>[07] (10) (1F) | <p>(1) <math>V_{DC}</math> input : 7V</p> <p>(2) Observe the TP5 parabola amplitude.</p> <p>(3) Measure the amplitude <math>V_{CR1}</math> (10) when set the data of subaddress [07] to (10).</p> <p>(4) Measure the amplitude <math>V_{CR1}</math> (1F) when set the data of subaddress [07] to (1F).</p>  <p><math>V_{CR1} = V_{CR1}(10) - V_{CR1}(1F)</math></p> |
| 23' | E / W NF<br>Corner Correction 2        | $V_{CR2}$ | $V_{p-p}$ | 2.30                       | 3.20       | 4.10       | [08] adjustment, SW <sub>2</sub> -B<br>[05] (3F)<br>[06] (20)<br>[07] (00) (1F) | <p>(1) <math>V_{DC}</math> input : 7V</p> <p>(2) Measure the TP5 parabola amplitude.</p> <p>(3) Measure the amplitude <math>V_{CR2}</math> (00) when set the data of subaddress [07] to (00).</p> <p>(4) Measure the amplitude <math>V_{CR2}</math> (1F) when set the data of subaddress [07] to (1F).</p> <p><math>V_{CR2} = V_{CR2}(00) - V_{CR2}(1F)</math></p>                                                                                   |
| 24  | Parabola<br>Symmetry Correction Change | $V_{TR}$  | %         | $\pm 11.0$                 | $\pm 13.0$ | $\pm 15.0$ | [08] (00) (7F), all SWA                                                         | <p>(1) Measure the following as in 15 above.</p> <p>(2) Measure the TP7 center voltage <math>V_C</math> (00) when set the data of subaddress [08] to (00).</p> <p>(3) Measure the voltage <math>V_C</math> (7F) when set the data of subaddress [07] to (7F).</p> $V_{TR} = \pm \frac{V_C(00) - V_C(7F)}{2 \times V_{P7}} \times 100 (\%)$ <p><math>V_{P7}</math> is the value measured in 10 above.</p>                                             |

(Note) Unless otherwise specified in the bus data and SW mode column, use PRESET values and SW-A.

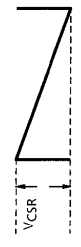
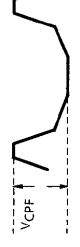
| No. | CHARACTERISTIC                      | SYMBOL            | UNIT | ELECTRICAL CHARACTERISTICS |      |      | TEST METHOD (CONDITIONS $V_{CC} = 9V$ , $T_a = 25 \pm 3^\circ C$ )              |                                                                                                                                                                                                                                                                                                                                                           |
|-----|-------------------------------------|-------------------|------|----------------------------|------|------|---------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                                     |                   |      | LIMITS                     |      |      | BUS DATA AND SWITCHING MODE<br>[ ] ; SUBADDRESS, ( ) ; DATA                     | TEST METHOD                                                                                                                                                                                                                                                                                                                                               |
|     |                                     |                   |      | MIN                        | TYP. | MAX  |                                                                                 |                                                                                                                                                                                                                                                                                                                                                           |
| 25  | E / W Parabola<br>EHT Correction    | VEH1              | %    | 2.0                        | 3.3  | 4.5  | [08] adjustment, SW <sub>2</sub> -B<br>[05] (3F)<br>[06] (3F)                   | (1) VDC input : DC voltage is variable<br>(2) Measure the TP5 parabola amplitude VEH (7) when DC = 7 V.<br>(3) Likewise, measure the amplitude VEH (1) when DC = 1 V.<br><br>$VEH1 = \frac{VEH(7) - VEH(1)}{VEH(7)} \times 100 (\%)$                                                                                                                      |
| 26  | E / W DC<br>EHT Correction          | VEH2              | V    | 0.6                        | 1.0  | 1.4  | [08] adjustment, SW <sub>2</sub> -B<br>[05] (3F)<br>[06] (3F)<br>[09] (00) (07) | (1) VDC input : DC voltage = 1 V<br>(2) Measure the TP5 parabola phase center voltage V <sub>PC</sub> (00) when set the data of subaddress [09] to (00).<br>(3) Likewise, measure the voltage V <sub>PC</sub> (07) when set the data of subaddress [09] to (07).<br><br> |
| 27  | E / W Amp<br>Maximum Output Current | I <sub>max3</sub> | mA   | 0.14                       | 0.20 | 0.27 | All PRESET values, all SW-A                                                     | VEH2 = V <sub>PC</sub> (07) - V <sub>PC</sub> (00) (V)<br><br>(1) Connect an ammeter between TP3 and GND.<br>(2) Read the current.                                                                                                                                                                                                                        |
| 28  | AGC Operating Current 1             | I <sub>AGC0</sub> | μA   | 250                        | 330  | 410  | All PRESET values, SW <sub>24</sub> -B                                          | (1) TP21 input : Same as 2 above (trigger pulse).<br>(2) Monitor the TP24 waveform. Measure the V <sub>X</sub> below.<br><br><br><br>$I_{AGC0} = V_X \div 200 (\mu A)$<br>(I <sub>AGC1</sub> )                                                                         |

(Note) Unless otherwise specified in the bus data and SW mode column, use PRESET values and SW-A.

| No. | CHARACTERISTIC                                         | SYMBOL     | UNIT      | ELECTRICAL CHARACTERISTICS |           |           | TEST METHOD (CONDITIONS $V_{CC} = 9V$ , $T_a = 25 \pm 3^\circ C$ ) |                                                                                                                                                                                                      |
|-----|--------------------------------------------------------|------------|-----------|----------------------------|-----------|-----------|--------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                                                        |            |           | LIMITS                     |           |           | BUS DATA AND SWITCHING MODE<br>[ ] ; SUBADDRESS, ( ) ; DATA        | TEST METHOD                                                                                                                                                                                          |
|     |                                                        |            |           | MIN                        | TYP.      | MAX       |                                                                    |                                                                                                                                                                                                      |
| 29  | AGC Operating Current 2                                | $I_{AGC1}$ | $\mu A$   | 60                         | 83        | 105       | [03] (12) SW24-B                                                   | Calculate, as above, $I_{AGC1}$ when set the data of subaddress [03] to (12).                                                                                                                        |
| 30  | Analog Blanking Output Current                         | $I_{B20}$  | mA        | 0.400                      | 0.650     | 0.800     | All PRESET values, SW7-B                                           | (1) VDC input : DC voltage = 5.5 V<br>(2) Connect an ammeter between TP20 and GND and measure the current.                                                                                           |
| 31  | Upper Blanking Level                                   | $V_{H20}$  | V         | 5.25                       | 5.50      | 5.75      | All PRESET values, SW7-B                                           | (1) Same as 30 above.<br>(2) VDC input : DC voltage = variable (4.0 to 5.5 V)<br>(3) Measure the VDC input voltage $V_{H20}$ when the output current reaches half the output current measured above. |
| 32  | Upper Blanking Change                                  | $V_{HC20}$ | mV        | $\pm 485$                  | $\pm 570$ | $\pm 655$ | [0C] (00) (1F) SW7-B                                               | Measure $V_{H20}$ (00) and $V_{H20}$ (1F) when set the data of subaddress [0C] to (00) and (1F) respectively.<br>$V_{HC20} = \pm [V_{H20} (1F) - V_{H20} (00)] / 2$ (mV)                             |
| 33  | Lower Blanking Level                                   | $V_{L20}$  | V         | 3.30                       | 3.50      | 3.70      | All PRESET values, SW7-B                                           | (1) Same as 30 above.<br>(2) VDC input : DC voltage = variable (2.5 to 4.0 V)<br>(3) Measure the VDC input voltage $V_{L20}$ when the output current reaches half the output current of 30 above.    |
| 34  | Lower Blanking Change                                  | $V_{LC20}$ | mV        | $\pm 485$                  | $\pm 570$ | $\pm 655$ | [0D] (00) (1F) SW7-B                                               | Measure $V_{L20}$ (00) and $V_{L20}$ (1F) when set the data of subaddress [0D] to (00) and (1F) respectively.<br>$V_{LC20} = \pm [V_{L20} (1F) - V_{L20} (00)] / 2$ (mV)                             |
| 35  | Center Curve Saw Positive Correction Maximum Amplitude | $V_{CSF}$  | $V_{p-p}$ | 3.2                        | 3.6       | 4.0       | [08] adjustment, all SW-A [0E] (47)                                | (1) Same as 12 above.<br>(2) Measure the TP18 output amplitude when set the data of subaddress [0E] to (47).                                                                                         |



(Note) Unless otherwise specified in the bus data and SW mode column, use PRESET values and SW-A.

| No. | CHARACTERISTIC                                              | SYMBOL    | UNIT      | ELECTRICAL CHARACTERISTICS |      |     | TEST METHOD (CONDITIONS $V_{CC} = 9V$ , $T_a = 25 \pm 3^\circ C$ ) |                                                                                                                                                                                                   |
|-----|-------------------------------------------------------------|-----------|-----------|----------------------------|------|-----|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                                                             |           |           | LIMITS                     |      |     | BUS DATA AND SWITCHING MODE<br>[ ] ; SUBADDRESS, ( ) ; DATA        | TEST METHOD                                                                                                                                                                                       |
|     |                                                             |           |           | MIN                        | TYP. | MAX |                                                                    |                                                                                                                                                                                                   |
| 36  | Center Curve Saw Negative Correction Maximum Amplitude      | $V_{CSR}$ | $V_{p-p}$ | 3.2                        | 3.6  | 4.0 | [08] adjustment, all SW-A [0E] (40)                                | As above, measure the TP18 output amplitude when set the data of subaddress [0E] to (40).<br>                    |
| 37  | Center Curve Parabola Positive Correction Maximum Amplitude | $V_{CPF}$ | $V_{p-p}$ | 1.2                        | 1.8  | 2.4 | [08] adjustment, all SW-A [0E] (74)                                | (1) Same as 12 above.<br>(2) Measure the TP18 output amplitude when set the data of subaddress [0E] to (74).<br> |
| 38  | Center Curve Parabola Negative Correction Maximum Amplitude | $V_{CPR}$ | $V_{p-p}$ | 1.2                        | 1.8  | 2.4 | [08] adjustment, all SW-A [0E] (04)                                | As above, measure the TP18 output amplitude when set the data of subaddress [0E] to (04).<br>                    |
| 39  | Horizontal Centering Maximum Output Voltage                 | $V_{H11}$ | V         | 4.8                        | 5.0  | 5.2 | [09] (40), all SW-A                                                | Measure the TP11 voltage $V_{H11}$ when set the data of subaddress [09] to (70).                                                                                                                  |
| 40  | Horizontal Centering Minimum Output Voltage                 | $V_{L11}$ | V         | 0.5                        | 1.3  | 2.1 | All PRESET values, all SW-A                                        | Measure the TP11 voltage $V_{L11}$ when set the data of subaddress [09] to (00).                                                                                                                  |
| 41  | Vertical Centering Maximum Output Voltage                   | $V_{H17}$ | V         | 4.8                        | 5.0  | 5.2 | [0B] (4F), all SW-A                                                | Measure the TP17 voltage $V_{H17}$ when set the data of subaddress [0B] to (7F).                                                                                                                  |
| 42  | Vertical Centering Minimum Output Voltage                   | $V_{L17}$ | V         | 0.0                        | 5.0  | 1.6 | All PRESET values, all SW-A                                        | Measure the TP17 voltage $V_{L17}$ when set the data of subaddress [0B] to (00).                                                                                                                  |
| 43  | Dynamic Focus Correction Maximum Output Voltage             | $V_{H19}$ | V         | 4.8                        | 5.0  | 5.2 | [0F] (3F), all SW-A                                                | Measure the TP19 voltage $V_{H19}$ when set the data of subaddress [0F] to (3F).                                                                                                                  |

(Note) Unless otherwise specified in the bus data and SW mode column, use PRESET values and SW-A.

| No. | CHARACTERISTIC                                  | SYMBOL    | UNIT | ELECTRICAL CHARACTERISTICS |      |      | TEST METHOD (CONDITIONS $V_{CC} = 9\text{ V}$ , $T_a = 25 \pm 3^\circ\text{C}$ ) |                                                                                                                                                                                                                                                                     |
|-----|-------------------------------------------------|-----------|------|----------------------------|------|------|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                                                 |           |      | LIMITS                     |      | MAX  | BUS DATA AND SWITCHING MODE<br>[ ] ; SUBADDRESS, ( ) ; DATA                      | TEST METHOD                                                                                                                                                                                                                                                         |
|     |                                                 |           |      | MIN                        | TYP. |      |                                                                                  |                                                                                                                                                                                                                                                                     |
| 44  | Dynamic Focus Correction Minimum Output Voltage | $V_{L19}$ | V    | 0.0                        | 0.8  | 1.6  | All PRESET values, all SW-A                                                      | Measure the TP19 voltage $V_{L19}$ when set the data of subaddress [0F] to (00).<br>(1) VDC input : DC voltage = variable;<br>Initial value = 9 V                                                                                                                   |
| 45  | LVP Input Discrimination Voltage                | $V_{LVP}$ | V    | 5.5                        | 5.8  | 6.1  | All PRESET values, SW <sub>10</sub> -B, READ-MODE                                | (2) Lower the VDC input voltage and measure the TP10 voltage when the fifth bit from the LSB (in READ mode) changes from 0 to 1.                                                                                                                                    |
| 46  | LVP Maximum Output Voltage                      | $V_{H12}$ | V    | 4.8                        | 5.0  | 5.2  | All PRESET values, SW <sub>10</sub> -B                                           | (1) VDC input : DC voltage = 0 V<br>(2) Measure the TP12 voltage.                                                                                                                                                                                                   |
| 47  | LVP Minimum Output Voltage                      | $V_{L12}$ | V    | 0.0                        | 0.8  | 1.6  | All PRESET values, SW <sub>10</sub> -B                                           | (1) VDC input : DC voltage = 9 V<br>(2) Measure the TP12 voltage.                                                                                                                                                                                                   |
| 48  | LVP Detection Output Current                    | $I_{L20}$ | mA   | 0.43                       | 0.65 | 0.87 | All PRESET values, SW <sub>10</sub> -B, SW <sub>7</sub> -B                       | (1) VDC input : DC voltage = 4 V<br>(2) Connect an ammeter between TP20 and GND and measure the current.                                                                                                                                                            |
| 49  | V-GUARD Discrimination Voltage                  | $V_{GRD}$ | V    | 5.8                        | 6.0  | 6.2  | All PRESET values, SW <sub>7</sub> -B, READ-MODE                                 | (1) VDC input : DC voltage = variable;<br>Initial value = 4 V<br>(2) Raise the VDC input voltage and measure the TP7 voltage when the data of the fourth bit from the LSB (when in READ mode) changes from 0 to 1.                                                  |
| 50  | V-GUARD Detection Output Current                | $I_{G20}$ | mA   | 0.43                       | 0.65 | 0.87 | All PRESET values, SW <sub>7</sub> -B                                            | (1) VDC input : DC voltage = 7 V<br>(2) Connect an ammeter between TP20 and GND and measure the current.                                                                                                                                                            |
| 51  | $V_{ref}$ Vertical Amplitude Control Ratio      | $V_r$     | %    | 24                         | 30   | 36   | [03] (44) SW <sub>1</sub> -B                                                     | (1) VDC input : DC voltage = variable;<br>Initial value = 6.2 V<br>(2) Set the data of subaddress [03] to (42).<br>(3) Measure the change in the TP7 amplitude when the DC voltage changes from 6.1 to 6.3V.<br>$V_r = \frac{V(6.1) - V(6.3)}{0.2} \times 100 (\%)$ |

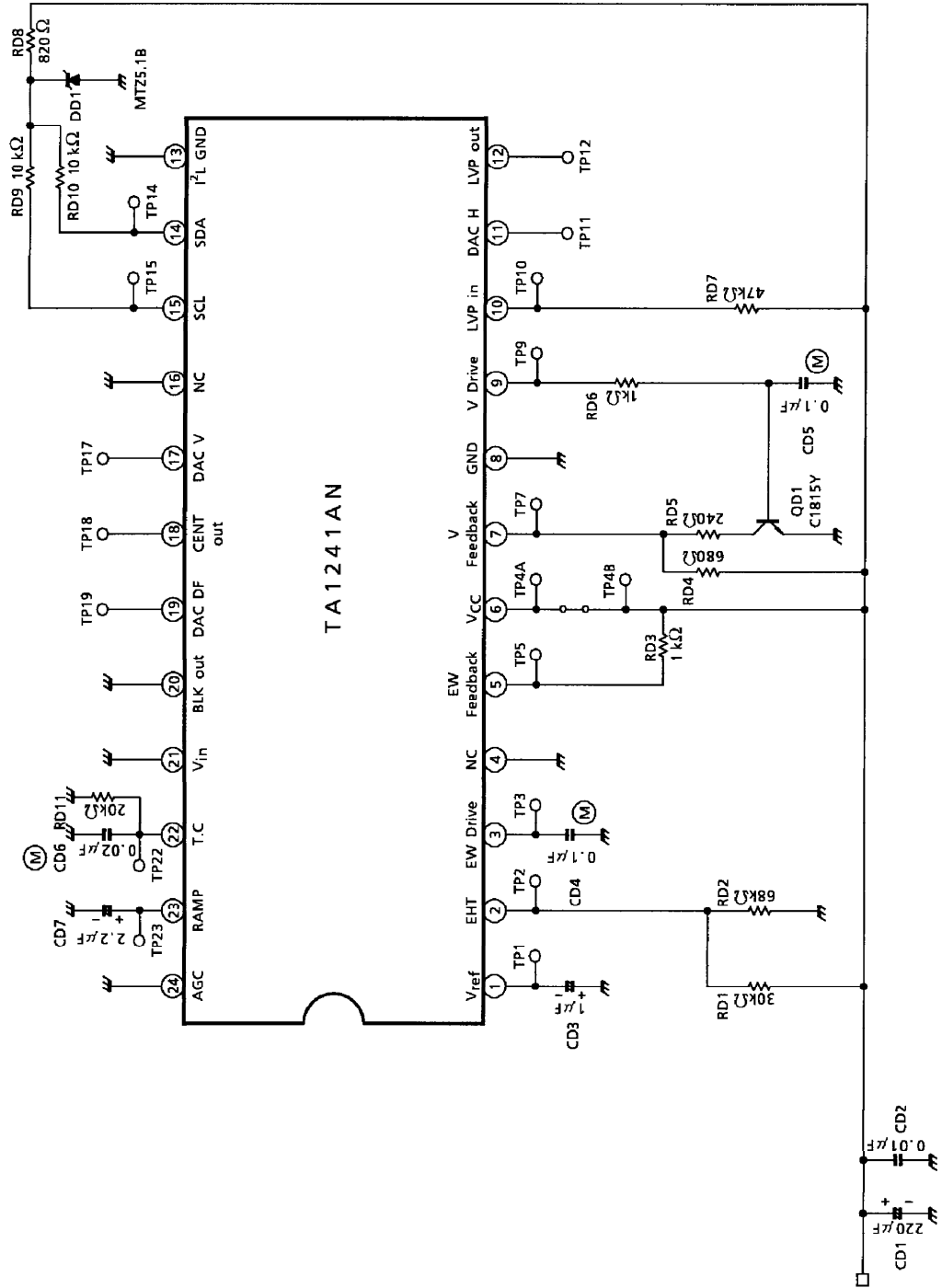
(Note) Unless otherwise specified in the bus data and SW mode column, use PRESET values and SW-A.

| No. | CHARACTERISTIC                  | SYMBOL | UNIT | ELECTRICAL CHARACTERISTICS |       |      | TEST METHOD (CONDITIONS $V_{CC} = 9V$ , $T_a = 25 \pm 3^\circ C$ ) |                                                                                                                                                                                                 |
|-----|---------------------------------|--------|------|----------------------------|-------|------|--------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                                 |        |      | LIMITS                     | TYP.  | MAX. | BUS DATA AND SWITCHING MODE<br>[ ] ; SUBADDRESS, ( ) ; DATA        | TEST METHOD                                                                                                                                                                                     |
|     |                                 |        |      | MIN                        |       |      |                                                                    |                                                                                                                                                                                                 |
| 52  | Self-Diagnosis Vertical Output  | —      | —    | —                          | Check | —    | All PRESET values, all SW-A, READ-MODE                             | (1) Turn the power on with no input to TP21.<br>(2) Check that in READ mode, the B <sub>2</sub> data = 0.<br>(3) Check that when a trigger pulse is input to TP21, the B <sub>2</sub> data = 1. |
| 53  | Self-Diagnosis E / W Output     | —      | —    | —                          | Check | —    | All PRESET values, all SW-A, READ-MODE                             | Check the B <sub>3</sub> data in the same way as above.                                                                                                                                         |
| 54  | Power On Reset Read Detection   | —      | —    | —                          | Check | —    | All PRESET values, all SW-A, READ-MODE                             | —                                                                                                                                                                                               |
| 55  | Blanking Switch Operation Check | —      | —    | —                          | Check | —    | [0A] (20), all SW-A                                                | (1) Input a trigger pulse to TP21.<br>(2) Measure TP22 when set the data of subaddress [0A] to (20). Check that TP22 outputs no signal.                                                         |

(Note) Unless otherwise specified in the bus data and SW mode column, use PRESET values and SW-A.

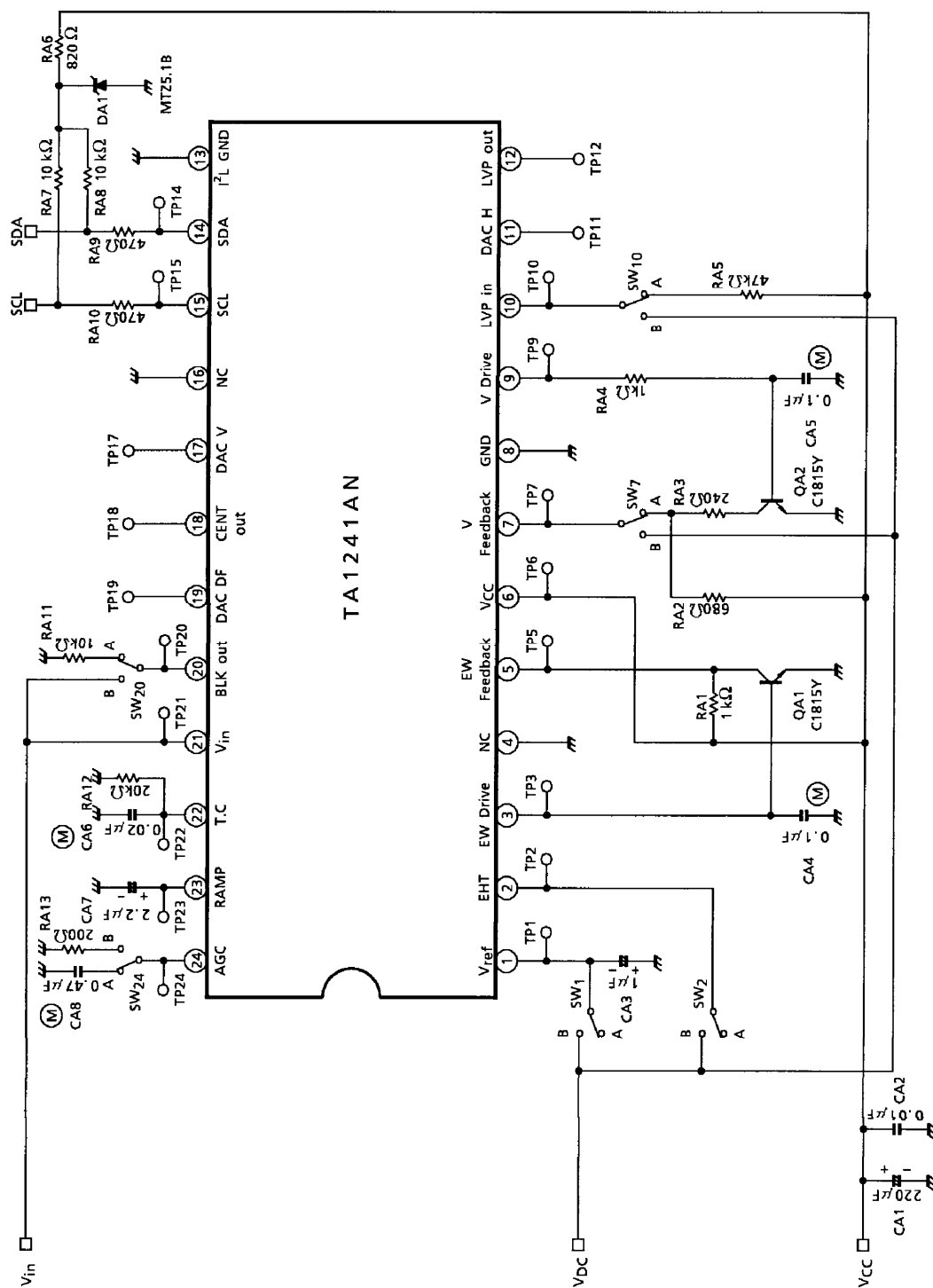


TEST CIRCUIT 1  
DC characteristics



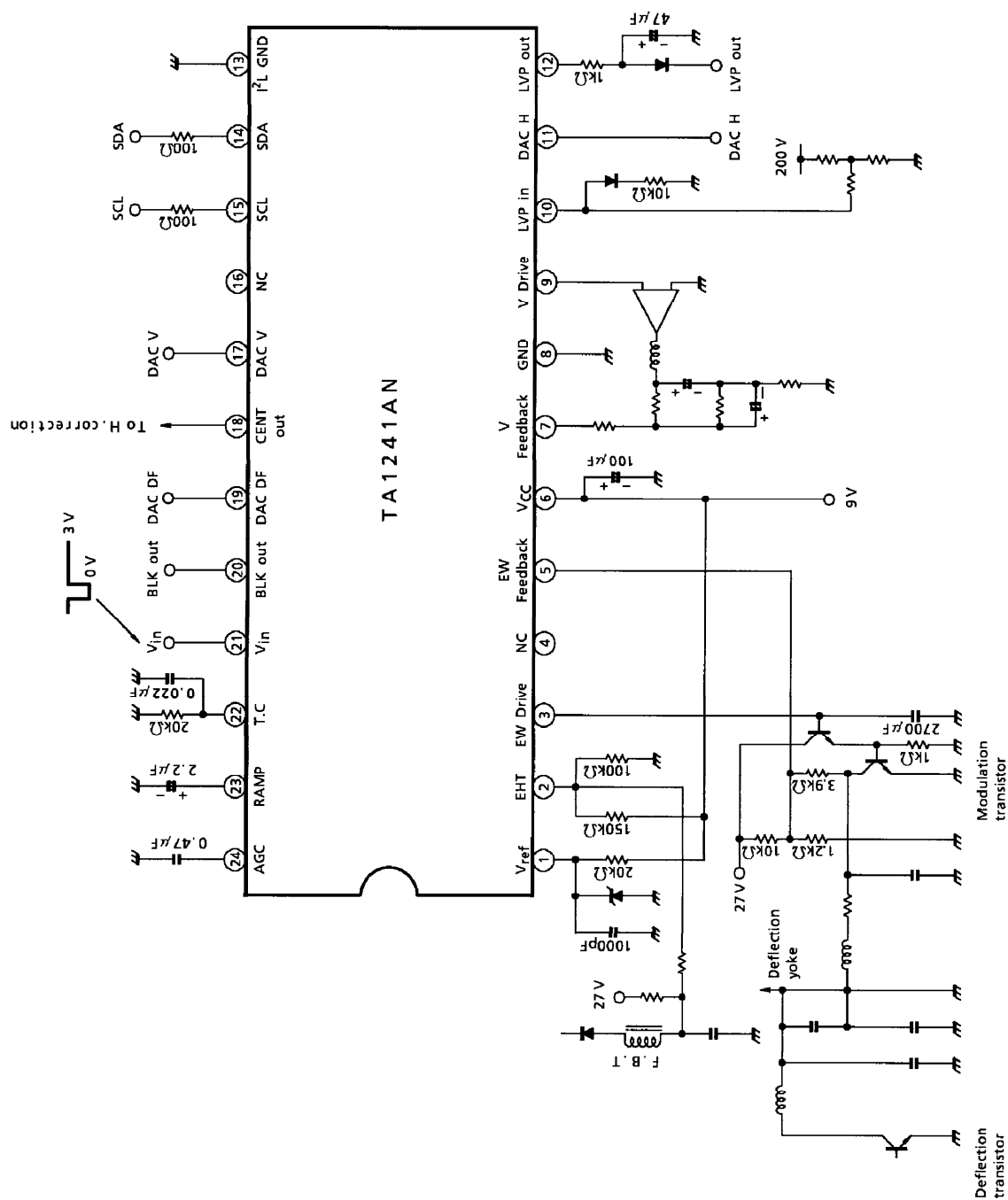
TA1241AN-25

TEST CIRCUIT 2  
AC characteristics



TA1241AN-26

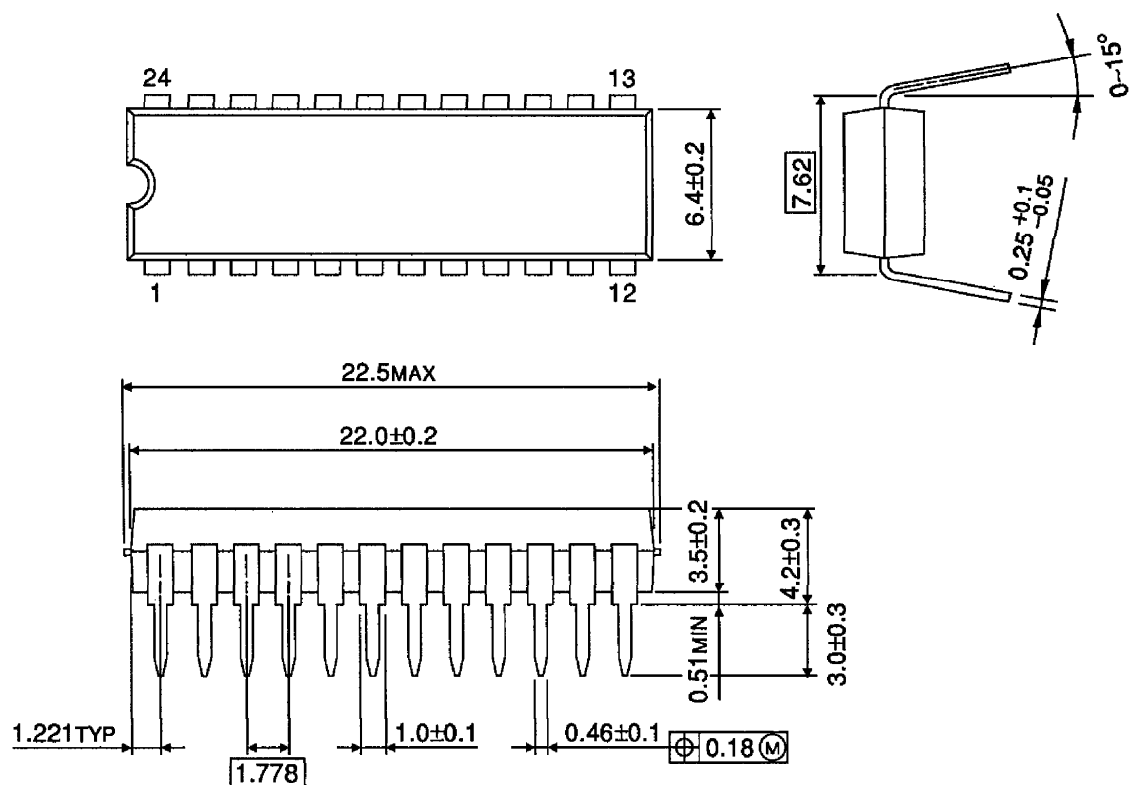
## APPLICATION CIRCUIT



**TA1241AN-27**

**OUTLINE DRAWING**  
SDIP24-P-300-1.78

Unit : mm



Weight : 1.22 g (Typ.)