

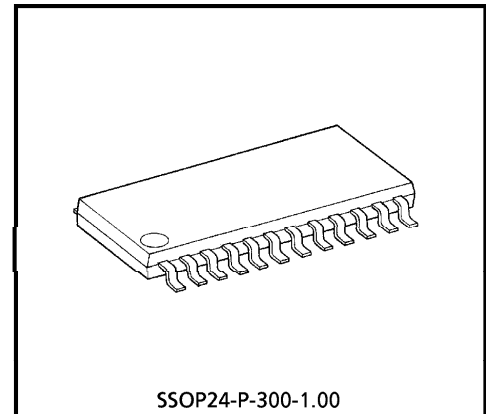
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA1250F**4-CHANNEL RECORDING AMPLIFIER & PRE-AMPLIFIER FOR VCR**

The TA1250F is a 4-channel recording amplifier and pre-amplifier for use in VCR. Since the recording amplifier uses a differential mechanism, it is particularly effective in reducing high-frequency even-ordered distortion. The pre-amplifier also has a differential mechanism and thus also reduces noise.

FEATURES

- Differential drive type recording amplifier
- Differential input type pre-amplifier
- Built-in envelope detector for auto-tracking
- Built-in envelope comparator for special playback
- Built-in recording mute circuit
- Board patterns can easily be shared, due to the high pin compatibility with the TA1249F 2-channel recording amplifier and pre-amplifier, and the TA1273F 6-channel recording amplifier and pre-amplifier.



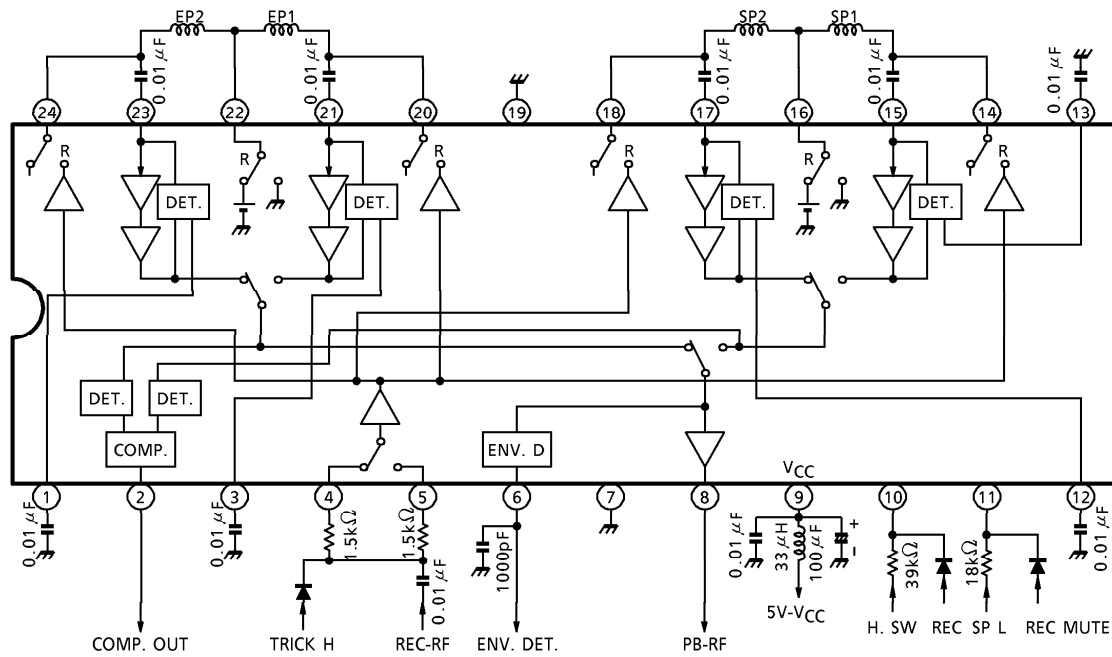
SSOP24-P-300-1.00

Weight : 0.32g (Typ.)

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BLOCK DIAGRAM



PIN FUNCTION ($V_{CC} = 5.0V$, $T_a = 25^\circ C$)

| PIN No. | FUNCTION | TYPICAL DC VOLTAGE | INTERFACE CIRCUIT | NOTES |
|---------|---------------------------------------|--------------------|-------------------|--|
| 1 | Filter 4 | 1.8V | | DC return filter |
| 3 | Filter 3 | | | |
| 12 | Filter 2 | | | |
| 13 | Filter 1 | | | |
| 2 | ENV.COMP. OUT | — | | SP : 0V EP : 5V |
| 4 | SP Rec input and trick mode switching | Rec : 0.9V | | Current input type Trick mode set when pin 4 (TP4) raised to H. |
| 5 | EP Rec input | Rec : 0.9V | | Current input type |
| 6 | ENV.DET.OUT | — | | — |
| 7 | GND | (0V) | — | — |
| 8 | PB RF OUT | 2V | | SP : 0.3mV _{p-p} input ↓ 57dB 212mV _{p-p} output EP : 0.3mV _{p-p} input ↓ 60dB 300mV _{p-p} output |
| 9 | V _{CC} | (5V) | — | — |
| 10 | Head SW & Rec H | 2.5V | | Refer to the head switching table in the Control Tables. TP10→H : Rec Mode |

| PIN No. | FUNCTION | TYPICAL DC VOLTAGE | INTERFACE CIRCUIT | NOTES |
|---------|---------------------------|-------------------------|-------------------|---|
| 11 | Mode switching & Rec Mute | — | | V ₁₁ voltage L : SP H : EP TP11 voltage H : Rec Mute |
| 14 | Rec OUT1 (SP1) | Open collector | | — |
| 18 | Rec OUT2 (SP2) | | | |
| 20 | Rec OUT3 (EP1) | | | |
| 24 | Rec OUT4 (EP2) | | | |
| 15 | PB IN1 (SP1) | PB : 0.9V | | — |
| 17 | PB IN2 (SP2) | | | |
| 21 | PB IN3 (EP1) | | | |
| 23 | PB IN4 (EP2) | | | |
| 16 | Head COMMON 1 | Rec : 4.3V PB : 0.1V | | — |
| 22 | Head COMMON 2 | | | |
| 19 | Head GND | (0V) | — | — |

CONTROL TABLES

HEAD switching

| During PB | V ₁₀ voltage | SP mode | EP mode |
|-----------|-------------------------|---------|---------|
| | H | 2ch | 1ch |
| | L | 1ch | 2ch |

(Note) The above settings are controlled by the input and output currents.
Pin10 (TP10) has function of Rec H too.

MODE switching

| V ₁₁ voltage | Mode |
|-------------------------|------|
| L | SP |
| H | EP |

(Note) Pin 11 has function of Rec Mute too.
When pin 11 (TP11) is raised to H (V_{CC}), then Rec Mute mode is set.

- Trick mode is set by raising pin 4 (TP4) to H.

EXAMPLES OF REC CURRENT SETTING

Input : 500mV_{p-p}, 4MHz

| MODE | INPUT RESISTANCE | REC CURRENT (SINGLE-CHANNEL OUTPUT) |
|------|------------------|-------------------------------------|
| SP | 1.5kΩ | 14.9mA |
| | 2.0kΩ | 11.2mA |
| EP | 1.5kΩ | 10.5mA |
| | 2.0kΩ | 7.9mA |

MAXIMUM RATINGS (Ta = 25°C)

| CHARACTERISTIC | SYMBOL | RATING | UNIT |
|-----------------------|--------------------------|---------------------------------|------|
| Power Supply Voltage | V _{CC} | 7 | V |
| Power Dissipation 1 | P _{D1} (Note 1) | 595 | mW |
| Power Dissipation 2 | P _{D2} (Note 2) | 830 | mW |
| Input Voltage | V _{IN} | GND - 0.3~V _{CC} + 0.3 | V |
| Operating Temperature | T _{opr} | - 20~75 | °C |
| Storage Temperature | T _{stg} | - 55~150 | °C |

(Note 1) Derated linearly above Ta = 25°C in the proportion of 4.8mW/°C.

(Note 2) On the board mounting (Glass epoxy 50×50×1.6mm, Area of copper : 30%)
Derated linearly above Ta = 25°C in the proportion of 6.7mW/°C.

RECOMMENDED POWER SUPPLY VOLTAGE RANGE

Power supply voltage : 4.5~5.5V, 5V (typical)

ELECTRICAL CHARACTERISTICS (V_{CC} = 5V, Ta = 25°C)

PB mode

| CHARACTERISTIC | SYMBOL | TEST CIR-CUIT | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|-------------------------------|-------------------|---------------|---|-------|------|------|------------------|
| Power Supply Current | I _{ccp} | — | — | 26 | 32 | 40 | mA |
| Voltage Gain (SP Mode) | G _{s1} | — | Input (V15, V17, V21, V23) : f = 1MHz, 0.3mV _{p-p} | 54 | 57 | 60 | dB |
| | G _{s2} | | | | | | |
| Voltage Gain (EP Mode) | G _{e1} | | | 57 | 60 | 63 | |
| | G _{e2} | | | | | | |
| Voltage Gain Difference | ΔG _S | — | G _{s1} - G _{s2} | -0.5 | 0 | 0.5 | dB |
| | ΔG _E | — | G _{e1} - G _{e2} | | | | |
| Frequency Characteristic | G _{Fs1} | — | Input (V15, V17, V21, V23) : 0.3mV _{p-p} Output ratio 8M / 1M | - 1.5 | 0.5 | 2.5 | dB |
| | G _{Fs2} | | | | | | |
| | G _{Fe1} | | | | | | |
| | G _{Fe2} | | | | | | |
| Secondary Harmonic Distortion | H _{Ds1} | — | Input (V15, V17, V21, V23) : 0.3mV _{p-p} Power ratio 8M / 4M | — | - 45 | - 40 | dB |
| | H _{Ds2} | | | | | | |
| | H _{De1} | | | | | | |
| | H _{De2} | | | | | | |
| Maximum Output Voltage | V _{oms1} | — | Input (V15, V17, V21, V23) : f = 1MHz Level when thirdly harmonic distortion of output reaches - 30dB. | 2.0 | 2.2 | — | V _{p-p} |
| | V _{oms2} | | | | | | |
| | V _{ome1} | | | | | | |
| | V _{ome2} | | | | | | |

| CHARACTERISTIC | SYMBOL | TEST CIR-CUIT | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|--------------------------------------|--------|---------------|--|------|------|------|-------------------|
| Crosstalk Between Channels (SP Mode) | CRS12 | — | Input (V15, V17, V21, V23) : f = 4MHz, 0.3mV _{p-p} Level difference between channels. | — | - 40 | - 38 | dB |
| | CRS21 | | | | | | |
| Crosstalk Between Channels (EP Mode) | CRE12 | — | Input (V15, V17, V21, V23) : f = 4MHz, 0.3mV _{p-p} Level difference between channels. | — | - 34 | - 32 | dB |
| | CRE21 | | | | | | |
| Crosstalk Between Modes | CRS1E1 | — | Input (V15, V17, V21, V23) : f = 4MHz, 0.3mV _{p-p} Level difference between modes. | — | - 60 | - 40 | dB |
| | CRS1E2 | | | | | | |
| | CRS2E1 | | | | | | |
| | CRS2E2 | | | | | | |
| | CRE1S1 | | | | | | |
| | CRE1S2 | | | | | | |
| | CRE2S1 | | | | | | |
| Output DC Offset | ΔVs1s2 | — | DC difference between outputs | - 15 | 0 | 15 | mV |
| | ΔVs1e1 | | | | | | |
| | ΔVs1e2 | | | | | | |
| | ΔVs2e1 | | | | | | |
| | ΔVs2e2 | | | | | | |
| | ΔVe1e2 | | | | | | |
| Equated Input Noise | NS1 | — | Measurement point 4MHz RBW : 10kHz | — | 0.1 | — | μV _{rms} |
| | NS2 | | | | | | |
| | NE1 | | | | | | |
| | NE2 | | | | | | |
| ENV Det (SP Mode) | VENVS1 | — | Input : f = 4MHz, 50μV _{p-p} | 0.4 | 0.7 | 1.0 | V |
| | VENVS2 | — | Input : f = 4MHz, 1mV _{p-p} | 2.95 | 3.35 | 3.75 | |
| ENV Det (EP Mode) | VENVE1 | — | Input : f = 4MHz, 50μV _{p-p} | 0.8 | 1.1 | 1.4 | V |
| | VENVE2 | — | Input : f = 4MHz, 1mV _{p-p} | 3.3 | 3.7 | 4.1 | |
| ENV Comp | VCOM1 | — | Selects SP head; pin 11 low | 0 | 0.1 | 0.3 | V |
| | VCOM2 | — | Selects EP head; pin 11 high | 4.7 | 4.9 | 5.0 | |

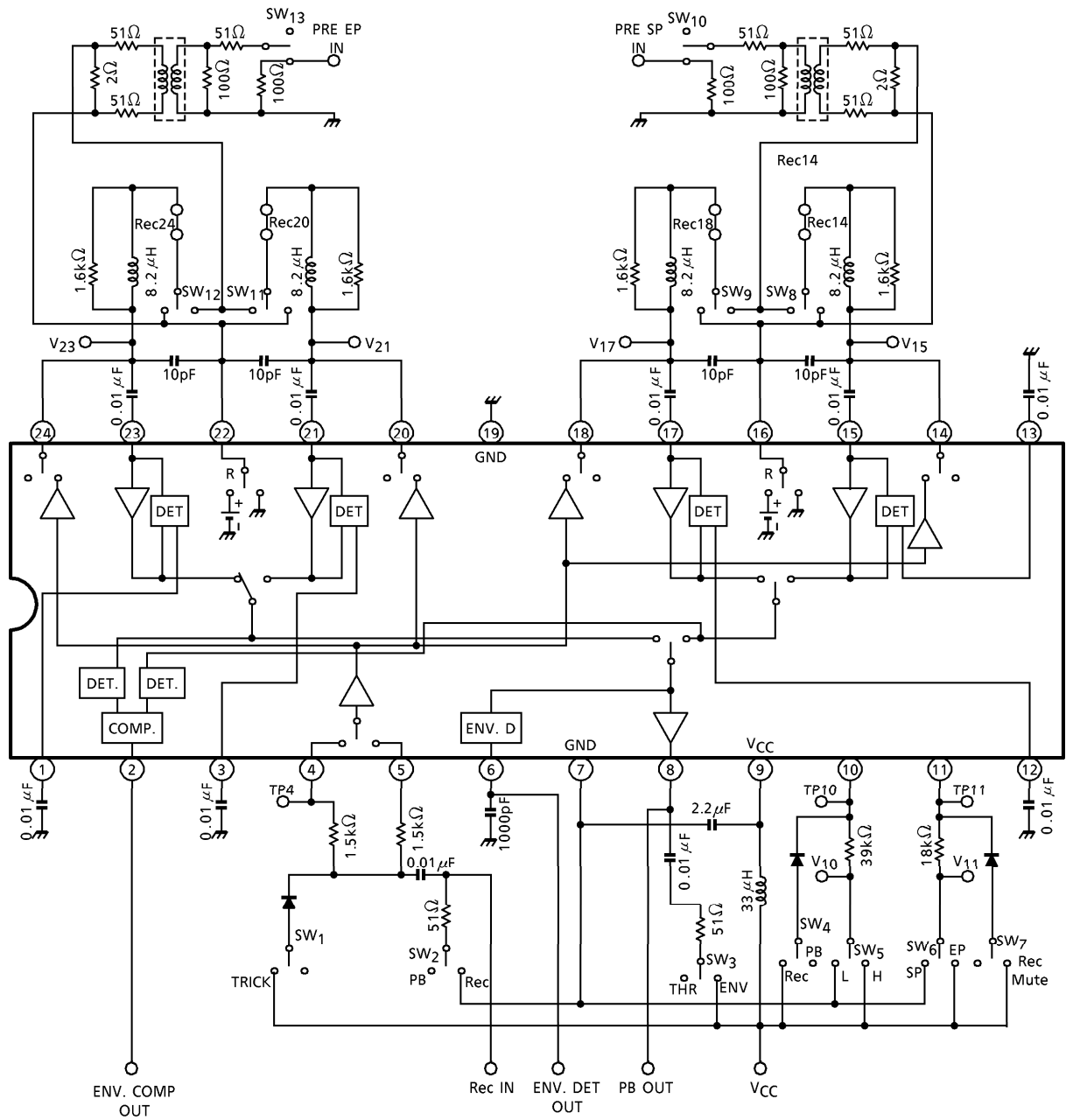
REC mode (Input resistance : 1.5kΩ)

| CHARACTERISTIC | SYMBOL | TEST CIR-CUIT | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|-------------------------------|-------------------|---------------|--|-------|------|------|------|
| Power Supply Current | I _{ccr} | — | — | 32 | 52 | 65 | mA |
| Current Gain (SP Mode) | G _{rs1} | — | Input : f = 1MHz, 500mV _{p-p} | 32.5 | 33 | 33.5 | dB |
| | G _{rs2} | | | | | | |
| Current Gain (EP Mode) | G _{re1} | — | Input : f = 1MHz, 500mV _{p-p} | 29.1 | 29.6 | 30.1 | dB |
| | G _{re2} | | | | | | |
| Frequency Characteristic | G _{rf1} | — | Input : 500mV _{p-p} Output ratio 1M / 8M | - 1.5 | 0 | 1.5 | dB |
| | G _{rf2} | | | | | | |
| | G _{rfe1} | | | | | | |
| | G _{rfe2} | | | | | | |
| Secondary Harmonic Distortion | HDRs1 | — | Input : f = 4MHz, 500mV _{p-p} Output ratio 8M / 4M | — | - 45 | - 40 | dB |
| | HDRs2 | | | | | | |
| | HDR _{e1} | | | | | | |
| | HDR _{e2} | | | | | | |

CONTROL SYSTEM

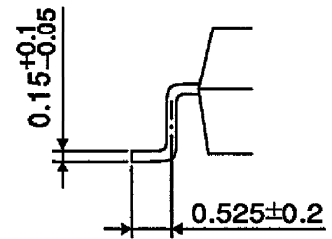
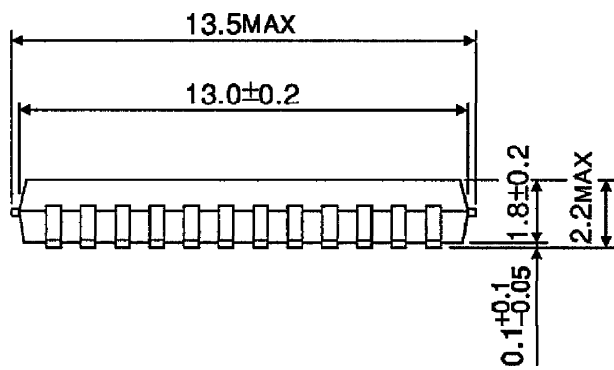
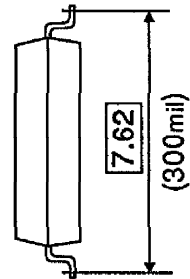
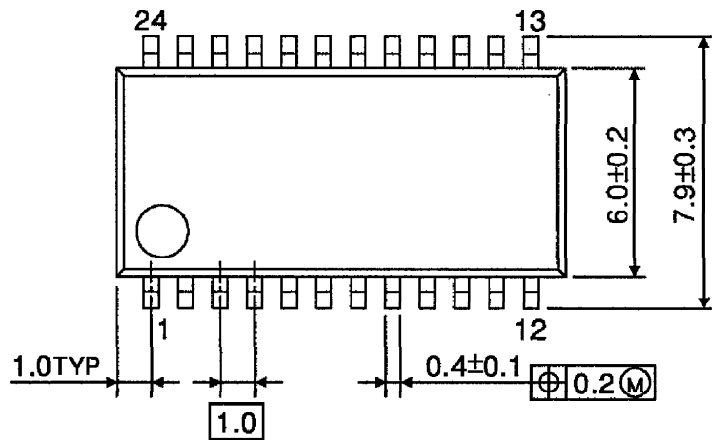
| CHARACTERISTIC | SYMBOL | TEST CIR-CUIT | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|------------------------|----------|---------------|----------------------|------|------|------|----------|
| Short SW ON Resistance | R_{in} | — | — | — | 6 | — | Ω |
| Input Resistance | r_{in} | — | — | — | 600 | — | Ω |
| Rec Mute | Mute1 | — | Mute ON (TP11) | 4.2 | | 5.0 | V |
| | Mute2 | — | Mute OFF (TP11) | 0.0 | | 3.4 | |
| Rec/PB | R/P1 | — | Rec mode (TP10) | 3.8 | | 5.0 | V |
| | R/P2 | — | PB mode (TP10) | 0.0 | | 2.8 | |
| SP/EP | EPS1 | — | SP mode (V_{11}) | 0.0 | | 0.9 | V |
| | EPS2 | — | EP mode (V_{11}) | 1.7 | | 5.0 | |
| LCH/HCH | SWP1 | — | LCH (V_{10}) | 0.0 | | 1.5 | V |
| | SWP2 | — | HCH (V_{10}) | 3.5 | | 5.0 | |
| Normal/Trick | NT1 | — | Normal mode (TP4) | 0.0 | | 0.4 | V |
| | NT2 | — | Trick mode (TP4) | 1.0 | | | |

TEST CIRCUIT



OUTLINE DRAWING
SSOP24-P-300-1.00

Unit : mm



Weight : 0.32g (Typ.)