THOMSON SEMICONDUCTORS

TEA2024

T-74-05-01

ADVANCE INFORMATION

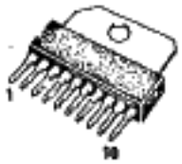
STEREO AF AMPLIFIER

The TEA2024 is an A.F. stereo amplifier in plastic package of 10 passages which is especially adapted for use in radio-cassette and low cost car-radio.
It has the capacity to supply an output power of 3.5 W per channel in the following conditions : V_{CC} = 12 V, THD = 10 %, R_L = 4 Ω.

- Low idle current
- Internal thermal protection
- Protection against short-circuit
- Single-in-line package
- Very few external components
- Excellent ripple rejection.

STEREO AF AMPLIFIER

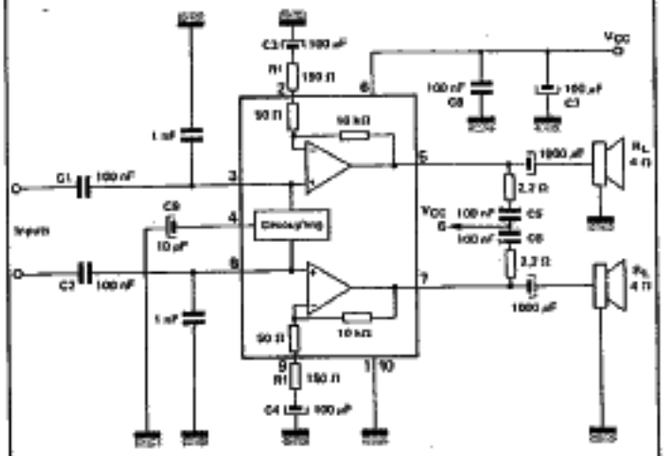
CASE CB-313



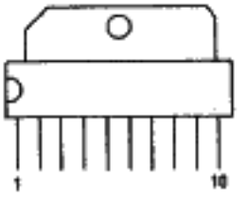
SP SUFFIX
PLASTIC PACKAGE

TYPICAL APPLICATION

DUAL MODE



PIN ASSIGNMENT



1. Ground (1)
2. Feedback (1)
3. Positive Input (1)
4. Decoupling
5. Output (1)
6. V_{CC} (1)
7. Output (2)
8. Positive Input (2)
9. Feedback (2)
10. Ground (2)

SP0235-A

THOMSON SEMICONDUCTORS
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Tel. : (3) 946 97 19 / Telex : 204780 F

THOMSON COMPONENTS

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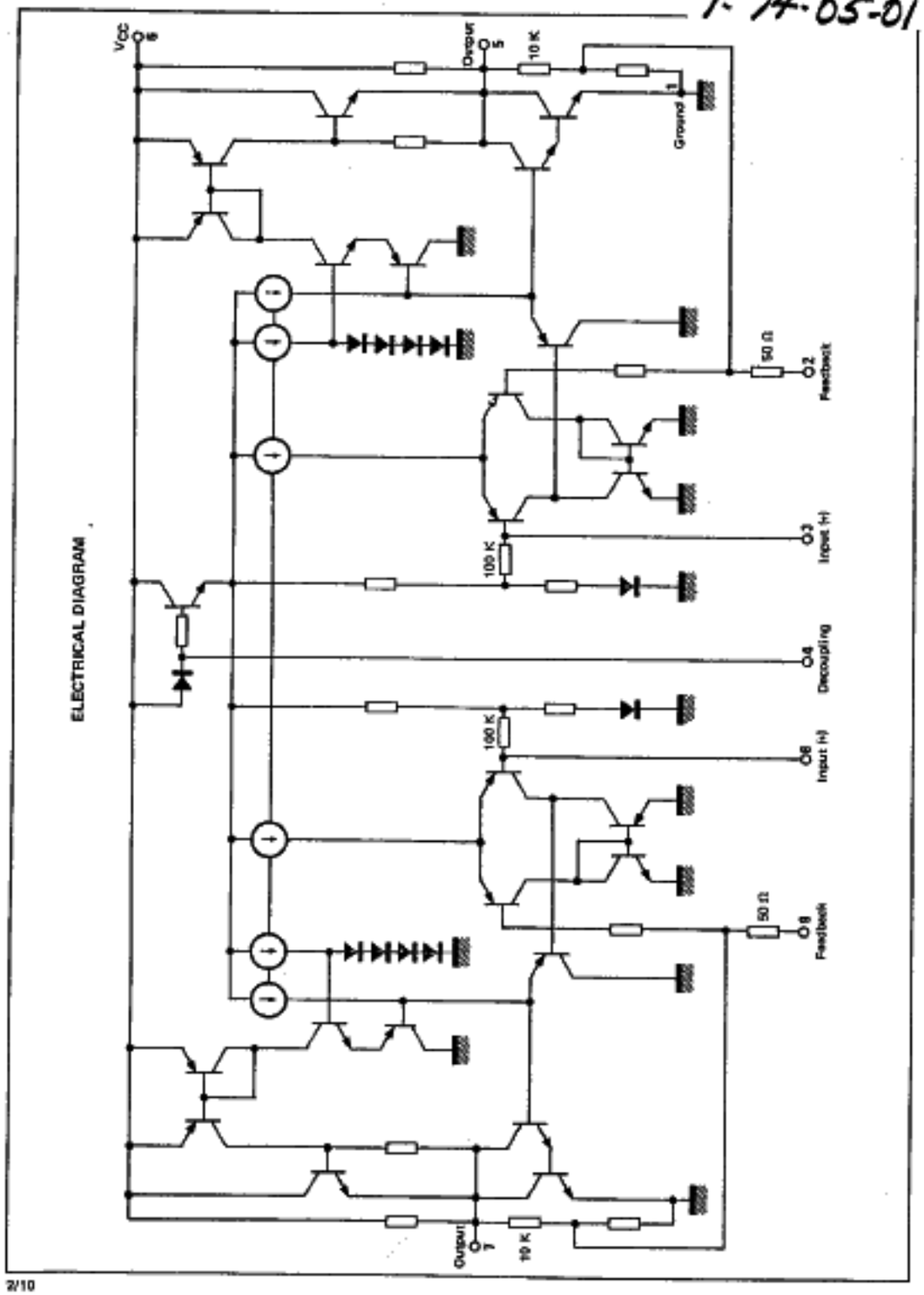
ELECTRICAL DIAGRAM
Vcc
8
Output
5
10 K
Ground
1
50 Ω
2
Feedback
3
Input (+)
100 K
4
Decoupling
6
Input (-)
100 K
7
Feedback
50 Ω
Output
1
10 K

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MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Supply voltage	V_{CC}	20	V
Operating supply voltage	V_{CC}	18	V
Power dissipation	P_{tot}	See graphs	
Maximum output current	I_O	2.5	A
Storage or junction temperature	T_{stg}, T_j	− 40, + 150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Value	Unit
Junction-ambient thermal resistance	$R_{th(j-a)}$	60	°C/W
Junction-case thermal resistance	$R_{th(j-c)}$	9	°C/W

ELECTRICAL CHARACTERISTICS

V_{CC} = 12 V, T_{amb} = + 25°C, R_L = 4 Ω, A_V = 46 dB, Dual mode (unless otherwise specified)

Characteristic	Symbol	Min	Typ	Max	Unit
Supply voltage range	V_{CC}	6	–	18	V
Supply current (V_E = 0)	I_{CC}	–	35	60	mA
D.C. output voltage (V_{CC} = 12 V)	V_{out}	5.4	6.0	6.6	V
Output power (f = 1 KHz ; d = 10 % ; R_L = 4 Ω)	P_{out}				W
Dual mode - per channel					
V_{CC} = 12 V		3	3.5	–	
V_{CC} = 9 V		–	1.75	–	
V_{CC} = 6 V		–	0.60	–	
V_{CC} = 14.4 V		–	5	–	
BTL mode - V_{CC} = 12 V		–	10	–	
Voltage gain without external resistance					dB
R_f = 150 Ω	A_{V1}	31	34	37	
R_f = 0 Ω	A_{V2}	–	46	–	
Distortion (f = 1 KHz ; V_{CC} = 12 V ; R_L = 4 Ω ; P_{out} 0.5 to 2 W)	d	–	0.3	1.5	%
Input noise voltage (R_G = 0 ; B = 20 KHz)		–	2	–	μV
Supply voltage ripple rejection f ripple = 100 Hz ; V ripple = 0.5 V_{RMS} ; R_G = 0	SVR	40	50	–	dB
Crosstalk (f = 1 KHz ; R_G = 10 K)	C_T	40	52	–	dB
Frequency response (3 dB) - (P_{out} = 1 W ; R_L = 4 Ω)	B	–	0.015 - 40	–	KHz
Open loop gain		–	80	–	dB

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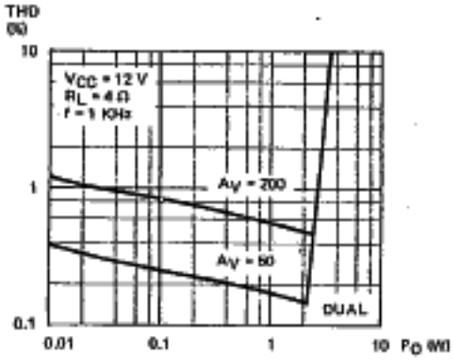
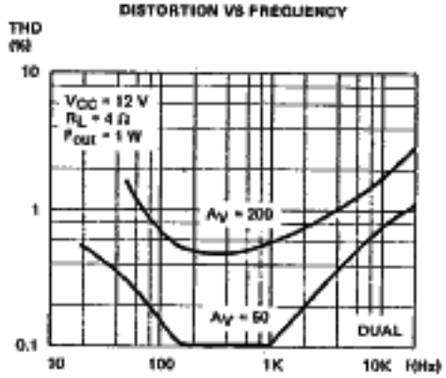
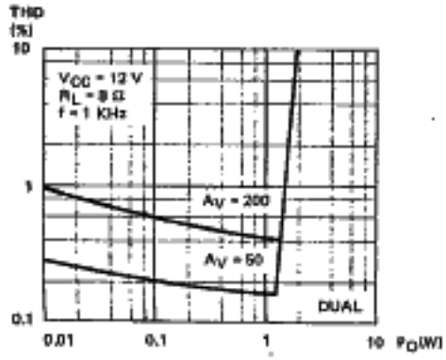
DISTORTION VS OUTPUT POWER



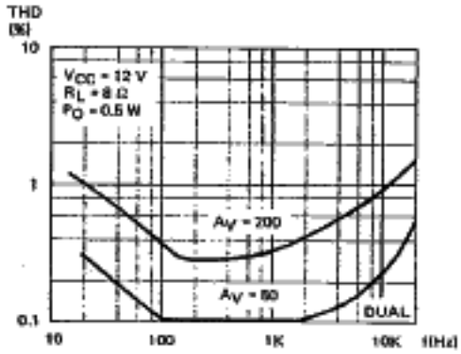
DISTORTION VS FREQUENCY



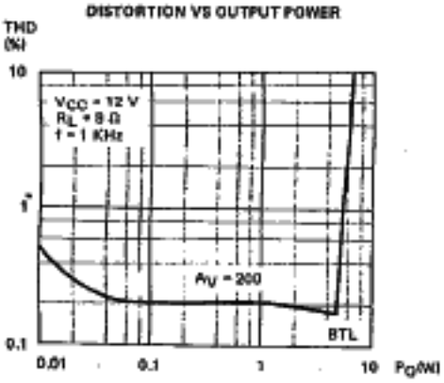
DISTORTION VS OUTPUT POWER



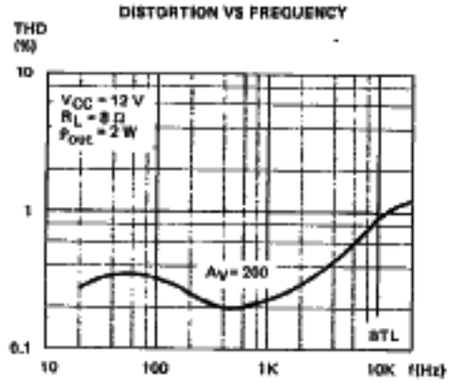
DISTORTION VS FREQUENCY



DISTORTION VS OUTPUT POWER



DISTORTION VS FREQUENCY



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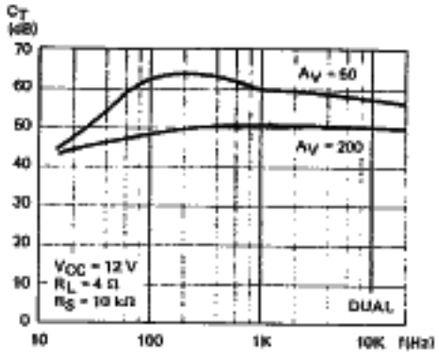
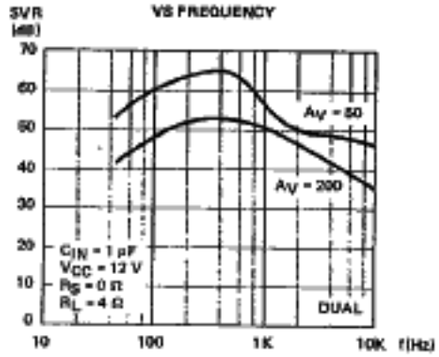
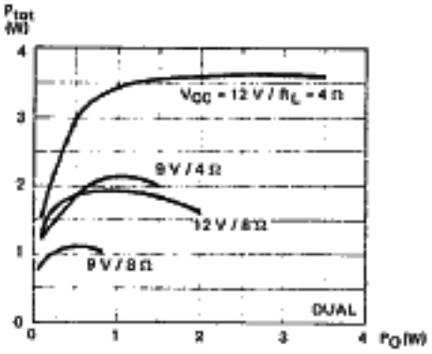
CROSSTALK VS FREQUENCY



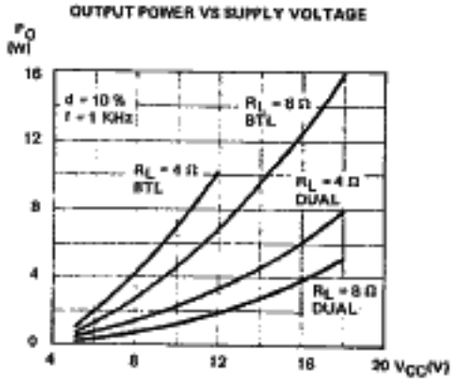
SUPPLY VOLTAGE RIPPLE REJECTION VS FREQUENCY



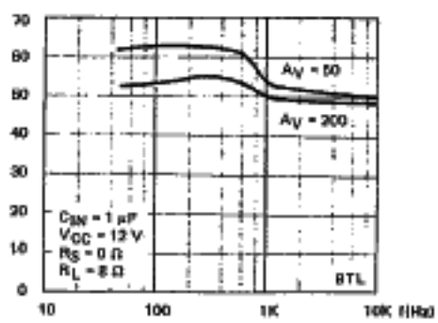
TOTAL DISSIPATED POWER VS OUTPUT POWER



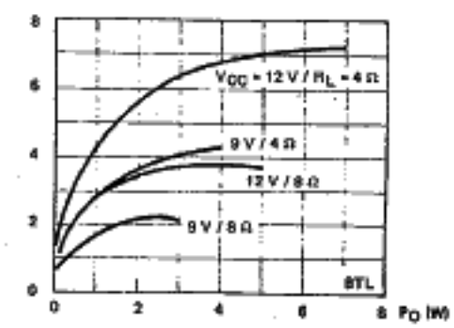
OUTPUT POWER VS SUPPLY VOLTAGE



SUPPLY VOLTAGE RIPPLE REJECTION VS FREQUENCY



TOTAL DISSIPATED POWER VS OUTPUT POWER



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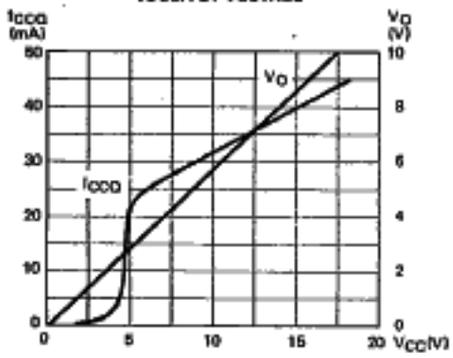
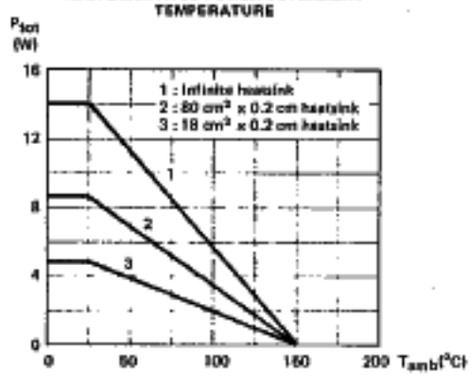
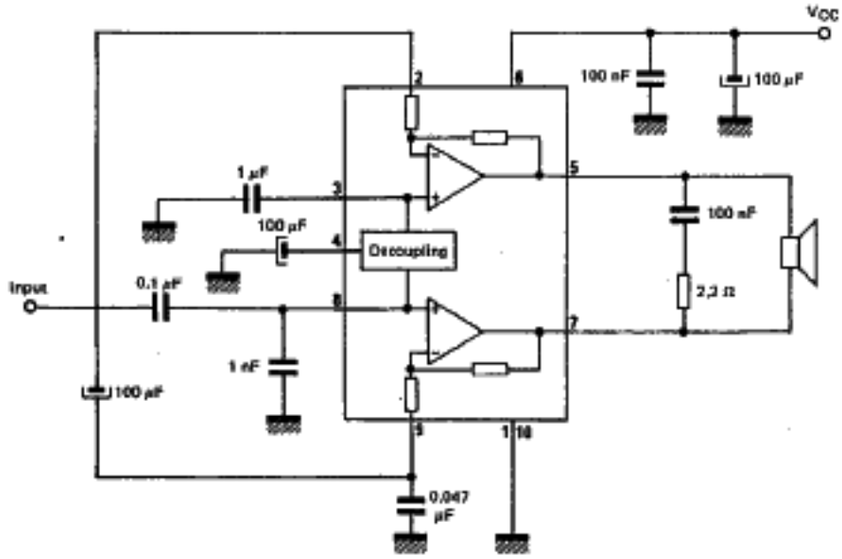
QUIESCENT CURRENT/D.C. OUTPUT VOLTAGE VS SUPPLY VOLTAGE



MAX DISSIPATED POWER VS AMBIENT TEMPERATURE



BRIDGE MODE



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APPLICATION INFORMATION

GROUND CONNECTION

Two ground pins are provided and must be connected together on the PC board. The GND connections for power - return from the load and negative supply - must be kept seperated from the signal and feed-back ground. Inappropriate ground connections will cause parasitic oscillation, distortion and cross-talk.

VOLTAGE GAIN

The voltage gain is determined by the ratio of internal feedback resistors and external resistor R_f.

$G_v = 34$ dB for $R_f = 150\ \Omega$

$G_v = 46$ dB for $R_f = 0\ \Omega$

CAPACITORS C5 AND C6

These capacitors must be connected close to the I.C. connections. Low temp-coefficient type will give the best results to prevent oscillations.

1 nF ceramic capacitors bypassing inputs to ground will help prevent high oscillations or radio interference.

OUTPUT POWER TABLE (TYPICAL VALUE)
THD = 10 % ; f = 1 KHz ; T_{amb} = + 25°C

LOAD \ V_{CC}		6 V	9 V	12 V	14.4 V
DUAL	8 Ω	–	1 W/ch	1.8 W/ch	3.0 W/ch
	4 Ω	0.6 W/ch	1.8 W/ch	3.5 W/ch	5 W/ch
BTL	8 Ω	1.2 W	3.5 W	6.7 W	10.5 W
	4 Ω	2.0 W	6.3 W	10 W	–

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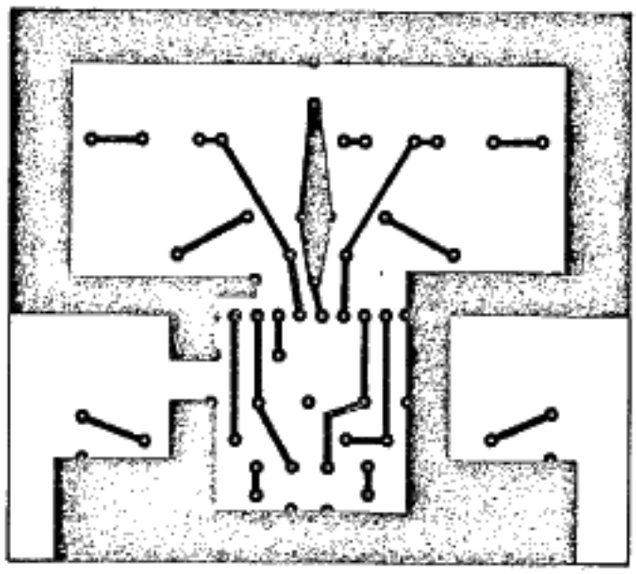
DUAL and BTL MODES

PRINTED CIRCUIT BOARD



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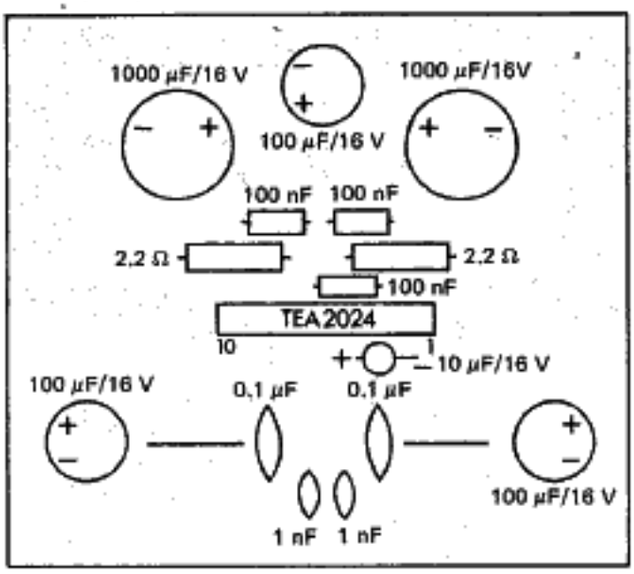
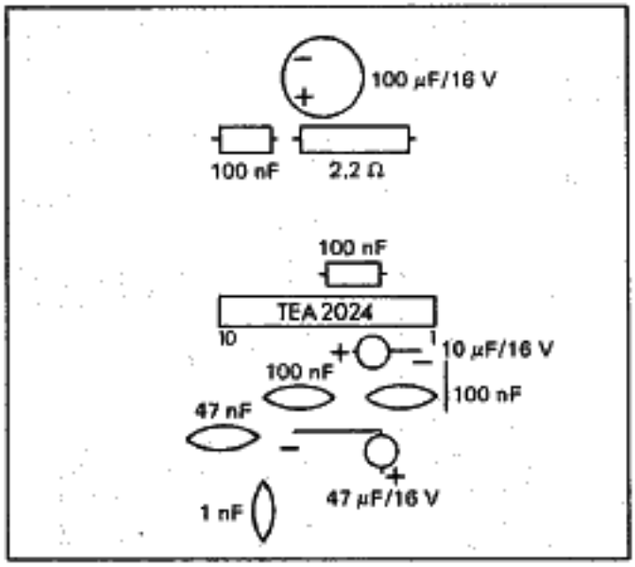
COMPONENT LAYOUT (DUAL MODE)



COMPONENT LAYOUT (BRIDGE MODE)



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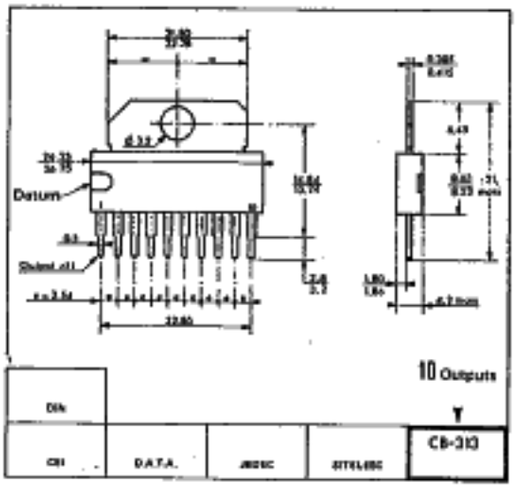
CASE CB-313

SP SUFFIX
PLASTIC PACKAGE



This is advance information and specifications are subject to change without notice.
Please inquire with our sales offices about the availability of the different packages.