

HIGH-POWER & LOW-VOLTAGE AUDIO POWER AMPLIFIER

■ GENERAL DESCRIPTION

The **NJU7084** is an audio power amplifier designed for telephone applications. No external coupling capacitors are required because of the differential outputs. The closed loop gain is adjusted by two external resistors, and a SD pin permit power down with muting the input signal.

The **NJU7084** improves high output power compared with other amplifier.

■ APPLICATION

- Cell Phone, PHS
- Portable Telephone, Wireless Telephone
- White Goods
- Security Alarm
- Monitor

■ FEATURES

- Operating Voltage
- Operating Current
- Supply Current in Shutdown Mode
- Output Power
- Thermal Shutdown Circuit
- C-MOS Technology
- Package Outline

$V^+ = 2.8$ to $5.5V$

$I_{DD1} = 2.5mA$ typ. ($V^+ = 5V, R_L = \infty$, no signal)

$I_{DD1} = 2mA$ typ. ($V^+ = 3V, R_L = \infty$, no signal)

$I_{DD2} = 2\mu A$ max.

$P_0 = 1W$ typ. ($V^+ = 5V, R_L = 8\Omega, THD = 2\%$)

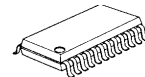
$P_0 = 400mW$ typ. ($V^+ = 3V, R_L = 4\Omega, THD = 2\%$)

VSP8, DMP24

■ PACKAGE OUTLINE

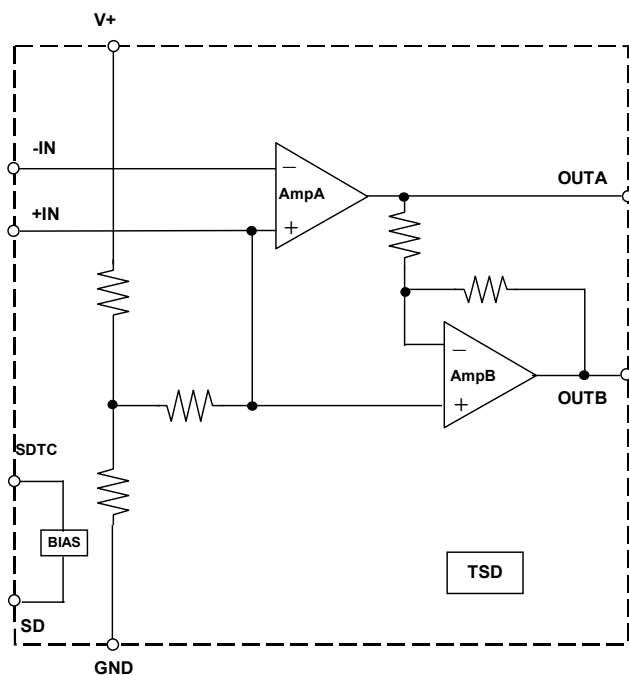


NJU7084R



NJU7084M

■ PIN CONFIGURATION & BLOCK DIAGRAM



(VSP8)

1. SD
2. SDTC
3. +IN
4. -IN
5. OUTA
6. V^+
7. GND
8. OUTB

(DMP24)

- | | | |
|---------|--------|-----------|
| 1. NC | 9. NC | 17. OUTA |
| 2. NC | 10. NC | 18. V^+ |
| 3. NC | 11. NC | 19. GND |
| 4. NC | 12. NC | 20. OUTB |
| 5. SD | 13. NC | 21. NC |
| 6. SDTC | 14. NC | 22. NC |
| 7. +IN | 15. NC | 23. NC |
| 8. -IN | 16. NC | 24. NC |

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■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V ⁺	+7	V
Power Dissipation	P _D	960 * ¹⁾ (VSP8) 1350 * ²⁾ (DMP24)	mW
Output Peak Current	I _{op}	500	mA
Input Voltage Range	V _{IN}	-0.3 to V ⁺ +0.3 * ³⁾	V
Operating Temperature Range	T _{opr}	-40 to +85	°C
Storage Temperature Range	T _{stg}	-40 to +150	°C

*¹⁾ EIA/JEDEC STANDARD Test board (76.2 x 114.3 x 1.6mm, 4layers, FR-4) mounting

*²⁾ EIA/JEDEC STANDARD Test board (76.2 x 114.3 x 1.6mm, 2layers, FR-4) mounting

*³⁾ SD, SDTC, IN+, IN-, OUTA, OUTB terminals.

■ RECOMMENDED OPERATING VOLTAGE RANGE (Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Voltage Range	V ⁺	-	2.8	3.0	5.5	V

■ ELECTRICAL CHARACTERISTICS

● Amplifier (Ta=25°C, V⁺=5V, G_v=6dB, f=1kHz, R_L=8Ω, Active)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Current 1	I _{DD1}	No signal, R _L =∞, Active	-	2.5	6	mA
Operating Current 2	I _{DD2}	No signal, R _L =∞, V _{SD} =0.25V	-	-	2	μA
Output Power	P _{O1}	THD≤2%	0.8	1	-	W
Total Harmonic Distortion (THD+N)	THD	P _O =400mW	-	0.1	-	%
Supply Voltage Rejection Ratio	PSRR	C1=1μF, C2=2.2μF V _{ripple} =100mVrms	45	55	-	dB
Mute Attenuation	MAT	Shutdown	-	70	-	dB
Input Resistance	R _{SD}	SD Terminal	105	150	195	kΩ
Output Offset Voltage	V _{OD}	V _{IN} =0V	-50	-	50	mV

(Ta=25°C, V⁺=3V, G_v=6dB, f=1kHz, R_L=4Ω, Active)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Current 1	I _{DD1}	No signal, R _L =∞, Active	-	2.0	4	mA
Operating Current 2	I _{DD2}	No signal, R _L =∞, V _{SD} =0.25V	-	-	2	μA
Output Power	P _{O1}	THD≤2%	320	400	-	mW
Total Harmonic Distortion (THD+N)	THD	P _O =200mW	-	0.1	-	%
Supply Voltage Rejection Ratio	PSRR	C1=1μF, C2=2.2μF V _{ripple} =100mVrms	-	55	-	dB
Mute Attenuation	MAT	Shutdown	-	70	-	dB
Output Offset Voltage	V _{OD}	V _{IN} =0V	-50	-	50	mV

V_{SD}: SD Terminal Voltage

● Mode Control (Ta=25°C)

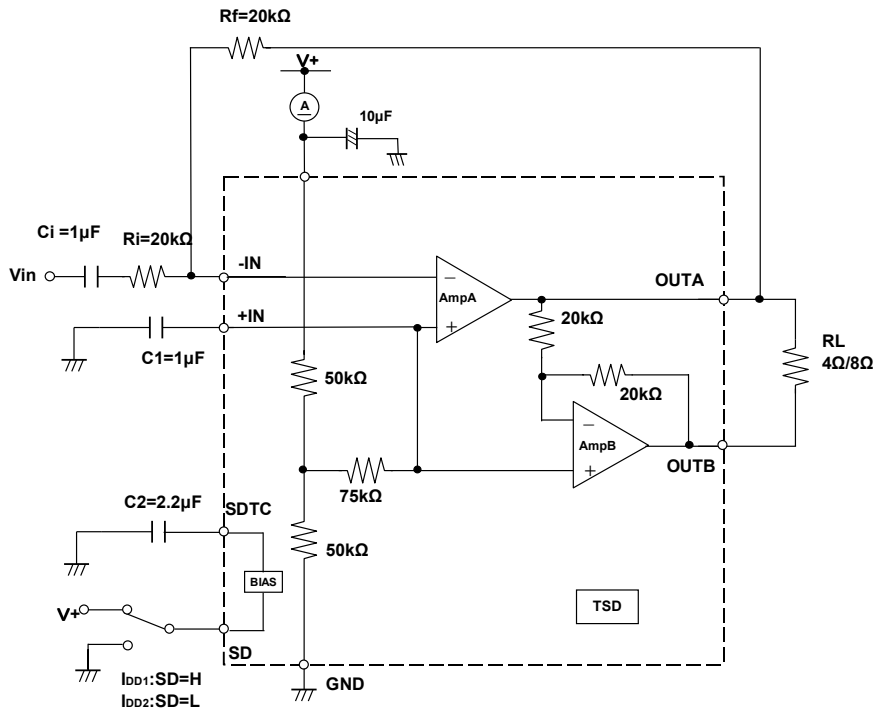
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
High Level Input Voltage	V _{IH}	-	0.7V ⁺	-	V ⁺	V
Low Level Input Voltage	V _{IL}	-	0	-	0.25	

■ CONTROL TERMINAL EXPLANATION

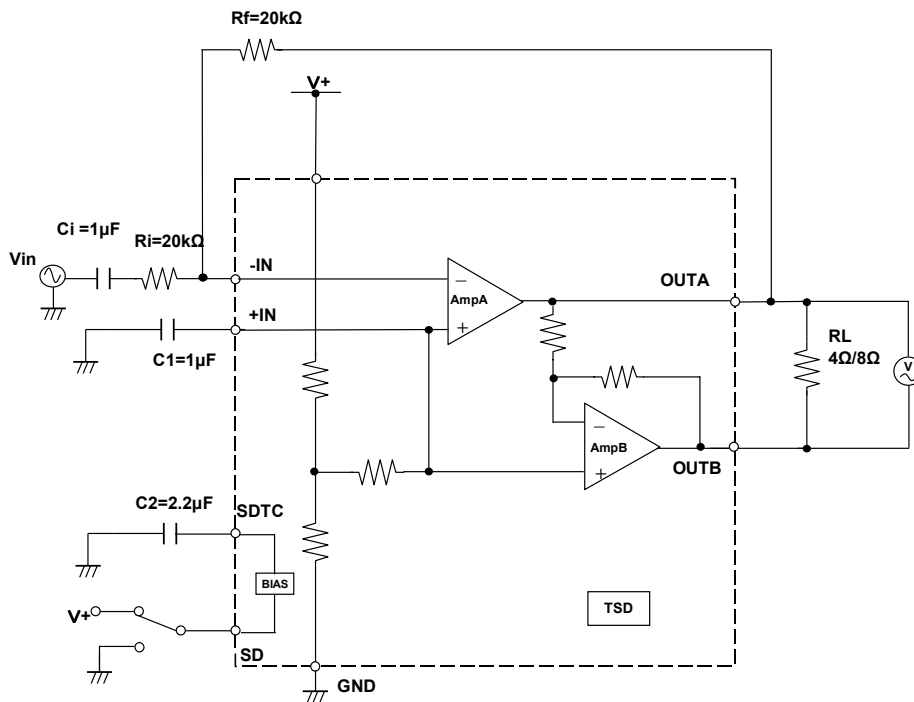
MODE	CONTROL SIGNAL (SD Terminal)	STATUS
Shutdown	L(=V _{IL})	IC is standby.
Active	H(=V _{IH})	IC is active.

TEST CIRCUIT

TEST CIRCUIT1 (Operating Current I_{DD1} , I_{DD2})

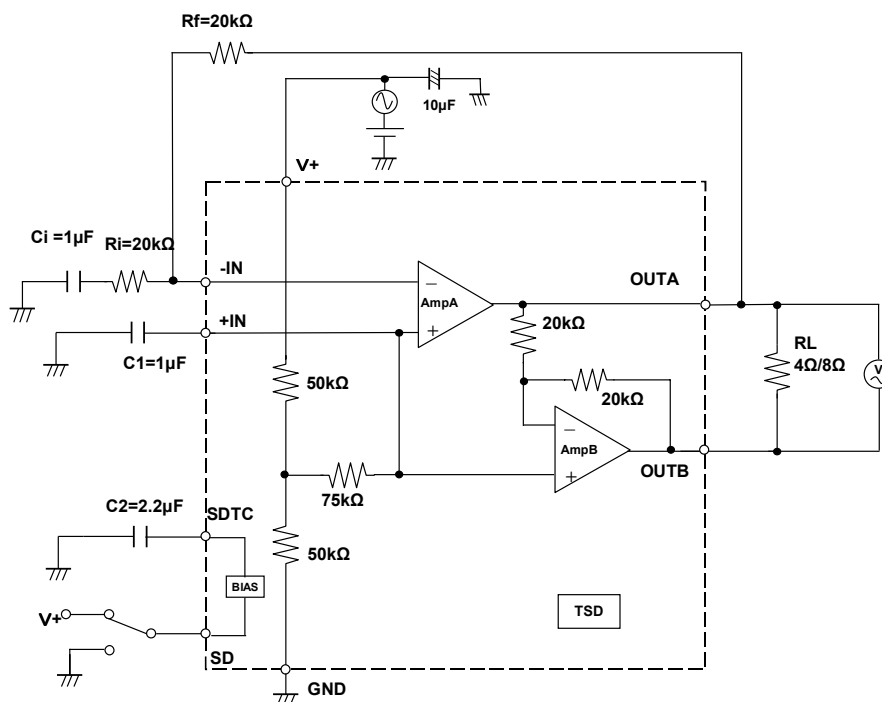


TEST CIRCUIT2 (Output Power P_O , Total Harmonic Distortion THD)

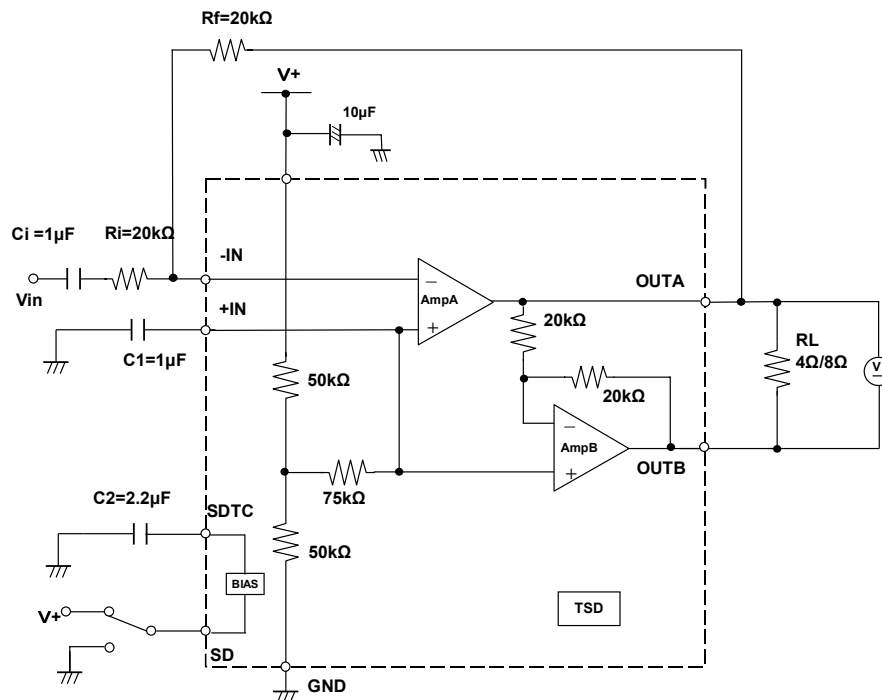


TEST CIRCUIT

TEST CIRCUIT3 (Supply Voltage Rejection Ratio PSRR)



TEST CIRCUIT4 (Output Offset Voltage V_{OD})



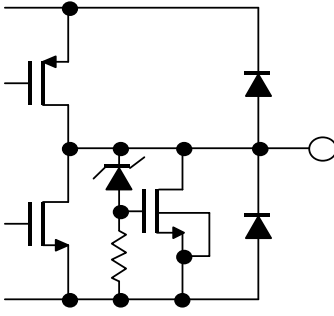
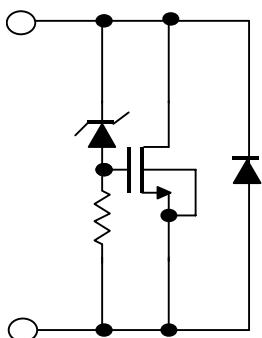
■ EQUIVALENT CIRCUIT

PIN No.		SYMBOL	EQUIVALENT CIRCUIT	TERMINAL VOLTAGE	Note
DMP 24	VSP 8				
5	1	SD		-	
6	2	SDTC		$2 * V^+ / 3$	
7	3	+IN		$V^+ / 2$	
8	4	-IN		$V^+ / 2$	

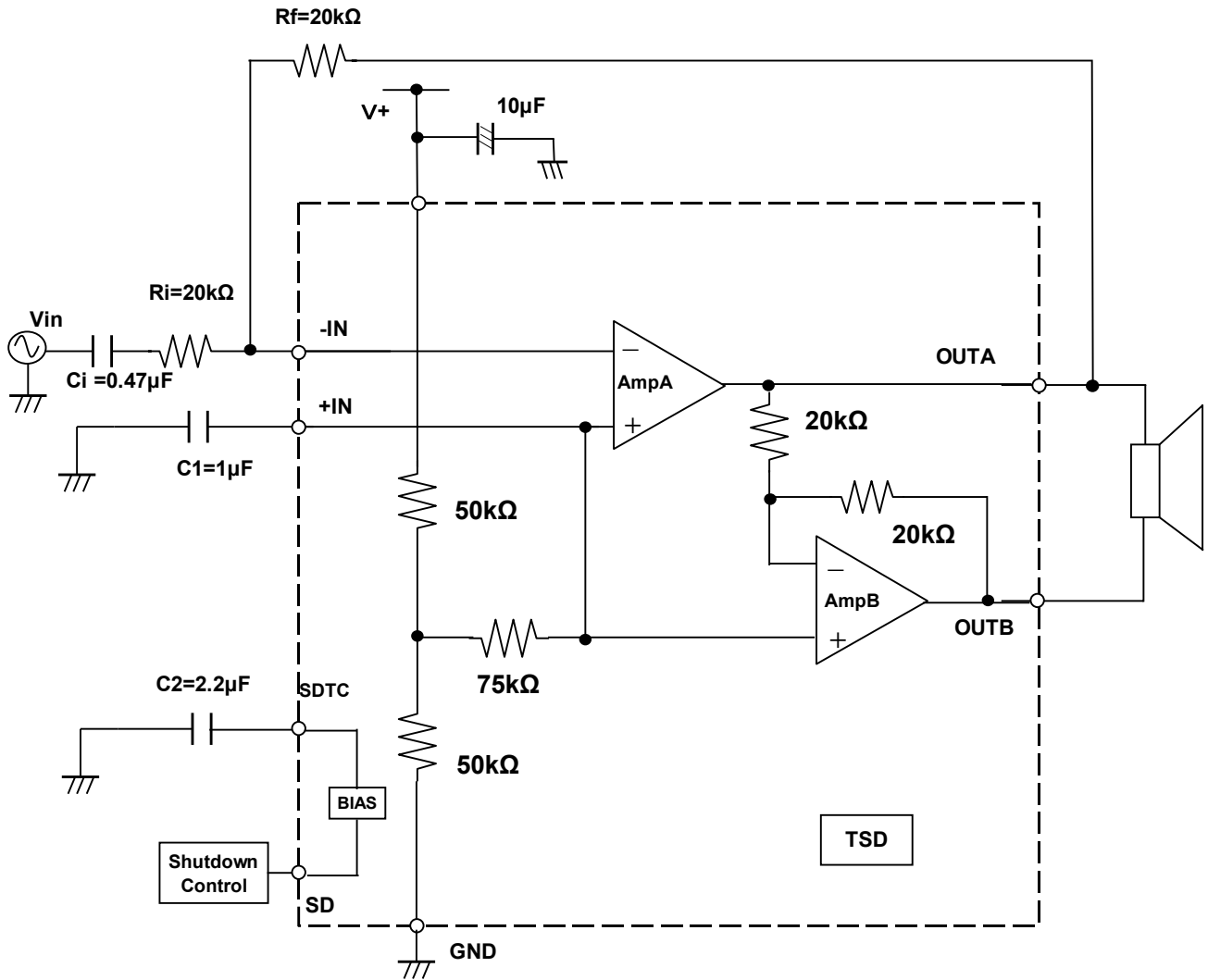
NJU7084

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■ EQUIVALENT CIRCUIT

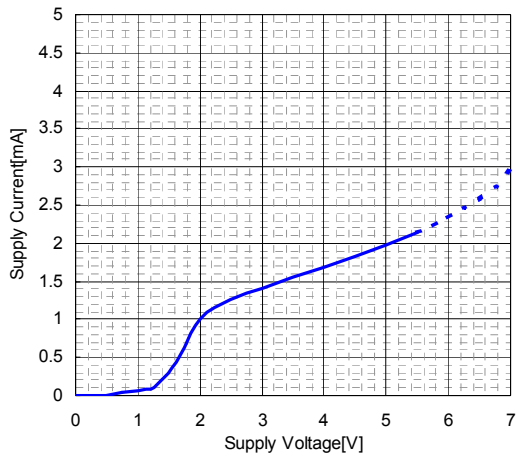
PIN No.		SYMBOL	EQUIVALENT CIRCUIT	TERMINAL VOLTAGE	Note
DMP 24	VSP 8				
17 20	5 8	OUTA OUTB		$V^+/2$	
18 19	6 7	V^+ GND		-	

APPLICATION CIRCUIT

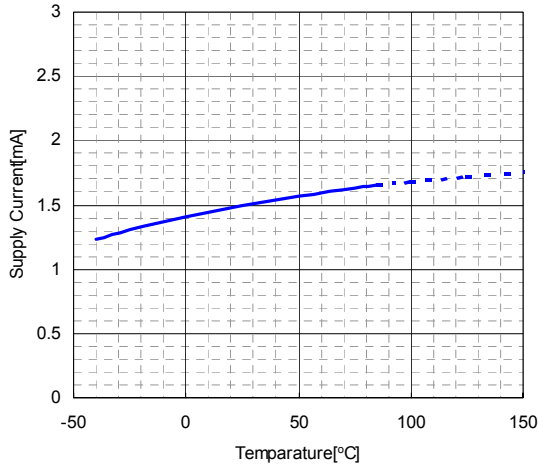


TYPICAL CHARACTERISTICS

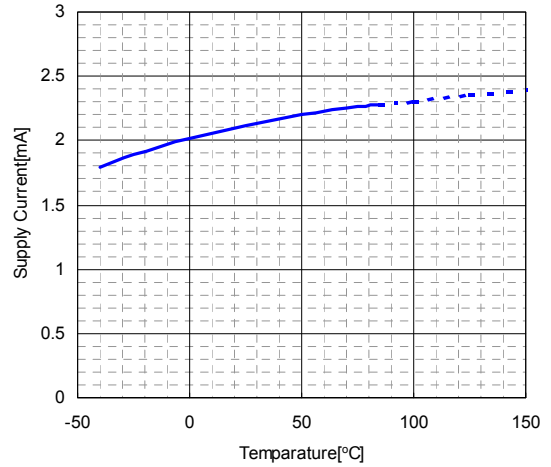
Supply Current vs Supply Voltage
RL=OPEN, Ta=25°C



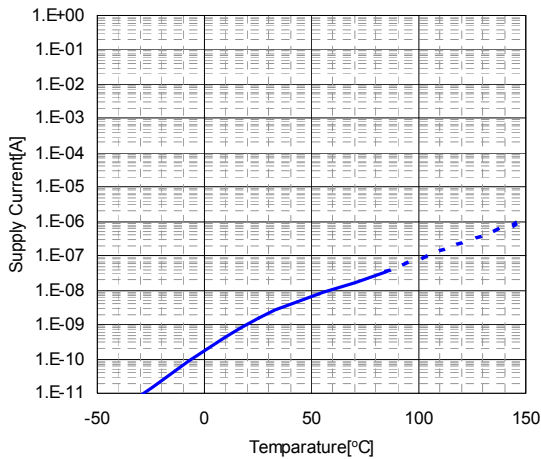
Supply Current vs Temperature
V+=3V, Gv=6dB, RL=OPEN



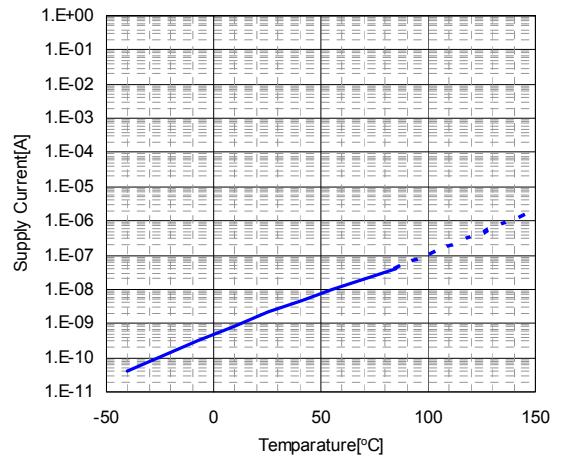
Supply Current vs Temperature
V+=5V, Gv=6dB, RL=OPEN



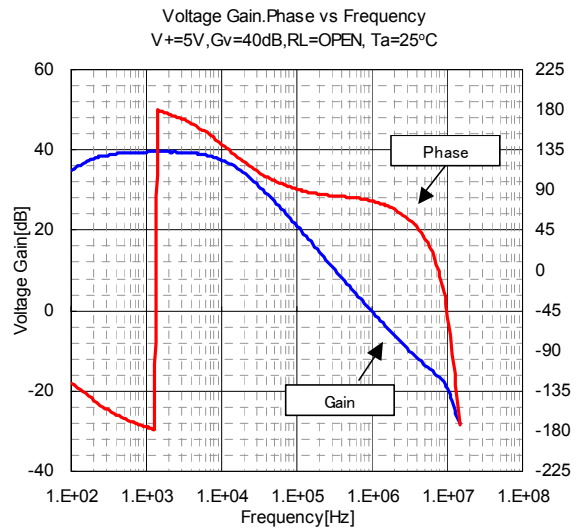
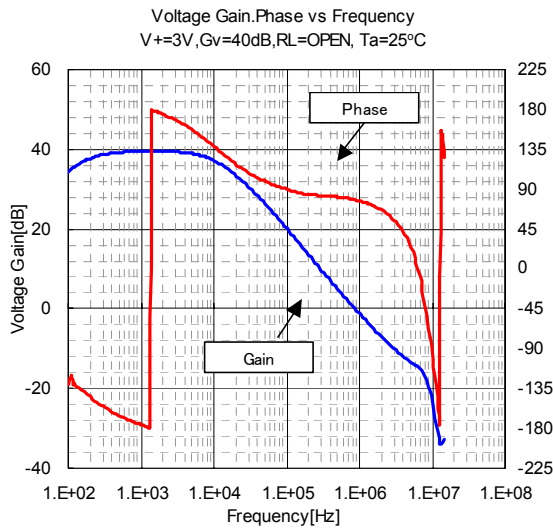
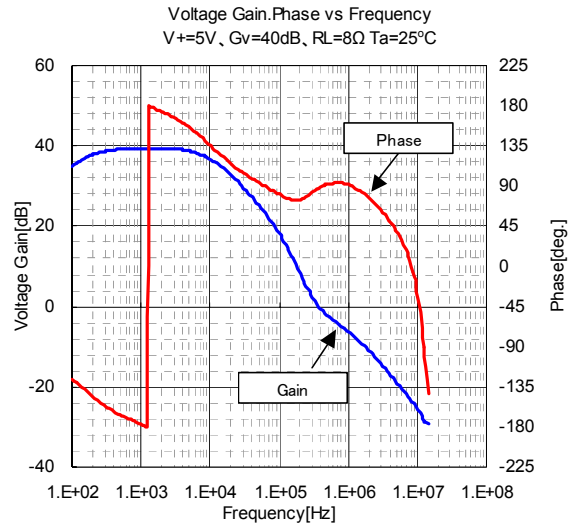
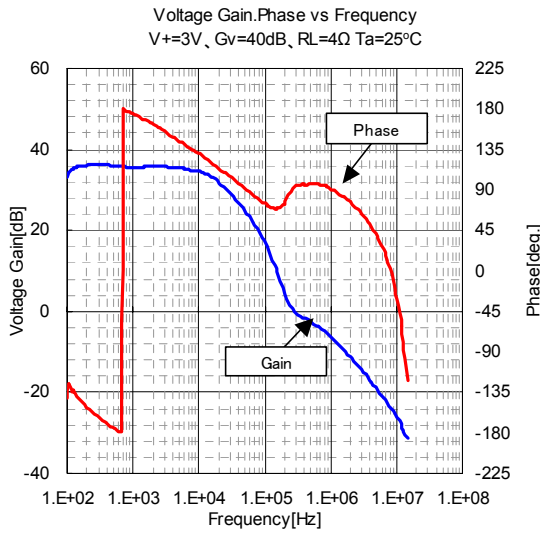
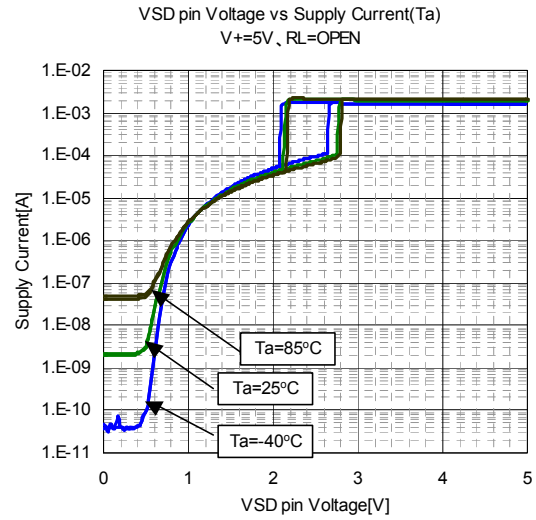
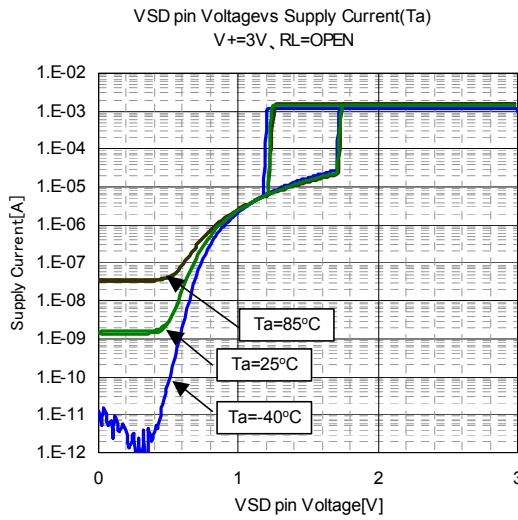
Supply Current vs Temperature(STANBY)
V+=3V, RL=OPEN, VSD=0.25V



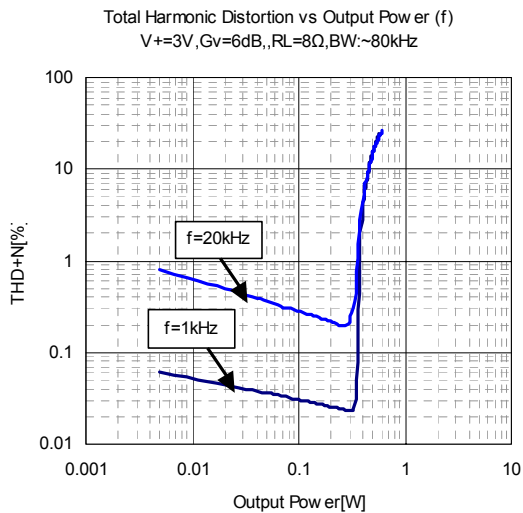
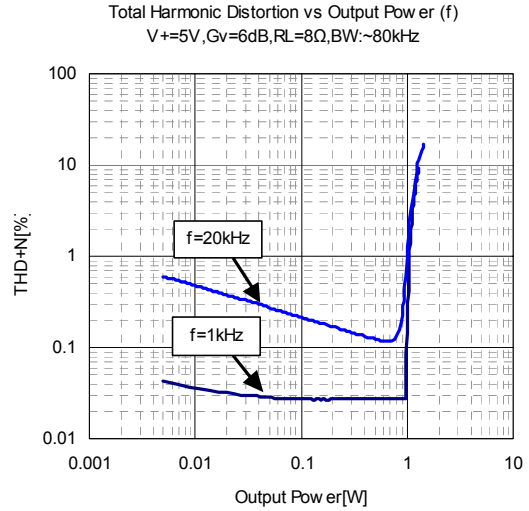
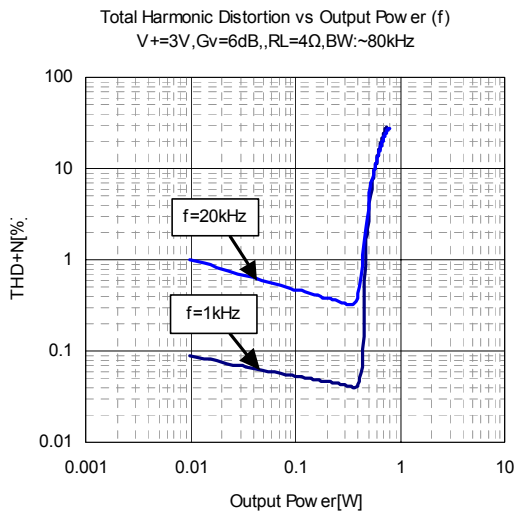
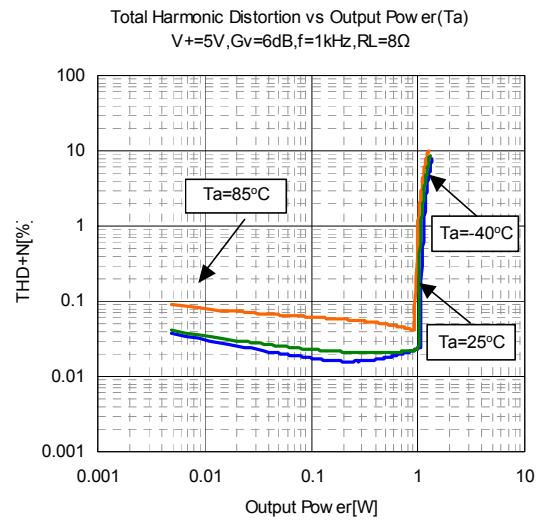
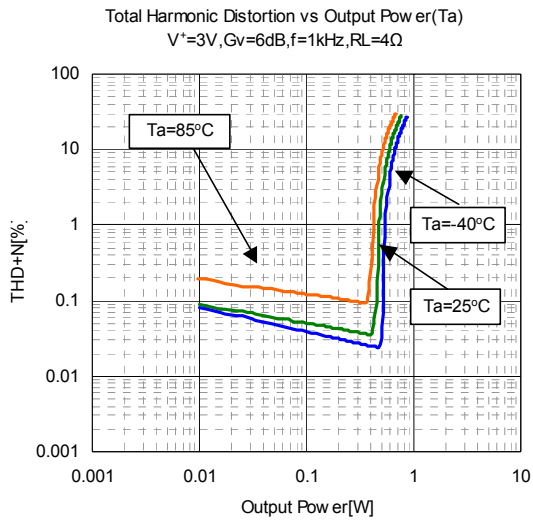
Supply Current vs Temperature(STANBY)
V+=5V, RL=OPEN, VSD=0.25V



TYPICAL CHARACTERISTICS

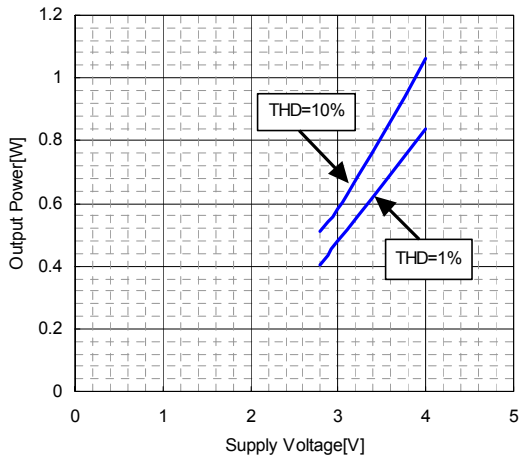


TYPICAL CHARACTERISTICS

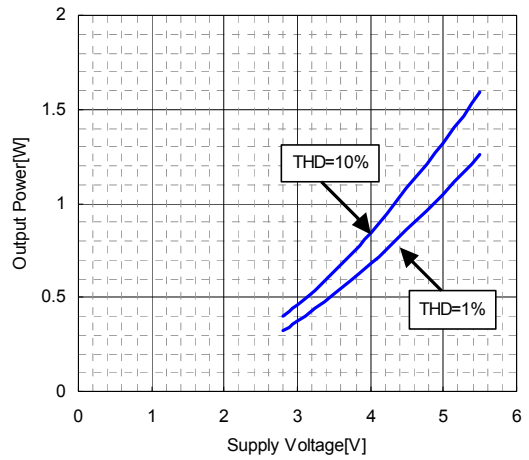


TYPICAL CHARACTERISTICS

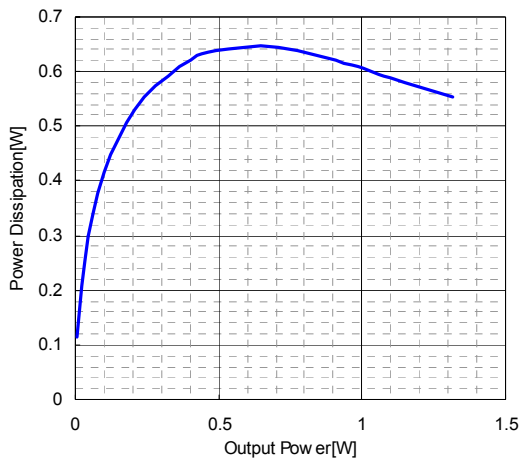
Output Voltage vs Supply Voltage (THD)
RL=4Ω, Ta=25°C



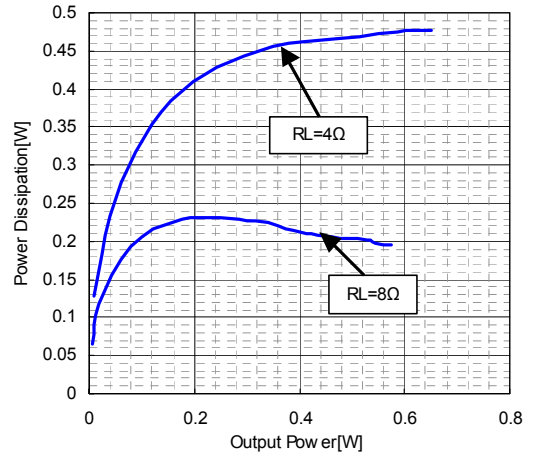
Output Voltage vs Supply Voltage (THD)
RL=8Ω, Ta=25°C



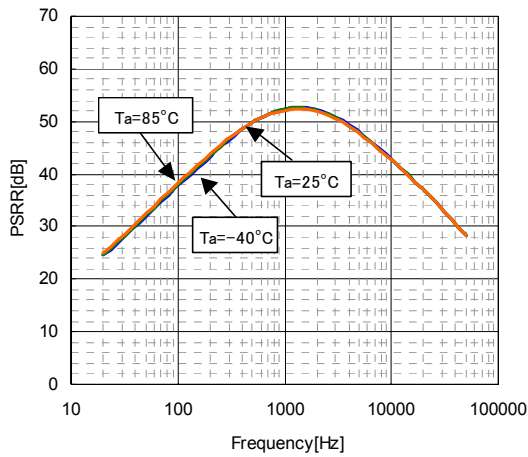
Power Dissipation vs Output Power
V+=5V, Gv=6dB, RL=8Ω, Ta=25°C



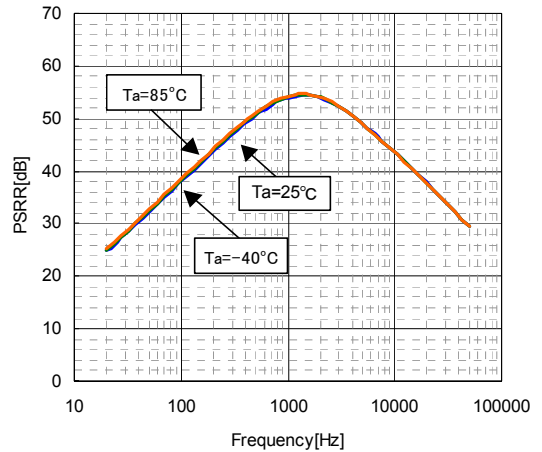
Power Dissipation vs Output Power (RL)
V+=3V, Gv=6dB, Ta=25°C



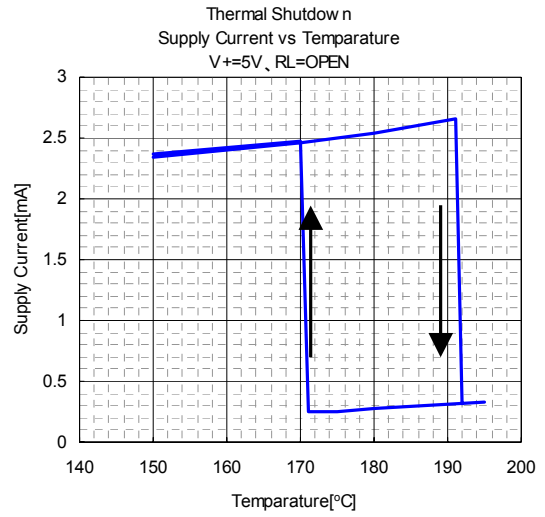
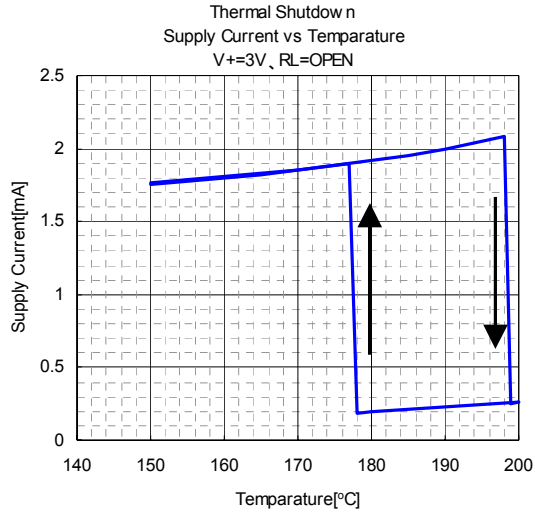
PSRR vs Frequency
V+=3V, RL=4Ω, Ta=25°C, RIN=GND



PSRR vs Frequency
V+=5V, RL=8Ω, Ta=25°C, RIN=GND

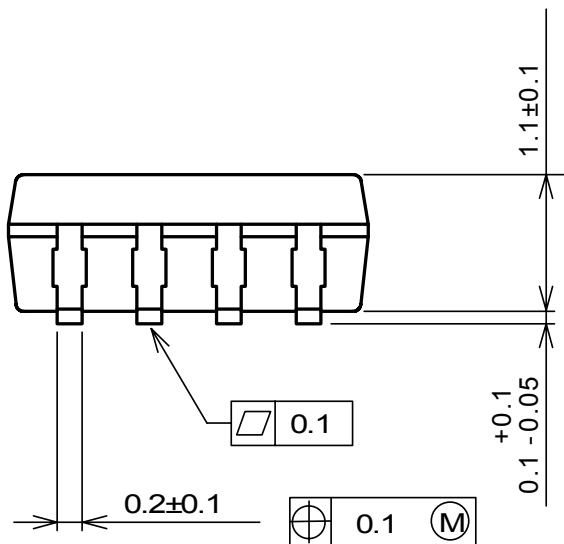
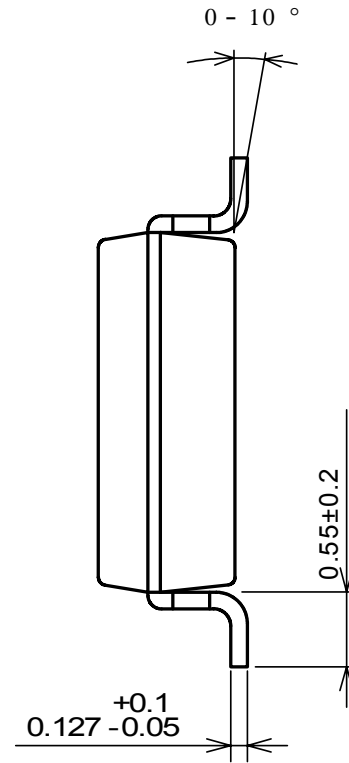
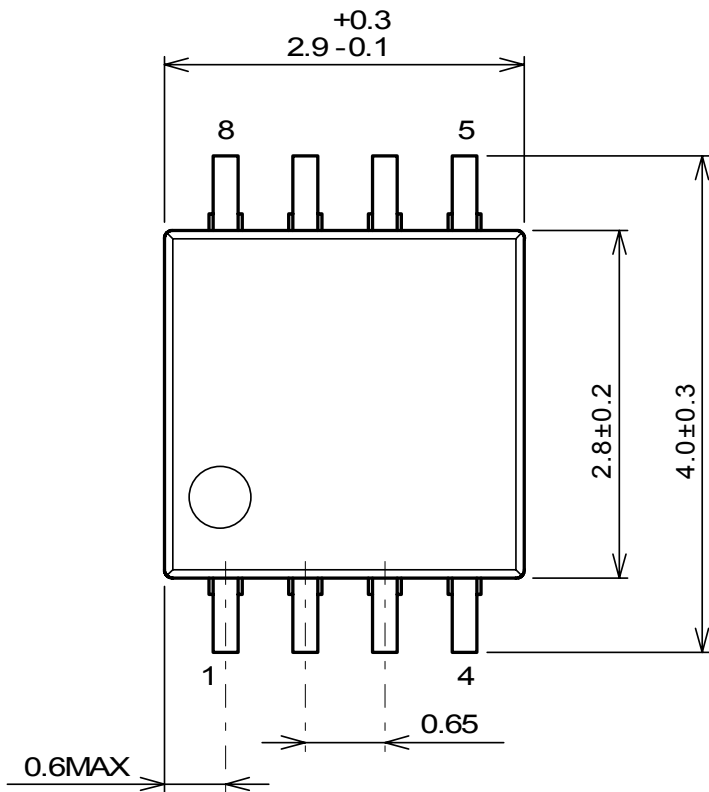


TYPICAL CHARACTERISTICS



PACKAGE DIMENSIONS

VSP8



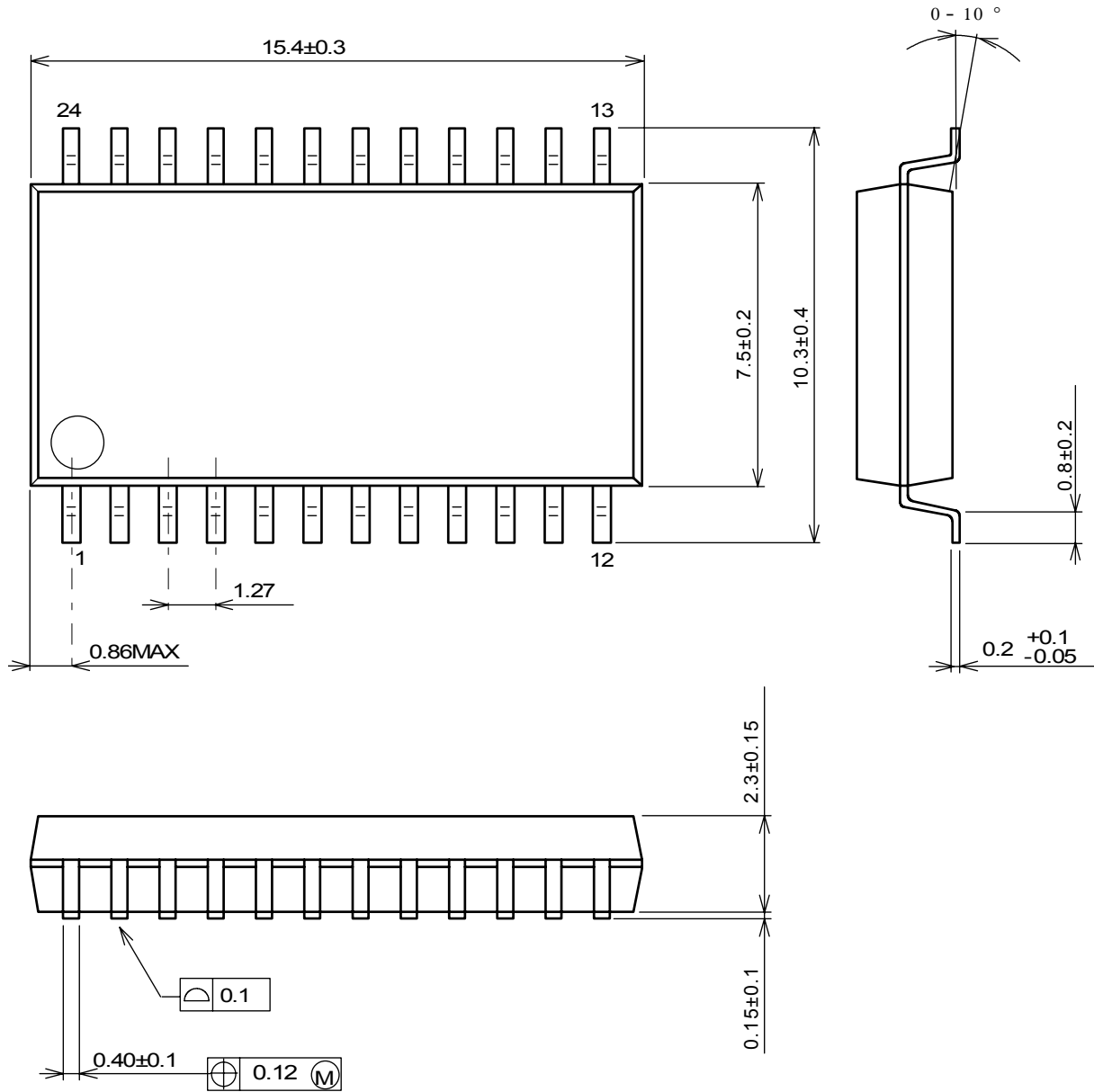
Unit:mm

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PACKAGE DIMENSIONS

DMP24



Unit:mm

[CAUTION]

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