UMW TL084

General J-FET quad operational amplifier

1.Description

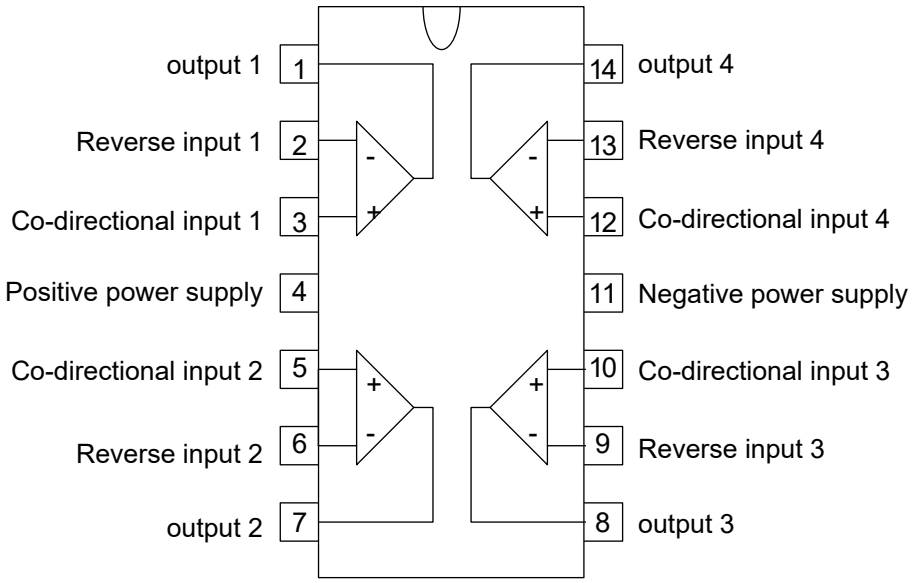
UMW TL084 is a high-speed operational amplifier with four J-FET inputs, which consists of high voltage J-FET and bipolar transistor.

It has high conversion rate, low input bias current and offset current, and low offset voltage temperature coefficient.

2.Features

- Wide common-mode and differential-mode input voltage range
- Low input bias current and offset current
- Output short-circuit current protection
- High input impedance
- Internal frequency compensation
- Self-latching station
- High conversion rate: 16V/us

3.Pinning Information



SOP-14

4.Limit Parameter

Absolute maximum rating, unless otherwise specified, Tamb=25°C.

Parameter		Value	Value	Units
Power Supply Voltage		V_{CC}	±18	V
Input Voltage		V_I	±15	V
Differential Mode Input Voltage		V_{ID}	±30	V
Power Consumption		P_{TOT}	680	mW
Working Temperature	UMW TL084I	T_{OPER}	-40 to 105	°C
	UMW TL084C		0 to 70	°C
Storage Temperature		T_{STG}	-65 to 150	°C

5.Electrical Characteristics

V_{CC}=±15V, Tamp=25°C shall be specified separately.

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Input offset voltage	V_{IO}	R_S=50Ω		3	13	mV
Input offset current	I_{IO}			5	105	pA
Output bias current	I_{IB}			30	200	pA
Large signal voltage gain	AVD	R_L=2kΩ, V_O=±10V	25	200		V/mV
Power supply voltage rejection ratio	SVR	R_S=50Ω	65	85		dB
Single-channel operational amplifier static current	I_{CC}			1.4	2.5	mA
Input common mode voltage range	V_{ICM}		±11	-12~15		V
Common mode rejection ratio	CMR	R_S=50Ω	65	85		dB
Output short- circuit current	I_{OS}		10	50	60	mA
Output voltage swing	±Vopp	R_L=2kΩ	10	12		V
		R_L=10kΩ	12	13.5		V
Conversion rate	SR	V_{IN}=10V, R_L=2kΩ, C_L=100pF	8	16		V/μs

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Rise time (T_{amb}=+25°C)	t_r	V_{in}=20mV, R_L=2kΩ, C_L=100pF,unity gain		0.1		μs
Overshoot (T_{amb}=+25°C)	K_{OV}	V_{in}=20mV, R_L=2kΩ, C_L=100pF, unity gain		10		%
Gain bandwidth product (T_{amb}=+25°C)	GBP	V_{in}=10mV, R_L=2kΩ C_L=100pF, f=100kHz	2.5	4		MHz
Input resistance	R_i			10^{12}		Ω
Total harmonic distortion (T_{amb}=+25°C	THD	f=1kHz, R_L=2kΩ, C_L=100pF A_V=20dB, V_O=2V_{pp}		0.01		%
Equivalent input noise voltage	e_n	R_S=100Ω, f=1KHz		15		nV/√Hz
Phase margin	Ø m			45		degrees
Channel separation	V_{O1}/V_{O2}	A_V=100		120		dB

1. The input bias currents are junction leakage currents which approximately double for every 10°C increase in the junction temperature.

6.1 Typical Characterisitics

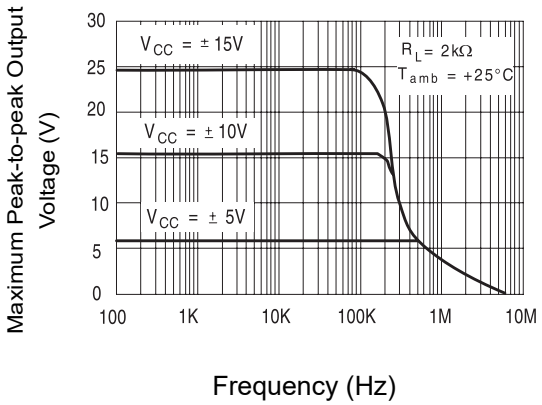


Figure 1: Maximum peak-to-peak output voltage versus frequency

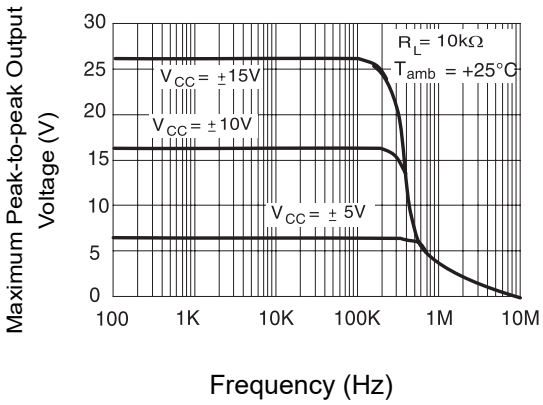


Figure 2: Maximum peak-to-peak output voltage versus frequency

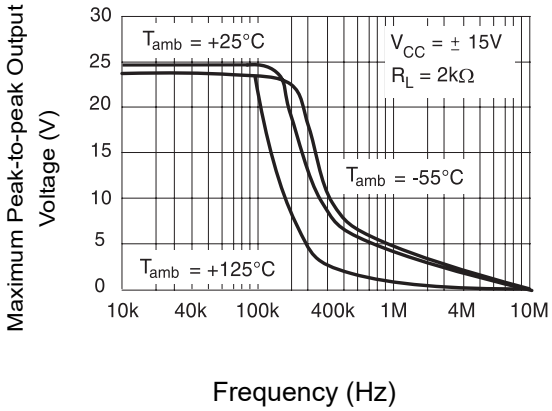


Figure 3: Maximum peak-to-peak output voltage versus frequency

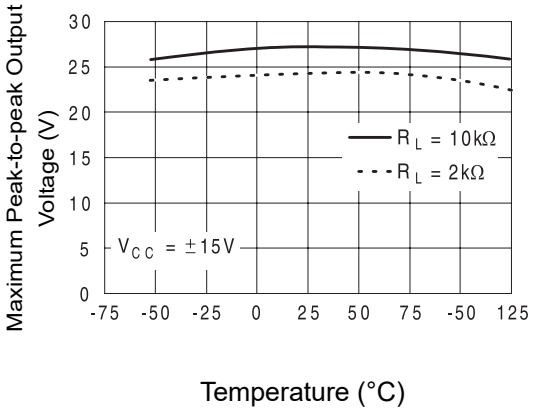


Figure 4: Maximum peak-to-peak output voltage versus free air temperature

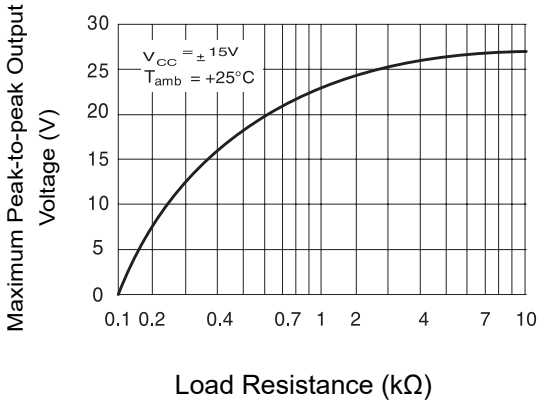


Figure 5: Maximum peak-to-peak output voltage versus load resistance

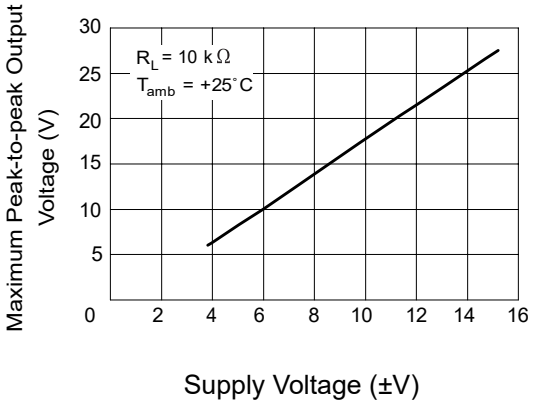


Figure 6: Maximum peak-to-peak output voltage versus supply voltage

6.2 Typical Characterisitics

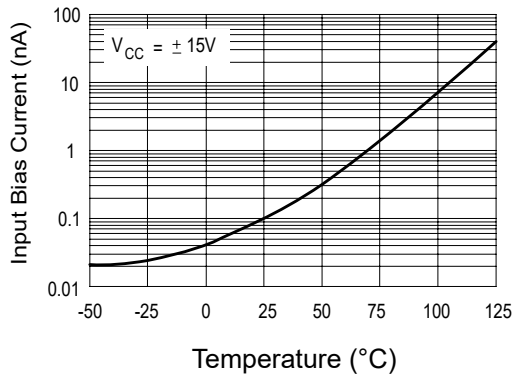


Figure 7: Input bias current versus free air temperature

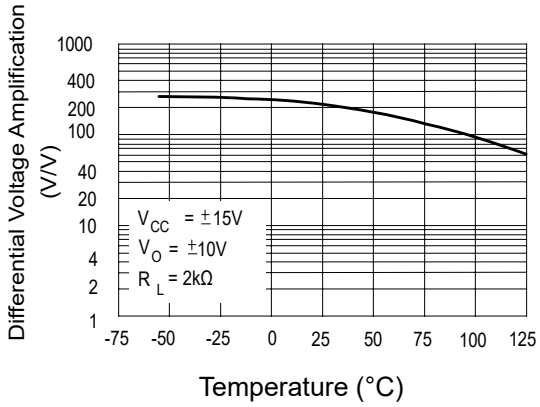


Figure 8: Large signal differential voltage amplification versus free air temperature

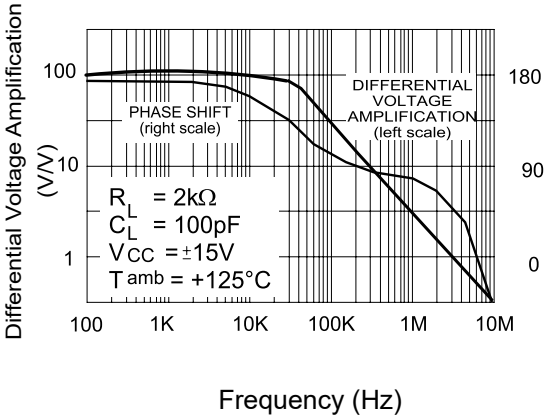


Figure 9: Large signal differential voltage amplification and phase shift versus frequency

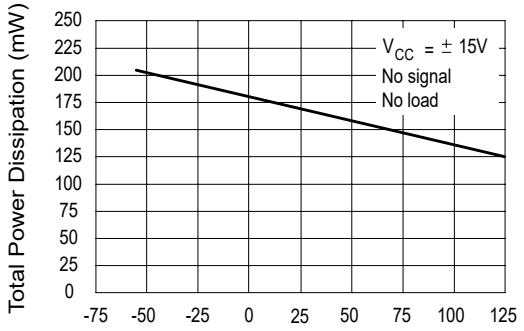


Figure 10: Total power dissipation versus free air temperature

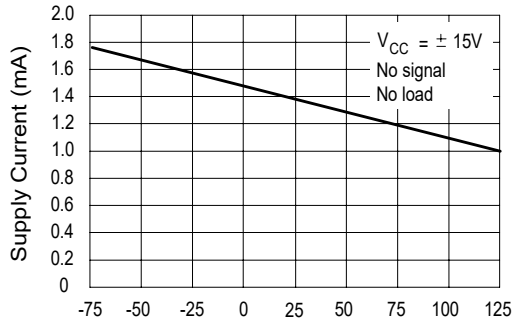


Figure 11: Supply current per amplifier versus free air temperature

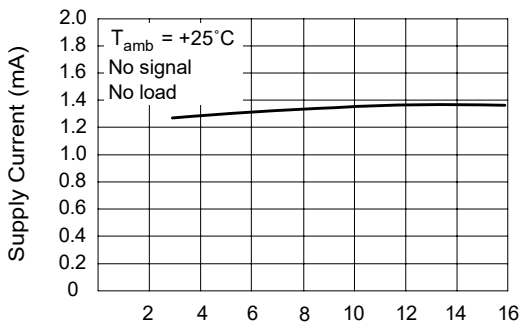


Figure 12: Supply current per amplifier versus supply voltage

6.3 Typical Characterisitics

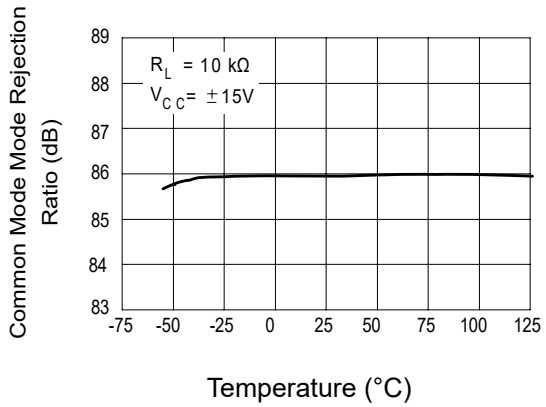


Figure 13: Common mode rejection ratio versus free air temperature

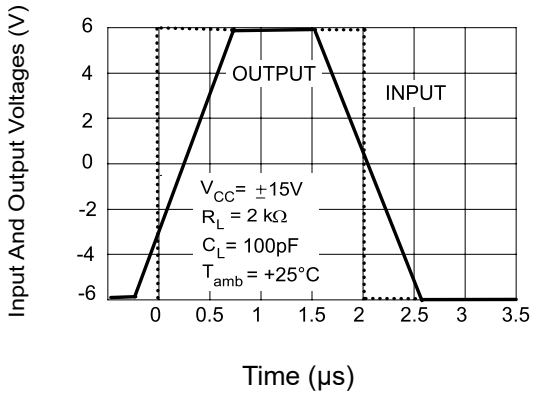


Figure 14: Voltage follower large signal pulse response

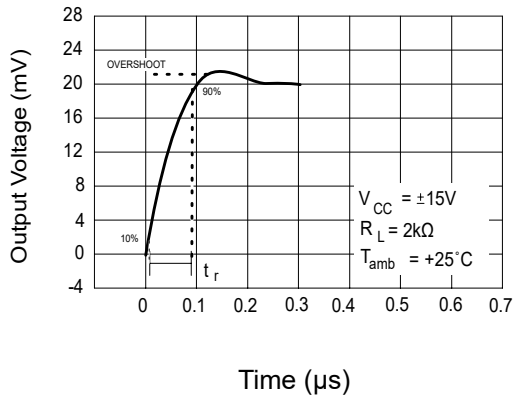


Figure 15: Output voltage versus elapsed time

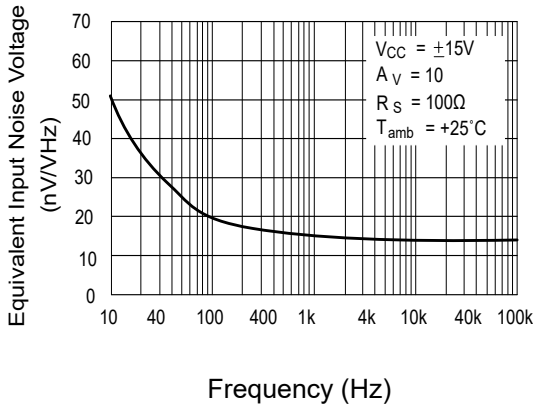


Figure 16: Equivalent input noise voltage versus frequency

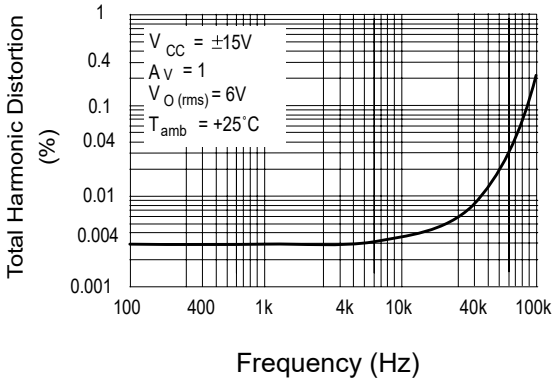
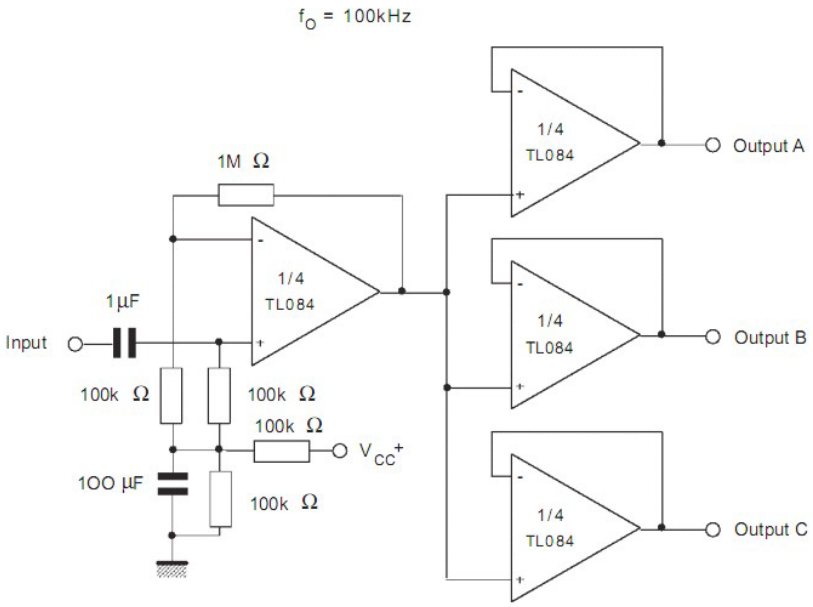


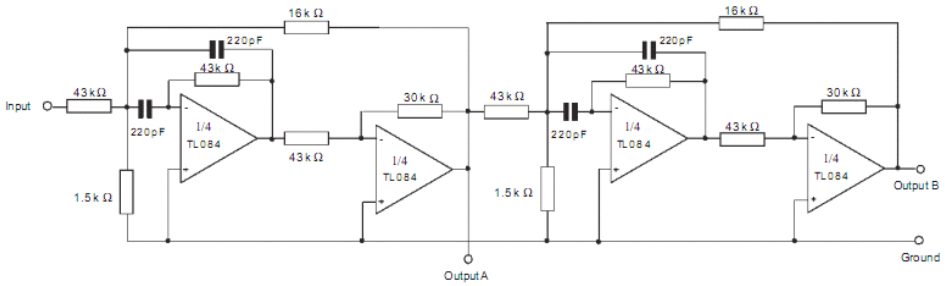
Figure 17: Total harmonic distortion versus frequency

7.Typical Application Diagram



Audio Distribution Amplifier

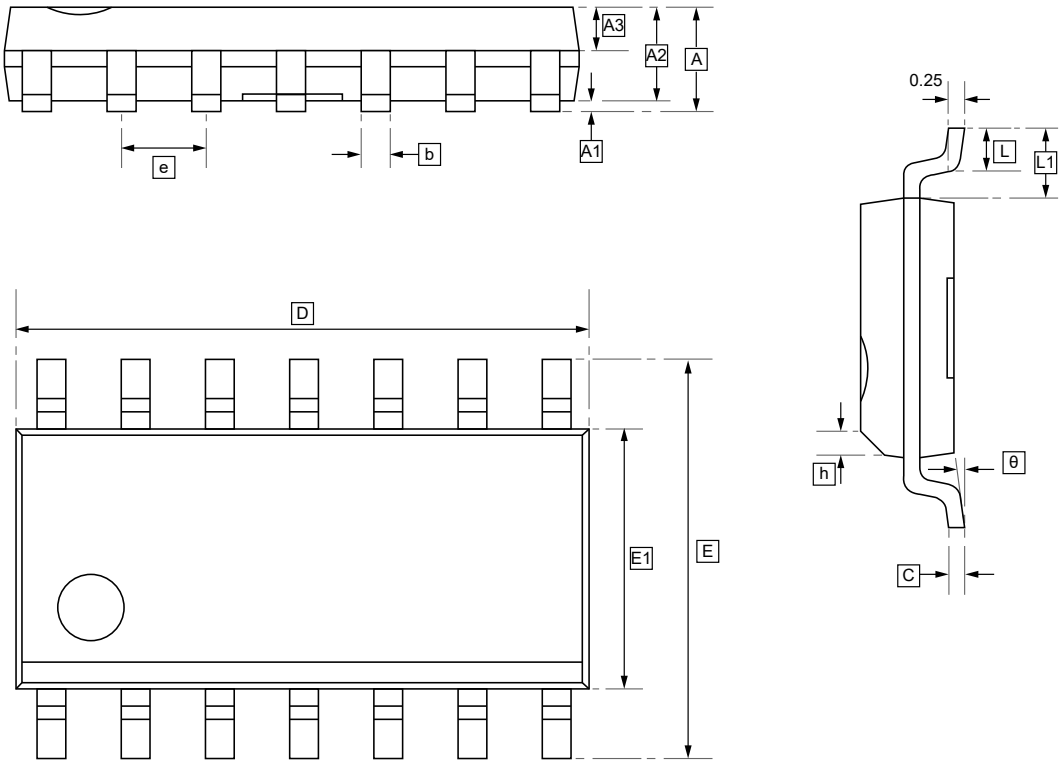
8. Application of Audio Distribution Amplifier



Application of active feedback filter

Positive Feedback Bandpass Filter

9.SOP-14 Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	A3	b	C	D	E	E1	e	h	L
Min	-	0.05	1.35	0.65	0.203	0.17	8.45	5.80	3.80	1.24	0.25	0.40
Max	1.75	0.25	1.55	0.75	0.305	0.25	8.85	6.20	4.00	1.30	0.50	0.80

Symbol	L1	θ
Min	1.00	0°
Max	1.10	8°

10.Ordering Information

yy: Year Code
ww: Week Code

Order Code	Marking	Package	Base QTY	Delivery Mode
UMW TL084CDR	TL084C	SOP-14	2500	Tape and reel
UMW TL084IDR	TL084I	SOP-14	2500	Tape and reel

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