

# UTC MC4580 LINEAR INTEGRATED CIRCUIT

## DUAL OPERATIONAL AMPLIFIER

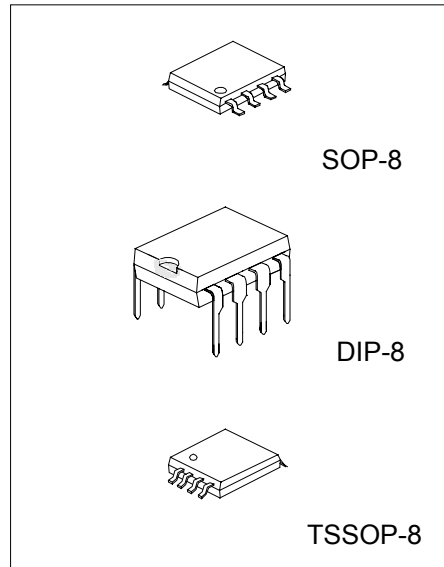
### DESCRIPTION

The UTC MC4580 is the dual operational amplifier, specially designed for improving the tone control, which is most suitable for the audio application.

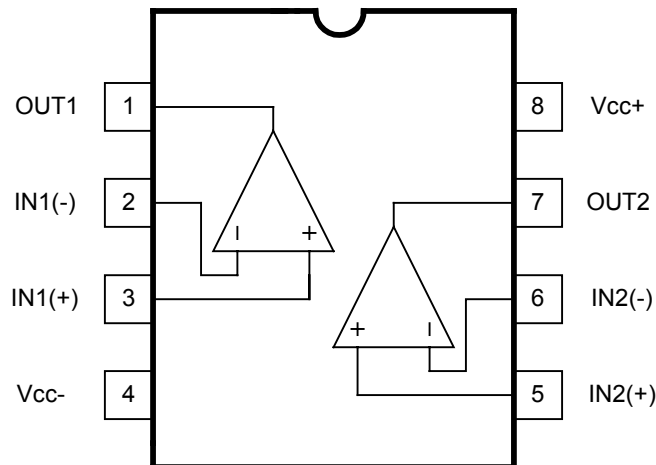
Featuring noiseless, higher gain bandwidth, high output current and low distortion ratio, and it is most suitable not only for acoustic electronic parts of audio pre-amp and active filter, but also for the industrial measurement tools. It is also suitable for the head phone amp at higher output current, and further more, it can be applied for the handy type set operational amplifier of general purpose in application of low voltage single supply type which is properly biased of the input low voltage source.

### FEATURES

- \*Operating Voltage  $(\pm 2V \text{ to } \pm 18V)$
- \*Low Input Noise Voltage  $(0.8 \mu V_{rms} \text{ typ.})$
- \*Wide Gain Bandwidth Product  $(15MHz \text{ typ.})$
- \*Low Distortion  $(0.0005\% \text{ typ.})$
- \*Slew Rate  $(5V/\mu s \text{ typ.})$
- \*Bipolar Technology

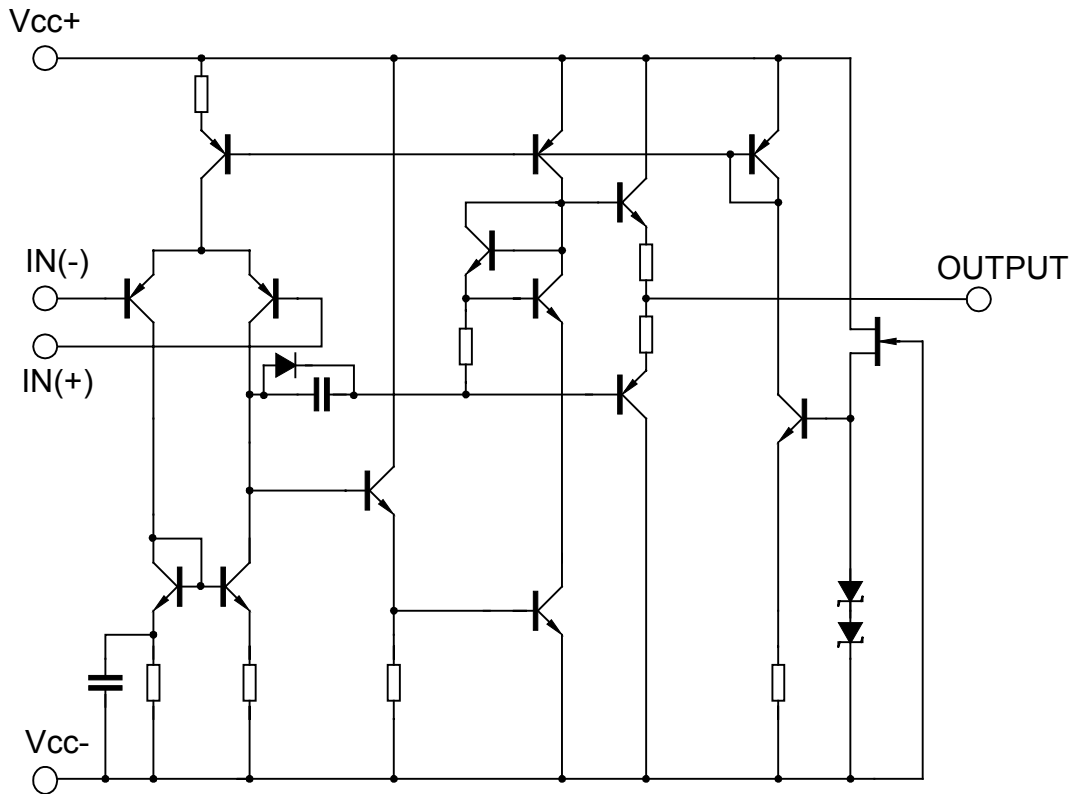


### PIN CONFIGURATION



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## TEST CIRCUIT



## ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

| PARAMETER                   | SYMBOL      | RATINGS                                     | UNIT |
|-----------------------------|-------------|---|------|
| Supply Voltage              | $V^+ / V^-$ | $\pm 18$                                    | V    |
| Input Voltage               | $V_{IC}$    | $\pm 15$                                    | V    |
| Differential Input Voltage  | $V_{ID}$    | $\pm 30$                                    | V    |
| Output Current              | $I_o$       | $\pm 50$                                    | mA   |
| Power Dissipation           | $P_D$       | 300 (SOP-8)<br>800 (DIP-8)<br>250 (TSSOP-8) | mW   |
| Operating Temperature Range | $T_{opr}$   | -40 to +85                                  | °C   |
| Storage Temperature Range   | $T_{stg}$   | -40 to +125                                 | °C   |

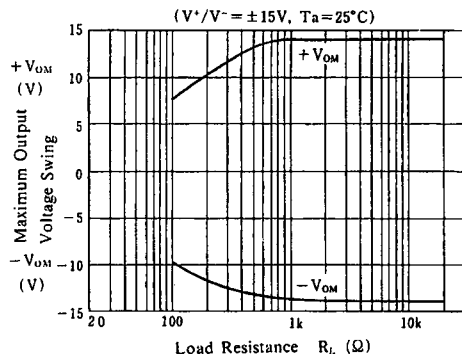
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## ELECTRICAL CHARACTERISTICS ( $V^+/V^- = \pm 15V$ , $T_a = 25^\circ C$ )

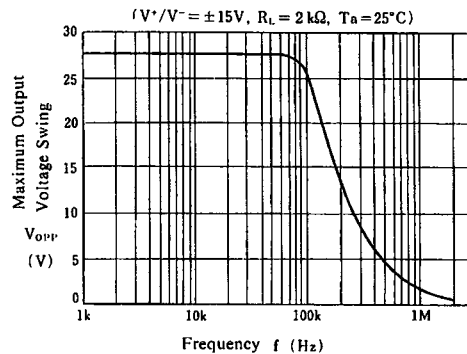
| PARAMETER                       | SYMBOL    | TEST CONDITION  | MIN      | TYP        | MAX | UNIT          |
|---------------------------------|-----------|---|----------|------------|-----|---------------|
| Input Offset Voltage            | $V_{IO}$  | $R_S \leq 10k\Omega$                                      | -        | 0.5        | 3   | mV            |
| Input Offset Current            | $I_{IO}$  |   | -        | 5          | 200 | nA            |
| Input Bias Current              | $I_B$     |   | -        | 100        | 500 | nA            |
| Large Signal Voltage Gain       | $A_V$     | $V_O = \pm 10V$ , $R_L \geq 2k\Omega$                     | 90       | 110        | -   | dB            |
| Output Voltage Swing            | $V_{OM}$  | $R_L \geq 2k\Omega$                                       | $\pm 12$ | $\pm 13.5$ | -   | V             |
| Input Common Mode Voltage Range | $V_{ICM}$ |   | $\pm 12$ | $\pm 13.5$ | -   | V             |
| Common Mode Rejection Ratio     | CMR       | $R_S \leq 10k\Omega$                                      | 80       | 110        | -   | dB            |
| Supply Voltage Rejection Ratio  | SVR       | $R_S \leq 10k\Omega$                                      | 80       | 110        | -   | dB            |
| Operating Current               | $I_{CC}$  |   | -        | 6          | 9   | mA            |
| Slew Rate                       | SR        | $R_L \geq 2k\Omega$                                       | -        | 5          | -   | V/ $\mu s$    |
| Gain bandwidth Product          | GB        | $f = 10KHz$   | -        | 15         | -   | MHz           |
| Total Harmonic Distortion       | THD       | $A_V = 20dB$ , $V_O = 5V$ , $R_L = 2k\Omega$ , $f = 1KHz$ | -        | 0.0005     | -   | %             |
| Input Noise Voltage             | $V_{NI}$  | RIAA $R_S = 2.2k\Omega$ , 30kHz LPF                       | -        | 0.8        | -   | $\mu V_{rms}$ |

## TYPICAL CHARACTERISTICS

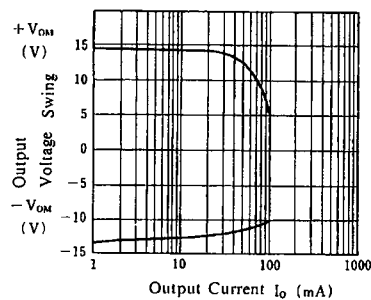
Maximum Output Voltage Swing vs. Load Resistance



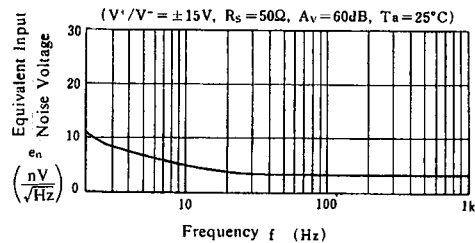
Maximum Output Voltage Swing vs. Frequency



Output Voltage Swing vs. Output Current

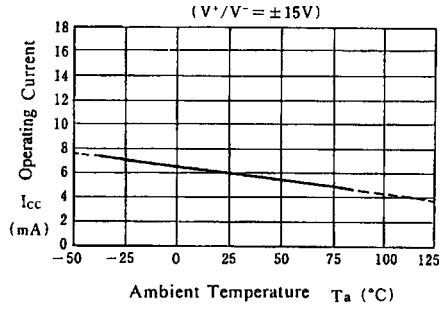


Equivalent Input Noise Voltage vs. Frequency

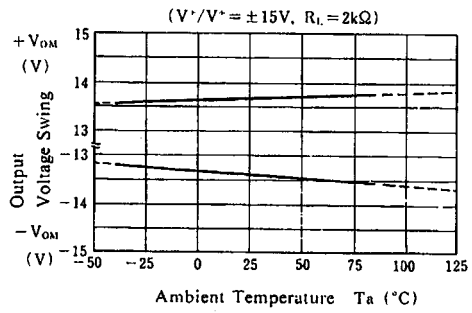


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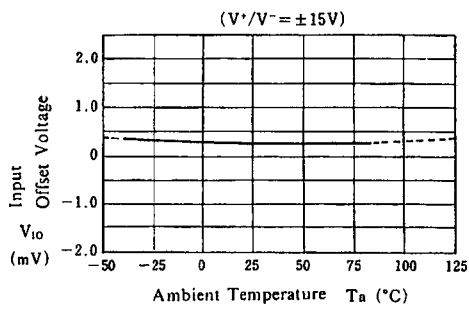
Operating Current vs. Temperature



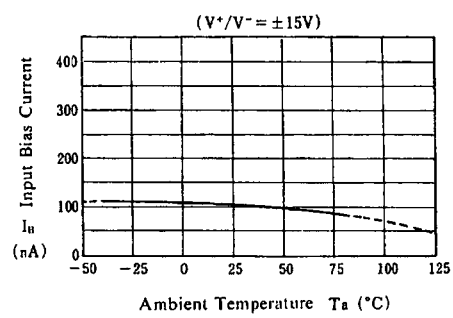
Output Voltage Swing vs. Temperature



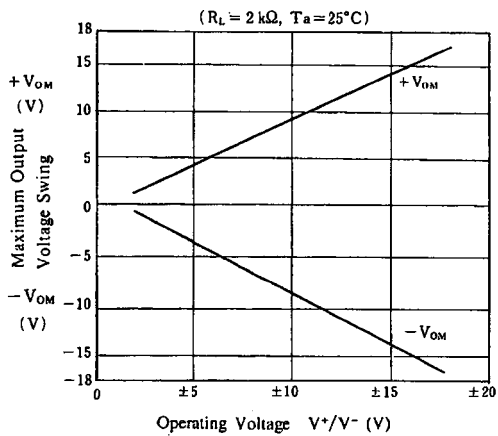
Input Offset Voltage vs. Temperature



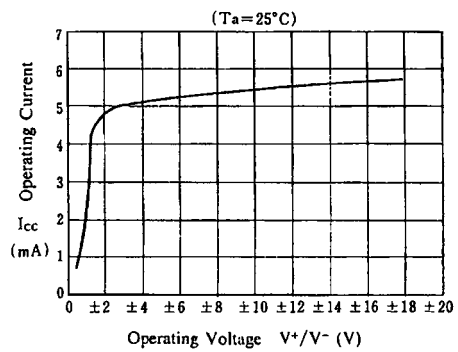
Input Bias Current vs. Temperature



Maximum Output Voltage Swing vs. Operating Voltage

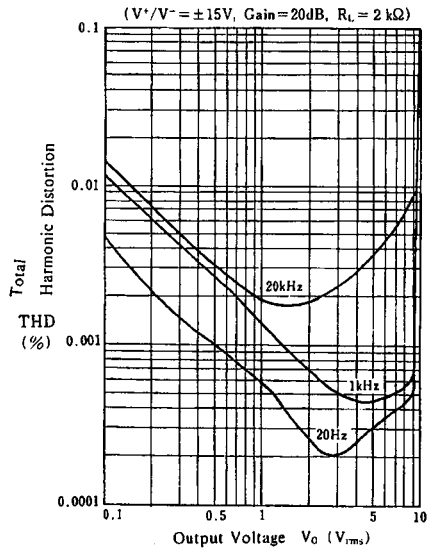


Operating Current vs. Operating Voltage

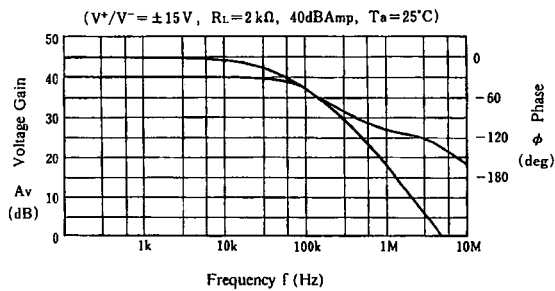


# UTC MC4580 LINEAR INTEGRATED CIRCUIT

Total Harmonic Distortion vs. Output Voltage



Voltage Gain, Phase vs. Frequency



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