

# UTC 79LXX LINEAR INTEGRATED CIRCUIT

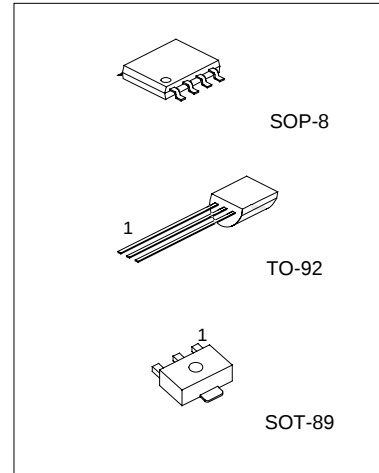
## 3-TERMINAL 0.1A NEGATIVE VOLTAGE REGULATOR

### DESCRIPTION

The UTC 79LXX family is monolithic fixed voltage regulator integrated circuit. They are suitable for applications that required supply current up to 100mA.

### FEATURES

- \*Output current up to 100mA
- \*Fixed output voltage of -5V, -6V, -8V, -9V, -12V, -15V, -18V and -24V available
- \*Thermal overload shutdown protection
- \*Short circuit current limiting

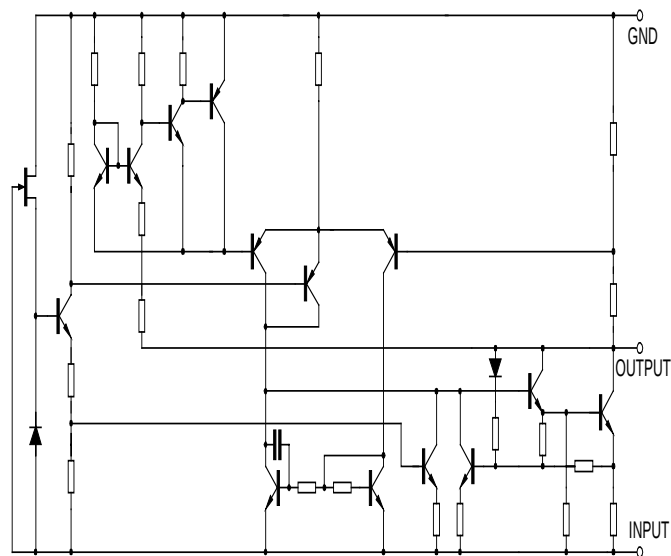


SOP-8 : 1. Vout ; 2,3,6,7 Vin ; 5. GND; 4,8 NC

TO-92 : 1: GND 2: Input 3: Output

SOT-89: 1: GND 2: Input 3: Output

### TEST CIRCUIT



# UTC 79LXX LINEAR INTEGRATED CIRCUIT

ABSOLUTE MAXIMUM RATINGS (Operating temperature range applies unless otherwise specified )

| PARAMETER                                                              | SYMBOL           | VALUE                                      | UNIT |
|------------------------------------------------------------------------|------------------|--------------------------------------------|------|
| Input voltage(for Vo=-5~-9V)<br>(for Vo=-12~-15V)<br>(for Vo=-18~-24V) | V <sub>I</sub>   | -30                                        | V    |
|                                                                        | V <sub>I</sub>   | -35                                        | V    |
|                                                                        | V <sub>I</sub>   |                                            |      |
| Power Dissipation                                                      | P <sub>D</sub>   | 350 (SOT-89)<br>300 (SOP-8)<br>625 (TO-92) | mW   |
| Operating Junction Temperature Range                                   | T <sub>OPR</sub> | -30 ~ +125                                 | °C   |
| Storage Temperature Range                                              | T <sub>STG</sub> | -40 ~ +125                                 | °C   |

## UTC79L05 ELECTRICAL CHARACTERISTICS

(T<sub>J</sub>=25°C, C<sub>1</sub>=0.33μF, C<sub>o</sub>=0.1μF, unless otherwise specified)

| PARAMETER            | SYMBOL                          | TEST CONDITIONS                                                                    | MIN  | TYP  | MAX  | UNIT |
|----------------------|---------------------------------|------------------------------------------------------------------------------------|------|------|------|------|
| Output Voltage       | V <sub>O</sub>                  | V <sub>IN</sub> =-10V, I <sub>O</sub> =40mA                                        | -4.8 | -5.0 | -5.2 | V    |
| Line Regulation      | V <sub>O</sub> -V <sub>IN</sub> | V <sub>IN</sub> =-7~-20V, I <sub>O</sub> =40mA                                     |      | 15   | 150  | mV   |
| Load Regulation      | V <sub>O</sub> -I <sub>O</sub>  | V <sub>IN</sub> =-10V, I <sub>O</sub> =1~100mA                                     |      | 7    | 60   | mV   |
| Quiescent current    | I <sub>Q</sub>                  | V <sub>IN</sub> =-10V, I <sub>O</sub> =40mA                                        |      | 3.5  | 6.0  | mA   |
| Ripple Rejection     | RR                              | V <sub>IN</sub> =-8~-18V, I <sub>O</sub> =40mA,<br>e <sub>in</sub> =1Vp-p, f=120Hz | 41   | 71   |      | dB   |
| Output Noise Voltage | V <sub>NO</sub>                 | V <sub>IN</sub> =-10V,<br>BW=10Hz~100kHz, I <sub>O</sub> =40mA                     |      | 120  |      | μV   |

## UTC79L06 ELECTRICAL CHARACTERISTICS

(T<sub>J</sub>=25°C, C<sub>1</sub>=0.33μF, C<sub>o</sub>=0.1μF, unless otherwise specified)

| PARAMETER            | SYMBOL                          | TEST CONDITIONS                                                                    | MIN   | TYP  | MAX   | UNIT |
|----------------------|---------------------------------|------------------------------------------------------------------------------------|-------|------|-------|------|
| Output Voltage       | V <sub>O</sub>                  | V <sub>IN</sub> =-12V, I <sub>O</sub> =40mA                                        | -5.76 | -6.0 | -6.24 | V    |
| Line Regulation      | V <sub>O</sub> -V <sub>IN</sub> | V <sub>IN</sub> =-8.5~-20V, I <sub>O</sub> =40mA                                   |       | 15   | 150   | mV   |
| Load Regulation      | V <sub>O</sub> -I <sub>O</sub>  | V <sub>IN</sub> =-12V, I <sub>O</sub> =1~100mA                                     |       | 7    | 60    | mV   |
| Quiescent current    | I <sub>Q</sub>                  | V <sub>IN</sub> =-12V, I <sub>O</sub> =40mA                                        |       | 3.5  | 6.0   | mA   |
| Ripple Rejection     | RR                              | V <sub>IN</sub> =-9~-19V,<br>I <sub>O</sub> =40mA, e <sub>in</sub> =1Vp-p, f=120Hz | 41    | 71   |       | dB   |
| Output Noise Voltage | V <sub>NO</sub>                 | V <sub>IN</sub> =-12V,<br>BW=10Hz~100kHz, I <sub>O</sub> =40mA                     |       | 120  |       | μV   |

## UTC79L08 ELECTRICAL CHARACTERISTICS

(T<sub>J</sub>=25°C, C<sub>1</sub>=0.33μF, C<sub>o</sub>=0.1μF, unless otherwise specified)

| PARAMETER            | SYMBOL                          | Test conditions                                                                     | MIN   | TYP  | MAX   | UNIT |
|----------------------|---------------------------------|-------------------------------------------------------------------------------------|-------|------|-------|------|
| Output Voltage       | V <sub>O</sub>                  | V <sub>IN</sub> =-14V, I <sub>O</sub> =40mA                                         | -7.68 | -8.0 | -8.32 | V    |
| Line Regulation      | V <sub>O</sub> -V <sub>IN</sub> | V <sub>IN</sub> =-10.5~-23V, I <sub>O</sub> =40mA                                   |       | 24   | 175   | mV   |
| Load Regulation      | V <sub>O</sub> -I <sub>O</sub>  | V <sub>IN</sub> =-14V, I <sub>O</sub> =1~100mA                                      |       | 10   | 80    | mV   |
| Quiescent current    | I <sub>Q</sub>                  | V <sub>IN</sub> =-14V, I <sub>O</sub> =40mA                                         |       | 3.5  | 6.0   | mA   |
| Ripple Rejection     | RR                              | V <sub>IN</sub> =-11~-21V,<br>I <sub>O</sub> =40mA, e <sub>in</sub> =1Vp-p, f=140Hz | 39    | 68   |       | dB   |
| Output Noise Voltage | V <sub>NO</sub>                 | V <sub>IN</sub> =-14V,<br>BW=10Hz~100kHz, I <sub>O</sub> =40mA                      |       | 190  |       | μV   |

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## UTC79L09 ELECTRICAL CHARACTERISTICS

(Tj=25°C, C1=0.33μF, Co=0.1μF, unless otherwise specified)

| PARAMETER            | SYMBOL | TEST CONDITIONS                              | MIN   | TYP  | MAX   | UNIT |
|----------------------|--------|----------------------------------------------|-------|------|-------|------|
| Output Voltage       | Vo     | VIN=-15V, Io=40mA                            | -8.64 | -9.0 | -9.36 | V    |
| Line Regulation      | Vo-VIN | VIN=-12.5~-24V, Io=40mA                      |       | 27   | 200   | mV   |
| Load Regulation      | Vo-Io  | VIN=-15V, Io=1~100mA                         |       | 12   | 90    | mV   |
| Quiescent current    | Iq     | VIN=-15V, Io=40mA                            |       | 3.5  | 6.0   | mA   |
| Ripple Rejection     | RR     | VIN=-12~-22V,<br>Io=40mA, Ein=1Vp-p, f=150Hz | 37    | 64   |       | dB   |
| Output Noise Voltage | VNO    | VIN=-15V,<br>BW=10Hz~100kHz, Io=40mA         |       | 210  |       | μV   |

## UTC79L12 ELECTRICAL CHARACTERISTICS

(Tj=25°C, C1=0.33μF, Co=0.1μF, unless otherwise specified)

| PARAMETER            | SYMBOL | TEST CONDITIONS                              | MIN    | TYP   | MAX    | UNIT |
|----------------------|--------|----------------------------------------------|--------|-------|--------|------|
| Output Voltage       | Vo     | VIN=-19V, Io=40mA                            | -11.52 | -12.0 | -12.48 | V    |
| Line Regulation      | Vo-VIN | VIN=-14.5~-27V, Io=40mA                      |        | 36    | 250    | mV   |
| Load Regulation      | Vo-Io  | VIN=-19V, Io=1~100mA                         |        | 16    | 100    | mV   |
| Quiescent current    | Iq     | VIN=-19V, Io=40mA                            |        | 3.5   | 6.0    | mA   |
| Ripple Rejection     | RR     | VIN=-15~-25V,<br>Io=40mA, Ein=1Vp-p, f=190Hz | 37     | 64    |        | dB   |
| Output Noise Voltage | VNO    | VIN=-19V,<br>BW=10Hz~100kHz, Io=40mA         |        | 210   |        | μV   |

## UTC79L15 ELECTRICAL CHARACTERISTICS

(Tj=25°C, C1=0.33μF, Co=0.1μF, unless otherwise specified)

| PARAMETER            | SYMBOL | TEST CONDITIONS                                  | MIN   | TYP   | MAX   | UNIT |
|----------------------|--------|--------------------------------------------------|-------|-------|-------|------|
| Output Voltage       | Vo     | VIN=-23V, Io=40mA                                | -14.4 | -15.0 | -15.6 | V    |
| Line Regulation      | Vo-VIN | VIN=-17.5~-30V, Io=40mA                          |       | 45    | 300   | mV   |
| Load Regulation      | Vo-Io  | VIN=-23V, Io=1~100mA                             |       | 20    | 150   | mV   |
| Quiescent current    | Iq     | VIN=-23V, Io=40mA                                |       | 3.5   | 6.0   | mA   |
| Ripple Rejection     | RR     | VIN=-18.5~-28.5V,<br>Io=40mA, Ein=1Vp-p, f=230Hz | 34    | 63    |       | dB   |
| Output Noise Voltage | VNO    | VIN=-23V,<br>BW=10Hz~100kHz, Io=40mA             |       | 340   |       | μV   |

## UTC79L18 ELECTRICAL CHARACTERISTICS

(Tj=25°C, C1=0.33μF, Co=0.1μF, unless otherwise specified)

| PARAMETER            | SYMBOL | TEST CONDITIONS                              | MIN    | TYP   | MAX    | UNIT |
|----------------------|--------|----------------------------------------------|--------|-------|--------|------|
| Output Voltage       | Vo     | VIN=-27V, Io=40mA                            | -17.28 | -18.0 | -18.72 | V    |
| Line Regulation      | Vo-VIN | VIN=-20.5~-33V, Io=40mA                      |        | 54    | 300    | mV   |
| Load Regulation      | Vo-Io  | VIN=-27V, Io=1~100mA                         |        | 23    | 170    | mV   |
| Quiescent current    | Iq     | VIN=-27V, Io=40mA                            |        | 3.5   | 6.0    | mA   |
| Ripple Rejection     | RR     | VIN=-23~-33V,<br>Io=40mA, Ein=1Vp-p, f=270Hz | 33     | 60    |        | dB   |
| Output Noise Voltage | VNO    | VIN=-27V,<br>BW=10Hz~100kHz, Io=40mA         |        | 410   |        | μV   |

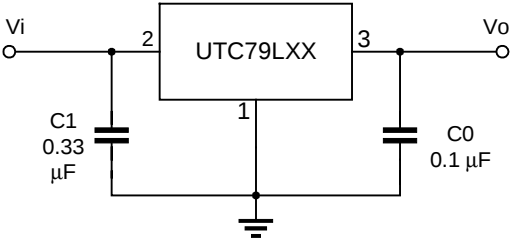
# UTC79LXX      LINEAR INTEGRATED CIRCUIT

## UTC79L24 ELECTRICAL CHARACTERISTICS

(T<sub>j</sub>=25°C, C<sub>1</sub>=0.33μF, C<sub>o</sub>=0.1μF, unless otherwise specified)

| PARAMETER            | SYMBOL                          | TEST CONDITIONS                                                                     | MIN    | TYP   | MAX    | UNIT |
|----------------------|---------------------------------|-------------------------------------------------------------------------------------|--------|-------|--------|------|
| Output Voltage       | V <sub>o</sub>                  | V <sub>IN</sub> =-33V, I <sub>o</sub> =40mA                                         | -23.04 | -24.0 | -24.96 | V    |
| Line Regulation      | V <sub>o</sub> -V <sub>IN</sub> | V <sub>IN</sub> =-27~-38V, I <sub>o</sub> =40mA                                     |        | 72    | 350    | mV   |
| Load Regulation      | V <sub>o</sub> -I <sub>o</sub>  | V <sub>IN</sub> =-33V, I <sub>o</sub> =1~100mA                                      |        | 30    | 200    | mV   |
| Quiescent current    | I <sub>Q</sub>                  | V <sub>IN</sub> =-33V, I <sub>o</sub> =40mA                                         |        | 3.5   | 6.0    | mA   |
| Ripple Rejection     | RR                              | V <sub>IN</sub> =-29~-35V,<br>I <sub>o</sub> =40mA, e <sub>in</sub> =1Vp-p, f=330Hz | 31     | 55    |        | dB   |
| Output Noise Voltage | V <sub>NO</sub>                 | V <sub>IN</sub> =-33V,<br>BW=10Hz~100kHz, I <sub>o</sub> =40mA                      |        | 550   |        | μV   |

## APPLICATION CIRCUIT



TYPICAL PERFORMANCE CHARACTERISTICS

Fig.1 Power dissipation vs. ambient temperature

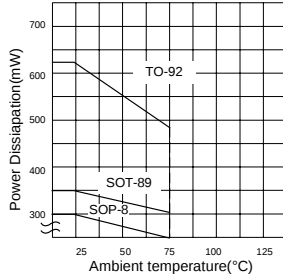


Fig.2 Input Voltage vs. Output Voltage

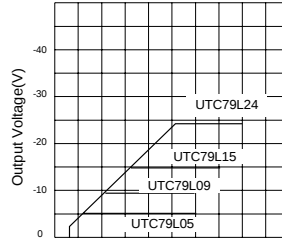


Fig.3 Load Characteristics (Tj=25°C)

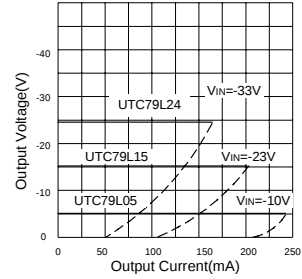


Fig.4 Short Circuit Current (Tj=25°C)

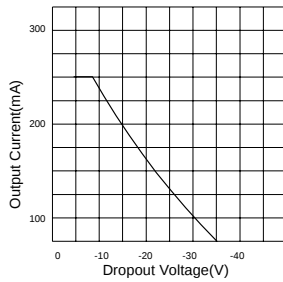


Fig.5 Output Voltage vs. Junction temperature

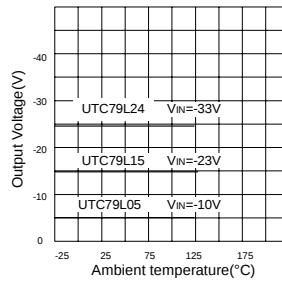


Fig.6 Output Voltage vs. ambient temperature

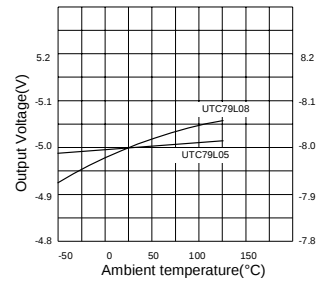


Fig.7 UTC79L05 Dropout Characteristics (Tj=25°C)

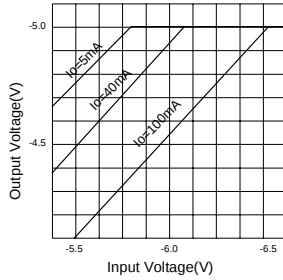


Fig.8 UTC79L08 Dropout Characteristics (Tj=25°C)

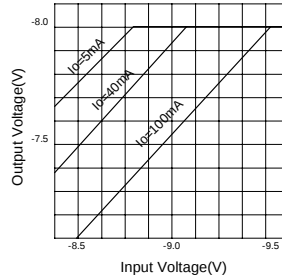


Fig.9 Current vs. Input Voltage (IOL=0mA, Tj=25°C)

