



# 79LXX

## LINEAR INTEGRATED CIRCUIT

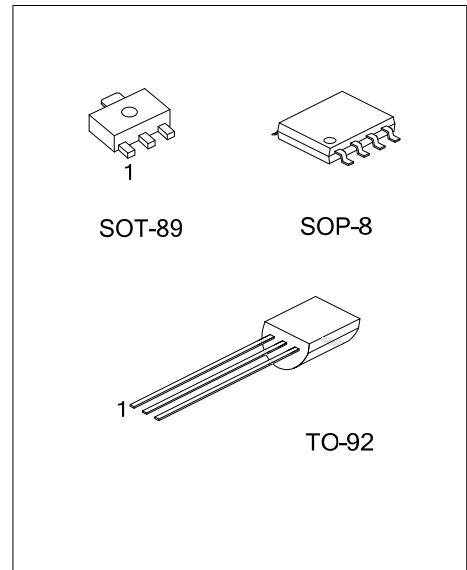
### 3-TERMINAL 0.1A NEGATIVE VOLTAGE REGULATOR

■ 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, -10V, -12V, -15V, -18V and -24V available.
- \* Thermal overload shutdown protection.
- \* Short circuit current limiting.



■ ORDERING INFORMATION

| Ordering Number |              | Package | Pin Assignment |   |   |   |   |   |   |   | Packing   |
|-----------------|--------------|---------|----------------|---|---|---|---|---|---|---|-----------|
| Lead Free       | Halogen Free |         | 1              | 2 | 3 | 4 | 5 | 6 | 7 | 8 |           |
| 79LXXL-AB3-R    | 79LXXG-AB3-R | SOT-89  | G              | I | O | - | - | - | - | - | Tape Reel |
| 79LXXL-S08-R    | 79LXXG-S08-R | SOP-8   | O              | I | I | N | G | I | I | N | Tape Reel |
| 79LXXL-T92-B    | 79LXXG-T92-B | TO-92   | G              | I | O | - | - | - | - | - | Tape Box  |
| 79LXXL-T92-K    | 79LXXG-T92-K | TO-92   | G              | I | O | - | - | - | - | - | Bulk      |

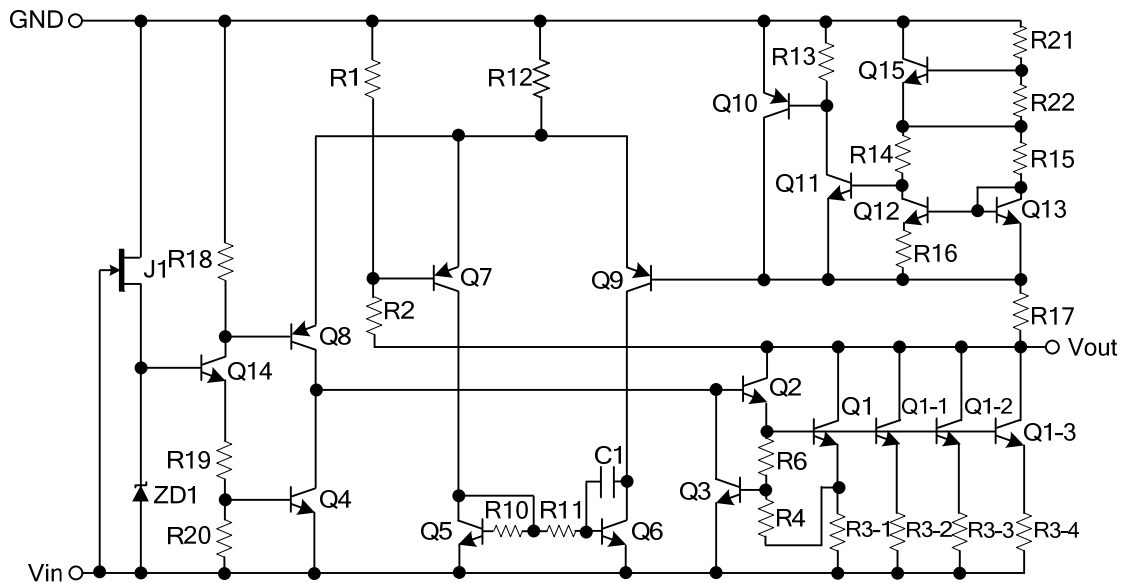
Notes: 1. XX: Output Voltage, refer to Marking Information  
 2. Note: Pin Assignment: I:V<sub>IN</sub> O:V<sub>OUT</sub> G:GND

|  |  |
|--|--|
| <p>79LXXG-AB3-R</p> <ul style="list-style-type: none"> <li>(1) Packing Type</li> <li>(2) Package Type</li> <li>(3) Green Package</li> <li>(4) Output Voltage Code</li> </ul> | <ul style="list-style-type: none"> <li>(1) B: Tape Box, K: Bulk, R: Tape Reel</li> <li>(2) AB3: SOT-89, S08: SOP-8, T92: TO-92</li> <li>(3) G: Halogen Free and Lead Free, L: Lead Free</li> <li>(4) XX: refer to Marking Information</li> </ul> |
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### MARKING INFORMATION

| PACKAGE | VOLTAGE CODE  | MARKING |
|---------|---|---------|
| SOT-89  |   |         |
| TO-92   | 05:-5.0V<br>06:-6.0V<br>08:-8.0V<br>09:-9.0V<br>10:-10V<br>12:-12V<br>15:-15V<br>18:-18V<br>24:-24V |         |
| SOP-8   |   |         |

### BLOCK DIAGRAM



### ■ ABSOLUTE MAXIMUM RATINGS

| PARAMETER             |                           | SYMBOL    | VALUE      | UNIT |
|-----------------------|---------------------------|-----------|------------|------|
| Input Voltage         | $V_{OUT} = -5 \sim -9V$   | $V_{IN}$  | -30        | V    |
|                       | $V_{OUT} = -12 \sim -15V$ |           | -35        | V    |
|                       | $V_{OUT} = -18 \sim -24V$ |           | -35        | V    |
| Power Dissipation     | SOT-89                    | $P_D$     | 350        | mW   |
|                       | SOP-8                     |           | 300        | mW   |
|                       | TO-92                     |           | 625        | mW   |
| Operating Temperature |                           | $T_{OPR}$ | -40 ~ +85  | °C   |
| Storage Temperature   |                           | $T_{STG}$ | -40 ~ +125 | °C   |

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

### ■ ELECTRICAL CHARACTERISTICS

**79L05**( $T_J=25^\circ C$ ,  $C_1=0.33\mu F$ ,  $C_{OUT}=1\mu F$ , unless otherwise specified)

| PARAMETER            | SYMBOL   | TEST CONDITIONS   | MIN  | TYP  | MAX  | UNIT    |
|----------------------|--|---|------|------|------|---------|
| Output Voltage       | $V_{OUT}$  | $V_{IN}=-10V$ , $I_{OUT}=40mA$  | -4.8 | -5.0 | -5.2 | V       |
| Line Regulation      | $\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$  | $V_{IN}=-7 \sim -20V$ , $I_{OUT}=40mA$                                    |      | 15   | 150  | mV      |
| Load Regulation      | $\frac{\Delta V_{OUT}}{\Delta I_{OUT} \times V_{OUT}}$ | $V_{IN}=-10V$ , $I_{OUT}=1 \sim 100mA$                                    |      | 7    | 60   | mV      |
| Quiescent current    | $I_Q$  | $V_{IN}=-10V$ , $I_{OUT}=40mA$  |      | 3.5  | 6.0  | mA      |
| Ripple Rejection     | RR   | $V_{IN}=-8 \sim -18V$ , $I_{OUT}=40mA$ ,<br>$e_{IN}=1V_{P-P}$ , $f=120Hz$ | 41   | 71   |      | dB      |
| Output Voltage Noise | eN   | $V_{IN}=-10V$ , $I_{OUT}=40mA$<br>$BW=10Hz \sim 100kHz$                   |      | 120  |      | $\mu V$ |

**79L06**( $T_J=25^\circ C$ ,  $C_1=0.33\mu F$ ,  $C_{OUT}=1\mu F$ , unless otherwise specified)

| PARAMETER            | SYMBOL   | TEST CONDITIONS   | MIN   | TYP  | MAX   | UNIT    |
|----------------------|--|---|-------|------|-------|---------|
| Output Voltage       | $V_{OUT}$  | $V_{IN}=-12V$ , $I_{OUT}=40mA$  | -5.76 | -6.0 | -6.24 | V       |
| Line Regulation      | $\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$  | $V_{IN}=-8.5 \sim -20V$ , $I_{OUT}=40mA$                                |       | 15   | 150   | mV      |
| Load Regulation      | $\frac{\Delta V_{OUT}}{\Delta I_{OUT} \times V_{OUT}}$ | $V_{IN}=-12V$ , $I_{OUT}=1 \sim 100mA$                                  |       | 7    | 60    | mV      |
| Quiescent current    | $I_Q$  | $V_{IN}=-12V$ , $I_{OUT}=40mA$  |       | 3.5  | 6.0   | mA      |
| Ripple Rejection     | RR   | $V_{IN}=-9 \sim -19V$ , $I_{OUT}=40mA$<br>$e_{IN}=1V_{P-P}$ , $f=120Hz$ | 41    | 71   |       | dB      |
| Output Voltage Noise | eN   | $V_{IN}=-12V$ , $I_{OUT}=40mA$<br>$BW=10Hz \sim 100kHz$                 |       | 120  |       | $\mu V$ |

**79L08**( $T_J=25^\circ C$ ,  $C_1=0.33\mu F$ ,  $C_{OUT}=1\mu F$ , unless otherwise specified)

| PARAMETER            | SYMBOL   | Test conditions  | MIN   | TYP  | MAX   | UNIT    |
|----------------------|--|--|-------|------|-------|---------|
| Output Voltage       | $V_{OUT}$  | $V_{IN}=-14V$ , $I_{OUT}=40mA$   | -7.68 | -8.0 | -8.32 | V       |
| Line Regulation      | $\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$  | $V_{IN}=-10.5 \sim -23V$ , $I_{OUT}=40mA$                                |       | 24   | 175   | mV      |
| Load Regulation      | $\frac{\Delta V_{OUT}}{\Delta I_{OUT} \times V_{OUT}}$ | $V_{IN}=-14V$ , $I_{OUT}=1 \sim 100mA$                                   |       | 10   | 80    | mV      |
| Quiescent current    | $I_Q$  | $V_{IN}=-14V$ , $I_{OUT}=40mA$   |       | 3.5  | 6.0   | mA      |
| Ripple Rejection     | RR   | $V_{IN}=-11 \sim -21V$ , $I_{OUT}=40mA$<br>$e_{IN}=1V_{P-P}$ , $f=140Hz$ | 39    | 68   |       | dB      |
| Output Voltage Noise | eN   | $V_{IN}=-14V$ , $I_{OUT}=40mA$<br>$BW=10Hz \sim 100kHz$                  |       | 190  |       | $\mu V$ |

■ ELECTRICAL CHARACTERISTICS(Cont.)

79L09( $T_J=25^\circ\text{C}$ ,  $C_1=0.33\mu\text{F}$ ,  $C_{OUT}=1\mu\text{F}$ , unless otherwise specified)

| PARAMETER            | SYMBOL   | TEST CONDITIONS  | MIN   | TYP  | MAX   | UNIT          |
|----------------------|--|--|-------|------|-------|---------------|
| Output Voltage       | $V_{OUT}$  | $V_{IN}=-15\text{V}$ , $I_{OUT}=40\text{mA}$   | -8.64 | -9.0 | -9.36 | V             |
| Line Regulation      | $\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$  | $V_{IN}=-12.5\sim-24\text{V}$ , $I_{OUT}=40\text{mA}$  |       | 27   | 200   | mV            |
| Load Regulation      | $\frac{\Delta V_{OUT}}{\Delta I_{OUT} \times V_{OUT}}$ | $V_{IN}=-15\text{V}$ , $I_{OUT}=1\sim 100\text{mA}$  |       | 12   | 90    | mV            |
| Quiescent current    | $I_Q$  | $V_{IN}=-15\text{V}$ , $I_{OUT}=40\text{mA}$   |       | 3.5  | 6.0   | mA            |
| Ripple Rejection     | RR   | $V_{IN}=-12\sim-22\text{V}$ , $I_{OUT}=40\text{mA}$<br>$e_{IN}=1\text{V}_{P-P}$ , $f=150\text{Hz}$ | 37    | 64   |       | dB            |
| Output Voltage Noise | eN   | $V_{IN}=-15\text{V}$ , $I_{OUT}=40\text{mA}$<br>$BW=10\text{Hz}\sim 100\text{kHz}$                 |       | 210  |       | $\mu\text{V}$ |

79L10( $T_J=25^\circ\text{C}$ ,  $C_1=0.33\mu\text{F}$ ,  $C_{OUT}=1\mu\text{F}$ , unless otherwise specified)

| PARAMETER            | SYMBOL   | TEST CONDITIONS  | MIN  | TYP | MAX   | UNIT          |
|----------------------|--|--|------|-----|-------|---------------|
| Output Voltage       | $V_{OUT}$  | $V_{IN}=-16\text{V}$ , $I_{OUT}=40\text{mA}$   | -9.6 | -10 | -10.4 | V             |
| Line Regulation      | $\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$  | $V_{IN}=-13\sim-24\text{V}$ , $I_{OUT}=40\text{mA}$  |      | 30  | 220   | mV            |
| Load Regulation      | $\frac{\Delta V_{OUT}}{\Delta I_{OUT} \times V_{OUT}}$ | $V_{IN}=-16\text{V}$ , $I_{OUT}=1\sim 100\text{mA}$  |      | 15  | 95    | mV            |
| Quiescent current    | $I_Q$  | $V_{IN}=-16\text{V}$ , $I_{OUT}=40\text{mA}$   |      | 3.5 | 6.0   | mA            |
| Ripple Rejection     | RR   | $V_{IN}=-13\sim-23\text{V}$ , $I_{OUT}=40\text{mA}$<br>$e_{IN}=1\text{V}_{P-P}$ , $f=150\text{Hz}$ | 37   | 64  |       | dB            |
| Output Voltage Noise | eN   | $V_{IN}=-16\text{V}$ , $I_{OUT}=40\text{mA}$<br>$BW=10\text{Hz}\sim 100\text{kHz}$                 |      | 210 |       | $\mu\text{V}$ |

79L12( $T_J=25^\circ\text{C}$ ,  $C_1=0.33\mu\text{F}$ ,  $C_{OUT}=1\mu\text{F}$ , unless otherwise specified)

| PARAMETER            | SYMBOL   | TEST CONDITIONS  | MIN    | TYP   | MAX    | UNIT          |
|----------------------|--|--|--------|-------|--------|---------------|
| Output Voltage       | $V_{OUT}$  | $V_{IN}=-19\text{V}$ , $I_{OUT}=40\text{mA}$   | -11.52 | -12.0 | -12.48 | V             |
| Line Regulation      | $\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$  | $V_{IN}=-14.5\sim-27\text{V}$ , $I_{OUT}=40\text{mA}$  |        | 36    | 250    | mV            |
| Load Regulation      | $\frac{\Delta V_{OUT}}{\Delta I_{OUT} \times V_{OUT}}$ | $V_{IN}=-19\text{V}$ , $I_{OUT}=1\sim 100\text{mA}$  |        | 16    | 100    | mV            |
| Quiescent current    | $I_Q$  | $V_{IN}=-19\text{V}$ , $I_{OUT}=40\text{mA}$   |        | 3.5   | 6.0    | mA            |
| Ripple Rejection     | RR   | $V_{IN}=-15\sim-25\text{V}$ , $I_{OUT}=40\text{mA}$<br>$e_{IN}=1\text{V}_{P-P}$ , $f=190\text{Hz}$ | 37     | 64    |        | dB            |
| Output Voltage Noise | eN   | $V_{IN}=-19\text{V}$ , $I_{OUT}=40\text{mA}$<br>$BW=10\text{Hz}\sim 100\text{kHz}$                 |        | 210   |        | $\mu\text{V}$ |

79L15( $T_J=25^\circ\text{C}$ ,  $C_1=0.33\mu\text{F}$ ,  $C_{OUT}=1\mu\text{F}$ , unless otherwise specified)

| PARAMETER            | SYMBOL   | TEST CONDITIONS  | MIN   | TYP   | MAX   | UNIT          |
|----------------------|--|--|-------|-------|-------|---------------|
| Output Voltage       | $V_{OUT}$  | $V_{IN}=-23\text{V}$ , $I_{OUT}=40\text{mA}$   | -14.4 | -15.0 | -15.6 | V             |
| Line Regulation      | $\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$  | $V_{IN}=-17.5\sim-30\text{V}$ , $I_{OUT}=40\text{mA}$  |       | 45    | 300   | mV            |
| Load Regulation      | $\frac{\Delta V_{OUT}}{\Delta I_{OUT} \times V_{OUT}}$ | $V_{IN}=-23\text{V}$ , $I_{OUT}=1\sim 100\text{mA}$  |       | 20    | 150   | mV            |
| Quiescent current    | $I_Q$  | $V_{IN}=-23\text{V}$ , $I_{OUT}=40\text{mA}$   |       | 3.5   | 6.0   | mA            |
| Ripple Rejection     | RR   | $V_{IN}=-18.5\sim-28.5\text{V}$ , $I_{OUT}=40\text{mA}$<br>$e_{IN}=1\text{V}_{P-P}$ , $f=230\text{Hz}$ | 34    | 63    |       | dB            |
| Output Voltage Noise | eN   | $V_{IN}=-23\text{V}$ , $I_{OUT}=40\text{mA}$<br>$BW=10\text{Hz}\sim 100\text{kHz}$                     |       | 340   |       | $\mu\text{V}$ |

■ ELECTRICAL CHARACTERISTICS(Cont.)

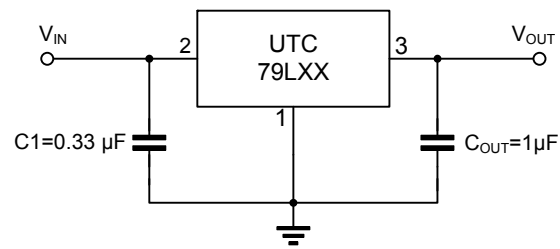
**79L18**( $T_J=25^\circ\text{C}$ ,  $C_1=0.33\mu\text{F}$ ,  $C_{OUT}=1\mu\text{F}$ , unless otherwise specified)

| PARAMETER            | SYMBOL   | TEST CONDITIONS  | MIN    | TYP   | MAX    | UNIT          |
|----------------------|--|--|--------|-------|--------|---------------|
| Output Voltage       | $V_{OUT}$  | $V_{IN}=-27\text{V}$ , $I_{OUT}=40\text{mA}$   | -17.28 | -18.0 | -18.72 | V             |
| Line Regulation      | $\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$  | $V_{IN}=-20.5\sim-33\text{V}$ , $I_{OUT}=40\text{mA}$  |        | 54    | 300    | mV            |
| Load Regulation      | $\frac{\Delta V_{OUT}}{\Delta I_{OUT} \times V_{OUT}}$ | $V_{IN}=-27\text{V}$ , $I_{OUT}=1\sim 100\text{mA}$  |        | 23    | 170    | mV            |
| Quiescent current    | $I_Q$  | $V_{IN}=-27\text{V}$ , $I_{OUT}=40\text{mA}$   |        | 3.5   | 6.0    | mA            |
| Ripple Rejection     | RR   | $V_{IN}=-23\sim-33\text{V}$ , $I_{OUT}=40\text{mA}$<br>$e_{IN}=1\text{V}_{P-P}$ , $f=270\text{Hz}$ | 33     | 60    |        | dB            |
| Output Voltage Noise | eN   | $V_{IN}=-27\text{V}$ , $I_{OUT}=40\text{mA}$<br>$BW=10\text{Hz}\sim 100\text{kHz}$                 |        | 410   |        | $\mu\text{V}$ |

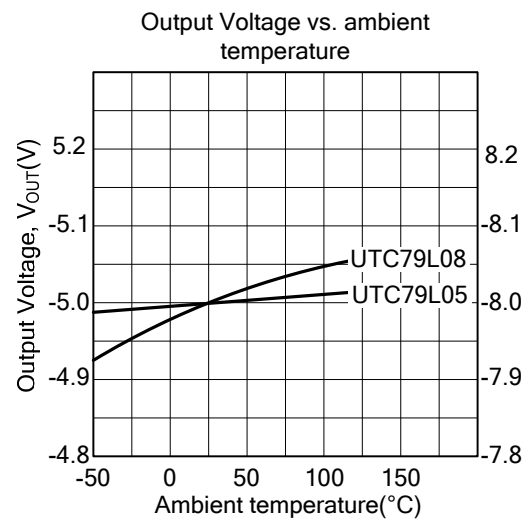
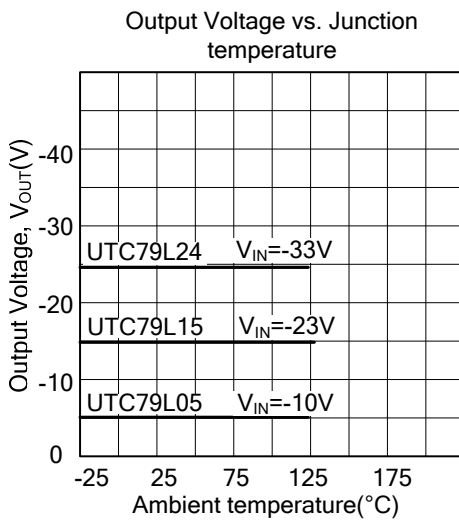
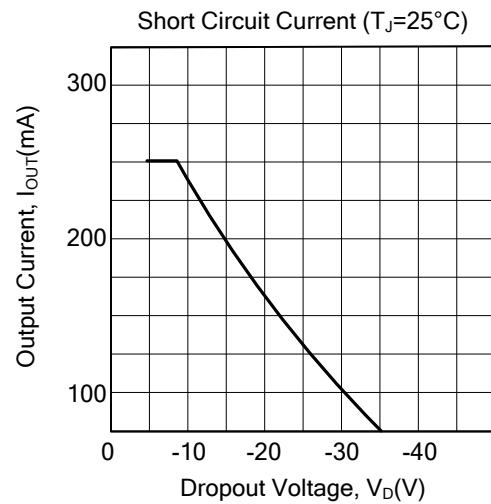
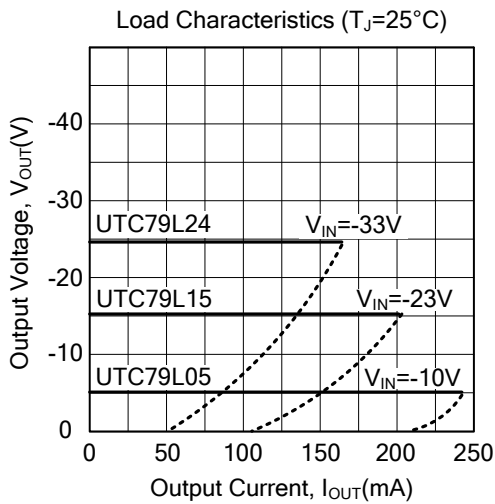
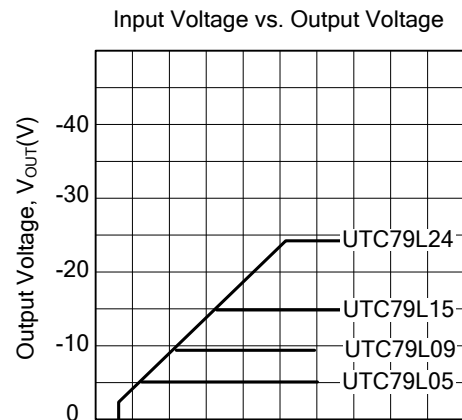
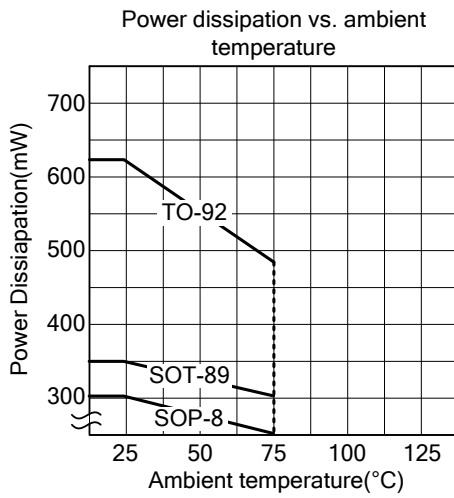
**79L24**( $T_J=25^\circ\text{C}$ ,  $C_1=0.33\mu\text{F}$ ,  $C_{OUT}=1\mu\text{F}$ , unless otherwise specified)

| PARAMETER            | SYMBOL   | TEST CONDITIONS  | MIN    | TYP   | MAX    | UNIT          |
|----------------------|--|--|--------|-------|--------|---------------|
| Output Voltage       | $V_{OUT}$  | $V_{IN}=-33\text{V}$ , $I_{OUT}=40\text{mA}$   | -23.04 | -24.0 | -24.96 | V             |
| Line Regulation      | $\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$  | $V_{IN}=-27\sim-38\text{V}$ , $I_{O}=40\text{mA}$  |        | 72    | 350    | mV            |
| Load Regulation      | $\frac{\Delta V_{OUT}}{\Delta I_{OUT} \times V_{OUT}}$ | $V_{IN}=-33\text{V}$ , $I_{OUT}=1\sim 100\text{mA}$  |        | 30    | 200    | mV            |
| Quiescent current    | $I_Q$  | $V_{IN}=-33\text{V}$ , $I_{OUT}=40\text{mA}$   |        | 3.5   | 6.0    | mA            |
| Ripple Rejection     | RR   | $V_{IN}=-29\sim-35\text{V}$ , $I_{OUT}=40\text{mA}$<br>$e_{IN}=1\text{V}_{P-P}$ , $f=330\text{Hz}$ | 31     | 55    |        | dB            |
| Output Voltage Noise | eN   | $V_{IN}=-33\text{V}$ , $I_{OUT}=40\text{mA}$<br>$BW=10\text{Hz}\sim 100\text{kHz}$                 |        | 550   |        | $\mu\text{V}$ |

## ■ APPLICATION CIRCUIT

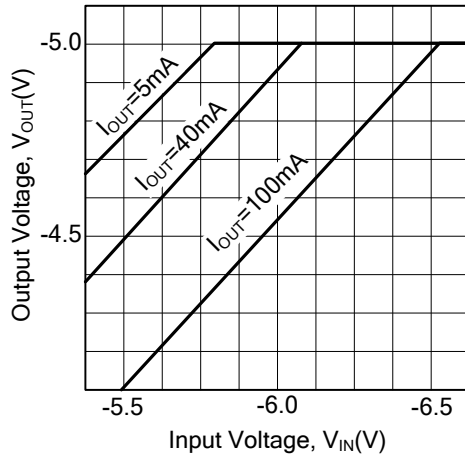


## TYPICAL CHARACTERISTICS

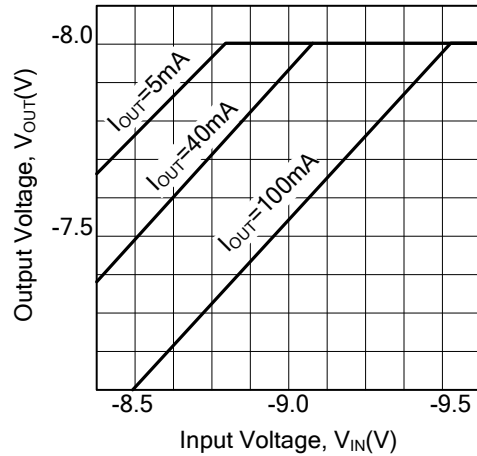


■ TYPICAL CHARACTERISTICS(Cont.)

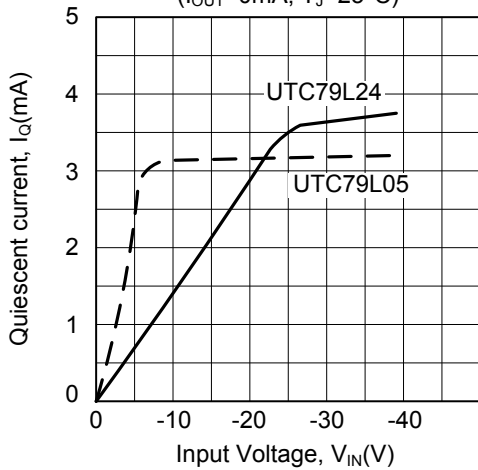
UTC79L05 Dropout Characteristics  
( $T_J=25^\circ\text{C}$ )



UTC79L08 Dropout Characteristics  
( $T_J=25^\circ\text{C}$ )



Current vs. Input Voltage  
( $I_{OUT}=0\text{mA}$ ,  $T_J=25^\circ\text{C}$ )



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