



79LXX

LINEAR INTEGRATED CIRCUIT

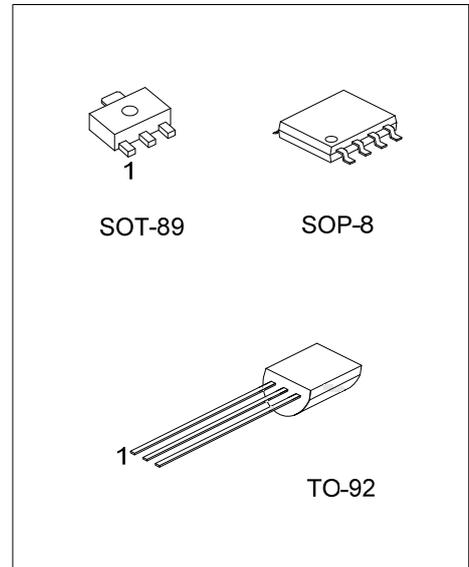
3-TERMINAL 0.1A NEGATIVE VOLTAGE REGULATOR

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 |

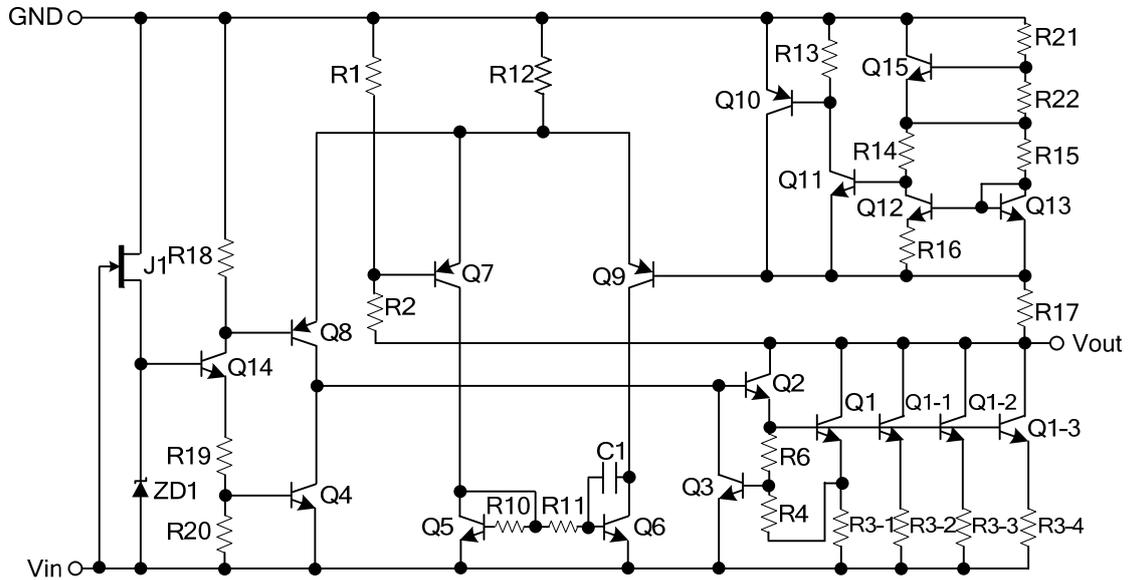
Notes: 1. XX: Output Voltage, refer to Marking Information
 2. Note: Pin Assignment: I: V_{IN} O: V_{OUT} G: GND

| | |
|---|---|
| <p>79LXXG-AB3-R</p> <p>(1)Packing Type (2)Package Type (3)Green Package (4)Output Voltage Code</p> | <p>(1) R: Tape Reel, B: Tape Box, K: Bulk (2) AB3: SOT-89, S08: SOP-8, T92: TO-92 (3) G: Halogen Free and Lead Free, L: Lead Free (4) XX: refer to Marking Information</p> |
|---|---|

MARKING INFORMATION

| PACKAGE | VOLTAGE CODE | MARKING |
|---------|---|---------|
| SOT-89 | 05:-5.0V 06:-6.0V 08:-8.0V 09:-9.0V 10:-10V 12:-12V 15:-15V 18:-18V 24:-24V | |
| TO-92 | | |
| 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 | 500 | mW |
| | SOP-8 | | 660 | mW |
| | TO-92 | | 625 | mW |
| Operating Junction Temperature | | T_J | +150 | °C |
| Operating Temperature | | T_{OPR} | -40 ~ +125 | °C |
| Storage Temperature | | T_{STG} | -40 ~ +150 | °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.

■ THERMAL DATA

| PARAMETER | | SYMBOL | RATING | UNIT |
|---------------------|--------|---------------|--------|------|
| Junction to Ambient | SOT-89 | θ_{JA} | 200 | °C/W |
| | SOP-8 | | 150 | °C/W |
| | TO-92 | | 160 | °C/W |
| Junction to Case | SOT-89 | θ_{JC} | 50 | °C/W |
| | SOP-8 | | 45 | °C/W |
| | TO-92 | | 83 | °C/W |

■ ELECTRICAL CHARACTERISTICS

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

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

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

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

■ ELECTRICAL CHARACTERISTICS(Cont.)

79L08 (T_J=25°C, C₁=0.33μF, C_{OUT}=1μF, 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~-23V, I _{OUT} =40mA | | 24 | 175 | mV |
| Load Regulation | $\frac{\Delta V_{OUT}}{\Delta I_{OUT} \times V_{OUT}}$ | V _{IN} =-14V, I _{OUT} =1~100mA | | 10 | 80 | mV |
| Quiescent current | I _Q | V _{IN} =-14V, I _{OUT} =40mA | | 3.5 | 6.0 | mA |
| Ripple Rejection | RR | V _{IN} =-11~-21V, I _{OUT} =40mA e _{IN} =1V _{P-P} , f=140Hz | 39 | 68 | | dB |
| Output Voltage Noise | eN | V _{IN} =-14V, I _{OUT} =40mA BW=10Hz~100kHz | | 190 | | μV |

79L09 (T_J=25°C, C₁=0.33μF, C_{OUT}=1μF, unless otherwise specified)

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

79L10 (T_J=25°C, C₁=0.33μF, C_{OUT}=1μF, unless otherwise specified)

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

79L12 (T_J=25°C, C₁=0.33μF, C_{OUT}=1μF, unless otherwise specified)

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

■ ELECTRICAL CHARACTERISTICS(Cont.)

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 | $V_{IN}=-18.5\sim-28.5\text{V}$, $I_{OUT}=40\text{mA}$ $e_{IN}=1\text{V}_{P-P}$, $f=230\text{Hz}$ | 34 | 63 | | dB |
| Output Voltage Noise | eN | $V_{IN}=-23\text{V}$, $I_{OUT}=40\text{mA}$ $BW=10\text{Hz}\sim 100\text{kHz}$ | | 340 | | μV |

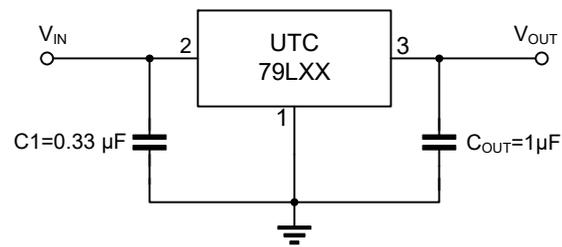
79L18 ($T_J=25^\circ\text{C}$, $C_1=0.33\mu\text{F}$, $C_{OUT}=1\mu\text{F}$, unless otherwise specified)

| 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 | $V_{IN}=-23\sim-33\text{V}$, $I_{OUT}=40\text{mA}$ $e_{IN}=1\text{V}_{P-P}$, $f=270\text{Hz}$ | 33 | 60 | | dB |
| Output Voltage Noise | eN | $V_{IN}=-27\text{V}$, $I_{OUT}=40\text{mA}$ $BW=10\text{Hz}\sim 100\text{kHz}$ | | 410 | | μV |

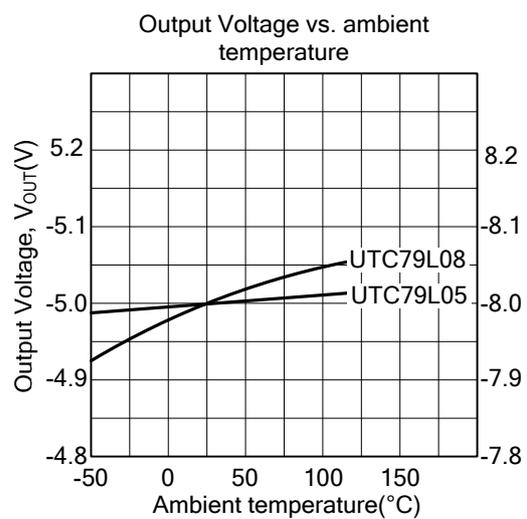
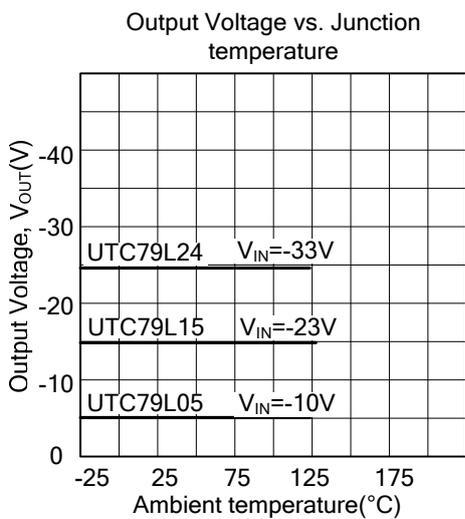
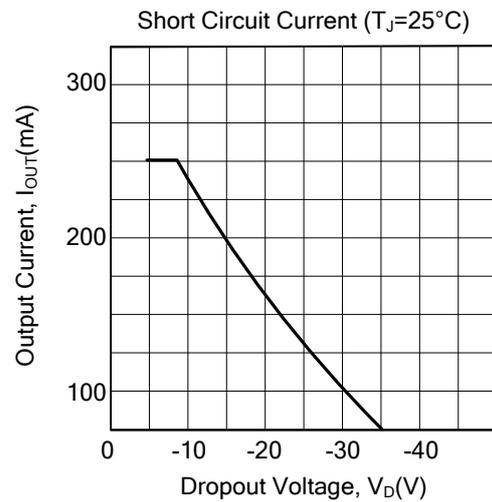
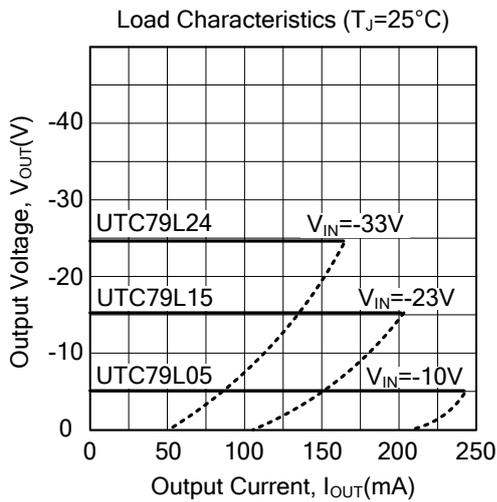
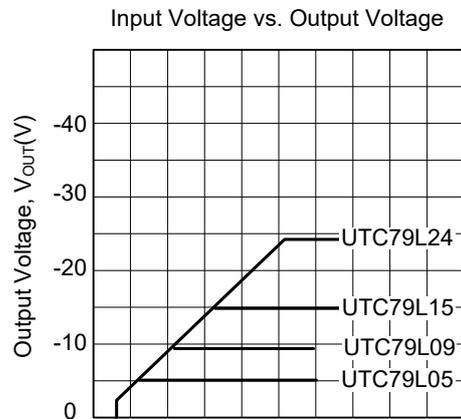
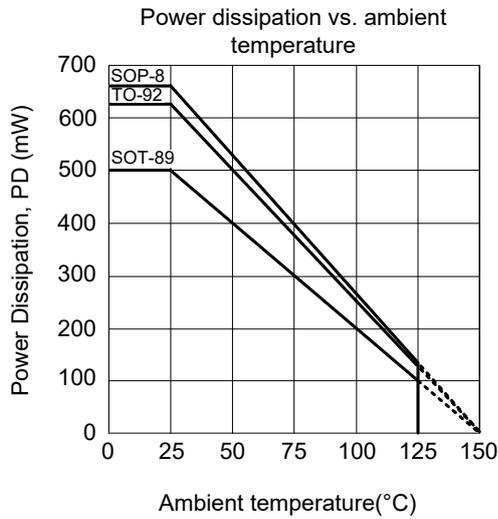
79L24 ($T_J=25^\circ\text{C}$, $C_1=0.33\mu\text{F}$, $C_{OUT}=1\mu\text{F}$, unless otherwise specified)

| 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 | $V_{IN}=-29\sim-35\text{V}$, $I_{OUT}=40\text{mA}$ $e_{IN}=1\text{V}_{P-P}$, $f=330\text{Hz}$ | 31 | 55 | | dB |
| Output Voltage Noise | eN | $V_{IN}=-33\text{V}$, $I_{OUT}=40\text{mA}$ $BW=10\text{Hz}\sim 100\text{kHz}$ | | 550 | | μV |

■ APPLICATION CIRCUIT

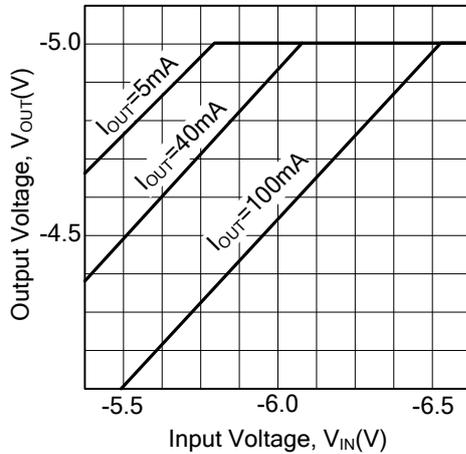


TYPICAL CHARACTERISTICS

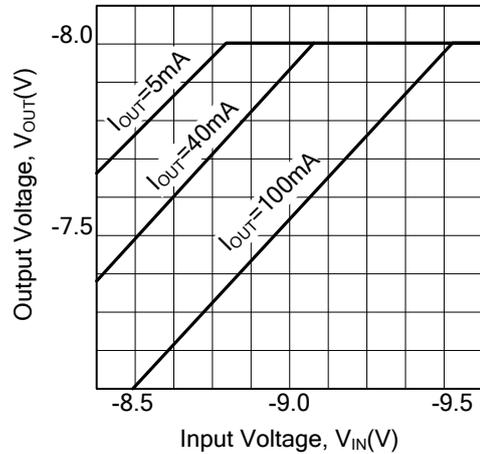


■ TYPICAL CHARACTERISTICS(Cont.)

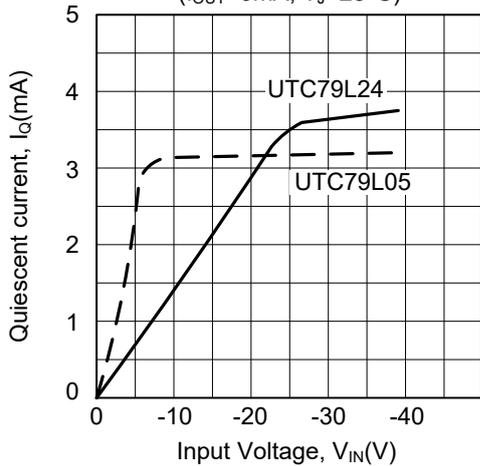
UTC79L05 Dropout Characteristics
($T_J=25^\circ\text{C}$)



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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