



## 79TXXAA

Advance

LINEAR INTEGRATED CIRCUIT

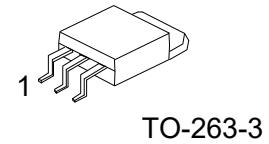
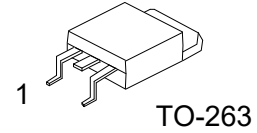
### 3 TERMINAL 1.5A NEGATIVE VOLTAGE REGULATOR

#### DESCRIPTION

The UTC **79TXXAA** series of three-terminal negative regulators is available several fixed output voltage, making them useful in a wide range of application. Each type employs internal current limiting, thermal shut-down, making it essentially indestructible.

#### FEATURES

- \* Output current up to 1.5A
- \* -5V, -12V output voltage available
- \* Thermal overload protection



#### ORDERING INFORMATION

| Ordering Number |                | Package  | Pin Assignment |   |   | Packing   |
|-----------------|----------------|----------|----------------|---|---|-----------|
| Lead Free       | Halogen Free   |          | 1              | 2 | 3 |           |
| 79TXXAAL-TQ2-R  | 79TXXAAG-TQ2-R | TO-263   | G              | I | O | Tape Reel |
| 79TXXAAL-TQ2-T  | 79TXXAAG-TQ2-T | TO-263   | G              | I | O | Tube      |
| 79TXXAAL-TQ3-R  | 79TXXAAG-TQ3-R | TO-263-3 | G              | I | O | Tape Reel |
| 79TXXAAL-TQ3-T  | 79TXXAAG-TQ3-T | TO-263-3 | G              | I | O | Tube      |

Note: Pin Code: G: GND I: Input O: Output

|                                                                                                                  |                                                                                                                                                                  |
|------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>79TXXAAG-TQ2-R</p> <p>(1) Packing Type<br/>(2) Package Type<br/>(3) Lead Free<br/>(4) Output Voltage Code</p> | <p>(1) R: Tape Reel, T: Tube<br/>(2) TQ2: TO-263, TQ3: TO-263-3<br/>(3) G: Halogen Free and Lead Free, L: Lead Free<br/>(4) XX: refer to Marking Information</p> |
|------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|

# MARKING INFORMATION

| PACKAGE            | VOLTAGE CODE                               | MARKING                                                                                                                                                                                                                                                                                                                            |
|--------------------|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TO-263<br>TO-263-3 | 05: 5.0V<br>08: 8.0V<br>12: 12V<br>15: 15V | <div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center;"> <p>Voltage Code<br/>Lot Code</p> </div> <div style="margin: 0 10px;"> <p>UTC<br/>79TXXAA</p> <p>1 2 3</p> </div> <div style="text-align: right;"> <p>L: Lead Free<br/>G: Halogen Free<br/>Date Code</p> </div> </div> |

# BLOCK DIAGRAM

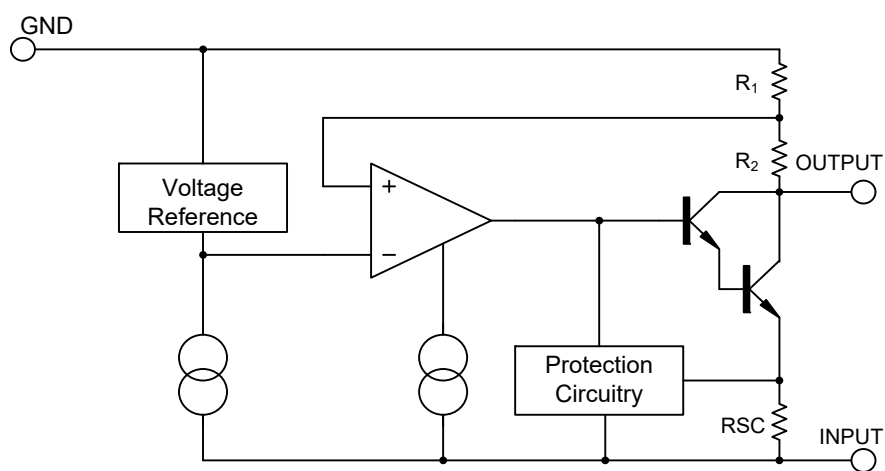


Fig.1

■ ABSOLUTE MAXIMUM RATINGS ( $T_A=25^{\circ}\text{C}$ , unless otherwise specified)

| PARAMETER             | SYMBOL    | RATING             | UNIT               |
|-----------------------|-----------|--------------------|--------------------|
| Input Voltage         | $V_{IN}$  | -35                | V                  |
| Output Current        | $I_{OUT}$ | 1.5                | A                  |
| Power Dissipation     | $P_D$     | Internally Limited | W                  |
| Operating Temperature | $T_{OPR}$ | -40 ~ +125         | $^{\circ}\text{C}$ |
| Storage Temperature   | $T_{STG}$ | -65 ~ +150         | $^{\circ}\text{C}$ |

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 | $\theta_{JA}$ | 65     | $^{\circ}\text{C/W}$ |
| Junction to Case    | $\theta_{JC}$ | 5      | $^{\circ}\text{C/W}$ |

■ ELECTRICAL CHARACTERISTICS

( $I_{OUT}=0.5\text{A}$ ,  $T_J=0^{\circ}\text{C}\sim 125^{\circ}\text{C}$ ,  $C_I=2.2\mu\text{F}$ ,  $C_O=1\mu\text{F}$ , unless otherwise specified)

For UTC 79T05AA ( $V_{IN}=-10\text{V}$ )

| PARAMETER                | SYMBOL                    | TEST CONDITIONS                                                              | MIN   | TYP  | MAX   | UNIT                         |
|--------------------------|---------------------------|------------------------------------------------------------------------------|-------|------|-------|------------------------------|
| Output Voltage           | $V_{OUT}$                 | $T_J=25^{\circ}\text{C}$                                                     | -4.80 | -5.0 | -5.20 | V                            |
|                          |                           | $V_{IN}=-7\text{V} \sim -20\text{V}$ , $I_{OUT}=5\text{mA} \sim 1.5\text{A}$ | -4.75 |      | -5.25 | V                            |
| Dropout Voltage          | $V_D$                     | $I_{OUT}=1.5\text{A}$ , $T_J=25^{\circ}\text{C}$                             |       | 2    |       | V                            |
| Line Regulation          | $\Delta V_{OUT}$          | $V_{IN}=-7\text{V} \sim -25\text{V}$ , $T_J=25^{\circ}\text{C}$              |       | 10   | 100   | mV                           |
|                          |                           | $V_{IN}=-8\text{V} \sim -12\text{V}$ , $T_J=25^{\circ}\text{C}$              |       | 4    | 50    | mV                           |
| Load Regulation          | $\Delta V_{OUT}$          | $I_{OUT}=5\text{mA} \sim 1.5\text{A}$ , $T_J=25^{\circ}\text{C}$             |       | 10   | 100   | mV                           |
|                          |                           | $I_{OUT}=250\text{mA} \sim 750\text{mA}$ , $T_J=25^{\circ}\text{C}$          |       | 3    | 50    | mV                           |
| Quiescent Current        | $I_Q$                     | $T_J=25^{\circ}\text{C}$                                                     |       | 3    | 6     | mA                           |
| Quiescent Current Change | $\Delta I_Q$              | $I_{OUT}=5\text{mA} \sim 1\text{A}$                                          |       | 0.05 | 0.5   | mA                           |
|                          |                           | $V_{IN}=-10.5\text{V} \sim -25\text{V}$                                      |       | 0.1  | 1.3   | mA                           |
| Output Noise Voltage     | eN                        | $f=10\text{Hz} \sim 100\text{kHz}$ , $T_A=25^{\circ}\text{C}$                |       | 100  |       | $\mu\text{V}$                |
| Output Voltage Drift     | $\Delta V_{OUT}/\Delta T$ | $I_{OUT}=5\text{mA}$                                                         |       | -0.4 |       | $\text{mV}/^{\circ}\text{C}$ |
| Ripple Rejection         | RR                        | $V_{IN}=-8\text{V} \sim -18\text{V}$ , $f=120\text{Hz}$                      | 54    | 60   |       | dB                           |
| Peak Current             | $I_{PEAK}$                | $T_J=25^{\circ}\text{C}$                                                     |       | 2.2  |       | A                            |

For UTC 79T08AA ( $V_{IN}=-14\text{V}$ )

| PARAMETER                | SYMBOL                    | TEST CONDITIONS                                                                 | MIN   | TYP  | MAX   | UNIT                         |
|--------------------------|---------------------------|---------------------------------------------------------------------------------|-------|------|-------|------------------------------|
| Output Voltage           | $V_{OUT}$                 | $T_J=25^{\circ}\text{C}$                                                        | -7.68 | -8.0 | -8.32 | V                            |
|                          |                           | $V_{IN}=-10.5\text{V} \sim -23\text{V}$ , $I_{OUT}=5\text{mA} \sim 1.5\text{A}$ | -7.60 |      | -8.40 | V                            |
| Dropout Voltage          | $V_D$                     | $I_{OUT}=1.5\text{A}$ , $T_J=25^{\circ}\text{C}$                                |       | 2    |       | V                            |
| Line Regulation          | $\Delta V_{OUT}$          | $V_{IN}=-10.5\text{V} \sim -25\text{V}$ , $T_J=25^{\circ}\text{C}$              |       | 12   | 160   | mV                           |
|                          |                           | $V_{IN}=-11.5\text{V} \sim -17\text{V}$ , $T_J=25^{\circ}\text{C}$              |       | 5    | 80    | mV                           |
| Load Regulation          | $\Delta V_{OUT}$          | $I_{OUT}=5\text{mA} \sim 1.5\text{A}$ , $T_J=25^{\circ}\text{C}$                |       | 12   | 160   | mV                           |
|                          |                           | $I_{OUT}=250\text{mA} \sim 750\text{mA}$ , $T_J=25^{\circ}\text{C}$             |       | 4    | 80    | mV                           |
| Quiescent Current        | $I_Q$                     | $T_J=25^{\circ}\text{C}$                                                        |       | 3    | 6     | mA                           |
| Quiescent Current Change | $\Delta I_Q$              | $I_{OUT}=5\text{mA} \sim 1\text{A}$                                             |       | 0.05 | 0.5   | mA                           |
|                          |                           | $V_{IN}=-11.5\text{V} \sim -25\text{V}$                                         |       | 0.1  | 1.0   | mA                           |
| Output Noise Voltage     | eN                        | $f=10\text{Hz} \sim 100\text{kHz}$ , $T_A=25^{\circ}\text{C}$                   |       | 175  |       | $\mu\text{V}$                |
| Output Voltage Drift     | $\Delta V_{OUT}/\Delta T$ | $I_{OUT}=5\text{mA}$                                                            |       | -0.6 |       | $\text{mV}/^{\circ}\text{C}$ |
| Ripple Rejection         | RR                        | $V_{IN}=-11.5\text{V} \sim -21.5\text{V}$ , $f=120\text{Hz}$                    | 54    | 60   |       | dB                           |
| Peak Current             | $I_{PEAK}$                | $T_J=25^{\circ}\text{C}$                                                        |       | 2.2  |       | A                            |

## ■ ELECTRICAL CHARACTERISTICS (Cont.)

For UTC 79T12AA ( $V_{IN}=-18V$ )

| PARAMETER                | SYMBOL                    | TEST CONDITIONS                                  | MIN    | TYP   | MAX    | UNIT            |
|--------------------------|---------------------------|--------------------------------------------------|--------|-------|--------|-----------------|
| Output Voltage           | $V_{OUT}$                 | $T_J=25^{\circ}C$                                | -11.52 | -12.0 | -12.48 | V               |
|                          |                           | $V_{IN}=-14.5V \sim -27V, I_{OUT}=5mA \sim 1.5A$ | -11.40 |       | -12.60 | V               |
| Dropout Voltage          | $V_D$                     | $I_{OUT}=1.5A, T_J=25^{\circ}C$                  |        | 2     |        | V               |
| Line Regulation          | $\Delta V_{OUT}$          | $V_{IN}=-14.5V \sim -30V, T_J=25^{\circ}C$       |        | 12    | 240    | mV              |
|                          |                           | $V_{IN}=-16V \sim -22V, T_J=25^{\circ}C$         |        | 6     | 120    | mV              |
| Load Regulation          | $\Delta V_{OUT}$          | $I_{OUT}=5mA \sim 1.5A, T_J=25^{\circ}C$         |        | 12    | 240    | mV              |
|                          |                           | $I_{OUT}=250mA \sim 750mA, T_J=25^{\circ}C$      |        | 4     | 120    | mV              |
| Quiescent Current        | $I_Q$                     | $T_J=25^{\circ}C$                                |        | 3     | 6      | mA              |
| Quiescent Current Change | $\Delta I_Q$              | $I_{OUT}=5mA \sim 1A$                            |        | 0.05  | 0.5    | mA              |
|                          |                           | $V_{IN}=-14.5V \sim -30V$                        |        | 0.1   | 1.0    | mA              |
| Output Noise Voltage     | eN                        | $f=10Hz \sim 100kHz, T_A=25^{\circ}C$            |        | 200   |        | $\mu V$         |
| Output Voltage Drift     | $\Delta V_{OUT}/\Delta T$ | $I_{OUT}=5mA$                                    |        | -0.8  |        | mV/ $^{\circ}C$ |
| Ripple Rejection         | RR                        | $V_{IN}=-15V \sim -25V, f=120Hz$                 | 54     | 60    |        | dB              |
| Peak Current             | $I_{PEAK}$                | $T_J=25^{\circ}C$                                |        | 2.2   |        | A               |

For UTC 79T15AA ( $V_{IN}=-23V$ )

| PARAMETER                | SYMBOL                    | TEST CONDITIONS                                  | MIN    | TYP   | MAX    | UNIT            |
|--------------------------|---------------------------|--------------------------------------------------|--------|-------|--------|-----------------|
| Output Voltage           | $V_{OUT}$                 | $T_J=25^{\circ}C$                                | -14.40 | -15.0 | -15.60 | V               |
|                          |                           | $V_{IN}=-17.5V \sim -30V, I_{OUT}=5mA \sim 1.5A$ | -14.25 |       | -15.75 | V               |
| Dropout Voltage          | $V_D$                     | $I_{OUT}=1.5A, T_J=25^{\circ}C$                  |        | 2     |        | V               |
| Line Regulation          | $\Delta V_{OUT}$          | $V_{IN}=-17.5V \sim -30V, T_J=25^{\circ}C$       |        | 12    | 300    | mV              |
|                          |                           | $V_{IN}=-20V \sim -26V, T_J=25^{\circ}C$         |        | 6     | 150    | mV              |
| Load Regulation          | $\Delta V_{OUT}$          | $I_{OUT}=5mA \sim 1.5A, T_J=25^{\circ}C$         |        | 12    | 300    | mV              |
|                          |                           | $I_{OUT}=250mA \sim 750mA, T_J=25^{\circ}C$      |        | 4     | 150    | mV              |
| Quiescent Current        | $I_Q$                     | $T_J=25^{\circ}C$                                |        | 3     | 6      | mA              |
| Quiescent Current Change | $\Delta I_Q$              | $I_{OUT}=5mA \sim 1A$                            |        | 0.05  | 0.5    | mA              |
|                          |                           | $V_{IN}=-17.5V \sim -30.5V$                      |        | 0.1   | 1.0    | mA              |
| Output Noise Voltage     | eN                        | $f=10Hz \sim 100kHz, T_A=25^{\circ}C$            |        | 250   |        | $\mu V$         |
| Output Voltage Drift     | $\Delta V_{OUT}/\Delta T$ | $I_{OUT}=5mA$                                    |        | -0.9  |        | mV/ $^{\circ}C$ |
| Ripple Rejection         | RR                        | $V_{IN}=-18.5V \sim -28.5V, f=120Hz$             | 54     | 60    |        | dB              |
| Peak Current             | $I_{PEAK}$                | $T_J=25^{\circ}C$                                |        | 2.2   |        | A               |

## ■ APPLICATION CIRCUITS

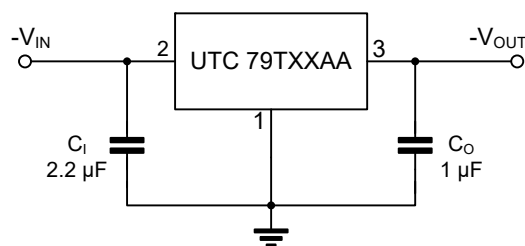


Fig.1 Fixed output regulator

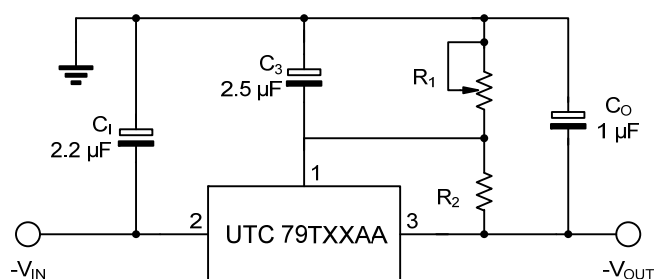


Fig.2 Circuit for increasing output voltage

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