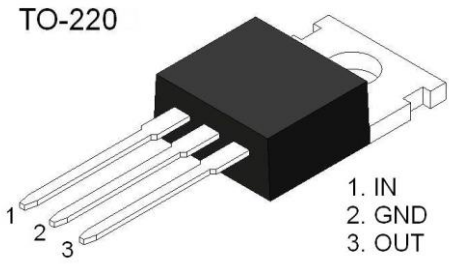
## 3-terminal 1A positive voltage regulator

### Description

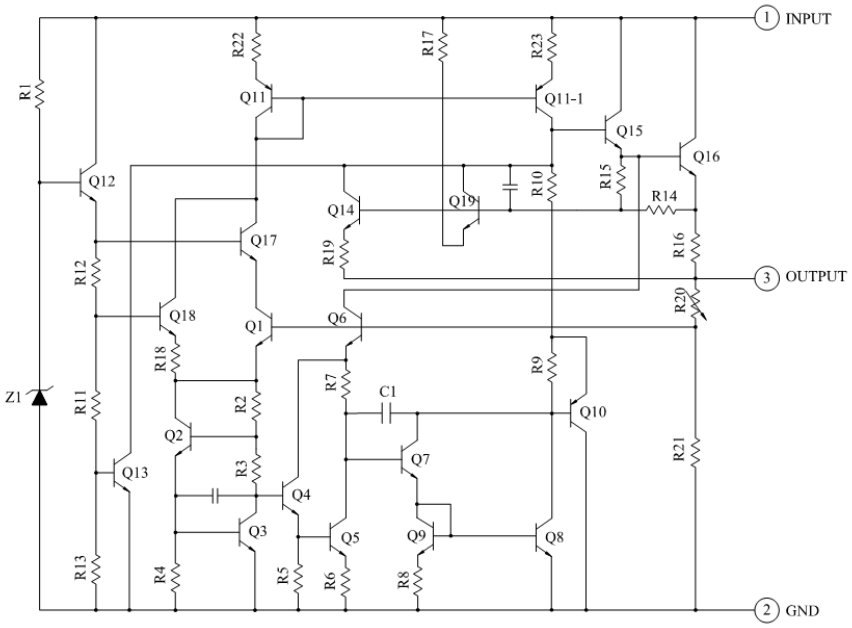
The L78xxCV family is monolithic fixed voltage regulator integrated circuit. They are suitablefor applications that required supply current up to 1 A.




### Features

- Output Current up to 1A
- Output Voltages of 5V,6V,8V,9V,10V,12V, 15V, 18V ,20V and 24V available
- Thermal overload shutdown protection
- Short circuit protection
- Output transistor SOA protection

### Test Crcuit




### Absolute Maximum Ratings

( Operating temperature range applies unless otherwise specified )

| Parameter | | Symbol | Value | Unit |
|---|---|---|---|---|
| Input Voltage | for $V_O$=5V~15V | $V_{IN}$ | 30 | V |
| | for $V_O$=18V~24V | | 40 | |
| Output Current | | $I_O$ | 1 | A |
| Power Dissipation | | $P_D$ | InternallyLimited | W |
| Operating Junction Temperature | | $T_{OPR}$ | -40 ~ + 150 | ℃ |
| Storage Temperature | | $T_{STG}$ | -55 ~ + 150 | ℃ |

## L7805CV **Electrical Characteristics**

($V_I$ = 10V, $I_O$ = 0.5A,$C_I$ = 0.33μF, $C_O$ = 0.1μF, $T_j$= 0 to 125℃, unless otherwise specified)

| Parameter | Symbol | Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Output Voltage | $V_O$ | $T_j$ = 25℃, $I_O$=5mA ~ 1A | | 4.80 | 5.0 | 5.20 | V |
| | | $V_I$ = 7.5V ~ 20V, $I_O$=5mA ~ 1A | | 4.75 | 5.0 | 5.25 | V |
| Line Regulation | Δ $V_O$ | $T_j$ = 25℃ $I_O$= 0.5A | $V_I$ = 7.0V ~ 25V | | | 100 | mV |
| | | | $V_I$ = 8.0V ~ 12V | | | 50 | |
| Load Regulation | Δ $V_O$ | $T_j$ = 25℃ | $I_O$= 5mA ~ 1A | | | 100 | mV |
| | | | $I_O$= 0.25A ~ 0.75A | | | 50 | |
| Quiescent Current | $I_Q$ | $T_j$ = 25℃, $I_O$=5mA | | | | 8.0 | mA |
| Quiescent Current Change | Δ $I_Q$ | $I_O$=5mA ~ 1A | | | | 0.5 | mA |
| | | $V_I$ = 7.0V ~ 25V | | | | 1.3 | |
| Output Voltage Drift | ΔV /ΔT | $I_O$ = 5mA | | | -0.6 | | mV/℃ |
| Output Noise Voltage | $V_N$ | 10$H_Z$ ≤ f ≤ 100K$H_Z$ | | | 40 | | μV/$V_O$ |
| Ripple Rejection | RR | $T_j$ = 25℃, $V_I$ = 8V ~ 18V f = 120Hz, $I_O$ = 300mA | | 55 | 78 | | dB |
| Short Circuit Current | $I_{SC}$ | $T_j$=25℃ | | | 230 | | mA |
| Peak Out Current | $I_{PK}$ | $T_j$=25℃ | | | 1.6 | | A |
| Dropout Voltage | $V_d$ | $T_j$=25℃, $I_O$=500mA | | | 2.0 | | V |

## L7806CV **Electrical Characteristics**

($V_I$ = 11V, $I_O$ = 0.5A,$C_I$ = 0.33μF, $C_O$ = 0.1μF, $T_j$= 0 to 125℃, unless otherwise specified)

| Parameter | Symbol | Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Output Voltage | $V_O$ | $T_j$ = 25℃, $I_O$=5mA ~ 1A | | 5.76 | 6.0 | 6..24 | V |
| | | $V_I$ = 7.5V ~ 20V, $I_O$=5mA ~ 1A | | 5.70 | 6.0 | 6.30 | V |
| Line Regulation | Δ $V_O$ | $T_j$ = 25℃ $I_O$= 0.5A | $V_I$ = 8.0V ~ 25V | | | 120 | mV |
| | | | $V_I$ = 9.0V ~ 13V | | | 60 | |
| Load Regulation | Δ $V_O$ | $T_j$ = 25℃ | $I_O$= 5mA ~ 1A | | | 120 | mV |
| | | | $I_O$= 0.25A ~ 0.75A | | | 60 | |
| Quiescent Current | $I_Q$ | $T_j$ = 25℃, $I_O$=5mA | | | | 8.0 | mA |
| Quiescent Current Change | Δ $I_Q$ | $I_O$=5mA ~ 1A | | | | 0.5 | mA |
| | | $V_I$ = 8.0V ~ 25V | | | | 1.3 | |
| Output Voltage Drift | ΔV /ΔT | $I_O$ = 5mA | | | -0.7 | | mV/℃ |
| Output Noise Voltage | $V_N$ | 10$H_Z$ ≤ f ≤ 100K$H_Z$ | | | 40 | | μV/$V_O$ |
| Ripple Rejection | RR | $T_j$ = 25℃, $V_I$ = 9V ~ 19V f = 120Hz, $I_O$ = 300mA | | 55 | 75 | | dB |
| Short Circuit Current | $I_{SC}$ | $T_j$=25℃ | | | 230 | | mA |
| Peak Out Current | $I_{PK}$ | $T_j$=25℃ | | | 1.6 | | A |
| Dropout Voltage | $V_d$ | $T_j$=25℃, $I_O$=500mA | | | 2.0 | | V |

## L7808CV **Electrical Characteristics**

($V_I$ = 14V, $I_O$ = 0.5A,$C_I$ = 0.33μF, $C_O$ = 0.1μF, $T_j$= 0 to 125℃, unless otherwise specified)

| Parameter | Symbol | Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Output Voltage | $V_O$ | $T_j$ = 25℃, $I_O$=5mA ~ 1A | | 7.70 | 8.0 | 8.30 | V |
| | | $V_I$ = 10.5V ~ 23V, $I_O$=5mA ~ 1A | | 7.60 | 8.0 | 8.40 | V |
| Line Regulation | Δ $V_O$ | $T_j$ = 25℃ $I_O$= 0.5A | $V_I$ = 10.5V ~ 25V | | | 160 | mV |
| | | | $V_I$ = 11V ~ 17V | | | 80 | |
| Load Regulation | Δ $V_O$ | $T_j$ = 25℃ | $I_O$= 5mA ~ 1A | | | 160 | mV |
| | | | $I_O$= 0.25A ~ 0.75A | | | 80 | |
| Quiescent Current | $I_Q$ | $T_j$ = 25℃, $I_O$=5mA | | | | 8.0 | mA |
| Quiescent Current Change | Δ $I_Q$ | $I_O$=5mA ~ 1A | | | | 0.5 | mA |
| | | $V_I$ = 10.5V ~ 25V | | | | 1.3 | |
| Output Voltage Drift | ΔV /ΔT | $I_O$ = 5mA | | | -0.7 | | mV/℃ |
| Output Noise Voltage | $V_N$ | 10$H_Z$ ≤ f ≤ 100K$H_Z$ | | | 58 | | μV/$V_O$ |
| Ripple Rejection | RR | $T_j$ = 25℃, $V_I$ = 11.5V ~ 21.5V f = 120Hz, $I_O$ = 300mA | | 55 | 75 | | dB |
| Short Circuit Current | $I_{SC}$ | $T_j$=25℃ | | | 230 | | mA |
| Peak Out Current | $I_{PK}$ | $T_j$=25℃ | | | 1.6 | | A |
| Dropout Voltage | $V_d$ | $T_j$=25℃, $I_O$=500mA | | | 2.0 | | V |

## L7809CV **Electrical Characteristics**

($V_I$ = 15V, $I_O$ = 0.5A,$C_I$ = 0.33μF, $C_O$ = 0.1μF, $T_j$= 0 to 125℃, unless otherwise specified)

| Parameter | Symbol | Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Output Voltage | $V_O$ | $T_j$ = 25℃, $I_O$=5mA ~ 1A | | 8.64 | 9.0 | 9.36 | V |
| | | $V_I$ = 11.5V ~ 24V, $I_O$=5mA ~ 1A | | 8.55 | 9.0 | 9.45 | V |
| Line Regulation | Δ $V_O$ | $T_j$ = 25℃ $I_O$= 0.5A | $V_I$ = 11.5V ~ 27V | | | 160 | mV |
| | | | $V_I$ = 12V ~ 16V | | | 80 | |
| Load Regulation | Δ $V_O$ | $T_j$ = 25℃ | $I_O$= 5mA ~ 1A | | | 160 | mV |
| | | | $I_O$= 0.25A ~ 0.75A | | | 80 | |
| Quiescent Current | $I_Q$ | $T_j$ = 25℃, $I_O$=5mA | | | | 8.0 | mA |
| Quiescent Current Change | Δ $I_Q$ | $I_O$=5mA ~ 1A | | | | 0.5 | mA |
| | | $V_I$ = 11.5V ~ 27V | | | | 1.3 | |
| Output Voltage Drift | ΔV /ΔT | $I_O$ = 5mA | | | -1 | | mV/℃ |
| Output Noise Voltage | $V_N$ | 10$H_Z$ ≤ f ≤ 100K$H_Z$ | | | 58 | | μV/$V_O$ |
| Ripple Rejection | RR | $T_j$ = 25℃, $V_I$ = 12V ~ 22V f = 120Hz, $I_O$ = 300mA | | 55 | 75 | | dB |
| Short Circuit Current | $I_{SC}$ | $T_j$=25℃ | | | 230 | | mA |
| Peak Out Current | $I_{PK}$ | $T_j$=25℃ | | | 1.6 | | A |
| Dropout Voltage | $V_d$ | $T_j$=25℃, $I_O$=500mA | | | 2.0 | | V |

## L7810CV **Electrical Characteristics**

($V_I$ = 16V, $I_O$ = 0.5A,$C_I$ = 0.33μF, $C_O$ = 0.1μF, $T_j$= 0 to 125℃, unless otherwise specified)

| Parameter | Symbol | Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Output Voltage | $V_O$ | $T_j$ = 25℃, $I_O$=5mA ~ 1A | | 9.6 | 10.0 | 10.4 | V |
| | | $V_I$ = 12.5V ~ 25V, $I_O$=5mA ~ 1A | | 9.5 | 10.0 | 10.5 | V |
| Line Regulation | Δ $V_O$ | $T_j$ = 25℃ $I_O$= 0.5A | $V_I$ = 12.5V ~ 27V | | | 240 | mV |
| | | | $V_I$ = 13V ~ 17V | | | 120 | |
| Load Regulation | Δ $V_O$ | $T_j$ = 25℃ | $I_O$= 5mA ~ 1A | | | 240 | mV |
| | | | $I_O$= 0.25A ~ 0.75A | | | 120 | |
| Quiescent Current | $I_Q$ | $T_j$ = 25℃, $I_O$=5mA | | | | 8.0 | mA |
| Quiescent Current Change | Δ $I_Q$ | $I_O$=5mA ~ 1A | | | | 0.5 | mA |
| | | $V_I$ = 12.5V ~ 27V | | | | 1.3 | |
| Output Voltage Drift | ΔV /ΔT | $I_O$ = 5mA | | | -1 | | mV/℃ |
| Output Noise Voltage | $V_N$ | 10$H_Z$ ≤ f ≤ 100K$H_Z$ | | | 58 | | μV/$V_O$ |
| Ripple Rejection | RR | $T_j$ = 25℃, $V_I$ = 13V ~ 23V f = 120Hz, $I_O$ = 300mA | | 55 | 75 | | dB |
| Short Circuit Current | $I_{SC}$ | $T_j$=25℃ | | | 230 | | mA |
| Peak Out Current | $I_{PK}$ | $T_j$=25℃ | | | 1.6 | | A |
| Dropout Voltage | $V_d$ | $T_j$=25℃, $I_O$=500mA | | | 2.0 | | V |

## L7812CV **Electrical Characteristics**

($V_I$ = 19V, $I_O$ = 0.5A,$C_I$ = 0.33μF, $C_O$ = 0.1μF, $T_j$= 0 to 125℃, unless otherwise specified)

| Parameter | Symbol | Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Output Voltage | $V_O$ | $T_j$ = 25℃, $I_O$=5mA ~ 1A | | 11.5 | 12.0 | 12.5 | V |
| | | $V_I$ = 14.5V ~ 27V $I_O$=5mA ~ 1A | | 11.4 | 12.0 | 12.6 | V |
| Line Regulation | Δ $V_O$ | $T_j$ = 25℃ $I_O$= 0.5A | $V_I$ = 14.5V ~ 30V | | | 240 | mV |
| | | | $V_I$ = 16V ~ 22V | | | 120 | |
| Load Regulation | Δ $V_O$ | $T_j$ = 25℃, | $I_O$= 5mA ~ 1A | | | 240 | mV |
| | | | $I_O$= 0.25A ~ 0.75A | | | 120 | |
| Quiescent Current | $I_Q$ | $T_j$ = 25℃ | | | | 8.0 | mA |
| Quiescent Current Change | Δ $I_Q$ | $I_O$=5mA ~ 1A | | | | 0.5 | mA |
| | | $V_I$ = 14.5V ~ 30V | | | | 1.3 | |
| Output Voltage Drift | ΔV /ΔT | $I_O$ = 5mA | | | -1.0 | | mV/℃ |
| Output Noise Voltage | $V_N$ | 10$H_Z$ ≤ f ≤ 100K$H_Z$ | | | 76 | | μV/$V_O$ |
| Ripple Rejection | RR | $T_j$ = 25℃, $V_I$ = 15V ~ 25V f = 120Hz, $I_O$ = 300mA | | 55 | 71 | | dB |
| Short Circuit Current | $I_{SC}$ | $T_j$=25℃ | | | 230 | | mA |
| Peak Out Current | $I_{PK}$ | $T_j$=25℃ | | | 1.6 | | A |
| Dropout Voltage | $V_d$ | $T_j$=25℃, $I_O$=500mA | | | 2.0 | | V |

## L7815CV **Electrical Characteristics**

($V_I$ = 23V, $I_O$ = 0.5A,$C_I$ = 0.33μF, $C_O$ = 0.1μF, $T_j$= 0 to 125℃, unless otherwise specified)

| Parameter | Symbol | Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Output Voltage | $V_O$ | $T_j$ = 25℃, $I_O$=5mA ~ 1A | | 14.4 | 15.0 | 15.6 | V |
| | | $V_I$ = 14.5V ~ 27V<br>$I_O$=5mA ~ 1A | | 11.25 | 15.0 | 15.75 | V |
| Line Regulation | Δ $V_O$ | $T_j$ = 25℃<br>$I_O$= 0.5A | $V_I$ = 17.5V ~ 30V | | | 300 | mV |
| | | | $V_I$ = 20V ~ 26V | | | 150 | |
| Load Regulation | Δ $V_O$ | $T_j$ = 25℃, | $I_O$= 5mA ~ 1A | | | 300 | mV |
| | | | $I_O$= 0.25A ~ 0.75A | | | 150 | |
| Quiescent Current | $I_Q$ | $T_j$ = 25℃ | | | | 8.0 | mA |
| Quiescent Current Change | Δ $I_Q$ | $I_O$=5mA ~ 1A | | | | 0.5 | mA |
| | | $V_I$ = 17.5V ~ 30V | | | | 1.3 | |
| Output Voltage Drift | ΔV /ΔT | $I_O$ = 5mA | | | -1.0 | | mV/℃ |
| Output Noise Voltage | $V_N$ | 10$H_Z$ ≤ f ≤ 100K$H_Z$ | | | 76 | | μV/$V_O$ |
| Ripple Rejection | RR | $T_j$ = 25℃, $V_I$ = 18.5V ~ 28.5V<br>f = 120Hz, $I_O$ = 300mA | | 55 | 71 | | dB |
| Short Circuit Current | $I_{SC}$ | $T_j$=25℃ | | | 230 | | mA |
| Peak Out Current | $I_{PK}$ | $T_j$=25℃ | | | 1.6 | | A |
| Dropout Voltage | $V_d$ | $T_j$=25℃, $I_O$=500mA | | | 2.0 | | V |

## L7818CV **Electrical Characteristics**

($V_I$ = 27V, $I_O$ = 0.5A,$C_I$ = 0.33μF, $C_O$ = 0.1μF, $T_j$= 0 to 125℃, unless otherwise specified)

| Parameter | Symbol | Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Output Voltage | $V_O$ | $T_j$ = 25℃, $I_O$=5mA ~ 1A | | 17.3 | 18.0 | 18.7 | V |
| | | $V_I$ = 21V ~ 33V<br>$I_O$=5mA ~ 1A | | 17.1 | 18.0 | 18.9 | V |
| Line Regulation | Δ $V_O$ | $T_j$ = 25℃<br>$I_O$= 0.5A | $V_I$ = 21V ~ 33V | | | 360 | mV |
| | | | $V_I$ = 24V ~ 30V | | | 180 | |
| Load Regulation | Δ $V_O$ | $T_j$ = 25℃, | $I_O$= 5mA ~ 1A | | | 360 | mV |
| | | | $I_O$= 0.25A ~ 0.75A | | | 180 | |
| Quiescent Current | $I_Q$ | $T_j$ = 25℃ | | | | 8.0 | mA |
| Quiescent Current Change | Δ $I_Q$ | $I_O$=5mA ~ 1A | | | | 0.5 | mA |
| | | $V_I$ = 21V ~ 33V | | | | 1.3 | |
| Output Voltage Drift | ΔV /ΔT | $I_O$ = 5mA | | | -1.0 | | mV/℃ |
| Output Noise Voltage | $V_N$ | 10$H_Z$ ≤ f ≤ 100K$H_Z$ | | | 76 | | μV/$V_O$ |
| Ripple Rejection | RR | $T_j$ = 25℃, $V_I$ = 22V ~ 32V<br>f = 120Hz, $I_O$ = 300mA | | 55 | 71 | | dB |
| Short Circuit Current | $I_{SC}$ | $T_j$=25℃ | | | 230 | | mA |
| Peak Out Current | $I_{PK}$ | $T_j$=25℃ | | | 1.6 | | A |
| Dropout Voltage | $V_d$ | $T_j$=25℃, $I_O$=500mA | | | 2.0 | | V |

## L7820CV **Electrical Characteristics**

($V_I$ = 29V, $I_O$ = 0.5A,$C_I$ = 0.33μF, $C_O$ = 0.1μF, $T_j$= 0 to 125℃, unless otherwise specified)

| Parameter | Symbol | Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Output Voltage | $V_O$ | $T_j$ = 25℃, $I_O$=5mA ~ 1A | | 19.2 | 20.0 | 20.8 | V |
| | | $V_I$ = 23V ~ 35V<br>$I_O$=5mA ~ 1A | | 19.0 | 20.0 | 21.0 | V |
| Line Regulation | Δ $V_O$ | $T_j$ = 25℃<br>$I_O$= 0.5A | $V_I$ = 23V ~ 35V | | | 400 | mV |
| | | | $V_I$ = 26V ~ 32V | | | 200 | |
| Load Regulation | Δ $V_O$ | $T_j$ = 25℃, | $I_O$= 5mA ~ 1A | | | 400 | mV |
| | | | $I_O$= 0.25A ~ 0.75A | | | 200 | |
| Quiescent Current | $I_Q$ | $T_j$ = 25℃ | | | | 8.0 | mA |
| Quiescent Current Change | Δ $I_Q$ | $I_O$=5mA ~ 1A | | | | 0.5 | mA |
| | | $V_I$ = 23V ~ 35V | | | | 1.3 | |
| Output Voltage Drift | ΔV /ΔT | $I_O$ = 5mA | | | -1.0 | | mV/℃ |
| Output Noise Voltage | $V_N$ | 10$H_Z$ ≤ f ≤ 100K$H_Z$ | | | 76 | | μV/$V_O$ |
| Ripple Rejection | RR | $T_j$ = 25℃, $V_I$ = 24V ~ 34V<br>f = 120Hz, $I_O$ = 300mA | | 55 | 71 | | dB |
| Short Circuit Current | $I_{SC}$ | $T_j$=25℃ | | | 230 | | mA |
| Peak Out Current | $I_{PK}$ | $T_j$=25℃ | | | 1.6 | | A |
| Dropout Voltage | $V_d$ | $T_j$=25℃, $I_O$=500mA | | | 2.0 | | V |

## L7824CV **Electrical Characteristics**

($V_I$ = 33V, $I_O$ = 0.5A,$C_I$ = 0.33μF, $C_O$ = 0.1μF, $T_j$= 0 to 125℃, unless otherwise specified)

| Parameter | Symbol | Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Output Voltage | $V_O$ | $T_j$ = 25℃, $I_O$=5mA ~ 1A | | 23.0 | 24.0 | 25.0 | V |
| | | $V_I$ = 27V ~ 38V<br>$I_O$=5mA ~ 1A | | 22.8 | 24.0 | 25.2 | V |
| Line Regulation | Δ $V_O$ | $T_j$ = 25℃<br>$I_O$= 0.5A | $V_I$ = 27V ~ 35V | | | 400 | mV |
| | | | $V_I$ = 30V ~ 36V | | | 200 | |
| Load Regulation | Δ $V_O$ | $T_j$ = 25℃, | $I_O$= 5mA ~ 1A | | | 400 | mV |
| | | | $I_O$= 0.25A ~ 0.75A | | | 200 | |
| Quiescent Current | $I_Q$ | $T_j$ = 25℃ | | | | 8.0 | mA |
| Quiescent Current Change | Δ $I_Q$ | $I_O$=5mA ~ 1A | | | | 0.5 | mA |
| | | $V_I$ = 27V ~ 38V | | | | 1.3 | |
| Output Voltage Drift | ΔV /ΔT | $I_O$ = 5mA | | | -1.0 | | mV/℃ |
| Output Noise Voltage | $V_N$ | 10$H_Z$ ≤ f ≤ 100K$H_Z$ | | | 76 | | μV/$V_O$ |
| Ripple Rejection | RR | $T_j$ = 25℃, $V_I$ = 28V ~ 38V<br>f = 120Hz, $I_O$ = 300mA | | 55 | 71 | | dB |
| Short Circuit Current | $I_{SC}$ | $T_j$=25℃ | | | 230 | | mA |
| Peak Out Current | $I_{PK}$ | $T_j$=25℃ | | | 1.6 | | A |
| Dropout Voltage | $V_d$ | $T_j$=25℃, $I_O$=500mA | | | 2.0 | | V |

## Test and Application Circuits

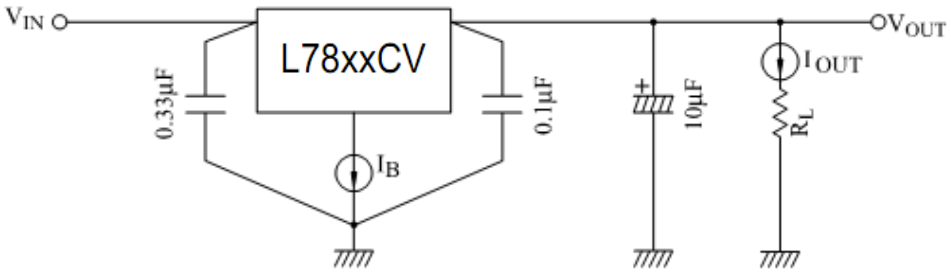



**Figure 1. Test and Application Circuits**

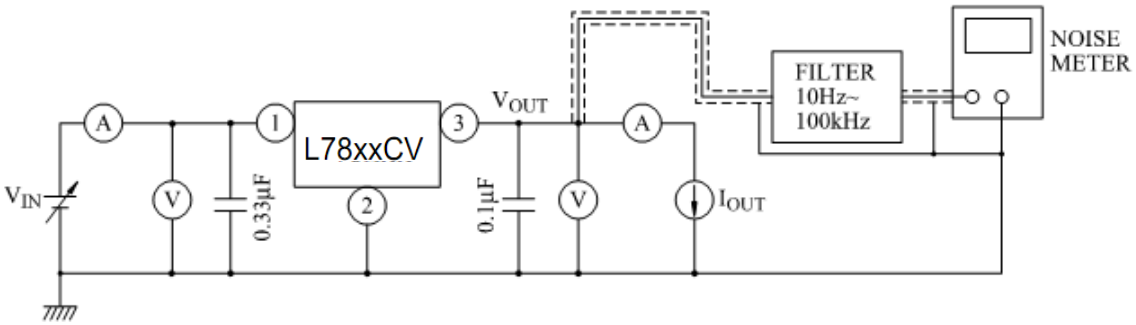



**Figure 2. $V_N$ Test Circuits**

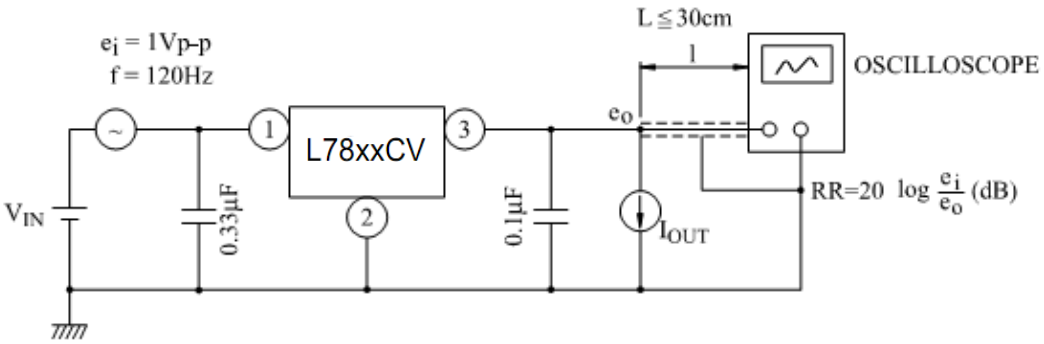



**Figure 3. Ripple Rejection**

## Application Circuits

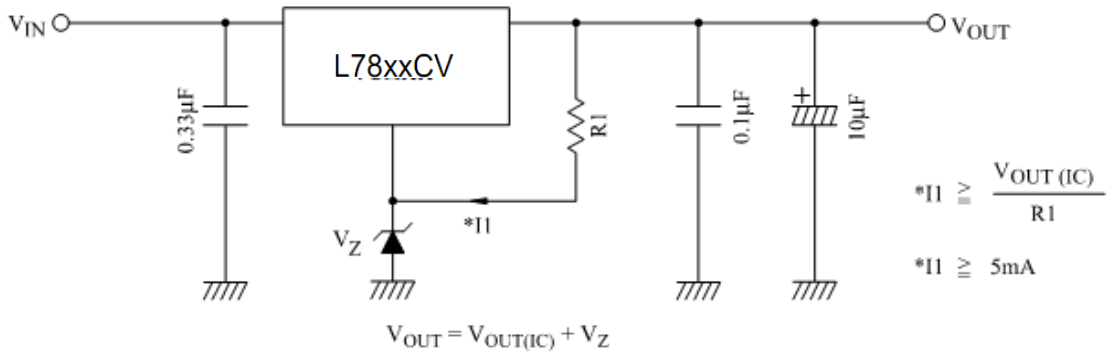



**Figure 4. Voltage boost by use of zener diode**

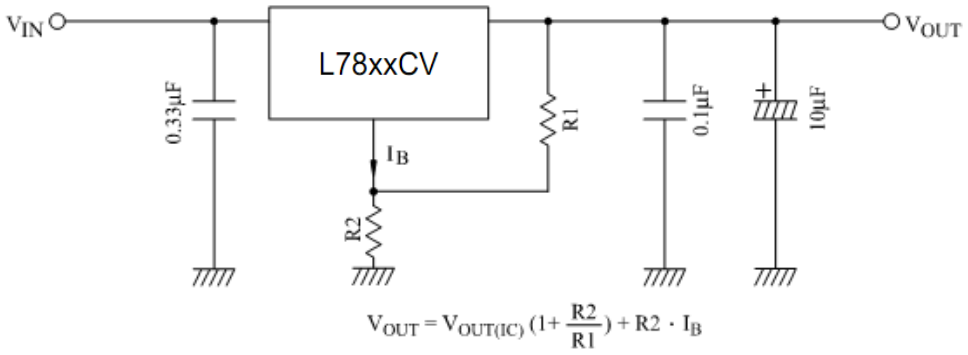



**Figure 5. Voltage boost by use of resistor**

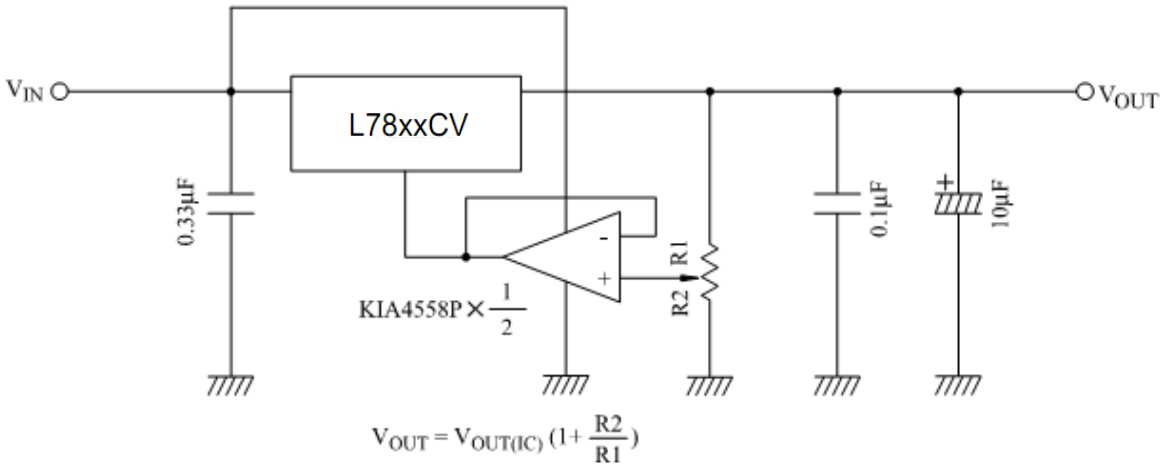



**Figure 6. Adjustable output regulator**

## Application Circuits

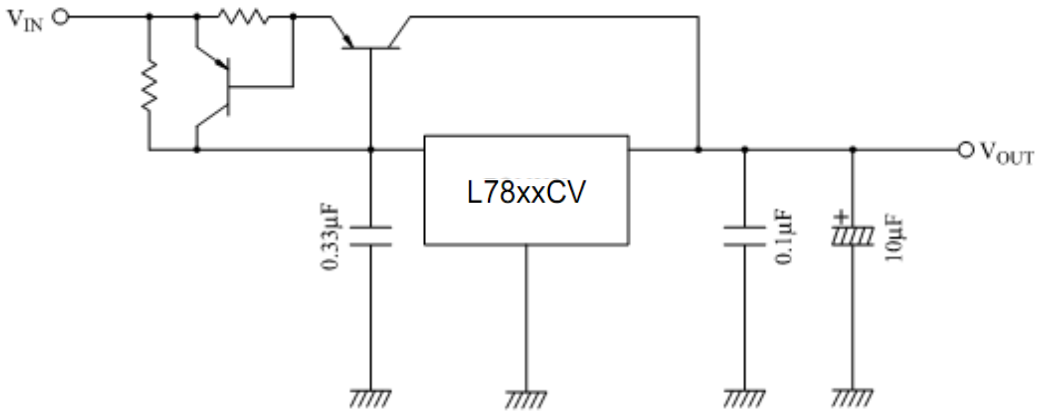



**Figure 7. Current boost regulator**

## Typical Characteristics

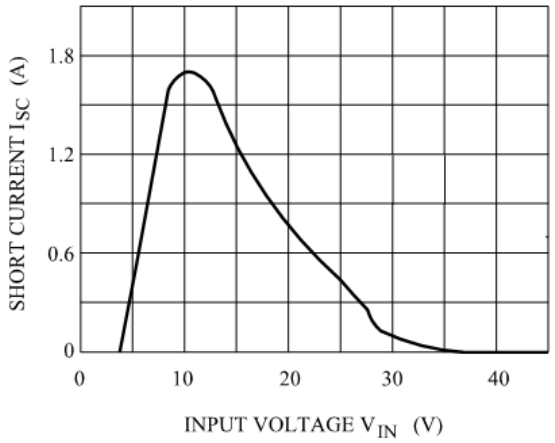



**Figure 8. Peak Output Current vs Dropout Voltage**

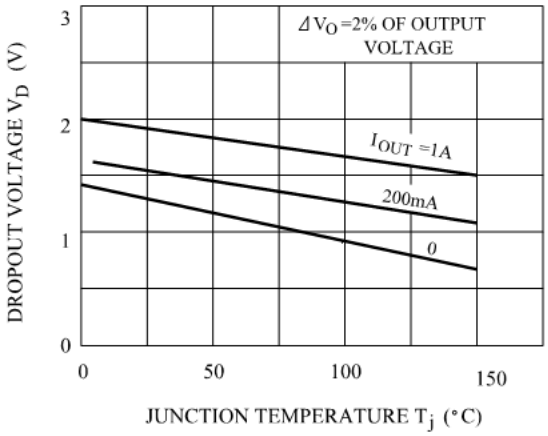



**Figure 9. Dropout Voltage vs Junction Temperature**

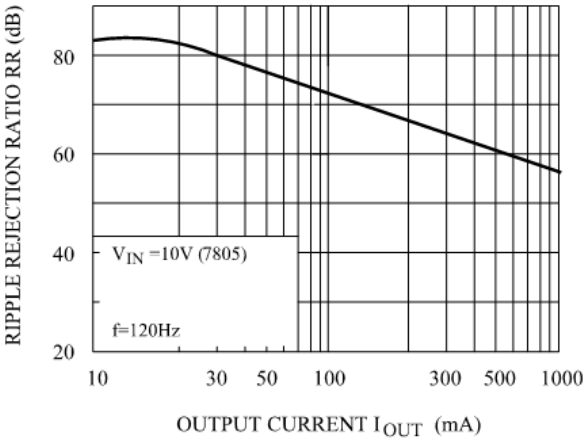



**Figure 10. Ripple Rejection vs Frequency**

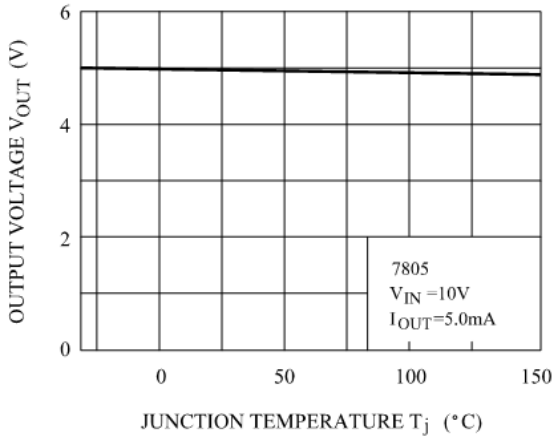
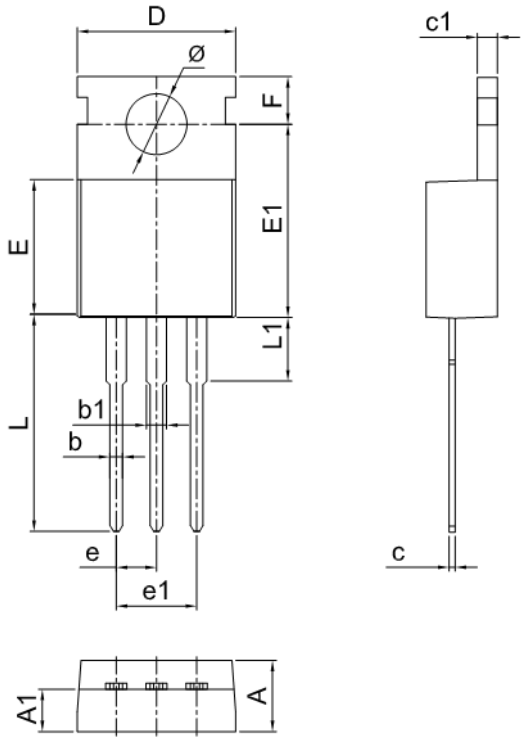



**Figure 11. Output Voltage vs Junction Temperature**

## Package Dimensions




| Dim | Millimeter | | Inches | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| A | 4.34 | 4.67 | 0.171 | 0.184 |
| A1 | 2.52 | 2.82 | 0.099 | 0.111 |
| b | 0.71 | 0.91 | 0.028 | 0.036 |
| b1 | 1.17 | 1.37 | 0.046 | 0.054 |
| c | 0.30 | 0.50 | 0.012 | 0.020 |
| c1 | 1.17 | 1.37 | 0.046 | 0.054 |
| D | 9.90 | 10.20 | 0.390 | 0.402 |
| E | 8.50 | 8.90 | 0.335 | 0.350 |
| E1 | 12.00 | 12.50 | 0.472 | 0.492 |
| e | 2.44 | 2.64 | 0.096 | 0.104 |
| e1 | 4.88 | 5.28 | 0.192 | 0.208 |
| F | 2.60 | 2.80 | 0.102 | 0.110 |
| L | 13.20 | 13.80 | 0.520 | 0.543 |
| L1 | 3.80 | 4.20 | 0.150 | 0.165 |
| Φ | 3.60 | 3.96 | 0.142 | 0.156 |