TOSHIBA Bipolar Linear Integrated Circuit Silicon Monolithic

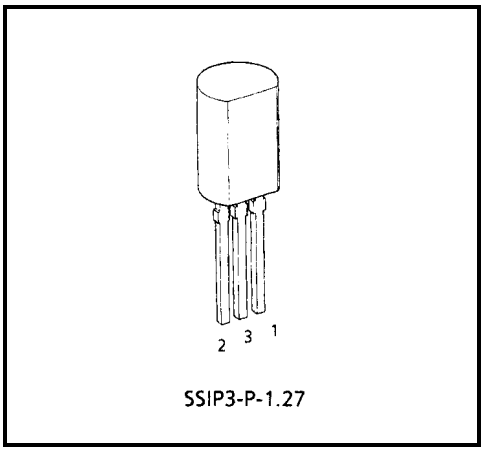
# TA79L005P,TA79L006P,TA79L008P,TA79L009P,TA79L010P, TA79L012P,TA79L015P,TA79L018P,TA79L020P,TA79L024P

−5 V, −6 V, −8 V, −9 V, −10 V, −12 V, −15 V, −18 V, −20 V, −24 V

Three-Terminal Negative Voltage Regulators

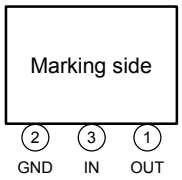
## Features

- Best suited to a power supply for TTL and $C^2MOS$.
- Built-in overcurrent protective circuit.
- Built-in thermal protective circuit.
- Maximum output current of 150 mA ($T_j$ = 25°C).
- Packaged in TO-92MOD.

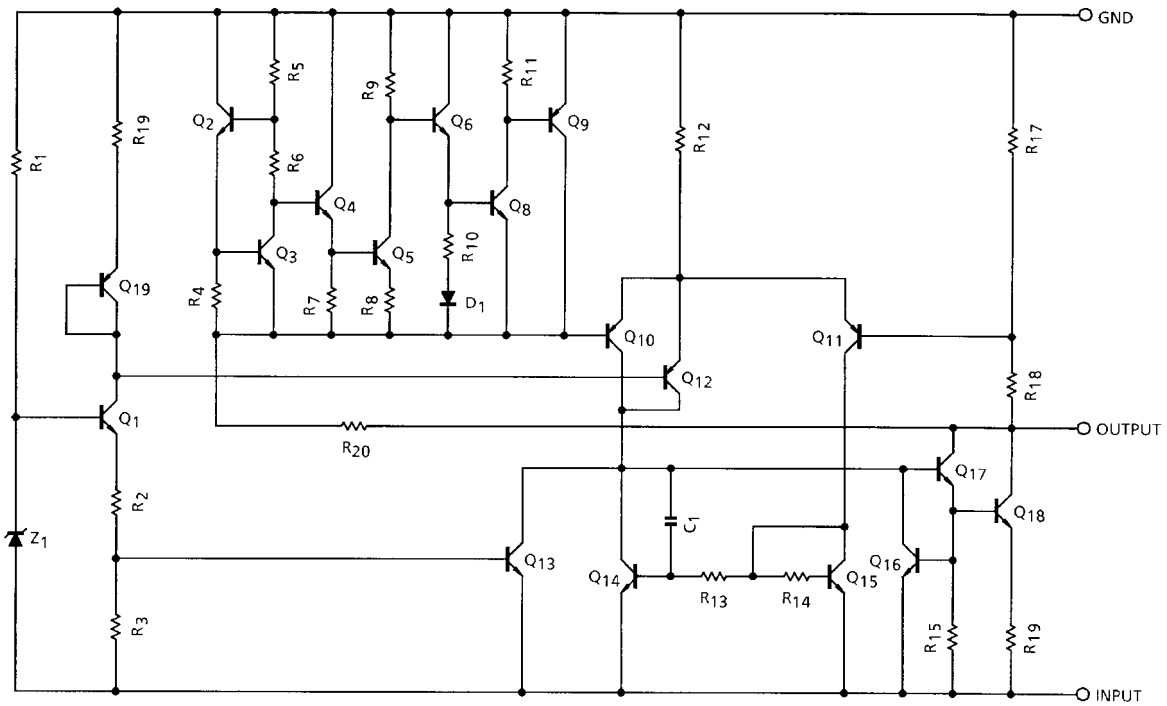



Weight: 0.36 g (Typ.)

## Pin Assignment




## Equivalent Circuit



## Maximum Ratings (Ta = 25°C)

| Characteristics | | Symbol | Rating | Unit |
|---|---|---|---|---|
| Input voltage | TA79L005P | $V_{IN}$ | −35 | V |
| | TA79L006P | | | |
| | TA79L008P | | | |
| | TA79L009P | | | |
| | TA79L010P | | | |
| | TA79L012P | | | |
| | TA79L015P | | | |
| | TA79L018P | | −40 | |
| | TA79L020P | | | |
| | TA79L024P | | | |
| Power dissipation | (Ta = 25°C) | $P_D$ | 800 | mW |
| Operating temperature | | $T_{opr}$ | −30~85 | °C |
| Storage temperature | | $T_{stg}$ | −55~150 | °C |
| Junction temperature | | $T_j$ | 150 | °C |
| Thermal resistance | | $R_{th\ (j-a)}$ | 156 | °C/W |

## TA79L005P
## Electrical Characteristics
**(Unless otherwise specified, $V_{IN}$ = −10 V, $I_{OUT}$ = 40 mA, $C_{IN}$ = 0.33 µF, $C_{OUT}$ = 0.1 µF, 0°C ≤ $T_j$ ≤ 125°C)**

| Characteristics | Symbol | Test Circuit | Test Condition | | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|---|---|
| Output voltage | $V_{OUT}$ | 1 | $T_j$ = 25°C | | −5.2 | −5.0 | −4.8 | V |
| Line regulation | Reg·line | 1 | $T_j$ = 25°C | −20 V ≤ $V_{IN}$ ≤ −7.0 V | — | 55 | 150 | mV |
| | | | | −20 V ≤ $V_{IN}$ ≤ −8.0 V | — | 45 | 100 | |
| Load regulation | Reg·load | 1 | $T_j$ = 25°C | 1.0 mA ≤ $I_{OUT}$ ≤ 100 mA | — | 11 | 60 | mV |
| | | | | 1.0 mA ≤ $I_{OUT}$ ≤ 40 mA | — | 5.0 | 30 | |
| Output voltage | $V_{OUT}$ | 1 | $T_j$ = 25°C | −20 V ≤ $V_{IN}$ ≤ −7.0 V, 1.0 mA ≤ $I_{OUT}$ ≤ 40 mA | −5.25 | — | −4.75 | V |
| | | | | 1.0 mA ≤ $I_{OUT}$ ≤ 70 mA | −5.25 | — | −4.75 | |
| Quiescent current | $I_B$ | 1 | $T_j$ = 25°C | | — | 3.1 | 6.0 | mA |
| | | | $T_j$ = 125°C | | — | — | 5.5 | |
| Quiescent current change | $\Delta I_{BI}$ | 1 | $T_j$ = 25°C | −20 V ≤ $V_{IN}$ ≤ −8.0 V | — | — | 1.5 | mA |
| | $\Delta I_{BO}$ | 1 | | 1.0 mA ≤ $I_{OUT}$ ≤ 40 mA | — | — | 0.1 | |
| Output noise voltage | $V_{NO}$ | 2 | Ta = 25°C, 10 Hz ≤ f ≤ 100 kHz | | — | 40 | — | $\mu V_{rms}$ |
| Long term stability | $\Delta V_{OUT}/\Delta t$ | 1 | — | | — | 12 | — | mV/kh |
| Ripple rejection ratio | R.R. | 3 | −18 V ≤ $V_{IN}$ ≤ −8.0 V, $T_j$ = 25°C, f = 120 Hz | | 41 | 49 | — | dB |
| Dropout voltage | $V_D$ | 1 | $T_j$ = 25°C | | — | 1.7 | — | V |
| Average temperature coefficient of output voltage | $T_{CVO}$ | 1 | $I_{OUT}$ = 5 mA | | — | 0.6 | — | mV/°C |

## TA79L006P
## Electrical Characteristics
**(Unless otherwise specified, $V_{IN}$ = −11 V, $I_{OUT}$ = 40 mA, $C_{IN}$ = 0.33 μF, $C_{OUT}$ = 0.1 μF, 0°C ≤ $T_j$ ≤ 125°C)**

| Characteristics | Symbol | Test Circuit | Test Condition | | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|---|---|
| Output voltage | $V_{OUT}$ | 1 | $T_j$ = 25°C | | −6.24 | −6.0 | −5.76 | V |
| Line regulation | Reg·line | 1 | $T_j$ = 25°C | −21 V ≤ $V_{IN}$ ≤ −8.1 V | — | 50 | 150 | mV |
| | | | | −21 V ≤ $V_{IN}$ ≤ −9.0 V | — | 45 | 110 | |
| Load regulation | Reg·load | 1 | $T_j$ = 25°C | 1.0 mA ≤ $I_{OUT}$ ≤ 100 mA | — | 12 | 70 | mV |
| | | | | 1.0 mA ≤ $I_{OUT}$ ≤ 40 mA | — | 5.5 | 35 | |
| Output voltage | $V_{OUT}$ | 1 | $T_j$ = 25°C | −21 V ≤ $V_{IN}$ ≤ −8.1 V, 1.0 mA ≤ $I_{OUT}$ ≤ 40 mA | −6.3 | — | −5.7 | V |
| | | | | 1.0 mA ≤ $I_{OUT}$ ≤ 70 mA | −6.3 | — | −5.7 | |
| Quiescent current | $I_B$ | 1 | $T_j$ = 25°C | | — | 3.1 | 6.0 | mA |
| | | | $T_j$ = 125°C | | — | — | 5.5 | |
| Quiescent current change | $\Delta I_{BI}$ | 1 | $T_j$ = 25°C | −21 V ≤ $V_{IN}$ ≤ −9.0 V | — | — | 1.5 | mA |
| | $\Delta I_{BO}$ | 1 | | 1.0 mA ≤ $I_{OUT}$ ≤ 40 mA | — | — | 0.1 | |
| Output noise voltage | $V_{NO}$ | 2 | Ta = 25°C, 10 Hz ≤ f ≤ 100 kHz | | — | 40 | — | $\mu V_{rms}$ |
| Long term stability | $\Delta V_{OUT}/\Delta t$ | 1 | — | | — | 14 | — | mV/kh |
| Ripple rejection ratio | R.R. | 3 | −19 V ≤ $V_{IN}$ ≤ −9.0 V, $T_j$ = 25°C, f = 120 Hz | | 39 | 47 | — | dB |
| Dropout voltage | $V_D$ | 1 | $T_j$ = 25°C | | — | 1.7 | — | V |
| Average temperature coefficient of output voltage | $T_{CVO}$ | 1 | $I_{OUT}$ = 5 mA | | — | 0.7 | — | mV/°C |

## TA79L008P
## Electrical Characteristics
**(Unless otherwise specified, $V_{IN}$ = −14 V, $I_{OUT}$ = 40 mA, $C_{IN}$ = 0.33 µF, $C_{OUT}$ = 0.1 µF, 0°C ≤ $T_j$ ≤ 125°C)**

| Characteristics | Symbol | Test Circuit | Test Condition | | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|---|---|
| Output voltage | $V_{OUT}$ | 1 | $T_j$ = 25°C | | −8.3 | −8.0 | −7.7 | V |
| Line regulation | Reg·line | 1 | $T_j$ = 25°C | −23 V ≤ $V_{IN}$ ≤ −10.5 V | — | 20 | 175 | mV |
| | | | | −23 V ≤ $V_{IN}$ ≤ −11 V | — | 12 | 125 | |
| Load regulation | Reg·load | 1 | $T_j$ = 25°C | 1.0 mA ≤ $I_{OUT}$ ≤ 100 mA | — | 15 | 80 | mV |
| | | | | 1.0 mA ≤ $I_{OUT}$ ≤ 40 mA | — | 7.0 | 40 | |
| Output voltage | $V_{OUT}$ | 1 | $T_j$ = 25°C | −23 V ≤ $V_{IN}$ ≤ −10.5 V, 1.0 mA ≤ $I_{OUT}$ ≤ 40 mA | −8.4 | — | −7.6 | V |
| | | | | 1.0 mA ≤ $I_{OUT}$ ≤ 70 mA | −8.4 | — | −7.6 | |
| Quiescent current | $I_B$ | 1 | $T_j$ = 25°C | | — | 3.1 | 6.5 | mA |
| | | | $T_j$ = 125°C | | — | — | 6.0 | |
| Quiescent current change | $\Delta I_{BI}$ | 1 | $T_j$ = 25°C | −23 V ≤ $V_{IN}$ ≤ −11 V | — | — | 1.5 | mA |
| | $\Delta I_{BO}$ | 1 | | 1.0 mA ≤ $I_{OUT}$ ≤ 40 mA | — | — | 0.1 | |
| Output noise voltage | $V_{NO}$ | 2 | Ta = 25°C, 10 Hz ≤ f ≤ 100 kHz | | — | 60 | — | $\mu V_{rms}$ |
| Long term stability | $\Delta V_{OUT}/\Delta t$ | 1 | — | | — | 20 | — | mV/kh |
| Ripple rejection ratio | R.R. | 3 | −23 V ≤ $V_{IN}$ ≤ −12 V, $T_j$ = 25°C, f = 120 Hz | | 37 | 45 | — | dB |
| Dropout voltage | $V_D$ | 1 | $T_j$ = 25°C | | — | 1.7 | — | V |
| Average temperature coefficient of output voltage | $T_{CVO}$ | 1 | $I_{OUT}$ = 5 mA | | — | 0.8 | — | mV/°C |

## TA79L009P
## Electrical Characteristics
**(Unless otherwise specified, $V_{IN}$ = −15 V, $I_{OUT}$ = 40 mA, $C_{IN}$ = 0.33 μF, $C_{OUT}$ = 0.1 μF, 0°C ≤ $T_j$ ≤ 125°C)**

| Characteristics | Symbol | Test Circuit | Test Condition | | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|---|---|
| Output voltage | $V_{OUT}$ | 1 | $T_j$ = 25°C | | −9.36 | −9.0 | −8.64 | V |
| Line regulation | Reg·line | 1 | $T_j$ = 25°C | −24 V ≤ $V_{IN}$ ≤ −11.4 V | — | 80 | 200 | mV |
| | | | | −24 V ≤ $V_{IN}$ ≤ −12 V | — | 20 | 160 | |
| Load regulation | Reg·load | 1 | $T_j$ = 25°C | 1.0 mA ≤ $I_{OUT}$ ≤ 100 mA | — | 17 | 90 | mV |
| | | | | 1.0 mA ≤ $I_{OUT}$ ≤ 40 mA | — | 8.0 | 45 | |
| Output voltage | $V_{OUT}$ | 1 | $T_j$ = 25°C | −24 V ≤ $V_{IN}$ ≤ −11.4 V, 1.0 mA ≤ $I_{OUT}$ ≤ 40 mA | −9.45 | — | −8.55 | V |
| | | | | 1.0 mA ≤ $I_{OUT}$ ≤ 70 mA | −9.45 | — | −8.55 | |
| Quiescent current | $I_B$ | 1 | $T_j$ = 25°C | | — | 3.2 | 6.5 | mA |
| | | | $T_j$ = 125°C | | — | — | 6.0 | |
| Quiescent current change | $\Delta I_{BI}$ | 1 | $T_j$ = 25°C | −24 V ≤ $V_{IN}$ ≤ −12 V | — | — | 1.5 | mA |
| | $\Delta I_{BO}$ | 1 | | 1.0 mA ≤ $I_{OUT}$ ≤ 40 mA | — | — | 0.1 | |
| Output noise voltage | $V_{NO}$ | 2 | Ta = 25°C, 10 Hz ≤ f ≤ 100 kHz | | — | 65 | — | $\mu V_{rms}$ |
| Long term stability | $\Delta V_{OUT}/\Delta t$ | 1 | — | | — | 21 | — | mV/kh |
| Ripple rejection ratio | R.R. | 3 | −24 V ≤ $V_{IN}$ ≤ −12 V, $T_j$ = 25°C, f = 120 Hz | | 36 | 44 | — | dB |
| Dropout voltage | $V_D$ | 1 | $T_j$ = 25°C | | — | 1.7 | — | V |
| Average temperature coefficient of output voltage | $T_{CVO}$ | 1 | $I_{OUT}$ = 5 mA | | — | 0.85 | — | mV/°C |

## TA79L010P
## Electrical Characteristics
**(Unless otherwise specified, $V_{IN}$ = −16 V, $I_{OUT}$ = 40 mA, $C_{IN}$ = 0.33 μF, $C_{OUT}$ = 0.1 μF, 0°C ≤ $T_j$ ≤ 125°C)**

| Characteristics | Symbol | Test Circuit | Test Condition | | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|---|---|
| Output voltage | $V_{OUT}$ | 1 | $T_j$ = 25°C | | −10.4 | −10.0 | −9.6 | V |
| Line regulation | Reg·line | 1 | $T_j$ = 25°C | −25 V ≤ $V_{IN}$ ≤ −12.5 V | — | 80 | 230 | mV |
| | | | | −25 V ≤ $V_{IN}$ ≤ −13 V | — | 30 | 170 | |
| Load regulation | Reg·load | 1 | $T_j$ = 25°C | 1.0 mA ≤ $I_{OUT}$ ≤ 100 mA | — | 18 | 90 | mV |
| | | | | 1.0 mA ≤ $I_{OUT}$ ≤ 40 mA | — | 8.5 | 45 | |
| Output voltage | $V_{OUT}$ | 1 | $T_j$ = 25°C | −25 V ≤ $V_{IN}$ ≤ −12.5 V, 1.0 mA ≤ $I_{OUT}$ ≤ 40 mA | −10.5 | — | −9.5 | V |
| | | | | 1.0 mA ≤ $I_{OUT}$ ≤ 70 mA | −10.5 | — | −9.5 | |
| Quiescent current | $I_B$ | 1 | $T_j$ = 25°C | | — | 3.2 | 6.5 | mA |
| | | | $T_j$ = 125°C | | — | — | 6.0 | |
| Quiescent current change | $\Delta I_{BI}$ | 1 | $T_j$ = 25°C | −25 V ≤ $V_{IN}$ ≤ −13 V | — | — | 1.5 | mA |
| | $\Delta I_{BO}$ | 1 | | 1.0 mA ≤ $I_{OUT}$ ≤ 40 mA | — | — | 0.1 | |
| Output noise voltage | $V_{NO}$ | 2 | Ta = 25°C, 10 Hz ≤ f ≤ 100 kHz | | — | 70 | — | $\mu V_{rms}$ |
| Long term stability | $\Delta V_{OUT}/\Delta t$ | 1 | — | | — | 22 | — | mV/kh |
| Ripple rejection ratio | R.R. | 3 | −24 V ≤ $V_{IN}$ ≤ −13 V, $T_j$ = 25°C, f = 120 Hz | | 36 | 43 | — | dB |
| Dropout voltage | $V_D$ | 1 | $T_j$ = 25°C | | — | 1.7 | — | V |
| Average temperature coefficient of output voltage | $T_{CVO}$ | 1 | $I_{OUT}$ = 5 mA | | — | 0.9 | — | mV/°C |

## TA79L012P
## Electrical Characteristics
**(Unless otherwise specified, $V_{IN}$ = −19 V, $I_{OUT}$ = 40 mA, $C_{IN}$ = 0.33 μF, $C_{OUT}$ = 0.1 μF, 0°C ≤ $T_j$ ≤ 125°C)**

| Characteristics | Symbol | Test Circuit | Test Condition | | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|---|---|
| Output voltage | $V_{OUT}$ | 1 | $T_j$ = 25°C | | −12.5 | −12.0 | −11.5 | V |
| Line regulation | Reg·line | 1 | $T_j$ = 25°C | −27 V ≤ $V_{IN}$ ≤ −14.5 V | — | 120 | 250 | mV |
| | | | | −27 V ≤ $V_{IN}$ ≤ −16 V | — | 100 | 200 | |
| Load regulation | Reg·load | 1 | $T_j$ = 25°C | 1.0 mA ≤ $I_{OUT}$ ≤ 100 mA | — | 20 | 100 | mV |
| | | | | 1.0 mA ≤ $I_{OUT}$ ≤ 40 mA | — | 10 | 50 | |
| Output voltage | $V_{OUT}$ | 1 | $T_j$ = 25°C | −27 V ≤ $V_{IN}$ ≤ −14.5 V, 1.0 mA ≤ $I_{OUT}$ ≤ 40 mA | −12.6 | — | −11.4 | V |
| | | | | 1.0 mA ≤ $I_{OUT}$ ≤ 70 mA | −12.6 | — | −11.4 | |
| Quiescent current | $I_B$ | 1 | $T_j$ = 25°C | | — | 3.2 | 6.5 | mA |
| | | | $T_j$ = 125°C | | — | — | 6.0 | |
| Quiescent current change | $\Delta I_{BI}$ | 1 | $T_j$ = 25°C | −27 V ≤ $V_{IN}$ ≤ −16 V | — | — | 1.5 | mA |
| | $\Delta I_{BO}$ | 1 | | 1.0 mA ≤ $I_{OUT}$ ≤ 40 mA | — | — | 0.1 | |
| Output noise voltage | $V_{NO}$ | 2 | Ta = 25°C, 10 Hz ≤ f ≤ 100 kHz | | — | 80 | — | $\mu V_{rms}$ |
| Long term stability | $\Delta V_{OUT}/\Delta t$ | 1 | — | | — | 24 | — | mV/kh |
| Ripple rejection ratio | R.R. | 3 | −25 V ≤ $V_{IN}$ ≤ −15 V, $T_j$ = 25°C, f = 120 Hz | | 37 | 42 | — | dB |
| Dropout voltage | $V_D$ | 1 | $T_j$ = 25°C | | — | 1.7 | — | V |
| Average temperature coefficient of output voltage | $T_{CVO}$ | 1 | $I_{OUT}$ = 5 mA | | — | 1.0 | — | mV/°C |

## TA79L015P
## Electrical Characteristics
**(Unless otherwise specified, $V_{IN}$ = −23 V, $I_{OUT}$ = 40 mA, $C_{IN}$ = 0.33 μF, $C_{OUT}$ = 0.1 μF, 0°C ≤ $T_j$ ≤ 125°C)**

| Characteristics | Symbol | Test Circuit | Test Condition | | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|---|---|
| Output voltage | $V_{OUT}$ | 1 | $T_j$ = 25°C | | −15.6 | −15.0 | −14.4 | V |
| Line regulation | Reg·line | 1 | $T_j$ = 25°C | −30 V ≤ $V_{IN}$ ≤ −17.5 V | — | 130 | 300 | mV |
| | | | | −30 V ≤ $V_{IN}$ ≤ −20 V | — | 110 | 250 | |
| Load regulation | Reg·load | 1 | $T_j$ = 25°C | 1.0 mA ≤ $I_{OUT}$ ≤ 100 mA | — | 25 | 150 | mV |
| | | | | 1.0 mA ≤ $I_{OUT}$ ≤ 40 mA | — | 12 | 75 | |
| Output voltage | $V_{OUT}$ | 1 | $T_j$ = 25°C | −30 V ≤ $V_{IN}$ ≤ −17.5 V, 1.0 mA ≤ $I_{OUT}$ ≤ 40 mA | −15.75 | — | −14.25 | V |
| | | | | 1.0 mA ≤ $I_{OUT}$ ≤ 70 mA | −15.75 | — | −14.25 | |
| Quiescent current | $I_B$ | 1 | $T_j$ = 25°C | | — | 3.3 | 6.5 | mA |
| | | | $T_j$ = 125°C | | — | — | 6.0 | |
| Quiescent current change | $\Delta I_{BI}$ | 1 | $T_j$ = 25°C | −30 V ≤ $V_{IN}$ ≤ −20 V | — | — | 1.5 | mA |
| | $\Delta I_{BO}$ | 1 | | 1.0 mA ≤ $I_{OUT}$ ≤ 40 mA | — | — | 0.1 | |
| Output noise voltage | $V_{NO}$ | 2 | Ta = 25°C, 10 Hz ≤ f ≤ 100 kHz | | — | 90 | — | $\mu V_{rms}$ |
| Long term stability | $\Delta V_{OUT}/\Delta t$ | 1 | — | | — | 30 | — | mV/kh |
| Ripple rejection ratio | R.R. | 3 | −28.5 V ≤ $V_{IN}$ ≤ −18.5 V, $T_j$ = 25°C, f = 120 Hz | | 34 | 39 | — | dB |
| Dropout voltage | $V_D$ | 1 | $T_j$ = 25°C | | — | 1.7 | — | V |
| Average temperature coefficient of output voltage | $T_{CVO}$ | 1 | $I_{OUT}$ = 5 mA | | — | 1.3 | — | mV/°C |

## TA79L018P
## Electrical Characteristics
**(Unless otherwise specified, $V_{IN}$ = −27 V, $I_{OUT}$ = 40 mA, $C_{IN}$ = 0.33 μF, $C_{OUT}$ = 0.1 μF, 0°C ≤ $T_j$ ≤ 125°C)**

| Characteristics | Symbol | Test Circuit | Test Condition | | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|---|---|
| Output voltage | $V_{OUT}$ | 1 | $T_j$ = 25°C | | −18.7 | −18.0 | −17.3 | V |
| Line regulation | Reg·line | 1 | $T_j$ = 25°C | −33 V ≤ $V_{IN}$ ≤ 20.7 V | — | 32 | 325 | mV |
| | | | | −33 V ≤ $V_{IN}$ ≤ −21 V | — | 27 | 275 | |
| Load regulation | Reg·load | 1 | $T_j$ = 25°C | 1.0 mA ≤ $I_{OUT}$ ≤ 100 mA | — | 30 | 170 | mV |
| | | | | 1.0 mA ≤ $I_{OUT}$ ≤ 40 mA | — | 15 | 75 | |
| Output voltage | $V_{OUT}$ | 1 | $T_j$ = 25°C | −33 V ≤ $V_{IN}$ ≤ −20.9 V, 1.0 mA ≤ $I_{OUT}$ ≤ 40 mA | −18.9 | — | −17.1 | V |
| | | | | 1.0 mA ≤ $I_{OUT}$ ≤ 70 mA | −18.9 | — | −17.1 | |
| Quiescent current | $I_B$ | 1 | $T_j$ = 25°C | | — | 3.3 | 6.5 | mA |
| | | | $T_j$ = 125°C | | — | — | 6.0 | |
| Quiescent current change | $\Delta I_{BI}$ | 1 | $T_j$ = 25°C | −33 V ≤ $V_{IN}$ ≤ −21 V | — | — | 1.5 | mA |
| | $\Delta I_{BO}$ | 1 | | 1.0 mA ≤ $I_{OUT}$ ≤ 40 mA | — | — | 0.1 | |
| Output noise voltage | $V_{NO}$ | 2 | Ta = 25°C, 10 Hz ≤ f ≤ 100 kHz | | — | 150 | — | $\mu V_{rms}$ |
| Long term stability | $\Delta V_{OUT}/\Delta t$ | 1 | — | | — | 45 | — | mV/kh |
| Ripple rejection ratio | R.R. | 3 | −33 V ≤ $V_{IN}$ ≤ −23 V, $T_j$ = 25°C, f = 120 Hz | | 33 | 48 | — | dB |
| Dropout voltage | $V_D$ | 1 | $T_j$ = 25°C | | — | 1.7 | — | V |
| Average temperature coefficient of output voltage | $T_{CVO}$ | 1 | $I_{OUT}$ = 5 mA | | — | 1.5 | — | mV/°C |

## TA79L020P
## Electrical Characteristics
**(Unless otherwise specified, $V_{IN}$ = −29 V, $I_{OUT}$ = 40 mA, $C_{IN}$ = 0.33 μF, $C_{OUT}$ = 0.1 μF, 0°C ≤ $T_j$ ≤ 125°C)**

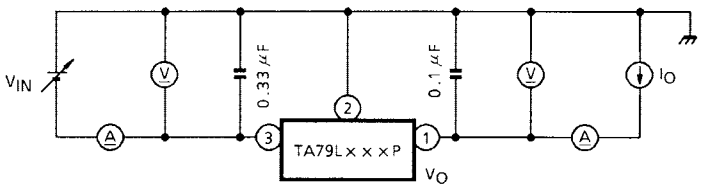
| Characteristics | Symbol | Test Circuit | Test Condition | | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|---|---|
| Output voltage | $V_{OUT}$ | 1 | $T_j$ = 25°C | | −20.8 | −20.0 | −19.2 | V |
| Line regulation | Reg·line | 1 | $T_j$ = 25°C | −35 V ≤ $V_{IN}$ ≤ −23.5 V | — | 33 | 330 | mV |
| | | | | −35 V ≤ $V_{IN}$ ≤ −24 V | — | 28 | 285 | |
| Load regulation | Reg·load | 1 | $T_j$ = 25°C | 1.0 mA ≤ $I_{OUT}$ ≤ 100 mA | — | 33 | 180 | mV |
| | | | | 1.0 mA ≤ $I_{OUT}$ ≤ 40 mA | — | 17 | 90 | |
| Output voltage | $V_{OUT}$ | 1 | $T_j$ = 25°C | −35 V ≤ $V_{IN}$ ≤ −23.5 V, 1.0 mA ≤ $I_{OUT}$ ≤ 40 mA | −21.0 | — | −19.0 | V |
| | | | | 1.0 mA ≤ $I_{OUT}$ ≤ 70 mA | −21.0 | — | −19.0 | |
| Quiescent current | $I_B$ | 1 | $T_j$ = 25°C | | — | 3.3 | 6.5 | mA |
| | | | $T_j$ = 125°C | | — | — | 6.0 | |
| Quiescent current change | $\Delta I_{BI}$ | 1 | $T_j$ = 25°C | −35 V ≤ $V_{IN}$ ≤ −24 V | — | — | 1.5 | mA |
| | $\Delta I_{BO}$ | 1 | | 1.0 mA ≤ $I_{OUT}$ ≤ 40 mA | — | — | 0.1 | |
| Output noise voltage | $V_{NO}$ | 2 | Ta = 25°C, 10 Hz ≤ f ≤ 100 kHz | | — | 170 | — | $\mu V_{rms}$ |
| Long term stability | $\Delta V_{OUT}/\Delta t$ | 1 | — | | — | 49 | — | mV/kh |
| Ripple rejection ratio | R.R. | 3 | −35 V ≤ $V_{IN}$ ≤ −27 V, $T_j$ = 25°C, f = 120 Hz | | 31 | 37 | — | dB |
| Dropout voltage | $V_D$ | 1 | $T_j$ = 25°C | | — | 1.7 | — | V |
| Average temperature coefficient of output voltage | $T_{CVO}$ | 1 | $I_{OUT}$ = 5 mA | | — | 1.7 | — | mV/°C |

## TA79L024P
## Electrical Characteristics
**(Unless otherwise specified, $V_{IN}$ = −33 V, $I_{OUT}$ = 40 mA, $C_{IN}$ = 0.33 μF, $C_{OUT}$ = 0.1 μF, 0°C ≤ $T_j$ ≤ 125°C)**

| Characteristics | Symbol | Test Circuit | Test Condition | | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|---|---|
| Output voltage | $V_{OUT}$ | 1 | $T_j$ = 25°C | | −25.0 | −24.0 | −23.0 | V |
| Line regulation | Reg·line | 1 | $T_j$ = 25°C | −38 V ≤ $V_{IN}$ ≤ −27 V | — | 35 | 350 | mV |
| | | | | −38 V ≤ $V_{IN}$ ≤ −28 V | — | 30 | 300 | |
| Load regulation | Reg·load | 1 | $T_j$ = 25°C | 1.0 mA ≤ $I_{OUT}$ ≤ 100 mA | — | 40 | 200 | mV |
| | | | | 1.0 mA ≤ $I_{OUT}$ ≤ 40 mA | — | 20 | 100 | |
| Output voltage | $V_{OUT}$ | 1 | $T_j$ = 25°C | −38 V ≤ $V_{IN}$ ≤ −27 V, 1.0 mA ≤ $I_{OUT}$ ≤ 40 mA | −25.2 | — | −22.8 | V |
| | | | | 1.0 mA ≤ $I_{OUT}$ ≤ 70 mA | −25.2 | — | −22.8 | |
| Quiescent current | $I_B$ | 1 | $T_j$ = 25°C | | — | 3.5 | 6.5 | mA |
| | | | $T_j$ = 125°C | | — | — | 6.0 | |
| Quiescent current change | $\Delta I_{BI}$ | 1 | $T_j$ = 25°C | −38 V ≤ $V_{IN}$ ≤ −28 V | — | — | 1.5 | mA |
| | $\Delta I_{BO}$ | 1 | | 1.0 mA ≤ $I_{OUT}$ ≤ 40 mA | — | — | 0.1 | |
| Output noise voltage | $V_{NO}$ | 2 | Ta = 25°C, 10 Hz ≤ f ≤ 100 kHz | | — | 200 | — | $\mu V_{rms}$ |
| Long term stability | $\Delta V_{OUT}/\Delta t$ | 1 | — | | — | 56 | — | mV/kh |
| Ripple rejection ratio | R.R. | 3 | −35 V ≤ $V_{IN}$ ≤ −29 V, $T_j$ = 25°C, f = 120 Hz | | 31 | 47 | — | dB |
| Dropout voltage | $V_D$ | 1 | $T_j$ = 25°C | | — | 1.7 | — | V |
| Average temperature coefficient of output voltage | $T_{CVO}$ | 1 | $I_{OUT}$ = 5 mA | | — | 2.0 | — | mV/°C |

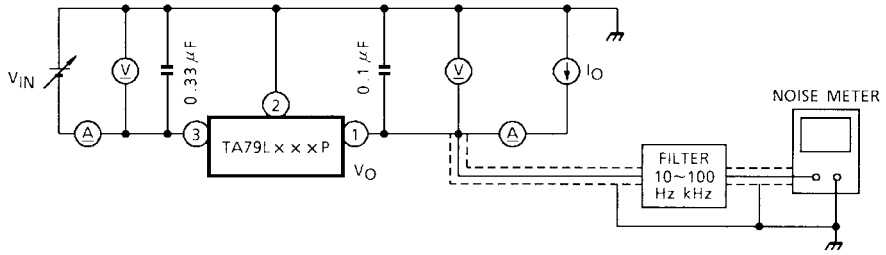
## Test Circuit 1

**$V_{OUT}$, Reg·line, Reg·load, $I_B$, $\Delta I_B$, $\Delta V_{OUT}/\Delta t$, $V_D$, $T_{CVO}$**



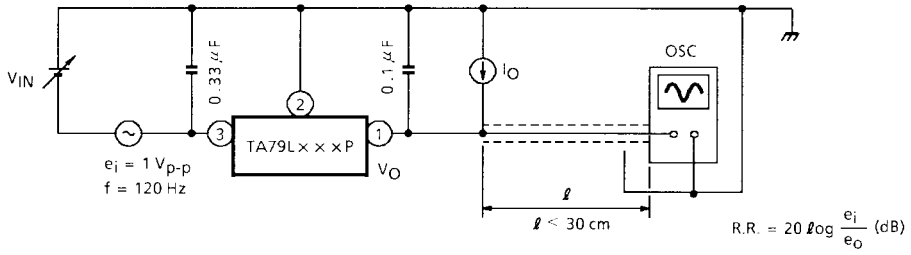

## Test Circuit 2

**$V_{NO}$**

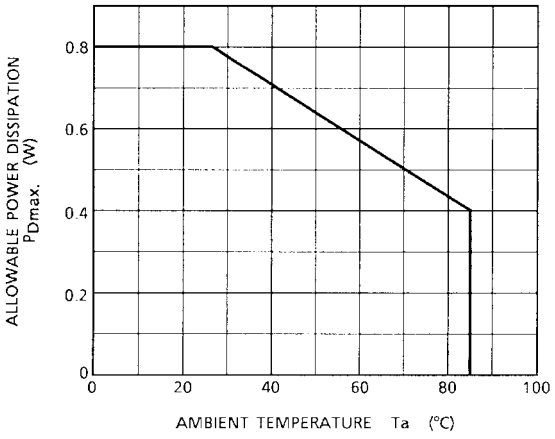



## Test Circuit 3

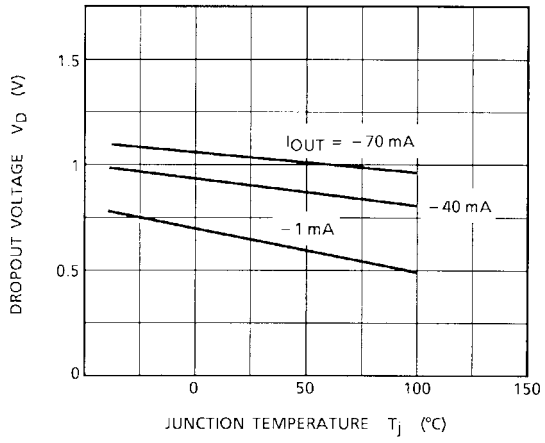
**R.R.**



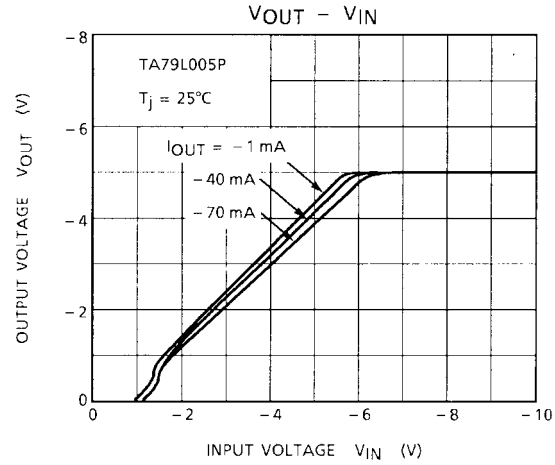
$P_{Dmax.}$ – Ta



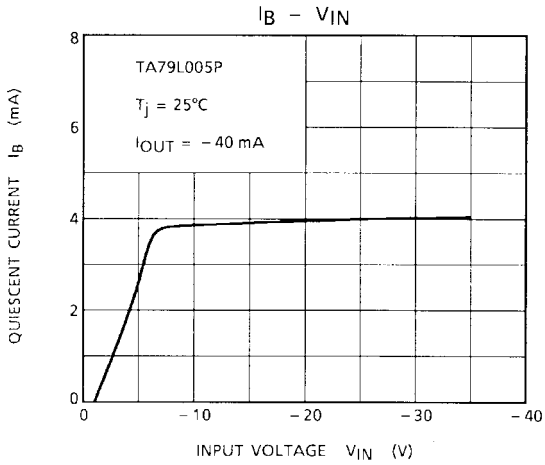

$V_D$ – $T_j$



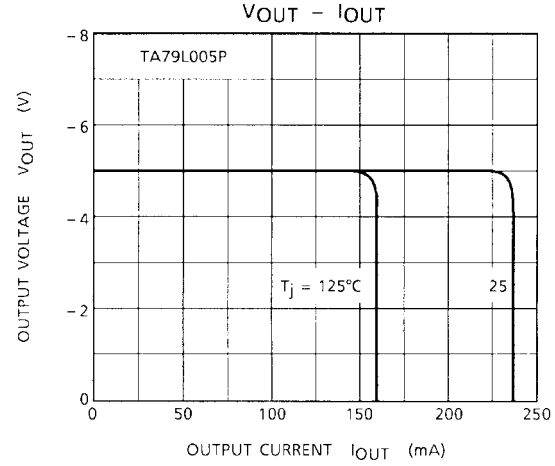

$V_{OUT}$ – $V_{IN}$




$I_B$ – $V_{IN}$

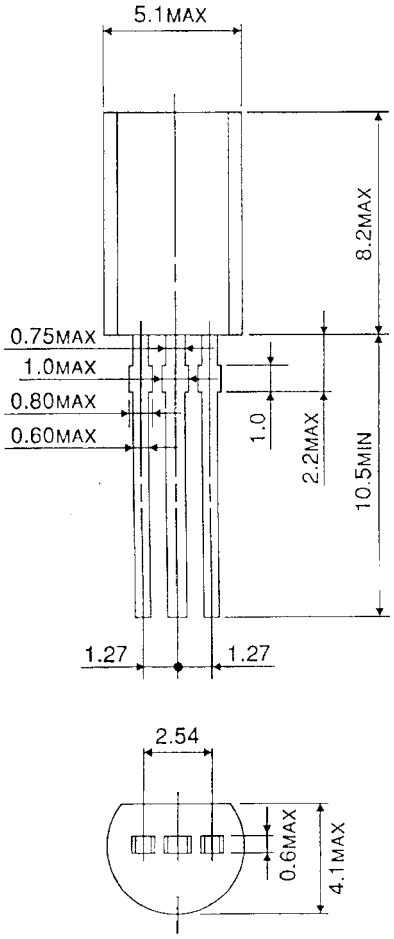



$V_{OUT}$ – $I_{OUT}$



## Package Dimensions

SSIP3-P-1.27 Unit : mm




Weight : 0.36 g (Typ.)

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000707EBA

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