

# HA178L02/56/06/09/10 Series

## 3-terminal Fixed Voltage Regulators

REJ03D0918-0100

Rev.1.00

Jan 16, 2009

### Description

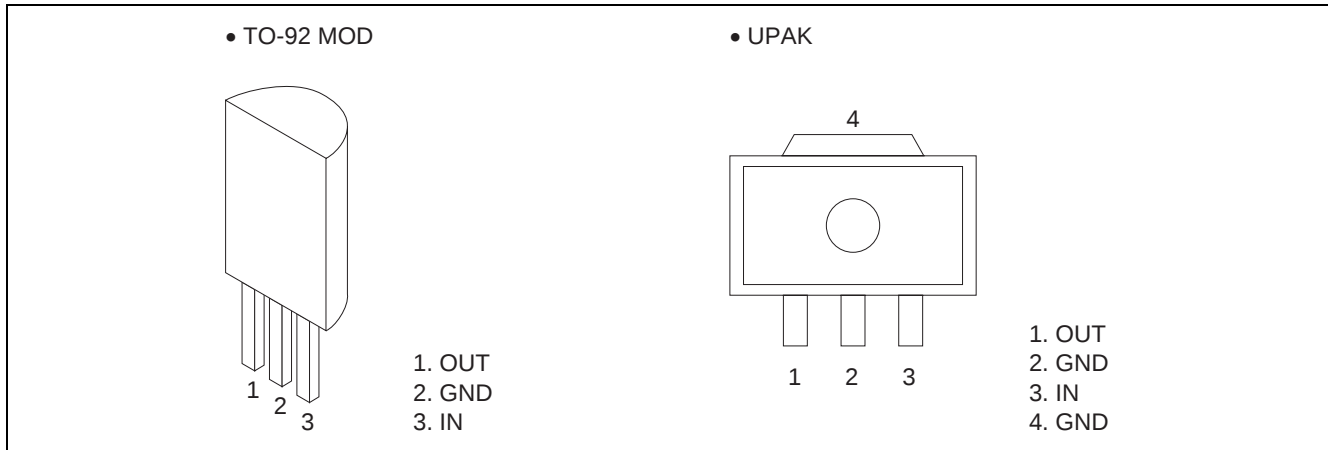
The HA178L02/56/06/09/10 series three-terminal fixed output voltage regulators. Can be used not only as stabilized power sources, but also as Zener diodes because of their small outline package.

### Features

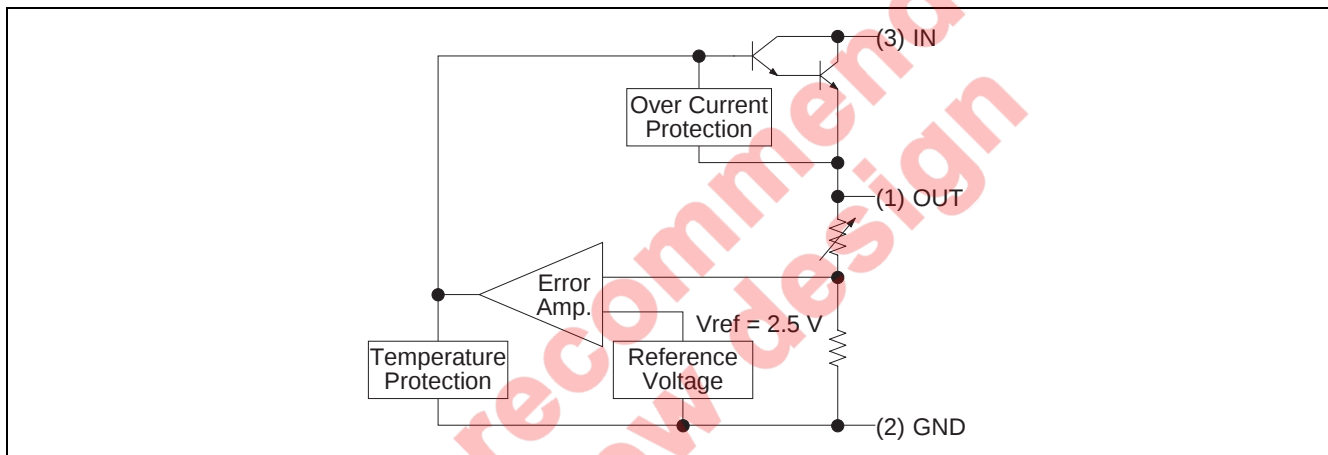
- Maximum output current: 150 mA ( $T_j = 25^\circ\text{C}$ )
- Large maximum power dissipation: 800 mW
- Over current protection
- Temperature protection circuit
- Ordering Information

| Part No.      | Output Voltage (V) | Output Voltage Tolerance (%) | Package Name | Package Code | Taping Abbreviation (Quantity) | Application    |
|---------------|--------------------|------------------------------|--------------|--------------|--------------------------------|----------------|
| HA178L02-TZ   | 2.5                | $\pm 8$                      | TO-92MOD     | PRSS0003DC-A | TZ (2,500pcs/box)              | Commercial use |
| HA178L02P-TZ  |                    |                              |              |              |                                | Industrial use |
| HA178L02A-TZ  |                    | $\pm 5$                      | UPAK         | PLZZ0004CA-A | TL (1,000pcs/reel)             | Commercial use |
| HA178L02PA-TZ |                    |                              |              |              |                                | Industrial use |
| HA178L02UA-TL |                    |                              |              |              |                                | Commercial use |
| HA178L56-TZ   | 5.6                | $\pm 8$                      | TO-92MOD     | PRSS0003DC-A | TZ (2,500pcs/box)              | Commercial use |
| HA178L56P-TZ  |                    |                              |              |              |                                | Industrial use |
| HA178L56A-TZ  |                    | $\pm 5$                      | UPAK         | PLZZ0004CA-A | TL (1,000pcs/reel)             | Commercial use |
| HA178L56PA-TZ |                    |                              |              |              |                                | Industrial use |
| HA178L56UA-TL |                    |                              |              |              |                                | Commercial use |
| HA178L06-TZ   | 6                  | $\pm 8$                      | TO-92MOD     | PRSS0003DC-A | TZ (2,500pcs/box)              | Commercial use |
| HA178L06P-TZ  |                    |                              |              |              |                                | Industrial use |
| HA178L06A-TZ  |                    | $\pm 5$                      | UPAK         | PLZZ0004CA-A | TL (1,000pcs/reel)             | Commercial use |
| HA178L06PA-TZ |                    |                              |              |              |                                | Industrial use |
| HA178L06UA-TL |                    |                              |              |              |                                | Commercial use |
| HA178L09-TZ   | 9                  | $\pm 8$                      | TO-92MOD     | PRSS0003DC-A | TZ (2,500pcs/box)              | Commercial use |
| HA178L09P-TZ  |                    |                              |              |              |                                | Industrial use |
| HA178L09A-TZ  |                    | $\pm 5$                      | UPAK         | PLZZ0004CA-A | TL (1,000pcs/reel)             | Commercial use |
| HA178L09PA-TZ |                    |                              |              |              |                                | Industrial use |
| HA178L09UA-TL |                    |                              |              |              |                                | Commercial use |
| HA178L10-TZ   | 10                 | $\pm 8$                      | TO-92MOD     | PRSS0003DC-A | TZ (2,500pcs/box)              | Commercial use |
| HA178L10P-TZ  |                    |                              |              |              |                                | Industrial use |
| HA178L10A-TZ  |                    | $\pm 5$                      | UPAK         | PLZZ0004CA-A | TL (1,000pcs/reel)             | Commercial use |
| HA178L10PA-TZ |                    |                              |              |              |                                | Industrial use |
| HA178L10UA-TL |                    |                              |              |              |                                | Commercial use |

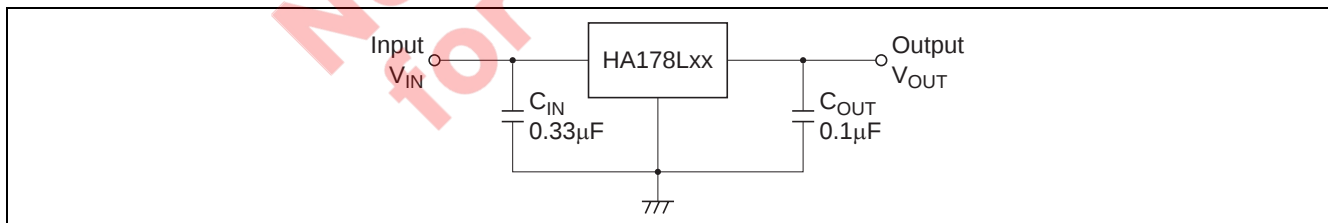
## Pin Arrangement



## Block Diagram



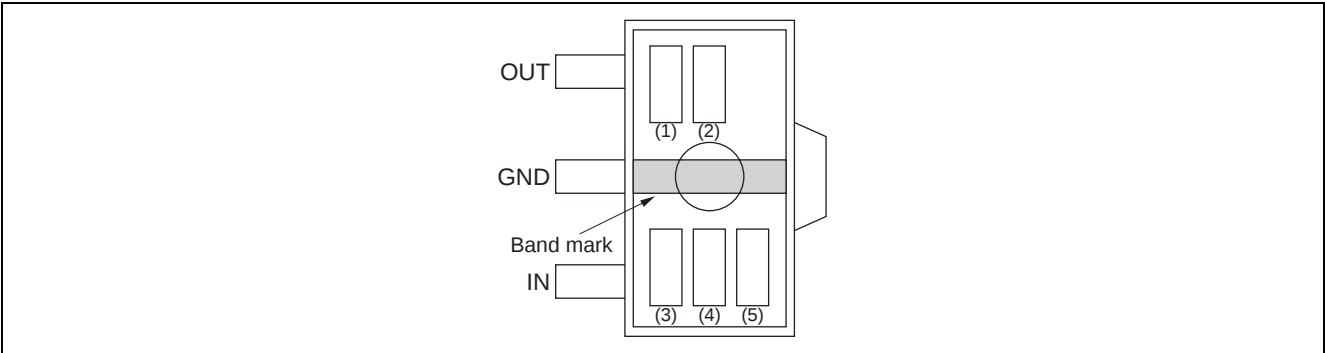
## Standard Circuit



UPAK Product (HA178LxxUA) Mark Patterns

The mark patterns shown below are used on UPAK products, as the package is small. Note that the product code and mark pattern are different.

The pattern is laser-printed.



- Notes: 1. Boxes (1) to (5) in the figures show the position of the letters or numerals, and are not actually marked on the package.  
2. (1) and (2) show the product-specific mark pattern.

| Output Voltage (V) | Part No.   | Mark Pattern (2 digit) |
|--------------------|------------|------------------------|
| 2.5                | HA178L02UA | 8A                     |
| 5.6                | HA178L56UA | 8C                     |
| 6                  | HA178L06UA | 8D                     |
| 9                  | HA178L09UA | 8F                     |
| 10                 | HA178L10UA | 8G                     |

3. (3) shows the production year code (the last digit of the year).  
4. (4) shows the production month code.

|                  |   |   |   |   |   |   |   |   |   |    |    |    |
|------------------|---|---|---|---|---|---|---|---|---|----|----|----|
| Production Month | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Marked Code      | A | B | C | D | E | F | G | H | J | K  | L  | M  |

5. (5) shows the production week code.

## Absolute Maximum Ratings

(Ta = 25°C)

| Item                          | Symbol   | Rating      | Unit | Note                     |
|-------------------------------|----------|-------------|------|--------------------------|
| Input voltage                 | $V_{IN}$ | 35          | V    |                          |
| Power dissipation             | $P_T$    | 800         | mW   | TO-92 MOD * <sup>1</sup> |
|                               |          | 800         |      | UPAK * <sup>2</sup>      |
| Operating ambient temperature | Topr     | −40 to +85  | °C   |                          |
| Storage temperature           | Tstg     | −55 to +150 | °C   |                          |

Note: 1. Ta ≤ 25°C, If Ta &gt; 25°C, derate by 6.4 mW/°C (See figure A)

2. 15mm × 25mm × 0.7 mm alumina ceramic board, Ta ≤ 25°C (See figure B)

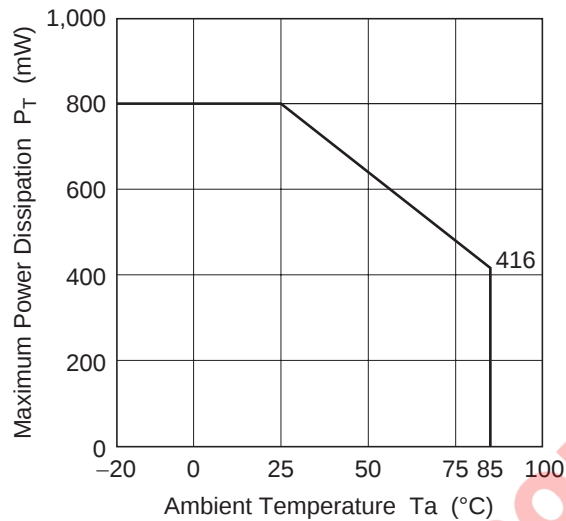


Figure A

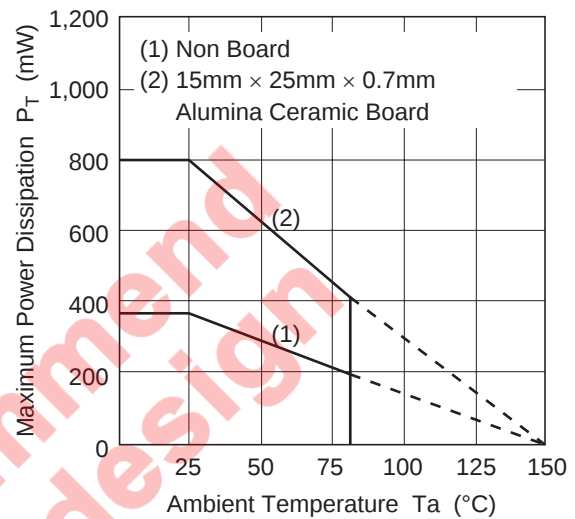


Figure B

## Electrical Characteristics

## HA178L02

(V<sub>IN</sub> = 10 V, I<sub>OUT</sub> = 40 mA, 0°C ≤ T<sub>j</sub> ≤ 125°C, C<sub>IN</sub> = 0.33 μF, C<sub>OUT</sub> = 0.1 μF)

| Item                                      | Symbol                             | HA178L02P<br>HA178L02 |      |      | HA178L02PA<br>HA178L02A<br>HA178L02UA |      |      | Unit  | Test Conditions                                                          |
|-------------------------------------------|------------------------------------|-----------------------|------|------|---------------------------------------|------|------|-------|--------------------------------------------------------------------------|
|                                           |                                    | Min                   | Typ  | Max  | Min                                   | Typ  | Max  |       |                                                                          |
| Output voltage                            | V <sub>OUT</sub>                   | 2.32                  | 2.48 | 2.64 | 2.38                                  | 2.48 | 2.58 | V     | T <sub>j</sub> = 25°C                                                    |
| Line regulation                           | ΔV <sub>OLINE</sub>                | —                     | 35   | 125  | —                                     | 35   | 95   | mV    | T <sub>j</sub> = 25°C                                                    |
|                                           |                                    | —                     | 30   | 100  | —                                     | 30   | 75   |       | 7 V ≤ V <sub>IN</sub> ≤ 20 V<br>8 V ≤ V <sub>IN</sub> ≤ 20 V             |
| Load regulation                           | ΔV <sub>OLOAD</sub>                | —                     | 14   | —    | —                                     | 14   | —    | mV    | T <sub>j</sub> = 25°C                                                    |
|                                           |                                    | —                     | 9.5  | 50   | —                                     | 9.5  | 50   |       | 1.0 mA ≤ I <sub>OUT</sub> ≤ 150 mA<br>1.0 mA ≤ I <sub>OUT</sub> ≤ 100 mA |
|                                           |                                    | —                     | 4.5  | 25   | —                                     | 4.5  | 25   |       | 1.0 mA ≤ I <sub>OUT</sub> ≤ 40 mA                                        |
| Output voltage                            | V <sub>OUT</sub>                   | 2.28                  | —    | 2.68 | 2.35                                  | —    | 2.61 | V     | 7 V ≤ V <sub>IN</sub> ≤ 20 V,<br>1.0 mA ≤ I <sub>OUT</sub> ≤ 40 mA       |
|                                           |                                    | 2.28                  | —    | 2.68 | 2.35                                  | —    | 2.61 |       | V <sub>IN</sub> = 9 V, 1.0 mA ≤ I <sub>OUT</sub> ≤ 70 mA                 |
| Quiescent current                         | I <sub>Q</sub>                     | —                     | 3.0  | 6.0  | —                                     | 3.0  | 6.0  | mA    | T <sub>j</sub> = 25°C                                                    |
| Quiescent current change                  | ΔI <sub>Q</sub>                    | —                     | —    | 1.5  | —                                     | —    | 1.5  | mA    | 8.0 V ≤ V <sub>IN</sub> ≤ 20 V, T <sub>j</sub> = 25°C                    |
|                                           |                                    | —                     | —    | 0.2  | —                                     | —    | 0.1  |       | 1.0 mA ≤ I <sub>OUT</sub> ≤ 40 mA, T <sub>j</sub> = 25°C                 |
| Ripple rejection ratio                    | R <sub>REJ</sub>                   | —                     | 60   | —    | —                                     | 60   | —    | dB    | f = 120 Hz, 8.0 V ≤ V <sub>IN</sub> < 18 V,<br>T <sub>j</sub> = 25°C     |
| Temperature coefficient of output voltage | ΔV <sub>OUT</sub> /ΔT <sub>j</sub> | —                     | +0.2 | —    | —                                     | +0.2 | —    | mV/°C | I <sub>OUT</sub> = 5 mA                                                  |

## HA178L56

(V<sub>IN</sub> = 11 V, I<sub>OUT</sub> = 40 mA, 0°C ≤ T<sub>j</sub> ≤ 125°C, C<sub>IN</sub> = 0.33 μF, C<sub>OUT</sub> = 0.1 μF)

| Item                                      | Symbol                             | HA178L56P<br>HA178L56 |      |      | HA178L56PA<br>HA178L56A<br>HA178L56UA |      |      | Unit  | Test Conditions                                                          |
|-------------------------------------------|------------------------------------|-----------------------|------|------|---------------------------------------|------|------|-------|--------------------------------------------------------------------------|
|                                           |                                    | Min                   | Typ  | Max  | Min                                   | Typ  | Max  |       |                                                                          |
| Output voltage                            | V <sub>OUT</sub>                   | 5.24                  | 5.6  | 5.96 | 5.38                                  | 5.6  | 5.82 | V     | T <sub>j</sub> = 25°C                                                    |
| Line regulation                           | ΔV <sub>OLINE</sub>                | —                     | 50   | 200  | —                                     | 50   | 150  | mV    | T <sub>j</sub> = 25°C                                                    |
|                                           |                                    | —                     | 45   | 150  | —                                     | 45   | 100  |       | 7.6 V ≤ V <sub>IN</sub> ≤ 21 V<br>8.5 V ≤ V <sub>IN</sub> ≤ 21 V         |
| Load regulation                           | ΔV <sub>OLOAD</sub>                | —                     | 17   | —    | —                                     | 17   | —    | mV    | T <sub>j</sub> = 25°C                                                    |
|                                           |                                    | —                     | 11   | 60   | —                                     | 11   | 60   |       | 1.0 mA ≤ I <sub>OUT</sub> ≤ 150 mA<br>1.0 mA ≤ I <sub>OUT</sub> ≤ 100 mA |
|                                           |                                    | —                     | 5.0  | 30   | —                                     | 5.0  | 30   |       | 1.0 mA ≤ I <sub>OUT</sub> ≤ 40 mA                                        |
| Output voltage                            | V <sub>OUT</sub>                   | 5.16                  | —    | 6.04 | 5.32                                  | —    | 5.88 | V     | 7.6 V ≤ V <sub>IN</sub> ≤ 21 V,<br>1.0 mA ≤ I <sub>OUT</sub> ≤ 40 mA     |
|                                           |                                    | 5.16                  | —    | 6.04 | 5.32                                  | —    | 5.88 |       | V <sub>IN</sub> = 11 V, 1.0 mA ≤ I <sub>OUT</sub> ≤ 70 mA                |
| Quiescent current                         | I <sub>Q</sub>                     | —                     | 3.0  | 6.0  | —                                     | 3.0  | 6.0  | mA    | T <sub>j</sub> = 25°C                                                    |
| Quiescent current change                  | ΔI <sub>Q</sub>                    | —                     | —    | 1.5  | —                                     | —    | 1.5  | mA    | 8.5 V ≤ V <sub>IN</sub> ≤ 2.0 V, T <sub>j</sub> = 25°C                   |
|                                           |                                    | —                     | —    | 0.2  | —                                     | —    | 0.1  |       | 1.0 mA ≤ I <sub>OUT</sub> ≤ 40 mA, T <sub>j</sub> = 25°C                 |
| Ripple rejection ratio                    | R <sub>REJ</sub>                   | —                     | 58   | —    | —                                     | 58   | —    | dB    | f = 120 Hz, 8.5 V ≤ V <sub>IN</sub> < 18.5 V,<br>T <sub>j</sub> = 25°C   |
| Temperature coefficient of output voltage | ΔV <sub>OUT</sub> /ΔT <sub>j</sub> | —                     | +0.1 | —    | —                                     | +0.1 | —    | mV/°C | I <sub>OUT</sub> = 5 mA                                                  |
| Dropout voltage                           | V <sub>DROP</sub>                  | —                     | 1.7  | —    | —                                     | 1.7  | —    | V     | T <sub>j</sub> = 25°C                                                    |

## HA178L06

(V<sub>IN</sub> = 11 V, I<sub>OUT</sub> = 40 mA, 0°C ≤ T<sub>J</sub> ≤ 125°C, C<sub>IN</sub> = 0.33 μF, C<sub>OUT</sub> = 0.1 μF)

| Item                                      | Symbol                             | HA178L06P<br>HA178L06 |      |      | HA178L06PA<br>HA178L06A<br>HA178L06UA |      |      | Unit  | Test Conditions                                                      |
|-------------------------------------------|------------------------------------|-----------------------|------|------|---------------------------------------|------|------|-------|----------------------------------------------------------------------|
|                                           |                                    | Min                   | Typ  | Max  | Min                                   | Typ  | Max  |       |                                                                      |
| Output voltage                            | V <sub>OUT</sub>                   | 5.61                  | 6.0  | 6.39 | 5.76                                  | 6.0  | 6.24 | V     | T <sub>J</sub> = 25°C                                                |
| Line regulation                           | ΔV <sub>OLINE</sub>                | —                     | 50   | 200  | —                                     | 50   | 150  | mV    | 8.1 V ≤ V <sub>IN</sub> ≤ 21 V                                       |
|                                           |                                    | —                     | 45   | 150  | —                                     | 45   | 110  |       | 9.0 V ≤ V <sub>IN</sub> ≤ 21 V                                       |
| Load regulation                           | ΔV <sub>OLOAD</sub>                | —                     | 17.5 | —    | —                                     | 17.5 | —    | mV    | 1.0 mA ≤ I <sub>OUT</sub> ≤ 150 mA                                   |
|                                           |                                    | —                     | 12   | 70   | —                                     | 12   | 70   |       | 1.0 mA ≤ I <sub>OUT</sub> ≤ 100 mA                                   |
|                                           |                                    | —                     | 5.5  | 35   | —                                     | 5.5  | 35   |       | 1.0 mA ≤ I <sub>OUT</sub> ≤ 40 mA                                    |
| Output voltage                            | V <sub>OUT</sub>                   | 5.52                  | —    | 6.48 | 5.7                                   | —    | 6.3  | V     | 8.1 V ≤ V <sub>IN</sub> ≤ 21 V,<br>1.0 mA ≤ I <sub>OUT</sub> ≤ 40 mA |
|                                           |                                    | 5.52                  | —    | 6.48 | 5.7                                   | —    | 6.3  |       | V <sub>IN</sub> = 11 V, 1.0 mA ≤ I <sub>OUT</sub> ≤ 70 mA            |
| Quiescent current                         | I <sub>Q</sub>                     | —                     | 3.0  | 6.0  | —                                     | 3.0  | 6.0  | mA    | T <sub>J</sub> = 25°C                                                |
| Quiescent current change                  | ΔI <sub>Q</sub>                    | —                     | —    | 1.5  | —                                     | —    | 1.5  | mA    | 9.0 V ≤ V <sub>IN</sub> ≤ 20 V, T <sub>J</sub> = 25°C                |
|                                           |                                    | —                     | —    | 0.2  | —                                     | —    | 0.1  |       | 1.0 mA ≤ I <sub>OUT</sub> ≤ 40 mA, T <sub>J</sub> = 25°C             |
| Ripple rejection ratio                    | R <sub>REJ</sub>                   | —                     | 57   | —    | —                                     | 57   | —    | dB    | f = 120 Hz, 9.0 V ≤ V <sub>IN</sub> < 19 V,<br>T <sub>J</sub> = 25°C |
| Temperature coefficient of output voltage | ΔV <sub>OUT</sub> /ΔT <sub>J</sub> | —                     | +0.1 | —    | —                                     | +0.1 | —    | mV/°C | I <sub>OUT</sub> = 5 mA                                              |
| Dropout voltage                           | V <sub>DROP</sub>                  | —                     | 1.7  | —    | —                                     | 1.7  | —    | V     | T <sub>J</sub> = 25°C                                                |

## HA178L09

(V<sub>IN</sub> = 15 V, I<sub>OUT</sub> = 40 mA, 0°C ≤ T<sub>J</sub> ≤ 125°C, C<sub>IN</sub> = 0.33 μF, C<sub>OUT</sub> = 0.1 μF)

| Item                                      | Symbol                             | HA178L09P<br>HA178L09 |       |      | HA178L09PA<br>HA178L09A<br>HA178L09UA |       |      | Unit  | Test Conditions                                                       |
|-------------------------------------------|------------------------------------|-----------------------|-------|------|---------------------------------------|-------|------|-------|-----------------------------------------------------------------------|
|                                           |                                    | Min                   | Typ   | Max  | Min                                   | Typ   | Max  |       |                                                                       |
| Output voltage                            | V <sub>OUT</sub>                   | 8.42                  | 9.0   | 9.58 | 8.64                                  | 9.0   | 9.36 | V     | T <sub>J</sub> = 25°C                                                 |
| Line regulation                           | ΔV <sub>OLINE</sub>                | —                     | 80    | 230  | —                                     | 80    | 200  | mV    | 11.4 V ≤ V <sub>IN</sub> ≤ 24 V                                       |
|                                           |                                    | —                     | 20    | 160  | —                                     | 20    | 160  |       | 12 V ≤ V <sub>IN</sub> ≤ 24 V                                         |
| Load regulation                           | ΔV <sub>OLOAD</sub>                | —                     | 24.5  | —    | —                                     | 24.5  | —    | mV    | 1.0 mA ≤ I <sub>OUT</sub> ≤ 150 mA                                    |
|                                           |                                    | —                     | 17    | 90   | —                                     | 17    | 90   |       | 1.0 mA ≤ I <sub>OUT</sub> ≤ 100 mA                                    |
|                                           |                                    | —                     | 8.0   | 45   | —                                     | 8.0   | 45   |       | 1.0 mA ≤ I <sub>OUT</sub> ≤ 40 mA                                     |
| Output voltage                            | V <sub>OUT</sub>                   | 8.28                  | —     | 9.72 | 8.55                                  | —     | 9.45 | V     | 11.4 V ≤ V <sub>IN</sub> ≤ 24 V,<br>1.0 mA ≤ I <sub>OUT</sub> ≤ 40 mA |
|                                           |                                    | 8.28                  | —     | 9.72 | 8.55                                  | —     | 9.45 |       | V <sub>IN</sub> = 15 V, 1.0 mA ≤ I <sub>OUT</sub> ≤ 70 mA             |
| Quiescent current                         | I <sub>Q</sub>                     | —                     | 3.1   | 6.5  | —                                     | 3.1   | 6.5  | mA    | T <sub>J</sub> = 25°C                                                 |
| Quiescent current change                  | ΔI <sub>Q</sub>                    | —                     | —     | 1.5  | —                                     | —     | 1.5  | mA    | 12 V ≤ V <sub>IN</sub> ≤ 24 V, T <sub>J</sub> = 25°C                  |
|                                           |                                    | —                     | —     | 0.2  | —                                     | —     | 0.1  |       | 1.0 mA ≤ I <sub>OUT</sub> ≤ 40 mA, T <sub>J</sub> = 25°C              |
| Ripple rejection ratio                    | R <sub>REJ</sub>                   | —                     | 55    | —    | —                                     | 55    | —    | dB    | f = 120 Hz, 12 V ≤ V < 24 V,<br>T <sub>J</sub> = 25°C                 |
| Temperature coefficient of output voltage | ΔV <sub>OUT</sub> /ΔT <sub>J</sub> | —                     | −0.15 | —    | —                                     | −0.15 | —    | mV/°C | I <sub>OUT</sub> = 5 mA                                               |
| Dropout voltage                           | V <sub>DROP</sub>                  | —                     | 1.7   | —    | —                                     | 1.7   | —    | V     | T <sub>J</sub> = 25°C                                                 |

## HA178L10

(V<sub>IN</sub> = 16 V, I<sub>OUT</sub> = 40 mA, 0°C ≤ T<sub>j</sub> ≤ 125°C, C<sub>IN</sub> = 0.33 μF, C<sub>OUT</sub> = 0.1 μF)

| Item                                      | Symbol                             | HA178L10P<br>HA178L10 |      |       | HA178L10PA<br>HA178L10A<br>HA178L10UA |      |      | Unit  | Test Conditions                                                       |
|-------------------------------------------|------------------------------------|-----------------------|------|-------|---------------------------------------|------|------|-------|-----------------------------------------------------------------------|
|                                           |                                    | Min                   | Typ  | Max   | Min                                   | Typ  | Max  |       |                                                                       |
| Output voltage                            | V <sub>OUT</sub>                   | 9.35                  | 10   | 10.65 | 9.6                                   | 10   | 10.4 | V     | T <sub>j</sub> = 25°C                                                 |
| Line regulation                           | ΔV <sub>OLINE</sub>                | —                     | 80   | 230   | —                                     | 80   | 230  | mV    | 12.5 V ≤ V <sub>IN</sub> ≤ 25 V                                       |
|                                           |                                    | —                     | 30   | 170   | —                                     | 30   | 170  |       | 13 V ≤ V <sub>IN</sub> ≤ 25 V                                         |
| Load regulation                           | ΔV <sub>OLOAD</sub>                | —                     | 26   | —     | —                                     | 26   | —    | mV    | 1.0 mA ≤ I <sub>OUT</sub> ≤ 150 mA                                    |
|                                           |                                    | —                     | 18   | 90    | —                                     | 18   | 90   |       | 1.0 mA ≤ I <sub>OUT</sub> ≤ 100 mA                                    |
|                                           |                                    | —                     | 8.5  | 45    | —                                     | 8.5  | 45   |       | 1.0 mA ≤ I <sub>OUT</sub> ≤ 40 mA                                     |
| Output voltage                            | V <sub>OUT</sub>                   | 9.2                   | —    | 10.8  | 9.5                                   | —    | 10.5 | V     | 12.5 V ≤ V <sub>IN</sub> ≤ 25 V,<br>1.0 mA ≤ I <sub>OUT</sub> ≤ 40 mA |
|                                           |                                    | 9.2                   | —    | 10.8  | 9.5                                   | —    | 10.5 |       | V <sub>IN</sub> = 16 V, 1.0 mA ≤ I <sub>OUT</sub> ≤ 70 mA             |
| Quiescent current                         | I <sub>Q</sub>                     | —                     | 3.1  | 6.5   | —                                     | 3.1  | 6.5  | mA    | T <sub>j</sub> = 25°C                                                 |
| Quiescent current change                  | ΔI <sub>Q</sub>                    | —                     | —    | 1.5   | —                                     | —    | 1.5  | mA    | 13 V ≤ V <sub>IN</sub> ≤ 25 V, T <sub>j</sub> = 25°C                  |
|                                           |                                    | —                     | —    | 0.2   | —                                     | —    | 0.1  |       | 1.0 mA ≤ I <sub>OUT</sub> ≤ 40 mA, T <sub>j</sub> = 25°C              |
| Ripple rejection ratio                    | R <sub>REJ</sub>                   | —                     | 54   | —     | —                                     | 54   | —    | dB    | f = 120 Hz, 13 V ≤ V <sub>IN</sub> < 24 V,<br>T <sub>j</sub> = 25°C   |
| Temperature coefficient of output voltage | ΔV <sub>OUT</sub> /ΔT <sub>j</sub> | —                     | −0.2 | —     | —                                     | −0.2 | —    | mV/°C | I <sub>OUT</sub> = 5 mA                                               |
| Dropout voltage                           | V <sub>DROP</sub>                  | —                     | 1.7  | —     | —                                     | 1.7  | —    | V     | T <sub>j</sub> = 25°C                                                 |

Not recommended  
for new design



Notes:

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