

HA179L00 Series

3-terminal Negative Fixed Voltage Regulators

REJ03D0690-0200

Rev.2.00

Oct 26, 2006

Description

The HA179L00 series are three-terminal fixed output voltage regulators. These are small outline packages which are useful ICs. For application example, as Zener diodes, easy stabilized power sources.

Features

- Some kinds output voltage series
- Superior ripple rejection ratio for audio frequency
- Large maximum power dissipation: 800 mW
- Over current and over temperature protection

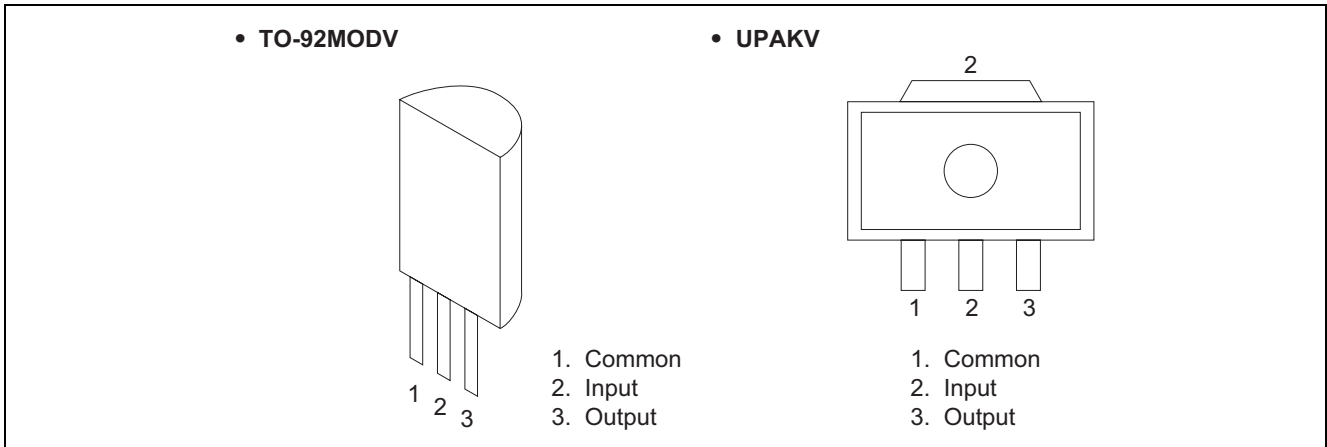
Ordering Information

| Application | Output Voltage | Type No. | Package Code (Package Name) |
|----------------|----------------|-----------|-----------------------------|
| Industrial use | -5 | HA179L05P | PRSS0003DC-A (TO-92MODV) |
| | -6 | HA179L06P | |
| | -8 | HA179L08P | |
| | -9 | HA179L09P | |
| | -10 | HA179L10P | |
| | -12 | HA179L12P | |
| | -15 | HA179L15P | |
| Commercial use | -5 | HA179L05 | PRSS0003DC-A (TO-92MODV) |
| | -6 | HA179L06 | |
| | -8 | HA179L08 | |
| | -9 | HA179L09 | |
| | -10 | HA179L10 | |
| | -12 | HA179L12 | |
| | -15 | HA179L15 | |
| Commercial use | -5 | HA179L05U | PLZZ0004CA-A (UPAK) |
| | -6 | HA179L06U | |
| | -8 | HA179L08U | |
| | -9 | HA179L09U | |
| | -10 | HA179L10U | |
| | -12 | HA179L12U | |
| | -15 | HA179L15U | |

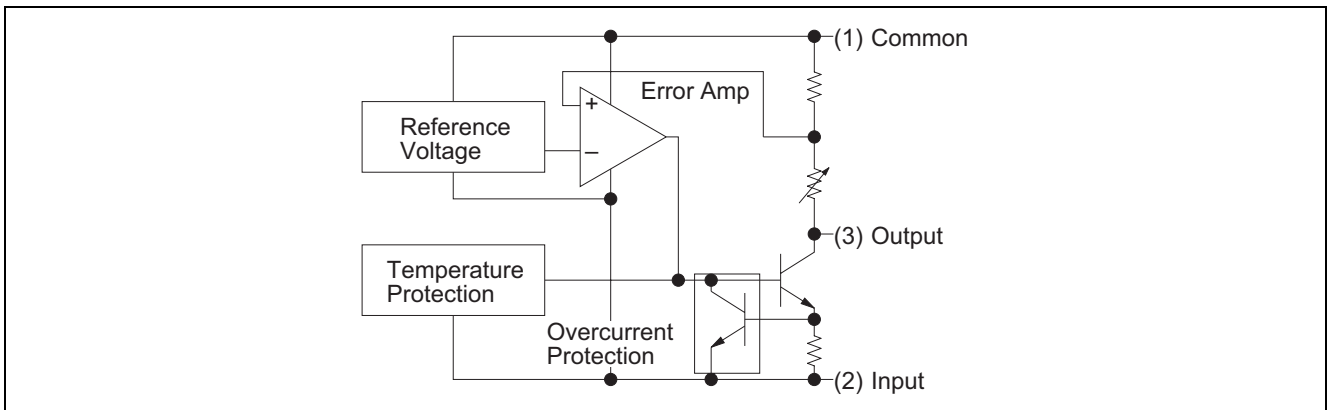
Output Voltage Accuracy Grade

| Use | Standard ($\pm 4\%$) |
|----------------|------------------------|
| Industrial Use | HA179L00P |
| Commercial Use | HA179L00 |
| | HA179L00U |

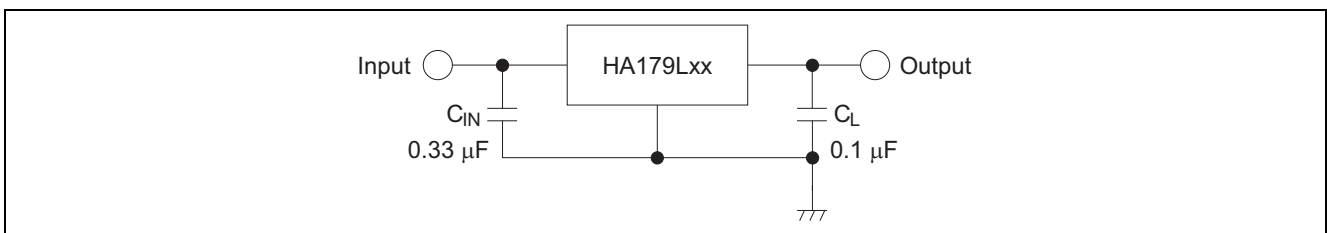
Pin Arrangement



Block Diagram



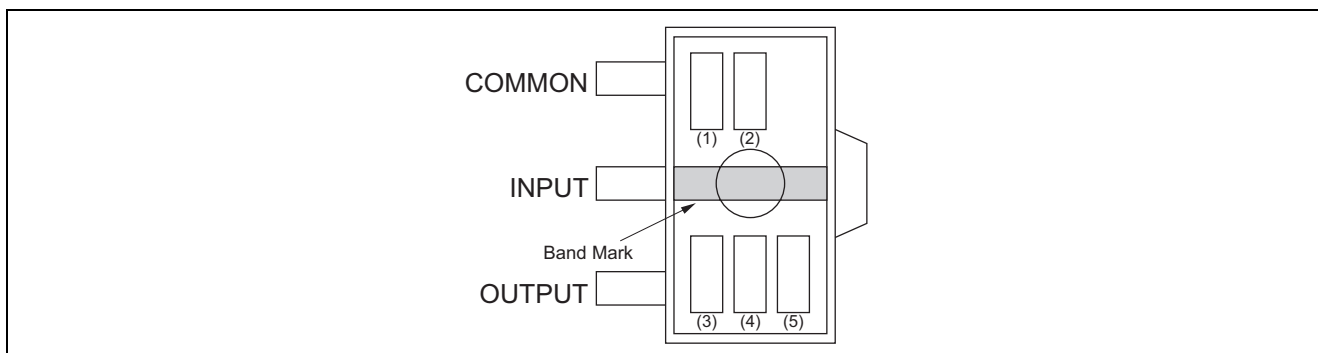
Standard Circuit



UPAKV Product (HA179L00U) Mark Patterns

The mark patterns shown below are used on UPAKV 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. (see table 1)

Table 1

| Output Voltage (V) | Type No. | Mark Pattern (2 digit) |
|--------------------|-----------|------------------------|
| -5 | HA179L05U | 9B |
| -6 | HA179L06U | 9D |
| -8 | HA179L08U | 9E |
| -9 | HA179L09U | 9F |
| -10 | HA179L10U | 9G |
| -12 | HA179L12U | 9H |
| -15 | HA179L15U | 9J |

3. (3) shows the production year code (the last digit of the year).
 4. (4) shows the production month code (see table 2).

Table 2

| | | | | | | | | | | | | |
|------------------|---|---|---|---|---|---|---|---|---|----|----|----|
| 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 |

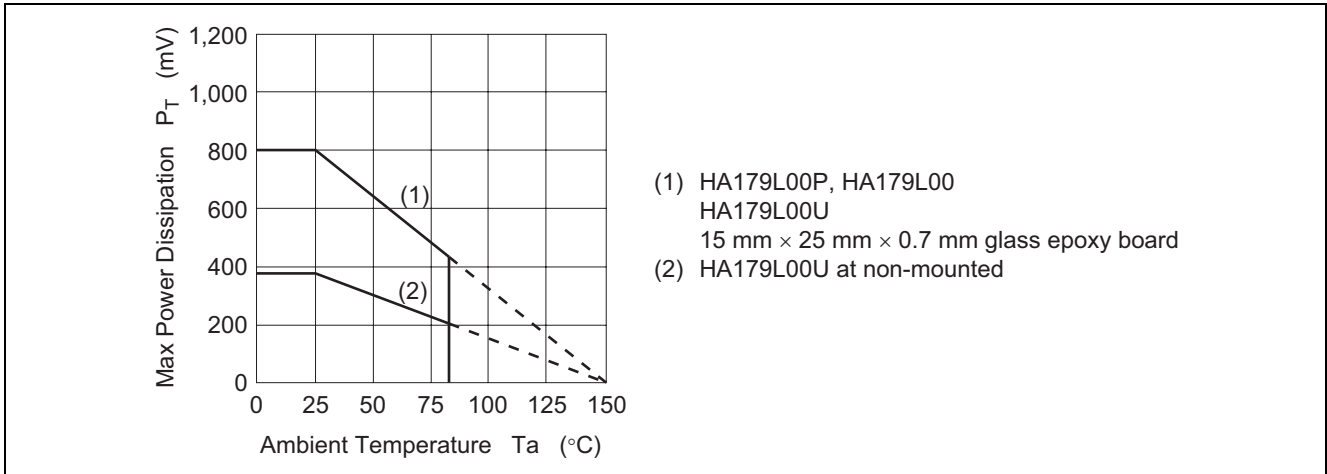
5. (5) shows the production week code.

Absolute Maximum Ratings

(Ta = 25°C)

| Item | Symbol | Rating | | Unit |
|-------------------------------|-------------------------------|----------------------------|--------------------|------|
| | | HA179L00P, HA179L00 Series | HA179L00U Series | |
| Input voltage | V _{IN} | -35 | -35 | V |
| Max power dissipation | P _T * ¹ | 800 | 800 * ² | mW |
| Operating ambient temperature | T _{opr} | -40 to +85 | -40 to +85 | °C |
| Storage temperature | T _{stg} | -55 to +150 | -55 to +150 | °C |

- Notes: 1. Ta ≤ 25°C, If Ta > 25°C, derate by 6.4 mW/°C
 2. 15 mm × 25 mm × 0.7 mm glass epoxy board, Ta ≤ 25°C



Electrical Characteristics

HA179L05P, HA179L05, HA179L05U

(V_{IN} = -10 V, I_{OUT} = 40 mA, 0°C ≤ T_j ≤ 125°C, C_{IN} = 0.33 μF, C_L = 0.1 μF)

| Item | Symbol | Min | Typ | Max | Unit | Test Condition |
|------------------------------|---------------------|-------|------|-------|------|--|
| Output voltage | V _{OUT} | -4.8 | -5.0 | -5.2 | V | T _j = 25°C |
| | | -4.75 | — | -5.25 | | V _{IN} = -10 V, 1.0 mA ≤ I _{OUT} ≤ 70 mA |
| Line regulation | ΔV _{OLINE} | — | 55 | 150 | mV | T _j = 25°C |
| | | — | 45 | 100 | | -20 V ≤ V _{IN} ≤ -7 V -20 V ≤ V _{IN} ≤ -8 V |
| Load regulation | ΔV _{OLOAD} | — | 16 | — | mV | T _j = 25°C |
| | | — | 11 | 60 | | 1.0 mA ≤ I _{OUT} ≤ 150 mA 1.0 mA ≤ I _{OUT} ≤ 100 mA |
| | | — | 5.0 | 30 | | 1.0 mA ≤ I _{OUT} ≤ 40 mA |
| Quiescent current | I _Q | — | 2.0 | 4.0 | mA | T _j = 25°C |
| Quiescent current change | ΔI _Q | — | — | 1.5 | mA | T _j = 25°C |
| | | — | — | 1.0 | | -20 V ≤ V _{IN} ≤ -8.0 V 1.0 mA ≤ I _{OUT} ≤ 40 mA |
| Voltage drop | V _{DROP} | — | 1.3 | — | V | T _j = 25°C |
| Output short circuit current | I _{OS} | — | 300 | — | mA | T _j = 25°C |

HA179L06P, HA179L06, HA179L06U

(V_{IN} = -11 V, I_{OUT} = 40 mA, 0°C ≤ T_j ≤ 125°C, C_{IN} = 0.33 μF, C_L = 0.1 μF)

| Item | Symbol | Min | Typ | Max | Unit | Test Condition |
|------------------------------|---------------------|-------|------|-------|------|--|
| Output voltage | V _{OUT} | -5.76 | -6.0 | -6.24 | V | T _j = 25°C |
| | | -5.70 | — | -6.30 | | V _{IN} = -11 V, 1.0 mA ≤ I _{OUT} ≤ 70 mA |
| Line regulation | ΔV _{OLINE} | — | 50 | 150 | mV | T _j = 25°C |
| | | — | 45 | 110 | | -21 V ≤ V _{IN} ≤ -8.1 V -21 V ≤ V _{IN} ≤ -9.0 V |
| Load regulation | ΔV _{OLOAD} | — | 17.5 | — | mV | T _j = 25°C |
| | | — | 12 | 70 | | 1.0 mA ≤ I _{OUT} ≤ 150 mA 1.0 mA ≤ I _{OUT} ≤ 100 mA |
| | | — | 5.5 | 35 | | 1.0 mA ≤ I _{OUT} ≤ 40 mA |
| Quiescent current | I _Q | — | 2.0 | 4.0 | mA | T _j = 25°C |
| Quiescent current change | ΔI _Q | — | — | 1.5 | mA | T _j = 25°C |
| | | — | — | 1.0 | | -21 V ≤ V _{IN} ≤ -9.0 V 1.0 mA ≤ I _{OUT} ≤ 40 mA |
| Voltage drop | V _{DROP} | — | 1.3 | — | V | T _j = 25°C |
| Output short circuit current | I _{OS} | — | 300 | — | mA | T _j = 25°C |

HA179L08P, HA179L08, HA179L08U

($V_{IN} = -14\text{ V}$, $I_{OUT} = 40\text{ mA}$, $0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$, $C_{IN} = 0.33\ \mu\text{F}$, $C_L = 0.1\ \mu\text{F}$)

| Item | Symbol | Min | Typ | Max | Unit | Test Condition |
|------------------------------|--------------------|-------|------|-------|------|--|
| Output voltage | V_{OUT} | -7.68 | -8.0 | -8.32 | V | $T_j = 25^\circ\text{C}$ |
| | | -7.60 | — | -8.40 | | $V_{IN} = -14\text{ V}$, $1.0\text{ mA} \leq I_{OUT} \leq 70\text{ mA}$ |
| Line regulation | ΔV_{OLINE} | — | 65 | 175 | mV | $T_j = 25^\circ\text{C}$ |
| | | — | 55 | 125 | | $-23\text{ V} \leq V_{IN} \leq -10.5\text{ V}$ $-23\text{ V} \leq V_{IN} \leq -11\text{ V}$ |
| Load regulation | ΔV_{OLOAD} | — | 22 | — | mV | $T_j = 25^\circ\text{C}$ |
| | | — | 15 | 80 | | $1.0\text{ mA} \leq I_{OUT} \leq 150\text{ mA}$ $1.0\text{ mA} \leq I_{OUT} \leq 100\text{ mA}$ |
| | | — | 7.0 | 40 | | $1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$ |
| Quiescent current | I_Q | — | 2.0 | 4.0 | mA | $T_j = 25^\circ\text{C}$ |
| Quiescent current change | ΔI_Q | — | — | 1.5 | mA | $T_j = 25^\circ\text{C}$ |
| | | — | — | 1.0 | | $-23\text{ V} \leq V_{IN} \leq -11\text{ V}$ $1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$ |
| Voltage drop | V_{DROP} | — | 1.3 | — | V | $T_j = 25^\circ\text{C}$ |
| Output short circuit current | I_{OS} | — | 270 | — | mA | $T_j = 25^\circ\text{C}$ |

HA179L09P, HA179L09, HA179L09U

($V_{IN} = -15\text{ V}$, $I_{OUT} = 40\text{ mA}$, $0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$, $C_{IN} = 0.33\ \mu\text{F}$, $C_L = 0.1\ \mu\text{F}$)

| Item | Symbol | Min | Typ | Max | Unit | Test Condition |
|------------------------------|--------------------|-------|------|-------|------|--|
| Output voltage | V_{OUT} | -8.64 | -9.0 | -9.36 | V | $T_j = 25^\circ\text{C}$ |
| | | -8.55 | — | -9.45 | | $V_{IN} = -15\text{ V}$, $1.0\text{ mA} \leq I_{OUT} \leq 70\text{ mA}$ |
| Line regulation | ΔV_{OLINE} | — | 80 | 200 | mV | $T_j = 25^\circ\text{C}$ |
| | | — | 70 | 160 | | $-24\text{ V} \leq V_{IN} \leq -11.4\text{ V}$ $-24\text{ V} \leq V_{IN} \leq -12\text{ V}$ |
| Load regulation | ΔV_{OLOAD} | — | 24.5 | — | mV | $T_j = 25^\circ\text{C}$ |
| | | — | 17 | 90 | | $1.0\text{ mA} \leq I_{OUT} \leq 150\text{ mA}$ $1.0\text{ mA} \leq I_{OUT} \leq 100\text{ mA}$ |
| | | — | 8.0 | 45 | | $1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$ |
| Quiescent current | I_Q | — | 2.6 | 4.6 | mA | $T_j = 25^\circ\text{C}$ |
| Quiescent current change | ΔI_Q | — | — | 1.5 | mA | $T_j = 25^\circ\text{C}$ |
| | | — | — | 1.0 | | $-24\text{ V} \leq V_{IN} \leq -12\text{ V}$ $1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$ |
| Voltage drop | V_{DROP} | — | 1.3 | — | V | $T_j = 25^\circ\text{C}$ |
| Output short circuit current | I_{OS} | — | 270 | — | mA | $T_j = 25^\circ\text{C}$ |

HA179L10P, HA179L10, HA179L10U

($V_{IN} = -16\text{ V}$, $I_{OUT} = 40\text{ mA}$, $0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$, $C_{IN} = 0.33\ \mu\text{F}$, $C_L = 0.1\ \mu\text{F}$)

| Item | Symbol | Min | Typ | Max | Unit | Test Condition |
|------------------------------|--------------------|-------|-----|--------|------|--|
| Output voltage | V_{OUT} | -9.6 | -10 | -10.4 | V | $T_j = 25^\circ\text{C}$ |
| | | -9.50 | — | -10.50 | | $V_{IN} = -16\text{ V}$, $1.0\text{ mA} \leq I_{OUT} \leq 70\text{ mA}$ |
| Line regulation | ΔV_{OLINE} | — | 80 | 230 | mV | $T_j = 25^\circ\text{C}$ |
| | | — | 70 | 170 | | $-25\text{ V} \leq V_{IN} \leq -12.5\text{ V}$ $-25\text{ V} \leq V_{IN} \leq -13\text{ V}$ |
| Load regulation | ΔV_{OLOAD} | — | 26 | — | mV | $T_j = 25^\circ\text{C}$ |
| | | — | 18 | 90 | | $1.0\text{ mA} \leq I_{OUT} \leq 150\text{ mA}$ $1.0\text{ mA} \leq I_{OUT} \leq 100\text{ mA}$ |
| | | — | 8.5 | 45 | | $1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$ |
| Quiescent current | I_Q | — | 2.6 | 4.6 | mA | $T_j = 25^\circ\text{C}$ |
| Quiescent current change | ΔI_Q | — | — | 1.5 | mA | $T_j = 25^\circ\text{C}$ |
| | | — | — | 1.0 | | $-25\text{ V} \leq V_{IN} \leq -13\text{ V}$ $1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$ |
| Voltage drop | V_{DROP} | — | 1.3 | — | V | $T_j = 25^\circ\text{C}$ |
| Output short circuit current | I_{OS} | — | 260 | — | mA | $T_j = 25^\circ\text{C}$ |

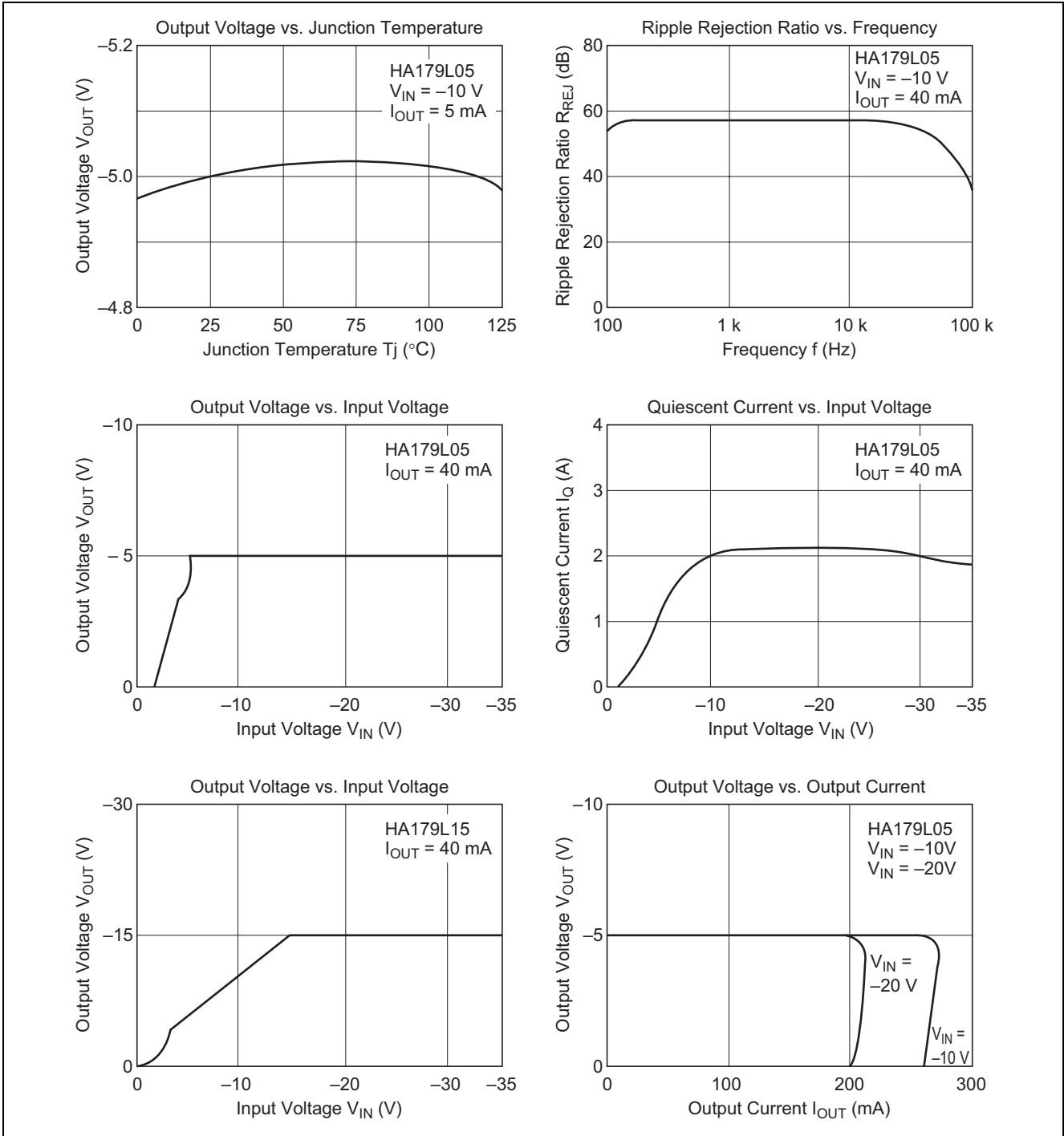
HA179L12P, HA179L12, HA179L12U
 $(V_{IN} = -19\text{ V}, I_{OUT} = 40\text{ mA}, 0^{\circ}\text{C} \leq T_j \leq 125^{\circ}\text{C}, C_{IN} = 0.33\text{ }\mu\text{F}, C_L = 0.1\text{ }\mu\text{F})$

| Item | Symbol | Min | Typ | Max | Unit | Test Condition |
|------------------------------|--------------------|--------|------|--------|------|---|
| Output voltage | V_{OUT} | -11.52 | -12 | -12.48 | V | $T_j = 25^{\circ}\text{C}$ |
| | | -11.40 | — | -12.60 | | $V_{IN} = -19\text{ V}, 1.0\text{ mA} \leq I_{OUT} \leq 70\text{ mA}$ |
| Line regulation | ΔV_{OLINE} | — | 120 | 250 | mV | $T_j = 25^{\circ}\text{C}$ $-27\text{ V} \leq V_{IN} \leq -14.5\text{ V}$ |
| | | — | 100 | 200 | | $-27\text{ V} \leq V_{IN} \leq -16\text{ V}$ |
| Load regulation | ΔV_{LOAD} | — | 28.5 | — | mV | $T_j = 25^{\circ}\text{C}$ $1.0\text{ mA} \leq I_{OUT} \leq 150\text{ mA}$ |
| | | — | 20 | 100 | | $1.0\text{ mA} \leq I_{OUT} \leq 100\text{ mA}$ |
| | | — | 10 | 50 | | $1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$ |
| Quiescent current | I_Q | — | 2.6 | 4.6 | mA | $T_j = 25^{\circ}\text{C}$ |
| Quiescent current change | ΔI_Q | — | — | 1.5 | mA | $T_j = 25^{\circ}\text{C}$ $-27\text{ V} \leq V_{IN} \leq -16\text{ V}$ |
| | | — | — | 1.0 | | $1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$ |
| Voltage drop | V_{DROP} | — | 1.3 | — | V | $T_j = 25^{\circ}\text{C}$ |
| Output short circuit current | I_{OS} | — | 250 | — | mA | $T_j = 25^{\circ}\text{C}$ |

HA179L15P, HA179L15, HA179L15U
 $(V_{IN} = -23\text{ V}, I_{OUT} = 40\text{ mA}, 0^{\circ}\text{C} \leq T_j \leq 125^{\circ}\text{C}, C_{IN} = 0.33\text{ }\mu\text{F}, C_L = 0.1\text{ }\mu\text{F})$

| Item | Symbol | Min | Typ | Max | Unit | Test Condition |
|------------------------------|--------------------|--------|-----|--------|------|---|
| Output voltage | V_{OUT} | -14.4 | -15 | -15.6 | V | $T_j = 25^{\circ}\text{C}$ |
| | | -14.25 | — | -15.75 | | $V_{IN} = -23\text{ V}, 1.0\text{ mA} \leq I_{OUT} \leq 70\text{ mA}$ |
| Line regulation | ΔV_{OLINE} | — | 130 | 300 | mV | $T_j = 25^{\circ}\text{C}$ $-30\text{ V} \leq V_{IN} \leq -17.5\text{ V}$ |
| | | — | 110 | 250 | | $-30\text{ V} \leq V_{IN} \leq -20\text{ V}$ |
| Load regulation | ΔV_{LOAD} | — | 36 | — | mV | $T_j = 25^{\circ}\text{C}$ $1.0\text{ mA} \leq I_{OUT} \leq 150\text{ mA}$ |
| | | — | 25 | 150 | | $1.0\text{ mA} \leq I_{OUT} \leq 100\text{ mA}$ |
| | | — | 12 | 75 | | $1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$ |
| Quiescent current | I_Q | — | 2.6 | 4.6 | mA | $T_j = 25^{\circ}\text{C}$ |
| Quiescent current change | ΔI_Q | — | — | 1.5 | mA | $T_j = 25^{\circ}\text{C}$ $-30\text{ V} \leq V_{IN} \leq -20\text{ V}$ |
| | | — | — | 1.0 | | $1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$ |
| Voltage drop | V_{DROP} | — | 1.3 | — | V | $T_j = 25^{\circ}\text{C}$ |
| Output short circuit current | I_{OS} | — | 240 | — | mA | $T_j = 25^{\circ}\text{C}$ |

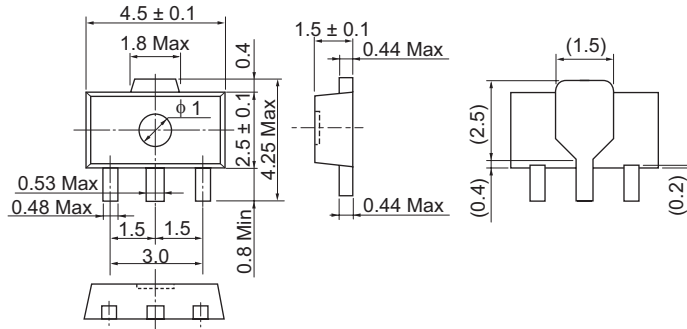
Characteristic Curves



Package Dimensions

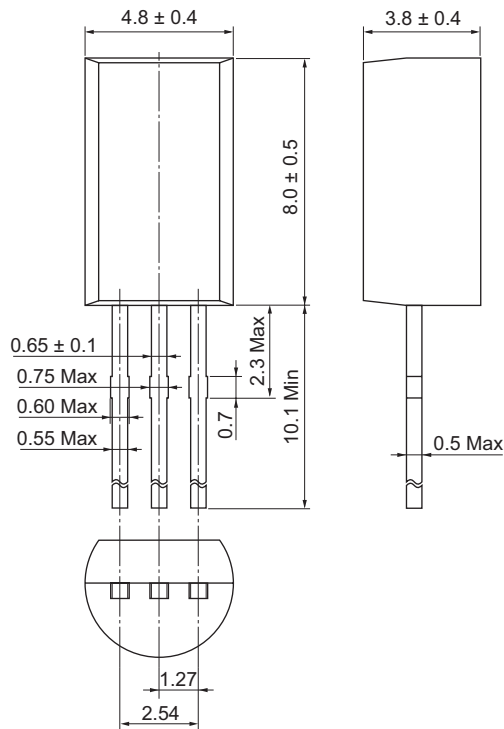
| Package Name | JEITA Package Code | RENESAS Code | Previous Code | MASS[Typ.] |
|--------------|--------------------|--------------|---------------|------------|
| UPAK | SC-62 | PLZZ0004CA-A | UPAK / UPAKV | 0.050g |

Unit: mm



| Package Name | JEITA Package Code | RENESAS Code | Previous Code | MASS[Typ.] |
|--------------|--------------------|--------------|------------------------|------------|
| TO-92 Mod | SC-51 | PRSS0003DC-A | TO-92 Mod / TO-92 ModV | 0.35g |

Unit: mm



Notes:

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