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HA179L00 Series

3-terminal Negative Fixed Voltage Regulators

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
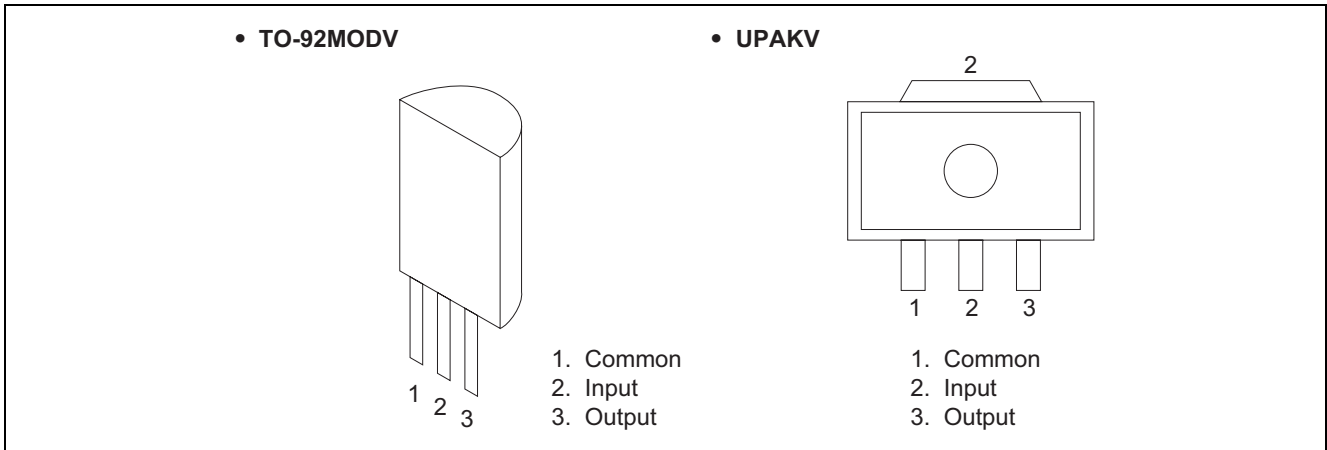- Over current and over temperature protection

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 (±4%)
Industrial Use	HA179L00P
Commercial Use	HA179L00
	HA179L00U

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Pin Arrangement

• TO-92MODV

1 2 3
1. Common
2. Input
3. Output

• UPAKV

2

1 2 3
1. Common
2. Input
3. Output

Block Diagram

Reference
Voltage

Error Amp

+

−

(1) Common

(3) Output

Temperature
Protection

Overcurrent
Protection

(2) Input
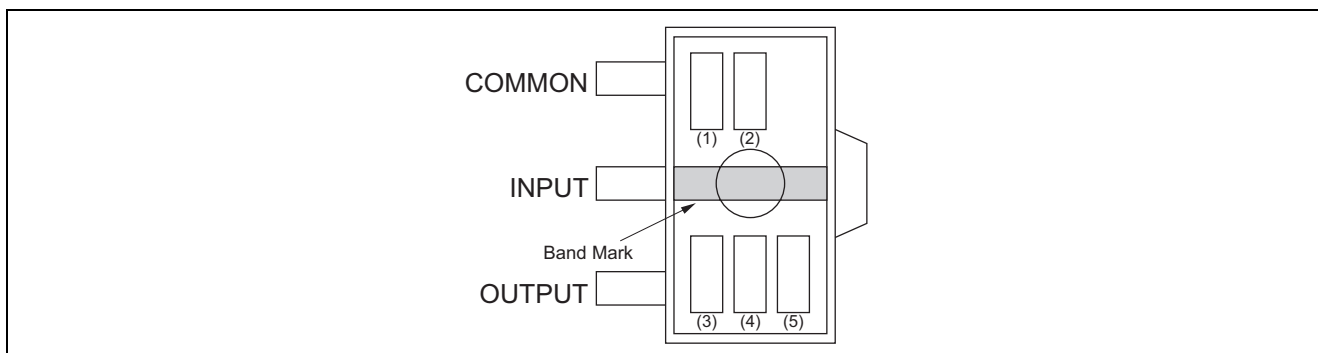
Standard Circuit

Input

C_{IN}
0.33 µF

HA179Lxx

Output

C_L
0.1 µF

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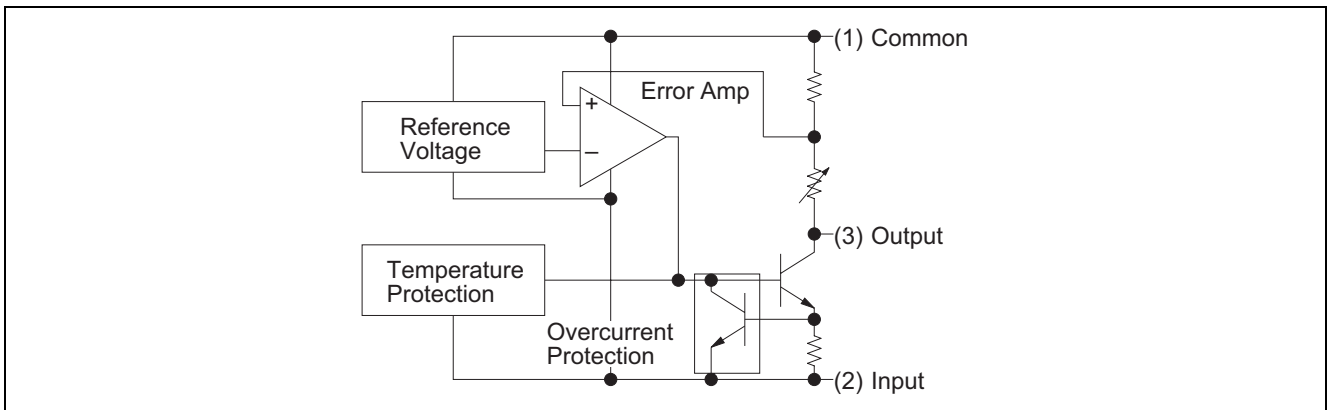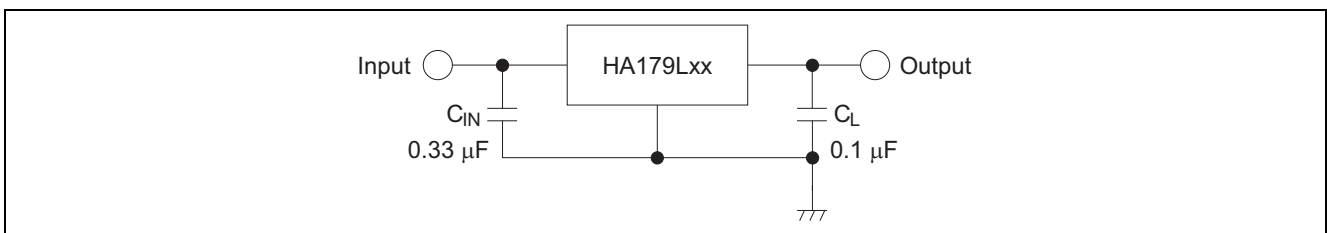
UPAKV Product (HA179L00U) Mark Patterns

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 HA179L00P, HA179L00 Series	Rating HA179L00U Series	Unit
Input voltage	V_{IN}	−35	−35	V
Max power dissipation	P_T [*1]	800	800 [*2]	mW
Operating ambient temperature	Topr	−40 to +85	−40 to +85	°C
Storage temperature	Tstg	−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
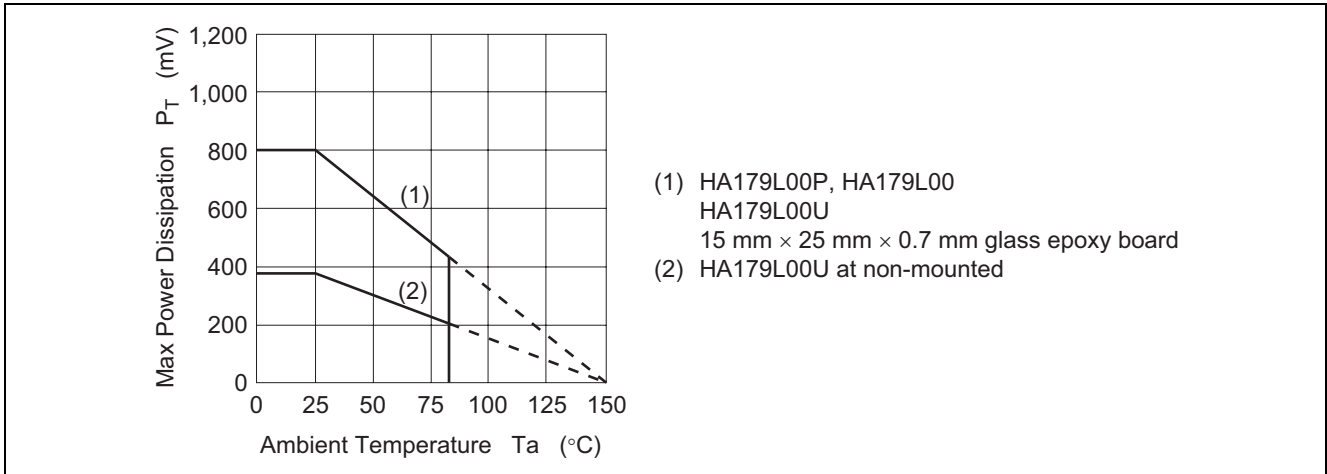
(1) HA179L00P, HA179L00
    HA179L00U
    15 mm × 25 mm × 0.7 mm glass epoxy board
(2) HA179L00U at non-mounted

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Electrical Characteristics

HA179L05P, HA179L05, HA179L05U

(V_{IN} = –10 V, I_{OUT} = 40 mA, 0°C ≤ Tj ≤ 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	Tj = 25°C	
		–4.75	—	–5.25		V_{IN} = –10 V, 1.0 mA ≤ I_{OUT} ≤ 70 mA	
Line regulation	ΔV_{OLINE}	—	55	150	mV	Tj = 25°C	–20 V ≤ V_{IN} ≤ –7 V
		—	45	100			–20 V ≤ V_{IN} ≤ –8 V
Load regulation	ΔV_{OLOAD}	—	16	—	mV	Tj = 25°C	1.0 mA ≤ I_{OUT} ≤ 150 mA
		—	11	60			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	Tj = 25°C	
Quiescent current change	ΔI_Q	—	—	1.5	mA	Tj = 25°C	–20 V ≤ V_{IN} ≤ –8.0 V
		—	—	1.0			1.0 mA ≤ I_{OUT} ≤ 40 mA
Voltage drop	V_{DROP}	—	1.3	—	V	Tj = 25°C	
Output short circuit current	I_{OS}	—	300	—	mA	Tj = 25°C	

HA179L06P, HA179L06, HA179L06U

(V_{IN} = –11 V, I_{OUT} = 40 mA, 0°C ≤ Tj ≤ 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	Tj = 25°C	
		–5.70	—	–6.30		V_{IN} = –11 V, 1.0 mA ≤ I_{OUT} ≤ 70 mA	
Line regulation	ΔV_{OLINE}	—	50	150	mV	Tj = 25°C	–21 V ≤ V_{IN} ≤ –8.1 V
		—	45	110			–21 V ≤ V_{IN} ≤ –9.0 V
Load regulation	ΔV_{OLOAD}	—	17.5	—	mV	Tj = 25°C	1.0 mA ≤ I_{OUT} ≤ 150 mA
		—	12	70			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	Tj = 25°C	
Quiescent current change	ΔI_Q	—	—	1.5	mA	Tj = 25°C	–21 V ≤ V_{IN} ≤ –9.0 V
		—	—	1.0			1.0 mA ≤ I_{OUT} ≤ 40 mA
Voltage drop	V_{DROP}	—	1.3	—	V	Tj = 25°C	
Output short circuit current	I_{OS}	—	300	—	mA	Tj = 25°C	

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HA179L08P, HA179L08, HA179L08U

($V_{IN} = -14$ V, $I_{OUT} = 40$ mA, $0°C \leq Tj \leq 125°C$, $C_{IN} = 0.33$ μF, $C_L = 0.1$ μF)

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

HA179L09P, HA179L09, HA179L09U

($V_{IN} = -15$ V, $I_{OUT} = 40$ mA, $0°C \leq Tj \leq 125°C$, $C_{IN} = 0.33$ μF, $C_L = 0.1$ μF)

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

HA179L10P, HA179L10, HA179L10U

($V_{IN} = -16$ V, $I_{OUT} = 40$ mA, $0°C \leq Tj \leq 125°C$, $C_{IN} = 0.33$ μF, $C_L = 0.1$ μF)

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

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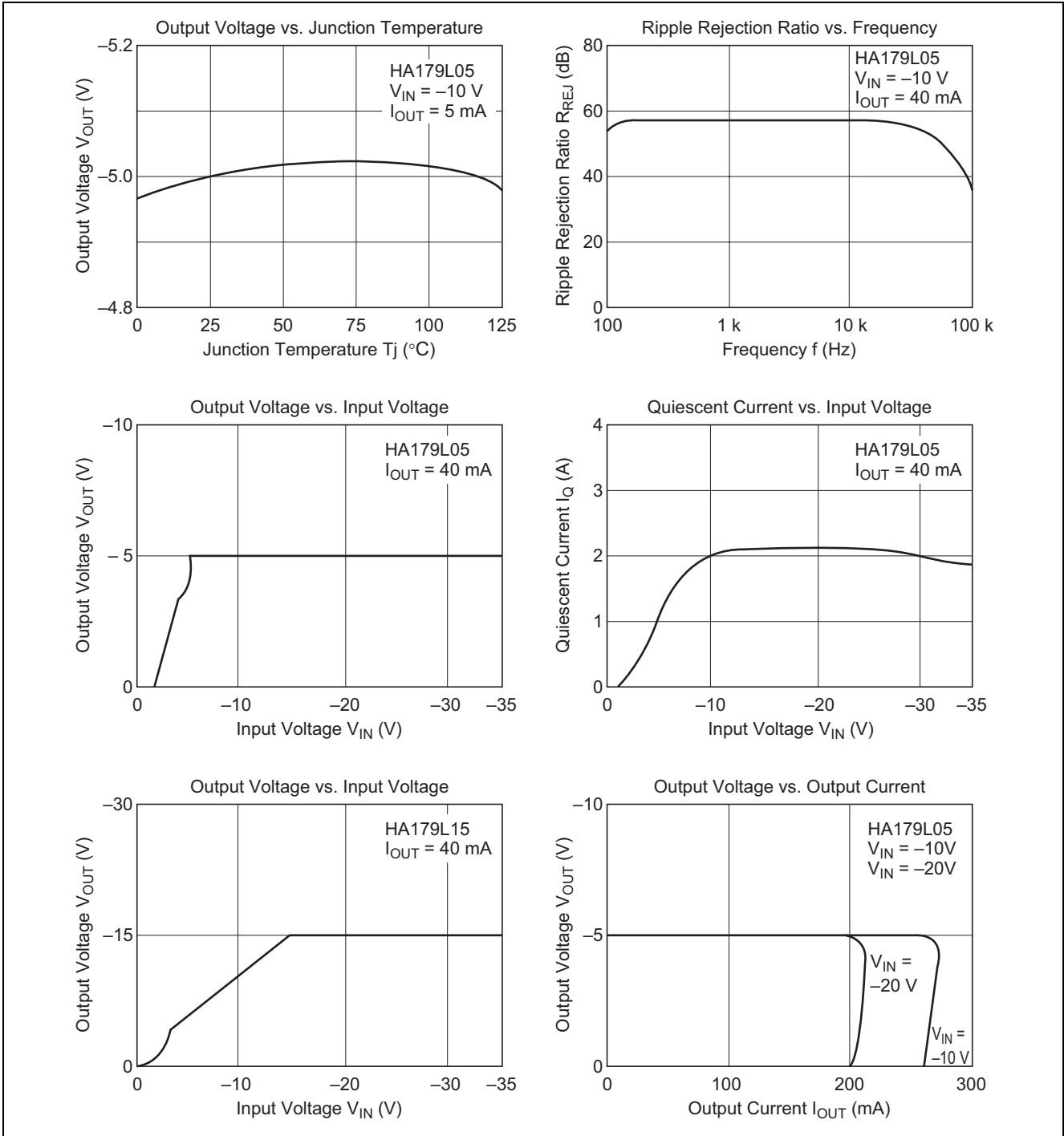### HA179L12P, HA179L12, HA179L12U

$(V_{IN} = -19 \text{ V}, I_{OUT} = 40 \text{ mA}, 0°C \leq Tj \leq 125°C, C_{IN} = 0.33 \text{ μF}, C_L = 0.1 \text{ μF})$

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

HA179L15P, HA179L15, HA179L15U

$(V_{IN} = -23 \text{ V}, I_{OUT} = 40 \text{ mA}, 0°C \leq Tj \leq 125°C, C_{IN} = 0.33 \text{ μF}, C_L = 0.1 \text{ μF})$

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

Characteristic Curves

Output Voltage vs. Junction Temperature

HA179L05
V_{IN} = –10 V
I_{OUT} = 5 mA

Output Voltage V_{OUT} (V)

Junction Temperature Tj (°C)

Ripple Rejection Ratio vs. Frequency

HA179L05
V_{IN} = –10 V
I_{OUT} = 40 mA

Ripple Rejection Ratio R_{REJ} (dB)

Frequency f (Hz)

Output Voltage vs. Input Voltage

HA179L05
I_{OUT} = 40 mA

Output Voltage V_{OUT} (V)

Input Voltage V_{IN} (V)

Quiescent Current vs. Input Voltage

HA179L05
I_{OUT} = 40 mA

Quiescent Current I_Q (A)

Input Voltage V_{IN} (V)

Output Voltage vs. Input Voltage

HA179L15
I_{OUT} = 40 mA

Output Voltage V_{OUT} (V)

Input Voltage V_{IN} (V)

Output Voltage vs. Output Current

HA179L05
V_{IN} = –10V
V_{IN} = –20V

V_{IN} = –20 V

V_{IN} = –10 V

Output Voltage V_{OUT} (V)

Output Current I_{OUT} (mA)

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Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]	
UPAK	SC-62	PLZZ0004CA-A	UPAK / UPAKV	0.050g	Unit: mm
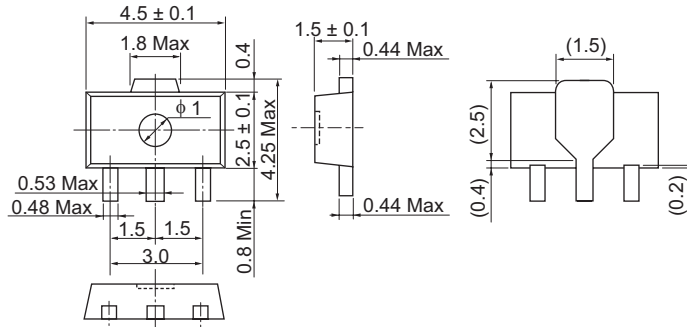
Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]	
TO-92 Mod	SC-51	PRSS0003DC-A	TO-92 Mod / TO-92 ModV	0.35g	Unit: mm

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