

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

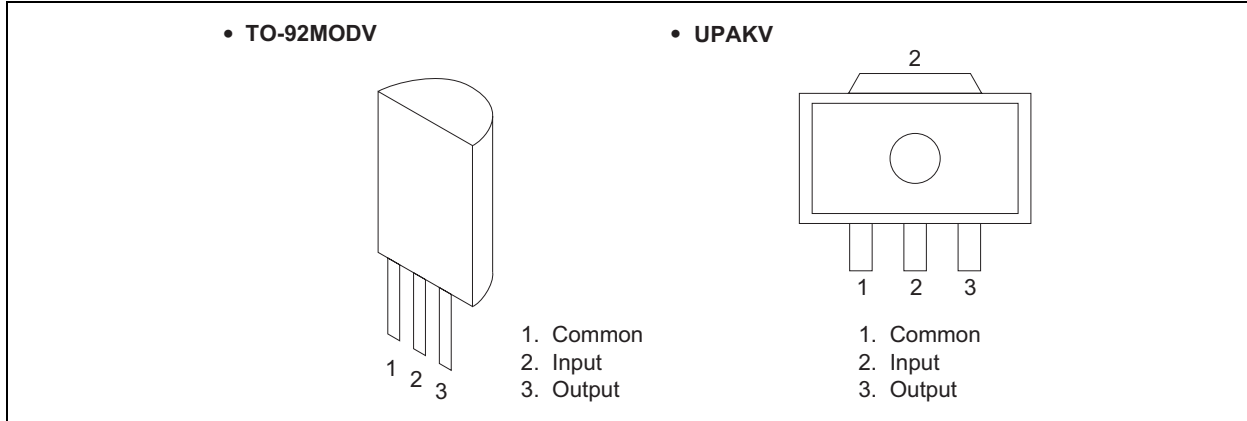
Ordering Information

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	

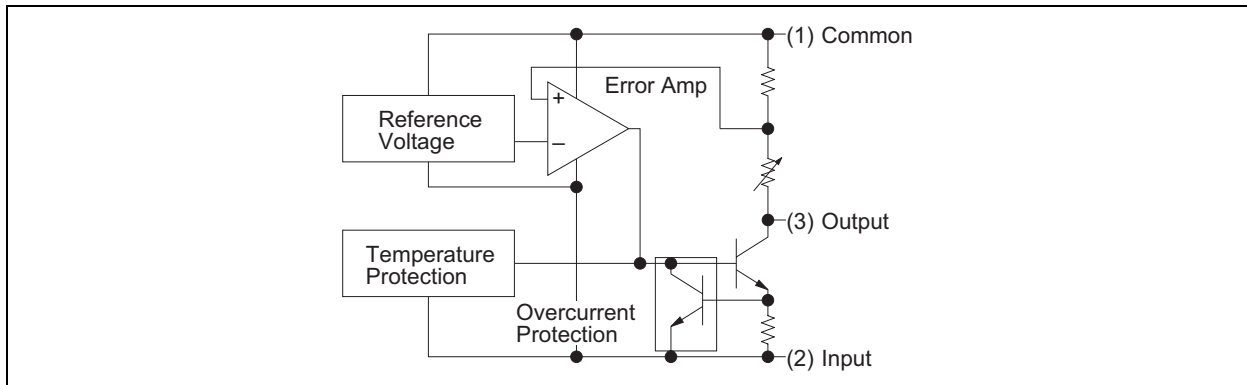
Output Voltage Accuracy Grade

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

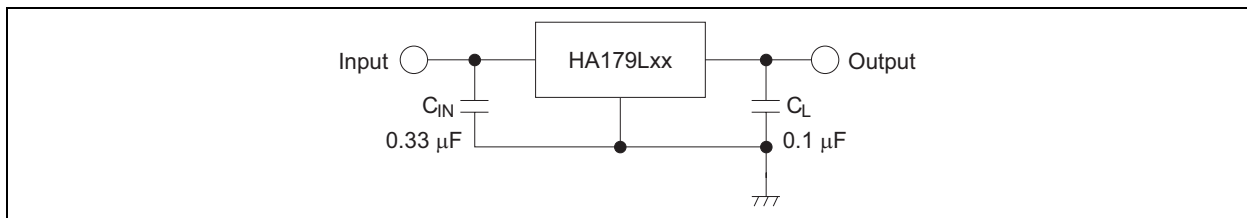
Pin Arrangement



Block Diagram



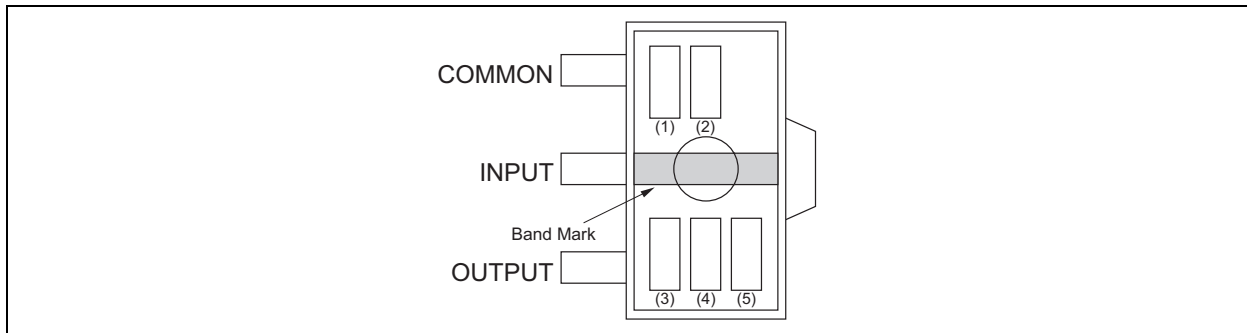
Standard Circuit



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

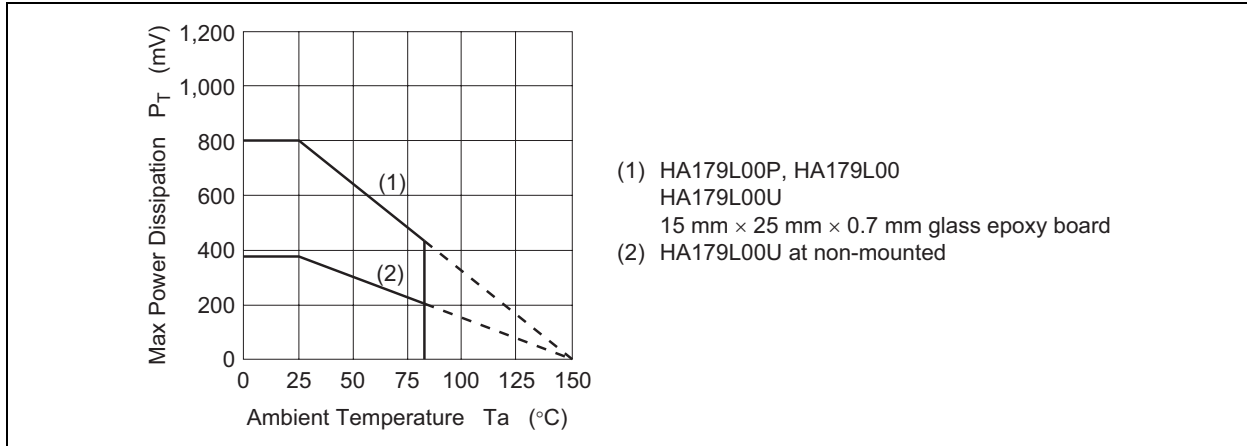
5. (5) shows the production week code.

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	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



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

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

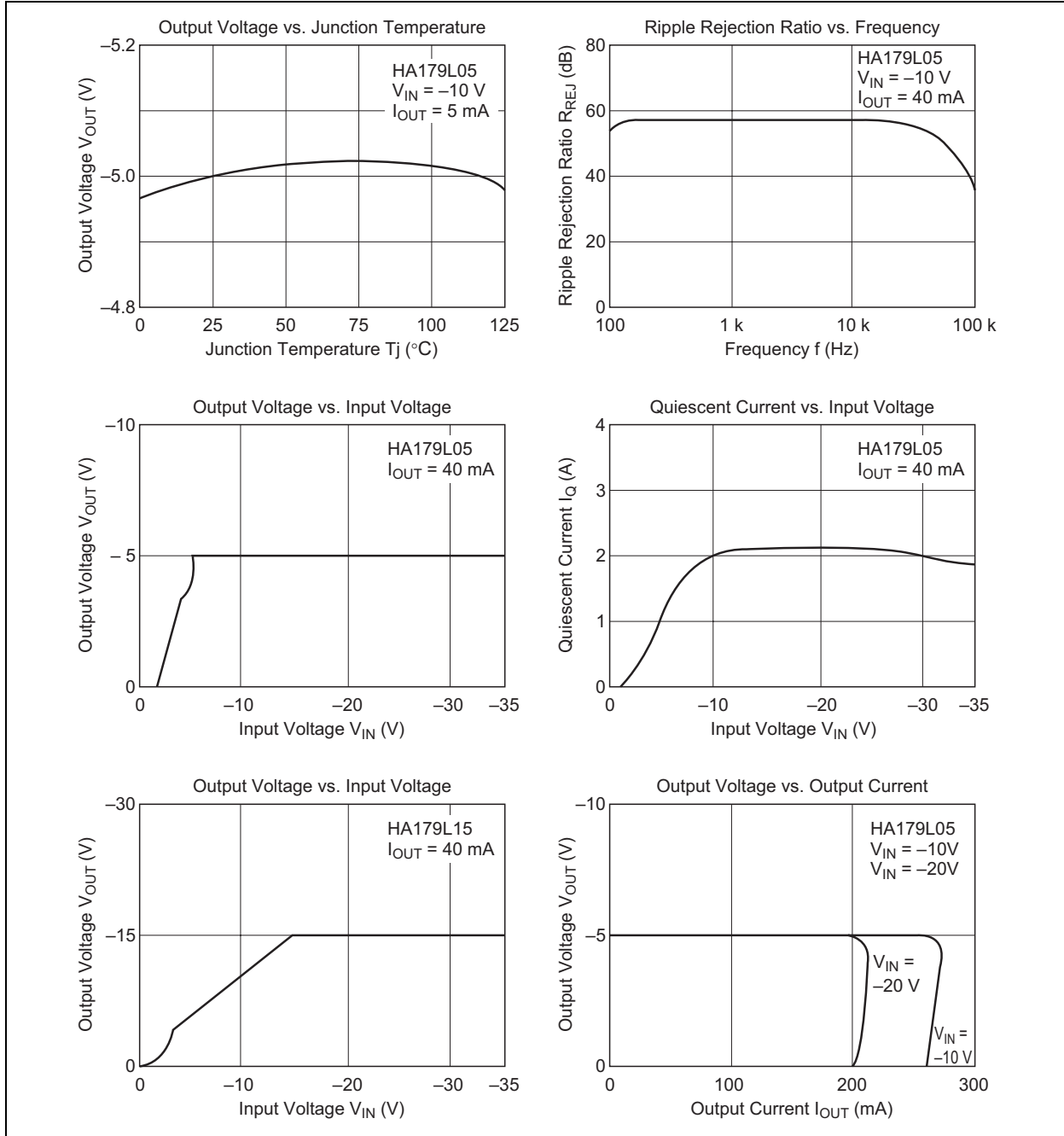
Item	Symbol	Min	Typ	Max	Unit	Test Condition
Output voltage	V_{OUT}	-11.52	-12	-12.48	V	$T_j = 25^\circ\text{C}$
		-11.40	—	-12.60		$V_{IN} = -19\text{ V}$, $1.0\text{ mA} \leq I_{OUT} \leq 70\text{ mA}$
Line regulation	ΔV_{OLINE}	—	120	250	mV	$T_j = 25^\circ\text{C}$
		—	100	200		$-27\text{ V} \leq V_{IN}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

HA179L15P, HA179L15, HA179L15U

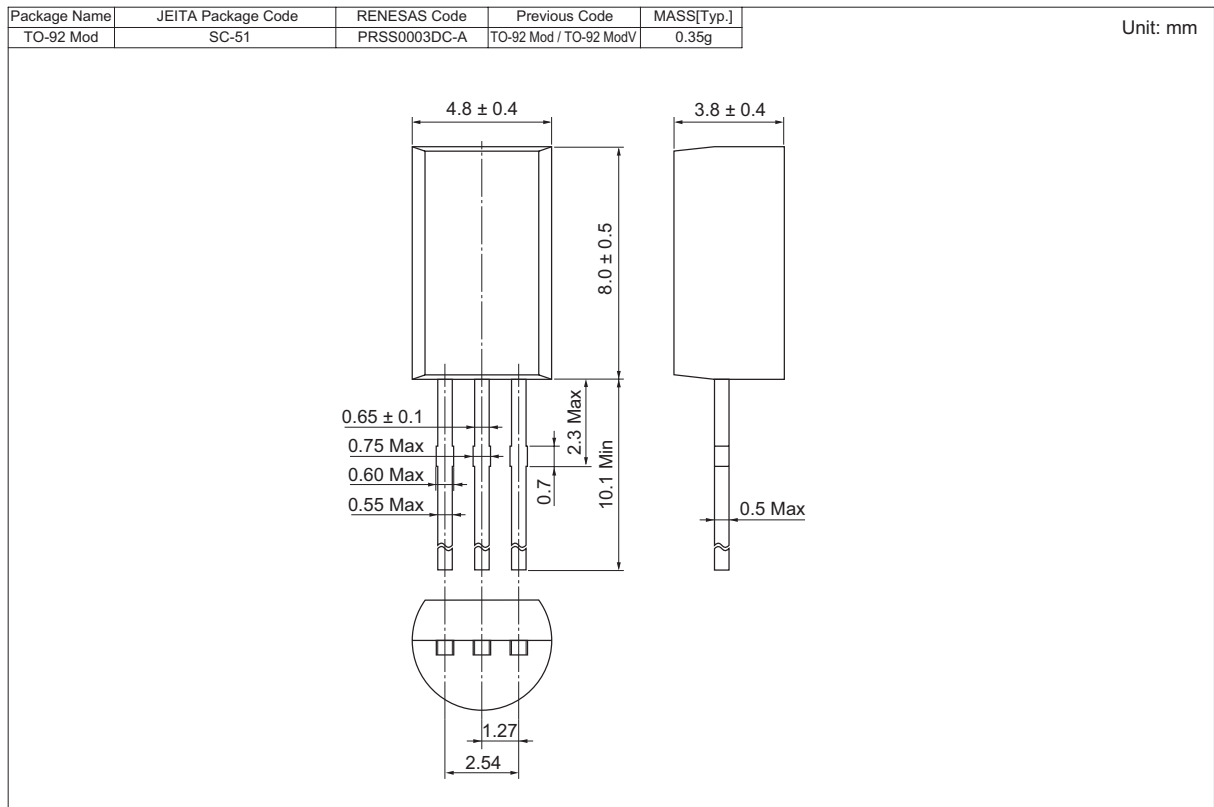
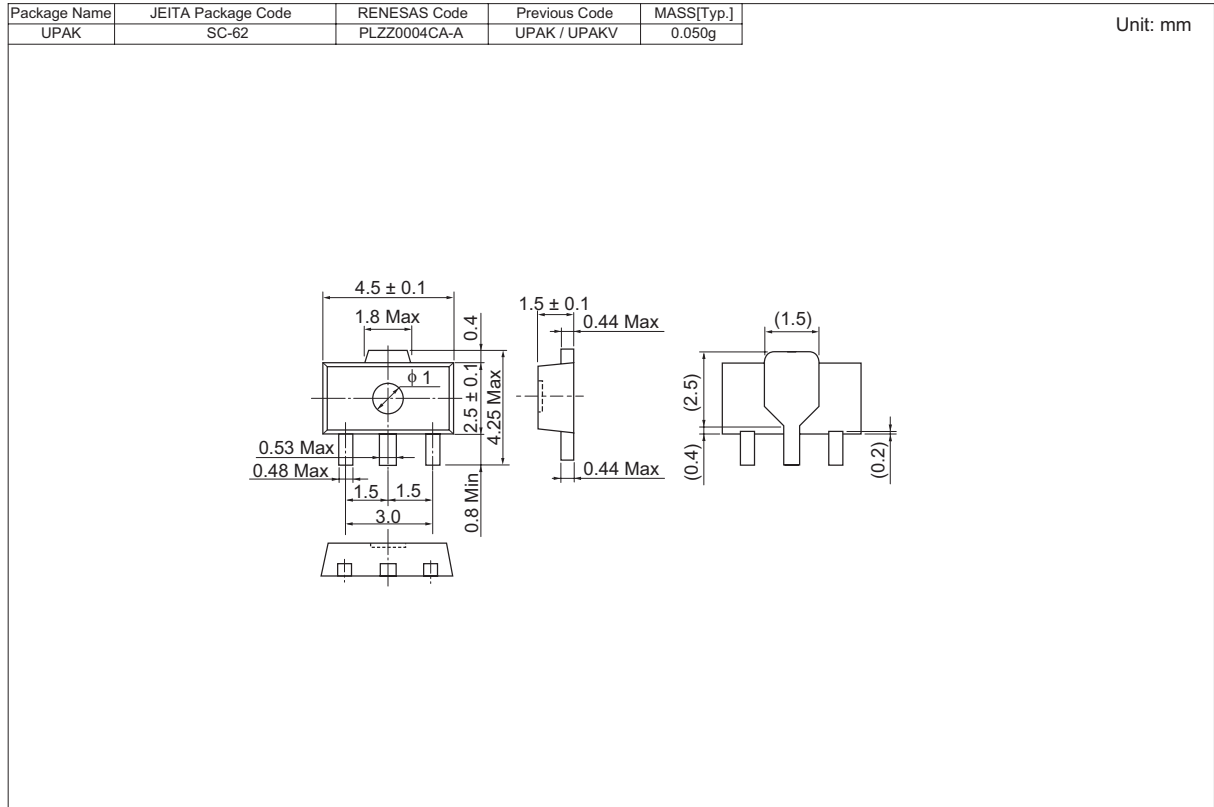
($V_{IN} = -23\text{ V}$, $I_{OUT} = 40\text{ mA}$, $0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$, $C_{IN} = 0.33\ \mu\text{F}$, $C_L = 0.1\ \mu\text{F}$)

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	$T_j = 25^\circ\text{C}$
		—	110	250		$-30\text{ V} \leq V_{IN} \leq -17.5\text{ V}$ $-30\text{ V} \leq V_{IN} \leq -20\text{ V}$
Load regulation	ΔV_{OLOAD}	—	36	—	mV	$T_j = 25^\circ\text{C}$
		—	25	150		$1.0\text{ mA} \leq I_{OUT} \leq 150\text{ mA}$ $1.0\text{ mA} \leq I_{OUT} \leq 100\text{ mA}$
		—	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	$T_j = 25^\circ\text{C}$
		—	—	1.0		$-30\text{ V} \leq V_{IN} \leq -20\text{ V}$ $1.0\text{ mA} \leq I_{OUT} \leq 40\text{ mA}$
Voltage drop	V_{DROP}	—	1.3	—	V	$T_j = 25^\circ\text{C}$
Output short circuit current	I_{OS}	—	240	—	mA	$T_j = 25^\circ\text{C}$

Characteristic Curves



Package Dimensions



Notes:

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