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

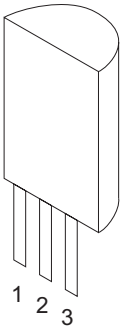
Application	Output Voltage	Type No.	Package Code (Package Name)
Industrial use	–5	HA179L05P	PRSS0003DC-A (TO-92MODV)
	–6	HA179L06P	
	–8	HA179L08P	
	–9	HA179L09P	
	–10	HA179L10P	
	–12	HA179L12P	
	–15	HA179L15P	
Commercial use	–5	HA179L05	PRSS0003DC-A (TO-92MODV)
	–6	HA179L06	
	–8	HA179L08	
	–9	HA179L09	
	–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 (±4%)
Industrial Use	HA179L00P
Commercial Use	HA179L00
	HA179L00U

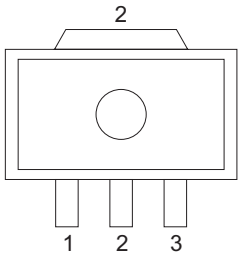
Pin Arrangement

- **TO-92MODV**



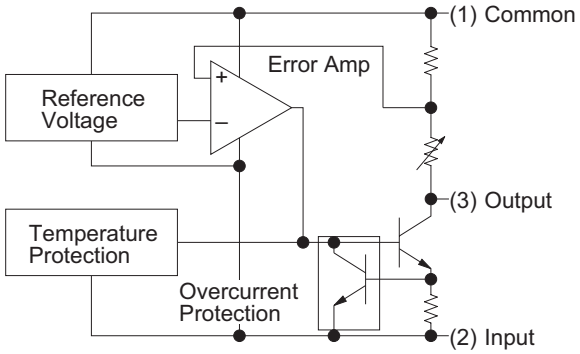
1. Common
2. Input
3. Output

- **UPAKV**

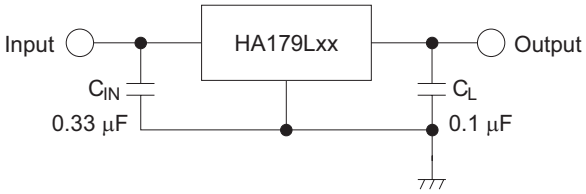


1. Common
2. Input
3. Output

Block Diagram



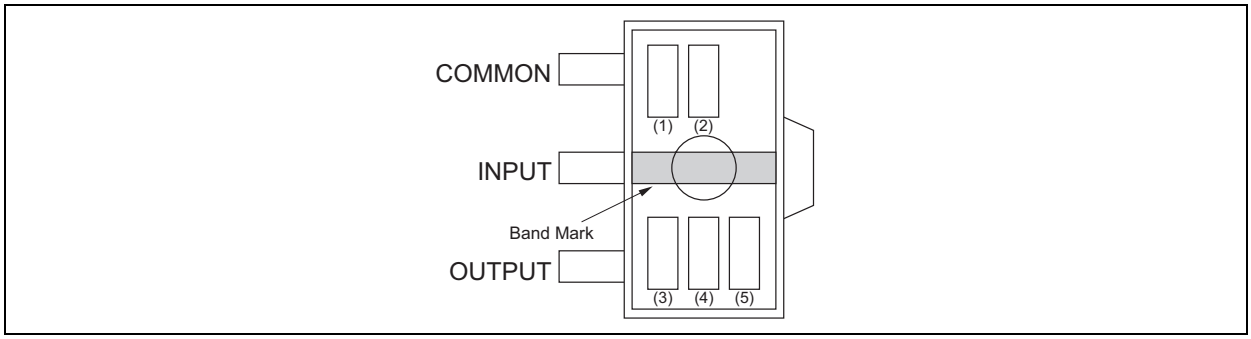
Standard Circuit



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

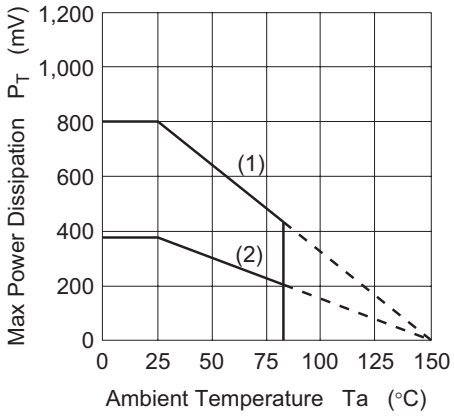
5. (5) shows the production week code.

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



(1) HA179L00P, HA179L00
HA179L00U
15 mm × 25 mm × 0.7 mm glass epoxy board
(2) HA179L00U at non-mounted

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	

HA179L08P, HA179L08, HA179L08U

(V_{IN} = –14 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}	–7.68	–8.0	–8.32	V	Tj = 25°C	
		–7.60	—	–8.40		V_{IN} = –14 V, 1.0 mA ≤ I_{OUT} ≤ 70 mA	
Line regulation	ΔV_{OLINE}	—	65	175	mV	Tj = 25°C	–23 V ≤ V_{IN} ≤ –10.5 V
		—	55	125			–23 V ≤ V_{IN} ≤ –11 V
Load regulation	ΔV_{OLOAD}	—	22	—	mV	Tj = 25°C	1.0 mA ≤ I_{OUT} ≤ 150 mA
		—	15	80			1.0 mA ≤ I_{OUT} ≤ 100 mA
		—	7.0	40			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	–23 V ≤ V_{IN} ≤ –11 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}	—	270	—	mA	Tj = 25°C	

HA179L09P, HA179L09, HA179L09U

(V_{IN} = –15 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}	–8.64	–9.0	–9.36	V	Tj = 25°C	
		–8.55	—	–9.45		V_{IN} = –15 V, 1.0 mA ≤ I_{OUT} ≤ 70 mA	
Line regulation	ΔV_{OLINE}	—	80	200	mV	Tj = 25°C	–24 V ≤ V_{IN} ≤ –11.4 V
		—	70	160			–24 V ≤ V_{IN} ≤ –12 V
Load regulation	ΔV_{OLOAD}	—	24.5	—	mV	Tj = 25°C	1.0 mA ≤ I_{OUT} ≤ 150 mA
		—	17	90			1.0 mA ≤ I_{OUT} ≤ 100 mA
		—	8.0	45			1.0 mA ≤ I_{OUT} ≤ 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 ≤ V_{IN} ≤ –12 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}	—	270	—	mA	Tj = 25°C	

HA179L10P, HA179L10, HA179L10U

(V_{IN} = –16 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}	–9.6	–10	–10.4	V	Tj = 25°C	
		–9.50	—	–10.50		V_{IN} = –16 V, 1.0 mA ≤ I_{OUT} ≤ 70 mA	
Line regulation	ΔV_{OLINE}	—	80	230	mV	Tj = 25°C	–25 V ≤ V_{IN} ≤ –12.5 V
		—	70	170			–25 V ≤ V_{IN} ≤ –13 V
Load regulation	ΔV_{OLOAD}	—	26	—	mV	Tj = 25°C	1.0 mA ≤ I_{OUT} ≤ 150 mA
		—	18	90			1.0 mA ≤ I_{OUT} ≤ 100 mA
		—	8.5	45			1.0 mA ≤ I_{OUT} ≤ 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 ≤ V_{IN} ≤ –13 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}	—	260	—	mA	Tj = 25°C	

HA179L12P, HA179L12, HA179L12U

(V_{IN} = –19 V, I_{OUT} = 40 mA, 0°C ≤ Tj ≤ 125°C, C_{IN} = 0.33 µF, C_L = 0.1 µF)

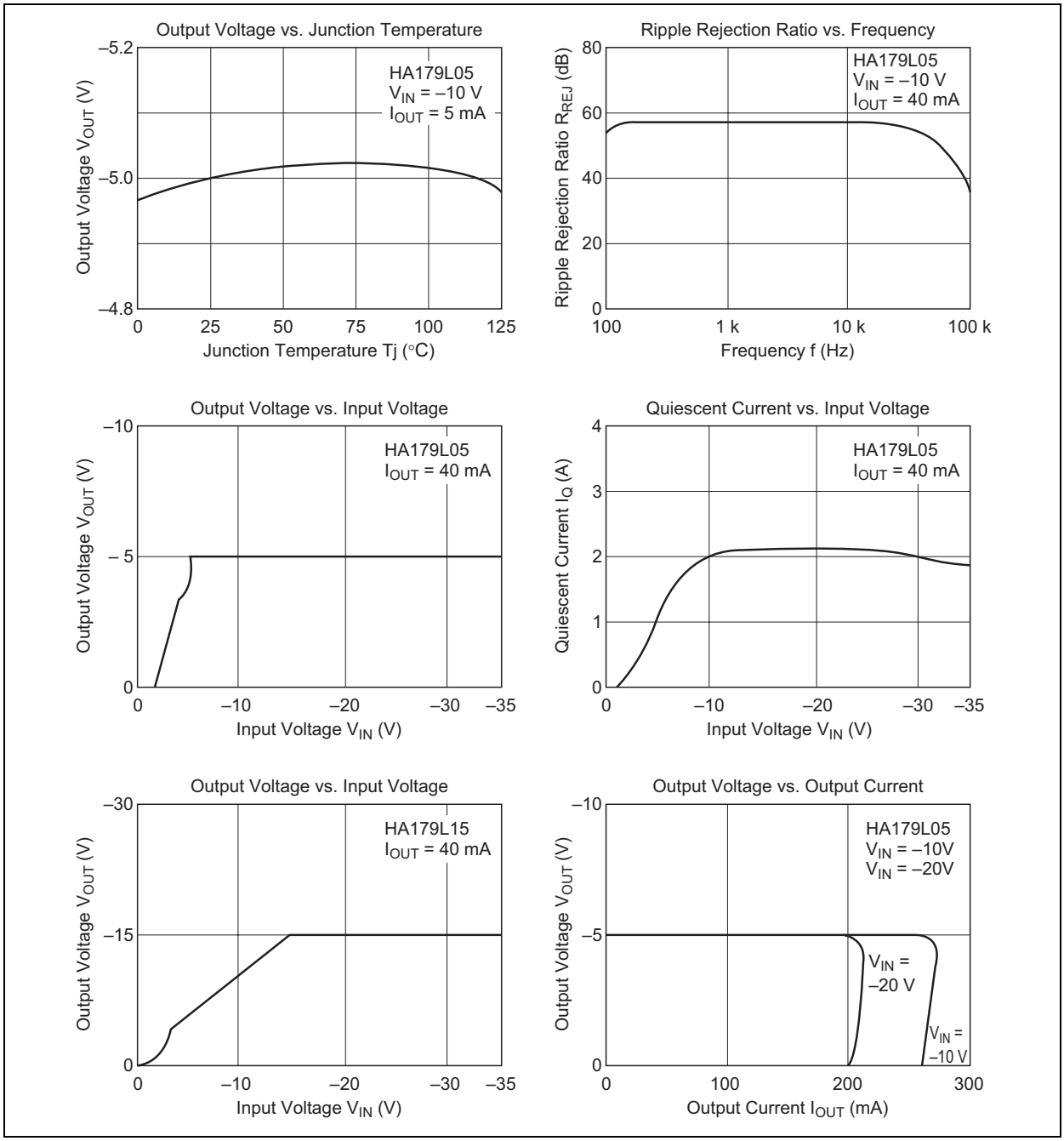
Item	Symbol	Min	Typ	Max	Unit	Test Condition	
Output voltage	V_{OUT}	–11.52	–12	–12.48	V	Tj = 25°C	
		–11.40	—	–12.60		V_{IN} = –19 V, 1.0 mA ≤ I_{OUT} ≤ 70 mA	
Line regulation	ΔV_{OLINE}	—	120	250	mV	Tj = 25°C	–27 V ≤ V_{IN} ≤ –14.5 V
		—	100	200			–27 V ≤ V_{IN} ≤ –16 V
Load regulation	ΔV_{OLOAD}	—	28.5	—	mV	Tj = 25°C	1.0 mA ≤ I_{OUT} ≤ 150 mA
		—	20	100			1.0 mA ≤ I_{OUT} ≤ 100 mA
		—	10	50			1.0 mA ≤ I_{OUT} ≤ 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 ≤ V_{IN} ≤ –16 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}	—	250	—	mA	Tj = 25°C	

HA179L15P, HA179L15, HA179L15U

(V_{IN} = –23 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}	–14.4	–15	–15.6	V	Tj = 25°C	
		–14.25	—	–15.75		V_{IN} = –23 V, 1.0 mA ≤ I_{OUT} ≤ 70 mA	
Line regulation	ΔV_{OLINE}	—	130	300	mV	Tj = 25°C	–30 V ≤ V_{IN} ≤ –17.5 V
		—	110	250			–30 V ≤ V_{IN} ≤ –20 V
Load regulation	ΔV_{OLOAD}	—	36	—	mV	Tj = 25°C	1.0 mA ≤ I_{OUT} ≤ 150 mA
		—	25	150			1.0 mA ≤ I_{OUT} ≤ 100 mA
		—	12	75			1.0 mA ≤ I_{OUT} ≤ 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 ≤ V_{IN} ≤ –20 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}	—	240	—	mA	Tj = 25°C	

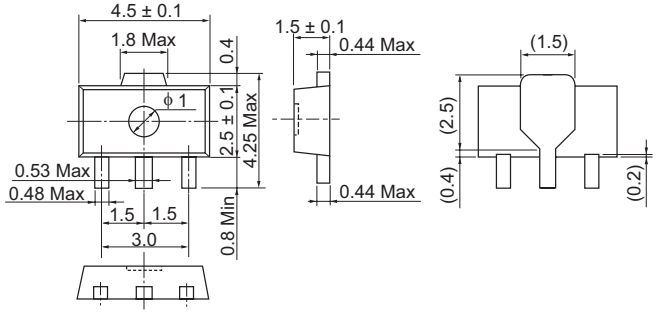
Characteristic Curves



Package Dimensions

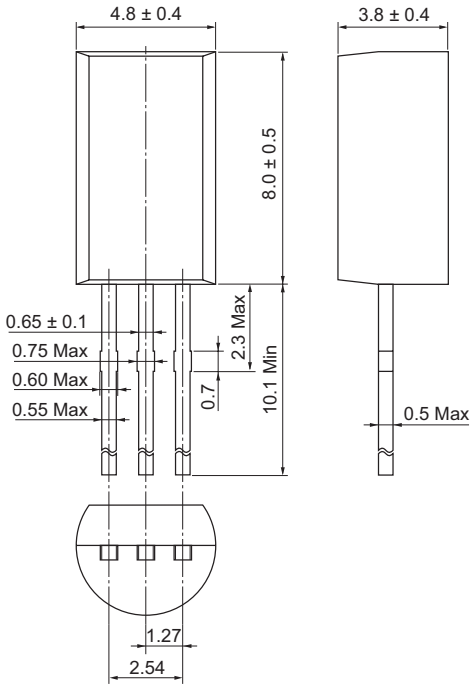
Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
UPAK	SC-62	PLZZ0004CA-A	UPAK / UPAKV	0.050g

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



Renesas Technology Corp. Sales Strategic Planning Div. Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan

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Renesas Technology America, Inc.
450 Holger Way, San Jose, CA 95134-1368, U.S.A
Tel: <1> (408) 382-7500, Fax: <1> (408) 382-7501

Renesas Technology Europe Limited
Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K.
Tel: <44> (1628) 585-100, Fax: <44> (1628) 585-900

Renesas Technology (Shanghai) Co., Ltd.
Unit 204, 205, AZIACenter, No.1233 Lujiazui Ring Rd, Pudong District, Shanghai, China 200120
Tel: <86> (21) 5877-1818, Fax: <86> (21) 6887-7898

Renesas Technology Hong Kong Ltd.
7th Floor, North Tower, World Finance Centre, Harbour City, 1 Canton Road, Tsimshatsui, Kowloon, Hong Kong
Tel: <852> 2265-6688, Fax: <852> 2730-6071

Renesas Technology Taiwan Co., Ltd.
10th Floor, No.99, Fushing North Road, Taipei, Taiwan
Tel: <886> (2) 2715-2888, Fax: <886> (2) 2713-2999

Renesas Technology Singapore Pte. Ltd.
1 Harbour Front Avenue, #06-10, Keppel Bay Tower, Singapore 098632
Tel: <65> 6213-0200, Fax: <65> 6278-8001

Renesas Technology Korea Co., Ltd.
Kukje Center Bldg. 18th Fl., 191, 2-ka, Hangang-ro, Yongsan-ku, Seoul 140-702, Korea
Tel: <82> (2) 796-3115, Fax: <82> (2) 796-2145

Renesas Technology Malaysia Sdn. Bhd
Unit 906, Block B, Menara Amcorp, Amcorp Trade Centre, No.18, Jalan Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia
Tel: <603> 7955-9390, Fax: <603> 7955-9510

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