

# μPC 1944

# μPD 12 1 W 18 A T1F - E1 - AT

Renesas Device  
 μPC: Bipolar type  
 μPD: CMOS type

Series

12	Regulator (CMOS)
10	Shunt Regulator (Bipolar)
19	
29	Low-power Regulator
78	3 Terminal Regulator (Bipolar)

Optional function

0	w/o on/off pin
1	w/ on/off pin

Revision

Output voltage(V)

00	Variabel
05	5.0
10	1.0 or 10
15	1.5 or 15
18	1.8 or 18
25	2.5
33	3.3
78	7.8

Output current(A)

L	0.1
N	0.3
M	0.5
-	1
A	2
W	1.5
S	0.1

## Renesas Shunt & Series Regulators

# GR - E2 - A

Lead-free code

A	Lead-free, Sn-Bi
AT	Lead-free, Sn
AZ	Lead-free*1, Sn
AY	Lead-free*1, Matte-Sn

\*1: High-melting-point solder excepted in RoHS is contained internally.

Taping direction



Package

TA	T, T1B	T1F	T	T1D
SC-74A (5pin MM)  2.9 x 2.8 (2.9 x 1.5)	SC-62 (3pin PoMM)  4.5 x 4.0 (4.5 x 2.5)	5-pin TO-252 (MP-3ZK)  6.5 x 10.4 (6.5 x 6.1)	SC-63 (MP-3Z)  6.5 x 9.5 (6.5 x 5.5)	TO-252 (MP-3ZK)  6.5 x 10.4 (6.5 x 6.1)
G, GR	T, HB	H*	HF*	
8-pin SOP  5.2 x 6.5 (5.2 x 4.4)	SC-64(MP-3)  6.5 x 13.7 (6.5 x 5.5)	MP-5(TO-126)  8.5 x 25.0 (8.5 x 12)	TO-220(MP-45G)  10.0 x 30.9(10.0 x 17.0)	

Note: Codes shown in gray color are optional.

Mark\*: Not recommend new design

# HA 17431 G LP A EL - E

**Renesas Device**

**Serial number**

17431-2	2.5V Shunt Regulator
17L431-2	1.24V Shunt Regulator
178L05, 08, 15	3 Terminal Regulator (5V, 8V, 15V)
179L05, 15	3 Terminal Regulator (-5V, -15V)

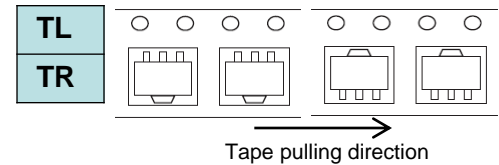
**Output voltage accuracy**

A	1%(HA17L431-2)
V	1%(HA17431-2)
-	4%(HA17431-2) 8%(HA178Lxx)

**Lead-free code**

E	Lead-free
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**Taping direction**



**Reference voltage accuracy**

A	2.2%(HA17431-2) 5%(HA178Lxx)
-	4%(HA17431-2)

**Package**

LTB	LP	U, UA, UP	FP	P, PN	
MPAKV	MPAK-5 (SC-74A)	UPAK (SC-62)	FP-8DGV	TO-92V	TO-92MODV
2.7 x 2.8 (2.7 x 1.5)	2.95 x 2.8 (2.95 x 1.6)	4.5 x 4.25 (4.5 x 2.5)	4.85 x 6.5 (4.85 x 4.4)	4.8 x 17.7 (4.8 x 5.0)	4.8 x 18.1 (4.8 x 8.0)

## Renesas Shunt & Series Regulators

Ex: HA17431GPA is Shunt Regulator in MPAK-5V package.

Note:

Codes shown in gray color are optional.

# μPC 1933 GR - E1 - A

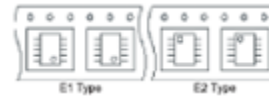
Renesas  
Bipolar Device

Lead-free code

A Lead-free, Sn-Bi



Taping direction

E1  
E2



Tape pulling direction

Package

GR	G	GT	GS
8-pin SOP  5.35 x 6.0 (5.35 x 4.4)	16-pin SOP 		
	10.0 x 10.3 (10.0 x 7.2)	10.2 x 10.3 (10.2 x 7.2)	10.2 x 7.7 (10.2 x 5.6)

Serial number

Serail #	PKG	V <sub>IN</sub> (V)max.	V <sub>OUT</sub> (V)max.	I <sub>OUT</sub> (mA)max.	f <sub>OSC</sub> ( KHz)min.	f <sub>OSC</sub> ( KHz)max.	P <sub>T</sub> (mW)
1099	GS	24	24	1200(Peak)	50	500	694
1909	GS	24	24	1200(Peak)	50	500	694
494	G, GS, GT	40	40	250	1	300	650
1100	GS	40	40	25	1	500	694
1150	GS	20	41	25	1	500	694
1933	GR	20	20	20	20	800	480

## Renesas SW regulators

Ex: μPC1933GR is SW regulator in 8pin-SOP package.

Note:

Codes shown in gray color are optional.

# HA 16114 FP - EL - E

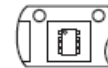
Renesas  
Device

Lead-free code

**E** Lead-free

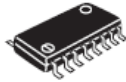


Taping direction

**EL**



Tape pulling direction

Package

FP		P
16-pin SOP  10.2 x 10.3 (10.2 x 7.2)	20-pin SOP  12.6 x 7.8 (12.6 x 5.5)	16-pin DIP  19.20 x 7.62 (19.20 x 6.3)

Serial number

Serial #	PKG		$V_{IN}(V)$ max.	$V_{OUT}(V)$ max.	$I_{OUT}(mA)$ max.	$f_{OSC}$ ( KHz)min.	$f_{OSC}$ ( KHz)max.	$P_T(mW)$
16107	FP, P	16-pin	30	27.8	200	1	600	-
16108	FP	16-pin	30	27.8	200	1	600	-
16114	FP, P	16-pin	40	38.4	100	0.001	600	680
16116	FP	20-pin	40	38.4	100	0.001	600	680
16120	FP	16-pin	40	38.4	100	0.001	600	680
16121	FP	20-pin	40	38.4	100	0.001	600	680

## Renesas SW regulators

Ex: HA16107FP is SW regulator in 16pin-SOP package.

Note:

Codes shown in gray color are optional.

# HA 1630 S 01 CM EL – E H1P

Renesas  
Device

Serial Number 1

1630	Operational Amplifiers(CMOS)
1631	Voltage Comparators(CMOS)

Serial Number 2

Operational Amplifier(HA1630)

	V <sub>DD</sub> (V)	V <sub>io</sub> max. (mV)	I <sub>DD</sub> typ. (mA)	SR typ. (V/ms)	I <sub>s</sub> typ. (mA)	Type
01	1.8 -5.5	4	15	0.125	0.01	Standard
02			50	0.5	0.05	
03			100	1.0	0.1	
04	1.8 -5.5	4	200	2.0	0.2	Hi-Slew Rate
05			400	4.0	0.4	
06			800	8.0	0.8	
07	2.7 -5.5	6	60	1.5	15	Hi-Drive Current
08			170	1.5	30	

Voltage Comparator(HA1631)

	V <sub>DD</sub> (V)	V <sub>io</sub> max. (mV)	I <sub>DD</sub> typ. (mA)	TPLH/HL typ.(ms)	I <sub>s</sub> typ. (mA)	Type
01	1.8 -5.5	5	5	1.2/0.6	14	Push pull
02			50	0.3/0.2		
03	1.8 -5.5	5	5	-/0.6	14	Open drain
04			50	-/0.2		

Channel

S	Single
D	Dual
Q	Quad

Lead-free code






E	Lead-free
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Taping direction

EL	
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Tape pulling direction

Package

CM	LP	MM	T	
CMPAK-5	MPAK-5	MMPAK-8	8pin-TSSOP	14pin-TSSOP
				
2.0 x 2.1 (2.0 x 1.25)	2.95 x 2.8 (2.95 x 1.6)	2.95 x 4.0 (2.95 x 2.8)	3.0 x 6.4 (3.0 x 4.40)	5.0 x 6.4 (5.0 x 4.40)
Single		Dual		Quad

## Renesas Operational Amplifiers & Voltage Comparators(CMOS Type)

Note:

Codes shown in gray color are optional.

Ex: HA1630S01CM is Operational Amplifier in CMPAK-5 package(Single type).

# μPC4574 GR-9LG E1 - A

Renesas Device

Serial Number

Lead-free code






A Lead-free

Taping direction



Package

Serial Number	Packages	Feature	Type	
151,741	G2	Standard	Single	
802, 4250		Micro power		
4081		J-FET input		
831, 4061		J-FET input, Micro power		
821, 4071		J-FET input, Low noise		
811, 813, 4091, 4093		J-FET input, Hi-accuracy		
251,1458	G2	Standard	Dual	
258,4556, 4558,4560	G2,MF	Low noise		
4570,4572	G2,GR,MF	Super low noise		
358,842,1251,4742	G2,GR,MF,MP	Single supply voltage		
803,4082	G2	J-FET input		
832,4062	G2	J-FET input, Micro power		
822,4072	G2,MF	J-FET input, Low noise		
812,814,835,4092,4094	G2,MN	J-FET input, Hi-accuracy		
324,451,452,844,3403,4744	G2,GR	Single supply voltage		Quad
458,4741	G2	Low noise		
4574	G2,GR	Super low noise		
834,4064	G2	J-FET input, Micro power		
824,4074	G2	J-FET input, Low noise		

	G2	MF-DAA	MP-KAA	GR-9LG	MN-KAA
Single, Dual	8pin-SOP(Single, Dual)  5.0 x 6.5 (5.0 x 4.4)	4.9 x 6.0 (4.9 x 3.9)	8pin-TSSOP (Dual)  3.0 x 4.0 (3.0 x 2.8)	8pin-TSSOP(Dual)  3.15 x 6.4 (5.0 x 4.40)    3.3 x 4.9 (3.3 x 3.3)	
	G2			GR-9LG	
Quad	14pin-SOP(Quad)  10.02 x 6.5 (10.02 x 4.4)		14pin-TSSOP(Quad)  5.15 x 6.4 (5.0 x 4.40)		

## Renesas Operational Amplifiers (Bipolar Type)

Ex: μPC4574 GR-9LG is Bipolar Type Operational Amplifier in 14pin-TSSOP package(Quad type).

Note:  
Codes shown in gray color are optional.

# μPC177 GR-9LG E1 - A

Renesas Device

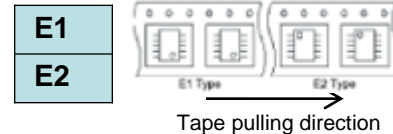
Serial Number

Serial Number	Packages	Feature	Type
271,311	G2	High speed	Single
272,277,393,	G2,GR,MP,MF	Single supply voltage, Low power	Dual
319	G2(14pin-SOP)	High speed	
177,339	G2,GR	Single supply voltage, Low power	Quad






Lead-free code

A Lead-free

Taping direction



Package

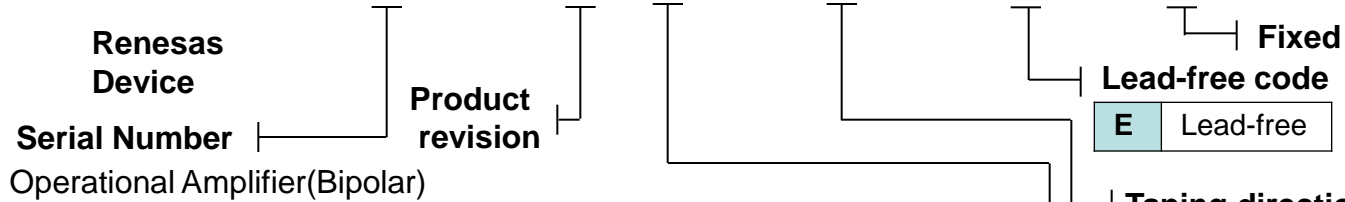
	G2	MF-DAA	MP-KAA	GR-9LG
Single, Dual	8pin-SOP  5.0 x 6.5 (5.0 x 4.4)	4.9 x 6.0 (4.9 x 3.9)	8pin-TSSOP  3.0 x 4.0 (3.0 x 2.8)	8pin-TSSOP  3.15 x 6.4 (5.0 x 4.40)
	G2			GR-9LG
Dual, Quad	14pin-SOP  10.02 x 6.5 (10.02 x 4.4)		14pin-TSSOP  5.15 x 6.4 (5.0 x 4.40)	

## Renesas Voltage Comparators (Bipolar Type)

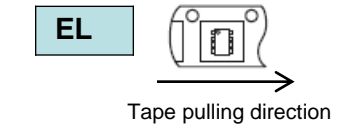
Ex: μPC177 GR-9LG is Bipolar Type Voltage Comparator in 14pin-TSSOP package(Quad type).

Note:  
Codes shown in gray color are optional.

# HA 17904 A F - EL - E - Q



Serial #	package	V <sub>CC</sub> max.(V)	V <sub>io</sub> max.(mV)	I <sub>IB</sub> max.(nA)	I <sub>CC</sub> typ.(mA)	SR typ.(V/μs)	Type	T <sub>A</sub> (°C)
17324A	-, F, RP	32	7	500	0.8	0.19	Quad	-40 - +85
17902A	P, FP, RP, T							
17358A	-, F, RP, T	32	7	250	0.8	0.2	Dual	-40 - +85
17904A	FP, T							
17458	-, F, PS, FP	±18	6	500	-	0.6		-20 - +85



## Voltage Comparator((Bipolar))

Serial #	package	V <sub>CC</sub> max.(V)	V <sub>io</sub> max.(mV)	I <sub>IB</sub> max.(nA)	I <sub>CC</sub> typ.(mA)	T <sub>respons</sub> typ.(μs)	Type	T <sub>A</sub> (°C)
17339A	-, F, RP, T	36	7	250	0.8	1.3	Quad	-40 - +85
17901A	FP, T						Dual	
17393A	-, F, RP, T		5					
17903A	FP, T							

	-, P, PS	F, FP	RP	T
Dual	8pin-DIP  9.6 x 7.62 (19.2 x 6.3)	8pin-SOP  4.85 x 6.5 (4.85 x 4.4)	4.90 x 6.1 (4.90 x 3.95)	8pin-TSSOP  3.0 x 6.4 (3.0 x 4.40)
Quad	14pin-DIP  19.2 x 7.62 (19.2 x 6.3)	14pin-SOP  10.06 x 7.8 (10.06 x 5.5)	8.65 x 6.1 (8.65 x 3.95)	14pin-TSSOP  5.0 x 6.4 (5.0 x 4.40)

# Renesas Operational Amplifiers & Voltage Comparators (Bipolar Type)

Note:  
Codes shown in gray color are optional.

Ex: HA16324AF is Operational Amplifier in 14pin-SOP package(Quad type).



# R2A 20 152 SP # W5

Renesas  
General-Purpose IC

Serial number

	Package	Ch	Bus	Function
152	NS,SP	2	I <sup>2</sup> C	R-2R
154	NS,SP	4	I <sup>2</sup> C	R-2R
158	NP	8	I <sup>2</sup> C	R-2R
162	NS,SA,SP	2	3-line	R-2R
164	NP,SA	4	3-line	R-2R
166	NP,SA	6	3-line	R-2R
168	NP,SA,SP	8	3-line	R-2R
169	NP,SA,SP	12	3-line	R-2R
178	NP	8	3-line	R-2R, Multiplying

Packaging, Material (Pb-free)

#W0	T&R	Pb-free, Halogen-Free
#W5	T&R	Pb-free, Halogen-Free

Package

NP	QFN
SP	SOP
NS	SON
SA	TSSOP

## Renesas DA Converters

Ex: R2A20152SP is R-2R type 2 channel D/A Convert in 8pin-SOP.

Note:

Codes shown in gray color are optional.

# RNA5 0C27 A US EL E

Renesas  
Reset ICs

Product Number

0C27	US,MM	Dual Power Supply control & Detection (3.3V/1.8V)
2A10	MM	CMOS Dual
194x	UP	Single(w/o delay circuit)
195x	FP,UP,P	Single
1Axx	LP	CMOS Single Open drain
1Bxx	LP	CMOS Single

Output /function\*

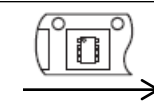
A	w/ fixed current load
B	Open collector
F	w/ base voltage output function

\*A/B: RNA5195x  
F: RNA51A/B







Lead-free code

E	Lead-free
0	Lead-free w/o Bi
1	Lead-free w/ Bi

Taping direction or Packing

EL		#H	Emboss taping (Left)
	Tape pulling direction	#T	Tube

Package

LP	US	MM
MPAK-5  2.0 x 2.1 (2.0 x 1.25)	8pin SSOP  2.0 x 3.1 (2.0 x 2.3)	MMPAK-8  2.95 x 4.0 (2.95 x 2.8)
UP	FP	P
UPAK  4.5 x 4.25 (4.5 x 2.5)	8-pin SOP  4.85 x 6.2 (4.85 x 4.4)	8pin-DIP  9.6 x 7.62 (9.6 x 6.3)

## Renesas Reset ICs (Voltage Detectors)

Ex: RNA51951AFP is 8-pin SOP package Reset IC(Detection Voltage = 4.25V).

Note:

Codes shown in gray color are optional.