1.Description

The UMW RS8031, RS8032, RS8034, families of products offer low voltage operation and rail-to-rail input and output, as well as excellent speed/power consumption ratio, providing an excellent bandwidth (15kHz) and slew rate of 7.5V/ms. The op-amps are unity gain stable and feature an ultra-low input bias current.

The devices are ideal for sensor interfaces, active filters and portable applications. The UMW RS8031, RS8032, RS8034 families of operational amplifiers are specified at the full temperature range of -40°C to +125°C under single or dual power supplies of 1.4V to 5.5V

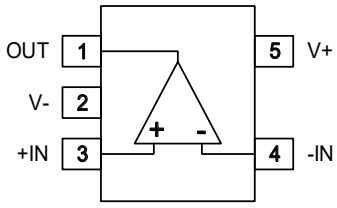
2.Features

- Gain Bandwidth: 15kHz
- Rail-to-rail Input And Output 0.5mV Typical V_{OS}
- Input Voltage Range: -0.1V to +5.6V with V_S=5.5V
- Supply Range: +1.4V to +5.5V
- Specified Up To +125° C
- Micro Size Packages: SOT23 -5

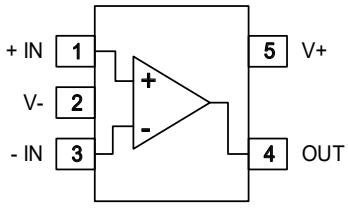
3.Applications

- Sensors
- Photodiode Amplification
- Wearable Products
- Temperature Measurement
- Battery Powered System

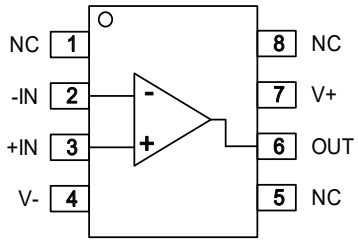
4.Pinning Information



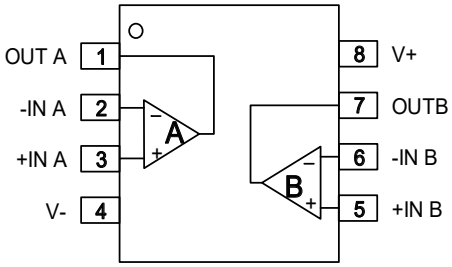
RS8031
SOT23-5



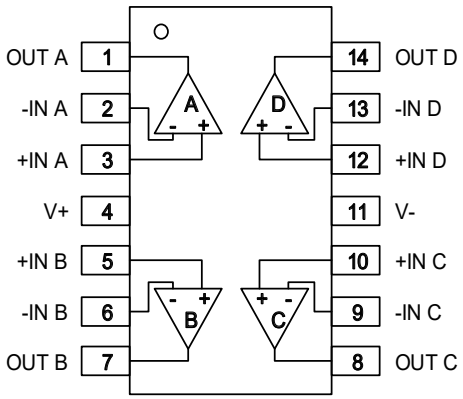
RS8031B
SOT23-5



RS8031
SOP-8



RS8032
SOP-8



RS8034
SOP-14

Note: NC indicates no internal connection

5.Absolute Maximum Ratings

Parameter	Value
Supply Voltage: V^+ - V^-	7V
Input Terminals, Voltage	-0.5 to (V+) + 0.5V
Current	±10mA
Storage Temperature	-65°C to 150°C
Operating Temperature	-40°C to 125°C
Junction Temperature	150°C
Package Thermal Resistance @ T_A=+25°C	
SOT23-5, SOT23-6	200°C/W
MSOP8, SOIC-8	150°C/W
SOIC-14, TSSOP-14	100°C/W
Lead Temperature (Soldering, 10s)	260°C
ESD Susceptibility	
HBM	5000V
MM	400V

6.Electrical Characteristics

(At T_A=+25°C, V_S=5V, R_L=1MΩ connected to V_S/2, and V_{OUT}=V_S/2, unless otherwise noted.)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Operating Voltage Range	V_S		1.4		5.5	V
Quiescent Current/Amplifier	I_Q			750	1500	nA
Power-Supply Rejection Ratio	PSRR	V_S=2.5V to 5.5V, V_{CM}=(V-)+0.5V	62	70		dB
Input Offset Voltage	V_{OS}			0.5	3	mV
Input Offset Voltage Drift	$\Delta V_{OS}/\Delta T$	-40°C to 125°C		2.3		μV/°C
Input Bias Current	I_B			1	10	pA
Input Offset Current	I_{OS}			1	10	pA
Common-Mode Voltage Range	V_{CM}	V_S=5.5V	-0.1		5.6	V
Common-Mode Rejection Ratio	CMRR	V_S=5.5V, V_{CM}=-0.1V to 4V	73	90		dB
		V_S=5.5V, V_{CM}=-0.1V to 5.6V	60	83		dB
Open-Loop Voltage Gain	A_{OL}	V_S=1.4V, R_L=50KΩ, V_O=V_S-0.1V	85	102		dB
		V_S=5V, R_L=50KΩ, V_O=V_S-0.1V	92	106		dB
Output Swing From Rail		R_L=50KΩ		5		mV
Output Short-Circuit Current	I_{OUT}			11		mA
Slew Rate	SR			7.5		v/ms
Gain-Bandwidth Product	GBP			15		kHz
Phase Margin	PM			60		°
Input Voltage Noise	e_np-p	f=0.1Hz to 10Hz		2.4		μVpp
Input Voltage Noise Density	e_n	f=1kHz		160		nV/√Hz

7.Typical characteristic

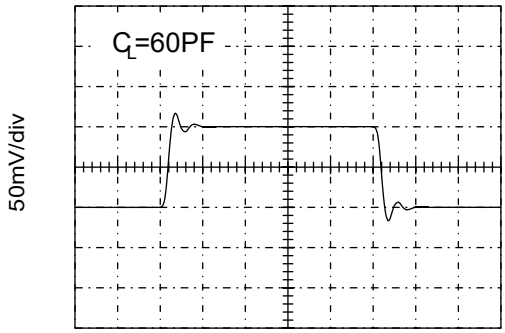


Figure 1: Small−signal Step Response

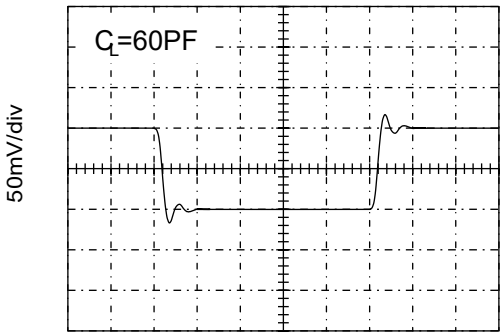


Figure 2: Small−signal Step Response

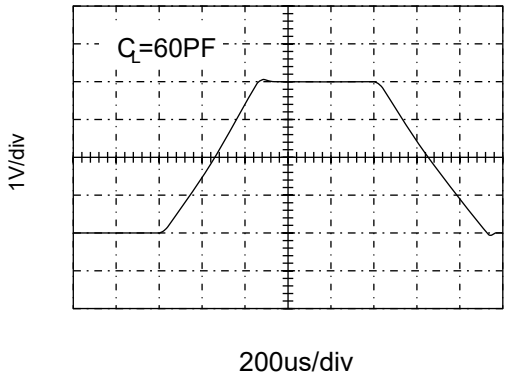


Figure 3: Large−signal Step Response

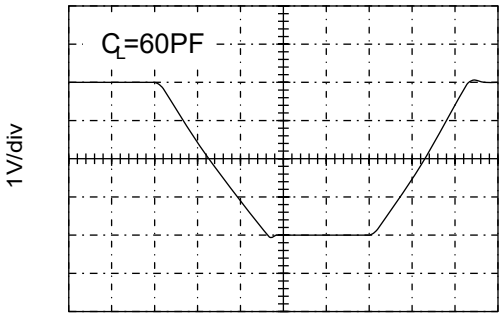


Figure 4: Large−signal Step Response

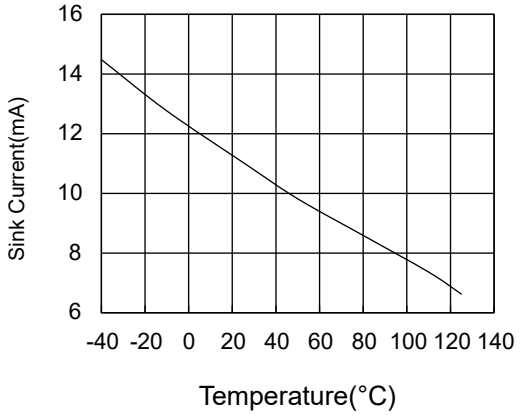


Figure 5: Sink Current vs Temperature

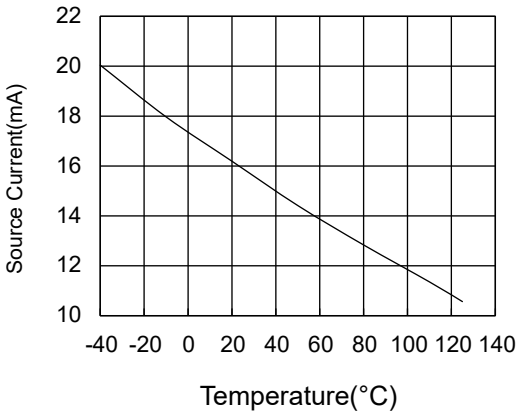
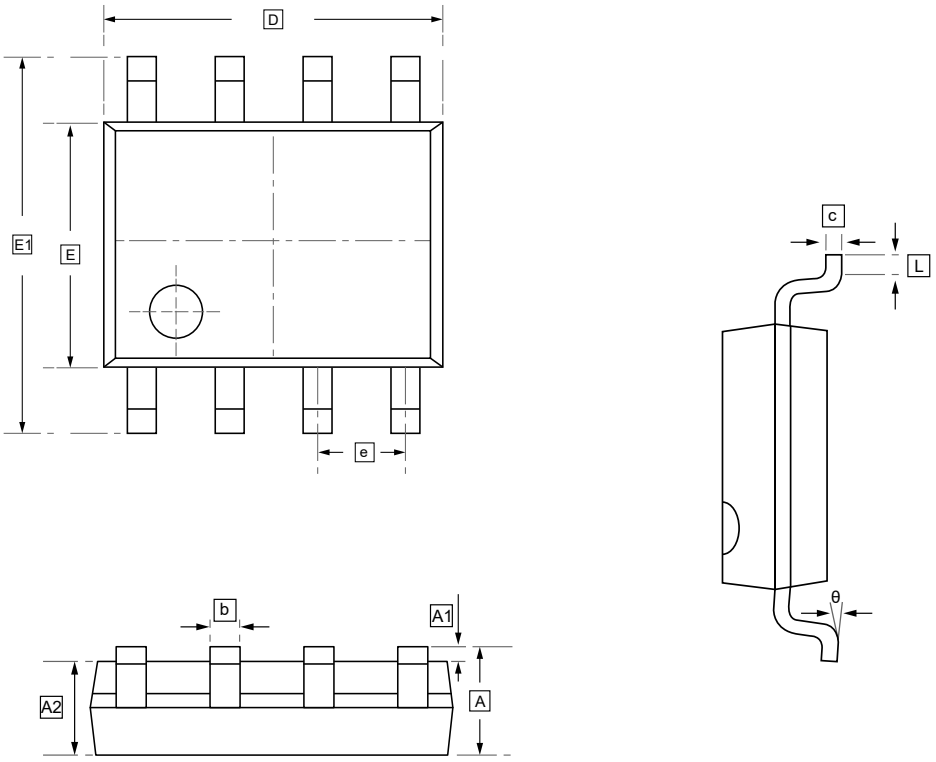


Figure 6: Source Current vs Temperature

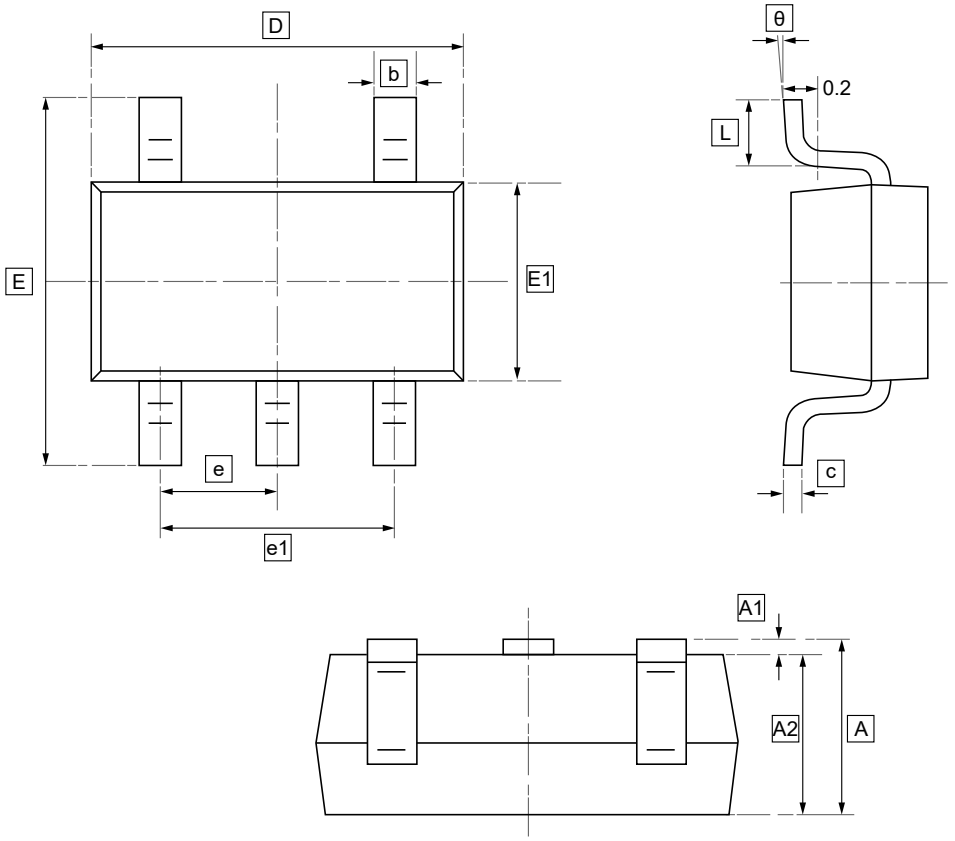
8.1 SOP-8 Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	c	D	E	E1	e	L	θ
Min	1.350	0.000	1.350	0.330	0.170	4.700	3.800	5.800	1.270	0.400	0°
Max	1.750	0.100	1.550	0.510	0.250	5.100	4.000	6.200	BSC	1.270	8°

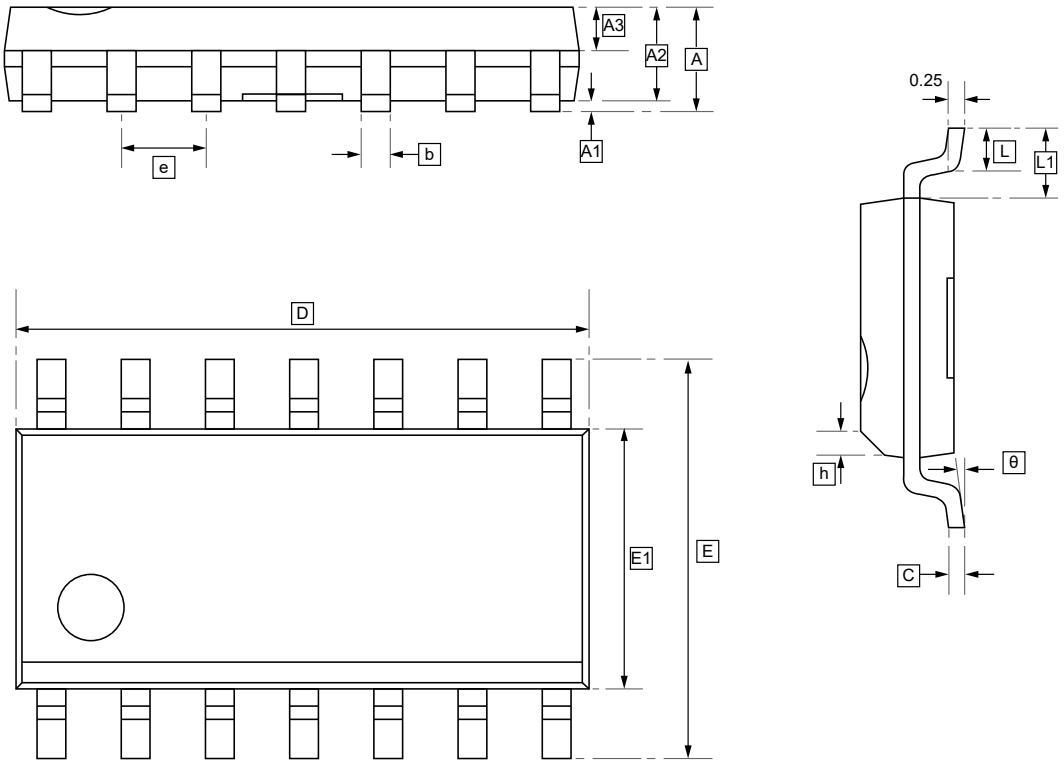
8.2 SOT-23-5 Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	c	D	E1	E	e	e1	L	θ
Min	1.050	0.000	1.050	0.300	0.100	2.820	1.500	2.650	0.950	1.800	0.300	0°
Max	1.250	0.100	1.150	0.500	0.200	3.020	1.700	2.950	BSC	2.000	0.600	8°

8.3 SOP-14 Package Outline Dimensions

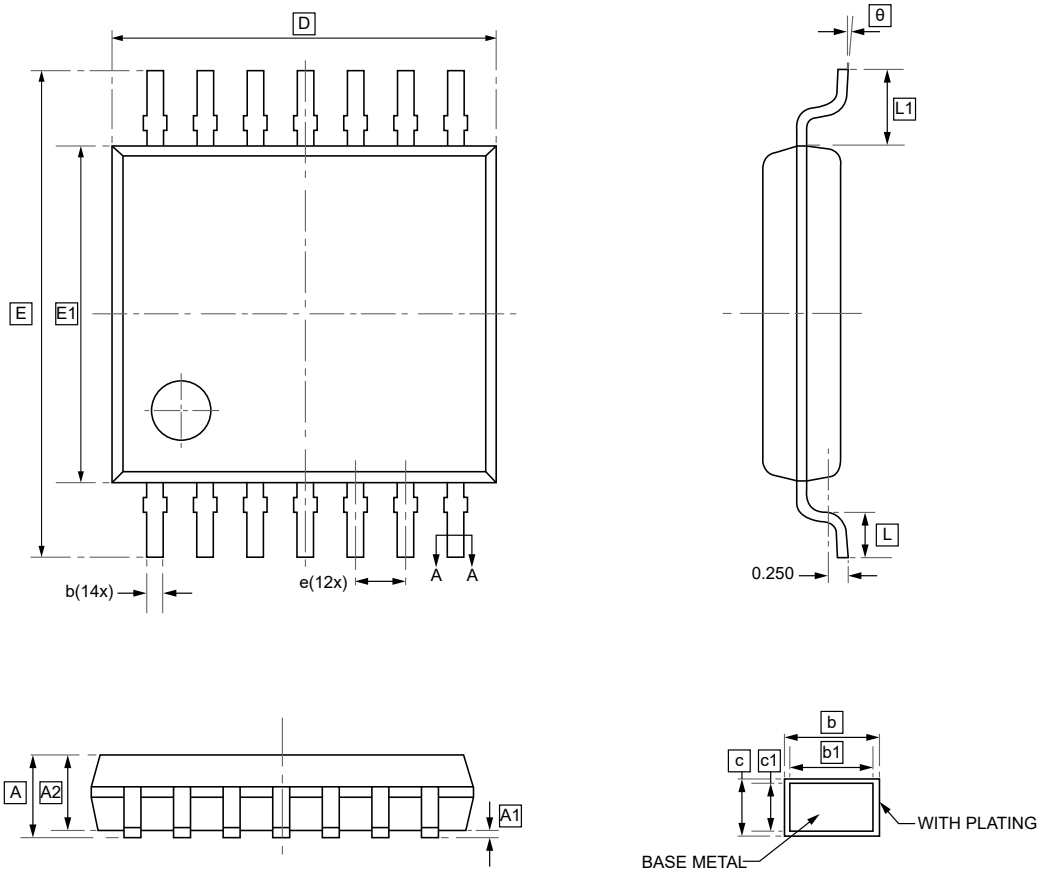


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	A3	b	C	D	E	E1	e	h	L
Min	-	0.05	1.35	0.65	0.203	0.17	8.45	5.80	3.80	1.24	0.25	0.40
Max	1.75	0.25	1.55	0.75	0.305	0.25	8.85	6.20	4.00	1.30	0.50	0.80

Symbol	L1	θ
Min	1.00	0°
Max	1.10	8°

8.4 TSSOP-14 Package Outline Dimensions



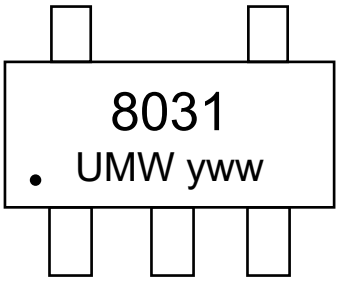
DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	b1	c	c1	D	E	E1	e	L1
Min	-	0.05	0.90	0.20	0.19	0.13	0.120	4.90	6.20	4.30	0.65	0.85
Max	1.20	0.15	1.05	0.28	0.25	0.17	0.14	5.10	6.60	4.50	BSC	1.15

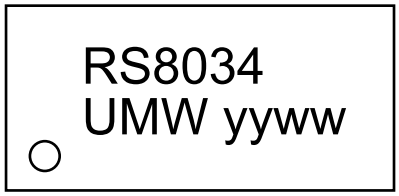
Symbol	L	θ
Min	0.45	0°
Max	0.75	8°

9.Ordering information

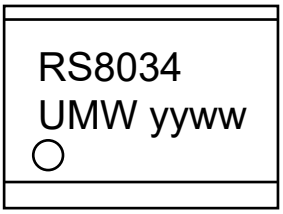
SOT23-5



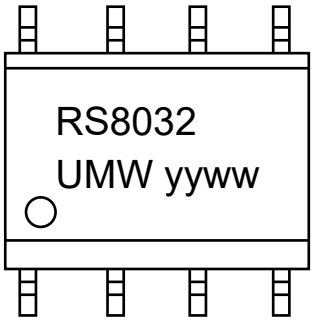
SOP-14



TSSOP-14



SOP-8



y: Year Code
yy: Year Code
ww: Week Code

Order Code	Marking	Package	Base QTY	Delivery Mode
UMW RS8031XF	8031	SOT23-5	3000	Tape and reel
UMW RS8032XK	RS8032	SOP-8	2500	Tape and reel
UMW RS8034XP	RS8034	SOP-14	2500	Tape and reel
UMW RS8034XQ	RS8034	TSSOP-14	4000	Tape and reel

10.Disclaimer

UMW reserves the right to make changes to all products, specifications. Customers should obtain the latest version of product documentation and verify the completeness and currency of the information before placing an order.

When applying our products, please do not exceed the maximum rated values, as this may affect the reliability of the entire system. Under certain conditions, any semiconductor product may experience faults or failures. Buyers are responsible for adhering to safety standards and implementing safety measures during system design, prototyping, and manufacturing when using our products to prevent potential failure risks that could lead to personal injury or property damage.

Unless explicitly stated in writing, UMW products are not intended for use in medical, life-saving, or life-sustaining applications, nor for any other applications where product failure could result in personal injury or death. If customers use or sell the product for such applications without explicit authorization, they assume all associated risks.

When reselling, applying, or exporting, please comply with export control laws and regulations of China, the United States, the United Kingdom, the European Union, and other relevant countries, regions, and international organizations.

This document and any actions by UMW do not grant any intellectual property rights, whether express or implied, by estoppel or otherwise. The product names and marks mentioned herein may be trademarks of their respective owners.