August 2001



# **Product Brief**

**KM4212** Dual, 70μA, Low Cost, +2.7V and +5V, 7.3MHz Rail-to-Rail Amplifier



SOIC-8 shown (not actual size). MSOP-8 package also available.

#### **Features**

- 70µA supply current per amplifier
- 7.3MHz bandwidth
- Fully specified at +2.7V and +5V supplies
- Output voltage range: 0.04V to 4.96V; V<sub>s</sub> = +5
- Input voltage range: -0.3V to +3.8V;  $V_s = +5$
- 9V/µs slew rate
- ±4mA linear output current
- ±9mA output short circuit current
- 29nV/√Hz input voltage noise
- Competes with low power CMOS amplifiers
- Package options (SOIC-8 and MSOP-8)

#### **Applications**

- Portable/battery-powered applications
- A/D buffer
- Active filters
- Signal conditioning
- Portable test instruments

#### **General Description**

The KM4212 is a dual, ultra-low power, low cost, voltage feedback amplifier. The KM4212 uses only  $70\mu$ A of supply current per amplifer, and is designed to operate on +2.7V, +5V, or ±2.5V supplies. The input voltage range extends 300mV below the negative rail and 1.2V below the positive rail.

The KM4212 offers high bipolar performance at a low CMOS price. The KM4212 offers superior dynamic performance with a 7.3MHz small signal bandwidth and  $9V/\mu s$  slew rate. The combination of low power, high bandwidth, and rail-to-rail performance make the KM4212 well suited for battery-powered communication/computing systems.

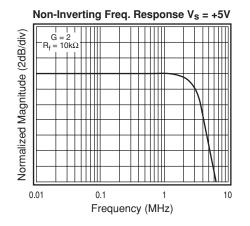
The KM4112 single amplifier is also available.

# Outperforms the competition in single-supply applications at a

### lower cost!

Advertised Specifications	KM4212	Typical CMOS Amplifier	Units
G = 1 BW	7.3	1	MHz
Noise	29	30	nV/√Hz
Slew rate	9	1	V/µs
Supply current/amp	70	50	μΑ

### **Typical Performance Plot**



#### **Ordering Information**

Part No.	Package	Container	Pack Qty	Eval Bd*
KM4212IC8	SOIC-8	Rail	95	KEB006
KM4212IC8TR3	SOIC-8	Reel	2500	KEB006
KM4212IM8	MSOP-8	Rail	50	KEB010
KM4212IM8TR3	MSOP-8	Reel	4000	KEB010

Temperature range for all parts: -40°C to +85°C.

\* Evaluation boards are available to aid in the evaluation of these products. See the full data sheet or website for complete information.

#### **Electrical Characteristics**

(G = +2,  $R_f = 10k\Omega$ ,  $R_L = 10k\Omega$  to  $V_s/2$ ,  $T_a = +25$ °C, unless noted)

PARAMETERS	CONDITIONS	TYP	TYP	UNITS
		V <sub>s</sub> = +2.7V	V <sub>s</sub> = +5V	
Frequency Domain Response -3dB bandwidth <sup>1</sup>	$G = +1, V_0 = 0.05V_{pp}$	6.5 3	7.3 3.4	MHz MHz
full power bandwidth gain bandwidth product	$G = +2, V_0 < 0.2V_{pp}$ $G = -1, V_0 = 2V_{pp}$	2 3.5	2.5 4	MHz MHz
Time Domain Response rise and fall time settling time to 0.1% <sup>2</sup> overshoot <sup>2</sup> slew rate	0.2V step 2V step 2V step 2V step, G = -1	55 700 7 7 7	50 600 4 9	ns ns % V/µs
Distortion and Noise Response 2nd harmonic distortion <sup>2</sup> 3rd harmonic distortion <sup>2</sup> THD <sup>2</sup> input voltage noise crosstalk	2V <sub>pp</sub> , 100kHz 2V <sub>pp</sub> , 100kHz 2Vpp, 100kHz >10kHz 0.01MHz	68 65 63 30 89	67 60 59 29 89	dBc dBc dB nV/Hz dB
DC Performance input offset voltage average drift input bias current average drift input offset current power supply rejection ratio open loop gain quiescent current per amplifier	DC	1 3 90 100 2.1 63 82 62	1 8 90 100 1.3 63 76 70	mV μV/°C μA nA/°C nA dB dB μA
Input Characteristics input resistance input capacitance input common mode voltage rar common mode rejection ratio	nge DC, V <sub>cm</sub> = 0V to V <sub>s</sub> – 1.5	>10 1.4 -0.3 to 1.5 95	>10 1.25 -0.3 to 3.8 97	MΩ pF V dB
Output Characteristics output voltage swing linear output current short circuit output current power supply operating range	$R_L = 10k\Omega$ to $V_s/2$ $R_L = 2k\Omega$ to $V_s/2$	0.035 to 2.665 0.07 to 2.6 ±4 ±9 2.7	0.09 to 4.9 ±4 ±9	V V mA mA V

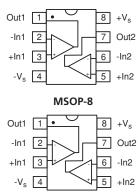
**Notes:** 1) For +2.7V supply, a  $1V_{pp}$  condition was used. 2) For G = +1,  $R_f = 0$ .

#### **Absolute Maximum Ratings**

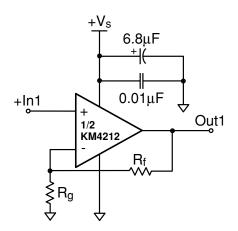
supply voltage	0 to +6V
maximum junction temperature	+175°C
storage temperature range	-65°C to +150°C
lead temperature (10 sec)	+260°C
operating temperature range	-40° to +85°C
input voltage range	±V <sub>s</sub> + 0.5V; -V <sub>s</sub> – 0.5V;
internal power disapation	see power derating curves in the full data sheet
$\theta_{ia}$ for 8 lead SOIC	152°C/W
$\theta_{ja}$ for 8 lead MSOP	206°C/W

#### **Available Packages**





#### Typical Circuit Configuration



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- A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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