FAIRCHILD SEMICONDUCTOR™

February 2001

KM4270

Dual, Low Cost, +2.7V and +5V, Rail-to-Rail I/O Amplifier

Product Brief

SOIC-8
(not actual size)

MSOP-8
(not actual size)

Preliminary

Outperforms the competition in single-supply applications at a

lower cost!

Features at 2.7V

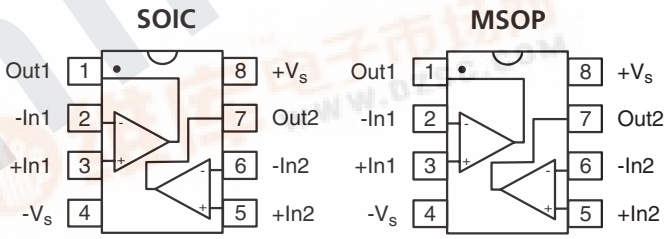
- 160μA supply current per amplifier
- 4.9MHz bandwidth
- Output swings to within 20mV of either rail
- Input voltage range exceeds the rail by >250mV
- 5.3V/μs slew rate
- 35mA short circuit output current
- 24nV/√Hz input voltage noise
- Directly replaces MAX4126, OPA2340, LMV822, and TLV2462 in single supply applications
- Available in SOIC and MSOP package options

Advertised 5V Specifications	KM4270	Competitors A	B	C	D	Units
G = 1 BW	4.3	5	5.5	5.6	6.4	MHz
Noise	27	22	25	24	11	nV/√Hz
Slew rate	9	2	6.0	2	1.6	V/μs
Supply current	160	850	750	250	550	μA

Applications

- Portable/battery-powered applications
- PCMCIA, USB
- Mobile communications, cellular phones, pagers
- Notebooks and PDA's
- Sensor Interface
- A/D buffer
- Active filters
- Signal conditioning
- Portable test instruments

Available Packages



General Description

The KM4270 is a dual ultra-low cost, low power, voltage feedback amplifier. At 5V, the KM4270 uses only 160μA of supply current per amplifier and is designed to operate from a supply range of 2.5V to 5.5V. The input voltage range exceeds the negative and positive rails. The KM4170 (single) and KM4470 (quad) are also available.

The KM4270 offers high bipolar performance at a low CMOS price. The KM4270 offers superior dynamic performance with a 4.9MHz small signal bandwidth and 5.3V/μs slew rate. The combination of low power, high bandwidth, and rail-to-rail performance make the KM4270 well suited for battery-powered communication/computing systems.

Ordering Information

Part No.	Package	Container	Pack Qty	Eval Bd*
KM4270IC8	SOIC-8	Rail	95	KEB006
KM4270IC8TR3	SOIC-8	Reel	2500	KEB006
KM4270IM8	MSOP-8	Rail	50	KEB010
KM4270IM8TR3	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.

KM4270
Typical Specifications

Electrical Characteristics
($G = +2$, $R_f = 5k\Omega$, $R_L = 10k\Omega$ to $V_s/2$, $T_a = +25°C$, unless noted)

PARAMETERS	CONDITIONS	TYP $V_s = +2.7V$	TYP $V_s = +5V$	UNITS
Frequency Domain Response[2]				
-3dB bandwidth	G = +1, $V_o = 0.02V_{pp}$	4.9	4.3	MHz
	G = +2, $V_o = 0.2V_{pp}$	3.7	3.0	MHz
full power bandwidth	G = +2, $V_o = 2V_{pp}$	1.4	2.3	MHz
gain bandwidth product		2.2	2.0	MHz
Time Domain Response				
rise and fall time	1V step	163	110	ns
overshoot	1V step	<1	<1	%
slew rate	1V step	5.3	9	V/µs
Distortion and Noise Response				
2nd harmonic distortion[1]	$1V_{pp}$, 10KHz	-75	-73	dBc
3rd harmonic distortion[1]	$1V_{pp}$, 10KHz	-76	-75	dBc
THD[1]	$1V_{pp}$, 10KHz	0.03	0.03	%
input voltage noise	>10KHz	24	27	nV/Hz
input voltage noise	>2KHz	32	28	nV/Hz
crosstalk	10KHz	TBD	TBD	dB
DC Performance				
input offset voltage		0.5	1.5	mV
average drift		5	15	µV/°C
input bias current		90	90	nA
average drift		32	40	pA/°C
power supply rejection ratio	DC	83	60	dB
open loop gain		90	80	dB
quiescent current per amplifier		136	160	µA
Input Characteristics				
input resistance		12	12	MΩ
input capacitance		2	2	pF
input common mode voltage range		-0.25 to 2.95	-0.25 to 5.25	V
common mode rejection ratio	DC	81	85	dBc
Output Characteristics				
output voltage swing	$R_L = 10k\Omega$ to $V_s/2$	0.020 to 2.68	0.04 to 4.96	V
	$R_L = 1k\Omega$ to $V_s/2$	0.05 to 2.63	0.07 to 4.9	V
	$R_L = 200\Omega$ to $V_s/2$	0.11 to 2.52	0.14 to 4.67	V
output current		16	30	mA
short circuit output current		35	60	mA
recommended power supply operating range		2.5 to 5.5		V

Notes: 1) For +5V supply, a $2V_{pp}$ 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)	+300°C
operating temperature range	-40° to +85°C
input voltage range	$+V_s + 0.5V$, $-V_s - 0.5V$
θ_{ja} for 8 lead SOIC	152°C/W
θ_{ja} for 8 lead MSOP	206°C/W

Typical Circuit Configuration