FAIRCHILD
SEMICONDUCTOR®

July 2001

KM4470

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

Product Brief

TSSOP-14
(not actual size)

Features at 2.7V

- 136μA 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 MAX4129, OPA4340, LMV824, and TLV2464 in single supply applications
- Available in TSSOP package

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

General Description

The KM4470 is a quad ultra-low cost, low power, voltage feedback amplifier. At 5V, the KM4470 uses only 160μA of supply current per amplifier and is designed to operate from a supply range of 2.5V to 5.5V (±1.25 to ±2.75V). The input voltage range exceeds the negative and positive rails. The KM4170 (single) and KM4270 (dual) are also available.

The KM4470 offers high bipolar performance at a low CMOS price. The KM4470 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 KM4470 well suited for battery-powered communication/computing systems.

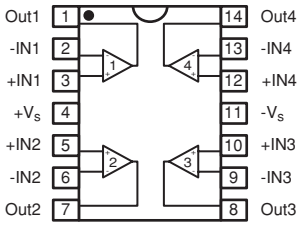
Outperforms the competition in single-supply applications at a

lower cost!

Advertised 5V Specifications	KM4470	Competitors A	B	C	D	Units
G = 1 BW	4.3	5	5.5	5.6	6.4	MHz
Noise	22	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

Available Package

TSSOP



Ordering Information

Part No.	Package	Container	Pack Qty	Eval Bd*
KM4470IP14	TSSOP-14	Rail	95	KEB012
KM4470IP14TR3	TSSOP-14	Reel	2500	KEB012

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.

KM4470
Typical Specifications

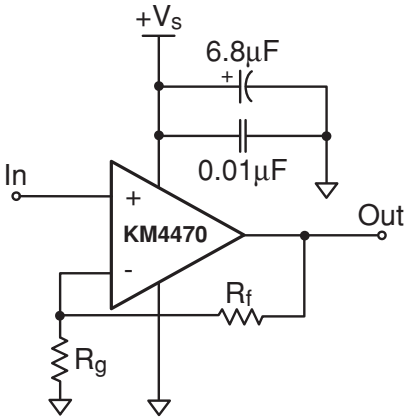
Electrical Characteristics

($G = +2$, $R_f = 5k\Omega$, $R_L = 10k\Omega$ 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	-72	-73	dBc
3rd harmonic distortion[1]	1V_{pp}, 10kHz	-72	-75	dBc
THD[1]	1V_{pp}, 10kHz	0.03	0.03	%
input voltage noise	>10kHz	21	22	nV/Hz
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	$R_L = 10k\Omega$	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, $R_f = 0$.

Typical Circuit Configuration



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	$+V_S$ + 0.5V, $-V_S$ - 0.5V
θ_{ja} for 14 lead TSSOP	100°C/W