

Product Brief



SOT23-5
(not actual size)



SC70-5
(not actual size)

Features at 2.7V

- 136 μ A supply current
- 4.9MHz bandwidth
- Output swings to within 20mV of either rail
- Input voltage range exceeds the rail by >250mV
- 5.3V/ μ s slew rate
- 16mA output current
- 21nV/ $\sqrt{\text{Hz}}$ input voltage noise
- Directly replaces OPA340, OPA343, and TLV2461 in single supply applications
- Available in SC70 and SOT23-5 package options

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 KM4170 is an ultra-low cost, low power, voltage feedback amplifier. At 5V, the KM4170 uses only 160 μ A of supply current 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.

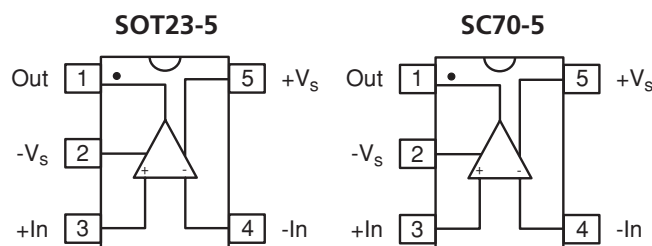
The KM4170 offers high bipolar performance at a low CMOS price. The KM4170 offers superior dynamic performance with a 4.9MHz small signal bandwidth and 5.3V/ μ s slew rate. The combination of low power, high bandwidth, and rail-to-rail performance make the KM4170 well suited for battery-powered communication/computing systems.

Outperforms the competition in single-supply applications at a

lower cost!

Advertised 5V Specifications	KM4170	Competitors			Units
		A	B	C	
G = 1 BW	4.3	5.5	5.5	6.4	MHz
Noise	22	25	25	11	nV/ $\sqrt{\text{Hz}}$
Slew rate	9	6.0	6.0	1.6	V/ μ s
Supply current	160	750	850	550	μ A

Available Packages



Ordering Information

Part No.	Package	Container	Pack Qty	Eval Bd*
KM4170IT5	SOT23-5	Partial Reel	<3000	KEB002
KM4170IT5TR3	SOT23-5	Reel	3000	KEB002
KM4170IS5	SC70-5	Partial Reel	<3000	KEB011
KM4170IS5TR3	SC70-5	Reel	3000	KEB011

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.

KM4170

Typical Specifications

Electrical Characteristics

($G = +2$, $R_f = 5k\Omega$, $R_L = 10k\Omega$ to $V_s/2$, $T_a = +25^\circ\text{C}$, unless noted)

PARAMETERS	CONDITIONS	TYP	TYP	UNITS
		$V_s = +2.7\text{V}$	$V_s = +5\text{V}$	
Frequency Domain Response²				
-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	$\mu\text{V}/^\circ\text{C}$
input bias current		90	90	nA
average drift		32	40	$\text{pA}/^\circ\text{C}$
power supply rejection ratio	DC	83	60	dB
open loop gain		90	80	dB
quiescent current		136	160	μA
Input Characteristics				
input resistance		12	12	M Ω
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
recommended power supply operating range		2.5 to 5.5		V

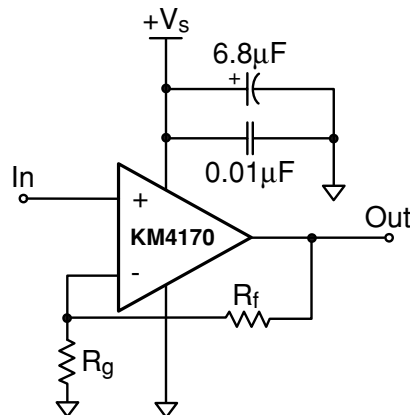
Notes: 1) For +5V supply, a $2V_{pp}$ condition was used.

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)	+260°C
operating temperature range	-40° to +85°C
input voltage range	$+V_s + 0.5\text{V}$, $-V_s - 0.5\text{V}$
θ_{ja} for 5 lead SOT23	256°C/W
I_{out} continuous	$\pm 30\text{mA}$

Typical Circuit Configuration



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