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# LIC Variable Operational Amplifiers

## CA3094 Programmable Power Switch/Amplifier CA3080 Programmable Op-Amp

- Input control permits user to vary voltage, power bandwidth, slew rate, input and output currents
- Devices can be programmed and/or signal-modulated for optimum gain, speed, bandwidth, power
- Outputs can "sink" or "source" currents
- Linear gain is adjustable over 3 decades of amplifier bias current  $I_{ABC}$
- Standby power levels can be adjusted from below  $1 \mu\text{W}$  up to 30 W

### Features

#### CA3094

- Programmable: strobing, gating, squelching, agc capabilities

- Capable of delivering 3 W average or 10 W peak to external loads
  - High current-handling capability: 100 mA avg., 300 mA peak
  - Sensitivity controlled by varying bias current
  - Power output of 0.6 W in high-power, single-ended class A amplifier (1.6 W dissipation)
  - THD: 1.4% typ. (at 0.6 W class A)
  - Designed for single or dual power supplies
- #### CA3080
- Differential input, single-ended class A output
  - $I_{ABC}$  used for either gating or linear gain control
  - Slew rate (unity gain, compensated):  $50 \text{ V}/\mu\text{s}$
  - Flexible supply voltage range:  $\pm 2 \text{ V}$  to  $\pm 15 \text{ V}$
  - Fully adjustable gain: 0 to  $g_{mRL}$  limit
  - Tight  $g_m$  spread: 2:1 for CA3080, 1.6:1 for

Sym- bol	Characteristics Limits, $T_A = 25^\circ\text{C}$						Units
	CA3094			CA3080			
	$I_{ABC} = 100 \mu\text{A}$			$I_{ABC} = 500 \mu\text{A}$			
	Min.	Typ.	Max.	Min.	Typ.	Max.	
$V_{IO}$	—	0.4	5	—	0.4	5	mV
$I_{IO}$	—	0.02	0.2	—	0.12	0.6	$\mu\text{A}$
$I_{IB}$	—	200	500	—	2	5	$\mu\text{A}$
$I_{OM}$	—	—	—	350	500	650	$\mu\text{A}$
$V_{OM}^+$	14.95	14.99	—	12	13.5	—	V
$V_{OM}^-$	—	14.96	—	12	14.4	—	
$V_{ABC}$	—	0.68	—	—	0.71	—	V
$g_m$	1.65	2.2	2.75	6.7	9.6	13	mmho
CMRR	70	110	—	80	110	—	dB
$V_{ICR}$	+12 <sup>▲</sup> -14 <sup>▲</sup>	+13.8 <sup>▲</sup> -4.5 <sup>▲</sup>	—	+12 to -12	+13.6 -14.6	—	V
SR	500 (max. value) 0.7 (unity gain)			—	—	75	$\text{V}/\mu\text{s}$

\*G21 <sup>▲</sup> $V^+ = 15 \text{ V}$  <sup>▲</sup> $V^- = 15 \text{ V}$

## CA3078 Micropower Op-Amp CA3060 Variable Op-Amp Array

CA3078: Low standby power assures operation from a single 1.5-V battery; a programmable input terminal permits tailoring the frequency response and slew rate without sacrificing power.

CA3060: 3 variable op-amps on one chip plus a zener bias regulator to control bias current or as a voltage-reference source for external circuits.

Sym- bol	Characteristics Limits, $T_A = 25^\circ\text{C}$						Units
	CA3060 (ea. amplifier)			CA3078A			
	$I_{ABC} = 100 \mu\text{A}$			RSET: 5.1 M $\Omega$ ; $I_Q$ : 20 $\mu\text{A}$			
	Min.	Typ.	Max.	Min.	Typ.	Max.	
$V_{IO}$	—	1	5	—	1.3	3.5	mV
$I_{IO}$	—	250	1000	—	0.5	2.5	$\mu\text{A}$
$I_{IB}$	—	2500	5000	—	7	12	nA
$I_{OM}$	150	240	—	—	$\pm 12$	—	mA
$V_{OM}^+$	12	13.6	—	5.1	5.3	—	V
$V_{OM}^-$	12	14.7	—	5.1	5.3	—	
$V_{ABC}$	—	0.66	—	—	—	—	V
g21	30	102	—	—	—	—	mmho
CMRR	70	90	—	80	115	—	dB
$V_{ICR}$	+12 to -12	+13 to -14	—	-5 5	-5.5 to+5.8	—	V
SR	—	8	—	—	—	—	$\text{V}/\mu\text{s}$

CA3078  $A_{OL}$ : 88 mm, 92 typ. dB  $I_Q$ : 100 typ. > 130 max.  $\mu\text{A}$

### Recommended Applications

#### CA3094

- Fire detection and intrusion alarm systems
- Portable GFI detectors
- Function generators
- Temperature-measuring equipment
- Driver for complementary power transistors for audio use
- Battery-operated flashers

#### CA3080

- Communications equipment
- Function generators (1,000,000-to-1 sweep capability)
- Peak detector instruments
- Battery-operated paging systems
- Audio-frequency synthesizers

### Features

#### CA3078

- Low standby power: as low as 700 nW
- Wide supply-voltage range: 0.75 to  $\pm 15 \text{ V}$
- High peak output current: 65 mA min.
- Adjustable quiescent current
- Output short-circuit protection

#### CA3060

- Low power consumption: as low as  $100 \mu\text{W}$ /amplifier
- Independent biasing for each amplifier
- Programmable range of input characteristics
- Low input bias and input offset current
- No effect on device under output short-circuit conditions
- High forward transconductance

### Recommended Applications

#### CA3078

- Portable electronics
- Medical electronics
- Instrumentation
- Telemetry

#### CA3060

- Active filters
- Gytrators
- Multiplexers
- Strobing and gating functions
- Sample-and-hold functions
- Comparators
- Modulators
- Multipliers