

# Other Analog Circuits

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## In Brief . . .

Other analog circuits are provided for special applications with both bipolar and CMOS technologies. These circuits range from the industry standard analog timing circuits and multipliers to specialized CMOS smoke detectors. These products provide key functions in a wide range of applications, including data transmission, commercial smoke detectors, and various industrial controls.

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# Timing Circuits

These highly stable timers are capable of producing accurate time delays or oscillation. In the time delay mode of operation, the time is precisely controlled by one external resistor and capacitor. For a stable operation as an oscillator, the free-running frequency and the duty cycle are both accurately controlled with two external resistors and one capacitor. The output structure can source or sink up to 200 mA or drive TTL circuits. Timing intervals from microseconds through hours can be obtained. Additional terminals are provided for triggering or resetting if desired.

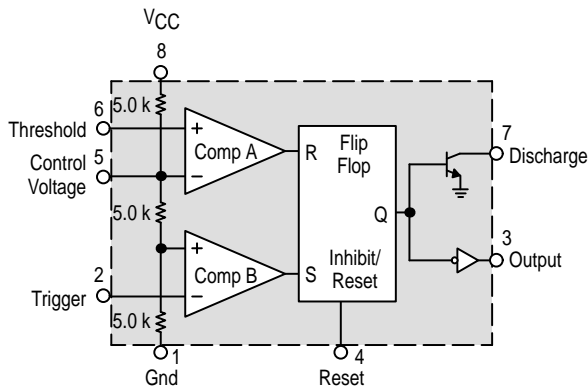
## Singles

### MC1455P1, D

$T_A = 0^\circ$  to  $+70^\circ\text{C}$ , Case 626, 751

### MC1455BP1, D

$T_A = -40^\circ$  to  $+85^\circ\text{C}$ , Case 626, 751



## Duals

### MC3456P

$T_A = 0^\circ$  to  $+70^\circ\text{C}$ , Case 646

### NE556N, D

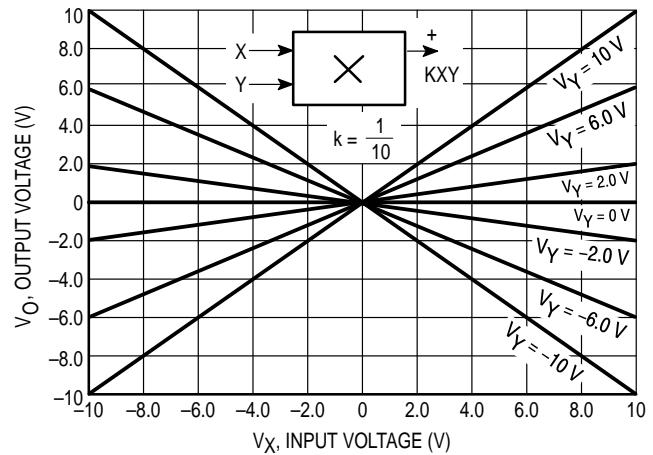
$T_A = 0^\circ$  to  $+70^\circ\text{C}$ , Case 646, 751A

# Multipliers

## Linear Four-Quadrant Multipliers

Multipliers are designed for use where the output voltage is a linear product of two input voltages. Typical applications include: multiply, divide, square, root-mean-square, phase detector, frequency doubler, balanced modulator/demodulator, electronic gain control.

**Multiplier Transfer Characteristics**



### MC1494P

$T_A = 0^\circ$  to  $+70^\circ\text{C}$ , Case 648

This device has all the necessary internal regulation and references. The single-ended output is referenced to ground.

### MC1495D, P

$T_A = 0^\circ$  to  $+70^\circ\text{C}$ , Case 751A, 646

Maximum versatility is assured by allowing the user to select the level shift method.

### MC1495BP

$T_A = -40^\circ$  to  $+125^\circ\text{C}$ , Case 646

Linearity and offset are actually tested over temperature. This is an improved specification over previous versions.

# Smoke Detectors (CMOS)

These smoke detector ICs require a minimum number of external components. When smoke is sensed, or a low battery voltage is detected, an alarm is sounded via an external

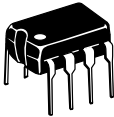
piezoelectric transducer. All devices are designed to comply with UL specifications.

**Table 1. Smoke Detectors (CMOS)**

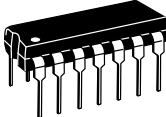
Function	Recommended Power Source	Unique Feature	Low Battery Detector	Piezoelectric Horn Driver	Complies with UL217 and UL268	Device Number	Suffix/Package
Ionization-Type Smoke Detector	Battery	High Input Impedance FET Comparator	✓	✓	✓	MC14467-1	P1/646
	Line		-	-	✓	MC14578	P/648
Ionization-Type Smoke Detector with Interconnect	Battery		✓	✓	✓	MC14468	
	Line		-	✓	✓	MC14470	
Photoelectric-Type Smoke Detector with Interconnect	Battery	Photo Amplifier	✓	✓	✓	MC145010	P/648, DW/751G
	Line		(1)	✓	✓	MC145011	
	Battery	Photo Amplifier, Temporal Pattern	✓	✓	✓	MC145012	P/646, DW/751G
	Line		(1)	✓	✓	MC145013	
Ionization-Type Smoke Detector	Battery	High Input Impedance FET Comparator, Temporal Pattern	✓	✓	✓	MC145017	P/648
Ionization-Type Smoke Detector with Interconnect	Battery		✓	✓	✓	MC145018	

(1) Low-supply detector.

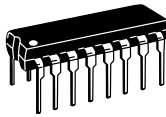
# Other Analog Circuits Package Overview



CASE 626  
P1 SUFFIX



CASE 646  
N, P, P1 SUFFIX



CASE 648  
P SUFFIX



CASE 751  
D SUFFIX



CASE 751A  
D SUFFIX



CASE 751G  
DW SUFFIX