

**FEATURES**

- EXCELLENT CARRIER SUPPRESSION  
65dB typ @ 0.5 MHz  
50dB typ @ 10 MHz
- ADJUSTABLE GAIN AND SIGNAL HANDLING
- BALANCED INPUTS AND OUTPUTS
- HIGH COMMON-MODE REJECTION—85dB typ

**APPLICATIONS**

- SUPPRESSED CARRIER AND AMPLITUDE MODULATION
- SYNCHRONOUS DETECTION
- FM DETECTION
- PHASE DETECTION
- SAMPLING
- SINGLE SIDEBAND
- FREQUENCY DOUBLING

**ABSOLUTE MAXIMUM RATINGS**

Applied Voltage (Note 1)	30V
Differential Input Signal ( $V_7 - V_8$ )	$\pm 5.0V$
Differential Input Signal ( $V_4 - V_1$ )	$(5 \pm I_5 R_e) V$
Input Signal ( $V_2 - V_1, V_3 - V_4$ )	5.0V
Bias Current ( $I_5$ )	10mA
Power Dissipation (Pkg. Limitation)	

K-Package	680mW
Derate above 25°C	5.4mW/°C

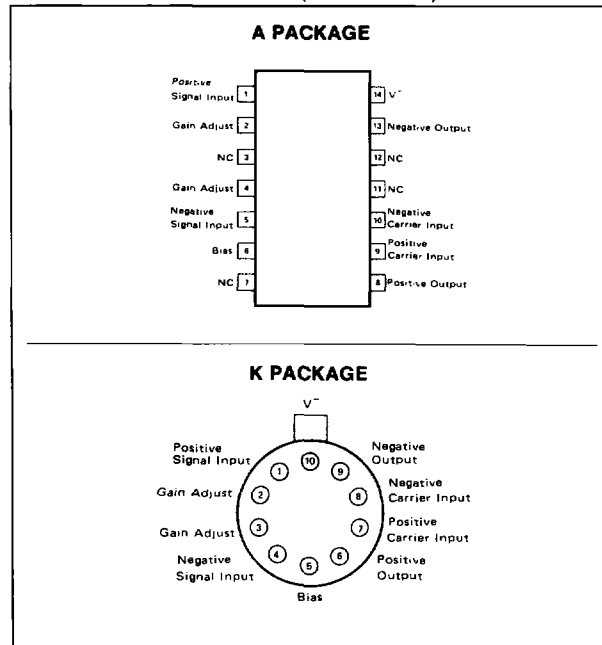
A-Package (TO-116)	900mW
Derate above 25°C	7.2mW/°C

Operating Temperature Range	-55°C to +125°C
Storage Temperature Range	-65°C to +150°C

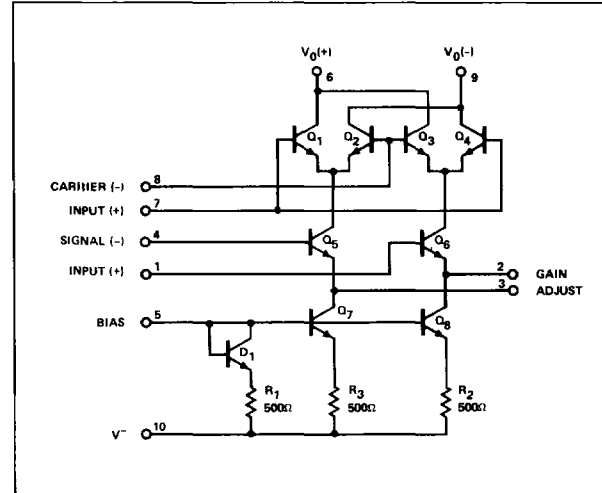
**NOTES**

1. Voltage applied between pins 6-7, 8-1, 9-7, 9-8, 7-4, 7-1, 8-4, 6-8, 2-5, 3-5.
2. Pin number references pertain to K package pinout only.

**PIN CONFIGURATIONS (TOP VIEW)**



**SCHEMATIC DIAGRAM**



**ANALOG**

## SIGNETICS BALANCED MODULATOR-DEMODULATOR ■ MC1596, MC1496

## ELECTRICAL CHARACTERISTICS\*

(All input and output characteristics are single-ended unless otherwise noted.)

PARAMETER	MC1596			MC1496			UNITS
	MIN	TYP	MAX	MIN	TYP	MAX	
Carrier Feedthrough $V_C = 60$ mV(rms) sine wave and offset adjusted to zero $f_C = 1.0$ kHz $V_C = 300$ mVp-p square wave: offset adjusted to zero $f_C = 10$ MHz offset not adjusted $f_C = 1.0$ kHz		40 140			40 140		$\mu$ V(rms)  mV(rms)
CarrierSuppressions $f_S = 10$ kHz, 300 mV(rms) $f_C = 500$ kHz, 60 mV(rms) sine wave $f_C = 10$ MHz, 60 mV(rms) sine wave	50	65 50		40	65 50		dB
Transadmittance Bandwidth (Magnitude) ( $R_L = 50 \Omega$ ) Carrier Input Port, $V_C = 60$ mV(rms) sine wave $f_S = 1.0$ kHz, 300 mV(rms) sine wave Signal Input Port, $V_S = 300$ mV(rms) sine wave $ V_C  = 0.5$ V dc		300 80			300 80		MHz
Signal Gain $V_S = 100$ mV(rms), $f = 1.0$ kHz; $ V_C  = 0.5$ V dc	2.5	3.5		2.5	3.5		V/V
Single-Ended Input Impedance, Signal Port, $f = 5.0$ MHz Parallel Input Resistance Parallel Input Capacitance		200 2.0			200 2.0		k $\Omega$ pF
Single-Ended Output Impedance, $f = 10$ MHz Parallel Output Resistance Parallel Output Capacitance		40 5.0			40 5.0		k $\Omega$ pF
Input Bias Current $I_{bS} = \frac{I_1 + I_4}{2}$ ; $I_{bC} = \frac{I_7 + I_8}{2}$		12 12	25 25		12 12	30 30	$\mu$ A
Input Offset Current $I_{oS} = I_1 - I_4$ ; $I_{oC} = I_7 - I_8$		0.7 0.7	5.0 5.0		0.7 0.7	7.0 7.0	$\mu$ A
Average Temperature Coefficient of Input Offset Current ( $T_A = -55^\circ$ to $+125^\circ$ C)		2.0			2.0		nA/ $^\circ$ C
Output Offset Current ( $I_6 - I_9$ )		14	50		15	80	$\mu$ A
Average Temperature Coefficient of Output Offset Current ( $T_A = -55^\circ$ C to $+125^\circ$ C)		90			90		nA/ $^\circ$ C
Common-Mode Input Swing, Signal Port, $f_S = 1.0$ kHz		5.0			5.0		Vp-p
Common-Mode Gain, Signal Port, $f_S = 1.0$ kHz, $ V_C  = 0.5$ V dc		-85			-85		dB
Common-Mode Quiescent Output Voltage (Pin 6 or Pin 9)		8.0			8.0		Vdc
Differential Output Voltage Swing Capability		8.0			8.0		Vp-p
Power Supply Current $I_6 + I_9$ $I_{10}$		2.0 3.0	3.0 4.0		2.0 3.0	4.0 5.0	mAdc
DC Power Dissipation		33			33		mW

( $V_+ = +12$  V dc,  $V_- = -8.0$  V dc,  $I_S = 1.0$  mA dc,  $R_L = 3.9$  k $\Omega$ ,  $R_e = 1.0$  k $\Omega$ ,  $T_A = +25^\circ$  C unless otherwise noted)

\*Pin number references pertain to K package pinout only.