



aptek microsystems

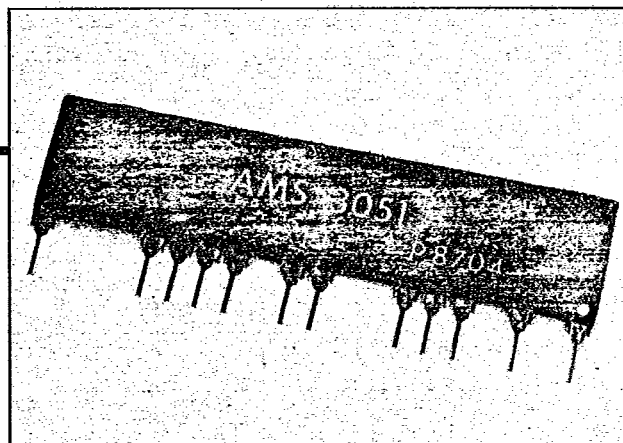
AMS 3050/3051

METERING PULSE RECEIVER

DESCRIPTION

The metering pulse receiver bridges a telephone line (usually a city trunk at a PBX) and detects single-frequency metering tones transmitted from the city.

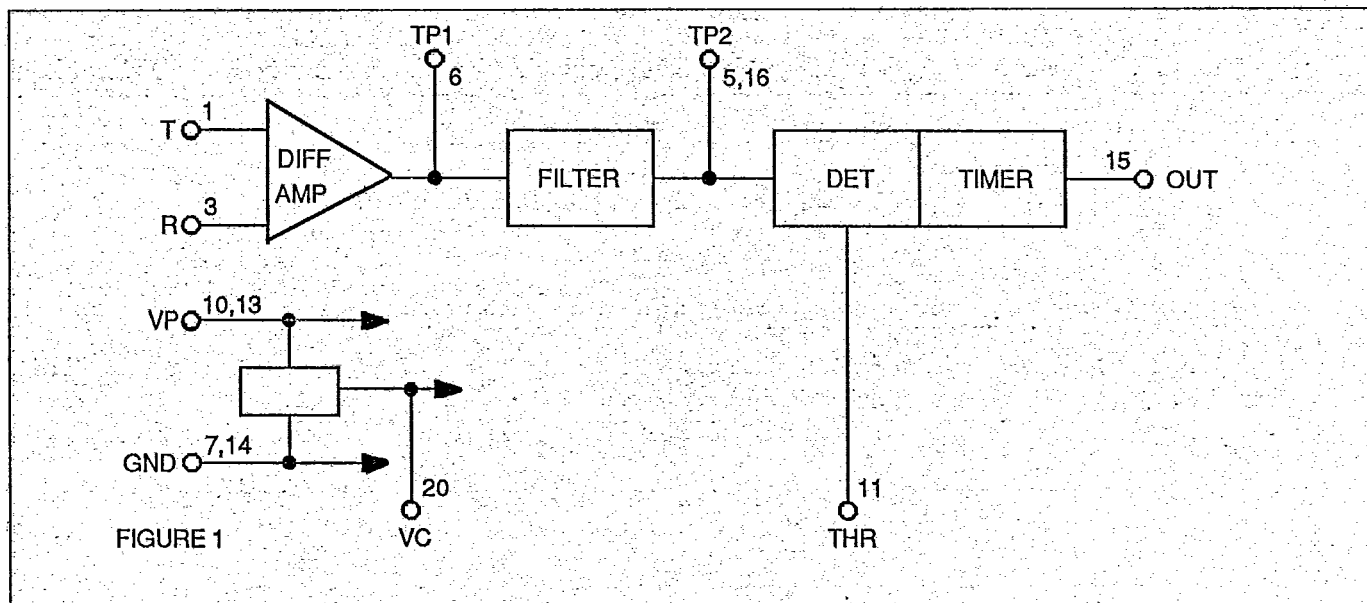
AMS 3050 is for 12KHz tones; AMS 3051 for 16KHz. The receivers have high input impedance, and can be connected directly to the line without coupling capacitors.



FEATURES

- 12 KHz (3050) or 16 KHz (3051)
- Direct connection to line
- Tolerates DC line voltage, power induction, lightning
- High input impedance (600K)
- Adjustable detection level
- Single supply, +5 to +18V

BLOCK DIAGRAM



AMS 3050/3051

SYSTEM OPERATION

The receiver contains a differential input stage, four-pole bandpass filter to separate tone from speech, detector with adjustable threshold level, and timer to deliver logic output when tone duration exceeds a prescribed length.

Power supply (VP, GND) is +5 to +18V. An internal bias circuit generates a voltage VC, one-half VP, for internal use.

Logic OUT is low (GND) without tone, high (VP) with tone.

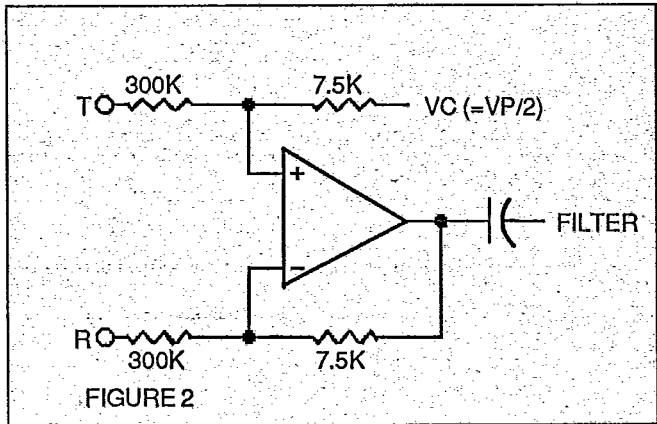
Figure 2 illustrates the high impedance input stage, which will withstand 1500V lightning transients and remain linear up to 60 volts DC line voltage. Loss in the input stage is made up by gain in the filter.

Figure 3 shows logic output, with pull-up resistor. Internal feedback from the output produces hysteresis to insure a given minimum output duration. (If external load reduces the logic-high level, release time also is reduced because of the feedback.)

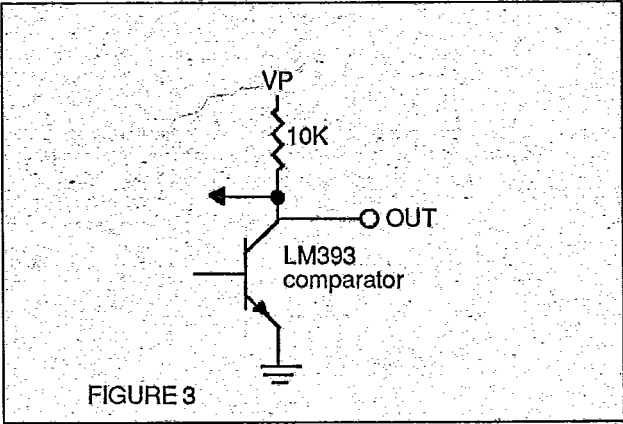
Tone detection level (threshold) can be adjusted by an external resistor, to allow for different applications or different supply voltages (threshold is directly proportional to supply). The table shows ratio of threshold with resistor to that without resistor, for various resistances from THR to VP or THR to VC.

THRESHOLD RATIO	3050: KOHM, THR		3051: KOHM, THR	
	to VP	to VC	to VP	to VC
3	32	-	41	-
2	76	-	88	-
1	-	-	-	-
1/2	-	12	-	6
1/3	-	6	-	3
1/4	-	4	-	2

INPUT STAGE



OUTPUT STAGE



2

Electrical Characteristics

CONDITIONS: TA=0° to 70° C, Supply Voltage=5V. No external threshold adjust resistor.				
PARAMETER	CONDITIONS	MIN	MAX	UNITS
Operate Level (In Band)	3050: 12KHZ ±1%	50	100	mV
	3051: 16KHZ ±1%	25	50	mV
Operate Level (Out of Band)	3050: <10KHz, >14.4KHz	2000		mV
	3051: <13.4KHz, >18.6KHz	500		mV
Operate Pulse	3050: 12KHz, >100mV	30	50	mS
	3051: 16KHz, >50mV			
Release Pause	3050: 12KHz, >100mV	30	75	mS
	3051: 16KHz, >50mV			
Input Impedance	Tip to Ring	600		KΩ
	Tip or Ring to GND	300		KΩ
Common Mode Rejection Ratio	f<19KHz	40		dB
D. C. Input for Linear Operation	Tip to Ring, or Tip or Ring to GND		60	VDC
Low Level Output Voltage	I _{Sink} = 3mA		0.4	VDC
High Level Output Voltage	See Note 2	.95	1.0	V _P
Power Supply Voltage		4.75	18	VDC
Power Supply Current	V _p ≤ 12VDC		15	mADC

NOTES: 1. Operate tone levels are proportional to supply voltage, adjustable by external resistance.

2. Output is open collector with 10kΩ internal pull up resistor to V_P.

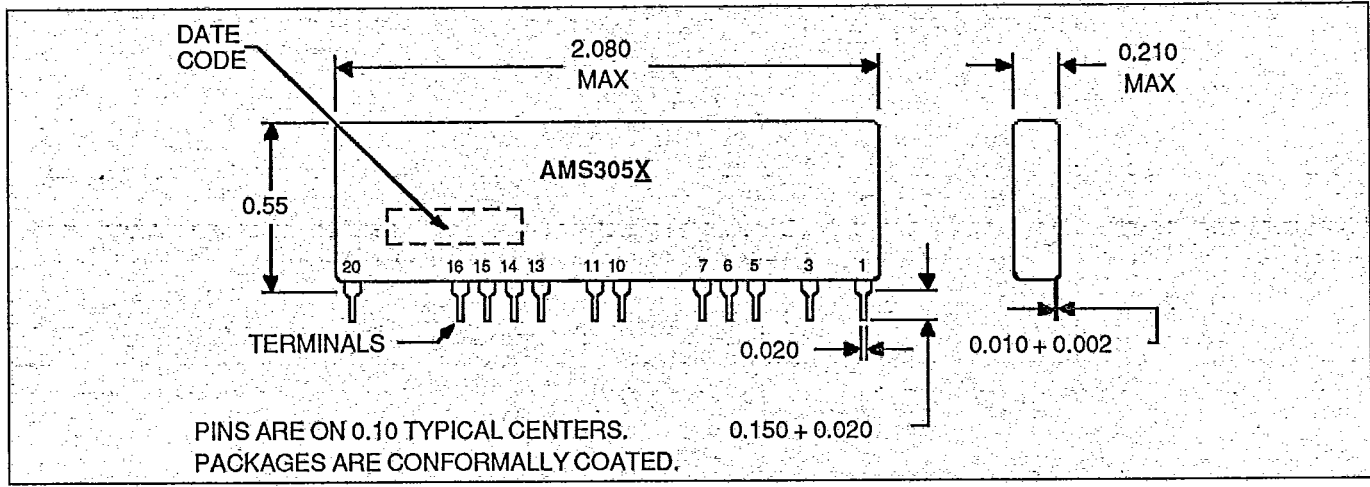
AMS 3050/3051

Pin Description

PIN	FUNCTION	PIN	FUNCTION
1	TIP: Input, one side of line	11	THR: Note 1
2	Not Used	12	Not Used
3	RING: Input, other side of line	13	VP: Positive supply
4	Not Used	14	GND: Negative supply; ground
5	TP2: Test Point	15	OUT: Logic output, normally low, high with tone
6	TP1: Test Point	16	TP2: Test Point
7	GND: Negative supply; ground	17	Not Used
8	Not Used	18	Not Used
9	Not Used	19	Not Used
10	VP: Positive Supply	20	VC: Internally derived DC bias, one-half VP

- NOTES: 1. External resistor from THR to VP raises detection threshold;
 THR to VC lowers threshold.
 2. Pins 5 to 16, 7 to 14, and 10 to 13 are internally tied together.

PACKAGE DESCRIPTION



For more information contact:
 Aptek Microsystems,
 700 N.W. 12th Avenue
 Deerfield Beach, Florida 33442
 (305) 421-8450
 TLX 441020
 FAX: (305) 421-8044

Information furnished by Aptek Microsystems is believed to be accurate and reliable. However, no responsibility is assumed by Aptek Microsystems for its use, nor for any infringements of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of Aptek Microsystems. Aptek Microsystems reserves the right to make changes at any time and without notice.

4