

# MAS 7849 AMPS/TACS AUDIO CIRCUIT CMOS

## APPLICATIONS

- AMPS/TACS mobile phones

## FEATURES

- Supervisory (SAT) signal filter and comparator
- Tx band pass filter, two limiters, pre-emphasis and low pass filter
- Rx de-emphasis and band pass filter
- Low power consumption and stand-by mode
- Uses the same 4.8 MHz clock frequency as the AMPS/TACS modem (MAS 7844)
- 28 PIN SO package

## GENERAL DESCRIPTION

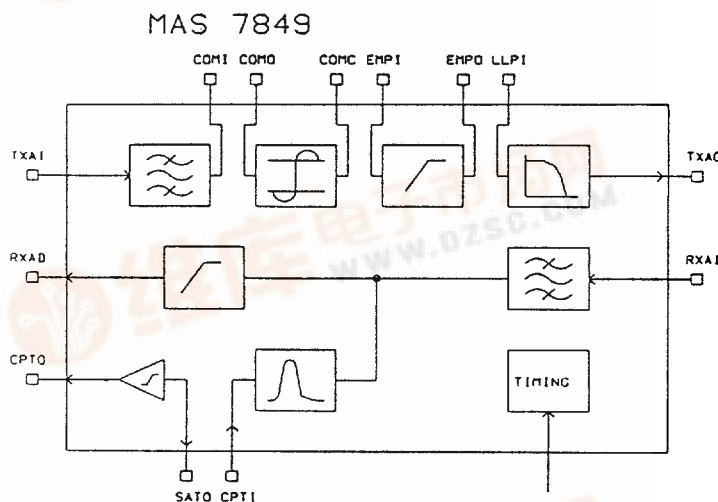
The MAS 7849 is an audio/supervisory signal filter chip intended to be used in conjunction with a modem chip (MAS 7844) in AMPS and TACS mobile phones. It is packed in a 28 pin PLCC or small outline (SO).

The device is consuming less than 100 mW:s from a single 5 volt supply when it is operational. A standby mode reduces the power to 250  $\mu$ W:s.

### SAT-filtering

The SAT filter is a sharp 6 kHz band pass filter to pass the supervisory (SAT) signal coming from the base station along with data. The output of the SAT filter is fed to the input of a SAT comparator. The output of the comparator is routed to MAS 7844, which contains SAT detectors, phase adjust and recovery circuits.

## BLOCK DIAGRAM



### TX-filtering

The TX-filter is a chain of signal shaping blocks which limit the microphone signal bandwidth and the amplitude within the AMPS/TACS specifications.

The first stage is a 3 kHz band pass filter feeding an external signal compander (2 to 1). The output of the compander goes into a first limiter and then to a pre-emphasis filter (6 dB/oct.)

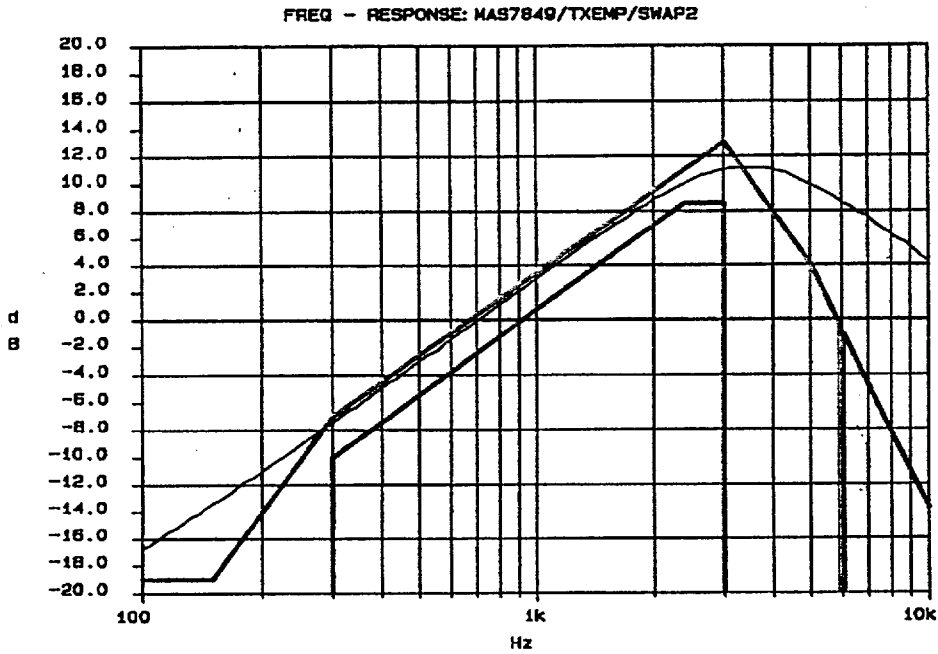
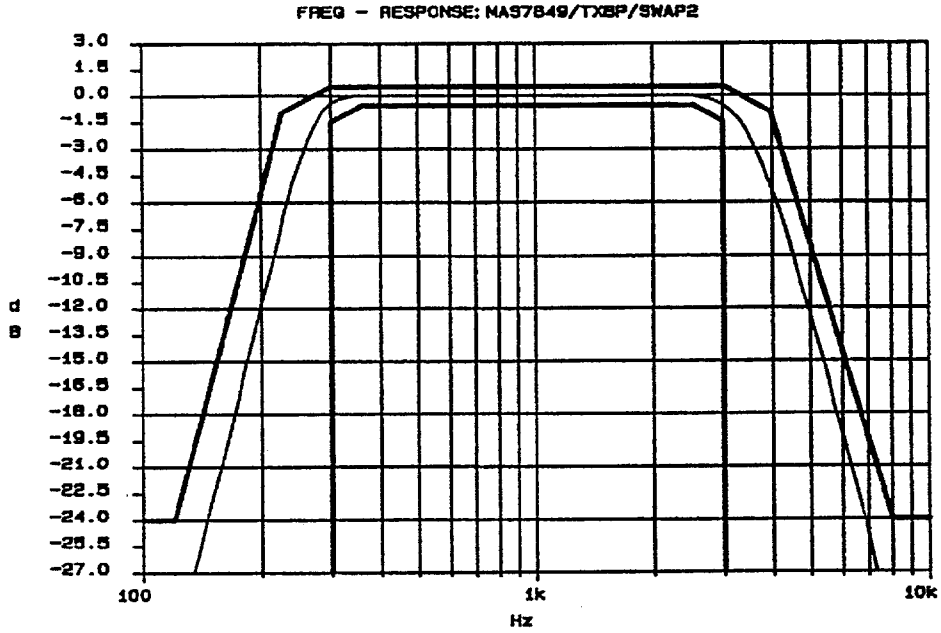
The second limiter cuts the amplitude of the pre-emphasized signal and finally a low pass post filter cuts the harmonics of the limited signal before going to a FM modulator.

### RX-filtering

The RX-filter first de-emphasizes the received signal and then limits the bandwidth to 3 kHz.

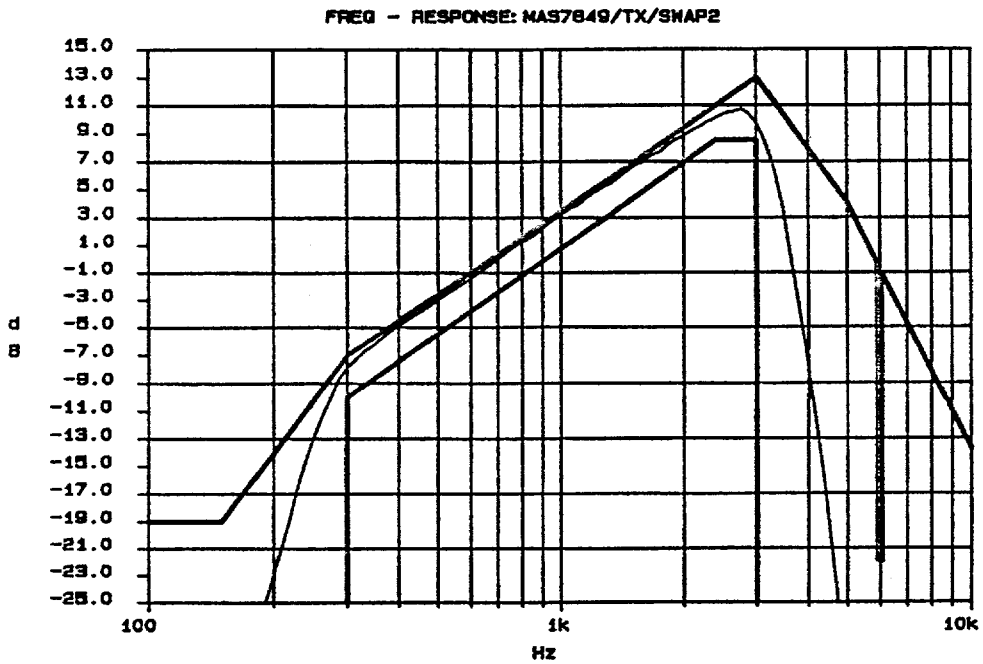
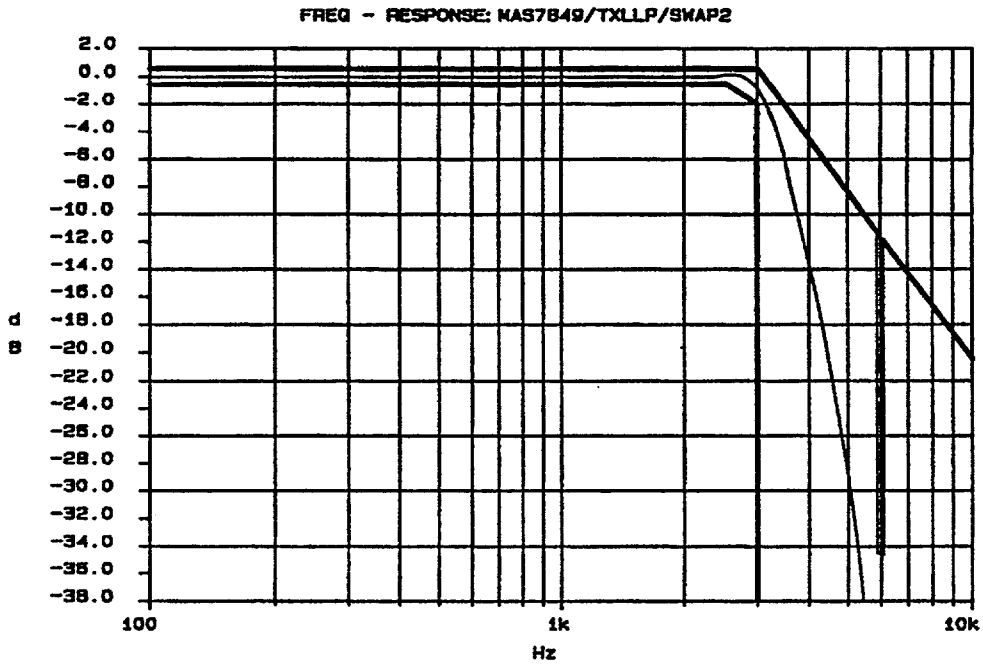
The output of the RX-filter feeds an external expander (1 to 2). The output of the expander goes to the earpiece amplifier.

**AC-CHARACTERISTICS (VDD = 5 V ± 0.1 Vdc)**



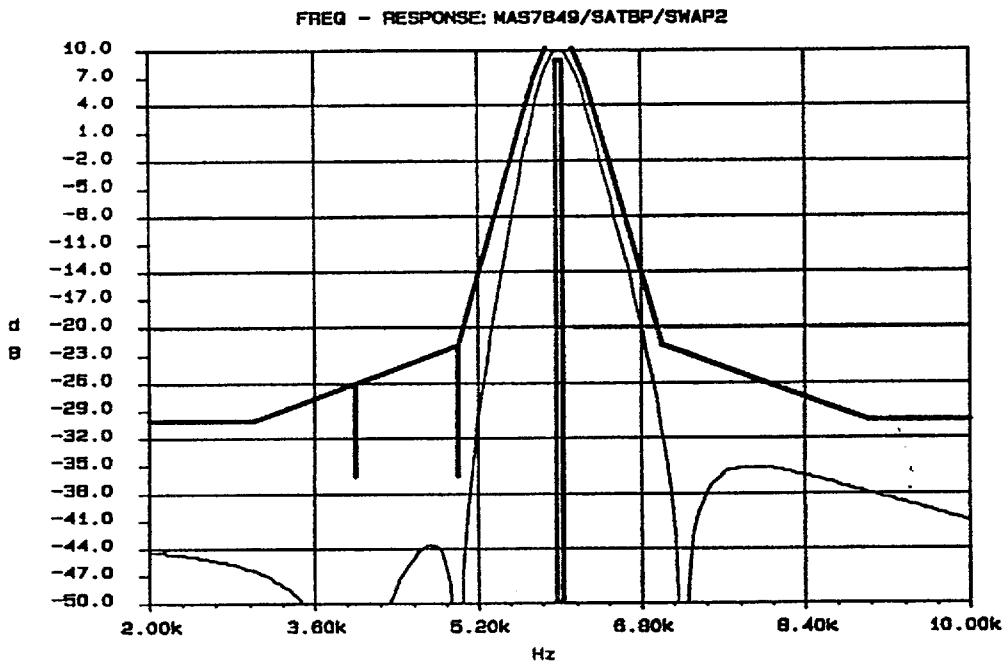
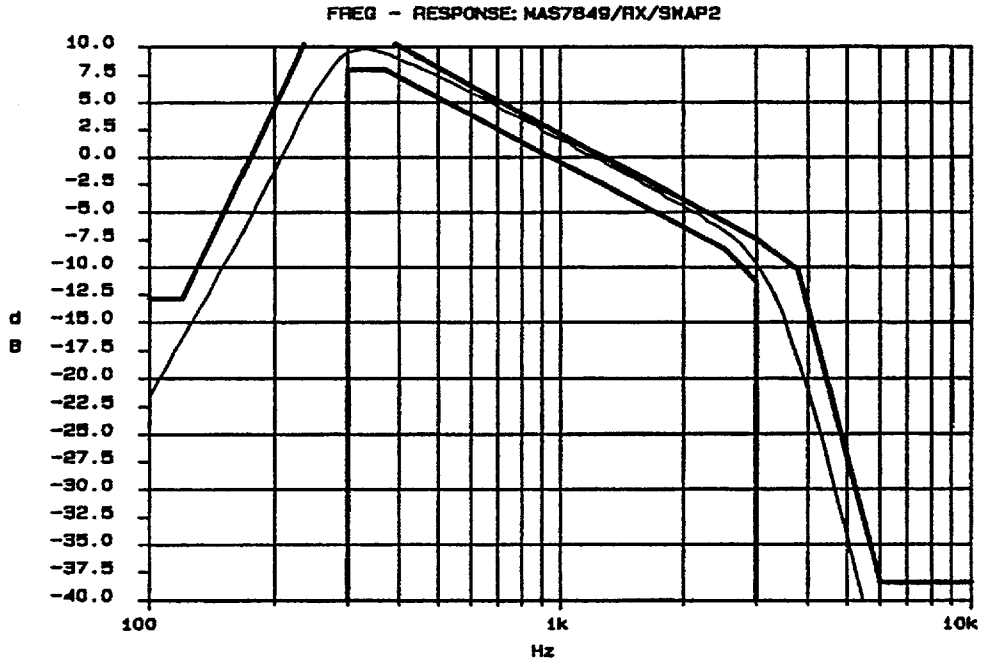
Note: TXEMP specification is for whole TX signal path.

### AC-COMPARISON CHARACTERISTICS (CONT.)





### AC-CHARACTERISTICS (CONT.)





## AC-CHARACTERISTICS (CONT.)

### Limiters 1 and 2

Chopping voltages  $\pm 439$  mV  
(equals to 310 mVrms sinEwave).

### Clock generator

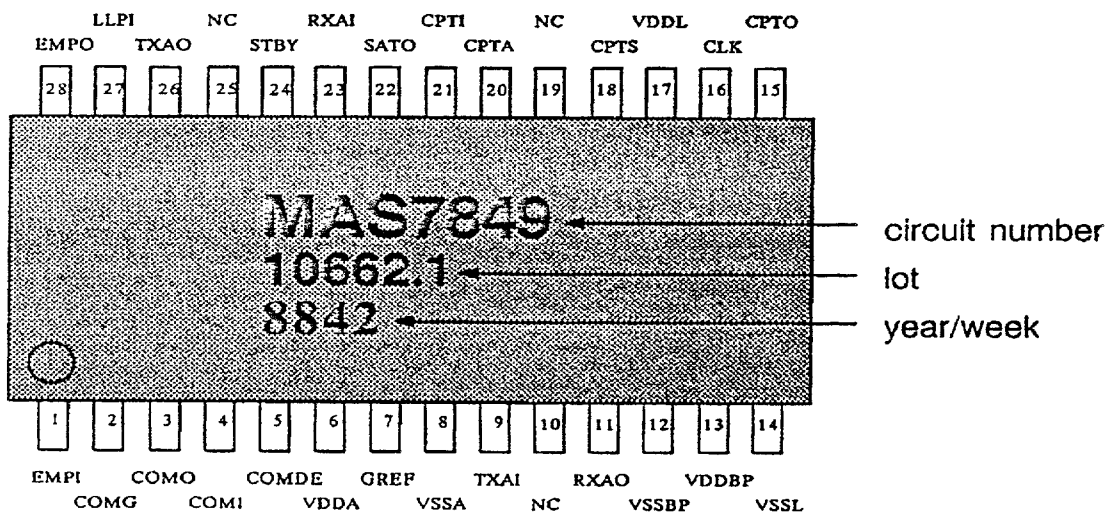
Input frequency 4.8 MHz.  
Duty cycle 45 - 55 %.  
Amplitude as any digital input.

Pin	Name	I/O	Function
1	EMPI	I	Data to Tx limiter 1 and pre-emphasis
2	COMG	O	Data from Tx band pass filter via mux
3	COMO	I	Input to Tx mux
4	COMI	O	Data from Tx band pass filter before mux
5	COMDE	I	Multiplexer control (When 1 selects COMI)
6	VDDA	-	Power supply for Rx and SAT circuits
7	GREF	-	High impedance analog (signal) ground
8	VSSA	-	Power ground for Rx and SAT circuits
9	TXAI	I	Data to Tx band pass filter
10	NC	-	Not connected
11	RXAO	O	Data from RX band-pass filter
12	VSSBP	-	Power ground for TX band pass filter
13	VDDBP	-	Power supply for Tx band pass filter
14	VSSL	-	Power ground for clock generation logic
15	CPTO	O	Data from SAT comparator
16	CLK	I	4.8 MHz clock input
17	VDDL	-	Power supply for clock generation logic





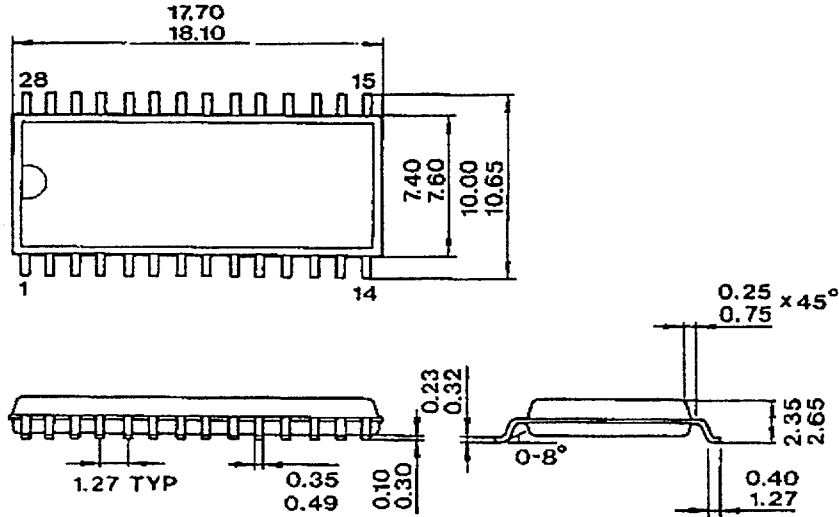
Pin	Name	I/O	Function
18	CPTS	I	Data to SAT comparator (from CPTA via Cap)
19	NC		Not connected
20	CPTA	O	Data from SAT postfilter/amplifier
21	CPTI	I	Data to SAT postfilter/amplifier (from SATO via Cap)
22	SATO	O	Data from SAT band pass filter
23	RXAI	I	Data to RX and SAT filters
24	STBY	I	Standby control (0 = standby 1 = functional)
25	NC		Not connected
26	TXAO	O	Data from TX low pass filter
27	LLPI		Data to second Tx limiter (and low pass)
28	EMPO		Data from Tx pre-emphasis filter





## PACKAGE DIMENSIONS

SO 28



## ORDERING INFORMATION

Our product code:

Product:

Package:

7849SO28X

MAS7849 AMPS/TACS  
AUDIO CIRCUIT

28 PIN SO

Please refer to our product code in ordering.

Your Local Source:



**ELECTRICAL CHARACTERISTICS****ABSOLUTE MAXIMUM RATING:**Supply voltage VDD  
Voltage on any input0 to +6 Vdc  
-0.5 Vdc to VDD + 0.5 Vdc**OPERATING CONDITIONS:**Supply voltage VDD  
Temperature  
Storage temperature+4.75 Vdc to 5.25 Vdc  
-35°C to +85°C  
-55°C to +125°C**DC CHARACTERISTICS**

(VDD = 5 V TA = 25°C)

Parameter	Symbol	Limits		Unit
		Min	Max	
Supply current	IDD		20	mA
Standby current			100	μA
Output low voltage	VOL		0.05	V
Output high voltage	VOH	4.95		V
Output low (sink) current, VOL = 0.4V CPTO	IOL	0.7		mA
Output high (source) current, VOH = 4.6V	IOH	-0.5		mA
Input high voltage CLK, COMDE, STBY	VIH	3.5		V
Input low voltage	VIL		1.0	V
Input current CLK, COMDE, STBY	IIN CIN	±1.0	5	μA pF
Analog output high voltage	VIH	4.0		V
Analog output low voltage	VIL		1.0	V