2nd TO 4th ORDER ANALOG FILTER ARRAY

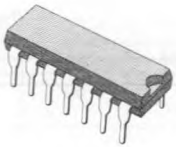
With the TSGF04 array, whose block diagram is given below, user is given 2 different pin-out configurations :

- 8 pin DIL only the filter up to 4th order is accessible.
- 14 pin DIL version where in addition, one uncommitted Op-amp and one internal oscillator capability are offered.

When the external driving of output sample-and-hold is used (CLKSH pin), PWF pin realizes the power adjustement of both uncommited Op-amp and filter unit.

TSGF04 are also available in SO wide package version (0.3 inch) : 16 pin version only.

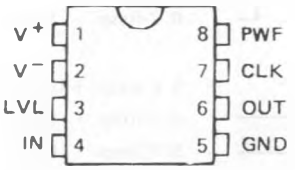
P
DIP-8
(Plastic Package)



P
DIP-14
(Plastic Package)

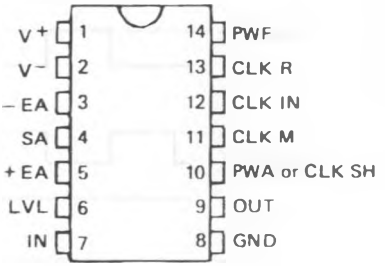
TSGF04
BLOCK DIAGRAM
See figure 4 (E88TSGFSERIES-05)

PIN CONNECTIONS



E88TSGF04-01

8 pins : FILTER ONLY
Compatible with TSGF08



E88TSGF04-02

14 pins : Filter
: + 1 Op - Amp

CLOCK OSCILLATOR

The TSGF04 base accepts external compatible TTL/CMOS clocks on CLKIN pin and provides an internal oscillator performed either by RC or crystal connected between CLKIN and CLKR pins.

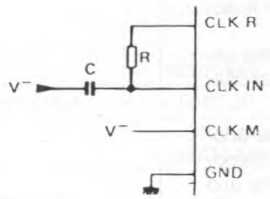
The clock selection mode is provided by CLKM pad which can be connected to V- or GND voltage levels. This connection is realized by two means, depending on the package type chosen :

- with 14-pin package, via CLKM pin.
- with 8-pin package, by internal connection readily performed, only on custom filters.

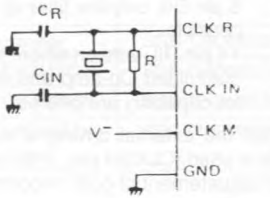
(Note that CLKM pin connected to V+, allows the selection of the internal crystal-controlled oscillator, but the selection by CLKM connected to V- is recommended).

The different possibilities are :

- two internal oscillator modes :
  - RC
  - Crystal

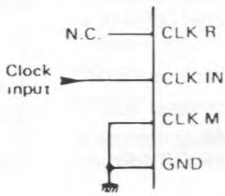


E88TSGF04-03



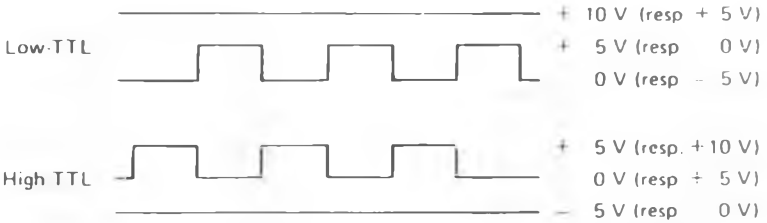
E88TSGF04-04

- three external clocks :
  - low-TTL
  - high-TTL
  - CMOS



E88TSGF04-05

The "low-TTL" and "high-TTL" clock levels are :



E88TSGF04-06

For each package version, the following tables resume, the availability of the different clocks, in terms of the power supply.

Note that in 8-pin version, the clock mode (CLKM) is internally set to GND voltage, except in the case of CMOS clock and 0-5V power supply, where CLKM is internally connected to V- voltage.

8-pin Package			
	0/5V	0/10V	– 5/+ 5V
Low-TTL	NO	C	C
High-TTL	NO	YES	YES
CMOS	C	YES	YES
RC Mode	NO	NO	NO
Crystal Mode	NO	NO	NO

C = Customization option.

14-pin Package			
	0/5V	0/10V	– 5/+ 5V
Low-TTL	NO	C	C
High-TTL	NO	CLKM=GND	CLKM=GND
CMOS	CLKM=V–	CLKM=GND	CLKM=GND
RC Mode	CLKM=V–	CLKM=V–	CLKM=V–
Crystal Mode	CLKM=V–	CLKM=V–	CLKM=V–

ELECTRICAL OPERATING CHARACTERISTICS :

WITH SINGLE SUPPLY VOLTAGE :
T_{amb} = 25°C, V + = 10V, V – = 0V, GND = 5V (unless otherwise specified)

CLKM	Parameter	Min.	Typ.	Max.	Unit
GND	Threshold Voltage		1.5		V
	External Clock Frequency			5	MHz
V –	RC MODE :				
	High Threshold Voltage on CLKIN	1	1.25	1.5	V
	Corresponding Voltage on CLKR		– 5		V
	Low Threshold Voltage on CLKIN	1.5	– 1.25	– 1	V
	Corresponding Voltage on CLKR		+ 5		V
	Oscillator Frequency			5	MHz
	Resistor	2		10 000	kΩ
	Capacitor	0		47	nF
V –	CRYSTAL MODE :				
	Oscillator Frequency			5	MHz
	Resistor		1		MΩ
	Capacitor C_R	10		100	pF
	Capacitor C_{IN}	10		30	pF

ELECTRICAL OPERATING CHARACTERISTICS (continued)

WITH DUAL SUPPLY VOLTAGE :
T_{amb} = 25°C, V + = 5V, V – = – 5V, GND = 0V (unless otherwise specified)

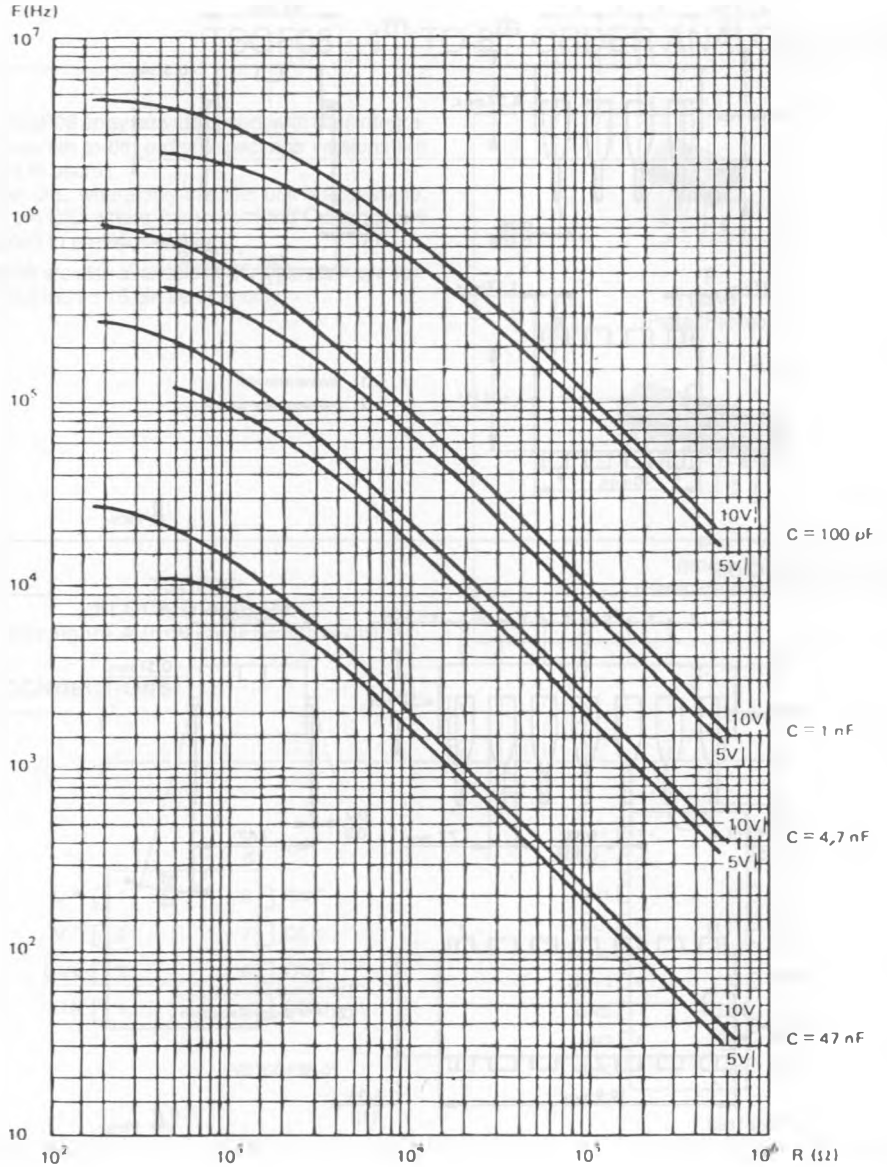
CLKM	Parameter	Min.	Typ.	Max.	Unit
GND	Threshold Voltage		6.5		V
	External Clock Frequency			5	MHz
V –	RC MODE :				
	High Threshold Voltage on CLKIN	6	6.25	6.5	V
	Corresponding Voltage on CLKR		0		V
	Low Threshold Voltage on CLKIN	3.5	3.75	4	V
	Corresponding Voltage on CLKR		+ 10		V
	Oscillator Frequency			5	MHz
	Resistor	2		10 000	kΩ
	Capacitor	0		47	nF
V –	CRYSTAL MODE :				
	Oscillator Frequency			5	MHz
	Resistor		1		MΩ
	Capacitor C_R	10		100	pF
	Capacitor C_{IN}	10		30	pF

WITH SINGLE SUPPLY VOLTAGE :
T_{amb} = 25°C, V + = 5V, V – = 0V, GND = 2.5V (unless otherwise specified)

CLKM	Parameter	Min.	Typ.	Max.	Unit
GND	Threshold Voltage		3.8		V
	External Clock Frequency			5	MHz
V –	RC MODE :				
	High Threshold Voltage on CLKIN	3	3.2	3.4	V
	Corresponding Voltage on CLKR		0		V
	Low Threshold Voltage on CLKIN	1.5	1.8	2	V
	Corresponding Voltage on CLKR		+ 5		V
	Oscillator Frequency			5	MHz
	Resistor	2		10 000	kΩ
	Capacitor	0		47	nF
V –	CRYSTAL MODE :				
	Oscillator Frequency			5	MHz
	Resistor		1		MΩ
	Capacitor C_R	10		100	pF
	Capacitor C_{IN}	10		30	pF

INVERTING TRIGGER FUNCTIONING FREQUENCY VARIATION AS FUNCTION OF R

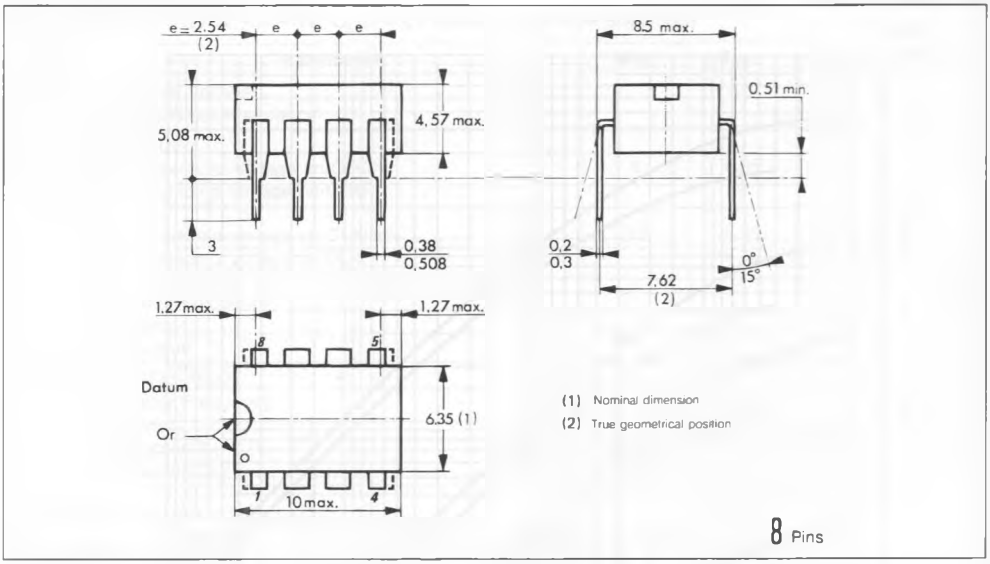
With internal RC oscillator mode, the user's guide for R and C choice is given by following curves and for both supply voltages : 0.5V, 0.10V.



E88TSGF04-07

PACKAGE MECHANICAL DATA

8 PINS - PLASTIC DIP



14 PINS - PLASTIC DIP