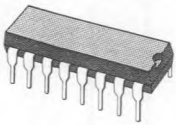
SGS-THOMSON MICROELECTRONICS

TSG8513

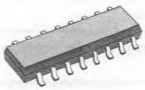
SWITCHED CAPACITOR MASK PROGRAMMABLE FILTER

- CHEBYCHEV TYPE
- 8TH ORDER
- STOPBAND ATTENUATION : 69dB (typ) AT 2 x F_c
- PASSBAND RIPPLE : 0.15dB (typ)
- CLOCK TO CUT-OFF FREQ; RATIO : 60
- CLOCK FREQUENCY RANGE : 1 TO 1500kHz
- CUT-OFF FREQUENCY RANGE : 16Hz TO 25kHz

Note : For general characteristics, see TSG85XX specifications. For non standard quality level, consult SGS-THOMSON general ordering information.



P
DIP-16
(Plastic Package)



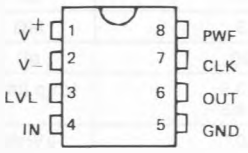
FP
SO-16
(Plastic Micropackage)

P
DIP-8
(Plastic Package)

DESCRIPTION

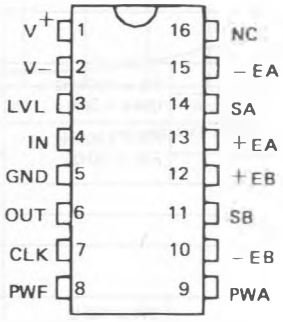
The TSG8513 is a HCMOS lowpass polynomial filter.

PIN CONNECTIONS



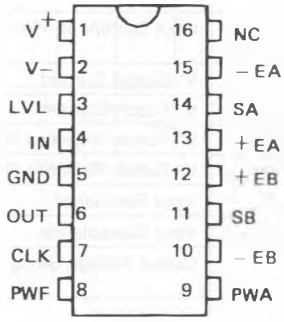
8 pins : FILTER ONLY
DIP-8 Package

E88TSG8513-01



16 pins : FILTER + 2 OP-AMPs
DIP-16 Package

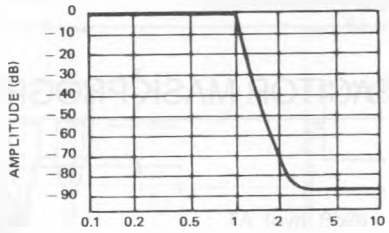
E88TSG8513-02



SO-16 Package

E88TSG8513-03

AMPLITUDE RESPONSE CURVE



E88TSG8513-04

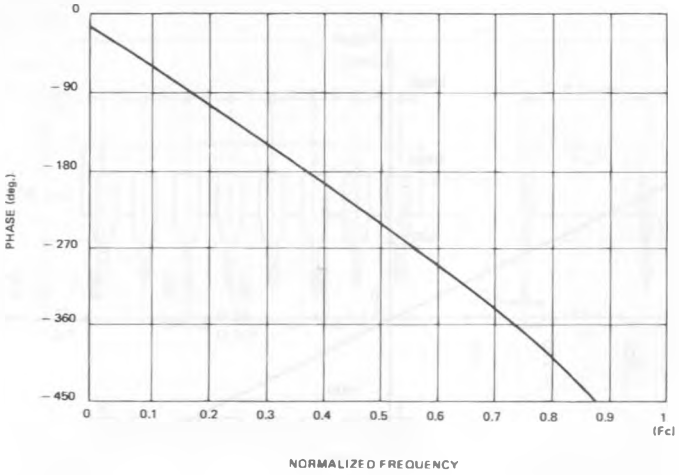
FILTER SPECIFICATIONS

Lowpass Filter : TSG8513 ; Type : Chebychev ; Order : 8.
$V^+ = 5V$, $V^- = -5V$, $T = 25°C$, $RL = 5k\Omega$, $CL = 100pF$, $I_{PWF} = 100\mu A$

Symbol	Parameter		Typ.	Tested Limits	Unit
Fe	External Clock Frequency		1 1500(*)		kHz (min) kHz (max)
Fi	Internal Sampling Freq.		0.5 750(*)		kHz (min) kHz (max)
Fe/Fc	Clock to Cutoff fr. Ratio		60 ± 1%		
Fc	Cutoff Frequency		0.016 25(*)		kHz (min) kHz (max)
G_o	Passband Gain		− 0.3 0		dB (min) dB (max)
Ap	Passband Ripple	Fe = 60kHz	0.15	0.5	dB (max)
As	Stopband Attenuation	Fe = 60kHz F > 2Fc	69	65	dB (min)
Voff	Output DC Offset Voltage	LVL = 0V	± 100	± 250	mV (max)
LVL	DC Level Adjustment		± 100		mV (max)
LG	Level gain		− 2.5		
R_{PWF}	PWF Resistance		10 72		kΩ (min) kΩ (max)
I_{PWF}	Input Current on PWF		50 250		µA (min) µA (max)
I^+	V^+ Supply Current	Fe = 100kHz Ipwa = 0µA	3.8	5	mA (max)
I^-	V^- Supply Current		3.8	5	mA (max)
$PSRR^+$	V^+ Supply Rejection Ratio	Fe = 120kHz Fin = 1kHz	25		dB
$PSRR^-$	V^- Supply Rejection Ratio		40		dB
R_{IN}	Input Resistance		3		MΩ
C_{IN}	Input Capacitance		20		pF
Vo	Output Voltage Swing		+ 3.5 − 4.5		Vp-p (max)
Vn	Output Noise	BW = 1kHz Fe = 60kHz Vin = 2Vrms	107		µVrms
SNR	Signal to Noise Ratio		85		dB

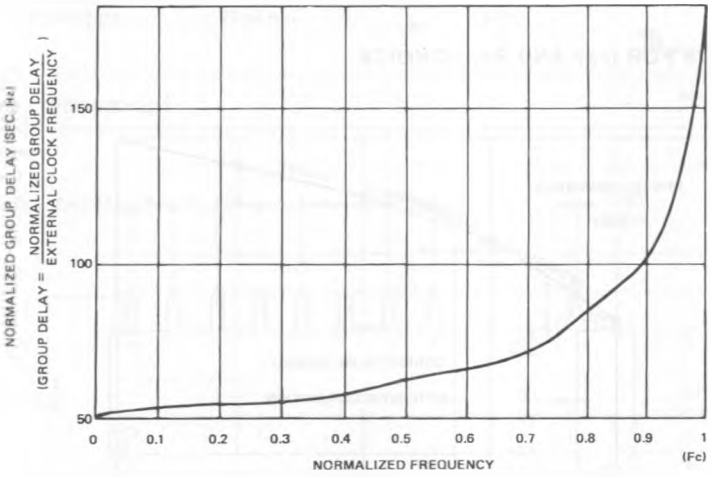
(*) At maximum Fe : - stopband attenuation As > 55dB for f > 2Fc
(with $I_{pwi} = 250\mu A$) - passband ripple : $A_p = 0.8dB$
- passband gain : $G_0 = -0.6dB$

PHASE RESPONSE CURVE (in passband)



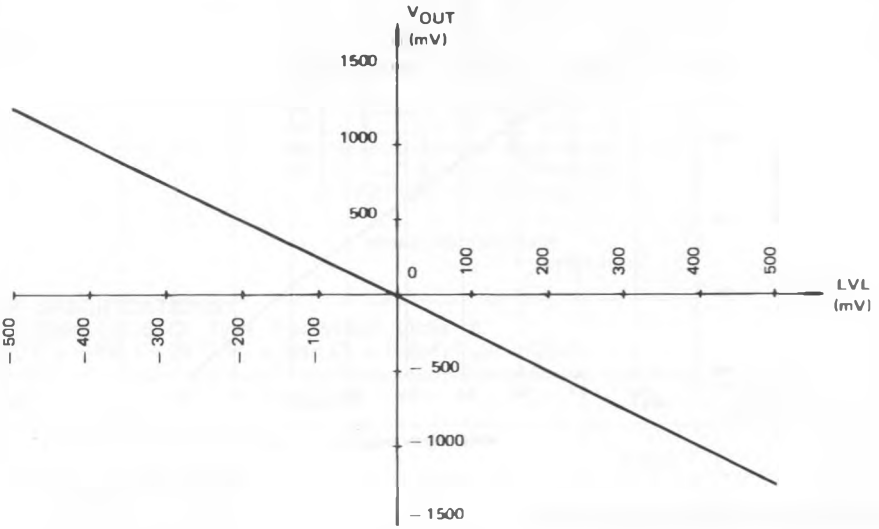
E88TSG8513-05

GROUP DELAY CURVE (in passband)



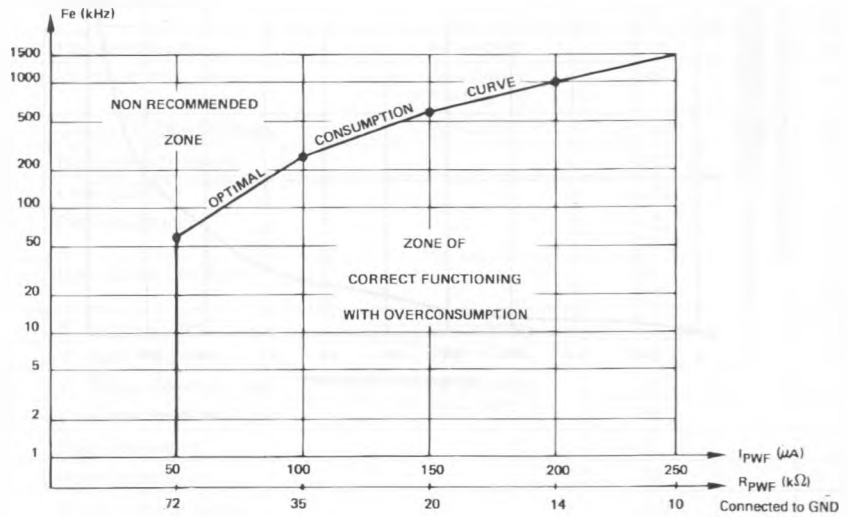
E88TSG8513-06

OUTPUT DC VOLTAGE ADJUSTMENT FROM LVL PIN



E88TSG8513-07

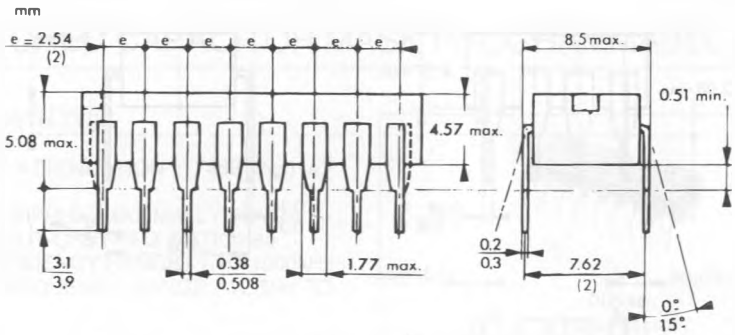
USER'S GUIDE FOR I_{PWF} AND R_{PWF} CHOICE



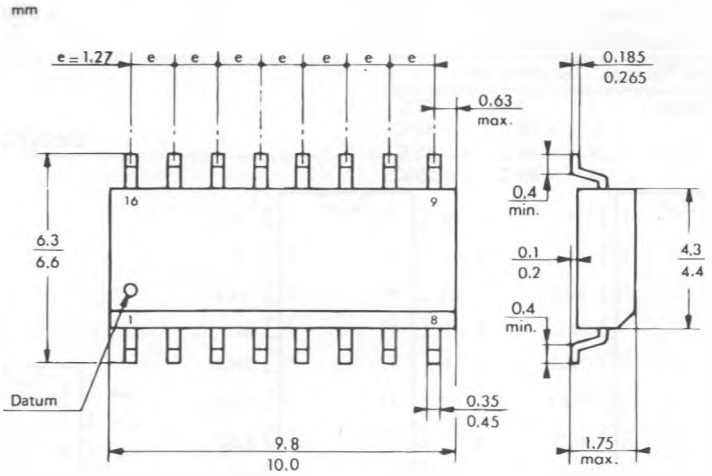
E88TSG8513-08

PACKAGE MECHANICAL DATA

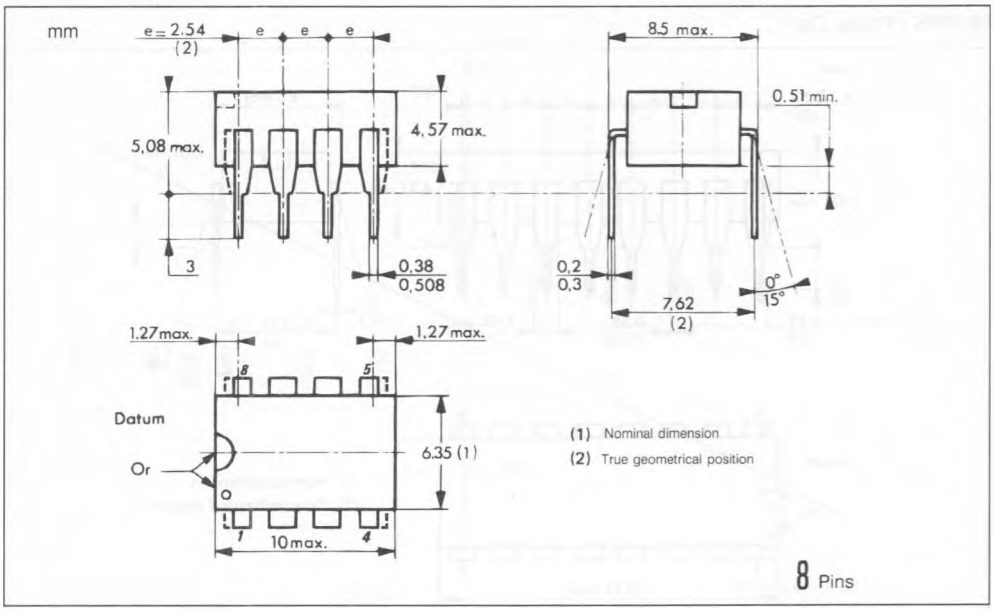
16 PINS - Plastic Dip



16 PINS - Plastic Micropackage



8 PINS - Plastic Dip



ORDER CODES

Plastic	16 Pins Package : TSG8513XP
Ceramic	16 Pins Package : TSG8513XC
Cerdip	16 Pins Package : TSG8513XJ
Plastic	8 Pins Package : TSG85131XP

X : Temperature Range =

I :	0°C	+	70°C
C :	– 25°C	+	85°C
V :	– 40°C	+	85°C
M :	– 55°C	+	125°C