Surface mount packaging

through hole products. All the components mentioned however are available as surface mount alternatives The circuits illustrated make use of E-line is complemented by SOT23 and SOT223 products whilst the IC can be made available in an SO8 package as making for even greater space saving. well as the DIL8,

Summary

The circuit described is only one example circuit solutions produced from Zetex discrete and IC technologies. For whichever configuration is required the Zetex solution will offer reduced of the possible configurations of alarm component count, space saving and cost saving whilst maintaining superior performance

office will assist you in sourcing a demonstration board which includes a ZSD100 and an output bridge own application then a call to Zetex local If you would like to try the circuit in your configuration.

Applications Note 16 Issue 1 June 1995

Automotive and Household Siren Driver Circuits

Many of today's modern alarm systems generation IC and a discrete H-bridge.

multivibrator causing it to sweep over ange of frequencies.

The drive circuit usually employs TO126 for any transistor leakage current. This since the currents involved and the base emitter resistors to provide a path or TO220 packaged power transistors, resulting power dissipation are both in excess of common smaller packaged products. The devices used normally require parallel collector emitter diodes, to divert destructive reverse transients factor is particularly important with usual TO126/TO220 products as their poor VCE(sat) performance can lead to a generated by the inductive load, and significant temperature rise. Some circuits use darlington TO220's which can reduce the component count if the

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Typical circuit based on 555 configuration Figure 1.

David Brotton

employ a moving coil loudspeaker as the siren element. To interface between the afarm systems processing unit and the speaker the usual circuits consist of a signal

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small microcontrollers. The 555 The signal generation circuit is often built around standard 555 timers, although circuits, op-amp derived circuits or even configuration will consist of a slow running astable multivibrator, generating a ramp signal, which modulates a second other systems may use discrete transistor

/ Zetex plc. Fields New Road, Chadderton, Oldham, OL9-BNP, United Kingdom. Telephone: (44)161-627 5105 (Sales), (44)161-627 4963 (General Enquiries) I Facsimile: (44)161-627 5467

Telephone: (516) 543-7100 Fax: (516) 864-7630 87 Modular Avenue Commack NY11725 Telefon: (49) 89 45 49 49 0 Fax: (49) 89 45 49 49 49 Streitfeldstraße 19 D-81673 München Zetex GmbH

These are supported by agents and distributors 3510 Metroplaza, Tower 2 a Hing Fong Road, Kwal Fong, Hong Kong Telephone:(652) 26100 611 Fax: (852) 24250 494

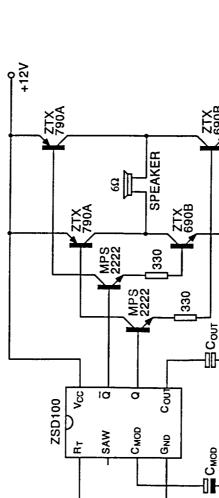
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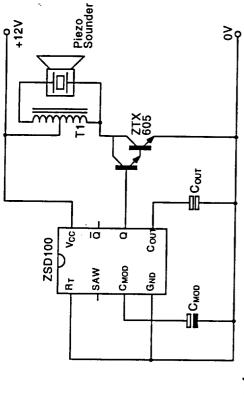
diodes however, the darlington configuration produces a high on-state voltage which causes excess devices include integral collector emitter dissipation. This type of circuit requires base emitter resistors and also reduces the power delivered to the load

requiring excessive board space and a consequential high cost. Fig 1 indicates a typical, and complex, solution to the The result of the above is a complex circuit, with a high component count, circuits described above.

has a minimal pin count and uses few Zetex total siren driver solution addresses all these problems in one by external components, and the superior performance of its discrete transistors. The result is a low cost, minimum maintains the performance advantages expected from a Zetex product. Fig 2 shows the Zetex circuit solution to that utilising a custom designed ASIC, which component count solution which still shown in Fig 1.



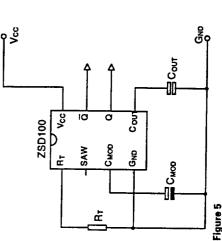
Zetex equivalent minimum component count solution. Figure 2



Single ended drive circuit for plezo sounders.

The external resistor pin can also perform another function in that if it is be the alarm microprocessor, it can act as a disable by inhibiting all the driver driven from a logic source, which could unctions, Fig 6. One further feature of the ASIC is that the modulation waveform can be simply selected as either ramp or sawtooth, by

using the SAW pin, giving variety in the properties of the siren output waveform. With battery operation in mind the IC can operate from 4 up to 18 volts consuming only 1mA in sleep mode. Another power saving property of the IC is the built in bridge circuits, prevents both arms of anti cross-conduction delay which, in full the bridge conducting simultaneously.



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2SD100

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Logic supply

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Logic controlled inhibit. Figure 6

Improved frequency control.

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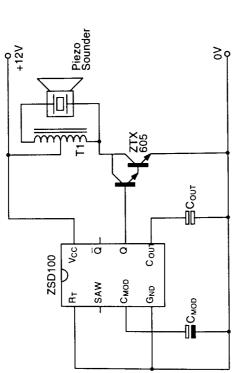
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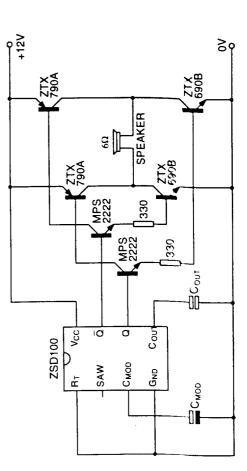
APPLICATIONS CIRCUITS

Piezo Sounder



Utilizing a standard autotransformer driven piezo sounder, this circuit indicates a minimum component count alarm solution. In this configuration a ZTX605 darlington transistor can be connected directly to the ouput of the IC without the need for base resistors.

Moving Coil Loudspeaker Sounder



Moving coil loudspeakers are often used for the very highest output automotive alarm sounders. The ZSD100 complementary outputs, with the selection of ZTX790A and ZTX690B transistors, can drive this H bridge ouput circuit without any additional interface components.

ZSD100

ABSOLUTE MAXIMUM RATINGS

-0.5V Min to +20V Max -40 to 125°C -65 to 150°C Operating Temperature Range Storage Temperature Range Power Dissipation

625mW MAX

ELECTRICAL CHARACTERISTICS TEST CONDITIONS (Unless otherwise stated): T_{amb}=25°C, V_{CC}=12V

	-				
PARAMETER	SYMBOL	N. N.	TYP.	MAX.	CONDITIONS.
Supply Voltage Operating Range	Vcc	4V		18V	
Supply Current Disabled Enabled	၁၁၂			1µA 25mA	R _T O/C _L V _{CC} =18V R _T , Q, Q at Gnd, V _{CC} =18V
Modulating Oscillator Frequency Range	Fмор	0.1Hz		10Hz	V _{CC} =4 to 18V
Frequency Value See Note 1	_{Fмор}	0.34Hz 0.51Hz	0.43Hz 0.55Hz	0.52Hz 0.59Hz	Rτ=0, C _{MOD} =10μF Rτ=470kΩ, C _{MOD} =1μF
Output Oscillator Frequency Range	Four	100Hz		10kHz	VCC=4 to 18V
	Fουτ ΔFουτ	1.01kHz	1.26kH ₂ ±33% 49%	1.58kHz 55%	R _{T=} 0, Cout=22nF
Output Source Current Sink Current Open Circuit Voltage	Isource Ismk Voutinigh) Voutilow)	5mA 0.5mA Vcc-1.5V		0.5V	Vour=1.4V Vour=1.4V Iour=100μA Isinκ=0.1μA
Frequency Control Components					
Internal Resistor External Resistor Modulation Capacitor Output Capacitor	Rt (INT) Rt (EXT) Cause	0 0.1μF 1nf	61.5kΩ	1MΩ 10µF 100nF	

FMOD = CMOD(61.5+RT(EXT))

Note 1.

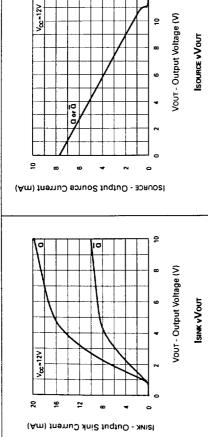
Note 2.

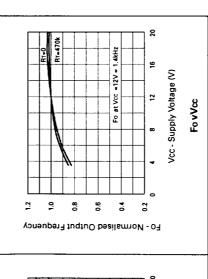
CMOD in µF, RT (EXT) in kΩ

 $F_{CVT} = \frac{17.10}{C_{CVT}(61.5+R_T(EXT))} kHz$

Cour in µF, Rr (EXT) in kΩ







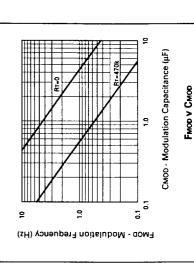
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FMOD - Normalised Modulation Frequency

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Vcc - Supply Voltage (V)

FMOD VVCC

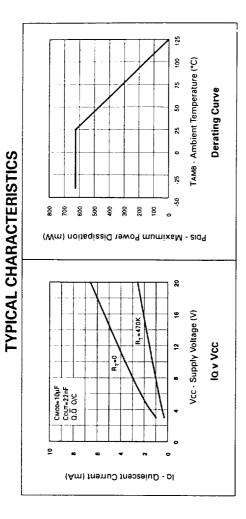


COUT - Output Oscillator Capacitance (nF)

0,

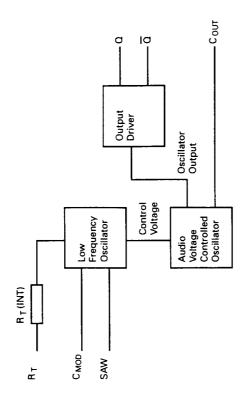
FOUT - Output Centre Frequency (kHz)

Four vCour



FUNCTIONAL DESCRIPTION

The audio signal of the ZSD100 is generated using a squarewave oscillator whose output is capable of directly driving a wide range of output circuits. To produce a characteristic alarm siren sound, the frequency of the audio oscillator is swept over a fixed 2:1 range by a second, low frequency oscillator. The freqencies of both oscillators are controlled by $R_T(INT)$ and capacitors C_{MOD} and C_{OUT} .



PIN DESCRIPTIONS

- R_T Optional external resistor for improved frequency control. An external resistor improves the control of both the modulating and output oscillators.
- The R_T pin is also used to power the device down. Either connecting R_T to V_{CC} or an open circuit will result in the device being disabled.
- SAW Selection of modulation waveform is made using the SAW pin. An open circuit produces a triangle wave, sawtooth is achieved by connecting SAW to the C_{MOD} pin.

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- C_{MOD} An external capacitor is used to program the low frequency modulating oscillator. The value of C_{MOD} recommended is between 0.1 μF and $10\mu F$.
- i. GND

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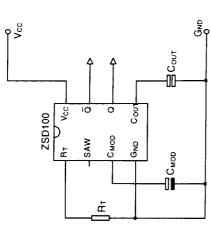
- Cout An external capacitor is used to program the output oscillator. The value of Cour recommended is between 1nF and 100nF.
- Q Non inverted output driver

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- 7. Q Inverted output driver
- 8. V_{CC}

ZSD100

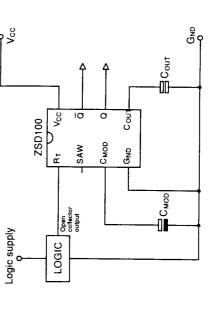
Improved Frequency Control



Improved frequency control can be achieved with an external resistor between the R_T pin and $G_{\rm ND}$. An external resistor reduces the value of the timing capacitors required for the selected operating frequency and also reduces the ZSD100's power consumption.

Note: The outputs of the ZSD100 have been designed to avoid cross-conduction in full bridge output circuits. Large value external timing resistors can lead to a small level of cross-conduction. It is recommended that external timing resistors are not used with bridge output circuits.

Remote Switching



If the RT pin is switched open-circuit, all internal functions of the IC are shut down.

Note: A small leakage current in the open collector logic controller will enable the IC. If such leakage cannot be eliminated, its effect can be easily negated by adding a high value resistor (eg. 100k) between pin R_T and V_{CC} . This resistor will have no effect on frequency control.

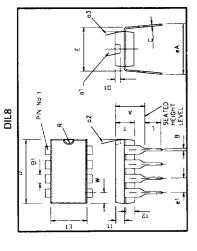
S08

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Max Min 4.98 0.185 (1.27 BSC 0.53 REF 0.015 (1.75 0.05 0.25 0.000 0.25 0.000 0.25 0.000 0.25 0.000 0.25 0.000 0.25 0.000 0.25 0.000 0.25 0.000 0.25 0.000 0.25 0.000 0.25 0.000 0.25 0.000 0.23 0.25 0.20 0.25 0.20 0.25 0.000 0.23 0.25 0.20 0.20	ľ				
Min Max Min 4.80 4.98 0.185 1.27 BSC 0.53 REF 0.015 3.81 3.99 0.15 1.35 1.75 0.05 0.10 0.10 0.25 0.000 0.19 0.10 0.10 0.10 0.10 0.10 0.1	Σ	Σ	netres	lnc	Inches
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1.27 BSC 0.53 REF 0.36 0.46 0.014 3.81 3.99 0.15 1.35 1.75 0.05 0.10 0.25 0.004 7° BSC 0.19 0.25 0.007 5.80 6.20 0.23	-	4.80	4.98	0.189	0.196
0.53 REF 0.36 0.46 3.81 3.99 1.35 1.75 0.10 0.25 7* BSC 0.19 0.25 5.80 6.20 0.41 1.27		1.27	, BSC	0.05	0.05 BSC
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3.81 3.99 1.35 1.75 0.10 0.25 7* BSC 0.19 0.25 5.80 6.20 0.41 1.27		0.36	0.46	0.014	0.018
1.35 1.75 0.10 0.25 7. BSC 0.19 0.25 6.20 0.9 0.9 0.00 0.00 0.00 0.00 0.00 0.0	.,,	3.81	3.99	0.15	0.157
0.10 0.25 7* BSC 0.19 0.25 5.80 6.20 0° 8°		1.35	1.75	0.05	0.07
7° BSC 0.19 0.25 5.80 6.20 0° 8°	(3	0.10	0.25	0.004	0.010
6.19 0.25 5.80 6.20 0° 8°	_	7°	BSC	7°	7° BSC
5.80 6.20 0° 8° 0.41 1.27		0.19	0.25	0.007	0.010
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1 27	J	00	.8	0،	.8
/ 7:-		0.41	1.27	0.016	0.050

ORDERING INFORMATION

Partmark	ZSD100	ZSD100
Package	DIL8	808
Part Number	ZSD100D8	ZSD100N8



A Min Max Min Max A 4.32 0.17 0.17 B 0.46 Nom 0.018 Nom 0.011 Nom C 0.25 Nom 0.01 Nom 0.01 Nom D 8.79 8.99 0.34 0.35 E 7.49 8.13 0.29 0.32 E 7.49 8.13 0.29 0.32 eA 8.13 9.40 0.25 0.37 eA 8.13 9.40 0.35 0.37 eA 8.13 9.40 0.35 0.37 I 3.08 0.37 0.13 0.13 I 3.08 0.15 0.13 0.13 I 1.52 Nom 0.06 Nom 0.06 Nom W 0.64 Ref 0.025 Ref a1 4° 10° a2 4° 10° a2 4° 10°	ΜG	Ξ	Millimetres	=	Inches
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4° 10° 4°	a2	4°	10°	4°	10°
	83	4°	10°	4°	10°

AUTOMOTIVE AND HOUSEHOLD SECURITY SIREN DRIVER

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ZSD100

ISSUE 4 -- MAY 1995

INTRODUCTION

systems. One ZSD100, two timing transformer is all that is necessary to produce an ear piercing 120 dB alarm The ZSD100 is a frequency swept alarm signal generator designed specifically for static and automotive security alarm capacitors, an in-expensive TO92 darlington, piezo transducer and coupling siren.

generator, low frequency sweep driver stages, the ZSD100 provides every compact solution to siren signal generation. The device operates from including an audio frequency signal generator, disable circuitry and output function necessary to produce a standard alarm signal. Available in either an 8 pin DIL or SO package the IC gives a low cost supplies of 4V up to 18V and is ideal for security alarms in battery powered applications, burglar alarms and automotive anti theft systems.

FEATURES

4-18V Operating voltage range.

Direct drive of darlington, mosfet and Small external component count. GBT output stages. Single ended or push-pull output stages. Suitable for automotive and static alarm systems.

- 1µA sleep mode Low supply current - 10mA operating

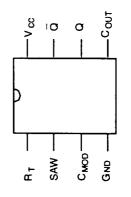
Low cost 8 pin DIL & SO packages.

-40°C to 125°C operating temperature User selected audio and sweep frequencies.

Choice of modulation waveform.

range.

PIN CONNECTIONS



DIL8 or SO8

Zelex (Asia) Ltd.

These are supported by 3510 Metroplaza. Tower 2 agents and distributors in Hing Forg Road, Kwai Fong major countries world-wide Fax: 24250 494 Telephone: (516) 543-7100 Fax: (516) 864-7630 Commack NY11725 87 Modular Avenue Drosselweg 30 D-81827 München Telefon: (089) 430 90 29

Fax: (089) 439 37 64

Zetex GmbH

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Facsimile: 0161-627 5467

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ZSD100 Siren Driver ASIC

The ZSD100 is a linear bipolar ASIC designed specifically to complement the drive circuits described above. The device utilises an 8 pin dual in line package and a minimum number of external components to generate a frequency swept signal suitable for either static or automotive security alarm systems. Fig 3 shows a schematic of the device.

As with other circuit approaches the device consists of a low frequency oscillator, which generates a control voltage to modulate the on-board voltage controlled oscillator.

The output stage of the device consists of a complementary driver which works equally well whether driving MOSFET's

or IGBT's as alternatives to the bipolar transistor circuits shown. The output configuration enables not only the drive requirements required for full bridge circuits, as described above, but also single ended drive circuits such as would be required for piezo transducers, the other popular alarm sound generating device. This circuit is shown in Fig 4.

The frequency programming of the device can be achieved with only two capacitors, although an extra pin is provided which provides improved control of the both the low and high frequency oscillators if an external resistor is used, see Fig 5. Selection of the appropriate capacitors gives a low frequency sweep in the range 0.1 to 10Hz and an output frequency modulated between 100Hz and 10KHz.

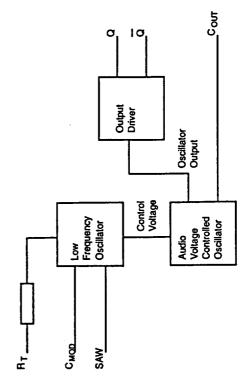


Figure 3 Schematic of the ZSD100

H-bridge circuits

Zetex recommend the use of their Super E-line transistors in this application. These TO92 style components have three important features which are exploited in addressing the problems described above.

exceptionally efficient matrix die current switching applications. This means for the typical operating currents there is very low dissipation and therefore minimal temperature rise. For example the ZTX690B devices shown in the diagram, with Ic=2A and Ig=20mA have a saturation voltage of only 300mV.This performance factor means that the need to divert leakage currents at high temperatures is removed and so he usual base emitter resistors are no mportant in automotive applications where the operating environment can Zetex discrete transistors use an geometry to achieve very low saturation oltages, Vce(sat), which is ideal for high onger required. This may be particularly required, normally in the region of 2A, produce very high temperatures.

The devices chosen for this application also possess an excellent reverse beta. Using the previous example, the ZTX690B has a typical peak beta of 125 in the reverse mode. This means that these transistors are still operating even

with reverse transients such as those generated when driving an inductive load. The benefit of this is that for siren driving applications the need for collector emitter protection diodes is removed.

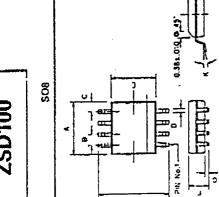
A further benefit of the transistor matrix design and low saturation voltage is that the devices can be housed in a very small package. The Zetex E-line package is smaller than a TO92 yet the performance of the devices matches that of similar TO126 and TO220 components. The result of this is equivalent or superior performance within a much smaller space.

The circuit shown in Fig 2 has been designed to operate with a 6 ohm load impedance or higher. If a lower load impedance is required, say 4 ohms, then changing the transistors to a selection from the ZTX850 and ZTX950 series will provide up to 5 amps drive current.

The circuit we have shown has been tested and is 98.5% efficient- the resultant siren produces more than an ear piercing 120dB output.

The drive circuit for this application has thus been minimised in terms of complexity, takes up less space, performs better and offers significant cost reductions.





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		Max	0.18	0.095	0.18	
0.564.019.045	Inches	Min	0.17	0.085	0,14	١
	res	Мак	4.77	2.41	4.01	1
	Millimetres	Min	4.37	2.16	3.61	
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	Min	Maĸ	Min	Max	
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ပ	3.61	4.01	0.14	0.16	
۵	13.00	13.97	0.51	0.55	
Е	NOM 1.27	27	50'0 WON) 5	
ч	0.37	0.495	0.015	0.019	
					Ξ

MK	Millimetres	res	Inches	
-	Min	Max	Min	Max
4	132	\$6'}	0.170	0,195
۵	0.36	15'0	0,014	0,020
ш	3.30	3.94	0.130	0.155
·•	2.41	267	0.095	0,105
•	1.14	1.40	0.045	0.055
1	12.70	15.49	0.500	0.610
æ	2.16	17.2	580'0	0.095
Sı	1.14	. 251	0.045	0.060
≱	11'0	95'0	910'0	0.022
a	4.45	4.95	0.175	0,195
:		ь	•	â

PIN CONNECTIONS

ORDERING INFORMATION

Portmark	ZSD100	2SD100
Package	SZ B11G	SZ 80S
Part Number	2SD100D8	ZSD100148

Fields Hew Road, Chaddenton, Othhern, Old-lefe", United Strepton. Telephone: 0181-627 5105 (Seles), 0181-627 4003 (General Engalts) Fischinisc 0161-627 8467

Men Gribh

Talephone; (516) 643-7100 Fac: (516) 864-7630 87 Moduler America Commack NY 11725 Orossehvag 30 O-81827 München Telefon: (089) 430 B0 29 Fac: (089) 439 37 64

Zena (Adh) LM. The 2.05 (Marchine). The 2010 Marchine. There 2.05 (Marchine). Temptone. 28 (40.00 81). The 24250 404

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AUTOMOTIVE AND HOUSEHOLD SECURITY SIREN DRIVER

ZSD100

ISSUE 3 - MARCH 1995

NTRODUCTION

darlington, piezo transduper and coupling transformer is all that is necessary to systems. One ZSD100, two timing capacitors, an in-axpansive TO92 produce an ear plercing 120 dB slarm signal generator designed appealibally for static and automotive security elerm The ZSD100 is a frequency awept atterm siren.

elarm signat. Available in either an 8 pin generation. The device operates from security alarms in battery powered applications, burglar alarms, and supplies of 4V up to 18V and is Ideal for Dil. or SO package the IC gives a low cost generator, low fraquency swaep generator, disable circuitry and output compact solution to stren signal including an audio frequency signal driver stages, the ZSD100 provides every function necessary to produce a standard automotive anti theft systems.

PEATURES.

Small external component count. 4-18V Operating voltage range.

Direct drive of derlington, mosfet and IGBT output stages. Single ended or push-pull output stages. Suitable for automotive and static alarm systems.

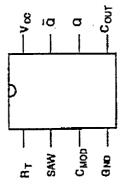
Low supply current - 10mA operating - 1µA sleep mode

User selected audio and sweep frequencies.

Low cost 8 pin DIL & SO packages.

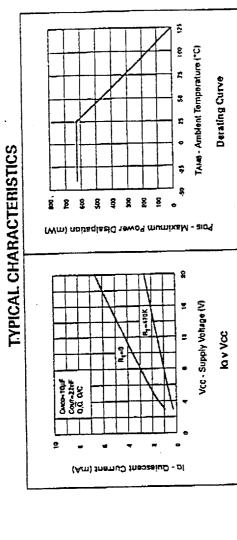
-40°C to 125°C operating temperature range.

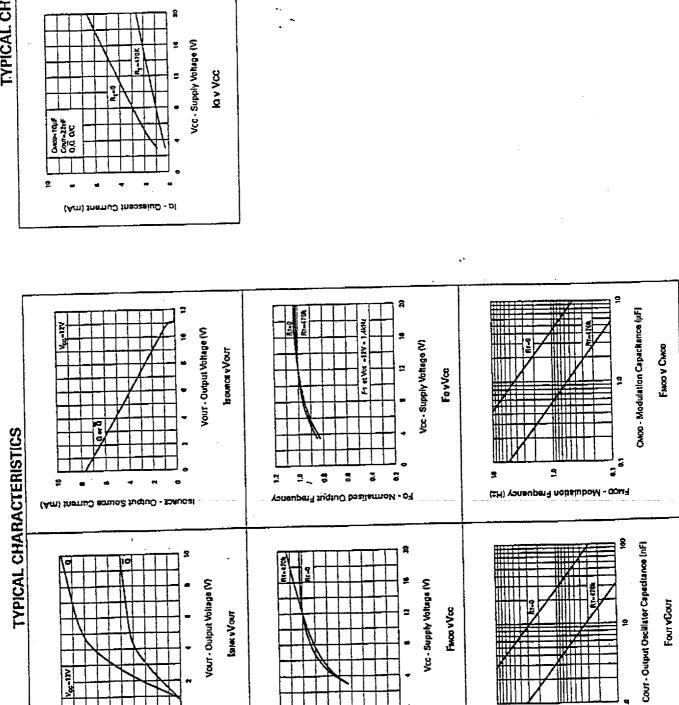
Choice of modulation waveform.



DILB or SOB







Pomenter - noiselubed beatlamon - court

2

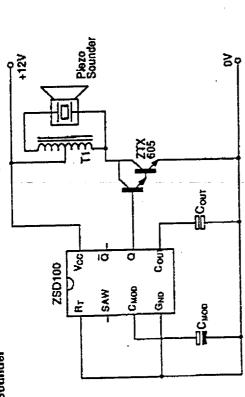
Four - Output Centre Frequency (kHz)

=

(Am) Joertu Sink Current (MA)

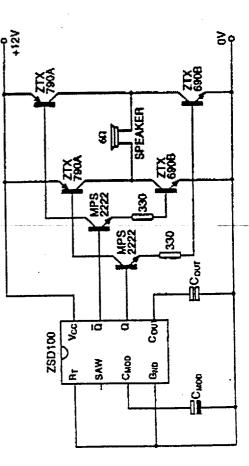
APPLICATIONS CIRCUITS

Piezo Sounder



Utilizing a standard autotransformer driven plazo soundar, this circuit indicates a minimum component count alarm solution. In this configuration a ZTX605 darlington translator can be connected directly to the ouput of the IC without the need for base resistors.

Moving Coil Loudspeaker Sounder



Maying coil loudspeakers are often used for the very highest output automotive alem sounders. The ZSD 100 complementary outputs, with the selection of ZTX790A and ZTX690B transistors, can drive this H bridge ouput circuit without any additional interface components

-0.5V Min to +20V Max ABSOLUTE MAXIMUM RATINGS

-40 to 125°C Operating Temperature Range

Storage Temperature Range Power Dissipation

625mW MAX -65 to 150°C

ELECTRICAL CHARACTERISTICS TEST CONDITIONS (Univas other

ELECTRICAL CHANACI EMB INCS TEST CONDITIONS (Unless otherwise stated): Temp=26*C, V _{CC} =12V	STORY OF STREET	wheest	ted!.Tar	nb=26*C	Vcc=12V
PARAMETER	SYMBOL MIN.		TYP.	MAX	CONDITIONS.
Supply Voltege Operating Range	Vœ	\$		187	
Supply Current Disabled Enabled	ಭ			tµA 26mA	Rr O.C. Vcc-18V Rr, Q, O et Gnd, Vcc-18V
Modulating Oscillator Frequency Ranga	Faco	0.1Ftz		10Ht	Vcc=410 18V
Frequency Value See Note 1	F.H.00	0.34Hz 0.51Hz	0.43Hr 0.65Hr	0.52년 10.69년	Rr-0, Cwos-10;tF Rr-470kΩ, Cwos-1μF
Output Oecifiator Fréquency Bange	Four	100t		10kHr	VCC-4 to 18V
Centre requency Ceviation Duty Cycle See Note 2	Four	1.01%	1.26kHz 1.33% 19%	1.58kHz 55%	Rr=0, Cour=22nF

(EXTI) IN ED

1MD 10kF 100nF

0.1µF

Rr (INT) Rr (EXT) Csico Cour

Modulation Capacitor

External Resistor **Output Capacitor**

Internal Resistor

81.550

Vour=1.4V lour=100µA lare=0.1µA

0.6V

/cc-1.5V 5mA 0.5mA

VOUTINION

Open Circuit Yokape

Frequency Control Components

ROUNCE Ĕ

Source Current Sink Current

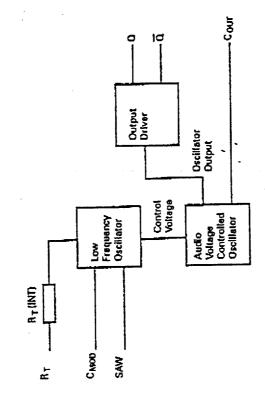
Output

Vour=1.4V

(EXT) In ka

FUNCTIONAL DESCRIPTION

The audio signal of the ZSD100 is generated using a squarewave oscillator whose output is capable of directly driving a wide range of output circuits. To produce a characteriatic elemension sound, the frequency of the audio oscillator is swept over a fixed 2:1 range by a second, low frequency oscillator. The freqencies of both oscillators are controlled by RrIMT) and capacitors CMop and Cour.



PIN DESCRIPTIONS

RT Optional external resistor for improved frequency control. An external resistor improves the control of both the modulating and output oscillators.

The $\rm R_T$ pin is also used to power the device down. Either connecting $\rm R_T$ to Vcc or an open circuit will result in the device being disabled.

SAW Selection of modulation waveform is made using the SAW pin. An open circuit produces a triangle wave, sawtooth is achieved by connecting SAW to the C_Moppin.

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CMOD An external capacitor is used to program the low frequency modulating oscillator. The value of CMOD recommended is between 0.1µF and 10µF.

Cour An external capacitor is used to program the output oscillator. The value of Cour recommended is between InF and 100nF.

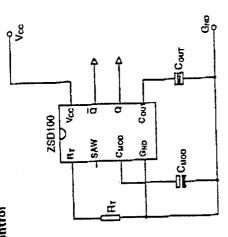
1 Inverted output driver

Non inverted output driver

d

Λcc

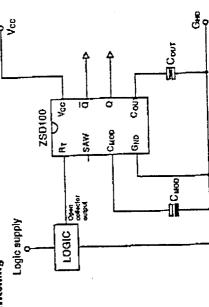
Improved Frequency Control



Improved frequency control can be achieved with an external resistor between the Rr pin and GND. An external resistor reduces the value of the timing capacitors required for the selected operating frequency and also reduces the ZSD100's power consumption.

Note: The outputs of the ZSD 100 have been designed to avoid cross-conduction in full bridge output circuits. Large value external timing resistors can lead to a small level of cross-conduction. It is recommended that external timing resistors are not used with bridge output circuits.

Remote Switching

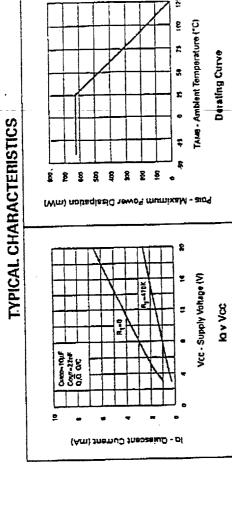


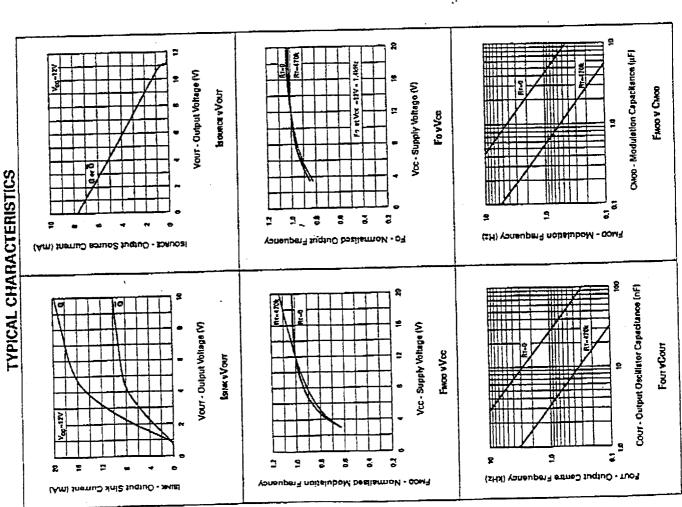
If the RT pin Is switched open-circuit, all internal functions of the IC are shut down.

Note: A small leakage current in the open collector logic controller will enable the IC. If such leakage cannot be eliminated, its effect can be easily negated by adding a high value resistor (eg. 100k) between pin A_T and V_{CC}. This resistor will have no effect on frequency control.

GNO

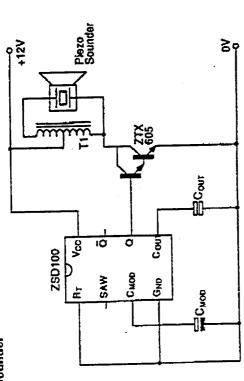
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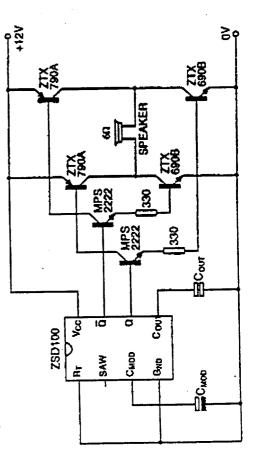
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Storage Temperature Range Power Dissipation

625mW MAX -85 to 150°C -40 to 125*C

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It's contained to make a contained the contained to the c					K
PARAMETER	SYMBOL	Z.	TYP.	MAX.	conditions,
Supply Voltage Operating Range	Væ	4 3)BV	
Supply Curant Disabled Enabled	χ			JuA 26mA	Rr O.C. Vcc-18V Rr, O. O st Gnd, Vcc-18V
Modulating Oscillator Frequency Range	Fuce	0,1Ftz		101lt	Vcc=4 to 18V
Frequency Value See Note 1	Fix00	0.34Hz 0.51Hz	0.43Hr 0.55Hr	0.6214 0.6914	Rr-0, CM00-10/1F Rr-470kΩ, CM00-1µF
Output Gecilintor Fréquency Range	Four	10014		10kHr	VCC-4 to 18V
Centre requency Ceviation Duty Cycle See Note 2	Four	1,011/12	1.26kHz 1.33% 49%	1.58kHr 65%	Rr-B, Cour-22nf
Output Source Current Sink Current Open Circuit Voltage	Isconce Isron Voltrinom Voutrom	5mA 0.5mA Vcc-1.5V		0.6V	Vour=1.4V Vour=1.4V lour=100µA larec=0.1µA
Frequency Control Components					
Internal Resistor External Resistor Modulation Cepacitor Output Cepacitor	Rr (INT) Rr (EXT) CMOO COUT	0 0.1µF 1nF	61.5kD	1001 1001 1000F	

FMOD = CNCC(61.5+Ar(EXT))

Note 1.

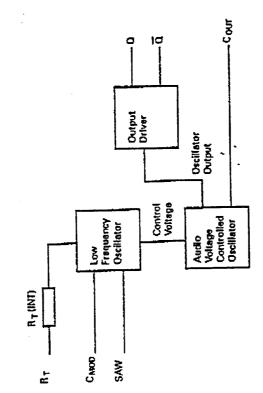
Note 2.

CMOD In pIF, fly (EXT) in Iso FOUT " COUT(81.5+Br(EXT))

Court in µF, Ar (EXT) in ka

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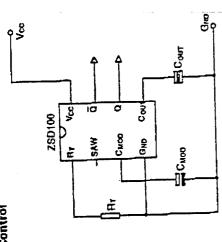
- CMOD An external capacitor is used to program the low frequency modulating oscillator. The value of CMOD recommended is between 0.1µF and 10µF.
- Cour An external capacitor is used to program the output oscillator. The value of Cour recommended is between 1nF and 100nF.
- O Non Inverted output driver

 inverted output driver

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B. Vcc

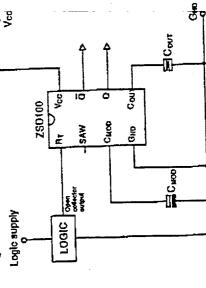
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GNO GNO

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