



# R&E International

A Subsidiary of Microchip Technology Inc.

## RE46C104

### Piezoelectric Horn Driver and Voltage Converter

#### Product Specification

#### General Description

The RE46C104 is a piezoelectric horn driver with voltage converter to provide maximum audibility in low voltage applications. The feedback control pin is designed for use with self-oscillating piezoelectric horn but can also be used in direct drive applications. The built-in charge pump voltage converter provides increased supply voltage for the horn drivers allowing outputs to swing from Vss to 2 x Vdd. A charge pump enable pin is provided to minimize supply current when not in use.

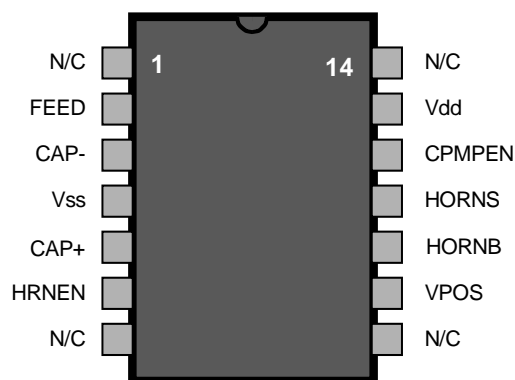
#### Applications

Smoke detectors  
CO Detectors  
Personal Security Products  
Electronic Toys

#### Features

- Low Quiescent Current
- Low Driver Ron
- Wide Operating Voltage Range
- Available in Standard Packaging or RoHS Compliant Pb Free Packaging

#### Pin Configuration



#### Absolute maximum ratings

|  |                                   |
|--|-----------------------------------|
| Supply Voltage $V_{DD}$ .....                          | -5V to +9.0V                      |
| Input voltage Range $V_{in}$ .....                     | -.3V to $V_{DD}+3V$ , except FEED |
| FEED Input Voltage Range $V_{inf}$ .....               | -10V to +22V                      |
| Input Current $I_{in}$ .....                           | 10mA, except FEED                 |
| Operating Temperature .....                            | 0 to 50°C                         |
| Continuous Output Current (HornS, HornB, or Vpos)..... | 30mA                              |

Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. These are stress ratings only and operation at these conditions for extended periods may affect device reliability.

This product utilizes CMOS technology with static protection; however proper ESD prevention procedures should be used when handling this product. Damage can occur when exposed to extremely high static electrical charges

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Electrical Characteristics at  $T_A = 25^\circ\text{C}$ ,  $V_{DD} = 5\text{V}$ ,  $V_{SS} = 0\text{V}$  (unless otherwise noted).

| Parameter                                 | Test Pin       | Test Conditions                                     | Limits |     |     | Units |
|---|----------------|---|--------|-----|-----|-------|
|   |                |   | Min    | Typ | Max |       |
| Supply Voltage                            | Vdd            | Operating   | 4.0    | 5.0 | 8.0 | V     |
| Standby Supply Current                    | Vdd            | Hrnen, Cpmpen = Vss<br>Feed = Vss ; Vdd = 5V        |        | 100 | 500 | nA    |
|   | Vdd            | Hrnen, Cpmpen = Vss<br>Feed = Vss ; Vdd = 8V        |        | 500 |     | nA    |
| Supply Current                            | Vdd            | Hrnen = Vss<br>Cpmpen = Vdd<br>No Loads; See note 1 |        | 200 | 500 | uA    |
| Input Leakage                             | Hrnen & Cpmpen | Vin = Vdd or Vss                                    | -100   |     | 100 | nA    |
|   | FEED           | Feed = +22V<br>Cpmpen = Vdd                         |        | 20  | 50  | uA    |
|   | FEED           | Feed = -10V<br>Cpmpen = Vdd                         | -50    | -15 |     | uA    |
| Input Voltage Low                         | Hrnen & Cpmpen |   |        |     | 1.0 | V     |
| Input Voltage High                        | Hrnen & Cpmpen |   | 2.3    |     |     | V     |
| Output Low Voltage                        | Horns or Hornb | Iout = -16mA<br>Cpmpen = Vdd                        |        | 0.3 | 0.5 | V     |
| Output High Voltage                       | Horns or Hornb | Iout = -16mA<br>Cpmpen = Vdd                        | 8.5    | 8.7 |     | V     |
| Vpos Output Voltage                       | Vpos           | Iout = -16mA<br>Cpmpen = Vdd<br>Hrnen = Vss         |        | 8.9 |     | V     |
| Charge Pump Oscillator Freq               | Vpos           |   |        | 16  |     | kHz   |
| Charge Pump Power Efficiency              | Vpos           | Iout = -16mA<br>C1=C2=10uF                          |        | 85  |     | %     |
| Charge Pump Voltage Conversion Efficiency | Vpos           | No Loads<br>C1=C2=10uF                              | 95     | 99  |     | %     |

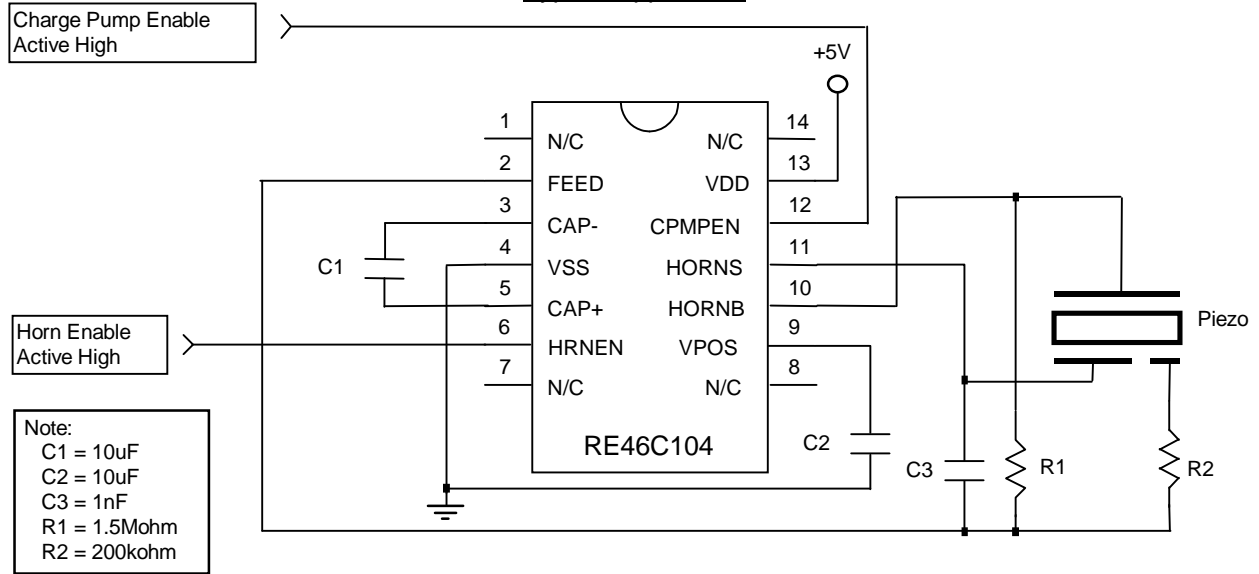
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## Typical Application



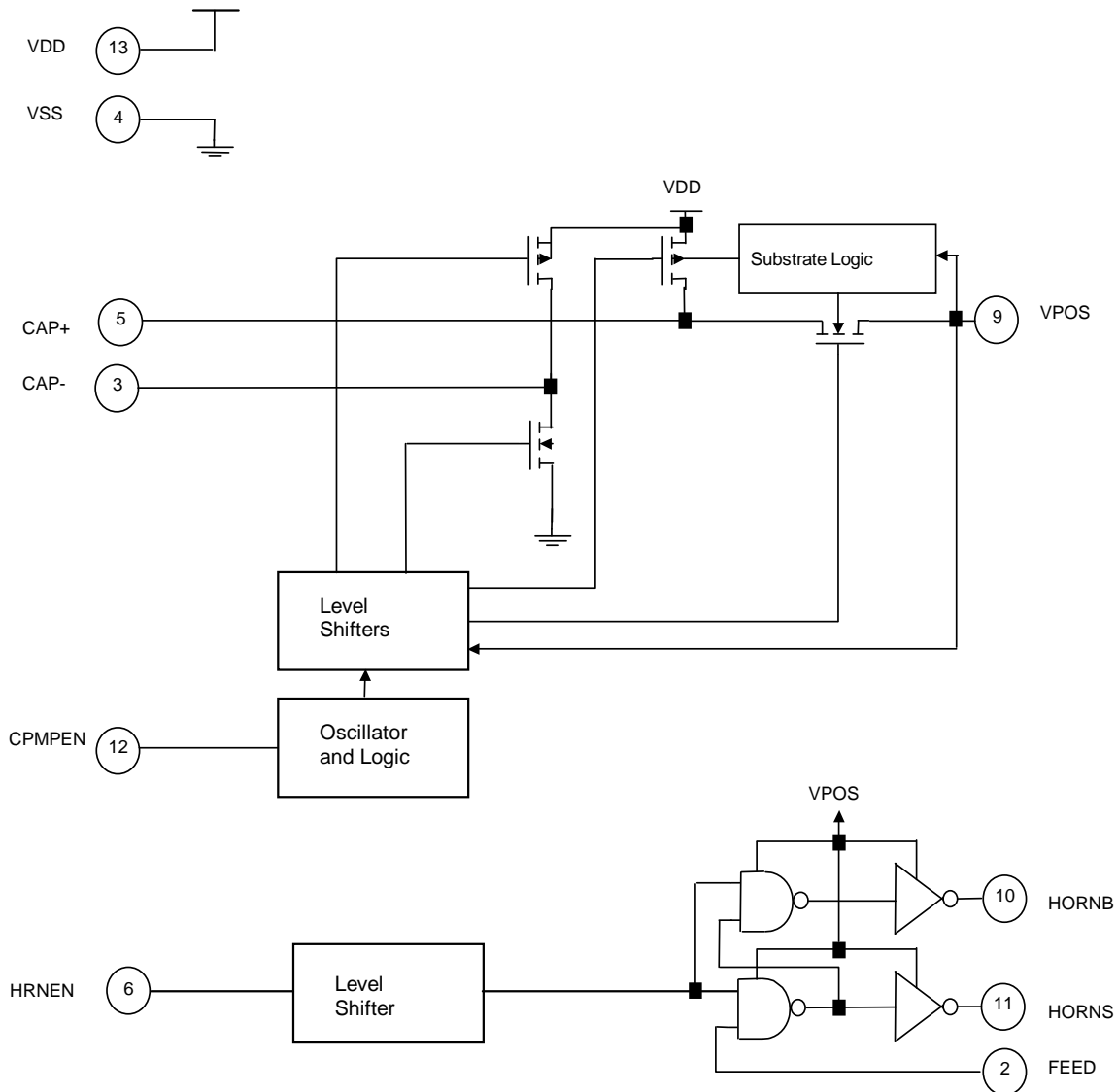
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## Functional Block Diagram



### Notes:

- 1/ The supply current specification is an average under steady state conditions. The instantaneous current will exceed this value when C1 and C2 charge-up initially (after charge pump is enabled) and during subsequent recharging of C1 and C2.

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