



WE9192 SERIES

TOUCH PULSE DIALER WITH REDIAL

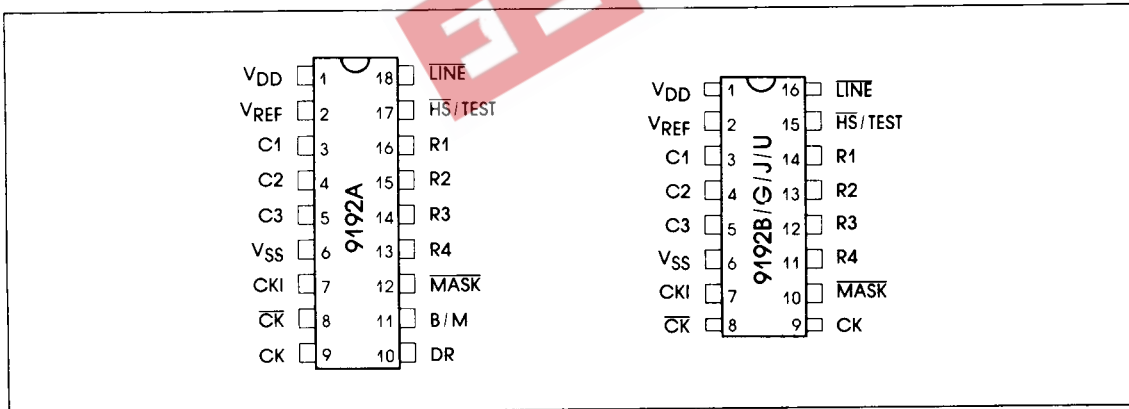
GENERAL DESCRIPTION

The WE9192 Series are CMOS monolithic integrated circuit, they can work at low voltage, low operating current and with high noise immunity. Operating directly off the telephone line supply.

FEATURES

- 2.5V to 5.5V Supply Voltage.
- Low Stand-by Power Consumption.
- Inexpensive RC Oscillator Network.
- High Line Out Break-Down Voltage.
- Continuous Mute.
- On Chip LINE OUT and Mask OUT.
- Redial with either a "*" or a "#" Key Depressed.
- 16 Digits Capacity for Redialing.
- Uses Either Inexpensive Signal Contact XY Matrix Keyboard or Standard 2-of-7 Keyboard with Negative Common.

PIN CONFIGURATION



PULSE DIALER

TABLE 1

| 9192 SERIES | BREAK/MAKE | DIALING RATE | PIN |
|-------------|----------------|----------------|-----|
| **9192A | pin selectable | pin selectable | 18 |
| 9192B | 60/40 | 10pps | 16 |
| 9192G | 66/33 | 10pps | 16 |
| **9192J | 60/40 | 20pps | 16 |
| **9192U | 66/33 | 20pps | 16 |

** STOP PRODUCTION

ABSOLUTE MAXIMUM RATINGS

| CHARACTERISTICS | RATINGS | UNIT |
|-----------------------|-------------|------|
| DC Supply Voltage | 6.0 | V |
| Operating Temperature | -20 to +60 | °C |
| Storage Temperature | -55 to +125 | °C |

ELECTRICAL CHARACTERISTICS

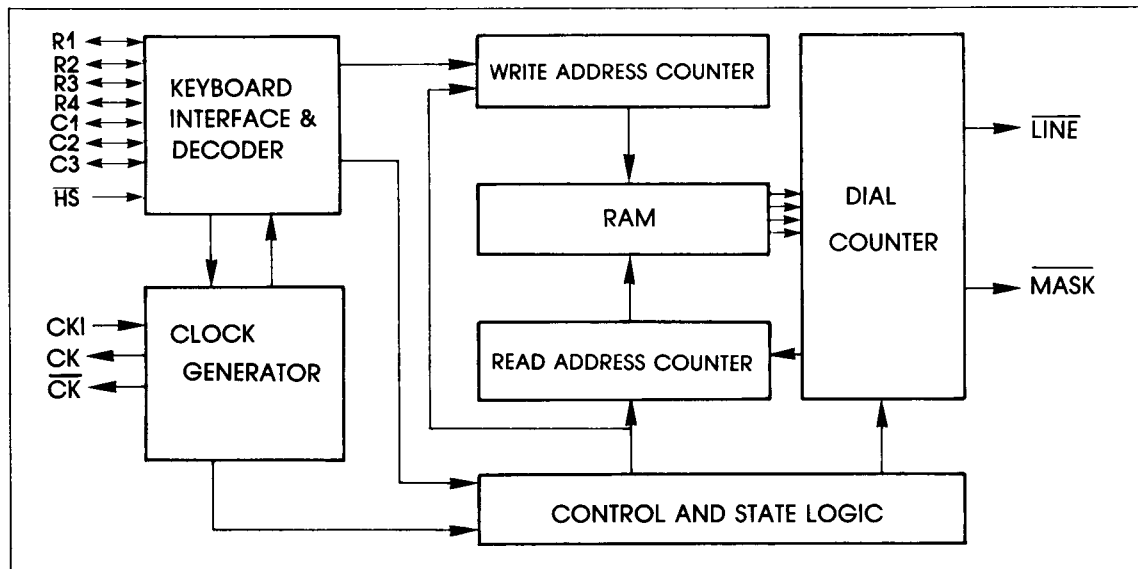
$T_A = 25^\circ\text{C}$, $V_{SS} = 0\text{V}$

| CHARACTERISTICS | SYMBOL | TEST CONDITION | | | LIMITS | | | UNITS |
|--|---------------------|----------------|----------|-----------|-------------|-----------|-------------|------------------|
| | | V_{DD} | V_{IN} | V_{OUT} | MIN | TYP | MAX | |
| Supply Voltage | V_{DD} | | | | 2.5 | | 5.5 | V |
| Input Current (HS) | I_{HS} | 2.5 | 0 | | | 20 | | μA |
| Key Contact Resistance | R_{KI} | 5.0 | | | | | 1 | $\text{k}\Omega$ |
| Keyboard Capacitance | R_{CI} | 5.0 | | | | | 30 | pF |
| Mask Sink Current | I_{MOS} | 2.5 | | 0.5 | | 3 | | mA |
| Line Out Sink Current | I_{LOS} | 2.5 | | 0.5 | | 5 | | mA |
| Key Input Level (R1-R4, C1-C3) | K_{IL} | | | | V_{SS} | | $0.2V_{DD}$ | V |
| 2-of-7 Input Mode | K_{IH} | | | | $0.8V_{DD}$ | | V_{DD} | V |
| Keyboard Resistance Pull-up (Pull-Down) | K_{IRU} / K_{IRD} | $2.5 / 2.5$ | | | | $170 / 6$ | | $\text{k}\Omega$ |
| Memory Retention Current | I_{MR} | 1.0 | | | | 0.1 | | μA |
| Mask off Leakage | I_{MLKG} | 5.5 | | 5.5 | | 0.001 | | μA |
| Line off Leakage | I_{LLKG} | 5.5 | | 15 | | 8 | | μA |
| V_{REF} Output Source Current | I_{REF} | 5 | | | | 4.5 | | mA |

ELECTRICAL CHARACTERISTICS

($V_{SS} = 0V, T_A = 25^\circ C$)

| PARAMETER | SYM | TEST CONDITION | LIMIT | | | UNIT |
|--------------------------|--------------|---|---|-----------|---------|---------|
| | | | MIN | TYP | MAX | |
| Operating Current | I_{DD} | $V_{DD}=5.5V$ | $V_{REF}=V_{SS}$ | 5.8 | 10 | mA |
| | | | $V_{REF}=OPEN$ | 200 | 300 | μA |
| | F_o | $R_E=2M\Omega$ $R_D=220K\Omega$ $C_D=390pF$ $V_{DD}=3.0V-3.5V$ | 3.8 | 4 | 4.2 | KHz |
| Frequency Stability | $\Delta f/f$ | $V_{DD}=2.5-3.5V$ | $R_E=2M\Omega$ $R_D=220K$ $C_D=390pF$ | ± 2.5 | ± 4 | % |
| | | $V_{DD}=3.5-5.5V$ | | | | |
| Key Input Debounce Time | T_{DB} | $F_{OSC}=4KHz$ | | 10 | | mS |
| Oscillator Start-up Time | T_{OS} | $V_{DD}=2.5V$ | | 1 | | mS |
| LINE OUT Dial Rate | L_{DR} | PIN 10 is tied to V_{SS} $F_{OSC}=1KHz$ | | 10 | | PPS |
| Inter-Digital Pause | T_{IDP} | PIN 10 is tied to V_{SS} $F_{OSC}=4KHz$ | | 800 | | mS |

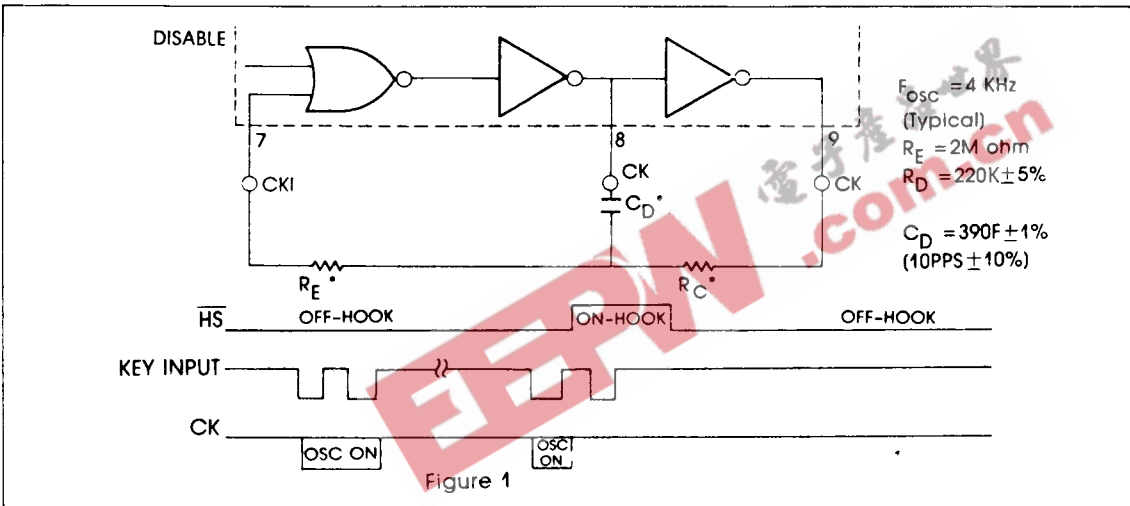


PULSE
DIALER

FUNCTIONAL DESCRIPTION

Clock Oscillator - The clock oscillator consists of a NOR gate and two inverters, the frequen-

cy of oscillation being controlled by external components.



V_{DD} POWER SUPPLY

This is the positive supply. The supply voltage range between 2.5 and 5.5 volts.

V_{REF} REFERENCE

The V_{REF} output provides a negative reference voltage relative to the V_{DD} supply. Its magnitude is a function of the internal parameters which define the minimum operating voltage of each part. The V_{REF} pin is simply tied to V_{SS} (Pin 6). The internal circuit with its associated I-V characteristic is shown in Figure 4.

HOOK SWITCH CONTROL AND TEST

External circuitry connected to HANDSET/TEST PIN is used to indicate whether the telephone handset is ON-HOOK or OFF-HOOK, these two states being represented by Logic Hi or floating and Logic Low respectively. In the off-hook mode, this pin normally by held at logic Low. A change from Off-hook mode to on-hook mode while the device is outpulsing

causes the remaining digits to be outpulsed at 100X the normal rate (B/M ratio is then 50/50). When come off-hook pushing the either a "*" or "#" key stored the memory number can be redialed..

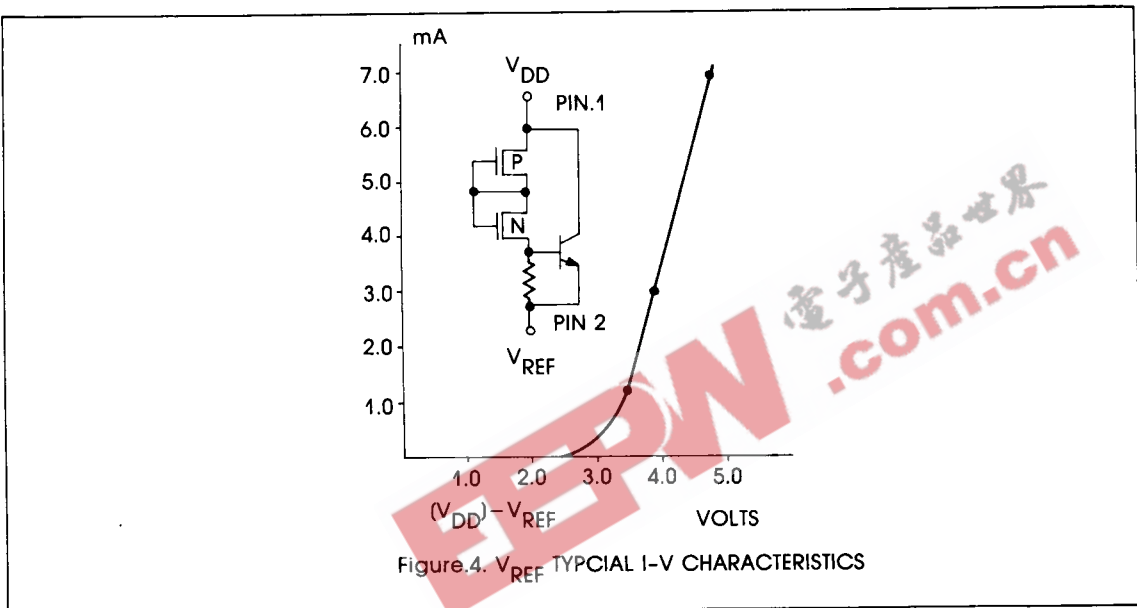
REDIAL

The keyboard inputs are retained in the memory and therefore can be redialed out by going off-hook and pushing either "*" or "#" key.

LINE AND MASK OUTPUT

The loop disconnect dial pulses appear at LINE OUTPUT (LINE) pin. the output stage consists of an open-drain N-channel transistor. During a dial pulse break period the output device is switched on and during the make period and IDP the device is switched off. The Mask output is used to control the muting of the telephone network during out dialing. The output is an open-drain N-channel transistor designed to drive an external bipolar transistor.

WE9192 SERIES



****Break/Make (B/M) Selection (only in 9192A)**
This pin controls the Break/Make ratio of the pulse output. The Break/Make ratio is con-

trolled by connecting V_{SS} or V_{DD} to this pin as shown in the Table 2.

| INPUT TO B/M PIN | LINE OUTPUT | |
|------------------|-------------|------|
| | BREAK | MAKE |
| V_{DD} | 66% | 34% |
| V_{SS} | 60% | 40% |

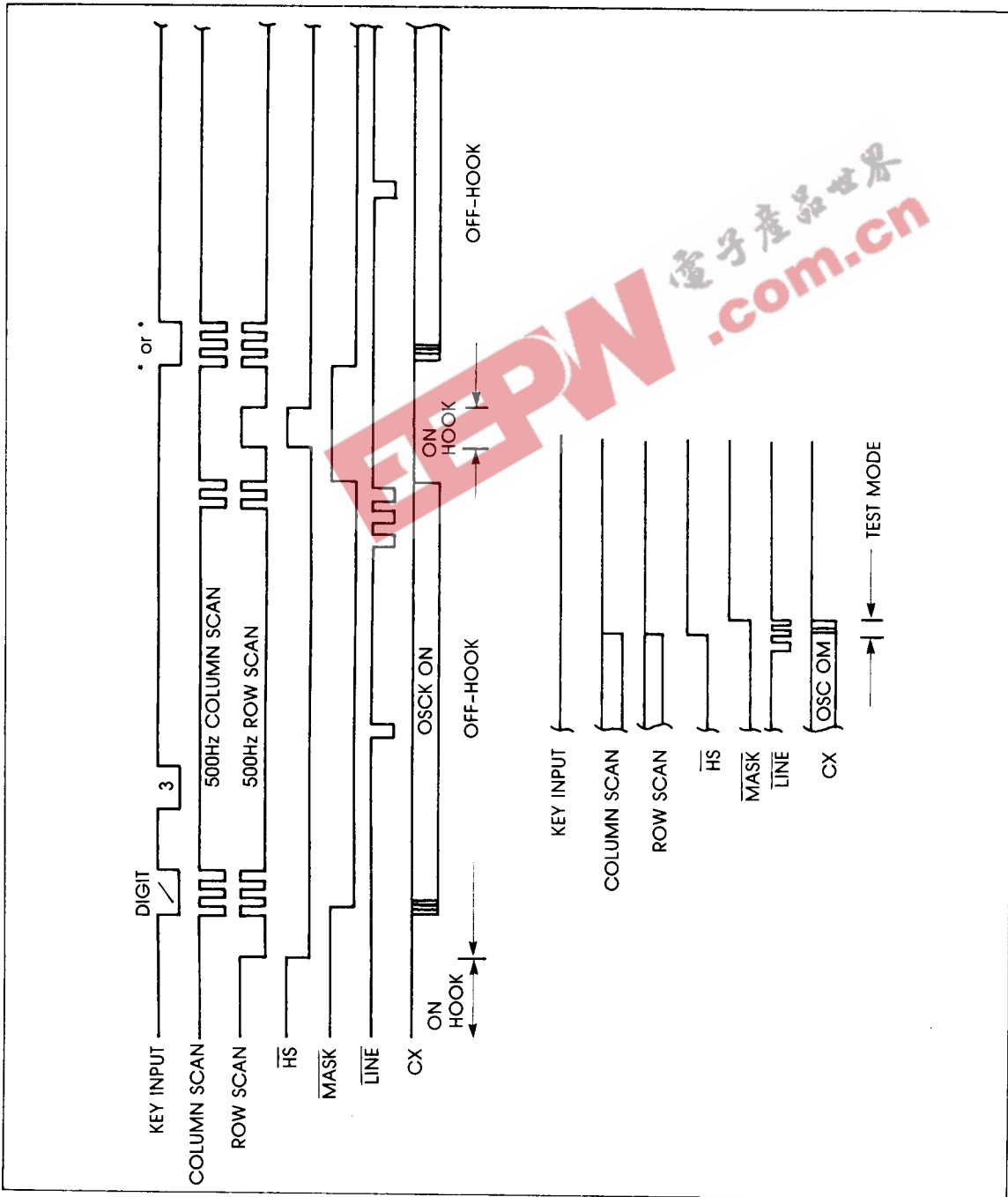
****Dialing Rates(DR) Selection (only in 9192A)**
The dialing rate is derived by dividing down the dial rate oscillator frequency. Table 3 shows the relationship of the dialing rate

and IDP with the OSC. Different dialing rates can be selected by connection the pin V_{DD} or V_{SS} will select a pulse of either 20PPS or 10PPS respectively.

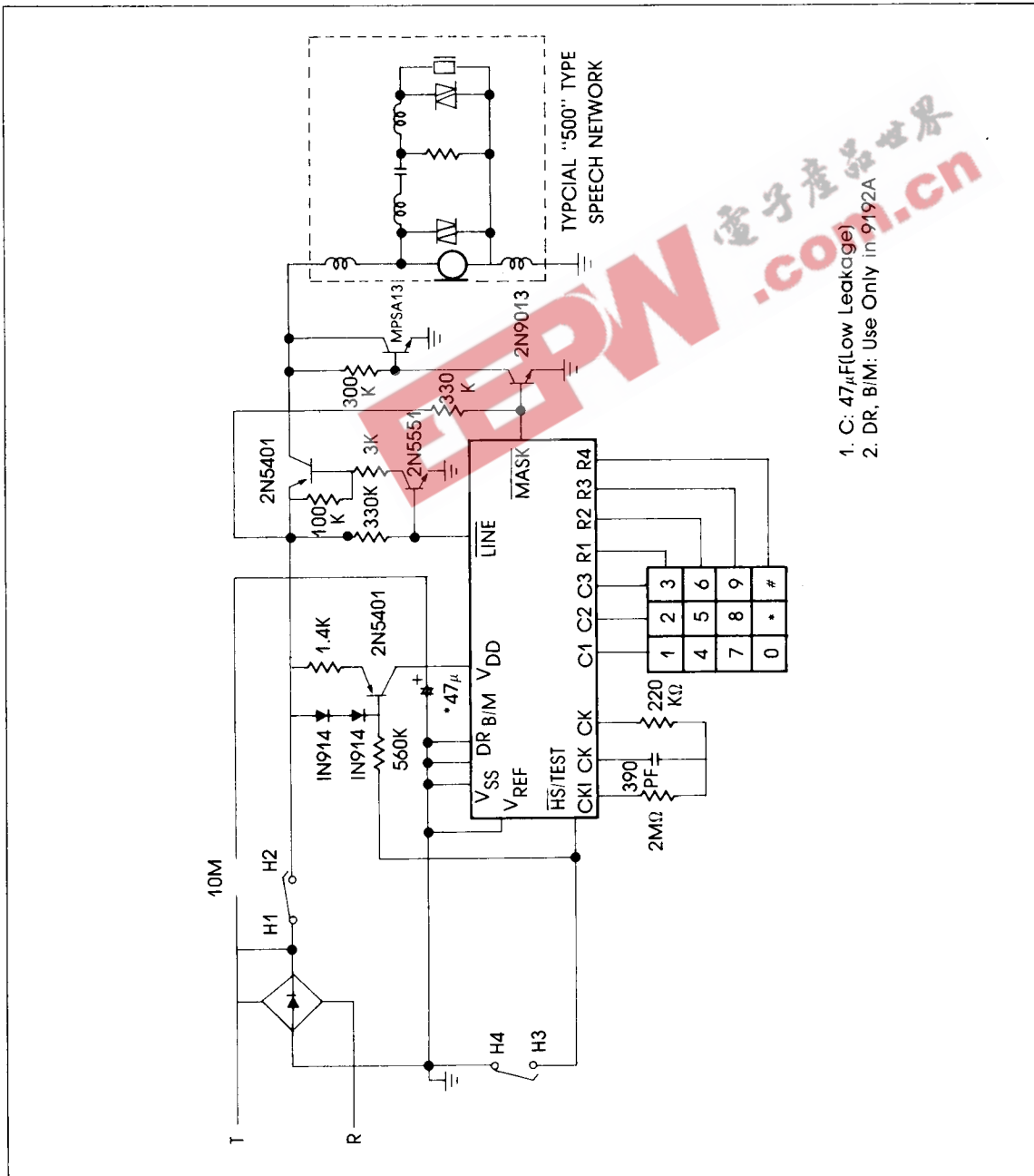
| INPUT TO THE OR AND IDP PINS | LINE OUTPUT | | NOTES |
|------------------------------|-------------|---------|------------------|
| | DR(PPS) | IDP(ms) | |
| V_{DD} | 20 | 400 | $F_{OSC} = 4KHz$ |
| V_{SS} | 10 | 800 | |

Table 3: Dialing Rate Selection

PULSE DIALER



APPLICATION CIRCUIT



PULSE
DIALER