

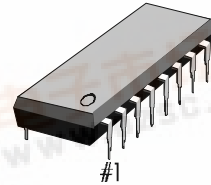
## INTRODUCTION

The S5T8803A is designed to select 10 channels of a cordless phone, whose frequency band is 46/49MHz. It has a reference frequency generator, programmable divider for Transmit and Receive section, and phase detector.

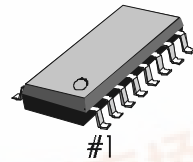
## FEATURES

- Able to select 10 Channels: S5T8803A (both transmit/receive)
- Include oscillation circuit with external x-tal (10.24MHz)
- 5KHz output for guard tone
- Unlock detector (phase difference more than 6.25us)
- Standby function for power saving

16-DIP-300A



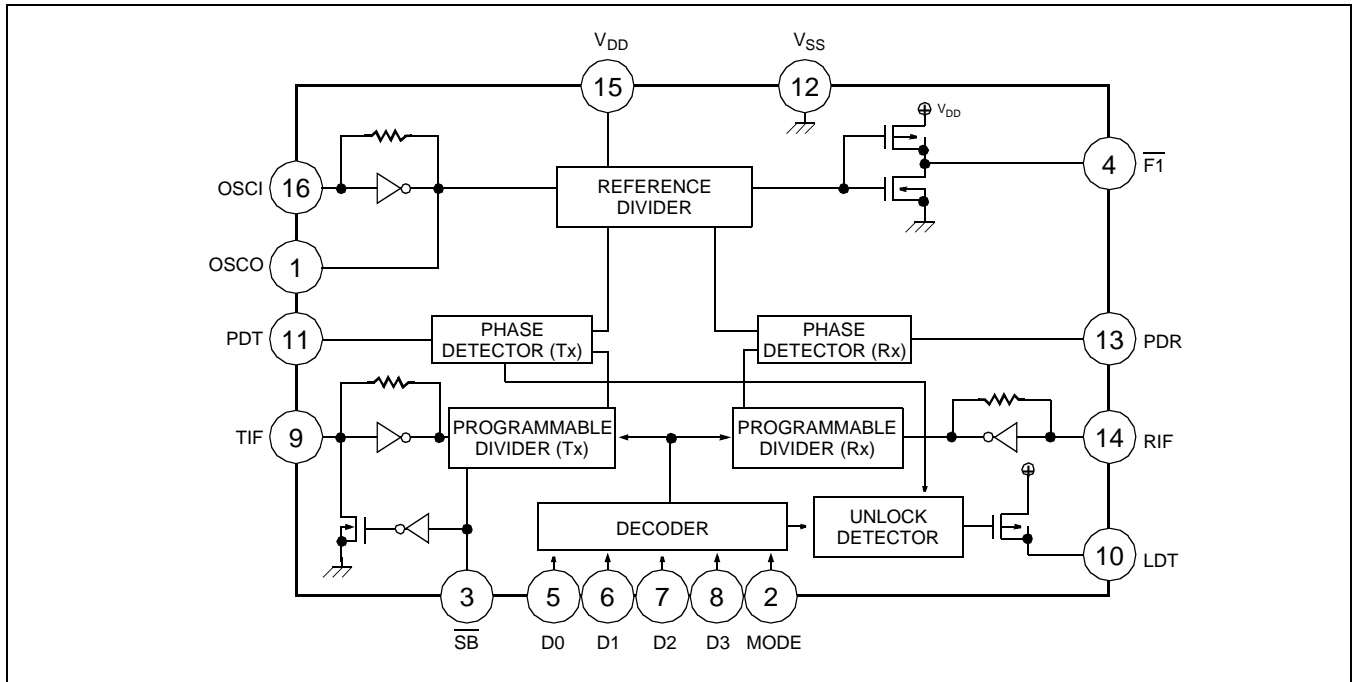
16-SOP-225



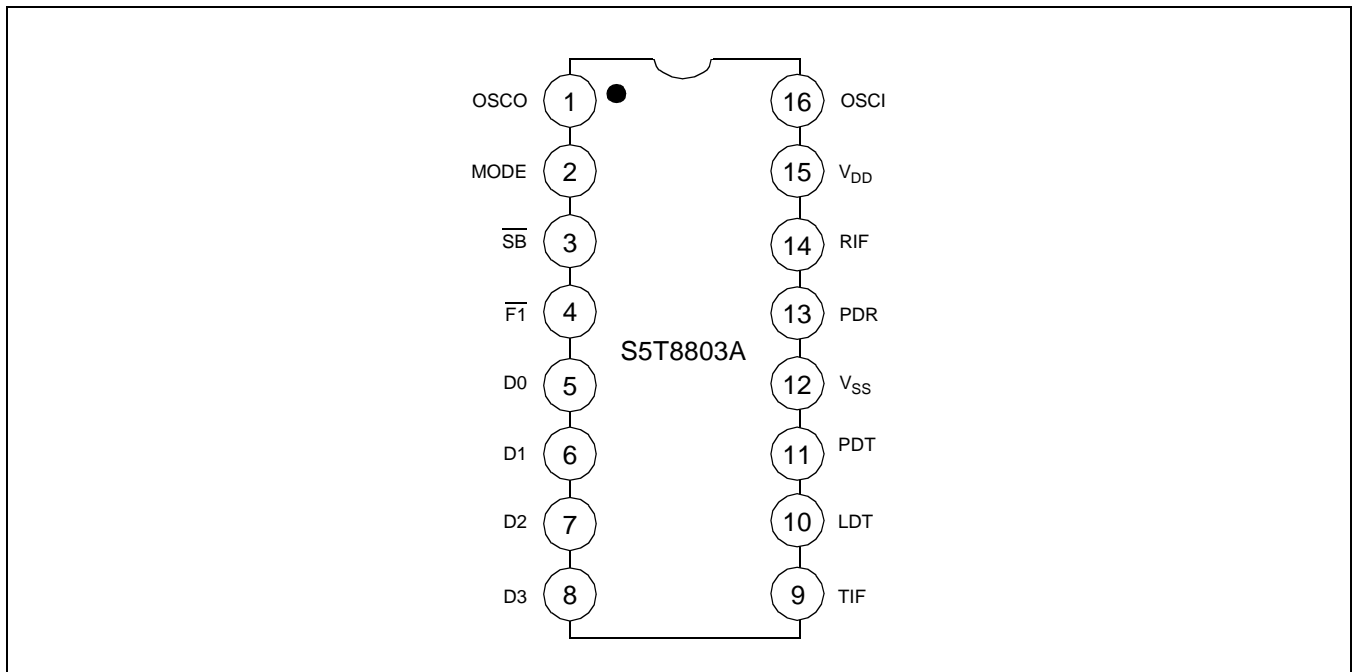
## ORDERING INFORMATION

| Device          | Package     | Operating Temperature |
|-----------------|-------------|-----------------------|
| S5T8803A01-D0B0 | 16-DIP-300A | -30°C to +75°C        |
| S5T8803A01-S0B0 | 16-SOP-225  |                       |

**BLOCK DIAGRAM**



**PIN CONFIGURATION**



## PIN DESCRIPTION

| Pin No       | Symbol           | Description   |
|--------------|------------------|---|
| 1            | OSCO             | This output generates the reference frequency when it is connected to Pin 16 with the external OSC, whose frequency is 10.24MHz.  |
| 2            | MODE             | Base/Remote Unit Selection Pin.<br>“High”: Base Unit<br>“Low” : Remote Unit   |
| 3            | SB               | Standby pin. This input controls Tx PLL for reducing the power dissipation<br>“High”: Normal operation<br>“Low”: Standby  |
| 4            | F1               | 5KHz output   |
| 5, 6<br>7, 8 | D0, D1<br>D2, D3 | Channel selection pins<br>The Combinations of these inputs select one channel among the 10 channels   |
| 9            | TIF              | Input to programmable divider of Tx. AC coupling with VCO<br>In case of a larger signal, It needs DC–coupling. Minimum input voltage is 0.1 Vrms                          |
| 10           | LDT              | Unlocked signal out pin (see output characteristics)  |
| 11           | PDT              | Phase detector output for Tx.<br>PDT detects the phase error from Tx PLL and its output is connected to the external low pass filter                                      |
| 12           | VSS              | This pin is the negative supply of the IC. It is usually grounded   |
| 13           | PDR              | Phase detector output for Rx. PDR detects the phase error from Rx PLL and its output is connected to the external low pass filter   |
| 14           | RIF              | Input of programmable divider for Rx. AC coupling with VCO<br>In case of a larger signal (standard CMOS logic), it needs DC coupling.<br>Minimum input voltage is 0.1Vrms |
| 15           | V <sub>DD</sub>  | This pin is the positive supply of the IC<br>Its reference is V <sub>SS</sub> , and normally + 3.0V ~ + 5.5V more positive than V <sub>SS</sub>                           |
| 16           | OSCI             | X-TAL OSC connection pin<br>This input generates the reference frequency when it is connected to pin 1 with the external OSC  |

## ABSOLUTE MAXIMUM RATINGS

| Characteristic        | Symbol           | Value                        | Unit |
|-----------------------|------------------|------------------------------|------|
| Supply voltage        | V <sub>DD</sub>  | -0.5 ~ + 6.0                 | V    |
| Input Voltage         | V <sub>I</sub>   | -0.3 ~ V <sub>DD</sub> + 0.5 | V    |
| Power Dissipation     | P <sub>D</sub>   | 350                          | mW   |
| Operating Temperature | T <sub>OPR</sub> | -30 ~ + 75                   | °C   |
| Storage Temperature   | T <sub>STG</sub> | -40 ~ + 125                  | °C   |

## ELECTRICAL CHARACTERISTICS

(Ta = 25°C, V<sub>DD</sub> = 5 V, unless otherwise specified)

| Characteristic             | Symbol               | Test Conditions  | Min.                 | Typ.  | Max.               | Unit |
|----------------------------|----------------------|--|----------------------|-------|--------------------|------|
| Supply Voltage             | V <sub>DD</sub>      | –  | 3                    | –     | 5.5                | V    |
| Input Voltage              | V <sub>IH1</sub>     | D0 - D3, $\overline{SB}$                                     | 0.7 V <sub>DD</sub>  | –     | V <sub>DD</sub>    | V    |
|                            | V <sub>IL1</sub>     | D0 - D3, $\overline{SB}$                                     | –                    | –     | 0.3V <sub>DD</sub> | V    |
|                            | V <sub>IH2</sub>     | MODE   | 0.9 V <sub>DD</sub>  | –     | V <sub>DD</sub>    | V    |
|                            | V <sub>IL2</sub>     | MODE   | –                    | –     | 0.1V <sub>DD</sub> | V    |
| Input Frequency            | f <sub>I1</sub>      | V <sub>TIF</sub> = 0.15Vrms                                  | 10                   | –     | 52                 | MHz  |
|                            | f <sub>I2</sub>      | V <sub>RIF</sub> = 0.15Vrms                                  | 30                   | –     | 42                 | MHz  |
|                            | f <sub>I3</sub>      | OSC <sub>IN</sub> = 0.3Vrms                                  | 5                    | 10.24 | 11                 | MHz  |
| Input Amplitude            | V <sub>I(AMP)1</sub> | f <sub>TIF</sub> = 52MHz                                     | 0.1                  | –     | 0.3V <sub>DD</sub> | Vrms |
|                            | V <sub>I(AMP)2</sub> | f <sub>RIF</sub> = 42MHz                                     | 0.1                  | –     | 0.3V <sub>DD</sub> | Vrms |
|                            | V <sub>I(AMP)3</sub> | OSC <sub>IN</sub> = 11MHz                                    | 0.3                  | –     | 0.3V <sub>DD</sub> | Vrms |
| Input Current              | I <sub>IH</sub>      | V <sub>IN</sub> = V <sub>DD</sub>                            | –                    | –     | 40                 | μA   |
|                            | I <sub>IL</sub>      | V <sub>IN</sub> = V <sub>SS</sub>                            | –                    | –     | 40                 | μA   |
| Output Voltage             | V <sub>OH1</sub>     | PDT, RDR: I <sub>O</sub> = 0.5mA                             | V <sub>DD</sub> -1.0 | –     | –                  | V    |
|                            | V <sub>OL1</sub>     | PDT, RDR : I <sub>O</sub> = 0.5mA                            | –                    | –     | 1.0                | V    |
|                            | V <sub>OH2</sub>     | LDT: I <sub>O</sub> = 1mA                                    | V <sub>DD</sub> -1.0 | –     | –                  | V    |
|                            | V <sub>OL2</sub>     | F1: I <sub>O</sub> = 1mA                                     | –                    | –     | 1.0                | V    |
| Output OFF Leakage Current | I <sub>LKG1</sub>    | PDT, PDR : V <sub>O</sub> = V <sub>DD</sub> /V <sub>SS</sub> | –                    | 0.01  | 1.0                | μA   |
|                            | I <sub>LKG2</sub>    | LDT: V <sub>O</sub> = V <sub>SS</sub>                        | –                    | –     | 5.0                | μA   |
| Standby Current            | I <sub>SB1</sub>     | V <sub>DD</sub> = 3V (Note 2)                                | –                    | 1.0   | 2.0                | mA   |
|                            | I <sub>SB2</sub>     | V <sub>DD</sub> = 3V (Note 2)                                | 3.5                  | 4.0   | –                  | mA   |
| Operating Current          | I <sub>DD1</sub>     | V <sub>DD</sub> = 3V (Note 1)                                | –                    | 2.0   | 3.0                | mA   |
|                            | I <sub>DD2</sub>     | V <sub>DD</sub> = 5V (Note 1)                                | –                    | 6.0   | 7.0                | mA   |

### NOTES:

- OSC IN: 10.24MHz X-tal Connection  
 TIF: 27MHz 150 mVrms  
 RIF: 42MHz 150 mVrms  
 MODE: V<sub>DD</sub>, SB = V<sub>DD</sub>, others are opened
- OSC IN: 10.24MHz X-tal Connection  
 TIF: 27MHz 150mVrms  
 RIF: 42MHz 150mVrms  
 MODE: V<sub>DD</sub>, SB = V<sub>SS</sub>, others are opened  
 Capacitor more than 2000pF should be connected between V<sub>DD</sub> & V<sub>SS</sub>

### OUTPUT CHARACTERISTICS

#### LOCK

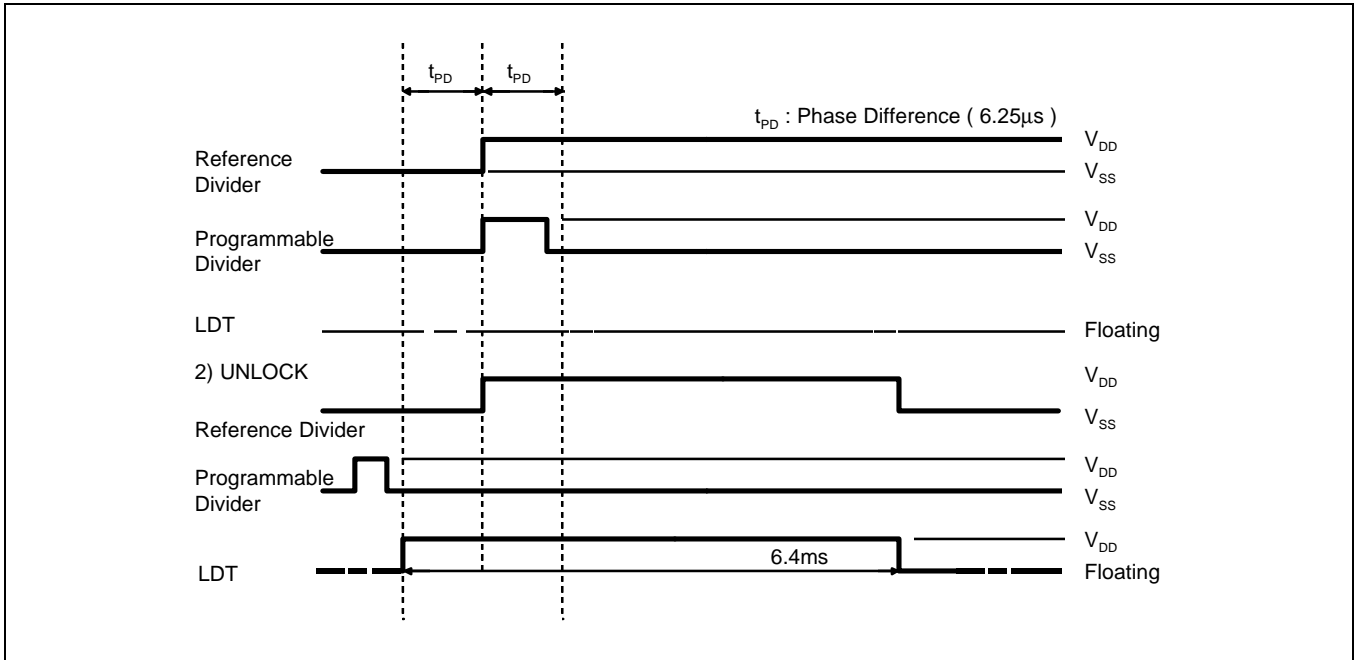


Figure 1.

## Channel &amp; Frequency table to Base/Remote Input Data for S5T8803A (10-CH)

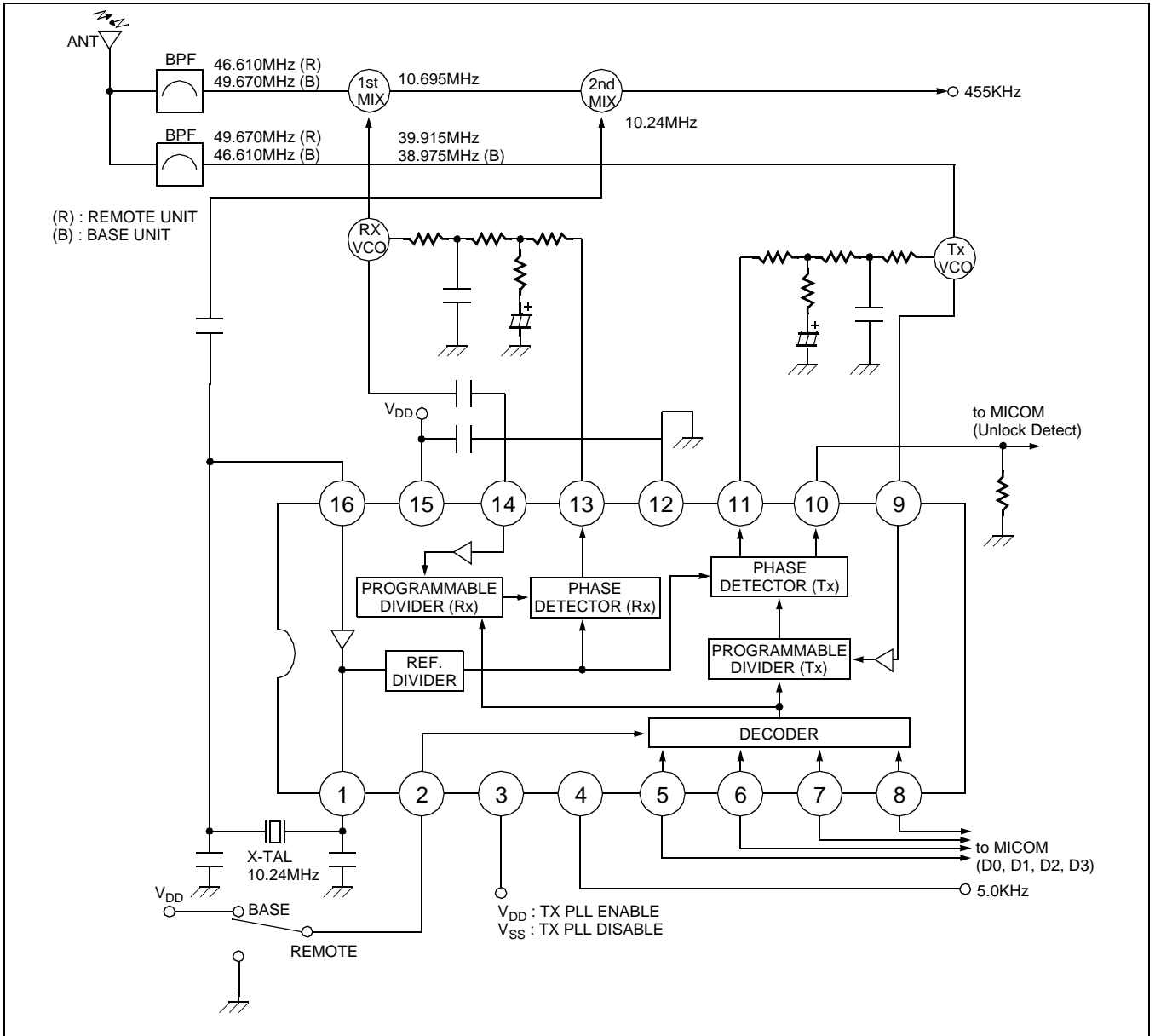
## BASE (MODE = 1)

| INPUT |    |    |    |    | Rx (f <sub>REF</sub> = 5kHz) |                        |      | Tx (f <sub>REF</sub> = 5kHz) |                        |      |
|-------|----|----|----|----|------------------------------|------------------------|------|------------------------------|------------------------|------|
| D0    | D1 | D2 | D3 | CH | f <sub>RX</sub> (MHz)        | f <sub>VCO</sub> (MHz) | N    | f <sub>TX</sub> (MHz)        | f <sub>VCO</sub> (MHz) | N    |
| 1     | 0  | 0  | 0  | 1  | 49.670                       | 38.975                 | 7795 | 46.610                       | 46.610                 | 9322 |
| 0     | 1  | 0  | 0  | 2  | 49.845                       | 39.150                 | 7830 | 46.630                       | 46.630                 | 9326 |
| 1     | 1  | 0  | 0  | 3  | 49.860                       | 39.165                 | 7833 | 46.670                       | 46.670                 | 9334 |
| 0     | 0  | 1  | 0  | 4  | 49.770                       | 39.075                 | 7815 | 46.710                       | 46.710                 | 9342 |
| 1     | 0  | 1  | 0  | 5  | 49.875                       | 39.180                 | 7836 | 46.730                       | 46.730                 | 9346 |
| 0     | 1  | 1  | 0  | 6  | 49.830                       | 39.135                 | 7827 | 46.770                       | 46.770                 | 9354 |
| 1     | 1  | 1  | 0  | 7  | 49.890                       | 39.195                 | 7839 | 46.830                       | 46.830                 | 9366 |
| 0     | 0  | 0  | 1  | 8  | 49.930                       | 39.235                 | 7847 | 46.870                       | 46.870                 | 9374 |
| 1     | 0  | 0  | 1  | 9  | 49.990                       | 39.295                 | 7859 | 46.930                       | 46.930                 | 9386 |
| 0     | 1  | 0  | 1  | 10 | 49.970                       | 39.275                 | 7855 | 46.970                       | 46.970                 | 9394 |
| 1     | 1  | 0  | 1  | 10 | 49.970                       | 39.275                 | 7855 | 46.970                       | 46.970                 | 9394 |
| 0     | 0  | 1  | 1  | 10 | 49.970                       | 39.275                 | 7855 | 46.970                       | 46.970                 | 9394 |
| 1     | 0  | 1  | 1  | 10 | 49.970                       | 39.275                 | 7855 | 46.970                       | 46.970                 | 9394 |
| 0     | 1  | 1  | 1  | 10 | 49.970                       | 39.275                 | 7855 | 46.970                       | 46.970                 | 9394 |
| 1     | 1  | 1  | 1  | 10 | 49.970                       | 39.275                 | 7855 | 46.970                       | 46.970                 | 9394 |
| 0     | 0  | 0  | 0  | 10 | 49.970                       | 39.275                 | 7855 | 46.970                       | 46.970                 | 9394 |

## REMOTE (MODE = 0)

| INPUT |    |    |    |    | Rx (f <sub>REF</sub> = 5kHz) |                        |      | Tx (f <sub>REF</sub> = 5kHz) |                        |      |
|-------|----|----|----|----|------------------------------|------------------------|------|------------------------------|------------------------|------|
| D0    | D1 | D2 | D3 | CH | f <sub>RX</sub> (MHz)        | f <sub>VCO</sub> (MHz) | N    | f <sub>RX</sub> (MHz)        | f <sub>VCO</sub> (MHz) | N    |
| 1     | 0  | 0  | 0  | 1  | 46.610                       | 35.915                 | 7183 | 49.670                       | 49.670                 | 9934 |
| 0     | 1  | 0  | 0  | 2  | 46.630                       | 35.935                 | 7187 | 49.845                       | 49.845                 | 9969 |
| 1     | 1  | 0  | 0  | 3  | 46.670                       | 35.975                 | 7195 | 49.860                       | 49.860                 | 9972 |
| 0     | 0  | 1  | 0  | 4  | 46.710                       | 36.015                 | 7203 | 49.770                       | 49.770                 | 9954 |
| 1     | 0  | 1  | 0  | 5  | 46.730                       | 36.035                 | 7207 | 49.875                       | 49.875                 | 9975 |
| 0     | 1  | 1  | 0  | 6  | 46.770                       | 36.075                 | 7215 | 49.830                       | 49.830                 | 9966 |
| 1     | 1  | 1  | 0  | 7  | 46.830                       | 36.135                 | 7227 | 49.890                       | 49.890                 | 9978 |
| 0     | 0  | 0  | 1  | 8  | 46.870                       | 36.175                 | 7235 | 49.930                       | 49.930                 | 9986 |
| 1     | 0  | 0  | 1  | 9  | 46.930                       | 36.235                 | 7247 | 49.990                       | 49.990                 | 9998 |
| 0     | 1  | 0  | 1  | 10 | 46.970                       | 36.275                 | 7255 | 49.970                       | 49.970                 | 9994 |
| 1     | 1  | 0  | 1  | 10 | 46.970                       | 36.275                 | 7555 | 49.970                       | 49.970                 | 9994 |
| 0     | 0  | 1  | 1  | 10 | 46.970                       | 36.275                 | 7255 | 49.970                       | 49.970                 | 9994 |
| 1     | 0  | 1  | 1  | 10 | 46.970                       | 36.275                 | 7255 | 49.970                       | 49.970                 | 9994 |
| 0     | 1  | 1  | 1  | 10 | 46.970                       | 36.275                 | 7255 | 49.970                       | 49.970                 | 9994 |
| 1     | 1  | 1  | 1  | 10 | 46.970                       | 36.275                 | 7255 | 49.970                       | 49.970                 | 9994 |
| 0     | 0  | 0  | 0  | 10 | 46.970                       | 36.275                 | 7255 | 49.970                       | 49.970                 | 9994 |

APPLICATION CIRCUIT



NOTES