



**CY2907**

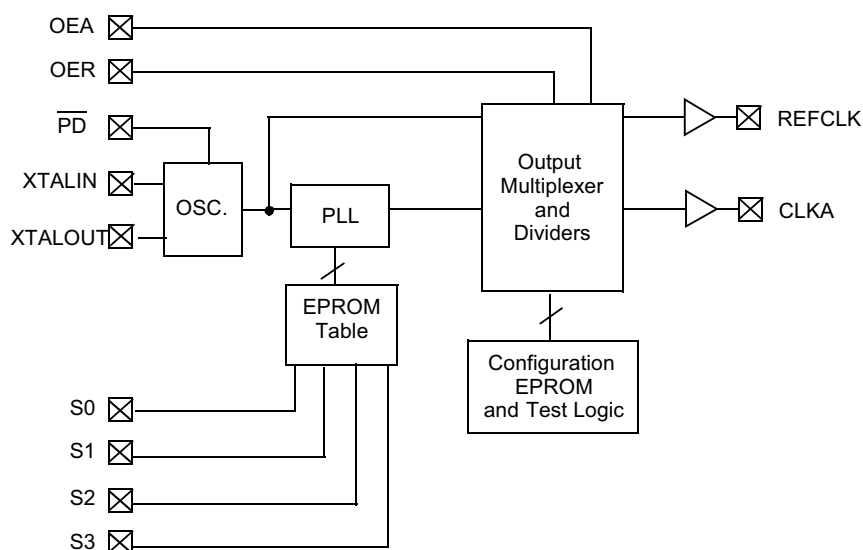
# Single-PLL General-Purpose EPROM Programmable Clock Generator

| Features                                                                                         | Benefits                                             |
|--------------------------------------------------------------------------------------------------|------------------------------------------------------|
| Single phase-locked loop architecture                                                            | Generates a custom frequency from an external source |
| EPROM programmability                                                                            | Easy customization and fast turnaround               |
| Factory-programmable (CY2907, CY2907I) or field-programmable (CY2907F & CY2907FI) device options | Programming support available for all opportunities  |
| Up to two configurable outputs                                                                   | Provides clocking requirements from a single device  |
| Low-skew, low-jitter, high-accuracy outputs                                                      | Meets critical industry standard timing requirements |
| Power management (Power-Down, OE)                                                                | Supports low-power applications                      |
| Frequency select option                                                                          | Up to 16 user-selectable frequencies                 |
| Configurable 5V or 3.3V operation                                                                | Supports industry-standard design platforms          |
| 8-pin or 14-pin SOIC packages                                                                    | Industry-standard packaging saves on board space     |

## Selector Guide

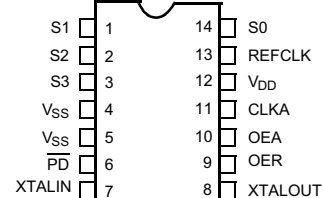
| Part Number             | Outputs | Input Frequency Range                                              | Output Frequency Range                          | Specifics                                           |
|-------------------------|---------|--------------------------------------------------------------------|-------------------------------------------------|-----------------------------------------------------|
| CY2907                  | 2       | 10 MHz–25 MHz (external crystal)<br>1 MHz–30 MHz (reference clock) | 500 kHz–130 MHz (5V)<br>500 kHz–100 MHz (3.3V)  | Factory Programmable<br>Commercial Temperature      |
| CY2907I                 | 2       | 10 MHz–25 MHz (external crystal)<br>1 MHz–30 MHz (reference clock) | 500 kHz–100 MHz (5V)<br>500 kHz–80 MHz (3.3V)   | Factory Programmable<br>Industrial Temperature      |
| CY2907F8<br>CY2907F14   | 2       | 10 MHz–25 MHz (external crystal)<br>1 MHz–30 MHz (reference clock) | 500 kHz–100 MHz (5V)<br>500 kHz–80 MHz (3.3V)   | <b>Field Programmable</b><br>Commercial Temperature |
| CY2907F8I<br>CY2907F14I | 2       | 10 MHz–25 MHz (external crystal)<br>1 MHz–30 MHz (reference clock) | 500 kHz–90 MHz (5V)<br>500 kHz–66.66 MHz (3.3V) | <b>Field Programmable</b><br>Industrial Temperature |

## Logic Block Diagram

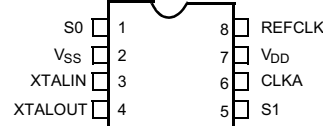


## Pin Configurations

### Top View 14-Pin SOIC



### 8-Pin SOIC



CyClocks is a trademark of Cypress Semiconductor Corporation.

## Pin Summary

| Name                      | Pin Number  |            | Description                                                                 |
|---------------------------|-------------|------------|-----------------------------------------------------------------------------|
|                           | 14-Pin SOIC | 8-Pin SOIC |                                                                             |
| S1                        | 1           | 5          | Frequency Select (CLKA) (Internal pull-up resistor to $V_{DD}$ )            |
| S2                        | 2           | NA         | Frequency Select (CLKA) (Internal pull-up resistor to $V_{DD}$ )            |
| S3                        | 3           | NA         | Frequency Select (CLKA) (Internal pull-up resistor to $V_{DD}$ )            |
| $V_{SS}$                  | 4           | 2          | Ground                                                                      |
| $V_{SS}$                  | 5           | NA         | Ground                                                                      |
| PD                        | 6           | NA         | Power-Down (active LOW) (Internal pull-up resistor to $V_{DD}$ )            |
| XTALIN <sup>[1]</sup>     | 7           | 3          | Reference Crystal Input                                                     |
| XTALOUT <sup>[1, 2]</sup> | 8           | 4          | Reference Crystal Feedback                                                  |
| OER                       | 9           | NA         | REFCLK Output Enable (active HIGH) (Internal pull-up resistor to $V_{DD}$ ) |
| OEA                       | 10          | NA         | CLKA Output Enable (active HIGH) (Internal pull-up resistor to $V_{DD}$ )   |
| CLKA                      | 11          | 6          | Clock Output                                                                |
| $V_{DD}$                  | 12          | 7          | Voltage Supply                                                              |
| REFCLK                    | 13          | 8          | Reference Clock Output (Default, can be driven by PLL if desired)           |
| S0                        | 14          | 1          | Frequency Select (CLKA) (Internal pull-up resistor to $V_{DD}$ )            |

### Notes:

- For best accuracy, use a parallel-resonant crystal,  $C_{LOAD} \approx 17$  pF.
- Float XTALOUT pin if XTALIN is driven by reference clock (as opposed to crystal).

## Functional Description

The CY2907 is a general-purpose Clock Generator designed for use in a wide variety of applications—from graphics to PC peripherals to disk drives. It generates selectable system clock frequencies from a single reference input (crystal or reference clock). The CY2907 is configured with an EPROM array, much like the other devices in the Cypress EPROM Programmable Clock Family, making it easily customizable for any application. Furthermore, the CY2907 is compatible with all industry-standard 9107 and 9108 clock synthesizers.

### CyClocks™ Software

CyClocks is an easy-to-use software application that allows you to configure any one of the EPROM Programmable Clocks offered by Cypress. You may specify the input frequency, PLL and output frequencies, and different functional options. Please note the output frequency ranges in this data sheet when specifying them in CyClocks to ensure that you stay within the limits. You can download a copy of CyClocks free on the Cypress Semiconductor website at [www.cypress.com](http://www.cypress.com).

Consider using the CY2081, CY2291, or CY2292 for applications that require unrelated and multiple output frequencies. Consider using the CY2071A for applications that require more than one output clock.

## Cypress FTG Programmer

The Cypress Frequency Timing Generator (FTG) Programmers are portable programmers designed to custom program our family of EPROM **Field** Programmable Clock Devices. The FTG programmers connect to a PC serial port and allow users of CyClocks software to quickly and easily program any of the CY2291F, CY2292F, CY2071AF, and CY2907F devices. The ordering code for the Cypress FTG Programmer is CY3670.

### Maximum Ratings

(Beyond which the useful life may be impaired. For user guidelines, not tested.)

|                                           |                                          |
|-------------------------------------------|------------------------------------------|
| Supply Voltage .....                      | –0.5 to +7.0V                            |
| Input Voltage .....                       | –0.5V to $V_{DD}+0.5V$                   |
| Storage Temperature (Non-Condensing) ...  | –65°C to +150°C                          |
| Max. Soldering Temperature (10 sec) ..... | +260°C                                   |
| Junction Temperature .....                | +150°C                                   |
| Static Discharge Voltage .....            | >2000V<br>(per MIL-STD-883, Method 3015) |

**Operating Conditions<sup>[3]</sup>**

| Parameter        | Description                                | Min. | Max. | Unit |
|------------------|--------------------------------------------|------|------|------|
| V <sub>DD</sub>  | Supply Voltage, 5V Operation               | 4.5  | 5.5  | V    |
|                  | Supply Voltage, 3.3V Operation             | 3.0  | 3.6  | V    |
| T <sub>A</sub>   | Commercial Operating Temperature, Ambient  | 0    | 70   | °C   |
|                  | Industrial Operating Temperature, Ambient  | -40  | 85   | °C   |
| C <sub>L</sub>   | Max. Capacitive Load                       |      | 15   | pF   |
| f <sub>REF</sub> | External Reference Crystal                 | 10.0 | 25.0 | MHz  |
|                  | External Reference Clock <sup>[4, 5]</sup> | 1.0  | 30.0 | MHz  |

**Electrical Characteristics at 5.0V Commercial** V<sub>DD</sub> = 4.5V to 5.5V, T<sub>A</sub> = 0°C to +70°C

| Parameter                      | Description               | Test Conditions                           |                          |      | Min. | Max. | Unit |
|--------------------------------|---------------------------|-------------------------------------------|--------------------------|------|------|------|------|
| V <sub>IH</sub>                | High-level Input Voltage  | Except Crystal Inputs                     |                          |      | 2.0  |      | V    |
| V <sub>IL</sub>                | Low-level Input Voltage   | Except Crystal Inputs                     |                          |      |      | 0.8  | V    |
| V <sub>OH</sub> <sup>[4]</sup> | High-level Output Voltage | V <sub>DD</sub> = V <sub>DD</sub> Min.    | I <sub>OH</sub> = -30 mA | CLKA | 2.4  |      | V    |
| V <sub>OL</sub> <sup>[4]</sup> | Low-level Output Voltage  | V <sub>DD</sub> = V <sub>DD</sub> Min.    | I <sub>OL</sub> = 10 mA  | CLKA |      | 0.4  | V    |
| I <sub>OH</sub> <sup>[4]</sup> | Output High Current       | V <sub>OH</sub> = 2.0V                    |                          |      |      | -35  | mA   |
| I <sub>OL</sub> <sup>[4]</sup> | Output Low Current        | V <sub>OL</sub> = 0.8V                    |                          |      | 22   |      | mA   |
| I <sub>IH</sub>                | Input High Current        | V <sub>IH</sub> = V <sub>DD</sub>         |                          |      | -2   | 2    | μA   |
| I <sub>IL</sub>                | Input Low Current         | V <sub>IL</sub> = 0V                      |                          |      |      | 20   | μA   |
| I <sub>DD</sub> <sup>[5]</sup> | Power Supply Current      | PD HIGH, CLKA = 50 MHz                    |                          |      |      | 42   | mA   |
| I <sub>DD</sub>                | Power Supply Current      | PD LOW, Logic Inputs LOW                  |                          |      |      | 100  | μA   |
| I <sub>DD</sub>                | Power Supply Current      | PD LOW, Logic Inputs HIGH                 |                          |      |      | 40   | μA   |
| R <sub>PU</sub> <sup>[4]</sup> | Pull-up Resistor          | V <sub>IN</sub> = V <sub>DD</sub> - 1.0 V |                          |      |      | 700  | kΩ   |

**Electrical Characteristics at 3.3V Commercial** V<sub>DD</sub> = 3.0V to 3.6V, T<sub>A</sub> = 0°C to +70°C

| Parameter                      | Description               | Test Conditions                          |  |  | Min.                 | Max.                | Unit |
|--------------------------------|---------------------------|------------------------------------------|--|--|----------------------|---------------------|------|
| V <sub>IH</sub>                | High-level Input Voltage  | Except Crystal Inputs                    |  |  | 0.7*V <sub>DD</sub>  |                     | V    |
| V <sub>IL</sub>                | Low-level Input Voltage   | Except Crystal Inputs                    |  |  |                      | 0.2*V <sub>DD</sub> | V    |
| V <sub>OH</sub> <sup>[4]</sup> | High-level Output Voltage | CLKA, I <sub>OH</sub> = -5 mA            |  |  | 0.85*V <sub>DD</sub> |                     | V    |
| V <sub>OL</sub> <sup>[4]</sup> | Low-level Output Voltage  | CLKA, I <sub>OL</sub> = 6 mA             |  |  |                      | 0.1*V <sub>DD</sub> | V    |
| I <sub>OH</sub> <sup>[4]</sup> | Output High Current       | V <sub>OH</sub> = 0.7*V <sub>DD</sub>    |  |  |                      | -10                 | mA   |
| I <sub>OL</sub> <sup>[4]</sup> | Output Low Current        | V <sub>OL</sub> = 0.2*V <sub>DD</sub>    |  |  | 15                   |                     | mA   |
| I <sub>IH</sub>                | Input High Current        | V <sub>IH</sub> = V <sub>DD</sub>        |  |  | -2                   | 2                   | μA   |
| I <sub>IL</sub>                | Input Low Current         | V <sub>IL</sub> = 0V                     |  |  |                      | 10                  | μA   |
| I <sub>DD</sub> <sup>[5]</sup> | Power Supply Current      | PD HIGH, CLKA = 50 MHz                   |  |  |                      | 40                  | mA   |
| I <sub>DD</sub>                | Power Supply Current      | PD LOW, Logic Inputs LOW                 |  |  |                      | 40                  | μA   |
| I <sub>DD</sub>                | Power Supply Current      | PD LOW, Logic Inputs HIGH                |  |  |                      | 12                  | μA   |
| R <sub>PU</sub> <sup>[4]</sup> | Pull-up Resistor          | V <sub>IN</sub> = V <sub>DD</sub> - 0.5V |  |  |                      | 900                 | kΩ   |

**Notes:**

- Electrical parameters are guaranteed with these operating conditions.
- Guaranteed by design, not 100% tested in production.
- Load = max. typical configuration, f<sub>REF</sub> = 14.318 MHz. Specific configurations may vary. A close approximation of I<sub>DD</sub> can be derived by the following formula:  

$$I_{DD} \text{ (mA)} = V_{DD} * (6.25 + (0.055 * F_{REF}) + (0.0017 * C_{LOAD} * (F_{CLKA} + REFCLK)))$$
C<sub>LOAD</sub> is specified in pF and F is specified in MHz.

**Electrical Characteristics at 5.0V Industrial**  $V_{DD} = 4.5V$  to  $5.5V$ ,  $T_A = -40^{\circ}C$  to  $+85^{\circ}C$ 

| Parameter      | Description               | Test Conditions                        |                           |      | Min. | Max. | Unit       |
|----------------|---------------------------|----------------------------------------|---------------------------|------|------|------|------------|
| $V_{IH}$       | High-level Input Voltage  | Except Crystal Inputs                  |                           |      | 2.0  |      | V          |
| $V_{IL}$       | Low-level Input Voltage   | Except Crystal Inputs                  |                           |      |      | 0.8  | V          |
| $V_{OH}^{[4]}$ | High-level Output Voltage | $V_{DD} = V_{DD} \text{ Min.}$         | $I_{OH} = -30 \text{ mA}$ | CLKA | 2.4  |      | V          |
| $V_{OL}^{[4]}$ | Low-level Output Voltage  | $V_{DD} = V_{DD} \text{ Min.}$         | $I_{OL} = 10 \text{ mA}$  | CLKA |      | 0.4  | V          |
| $I_{OH}^{[4]}$ | Output High Current       | $V_{OH} = 2.0V$                        |                           |      |      | -45  | mA         |
| $I_{OL}^{[4]}$ | Output Low Current        | $V_{OL} = 0.8V$                        |                           |      | 20   |      | mA         |
| $I_{IH}$       | Input High Current        | $V_{IH} = V_{DD}$                      |                           |      | -2   | 2    | $\mu A$    |
| $I_{IL}$       | Input Low Current         | $V_{IL} = 0V$                          |                           |      |      | 20   | $\mu A$    |
| $I_{DD}^{[5]}$ | Power Supply Current      | $\overline{PD}$ HIGH, CLKA = 50 MHz    |                           |      |      | 54   | mA         |
| $I_{DD}$       | Power Supply Current      | $\overline{PD}$ LOW, Logic Inputs LOW  |                           |      |      | 110  | $\mu A$    |
| $I_{DD}$       | Power Supply Current      | $\overline{PD}$ LOW, Logic Inputs HIGH |                           |      |      | 45   | $\mu A$    |
| $R_{PU}^{[4]}$ | Pull-up Resistor          | $V_{IN} = V_{DD} - 1.0 \text{ V}$      |                           |      |      | 700  | k $\Omega$ |

**Electrical Characteristics at 3.3V Industrial**  $V_{DD} = 3.0V$  to  $3.6V$ ,  $T_A = -40^{\circ}C$  to  $+85^{\circ}C$ 

| Parameter      | Description               | Test Conditions                        |  |  | Min.                | Max.               | Unit       |
|----------------|---------------------------|----------------------------------------|--|--|---------------------|--------------------|------------|
| $V_{IH}$       | High-level Input Voltage  | Except Crystal Inputs                  |  |  | $0.7 \cdot V_{DD}$  |                    | V          |
| $V_{IL}$       | Low-level Input Voltage   | Except Crystal Inputs                  |  |  |                     | $0.2 \cdot V_{DD}$ | V          |
| $V_{OH}^{[4]}$ | High-level Output Voltage | CLKA, $I_{OH} = -5 \text{ mA}$         |  |  | $0.85 \cdot V_{DD}$ |                    | V          |
| $V_{OL}^{[4]}$ | Low-level Output Voltage  | CLKA, $I_{OL} = 6 \text{ mA}$          |  |  |                     | $0.1 \cdot V_{DD}$ | V          |
| $I_{OH}^{[4]}$ | Output High Current       | $V_{OH} = 0.7 \cdot V_{DD}$            |  |  |                     | -12                | mA         |
| $I_{OL}^{[4]}$ | Output Low Current        | $V_{OL} = 0.2 \cdot V_{DD}$            |  |  | 14                  |                    | mA         |
| $I_{IH}$       | Input High Current        | $V_{IH} = V_{DD}$                      |  |  | -2                  | 2                  | $\mu A$    |
| $I_{IL}$       | Input Low Current         | $V_{IL} = 0V$                          |  |  |                     | 10                 | $\mu A$    |
| $I_{DD}^{[5]}$ | Power Supply Current      | $\overline{PD}$ HIGH, CLKA = 50 MHz    |  |  |                     | 50                 | mA         |
| $I_{DD}$       | Power Supply Current      | $\overline{PD}$ LOW, Logic Inputs LOW  |  |  |                     | 50                 | $\mu A$    |
| $I_{DD}$       | Power Supply Current      | $\overline{PD}$ LOW, Logic Inputs HIGH |  |  |                     | 15                 | $\mu A$    |
| $R_{PU}^{[4]}$ | Pull-up resistor          | $V_{IN} = V_{DD} - 0.5V$               |  |  |                     | 900                | k $\Omega$ |

**Switching Characteristics at 5.0V Commercial<sup>[4]</sup>**

| Parameter        | Output <sup>[6]</sup> | Description                   | Test Conditions                     | Min. | Max.  | Unit |
|------------------|-----------------------|-------------------------------|-------------------------------------|------|-------|------|
| t <sub>R</sub>   | CLKA                  | Output Rise Time 0.8V to 2.0V | 15-pF Load                          |      | 1.40  | ns   |
| t <sub>F</sub>   | CLKA                  | Output Fall Time 2.0V to 0.8V | 15-pF Load                          |      | 1.00  | ns   |
| t <sub>R</sub>   | CLKA                  | Output Rise Time 20% to 80%   | 15-pF Load                          |      | 3.5   | ns   |
| t <sub>F</sub>   | CLKA                  | Output Fall Time 80% to 20%   | 15-pF Load                          |      | 2.5   | ns   |
| t <sub>D</sub>   | CLKA                  | Duty Cycle                    | 15-pF Load at 1.4V                  | 45.0 | 55.0  | %    |
| F <sub>I</sub>   | XTALIN                | Input Frequency               | Crystal Oscillator                  | 10   | 25    | MHz  |
| F <sub>I</sub>   | XTALIN                | Input Frequency               | External Input Clock <sup>[7]</sup> | 1    | 30    | MHz  |
| F <sub>O</sub>   | CLKA                  | Output Frequency              | CY2907, 15-pF Load                  | 0.5  | 130.0 | MHz  |
|                  |                       |                               | CY2907F, 15-pF Load                 | 0.5  | 100.0 | MHz  |
| t <sub>JIS</sub> | CLKA                  | Jitter (One Sigma)            | 20 MHz to 130 MHz                   |      | 150   | ps   |
| t <sub>JIS</sub> | CLKA                  | Jitter (One Sigma)            | 14 MHz to 20 MHz                    |      | 200   | ps   |
| t <sub>JIS</sub> | CLKA                  | Jitter (One Sigma)            | Less than 14 MHz                    |      | 1     | %    |
| t <sub>JAB</sub> | CLKA                  | Jitter (Absolute)             | 20 MHz to 130 MHz                   | -250 | + 250 | ps   |
| t <sub>JAB</sub> | CLKA                  | Jitter (Absolute)             | 14 MHz to 20 MHz                    | -500 | + 500 | ps   |
| t <sub>JAB</sub> | CLKA                  | Jitter (Absolute)             | Less than 14 MHz                    |      | 3     | %    |
| t <sub>PU</sub>  |                       | Power-up Time                 |                                     |      | 18    | ms   |
| t <sub>FT</sub>  | CLKA                  | Transition Time               | 8 MHz to 66.6 MHz                   |      | 13    | ms   |

**Switching Characteristics at 3.3V Commercial<sup>[4]</sup>**

| Parameter        | Output <sup>[6]</sup> | Description                 | Test Conditions                     | Min. | Max.  | Unit |
|------------------|-----------------------|-----------------------------|-------------------------------------|------|-------|------|
| t <sub>R</sub>   | CLKA                  | Output Rise Time 20% to 80% | 15-pF Load                          |      | 3.5   | ns   |
| t <sub>F</sub>   | CLKA                  | Output Fall Time 80% to 20% | 15-pF Load                          |      | 2.5   | ns   |
| t <sub>D</sub>   | CLKA                  | Duty Cycle                  | 15-pF Load at 1.4V                  | 40.0 | 53.0  | %    |
| F <sub>I</sub>   | XTALIN                | Input Frequency             | Crystal Oscillator                  | 10   | 25    | MHz  |
| F <sub>I</sub>   | XTALIN                | Input Frequency             | External Input Clock <sup>[7]</sup> | 1    | 30    | MHz  |
| F <sub>O</sub>   | CLKA                  | Output Frequency            | CY2907, 15-pF Load                  | 0.5  | 100.0 | MHz  |
|                  |                       |                             | CY2907F, 15-pF Load                 | 0.5  | 80.0  | MHz  |
| t <sub>JIS</sub> | CLKA                  | Jitter (One Sigma)          | 25 MHz to 100 MHz                   |      | 150   | ps   |
| t <sub>JIS</sub> | CLKA                  | Jitter (One Sigma)          | 14 MHz to 25 MHz                    |      | 200   | ps   |
| t <sub>JIS</sub> | CLKA                  | Jitter (One Sigma)          | Less than 14 MHz                    |      | 1     | %    |
| t <sub>JAB</sub> | CLKA                  | Jitter (Absolute)           | 25 MHz to 120 MHz                   | -250 | +250  | ps   |
| t <sub>JAB</sub> | CLKA                  | Jitter (Absolute)           | 14 MHz to 25 MHz                    | -500 | +500  | ps   |
| t <sub>JAB</sub> | CLKA                  | Jitter (Absolute)           | Less than 14 MHz                    |      | 3     | %    |
| t <sub>PU</sub>  |                       | Power-up Time               |                                     |      | 18    | ms   |
| t <sub>FT</sub>  | CLKA                  | Transition Time             | 8 MHz to 66.6 MHz                   |      | 13    | ms   |

**Notes:**

6. REFCLK output can also be configured to be driven by the PLL, in which case the above characteristics are valid.
7. Please refer to the application note "Crystal Oscillator Topics" when using an external reference clock as an input frequency source.

**Switching Characteristics at 5.0V Industrial**

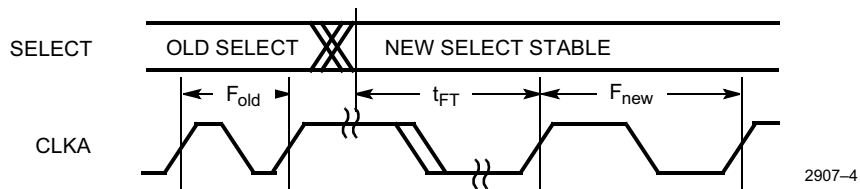
| Parameter        | Output <sup>[6]</sup> | Description                   | Test Conditions                     | Min. | Max.  | Unit |
|------------------|-----------------------|-------------------------------|-------------------------------------|------|-------|------|
| t <sub>R</sub>   | CLKA                  | Output Rise Time 0.8V to 2.0V | 15-pF Load                          |      | 1.40  | ns   |
| t <sub>F</sub>   | CLKA                  | Output Fall Time 2.0V to 0.8V | 15-pF Load                          |      | 1.00  | ns   |
| t <sub>R</sub>   | CLKA                  | Output Rise Time 20% to 80%   | 15-pF Load                          |      | 3.5   | ns   |
| t <sub>F</sub>   | CLKA                  | Output Fall Time 80% to 20%   | 15-pF Load                          |      | 2.5   | ns   |
| t <sub>D</sub>   | CLKA                  | Duty Cycle                    | 15-pF Load at 1.4V                  | 45.0 | 55.0  | %    |
| F <sub>I</sub>   | XTALIN                | Input Frequency               | Crystal Oscillator                  | 10   | 25    | MHz  |
| F <sub>I</sub>   | XTALIN                | Input Frequency               | External Input Clock <sup>[7]</sup> | 1    | 30    | MHz  |
| F <sub>O</sub>   | CLKA                  | Output Frequency              | CY2907, 15-pF Load                  | 0.5  | 100.0 | MHz  |
|                  |                       |                               | CY2907F, 15-pF Load                 | 0.5  | 90    | MHz  |
| t <sub>JIS</sub> | CLKA                  | Jitter (One Sigma)            | 20 MHz to 130 MHz                   |      | 150   | ps   |
| t <sub>JIS</sub> | CLKA                  | Jitter (One Sigma)            | 14 MHz to 20 MHz                    |      | 200   | ps   |
| t <sub>JIS</sub> | CLKA                  | Jitter (One Sigma)            | Less than 14 MHz                    |      | 1     | %    |
| t <sub>JAB</sub> | CLKA                  | Jitter (Absolute)             | 20 MHz to 130 MHz                   | -250 | + 250 | ps   |
| t <sub>JAB</sub> | CLKA                  | Jitter (Absolute)             | 14 MHz to 20 MHz                    | -500 | + 500 | ps   |
| t <sub>JAB</sub> | CLKA                  | Jitter (Absolute)             | Less than 14 MHz                    |      | 3     | %    |
| t <sub>PU</sub>  |                       | Power-up Time                 |                                     |      | 18    | ms   |
| t <sub>FT</sub>  | CLKA                  | Transition Time               | 8 MHz to 66.6 MHz                   |      | 13    | ms   |

**Switching Characteristics at 3.3V Industrial**

| Parameter        | Output <sup>[6]</sup> | Description                 | Test Conditions                     | Min. | Max. | Unit |
|------------------|-----------------------|-----------------------------|-------------------------------------|------|------|------|
| t <sub>R</sub>   | CLKA                  | Output Rise Time 20% to 80% | 15-pF Load                          |      | 3.5  | ns   |
| t <sub>F</sub>   | CLKA                  | Output Fall Time 80% to 20% | 15-pF Load                          |      | 2.5  | ns   |
| t <sub>D</sub>   | CLKA                  | Duty Cycle                  | 15-pF Load at 1.4V                  | 40.0 | 53.0 | %    |
| F <sub>I</sub>   | XTALIN                | Input Frequency             | Crystal Oscillator                  | 10   | 25   | MHz  |
| F <sub>I</sub>   | XTALIN                | Input Frequency             | External Input Clock <sup>[7]</sup> | 1    | 30   | MHz  |
| F <sub>O</sub>   | CLKA                  | Output Frequency            | CY2907I, 15-pF Load                 | 0.5  | 80.0 | MHz  |
|                  |                       |                             | CY2907FI, 15-pF Load                | 0.5  | 66.6 | MHz  |
| t <sub>JIS</sub> | CLKA                  | Jitter (One Sigma)          | 25 MHz to 100 MHz                   |      | 150  | ps   |
| t <sub>JIS</sub> | CLKA                  | Jitter (One Sigma)          | 14 MHz to 25 MHz                    |      | 200  | ps   |
| t <sub>JIS</sub> | CLKA                  | Jitter (One Sigma)          | Less than 14 MHz                    |      | 1    | %    |
| t <sub>JAB</sub> | CLKA                  | Jitter (Absolute)           | 25 MHz to 120 MHz                   | -250 | +250 | ps   |
| t <sub>JAB</sub> | CLKA                  | Jitter (Absolute)           | 14 MHz to 25 MHz                    | -500 | +500 | ps   |
| t <sub>JAB</sub> | CLKA                  | Jitter (Absolute)           | Less than 14 MHz                    |      | 3    | %    |
| t <sub>PU</sub>  |                       | Power-up Time               |                                     |      | 18   | ms   |
| t <sub>FT</sub>  | CLKA                  | Transition Time             | 8 MHz to 66.6 MHz                   |      | 13   | ms   |

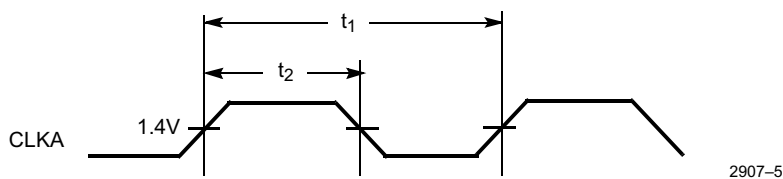
## Switching Waveforms

### Frequency Select Change (Transition Time)

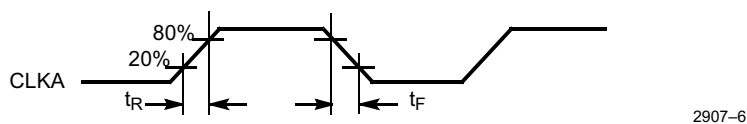


### Duty Cycle Timing

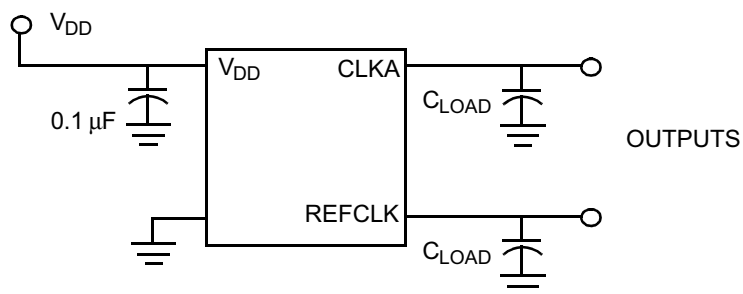
$$t_D = t_2 \div t_1$$



### All Outputs Rise/Fall Time



## Test Circuit



Note: All capacitors should be placed as close to each pin as possible.

## Ordering Information

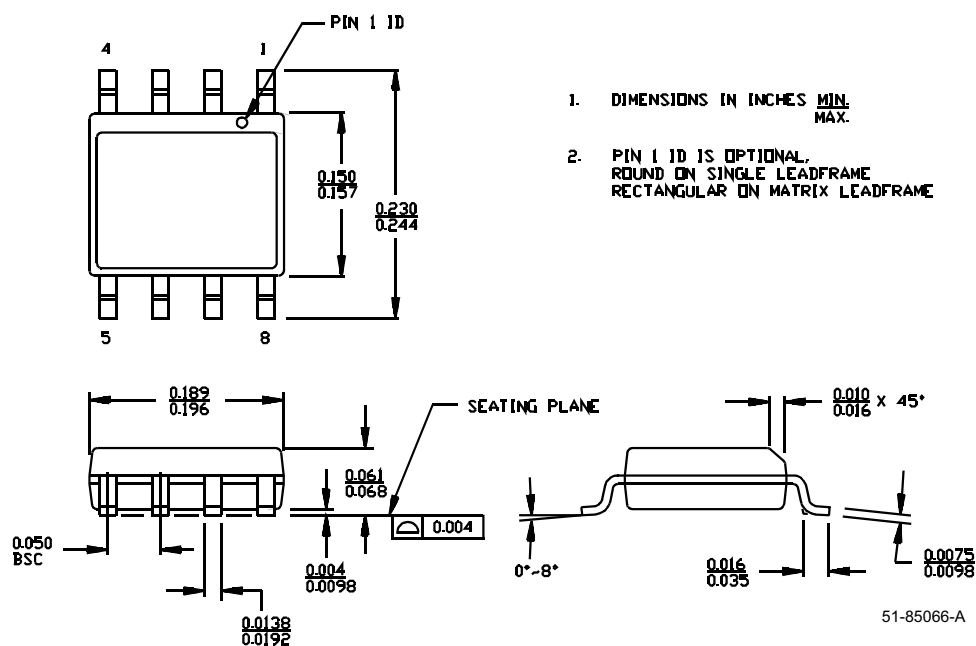
| Ordering Code | Package Name | Package Type           | Operating Range                                  |
|---------------|--------------|------------------------|--------------------------------------------------|
| CY2907SC-xxx  | S8, S14      | 8-pin or 14-pin SOIC   | 5.0V, Commercial, Factory Programmable           |
| CY2907SL-xxx  | S8, S14      | 8-pin or 14-pin SOIC   | 3.3V, Commercial, Factory Programmable           |
| CY2907SI-xxx  | S8, S14      | 8-pin or 14-pin SOIC   | 5.0V/3.3V, Industrial, Factory Programmable      |
| CY2907F8      | S8           | 8-pin SOIC             | 5.0V/3.3V, Commercial, Field Programmable        |
| CY2907F8I     | S8           | 8-pin SOIC             | 5.0V/3.3V, Industrial, Field Programmable        |
| CY2907F14     | S14          | 14-pin SOIC            | 5.0V/3.3V, Commercial, Field Programmable        |
| CY2907F14I    | S14          | 14-pin SOIC            | 5.0V/3.3V, Industrial, Field Programmable        |
| CY3670        |              | Cypress FTG Programmer | Custom Programming for Field Programmable Clocks |

## Package Characteristics

| Package     | $\theta_{JA}$ (C/W) | $\theta_{JC}$ (C/W) | Transistor Count |
|-------------|---------------------|---------------------|------------------|
| 8-pin SOIC  | 170                 | 35                  | 5436             |
| 14-pin SOIC | 140                 | 31                  | 5436             |

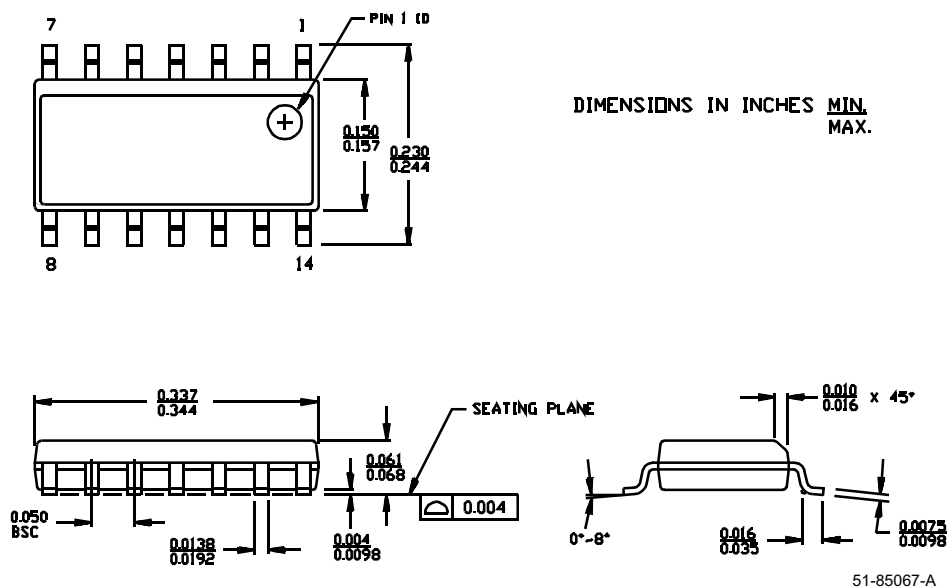
## Package Diagrams

8-Lead (150-Mil) SOIC S8



Package Diagrams (continued)

14-Lead (150-Mil) SOIC S14



Document Title: CY2907 Single-PLL General-Purpose EPROM Programmable Clock Generator  
Document Number: 38-07137

| REV. | ECN NO. | Issue Date | Orig. of Change | Description of Change                         |
|------|---------|------------|-----------------|-----------------------------------------------|
| **   | 110246  | 12/18/01   | SZV             | Change from Spec number: 38-00505 to 38-07137 |