

# Single-PLL General Purpose EPROM Programmable Clock Generator

## Features

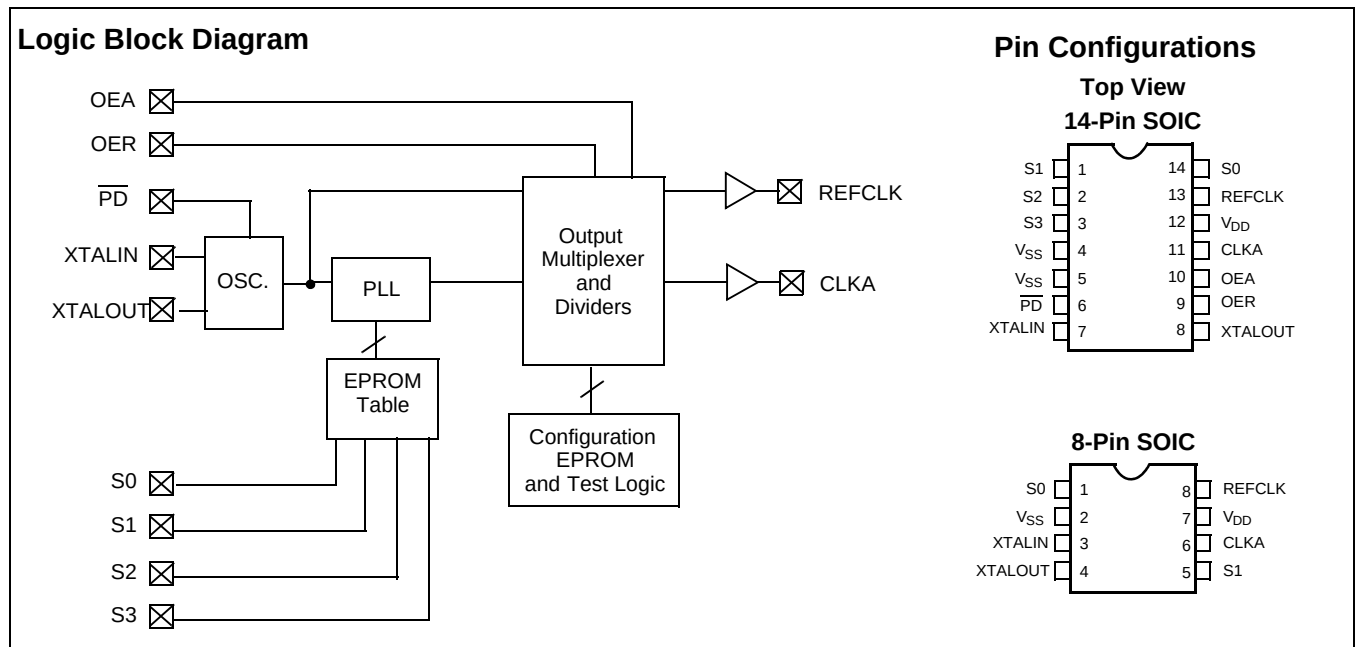
- Single phase locked loop (PLL) architecture
- EPROM programmability
- Factory-programmable (CY2907, CY2907I) or field-programmable (CY2907F, CY2907FI) device options
- Up to two configurable outputs
- Low skew, low jitter, high accuracy outputs
- Power management (power down, OE)
- Frequency select option
- Configurable 5V or 3.3V operation
- 8-pin or 14-pin SOIC packages

## Benefits

- Generates a custom frequency from an external source
- Easy customization and fast turnaround
- Programming support available for all opportunities
- Provides clocking requirements from a single device
- Meets critical industry-standard timing requirements
- Supports low-power applications
- Up to 16 user-selectable frequencies
- Supports industry-standard design platforms
- 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 |



## Pin Summary

| Name                      | Pin Number  |            | Description                                                                        |
|---------------------------|-------------|------------|------------------------------------------------------------------------------------|
|                           | 14-Pin SOIC | 8-Pin SOIC |                                                                                    |
| S1                        | 1           | 5          | Frequency Select (CLKA) (Internal pull up resistor to V <sub>DD</sub> )            |
| S2                        | 2           | NA         | Frequency Select (CLKA) (Internal pull up resistor to V <sub>DD</sub> )            |
| S3                        | 3           | NA         | Frequency Select (CLKA) (Internal pull up resistor to V <sub>DD</sub> )            |
| V <sub>SS</sub>           | 4           | 2          | Ground                                                                             |
| V <sub>SS</sub>           | 5           | NA         | Ground                                                                             |
| PD                        | 6           | NA         | Power Down (Active LOW) (Internal pull up resistor to V <sub>DD</sub> )            |
| 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 <sub>DD</sub> ) |
| OEA                       | 10          | NA         | CLKA Output Enable (Active HIGH) (Internal pull up resistor to V <sub>DD</sub> )   |
| CLKA                      | 11          | 6          | Clock Output                                                                       |
| V <sub>DD</sub>           | 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 <sub>DD</sub> )            |

## 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, similar to the other devices in the Cypress EPROM Programmable Clock family, making it easy to customize for any application. Furthermore, the CY2907 is compatible with all industry-standard 9107 and 9108 clock synthesizers.

## Device Programming

Two versions of the CY2907 are available - Field Programmable and Factory Programmable. Field programmable devices must be programmed before being installed in an application. They are one-time-programmable (OTP). Customers can program small quantities in-house using the Cypress CY3670 programmer. Production quantities are available through Cypress's value-added distribution partners, or by using third party programmers from BP Microsystems, Hi-Lo Systems, and others.

For high-volume orders, devices can be factory programmed by Cypress. All requests must be submitted to the local Cypress Field Application Engineer (FAE) or sales representative. Once the request has been processed, you will receive a new part number, samples, and a data sheet with the programmed values. This part number will be used for additional sample requests and production orders.

### Notes

1. For best accuracy, use a parallel resonant crystal, C<sub>LOAD</sub> ≈ 17 pF.
2. Float XTALOUT pin if XTALIN is driven by reference clock (as opposed to crystal).

## CyberClocks™ Software

CyberClocks is an easy-to-use software application that allows the user 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. Note the output frequency ranges in this data sheet when specifying them in CyberClocks to make sure that you stay within the limits. Once a configuration is established, you can print the configuration and save programming files in ENT and JED formats.

CyberClocks runs on PCs running the Windows™ operating system, and is available for free download on the Cypress Semiconductor website at [www.cypress.com](http://www.cypress.com).

Within the CyberClocks application, the CY2907 is found in the CyClocks™ section. Note that the stand-alone CyberClocks software should not be confused with the CyberClocks Online software, which is a web-based application that is used to configure other programmable clock devices.

## Cypress CY3670 Programming Kit

Cypress's CY3670 is a portable programmer that connects 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. An adapter is also required and is ordered separately. The CY3097 is the adapter for the CY2907F8. For the CY2907F14, order adapter CY3098.

## Maximum Ratings

Exceeding maximum ratings may shorten the battery life of the device. User guidelines are 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  
(per MIL-STD-883, Method 3015)

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

| Parameter | Description                                | Min  | Max  | Unit |
|-----------|--------------------------------------------|------|------|------|
| $V_{DD}$  | Supply Voltage, 5V Operation               | 4.5  | 5.5  | V    |
|           | Supply Voltage, 3.3V Operation             | 3.0  | 3.6  | V    |
| $T_A$     | Commercial Operating Temperature, Ambient  | 0    | 70   | °C   |
|           | Industrial Operating Temperature, Ambient  | –40  | 85   | °C   |
| $C_L$     | Max. Capacitive Load                       |      | 15   | pF   |
| $f_{REF}$ | 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 $V_{DD} = 4.5V$ to $5.5V$ , $T_A = 0^\circ C$ to $+70^\circ C$

| 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       | $V_{OH} = 2.0V$                   |                           |      |     | –35 | mA   |
| $I_{OL}^{[4]}$ | Output Low Current        | $V_{OL} = 0.8V$                   |                           |      | 22  |     | mA   |
| $I_{IH}$       | Input High Current        | $V_{IH} = V_{DD}$                 |                           |      | –2  | 2   | μA   |
| $I_{IL}$       | Input Low Current         | $V_{IL} = 0V$                     |                           |      |     | 20  | μA   |
| $I_{DD}^{[5]}$ | Power Supply Current      | PD HIGH, CLKA = 50 MHz            |                           |      |     | 42  | mA   |
| $I_{DD}$       | Power Supply Current      | PD LOW, Logic Inputs LOW          |                           |      |     | 100 | μA   |
| $I_{DD}$       | Power Supply Current      | PD LOW, Logic Inputs HIGH         |                           |      |     | 40  | μA   |
| $R_{PU}^{[4]}$ | Pull Up Resistor          | $V_{IN} = V_{DD} - 1.0 \text{ V}$ |                           |      |     | 700 | kΩ   |

### Notes

3. Electrical parameters are guaranteed with these operating conditions.

4. Guaranteed by design, not 100% tested in production.

5. Load = max. typical configuration,  $f_{REF} = 14.318 \text{ MHz}$ . Specific configurations may vary. A close approximation of  $I_{DD}$  can be derived by the following formula:  
 $I_{DD} \text{ (mA)} = V_{DD} * (6.25 + (0.055 * f_{REF})) + (0.0017 * C_{LOAD} * (f_{CLKA} + REFCLK))$ .  $C_{LOAD}$  is specified in pF and F is specified in MHz.

**Electrical Characteristics at 3.3V Commercial**  $V_{DD} = 3.0V$  to  $3.6V$ ,  $T_A = 0^{\circ}C$  to  $+70^{\circ}C$

| 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, $I_{OH} = -5$ mA                 | $0.85 \cdot V_{DD}$ |                    | V         |
| $V_{OL}^{[4]}$ | Low-level Output Voltage  | CLKA, $I_{OL} = 6$ mA                  |                     | $0.1 \cdot V_{DD}$ | V         |
| $I_{OH}^{[4]}$ | Output High Current       | $V_{OH} = 0.7 \cdot V_{DD}$            |                     | -10                | mA        |
| $I_{OL}^{[4]}$ | Output Low Current        | $V_{OL} = 0.2 \cdot V_{DD}$            | 15                  |                    | 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    |                     | 40                 | mA        |
| $I_{DD}$       | Power Supply Current      | $\overline{PD}$ LOW, Logic Inputs LOW  |                     | 40                 | $\mu A$   |
| $I_{DD}$       | Power Supply Current      | $\overline{PD}$ LOW, Logic Inputs HIGH |                     | 12                 | $\mu A$   |
| $R_{PU}^{[4]}$ | Pull Up Resistor          | $V_{IN} = V_{DD} - 0.5V$               |                     | 900                | $k\Omega$ |

6.

**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 | $V_{DD} = V_{DD}$ Min. $I_{OH} = -30$ mA CLKA | 2.4 |     | V         |
| $V_{OL}^{[4]}$ | Low-level Output Voltage  | $V_{DD} = V_{DD}$ Min. $I_{OL} = 10$ 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          | $V_{IN} = V_{DD} - 1.0$ 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, $I_{OH} = -5$ mA                 | $0.85 \cdot V_{DD}$ |                    | V          |
| $V_{OL}^{[4]}$ | Low-level Output Voltage  | CLKA, $I_{OL} = 6$ 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>[7]</sup> | Description                   | Test Conditions                     | Min  | Max   | Unit |
|-----------|-----------------------|-------------------------------|-------------------------------------|------|-------|------|
| $t_R$     | CLKA                  | Output Rise Time 0.8V to 2.0V | 15-pF Load                          |      | 1.40  | ns   |
| $t_F$     | CLKA                  | Output Fall Time 2.0V to 0.8V | 15-pF Load                          |      | 1.00  | ns   |
| $t_R$     | CLKA                  | Output Rise Time 20% to 80%   | 15-pF Load                          |      | 3.5   | ns   |
| $t_F$     | CLKA                  | Output Fall Time 80% to 20%   | 15-pF Load                          |      | 2.5   | ns   |
| $t_D$     | CLKA                  | Duty Cycle                    | 15-pF Load at 1.4V                  | 45.0 | 55.0  | %    |
| $F_I$     | XTALIN                | Input Frequency               | Crystal Oscillator                  | 10   | 25    | MHz  |
| $F_I$     | XTALIN                | Input Frequency               | External Input Clock <sup>[8]</sup> | 1    | 30    | MHz  |
| $F_O$     | CLKA                  | Output Frequency              | CY2907, 15-pF Load                  | 0.5  | 130.0 | MHz  |
|           |                       |                               | CY2907F, 15-pF Load                 | 0.5  | 100.0 | MHz  |
| $t_{JIS}$ | CLKA                  | Jitter (One Sigma)            | 20 MHz to 130 MHz                   |      | 150   | ps   |
| $t_{JIS}$ | CLKA                  | Jitter (One Sigma)            | 14 MHz to 20 MHz                    |      | 200   | ps   |
| $t_{JIS}$ | CLKA                  | Jitter (One Sigma)            | Less than 14 MHz                    |      | 1     | %    |
| $t_{JAB}$ | CLKA                  | Jitter (Absolute)             | 20 MHz to 130 MHz                   | -250 | + 250 | ps   |
| $t_{JAB}$ | CLKA                  | Jitter (Absolute)             | 14 MHz to 20 MHz                    | -500 | + 500 | ps   |
| $t_{JAB}$ | CLKA                  | Jitter (Absolute)             | Less than 14 MHz                    |      | 3     | %    |
| $t_{PU}$  |                       | Power Up Time                 |                                     |      | 18    | ms   |
| $t_{FT}$  | CLKA                  | Transition Time               | 8 MHz to 66.6 MHz                   |      | 13    | ms   |

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

| Parameter        | Output <sup>[7]</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>[8]</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   |

**Switching Characteristics at 5.0V Industrial**

| Parameter        | Output <sup>[7]</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>[8]</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   |

**Notes**

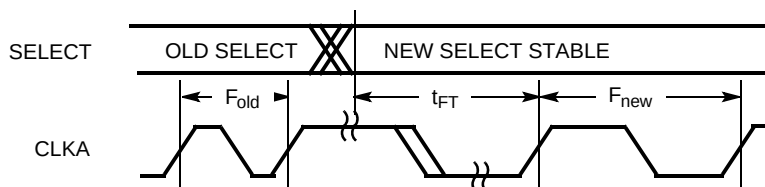
7. REFCLK output can also be configured to be driven by the PLL. In that case these characteristics are also valid.
8. Refer to the application note *Crystal Oscillator Topics* when using an external reference clock as an input frequency source.

## Switching Characteristics at 3.3V Industrial

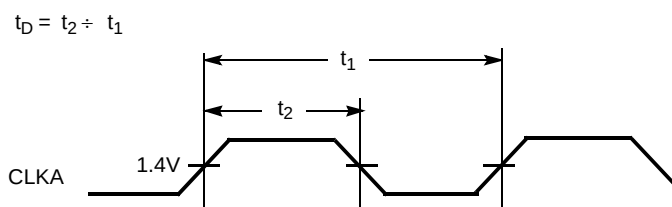
| Parameter | Output <sup>[7]</sup> | Description                 | Test Conditions                     | Min  | Max  | Unit |
|-----------|-----------------------|-----------------------------|-------------------------------------|------|------|------|
| $t_R$     | CLKA                  | Output Rise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

## Switching Waveforms

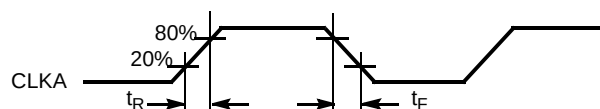
**Figure 1. Frequency Select Change (Transition Time)**



**Figure 2. Duty Cycle Timing**

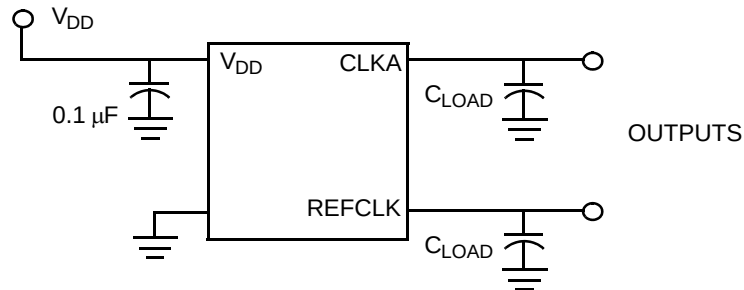


**Figure 3. All Outputs Rise/Fall Time**



## Test Circuit

Figure 4. Test Circuit



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

## Ordering Information

| Ordering Code  | Package Type                         | Operating Range                                  |
|----------------|--------------------------------------|--------------------------------------------------|
| CY2907SC-xxx   | 8-pin or 14-pin SOIC                 | 5.0V, Commercial, Factory Programmable           |
| CY2907SC-xxxT  | 8-pin or 14-pin SOIC -Tape and Reel  | 5.0V, Commercial, Factory Programmable           |
| CY2907SL-xxx   | 8-pin or 14-pin SOIC                 | 3.3V, Commercial, Factory Programmable           |
| CY2907SL-xxxT  | 8-pin or 14-pin SOIC - Tape and Reel | 3.3V, Commercial, Factory Programmable           |
| CY2907SI-xxx   | 8-pin or 14-pin SOIC                 | 5.0V/3.3V, Industrial, Factory Programmable      |
| CY2907SI-xxxT  | 8-pin or 14-pin SOIC - Tape and Reel | 5.0V/3.3V, Industrial, Factory Programmable      |
| CY2907F8       | 8-pin SOIC                           | 5.0V/3.3V, Commercial, Field Programmable        |
| CY2907F8T      | 8-pin SOIC - Tape and Reel           | 5.0V/3.3V, Commercial, Field Programmable        |
| CY2907F8I      | 8-pin SOIC                           | 5.0V/3.3V, Industrial, Field Programmable        |
| CY2907F8IT     | 8-pin SOIC - Tape and Reel           | 5.0V/3.3V, Industrial, Field Programmable        |
| CY2907F14      | 14-pin SOIC                          | 5.0V/3.3V, Commercial, Field Programmable        |
| CY2907F14T     | 14-pin SOIC - Tape and Reel          | 5.0V/3.3V, Commercial, Field Programmable        |
| CY2907F14I     | 14-pin SOIC                          | 5.0V/3.3V, Industrial, Field Programmable        |
| CY2907F14IT    | 14-pin SOIC - Tape and Reel          | 5.0V/3.3V, Industrial, Field Programmable        |
| CY3670         | Cypress FTG Programmer               | Custom Programming for Field Programmable Clocks |
| <b>Pb-free</b> |                                      |                                                  |
| CY2907FX8      | 8-pin SOIC                           | 5.0V/3.3V, Commercial, Field Programmable        |
| CY2907FX8T     | 8-pin SOIC - Tape and Reel           | 5.0V/3.3V, Commercial, Field Programmable        |
| CY2907FX14     | 14-pin SOIC                          | 5.0V/3.3V, Commercial, Field Programmable        |
| CY2907FX14T    | 14-pin SOIC - Tape and Reel          | 5.0V/3.3V, Commercial, Field Programmable        |

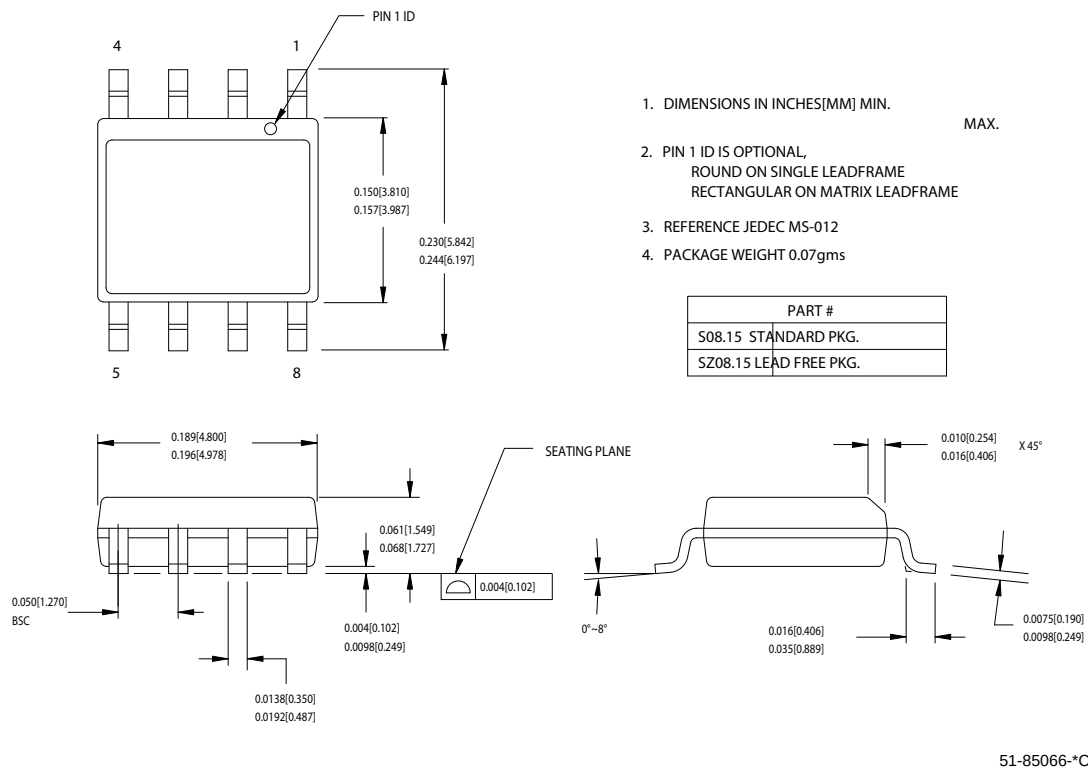
## Package Characteristics

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



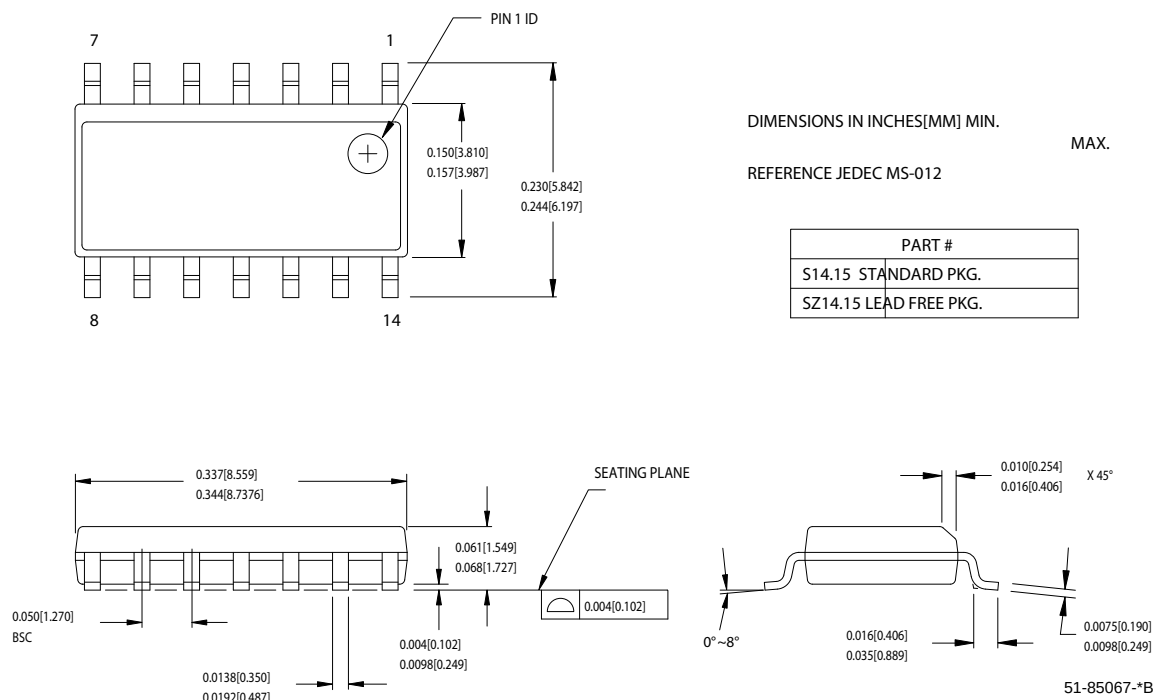
## Package Diagrams

Figure 5. 8-Lead (150-Mil) SOIC S8



**Package Diagrams (continued)**

**Figure 6. 14-Lead (150-Mil) SOIC S14**



## Document History Page

| Document Title: CY2907 Single-PLL General Purpose EPROM Programmable Clock Generator<br>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                                                                                      |
| *A                                                                                                                | 1088524 | See ECN    | KVM/<br>KKVTMP  | Added Pb-free for CY2907F8 and CY2907F14 field programmable devices<br>Updated and added to text on page 2<br>Applied new template |