

# Design Information Fact Sheet

## UT7R995 & UT7R995C RadClock™ RadHard 2.5V/3.3V 200MHz High-Speed Multi-phase PLL Clock Buffer



### FEATURES:

- ❑ +3.3V Core Power Supply
- ❑ +2.5V or +3.3V Clock Output Power Supply
  - Independent Clock Output Bank Power Supplies
- ❑ Output frequency range: 6 MHz to 200 MHz
- ❑ Bank pair output-output skew < 100 ps
- ❑ Cycle-cycle jitter < 50 ps
- ❑ 50% ± 2% maximum output duty cycle at 100MHz
- ❑ Eight LVTTTL outputs with selectable drive strength
- ❑ Selectable positive- or negative-edge synchronization
- ❑ Selectable phase-locked loop (PLL) frequency range and lock indicator
- ❑ Phase adjustments in 625 to 1300 ps steps up to ± 7.8 ns
- ❑ (1-6,8,10,12) x multiply and (1/2,1/4) x divide ratios
- ❑ Compatible with Spread-Spectrum reference clocks
- ❑ Power-down mode
- ❑ Selectable reference input divider
- ❑ Radiation performance
  - Total-dose tolerance: 100 krad (Si)
  - SEL Immune to a LET of 109 MeV-cm<sup>2</sup>/mg
  - SEU Immune to a LET of 109 MeV-cm<sup>2</sup>/mg
- ❑ Military temperature range: -55°C to +125°C
- ❑ Extended industrial temp: -40°C to +125°C
- ❑ Packaging options:
  - 48-Lead Ceramic Flatpack
- ❑ Standard Microcircuit Drawing: 5962-05214
  - QML-Q and QML-V compliant part

### INTRODUCTION:

The UT7R995/UT7R995C is a low-voltage, low-power, eight-output, 6-to-200 MHz clock driver. It features output phase programmability which is necessary to optimize the timing of high-performance microprocessor and communication systems.

The user programs both the frequency and the phase of the output banks through nF[1:0] and DS[1:0] pins. The adjustable phase feature allows the user to skew the outputs to lead or lag the reference clock. Connect any one of the outputs to the feedback input to achieve different reference frequency multiplication and division ratios.

The devices also feature split output bank power supplies that enable banks 1 & 2, bank 3, and bank 4 to operate at a different power supply levels. The ternary PE/HD pin controls the synchronization of output signals to either the rising or the falling edge of the reference clock and selects the drive strength of the output buffers. The UT7R995 and UT7R995C both interface to a digital clock while the UT7R995C will also interface to a quartz crystal.

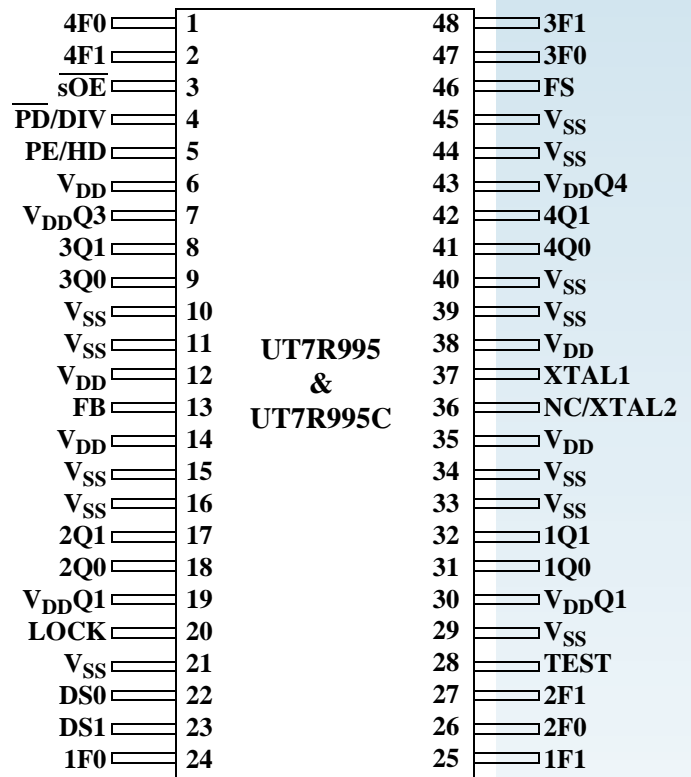
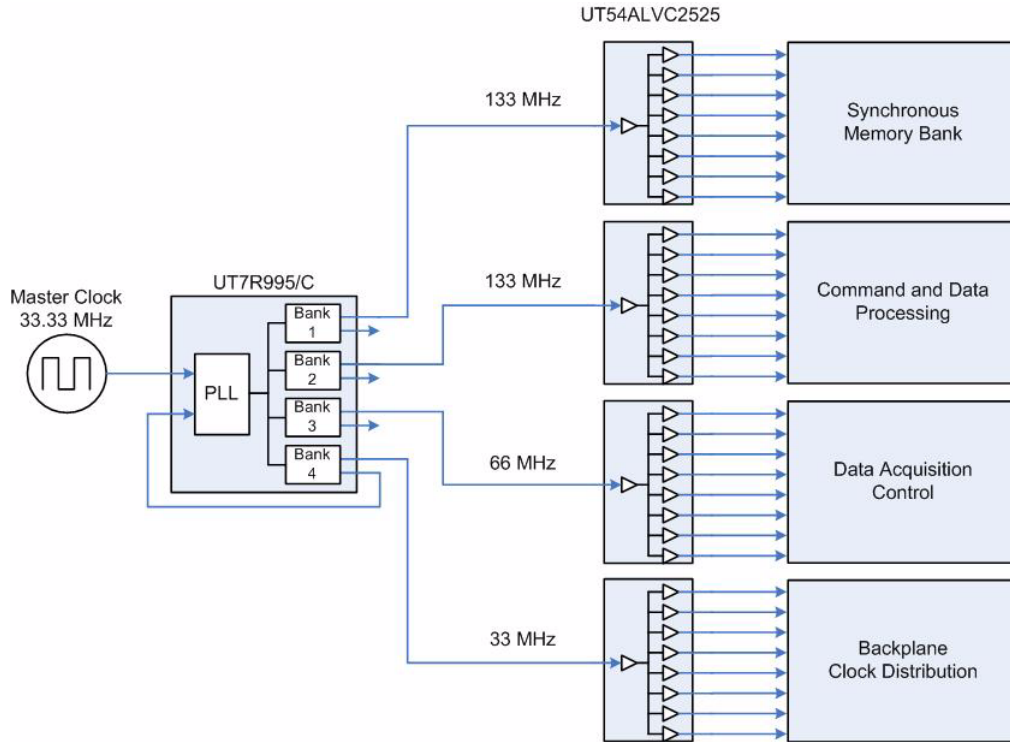
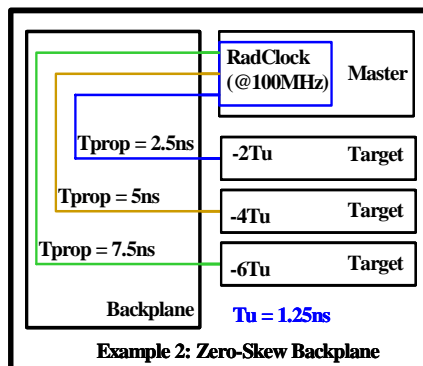
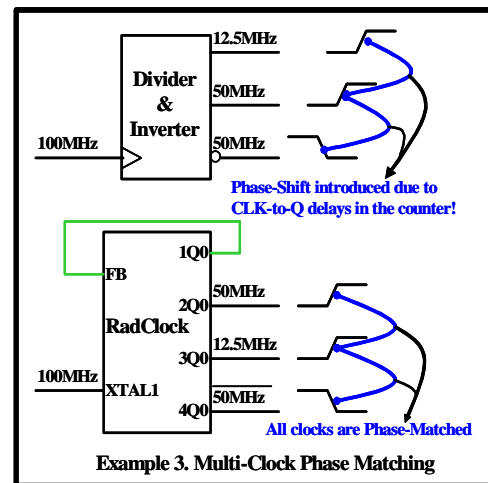
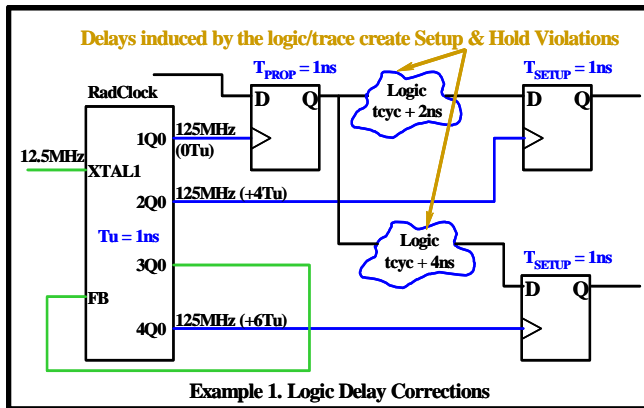


Figure 1. 48-Lead Ceramic Flatpack Pin Description

# RadClock Design Examples



This is an example of the RadClock's capability to provide multiple clock outputs of different frequencies using a single reference clock input



Using the RadClock to compensate for propagation delays within a system

## Evaluation Board and Configuration Software

Aeroflex Colorado Springs' (Aeroflex) UT7R995 RadClock Development Kit is now available to aid customers in designing with the UT7R995 RadClock. Specifically, the UT7R995-EVB allows the designer to quickly evaluate various device configurations including input reference sources, output skew controls, selectable I/O power supplies, and flexible feedback clock selections. Furthermore, the RadClock evaluation kit affords the designer with the ability to evaluate various termination techniques and obtain useful layout guidelines. To maximize the user's evaluation effectiveness, the UT7R995-EVB RadClock Evaluation Kit includes the following:

UT7R995 RadClock Reconfigurable GUI Software (Quantity: 1)

UT7R995-EVB RadClock Evaluation Board and Documentation (Quantity: 1)

36" RG-179B, SMB-SMB Cables (Quantity: 5)

36" RG-178, SMA-SMA Cables (Quantity: 5)

12" RG-179B, SMB-SMB Cable (Quantity: 1)

12" RG-178, SMA-SMA Cable (Quantity: 1)

BNC to Banana Breakouts (Quantity: 2)

36" RG-59B, BNC-BNC Cable (Quantity: 2)

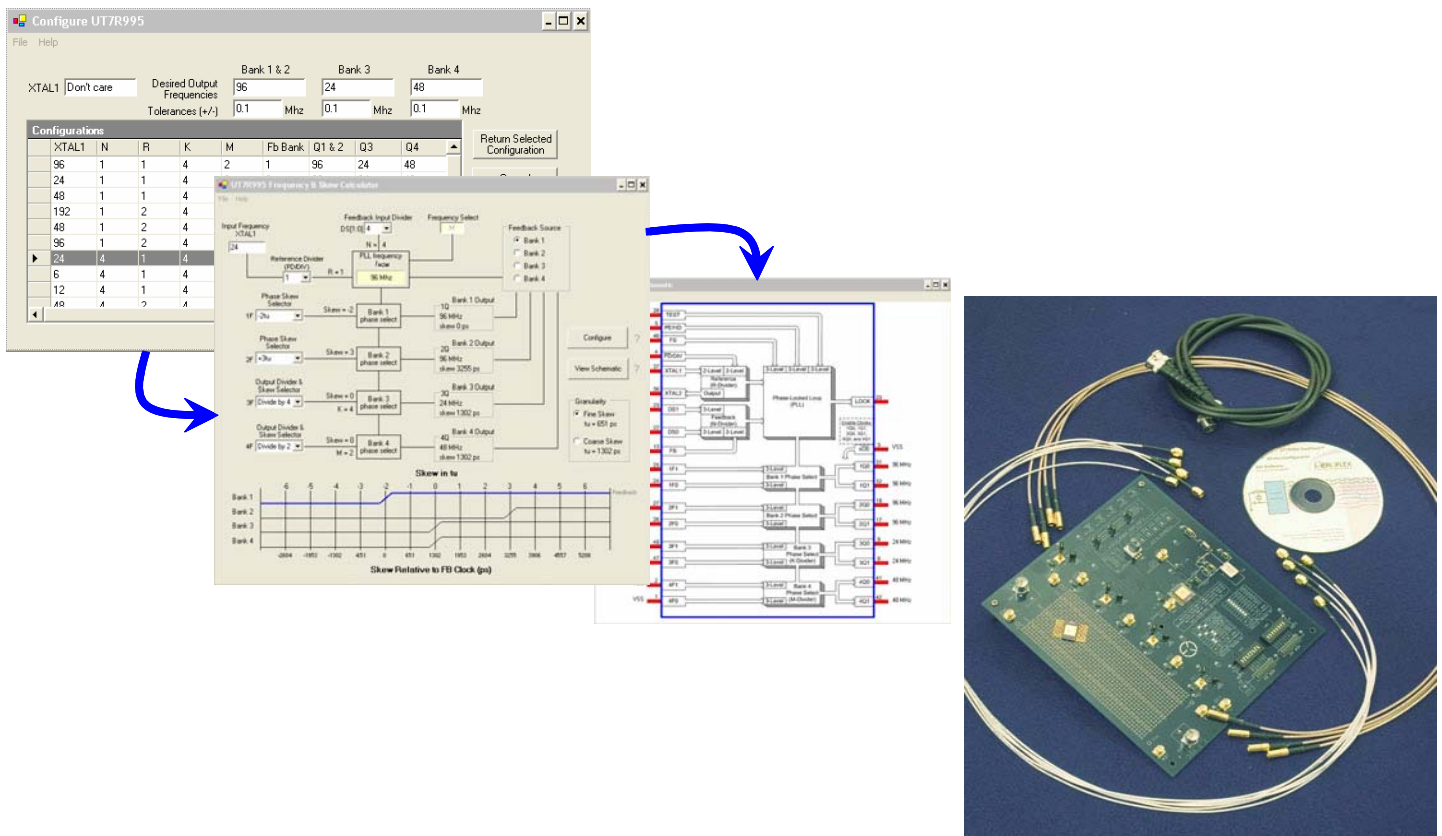
SMA Female to BNC Male Adapters (Quantity: 4)

SMA Plug to SMB Jack Adapters (Quantity: 5)

SMA 10dB Attenuators (Quantity: 4)

Aeroflex has historically provided Development Kits for their RadHard products. We recommend the RadClock Development Kit for designers who are evaluating or using the UT7R995 RadClock. Because the UT7R995 RadClock presents numerous configuration options to the system designer, the UT7R995-EVB provides an efficient and flexible platform from which to evaluate nearly any device configuration imaginable and significantly reduces the amount of time spent evaluating RadClock configurations, termination options, and layout techniques. The Kit frees the user from developing custom evaluation hardware and researching appropriate interconnect and test accessories. The UT7R995 RadClock Development Kit is available now for \$2500. The Development Kit is complimentary for quantity orders of 100 units or more.

Aeroflex Colorado Springs also offers configuration software, free of charge. The RadClock Evaluation Board, combined with the Configuration Software, allows you to quickly evaluate and determine the effectiveness of the RadClock for your application.



## Internet Resources:

Visit [www.aeroflex.com/RadClock](http://www.aeroflex.com/RadClock) to download:

- RadClock Product and Evaluation Board Data Sheets
- Applications Notes
- Free GUI Software
- IBIS Models
- RadClock Tutorial "Managing High Speed Clocks"

Visit [www.aeroflex.com/RadHard](http://www.aeroflex.com/RadHard) to see the latest  
Aeroflex Colorado Springs' RadHard products for space applications!



### COLORADO

Toll Free: 800-645-8862  
Fax: 719-594-8468

### INTERNATIONAL

Tel: 805-778-9229  
Fax: 805-778-1980

### NORTHEAST

Tel: 603-888-3975  
Fax: 603-888-4585

### SE AND MID-ATLANTIC

Tel: 321-951-4164  
Fax: 321-951-4254

### WEST COAST

Tel: 949-362-2260  
Fax: 949-362-2266

### CENTRAL

Tel: 719-594-8017  
Fax: 719-594-8468

[www.aeroflex.com](http://www.aeroflex.com)    [info-ams@aeroflex.com](mailto:info-ams@aeroflex.com)

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attributes represented by these three icons:  
solution-minded, performance-driven and customer-focused