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# ZN705E

## CRYSTAL CONTROLLED OSCILLATOR CIRCUIT

The ZN705E is a square wave oscillator designed to be used with AT cut crystals which have a low effective series resistance.

A master oscillator feeds a two stage divider giving  $f/2$  and  $f/4$  outputs. Complementary outputs are also provided.

### FEATURES

- Operate upto 10MHz
- Low crystal drive required, suitable for AT cut types
- $f/2$ ,  $f/4$  and antiphase outputs
- TTL compatible
- Single 5V supply
- 14 pin moulded plastic
- Replaces SP705/B/DG

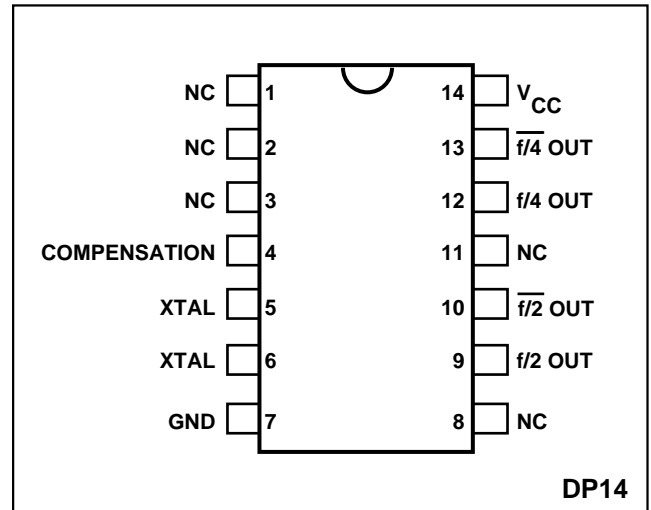


Fig.1 Pinout

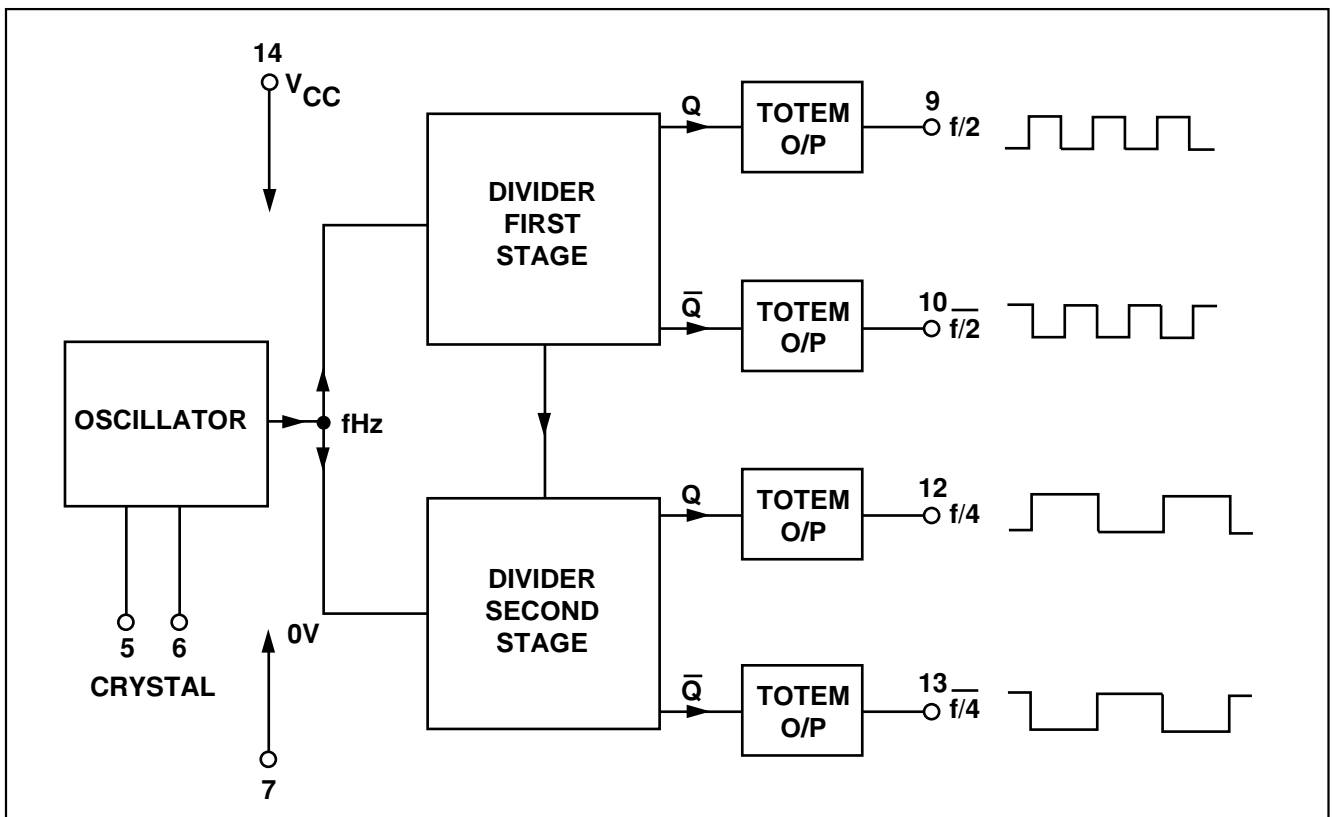


Fig.2 System diagram

## ZN705E

### ABSOLUTE MAXIMUM RATINGS (see note 1)

Supply voltage, $V_{CC}$	7.0V
Operating supply range	$5.0 \pm 0.25V$
Input voltage, $V_{IN}$ (see note 2)	-0.3 to 7.0V
Current sink	16mA
Operating temperature range	0°C to +70°C
Storage temperature range	-55°C to +150°C

### DC CHARACTERISTICS

These characteristics are guaranteed over the following conditions unless otherwise stated.

Parameter	Symbol	Pins	Min.	Typ.	Max.	Units.	Conditions
Supply current	$I_{CC}$				35	mA	$V_{CC} = 5.0V$
Low level output voltage	$V_{OL}$	9, 10, 12, 13			0.4	V	$V_{CC} = 5.25V$ , $I_{OL} = 8mA$ see Fig.3
High level output voltage	$V_{OH}$	9, 10, 12, 13	2.6			V	$V_{CC} = 4.75V$ , $I_{OH} = 0.2mA$ see Fig.3

### AC CHARACTERISTICS

These characteristics are guaranteed over the following conditions unless otherwise stated.

Parameter	Symbol	Pins	Min.	Typ.	Max.	Units.	Conditions
Crystal frequency	$f_C$	5, 6			10	MHz	
Output rise time	$t_R$	9, 10, 12, 13			20	ns	$V_{CC} = 5.0V$ , see Fig.3
Output fall time	$t_F$	9, 10, 12, 13			20	ns	$V_{CC} = 5.0V$ , see Fig.3

Note.1 The absolute maximum ratings are limiting values above which operating life may be shortened or specific parameters degraded.

Note.2  $V_{IN}$  = voltage on any input relative to pin 7.

### Functional description (by pin number)

**1, 2, 3, 8, 11** Not connected

#### 4 Compensation

External compensation point. A capacitor may be connected between this pin and  $V_{CC}$  to prevent unwanted high frequency oscillations. A 14pF capacitor is included on-chip for compensation and this may be sufficient for most applications.

#### 5,6 Crystal

The crystal is connected, in series, with a 20pF capacitor, between these pins. Small frequency changes may be made by exchanging the capacitor for a mechanical trimmer.

#### 7 Ground

#### 9 $f/2$

$f/2$  output TTL compatible totem pole output, frequency equal to half that of the crystal.

#### 10 $\bar{f}/2$

Inverse function of pin 9.

#### 12 $f/4$

$f/4$  output TTL compatible totem pole output, frequency equal to one quarter that of the crystal.

#### 13 $\bar{f}/4$

Inverse function of pin 12.

#### 14 $V_{CC}$

Positive supply connection.

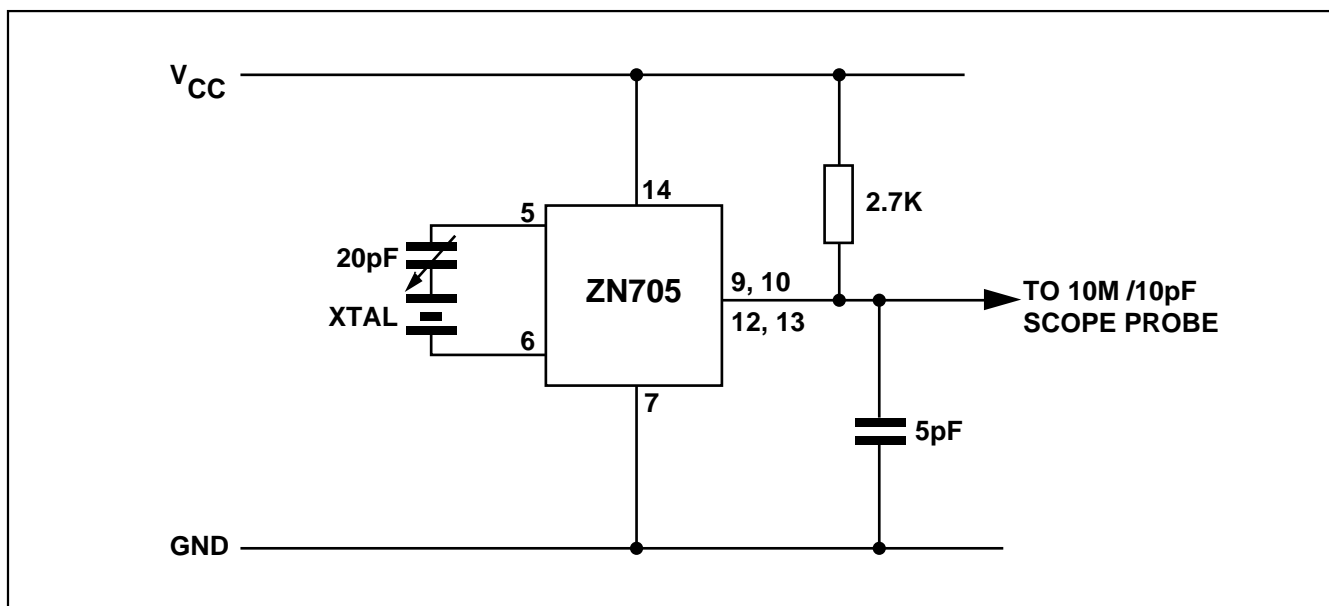


Fig.3 Test circuit (All outputs)

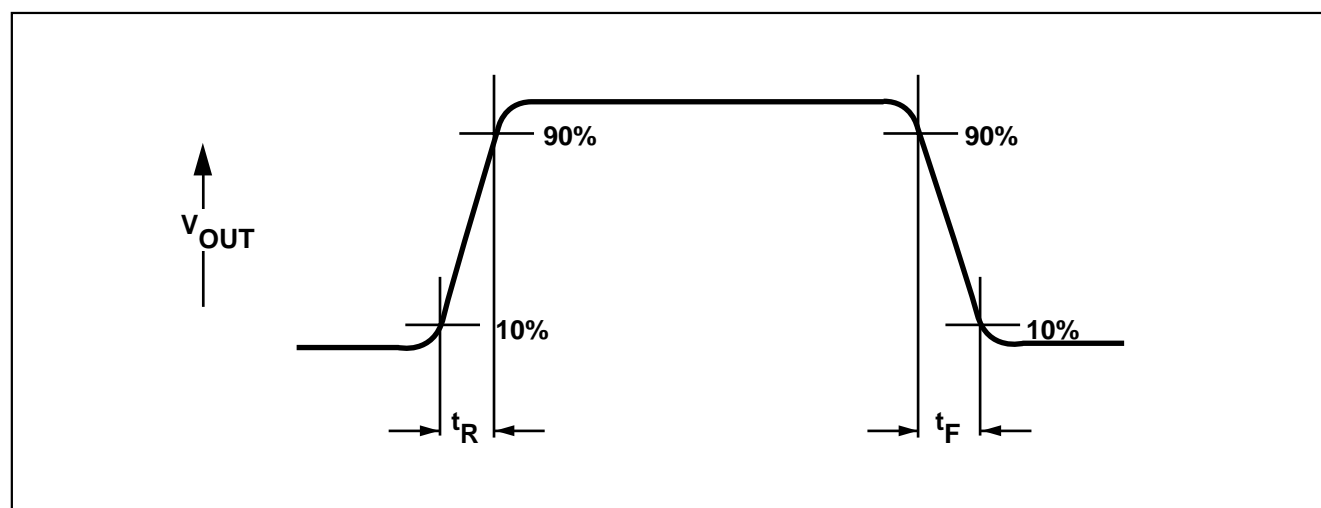
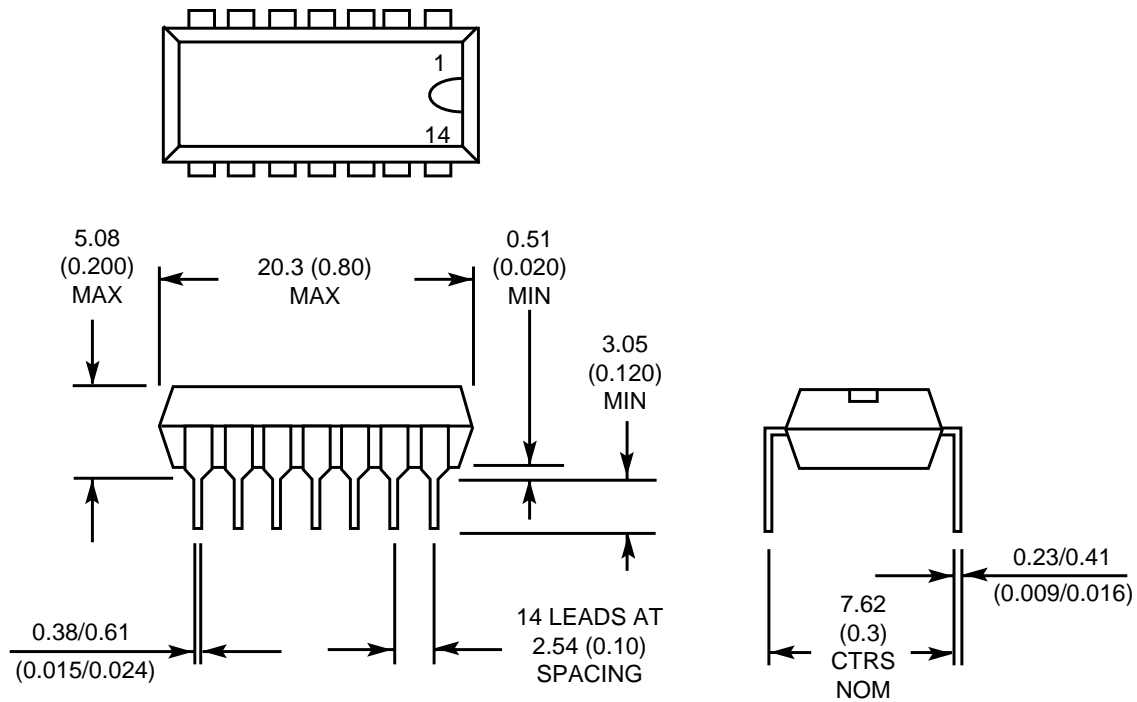


Fig.4

## ZN705E

### PACKAGE DETAILS

Dimensions are shown thus: mm (in).



14-LEAD PLASTIC DIP - DP14



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