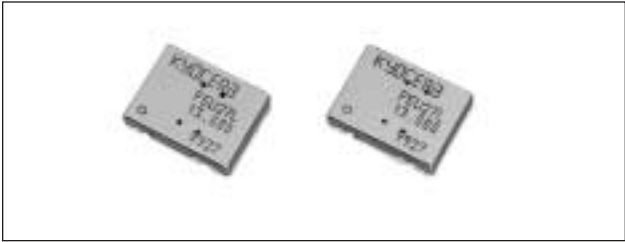
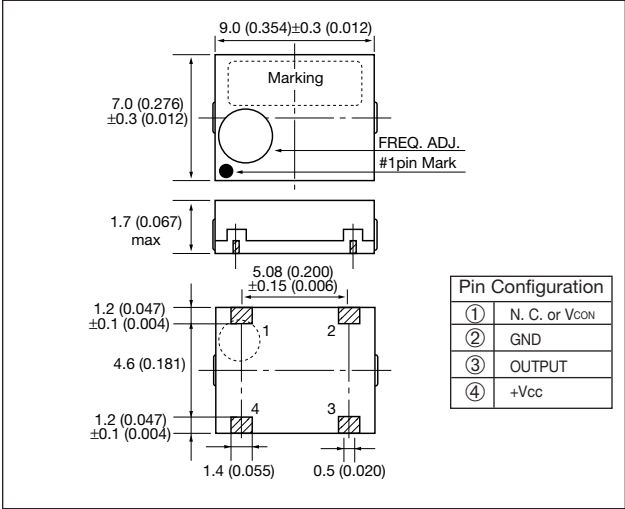


# Temperature Compensated Crystal Oscillators KT14 Series



## DIMENSIONS millimeters (inches)



## FEATURES

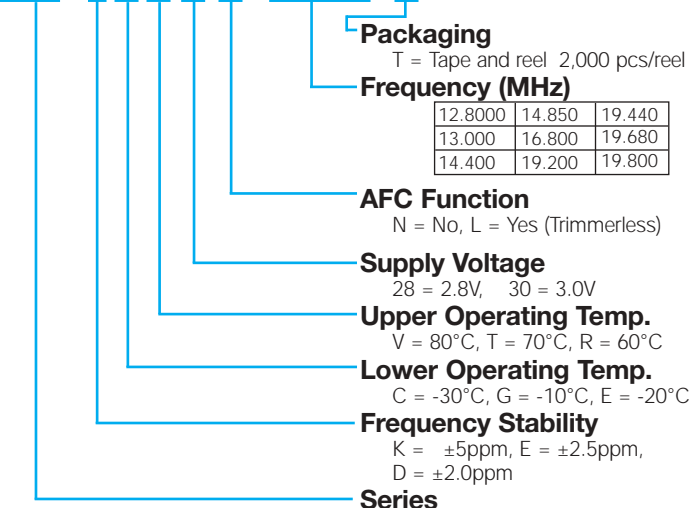
- Low profile SMD type (9.0x7.0x1.7mm)
- Frequency adjustment free after reflow soldering process
- AFC function available
- 2.8, 3.0, 3.3V drive available

## APPLICATIONS

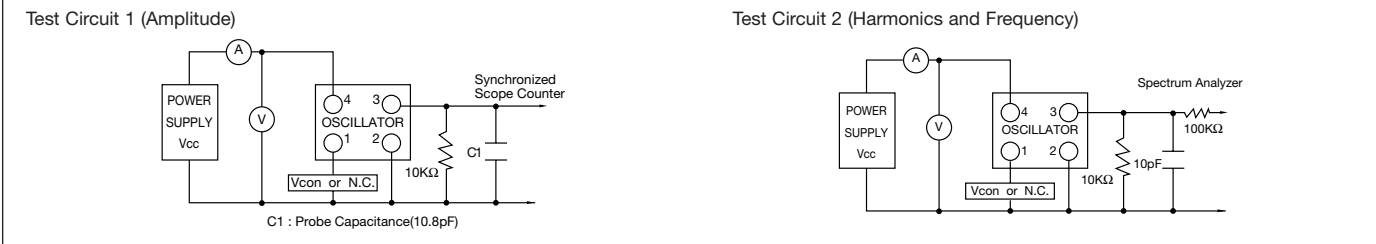
- PHS, PDC, GSM, DCS1800, AMPS, CDMA, D-AMPS, PCS1900, etc.

## HOW TO ORDER

**KT14 - E G R 28 N - 19.200M T**



## TEST CIRCUIT



## SPECIFICATIONS

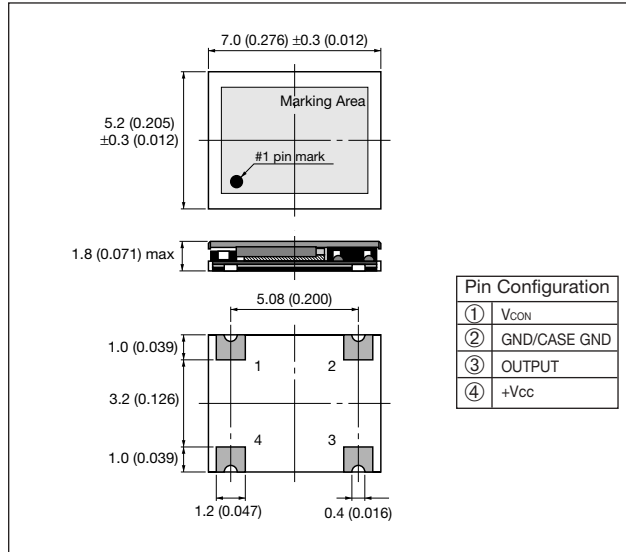
Items	Code	Specifications		Unit	Remarks
		PHS	Cellular		
Supply Voltage	Vcc	2.8±5%	2.8±5%	V	—
			3.0±5%		
			3.3±5%		
Output Frequency	fo	19.200	12.800 13.000 14.000	MHz	—
			14.850 16.800		
			19.200 19.440		
			19.680 19.800		
Operating Temperature	Topr	-10 to 60	-30 to +80	°C	—
Storage Temperature	Tstr	-20 to 70	-40 to 85	°C	—
Frequency Stability	Δf/fo	±2.5 max.	±2.0 max.	ppm	vs temperature (after reflow)
			±2.5 max.		
			±0.2 max.		
Aging Rate	Aging	±1.0 max.	±0.3 max.	ppm/year	1 year
			±1.0 max.		
Output Voltage	Vout	0.8 min.	—	Vp-p	load 10kΩ/10pF
Supply Current	Icc	2.0 max.	—	mA	no load
Trimmer Control Range	Δf/C	±3.0 min.	—	ppm	—
Voltage Control Range	Δf/V	—	ex: ±4.0 to ±8.0	ppm	1.5V±1V, 2.5V±1V
Harmonics	—	—	-3.0 max.	dBc	—

# Temperature Compensated Crystal Oscillators KT16 Series



## DIMENSIONS

millimeters (inches)



## FEATURES

- Miniature SMD type (7.0x5.2.0x1.8mm)
- Frequency adjustment free after reflow soldering process
- AFC function available
- 2.7V, 3.0V, 3.3V drive available
- Frequency Stability =  $\pm 2$ ppm at 30 to  $+80^{\circ}\text{C}$

## APPLICATIONS

- PDC, GSM, CDMA, TDMA

## HOW TO ORDER

KT16 - D C V 30 L - 19.680M T

### Packaging

T = Tape and reel 4,000 pcs/reel

### Frequency (MHz)

12.800	14.850	19.440
13.000	16.800	19.680
14.400	19.200	19.800

### AFC Function

L = Yes

### Supply Voltage

28 = 2.8V, 30 = 3.0V

### Upper Operating Temp.

V =  $80^{\circ}\text{C}$ , T =  $70^{\circ}\text{C}$ , R =  $60^{\circ}\text{C}$

### Lower Operating Temp.

C =  $-30^{\circ}\text{C}$ , G =  $-10^{\circ}\text{C}$ , E =  $-20^{\circ}\text{C}$

### Frequency Stability

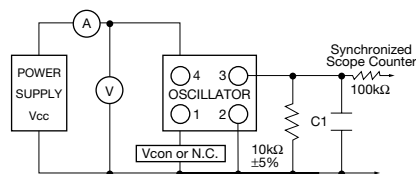
K =  $\pm 5$ ppm, E =  $\pm 2.5$ ppm,

D =  $\pm 2.0$ ppm

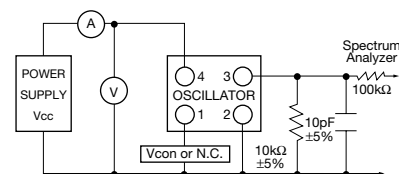
### Series

## TEST CIRCUIT

Test Circuit 1 (Amplitude)



Test Circuit 2 (Harmonics and Frequency)



## SPECIFICATIONS

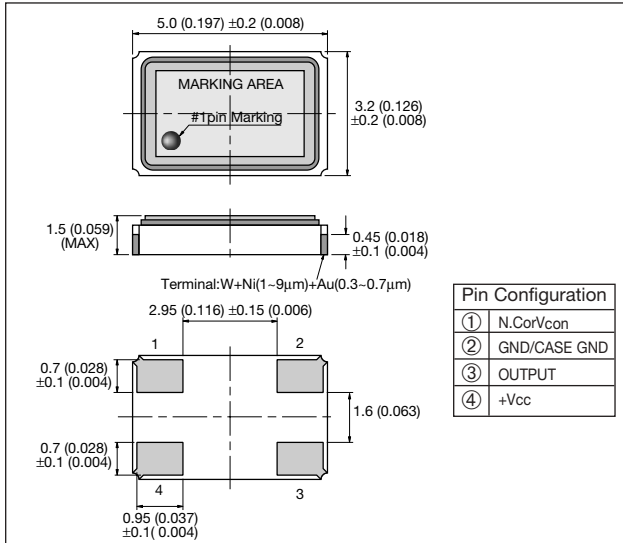
Items	Code	Specifications		Unit	Remarks
		Cellular			
Supply Voltage	Vcc	2.7		V	—
		3.0			
		3.3			
Output Frequency	fo	26.000	19.440	MHz	—
		19.680	14.400		
		13.000	12.800		
Operating Temperature	Topr	-30 to +80		$^{\circ}\text{C}$	—
Storage Temperature	Tstg	-40 to +85		$^{\circ}\text{C}$	—
Frequency Stability	$\Delta f/fo$	$\pm 2.0$ max.		ppm	vs temperature (after reflow)
		$\pm 2.5$ max.		ppm	vs load
		$\pm 0.2$ max.		ppm	vs voltage
		$\pm 0.3$ max.		ppm	—
Aging Rate	Aging	$\pm 1.0$ max.		ppm/year	$25^{\circ}\text{C} \pm 2^{\circ}\text{C}$
Output Voltage	Vout	0.8 min.		Vp-p	load 10k $\Omega$ /10pF
Supply Current	Icc	1.5 max.		mA	—
Trimmer Control Range	$\Delta f/C$	—		ppm	—
Voltage Control Range	$\Delta f/V$	$\pm 8.0$ to $\pm 15$		ppm	—
Harmonics	—	-3.0 max.		dBc	—

# Temperature Compensated Crystal Oscillators KT18 Series



## DIMENSIONS

millimeters (inches)



## FEATURES

- Miniature SMD type (5.0x3.2x1.5mm)
- Frequency adjustment free after reflow soldering process
- AFC function available
- 2.6 to 5.5V drive available
- Frequency Stability =  $\pm 2$ ppm at 30 to +80°C

## APPLICATIONS

- PDC, GSM, CDMA, TDMA

## HOW TO ORDER

KT18 - D C V 30 A - 19.680M T

### Packaging

T = Tape and reel 4,000 pcs/reel

### Frequency (MHz)

12.800	16.800	19.680
13.000	19.200	19.800
14.400	19.440	26.000

### AFC Function

A = Yes

### Supply Voltage

28 = 2.8V, 30 = 3.0V

### Upper Operating Temp.

V = 80°C, T = 70°C, R = 60°C

### Lower Operating Temp.

C = -30°C, G = -10°C, E = -20°C

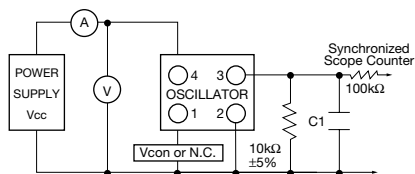
### Frequency Stability

K =  $\pm 5$ ppm, E =  $\pm 2.5$ ppm, D =  $\pm 2.0$ ppm

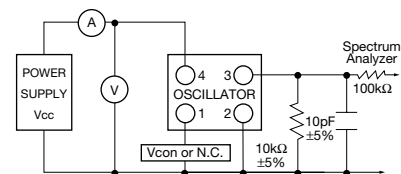
### Series

## TEST CIRCUIT

Test Circuit 1 (Amplitude)



Test Circuit 2 (Harmonics and Frequency)



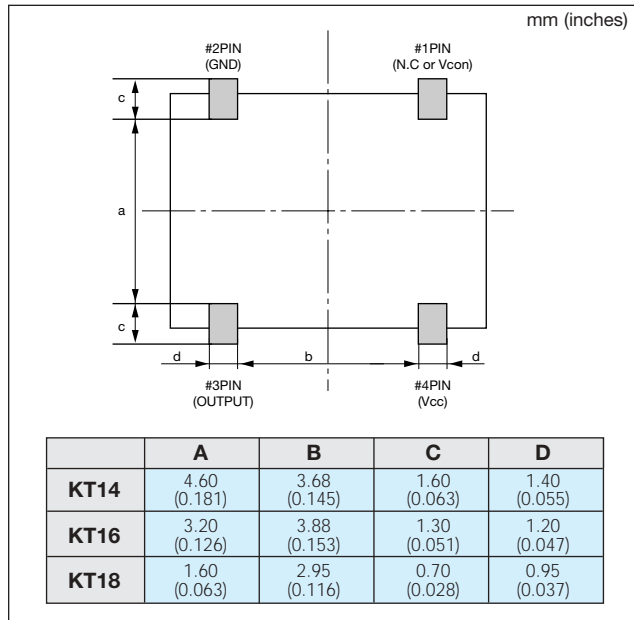
## SPECIFICATIONS

Items	Code	Specifications			Unit	Remarks
		Cellular				
Supply Voltage	Vcc	2.6 to 5.5			V	—
Output Frequency	fo	26.000	19.440	19.200	MHz	—
		19.680	14.400	19.800		
		13.000	12.800	16.800		
Operating Temperature	Topr	-30 to +80			°C	—
Storage Temperature	Tstg	-40 to +85			°C	—
Frequency Stability	$\Delta f/f_0$	$\pm 1.5$ max.			ppm	vs temperature (after reflow)
		$\pm 2.0$ max.			ppm	vs load
		$\pm 0.2$ max.			ppm	vs voltage
		$\pm 0.3$ max.			ppm	—
Aging Rate	Aging	$\pm 1.0$ max.			ppm/year	25°C $\pm 2$ °C
Output Voltage	Vout	0.8 min.			Vp-p	load 10kΩ/10pF
Supply Current	Icc	2.0 max.			mA	—
Trimmer Control Range	$\Delta f/C$	—			ppm	—
Voltage Control Range	$\Delta f/V$	$\pm 8.0$ to $\pm 15$			ppm	—
Harmonics	—	-3.0 max.			dBc	—

# Temperature Compensated Crystal Oscillators

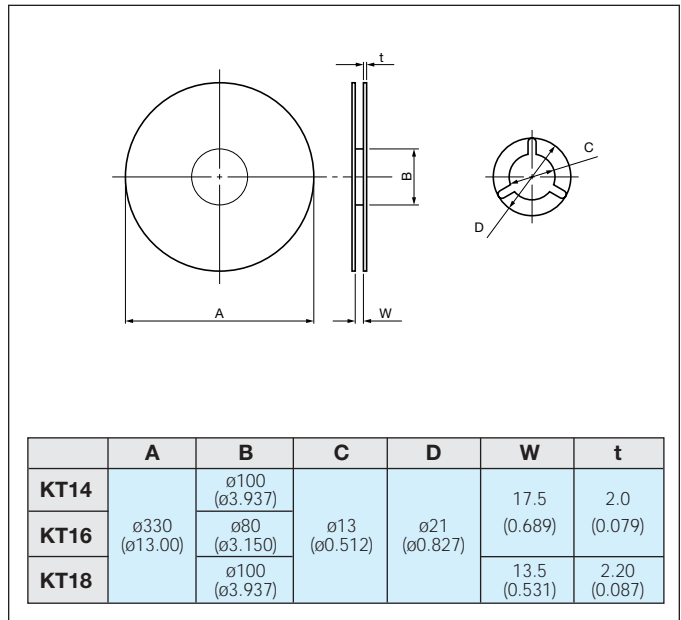


## RECOMMENDED LAND PATTERN



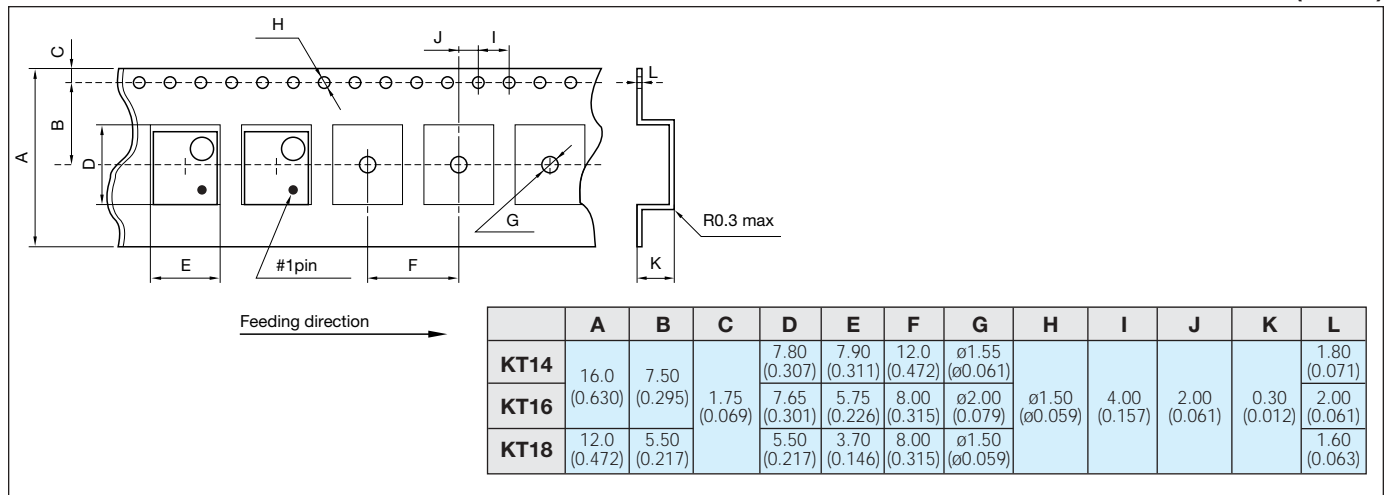
## REEL DIMENSIONS

millimeters (inches)

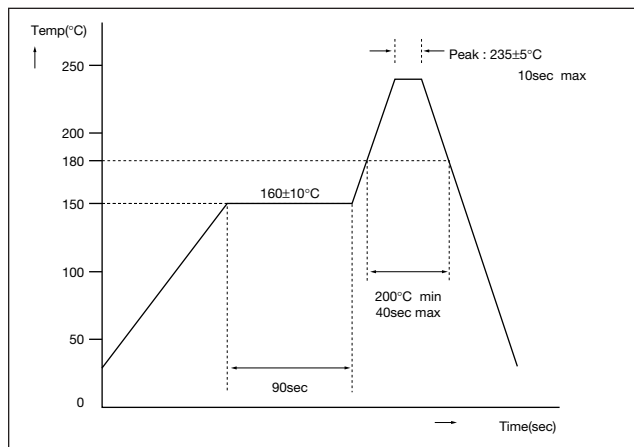


## PACKAGING

millimeters (inches)



## RECOMMENDED REFLOW PROFILE



## PACKAGING

KT14: 2,000 pcs/reel  
 KT16/KT18: 4,000 pcs/reel