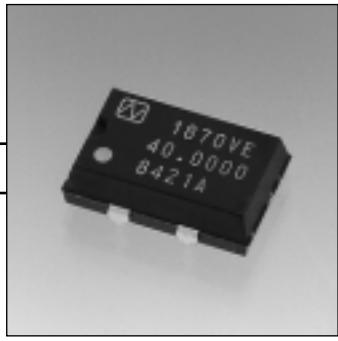
CRYSTAL CLOCK OSCILLATORS



1870XE • 1870YE SERIES

■ Features

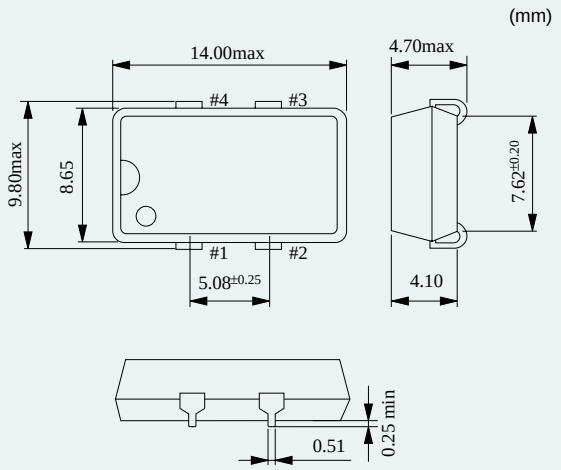
- Supply Voltage 3.3V.
- Directly drives C-MOS IC.
- The PLL technology enables this series to cover the frequency range from 1 to 125MHz.
- The frequency writing technology makes quick delivery possible.
- Stand-by function for output (Tri-state output).
- Compact and light weight : height 4.7mm, volume 0.4㎤, weight 1.5g.
- High reliability.
  (metal hermetic sealed crystal unit is inhoused)
- Applicable for reflow automatic mounting processes.
- Static electricity proof packaging : tape & reel.

■ Absolute Maximum Rating
Supply Voltage (V_{DD}) –0.5~+7.0V DC
Storage Temperature Range –55~+125°C

Item \ Model		1870XE	1870YE
Output Level		C-MOS	
Frequency Range	(MHz)	1~125	
Frequency Stability	($\times10^{-6}$)	±50, ±100	
Operating Temp. Range	(°C)	–20~+70	
Supply Voltage	(V)	3.3V±0.3	
Current Consumption (+3.3V, at 25˚C)		28mA (max)	
	stand-by	16mA (max)	50µA (max)
V_{OL} max / V_{OH} min	(V)	0.4/V_{DD}–0.4 I_{OL}=8mA, I_{OH}=–8mA	
Tr max/Tf max	(ns)	3.3 (at 0.2V_{DD}~0.8V_{DD})	
Duty Cycle	(%)	45~55 (≦40MHz), 40~60(>40MHz) : at 1/2V_{DD}	
Fanout (gate)	C_L (pF)	15	
Stand-by Function		Yes (tri-state)	
Jitter	P-P (ps)	250 (max) : at C_L=15pF	

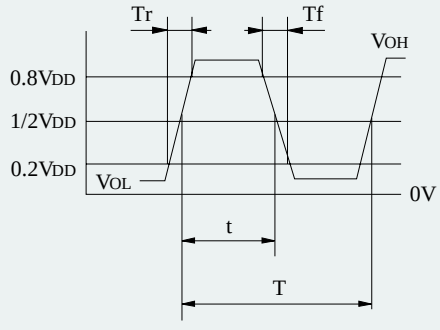
Note : If requested, Supply Voltage 2.7~3.3V (≦66.7MHz•Duty Cycle 40 ~ 60%), Operating Temp. Range –40~+85˚C (Frequency Stability ±100×10⁻⁶) is available.

■ 1870XE • 1870YE Series Outline



PIN	Connection
# 1	STAND-BY
# 2	GND
# 3	OUTPUT
# 4	+3.3VDC

■ Output Wave <C-MOS>



Duty Cycle = t/T×100 [%]

■ Stand-by Function

# 1 pin input	# 3 pin output
H level (0.7V_{DD} min) or open	Operating
L level (0.2V_{DD} max)	High impedance (Weak pull down)

1870VE • 1870WE SERIES

Features

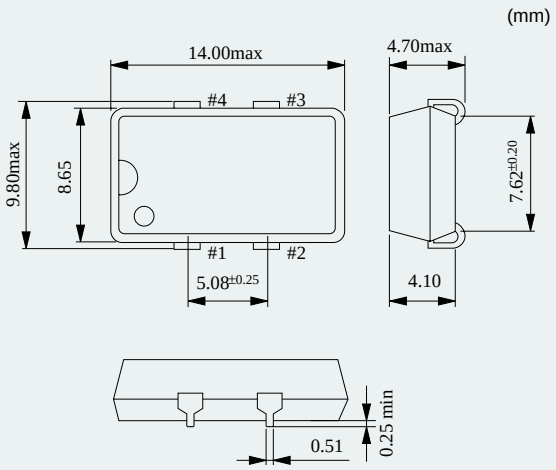
- Directly drives C-MOS IC.
- The PLL technology enables this series to cover the frequency range from 1 to 125MHz.
- The frequency writing technology makes quick delivery possible.
- Stand-by function for output (Tri-state output).
- Compact and light weight : height 4.7mm, volume 0.4㎤, weight 1.5g.
- High reliability.
  (metal hermetic sealed crystal unit is inhoused)
- Applicable for reflow automatic mounting processes.
- Static electricity proof packaging : tape & reel.

■ Absolute Maximum Rating
Supply Voltage (V_{DD}) –0.5~+7.0V DC
Storage Temperature Range –55~+125°C

Item \ Model		1870VE	1870WE
Output Level		C-MOS	
Frequency Range	(MHz)	1~125	
Frequency Stability	(×10⁻⁶)	±50, ±100	
Operating Temp. Range	(°C)	–20~+70	
Supply Voltage	(V)	5.0±10%	
Current Consumption (+5V, at 25˚C)		45mA (max)	
	stand-by	30mA (max)	50μA (max)
V_{OL} max / V_{OH} min	(V)	0.4/V_{DD}–0.4 I_{OL}=8mA, I_{OH}=–8mA	
Tr max/Tf max	(ns)	3/3 (at 0.2V_{DD}~0.8V_{DD})	
Duty Cycle	(%)	45~55 (≦66.7MHz), 40~60(>66.7MHz): at 1/2V_{DD}	
Fanout (gate)	C_L (pF)	25	
Stand-by Function		Yes (tri-state)	
Jitter	P-P (ps)	250 max (<33MHz), 200 max (≧33MHz): at C_L=15pF	

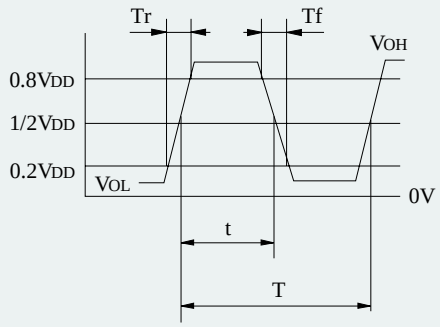
Note : If requested, Operating Temp. Range –40~+85˚C (Frequency 40MHz max./Frequency Stability ±100×10⁻⁶) is available.

■ 1870VE • 1870WE Series Outline



PIN	Connection
# 1	STAND-BY
# 2	GND
# 3	OUTPUT
# 4	+5VDC

■ Output Wave <C-MOS>



Duty Cycle = t/T×100 [%]

■ Stand-by Function

# 1 pin input	# 3 pin output
H level (+2.0 Vmin) or open	Operating
L level (+0.8 Vmax)	High impedance (Weak pull down)

1880VE • 1880WE SERIES

Features

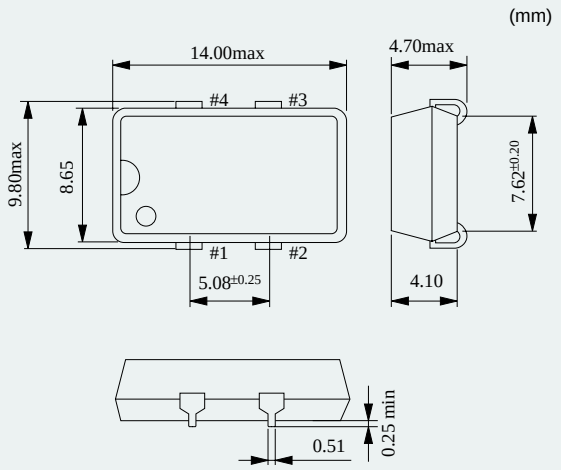
- Directly drives TTL IC.
- The PLL technology enables this series to cover the frequency range from 1 to 125MHz.
- The frequency writing technology makes quick delivery possible.
- Stand-by function for output.
- Compact and light weight : height 4.7mm, volume 0.4㎤, weight 1.5g.
- High reliability.
  (metal hermetic sealed crystal unit is inhoused)
- Applicable for reflow automatic mounting processes.
- Static electricity proof packaging : tape & reel.

■ Absolute Maximum Rating
Supply Voltage (V_{DD}) –0.5~+7.0V DC
Storage Temperature Range –55~+125°C

Item \ Model		1880VE	1880WE
Output Level		TTL	
Frequency Range	(MHz)	1~125	
Frequency Stability	(×10⁻⁶)	±50, ±100	
Operating Temp. Range	(°C)	–20~+70	
Supply Voltage	(V)	5.0±10%	
Current Consumption (+5V, at 25˚C)		45mA (max)	
	stand-by	30mA (max)	50μA (max)
V_{OL} max / V_{OH} min	(V)	0.4/V_{DD}–0.4 I_{OL}=8mA, I_{OH}=–8mA	
Tr max/Tf max	(ns)	4/4 (at 0.4V_{DD}~2.4V_{DD})	
Duty Cycle	(%)	45~55 (≦66.7MHz), 40~60(>66.7MHz): at 1.4V	
Fanout (gate)	TTL GATE	5	
Stand-by Function		Yes (tri-state)	
Jitter	P-P (ps)	250 max (<33MHz), 200 max (≧33MHz): at C_L=15pF	

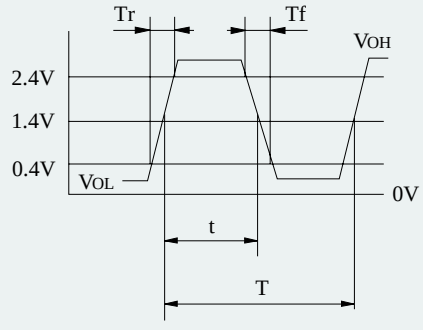
Note : If requested, Operating Temp. Range –40~+85˚C (Frequency 40MHz/Frequency Stability ±100×10⁻⁶) is available.

■ 1880VE • 1880WE Series Outline



PIN	Connection
# 1	STAND-BY
# 2	GND
# 3	OUTPUT
# 4	+5VDC

■ Output Wave <TTL>



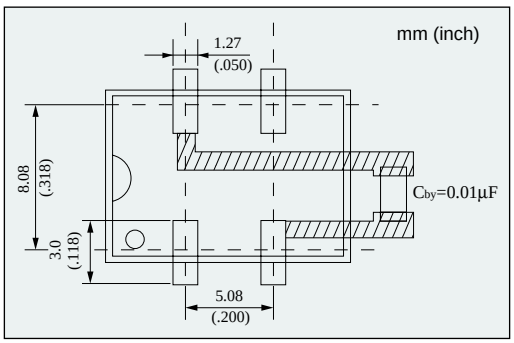
Duty Cycle = t/T×100 [%]

■ Stand-by Function

# 1 pin input	# 3 pin output
H level (+2.0 Vmin) or open	Operating
L level (+0.8 Vmax)	High impedance (Weak pull down)

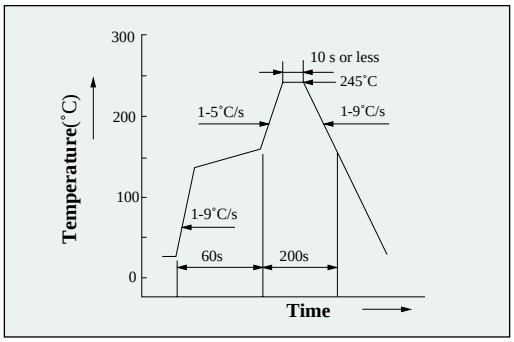
Handling Cautions (1800 series)

■ Recommended footprint



■ Examples for soldering conditions

(Infra-red ray reflow soldering)



- **Soldering**

  In order to avoid product damage during soldering, for reflow conditions, please follow either below conditions (a) or (b).

  (a) Temperature : 260°C (max)
  Duration : 10 (max)

  (b) Temperature : 230°C (max)
  Duration : 60 (max)

- **Shock**

  Basically, the 1800 series include height resistance design against shock (guaranteed 3 times drops from 75 cm height on to hard wooden board).

  In case of unexpected drop, please remeasure the product characteristics.

- **Cleaning**

  Basically, the 1800 series are applicable for ultrasonic cleanings. However, in some cases, during ultrasonic cleanings, damage my occur. Please check conditions carefully beforehand.

- **Others**

  The 1800 series are C-MOS products. And careful handling (same as with C-MOS IC) is needed to avoid electrostatic problems.

  Incorrect pin connection is cause of trouble.
  Please make sure to connect correctly as below.
  #2 terminal → GND
  #4 terminal → V_{DD}

■ PLL cascade connection

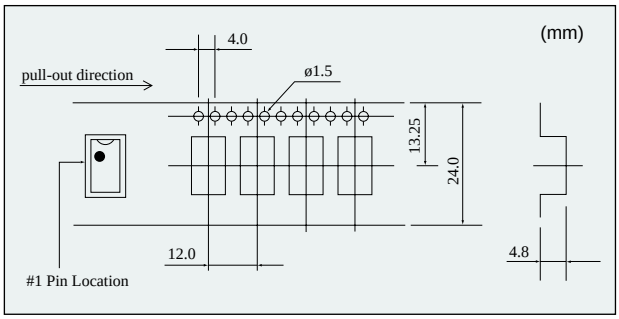
Crystal units of this series output required frequencies by the PLL (Phase Locked Loop) circuit using quartz oscillation as a reference. Therefore, jitters may increase when the output of this oscillator is connected to a PLL in cascade where the oscillator is operated using an existing PLL circuit in the customer's system as a reference.
Check your system carefully before applying to image processing, synchronous process of communication, etc.

■ Output state during standby

Because the output of the clock oscillators of the 1800 series is pulled down to GND (weak pull-down) with a high impedance (typically 500 kΩ) during standby, the pull-down resistor for the input section of GATE IC of the next stage is not necessary. When pulling up the input section of the GATE IC of the next stage, a resistor of 10 kΩ to 50 kΩ or less should be used.

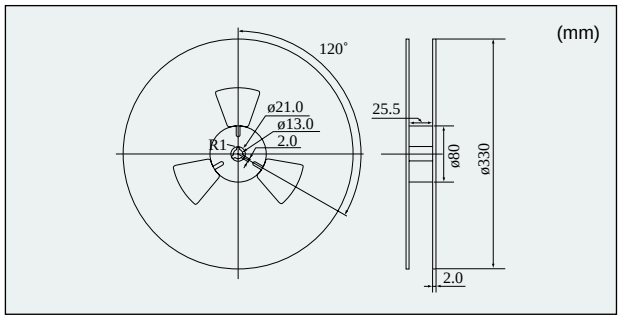
Taping Dimensions (1800 Series)

■ Tape



1,000 pieces/reel are boxed and shipped with the taping method as shown above

■ Reel



*Note The Packaging method shown above is only for large orders. For small orders, or for samples, the packaging form is different according to the requested quantity.