



RoHS Compliant

### Features

- Miniature ceramic package
- Highly reliable with seam welding
- CMOS output
- Supply voltage  $V_{CC}=3.3V$
- Excellent Jitter performance

Table 1

Freq. Tol. Code	Freq. Tol. $\times 10^{-6}$	Operating Temperature Range (°C)	Note
O	$\pm 50$	-10 to +70	Standard specifications
S	$\pm 30$	-10 to +70	With only certain frequencies
G	$\pm 50$	-40 to +85	With only certain frequencies

### How to Order

**KV5032C 74.1758 C 3 0 F 00**  
 ① ② ③ ④ ⑤ ⑥ ⑦

- ① Type (5.0×3.2mm SMD VCXO)
- ② Output Frequency
- ③ Output Type (CMOS)
- ④ Supply Voltage (3.3V)
- ⑤ Frequency Tolerance (See Table 1)
- ⑥ Symmetry (45/ 55%)
- ⑦ Customer Special Model Suffix (STD Specification is "00")

Packaging (Tape & Reel 1000 pcs./ reel)

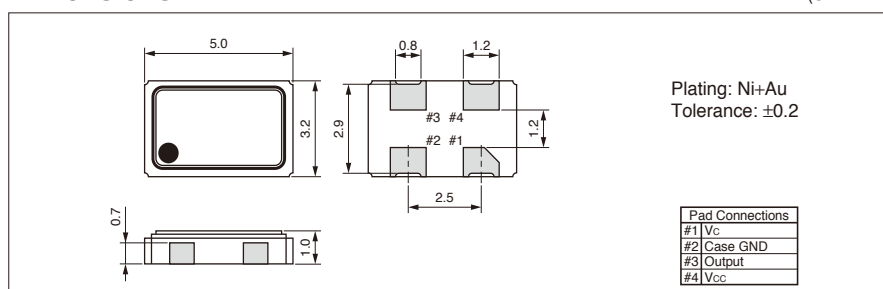
### Specifications

Item	Symbol	Conditions	Min.	Max.	Units	
Output Frequency Range	fo		1.5	80	MHz	
Frequency Tolerance	f <sub>tol</sub>	Initial tolerance, Operating temperature range, Rated power supply voltage change, Load change, Aging (1 year @25°C), Shock and vibration	Op. Temp.: -10 to +70°C/ -40 to +85°C	-50	+50	$\times 10^{-6}$
			Op. Temp.: -10 to +70°C	-30	+30	
Absolute Pull Range	APR	1.5≤fo≤30 30<fo≤80	$\pm 100$ $\pm 50$	—	$\times 10^{-6}$	
Control Voltage	V <sub>c</sub>		0	3.3	V	
Storage Temperature Range	T <sub>stg</sub>		-55	+125	°C	
Operating Temperature Range	T <sub>use</sub>	Standard Specifications	-10	+70	°C	
		Extend (Option)	-40	+85		
Max. Supply Voltage	—		-0.5	+7	V	
Supply Voltage	V <sub>CC</sub>		2.97	3.63	V	
Current Consumption	I <sub>CC</sub>		—	15	mA	
Symmetry	SYM	@50% V <sub>CC</sub>	45	55	%	
Rise/ Fall Time (10% V <sub>CC</sub> to 90% V <sub>CC</sub> )	tr/ tf	1.5≤fo≤30	—	8	ns	
		30<fo≤80	—	5		
Low Level Output Voltage	V <sub>OL</sub>		—	10% V <sub>CC</sub>	V	
High Level Output Voltage	V <sub>OH</sub>		90% V <sub>CC</sub>	—	V	
CMOS Load	L <sub>CMOS</sub>		—	15	pF	
Input Resistance	—	Standard Specifications	100k	—	ohm	
		Extend (Option)	5M	—		
Start-up Time	t <sub>str</sub>	@Minimum operating voltage to be 0 sec.	—	10	ms	
Phase Jitter	J <sub>Phase</sub>	12kHz to 20MHz @27MHz	—	1	ps	
Phase Noise @27.0000MHz	—	- 70 (@10Hz offset) - 100 (@100Hz offset) - 130 (@1kHz offset) - 145 (@10kHz offset) - 152 (@100kHz offset) - 158 (@1MHz offset) - 158 (@10MHz offset)			dBc/ Hz	

Note: All electrical characteristics are defined at the maximum load and operating temperature range.  
 Please contact us for inquiry about operating temperature range, available frequencies and other conditions.

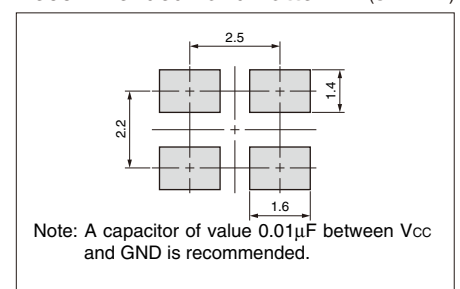
### Dimensions

(Unit: mm)



### Recommended Land Pattern

(Unit: mm)





# Voltage Controlled Crystal Oscillators (VCXO) Surface Mount Type KV7050A Series (VC-FXO-35F Series)



CMOS/ 3.3V/ 5.0V/ 7.0x5.0mm



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## Features

- Surface mount type suitable for auto pick-and-place
- Reflow soldering compatible
- Supply voltage  $V_{CC}$ =3.3/ 5.0V available
- for DTV, DVD Applications

## How to Order

KV7050A 27.0000 C 3 S C 00  
①                      ②                      ③ ④ ⑤ ⑥ ⑦

- ① Type
- ② Output Frequency
- ③ Output Type (CMOS)
- ④ Supply Voltage 5=5.0V, 3=3.3V
- ⑤ Frequency Tolerance (S=±30×10<sup>-6</sup>)
- ⑥ Symmetry (40/ 60%)
- ⑦ Customer Special Model Suffix (STD Specification is "00")

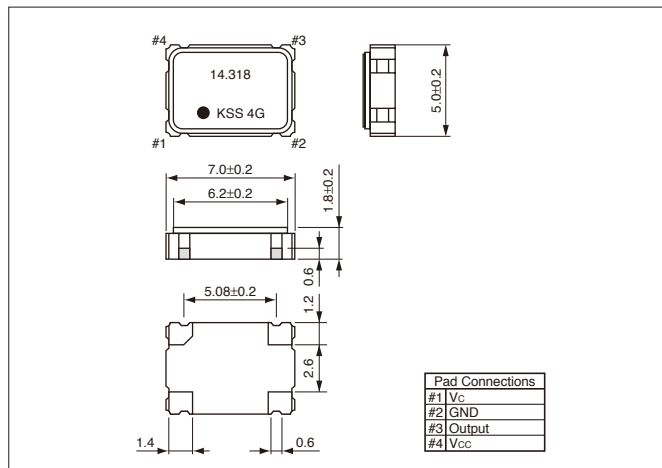
## Specifications

Item	Symbol	Specifications		Units
		KV7050Axx.xxxxC5SC00 (VC-FXO-35F)	KV7050Axx.xxxxC3SC00 (VC-FXO-35FL)	
Output Frequency Range	f <sub>o</sub>	8 to 30	8 to 30	MHz
Frequency Tolerance (Overall)	f <sub>tol</sub>	±30		×10 <sup>-6</sup>
Storage Temperature Range	T <sub>stg</sub>	-35 to +85		°C
Operating Temperature Range	T <sub>use</sub>	-10 to +70		°C
Max. Supply Voltage	—	7 max.		V
Supply Voltage	V <sub>CC</sub>	5±5%	3.3±5%	V
Current Consumption	I <sub>CC</sub>	25 max.	20 max.	mA
Symmetry	SYM	40 to 60@50%V <sub>CC</sub>		%
Rise/ Fall Time	tr/ tf	10 max.	15 max.	ns
Low Level Output Voltage	V <sub>OL</sub>	0.5 max.		V
High Level Output Voltage	V <sub>OH</sub>	90% V <sub>CC</sub> min.		V
CMOS Load	L <sub>CMOS</sub>	15		pF
Start-up Time	t <sub>str</sub>	10 max.		ms
Voltage Control Range	f <sub>cont</sub>	±50 min.	±50 min.	×10 <sup>-6</sup>
Frequency Deviation	f <sub>cont</sub>	2.5V±2.5V	1.65V±1.65V	V

Note: All electrical characteristics are defined at the maximum load and operating temperature range.  
Please contact us for inquiry about operating temperature range, available frequencies and other conditions.

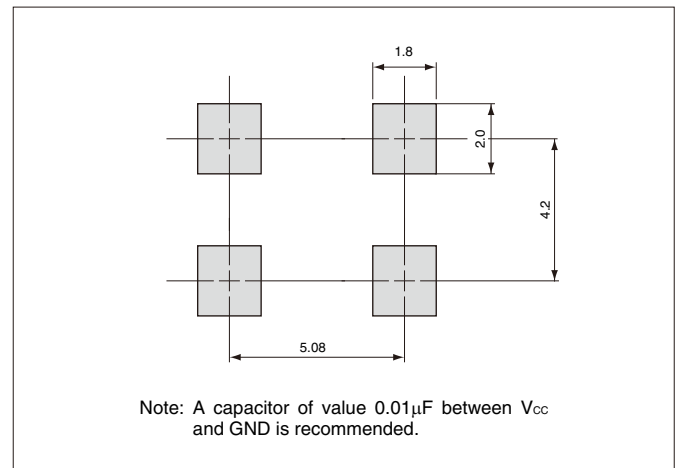
## Dimensions

(Unit: mm)



## Recommended Land Pattern

(Unit: mm)





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### Features

- High frequency to 170MHz
- Miniature ceramic package
- Highly reliable with seam welding
- CMOS output
- Supply voltage  $V_{CC}=3.3V$
- Excellent Jitter performance

Table 1

Freq. Tol. Code	Tol. $\times 10^{-6}$	Operating Temperature Range (°C)	Note
<b>0</b>	$\pm 50$	-10 to +70	Standard specifications
<b>S</b>	$\pm 30$	-10 to +70	With only certain frequencies
<b>G</b>	$\pm 50$	-40 to +85	

### How to Order

**KV7050B 74.1758 C 3 0 D 00**  
 ① ② ③ ④ ⑤ ⑥ ⑦

- ① Type (7.0x5.0mm SMD VCXO)
- ② Output Frequency
- ③ Output Type (CMOS)
- ④ Supply Voltage (3.3V)
- ⑤ Frequency Tolerance (See Table 1)
- ⑥ Symmetry/ INH Function (45/ 55%, Disable)
- ⑦ Customer Special Model Suffix (STD Specification is "00")

Packaging (Tape & Reel 1000 pcs./ reel)

### Specifications

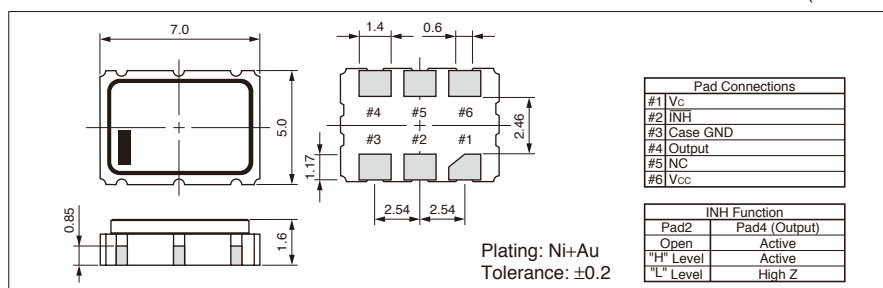
Item	Symbol	Conditions	Min.	Max.	Units	
Output Frequency Range <sup>Note1</sup>	$f_o$		1.5	170	MHz	
Frequency Tolerance <sup>Note2</sup>	$f_{tol}$	Initial tolerance, Operating temperature range, Rated power supply voltage change, Aging (1 year @25°C), Shock and vibration	Op. Temp.: -10 to +70°C/ -40 to +85°C	-50	+50	$\times 10^{-6}$
			Op. Temp.: -10 to +70°C	-30	+30	
Absolute Pull Range	APR	1.5 $\leq f_o \leq 30$ MHz 30 $< f_o \leq 170$ MHz	$\pm 100$ $\pm 50$	—	$\times 10^{-6}$	
Control Voltage	$V_c$		0	+3.3	V	
Storage Temperature Range	$T_{stg}$		-55	+125	°C	
Operating Temperature Range	$T_{use}$	Standard Specifications Extend (Option)	-10 -40	+70 +85	°C	
Max. Supply Voltage	—		-0.5	+5	V	
Supply Voltage	$V_{CC}$		+2.97	+3.63	V	
Current Consumption	$I_{CC}$	1.5 $\leq f_o \leq 80$ MHz	—	15	mA	
		80 $< f_o \leq 170$ MHz	—	35		
Disable Current	$I_{dis}$	1.5 $\leq f_o \leq 80$ MHz	—	10	mA	
		80 $< f_o \leq 170$ MHz	—	50		
Symmetry	SYM	@50% $V_{CC}$	45	55	%	
Rise/ Fall Time (10% $V_{CC}$ to 90% $V_{CC}$ )	$t_r/ t_f$	1.5 $\leq f_o \leq 30$ MHz	—	8	ns	
		30 $< f_o \leq 80$ MHz	—	5		
		80 $< f_o \leq 170$ MHz	—	4		
Low Level Output Voltage	$V_{OL}$		—	10% $V_{CC}$	V	
High Level Output Voltage	$V_{OH}$		90% $V_{CC}$	—	V	
Output Load	$L_{CMOS}$		—	15	pF	
Input Voltage Range	$V_{IN}$		0	+3.3	V	
Low Level Input Voltage	$V_{IL}$		—	30% $V_{CC}$	V	
High Level Input Voltage	$V_{IH}$		70% $V_{CC}$	—	V	
Input Resistance	—		5	—	Mohm	
Disable Time	$t_{dis}$		—	100	ns	
Enable Time	$t_{ena}$	1.5 $\leq f_o \leq 80$ MHz	—	100	ns	
		80 $< f_o \leq 170$ MHz	—	2	ms	
Start-up Time	$t_{str}$	@Minimum operating voltage to be 0 sec.	—	10	ms	
Phase Jitter	$J_{Phase}$	12kHz to 20MHz @155.52MHz	—	1	ps	
Phase Noise @155.52MHz	—	- 55 (@10Hz offset) - 85 (@100Hz offset) - 115 (@1kHz offset) - 130 (@10kHz offset) - 145 (@100kHz offset) - 150 (@1MHz offset) - 155 (@10MHz offset)			dBc/ Hz	

Note : All electrical characteristics are defined at the maximum load and operating temperature range.

Note1: Please contact us for inquiry about operating temperature range, available frequencies and other conditions.

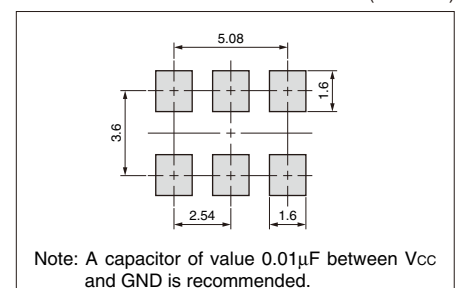
### Dimensions

(Unit: mm)



### Recommended Land Pattern

(Unit: mm)





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### Features

- High frequency to 165MHz
- LV-PECL output
- Miniature ceramic package
- Highly reliable with seam welding
- Low Phase Noise

Table 1

Freq. Tol. Code	Tol. $\times 10^{-6}$	Operating Temperature Range (°C)	Note
O	$\pm 50$	0 to +70	Standard specifications
S	$\pm 30$	0 to +70	With only certain frequencies
G	$\pm 50$	-40 to +85	With only certain frequencies

### How to Order

KV7050C 155.520 P 3 G K 00

①                      ②                      ③ ④ ⑤ ⑥ ⑦

- ① Type (7.0x5.0mm SMD VCXO)
- ② Output Frequency
- ③ Output Type (LV-PECL)
- ④ Supply Voltage (3.3V)
- ⑤ Frequency Tolerance (See Table 1)
- ⑥ Symmetry/ INH Function (45/ 55%, Disable)
- ⑦ Customer Special Model Suffix (STD Specification is "00")

Packaging (Tape & Reel 1000 pcs./ reel)

### Specifications

Item	Symbol	Conditions	Min.	Max.	Units	
Output Frequency Range <sup>Note1</sup>	f <sub>o</sub>		70	165	MHz	
Frequency Tolerance <sup>Note2</sup>	f <sub>tol</sub>	Initial tolerance, Operating temperature range, Rated power supply voltage change, Aging (1 year @25°C), Shock and vibration	Op. Temp.: 0 to +70°C/ -40 to +85°C	-50	+50	$\times 10^{-6}$
			Op. Temp.: 0 to +70°C	-30	+30	
Absolute Pull Range	APR		-50	—	$\times 10^{-6}$	
Frequency Aging	f <sub>age</sub>	Per 20years @25°C	-15	+15	$\times 10^{-6}$	
Control Voltage	V <sub>c</sub>		0	+3.3	V	
Storage Temperature Range	T <sub>stg</sub>		-55	+90	°C	
Operating Temperature Range	T <sub>use</sub>	Standard Specifications	0	+70	°C	
		Extend (Option)	-40	+85		
Max. Supply Voltage	—		-0.5	+5	V	
Supply Voltage	V <sub>CC</sub>		+2.97	+3.63	V	
Current Consumption	I <sub>CC</sub>		—	50	mA	
Disable Current	I <sub>dis</sub>		—	0.1	mA	
Symmetry	SYM	50ohm@crossing point	45	55	%	
Rise/ Fall Time (20% to 80% Output Level)	tr/ tf	50ohm	—	0.5	ns	
Low Level Output Voltage <sup>Note3</sup>	V <sub>OL</sub>		—	V <sub>CC</sub> -1.620	V	
High Level Output Voltage <sup>Note3</sup>	V <sub>OH</sub>		V <sub>CC</sub> -1.025	—	V	
Output Load	—	LV-PECL Output	—	50	ohm	
Input Voltage Range	V <sub>IN</sub>		0	+3.3	V	
Low Level Input Voltage <sup>Note3</sup>	V <sub>IL</sub>		—	30% V <sub>CC</sub>	V	
High Level Input Voltage <sup>Note3</sup>	V <sub>IH</sub>		70% V <sub>CC</sub>	—	V	
Input Resistance	—		5	—	Mohm	
Disable Time	t <sub>dis</sub>		—	200	ns	
Enable Time	t <sub>ena</sub>		—	2	ms	
Start-up Time	t <sub>str</sub>	@Minimum operating voltage to be 0 sec.	—	3	ms	
Phase Jitter	J <sub>Phase</sub>	12kHz to 20MHz @155.52MHz	—	0.5	ps	
Phase Noise @155.52MHz	—	- 63 (@10Hz offset) - 93 (@100Hz offset) - 120 (@1kHz offset) - 135 (@10kHz offset) - 145 (@100kHz offset) - 152 (@1MHz offset) - 157 (@10MHz offset)			dBc/ Hz	

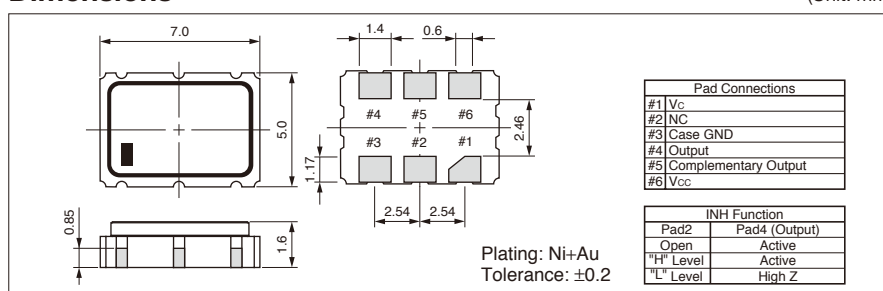
Note : All electrical characteristics are defined at the maximum load and operating temperature range.

Note1: Please contact us for inquiry about operating temperature range, available frequencies and other conditions.

Note2: DC characteristic

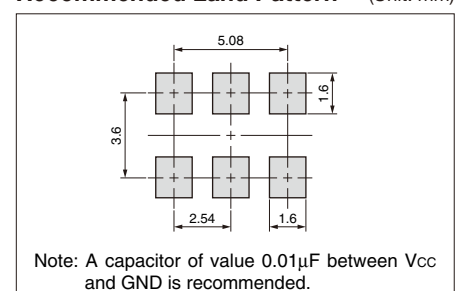
### Dimensions

(Unit: mm)



### Recommended Land Pattern

(Unit: mm)





# Voltage Controlled Crystal Oscillators (VCXO) Surface Mount Type KV7050R-P3 Series



CMOS/ 3.3V/ 7.0x5.0mm



RoHS Compliant

## Features

- High frequency to 800MHz
- LV-PECL output
- Miniature ceramic package
- Highly reliable with seam welding
- for WDM, Networking Applications

Table 1

Freq. Tol. Code	Tol. $\times 10^{-6}$	Operating Temperature Range (°C)	Note
G	$\pm 50$	-40 to +85	Standard specifications With only certain frequencies

## How to Order

KV7050R 622.080 P 3 G D 00  
 ① ② ③ ④ ⑤ ⑥ ⑦

- ① Type (7.0x5.0mm SMD VCXO)
- ② Output Frequency
- ③ Output Type (LV-PECL)
- ④ Supply Voltage (3.3V)
- ⑤ Frequency Tolerance (See Table 1)
- ⑥ Symmetry/ INH Function (45/ 55%, Disable)
- ⑦ Customer Special Model Suffix (STD Specification is "00")

Packaging (Tape & Reel 1000 pcs./ reel)

## Specifications

Item	Symbol	Conditions	Min.	Max.	Units
Output Frequency Range <sup>Note1</sup>	fo		10	800	MHz
Frequency Tolerance @Vc=+1.65V	f <sub>tol</sub>	Initial tolerance, Operating temperature range, Rated power supply voltage change, Aging (1 year @25°C), Shock and vibration Op. Temp.: -40 to +85°C	-50	+50	$\times 10^{-6}$
Pull Range	—	Vc=0V Vc=+3.3V	— +150	-150 —	$\times 10^{-6}$
Control Voltage	Vc		0	+3.3	V
Storage Temperature Range	T <sub>stg</sub>		-55	+125	°C
Operating Temperature Range	T <sub>use</sub>		-40	+85	°C
Max. Supply Voltage	—		-0.5	+4.2	V
Supply Voltage	VCC		+2.97	+3.63	V
Linearity	—	Vc=0V to +3.3V	-10	+10	%
Current Consumption	Icc		—	100	mA
Symmetry	SYM	50ohm @crossing point	45	55	%
Rise/ Fall Time (20% to 80% Output Level)	tr/ tf	50ohm	—	0.4	ns
Low Level Output Voltage <sup>Note2</sup>	VOL		—	Vcc-1.620	V
High Level Output Voltage <sup>Note2</sup>	VOH		Vcc-1.025	—	V
Output Load	—	LV-PECL Output	—	50	ohm
Low Level Input Voltage	VIL		—	30% Vcc	V
High Level Input Voltage	VIH		70% Vcc	—	V
Input Resistance	—		150	—	k ohm
Start-up Time	t <sub>str</sub>	@Minimum operating voltage to be 0 sec.	—	10	ms
Phase Jitter	J <sub>Phase</sub>	12kHz to 20MHz @622.08MHz	—	1.0	ps
Phase Noise @622.08MHz	—	- 40 (@10Hz offset) - 70 (@100Hz offset) - 95 (@1kHz offset) - 105 (@10kHz offset) - 105 (@100kHz offset) - 125 (@1MHz offset) - 135 (@10MHz offset)			dBc/ Hz

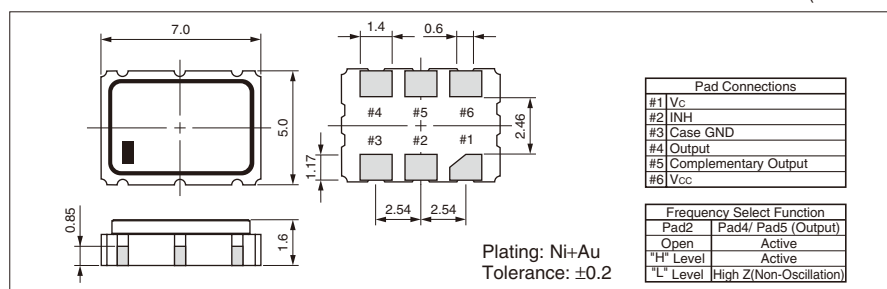
Note : All electrical characteristics are defined at the maximum load and operating temperature range.

Note1: Please contact us for inquiry about operating temperature range, available frequencies and other conditions.

Note2: DC characteristic

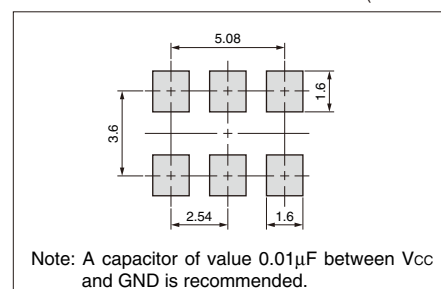
## Dimensions

(Unit: mm)



## Recommended Land Pattern

(Unit: mm)

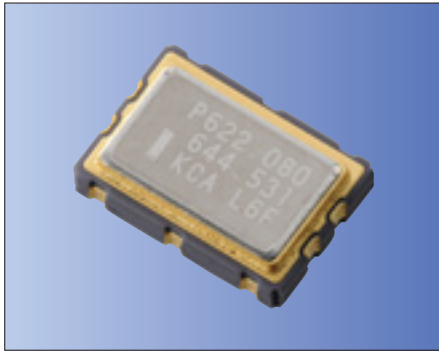




# Voltage Controlled Crystal Oscillators (VCXO) Surface Mount Type KV7050G-P3 Series Dual Selectable



CMOS/ 3.3V/ 7.0x5.0mm



RoHS Compliant

## Features

- High frequency to 800MHz
- Dual Selectable
- LV-PECL output
- Miniature ceramic package
- Highly reliable with seam welding
- for WDM, Networking Applications

Table 1

Freq. Tol. Code	Tol. $\times 10^{-6}$	Operating Temperature Range (°C)	Note
G	$\pm 50$	-40 to +85	Standard specifications With only certain frequencies

## How to Order

KV7050G 622A644 P 3 G F 00  
① ② ③ ④ ⑤ ⑥ ⑦

- ① Type (7.0x5.0mm SMD VCXO)
- ② Output Frequency/ Selection Frequency
- ③ Output Type (LV-PECL)
- ④ Supply Voltage (3.3V)
- ⑤ Frequency Tolerance (See Table 1)
- ⑥ Symmetry (45/ 55%)
- ⑦ Customer Special Model Suffix (STD Specification is "00")

Packaging (Tape & Reel 1000 pcs./ reel)

## Specifications

Item	Symbol	Conditions	Min.	Max.	Units
Output Frequency Range <sup>Note1</sup>	f1	Primary Output/ #2 "H"-Level or Open	10	800	MHz
	f2	Secondly Output/ #2 "L"-Level	10	800	MHz
Frequency Tolerance @Vc=+1.65V	f <sub>tol</sub>	Initial tolerance, Operating temperature range, Rated power supply voltage change, Aging (1 year @25°C), Shock and vibration	-50	+50	$\times 10^{-6}$
Pull Range	—	Vc=0V	—	-150	$\times 10^{-6}$
		Vc=+3.3V	+150	—	
Control Voltage	Vc		0	+3.3	V
Storage Temperature Range	T <sub>stg</sub>		-55	+125	°C
Operating Temperature Range	T <sub>use</sub>		-40	+85	°C
Max. Supply Voltage	—		-0.5	+4.2	V
Supply Voltage	V <sub>CC</sub>		+2.97	+3.63	V
Linearity	—	Vc=0V to +3.3V	-10	+10	%
Current Consumption	I <sub>cc</sub>		—	100	mA
Symmetry	SYM	50ohm @crossing point	45	55	%
Rise/ Fall Time (20% to 80% Output Level)	tr/ tf	50ohm	—	0.4	ns
Low Level Output Voltage <sup>Note2</sup>	V <sub>OL</sub>		—	V <sub>CC</sub> -1.620	V
High Level Output Voltage <sup>Note2</sup>	V <sub>OH</sub>		V <sub>CC</sub> -1.025	—	V
Output Load	—	LV-PECL Output	50		ohm
Low Level Input Voltage	V <sub>IL</sub>		—	30% V <sub>CC</sub>	V
High Level Input Voltage	V <sub>IH</sub>		70% V <sub>CC</sub>	—	V
Input Resistance	—		150	—	k ohm
Start-up Time	t <sub>str</sub>	@Minimum operating voltage to be 0 sec.	—	10	ms
Phase Jitter	J <sub>Phase</sub>	12kHz to 20MHz @622.08MHz	—	1.0	ps
Phase Noise @622.08MHz	—	- 40 (@10Hz offset) - 70 (@100Hz offset) - 95 (@1kHz offset) -105 (@10kHz offset) -105 (@100kHz offset) -125 (@1MHz offset) -135 (@10MHz offset)			dBc/ Hz

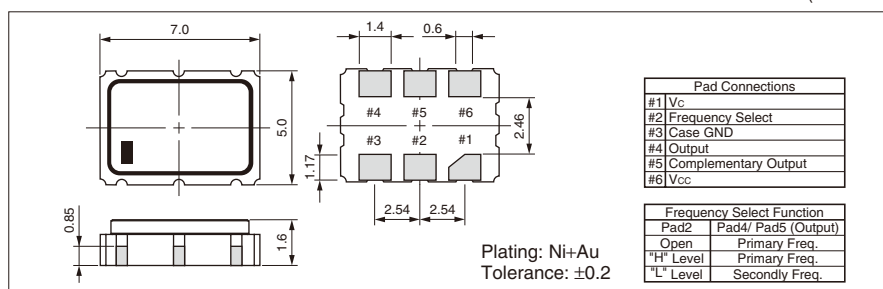
Note : All electrical characteristics are defined at the maximum load and operating temperature range.

Note1: Please contact us for inquiry about operating temperature range, available frequencies and other conditions.

Note2: DC characteristic

## Dimensions

(Unit: mm)



## Recommended Land Pattern

(Unit: mm)

