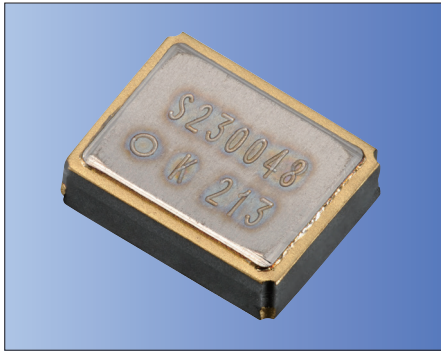




CMOS/ 3.0V Typ./ 3.2×2.5mm



AEC-Q200 RoHS Compliant

**Features**

- Miniature SMD type (3.2×2.5×1.0mm)
- 32.768kHz D-TCXO
- High frequency stability :  $\pm 5.0 \times 10^{-6} / -40$  to  $+85^\circ\text{C}$
- Low supply current : 1.5 $\mu\text{A}$  typ ( $V_{\text{DD}}=3.0\text{V}$ , Output at no load)
- Temperature compensated voltage Range : 2.0V to 5.5V
- Operating Temp.  $-40$  to  $+105^\circ\text{C}$  (option)

**Applications**

- High accuracy time references
- Microcontroller with built in RTC

**How to Order**

Frequency Tolerance (vs Temp.) :  $\pm 3.8 \times 10^{-6} / -10^\circ\text{C}$  to  $60^\circ\text{C}$

KT3225T 32768 D G R □ □ T xx  
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧

Frequency Tolerance (vs Temp.) :  $\pm 5.0 \times 10^{-6} / -40^\circ\text{C}$  to  $85^\circ\text{C}$

KT3225T 32768 E A W □ □ T xx  
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧

- ① Series
- ② Output Frequency
- ③ Frequency Stability
- ④ Lower Temperature
- ⑤ Upper Temperature

	③	④	⑤
DGR	$\pm 3.8 \times 10^{-6}$	$-10^\circ\text{C}$	$+60^\circ\text{C}$
EAW	$\pm 5.0 \times 10^{-6}$	$-40^\circ\text{C}$	$+85^\circ\text{C}$

⑥ Supply Voltage	⑦ Initial Frequency Tolerance
30 3.0V	T $\pm 3.0 \times 10^{-6}$
33 3.3V	
50 5.0V	

⑧ Individual Specification

Packaging (Tape & Reel 3000 pcs./ reel)

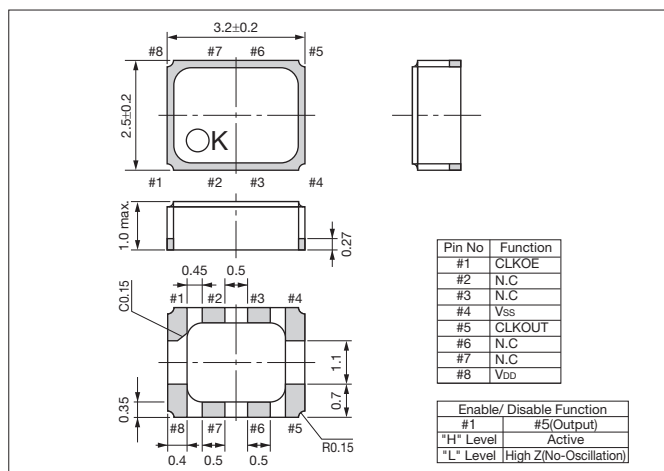
**Specifications**

Item	Symbol	Conditions	Specifications			Units
			Min.	Typ.	Max.	
Nominal Frequency	$f_{\text{nom}}$		—	32.768	—	kHz
Oscillation Output Voltage	$V_{\text{DD}}$		1.3	3.0	5.5	V
Temperature Compensated Voltage	$V_{\text{TEM}}$		2.0	3.0	5.5	V
Storage Temperature	$T_{\text{stg}}$		$-40$	$+25$	$+85$	$^\circ\text{C}$
Operating Temperature	$T_{\text{use}}$		$-40$	$+25$	$+85$	$^\circ\text{C}$
Initial Frequency Tolerance		$T_a=25 \pm 2^\circ\text{C}$	$-3.0$	—	$+3.0$	$\times 10^{-6}$
Frequency Stability vs Temp.	fo-Tc	E: $T_a=-40$ to $+85^\circ\text{C}$	$-5.0$	—	$+5.0$	$\times 10^{-6}$
Frequency Stability vs Supply Voltage	df/ fo	$V_{\text{DD}}=2.0$ to $5.5\text{V}$ , $T_a=25 \pm 2^\circ\text{C}$	$-1.0$	—	$+1.0$	$\times 10^{-6}/\text{V}$
Frequency Aging	$f_{\text{age}}$		$-3.0$	—	$+3.0$	$\times 10^{-6}$
Low Level Output Voltage	$V_{\text{OL}}$	$I_{\text{OL}}=+1.0\text{mA}$ , $V_{\text{DD}}=3\text{V}$	0.0	—	0.8	V
High Level Output Voltage	$V_{\text{OH}}$	$I_{\text{OH}}=-1.0\text{mA}$ , $V_{\text{DD}}=3\text{V}$	2.2	—	3.0	V
Low Level Input Voltage	$V_{\text{IL}}$	CLKOE pin	0.0	—	$0.2 \times V_{\text{DD}}$	V
High Level Input Voltage	$V_{\text{IH}}$	CLKOE pin	$0.8 \times V_{\text{DD}}$	—	5.5	V
DUTY Ratio	Duty	$CL=15\text{pF}$	40	—	60	%
Rise Time	$T_r$	$20\%V_{\text{DD}}$ $80\%V_{\text{DD}}$ , $CL=15\text{pF}$ , $V_{\text{DD}}=3\text{V}$	—	—	100	ns
Fall Time	$T_f$	$80\%V_{\text{DD}}$ $20\%V_{\text{DD}}$ , $CL=15\text{pF}$ , $V_{\text{DD}}=3\text{V}$	—	—	100	ns
Start-up Time	$t_{\text{str}}$	$T_a=25^\circ\text{C}$	—	—	1.0	sec
		$T_a=-40$ to $85^\circ\text{C}$	—	—	3.0	sec
Power Supply Current1	$I_{\text{CC1}}$	CLKOE= $V_{\text{SS}}$ , $V_{\text{DD}}=3\text{V}$	—	0.6	2.0	$\mu\text{A}$
Power Supply Current2	$I_{\text{CC2}}$	CLKOE= $V_{\text{DD}}$ , $V_{\text{DD}}=3\text{V}$ , Output at no load	—	1.5	4.0	$\mu\text{A}$
		CLKOE= $V_{\text{DD}}$ , $V_{\text{DD}}=3\text{V}$ , $CL=15\text{pF}$	—	2.7	5.5	$\mu\text{A}$
Output Load Condition	$L_{\text{CMOS}}$	CMOS Output	—	—	15.0	pF

\* Please contact us for other specifications.

**Dimensions**

(Unit: mm)



**Recommended Land Pattern**

(Unit: mm)

