

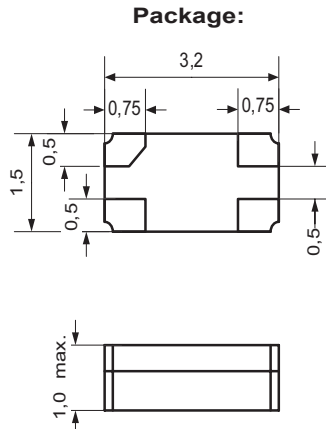
# OV-7604-C7

Low Power Clock Oscillator 32.768 kHz

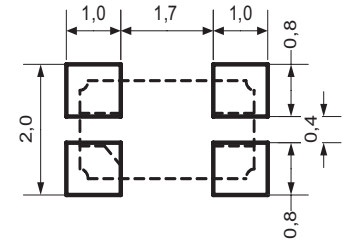


100% leadfree, RoHS - compliant

## DIMENSIONS



## Recommended Solder Pad:



All dimensions in mm typical

Xtal integrated solution  
 Ultra miniature SMT ceramic pack.  
 Ind. and Ext. temperature ranges  
 Package height 1.0 mm  
 Very low power consumption  
 Very tight frequency tolerance  
 Low aging  
 High shock and vibration resistant

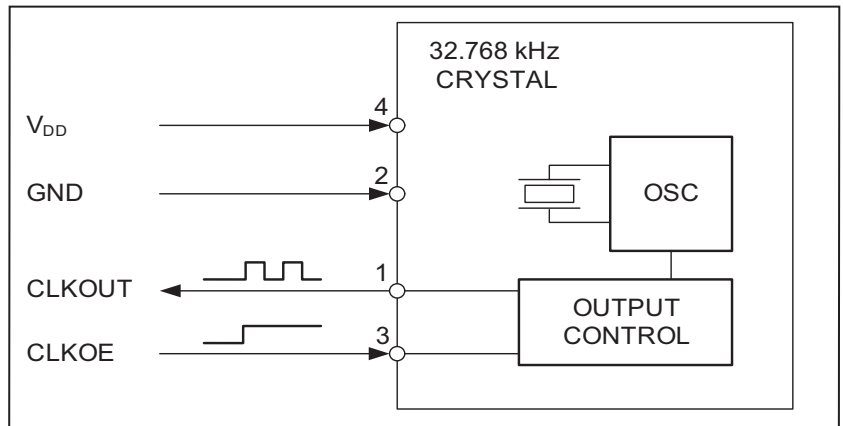
## DESCRIPTION:

This very small SMD ceramic package has been specially designed to combine the 32.768 kHz crystal unit with the CMOS-based oscillator circuit. Ultra Low Power consumption, as low as 300 nA, are made possible through 32.768 kHz Tuning-Fork-Crystals and sophisticated CMOS-circuitry.

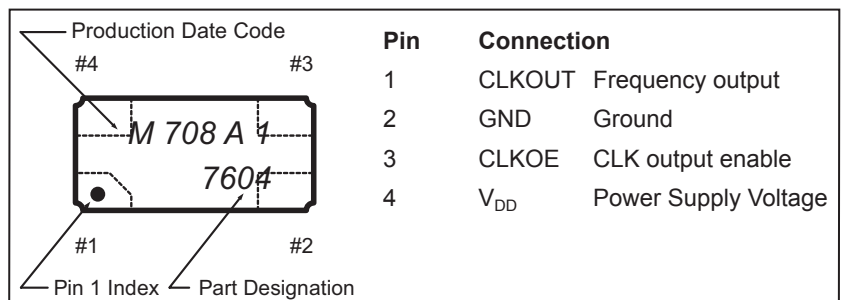
For pick-and-place equipment, the parts are available in 12 mm tape:

- 7" (178 mm) reel with 3'000 oscillators
- 13" (330 mm) reel with 14'000 oscillators

## BLOCK DIAGRAM:



## PIN CONNECTIONS TOP VIEW:



**ELECTRICAL CHARACTERISTICS  
AT 25°C:**

<b>Output Frequency</b>	<b>F</b>	<b>32.768</b>	<b>kHz</b>
Frequency tolerance <sup>1)</sup>	$\Delta F/F$	+/-20	ppm
Supply voltage	$V_{DD}$	1.2 – 5.5	V
Current consumption (typ./max.) <sup>2)</sup>	$I_{DD}$	0.3 / 0.5	$\mu A$
Duty cycle (min./max.)		40 / 60	%
Output voltage (high) <sup>3)</sup>	$V_{OH}$	$V_{DD} - 0.4$	V
Output voltage (low) <sup>4)</sup>	$V_{OL}$	Gnd +0.4	V
Output Load	HCMOS	15	pF
Output Current	$I_{OH}$	1	mA
	$I_{OL}$	-1	mA
Output rise time (max.) <sup>5)</sup>	$t_r$	70	ns
Output fall time (max.) <sup>5)</sup>	$t_f$	70	ns
Start up time (max.)	$t_{start}$	0.5	s
CLK Output Enable (High)	$V_{IH}$	80% $V_{DD}$ min.	V
CLK Output Disable (Low)	$V_{IL}$	20% $V_{DD}$ max.	V
Voltage coefficient (max.)		+/-1.5	ppm/V
Aging first year max. @ 25°C	$\Delta F/F$	+/-3	ppm
Turnover temperature (typ.)	$T_0$	25 +/-5	°C
Frequency vs. temperature	$\Delta F/F_0$	$-0.035 \text{ ppm}/^\circ\text{C}^2 (T - T_0)^2 +/-10\%$	ppm

1) Tighter tolerances on request.

2)  $V_{DD} = 3.0 \text{ V OE}$ .

3)  $I_{OH} = -1.0 \text{ mA}$ .

4)  $I_{OL} = 1.0 \text{ mA}$ .

5)  $C_L = 10 \text{ pF}$ , 10% to 90%.

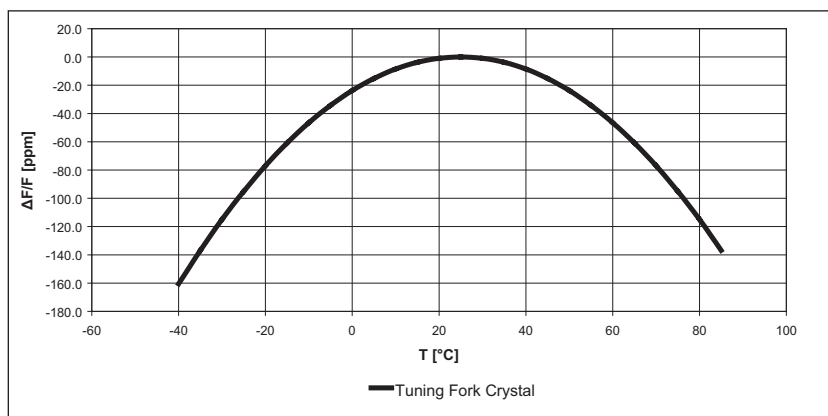
**ENVIRONMENTAL  
CHARACTERISTICS:**

		<b>Conditions</b>	<b>Max. Dev.</b>
Storage temp. range		-55 to +125°C	
Industrial operating temp. range		-40 to +85°C	
Extended operating temp. range		-55 to +125°C	
Shock resistance	$\Delta F/F$	5000 g, 0.3 ms, 1/2 sine	+/-5 ppm
Vibration resistance	$\Delta F/F$	20 g / 10–2000 Hz	+/-5 ppm

**TERMINATIONS AND  
PROCESSING:**

<b>Package-Type</b>	<b>Termination</b>	<b>Processing</b>
Ceramic	For SMD mounting Au flashed pads	Reflow soldering 260°C / 20 s max.

**FREQUENCY TEMPERATURE  
CHARACTERISTICS:**



All specifications subject to change without notice.

04.09



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