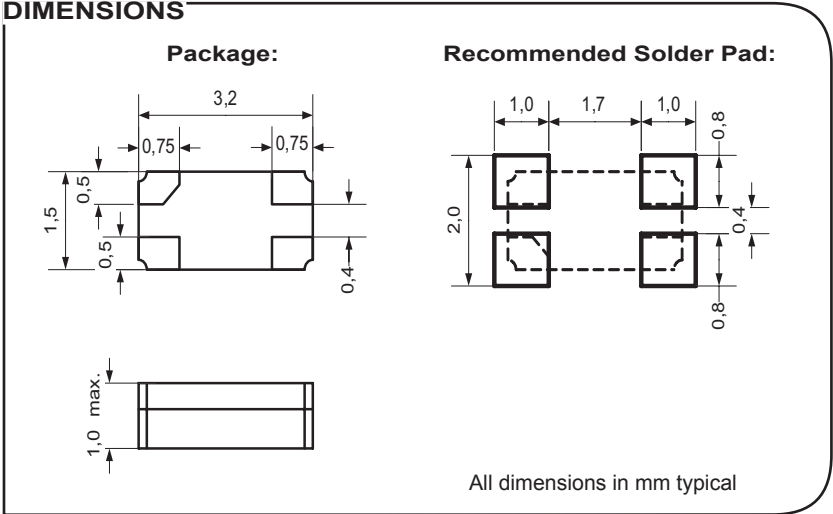


# OV-7604-C7

## Low Power Clock Oscillator 32.768 kHz

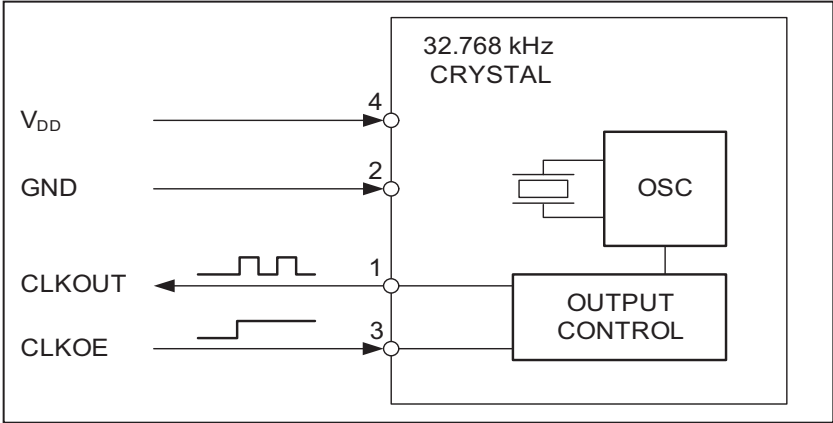


- Xtal integrated solution
- Ultra miniature SMT ceramic pack.
- Ind. and Ext. temperature ranges
- Package height 1.0 mm
- Very low power consumption
- Very tight frequency tolerance
- Low aging
- High shock and vibration resistance

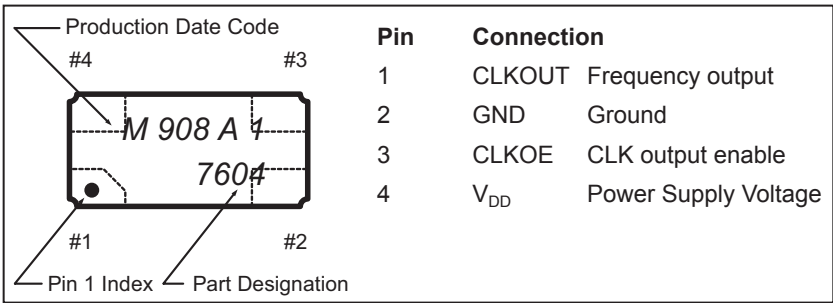
**DESCRIPTION:**  
 This very small SMD ceramic package has been specially designed to combine the 32.768 kHz crystal unit with the CMOS-based oscillator circuit. Ultra Low Power consumption, as low as 300 nA, are made possible through 32.768 kHz Tuning-Fork-Crystals and sophisticated CMOS-circuitry.

For pick-and-place equipment, the parts are available in 12 mm tape:  
 7" (178 mm) reel with 1'000 oscillators  
 7" (178 mm) reel with 3'000 oscillators

**BLOCK DIAGRAM:**



**PIN CONNECTIONS TOP VIEW:**



**ELECTRICAL CHARACTERISTICS  
AT 25°C:**

Output Frequency	F	32.768	kHz
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%.

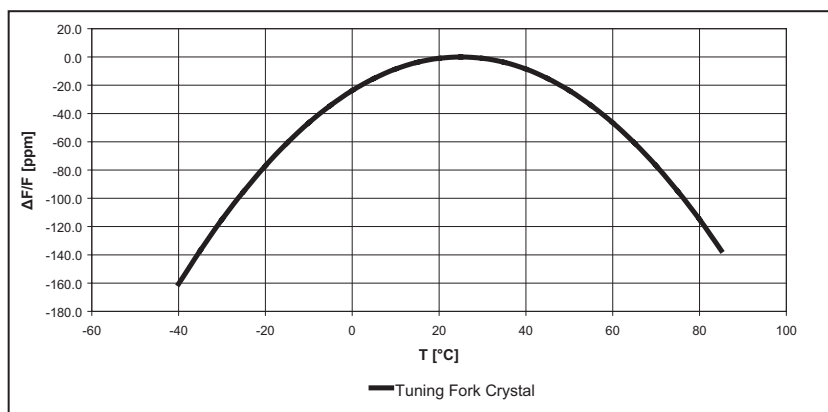
**ENVIRONMENTAL  
CHARACTERISTICS:**

		Conditions	Max. Dev.
Storage temp. range		-55 to +125°C	
TA Operating temperature range		-40 to +85°C	
TB Extended oper. temp. range		-40 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:**

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

**FREQUENCY TEMPERATURE  
CHARACTERISTICS:**



All specifications subject to change without notice.



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