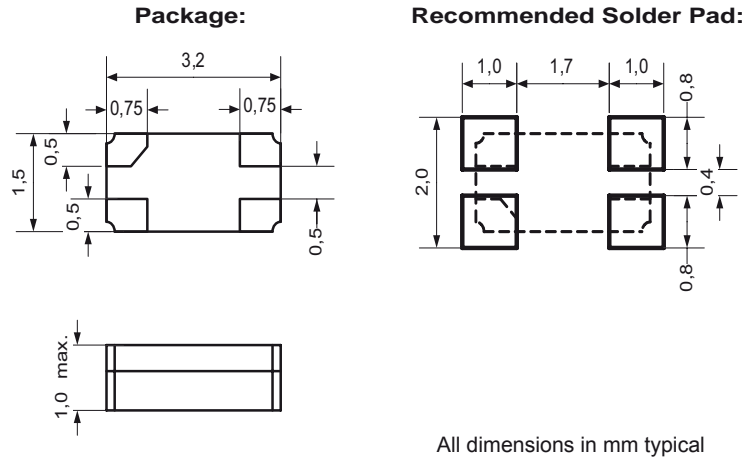


OV-7604-C7

Low Power Clock Oscillator 32.768 kHz



DIMENSIONS



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

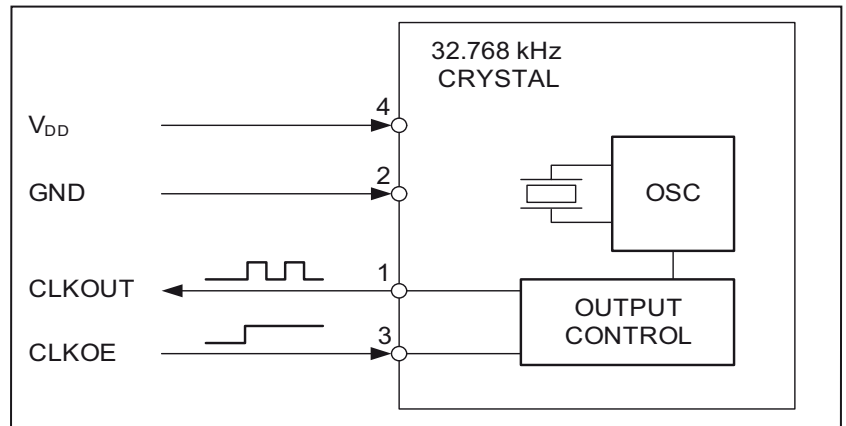
DESCRIPTION:

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.

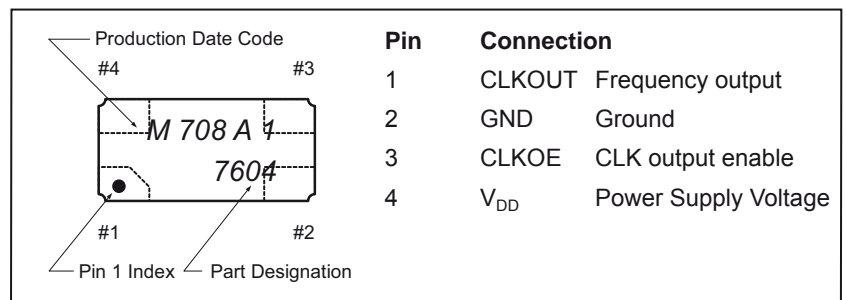
For pick-and-place equipment, the parts are available in 12 mm tape:

- 7" (178 mm) reel with 3'000 oscillators
- 10" (254 mm) reel with 7'000 oscillators
- 13" (330 mm) reel with 14'000 oscillators

BLOCK DIAGRAM:



PIN CONNECTIONS TOP VIEW:



**ELECTRICAL CHARACTERISTICS
AT 25°C:**

Output Frequency	F	32.768	kHz
Frequency tolerance ¹⁾	$\Delta F/F$	+/-20	ppm
Supply voltage	V_{DD}	1.2 – 5.5	V
Current consumption (typ./max.) ²⁾	I_{DD}	0.3 / 0.5	μA
Duty cycle (min./max.)		40 / 60	%
Output voltage (high) ³⁾	V_{OH}	$V_{DD} - 0.4$	V
Output voltage (low) ⁴⁾	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.) ⁵⁾	t_r	70	ns
Output fall time (max.) ⁵⁾	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	$\Delta F/F_0$	$-0.035 \text{ ppm}/^\circ\text{C}^2 (T - T_0)^2 \pm 10\%$	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%.

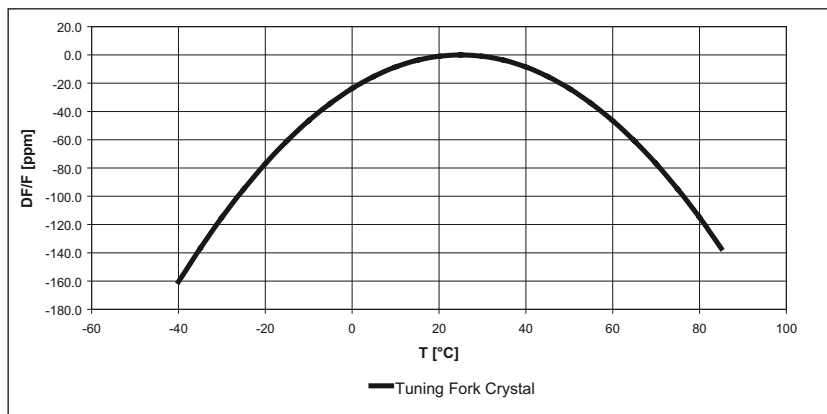
**ENVIRONMENTAL
CHARACTERISTICS:**

	Conditions	Max. Dev.
Storage temp. range	-55 to +125°C	
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:**

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

**FREQUENCY TEMPERATURE
CHARACTERISTICS:**



All specifications subject to change without notice. 03.07



Micro Crystal
Div. of ETA SA
Mühlestrasse 14
CH-2540 Grenchen
Switzerland

Tel. +41 32 655 82 82
Fax +41 32 655 82 83
sales@microcrystal.ch
www.microcrystal.com

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