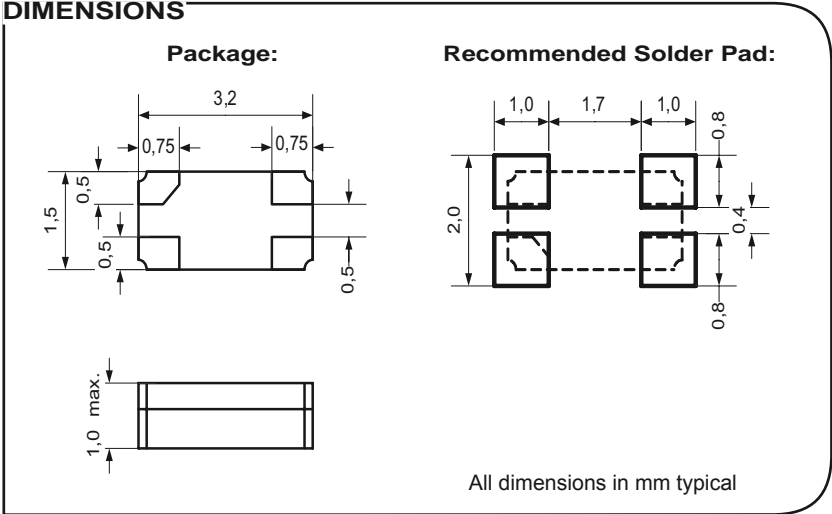


OV-7604-C7

Low Power Clock Oscillator 32.768 kHz

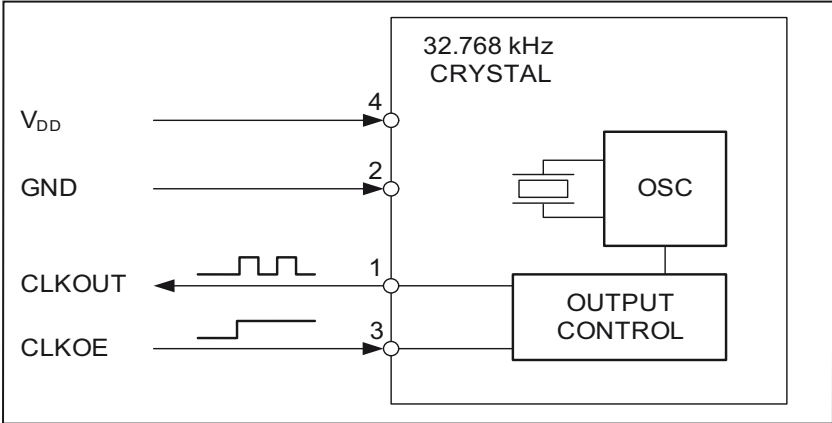


- Xtal integrated solution
- Ultra miniature SMT ceramic pack.
- Ind. and Ext. temperature ranges
- Package height 1.0 mm
- Very low power consumption
- Very tight frequency tolerance
- Low aging
- High shock and vibration resistante

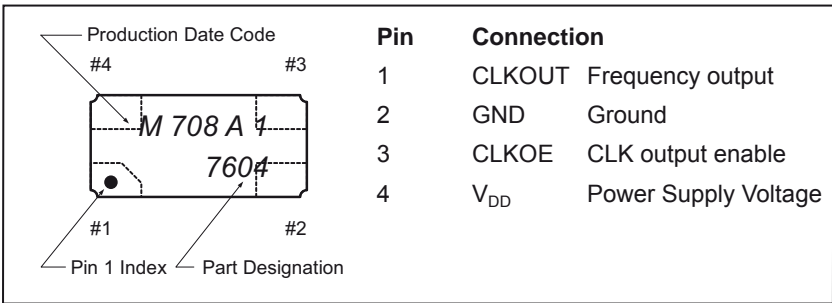
DESCRIPTION:
 This very small SMD ceramic package has been specially designed to combine the 32.768 kHz crystal unit with the CMOS-based oscillator circuit. Ultra Low Power consumption, as low as 300 nA, are made possible through 32.768 kHz Tuning-Fork-Crystals and sophisticated CMOS-circuitry.

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%.

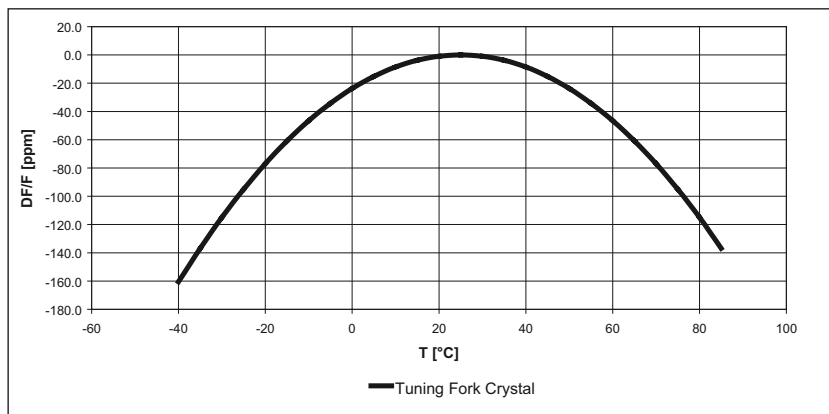
**ENVIRONMENTAL
CHARACTERISTICS:**

	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



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