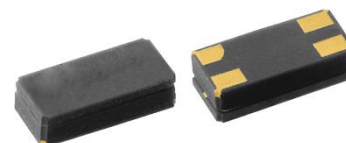


32.768kHz LOW POWER SMD CRYSTAL OSCILLATOR

Description

Abrakon's ASH7KW series is a low power 32.768 kHz crystal oscillator within a 3.2 mm x 1.5 mm x 1.0 mm package. This series offers a variable supply voltage, capable of operating with 1.2V to 5.5V. The ASH7KW delivers a CMOS output with a ± 20 ppm frequency tolerance. This series has an output enable/disable feature, with a low 0.3 μ A typical disable current.



Features

- Ultra-miniature size 3.2 x 1.5 x 1.0 mm (max)
- Low voltage operation (Min: 1.2V)
- Low current consumption
- Operating temperature: -40 to +85 °C; -40 to +125 °C
- VDD controls the output amplitude

Typical Applications

- Factory Automation
- PC server
- W-LAN/GPS Chipset
- General purpose clock generator for digital systems
- Clock drivers for Real Time Clocks
- Timekeeping in network servers and computers
- Electricity, gas, and water metering
- Portable field communication
- Mobile phone
- Clock & data recovery
- CCD clock for VTR camera
- Computers and peripherals
- Portable MP3 players & games

Electrical Specifications [Note 1]

Parameters	Min.	Typ.	Max.	Units	Notes
Output Frequency		32.768		kHz	
Operating Temperature	-40		+85	°C	Option "L"
	-40		+125		Option "H"
Storage Temperature	-55		+125	°C	
Turnover Temperature	+20	+25	+30	°C	
Frequency Tolerance	-20		+20	ppm	
Temperature Coefficient		-0.035 $\pm$ 10%		ppm/C ²	
Supply Voltage Range (Vdd)	1.2		5.5	V	
Current Consumption		0.3	0.5	μ A	Vdd=3.0V, $\overline{\text{OE}}$ (output disabled)
Current Consumption		1.8		μ A	Load=15pF, Vdd=3.0V, OE
Output Load (CMOS)			15	pF	
Output Voltage	V _{OH}	Vdd -0.4		V	I _{OH} = -1mA
	V _{OL}		GND+0.4		I _{OL} = 1mA
CLKOE Pin Function	"1" (VIH $\geq$ 0.8*Vdd) or Open: Oscillation "0" (VIL<0.2*Vdd) : Output disabled				
Aging@+25	-3.0		+3.0	ppm	First year
Duty Cycle	40		60	%	
Voltage Coefficient	-1.5		+1.5	ppm/V	
Start-up Time			0.5	s	
Output Rise Time			70.0	ns	Load=10pF, 10% to 90%
Output Fall Time			70.0	ns	Load=10pF, 10% to 90%

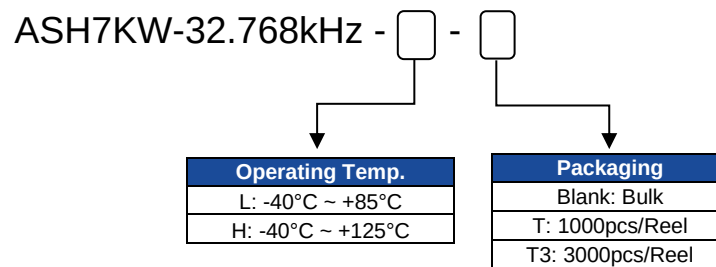
Note 1: All measurements guaranteed at nominal Vdd and at +25°C unless otherwise specified.

32.768kHz LOW POWER SMD CRYSTAL OSCILLATOR

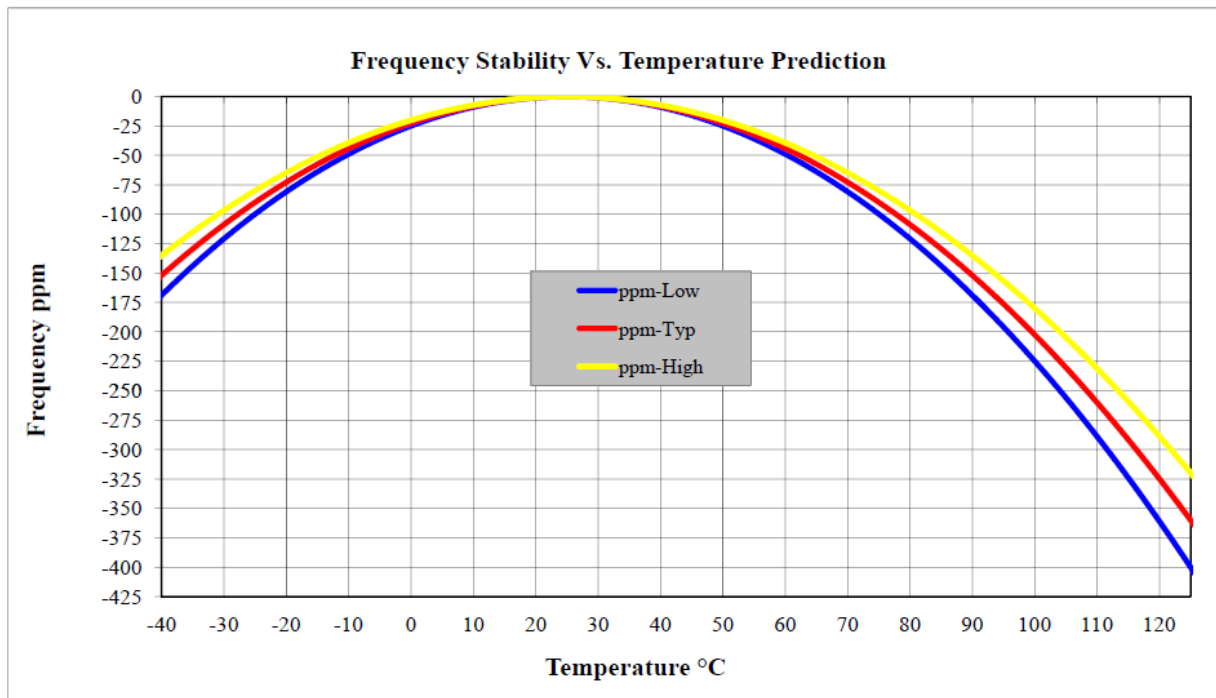
Environmental Parameters

Parameters	Description
MSL	Level 1
REACH/RoHS II	Compliant and 100% Pb free

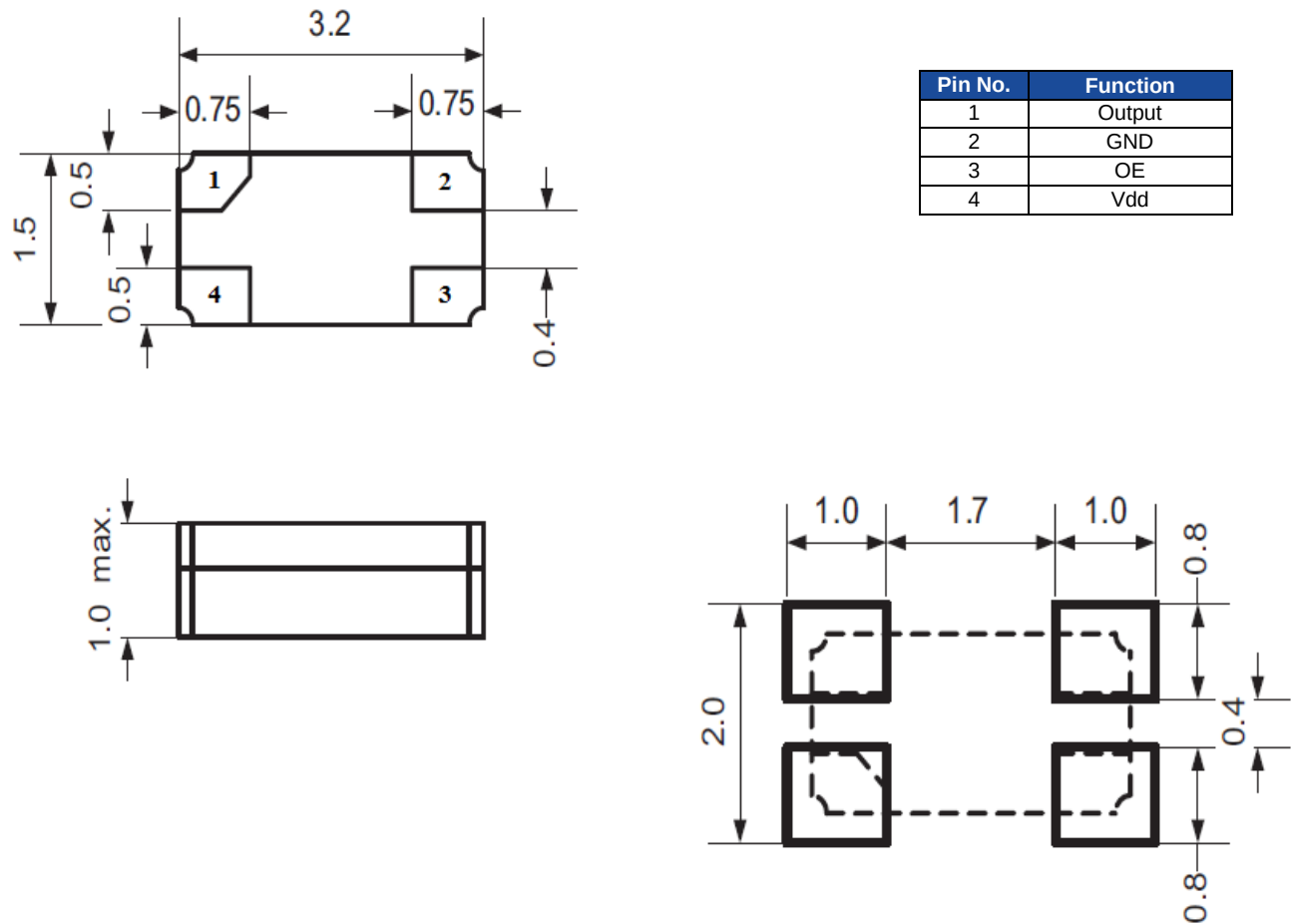
Part Identification



Typical Frequency Temperature Characteristics



Mechanical Dimensions



Note: Due to material availability, the component cover may vary (ceramic or metal). This variation in no way affects the electrical performance of the product.

Dimensions: mm

Sealing Method = Solder Sealing

32.768kHz LOW POWER SMD CRYSTAL OSCILLATOR

Reflow Profile [JEDEC J-STD-020]

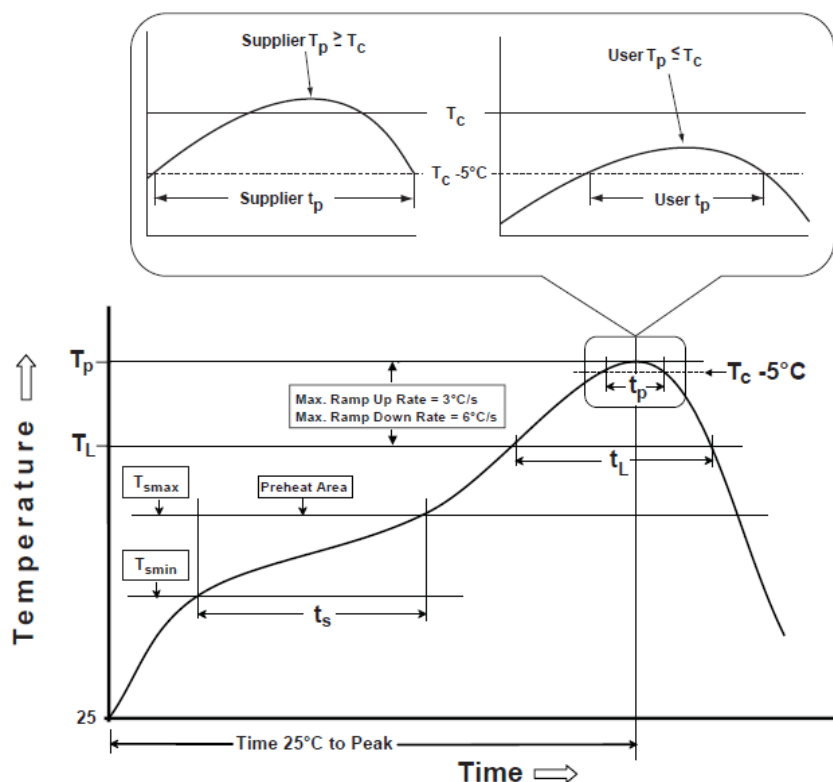


Table 1

SnPb Eutectic Process Classification Temperatures (T_c)		
Package Thickness	Volume mm ³ <350	Volume mm ³ ≥350
<2.5 mm	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

Table 2

Pb-Free Process Classification Temperatures (T_c)			
Package Thickness	Volume mm ³ <350	Volume mm ³ 350-2000	Volume mm ³ >2000
<1.6 mm	260 °C	260 °C	260 °C
1.6 mm - 2.5 mm	260 °C	250 °C	245 °C
>2.5 mm	250 °C	245 °C	245 °C

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat / soak		
Temperature minimum (T_{smin})	100°C	150°C
Temperature maximum (T_{smax})	150°C	200°C
Time (T_{smin} to T_{smax}) (t_s)	60 - 120 sec.	60 - 120 sec.
Average ramp-up rate (T_{smax} to T_p)	3°C/sec. max	3°C/sec. max
Liquidous temperature (T_L)	183°C	217°C
Time at liquidous (t_L)	60 - 150 sec.	60 - 150 sec.
Peak package body temperature (T_p)*	see Table 1	see Table 2
Time (t_p)** within 5°C of the specified classification temperature (T_c)	20 sec.	30 sec.
Ramp-down rate (T_p to T_{smax})	6°C/sec. max	6°C/sec. max
Time 25°C to peak temperature	6 min. max	8 min. max
Reflow cycles	2 max	2 max

*Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum.

**Tolerance for time at peak profile temperature (t_p) is defined as supplier minimum and a user maximum.

