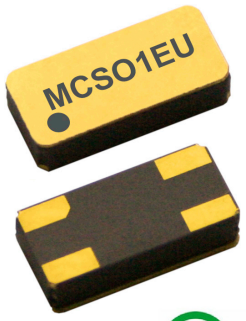
MICRO CRYSTAL SWITZERLAND

MCSO1EU Ultra Low Power
High Temp Clock Oscillator 32.768 kHz

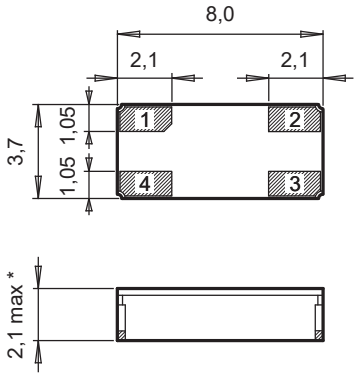


lead-free

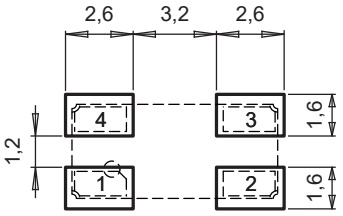
RoHS COMPLIANT

DIMENSIONS

Package:



Recommended Solder Pad:



pin 1 E/D
pin 2 GND
pin 3 F_{OUT}
pin 4 V_{DD}

* for ceramic lid 2.4 max

All dimensions in mm typical

APPLICATIONS

Security / Safety
Avionics / Aerospace
Radio Communication
Geothermal Equipment
Remote Control / Telemetry
Down Hole and Well Drilling

DESCRIPTION

The MCSO1EU is a High Temperature, 32.768 kHz SMD Oscillator that incorporates an integrated HCMOS circuit together with an XTAL. It operates under vacuum in a hermetically sealed ceramic package.

FEATURES

Outstanding hermetic sealing with gold-tin preform.
High stability and low aging guaranteed by hermetic sealing.
Frequency stability guaranteed for 1000 h at T_{MAX}.
Very fast start-up.
Operates in fundamental mode.
High shock and vibration resistant.
100% Pb-free, RoHS-compliant.

ELECTRICAL CHARACTERISTICS AT 25°C

Overall frequency stability over temperature range [1)] C = –55 to +125°C E = –55 to +150°C D = –55 to +175°C	ΔF/F	≤ ±100 ≤ ±150 ≤ ±300	ppm
Supply voltage ±5% [2)]	V_{DD}	2.5 / 3.3	V
Input current	I_{DD}	See I_{DD} table	
Output signal		HCMOS compatible	
F_{OUT} duty cycle @ $V_{DD}/2$ (min./max.)	δ_{FOUT}	40 / 60	%
Rise & fall time (C_L = 15 pF, 20% to 80% V_{DD})	t_r / t_f	≤ 25	ns
Output level V_{OL} / V_{OH}		< 0.4 / > V_{DD} -0.5	V
Start-up time	t_{START}	< 5	ms
Capacitive load min. / max.	C_L	3 / 27	pF

1) Including adjustment at +25°C, long term aging 1000 h at T_{MAX}, V_{DD} variations ±5% and C_L variations min. to max.
2) A 47 nF decoupling capacitor has to be connected between V_{DD} and GND

INPUT CURRENT: I_{DD} (C_L = 10 pF)

Frequency	32.768 kHz
V_{DD} = 2.5 V (W)	< 20 µA
V_{DD} = 3.3 V (V)	< 20 µA

STANDARD FREQUENCY

Frequency
32.768 kHz
Other frequencies from 15 kHz to 100 kHz on request

ENABLE/DISABLE E/D, OPTION 1

Input level V_{IL} / V_{IH}		< 0.3 V_{DD} / > 0.7 V_{DD}	V
Reaction time	t	< 5	ms
Standby current	I_{DDD}	< 2	µA

Pin 1 E/D	Pin 3 F_{OUT}
V_{IH} or open	Output enabled
V_{IL}	Output disabled (Hi-Z)

No E/D function before V_{DD} is set.

ENVIRONMENTAL CHARACTERISTICS

	Conditions
Storage temperature range	–65 to +125°C
Shock resistance (survival)	10000 g, 0.3 ms, ½ sine
Vibration resistance (survival)	80 g / 10 – 2000 Hz

TERMINATIONS AND PROCESSING, OPTION 2

Reflow per IPC/JEDEC J-STD-020C	260°C / 20 - 40 s
Package	Ceramic
Lid	Ceramic lid (C)
	Kovar lid (Blank)
Terminations (Option 2)	SnAgCu solder dipped pads (T3)
	Au flashed pads (Blank)

ORDERING INFORMATION

MCSO1EU C V – D 32.768 kHz E/D T3 XXX

C = Ceramic lid
Blank = Kovar lid

Supply voltage
W = V_{DD} = 2.5 V
V = V_{DD} = 3.3 V

Temperature range
C = -55 to +125°C
E = -55 to +150°C
D = -55 to +175°C
X = Custom

Frequency

Option 1
E/D = Enable/Disable
Blank = No function

Option 2
T3 = SnAgCu solder dipped pads
Blank = Au flashed pads

Customer specification N°

A unique part number will be generated for each product specification, i.e:	
20xxxx-ML00	≥250 pcs (in 16 mm tape on 7" reel)
20xxxx-EA00	yyy pcs (in ESD plastic tray)

All specifications subject to change without notice.

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