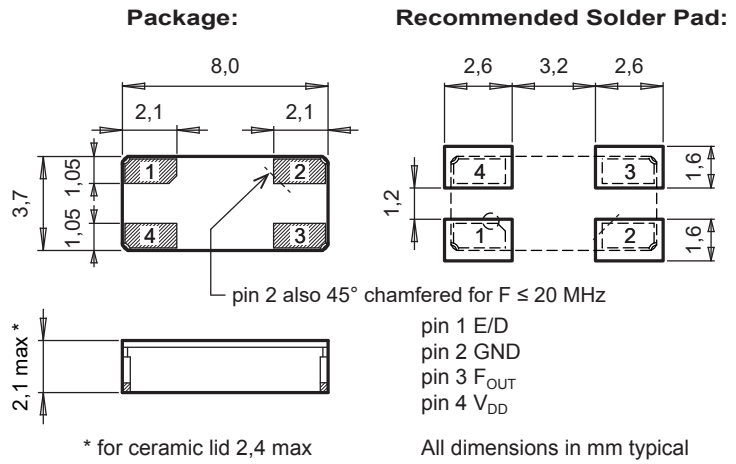




DIMENSIONS



APPLICATIONS

- Security / Safety
- Avionics / Aerospace
- Remote Control / Telemetry
- Microprocessor and FPGA Clocks
- Test and Measurement Equipment
- Wired and Wireless Communications

DESCRIPTION

The MCSO1 is a High Frequency 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.
- Very fast start-up.
- Wide temperature range.
- 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⁾		
Standard version	²⁾	$\Delta F/F$	$\leq \pm 100$ ppm
T version	³⁾		$\leq \pm 50$
Supply voltage $\pm 5\%$	^{4) 5) 6)}	V_{DD}	1.8 / 2.5 / 3.3 / 5.0 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, ≤ 20 MHz For $F = 32.768$ kHz, $t_r / t_f \leq 150$ ns ($C_L = 15$ pF, 20% to 80% V_{DD})		t_r / t_f	≤ 7 ns
Rise & fall time, > 20 MHz ($C_L = 15$ pF, 10% to 90% V_{DD})		t_r / t_f	≤ 3 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 / 47 pF

1) Including adjustment at +25°C, V_{DD} variations $\pm 5\%$ and C_L variations min. to max.
 2) Including long term aging 10 years
 3) Including long term aging 1 year
 4) A 47 nF decoupling capacitor has to be connected between V_{DD} and GND
 5) 5.0 V version not available for low jitter version (F)
 6) 1.2 V version available on request

INPUT CURRENT: I_{DD} (no load)

Frequency	32.768 kHz	≤ 10 MHz	≤ 20 MHz	> 20 to 225 MHz
V _{DD} = 2.5 V (W)	< 100 µA	< 2 mA	< 3 mA	< 25 mA
V _{DD} = 3.3 V (V)	< 110 µA	< 4 mA	< 5 mA	< 30 mA
V _{DD} = 5.0 V (Blank)	< 120 µA	< 6 mA	< 7 mA	< 40 mA

V_{DD} = 5.0 V not available for low jitter version (F)

STANDARD FREQUENCIES

Frequencies				
32.768 kHz	1.000 MHz	1.2288 MHz	3.6864 MHz	4.000 MHz
8.000 MHz	10.000 MHz	12.000 MHz	12.800 MHz	14.7456 MHz
16.000 MHz	20.000 MHz	24.000 MHz	25.000 MHz	30.000 MHz
40.000 MHz	48.000 MHz	64.000 MHz	80.000 MHz	120.000 MHz
125.000 MHz	160.000 MHz			
Other frequencies from 10 kHz to 225 MHz 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	< 1	µs

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)	5000 g, 0.3 ms, ½ sine
Vibration resistance (survival)	50 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

MCS01 F C H V T - C 40.000 MHz E/D T3 XXX

F = Low jitter *
Blank = Standard

C = Ceramic lid
Blank = Kovar lid

Frequency range
H > 20 MHz
Blank ≤ 20 MHz **

Supply voltage
Z = V_{DD} = 1.8 V
W = V_{DD} = 2.5 V
V = V_{DD} = 3.3 V
Blank = V_{DD} = 5.0 V ***

Frequency stability
T = ±50 ppm
Blank = ±100 ppm

Temperature range
A = 0 to +70°C
B = -40 to +85°C
C = -55 to +125°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°

* One-sigma jitter for low jitter version (F):
t_{RMS} < 2 ps for F ≤ 20 MHz
t_{RMS} < 10 ps for F > 20 MHz

** pin 2 also 45° chamfered for F ≤ 20 MHz

*** 5.0 V version not available for low jitter version (F)

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.



A COMPANY OF THE SWATCH GROUP

Micro Crystal AG
Muehlestrasse 14
CH-2540 Grenchen
Switzerland

Phone +41 32 655 82 82
sales@microcrystal.com
www.microcrystal.com