MICRO CRYSTAL SWITZERLAND

MCSO6

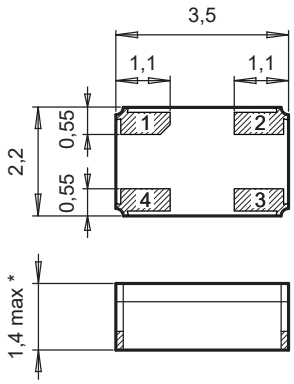
Clock Oscillator 10 kHz – 155 MHz

lead-free

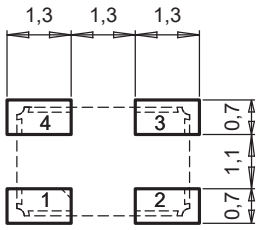
RoHS COMPLIANT

DIMENSIONS

Package:



Recommended Solder Pad:



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

* for kovar lid 1,35 max

All dimensions in mm typical

APPLICATIONS

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

DESCRIPTION

The MCSO6 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] T version [3]	ΔF/F	≤ ±100 ≤ ±50	ppm
Supply voltage ±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 For F = 32.768 kHz, t_r / t_f ≤ 150 ns (C_L = 15 pF, 20% to 80% V_{DD})	t_r / t_f	≤ 7	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 ±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 155 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	4.0000 MHz	8.0000 MHz	10.0000 MHz
12.0000 MHz	16.0000 MHz	20.0000 MHz	24.0000 MHz
40.0000 MHz	50.0000 MHz	60.0000 MHz	
Other frequencies from 10 kHz to 155 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	Kovar lid (K)
	Ceramic lid (Blank)
Terminations (Option 2)	SnAgCu solder dipped pads (T3)
	Au flashed pads (Blank)

ORDERING INFORMATION

MCSO6 F K V T – C 40.000 MHz E/D T3 XXX

F = Low jitter *
Blank = Standard

K = Kovar lid
Blank = Ceramic lid

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

** 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-MG00	≥250 pcs (in 12 mm tape on 7" reel)
20xxxx-EA00	yyy pcs (in ESD plastic tray)

All specifications subject to change without notice.

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