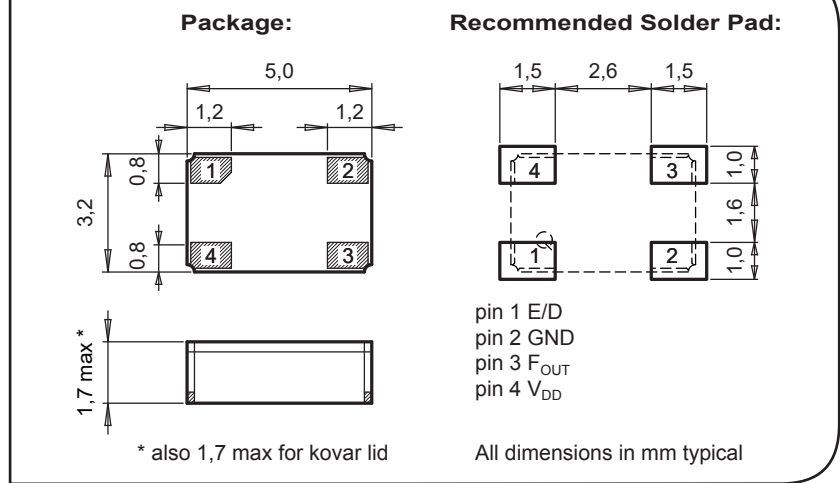




DIMENSIONS



APPLICATIONS

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

DESCRIPTION

The MCSO2 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 Standard version T version	¹⁾ ²⁾ ³⁾	$\Delta F/F$	$\leq \pm 100$ $\leq \pm 50$	ppm
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	3.6864 MHz	4.0000 MHz	8.0000 MHz
10.0000 MHz	12.0000 MHz	12.8000 MHz	14.7456 MHz
16.0000 MHz	20.0000 MHz	24.0000 MHz	40.0000 MHz
48.0000 MHz	120.0000 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	Kovar lid (K)
	Ceramic lid (Blank)
Terminations (Option 2)	SnAgCu solder dipped pads (T3)
	Au flashed pads (Blank)

ORDERING INFORMATION

MCS02	F	K	H	V	T	-	C	40.000 MHz	E/D	T3	XXX				
	F = Low jitter * Blank = Standard	K = Kovar lid Blank = Ceramic 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°				
<p>* One-sigma jitter for low jitter version (F): t_{RMS} < 2 ps for F ≤ 20 MHz t_{RMS} < 10 ps for F > 20 MHz</p> <p>** 5.0 V version not available for low jitter version (F)</p>															
<p>A unique part number will be generated for each product specification, i.e:</p> <table border="1"> <tr> <td>20xxxx-MG00</td> <td>≥250 pcs (in 12 mm tape on 7" reel)</td> </tr> <tr> <td>20xxxx-EA00</td> <td>yyy pcs (in ESD plastic tray)</td> </tr> </table>												20xxxx-MG00	≥250 pcs (in 12 mm tape on 7" reel)	20xxxx-EA00	yyy pcs (in ESD plastic tray)
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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