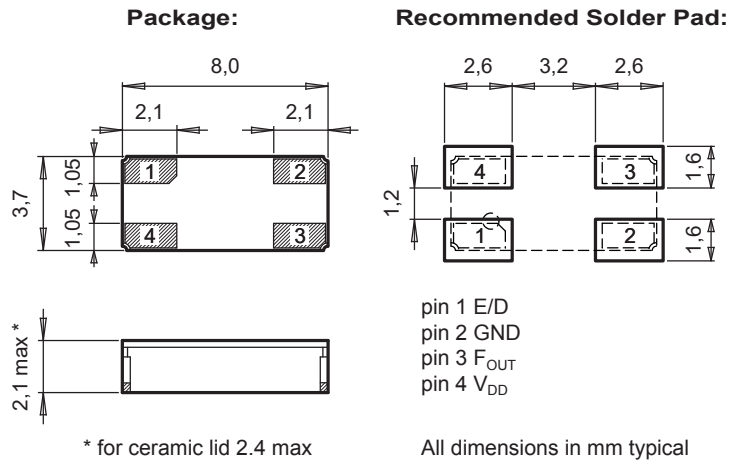


### DIMENSIONS



### APPLICATIONS

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

### DESCRIPTION

The MCSO1ES is a High Temperature, High Frequency SMD Oscillator that incorporates an integrated HCMOS circuit and an SC-Cut 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<sub>MAX</sub>.  
Very fast start-up.  
Operates in fundamental mode.  
High shock and vibration resistant.  
100% Pb-free, RoHS-compliant.

### ELECTRICAL CHARACTERISTICS AT 25°C

<b>Overall frequency stability over temperature range</b> R = -10 to +150°C S = -10 to +175°C T = -10 to +210°C	<sup>1)</sup> ΔF/F	≤ ±50 ≤ ±100 ≤ ±150	ppm
Supply voltage ±5%	<sup>3)</sup> V <sub>DD</sub>	2.5 / 3.3 / 5.0	V
Input current	I <sub>DD</sub>	See I <sub>DD</sub> table	
Output signal		HCMOS compatible	
F <sub>OUT</sub> duty cycle @ V <sub>DD</sub> /2 (min./max.)	δ <sub>FOUT</sub>	40 / 60	%
Rise & fall time, ≤ 30 MHz For L version, t <sub>r</sub> / t <sub>f</sub> ≤ 25 ns (C <sub>L</sub> = 15 pF, 20% to 80% V <sub>DD</sub> )	t <sub>r</sub> / t <sub>f</sub>	≤ 7	ns
Rise & fall time, > 30 MHz (C <sub>L</sub> = 15 pF, 10% to 90% V <sub>DD</sub> )	t <sub>r</sub> / t <sub>f</sub>	≤ 3	ns
Output level V <sub>OL</sub> / V <sub>OH</sub>		< 0.4 / > V <sub>DD</sub> - 0.5	V
Start-up time	t <sub>START</sub>	< 5	ms
Capacitive load min. / max. For L version, C <sub>L</sub> max. = 27 pF	C <sub>L</sub>	3 / 47	pF

- 1) Including adjustment at +25°C, long term aging 1000 h at T<sub>MAX</sub>, V<sub>DD</sub> variations ±5% and C<sub>L</sub> variations min. to max.
- 2) For the low consumption version (L), T version is only available as 5.0 V version and the T range is limited to +200°C
- 3) A 47 nF decoupling capacitor has to be connected between V<sub>DD</sub> and GND

**INPUT CURRENT:  $I_{DD}$  (no load)**  
(For L version,  $C_L = 10$  pF)

Frequency	32.768 kHz (L)	$\leq 10$ MHz	$\leq 30$ MHz	$> 30$ to 100 MHz
$V_{DD} = 2.5$ V (W)	$< 100$ $\mu$ A	$< 2$ mA	$< 3$ mA	$< 15$ mA
$V_{DD} = 3.3$ V (V)	$< 110$ $\mu$ A	$< 4$ mA	$< 5$ mA	$< 20$ mA
$V_{DD} = 5.0$ V (Blank)	$< 120$ $\mu$ A	$< 6$ mA	$< 7$ mA	$< 30$ mA

**STANDARD FREQUENCIES**

Frequencies			
32.768 kHz	20.0000 MHz	24.5760 MHz	
L version: Other frequencies from 15 kHz to 100 kHz on request Standard version: Other frequencies from 100 kHz to 100 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, Standard version	t	$< 1$	$\mu$ s
Reaction time, L version	t	$< 5$	ms

Pin 1 E/D	Pin 3 F <sub>OUT</sub>
$V_{IH}$ 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 $+125^\circ\text{C}$
Shock resistance (survival)	10000 g, 0.3 ms, $\frac{1}{2}$ 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) (T3 not available for T range)	SnAgCu solder dipped pads (T3)
	Au flashed pads (Blank)

**ORDERING INFORMATION**

MCS01ES	C	V	S	40.000 MHz	E/D	T3	XXX
<b>L</b> = Low power <b>Blank</b> = Standard  <b>C</b> = Ceramic lid <b>Blank</b> = Kovar lid  <b>Supply voltage</b> <b>W</b> = $V_{DD} = 2.5$ V <b>V</b> = $V_{DD} = 3.3$ V <b>Blank</b> = $V_{DD} = 5.0$ V  <b>Temperature range</b> <b>R</b> = $-10$ to $+150^\circ\text{C}$ <b>S</b> = $-10$ to $+175^\circ\text{C}$ <b>T</b> = $-10$ to $+210^\circ\text{C}$ * <b>X</b> = Custom				<b>Frequency</b>  <b>Option 1</b> <b>E/D</b> = Enable/Disable <b>Blank</b> = No function  <b>Option 2</b> <b>T3</b> = SnAgCu solder dipped pads ** <b>Blank</b> = Au flashed pads  <b>Customer specification N°</b>			
* For the low consumption version (L), T version is only available as 5.0 V version and the T range is limited to $+200^\circ\text{C}$ . Kovar lid on T range version. ** T3 not available for T range version.							
A unique part number will be generated for each product specification, i.e.:							
20xxxx-ML00	$\geq 250$ 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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