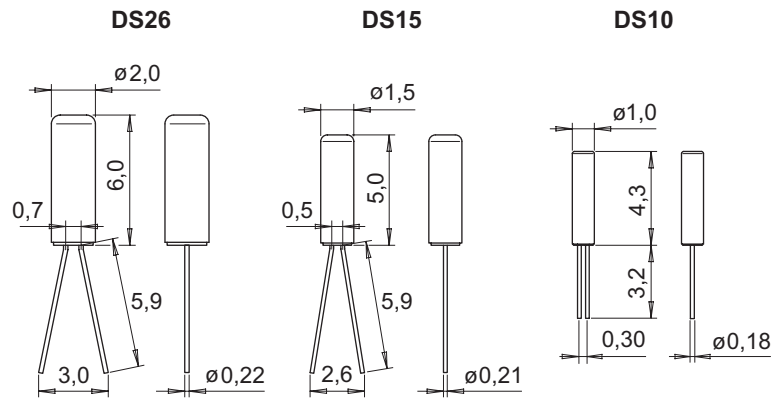




### DIMENSIONS



All dimensions in mm typical

### APPLICATIONS

IoT  
Watches  
Industrial  
Consumer Electronics  
Timers and Clock Sources

### DESCRIPTION

The DS – Series are low frequency through-hole technology Watch Quartz Crystal Units which incorporate a tuning fork Quartz Crystal Resonator. They operate under vacuum in a hermetically sealed tubular metal can package.

*DS10 and DS15 are compatible with other suppliers' same footprint crystals.*

### FEATURES

High stability is guaranteed by the hermetic sealed package.  
High shock and vibration resistant.  
Smallest available tubular package DS10 with Ø 1.0 mm.  
Very price competitive product.  
100% Pb-free, RoHS-compliant.

### ELECTRICAL CHARACTERISTICS AT 25°C

Package Size		DS26	DS15	DS10	
Standard frequency	$F_L$	32.768			kHz
Load capacitance	$C_L$	7.0 / 8.2 / 9.0 / 12.5			pF
Frequency tolerance	$\Delta F/F$	±20			ppm
	$\Delta F/F$	±30			ppm
	$\Delta F/F$	±100			ppm
Series resistance typ./max.	$R_S$	30 / 42	35 / 50	40 / 60	kΩ
Motional capacitance typ.	$C_1$	2.25	2.25	2.4	fF
Static capacitance typ.	$C_0$	0.9			pF
Drive level max.	P	1.0			μW
Insulation resistance min.	$R_i$	500			MΩ
Aging first year max.	$\Delta F/F$	±3			ppm
Turnover temperature	$T_0$	25 ±5			°C
Frequency vs. temperature	$\Delta F/F_0$	$-0.035 \text{ ppm}/^\circ\text{C}^2 (T - T_0)^2 \pm 10\%$			ppm

1) Other load capacitances on request.

2) Tighter and wider frequency tolerances on request.



**STANDARD FREQUENCIES**

Frequency
32.768 kHz

**ENVIRONMENTAL CHARACTERISTICS**

		Conditions	Max. Dev.
Storage temperature range		-20 to +70°C	
TW Operating temp. range		-10 to +60°C	
Shock resistance	ΔF/F	5000 g, 0.3 ms, ½ sine	±5 ppm
Vibration resistance	ΔF/F	20 g / 10–2000 Hz	±5 ppm

**TERMINATIONS AND PROCESSING**

Type	Termination	Processing
DS26-L3N	Can: Ni plated Leads: Straight leads SnCu plated	For through-hole mounting Wave or hand soldering Max. 230°C / 5 sec. leads only  
DS15-L3N		
DS10-L3N		

**ORDERING INFORMATION**

**DS10-L3N 32.768 kHz 8.2 pF ±30 ppm TW**

<b>Watch crystal</b>	_____	<b>Frequency <math>F_L</math></b>	_____
<b>Package size</b>	_____	<b>Load capacitance <math>C_L</math></b>	_____
26 = Ø 2.0 x 6.0 mm		7.0 pF	
15 = Ø 1.5 x 5.0 mm		8.2 pF	
10 = Ø 1.0 x 4.3 mm		9.0 pF	
<b>SnCu plated leads (Pb-free)</b>	_____	12.5 pF	
		Other $C_L$ on request	
<b>Straight leads</b>	_____	<b>Frequency tolerance</b>	_____
		±20 ppm	
		±30 ppm	
		±100 ppm	
		Tighter and wider freq. tolerances on request	
		<b>Temperature range</b>	_____
		<b>TW = -10 to +60°C</b>	

A unique part number will be generated for each product specification, i.e:	
20xxxx-BA01	1'000 pcs (in plastic bag)

All specifications subject to change without notice.



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