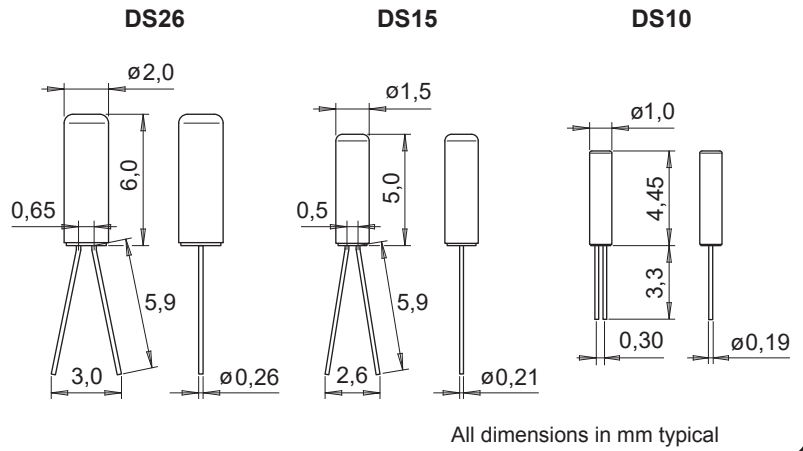




DIMENSIONS



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	
Watch crystal	Frequency F_L
Package size 26 = Ø 2.0 x 6.0 mm 15 = Ø 1.5 x 5.0 mm 10 = Ø 1.0 x 4.45 mm	Load capacitance C_L 7.0 pF 8.2 pF 9.0 pF 12.5 pF Other C_L on request
SnCu plated leads (Pb-free)	Frequency tolerance ±20 ppm ±30 ppm ±100 ppm Tighter and wider freq. tolerances on request
Straight leads	Temperature range TW = -10 to +60°C
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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