

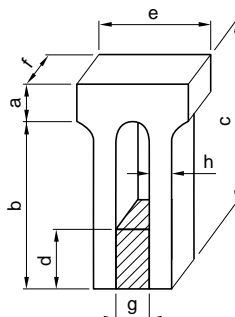
# Ferrite Cores

## For Ultrasonic Oscillator Magnetostriction Vibrators

## V2X Series


### FEATURES

- Due to high specific resistance, eddy current loss is very small.
- Electro-mechanical energy conversion efficiency is high(85 to 90%).
- Since a ferrite magnet is used, there is not necessary for DC bias.
- The magnet has excellent anticorrosive characteristics that permits to use in solvent such as acid, alkaline and others.



### APPLICATIONS

Ultrasonic cleaning, sonar, ultrasonic machining.

 denotes the ferrite magnet for DC bias.  
Designed to be used by inserting the ferrite magnet between legs.

### MATERIAL CHARACTERISTICS(V2 MATERIAL)

Temperature dependence of resonant frequency	$T_k$	(1/°C)	$17 \times 10^{-5}$	
Motional impedance	$Z_{m00}$	( $\Omega$ )	180	With 28kHz $\pi$ type at 4AT
Quality factor Q	$Q_m$		350	
Electro-acoustic efficiency	$\eta_0$	(%)	90	
Electro-mechanical coupling factor	K	(%)	18	
Maximum input power(water load)	$W/cm^2$		10	
Continuous input power(water load)	$W/cm^2$		3 to 5	
Electrical resistivity	$\rho$	( $\Omega \cdot m$ )	$\geq 1$	
Density	d	( $kg/m^3$ )	$5.1 \times 10^3$	With square pole specimen
Bending strength	P	( $N/mm^2$ )	107.9 to 127.5	
Thermal expansion coefficient	$\alpha$		$8 \times 10^{-6}/^\circ C$	
Curie temperature	$T_c$	(°C)	450	With toroidal specimen
Magnetic susceptibility	k	(emu)	$2.21 \times 10^{-7}$	
Magnetostrictivity	$\Gamma$		$2.5 \times 10^5$	
Activity ratio	$k\Gamma^2$		$9 \times 10^{10}$	With toroidal specimen at H=796A/m
Incremental permeability	$\mu\Delta$		35	
Propagation velocity	v	(km/s)	5.6	

Part No.	Nominal frequency(kHz)	Resonant frequency(kHz)	Dimensions(mm)								Weight(g)
			a	b	c	d	e	f	g	h	
V2X $\pi$ 20	20	19.5±0.4	18	114	132±3	26	51±1	25±0.5	14	13	555
V2X $\pi$ 28(A)	28	28.5±0.4	14	74	88±3	18	40±1	20±0.5	11	9	240
V2X $\pi$ 40(A)	40	40.5±0.8	12	50	62±2	18	40±1	20±0.5	11	9	179
V2X $\pi$ 50	50	50.5±0.8	12	37	49±2	18	40±1	20±0.5	11	9	146
V2X $\pi$ 75(A)	75	75±1.6	6.5	26	32.5±2	12	27±1	13±0.5	7.7	6	40
V2X $\pi$ 100	100	100±1.6	5	20	25±2	9	21±1	10±0.5	5.5	4.5	17

- Appended to the product number is our control code.

### RESONANT FREQUENCY DEVIATION AND COLOR INDICATION

Unit:kHz

Frequency rank	Nominal resonant frequency					
	20kHz	28kHz	40kHz	50kHz	75kHz	100kHz
1	19.1 to 19.2	28.1 to 28.2	39.7 to 39.9	49.7 to 49.9	73.4 to 73.8	98.4 to 98.8
2	19.2 to 19.3	28.2 to 28.3	39.9 to 40.1	49.9 to 50.1	73.8 to 74.2	98.8 to 99.2
3	19.3 to 19.4	28.3 to 28.4	40.1 to 40.3	50.1 to 50.3	74.2 to 74.6	99.2 to 99.6
4	19.4 to 19.5	28.4 to 28.5	40.3 to 40.5	50.3 to 50.5	74.6 to 75	99.6 to 100
5	19.5 to 19.6	28.5 to 28.6	40.5 to 40.7	50.5 to 50.7	75 to 75.4	100 to 100.4
6	19.6 to 19.7	28.6 to 28.7	40.7 to 40.9	50.7 to 50.9	75.4 to 75.8	100.4 to 100.8
7	19.7 to 19.8	28.7 to 28.8	40.9 to 41.1	50.9 to 51.1	75.8 to 76.2	100.8 to 101.2
8	19.8 to 19.9	28.8 to 28.9	41.1 to 41.3	51.1 to 51.3	76.2 to 76.6	101.2 to 101.6

- The resonant frequency deviation is color coded. When two or more units are used as a set, those having the same color should be combined.

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Magnetostriction Vibrators

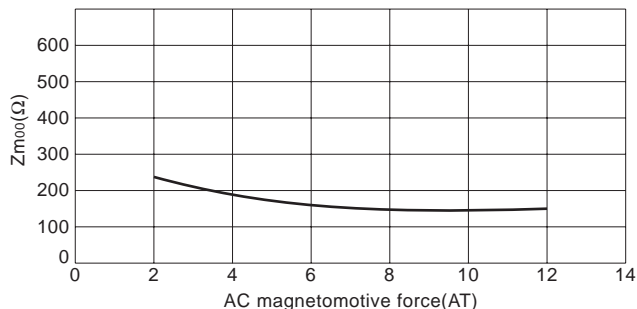
# V2X Series

## ELECTRICAL CHARACTERISTICS

### MOTIONAL IMPEDANCE BY AC MAGNETOMOTIVE FORCE

Winding number: 40Ts/leg

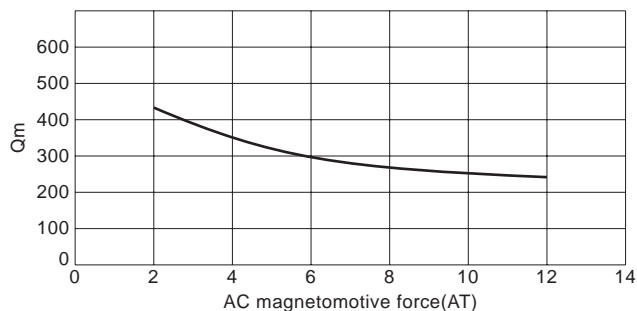
Winding width: 25mm



### QUALITY FACTOR Q BY AC MAGNETOMOTIVE FORCE

Winding number: 40Ts/leg

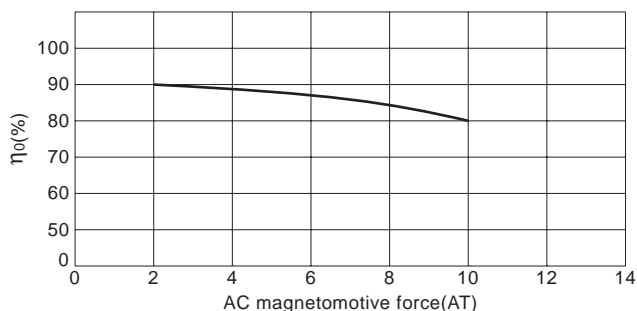
Winding width: 25mm



### ELECTRO-ACOUSTIC EFFICIENCY BY AC MAGNETOMOTIVE FORCE

Winding number: 40Ts/leg

Winding width: 25mm

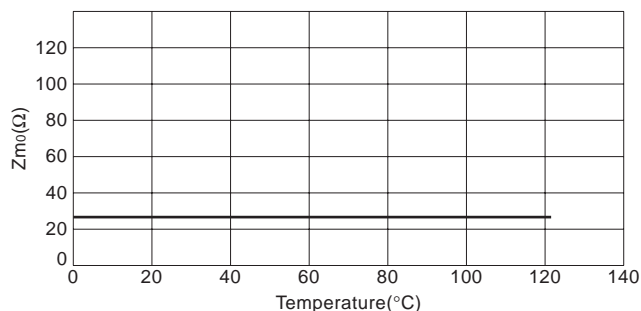


### TEMPERATURE CHANGE OF $Z_{m0}$

Measure underwater of the radiating surface

Water temperature: 20°C

Winding number: 40Ts/leg



### CHANGE BY $Z_{m0}$ AMPLITUDE BY VIBRATION

Measure underwater of the radiating surface

Winding number: 40Ts/leg

