



# Product specification

The **DCS1-050539** piezoelectric stack consists of multiple chips which are bonded via epoxy. It offers a maximum displacement of 44.8  $\mu\text{m}$ . The red wire of the electrode serves as the positive terminal (+), and the black wire is the negative terminal (-).

**DCS1-050539**

## Performance Parameters

Drive Voltage Range	-15~75 V	Capacitance	16.5 $\mu\text{F}$ $\pm$ 15%
Displacement (Free Stroke) at 150 V	44.8 $\mu\text{m}$ $\pm$ 15%	Dissipation Factor	<2.3%
Hysteresis	<15%	Resonant Frequency	30kHz
Stiffness	22 N/ $\mu\text{m}$	Blocking Force at 150 V	1000N
Curie Temperature	230 $^{\circ}\text{C}$	Operating Temperature	-25 ~ 130 $^{\circ}\text{C}$
Product Size	L: 5.0mm	Outer Dimensions	L: 5.2 $\pm$ 0.2mm
	W: 5.0mm		W: 7.1 $\pm$ 0.2mm
	H: 39.0mm		H: 39.8 $\pm$ 0.1mm

- All specifications are quoted at 25 $^{\circ}\text{C}$ , unless otherwise stated.
- The displacement may vary slightly for different loads, and the maximum displacement occurs when used with the recommended load.

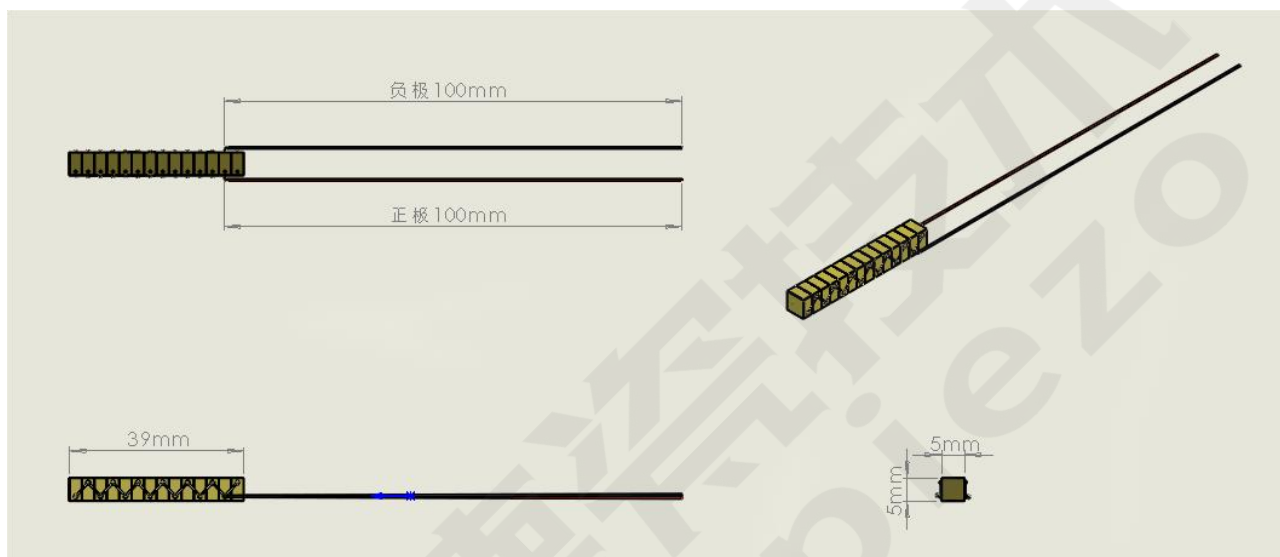
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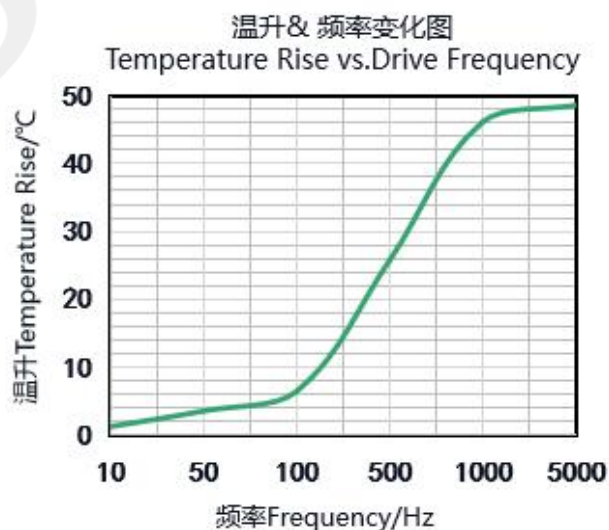
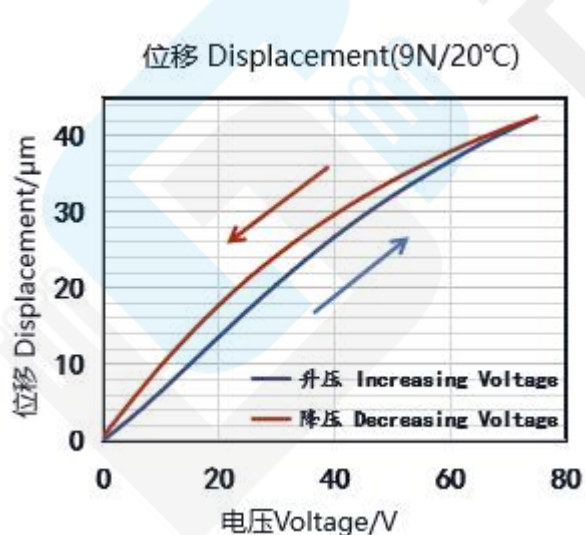


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## Product Size



## Performance Curve



- These temperature rises were measured after applying a sine-wave drive voltage ranging from 0 to 75V at the specified frequency for 10 minutes.

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## Matters Needing Attention

### 1. Storage Conditions & Precautions:

Temperature:  $<50^{\circ}\text{C}$ , Humidity:  $<40\%\text{Rh}$ . Avoid impact and compression. Store in vacuum-sealed bags for long-term preservation. When not in use, connect to a resistive discharge ( $\geq 100\text{k}\Omega$ ) or short-circuit (for low-capacitance ceramics).

### 2. Operating Conditions & Precautions:

Temperature: Maximum operating temperature  $\leq 130^{\circ}\text{C}$  (preferably  $<60^{\circ}\text{C}$ ). Add heat dissipation measures if temperature exceeds  $80^{\circ}\text{C}$ .

Humidity:  $<50\%\text{Rh}$ . In high-humidity environments, preheat at low voltage before use to avoid creepage discharge.

Dust Avoidance: Dust adhesion on ceramic surfaces may reduce insulation resistance.

Clearance: Maintain a gap  $>1.6\text{mm}$  between ceramics and other conductors.

Safety: Do not immerse piezoelectric stacks in organic solvents or expose to flammable gases/liquids.

### 3. Assembly Precautions:

Polarity: Red wire = positive (+), black wire = negative (-). Reverse polarity may cause mechanical failure.

Handling: Handle with care to avoid impact. Wear gloves to prevent oil contamination.

Fit Tolerance: Assemble with clearance fit first, then tighten. Avoid interference fit to prevent ceramic compression.

Electrostatic Protection: Maintain  $>1.6\text{mm}$  gap between ceramics and metal parts to avoid static discharge.

Adhesive Bonding: Ensure flat bonding surfaces and remove excess glue to minimize contamination.

Soldering: Limit contact time under high temperature to  $<1$  second to protect ceramics and coatings.

High-Temperature Assembly: Control temperature  $<120^{\circ}\text{C}$  to prevent depolarization, adhesive failure, or coating damage.

### 4. Preload Instructions:

Load Application: Apply external load to the center of the stack or distribute uniformly on the

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mounting surface. Ensure contact surfaces are flat and smooth.

Force Direction: Piezoelectric stacks can only withstand axial forces. Shear or torsional forces may cause mechanical failure.

Preload Force: Preload should not exceed 40% of maximum blocking force, and its direction must align with the motion axis to minimize shear stress.

