PIEZO TECH

PiezoElectric Technology Co.,Ltd.

(주)피에조테크놀리지

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PIEZOELECTRIC TECHNOLOGY

- TULA series
- BuPLM series
- PUC series

(주)피에조테크놀리지
PIEZOELECTRIC TECHNOLOGY CO., LTD.

Welcome to Piezo Tech!

This is a representative director, Seong-il, Yoon who takes the enormous responsibility for the company in running business.
Above all, I express my deep gratitude to you for visiting our homepage. Our piezo- tech , the word which was last 2000 a ultrasonic motor from the Republic of Korea which was unfamiliar, solely founded the company with only confidence and the belief against a technical power.

Until we've industrialized the ultrasonic motor at the domestic beginning and put out , we were in trouble . But we keep going our way.

Our piezo-tech which was feeble at first, we will be a leading company in the future.
We do our best for our future from C.E.O to all employees. With quality and technique of the best in the world , we pursue investment of positive R&D field to lead rather than the profit which is visible immediately in close at hand, and will return customer's favor.
Please watch the figure we grow in the future

C.E.O Seong-il, Yoon
Piezoelectric Technology Co., Ltd.

Piezoelectric Technology History

Piezoelectric Technology History

2000.11 Piezoelectric Technology Co., Ltd. was established
2001.07 Certified " Venture company" (SMBA, 2001112571-6881)
2001.08 Selected "INNO -BIZ" enterprise by SMBA of Government
2001.10 Awarded the Minister's prize of Ministry of commerce, Industry and Energy, Korea for Piezoelectric Ultrasonic Motors as the very best product

2002.04 Laboratory(R&D center)established, and certified by the government
2002.12 Acquired "NT"(New Technology) mark from KITA
2003.07 Selected "Export promising enterprise" by SMBA
2004.05 Developed TULA(Tiny Ultrasonic Linear Actuator)
2004.05 Designated as "Professional enterprise in parts and material industry" by Ministry of Commerce, Industry and Energy.

2005.05 Acquired "QS9000" Mark (Product quality management system) from KOTRIC
2005.06 Selected as a accomplishment enterprise in "Korea Materials and Components in dustry developing project" by Ministry of Commerce, Industry and Energy

2006.03 Registered for "Foreign Direct Investment Company" by Woori bank (registration No:22218)
2006.06 Launched TULA50-165 Mass-production for DSC (Digital Still Camera of Samsung)

2007.04 Developed "Linear Actuator of Butterfly Type"
2007.06 Registered as a S-Partner certified supplier from Samsung Techwin (KSTW07-1061)
2007.08 Acquired a certificate of ISO9001 Quality Management System
2007.08 Acquired a certificate of ISO14001 Environmental Management System
2007.10 Awarded "Most Excellent Prize" with TULA in the 12th Contest of Excellent Development of Electronic Parts

2008.10 US Patent for TULA(No.14-240758)
2008.10 Acquired CE Certificate for "10W Ultrasonic Cutter" (PUC 10W)
2008.12 Selected as TULA- "30 Excellent Successful Cases of Technology Development" by Korea Institute of Industrial Technology Evaluation and Planning

2009.09 Acquired NEP(New Excellent Product) Certification by Ministry (Ministry of Knowledge Economy, NEP-MKE-2009-030)

PRODUCT LINE

- **TULA Series**

  Tiny Ultrasonic Linear Actuators

  TULA35
  TULA50
  TULA70

- **BuPLM Series**

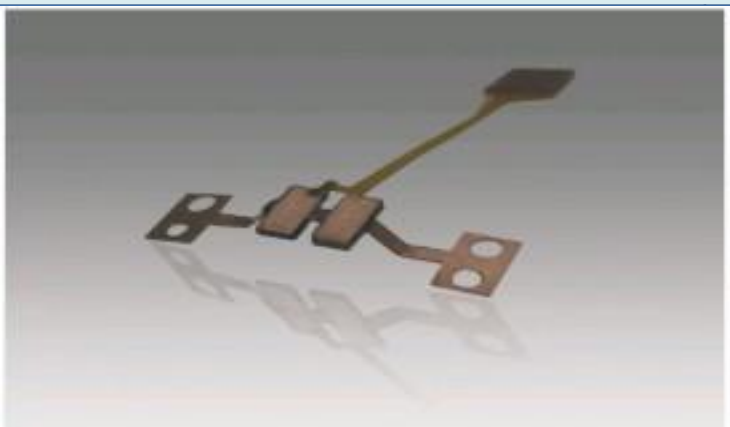
  Butterfly typed piezoelectric Linear Motor

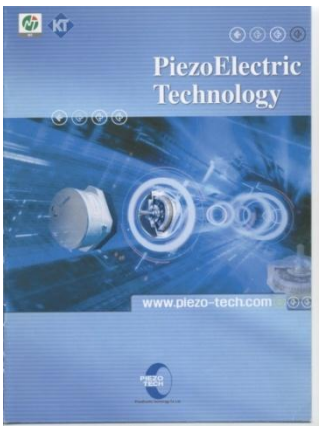
  BuPLM13
  BuPLM24
  BuPLM36
  BuPLM48

- **PUC Series**

  Piezoelectric Ultrasonic Cutters

  PUC10
  PUC15
  PUC100

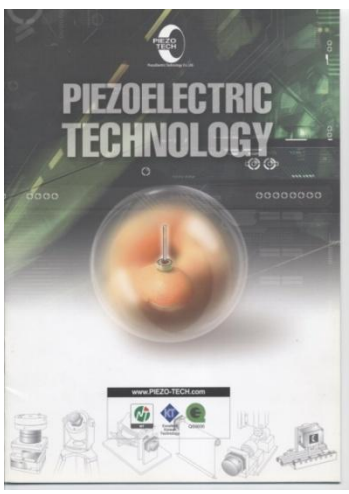


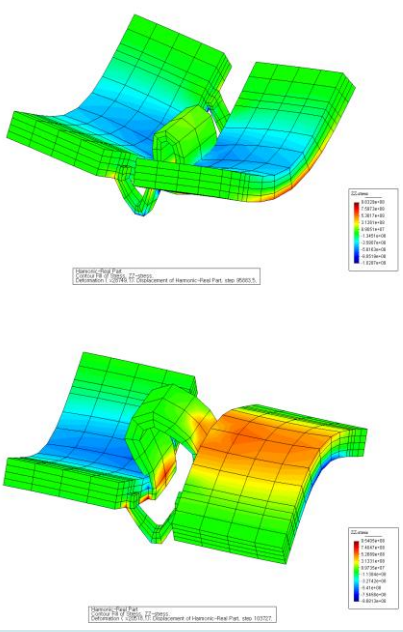


PIEZOELECTRIC ULTRASONIC MOTOR

PIEZOELECTRIC EFFECT

Piezoelectic effect is an appearance of an electric potential across certain faces of piezoceramics when it is subjected to a mechanical pressure.
The word originates from the Greek word “piezein”, which means “to press”.
A piezoelectric substance is one that produces an electric charge when a mechanical stress is applied (the substance is squeezed or stretched).
Conversely, a mechanical deformation (the substance shrinks or expands) is produced when an electric field is applied.

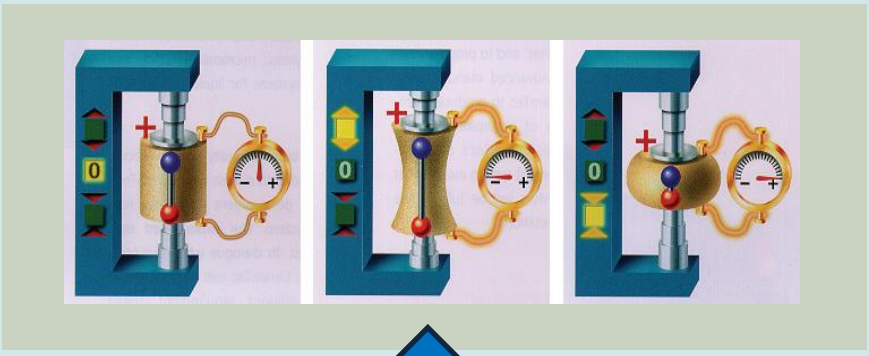




Piezoelectric effect

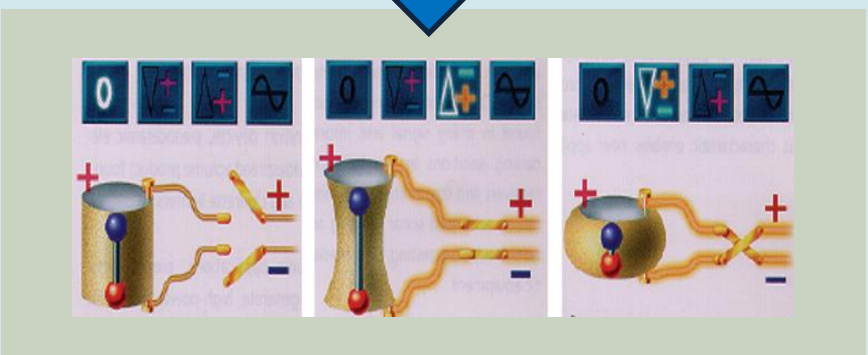
Direct piezoelectric effect

Pi = dijkTjk



Inverse piezoelectric effect

Sij = dkijEk

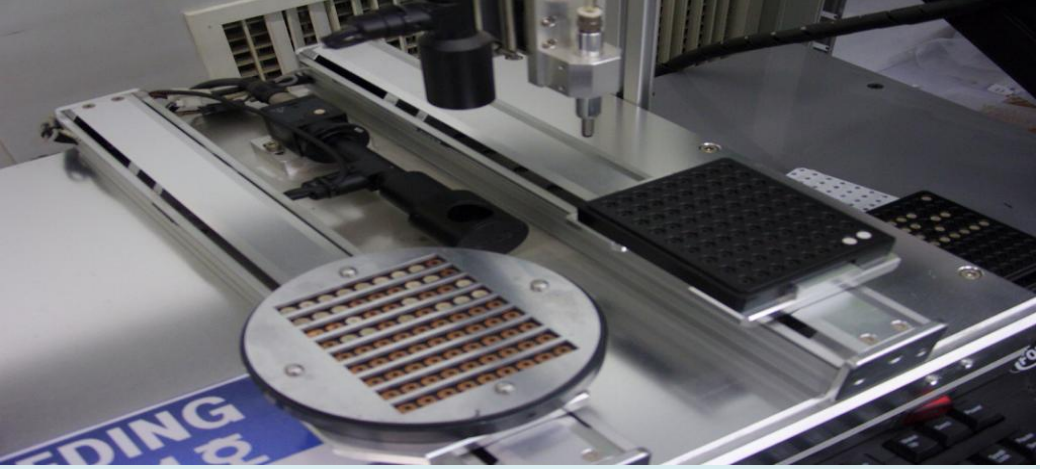


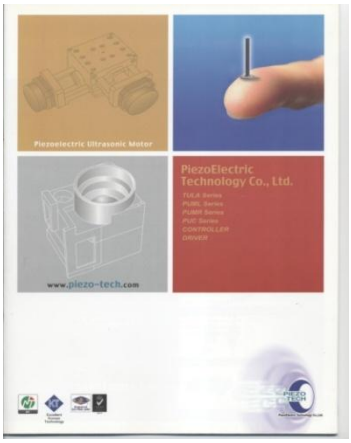
OPERATING PRINCIPLE

Energy Conversion : Two step processes

1st step : Electrical energy to oscillatory vibration motion

2nd step : Vibration motion to linear or rotary motion





TULA(Tiny Ultrasonic Linear Actuator)

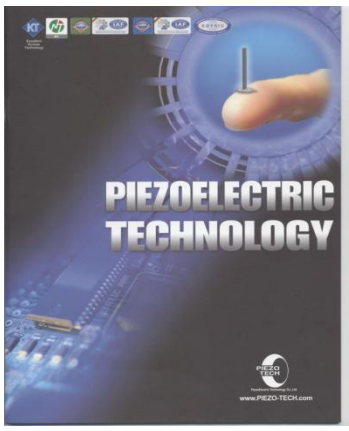
Next generation actuator driven by linear motion of unimorph or bimorph piezoelectric body.

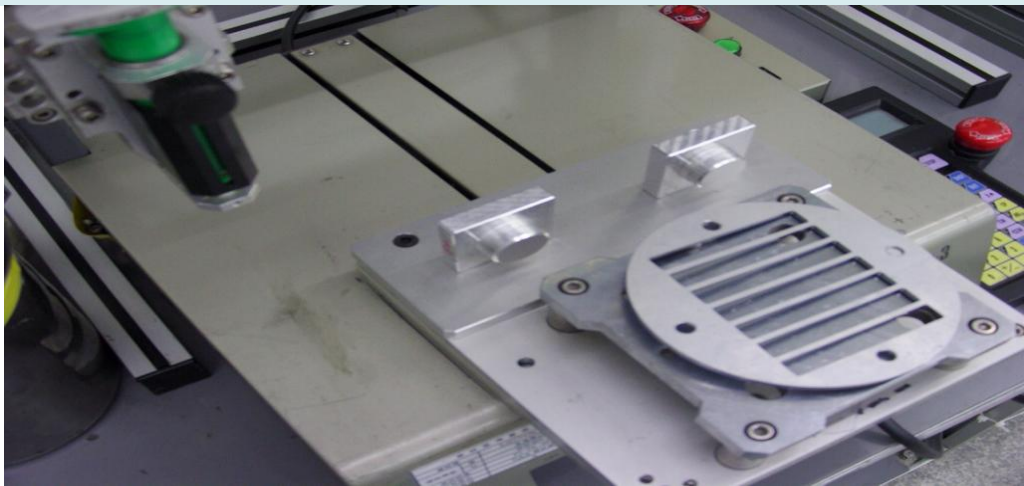
TULA X X – □□□

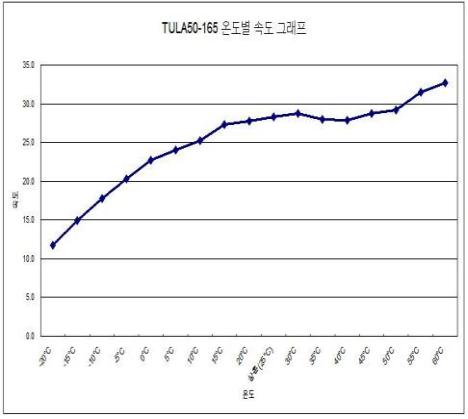
- The diameter of piezoelectric ceramic
- The length of the rod

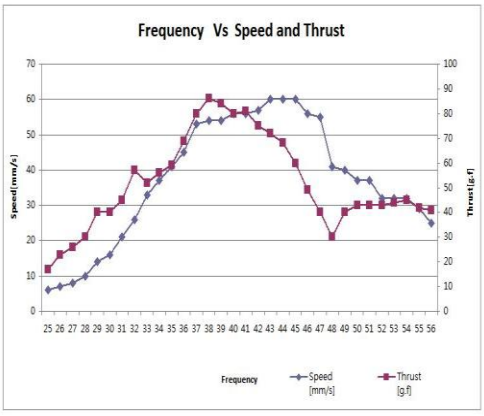
FEATURES

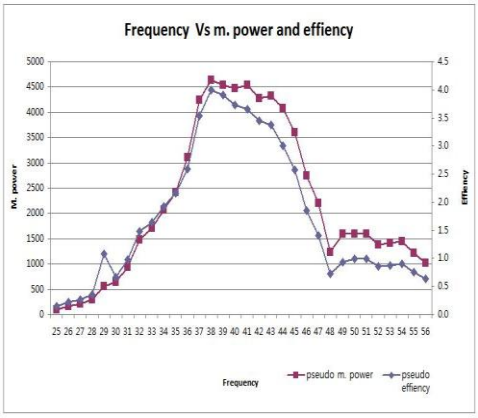
- Very small size, light weight and simple structure
- Variable stroke
- Quick response
- Intrinsic holding force
- Excellent controllability
- Fine positioning / High resolution
- Quiet operation
- No EMI



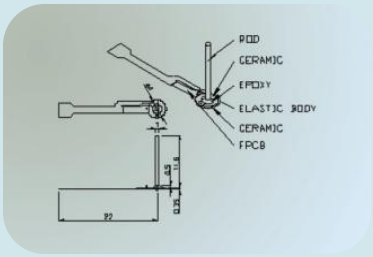




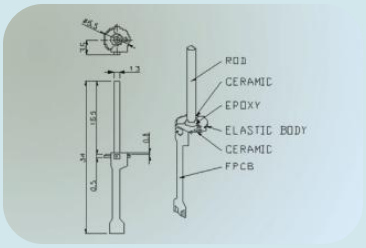




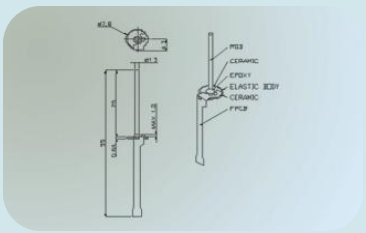
PRODUCT LINE UP



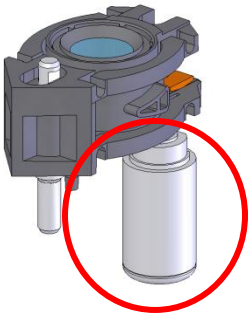
TULA35-116
Low power consumption Mobile & hand-held appliance
- Speed : <20
- Thrust : <20
-Power consumption : <300

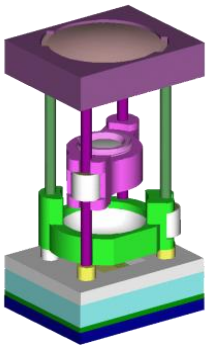


TULA50-165
Applicable to wide-range commercial & industrial equipment
- Speed : <40
- Thrust : <40
- Power consumption : <500



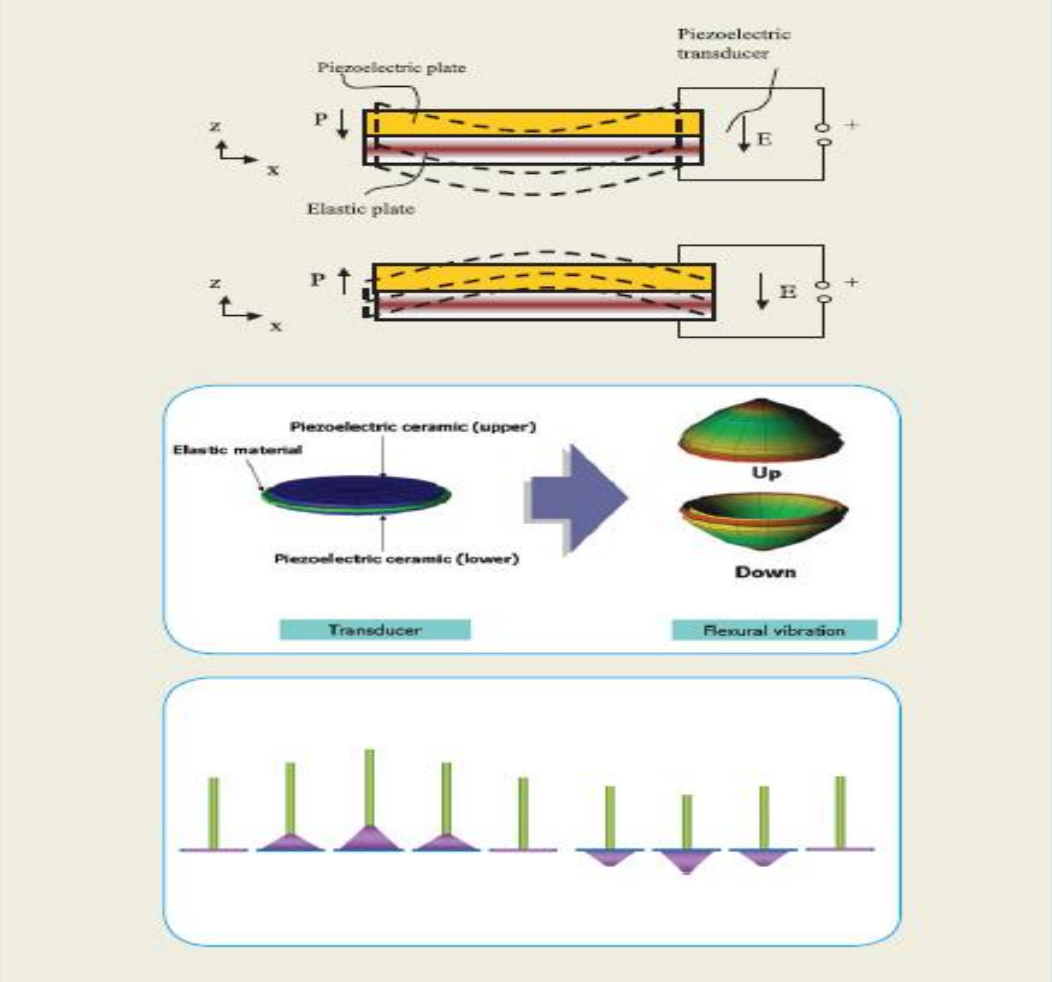
TULA70-250
High mechanical power Precisive linear stage for industrial equipment
- Speed : <50
- Thrust : <100
- Power consumption : <1500

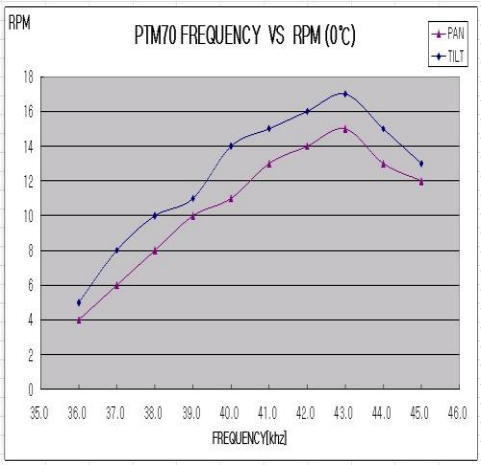


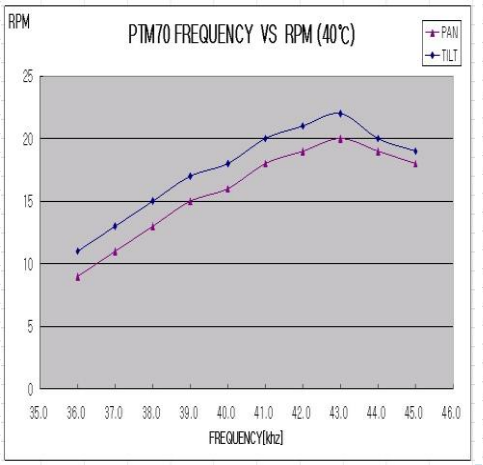


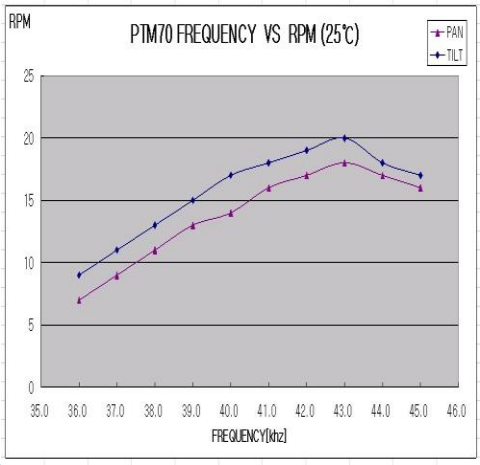
OPERATING PRINCIPLE

The operating principle of the TULA is explained by the characteristics of the piezoelectricity and Newton's first law.
In other words, the TULA exploits the vibration modes of the piezoelectric ceramics, the inertia principle and the friction of the moving part.



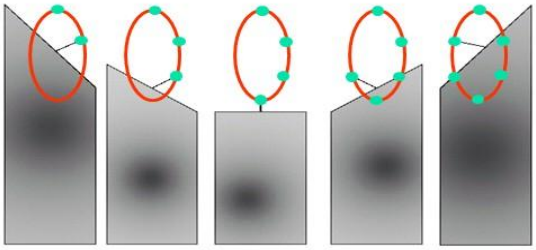


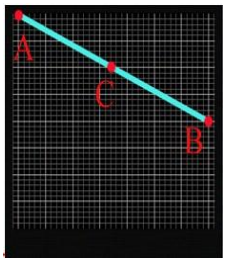


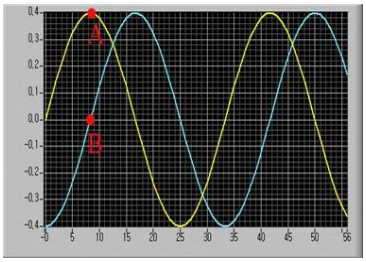


SPECIFICATION

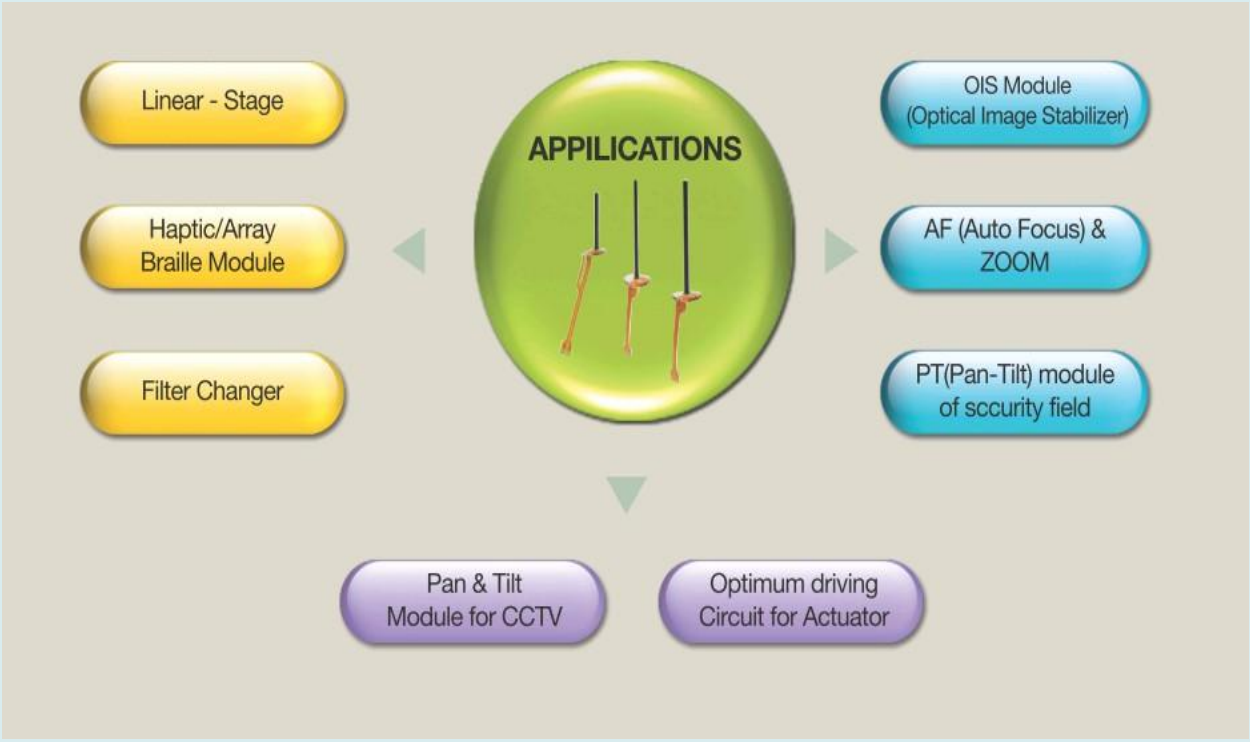
SPECIFICATION			TULA35	TULA50	TULA70
Mechanical Property	Transducer	Thickness(mm)	<0.4	<0.5	<1.0
		Diameter(mm)	4.0	5.5	7.6
	Rod	Length(mm)	<20	<24	<40
		Diameter(mm)	1.0	1.3	1.5
	Speed	(mm/s)	<20	<40	<50
	Thrust	(g·f)	<20	<40	<100
	Stroke	(mm)	3～11	3～ 20	3～30
Electric Property	Driving voltage	(V)	10～35	15～35	25～35
	Driving frequency	(kHz)	80～130	65～75	25～60
	Power consumption	(mW)	<300	<400	<1500
Environmental Property	Operating Temp.	℃)	-10～50		
	Storage Temp.	(℃)	-20～80		
	Relative/Humidity	%	15～90		



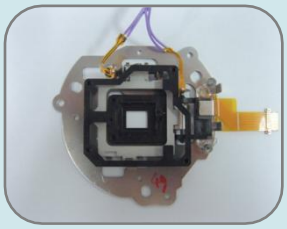




APPILICATIONS

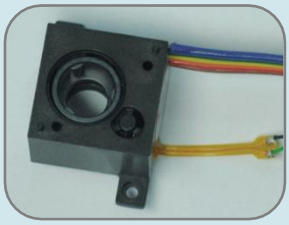


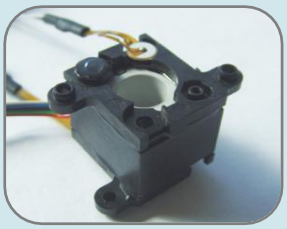
OIS Module



- Digital camera
- Mobile phone

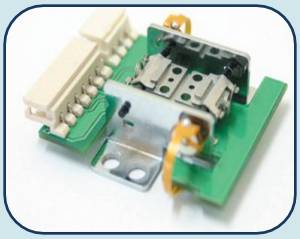
AF Module



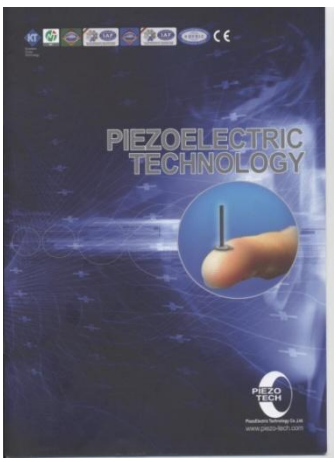


- Barcode reader
- Digital camera
- Mobile phone camera

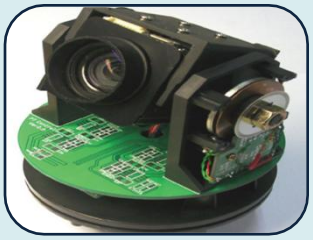
Linear -stage



- Optical equipment
- Lens inspector

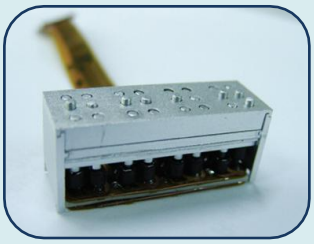
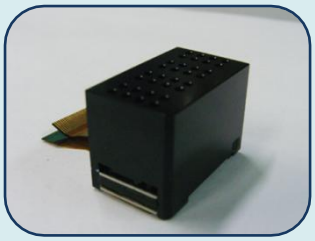


Pan & Tilt Module for CCTV & Web Cam



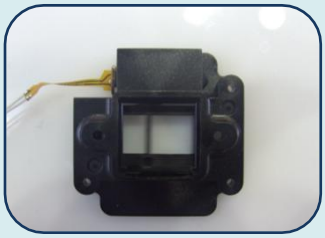
- CCTV camera

Braille Module

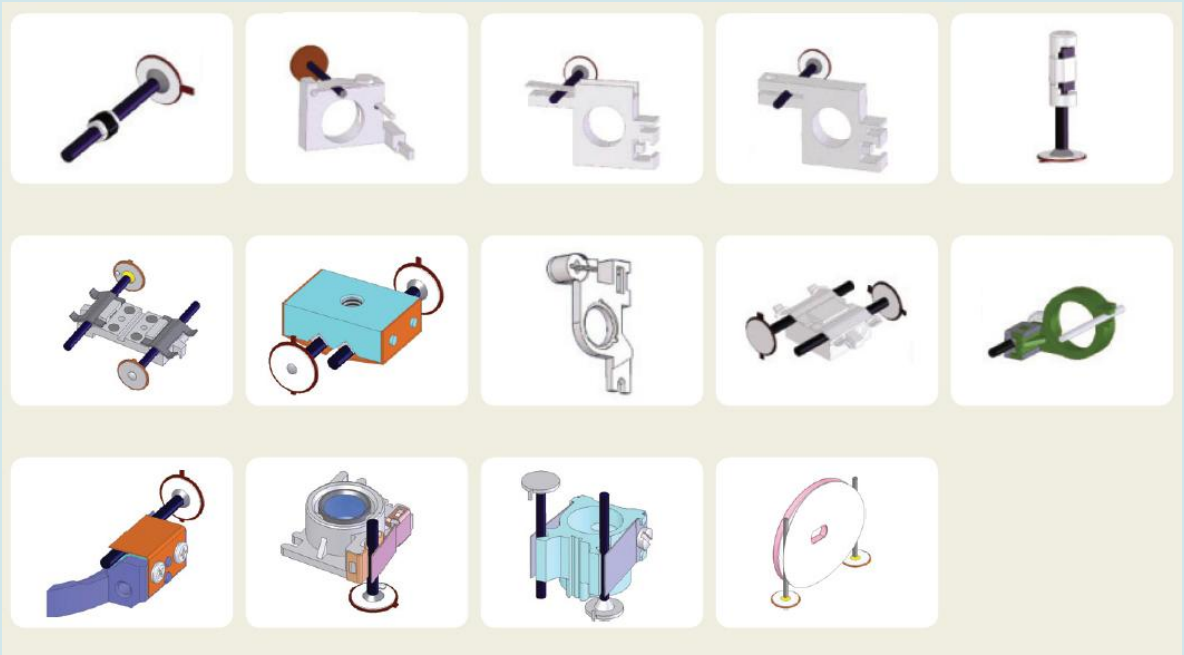
- Various Braille Module

IR Filter changer



- IR Filter Changer for CCTV


MOVING ELEMENT EXAMPLE



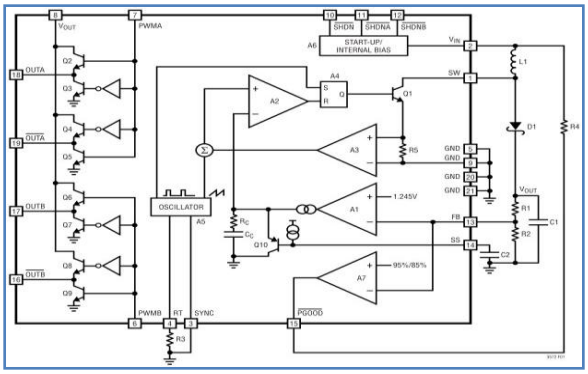


TULA EV-KIT(TULA Evaluation Kit)

The TULA EV-KIT helps the user to understand the basic characteristics of the TULA by changing the duty ratio, driving voltage and driving frequency.
The purpose of the TULA EV-KIT is to assist the development of user's application with TULA.

FEATURES

- Variable driving frequency
- Variable duty ratio
- Variable turnover time
- The position sensing with MR sensor
- USB interface
- LCD display (option)
- Key button inputs(option)

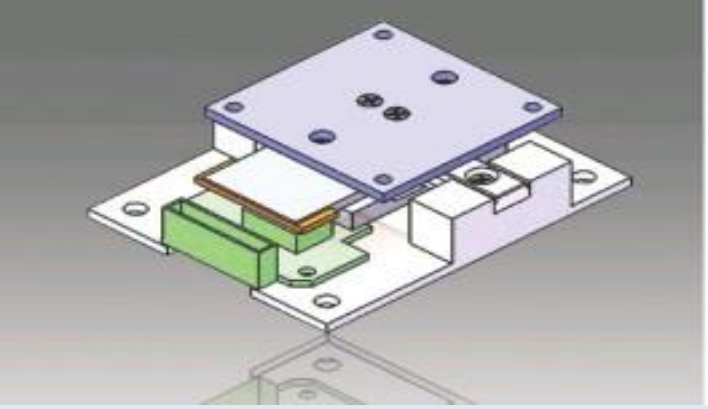



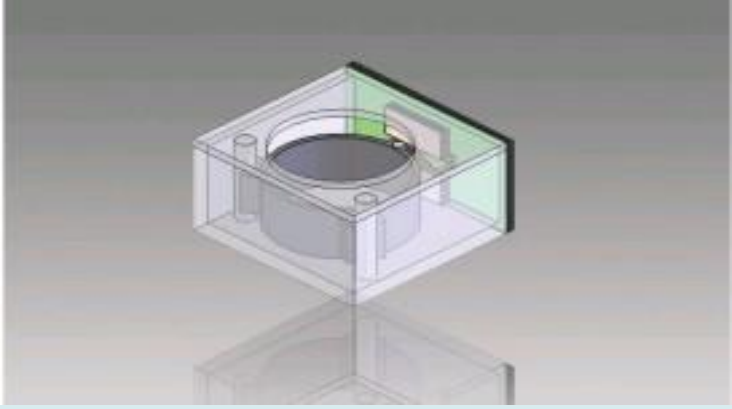
LT3572

The Linear Technology has developed the driving IC for TULA series.

FUNCTIONS

- 2.7V to 10V input voltage range
- 900mA boost converter
- Dual 500mA piezo drivers
- Up to 180kHz PWM frequency
- Programmable switching frequency from 500kHz to 2.5MHz
- Synchronizable up to 2.5MHz
- Soft-start
- Separate enable for each piezo driver and boost converter
- Available in a 4mm X 4mm 20-Pin QFN package





BuPLM(Butterfly typed Piezoelectric Linear Motor)

BuPLM consists of two flexural mode of piezoelectric actuators, coupling tip and moving element.

OPERATING PRINCIPLE

- BuPLM is elastically pressed together in order to ensure frictional contact with slider
- Combination of two flexural vibrations with 90 degree phase difference
- Coupling tip which connect the transducers makes the elliptical displacement

FEATURES

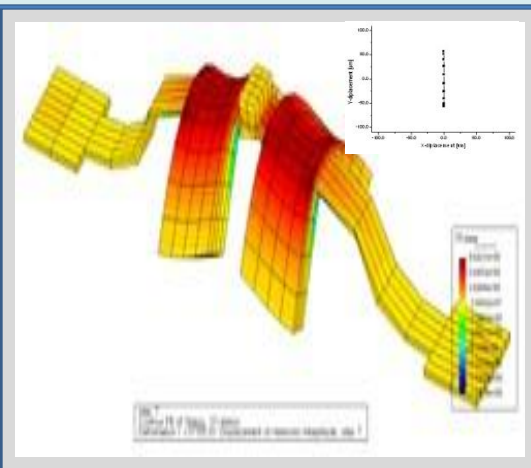
- High resolution
- Unlimited stroke
- Direct drive
- Dynamic range of velocity
- Low Profile
- Compact and simple system design
- Superior “ Move and settle” time

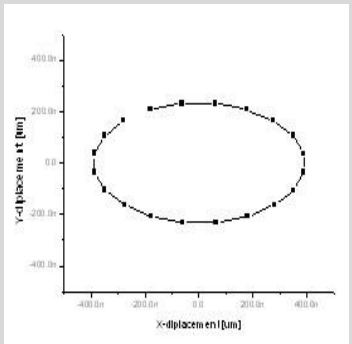
APPILICATIONS

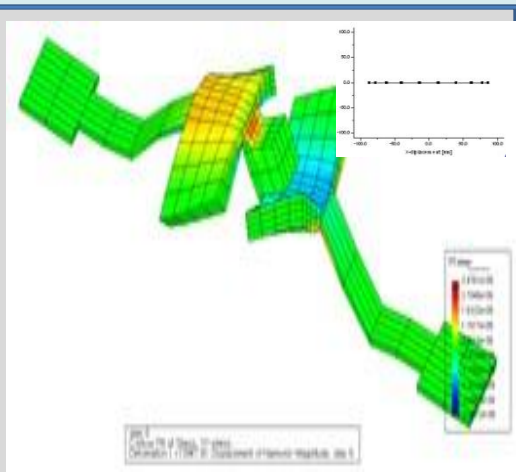
- Micro-, Nano positioning
- Semiconductor handing system
- Precision lathe machinery, robotics for FA
- AF camera module
- Other driving system for industrial equipments

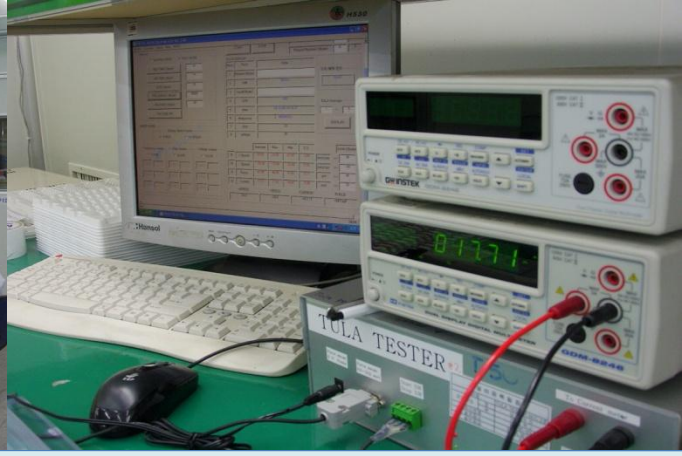
SPECIFICATIONS

ITEM	BX01
Operating frequency (KHz)	60 ~ 90
Input voltage (VDC)	24
Driving voltage (Vrms)	80
Holding force (N)	7 ~ 8
Thrust (N)	5
Max. speed (mm/s)	92
Resolution (nm)	50
Operating Temp.(oC)	0 ~ 50
Size (L * W * H)(mm)	40 x 51 x 11









PUC(Piezoelectric Ultrasonic Cutter)

PUC is advanced cutting (welding) machine using the ultrasonic vibration.
PUC series are divided into three models: PUC10, PUC15 and PUC100

PUC X X
└→The ultrasonic power output

OPERATING PRINCIPLE

The PUC uses BLT(Bolt-tightened Langevin Transducer) as a driving source with an elastic body. The BLT is designed to maximize the longitudinal vibration by clamping the bolt.
Multiple PZT are sandwiched by the metal overlay with the BLT, which generates longitudinal μm-level
vibration at the resonant frequency (20 ～50kHz). Using horn, this displacement is
amplified by several tens times, and finally μm-level displacement is excited at the blade tip.

FEATURES

· Possible to cut special fabrics
· Neat cutting plane
· Melting and adhesion
· Easy to use
· Compact design and light weight

PUC10/15

PUC100

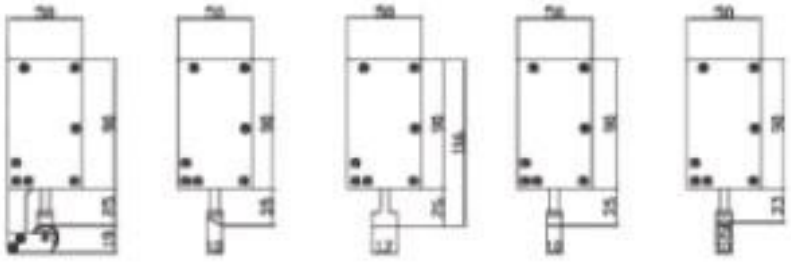
SPECIFICATION

ITEM	PUC15	PUC200
Frequency (kHz)	28~35	30~33
Current (A)	0.5~0.7	1.0
Input voltage (V)	DC24	AC 220
Driving voltage (V)	600	600

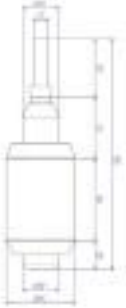
APPILICATIONS

Cutting and melting of fabrics (textile), clothes, label, vinyl, plastic film, rubber etc.

BLADE TYPE



PUC10/15



PUC100