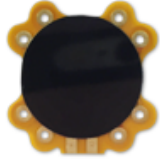


FSR Sensor Data Sheet

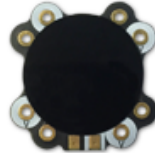
产品目录



RA18
18mm x 30mm



RA18-DIY
18mm x 18mm



RA18P-DIY
18mm x 18mm



QA6P
6mm x 11mm



RA9P
9mm x 12mm



RA12P
12mm x 14.15mm



RA30P
30mm x 32mm



RA3040P
46mm x 33mm

产品介绍

该文件对Marveldex的6款1通道FSR传感器的规格进行了说明。每种规格的传感器都拥有不同的大小和外观。基板也分为FPC或PCB两种类型。每个传感器的外观虽然多少有些不同，但都具有共同的固定特征，即电阻与与按压力量成反比。

利用该特性构建典型ADC测定回路时，能够获得与力量大小成反比的电压功率。利用该特性可以提供触控解决方案或工业用解决方案。适合开发平整度检测机、加压解决方案、减压解决方案或者对特定重量起反应的应用产品。但由于没有线性，因此可能不适合秤等定量性产品。

使用方法

为了得到本文件提供的传感功率图表上一样的功率，需要营造尽可能与本测试中一样的环境条件。也就是说，按的部位（促动器，Actuator）的宽度和材质，方向的误差应低于 $5\mu\text{m}$ 。即使满足了器具的条件，还是有可能因为温度、湿度以及制作LOT的不同，出现功率值的偏差。可以在本文件中举例的回路图中相当于Rc的位置上安装可变电阻，通过调整可变电阻修正偏差。

本文件中介绍的传感器中有对传感比较敏感的部分（Prime sensing zone），不能进行传感的部分（Dead zone），以及中间区域，即干涉区（Intermediate zone），应尽可能瞄准Prime sensing zone并施加力量。

将传感器连接到驱动板时，有焊接的方法和打结的方法。传感器连接部位的孔是为了给电线打结提供的孔，能够提高组装的方便性。传感器的端口中，标示为“V”的都在内部互相连接着。同样的，标示为“A”的端口都在内部互相连接着。连接电线时，只需选择最容易连接的端口就可以。

部位编号说明。

R A 18 P - DIY

- DIY : Sensors has intenal connected holes for wire knots
- Material of circuit part. P: PCB, None : FPC
- Size. Pi or length of side. (exception : 3040 is 30mm and 40mm)
- Version (A, B, C, ...)
- R : Round, Q : Quadrangle

Sensor Characteristics

Typical Performance

Unit	Description
Response time	< 10 μ sec
Operating temp	-20 $^{\circ}$ C ~ 60 $^{\circ}$ C
Storage temp	-30 $^{\circ}$ C ~ 60 $^{\circ}$ C
Operating Humidity	$\leq$ 90%
Durability	2,000,000 stroke (100g) or over 500,000 stroke (150g)
Drift	< 5% per logarithmic time scale by constant load of 100g
Electric crosstalk (noise)	None
Power consumption	Consumes only while operating. Typically around 5mA, and maximum 20mA.
Resistance output range	∞ ~ 200 Ω
Sensing range	5g ~ 4kg

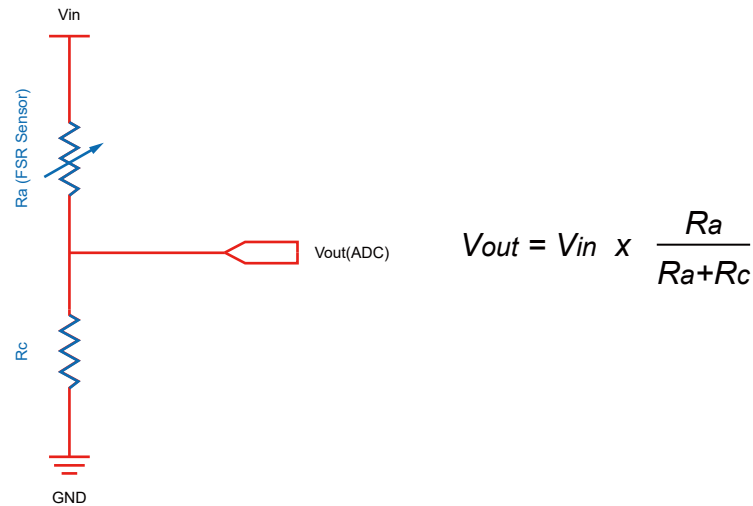
Tolerance

Unit	Description
Mechanical tolerance	$\leq$ 50 μ m
Temperature influence	$\leq$ 10%
Humidity influence	$\leq$ 20%
Output tolerance	Max 20%

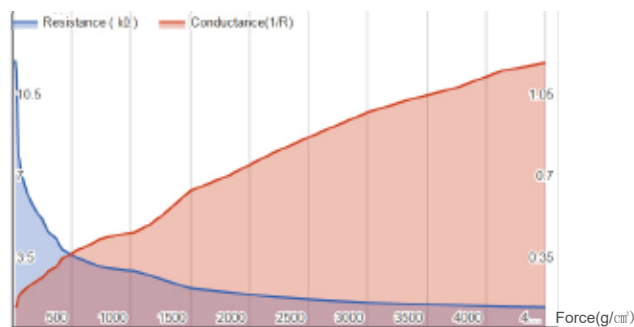
Application Information

想查看功率时，只需用万用表检测电阻即可。或者也可以构建ADC回路，检测与电阻的倒数成正比的值（电导，Conductance）。

若按如下方法构建简单回路，即可根据右侧的公式得出功率值。回路图上，Ra是FSR传感器的电阻，Rc是下拉电阻。

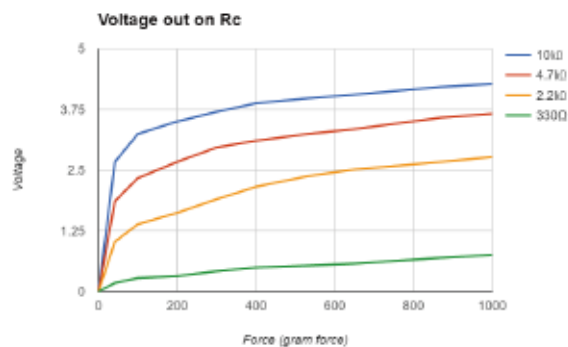


功率值应该呈现与如下图表相似的形态。蓝色是传感器的电阻值，红色是电阻值得倒数（电导）。从回路中得出的ADC功率值呈现与蓝色图表类似的样子。



查看电导图表就可以发现，50g以下时倾斜度较高，500g以上时倾斜度较低。更改Rc电阻值，图表就会变成如下形态。

若增加Rc值，较低重量的分辨率会提高，反之减少Rc值，较高重量的分辨率就会提高。

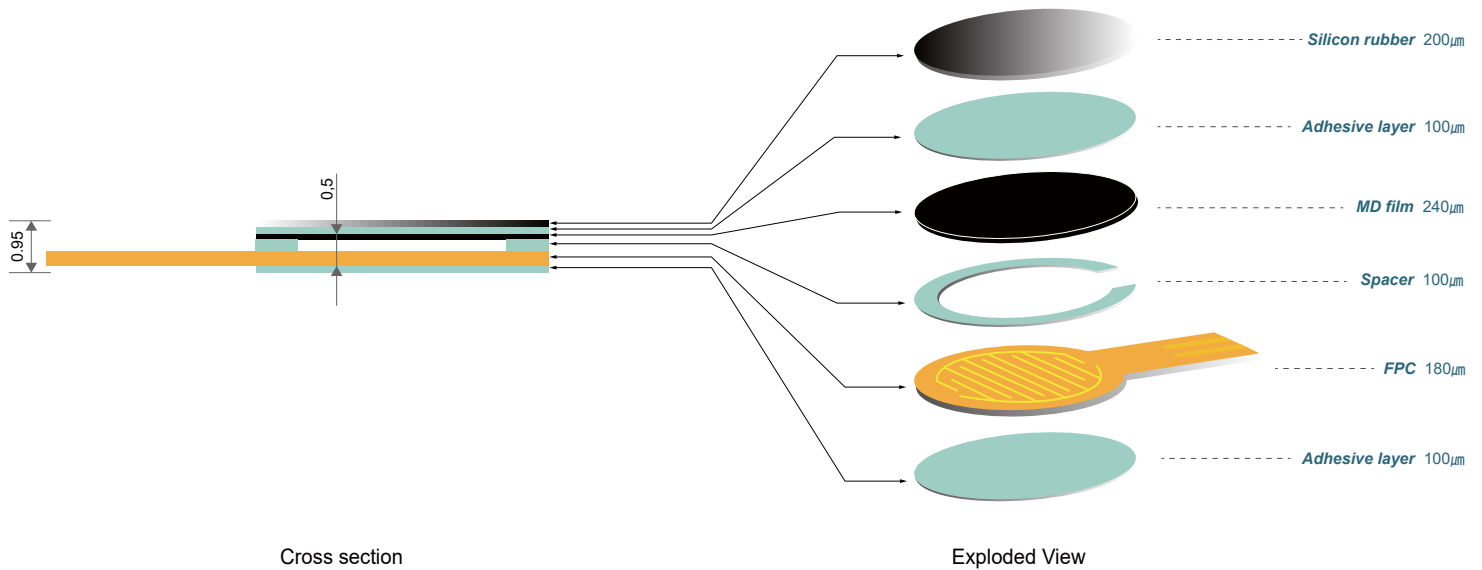
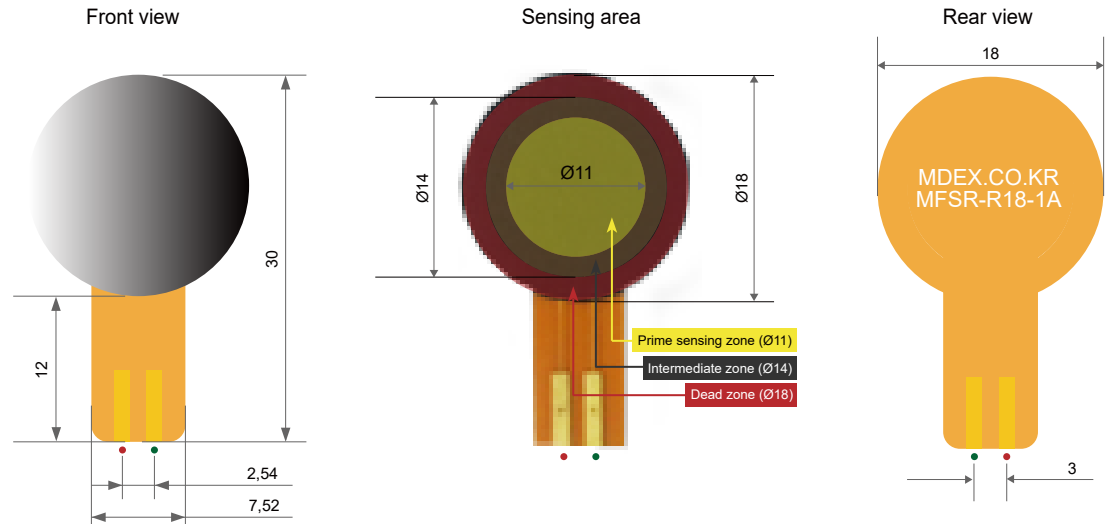


Model RA18

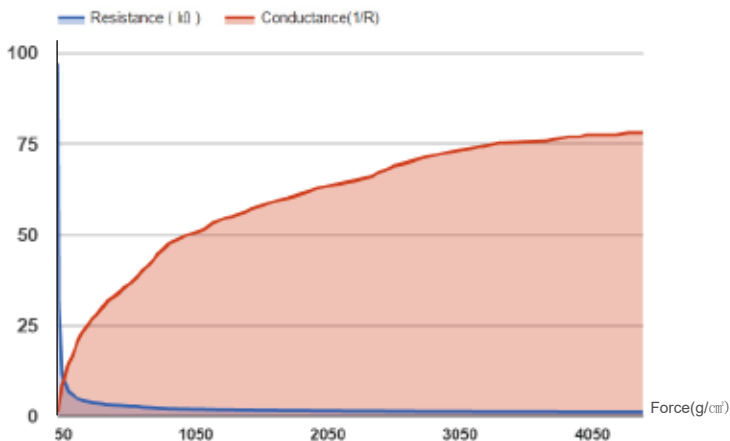
Model RA18

Unit	Description
Length	30mm
Width	18mm
Thickness	0.95mm
Sensing area	11mm
Sensing range	5gf ~ 4Kgf
Pin	Vin ● ADC out ●
Actuator layer	Silicon rubber

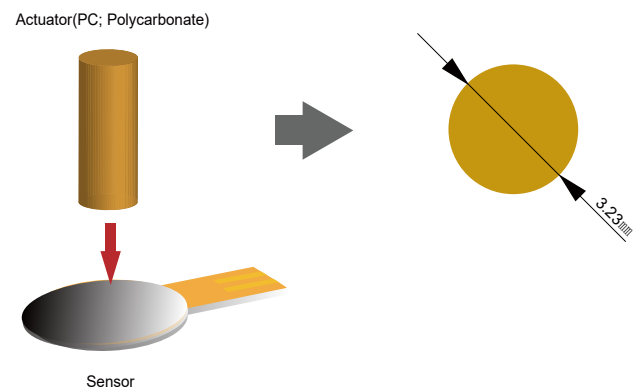
Sensor Mechanical Data(Scale : mm)



Graph) Force to Resistance and Conductance



Actuator



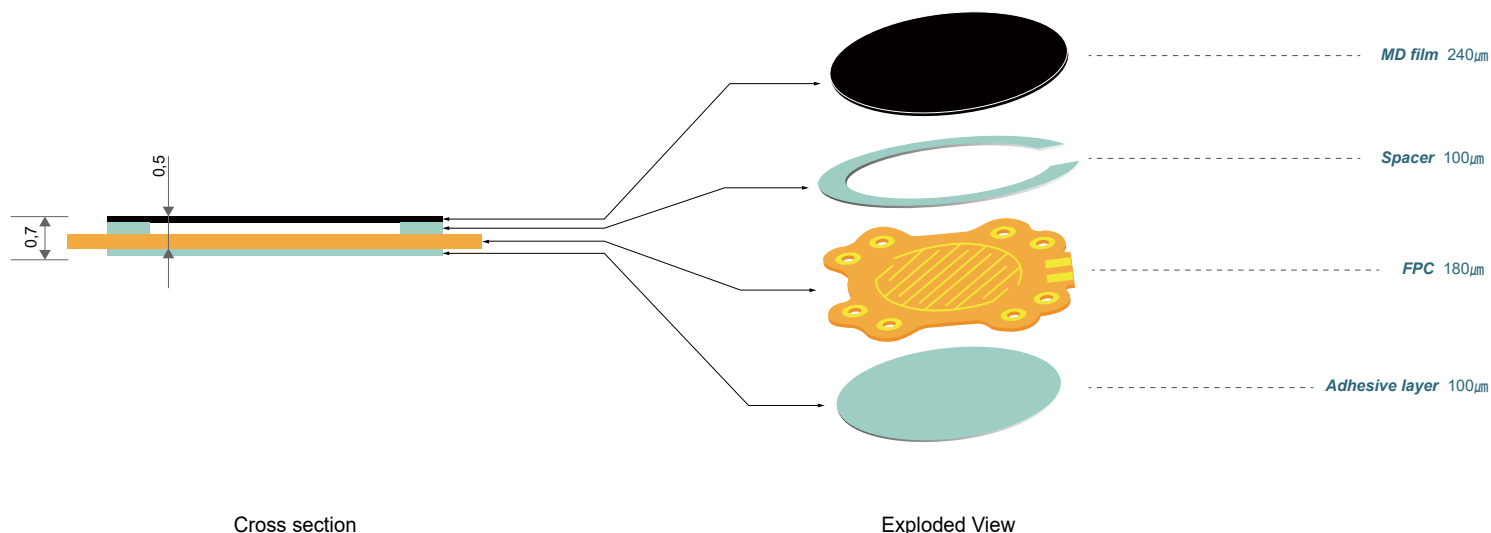
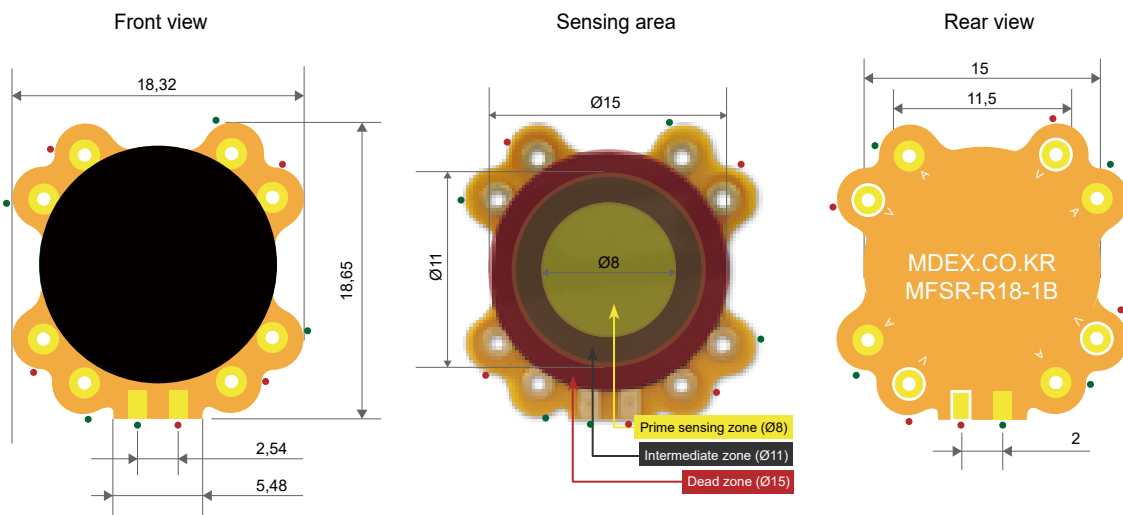
Sensing range is 5gf ~ 4Kgf while actuator is size of 3,23mm

Model RA18-DIY

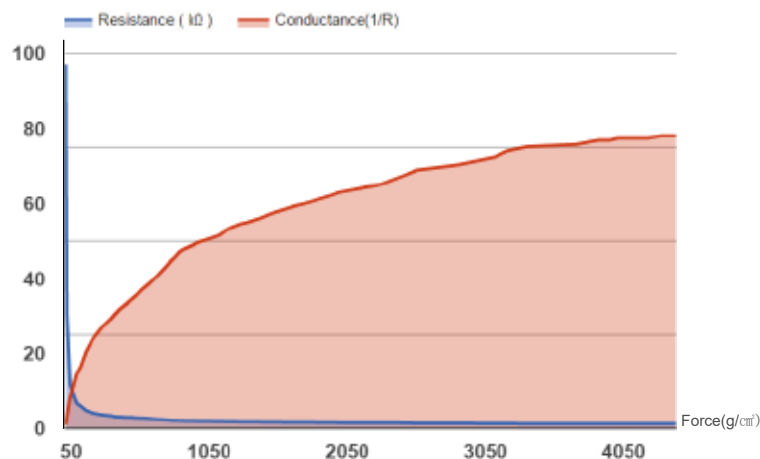
Model RA18-DIY

Sensor Mechanical Data(Scale : mm)

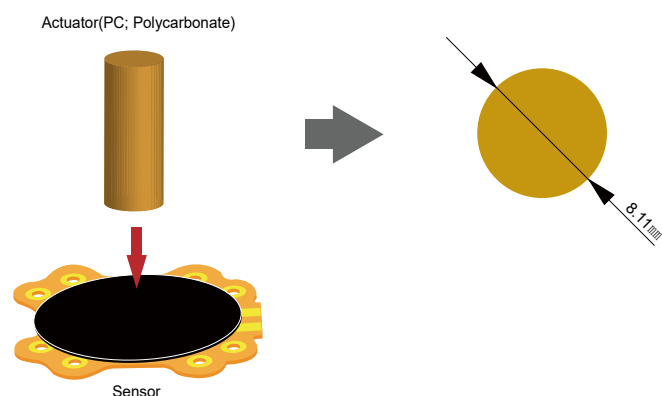
Unit	Description
Length	18.65mm
Width	18.32mm
Thickness	0.7mm
Sensing area	8mm
Sensing range	5gf ~ 4Kgf
Pin	Vin ● ADC out ●



Graph) Force to Resistance and Conductance



Actuator



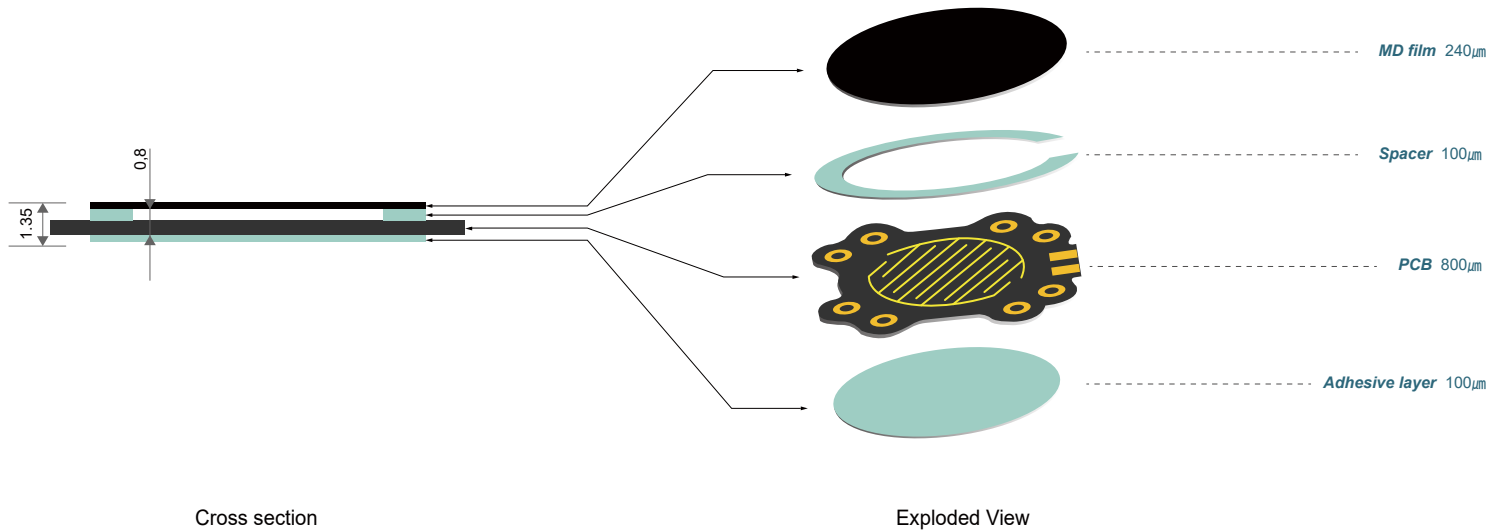
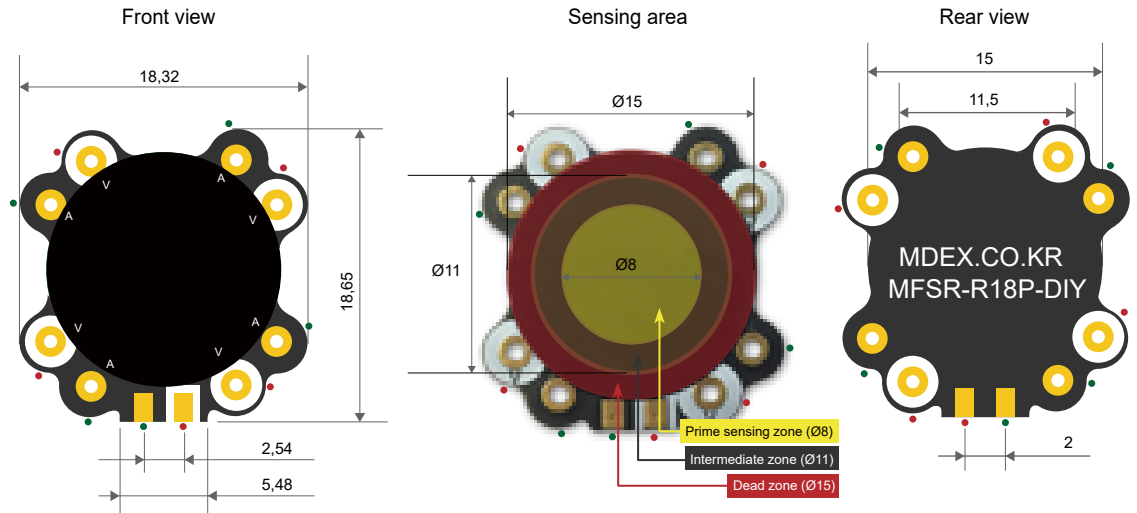
Sensing range is 5gf ~ 4Kgf while actuator is size of 8,11mm

Model RA18P-DIY

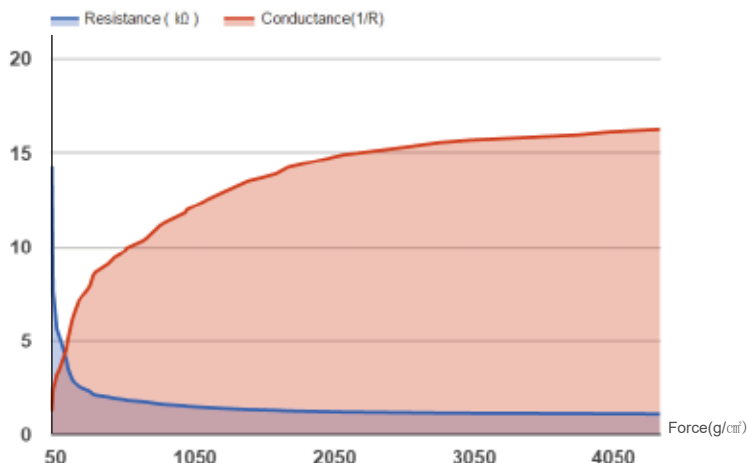
Model RA18P-DIY

Unit	Description
Length	18.65mm
Width	18.32mm
Thickness	1.35mm
Sensing area	8mm
Sensing range	5gf ~ 4Kgf
Pin	Vin ● ADC out ●

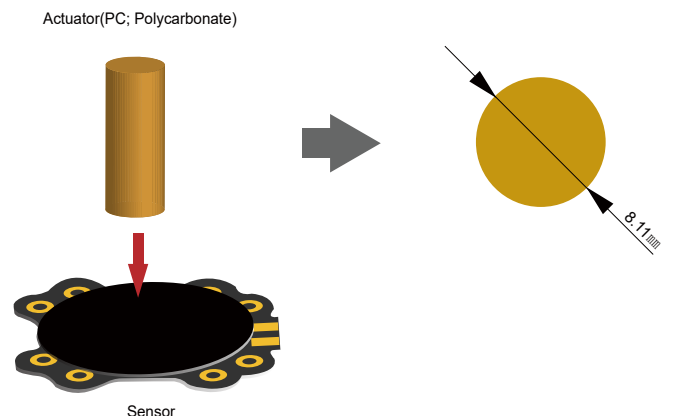
Sensor Mechanical Data(Scale : mm)



Graph) Force to Resistance and Conductance



Actuator



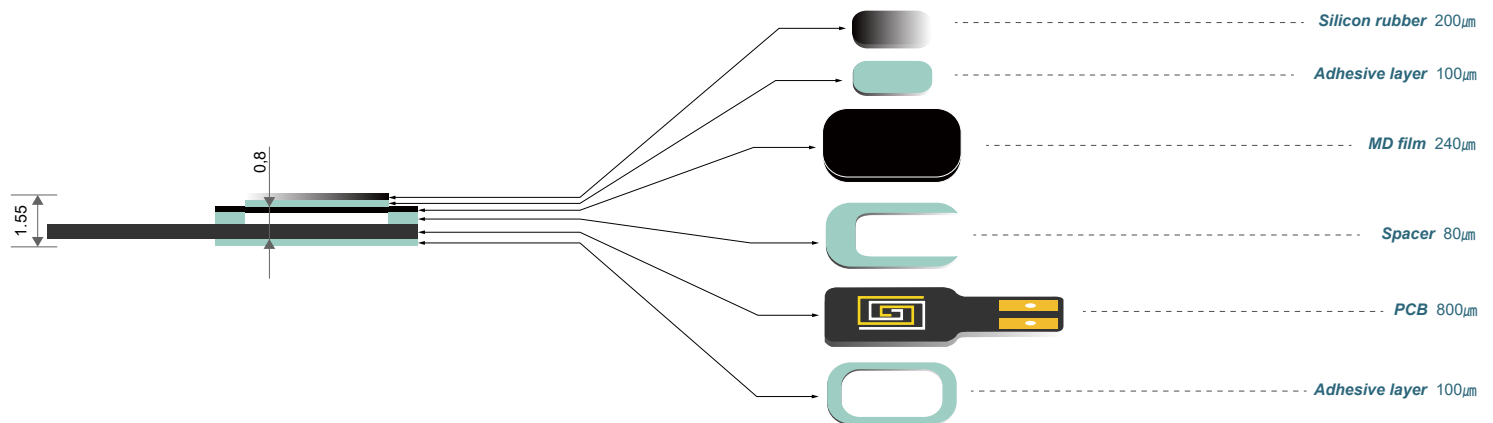
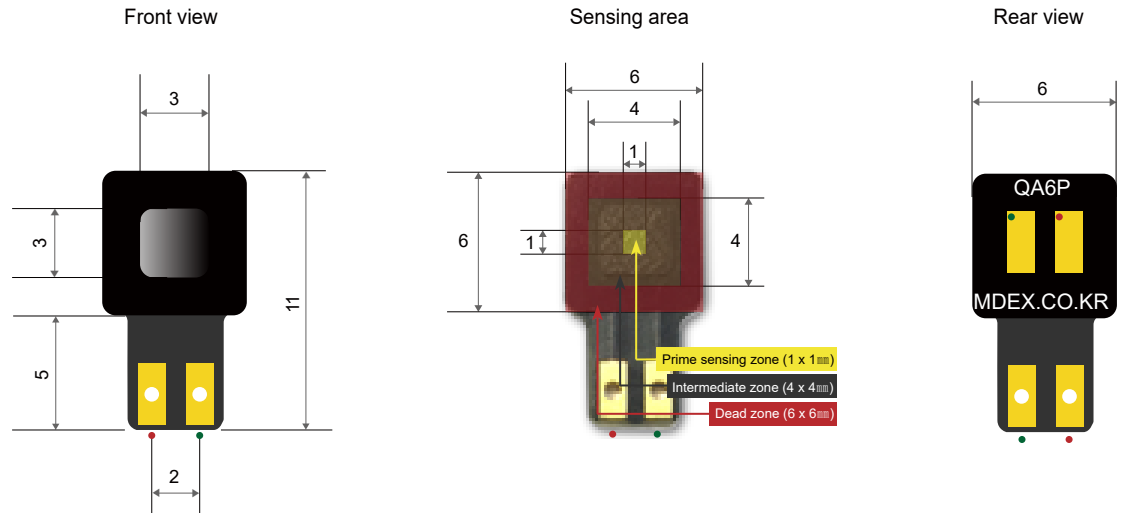
Sensing range is 5gf ~ 4Kgf while actuator is size of 8,11mm

Model QA6P

Model QA6P

Unit	Description
Length	11mm
Width	6mm
Thickness	1.55mm
Sensing area	1mm x 1mm
Sensing range	5gf ~ 4Kgf
Pin	Vin • ADC out •
Actuator layer	Silicon rubber

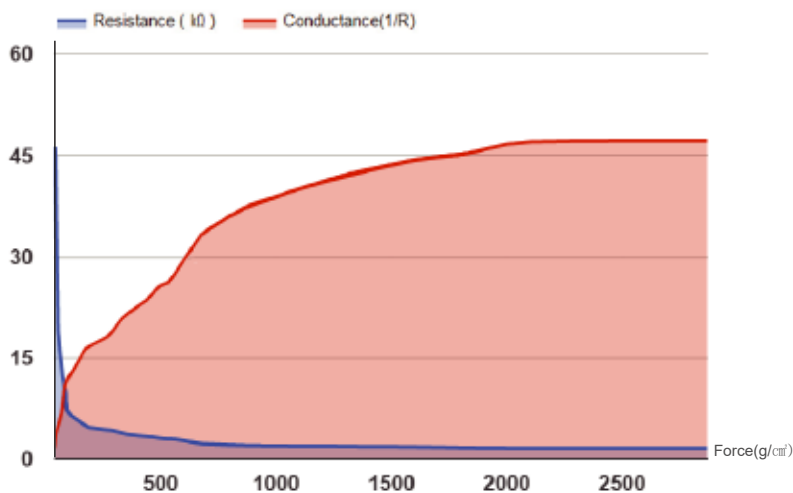
Sensor Mechanical Data(Scale : mm)



Cross section

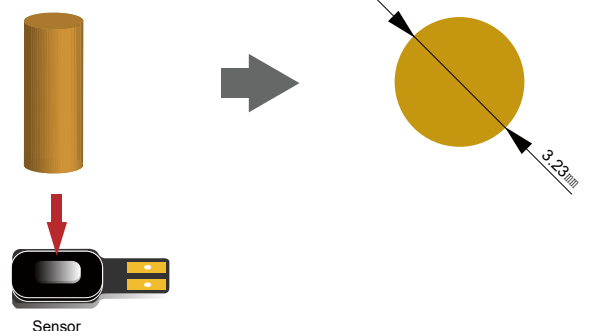
Exploded View

Graph) Force to Resistance and Conductance



Actuator

Actuator(PC; Polycarbonate)



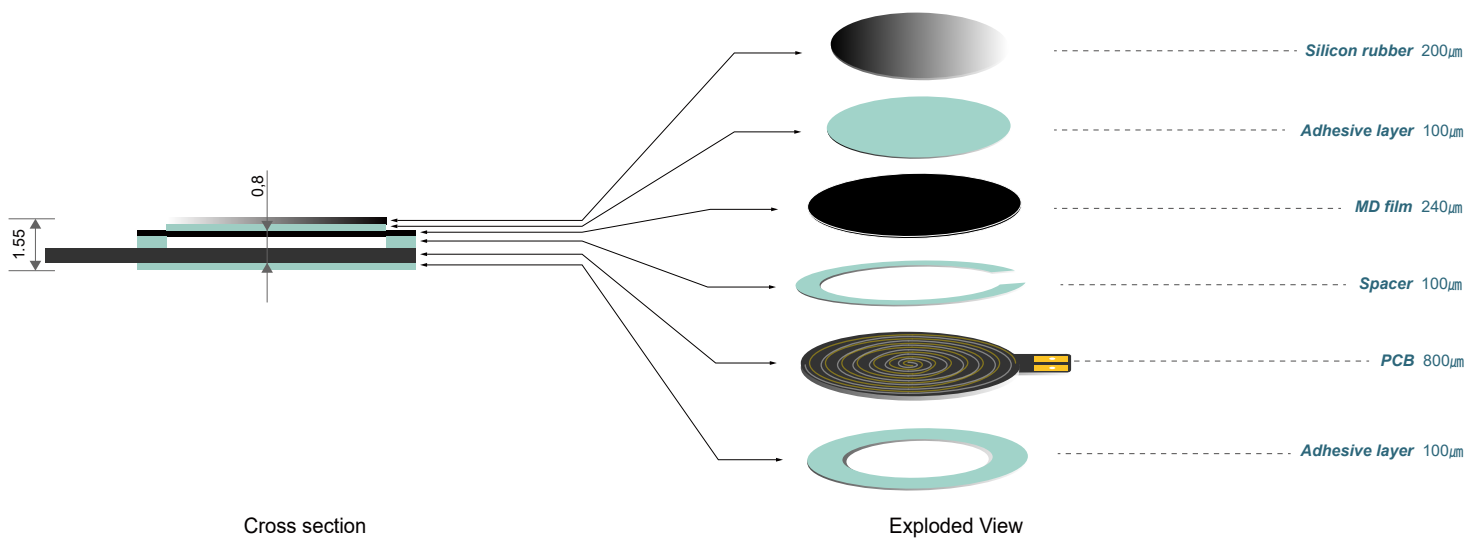
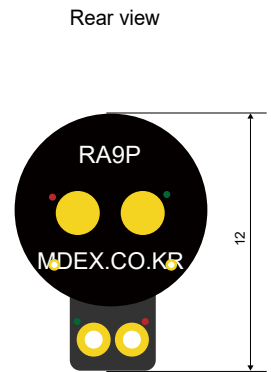
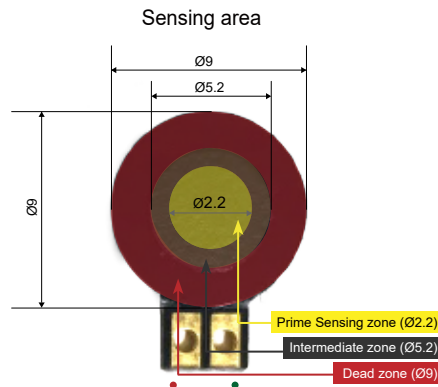
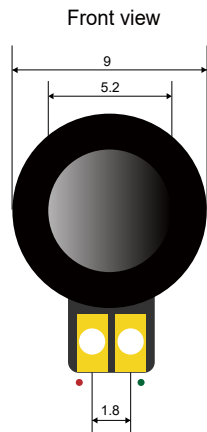
Sensing range is 5gf ~ 4Kgf while actuator is size of 3,23mm

Model RA9P

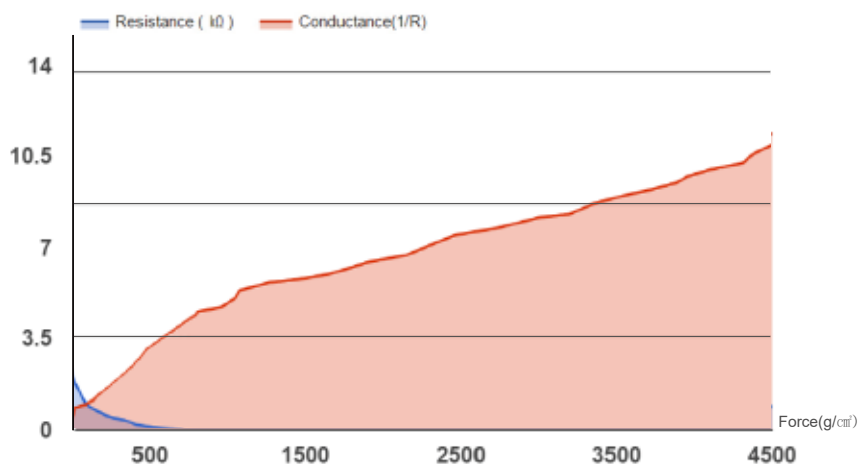
Model QA3040P

Sensor Mechanical Data(Scale : mm)

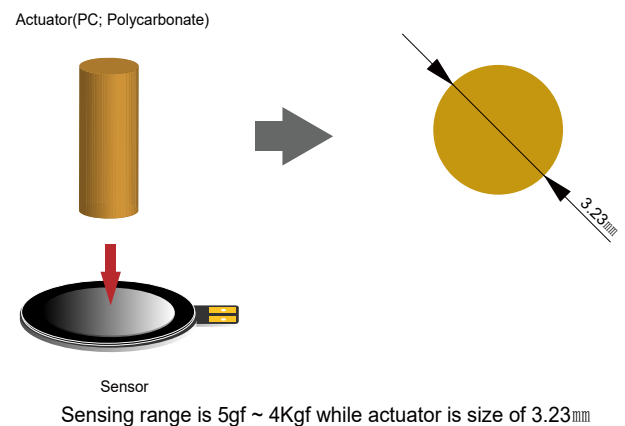
Unit	Description
Length	12mm
Width	9mm
Thickness	1.55mm
Sensing area	2.2mm
Sensing range	5gf ~ 4Kgf
Pin	Vin ● ADC out ●
Actuator layer	Silicon rubber



Graph) Force to Resistance and Conductance



Actuator

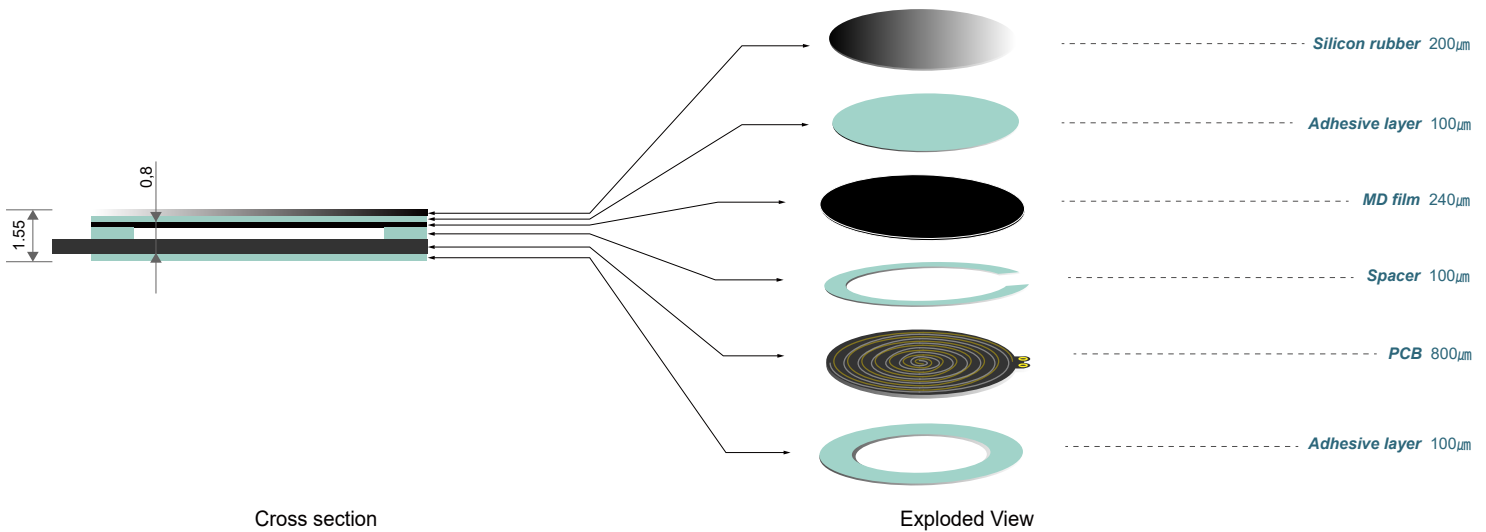
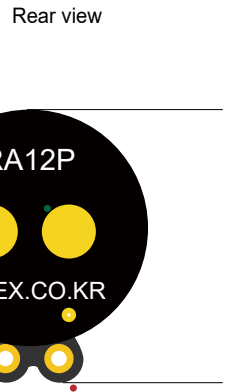
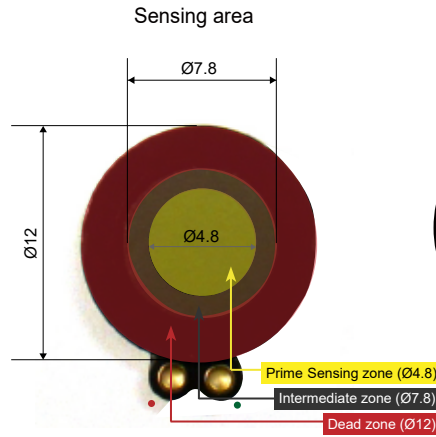
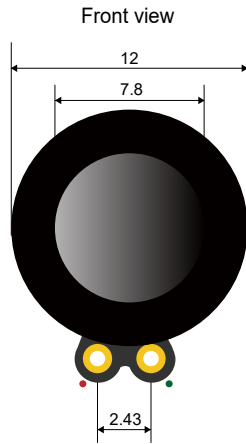


Model RA12P

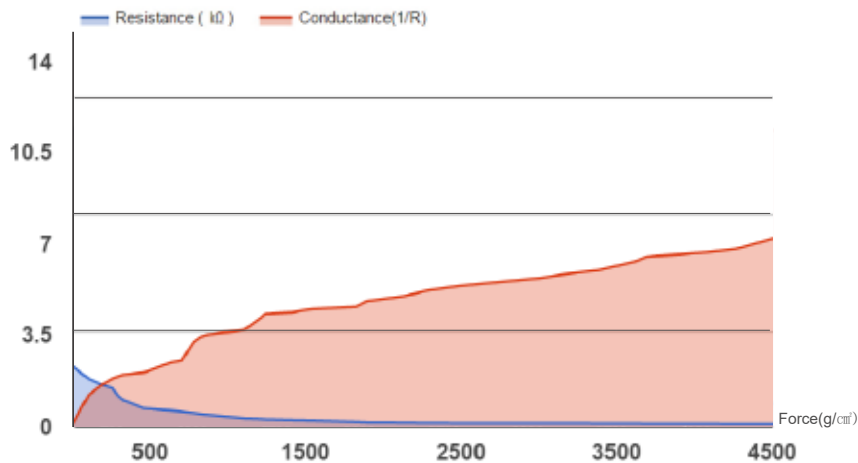
Model QA3040P

Sensor Mechanical Data(Scale : mm)

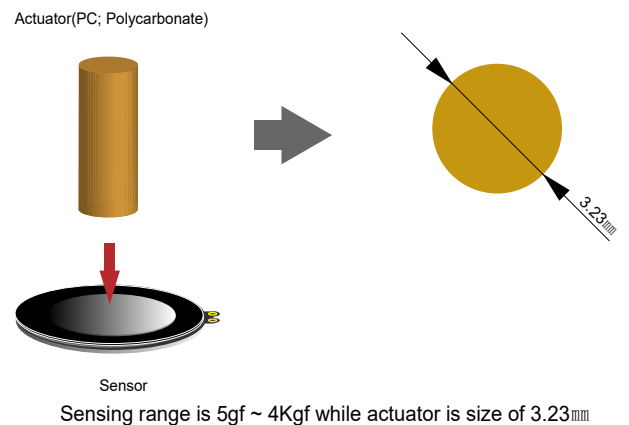
Unit	Description
Length	14.15mm
Width	12mm
Thickness	1.55mm
Sensing area	7.8mm
Sensing range	5gf ~ 4Kgf
Pin	Vin ● ADC out ●
Actuator layer	Silicon rubber



Graph) Force to Resistance and Conductance



Actuator

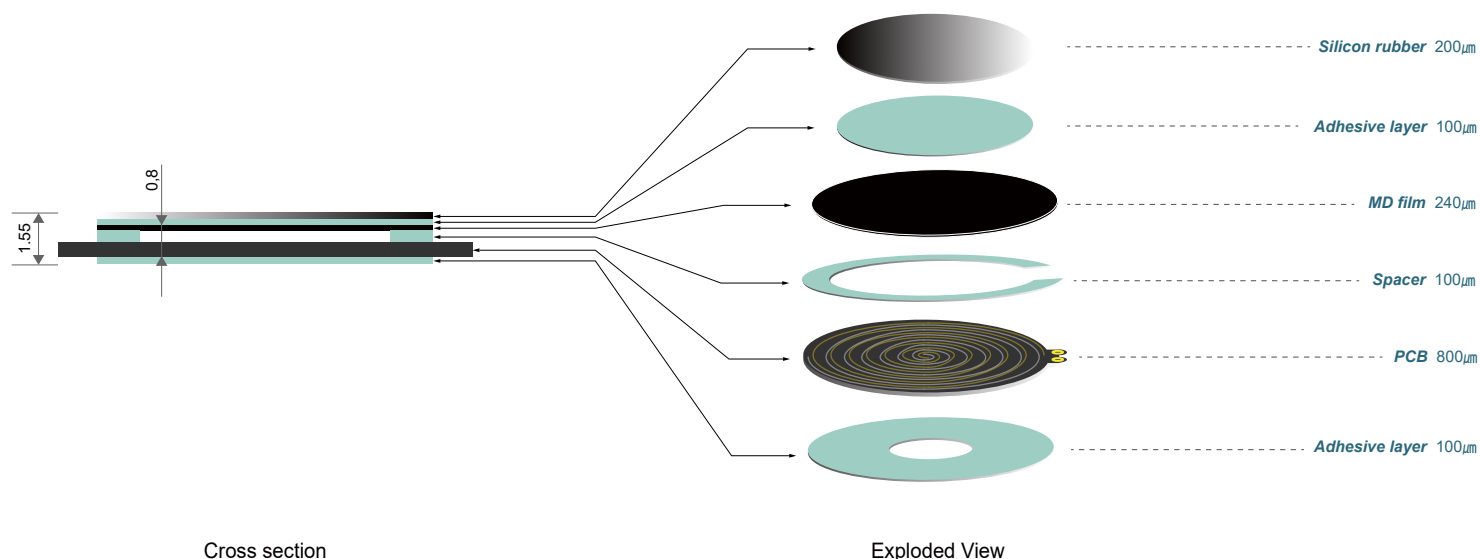
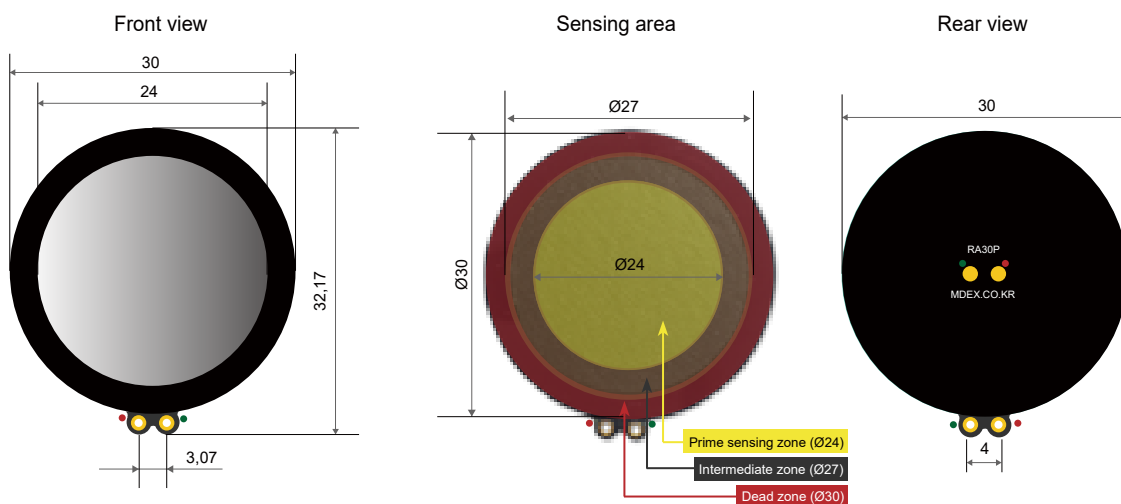


Model RA30P

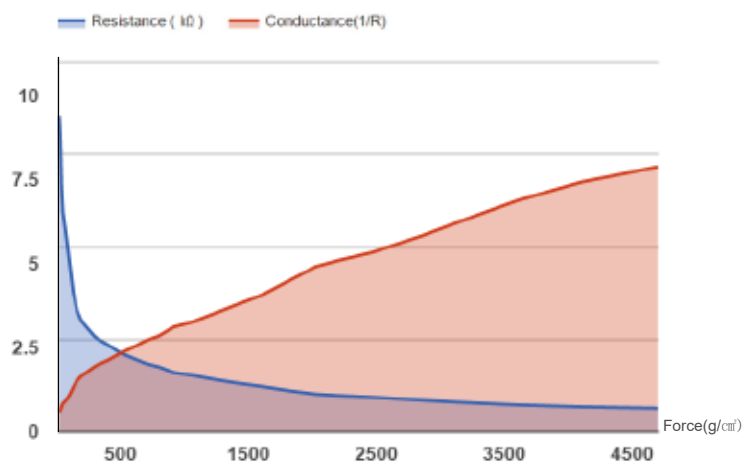
Model RA30P

Unit	Description
Length	32.17mm
Width	30mm
Thickness	1.55mm
Sensing area	24mm
Sensing range	5gf ~ 4Kgf
Pin	Vin • ADC out •
Actuator layer	Silicon rubber

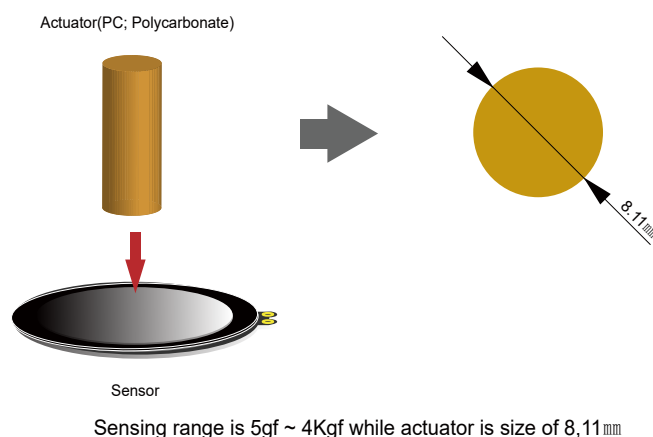
Sensor Mechanical Data(Scale : mm)



Graph) Force to Resistance and Conductance



Actuator

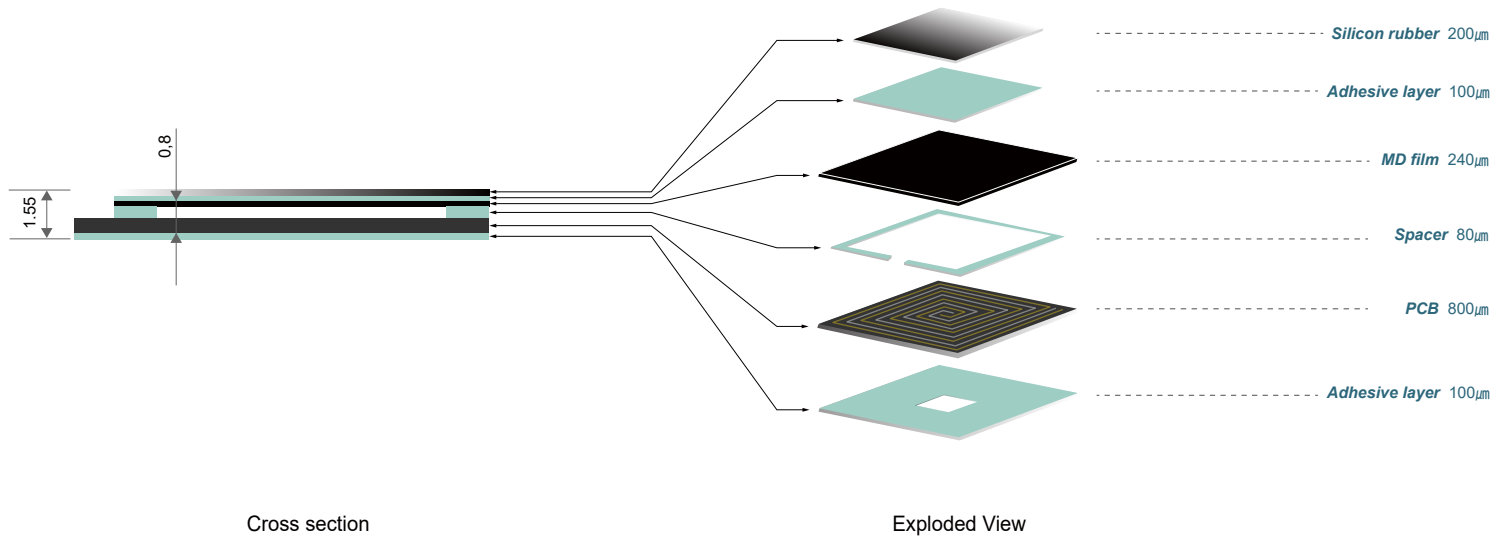
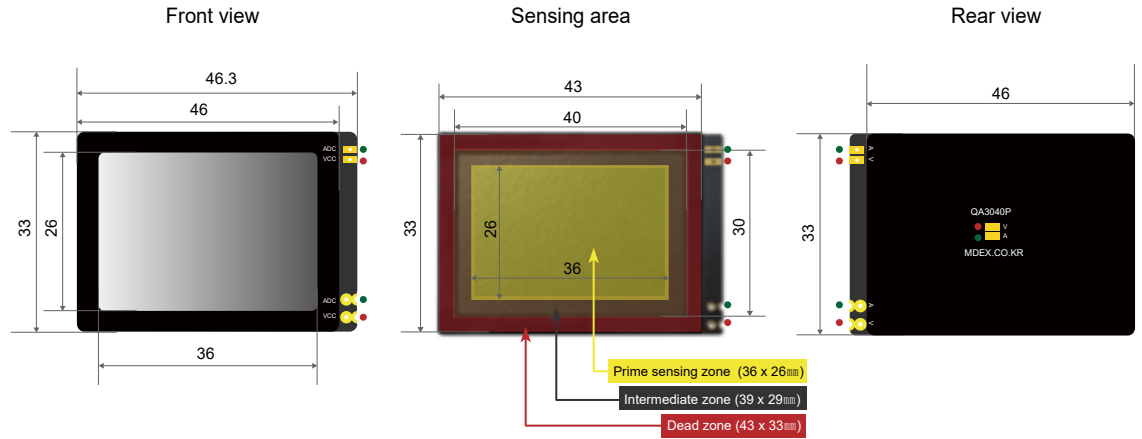


Model QA3040P

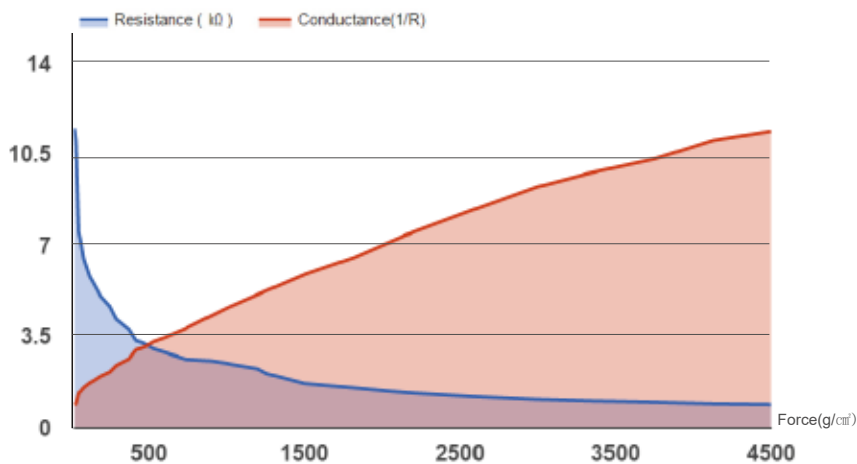
Model QA3040P

Sensor Mechanical Data(Scale : mm)

Unit	Description
Length	46.3mm
Width	33mm
Thickness	1.55mm
Sensing area	36mm x 26mm
Sensing range	5gf ~ 4Kgf
Pin	Vin ● ADC out ●
Actuator layer	Silicon rubber



Graph) Force to Resistance and Conductance



Actuator

