EMI
SHIELDING MATERIAL

EMI Metal Product • FoF • ECE • Microwave Absorber • Nanocrystalline Series



FRD

Stock Code: 300602

Company Overview

Established in Shenzhen, China, in 1993, FRD manufactures a wide range of products including EMI Shielding Materials, Thermal Interface Materials and other related electronic materials. FRD (Stock Code: 300602) is a registered National Hi-Tech Enterprise and certificate of ISO9001, ISO14001, IATF16949, QC080000 and ISO45001.

FRD has long-term business relationships with customers such as Huawei, ZTE, Cisco, Nokia, Ericsson, Microsoft, Samsung, Google, Meta, Xiaomi, Honor, Dell, Lenovo, Inspur, Seagate, TESLA, CATL, BYD, CRRC, FAW, SAIC Group, GAC Group, BAIC Group, Mindray, GREE, Panasonic, FUJIFILM, Foxconn, Pegatron, Quanta, etc.

As a leading manufacturer in its industry, FRD is growing tremendously. We are willing to provide quality products and services for more customers in various industries, including networks & telecommunication equipment, consumer electronics, new energy, power supplies, lighting, aerospace, etc.

In the future, FRD will continue to meet the challenge, grow the FRD brand, and strive to become a world-class technology leader in new materials for all of our manufacturing processes.

FRD Strategic layout



Headquarters
Shenzhen FRD New Materials Park



New base in South China
Guangdong FRD（Foshan）Industrial Park
(Under Construction)



East China Base
FRD（Jiangsu）New Campus Phase I



East China Base
FRD（Jiangsu）New Campus Phase II
(Under Construction)

CONTENTS

Foreword	2
Applications	3
1 | EMI Metal Product	4
Applications & Features	5
Mounting Options	6
Design Options	7
Coding Principles	10
Mounting Series	11
Application	23
2 | Fabric-Over-Foam (FoF)	24
Conductive Fabric (Fabric-Over-Foam) Item Description	25
Product Features	28
Size Standard and Tolerance Standard	29
Coding Principles	30
FoF Standard Parts	32
Application	39
Conductive Tape Series	40
3 | Electrically Conductive Elastomer	42
Design Consideration	43
Application Environments & Gaskets Install Guide & FRD Products' Dimension	44
Extruded Product Characteristics	45
Co-extruded Strip/Ring Characteristics	46
Co-extruded Strip/Ring Aging Test	47
Molding Product Characteristics	48
Form-In-Place (FIP) Series	49
Typical Product	51
4 | Microwave Absorber	52
Products Outline	53
Applications	54
Microwave Absorbers Series	55
5 | Nanocrystalline Series	64
Production Equipment and Applications	65
Inductance Core	66
Transformer Core	67
Single Core Anti DC Transformer Core	68
Metal Magnetic Powder Cores	69

Foreword

To Create a Safe Electromagnetic Environment

In recent years, with science and technology and the rapid development of the electronics industry, a variety of digital, high frequency of the electrical and electronic equipment to the space radiation at work, a large number of different wavelengths and frequencies of the electromagnetic wave, which has led to new environmental pollution - electromagnetic waves Interference (Electromagnetic Interference, EMI) and radio frequency interference (Radio Frequency Interference, RFI). At the same time, the electronic components are also toward the small, lightweight, digital and high-density integration direction, getting higher and higher sensitivity, are susceptible to external electromagnetic interference arising from malfunction, image disorder as well as sound barriers. Electromagnetic radiation produced by electromagnetic interference not only affects the performance of electronic products to achieve, and the resulting electromagnetic pollution impact on human and other organisms causing serious harm. To this end, international organizations made a series of technical regulations to require electronic products to meet stringent criteria for susceptibility and emission. Comply with these regulations, the product is called electromagnetic compatibility EMC (Electromagnetic Compatibility).

Electromagnetic compatibility (EMC) refers to “a device, equipment or system performance, it can make its own work environment and this environment without any other device to produce strong electromagnetic interference (IEEE C63.12 - , 1987). “all electrical and electronic equipment at work, there will be intermittent or continuous voltage and current changes, resulting in a different frequency band within or between the electromagnetic energy, while the corresponding circuits of such energy will be launched into the surrounding environment, . These high-frequency interference between the instrument is known as electromagnetic interference (EMI).

EMI There are two ways to enter or leave a circuit: radiation and conduction. Signal radiation through the shell slit, slot, hole or other gaps leak; and signal transduction through the coupling to the power supply, signal and control lines to leave the shell, in an open space free of radiation, resulting in interference.

EMI suppression have adopted a lot of shielding and crack shielding shell as the way to achieve, most of the time following these simple principles can help to achieve EMI shielding: from the source at reducing interference; through the shield, filter, or ground would interfere with generating circuit isolation, and enhanced sensitive circuits such as anti-jamming capability. EMI suppression, isolation and low sensitivity of the circuit designer should be a goal of all of these properties early in the design phase should be completed.

In terms of design engineers with shielding materials is an effective way to reduce EMI. For different sources of interference, in considering the size and spatial location to install and select the best shielding material for shielding, so that we can guarantee the system to achieve the best shielding effectiveness. FRD is committed to create a safe electromagnetic environment cause a variety of EMI shielding materials are already widely used and recognized, from the Metal Fingerstock, Fabric-Over-Foam (FoF), Conductive Elastomer, Conductive Plastics to the Microwave Absorbing Material and so on, the shielding effectiveness of these products and other properties are highly competitive.



Applications

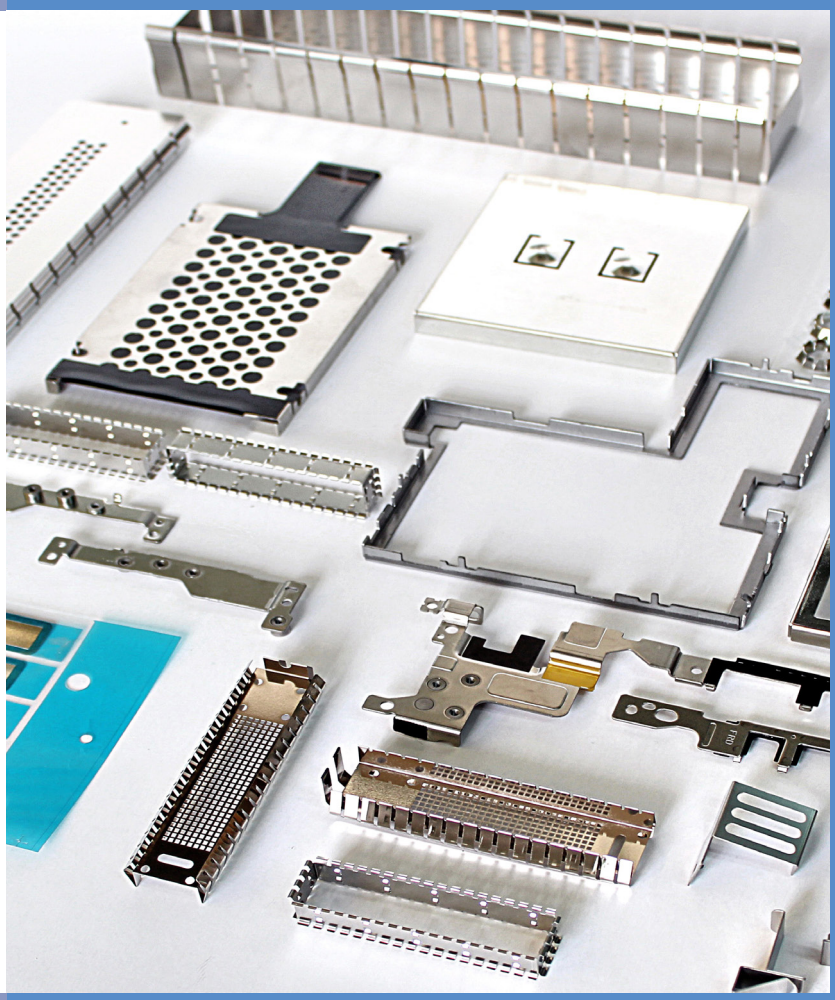


EMI Metal Product

FRD’ s EMI metal shielding products are suitable for a wide range of electronic devices which have EMI/RFI or ESD problems. There are many kinds of products with different profile and dimension. Most of products are made by beryllium copper, phosphor-bronze and stainless steel. The superiorities of metal shielding products are shown as the following:

- EMI metal shielding products will not burn, without influence of ray, ultraviolet radiation or ozone.They not only solve the tangential slip joint problems of other gasket materials, but also have excellent shielding performance over a broad band of frequencies.
- Excellent elasticity and reusability.
- Excellentmechanical property, Suitable for a variety of applications.
- EMI metal shielding products can work well in many kinds of environments (e.g. high temperature), having different plating to guarantee the compatibility with other contact surface.
- Little joint pressure, light weight, sundry installation mode.Excellent thermal conductivity, pressure resistance, wearing resistance and plasticity.

Therefore, incommunication equipments, computers, portableelectronic devices, medical instruments and military equipments field, most engineer use metal finger stock as the ideal EMI shielding materials.



FRD's EMI metal shielding products are suitable for a wide range of electronic devices which have EMI / RFI or ESD problems.

- ► A wide range of product types and diverse installation can be used for a variety of shielded room/door/ cabinet doors/cover/printed circuit board(PCB)/integrated circuits shielding.
- ► Can be well used in many occa sions which the shielding material needs to sliding friction and can be installed on the top or side of the shielding.
- ► Applied from small handheld devices to large shielding room.

- Excellent elastic recovery
- Low compression force, can bear bidirectional compression
- Persistent fatigueresistance
- Does not exist stress relaxation phenomenon, with stable size
- Material properties is almost free from the rounded corners and the rolling direction
- Easily processed and into many shapes
- Easily designed to miniaturization
- Suitable for larger gap fill
- Easy to install, having a variety of installation methods
- Easy to plating and welding
- Excellent conductivity
- Ultra-low permeability
- A wide range of temperature-change adaptation
- Incombustible material
- Corrosion-resistant
- Excellent shielding efficacy

Beryllium Copper

Beryllium copper(BeCu) is a high-performance metal, it can be cast and used in a wide range of part field. Its mechanical and electrical properties make it to be an ideal shielding materials resistant to electromagnetic and radio frequency interference.

The electrical characteristics of beryllium copper provides a shielding effect in a wide range of frequency. Meanwhile, it’ s superior mechanical properties such as maximum flexibility and fatigue resistance make it have a long life cycle. In addition, BeCu has excellent conductivity and different plating. Therefore, it used as the best material in shielding area.

Beryllium Copper Specifications

Chemical Composition			
Be	1.8-2.0%		
Co + Ni	0.2% (Min.)		
Co + Ni + Fe	0.6% (Max.)		
Cu	Remainder		
General plating thickness	About 2.6μm (including no rare metals)		
Physical Characteristics			
Electrical conductivity (% IACS)	22-25		
Elastic Modulus (psi)	$18.5x10^6$		
Mechanical properties (after heat treatment)			
Temper grade	1/4 HT	1/2 HT	HT
Tensile strength (kgf/m^2)	123 (Min.)	130 (Min.)	133 (Min.)
Yield strength (kgf/m^2)	105 (Min.)	112 (Min.)	116 (Min.)
Hardness range (HV)	350-430	360-440	380-450

Mounting Options

1. Slot Mounting

Snap-on Slot and Edge Symmetrical fingers using single or double fingers are very economical for applications such as sliding drawers, doors, rack-mounted assemblies and covers. They perform well in bidirectional applications and the snap-on capability makes them easy to install.

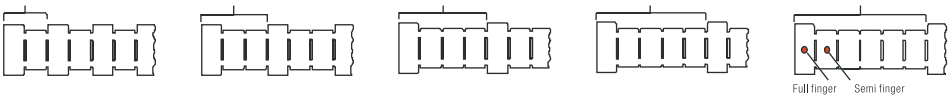
Slot Mount



Edge Mount



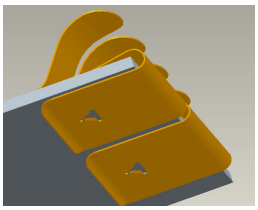
The 23 to 25 series utilizing the same snap on mounting feature can be used in continuous shielding condition. Available repeating finger patterns for the 23 to 25 series are shown here:



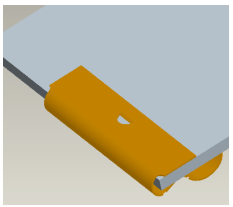
*Consult FRD for the availability of other patterns.

2. Clip-on Mounting

Clip-on Mounting provides a reliable mechanical installation by the friction between shielding materials and structures. Meanwhile, “D” -shape and “T” -shape lance can be incorporated to enhance the holding force. Some barbed-bit installation location or installation of thickness may be different from your existing structure, please contact our engineering staff to determine changes.



"T"-shaped barb



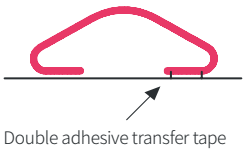
"D” -shaped barb

Certain clip-on strips have lance locations or plate thickness other than shown above. Consult our engineer to determine the specific dimensions.

3. PSA Mounting

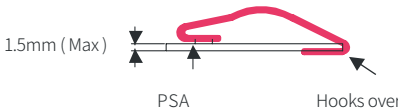
Pressure Sensitive Mounting provides double-sided pressure sensitive transfer tape for a fast, reliable installation, 3M 467 transfer tape or equivalent may be used at ambient temperature from -55 to 230°C . Apply only on a clean, oil-free surface, and allow a 24-hour cure time. Please consult our engineer to provide other sticky tapes and expanded products.Hook and viscous fingers are low pressure and small-gap shield the edges of an ideal material for applications.

PSA gasket



Double adhesive transfer tape

Hook and PSA gasket



Hook and stick fingers are ideal for flange mounting applications requiring low compression forces and small gap shielding.

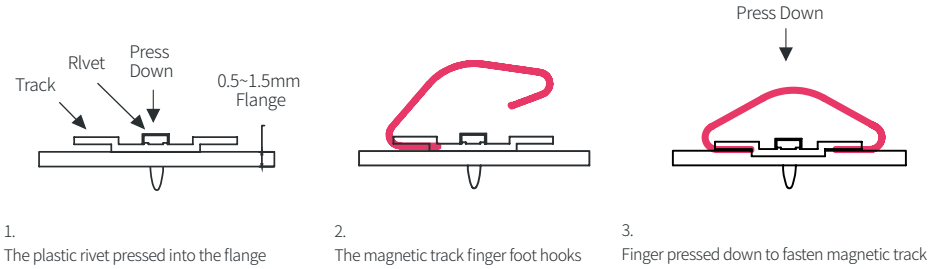
Spider gaskets, featuring a continuous, smooth web of fingers on each side, are available in both PSA and Hook & PSA mounting configurations. Non-conductive 0.25mm thick adhesive may be specified for improved adhesion on rough surfaces. Conductive adhesives are also available.

4. Track Mounting

The following are two ways to provide track:

- By the risings and fallings of the structure itself
- By adding other material to the structure

Three-step Installation



1. The plastic rivet pressed into the flange
2. The magnetic track finger foot hooks
3. Finger pressed down to fasten magnetic track

5. Special Mounting

Special mounting shielding strips can be installed by spot welding or soldering.

Galvanic Compatibility Design

Materials in adjacent groups may be safely used together in order to avoid the influence between the base material and the electroplated layer. The materials chose from the same group provide better resistance to corrosion. For example, since BeCu is in group III, so it' s safe to choose the material in group II, III & IV to use together.

FRD EMI metal shield products for more than 20 variety of plating layer, in order to ensure compatibility with the substrate electrochemical specific please consult our engineering department.

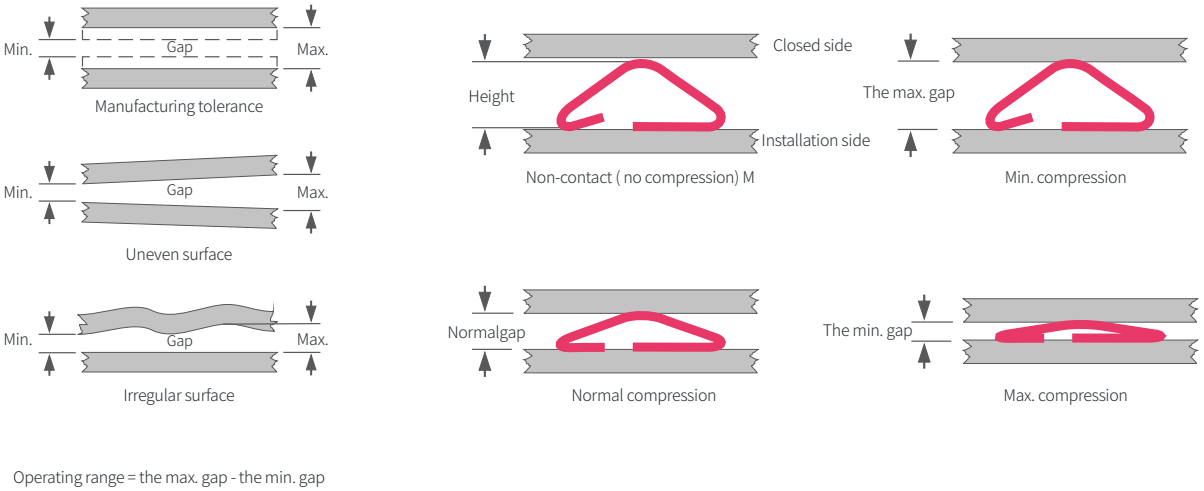
Grouping of Metals by Decreasing Galvanic Activity			
I	II	III	IV
Mg	Al	Chrome Plating	Brass
Magnesium Alloys	Aluminum Alloys	Carbon Steel	Stainless Steel
Al	Zinc/Zinc plating	Steel	Be Cu
Aluminum Alloys	Chromium Plating	Ni/ Nickel Plating	Cu/Copper Alloy
Zinc/Zinc plating	Cadmium Plating	Sn/Tin plating	Ni/ Copper Alloy
Chromium Plating	Carbon steel	Sn/Lead solder	Monel
	Cu	Pb	Ag
	Ni/ Nickel Plat ing	Brass	Graphite
	Sn/Tin plating	Stainless Steel	Rh
	Sn/Lead solder	BeCu	Ti
		Cu/Copper Alloy	Pt
		Ni/Copper Alloy	Au

The appropriate choice of Force, Compression and Resistance

Compression

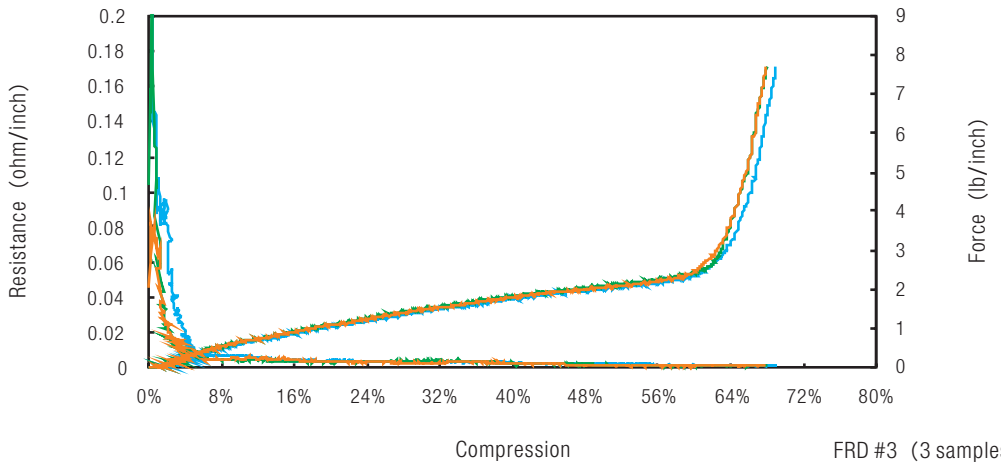
The purpose of shielding is to shade the clearance between two conjoint surface. The shielding materials must take up the maximal and minimal gap to make itself effectively. The clearance exists due to the manufacturing tolerance, irregular surface and arraying, so appropriate compression can provide the shielding of electromagnetic interference.

At the maximum gap the gasket should be compressed approximately 25%. Gaskets may be compressed to 50% of the height or more.



Operating range = the max. gap - the min. gap

The following figure shows that the compression resistance is small and steady with the deflection between 15% to 60%. Meanwhile, the compression force is small comparatively. That is the reason we often suggest the deflection to be around 30%.



Shielding Effectiveness

Attenuation

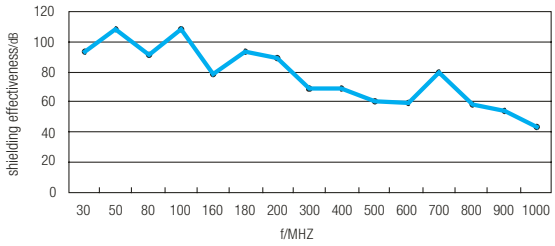
For maximum attenuation of a gasket gap, the contact resistance of the mounting joint and closing joint must be very low and remain so throughout the life of the product. While a gasket may have the potential for very high attenuation under ideal conditions, over time oxidation, corrosion and dirt at the mounting and closing joints may reduce effectiveness.

Factors influencing contact resistant are pressure(closing pressure), plating and wiping action. Our engineer can help you determine the optimal specifications to ensure sustained attenuation.

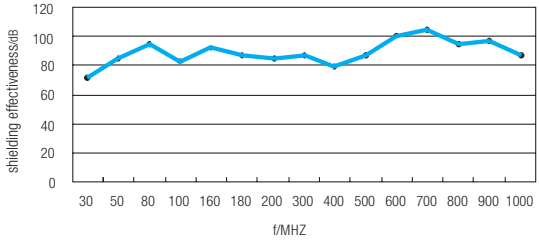
The test result best embodies the shielding characteristics. However, many factors such as specifications, tolerance, spacing, electroplated layer, installation and the rigidity of cover boards may cause measurement error even in the same standard of MIL-DTL-83528 or SAE ARP 1705.

FRD engineering team has rich experience in analyzing and improving the shielding effectiveness of materials and complete appliances together with customers. Contact us if having some doubts in this respect.

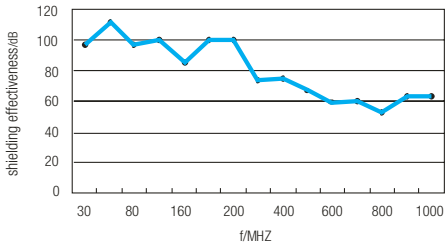
The following are the test results of our typical shielding products.



1. The shielding effectiveness of 1-58E0-06096 sample compressed to a thickness of 0.5mm



2. The shielding effectiveness of 1-73A2-03430 sample

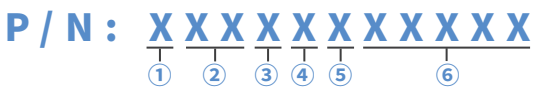


3. The shielding effectiveness of 1-22B1-04080 sample compressed to a thickness of 2.0mm

If the standard series are still unable to fully meet your requirements, please contact the engineering staff to confirm the following information:

- Products may be using the machine the desired frequency band and the value of shielding effectiveness
- Material selection and characteristic parameters
- Structural parts can be set aside for the design of the cushioning material gap value
- Whether particular compression force and Plug Power requirements
- Lining force forms and expectations of installation
- Structural parts can be reserved for the other direction of the cushioning material installation space or hole location and other requirements
- With regard to the requirements of pressure-sensitive adhesive (For Use)
- The choice of coating
- The use of special occasions and environmental requirements
- A special packaging (eg, SMT) and follow-up of production installation requirements
- Other special requirements

Part Number System



① FRD shielding product style
② Metal products series
③ Metal products sub-series
④ Special property
⑤ Surface finishing
⑥ Length or series number of metal products

① **The first number indicates FRD shielding products categories by 1-9**
"1" indicates finger stock and other metal strip

② **The second and third numbers indicates products categories of different functions by 1-9**
For example: 20-29, indicate slot mounting series
30-39, indicate clip-on mounting series
.....

③ **The fourth character means sub-series by letter from A to Z**

④ **The fifth number indicates different function that derived from standard material**
0 Indicated beryllium copper products with normal thickness
1 Other thickness series
2 Stainless steel series of standard products
.....

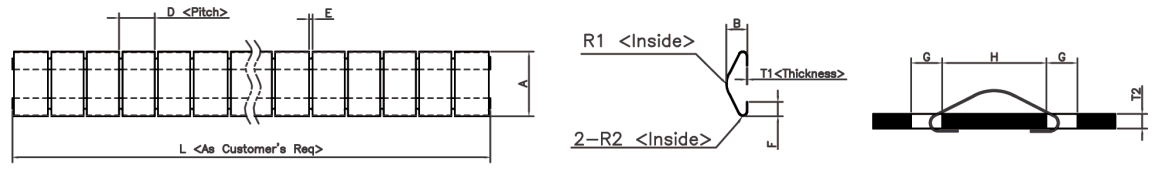
⑤ **The sixth character indicates available finishes**
A clean and bright
B gold plated
C silver plated
D bright tin plated
E dull tin plated
F bright nickel plated
G dull nickel plated
H electroless nickel plated
J white zinc plated
K blue zinc plated
.....

⑥ **The 7th to 11th numbers indicate approximate length or series number by 0-9**

Slot Mounting Series

P/N	A	B	T1	D	E	F	L	R1	R2	Recommended installation design dimensions			Finger quantity
										G	H	T2	
*120A0X00043	7.10	2.80	0.08	-	-	1.90	4.30	2.80	0.75	2.30	5.60	1.00	1
*120A0X00090	7.10	2.80	0.08	4.75	0.46	1.90	9.00	2.80	0.75	2.30	5.60	1.00	2
*120A0X00138	7.10	2.80	0.08	4.75	0.46	1.90	13.75	2.80	0.75	2.30	5.60	1.00	3
*120A0X00185	7.10	2.80	0.08	4.75	0.46	1.90	18.50	2.80	0.75	2.30	5.60	1.00	4
120B0X00043	8.15	2.80	0.08	-	-	2.15	4.30	2.80	0.50	2.30	6.60	1.00	1
120B0X00090	8.15	2.80	0.08	4.75	0.46	2.15	9.00	2.80	0.50	2.30	6.60	1.00	2
120B0X00138	8.15	2.80	0.08	4.75	0.46	2.15	13.75	2.80	0.50	2.30	6.60	1.00	3
120B0X00185	8.15	2.80	0.08	4.75	0.46	2.15	18.50	2.80	0.50	2.30	6.60	1.00	4
120B0X00233	8.15	2.80	0.08	4.75	0.46	2.15	23.25	2.80	0.50	2.30	6.60	1.00	5
120B0X00280	8.15	2.80	0.08	4.75	0.46	2.15	28.00	2.80	0.50	2.30	6.60	1.00	6
120B0X04080	8.15	2.80	0.08	4.75	0.46	2.15	408.00	2.80	0.50	2.30	6.60	1.00	86
120B1X04080	8.15	2.80	0.05	4.75	0.46	2.15	408.00	2.80	0.50	2.30	6.60	1.00	86
120C0X04080	8.15	2.80	0.08	4.75	0.46	2.15	408.00	2.80	0.90	2.30	6.60	1.50	86
120C1X04080	8.15	2.80	0.05	4.75	0.46	2.15	408.00	2.80	0.90	2.30	6.60	1.50	86
120C0X00043	8.15	2.80	0.08	-	-	2.15	4.30	2.80	0.90	2.30	6.60	1.50	1
120D0X00057	9.40	3.30	0.08	-	-	2.15	5.70	2.80	0.50	2.30	7.60	1.00	1
120D0X00120	9.40	3.30	0.08	6.35	0.64	2.15	12.05	2.80	0.50	2.30	7.60	1.00	2
120D0X00184	9.40	3.30	0.08	6.35	0.64	2.15	18.40	2.80	0.50	2.30	7.60	1.00	3
120D0X00248	9.40	3.30	0.08	6.35	0.64	2.15	24.75	2.80	0.50	2.30	7.60	1.00	4
120D0X00311	9.40	3.30	0.08	6.35	0.64	2.15	31.10	2.80	0.50	2.30	7.60	1.00	5
120D0X00375	9.40	3.30	0.08	6.35	0.64	2.15	37.45	2.80	0.50	2.30	7.60	1.00	6
120D0X04058	9.40	3.30	0.08	6.35	0.64	2.15	405.75	2.80	0.50	2.30	7.60	1.00	64
120E1X00064	15.25	5.60	0.05	-	-	3.55	6.35	4.60	1.00	3.55	13.20	1.80	1
120E1X00135	15.25	5.60	0.05	7.15	0.80	3.55	13.50	4.60	1.00	3.55	13.20	1.80	2
120E1X00207	15.25	5.60	0.05	7.15	0.80	3.55	20.65	4.60	1.00	3.55	13.20	1.80	3
120E1X00278	15.25	5.60	0.05	7.15	0.80	3.55	27.80	4.60	1.00	3.55	13.20	1.80	4
120E1X00350	15.25	5.60	0.05	7.15	0.80	3.55	34.95	4.60	1.00	3.55	13.20	1.80	5
120E1X00421	15.25	5.60	0.05	7.15	0.80	3.55	42.10	4.60	1.00	3.55	13.20	1.80	6
120E1X04068	15.25	5.60	0.05	7.15	0.80	3.55	406.75	4.60	1.00	3.55	13.20	1.80	57
120F1X00091	4.00	2.60	0.05	3.20	0.50	1.40	9.10	1.95	0.40	1.40	3.10	0.80	3

1-20 Series Sketch

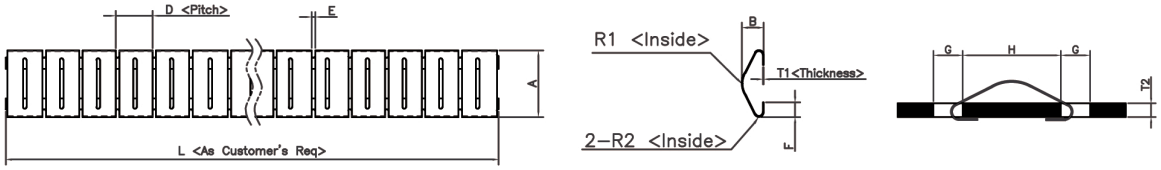


Note: please consult the sales and engineering personnel of our company before type selection of the marked *

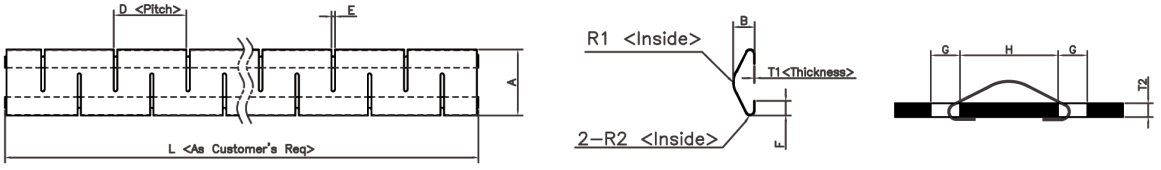
Slot Mounting Series

P/N	A	B	T1	D	E	F	L	R1	R2	Recommended installation design dimensions			Finger quantity
										G	H	T2	
*121A0X04080	8.25	2.55	0.08	4.75	0.46	1.90	408.00	2.80	0.50	2.30	6.60	1.00	86
121D0X04080	8.25	3.55	0.08	4.75	0.46	2.15	408.00	2.80	0.50	2.30	6.60	1.00	86
121S1X04080	8.13	2.80	0.05	4.75	0.46	2.15	408.00	2.80	0.50	2.30	6.60	1.00	86
122B0X03705	8.15	2.80	0.08	9.50	0.46	2.15	370.50	2.80	0.50	2.30	6.60	1.00	39
123A0X02608	8.15	2.80	0.08	4.75	0.50	2.15	260.80	2.80	0.50	2.30	6.60	1.00	55
123A0X04080	8.15	2.80	0.08	4.75	0.50	2.15	408.00	2.80	0.50	2.30	6.60	1.00	86
123A8X04080	8.00	3.00	0.05	4.75	0.66	2.00	408.00	2.80	0.50	2.10	7.00	1.00	86

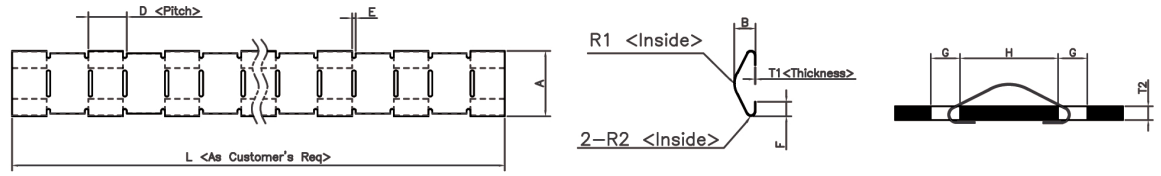
1-21 Series Sketch



1-22 Series Sketch



1-23 Series Sketch

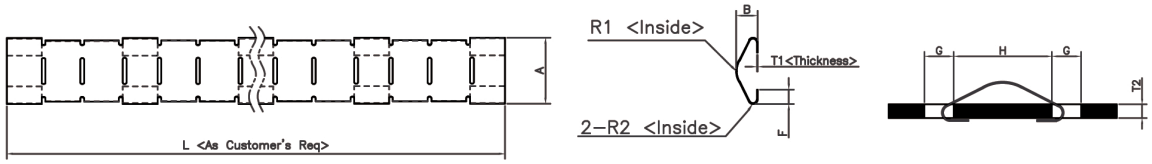


Note: please consult the sales and engineering personnel of our company before type selection of the marked *

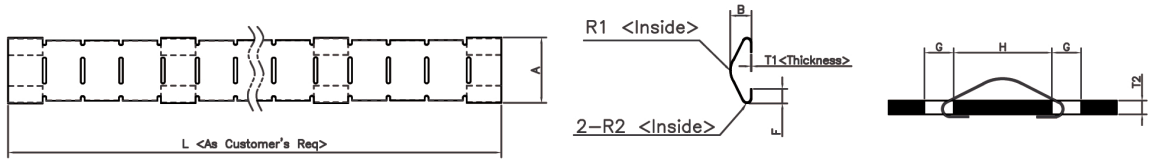
Slot Mounting Series

P/N	A	B	T1	D	E	F	L	R1	R2	Recommended installation design dimensions			Finger quantity
										G	H	T2	
124A0X02608	8.15	2.80	0.08	4.75	0.46	2.15	260.80	2.80	0.50	2.30	6.60	1.00	55
124A0X04080	8.15	2.80	0.08	4.75	0.46	2.15	408.00	2.80	0.50	2.30	6.60	1.00	86
125A0X02680	8.15	2.80	0.08	4.75	0.46	2.15	260.80	2.80	0.50	2.30	6.60	1.00	55
125A0X04080	8.15	2.80	0.08	4.75	0.46	2.15	408.00	2.80	0.50	2.30	6.60	1.00	86
126A1X04060	4.85	1.65	0.05	6.35	0.46	1.35	406.00	1.33	0.25				
126B1X04060	4.85	1.57	0.05	4.57	0.51	1.48	406.00	2.50	0.25				

1-24 Series Sketch



1-25 Series Sketch



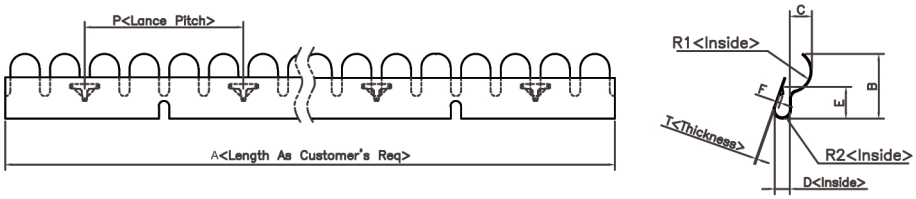
1-26 Series Sketch



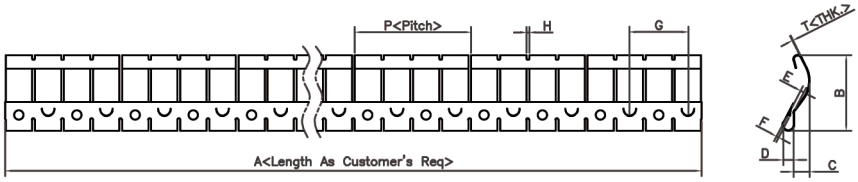
Clip-on Mounting Series

P/N	A	B	C	D	E	F	G	H	J	P	R	R1	R2	T	Lance shape
131A0X04056	405.60	7.54	2.55	1.80	3.70	0.50				18.50		2.35	0.89	0.12	"T"
*131B0X04056	405.60	7.54	2.55	1.80	3.70	0.50				18.50		2.35	0.89	0.12	"D"
*131C0X04980	498.00	7.54	2.55	1.27	3.50	0.50				18.50		2.35	0.65	0.12	"T"
*131D0X04980	498.00	7.54	2.55	1.27	3.50	0.50				18.50		2.35	0.65	0.12	"D"
*132A0X04202	420.20	9.10	2.65	1.80	0.80	0.50	9.55	0.50		19.10				0.08	
*132B0X04198	419.80	13.00	2.75	2.00	0.65	0.50	9.55	0.50		19.10				0.08	
*133A0X04056	405.60	7.10	7.00	-	2.00	6.35	0.75	-						0.15	NO "D"
*133B0X04056	405.60	7.10	7.00	0.60	2.00	6.35	0.75	25.40						0.15	with "D"
*133C0X06096	609.60	6.35	7.00	-	5.35	6.35	0.75	-						0.15	NO "D"
*133D0X06096	609.60	6.35	7.00	1.80	5.35	6.35	0.75	25.40						0.15	with "D"
133F0D00348	34.80	6.35	5.34	0.63	1.78	5.08	0.76	-						0.08	"D"

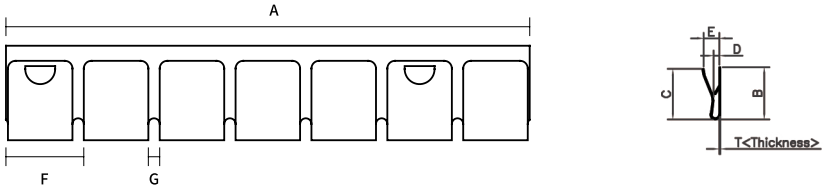
1-31 Series Sketch



1-32 Series Sketch



1-33 Series Sketch

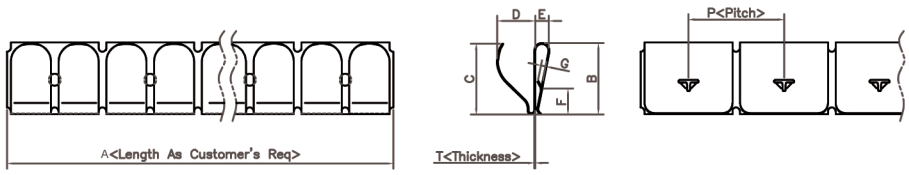


Note: please consult the sales and engineering personnel of our company before type selection of the marked *

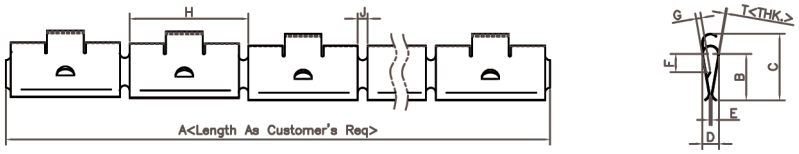
Clip-on Mounting Series

P/N	A	B	C	D	E	F	G	H	J	P	R	R1	R2	T	Lance shape
135C0X04056	405.60	9.50	9.50	5.10	1.80	1.67	0.33			12.70					"T"
*135D0X04056	405.60	9.50	9.50	7.00	1.80	3.45	0.75			12.70					"D"
136A0X00127	12.70	5.40	7.50	1.80	0.25	2.10	0.50	-	-					0.08	
136A0X00751	75.10	5.40	7.50	1.80	0.25	2.10	0.50	12.70	1.15					0.08	
136A0X01523	152.30	5.40	7.50	1.80	0.25	2.10	0.50	12.70	1.15					0.08	
137A0X00127	12.70	6.35	5.75	0.90	0.50	4.40	-			-	0.60			0.08	
137A0X00831	83.10	6.35	5.75	0.90	0.50	4.40	1.15			13.85	0.60			0.08	

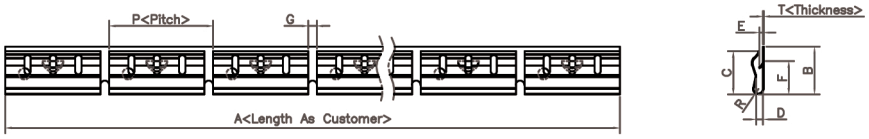
1-35 Series Sketch



1-36 Series Sketch



1-37 Series Sketch

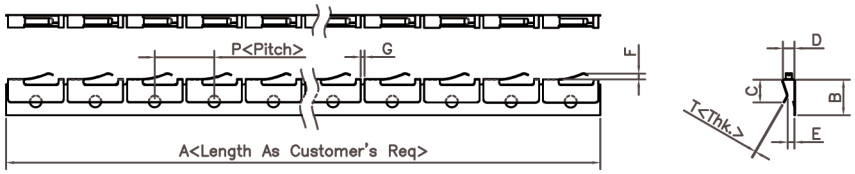


Note: please consult the sales and engineering personnel of our company before type selection of the marked *

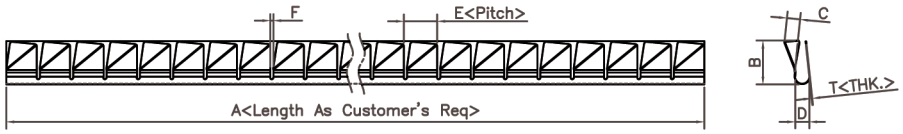
Clip-on Mounting Series

P/N	A	B	C	D	E	F	G	H	I	J	P	R	T	Lance shape
138C0X03048	304.80	4.65	2.95	1.65	0.90	0.75	0.50				20.00		0.08	"D"
*138F0X04080	408.00	3.80	0.75	1.80	2.40	0.50	-						0.08	
139B0X01180	118.00	6.70	3.18	5.80	4.80	2.30	2.30	3.80	1.10	0.55	15.00	1.50		

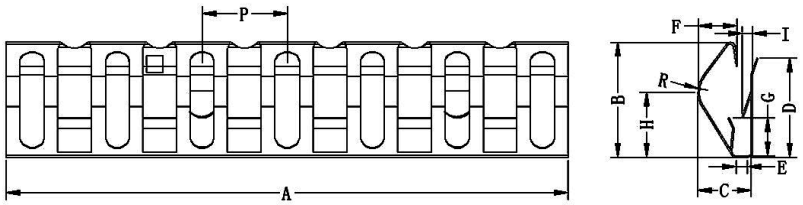
1-38C Series Sketch



1-38F Series Sketch



1-39B Series Sketch

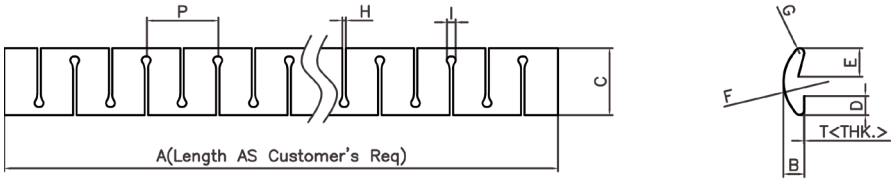


Note: please consult the sales and engineering personnel of our company before type selection of the marked *

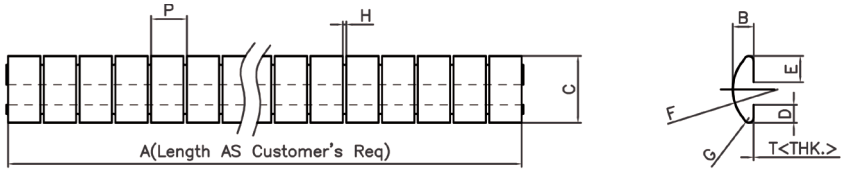
Track Mounting Series

P/N	A	B	C	D	E	F	G	H	I	P	T	S
140F1X03605	360.50	2.50	8.13	2.29	2.29	5.54	0.51	0.46	1.50	9.50	0.05	
140G1X04230	423.00	2.80	8.89	2.54	3.71	6.35	0.60	0.46	1.20	9.50	0.05	
140H0X02655	265.50	2.80	8.89	2.40	3.50	5.90	0.60	0.46	-	4.75	0.08	
141A0X04080	408.00	6.35	28.10	3.55						9.50	0.12	1.00

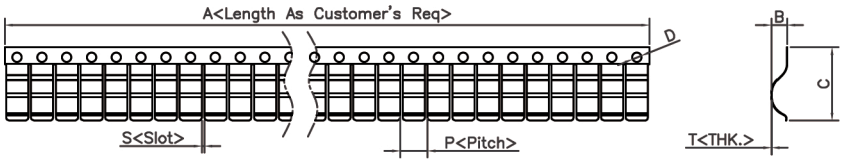
1-40G Series Sketch



1-40H Series Sketch



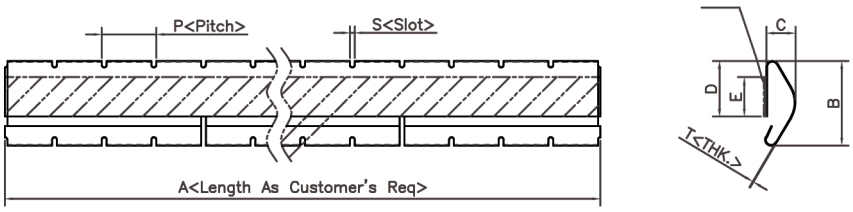
1-41 Series Sketch



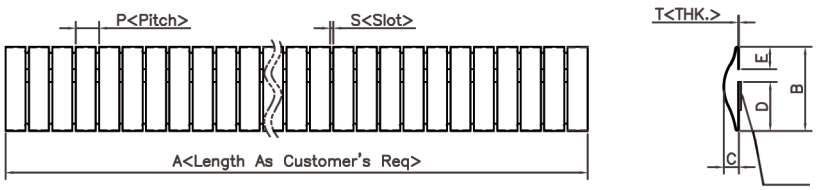
PSA Mounting Series

P/N	A	B	C	D	E	F	S	P	T
150A0X06096	609.60	8.15	2.80	5.35	3.80		0.50	4.75	0.05
152A0X04080	408.00	11.45	2.05	6.65	3.05		0.50	3.20	0.08
153A0X04129	412.90	11.45	1.55	1.65	3.45	6.80	0.50	3.20	0.08
154A0X04080	408.00	7.10	6.05	2.70	0.25		0.50	4.80	0.05
154B0X04080	408.00	9.40	8.40	3.60	0.50		0.55	6.40	0.05
154D0X06096	609.60	15.25	12.70	5.85	0.25		0.80	9.50	0.05

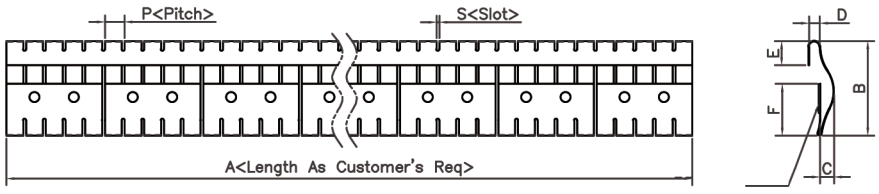
1-50 Series Sketch



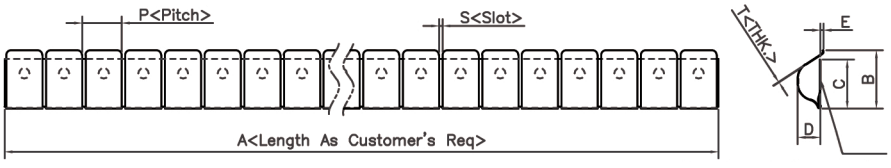
1-52 Series Sketch



1-53 Series Sketch



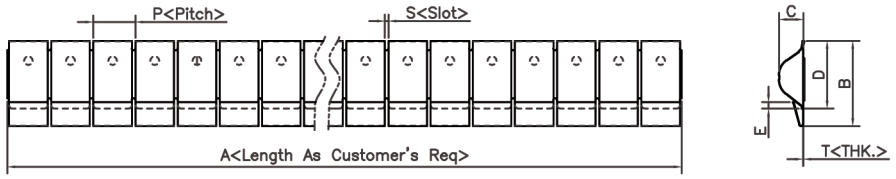
1-54 Series Sketch



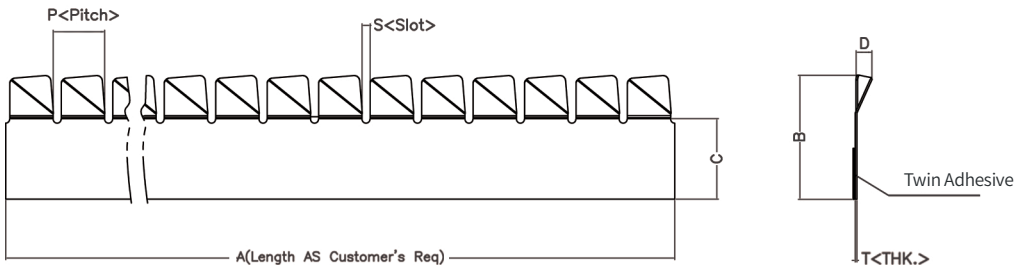
PSA Mounting Series

P/N	A	B	C	D	E	F	S	P	T
*155A0X04080	408.00	6.35	2.05	4.90	0.70		0.50	4.80	0.06
*155B0X04080	408.00	9.65	2.70	7.30	0.50		0.50	4.80	0.06
*155D0X06096	609.60	19.30	5.85	15.30	0.75		0.80	9.50	0.08
158E0X06096	609.60	5.80	3.60	0.80			0.40	2.40	0.08
160A0X06096	609.60	4.05	0.75	2.05			0.40	2.40	0.08
160S0X06096	609.60	4.05	0.75	2.05			0.40	2.40	0.08

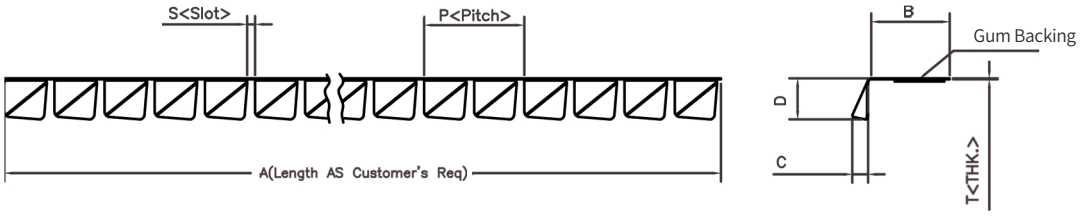
1-55 Series Sketch



1-58 Series Sketch



1-60 Series Sketch

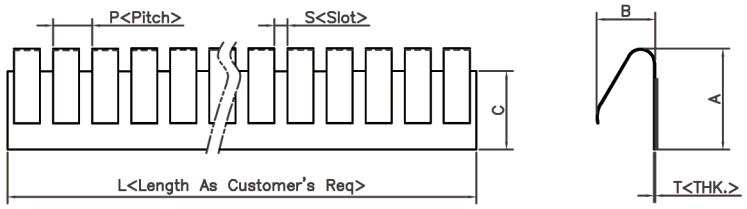


Note: please consult the sales and engineering personnel of our company before type selection of the marked *

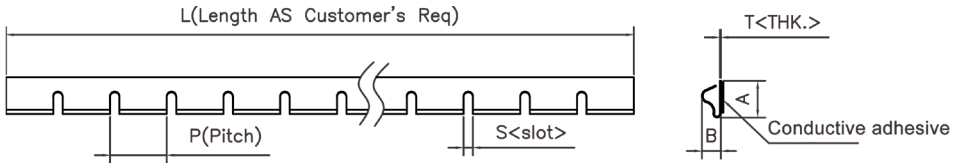
Contact Series

P/N	A	B	C	D	E	F	L	P	S	S1	S2	T
170A0X03050	3.20	1.80	2.30				305.00	1.60	0.50			0.08
170D0X04060	12.20	7.10	9.40				406.00	4.80	1.60			0.15
172K1X03460	1.92	1.00	3.00				346		0.50			0.05
173A2X03430	5.25	2.00	0.70	3.10	5.00	5.40	343	14.82		5.00	5.40	0.05

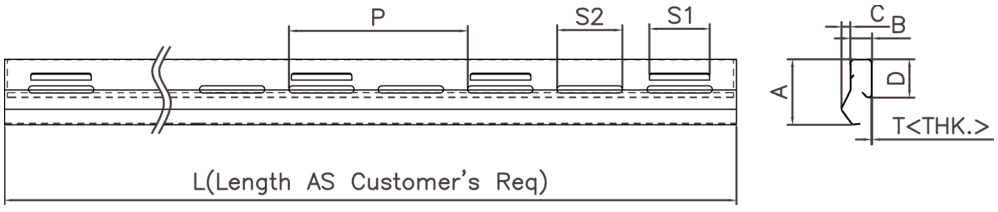
1-70 Series Sketch



1-72K Series Sketch



1-73A Series Sketch



Metal Fingerstock Products



Slot Mounting Series



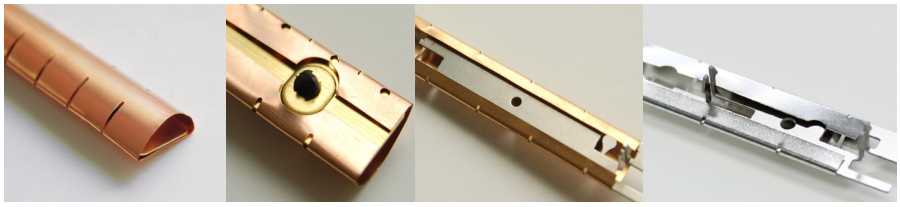


Clip-on Mounting Series



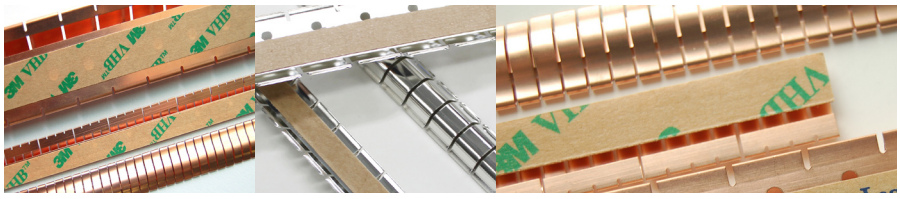


Track Mounting Series





PSA Mounting Series



Other Metal Products

Shielding Can

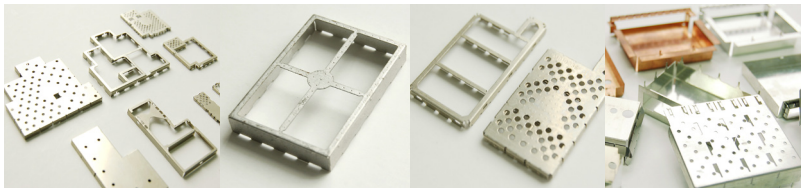
- This product is mainly used in mobile phones, GPS and so on, it is used for electromagnetic shielding(EMI), and it protects the components and LCM on the PCB from EMI.
- The shield material generally uses T=0.1mm~0.2mm stainless steel, nickel silver & tin plated CRS.
- The shielding can is soldered to the PCB directly.

SFP Cage

- The SFP Cage is a metal assembly part with PIN needles, the Cage will be soldered onto the PCB ,and the SFP model will be insert the Cage.
- It is suitable for the high-performance switches, routers, servers, and the hot-plugging interface of the host bus adapter in computing and telecommunications applications.

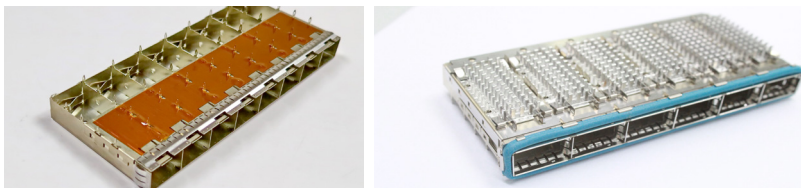


Metal Shielding Can



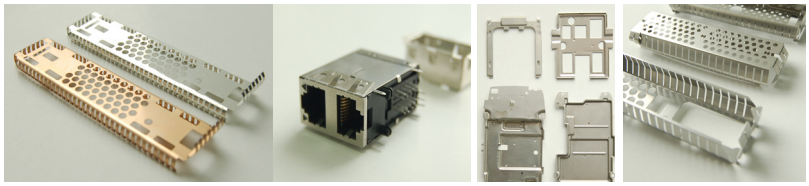


Optical Connector



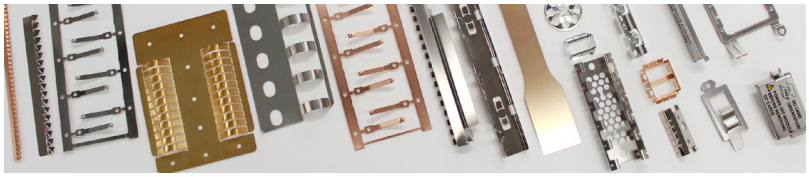


Custom Metal products



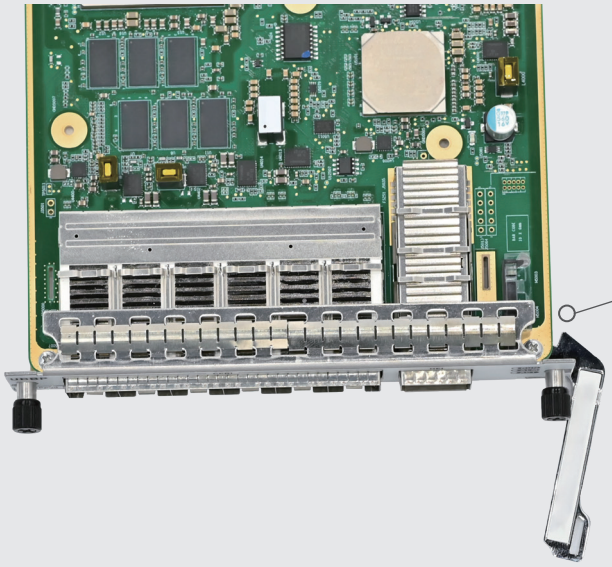


Conductive Contact Strip and Non-standard Mount and Metal Hardware



Applications Of Metal Shielding Products

Application Of Metal Reed In Communication Equipment



The metal spring used in communication equipment makes the installation device in close contact with the metal shell, plays the role of grounding and antistatic while balancing the stress, and protects the safety of the equipment.



Embedded Power Supply

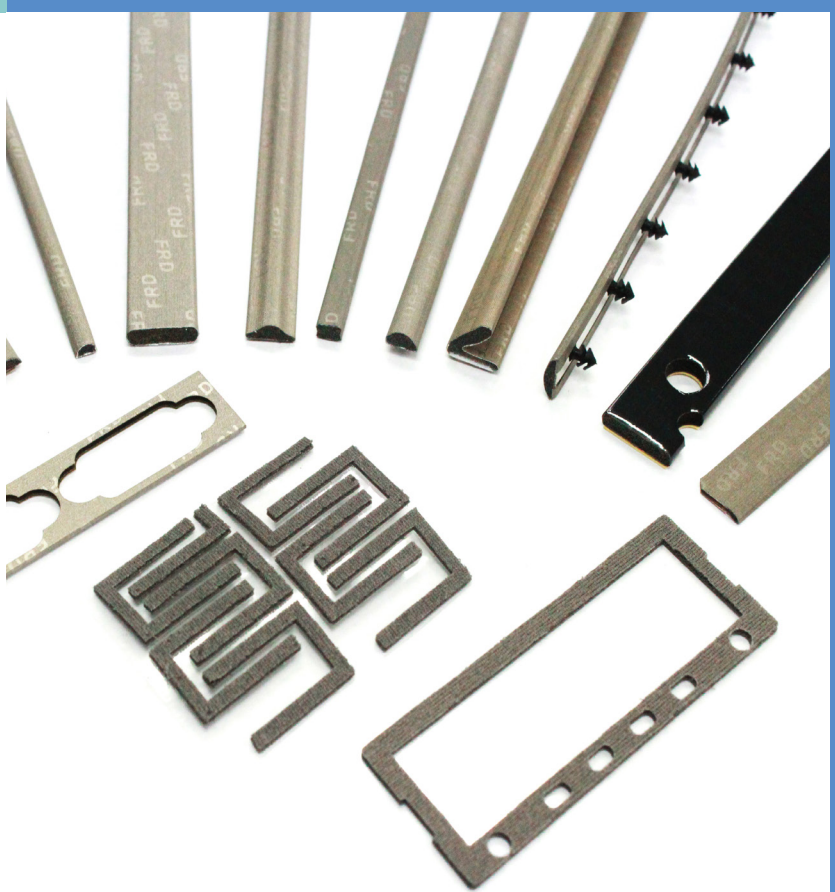
Fabric-over-Foam(FoF)

FRD now has been conducting R&D, design and manufacturing conductive fabric projects. A number of the relevant technologies are in a leading position in the domestic industry. For example, the product of Halogen-Free Flame-Retardant Fabric-Over-Foam launched in 2009 filled the domestic to the product gaps. FRD now has 24 full-automatic high-speed production lines, monthly production capacity of more than 7 million meters. Its customers include in different areas, such as consuming electronics, telecommunications, automotive, medical, military, and many other categories.

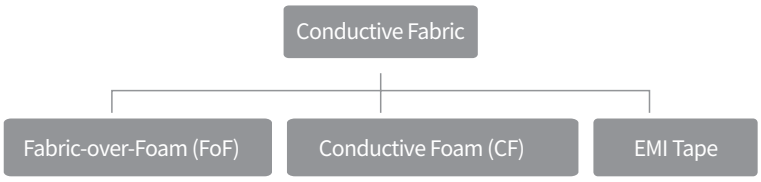
FoF gasket is the conductive fiber cloth which is electrically conductive and corrosion resistant, lined with PU foam of low compression force. It has a good shielding effectiveness. Conductive fabric is the polyester fiber covered with copper and nickel metal. The combination of copper and nickel provide excellent conductivity and shielding effectiveness. FoF gasket provides excellent shielding effectiveness in the range of 30MHz to 40GHz.

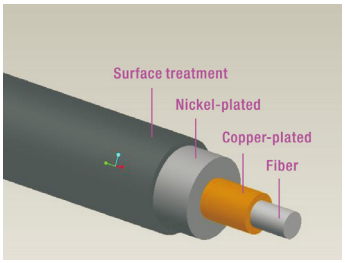
Our latest product, conductive PI gasket, has been widely used in 5G mobile phones, tablets, laptops and other high-end electronic products.

FoF gasket is particularly applicable to the low compression force environments. It is a cost effective product that can apply consuming electronics, telecommunications, automotive, medical, military, ect..



Conductive Fabric Project Classify & FoF Raw Materials













Our Advantage

- Reserves experienced FOF design engineers who can provide the optimal shielding solutions based on the customers' requirements;
- Strong R&D capability, halogen free FOF gasket can meet UL94-V0 flame retardant;
- Quick response: Sampling within 24hours,
- Output capacity: 7 million meter/month



Catalytic

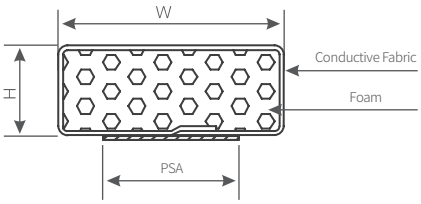


Plating



Auto wrapping lines

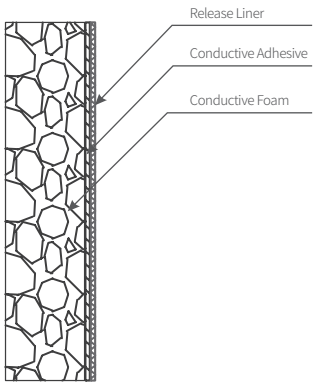
Conductive Fabric Over Foam (FOF)



Fabric-Over-Foam (FoF)

FoF gasket is for the substrate with a conductive fabric, elastic properties and has a certain function of anti-electromagnetic interference electronic equipment used to prevent the electromagnetic waves through the components.

In order to give client-side design engineers to provide more useful information, we are here to talk about the product features FoF gasket, type, material, product standard sizes and configurations. If these elements can not meet your needs, please contact our engineers, we will be based on your needs to design and manufacture of products.



Conductive Foam(CF)

The CF is a type of brand new shielding material, it is an X-Y-Z-axis conductive material, of which the shielding effectiveness is greater than traditional FOF gaskets. It can meet the increasing demands of shielding effectiveness. CF is suitable for I/O port.

The CF is composed of 4 layers with the first layer of polyester fiber, the second layer of PU foam, the third layer of polyester fiber, the forth layer of conductive adhesive.

The Advantages of FOF

- Good conductivity, high shielding effectiveness (⩾ 80dB 30MHz~18GHz) (Figure 1)
- A good antioxidant, anti-corrosion
- Very good wear resistance, high reliability (⩾ 100 million times)
- Very soft, suitable for the occasion can not provide greater pressure
- Low price, it is very good shielding material
- Installation is simple and diverse, suitable for paste, slot
- Products adhesion ROHS, Halogen Free, REACH, UL94-V0 requirements in general.

Fabric-Over-Foam (FoF) is an excellent cost-effective EMI shielding materials.

Fabric / Foam / Pressure Sensitive Adhesive

1. Fabric

Fabric types	Mental Coating	Conductivity (ASTM F390)	Application	Benefits
Ripstop	Ni/Cu	⩽ 0.05 Ohms/inch^2	I/O or Profile Gaskets	Complex shapes, flame retardant, shear resistance
Taffeta	Ni/Cu	⩽ 0.05 Ohms/inch^2	I/O or Profile Gaskets	Complex shapes, flame retardant
Knit Mesh	Ni/Cu	⩽ 0.05 Ohms/inch^2	I/O Gaskets	Low cost, flame retardant
Non-Woven	Ni/Cu	⩽ 0.05 Ohms/inch^2	I/O Gaskets	Low cost, flame retardant

2. Foam

Foam Types	Compression Set (ASTM D3574)	Color	Application	Benefits
PU Foam	⩽ 20%	Charcoal	I/O or Profile Gaskets	Complex shapes, flame retardant, Low Compression Gaskets
Silicon Foam	⩽ 20%	N/A	I/O or Profile Gaskets	Complex shapes, Flame retardant

3. Pressure Sensitive Adhesive

Pressure Sensitive Adhesive	Adhesive Force (ASTM D3330)	Conductivity	Application	Temperature Resistance
3M™ 9485PC or equivalent	⩾ 1.0 Kg/in	N/A	High tack, Shear Resistance	-30°C to 160°C
TT 219 or equivalent	⩾ 0.8 Kg/in	⩽ 0.05 Ohms/inch^2	High tack, Conductivity	-10°C to 100°C

Other Pressure Sensitive Adhesives can be provided. Contact engineering to discuss requirements.

The recommended operating compression for Fabric-Over-Foam EMI Gaskets will vary depending on the shape and size of the particular gasket.Typically, D-shaped, Rectangular Shaped, and Triangle Shaped Fabric-Over-Foam EMI Gaskets should be compressed between 30%~50% of the foam height. Similarly, C shaped Fabric-Over-Foam EMI Gaskets should typically be compressed between 50%~70% of the gasket height.

Displacement Force Resistance (DFR) graphs are available upon request (Figure 2). Please contact Engineering when unsure.

Technical Specificaions of Fabric-Over-Foam Gasket

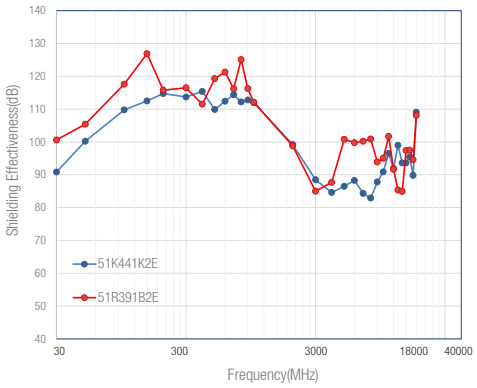
Charcteristics	Specifications		Tesst Standard
Electrical Property			
Shielding Effectiveness	⩾ 80 dB (30MHz~18GHz) (Figure 1)		MIL-DTL-83528F
Surface Resistance	⩽ 0.05 Ohms/inch^2		MIL-DTL-83528F
Compression Resistance	⩽ 0.05 Ohms (Compression 30%) (Figure 2)		Industrial standard
Mechanical Property			
Abrasion Resistance	⩽ 1 Ohms/sq (1,000,000 cycles)		ASTM D 3885
Compression Force	⩽ 50N (Compression 30%) (Figure 2)		Industrial standard
Compression Set	⩽ 20% (Compressed 50% for 22hrs at 70°C)		ASTM D 3574
Compression Range	30~70%		Industrial standard
Reliability Test	⩽ 0.20 Ohms/inch^2 (120H cycles)		Industrial standard
Salt Spray	⩽ 0.20 Ohms/inch^2 (24H)		ASTM B 117
Adhesive Force	⩾ 1.0 Kg/in		ASTM D 3330
Others			
Flame Retardant	UL94 V0		UL94
RoHS	EU (RoHS 2.0)		IEC 62321
Service Temperatures	Option 1	-40°C ~ +70°C Normal Foam	ASTM D 3574
	Option 2	-40°C ~ +85°C Thermostable Foam	
	Option 3	-40°C ~ +105°C High-performance Foam	
	Option 4	-40°C ~ +125°C Silica Gel Foam	
Halogen Content	⩽ 900 ppm chlorine & ⩽ 900 ppm bromine & 1500 ppm max for both		EN 14582

The technical specification data is based on FRD electronic materials tests and analysis that we believe to be reliable. However, in no event, shall FRD electronic materials be liable for the inaccuracies or omissions contained therein. In all cases, details and values should be verified by the customer.

Test Data

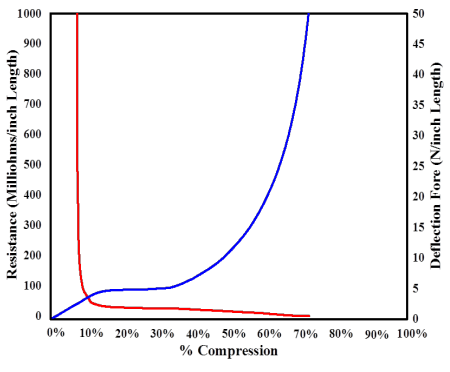
Shielding Effectiveness

Bell Shape-Profile 51K441K2E/Rectangle Shape-Profile 51R391B2E



Displacement Force Resistance (DFR) Test Data

Triangle Shape-Profile 51T401B2E



Test Equipment & The Product Size and Tolerance

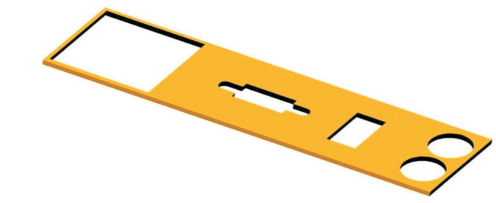
- Projection Testing Apparatuses
- Stripping Force Testing Apparatus
- Salt Spray Testing Machine
- Type EDX3600B RoHS Detector
- Horizontal-Vertical Flame Tester
- Steady Temperature Damp Testing Apparatus
- 4-Point Resistivity with Multi-meter
- Electronic Universal Test Machine
- Force Displacement Resistance Tester
- Textile Abrasion Tester
- A&D Electronic Density Meter
- Precision Thickness Gauge
- Optical Microscope
- Low DC Resistance Tester

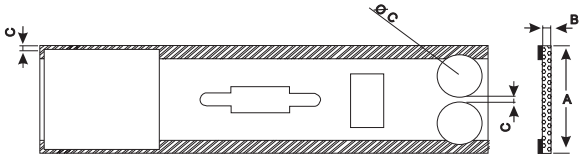
1. Tolerance Standard

- I/O: Height, Width, Length: ±0.5mm
- Profile: Height & Width: ±0.5mm
- Profile Length:
- 0.5 ---- 3mm: ±0.2mm
- 3.0 ----6mm: ±0.3mm
- 6.0 ----30mm: ±0.5mm
- 30 ---120mm: ±0.8mm
- 120 ---400mm: ±1.2mm
- 400---1000mm: ±2.0mm
- 1000--2000mm: ±3.0mm
- 2000--4000mm: ±4.0mm

2. Dimension Notes

- A cross-section width of the product is less than 150mm, the thickness of B is less than 30mm
- I/O product, the hole -to -hole distance and the hole- to- edge distance must shorter than 1.5mm, the diameter of the hole must smaller than 1.5mm
- The directions of the adhesive and liner are the same as the wrapping direction
- The length of the product cannot be longer than 2500mm





FOF Part Number System

P/N: 51 X XX X X X X XXXXX X

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

① **51 - PRODUCT TYPE**

51 - Fabric-Over-Foam

② **X - PROFILE SHAPE**

R	Rectangle	D	D-Shape	C	C-Shape
H	I/O	T	Triangle Shape	K	Bell
Q	Custom	P	P-Shape		

③ **XX - PROFILE NUMBERS**

Sequence code from 00 - ZZ, If enough 000 - ZZZ

④ **X - CUSTOMIZED OPTIONS**

1~9 or A-Z Tape Type/Spec/Positions...

Designate part-specific attributes of the product including tape type, tape width, tape position,with or without PET and a variety of other customized detail. "1" is the default and usually designates Pressure Sensitive Adhesive centered on base. These digits will be supplied by FRD Technologies Engineering Personnel.

⑤ **X - Fillers**

Designate the core material

A	No Foam	B	PU Foam	C	HD-PU Foam
D	LD-PU Foam	F	PET/FRP.....Carrier	K	HT -PU Foam
M	CF	N	Compression Foam		
P	Silicon Foam (Service Temperature -40~125°C)				

⑥ **X - FLAMMABILITY RATING (FR)**

Designate the flame rating of product

0	No Rating
1	UL94 V0 + ROHS
2	UL94 V0 + ROHS + Halogen-Free

⑦ **X - FABRIC COVERING**

Designate the fabric cover of product

A	AL Foil	B	Black Fabric	C	Non Conductive Ripstop
E	Ni/Cu Ripstop	H	Ni/Cu Taffeta		

⑧ **XXXXX - LENGTH EXTENSION**

Designate the part length in millimeters to one decimal places.For the example shown sbove, the "01524" denotes a 6.00 inch (152.4mm) long gasket.

⑨ **X - IDENTIFICATION CODE**

In view of the same product, if the customer request unit/layout/packing and so on at the same time, should be distinguishfrom A to Z

CF & Conductive Tape Part Number System

P / N : 52 X XXX X XXXX XXXX X

① ② ③ ④ ⑤ ⑥ ⑦

① **52 - PRODUCT TYPE**

52 - Conductive Foam

② **X - ADHESIVE**

A - No adhesive

B - Conductive Adhesive

C - Non conductive Adhesive

D - Custom

③ **XX - PRODUCT THICKNESS**

For example: 100 = 1.00 mm; 025 = 0.25 mm

④ **X - SHAPE**

R - Rectangle

P - Punching

⑤ **XXXX - WIDTH EXTENSION**

Four digits, for example, 1234 = 123.4 mm

⑥ **XXXX - LENGTH EXTENSION**

Four digits, for example, 1234 = 123.4 mm

⑦ **X - IDENTIFICATION CODE**

In view of the same product, if the customer request unit/layout/packing and so on at the same time, should be distinguish from A to Z

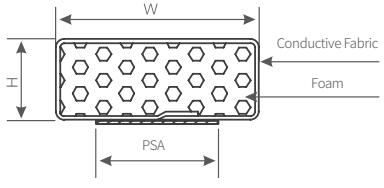
FOF Gasket (Rectangle)

Rectangle														
P/N	H(inch : mm)		W(inch : mm)		P/N	H(inch : mm)		W(inch : mm)		P/N	H(inch : mm)		W(inch : mm)	
51R11	0.079	2.0	0.709	18.0	51R60	0.157	4.0	0.157	4.0	51RA9	0.079	2.0	0.118	3.0
51R13	0.118	3.0	0.236	6.0	51R62	0.059	1.5	0.157	4.0	51RB1	0.059	1.5	0.205	5.2
51R14	0.118	3.0	0.157	4.0	51R63	0.709	18.0	0.945	24.0	51RB2	0.079	2.0	0.508	12.9
51R15	0.028	0.7	0.394	10.0	51R64	0.197	5.0	0.394	10.0	51RB3	0.059	1.5	0.787	20.0
51R16	0.126	3.2	0.236	6.0	51R65	0.126	3.2	0.500	12.7	51RB4	0.098	2.5	0.197	5.0
51R17	0.118	3.0	0.197	5.0	51R66	0.197	5.0	0.315	8.0	51RB5	0.157	4.0	0.177	4.5
51R19	0.098	2.5	0.157	4.0	51R67	0.126	3.2	0.374	9.5	51RB6	0.059	1.5	0.236	6.0
51R20	0.252	6.4	0.252	6.4	51R68	0.500	12.7	0.500	12.7	51RB7	0.197	5.0	0.354	9.0
51R21	0.394	10.0	0.394	10.0	51R69	0.079	2.0	0.315	8.0	51RB8	0.079	2.0	0.433	11.0
51R22	0.118	3.0	0.118	3.0	51R70	0.059	1.5	0.315	8.0	51RB9	0.551	14.0	0.315	8.0
51R23	0.118	3.0	0.315	8.0	51R71	0.079	2.0	0.197	5.0	51RC1	0.374	9.5	0.500	12.7
51R24	0.059	1.5	0.197	5.0	51R72	0.472	12.0	0.394	10.0	51RC2	0.039	1.0	0.524	13.3
51R25	0.039	1.0	0.197	5.0	51R73	0.059	1.5	0.252	6.4	51RC3	0.020	0.5	0.063	1.6
51R26	0.039	1.0	0.394	10.0	51R74	0.039	1.0	0.079	2.0	51RC4	0.014	0.4	0.276	7.0
51R27	0.039	1.0	0.118	3.0	51R75	0.138	3.5	0.138	3.5	51RC5	0.157	4.0	0.197	5.0
51R28	0.055	1.4	0.098	2.5	51R76	0.024	0.6	0.354	9.0	51RC6	0.039	1.0	0.433	11.0
51R29	0.106	2.7	0.276	7.0	51R77	0.012	0.3	0.217	5.5	51RC7	0.157	4.0	0.138	3.5
51R30	0.098	2.5	0.264	6.7	51R78	0.094	2.4	0.929	23.6	51RC8	0.157	4.0	0.394	10.0
51R31	0.039	1.0	0.276	7.0	51R79	0.787	20.0	0.276	7.0	51RC9	0.039	1.0	0.787	20.0
51R32	0.059	1.5	0.394	10.0	51R80	0.020	0.5	0.157	4.0	51RD1	0.256	6.5	1.000	25.4
51R33	0.118	3.0	0.787	20.0	51R81	0.039	1.0	0.236	6.0	51RD2	0.110	2.8	0.197	5.0
51R34	0.256	6.5	1.122	28.5	51R82	0.094	2.4	0.929	23.6	51RD3	0.157	4.0	0.256	6.5
51R35	0.079	2.0	0.157	4.0	51R83	0.079	2.0	0.276	7.0	51RD4	0.197	5.0	0.157	4.0
51R36	0.315	8.0	0.591	15.0	51R84	0.079	2.0	0.138	3.5	51RD5	0.079	2.0	0.150	3.8
51R37	0.079	2.0	0.394	10.0	51R85	0.039	1.0	0.315	8.0	51RD6	0.059	1.5	0.709	18.0
51R38	0.020	0.5	0.276	7.0	51R86	0.177	4.5	0.157	4.0	51RD7	1.181	30.0	0.394	10.0
51R39	0.039	1.0	0.177	4.5	51R87	0.189	4.8	0.299	7.6	51RD8	0.252	6.4	0.500	12.7
51R40	0.035	0.9	0.472	12.0	51R88	0.276	7.0	0.236	6.0	51RD9	0.256	6.5	0.866	22.0
51R41	0.035	0.9	0.354	9.0	51R89	0.276	7.0	0.157	4.0	51RE1	0.079	2.0	0.098	2.5
51R42	0.067	1.7	0.157	4.0	51R90	0.315	8.0	0.236	6.0	51RE2	0.047	1.2	0.079	2.0
51R43	0.118	3.0	0.551	14.0	51R91	0.079	2.0	0.236	6.0	51RE3	0.098	2.5	0.866	22.0
51R44	0.157	4.0	0.220	5.6	51R92	0.039	1.0	0.157	4.0	51RE4	0.134	3.4	0.236	6.0
51R45	0.091	2.3	0.177	4.5	51R93	0.197	5.0	0.197	5.0	51RE5	0.177	4.5	0.256	6.5
51R46	0.079	2.0	0.079	2.0	51R94	0.039	1.0	0.098	2.5	51RE6	0.047	1.2	0.059	1.5
51R47	0.098	2.5	0.118	3.0	51R95	0.217	5.5	0.276	7.0	51RE7	0.177	4.5	0.276	7.0
51R48	0.118	3.0	0.591	15.0	51R96	0.138	3.5	0.512	13.0	51RE8	0.157	4.0	0.374	9.5
51R49	0.138	3.5	0.118	3.0	51R97	0.138	3.5	0.394	10.0	51RE9	0.118	3.0	0.201	5.1
51R50	0.024	0.6	0.102	2.6	51R98	0.177	4.5	0.197	5.0	51RF1	0.118	3.0	0.362	9.2
51R51	0.020	0.5	0.315	8.0	51R99	0.177	4.5	0.236	6.0	51RF2	0.205	5.2	0.268	6.8
51R52	0.236	6.0	0.118	3.0	51RA1	0.236	6.0	0.098	2.5	51RF3	0.205	5.2	0.283	7.2
51R53	0.059	1.5	0.118	3.0	51RA2	0.236	6.0	0.591	15.0	51RF4	0.283	7.2	0.354	9.0
51R54	0.024	0.6	0.236	6.0	51RA3	0.138	3.5	0.315	8.0	51RF5	0.283	7.2	0.248	6.3
51R55	0.118	3.0	0.177	4.5	51RA4	0.315	8.0	0.315	8.0	51RF6	0.083	2.1	0.394	10.0
51R56	0.197	5.0	0.236	6.0	51RA5	0.138	3.5	0.630	16.0	51RF7	0.083	2.1	0.268	6.8
51R57	0.039	1.0	0.217	5.5	51RA6	0.315	8.0	0.394	10.0	51RF8	0.244	6.2	0.248	6.3
51R58	0.079	2.0	0.374	9.5	51RA7	0.098	2.5	0.472	12.0	51RF9	0.236	6.0	0.197	5.0
51R59	0.984	25.0	0.591	15.0	51RA8	0.059	1.5	0.130	3.3	51RG1	0.236	6.0	0.394	10.0

FOF Gasket (Rectangle)

Rectangle														
P/N	H(inch : mm)		W(inch : mm)		P/N	H(inch : mm)		W(inch : mm)		P/N	H(inch : mm)		W(inch : mm)	
51RG2	0.433	11.0	0.394	10.0	51RN9	0.059	1.5	0.098	2.5	51RT7	0.047	1.2	0.197	5.0
51RG3	0.433	11.0	0.197	5.0	51RP1	0.039	1.0	0.220	5.6	51RT8	0.087	2.2	0.197	5.0
51RG4	0.020	0.5	0.197	5.0	51RP2	0.039	1.0	1.969	50.0	51RT9	0.039	1.0	0.201	5.1
51RG5	0.220	5.6	0.311	7.9	51RP3	0.236	6.0	0.472	12.0	51RV1	0.035	0.9	0.071	1.8
51RG6	0.075	1.9	0.476	12.1	51RP4	0.217	5.5	0.157	4.0	51RV2	0.051	1.3	0.091	2.3
51RG7	0.020	0.5	0.079	2.0	51RP5	0.787	20.0	0.591	15.0	51RV3	0.051	1.3	0.236	6.0
51RG8	0.012	0.3	0.370	9.4	51RP6	0.020	0.5	0.150	3.8	51RV4	0.016	0.4	0.201	5.1
51RG9	0.020	0.5	0.394	10.0	51RP7	0.039	1.0	0.246	6.3	51RV5	0.394	10.0	0.472	12.0
51RH1	0.866	22.0	0.591	15.0	51RP8	0.236	6.0	0.157	4.0	51RV6	0.315	8.0	0.472	12.0
51RH2	0.055	1.4	0.079	2.0	51RP9	0.472	12.0	0.315	8.0	51RV7	0.551	14.0	0.394	10.0
51RH3	0.157	4.0	0.236	6.0	51RQ1	0.012	0.3	0.118	3.0	51RV8	0.472	12.0	0.197	5.0
51RH4	0.079	2.0	0.591	15.0	51RQ2	0.217	5.5	0.394	10.0	51RV9	0.020	0.5	0.264	6.7
51RH5	0.236	6.0	0.315	8.0	51RQ3	0.024	0.6	0.315	8.0	51RW1	0.059	1.5	0.201	5.1
51RH6	0.087	2.2	0.098	2.5	51RQ4	0.087	2.2	0.116	3.0	51RW2	0.079	2.0	0.201	5.1
51RH7	0.063	1.6	0.157	4.0	51RQ5	0.063	1.6	0.071	1.8	51RW3	0.020	0.5	0.118	3.0
51RH8	0.236	6.0	0.236	6.0	51RQ6	0.087	2.2	0.071	1.8	51RW4	0.071	1.8	0.177	4.5
51RH9	0.472	12.0	0.591	15.0	51RQ7	0.039	1.0	0.591	15.0	51RW5	0.039	1.0	0.339	8.6
51RK1	0.022	0.6	0.551	14.0	51RQ8	0.276	7.0	0.394	10.0	51RW6	0.071	1.8	0.157	4.0
51RK2	0.039	1.0	0.354	9.0	51RQ9	0.709	18.0	0.394	10.0	51RW7	0.071	1.8	0.197	5.0
51RK3	0.591	15.0	0.394	10.0	51RR1	0.059	1.5	0.280	7.1	51RW8	0.201	5.1	0.201	5.1
51RK4	0.126	3.2	0.252	6.4	51RR2	0.091	2.3	0.661	16.8	51RW9	0.118	3.0	0.138	3.5
51RK5	0.039	1.0	0.709	18.0	51RR3	0.059	1.5	1.201	30.5	51RX1	0.039	1.0	0.157	4.0
51RK6	0.150	3.8	0.110	2.8	51RR4	0.173	4.4	0.449	11.4	51RX2	0.024	0.6	0.276	7.0
51RK7	0.472	12.0	0.472	12.0	51RR5	0.157	4.0	0.315	8.0	51RX3	0.063	1.6	0.079	2.0
51RK8	0.161	4.1	0.236	6.0	51RR6	0.177	4.5	0.394	10.0	51RX4	0.016	0.4	0.197	5.0
51RK9	0.098	2.5	0.236	6.0	51RR7	0.177	4.5	0.315	8.0	51RX5	0.059	1.5	0.354	9.0
51RM1	0.059	1.5	0.110	2.8	51RR8	0.098	2.5	0.315	8.0	51RX6	0.098	2.5	0.071	1.8
51RM2	0.087	2.2	0.177	4.5	51RR9	0.394	10.0	0.315	8.0	51RX7	0.079	2.0	0.063	1.6
51RM3	0.059	1.5	0.213	5.4	51RS1	0.354	9.0	0.394	10.0	51RX8	0.118	3.0	0.394	10.0
51RM4	0.059	1.5	0.079	2.0	51RS2	0.118	3.0	0.669	17.0	51RX9	0.051	1.3	0.217	5.5
51RM5	0.094	2.4	0.118	3.0	51RS3	0.118	3.0	0.630	16.0	51RY1	0.224	5.7	0.177	4.5
51RM6	0.020	0.5	1.024	26.0	51RS4	0.118	3.0	1.276	32.4	51RY2	0.047	1.2	0.157	4.0
51RM7	0.059	1.5	0.059	1.5	51RS5	0.118	3.0	0.953	24.2	51RY3	0.039	1.0	0.260	6.6
51RM8	0.012	0.3	0.181	4.6	51RS6	0.098	2.5	0.276	7.0	51RY4	0.150	3.8	0.500	12.7
51RM9	0.094	2.4	0.079	2.0	51RS7	0.039	1.0	0.256	6.5	51RY5	0.043	1.1	0.528	13.4
51RN1	0.157	4.0	0.354	9.0	51RS8	0.197	5.0	0.709	18.0	51RY6	0.433	11.0	0.236	6.0
51RN2	0.012	0.3	0.394	10.0	51RS9	0.079	2.0	0.630	16.0	51RY7	0.039	1.0	0.512	13.0
51RN3	0.236	6.0	0.354	9.0	51RT1	0.138	3.5	0.157	4.0	51RY8	0.130	3.3	0.189	4.8
51RN4	0.039	1.0	1.614	41.0	51RT2	0.276	7.0	0.098	2.5	51RY9	0.028	0.7	0.315	8.0
51RN5	0.047	1.2	0.866	22.0	51RT3	0.031	0.8	0.315	8.0	51RZ1	0.118	3.0	0.276	7.0
51RN6	0.098	2.5	0.268	6.8	51RT4	0.126	3.2	0.591	15.0	51RZ5	0.323	8.2	0.177	4.5
51RN7	0.472	12.0	0.177	4.5	51RT5	0.024	0.6	0.366	9.3	51RZ6	0.063	1.6	0.394	10.0
51RN8	0.197	5.0	0.472	12.0	51RT6	0.051	1.3	0.220	5.6	51RZ7	0.047	1.2	0.071	1.8

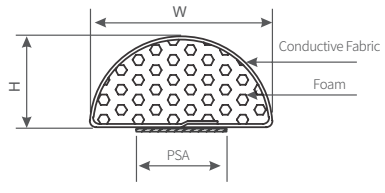
Rectangular Series Sketch



FOF Gasket (D-Shape)

D-Shape														
P/N	H(inch : mm)		W(inch : mm)		P/N	H(inch : mm)		W(inch : mm)		P/N	H(inch : mm)		W(inch : mm)	
51D11	0.142	3.6	0.252	6.4	51D52	0.079	2.0	0.157	4.0	51D89	0.071	1.8	0.295	7.5
51D12	0.106	2.7	0.169	4.3	51D53	0.106	2.7	0.142	3.6	51D90	0.157	4.0	0.425	10.8
51D13	0.079	2.0	0.394	10.0	51D54	0.197	5.0	0.374	9.5	51D91	0.201	5.1	0.480	12.2
51D14	0.098	2.5	0.299	7.6	51D55	0.126	3.2	0.374	9.5	51D92	0.079	2.0	0.236	6.0
51D15	0.098	2.5	0.248	6.3	51D56	0.071	1.8	0.181	4.6	51D93	0.118	3.0	0.394	10.0
51D16	0.189	4.8	0.299	7.6	51D57	0.157	4.0	0.315	8.0	51D94	0.098	2.5	0.157	4.0
51D17	0.098	2.5	0.394	10.0	51D58	0.118	3.0	0.150	3.8	51D95	0.130	3.3	0.256	6.5
51D18	0.059	1.5	0.150	3.8	51D59	0.091	2.3	0.205	5.2	51D96	0.098	2.5	0.394	10.0
51D19	0.079	2.0	0.079	2.0	51D60	0.083	2.1	0.315	8.0	51D97	0.138	3.5	0.394	10.0
51D20	0.079	2.0	0.394	10.0	51D61	0.138	3.5	0.394	10.0	51D98	0.098	2.5	0.250	6.4
51D21	0.252	6.4	0.252	6.4	51D62	0.059	1.5	0.118	3.0	51D99	0.130	3.3	0.189	4.8
51D22	0.157	4.0	0.500	12.7	51D63	0.059	1.5	0.236	6.0	51DA1	0.200	5.1	0.394	10.0
51D23	0.091	2.3	0.150	3.8	51D64	0.118	3.0	0.354	9.0	51DA2	0.098	2.5	0.583	14.8
51D24	0.181	4.6	0.394	10.0	51D65	0.075	1.9	0.150	3.8	51DA3	0.079	2.0	0.118	3.0
51D25	0.217	5.5	0.409	10.4	51D66	0.118	3.0	0.118	3.0	51DA4	0.110	2.8	0.276	7.0
51D26	0.173	4.4	0.244	6.2	51D67	0.102	2.6	0.370	9.4	51DA5	0.059	1.5	0.177	4.5
51D27	0.059	1.5	0.315	8.0	51D68	0.118	3.0	0.358	9.1	51DA6	0.094	2.4	0.201	5.1
51D28	0.094	2.4	0.374	9.5	51D68	0.118	3.0	0.358	9.1	51DA7	0.118	3.0	0.500	12.7
51D29	0.079	2.0	0.142	3.6	51D69	0.087	2.2	0.299	7.6	51DA8	0.138	3.5	0.315	8.0
51D31	0.157	4.0	0.236	6.0	51D70	0.039	1.0	0.150	3.8	51DA9	0.059	1.5	0.394	10.0
51D32	0.079	2.0	0.315	8.0	51D71	0.150	3.8	0.150	3.8	51DA10	0.118	3.0	0.250	6.4
51D33	0.157	4.0	0.150	3.8	51D72	0.157	4.0	0.787	20.0	51DA11	0.098	2.5	0.315	8.0
51D34	0.079	2.0	0.276	7.0	51D73	0.079	2.0	0.500	12.7	51DA12	0.079	2.0	0.394	10.0
51D35	0.079	2.0	0.295	7.5	51D74	0.106	2.7	0.500	12.7	51DA13	0.150	3.8	0.354	9.0
51D36	0.118	3.0	0.472	12.0	51D75	0.150	3.8	0.500	12.7	51DA14	0.177	4.5	0.315	8.0
51D37	0.039	1.0	0.276	7.0	51D76	0.071	1.8	0.500	12.7	51DA15	0.197	5.0	0.315	8.0
51D38	0.079	2.0	0.394	10.0	51D77	0.098	2.5	0.500	12.7	51DA16	0.071	1.8	0.150	3.8
51D39	0.071	1.8	0.169	4.3	51D78	0.138	3.5	0.500	12.7	51DA17	0.250	6.4	0.250	6.4
51D40	0.118	3.0	0.335	8.5	51D79	0.157	4.0	0.591	15.0	51DA18	0.106	2.7	0.169	4.3
51D41	0.157	4.0	0.433	11.0	51D80	0.059	1.5	0.252	6.4	51DA19	0.118	3.0	0.394	10.0
51D42	0.118	3.0	0.315	8.0	51D81	0.118	3.0	0.394	10.0	51DA20	0.169	4.3	0.250	6.4
51D43	0.252	6.4	0.374	9.5	51D82	0.181	4.6	0.402	10.2	51DA21	0.374	9.5	0.500	12.7
51D44	0.079	2.0	0.370	9.4	51D83	0.070	1.8	0.394	10.0	51DA22	0.299	7.6	0.500	12.7
51D45	0.118	3.0	0.252	6.4	51D84	0.110	2.8	0.374	9.5	51DA23	0.110	2.8	0.224	5.7
51D47	0.039	1.0	0.394	10.0	51D85	0.201	5.1	0.252	6.4	51DA24	0.161	4.1	0.240	6.1
51D48	0.091	2.3	0.091	2.3	51D86	0.106	2.7	0.394	10.0	51DA25	0.161	4.1	0.250	6.4
51D49	0.102	2.6	0.177	4.5	51D87	0.157	4.0	0.394	10.0	51DA26	0.142	3.6	0.339	8.6
51D51	0.130	3.3	0.299	7.6	51D88	0.118	3.0	0.098	2.5					

D-shaped Series Sketch

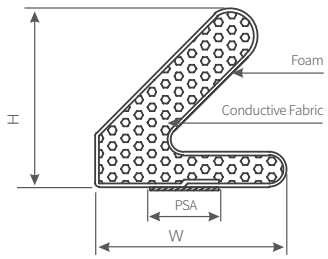


FOF Gasket (C, P, M, Bell-Shape and Triangle Shape)

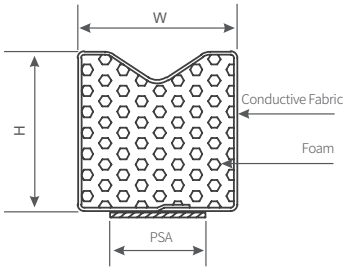
C, P, M-Shape					Bell-Shape					Triangle Shape				
P/N	H(inch : mm)		W(inch : mm)		P/N	H(inch : mm)		W(inch : mm)		P/N	H(inch : mm)		W(inch : mm)	
51C11	0.315	8.0	0.315	8.0	51K11	0.217	5.5	0.591	15.0	51T12	0.236	6.0	0.488	12.4
51C12	0.394	10.0	0.433	11.0	51K12	0.071	1.8	0.563	14.3	51T13	0.118	3.0	0.512	13.0
51C13	0.315	8.0	0.315	8.0	51K13	0.071	1.8	0.181	4.6	51T14	0.098	2.5	0.394	10.0
51C15	0.386	9.8	0.421	10.7	51K14	0.122	3.1	0.315	8.0	51T15	0.157	4.0	0.720	18.3
51C16	0.465	11.8	0.421	10.7	51K15	0.059	1.5	0.563	14.3	51T16	0.091	2.3	0.362	9.2
51C23	0.252	6.4	0.256	6.5	51K16	0.071	1.8	0.559	14.2	51T17	0.118	3.0	0.276	7.0
51C24	0.315	8.0	0.315	8.0	51K17	0.059	1.5	0.315	8.0	51T18	0.138	3.5	0.394	10.0
51C25	0.402	10.2	0.429	10.9	51K18	0.067	1.7	0.484	12.3	51T19	0.079	2.0	0.236	6.0
51C26	0.673	17.1	0.591	15.0	51K19	0.157	4.0	0.500	12.7	51T20	0.094	2.4	0.299	7.6
P-Shape					51K20	0.071	1.8	0.181	4.6	51T21	0.110	2.8	0.618	15.7
51P11	0.118	3.0	0.492	12.5	51K21	0.098	2.5	0.299	7.6	51T22	0.039	1.0	0.374	9.5
51P12	0.276	7.0	0.433	11.0	51K22	0.098	2.5	0.394	10.0	51T23	0.098	2.5	0.394	10.0
51P13	0.173	4.4	0.646	16.4	51K23	0.087	2.2	0.181	4.6	51T24	0.098	2.5	0.374	9.5
51P14	0.118	3.0	0.520	13.2	51K24	0.138	3.5	0.315	8.0	51T25	0.059	1.5	0.394	10.0
M-Shape					51K25	0.130	3.3	0.394	10.0	51T26	0.118	3.0	0.319	8.1
51M11	0.394	10.0	0.394	10.0	51K26	0.079	2.0	0.299	7.6	51T27	0.098	2.5	0.394	10.0
51M12	0.374	9.5	0.500	12.7	51K27	0.181	4.6	0.551	14.0	51T28	0.157	4.0	0.394	10.0
										51T29	0.063	1.6	0.197	5.0
										51T30	0.079	2.0	0.315	8.0
										51T31	0.110	2.8	0.319	8.1
										51T32	0.091	2.3	0.250	6.4
										51T33	0.126	3.2	0.250	6.4
										51T34	0.091	2.3	0.500	12.7
										51T35	0.126	3.2	0.500	12.7

C-shaped, M-shaped, P-shaped, Bell-shaped and Triangle shaped Series Sketch

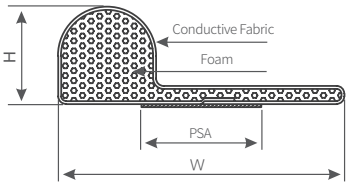
C-shaped



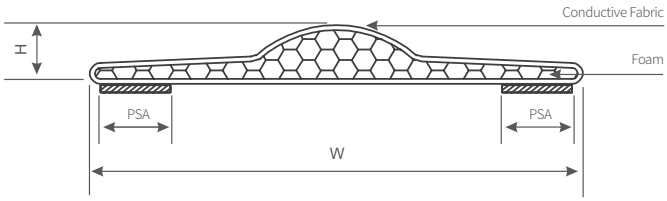
M-shaped



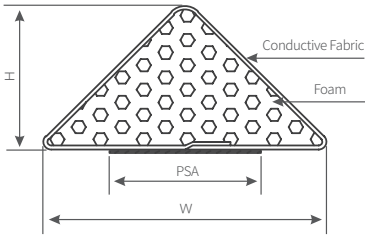
P-shaped



Bell-shaped



Triangle shaped



FOF Gasket (I/O and Others)

I/0																						
P/N	H(inch:mm)		W(inch:mm)		L(inch:mm)		P/N	H(inch:mm)		W(inch:mm)		L(inch:mm)		P/N	H(inch:mm)		W(inch:mm)		L(inch:mm)	
5IH11	0.039	1.0	1.339	34.0	6.055	153.8	51H58	0.059	1.5	1.732	44.0	6.299	160.0	51HA7	0.157	4.0	0.787	20.0	0.906	23.0
5IH12	0.079	2.0	1.102	28.0	6.299	160.0	51H58A	0.079	2.0	1.398	35.5	5.118	130.0	51HA8	0.079	2.0	2.953	75.0	10.000	254.0
5IH13	0.197	5.0	0.787	20.0	1.024	26.0	51H60	0.039	1.0	3.378	85.8	8.976	228.0	51HA9	0.079	2.0	1.772	45.0	1.378	35.0
5IH14	0.059	1.5	0.748	19.0	1.339	34.0	51H61	0.059	1.5	1.772	45.0	6.102	155.0	51HB1	0.039	1.0	0.591	15.0	2.165	55.0
5IH15	0.039	1.0	0.689	17.5	6.417	163.0	51H62	0.039	1.0	0.551	14.0	2.559	65.0	51HB2	0.079	2.0	1.359	34.5	5.874	149.2
5IH16	0.079	2.0	1.063	27.0	1.181	30.0	51H63	0.079	2.0	0.535	13.6	2.197	55.8	51HB3	0.157	4.0	0.236	6.0	0.236	6.0
5IH17	0.039	1.0	0.512	13.0	2.138	54.3	51H64	0.098	2.5	1.693	43.0	4.825	122.6	51HB4	0.039	1.0	2.953	75.0	10.000	254.0
5IH18	0.031	0.8	0.709	18.0	2.795	71.0	51H65	0.079	2.0	0.866	22.0	5.118	130.0	51HB5	0.079	2.0	0.551	14.0	0.945	24.0
5IH19	0.031	0.8	0.551	14.0	1.457	37.0	51H66	0.118	3.0	2.244	57.0	4.528	115.0	51HB6	0.039	1.0	0.748	19.0	1.319	33.5
5IH20	0.059	1.5	1.772	45.0	6.220	158.0	51H67	0.079	2.0	0.736	18.7	1.713	43.5	51HB7	0.118	3.0	0.630	16.0	1.827	46.4
5IH21	0.079	2.0	0.669	17.0	0.866	22.0	51H68	0.079	2.0	0.665	16.9	1.378	35.0	51HB8	0.039	1.0	0.638	16.2	1.319	33.5
5IH22	0.039	1.0	0.394	10.0	15.323	389.2	51H69	0.039	1.0	0.669	17.0	1.398	35.5	51HB9	0.079	2.0	0.787	20.0	2.854	72.5
5IH23	0.039	1.0	0.394	10.0	6.646	168.8	51H70	0.079	2.0	1.063	27.0	1.236	31.4	51HC1	0.039	1.0	3.378	85.8	8.937	227.0
5IH24	0.059	1.5	0.748	19.0	1.949	49.5	51H71	0.079	2.0	0.551	14.0	2.205	56.0	51HC2	0.157	4.0	0.630	16.0	0.945	24.0
5IH25	0.157	4.0	0.866	22.0	0.866	22.0	51H72	0.157	4.0	0.630	16.0	0.984	25.0	51HC3	0.118	3.0	0.579	14.7	1.807	45.9
5IH26	0.079	2.0	0.591	15.0	7.874	200.0	51H73	0.079	2.0	1.102	28.0	5.862	148.9	51HC4	0.079	2.0	0.551	14.0	1.890	48.0
5IH27	0.059	1.5	1.772	45.0	5.984	152.0	51H74	0.079	2.0	0.709	18.0	2.205	56.0	51HC5	0.157	4.0	0.315	8.0	0.315	8.0
5IH28	0.118	3.0	1.362	34.6	6.358	161.5	51H75	0.120	3.1	1.689	42.9	6.270	159.3	51HC6	0.039	1.0	0.713	18.1	3.902	99.1
5IH29	0.118	3.0	0.886	22.5	5.807	147.5	51H76	0.079	2.0	0.957	24.3	1.902	48.3	51HC7	0.039	1.0	0.394	10.0	1.260	32.0
5IH35	0.039	1.0	1.417	36.0	5.512	140.0	51H77	0.039	1.0	1.343	34.1	5.583	141.8	51HC8	0.039	1.0	0.669	17.0	4.055	103.0
5IH30	0.079	2.0	1.654	42.0	4.882	124.0	51H78	0.079	2.0	0.984	25.0	18.976	482.0	51HC9	0.079	2.0	0.591	15.0	2.283	58.0
5IH31	0.059	1.5	1.850	47.0	6.102	155.0	51H79	0.039	1.0	0.394	10.0	8.268	210.0	51HD1	0.039	1.0	1.811	46.0	2.874	73.0
5IH32	0.250	6.4	1.598	40.6	2.000	50.8	51H80	0.039	1.0	0.394	10.0	1.752	44.5	51HD2	0.079	2.0	0.433	11.0	0.709	18.0
5IH33	0.079	2.0	1.181	30.0	0.945	24.0	51H81	0.039	1.0	0.394	10.0	2.421	61.5	51HD3	0.059	1.5	0.811	20.6	2.720	69.1
5IH34	0.039	1.0	0.630	16.0	1.575	40.0	51H82	0.039	1.0	0.394	10.0	6.929	176.0	51HD4	0.059	1.5	0.587	14.9	3.465	88.0
5IH36	0.039	1.0	3.370	85.6	8.937	227.0	51H83	0.039	1.0	0.394	10.0	2.441	62.0	51HD5	0.354	9.0	0.354	9.0	12.795	325.0
5IH37	0.039	1.0	0.516	13.1	0.902	22.9	51H84	0.039	1.0	0.276	7.0	0.709	18.0	51HD6	0.354	9.0	0.354	9.0	16.654	423.0
5IH38	0.039	1.0	0.843	21.4	2.913	74.0	51H85	0.197	5.0	0.846	21.5	0.665	16.9	51HD7	0.098	2.5	1.669	42.4	5.839	148.3
5IH39	0.098	2.5	0.646	16.4	1.031	26.2	51H86	0.079	2.0	0.764	19.4	3.492	88.7	51HD8	0.039	1.0	1.803	45.8	8.374	212.7
5IH40	0.079	2.0	1.654	42.0	4.882	124.0	51H87	0.079	2.0	0.764	19.4	1.957	49.7	51HD9	0.394	10.0	0.591	15.0	7.874	200.0
5IH41	0.276	7.0	2.372	60.3	6.559	166.6	51H88	0.079	2.0	0.787	20.0	1.197	30.4	51HE1	0.039	1.0	0.328	8.3	1.071	27.2
51H42	0.079	2.0	0.618	15.7	1.004	25.5	51H89	0.157	4.0	0.472	12.0	0.709	18.0	51HE2	0.394	10.0	0.591	15.0	8.268	210.0
51H43	0.079	2.0	0.807	20.5	3.819	97.0	51H90	0.039	1.0	1.575	40.0	15.535	394.6	51HE3	0.059	1.5	1.138	28.9	3.492	88.7
51H44	0.079	2.0	0.752	19.1	2.787	70.8	51H91	0.079	2.0	0.661	16.8	0.693	17.6	51HE4	0.079	2.0	0.807	20.5	0.768	19.5
51H45	0.039	1.0	0.315	8.0	2.047	52.0	51H92	0.028	0.7	2.953	75.0	10.000	254.0	51HE5	0.079	2.0	1.024	26.0	4.567	116.0
51H46	0.197	5.0	0.197	5.0	4.441	112.8	51H94	0.079	2.0	1.732	44.0	9.606	244.0	51HE6	0.079	2.0	1.220	31.0	10.827	275.0
51H47	0.020	0.5	0.787	20.0	3.740	95.0	51H95	0.118	3.0	0.787	20.0	1.024	26.0	51HE7	0.079	2.0	2.421	61.5	6.890	175.0
51H48	0.039	1.0	1.575	40.0	16.260	413.0	51H96	0.079	2.0	0.984	25.0	0.591	15.0	51HE8	0.079	2.0	2.835	72.0	5.504	139.8
51H49	0.157	4.0	0.650	16.5	0.984	25.0	51H97	0.039	1.0	0.630	16.0	2.559	65.0	51HE9	0.039	1.0	0.752	19.1	1.319	33.5
51H50	0.079	2.0	2.323	59.0	8.819	224.0	51H98	0.039	1.0	0.689	17.5	0.394	10.0	51HF1	0.118	3.0	1.457	37.0	6.102	155.0
51H51	0.094	2.4	0.929	23.6	1.220	31.0	51H99	0.079	2.0	1.417	36.0	5.157	131.0	51HF2	0.039	1.0	0.689	17.5	0.728	18.5
51H52	0.059	1.5	1.654	42.0	6.220	158.0	51HA1	0.039	1.0	0.559	14.2	3.000	76.2	51HF3	0.079	2.0	1.402	35.6	4.331	110.0
51H53	0.177	4.5	1.339	34.0	1.181	30.0	51HA2	0.059	1.5	0.752	19.1	1.319	33.5	51HF4	0.118	3.0	0.709	18.0	1.083	27.5
51H54	0.079	2.0	2.323	59.0	8.815	223.9	51HA3	0.039	1.0	0.984	25.0	0.591	15.0	51HF5	0.039	1.0	0.791	20.1	1.177	29.9
51H55	0.059	1.5	1.594	40.5	3.906	99.2	51HA4	0.236	6.0	0.630	16.0	11.220	285.0	51HF6	0.039	1.0	0.276	7.0	2.283	58.0
51H56	0.157	4.0	0.709	18.0	0.945	24.0	51HA5	0.079	2.0	0.535	13.6	2.197	55.8	51HF7	0.039	1.0	0.902	22.9	0.516	13.1
51H57	0.118	3.0	1.604	40.8	7.864	199.8	51HA6	0.118	3.0	0.630	16.0	0.984	25.0	51HF8	0.059	1.5	1.343	34.1	5.583	141.8

FOF Gasket (I/O and Others)

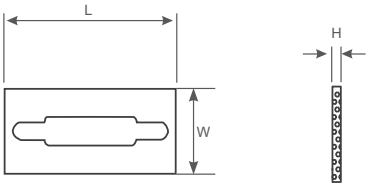
I/0																						
P/N	H(inch:mm)		W(inch:mm)		L(inch:mm)		P/N	H(inch:mm)		W(inch:mm)		L(inch:mm)		P/N	H(inch:mm)		W(inch:mm)		L(inch:mm)	
51HF9	0.039	1.0	0.579	14.7	1.909	48.5	51HN2	0.079	2.0	1.575	40.0	6.102	155.0	51HT4	0.134	3.4	1.181	30.0	14.150	359.4
51HG1	0.079	2.0	0.315	8.0	51.181	1300.0	51HN3	0.039	1.0	0.394	10.0	1.496	38.0	51HT5	0.118	3.0	1.402	35.6	2.189	55.6
51HG2	0.118	3.0	1.402	35.6	4.331	110.0	51HN4	0.098	2.5	0.406	10.3	4.252	108.0	51HT6	0.039	1.0	0.433	11.0	1.181	30.0
51HG3	0.098	2.5	0.587	14.9	3.465	88.0	51HN5	0.098	2.5	0.406	10.3	3.252	82.6	51HT7	0.079	2.0	0.492	12.5	2.756	70.0
51HG4	0.030	0.8	0.606	15.4	1.083	27.5	51HN6	0.098	2.5	0.406	10.3	8.752	222.3	51HT9	0.039	1.0	0.768	19.5	0.866	22.0
51HG5	0.197	5.0	1.031	26.2	3.409	86.6	51HN7	0.098	2.5	0.406	10.3	14.000	355.6	51HV1	0.039	1.0	0.610	15.5	1.378	35.0
51HG6	0.039	1.0	0.831	21.1	1.969	50.0	51HN8	0.098	2.5	0.406	10.3	16.000	406.4	51HV2	0.126	3.2	1.244	31.6	1.831	46.5
51HG7	0.039	1.0	0.394	10.0	17.323	440.0	51HN9	0.098	2.5	1.811	46.0	5.098	129.5	51HV3	0.039	1.0	1.811	46.0	2.677	68.0
51HG8	0.039	1.0	0.394	10.0	21.654	550.0	51HP1	0.098	2.5	1.811	46.0	3.031	77.0	51HV4	0.039	1.0	1.220	31.0	2.661	67.6
51HG9	0.039	1.0	0.394	10.0	4.488	114.0	51HP2	0.079	2.0	0.594	15.1	2.697	68.5	51HV5	0.039	1.0	0.630	16.0	1.457	37.0
51HH1	0.059	1.5	1.295	32.9	7.630	193.8	51HP3	0.079	2.0	0.276	7.0	5.299	134.6	51HV6	0.039	1.0	1.693	43.0	4.961	126.0
51HH2	0.051	1.3	0.843	21.4	2.913	74.0	51HP4	0.079	2.0	0.315	8.0	5.799	147.3	51HV7	0.118	3.0	0.610	15.5	1.827	46.4
51HH3	0.197	5.0	1.260	32.0	2.047	52.0	51HP5	0.079	2.0	0.315	8.0	7.091	180.1	51HV8	0.236	6.0	0.547	13.9	0.976	24.8
51HH4	0.079	2.0	0.740	18.8	2.370	60.2	51HP6	0.098	2.5	1.614	41.0	3.031	77.0	51HV9	0.079	2.0	1.693	43.0	3.425	87.0
51HH5	0.157	4.0	0.571	14.5	2.028	51.5	51HP7	0.236	6.0	0.547	13.9	0.976	24.8	51HW1	0.252	6.4	0.650	16.5	8.681	220.5
51HH6	0.020	0.5	0.197	5.0	11.752	298.5	51HP8	0.059	1.5	0.831	21.1	0.752	19.1	51HW2	0.252	6.4	0.650	16.5	9.598	243.8
51HH7	0.059	1.5	0.787	20.0	0.846	21.5	51HP9	0.118	3.0	0.709	18.0	1.890	48.0	51HW3	0.039	1.0	2.516	63.9	1.386	35.2
51HH8	0.118	3.0	0.787	20.0	0.489	12.4	51HQ1	0.118	3.0	1.504	38.2	5.906	150.0	51HW4	0.106	2.7	0.319	8.1	10.988	279.1
51HH9	0.039	1.0	1.339	34.0	3.543	90.0	51HQ2	0.079	2.0	1.732	44.0	12.587	319.7	51HW5	0.098	2.5	0.510	13.0	2.835	72.0
51HJ1	0.079	2.0	1.575	40.0	6.102	155.0	51HQ3	0.039	1.0	0.630	16.0	1.457	37.0	51HW6	0.102	2.6	0.276	7.0	20.000	508.0
51HJ2	0.039	1.0	0.335	8.5	11.102	282.0	51HQ4	0.079	2.0	0.602	15.3	2.697	68.5	51HW7	0.106	2.7	0.315	8.0	17.346	440.6
51HJ3	0.079	2.0	1.850	47.0	6.102	155.0	51HQ5	0.039	1.0	0.874	22.2	0.870	22.1	51HW8	0.079	2.0	0.118	3.0	0.618	15.7
51HJ4	0.059	1.5	0.335	8.5	11.102	282.0	51HQ6	0.118	3.0	0.654	16.6	0.996	25.3	51HW9	0.031	0.8	1.811	46.0	9.110	231.4
51HJ5	0.059	1.5	0.886	22.5	6.283	159.6	51HQ7	0.039	1.0	0.748	19.0	0.748	19.0	51HX1	0.069	1.8	1.669	42.4	5.839	148.3
51HJ6	0.079	2.0	0.591	15.0	2.697	68.5	51HQ8	0.039	1.0	1.417	36.0	3.037	77.2	51HX2	0.039	1.0	0.701	17.8	7.760	197.1
51HJ7	0.118	3.0	1.496	38.0	6.240	158.5	51HQ9	0.059	1.5	0.315	8.0	17.205	437.0	51HX3	0.039	1.0	0.701	17.8	15.862	402.9
51HJ8	0.079	2.0	1.575	40.0	6.102	155.0	51HR1	0.039	1.0	0.866	22.0	4.882	124.0	51HX4	0.079	2.0	0.780	19.8	2.409	61.2
51HJ9	0.118	3.0	1.673	42.5	1.630	41.4	51HR2	0.039	1.0	0.630	16.0	2.933	74.5	51HX5	0.039	1.0	0.512	13.0	8.000	203.2
51HK1	0.118	3.0	0.933	23.7	6.324	160.6	51HR3	0.079	2.0	1.732	44.0	3.504	89.0	51HX6	0.039	1.0	0.315	8.0	4.724	120.0
51HK2	0.098	2.5	1.669	42.4	5.839	148.3	51HR4	0.079	2.0	1.693	43.0	5.787	147.0	51HX7	0.039	1.0	1.280	32.5	6.370	161.8
51HK3	0.020	0.5	1.272	32.3	7.087	180.0	51HR5	0.039	1.0	0.492	12.5	1.575	40.0	51HX8	0.039	1.0	0.276	7.0	1.693	43.0
51HK4	0.079	2.0	1.181	30.0	2.480	63.0	51HR6	0.079	2.0	2.913	74.0	2.923	74.3	51HX9	0.039	1.0	0.276	7.0	1.693	43.0
51HK5	0.039	1.0	1.291	32.8	4.409	112.0	51HR7	0.157	4.0	0.551	14.0	2.205	56.0	51HY1	0.118	3.0	1.043	26.5	3.189	81.0
51HK6	0.098	2.5	0.394	10.0	1.181	30.0	51HR8	0.039	1.0	0.433	11.0	1.181	30.0	51HY2	0.039	1.0	0.539	13.7	1.307	33.2
51HK7	0.157	4.0	0.630	16.0	1.063	27.0	51HR9	0.079	2.0	0.787	20.0	16.850	428.0	51HY3	0.039	1.0	1.028	26.1	1.181	30.0
51HK8	0.157	4.0	0.709	18.0	1.181	30.0	51HS1	0.079	2.0	0.787	20.0	1.732	44.0	51HY4	0.039	1.0	0.866	22.0	1.378	35.0
51HK9	0.059	1.5	1.201	30.5	0.650	16.5	51HS2	0.039	1.0	0.630	16.0	1.575	40.0	51HY5	0.039	1.0	1.378	35.0	2.500	63.5
51HM1	0.039	1.0	1.583	40.2	6.083	154.5	51HS3	0.039	1.0	0.591	15.0	0.984	25.0	51HY6	0.386	9.8	0.500	12.7	20.339	516.6
51HM2	0.118	3.0	0.630	16.0	0.945	24.0	51HS4	0.039	1.0	0.665	16.9	1.339	34.0	51HY7	0.386	9.8	0.500	12.7	41.583	1056.2
51HM3	0.079	2.0	0.594	15.1	2.697	68.5	51HS5	0.020	0.5	0.394	10.0	16.378	416.0	51HY8	0.386	9.8	0.500	12.7	67.803	1722.2
51HM4	0.039	1.0	0.591	15.0	2.165	55.0	51HS6	0.157	4.0	0.551	14.0	17.441	443.0	51HY9	0.079	2.0	0.724	18.4	2.843	72.2
51HM5	0.118	3.0	0.630	16.0	1.890	48.0	51HS7	0.079	2.0	1.732	44.0	3.504	89.0	51HZ1	0.079	2.0	0.787	20.0	5.354	136.0
51HM6	0.039	1.0	0.669	17.0	0.521	13.2	51HS8	0.069	1.8	0.484	12.3	N/A	N/A	51HZ2	0.110	2.8	0.551	14.0	17.441	443.0
51HM7	0.071	1.8	0.559	14.2	0.559	14.2	51HS9	0.157	4.0	0.551	14.0	2.205	56.0	51HZ3	0.039	1.0	0.571	14.5	2.500	63.5
51HM8	0.039	1.0	0.929	23.6	2.396	60.9	51HT1	0.079	2.0	0.787	20.0	16.850	428.0	51HZ4	0.039	1.0	1.260	32.0	2.665	67.7
51HM9	0.039	1.0	0.929	23.6	1.890	48.0	51HT2	0.039	1.0	0.827	21.0	4.646	118.0	51HZ5	0.079	2.0	1.614	41.0	2.906	73.8
51HN1	0.118	3.0	0.591	15.0	0.969	24.6	51HT3	0.039	1.0	0.551	14.0	1.378	35.0	51HZ6	0.020	0.5	1.043	26.5	3.189	81.0

FOF Gasket (I/O and Others)

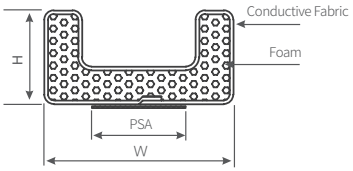
I/0							Custom									
P/N	H(inch:mm)		W(inch:mm)		L(inch:mm)		P/N	H(inch:mm)		W(inch:mm)		P/N	H(inch:mm)		W(inch:mm)	
51HZ7	0.079	2.0	1.142	29.0	4.972	126.3	51Q11	0.201	5.1	0.413	10.5	51Q41	0.079	2.0	0.500	12.7
51HZ8	0.039	1.0	1.035	26.3	1.854	47.1	51Q12	0.346	8.8	0.685	17.4	51Q42	0.146	3.7	0.256	6.5
51HZ9	0.039	1.0	0.618	15.7	0.854	21.7	51Q13	0.106	2.7	0.445	11.3	51Q43	0.059	1.5	0.256	6.5
51H100	0.079	2.0	0.642	16.3	14.291	363.0	51Q14	0.157	4.0	0.386	9.8	51Q44	0.197	5.0	0.673	17.1
51H101	0.079	2.0	1.669	42.4	5.839	148.3	51Q15	0.118	3.0	0.220	5.6	51Q45	0.091	2.3	0.394	10.0
51H102	0.059	1.5	1.248	31.7	1.866	47.4	51Q16	0.118	3.0	0.382	9.7	51Q46	0.098	2.5	0.394	10.0
51H103	0.039	1.0	0.768	19.5	3.898	99.0	51Q17	0.205	5.2	0.287	7.3	51Q47	0.177	4.5	0.433	11.0
51H104	0.039	1.0	0.614	15.6	0.772	19.6	51Q18	0.205	5.2	0.303	7.7	51Q48	0.315	8.0	0.472	12.0
51H105	0.126	3.2	1.260	32.0	14.150	359.4	51Q19	0.283	7.2	0.374	9.5	51Q49	0.079	2.0	0.394	10.0
51H106	0.126	3.2	1.250	31.8	1.831	46.5	51Q20	0.283	7.2	0.268	6.8	51Q50	0.118	3.0	0.394	10.0
51H107	0.118	3.0	1.516	38.5	1.516	38.5	51Q21	0.083	2.1	0.413	10.5	51Q51	0.098	2.5	0.248	6.3
51H108	0.047	1.2	1.516	38.5	1.516	38.5	51Q22	0.083	2.1	0.287	7.3	51Q52	0.122	3.1	0.256	6.5
51H109	0.079	2.0	0.157	4.0	4.921	125.0	51Q23	0.244	6.2	0.268	6.8	51Q53	0.102	2.6	0.197	5.0
51H110	0.039	1.0	0.276	7.0	4.843	123.0	51Q24	0.220	5.6	0.331	8.4	51Q54	0.098	2.5	0.157	4.0
51H111	0.079	2.0	1.063	27.0	5.862	148.9	51Q25	0.276	7.0	0.295	7.5	51Q55	0.236	6.0	0.244	6.2
51H112	0.118	3.0	0.630	16.0	4.724	120.0	51Q26	0.118	3.0	0.394	10.0	51Q56	0.098	2.5	0.319	8.1
51H113	0.386	9.8	0.421	10.7	1.969	50.0	51Q27	0.185	4.7	0.197	5.0	51Q57	0.087	2.2	0.118	3.0
51H114	0.433	11.0	0.079	2.0	0.709	18.0	51Q28	0.354	9.0	0.157	4.0	51Q58	0.118	3.0	0.197	5.0
51H115	0.079	2.0	0.902	22.9	8.000	203.2	51Q29	0.276	7.0	0.236	6.0	51Q59	0.110	2.8	0.197	5.0
51H116	0.118	3.0	0.315	8.0	10.043	255.1	51Q30	0.217	5.5	0.177	4.5	51Q60	0.138	3.5	0.157	4.0
51H117	0.079	2.0	0.630	16.0	0.984	25.0	51Q31	0.110	2.8	0.382	9.7	51Q61	0.091	2.3	0.500	12.7
51H118	0.079	2.0	0.598	15.2	11.953	303.6	51Q32	0.118	3.0	0.319	8.1	51Q62	0.079	2.0	0.295	7.5
51H119	0.039	1.0	0.756	19.2	10.039	255.0	51Q33	0.138	3.5	0.315	8.0	51Q63	0.079	2.0	0.500	12.7
51H120	0.126	3.2	0.591	15.0	15.748	400.0	51Q34	0.098	2.5	0.374	9.5	51Q64	0.079	2.0	0.354	9.0
51H121	0.098	2.5	1.043	26.5	3.189	81.0	51Q35	0.110	2.8	0.618	15.7	51Q65	0.098	2.5	0.406	10.3
51H122	0.110	2.8	0.354	9.0	17.441	443.0	51Q36	0.106	2.7	0.445	11.3	51Q66	0.209	5.3	0.130	3.3
51H123	0.039	1.0	2.413	61.3	4.961	126.0	51Q37	0.150	3.8	0.150	3.8	51Q67	0.154	3.9	0.236	6.0
51H124	0.039	1.0	0.831	21.1	1.969	50.0	51Q38	0.138	3.5	0.374	9.5	51Q68	0.094	2.4	0.354	9.0
51H125	0.039	1.0	0.433	11.0	1.181	30.0	51Q39	0.142	3.6	0.500	12.7	51Q69	0.138	3.5	0.315	8.0
							51Q40	0.098	2.5	0.299	7.6	51Q70	0.091	2.3	0.827	21.0

I/O and Others Series Sketch

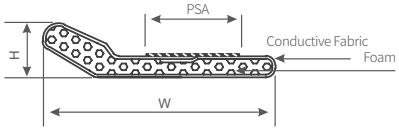
I/O Series Sketch



Concave B



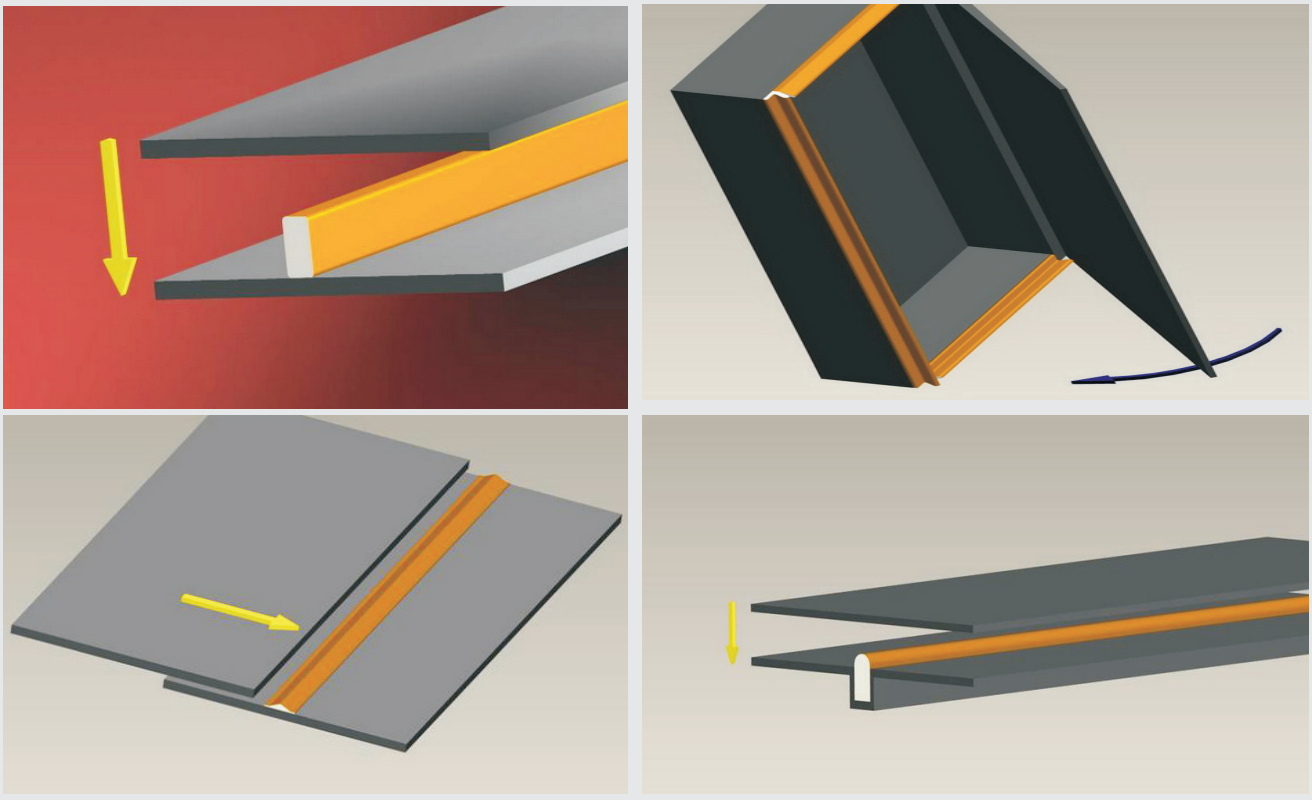
Knife-shaped



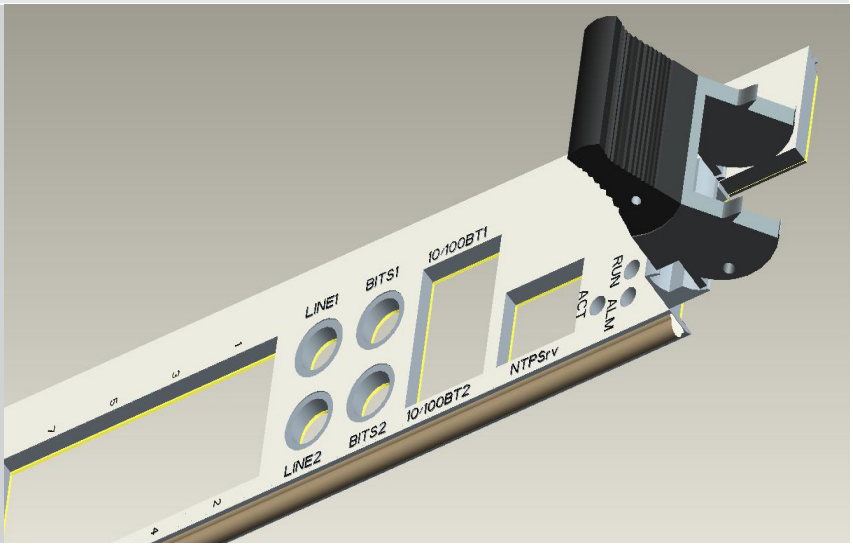
If the directory listed in the content of conductive foam still can not meet your needs, please contact our engineers, we can design and manufacture according to your needs.

The Application of FOF Gaskets

FoF Application of Different Cross-Section Virtual Reality Images



The Actual Assembly Effect Picture (Pro/E)



Conductive Tape Series



FRD conductive tape series include Copper-foil tape, Aluminum-foil tape, and conductive fabric tape.

Conductive taps are wildly used in devices such as equipments, components, ESD grounding, and EMI shielding, especially in the mobile communication equipments. They are applied to the cell phone for shielding and to its LCD screen and keyboard for purposes of adhesion, fixing, ESD and conductive grounding. They can also be applied to PCB board for fixed grounding and adhesion, and to the built-in antenna interface shielding and bonding fixing.

The FRD conductive tapes, with excellent performance, are the ideal substitutes for some well-known brands. They currently have been largely used by customers.

Conductive Foam

Material Type	Material	Nominal Thickness (mm)	Surface Resistivity (Ω/ □)	Volume Resistivity (Ω/ □)	Shielding At 100MHz/1GHz (dB)	Application
52S03	CF+Cu+CPSA	0.30	⩽ 0.20	⩽ 0.05	⩾ 80	Conductive，Grounding，EMI Shielding
52S05	CF+Cu+CPSA	0.50	⩽ 0.20	⩽ 0.05	⩾ 80	Conductive，Grounding，EMI Shielding
52S08	CF+Cu+CPSA	0.80	⩽ 0.20	⩽ 0.05	⩾ 80	Conductive，Grounding，EMI Shielding
52S10	CF+Cu+CPSA	1.00	⩽ 0.20	⩽ 0.05	⩾ 80	Conductive，Grounding，EMI Shielding
52S15	CF+Cu+CPSA	1.50	⩽ 0.20	⩽ 0.05	⩾ 80	Conductive，Grounding，EMI Shielding
52S20	CF+Cu+CPSA	2.00	⩽ 0.20	⩽ 0.05	⩾ 80	Conductive，Grounding，EMI Shielding
52S25	CF+Cu+CPSA	2.50	⩽ 0.20	⩽ 0.05	⩾ 80	Conductive，Grounding，EMI Shielding
52S30	CF+Cu+CPSA	3.00	⩽ 0.20	⩽ 0.05	⩾ 80	Conductive，Grounding，EMI Shielding
52S35	CF+Cu+CPSA	3.50	⩽ 0.20	⩽ 0.05	⩾ 80	Conductive，Grounding，EMI Shielding
52S40	CF+Cu+CPSA	4.00	⩽ 0.20	⩽ 0.05	⩾ 80	Conductive，Grounding，EMI Shielding
52S45	CF+Cu+CPSA	4.50	⩽ 0.20	⩽ 0.05	⩾ 80	Conductive，Grounding，EMI Shielding
52Q03	CF+CPSA	0.30	⩽ 0.20	⩽ 0.10	⩾ 80	Conductive，Grounding，EMI Shielding
52Q05	CF+CPSA	0.50	⩽ 0.20	⩽ 0.10	⩾ 80	Conductive，Grounding，EMI Shielding
52Q10	CF+CPSA	1.00	⩽ 0.20	⩽ 0.10	⩾ 80	Conductive，Grounding，EMI Shielding
52Q15	CF+CPSA	1.50	⩽ 0.20	⩽ 0.10	⩾ 80	Conductive，Grounding，EMI Shielding
52Q20	CF+CPSA	2.00	⩽ 0.20	⩽ 0.10	⩾ 80	Conductive，Grounding，EMI Shielding
52Q25	CF+CPSA	2.50	⩽ 0.20	⩽ 0.10	⩾ 80	Conductive，Grounding，EMI Shielding
52Q30	CF+CPSA	3.00	⩽ 0.20	⩽ 0.10	⩾ 80	Conductive，Grounding，EMI Shielding
52Q35	CF+CPSA	3.50	⩽ 0.20	⩽ 0.10	⩾ 80	Conductive，Grounding，EMI Shielding
52Q40	CF+CPSA	4.00	⩽ 0.20	⩽ 0.10	⩾ 80	Conductive，Grounding，EMI Shielding
52QH03	CF+CPSA	0.30	⩽ 0.20	⩽ 0.10	⩾ 80	Conductive，Grounding，EMI Shielding
52QH05	CF+CPSA	0.50	⩽ 0.20	⩽ 0.10	⩾ 80	Conductive，Grounding，EMI Shielding
52QS05	CF+CPSA	0.50	⩽ 0.20	⩽ 0.10	⩾ 80	Conductive，Grounding，EMI Shielding
52QS10	CF+CPSA	1.00	⩽ 0.20	⩽ 0.10	⩾ 80	Conductive，Grounding，EMI Shielding

Conductive Tape Series

Conductive Fabric Tape

Material Type	Material	Nominal Thickness (mm)	Surface Resistivity (Ω/ □)	Volume Resistivity (Ω/ □)	Shielding At 100MHz/1GHz (dB)	Application
53B014	Conductive Fabric +CPSA	0.140	⩽ 0.10	⩽ 0.05	⩾ 80	Conductive, EMI Shielding, Heat Dissipation
53B006Y	Conductive Fabric +CPSA	0.060	⩽ 0.10	⩽ 0.05	⩾ 80	Conductive, EMI Shielding, Heat Dissipation
53B011Y	Conductive Fabric +CPSA	0.110	⩽ 0.10	⩽ 0.05	⩾ 80	Conductive, EMI Shielding, Heat Dissipation
53B012Y	Conductive Fabric +CPSA	0.120	⩽ 0.10	⩽ 0.05	⩾ 80	Conductive, EMI Shielding, Heat Dissipation
54B003	Conductive Fabric +CPSA	0.030	⩽ 0.10	⩽ 0.05	⩾ 80	Conductive, EMI Shielding, Heat Dissipation
54B005	Conductive Fabric +CPSA	0.050	⩽ 0.10	⩽ 0.05	⩾ 80	Conductive, EMI Shielding, Heat Dissipation
54B010	Conductive Fabric +CPSA	0.100	⩽ 0.10	⩽ 0.05	⩾ 80	Conductive, EMI Shielding, Heat Dissipation
55B0025	Conductive Fabric +CPSA	0.025	⩽ 0.10	⩽ 0.05	⩾ 80	Conductive, EMI Shielding, Heat Dissipation
54B006Y	Conductive Fabric +CPSA	0.060	⩽ 0.10	⩽ 0.05	⩾ 80	Conductive, EMI Shielding, Heat Dissipation
54B014Y	Conductive Fabric +CPSA	0.140	⩽ 0.10	⩽ 0.05	⩾ 80	Conductive, EMI Shielding, Heat Dissipation
54B005A	CPSA+Conductive Fabric +CPSA	0.050	⩽ 0.10	⩽ 0.06	⩾ 80	Conductive, EMI Shielding, Heat Dissipation
54B010A	CPSA+Conductive Fabric +CPSA	0.100	⩽ 0.10	⩽ 0.06	⩾ 80	Conductive, EMI Shielding, Heat Dissipation
54B015A	CPSA+Conductive Fabric +CPSA	0.150	⩽ 0.10	⩽ 0.06	⩾ 80	Conductive, EMI Shielding, Heat Dissipation
54B020A	CPSA+Conductive Fabric +CPSA	0.200	⩽ 0.10	⩽ 0.06	⩾ 80	Conductive, EMI Shielding, Heat Dissipation
54BB005Y	CPSA+Conductive Fabric +CPSA	0.050	⩽ 0.10	⩽ 0.05	⩾ 80	Conductive, EMI Shielding, Heat Dissipation
54BB007Y	CPSA+Conductive Fabric +CPSA	0.070	⩽ 0.10	⩽ 0.05	⩾ 80	Conductive, EMI Shielding, Heat Dissipation
54BB010Y	CPSA+Conductive Fabric +CPSA	0.100	⩽ 0.10	⩽ 0.05	⩾ 80	Conductive, EMI Shielding, Heat Dissipation
54BB015Y	CPSA+Conductive Fabric +CPSA	0.150	⩽ 0.10	⩽ 0.05	⩾ 80	Conductive, EMI Shielding, Heat Dissipation
54BB005TY	CPSA+Conductive Fabric +CPSA	0.050	⩽ 0.10	⩽ 0.05	⩾ 80	Conductive, EMI Shielding, Heat Dissipation
54BB010TY	CPSA+Conductive Fabric +CPSA	0.100	⩽ 0.10	⩽ 0.05	⩾ 80	Conductive, EMI Shielding, Heat Dissipation
55B003A	CPSA+Conductive Fabric +CPSA	0.030	⩽ 0.10	⩽ 0.06	⩾ 80	Conductive, EMI Shielding, Heat Dissipation

Cu Foil Tape

Material Type	Material	Nominal Thickness (mm)	Surface Resistivity (Ω/ □)	Volume Resistivity (Ω/ □)	Shielding At 100MHz/1GHz (dB)	Application
56B005	Cu Foil+CPSA	0.05	⩽ 0.03	⩽ 0.06	⩾ 80	Conductive, EMI Shielding, Heat Dissipation
56B010	Cu Foil+CPSA	0.10	⩽ 0.03	⩽ 0.06	⩾ 80	Conductive, EMI Shielding, Heat Dissipation
56B003Y	Cu Foil+CPSA	0.030	⩽ 0.03	⩽ 0.06	⩾ 80	Conductive, EMI Shielding, Heat Dissipation
56B005Y	Cu Foil+CPSA	0.050	⩽ 0.03	⩽ 0.06	⩾ 80	Conductive, EMI Shielding, Heat Dissipation
56BB003Y	Cu Foil+CPSA	0.030	⩽ 0.03	⩽ 0.06	⩾ 80	Conductive, EMI Shielding, Heat Dissipation
56B005TY	Cu Foil+CPSA	0.050	⩽ 0.03	⩽ 0.06	⩾ 80	Conductive, EMI Shielding, Heat Dissipation
56C005	Cu Foil+PSA	0.05	⩽ 0.03	N/A	N/A	Heat Dissipation
56C010	Cu Foil+PSA	0.10	⩽ 0.03	N/A	N/A	Heat Dissipation
56C005AY	Cu Foil+PSA	0.050	⩽ 0.03	N/A	N/A	Heat Dissipation
56C005Y	Cu Foil+PSA	0.050	⩽ 0.03	N/A	N/A	Heat Dissipation
56C006Y	Cu Foil+PSA	0.060	⩽ 0.03	N/A	N/A	Heat Dissipation

Al Foil Tape

Material Type	Material	Nominal Thickness (mm)	Surface Resistivity (Ω/ □)	Volume Resistivity (Ω/ □)	Shielding At 100MHz/1GHz (dB)	Application
57B005	Al Foil+CPSA	0.05	⩽ 0.03	⩽ 0.06	⩾ 80	Conductive, EMI Shielding, Heat Dissipation
57B010	Al Foil+CPSA	0.10	⩽ 0.03	⩽ 0.06	⩾ 80	Conductive, EMI Shielding, Heat Dissipation
57C004	Al Foil+PSA	0.04	⩽ 0.03	N/A	N/A	Heat Dissipation
57C009	Al Foil+PSA	0.09	⩽ 0.03	N/A	N/A	Heat Dissipation

Electrically Conductive Elastomer

Conductive Elastomer EMI Gaskets are to point to in the silicone base material, surface treatment technology is used to change the pure silver, silver plated copper, silver, nickel, aluminum, silver plated nickel plating graphite conductive particles filled in the silica gel, the formation of homogeneous mixture, then through chemical crosslinking to form excellent shielding performance and environmental sealing function of the product.

FRD can produced extruded strip , co-extruded conductive silicone (conductive and non-conductive), compression molding products, transfer mounding, co-molding, sheet cutting, form in place(FIP) gaskets and other series conductive products, and we are more proficient in according to customer requirements, designs and manufactures custom products you need.



In addition to choices of size and shape dictated by the enclosing structure and the joint geometry itself, the following factors greatly influence the suitability of ECE gasket materials:

1. Shielding Effectiveness

Design Consideration should include intensity and frequency of interference source, the intensity and frequency of the interference present, the predominance of electrical (E) or magnetic (H) fields, and system power and signal attenuation requirements will automatically exclude certain types of EMI shielding materials.

2. Closure Force

Solid electrically conductive elastomer materials stand up better to high closure forces, environment pressure and repeated opening and closing of the joint. Elastomers accommodate pressure by change shapes rather than volume to get environmental sealing. Therefore, a potential space for shape changes at heat or pressure situation should be taken into account. Closure forces accommodate sealing requirements. For example, 6 pounds/inch force is enough for electromagnetic shielding. To meet water proof as well as electromagnetic shielding, the closure force should be 8 pound/inch or more. If low closure force is a consideration, however, the use of hollow extruded profiles such as hollow "O" and hollow "D" in conjunction with softer durometer elastomers will dramatically reduce closure force requirements.

3. Percent Gland Fill

Design of an elastomeric O-ring gland, or groove and contacting surfaces which make up the seal assembly, is as important as percent gland fill. For most static seal applications, it is necessary to calculate the area of the seal and the gland it will occupy, to determine whether the latter is large enough to receive the ring. Overfill and underfill may cause sealing failure.



As a general rule we recommend a gland fill of 70% –85% for optimum shielding effectiveness. However, for critical applications that require both shielding and environmental sealing, a 95%-98% gland fill is suggested.

4. Compression

Compression data provide the engineer or designer with a qualitative comparison of the deformability of different profiles of electrically conductive elastomer. Deflection is defined as the change in the cross-sectional height of a gasket under compressive load and is a function of material hardness and profile.

Profiles	Compression %
Rectangle	5~10
Solid O	20~25
Solid D	15~20
Hollow O	20~50
Hollow D	25~50
Hollow P	25~50
Overfill	15~25

Note： That wall thickness of hollow profiles has a major effect on deflection.

The recommended deflection ranges of various electrically conductive elastomer profiles are shown in Table 1. In no case however, should the amount of actual deflection be less than 10% for Electro Seal materials. Remember that the minimum unevenness of the mating flanges must be taken into consideration in determining the original (uncompressed) and installed (compressed) height of the seal.

5. Galvanic Compatibility

- Two different conductive materials are directly contacted or through conductor;
- Conductive environment is existed. Such as electrolyte, salty spray, water vapor, etc.
- Huge electric potential difference between the two materials.

All the 3 conditions are compiled; galvanic corrosion will happen and influence environmental sealing. Otherwise, penetrability of polymer will limit the electrolyte to get inside of electrically conductive elastomer to avoid galvanic corrosion.

6. Other

- Always try to avoid stretch the elastomer more than 5% when assemble. Because in an over stretch condition, conductive particles will disconnect inside the electrically conductive elastomer and lead to conductivity and shielding effectiveness failure;
- Do not choose O shape when shearing force exists, use D, O or P shape instead;
- The less compression set, the better performance. Generally compression set should be less than 30%.

Application Environments

Proper material selection for effective EMI shielding depends on the total environmental envelope within which the seal/shield will be expected to function. The material selection process should begin with a careful analysis of the following major environmental conditions:

- Temperature
- Aging/Shelf Life
- Pressure/Vacuum
- Fluid Compatibility
- Galvanic Compatibility

Gaskets Install Guide

- Electrically conductive elastomer need to be compressed to get good conductivity, therefore the structure should be designed to provide proper pressure but not over pressed.
- Generally grooves are needed to install conductive elastomer. And the dimensions of groove should be right to keep compression within defined limits.
- The D shape and rectangle profiles have both with and without adhesive type to be according with adhesive or groove mount types.

FRD Products' Dimension

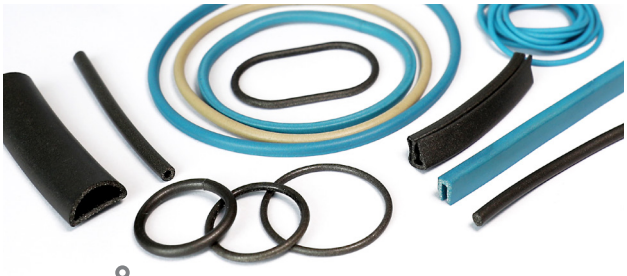
Extruded Products		Compression Molded Products	
Conductive Filler	Ni/C, Ag/Glass, Ag/Al	Conductive Filler	Ni/C, Ag/Glass, Ag/Al, Ag/Cu
Max Diameter (mm)	Conductive: 0.7~12 Non Conductive: 0.5~20	Max Thickness (mm)	Conductive: 0.3~20 Non Conductive: 0.1~25
Min Thickness(mm)	Conductive: 0.2 Non Conductive: 0.1	Max Dimension(mm)	500*500

Extruded Product Characteristics

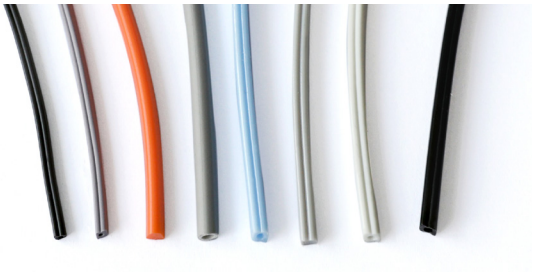
Extrusion Series

Item	Test Method	AS5G-70-V0	AS3T-50-V0	AS1B-65-HB	AS2T-60-HB	AS8D-40-V1
Filler		Ni/C	Ag/Cu	Ag/Al	Ag/Glass	Carbon Black
Color	Visual	Grey	Tan	Blue	Tan	Dark
Electrical Property						
Volume Resistivity (ohm-cm)	ENG-WI-550RevA2	0.1	0.002	0.004	0.005	5.0
Shielding Effectiveness (dB)	MIL-DTL-83528E	＞70	＞80	＞70	＞70	＞30
Electrical Stability						
Heat Aging Test (100°C ,168H) (ohm-cm)	ENG-WI-550RevA2	0.2	0.005	0.006	0.006	12
Mechanical Property						
Hardness (shore A)	ASTM D2240	70±5	50±5	65±5	60±5	45±5
Density (g/cm^3)	ASTM D792	1.9±0.1	3.5±0.1	2.0±0.1	1.9±0.1	1.2±0.1
Tensile Strengt (MPa)	ASTM D412	1.6	1.7	1.3	1.3	5.0
Elongation (%)	ASTM D412	110	220	350	450	400
Tear Strength (KN/m)	ASTM D624	8.0	11.0	8.5	4.8	18
Compression Set (100°C ,24H)%	ASTM D395	⩽20	⩽20	⩽20	⩽35	⩽25
Environment						
Operating Temperature (°C)		-40~160	-40~160	-40~160	-40~160	-40~160
Environment	RoHS 2.0	OK	OK	OK	OK	OK
Flame Rating	UL 94	V0	V0	V0	V0	V1

- Low resistivity and excellent EMI shielding
- Low compression set and good sealing
- High distortion efficiency, continuous production.
- Temperature extremes - heat, cold.
- Conform RoHS 2.0 & Halogen-free.
- Apply to communication, medical, military and etc.



Extruded Product (EMI Strip/Ring)



Silicon Rubber Extruded Product (Sealing Strip)

Co-extruded Strip/Ring Characteristics

Co-extruded Series

Item	Test Method	428C (Conductive)	AS5G (Conductive)	428AB (Non-conductive)	629AB (Non-conductive)
Color	Visual	Silver White	Grey	Orange	Purle
Filler	/	Al/Al	Ni/C	/	/
Density（g/cm^3）	ASTM D792	2.5±0.1	2.0±0.1	1.1±0.1	1.4±0.1
Tensile Strength（MPa）	ASTM D412	2.2	2.4	4.0	4.5
Elongation（%）	ASTM D412	200	300	340	200
Tear Strength（KN/m）	ASTM D642	6.5	14.5	14	25
Compression Set (100°C ,24H) %	ASTM D395	＜30	＜30	＜15	＜25
Operating Temperature (°C)	/	-40～160	-40～160	-40～160	-35～160

- Low resistivity and excellent EMI shielding
- Low compression set and good sealing
- Impermeability –exposure to gases.
- Apply to communication, medical, military and etc.
- Temperature extremes - heat, cold.
- Conform RoHS 2.0 & Halogen-free.



Co-extruded Strip/Ring Aging Test

SS-428C-428AB-02 Compression Set and Resistivity after Heat Aging Test

Item		Condition	1	2	3	4	5	AVE
Compression Set（%）		100°C ,168H； 30% Compressed	4.64	5.64	6.14	5.64	5.63	5.54
Surface Resistivity（Ω/inch）	Before		0.19	0.16	0.15	0.16	0.12	0.16
	After		0.44	0.46	0.28	0.32	0.24	0.35

SS-428C-428AB-01 IPX7 Test

Item	Test Data			Requirement	Result
IPX7 Waterproof Test	No Leaking Phenomenon			No Leaking	Pass
Gas-tightness	0.137kPa			⩽ 0.45 kPa	Pass
Surface Resistivity（Ω-inch）	0.68	0.82	0.89	AVE ⩽ 8，MAX ⩽ 20	Pass
Compression Set（%）	15.24	14.29	15.24	＜ 20%	Pass

SS-428C-428AB-01 UL60950 Aging Test

Item		428C Test Data	428AB Test Data	Requirement	Test Standard
Tensile Strength (Comparison Value)%	70°C ,168H	88.1	88.8	Not Less Than 75%	UL 60950-22
Elongation (Comparison Value)%		86.3	88.2	Not Less Than 60%	
Compression Set (Comparison Value)%	Room Temperature	95.2	98.7	Not Less Than 50%	
	High Temperature (70°C ,120H)	93.7	97.8		
	Low Temperature (-30°C ,24H)	91.7	97.0		

Note: Comparison Value =（After the aging /Before the aging）*100%。

SS-428C-428AB-01 UV Aging Test

Material	Grey Scale Rating
428C	4~5
428AB	4~5

SS-428C-428AB-01 Mould proof Test

Fungi-growth Grade	Fungi-growth Level	Test Standard
0 Grade	Magnified 50 times, no fungi-grade	GB/T 2423.16-2008

SS-428C-428AB-01 Ozone Resistance Test

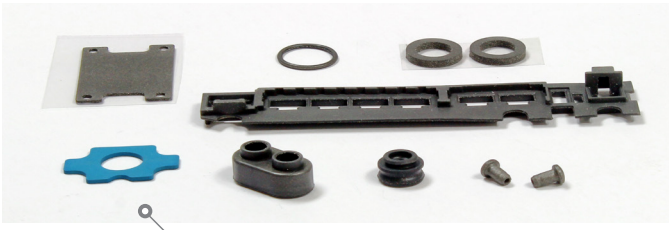
Material	Performance	Test Standard
428C	No Crack	ASTM D1149-07
428AB	No Crack	ASTM D1149-07

Molding Product Characteristics

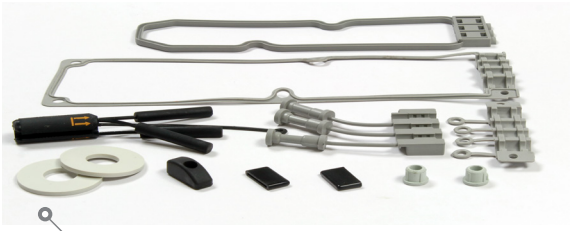
Molded Series

Item	Test Method	MS5G-55-HB	MS5G-60-V0	MS5G-70-V0	MS1B-65-HB	MS3T-50-V0	MS8D-60-V0
Filler		Ni/C	Ni/C	Ni/C	Ag/Al	Ag/Cu	Carbon Black
Color		Grey	Grey	Dark	Blue	Tan	Dark
Electrical Property							
Volume Resistivity （ohm-cm）	ENG-WI-550RevA2	0.1	0.08	0.1	0.004	0.002	5.5
Shielding Effectiveness （dB）	MIL-DTL-83528E	＞70	＞70	＞70	＞70	＞80	＞30
Electrical Stability							
Heat Aging Test (100°C ,168H) (ohm-cm)	ENG-WI-550RevA2	0.2	0.2	0.2	0.006	0.004	6.0
Mechanical Property							
Hardness （shore A）	ASTM D2240	55±5	60±5	70±5	65±5	50±5	60±5
Density （g/cm^3）	ASTM D792	1.9±0.1	1.9±0.1	2.0±0.1	1.95±0.1	3.5±0.1	1.2±0.1
Tensile Strength （MPa）	ASTM D412	1.2	1.8	1.8	1.3	1.7	5.0
Elongation （%）	ASTM D412	200	120	120	350	220	300
Tear Strength （KN/m）	ASTM D624	8.0	9.5	9.5	8.5	11.0	14.0
Compression Set （100°C ,24H) %	ASTM D395	⩽20	⩽20	⩽20	⩽20	⩽20	⩽25
Environment Standard							
Operating Temperature(°C)		-40~160	-40~160	-40~160	-40~160	-40~160	-40~150
Environment		OK	OK	OK	OK	OK	OK
Flame Rating		HB	V0	V0	HB	V0	V0

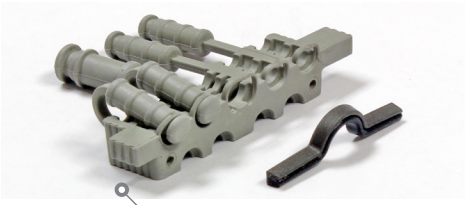
- Low resistivity and good EMI shielding.
- Molded at high temperature and high pressure.
- Molded shapes such as O-rings or intricate parts.
- Temperature extremes - heat, cold.
- Conform RoHS 2.0 & Halogen-free.
- Apply to communication, medical, military and etc.



Compression Molded Parts （Shielding Gaskets）



Silicone Rubber Molded Product
（Sealing Block、Dustproof Plug）



Co-molding Product
（Sealing Block、Sealing Gasket）

Using the process of compressed molding. Electrically conductive elastomer and non-conductive elastomer co-molding, then producing product with shielding and sealing. Or non-conductive elastomer and metal co-molding, then producing product with sealing and rugged construction.

Form-In-Place (FIP) Series

Item	Test Standard	FS5G-70-V0	FS5G-50-V0	FS4T-60-V0	FS3T-50-V0
Material Forms		2 part	2 part	1 part	1 part
Mixing Ratio (Mass Ratio)		A : B=1:1	A : B=1:1	/	/
Crosslinking Mechanisms		Addition Type	Addition Type	Addition Type	Condensation Type (Moisture)
Crosslinking Temperature		LTV	LTV	LTV	RTV
Conductive Filler		Ni/C	Ni/C	Ag/Ni	Ag/Cu
Mechanical Property					
Density (g/cm^3)	ASTM D792	2.0±0.2	2.0±0.2	3.8±0.2	2.4±0.2
Hardness(shore A)	ASTM D2240	70±5	50±5	60±5	50±5
Compression Set (%)	QA-WI-1048	25	25	25	30
Tensile Strength(MPa)	ASTM D412	1.5	1.2	1.2	1.2
Elongatio(%)	ASTM D412	100	150	150	150
Tear Strength (KN/m)	ASTM D624	8	8	8	8
Adhesion Strength (N/cm^2)	QA-WI-1049	150	150	150	120
Applicable Temperature		-50°C ~125°C	-50°C ~125°C	-50°C ~125°C	-50°C ~125°C
Electrical Properties and Stability					
Surface Resistance (Ω/inch)	QA-WI-1052	⩽ 0.3	⩽ 0.3	⩽ 0.3	⩽ 0.3
Volume Resistivity (Ω-cm)	MIL-DTL-83528E	0.05	0.05	0.004	0.004
100°C , 168H (Ω-cm)	MIL-DTL-83528E	0.06	0.08	0.008	0.02
85°C , 85%RH, 168H (Ω-cm)	MIL-DTL-83528E	0.08	0.10	0.006	0.03
Salt Spray,168H Ω-cm)	MIL-DTL-83528E	0.06	0.06	0.008	0.06
Curing Conditions		Low temperature vulcanized, usually 150°C *40min; The cure time decreases by warming up, better no more than 180°C .		100°C， 40~60min	Surface dry at room temperature for 30 min; 24 h crosslinking degree is 98%; Improving the rate of warming and humidifying will improve crosslinking.
Storage Condition		-25°C ~ 5°C			
Shelf Life					
Sealed (unmixed)		6 Month	6 Month	6 Month	3 Month
Unsealed (mixed)		7 Day	7 Day	7 Day	3 Day

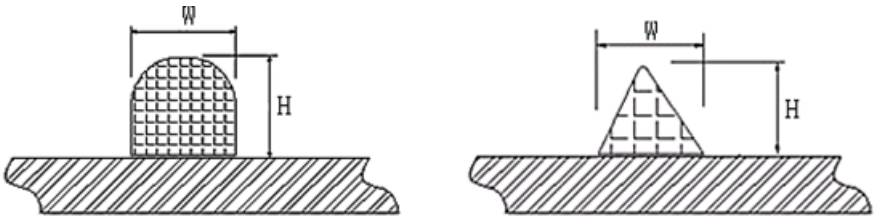
Note: Unsealed product expiring shelf life can still be used normally when test qualified. The environment has a great influence upon crosslinking cycle of this kind rubber, the appropriate storage and shelf life can be based on the actual experiment.

FIP Conductive Gaskets

FRD FSXX series material is a kind of liquid conductive silicone rubber, suitable for programmed CNC automatic dispensing equipment, can be cross-linked to elastomer material at room temperature or slightly heated by contact with moisture or blending with another component.

Form in place (FIP) is to disperse liquid conductive silicone rubber precisely onto the base material using programmed CNC dispensing equipment, and unite the chassis as an organic whole through the cross-linking process. Repeatable programming design ensures the consistency of product size and mass production.

FIP liquid conductive silicone molding is suitable for mobile phones, PC, telecommunication infrastructure, cars etc. which have partition requirement for metal, electroplated shell or electronic components.
The forming section is D shape or triangle, as shown in the figure below.

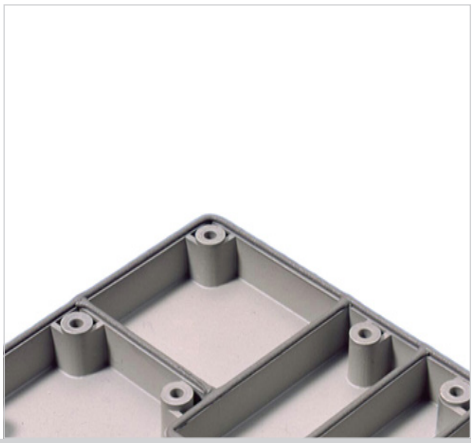


The differences between D section triangle sections are as follows:

Section Shape	Characteristics
D Section	① H/W <1 ② If the height of FIP gasket is the same, larger force at the same compression compared with triangle section. ③ If the height of FIP gasket is the same, more material is required compared with triangle section.
Triangle Section	① H/W ⩾ 1 (usually) ② If the height of FIP gasket is the same, smaller force at the same compression compared with D section. ③ If the height of FIP gasket is the same, less material is required compared with D section.

FIP Gaskets Characteristics

- It crosslinks without high temperature. At room temperature and moisture contact or with slightly heating it can be cross-linked to elastomer, saving energy and equipment investment.
- High SE, 100 dB of plane wave shielding effectiveness at 10 GHz.
- Automated batch production available. The material preparation, product molding and crosslinking can all be automated and operated continuously.
- Proofing cycle is short. Do not need mold, able to form only after defining the route.
- The material integrated with the matrix in place, do not need extra assembling.
- FRD FSXX series materials suit the surface of all kinds of base materials, have good adhesion performance.
- The equipment covers small area, saves space.



Typical Product

SMT EMI Gaskets

SMT EMI Gaskets are mounted on the PCB by surface mount technology (SMT), they can solve EMI, electrical grounding and electrical connection problem, and they also offer buffering.

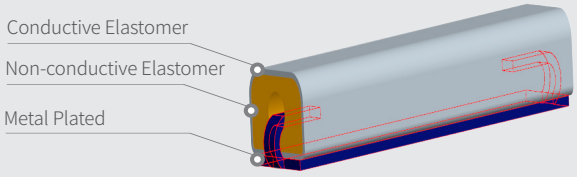
Characteristics:

- Low electrical resistance, used for shielding, grounding, and electrical connection;
- Excellent elasticity, used for buffering;
- Due to reflow soldering, it has good electrical connection to PCB;
- Carrier tape packaging, massive automatic installing, and high production efficiency.

Structure:

The SMT EMI Gaskets consist of three parts, see figure;

- The blue is metal base used for reflow-soldering;
- The gray is conductive elastomer;
- The middle part golden is unconducive elastomer.

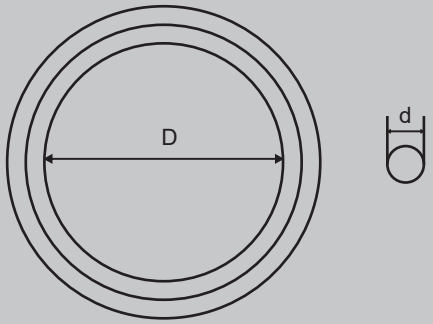


O Ring

Electrically Conductive Elastomer product—O ring meet US MIL-DTL-83528. In aviation, aerospace, and other military are widely used in electronic equipment. Can achieve environmental sealing and electromagnetic sealing at the same time.

Especially applicable for following:

- Military electronic chassis and microwave waveguide system;
- Electronic products (such as computer cases, mobile phone), telecom, high frequency control equipment, etc;
- Aerospace, aviation, ships, military application and military electronic equipment;
- The electric power, railway and other harsh electronic equipment.



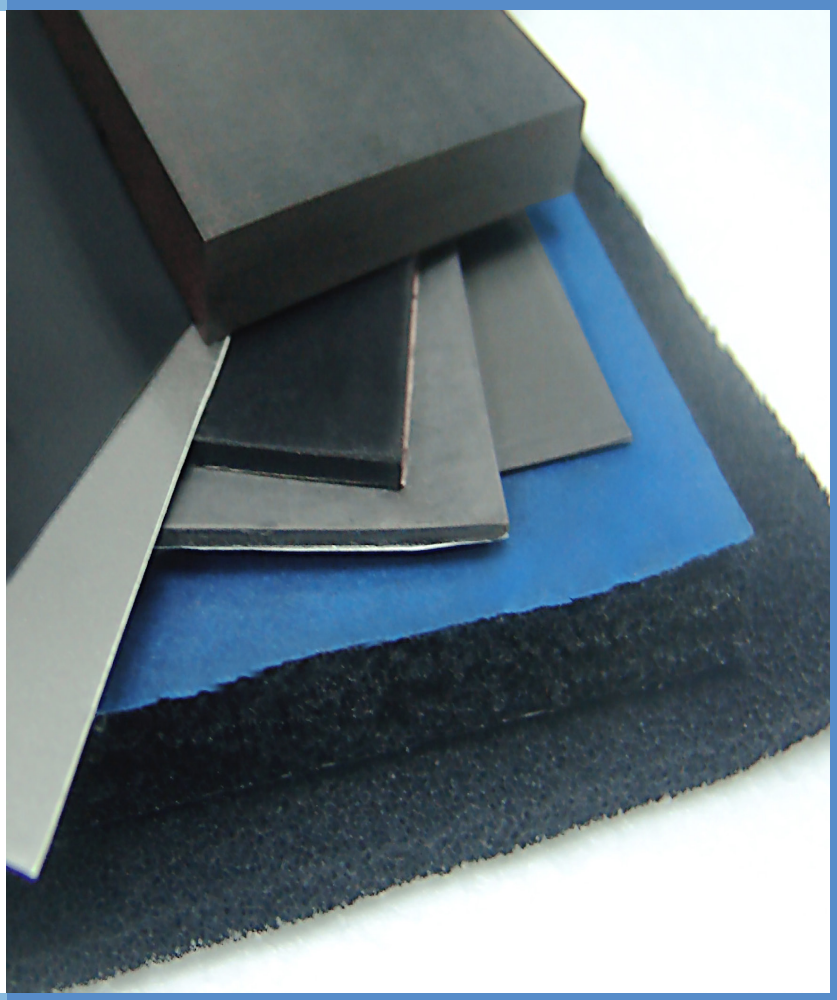


Microwave Absorber

As the technology developed, with faster switching speeds (increasing emissions) and lower circuit voltages (increasing susceptibility), EMC (Electromagnetic compatibility) increasingly became a source of concern, Many more nations were aware of EMC as a growing problem and issued directives to the manufacturers of digital electronic equipment which set out the essential manufacturer requirements before their equipment could be marketed or sold.

Recently the ever-increasing use of mobile communications and broadcast media channels has put huge pressure on the available airspace; Regulatory authorities are squeezing band allocations closer and closer together. We need more sophisticated EMC design methods to keep cross-channel interference to acceptable levels. The use of Microwave Absorbersl will offer far easier way to implement highly EMC capability of different devices.

FRD has extensive experiences in making EMC materials, and FRD engineers know EMC design methods very well. With superior design capability, unique manufacturing processes and test procedures, FRD provide a wide range of standard to most needs, and custom parts to special requirements.



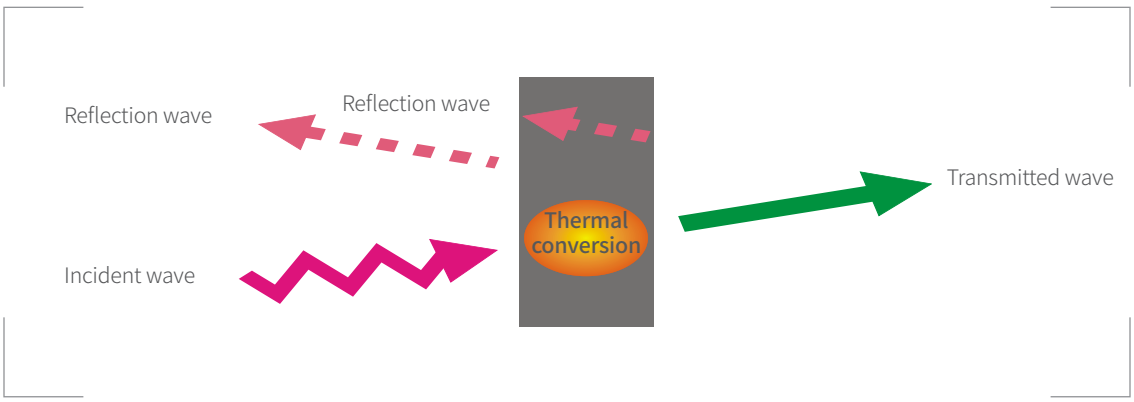
- Suppress electromagnetic interference, improve antenna pattern and improve the accuracy of radar direction finding and ranging;
- Prevent electromagnetic interference, electromagnetic wave radiation and waveform shaping of microwave devices and equipment;
- Microwave anechoic chamber, electromagnetic compatibility chamber, absorbing load, attenuator, radar wave RCS Reduction, etc.

Design principle and leadership

- High performance absorbers such as nano materials, planar hexagonal ferrite, amorphous magnetic fiber and granular film are used as absorption media;
- Using the new absorption principle electromagnetic resonance and eddy current loss, the prepared absorbing plate has the advantages of thin thickness, light weight, wide absorption band and high absorption rate;
- According to Maxwell equation, genetic algorithm (GA) is used to realize electromagnetic wave absorber simulation (CAD), give full play to the characteristics of absorbing medium, shorten the development cycle of materials, and meet the special needs of users.

Applications

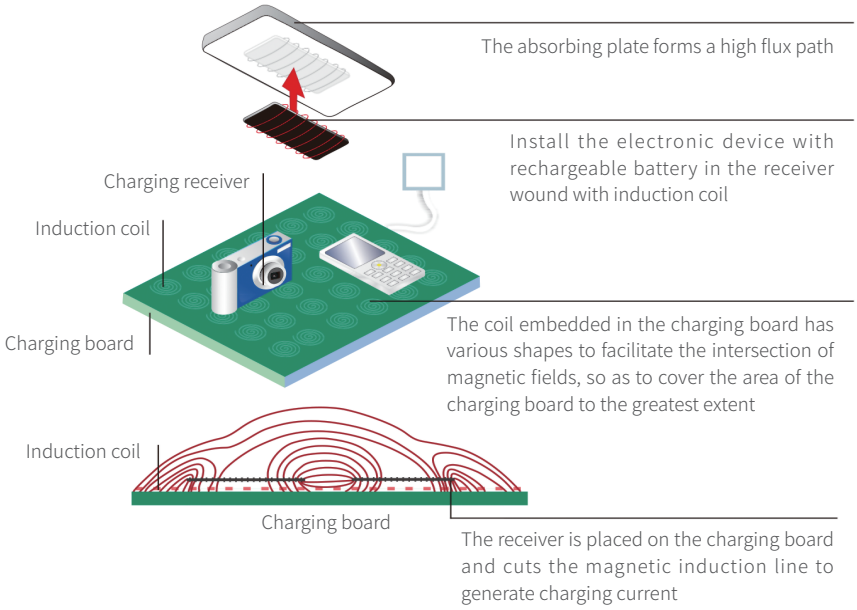
Microwave refers to the electromagnetic wave with the frequency of 300mhz-300ghz. It is the abbreviation of a limited frequency band in radio wave, that is, the electromagnetic wave with the wavelength between 1m (excluding 1m) and 1mm. It is the general name of decimeter wave, centimeter wave and millimeter wave. The microwave frequency is higher than the general radio wave frequency, which is usually called "UHF electromagnetic wave". The basic properties of microwave usually show three characteristics: penetration, reflection and absorption. For glass, plastic and porcelain, microwaves almost pass through without being absorbed. For water and food, it will absorb microwaves and make itself hot. For metal things, they will reflect microwaves.



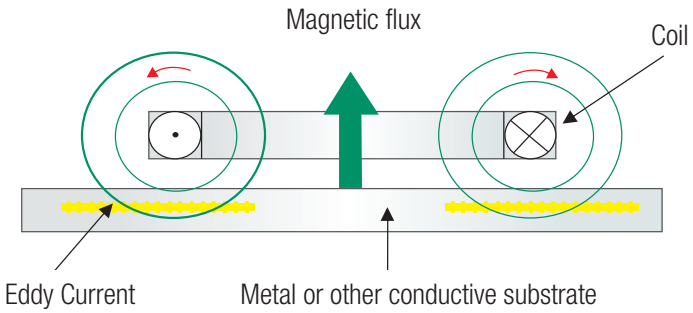
FRD® Application of Absorbing Plate

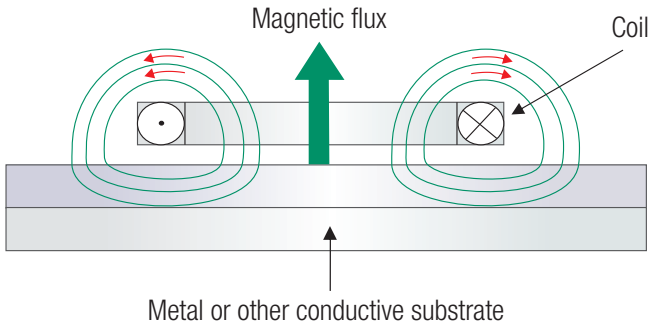
In the field of wireless charging

Wireless charging technology uses electromagnetic induction to generate current through primary and secondary coil induction, so as to transfer energy from the transmission end to the receiving end, so as to realize the purpose of charging mobile phones, MP3, Bluetooth headsets, game consoles, DV and other electronic products. It can also charge low-power wireless sensor networks and medical implant devices in patients.

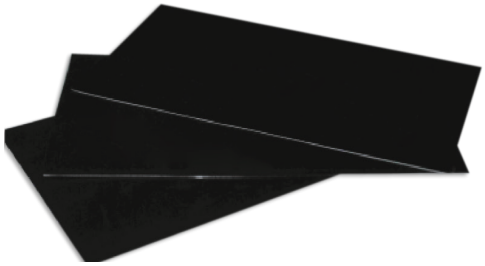


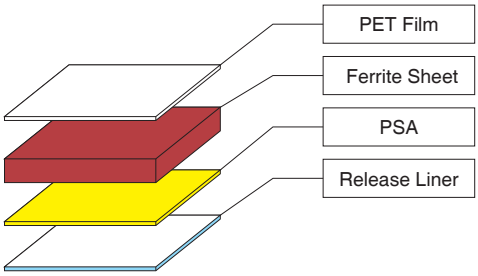
In the field of RFID





JCXB-F Series





JCXB-F Series Features:

- Ferrite, High permeability, Low loss;
- Efficient reduce the metal interference in HF (13.56MHz) RFID system, enhance antenna signal, Lengthen communication distance;
- Customized products for wireless charging

Typical Applications:

- Module NFC;
- Module RFID Tag on/in metal;
- Wireless charging module;

JCXB-F series absorber complies with worldwide directives ecological compatibility, such as RoHS standards and Halogen Free.
Standard size is 65mmx65mm，custom size may be available upon request.

How to order:
JCXB-FX-XX. Series number: F0; F2; F6... Thickness(mm): 010 means 0.1mm, thickness tolerance: ±0.01mm.

AProperties

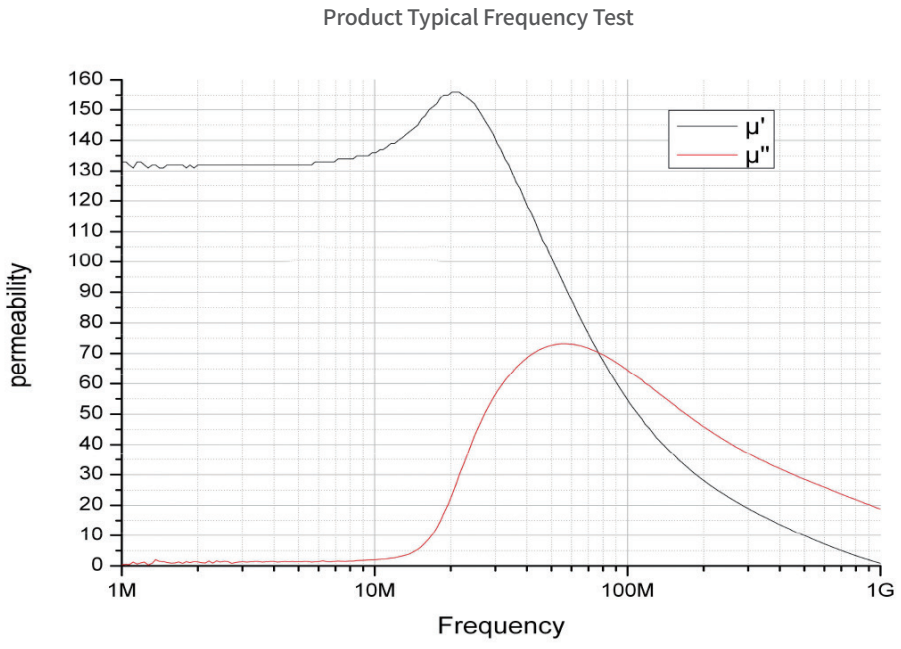
Type	Permeability(13.56MHz)		Thickness(mm)	Operating Temperature(℃)	Surface Resistance(Ω)	Frequency Range(MHz)
	μ'typ	μ''typ				
JCXB-F0	110±20%	3±20%	0.12; 0.17; 0.22	-40~+85	>10^8	10~900 (13.56 MHz and is mainly used in the following)
JCXB-F2	150±20%	5±20%	0.12; 0.17; 0.22	-40~+85	>10^8	10~900 (13.56 MHz and is mainly used in the following)
JCXB-F3	150±20%	2.5±20%	0.08; 0.1; 0.19	-40~+85	>10^8	10~900 (13.56 MHz and is mainly used in the following)
JCXB-F6	150±20%	4±20%	0.07; 0.115;	-40~+85	>10^8	10~900 (13.56 MHz and is mainly used in the following)

Classfication

Type	Ferrite Thickness (mm)	Adhesive Thickness (mm)	PET Film Thickness (mm)	PET Film Colour
F310A	$0.08^{\pm0.01}$	0.013	0.01	Black
F310D	$0.08^{\pm0.01}$	0.013	0.012	White
F310G	$0.08^{\pm0.01}$	0.013	---	---
F312A	$0.1^{\pm0.01}$	0.013	0.01	Black
F312B	$0.08^{\pm0.01}$	0.013	0.03	Black
F312C	$0.08^{\pm0.01}$	0.013	0.03	White
F312D	$0.1^{\pm0.01}$	0.013	0.012	White
F312G	$0.1^{\pm0.01}$	0.013	---	---
F321A	$0.19^{\pm0.01}$	0.01	0.01	---

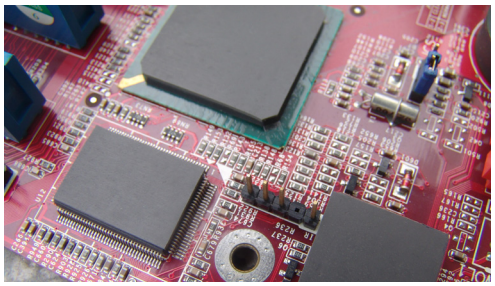
Note: Product JCXB - F310G / F312G is with adhesive on both side, no pet film.

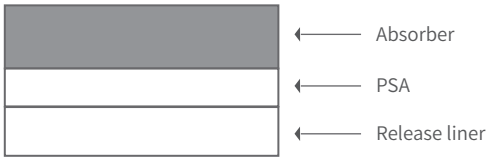
JCXB-F3 Typical Permeability



Note: The data is only included in a typical value of laboratory testing and should not be regarded as technical specifications.

Qzorb Series





Qzorb Series Features and Benefits:

- Wide working frequency range
- Thin, flexible, can be cut and fitted to compound curves
- RoHS complaint
- Halogen-free

Applications:

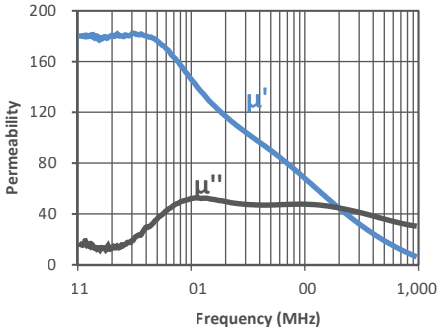
- EMI suppression in 3C products
- Attenuate EMI coupling of HSDLs
- High order harmonic restrain of components
- Reduce cavity resonance of metal housing of RF devices

Qzorb absorber consists Fe-based nanocrystalline filler in organic resin. Qzorb absorber can prevent interference between loop antennas and nearby metal objects with high magnetic permeability. It can be improve magnetic field convergence in NFC and other RFID systems.

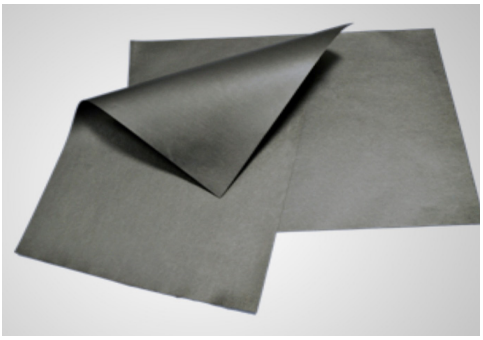
Properties

Property	Typical Value	Remark
Frequency Range	10MHz ~ 6GHz	
Thickness (mm)	0.05 / 0.1 / 0.2 / 0.3 / 0.5	Can be customized
Magnetic Permeability@MHz	120 / 150 / 180	Agilent E4991A
Standard Packaging (mm)	300 x 200	Can be customized
Density (g/cm^3)	3.2 / 3.6	
Surface Resistance (Ω/cm^2)	$>1x10^4$	
PSA Thickness (mm)	0.03	Can be customized
Continuous Use Temperature (°C)	-25 ~ +120	

Qzrob Typical Permeability



JCXB-R Series



JCXB-R Series Features:

JCXB-R series absorber consists Fe-based nanocrystalline fillers in elastomer. This absorber attenuates EMI for broadband radio frequency range (From 10 MHz to 10 GHz).

JCXB-R series absorber’ s common uses include cell phone (EMC and SAR), laptop, flat-panel TV and most of portable electronics.

JCXB-R series absorber can improve magnetic field convergence and prevent interference between loop antennas and nearby metal objects with high magnetic permeability. It can be used in NFC and other RFID systems.

JCXB-R series absorber complies with RoHS standards and it is Sulfur-free (Halogen free type available). Its working temperature range is -25~85°C.

How to order:

JCXB-XX(HF)-P-XXX-(L)

(1) Series Number: R-- relative magnetic permeability is 20, RF---relative magnetic permeability is 40.

(2) HF: Halogen free.

(3) P: with PSA.

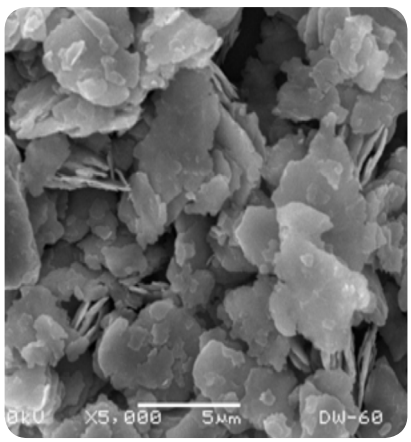
(4) Thickness(mm): 100 means 1.0mm, thickness tolerance: ±0.2mm.

(5) L: Laminating Film.

Standard size is 140mmx180mm, custom size may be available upon request.

Properties

Type	Thickness (mm)	Frequency Range(GHz)	Surface resistivity	Surface density
JCXB-RF(HF)-010	0.1	10MHz-900MHz	>10^5	⩽ 0.3
JCXB-RF(HF)-030	0.3	10MHz-900MHz	>10^5	⩽ 0.7
JCXB-RF(HF)-050	0.5	10MHz-900MHz	>10^5	⩽ 1.2
JCXB-R(HF)-030	0.3	10MHz-10GHz	>10^5	⩽ 0.7
JCXB-R(HF)-050	0.5	10MHz-10GHz	>10^5	⩽ 1.2
JCXB-R(HF)-080	0.8	10MHz-10GHz	>10^6	⩽ 1.8
JCXB-R(HF)-100	1.0	10MHz-10GHz	>10^6	⩽ 2.3

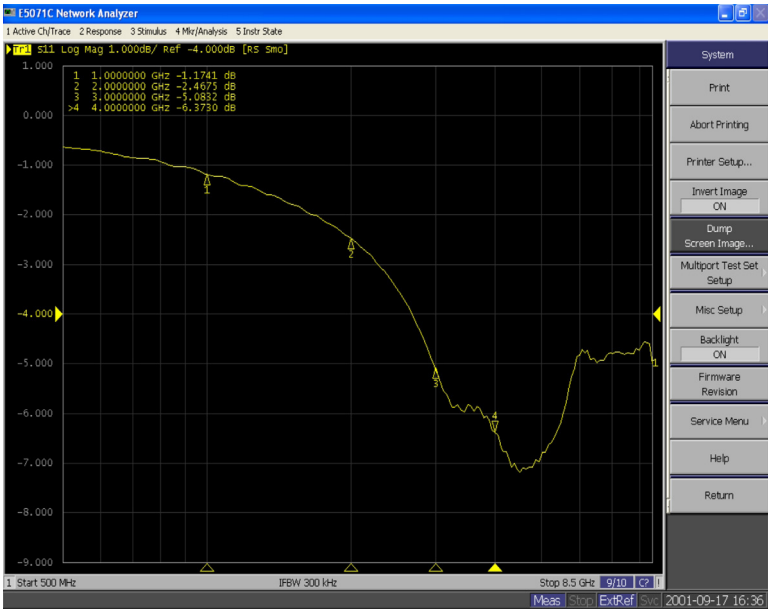


Absorbent

JCXB-R Series Typical Permeability

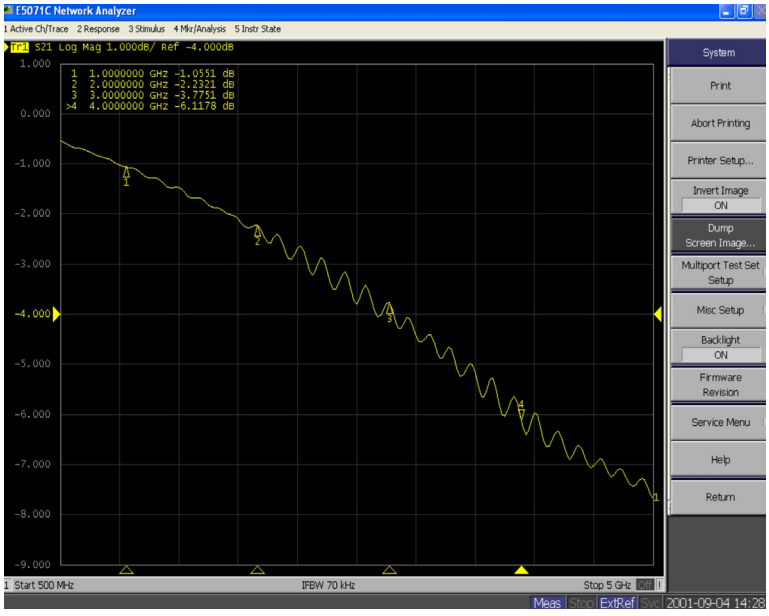
JCXB-R-050

Return loss（7mm Coaxial Method）



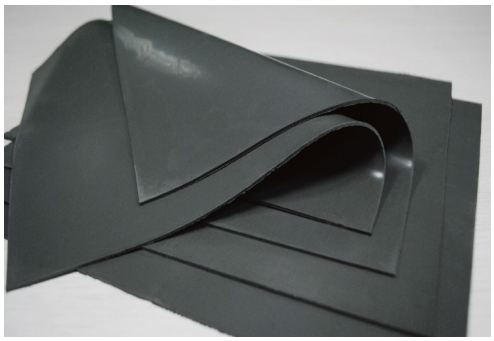
JCXB-R-050

Transmission (7mm Coaxial Method)



Note: The data is only included in a typical value of laboratory testing and should not be regarded as technical specifications.

JCXB-S(V) Series



JCXB-S(V) Series Features:

JCXB-S（V）is a flexible elastomeric magnetic absorbing material. The cermet fillers work well in suppressing resonant cavity modes, reduce EMI, and attenuating surface currents. It is thin，flexible and easy to bond on the surface of metal or PCBAs..

Key Features:

- Large working frequency range and high loss.
- High strength(tensile strength>0.5MPa).
- Halogen and Sulfur free, RoHS compliant.
- Fire retardant versions to UL 94 V0 are available(With V in PN).
- Service temperature: -40°C~+150°C.

Applications:

- Attenuation or modification of radiating patterns of antenna elements and microwave dishes.
- Isolation for waveguides.
- Suppression of EMI.
- Reduction of RCS.

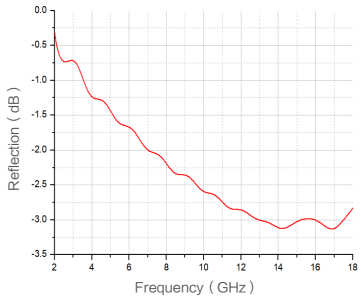
Properties

PN	Average Reflection(dB)	Thickness (mm)
JCXB-S-025S	>1.5@6-18GHz	0.25+/-0.05
JCXB-S-050S	>5@18-32GHz	0.50+/-0.10
JCXB-S-050T	>5@8-18GHz	0.50+/-0.10
JCXB-S-070S	>8@8-18GHz	0.70+/-0.10
JCXB-S-090S	>9@10-18GHz	0.90+/-0.10
JCXB-S-100S	>12@12-22GHz	1.00+/-0.10
JCXB-S-100J	>10@6-10GHz	1.00+/-0.10
JCXB-S-100T	>8@8-18GHz	1.00+/-0.10
JCXB-S-130S	>15@8-12GHz	1.30+0/-0.20
JCXB-S-150S	>12@6-12GHz	1.50+0/-0.20
JCXB-S-180S	>12@4-8GHz	1.80+/-0.20

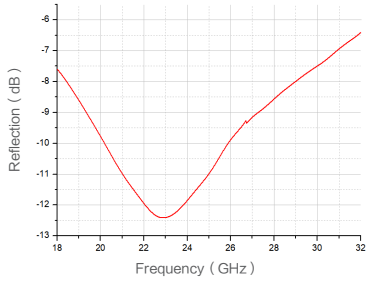
PN	Average Reflection(dB)	Thickness (mm)
JCXB-SC-100S	>4@0.5-2GHz	1.00+/-0.10
JCXB-SC-180S	>12@3-6GHz	1.80+/-0.20
JCXB-SC-200S	>10@2-5GHz	2.00+/-0.20
JCXB-SC-250S	>13@2-4GHz	2.50+/-0.20
JCXB-SC-300S	>8@2-6GHz	3.00+/-0.20
JCXB-SM-030S	>2@26-40GHz	0.30+/-0.05
JCXB-SM-050S	>6@30-40GHz	0.50+/-0.10
JCXB-SM-060S	>10@30-40GHz	0.60+/-0.10
JCXB-SM-080S	>10@30-40GHz	0.80+0/-0.20
JCXB-SZ-200S	>4@2-8GHz	2.00+/-0.20
JCXB-SZ-400S	>8@0.5-2GHz	4.00+/-0.30

JCXB-S(V) Series Typical Reflectivity Performance

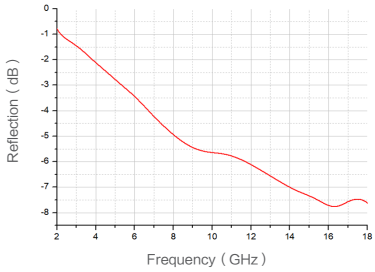
JCXB-S-025S



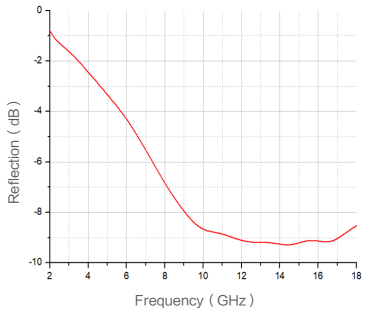
JCXB-S-050S



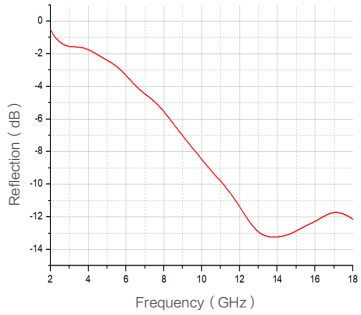
JCXB-S-050T



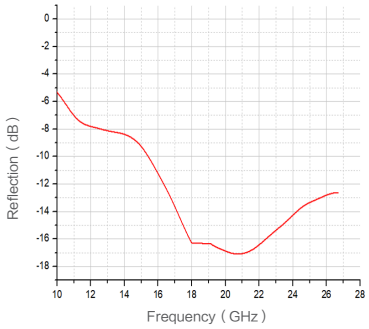
JCXB-S-070S



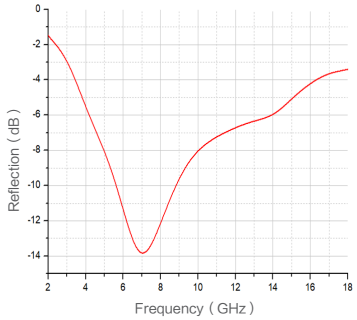
JCXB-S-090S



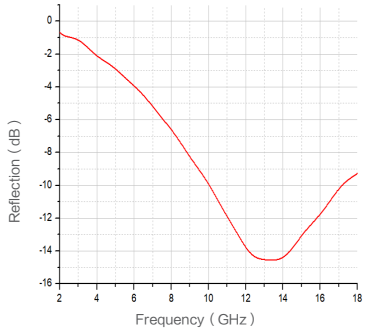
JCXB-S-100S



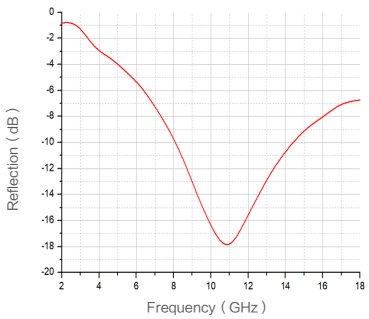
JCXB-S-100J



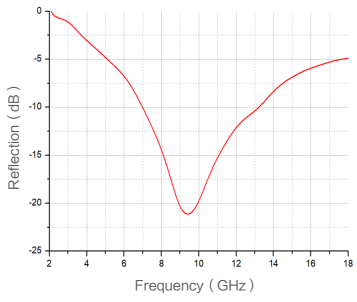
JCXB-S-100T



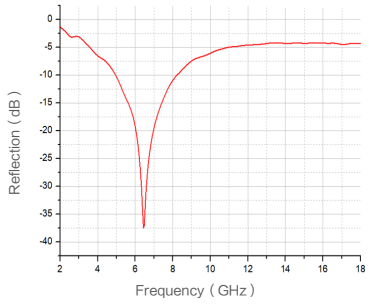
JCXB-S-130S



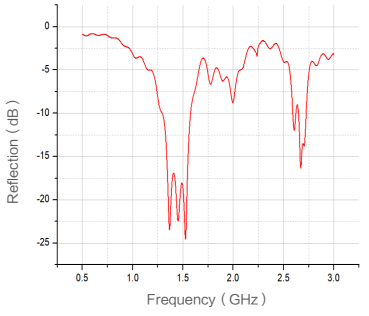
JCXB-S-150S



JCXB-S-180S



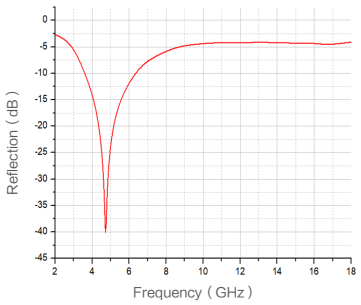
JCXB-SC-100S



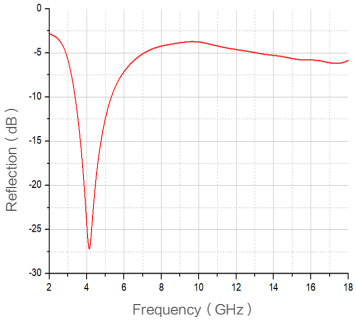
Note: The data is only included in a typical value of laboratory testing and should not be regarded as technical specifications.

JCXB-S(V) Series Typical Reflectivity Performance

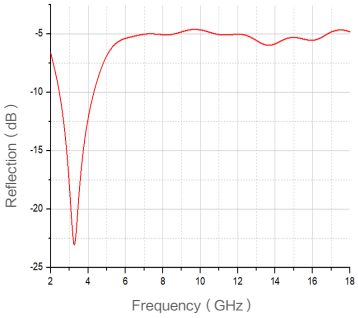
JCXB-SC-180S



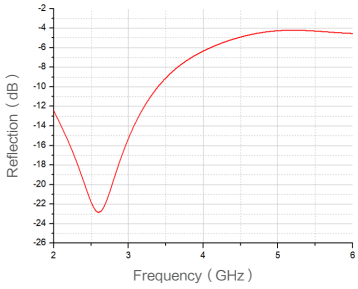
JCXB-SC-200S



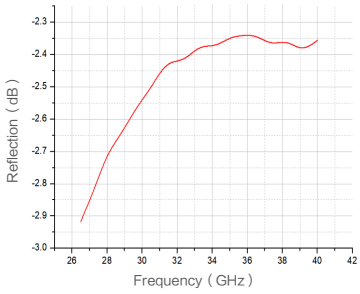
JCXB-SC-250S



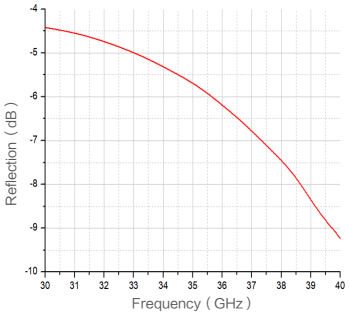
JCXB-SC-300S



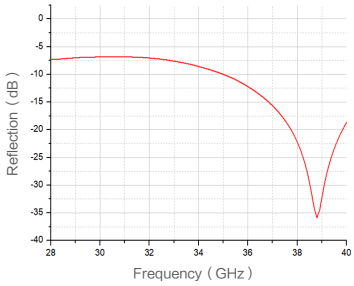
JCXB-SM-030S



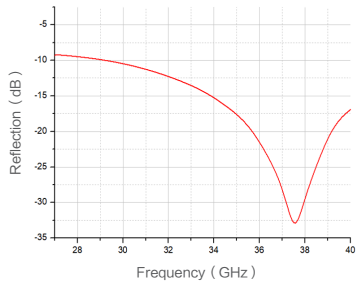
JCXB-SM-050S



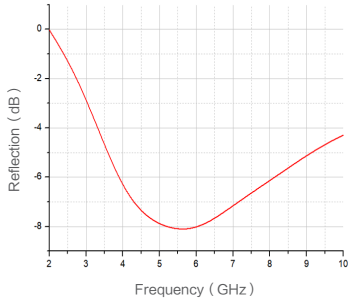
JCXB-SM-060S



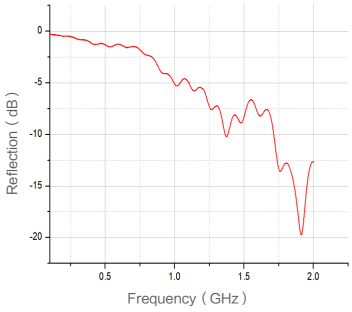
JCXB-SM-080S



JCXB-SZ-200S

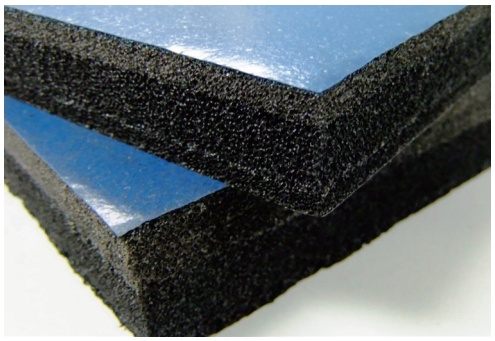


JCXB-SZ-400S



Note: The data is only included in a typical value of laboratory testing and should not be regarded as technical specifications.

FLXB Series



FLXB Series Features:

FLXB series absorber is widely known and used foam sheet product which is high loss, low density, flexible and low cost.
FLXB series absorber is used to isolate the microwave transmission and specular reflection by insertion loss, and it can also lower cavity Q' s. It is very useful in radar systems, RF components, telecom systems and test devices.
FLXB series absorber will not drop any conductive powders for safety use, and has weatherproof coating for outdoor applications.
FLXB series absorber complies with RoHS standards, and can achieve GB FH-1 flame retardant grade. Its working temperature range is -25~85°C.

How to order :

FLXB-XX-X

(1) Thickness(mm): 05 means 5mm.

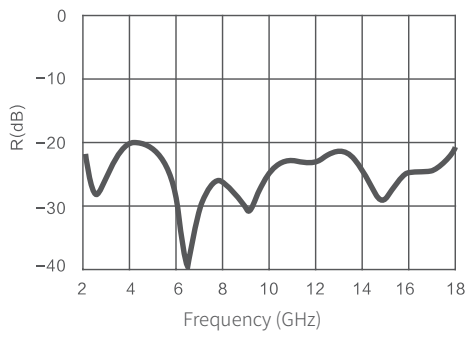
(2) P means with PSA.

Standard size is 400mmx400mm, custom size may be available upon request.

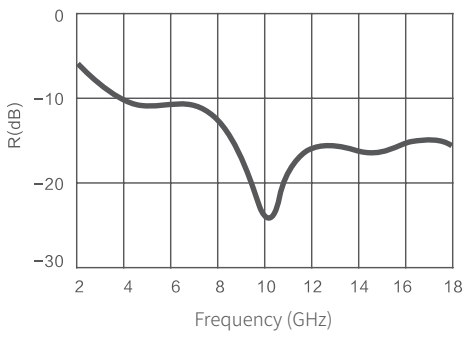
Properties

Type	Frequency Range (GHz)	AverageReflectivity (dB)	Thickness (mm)	Surface resistivity (kg/m^2)
FLXB-03	10 ~ 18	>8	3±1	0.3
FLXB-06	6 ~ 18	>8	6±1	0.6
FLXB-12	5 ~ 18	>10	12±2	1.0
FLXB-20	4 ~ 18	>15	20±2	1.5
FLXB-40	3 ~ 18	>20	40±3	3.0
FLXB-55	2 ~ 18	>20	55±4	4.0

FLXB-55



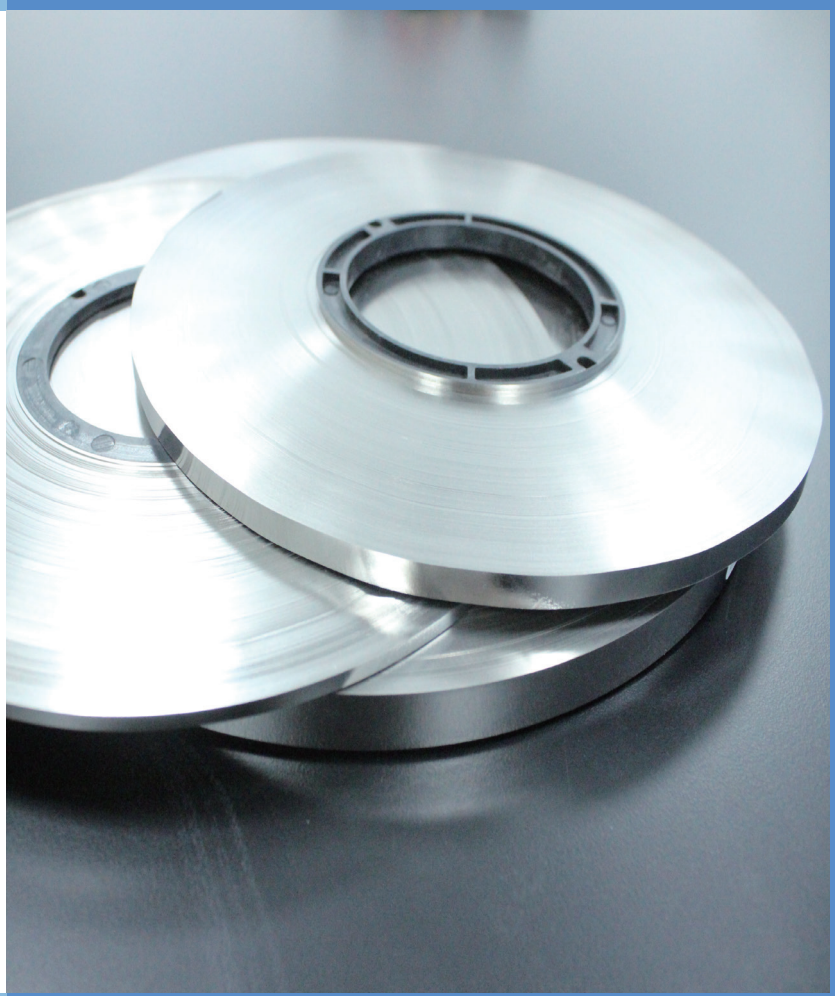
FLXB-12



Nanocrystalline Series

After proper crystallization and annealing treatment, amorphous alloys form a material composed of nano-sized micro crystalline particles and amorphous, which is called nanocrystalline material.

Nanocrystalline materials have excellent saturation magnetic induction(1.4T) and highinitial permeability (8×10^4),low high frequencyloss under high magnetic induction, excellent,temperature stability andflexible frequency characteristics. Nanocrystalline strip canbe made into directional magnetic barrier sheets and applied to ultra-thinwireless charging module. In addition, it can also be made intohigh-performance iron core. It is widely used in industrial power supply, smartmeter, new energy vehicle, photovoltaic and other fields, such as high-powerswitching power supply, inverter power supply, high-frequency transformer,high-frequency magnetic amplifier, high-frequency choke iron core, current transformeriron core, leakage protection switch Common mode inductance, iron core, etc.



Fe based nanocrystalline alloys are composed of iron, silicon, boron, niobium, copper and other elements. When the Fe based amorphous alloy containing Cu and Nb is annealed above the crystallization temperature, it will form a very fine grain structure with a grain size of only 10-20 nm. The microcrystalline material formed after heat treatment of this amorphous alloy is called nanocrystalline alloy.

Iron based nanocrystalline alloy has excellent characteristics such as high saturated magnetic induction strength, high permeability, low coercivity, low loss, good temperature stability, high strength, toughness, wear resistance and corrosion resistance. As a nanocrystalline alloy material with the best performance price ratio in metal soft magnetic materials, it can replace silicon steel, permalloy and ferrite for high-power wireless charging Medium and high frequency transformers, mutual inductors, inductors and other magnetic components.

Production Line	Specifications	Performance Parameter
Positive spraying production line	Width：35~80mm Thickness：18~26μm Thickness tolerance：±2μm	Bs：1.2T、1.4T Hc：⩽2.0A/M
Reverse injection production line	Width：35~80mm Thickness：16~20μm Thickness tolerance：±1μm	Bs：1.2T、1.4T Hc：⩽2.0A/M

Performance comparison of soft magnetic materials

Soft magnetic material	Saturation Flux Density Bs (T)	Coercive Force Hc (A/m)	Relative Permeability μr (1kHz) (×10^3)	Ps (Kw/m^3)	Magnetostrictive Coefficient λ (×10^{-6})	Curie Temperature Tc (°C)
Nanocrystalline alloy (1K107)	1.25	1~2	80	600	2~5	570
Fe-based amorphous alloys (1K101)	1.56	3~5	6	2200	24	415
Cobalt based amorphous alloy	0.55	0.5~1	120	400	~0	200
3% Fe-Si	1.9	⩽30	2.7	8400	2~5	750
6.5% Fe-Si	1.3	⩽40	1.2	5800	~0	700
50% Permalloy	1.5	10~15	20	3400	25	500
80% Permalloy	0.75	2~4	50	1000	~0	460
Mn-Zn Ferrite	0.45	8~10	5	1200	10	200

注：（1）Bs、Hc：Hm=800A/m，25°C；（2）μr（1kHz）、μr（100kHz）：Hm=0.05A/m，25 °C，1kHz；（3）Ps：100kHz，Bm=0.2T，室温

Nanocrystalline strip

Product	Number	Saturation Magnetic Induction （T）	Main Components	Width (mm)	Thickness (um)	Application
Ordinary	D11Y D11G	1.25	FeCuNbSiB	3.2~80	16~26	Wireless charging, inductance, transformer
High saturation	D21Y	1.4	FeCuNbSiB	3.2~70	16~26	Wireless charging, inductance, transformer
Low magnetic conductivity	D31G	1.2	FeCuNbSiBNiCo	3.2~40	18~26	Inductance and transformer
Low magnetic conductivity amorphous strip	D41G	1.4	FeCoNiSiB	3.2~40	18~26	Inductance and transformer

Inductance Core



Characteristic

- High saturation flux density 1.2t
- High permeability 10000 to 140000
- High impedance and good frequency performance
- Low core loss, low temperature rise and good high temperature stability
- The iron core is small in size and low in weight

Application

- High voltage pulse noise suppressor
- Common mode choke for switching power supply
- Variable frequency power supply, uninterruptible power supply (UPS)

Type	VAC	Core Size(mm)			Final Dimension(mm)			Sectional Area (cm^2)	Path Length (cm)	Core Weight (g)	Permeability (μ at 10kHz)		Single Turn Inductance (μH)	
		OD	ID	H	OD	ID	H	AFe	LFe	mFe	Range value	reference value	10KHz 0.3V	100KHz 0.3V
DM120805	W902	12	8	4.5	14.1	6.6	6.3	0.07	3.1	1.7	72000~139000	97000	28	6.8
DM201208	W409	20	12.5	8	22.6	10.3	10.2	0.24	5.1	9	72000~139000	97000	55.2	13.6
DM201208L	W450	20	12.5	8	22.6	10.3	10.2	0.24	5.1	9	18100~35000	23700	14.3	9.1
DM251610	W380	25	16	10	27.9	13.6	12.5	0.36	6.4	17	72000~135000	95000	65.5	15.5
DM251610L	W451	25	16	10	27.9	13.6	12.5	0.36	6.4	17	15000~35000	24300	17	11.5
DM252010	W523	25	20	10	27.3	17.5	12.8	0.19	7.1	9.9.0	60000~116000	80000	28.4	7.3
DM302010	W423	30	20	10	32.5	17.8	12.5	0.4	7.9	23.1	72000~135000	103000	59.3	14
DM302010L	W358	30	20	10	32.5	17.8	12.5	0.4	7.9	23.1	19500~35200	25500	15.5	11.1
DM302015	W514	30	20	15	32.8	17.6	17.8	0.57	7.9	33	72000~135000	96000	88	20
DM403215	W422	40	32	15	42.3	29.1	17.8	0.44	11.3	36	72000~135000	95000	47.2	11.1
DM403215L	W452	40	32	15	42.3	29.1	17.8	0.44	11.3	36	15000~29000	20000	12.2	7.9
DM402515	W424	40	25	15	43.1	22.5	18.5	0.86	10.2	64	72000~135000	94000	101	23.1
DM402515L	W453	40	25	15	43.1	22.5	18.5	0.86	10.2	64	17850~34500	23700	25.4	17.2
DM453015	V102	45	30	15	48.3	26.4	18.2	0.86	11.8	74	72000~135000	96000	87.5	20.3
DM504020	W516	50	40	20	53.5	36.3	23.4	0.76	14.1	79	50000~97000	66000	45.3	14
DM504020L	W565	50	40	20	53.5	36.3	23.4	0.76	14.1	79	20000~38700	26600	18	10
DM635025	W517	63	50	25	67.3	46.6	28.6	1.24	17.8	161	50000~97000	67000	58.6	18.1
DM805020	V140	80	50	20	86	44.7	25.7	2.28	20.4	342	71250~137000	95000	94	28
DM906020	W518	90	60	20	95.4	54.7	24.7	2.28	23.6	400	50000~97000	67000	81	25.1
DM1027625	W468	102	76	25	108.1	70	30.3	2.47	28	508	50000~97000	67000	68.8	21.6

Note: nanocrystalline inductance iron core of other specifications can be designed and manufactured according to customer requirements.

Transformer Core



Characteristic

- High saturation magnetic induction
- High permeability - can improve the accuracy of transformer
- Good cost performance – small size and light weight
- Good temperature stability, can work at 55 ~ 130 °C for a long time

Application

- Precision transformer with accuracy class of 0.2, 0.2S and 0.1
- Epoxy encapsulated current transformer
- Switching Mode Power Supply
- Relay protection
- Electric energy monitoring device

Type	Core Size (mm)			Protective Box Size (mm)			Sectional Area (cm^2)	Path Length (cm)	Single Turn Inductance（μH）
	OD	ID	H	OD	ID	H	Ae	Lm	1KHz 0.3V
DT130903	12.8	9.5	3.2	14.5	7.9	4.8	0.04	3.5	23.3
DT141005	14	10	5	15.6	8.5	7.1	0.08	3.77	41
DT171303	17	13	3.2	19.6	10.4	5.5	0.05	4.71	21
DT181305	17.8	13	5	19.5	11.5	6.2	0.1	4.84	38.4
DT191407	19	14	6.5	21.3	12.5	8.7	0.13	5.18	48.5
DT191408	19	14	8	22.1	12.4	10.5	0.16	5.18	59.7
DT211610	21	16	10	23.8	14.3	13.1	0.21	5.81	66.5
DT252007	25	20	6.5	27.4	18.2	8.7	0.13	7.07	35.6
DT252010	25	20	10	27.6	18.2	12.8	0.21	7.07	54.7
DT342808	34	28	8	36.5	26.1	10.6	0.2	9.73	38.1
The following are epoxy coated cores									
DT140905	14	9	5	<15.0	>8.0	<6.0	0.11	3.61	57.43
DT171205	17.4	12	5	<18.4	>11.0	<6.0	0.11	4.62	44.88
DT181306	18.5	13	6	<19.5	>12.0	<7.0	0.14	4.95	53.31
DT191407	19	14	6.5	<20.0	>13.0	<7.5	0.14	5.18	50.94

Note: inductance is the minimum value

Various transformer cores can be customized according to customer needs: annular, rectangular, runway type, etc

Single Core Anti DC Transformer Core

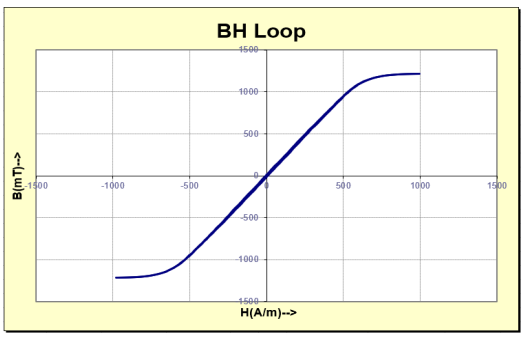




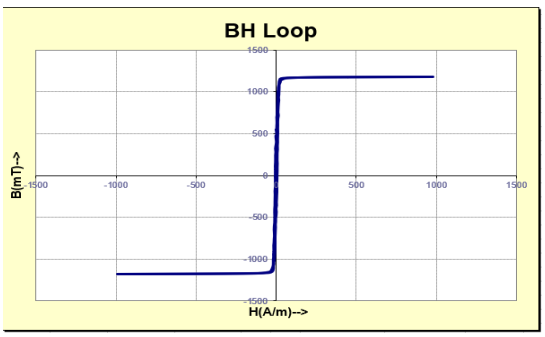
Characteristic

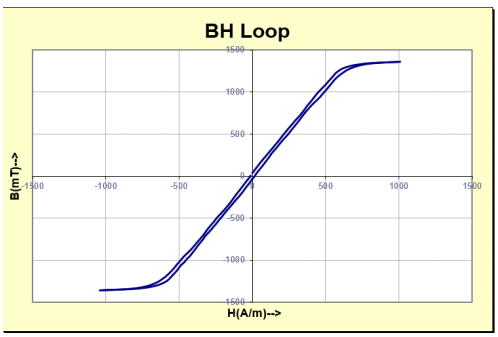
- The nanocrystalline magnetic core obtained by tension annealing process has the characteristics of constant permeability, low coercivity and low loss
- Single core DC transformer core can resist 100A DC component; The performance is much better than the traditional amorphous / nanocrystalline composite iron core, with small size and low weight

Project	Remanence Ratio (Br/Bp)	Coercive Force （Hc）	Permeability (μ)	Loss（W/kg） @20KHz, 0.5T
Single core anti DC iron core	1%	5	1000~1500	8
Iron cobalt nickel core	3%	15	1800~2000	20
Conventional nanocrystalline core	46%	5	60000	16

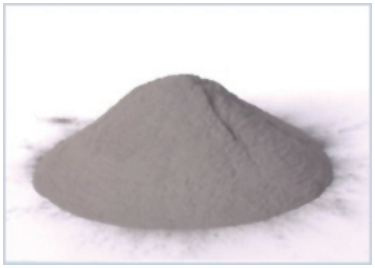


Test conditions：20KHz，500mT





Metal Magnetic Powder Cores





Characteristic

- Good DC bias characteristics
- Low loss and low temperature rise
- Lower cost
- Good temperature stability

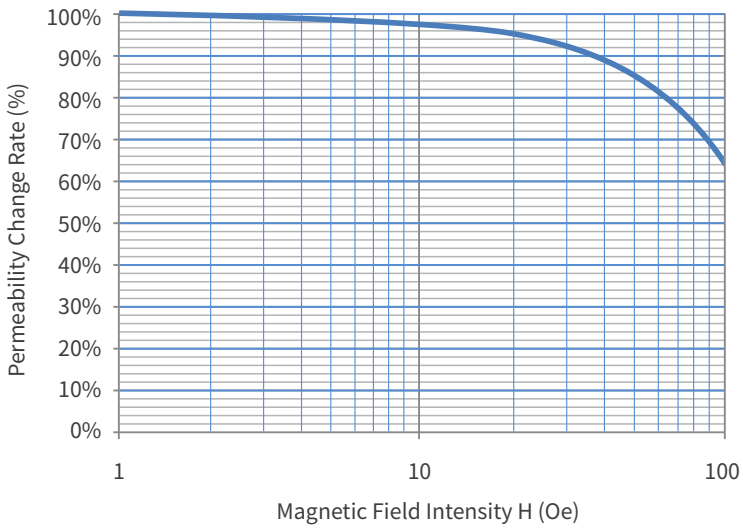
Application

- Noise filter
- PFC choke
- Power modulation inductor
- High energy storage power inductor
- Pulse transformer

27060 Performance Index

CORE Size	Outer Diameter (max.)	Inside Diameter (min.)	Height (max.)
Before painting (nominal value)	26.90mm(1.060in)	14.7mm(0.580in)	11.1mm(0.437in)
After coating (limit value)	27.7mm(1.090in)	14.1mm(0.555in)	12.0mm(0.470in)

Core Parameters	
Window area (WA)	156mm^2
Sectional area (AE)	65.4 mm^2
Length of magnetic circuit (LE)	63.5 mm^2
Volume(v)	4150mm^3
Weight(g)	25g
Permeability (μ)	60
AL±8%(nH/N2)	80



Remarks Age

SHENZHEN FRD SCIENCE & TECHNOLOGY CO., LTD.
FRD Industrial Park, Nanlin Road, Guangming District,
Shenzhen City, China.
Tel: 86-755-86081680
Fax: 86-755-86081689

FRD SCIENCE & TECHNOLOGY (JIANGSU) CO., LTD.
No. 139, Huaye Road, Jintan District, Changzhou City,
Jiangsu province
Tel: 86-519-82905888

FRD (HONG KONG) CO., LTD.
Unit 503, 5/F, Silvercord, Tower 2,30 Canton Road,
Tsimshatsui, Kowloon Hong Kong
Tel: 852-35195726
Fax: 852-30137466

GUANGDONG FRD PRECISION MANUFACTURING TECHNOLOGY CO., LTD. *(Under Construction)*
South side of East extension line of Guanhe Road, Lishui Town,
Nanhai District, Foshan City

BEIJING | SHANGHAI | WUHAN | CHENGDU | TAIPEI
SUWON | TOKYO | HELSINKI | SAN JOSE | SEATTLE

info@frd.cn

www.frd.cn

©2021 FRD
1012-V1.0-Wu