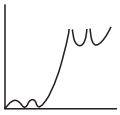
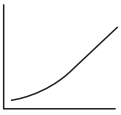
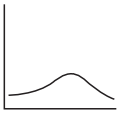
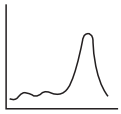
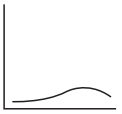
# FILTER

## Circuit model and filter characteristics

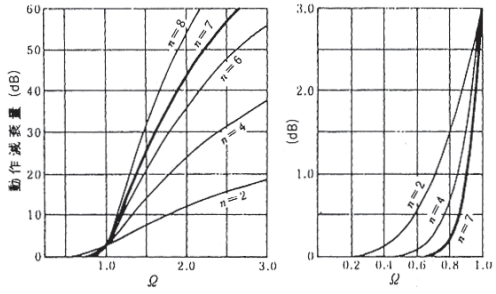
There are various circuits featuring filter characteristics, typical examples of which are the Butterworth type with a flat amplitude and the Elliptic Tchebyscheff type with a fluctuating amplitude. With the Bessel-Thomson type, the group delay frequency is even due to phase characteristics within a passband. Each of them has outstanding advantages in its pass and attenuation frequencies. Refer to the comparison chart below and select the optimal product for your purpose and device structure. As for delivery parts, the optimal items will be arranged according to your order.

| | Butterworth | Elliptic Tchebyscheff | Bessel-Thomson |
|---|---|---|---|
| Pass range | Flattness | Ripple | Flat group delay |
| Att. curb | Small refrection | Large refrection | Small refrection |
| Sections | many | few | many |
| Applied freqency | Till SHF band | Till a couple hundreds of frequency | Till SHF band |
| Cost | Expensive | lowest | Expensive |
| Technical difficulty | Easy | difficult | difficult |
| Freq. characteristic (LPF) |  |  |  |
| Group-delay of characteristics (LPF) |  |  |  |

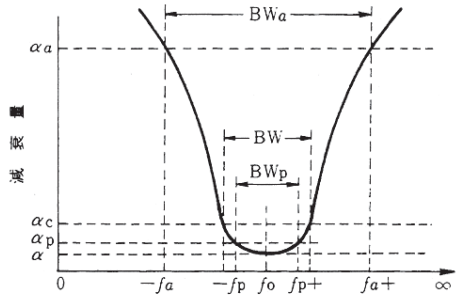
## Glossary and symbols

fp: upper or lower limit of pass frequency
fc: 3 dB decrease point for the upper or lower limit of pass frequency
fa: attenuation frequency
αp: insertion loss or ripple range at pass frequency
αc: 3dB decrease point for insertion loss
α: insertion loss at center frequency
fo: center frequency
k: slope of attenuation curve; k = fa/fp or fa/fc; k = BWa/BW or BWp/BWa
BW: bandwidth of 3 dB decrease point
BWp: pass bandwidth
BWa: attenuation bandwidth
Ω: basic angular frequency(equivqlent term of k)
n: number of circuits

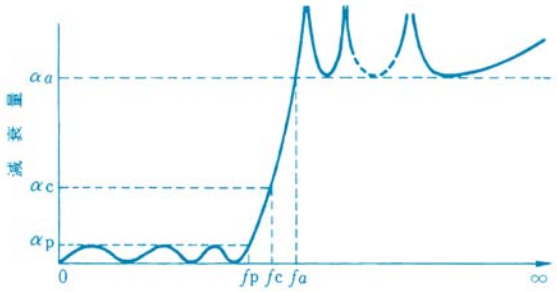
■ Butterworth characteristics




■ Elliptic Tchebyscheff characteristics



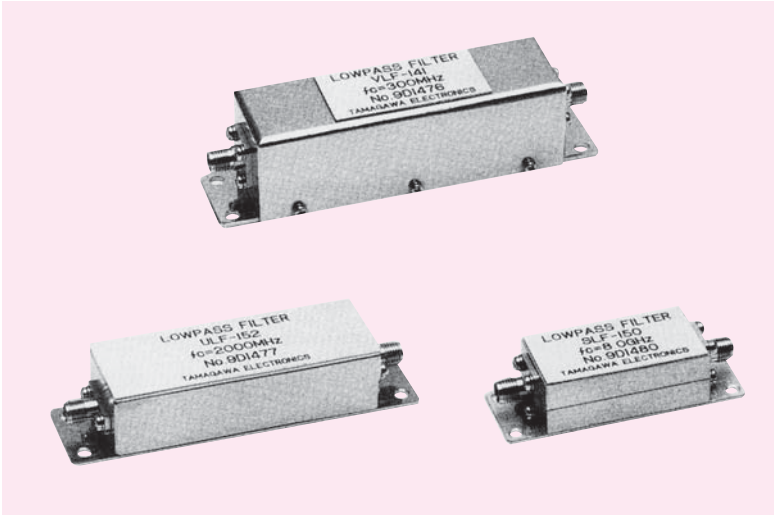

■ Attenuation of Elliptic Tchebyscheff filter




## Ordering filters

For inquiries about or ordering customized filters, please fill in the inquiry form on the next page and fax it to our sales department.

# LOW PASS FILTER Series




## Product features and applications

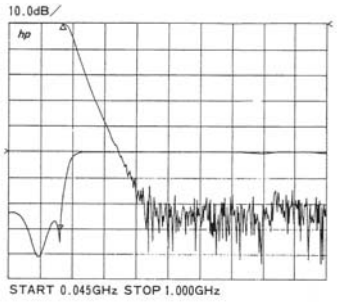
The low-pass filter is designed to pass lower frequency signals and block higher ones. It reduces spurious signals from wireless devices and is available for measurement and imple--mentation. The wide range of applicable frequencies, from 30 to 8,000 MHz, makes this product ideal for various purposes.

## VLF･ULF･SLF series Standard Specifications

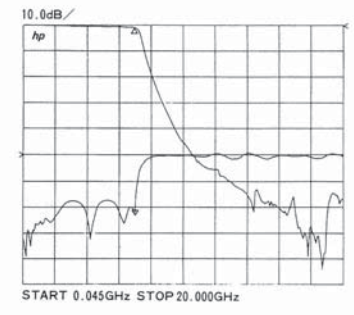
| Model | Pass Band (fp) MHz | Impedance | VSWR (Max.) | Insertion loss (dB) (Max.) | Connec-tors | Power (Max.) | Attenuation (Max.) | Guarantted att.range (Max.) | Dimensions (mm) W×D×H |
|---|---|---|---|---|---|---|---|---|---|
| VLF-141 | 30~300 | 50Ω<br>75Ω | 1.3 | 1.0 | BNCJ<br>SMAJ | 1W | fp×√2 at 20dB<br>fp×2 at 40dB | fp× 3 | 25×80×25 |
| ULF-174 | 300~3000 | 50Ω<br>75Ω | 1.3 | 1.0 | SMAJ | 1W | fp×√2 at 20dB<br>fp×2 at 40dB | fp× 3 | 20×70×26 |
| SLF-165 | 3000~5000 | 50Ω | 1.5 | 1.5 | SMAJ | 1W | fp×√2 at 20dB<br>fp×2 at 40dB | fp× 3 | 16×50×26 |
| SLF-150 | 5000~8000 | 50Ω | 1.5 | 1.5 | SMAJ | 1W | fp×√2 at 20dB<br>fp×2 at 40dB | fp×3<br>upper freq. below 20GHz | 16×42×22 |

## Frequency Characterictics

VLF-141(fp=200MHz)

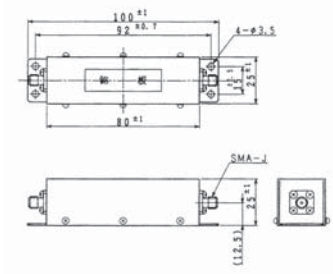



SLF-150(fp=7000MHz)

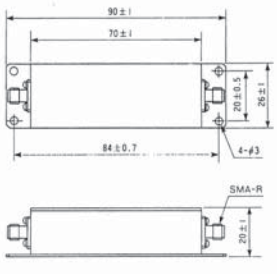



## Outline Drawings

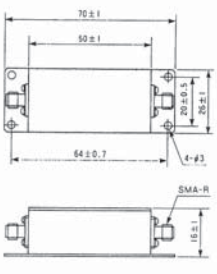
VLF-141



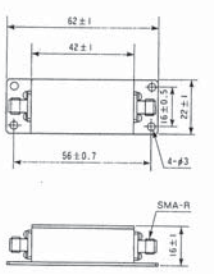
ULF-174



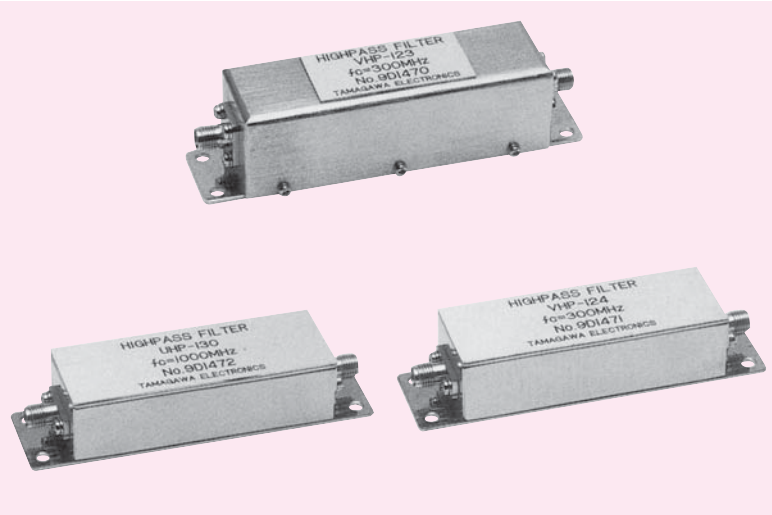
SLF-165



SLF-150



# HIGH PASS FILTER Series




## Product features and applications

The high-pass filter is designed to pass higher frequency signals and block lower ones. It is used for measurement and testing of wireless devices. This series supports two frequency ranges: 30–3,000 MHz (VHP/UHP series) and 4,250–13,000 MHz (SHP-119).

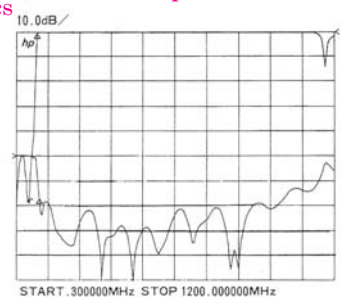
## VHP・UHP series Standard Specifications

| Model | Pass Band (fp) MHz | Impedance | VSWR (Max.) | Insertion loss (dB) (Max.) | Connectors | Power (Max.) | Attenuation (Max.) | Guarantted att.range (Max.) | Dimensions (mm) W×D×H |
|---|---|---|---|---|---|---|---|---|---|
| VHP-123 | 30~300 | 50Ω<br>75Ω | 1.3 | 1.0 | BNCJ<br>SMAJ | 1W | fp／√2 at 20dB<br>fp／2 at 40dB | fp×5 | 25×80×25 |
| VHP-126 | 100~300 | 50Ω<br>75Ω | 1.3 | 1.0 | BNCJ<br>SMAJ | 1W | fp／√2 at 20dB<br>fp／2 at 40dB | fp×5 | 20×70×26 |
| UHP-133 | 300~1000 | 50Ω<br>75Ω | 1.3 | 1.0 | SMAJ | 1W | fp／√2 at 20dB<br>fp／2 at 40dB | fp×5 | 20×70×26 |
| UHP-127 | 1000~3000 | 50Ω | 1.5 | 1.0 | SMAJ | 1W | fp／√2 at 20dB<br>fp／2 at 40dB | fp×3 | 20×70×26 |
| NEW SHP-119 | 4250~13000<br>fp=4250 | 50Ω | 2.0 | 2.0 | SMAJ | 10W | 2170(MHz Max.)<br>40(dB Max.) | — | 14×48×57.9 |

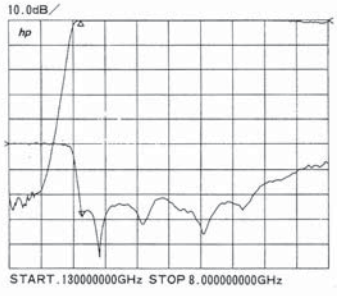
＊UHP-133 of 75Ω type which upper passband is below 2GHz

## Frequency Characterictics

VHP-123(fp=85MHz)

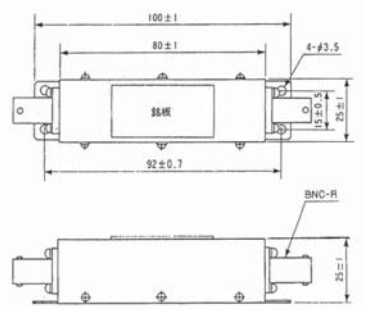



UHP-127(fp=1900MHz)

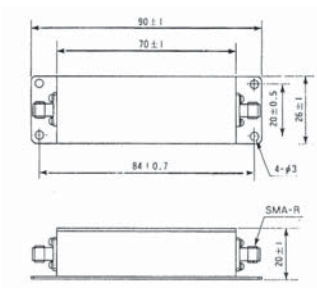



## Outline Drawings

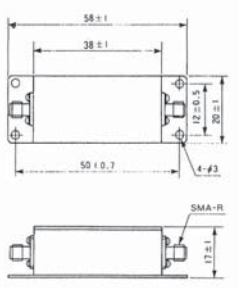
VHP-123



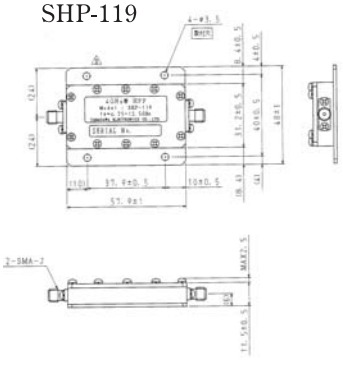

UHP-133




UHP-127

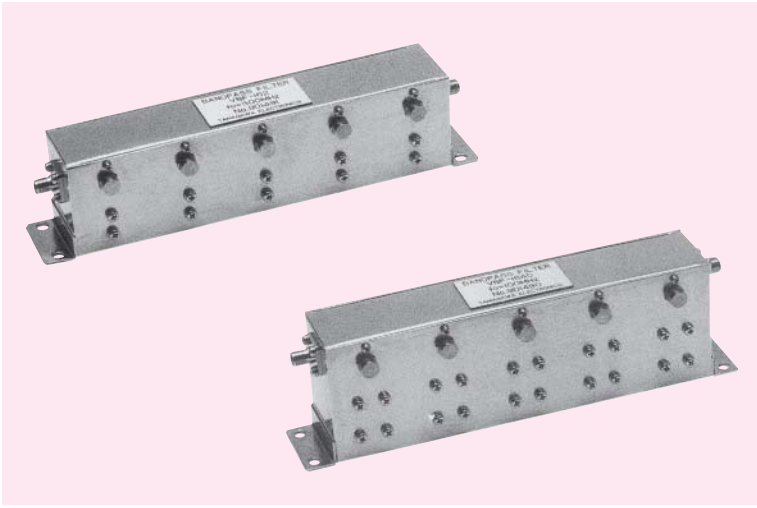



SHP-119



TAMAGAWA ELECTRONICS CO.,LTD.
3-11-23, Kamituchidana-naka,Ayase City,Kanagawa, 252-1113 Japan Tel.81-467-76-2291 FAX.81-467-70-4390

# HELICAL FILTER Series



## Product features and applications

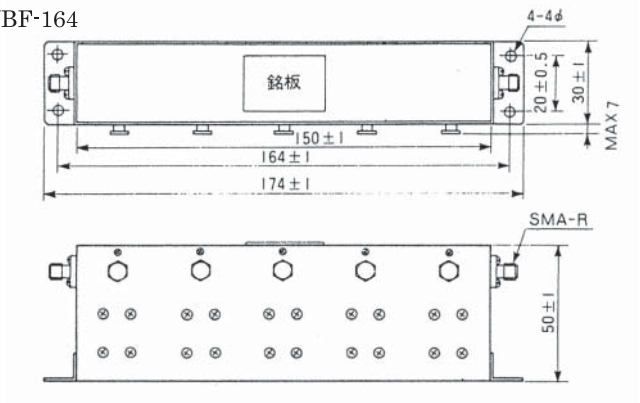
The helical resonator filter is used as a band-pass filter in a low frequency range. This series covers two ranges: 30–300 MHz by VBF-164 and 300–500 MHz by UBF-234. They are suitable for emergency and train wireless networks as well as 75ÙVHF filters.

## VBF･UBF series Standard Specifications

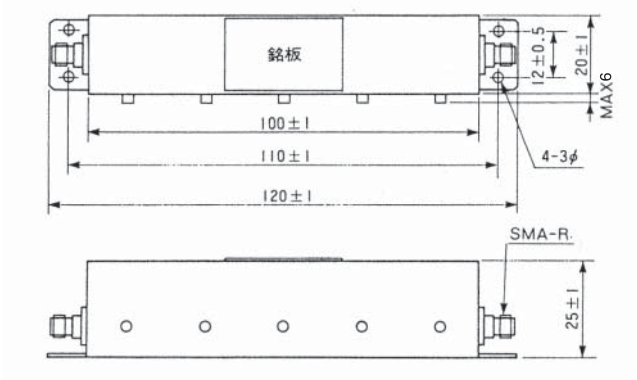
| Models | Center Frequency ($f_0$)MHz | Impedance | 3dB Band width | VSWR (Max.) | Insertion loss dB (Max.) | Connec-tors | Power (Max.) | Attenuation (Max.) | Guarantted att.range (Max.) | Dimensions (mm) W×D×H |
|---|---|---|---|---|---|---|---|---|---|---|
| VBF-164 | 30~300 | 50Ω | 3% | 1.3 | 3.0 | SMAJ BNCJ | 1W | f0±5% at 40dB | $f_0 \times 5$ | 50×150×30 |
| | | 75Ω | 10% | | 1.5 | | | f0±20% at 40dB | | |
| UBF-234 | 300~500 | 50Ω | 3% | 1.3 | 3.0 | SMAJ BNCJ | 1W | f0±10% at 40dB | $f_0 \times 5$ | 25×100×20 |
| | | 75Ω | 10% | | 1.0 | | | f0±30% at 40dB | | |

## Outline Drawings

VBF-164

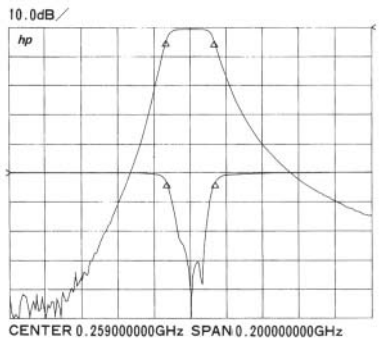



UBF-234

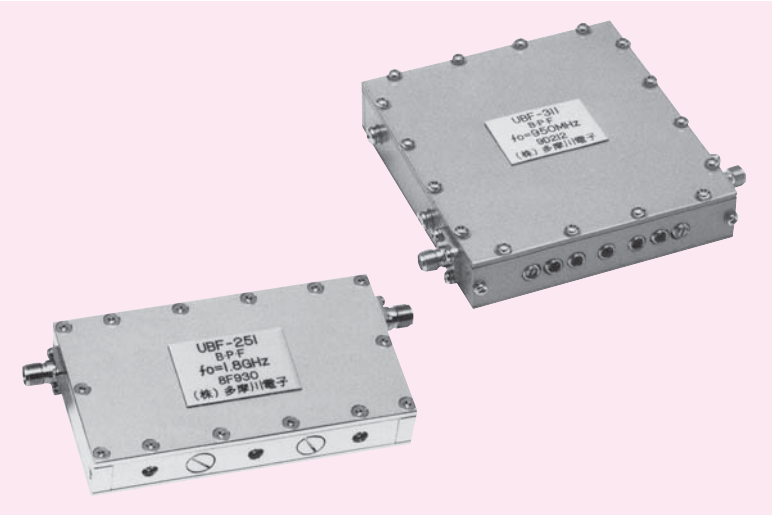



## Frequency Characteristic

VBF-164（$f_0$＝259MHz）



# COMBLINE(1/8λ) / INTERDIGITAL(1/4λ)FILTER Series




## Product features

The combline filter utilizes wavelength contra--ction according to the power capacity of a mounted resonator. It adopts a 1/8 l semi-coaxial resonator to function as a band-pass filter.

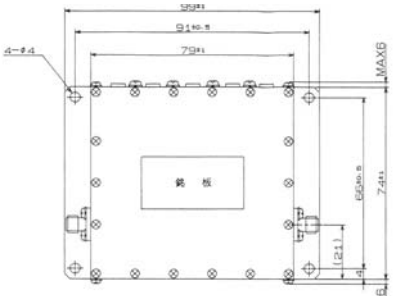
The interdigital filter features a 1/4 l comb-shape semi-coaxial resonator, and can be used as a band-pass filter in many fields.

## UBF series Standard Specifications (combline type) (1/8λ)

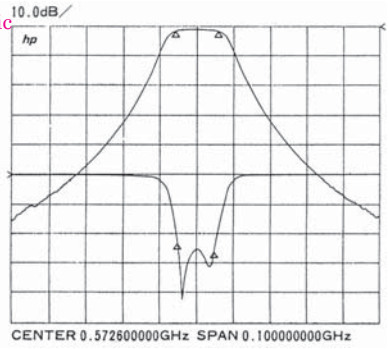
| Models | Center Frequency (f0)MHz | Impedance | 3dB Bandwidth | VSWR (Max.) | Insertion Loss dB (Max.) | Connectors | POWER (Max.) | Attenuation (Max.) | Guarantted att.range (Max.) | Dimensions (mm) W×D×H |
|---|---|---|---|---|---|---|---|---|---|---|
| UBF-***<br>By spec. | 500~3000 | 50Ω<br>75Ω | 3% | 1.3 | 2.0 | SMAJ<br>BNCJ | 1W | f0±5% at 40dB | According To Specifications | According To Specifications |

＊75Ωtype filter which upper band is below 2GHz

## Outline Drawings



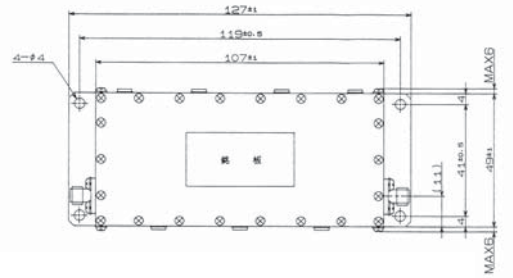

## Frequency Characterictic Example



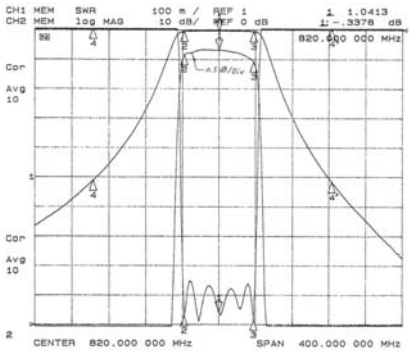

## UBF･SBF series Standard Specifications (Inter Digital type) (1/4λ)

| Models | Center Frequency (f0)MHz | Impedance | 3dB Bandwidth | VSWR (Max.) | Insertion Loss dB (Max.) | Connectors | Power (Max.) | Attenuation (Max.) | Guarantted att.range (Max.) | Dimensions (mm) W×D×H |
|---|---|---|---|---|---|---|---|---|---|---|
| UBF-***<br>By spec. | 500~1000 | 50Ω<br>75Ω | 10~30% | 1.3 | 3.0 | SMAJ<br>BNCJ | 1W | According To Specifications | According To Specifications | According To Specifications |
| UBF-***<br>By spec. | 1000~<br>3000 | 50Ω | 10~30% | 1.3 | 2.0 | SMAJ | 1W | According To Specifications | According To Specifications | According To Specifications |
| SBF-***<br>By spec. | 3000~<br>5000 | 50Ω | 10~30% | 1.3 | 1.0 | SMAJ | 1W | According To Specifications | According To Specifications | According To Specifications |

## Outline Drawings

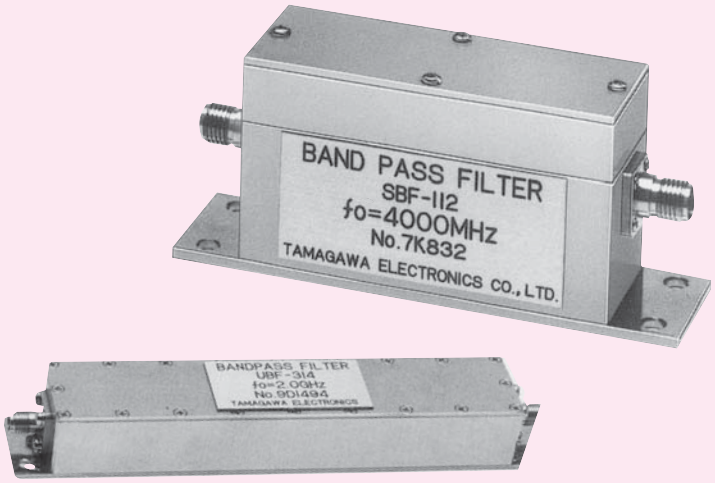



## Frequency Chracteristic




TAMAGAWA ELECTRONICS CO.,LTD.
3-11-23, Kamituchidana-naka,Ayase City,Kanagawa, 252-1113 Japan Tel.81-467-76-2291 FAX.81-467-70-4390

# CAVITY / WIDE-RANGE FILTER Series




## Product features

These filters are equipped with semi-coaxial cavities as resonators and feature the following advantages compared with other designs of band-pass filters:

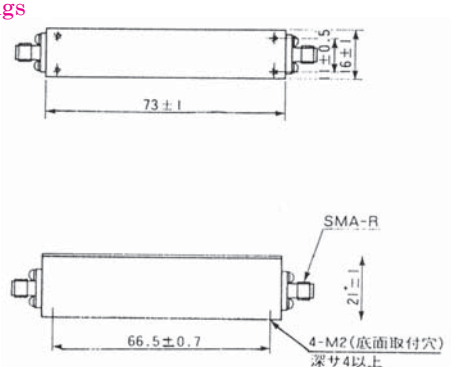
- Higher applicable frequency range
- Narrower pass bandwidth
- Compact and lightweight design
- High Q value and low insertion loss

## Specifications

| Models | Center Frequency (f0)MHz | Impeda-nce | 3dB Band width | VSWR (Max.) | Insertion Loss (dB) (Max.) | Connectors | Power (Max.) | Attenuation (Max.) | Guarantted att.range (Max.) | Dimensions (mm) W×D×H |
|---|---|---|---|---|---|---|---|---|---|---|
| By spec. | 1.2～10000 | 50Ω | 0.5～5% | 1.3 | According To Specifications | SMAJ | 1W | According To Specifications | According To Specifications | According To Specifications |

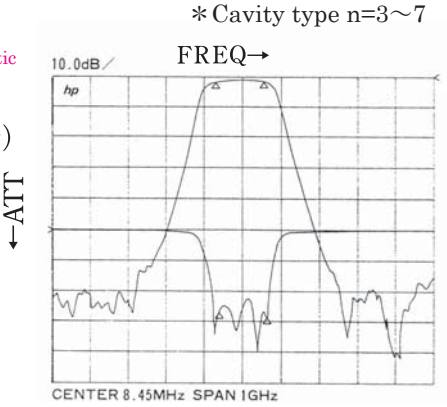
＊Cavity type n=3～7

## Outline Drawings




## Frequency Characterictic Example

($f_0$＝8450MHz)



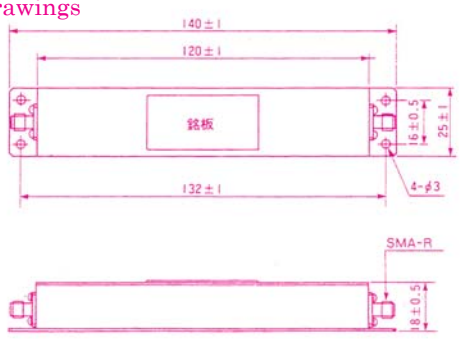

## VBF･UBF series Standard Specifications

| Models | Center Frequency (fL,fH)MHz | Impeda-nce | VSWR (Max.) | Insertion loss (dB) (Max.) | Connec-tors | Power (Max.) | Attenuation (Max.) | Guarantted att.range (Max.) | Dimensions (mm) W×D×H |
|---|---|---|---|---|---|---|---|---|---|
| VBF-189 | 30～300 | 50Ω 75Ω | 1.5 | 1.5 | SMAJ BNCJ | 1W | fL/√2 , fH×√2 at 20dB fL/2 , fH×2 at 40dB | fH×3 | 25×120×25 |
| UBF-314 | 300～3000 | 50Ω | 1.5 | 1.5 | SMAJ | 1W | fL/√2 , fH×√2 at 20dB fL/2 , fH×2 at 40dB | fH×3 | 18×120×25 |

＊Maximum pass band is 200% f0 center frequency (fH－fL/√fH×fL)

## Outline Drawings

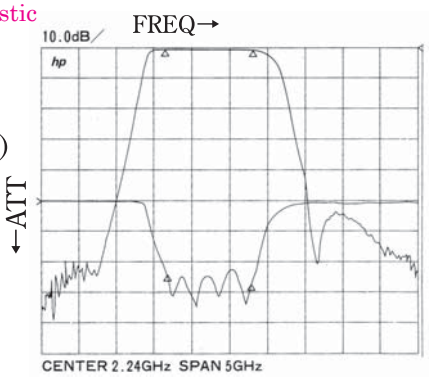
UBF-314



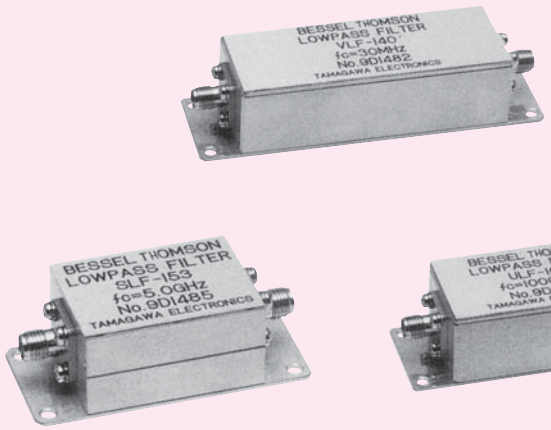

## Frequency Characteristic

UBF-314

($f_0$＝2240MHz)



# BESSEL THOMSON FILTER Series




## Product features

The Bessel-Thomson filter is a linear phase wave filter compatible with the Bessel function.
The attenuation is more moderate than those of Butterworth and Tchebyscheff filters, but neither ringing nor overshoot appears against a step response, and the impulse response does not fluctuate.
These characteristics enable the filter to transmit digital signals without distortion and prevent unwanted waves.
Moreover, the filter can be used to generate digital waveforms with ringing or overshoot.

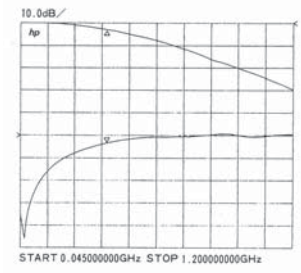
## VLF・ULF・SLF series Standard Specifications

| Models | Cut-Off Frequency (fc)MHz | Impedance | Unmatched att. | Insertion Loss | Connectors | Power (Max.) | Attenuation (dB) | Ground (Max.) | Section | Dimensions (mm) W×D×H |
|---|---|---|---|---|---|---|---|---|---|---|
| VLF-140 | 30～300 | 50Ω | 20dB (Max.) at fc/10 | 0.5dB (Max.) at fc/10 | SMAJ | 1W | 3±0.5 at fc<br>14±2 at fc×2<br>28.5±3 at fc×3 | ±0.15T at fc/10～fc ⊿T2±0.25T | 5 Sec. | 20×70×26 |
| ULF-160 | 300～2000 | 50Ω | 17dB (Max.) at fc/10 | 0.5dB (Max.) at fc/10 | SMAJ | 1W | | | 5 Sec. | 20×50×26 |
| ULF-171 | 2000～3000 | 50Ω | 15dB (Max.) at fc/10 | 0.5dB (Max.) at fc/10 | SMAJ | 1W | 3±0.5 at fc<br>14±2 at fc×2<br>28.5±3 at fc×3 | ±0.15T at fc/10～fc ⊿T2±0.3T | 5 Sec. | 16×36×26 |
| SLF-153 | 3000～5000 | 50Ω | 15dB (Max.) at fc/10 | 0.5dB (Max.) at fc/10 | SMAJ | 1W | | | 5 Sec. | 16×36×26 |

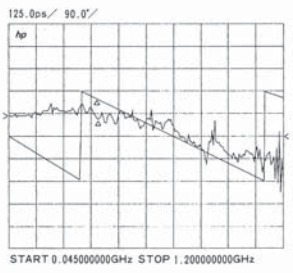
T=fc/10 under groupdelay(estimate) ⊿T2=fc/10-2fc under groupdelay(estimate).

## Frequency Characterictics

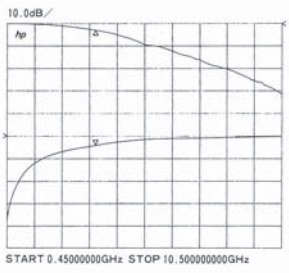
ULF-160(fc＝400MHz)



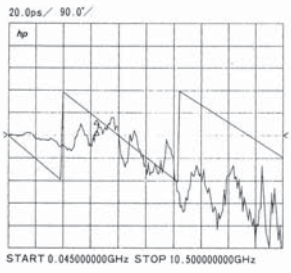

ULF-160 (fc＝400MHz)




SLF-153 (fc＝3500MHz)

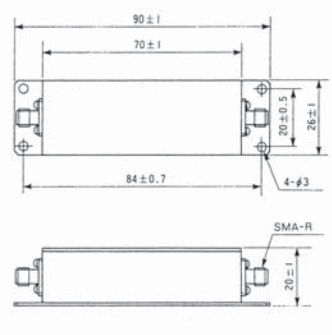



SLF-153 (fc＝3500MHz)

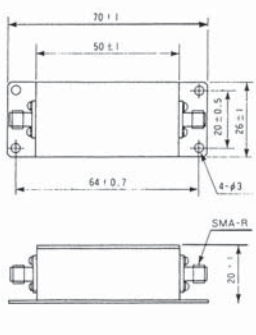



## Outline Drawings

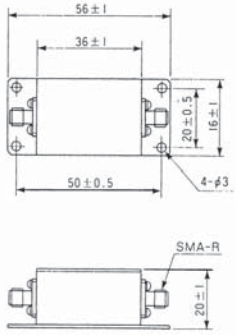
VLF-140



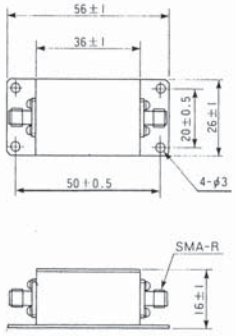

ULF-160




ULF-171

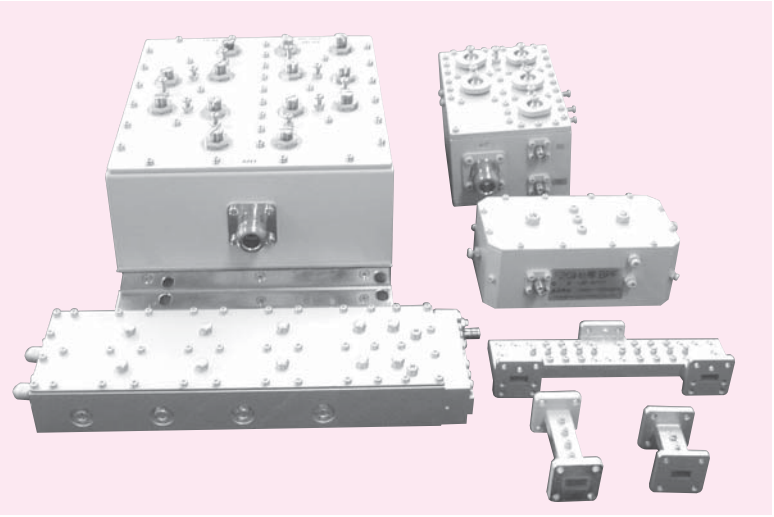



SLF-153




TAMAGAWA ELECTRONICS CO.,LTD.
3-11-23, Kamituchidana-naka,Ayase City,Kanagawa, 252-1113 Japan Tel.81-467-76-2291 FAX.81-467-70-4390

# ANTENNA DUPLEXER · BPF Series



## Product features and applications

A variety of band-pass filters are available for 400 MHz, 5 GHz and 26 GHz frequency ranges. Also, the duplexer DIP series supports a broad range of bandwidth including the 800 MHz, 1.GHz, 2.0 GHz, 5.0 GHz, 18 GHz and 26 GHz bands. It is suitable for various wireless devices. Especially, a special dielectric duplexer is ideal for an antenna duplexer in a small base station.

Customized specifications are available upon request. Please contact our sales department.

## Band pass filter specifications

| | Models | Pass Band (MHz) | Insertion Loss (dB Max.) | Attenuation (dB) | VSWR (Max.) | Impedance (Ω) | Power (W) (Max.) | Connectors | Dimensions (mm) W×D×H |
|---|---|---|---|---|---|---|---|---|---|
| NEW | UBF-1477 | Any 6MHz at 470～770 | 2.0 | 26dB(Min.) at f0±9.75MHz | 1.5 | 75 | 0.1 | C-15 | 170×103×34 |
| NEW | UBF-1532 | Any 24～96MHz at 470～770 | 1.5 | 20dB(Min.) at6MHz | 1.2 | 50 | 10 | TNC-J | 480×250×49 |
| NEW | SBF-513 | Any 6MHz at 5800～7200 | 1.5 | 50dB(Min.) at f0±70MHz | 1.3 | 50 | 5 | SMA-J | 134×28×22 |
| NEW | SBF-495 | Any 6MHz at 6745～6785 | 2.0 | 50dB(Min.) at f0～140MHz | 1.3 | 50 | 1 | SMA-J | 150×26×18.5 |
| NEW | SBF-468 | Any 6MHz at 10556.5～10673.5 | 2.0 | 70dB(Min.) at f0～150MHz | 1.3 | 50 | 0.1 | SMA-J | 110×25×14.5 |
| NEW | SBF-478 | Any 6MHz at 12960.5～13239.5 | 2.0 | 70dB(Min.) at f0～150MHz | 1.3 | 50 | 0.1 | SMA-J | 110×25×14.5 |
| NEW | KBF-145 | Any 6MHz at 25300～26095 | 0.7 | 15dB(Min.) at f0±1000MHz | 1.5 | 50 | 1 | FUBR-260 フランジ | 25×22×22 |

## Antenna duplexer specifications

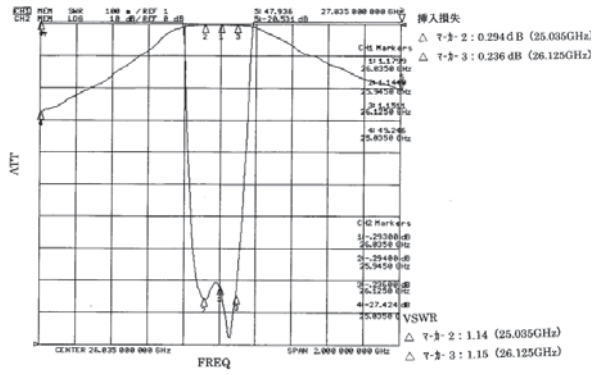
| | Models | Transmitted Frequency (TX) (MHz) | Recieved Frequency (RX) (MHz) | Impedance (Ω) | TX-RX Interval (MHz) | Insertion Loss dB (Max.) | VSWR (Max.) | TX-RX Isolastion (dB) | Power (W) (Max.) | Connectors | Dimensions (mm) W×D×H |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NEW | DIP-535 | 860～870 | 915～925 | 50 | 45 | 1.0 | 1.2 | 80(Min.) | TX 60 | SMA-J | 150×98×87 |
| NEW | DIP-536 | 870～885 | 925～948/ 956～960 | 50 | 40 | 1.2 | 1.2 | 80(Min.) | TX 20 RX 1 | SMA-J | 240×51×87 |
| NEW | DIP-520 | 810～830 | 940～960 | 50 | 110 | 2.0 | 1.3 | 70(Min.) | TX 5 | SMA-J | 120×80×45 |
| | DIP-276 | 1443～1453 | 1491～1501 | 50 | 38 | 2.0 | 1.3 | 80(Min.) | 10 | SMA-J | 214×50×60 |
| NEW | DIP-531 | 1429～1501 | 1920～2170 | 50 | 419 | 0.5 | 1.2 | 60(Min.) | 160 | N-J | 205×65×52 |
| NEW | DIP-528 | 1840～1865 | 1745～1770 | 50 | 70 | 1.5 | 1.3 | 60(Min.) | 1 | SMA-J | 149×42×51.5 |
| NEW | DIP-465-2 | 2110～2170 | 1920～1980 | 50 | 130 | 1.0 | 1.3 | 60(Min.) | 30 | SMA-J | 149×42×47 |
| NEW | DIP-540 | 5791～5809 | 5831～5849 | 50 | 22 | 2.0 | 1.3 | 45(Min.) | 1 | SMA-J | 137×48×19 |
| NEW | DIP-537 | 18090±120 | 19340±120 | 50 | 1010 | 1.2 | 1.5 | 50(Min.) | 1 | SMA-J | 73×17×17 |
| NEW | DIP-538 | 19340±120 | 18090±120 | 50 | 1010 | 1.2 | 1.5 | 50(Min.) | 1 | WR-42 | 73×52×29 |
| NEW | DIP-539 | 26125～26305 | 25270～25450 | 50 | 1035 | 1.5 | 1.5 | 55(Min.) | 1 | UG-595 | 114×31×22.4 |

## The special small directic resonater of Duplexer series

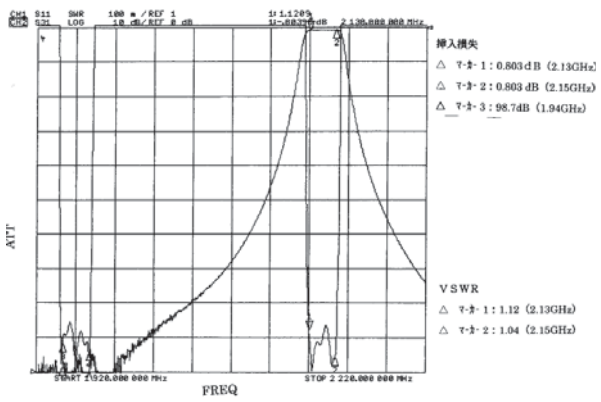
| | Models | Transmitted Frequency (MHz) | Recieved Frequency (MHz) | Impedance (Ω) | TX-RX Interval (MHz) | Insertion Loss (dB Max.) | VSWR (Max.) | TX-RX Isolastion (dB) | Power (W) (Max.) | Connectors | Dimensions (mm) W×D×H |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NEW | DIP-510 | 2130～2150 | 1940～1960 | 50 | 170 | 1.0 | 1.3 | 80(Min.) | 10 | ANT:N-J, TRX:SMA-J | 105×72×70 |
| NEW | DIP-541 | 2130～2150 | 1940～1960 | 50 | 170 | 1.0 | 1.3 | 80(Min.) | 10 | SMA-J | 200×60×25.5 |

## ■ Frequency Characteristics

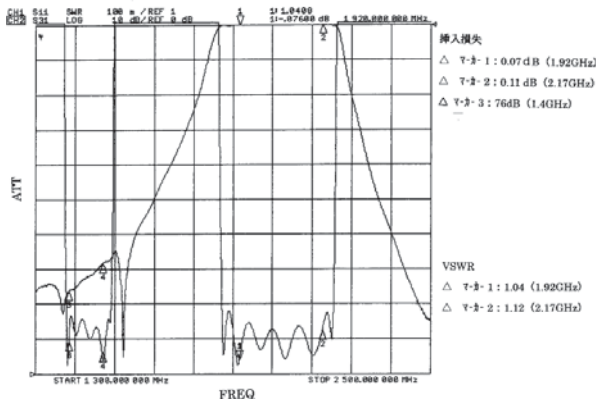
KBF-145



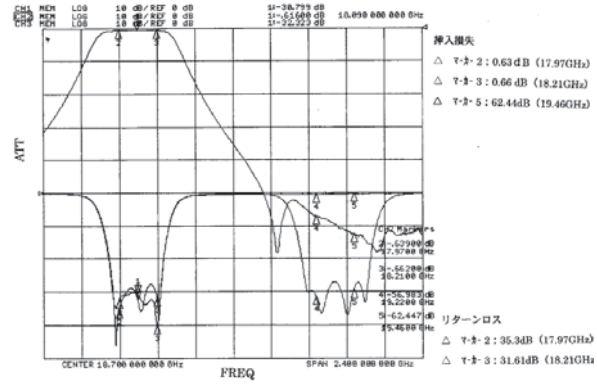

DIP-510




DIP-531

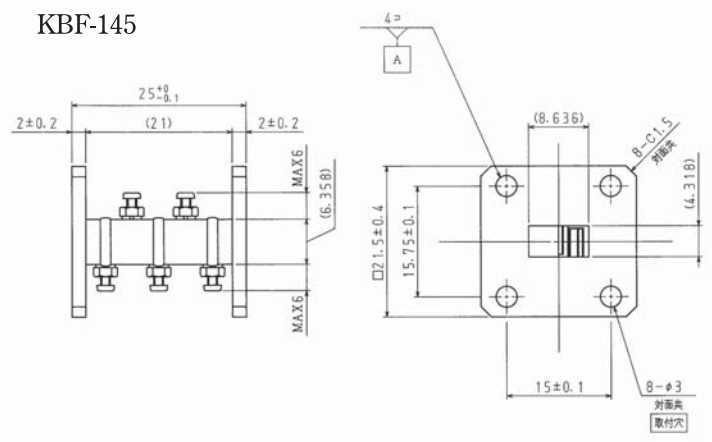



DIP-537

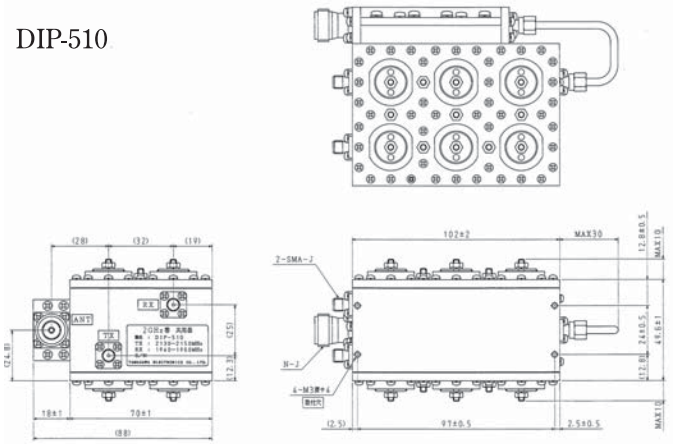



## ■ Outline Drawings

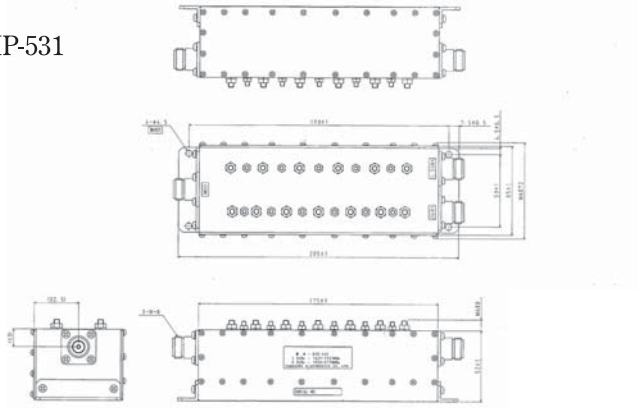
KBF-145



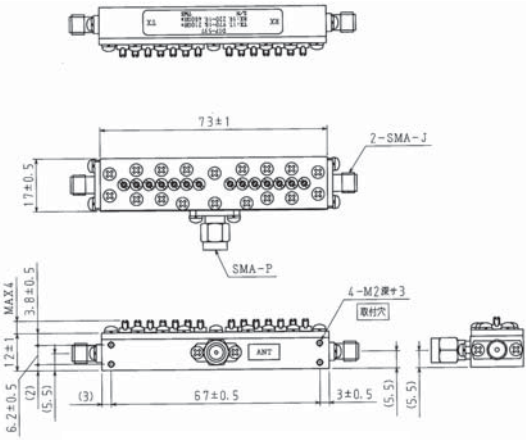

DIP-510




DIP-531

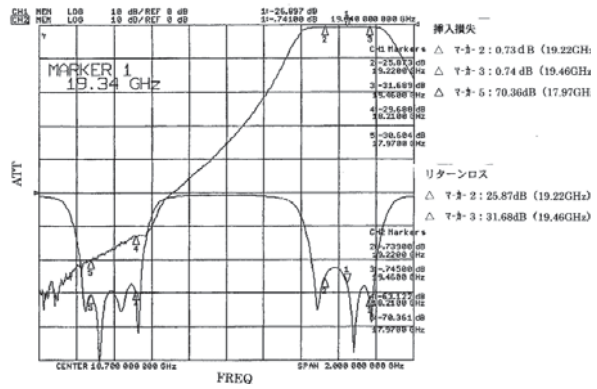


DIP-537

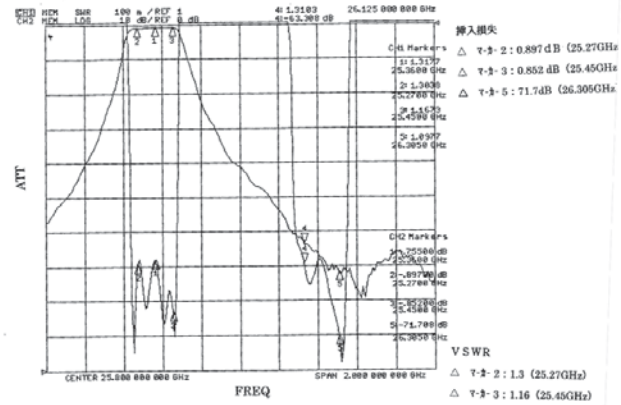


## Frequency Characterictics

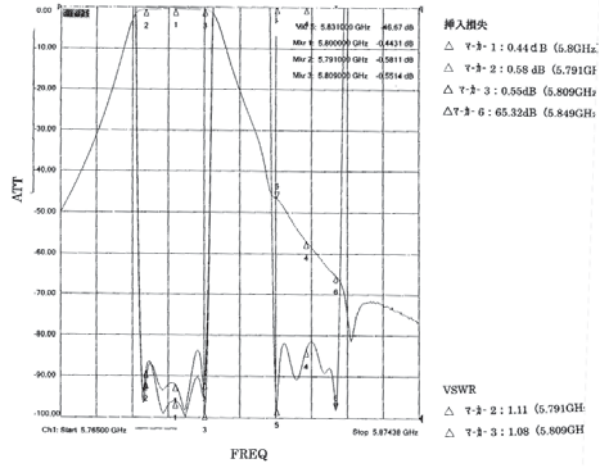
DIP-538



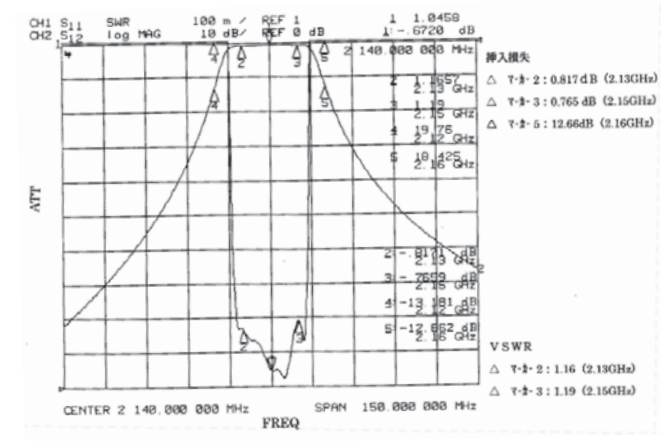

DIP-539




DIP-540

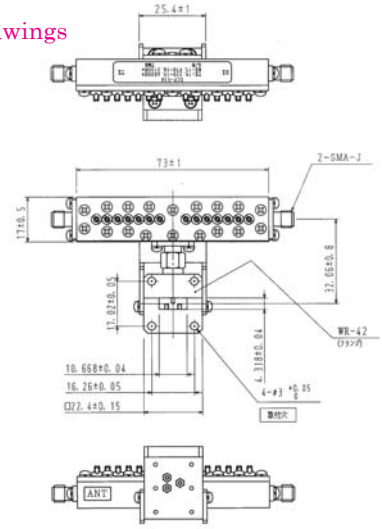



DIP-541

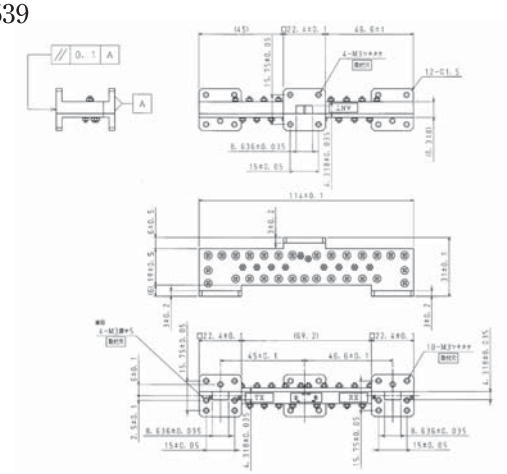



## Outline Drawings

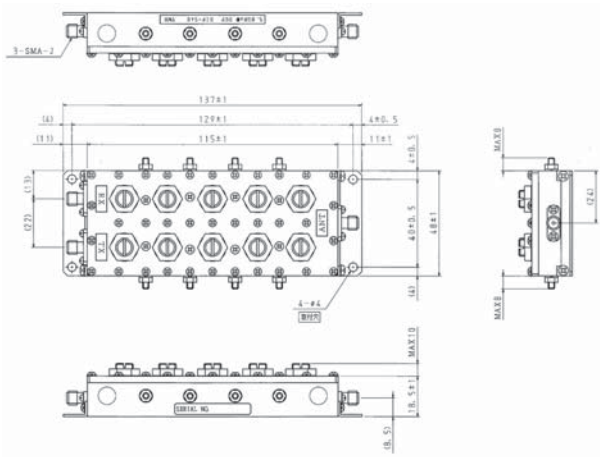
DIP-538



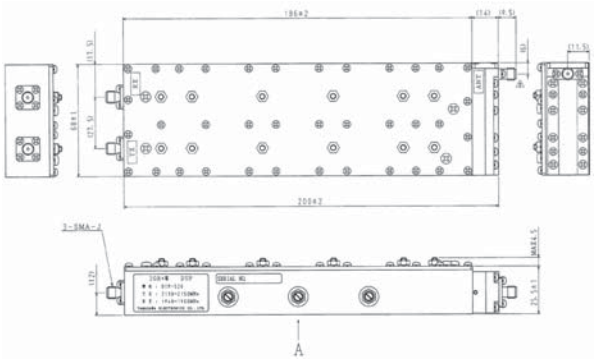

DIP-539



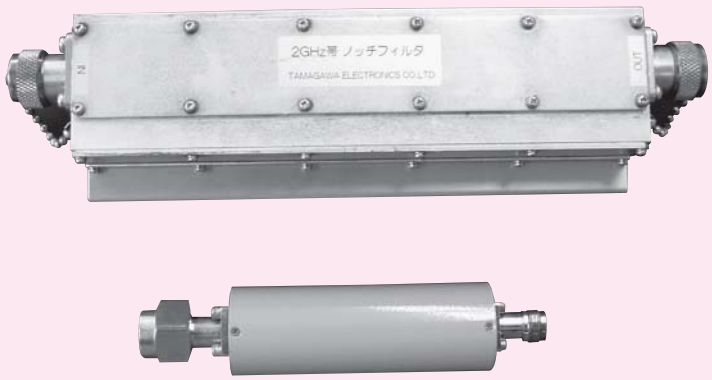
DIP-540




DIP-541



# URF Series




## Product features and applications

The band limitation filter URF series are notch filters to attenuate particular unwanted frequencies.

It can be used to reduce unnecessary or particular spurious waves. Both PHS and 2 GHz band enabled products are available.

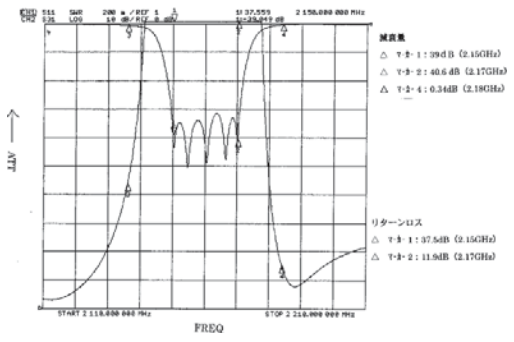
Customized specifications are available upon request. Contact our sales department.

## Standard Specifications

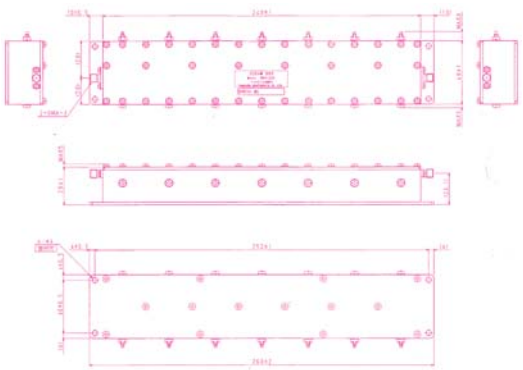
| | Models | Pass Band (MHz) | Insertion Loss (dB Max.) | Attenuation at attenuation range (dB) | VSWR (Max.) | Impedance (Ω) | Power (Max.) (W) | Connectors | Dimensions (mm) W×H×D |
|---|---|---|---|---|---|---|---|---|---|
| NEW | URF-172 | 1884.5～1919.6 | 0.7 | 20dB (Max.) at 2110～2170MHz | 1.5 | 50 | 10 | N-P:N-J | 137.5×Φ30 |
| NEW | URF-221 | 1～1900、2000～2350 | 4.0 | 20dB (Max.) at 1920～1980MHz | 2.0 | 50 | 10 | SMA-J | 176.8×62×65 |
| NEW | URF-222 | 1～2090、2190～2500 | 4.0 | 30dB (Max.) at 2110～2170MHz | 2.0 | 50 | 10 | SMA-J | 176.8×62×65 |
| NEW | URF-220 | 1～2120、2160～4000 | 4.0 | 30dB (Max.) at 2130～2150MHz | 2.0 | 50 | 10 | SMA-J | 260×61×33 |

## Frequency Characterictic

URF-221

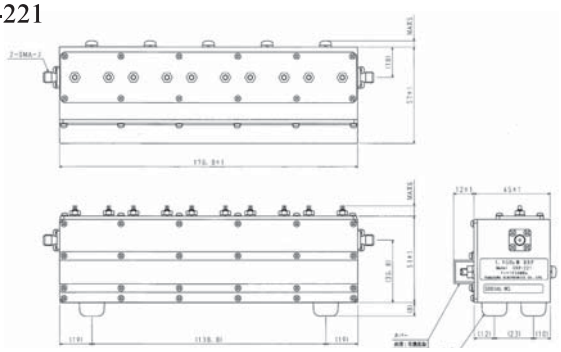



URF-220

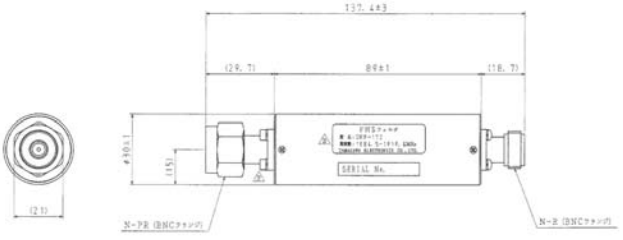


## Outline Drawings

URF-221

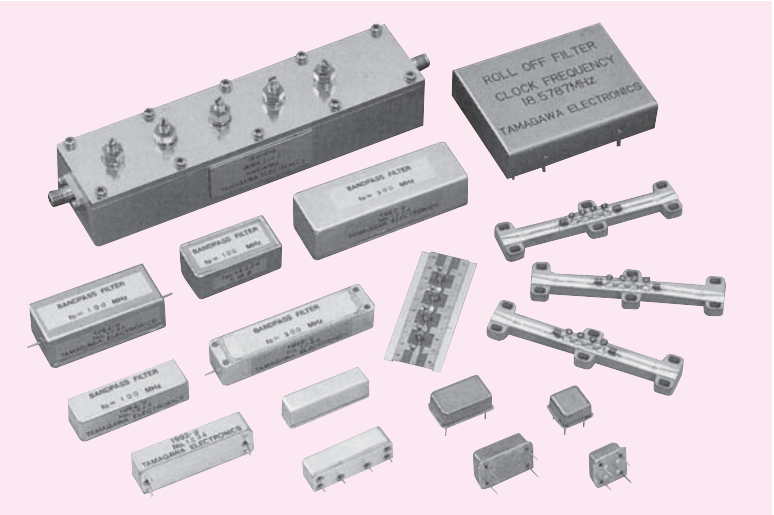


URF-172



TAMAGAWA ELECTRONICS CO.,LTD.
3-11-23, Kamituchidana-naka,Ayase City,Kanagawa, 252-1113 Japan Tel.81-467-76-2291 FAX.81-467-70-4390

# MINIATURE FILTER Series




## Product features and applications

This frequency filter is intended for high-performance printed circuit boards (PCB). The compact and lightweight design is suitable for miniaturized devices.

This series includes two models: one is a radial pin type to be inserted into a PCB, and the other is an axial pin type to be mounted on a board surface. Each model consists of low, high and band-pass types including a flat phase type individually.

You can select the shape and dimensions according to your specifications. Please contact us if you wish to customize the shape and

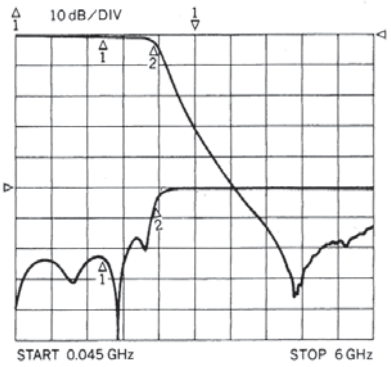
## Standard Specifications

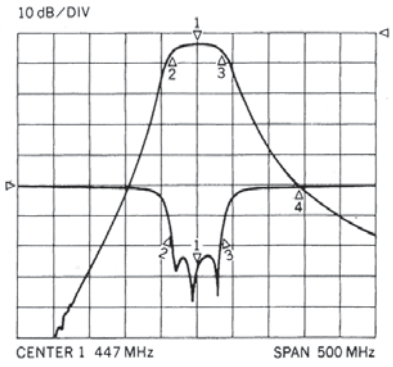
| | Pass Band fp·f0 (MHz) | Impedance | VSWR (Max.) | Insertion Loss (Max.) | 3dB Bandwidth (Min.) | Power (Max.) | Attenuation | Gurantted att.range | Circuit Type | Standard Combining Pole | Dimensions |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Low Pass Filter | 30～3000 | 50Ω Max.2GHz at 75Ω | 1.3 | 1.5dB | — | 1W | According To Specifications | fp × 5 | Butterworth Type Tchebyscheff Type Bessel Type | N=9 | Attachment PG1～8 |
| High Pass Filter | 30～3000 | 50Ω 75Ω | 1.5 | 1.5dB | — | 1W | According To Specifications | fp × 3 | Butterworth Type Tchebyscheff Type Bessel Type | N=9 | Attachment PG1～8 |
| Low Pass Filter | 30～3000 | 50Ω 75Ω | 1.3 | According To Specifications | 3% | 1W | According To Specifications | f0 × 5 | Butterworth Type Tchebyscheff Type C-Couplong Bessel Type | N=5 | Attachment PG1～8 |

## Standard Specifications

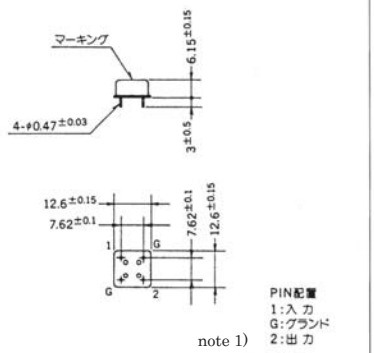
| | Pass Band fp・f0 (MHz) | Impedance | VSWR (Max.) | Insertion Loss (Max.) | 3dB Bandwidth (Min.) | Power (Max.) | Attenuation | Gurantted att.range | Circuit Type | Standard Combining Pole | Dimensions |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Low Pass Filter | 30～3000 | 50Ω Max.2GHz at 75Ω | 1.3 | 1.5dB | — | 1W | According To Specifications | fp × 5 | Butterworth Type Tchebyscheff Type Bessel Type | N=9 | Attachment PG20～23 |
| High Pass Filter | 30～2000 | 50Ω 75Ω | 1.5 | 1.5dB | — | 1W | According To Specifications | fp × 3 | Butterworth Type Tchebyscheff Type Bessel Type | N=9 | Attachment PG20～23 |
| Low Pass Filter | 30～2000 | 50Ω 75Ω | 1.3 | According To Specifications | 3% | 1W | According To Specifications | f0 × 5 | Butterworth Type Tchebyscheff Type C-Couplong Bessel Type | N=5 | Attachment PG20～23 |

## Frequency Characteristics



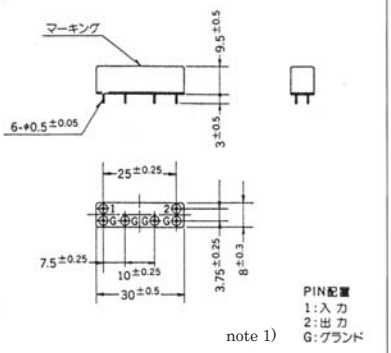



PG1



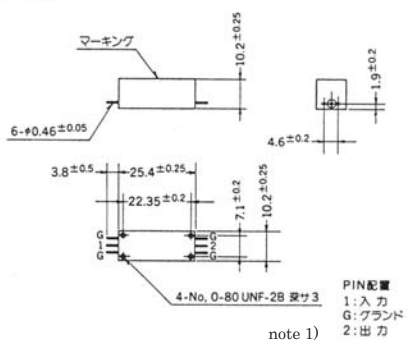

note 1)

PG5



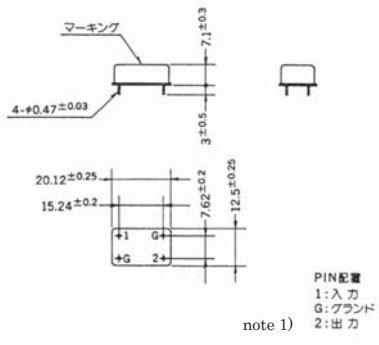

note 1)

PG20



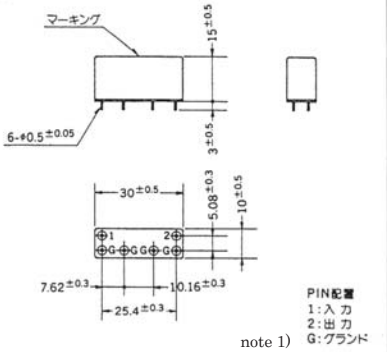

note 1)

PG2



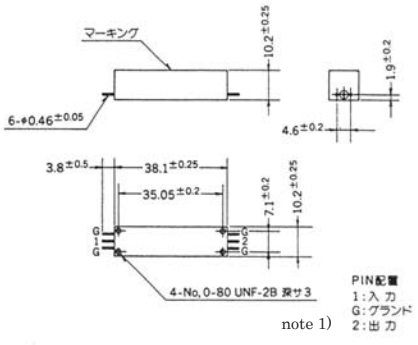

note 1)

PG6



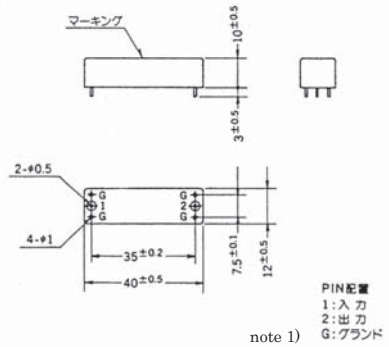

note 1)

PG21



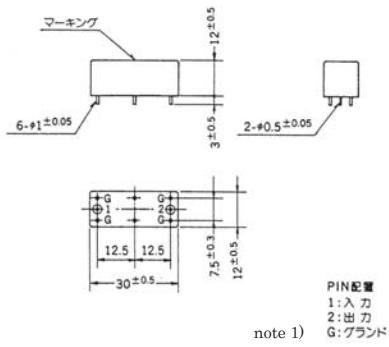

note 1)

PG3



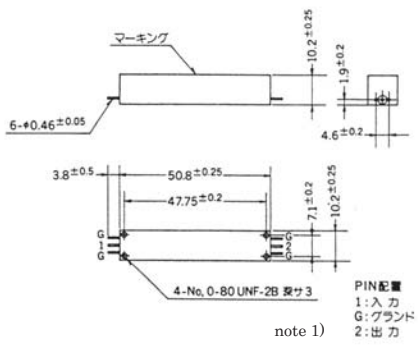

note 1)

PG7



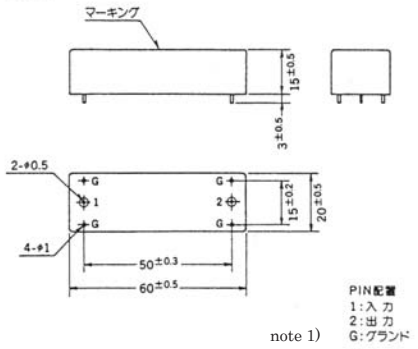

note 1)

PG22



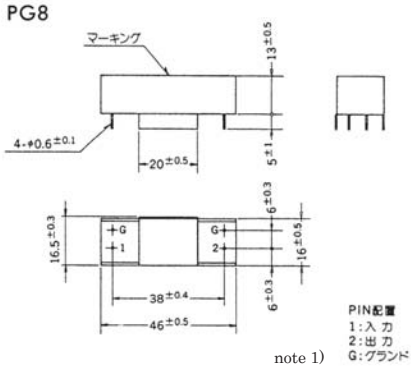

note 1)

PG4



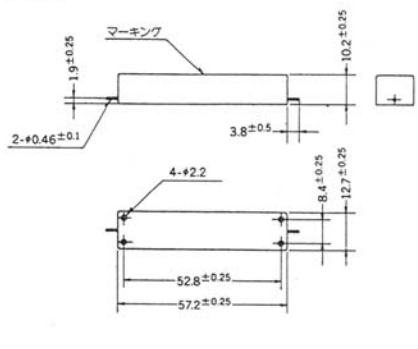

note 1)

PG8




note 1)

PG23




note 1)
1: Input
2: Output
G: Ground