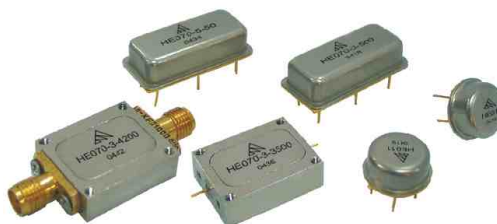


Features

- Hermetic or small case package
- Thin-Thick film construction
- Can be cascaded as multiplier
- Operating temperature: $-55^{\circ}\text{C} \sim +85^{\circ}\text{C}$



Ordering Information

| Model | Description | Package | |
|--------------|----------------------|--------------------------|---|
| HE011 | Broadband doubler | Hermetic TO-8A package | |
| HE011H | Broadband doubler | Removable SMA connectors | |
| HE070-3-xxx | Miniature Tripler | Hermetic DIP-18B package | **** Indicates the center frequency of Input signal |
| HE070H-3-xxx | Tripler | Removable SMA connectors | |
| HE070-5-xxx | Miniature Quintapler | Hermetic DIP-18B package | |

Specifications ($P_{in}=+13\text{dBm}$, Harmonic suppression $>45\text{dB}$, $T_A=25^{\circ}\text{C}$)

| Model | Input Frequency Range (MHz) | Relative Bandwidth | Frequency Output | Conversion Loss (dB) | | Power Level (dBm) | Harmonic Suppression ¹⁾ (dB) | | | |
|----------|-------------------------------|--------------------|-------------------------|------------------------|------|---------------------|---|--------|-------------------|--------|
| | | | | Max | Typ | | Min | | Typ ⁵⁾ | |
| HE011 | 10~1000 | - | $2f_{in}$ ⁴⁾ | 13.0 | 12.0 | 10~14 | 20(F1) | 20(F3) | 25(F1) | 25(F3) |
| | 1000~1500 | | | 14.0 | 13.0 | | 17(F1) | 17(F3) | 20(F1) | 20(F3) |
| HE011H | 2000~6000 | | | 11.0 | 9.0 | | 20(F1) | 20(F3) | 30(F1) | 30(F3) |
| HE070-3 | 20~100 | 10% ²⁾ | $3f_{in}$ | 17.0 | 14.0 | 11~15 | 20(F2) | 20(F4) | 40(F2) | 40(F4) |
| | 100~500 | | | | 12.0 | | | | 35(F2) | 40(F4) |
| | 500~1500 | | | | 14.0 | | | | 12~15 | 30(F2) |
| HE070H-3 | 1200~4200 | 10% ²⁾ | $3f_{in}$ | 17.0 | 14.0 | 12~15 | 17(F2) | 17(F4) | 25(F2) | 30(F4) |
| HE070-5 | 20~100 | 6% ³⁾ | $5f_{in}$ | 28.0 | 24.0 | 11~15 | 20(F4) | 20(F6) | 40(F4) | 40(F6) |
| | 100~400 | | | | 21.0 | | | | 35(F4) | 40(F6) |

1) F1 is input at frequency F1 $F_n(n=2, 3, \dots)$ is harmonic output ($n \times F1$)

2) HE070-3, HE070H-3 Custom relative bandwidth is available up to 20% while deteriorating loss 2~4 dB

3) HE070-5 Custom relative bandwidth is available up to 12% while deteriorating loss 2~4 dB

4) Harmonic rejection is subject to the harmonic outputs. The typical suppression was Taken at the condition that harmonic rejection $>45\text{dB}$

Absolute Maximum Ratings

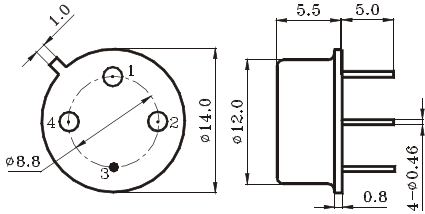
Input power : 200mW

Storage Temp: + 125 $^{\circ}\text{C}$

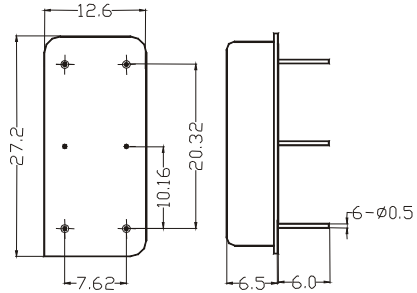
Daubler Tripler Quintapler

BOWEI

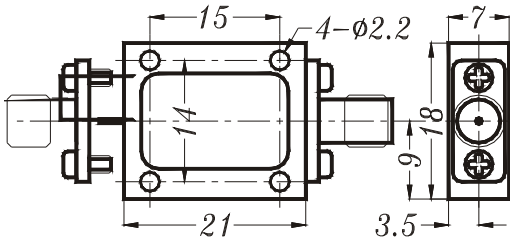
Outline Drawings



TO-8A



DIP-18B



HE070H

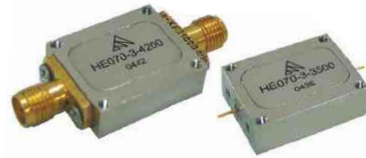
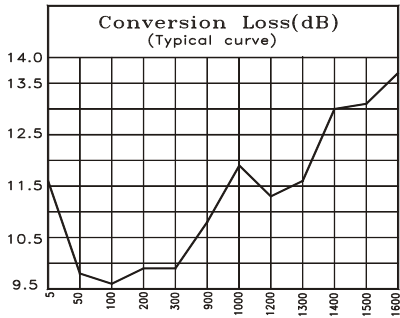


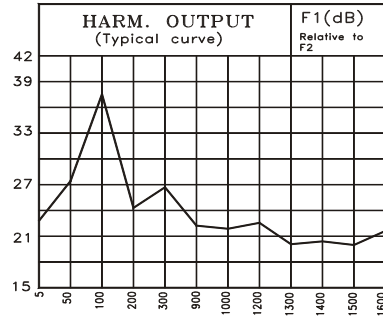
Photo of HE070H

Typical Performance-1 ($P_{in}=+13dBm$, $t_{farnuonic}$ suppression $>45dB$, $T_A=25^\circ C$)

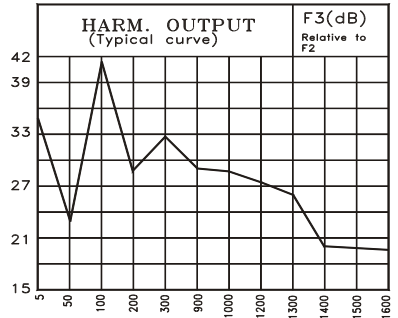
Conversion loss vs. Input Frequency(HE011)



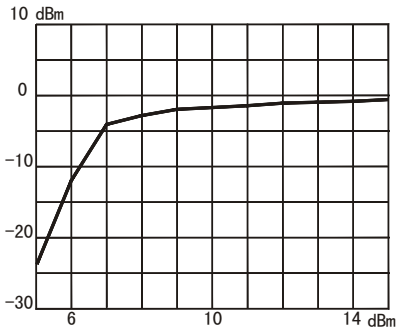
F1 rejection Vs. Input Frequency(HE011)



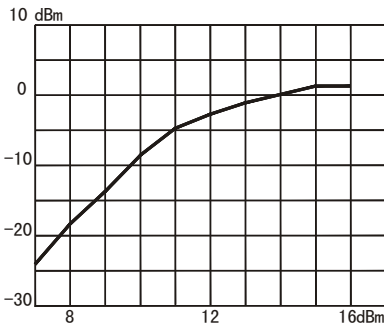
F3 rejection Vs. Input Frequency(HE011)



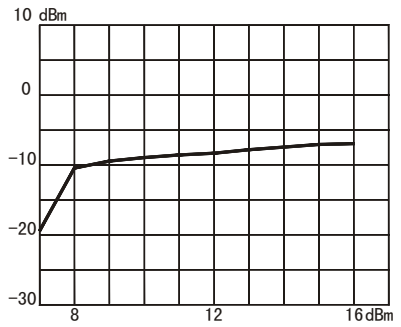
Input power vs. Output Power (HE070-3-100)



Input power vs. Output Power(HE070-3-500)



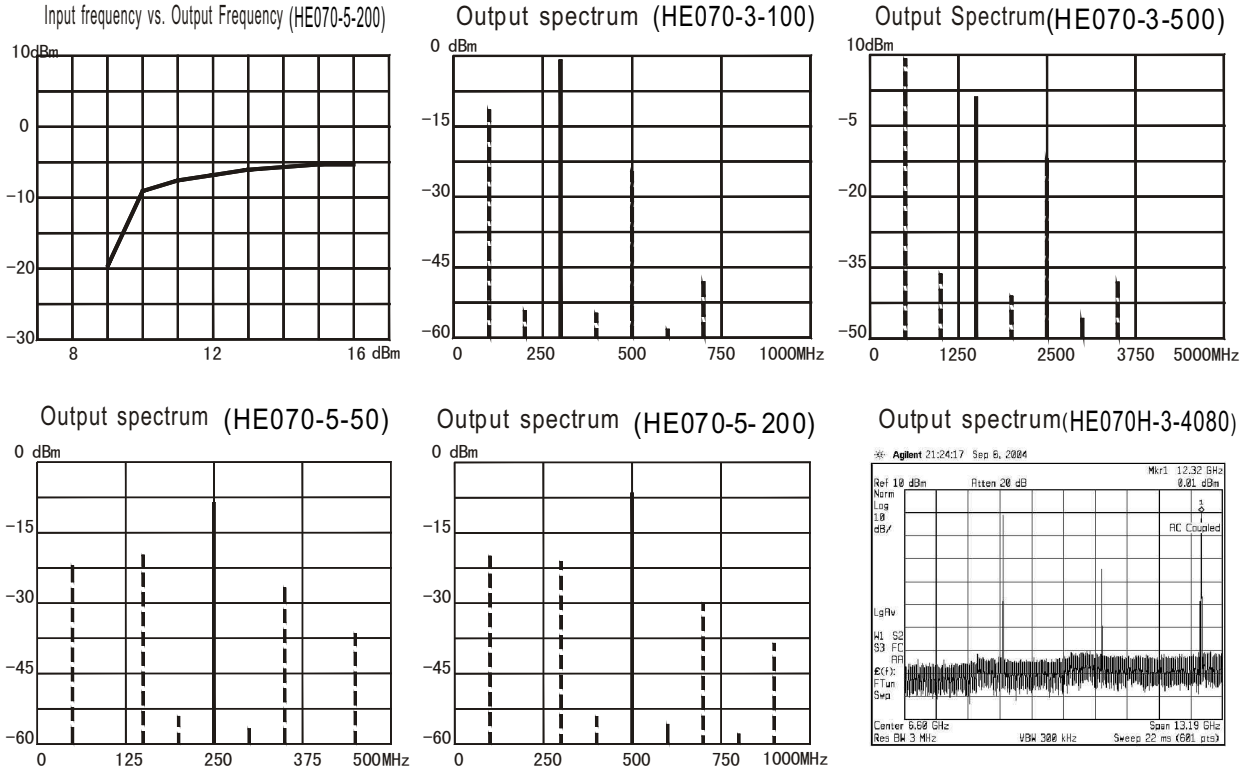
Input power vs. Output Power (HE070-5-50)



Daubler Tripler Quintapler

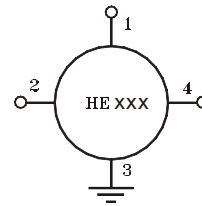
BOWEI

Typical Performance-2 ($P_{in}=+13dBm$, Harmonic suppression $>45dB$, $T_A=25^{\circ}C$)



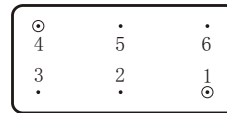
Application Notes :

- 1.Functional diagram shown as right.The package should be place as close to PCB as possible.
- 2.There is no internal decoupling capacitor on the input output ports. Decoupling capacitor(1000PF) is required if necessary.
- 3.2~4dB attenuator is recommed when HE070 series is connected to filter or other resonance circait.
- 4.Castom SMA connecteder doubler is available. Input frequency up to 8GHz.
- 5.Please contact the factory for custom multiplers module Integrated with amplifier, filter and doubler.



- 1.N/C or GND
- 2.RF Input
- 3.GND
- 4.RF Output

HE070



- 1.RF Input
- 4.RF Output
- 2,3,5,6. GND