

# FREQUENCY MIXERS

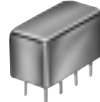
Plug-In

## LEVEL 13 25 kHz to 7 GHz

+13 dBm LO, up to +9 dBm RF



ROK



SBL / SIMA / SRA



TFM / TUF

| MODEL NO.    | FREQUENCY MHz                           |         | CONVERSION LOSS dB |          |      |                  | LO-RF ISOLATION, dB |           |      |      |      |      | LO-IF ISOLATION, dB |           |      |      |    |    | CASE STYLE | CONNECTION | PRICE \$   |
|--------------|-----------------------------------------|---------|--------------------|----------|------|------------------|---------------------|-----------|------|------|------|------|---------------------|-----------|------|------|----|----|------------|------------|------------|
|              | LO/RF<br>f <sub>L</sub> -f <sub>U</sub> | IF      | Mid-Band m         |          |      | Total Range Max. | L                   |           | M    |      | U    |      | L                   |           | M    |      | U  |    | Note B     |            | Qty. (1-9) |
|              |                                         |         | $\bar{x}$          | $\sigma$ | Max. |                  | Typ.                | Min.      | Typ. | Min. | Typ. | Min. | Typ.                | Min.      | Typ. | Min. |    |    |            |            |            |
| ROK-186MH    | 5-2500                                  | 10-1000 | 6.57               | .11      | 8.5  | 9.5              | 33                  | 25        | 35   | 25   | 25   | 20   | 33                  | 20        | 31   | 25   | 27 | 20 | QQ96       | v          | 47.95      |
| ❑ SBL-1MH    | 1-500                                   | DC-500  | 5.73               | .08      | 7.5  | 8.5              | 50                  | 35        | 45   | 30   | 35   | 25   | 45                  | 30        | 40   | 25   | 30 | 20 | A06        | d          | 11.45      |
| ❑ SBL-12MH   | 2-1100                                  | DC-500  | 6.63               | .10      | 8.0  | 9.0              | 50                  | 40        | 40   | 30   | 30   | 20   | 40                  | 30        | 25   | 20   | 25 | 15 | A06        | s          | 13.45      |
| SRA-1MH      | .5-500                                  | DC-500  | 5.65               | .04      | 7.0  | 8.5              | 50                  | 45        | 45   | 30   | 35   | 25   | 45                  | 35        | 40   | 25   | 30 | 20 | A01        | e          | 15.95      |
| SRA-3MH      | .025-200                                | DC-200  | 4.77               | .07      | 7.5  | 8.5              | 60                  | 50        | 45   | 35   | 35   | 25   | 45                  | 35        | 40   | 30   | 30 | 20 | A01        | e          | 18.95      |
| SRA-2010MH   | 10-2000                                 | DC-600  | 7.50               | .20      | 8.5  | 9.8              | 50                  | 45        | 45   | 30   | 40   | 25   | 45                  | 45        | 35   | 30   | 35 | 20 | A06        | m          | 40.95      |
| TFM-1MH      | 2-500                                   | DC-500  | 5.80               | .05      | 7.5  | 8.5              | 50                  | 45        | 40   | 30   | 30   | 20   | 45                  | 40        | 35   | 25   | 25 | 20 | B02        | z          | 26.95      |
| TFM-3MH      | 1-250                                   | DC-250  | 4.79               | .23      | 7.0  | 8.5              | 50                  | 45        | 40   | 30   | 28   | 23   | 45                  | 40        | 35   | 25   | 26 | 20 | B02        | z          | 26.95      |
| TFM-12MH     | 0.5-2000                                | 0.2-600 | 6.99               | .16      | 8.0  | 9.5              | 60                  | 45        | 35   | 30   | 30   | 25   | 55                  | 40        | 30   | 25   | 25 | 20 | B13        | z          | 48.95      |
| TFM-42MH     | 10-4200                                 | 10-1000 | 7.46               | .12      | 8.5  | 11               | 35                  | 25        | 40   | 25   | 35   | 25   | 35                  | 20        | 35   | 25   | 27 | 20 | B13        | aa         | 69.95      |
| ❑ TUF-1MH    | 2-600                                   | DC-600  | 6.3                | .12      | 7.0  | 8.0              | 68                  | 50        | 50   | 30   | 43   | 25   | 65                  | 45        | 48   | 30   | 37 | 22 | B02        | z          | 8.25       |
| ❑ TUF-2MH*   | 50-1000                                 | DC-1000 | 6.0                | .25      | 7.5  | 9.0              | 58                  | 40        | 47   | 30   | 37   | 25   | 55                  | 35        | 47   | 20   | 32 | 18 | B02        | z          | 9.20       |
| ❑ TUF-3MH    | 0.15-400                                | DC-400  | 5.0                | .33      | 7.0  | 8.0              | 60                  | 50        | 46   | 30   | 35   | 25   | 60                  | 40        | 42   | 25   | 35 | 20 | B02        | z          | 10.20      |
| ❑ TUF-5MH    | 20-1500                                 | DC-1000 | 7.0                | .25      | 8.5  | 9.0              | 50                  | 40        | 41   | 30   | 35   | 25   | 38                  | 25        | 28   | 18   | 20 | 8  | B02        | z          | 13.45      |
| ❑ TUF-11AMH  | 1400-1900                               | 40-500  | 7.4                | .20      | 8.6  | 8.6              | 33 (Typ.)           | 20 (Min.) |      |      |      |      | 24 (Typ.)           | 15 (Min.) |      |      |    |    | B02        | z          | 21.95      |
| ❑ TUF-2500MH | 400-2500                                | 30-800  | 7.3                | .15      | 8.5  | 10.0             | 32 (Typ.)           | 24 (Min.) |      |      |      |      | 27 (Typ.)           | 17 (Min.) |      |      |    |    | B02        | z          | 26.95      |

L = low range [ $f_L$  to  $10 f_L$ ]

M = mid range [ $10 f_L$  to  $f_U/2$ ]  
m = mid band [ $2f_L$  to  $f_U/2$ ]

U = upper range [ $f_U/2$  to  $f_U$ ]

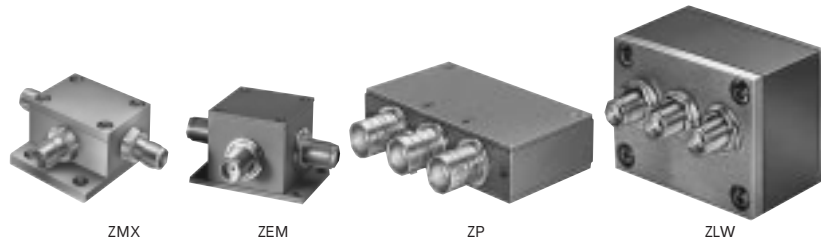
### NOTES:

- $\bar{x}$  Average of conversion loss at center of mid-band frequency ( $f_L + f_U/4$ )
- $\sigma$  Standard deviation
- Non-hermetic
- \* L=50-100 MHz; M=100-500 MHz
- A. General Quality Control Procedures, Environmental Specifications, Hi-Rel and MIL description are given in General Information (Section 0).
- B. Connector types and case mounted options, case finishes are given in section 0, see "Case Styles & Outline Drawings".
- C. Prices and Specifications subject to change without notice.
- 1. Absolute maximum power, voltage and current ratings:
  - 1a. RF power 200mW; 1b. Peak IF current, 40mA

### NSN GUIDE

| MCL NO.   | NSN              |
|-----------|------------------|
| ROK-186MH | 5895-01-392-2276 |
| SRA-1MH   | 5895-01-391-0113 |
| TFM-3MH   | 5895-01-302-7047 |
| TFM-42MH  | 5895-01-408-6093 |

## Coaxial



+13 dBm LO, up to +9 dBm RF

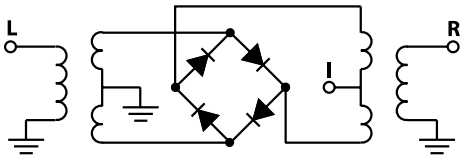
| MODEL NO.  | FREQUENCY MHz                           |         | CONVERSION LOSS dB |     |      |             | LO-RF ISOLATION, dB |    |           |                    | LO-IF ISOLATION, dB |    |           |           | CASE STYLE | CONNECTION | PRICE \$ |      |      |       |        |
|------------|-----------------------------------------|---------|--------------------|-----|------|-------------|---------------------|----|-----------|--------------------|---------------------|----|-----------|-----------|------------|------------|----------|------|------|-------|--------|
|            | LO/RF<br>f <sub>L</sub> -f <sub>U</sub> | IF      | Mid-Band           |     |      | Total Range | L                   | M  | U         | L                  | M                   | U  |           |           |            |            |          |      |      |       |        |
|            |                                         |         | m                  | σ   | Max. |             |                     |    |           |                    |                     |    |           |           |            |            |          |      |      |       |        |
|            |                                         |         |                    |     |      |             |                     |    |           |                    |                     |    | $\bar{x}$ | σ         |            |            |          | Max. |      |       |        |
| ZMX-7GMH   | 3700-7000                               | DC-2000 | 4.7                | .20 | —    | 8.0         | 37 (Typ.) 20 (Min.) |    |           | 17 (Typ.) 8 (Min.) |                     |    | BU413     | ad        | 74.95      |            |          |      |      |       |        |
| ZEM-4300MH | 300-4300                                | DC-1000 | 6.42               | .15 | —    | 8.5         | 40                  | 20 | —         | —                  | 40                  | 20 | 14        | 7         | —          | 12         | 7        | V37  | af   | 89.95 |        |
| ZEM-M2TMH  | 10-2400                                 | 10-1000 | 6.9                | .10 | 9.0  | 9.5         | 49                  | 40 | 43        | 35                 | 42                  | 35 | 49        | 40        | 44         | 30         | 40       | 30   | V37  | hq    | 114.95 |
| ZP-1MH     | 2-600                                   | DC-600  | 6.3                | .12 | 7.0  | 8.0         | 68                  | 50 | 50        | 30                 | 43                  | 25 | 65        | 45        | 48         | 30         | 37       | 22   | GG60 | ag    | 43.95  |
| ZP-2MH*    | 50-1000                                 | DC-1000 | 6.0                | .25 | 7.5  | 9.0         | 58                  | 40 | 47        | 30                 | 37                  | 25 | 55        | 35        | 47         | 20         | 32       | 18   | GG60 | ag    | 43.95  |
| ZP-3MH     | 0.15-400                                | DC-400  | 5.0                | .33 | 7.0  | 8.0         | 60                  | 50 | 46        | 30                 | 35                  | 25 | 60        | 40        | 42         | 25         | 35       | 20   | GG60 | ag    | 43.95  |
| ZP-5MH     | 20-1500                                 | DC-1000 | 7.0                | .25 | 8.5  | 9.0         | 50                  | 40 | 41        | 30                 | 35                  | 25 | 38        | 25        | 28         | 18         | 20       | 8    | GG60 | ag    | 47.95  |
| ZP-11AMH   | 1400-1900                               | 40-500  | 7.4                | .20 | 8.6  | 8.6         | 33 (Typ.)           |    | 20 (Min.) |                    |                     |    |           | 24 (Typ.) |            | 15 (Min.)  |          | GG60 |      | ag    | 47.95  |
| ZLW-186MH  | 2-2500                                  | 2-1000  | 6.9                | .11 | 8.5  | 9.5         | 33                  | 25 | 35        | 25                 | 30                  | 20 | 42        | 25        | 49         | 25         | 32       | 20   | M21  | ae    | 69.95  |

L = low range [ $f_L$  to  $10 f_L$ ]

M = mid range [ $10 f_L$  to  $f_U/2$ ]

U = upper range [ $f_U/2$  to  $f_U$ ]

m = mid band [ $2f_L$  to  $f_U/2$ ]



pin and coaxial connections see case style outline drawings

| PORT     | d       | e       | m       | s       | v                   | z | aa | ad | ae | af | ag | hq |
|----------|---------|---------|---------|---------|---------------------|---|----|----|----|----|----|----|
| LO       | 8       | 8       | 8       | 1       | 5                   | 4 | 1  | 1  | 1  | 2  | L  | 3  |
| RF       | 1       | 1       | 1       | 8       | 11                  | 1 | 4  | 2  | 3  | 1  | R  | 2  |
| IF       | 3,4^    | 3,4^    | 3       | 3       | 2                   | 2 | 2  | 3  | 2  | 3  | X  | 1  |
| GND EXT. | 2,5,6,7 | 2,5,6,7 | 2,5,6,7 | 2,5,6,7 | 1,3,4,6,7,8,9,10,12 | 3 | 3  | —  | —  | —  | —  | —  |
| CASE GND | —       | 2       | 2,5,6,7 | 2,5,6,7 | 1,3,4,6,7,8,9,10,12 | 3 | 3  | —  | —  | —  | —  | —  |
| NOT USED | —       | —       | 4       | 4       | —                   | — | —  | —  | —  | —  | —  | —  |

^ pins must be connected together externally