

## Non-Catalog Model

# Frequency Mixer

# TUF-3H

Level 17 (LO Power +17 dBm)

### Important Note

This is a non-catalog model and can be manufactured on specific request.  
Pricing and delivery information can be supplied upon request.



Please click "Back", and then click "Contact Us" for Applications support.

**CASE STYLE : B02**

| ELECTRICAL SPECIFICATIONS 50Ω @ +25°C |               |       |      |      |       |
|---------------------------------------|---------------|-------|------|------|-------|
| Parameter                             |               | Min.  | Typ. | Max. | Units |
| Frequency                             | LO (fL to fU) | 0.15  |      | 400  | MHz   |
|                                       | RF (fL to fU) | 0.15  |      | 400  | MHz   |
|                                       | IF            | 0     |      | 400  | MHz   |
| Conversion Loss                       | mid band      |       | 5.0  | 7.0  | dB    |
|                                       | Total Range   |       |      | 8.0  | dB    |
| LO-RF Isolation                       | Low Range     | 50    | 60   |      | dB    |
|                                       | Mid Range     | 35    | 50   |      | dB    |
|                                       | Upper Range   | 30    | 40   |      | dB    |
| LO-IF Isolation                       | Low Range     | 40    | 60   |      | dB    |
|                                       | Mid Range     | 25    | 45   |      | dB    |
|                                       | Upper Range   | 20    | 35   |      | dB    |
| IP3 Input                             |               | +27.5 | +30  |      | dBm   |
| 1 dB Comp. Input Power                |               |       | +14  |      | dBm   |

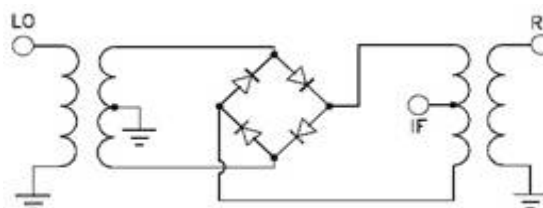
**Notes:** Low Range = [fL to 10fL]      Mid Range = [10fL to fU/2]      Upper Range = [fU/2 to fU]  
mid band = [2fL to fU/2]

IP3 : RF Power = 0 dBm @ 200 MHz & 202 MHz , LO Power = +17 dBm @ 180 MHz  
Non-hermetic

| MAXIMUM RATINGS       |                |
|-----------------------|----------------|
| Operating Temperature | -55°C to 100°C |
| Storage Temperature   | -55°C to 100°C |
| RF Power              | 200mW          |
| IF Current            | 40mA           |

| PIN CONNECTIONS |   |
|-----------------|---|
| LO              | 4 |
| RF              | 1 |
| IF              | 2 |
| GROUND          | 3 |

### Electrical Schematics



# Frequency Mixer

# TUF-3H

## Typical Performance Data

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>IF FIXED<br>@IF(OUT)=30MHz<br>(dB) |       |      |
|---------------------|-------------|-------------------------------------------------------|-------|------|
|                     |             | @LO (dBm)                                             |       |      |
|                     |             | +14                                                   | +17   | +20  |
| 0.1                 | 30.1        | 5.71                                                  | 5.43  | 5.26 |
| 5.0                 | 35.0        | 5.24                                                  | 4.99  | 4.92 |
| 10.0                | 40.0        | 5.17                                                  | 4.91  | 4.78 |
| 30.6                | 60.6        | 5.65                                                  | 5.18  | 4.95 |
| 51.1                | 81.1        | 5.56                                                  | 5.17  | 4.99 |
| 71.6                | 101.6       | 5.51                                                  | 5.15  | 4.98 |
| 92.1                | 122.1       | 5.61                                                  | 5.19  | 5.01 |
| 112.5               | 142.5       | 5.52                                                  | 5.17  | 5.01 |
| 133.0               | 163.0       | 5.53                                                  | 5.20  | 5.06 |
| 153.5               | 183.5       | 5.61                                                  | 5.28  | 5.11 |
| 174.0               | 204.0       | 5.55                                                  | 5.26  | 5.12 |
| 194.5               | 224.5       | 5.57                                                  | 5.21  | 5.08 |
| 215.0               | 245.0       | 5.70                                                  | 5.33  | 5.13 |
| 256.0               | 286.0       | 5.89                                                  | 5.62  | 5.42 |
| 276.4               | 306.4       | 5.83                                                  | 5.59  | 5.43 |
| 296.9               | 326.9       | 5.78                                                  | 5.53  | 5.38 |
| 317.4               | 347.4       | 5.83                                                  | 5.54  | 5.38 |
| 337.9               | 367.9       | 5.91                                                  | 5.52  | 5.37 |
| 358.4               | 388.4       | 6.15                                                  | 5.63  | 5.44 |
| 378.9               | 408.9       | 6.38                                                  | 5.89  | 5.59 |
| 399.4               | 429.4       | 6.43                                                  | 6.09  | 5.80 |
| 419.9               | 449.9       | 6.63                                                  | 6.33  | 6.10 |
| 440.3               | 470.3       | 6.92                                                  | 6.60  | 6.36 |
| 460.8               | 490.8       | 7.31                                                  | 6.95  | 6.67 |
| 481.3               | 511.3       | 7.85                                                  | 7.42  | 6.99 |
| 501.8               | 531.8       | 8.52                                                  | 7.94  | 7.27 |
| 522.3               | 552.3       | 9.14                                                  | 8.28  | 7.22 |
| 542.8               | 572.8       | 9.47                                                  | 8.20  | 6.83 |
| 563.3               | 593.3       | 9.52                                                  | 7.90  | 6.48 |
| 583.8               | 613.8       | 9.27                                                  | 7.43  | 6.48 |
| 604.2               | 634.2       | 8.98                                                  | 7.20  | 6.54 |
| 624.7               | 654.7       | 8.67                                                  | 7.28  | 6.75 |
| 645.2               | 675.2       | 8.64                                                  | 7.46  | 7.00 |
| 665.7               | 695.7       | 8.59                                                  | 7.66  | 7.27 |
| 686.2               | 716.2       | 8.69                                                  | 7.89  | 7.52 |
| 706.7               | 736.7       | 8.82                                                  | 8.19  | 7.82 |
| 727.2               | 757.2       | 9.07                                                  | 8.45  | 8.09 |
| 768.1               | 798.1       | 9.37                                                  | 8.80  | 8.51 |
| 829.6               | 859.6       | 10.42                                                 | 9.55  | 9.37 |
| 850.1               | 880.1       | 10.72                                                 | 10.00 | 9.84 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | IP3 INPUT<br>(dBm) |       |       |
|---------------------|-------------|--------------------|-------|-------|
|                     |             | @LO (dBm)          |       |       |
|                     |             | +14                | +17   | +20   |
| 10.1                | 40.1        | 29.35              | 31.52 | 31.15 |
| 30.6                | 60.6        | 27.76              | 29.93 | 28.56 |
| 51.1                | 81.1        | 30.49              | 27.55 | 27.71 |
| 71.6                | 101.6       | 28.00              | 26.25 | 29.63 |
| 92.1                | 122.1       | 24.25              | 25.69 | 32.79 |
| 112.5               | 142.5       | 28.00              | 32.52 | 28.86 |
| 133.0               | 163.0       | 23.07              | 28.48 | 26.16 |
| 153.5               | 183.5       | 25.72              | 29.72 | 28.98 |
| 174.0               | 204.0       | 29.80              | 25.81 | 24.59 |
| 194.5               | 224.5       | 31.04              | 24.15 | 23.06 |
| 215.0               | 245.0       | 24.52              | 23.15 | 23.02 |
| 235.5               | 265.5       | 23.66              | 21.59 | 21.99 |
| 256.0               | 286.0       | 25.94              | 23.53 | 22.48 |
| 276.4               | 306.4       | 29.14              | 27.61 | 26.68 |
| 296.9               | 326.9       | 30.11              | 28.87 | 26.78 |
| 317.4               | 347.4       | 30.10              | 24.59 | 23.34 |
| 337.9               | 367.9       | 21.84              | 21.96 | 22.31 |
| 358.4               | 388.4       | 18.94              | 22.12 | 22.18 |
| 378.9               | 408.9       | 15.23              | 16.74 | 20.48 |
| 399.4               | 429.4       | 14.46              | 14.09 | 17.09 |
| 419.9               | 449.9       | 13.96              | 12.94 | 13.44 |
| 440.3               | 470.3       | 13.54              | 12.79 | 12.66 |
| 460.8               | 490.8       | 13.13              | 12.74 | 12.82 |
| 481.3               | 511.3       | 12.71              | 12.82 | 13.54 |
| 501.8               | 531.8       | 12.38              | 13.04 | 14.59 |
| 522.3               | 552.3       | 12.77              | 14.10 | 16.62 |
| 542.8               | 572.8       | 13.27              | 14.88 | 19.27 |
| 563.3               | 593.3       | 13.66              | 16.12 | 23.77 |
| 583.8               | 613.8       | 14.51              | 19.45 | 26.26 |
| 604.2               | 634.2       | 15.87              | 23.91 | 29.02 |
| 624.7               | 654.7       | 19.00              | 26.81 | 28.99 |
| 645.2               | 675.2       | 22.73              | 27.01 | 27.54 |
| 665.7               | 695.7       | 24.76              | 26.90 | 25.50 |
| 686.2               | 716.2       | 23.51              | 25.56 | 25.23 |
| 706.7               | 736.7       | 24.92              | 24.89 | 26.02 |
| 727.2               | 757.2       | 24.47              | 24.56 | 25.60 |
| 768.1               | 798.1       | 23.49              | 24.88 | 26.82 |
| 788.6               | 818.6       | 24.15              | 26.97 | 28.98 |
| 829.6               | 859.6       | 21.98              | 27.73 | 32.45 |
| 850.1               | 880.1       | 21.40              | 24.66 | 30.00 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | COMPRESSION<br>@RF IN=+14dBm<br>(dB) |      |      |
|---------------------|-------------|--------------------------------------|------|------|
|                     |             | @LO (dBm)                            |      |      |
|                     |             | +14                                  | +17  | +20  |
| 10.1                | 40.1        | 1.41                                 | 0.94 | 0.68 |
| 30.6                | 60.6        | 1.14                                 | 0.80 | 0.59 |
| 51.1                | 81.1        | 1.16                                 | 0.79 | 0.57 |
| 71.6                | 101.6       | 1.23                                 | 0.79 | 0.55 |
| 92.1                | 122.1       | 1.18                                 | 0.74 | 0.51 |
| 112.5               | 142.5       | 1.14                                 | 0.68 | 0.47 |
| 133.0               | 163.0       | 1.08                                 | 0.66 | 0.47 |
| 153.5               | 183.5       | 1.09                                 | 0.64 | 0.46 |
| 174.0               | 204.0       | 1.05                                 | 0.60 | 0.43 |
| 194.5               | 224.5       | 1.10                                 | 0.70 | 0.52 |
| 215.0               | 245.0       | 0.98                                 | 0.68 | 0.52 |
| 235.5               | 265.5       | 0.92                                 | 0.55 | 0.45 |
| 256.0               | 286.0       | 1.05                                 | 0.56 | 0.45 |
| 276.4               | 306.4       | 1.24                                 | 0.71 | 0.55 |
| 296.9               | 326.9       | 1.44                                 | 0.85 | 0.63 |
| 317.4               | 347.4       | 1.62                                 | 1.03 | 0.71 |
| 337.9               | 367.9       | 1.78                                 | 1.29 | 0.82 |
| 358.4               | 388.4       | 1.76                                 | 1.44 | 0.94 |
| 378.9               | 408.9       | 1.89                                 | 1.53 | 1.11 |
| 399.4               | 429.4       | 2.13                                 | 1.67 | 1.28 |
| 419.9               | 449.9       | 2.34                                 | 1.91 | 1.45 |
| 440.3               | 470.3       | 2.32                                 | 1.94 | 1.55 |
| 460.8               | 490.8       | 2.14                                 | 1.73 | 1.39 |
| 481.3               | 511.3       | 1.69                                 | 1.32 | 1.04 |
| 501.8               | 531.8       | 1.19                                 | 0.90 | 0.75 |
| 522.3               | 552.3       | 0.63                                 | 0.54 | 0.70 |
| 542.8               | 572.8       | 0.32                                 | 0.51 | 0.96 |
| 563.3               | 593.3       | 0.32                                 | 0.77 | 1.20 |
| 583.8               | 613.8       | 0.59                                 | 1.16 | 1.21 |
| 604.2               | 634.2       | 1.03                                 | 1.43 | 1.23 |
| 624.7               | 654.7       | 1.34                                 | 1.40 | 1.11 |
| 645.2               | 675.2       | 1.56                                 | 1.31 | 1.00 |
| 665.7               | 695.7       | 1.60                                 | 1.21 | 0.93 |
| 686.2               | 716.2       | 1.65                                 | 1.13 | 0.91 |
| 706.7               | 736.7       | 1.44                                 | 1.03 | 0.88 |
| 727.2               | 757.2       | 1.43                                 | 0.95 | 0.82 |
| 768.1               | 798.1       | 1.20                                 | 0.74 | 0.63 |
| 788.6               | 818.6       | 1.20                                 | 0.66 | 0.52 |
| 829.6               | 859.6       | 1.09                                 | 0.56 | 0.38 |
| 850.1               | 880.1       | 0.98                                 | 0.51 | 0.31 |

REV. X2

TUF-3H

100818

Page 1 of 5



IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS 9100 CERTIFIED • RoHS compliant

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661



The Design Engineers Search Engine finds the model you need, instantly • For detailed performance specs & shopping online see



# Frequency Mixer

# TUF-3H

## Typical Performance Data

| IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=200.1MHz<br>(dB) | IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=10.1MHz<br>(dB) | IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=400.1MHz<br>(dB) |
|----------------------|-------------|-----------------------------------------------------------------|----------------------|-------------|----------------------------------------------------------------|----------------------|-------------|-----------------------------------------------------------------|
|                      |             | @LO (dBm)                                                       |                      |             | @LO (dBm)                                                      |                      |             | @LO (dBm)                                                       |
|                      |             | +17                                                             |                      |             | +17                                                            |                      |             | +17                                                             |
| 190.0                | 10.1        | 5.46                                                            | 10.0                 | 20.1        | 5.01                                                           | 390.0                | 10.1        | 6.13                                                            |
| 185.4                | 14.7        | 5.48                                                            | 19.7                 | 29.8        | 4.96                                                           | 380.3                | 19.8        | 6.06                                                            |
| 180.8                | 19.3        | 5.42                                                            | 29.5                 | 39.6        | 4.86                                                           | 370.5                | 29.6        | 5.99                                                            |
| 176.2                | 23.9        | 5.34                                                            | 39.2                 | 49.3        | 4.92                                                           | 360.8                | 39.3        | 5.92                                                            |
| 171.5                | 28.6        | 5.36                                                            | 49.0                 | 59.1        | 4.97                                                           | 351.0                | 49.1        | 5.87                                                            |
| 166.9                | 33.2        | 5.30                                                            | 58.7                 | 68.8        | 4.90                                                           | 341.3                | 58.8        | 5.80                                                            |
| 162.3                | 37.8        | 5.29                                                            | 68.5                 | 78.6        | 4.99                                                           | 331.5                | 68.6        | 5.74                                                            |
| 157.7                | 42.4        | 5.30                                                            | 78.2                 | 88.3        | 5.04                                                           | 321.8                | 78.3        | 5.79                                                            |
| 153.1                | 47.0        | 5.34                                                            | 87.9                 | 98.0        | 5.02                                                           | 312.1                | 88.0        | 5.72                                                            |
| 148.5                | 51.6        | 5.27                                                            | 97.7                 | 107.8       | 5.03                                                           | 302.3                | 97.8        | 5.62                                                            |
| 143.8                | 56.3        | 5.21                                                            | 107.4                | 117.5       | 5.08                                                           | 292.6                | 107.5       | 5.65                                                            |
| 139.2                | 60.9        | 5.24                                                            | 117.2                | 127.3       | 5.08                                                           | 282.8                | 117.3       | 5.64                                                            |
| 134.6                | 65.5        | 5.19                                                            | 126.9                | 137.0       | 5.11                                                           | 273.1                | 127.0       | 5.62                                                            |
| 130.0                | 70.1        | 5.18                                                            | 136.7                | 146.8       | 5.10                                                           | 263.3                | 136.8       | 5.60                                                            |
| 125.4                | 74.7        | 5.25                                                            | 146.4                | 156.5       | 5.17                                                           | 253.6                | 146.5       | 5.64                                                            |
| 120.8                | 79.3        | 5.20                                                            | 156.2                | 166.3       | 5.22                                                           | 243.8                | 156.3       | 5.63                                                            |
| 116.2                | 83.9        | 5.18                                                            | 165.9                | 176.0       | 5.19                                                           | 234.1                | 166.0       | 5.62                                                            |
| 111.5                | 88.6        | 5.18                                                            | 175.6                | 185.7       | 5.23                                                           | 224.4                | 175.7       | 5.69                                                            |
| 106.9                | 93.2        | 5.15                                                            | 185.4                | 195.5       | 5.29                                                           | 214.6                | 185.5       | 5.72                                                            |
| 102.3                | 97.8        | 5.08                                                            | 195.1                | 205.2       | 5.20                                                           | 204.9                | 195.2       | 5.72                                                            |
| 97.7                 | 102.4       | 5.10                                                            | 204.9                | 215.0       | 5.23                                                           | 195.1                | 205.0       | 5.77                                                            |
| 93.1                 | 107.0       | 5.15                                                            | 214.6                | 224.7       | 5.22                                                           | 185.4                | 214.7       | 5.84                                                            |
| 88.5                 | 111.6       | 5.14                                                            | 224.4                | 234.5       | 5.19                                                           | 175.6                | 224.5       | 5.84                                                            |
| 83.8                 | 116.3       | 5.14                                                            | 234.1                | 244.2       | 5.27                                                           | 165.9                | 234.2       | 5.84                                                            |
| 79.2                 | 120.9       | 5.14                                                            | 243.8                | 253.9       | 5.33                                                           | 156.2                | 243.9       | 5.91                                                            |
| 74.6                 | 125.5       | 5.10                                                            | 253.6                | 263.7       | 5.45                                                           | 146.4                | 253.7       | 5.89                                                            |
| 70.0                 | 130.1       | 5.09                                                            | 263.3                | 273.4       | 5.48                                                           | 136.7                | 263.4       | 5.82                                                            |
| 65.4                 | 134.7       | 5.10                                                            | 273.1                | 283.2       | 5.46                                                           | 126.9                | 273.2       | 5.81                                                            |
| 60.8                 | 139.3       | 5.13                                                            | 282.8                | 292.9       | 5.51                                                           | 117.2                | 282.9       | 5.79                                                            |
| 56.2                 | 143.9       | 5.15                                                            | 292.6                | 302.7       | 5.51                                                           | 107.4                | 292.7       | 5.72                                                            |
| 51.5                 | 148.6       | 5.17                                                            | 302.3                | 312.4       | 5.50                                                           | 97.7                 | 302.4       | 5.72                                                            |
| 46.9                 | 153.2       | 5.18                                                            | 312.1                | 322.2       | 5.60                                                           | 87.9                 | 312.2       | 5.74                                                            |
| 42.3                 | 157.8       | 5.16                                                            | 321.8                | 331.9       | 5.60                                                           | 78.2                 | 321.9       | 5.74                                                            |
| 37.7                 | 162.4       | 5.15                                                            | 331.5                | 341.6       | 5.54                                                           | 68.5                 | 331.6       | 5.74                                                            |
| 33.1                 | 167.0       | 5.16                                                            | 341.3                | 351.4       | 5.51                                                           | 58.7                 | 341.4       | 5.76                                                            |
| 28.5                 | 171.6       | 5.17                                                            | 351.0                | 361.1       | 5.50                                                           | 49.0                 | 351.1       | 5.81                                                            |
| 23.8                 | 176.3       | 5.20                                                            | 360.8                | 370.9       | 5.48                                                           | 39.2                 | 360.9       | 5.82                                                            |
| 19.2                 | 180.9       | 5.21                                                            | 370.5                | 380.6       | 5.45                                                           | 29.5                 | 370.6       | 5.83                                                            |
| 14.6                 | 185.5       | 5.27                                                            | 380.3                | 390.4       | 5.48                                                           | 19.7                 | 380.4       | 5.89                                                            |
| 10.0                 | 190.1       | 5.30                                                            | 390.0                | 400.1       | 5.49                                                           | 10.0                 | 390.1       | 5.97                                                            |

REV. X2  
TUF-3H  
100818  
Page 2 of 5



IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS 9100 CERTIFIED • RoHS compliant  
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661



The Design Engineers Search Engine finds the model you need, instantly • For detailed performance specs & shopping online see



## Typical Performance Data

| LO<br>(MHz) | LO-RF ISOLATION<br>(dB) |       |       | LO-IF ISOLATION<br>(dB) |       |       |
|-------------|-------------------------|-------|-------|-------------------------|-------|-------|
|             | @LO (dBm)               |       |       | @LO (dBm)               |       |       |
|             | +14                     | +17   | +20   | +14                     | +17   | +20   |
| 0.1         | 64.78                   | 66.42 | 66.35 | 68.59                   | 66.28 | 63.03 |
| 5.0         | 60.18                   | 61.64 | 63.09 | 64.99                   | 64.07 | 62.71 |
| 10.0        | 59.08                   | 60.33 | 61.40 | 61.56                   | 61.62 | 60.74 |
| 30.6        | 71.60                   | 74.47 | 77.21 | 60.61                   | 56.39 | 54.07 |
| 51.1        | 69.13                   | 73.22 | 78.25 | 57.25                   | 52.88 | 50.58 |
| 71.6        | 67.99                   | 72.62 | 77.65 | 53.85                   | 50.40 | 47.96 |
| 92.1        | 68.20                   | 76.87 | 77.22 | 51.78                   | 48.75 | 46.56 |
| 112.5       | 69.20                   | 76.84 | 76.17 | 49.54                   | 46.71 | 44.72 |
| 133.0       | 67.22                   | 74.79 | 65.19 | 45.80                   | 44.19 | 42.83 |
| 153.5       | 71.99                   | 77.06 | 68.10 | 44.93                   | 43.62 | 41.91 |
| 174.0       | 74.28                   | 69.16 | 65.89 | 42.23                   | 42.31 | 41.41 |
| 194.5       | 90.00                   | 60.27 | 56.07 | 39.48                   | 39.83 | 39.83 |
| 215.0       | 68.35                   | 62.08 | 56.68 | 38.49                   | 38.79 | 38.51 |
| 256.0       | 59.64                   | 63.30 | 63.48 | 35.60                   | 35.36 | 35.47 |
| 276.4       | 57.49                   | 64.15 | 66.74 | 35.35                   | 36.09 | 35.75 |
| 296.9       | 55.73                   | 59.70 | 57.44 | 33.98                   | 35.20 | 35.49 |
| 317.4       | 51.74                   | 54.74 | 54.42 | 32.89                   | 34.51 | 35.30 |
| 337.9       | 46.20                   | 46.88 | 47.18 | 32.09                   | 34.56 | 36.04 |
| 358.4       | 45.67                   | 46.29 | 48.30 | 30.55                   | 32.64 | 34.19 |
| 378.9       | 44.00                   | 43.91 | 46.02 | 29.03                   | 31.36 | 33.26 |
| 399.4       | 46.22                   | 43.90 | 47.26 | 27.97                   | 29.46 | 31.37 |
| 419.9       | 51.68                   | 47.25 | 48.32 | 28.85                   | 28.48 | 29.71 |
| 440.3       | 51.96                   | 48.19 | 47.66 | 28.47                   | 28.22 | 28.50 |
| 460.8       | 56.15                   | 51.92 | 49.84 | 28.56                   | 28.47 | 28.32 |
| 481.3       | 58.49                   | 51.66 | 47.42 | 28.32                   | 28.70 | 28.87 |
| 501.8       | 51.33                   | 49.16 | 46.75 | 27.84                   | 28.25 | 28.40 |
| 522.3       | 48.59                   | 46.52 | 43.75 | 28.00                   | 28.68 | 28.69 |
| 542.8       | 44.79                   | 43.81 | 42.12 | 27.62                   | 28.45 | 28.58 |
| 563.3       | 43.06                   | 42.32 | 40.82 | 27.64                   | 28.42 | 28.45 |
| 583.8       | 40.59                   | 40.05 | 40.28 | 27.89                   | 28.45 | 28.58 |
| 604.2       | 40.24                   | 40.37 | 40.98 | 28.07                   | 28.19 | 28.45 |
| 624.7       | 38.47                   | 37.92 | 37.82 | 28.40                   | 27.53 | 28.00 |
| 645.2       | 37.89                   | 37.53 | 37.88 | 28.45                   | 26.98 | 27.44 |
| 665.7       | 36.50                   | 35.38 | 34.97 | 27.78                   | 26.11 | 26.50 |
| 686.2       | 35.71                   | 35.01 | 35.43 | 26.88                   | 25.51 | 25.95 |
| 706.7       | 34.73                   | 33.70 | 33.09 | 26.04                   | 25.06 | 25.09 |
| 727.2       | 34.31                   | 33.55 | 33.27 | 26.52                   | 25.24 | 24.88 |
| 768.1       | 34.23                   | 32.56 | 31.66 | 28.93                   | 25.94 | 24.56 |
| 829.6       | 32.20                   | 30.66 | 28.99 | 25.41                   | 24.26 | 22.38 |
| 850.1       | 29.75                   | 29.36 | 27.68 | 23.02                   | 23.64 | 21.98 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | RF-IF ISOLATION<br>(dB) |       |       |
|---------------------|-------------|-------------------------|-------|-------|
|                     |             | @LO (dBm)               |       |       |
|                     |             | +14                     | +17   | +20   |
| 10.1                | 40.1        | 40.80                   | 41.23 | 41.18 |
| 30.6                | 60.6        | 32.31                   | 32.48 | 32.83 |
| 51.1                | 81.1        | 28.31                   | 28.70 | 28.90 |
| 71.6                | 101.6       | 25.80                   | 26.19 | 26.57 |
| 92.1                | 122.1       | 24.33                   | 24.83 | 25.15 |
| 112.5               | 142.5       | 23.04                   | 23.55 | 24.02 |
| 133.0               | 163.0       | 22.40                   | 22.73 | 22.93 |
| 153.5               | 183.5       | 21.97                   | 22.75 | 23.21 |
| 174.0               | 204.0       | 21.35                   | 22.15 | 22.72 |
| 194.5               | 224.5       | 21.12                   | 21.95 | 22.61 |
| 215.0               | 245.0       | 21.14                   | 21.69 | 22.33 |
| 235.5               | 265.5       | 21.96                   | 22.24 | 22.55 |
| 256.0               | 286.0       | 23.12                   | 23.48 | 23.59 |
| 276.4               | 306.4       | 23.35                   | 23.99 | 24.28 |
| 296.9               | 326.9       | 23.18                   | 24.18 | 25.32 |
| 317.4               | 347.4       | 21.98                   | 23.11 | 24.46 |
| 337.9               | 367.9       | 20.17                   | 20.95 | 21.72 |
| 358.4               | 388.4       | 18.70                   | 19.17 | 19.42 |
| 378.9               | 408.9       | 17.62                   | 17.66 | 17.50 |
| 399.4               | 429.4       | 16.83                   | 16.62 | 16.25 |
| 419.9               | 449.9       | 16.34                   | 16.08 | 15.61 |
| 440.3               | 470.3       | 15.58                   | 15.31 | 14.95 |
| 460.8               | 490.8       | 15.37                   | 15.01 | 14.71 |
| 481.3               | 511.3       | 15.20                   | 14.96 | 14.80 |
| 501.8               | 531.8       | 15.33                   | 15.11 | 14.90 |
| 522.3               | 552.3       | 16.10                   | 15.85 | 15.53 |
| 542.8               | 572.8       | 16.53                   | 16.17 | 15.64 |
| 563.3               | 593.3       | 16.83                   | 16.21 | 15.52 |
| 583.8               | 613.8       | 16.52                   | 15.77 | 15.12 |
| 604.2               | 634.2       | 15.82                   | 14.94 | 14.39 |
| 624.7               | 654.7       | 14.88                   | 14.17 | 13.81 |
| 645.2               | 675.2       | 14.02                   | 13.43 | 13.14 |
| 665.7               | 695.7       | 13.10                   | 12.75 | 12.50 |
| 686.2               | 716.2       | 12.48                   | 12.13 | 11.89 |
| 706.7               | 736.7       | 11.76                   | 11.46 | 11.22 |
| 727.2               | 757.2       | 11.15                   | 10.78 | 10.59 |
| 768.1               | 798.1       | 10.08                   | 9.56  | 9.22  |
| 788.6               | 818.6       | 9.48                    | 8.90  | 8.60  |
| 829.6               | 859.6       | 8.58                    | 7.89  | 7.44  |
| 850.1               | 880.1       | 8.04                    | 7.40  | 6.93  |

REV. X2

TUF-3H

100818

Page 3 of 5



IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED • RoHS compliant

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661



The Design Engineers Search Engine finds the model you need, instantly • For detailed performance specs & shopping online see



# Frequency Mixer

TUF-3H

## Typical Performance Data

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | RF VSWR<br>(:1) |      |      | LO<br>(MHz) | LO VSWR<br>(:1) |      |      | IF<br>(OUT)<br>(MHz) | IF VSWR<br>@LO=400.1MHz<br>(:1) |      |      |
|---------------------|-------------|-----------------|------|------|-------------|-----------------|------|------|----------------------|---------------------------------|------|------|
|                     |             | @LO (dBm)       |      |      |             | @LO (dBm)       |      |      |                      | @LO (dBm)                       |      |      |
|                     |             | +14             | +17  | +20  |             | +14             | +17  | +20  |                      | +14                             | +17  | +20  |
| 5.0                 | 35.0        | 1.66            | 1.40 | 1.24 | 5.0         | 1.32            | 1.51 | 2.55 | 5.0                  | 1.78                            | 1.56 | 1.47 |
| 10.1                | 40.1        | 1.48            | 1.29 | 1.19 | 10.1        | 1.09            | 1.44 | 2.11 | 10.0                 | 2.72                            | 2.14 | 1.75 |
| 30.6                | 60.6        | 1.53            | 1.32 | 1.21 | 30.6        | 1.10            | 1.53 | 2.32 | 20.0                 | 2.62                            | 2.05 | 1.67 |
| 51.1                | 81.1        | 1.49            | 1.31 | 1.20 | 51.1        | 1.09            | 1.52 | 2.28 | 30.0                 | 2.60                            | 2.06 | 1.67 |
| 71.6                | 101.6       | 1.48            | 1.30 | 1.19 | 71.6        | 1.12            | 1.48 | 2.16 | 40.0                 | 2.41                            | 1.90 | 1.55 |
| 92.1                | 122.1       | 1.49            | 1.29 | 1.17 | 92.1        | 1.11            | 1.45 | 2.15 | 50.0                 | 2.31                            | 1.84 | 1.50 |
| 112.5               | 142.5       | 1.42            | 1.24 | 1.13 | 112.5       | 1.15            | 1.48 | 2.17 | 60.0                 | 2.26                            | 1.80 | 1.47 |
| 133.0               | 163.0       | 1.42            | 1.25 | 1.14 | 133.0       | 1.19            | 1.53 | 2.25 | 70.0                 | 2.27                            | 1.81 | 1.49 |
| 153.5               | 183.5       | 1.42            | 1.25 | 1.13 | 153.5       | 1.15            | 1.52 | 2.21 | 80.0                 | 2.43                            | 1.92 | 1.58 |
| 174.0               | 204.0       | 1.35            | 1.19 | 1.09 | 174.0       | 1.20            | 1.51 | 2.15 | 90.0                 | 2.49                            | 1.98 | 1.62 |
| 194.5               | 224.5       | 1.36            | 1.16 | 1.07 | 194.5       | 1.25            | 1.53 | 2.17 | 100.0                | 2.58                            | 2.05 | 1.69 |
| 215.0               | 245.0       | 1.37            | 1.18 | 1.07 | 215.0       | 1.24            | 1.56 | 2.23 | 110.0                | 2.63                            | 2.10 | 1.73 |
| 235.5               | 265.5       | 1.34            | 1.20 | 1.09 | 235.5       | 1.29            | 1.61 | 2.26 | 120.0                | 2.58                            | 2.05 | 1.70 |
| 256.0               | 286.0       | 1.29            | 1.17 | 1.09 | 256.0       | 1.30            | 1.63 | 2.25 | 130.0                | 2.51                            | 1.99 | 1.64 |
| 276.4               | 306.4       | 1.25            | 1.12 | 1.06 | 276.4       | 1.29            | 1.62 | 2.25 | 140.0                | 2.48                            | 1.97 | 1.63 |
| 296.9               | 326.9       | 1.18            | 1.06 | 1.05 | 296.9       | 1.35            | 1.63 | 2.26 | 150.0                | 2.51                            | 1.99 | 1.65 |
| 317.4               | 347.4       | 1.16            | 1.01 | 1.10 | 317.4       | 1.40            | 1.68 | 2.31 | 160.0                | 2.56                            | 2.04 | 1.70 |
| 337.9               | 367.9       | 1.16            | 1.04 | 1.14 | 337.9       | 1.44            | 1.70 | 2.30 | 170.0                | 2.59                            | 2.07 | 1.74 |
| 358.4               | 388.4       | 1.21            | 1.07 | 1.15 | 358.4       | 1.54            | 1.73 | 2.28 | 180.0                | 2.59                            | 2.09 | 1.76 |
| 378.9               | 408.9       | 1.26            | 1.09 | 1.13 | 378.9       | 1.58            | 1.80 | 2.32 | 190.0                | 2.61                            | 2.10 | 1.78 |
| 399.4               | 429.4       | 1.29            | 1.17 | 1.15 | 399.4       | 1.56            | 1.87 | 2.42 | 200.0                | 2.63                            | 2.10 | 1.78 |
| 419.9               | 449.9       | 1.35            | 1.26 | 1.21 | 419.9       | 1.54            | 1.94 | 2.53 | 210.0                | 2.64                            | 2.10 | 1.78 |
| 440.3               | 470.3       | 1.42            | 1.36 | 1.30 | 440.3       | 1.53            | 1.94 | 2.56 | 220.0                | 2.67                            | 2.12 | 1.80 |
| 460.8               | 490.8       | 1.55            | 1.48 | 1.42 | 460.8       | 1.55            | 1.97 | 2.59 | 230.0                | 2.70                            | 2.15 | 1.83 |
| 481.3               | 511.3       | 1.69            | 1.61 | 1.54 | 481.3       | 1.55            | 1.92 | 2.53 | 240.0                | 2.71                            | 2.18 | 1.85 |
| 501.8               | 531.8       | 1.87            | 1.78 | 1.66 | 501.8       | 1.57            | 1.93 | 2.56 | 250.0                | 2.70                            | 2.17 | 1.86 |
| 522.3               | 552.3       | 2.04            | 1.90 | 1.73 | 522.3       | 1.58            | 1.94 | 2.56 | 260.0                | 2.66                            | 2.15 | 1.85 |
| 542.8               | 572.8       | 2.17            | 1.96 | 1.75 | 542.8       | 1.61            | 1.92 | 2.52 | 270.0                | 2.66                            | 2.14 | 1.84 |
| 563.3               | 593.3       | 2.25            | 2.00 | 1.80 | 563.3       | 1.63            | 1.89 | 2.48 | 280.0                | 2.73                            | 2.17 | 1.87 |
| 583.8               | 613.8       | 2.27            | 2.00 | 1.87 | 583.8       | 1.65            | 1.89 | 2.49 | 290.0                | 2.81                            | 2.24 | 1.91 |
| 604.2               | 634.2       | 2.31            | 2.06 | 1.97 | 604.2       | 1.66            | 1.88 | 2.52 | 300.0                | 2.87                            | 2.29 | 1.96 |
| 624.7               | 654.7       | 2.34            | 2.17 | 2.09 | 624.7       | 1.69            | 1.89 | 2.54 | 310.0                | 2.88                            | 2.30 | 1.98 |
| 645.2               | 675.2       | 2.39            | 2.27 | 2.20 | 645.2       | 1.73            | 1.94 | 2.58 | 320.0                | 2.86                            | 2.27 | 1.96 |
| 665.7               | 695.7       | 2.45            | 2.36 | 2.31 | 665.7       | 1.84            | 1.99 | 2.60 | 330.0                | 2.82                            | 2.24 | 1.93 |
| 686.2               | 716.2       | 2.51            | 2.43 | 2.38 | 686.2       | 1.97            | 2.10 | 2.70 | 340.0                | 2.82                            | 2.23 | 1.91 |
| 706.7               | 736.7       | 2.55            | 2.49 | 2.43 | 706.7       | 2.14            | 2.22 | 2.79 | 350.0                | 2.84                            | 2.24 | 1.91 |
| 727.2               | 757.2       | 2.60            | 2.53 | 2.48 | 727.2       | 2.36            | 2.34 | 2.86 | 360.0                | 2.89                            | 2.27 | 1.94 |
| 768.1               | 798.1       | 2.66            | 2.55 | 2.48 | 768.1       | 2.92            | 2.62 | 3.01 | 370.0                | 2.96                            | 2.33 | 1.98 |
| 788.6               | 818.6       | 2.70            | 2.57 | 2.49 | 788.6       | 3.15            | 2.78 | 3.13 | 380.0                | 2.99                            | 2.36 | 2.01 |
| 829.6               | 859.6       | 2.84            | 2.62 | 2.53 | 829.6       | 3.73            | 3.18 | 3.42 | 390.0                | 2.97                            | 2.35 | 2.01 |
| 850.1               | 880.1       | 2.86            | 2.67 | 2.57 | 850.1       | 4.62            | 3.46 | 3.48 | 400.0                | 2.91                            | 2.35 | 2.05 |

REV. X2

TUF-3H

100818

Page 4 of 5



IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS 9100 CERTIFIED • RoHS compliant

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661



The Design Engineers Search Engine finds the model you need, instantly • For detailed performance specs & shopping online see



## Harmonics Tables

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0  | -      | -      | 14  | 35  | 18  | 36  | 20  | 54  | 25  | 41  | 41  | 52  |
| 1  | -      | 16     | +0  | 25  | 13  | 38  | 24  | 36  | 38  | 48  | 30  | 51  |
| 2  | 98     | 63     | 54  | 62  | 51  | 76  | 54  | 65  | 48  | 68  | 55  | 62  |
| 3  | >100   | 52     | 53  | 56  | 58  | 61  | 50  | 56  | 49  | 79  | 55  | 71  |
| 4  | >100   | 83     | 79  | 81  | 77  | 80  | 71  | 76  | 71  | 81  | 77  | 79  |
| 5  | >100   | 78     | 77  | 80  | 75  | 83  | 67  | 78  | 65  | 86  | 69  | 82  |
| 6  | >100   | >94    | 92  | 92  | >94 | 90  | >94 | 92  | 89  | 93  | 84  | >94 |
| 7  | >100   | >94    | >94 | 93  | 91  | >94 | 90  | 90  | 87  | 91  | 85  | 90  |
| 8  | >100   | >94    | >94 | >94 | >94 | >94 | >94 | >94 | 82  | >94 | >94 | >94 |
| 9  | >100   | >94    | >94 | >94 | >94 | >94 | >94 | >94 | >94 | 87  | >94 | >94 |
| 10 | >100   | >94    | >94 | >94 | >94 | >94 | >94 | >94 | >94 | >94 | 92  | >94 |
|    | RF CAL | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |

### LO HARMONICS ORDER

Test conditions: RF IN: 200.1 MHz; -1.00 dBm.  
LO IN: 230.01 MHz; +17.00 dBm  
IF OUT: 29.91 MHz; -6.18 dBm

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |    |    |    |    |    |    |    |    |    |    |
|----|--------|--------|----|----|----|----|----|----|----|----|----|----|
| 0  | -      | -      | 24 | 44 | 30 | 45 | 33 | 61 | 40 | 60 | 52 | 62 |
| 1  | -      | 17     | +0 | 28 | 13 | 39 | 22 | 43 | 46 | 56 | 43 | 59 |
| 2  | 82     | 55     | 47 | 55 | 45 | 63 | 47 | 67 | 45 | 70 | 48 | 69 |
| 3  | >100   | 41     | 37 | 43 | 39 | 44 | 38 | 45 | 52 | 53 | 51 | 58 |
| 4  | >100   | 66     | 70 | 72 | 62 | 77 | 57 | 79 | 58 | 77 | 61 | 73 |
| 5  | >100   | 62     | 52 | 53 | 55 | 53 | 50 | 61 | 47 | 53 | 52 | 71 |
| 6  | >100   | 87     | 71 | 95 | 68 | 78 | 69 | 75 | 65 | 69 | 66 | 88 |
| 7  | >100   | 89     | 75 | 65 | 61 | 61 | 64 | 64 | 60 | 65 | 57 | 68 |
| 8  | >100   | 95     | 83 | 96 | 74 | 93 | 73 | 78 | 70 | 76 | 70 | 71 |
| 9  | >100   | 80     | 82 | 85 | 89 | 73 | 69 | 71 | 70 | 75 | 64 | 67 |
| 10 | >100   | 98     | 89 | 98 | 93 | 97 | 81 | 90 | 77 | 83 | 76 | 80 |
|    | RF CAL | 0      | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 |

### LO HARMONICS ORDER

Test conditions: RF IN: 200.1 MHz; 9.00 dBm.  
LO IN: 230.01 MHz; +17.00 dBm  
IF OUT: 29.91 MHz; 3.72 dBm

- Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.  
2. + entry denotes harmonics are in (dBc) above IF OUTPUT.  
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

REV. X2  
TUF-3H  
100818  
Page 5 of 5

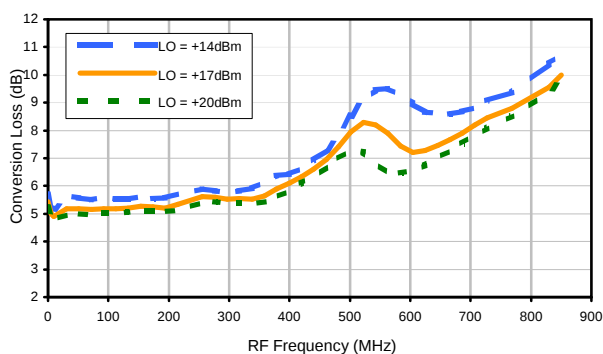


# Frequency Mixer

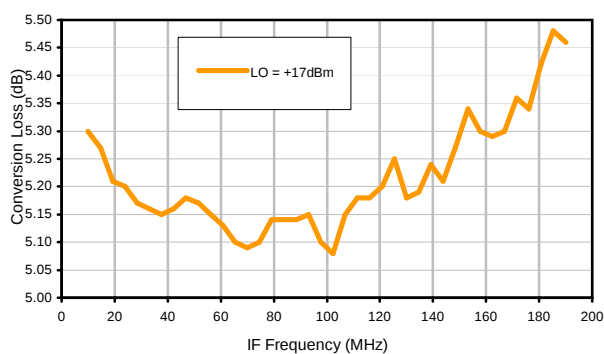
TUF-3H

## Typical Performance Curves

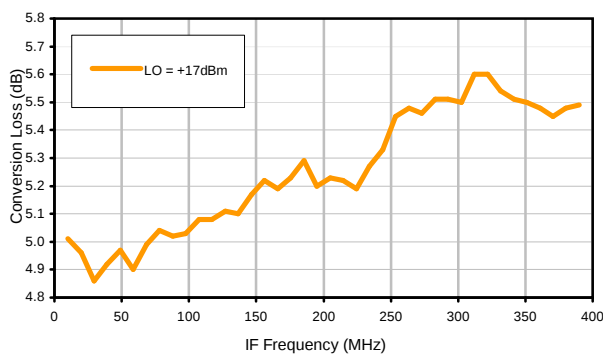
Conversion Loss @ IF=30MHz



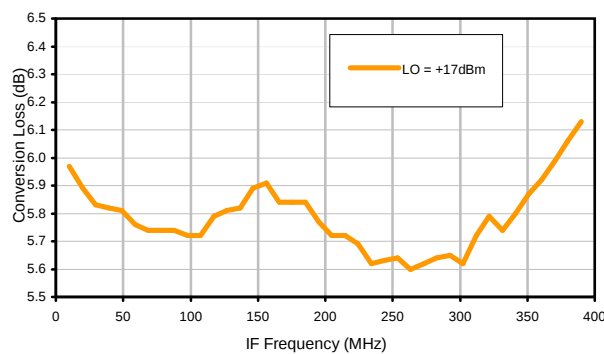
Conversion Loss vs. IF @ RF=200.1MHz



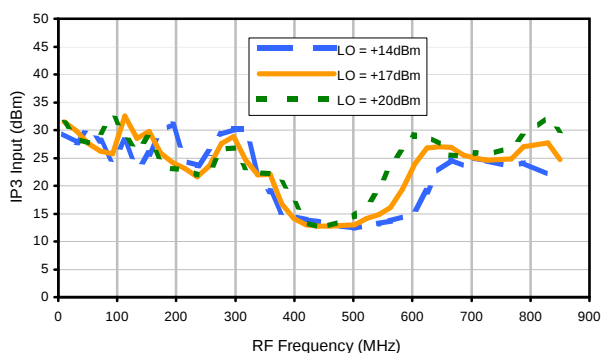
Conversion Loss vs. IF @ RF=10.1MHz



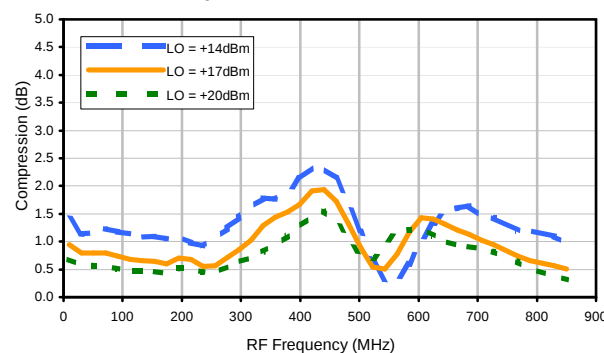
Conversion Loss vs. IF @ RF=400.1MHz



IP3 Input



Compression @ RF IN=+14dBm



REV. X2

TUF-3H

100818

Page 1 of 3



IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS 9100 CERTIFIED • RoHS compliant

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

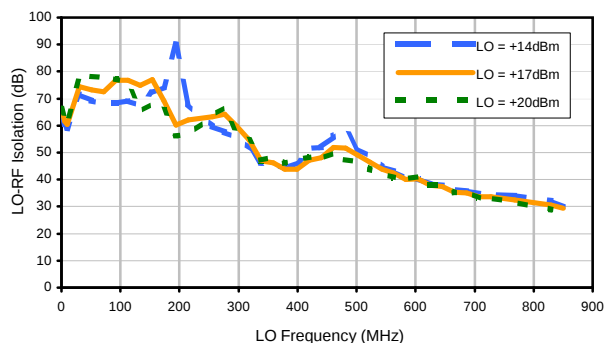


The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see

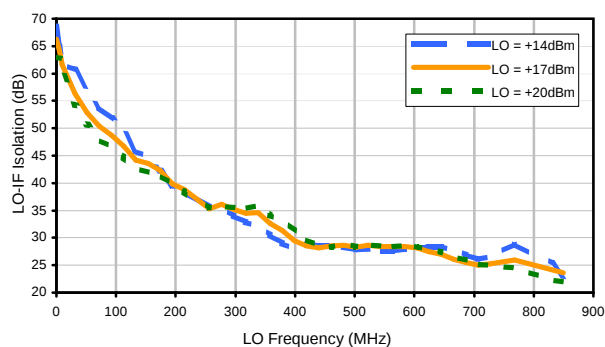


## Typical Performance Curves

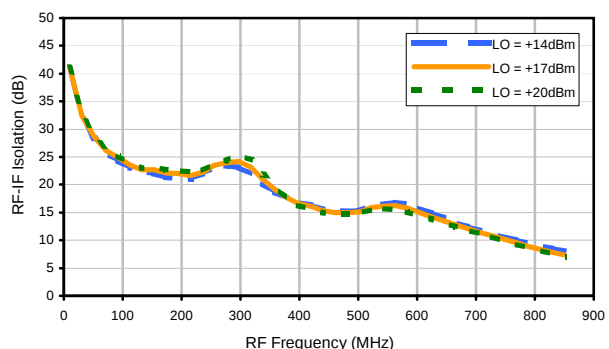
LO-RF Isolation



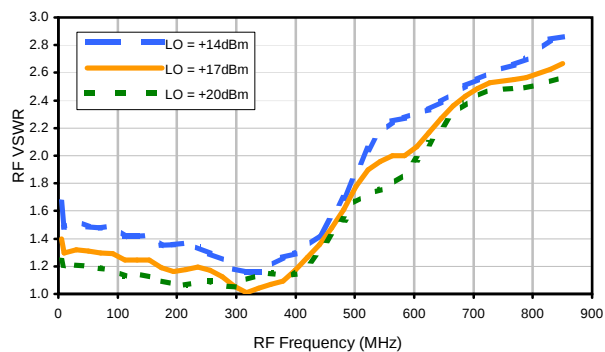
LO-IF Isolation



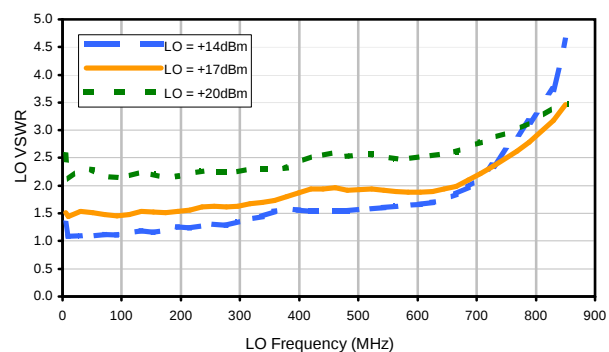
RF-IF Isolation



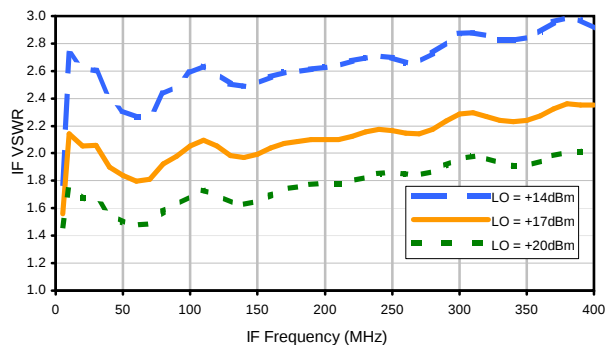
RF VSWR



LO VSWR



IF VSWR



REV. X2

TUF-3H

100818

Page 2 of 3



IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS 9100 CERTIFIED • RoHS compliant

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661



The Design Engineers Search Engine finds the model you need, instantly • For detailed performance specs & shopping online see



## Harmonics Tables

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0  | -      | -      | 14  | 35  | 18  | 36  | 20  | 54  | 25  | 41  | 41  | 52  |
| 1  | -      | 16     | +0  | 25  | 13  | 38  | 24  | 36  | 38  | 48  | 30  | 51  |
| 2  | 98     | 63     | 54  | 62  | 51  | 76  | 54  | 65  | 48  | 68  | 55  | 62  |
| 3  | >100   | 52     | 53  | 56  | 58  | 61  | 50  | 56  | 49  | 79  | 55  | 71  |
| 4  | >100   | 83     | 79  | 81  | 77  | 80  | 71  | 76  | 71  | 81  | 77  | 79  |
| 5  | >100   | 78     | 77  | 80  | 75  | 83  | 67  | 78  | 65  | 86  | 69  | 82  |
| 6  | >100   | >94    | 92  | 92  | >94 | 90  | >94 | 92  | 89  | 93  | 84  | >94 |
| 7  | >100   | >94    | >94 | 93  | 91  | >94 | 90  | 90  | 87  | 91  | 85  | 90  |
| 8  | >100   | >94    | >94 | >94 | >94 | >94 | >94 | >94 | 82  | >94 | >94 | >94 |
| 9  | >100   | >94    | >94 | >94 | >94 | >94 | >94 | >94 | >94 | 87  | >94 | >94 |
| 10 | >100   | >94    | >94 | >94 | >94 | >94 | >94 | >94 | >94 | >94 | 92  | >94 |
|    | RF CAL | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |

### LO HARMONICS ORDER

Test conditions: RF IN: 200.1 MHz; -1.00 dBm.  
LO IN: 230.01 MHz; +17.00 dBm  
IF OUT: 29.91 MHz; -6.18 dBm

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |    |    |    |    |    |    |    |    |    |    |
|----|--------|--------|----|----|----|----|----|----|----|----|----|----|
| 0  | -      | -      | 24 | 44 | 30 | 45 | 33 | 61 | 40 | 60 | 52 | 62 |
| 1  | -      | 17     | +0 | 28 | 13 | 39 | 22 | 43 | 46 | 56 | 43 | 59 |
| 2  | 82     | 55     | 47 | 55 | 45 | 63 | 47 | 67 | 45 | 70 | 48 | 69 |
| 3  | >100   | 41     | 37 | 43 | 39 | 44 | 38 | 45 | 52 | 53 | 51 | 58 |
| 4  | >100   | 66     | 70 | 72 | 62 | 77 | 57 | 79 | 58 | 77 | 61 | 73 |
| 5  | >100   | 62     | 52 | 53 | 55 | 53 | 50 | 61 | 47 | 53 | 52 | 71 |
| 6  | >100   | 87     | 71 | 95 | 68 | 78 | 69 | 75 | 65 | 69 | 66 | 88 |
| 7  | >100   | 89     | 75 | 65 | 61 | 61 | 64 | 64 | 60 | 65 | 57 | 68 |
| 8  | >100   | 95     | 83 | 96 | 74 | 93 | 73 | 78 | 70 | 76 | 70 | 71 |
| 9  | >100   | 80     | 82 | 85 | 89 | 73 | 69 | 71 | 70 | 75 | 64 | 67 |
| 10 | >100   | 98     | 89 | 98 | 93 | 97 | 81 | 90 | 77 | 83 | 76 | 80 |
|    | RF CAL | 0      | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 |

### LO HARMONICS ORDER

Test conditions: RF IN: 200.1 MHz; 9.00 dBm.  
LO IN: 230.01 MHz; +17.00 dBm  
IF OUT: 29.91 MHz; 3.72 dBm

- Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.  
2. + entry denotes harmonics are in (dBc) above IF OUTPUT.  
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

REV. X2  
TUF-3H  
100818  
Page 3 of 3



**Mini-Circuits®**

IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED • RoHS compliant  
P.O. Box 350166, Brooklyn, New York 11235-0006 (718) 934-4500 Fax (718) 332-4661

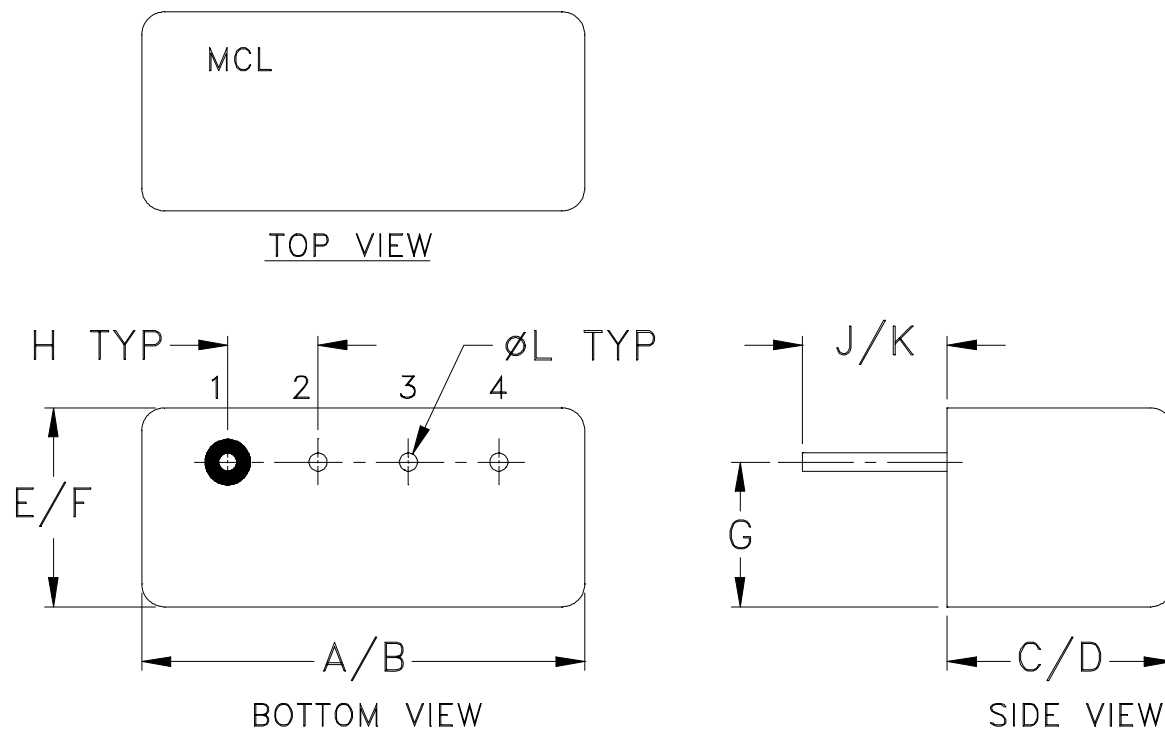
The Design Engineers Search Engine finds the model you need, instantly • For detailed performance specs & shopping online see



B02

B13

## Outline Dimensions



| CASE# | A               | B               | C              | D               | E              | F              | G             | H              | J             | K             | L             | WT,<br>GRAM |
|-------|-----------------|-----------------|----------------|-----------------|----------------|----------------|---------------|----------------|---------------|---------------|---------------|-------------|
| B02   | .480<br>(12.19) | .500<br>(12.70) | .240<br>(6.10) | .255<br>(6.48)  | .210<br>(5.33) | .230<br>(5.84) | .16<br>(4.06) | .100<br>(2.54) | .14<br>(3.56) | .20<br>(5.08) | .020<br>(.51) | 1.9         |
| B13   |                 |                 | .390<br>(9.91) | .405<br>(10.29) |                |                |               |                |               |               |               | 2.3         |

Dimensions are in inches (mm). Tolerances: 2 Pl.  $\pm .03$ ; 3 Pl.  $\pm .015$

### Notes:

- Header material: C.R.S.  
Pin material: #52 alloy.  
Cover material: Cupro-Nickel.
- Pin finish: Electro Tin-Silver.
- Tolerance on pin diameter  $\pm .005$  inch.
- Glass meniscus 0.015 inch max.
- Blue bead indicates Pin 1. Pin numbers do not appear on unit, for reference only.



INTERNET <http://www.minicircuits.com>

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010

Mini-Circuits ISO 9001 & ISO 14001 Certified