

## Non-Catalog Model

# Frequency Mixer

# TUF-2H

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) | 50    |      | 1000 | MHz   |
|                                       | RF (fL to fU) | 50    |      | 1000 | MHz   |
|                                       | IF            | 0     |      | 1000 | MHz   |
| Conversion Loss                       | mid band      |       | 6.2  | 7.5  | dB    |
|                                       | Total Range   |       |      | 9.0  | dB    |
| LO-RF Isolation                       | Low Range     | 40    | 58   |      | dB    |
|                                       | Mid Range     | 30    | 47   |      | dB    |
|                                       | Upper Range   | 25    | 42   |      | dB    |
| LO-IF Isolation                       | Low Range     | 35    | 58   |      | dB    |
|                                       | Mid Range     | 25    | 44   |      | dB    |
|                                       | Upper Range   | 18    | 28   |      | dB    |
| IP3 Input                             |               | +27.5 | +30  |      | dBm   |
| 1 dB Comp. Input Power                |               |       | +14  |      | dBm   |

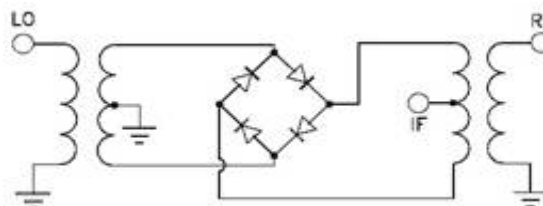
Notes: Low Range = [fL to 10fL]      Mid Range = [10fL to fU/2]      Upper Range = [fU/2 to fU]  
mid band = [2fL to fU/2]

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-2H

## 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  |
| 10.1                | 40.1        | 7.49                                                  | 6.47  | 5.90 |
| 51.1                | 81.1        | 7.47                                                  | 6.51  | 6.04 |
| 92.0                | 122.0       | 7.43                                                  | 6.46  | 5.99 |
| 133.0               | 163.0       | 7.23                                                  | 6.34  | 5.92 |
| 173.9               | 203.9       | 7.31                                                  | 6.41  | 5.95 |
| 214.9               | 244.9       | 7.20                                                  | 6.25  | 5.88 |
| 255.8               | 285.8       | 7.15                                                  | 6.26  | 5.95 |
| 296.8               | 326.8       | 7.13                                                  | 6.21  | 5.95 |
| 337.7               | 367.7       | 7.02                                                  | 6.23  | 6.02 |
| 378.7               | 408.7       | 6.92                                                  | 6.22  | 6.08 |
| 419.6               | 449.6       | 6.92                                                  | 6.24  | 6.09 |
| 440.1               | 470.1       | 6.81                                                  | 6.19  | 6.07 |
| 481.1               | 511.1       | 6.92                                                  | 6.32  | 6.20 |
| 501.5               | 531.5       | 6.87                                                  | 6.34  | 6.21 |
| 542.5               | 572.5       | 6.98                                                  | 6.51  | 6.33 |
| 563.0               | 593.0       | 6.93                                                  | 6.51  | 6.35 |
| 603.9               | 633.9       | 7.06                                                  | 6.60  | 6.48 |
| 624.4               | 654.4       | 7.02                                                  | 6.60  | 6.50 |
| 665.3               | 695.3       | 7.11                                                  | 6.67  | 6.58 |
| 685.8               | 715.8       | 7.10                                                  | 6.69  | 6.59 |
| 726.8               | 756.8       | 7.18                                                  | 6.79  | 6.68 |
| 747.2               | 777.2       | 7.17                                                  | 6.83  | 6.72 |
| 788.2               | 818.2       | 7.29                                                  | 6.98  | 6.88 |
| 808.7               | 838.7       | 7.35                                                  | 7.05  | 6.95 |
| 849.6               | 879.6       | 7.50                                                  | 7.23  | 7.16 |
| 870.1               | 900.1       | 7.62                                                  | 7.35  | 7.29 |
| 911.1               | 941.1       | 7.83                                                  | 7.54  | 7.46 |
| 931.5               | 961.5       | 8.02                                                  | 7.66  | 7.56 |
| 972.5               | 1002.5      | 8.28                                                  | 7.78  | 7.64 |
| 993.0               | 1023.0      | 8.45                                                  | 7.82  | 7.63 |
| 1033.9              | 1063.9      | 8.86                                                  | 7.89  | 7.62 |
| 1054.4              | 1084.4      | 8.95                                                  | 7.90  | 7.58 |
| 1095.3              | 1125.3      | 9.48                                                  | 8.08  | 7.63 |
| 1115.8              | 1145.8      | 9.74                                                  | 8.18  | 7.65 |
| 1156.8              | 1186.8      | 10.38                                                 | 8.55  | 7.85 |
| 1177.2              | 1207.2      | 10.68                                                 | 8.74  | 7.85 |
| 1218.2              | 1248.2      | 11.37                                                 | 9.29  | 8.13 |
| 1238.7              | 1268.7      | 11.52                                                 | 9.43  | 8.22 |
| 1279.6              | 1309.6      | 12.12                                                 | 9.95  | 8.64 |
| 1300.1              | 1330.1      | 12.52                                                 | 10.30 | 8.89 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | IP3 INPUT<br>(dBm) |       |       |
|---------------------|-------------|--------------------|-------|-------|
|                     |             | @LO (dBm)          |       |       |
|                     |             | +14                | +17   | +20   |
| 10.1                | 40.1        | 22.26              | 26.49 | 29.40 |
| 51.1                | 81.1        | 22.06              | 25.46 | 29.44 |
| 92.0                | 122.0       | 21.94              | 25.10 | 27.69 |
| 133.0               | 163.0       | 24.06              | 26.83 | 25.79 |
| 173.9               | 203.9       | 23.00              | 24.77 | 25.45 |
| 214.9               | 244.9       | 23.69              | 23.02 | 29.32 |
| 255.8               | 285.8       | 22.91              | 25.23 | 24.39 |
| 296.8               | 326.8       | 20.77              | 27.16 | 22.42 |
| 337.7               | 367.7       | 22.30              | 27.02 | 22.54 |
| 378.7               | 408.7       | 22.94              | 23.10 | 22.83 |
| 419.6               | 449.6       | 23.59              | 21.83 | 22.50 |
| 440.1               | 470.1       | 31.36              | 20.58 | 22.15 |
| 481.1               | 511.1       | 28.73              | 19.96 | 21.03 |
| 501.5               | 531.5       | 25.93              | 20.35 | 21.76 |
| 542.5               | 572.5       | 23.01              | 20.45 | 22.47 |
| 563.0               | 593.0       | 21.92              | 20.79 | 23.44 |
| 603.9               | 633.9       | 20.87              | 20.57 | 22.63 |
| 624.4               | 654.4       | 19.90              | 20.64 | 22.49 |
| 665.3               | 695.3       | 19.63              | 20.75 | 22.28 |
| 685.8               | 715.8       | 19.28              | 21.10 | 22.39 |
| 726.8               | 756.8       | 17.99              | 20.74 | 22.66 |
| 747.2               | 777.2       | 17.76              | 20.13 | 22.79 |
| 788.2               | 818.2       | 16.78              | 18.38 | 21.79 |
| 808.7               | 838.7       | 16.08              | 17.79 | 20.93 |
| 849.6               | 879.6       | 15.61              | 17.04 | 18.96 |
| 870.1               | 900.1       | 15.47              | 16.96 | 18.99 |
| 911.1               | 941.1       | 14.99              | 16.37 | 18.59 |
| 931.5               | 961.5       | 15.16              | 16.56 | 18.93 |
| 972.5               | 1002.5      | 15.19              | 17.20 | 20.10 |
| 993.0               | 1023.0      | 14.97              | 17.78 | 21.32 |
| 1033.9              | 1063.9      | 14.70              | 19.20 | 23.21 |
| 1054.4              | 1084.4      | 14.89              | 20.00 | 24.11 |
| 1095.3              | 1125.3      | 14.18              | 20.61 | 25.36 |
| 1115.8              | 1145.8      | 13.89              | 20.86 | 26.17 |
| 1156.8              | 1186.8      | 13.48              | 20.13 | 27.69 |
| 1177.2              | 1207.2      | 13.08              | 19.11 | 28.62 |
| 1218.2              | 1248.2      | 13.07              | 17.78 | 28.45 |
| 1238.7              | 1268.7      | 13.35              | 17.81 | 27.56 |
| 1279.6              | 1309.6      | 13.53              | 17.82 | 24.90 |
| 1300.1              | 1330.1      | 13.80              | 17.98 | 24.60 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | COMPRESSION<br>@RF IN=+14dBm<br>(dB) |       |      |
|---------------------|-------------|--------------------------------------|-------|------|
|                     |             | @LO (dBm)                            |       |      |
|                     |             | +14                                  | +17   | +20  |
| 10.1                | 40.1        | 0.65                                 | 0.28  | 0.14 |
| 51.1                | 81.1        | 0.78                                 | 0.25  | 0.13 |
| 92.0                | 122.0       | 0.53                                 | 0.24  | 0.12 |
| 133.0               | 163.0       | 0.80                                 | 0.31  | 0.17 |
| 173.9               | 203.9       | 0.49                                 | 0.22  | 0.15 |
| 214.9               | 244.9       | 0.69                                 | 0.30  | 0.19 |
| 255.8               | 285.8       | 0.76                                 | 0.36  | 0.17 |
| 296.8               | 326.8       | 0.71                                 | 0.36  | 0.19 |
| 337.7               | 367.7       | 0.89                                 | 0.33  | 0.15 |
| 378.7               | 408.7       | 0.98                                 | 0.36  | 0.15 |
| 419.6               | 449.6       | 0.99                                 | 0.40  | 0.18 |
| 440.1               | 470.1       | 1.06                                 | 0.43  | 0.19 |
| 481.1               | 511.1       | 1.04                                 | 0.39  | 0.19 |
| 501.5               | 531.5       | 1.12                                 | 0.40  | 0.18 |
| 542.5               | 572.5       | 1.08                                 | 0.36  | 0.18 |
| 563.0               | 593.0       | 1.24                                 | 0.39  | 0.21 |
| 603.9               | 633.9       | 1.20                                 | 0.38  | 0.21 |
| 624.4               | 654.4       | 1.29                                 | 0.46  | 0.25 |
| 665.3               | 695.3       | 1.35                                 | 0.49  | 0.27 |
| 685.8               | 715.8       | 1.29                                 | 0.52  | 0.26 |
| 726.8               | 756.8       | 1.40                                 | 0.55  | 0.31 |
| 747.2               | 777.2       | 1.44                                 | 0.57  | 0.33 |
| 788.2               | 818.2       | 1.43                                 | 0.58  | 0.34 |
| 808.7               | 838.7       | 1.47                                 | 0.62  | 0.35 |
| 849.6               | 879.6       | 1.57                                 | 0.72  | 0.38 |
| 870.1               | 900.1       | 1.50                                 | 0.61  | 0.35 |
| 911.1               | 941.1       | 1.56                                 | 0.66  | 0.31 |
| 931.5               | 961.5       | 1.54                                 | 0.61  | 0.26 |
| 972.5               | 1002.5      | 1.45                                 | 0.60  | 0.23 |
| 993.0               | 1023.0      | 1.41                                 | 0.65  | 0.24 |
| 1033.9              | 1063.9      | 1.32                                 | 0.71  | 0.30 |
| 1054.4              | 1084.4      | 1.19                                 | 0.70  | 0.34 |
| 1095.3              | 1125.3      | 0.84                                 | 0.74  | 0.40 |
| 1115.8              | 1145.8      | 0.68                                 | 0.74  | 0.43 |
| 1156.8              | 1186.8      | 0.14                                 | 0.57  | 0.45 |
| 1177.2              | 1207.2      | -0.07                                | 0.53  | 0.52 |
| 1218.2              | 1248.2      | -0.49                                | 0.31  | 0.55 |
| 1238.7              | 1268.7      | -0.71                                | 0.21  | 0.55 |
| 1279.6              | 1309.6      | -1.10                                | -0.03 | 0.43 |
| 1300.1              | 1330.1      | -1.25                                | -0.17 | 0.39 |

REV. X2

TUF-2H

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-2H

## Typical Performance Data

| IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=500.1MHz<br>(dB) | IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=50.1MHz<br>(dB) | IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=1000.1MHz<br>(dB) |
|----------------------|-------------|-----------------------------------------------------------------|----------------------|-------------|----------------------------------------------------------------|----------------------|-------------|------------------------------------------------------------------|
|                      |             | @LO (dBm)                                                       |                      |             | @LO (dBm)                                                      |                      |             | @LO (dBm)                                                        |
|                      |             | +17                                                             |                      |             | +17                                                            |                      |             | +17                                                              |
| 400.0                | 100.1       | 6.49                                                            | 10.0                 | 60.1        | 6.47                                                           | 950.0                | 50.1        | 7.82                                                             |
| 390.3                | 109.9       | 6.51                                                            | 30.0                 | 80.1        | 6.56                                                           | 930.0                | 70.1        | 7.77                                                             |
| 380.5                | 119.6       | 6.51                                                            | 50.0                 | 100.1       | 6.39                                                           | 910.0                | 90.1        | 7.79                                                             |
| 370.8                | 129.4       | 6.44                                                            | 70.0                 | 120.1       | 6.46                                                           | 890.0                | 110.1       | 7.61                                                             |
| 361.0                | 139.1       | 6.45                                                            | 90.0                 | 140.1       | 6.50                                                           | 870.0                | 130.1       | 7.54                                                             |
| 351.3                | 148.9       | 6.32                                                            | 110.0                | 160.1       | 6.42                                                           | 850.0                | 150.1       | 7.55                                                             |
| 341.5                | 158.6       | 6.37                                                            | 130.0                | 180.1       | 6.52                                                           | 830.0                | 170.1       | 7.57                                                             |
| 331.8                | 168.4       | 6.41                                                            | 150.0                | 200.1       | 6.50                                                           | 810.0                | 190.1       | 7.42                                                             |
| 322.0                | 178.1       | 6.32                                                            | 170.0                | 220.1       | 6.53                                                           | 790.0                | 210.1       | 7.33                                                             |
| 312.3                | 187.9       | 6.40                                                            | 190.0                | 240.1       | 6.46                                                           | 770.0                | 230.1       | 7.24                                                             |
| 302.5                | 197.6       | 6.34                                                            | 210.0                | 260.1       | 6.53                                                           | 750.0                | 250.1       | 7.24                                                             |
| 292.8                | 207.4       | 6.23                                                            | 230.0                | 280.1       | 6.64                                                           | 730.0                | 270.1       | 7.21                                                             |
| 283.0                | 217.1       | 6.25                                                            | 250.0                | 300.1       | 6.51                                                           | 710.0                | 290.1       | 7.12                                                             |
| 273.3                | 226.9       | 6.15                                                            | 270.0                | 320.1       | 6.51                                                           | 690.0                | 310.1       | 7.19                                                             |
| 263.5                | 236.6       | 6.18                                                            | 290.0                | 340.1       | 6.56                                                           | 670.0                | 330.1       | 7.17                                                             |
| 253.8                | 246.4       | 6.17                                                            | 310.0                | 360.1       | 6.58                                                           | 650.0                | 350.1       | 7.24                                                             |
| 244.0                | 256.1       | 6.11                                                            | 330.0                | 380.1       | 6.52                                                           | 630.0                | 370.1       | 7.27                                                             |
| 234.3                | 265.9       | 6.20                                                            | 350.0                | 400.1       | 6.51                                                           | 610.0                | 390.1       | 7.28                                                             |
| 224.5                | 275.6       | 6.17                                                            | 370.0                | 420.1       | 6.57                                                           | 590.0                | 410.1       | 7.35                                                             |
| 214.8                | 285.4       | 6.11                                                            | 390.0                | 440.1       | 6.45                                                           | 570.0                | 430.1       | 7.38                                                             |
| 205.0                | 295.1       | 6.17                                                            | 410.0                | 460.1       | 6.51                                                           | 550.0                | 450.1       | 7.47                                                             |
| 195.3                | 304.9       | 6.14                                                            | 430.0                | 480.1       | 6.53                                                           | 530.0                | 470.1       | 7.46                                                             |
| 185.5                | 314.6       | 6.13                                                            | 450.0                | 500.1       | 6.47                                                           | 510.0                | 490.1       | 7.50                                                             |
| 175.8                | 324.4       | 6.13                                                            | 470.0                | 520.1       | 6.41                                                           | 490.0                | 510.1       | 7.51                                                             |
| 166.0                | 334.1       | 6.16                                                            | 510.0                | 560.1       | 6.49                                                           | 450.0                | 550.1       | 7.62                                                             |
| 156.3                | 343.9       | 6.18                                                            | 530.0                | 580.1       | 6.44                                                           | 430.0                | 570.1       | 7.56                                                             |
| 146.5                | 353.6       | 6.15                                                            | 570.0                | 620.1       | 6.50                                                           | 390.0                | 610.1       | 7.59                                                             |
| 136.8                | 363.4       | 6.17                                                            | 590.0                | 640.1       | 6.49                                                           | 370.0                | 630.1       | 7.63                                                             |
| 127.0                | 373.1       | 6.25                                                            | 630.0                | 680.1       | 6.62                                                           | 330.0                | 670.1       | 7.60                                                             |
| 117.3                | 382.9       | 6.18                                                            | 650.0                | 700.1       | 6.63                                                           | 310.0                | 690.1       | 7.66                                                             |
| 107.5                | 392.6       | 6.18                                                            | 690.0                | 740.1       | 6.63                                                           | 270.0                | 730.1       | 7.65                                                             |
| 97.8                 | 402.4       | 6.23                                                            | 710.0                | 760.1       | 6.67                                                           | 250.0                | 750.1       | 7.70                                                             |
| 88.0                 | 412.1       | 6.21                                                            | 750.0                | 800.1       | 6.67                                                           | 210.0                | 790.1       | 7.79                                                             |
| 78.3                 | 421.9       | 6.19                                                            | 770.0                | 820.1       | 6.61                                                           | 190.0                | 810.1       | 7.83                                                             |
| 68.5                 | 431.6       | 6.23                                                            | 810.0                | 860.1       | 6.58                                                           | 150.0                | 850.1       | 7.96                                                             |
| 58.8                 | 441.4       | 6.25                                                            | 830.0                | 880.1       | 6.52                                                           | 130.0                | 870.1       | 7.96                                                             |
| 49.0                 | 451.1       | 6.26                                                            | 870.0                | 920.1       | 6.41                                                           | 90.0                 | 910.1       | 8.01                                                             |
| 39.3                 | 460.9       | 6.26                                                            | 890.0                | 940.1       | 6.40                                                           | 70.0                 | 930.1       | 8.02                                                             |
| 19.8                 | 480.4       | 6.35                                                            | 930.0                | 980.1       | 6.35                                                           | 30.0                 | 970.1       | 8.02                                                             |
| 10.0                 | 490.1       | 6.35                                                            | 950.0                | 1000.1      | 6.32                                                           | 10.0                 | 990.1       | 7.93                                                             |

REV. X2

TUF-2H

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



# Frequency Mixer

TUF-2H

## 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   |
| 10.1        | 70.94                   | 74.41 | 77.00 | 61.80                   | 62.70 | 62.57 |
| 51.1        | 59.58                   | 61.76 | 63.70 | 58.56                   | 61.13 | 62.32 |
| 92.0        | 54.72                   | 56.70 | 58.69 | 55.36                   | 59.26 | 60.73 |
| 133.0       | 51.54                   | 53.70 | 55.84 | 52.66                   | 57.79 | 58.69 |
| 173.9       | 49.31                   | 51.39 | 53.46 | 50.64                   | 55.36 | 57.73 |
| 214.9       | 47.65                   | 49.77 | 52.06 | 48.67                   | 53.89 | 55.66 |
| 255.8       | 46.20                   | 48.52 | 50.91 | 46.94                   | 52.27 | 51.68 |
| 296.8       | 45.07                   | 47.28 | 49.99 | 45.67                   | 49.91 | 49.69 |
| 337.7       | 44.10                   | 46.34 | 49.00 | 44.42                   | 46.40 | 47.10 |
| 378.7       | 43.07                   | 45.77 | 48.27 | 43.19                   | 43.68 | 45.07 |
| 419.6       | 42.19                   | 45.45 | 48.32 | 41.98                   | 42.27 | 44.30 |
| 440.1       | 41.91                   | 45.26 | 48.25 | 40.44                   | 41.09 | 43.19 |
| 481.1       | 41.23                   | 44.05 | 46.60 | 39.21                   | 39.96 | 41.81 |
| 501.5       | 40.70                   | 43.75 | 46.04 | 38.09                   | 39.19 | 41.03 |
| 542.5       | 39.97                   | 42.45 | 44.60 | 36.96                   | 37.84 | 39.41 |
| 563.0       | 39.62                   | 41.77 | 43.92 | 36.07                   | 37.16 | 38.63 |
| 603.9       | 39.31                   | 41.20 | 43.40 | 35.15                   | 36.61 | 38.09 |
| 624.4       | 39.06                   | 40.90 | 43.26 | 34.40                   | 36.07 | 37.79 |
| 665.3       | 39.11                   | 41.05 | 43.23 | 33.39                   | 35.26 | 37.35 |
| 685.8       | 38.98                   | 41.24 | 43.32 | 32.97                   | 35.02 | 37.07 |
| 726.8       | 39.34                   | 42.45 | 44.86 | 32.24                   | 34.36 | 36.26 |
| 747.2       | 39.51                   | 42.97 | 45.53 | 31.94                   | 34.09 | 35.89 |
| 788.2       | 39.67                   | 43.16 | 45.62 | 31.54                   | 33.58 | 35.11 |
| 808.7       | 39.66                   | 42.80 | 44.90 | 31.21                   | 33.29 | 34.65 |
| 849.6       | 39.90                   | 42.55 | 43.90 | 30.63                   | 32.72 | 33.75 |
| 870.1       | 39.40                   | 41.79 | 43.11 | 30.11                   | 32.22 | 33.54 |
| 911.1       | 38.93                   | 40.69 | 41.46 | 29.52                   | 31.53 | 32.85 |
| 931.5       | 38.57                   | 40.02 | 40.79 | 29.20                   | 31.14 | 32.49 |
| 972.5       | 37.80                   | 39.09 | 40.11 | 28.49                   | 30.16 | 31.48 |
| 993.0       | 37.22                   | 38.45 | 39.55 | 28.27                   | 29.88 | 31.12 |
| 1033.9      | 36.41                   | 38.02 | 39.27 | 27.56                   | 29.04 | 30.08 |
| 1054.4      | 35.55                   | 37.24 | 38.80 | 27.19                   | 28.45 | 29.63 |
| 1095.3      | 34.37                   | 36.15 | 37.64 | 26.67                   | 27.74 | 28.78 |
| 1115.8      | 33.79                   | 35.65 | 37.17 | 26.32                   | 27.41 | 28.42 |
| 1156.8      | 32.63                   | 34.44 | 36.07 | 25.84                   | 26.66 | 27.60 |
| 1177.2      | 32.28                   | 33.93 | 35.45 | 25.65                   | 26.40 | 27.30 |
| 1218.2      | 31.57                   | 33.17 | 34.81 | 25.21                   | 25.83 | 26.61 |
| 1238.7      | 31.12                   | 32.79 | 34.48 | 24.93                   | 25.60 | 26.37 |
| 1279.6      | 30.72                   | 32.22 | 33.80 | 24.70                   | 25.28 | 25.91 |
| 1300.1      | 30.52                   | 32.09 | 33.63 | 24.57                   | 25.33 | 25.93 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | RF-IF ISOLATION<br>(dB) |       |       |
|---------------------|-------------|-------------------------|-------|-------|
|                     |             | @LO (dBm)               |       |       |
|                     |             | +14                     | +17   | +20   |
| 10.1                | 40.1        | 47.85                   | 48.27 | 47.51 |
| 51.1                | 81.1        | 33.41                   | 33.69 | 33.99 |
| 92.0                | 122.0       | 28.69                   | 28.99 | 29.35 |
| 133.0               | 163.0       | 25.89                   | 26.38 | 26.65 |
| 173.9               | 203.9       | 23.97                   | 24.42 | 24.83 |
| 214.9               | 244.9       | 22.67                   | 23.31 | 23.66 |
| 255.8               | 285.8       | 21.96                   | 22.51 | 23.01 |
| 296.8               | 326.8       | 21.38                   | 22.12 | 22.50 |
| 337.7               | 367.7       | 20.91                   | 22.03 | 22.42 |
| 378.7               | 408.7       | 20.67                   | 21.84 | 22.48 |
| 419.6               | 449.6       | 20.58                   | 21.64 | 22.43 |
| 440.1               | 470.1       | 20.98                   | 21.93 | 22.81 |
| 481.1               | 511.1       | 21.36                   | 21.95 | 22.46 |
| 501.5               | 531.5       | 21.96                   | 22.48 | 22.67 |
| 542.5               | 572.5       | 22.32                   | 23.03 | 23.15 |
| 563.0               | 593.0       | 22.44                   | 22.95 | 23.19 |
| 603.9               | 633.9       | 22.28                   | 22.61 | 23.13 |
| 624.4               | 654.4       | 21.65                   | 21.99 | 22.79 |
| 665.3               | 695.3       | 20.12                   | 20.56 | 21.45 |
| 685.8               | 715.8       | 19.30                   | 19.68 | 20.55 |
| 726.8               | 756.8       | 17.63                   | 17.89 | 18.36 |
| 747.2               | 777.2       | 17.06                   | 17.13 | 17.38 |
| 788.2               | 818.2       | 15.97                   | 15.75 | 15.60 |
| 808.7               | 838.7       | 15.55                   | 15.36 | 15.17 |
| 849.6               | 879.6       | 14.92                   | 14.60 | 14.40 |
| 870.1               | 900.1       | 14.57                   | 14.19 | 13.93 |
| 911.1               | 941.1       | 14.18                   | 13.74 | 13.53 |
| 931.5               | 961.5       | 13.93                   | 13.51 | 13.36 |
| 972.5               | 1002.5      | 13.65                   | 13.27 | 13.07 |
| 993.0               | 1023.0      | 13.55                   | 13.15 | 12.91 |
| 1033.9              | 1063.9      | 13.36                   | 12.91 | 12.56 |
| 1054.4              | 1084.4      | 13.23                   | 12.76 | 12.37 |
| 1095.3              | 1125.3      | 13.03                   | 12.53 | 12.16 |
| 1115.8              | 1145.8      | 12.86                   | 12.40 | 12.04 |
| 1156.8              | 1186.8      | 12.57                   | 12.19 | 11.89 |
| 1177.2              | 1207.2      | 12.44                   | 12.14 | 11.89 |
| 1218.2              | 1248.2      | 12.18                   | 12.04 | 11.93 |
| 1238.7              | 1268.7      | 12.06                   | 12.02 | 12.01 |
| 1279.6              | 1309.6      | 11.80                   | 11.91 | 12.05 |
| 1300.1              | 1330.1      | 11.63                   | 11.78 | 11.96 |

REV. X2

TUF-2H

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-2H

## 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=1000.1MHz<br>(:1) |      |      |
|---------------------|-------------|-----------------|------|------|-------------|-----------------|------|------|----------------------|----------------------------------|------|------|
|                     |             | @LO (dBm)       |      |      |             | @LO (dBm)       |      |      |                      | @LO (dBm)                        |      |      |
|                     |             | +14             | +17  | +20  |             | +14             | +17  | +20  |                      | +14                              | +17  | +20  |
| 10.1                | 40.1        | 1.34            | 1.14 | 1.07 | 10.1        | 1.09            | 1.49 | 2.09 | 10.0                 | 2.90                             | 2.34 | 2.10 |
| 51.1                | 81.1        | 1.36            | 1.16 | 1.05 | 51.1        | 1.06            | 1.53 | 2.29 | 30.2                 | 2.69                             | 2.14 | 1.91 |
| 92.0                | 122.0       | 1.38            | 1.17 | 1.05 | 92.0        | 1.04            | 1.47 | 2.17 | 50.4                 | 2.56                             | 2.03 | 1.80 |
| 133.0               | 163.0       | 1.35            | 1.15 | 1.04 | 133.0       | 1.06            | 1.49 | 2.22 | 70.6                 | 2.58                             | 2.05 | 1.82 |
| 173.9               | 203.9       | 1.35            | 1.17 | 1.06 | 173.9       | 1.05            | 1.45 | 2.10 | 90.8                 | 2.59                             | 2.06 | 1.84 |
| 214.9               | 244.9       | 1.35            | 1.15 | 1.07 | 214.9       | 1.05            | 1.46 | 2.13 | 111.0                | 2.64                             | 2.11 | 1.88 |
| 255.8               | 285.8       | 1.34            | 1.15 | 1.09 | 255.8       | 1.06            | 1.45 | 2.12 | 131.2                | 2.71                             | 2.16 | 1.92 |
| 296.8               | 326.8       | 1.36            | 1.15 | 1.10 | 296.8       | 1.06            | 1.43 | 2.07 | 151.4                | 2.65                             | 2.11 | 1.89 |
| 337.7               | 367.7       | 1.34            | 1.14 | 1.11 | 337.7       | 1.06            | 1.46 | 2.13 | 171.6                | 2.56                             | 2.05 | 1.83 |
| 378.7               | 408.7       | 1.31            | 1.12 | 1.13 | 378.7       | 1.07            | 1.42 | 2.10 | 191.8                | 2.63                             | 2.11 | 1.89 |
| 419.6               | 449.6       | 1.31            | 1.11 | 1.13 | 419.6       | 1.08            | 1.44 | 2.10 | 212.0                | 2.68                             | 2.16 | 1.94 |
| 440.1               | 470.1       | 1.28            | 1.11 | 1.14 | 440.1       | 1.08            | 1.45 | 2.10 | 232.2                | 2.61                             | 2.11 | 1.89 |
| 481.1               | 511.1       | 1.28            | 1.10 | 1.12 | 481.1       | 1.08            | 1.42 | 2.06 | 252.4                | 2.59                             | 2.09 | 1.87 |
| 501.5               | 531.5       | 1.25            | 1.11 | 1.13 | 501.5       | 1.11            | 1.44 | 2.07 | 272.7                | 2.66                             | 2.15 | 1.94 |
| 542.5               | 572.5       | 1.25            | 1.12 | 1.14 | 542.5       | 1.11            | 1.46 | 2.09 | 292.9                | 2.64                             | 2.16 | 1.96 |
| 563.0               | 593.0       | 1.23            | 1.12 | 1.15 | 563.0       | 1.12            | 1.46 | 2.08 | 313.1                | 2.59                             | 2.12 | 1.92 |
| 603.9               | 633.9       | 1.23            | 1.13 | 1.16 | 603.9       | 1.13            | 1.46 | 2.08 | 333.3                | 2.65                             | 2.16 | 1.96 |
| 624.4               | 654.4       | 1.22            | 1.14 | 1.17 | 624.4       | 1.14            | 1.47 | 2.10 | 353.5                | 2.66                             | 2.19 | 1.99 |
| 665.3               | 695.3       | 1.21            | 1.14 | 1.17 | 665.3       | 1.15            | 1.47 | 2.07 | 373.7                | 2.59                             | 2.14 | 1.96 |
| 685.8               | 715.8       | 1.19            | 1.14 | 1.19 | 685.8       | 1.16            | 1.48 | 2.07 | 393.9                | 2.59                             | 2.14 | 1.95 |
| 726.8               | 756.8       | 1.17            | 1.13 | 1.17 | 726.8       | 1.17            | 1.50 | 2.09 | 434.3                | 2.60                             | 2.16 | 2.00 |
| 747.2               | 777.2       | 1.16            | 1.12 | 1.17 | 747.2       | 1.18            | 1.53 | 2.11 | 454.5                | 2.58                             | 2.13 | 1.97 |
| 788.2               | 818.2       | 1.14            | 1.09 | 1.13 | 788.2       | 1.19            | 1.51 | 2.08 | 494.9                | 2.63                             | 2.19 | 2.03 |
| 808.7               | 838.7       | 1.12            | 1.08 | 1.12 | 808.7       | 1.21            | 1.53 | 2.10 | 515.1                | 2.54                             | 2.11 | 1.96 |
| 849.6               | 879.6       | 1.12            | 1.05 | 1.07 | 849.6       | 1.21            | 1.56 | 2.10 | 555.5                | 2.61                             | 2.18 | 2.02 |
| 870.1               | 900.1       | 1.12            | 1.05 | 1.07 | 870.1       | 1.23            | 1.53 | 2.09 | 575.7                | 2.59                             | 2.17 | 2.02 |
| 911.1               | 941.1       | 1.16            | 1.09 | 1.10 | 911.1       | 1.24            | 1.55 | 2.11 | 616.1                | 2.57                             | 2.13 | 1.97 |
| 931.5               | 961.5       | 1.19            | 1.12 | 1.13 | 931.5       | 1.25            | 1.58 | 2.15 | 636.3                | 2.55                             | 2.13 | 1.98 |
| 972.5               | 1002.5      | 1.26            | 1.20 | 1.22 | 972.5       | 1.27            | 1.56 | 2.09 | 676.7                | 2.60                             | 2.15 | 1.99 |
| 993.0               | 1023.0      | 1.30            | 1.24 | 1.26 | 993.0       | 1.28            | 1.56 | 2.09 | 696.9                | 2.63                             | 2.17 | 2.00 |
| 1033.9              | 1063.9      | 1.40            | 1.34 | 1.35 | 1033.9      | 1.30            | 1.59 | 2.09 | 737.3                | 2.50                             | 2.05 | 1.88 |
| 1054.4              | 1084.4      | 1.43            | 1.37 | 1.38 | 1054.4      | 1.31            | 1.57 | 2.09 | 757.6                | 2.57                             | 2.12 | 1.93 |
| 1095.3              | 1125.3      | 1.55            | 1.47 | 1.47 | 1095.3      | 1.33            | 1.60 | 2.10 | 798.0                | 2.55                             | 2.07 | 1.87 |
| 1115.8              | 1145.8      | 1.61            | 1.51 | 1.51 | 1115.8      | 1.34            | 1.62 | 2.14 | 818.2                | 2.52                             | 2.04 | 1.83 |
| 1156.8              | 1186.8      | 1.73            | 1.62 | 1.60 | 1156.8      | 1.35            | 1.64 | 2.14 | 858.6                | 2.48                             | 2.01 | 1.81 |
| 1177.2              | 1207.2      | 1.79            | 1.67 | 1.64 | 1177.2      | 1.36            | 1.66 | 2.15 | 878.8                | 2.52                             | 2.04 | 1.81 |
| 1218.2              | 1248.2      | 1.91            | 1.79 | 1.74 | 1218.2      | 1.37            | 1.69 | 2.17 | 919.2                | 2.49                             | 1.99 | 1.74 |
| 1238.7              | 1268.7      | 1.96            | 1.84 | 1.79 | 1238.7      | 1.37            | 1.69 | 2.18 | 939.4                | 2.40                             | 1.92 | 1.68 |
| 1279.6              | 1309.6      | 2.08            | 1.96 | 1.89 | 1279.6      | 1.39            | 1.71 | 2.20 | 979.8                | 2.48                             | 1.99 | 1.73 |
| 1300.1              | 1330.1      | 2.13            | 2.01 | 1.94 | 1300.1      | 1.40            | 1.74 | 2.22 | 1000.0               | 2.21                             | 1.86 | 1.77 |

REV. X2

TUF-2H

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  | 31  | 16  | 30  | 40  | 39  | 33  | 36  | 41  | 56  |
| 1  | -      | 16     | +0  | 23  | 13  | 32  | 28  | 37  | 38  | 32  | 41  | 36  |
| 2  | 90     | 59     | 51  | 54  | 50  | 61  | 48  | 58  | 84  | 75  | 59  | 57  |
| 3  | >100   | 64     | 52  | 77  | 51  | 63  | 50  | 68  | 56  | 71  | 65  | 64  |
| 4  | >100   | 80     | >93 | 82  | 89  | 87  | 86  | 84  | >93 | 89  | 86  | 92  |
| 5  | >100   | >93    | 86  | 87  | 83  | 87  | 80  | 83  | 79  | 88  | 86  | >93 |
| 6  | >100   | >93    | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | 93  | >93 |
| 7  | >100   | >93    | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 |
| 8  | >100   | >93    | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 |
| 9  | >100   | >93    | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 |
| 10 | >100   | >93    | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 |
|    | RF CAL | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |

### LO HARMONICS ORDER

Test conditions: RF IN: 500.1 MHz; -1.00 dBm.  
LO IN: 530.01 MHz; +17.00 dBm  
IF OUT: 29.91 MHz; -7.4 dBm

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |    |    |      |     |    |      |    |    |    |    |
|----|--------|--------|----|----|------|-----|----|------|----|----|----|----|
| 0  | -      | -      | 25 | 44 | 29   | 48  | 53 | 50   | 55 | 48 | 64 | 69 |
| 1  | -      | 16     | +0 | 25 | 13   | 32  | 28 | 41   | 45 | 40 | 52 | 41 |
| 2  | 74     | 58     | 46 | 52 | 43   | 64  | 42 | 55   | 65 | 66 | 56 | 59 |
| 3  | >100   | 49     | 37 | 52 | 38   | 46  | 37 | 58   | 50 | 52 | 51 | 48 |
| 4  | >100   | 65     | 65 | 66 | 60   | 61  | 59 | 64   | 56 | 64 | 77 | 77 |
| 5  | >100   | 83     | 53 | 60 | 50   | 62  | 49 | 56   | 48 | 68 | 55 | 70 |
| 6  | >100   | 83     | 80 | 73 | 75   | 72  | 69 | 72   | 69 | 71 | 68 | 77 |
| 7  | >100   | 77     | 86 | 80 | 65   | 66  | 62 | 68   | 62 | 65 | 61 | 73 |
| 8  | >100   | 91     | 97 | 89 | 89   | 85  | 81 | 86   | 77 | 81 | 76 | 79 |
| 9  | >100   | 91     | 93 | 92 | 90   | 82  | 75 | 72   | 70 | 73 | 71 | 72 |
| 10 | >100   | 91     | 94 | 96 | >103 | 101 | 96 | >103 | 85 | 99 | 83 | 86 |
|    | RF CAL | 0      | 1  | 2  | 3    | 4   | 5  | 6    | 7  | 8  | 9  | 10 |

### LO HARMONICS ORDER

Test conditions: RF IN: 500.1 MHz; 9.00 dBm.  
LO IN: 530.01 MHz; +17.00 dBm  
IF OUT: 29.91 MHz; 2.61 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-2H  
100818  
Page 5 of 5

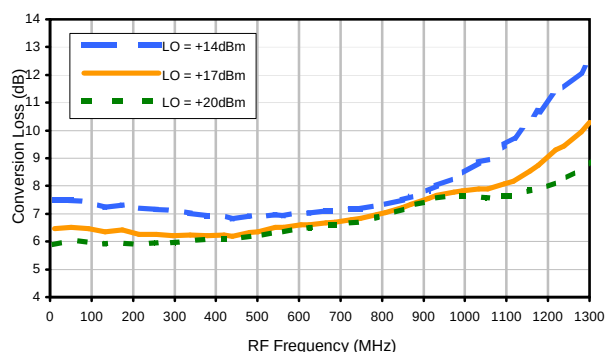


# Frequency Mixer

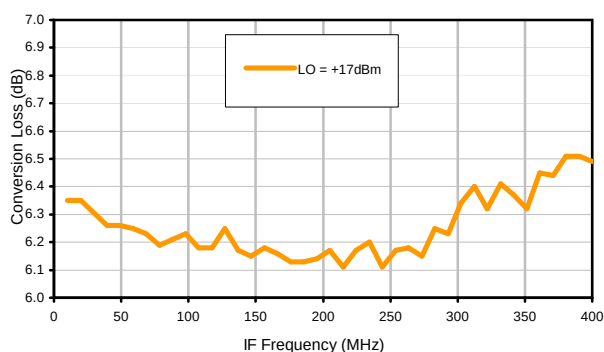
TUF-2H

## Typical Performance Curves

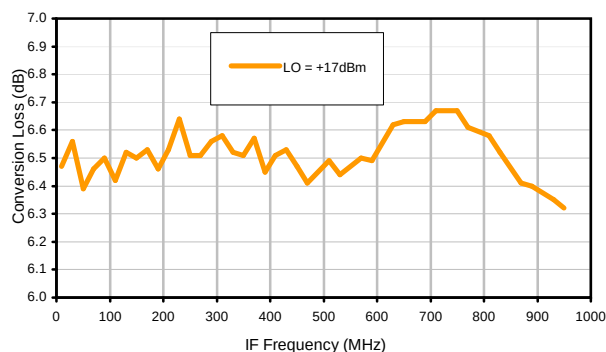
Conversion Loss @ IF=30MHz



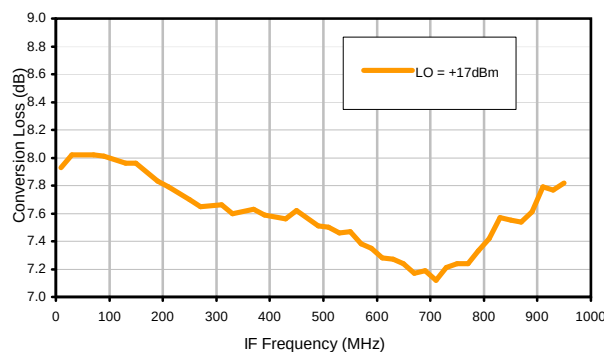
Conversion Loss vs. IF @ RF=500.1MHz



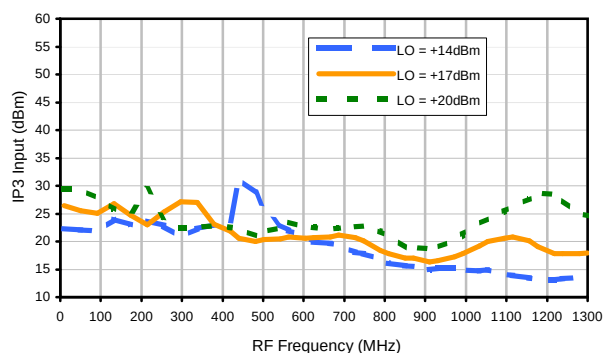
Conversion Loss vs. IF @ RF=50.1MHz



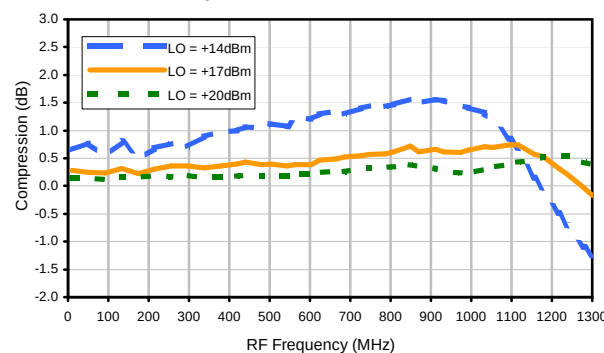
Conversion Loss vs. IF @ RF=1000.1MHz



IP3 Input



Compression @ RF IN=+14dBm



REV. X2

TUF-2H

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

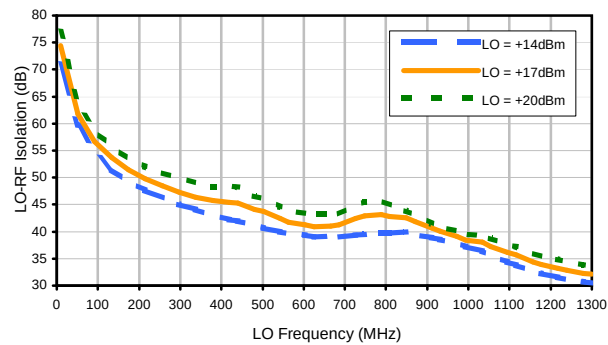


The Design Engineers Search Engine finds the model you need, instantly • For detailed performance specs & shopping online see

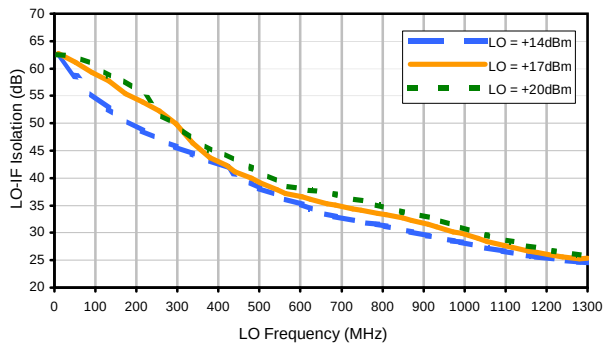


## Typical Performance Curves

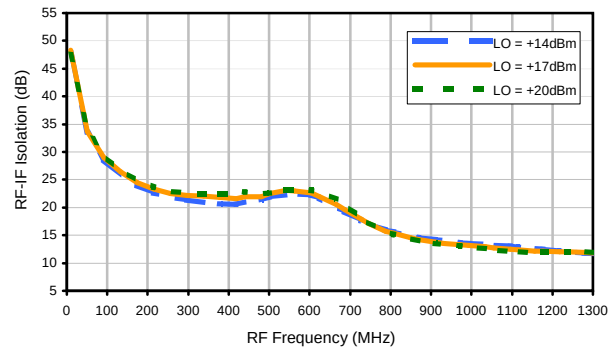
LO-RF Isolation



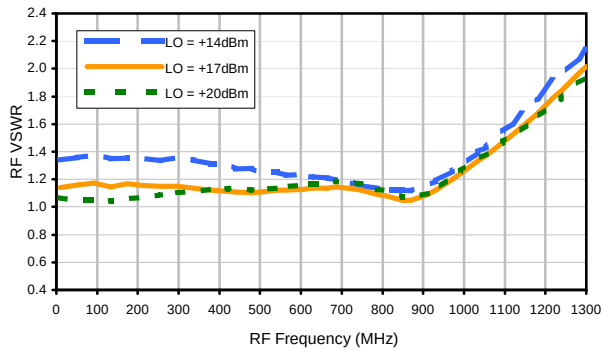
LO-IF Isolation



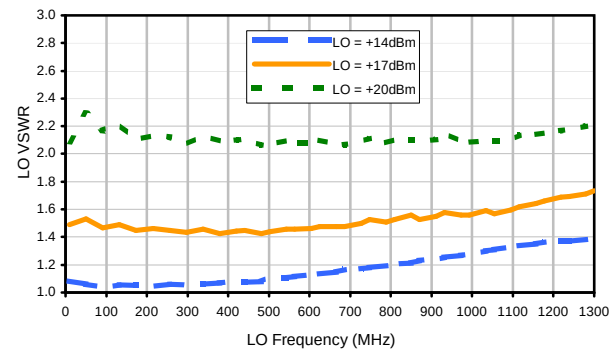
RF-IF Isolation



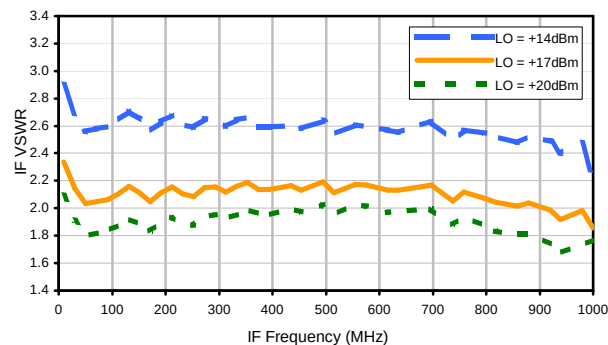
RF VSWR



LO VSWR



IF VSWR



REV. X2

TUF-2H

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  | 31  | 16  | 30  | 40  | 39  | 33  | 36  | 41  | 56  |
| 1  | -      | 16     | +0  | 23  | 13  | 32  | 28  | 37  | 38  | 32  | 41  | 36  |
| 2  | 90     | 59     | 51  | 54  | 50  | 61  | 48  | 58  | 84  | 75  | 59  | 57  |
| 3  | >100   | 64     | 52  | 77  | 51  | 63  | 50  | 68  | 56  | 71  | 65  | 64  |
| 4  | >100   | 80     | >93 | 82  | 89  | 87  | 86  | 84  | >93 | 89  | 86  | 92  |
| 5  | >100   | >93    | 86  | 87  | 83  | 87  | 80  | 83  | 79  | 88  | 86  | >93 |
| 6  | >100   | >93    | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | 93  | >93 |
| 7  | >100   | >93    | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 |
| 8  | >100   | >93    | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 |
| 9  | >100   | >93    | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 |
| 10 | >100   | >93    | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 |
|    | RF CAL | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |

### LO HARMONICS ORDER

Test conditions: RF IN: 500.1 MHz; -1.00 dBm.  
LO IN: 530.01 MHz; +17.00 dBm  
IF OUT: 29.91 MHz; -7.4 dBm

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |    |    |      |     |    |      |    |    |    |    |
|----|--------|--------|----|----|------|-----|----|------|----|----|----|----|
| 0  | -      | -      | 25 | 44 | 29   | 48  | 53 | 50   | 55 | 48 | 64 | 69 |
| 1  | -      | 16     | +0 | 25 | 13   | 32  | 28 | 41   | 45 | 40 | 52 | 41 |
| 2  | 74     | 58     | 46 | 52 | 43   | 64  | 42 | 55   | 65 | 66 | 56 | 59 |
| 3  | >100   | 49     | 37 | 52 | 38   | 46  | 37 | 58   | 50 | 52 | 51 | 48 |
| 4  | >100   | 65     | 65 | 66 | 60   | 61  | 59 | 64   | 56 | 64 | 77 | 77 |
| 5  | >100   | 83     | 53 | 60 | 50   | 62  | 49 | 56   | 48 | 68 | 55 | 70 |
| 6  | >100   | 83     | 80 | 73 | 75   | 72  | 69 | 72   | 69 | 71 | 68 | 77 |
| 7  | >100   | 77     | 86 | 80 | 65   | 66  | 62 | 68   | 62 | 65 | 61 | 73 |
| 8  | >100   | 91     | 97 | 89 | 89   | 85  | 81 | 86   | 77 | 81 | 76 | 79 |
| 9  | >100   | 91     | 93 | 92 | 90   | 82  | 75 | 72   | 70 | 73 | 71 | 72 |
| 10 | >100   | 91     | 94 | 96 | >103 | 101 | 96 | >103 | 85 | 99 | 83 | 86 |
|    | RF CAL | 0      | 1  | 2  | 3    | 4   | 5  | 6    | 7  | 8  | 9  | 10 |

### LO HARMONICS ORDER

Test conditions: RF IN: 500.1 MHz; 9.00 dBm.  
LO IN: 530.01 MHz; +17.00 dBm  
IF OUT: 29.91 MHz; 2.61 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-2H  
100818

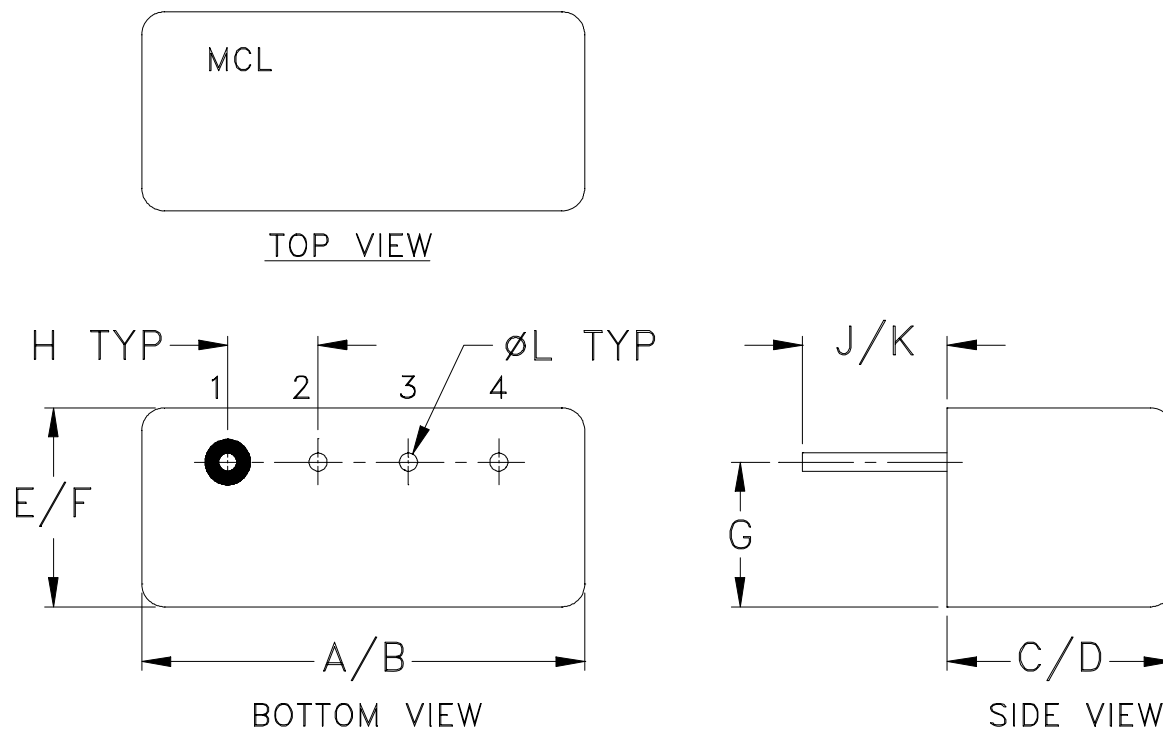
Page 3 of 3



**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



All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

| Specification                  | Test/Inspection Condition                                                                                                                                       | Reference/Spec                                                                                       |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Operating Temperature          | -55° to 100°C<br>Ambient Environment                                                                                                                            | Individual Model Data Sheet                                                                          |
| Storage Temperature            | -55° to 100° C<br>Ambient Environment                                                                                                                           | Individual Model Data Sheet                                                                          |
| Thermal Shock                  | -55° to 100°C, 100 cycles                                                                                                                                       | MIL-STD-202, Method 107, Condition A-3, except +100°C                                                |
| Vibration (High Frequency)     | 20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)                                                                             | MIL-STD-202, Method 204, Condition D                                                                 |
| Mechanical Shock               | 50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes                                                                                               | MIL-STD-202, Method 213, Condition A                                                                 |
| Moisture Resistance            | 10 cycles, 24 hours per cycle                                                                                                                                   | MIL-STD-202, Method 106, Condition A, except 50°C and end point electrical test done within 12 hours |
| Solderability                  | 10X Magnification                                                                                                                                               | J-STD-002, 95% Coverage                                                                              |
| Resistance to Solder Heat      | 260°C for 10 seconds                                                                                                                                            | MIL-STD-202, Method 210, Condition B                                                                 |
| Marking Resistance to Solvents | Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C;<br>distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C | MIL-STD-202, Method 215                                                                              |
| Terminal Strength              | 4 1/2 Pound Pull                                                                                                                                                | MIL-STD-202, Method 211, Condition A                                                                 |



## Environmental Specifications

# ENV30

All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

| Specification       | Test/Inspection Condition | Reference/Spec                       |
|---------------------|---------------------------|--------------------------------------|
| Barometric Pressure | 100,000 Feet              | MIL-STD-202, Method 105, Condition D |