

# FREQUENCY MIXERS

Surface Mount

High IP3 (up to 38 dBm)

140 to 3600 MHz



HJK



HUD

| MODEL NO.  | FREQUENCY (MHz) |           |         | IP3 (dBm) | LO level (dBm) | RF @ 1dB compr. (dBm) | CONVERSION LOSS (dB) |          |      | LO-RF ISOLATION (dB) |      | LO-IF ISOLATION (dB) |      | CASE STYLE | CONNECTION | PRICE \$ |
|------------|-----------------|-----------|---------|-----------|----------------|-----------------------|----------------------|----------|------|----------------------|------|----------------------|------|------------|------------|----------|
|            | RF              | LO        | IF      |           |                |                       | Typ.                 | $\sigma$ | Max. | Typ.                 | Min. | Typ.                 | Min. |            |            |          |
| HJK-9      | 818-853         | 753-778   | 40-100  | 22        | 7              | 10                    | 7.1                  | 0.3      | 8.7  | 36                   | 24   | 26                   | 20   | TTT167     | x          | 10.95    |
| HJK-19     | 1850-1910       | 1780-1840 | 70-130  | 21        | 7              | 10                    | 8.0                  | 0.2      | 9.5  | 30                   | 20   | 24                   | 16   | TTT167     | x          | 10.95    |
| HJK-21     | 1850-1910       | 2090-2150 | 180-300 | 22        | 7              | 10                    | 7.5                  | 0.3      | 9.5  | 28                   | 18   | 19                   | 13   | TTT167     | x          | 10.95    |
| HJK-9LH    | 818-853         | 753-778   | 40-100  | 27        | 10             | 13                    | 6.7                  | 0.2      | 8.0  | 37                   | 24   | 27                   | 20   | TTT167     | x          | 12.95    |
| HJK-19LH   | 1850-1910       | 1780-1840 | 70-130  | 25        | 10             | 13                    | 7.5                  | 0.2      | 9.4  | 30                   | 20   | 23                   | 15   | TTT167     | x          | 12.95    |
| HJK-21LH   | 1850-1910       | 2090-2150 | 180-300 | 25        | 10             | 13                    | 7.2                  | 0.3      | 8.9  | 28                   | 20   | 19                   | 13   | TTT167     | x          | 12.95    |
| HJK-9MH    | 818-853         | 753-778   | 40-100  | 31        | 13             | 16                    | 6.7                  | 0.2      | 8.0  | 37                   | 24   | 27                   | 20   | TTT167     | x          | 14.95    |
| HJK-19MH   | 1850-1910       | 1780-1840 | 70-130  | 30        | 13             | 16                    | 7.4                  | 0.2      | 8.9  | 30                   | 20   | 23                   | 15   | TTT167     | x          | 14.95    |
| HJK-21MH   | 1850-1910       | 2090-2150 | 180-300 | 29        | 13             | 16                    | 7.2                  | 0.2      | 8.9  | 29                   | 20   | 19                   | 13   | TTT167     | x          | 14.95    |
| HJK-3H*    | 140-180         | 160       | 0.5-20  | 37        | 16             | 19                    | 8.0                  | 0.1      | 9.2  | 44                   | 35   | 44                   | 30   | TTT167     | x          | 16.95    |
| HUD-3H*    | 140-180         | 160       | 0.5-20  | 37        | 16             | 19                    | 8.1                  | 0.1      | 9.2  | 47                   | 40   | 45                   | 38   | BK276      | mx         | 15.95    |
| HJK-9H     | 818-853         | 753-778   | 40-100  | 33        | 17             | 20                    | 6.7                  | 0.2      | 8.0  | 35                   | 24   | 31                   | 23   | TTT167     | x          | 16.95    |
| HJK-19H    | 1850-1910       | 1780-1840 | 70-130  | 34        | 17             | 20                    | 7.7                  | 0.2      | 8.9  | 28                   | 20   | 22                   | 16   | TTT167     | x          | 16.95    |
| HJK-21H    | 1850-1910       | 2090-2150 | 180-300 | 36        | 17             | 20                    | 7.6                  | 0.2      | 8.9  | 28                   | 20   | 25                   | 18   | TTT167     | x          | 16.95    |
| ◆HUD-19SH* | 1819-1910       | 1710-1769 | 50-200  | 38        | 19             | 22                    | 7.5                  | 0.2      | 8.9  | 38                   | 27   | 36                   | 25   | BK276      | mx         | 19.95    |

## features

- high IP3, up to 38 dBm
- compression, 3 dB higher than LO power

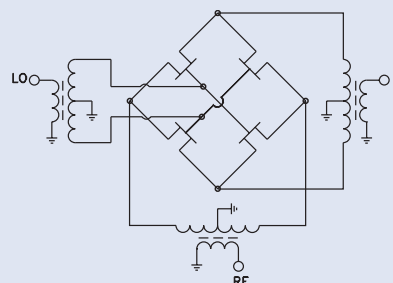
## applications

- base stations
- communication systems, cellular, PCS

## NOTES:

- $\bar{x}$  Average of conversion loss at center of mid-band frequency ( $f_L + f_U/4$ )  
 $\sigma$  Standard deviation  
 ◆ Aqueous washable  
 \* Patent pending  
 A. Environmental specifications and re-flow soldering information available in General Information Section.  
 B. Units are non-hermetic unless otherwise noted. For details on case dimensions & finishes see "Case Styles & Outline Drawings".  
 C. Prices and Specifications subject to change without notice.  
 1. Absolute maximum power, voltage and current ratings:  
 1a. LO & RF power: 16 dBm for level 7,10,13  
 19 dBm for level 16  
 20 dBm for level 17  
 22 dBm for level 19  
 2. For MCA models: operating temperature: -55°C to 100°C  
 storage temperature: -55°C to 125°C

## electrical schematic



## pin connections

see case style outline drawings

| PORT       | x     | mx         | ld         |
|------------|-------|------------|------------|
| LO         | 2     | 1          | 10         |
| RF         | 1     | 8          | 5          |
| IF         | 3     | 5          | 3          |
| GND EXT.   | 4,5,6 | all others | all others |
| DEMO BOARD | TB-12 | TB-107     | TB-144     |

**NEW!**



MCA

| MODEL<br>NO. | FREQUENCY<br>(MHz) |           |         | IP3<br>(dBm) | LO<br>level<br>(dBm) | RF<br>@ 1dB<br>compr.<br>(dBm) | CONVERSION<br>LOSS<br>(dB) |      | LO-RF<br>ISOLATION<br>(dB) |      | LO-IF<br>ISOLATION<br>(dB) |      | E**<br>FACTOR | CASE<br>STYLE | CON-<br>NECT-<br>ION | PRICE<br>\$ |
|--------------|--------------------|-----------|---------|--------------|----------------------|--------------------------------|----------------------------|------|----------------------------|------|----------------------------|------|---------------|---------------|----------------------|-------------|
|              | RF                 | LO        | IF      |              |                      |                                | Typ.                       | Max. | Typ.                       | Min. | Typ.                       | Min. |               |               |                      |             |
| MCA-19FLH*   | 1850-1910          | 1760-1820 | 70-130  | 25           | 10                   | 10                             | 6.9                        | 8.8  | 40                         | 22   | 39                         | 20   | 1.5           | DZ883         | Id                   | 9.95        |
| MCA-30FLH*   | 2960-3060          | 2780-2880 | 130-230 | 25           | 10                   | 10                             | 7.5                        | 8.9  | 35                         | 20   | 27                         | 15   | 1.5           | DZ883         | Id                   | 9.95        |
| MCA-36FLH*   | 3500-3600          | 3070-3170 | 380-480 | 25           | 10                   | 10                             | 8.4                        | 9.4  | 40                         | 20   | 28                         | 15   | 1.5           | DZ883         | Id                   | 9.95        |
| MCA-19FMH*   | 1850-1910          | 1760-1820 | 70-130  | 30           | 13                   | 13                             | 6.9                        | 8.4  | 40                         | 22   | 39                         | 20   | 1.7           | DZ883         | Id                   | 10.95       |
| MCA-30FMH*   | 2960-3060          | 2780-2880 | 130-230 | 30           | 13                   | 13                             | 7.4                        | 8.9  | 35                         | 20   | 27                         | 15   | 1.7           | DZ883         | Id                   | 10.95       |
| MCA-36FMH*   | 3500-3600          | 3070-3170 | 380-480 | 30           | 13                   | 13                             | 8.3                        | 9.3  | 42                         | 20   | 27                         | 15   | 1.7           | DZ883         | Id                   | 10.95       |
| MCA-19FH*    | 1850-1910          | 1760-1820 | 70-130  | 35           | 17                   | 17                             | 6.9                        | 8.5  | 40                         | 22   | 39                         | 20   | 1.8           | DZ883         | Id                   | 11.95       |
| MCA-30FH*    | 2960-3060          | 2780-2880 | 130-230 | 34           | 17                   | 17                             | 7.4                        | 8.9  | 37                         | 20   | 27                         | 15   | 1.7           | DZ883         | Id                   | 11.95       |
| MCA-36FH*    | 3500-3600          | 3070-3170 | 380-480 | 33           | 17                   | 17                             | 8.3                        | 9.2  | 44                         | 20   | 29                         | 15   | 1.6           | DZ883         | Id                   | 11.95       |

\*\*E= [IP3(dBm)-LO Power(dBm)]/10

### features

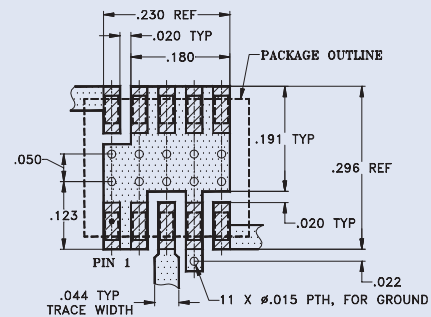
- excellent IP3, up to 35 dBm
- excellent compression, 1 dB compr, RF>LO power
- industry standard foot print
- LTCC design for excellent temperature stability
- performance repeatability

### applications

- GSM 1800
- DECT
- line of sight links
- satellite communications



### suggested PCB layout (PL-045) MCA models



NOTE: TRACE WIDTH IS SHOWN FOR ROGERS RO4350, WITH DIELECTRIC THICKNESS 0.020" ± 0.0015", COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.

- DENOTES LAND PATTERN
- DENOTES PCB LAYOUT



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