

# Innovative Products

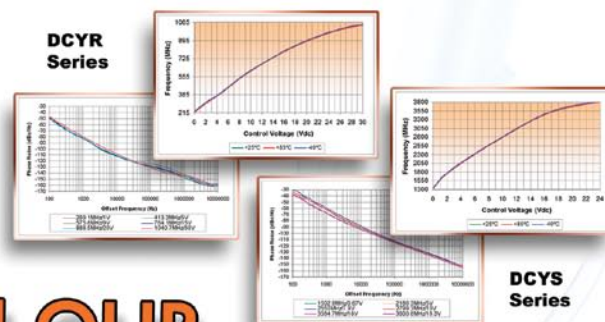
*Frequency Sources  
& Signal Processing  
Components*



Setting The Standard for High Performance  
Microwave & RF Building Blocks

OUT  
WITH  
THE OLD  
YIG  
SOURCES

# IN WITH OUR NEW PLANAR YIG REPLACEMENT VCOs



0.5" x 0.5"



0.75" x 0.75"



## FEATURES

- \* Octave & Higher Than Octave Tuning
- \* High Spectral Purity Signal
- \* Low Power Consumption
- \* Wide Modulation Bandwidth
- \* Low Microphonic Effects
- \* Low Cost
- \* Excellent Tuning Linearity
- \* Extended Temperature Range
- \* Superb Phase Noise Performance
- \* Low Post Thermal Drift
- \* High Reliability
- \* High Immunity To EMI & Phase Hits
- \* Compact Size: 0.5" x 0.5" & 0.75" x 0.75"
- \* Integrability To MMIC, Chip & Wire
- \* Standard & Customized Designs
- \* REL-PRO® - RoHS Compliant
- \* Patented Technology

| Model          | Frequency (MHz) | Tuning Voltage (VDC) | DC Bias VDC @ I (Max) | Typical Phase Noise @ 10 kHz (dBc/Hz) |
|----------------|-----------------|----------------------|-----------------------|---------------------------------------|
| DCYR2060-5     | 200 - 600       | 0.5 - 28             | +5 @ 65 mA            | -119                                  |
| DCYR3097-5     | 300 - 970       | 0.5 - 28             | +5 @ 40 mA            | -112                                  |
| DCYR50125-10   | 500 - 1250      | 0.5 - 25             | +10 @ 50 mA           | -110                                  |
| DCYR100200-12  | 1000 - 2000     | 0.5 - 28             | +12 @ 50 mA           | -108                                  |
| DCYS160360-5   | 1600 - 3600     | 0.5 - 24             | +5 @ 60 mA            | -90                                   |
| DCYS200400-5   | 2000 - 4000     | 0.5 - 15             | +5 @ 50 mA            | -90                                   |
| DCYS250500-5   | 2500 - 5000     | 0.5 - 20             | +5 @ 50 mA            | -75                                   |
| DCYS300600-5   | 3000 - 6000     | 0 - 25               | +5 @ 50 mA            | -80                                   |
| DCYR400800-5*  | 4000 - 8000     | 0 - 18               | +5 @ 130 mA           | -84                                   |
| DCYR5001000-5* | 5000 - 10000    | 0 - 25               | +5 @ 130 mA           | -75                                   |
| DCYR6001200-5* | 6000 - 12000    | 0 - 25               | +5 @ 130 mA           | -74                                   |

\* Sub-Harmonic suppression 35 dB typical.



For additional information, contact Synergy's sales and application team.

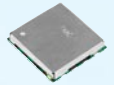
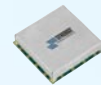
Phone: (973) 881-8800 Fax: (973) 881-8361

E-mail: [sales@synergymwave.com](mailto:sales@synergymwave.com) or [info@synergymwave.com](mailto:info@synergymwave.com)

Visit Our Web Site At [WWW.SYNERGYMWAVE.COM](http://WWW.SYNERGYMWAVE.COM)

## FEATURES

- » Octave & Higher Than Octave Tuning
- » High Spectral Purity Signal
- » Low Power Consumption
- » Wide Modulation Bandwidth
- » Low Microphonic Effects
- » Low Cost Than YIG
- » Excellent Tuning Linearity
- » Extended Temperature Range
- » Exceptional Phase Noise Performance
- » Low Post Thermal Drift
- » High Reliability
- » High Immunity To EMI & Phase Hits
- » Compact Size: 0.5" x 0.5" & 0.75" x 0.75"
- » Buffered Output



| Package # | 278LF | 320LF |
|-----------|-------|-------|
|-----------|-------|-------|

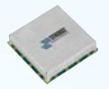
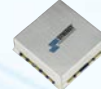
## YIG REPLACEMENT VCOS

| Model          | Frequency ( MHz ) | Tuning Voltage ( VDC ) | DC Bias VDC @ I (Max) | Minimum Output Power ( dBm ) | Typical Tuning Sensitivity ( MHz/V ) | Typical Harmonic Suppression ( dB ) | Typical Frequency Pulling ( MHz ) | Typical Frequency Pushing ( MHz/V ) | Typical Phase Noise @ 10 kHz ( dBc/Hz ) | Pkg. # |
|----------------|-------------------|------------------------|-----------------------|------------------------------|--------------------------------------|-------------------------------------|-----------------------------------|-------------------------------------|-----------------------------------------|--------|
| DCYR2060-5     | 200 - 600         | 0.5 - 28               | +5 @ 65 mA            | +5                           | 14 - 28                              | 12                                  | 3                                 | 1                                   | -119                                    | 320LF  |
| DCYR3097-5     | 300 - 970         | 0.5 - 28               | +5 @ 40 mA            | +4                           | 15 - 45                              | 25                                  | 3                                 | 1                                   | -112                                    | 320LF  |
| DCYR50125-10   | 500 - 1250        | 0.5 - 25               | +10 @ 50 mA           | 0                            | 30 - 60                              | 10                                  | 2                                 | 4                                   | -110                                    | 320LF  |
| DCYR100200-12  | 1000 - 2000       | 0.5 - 28               | +12 @ 50 mA           | +3                           | 40 - 100                             | 15                                  | 4                                 | 4                                   | -108                                    | 320LF  |
| DCYS160360-5   | 1600 - 3600       | 0.5 - 23               | +5 @ 60 mA            | 0                            | 40 - 200                             | 15                                  | 12                                | 2                                   | -90                                     | 278LF  |
| DCYS200400-5   | 2000 - 4000       | 0.5 - 15               | +5 @ 50 mA            | +2                           | 150 - 250                            | 15                                  | 4                                 | 4                                   | -90                                     | 278LF  |
| DCYS250500-5   | 2500 - 5000       | 0.5 - 20               | +5 @ 50 mA            | +2                           | 80 - 220                             | 15                                  | 14                                | 7                                   | -75                                     | 278LF  |
| DCYS300600-5   | 3000 - 6000       | 0 - 25                 | +5 @ 50 mA            | +3                           | 35 - 130                             | 10                                  | 16                                | 8                                   | -80                                     | 278LF  |
| DCYR400800-5*  | 4000 - 8000       | 0 - 18                 | +5 @ 130 mA           | +3                           | 200 - 500                            | 25                                  | 22                                | 12                                  | -84                                     | 320LF  |
| DCYR5001000-5* | 5000 - 10000      | 0 - 25                 | +5 @ 130 mA           | +3                           | 60 - 250                             | 20                                  | 24                                | 14                                  | -75                                     | 320LF  |
| DCYR6001200-5* | 6000 - 12000      | 0 - 25                 | +5 @ 130 mA           | +3                           | 200 - 600                            | 20                                  | 32                                | 16                                  | -74                                     | 320LF  |

\*Sub-Harmonic suppression 35 dB typical.

## FEATURES

- » Highly Immune To Phase Hits
- » Superb Phase Noise Performance
- » Fast Tuning Than SAW
- » Small Size, Surface Mount



| Package # | 174LF | 249LF | 278LF |
|-----------|-------|-------|-------|
|-----------|-------|-------|-------|

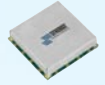
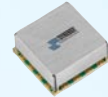
## SAW REPLACEMENT VCOS

| Model       | Frequency ( MHz ) | Tuning Voltage ( VDC ) | DC Bias VDC @ I (Max) | Minimum Output Power ( dBm ) | Typical Tuning Sensitivity ( MHz/V ) | Typical Harmonic Suppression ( dB ) | Typical Frequency Pulling ( MHz ) | Typical Frequency Pushing ( MHz/V ) | Typical Phase Noise @ 10 kHz ( dBc/Hz ) | Pkg. # |
|-------------|-------------------|------------------------|-----------------------|------------------------------|--------------------------------------|-------------------------------------|-----------------------------------|-------------------------------------|-----------------------------------------|--------|
| DCSR100-5   | 100               | 0 - 5                  | +5 @ 30 mA            | +5                           | 0.15 - 0.3                           | 22                                  | 0.05                              | 0.05                                | -128                                    | 174LF  |
| DSCO1000-12 | 1000              | 0.5 - 12               | +12 @ 35 mA           | +4                           | 2                                    | 20                                  | 0.5                               | 0.05                                | -126                                    | 249LF  |
| DSCO1200-12 | 1200              | 0 - 12                 | +12 @ 45 mA           | +3                           | 2 - 4                                | 20                                  | 0.5                               | 0.05                                | -125                                    | 249LF  |
| DSCO1300-12 | 1300              | 0 - 12                 | +12 @ 45 mA           | +3                           | 2 - 4                                | 20                                  | 1                                 | 0.6                                 | -120                                    | 249LF  |
| DSCO-1250-8 | 1250              | 2 - 8                  | +10 @ 35 mA           | +8                           | 1.5                                  | 10                                  | 0.25                              | 0.2                                 | -127                                    | 249LF  |
| DSCO-1750-8 | 1750              | 0.5 - 8                | +8 @ 35 mA            | +2                           | 1                                    | 10                                  | 1                                 | 2                                   | -123                                    | 249LF  |
| DSCO1920-12 | 1920              | 0.5 - 8                | +12 @ 35 mA           | +2                           | 1 - 3                                | 20                                  | 1                                 | 1                                   | -120                                    | 249LF  |
| DSCO2200-12 | 2200              | 0.5 - 12               | +12 @ 65 mA           | +2                           | 1 - 3                                | 20                                  | 1                                 | 1                                   | -116                                    | 249LF  |
| DSCO-2000-8 | 2000              | 0.5 - 8                | +8 @ 35 mA            | +2                           | 1 - 2                                | 20                                  | 1.5                               | 1.5                                 | -118                                    | 249LF  |
| DCSR2176-6  | 2176              | 0.5 - 5                | +6 @ 30 mA            | +2                           | 6                                    | 10                                  | 4                                 | 2.5                                 | -115                                    | 278LF  |
| DSCO2294-10 | 2293.75           | 0.5 - 10               | +10 @ 50 mA           | +2                           | 1 - 2                                | 20                                  | 1.5                               | 1.5                                 | -116                                    | 249LF  |
| DSCO2308-10 | 2307.8125         | 0.5 - 10               | +10 @ 50 mA           | +2                           | 1 - 2                                | 20                                  | 1.5                               | 1.5                                 | -116                                    | 249LF  |
| DSCO2438-10 | 2437.50           | 0.5 - 10               | +10 @ 50 mA           | +2                           | 1 - 2                                | 20                                  | 1.5                               | 1.5                                 | -116                                    | 249LF  |
| DSCO2452-10 | 2451.5625         | 0.5 - 10               | +10 @ 50 mA           | +2                           | 1 - 2                                | 20                                  | 1.5                               | 1.5                                 | -116                                    | 249LF  |
| DSCO2488-12 | 2488.32           | 1 - 7                  | +12 @ 60 mA           | 0.5                          | 1 - 2                                | 15                                  | 0.25                              | 0.2                                 | -117                                    | 249LF  |
| DSCO2666-12 | 2666.306          | 1 - 7                  | +12 @ 60 mA           | 0.5                          | 1 - 2                                | 15                                  | 0.25                              | 0.2                                 | -117                                    | 249LF  |
| DSCO2677-12 | 2677.306          | 1 - 7                  | +12 @ 60 mA           | 0.5                          | 1 - 2                                | 15                                  | 0.25                              | 0.2                                 | -117                                    | 249LF  |
| DCSR2688-12 | 2688              | 0.5 - 8                | +5 @ 35               | +3                           | 1.5 - 3                              | 12                                  | 2                                 | 2                                   | -117                                    | 278LF  |
| DSCO2688-12 | 2688.651          | 1 - 7                  | +12 @ 60 mA           | 0.5                          | 1 - 2                                | 15                                  | 0.25                              | 0.2                                 | -117                                    | 249LF  |
| DCSR3210-8  | 3210              | 0.5 - 6                | +8 @ 35               | +3                           | 6 - 12                               | 12                                  | 2                                 | 2                                   | -110                                    | 278LF  |
| DCSR3910-8  | 3910              | 0.5 - 6                | +8 @ 35               | +3                           | 6 - 12                               | 12                                  | 3                                 | 2.5                                 | -108                                    | 278LF  |
| DCSR4210-8  | 4210              | 0.5 - 6                | +8 @ 35               | +3                           | 6 - 12                               | 12                                  | 3                                 | 2.5                                 | -106                                    | 278LF  |



## FEATURES

- » Octave & Higher Than Octave Bandwidth
- » Exceptional Phase Noise Performance
- » Very Low Post Thermal Drift
- » Simplifies design...better value
- » Power efficient
- » Small Size, Surface Mount



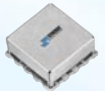
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| Package # | 277 | 278LF |
|-----------|-----|-------|

## ULTRA WIDEBAND VCOs

| Model         | Frequency ( MHz ) | Tuning Voltage ( VDC ) | DC Bias VDC @ I (Max) | Minimum Output Power ( dBm ) | Typical Tuning Sensitivity ( MHz/V ) | Typical Harmonic Suppression ( dB ) | Typical Frequency Pulling ( MHz ) | Typical Frequency Pushing ( MHz/V ) | Typical Phase Noise @ 10 kHz ( dBc/Hz ) | Pkg. # |
|---------------|-------------------|------------------------|-----------------------|------------------------------|--------------------------------------|-------------------------------------|-----------------------------------|-------------------------------------|-----------------------------------------|--------|
| DCMO514-5     | 50 - 140          | 0.5 - 24               | +5 @ 30 mA            | +3.5                         | 2 - 6                                | 10                                  | 3                                 | 1                                   | -110                                    | 278LF  |
| DCMO616-5     | 65 - 160          | 0.5 - 24               | +5 @ 35 mA            | +3                           | 3.5 - 7                              | 10                                  | 3                                 | 1                                   | -108                                    | 278LF  |
| DCMO1027      | 100 - 270         | 0 - 24                 | +5 to 12 @ 35 mA      | +2.5                         | 6 - 14                               | 10                                  | 0.4                               | 1                                   | -112                                    | 278LF  |
| DCMO1129      | 110 - 290         | 0.5 - 24               | +5 to +12 @ 35 mA     | +2.5                         | 100 - 200                            | 18                                  | 0.5                               | 0.3                                 | -105                                    | 273LF  |
| DCMO1545      | 150 - 450         | 0.5 - 24               | +5 to 12 @ 35 mA      | +4                           | 8 - 20                               | 10                                  | 4                                 | 2                                   | -108                                    | 278LF  |
| DCMO1857      | 180 - 570         | 0.5 - 24               | +5 to 12 @ 30 mA      | +3                           | 10 - 15                              | 10                                  | 7                                 | 2                                   | -108                                    | 278LF  |
| DCMO2260-5    | 220 - 600         | 0.5 - 24               | +5 @ 35 mA            | +2                           | 15 - 25                              | 10                                  | 5                                 | 2                                   | -108                                    | 278LF  |
| DCMO2476      | 240 - 760         | 0.5 - 24               | +5 to 12 @ 35 mA      | +4                           | 10 - 40                              | 10                                  | 3                                 | 1                                   | -108                                    | 278LF  |
| DCMO3288-5    | 320 - 880         | 0.5 - 24               | +5 @ 35 mA            | +3                           | 15 - 40                              | 10                                  | 5                                 | 2                                   | -109                                    | 278LF  |
| DCFO35105-5   | 350 - 1050        | 0 - 25                 | +5 @ 40 mA            | +7                           | 27 - 54                              | 25                                  | 4                                 | 2                                   | -112                                    | 277    |
| DCMO50120-5   | 500 - 1200        | 0.5 - 24               | +5 @ 40 mA            | +6                           | 25 - 50                              | 10                                  | 5                                 | 5                                   | -118                                    | 273LF  |
| DCMO50120-12  | 500 - 1200        | 0.5 - 24               | +12 @ 35 mA           | +6                           | 20 - 50                              | 10                                  | 5                                 | 5                                   | -103                                    | 278LF  |
| DCMO60170-5   | 600 - 1700        | 0 - 25                 | +5 @ 35 mA            | +3                           | 30 - 90                              | 10                                  | 8                                 | 3                                   | -99                                     | 278LF  |
| DCMO80210-5   | 800 - 2100        | 0.5 - 24               | +5 @ 35 mA            | +5                           | 35 - 95                              | 10                                  | 5                                 | 4                                   | -96                                     | 278LF  |
| DCMO80210-10  | 800 - 2100        | 0.5 - 24               | +10 @ 35 mA           | +6                           | 45 - 95                              | 15                                  | 5                                 | 4                                   | -100                                    | 278LF  |
| DCMO90220-5   | 900 - 2200        | 0.5 - 24               | +5 @ 35 mA            | +4                           | 24 - 82                              | 15                                  | 5                                 | 5                                   | -98                                     | 278LF  |
| DCMO90220-12  | 900 - 2200        | 0.5 - 25               | +12 @ 35 mA           | +6                           | 35 - 100                             | 10                                  | 15                                | 8                                   | -99                                     | 278LF  |
| DCMO100230-12 | 1000 - 2300       | 0.5 - 24               | +12 @ 35 mA           | +3                           | 40 - 100                             | 10                                  | 3                                 | 2                                   | -101                                    | 278LF  |
| DCMO100230-5  | 1000 - 2300       | 0.5 - 24               | +5 @ 35 mA            | +3                           | 40 - 100                             | 10                                  | 3                                 | 2                                   | -98                                     | 278LF  |
| DCMO110250-5  | 1100 - 2500       | 0.5 - 28               | +5 @ 35 mA            | +6                           | 30 - 90                              | 18                                  | 5                                 | 5                                   | -100                                    | 278LF  |
| DCMO135270-8  | 1350 - 2700       | 0.5 - 20               | +8 @ 35 mA            | +4                           | 45 - 150                             | 15                                  | 8                                 | 5                                   | -93                                     | 278LF  |
| DCMO150318-5  | 1500 - 3200       | 0.5 - 20               | +5 @ 30 mA            | +7                           | 40 - 160                             | 10                                  | 10                                | 5                                   | -93                                     | 278LF  |
| DCMO150320-5  | 1500 - 3200       | 0.5 - 18               | +5 @ 60 mA            | 0                            | 100 - 225                            | 12                                  | 12                                | 2                                   | -92                                     | 278LF  |
| DCMO172332-5  | 1720 - 3320       | 0.5 - 24               | +5 @ 30 mA            | +4                           | 40 - 80                              | 15                                  | 10                                | 5                                   | -94                                     | 273LF  |
| DCMO190410-5  | 1900 - 4100       | 0.5 - 16               | +5 @ 50 mA            | +2                           | 100 - 200                            | 10                                  | 4                                 | 4                                   | -90                                     | 278LF  |
| DCMO250512-5  | 2500 - 5125       | 0.5 - 24               | +5 @ 50 mA            | -2                           | 80 - 220                             | 15                                  | 14                                | 7                                   | -78                                     | 278LF  |

## FEATURES

- » Exceptional Phase Noise
- » Dual Tuning Port
- » Small Size
- » Surface Mount
- » Applications: Agile Synthesizers



|           |     |
|-----------|-----|
| Package # | 266 |
|-----------|-----|

## DUAL TUNING PORT VCOs

| Model       | Frequency ( MHz ) | Tuning Voltage ( VDC ) | DC Bias VDC @ I (Max) | Output Power ( dBm ) | Typical Tuning Sensitivity ( MHz/V ) | Harmonic Suppression ( dB ) | Frequency Pulling ( MHz ) | Frequency Pushing ( MHz/V ) | Typical Phase Noise @ 10 kHz ( dBc/Hz ) | Pkg. # |
|-------------|-------------------|------------------------|-----------------------|----------------------|--------------------------------------|-----------------------------|---------------------------|-----------------------------|-----------------------------------------|--------|
| DTMFO-900A  | 900 - 1050        | 0.5 - 10**<br>1 - 5*   | +8                    | +5                   | 13 - 26**<br>2 - 4*                  | 10                          | 8                         | 4                           | -110                                    | 266 ‡  |
| DTMFC-1025A | 1000 - 1700       | 0.5 - 15**<br>1 - 5 *  | +8                    | +5                   | 45 - 80**<br>9 - 16*                 | 10                          | 15                        | 4                           | -100                                    | 266 ‡  |
| DTMFC-2100A | 2100 - 2950       | 0.5 - 15**<br>1 - 5*   | +8                    | +4                   | 50 - 90**<br>12 - 23*                | 10                          | 20                        | 8                           | -85                                     | 266 ‡  |

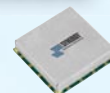
\*\* Coarse Tune / \* Fine Tune

‡ The DTMF(X) series are not RoHS compliant. See RoHS Compliance Information from our web site: [www.synergymwave.com](http://www.synergymwave.com)

## FEATURES

- » Less Than Octave Bandwidth
- » High Immunity to Phase Hits
- » Superb Phase Noise
- » Very Low Post Thermal Drift
- » Small Size Surface Mount

# SIGNAL SOURCES



Package #

278LF

## OPTIMIZED BANDWIDTH VCOS

| Model         | Frequency ( MHz ) | Tuning Voltage ( VDC ) | DC Bias VDC @ I (Max) | Minimum Output Power dBm | Typical Tuning Sensitivity ( MHz/V ) | Typical Harmonic Suppression ( dB ) | Typical Frequency Pulling ( MHz ) | Typical Frequency Pushing ( MHz/V ) | Typical Phase Noise @ 10 kHz ( dBc/Hz ) | Pkg. # |
|---------------|-------------------|------------------------|-----------------------|--------------------------|--------------------------------------|-------------------------------------|-----------------------------------|-------------------------------------|-----------------------------------------|--------|
| MFC1223-12    | 120 - 230         | 0.5 - 24               | +12 @ 35 mA           | +2                       | 4 - 12                               | 10                                  | 3                                 | 2                                   | -115                                    | 278LF  |
| MFC1926-12    | 190 - 260         | 0.5 - 12               | +12 @ 35 mA           | +1                       | 6 - 14                               | 10                                  | 3                                 | 2                                   | -114                                    | 278LF  |
| MFC1921-5     | 195 - 210         | 0.5 - 10               | +5 @ 22 mA            | +3                       | 2 - 3                                | 20                                  | 1                                 | 0.5                                 | -120                                    | 278LF  |
| MFC2931-5     | 290 - 310         | 0.5 - 10               | +5 @ 30 mA            | +4                       | 3 - 5                                | 25                                  | 5                                 | 2                                   | -121                                    | 278LF  |
| MFC2941-12    | 290 - 410         | 0.5 - 24               | +12 @ 35 mA           | +1                       | 3 - 7                                | 10                                  | 2                                 | 2                                   | -110                                    | 278LF  |
| MFC4151-12    | 410 - 510         | 0.5 - 15               | +12 @ 35 mA           | +1                       | 6 - 12                               | 10                                  | 2                                 | 2                                   | -112                                    | 278LF  |
| MFC6170-5     | 610 - 700         | 0.5 - 5                | +5 @ 35 mA            | +3                       | 15 - 30                              | 10                                  | 1                                 | 0.5                                 | -113                                    | 278LF  |
| MFC7995-5     | 790 - 950         | 0.5 - 15               | +5 @ 30 mA            | +3                       | 10 - 15                              | 10                                  | 3                                 | 1                                   | -114                                    | 278LF  |
| MFC8192-5     | 810 - 920         | 0.5 - 5                | +5 @ 30 mA            | +3                       | 25 - 40                              | 10                                  | 5                                 | 2                                   | -106                                    | 278LF  |
| DCRO92103-5   | 920 - 1030        | 0.5 - 10               | +5 @ 25 mA            | +2                       | 10 - 25                              | 20                                  | 4                                 | 3                                   | -112                                    | 278LF  |
| MFC102110-5   | 1020 - 1100       | 0.5 - 5                | +5 @ 35 mA            | +3                       | 23 - 30                              | 15                                  | 4                                 | 5                                   | -106                                    | 278LF  |
| MFC114133-5   | 1140 - 1330       | 0.5 - 10               | +5 @ 35 mA            | +3                       | 20 - 30                              | 20                                  | 3                                 | 1                                   | -105                                    | 278LF  |
| DCRO127175-5  | 1270 - 1750       | 0.5 - 18               | +5 @ 35 mA            | +4                       | 20 - 40                              | 10                                  | 5                                 | 5                                   | -107                                    | 278LF  |
| DCRO128177-12 | 1280 - 1775       | 0.5 - 24               | +12 @ 40 mA           | +3                       | 15 - 38                              | 10                                  | 7                                 | 5                                   | -112                                    | 278LF  |
| MFC138165-5   | 1380 - 1650       | 0.5 - 24               | +5 @ 35 mA            | +3.5                     | 7 - 20                               | 10                                  | 5                                 | 2                                   | -102                                    | 278LF  |
| DCRO160260-5  | 1600 - 2600       | 0.5 - 15               | +5 @ 35 mA            | +3                       | 50 - 125                             | 15                                  | 3                                 | 1                                   | -95                                     | 278LF  |
| DCRO150165-8  | 1500 - 1650       | 0.5 - 10               | +8 @ 30 mA            | +3                       | 20 - 28                              | 15                                  | 5                                 | 5                                   | -103                                    | 278LF  |
| MFC170195-5   | 1700 - 1950       | 0.5 - 10               | +5 @ 30 mA            | +3                       | 30 - 40                              | 15                                  | 3                                 | 1                                   | -104                                    | 278LF  |
| DCRO172174-12 | 1720 - 1740       | 0.5 - 10               | +12 @ 35 mA           | 0                        | 3 - 6                                | 30                                  | 5                                 | 5                                   | -118                                    | 278LF  |
| DCRO175290-5  | 1750 - 2900       | 0.5 - 24               | +5 @ 35 mA            | +4                       | 40 - 90                              | 12                                  | 9                                 | 5                                   | -95                                     | 278LF  |
| DCRO178205-10 | 1785 - 2050       | 0.5 - 12               | +10 @ 35 mA           | +4                       | 25 - 40                              | 20                                  | 4                                 | 4                                   | -109                                    | 278LF  |
| DCRO196225-5  | 1965 - 2250       | 0.5 - 24               | +5 @ 25 mA            | +2                       | 10 - 25                              | 20                                  | 2                                 | 1                                   | -107                                    | 278LF  |
| DCRO204235-8  | 2040 - 2350       | 0.5 - 24               | +8 @ 35 mA            | +2                       | 12 - 25                              | 10                                  | 2                                 | 2                                   | -109                                    | 278LF  |
| DCRO205242-10 | 2050 - 2420       | 0.5 - 15               | +10 @ 35 mA           | +1                       | 30 - 45                              | 20                                  | 4                                 | 4                                   | -108                                    | 278LF  |
| DCRO215265-10 | 2150 - 2650       | 0.5 - 15               | +10 @ 35 mA           | +3                       | 32 - 64                              | 18                                  | 3                                 | 3                                   | -104                                    | 278LF  |
| DCRO219250-8  | 2190 - 2500       | 0.5 - 24               | +8 @ 35 mA            | +2                       | 10 - 25                              | 10                                  | 2                                 | 2                                   | -106                                    | 278LF  |
| DCRO230253-10 | 2300 - 2530       | 0.5 - 10               | +10 @ 35 mA           | +5                       | 25 - 35                              | -15                                 | 3                                 | 5                                   | -104                                    | 278LF  |
| DCRO243298-5  | 2430 - 2980       | 0.5 - 15               | +5 @ 35 mA            | +3                       | 25 - 75                              | 10                                  | 5                                 | 10                                  | -101                                    | 278LF  |
| DCRO250300-10 | 2500 - 3000       | 0.5 - 24               | +10 @ 35 mA           | +3                       | 10 - 40                              | 20                                  | 5                                 | 5                                   | -107                                    | 278LF  |
| DCRO270400-8  | 2700 - 4000       | 0.5 - 18               | +8 @ 35 mA            | 0                        | 10 - 15                              | 5                                   | 5                                 | 5                                   | -93                                     | 278LF  |
| DCRO270420-8  | 2700 - 4200       | 0.5 - 24               | +8 @ 35 mA            | 0                        | 30 - 100                             | 15                                  | 5                                 | 5                                   | -92                                     | 278LF  |
| DCRO273290-10 | 2730 - 2900       | 0.5 - 15               | +10 @ 35 mA           | +5                       | 15 - 25                              | 30                                  | 1.5                               | 1.5                                 | -108                                    | 278LF  |
| DCRO285345-5  | 2850 - 3450       | 0.5 - 24               | +5 @ 35 mA            | +5                       | 16 - 45                              | 10                                  | 5                                 | 7                                   | -98                                     | 278LF  |
| DCRO307331-10 | 3075 - 3310       | 0.5 - 20               | +10 @ 38 mA           | +3                       | 15 - 27                              | 20                                  | 12                                | 2                                   | -100                                    | 278LF  |
| DCRO310430-5  | 3100 - 4300       | 0.5 - 15               | +5 @ 40 mA            | +3                       | 100 - 300                            | 15                                  | 12                                | 7                                   | -80                                     | 278LF  |
| DCRO330440-5  | 3300 - 4400       | 0.5 - 10               | +5 @ 50 mA            | +3                       | 100 - 200                            | 20                                  | 12                                | 7                                   | -82                                     | 278LF  |
| DCRO354374-10 | 3540 - 3740       | 0.5 - 15               | +10 @ 35 mA           | +5                       | 18 - 28                              | 22                                  | 8                                 | 5                                   | -102                                    | 278LF  |
| DCRO360382-8  | 3600 - 3820       | 0.5 - 24               | +8 @ 35 mA            | +2                       | 10 - 25                              | 20                                  | 8                                 | 3                                   | -102                                    | 278LF  |
| DCRO403432-8  | 4030 - 4320       | 0.5 - 16               | +8 @ 40 mA            | +3                       | 20 - 30                              | 15                                  | 8                                 | 5                                   | -103                                    | 278LF  |
| DCRO440520-5  | 4400 - 5200       | 0.5 - 20               | +5 @ 35 mA            | +2                       | 25 - 65                              | 20                                  | 5                                 | 5                                   | -90                                     | 278LF  |
| DCRO490575-5  | 4900 - 5750       | 0.5 - 24               | +5 @ 35 mA            | +2                       | 25 - 60                              | 10                                  | 5                                 | 5                                   | -88                                     | 278LF  |
| DCRO500630-5  | 5000 - 6300       | 0.5 - 18               | +5 @ 45 mA            | -2                       | 50 - 175                             | 10                                  | 15                                | 15                                  | -77                                     | 278LF  |

## Features:

- » Exceptional Phase Noise
- » Interactive Communication
- » Standard Programming Interface
- » Power Supply Options
- » Wide Bandwidth
- » Small Size Surface Mount
- » Lead Free - RoHS Compliant
- » REL-PRO® (Patent Pending) Technology



|           |       |       |       |
|-----------|-------|-------|-------|
| Package # | 197LF | 273LF | 280LF |
|-----------|-------|-------|-------|

## INTELLIGENT INTERACTIVE SYNTHESIZERS

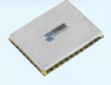
| Model #                         | Frequency (MHz) | Step Size (KHz) | Typical Phase Noise (dBc/Hz) |          | Pkg. # |
|---------------------------------|-----------------|-----------------|------------------------------|----------|--------|
|                                 |                 |                 | @10 kHz                      | @100 kHz |        |
| Compact size                    |                 |                 |                              |          |        |
| FSW511-50                       | 50 - 115        | 500             | -115                         | -127     | 273LF  |
| FSW1125-50                      | 110 - 250       | 500             | -105                         | -130     | 273LF  |
| FSW1545-50                      | 150 - 450       | 500             | -98                          | -120     | 273LF  |
| FSW1857-100                     | 180 - 570       | 1000            | -98                          | -126     | 273LF  |
| FSW2476-50                      | 240 - 760       | 500             | -95                          | -119     | 273LF  |
| FSW60135-50                     | 600 - 1350      | 500             | -90                          | -117     | 273LF  |
| FSW60170-50                     | 600 - 1700      | 500             | -90                          | -117     | 273LF  |
| FSW80210-50                     | 800 - 2100      | 500             | -90                          | -115     | 273LF  |
| FSH9496-20                      | 940 - 965       | 200             | -109                         | -134     | 273LF  |
| FSW150290-10                    | 1500 - 2900     | 100             | -79                          | -101     | 273LF  |
| FSW150320-50                    | 1500 - 3200     | 500             | -85                          | -107     | 273LF  |
| FSW190410-50                    | 1900 - 4100     | 500             | -82                          | -107     | 273LF  |
| FSW190410-100                   | 1900 - 4100     | 1000            | -85                          | -110     | 273LF  |
| FSH196225-50                    | 1960 - 2250     | 500             | -94                          | -119     | 273LF  |
| FSW200400-100                   | 2000 - 4000     | 1000            | -85                          | -110     | 273LF  |
| FSW215265-50                    | 2150 - 2650     | 500             | -90                          | -120     | 273LF  |
| FSH250300-1M                    | 2500 - 3000     | 10000           | -98                          | -122     | 197LF  |
| Single Supply (Buffered Output) |                 |                 |                              |          |        |
| LFSW514-50                      | 50 - 140        | 500             | -115                         | -127     | 197LF  |
| LFSW1129-50                     | 110 - 290       | 500             | -108                         | -133     | 197LF  |
| LFSW1545-50                     | 150 - 450       | 500             | -98                          | -120     | 197LF  |
| LFSW1857-50                     | 180 - 570       | 500             | -94                          | -120     | 197LF  |
| LFSW1857-100                    | 180 - 570       | 1000            | -98                          | -120     | 197LF  |
| LFSW2476-50                     | 240 - 760       | 500             | -94                          | -119     | 197LF  |
| LFSW35105-50                    | 350 - 1050      | 500             | -108                         | -130     | 280LF  |
| LFSW35105-100                   | 350 - 1050      | 1000            | -102                         | -132     | 280LF  |
| LFSW50120-50                    | 500 - 1200      | 500             | -97                          | -120     | 197LF  |
| LFSW60170-50                    | 600 - 1700      | 500             | -90                          | -117     | 197LF  |
| LFSW110250-50                   | 1100 - 2500     | 500             | -95                          | -118     | 197LF  |
| LFSW150320-25                   | 1500 - 3200     | 250             | -82                          | -107     | 197LF  |
| LFSW150320-50                   | 1500 - 3200     | 500             | -85                          | -110     | 197LF  |
| LFSW190410-50                   | 1900 - 4100     | 500             | -82                          | -107     | 197LF  |
| LFSW190410-100                  | 1900 - 4100     | 1000            | -85                          | -110     | 197LF  |
| LFSW290342-100                  | 2900 - 3420     | 1000            | -87                          | -107     | 197LF  |

Contact us for other frequency bands not listed.

# SIGNAL SOURCES

## FEATURES

- » Exceptional Phase Noise
- » Small Size Surface Mount
- » Lead Free - RoHS Compliant
- » REL-PRO® (Patent Pending) Technology
- » No Programming Required
- » Applications: LO for IF Converters  
& Phase Locked Oscillators



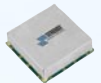
|           |       |       |
|-----------|-------|-------|
| Package # | 273LF | 197LF |
|-----------|-------|-------|

## FIXED FREQUENCY SYNTHESIZER

| Model #     | Output Frequency ( MHz ) | Input Reference Frequency (MHz) | Typical Phase Noise (dBc/Hz) |          | Pkg. # |
|-------------|--------------------------|---------------------------------|------------------------------|----------|--------|
|             |                          |                                 | @10 kHz                      | @100 kHz |        |
| FCPL680F    | 680                      | 10                              | -98                          | -118     | 273LF  |
| FCPL840-10  | 840                      | 10                              | -100                         | -120     | 273LF  |
| FCPL982-10  | 982                      | 10                              | -100                         | -120     | 273LF  |
| FCPH1250-10 | 1250                     | 10                              | -126                         | -150     | 197LF  |
| FCPH1280F   | 1280                     | 10                              | -110                         | -113     | 273LF  |
| FCPH1950-13 | 1950                     | 13                              | -110                         | -130     | 273LF  |
| FCPH1987.5  | 1985.5                   | 10                              | -95                          | -115     | 273LF  |
| FCPH2062.5  | 2062.5                   | 10                              | -95                          | -115     | 273LF  |
| FCPH3210-10 | 3210                     | 10                              | -100                         | -125     | 197LF  |
| FCPH3710-10 | 3710                     | 10                              | -100                         | -125     | 197LF  |

## FEATURES

- » Exceptional Phase Noise
- » Small Size Surface Mount
- » Lead Free - RoHS Compliant
- » REL-PRO® (Patent Pending) Technology
- » Up To 16 selectable frequencies  
(see frequency table in spec. sheet)



|           |       |
|-----------|-------|
| Package # | 273LF |
|-----------|-------|

## SELECTABLE FREQUENCY SYNTHESIZERS

| Model #        | Frequency (MHz) | Input Reference Frequency (MHz) | Typical Phase Noise (dBc/Hz) |          | Pkg. # |
|----------------|-----------------|---------------------------------|------------------------------|----------|--------|
|                |                 |                                 | @10 kHz                      | @100 kHz |        |
| FCPL-70        | 65 - 72         | 10                              | -108                         | -125     | 273LF  |
| FCPL1114-5     | 112.5 - 140     | 10                              | -115                         | -132     | 273LF  |
| FCPL3239-10    | 320 - 390       | 10                              | -108                         | -120     | 273LF  |
| FCPL610-10     | 65 - 102.5      | 10                              | -110                         | -125     | 273LF  |
| FCPH100125-10  | 1000 - 1250     | 10                              | -99                          | -110     | 273LF  |
| FCPH183187-10  | 1830 - 1865     | 10                              | -98                          | -112     | 273LF  |
| FCPH200201-100 | 2000 - 2015     | 10                              | -90                          | -110     | 273LF  |
| FCPH225375     | 2250 - 3750     | 250                             | -80                          | -100     | 273LF  |

*Also Available  
In Connectorized  
Package!*

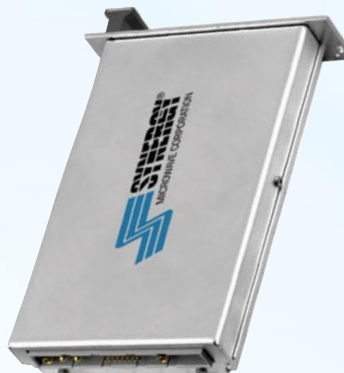


## MTS3000DS Series

168.5 x 110.1 x 30.14 mm

### FEATURES

- » Over an octave bandwidth tuning
- » Small step size resolution
- » Outstanding spectral purity
- » High spurious rejection
- » Fast lock settling time
- » Easy programmable format
- » Internal Reference



- » 3 HU 19" rack cassette
- » 350-1050 MHz \*
- » 1 Hz Resolution
- » -110 dBc @ 10 kHz
- » +13  $\pm$ 3 V Supply
- » Also available as piggy back board

### SPECIFICATIONS

#### RF Output Frequency Range:

##### Output options:

|                  |                |
|------------------|----------------|
| Amplifier/Filter | 350 - 1050 MHz |
| Divider Option   | 5.5 - 1050 MHz |

**Bandwidth:** 700 MHz

**Step Size:** 1 Hz

#### Internal Reference

##### Options:

|                                                     |                          |
|-----------------------------------------------------|--------------------------|
| <b>TCXO Specifications</b>                          | 12.8 MHz                 |
| Temperature Stability                               | $\pm 1.5 \times 10^{-6}$ |
| Aging first year                                    | $\pm 2 \times 10^{-6}$   |
| Operating Temp. Range                               | -10 to +60 °C            |
| (With freq. adjustment through voltage control pin) |                          |

|                            |                          |
|----------------------------|--------------------------|
| <b>OCXO Specifications</b> | 13 MHz                   |
| Temperature Stability      | $\pm 2.0 \times 10^{-8}$ |
| Aging first year           | $\pm 1 \times 10^{-7}$   |
| Operating Temp. Range      | -10 to +70 °C            |
| Warm-Up Time:              | 10 min.                  |

**External Reference Input:** 10, 12.8, 13, 19.44 MHz and multiples thereof

**Bias Voltage:** VCC: +13 VDC ( $\pm 3$  V)

**Supply Current:** <800 mA @ 13 V

**Bias Voltage Ripple:** 100 mV p-p (Max)

**RF Output Power:** (w/amp. option) +10 dBm (Min)

**When Unlocked:**  $\leq -20$  dBm

**Spurious Suppression:** -65 dBc (Max)

**Harmonic Suppression:**

Amplifier/Filter option 15 dBc (Min)

Divider option (Full range model) 8 dBc (Min)

(Octave band in divider range) 15 dBc (Min)

#### Maximum Phase Noise

| Offset  | Frequency: 350 MHz (dBc/Hz) | Frequency: 1050 MHz (dBc/Hz) |
|---------|-----------------------------|------------------------------|
| 10 kHz  | -115                        | -110                         |
| 100 kHz | -115                        | -115                         |
| 1 MHz   | -140                        | -140                         |

#### Switching Speed:

Per programming step:  $\leq 8$  mSec

After Turn-on <1 Sec

**Output Impedance:** 50 Ohms (Nom)

**Operating Temp. Range:** (See reference option)

**Storage Temp. Range:** -40 to +85 °C

Programming Interface: 3.3V SPI, 3.3V I<sup>2</sup>C, RS232 or (Ethernet - special development requires NRE and longer leadtime)

\* Available bandwidth up to 3:1 with frequencies ranging from 60 to 6500 MHz.



## FEATURES

- » FET Technology
- » Very High IP<sub>3</sub>
- » 0.1 to 2400 MHz
- » Lead Free - RoHS Compliant



Package #

285

## SUPER HIGH IP<sub>3</sub> FET MIXERS

| Model # | Frequency (MHz) |             |             | Conversion Loss (dB) [Typ/Max] | RF/IF Isolation [Typ/Min] | Input IP <sub>3</sub> (dBm) [Typ] | LO Power (dBm) [Nom] | Pkg. # |
|---------|-----------------|-------------|-------------|--------------------------------|---------------------------|-----------------------------------|----------------------|--------|
|         | LO              | RF          | IF          |                                |                           |                                   |                      |        |
| SFM-2   | 62 - 94         | 0.1 - 32    | 30 - 96     | 6.5/8.5                        | 30/20                     | +40                               | 0                    | 285    |
| SFM-4   | 650 - 1000      | 700 - 1200  | 50 - 200    | 9/10                           | 20/17                     | +38                               | +17                  | 285    |
| SFM-5   | 1100 - 2000     | 1200 - 2400 | 50 - 200    | 10/11                          | 20/15                     | +38                               | +17                  | 285    |
| SFM-62  | 60 - 200        | 1800 - 2200 | 1840 - 2275 | 9.5/10                         | 20/17                     | +38                               | +17                  | 285    |

## FEATURES

- » Multi-Octave Bandwidth
- » Schottky Diode Mixers
- » Low Conversion Loss
- » Conventional & GALAXY Models (SYNSTRIP® Multi-Layer Technology)



Package #

310

327

133\*

134\*

159\*

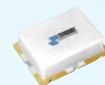
## WIDE BANDWIDTH MIXERS

| Model #   | Frequency (MHz) |           | Conversion Loss (dB) [Typ/Max] | Isolation (dB) [Typ/Min] |        | LO Power (dBm) [Nom] | Input IP <sub>3</sub> (dBm) | Pkg. # |
|-----------|-----------------|-----------|--------------------------------|--------------------------|--------|----------------------|-----------------------------|--------|
|           | LO/RF           | IF        |                                | LO/RF                    | LO/IF  |                      |                             |        |
| SMD-C8RM  | 1 - 2500        | 1 - 2000  | 7.5/9.5                        | 40/25                    | 25/16  | +10                  | +20                         | 133*   |
| SMD-6000  | 1 - 6000        | DC - 700  | 8.5/10                         | 25/15                    | 18/12  | +7                   | +15                         | 133*   |
| SLD-K2    | 5 - 1000        | DC - 1000 | 6.5/9.0                        | 40/20                    | 30/12  | +7                   | +16                         | 159*   |
| SLD-K5    | 5 - 1000        | 5 - 1000  | 7.5/9.5                        | 40/23                    | 30/20  | +10                  | +18                         | 159*   |
| SMD-K2    | 5 - 1000        | DC - 1000 | 6.5/9.0                        | 40/20                    | 30/12  | +7                   | +16                         | 134*   |
| SMD-K5    | 5 - 1000        | 5 - 1000  | 7.5/9.5                        | 40/23                    | 30/20  | +10                  | +18                         | 134*   |
| SMD-3500L | 10 - 3500       | 1 - 2000  | 8.0/9.0                        | 35/25                    | 30/18  | +10                  | +19                         | 133*   |
| SMD-3500  | 10 - 3500       | 1 - 2000  | 7.8/8.7                        | 35/25                    | 30/20  | +17                  | +28                         | 133*   |
| SGM-2-10  | 250 - 3250      | DC - 700  | 6.5/8.5                        | 30/15                    | 10/5   | +10                  | +15                         | 310    |
| SGM-2-13  | 250 - 3250      | DC - 700  | 6.5/8.5                        | 30/15                    | 10/5   | +13                  | +18                         | 310    |
| SGM-2-17  | 250 - 3250      | DC - 700  | 6.5/8.5                        | 30/15                    | 10/5   | +17                  | +18                         | 310    |
| SGM-3-10  | 1350 - 7000     | DC - 2000 | 7.0/9.5                        | 25/10                    | 20/8   | +10                  | +13                         | 310    |
| SGM-3-13  | 1350 - 7000     | DC - 2000 | 7.0/9.5                        | 25/10                    | 20/8   | +13                  | +20                         | 310    |
| SGM-3-17  | 1350 - 7000     | DC - 2000 | 7.0/9.5                        | 25/10                    | 20/8   | +17                  | +20                         | 310    |
| SGS-5-10  | 3000 - 19000    | DC - 4000 | 7.5/9.5                        | 25/17                    | 10/7.0 | +10                  | +10                         | 327    |
| SGS-5-13  | 3000 - 19000    | DC - 4000 | 7.5/9.5                        | 25/17                    | 10/7.0 | +13                  | +12.5                       | 327    |
| SGS-5-17  | 3000 - 19000    | DC - 4000 | 7.5/9.5                        | 25/17                    | 10/7.0 | +17                  | +15                         | 327    |
| KGS-5-10  | 3000 - 19000    | DC - 4000 | 7.5/9.5                        | 25/17                    | 10/7.0 | +10                  | +10                         | 328    |
| KGS-5-13  | 3000 - 19000    | DC - 4000 | 7.5/9.5                        | 25/17                    | 10/7.0 | +13                  | +12.5                       | 328    |
| KGS-5-17  | 3000 - 19000    | DC - 4000 | 7.5/9.5                        | 25/17                    | 10/7.0 | +17                  | +15                         | 328    |

\* See RoHS Compliance Information from our web site: [www.synergymwave.com](http://www.synergymwave.com)

## FEATURES

- » Wide Bandwidth
- » Low Loss
- » High Power (40 to 50 W)
- Conventional & SYNSTRIP® Technology
- » Applications: Signal Sampling & VSWR Bridges



| Package # | 110* | 110N* | 152* | 255* |
|-----------|------|-------|------|------|
|-----------|------|-------|------|------|

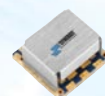
## COUPLERS

| Model Number  | Frequency (MHz) | Coupling (dB) [Nom] | Coupling Flatness (dB) | Mainline Loss (dB) [Typ/Max] | Directivity (dB) [Typ/Min] | Input Power (Watts) [Max] | PKG. # |
|---------------|-----------------|---------------------|------------------------|------------------------------|----------------------------|---------------------------|--------|
| KBK-703       | 1 - 500         | 11.25 ±0.5          | ±0.6                   | 0.8/1/0                      | 28/20                      | 1                         | 110*   |
| KBK-7C4       | 1-1000          | 11.0 ±0.5           | ±0.5                   | 1.6/2.0                      | 26/20                      | 1                         | 110*   |
| KBK-708S      | 10 - 2000       | 9.8 ±0.8            | ±1.0                   | 2.4/3.0                      | 22/13                      | 1                         | 110*   |
| SDC-C7        | 10 - 2000       | 9.8 ±0.8            | ±1.0                   | 2.4/3.0                      | 17/13                      | 1                         | 152*   |
| KBS-10-225    | 225 - 400       | 10.5 ±1.0           | ±0.5                   | 0.6/0.7                      | 25/18                      | 50                        | 255*   |
| KDS-20-225    | 225 - 400       | 20 ±1.0             | ±0.5                   | 0.2/0.4                      | 25/18                      | 50                        | 255*   |
| KBK-10-225    | 225 - 400       | 10.5 ±1.0           | ±0.5                   | 0.6/0.7                      | 25/18                      | 50                        | 110N*  |
| KDK-20-225    | 225 - 400       | 20.0 ±1.0           | ±0.5                   | 0.2/0.4                      | 25/18                      | 50                        | 110N*  |
| SCS100800-10  | 1000 - 8000     | 10 ±1.5             | ±1.2                   | 0.4/0.8                      | 22/15                      | 40                        | 321    |
| KBK100800-10  | 1000 - 8000     | 10 ±1.5             | ±1.2                   | 0.4/0.8                      | 22/15                      | 40                        | 322    |
| SCS100800-16  | 1000 - 8000     | 16 ±1.5             | ±1.2                   | 0.4/0.8                      | 22/15                      | 40                        | 321    |
| KCK100800-16  | 1000 - 8000     | 16 ±1.5             | ±1.2                   | 0.4/0.8                      | 22/15                      | 40                        | 322    |
| SCS100800-20  | 1000 - 8000     | 20 ±1.5             | ±1.2                   | 0.4/0.8                      | 22/15                      | 40                        | 321    |
| KDK100800-20  | 1000 - 8000     | 20 ±1.5             | ±1.2                   | 0.4/0.8                      | 22/15                      | 40                        | 322    |
| SCS1701650-10 | 1700 - 16500    | 10 ±1.5             | ±0.6                   | 0.2/0.4                      | 20/15                      | 40                        | 323    |
| KBK1701650-10 | 1700 - 16500    | 10 ±1.5             | ±0.6                   | 0.2/0.4                      | 20/15                      | 40                        | 324    |
| SCS1701650-16 | 1700 - 16500    | 16 ±1.5             | ±0.6                   | 0.2/0.4                      | 20/15                      | 40                        | 323    |
| KCK1701650-17 | 1700 - 16500    | 16 ±1.5             | ±0.6                   | 0.2/0.5                      | 20/16                      | 40                        | 324    |
| SCS1701650-20 | 1700 - 16500    | 20 ±1.5             | ±0.6                   | 0.2/0.4                      | 20/15                      | 40                        | 323    |
| KDK1701650-20 | 1700 - 16500    | 20 ±1.5             | ±0.6                   | 0.2/0.4                      | 20/15                      | 40                        | 324    |

\* See RoHS Compliance Information from our web site: [www.synergymwave.com](http://www.synergymwave.com)

## FEATURES

- » Excellent Performance
- » Low VSWR
- » High Efficiency
- » Lead Free - RoHS Compliant



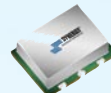
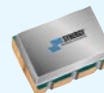
| Package # | 306 | 307 |
|-----------|-----|-----|
|-----------|-----|-----|

## PHASE SHIFTERS

| Model Number | Frequency (MHz) | Phase Shift (Deg.) [Min] | Insertion Loss (dB) [Typ/Max] | Control Voltage (VDC) | Typical VSWR | Input Power (dBm) [Max] | PKG. # |
|--------------|-----------------|--------------------------|-------------------------------|-----------------------|--------------|-------------------------|--------|
| PS193199B    | 1930 - 1990     | 0 - 360                  | 2.5/3.5                       | 0 - 12                | 1.8:1        | 0                       | 307    |
| PS210220B    | 2100 - 2200     | 0 - 360                  | 2.5/3.5                       | 0 - 12                | 1.5:1        | 0                       | 307    |
| PS2122A      | 2100 - 2200     | 0 - 90                   | 1.5/2.2                       | 0 - 5                 | 1.5:1        | 0                       | 306    |
| PS2122B      | 2100 - 2200     | 0 - 180                  | 1.5/2.2                       | 0 - 15                | 1.5:1        | 0                       | 306    |

## FEATURES

- » Excellent Performance
- » Wide Bandwidth
- » Moderate Power
- » Applications: Signal Splitting & Low Power Combining



| Package # | 110* | 133* | 134* | 159* | 220* | 231* | 232* |
|-----------|------|------|------|------|------|------|------|
|-----------|------|------|------|------|------|------|------|

## POWER DIVIDERS

| Model Number | Frequency (MHz) | Insertion Loss (dB) [Typ/Max] | Amplitude Unbalance (dB) [Typ/Max] | Phase Unbalance (Deg.) [Typ/Max] | Isolation (dB) [Typ/Min] | VSWR (Typ) | Input Power (Watts)** [Max] | PKG. # |
|--------------|-----------------|-------------------------------|------------------------------------|----------------------------------|--------------------------|------------|-----------------------------|--------|
| <b>2-Way</b> |                 |                               |                                    |                                  |                          |            |                             |        |
| DSK-7M2      | 2 - 350         | 0.4/0.8                       | 0.08/0.2                           | 0.2/2.0                          | 32/26                    | 1.18:1     | 1                           | 110*   |
| SD-3         | 10 - 1000       | 1.0/1.5                       | 0.5/0.7                            | 4.0/7.0                          | 30/17                    | 1.3:1      | 1                           | 134*   |
| SDL-100      | 2 - 1000        | 1.2/1.5                       | 0.3/0.6                            | 2.0/4.0                          | 27/17                    | 1.3:1      | 1                           | 159*   |
| SPD-C12      | 400 - 2700      | 1.0/1.5                       | 0.4/0.5                            | 4.0/6.0                          | 25/20                    | 1.5:1      | 1                           | 133*   |
| SDL-4        | 500 - 1500      | 1.0/1.4                       | 0.4/0.7                            | 4.0/7.0                          | 20/13                    | 1.5:1      | 1                           | 159*   |
| M2D810       | 800 - 1000      | 0.5/0.8                       | 0.2/0.5                            | 2.0/5.0                          | 20/14                    | 1.4:1      | 1                           | 232*   |
| DSK-H3N      | 800 - 2400      | 0.6/0.8                       | 0.25/0.5                           | 2.0/4.0                          | 23/18                    | 1.5:1      | 30                          | 220*   |
| P2D100800    | 1000 - 8000     | 0.6/1.1                       | 0.05/0.2                           | 1.0/2.0                          | 28/22                    | 1.17       | 20                          | 329    |
| DSK100800    | 1000 - 8000     | 0.6/1.1                       | 0.05/0.2                           | 1.0/2.0                          | 28/22                    | 1.17       | 20                          | 330    |
| M2D1822      | 1800 - 2200     | 0.35/1.0                      | 0.05/0.7                           | 2.2/6.0                          | 20/15                    | 1.25:1     | 1                           | 231*   |
| P2D180900    | 1800 - 9000     | 0.4/0.8                       | 0.05/0.2                           | 1.0/2.0                          | 27/23                    | 1.17       | 20                          | 331    |
| DSK180900    | 1800 - 9000     | 0.4/0.8                       | 0.05/0.2                           | 1.0/2.0                          | 27/23                    | 1.17       | 20                          | 330    |
| P2D2001800   | 2000 - 18000    | 1/1.7                         | 0.05/0.3                           | 2.0/4.0                          | 25/20                    | 1.4        | 20                          | 329    |
| DSK2001800   | 2000 - 18000    | 1/1.7                         | 0.05/0.3                           | 2.0/4.0                          | 25/20                    | 1.4        | 20                          | 330    |
| M2D2025      | 2000 - 2550     | 0.40/1.0                      | 0.03/0.7                           | 0.3/6.0                          | 20/15                    | 1.4:1      | 1                           | 231*   |
| M2D2428      | 2400 - 2800     | 0.5/1.0                       | 0.1/0.5                            | 1.5/5.0                          | 20/15                    | 1.3:1      | 1                           | 231*   |



| Package # | 113* | 133M* | 159* |
|-----------|------|-------|------|
|-----------|------|-------|------|

## POWER DIVIDERS

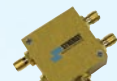
| Model Number | Frequency (MHz) | Insertion Loss (dB) [Typ/Max] | Amplitude Unbalance (dB) [Typ/Max] | Phase Unbalance (Deg.) [Typ/Max] | Isolation (dB) [Typ/Min] | VSWR (Typ) | Input Power (Watts)** [Max] | PKG. # |
|--------------|-----------------|-------------------------------|------------------------------------|----------------------------------|--------------------------|------------|-----------------------------|--------|
| <b>3-Way</b> |                 |                               |                                    |                                  |                          |            |                             |        |
| DCK-7J2      | 1 - 500         | 0.7/1.2                       | 0.2/0.4                            | 1.0/3.0                          | 27/18                    | 1.3:1      | 1                           | 113*   |
| SDL-110      | 2 - 200         | 0.5/1.0                       | 0.2/0.4                            | 1.0/3.0                          | 38/23                    | 1.18:1     | 1                           | 159*   |
| SDL-135      | 5 - 760         | 1.3/1.8                       | 0.4/0.75                           | 3.5/7.0                          | 23/18                    | 1.3:1      | 1                           | 159*   |
| SPD-3-7      | 20 - 1200       | 1.5/1.8                       | 0.25/0.5                           | 1.5/5.0                          | 23/15                    | 1.4:1      | 1                           | 159*   |
| SPD-C9       | 1700 - 2200     | 0.4/0.8                       | 0.3/0.5                            | 4.0/5.0                          | 23/18                    | 1.3:1      | 1                           | 133M*  |

\* See RoHS Compliance Information from our web site: [www.synergymwave.com](http://www.synergymwave.com)

\*\* Assumes ideal impedance matching on all ports

## FEATURES

- » Excellent Performance
- » Wide Bandwidth
- » Moderate Power
- » Applications: Signal Splitting & Low Power Combining



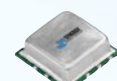
| Package # | 134* | 159* | 219* | 233* | 247* |
|-----------|------|------|------|------|------|
|-----------|------|------|------|------|------|

## POWER DIVIDERS

| Model Number | Frequency (MHz) | Insertion Loss (dB) [Typ/Max] | Amplitude Unbalance (dB) [Typ/Max] | Phase Unbalance (Deg.) [Typ/Max] | Isolation (dB) [Typ/Min] | VSWR (Typ) | Input Power (Watts)** [Max] | PKG. # |
|--------------|-----------------|-------------------------------|------------------------------------|----------------------------------|--------------------------|------------|-----------------------------|--------|
| <b>4-Way</b> |                 |                               |                                    |                                  |                          |            |                             |        |
| SPD-5-1000   | 5 - 1000        | 0.65/1.0                      | 0.1/0.5                            | 2.0/5.0                          | 25/20                    | 1.25:1     | 1                           | 219*   |
| SPD-5-1500   | 5 - 1000        | 1.3/2.0                       | 0.35/0.5                           | 3.5/5.0                          | 25/20                    | 1.4:1      | 1                           | 219*   |
| SD-4-1       | 5 - 1000        | 1.3/2.0                       | 0.4/0.7                            | 2.5/5.0                          | 20/15                    | 1.37:1     | 1                           | 134*   |
| DSK-745S     | 5 - 2000        | 2.3/2.8                       | 0.2/0.6                            | 2.0/5.0                          | 20/15                    | 1.5:1      | 1                           | 247*   |
| SDL-120      | 20 - 400        | 1.3/1.8                       | 0.6/0.75                           | 3.0/7.0                          | 25/17                    | 1.5:1      | 1                           | 159*   |
| M4D1626      | 1600 - 2600     | 0.5/1.2                       | 0.4/0.7                            | 3.0/7.0                          | 22/12                    | 1.3:1      | 1                           | 312    |
| M4D1720      | 1700 - 2000     | 0.5/0.8                       | 0.2/0.5                            | 2.3/7.0                          | 22/16                    | 1.4:1      | 1                           | 233*   |
| M4D3236      | 3200 - 3600     | 0.3/1.0                       | 0.1/0.5                            | 2.0/6.0                          | 20/15                    | 1.2:1      | 1                           | 312    |

\* See RoHS Compliance Information from our web site: [www.synergymwave.com](http://www.synergymwave.com)

\*\* Assumes ideal impedance matching on all ports

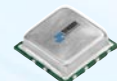


| Package # | 124S* | 157* |
|-----------|-------|------|
|-----------|-------|------|

## POWER DIVIDERS

| Model Number | Frequency (MHz) | Insertion Loss (dB) [Typ/Max] | Amplitude Unbalance (dB) [Typ/Max] | Phase Unbalance (Deg.) [Typ/Max] | Isolation (dB) [Typ/Min] | VSWR (Typ) | Input Power (Watts) [Max] | PKG. # |
|--------------|-----------------|-------------------------------|------------------------------------|----------------------------------|--------------------------|------------|---------------------------|--------|
| <b>5-Way</b> |                 |                               |                                    |                                  |                          |            |                           |        |
| DES-901      | 0.5 - 30        | 0.7/1.0                       | 0.1/0.3                            | 0.25/4.0                         | 25/20                    | 1.5:1      | 1                         | 124S*  |
| DEK-701      | 0.5 - 30        | 0.7/1.0                       | 0.1/0.3                            | 0.25/4.0                         | 25/20                    | 1.5:1      | 1                         | 157*   |
| DES-902      | 1 - 300         | 1.5/2.0                       | 0.5/0.6                            | 2.5/8.0                          | 25/17                    | 1.6:1      | 1                         | 124S*  |
| DEK-702      | 1 - 300         | 1.5/2.0                       | 0.5/0.6                            | 2.5/8.0                          | 25/17                    | 1.6:1      | 1                         | 157*   |

\* See RoHS Compliance Information from our web site: [www.synergymwave.com](http://www.synergymwave.com)



| Package # | 124SL* |
|-----------|--------|
|-----------|--------|

## POWER DIVIDERS

| Model Number | Frequency (MHz) | Insertion Loss (dB) [Typ/Max] | Amplitude Unbalance (dB) [Typ/Max] | Phase Unbalance (Deg.) [Typ/Max] | Isolation (dB) [Typ/Min] | VSWR (Typ) | Input Power (Watts) [Max] | PKG. # |
|--------------|-----------------|-------------------------------|------------------------------------|----------------------------------|--------------------------|------------|---------------------------|--------|
| <b>6-Way</b> |                 |                               |                                    |                                  |                          |            |                           |        |
| DFS-905      | 1 - 500         | 1.0/1.8                       | 0.2/0.6                            | 4.0/8.0                          | 23/15                    | 1.2:1      | 1                         | 124SL* |

\* See RoHS Compliance Information from our web site: [www.synergymwave.com](http://www.synergymwave.com)



## FEATURES

- » Excellent Performance
- » Ultra Wide Bandwidth
- » Building Block For:
  - Power Amplifier
  - Image Rejection Mixers
  - I & Q / SSB Modulators
  - Phase Shifters & More...



| Package # | 301LF | 325 | 326 | 102S* | 129* | 159* |
|-----------|-------|-----|-----|-------|------|------|
|-----------|-------|-----|-----|-------|------|------|

## 90° HYBRIDS

| Model Number | Frequency (MHz) | Insertion Loss (dB) [Typ/Max] | Amplitude Unbalance (dB) [Typ/Max] | Phase Unbalance (Deg.) [Typ/Max] | Isolation (dB) [Typ/Min] | VSWR (Typ) | Input Power (Watts) [Max] | PKG. # |
|--------------|-----------------|-------------------------------|------------------------------------|----------------------------------|--------------------------|------------|---------------------------|--------|
| SMQ-C09      | 14 - 42         | 0.3/0.6                       | 0.4/0.75                           | 1.0/3.0                          | 25/17                    | 1.1:1      | 1                         | 129*   |
| SLQ-302      | 20 - 60         | 0.3/0.5                       | 0.8/1.0                            | 1.0/3.0                          | 23/20                    | 1.2:1      | 1                         | 159*   |
| SLQ-KH1      | 30 - 60         | 0.3/0.6                       | 0.4/0.75                           | 1.0/3.0                          | 25/20                    | 1.2:1      | 1                         | 159*   |
| SLQ-303      | 30 - 90         | 0.3/0.6                       | 0.8/1.2                            | 1.0/3.0                          | 23/18                    | 1.2:1      | 1                         | 159*   |
| SLQ-K02      | 40 - 80         | 0.3/0.6                       | 0.4/0.75                           | 1.0/3.0                          | 25/20                    | 1.2:1      | 1                         | 159*   |
| SMQ-C23      | 55 - 90         | 0.3/0.7                       | 0.6/1.2                            | 1.0/3.0                          | 30/17                    | 1.2:1      | 1                         | 129*   |
| SLQ-K04      | 100 - 200       | 0.4/0.75                      | 0.5/1.0                            | 1.0/3.0                          | 25/18                    | 1.2:1      | 1                         | 159*   |
| SMQ-C12      | 122 - 134       | 0.2/0.4                       | 0.1/0.2                            | 1.0/2.0                          | 20/17                    | 1.2:1      | 1                         | 129*   |
| SLQ-K07      | 225 - 400       | 0.4/0.75                      | 0.6/1.2                            | 2.0/4.0                          | 25/17                    | 1.3:1      | 1                         | 159*   |
| SLQ-330      | 240 - 720       | 0.7/1.0                       | 1.2/1.8                            | 3.0/5.0                          | 23/15                    | 1.35:1     | 1                         | 159*   |
| SLQ-67       | 428 - 473       | 0.2/0.4                       | 0.5/0.9                            | 1.0/3.0                          | 25/17                    | 1.3:1      | 1                         | 159*   |
| DQS-30-90    | 30 - 90         | 0.3/0.6                       | 0.8/1.2                            | 1.0/3.0                          | 23/18                    | 1.35:1     | 25                        | 102S*  |
| DQS-30-450   | 30 - 450        | 1.2/1.7                       | 1.0/1.5                            | 4.0/6.0                          | 23/18                    | 1.4:1      | 5                         | 102S*  |
| DQS-50-500   | 50 - 500        | 1.7/2.2                       | 1.0/1.5                            | 3.0/5.0                          | 23/15                    | 1.3:1      | 1                         | 102S*  |
| DQS-90-450   | 90 - 450        | 1.2/1.5                       | 0.7/1.0                            | 3.0/5.0                          | 22/16                    | 1.5:1      | 1                         | 102S*  |
| DQS-118-174  | 118 - 174       | 0.3/0.6                       | 0.4/1.0                            | 1.0/3.0                          | 23/18                    | 1.35:1     | 25                        | 102S*  |
| DQS-100-500  | 100 - 500       | 1.2/1.5                       | 0.8/1.25                           | 3.0/5.0                          | 25/16                    | 1.4:1      | 1                         | 102S*  |
| DQS-100-1000 | 100 - 1000      | 1.7/2.3                       | 1.2/1.8                            | 6.0/10                           | 25/16                    | 1.5:1      | 1                         | 301LF  |
| MSQ80300     | 800 - 3000      | 0.2/0.4                       | 0.5/0.8                            | 2.0/5.0                          | 20/18                    | 1.3:1      | 40                        | 325    |
| DQK80300     | 800 - 3000      | 0.2/0.4                       | 0.5/0.8                            | 2.0/5.0                          | 20/18                    | 1.3:1      | 40                        | 326    |
| MSQ100800    | 1000 - 8000     | 0.8/1.6                       | 1.0/1.6                            | 1.0/4.0                          | 22/20                    | 1.2:1      | 40                        | 325    |
| DQK100800    | 1000 - 8000     | 0.8/1.6                       | 1.0/1.6                            | 1.0/4.0                          | 22/20                    | 1.2:1      | 40                        | 326    |

\* See RoHS Compliance Information from our web site: [www.synergymwave.com](http://www.synergymwave.com)

## FEATURES

- » Wide Bandwidth
- » Good Amplitude/Phase Unbalance
- » Small Size, Surface Mount
- » Lead Free RoHS Compliant
- » Application: Impedance Matching, Phase Shifting/Splitting
- » Balance to Unbalance Transformation



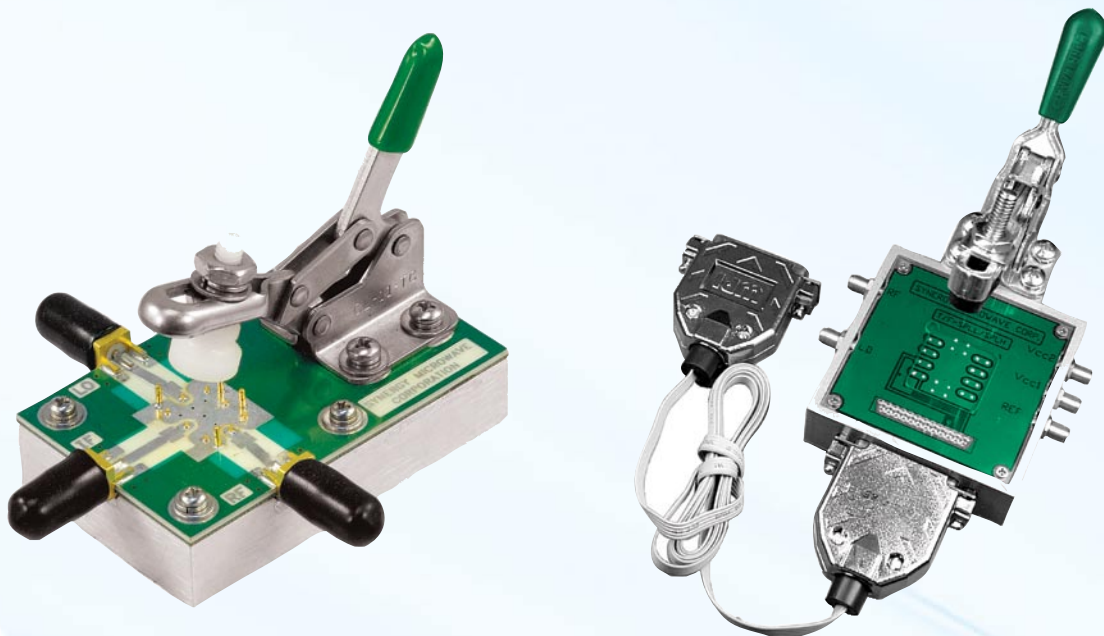
| Package # | 134 | 311 |
|-----------|-----|-----|
|-----------|-----|-----|

## TRANSFORMERS

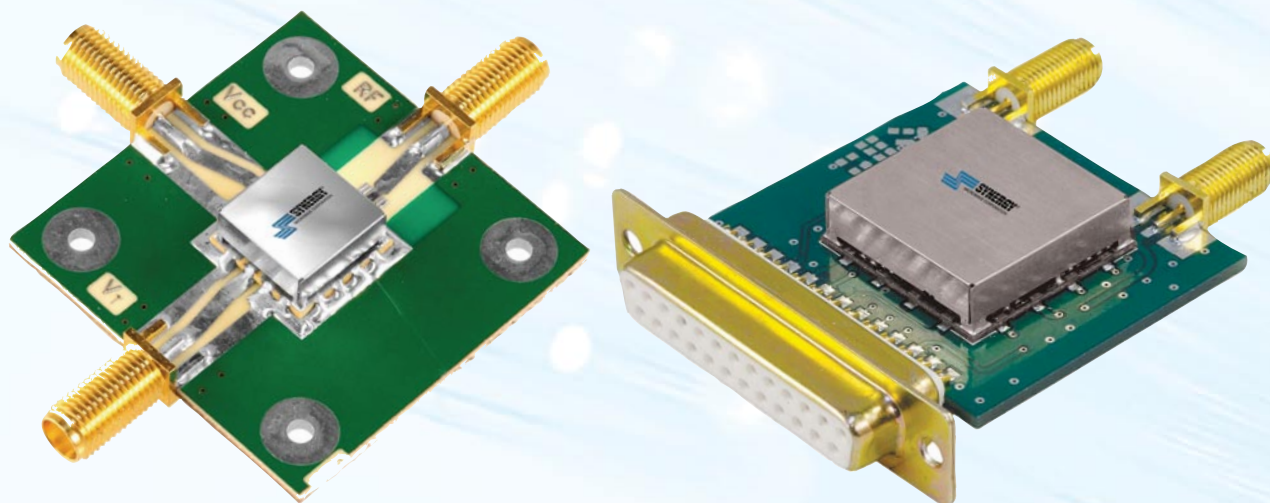
| Model Number | Frequency (MHz) | Impedance Ratio | Insertion Loss (dB) [Typ/Max] | Amplitude Unbalance (dB) [Typ/Max] | Phase Unbalance (Deg.) [Typ/Max] | DC Current (Max) | Input Power (Watts) [Max] | PKG. # |
|--------------|-----------------|-----------------|-------------------------------|------------------------------------|----------------------------------|------------------|---------------------------|--------|
| ST-K1        | 0.003 - 300     | 1:1             | 1.5/3.0                       | 0.5/1.0                            | 2.0/5.0                          | 15               | 0.25                      | 134    |
| ST-K2        | 0.075 - 400     | 1:1.5           | 1.8/3.0                       | 0.5/1.0                            | 3.0/8.0                          | 30               | 0.25                      | 134    |
| ST-K6        | 0.2 - 350       | 1:4             | 1.5/3.0                       | 0.3/0.7                            | 3.0/6.0                          | 30               | 0.25                      | 134    |
| TM1-1        | 0.4 - 500       | 1:1             | 1.2/1.8                       | 0.1/0.3                            | 1.0/3.0                          | 30               | 0.25                      | 311    |
| ST-K3        | 0.65 - 525      | 1:2             | 1.9/3.0                       | 0.4/0.8                            | 3.0/8.0                          | 30               | 0.25                      | 134    |
| TM4-1        | 10 - 1000       | 1:4             | 1.9/2.6                       | 0.4/0.7                            | 4.0/8.0                          | 50               | 1                         | 311    |
| TM4-4        | 10 - 2500       | 1:4             | 1.9/2.6                       | 0.4/0.7                            | 4.0/8.0                          | 50               | 1                         | 311    |

\* See RoHS Compliance Information from our web site: [www.synergymwave.com](http://www.synergymwave.com)

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## *VCO & SYNTHESIZER TEST BOARDS*



# ARE YOU READY FOR THIS?

## The First Surface Mount Up To

# 20

# GHZ

- > Excellent Performance
- > Ultra Wide Bandwidth
- > Building Block For:
  - Power Amplifiers
  - Image Rejection Mixers
  - I & Q / SSB Modulators
  - Phase Shifters & More...

#### 2-Way Power Dividers

| Model #   | Frequency (GHz) |
|-----------|-----------------|
| P2D80800  | 1 to 8          |
| P2D180900 | 1.8 to 9        |

#### 90° Hybrids

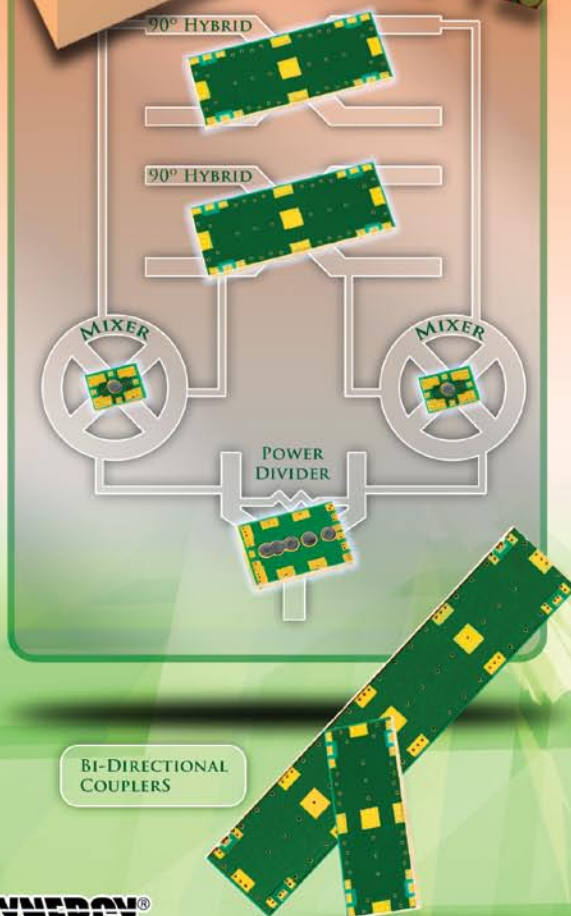
| Model #    | Frequency (GHz) |
|------------|-----------------|
| MSQ100800  | 1 to 8          |
| MSQ5002000 | 5 to 20         |

#### Bi-Directional Couplers

| Model #       | Description | Frequency (GHz) |
|---------------|-------------|-----------------|
| SCS100800-8   | 8 dB        | 1 to 8          |
| SCS100800-10  | 10 dB       | 1 to 8          |
| SCS100800-20  | 20 dB       | 1 to 8          |
| SCS5002000-8  | 8 dB        | 5 to 20         |
| SCS5002000-10 | 10 dB       | 5 to 20         |
| SCS5002000-20 | 20 dB       | 5 to 20         |

#### Double Balanced Mixers

| Model #  | LO Power (dBm) [ Nom ] | Frequency (GHz) |           |
|----------|------------------------|-----------------|-----------|
|          |                        | LO/RF           | IF        |
| SGM-2-7  | +7                     | 0.25 to 3.25    | DC to 0.7 |
| SGM-2-17 | +17                    | 0.25 to 3.25    | DC to 0.7 |
| SGM-3-7  | +7                     | 1.35 to 7       | DC to 2   |
| SGM-3-13 | +13                    | 1.35 to 7       | DC to 2   |
| SGS-5-10 | +10                    | 3 to 18         | DC to 3.2 |



For additional information, contact Synergy's sales and application team.  
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Transformers  
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