

| Low Noise Amplifiers | | | | | | | | | |
|-----------------------------|-----------------|-----------|-------------------|-------------------|-------------------|------------|------------------|-------------------|---------------|
| Part Number | Frequency (GHz) | Gain (dB) | Noise Figure (dB) | Output P1dB (dBm) | Output Psat (dBm) | OIP3 (dBm) | Bias Voltage (V) | Bias Current (mA) | Package |
| CMD228 | 2 - 6 | 30 | 1.2 | 12 | 14 | 23 | 3-5 / 3-5 | 45 | DIE |
| CMD228P4 | 2 - 6 | 28 | 1.5 | 13 | 14 | 25 | 3-5 / 3-5 | 45 | 4x4 mm QFN |
| CMD185/P3 | 4 - 8 | 15.5 | 1.9 | 15 | 17 | 29 | 2-5 | 75 | 3x3 mm QFN |
| CMD219 (GaN) | 4 - 8 | 23 | 1.0 | 18 | 26 | 28 | 5-28 / -2.3 | 75 | DIE |
| CMD219C4(GaN) | 4 - 8 | 22.5 | 1.0 | 17 | 25.5 | 28 | 5-28 / -2.3 | 75 | 4x4 mm QFN |
| CMD119P3 | 5 - 9 | 22 | 1.2 | 11 | 13 | 21 | 2-4.5 | 30 | 3x3 mm QFN |
| CMD218 (GaN) | 5 - 9 | 22 | 1.1 | 21.5 | 26 | 30 | 5-28 / -2.7 | 80 | DIE |
| CMD229 | 5 - 11 | 27 | 1.4 | 13 | 15 | 25 | 3-5 / 3-5 | 45 | DIE |
| CMD229P4 | 5 - 11 | 26 | 1.5 | 13 | 15 | 24 | 3-5 / 3-5 | 45 | 4x4 mm QFN |
| CMD132/P3 | 5 - 11 | 23/21 | 1.4 | 10 | 13 | 22 | 2-4.5 | 30 | DIE & 3x3 QFN |
| CMD263* | 5 - 11 | 23 | 1.4 | 11 | 15 | 23 | 2-4.5 | 35 | DIE |
| CMD222 | 5 - 11 | 22 | 1.2 | 11 | 14 | 23 | 2-5 | 107 | DIE |
| CMD186P3 | 6 - 11 | 18.5 | 2.1 | 17 | 20 | 28 | 2-5 | 78 | 3x3 mm QFN |
| CMD157/P3 | 6 - 18 | 26 | 1.5 | 11 | 13.5 | 23 | 2-4.5 | 52 | DIE & 3x3 QFN |
| CMD264* | 6 - 18 | 26 | 1.5 | 13 | 15 | 27.5 | 2-4.5 | 63 | DIE |
| CMD194/C3 | 6 - 20 | 20 | 2.0 | 15.5 | 16.5 | 26 | 2-5 | 120 | DIE & 3x3 QFN |
| CMD167P3 | 8 - 16 | 16 | 1.8 | 11 | 13 | 23 | 2-4 | 50 | 3x3 mm QFN |
| CMD223 | 9 - 18 | 22 | 1.5 | 13.5 | 16 | 22.5 | 3-5 | 93 | DIE |
| CMD161 | 10 - 14 | 19 | 1.05 | 5 | 12 | | 2-4 / 1.5 | 20 | DIE |
| CMD189P3 | 10 - 14 | 19 | 1.4 | 4 | 7 | 13 | 1-4 / 1.5 | 20 | 3x3 mm QFN |
| CMD159 | 10 - 17 | 26 | 1.1 | 4 | 10 | 14 | 2-4 / 1.5 | 29 | DIE |
| CMD167 | 10 - 17 | 15 | 2.0 | 11 | 13 | 24 | 2-4 | 55 | DIE |
| CMD224 | 16 - 26 | 23 | 2.2 | 7 | 13 | 18 | 2-5 | 110 | DIE |
| CMD160/C4* | 17 - 25 | 26.5 | 1.4/1.6 | 8 | 11 | 16 | 2-4 / 1.5 | 26 | DIE & 4x4 QFN |
| CMD163/C4 | 17 - 27 | 24/23 | 1.3/1.7 | 19/18 | 20/19 | 26 | 2-4 / 3 | 120 | DIE & 4x4 QFN |
| CMD162 | 26 - 34 | 22 | 1.7 | 7 | 9 | 14 | 1-4 | 25 | DIE |
| CMD188 | 26 - 34 | 20 | 1.4 | 6 | 8 | 15 | 1-4 / 2 | 20 | DIE |
| CMD190 | 33 - 45 | 19 | 2.1 | 4 | 7 | 13 | 1-4 / 2 | 25 | DIE |

| Distributed Amplifiers | | | | | | | | | |
|-------------------------------|-----------------|-----------|-------------------|-------------------|-------------------|------------|------------------|-------------------|---------------|
| Part Number | Frequency (GHz) | Gain (dB) | Noise Figure (dB) | Output P1dB (dBm) | Output Psat (dBm) | OIP3 (dBm) | Bias Voltage (V) | Bias Current (mA) | Package |
| CMD173/P4 | DC - 20 | 15 | 2 | 18 | 20 | 28 | 5-8 / 3 | 78 | DIE & 4x4 QFN |
| CMD192/C5 | DC - 20 | 19.5 | 1.9 | 24.5 | 26 | 31 | 5-8 / -1 | 200 | DIE & 5x5 QFN |
| CMD201/P5 | DC - 20 | 12/11 | 3.4 | 29/27 | 30 | 38 | 10/-0.55/5 | 400 | DIE & 5x5 QFN |
| CMD249 | DC - 20 | 13 | 3.4 | 30 | 31 | 38 | 10/0.95 | 400 | DIE |
| CMD233/C4* | 2 - 20 | 9 | 4.5 | 20.5 | 22 | 24 | 3-6 | 120 | DIE & 4x4 QFN |
| CMD238* | 2 - 20 | 14 | 4.5 | 26 | 27 | 34 | 5-8 | 360 | DIE |
| CMD241/P4* | 2 - 22 | 13.5 | 2.3 | 21 | 23 | 28 | 3-8 / -0.65 | 74 | DIE & 4x4 QFN |
| CMD197/C4 | 1 - 24 | 16 | 2.5 | 22/24 | 24/25 | 32/31 | 5-8 | 225 | DIE & 4x4 QFN |
| CMD240/P4* | DC - 22 | 15 | 2.2 | 19 | 22 | 28 | 3-8/-0.65 | 80 | DIE & 4x4 QFN |
| CMD244* | DC - 24 | 18 | 2.5 | 25 | 26.5 | 32 | 5-8 / -0.65 | 185 | DIE |
| CMD242 | DC - 40 | 11 | 4.4 | 18 | 21 | 27 | 5-8 / -0.32 | 100 | DIE |
| CMD206 | DC - 50 | 11 | 3.5 | 12 | 14.5 | 22 | 4 / 3 | 32 | DIE |

* = recent release



Standard Product Selection Guide

Low Phase Noise Amplifiers

| Part Number | Frequency (GHz) | Phase Noise (dBc/Hz @ 10kHz) | Gain (dB) | Output P1dB (dBm) | Output Psat (dBm) | OIP3 (dBm) | Bias Voltage (V) | Bias Current (mA) | Package |
|-------------|-----------------|------------------------------|-----------|-------------------|-------------------|------------|------------------|-------------------|-------------|
| CMD245/C4* | 6 - 18 | -165 | 18 | 18 | 22 | 29 | 3-5 / 3 | 76 | DIE & 4x4mm |
| CMD246/C4* | 8 - 22 | -165 | 17 | 13 | 18 | 25 | 3-5 / 3 | 48 | DIE & 4x4mm |
| CMD247* | 30 - 40 | <-160 | 13 | 13.5 | 15 | 21 | 2-4 / 2-3 | 28 | DIE |

Driver Amplifiers

| Part Number | Frequency (GHz) | Gain (dB) | Noise Figure (dB) | Output P1dB (dBm) | Output Psat (dBm) | OIP3 (dBm) | Bias Voltage (V) | Bias Current (mA) | Package |
|-------------|-----------------|-----------|-------------------|-------------------|-------------------|------------|------------------|-------------------|-------------|
| CMD231/C3* | 2 - 6 | 14.5 | 4.5 | 13.5 | 16.5 | 23.5 | 3-8 | 45 | DIE & 3x3mm |
| CMD232/C3* | 2 - 9 | 15 | 4.5 | 17 | 18.5 | 23 | 5-6 | 90 | DIE & 3x3mm |
| CMD191C4 | 4 - 10 | 20 | 4.5 | 21.5 | 22.5 | 30 | 5 | 123 | 4x4 mm QFN |
| CMD158 | 6 - 16 | 20 | 3.5 | 20 | 21 | 26 | 3-6 | 95 | DIE |
| CMD158P3 | 6 - 14 | 19.5 | 4 | 19.5 | 20.5 | 26.5 | 3-6 | 95 | 3x3 mm QFN |
| CMD158C4 | 6 - 16 | 21 | 4 | 20 | 21 | 26 | 3-6 | 95 | 4x4 mm QFN |
| CMD200 | 9 - 13 | 15.5 | 3.25 | 15.5 | 17 | 20.5 | 5 | 38 | DIE |
| CMD187 | 2 - 20 | 22.5 | 6 | 14 | 16 | 29 | 3 / 2 | 115 | DIE |
| CMD187C4 | 2 - 20 | 22.5 | 6 | 13 | 15 | 29 | 3 / 2 | 115 | 4x4 mm QFN |
| CMD166 | 20 - 40 | 9 | 4.5 | 17 | 18 | 27 | 2-4 | 76 | DIE |
| CMD207 | 20 - 40 | 35 | 5.5 | 18.5 | 21 | 29 | 4 / 3 | 270 | DIE |
| CMD199 | 26 - 35 | 15 | 3.5 | 19.5 | 21.5 | 24.5 | 5 | 72 | DIE |
| CMD243* | 26 - 35 | 15.5 | 4.4 | 21 | 22.5 | 26 | 3-5 | 90 | DIE |

Power Amplifiers

| Part Number | Frequency (GHz) | Gain (dB) | Noise Figure (dB) | Output P1dB (dBm) | Output Psat (dBm) | OIP3 (dBm) | Bias Voltage (V) | Bias Current (mA) | Package |
|--------------|-----------------|-----------|-------------------|-------------------|-------------------|------------|------------------|-------------------|---------------|
| CMD169P4 | 5 - 7 | 19 | 6.5 | 28.4 | 29.4 | 37 | 7 / 3 | 375 | 4x4 mm QFN |
| CMD170/P4 | 7.5 - 9 | 30 | 6.5 | 28.3 | 29 | 34 | 7 / 3 | 365 | DIE & 4x4 QFN |
| CMD171P4 | 9.5 - 11 | 21 | 6.5 | 28.4 | 29 | 35 | 7 / 3 | 380 | 4x4 mm QFN |
| CMD216 (GaN) | 14 - 18 | 16 | | 37 | 38 | 43 | 28 / -3.4 | 550 | DIE |
| CMD217 (GaN) | 28 - 32 | 20 | | 36.7 | 39.3 | 41 | 28 / -3.4 | 580 | DIE |
| CMD184 (GaN) | 0.5 - 20 | 13 | | 34.5 | 36.5 | 42 | 28 / -2.8/10 | 700 | DIE |
| CMD201/P5* | DC - 20 | 12 | 3.4 | 29/27 | 30 | 38 | 10/-0.55/5 | 400 | DIE & 5x5 QFN |
| CMD249* | DC - 20 | 12 | 3.4 | 30 | 31 | 38 | 10/0.95 | 400 | DIE |

| Switches (Non-Reflective) | | | | | | | | | |
|----------------------------------|------------------|-------------|-------------------|----------------|------------------|------------------|-------------------|---------------------|------------|
| Part Number | Part Description | Freq. (GHz) | Insert. Loss (dB) | Isolation (dB) | Input P1dB (dBm) | Return Loss (dB) | Switch Speed (nS) | Control Voltage (V) | Package |
| CMD204 | SPST | DC - 20 | 1 | 50 | 25 | 17 | 1.8 | 0 / -5 | DIE |
| CMD204C3 | SPST | DC - 20 | 1.3 | 48 | 25 | 15 | 1.8 | 0 / -5 | 3x3 mm QFN |
| CMD230 | SPDT refl | DC - 26 | 1.4 | 40 | 21 | 16 | 3.4 | 0 / -5 | DIE |
| CMD195C3 | SPDT | DC - 18 | 2 | 37 | 25 | 13 | 1.8 | 0 / -5 | 3x3 mm QFN |
| CMD196C3 | SPDT | DC - 18 | 1.5 | 46 | 23 | 17 | 1.8 | 0 / -5 | 3x3 mm QFN |
| CMD195 | SPDT | DC - 20 | 2 | 41 | 25 | 17 | 1.8 | 0 / -5 | DIE |
| CMD196 | SPDT | DC - 28 | 1.75 | 46 | 23 | 15 | 1.8 | 0 / -5 | DIE |
| CMD234C4* | SP3T | DC - 15 | 2 | 40 | 21 | 9 | 66 | 0 / -5 | 4x4 mm QFN |
| CMD203 | SP4T | DC - 20 | 2.4 | 39 | 21 | 9 | 66 | 0 / -5 | DIE |
| CMD203C4 | SP4T | DC - 20 | 2.4 | 39 | 21 | 9 | 66 | 0 / -5 | 4x4 mm QFN |
| CMD235C4* | SP5T | DC - 15 | 2.5 | 40 | 21 | 9 | 66 | 0 / -5 | 4x4 mm QFN |
| CMD215* | SPDT | DC - 40 | 2.3 | 36 | 19 | 16 | 4 | 0 / -5 | DIE |

| Mixers | | | | | | | | | |
|---------------|------------------|---------------------|----------------|----------------|-------------------|----------------------|----------------------|------------------|--------------|
| Part Number | Part Description | Freq. LO / RF (GHz) | Freq. IF (GHz) | LO Drive (dBm) | Conver. Gain (dB) | LO-RF Isolation (dB) | LO-IF Isolation (dB) | Input P1dB (dBm) | Package |
| CMD251C3* | Fund. Mixer | 4 - 8.5 | DC - 2.2 | +17 | -7 | 45 | 36 | 17 | 3x3 mm QFN |
| CMD252C4* | I/Q / IRM | 4 - 8 | DC - 2.4 | +20 | -6.5 | 52 | 27 | 17 | 4x4 mm QFN |
| CMD182/C4 | I/Q / IRM | 6 - 10 | DC - 3.5 | +15 | -6 | 46 | 20 | 9 | DIE & 4x4mm |
| CMD177/C3 | Fund. Mixer | 6 - 14 | DC - 5 | +13 | -6.5 | 43 | 37 | 9.5 | DIE & 3x3 mm |
| CMD183C4 | I/Q / IRM | 7.5 - 13 | DC - 4.5 | +15 | -5.5 | 43 | 23 | 9 | 4x4 mm QFN |
| CMD178C3 | Fund. Mixer | 11 - 21 | DC - 6 | +13 | -6 | 45 | 45 | 9 | 3x3 mm QFN |
| CMD179 | Fund. Mixer | 16 - 26 | DC - 9 | +13 | -6.5 | 40 | 48 | 10 | DIE |
| CMD179C3 | Fund. Mixer | 16 - 26 | DC - 9 | +13 | -6.5 | 40 | 48 | 10 | 3x3 mm QFN |
| CMD180/C3* | Fund. Mixer | 20 - 32 | DC - 10 | +13 | -7 | 36 | 36 | 10 | DIE & 3x3 mm |
| CMD181 | Fund. Mixer | 26 - 45 | DC - 12 | +17 | -6.5 | 37 | 29 | 10 | DIE |
| CMD261 | Fund. Mixer | 30 - 46 | 5 - 20 | +19 | -8 | 30 | 20 | 12 | DIE |

| Multipliers | | | | | | | | |
|--------------------|-----------------------|-------------------|--------------------|-------------------|--------------------|-------------------|---------------------|--------------|
| Part Number | Part Description | Input Freq. (GHz) | Output Freq. (GHz) | Input Power (dBm) | Output Power (dBm) | Fo Isolation (dB) | 3 Fo Isolation (dB) | Package |
| CMD225/C3* | Passive Freq. Doubler | 4 - 8 | 8 - 16 | 15 | 3 | 48 | 50 | DIE & 3x3 mm |
| CMD226/N3 | Passive Freq. Doubler | 7 - 11 | 14 - 22 | 15 | 5 | 44 | 46 | DIE & 3x3 mm |
| CMD227 | Passive Freq. Doubler | 8 - 15 | 16 - 30 | 15 | 4 | 40 | 43 | DIE |
| CMD214 | Active Freq. Doubler | 12 - 18 | 24 - 36 | 13 | 17 | 32 | 25 | DIE |
| CMD213 | Active Freq. Doubler | 15 - 20 | 30 - 40 | 17 | 17 | 46 | | DIE |

* = recent release



Standard Product Selection Guide

| Phase Shifters | | | | | | | | | |
|-----------------------|-----------------|----------------|-------------------|-------------------|------------------|-------------------|------------------|-----------------|--------------|
| Part Number | Frequency (GHz) | Number of Bits | Bit Resolu. (deg) | Insert. Loss (dB) | Return Loss (dB) | Phase Error (deg) | Input P1dB (dBm) | Input IP3 (dBm) | Package |
| CMD175P4 | 2 - 4 | 5 | 11.25 | 7 | 17 | +/- 5 | 24 | 37 | 4x4 mm QFN |
| CMD174/P4 | 3 - 6 | 5 | 11.25 | 7.6 | 15 | +/- 2 | 26 | 36 | DIE & 4x4 mm |
| CMD176P4 | 13 - 17 | 4 | 22.5 | 8 | 14 | +/- 5 | 26 | 41 | 4x4 mm QFN |

| Voltage Variable Attenuators | | | | | | | | | |
|-------------------------------------|-----------------|-------------------|-----------------|------------------|-----------------|------------------|---------------------|------------------|---------|
| Part Number | Frequency (GHz) | Insert. Loss (dB) | Attn Range (dB) | Input P1dB (dBm) | Input IP3 (dBm) | Return Loss (dB) | Control Voltage (V) | Max. Power (dBm) | Package |
| CMD172 | 18 - 40 | 1.6 | 37 | 15 | 25 | 12 | 0 / -3 | 30 | DIE |

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Datasheets and S-Parameters available at www.custommmic.com
 Evaluation Boards available for packaged products

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