TELEDYNE
MICROWAVE SOLUTIONS
Everywhereyoulook™

Rev. 5/10

# AC518
# AC519

## 5 TO 500 MHz
## TO-8 CASCADABLE AMPLIFIERS

| Typical Values | AC518 | AC519 |
|---|---|---|
| High Gain | 28.0 dB | 27.5 dB |
| High Output Power | +19.3 dBm | +21.8 dBm |
| High Third Order I.P. | +32.0 dBm | +33.0 dBm |
| Low Noise Figure | 4.0 dB | 3.5 dB |

High Performance Thin Film
Standard Size TO-8 Package
Available in Surface Mount

## SPECIFICATIONS*

| Parameter | | Typical | Guaranteed 0 to 50 °C | Guaranteed -55 to +85 °C |
|---|---|---|---|---|
| Frequency (Min.) | | 3-600 MHz | 5-500 MHz | 5-500 MHz |
| Small Signal Gain (Min.) | AC518 | 28.0 dB | 26.5 dB | 26.0 dB |
| | AC519 | 27.5 dB | 26.5 dB | 26.0 dB |
| Gain Flatness (Max.) | | < ±0.25 dB | ±0.5 dB | ±0.7 dB |
| Noise Figure (Max.) | AC518 | 4.0 dB | 4.7 dB | 5.2 dB |
| | AC519 | 3.5 dB | 4.5 dB | 5.0 dB |
| SWR (Max.) | Input/Output | < 1.4:1 | 1.7:1 | 1.8:1 |
| Power Output (Min.) @ 1dB comp. | AC518 | +19.3 dBm | +18.5 dBm | +17.0 dBm |
| | AC519 | +21.8 dBm | +20.5 dBm | +20.0 dBm |
| Reverse Isolation | | 36.0 dB | — | — |
| DC Current (Max.) | AC518 | 96.0 mA | 103.0 mA | 110.0 mA |
| | AC519 | 127.0 mA | 135.0 mA | 140.0 mA |

* Measured in a 50-ohm system at +15 Vdc unless otherwise specified.

## INTERMODULATION PERFORMANCE

| Typical @ 25 °C | AC518 | AC519 |
|---|---|---|
| Second Order Harmonic Intercept Point | +55 dBm | +50 dBm |
| Second Order Two Tone Intercept Point | +50 dBm | +44 dBm |
| Third Order Two Tone Intercept Point | +32 dBm | +33 dBm |

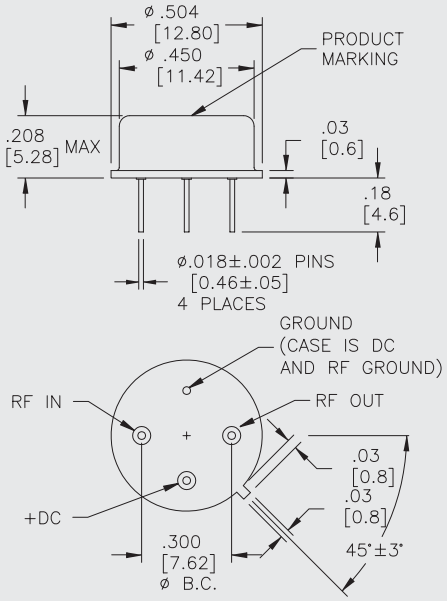
## ABSOLUTE MAXIMUM RATINGS

| | |
|---|---|
| Storage Temperature | -62 to +125 °C |
| Maximum Case Temperature | +125 °C |
| Maximum DC Voltage | +19 Volts |
| Maximum Continuous RF Input Power | +13 dBm |
| Maximum Short Term Input Power (1 Minute Max.) | 100 Milliwatts |
| Maximum Peak Power (3 µsec Max.) | 0.5 Watt |
| Burn-in Temperature (AC518/AC519) | +85 °C/+105 °C |
| Thermal Resistance[1] (θjc; AC518) | +35 °C/Watt |
| Thermal Resistance[1] (θjc; AC519) | +20 °C/Watt |
| Junction Temperature Rise Above Case (Tjc; AC518) | +50 °C |
| Junction Temperature Rise Above Case (Tjc; AC519) | +37.4 °C |

[1] Thermal resistance is based on total power dissipation.

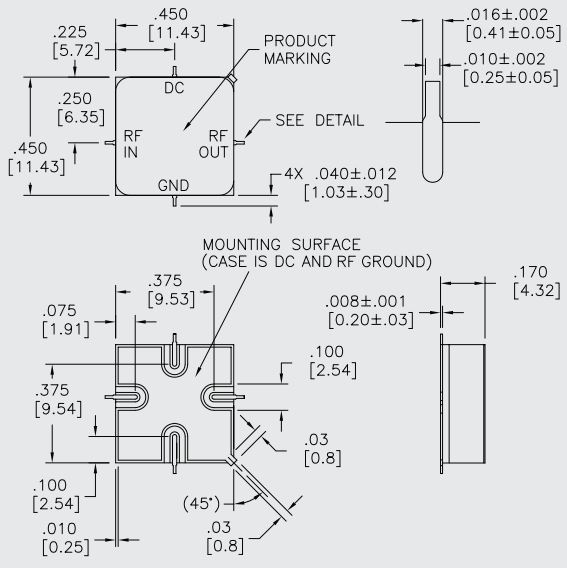
## AC518/AC519

### TO-8 Package for Amplifiers




## AS518/AS519

### SMTO-8 Package for Amplifiers




DIMENSIONS ARE IN INCHES [MILLIMETERS]

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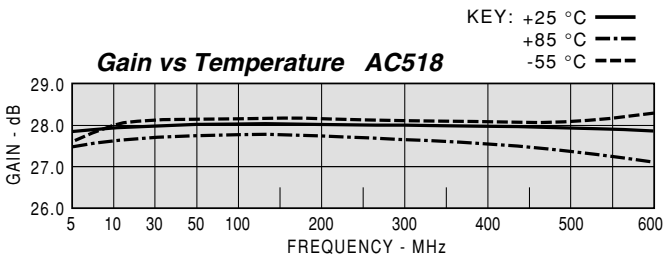
# AC518/AC519

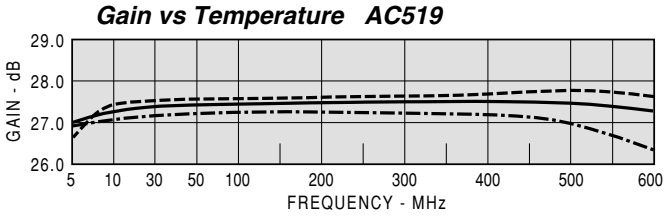
## TYPICAL PERFORMANCE



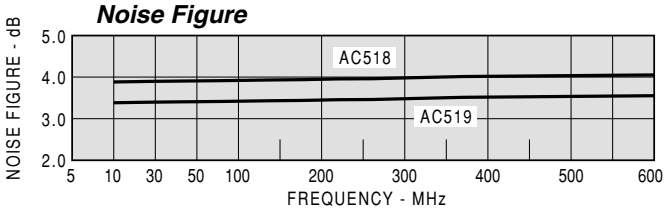

### Gain vs Temperature AC518



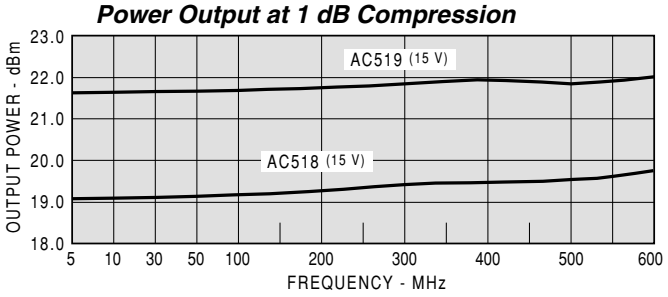

### Gain vs Temperature AC519



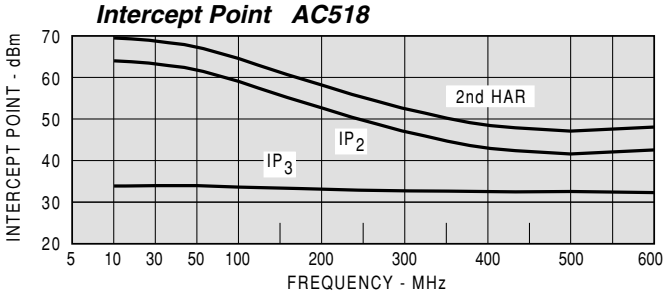

### Noise Figure



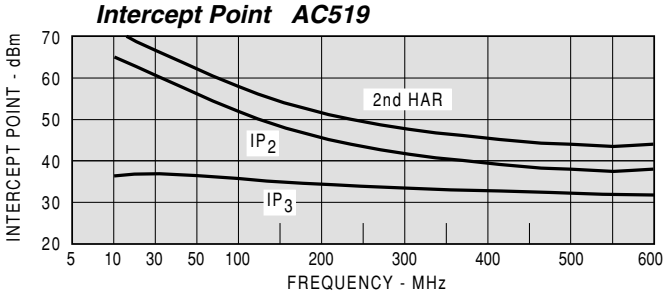

### Power Output at 1 dB Compression




### Intercept Point AC518




### Intercept Point AC519




## TYPICAL AUTOMATIC TEST DATA

Model: AC519 Vcc=+15V Icc=129.18

| FREQ MHZ | SWR IN | SWR OUT | GAIN DB | PHASE DEG | GROUP DELAY NSEC | REV/ISO DB |
|---|---|---|---|---|---|---|
| 5 | 1.09 | 1.09 | 26.88 | 36 | | -37.1 |
| 10 | 1.12 | 1.05 | 27.27 | 16 | | -37.0 |
| 20 | 1.15 | 1.03 | 27.43 | 4 | 3.4 | -37.0 |
| 50 | 1.17 | 1.05 | 27.51 | -11 | 1.4 | -36.7 |
| 100 | 1.19 | 1.06 | 27.48 | -29 | 0.97 | -36.7 |
| 200 | 1.26 | 1.07 | 27.43 | -60 | 0.88 | -36.9 |
| 300 | 1.34 | 1.10 | 27.36 | -92 | 0.86 | -36.7 |
| 400 | 1.42 | 1.17 | 27.32 | -123 | 0.87 | -36.6 |
| 500 | 1.44 | 1.27 | 27.27 | -155 | 0.89 | -36.1 |
| 600 | 1.39 | 1.46 | 27.26 | 172 | 0.92 | -35.2 |
| 700 | 1.27 | 1.82 | 27.20 | 137 | 0.98 | -34.0 |

LINEAR S-PARAMETERS

Model: AC519 Vcc=+15V Icc=129.18

| FREQ. | S11 | | S21 | | S12 | | S22 | |
|---|---|---|---|---|---|---|---|---|
| MHz | MAG | ANG | MAG | ANG | MAG | ANG | MAG | ANG |
| 5 | 0.04 | -53.0 | 22.09 | 35.7 | 0.014 | 35.0 | 0.04 | -84.7 |
| 10 | 0.06 | -13.2 | 23.11 | 16.1 | 0.014 | 17.6 | 0.02 | -60.5 |
| 20 | 0.07 | -8.6 | 23.53 | 3.7 | 0.014 | 10.6 | 0.02 | -17.6 |
| 50 | 0.08 | -19.4 | 23.73 | -11.4 | 0.015 | 0.5 | 0.02 | 0.7 |
| 100 | 0.09 | -36.7 | 23.67 | -28.8 | 0.015 | -6.8 | 0.03 | 0.5 |
| 200 | 0.11 | -64.5 | 23.53 | -60.5 | 0.014 | -17.1 | 0.04 | 1.0 |
| 300 | 0.15 | -84.1 | 23.35 | -91.5 | 0.015 | -24.1 | 0.05 | -3.7 |
| 400 | 0.17 | -102.4 | 23.21 | -122.9 | 0.015 | -32.3 | 0.08 | -14.4 |
| 500 | 0.18 | -122.2 | 23.10 | -154.8 | 0.016 | -40.8 | 0.12 | -30.8 |
| 600 | 0.16 | -148.9 | 23.08 | 172.0 | 0.017 | -54.9 | 0.19 | -53.3 |
| 700 | 0.12 | 163.0 | 22.91 | 136.7 | 0.020 | -69.6 | 0.29 | -77.2 |

Model: AC519 Vcc=+12V Icc=102.49

| FREQ MHZ | SWR IN | SWR OUT | GAIN DB | PHASE DEG | GROUP DELAY NSEC | REV/ISO DB |
|---|---|---|---|---|---|---|
| 5 | 1.11 | 1.11 | 26.71 | 35 | | -37.1 |
| 10 | 1.14 | 1.06 | 27.10 | 16 | | -36.7 |
| 20 | 1.16 | 1.04 | 27.26 | 3 | 3.4 | -36.6 |
| 50 | 1.18 | 1.05 | 27.33 | -12 | 1.4 | -36.6 |
| 100 | 1.20 | 1.06 | 27.30 | -29 | 0.97 | -36.8 |
| 200 | 1.28 | 1.09 | 27.25 | -61 | 0.89 | -36.2 |
| 300 | 1.37 | 1.13 | 27.17 | -92 | 0.87 | -36.4 |
| 400 | 1.45 | 1.20 | 27.12 | -124 | 0.88 | -35.9 |
| 500 | 1.47 | 1.32 | 27.09 | -156 | 0.9 | -35.7 |
| 600 | 1.43 | 1.53 | 27.09 | 170 | 0.93 | -34.6 |
| 700 | 1.33 | 1.94 | 27.02 | 134 | 1 | -33.8 |

Model: AC518 Vcc=+15V Icc=96.59

| FREQ MHZ | SWR IN | SWR OUT | GAIN DB | PHASE DEG | GROUP DELAY NSEC | REV/ISO DB |
|---|---|---|---|---|---|---|
| 5 | 1.24 | 1.07 | 27.71 | 30 | | -37.6 |
| 10 | 1.13 | 1.15 | 27.84 | 13 | | -37.1 |
| 20 | 1.08 | 1.18 | 27.91 | 2 | 3 | -36.7 |
| 50 | 1.08 | 1.19 | 27.94 | -11 | 1.3 | -36.8 |
| 100 | 1.11 | 1.20 | 27.93 | -28 | 0.9 | -36.9 |
| 200 | 1.20 | 1.21 | 27.96 | -58 | 0.84 | -36.6 |
| 300 | 1.31 | 1.20 | 28.01 | -88 | 0.84 | -36.0 |
| 400 | 1.38 | 1.21 | 28.04 | -119 | 0.86 | -35.9 |
| 500 | 1.45 | 1.24 | 28.01 | -151 | 0.89 | -35.6 |
| 600 | 1.53 | 1.40 | 27.84 | 175 | 0.93 | -34.2 |
| 700 | 1.76 | 1.77 | 27.44 | 140 | 0.97 | -33.7 |

LINEAR S-PARAMETERS

Model: AC518 Vcc=+15V Icc=96.59

| FREQ. | S11 | | S21 | | S12 | | S22 | |
|---|---|---|---|---|---|---|---|---|
| MHz | MAG | ANG | MAG | ANG | MAG | ANG | MAG | ANG |
| 5 | 0.11 | -109.0 | 24.28 | 30.1 | 0.013 | 37.2 | 0.03 | 47.2 |
| 10 | 0.06 | -127.0 | 24.66 | 12.8 | 0.014 | 17.7 | 0.07 | 15.1 |
| 20 | 0.04 | -157.0 | 24.85 | 2.1 | 0.015 | 10.7 | 0.08 | 7.7 |
| 50 | 0.04 | 157.5 | 24.94 | -11.5 | 0.014 | 0.6 | 0.09 | 2.3 |
| 100 | 0.05 | 128.0 | 24.91 | -27.7 | 0.014 | -0.6 | 0.09 | -2.5 |
| 200 | 0.09 | 106.5 | 25.01 | -57.9 | 0.015 | -10.1 | 0.09 | -10.6 |
| 300 | 0.13 | 97.5 | 25.14 | -88.1 | 0.016 | -10.7 | 0.09 | -25.0 |
| 400 | 0.16 | 93.6 | 25.24 | -119.1 | 0.016 | -17.0 | 0.09 | -52.2 |
| 500 | 0.18 | 94.6 | 25.16 | -151.1 | 0.017 | -26.6 | 0.11 | -95.6 |
| 600 | 0.21 | 103.0 | 24.66 | 175.3 | 0.019 | -38.5 | 0.17 | -142.0 |
| 700 | 0.27 | 113.5 | 23.55 | 140.4 | 0.021 | -51.5 | 0.28 | -179.2 |

Model: AC518 Vcc=+12V Icc=76.42

| FREQ MHZ | SWR IN | SWR OUT | GAIN DB | PHASE DEG | GROUP DELAY NSEC | REV/ISO DB |
|---|---|---|---|---|---|---|
| 5 | 1.24 | 1.07 | 27.51 | 29 | | -37.4 |
| 10 | 1.12 | 1.15 | 27.65 | 13 | | -37.1 |
| 20 | 1.07 | 1.17 | 27.72 | 2 | 2.9 | -37.2 |
| 50 | 1.06 | 1.19 | 27.75 | -12 | 1.3 | -36.6 |
| 100 | 1.09 | 1.19 | 27.74 | -28 | 0.9 | -36.7 |
| 200 | 1.18 | 1.21 | 27.78 | -58 | 0.84 | -36.9 |
| 300 | 1.27 | 1.22 | 27.85 | -89 | 0.85 | -36.3 |
| 400 | 1.34 | 1.22 | 27.90 | -120 | 0.87 | -35.7 |
| 500 | 1.43 | 1.26 | 27.89 | -152 | 0.9 | -34.8 |
| 600 | 1.55 | 1.42 | 27.72 | 174 | 0.95 | -34.3 |
| 700 | 1.85 | 1.81 | 27.29 | 138 | 0.98 | -33.2 |