

A2CP2596

20 TO 2500 MHz, 3 WATTS COUGARPAK™ AMPLIFIER

| Typical Values | A2CP2596 |
|----------------------------------|-----------|
| High Gain | +23.5 dB |
| High Output Power, P1dB | 3.0 Watts |
| High Saturated Power, Psat. | 6.0 Watts |
| High Third Order I.P. | +45 dBm |
| Thin Film Two-stage CougarPak™ | |

SPECIFICATIONS*

| Parameter | Typical | Guaranteed | |
|---------------------------------------|--------------|-------------|---------------|
| | | 0 to 50 °C | -55 to +85 °C |
| Frequency (Min.) | 10-2600 MHz | 20-2500 MHz | 20-2500 MHz |
| Small Signal Gain [^] (Min.) | 23.5 dB | 22.0 dB | 21.0 dB |
| Gain Flatness (Max.) | ±0.6 dB | ±0.8 dB | ±1.0 dB |
| Noise Figure (Max.) | | | |
| 100-300 MHz | 4.8 dB | 5.5 dB | 8.0 dB |
| 300-2500 MHz | 4.3 dB | 5.0 dB | 5.5 dB |
| SWR (Max.) | Input/Output | 2.0:1 | 2.0:1 |
| Power Output (Min.) | | | |
| @ 1dB comp. 20-500 MHz | +36.5 dBm | +36.0 dBm | +35.0 dBm |
| 500-2500 MHz | +34.5 dBm | +34.0 dBm | +34.0 dBm |
| Reverse Isolation | 37.0 dB | — | — |
| DC Current (Max.) | | | |
| 1st Stg: +15V | 335 mA | 350 mA | 360 mA |
| Linear Oper. 2nd Stg: +28V | 530 mA | 560 mA | 580 mA |
| Psat w/+20 dBm Input | | | |
| 2nd Stage: +28V | 700 mA | 750 mA | 760 mA |

* Measured in a 50-ohm system at +15/+28V. ^ 0.5 dB less under 50 MHz.

INTERMODULATION PERFORMANCE

| Typical @ 25 °C | A2CP2596 |
|---|----------|
| Second Order Harmonic Intercept Point | +51 dBm |
| Second Order Two Tone Intercept Point | +46 dBm |
| Third Order Two Tone Intercept Point | +45 dBm |

ABSOLUTE MAXIMUM RATINGS

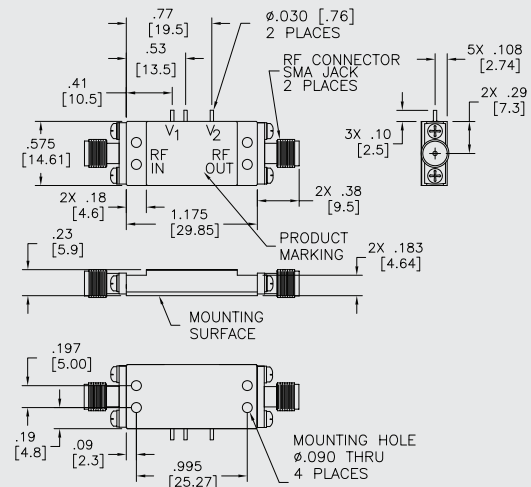
| | |
|--|----------------------|
| Storage Temperature | -62 to +125 °C |
| Maximum Case Temperature, +28V/+32V | +90 °C/+75 °C |
| Maximum DC Voltage | +33 Volts |
| Maximum Continuous RF Input Power | +20 dBm ¹ |
| Maximum Short Term Input Power (1 Minute Max.) | +22 dBm |
| Maximum Peak Power (3 µsec Max.) | +24 dBm |
| Burn-in Temperature, +28V | +85 °C |
| Thermal Resistance ² (θjc) | +4.3 °C/Watt |
| Junction Temperature Rise Above Case (Tjc), +28V | +83 °C |

¹ If no load or a short on output; decrease input power by +10 dBm.

² Thermal resistance is based on total power dissipation.

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Two-stage High Power CougarPak™ SMA Package



Pin V₁: +15V

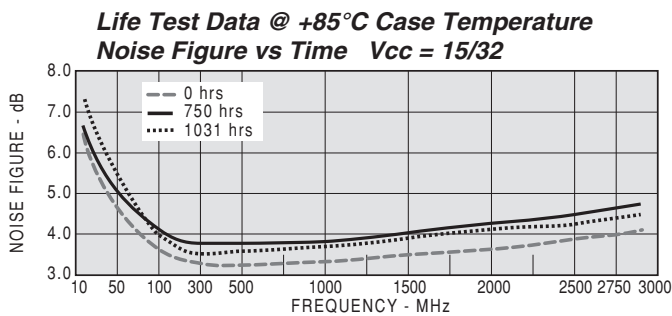
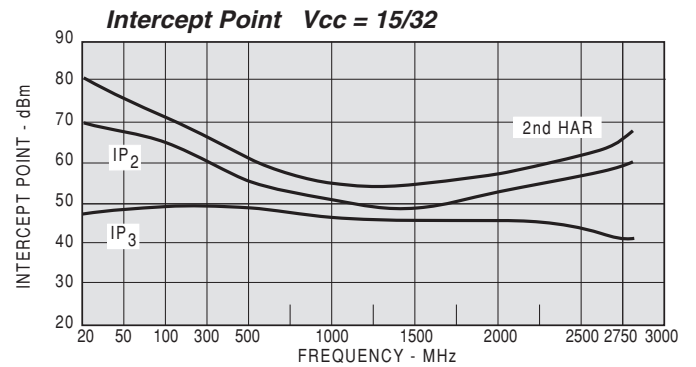
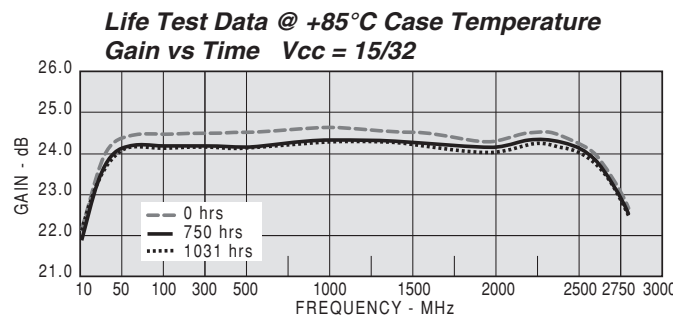
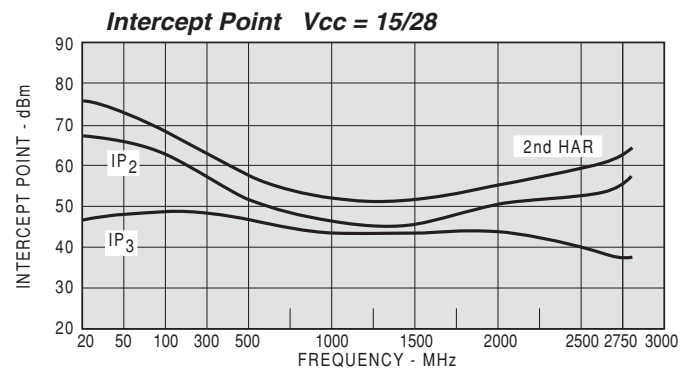
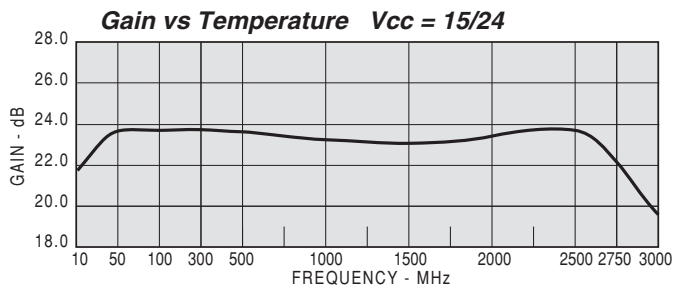
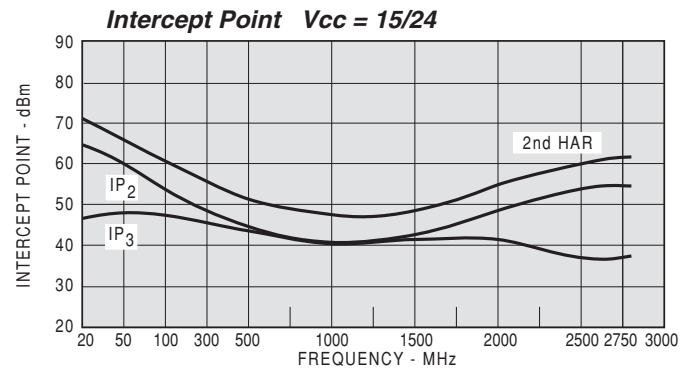
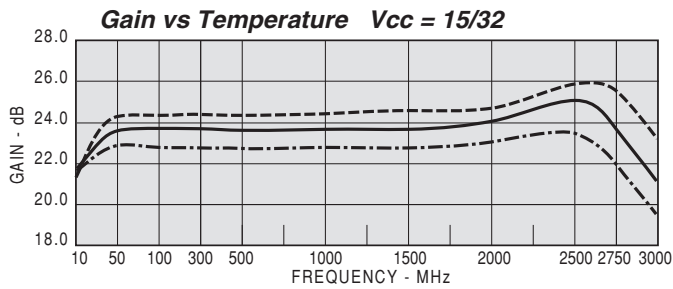
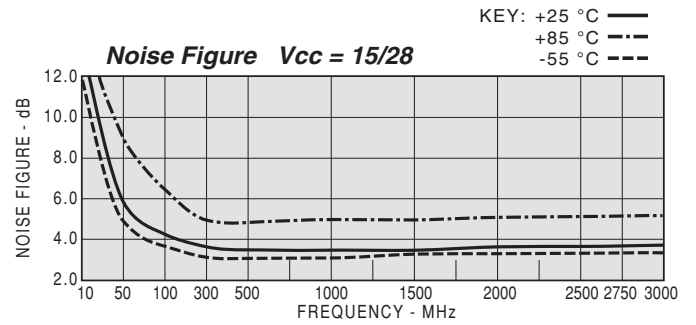
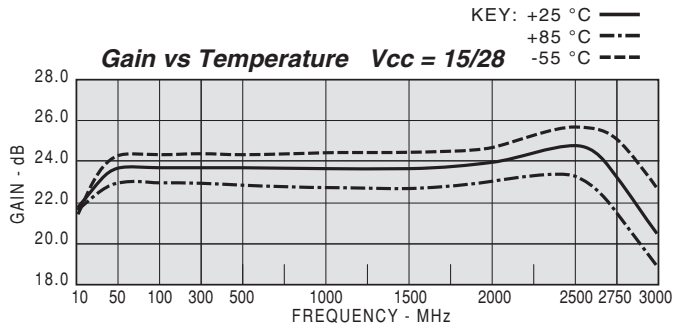
Pin V₂: +28V

HEAT SINK WARNING:

This amplifier requires an adequate heat sink to prevent damage. Maximum case temperature must not be exceeded. The package is designed to provide adequate heat transfer to proper aluminum heat sink.

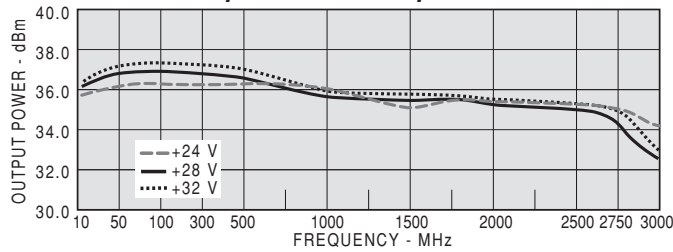
DIMENSIONS ARE IN INCHES [MILLIMETERS]

TYPICAL PERFORMANCE

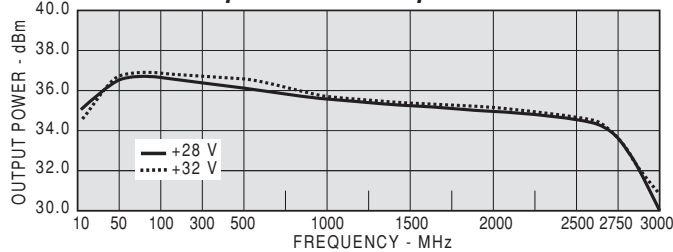


TYPICAL PERFORMANCE

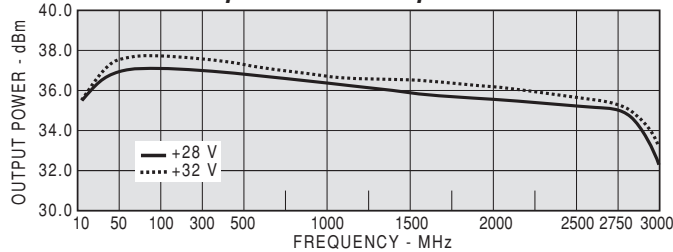
Power Output at 1 dB Compression +25° C



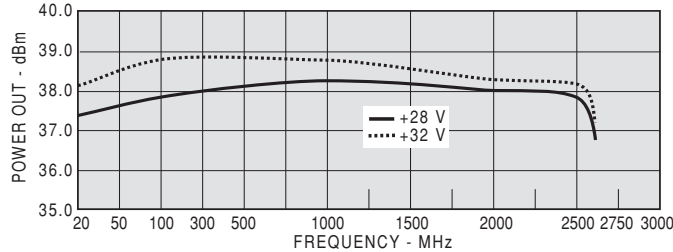
Power Output at 1 dB Compression +85° C



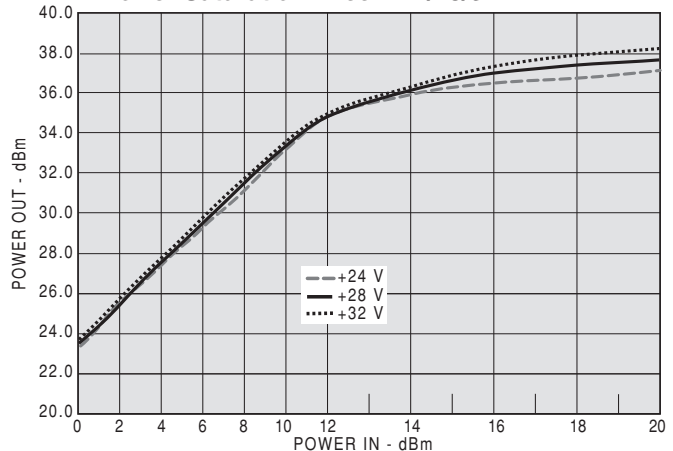
Power Output at 1 dB Compression -55° C



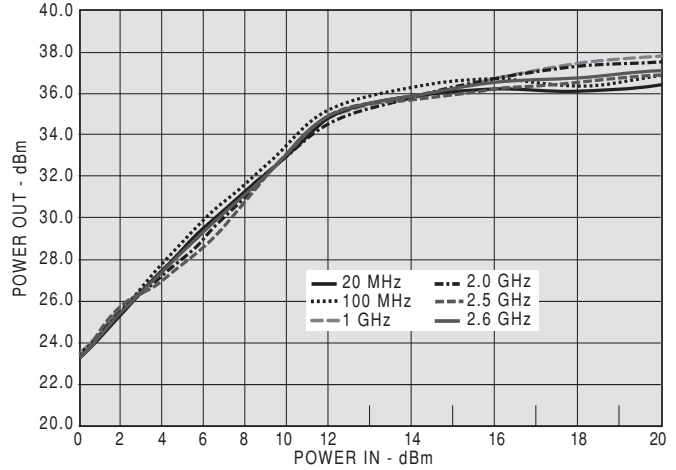
Power Saturation at 20 dBm Vcc = 28/32



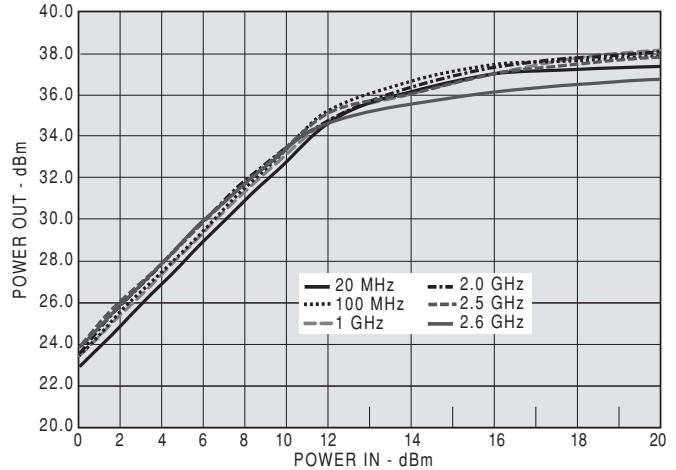
Power Saturation Vcc = 24/28/32



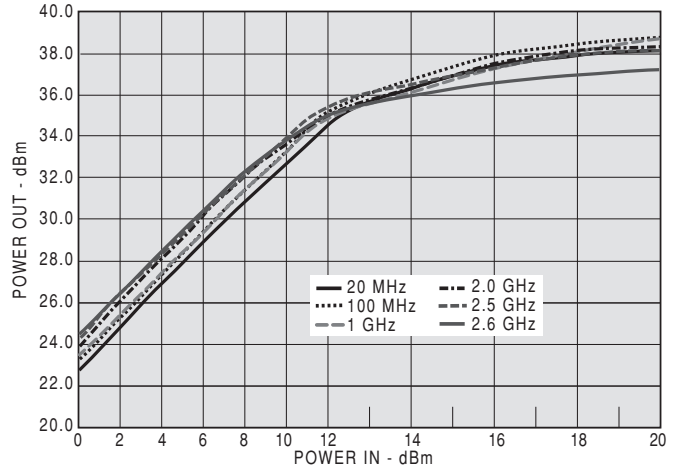
Power Saturation Vcc = 15/24



Power Saturation Vcc = 15/28

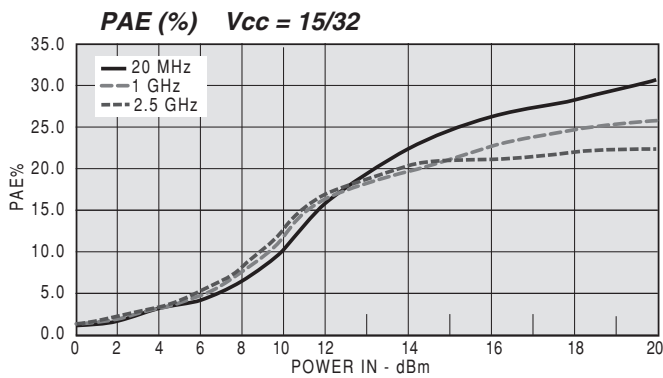
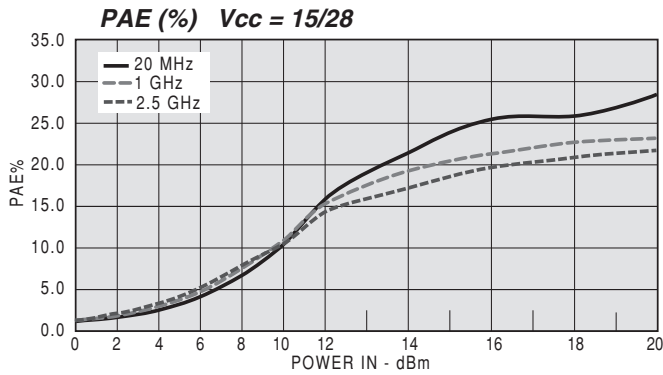


Power Saturation Vcc = 15/32



TYPICAL PERFORMANCE

TYPICAL AUTOMATIC TEST DATA



| Model: A2CP2596 | | | Vcc=+15V / +28V | | | Icc=336.0 | |
|-----------------|------|------|-----------------|---------|-------|-----------|--------|
| FREQ | SWR | SWR | GAIN | PHASE | DELAY | REV/ISO | |
| GHZ | IN | OUT | DB | DEG | NSEC | DB | |
| 10 | 1.21 | 1.52 | 21.80 | 65.00 | 29.00 | | -36.10 |
| 20 | 1.11 | 1.18 | 23.42 | 30.00 | 6.60 | | -36.30 |
| 50 | 1.23 | 1.16 | 23.82 | 5.00 | 1.30 | | -37.10 |
| 100 | 1.25 | 1.17 | 23.85 | -9.00 | 0.63 | | -37.30 |
| 200 | 1.26 | 1.20 | 23.87 | -29.00 | 0.51 | | -37.10 |
| 300 | 1.26 | 1.26 | 23.86 | -46.00 | 0.48 | | -37.20 |
| 400 | 1.25 | 1.32 | 23.82 | -63.00 | 0.45 | | -37.40 |
| 500 | 1.25 | 1.38 | 23.81 | -79.00 | 0.46 | | -37.50 |
| 600 | 1.24 | 1.45 | 23.81 | -95.00 | 0.45 | | -37.70 |
| 700 | 1.25 | 1.50 | 23.83 | -112.00 | 0.46 | | -37.40 |
| 800 | 1.25 | 1.55 | 23.82 | -128.00 | 0.45 | | -37.40 |
| 900 | 1.26 | 1.58 | 23.85 | -144.00 | 0.45 | | -37.20 |
| 1000 | 1.27 | 1.60 | 23.82 | -161.00 | 0.46 | | -37.30 |
| 1200 | 1.32 | 1.60 | 23.85 | 166.00 | 0.47 | | -37.30 |
| 1400 | 1.40 | 1.58 | 23.86 | 134.00 | 0.45 | | -37.00 |
| 1600 | 1.51 | 1.61 | 23.88 | 100.00 | 0.46 | | -37.20 |
| 1800 | 1.64 | 1.70 | 23.97 | 66.00 | 0.48 | | -36.70 |
| 2000 | 1.73 | 1.80 | 24.19 | 31.00 | 0.51 | | -36.40 |
| 2200 | 1.71 | 1.75 | 24.52 | -5.00 | 0.53 | | -35.60 |
| 2300 | 1.62 | 1.64 | 24.59 | -25.00 | 0.55 | | -35.30 |
| 2400 | 1.48 | 1.46 | 24.74 | -46.00 | 0.59 | | -35.00 |
| 2500 | 1.28 | 1.24 | 24.67 | -68.00 | 0.64 | | -34.90 |
| 2600 | 1.07 | 1.06 | 24.27 | -91.00 | 0.64 | | -35.30 |
| 2700 | 1.14 | 1.27 | 23.50 | -115.00 | 0.58 | | -35.70 |
| 2800 | 1.38 | 1.58 | 22.48 | -135.00 | 0.57 | | -36.30 |
| 2900 | 1.62 | 1.88 | 21.31 | -156.00 | 0.55 | | -37.30 |
| 3000 | 1.85 | 2.19 | 20.00 | -172.00 | 0.40 | | -37.60 |

| Model: A2CP2596 | | | LINEAR S-PARAMETERS | | | | | | Icc=336.5 | |
|-----------------|------|---------|---------------------|---------|-------|---------|------|---------|-----------|--|
| | | | Vcc=+15V / +28V | | | | | | | |
| FREQ. | S11 | | S21 | | S12 | | S22 | | | |
| GHZ | MAG | ANG | MAG | ANG | MAG | ANG | MAG | ANG | | |
| 5 | 0.38 | -86.70 | 6.80 | 117.80 | 0.013 | 99.60 | 0.61 | 162.90 | | |
| 10 | 0.10 | -109.70 | 12.30 | 65.10 | 0.016 | 41.90 | 0.21 | 118.80 | | |
| 20 | 0.05 | 20.80 | 14.82 | 30.40 | 0.015 | 14.80 | 0.08 | 140.10 | | |
| 50 | 0.10 | 7.40 | 15.52 | 5.30 | 0.014 | 1.40 | 0.07 | 174.20 | | |
| 100 | 0.11 | -2.90 | 15.59 | -9.40 | 0.014 | -6.50 | 0.08 | -172.50 | | |
| 200 | 0.12 | -16.40 | 15.61 | -29.00 | 0.014 | -12.60 | 0.09 | -158.90 | | |
| 300 | 0.11 | -28.10 | 15.60 | -46.40 | 0.014 | -22.40 | 0.11 | -153.30 | | |
| 400 | 0.11 | -39.30 | 15.52 | -62.90 | 0.014 | -29.90 | 0.14 | -153.80 | | |
| 500 | 0.11 | -51.00 | 15.51 | -79.20 | 0.013 | -37.50 | 0.16 | -156.30 | | |
| 600 | 0.11 | -62.20 | 15.50 | -95.40 | 0.013 | -43.50 | 0.18 | -161.30 | | |
| 700 | 0.11 | -74.20 | 15.55 | -111.80 | 0.014 | -52.40 | 0.20 | -165.80 | | |
| 800 | 0.11 | -85.60 | 15.52 | -128.00 | 0.013 | -60.70 | 0.21 | -171.10 | | |
| 900 | 0.11 | -96.80 | 15.58 | -144.30 | 0.014 | -66.70 | 0.23 | -176.30 | | |
| 1000 | 0.12 | -107.20 | 15.53 | -160.90 | 0.014 | -74.40 | 0.23 | 178.70 | | |
| 1200 | 0.14 | -126.40 | 15.58 | 166.20 | 0.014 | -91.10 | 0.23 | 171.20 | | |
| 1400 | 0.17 | -143.70 | 15.60 | 133.60 | 0.014 | -105.60 | 0.23 | 168.30 | | |
| 1600 | 0.20 | -160.40 | 15.63 | 100.10 | 0.014 | -122.10 | 0.23 | 168.40 | | |
| 1800 | 0.24 | -178.80 | 15.80 | 66.00 | 0.015 | -138.90 | 0.26 | 166.00 | | |
| 2000 | 0.27 | 160.30 | 16.19 | 31.30 | 0.015 | -154.60 | 0.29 | 156.70 | | |
| 2200 | 0.26 | 136.10 | 16.83 | -5.00 | 0.017 | -173.90 | 0.27 | 140.10 | | |
| 2300 | 0.24 | 122.00 | 16.96 | -25.10 | 0.017 | 176.90 | 0.24 | 129.00 | | |
| 2400 | 0.19 | 105.80 | 17.26 | -45.60 | 0.018 | 164.50 | 0.19 | 114.40 | | |
| 2500 | 0.12 | 87.30 | 17.12 | -68.40 | 0.018 | 151.90 | 0.11 | 93.00 | | |
| 2600 | 0.03 | 60.70 | 16.34 | -91.30 | 0.017 | 138.00 | 0.03 | -3.40 | | |
| 2700 | 0.07 | -120.20 | 14.95 | -114.50 | 0.016 | 124.00 | 0.12 | -89.70 | | |
| 2800 | 0.16 | -143.00 | 13.30 | -135.50 | 0.015 | 114.10 | 0.22 | -111.30 | | |
| 2900 | 0.24 | -160.00 | 11.63 | -155.80 | 0.014 | 104.30 | 0.31 | -126.40 | | |
| 3000 | 0.30 | -175.10 | 10.00 | -171.80 | 0.013 | 98.00 | 0.37 | -138.10 | | |