

NSVF4015SG4

RF Transistor for Low Noise Amplifier

12 V, 100 mA, $f_T = 10$ GHz typ.

This RF transistor is designed for low noise amplifier applications. MCPH package is suitable for use under high temperature environment because it has superior heat radiation characteristics. This RF transistor is AEC-Q101 qualified and PPAP capable for automotive applications.

Features

- Low-noise Use: $NF = 1.2$ dB typ. ($f = 1$ GHz)
- High Cut-off Frequency: $f_T = 10$ GHz typ. ($V_{CE} = 5$ V)
- High Gain: $|S_{21e}|^2 = 17$ dB typ. ($f = 1$ GHz)
- MCPH4 Package is Pin-compatible with SC-82FL
- AEC-Q101 Qualified and PPAP Capable
- Pb-Free, Halogen Free and RoHS Compliance

Typical Applications

- Low Noise Amplifier for Digital Radio
- Low Noise Amplifier for TV
- Low Noise Amplifier for FM Radio
- RF Amplifier for UHF Application

Specifications

ABSOLUTE MAXIMUM RATINGS at $T_A = 25^\circ\text{C}$

| Rating | Symbol | Value | Unit |
|--|----------------|-------------|------------------|
| Collector to Base Voltage | V_{CBO} | 20 | V |
| Collector to Emitter Voltage | V_{CEO} | 12 | V |
| Emitter to Base Voltage | V_{EBO} | 2 | V |
| Collector Current | I_C | 100 | mA |
| Collector Dissipation | P_C | 450 | mW |
| Operating Junction and Storage Temperature | T_J, T_{stg} | -55 to +150 | $^\circ\text{C}$ |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

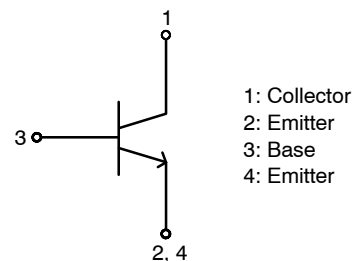


ON Semiconductor®

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12 V, 100 mA
 $f_T = 10$ GHz typ.
RF Transistor

ELECTRICAL CONNECTION NPN



MARKING DIAGRAM



ORDERING INFORMATION

See detailed ordering and shipping information on page 10 of this data sheet.

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Table 1. ELECTRICAL CHARACTERISTICS at $T_A = 25^\circ\text{C}$ (Note 1)

| Parameter | Symbol | Conditions | Value | | | Unit |
|--------------------------|---------------|---|-------|-----|-----|---------------|
| | | | Min | Typ | Max | |
| Collector Cutoff Current | I_{CBO} | $V_{CB} = 5\text{ V}, I_E = 0\text{ A}$ | – | – | 1.0 | μA |
| Emitter Cutoff Current | I_{EBO} | $V_{EB} = 1\text{ V}, I_C = 0\text{ A}$ | – | – | 1.0 | μA |
| DC Current Gain | h_{FE} | $V_{CE} = 5\text{ V}, I_C = 50\text{ mA}$ | 60 | – | 150 | |
| Gain–Bandwidth Product | f_T | $V_{CE} = 5\text{ V}, I_C = 30\text{ mA}$ | 8 | 10 | – | GHz |
| Forward Transfer Gain | $ S_{21e} ^2$ | $V_{CE} = 5\text{ V}, I_C = 30\text{ mA}, f = 1\text{ GHz}$ | 14 | 17 | – | dB |
| Noise Figure | NF | $V_{CE} = 5\text{ V}, I_C = 10\text{ mA}, f = 1\text{ GHz}$ | | 1.2 | 1.8 | dB |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

1. Pay attention to handling since it is liable to be affected by static electricity due to the high-frequency process adopted.

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TYPICAL CHARACTERISTICS

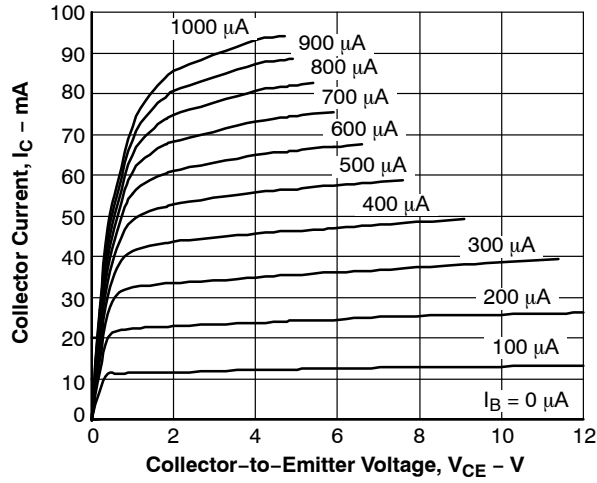


Figure 1. I_C vs. V_{CE}

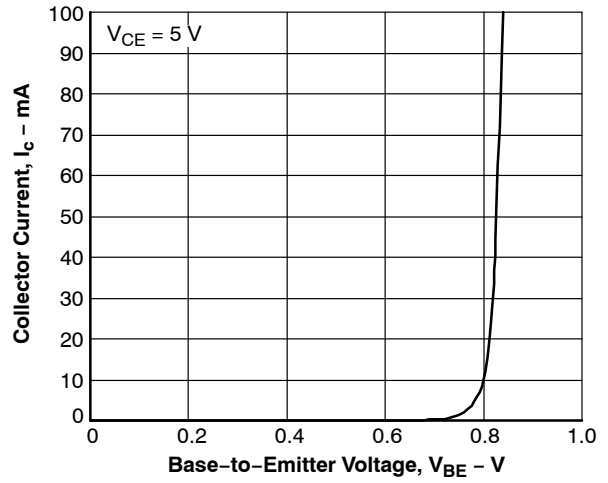


Figure 2. I_C vs. V_{BE}

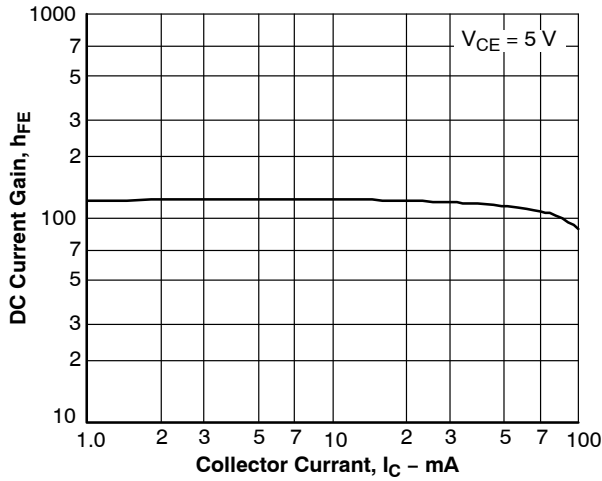


Figure 3. h_{FE} vs. I_C

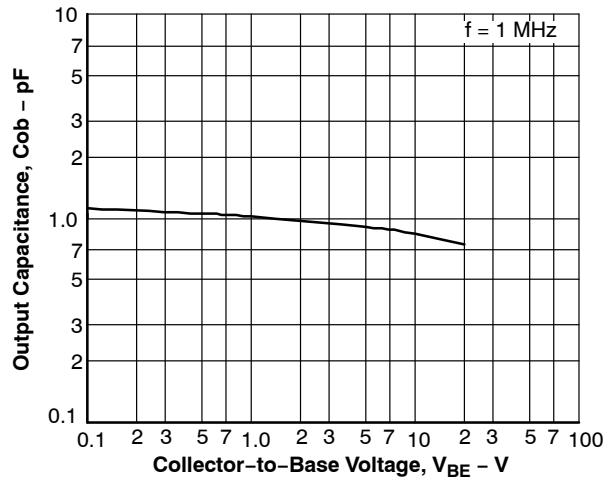


Figure 4. C_{ob} vs. V_{CB}

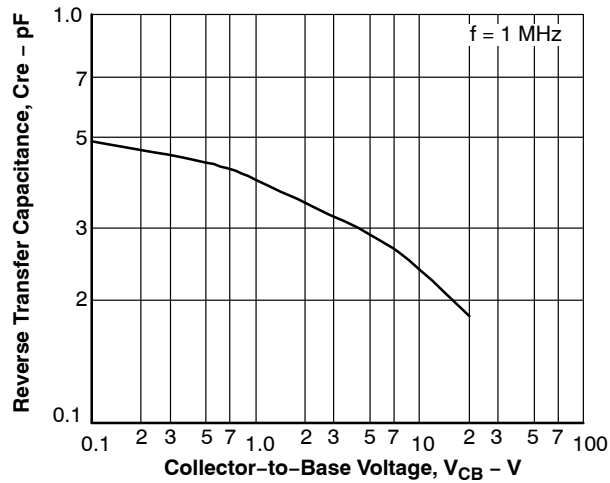


Figure 5. C_{re} vs. V_{CB}

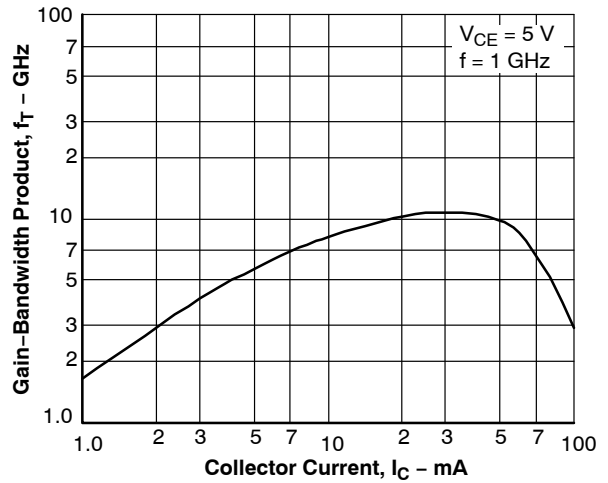


Figure 6. f_T vs. I_C

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TYPICAL CHARACTERISTICS

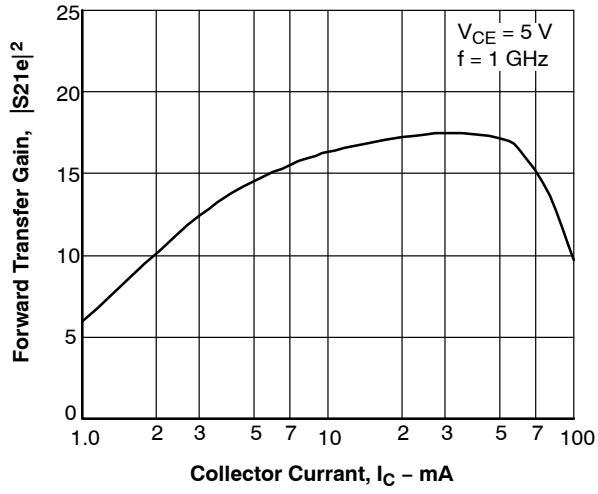


Figure 7. $|S_{21e}|^2$ vs. I_C

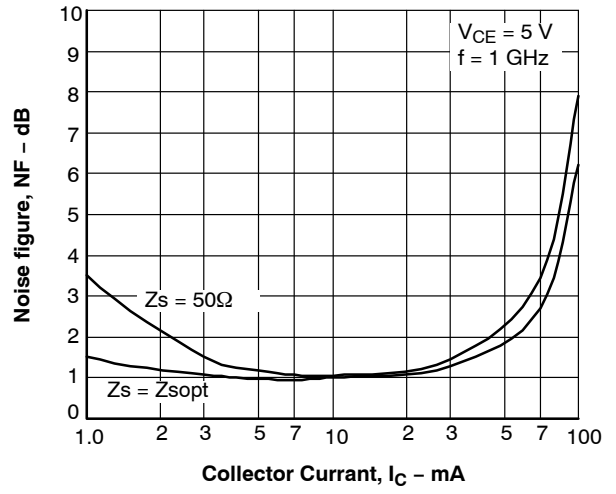


Figure 8. NF vs. I_C

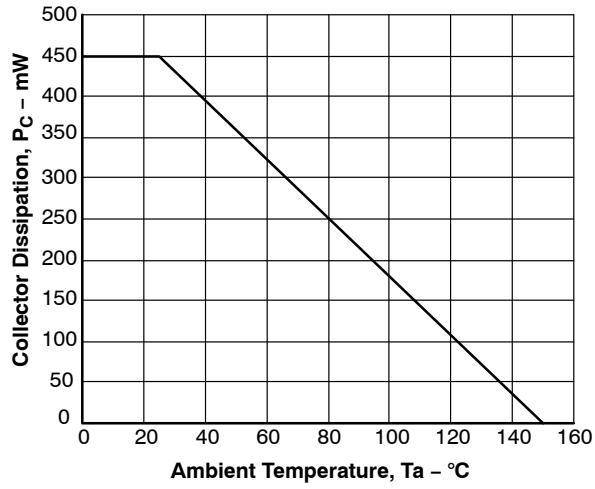


Figure 9. P_C vs. T_a

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S PARAMETERS (COMMON EMITTER)

$V_{CE} = 3\text{ V}$, $I_C = 10\text{ mA}$

| Freq (MHz) | S11 | < S11 | S21 | < S21 | S12 | < S12 | S22 | < S22 |
|------------|-------|--------|--------|-------|-------|-------|-------|--------|
| 100 | 0.763 | -38.0 | 22.980 | 155.3 | 0.018 | 71.5 | 0.923 | -22.7 |
| 200 | 0.733 | -71.8 | 20.122 | 135.9 | 0.031 | 58.6 | 0.798 | -40.2 |
| 300 | 0.702 | -98.5 | 17.019 | 121.3 | 0.038 | 50.6 | 0.703 | -53.5 |
| 400 | 0.690 | -116.5 | 14.110 | 110.7 | 0.043 | 46.3 | 0.626 | -62.9 |
| 500 | 0.701 | -127.2 | 12.307 | 103.5 | 0.048 | 45.0 | 0.592 | -67.4 |
| 600 | 0.679 | -137.1 | 10.431 | 97.5 | 0.050 | 43.7 | 0.531 | -72.0 |
| 700 | 0.663 | -145.1 | 8.949 | 92.7 | 0.052 | 43.6 | 0.484 | -75.2 |
| 800 | 0.651 | -152.1 | 7.848 | 88.4 | 0.054 | 43.9 | 0.446 | -78.7 |
| 900 | 0.646 | -157.6 | 6.993 | 84.8 | 0.057 | 44.0 | 0.422 | -81.6 |
| 1000 | 0.639 | -162.3 | 6.272 | 81.9 | 0.059 | 45.1 | 0.404 | -84.4 |
| 1200 | 0.635 | -170.2 | 5.211 | 76.5 | 0.063 | 47.1 | 0.375 | -88.7 |
| 1400 | 0.634 | -176.5 | 4.462 | 71.7 | 0.068 | 49.1 | 0.362 | -92.4 |
| 1600 | 0.633 | 177.9 | 3.907 | 67.3 | 0.073 | 51.2 | 0.352 | -95.9 |
| 1800 | 0.636 | 173.2 | 3.463 | 63.4 | 0.079 | 52.7 | 0.351 | -99.0 |
| 2000 | 0.637 | 169.1 | 3.122 | 59.5 | 0.085 | 54.3 | 0.352 | -102.3 |
| 2200 | 0.637 | 164.9 | 2.838 | 55.8 | 0.091 | 55.5 | 0.356 | -105.2 |
| 2400 | 0.638 | 161.0 | 2.604 | 52.1 | 0.098 | 56.5 | 0.364 | -108.1 |
| 2600 | 0.639 | 157.3 | 2.413 | 48.7 | 0.105 | 57.2 | 0.372 | -111.1 |
| 2800 | 0.642 | 153.7 | 2.244 | 45.1 | 0.112 | 57.9 | 0.384 | -113.5 |
| 3000 | 0.641 | 150.0 | 2.095 | 41.8 | 0.120 | 57.8 | 0.396 | -116.2 |

$V_{CE} = 3\text{ V}$, $I_C = 30\text{ mA}$

| Freq (MHz) | S11 | < S11 | S21 | < S21 | S12 | < S12 | S22 | < S22 |
|------------|-------|--------|--------|-------|-------|-------|-------|--------|
| 100 | 0.542 | -76.9 | 42.437 | 142.3 | 0.013 | 63.9 | 0.801 | -36.2 |
| 200 | 0.588 | -118.2 | 30.735 | 119.6 | 0.020 | 53.9 | 0.602 | -56.8 |
| 300 | 0.614 | -138.6 | 22.677 | 106.5 | 0.024 | 52.3 | 0.505 | -69.3 |
| 400 | 0.626 | -150.0 | 17.506 | 98.4 | 0.027 | 53.8 | 0.448 | -77.9 |
| 500 | 0.635 | -155.0 | 14.522 | 92.7 | 0.031 | 55.6 | 0.423 | -79.8 |
| 600 | 0.630 | -161.3 | 12.035 | 88.5 | 0.035 | 57.8 | 0.381 | -83.6 |
| 700 | 0.627 | -166.4 | 10.249 | 85.2 | 0.038 | 59.8 | 0.350 | -86.9 |
| 800 | 0.626 | -170.9 | 8.902 | 82.2 | 0.042 | 61.3 | 0.327 | -90.4 |
| 900 | 0.627 | -174.7 | 7.888 | 79.5 | 0.045 | 62.3 | 0.314 | -93.2 |
| 1000 | 0.626 | -177.8 | 7.046 | 77.3 | 0.049 | 63.4 | 0.303 | -96.1 |
| 1200 | 0.629 | 176.7 | 5.835 | 73.1 | 0.057 | 65.4 | 0.287 | -100.4 |
| 1400 | 0.631 | 171.9 | 4.976 | 69.2 | 0.065 | 66.2 | 0.282 | -103.8 |
| 1600 | 0.633 | 167.7 | 4.344 | 65.6 | 0.073 | 66.5 | 0.280 | -106.9 |
| 1800 | 0.637 | 163.9 | 3.854 | 62.0 | 0.082 | 66.8 | 0.281 | -109.7 |
| 2000 | 0.638 | 160.5 | 3.474 | 58.7 | 0.090 | 66.6 | 0.287 | -112.5 |
| 2200 | 0.638 | 156.8 | 3.160 | 55.5 | 0.099 | 66.5 | 0.293 | -115.1 |
| 2400 | 0.640 | 153.5 | 2.900 | 52.2 | 0.108 | 65.8 | 0.302 | -117.3 |
| 2600 | 0.640 | 150.2 | 2.684 | 49.0 | 0.117 | 65.2 | 0.312 | -119.5 |
| 2800 | 0.642 | 146.9 | 2.499 | 45.9 | 0.125 | 64.3 | 0.324 | -121.6 |
| 3000 | 0.640 | 143.6 | 2.337 | 42.8 | 0.134 | 63.6 | 0.337 | -123.8 |

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S PARAMETERS (COMMON EMITTER)

$V_{CE} = 3\text{ V}$, $I_C = 50\text{ mA}$

| Freq (MHz) | S11 | < S11 | S21 | < S21 | S12 | < S12 | S22 | < S22 |
|------------|-------|--------|--------|-------|-------|-------|-------|--------|
| 100 | 0.514 | -110.3 | 43.067 | 133.3 | 0.011 | 59.0 | 0.700 | -40.9 |
| 200 | 0.607 | -141.4 | 29.221 | 112.3 | 0.016 | 53.1 | 0.495 | -58.9 |
| 300 | 0.642 | -154.9 | 20.818 | 101.0 | 0.019 | 55.3 | 0.417 | -68.7 |
| 400 | 0.657 | -162.5 | 15.865 | 94.1 | 0.023 | 58.5 | 0.376 | -75.5 |
| 500 | 0.660 | -165.8 | 13.033 | 88.9 | 0.027 | 61.4 | 0.360 | -75.7 |
| 600 | 0.659 | -170.3 | 10.812 | 85.3 | 0.030 | 64.0 | 0.330 | -78.7 |
| 700 | 0.658 | -174.3 | 9.213 | 82.3 | 0.034 | 66.1 | 0.307 | -81.5 |
| 800 | 0.660 | -177.8 | 7.995 | 79.5 | 0.038 | 67.8 | 0.291 | -84.5 |
| 900 | 0.663 | 179.2 | 7.097 | 77.1 | 0.042 | 68.6 | 0.284 | -87.1 |
| 1000 | 0.662 | 176.6 | 6.333 | 74.8 | 0.046 | 69.6 | 0.277 | -89.7 |
| 1200 | 0.666 | 172.0 | 5.247 | 70.8 | 0.055 | 70.9 | 0.268 | -93.7 |
| 1400 | 0.670 | 167.9 | 4.475 | 67.0 | 0.063 | 71.3 | 0.269 | -97.1 |
| 1600 | 0.673 | 164.1 | 3.897 | 63.4 | 0.072 | 71.5 | 0.270 | -100.2 |
| 1800 | 0.676 | 160.6 | 3.469 | 59.9 | 0.080 | 71.4 | 0.275 | -103.3 |
| 2000 | 0.678 | 157.5 | 3.113 | 56.5 | 0.089 | 71.0 | 0.284 | -106.5 |
| 2200 | 0.679 | 154.1 | 2.836 | 53.1 | 0.098 | 70.4 | 0.293 | -109.3 |
| 2400 | 0.681 | 150.9 | 2.598 | 49.8 | 0.107 | 69.8 | 0.304 | -111.9 |
| 2600 | 0.682 | 147.8 | 2.404 | 46.6 | 0.116 | 68.9 | 0.316 | -114.4 |
| 2800 | 0.683 | 144.6 | 2.241 | 43.4 | 0.125 | 67.8 | 0.330 | -117.0 |
| 3000 | 0.682 | 141.3 | 2.094 | 40.3 | 0.135 | 66.8 | 0.346 | -119.6 |

$V_{CE} = 3\text{ V}$, $I_C = 80\text{ mA}$

| Freq (MHz) | S11 | < S11 | S21 | < S21 | S12 | < S12 | S22 | < S22 |
|------------|-------|--------|--------|-------|-------|-------|-------|--------|
| 100 | 0.662 | -146.8 | 29.622 | 120.5 | 0.011 | 47.5 | 0.455 | -44.8 |
| 200 | 0.751 | -164.0 | 16.762 | 102.8 | 0.014 | 46.9 | 0.315 | -52.9 |
| 300 | 0.774 | -171.2 | 11.369 | 94.2 | 0.017 | 52.5 | 0.288 | -57.1 |
| 400 | 0.783 | -175.6 | 8.549 | 88.9 | 0.019 | 58.6 | 0.279 | -61.3 |
| 500 | 0.778 | -178.0 | 6.977 | 84.2 | 0.023 | 62.0 | 0.283 | -61.0 |
| 600 | 0.778 | 179.0 | 5.801 | 81.0 | 0.027 | 66.0 | 0.272 | -62.9 |
| 700 | 0.778 | 176.3 | 4.965 | 78.3 | 0.030 | 68.6 | 0.265 | -65.2 |
| 800 | 0.780 | 173.9 | 4.316 | 75.7 | 0.034 | 70.2 | 0.260 | -68.0 |
| 900 | 0.782 | 171.6 | 3.846 | 73.3 | 0.038 | 71.9 | 0.263 | -70.7 |
| 1000 | 0.782 | 169.6 | 3.439 | 71.0 | 0.042 | 73.0 | 0.263 | -73.7 |
| 1200 | 0.787 | 166.0 | 2.860 | 66.6 | 0.051 | 74.5 | 0.268 | -78.5 |
| 1400 | 0.789 | 162.5 | 2.454 | 62.4 | 0.059 | 75.3 | 0.278 | -83.1 |
| 1600 | 0.792 | 159.2 | 2.139 | 58.4 | 0.068 | 75.7 | 0.288 | -87.5 |
| 1800 | 0.796 | 156.0 | 1.912 | 54.5 | 0.077 | 75.7 | 0.300 | -91.7 |
| 2000 | 0.797 | 153.1 | 1.721 | 50.8 | 0.086 | 75.4 | 0.314 | -96.1 |
| 2200 | 0.797 | 149.9 | 1.569 | 47.1 | 0.095 | 75.0 | 0.328 | -100.0 |
| 2400 | 0.799 | 146.8 | 1.436 | 43.4 | 0.105 | 74.1 | 0.343 | -103.8 |
| 2600 | 0.800 | 143.8 | 1.331 | 39.9 | 0.115 | 73.4 | 0.359 | -107.4 |
| 2800 | 0.801 | 140.6 | 1.238 | 36.5 | 0.125 | 72.2 | 0.377 | -110.9 |
| 3000 | 0.799 | 137.4 | 1.157 | 33.3 | 0.135 | 71.1 | 0.394 | -114.4 |

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S PARAMETERS (COMMON EMITTER)

$V_{CE} = 5\text{ V}$, $I_C = 10\text{ mA}$

| Freq (MHz) | S11 | < S11 | S21 | < S21 | S12 | < S12 | S22 | < S22 |
|------------|-------|--------|--------|-------|-------|-------|-------|--------|
| 100 | 0.771 | -35.8 | 23.180 | 156.3 | 0.016 | 72.7 | 0.933 | -20.3 |
| 200 | 0.741 | -68.2 | 20.484 | 137.3 | 0.028 | 60.4 | 0.820 | -36.2 |
| 300 | 0.706 | -94.4 | 17.503 | 122.8 | 0.035 | 53.0 | 0.722 | -48.5 |
| 400 | 0.691 | -112.7 | 14.633 | 111.9 | 0.040 | 48.5 | 0.656 | -57.3 |
| 500 | 0.701 | -123.8 | 12.817 | 104.7 | 0.044 | 47.2 | 0.622 | -61.7 |
| 600 | 0.677 | -133.9 | 10.891 | 98.4 | 0.047 | 46.0 | 0.560 | -66.0 |
| 700 | 0.659 | -142.2 | 9.349 | 93.5 | 0.049 | 45.5 | 0.513 | -68.9 |
| 800 | 0.646 | -149.5 | 8.209 | 89.1 | 0.051 | 45.7 | 0.474 | -72.0 |
| 900 | 0.640 | -155.2 | 7.315 | 85.3 | 0.053 | 46.1 | 0.449 | -74.7 |
| 1000 | 0.633 | -160.1 | 6.557 | 82.3 | 0.055 | 46.9 | 0.428 | -77.4 |
| 1200 | 0.628 | -168.2 | 5.459 | 76.8 | 0.060 | 49.0 | 0.399 | -81.4 |
| 1400 | 0.625 | -174.7 | 4.663 | 71.9 | 0.064 | 51.0 | 0.385 | -84.9 |
| 1600 | 0.625 | 179.5 | 4.086 | 67.5 | 0.069 | 53.3 | 0.373 | -88.4 |
| 1800 | 0.627 | 174.7 | 3.616 | 63.5 | 0.075 | 54.8 | 0.372 | -91.5 |
| 2000 | 0.628 | 170.5 | 3.260 | 59.5 | 0.080 | 56.6 | 0.372 | -94.9 |
| 2200 | 0.628 | 166.2 | 2.960 | 55.7 | 0.086 | 57.9 | 0.376 | -98.0 |
| 2400 | 0.630 | 162.2 | 2.715 | 52.0 | 0.093 | 58.9 | 0.383 | -101.1 |
| 2600 | 0.631 | 158.5 | 2.517 | 48.5 | 0.100 | 59.8 | 0.391 | -104.3 |
| 2800 | 0.634 | 154.8 | 2.337 | 44.9 | 0.107 | 60.4 | 0.402 | -107.0 |
| 3000 | 0.633 | 151.1 | 2.180 | 41.5 | 0.115 | 60.6 | 0.416 | -109.9 |

$V_{CE} = 5\text{ V}$, $I_C = 30\text{ mA}$

| Freq (MHz) | S11 | < S11 | S21 | < S21 | S12 | < S12 | S22 | < S22 |
|------------|-------|--------|--------|-------|-------|-------|-------|--------|
| 100 | 0.542 | -70.6 | 43.013 | 144.3 | 0.012 | 66.3 | 0.826 | -31.8 |
| 200 | 0.577 | -112.5 | 32.303 | 121.4 | 0.018 | 56.3 | 0.636 | -50.4 |
| 300 | 0.599 | -134.2 | 24.068 | 107.8 | 0.022 | 55.0 | 0.539 | -61.6 |
| 400 | 0.611 | -146.5 | 18.636 | 99.4 | 0.025 | 55.5 | 0.478 | -69.3 |
| 500 | 0.620 | -151.9 | 15.457 | 93.6 | 0.029 | 57.7 | 0.454 | -71.4 |
| 600 | 0.614 | -158.6 | 12.813 | 89.2 | 0.033 | 59.6 | 0.410 | -74.7 |
| 700 | 0.611 | -164.1 | 10.898 | 85.6 | 0.036 | 61.5 | 0.376 | -77.5 |
| 800 | 0.610 | -168.7 | 9.470 | 82.5 | 0.039 | 62.9 | 0.351 | -80.5 |
| 900 | 0.611 | -172.7 | 8.381 | 79.8 | 0.043 | 64.1 | 0.337 | -83.2 |
| 1000 | 0.610 | -176.0 | 7.487 | 77.5 | 0.047 | 65.3 | 0.324 | -85.8 |
| 1200 | 0.612 | 178.3 | 6.186 | 73.2 | 0.054 | 66.8 | 0.306 | -89.7 |
| 1400 | 0.615 | 173.4 | 5.277 | 69.2 | 0.062 | 67.7 | 0.299 | -93.1 |
| 1600 | 0.617 | 169.0 | 4.596 | 65.6 | 0.070 | 68.2 | 0.296 | -96.3 |
| 1800 | 0.620 | 165.1 | 4.085 | 62.0 | 0.078 | 68.6 | 0.297 | -99.3 |
| 2000 | 0.622 | 161.6 | 3.669 | 58.7 | 0.086 | 68.4 | 0.301 | -102.5 |
| 2200 | 0.622 | 158.0 | 3.344 | 55.5 | 0.095 | 68.3 | 0.307 | -105.1 |
| 2400 | 0.625 | 154.6 | 3.065 | 52.1 | 0.103 | 67.8 | 0.316 | -107.9 |
| 2600 | 0.625 | 151.3 | 2.835 | 48.8 | 0.112 | 67.2 | 0.326 | -110.5 |
| 2800 | 0.628 | 148.0 | 2.638 | 45.7 | 0.120 | 66.5 | 0.339 | -113.0 |
| 3000 | 0.626 | 144.6 | 2.464 | 42.6 | 0.129 | 65.6 | 0.352 | -115.5 |

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S PARAMETERS (COMMON EMITTER)

$V_{CE} = 5\text{ V}$, $I_C = 50\text{ mA}$

| Freq (MHz) | S11 | < S11 | S21 | < S21 | S12 | < S12 | S22 | < S22 |
|------------|-------|--------|--------|-------|-------|-------|-------|--------|
| 100 | 0.479 | -97.2 | 42.927 | 137.2 | 0.010 | 63.4 | 0.761 | -35.0 |
| 200 | 0.566 | -132.9 | 32.978 | 115.4 | 0.015 | 56.7 | 0.560 | -51.6 |
| 300 | 0.603 | -148.8 | 23.718 | 103.2 | 0.018 | 58.0 | 0.485 | -60.6 |
| 400 | 0.620 | -157.8 | 18.120 | 95.7 | 0.021 | 60.4 | 0.427 | -66.9 |
| 500 | 0.625 | -161.4 | 14.893 | 90.4 | 0.025 | 63.7 | 0.410 | -68.0 |
| 600 | 0.624 | -166.7 | 12.324 | 86.4 | 0.029 | 66.0 | 0.375 | -70.7 |
| 700 | 0.624 | -171.0 | 10.482 | 83.2 | 0.032 | 68.0 | 0.348 | -73.2 |
| 800 | 0.626 | -174.8 | 9.088 | 80.4 | 0.036 | 69.2 | 0.328 | -75.9 |
| 900 | 0.628 | -178.1 | 8.053 | 77.9 | 0.040 | 70.4 | 0.317 | -78.4 |
| 1000 | 0.628 | 179.1 | 7.184 | 75.6 | 0.044 | 70.9 | 0.308 | -80.9 |
| 1200 | 0.633 | 174.2 | 5.943 | 71.5 | 0.052 | 72.2 | 0.295 | -84.6 |
| 1400 | 0.636 | 169.8 | 5.061 | 67.7 | 0.060 | 72.7 | 0.292 | -88.2 |
| 1600 | 0.640 | 165.9 | 4.407 | 64.1 | 0.069 | 72.7 | 0.292 | -91.5 |
| 1800 | 0.643 | 162.3 | 3.917 | 60.6 | 0.077 | 72.6 | 0.295 | -94.7 |
| 2000 | 0.645 | 159.1 | 3.518 | 57.2 | 0.086 | 72.3 | 0.301 | -98.1 |
| 2200 | 0.646 | 155.6 | 3.202 | 54.0 | 0.094 | 71.8 | 0.309 | -101.1 |
| 2400 | 0.648 | 152.4 | 2.931 | 50.6 | 0.103 | 71.1 | 0.319 | -104.0 |
| 2600 | 0.650 | 149.3 | 2.708 | 47.3 | 0.112 | 70.3 | 0.331 | -106.8 |
| 2800 | 0.652 | 146.0 | 2.520 | 44.2 | 0.121 | 69.3 | 0.344 | -109.6 |
| 3000 | 0.650 | 142.7 | 2.353 | 41.1 | 0.130 | 68.2 | 0.358 | -112.5 |

$V_{CE} = 5\text{ V}$, $I_C = 80\text{ mA}$

| Freq (MHz) | S11 | < S11 | S21 | < S21 | S12 | < S12 | S22 | < S22 |
|------------|-------|--------|--------|-------|-------|-------|-------|--------|
| 100 | 0.558 | -133.0 | 39.014 | 127.8 | 0.009 | 54.5 | 0.618 | -33.7 |
| 200 | 0.671 | -155.6 | 23.364 | 107.6 | 0.012 | 52.6 | 0.457 | -41.5 |
| 300 | 0.704 | -165.1 | 16.107 | 97.6 | 0.014 | 57.5 | 0.415 | -45.4 |
| 400 | 0.718 | -170.7 | 12.150 | 91.5 | 0.017 | 62.9 | 0.395 | -49.0 |
| 500 | 0.716 | -173.4 | 9.907 | 86.7 | 0.021 | 66.8 | 0.385 | -50.4 |
| 600 | 0.717 | -177.0 | 8.214 | 83.3 | 0.024 | 69.5 | 0.378 | -52.4 |
| 700 | 0.718 | 179.9 | 7.015 | 80.4 | 0.028 | 72.5 | 0.364 | -54.4 |
| 800 | 0.720 | 177.1 | 6.091 | 77.8 | 0.031 | 73.9 | 0.354 | -57.0 |
| 900 | 0.723 | 174.5 | 5.413 | 75.3 | 0.035 | 75.7 | 0.351 | -59.7 |
| 1000 | 0.723 | 172.3 | 4.829 | 72.9 | 0.039 | 76.8 | 0.346 | -62.4 |
| 1200 | 0.728 | 168.3 | 4.009 | 68.8 | 0.047 | 78.1 | 0.343 | -67.0 |
| 1400 | 0.731 | 164.7 | 3.423 | 64.7 | 0.055 | 78.9 | 0.347 | -71.8 |
| 1600 | 0.735 | 161.2 | 2.987 | 60.8 | 0.063 | 78.9 | 0.352 | -76.2 |
| 1800 | 0.738 | 157.9 | 2.662 | 57.1 | 0.072 | 79.1 | 0.359 | -80.6 |
| 2000 | 0.740 | 155.0 | 2.393 | 53.5 | 0.081 | 78.7 | 0.369 | -85.3 |
| 2200 | 0.741 | 151.7 | 2.179 | 50.0 | 0.090 | 78.2 | 0.379 | -89.5 |
| 2400 | 0.743 | 148.6 | 1.993 | 46.4 | 0.099 | 77.4 | 0.391 | -93.5 |
| 2600 | 0.744 | 145.6 | 1.843 | 43.0 | 0.109 | 76.5 | 0.404 | -97.4 |
| 2800 | 0.746 | 142.4 | 1.716 | 39.6 | 0.119 | 75.4 | 0.418 | -101.3 |
| 3000 | 0.744 | 139.2 | 1.601 | 36.3 | 0.129 | 74.2 | 0.433 | -105.1 |

NSVF4015SG4

S PARAMETERS (COMMON EMITTER)

$V_{CE} = 8 \text{ V}$, $I_C = 10 \text{ mA}$

| Freq (MHz) | S11 | < S11 | S21 | < S21 | S12 | < S12 | S22 | < S22 |
|------------|-------|--------|--------|-------|-------|-------|-------|--------|
| 100 | 0.784 | -33.9 | 22.973 | 157.1 | 0.014 | 73.5 | 0.941 | -18.1 |
| 200 | 0.754 | -64.8 | 20.491 | 138.6 | 0.025 | 62.4 | 0.839 | -32.6 |
| 300 | 0.715 | -90.5 | 17.690 | 124.1 | 0.032 | 55.0 | 0.739 | -44.1 |
| 400 | 0.697 | -109.0 | 14.905 | 113.1 | 0.037 | 50.3 | 0.685 | -52.2 |
| 500 | 0.704 | -120.4 | 13.108 | 105.8 | 0.041 | 49.3 | 0.652 | -56.5 |
| 600 | 0.678 | -130.9 | 11.176 | 99.3 | 0.044 | 47.7 | 0.591 | -60.6 |
| 700 | 0.659 | -139.5 | 9.599 | 94.2 | 0.046 | 47.3 | 0.544 | -63.3 |
| 800 | 0.645 | -146.9 | 8.439 | 89.7 | 0.048 | 47.3 | 0.504 | -66.1 |
| 900 | 0.638 | -152.9 | 7.523 | 85.8 | 0.050 | 47.5 | 0.478 | -68.7 |
| 1000 | 0.629 | -158.0 | 6.746 | 82.7 | 0.052 | 48.6 | 0.457 | -71.2 |
| 1200 | 0.623 | -166.3 | 5.618 | 77.1 | 0.056 | 50.5 | 0.427 | -75.0 |
| 1400 | 0.621 | -173.1 | 4.797 | 72.1 | 0.060 | 52.6 | 0.411 | -78.5 |
| 1600 | 0.620 | -179.0 | 4.199 | 67.5 | 0.065 | 55.0 | 0.399 | -81.8 |
| 1800 | 0.622 | 176.1 | 3.717 | 63.4 | 0.071 | 56.9 | 0.398 | -85.2 |
| 2000 | 0.623 | 171.8 | 3.348 | 59.4 | 0.076 | 58.6 | 0.397 | -88.5 |
| 2200 | 0.623 | 167.4 | 3.039 | 55.5 | 0.082 | 60.1 | 0.401 | -91.7 |
| 2400 | 0.625 | 163.5 | 2.786 | 51.8 | 0.089 | 61.4 | 0.407 | -95.0 |
| 2600 | 0.626 | 159.6 | 2.581 | 48.2 | 0.096 | 62.2 | 0.415 | -98.3 |
| 2800 | 0.629 | 155.9 | 2.395 | 44.6 | 0.103 | 62.8 | 0.426 | -101.3 |
| 3000 | 0.629 | 152.2 | 2.233 | 41.1 | 0.111 | 63.0 | 0.439 | -104.4 |

$V_{CE} = 8 \text{ V}$, $I_C = 30 \text{ mA}$

| Freq (MHz) | S11 | < S11 | S21 | < S21 | S12 | < S12 | S22 | < S22 |
|------------|-------|--------|--------|-------|-------|-------|-------|--------|
| 100 | 0.556 | -65.2 | 43.179 | 145.8 | 0.011 | 67.8 | 0.846 | -28.0 |
| 200 | 0.578 | -106.8 | 32.894 | 123.0 | 0.017 | 57.9 | 0.669 | -44.6 |
| 300 | 0.594 | -129.7 | 24.775 | 109.1 | 0.021 | 56.2 | 0.584 | -54.7 |
| 400 | 0.604 | -142.8 | 19.256 | 100.3 | 0.024 | 57.0 | 0.512 | -61.6 |
| 500 | 0.614 | -148.7 | 15.997 | 94.4 | 0.028 | 59.0 | 0.488 | -63.9 |
| 600 | 0.606 | -155.8 | 13.266 | 89.8 | 0.031 | 60.8 | 0.443 | -66.9 |
| 700 | 0.603 | -161.6 | 11.285 | 86.1 | 0.034 | 62.5 | 0.409 | -69.3 |
| 800 | 0.602 | -166.5 | 9.802 | 82.9 | 0.037 | 64.2 | 0.382 | -72.0 |
| 900 | 0.602 | -170.7 | 8.672 | 80.0 | 0.041 | 65.4 | 0.366 | -74.3 |
| 1000 | 0.600 | -174.1 | 7.739 | 77.6 | 0.044 | 66.3 | 0.352 | -76.7 |
| 1200 | 0.603 | 179.9 | 6.401 | 73.3 | 0.051 | 68.1 | 0.333 | -80.3 |
| 1400 | 0.605 | 174.9 | 5.453 | 69.2 | 0.059 | 69.2 | 0.325 | -83.7 |
| 1600 | 0.607 | 170.4 | 4.753 | 65.4 | 0.066 | 69.8 | 0.321 | -87.0 |
| 1800 | 0.611 | 166.4 | 4.215 | 61.8 | 0.074 | 70.0 | 0.321 | -90.2 |
| 2000 | 0.613 | 162.9 | 3.791 | 58.4 | 0.082 | 69.9 | 0.325 | -93.4 |
| 2200 | 0.614 | 159.2 | 3.445 | 55.1 | 0.090 | 70.1 | 0.330 | -96.5 |
| 2400 | 0.616 | 155.8 | 3.155 | 51.7 | 0.099 | 69.6 | 0.339 | -99.4 |
| 2600 | 0.617 | 152.4 | 2.916 | 48.4 | 0.107 | 69.1 | 0.349 | -102.4 |
| 2800 | 0.619 | 149.1 | 2.711 | 45.2 | 0.115 | 68.5 | 0.361 | -105.3 |
| 3000 | 0.619 | 145.7 | 2.531 | 42.0 | 0.124 | 67.5 | 0.375 | -108.2 |

NSVF4015SG4

S PARAMETERS (COMMON EMITTER)

$V_{CE} = 8 \text{ V}$, $I_C = 50 \text{ mA}$

| Freq (MHz) | S11 | < S11 | S21 | < S21 | S12 | < S12 | S22 | < S22 |
|------------|-------|--------|--------|-------|-------|-------|-------|--------|
| 100 | 0.477 | -88.8 | 42.926 | 139.6 | 0.009 | 65.5 | 0.793 | -30.4 |
| 200 | 0.554 | -127.0 | 34.154 | 117.2 | 0.014 | 59.2 | 0.603 | -45.1 |
| 300 | 0.589 | -144.5 | 24.758 | 104.4 | 0.017 | 59.1 | 0.529 | -53.1 |
| 400 | 0.606 | -154.4 | 18.954 | 96.6 | 0.020 | 61.9 | 0.478 | -58.7 |
| 500 | 0.613 | -158.4 | 15.585 | 91.2 | 0.024 | 64.8 | 0.453 | -60.2 |
| 600 | 0.611 | -164.1 | 12.888 | 87.0 | 0.027 | 67.3 | 0.416 | -62.6 |
| 700 | 0.611 | -168.8 | 10.954 | 83.7 | 0.031 | 69.1 | 0.388 | -64.8 |
| 800 | 0.613 | -172.8 | 9.503 | 80.7 | 0.034 | 70.4 | 0.366 | -67.2 |
| 900 | 0.616 | -176.3 | 8.407 | 78.1 | 0.038 | 71.5 | 0.355 | -69.5 |
| 1000 | 0.615 | -179.2 | 7.494 | 75.7 | 0.042 | 72.3 | 0.343 | -71.9 |
| 1200 | 0.619 | 175.7 | 6.192 | 71.6 | 0.049 | 73.7 | 0.329 | -75.5 |
| 1400 | 0.623 | 171.2 | 5.272 | 67.7 | 0.057 | 74.1 | 0.324 | -79.0 |
| 1600 | 0.626 | 167.2 | 4.586 | 64.0 | 0.065 | 74.5 | 0.323 | -82.4 |
| 1800 | 0.631 | 163.5 | 4.071 | 60.4 | 0.073 | 74.4 | 0.325 | -85.8 |
| 2000 | 0.633 | 160.2 | 3.658 | 57.0 | 0.081 | 74.0 | 0.331 | -89.4 |
| 2200 | 0.634 | 156.7 | 3.322 | 53.7 | 0.090 | 73.7 | 0.337 | -92.7 |
| 2400 | 0.637 | 153.5 | 3.041 | 50.3 | 0.099 | 73.0 | 0.347 | -95.9 |
| 2600 | 0.638 | 150.3 | 2.809 | 47.0 | 0.107 | 72.2 | 0.358 | -99.1 |
| 2800 | 0.641 | 147.0 | 2.611 | 43.8 | 0.116 | 71.3 | 0.371 | -102.3 |
| 3000 | 0.640 | 143.7 | 2.435 | 40.7 | 0.125 | 70.4 | 0.386 | -105.5 |

ORDERING INFORMATION

| Device | Marking | Package | Shipping (Qty / Packing) [†] |
|----------------|---------|---|---------------------------------------|
| NSVF4015SG4T1G | GN | SC-82FL / MCPH4 (Pb-Free / Halogen Free) | 3,000 / Tape & Reel |

[†]For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

MECHANICAL CASE OUTLINE

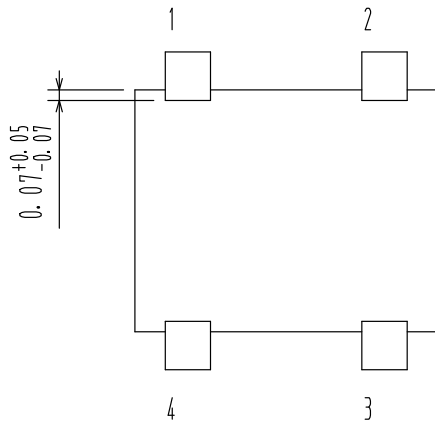
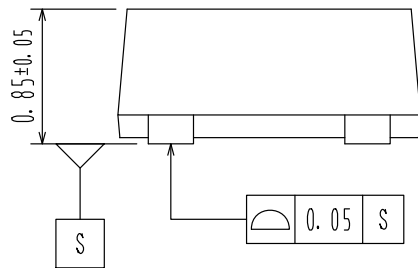
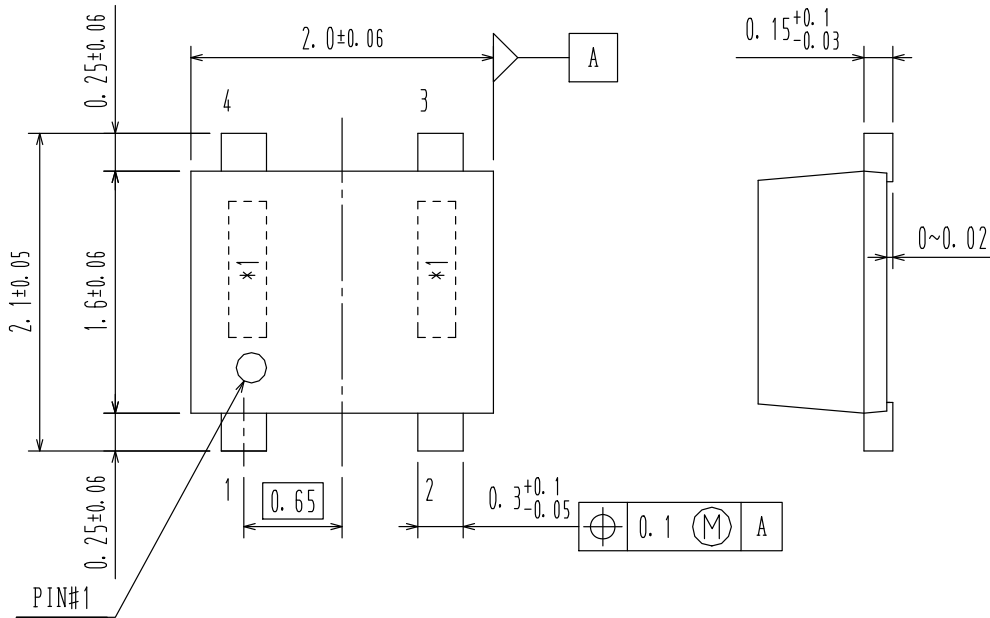
PACKAGE DIMENSIONS

ON Semiconductor®



SC-82FL / MCPH4 CASE 419AR ISSUE O

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