

# 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.

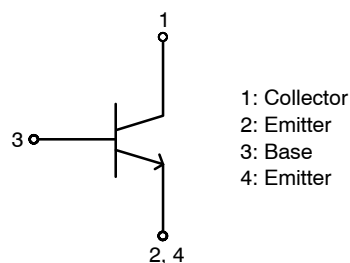


ON Semiconductor®

[www.onsemi.com](http://www.onsemi.com)

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.

# NSVF4015SG4

**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 | $\mu\text{A}$ |
| Emitter Cutoff Current   | $I_{EBO}$     | $V_{EB} = 1\text{ V}, I_C = 0\text{ A}$                     | –     | –   | 1.0 | $\mu\text{A}$ |
| 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.

TYPICAL CHARACTERISTICS

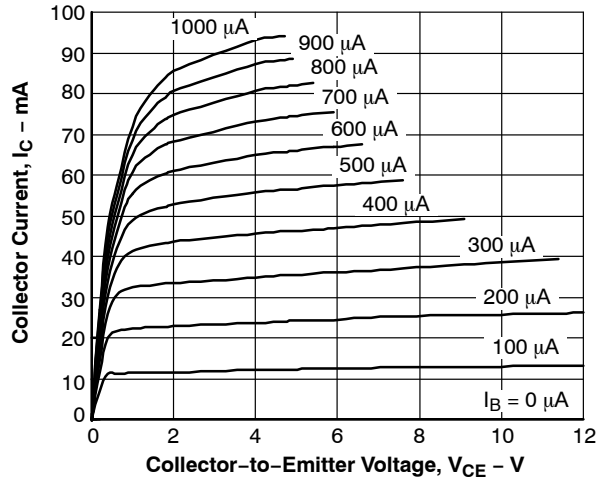


Figure 1.  $I_C$  vs.  $V_{CE}$

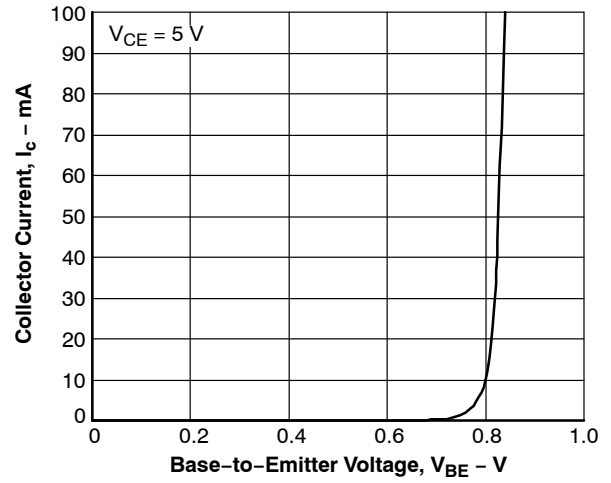


Figure 2.  $I_C$  vs.  $V_{BE}$

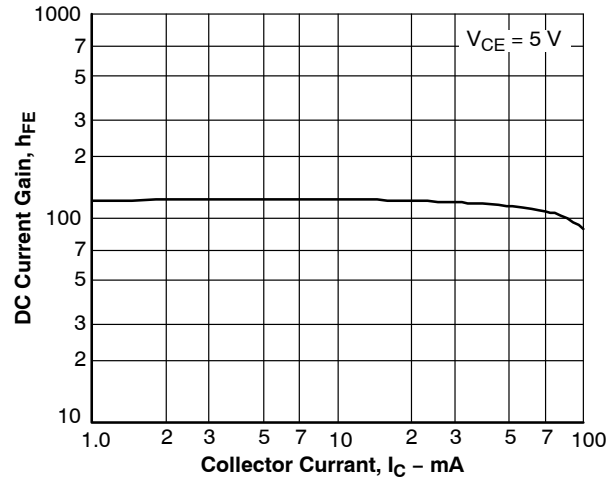


Figure 3.  $h_{FE}$  vs.  $I_C$

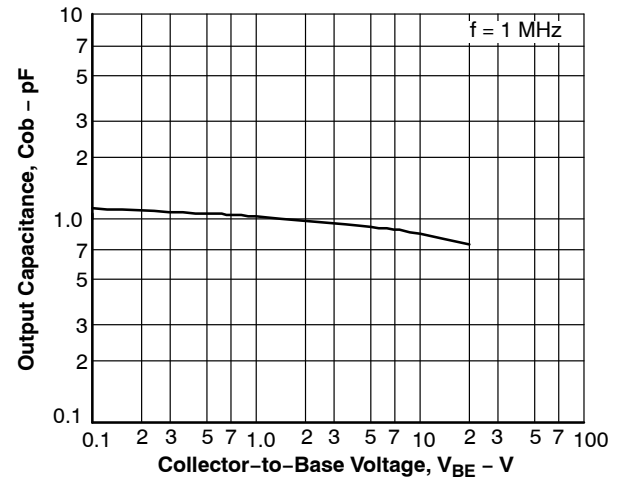


Figure 4.  $C_{ob}$  vs.  $V_{CB}$

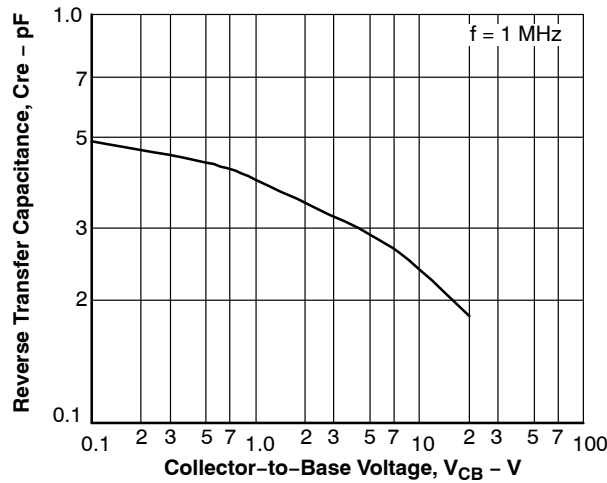


Figure 5.  $C_{re}$  vs.  $V_{CB}$

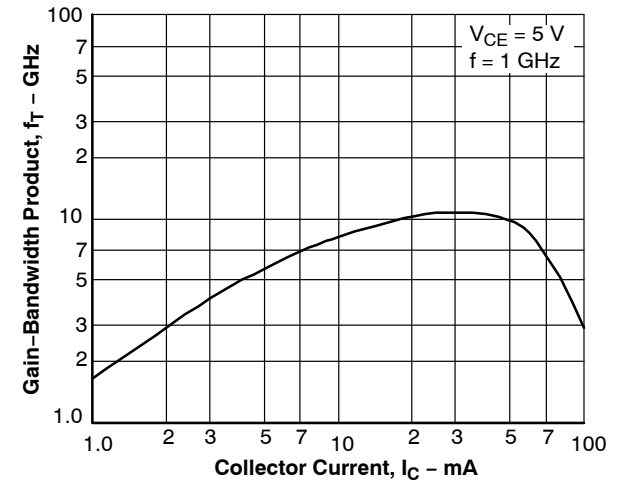


Figure 6.  $f_T$  vs.  $I_C$

TYPICAL CHARACTERISTICS

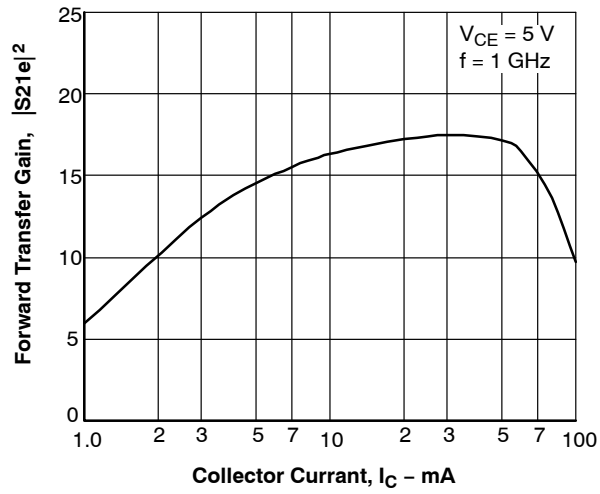


Figure 7.  $|S_{21e}|^2$  vs.  $I_C$

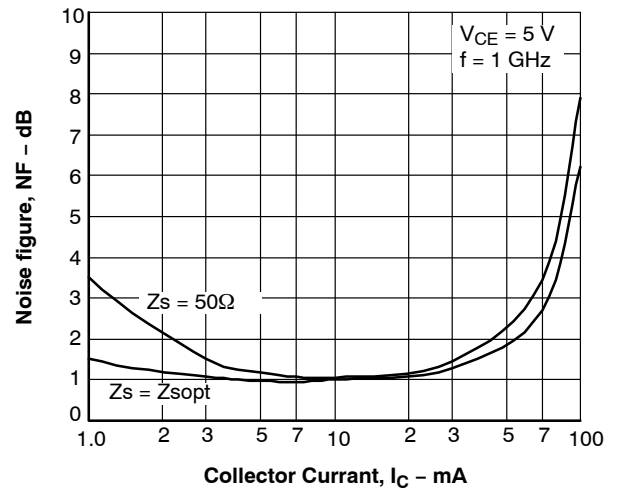


Figure 8. NF vs.  $I_C$

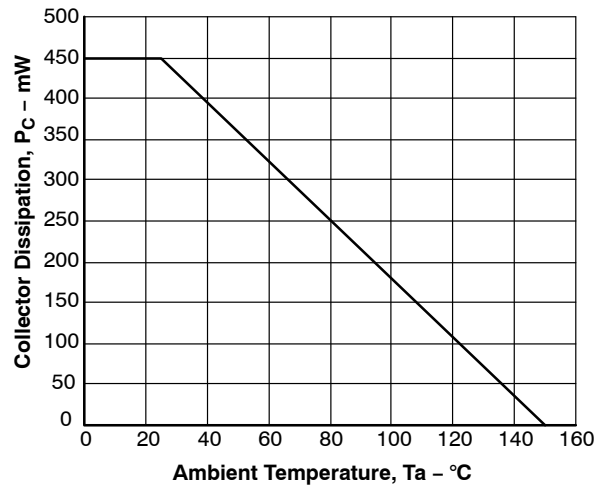


Figure 9.  $P_C$  vs.  $T_a$

# NSVF4015SG4

## 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 |

# NSVF4015SG4

## 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 |

# NSVF4015SG4

## 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 |

# NSVF4015SG4

## 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) <sup>†</sup> |
|----------------|---------|---------------------------------------------|---------------------------------------|
| NSVF4015SG4T1G | GN      | SC-82FL / MCPH4<br>(Pb-Free / Halogen Free) | 3,000 / Tape & Reel                   |

<sup>†</sup>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

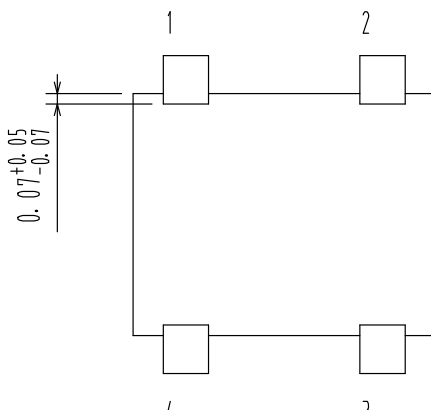
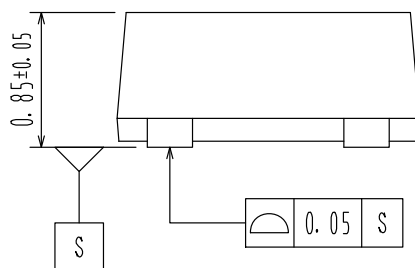
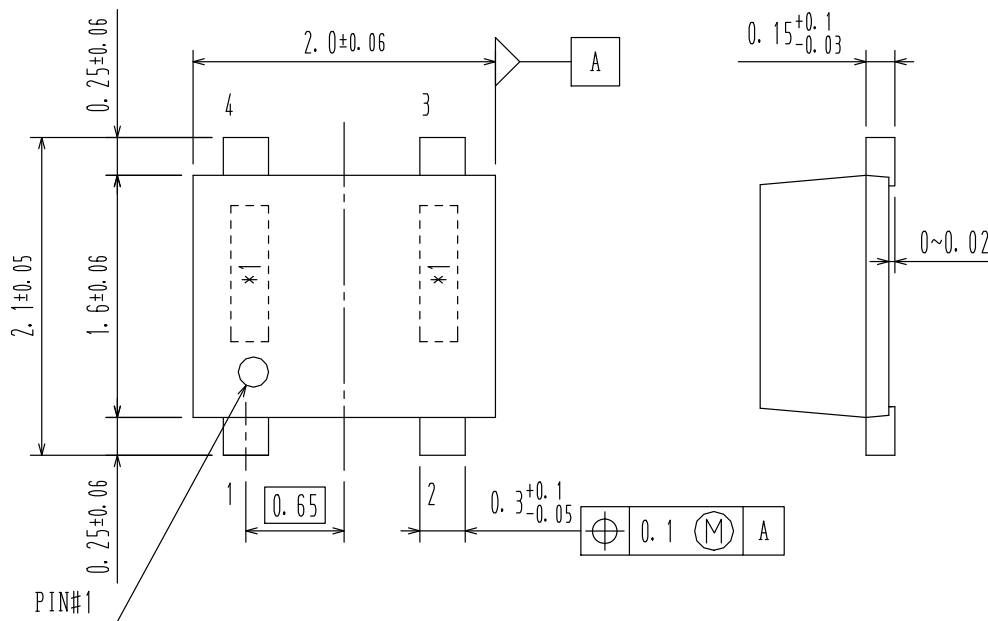
## PACKAGE DIMENSIONS

ON Semiconductor®

ON

SC-82FL / MCPH4  
CASE 419AR  
ISSUE O

DATE 30 DEC 2011



|                  |                           |                                                                                                                                                                                  |
|------------------|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DOCUMENT NUMBER: | 98AON65645E               | Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red. |
| STATUS:          | ON SEMICONDUCTOR STANDARD |                                                                                                                                                                                  |
| NEW STANDARD:    |                           |                                                                                                                                                                                  |
| DESCRIPTION:     | SC-82FL / MCPH4           | PAGE 1 OF 2                                                                                                                                                                      |

**ON Semiconductor** and **ON** are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

ON Semiconductor and  are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at [www.onsemi.com/site/pdf/Patent-Marking.pdf](http://www.onsemi.com/site/pdf/Patent-Marking.pdf). ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

## PUBLICATION ORDERING INFORMATION

### LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor  
19521 E. 32nd Pkwy, Aurora, Colorado 80011 USA  
**Phone:** 303-675-2175 or 800-344-3860 Toll Free USA/Canada  
**Fax:** 303-675-2176 or 800-344-3867 Toll Free USA/Canada  
**Email:** [orderlit@onsemi.com](mailto:orderlit@onsemi.com)

**N. American Technical Support:** 800-282-9855 Toll Free  
USA/Canada  
**Europe, Middle East and Africa Technical Support:**  
Phone: 421 33 790 2910

**ON Semiconductor Website:** [www.onsemi.com](http://www.onsemi.com)

**Order Literature:** <http://www.onsemi.com/orderlit>

For additional information, please contact your local Sales Representative

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[ON Semiconductor:](#)

[NSVF4015SG4T1G](#)