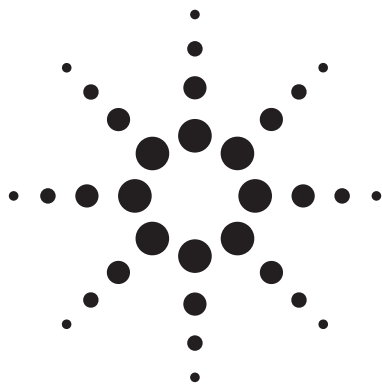




# Agilent ABA-54563

## 3.4 GHz Broadband Silicon RFIC Amplifier

### Data Sheet

#### Description

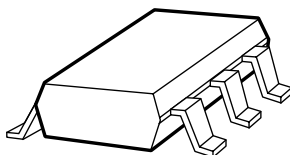
Agilent's ABA-54563 is an economical, easy-to-use internally 50-ohm matched silicon monolithic amplifier that offers excellent gain and broadband response from DC to 3.4 GHz. Packaged in an ultraminiature industry-standard SOT-363 package, it requires half the board space of a SOT-143 package.

At 2 GHz, the ABA-54563 offers a small-signal gain of 23 dB, output P1dB of 16.1 dB and 27.8 dBm output third order intercept point. It is suitable for use as buffer amplifiers for wideband applications. They are designed for low cost gain blocks in cellular applications, DBS tuners, LNB and other wireless communications systems.

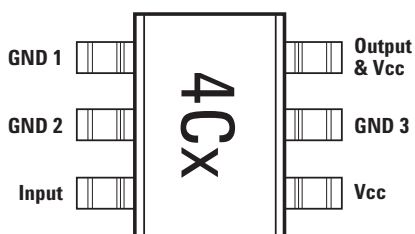
At IF frequencies, the ABA-54563 offers good linearity performance with a typical OIP3 of 35 dBm at 200 MHz.

ABA-54563 is fabricated using Agilent's HP25 silicon bipolar process, which employs a double-diffused single polysilicon process with self-aligned submicron emitter geometry. The process is capable of simultaneous high  $f_T$  and high NPN breakdown (25 GHz  $f_T$  at 6V BVCEO). The process utilizes industry standard device oxide isolation technologies and submicron aluminum multilayer interconnect to achieve superior performance, high uniformity and proven reliability.

#### Surface Mount Package SOT-363 / SC70



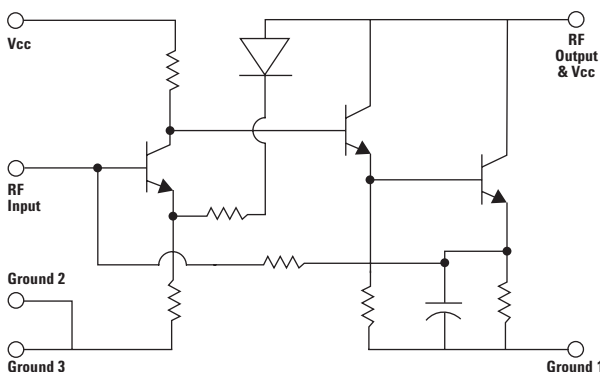
#### Pin Connections and Package Marking



#### Note:

Top View. Package marking provides orientation and identification. "x" is character to identify date code.

#### Simplified Schematic



#### Features

- Single +5V Supply
- High linearity
- VSWR < 1.4 throughout operating frequency
- Miniature SOT363 (SC70) Package
- Unconditionally stable
- Lead-free

#### Typical Performance at +5V/79 mA

- 2 GHz
  - 23 dB Gain
  - 27.8 dBm OIP3
  - 16.1 dBm  $P_{1dB}$
  - 4.4 dB Noise Figure
- 200 MHz
  - 23 dB Gain
  - 35 dBm OIP3
  - 18 dBm  $P_{1dB}$
  - 3.6 dB Noise Figure



Agilent Technologies

## ABA-54563 Absolute Maximum Ratings<sup>[1]</sup>

| Symbol         | Parameter                                                        | Units                       | Absolute Max. |
|----------------|------------------------------------------------------------------|-----------------------------|---------------|
| $V_{cc}$       | Device Voltage, RF output to ground ( $T = 25^{\circ}\text{C}$ ) | V                           | 6             |
| $P_{in}$       | CW RF Input Power                                                | dBm                         | 20            |
| $P_{diss}$     | Total Power Dissipation <sup>[3]</sup>                           | mW                          | 560           |
| $\theta_{j-c}$ | Thermal Resistance <sup>[2]</sup>                                | $^{\circ}\text{C}/\text{W}$ | 110           |
| $T_j$          | Junction Temperature                                             | $^{\circ}\text{C}$          | 150           |
| $T_{STG}$      | Storage Temperature                                              | $^{\circ}\text{C}$          | -65 to 150    |

### Notes:

1. Operation of this device in excess of any of these limits may cause permanent damage.
2. Thermal resistance measured using  $150^{\circ}\text{C}$  Liquid Crystal Measurement method.
3. Case temperature  $T_c$  at  $25^{\circ}\text{C}$ . Derate at  $9.1\text{mW}/^{\circ}\text{C}$  for  $T_c > 87.5^{\circ}\text{C}$ .

## Product Consistency Distribution Charts at 5.0V and 2 GHz.<sup>[1]</sup>

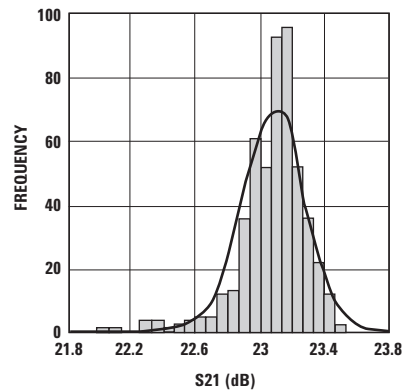


Figure 1. S21 Distribution.

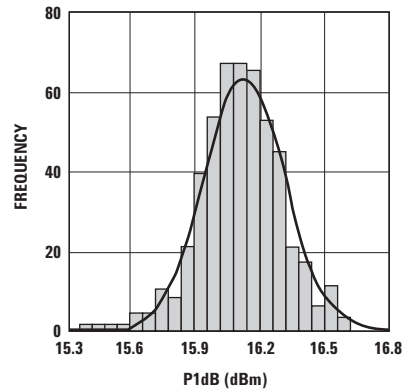


Figure 2. P1dB Distribution.

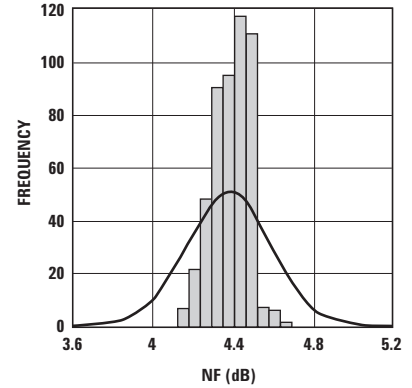


Figure 3. Noise Figure Distribution.

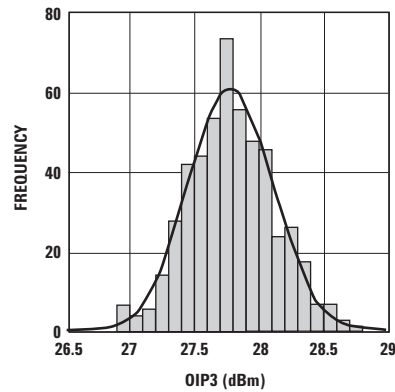


Figure 4. OIP3 Distribution.

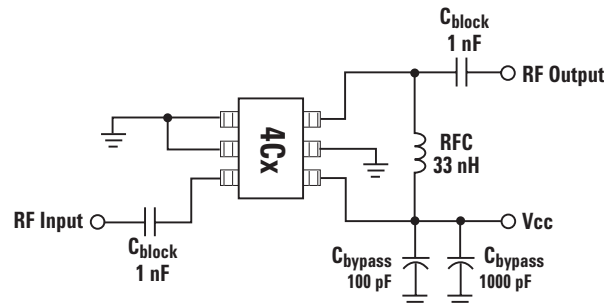


Figure 5. Test circuit at of the 2 GHz production test board used for NF, Gain and OIP3 measurements. Circuit losses have been de-embedded from actual measurements.

### Note:

1. Measured on the production test circuit base on 500 samples.

## Electrical Specifications

$T_c = +25^\circ\text{C}$ ,  $Z_0 = 50\ \Omega$ ,  $P_{in} = -30\ \text{dBm}$ ,  $V_{cc} = 5\text{V}$ ,  $\text{Freq} = 2\ \text{GHz}$ , unless stated otherwise.

| Symbol                   | Parameter and Test Condition         |                                        | Units | Min. | Typ.         | Max. | Std Dev. |
|--------------------------|--------------------------------------|----------------------------------------|-------|------|--------------|------|----------|
| Gp                       | Power Gain ( $ S_{21} ^2$ )          | f = 200 MHz<br>f = 2.0 GHz             | dB    | 21   | 23<br>23     | 25   | 0.2      |
| $\Delta\text{Gp}$        | Power Gain Flatness,                 | f = 0.1 ~ 2.0 GHz<br>f = 0.1 ~ 3.4 GHz | dB    |      | 0.5<br>3.0   |      |          |
| NF                       | Noise Figure                         | f = 200 MHz<br>f = 2.0 GHz             | dB    |      | 3.6<br>4.4   | 4.8  | 0.08     |
| $\text{P1dB}_{50\Omega}$ | Output Power at 1dB Gain Compression | f = 200 MHz<br>f = 2.0 GHz             | dBm   |      | 18.0<br>16.1 |      | 0.18     |
| OIP3                     | Output Third Order Intercept Point   | f = 200 MHz<br>f = 2.0 GHz             | dBm   |      | 35.0<br>27.8 |      | 0.32     |
| $\text{VSWR}_{in}$       | Input VSWR                           | f = 200 MHz<br>f = 2.0 GHz             |       |      | 1.20<br>1.11 |      | 0.02     |
| $\text{VSWR}_{out}$      | Output VSWR                          | f = 200 MHz<br>f = 2.0 GHz             |       |      | 1.20<br>1.14 |      | 0.02     |
| Icc                      | Device Current                       |                                        | mA    |      | 79           | 90   | 0.2      |

### Notes:

Measurements taken on 50 $\Omega$  test board shown on Figure 1. Excess circuit losses had been de-embedded from actual measurements. Standard deviation and typical data based on at least 500 parts sample size from 2 wafer lots. Future wafers allocated to this product may have nominal values anywhere within the upper and lower spec limits.

## ABA-54563 Typical Performance

$T_c = +25^\circ\text{C}$ ,  $Z_0 = 50\Omega$ ,  $V_{cc} = 5\text{V}$  unless stated otherwise.

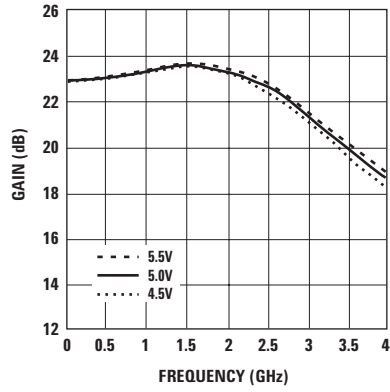


Figure 6. Gain vs. Frequency and Voltage.

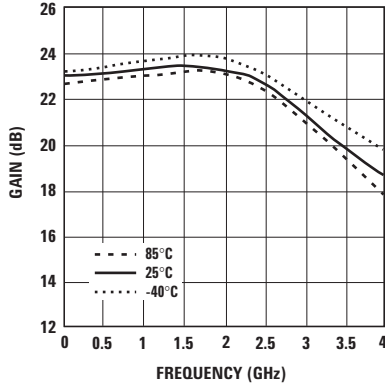


Figure 7. Gain vs. Frequency and Temperature.

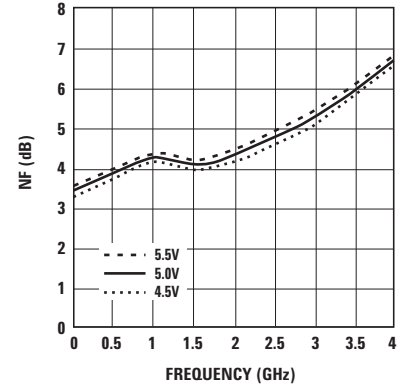


Figure 8. Noise Figure vs. Frequency and Voltage.

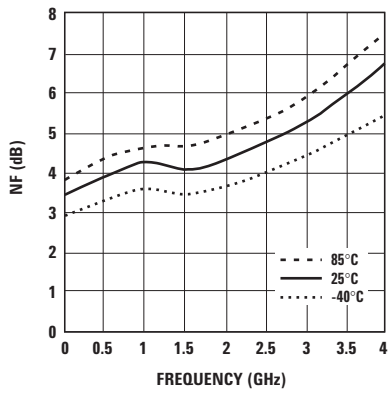


Figure 9. Noise Figure vs. Frequency and Temperature.

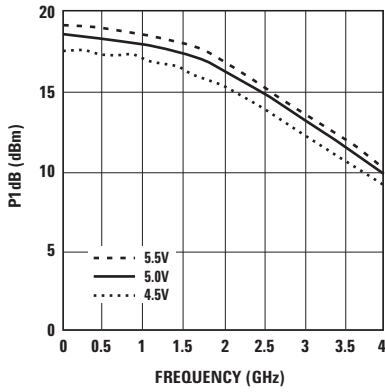


Figure 10. Output Power for 1dB Gain Compression vs. Frequency and Voltage.

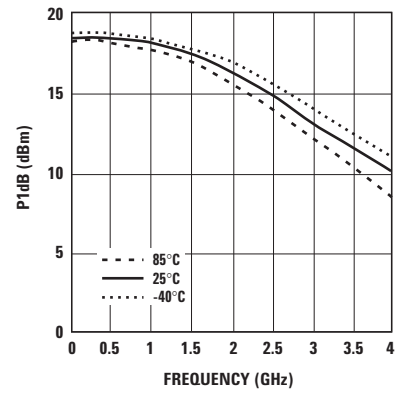


Figure 11. Output Power for 1dB Gain Compression vs. Frequency and Temperature.

## ABA-54563 Typical Performance, continued

$T_c = +25^\circ\text{C}$ ,  $Z_o = 50\Omega$ ,  $V_{cc} = 5\text{V}$  unless stated otherwise.

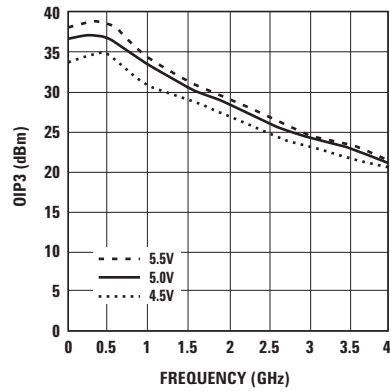


Figure 12. Output IP3 vs. Frequency and Voltage.

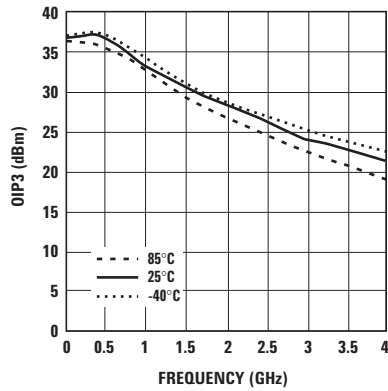


Figure 13. Output IP3 vs. Frequency and Temperature.

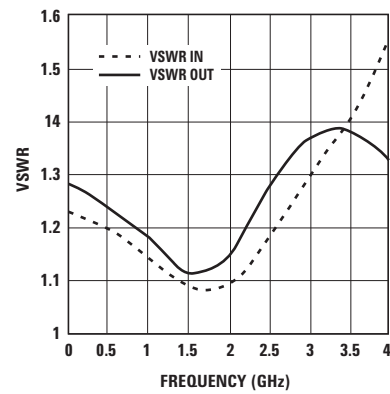


Figure 14. Input and Output VSWR vs. Frequency.

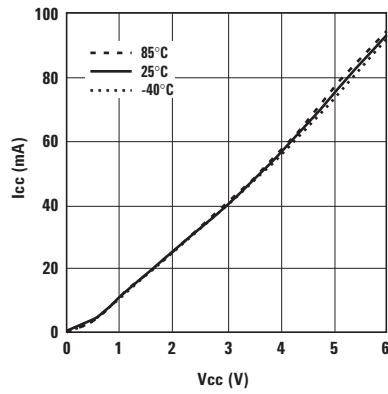


Figure 15. Supply Current vs. Voltage and Temperature.

**ABA-54563 Typical Scattering Parameters**T<sub>C</sub> = +25°C, Z<sub>0</sub> = 50 Ω, V<sub>cc</sub> = 4.5V, unless stated otherwise

| <b>Freq<br/>(GHz)</b> | <b>S<sub>11</sub><br/>Mag.</b> | <b>S<sub>11</sub><br/>Ang.</b> | <b>S<sub>21</sub><br/>dB</b> | <b>S<sub>21</sub><br/>Mag.</b> | <b>S<sub>21</sub><br/>Ang.</b> | <b>S<sub>12</sub><br/>dB</b> | <b>S<sub>12</sub><br/>Mag.</b> | <b>S<sub>12</sub><br/>Ang.</b> | <b>S<sub>22</sub><br/>Mag.</b> | <b>S<sub>22</sub><br/>Ang.</b> | <b>K<br/>Factor</b> |
|-----------------------|--------------------------------|--------------------------------|------------------------------|--------------------------------|--------------------------------|------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|---------------------|
| 0.1                   | 0.098                          | 175.8                          | 23.0                         | 14.06                          | -5.1                           | -31.4                        | 0.027                          | -0.2                           | 0.142                          | -6.5                           | 1.5                 |
| 0.2                   | 0.094                          | 174.2                          | 23.0                         | 14.09                          | -9.9                           | -31.4                        | 0.027                          | 0.0                            | 0.141                          | -13.0                          | 1.5                 |
| 0.3                   | 0.090                          | 173.3                          | 23.0                         | 14.14                          | -14.9                          | -31.7                        | 0.026                          | 0.7                            | 0.141                          | -18.8                          | 1.5                 |
| 0.4                   | 0.084                          | 172.3                          | 23.0                         | 14.17                          | -19.9                          | -31.7                        | 0.026                          | 1.6                            | 0.141                          | -24.5                          | 1.5                 |
| 0.5                   | 0.087                          | 157.6                          | 23.0                         | 14.19                          | -25.1                          | -31.7                        | 0.026                          | 2.5                            | 0.129                          | -25.0                          | 1.5                 |
| 0.6                   | 0.084                          | 152.7                          | 23.1                         | 14.22                          | -30.2                          | -31.7                        | 0.026                          | 3.7                            | 0.126                          | -27.9                          | 1.5                 |
| 0.7                   | 0.081                          | 146.2                          | 23.1                         | 14.26                          | -35.3                          | -31.7                        | 0.026                          | 4.9                            | 0.122                          | -30.6                          | 1.5                 |
| 0.8                   | 0.076                          | 140.3                          | 23.1                         | 14.31                          | -40.4                          | -31.7                        | 0.026                          | 6.3                            | 0.117                          | -33.4                          | 1.5                 |
| 0.9                   | 0.071                          | 136.0                          | 23.2                         | 14.39                          | -45.7                          | -31.7                        | 0.026                          | 7.7                            | 0.112                          | -36.3                          | 1.5                 |
| 1.0                   | 0.067                          | 130.2                          | 23.2                         | 14.45                          | -51.0                          | -31.7                        | 0.026                          | 9.0                            | 0.106                          | -38.4                          | 1.5                 |
| 1.2                   | 0.053                          | 122.0                          | 23.3                         | 14.58                          | -61.9                          | -31.7                        | 0.026                          | 11.8                           | 0.095                          | -42.1                          | 1.5                 |
| 1.4                   | 0.040                          | 118.7                          | 23.3                         | 14.69                          | -73.2                          | -31.7                        | 0.026                          | 14.5                           | 0.081                          | -43.7                          | 1.5                 |
| 1.6                   | 0.027                          | 124.9                          | 23.4                         | 14.75                          | -85.0                          | -31.4                        | 0.027                          | 17.4                           | 0.068                          | -40.5                          | 1.4                 |
| 1.8                   | 0.018                          | 155.0                          | 23.3                         | 14.66                          | -97.2                          | -31.1                        | 0.028                          | 19.8                           | 0.058                          | -29.1                          | 1.4                 |
| 2.0                   | 0.023                          | -174.5                         | 23.2                         | 14.39                          | -109.9                         | -30.5                        | 0.030                          | 22.3                           | 0.058                          | -8.3                           | 1.4                 |
| 2.2                   | 0.043                          | -164.5                         | 22.9                         | 14.04                          | -122.4                         | -30.2                        | 0.031                          | 24.1                           | 0.069                          | -2.4                           | 1.4                 |
| 2.4                   | 0.058                          | -165.3                         | 22.5                         | 13.41                          | -134.9                         | -29.6                        | 0.033                          | 25.9                           | 0.087                          | 3.6                            | 1.3                 |
| 2.6                   | 0.076                          | -171.1                         | 22.1                         | 12.72                          | -146.9                         | -29.4                        | 0.034                          | 26.7                           | 0.106                          | 0.3                            | 1.3                 |
| 2.8                   | 0.093                          | -177.5                         | 21.5                         | 11.95                          | -158.4                         | -28.9                        | 0.036                          | 27.2                           | 0.122                          | -6.1                           | 1.3                 |
| 3.0                   | 0.113                          | 173.8                          | 21.0                         | 11.17                          | -169.5                         | -28.4                        | 0.038                          | 28.0                           | 0.126                          | -13.4                          | 1.3                 |
| 3.2                   | 0.125                          | 167.4                          | 20.3                         | 10.39                          | -179.7                         | -27.7                        | 0.041                          | 27.5                           | 0.135                          | -21.1                          | 1.3                 |
| 3.4                   | 0.144                          | 160.7                          | 19.7                         | 9.71                           | 170.6                          | -27.3                        | 0.043                          | 26.9                           | 0.136                          | -31.7                          | 1.4                 |
| 3.5                   | 0.154                          | 157.1                          | 19.5                         | 9.40                           | 165.8                          | -27.3                        | 0.043                          | 27.0                           | 0.131                          | -36.9                          | 1.4                 |
| 4.0                   | 0.202                          | 137.5                          | 18.2                         | 8.10                           | 143.0                          | -26.2                        | 0.049                          | 26.0                           | 0.109                          | -62.8                          | 1.4                 |
| 4.5                   | 0.237                          | 115.5                          | 16.9                         | 7.00                           | 119.4                          | -24.9                        | 0.057                          | 25.0                           | 0.074                          | -92.4                          | 1.4                 |
| 5.0                   | 0.245                          | 97.9                           | 15.3                         | 5.81                           | 96.6                           | -23.6                        | 0.066                          | 21.4                           | 0.050                          | -132.0                         | 1.4                 |
| 5.5                   | 0.247                          | 86.8                           | 13.7                         | 4.82                           | 77.5                           | -22.4                        | 0.076                          | 15.9                           | 0.056                          | -163.0                         | 1.5                 |
| 6.0                   | 0.246                          | 78.1                           | 12.2                         | 4.09                           | 59.4                           | -21.4                        | 0.085                          | 9.3                            | 0.088                          | 168.9                          | 1.5                 |

**ABA-54563 Typical Scattering Parameters**T<sub>C</sub> = +25°C, Z<sub>0</sub> = 50 Ω, V<sub>cc</sub> = 5.0V, unless stated otherwise

| Freq<br>(GHz) | S <sub>11</sub><br>Mag. | S <sub>11</sub><br>Ang. | S <sub>21</sub><br>dB | S <sub>21</sub><br>Mag. | S <sub>21</sub><br>Ang. | S <sub>12</sub><br>dB | S <sub>12</sub><br>Mag. | S <sub>12</sub><br>Ang. | S <sub>22</sub><br>Mag. | S <sub>22</sub><br>Ang. | K<br>Factor |
|---------------|-------------------------|-------------------------|-----------------------|-------------------------|-------------------------|-----------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------|
| 0.1           | 0.102                   | 176.3                   | 22.9                  | 14.04                   | -5.0                    | -31.1                 | 0.028                   | -0.3                    | 0.123                   | -6.8                    | 1.5         |
| 0.2           | 0.098                   | 175.4                   | 23.0                  | 14.07                   | -9.8                    | -31.4                 | 0.027                   | 0.0                     | 0.121                   | -13.6                   | 1.5         |
| 0.3           | 0.094                   | 174.7                   | 23.0                  | 14.12                   | -14.7                   | -31.4                 | 0.027                   | 0.5                     | 0.121                   | -19.7                   | 1.5         |
| 0.4           | 0.089                   | 173.9                   | 23.0                  | 14.15                   | -19.7                   | -31.4                 | 0.027                   | 1.4                     | 0.121                   | -25.5                   | 1.5         |
| 0.5           | 0.091                   | 160.8                   | 23.0                  | 14.16                   | -24.7                   | -31.4                 | 0.027                   | 2.2                     | 0.109                   | -25.3                   | 1.5         |
| 0.6           | 0.089                   | 156.2                   | 23.0                  | 14.20                   | -29.7                   | -31.4                 | 0.027                   | 3.3                     | 0.105                   | -27.9                   | 1.5         |
| 0.7           | 0.085                   | 151.1                   | 23.1                  | 14.24                   | -34.7                   | -31.7                 | 0.026                   | 4.4                     | 0.101                   | -30.3                   | 1.5         |
| 0.8           | 0.080                   | 146.0                   | 23.1                  | 14.29                   | -39.7                   | -31.7                 | 0.026                   | 5.7                     | 0.096                   | -32.6                   | 1.5         |
| 0.9           | 0.075                   | 143.0                   | 23.2                  | 14.38                   | -44.9                   | -31.7                 | 0.026                   | 7.0                     | 0.090                   | -35.0                   | 1.5         |
| 1.0           | 0.071                   | 138.4                   | 23.2                  | 14.44                   | -50.2                   | -31.7                 | 0.026                   | 8.1                     | 0.084                   | -36.2                   | 1.5         |
| 1.2           | 0.057                   | 133.9                   | 23.3                  | 14.59                   | -60.8                   | -31.4                 | 0.027                   | 10.7                    | 0.073                   | -37.6                   | 1.5         |
| 1.4           | 0.046                   | 135.0                   | 23.4                  | 14.72                   | -71.9                   | -31.4                 | 0.027                   | 13.4                    | 0.060                   | -34.8                   | 1.5         |
| 1.6           | 0.037                   | 145.5                   | 23.4                  | 14.81                   | -83.6                   | -31.1                 | 0.028                   | 16.1                    | 0.049                   | -22.7                   | 1.4         |
| 1.8           | 0.035                   | 164.3                   | 23.2                  | 14.53                   | -95.6                   | -31.1                 | 0.028                   | 18.4                    | 0.049                   | -1.7                    | 1.4         |
| 2.0           | 0.041                   | 175.9                   | 23.1                  | 14.26                   | -108.1                  | -30.5                 | 0.030                   | 20.8                    | 0.064                   | 17.9                    | 1.4         |
| 2.2           | 0.059                   | -176.2                  | 23.1                  | 14.23                   | -120.4                  | -30.2                 | 0.031                   | 22.5                    | 0.083                   | 17.7                    | 1.3         |
| 2.4           | 0.073                   | -177.3                  | 22.7                  | 13.63                   | -132.9                  | -29.6                 | 0.033                   | 24.3                    | 0.107                   | 17.5                    | 1.3         |
| 2.6           | 0.090                   | 178.4                   | 22.3                  | 12.97                   | -144.9                  | -29.1                 | 0.035                   | 25.2                    | 0.129                   | 11.1                    | 1.3         |
| 2.8           | 0.107                   | 174.0                   | 21.7                  | 12.22                   | -156.4                  | -28.9                 | 0.036                   | 25.6                    | 0.146                   | 2.8                     | 1.3         |
| 3.0           | 0.127                   | 166.7                   | 21.2                  | 11.46                   | -167.4                  | -28.4                 | 0.038                   | 26.4                    | 0.152                   | -5.4                    | 1.3         |
| 3.2           | 0.139                   | 160.7                   | 20.6                  | 10.68                   | -177.7                  | -27.7                 | 0.041                   | 26.0                    | 0.162                   | -13.8                   | 1.3         |
| 3.4           | 0.158                   | 155.0                   | 20.0                  | 10.00                   | 172.6                   | -27.5                 | 0.042                   | 25.4                    | 0.163                   | -24.4                   | 1.3         |
| 3.5           | 0.168                   | 151.8                   | 19.7                  | 9.69                    | 167.8                   | -27.3                 | 0.043                   | 25.6                    | 0.159                   | -29.3                   | 1.3         |
| 4.0           | 0.217                   | 133.3                   | 18.5                  | 8.38                    | 145.0                   | -26.4                 | 0.048                   | 24.7                    | 0.137                   | -53.7                   | 1.4         |
| 4.5           | 0.256                   | 111.9                   | 17.2                  | 7.27                    | 121.3                   | -25.0                 | 0.056                   | 24.1                    | 0.099                   | -78.8                   | 1.4         |
| 5.0           | 0.263                   | 93.8                    | 15.6                  | 6.05                    | 98.2                    | -23.9                 | 0.064                   | 21.0                    | 0.069                   | -110.0                  | 1.4         |
| 5.5           | 0.260                   | 82.3                    | 14.0                  | 5.03                    | 79.0                    | -22.6                 | 0.074                   | 15.8                    | 0.068                   | -140.4                  | 1.4         |
| 6.0           | 0.255                   | 73.6                    | 12.6                  | 4.27                    | 60.8                    | -21.5                 | 0.084                   | 9.4                     | 0.093                   | -175.5                  | 1.5         |

**ABA-54563 Typical Scattering Parameters**T<sub>C</sub> = +25°C, Z<sub>0</sub> = 50 Ω, V<sub>cc</sub> = 5.5V, unless stated otherwise

| Freq<br>(GHz) | S <sub>11</sub><br>Mag. | S <sub>11</sub><br>Ang. | S <sub>21</sub><br>dB | S <sub>21</sub><br>Mag. | S <sub>21</sub><br>Ang. | S <sub>12</sub><br>dB | S <sub>12</sub><br>Mag. | S <sub>12</sub><br>Ang. | S <sub>22</sub><br>Mag. | S <sub>22</sub><br>Ang. | K<br>Factor |
|---------------|-------------------------|-------------------------|-----------------------|-------------------------|-------------------------|-----------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------|
| 0.1           | 0.105                   | 176.6                   | 23.0                  | 14.05                   | -4.9                    | -31.1                 | 0.028                   | -0.3                    | 0.112                   | -6.8                    | 1.4         |
| 0.2           | 0.101                   | 176.2                   | 23.0                  | 14.08                   | -9.7                    | -31.1                 | 0.028                   | -0.1                    | 0.111                   | -13.6                   | 1.5         |
| 0.3           | 0.098                   | 175.5                   | 23.0                  | 14.13                   | -14.5                   | -31.1                 | 0.028                   | 0.4                     | 0.111                   | -19.4                   | 1.5         |
| 0.4           | 0.092                   | 175.5                   | 23.0                  | 14.16                   | -19.4                   | -31.4                 | 0.027                   | 1.2                     | 0.110                   | -25.1                   | 1.5         |
| 0.5           | 0.095                   | 163.2                   | 23.0                  | 14.18                   | -24.4                   | -31.4                 | 0.027                   | 2.0                     | 0.099                   | -24.0                   | 1.5         |
| 0.6           | 0.092                   | 159.3                   | 23.1                  | 14.21                   | -29.3                   | -31.4                 | 0.027                   | 2.9                     | 0.094                   | -26.0                   | 1.5         |
| 0.7           | 0.088                   | 154.6                   | 23.1                  | 14.26                   | -34.3                   | -31.4                 | 0.027                   | 4.0                     | 0.090                   | -27.7                   | 1.5         |
| 0.8           | 0.084                   | 150.6                   | 23.1                  | 14.32                   | -39.2                   | -31.4                 | 0.027                   | 5.2                     | 0.085                   | -29.1                   | 1.5         |
| 0.9           | 0.079                   | 148.1                   | 23.2                  | 14.41                   | -44.3                   | -31.4                 | 0.027                   | 6.4                     | 0.080                   | -30.5                   | 1.5         |
| 1.0           | 0.075                   | 144.3                   | 23.2                  | 14.49                   | -49.5                   | -31.4                 | 0.027                   | 7.5                     | 0.074                   | -30.4                   | 1.5         |
| 1.2           | 0.063                   | 142.7                   | 23.3                  | 14.65                   | -60.1                   | -31.4                 | 0.027                   | 9.9                     | 0.063                   | -28.0                   | 1.5         |
| 1.4           | 0.053                   | 145.9                   | 23.4                  | 14.82                   | -71.1                   | -31.4                 | 0.027                   | 12.5                    | 0.053                   | -19.7                   | 1.4         |
| 1.6           | 0.048                   | 155.7                   | 23.5                  | 14.94                   | -82.6                   | -31.1                 | 0.028                   | 15.1                    | 0.050                   | -2.1                    | 1.4         |
| 1.8           | 0.050                   | 167.2                   | 23.5                  | 14.91                   | -94.5                   | -30.8                 | 0.029                   | 17.3                    | 0.061                   | 15.2                    | 1.4         |
| 2.0           | 0.056                   | 173.0                   | 23.4                  | 14.73                   | -107.0                  | -30.5                 | 0.030                   | 19.7                    | 0.083                   | 26.0                    | 1.3         |
| 2.2           | 0.075                   | 177.2                   | 23.2                  | 14.50                   | -119.5                  | -30.2                 | 0.031                   | 21.4                    | 0.104                   | 22.5                    | 1.3         |
| 2.4           | 0.088                   | 176.1                   | 22.9                  | 13.91                   | -131.8                  | -29.6                 | 0.033                   | 23.1                    | 0.131                   | 19.4                    | 1.3         |
| 2.6           | 0.105                   | 171.7                   | 22.5                  | 13.28                   | -143.9                  | -29.1                 | 0.035                   | 23.9                    | 0.154                   | 11.9                    | 1.3         |
| 2.8           | 0.121                   | 167.5                   | 22.0                  | 12.54                   | -155.5                  | -28.9                 | 0.036                   | 24.5                    | 0.173                   | 3.1                     | 1.3         |
| 3.0           | 0.141                   | 161.0                   | 21.4                  | 11.78                   | -166.6                  | -28.4                 | 0.038                   | 25.1                    | 0.180                   | -5.7                    | 1.3         |
| 3.2           | 0.153                   | 155.0                   | 20.8                  | 10.99                   | -177.0                  | -28.0                 | 0.040                   | 24.8                    | 0.190                   | -14.4                   | 1.3         |
| 3.4           | 0.171                   | 149.8                   | 20.2                  | 10.29                   | 173.2                   | -27.5                 | 0.042                   | 24.3                    | 0.192                   | -24.9                   | 1.3         |
| 3.5           | 0.182                   | 146.9                   | 20.0                  | 9.98                    | 168.3                   | -27.3                 | 0.043                   | 24.5                    | 0.187                   | -30.0                   | 1.3         |
| 4.0           | 0.231                   | 129.5                   | 18.7                  | 8.63                    | 145.4                   | -26.6                 | 0.047                   | 23.9                    | 0.165                   | -54.4                   | 1.3         |
| 4.5           | 0.269                   | 108.5                   | 17.5                  | 7.49                    | 121.5                   | -25.4                 | 0.054                   | 23.9                    | 0.126                   | -79.5                   | 1.3         |
| 5.0           | 0.275                   | 90.4                    | 15.9                  | 6.22                    | 98.2                    | -24.0                 | 0.063                   | 21.3                    | 0.092                   | -108.5                  | 1.4         |
| 5.5           | 0.268                   | 79.0                    | 14.2                  | 5.15                    | 78.9                    | -22.7                 | 0.073                   | 16.4                    | 0.088                   | -135.5                  | 1.4         |
| 6.0           | 0.260                   | 70.1                    | 12.8                  | 4.36                    | 60.6                    | -21.6                 | 0.083                   | 10.3                    | 0.108                   | -169.1                  | 1.5         |

Refer to Agilent Web Site for S-parameters at different frequencies:

<http://www.agilent.com/view/rf>

## Device Models

Refer to Agilent's web site  
[www.agilent.com/view/rf](http://www.agilent.com/view/rf)

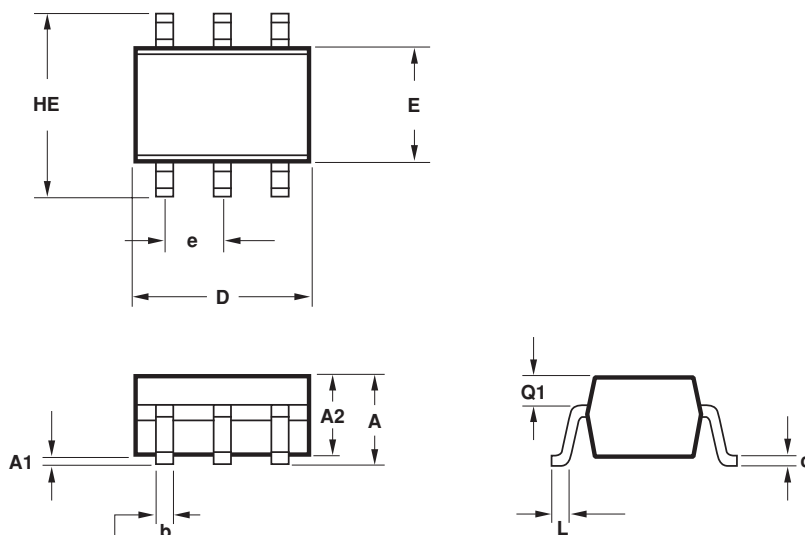
## Ordering Information

| Part Number    | Devices per Container | Container      |
|----------------|-----------------------|----------------|
| ABA-54563-TR1G | 3000                  | 7" reel        |
| ABA-54563-TR2G | 10000                 | 13" reel       |
| ABA-54563-BLKG | 100                   | antistatic bag |

Note: Only lead-free option available.

## Package Dimensions

### Outline 63 (SOT-363/SC-70)

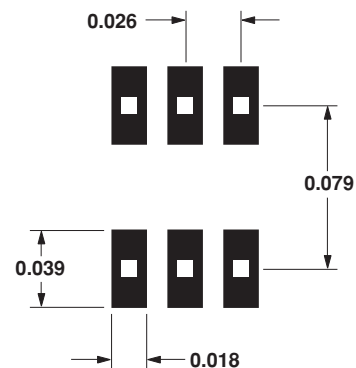


| SYMBOL | DIMENSIONS (mm) |      |
|--------|-----------------|------|
|        | MIN.            | MAX. |
| E      | 1.15            | 1.35 |
| D      | 1.80            | 2.25 |
| HE     | 1.80            | 2.40 |
| A      | 0.80            | 1.10 |
| A2     | 0.80            | 1.00 |
| A1     | 0.00            | 0.10 |
| Q1     | 0.10            | 0.40 |
| e      | 0.650 BCS       |      |
| b      | 0.15            | 0.30 |
| c      | 0.10            | 0.20 |
| L      | 0.10            | 0.30 |

#### NOTES:

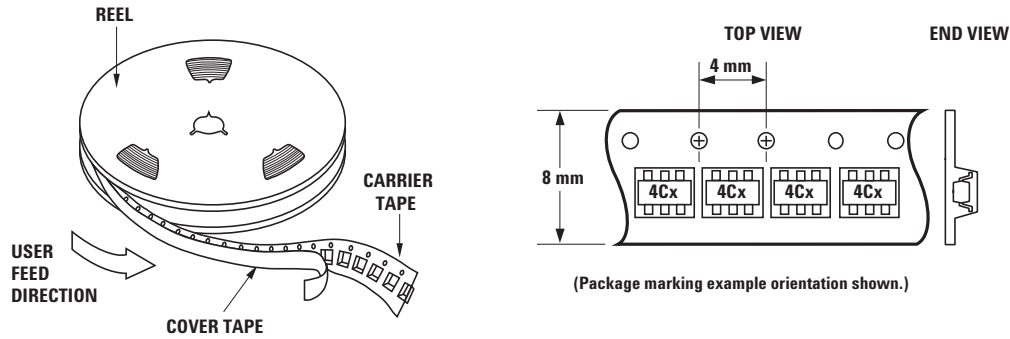
1. All dimensions are in mm.
2. Dimensions are inclusive of plating.
3. Dimensions are exclusive of mold flash & metal burr.
4. All specifications comply to EIAJ SC70.
5. Die is facing up for mold and facing down for trim/form, ie: reverse trim/form.
6. Package surface to be mirror finish.

## Recommended PCB Pad Layout for Agilent's SC70 6L/SOT-363 Products

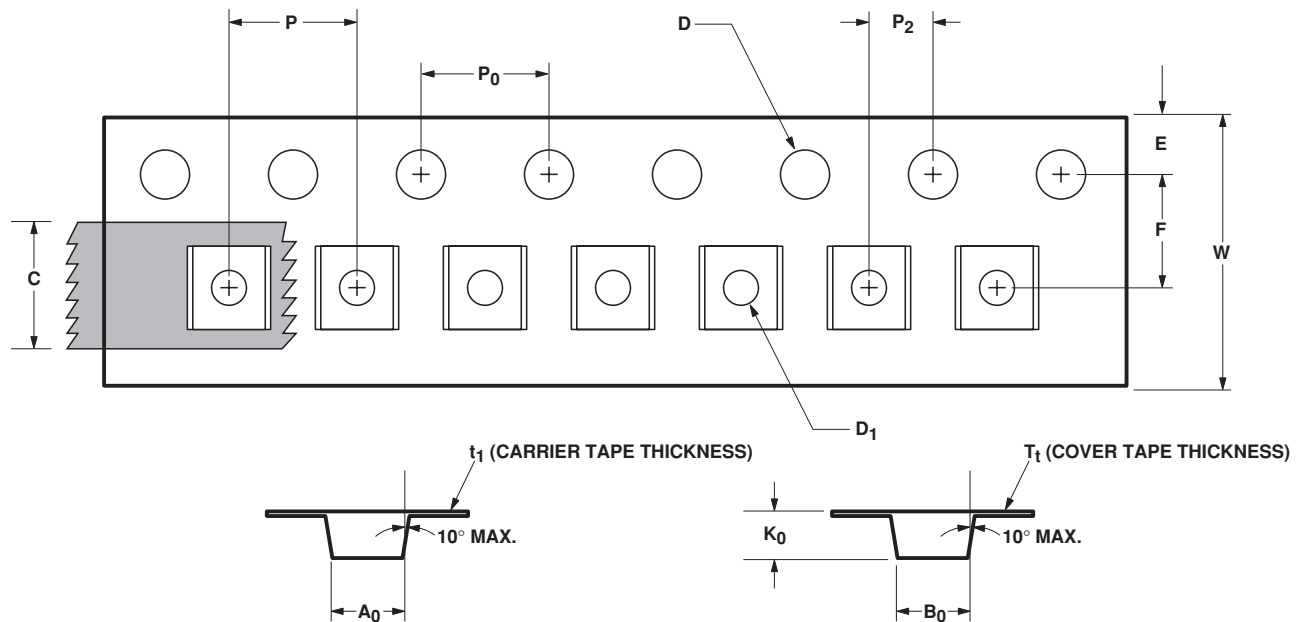


Dimensions in inches.

## Device Orientation



## Tape Dimensions and Product Orientation



| DESCRIPTION  |                                          | SYMBOL         | SIZE (mm)          | SIZE (INCHES)   |
|--------------|------------------------------------------|----------------|--------------------|-----------------|
| CAVITY       | LENGTH                                   | A <sub>0</sub> | 2.40 ± 0.10        | 0.094 ± 0.004   |
|              | WIDTH                                    | B <sub>0</sub> | 2.40 ± 0.10        | 0.094 ± 0.004   |
|              | DEPTH                                    | K <sub>0</sub> | 1.20 ± 0.10        | 0.047 ± 0.004   |
|              | PITCH                                    | P              | 4.00 ± 0.10        | 0.157 ± 0.004   |
|              | BOTTOM HOLE DIAMETER                     | D <sub>1</sub> | 1.00 ± 0.25        | 0.039 ± 0.010   |
|              |                                          |                |                    |                 |
| PERFORATION  | DIAMETER                                 | D              | 1.50 ± 0.10        | 0.061 ± 0.002   |
|              | PITCH                                    | P <sub>0</sub> | 4.00 ± 0.10        | 0.157 ± 0.004   |
|              | POSITION                                 | E              | 1.75 ± 0.10        | 0.069 ± 0.004   |
| CARRIER TAPE | WIDTH                                    | W              | 8.00 ± 0.30 - 0.10 | 0.315 ± 0.012   |
|              | THICKNESS                                | t <sub>1</sub> | 0.254 ± 0.02       | 0.0100 ± 0.0008 |
| COVER TAPE   | WIDTH                                    | C              | 5.40 ± 0.10        | 0.205 ± 0.004   |
|              | TAPE THICKNESS                           | T <sub>t</sub> | 0.062 ± 0.001      | 0.0025 ± 0.0004 |
| DISTANCE     | CAVITY TO PERFORATION (WIDTH DIRECTION)  | F              | 3.50 ± 0.05        | 0.138 ± 0.002   |
|              | CAVITY TO PERFORATION (LENGTH DIRECTION) | P <sub>2</sub> | 2.00 ± 0.05        | 0.079 ± 0.002   |

**[www.agilent.com/semiconductors](http://www.agilent.com/semiconductors)**

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Data subject to change.

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Obsoletes 5989-0884EN

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