

AVT-50663
 DC – 6000 MHz
 InGaP HBT Gain Block



Data Sheet

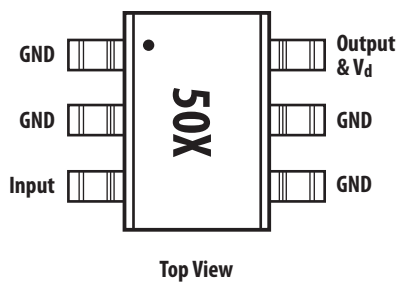
Description

Avago Technologies' AVT-50663 is an economical, easy-to-use, general purpose InGaP HBT MMIC gain block amplifier utilizing Darlington pair configuration housed in a 6-lead (SOT-363) surface mount plastic package.


The Darlington feedback structure provides inherent broad bandwidth performance, resulting in useful operating frequency up to 6 GHz. This is an ideal device for small-signal gain cascades or IF amplification.

AVT-50663 is fabricated using advanced InGaP HBT (Hetero-junction Bipolar Transistor) technology that offers state-of-the-art reliability, temperature stability and performance consistency.

Component Image



Notes:
 Package marking provides orientation and identification
 "50" = Device Code
 "X" = Month of Manufacture
 "•" = Pin 1



Attention: Observe precautions for handling electrostatic sensitive devices.
 ESD Machine Model (120V)
 ESD Human Body Model (1200V)
 Refer to Avago Application Note A004R:
 Electrostatic Discharge, Damage and Control.

Features

- Small signal gain amplifier
- Operating frequency DC to 6 GHz
- Unconditionally stable
- 50 Ohm input & output
- Flat, Broadband Frequency Response up to 2 GHz
- Industry standard SOT-363
- Lead-free, RoHS compliant, Green

Specifications

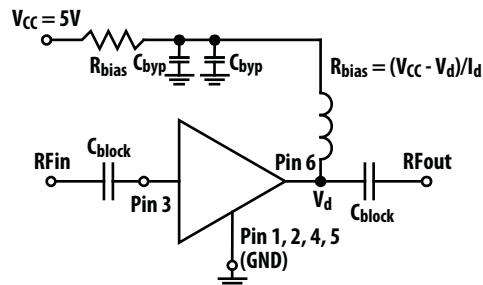
2 GHz, 5V Vcc, 36mA (typical)

- 15.3 dB Gain
- 12.5 dBm P1dB
- 25 dBm OIP3
- 4 dB NF
- 15 dB IRL and ORL

Applications

- Cellular / PCS / 3G base station
- Wireless Data / WLAN
- WiMAX / WiBRO
- CATV & Cable modem
- ISM

Typical Biasing Configuration



Absolute Maximum Rating^[1] $T_A=25^\circ\text{C}$

| Symbol | Parameter | Units | Absolute Max. |
|--------------|--|------------------|---------------|
| I_d | Device Current | mA | 70 |
| $P_{IN,MAX}$ | CW RF Input Power | dBm | 15 |
| P_{DISS} | Total Power Dissipation ^[3] | mW | 297 |
| T_{OPT} | Operating Temperature | $^\circ\text{C}$ | -40 to 85 |
| $T_{J,MAX}$ | Junction Temperature | $^\circ\text{C}$ | 150 |
| T_{STG} | Storage Temperature | $^\circ\text{C}$ | -65 to 150 |

Thermal Resistance

Thermal Resistance^[2] $\theta_{JC} = 149^\circ\text{C/W}$
 $(I_d = 36 \text{ mA}, T_C = 85^\circ\text{C})$

Notes:

1. Operation of this device in excess of any of these limits may cause permanent damage.
2. Thermal resistance measured using Infrared measurement technique.
3. Ground lead temperature is 25°C . Derate $6.7\text{mW}/^\circ\text{C}$ for $T_C > 106^\circ\text{C}$.

Electrical Specifications^[4]

$T_A = 25^\circ\text{C}$, $Z_o = 50 \Omega$, $V_{CC} = 5 \text{ V}$, $R_{bias} = 30 \Omega$, $P_{in} = -15 \text{ dBm}$ (unless specified otherwise)

| Symbol | Parameter and Test Condition | Frequency | Units | Min. | Typ. | Max. |
|---------------------|--|---------------------|-------|------|----------------|------|
| I_d | Device Current | | mA | 32.5 | 36 | 39.5 |
| G_p | Power Gain | 900 MHz 2000 MHz | dB | 13.8 | 15.8 15.3 | 16.8 |
| ΔG_p | Gain Flatness | 0.05 - 2 GHz | | | 0.6 | |
| f_{3dB} | 3 dB Bandwidth | | GHz | | 5.2 | |
| OIP3 ^[5] | Output 3 rd Intercept Point | 900 MHz 2000 MHz | dBm | 23.5 | 26.4 25 | |
| S11 | Input Return Loss, 50Ω source | 900 MHz 2000 MHz | dB | | -21.9 -15.4 | |
| S22 | Output Return Loss, 50Ω load | 900MHz 2000 MHz | dB | | -19.1 -14.4 | |
| S12 | Reverse Isolation | 900 MHz 2000 MHz | dB | | -19.2 -19.2 | |
| P1dB | Output Power at 1dB Gain Compression | 900 MHz 2000 MHz | dBm | | 13 12.5 | |
| NF | Noise Figure | 900 MHz 2000 MHz | dB | | 3.7 4 | |

Notes:

4. Measurements obtained on CPWG line with reference plane at the ends of DUT leads (as shown in Figure 1).
5. OIP3 test condition: $F_{RF1} - F_{RF2} = 10\text{MHz}$ with input power of -15 dBm per tone measured at worse side band.

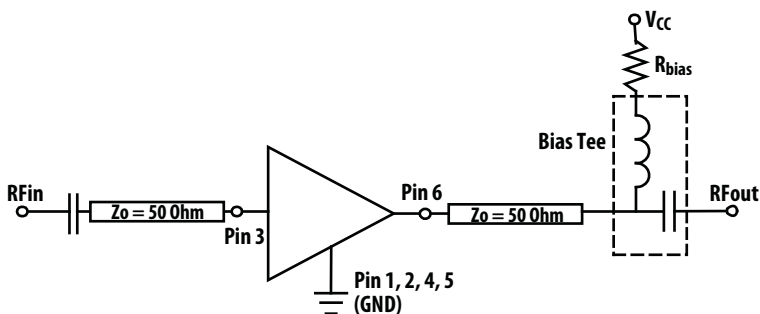


Figure 1. Block diagram of board used for I_d , Gain, OIP3, S11, S22, S12, OP1dB and NF measurements. Circuit losses have been de-embedded from actual measurements.

Product Consistency Distribution Charts at 2 GHz, $V_{CC} = 5\text{ V}$, $R_{bias} = 30\ \Omega$

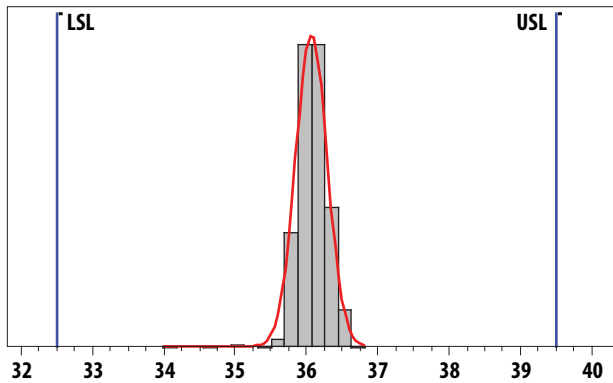


Figure 2. I_d (mA) distribution. LSL = 32.5, Nominal = 36, USL = 39.5

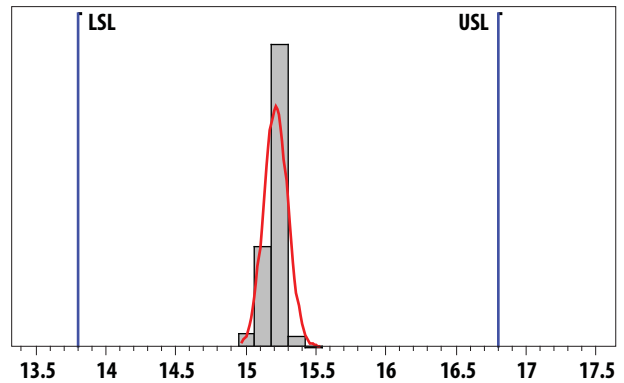


Figure 3. Gain (dB) distribution. LSL = 13.8, Nominal = 15.2, USL = 16.8

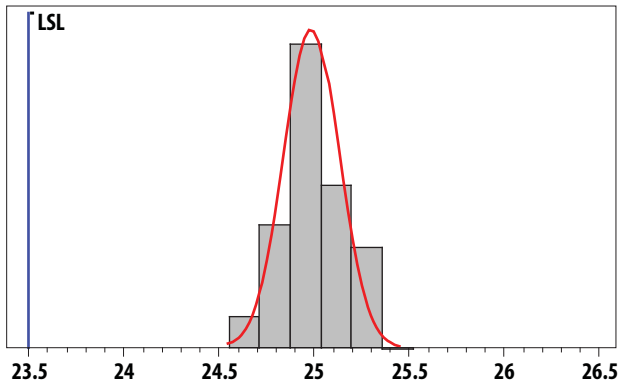


Figure 4. OIP3 (dBm) distribution. LSL = 23.5, Nominal = 25

Notes:

1. Statistical distribution determined from a sample size of 1421 samples taken from 6 different wafers, measured on a production test board.
2. Future wafers allocated to this product may have typical values anywhere between the minimum and maximum specification limits.

AVT-50663 Typical Performance Curves

$T_A = 25^\circ\text{C}$, $Z_o = 50\ \Omega$, $P_{in} = -15\ \text{dBm}$ (unless specified otherwise)

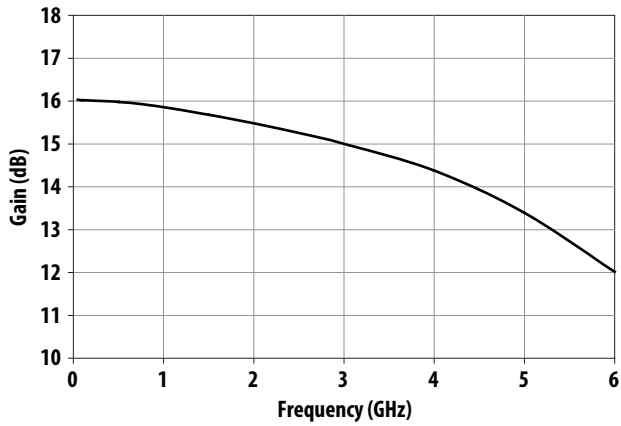


Figure 5. Gain vs Frequency at $I_d = 36\text{mA}$

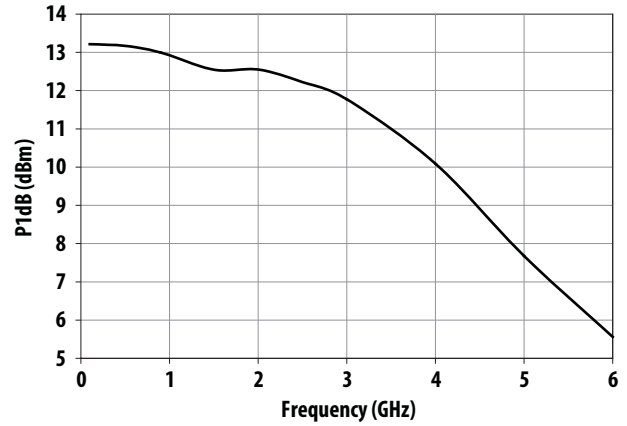


Figure 6. P1dB vs Frequency at $I_d = 36\text{mA}$

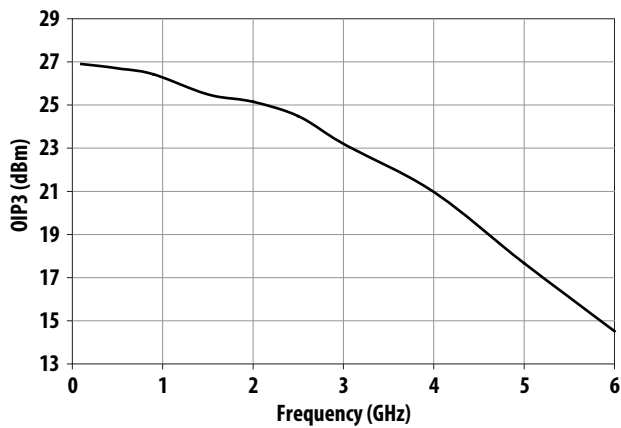


Figure 7. OIP3 vs Frequency at $I_d = 36\text{mA}$

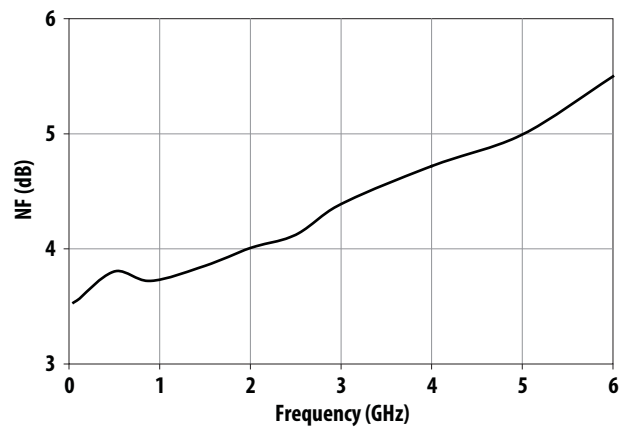


Figure 8. NF vs Frequency at $I_d = 36\text{mA}$

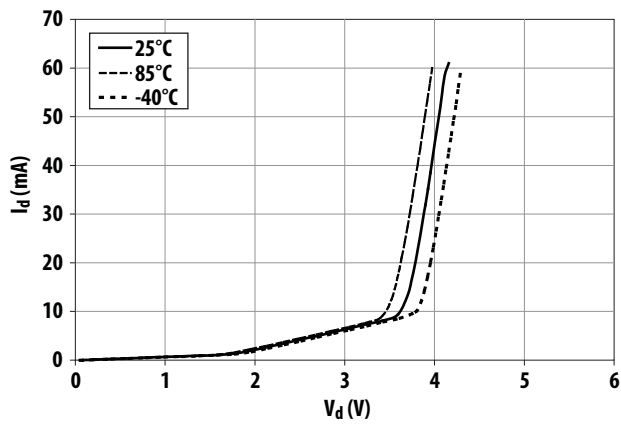


Figure 9. I_d vs V_d and Temperature

AVT-50663 Typical Performance Curves

$T_A = 25^\circ\text{C}$, $Z_o = 50 \Omega$, $P_{in} = -15 \text{ dBm}$ (unless specified otherwise), continued

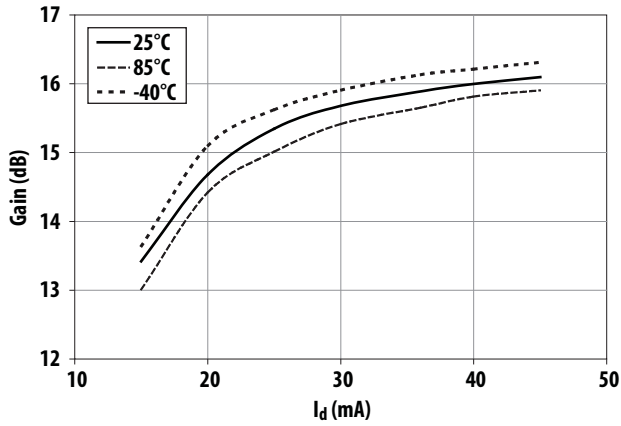


Figure 10. Gain vs I_d and Temperature at 900 MHz

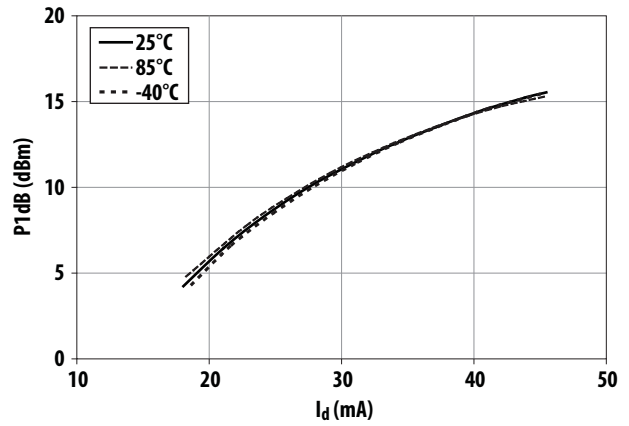


Figure 11. P1dB vs I_d and Temperature at 900 MHz

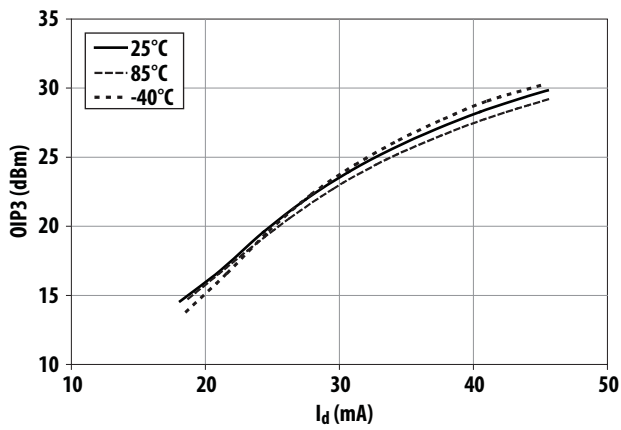


Figure 12. OIP3 vs I_d and Temperature at 900 MHz

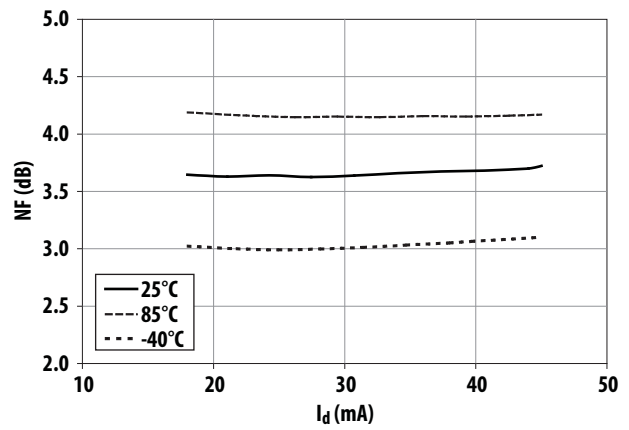


Figure 13. NF vs I_d and Temperature at 900 MHz

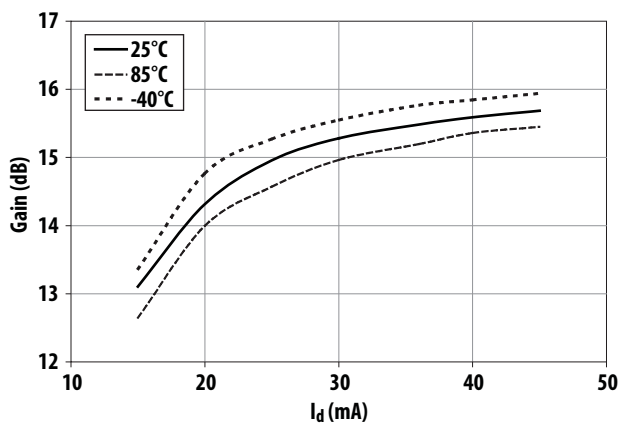


Figure 14. Gain vs I_d and Temperature at 2 GHz

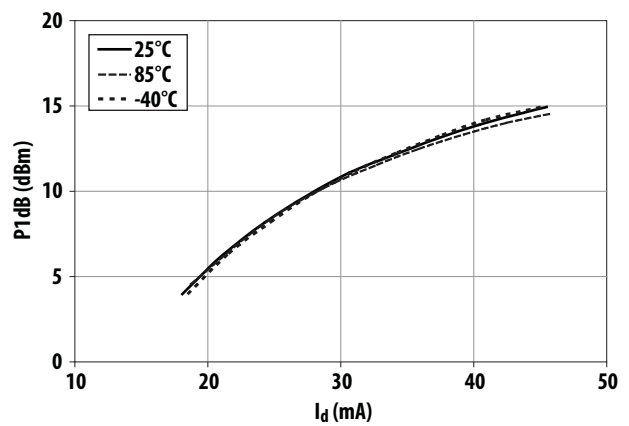


Figure 15. P1dB vs I_d and Temperature at 2 GHz

AVT-50663 Typical Performance Curves

$T_A = 25^\circ\text{C}$, $Z_o = 50 \Omega$, $P_{in} = -15 \text{ dBm}$ (unless specified otherwise), continued

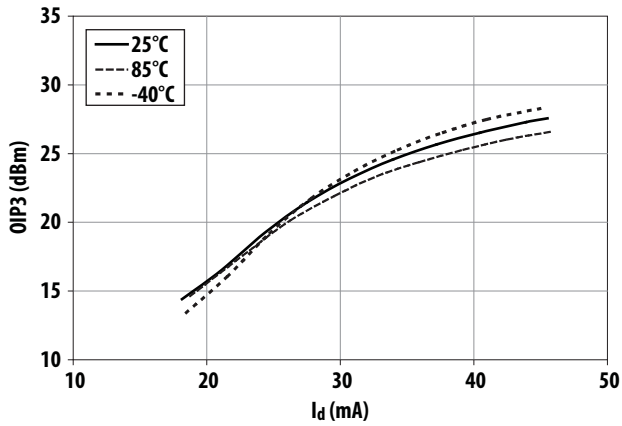


Figure 16. OIP3 vs I_d and Temperature at 2 GHz

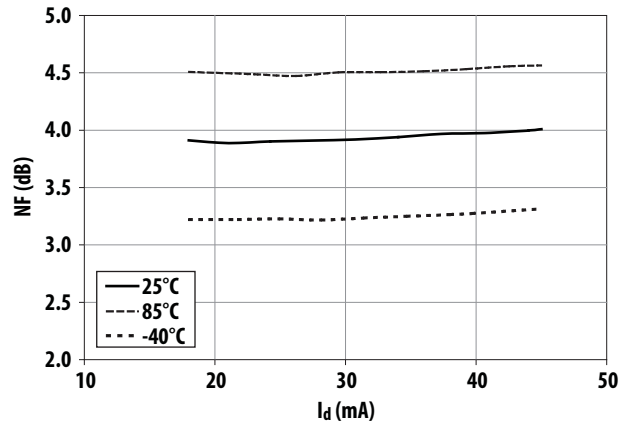


Figure 17. NF vs I_d and Temperature at 2 GHz

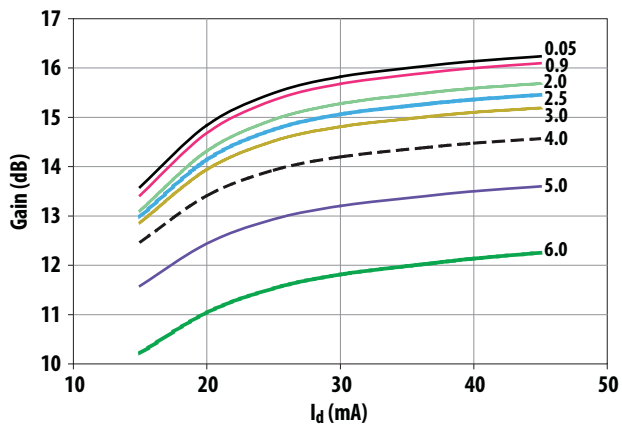


Figure 18. Gain vs I_d and Frequency (GHz)

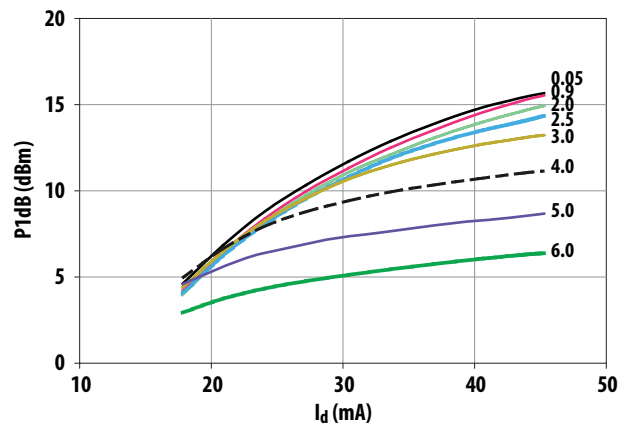


Figure 19. P1dB vs I_d and Frequency (GHz)

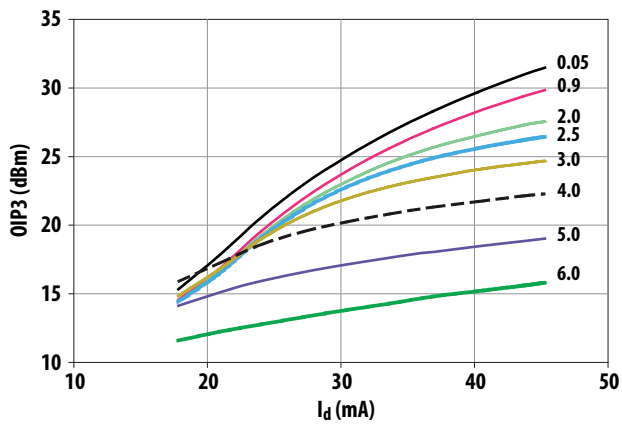


Figure 20. OIP3 vs I_d and Frequency (GHz)

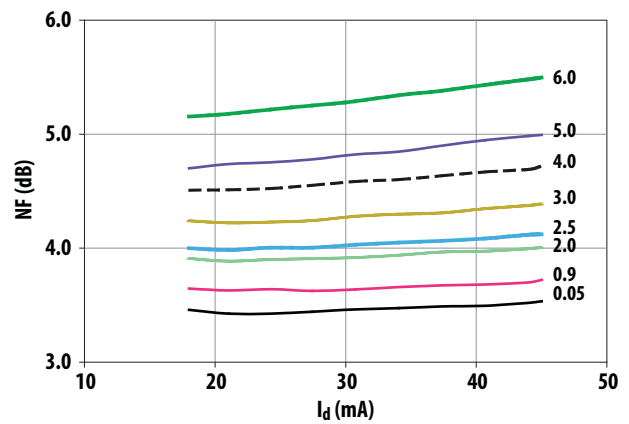


Figure 21. NF vs I_d and Frequency (GHz)

AVT-50663 Typical Performance Curves

$T_A = 25^\circ\text{C}$, $Z_o = 50 \Omega$, $P_{in} = -15 \text{ dBm}$ (unless specified otherwise), continued

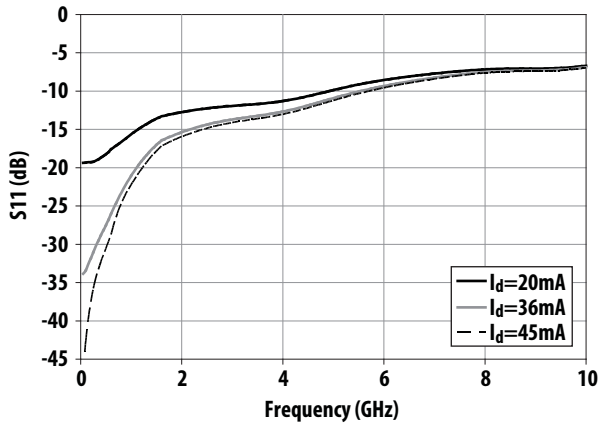


Figure 22. S_{11} vs Frequency and I_d

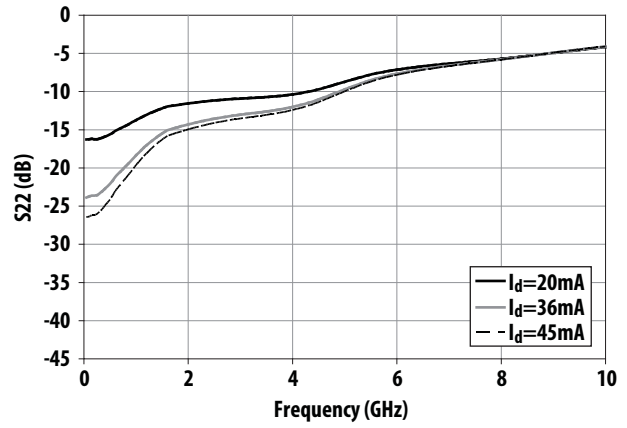


Figure 23. S_{22} vs Frequency and I_d

AVT-50663 Typical Scattering Parameters $T_A = 25^\circ\text{C}$, $Z_0 = 50 \Omega$, $I_d = 20 \text{ mA}$, (unless specified otherwise)

| Id=20mA | S11 | | S21 | | S12 | | S22 | | K | |
|---------|------|-------|-------|------|-------|------|-------|------|-------|-------|
| | mag | angle | dB | mag | angle | mag | angle | mag | | angle |
| 0.05 | 0.11 | 0.5 | 14.84 | 5.52 | 178.1 | 0.12 | -1.16 | 0.15 | -1.3 | 1.1 |
| 0.1 | 0.11 | 0.058 | 14.83 | 5.51 | 176.3 | 0.12 | -1.79 | 0.15 | -2.2 | 1.1 |
| 0.5 | 0.12 | -4.9 | 14.79 | 5.49 | 161.8 | 0.12 | -8.75 | 0.17 | -10.7 | 1.1 |
| 0.9 | 0.16 | -14.3 | 14.68 | 5.42 | 147.4 | 0.12 | -15.6 | 0.2 | -21.3 | 1.1 |
| 1.5 | 0.21 | -30.4 | 14.48 | 5.3 | 126.1 | 0.12 | -25.6 | 0.25 | -39.2 | 1.1 |
| 2.0 | 0.23 | -42.5 | 14.32 | 5.2 | 108.7 | 0.11 | -33.6 | 0.26 | -54.1 | 1.1 |
| 2.5 | 0.24 | -54.7 | 14.14 | 5.09 | 91.24 | 0.11 | -41.5 | 0.28 | -69.3 | 1.1 |
| 3.0 | 0.25 | -67.6 | 13.94 | 4.98 | 73.8 | 0.1 | -49.1 | 0.28 | -85.2 | 1.2 |
| 3.5 | 0.26 | -82 | 13.71 | 4.85 | 56.21 | 0.09 | -56.5 | 0.29 | -102 | 1.3 |
| 4.0 | 0.27 | -98.3 | 13.41 | 4.68 | 38.38 | 0.09 | -63.5 | 0.3 | -120 | 1.3 |
| 4.5 | 0.29 | -116 | 13 | 4.47 | 20.38 | 0.08 | -69.7 | 0.33 | -139 | 1.4 |
| 5.0 | 0.32 | -135 | 12.44 | 4.19 | 2.521 | 0.07 | -74.3 | 0.37 | -156 | 1.6 |
| 5.5 | 0.35 | -153 | 11.78 | 3.88 | -14.9 | 0.06 | -76.2 | 0.41 | -172 | 1.8 |
| 6.0 | 0.37 | -171 | 11.04 | 3.56 | -31.7 | 0.05 | -74.7 | 0.44 | 172.9 | 2.1 |
| 6.5 | 0.39 | 171.5 | 10.23 | 3.25 | -48.2 | 0.05 | -70.4 | 0.46 | 157.5 | 2.1 |
| 7.0 | 0.41 | 154.8 | 9.35 | 2.94 | -64.4 | 0.05 | -65.1 | 0.48 | 141.6 | 2.2 |
| 7.5 | 0.43 | 138.8 | 8.41 | 2.64 | -80.2 | 0.05 | -61 | 0.5 | 125.5 | 2.2 |
| 8.0 | 0.44 | 123.5 | 7.42 | 2.35 | -95.5 | 0.06 | -59.6 | 0.52 | 109.6 | 2.0 |
| 8.5 | 0.44 | 108.3 | 6.38 | 2.09 | -110 | 0.06 | -61.1 | 0.54 | 94.53 | 2.1 |
| 9.0 | 0.44 | 92.68 | 5.29 | 1.84 | -124 | 0.07 | -64.6 | 0.57 | 80.78 | 1.9 |
| 9.5 | 0.45 | 76.47 | 4.13 | 1.61 | -137 | 0.07 | -69.3 | 0.59 | 68.48 | 2.1 |
| 10.0 | 0.46 | 61.11 | 2.91 | 1.4 | -150 | 0.08 | -74.6 | 0.62 | 57.6 | 1.9 |
| 10.5 | 0.49 | 48.39 | 1.64 | 1.21 | -161 | 0.08 | -79.8 | 0.64 | 48.02 | 2.1 |
| 11.0 | 0.52 | 38.47 | 0.36 | 1.04 | -171 | 0.09 | -85 | 0.66 | 39.08 | 1.9 |
| 11.5 | 0.54 | 29.93 | -0.89 | 0.9 | 179.5 | 0.09 | -90.7 | 0.67 | 29.65 | 2.1 |
| 12.0 | 0.56 | 21.19 | -2.13 | 0.78 | 169.2 | 0.09 | -97.4 | 0.68 | 19.03 | 2.3 |
| 12.5 | 0.57 | 11.68 | -3.33 | 0.68 | 158.4 | 0.1 | -105 | 0.69 | 7.452 | 2.3 |
| 13.0 | 0.58 | 1.218 | -4.48 | 0.6 | 147.1 | 0.1 | -114 | 0.7 | -4.48 | 2.5 |
| 13.5 | 0.59 | -10.6 | -5.58 | 0.53 | 135.5 | 0.1 | -123 | 0.71 | -16.3 | 2.8 |
| 14.0 | 0.59 | -23.8 | -6.69 | 0.46 | 124.2 | 0.1 | -133 | 0.72 | -27.5 | 3.1 |
| 14.5 | 0.61 | -37.2 | -7.91 | 0.4 | 113.8 | 0.1 | -142 | 0.74 | -37 | 3.3 |
| 15.0 | 0.63 | -48.6 | -9.22 | 0.35 | 105.1 | 0.1 | -149 | 0.76 | -44.1 | 3.3 |
| 16.0 | 0.69 | -62.8 | -11.8 | 0.26 | 93.18 | 0.1 | -159 | 0.79 | -51.8 | 3.4 |
| 17.0 | 0.71 | -69.7 | -14.2 | 0.19 | 85.49 | 0.1 | -167 | 0.8 | -57.5 | 4.3 |
| 18.0 | 0.72 | -73.8 | -16.2 | 0.15 | 78.34 | 0.1 | -175 | 0.79 | -67.4 | 5.6 |
| 19.0 | 0.71 | -87.4 | -18.1 | 0.12 | 65.13 | 0.1 | 169.3 | 0.79 | -86.3 | 7.4 |
| 20.0 | 0.73 | -111 | -20.9 | 0.09 | 47.87 | 0.09 | 148.5 | 0.82 | -109 | 9.1 |

Notes:

1. S-parameters are measured on a CPWG line fabricated on 0.025 inch thick Rogers® RO4350 material. The input reference plane is at the end of the input lead. The output reference plane is at the end of the output lead.

AVT-50663 Typical Scattering Parameters $T_A = 25^\circ\text{C}$, $Z_0 = 50 \Omega$, $I_d = 36 \text{ mA}$, (unless specified otherwise)

| Id=36mA | S11 | | S21 | | S12 | | S22 | | K | |
|---------|------|-------|--------|------|-------|------|-------|------|-------|-------|
| | mag | angle | dB | mag | angle | mag | angle | mag | | angle |
| 0.05 | 0.02 | 8.06 | 16.03 | 6.33 | 178.2 | 0.11 | -0.93 | 0.06 | -0.64 | 1.1 |
| 0.10 | 0.02 | 15.19 | 16.02 | 6.32 | 176.4 | 0.11 | -1.6 | 0.07 | -0.29 | 1.1 |
| 0.50 | 0.04 | 24.46 | 15.98 | 6.3 | 161.7 | 0.11 | -7.94 | 0.08 | -2.75 | 1.1 |
| 0.90 | 0.08 | 10.9 | 15.89 | 6.23 | 147.2 | 0.11 | -14.4 | 0.11 | -13 | 1.1 |
| 1.50 | 0.14 | -14.7 | 15.68 | 6.08 | 125.6 | 0.11 | -23.9 | 0.17 | -33.1 | 1.1 |
| 2.00 | 0.17 | -27.4 | 15.48 | 5.95 | 107.9 | 0.11 | -31.7 | 0.19 | -48.6 | 1.1 |
| 2.50 | 0.19 | -39.7 | 15.26 | 5.79 | 90.43 | 0.1 | -39.3 | 0.21 | -64.5 | 1.1 |
| 3.00 | 0.21 | -52.9 | 15.00 | 5.62 | 73.02 | 0.1 | -46.7 | 0.22 | -81.1 | 1.1 |
| 3.50 | 0.22 | -67.7 | 14.71 | 5.44 | 55.58 | 0.09 | -54 | 0.23 | -99 | 1.2 |
| 4.00 | 0.23 | -84.8 | 14.38 | 5.23 | 37.97 | 0.08 | -60.9 | 0.25 | -118 | 1.3 |
| 4.50 | 0.26 | -104 | 13.95 | 4.98 | 20.21 | 0.08 | -67.1 | 0.28 | -138 | 1.3 |
| 5.00 | 0.28 | -124 | 13.39 | 4.67 | 2.574 | 0.07 | -71.6 | 0.33 | -156 | 1.5 |
| 5.50 | 0.31 | -145 | 12.74 | 4.33 | -14.7 | 0.06 | -73.3 | 0.38 | -172 | 1.7 |
| 6.00 | 0.34 | -164 | 12.01 | 3.99 | -31.5 | 0.05 | -71.3 | 0.41 | 171.9 | 2.0 |
| 6.50 | 0.37 | 178 | 11.22 | 3.64 | -47.9 | 0.05 | -66.3 | 0.44 | 156 | 2.0 |
| 7.00 | 0.39 | 160.5 | 10.35 | 3.29 | -64.1 | 0.05 | -60.4 | 0.47 | 139.7 | 2.0 |
| 7.50 | 0.41 | 143.7 | 9.42 | 2.96 | -80 | 0.05 | -56.2 | 0.49 | 123.3 | 2.1 |
| 8.00 | 0.42 | 127.7 | 8.43 | 2.64 | -95.5 | 0.06 | -55.2 | 0.51 | 107.1 | 1.8 |
| 8.50 | 0.43 | 112 | 7.39 | 2.34 | -110 | 0.06 | -57.3 | 0.54 | 91.87 | 1.9 |
| 9.00 | 0.43 | 95.8 | 6.30 | 2.07 | -125 | 0.07 | -61.6 | 0.57 | 78.02 | 1.7 |
| 9.50 | 0.44 | 79.08 | 5.15 | 1.81 | -138 | 0.08 | -66.9 | 0.6 | 65.67 | 1.6 |
| 10.00 | 0.45 | 63.22 | 3.92 | 1.57 | -150 | 0.08 | -72.8 | 0.62 | 54.82 | 1.8 |
| 10.50 | 0.48 | 50.05 | 2.65 | 1.36 | -161 | 0.09 | -78.5 | 0.64 | 45.31 | 1.6 |
| 11.00 | 0.51 | 39.79 | 1.37 | 1.17 | -171 | 0.09 | -84.1 | 0.66 | 36.42 | 1.7 |
| 11.50 | 0.53 | 30.99 | 0.11 | 1.01 | 178.6 | 0.09 | -90.1 | 0.67 | 27.04 | 1.9 |
| 12.00 | 0.55 | 22.04 | -1.13 | 0.88 | 168.3 | 0.1 | -97.1 | 0.68 | 16.47 | 1.9 |
| 12.50 | 0.57 | 12.35 | -2.34 | 0.76 | 157.3 | 0.1 | -105 | 0.69 | 4.954 | 2.0 |
| 13.00 | 0.58 | 1.748 | -3.49 | 0.67 | 145.9 | 0.1 | -114 | 0.7 | -6.9 | 2.2 |
| 13.50 | 0.58 | -10.2 | -4.59 | 0.59 | 134.2 | 0.1 | -124 | 0.71 | -18.6 | 2.5 |
| 14.00 | 0.59 | -23.5 | -5.71 | 0.52 | 122.7 | 0.1 | -133 | 0.72 | -29.7 | 2.7 |
| 14.50 | 0.61 | -36.9 | -6.92 | 0.45 | 112.2 | 0.1 | -142 | 0.74 | -39.1 | 2.9 |
| 15.00 | 0.63 | -48.4 | -8.23 | 0.39 | 103.4 | 0.1 | -150 | 0.75 | -46.1 | 3.1 |
| 16.00 | 0.69 | -62.8 | -10.82 | 0.29 | 91.06 | 0.1 | -160 | 0.78 | -53.5 | 3.2 |
| 17.00 | 0.71 | -69.7 | -13.19 | 0.22 | 82.81 | 0.1 | -167 | 0.79 | -59 | 3.8 |
| 18.00 | 0.72 | -74 | -15.13 | 0.18 | 74.96 | 0.1 | -176 | 0.78 | -68.8 | 4.8 |
| 19.00 | 0.71 | -87.5 | -17.05 | 0.14 | 60.98 | 0.1 | 168.7 | 0.77 | -87.6 | 6.8 |
| 20.00 | 0.73 | -112 | -19.79 | 0.1 | 42.85 | 0.09 | 147.9 | 0.8 | -110 | 9.0 |

Notes:

1. S-parameters are measured on a CPWG line fabricated on 0.025 inch thick Rogers® RO4350 material. The input reference plane is at the end of the input lead. The output reference plane is at the end of the output lead.

AVT-50663 Typical Scattering Parameters $T_A = 25^\circ\text{C}$, $Z_0 = 50 \Omega$, $I_d = 45 \text{ mA}$, (unless specified otherwise)

| Id=45mA | S11 | | S21 | | S12 | | S22 | | K | |
|---------|------|-------|-------|------|-------|------|-------|------|-------|-------|
| | mag | angle | dB | mag | angle | mag | angle | mag | | angle |
| 0.05 | 0 | 46.76 | 16.24 | 6.48 | 178.2 | 0.11 | -0.72 | 0.05 | -0.52 | 1.1 |
| 0.10 | 0.01 | 58.22 | 16.23 | 6.48 | 176.4 | 0.11 | -1.52 | 0.05 | 0.833 | 1.1 |
| 0.50 | 0.03 | 48.46 | 16.19 | 6.45 | 161.8 | 0.11 | -7.75 | 0.06 | 1.615 | 1.1 |
| 0.90 | 0.07 | 22.8 | 16.1 | 6.38 | 147.3 | 0.11 | -14.1 | 0.09 | -8.8 | 1.1 |
| 1.50 | 0.13 | -9.99 | 15.89 | 6.23 | 125.7 | 0.11 | -23.5 | 0.15 | -30.6 | 1.1 |
| 2.00 | 0.16 | -23.4 | 15.69 | 6.09 | 108 | 0.1 | -31.2 | 0.18 | -46.3 | 1.1 |
| 2.50 | 0.18 | -36 | 15.45 | 5.93 | 90.57 | 0.1 | -38.8 | 0.2 | -62.3 | 1.1 |
| 3.00 | 0.2 | -49.2 | 15.19 | 5.75 | 73.22 | 0.1 | -46.2 | 0.21 | -79.1 | 1.1 |
| 3.50 | 0.21 | -64.1 | 14.9 | 5.56 | 55.87 | 0.09 | -53.5 | 0.22 | -97.1 | 1.2 |
| 4.00 | 0.22 | -81.4 | 14.57 | 5.35 | 38.36 | 0.08 | -60.4 | 0.24 | -117 | 1.3 |
| 4.50 | 0.25 | -101 | 14.14 | 5.1 | 20.7 | 0.08 | -66.7 | 0.27 | -137 | 1.3 |
| 5.00 | 0.27 | -122 | 13.6 | 4.79 | 3.128 | 0.07 | -71.3 | 0.32 | -155 | 1.5 |
| 5.50 | 0.3 | -142 | 12.96 | 4.45 | -14.1 | 0.06 | -73.1 | 0.37 | -172 | 1.7 |
| 6.00 | 0.33 | -162 | 12.25 | 4.1 | -30.8 | 0.05 | -71.4 | 0.41 | 172.7 | 2.0 |
| 6.50 | 0.36 | 179.9 | 11.47 | 3.75 | -47.3 | 0.05 | -66.4 | 0.44 | 156.7 | 2.0 |
| 7.00 | 0.38 | 162 | 10.62 | 3.4 | -63.6 | 0.05 | -60.2 | 0.46 | 140.3 | 2.0 |
| 7.50 | 0.4 | 145.1 | 9.702 | 3.06 | -79.5 | 0.05 | -55.7 | 0.49 | 123.7 | 2.0 |
| 8.00 | 0.42 | 128.9 | 8.724 | 2.73 | -95 | 0.06 | -54.6 | 0.51 | 107.4 | 1.7 |
| 8.50 | 0.42 | 113 | 7.69 | 2.42 | -110 | 0.06 | -56.6 | 0.54 | 92.11 | 1.9 |
| 9.00 | 0.43 | 96.69 | 6.603 | 2.14 | -124 | 0.07 | -60.9 | 0.57 | 78.13 | 1.7 |
| 9.50 | 0.43 | 79.8 | 5.45 | 1.87 | -138 | 0.08 | -66.3 | 0.6 | 65.67 | 1.6 |
| 10.00 | 0.45 | 63.79 | 4.226 | 1.63 | -150 | 0.08 | -72.2 | 0.62 | 54.74 | 1.7 |
| 10.50 | 0.48 | 50.49 | 2.953 | 1.4 | -161 | 0.09 | -78 | 0.65 | 45.17 | 1.5 |
| 11.00 | 0.51 | 40.13 | 1.671 | 1.21 | -171 | 0.09 | -83.7 | 0.66 | 36.24 | 1.7 |
| 11.50 | 0.53 | 31.23 | 0.408 | 1.05 | 178.5 | 0.1 | -89.8 | 0.67 | 26.81 | 1.6 |
| 12.00 | 0.55 | 22.22 | -0.83 | 0.91 | 168.1 | 0.1 | -96.9 | 0.68 | 16.2 | 1.8 |
| 12.50 | 0.57 | 12.47 | -2.04 | 0.79 | 157.1 | 0.1 | -105 | 0.69 | 4.669 | 2.0 |
| 13.00 | 0.58 | 1.813 | -3.19 | 0.69 | 145.6 | 0.1 | -114 | 0.7 | -7.19 | 2.2 |
| 13.50 | 0.58 | -10.1 | -4.29 | 0.61 | 133.9 | 0.1 | -124 | 0.71 | -19 | 2.4 |
| 14.00 | 0.59 | -23.5 | -5.42 | 0.54 | 122.3 | 0.11 | -133 | 0.72 | -30 | 2.4 |
| 14.50 | 0.6 | -36.9 | -6.63 | 0.47 | 111.7 | 0.1 | -142 | 0.74 | -39.4 | 2.8 |
| 15.00 | 0.63 | -48.4 | -7.93 | 0.4 | 102.9 | 0.1 | -150 | 0.75 | -46.4 | 3.0 |
| 16.00 | 0.69 | -62.9 | -10.5 | 0.3 | 90.4 | 0.1 | -160 | 0.78 | -53.8 | 3.1 |
| 17.00 | 0.71 | -69.8 | -12.9 | 0.23 | 81.97 | 0.1 | -167 | 0.79 | -59.3 | 3.7 |
| 18.00 | 0.72 | -74.1 | -14.8 | 0.18 | 73.92 | 0.1 | -176 | 0.78 | -69.1 | 4.8 |
| 19.00 | 0.71 | -87.7 | -16.7 | 0.15 | 59.73 | 0.1 | 168.5 | 0.77 | -87.9 | 6.3 |
| 20.00 | 0.73 | -112 | -19.5 | 0.11 | 41.32 | 0.09 | 147.8 | 0.8 | -110 | 8.1 |

Notes:

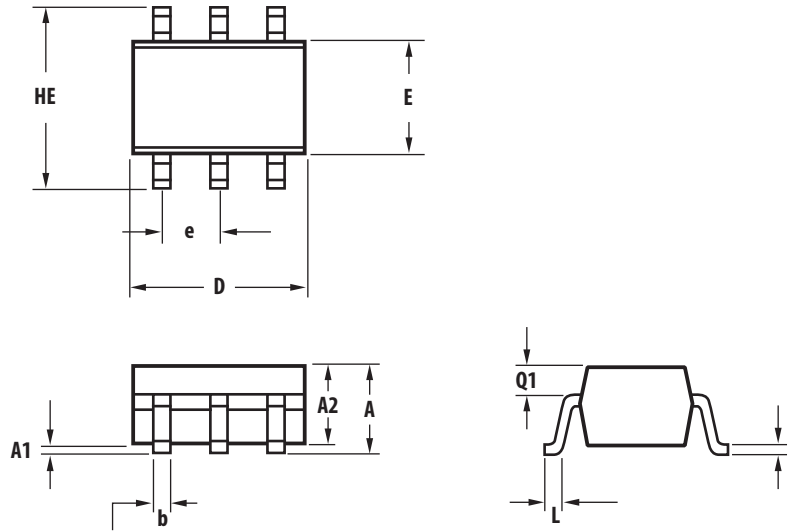
1. S-parameters are measured on a CPWG line fabricated on 0.025 inch thick Rogers® RO4350 material. The input reference plane is at the end of the input lead. The output reference plane is at the end of the output lead.

Part Number Ordering Information

| Part Number | No. of Devices | Container |
|----------------|----------------|----------------|
| AVT-50663-TR1G | 3000 | 7" Reel |
| AVT-50663-BLKG | 100 | Antistatic Bag |

Package Dimensions

Outline 63 (SOT-363/SC-70)

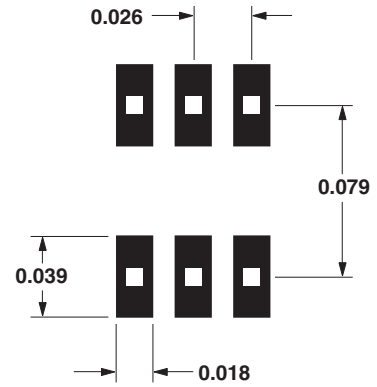


| SYMBOL | DIMENSIONS (mm) | |
|--------|-----------------|------|
| | MIN. | MAX. |
| E | 1.15 | 1.35 |
| D | 1.80 | 2.25 |
| HE | 1.80 | 2.40 |
| A | 0.80 | 1.10 |
| A2 | 0.80 | 1.00 |
| A1 | 0.00 | 0.10 |
| Q1 | 0.10 | 0.40 |
| e | 0.65 | |
| b | 0.15 | 0.30 |
| c | 0.10 | 0.25 |
| L | 0.10 | 0.46 |

Notes:

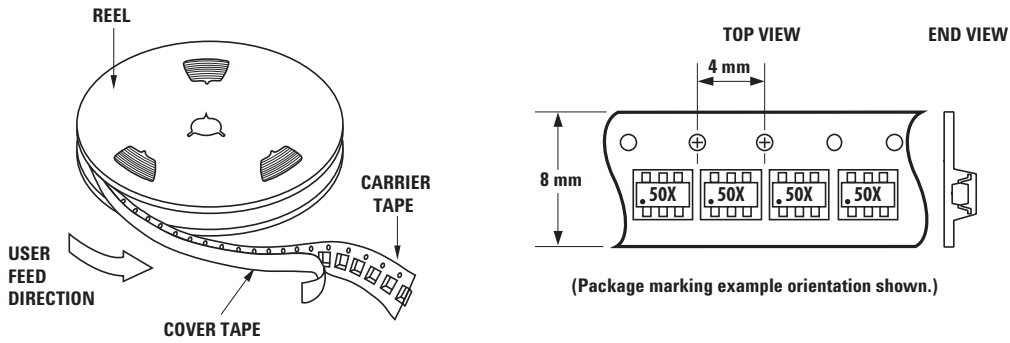
1. All dimensions are in mm.
2. Dimensions are inclusive of plating.
3. Dimensions are exclusive of mold flash & metal burr.
4. All specifications comply to EIAJSC70.
5. Die is facing up for mold and facing down for trim/form, ie: reverse trim/form.
6. Package surface to be mirror finish. 0.650BCS.

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

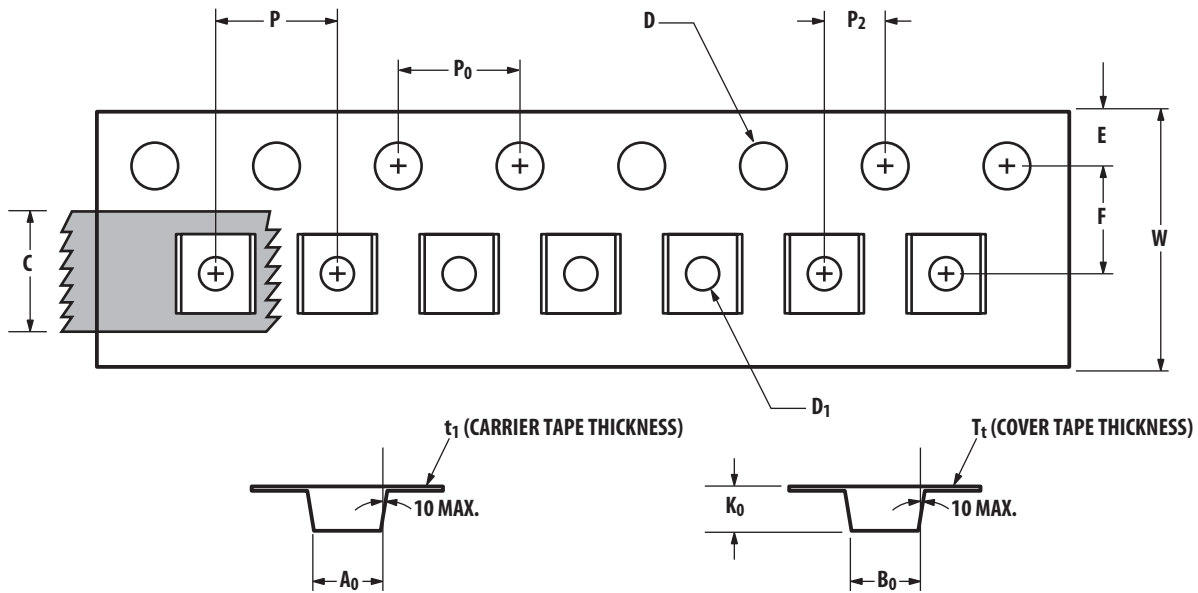


Dimensions in inches.

Device Orientation

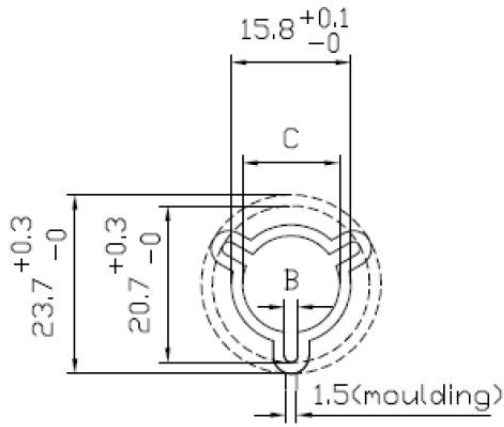
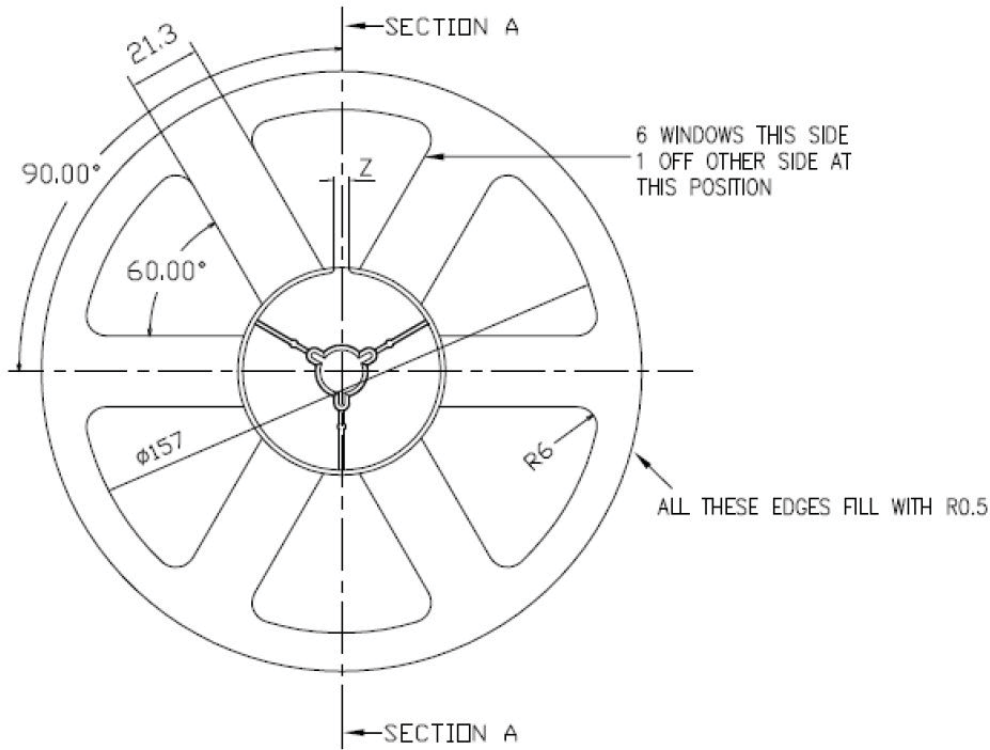


Tape Dimensions and Product Orientation for Outline 63

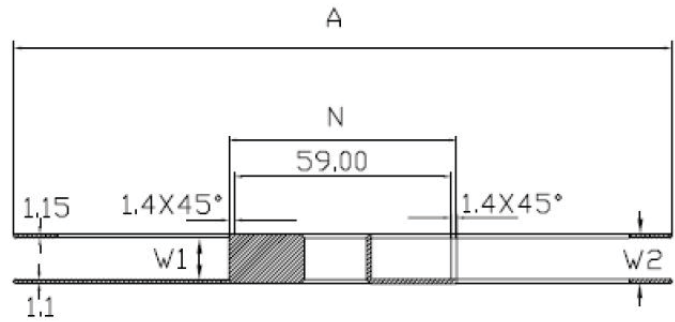


| | DESCRIPTION | SYMBOL | SIZE (mm) | SIZE (INCHES) |
|--------------|--|----------------|--------------------|---------------|
| CAVITY | LENGTH | A ₀ | 2.40 0.10 | 0.094 0.004 |
| | WIDTH | B ₀ | 2.40 0.10 | 0.094 0.004 |
| | DEPTH | K ₀ | 1.20 0.10 | 0.047 0.004 |
| | PITCH | P | 4.00 0.10 | 0.157 0.004 |
| | BOTTOM HOLE DIAMETER | D ₁ | 1.00 + 0.25 | 0.039 + 0.010 |
| PERFORATION | DIAMETER | D | 1.50 0.10 | 0.061 + 0.002 |
| | PITCH | P ₀ | 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 ₁ | 0.254 0.02 | 0.0100 0.0008 |
| COVER TAPE | WIDTH | C | 5.40 0.10 | 0.205 + 0.004 |
| | TAPE THICKNESS | T _t | 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 ₂ | 2.00 0.05 | 0.079 0.002 |

Reel Dimension 7 inch



HUB DETAIL



SECTION A

For product information and a complete list of distributors, please go to our web site: www.avagotech.com

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