# AVT-53663
DC – 6000 MHz
InGaP HBT Gain Block

## Data Sheet

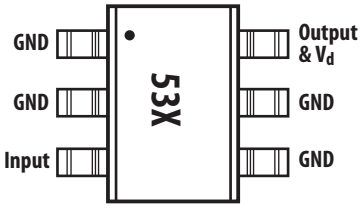
### Description

Avago Technologies' AVT-53663 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-53663 is fabricated using advanced InGaP HBT (Hetero-junction Bipolar Transistor) technology that offers state-of-the-art reliability, temperature stability and performance consistency.

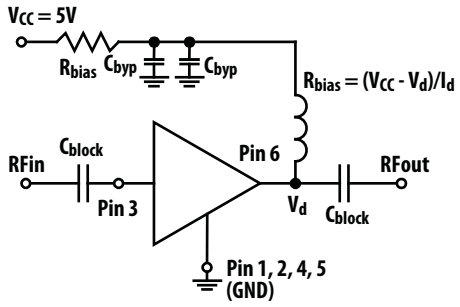
### Component Image




Top View

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

### Typical Biasing Configuration




### 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, 48mA (typical)**

- 19.5 dB Gain
- 15.1 dBm P1dB
- 26.5 dBm OIP3
- 3.2 dB NF
- 10 dB IRL and ORL

### Applications

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

**Attention: Observe precautions for handling electrostatic sensitive devices.**
ESD Machine Model = 160 V
ESD Human Body Model = 2000 V
*Refer to Avago Application Note A004R: Electrostatic Discharge, Damage and Control.*

## Absolute Maximum Rating[1] $T_A$=25°C

| Symbol | Parameter | Units | Absolute Max. |
|---|---|---|---|
| $I_d$ | Device Current | mA | 80 |
| $P_{IN,MAX}$ | CW RF Input Power | dBm | 18 |
| $P_{DISS}$ | Total Power Dissipation [3] | mW | 327 |
| $T_{OPT}$ | Operating Temperature | °C | -40 to 85 |
| $T_{J,MAX}$ | Junction Temperature | °C | 150 |
| $T_{STG}$ | Storage Temperature | °C | -65 to 150 |

## Thermal Resistance

**Thermal Resistance [2] $\theta_{jc}$ = 184°C/W**
**($I_d$ = 48 mA, $T_c$ = 85°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 5.5mW/°C for $T_c$ >90°C.

## Electrical Specifications [1]

$T_A$ = 25°C, Zo = 50 Ω, $V_{CC}$ = 5 V, $R_{bias}$ = 22 Ω, $P_{in}$ = -15 dBm (unless specified otherwise)

| Symbol | Parameter and Test Condition | Frequency | Units | Min. | Typ. | Max. |
|---|---|---|---|---|---|---|
| $I_d$ | Device Current | | mA | 44.0 | 47.6 | 51.0 |
| Gp | Power Gain | 900 MHz | dB | | 21.8 | |
| | | 2000 MHz | | 18.0 | 19.5 | 21.0 |
| OIP3 [2] | Output 3rd Intercept Point | 900 MHz | dBm | | 28.9 | |
| | | 2000 MHz | | 25.0 | 26.5 | |
| S11 | Input Return Loss, 50Ω source | 900 MHz | dB | | -16.5 | |
| | | 2000 MHz | | | -12.0 | |
| S22 | Output Return Loss, 50Ω load | 900MHz | dB | | -17.3 | |
| | | 2000 MHz | | | -13.4 | |
| S12 | Reverse Isolation | 900 MHz | dB | | -24.3 | |
| | | 2000 MHz | | | -24.7 | |
| P1dB | Output Power at 1dB Gain Compression | 900 MHz | dBm | | 16.0 | |
| | | 2000 MHz | | | 15.1 | |
| NF | Noise Figure | 900 MHz | dB | | 2.9 | |
| | | 2000 MHz | | | 3.2 | |

Notes:
1. Measurements obtained on CPWG line with reference plane at the ends of DUT leads (as shown in Figure 1).
2. OIP3 test condition: $F_{RF1}$ - $F_{RF2}$ = 10MHz with input power of -23 dBm per tone measured at worse side band.

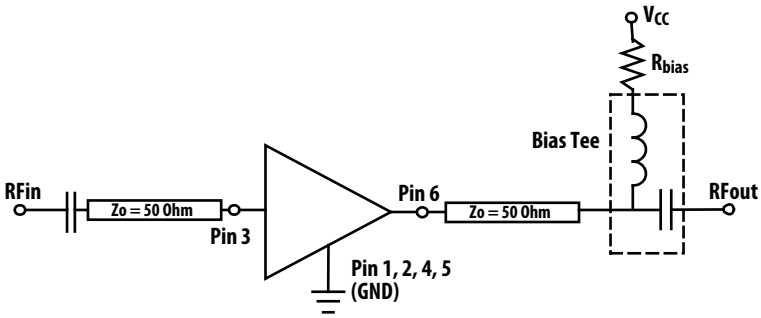



**Figure 1. Block diagram of board used for Id, Gain, OIP3, S11, S22, S12, OP1dB and NF measurements. Circuit losses have been de-embedded from actual measurements.**

## Product Consistency Distribution Charts at 2 GHz, $V_{cc}$ = 5 V, $R_{bias}$ = 22 Ω

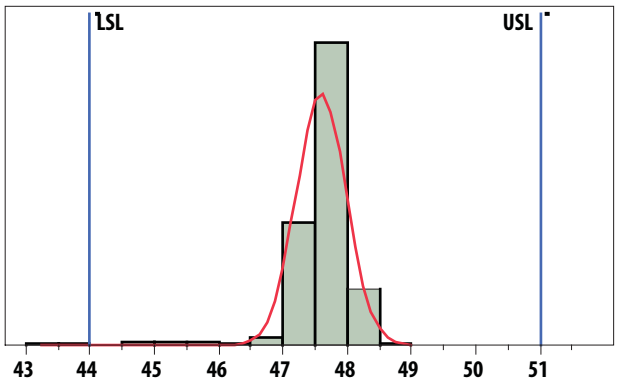



**Figure 2. $I_d$ (mA) distribution. LSL = 44.5, Nominal = 47.6, USL = 50.5**

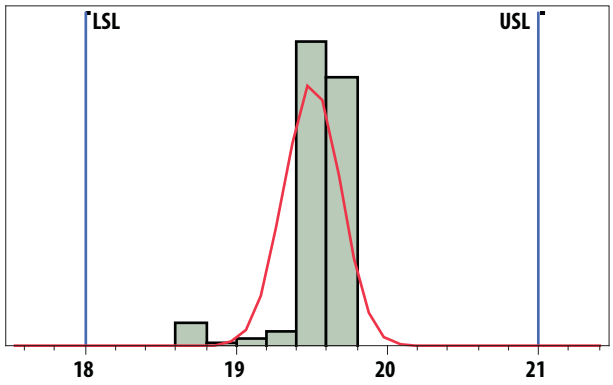



**Figure 3. Gain (dB) distribution. LSL = 18, Nominal = 19.5, USL = 21**

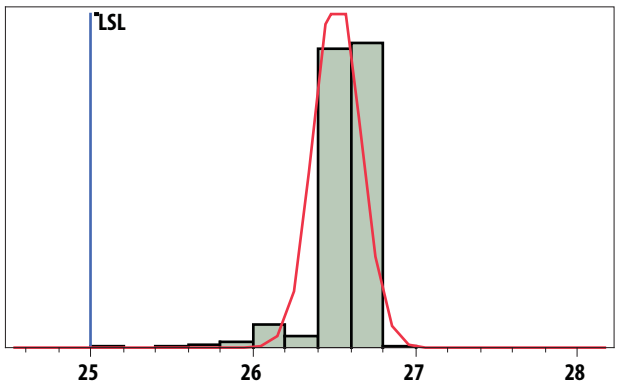



**Figure 4. OIP3 (dBm) distribution. LSL = 25.5, Nominal = 26.6**

Notes:
1. Statistical distribution determined from a sample size of 1500 samples taken from 3 different wafers from 2 wafer lots, 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-53663 Typical Performance Curves

$T_A$ = 25°C, Zo = 50 Ω, $P_{in}$ = -15 dBm (unless specified otherwise)

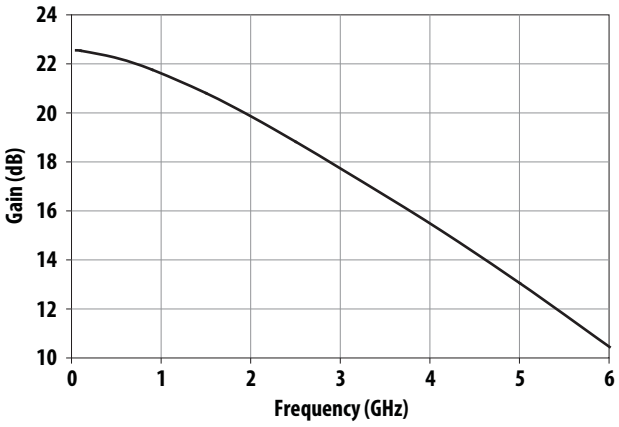



Figure 5. Gain vs Frequency at Id = 48mA

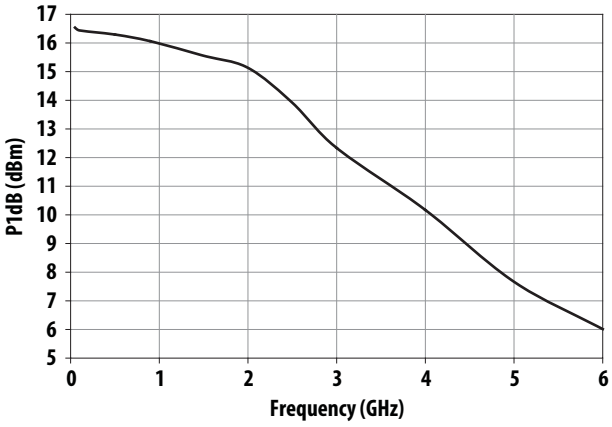



Figure 6. P1dB vs Frequency at Id = 48mA

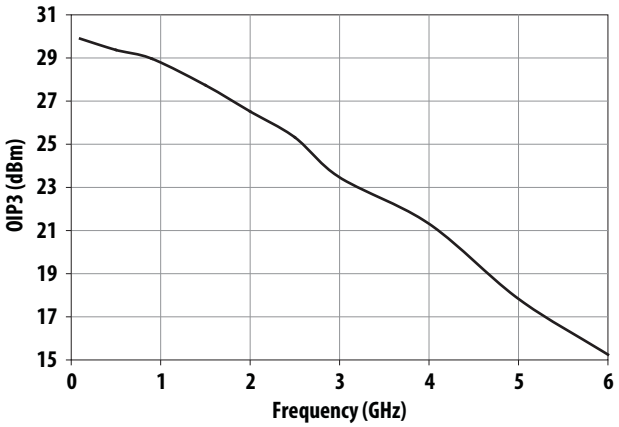



Figure 7. OIP3 vs Frequency at Id = 48mA, Pin = -23dBm

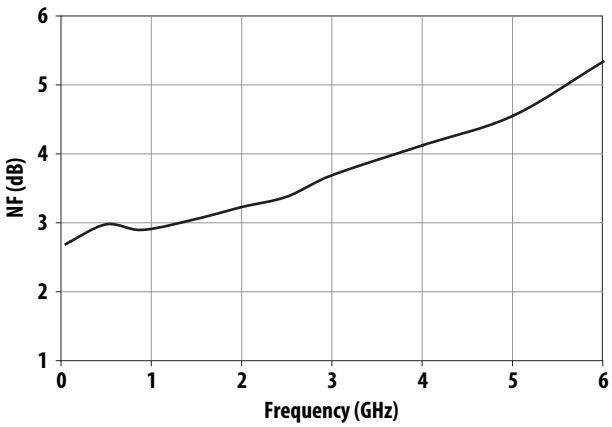



Figure 8. NF vs Frequency at Id = 48mA

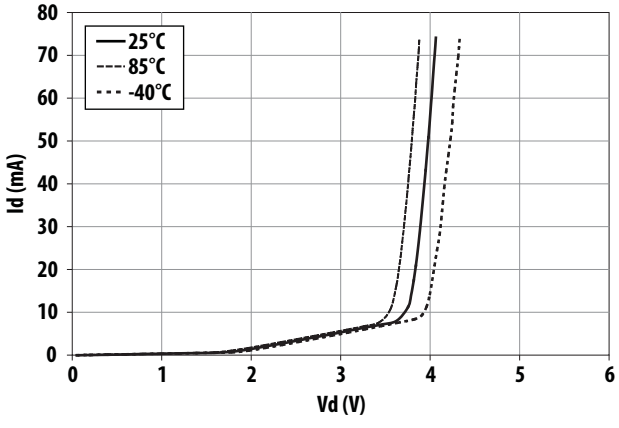



Figure 9. $I_d$ vs $V_d$ and Temperature

## AVT-53663 Typical Performance Curves

$T_A$ = 25°C, Zo = 50 Ω, $P_{in}$ = -15 dBm (unless specified otherwise), continued

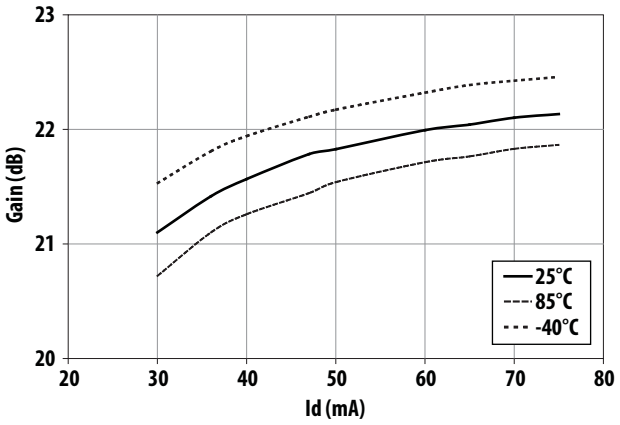



Figure 10. Gain vs $I_d$ and Temperature at 900 MHz

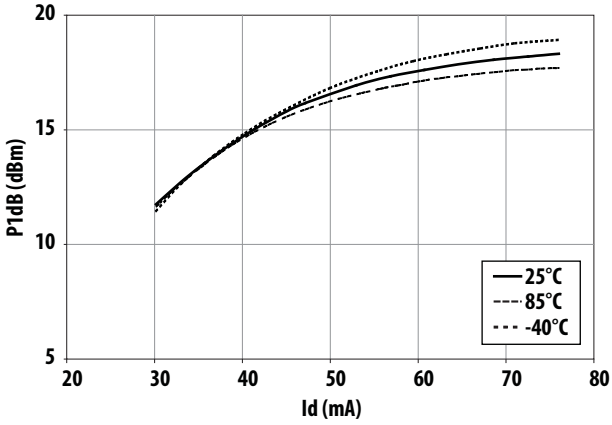



Figure 11. P1dB vs $I_d$ and Temperature at 900 MHz

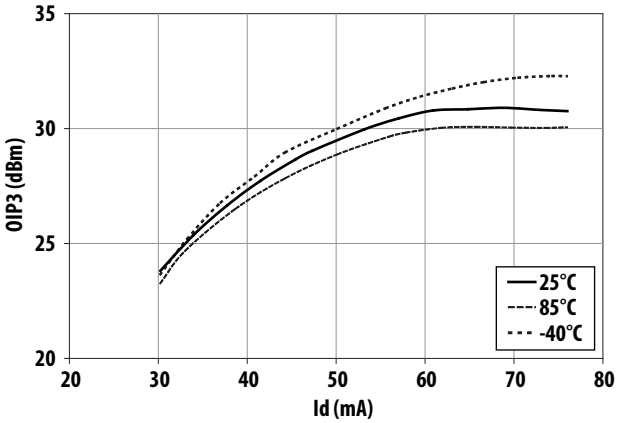



Figure 12. OIP3 vs $I_d$ and Temperature at 900 MHz, Pin = -23dBm

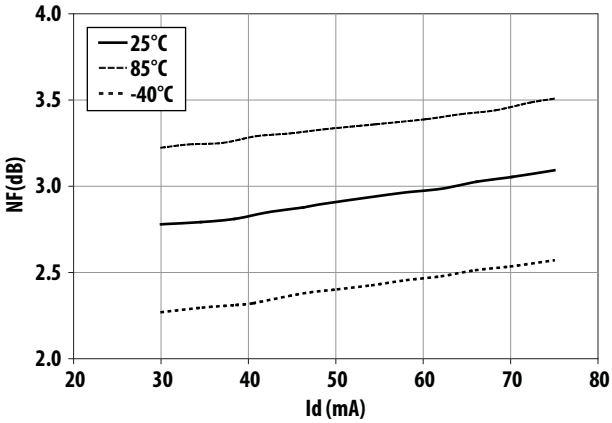



Figure 13. NF vs $I_d$ and Temperature at 900 MHz

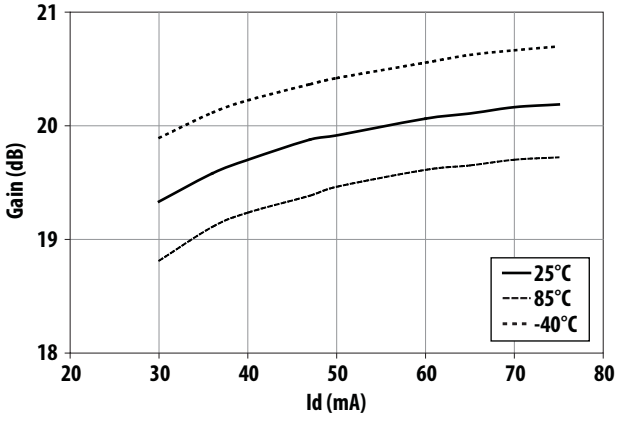



Figure 14. Gain vs $I_d$ and Temperature at 2 GHz

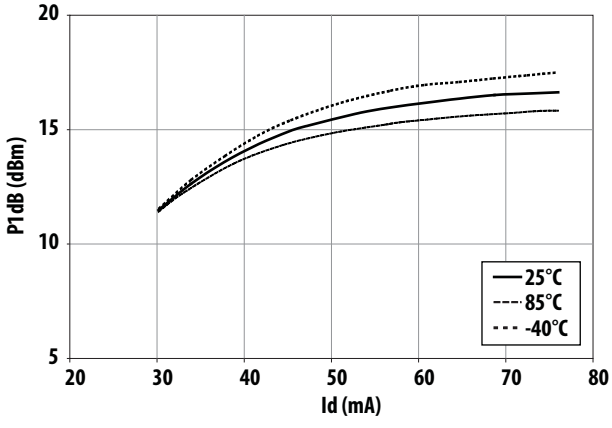



Figure 15. P1dB vs $I_d$ and Temperature at 2 GHz

## AVT-53663 Typical Performance Curves

$T_A$ = 25°C, Zo = 50 Ω, $P_{in}$ = -15 dBm (unless specified otherwise), continued

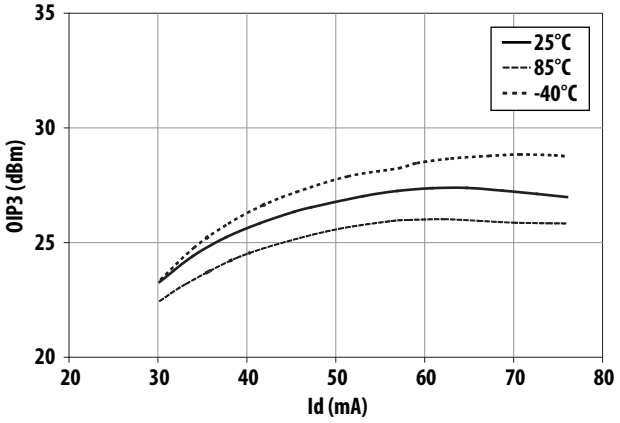



Figure 16. OIP3 vs $I_d$ and Temperature at 2 GHz, Pin = -23dBm

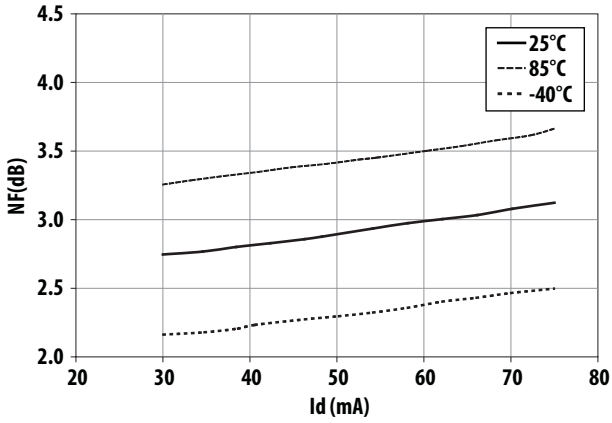



Figure 17. NF vs $I_d$ and Temperature at 2 GHz

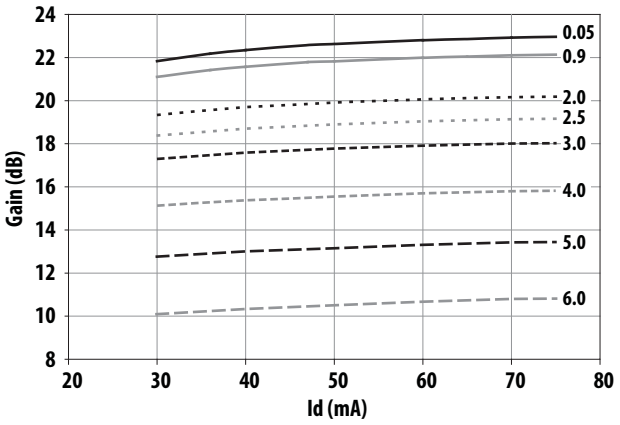



Figure 18. Gain vs $I_d$ and Frequency (GHz)

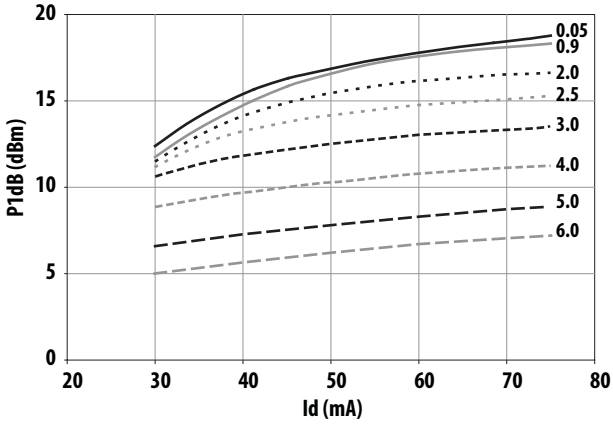



Figure 19. P1dB vs $I_d$ and Frequency (GHz)

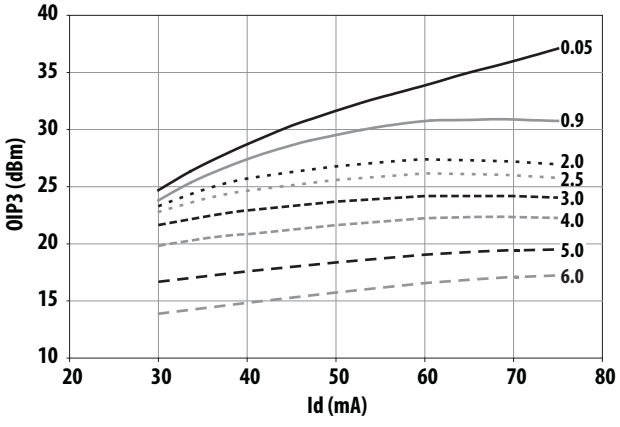



Figure 20. OIP3 vs $I_d$ and Frequency (GHz), Pin = -23dBm

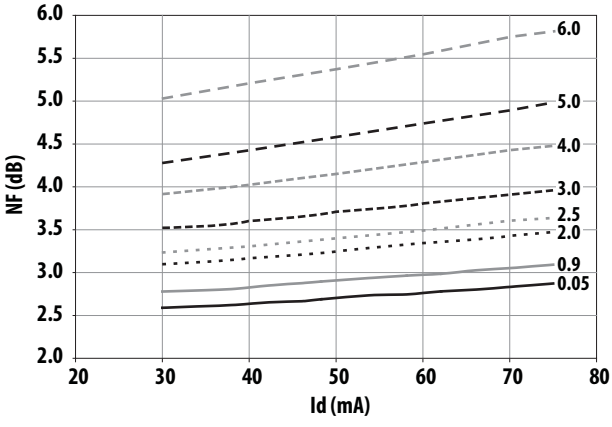



Figure 21. NF vs $I_d$ and Frequency (GHz)

## AVT-53663 Typical Performance Curves

$T_A$ = 25°C, Zo = 50 Ω, $P_{in}$ = -15 dBm (unless specified otherwise), continued

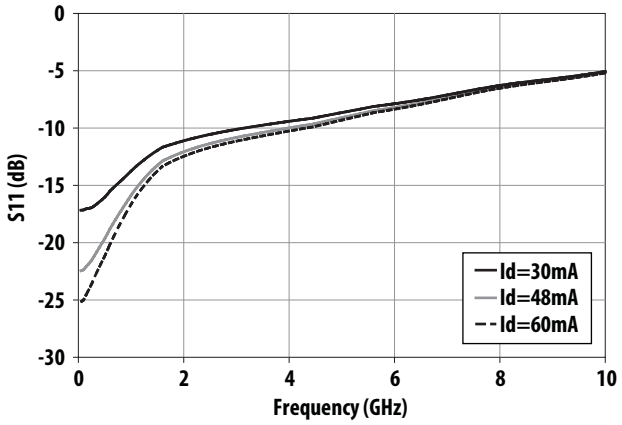



**Figure 22. S11 vs Frequency and $I_d$**

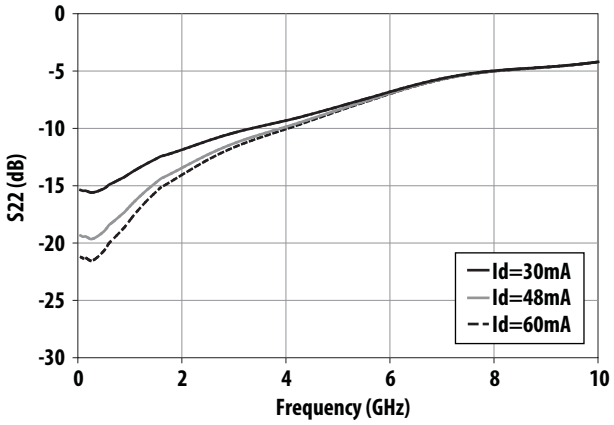



**Figure 23. S22 vs Frequency and $I_d$**

**AVT-53663 Typical Scattering Parameters** $T_A$ = 25°C, Zo = 50 Ω, $I_d$ = 30 mA, (unless specified otherwise)

| Frequency | S11 | | | S21 | | S12 | | S22 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| GHz | Mag | Angle | dB | Mag | Angle | Mag | Angle | Mag | Angle | K |
| 0.05 | 0.14 | 0.3 | 21.8 | 12.35 | 177.2 | 0.07 | -0.9 | 0.17 | -2.3 | 1.0 |
| 0.1 | 0.14 | 0.5 | 21.8 | 12.33 | 174.6 | 0.07 | -1.4 | 0.17 | -5.2 | 1.0 |
| 0.5 | 0.16 | -3.1 | 21.5 | 11.95 | 153.6 | 0.06 | -5.9 | 0.17 | -27.2 | 1.0 |
| 0.9 | 0.19 | -13.0 | 21.1 | 11.35 | 133.4 | 0.06 | -10.1 | 0.19 | -48.1 | 1.0 |
| 1.5 | 0.25 | -32.7 | 20.2 | 10.25 | 104.4 | 0.06 | -15.9 | 0.23 | -79.5 | 1.1 |
| 2.0 | 0.28 | -50.1 | 19.3 | 9.26 | 81.5 | 0.06 | -20.4 | 0.26 | -104.2 | 1.1 |
| 2.5 | 0.30 | -69.3 | 18.3 | 8.27 | 59.8 | 0.06 | -24.3 | 0.28 | -125.7 | 1.2 |
| 3.0 | 0.31 | -89.6 | 17.3 | 7.33 | 39.3 | 0.06 | -27.7 | 0.30 | -144.4 | 1.2 |
| 3.5 | 0.33 | -110.5 | 16.2 | 6.47 | 19.7 | 0.06 | -30.7 | 0.32 | -161.8 | 1.3 |
| 4.0 | 0.34 | -131.5 | 15.1 | 5.69 | 0.7 | 0.06 | -33.4 | 0.34 | -179.0 | 1.4 |
| 4.5 | 0.35 | -152.0 | 13.9 | 4.97 | -17.5 | 0.06 | -36.0 | 0.37 | 164.0 | 1.4 |
| 5.0 | 0.37 | -172.0 | 12.7 | 4.30 | -35.1 | 0.06 | -38.6 | 0.39 | 148.2 | 1.5 |
| 5.5 | 0.39 | 168.8 | 11.4 | 3.71 | -51.9 | 0.06 | -41.3 | 0.42 | 133.3 | 1.6 |
| 6.0 | 0.40 | 150.6 | 10.1 | 3.19 | -67.9 | 0.06 | -44.5 | 0.46 | 118.8 | 1.6 |
| 6.5 | 0.42 | 133.4 | 8.7 | 2.73 | -83.1 | 0.06 | -48.2 | 0.49 | 105.5 | 1.7 |
| 7.0 | 0.44 | 117.5 | 7.4 | 2.34 | -97.4 | 0.07 | -52.3 | 0.52 | 93.7 | 1.7 |
| 7.5 | 0.46 | 103.1 | 6.1 | 2.02 | -110.8 | 0.07 | -56.8 | 0.55 | 83.4 | 1.8 |
| 8.0 | 0.49 | 89.5 | 4.8 | 1.74 | -123.5 | 0.07 | -61.8 | 0.56 | 73.8 | 1.8 |
| 8.5 | 0.50 | 76.1 | 3.6 | 1.52 | -135.9 | 0.08 | -67.6 | 0.58 | 64.2 | 1.9 |
| 9.0 | 0.52 | 62.3 | 2.4 | 1.32 | -148.2 | 0.08 | -74.2 | 0.59 | 53.7 | 2.0 |
| 9.5 | 0.54 | 48.5 | 1.1 | 1.14 | -160.4 | 0.08 | -81.4 | 0.60 | 42.4 | 2.1 |
| 10.0 | 0.56 | 35.9 | -0.2 | 0.98 | -172.2 | 0.09 | -88.9 | 0.62 | 30.7 | 2.3 |
| 10.5 | 0.58 | 25.1 | -1.6 | 0.83 | 176.7 | 0.09 | -96.2 | 0.64 | 19.1 | 2.4 |
| 11.0 | 0.60 | 16.1 | -3.1 | 0.70 | 166.6 | 0.09 | -103.0 | 0.67 | 8.8 | 2.6 |
| 11.5 | 0.62 | 8.1 | -4.6 | 0.59 | 157.6 | 0.08 | -109.3 | 0.70 | 0.0 | 2.8 |
| 12.0 | 0.64 | 0.4 | -6.1 | 0.50 | 149.2 | 0.08 | -115.2 | 0.73 | -7.6 | 3.0 |
| 12.5 | 0.66 | -7.6 | -7.4 | 0.43 | 141.2 | 0.08 | -121.3 | 0.74 | -14.3 | 3.2 |
| 13.0 | 0.67 | -16.1 | -8.7 | 0.37 | 133.1 | 0.08 | -127.8 | 0.75 | -20.9 | 3.5 |
| 13.5 | 0.68 | -25.4 | -9.8 | 0.32 | 124.8 | 0.08 | -135.0 | 0.75 | -28.2 | 3.9 |
| 14.0 | 0.70 | -35.4 | -10.9 | 0.29 | 115.9 | 0.09 | -143.0 | 0.74 | -37.2 | 4.4 |
| 14.5 | 0.71 | -45.6 | -12.0 | 0.25 | 106.7 | 0.09 | -151.6 | 0.74 | -47.8 | 5.0 |
| 15.0 | 0.72 | -55.3 | -13.3 | 0.22 | 97.8 | 0.08 | -160.3 | 0.74 | -59.0 | 5.5 |
| 16.0 | 0.75 | -70.1 | -16.1 | 0.16 | 83.7 | 0.08 | -174.3 | 0.78 | -76.4 | 6.6 |
| 17.0 | 0.76 | -80.6 | -18.9 | 0.11 | 76.4 | 0.07 | 176.4 | 0.82 | -84.6 | 7.7 |
| 18.0 | 0.77 | -89.5 | -21.1 | 0.09 | 73.0 | 0.07 | 168.7 | 0.84 | -89.0 | 9.2 |
| 19.0 | 0.78 | -99.2 | -22.8 | 0.07 | 68.3 | 0.07 | 158.4 | 0.82 | -98.8 | 12.0 |
| 20.0 | 0.80 | -113.4 | -24.7 | 0.06 | 59.8 | 0.07 | 142.7 | 0.80 | -118.2 | 16.2 |

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-53663 Typical Scattering Parameters** $T_A$ = 25°C, Zo = 50 Ω, $I_d$ = 48 mA, (unless specified otherwise)

| Frequency | S11 | | | S21 | | S12 | | S22 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| GHz | Mag | Angle | dB | Mag | Angle | Mag | Angle | Mag | Angle | K |
| 0.05 | 0.08 | 1.9 | 22.6 | 13.46 | 177.2 | 0.06 | -0.1 | 0.11 | -2.3 | 1.0 |
| 0.1 | 0.08 | 4.9 | 22.6 | 13.43 | 174.5 | 0.06 | -1.0 | 0.11 | -5.8 | 1.0 |
| 0.5 | 0.10 | 9.3 | 22.3 | 12.98 | 153.1 | 0.06 | -5.3 | 0.11 | -29.6 | 1.0 |
| 0.9 | 0.15 | -0.6 | 21.8 | 12.28 | 132.5 | 0.06 | -9.3 | 0.14 | -51.6 | 1.0 |
| 1.5 | 0.22 | -24.0 | 20.8 | 11.00 | 103.2 | 0.06 | -14.8 | 0.18 | -84.0 | 1.1 |
| 2.0 | 0.25 | -43.0 | 19.9 | 9.86 | 80.3 | 0.06 | -19.0 | 0.21 | -108.9 | 1.1 |
| 2.5 | 0.27 | -63.4 | 18.8 | 8.74 | 58.7 | 0.06 | -22.8 | 0.24 | -130.0 | 1.2 |
| 3.0 | 0.29 | -84.8 | 17.7 | 7.71 | 38.3 | 0.06 | -26.0 | 0.27 | -148.0 | 1.2 |
| 3.5 | 0.30 | -106.7 | 16.6 | 6.78 | 18.9 | 0.06 | -28.8 | 0.30 | -164.9 | 1.3 |
| 4.0 | 0.32 | -128.5 | 15.5 | 5.95 | 0.1 | 0.06 | -31.3 | 0.32 | 178.3 | 1.4 |
| 4.5 | 0.33 | -149.6 | 14.3 | 5.19 | -18.0 | 0.06 | -33.7 | 0.35 | 161.5 | 1.4 |
| 5.0 | 0.35 | -170.2 | 13.1 | 4.49 | -35.5 | 0.06 | -36.1 | 0.38 | 146.0 | 1.5 |
| 5.5 | 0.37 | 170.1 | 11.8 | 3.87 | -52.1 | 0.06 | -38.7 | 0.41 | 131.4 | 1.6 |
| 6.0 | 0.39 | 151.6 | 10.4 | 3.33 | -68.1 | 0.06 | -41.9 | 0.45 | 117.1 | 1.6 |
| 6.5 | 0.41 | 134.2 | 9.1 | 2.86 | -83.2 | 0.06 | -45.7 | 0.49 | 104.0 | 1.6 |
| 7.0 | 0.43 | 118.1 | 7.8 | 2.45 | -97.5 | 0.07 | -50.0 | 0.52 | 92.4 | 1.7 |
| 7.5 | 0.45 | 103.4 | 6.5 | 2.11 | -110.9 | 0.07 | -54.8 | 0.54 | 82.1 | 1.7 |
| 8.0 | 0.48 | 89.8 | 5.2 | 1.82 | -123.6 | 0.07 | -60.0 | 0.56 | 72.6 | 1.7 |
| 8.5 | 0.49 | 76.3 | 4.0 | 1.59 | -136.0 | 0.08 | -66.0 | 0.57 | 63.0 | 1.8 |
| 9.0 | 0.51 | 62.4 | 2.8 | 1.38 | -148.4 | 0.08 | -72.8 | 0.58 | 52.6 | 1.9 |
| 9.5 | 0.53 | 48.6 | 1.5 | 1.19 | -160.6 | 0.09 | -80.3 | 0.60 | 41.3 | 2.0 |
| 10.0 | 0.55 | 36.0 | 0.2 | 1.02 | -172.4 | 0.09 | -87.9 | 0.62 | 29.6 | 2.2 |
| 10.5 | 0.58 | 25.2 | -1.2 | 0.87 | 176.6 | 0.09 | -95.4 | 0.64 | 18.2 | 2.3 |
| 11.0 | 0.60 | 16.1 | -2.7 | 0.73 | 166.5 | 0.09 | -102.3 | 0.67 | 8.0 | 2.5 |
| 11.5 | 0.62 | 8.1 | -4.2 | 0.62 | 157.4 | 0.09 | -108.7 | 0.70 | -0.7 | 2.7 |
| 12.0 | 0.63 | 0.4 | -5.6 | 0.52 | 148.9 | 0.09 | -114.7 | 0.73 | -8.2 | 2.9 |
| 12.5 | 0.65 | -7.6 | -7.0 | 0.45 | 140.9 | 0.08 | -120.9 | 0.74 | -14.9 | 3.1 |
| 13.0 | 0.67 | -16.1 | -8.2 | 0.39 | 132.8 | 0.08 | -127.5 | 0.75 | -21.5 | 3.3 |
| 13.5 | 0.68 | -25.4 | -9.3 | 0.34 | 124.3 | 0.09 | -134.7 | 0.75 | -28.8 | 3.7 |
| 14.0 | 0.69 | -35.5 | -10.4 | 0.30 | 115.3 | 0.09 | -142.8 | 0.74 | -37.7 | 4.2 |
| 14.5 | 0.71 | -45.7 | -11.6 | 0.26 | 106.0 | 0.09 | -151.5 | 0.74 | -48.4 | 4.7 |
| 15.0 | 0.72 | -55.3 | -12.8 | 0.23 | 97.0 | 0.09 | -160.2 | 0.74 | -59.5 | 5.2 |
| 16.0 | 0.75 | -70.2 | -15.6 | 0.17 | 82.7 | 0.08 | -174.3 | 0.78 | -76.8 | 6.3 |
| 17.0 | 0.76 | -80.7 | -18.4 | 0.12 | 74.9 | 0.07 | 176.4 | 0.82 | -84.9 | 7.4 |
| 18.0 | 0.77 | -89.5 | -20.6 | 0.09 | 71.0 | 0.07 | 168.7 | 0.83 | -89.3 | 8.8 |
| 19.0 | 0.78 | -99.3 | -22.4 | 0.08 | 65.8 | 0.07 | 158.4 | 0.81 | -99.1 | 11.6 |
| 20.0 | 0.80 | -113.4 | 0.0 | 0.06 | 56.6 | 0.07 | 142.7 | 0.80 | -118.5 | 15.7 |

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-53663 Typical Scattering Parameters** $T_A$ = 25°C, Zo = 50 Ω, $I_d$ = 60 mA, (unless specified otherwise)

| Frequency | S11 | | | S21 | | S12 | | S22 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| GHz | Mag | Angle | dB | Mag | Angle | Mag | Angle | Mag | Angle | K |
| 0.05 | 0.06 | 3.9 | 22.8 | 13.81 | 177.2 | 0.06 | -0.3 | 0.09 | -2.5 | 1.0 |
| 0.1 | 0.06 | 8.5 | 22.8 | 13.78 | 174.5 | 0.06 | -1.0 | 0.09 | -5.9 | 1.0 |
| 0.5 | 0.09 | 16.0 | 22.5 | 13.31 | 153.0 | 0.06 | -5.1 | 0.09 | -30.4 | 1.0 |
| 0.9 | 0.13 | 5.1 | 22.0 | 12.58 | 132.4 | 0.06 | -9.0 | 0.12 | -52.7 | 1.0 |
| 1.5 | 0.21 | -20.7 | 21.0 | 11.25 | 103.1 | 0.06 | -14.4 | 0.17 | -85.2 | 1.1 |
| 2.0 | 0.24 | -40.3 | 20.1 | 10.07 | 80.2 | 0.06 | -18.5 | 0.20 | -110.1 | 1.1 |
| 2.5 | 0.26 | -61.3 | 19.0 | 8.92 | 58.6 | 0.06 | -22.3 | 0.23 | -130.9 | 1.2 |
| 3.0 | 0.28 | -83.1 | 17.9 | 7.87 | 38.3 | 0.06 | -25.5 | 0.26 | -148.7 | 1.2 |
| 3.5 | 0.29 | -105.3 | 16.8 | 6.92 | 19.0 | 0.05 | -28.2 | 0.29 | -165.4 | 1.3 |
| 4.0 | 0.31 | -127.4 | 15.7 | 6.07 | 0.3 | 0.05 | -30.7 | 0.31 | 177.9 | 1.4 |
| 4.5 | 0.32 | -148.7 | 14.5 | 5.30 | -17.8 | 0.06 | -33.0 | 0.34 | 161.2 | 1.4 |
| 5.0 | 0.34 | -169.5 | 13.2 | 4.59 | -35.2 | 0.06 | -35.4 | 0.38 | 145.7 | 1.5 |
| 5.5 | 0.36 | 170.6 | 12.0 | 3.96 | -51.9 | 0.06 | -38.0 | 0.41 | 131.1 | 1.6 |
| 6.0 | 0.38 | 151.9 | 10.6 | 3.41 | -67.8 | 0.06 | -41.2 | 0.45 | 116.9 | 1.6 |
| 6.5 | 0.40 | 134.4 | 9.3 | 2.92 | -83.0 | 0.06 | -45.0 | 0.48 | 103.8 | 1.6 |
| 7.0 | 0.42 | 118.2 | 8.0 | 2.51 | -97.3 | 0.07 | -49.3 | 0.52 | 92.2 | 1.6 |
| 7.5 | 0.45 | 103.5 | 6.7 | 2.16 | -110.7 | 0.07 | -54.2 | 0.54 | 81.9 | 1.7 |
| 8.0 | 0.47 | 89.9 | 5.4 | 1.87 | -123.5 | 0.08 | -59.5 | 0.56 | 72.4 | 1.7 |
| 8.5 | 0.49 | 76.4 | 4.2 | 1.63 | -135.9 | 0.08 | -65.6 | 0.57 | 62.7 | 1.8 |
| 9.0 | 0.51 | 62.5 | 3.0 | 1.41 | -148.3 | 0.08 | -72.5 | 0.58 | 52.3 | 1.9 |
| 9.5 | 0.53 | 48.6 | 1.7 | 1.22 | -160.5 | 0.09 | -80.0 | 0.60 | 41.1 | 2.0 |
| 10.0 | 0.55 | 35.9 | 0.4 | 1.05 | -172.3 | 0.09 | -87.7 | 0.62 | 29.3 | 2.1 |
| 10.5 | 0.57 | 25.1 | -1.0 | 0.89 | 176.6 | 0.09 | -95.2 | 0.64 | 18.0 | 2.2 |
| 11.0 | 0.60 | 16.0 | -2.5 | 0.75 | 166.5 | 0.09 | -102.2 | 0.67 | 7.8 | 2.4 |
| 11.5 | 0.62 | 8.0 | -4.0 | 0.63 | 157.3 | 0.09 | -108.6 | 0.70 | -0.9 | 2.6 |
| 12.0 | 0.63 | 0.3 | -5.4 | 0.54 | 148.9 | 0.09 | -114.6 | 0.72 | -8.4 | 2.8 |
| 12.5 | 0.65 | -7.6 | -6.8 | 0.46 | 140.7 | 0.09 | -120.8 | 0.74 | -15.1 | 3.0 |
| 13.0 | 0.67 | -16.2 | -8.0 | 0.40 | 132.6 | 0.09 | -127.4 | 0.75 | -21.7 | 3.2 |
| 13.5 | 0.68 | -25.5 | -9.1 | 0.35 | 124.1 | 0.09 | -134.7 | 0.75 | -29.0 | 3.6 |
| 14.0 | 0.69 | -35.5 | -10.2 | 0.31 | 115.0 | 0.09 | -142.8 | 0.74 | -37.9 | 4.1 |
| 14.5 | 0.70 | -45.7 | -11.3 | 0.27 | 105.6 | 0.09 | -151.5 | 0.73 | -48.5 | 4.6 |
| 15.0 | 0.72 | -55.3 | -12.6 | 0.24 | 96.5 | 0.09 | -160.3 | 0.74 | -59.7 | 5.1 |
| 16.0 | 0.75 | -70.3 | -15.4 | 0.17 | 82.0 | 0.08 | -174.3 | 0.78 | -77.0 | 6.1 |
| 17.0 | 0.76 | -80.7 | -18.1 | 0.12 | 74.0 | 0.07 | 176.4 | 0.82 | -85.0 | 7.2 |
| 18.0 | 0.77 | -89.5 | -20.3 | 0.10 | 69.8 | 0.07 | 168.6 | 0.83 | -89.4 | 8.6 |
| 19.0 | 0.78 | -99.3 | -22.2 | 0.08 | 64.3 | 0.07 | 158.3 | 0.81 | -99.2 | 11.3 |
| 20.0 | 0.79 | -113.5 | -24.1 | 0.06 | 54.8 | 0.07 | 142.6 | 0.79 | -118.6 | 15.4 |

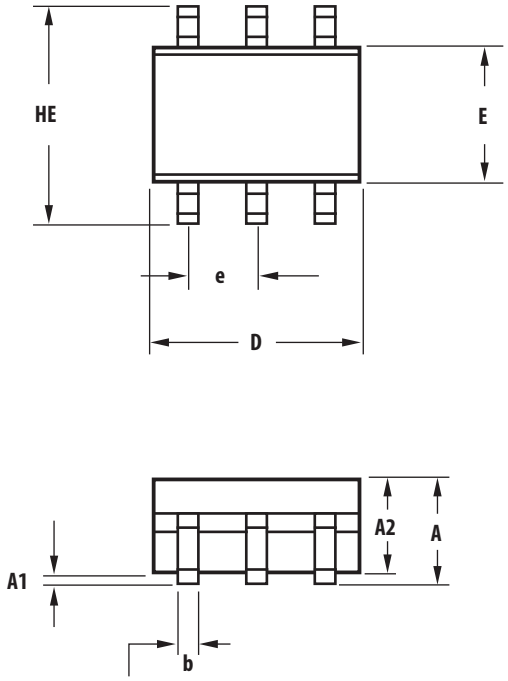
Notes:
1. S-parameters are measured on a CPWG line fabricated on 0.025 inch thick Rogers® RO4350 material. The input reference plane is at the end of the input lead. The output reference plane is at the end of the output lead.

## Part Number Ordering Information

| Part Number | No. of Devices | Container |
|---|---|---|
| AVT-53663-TR1G | 3000 | 7″ Reel |
| AVT-53663-BLKG | 100 | Antistatic bag |

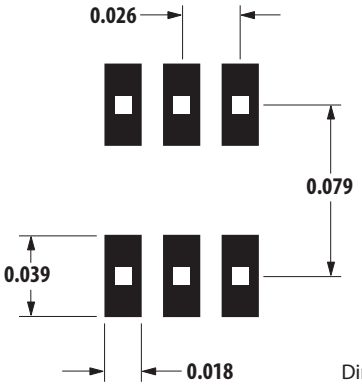
## Package Dimensions

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

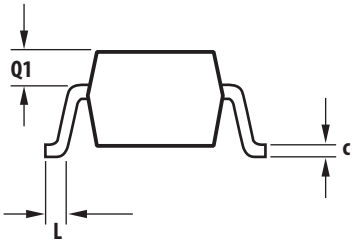



| Symbol | Dimensions (mm) | |
|---|---|---|
| | Min | Max |
| E | 1.15 | 1.35 |
| D | 1.80 | 2.25 |
| HE | 1.80 | 2.40 |
| A | 0.80 | 1.10 |
| A2 | 0.80 | 1.00 |
| A1 | 0.00 | 0.10 |
| Q1 | 0.10 | 0.40 |
| e | 0.65 | |
| b | 0.15 | 0.30 |
| c | 0.08 | 0.25 |
| L | 0.10 | 0.46 |

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

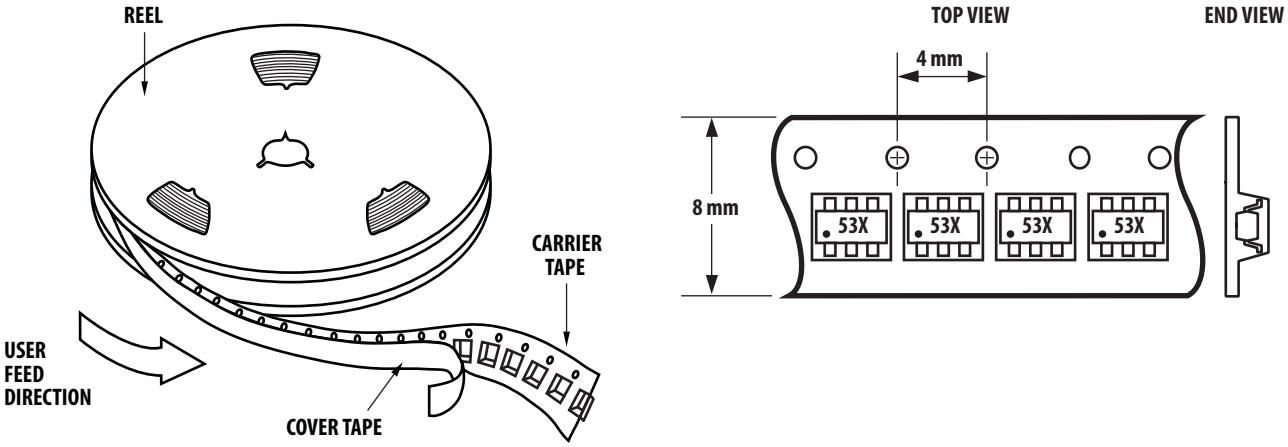



Dimensions in inches.

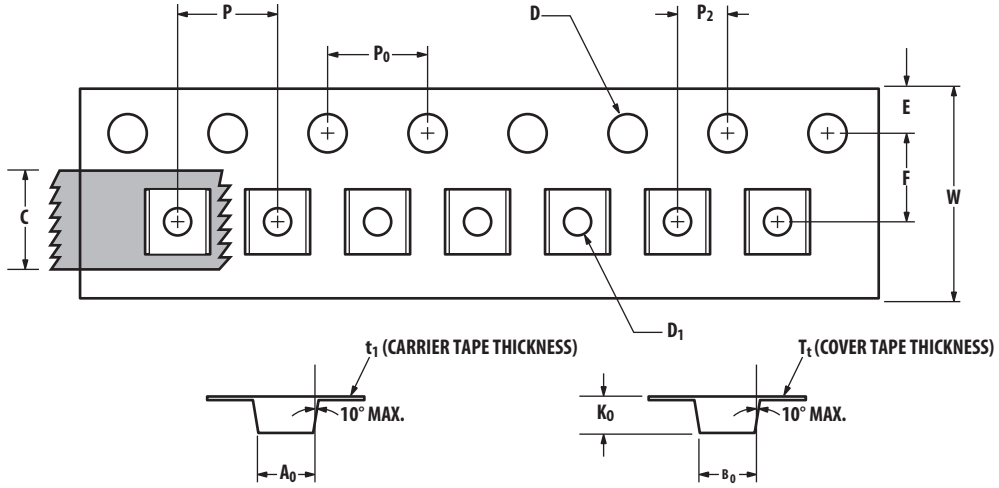



Notes:
1. All dimensions are in mm.
2. Dimensions are inclusive of plating.
3. Dimensions are exclusive of mold flash & metal burr.
4. All specifications comply to EIAJSC70.
5. Die is facing up for mold and facing down for trim/form, ie: reverse trim/form.
6. Package surface to be mirror finish. 0.650BCS.

## Device Orientation

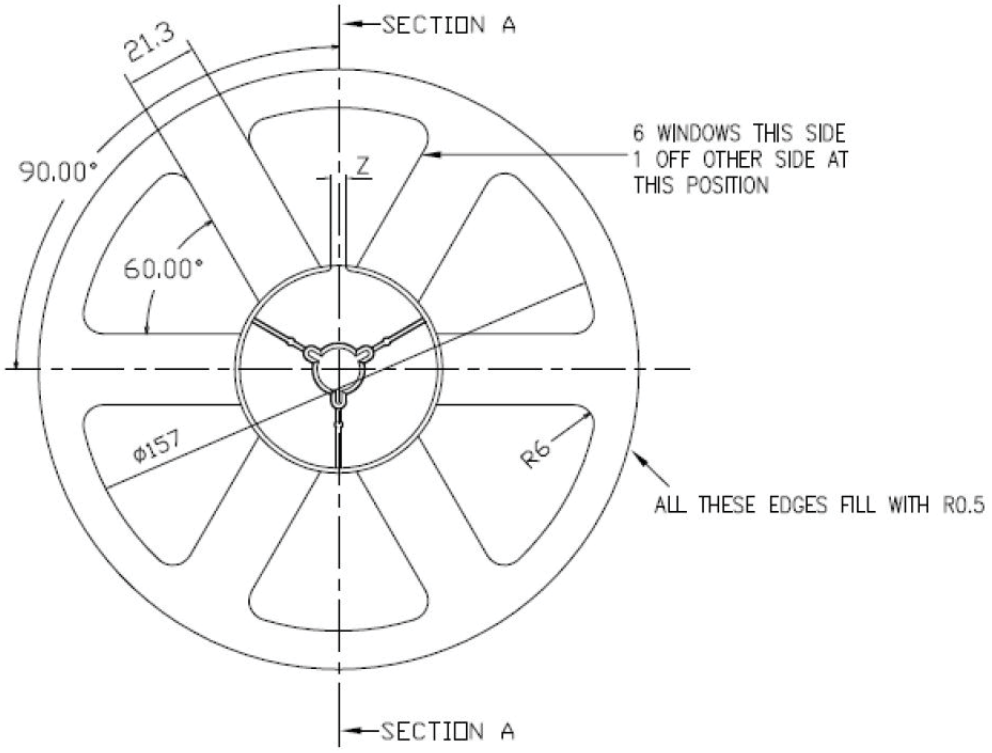


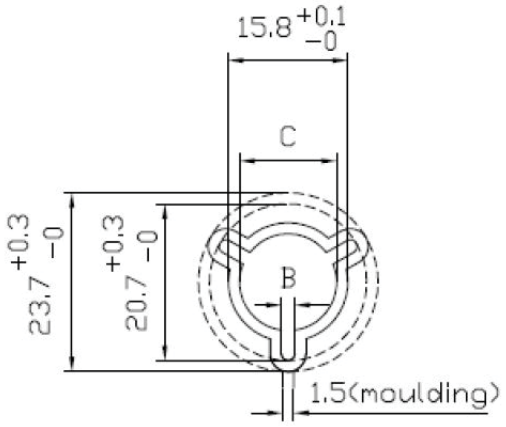

## Tape Dimensions and Product Orientation for Outline 63



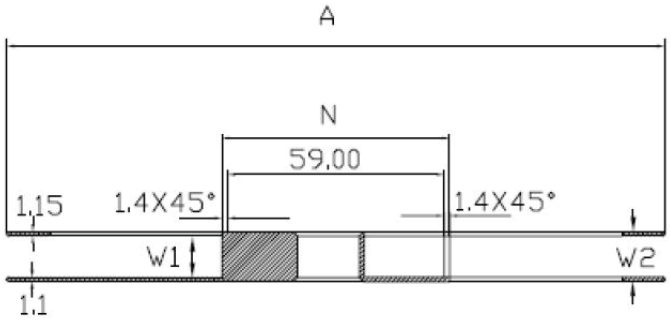

| DESCRIPTION | | SYMBOL | SIZE (mm) | SIZE (INCHES) |
|---|---|---|---|---|
| CAVITY | LENGTH | $A_0$ | 2.40 ± 0.10 | 0.094 ± 0.004 |
| | WIDTH | $B_0$ | 2.40 ± 0.10 | 0.094 ± 0.004 |
| | DEPTH | $K_0$ | 1.20 ± 0.10 | 0.047 ± 0.004 |
| | PITCH | P | 4.00 ± 0.10 | 0.157 ± 0.004 |
| | BOTTOM HOLE DIAMETER | $D_1$ | 1.00 + 0.25 | 0.039 + 0.010 |
| PERFORATION | DIAMETER | D | 1.55 ± 0.05 | 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 | 0.315 ± 0.012 |
| | THICKNESS | $t_1$ | 0.254 ± 0.02 | 0.0100 ± 0.0008 |
| COVER TAPE | WIDTH | C | 5.4 ± 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**


AV02-2359EN - September 29, 2011