

**AVT-51663**  
 DC – 6000 MHz  
 InGaP HBT Gain Block



**Data Sheet**

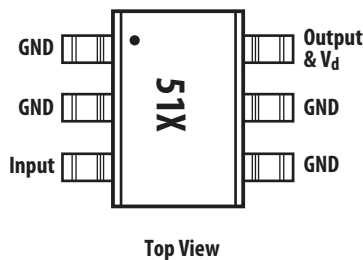
**Description**

Avago Technologies' AVT-51663 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-51663 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  
 "51" = Device Code  
 "X" = Month of Manufacture  
 "•" = Pin 1

**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**

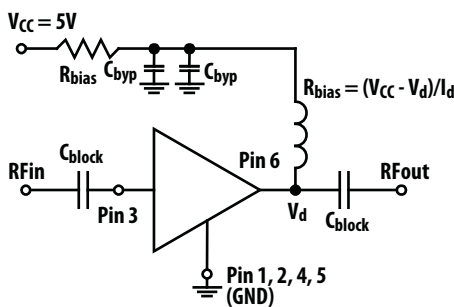
**2 GHz, 5V Vcc, 37mA (typical)**

- 19.6 dB Gain
- 12.9 dBm P1dB
- 25.1 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

**Typical Biasing Configuration**



**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<sup>[1]</sup> T<sub>A</sub>=25°C

Symbol	Parameter	Units	Absolute Max.
I <sub>d</sub>	Device Current	mA	70
P <sub>IN,MAX</sub>	CW RF Input Power	dBm	15
P <sub>DISS</sub>	Total Power Dissipation <sup>[3]</sup>	mW	284
T <sub>OPT</sub>	Operating Temperature	°C	-40 to 85
T <sub>J,MAX</sub>	Junction Temperature	°C	150
T <sub>STG</sub>	Storage Temperature	°C	-65 to 150

## Thermal Resistance

Thermal Resistance<sup>[2]</sup> θ<sub>JB</sub> = 184°C/W  
(I<sub>d</sub> = 36 mA, T<sub>C</sub> = 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<sub>C</sub> > 98°C.

## Electrical Specifications<sup>[1]</sup>

T<sub>A</sub> = 25°C, Z<sub>o</sub> = 50 Ω, V<sub>CC</sub> = 5 V, R<sub>bias</sub> = 30 Ω, P<sub>in</sub> = -15 dBm (unless specified otherwise)

Symbol	Parameter and Test Condition	Frequency	Units	Min.	Typ.	Max.
I <sub>d</sub>	Device Current		mA	33.0	36.4	40.0
G <sub>p</sub>	Power Gain	900 MHz 2000 MHz	dB	18.0	21.7 19.6	21.0
OIP3 <sup>[2]</sup>	Output 3rd Intercept Point	900 MHz 2000 MHz	dBm	24.0	25.8 25.1	
S11	Input Return Loss, 50Ω source	900 MHz 2000 MHz	dB		-14.8 -10.8	
S22	Output Return Loss, 50Ω load	900MHz 2000 MHz	dB		-14.9 -11.8	
S12	Reverse Isolation	900 MHz 2000 MHz	dB		-24.1 -24.6	
P1dB	Output Power at 1dB Gain Compression	900 MHz 2000 MHz	dBm		13.3 12.9	
NF	Noise Figure	900 MHz 2000 MHz	dB		2.8 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<sub>RF1</sub> - F<sub>RF2</sub> = 10MHz with input power of -23 dBm per tone measured at worse side band.

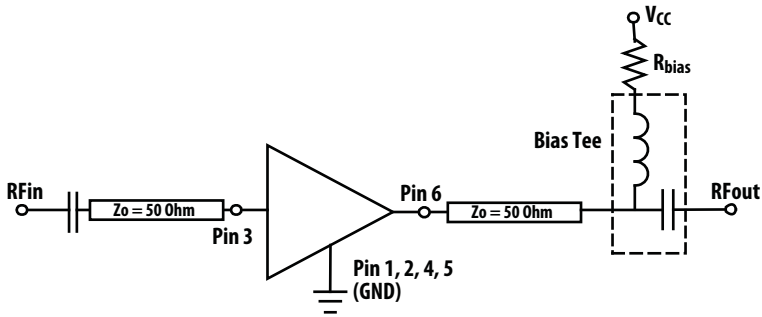


Figure 1. Block diagram of board used for  $I_d$ , Gain, OIP3, S11, S22, S12, OP1dB and NF measurements. Circuit losses have been de-embedded from actual measurements.

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

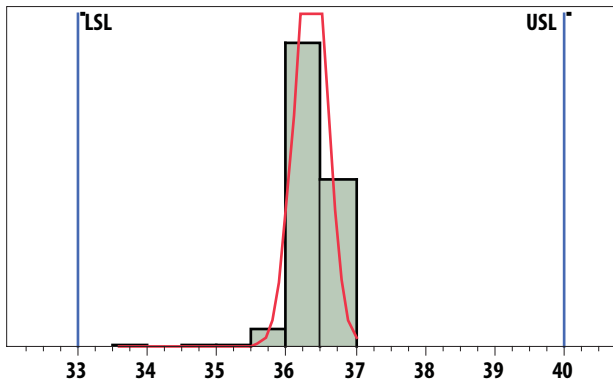


Figure 2.  $I_d$  (mA) distribution. LSL = 33, Nominal = 36.4, USL = 40

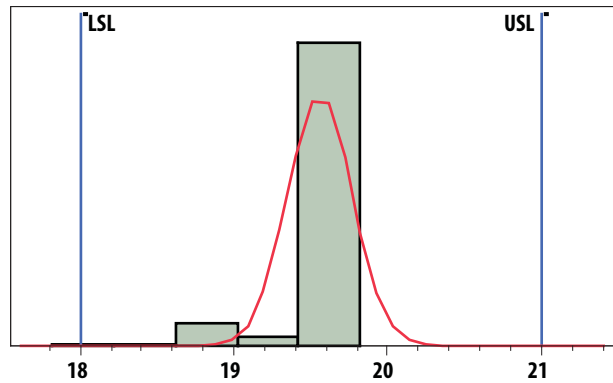


Figure 3. Gain (dB) distribution. LSL = 18, Nominal = 19.6, USL = 21

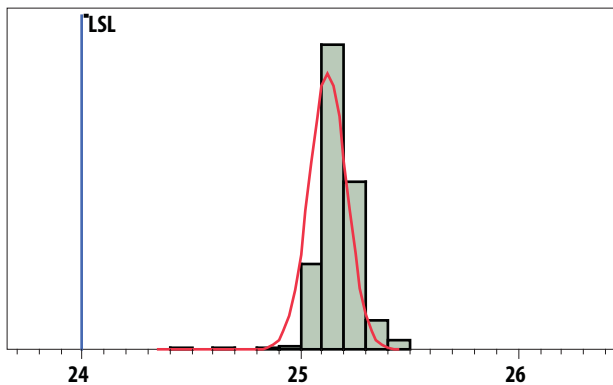


Figure 4. OIP3 (dBm) distribution. LSL = 24, Nominal = 25.1

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-51663 Typical Performance Curves

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

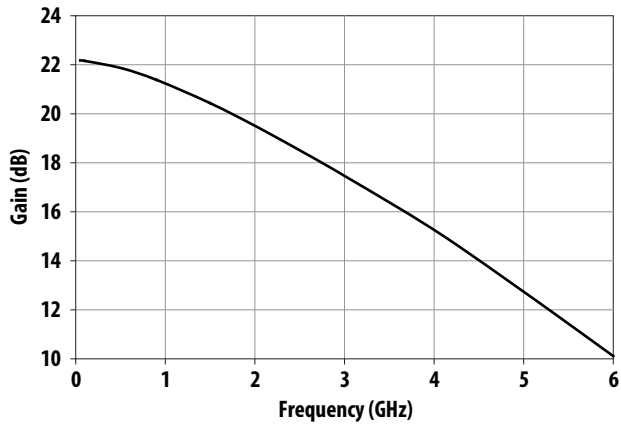


Figure 5. Gain vs Frequency at  $I_d = 37\text{mA}$

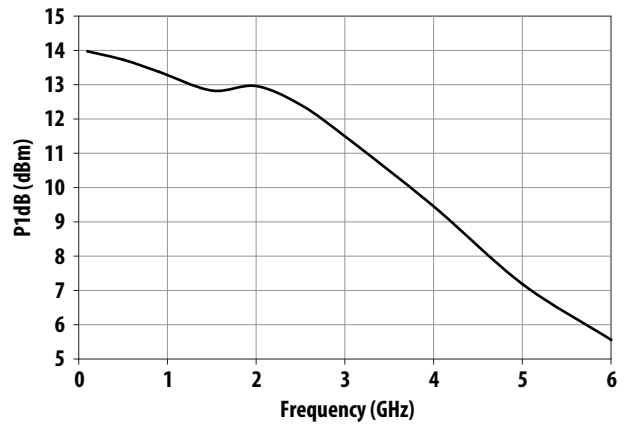


Figure 6. P1dB vs Frequency at  $I_d = 37\text{mA}$

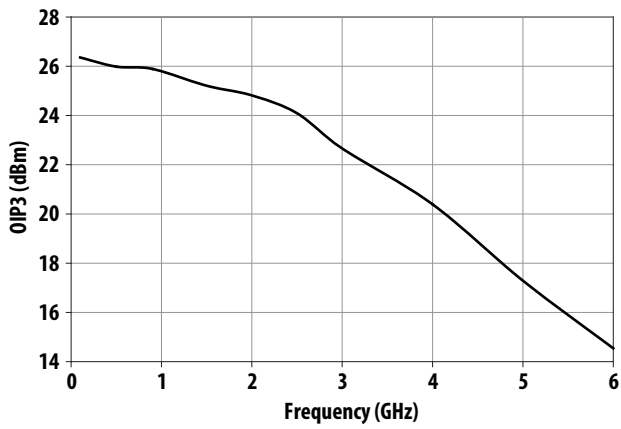


Figure 7. OIP3 vs Frequency at  $I_d = 37\text{mA}$ ,  $P_{in} = -23\text{dBm}$

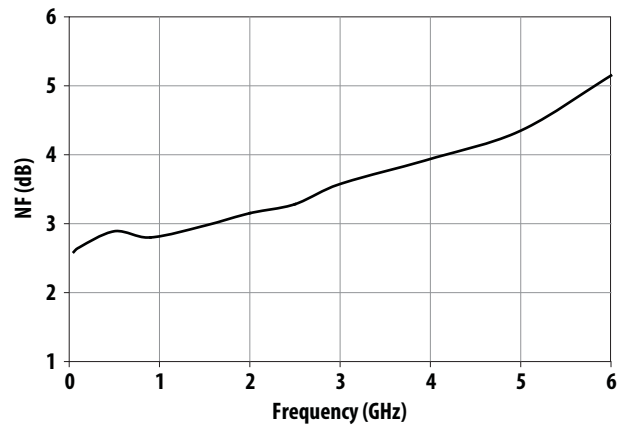


Figure 8. NF vs Frequency at  $I_d = 37\text{mA}$

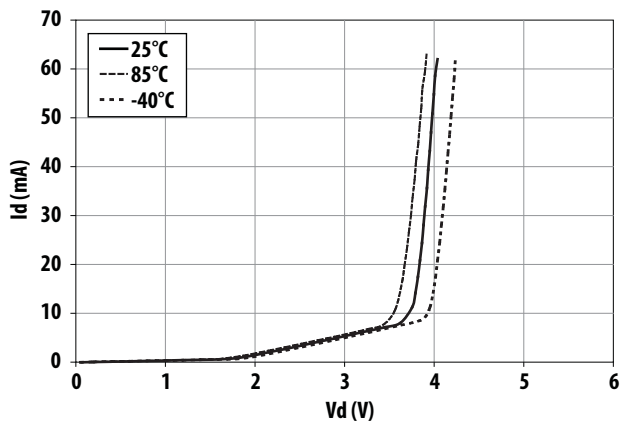


Figure 9.  $I_d$  vs  $V_d$  and Temperature

## AVT-51663 Typical Performance Curves

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

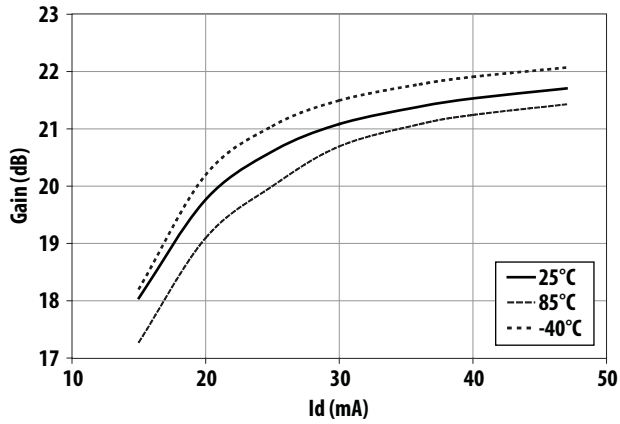


Figure 10. Gain vs  $I_d$  and Temperature at 900 MHz

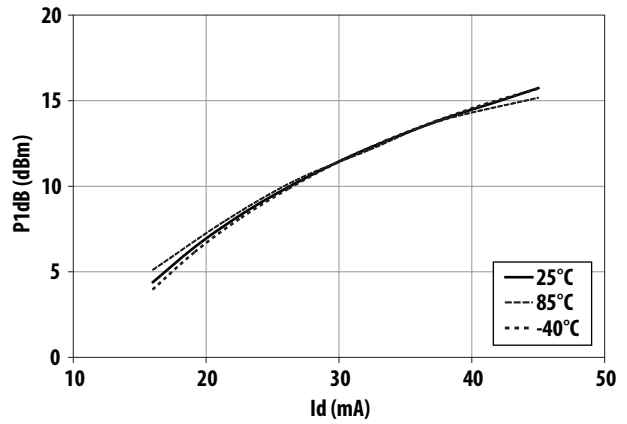


Figure 11. P1dB vs  $I_d$  and Temperature at 900 MHz

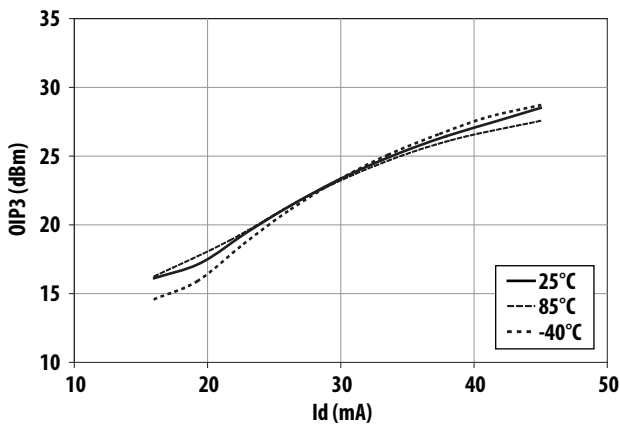


Figure 12. OIP3 vs  $I_d$  and Temperature at 900 MHz,  $P_{in} = -23 \text{ dBm}$

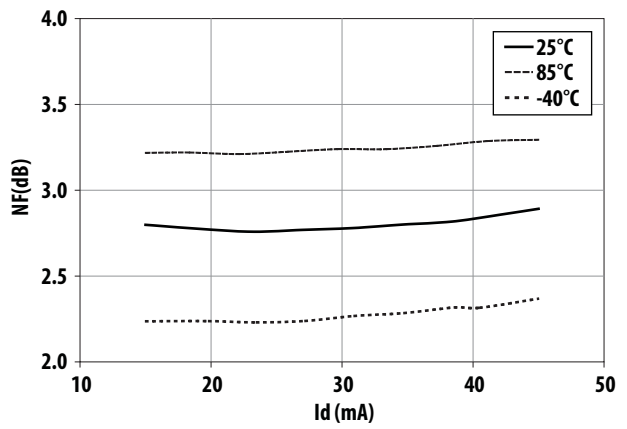


Figure 13. NF vs  $I_d$  and Temperature at 900 MHz

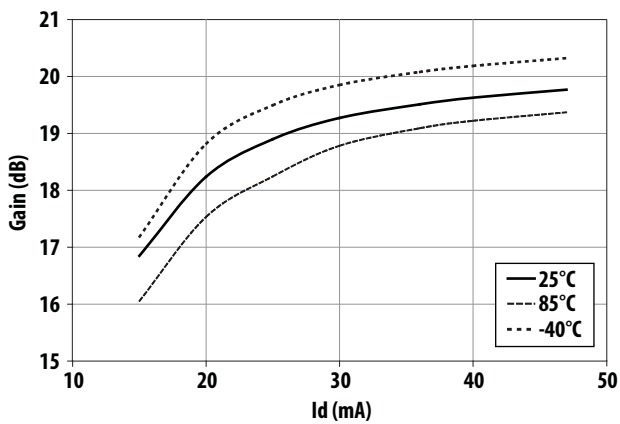


Figure 14. Gain vs  $I_d$  and Temperature at 2 GHz

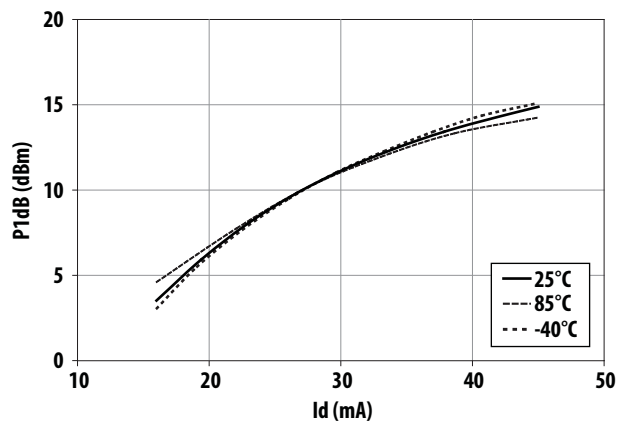


Figure 15. P1dB vs  $I_d$  and Temperature at 2 GHz

# AVT-51663 Typical Performance Curves

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

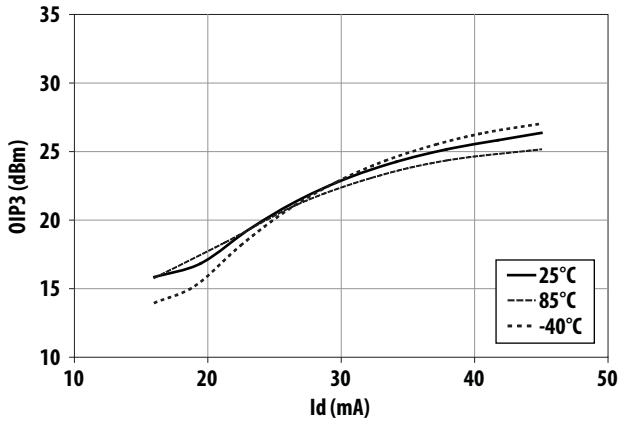


Figure 16. OIP3 vs  $I_d$  and Temperature at 2 GHz,  $P_{in}=-23\text{dBm}$

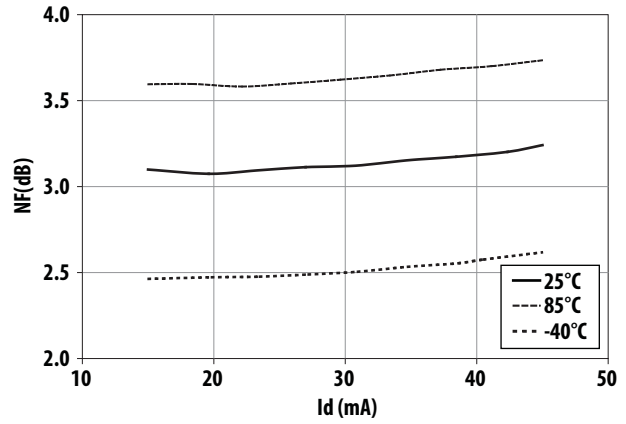


Figure 17. NF vs  $I_d$  and Temperature at 2 GHz

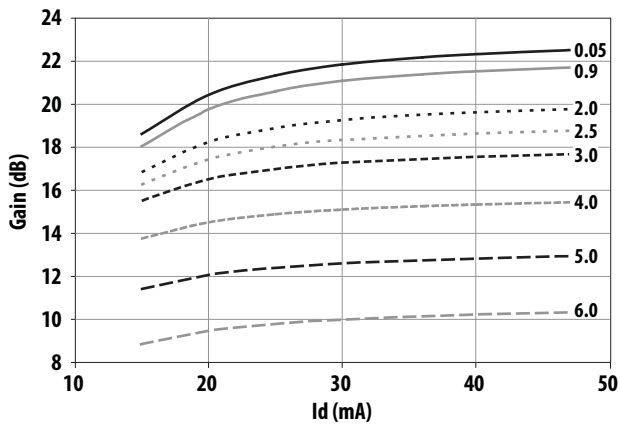


Figure 18. Gain vs  $I_d$  and Frequency (GHz)

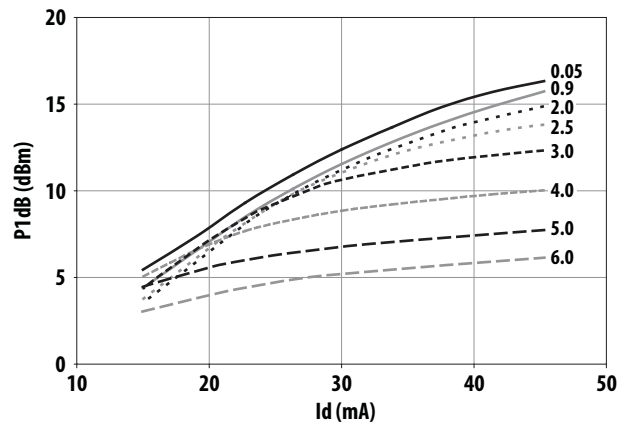


Figure 19. P1dB vs  $I_d$  and Frequency (GHz)

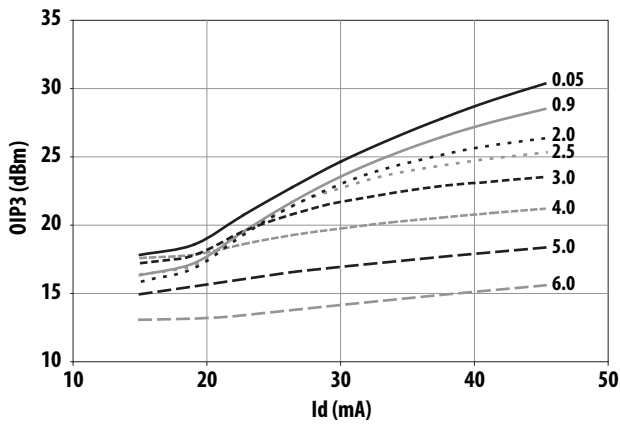


Figure 20. OIP3 vs  $I_d$  and Frequency (GHz),  $P_{in}=-23\text{dBm}$

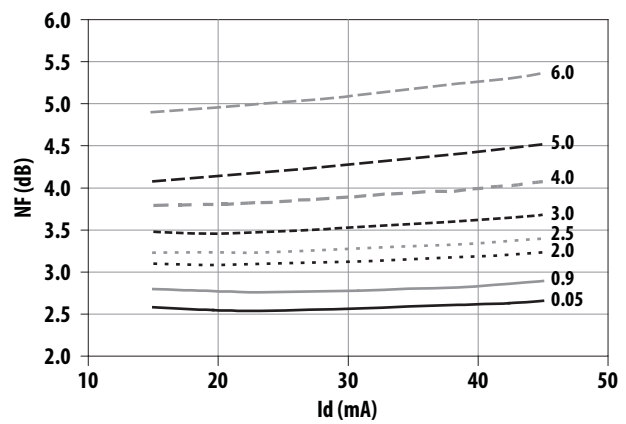


Figure 21. NF vs  $I_d$  and Frequency (GHz)

### AVT-51663 Typical Performance Curves

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

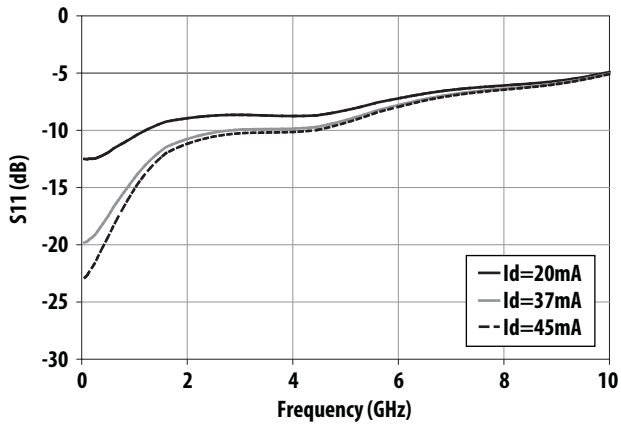


Figure 22.  $S_{11}$  vs Frequency and  $I_d$

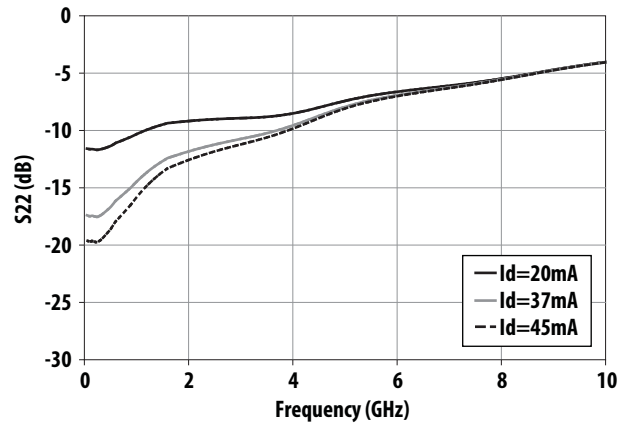


Figure 23.  $S_{22}$  vs Frequency and  $I_d$

**AVT-51663 Typical Scattering Parameters**  $T_A = 25^\circ\text{C}$ ,  $Z_0 = 50 \Omega$ ,  $I_D = 20 \text{ mA}$ , (unless specified otherwise)

Frequency GHz	S11			S21		S12		S22		K
	Mag	Angle	dB	Mag	Angle	Mag	Angle	Mag	Angle	
0.05	0.24	-0.7	20.4	10.51	177.2	0.07	-0.9	0.26	-2.2	1.0
0.1	0.24	-1.7	20.4	10.50	174.8	0.07	-1.4	0.26	-5.0	1.0
0.5	0.25	-11.5	20.2	10.21	154.5	0.07	-6.6	0.27	-25.0	1.0
0.9	0.29	-23.5	19.8	9.73	135.1	0.07	-11.0	0.30	-43.2	1.0
1.5	0.34	-43.5	19.0	8.89	107.3	0.07	-16.9	0.34	-69.4	1.1
2.0	0.36	-60.5	18.2	8.16	85.0	0.06	-21.3	0.35	-90.6	1.1
2.5	0.37	-78.0	17.4	7.43	63.6	0.06	-25.3	0.35	-111.0	1.1
3.0	0.37	-96.1	16.5	6.70	43.0	0.06	-28.9	0.36	-131.0	1.2
3.5	0.37	-115.4	15.6	6.00	23.0	0.06	-32.4	0.36	-150.8	1.2
4.0	0.37	-136.2	14.5	5.32	3.5	0.06	-35.8	0.38	-169.9	1.3
4.5	0.37	-157.4	13.3	4.64	-15.3	0.06	-39.0	0.40	173.0	1.4
5.0	0.39	-178.3	12.0	4.00	-32.9	0.06	-41.8	0.43	159.0	1.5
5.5	0.41	162.1	10.7	3.44	-49.5	0.06	-44.3	0.45	146.7	1.6
6.0	0.44	144.5	9.4	2.96	-65.2	0.06	-47.0	0.47	134.4	1.7
6.5	0.46	128.9	8.2	2.56	-80.0	0.06	-49.9	0.48	121.7	1.7
7.0	0.47	114.6	6.9	2.22	-94.2	0.07	-53.5	0.50	108.7	1.8
7.5	0.49	100.6	5.7	1.93	-107.9	0.07	-57.9	0.51	95.7	1.9
8.0	0.50	86.2	4.5	1.68	-121.3	0.07	-63.2	0.53	83.0	2.0
8.5	0.51	70.9	3.2	1.45	-134.5	0.08	-69.3	0.56	71.3	2.1
9.0	0.52	55.2	1.9	1.25	-147.2	0.08	-75.8	0.58	60.7	2.2
9.5	0.54	40.2	0.5	1.06	-159.3	0.08	-82.5	0.61	51.1	2.4
10.0	0.57	27.4	-0.9	0.90	-170.3	0.08	-88.9	0.63	42.2	2.5
10.5	0.60	17.7	-2.4	0.76	179.7	0.08	-94.8	0.65	33.4	2.7
11.0	0.62	10.7	-3.8	0.65	170.6	0.08	-100.3	0.67	24.7	2.9
11.5	0.64	4.7	-5.1	0.56	162.0	0.08	-105.9	0.68	15.5	3.1
12.0	0.65	-2.1	-6.4	0.48	153.2	0.08	-112.1	0.69	5.8	3.4
12.5	0.66	-10.4	-7.6	0.42	144.1	0.08	-119.0	0.71	-4.0	3.7
13.0	0.67	-20.0	-8.8	0.36	134.8	0.08	-126.6	0.72	-13.8	4.0
13.5	0.68	-30.9	-10.1	0.31	125.3	0.08	-134.9	0.73	-23.5	4.4
14.0	0.70	-42.5	-11.4	0.27	115.7	0.08	-143.7	0.74	-33.4	4.9
14.5	0.72	-53.6	-12.8	0.23	106.7	0.08	-152.0	0.75	-42.7	5.4
15.0	0.74	-62.7	-14.4	0.19	99.2	0.08	-159.2	0.77	-50.0	5.9
16.0	0.76	-75.1	-17.1	0.14	89.1	0.07	-169.4	0.80	-58.9	7.1
17.0	0.77	-84.2	-19.5	0.11	82.8	0.07	-177.9	0.81	-66.7	8.8
18.0	0.78	-92.2	-21.4	0.08	77.3	0.07	172.3	0.81	-77.7	10.8
19.0	0.78	-104.1	-23.4	0.07	69.5	0.07	158.6	0.81	-94.4	13.9
20.0	0.80	-119.5	-26.0	0.05	61.1	0.06	143.3	0.83	-112.5	17.9

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-51663 Typical Scattering Parameters**  $T_A = 25^\circ\text{C}$ ,  $Z_0 = 50 \Omega$ ,  $I_D = 37 \text{ mA}$ , (unless specified otherwise)

Frequency GHz	S11			S21		S12		S22		K
	Mag	Angle	dB	Mag	Angle	Mag	Angle	Mag	Angle	
0.05	0.10	1.7	22.2	12.85	177.2	0.06	0.0	0.13	-2.3	1.0
0.1	0.10	3.1	22.2	12.82	174.5	0.06	-1.0	0.13	-5.9	1.0
0.5	0.13	2.7	21.9	12.40	153.3	0.06	-5.7	0.15	-29.1	1.0
0.9	0.18	-8.3	21.4	11.73	132.9	0.06	-9.8	0.18	-48.9	1.0
1.5	0.26	-31.2	20.4	10.51	103.9	0.06	-15.2	0.23	-76.3	1.1
2.0	0.29	-49.8	19.5	9.45	81.2	0.06	-19.2	0.26	-98.2	1.1
2.5	0.31	-68.7	18.5	8.42	59.8	0.06	-22.7	0.27	-119.0	1.2
3.0	0.32	-88.0	17.5	7.47	39.5	0.06	-25.8	0.29	-139.0	1.2
3.5	0.32	-108.4	16.4	6.60	19.9	0.06	-28.5	0.31	-158.8	1.3
4.0	0.32	-130.4	15.3	5.79	0.9	0.06	-31.1	0.33	-177.6	1.4
4.5	0.33	-152.9	14.0	5.04	-17.4	0.06	-33.6	0.37	166.0	1.5
5.0	0.35	-175.0	12.7	4.33	-34.7	0.06	-35.8	0.40	152.8	1.5
5.5	0.38	164.5	11.4	3.72	-51.0	0.06	-38.1	0.43	141.1	1.6
6.0	0.41	146.3	10.1	3.20	-66.5	0.06	-40.8	0.45	129.2	1.6
6.5	0.43	130.2	8.8	2.77	-81.2	0.06	-44.1	0.47	116.7	1.7
7.0	0.45	115.6	7.6	2.40	-95.3	0.07	-48.2	0.49	104.0	1.7
7.5	0.47	101.3	6.4	2.08	-109.0	0.07	-53.3	0.51	91.2	1.8
8.0	0.48	86.7	5.2	1.81	-122.3	0.08	-59.2	0.53	78.8	1.8
8.5	0.49	71.2	3.9	1.56	-135.4	0.08	-65.8	0.55	67.4	1.9
9.0	0.51	55.3	2.6	1.34	-148.1	0.08	-72.9	0.58	57.1	2.0
9.5	0.53	40.1	1.2	1.14	-160.1	0.08	-80.1	0.61	47.8	2.1
10.0	0.56	27.2	-0.3	0.97	-171.1	0.09	-86.9	0.63	39.1	2.3
10.5	0.59	17.5	-1.7	0.82	178.9	0.09	-93.2	0.65	30.6	2.4
11.0	0.62	10.4	-3.1	0.70	169.8	0.09	-99.1	0.66	22.1	2.6
11.5	0.64	4.3	-4.4	0.60	161.1	0.09	-105.1	0.68	13.2	2.8
12.0	0.65	-2.5	-5.7	0.52	152.3	0.09	-111.6	0.69	3.6	3.0
12.5	0.66	-10.8	-6.9	0.45	143.1	0.09	-118.7	0.70	-6.1	3.3
13.0	0.67	-20.5	-8.1	0.39	133.8	0.09	-126.5	0.72	-15.7	3.6
13.5	0.68	-31.5	-9.4	0.34	124.1	0.09	-134.9	0.73	-25.4	4.0
14.0	0.69	-43.1	-10.7	0.29	114.4	0.09	-143.7	0.74	-35.2	4.4
14.5	0.71	-54.1	-12.1	0.25	105.3	0.08	-152.2	0.75	-44.3	4.9
15.0	0.73	-63.2	-13.6	0.21	97.6	0.08	-159.4	0.77	-51.6	5.4
16.0	0.76	-75.7	-16.4	0.15	87.0	0.07	-169.8	0.80	-60.3	6.5
17.0	0.77	-85.0	-18.7	0.12	79.9	0.07	-178.4	0.81	-67.9	8.0
18.0	0.77	-93.2	-20.6	0.09	73.6	0.07	171.6	0.81	-78.9	10.0
19.0	0.78	-104.8	-22.7	0.07	65.1	0.07	158.1	0.80	-95.5	12.9
20.0	0.79	-120.2	-25.4	0.05	55.7	0.06	142.9	0.83	-113.5	17.0

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-51663 Typical Scattering Parameters**  $T_A = 25^\circ\text{C}$ ,  $Z_0 = 50 \Omega$ ,  $I_D = 45 \text{ mA}$ , (unless specified otherwise)

Frequency GHz	S11			S21		S12		S22		K
	Mag	Angle	dB	Mag	Angle	Mag	Angle	Mag	Angle	
0.05	0.07	3.4	22.5	13.37	177.2	0.06	-0.3	0.10	-2.5	1.0
0.1	0.07	6.5	22.5	13.34	174.5	0.06	-1.0	0.10	-6.4	1.0
0.5	0.11	9.9	22.2	12.89	153.1	0.06	-5.4	0.12	-30.5	1.0
0.9	0.16	-1.9	21.7	12.17	132.5	0.06	-9.3	0.15	-50.5	1.0
1.5	0.24	-27.4	20.7	10.87	103.3	0.06	-14.7	0.21	-77.8	1.1
2.0	0.28	-46.7	19.8	9.74	80.6	0.06	-18.6	0.23	-99.6	1.1
2.5	0.30	-66.2	18.7	8.65	59.2	0.06	-22.0	0.26	-120.4	1.2
3.0	0.31	-85.9	17.7	7.65	38.9	0.06	-25.0	0.27	-140.4	1.2
3.5	0.31	-106.7	16.6	6.75	19.4	0.06	-27.7	0.29	-160.1	1.3
4.0	0.31	-129.0	15.4	5.92	0.5	0.06	-30.2	0.32	-178.8	1.4
4.5	0.32	-151.9	14.2	5.14	-17.7	0.06	-32.5	0.36	164.9	1.5
5.0	0.34	-174.3	12.9	4.43	-34.9	0.06	-34.7	0.39	151.8	1.5
5.5	0.37	164.9	11.6	3.80	-51.2	0.06	-37.0	0.42	140.4	1.6
6.0	0.40	146.5	10.3	3.27	-66.7	0.06	-39.7	0.45	128.4	1.6
6.5	0.43	130.3	9.0	2.83	-81.4	0.06	-43.1	0.47	116.0	1.7
7.0	0.45	115.6	7.8	2.45	-95.5	0.07	-47.3	0.48	103.3	1.7
7.5	0.46	101.3	6.6	2.13	-109.1	0.07	-52.5	0.50	90.5	1.7
8.0	0.48	86.6	5.3	1.85	-122.5	0.08	-58.5	0.53	78.2	1.8
8.5	0.49	71.0	4.1	1.60	-135.6	0.08	-65.3	0.55	66.8	1.9
9.0	0.50	55.1	2.8	1.37	-148.3	0.08	-72.5	0.58	56.5	2.0
9.5	0.53	39.9	1.4	1.17	-160.3	0.09	-79.8	0.60	47.2	2.1
10.0	0.56	27.0	-0.1	0.99	-171.3	0.09	-86.7	0.63	38.5	2.2
10.5	0.59	17.3	-1.5	0.84	178.7	0.09	-93.1	0.65	30.1	2.4
11.0	0.62	10.2	-2.9	0.72	169.6	0.09	-99.0	0.66	21.6	2.5
11.5	0.63	4.1	-4.2	0.62	160.8	0.09	-105.0	0.68	12.7	2.7
12.0	0.64	-2.8	-5.5	0.53	151.9	0.09	-111.6	0.69	3.2	3.0
12.5	0.65	-11.1	-6.7	0.46	142.8	0.09	-118.8	0.70	-6.6	3.2
13.0	0.66	-20.9	-7.9	0.40	133.3	0.09	-126.6	0.72	-16.2	3.5
13.5	0.68	-31.8	-9.2	0.35	123.6	0.09	-135.1	0.73	-25.8	3.9
14.0	0.69	-43.4	-10.5	0.30	113.9	0.09	-143.9	0.74	-35.6	4.3
14.5	0.71	-54.4	-11.9	0.25	104.7	0.08	-152.4	0.75	-44.7	4.8
15.0	0.73	-63.5	-13.4	0.21	97.0	0.08	-159.6	0.77	-52.0	5.2
16.0	0.76	-76.1	-16.1	0.16	86.1	0.07	-170.1	0.80	-60.6	6.3
17.0	0.77	-85.4	-18.4	0.12	78.8	0.07	-178.8	0.81	-68.3	7.8
18.0	0.77	-93.7	-20.4	0.10	72.1	0.07	171.2	0.80	-79.3	9.8
19.0	0.78	-105.2	-22.4	0.08	63.3	0.07	157.7	0.80	-95.9	12.7
20.0	0.79	-120.6	-25.2	0.06	53.8	0.06	142.6	0.82	-113.9	16.7

Notes:

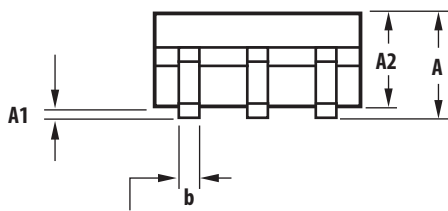
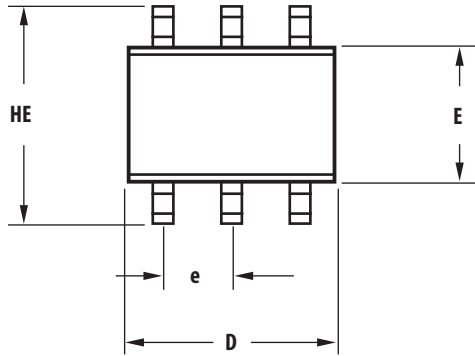
1. S-parameters are measured on a CPWG line fabricated on 0.025 inch thick Rogers® RO4350 material. The input reference plane is at the end of the input lead. The output reference plane is at the end of the output lead.

## Part Number Ordering Information

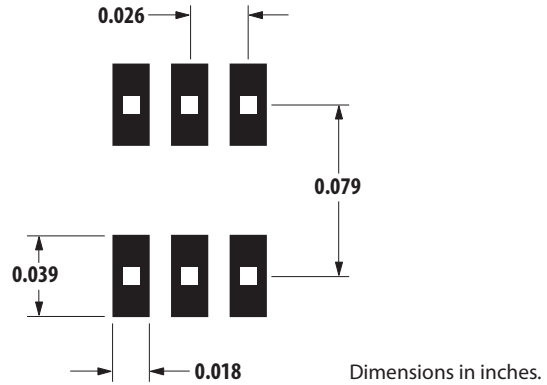
Part Number	No. of Devices	Container
AVT-51663-TR1G	3000	7" Reel
AVT-51663-BLKG	100	Antistatic bag

## Package Dimensions

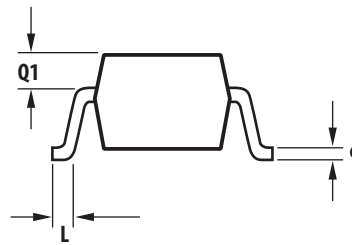
Outline 63 (SOT-363/SC-70)



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



Dimensions in inches.

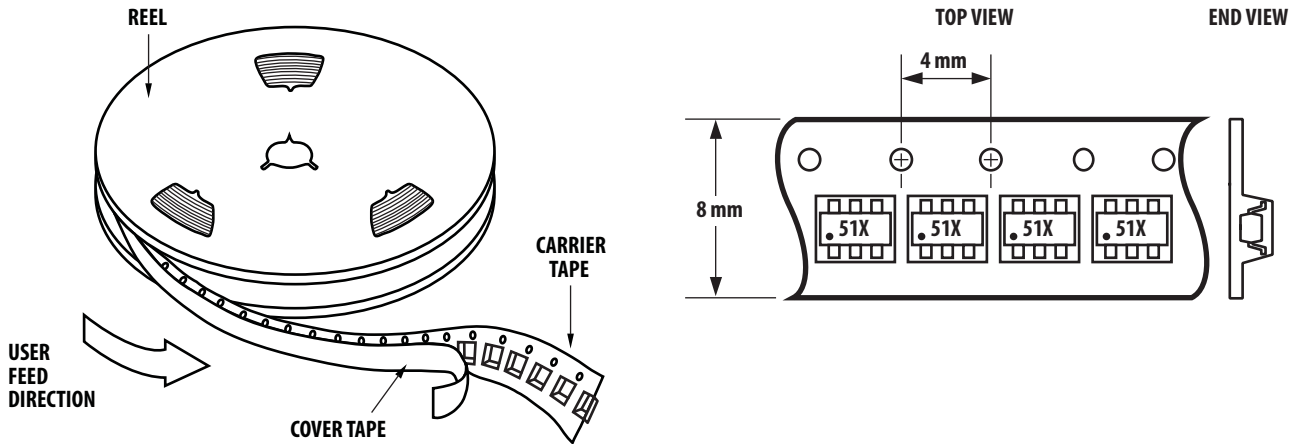


Symbol	Dimensions (mm)	
	Min	Max
E	1.15	1.35
D	1.80	2.25
HE	1.80	2.40
A	0.80	1.10
A2	0.80	1.00
A1	0.00	0.10
Q1	0.10	0.40
e	0.65	
b	0.15	0.30
c	0.08	0.25
L	0.10	0.46

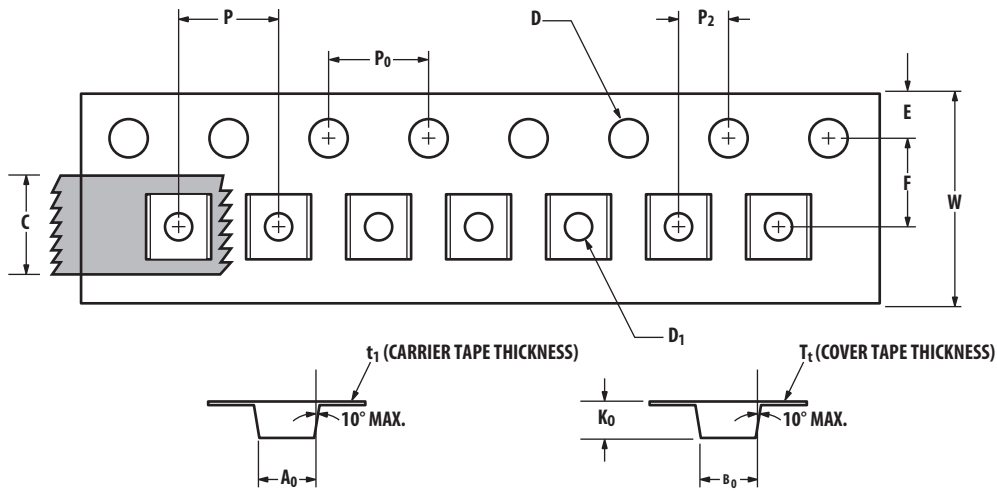
### Notes:

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

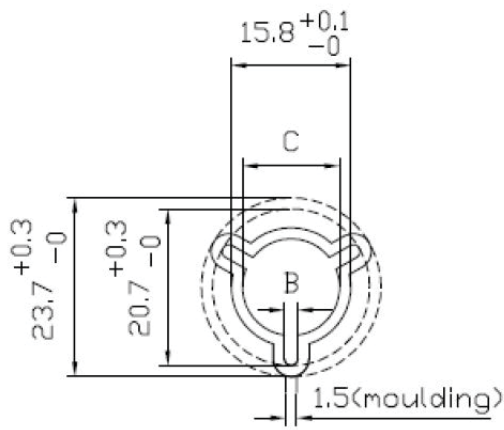
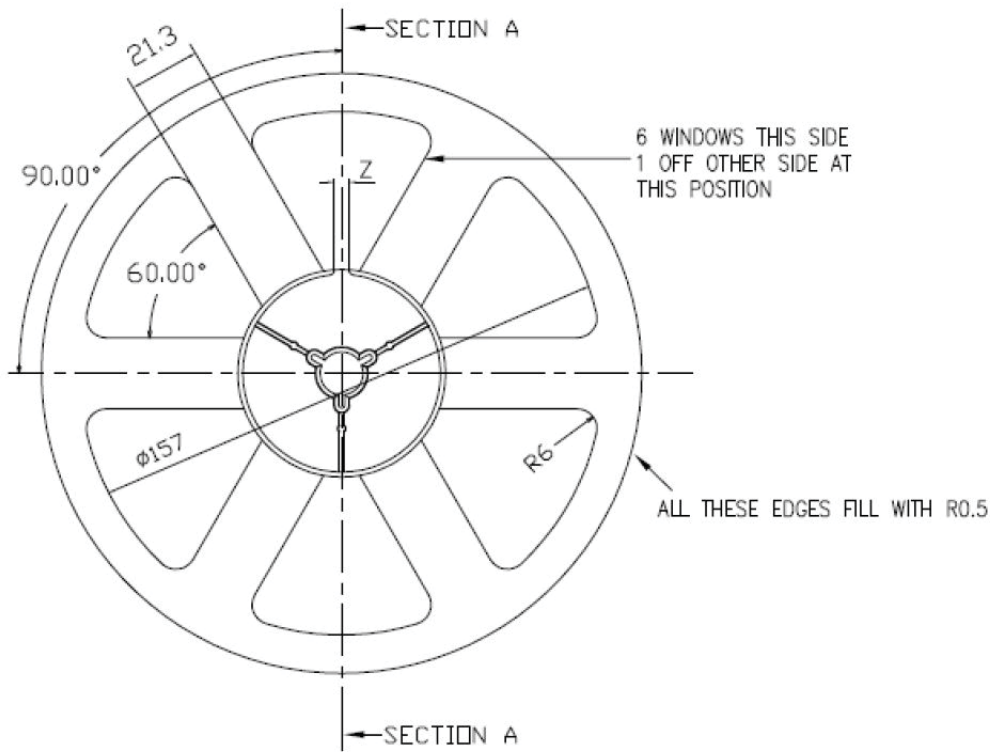


## Tape Dimensions and Product Orientation for Outline 63

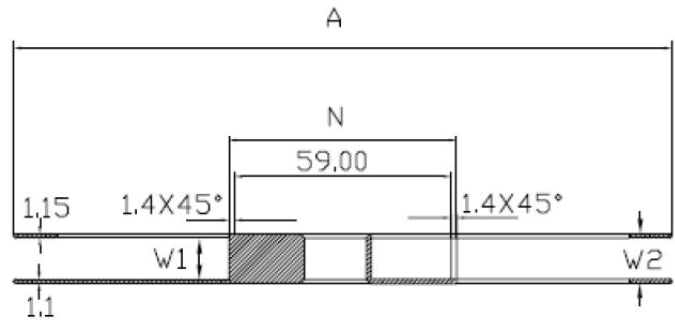


	DESCRIPTION	SYMBOL	SIZE (mm)	SIZE (INCHES)
CAVITY	LENGTH	A <sub>0</sub>	2.40 ± 0.10	0.094 ± 0.004
	WIDTH	B <sub>0</sub>	2.40 ± 0.10	0.094 ± 0.004
	DEPTH	K <sub>0</sub>	1.20 ± 0.10	0.047 ± 0.004
	PITCH	P	4.00 ± 0.10	0.157 ± 0.004
	BOTTOM HOLE DIAMETER	D <sub>1</sub>	1.00 + 0.25	0.039 + 0.010
PERFORATION	DIAMETER	D	1.55 ± 0.05	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	0.315 ± 0.012
	THICKNESS	t <sub>1</sub>	0.254 ± 0.02	0.0100 ± 0.0008
COVER TAPE	WIDTH	C	5.4 ± 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

**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](http://www.avagotech.com)

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