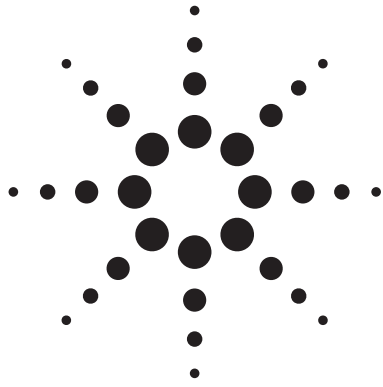


[ Obsolete product ]

Agilent has a new name

Keysight Technologies.

Keysight Technologies Inc. is the world's leading electronic measurement company, transforming today's measurement experience through innovations in wireless, modular, and software solutions. With its HP and Agilent legacy, Keysight delivers solutions in wireless communications, aerospace and defense and semiconductor markets with world-class platforms, software and consistent measurement science.



# Agilent MGA-565P8 20 dBm $P_{sat}$ High Isolation Buffer Amplifier

## Data Sheet

### Description

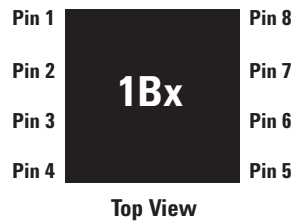
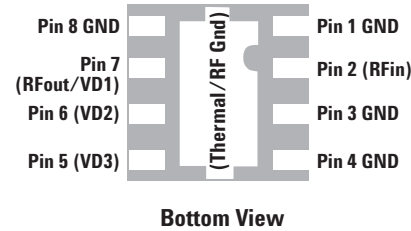
The MGA-565P8 is designed for use in LO chains to drive high dynamic range passive mixers. It provides high isolation, high gain, and consistent output power. It is a GaAs MMIC, fabricated using Agilent Technologies' cost effective, reliable enhancement mode PHEMT (Pseudomorphic High Electron Mobility Transistor)<sup>[1]</sup> process. This device is housed in the LPCC 2x2 mm package. This package offers good thermal dissipation and RF characteristics.

MGA-565P8 features a saturated power of 20 dBm (with 0 dBm input power) and reverse isolation in excess of 40 dB at 2 GHz. The saturated output power can be set between 9 dBm and 20 dBm using an external resistor, with a corresponding adjustment in current consumption.

### Notes:

1. Enhancement mode technology employs a single positive  $V_{gs}$ , eliminating the need of negative gate voltage associated with conventional depletion mode devices.
2. Conform to JEDEC reference outline MO229 for DRP-N

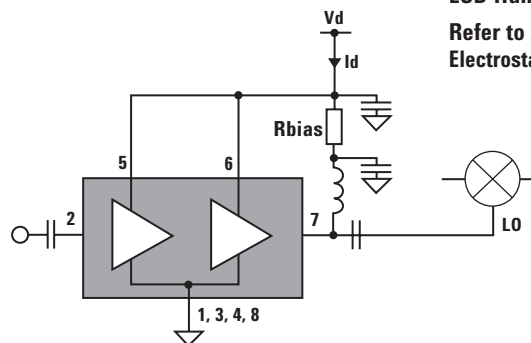
### Pin Connections and Package Marking



**Note:**  
Package marking provides orientation and identification

"1B" = Device Code  
"x" = Data code indicates the month of manufacture.

### Simplified Schematic



### Features

- Up to 3.5 GHz operating frequency
- 2:1 VSWR input and output at 2GHz
- Small package size: 2.0 x 2.0 x 0.75 mm LPCC<sup>[3]</sup>
- MSL-1 and lead-free
- Tape-and-reel packaging option available

### Specifications

@ 2 GHz,  $V_d = 5V$ ,  $P_{in} = 0$  dBm

- $P_{sat} = 20$  dBm
- $I_{dsat} = 67$  mA
- Isolation = 42 dB
- Small Signal Gain = 22 dB

### Applications

- VCO buffer amplifier for Cellular/PCS or other wireless infrastructures



**Attention:**  
Observe precautions for handling electrostatic sensitive devices.

ESD Machine Model (Class A)

ESD Human Body Model (Class 0)

Refer to Agilent Application Note A004R: Electrostatic Discharge Damage and Control.



Agilent Technologies

## MGA-565P8 Absolute Maximum Ratings<sup>[1]</sup>

Symbol	Parameter	Units	Absolute Maximum
$V_d$	DC Supply Voltage	V	8
$P_{diss}$	Total Power Dissipation <sup>[2]</sup>	mW	448
$P_{in\ max.}$	RF Input Power ( $V_d=5V$ )	dBm	15
$T_{CH}$	Channel Temperature	°C	150
$T_{STG}$	Storage Temperature	°C	-65 to 150
$\theta_{ch\_b}$	Thermal Resistance <sup>[3]</sup>	°C/W	91
	ESD (Human Body Model)	V	100
	ESD (Machine Model)	V	30

### Notes:

1. Operation of this device in excess of any one of these parameters may cause permanent damage.
2. Board (package belly) temperature  $T_B$  is 25°C. Derate 11 mW/°C for  $T_B > 109^\circ\text{C}$ .
3. Channel-to-board thermal resistance measured using 150°C Liquid Crystal Measurement method.

## Electrical Specifications

$T_A = 25^\circ\text{C}$ , Frequency = 2 GHz,  $R_{bias} = 0\Omega$  (unless specified otherwise)

Symbol	Parameter and Test Condition	Units	Min.	Typ.	Max.	
$P_{sat}$	Saturated Power at 0 dBm input	$V_d = 5V^{[1]}$	dBm	18.5	20	20.6
		$V_d = 3V$	dBm		17	
$I_{dsat}$	Saturation Current	$V_d = 5V^{[1]}$	mA	58	67	78
		$V_d = 3V$	mA		45	
ISL <sup>[1]</sup>	Reverse Isolation	dB	42	50		
Gain	Small Signal Gain	$V_d = 5V^{[1]}$	dB	20	21.8	23.5
		$V_d = 3V$			20	
$I_{ds}$	Small Signal Current ( $P_{in} = -10\ \text{dBm}$ )	$V_d = 5V^{[1]}$	mA	33	37	43
		$V_d = 3V$	dB		27	
RL <sup>[1]</sup>	Return Loss	Input			-8	
		Output				-10

### Notes:

1. Typical value determined from a sample size of 500 parts from 3 wafers.
2. Measurement obtained using production test board described in the block diagram below. Circuit losses have been de-embedded from actual measurements.

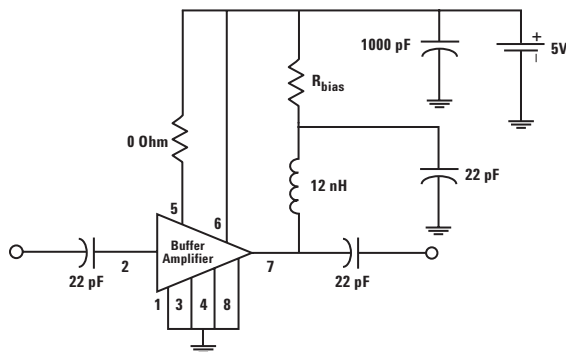
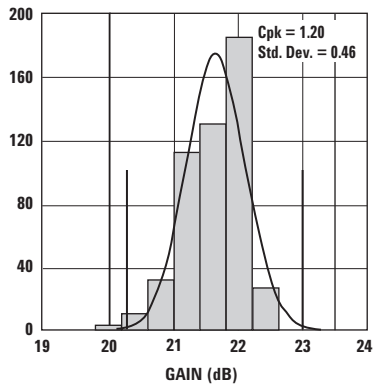
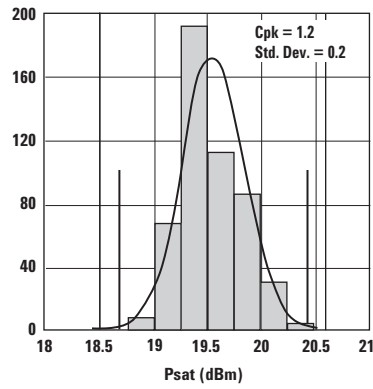


Figure 1. Production Test Circuit Schematic at 2 GHz..

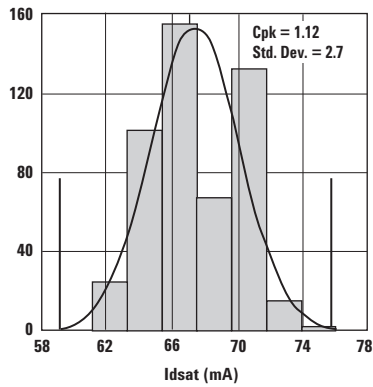
**Product Consistency Distribution Charts at 2 GHz<sup>[1, 2]</sup>**



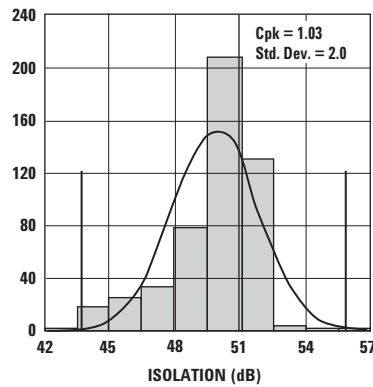
**Figure 2. Gain Distribution.**  
LSL = 20.0 dB, USL = 23.5 dB.



**Figure 3. Psat Distribution.**  
LSL = 18.5 dBm, USL = 20.6



**Figure 4. Idsat Distribution.**  
LSL = 58.0 dBm, USL = 78.0 dBm.



**Figure 5. Isolation Distribution.**  
LSL = 42.0 dB, USL = 56.0 dB.

**Notes:**

1. Statistical distribution determined from a sample size of 500 parts from 3 wafers.
2. Future wafers allocated to this product may have typical values anywhere between the minimum and maximum specification limits.

**MGA-565P8 Typical Performance Curves** (at 25°C, 2 GHz,  $R_{bias} = 0\Omega$ , unless specified otherwise)

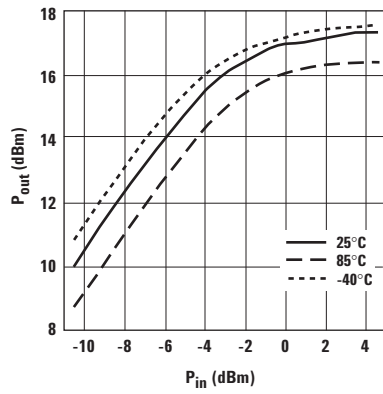


Figure 6.  $P_{out}$  vs.  $P_{in}$ ,  $V_d = 3V$ .

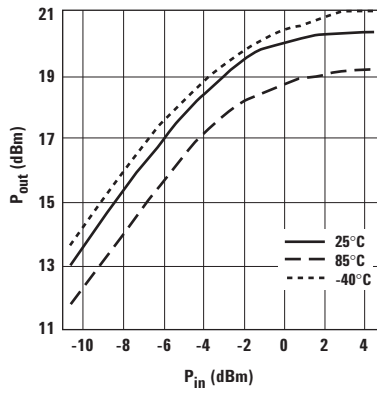


Figure 7.  $P_{out}$  vs.  $P_{in}$ ,  $V_d = 5V$ .

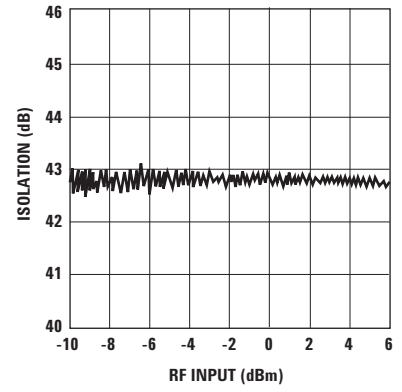


Figure 8. Isolation vs  $P_{in}$ ,  $V_d = 3V$ .

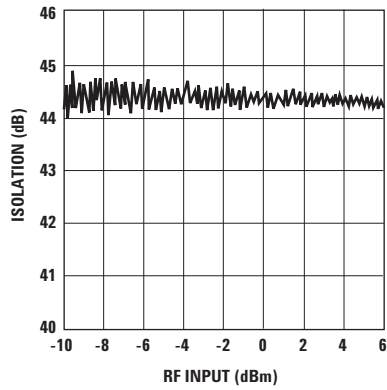
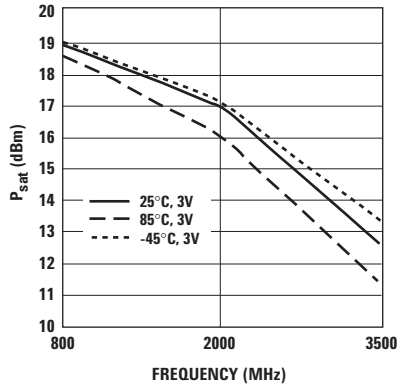
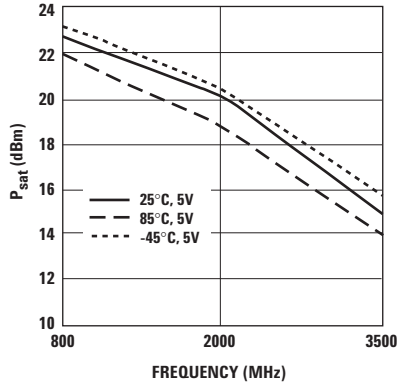


Figure 9. Isolation vs.  $P_{in}$ ,  $V_d = 5V$ .

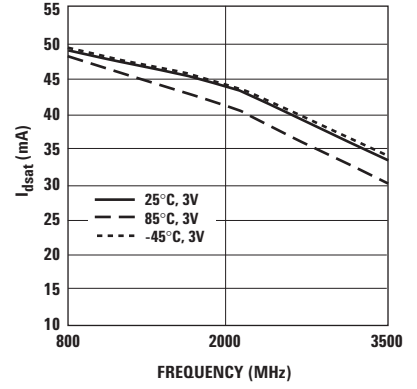
**MGA-565P8 Typical Performance Curves ( $R_{bias} = 0\Omega$ , temperature variation)**



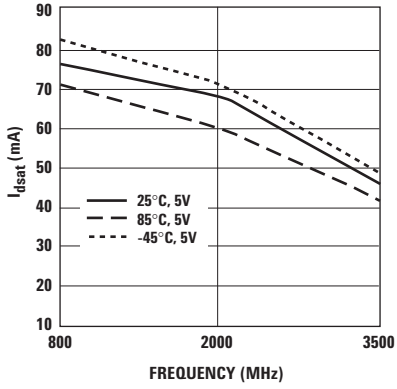
**Figure 10.  $P_{sat}$  vs. Frequency.**  
( $P_{in} = 0$  dBm,  $V_d = 3$  V)



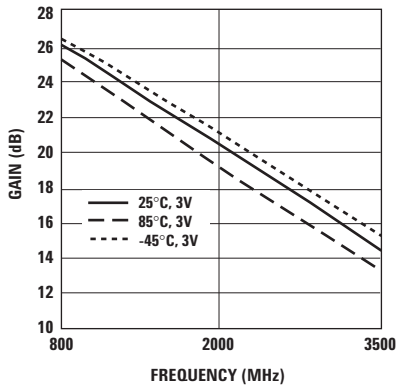
**Figure 11.  $P_{sat}$  vs. Frequency.**  
( $P_{in} = 0$  dBm,  $V_d = 5$  V)



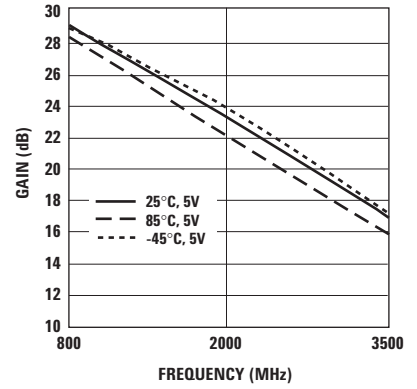
**Figure 12.  $I_{dsat}$  vs. Frequency.**  
( $P_{in} = 0$  dBm,  $V_d = 3$  V)



**Figure 13.  $I_{dsat}$  vs. Frequency.**  
( $P_{in} = 0$  dBm,  $V_d = 5$  V)

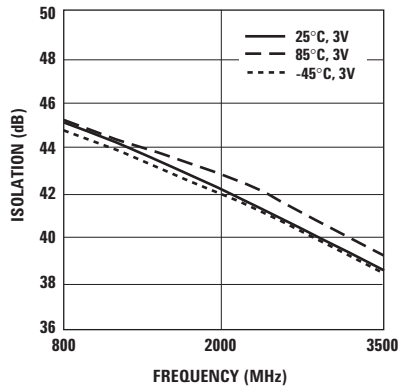


**Figure 14. Gain vs. Frequency.**  
( $P_{in} = -10$  dBm,  $V_d = 3$  V)

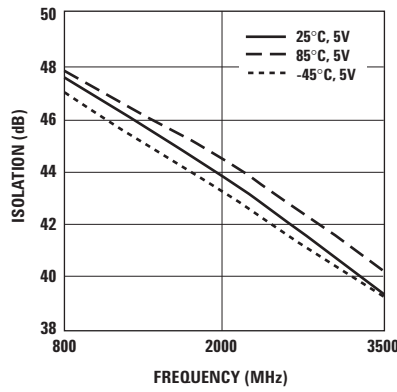


**Figure 15. Gain vs. Frequency.**  
( $P_{in} = -10$  dBm,  $V_d = 5$  V)

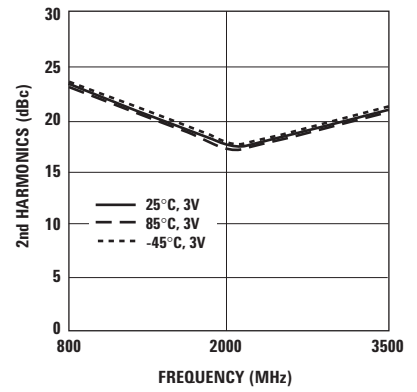
**MGA-565P8 Typical Performance Curves** ( $R_{bias} = 0\Omega$ , temperature variation), continued



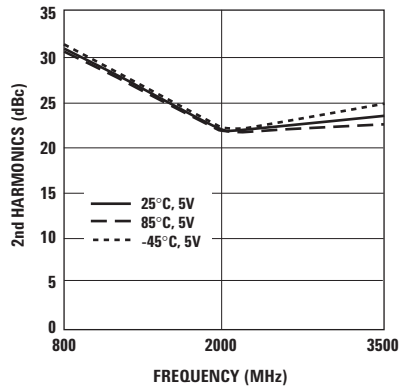
**Figure 16. Isolation vs. Frequency.**  
( $P_{in} = -10$  dBm,  $V_d = 3$  V)



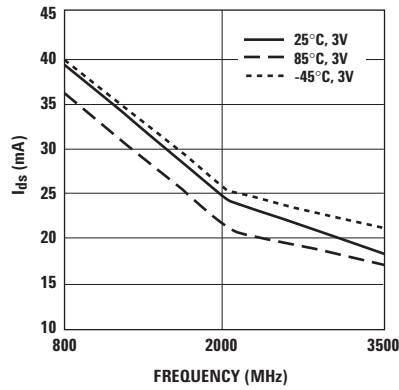
**Figure 17. Isolation vs. Frequency.**  
( $P_{in} = -10$  dBm,  $V_d = 5$  V)



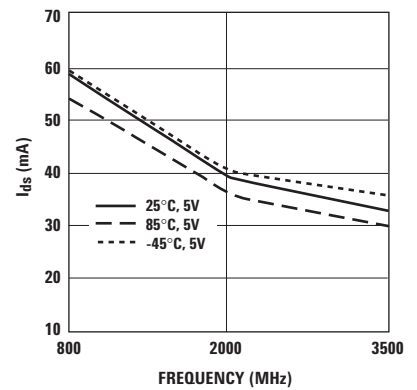
**Figure 18. Second Harmonics vs. Frequency.**  
( $P_{in} = 0$  dBm,  $V_d = 3$  V)



**Figure 19. Second Harmonics vs. Frequency.**  
( $P_{in} = 0$  dBm,  $V_d = 5$  V)

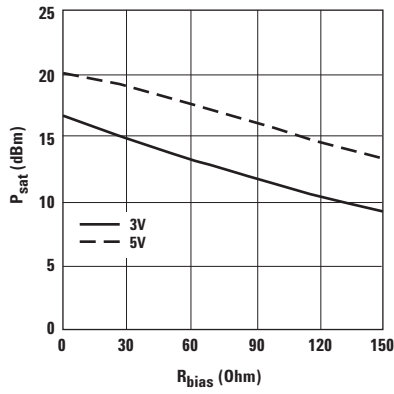


**Figure 20.  $I_{ds}$  vs. Frequency.**  
( $P_{in} = -10$  dBm,  $V_d = 3$  V)

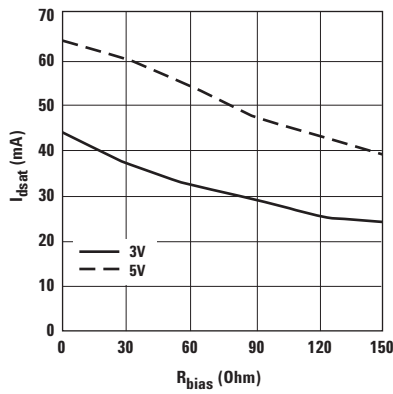


**Figure 21.  $I_{ds}$  vs. Frequency.**  
( $P_{in} = -10$  dBm,  $V_d = 5$  V)

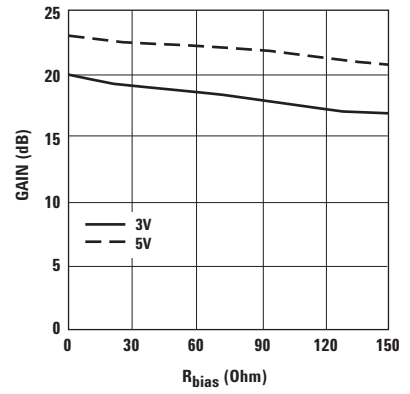
**MGA-565P8 Typical Performance Curves** (at 25°C, 2 GHz, unless specified otherwise)



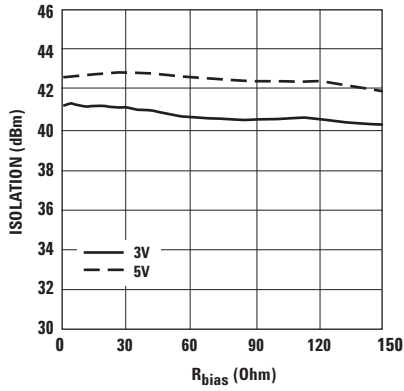
**Figure 22.** P<sub>sat</sub> vs. R<sub>bias</sub>,  
P<sub>in</sub> = 0 dBm for V<sub>d</sub> = 3V and 5V.



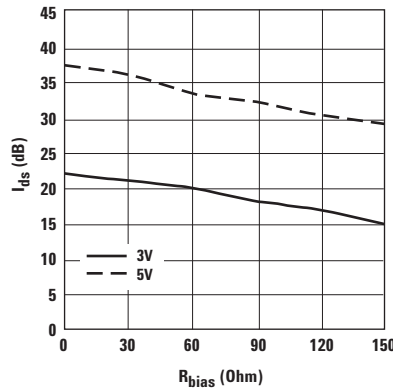
**Figure 23.** I<sub>dsat</sub> vs. R<sub>bias</sub>,  
P<sub>in</sub> = 0 dBm for V<sub>d</sub> = 3V and 5V.



**Figure 24.** Gain vs. R<sub>bias</sub>,  
P<sub>in</sub> = -10 dBm for V<sub>d</sub> = 3V and 5V.



**Figure 25.** Isolation vs. R<sub>bias</sub>,  
P<sub>in</sub> = -10 dBm for V<sub>d</sub> = 3V and 5V.



**Figure 26.** I<sub>ds</sub> vs. R<sub>bias</sub>,  
P<sub>in</sub> = -10 dBm for V<sub>d</sub> = 3V and 5V.



**MGA-565P8 Typical Scattering Parameters** (at 25°C,  $V_d = 5V$ ,  $I_d = 35\text{ mA}$ ,  $R_{\text{bias}} = 0\Omega$ )

Freq. GHz	$S_{11}$			$S_{21}$			$S_{12}$			$S_{22}$		K
	Mag.	Ang.	dB	Mag.	Ang.	dB	Mag.	Ang.	Mag.	Ang.		
0.1	0.48	-82.9	33.7	48.51	20.3	-66.0	0.001	96.5	0.46	-27.5	12.7	
0.2	0.19	-136.9	33.9	49.83	-21.5	-60.1	0.001	86.2	0.43	-34.8	8.1	
0.3	0.08	127.4	33.5	47.25	-48.8	-56.0	0.002	61.1	0.40	-49.9	5.6	
0.4	0.14	54.5	32.3	41.22	-70.5	-53.1	0.002	39.3	0.38	-61.2	4.6	
0.5	0.20	23.2	32.2	40.90	-90.8	-52.6	0.002	26.6	0.36	-77.0	4.3	
0.6	0.25	0.2	31.5	37.47	-109.9	-51.6	0.003	13.3	0.34	-89.5	4.1	
0.7	0.29	-18.7	30.8	34.58	-127.1	-50.6	0.003	1.3	0.33	-101.8	4.0	
0.8	0.33	-36.0	30.1	32.04	-143.8	-49.5	0.003	-9.5	0.32	-114.5	3.7	
0.9	0.36	-54.3	29.3	29.32	-161.1	-48.0	0.004	-25.4	0.31	-129.7	3.3	
1.0	0.36	-71.0	28.4	26.32	-176.0	-48.1	0.004	-44.9	0.27	-141.3	3.9	
1.1	0.36	-85.0	27.7	24.18	170.1	-48.6	0.004	-56.7	0.25	-149.8	4.5	
1.2	0.37	-98.1	27.1	22.60	156.4	-48.7	0.004	-66.7	0.24	-159.4	4.9	
1.3	0.37	-111.5	26.4	21.01	142.3	-48.7	0.004	-75.9	0.24	-169.0	5.2	
1.4	0.37	-124.1	25.8	19.56	129.1	-48.7	0.004	-85.4	0.23	-178.8	5.6	
1.5	0.38	-135.9	25.3	18.36	116.2	-48.6	0.004	-94.0	0.22	171.5	6.0	
1.6	0.38	-148.7	24.8	17.36	102.6	-48.5	0.004	-102.9	0.22	161.7	6.2	
1.7	0.38	-160.8	24.2	16.26	89.5	-48.5	0.004	-111.9	0.21	151.9	6.6	
1.8	0.38	-172.4	23.7	15.28	76.8	-48.4	0.004	-120.6	0.21	142.2	7.0	
1.9	0.38	176.3	23.2	14.43	64.4	-48.3	0.004	-129.1	0.20	132.2	7.4	
2.0	0.38	165.0	22.8	13.73	51.9	-48.3	0.004	-137.0	0.20	122.5	7.7	
2.1	0.37	153.7	22.3	12.99	39.3	-48.1	0.004	-143.4	0.19	113.1	8.1	
2.2	0.37	143.3	21.8	12.33	27.3	-46.8	0.005	-151.2	0.19	105.0	7.4	
2.3	0.37	131.1	21.5	11.86	15.1	-47.0	0.004	-168.4	0.19	93.0	7.8	
2.4	0.37	119.5	21.1	11.31	2.6	-47.5	0.004	-177.2	0.19	82.3	8.7	
2.5	0.36	108.2	20.7	10.80	-9.6	-47.5	0.004	174.1	0.18	71.7	9.2	
2.6	0.36	96.8	20.3	10.33	-21.5	-47.4	0.004	165.1	0.18	61.5	9.5	
2.7	0.35	85.6	19.9	9.91	-33.7	-47.4	0.004	155.8	0.18	51.0	10.0	
2.8	0.34	74.0	19.6	9.50	-45.9	-47.3	0.004	144.5	0.17	40.0	10.4	
2.9	0.34	62.5	19.2	9.13	-58.1	-47.5	0.004	131.2	0.17	28.7	11.1	
3.0	0.32	51.1	18.8	8.70	-70.3	-49.6	0.003	112.5	0.16	16.0	15.2	
3.1	0.32	43.0	18.4	8.33	-81.6	-50.7	0.003	131.5	0.16	8.4	18.0	
3.2	0.32	31.4	18.1	8.08	-93.5	-49.1	0.004	123.9	0.16	-0.7	15.4	
3.3	0.31	19.7	17.8	7.78	-105.6	-48.8	0.004	113.8	0.16	-11.8	15.5	
3.4	0.30	8.1	17.5	7.49	-117.6	-48.9	0.004	105.4	0.16	-21.8	16.4	
3.5	0.30	-3.7	17.2	7.22	-129.7	-48.8	0.004	97.3	0.16	-31.9	16.8	
3.6	0.29	-16.1	16.8	6.93	-142.1	-49.3	0.003	87.8	0.17	-42.7	18.8	
3.7	0.27	-29.6	16.4	6.61	-153.3	-49.7	0.003	93.0	0.16	-68.1	20.8	
3.8	0.25	-43.8	16.1	6.37	-165.9	-49.3	0.003	87.1	0.14	-70.2	21.0	
3.9	0.22	-59.0	15.5	5.96	-178.3	-48.7	0.004	90.2	0.13	-77.6	21.5	
4.0	0.14	-64.5	14.7	5.44	171.9	-45.6	0.005	91.4	0.14	-84.1	16.9	
4.1	0.16	-41.6	14.6	5.37	165.1	-43.9	0.006	68.4	0.15	-95.7	13.8	
4.2	0.22	-56.0	14.8	5.50	153.7	-43.7	0.007	42.7	0.15	-111.2	12.9	
4.3	0.23	-73.2	14.7	5.42	141.0	-44.0	0.006	19.5	0.15	-124.9	13.6	
4.4	0.22	-87.9	14.4	5.26	128.9	-44.3	0.006	7.6	0.15	-137.1	14.5	
4.5	0.21	-99.6	14.1	5.06	117.2	-45.1	0.006	-21.7	0.14	-153.5	16.5	
4.6	0.20	-110.4	13.7	4.86	106.0	-47.2	0.004	-55.1	0.13	-168.4	22.2	
4.7	0.19	-111.2	13.6	4.77	96.6	-48.8	0.004	-176.2	0.09	-170.7	27.6	
4.8	0.23	-127.2	13.6	4.76	83.4	-44.0	0.006	32.8	0.12	-175.4	15.6	
4.9	0.22	-140.4	13.2	4.59	72.3	-47.0	0.004	5.6	0.11	170.3	22.9	
5.0	0.21	-153.3	13.0	4.48	60.8	-46.4	0.005	-11.0	0.11	160.7	22.1	
5.1	0.21	-165.3	12.8	4.37	49.3	-46.9	0.005	-22.0	0.11	152.2	24.0	
5.2	0.20	-177.2	12.6	4.25	37.7	-47.5	0.004	-28.1	0.11	142.3	26.3	
5.3	0.20	170.5	12.3	4.14	26.2	-47.8	0.004	-30.1	0.11	132.3	28.3	
5.4	0.19	158.7	12.1	4.02	14.7	-47.4	0.004	-25.1	0.12	124.4	27.7	
5.5	0.19	146.7	11.8	3.90	3.4	-44.5	0.006	-27.6	0.13	113.5	20.3	
5.6	0.18	135.4	11.6	3.79	-8.0	-42.6	0.007	-47.1	0.13	100.8	16.8	
5.7	0.18	123.7	11.3	3.68	-19.4	-42.5	0.008	-66.0	0.14	88.9	17.1	
5.8	0.18	111.4	11.0	3.56	-30.5	-43.2	0.007	-80.4	0.14	77.2	19.3	
5.9	0.18	100.4	10.8	3.45	-41.7	-44.2	0.006	-85.9	0.14	70.6	22.1	
6.0	0.18	88.9	10.4	3.32	-52.7	-44.1	0.006	-88.2	0.16	62.3	22.6	

**MGA-565P8 Typical Scattering Parameters** (at 25°C,  $V_d = 3V$ ,  $I_d = 20$  mA,  $R_{bias} = 0\Omega$ )

Freq. GHz	$S_{11}$		$S_{21}$			$S_{12}$			$S_{22}$		K
	Mag.	Ang.	dB	Mag.	Ang.	dB	Mag.	Ang.	Mag.	Ang.	
0.1	0.53	-75.3	30.8	34.87	27.3	-62.9	0.001	105.7	0.48	-27.5	11.2
0.2	0.17	-116.2	31.1	35.82	-21.4	-55.2	0.002	89.1	0.45	-34.4	6.3
0.3	0.00	162.6	30.6	34.07	-47.6	-52.3	0.002	61.2	0.43	-53.8	5.0
0.4	0.12	26.9	29.4	29.48	-71.1	-50.5	0.003	36.9	0.40	-72.6	4.7
0.5	0.18	3.8	29.4	29.43	-89.6	-48.9	0.004	25.1	0.38	-83.5	3.9
0.6	0.24	-13.8	28.6	26.95	-108.7	-47.9	0.004	10.7	0.36	-97.1	3.8
0.7	0.28	-30.1	27.9	24.85	-126.0	-47.0	0.004	-3.0	0.34	-111.3	3.7
0.8	0.31	-45.9	27.2	22.90	-142.7	-46.2	0.005	-16.6	0.32	-125.3	3.6
0.9	0.33	-61.5	26.4	20.95	-159.2	-45.7	0.005	-30.3	0.30	-138.5	3.7
1.0	0.34	-75.5	25.6	19.15	-174.2	-45.4	0.005	-43.6	0.27	-150.8	4.0
1.1	0.35	-89.0	24.9	17.63	171.4	-45.3	0.005	-55.7	0.25	-162.2	4.3
1.2	0.36	-101.9	24.3	16.46	157.5	-45.2	0.005	-67.1	0.24	-173.9	4.5
1.3	0.37	-114.8	23.7	15.30	143.4	-45.2	0.005	-77.7	0.22	175.0	4.9
1.4	0.37	-127.0	23.1	14.25	130.1	-45.2	0.006	-88.0	0.21	164.8	5.2
1.5	0.37	-138.4	22.5	13.38	117.2	-45.1	0.006	-97.1	0.19	155.1	5.6
1.6	0.38	-150.8	22.1	12.67	103.7	-45.0	0.006	-106.8	0.19	144.7	5.8
1.7	0.37	-162.4	21.5	11.89	90.4	-45.0	0.006	-116.1	0.18	134.0	6.2
1.8	0.37	-173.8	21.0	11.20	77.8	-44.9	0.006	-125.0	0.16	124.2	6.6
1.9	0.37	175.2	20.5	10.59	65.3	-44.9	0.006	-134.0	0.16	114.5	6.9
2.0	0.37	164.3	20.1	10.09	52.7	-44.8	0.006	-142.2	0.15	104.7	7.2
2.1	0.37	153.2	19.6	9.57	40.0	-44.7	0.006	-150.0	0.14	94.9	7.6
2.2	0.37	142.9	19.1	9.05	27.9	-43.8	0.006	-157.7	0.14	87.3	7.3
2.3	0.37	131.2	18.8	8.75	15.6	-43.8	0.006	-172.5	0.13	76.1	7.5
2.4	0.36	119.9	18.4	8.35	3.1	-44.1	0.006	178.3	0.12	64.7	8.2
2.5	0.35	108.8	18.1	7.99	-9.2	-44.2	0.006	169.9	0.12	53.6	8.7
2.6	0.35	97.8	17.7	7.65	-21.2	-44.1	0.006	161.0	0.11	43.9	9.0
2.7	0.35	86.8	17.3	7.34	-33.5	-44.0	0.006	151.0	0.11	34.0	9.3
2.8	0.34	75.7	17.0	7.04	-45.8	-43.8	0.006	140.5	0.10	23.2	9.7
2.9	0.33	64.4	16.6	6.76	-58.0	-43.9	0.006	128.6	0.10	12.0	10.2
3.0	0.32	53.6	16.2	6.45	-70.2	-45.1	0.006	115.1	0.10	-0.7	12.5
3.1	0.32	44.9	15.9	6.20	-81.7	-45.5	0.005	119.6	0.09	-8.0	13.5
3.2	0.32	33.7	15.6	6.00	-93.8	-44.6	0.006	111.0	0.09	-15.5	12.6
3.3	0.31	22.3	15.2	5.78	-106.0	-44.4	0.006	101.1	0.09	-26.4	12.9
3.4	0.31	11.3	14.9	5.56	-118.0	-44.5	0.006	91.5	0.08	-34.8	13.5
3.5	0.30	-0.1	14.6	5.35	-130.0	-44.5	0.006	82.2	0.09	-43.1	14.2
3.6	0.29	-11.9	14.2	5.15	-142.1	-45.1	0.006	72.4	0.10	-54.3	15.8
3.7	0.28	-24.4	14.0	5.00	-154.1	-45.1	0.006	76.0	0.10	-92.6	16.4
3.8	0.27	-37.4	13.6	4.79	-166.8	-44.5	0.006	63.6	0.06	-97.0	16.1
3.9	0.25	-51.6	13.1	4.53	-179.4	-44.9	0.006	56.0	0.05	-99.7	18.2
4.0	0.20	-66.7	12.5	4.21	168.6	-45.2	0.006	58.1	0.05	-100.9	20.6
4.1	0.13	-63.3	11.7	3.85	159.7	-43.6	0.007	61.7	0.06	-101.1	19.3
4.2	0.18	-48.6	11.8	3.87	152.0	-43.5	0.007	39.9	0.06	-115.6	18.7
4.3	0.21	-64.6	11.8	3.89	140.0	-43.2	0.007	13.8	0.06	-132.4	17.7
4.4	0.22	-80.1	11.6	3.80	127.7	-43.6	0.007	2.6	0.06	-143.7	18.9
4.5	0.21	-91.4	11.3	3.66	116.0	-44.3	0.006	-23.8	0.06	-165.6	21.2
4.6	0.21	-102.3	10.9	3.52	104.7	-44.2	0.006	-50.6	0.05	172.5	22.0
4.7	0.20	-105.6	10.7	3.42	95.0	-44.9	0.006	-115.3	0.02	156.2	24.6
4.8	0.24	-120.3	10.6	3.41	82.1	-44.4	0.006	4.5	0.04	-175.3	23.0
4.9	0.23	-133.3	10.3	3.28	71.1	-44.6	0.006	-34.5	0.03	166.0	24.5
5.0	0.22	-146.0	10.1	3.20	59.8	-43.8	0.006	-47.7	0.03	164.1	23.1
5.1	0.22	-158.0	9.8	3.10	48.4	-44.1	0.006	-61.1	0.03	166.9	24.6
5.2	0.22	-170.0	9.6	3.01	37.0	-44.8	0.006	-72.7	0.03	162.5	27.4
5.3	0.21	177.7	9.3	2.92	25.6	-45.9	0.005	-82.5	0.04	157.3	32.4
5.4	0.21	165.5	9.0	2.82	14.3	-48.1	0.004	-84.1	0.04	153.6	43.1
5.5	0.20	152.8	8.7	2.73	3.4	-48.1	0.004	-64.4	0.06	139.9	44.3
5.6	0.20	142.6	8.5	2.66	-7.4	-44.2	0.006	-70.4	0.06	125.5	29.2
5.7	0.20	131.3	8.2	2.58	-18.6	-43.0	0.007	-90.9	0.07	111.2	26.2
5.8	0.20	118.6	8.0	2.50	-29.4	-43.7	0.007	-109.0	0.08	97.5	29.4
5.9	0.19	106.8	7.7	2.43	-40.0	-45.6	0.005	-115.0	0.09	89.2	37.4
6.0	0.19	94.9	7.5	2.36	-50.3	-46.4	0.005	-106.5	0.12	73.1	42.2

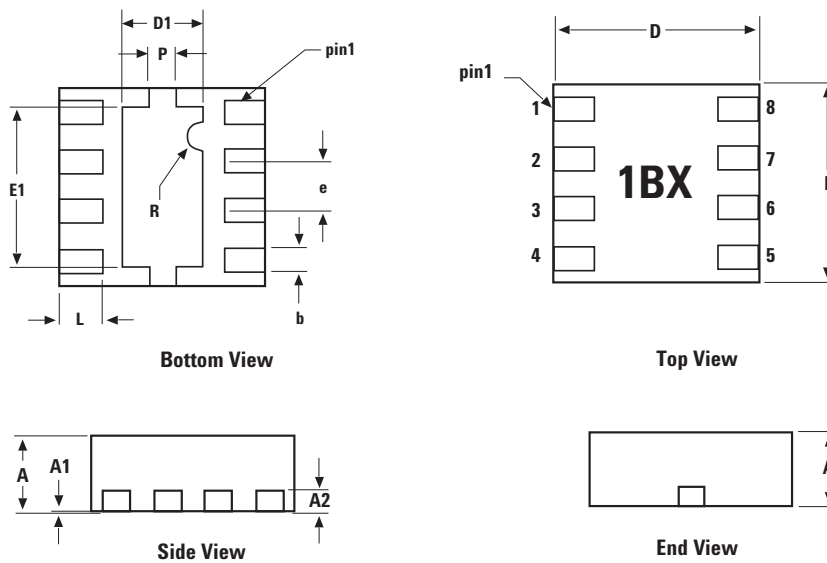
## Device Models

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

## Ordering Information

Part Number	No. of Devices	Container
MGA-565P8-TR1	3000	7" Reel
MGA-565P8-TR2	10000	13" Reel
MGA-565P8-BLK	100	antistatic bag

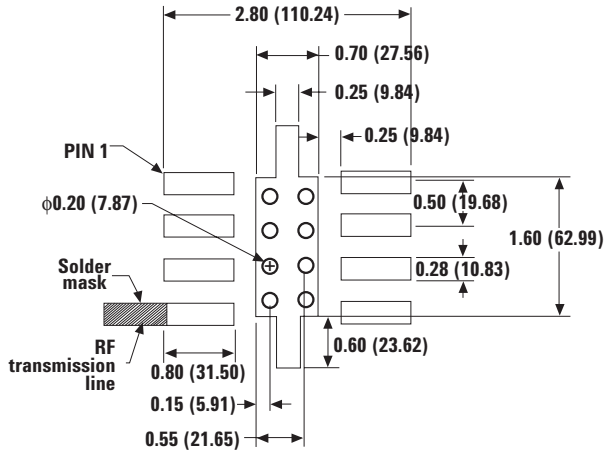
## 2x2 LPCC (JEDEC DFP-N) Package Dimensions



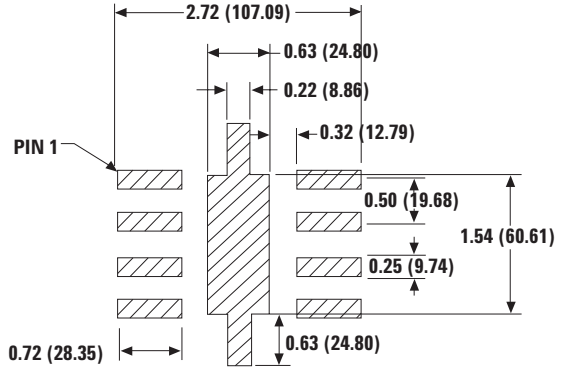
SYMBOL	DIMENSIONS		
	MIN.	NOM.	MAX.
A	0.70	0.75	0.80
A1	0	0.02	0.05
A2		0.203 REF	
b	0.225	0.25	0.275
D	1.9	2.0	2.1
D1	0.65	0.80	0.95
E	1.9	2.0	2.1
E1	1.45	1.6	1.75
e		0.50 BSC	

DIMENSIONS ARE IN MILLIMETERS

## PCB Land Pattern and Stencil Design



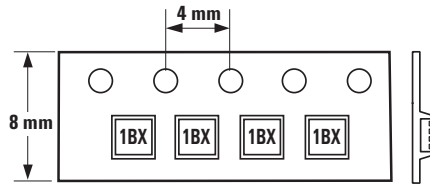
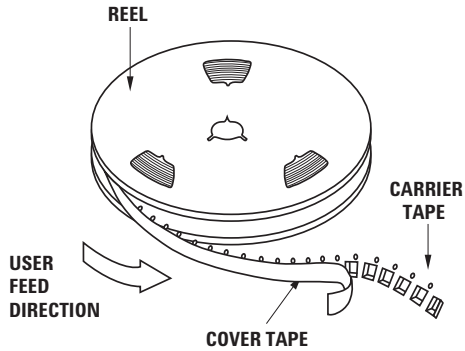
PCB Land Pattern (top view)



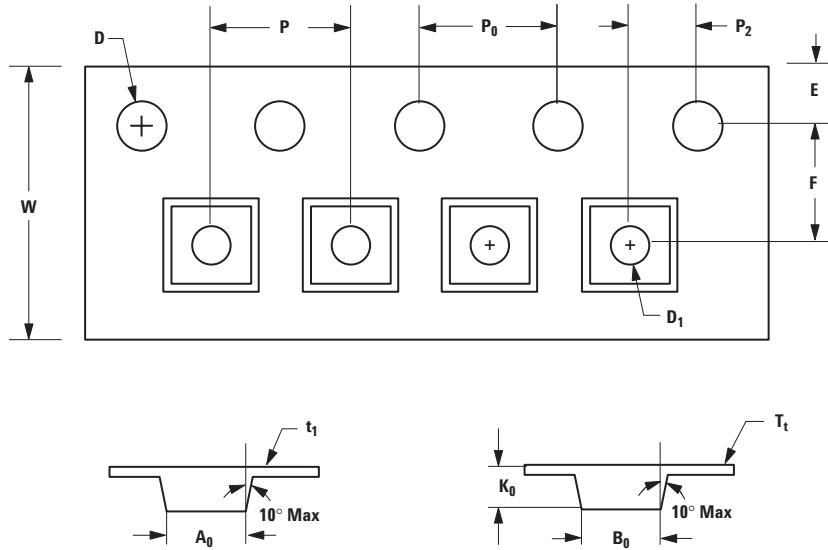
Stencil Layout (top view)

Notes: Typical stencil thickness is 5 mils.  
Measurements are in millimeters (mils).

## Device Orientation



## Tape Dimensions



DESCRIPTION		SYMBOL	SIZE (mm)	SIZE (inches)
CARRIER TAPE	LENGTH	A <sub>0</sub>	2.30 ± 0.05	0.091 ± 0.004
	WIDTH	B <sub>0</sub>	2.30 ± 0.05	0.091 ± 0.004
	DEPTH	K <sub>0</sub>	1.00 ± 0.05	0.039 ± 0.002
	PITCH	P	4.00 ± 0.10	0.157 ± 0.004
	BOTTOM HOLE DIAMETER	D <sub>1</sub>	1.00 ± 0.25	0.039 ± 0.002
PERFORATION	DIAMETER	D	1.50 ± 0.10	0.060 ± 0.004
	PITCH	P <sub>0</sub>	4.00 ± 0.10	0.157 ± 0.004
	POSITION	E	1.75 ± 0.10	0.069 ± 0.004
COVER TAPE	WIDTH	W	8.00 + 0.30 8.00 - 0.10	0.315 ± 0.012 0.315 ± 0.004
	THICKNESS	t <sub>1</sub>	0.254 ± 0.02	0.010 ± 0.0008
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

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