



Agilent Technologies

Transistors

Selection Guide

Silicon Bipolar Transistors

NF_o and G_a are specified at a low noise bias point, while $P_{1\text{ dB}}$, $G_{1\text{ dB}}$, and $|S_{21E}|^2$ are specified at bias points which optimize these parameters.

Low Noise Transistors (Typical Specifications @ 25°C Case Temperature)

Part Number	Frequency (GHz)	V_{CE} (V)	NF_o (dB)	G_a (dB)	$P_{1\text{ dB}}$ (dBm)	$G_{1\text{ dB}}$ (dBm)	$ S_{21E} ^2$ @ 1.0 GHz (dB)	Package
AT-30511	0.9	2.7	1.1	16.0	+7.0	16.5	17.9 ^[1]	SOT-143 plastic SM
AT-30533	0.9	2.7	1.1	13.0	+7.0	15.0	15.2 ^[1]	SOT-23 plastic SM
AT-31011	0.9	2.7	0.9	13.0	+9.0	14.0	19.1 ^[1]	SOT-143 plastic SM
AT-31033	0.9	2.7	0.9	11.0	+9.0	12.0	15.8 ^[1]	SOT-23 plastic SM
AT-32011	0.9	2.7	1.0	14.0	+13.0	16.5	18.9 ^[1]	SOT-143 plastic SM
AT-32032	0.9	2.7	1.0	15.0	+13.0	15.5	11.5 ^[1]	SOT-323 plastic SM
AT-32033	0.9	2.7	1.0	12.5	+13.0	14.5	15.1 ^[1]	SOT-23 plastic SM
AT-32063 ^[2]	0.9	2.7	1.1	14.5	+12.0	16.0	17.0 ^[1]	SOT-363 plastic SM
AT-41411	2.0	8.0	1.8	13.0	+17.0	13.0	16.7	SOT-143 plastic SM
AT-41435	2.0	8.0	1.7	14.0	+19.0	14.0	17.2	micro-X SM
AT-41486	1.0	8.0	1.4	18.0	+18.0	13.5 ^[3]	17.5	85 mil plastic SM
AT-41511	0.9	5.0	1.0	15.5	+14.5	17.5	15.8 ^[1]	SOT-143 plastic SM
AT-41532	0.9	5.0	1.0	15.5	+14.5	14.5	13.3 ^[1]	SOT-323 plastic SM
AT-41533	0.9	5.0	1.0	14.5	+14.5	14.5	13.9 ^[1]	SOT-23 plastic SM
AT-41586	1.0	8.0	1.4	17.0	+18.0	13.0 ^[3]	17.0	85 mil plastic SM
AT-42036	2.0	8.0	1.9	13.5	+21.0	14.0	16.6	micro-X SM
AT-42070	2.0	8.0	1.9	14.0	+21.0	15.0	17.3	70 mil stripline
AT-42085	2.0	8.0	1.9	13.5	+20.5	14.0	17.0	85 mil plastic
AT-42086	2.0	8.0	1.9	13.0	+20.5	13.5	16.5	85 mil plastic SM

Medium Power Transistors (Typical Specifications @ 25°C Case Temperature)

Part Number	V_{CE} (V)	$P_{1\text{ dB}}$ @ 2 GHz (dBm)	$G_{1\text{ dB}}$ @ 2 GHz (dBm)	$P_{1\text{ dB}}$ @ 4 GHz (dBm)	$G_{1\text{ dB}}$ @ 4 GHz (dBm)	Package
AT-64020	16.0	+28	10.0	+27	6.5	200 mil BeO disk

Notes:

1. Typical at 900 MHz
2. Dual transistor — All data is per individual transistor.
3. Typical $G_{1\text{ dB}}$ at 2 GHz



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Gallium Arsenide (GaAs) Field Effect Transistors (FETs)

NF_o and G_a are specified at a low noise bias point, while $P_{1\text{ dB}}$ and $G_{1\text{ dB}}$ are specified at bias points which optimize these parameters.

Single Voltage Low Noise E-pHEMTs^[1] (Typical Specifications @ 25°C Case Temperature)

	Part Number	Gate Width (μm)	Frequency Range (GHz)	Test Freq. (GHz)	V _{dd} (V)	I _{dd} (mA)	NF _o (dB)	G _a (dB)	OIP3 (dBm)	P _{1 dB} (dBm)	Package
New	ATF-50189	6400	0.05 - 6	2	4.5	280	1.1	15.5	45.3	+29.1	SOT-89
New	ATF-501P8	6400	0.05 - 6	2	4.5	280	1.8	14.6	47.0	+28	LPCC ^[3]
	ATF-511P8	6400	0.05 - 6	2	4.5	200	1.4	14.8	41.7	+30	LPCC ^[3]
	ATF-521P8	3200	0.05 - 6	2	4.5	200	1.5	17.0	42	+26.5	LPCC ^[3]
	ATF-531P8	1600	0.05 - 6	2	4.0	135	0.6	20.0	38	+24.5	LPCC ^[3]
	ATF-54143	800	0.45 - 6	2	3	60	0.5	16.6	36.2	+20	SOT-343 (SC-70)
	ATF-541M4	800	0.45 - 10	2	3	60	0.5	17.5	35.8	+21	MiniPak ^[2]
	ATF-55143	400	0.45 - 6	2	2.7	10	0.6	17.7	24.2	+14	SOT-343 (SC-70)
	ATF-551M4	400	0.45 - 10	2	2.7	10	0.5	17.5	24.1	+15	MiniPak ^[2]
New	ATF-58143	800	0.45 - 6	2	3	30	0.5	16.5	30.5	+19	SOT-343 (SC-70)

Low Noise pHEMTs (Typical Specifications @ 25°C Case Temperature)

Part Number	Gate Width (μm)	Frequency Range (GHz)	Test Freq. (GHz)	V _{dd} (V)	I _{dd} (mA)	NF _o (dB)	G _a (dB)	OIP3 (dBm)	P _{1 dB} (dBm)	Package
ATF-33143	1600	0.45 - 6	2	4	80	0.5	15.0	33.5	+22	SOT-343 (SC-70)
ATF-331M4	1600	0.45 - 6	2	4	60	0.6	15.0	31	+19	MiniPak ^[2]
ATF-34143	800	0.45 - 6	2	4	60	0.5	17.5	31.5	+20	SOT-343 (SC-70)
ATF-35143	400	0.45 - 6	2	2	15	0.4	18.0	21	+10	SOT-343 (SC-70)
ATF-38143	800	0.45 - 6	2	2	10	0.4	16.0	22	+12	SOT-343 (SC-70)
ATF-36077	200	1.5 - 18	12	1.5	10	0.5	12.0	—	+5	70 mil SM
ATF-36163	200	1.5 - 18	12	1.5	15	1.2	10.0	—	+5	SOT-363 (SC-70)

Notes:

- Agilent's enhancement mode E-pHEMT devices are the first commercially available single-supply GaAs transistors that do not need a negative gate bias voltage for operation. They can help simplify the design and reduce the cost of receivers and transmitters in many RF applications.
- MiniPak is a thin miniature packaging with the following dimension: 1.4 mm (L) x 1.2 mm (W) x 0.7 mm (D)
- LPCC (Leadless Plastic Chip Carrier) is a copper leadframe based plastic molded package with the following dimensions: 2.0 mm (L) x 2.0 mm (W) x 0.75 mm (D)

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