

# Transistor 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 <sup>[1]</sup>	SOT-143 plastic SM
	AT-30533	0.9	2.7	1.1	13.0	+7.0	15.0	15.2 <sup>[1]</sup>	SOT-23 plastic SM
	AT-31011	0.9	2.7	0.9	13.0	+9.0	14.0	19.1 <sup>[1]</sup>	SOT-143 plastic SM
	AT-31033	0.9	2.7	0.9	11.0	+9.0	12.0	15.8 <sup>[1]</sup>	SOT-23 plastic SM
	AT-32011	0.9	2.7	1.0	14.0	+13.0	16.5	18.9 <sup>[1]</sup>	SOT-143 plastic SM
NEW	AT-32032	0.9	2.7	1.0	15.0	+13.0	15.5	11.5 <sup>[1]</sup>	SOT-323 plastic SM
	AT-32033	0.9	2.7	1.0	12.5	+13.0	14.5	15.1 <sup>[1]</sup>	SOT-23 plastic SM
NEW	AT-32063 <sup>[2]</sup>	0.9	2.7	1.1	14.5	+12.0	16.0	17.0 <sup>[1]</sup>	SOT-363 plastic SM
	AT-41410	2.0	8.0	1.6	14.0	+19.0	14.0	17.7	100 mil stripline
	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-41485	1.0	8.0	1.4	18.5	+18.5	14.0 <sup>[3]</sup>	17.5	85 mil plastic
	AT-41486	1.0	8.0	1.4	18.0	+18.0	13.5 <sup>[3]</sup>	17.5	85 mil plastic SM
	AT-41511	0.9	5.0	1.0	15.5	+14.5	17.5	15.8 <sup>[1]</sup>	SOT-143 plastic SM
NEW	AT-41532	0.9	5	1.0	15.5	+14.5	14.5	13.3 <sup>[1]</sup>	SOT-323 plastic SM
	AT-41533	0.9	5.0	1.0	14.5	+14.5	14.5	13.9 <sup>[1]</sup>	SOT-23 plastic SM
	AT-41586	1.0	8.0	1.4	17.0	+18.0	13.0 <sup>[3]</sup>	17.0	85 mil plastic SM
	AT-42010	2.0	8.0	1.9	13.5	+21.0	14.0	17.0	100 mil stripline
	AT-42035	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
NEW	HBFP-0405	1.8	2.0	1.2	18	+5	17	17 <sup>[4]</sup>	SOT-343 plastic SM
NEW	HBFP-0420	1.8	2.0	1.1	17	+12	16	17 <sup>[4]</sup>	SOT-343 plastic SM
NEW	HBFP-0450	1.8	2.0	1.3	14	+19	16	12 <sup>[4]</sup>	SOT-343 plastic SM

**Notes:**

1. Typical at 900 MHz
2. Dual transistor — All data is per individual transistor.
3. Typical  $G_{1\text{dB}}$  at 2 GHz
4. Typical @ 1.8 GHz

## Silicon Bipolar Transistors, continued

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

Part Number	$V_{CE}$	$P_{1\text{dB}}$ @ 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
AT-64023	16.0	+28	12.5	+27	9.5	230 mil flange BeO

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

Part Number	Frequency (GHz)	$V_{CE}$ (V)	$P_{out}$ (dBm)	Power Gain (dB)	Collector Efficiency (%)	Package
NEW AT-31625	0.9	4.8	+28, CW	9	70	MSOP-3
NEW AT-33225	0.9	4.8	+31, CW	9	70	MSOP-3
NEW AT-36408	0.9	4.8	+35, pulsed	9	60	SOIC-8
NEW AT-38043	0.9	4.8	+25, CW	15	60	SOT-343 plastic SM
NEW AT-38086	0.9	4.8	+28, pulsed	11	60	85 mil plastic

## 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.

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

Part Number	Gate Width (mm)	Optimum Frequency Range (GHz)	Test Frequency (GHz)	$V_{dd}$ (V)	$NF_o$ (dB)	$G_a$ (dB)	$P_{1\text{dB}}$ (dBm)	Package
ATF-36077	200	1.5 - 18	12	1.5	0.5	12.0	+5	70 mil SM
ATF-36163	200	1.5 - 18	12	1.5	1.2	10.0	+5	SOT-363 (SC-70)
ATF-34143	800	0.45 - 6	22	4	0.5	17.5	+20	SOT-343 (SC-70)

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

Part Number	Gate Width (mm)	Optimum Frequency Range (GHz)	Test Frequency (GHz)	$V_{dd}$ (V)	$NF_o$ (dB)	$G_a$ (dB)	$P_{1\text{dB}}$ (dBm)	Package
ATF-13336	250	2 - 16	12	2.5	1.4	9.0	+17.5	micro-X SM
ATF-13736	250	2 - 16	12	2.5	1.8	9.0	+17.5	micro-X SM
ATF-13786	250	1 - 12	10	3.0	—	7.5 <sup>[1]</sup>	+16.5	85 mil plastic SM
ATF-26836	250	2 - 16	12	5.0	2.2	9.0	+18.0	micro-X SM
ATF-26884	250	2 - 16	12	5.0	2.2	9.0	+18.0	85 mil plastic
ATF-10136	500	0.5 - 12	4	2.0	0.5	13.0	+20.0	micro-X SM
ATF-10236	500	0.5 - 12	4	2.0	0.8	13.0	+20.0	micro-X SM
ATF-10736	500	0.5 - 12	4	2.0	1.3	13.0	+20.0	micro-X SM
ATF-25170	500	0.5 - 10	4	3.0	0.8	14.0	+21.0	70 mil stripline
ATF-25570	500	0.5 - 10	4	3.0	1.0	14.0	+20.5	70 mil stripline
ATF-21170	750	0.5 - 6	4	3.0	0.9	13.0	+23.0	70 mil stripline
ATF-21186	750	0.5 - 6	2	2.0	0.65	13.0	+19.0	85 mil plastic SM

Note 1.  $G_{1\text{dB}}$

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

Part Number	Gate Width (mm)	Optimum Frequency Range (GHz)	Test Frequency (GHz)	$V_{dd}$ (V)	$P_{1\text{dB}}$ (dBm)	$G_{1\text{dB}}$ (dBm)	Package
ATF-44101	5000	2 - 8	4	9.0	+32.0	8.5	100 mil flange
ATF-45101	2500	2 - 8	4	9.0	+29.0	10.0	100 mil flange
ATF-45171	2500	2 - 8	4	9.0	+29.0	10.5	70 mil flange
ATF-46101	1250	2 - 10	4	9.0	+27.0	10.0	100 mil flange
ATF-46171	1250	2 - 10	4	9.0	+27.0	11.0	70 mil flange

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