

Features

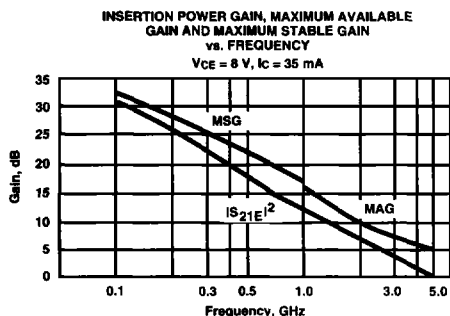
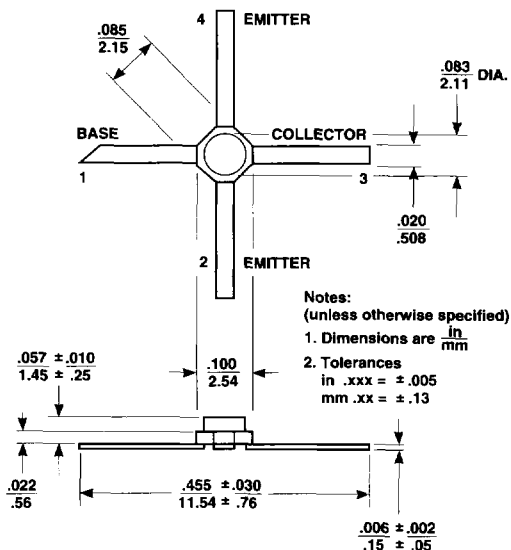
- 22.0 dBm typical P_1 dB at 2.0 GHz
- 9.5 dB typical G_1 dB at 2.0 GHz
- High Gain-Bandwidth Product: 7.0 GHz typical f_T
- Cost Effective Ceramic Microstrip Package

Description

The AT-01635 is a high performance NPN silicon bipolar transistor housed in a cost effective, microstrip package. This device is designed for use in medium power, wide band amplifier applications operating over VHF, UHF and microwave frequencies.

Excellent device uniformity, performance and reliability are produced by the use of ion-implantation, self-alignment techniques, and gold metallization in the fabrication of these devices.

35 micro-X Package



Electrical Specifications, $T_A = 25^\circ\text{C}$

Symbol	Parameters and Test Conditions	Units	Min.	Typ.	Max.
$ S_{21E} ^2$	Insertion Power Gain: $V_{CE} = 8$ V, $I_C = 35$ mA $f = 1.0$ GHz $f = 2.0$ GHz	dB	11.0	12.0 6.5	
P_1 dB	Power Output @ 1 dB Gain Compression: $V_{CE} = 8$ V, $I_C = 60$ mA $f = 2.0$ GHz	dBm		22.0	
G_1 dB	1 dB Compressed Gain: $V_{CE} = 8$ V, $I_C = 60$ mA $f = 2.0$ GHz	dB		9.5	
NFO	Optimum Noise Figure: $V_{CE} = 8$ V, $I_C = 35$ mA $f = 2.0$ GHz	dB		3.0	
G_A	Gain @ NFO: $V_{CE} = 8$ V, $I_C = 35$ mA $f = 2.0$ GHz	dB		10.0	
f_T	Gain Bandwidth Product: $V_{CE} = 8$ V, $I_C = 35$ mA	GHz		7.0	
h_{FE}	Forward Current Transfer Ratio: $V_{CE} = 8$ V, $I_C = 35$ mA		30	150	300
I_{CBO}	Collector Cutoff Current: $V_{CB} = 8$ V	μA			0.2
I_{EBO}	Emitter Cutoff Current: $V_{EB} = 1$ V	μA			2.0
CGB	Collector Base Capacitance ¹ : $V_{CE} = 8$ V, $f = 1$ MHz	pF		0.8	

Note: 1. For this test, the emitter is grounded.

AT-01635

General Purpose Silicon Bipolar Transistor

Absolute Maximum Ratings

Parameter	Symbol	Absolute Maximum ¹
Emitter-Base Voltage	VEBO	1.5 V
Collector-Base Voltage	VCBO	20 V
Collector-Emitter Voltage	VCEO	12 V
Collector Current	IC	150 mA
Power Dissipation ^{2,3}	PT	1000 mW
Junction Temperature	TJ	200°C
Storage Temperature ⁴	TSTG	-65°C to 200°C

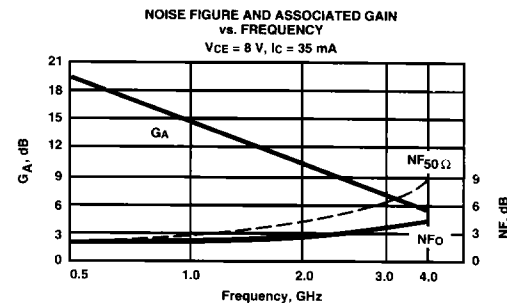
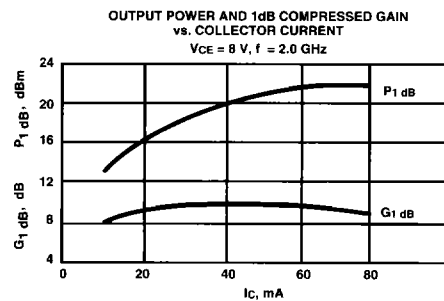
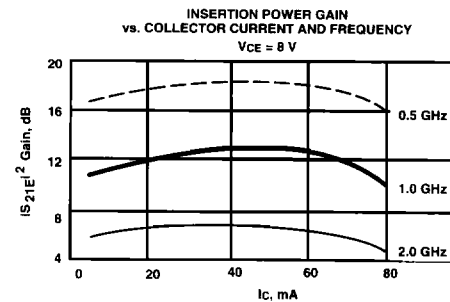
Thermal Resistance^{2,5}: $\theta_{JC} = 145^\circ\text{C/W}$

Notes:

1. Operation of this device above any one of these parameters may cause permanent damage.
2. TCASE = 25°C.
3. Derate at 6.9 mW/°C for $T_C > 55^\circ\text{C}$.
4. Storage above 150°C may tarnish the leads of this package making it difficult to solder into a circuit. After a device has been soldered into a circuit, it may be safely stored up to 200°C.
5. The small spot size of this technique results in a higher, though more accurate determination of θ_{JC} than do alternate methods. See MEASUREMENTS section "Thermal Resistance" for more information.

Typical Performance, $T_A = 25^\circ\text{C}$

(unless otherwise noted)



Typical Scattering Parameters: Common Emitter, $Z_0 = 50\ \Omega$

$T_A = 25^\circ\text{C}, V_{CE} = 8\text{ V}, I_C = 35\text{ mA}$

Freq. GHz	S ₁₁		S ₂₁			S ₁₂			S ₂₂	
	Mag	Ang	dB	Mag	Ang	dB	Mag	Ang	Mag	Ang
0.1	.61	-119	30.6	33.90	119	-32.4	.024	52	.50	-69
0.5	.62	-173	18.0	7.97	85	-26.0	.050	53	.20	-130
1.0	.63	169	12.3	4.10	68	-21.4	.085	52	.18	-152
1.5	.65	157	9.0	2.80	55	-19.0	.112	48	.18	-167
2.0	.67	146	6.6	2.14	42	-17.1	.139	43	.20	-178
2.5	.69	140	4.9	1.75	34	-15.7	.164	41	.23	176
3.0	.71	132	3.4	1.47	23	-14.9	.180	36	.25	172
3.5	.71	123	2.2	1.29	12	-13.9	.202	31	.28	169
4.0	.71	115	1.2	1.15	2	-12.9	.226	25	.29	168
4.5	.70	104	0.4	1.05	-8	-12.2	.246	19	.30	165
5.0	.71	93	-0.3	0.97	-19	-11.4	.270	12	.30	158

$T_A = 25^\circ\text{C}, V_{CE} = 8\text{ V}, I_C = 60\text{ mA}$

0.1	.60	-132	31.0	35.53	114	-35.4	.017	51	.42	-78
0.5	.64	-176	18.1	8.00	84	-27.0	.045	55	.20	-137
1.0	.66	167	12.3	4.11	68	-22.2	.077	55	.18	-160
1.5	.67	155	9.0	2.80	54	-19.7	.104	51	.19	-172
2.0	.68	144	6.5	2.12	41	-17.5	.133	46	.21	176
2.5	.70	138	4.8	1.73	34	-16.1	.157	45	.23	174
3.0	.71	130	3.3	1.46	23	-15.0	.178	40	.26	170
3.5	.72	122	2.1	1.27	13	-13.9	.203	33	.29	168
4.0	.71	114	1.1	1.13	2	-13.1	.221	28	.30	166
4.5	.71	104	0.4	1.04	-8	-12.1	.249	21	.30	163
5.0	.71	92	-0.3	0.95	-19	-11.4	.269	14	.31	156

A model for this device is available in the DEVICE MODELS section.