



ATF-26550 (AT-10650-5)
2-16 GHz General Purpose
Gallium Arsenide FET

T-31-25

Features

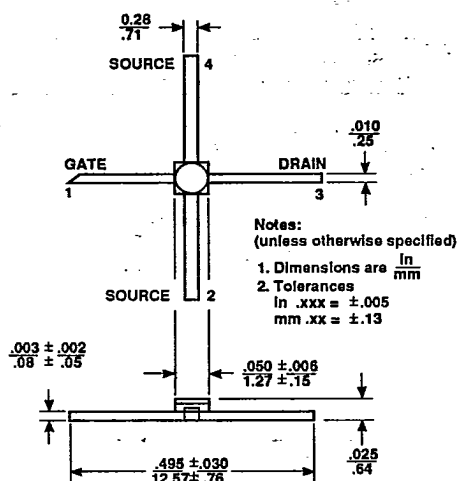
- High Associated Gain: 8.0 dB typical at 12 GHz
- High Output Power: 18.0 dBm typical $P_{1\text{ dB}}$ at 12 GHz
- Low Noise Figure: 2.5 dB typical at 12 GHz
- Hermetic Gold-Ceramic Microstrip Package

Description

Avantek's ATF-26550 is a high performance gallium arsenide Schottky-barrier-gate field effect transistor housed in a hermetic, high reliability package. Its noise figure makes this device appropriate for use in the gain stages of low noise amplifiers operating in the 2-16 GHz frequency range.

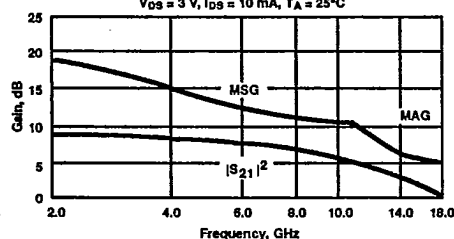
This GaAs FET device has a nominal 0.3 micron gate length with a total gate periphery of 250 microns. Proven gold based metallization systems and nitride passivation assure a rugged, reliable device.

Avantek 50 mil Package



INSERTION POWER GAIN, MAXIMUM AVAILABLE GAIN
AND MAXIMUM STABLE GAIN vs. FREQUENCY

$V_{DS} = 3\text{ V}$, $I_{DS} = 10\text{ mA}$, $T_A = 25^\circ\text{C}$

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

Symbol	Parameters and Test Conditions	Units	Min.	Typ.	Max.
NFO	Optimum Noise Figure: $V_{DS} = 3\text{ V}$, $I_{DS} = 10\text{ mA}$				
	$f = 8.0\text{ GHz}$	dB		2.2	
	$f = 12.0\text{ GHz}$			2.5	
	$f = 14.0\text{ GHz}$			2.7	2.8
GA	Gain @ NFO: $V_{DS} = 3\text{ V}$, $I_{DS} = 10\text{ mA}$				
	$f = 8.0\text{ GHz}$	dB		10.0	
	$f = 12.0\text{ GHz}$		7.0	8.0	
	$f = 14.0\text{ GHz}$			7.0	
$P_{1\text{ dB}}$	Output Power @ 1 dB Gain Compression: $V_{DS} = 5\text{ V}$, $I_{DS} = 30\text{ mA}$	dBm		18.0	
$G_{1\text{ dB}}$	1 dB Compressed Gain: $V_{DS} = 5\text{ V}$, $I_{DS} = 30\text{ mA}$	dB		7.5	
g_m	Transconductance: $V_{DS} = 3\text{ V}$, $V_{GS} = 0\text{ V}$	mmho	20	40	
I_{DSS}	Saturated Drain Current: $V_{DS} = 3\text{ V}$, $V_{GS} = 0\text{ V}$	mA	25	50	90
V_p	Pinchoff Voltage: $V_{DS} = 3\text{ V}$, $I_{DS} = 1\text{ mA}$	V	-3.0	-1.7	-0.8

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Absolute Maximum Ratings

Parameter	Symbol	Absolute Maximum ¹
Drain-Source Voltage	V _{DS}	+7 V
Gate-Source Voltage	V _{GS}	-4 V
Drain Current	I _{DS}	I _{DSS}
Power Dissipation ^{2,3}	P _T	275 mW
Channel Temperature	T _{CH}	175°C
Storage Temperature	T _{STG}	-65°C to +175°C

Thermal Resistance: $\theta_{JC} = 325^\circ\text{C/W}$; T_{CH} = 150°CLiquid Crystal Measurement; 1 μm Spot Size⁴

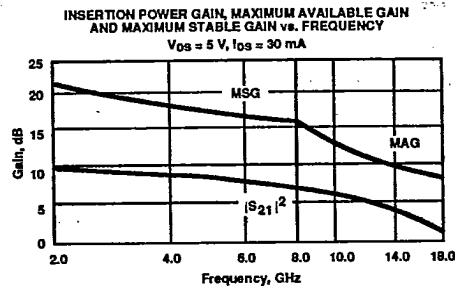
Notes:

- Operation of this device above any one of these parameters may cause permanent damage.
- Case Temperature = 25°C.
- Derate at 3 mW/°C for T_{CASE} > 86°C.
- 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 for more information.

Typical Performance, T_A = 25°C

(unless otherwise noted)

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Typical Scattering Parameters: Common Source, Z₀ = 50 Ω T_A = 25°C, V_{DS} = 3 V, I_{DS} = 10 mA

Freq. GHz	S ₁₁		S ₂₁			S ₁₂			S ₂₂	
	Mag	Ang	dB	Mag	Ang	dB	Mag	Ang	Mag	Ang
2.0	.95	-36	8.1	2.53	148	-28.0	.040	64	.75	-18
3.0	.92	-51	7.6	2.41	133	-24.7	.058	55	.71	-26
4.0	.90	-67	7.2	2.30	118	-22.4	.076	43	.68	-39
5.0	.87	-82	6.8	2.18	102	-20.5	.094	34	.64	-49
6.0	.84	-97	6.3	2.06	87	-19.0	.112	24	.60	-58
7.0	.80	-118	6.4	2.08	70	-18.2	.123	7	.55	-71
8.0	.73	-140	6.2	2.04	53	-17.4	.135	-5	.47	-85
9.0	.71	-161	5.8	1.95	35	-17.0	.142	-17	.43	-103
10.0	.67	-178	5.2	1.81	18	-16.7	.146	-27	.42	-120
11.0	.66	167	4.4	1.66	5	-16.8	.144	-39	.41	-134
12.0	.64	150	4.0	1.59	-10	-17.1	.140	-49	.40	-144
13.0	.63	133	3.6	1.51	-23	-17.4	.135	-59	.38	-154
14.0	.63	115	3.0	1.42	-38	-17.5	.133	-66	.36	-172
15.0	.62	99	2.5	1.34	-53	-17.7	.130	-74	.35	-158
16.0	.62	89	1.7	1.22	-67	-17.9	.128	-88	.40	134
17.0	.63	81	1.0	1.11	-79	-17.9	.127	-91	.44	123
18.0	.62	70	0.1	1.01	-92	-17.8	.129	-94	.48	118

T_A = 25°C, V_{DS} = 5 V, I_{DS} = 30 mA

2.0	.96	-38	9.0	2.82	144	-32.8	.023	69	.75	-20
3.0	.92	-52	8.4	2.62	130	-30.2	.031	70	.75	-28
4.0	.89	-66	7.9	2.48	116	-27.5	.042	68	.76	-36
5.0	.85	-82	7.8	2.46	100	-25.4	.054	65	.76	-47
6.0	.78	-102	7.7	2.43	84	-24.0	.063	46	.71	-57
7.0	.71	-124	7.5	2.38	66	-23.9	.064	30	.66	-68
8.0	.68	-144	7.2	2.30	52	-23.6	.066	25	.63	-78
9.0	.64	-163	7.0	2.23	37	-23.2	.069	19	.62	-86
10.0	.62	-178	6.4	2.08	21	-23.2	.069	12	.61	-99
11.0	.60	165	5.7	1.93	8	-23.1	.070	5	.61	-112
12.0	.60	149	5.2	1.82	-6	-23.1	.070	-3	.60	-124
13.0	.59	131	4.7	1.71	-21	-23.1	.070	-8	.60	-138
14.0	.59	122	4.1	1.60	-34	-22.5	.075	-15	.60	-152
15.0	.62	105	3.3	1.47	-48	-21.9	.080	-20	.59	-162
16.0	.61	93	3.0	1.42	-60	-21.5	.084	-25	.58	175
17.0	.62	83	2.2	1.29	-74	-21.1	.088	-31	.60	161
18.0	.63	73	1.1	1.13	-85	-20.3	.097	-40	.65	145

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