

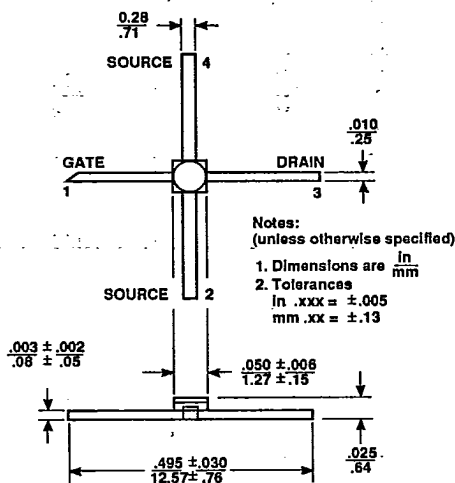


ATF-26150 (AT-10650-1)
2-16 GHz General Purpose
Gallium Arsenide FET

T-31-25

Features

- Low Noise Figure: 1.8 dB typical at 12 GHz
- High Associated Gain: 9.0 dB typical at 12 GHz
- High Output Power: 18.0 dBm typical $P_{1\text{ dB}}$ at 12 GHz
- Hermetic Gold-Ceramic Microstrip Package

Avantek 50 mil Package**Description**

Avantek's ATF-26150 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 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.

Noise Parameters: $V_{DS} = 3\text{ V}$, $I_{DS} = 10\text{ mA}$

Freq. GHz	NF ₀ dB	Gamma Mag	Opt Ang	R _N /50
6.0	1.3	.59	74	.77
8.0	1.5	.57	110	.56
12.0	1.8	.63	178	.06
14.0	2.0	.70	-134	.73

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

Symbol	Parameters and Test Conditions	Units	Min.	Typ.	Max.
NF ₀	Optimum Noise Figure: $V_{DS} = 3\text{ V}$, $I_{DS} = 10\text{ mA}$ $f = 8.0\text{ GHz}$ $f = 12.0\text{ GHz}$ $f = 14.0\text{ GHz}$	dB		1.5 1.8 2.0	2.2
G _A	Gain @ NF ₀ : $V_{DS} = 3\text{ V}$, $I_{DS} = 10\text{ mA}$ $f = 8.0\text{ GHz}$ $f = 12.0\text{ GHz}$ $f = 14.0\text{ GHz}$	dB	8.0	11.5 9.0 8.0	
P _{1 dB}	Output Power @ 1 dB Gain Compression: $V_{DS} = 5\text{ V}$, $I_{DS} = 30\text{ mA}$ $f = 12.0\text{ GHz}$	dBm		18.0	
G _{1 dB}	1 dB Compressed Gain: $V_{DS} = 5\text{ V}$, $I_{DS} = 30\text{ mA}$ $f = 12.0\text{ GHz}$	dB		8.0	
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

AVANTEK INC

ATF-26150, 2-16 GHz
General Purpose Gallium Arsenide FET

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°C
Liquid Crystal Measurement; 1 μm Spot Size⁴

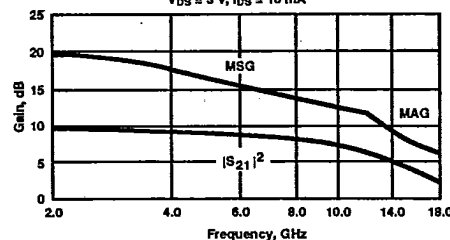
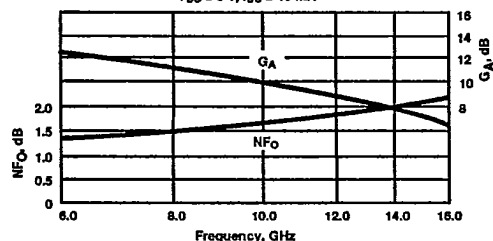
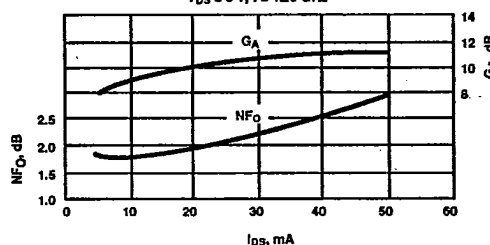
Notes:

- 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)

T-31-25

INSERTION POWER GAIN, MAXIMUM AVAILABLE GAIN
AND MAXIMUM STABLE GAIN vs. FREQUENCY
V_{DS} = 3 V, I_{DS} = 10 mAOPTIMUM NOISE FIGURE AND
ASSOCIATED GAIN vs. FREQUENCY
V_{DS} = 3 V, I_{DS} = 10 mAOPTIMUM NOISE FIGURE AND
ASSOCIATED GAIN vs. I_{DS}
V_{DS} = 3 V, f = 12.0 GHzTypical 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	dB	Mag	Mag	Ang
2.0	.96	-35	8.7	2.73	-28.0	.040	.76	-20
3.0	.93	-50	8.4	2.64	-26.2	.049	.72	-29
4.0	.91	-64	8.1	2.54	-24.7	.058	.68	-38
5.0	.88	-79	7.7	2.42	-23.5	.067	.64	-47
6.0	.85	-94	7.2	2.30	-22.4	.076	.60	-56
7.0	.81	-110	7.1	2.27	-21.4	.085	.56	-65
8.0	.76	-129	7.0	2.25	-20.3	.097	.51	-75
9.0	.73	-147	6.8	2.20	-19.4	.107	.46	-89
10.0	.69	-164	6.5	2.11	-19.2	.110	.44	-105
11.0	.67	-178	5.9	1.98	-19.1	.111	.41	-123
12.0	.64	166	5.7	1.93	-19.0	.112	.39	-137
13.0	.62	151	5.3	1.85	-18.9	.114	.37	-152
14.0	.59	135	5.1	1.81	-18.7	.116	.34	-173
15.0	.56	120	4.5	1.68	-18.6	.117	.35	160
16.0	.54	109	3.8	1.55	-18.5	.119	.41	137
17.0	.51	99	3.1	1.43	-18.4	.120	.46	125
18.0	.48	86	2.3	1.31	-18.1	.125	.51	114

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