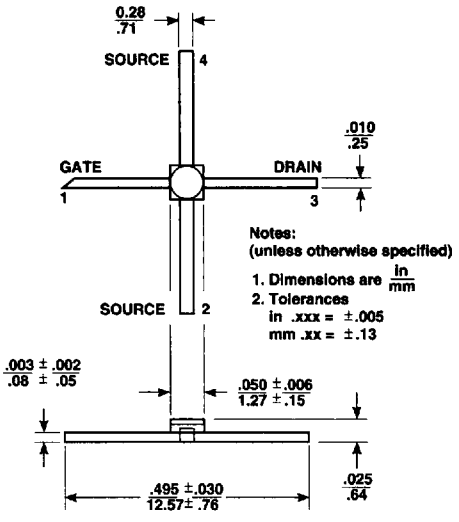
HEWLETT PACKARD

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

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 $P_{1\,dB}$ at 12 GHz**
- **Hermetic Gold-Ceramic Microstrip Package**

50 mil Package



Description

The 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 V, I_{DS} = 10 mA

Freq. GHz	NF_O dB	Gamma Opt Mag	Gamma 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°C

Symbol	Parameters and Test Conditions		Units	Min.	Typ.	Max.
NF_O	Optimum Noise Figure: V_{DS} = 3 V, I_{DS} = 10 mA	f = 8.0 GHz f = 12.0 GHz f = 14.0 GHz	dB dB dB		1.5 1.8 2.0	2.2
G_A	Gain @ NF_O: V_{DS} = 3 V, I_{DS} = 10 mA	f = 8.0 GHz f = 12.0 GHz f = 14.0 GHz	dB dB dB	8.0	11.5 9.0 8.0	
$P_{1\,dB}$	Output Power @ 1 dB Gain Compression: V_{DS} = 5 V, I_{DS} = 30 mA	f = 12.0 GHz	dBm		18.0	
$G_{1\,dB}$	1 dB Compressed Gain: V_{DS} = 5 V, I_{DS} = 30 mA	f = 12.0 GHz	dB		8.0	
g_m	Transconductance: V_{DS} = 3 V, V_{GS} = 0 V		mmho	20	40	
I_{DSS}	Saturated Drain Current: V_{DS} = 3 V, V_{GS} = 0 V		mA	30	50	90
V_P	Pinchoff Voltage: V_{DS} = 3 V, I_{DS} = 1 mA		V	–3.0	–1.7	–0.8

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

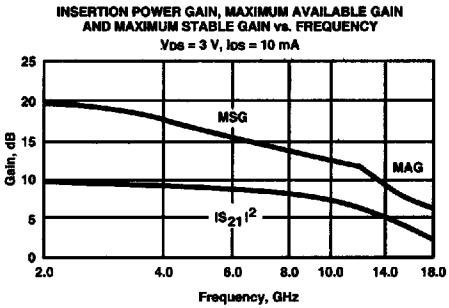
Thermal Resistance: θ_{jc} = 325°C/W; T_{CH} = 150°C
Liquid Crystal Measurement; 1 μm Spot Size[4]

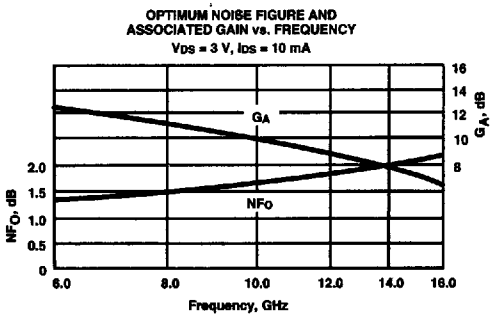
Notes:

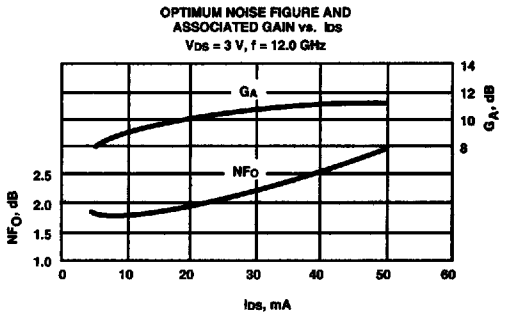
1. Operation of this device above any one of these parameters may cause permanent damage.
2. Case Temperature = 25°C.
3. Derate at 3 mW/°C for T_{CASE} > 86°C.
4. The small spot size of this technique results in a higher, though more accurate determination of θ_{jc} than do alternate methods. See MEASUREMENTS section for more information.

Typical Performance, T_A = 25°C

(unless otherwise noted)







Typical Scattering Parameters: Common Source, Z_O = 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	.96	–35	8.7	2.73	153	–28.0	.040	73	.76	–20
3.0	.93	–50	8.4	2.64	139	–26.2	.049	62	.72	–29
4.0	.91	–64	8.1	2.54	122	–24.7	.058	51	.68	–38
5.0	.88	–79	7.7	2.42	105	–23.5	.067	40	.64	–47
6.0	.85	–94	7.2	2.30	89	–22.4	.076	29	.60	–56
7.0	.81	–110	7.1	2.27	75	–21.4	.085	18	.56	–65
8.0	.76	–129	7.0	2.25	60	–20.3	.097	7	.51	–75
9.0	.73	–147	6.8	2.20	44	–19.4	.107	–3	.46	–89
10.0	.69	–164	6.5	2.11	27	–19.2	.110	–14	.44	–105
11.0	.67	–178	5.9	1.98	14	–19.1	.111	–20	.41	–123
12.0	.64	166	5.7	1.93	–1	–19.0	.112	–30	.39	–137
13.0	.62	151	5.3	1.85	–15	–18.9	.114	–32	.37	–152
14.0	.59	135	5.1	1.81	–29	–18.7	.116	–46	.34	–173
15.0	.56	120	4.5	1.68	–43	–18.6	.117	–54	.35	160
16.0	.54	109	3.8	1.55	–58	18.5	.119	–67	.41	137
17.0	.51	99	3.1	1.43	–71	18.4	.120	–72	.46	125
18.0	.48	86	2.3	1.31	–85	18.1	.125	–77	.51	114

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