

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

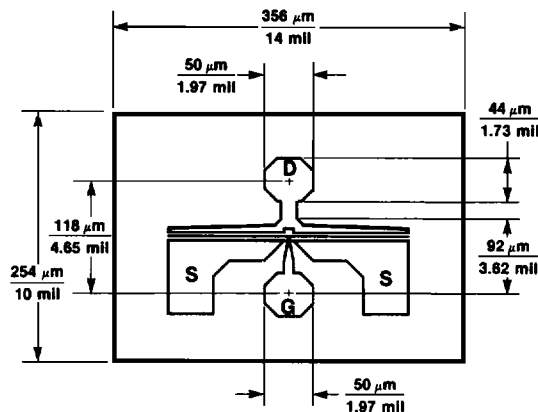
Description

The ATF-26100 is a high performance gallium arsenide Schottky-barrier-gate field effect transistor chip. This device is designed for use in low noise, wideband amplifier and oscillator applications in the 2-18 GHz frequency range.

This GaAs FET chip 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.

The recommended mounting procedure is to die attach at a stage temperature of 300 °C using a gold-tin preform under forming gas. Assembly can be performed with either wedge or ball bonding using 0.7 mil gold wire. See also "Chip Use" in the APPLICATIONS section.

Chip Outline



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	.67	52	1.08
8.0	1.5	.45	84	1.03
12.0	1.8	.22	-158	.84
14.0	2.0	.33	-136	.91

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

Symbol	Parameters and Test Conditions ¹	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 dB dB		1.5 1.8 2.0	2.2
GA	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 dB dB	8.0	12.0 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}	1dB 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	30	50	90
V _P	Pinchoff Voltage: $V_{DS} = 3\text{ V}$, $I_{DS} = 1\text{ mA}$	V	-3.0	-1.7	-0.8

Note: 1. RF performance is determined by assembling and testing 10 samples per wafer.

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: $\theta_{JC} = 225^{\circ}\text{C/W}$; $T_{CH} = 150^{\circ}\text{C}$
Liquid Crystal Measurement; 1 μm Spot Size⁴

Notes:

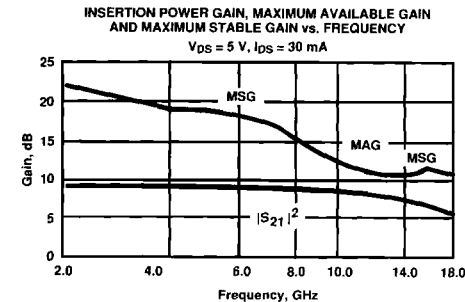
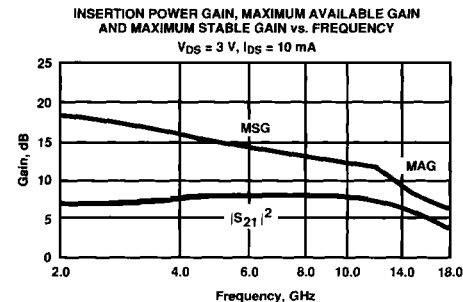
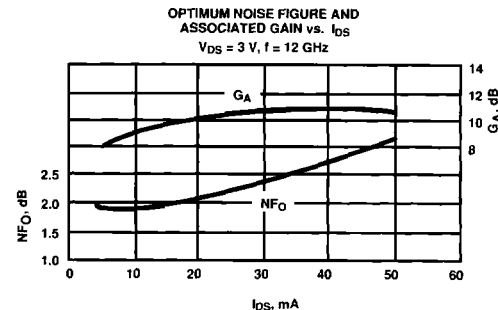
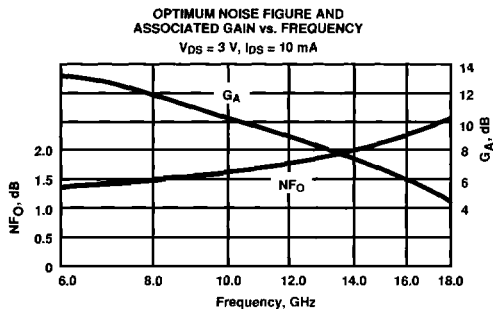
1. Operation of this device above any one of these parameters may cause permanent damage.
2. Mounting Surface Temperature = 25°C.
3. Derate at 4.4 mW/°C for T_{MOUNTING SURFACE} > 113°C.
4. The small spot size of this technique results in a higher, though more accurate determination of θ_{JC} than do alternate methods. See MEASUREMENTS section for more information.

Part Number Ordering Information

Part Number	Devices Per Tray
ATF-26100-GP1	5
ATF-26100-GP3	50
ATF-26100-GP6	up to 300

Typical Performance, T_A = 25°C

(unless otherwise noted)



ATF-26100, 2-18 GHz
General Purpose Gallium Arsenide FET

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

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

Freq. GHz	S_{11}		S_{21}			S_{12}			S_{22}	
	Mag	Ang	dB	Mag	Ang	dB	Mag	Ang	Mag	Ang
2.0	.98	-19	6.5	2.11	161	-29.4	.034	82	.68	-4
3.0	.96	-28	6.5	2.11	151	-25.8	.051	78	.67	-6
4.0	.93	-37	6.6	2.15	142	-23.5	.067	74	.64	-9
5.0	.90	-47	6.9	2.22	131	-21.5	.084	69	.61	-13
6.0	.86	-59	7.1	2.27	120	-19.9	.101	64	.57	-17
7.0	.80	-72	7.2	2.29	110	-18.6	.117	59	.52	-23
8.0	.74	-83	7.3	2.32	100	-17.7	.130	54	.48	-28
9.0	.68	-97	7.3	2.33	89	-16.9	.143	48	.43	-36
10.0	.61	-114	7.3	2.31	77	-16.1	.156	42	.38	-46
11.0	.55	-133	7.1	2.27	66	-15.6	.166	35	.33	-56
12.0	.52	-153	6.8	2.18	54	-15.2	.174	28	.28	-66
13.0	.49	-174	6.4	2.10	44	-14.9	.180	21	.24	-78
14.0	.49	165	6.0	2.00	33	-14.7	.184	10	.17	-99
15.0	.52	144	5.3	1.84	21	-14.6	.186	6	.15	-109
16.0	.54	131	4.6	1.69	12	-14.6	.187	3	.13	-121
17.0	.57	117	4.0	1.58	3	-14.5	.189	-6	.10	-177
18.0	.58	105	3.2	1.45	-6	-14.4	.190	-12	.13	145

$T_A = 25^\circ\text{C}$, $V_{DS} = 5 \text{ V}$, $I_{DS} = 30 \text{ mA}$

2.0	.98	-22	9.6	3.01	158	-33.2	.022	85	.71	-3
3.0	.93	-34	9.5	2.98	146	-30.8	.029	81	.70	-5
4.0	.87	-45	9.6	3.02	136	-28.2	.039	78	.68	-8
5.0	.81	-59	9.7	3.05	124	-25.8	.051	76	.65	-11
6.0	.74	-72	9.5	2.98	112	-24.7	.058	74	.62	-14
7.0	.68	-86	9.1	2.86	101	-23.4	.068	72	.60	-18
8.0	.63	-100	8.9	2.80	91	-22.5	.075	70	.57	-22
9.0	.56	-113	8.8	2.76	82	-21.7	.082	69	.55	-26
10.0	.51	-130	8.4	2.62	72	-20.6	.096	68	.53	-30
11.0	.46	-143	8.0	2.52	62	-20.0	.100	66	.51	-40
12.0	.42	-156	7.8	2.45	54	-19.6	.105	64	.47	-49
13.0	.41	-168	7.5	2.37	46	-18.9	.114	60	.46	-54
14.0	.40	164	7.2	2.29	38	-17.8	.129	56	.44	-60
15.0	.41	145	6.6	2.15	29	-16.9	.143	52	.42	-65
16.0	.44	132	6.2	2.04	21	-15.5	.167	45	.40	-72
17.0	.47	120	5.9	1.97	11	-14.7	.185	40	.35	-80
18.0	.51	104	5.2	1.83	2	-14.6	.187	34	.30	-93

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