

Features

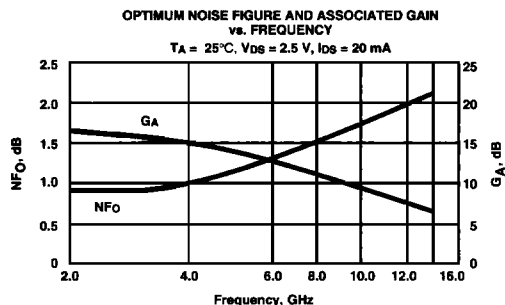
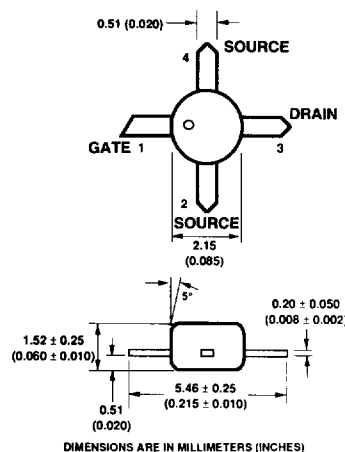
- **Low Noise Figure: 1.0 dB typical at 4 GHz**
- **High Associated Gain: 14.0 dB typical at 4 GHz**
- **High Output Power: 18.0 dBm typical P₁ dB at 4 GHz**
- **Low Cost Plastic Package**
- **Tape-and-Reel Packaging Option Available¹**

Description

The ATF-13484 is a high performance gallium arsenide Schottky-barrier-gate field effect transistor housed in a low cost plastic package. Its low noise figure makes this device appropriate for use in the first or second stages of low noise amplifiers operating in the 1-16 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.

84 Plastic Package



Noise Parameters: V_{DS} = 2.5 V, I_{DS} = 20 mA

Freq. GHz	NFO dB	Gamma Mag	Opt Ang	R _n /50
1.0	0.8	.92	14	1.3
2.0	0.8	.85	28	1.1
4.0	1.0	.76	61	0.9
8.0	1.5	.60	152	0.2
12.0	2.0	.55	-104	0.2

Electrical Specifications, T_A = 25°C

Symbol	Parameters and Test Conditions	Units	Min.	Typ.	Max.
NFO	Optimum Noise Figure: V _{DS} = 2.5 V, I _{DS} = 15 - 30 mA	f = 4.0 GHz dB f = 12.0 GHz		1.0 2.0	1.2
GA	Gain @ NFO: V _{DS} = 2.5 V, I _{DS} = 15 - 30 mA	f = 4.0 GHz dB f = 12.0 GHz	12.0	14.0 7.5	
P ₁ dB	Output Power @ 1 dB Gain Compression: V _{DS} = 4 V, I _{DS} = 40 mA	f = 4.0 GHz		18.0	
G ₁ dB	1dB Compressed Gain: V _{DS} = 4 V, I _{DS} = 40 mA	f = 4.0 GHz		14.5	
g _m	Transconductance: V _{DS} = 2.5 V, V _{GS} = 0 V	mmho	25	55	
I _{DS}	Saturated Drain Current: V _{DS} = 2.5 V, V _{GS} = 0 V	mA	40	50	90
V _P	Pinchoff Voltage: V _{DS} = 2.5 V, I _{DS} = 1 mA	V	-4.0	-1.5	-0.5

Note: 1. Refer to PACKAGING section "Tape-and-Reel Packaging for Surface Mount Semiconductors".

Absolute Maximum Ratings

Parameter	Symbol	Absolute Maximum ¹
Drain-Source Voltage	V _{DS}	+5 V
Gate-Source Voltage	V _{GS}	-4 V
Drain Current	I _{DS}	I _{DSS}
Total Power Dissipation ^{2,3}	P _T	225 mW
Channel Temperature	T _{CH}	175°C
Storage Temperature	T _{STG}	-65°C to +150°C

Thermal Resistance: $\theta_{JC} = 325^\circ\text{C/W}$; T_{CH} = 150°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. Case Temperature = 25°C.
3. Derate at 3.1 mW/°C for T_C > 102°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.

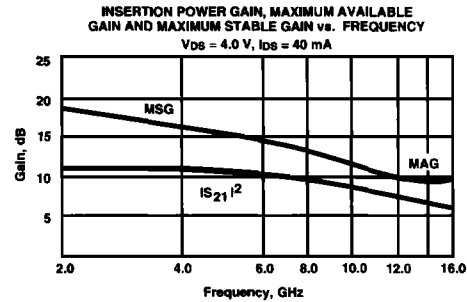
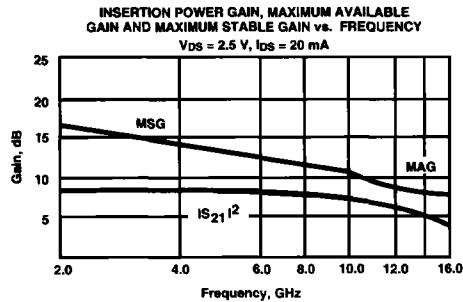
Part Number Ordering Information

Part Number	Devices Per Reel	Reel Size
ATF-13484-TR1	1000	7"
ATF-13484-TR2	4000	13"
ATF-13484-STR	1	strip

For more information, see "Tape and Reel Packaging for Semiconductor Devices", page 14-14.

Typical Performance, T_A = 25°C

(unless otherwise noted)



**ATF-13484, 1-16 GHz
Low Noise Gallium Arsenide FET**

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

$T_A = 25^\circ\text{C}$, $V_{DS} = 2.5 \text{ V}$, $I_{DS} = 20 \text{ mA}$

Freq. GHz	S_{11}		dB	S_{21}		dB	S_{12}		S_{22}	
	Mag	Ang		Mag	Ang		Mag	Ang	Mag	Ang
0.5	.99	-12	8.9	2.79	170	-37.1	.014	81	.50	-10
1.0	.99	-22	8.5	2.67	158	-32.4	.024	78	.50	-18
2.0	.97	-35	8.2	2.56	143	-26.2	.049	63	.50	-26
3.0	.92	-53	8.4	2.64	126	-23.1	.070	51	.49	-38
4.0	.87	-73	8.5	2.66	107	-20.4	.095	38	.45	-55
5.0	.80	-91	8.4	2.62	90	-18.9	.113	28	.41	-69
6.0	.75	-109	8.2	2.57	74	-17.3	.136	16	.38	-81
7.0	.69	-127	8.0	2.52	57	-16.6	.148	5	.34	-91
8.0	.64	-148	7.7	2.43	41	-15.7	.164	-5	.31	-102
9.0	.61	-173	7.4	2.35	23	-15.4	.169	-14	.25	-117
10.0	.58	163	6.8	2.20	6	-15.4	.170	-28	.20	-134
11.0	.57	140	6.2	2.03	-11	-15.3	.172	-38	.16	-165
12.0	.56	119	5.8	1.95	-23	-15.4	.170	-49	.11	161
13.0	.60	97	5.6	1.90	-41	-15.5	.168	-59	.09	121
14.0	.64	79	5.3	1.84	-56	-15.6	.166	-75	.12	74
15.0	.67	66	4.6	1.70	-69	-15.7	.164	-79	.17	52
16.0	.71	49	3.9	1.57	-81	-15.8	.162	-82	.22	30
17.0	.73	38	3.1	1.43	-94	-15.9	.160	-85	.28	20
18.0	.75	27	2.3	1.30	-106	-16.0	.158	-89	.34	14

$T_A = 25^\circ\text{C}$, $V_{DS} = 4.0 \text{ V}$, $I_{DS} = 40 \text{ mA}$

1.0	.98	-19	11.2	3.61	160	-33.2	.022	74	.61	-11
2.0	.94	-40	11.3	3.67	141	-27.1	.044	65	.58	-25
3.0	.88	-59	11.4	3.71	121	-23.4	.068	48	.54	-38
4.0	.80	-80	11.3	3.65	102	-21.6	.083	38	.48	-55
5.0	.72	-99	10.9	3.50	84	-20.2	.098	27	.44	-68
6.0	.65	-118	10.5	3.34	68	-19.1	.111	19	.40	-80
7.0	.59	-137	10.1	3.20	51	-18.1	.124	7	.37	-89
8.0	.54	-159	9.7	3.04	36	-17.3	.136	0	.34	-100
9.0	.52	175	9.1	2.86	19	-17.1	.140	-12	.29	-112
10.0	.50	151	8.5	2.65	2	-16.5	.150	-21	.23	-127
11.0	.50	129	7.7	2.43	-13	-16.4	.152	-31	.17	-150
12.0	.51	108	7.3	2.32	-25	-16.4	.151	-40	.12	-175
13.0	.55	87	7.0	2.25	-42	-16.4	.151	-47	.09	163
14.0	.62	70	6.8	2.20	-56	-16.5	.150	-58	.09	106
15.0	.67	60	6.3	2.06	-66	-16.5	.149	-65	.11	89
16.0	.69	44	5.6	1.90	-81	-16.7	.147	-72	.15	64
17.0	.66	30	4.5	1.68	-95	-16.1	.156	-82	.19	57
18.0	.62	18	3.8	1.55	-112	-15.0	.178	-100	.31	51