

# 2–16 GHz General Purpose Gallium Arsenide FET

## Technical Data

### ATF-26836

#### Features

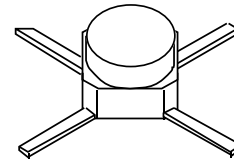
- **High Output Power:**  
18.0 dBm Typical  $P_{1\text{dB}}$  at 12 GHz
- **High Gain:**  
9.0 dB Typical  $G_{\text{SS}}$  at 12 GHz
- **Cost Effective Ceramic Microstrip Package**
- **Tape-and-Reel Packaging Option Available<sup>[1]</sup>**

#### Description

The ATF-26836 is a high performance gallium arsenide Schottky-barrier-gate field effect transistor housed in a cost effective microstrip package. This device is designed for use in oscillator applications and general purpose amplifier applications 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.

#### 36 micro-X Package



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

Symbol	Parameters and Test Conditions	Units	Min.	Typ.	Max.
$G_{\text{SS}}$	Tuned Small Signal Gain: $V_{\text{DS}} = 5\text{ V}$ , $I_{\text{DS}} = 30\text{ mA}$ $f = 12.0\text{ GHz}$	dB	7.0	9.0	
$\text{NF}_O$	Optimum Noise Figure: $V_{\text{DS}} = 3\text{ V}$ , $I_{\text{DS}} = 10\text{ mA}$ $f = 12.0\text{ GHz}$	dB		2.2	
$G_A$	Gain @ $\text{NF}_O$ : $V_{\text{DS}} = 3\text{ V}$ , $I_{\text{DS}} = 10\text{ mA}$ $f = 12.0\text{ GHz}$	dB		6.0	
$P_{1\text{dB}}$	Power Output @ 1 dB Gain Compression: $V_{\text{DS}} = 5\text{ V}$ , $I_{\text{DS}} = 30\text{ mA}$ $f = 12.0\text{ GHz}$	dBm	15.0	18.0	
$g_m$	Transconductance: $V_{\text{DS}} = 3\text{ V}$ , $V_{\text{GS}} = 0\text{ V}$	mmho	15	35	
$I_{\text{DSS}}$	Saturated Drain Current: $V_{\text{DS}} = 3\text{ V}$ , $V_{\text{GS}} = 0\text{ V}$	mA	30	50	90
$V_P$	Pinch-off Voltage: $V_{\text{DS}} = 3\text{ V}$ , $I_{\text{DS}} = 1\text{ mA}$	V	-3.5	-1.5	-0.5

#### Note:

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

## ATF-26836 Absolute Maximum Ratings

Symbol	Parameter	Units	Absolute Maximum <sup>[1]</sup>
V <sub>DS</sub>	Drain-Source Voltage	V	+7
V <sub>GS</sub>	Gate-Source Voltage	V	-4
V <sub>GD</sub>	Gate-Drain Voltage	V	-8
I <sub>DS</sub>	Drain Current	mA	I <sub>DSS</sub>
P <sub>T</sub>	Power Dissipation <sup>[2,3]</sup>	mW	275
T <sub>CH</sub>	Channel Temperature	°C	175
T <sub>STG</sub>	Storage Temperature <sup>[4]</sup>	°C	-65 to +175

**Thermal Resistance:**  $\theta_{jc} = 350^{\circ}\text{C}/\text{W}; T_{CH} = 150^{\circ}\text{C}$   
**Liquid Crystal Measurement:** 1  $\mu\text{m}$  Spot Size<sup>[5]</sup>

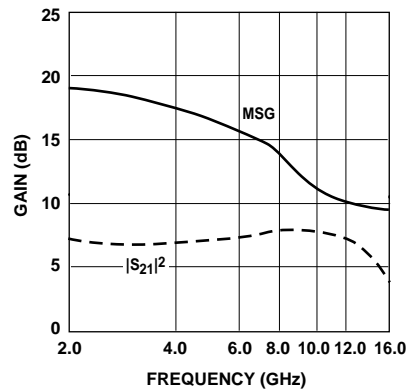
### Notes:

1. Permanent damage may occur if any of these limits are exceeded.
2. T<sub>CASE</sub> = 25°C.
3. Derate at 2.9 mW/°C for T<sub>CASE</sub> > 79°C.
4. Storage above +150°C may tarnish the leads of this package difficult to solder into a circuit. After a device has been soldered into a circuit, it may be safely stored up to 175°C.
5. The small spot size of this technique results in a higher, though more accurate determination of  $\theta_{jc}$  than do alternate methods. See MEASUREMENTS section for more information.

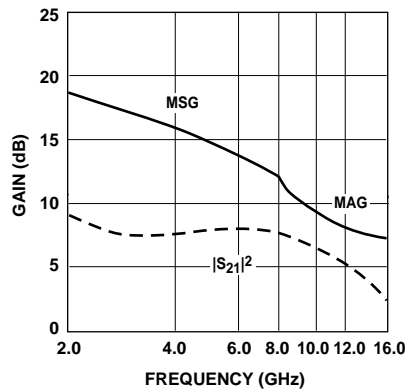
## Part Number Ordering Information

Part Number	Devices Per Reel	Reel Size
ATF-26836-TR1	1000	7"
ATF-26836-STR	10	strip

## ATF-26836 Typical Performance, T<sub>A</sub> = 25°C



**Figure 1. Insertion Power Gain, Maximum Available Gain and Maximum Stable Gain vs. Frequency.**  
V<sub>DS</sub> = 5 V, I<sub>DS</sub> = 30 mA.



**Figure 2. Insertion Power Gain, Maximum Available Gain and Maximum Stable Gain vs. Frequency.**  
V<sub>DS</sub> = 3 V, I<sub>DS</sub> = 10 mA.

**Typical Scattering Parameters, Common Emitter,  $Z_O = 50 \Omega$ ,  $T_A = 25^\circ\text{C}$ ,  $V_{DS} = 3\text{V}$ ,  $I_{DS} = 10\text{mA}$**

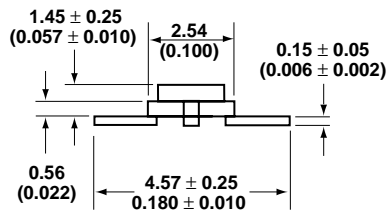
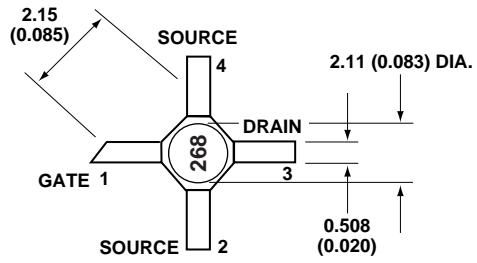
Freq. GHz	$S_{11}$		dB	$S_{21}$		dB	$S_{12}$		$S_{22}$	
	Mag.	Ang.		Mag.	Ang.		Mag.	Ang.	Mag.	Ang.
2.0	.94	-38	8.2	2.57	138	-27.1	.044	60	.74	-26
3.0	.90	-55	7.8	2.45	120	-24.9	.057	51	.71	-35
4.0	.84	-72	7.6	2.41	102	-22.9	.072	44	.71	-44
5.0	.75	-92	8.0	2.50	82	-20.6	.093	30	.66	-53
6.0	.64	-117	8.1	2.55	61	-19.3	.109	15	.60	-64
7.0	.52	-155	8.3	2.60	37	-18.1	.124	5	.51	-78
8.0	.49	163	7.9	2.47	14	-17.5	.133	-12	.41	-92
9.0	.52	126	7.2	2.30	-7	-16.9	.143	-21	.30	-106
10.0	.56	100	6.4	2.10	-28	-16.8	.144	-32	.24	-125
11.0	.61	78	5.6	1.91	-47	-17.1	.140	-41	.18	-154
12.0	.67	58	4.7	1.71	-66	-17.1	.139	-49	.15	168
13.0	.69	45	3.9	1.57	-83	-17.3	.137	-61	.17	134
14.0	.72	35	3.0	1.42	-98	-17.2	.138	-66	.19	107
15.0	.72	22	2.5	1.33	-115	-17.2	.138	-77	.23	89
16.0	.72	13	2.0	1.26	-128	-17.4	.135	-85	.27	71

**Typical Scattering Parameters, Common Emitter,  $Z_O = 50 \Omega$ ,  $T_A = 25^\circ\text{C}$ ,  $V_{DS} = 5\text{V}$ ,  $I_{DS} = 30\text{mA}$**

Freq. GHz	$S_{11}$		dB	$S_{21}$		dB	$S_{12}$		$S_{22}$	
	Mag.	Ang.		Mag.	Ang.		Mag.	Ang.	Mag.	Ang.
2.0	.94	-44	9.0	2.82	130	-30.2	.031	65	.80	-31
3.0	.86	-63	8.5	2.65	110	-28.4	.038	56	.80	-43
4.0	.78	-81	8.0	2.51	89	-26.9	.045	47	.79	-52
5.0	.68	-97	7.9	2.49	71	-25.5	.053	41	.78	-58
6.0	.57	-118	8.1	2.53	51	-24.4	.060	39	.76	-67
7.0	.43	-151	8.5	2.65	28	-22.4	.076	38	.73	-80
8.0	.37	165	8.5	2.66	3	-20.6	.093	30	.69	-99
9.0	.40	122	8.0	2.52	-20	-18.0	.126	15	.64	-119
10.0	.47	96	7.7	2.42	-42	-16.4	.152	3	.66	-140
11.0	.55	75	7.5	2.37	-66	-15.1	.176	-4	.63	-166
12.0	.61	53	7.4	2.35	-88	-13.8	.205	-19	.64	168
13.0	.71	33	7.4	2.34	-116	-13.2	.220	-39	.71	132
14.0	.71	10	6.7	2.17	-143	-13.5	.212	-56	.78	104
15.0	.65	-10	5.7	1.93	-170	-14.0	.200	-72	.85	79
16.0	.58	-30	4.2	1.62	166	-14.9	.180	-93	.98	61

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

### 36 micro-X Package Dimensions



**Notes:**

1. Dimensions are in millimeters (inches)
2. Tolerances: in .xxx = ± 0.005  
mm .xx = ± 0.13