Stanford Microdevices

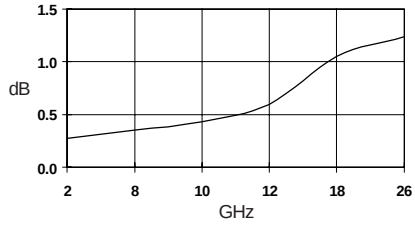
Product Description

Stanford Microdevices' SPF-1576 is a PHEMT gallium arsenide FET housed in a low cost, stripline mount ceramic package. These devices are ideal for use as the first stage of ultra low noise cascades operating in the 2-26 GHz frequency range.

This device has a 0.25 micron gate length with a total gate periphery of 200 microns. These rugged devices have proven gold metallization and nitride passivation. These devices are ideal for Ku-Band DBS systems as well as other low-noise amplifiers up to 26 GHz.

The SPF series of ceramic PHEMT FET's are available in tape and reel form and in different package styles.

Optimum Noise Figure vs. Frequency
Vds=2.0V, Ids=15mA



SPF-1576

2-26 GHz, Low Noise PHEMT GaAs FET

Product Features

- **Pseudomorphic HEMT Technology**
- **Low Noise Figure: 0.6dB Typical at 12 GHz**
- **High Associated Gain : 10dB typical at 12 GHz**
- **Low Cost Stripline Mount Ceramic Package**
- **Tape and Reel Packaging Available**

Applications

- **Ultra Low Noise Cascades**
- **VSAT Receivers**

Electrical Specifications at Ta = 25C

Symbol	Parameters: Test Conditions		Units	Min.	Typ.	Max.
NF_{opt}	Optimum Noise Figure: Vds = 2.0V, Ids = 15mA	f = 12 GHz f = 18 GHz	dB		0.6 1.0	0.7 1.2
G_a	Gain at NF_{opt}: Vds = 2.0V, Ids = 15mA	f = 12 GHz f = 18 GHz	dB dB	9.0 7.0	10.0 8.0	
I_{DSS}	Saturated Drain Current: Vds = 2.0V, Vgs = 0V		mA	15	35	70
G_m	Transconductance: Vds = 2.0V, Ids = 15mA		mmho	45	75	
V_p	Pinch-off Voltage: Vds = 2.0V, Ids = 1mA		V		-0.6	
V_{bgs}	Gate-to-Source Breakdown Voltage		V		-3.0	
V_{bgd}	Gate-to-Drain Breakdown Voltage		V		-3.0	

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SPF-1576 2-26 GHz Low Noise PHEMT GaAs FET

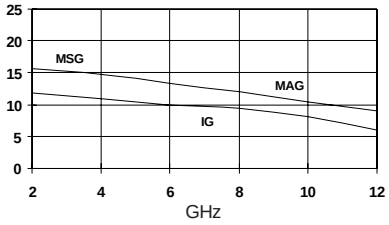
Absolute Maximum Ratings at 25C

Parameter	Absolute Maximum
Drain-Source Voltage (Vds)	+5V
Gate-Source Voltage (Vgs)	-3V
Drain Current (Ids)	Idss
Forward Gate Current (Igsf)	10mA
RF Input Power (Pin)	30mW
Channel Temperature (Tch)	+175C
Operating Temperature	-45C to +85C
Storage Temperature	-65C to +150C
Power Dissipation	180mW

Notes:

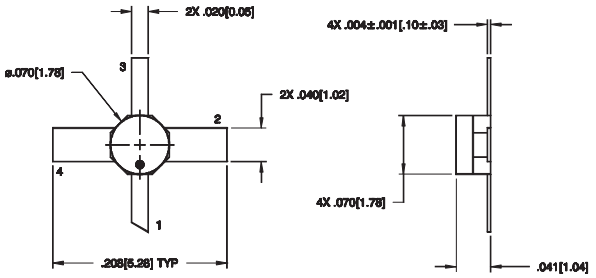
1. Operation of this device above any one of these parameters may cause permanent damage.
2. Mounting Surface Temperature = 25° C

Maximum Stable Gain, Maximum Available Gain and Insertion Gain vs. Frequency



Typical Noise Parameters (Vds=2.0V, Ids=15mA)

Freq. GHz	NF_{OPT} dB	Gamma Opt Mag	Gamma Opt Ang	$R_N/50$
2.0	0.4	0.81	13	0.23
4.0	0.4	0.68	24	0.23
6.0	0.5	0.64	37	0.22
8.0	0.5	0.57	52	0.19
10.0	0.5	0.51	66	0.17
12.0	0.6	0.47	81	0.16
14.0	0.8	0.47	95	0.14
16.0	0.9	0.42	112	0.11
18.0	1.0	0.43	128	0.09



Pin Designation	
1	Gate
2	Source
3	Drain
4	Source

Typical S-Parameters Vds= 2.0V, Ids= 15mA

Freq GHz	|S11|	S11 Ang	|S21|	S21 Ang	|S12|	S12 Ang	|S22|	S22 Ang
2.00	.960	-29	6.177	156	.039	73	.664	-18
4.00	.877	-42	4.951	146	.065	70	.523	-27
6.00	.805	-51	4.417	139	.084	69	.496	-28
8.00	.717	-62	4.209	132	.103	67	.455	-28
10.00	.588	-79	4.009	123	.121	65	.366	-34
12.00	.473	-113	3.594	114	.127	62	.263	-58
14.00	.597	-136	3.241	100	.132	52	.226	-105
16.00	.673	-146	2.652	93	.122	50	.247	-123
18.00	.696	-145	2.288	89	.118	50	.266	-122
20.00	.685	-139	2.022	88	.120	51	.267	-113
22.00	.688	-137	1.910	86	.126	50	.262	-107
24.00	.431	-113	1.870	90	.137	52	.135	-79
26.00	.445	-156	1.935	62	.164	43	.155	-128

(S-Parameters include the effects of two 1.0 mil diameter bond wires, each 30 mils long, connected to the gate and drain pads on the die)