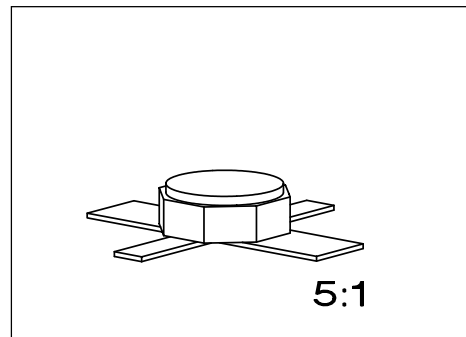


## GaAs FET

CFY 25

- Low noise
- High gain
- For front-end amplifiers
- Ion-implanted planar structure
- All gold metallization



**ESD:** Electrostatic discharge sensitive device, observe handling precautions!

Type	Marking	Ordering Code (tape and reel)	Pin Configuration				Package <sup>1)</sup>
			1	2	3	4	
CFY 25-17	C 5	Q62703-F106	D	S	G	S	Micro-X
CFY 25-20	C 6	Q62703-F107					
CFY 25-23	C 7	Q62703-F108					

### Maximum Ratings

Parameter	Symbol	Values	Unit
Drain-source voltage	$V_{DS}$	5	V
Drain-gate voltage	$V_{DG}$	7	
Gate-source voltage	$V_{GS}$	- 5 ... + 0	
Drain current	$I_D$	80	mA
Total power dissipation, $T_S \leq 56 \text{ }^\circ\text{C}^2)$	$P_{tot}$	250	mW
Channel temperature	$T_{ch}$	150	$^\circ\text{C}$
Storage temperature range	$T_{stg}$	- 65 ... + 150	

### Thermal Resistance

Channel - soldering point <sup>2)</sup>	$R_{th\ chS}$	375	K/W
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1) For detailed information see chapter Package Outlines.

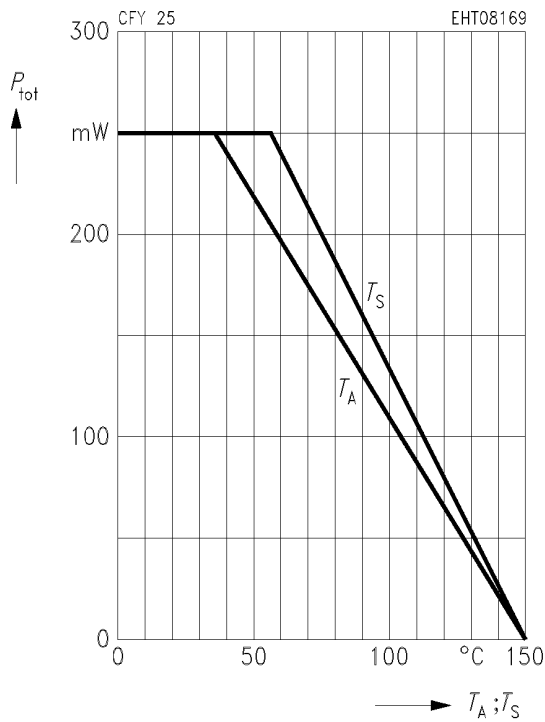
2)  $T_S$  is measured on the source lead at the soldering point to the pcb.

**Electrical Characteristics**

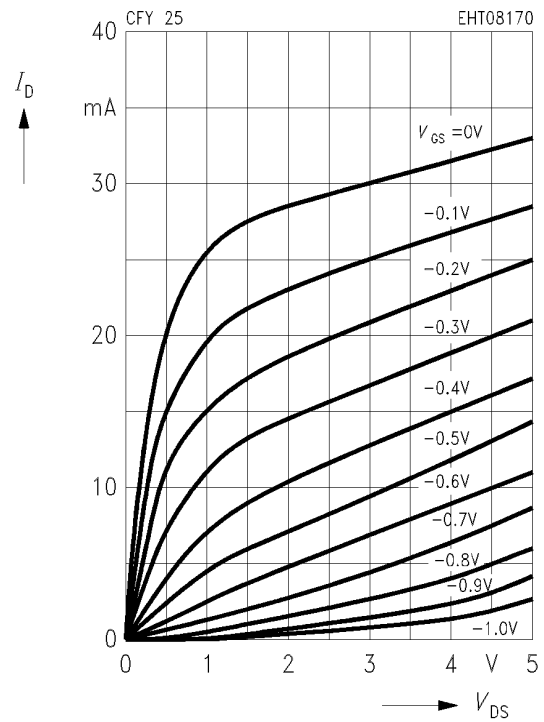
at  $T_A = 25\text{ }^\circ\text{C}$ , unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Drain-source saturation current $V_{DS} = 3\text{ V}$ , $V_{GS} = 0$	$I_{DSS}$	15	30	60	mA
Pinch-off voltage $I_D = 1\text{ mA}$ , $V_{DS} = 3\text{ V}$	$V_p$	- 0.3	- 1.0	- 3.0	V
Gate leakage current $I_D = 15\text{ mA}$ , $V_{DS} = 3\text{ V}$	$I_G$	-	0.1	2	$\mu\text{A}$
Transconductance $I_D = 15\text{ mA}$ , $V_{DS} = 3\text{ V}$	$g_m$	30	40	-	mS
Noise figure $I_{DS} = 15\text{ mA}$ , $V_{DS} = 3\text{ V}$ , $f = 12\text{ GHz}$	$F$				dB
CFY 25-17	-	1.6	1.7		
CFY 25-20	-	1.9	2.0		
CFY 25-23	-	2.2	2.3		
Associated gain $I_{DS} = 15\text{ mA}$ , $V_{DS} = 3\text{ V}$ , $f = 12\text{ GHz}$	$G_a$				
CFY 25-17	9	9.5	-		
CFY 25-20	8.5	9	-		
CFY 25-23	8.5	9	-		

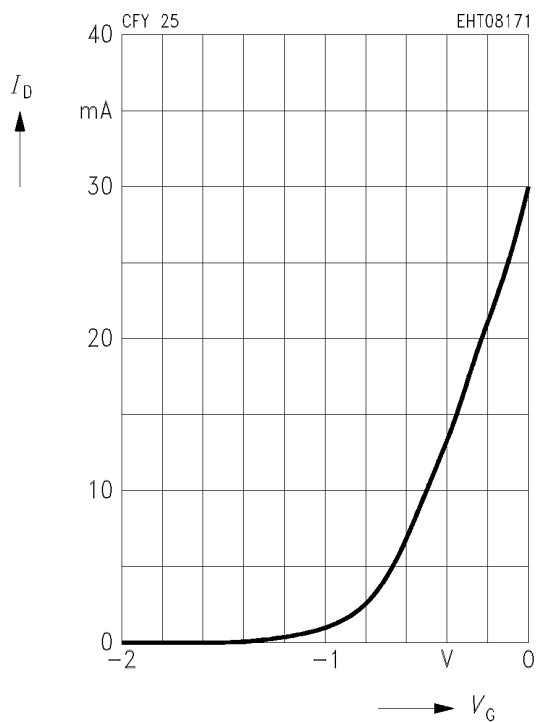
**Total power dissipation  $P_{tot} = f(T_S; T_A^*)$**   
 \* Package mounted on alumina



**Output characteristics  $I_D = f(V_{DS})$**



**Transfer characteristics  $I_D = f(V_G)$**   
 $V_{DS} = 3 V$



**Common Source Noise Parameters**

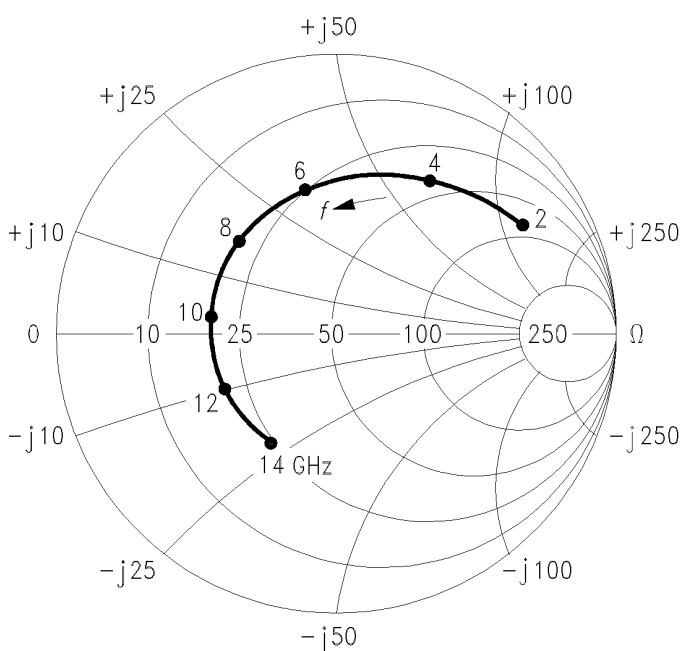
$f$	$F_{min}$	$G_a$	$\Gamma_{opt}$		$R_N$	$r_N$	$N$	$F_{50 \Omega}$	$G(F_{50 \Omega})$
GHz	dB	dB	MAG	ANG	$\Omega$	—	—	dB	dB

$I_D = 15 \text{ mA}, V_{DS} = 3.0 \text{ V}, Z_0 = 50 \Omega$

2	0.60	18.5	0.70	31	29	0.580	0.10	2.0	11.4
4	0.77	14.6	0.59	63	21	0.420	0.14	1.8	10.5
6	1.00	12.4	0.50	103	13	0.260	0.19	1.8	9.3
8	1.25	11.0	0.47	140	7.3	0.146	0.23	2.0	8.2
10	1.55	9.8	0.45	174	5.6	0.112	0.28	2.4	7.3
12	1.77	9.0	0.43	-156	7.1	0.142	0.29	2.5	6.4
14	2.15	8.1	0.41	-130	18	0.360	0.46	3.0	5.8

**Source impedance for min. noise figure**

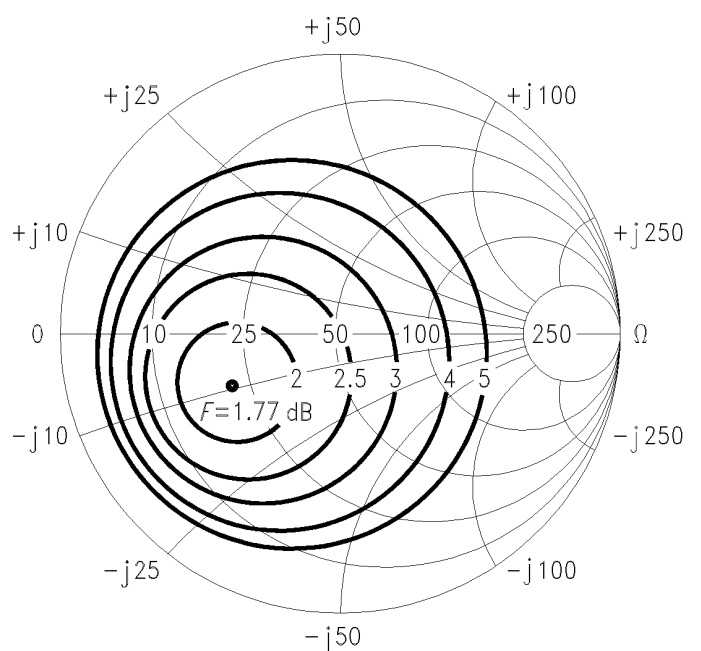
$I_D = 15 \text{ mA}, V_{DS} = 3 \text{ V}$



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**Circles of constant noise figure**

$I_D = 15 \text{ mA}, V_{DS} = 3 \text{ V}, f = 12 \text{ GHz}$

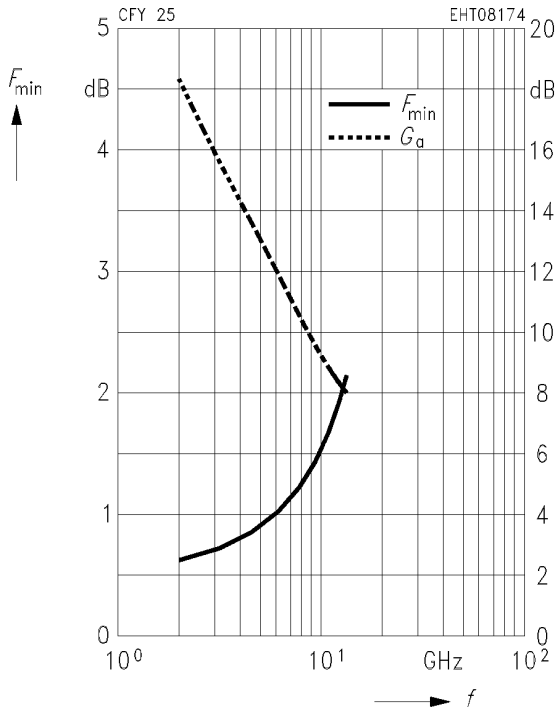


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**Minimum noise figure  $F_{min} = f(f)$**

**Associated gain  $G_a = f(f)$**

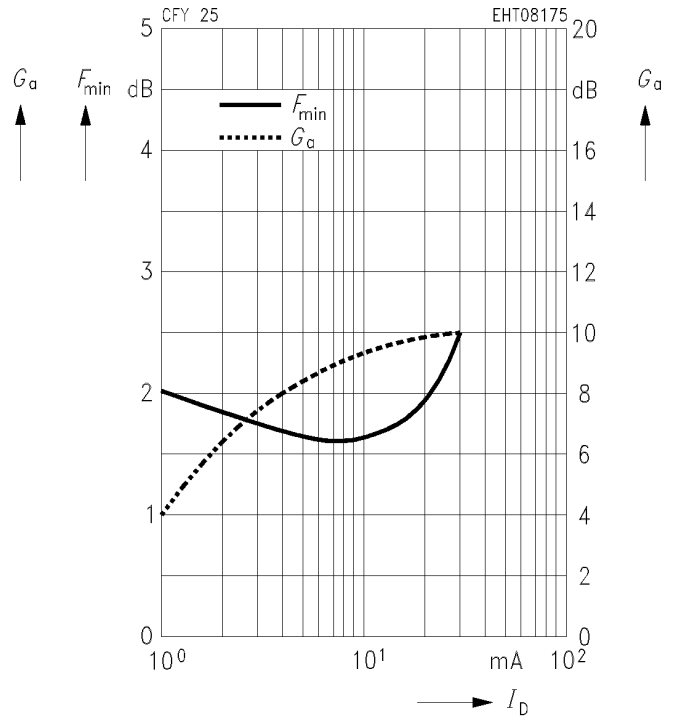
$I_D = 15 \text{ mA}$ ,  $V_{DS} = 3 \text{ V}$ ,  $Z_{Sopt}$



**Minimum noise figure  $F_{min} = f(I_D)$**

**Associated gain  $G_a = f(I_D)$**

$V_{DS} = 3 \text{ V}$ ,  $f = 12 \text{ GHz}$ ,  $Z_{Sopt}$

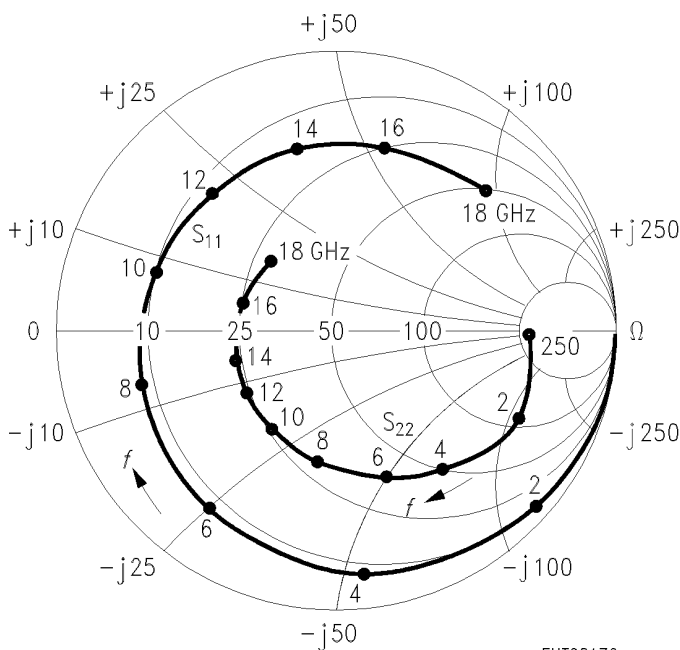


Common Source S Parameters

<i>f</i>	<i>S</i> <sub>11</sub>		<i>S</i> <sub>21</sub>		<i>S</i> <sub>12</sub>		<i>S</i> <sub>22</sub>	
GHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
<i>I</i> <sub>D</sub> = 15 mA, <i>V</i> <sub>DS</sub> = 3 V, <i>Z</i> <sub>0</sub> = 50 Ω								
1.0	0.99	- 21	3.83	161	0.026	75	0.68	- 13
2.0	0.96	- 42	3.73	141	0.049	61	0.66	- 27
3.0	0.91	- 67	3.55	121	0.069	45	0.63	- 41
4.0	0.86	- 87	3.34	103	0.083	33	0.59	- 55
5.0	0.81	- 107	3.10	86	0.093	21	0.56	- 66
6.0	0.77	- 125	2.92	70	0.100	11	0.52	- 77
7.0	0.74	- 145	2.74	54	0.105	1	0.48	- 89
8.0	0.70	- 165	2.57	37	0.107	- 9	0.45	- 102
9.0	0.68	178	2.42	23	0.108	- 17	0.42	- 112
10.0	0.67	161	2.31	9	0.109	- 24	0.41	- 124
11.0	0.67	146	2.20	- 4	0.110	- 30	0.39	- 134
12.0	0.66	132	2.10	- 17	0.110	- 36	0.37	- 145
13.0	0.66	117	2.02	- 31	0.110	- 42	0.36	- 158
14.0	0.66	103	1.94	- 44	0.112	- 49	0.35	- 169
15.0	0.66	90	1.90	- 57	0.115	- 55	0.34	180
16.0	0.66	77	1.84	- 70	0.119	- 63	0.33	165
17.0	0.66	63	1.80	- 84	0.125	- 72	0.32	151
18.0	0.66	47	1.78	- 99	0.132	- 83	0.31	136

*S*<sub>11</sub>, *S*<sub>22</sub>

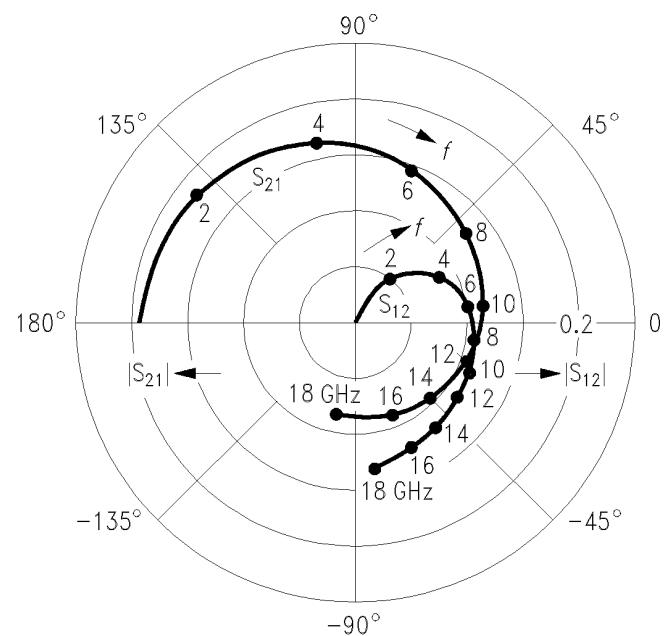
*I*<sub>D</sub> = 15 mA, *V*<sub>DS</sub> = 3 V, *Z*<sub>0</sub> = 50 Ω



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*S*<sub>12</sub>, *S*<sub>21</sub>

*I*<sub>D</sub> = 15 mA, *V*<sub>DS</sub> = 3 V, *Z*<sub>0</sub> = 50 Ω



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