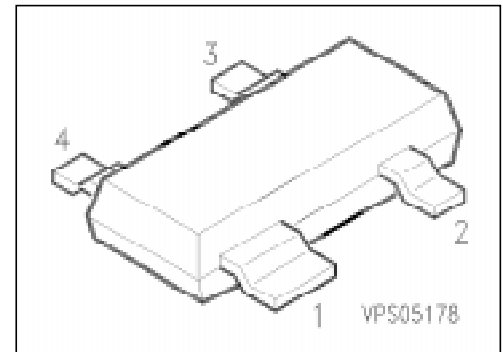


### Features

- N-channel dual-gate GaAs MES FET
- Depletion mode transistor for tuned small-signal applications up to 2 GHz, e. g. VHF, UHF, Sat-TV tuners
- Low noise
- High gain
- Low input capacitance



**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	
CF 739	MS	Q62702-F1215	S	D	G <sub>2</sub>	G <sub>1</sub>	SOT-143

### Maximum Ratings

Parameter	Symbol	Values	Unit
Drain-source voltage	$V_{DS}$	10	V
Gate 1-source voltage	$-V_{G1S}$	6	
Gate 2-source voltage	$-V_{G2S}$	6	
Drain current	$I_D$	80	mA
Gate 1-source peak current	$+I_{G1SM}$	1	
Gate 2-source peak current	$+I_{G2SM}$	1	
Total power dissipation, $T_s \leq 66\text{ °C}^2)$	$P_{tot}$	240	mW
Channel temperature	$T_{ch}$	150	°C
Storage temperature range	$T_{stg}$	- 55 ... + 150	

### Thermal Resistance

Channel - soldering point <sup>3)</sup>	$R_{thchS}$	$\leq 350$	K/W
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<sup>1)</sup> For detailed information see chapter Package Outlines.

<sup>2)</sup> Package mounted on alumina 15 mm × 16.7 mm × 0.7 mm.

<sup>3)</sup>  $T_s$  is measured on the source lead at the soldering point to the pcb.

## Electrical Characteristics

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

### DC Characteristics

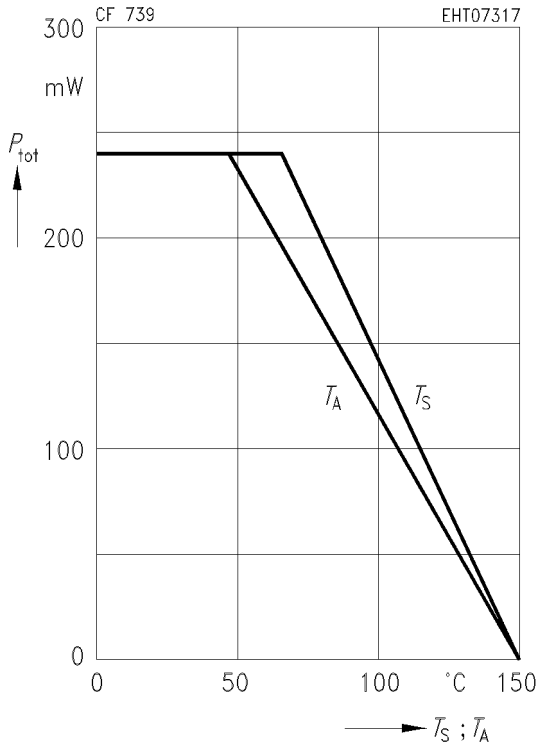
Drain-source breakdown voltage $I_D = 100\text{ }\mu\text{A}$ , $-V_{G1S} = -V_{G2S} = 4\text{ V}$	$V_{(BR)DS}$	10	–	–	V
Gate 1 leakage current $-V_{G1S} = 5\text{ V}$ , $V_{G2S} = V_{DS} = 0$	$-I_{G1SS}$	–	–	20	$\mu\text{A}$
Gate 2 leakage current $-V_{G2S} = 5\text{ V}$ , $V_{G1S} = V_{DS} = 0$	$-I_{G2SS}$	–	–	20	
Drain current $V_{G1S} = 0$ , $V_{G2S} = 0$ , $V_{DS} = 3\text{ V}$	$I_{DSS}$	6	–	60	mA
Gate 1-source pinch-off voltage $V_{G2S} = 0$ , $V_{DS} = 5\text{ V}$ , $I_D = 200\text{ }\mu\text{A}$	$-V_{G1S(P)}$	–	–	2.5	V
Gate 2-source pinch-off voltage $V_{G1S} = 0$ , $V_{DS} = 5\text{ V}$ , $I_D = 200\text{ }\mu\text{A}$	$-V_{G2S(P)}$	–	–	2.5	

### AC Characteristics

Forward transconductance $V_{DS} = 5\text{ V}$ , $V_{G2S} = 2\text{ V}$ , $I_D = 10\text{ mA}$ , $f = 1\text{ kHz}$	$g_{fs}$	–	25	–	mS
Gate 1 input capacitance $V_{G2S} = 2\text{ V}$ , $V_{DS} = 5\text{ V}$ , $I_D = 10\text{ mA}$ , $f = 1\text{ MHz}$	$C_{gfss}$	–	0.95	–	pF
Output capacitance $V_{G2S} = 2\text{ V}$ , $V_{DS} = 5\text{ V}$ , $I_D = 10\text{ mA}$ , $f = 1\text{ MHz}$	$C_{dss}$	–	0.5	–	
Noise figure $V_{G2S} = 2\text{ V}$ , $V_{DS} = 5\text{ V}$ , $I_D = 10\text{ mA}$ , $f = 1.75\text{ GHz}$ $V_{G2S} = 2\text{ V}$ , $V_{DS} = 5\text{ V}$ , $I_D = 10\text{ mA}$ , $f = 800\text{ MHz}$	$F$	–	1.8	–	dB
		–	1.1	–	
Power gain $V_{G2S} = 2\text{ V}$ , $V_{DS} = 5\text{ V}$ , $I_D = 10\text{ mA}$ , $f = 1.75\text{ GHz}$ $V_{G2S} = 2\text{ V}$ , $V_{DS} = 5\text{ V}$ , $I_D = 10\text{ mA}$ , $f = 800\text{ MHz}$	$G_{ps}$	–	17	–	
		–	22	–	
Control range $V_{G2S} = 2\text{ V} \dots -3\text{ V}$	$\Delta G_{psc}$	–	50	–	

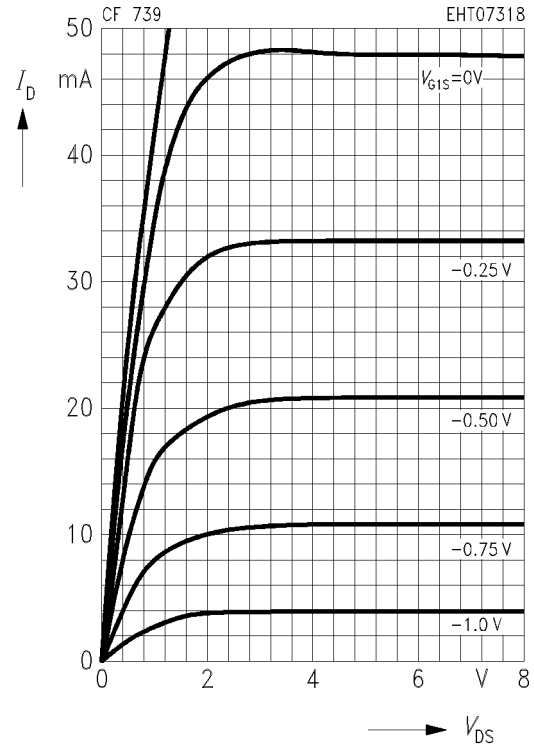
**Total power dissipation  $P_{tot} = f(T_A^*; T_S)$**

\*Package mounted on alumina



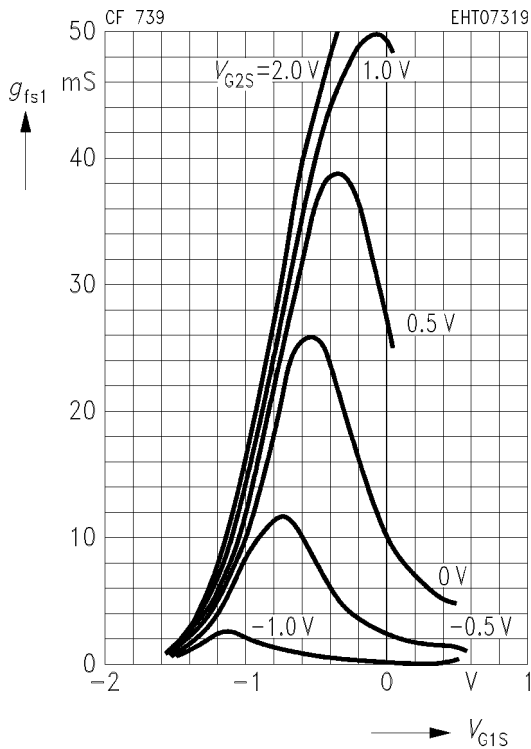
**Output characteristics  $I_D = f(V_{DS})$**

$V_{G2S} = 2\text{ V}$



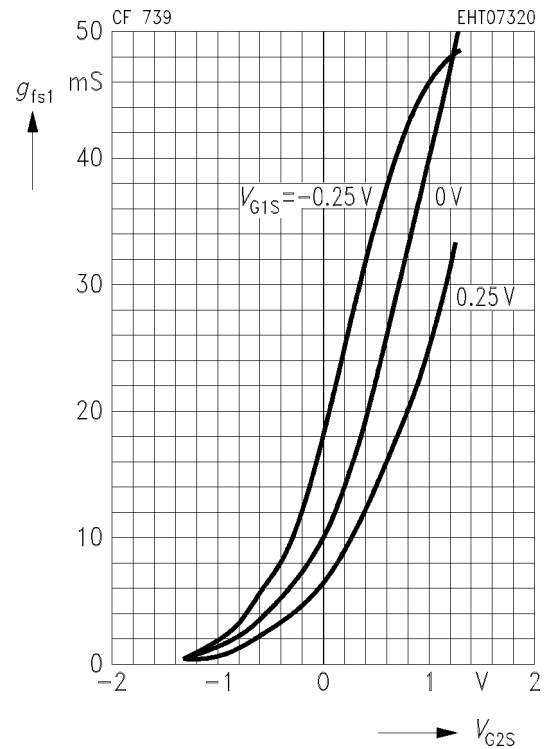
**Gate 1 forward transconductance  $g_{fs1} = f(V_{G1S})$**

$V_{DS} = 5\text{ V}, f = 1\text{ kHz}$



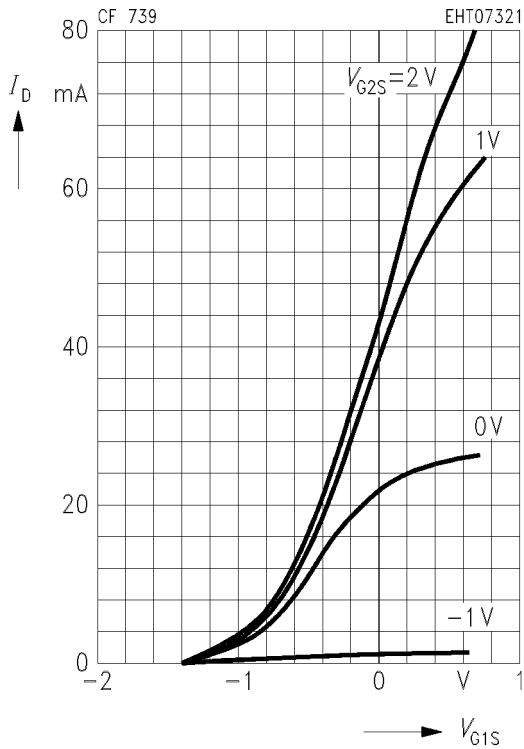
**Gate 1 forward transconductance  $g_{fs1} = f(V_{G2S})$**

$V_{DS} = 5\text{ V}, f = 1\text{ kHz}$



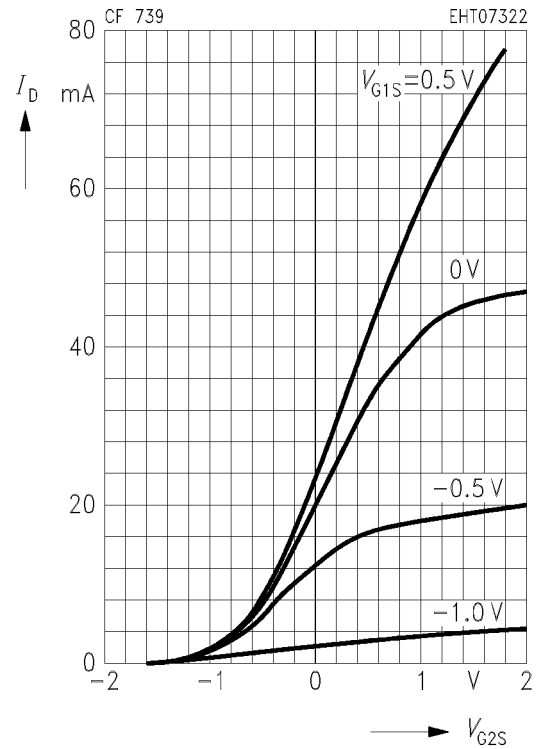
**Drain current  $I_D = f(V_{G1S})$**

$V_{DS} = 5\text{ V}$



**Drain current  $I_D = f(V_{G2S})$**

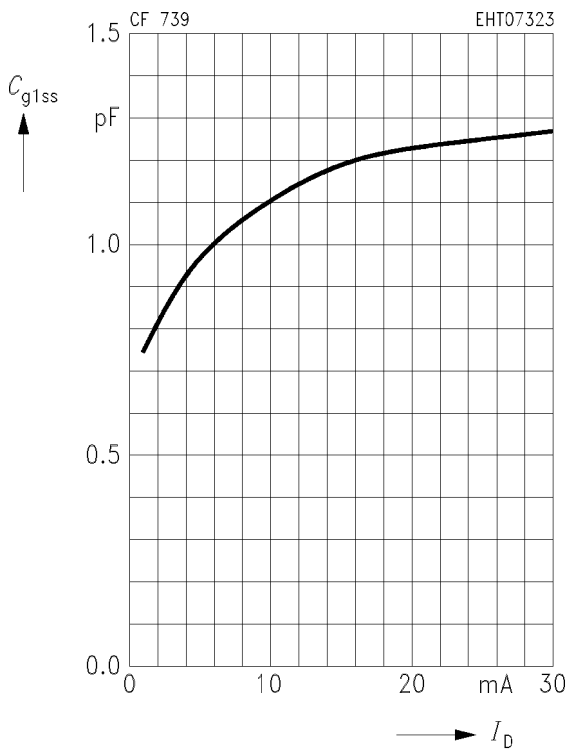
$V_{DS} = 5\text{ V}$



**Gate 1 input transconductance**

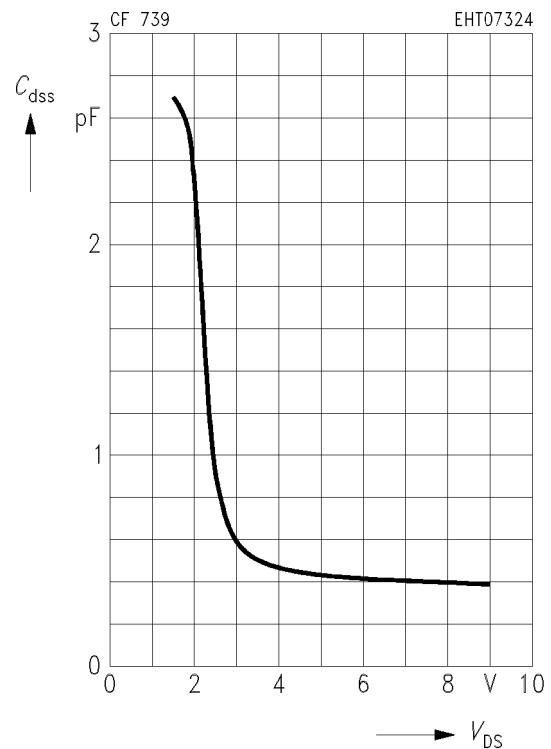
$C_{g1ss} = f(I_D)$

$V_{G2S} = 2\text{ V}, V_{DS} = 5\text{ V}, f = 0.1 - 1\text{ GHz}$



**Output capacitance  $C_{dss} = f(V_{DS})$**

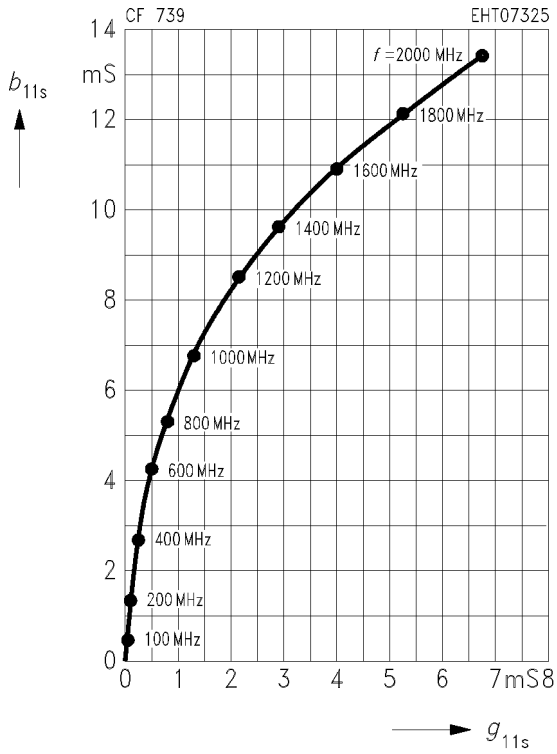
$V_{G2S} = 2\text{ V}, I_D = 10\text{ mA}, f = 0.1 - 1\text{ GHz}$



**Common Source Admittance Parameters,  $G_2$  RF grounded**

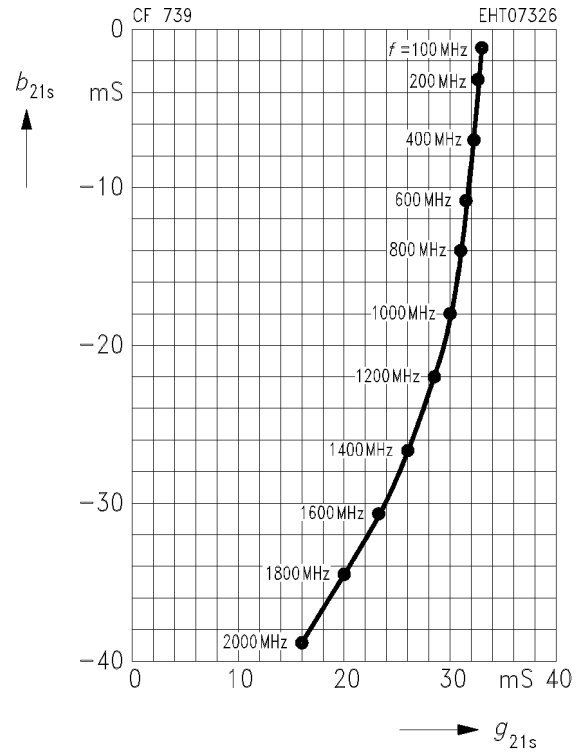
**Gate 1 input admittance  $y_{11s}$**

$V_{DS} = 5\text{ V}$ ,  $V_{G2S} = 2\text{ V}$ ,  $I_D = 10\text{ mA}$



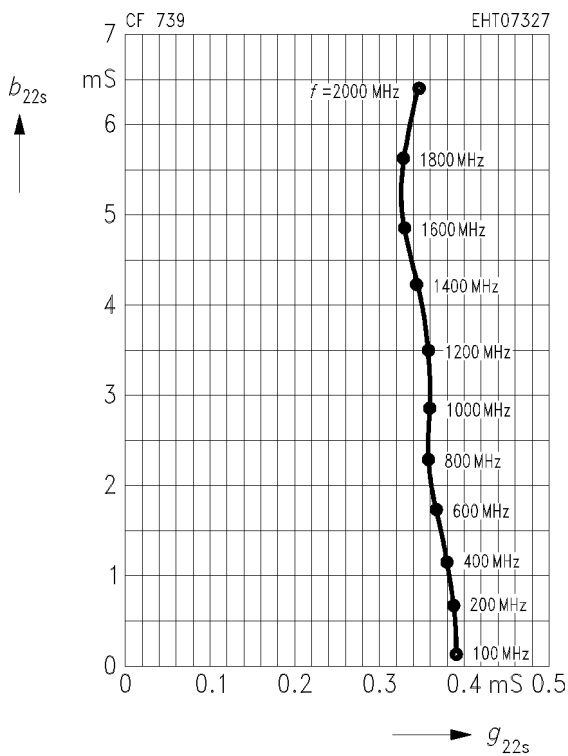
**Gate 1 forward transfer admittance  $y_{21s}$**

$V_{DS} = 5\text{ V}$ ,  $V_{G2S} = 2\text{ V}$ ,  $I_D = 10\text{ mA}$



**Output admittance  $y_{22s}$**

$V_{DS} = 5\text{ V}$ ,  $V_{G2S} = 2\text{ V}$ ,  $I_D = 10\text{ mA}$

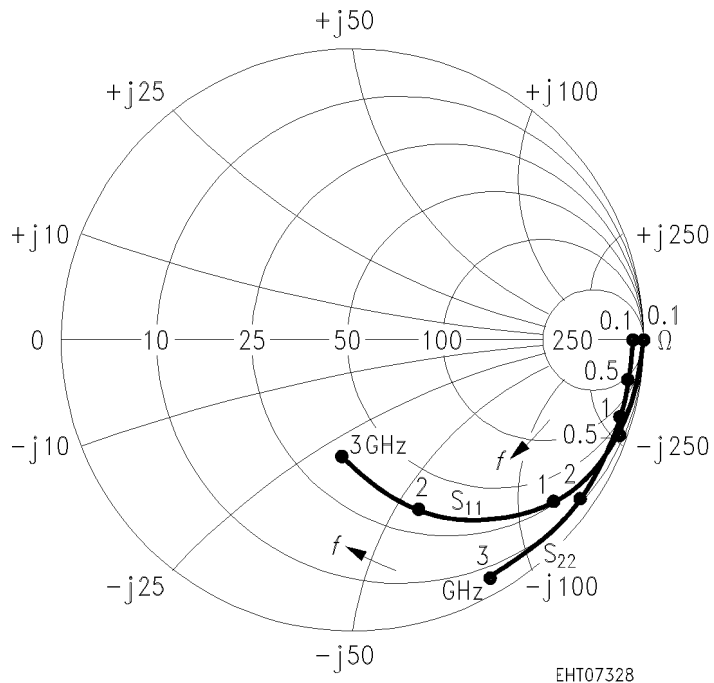


**Common Source S-Parameters, G<sub>2</sub> RF grounded**

<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>	
<b>GHz</b>	<b>MAG</b>	<b>ANG</b>	<b>MAG</b>	<b>ANG</b>	<b>MAG</b>	<b>ANG</b>	<b>MAG</b>	<b>ANG</b>
<i>V</i> <sub>DS</sub> = 5 V, <i>V</i> <sub>G2S</sub> = 2 V, <i>I</i> <sub>D</sub> = 10 mA, <i>Z</i> <sub>0</sub> = 50 Ω								
0.06	0.999	- 2.4	3.21	176.9	0.001	81.8	0.963	- 1.0
0.08	0.998	- 3.2	3.21	175.5	0.001	85.8	0.963	- 1.4
0.10	0.998	- 4.1	3.21	174.3	0.001	90.8	0.962	- 1.7
0.15	0.997	- 6.0	3.22	171.4	0.002	84.2	0.962	- 2.5
0.20	0.993	- 8.0	3.22	168.4	0.002	88.1	0.962	- 3.4
0.25	0.989	- 10.1	3.21	165.5	0.003	84.4	0.962	- 4.3
0.30	0.987	- 12.1	3.21	162.5	0.003	83.3	0.962	- 5.2
0.40	0.975	- 16.0	3.18	156.6	0.004	79.6	0.961	- 6.8
0.50	0.965	- 19.9	3.15	150.7	0.005	78.6	0.960	- 8.5
0.60	0.951	- 23.8	3.12	145.0	0.006	78.0	0.960	- 10.3
0.70	0.935	- 27.5	3.09	139.3	0.007	76.6	0.961	- 12.0
0.80	0.918	- 31.4	3.05	134.0	0.008	73.3	0.958	- 13.7
0.90	0.900	- 35.2	3.03	128.5	0.009	70.4	0.956	- 15.4
1.00	0.877	- 39.0	3.02	122.9	0.009	69.5	0.955	- 17.0
1.20	0.883	- 46.6	2.96	111.4	0.010	66.4	0.953	- 20.6
1.40	0.773	- 53.7	2.85	99.7	0.011	59.9	0.949	- 24.3
1.50	0.744	- 56.8	2.77	94.4	0.012	59.9	0.949	- 26.2
1.60	0.720	- 60.1	2.74	89.2	0.012	57.5	0.949	- 27.9
1.80	0.666	- 66.2	2.64	78.9	0.012	54.1	0.948	- 31.5
2.00	0.614	- 72.8	2.59	68.6	0.012	49.2	0.945	- 35.3
2.20	0.556	- 80.3	2.53	57.4	0.012	43.7	0.941	- 39.4
2.40	0.497	- 87.2	2.45	45.6	0.010	39.4	0.937	- 44.4
2.50	0.466	- 90.2	2.38	40.0	0.009	35.2	0.936	- 47.0
2.60	0.449	- 92.8	2.34	34.5	0.008	32.2	0.936	- 49.6
2.80	0.408	- 97.1	2.24	23.6	0.005	25.1	0.937	- 54.6
3.00	0.375	- 101.7	2.17	12.2	0.002	- 25.0	0.934	- 59.1

$S_{11}, S_{22} = f(f), Z\text{-plane}$

$V_{DS} = 5\text{ V}, V_{GS} = 2\text{ V}, I_D = 10\text{ mA}, Z_0 = 50\ \Omega$



$S_{12}, S_{21} = f(f)$

$V_{DS} = 5\text{ V}, V_{GS} = 2\text{ V}, I_D = 10\text{ mA}, Z_0 = 50\ \Omega$

