

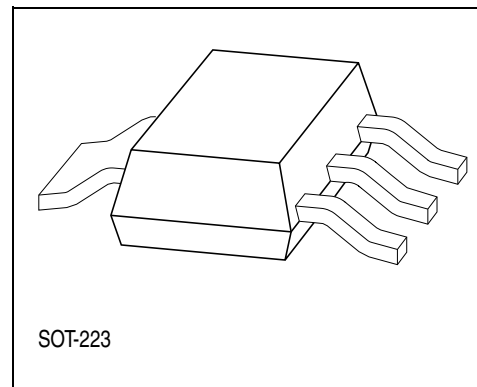
GaAs FET

Data Sheet

CLY 10

- Power amplifier for mobile phones
- For frequencies from 400 MHz to 2.5 GHz
- Wide operating voltage range: 2.7 to 6 V
- $V_D = 3\text{ V}$, $f = 1.8\text{ GHz}$, $P_{OUT} = 28.5\text{ dBm typ.}$
- High efficiency better 55%

ESD: Electrostatic discharge sensitive device, observe handling precautions!



Type	Marking	Ordering Code (taped)	Pin Configuration				Package
			1	2	3	4	
CLY 10	CLY 10	Q62702-L94	G	S	D	S	P-SOT223-4-2

Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	9	V
Drain-gate voltage	V_{DG}	12	V
Gate-source voltage	V_{GS}	- 6	V
Drain current	I_D	2.1	A
Channel temperature	T_{Ch}	150	°C
Storage temperature	T_{stg}	- 55 ... + 150	°C
Total power dissipation ($T_S \leq 80\text{ °C}$) ¹⁾	P_{totDC}	3.5	W
Total power dissipation ($T_S < 110\text{ °C}$) ¹⁾		2.0	

¹⁾ T_S is measured on the source lead to the PCB under load.

Thermal Resistance

Parameter	Symbol	Value	Unit
Channel - soldering point ¹⁾	R_{thChS}	≤ 20	K/W

¹⁾ T_S is measured on the source lead to the PCB under load.

Electrical Characteristics

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

Characteristics	Symbol	Limit Values			Unit	Test Conditions
		min.	typ.	max.		
Drain-source saturation current	I_{DSS}	1.2	1.6	2.4	A	$V_{DS} = 3\text{ V}$, $V_{GS} = 0\text{ V}$
Drain-source pinch-off current	I_D	–	–	200	μA	$V_{DS} = 3\text{ V}$, $V_{GS} = -3.8\text{ V}$
Gate pinch-off current	I_G	–	10	35	μA	$V_{DS} = 3\text{ V}$, $V_{GS} = -3.8\text{ V}$
Pinch-off Voltage	$V_{GS(p)}$	– 3.8	– 2.8	– 1.8	V	$V_{DS} = 3\text{ V}$, $I_D = 200\text{ }\mu\text{A}$
Small Signal Gain ¹⁾	G	–	9	–	dB	$V_{DS} = 3\text{ V}$, $I_D = 700\text{ mA}$, $f = 1.8\text{ GHz}$, $P_{IN} = 0\text{ dBm}$
Small Signal Gain ²⁾	G	–	8	–	dB	$V_{DS} = 3\text{ V}$, $I_D = 700\text{ mA}$, $f = 1.8\text{ GHz}$, $P_{IN} = 0\text{ dBm}$
Output Power	P_O	28	28.5	–	dBm	$V_{DS} = 3\text{ V}$, $I_D = 700\text{ mA}$, $f = 1.8\text{ GHz}$, $P_{IN} = 20.5\text{ dBm}$
Output Power	P_O	32.0	32.5	–	dBm	$V_{DS} = 5\text{ V}$, $I_D = 700\text{ mA}$, $f = 0.9\text{ GHz}$, $P_{IN} = 20\text{ dBm}$
1 dB-Compression Point	$P_{1\text{ dB}}$	–	28.5	–	dBm	$V_{DS} = 3\text{ V}$, $I_D = 700\text{ mA}$, $f = 1.8\text{ GHz}$

Electrical Characteristics (cont'd)

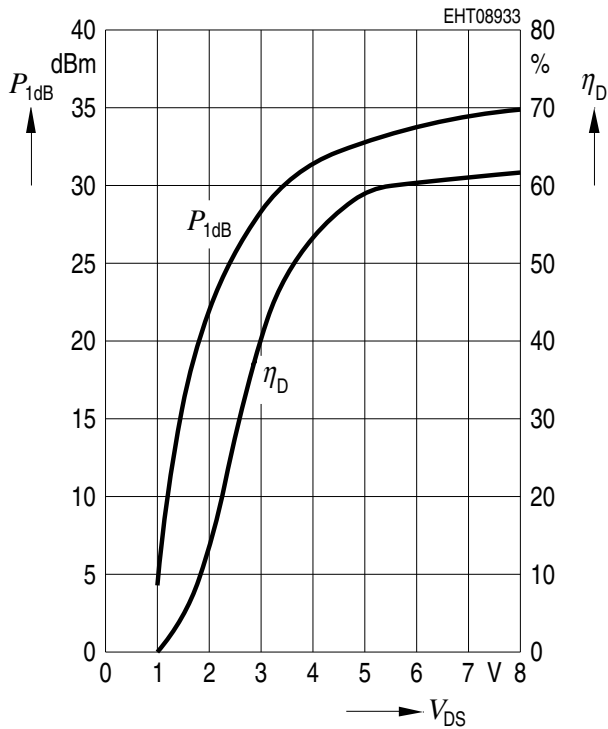
$T_A = 25\text{ °C}$, unless otherwise specified.

Characteristics	Symbol	Limit Values			Unit	Test Conditions
		min.	typ.	max.		
1 dB-Compression Point	$P_{1\text{ dB}}$	–	32.5	–	dBm	$V_{DS} = 5\text{ V}$, $I_D = 700\text{ mA}$, $f = 1.8\text{ GHz}$
Power Added Efficiency	PAE	40	55	–	%	$V_{DS} = 5\text{ V}$, $I_D = 700\text{ mA}$, $f = 1.8\text{ GHz}$, $P_{IN} = 20\text{ dBm}$

- 1) Matching conditions for maximum small signal gain: $f = 1.8\text{ GHz}$
Source Match: G_{MS} : MAG = 0.70, ANG – 116°; Load Match: G_{ML} : MAG 0.68, ANG – 145°
- 2) Power matching conditions: $f = 1.8\text{ GHz}$
Source Match: G_{MS} : MAG = 0.70, ANG – 120°; Load Match: G_{ML} : MAG 0.68, ANG – 130°

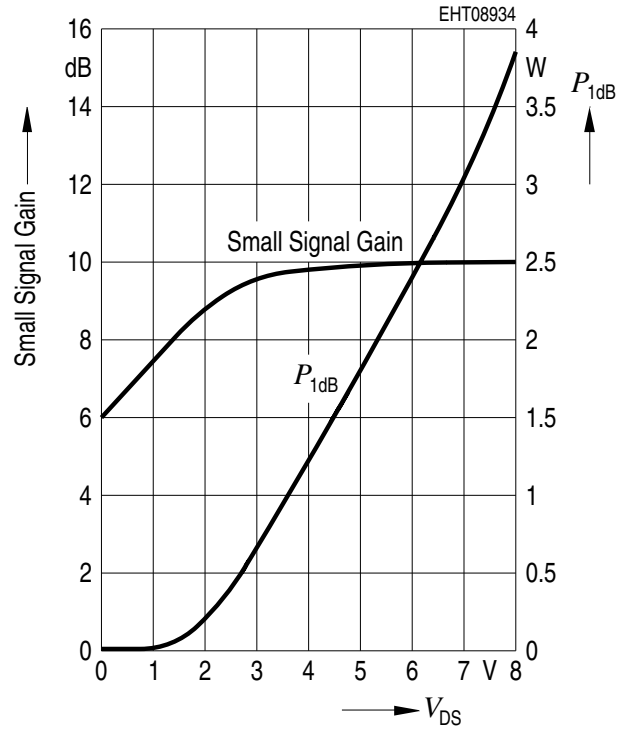
Compression Power vs. Drain-Source Voltage

$f = 1.8 \text{ GHz}$; $I_{DS} = 0.5 \times I_{DSS}$

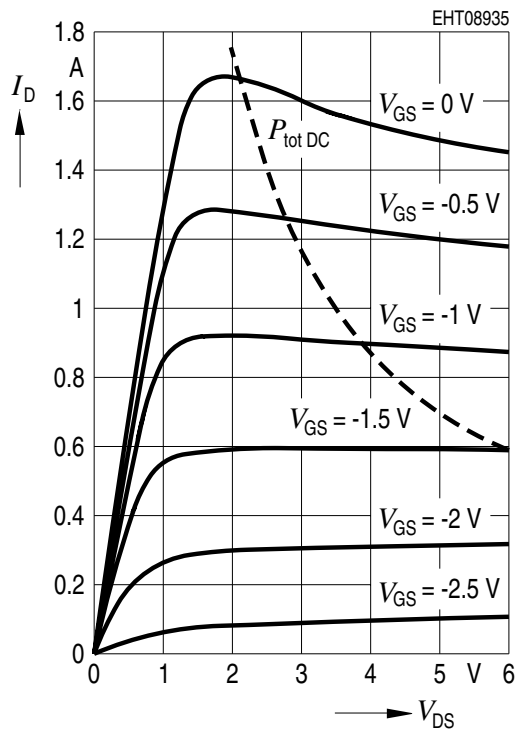


Gain and P_{1dB} vs. Drain Source Voltage,

$f = 1.8 \text{ GHz}$; $I_{DS} = 0.5 \times I_{DSS}$



Output Characteristics



Typ. Common Source S-Parameters
 $V_{DS} = 5 \text{ V}, I_D = 700 \text{ mA}, Z_o = 50 \Omega$

f	S11		S21		S12		S22	
GHZ	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
0.1	0.96	– 48.5	14.2	150.6	0.01079	68.9	0.45	– 171.9
0.15	0.93	– 68.8	12.97	137.9	0.01503	60.6	0.47	– 171.3
0.2	0.91	– 86.4	11.48	127.5	0.01801	54.4	0.5	– 173.3
0.25	0.88	– 101	10.26	119.1	0.02041	50.1	0.53	– 174.5
0.3	0.87	– 113.2	9.19	111.4	0.02224	45.9	0.55	– 175.6
0.4	0.84	– 132.9	7.43	99.4	0.02486	41.7	0.56	– 179.8
0.5	0.83	– 147.7	6.17	89.4	0.02691	39.1	0.58	177.5
0.6	0.82	– 159.5	5.25	81.2	0.02894	37.6	0.59	173.8
0.7	0.82	– 169.4	4.54	73.9	0.03078	36.7	0.6	171.4
0.8	0.81	– 177.9	3.98	67.1	0.03264	35.8	0.61	168.7
0.9	0.82	174.5	3.55	61	0.03469	35	0.61	165.8
1	0.82	167.7	3.17	55.1	0.03667	34.4	0.62	163.9
1.2	0.82	155.7	2.62	43.9	0.04065	32.4	0.64	158.8
1.4	0.83	145.1	2.2	33.6	0.04503	29.9	0.65	153.6
1.5	0.84	140.1	2.04	28.7	0.04721	28.8	0.66	151.6
1.6	0.84	135.4	1.88	23.8	0.04917	27.2	0.67	148.5
1.8	0.85	126.3	1.63	14.3	0.05335	23.5	0.69	143.3
2	0.86	118	1.42	5.1	0.05705	19.7	0.71	138.5
2.2	0.87	110.1	1.25	– 3.6	0.0602	15.9	0.72	133.8
2.4	0.88	102.8	1.1	– 12.2	0.06313	12	0.73	129
2.5	0.88	99.1	1.03	– 16.1	0.06448	9.9	0.74	125.9

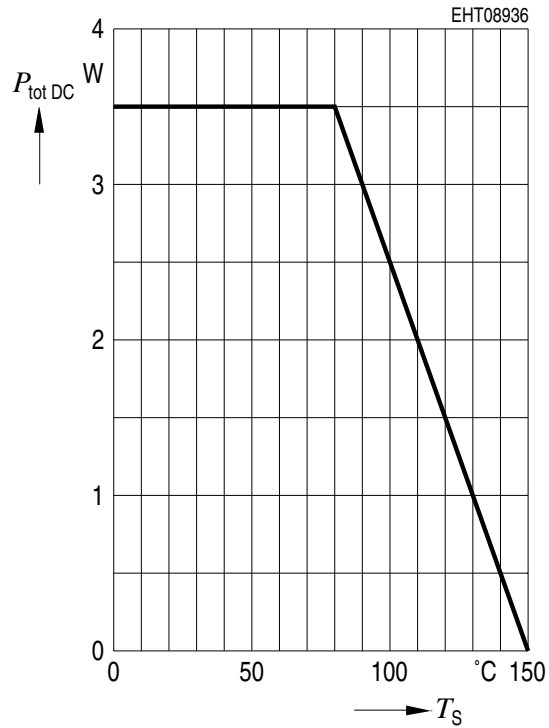
Typ. Common Source S-Parameters (cont'd)
 $V_{DS} = 5 \text{ V}, I_D = 700 \text{ mA}, Z_o = 50 \Omega$

f	S11		S21		S12		S22	
GHZ	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
3	0.9	83.3	0.76	– 34.4	0.06956	– 0.2	0.77	113.9
3.5	0.91	70.3	0.57	– 49	0.07219	– 9	0.81	102.8
4	0.91	59.3	0.45	– 60.5	0.07429	– 17.1	0.83	92.1
4.5	0.92	48.9	0.37	– 71.1	0.07489	– 25.5	0.85	82.5
5	0.93	39.2	0.31	– 81.2	0.07614	– 32.9	0.89	72.3
5.5	0.93	29.5	0.26	– 90.4	0.07667	– 40.9	0.9	61.7
6	0.92	20.6	0.23	– 97.9	0.07466	– 48.6	0.91	51

Additional S-Parameter available on data disc!

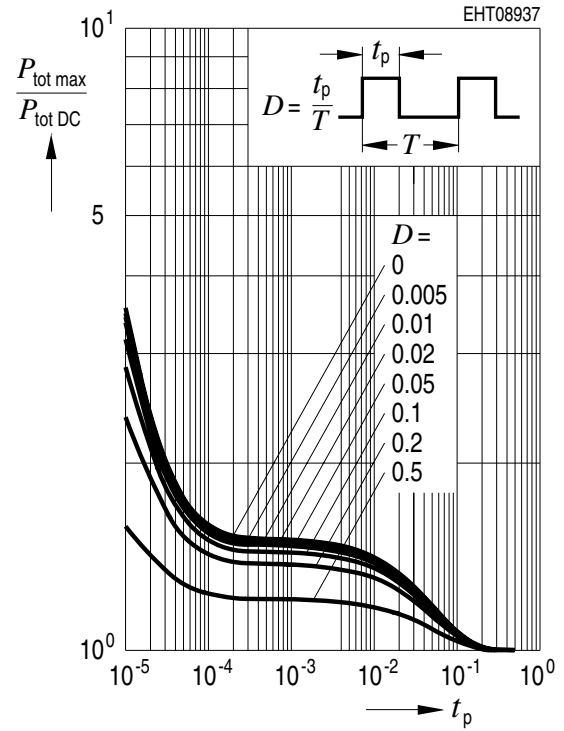
Total Power Dissipation

$$P_{\text{tot_DC}} = f(T_S)$$



Permissible Pulse Load

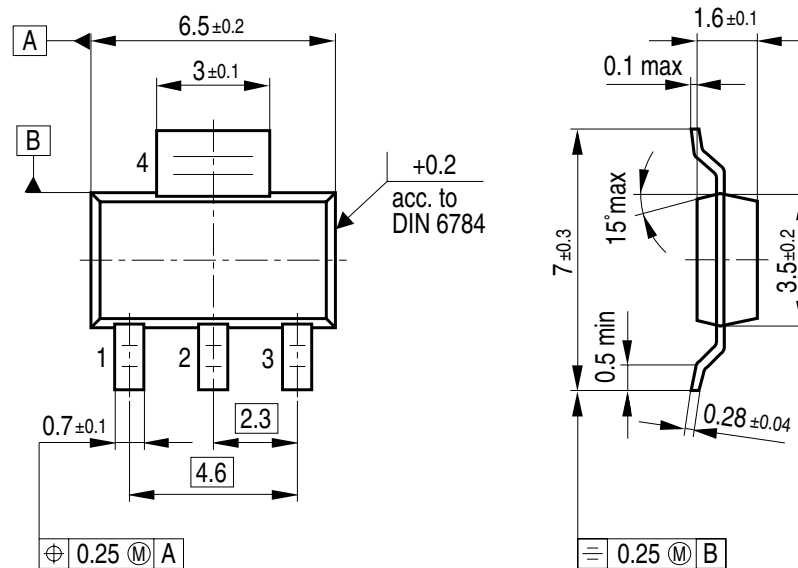
$$P_{\text{tot_max}}/P_{\text{tot_DC}} = f(t_p)$$



Package Outlines

P-SOT223-4-2

(Small Outline Transistor)



GPS05560

Sorts of Packing

Package outlines for tubes, trays etc. are contained in our Data Book "Package Information".

SMD = Surface Mounted Device

Dimensions in mm