

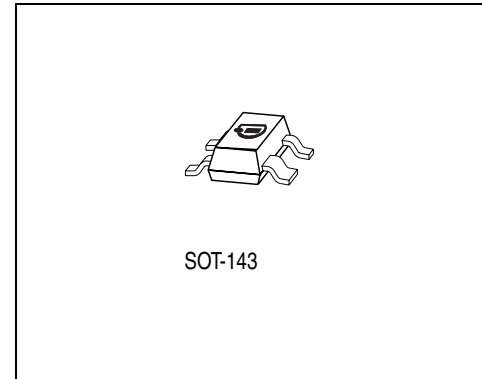
# GaAs FET

## Data Sheet

# CFY 30

- Low noise ( $F_{\min} = 1.4 \text{ dB @ 4 GHz}$ )
- High gain (11.5 dB typ. @ 4 GHz)
- For oscillators up to 12 GHz
- For amplifiers up to 6 GHz
- Ion implanted planar structure
- Chip all gold metallization
- Chip nitride passivation

**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 30	A2	Q62703-F97	S	D	S	G	P-SOT143-4-1

<sup>1)</sup> Dimensions see **Page 8**.

### Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	$V_{DS}$	5	V
Drain-gate voltage	$V_{DG}$	7	V
Gate-source voltage	$V_{GS}$	- 4 ... + 0.5	V
Drain current	$I_D$	80	mA
Channel temperature	$T_{Ch}$	150	°C
Storage temperature range	$T_{stg}$	- 40 ... + 150	°C
Total power dissipat. ( $T_S \leq 48 \text{ °C}$ ) <sup>1)</sup>	$P_{tot}$	250	mW

<sup>1)</sup>  $T_S$  is measured on the source 1 lead at the soldering point to the PCB.

### Thermal Resistance

Parameter	Symbol	Value	Unit
Channel-soldering point <sup>1)</sup>	$R_{thChS}$	< 320	K/W

<sup>1)</sup>  $T_S$  is measured on the source 1 lead at the soldering point to the PCB.

**Electrical Characteristics**
 $T_A = 25\text{ °C}$ , unless otherwise specified

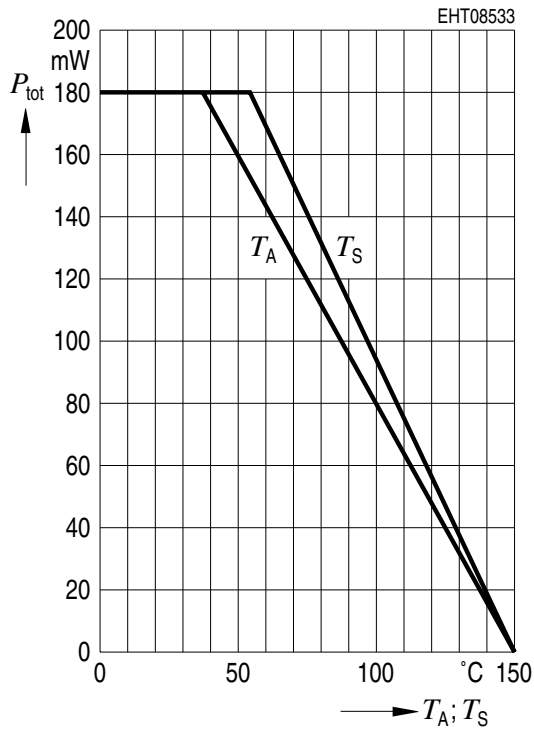
Characteristics	Symbol	Limit Values			Unit	Test Conditions
		min.	typ.	max.		
Drain-source saturation current	$I_{DSS}$	20	50	80	mA	$V_{DS} = 3.5\text{ V}$ $V_{GS} = 0\text{ V}$
Pinch-off voltage	$V_{GS(P)}$	- 0.5	- 1.3	- 4.0	V	$V_{DS} = 3.5\text{ V}$ $I_D = 1\text{ mA}$
Transconductance	$g_m$	20	30	-	mS	$V_{DS} = 3.5\text{ V}$ $I_D = 15\text{ mA}$
Gate leakage current	$I_G$	-	0.1	2	$\mu\text{A}$	$V_{DS} = 3.5\text{ V}$ $I_D = 15\text{ mA}$
Noise figure $f = 4\text{ GHz}$ $f = 6\text{ GHz}$	$NF$	-	1.4 2.0	1.6 -	dB	$V_{DS} = 3.5\text{ V}$ $I_D = 15\text{ mA}$
Associated gain $f = 4\text{ GHz}$ $f = 6\text{ GHz}$	$G_A$	10 -	11.5 8.9	- -	dB	$V_{DS} = 3.5\text{ V}$ $I_D = 15\text{ mA}$
Maximum available gain	MAG	-	11.2	-	dB	$V_{DS} = 3.5\text{ V}$ $I_D = 15\text{ mA}$ $f = 6\text{ GHz}$
Maximum stable gain	MSG	-	14.4	-	dB	$V_{DS} = 3.5\text{ V}$ $I_D = 15\text{ mA}$ $f = 4\text{ GHz}$
Power output at 1 dB compression	$P_{-1\text{ dB}}$	-	16	-	dBm	$V_{DS} = 4\text{ V}$ $I_D = 30\text{ mA}$ $f = 6\text{ GHz}$

**Typical Common Source Noise Parameters**
 $I_D = 15 \text{ mA}, V_{DS} = 3 \text{ V}, Z_0 = 50 \Omega$ 

$f$	$F_{\min}$	$G_A$	$\Gamma_{\text{opt}}$		$R_N$	$N$	$F_{50 \Omega}$	$G(F_{50 \Omega})$
<b>GHz</b>	<b>dB</b>	<b>dB</b>	<b>MAG</b>	<b>ANG</b>	$\Omega$	–	<b>dB</b>	<b>dB</b>
2	1.0	15.5	0.72	27	49	0.17	2.9	10.0
4	1.4	11.5	0.64	61	29	0.17	2.7	9.3
6	2.0	8.9	0.46	101	19	0.30	2.8	7.5
8	2.5	7.1	0.31	153	9	0.31	2.8	6.4
10	3.0	5.8	0.34	– 133	14	0.38	3.4	4.2
12	3.5	5.0	0.41	– 93	28	0.42	4.1	2.9

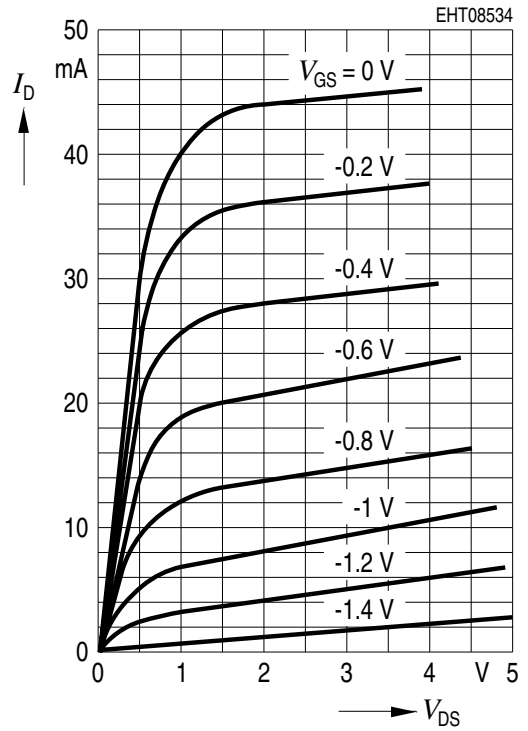
**Total Power Dissipation**

$$P_{\text{tot}} = f(T_S; T_A)$$



**Output Characteristics**

$$I_D = f(V_{\text{DS}})$$



**Typical Common Source S-Parameters**
 $I_D = 15 \text{ mA}, V_D = 3.5 \text{ V}, Z_0 = 50 \Omega$ 

<i>f</i>	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
0.1	1.00	- 1	2.43	178	0.003	87	0.70	- 1
0.4	1.00	- 6	2.43	171	0.010	23	0.69	- 5
0.8	0.99	- 14	2.43	162	0.020	78	0.68	- 11
1.2	0.98	- 21	2.43	154	0.030	72	0.67	- 15
1.6	0.97	- 28	2.44	145	0.040	66	0.66	- 20
2.0	0.96	- 36	2.45	137	0.050	60	0.65	- 26
2.4	0.93	- 44	2.47	129	0.058	55	0.64	- 30
2.8	0.90	- 53	2.49	120	0.066	50	0.62	- 35
3.2	0.87	- 62	2.50	111	0.074	45	0.60	- 41
3.6	0.83	- 72	2.50	102	0.082	39	0.57	- 47
4.0	0.80	- 82	2.50	93	0.090	32	0.54	- 54
4.4	0.77	- 92	2.51	83	0.097	25	0.50	- 61
4.8	0.74	- 104	2.49	73	0.103	18	0.46	- 67
5.2	0.70	- 115	2.45	64	0.108	12	0.43	- 73
5.6	0.66	- 127	2.41	54	0.112	6	0.40	- 80
6.0	0.63	- 139	2.36	45	0.114	0	0.36	- 88
6.4	0.60	- 150	2.30	37	0.115	- 6	0.31	- 98
6.8	0.57	- 162	2.24	27	0.116	- 11	0.27	- 110
7.2	0.55	- 174	2.19	17	0.116	- 17	0.24	- 122
7.6	0.54	172	2.14	8	0.116	- 22	0.21	- 137
8.0	0.53	160	2.08	- 2	0.115	- 27	0.19	- 154
8.4	0.54	147	2.00	- 11	0.113	- 32	0.18	- 173
8.8	0.55	135	1.92	- 21	0.111	- 37	0.18	171
9.2	0.56	124	1.83	- 30	0.109	- 42	0.19	155
9.6	0.57	114	1.72	- 40	0.107	- 46	0.21	141
10.0	0.58	106	1.61	- 48	0.104	- 50	0.23	128

**Typical Common Source S-Parameters (cont'd)**
 $I_D = 15 \text{ mA}, V_D = 3.5 \text{ V}, Z_0 = 50 \Omega$ 

<i>f</i>	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
10.4	0.59	98	1.51	- 56	0.102	- 53	0.26	118
10.8	0.60	91	1.42	- 62	0.101	- 56	0.29	108
11.2	0.61	85	1.35	- 69	0.099	- 58	0.32	100
11.6	0.62	79	1.30	- 75	0.098	- 60	0.34	93
12.0	0.62	74	1.25	- 81	0.096	- 63	0.36	85

**Typical Common Source S-Parameters**
 $I_D = 30 \text{ mA}, V_D = 3.5 \text{ V}, Z_0 = 50 \Omega$ 

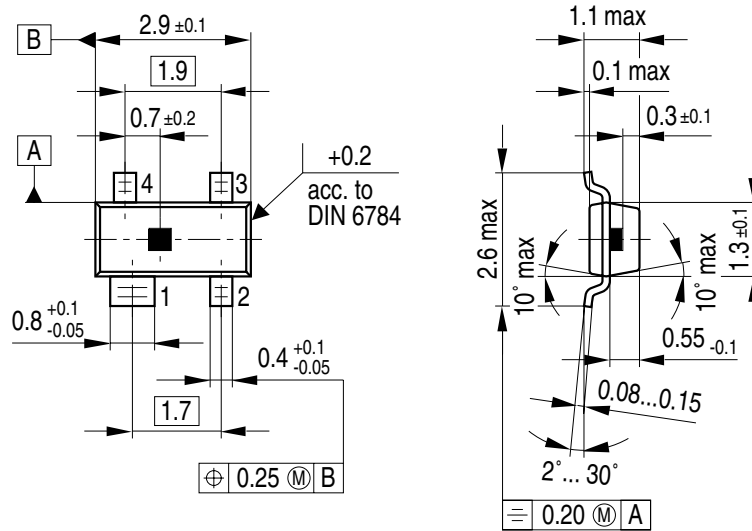
<i>f</i>	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
0.1	1.00	- 2	3.23	178	0.002	85	0.71	- 1
0.4	1.00	- 8	3.21	171	0.009	79	0.70	- 6
0.8	0.99	- 16	3.19	162	0.017	73	0.69	- 11
1.2	0.97	- 24	3.18	153	0.025	70	0.67	- 16
1.6	0.95	- 32	3.17	143	0.034	65	0.66	- 21
2.0	0.92	- 40	3.17	135	0.042	61	0.65	- 26
2.4	0.90	- 48	3.17	127	0.051	56	0.63	- 31
2.8	0.87	- 58	3.17	119	0.059	50	0.61	- 36
3.2	0.83	- 68	3.16	109	0.067	45	0.58	- 42
3.6	0.79	- 79	3.12	99	0.073	40	0.55	- 48
4.0	0.75	- 91	3.08	88	0.079	34	0.52	- 54
4.4	0.71	- 102	3.04	78	0.084	28	0.50	- 60
4.8	0.67	- 114	3.00	68	0.089	21	0.47	- 66
5.2	0.63	- 126	2.95	58	0.092	15	0.43	- 73
5.6	0.60	- 138	2.87	49	0.094	10	0.38	- 81
6.0	0.57	- 150	2.77	40	0.096	4	0.34	- 89

**Typical Common Source S-Parameters (cont'd)**
 $I_D = 30 \text{ mA}, V_D = 3.5 \text{ V}, Z_0 = 50 \Omega$ 

<i>f</i>	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
6.4	0.54	- 162	2.68	31	0.097	- 1	0.30	- 99
6.8	0.52	- 174	2.58	22	0.098	- 6	0.27	- 109
7.2	0.51	173	2.50	14	0.099	- 11	0.24	- 121
7.6	0.50	160	2.43	5	0.099	- 16	0.21	- 134
8.0	0.50	147	2.36	- 4	0.099	- 20	0.18	- 148
8.4	0.51	135	2.26	- 13	0.099	- 24	0.16	- 164
8.8	0.52	125	2.15	- 22	0.099	- 29	0.16	176
9.2	0.54	115	2.04	- 30	0.099	- 33	0.17	158
9.6	0.55	107	1.93	- 39	0.099	- 37	0.19	142
10.0	0.57	99	1.82	- 47	0.099	- 41	0.22	128
10.4	0.59	91	1.71	- 54	0.100	- 44	0.25	118
10.8	0.60	85	1.60	- 62	0.101	- 47	0.27	109
11.2	0.61	79	1.51	- 69	0.102	- 49	0.30	100
11.6	0.62	73	1.44	- 75	0.103	- 52	0.32	92
12.0	0.62	68	1.38	- 82	0.104	- 55	0.34	85

Package Outlines

**P-SOT143-4-1**  
(Small Outline Transistor)



GPS05559

**Sorts of Packing**

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

**SMD = Surface Mounted Device**

Dimensions in mm