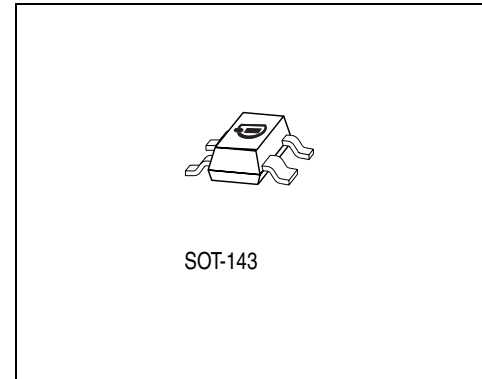# GaAs FET

Data Sheet

CFY 30

- Low noise (F_{min} = 1.4 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: **E**lectro**s**tatic **d**ischarge sensitive device, observe handling precautions!

SOT-143

Type	Marking	Ordering Code (tape and reel)	Pin Configuration				Package[1]
			1	2	3	4	
CFY 30	A2	Q62703-F97	S	D	S	G	P-SOT143-4-1

[1] 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}	$-4 \ldots +0.5$	V
Drain current	I_D	80	mA
Channel temperature	T_{Ch}	150	°C
Storage temperature range	T_{stg}	$-40 \ldots +150$	°C
Total power dissipat. ($T_S \leq 48\ °C$)[1]	P_{tot}	250	mW

[1] 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[1]	R_{thChS}	< 320	K/W

[1] T_S is measured on the source 1 lead at the soldering point to the PCB.

Electrical Characteristics

$T_A = 25\ °C$, unless otherwise specified

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

Typical Common Source Noise Parameters

I_D = 15 mA, V_{DS} = 3 V, Z_0 = 50 Ω

f	F_{min}	G_A	Γ_{opt}		R_N	N	$F_{50\,\Omega}$	$G(F_{50\,\Omega})$
GHz	dB	dB	MAG	ANG	Ω	–	dB	dB
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

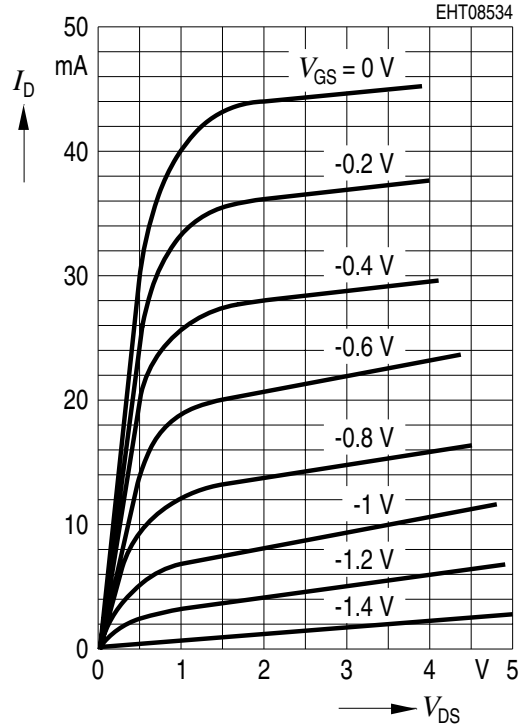## Total Power Dissipation

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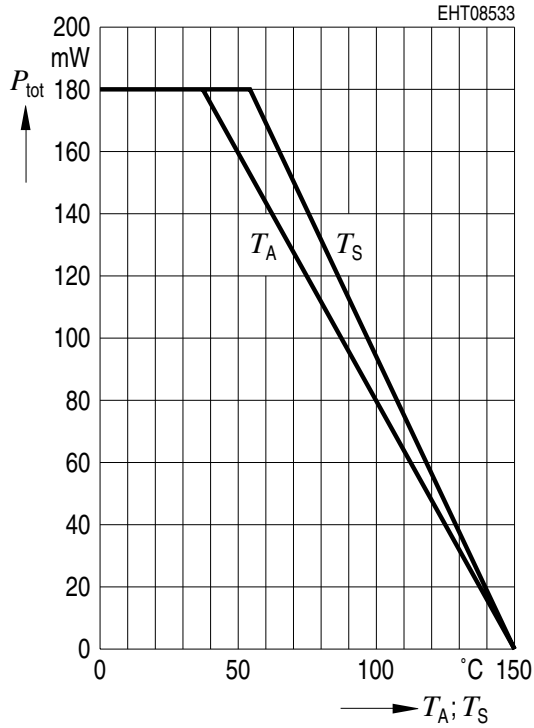
Output Characteristics

$I_D = f(V_{DS})$

Typical Common Source S-Parameters

$I_D = 15$ mA, $V_D = 3.5$ V, $Z_0 = 50$ Ω

f	S11		S21		S12		S22	
GHz	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)

$I_D = 15$ mA, $V_D = 3.5$ V, $Z_0 = 50\ \Omega$

f	S11		S21		S12		S22	
GHz	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

$I_D = 30$ mA, $V_D = 3.5$ V, $Z_0 = 50\ \Omega$

f	S11		S21		S12		S22	
GHz	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)

$I_D = 30$ mA, $V_D = 3.5$ V, $Z_0 = 50$ Ω

f	S11		S21		S12		S22	
GHz	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)

2.9 ±0.1

1.9

0.7 ±0.2

+0.2
acc. to
DIN 6784

0.8 +0.1 -0.05

0.4 +0.1 -0.05

1.7

⊕ | 0.25 Ⓜ | B

1.1 max

0.1 max

0.3 ±0.1

2.6 max

10° max

10° max

1.3 ±0.1

0.55 -0.1

0.08...0.15

2°... 30°

⏛ | 0.20 Ⓜ | A
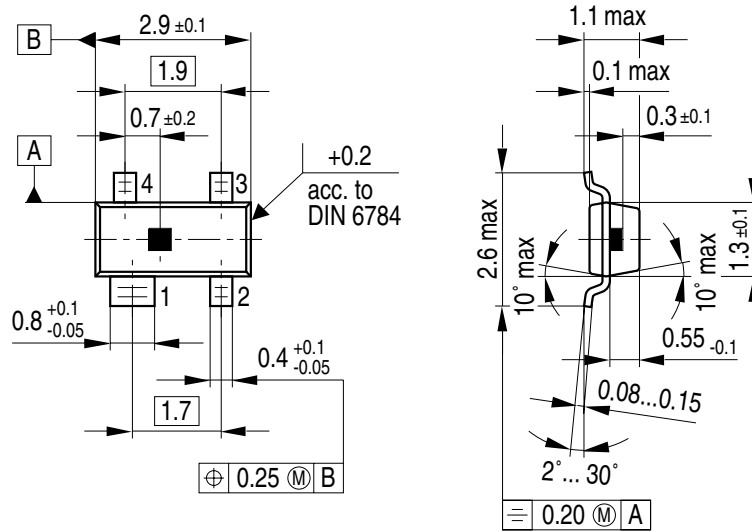
GPS05559

Sorts of Packing
Package outlines for tubes, trays etc. are contained in
our Data Book "Package Information".
SMD = Surface Mounted Device

Dimensions in mm