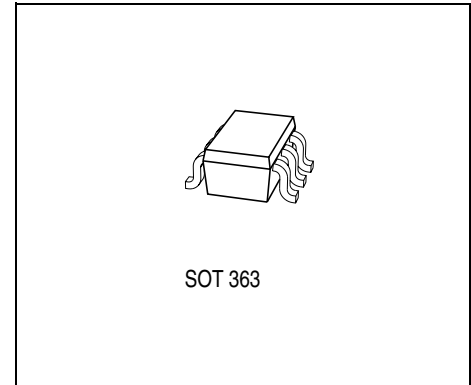


GaAs MMIC

Data Sheet

CGY 59W

- Low noise preamplifier for mobile communication (PCN, DECT, GSM) in 2.7 V to 6 V systems
- Biased monolithic microwave IC (MMIC)
- Easily matchable to 50 Ω
- No bias coil needed
- Single positive supply voltage
- Low noise figure and high gain
 $NF = 1.3 \text{ dB}$, $G = 16.5 \text{ dB}$ @ 3 V, 950 MHz (typ.)
 $NF = 1.7 \text{ dB}$, $G = 12 \text{ dB}$ @ 3 V, 1.85 GHz (typ.)
- Low power consumption
- Frequency range 200 MHz ... 2.5 GHz
- Miniature package P-SOT363-6-1



ESD: Electrostatic discharge sensitive device, observe handling precautions!

Type	Marking	Ordering Code (taped)	Package
CGY 59W	Y5s	Q62702 - G69	P-SOT363-6-1

Maximum Ratings

Parameter	Symbol	Value	Unit
Drain voltage	V_D	8	V
Channel temperature	T_{Ch}	150	$^{\circ}\text{C}$
Storage temperature range	T_{stg}	- 55 ... + 150	$^{\circ}\text{C}$
Total power dissipation ($T_S \leq \text{t.b.d. } ^{\circ}\text{C}$) ¹⁾	P_{tot}	80	mW

¹⁾ Please care for sufficient heat dissipation on the pcb!

Thermal Resistance

Parameter	Symbol	Value	Unit
Channel-soldering point (GND)	R_{thChS}	≤ t.b.d.	K/W
Junction-ambient ¹⁾	R_{thJA}	< t.b.d.	K/W

¹⁾ Package mounted on alumina 15 mm × 16.7 mm × 0.7 mm.

Electrical Characteristics of CGY 59W in 1850 MHz Application Circuit

$T_A = 25\text{ °C}$, $f = 1850\text{ MHz}$, $R_S = R_L = 50\text{ }\Omega$, unless otherwise specified

Characteristics	Symbol	Limit Values			Unit
		min.	typ.	max.	
Drain current	I_D	–	6	–	mA
Power Gain	G				dB
$V_D = 3\text{ V}$		–	12	–	
$V_D = 5\text{ V}$		–	13	–	
Noise figure	F				dB
$V_D = 3\text{ V}$		–	1.70	–	
$V_D = 5\text{ V}$		–	1.65	–	
Input return loss	RL_{IN}				dB
$V_D = 3\text{ V}$		–	12	–	
$V_D = 5\text{ V}$		–	12	–	
Output return loss	RL_{OUT}				dB
$V_D = 3\text{ V}$		–	13	–	
$V_D = 5\text{ V}$		–	13	–	
Third order input intercept point two-tone intermodulation test $f_1 = 1850\text{ MHz}$, $f_2 = 1851\text{ MHz}$ $P_{IN} = -20\text{ dBm}$ (both carriers)	IP_3				dBm
$V_D = 3\text{ V}$		–	1	–	
$V_D = 5\text{ V}$		–	2	–	
Input power at 1 dB gain compression	$P_{-1\text{ dB}}$				dBm
$V_D = 3\text{ V}$		–	– 8	–	
$V_D = 5\text{ V}$		–	– 6	–	

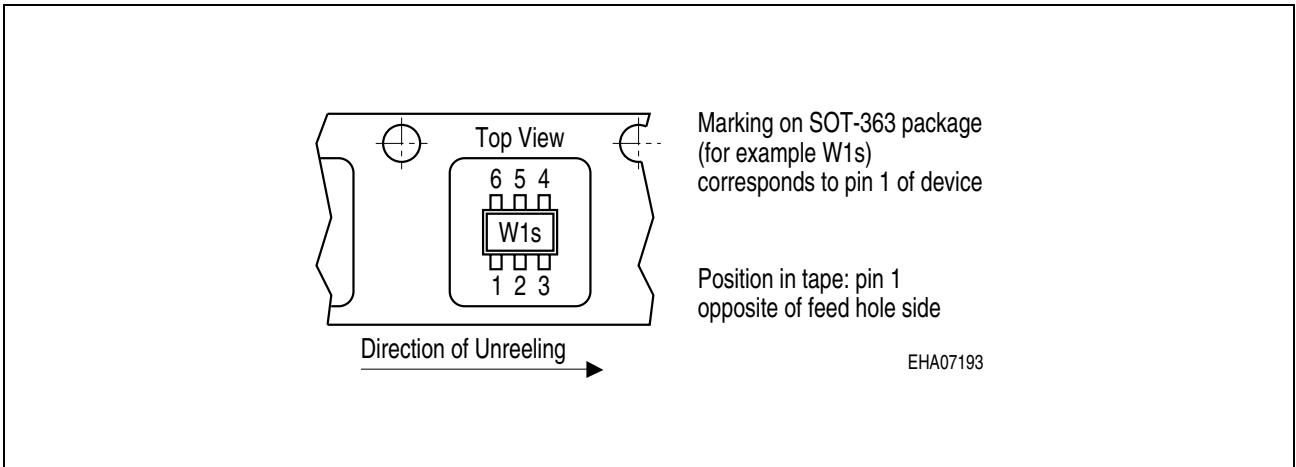


Figure 1

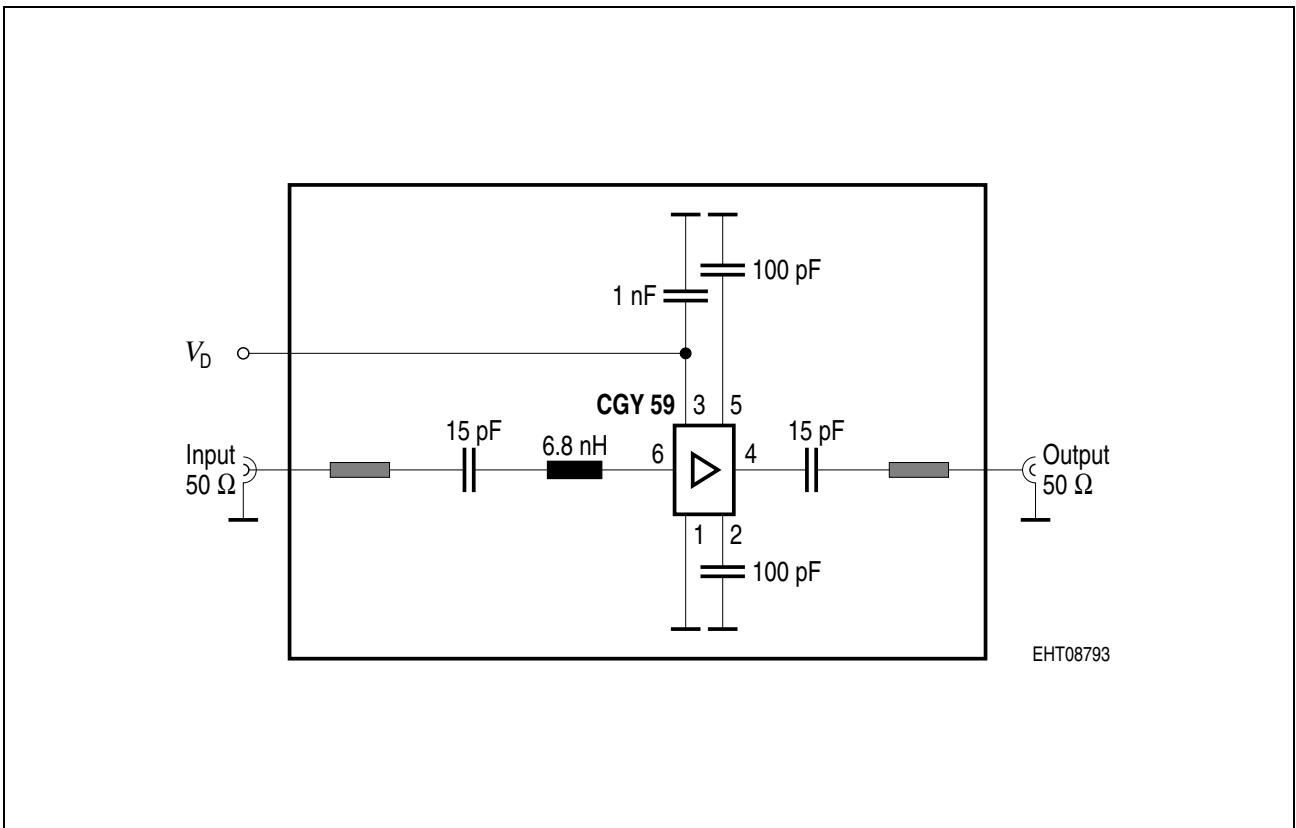


Figure 2 1850 MHz Application (PCN, DECT)

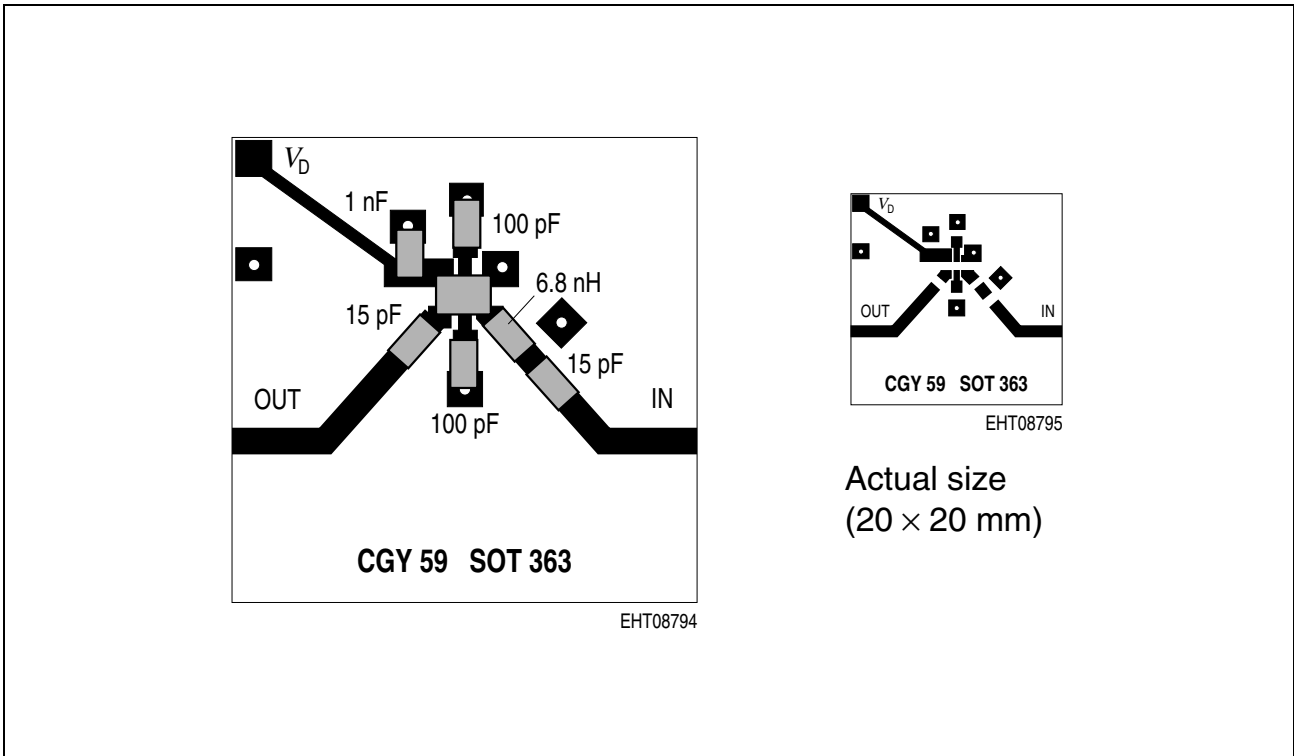


Figure 3 PCB - Layouts for Application Circuits
1850 MHz PCN -, DECT - application board

PCB - data: Glass fiber teflon board (double sided) TACONIC TLX-9-0150-CH/CH,
 $\epsilon_r = 2.45$, thickness = 0.4 mm

Typical S- and Noise-Parameters

$V_D = 3 \text{ V}, Z_0 = 50 \Omega$

<i>f</i>	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
0.1	0.999	- 4	4.30	- 177	0.006	- 75	0.261	- 17
0.2	0.998	- 6.6	4.32	- 173	0.011	97.6	0.251	- 10
0.3	0.997	- 10	4.30	- 167	0.010	94	0.247	- 11
0.4	0.982	- 14	4.26	161	0.016	76	0.238	- 12
0.5	0.970	- 18	4.24	156	0.019	78	0.232	- 13
0.6	0.958	- 21	4.16	151	0.020	78	0.226	- 15
0.7	0.940	- 24	4.13	146	0.023	73	0.221	- 16
0.8	0.918	- 27	4.02	141	0.026	79	0.218	- 18
0.9	0.889	- 32	3.91	136	0.031	79	0.209	- 22
1.0	0.870	- 34	3.82	132	0.033	76	0.195	- 21
1.1	0.845	- 37	3.76	128	0.036	75	0.189	- 23
1.2	0.829	- 39	3.63	123	0.039	73	0.186	- 24
1.3	0.806	- 42	3.58	119	0.041	72	0.177	- 24
1.4	0.789	- 45	3.47	115	0.043	71	0.173	- 24
1.5	0.765	- 47	3.39	111	0.046	71	0.166	- 24
1.6	0.748	- 50	3.29	107	0.046	72	0.159	- 24
1.7	0.725	- 52	3.21	104	0.051	71	0.154	- 22
1.8	0.703	- 54	3.14	100	0.051	71	0.147	- 21
1.9	0.695	- 56	3.08	97	0.055	69	0.140	- 18
2.0	0.664	- 58	2.98	93	0.056	71	0.135	- 15
2.1	0.644	- 59	2.86	90	0.059	70	0.129	- 13
2.2	0.631	- 61	2.83	86	0.062	69	0.123	- 9.6
2.3	0.605	- 63	2.79	83	0.063	69	0.114	- 3.4
2.4	0.590	- 65	2.70	80	0.064	69	0.109	2.7
2.5	0.570	- 67	2.65	76	0.065	70	0.106	9.2

f	F_{\min}	Γ_{opt}		R_N
		MAG	ANG	
GHz	dB	–	deg	Ω
0.8	1.15	0.77	19	59.7
1.0	1.19	0.74	22	56.4
1.2	1.24	0.72	27	54.0
1.4	1.31	0.71	32	51.8
1.6	1.39	0.70	36	49.6
1.8	1.49	0.68	39	47.3
2.0	1.62	0.66	43	43.9

S- and noise-parameters are also available on CD-ROM.

Typical S- and Noise-Parameters

$$V_D = 5 \text{ V}, Z_0 = 50 \Omega$$

f	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
0.1	0.998	– 3.4	4.99	– 177	0.007	– 73	0.366	– 15
0.2	0.997	– 6.8	4.97	– 173	0.008	30	0.331	– 8.8
0.3	0.995	– 10	4.99	– 167	0.012	96	0.328	– 9.2
0.4	0.976	– 14	4.98	161	0.012	82	0.316	– 11
0.5	0.963	– 17	4.91	156	0.014	89	0.318	– 12
0.6	0.957	– 21	4.81	151	0.020	77	0.306	– 14
0.7	0.942	– 24	4.76	146	0.022	83	0.302	– 16
0.8	0.920	– 27	4.63	141	0.027	79	0.297	– 17
0.9	0.887	– 31	4.50	136	0.031	79	0.289	– 21
1.0	0.871	– 33	4.40	132	0.033	75	0.276	– 21
1.1	0.846	– 36	4.31	128	0.035	75	0.269	– 22
1.2	0.826	– 39	4.16	123	0.037	75	0.263	– 22
1.3	0.807	– 41	4.12	119	0.039	70	0.256	– 24
1.4	0.788	– 44	4.01	116	0.042	73	0.246	– 24

Typical S- and Noise-Parameters (cont'd)

$$V_D = 5 \text{ V}, Z_0 = 50 \Omega$$

<i>f</i>	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1.5	0.762	- 46	3.91	112	0.043	72	0.240	- 24
1.6	0.744	- 49	3.77	108	0.047	71	0.234	- 25
1.7	0.723	- 51	3.69	105	0.048	71	0.229	- 24
1.8	0.703	- 53	3.60	101	0.051	70	0.221	- 23
1.9	0.687	- 55	3.50	98	0.052	71	0.215	- 22
2.0	0.665	- 57	3.42	94	0.054	72	0.208	- 21
2.1	0.647	- 58	3.28	91	0.057	72	0.203	- 20
2.2	0.636	- 60	3.25	88	0.058	70	0.193	- 59
2.3	0.611	- 62	3.20	84	0.060	69	0.184	- 17
2.4	0.595	- 63	3.14	82	0.062	70	0.176	- 14
2.5	0.573	- 66	3.06	78	0.063	71	0.172	- 11

<i>f</i>	F_{min}	Γ_{opt}		R_N
		MAG	ANG	
GHz	dB	-	deg	Ω
0.8	1.13	0.76	18	58.5
1.0	1.16	0.74	21	56.3
1.2	1.21	0.73	27	52.7
1.4	1.26	0.72	30	49.1
1.6	1.33	0.70	34	48.5
1.8	1.42	0.68	38	45.2
2.0	1.55	0.66	42	43.4

S- and noise-parameters are also available on CD-ROM.

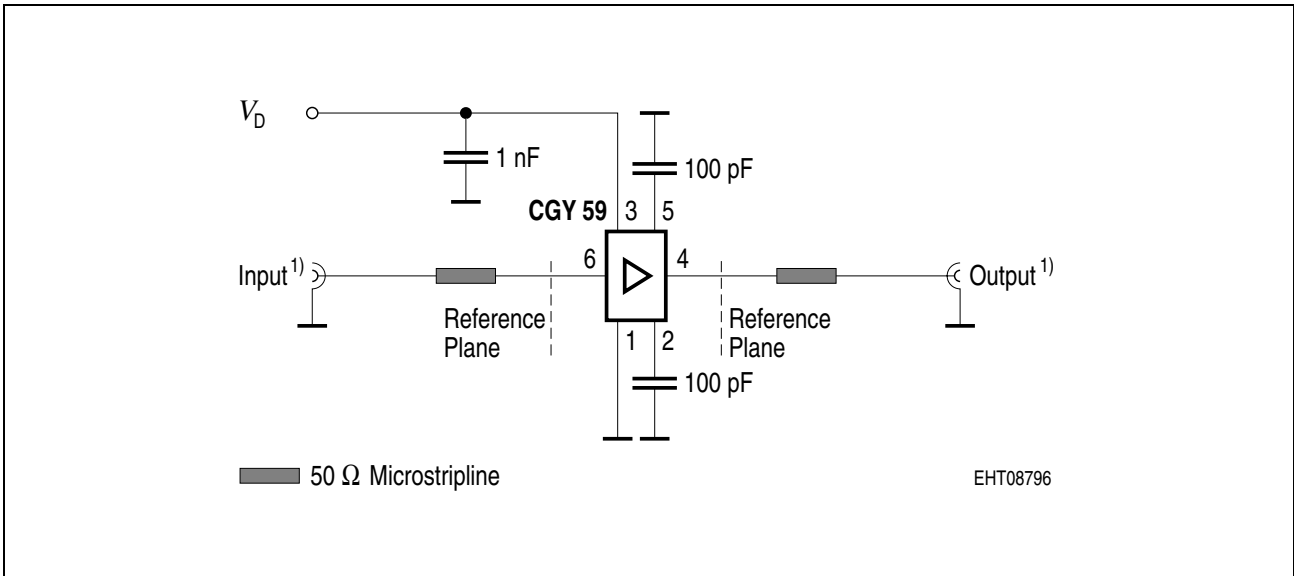
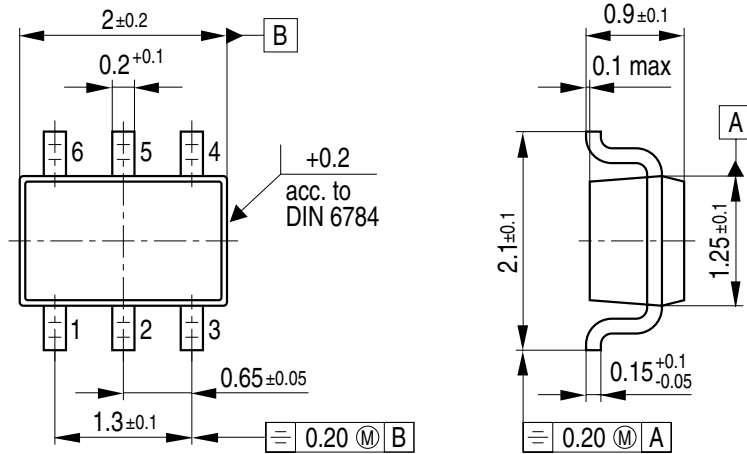


Figure 4 Application Circuit for Measuring S-Parameters
 $f = 200 \text{ MHz to } 2.5 \text{ GHz}$

¹⁾ Caution! DC - decoupling capacitors are not integrated in device

Package Outlines

P-SOT363-6-1
(Small Outline Transistor)



GPS05604

Sorts of Packing

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

SMD = Surface Mounted Device

Dimensions in mm