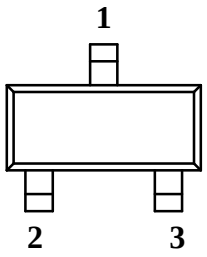
Silicon NPN Planar RF Transistor

Applications

RF-amplifier up to 2GHz especially for wide band antenna amplifier mixers and oscillators in TV-sat-tuners.

Features

- High power gain
- Low noise figure
- High transition frequency



BF775 Marking: 775
Plastic case (SOT 23)
1= Collector; 2= Base; 3= Emitter

Absolute Maximum Ratings

Parameters	Symbol	Value	Unit
Collector-base voltage	V_{CBO}	20	V
Collector-emitter voltage	V_{CEO}	15	V
Emitter-base voltage	V_{EBO}	2	V
Collector current	I_C	30	mA
Total power dissipation $T_{amb} \leq 60°C$	P_{tot}	200	mW
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	–65 to +150	°C

Maximum Thermal Resistance

Parameters	Symbol	Value	Unit
Junction ambient on glass fibre printed board (25 x 20 x 1.5) mm^3 plated with 35 µm Cu	R_{thJA}	450	K/W

Electrical DC Characteristics

T_{amb} = 25°C, unless otherwise specified

Parameters / Test Conditions	Symbol	Min.	Typ.	Max.	Unit
Collector-emitter cut-off current V_{CE} = 20 V, V_{BE} = 0	I_{CES}			100	µA
Collector-base cut-off current V_{CB} = 15 V, I_E = 0	I_{CBO}			100	nA
Emitter-base cut-off current V_{EB} = 2 V, I_C = 0	I_{EBO}			10	µA
Collector-emitter breakdown voltage I_C = 1 mA, I_B = 0	$V_{(BR)CEO}$	15			V
DC forward current transfer ratio V_{CE} = 6 V, I_C = 5 mA V_{CE} = 6 V, I_C = 20 mA	 h_{FE} h_{FE}	 40 40	 90 100	 150 150	

Electrical AC Characteristics

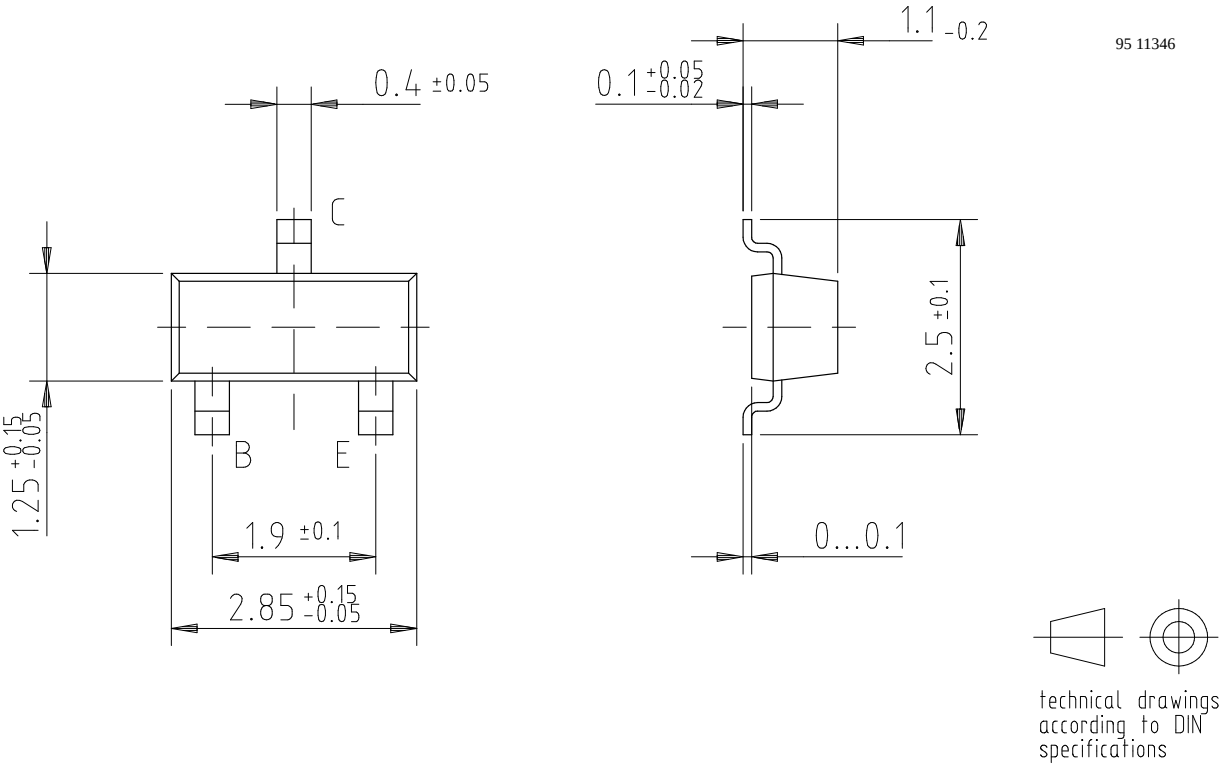
T_{amb} = 25°C

Parameters / Test Conditions	Symbol	Min.	Typ.	Max.	Unit
Transition frequency V_{CE} = 6 V, I_C = 5 mA, f = 500 MHz V_{CE} = 6 V, I_C = 20 mA, f = 500 MHz	 f_T f_T		 4.2 5.2		 GHz GHz
Collector-emitter capacitance V_{CE} = 10 V, f = 1 MHz	C_{ce}		0.15		pF
Collector-base capacitance V_{CB} = 10 V, f = 1 MHz	C_{cb}		0.4		pF
Emitter-base capacitance V_{EB} = 0.5 V, f = 1 MHz	C_{eb}		1.3		pF
Noise figure V_{CE} = 6 V, I_C = 2 mA, f = 500 MHz, Z_S = 50 Ω	F		2.0		dB
Power gain V_{CE} = 6 V, I_C = 14 mA, $Z_L = Z_{Lopt}$ f = 500 MHz f = 800 MHz	 G_{pe} G_{pe}		 19.5 14		 dB dB
Linear output voltage – two tone intermodulation test V_{CE} = 6 V, I_C = 14 mA, d_{IM} = 60 dB $Z_S = Z_L$ = 50 Ω, f_1 = 806 MHz, f_2 = 810 MHz	 $V_1 = V_2$		 110		 mV
Third order intercept point V_{CE} = 6 V, I_C = 14 mA, f = 800 MHz	IP_3		23.5		dBm

Common Emitter S-Parameters

V_{CE}/V	I_C/mA	f/MHz	S_{11}		S_{21}		S_{12}		S_{22}	
			LIN MAG	ANG	LIN MAG	ANG	LIN MAG	ANG	LIN MAG	ANG
				deg		deg		deg		deg
6	5	100	0.791	–29.6	13.23	154.8	0.024	74.9	0.927	–14.2
		300	0.531	–75.1	9.15	120.5	0.053	60.4	0.684	–27.3
		500	0.357	–105.6	6.34	102.6	0.069	58.5	0.554	–27.8
		800	0.245	–135.5	4.23	87.8	0.092	61.7	0.495	–25.0
		1000	0.221	–150.8	3.49	80.8	0.108	63.5	0.492	–25.5
		1200	0.210	–164.1	3.00	74.4	0.125	64.5	0.490	–27.9
		1500	0.225	177.2	2.48	65.5	0.152	65.2	0.476	–32.5
		1800	0.235	158.5	2.13	57.9	0.180	65.1	0.466	–36.4
		2000	0.245	149.0	1.97	53.3	0.200	64.8	0.466	–39.7
	10	100	0.641	–43.0	20.27	144.5	0.021	71.1	0.854	–19.4
		300	0.358	–95.3	11.14	109.5	0.043	64.2	0.567	–27.6
		500	0.247	–127.4	7.20	95.3	0.061	66.8	0.472	–24.2
		800	0.190	–159.6	4.64	83.0	0.089	69.3	0.447	–20.3
		1000	0.178	–171.7	3.79	77.2	0.109	69.8	0.454	–21.1
		1200	0.180	177.8	3.24	71.5	0.128	69.5	0.458	–24.2
		1500	0.202	164.3	2.67	63.6	0.158	68.7	0.446	–29.3
		1800	0.219	147.7	2.29	56.6	0.187	67.6	0.439	–33.4
		2000	0.236	139.1	2.11	52.2	0.209	66.2	0.440	–36.9
	15	100	0.534	–53.0	24.01	137.9	0.019	70.6	0.800	–21.8
		300	0.290	–108.6	11.70	104.8	0.040	67.7	0.523	–25.7
		500	0.218	–141.6	7.40	92.1	0.059	70.5	0.450	–21.4
		800	0.182	–171.9	4.73	81.2	0.088	72.1	0.438	–17.8
		1000	0.172	177.9	3.86	75.5	0.109	72.1	0.450	–19.1
		1200	0.179	169.1	3.28	70.3	0.129	71.3	0.453	–22.5
		1500	0.207	158.9	2.71	62.7	0.159	70.2	0.443	–27.8
		1800	0.227	144.5	2.31	55.9	0.189	68.6	0.437	–32.0
		2000	0.241	136.4	2.13	51.6	0.210	67.1	0.438	–35.7
	20	100	0.468	–61.0	26.03	133.4	0.018	70.4	0.761	–22.8
		300	0.259	–119.0	11.80	101.9	0.038	70.6	0.503	–23.6
		500	0.214	–151.7	7.38	90.3	0.057	72.6	0.445	–19.2
		800	0.189	–179.5	4.71	79.8	0.088	73.6	0.441	–16.3
		1000	0.181	170.9	3.83	74.3	0.108	73.5	0.454	–18.0
		1200	0.188	165.0	3.26	69.1	0.128	72.5	0.458	–21.6
		1500	0.218	155.7	2.68	61.7	0.158	70.9	0.448	–27.1
		1800	0.236	142.6	2.29	54.9	0.188	69.4	0.442	–31.4
		2000	0.255	135.1	2.11	50.9	0.209	68.0	0.444	–35.3
	30	100	0.379	–79.7	26.29	126.5	0.016	68.5	0.708	–22.2
		300	0.252	–139.5	10.98	98.1	0.035	72.9	0.503	–19.4
		500	0.241	–166.8	6.81	87.5	0.055	75.2	0.465	–16.3
		800	0.227	170.7	4.33	77.8	0.085	75.7	0.466	–15.3
		1000	0.225	163.1	3.52	72.3	0.105	75.3	0.479	–17.6
		1200	0.232	158.1	3.01	67.0	0.125	74.3	0.483	–21.6
		1500	0.260	150.7	2.47	59.5	0.154	72.8	0.474	–27.5
		1800	0.282	138.7	2.11	52.7	0.185	71.3	0.468	–32.4
		2000	0.304	132.0	1.95	48.7	0.206	69.9	0.469	–36.3

Dimensions in mm



Ozone Depleting Substances Policy Statement

It is the policy of **TEMIC TELEFUNKEN microelectronic GmbH** to

1. Meet all present and future national and international statutory requirements.

2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

TEMIC TELEFUNKEN microelectronic GmbH semiconductor division has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively

2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA

3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

TEMIC can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

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