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NPN 2 GHz wideband transistor — BF689K

DESCRIPTION

NPN transistor in a plastic SOT54 (TO-92 variant) envelope. It is intended for application as an amplifier or oscillator in the VHF and UHF range.

PINNING

PIN	DESCRIPTION
1	emitter
2	base
3	collector

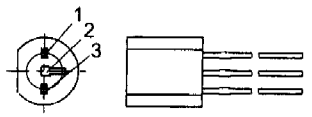


Fig.1 SOT54.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	–	–	25	V
V_{CEO}	collector-emitter voltage	open base	–	–	15	V
I_C	DC collector current		–	–	25	mA
P_{tot}	total power dissipation	up to T_{amb} = 60 °C	–	–	360	mW
h_{FE}	DC current gain	I_C = 2 mA; V_{CE} = 5 V; T_j = 25 °C	20	–	–	
		I_C = 20 mA; V_{CE} = 5 V; T_j = 25 °C	35	–	–	
f_T	transition frequency	I_C = 15 mA; V_{CE} = 5 V; f = 500 MHz	–	1.8	–	GHz

LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	–	25	V
V_{CEO}	collector-emitter voltage	open base	–	15	V
V_{CER}	collector-emitter voltage	$R_{BE} \leq 50\ \Omega$	–	25	V
V_{EBO}	emitter-base voltage	open collector	–	3.5	V
I_C	DC collector current		–	25	mA
I_{CM}	peak collector current	$t_p < 1\ \mu s$	–	50	mA
P_{tot}	total power dissipation	up to T_{amb}= 60 °C	–	360	mW
T_{stg}	storage temperature		–55	150	°C
T_j	junction temperature		–	150	°C

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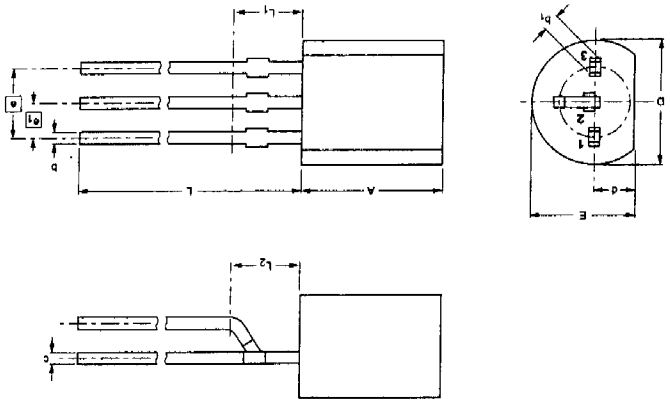
THERMAL RESISTANCE

SYMBOL	PARAMETER	CONDITIONS	THERMAL RESISTANCE
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	in free air	250 K/W

CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CBO}	collector cut-off current	I_E = 0; V_{CB} = 15 V	–	–	50	nA
I_{EBO}	emitter cut-off current	I_C = 0; V_{EB} = 2 V	–	–	1	μA
$V_{CE\ sat}$	collector-emitter saturation voltage	I_C = 25 mA; I_B = 1.25 mA	–	–	1.0	V
$V_{BE\ sat}$	base-emitter saturation voltage	I_C = 25 mA; I_B = 1.25 mA	–	–	1.0	V
h_{FE}	DC current gain	I_C = 2 mA; V_{CE} = 5 V	20	–	–	
		I_C = 20 mA; V_{CE} = 5 V	35	–	–	
f_T	transition frequency	I_C = 15 mA; V_{CE} = 5 V; f = 500 MHz	–	1.8	–	GHz
C_{re}	feedback capacitance	I_C = 2 mA; V_{CE} = 5 V; f = 1 MHz; T_{amb} = 25 °C	–	1.1	–	pF
G_p	power gain	I_C = 2 mA; V_{CE} = 5 V; f = 100 MHz; T_{amb} = 25 °C; Z_S = 60 Ω; R_L = 2 kΩ	–	16	–	dB
		I_C = 2 mA; V_{CE} = 5 V; f = 200 MHz; T_{amb} = 25 °C; Z_S = 60 Ω; R_L = 920 Ω	–	16	–	dB
F	noise figure	I_C = 2 mA; V_{CE} = 5 V; f = 100 MHz; T_{amb} = 25 °C; Z_S = 60 Ω	–	4	–	dB
		I_C = 2 mA; V_{CE} = 5 V; f = 200 MHz; T_{amb} = 25 °C; Z_S = 60 Ω	–	3	–	dB



DIMENSIONS (mm are the original dimensions)

UNIT	A	b	b_1	c	D	d	E	e	e_1	L	$L_1^{(1)}$ max	L_2 max
mm	5.2 5.0	0.48 0.40	0.66 0.56	0.45 0.40	4.8 4.4	1.7 1.4	4.2 3.6	2.54	1.27	14.5 12.7	2.5	2.5

Notes

1. Terminal dimensions within this zone are uncontrolled to allow for flow of plastic and terminal irregularities.

OUTLINE VERSION	REFERENCES			
	IEC	JEDEC	EIAJ	
SOT54 variant		TO-92	SC-43	