

NPN video transistor

BFQ161

FEATURES

- Low output capacitance
- High gain bandwidth
- High current applicability
- Good thermal stability
- Gold metallization ensures excellent reliability.

APPLICATIONS

- Pre-stage driver in high resolution colour graphics monitors.

DESCRIPTION

NPN video transistor in a SOT54 (TO-92) plastic package.

PINNING

PIN	DESCRIPTION
1	base
2	collector
3	emitter

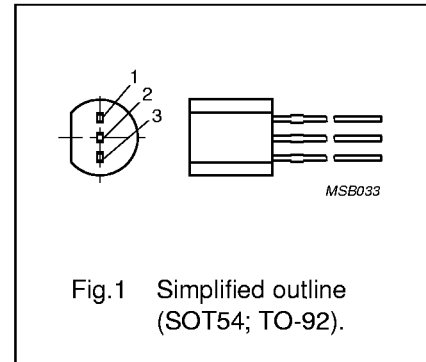


Fig.1 Simplified outline (SOT54; TO-92).

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	—	20	V
V_{CER}	collector-emitter voltage	$R_{BE} = 100 \Omega$	—	19	V
I_C	collector current (DC)		—	500	mA
P_{tot}	total power dissipation	$T_s \leq 75^\circ\text{C}$; note 1	—	1	W
h_{FE}	DC current gain	$I_C = 300 \text{ mA}$; $V_{CE} = 5 \text{ V}$	25	—	
f_T	transition frequency	$I_C = 300 \text{ mA}$; $V_{CE} = 5 \text{ V}$; $T_{amb} = 25^\circ\text{C}$	1	—	GHz
T_j	junction temperature		—	150	$^\circ\text{C}$

Note

1. T_s is the temperature at the soldering point of the collector pin, 4 mm from the body.

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	—	20	V
V_{CEO}	collector-emitter voltage	open base	—	10	V
V_{CER}	collector-emitter voltage	$R_{BE} = 100 \Omega$	—	19	V
V_{EBO}	emitter-base voltage	open collector	—	3	V
I_C	collector current (DC)		—	500	mA
P_{tot}	total power dissipation	$T_s \leq 75^\circ\text{C}$; notes 1 and 2; see Fig.3	—	1	W
T_{stg}	storage temperature range		−65	+150	$^\circ\text{C}$
T_j	junction temperature		—	150	$^\circ\text{C}$

Notes

1. T_s is the temperature at the soldering point of the collector pin, 4 mm from the body.
2. Transistor mounted on a printed-circuit board with a metallized pad area of 10 mm^2 .

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THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-s}$	thermal resistance from junction to soldering point	note 1	75	K/W
$R_{th\ j-a}$	thermal resistance from junction to ambient		175	K/W
$R_{th\ s-a}$	thermal resistance from soldering point to ambient		100	K/W

Note

1. T_s is the temperature at the soldering point of the collector pin, 4 mm from the body.

CHARACTERISTICS

$T_j = 25\ ^\circ\text{C}$ unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{(BR)CBO}$	collector-base breakdown voltage	$I_C = 5\ \text{mA}; I_E = 0$	20	—	—	V
$V_{(BR)CEO}$	collector-emitter breakdown voltage	$I_C = 10\ \text{mA}; I_B = 0$	10	—	—	V
$V_{(BR)EBO}$	emitter-base breakdown voltage	$I_E = 0.1\ \text{mA}; I_C = 0$	3	—	—	V
I_{CES}	collector-emitter cut-off current	$I_B = 0; V_{CE} = 10\ \text{V}$	—	—	100	μA
h_{FE}	DC current gain	$I_C = 300\ \text{mA}; V_{CE} = 5\ \text{V};$ $T_{amb} = 25\ ^\circ\text{C};$ see Fig.4	25	—	—	
		$I_C = 100\ \text{mA}; V_{CE} = 5\ \text{V};$ $T_{amb} = 25\ ^\circ\text{C};$ see Fig.4	40	50	—	
C_{cb}	collector-base capacitance	$I_C = 0; V_{CB} = 5\ \text{V}; f = 1\ \text{MHz};$ see Fig.5	—	4.3	—	pF
C_c	collector capacitance	$I_E = I_e = 0; V_{CB} = 5\ \text{V}; f = 1\ \text{MHz}$	—	6	—	pF
f_T	transition frequency	$I_C = 300\ \text{mA}; V_{CE} = 5\ \text{V};$ see Fig.6	1	—	—	GHz

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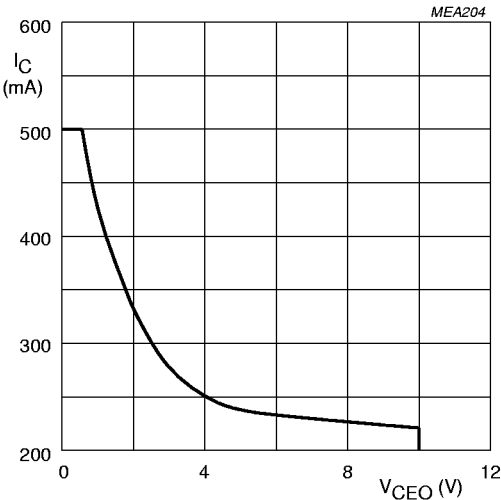


Fig.2 DC SOAR.

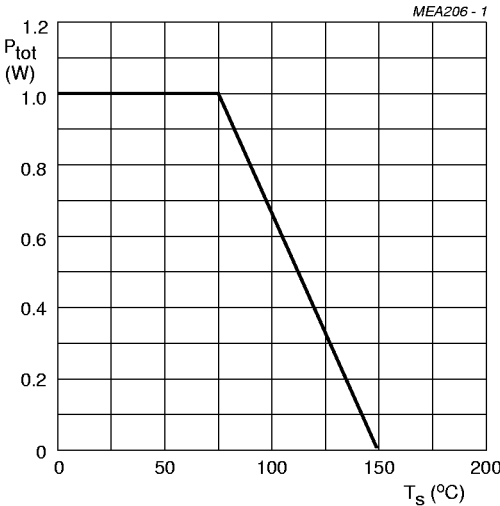
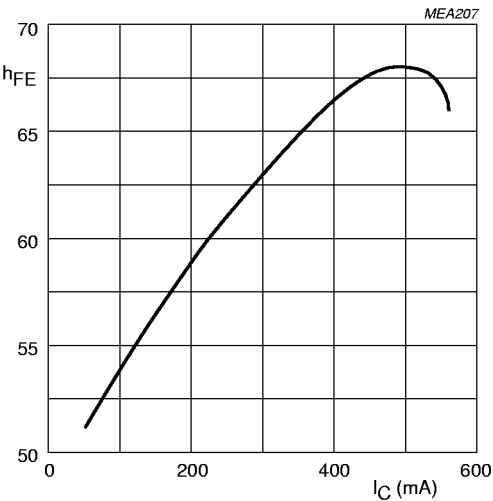
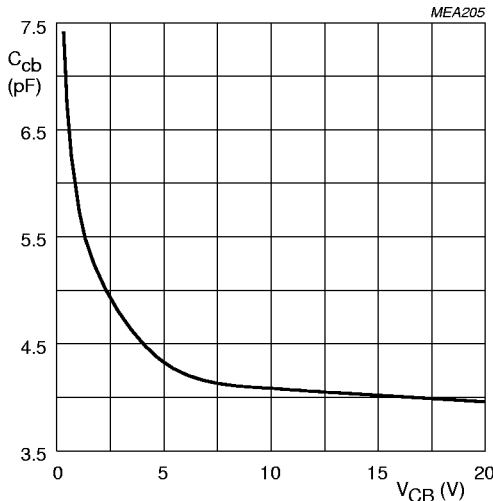


Fig.3 Power derating curve.



$V_{CE} = 5$ V; $T_{amb} = 25$ $^{\circ}C$.

Fig.4 DC current gain as a function of collector current; typical values.

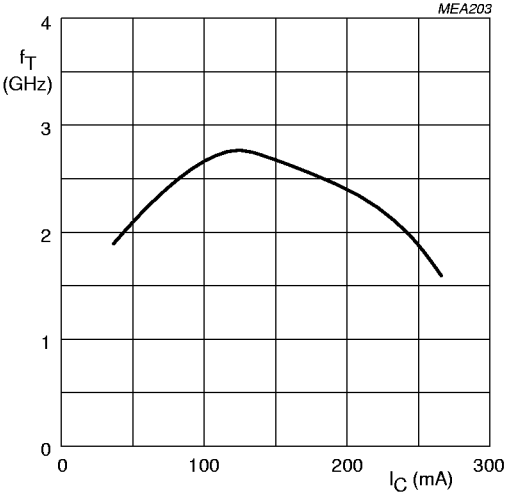


$f = 1$ MHz; $T_{amb} = 25$ $^{\circ}C$.

Fig.5 Collector-base capacitance as a function of collector-base voltage; typical values.

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$V_{CE} = 5\text{ V}; T_{amb} = 25\text{ }^{\circ}\text{C}.$

Fig.6 Transition frequency as a function of collector current; typical values.

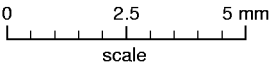
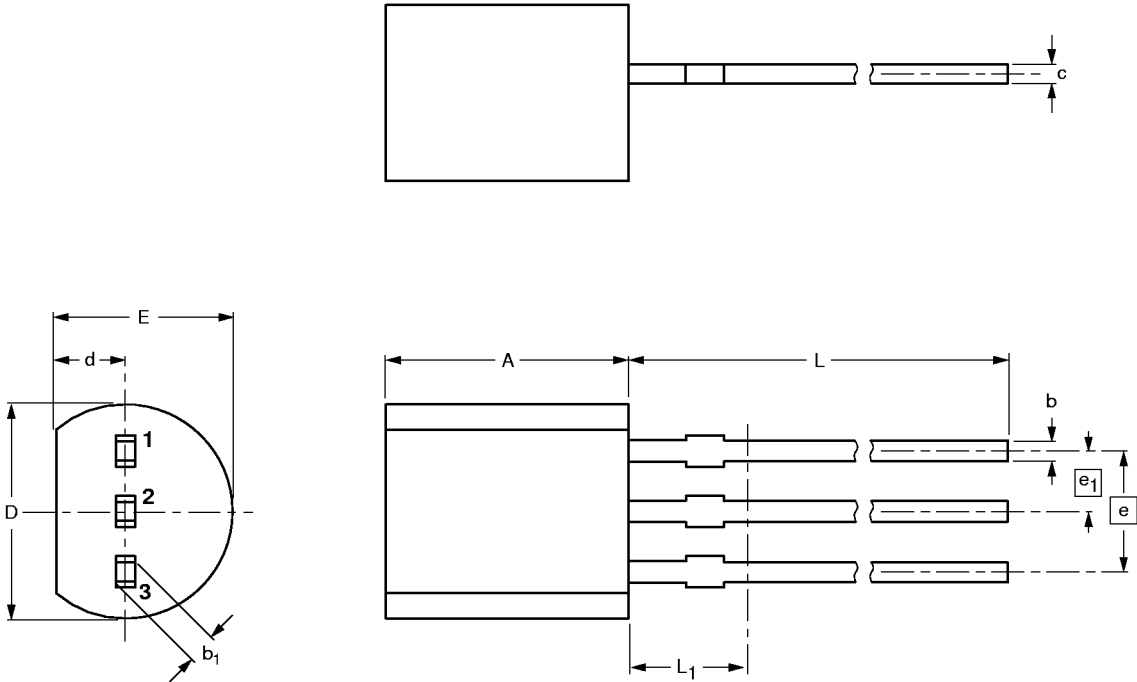
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PACKAGE OUTLINE

Plastic single-ended leaded (through hole) package; 3 leads

SOT54



DIMENSIONS (mm are the original dimensions)

UNIT	A	b	b ₁	c	D	d	E	e	e ₁	L	L ₁ ⁽¹⁾
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

Note

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

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT54		TO-92	SC-43			97-02-28