

# HN / 2N 4400/4401

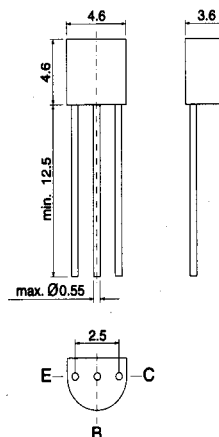
## NPN EPITAXIAL SILICON TRANSISTOR

General purpose transistor

Collector Emitter Voltage:  $V_{CEO} = 40V$

Collector Dissipation:  $P_C (\text{max}) = 625\text{mW}$

On special request, these transistors can be manufactured in different pin configurations. Please refer to the "TO-92 TRANSISTOR PACKAGE OUTLINE" on page 80 for the available pin options.

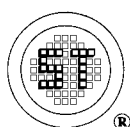


TO-92 Plastic Package  
Weight approx. 0.18 g  
Dimensions in mm

### Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	60	V
Collector-Emitter Voltage	$V_{CEO}$	40	V
Emitter-Base Voltage	$V_{EBO}$	6	V
Collector Current	$I_C$	600	mA
Collector Dissipation	$P_C$	625	mW
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature Range	$T_S$	-55 to + 150	$^\circ\text{C}$

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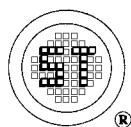
## NPN EPITAXIAL SILICON TRANSISTOR

Characteristics at  $T_{amb} = 25^{\circ}\text{C}$

	Symbol	Min.	Typ.	Max.	Unit
DC Current Gain. at $V_{CE} = 1\text{V}$ , $I_C = 0.1\text{ mA}$	<b>HN / 2N 4401</b> $h_{FE}$	20	-	-	-
at $V_{CE} = 1\text{V}$ , $I_C = 1\text{ mA}$	<b>HN / 2N 4400</b> $h_{FE}$	20	-	-	-
	<b>HN / 2N 4401</b> $h_{FE}$	40	-	-	-
at $V_{CE} = 1\text{V}$ , $I_C = 10\text{ mA}$	<b>HN / 2N 4400</b> $h_{FE}$	40	-	-	-
	<b>HN / 2N 4401</b> $h_{FE}$	80	-	-	-
at $V_{CE} = 1\text{V}$ , $I_C = 150\text{ mA}$	<b>HN / 2N 4400</b> $h_{FE}$	50	-	150	-
	<b>HN / 2N 4401</b> $h_{FE}$	100	-	300	-
at $V_{CE} = 2\text{V}$ , $I_C = 500\text{ mA}$	<b>HN / 2N 4400</b> $h_{FE}$	20	-	-	-
	<b>HN / 2N 4401</b> $h_{FE}$	40	-	-	-
Collector Cutoff Current at $V_{CE} = 35\text{ V}$ , at $V_{EB} = 0.4\text{V}$	$I_{CEX}$	-	-	100	nA
Collector Emitter Breakdown Voltage at $I_C = 1\text{ mA}$ , $I_B = 0$	$V_{(BR)CEO}$	40	-	-	V
Collector Base Breakdown Voltage at $I_C = 100\text{ }\mu\text{A}$ , $I_E = 0$	$V_{(BR)CBO}$	60	-	-	V
Collector Emitter Saturation Voltage at $I_C = 150\text{ mA}$ , $I_B = 15\text{ mA}$ at $I_C = 50\text{ mA}$ , $I_B = 50\text{ mA}$	$V_{CEsat}$	-	-	0.4 0.75	V V
Collector Saturation Voltage at $I_C = 150\text{ mA}$ , $I_B = 15\text{ mA}$ at $I_C = 500\text{ mA}$ , $I_B = 50\text{ mA}$	$V_{BEsat}$	0.75 -	-	0.95 1.2	V V
Emitter Base Breakdown Voltage at $I_E = 100\text{ }\mu\text{A}$ , $I_C = 0$	$V_{BR(EBO)}$	6	-	-	V
Gain Bandwidth Product at $V_{CE} = 10\text{V}$ , $I_C = 20\text{ mA}$ , $f = 100\text{MHz}$	<b>HN / 2N 4400</b> <b>HN / 2N 4401</b> $f_T$	200 250	- -	- -	MHz MHz
Collector Base Capacitance at $V_{CB} = 5\text{ V}$ , $f = 100\text{MHz}$ , $I_E = 0$	$C_{(CBO)}$	-	-	6.5	pF
Turn On Time at $V_{CC} = 30\text{ V}$ , $V_{BE} = 2\text{V}$ , $I_C = 150\text{ mA}$ , $I_{B1} = 15\text{ mA}$	$t_{on}$	-	-	35	ns
Turn Off Time at $V_{CC} = 30\text{ V}$ , $I_C = 150\text{ mA}$ , $I_{B1} = I_{B2} = 15\text{mA}$	$t_{off}$	-	-	255	ns

<sup>1)</sup> Valid provided that leads are kept at ambient temperature at a distance of 2 mm from case.

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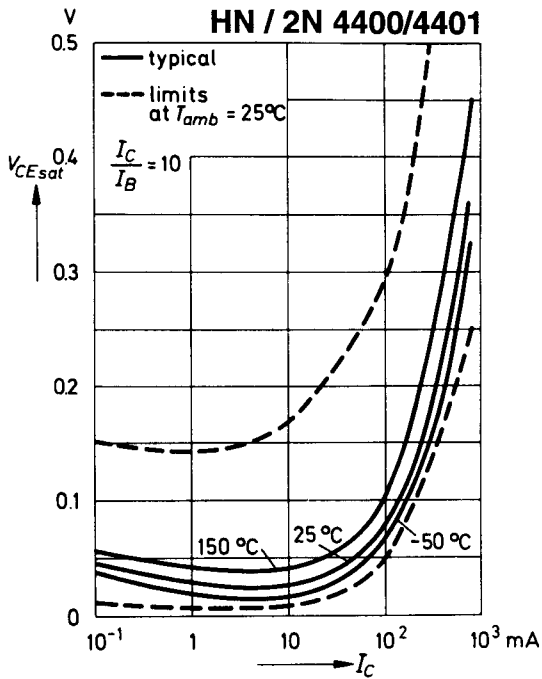
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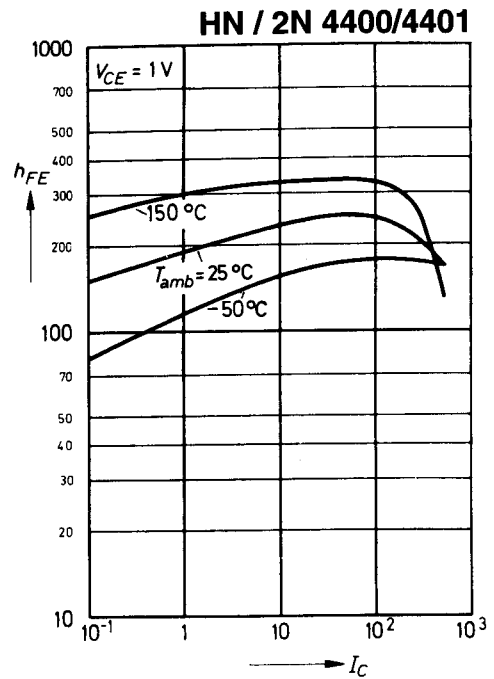
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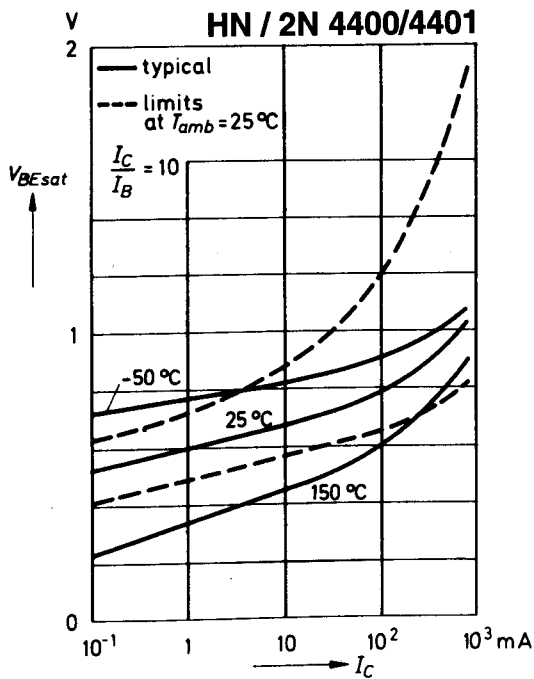
Collector saturation voltage  
versus collector current



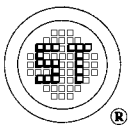
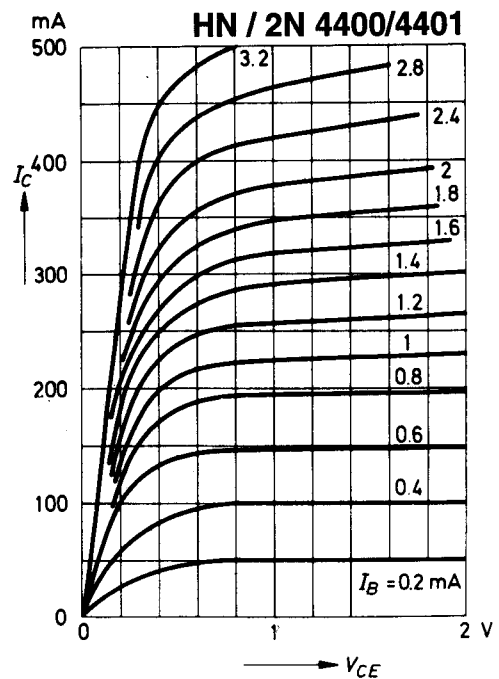
DC current gain  
versus collector current



Base saturation voltage  
versus collector current



Common emitter  
collector characteristics



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