



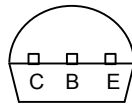
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# NPN 2N6515, 2N6517 PNP 2N6519, 2N6520

## Features

- Through Hole Package
- 150°C Junction Temperature
- Voltage and Current are negative for PNP transistors

Pin Configuration  
Bottom View



## High Voltage Transistor 625mW

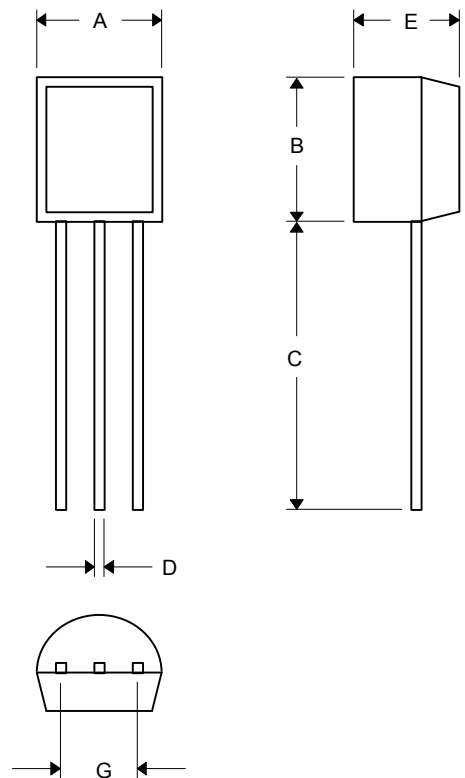
## Mechanical Data

- Case: TO-92, Molded Plastic
- Polarity: indicated as above.

Maximum Ratings @ 25°C Unless Otherwise Specified

Charateristic	Symbol	Value	Unit
Collector-Emitter Voltage 2N6515 2N6519 2N6517, 2N6520	$V_{CEO}$	250 300 350	V
Collector-Base Voltage 2N6515 2N6519 2N6517, 2N6520	$V_{CBO}$	250 300 350	V
Emitter-Base Voltage 2N6515-6517 2N6519-6520	$V_{EBO}$	6.0 5.0	V
Base Current	$I_B$	250	mA
Collector Current(DC)	$I_C$	500	mA
Power Dissipation@TA=25°C	$P_d$	625 5.0	W mW/°C
Power Dissipation@TC=25°C	$P_d$	1.5 12	W mW/°C
Thermal Resistance, Junction to Ambient Air	$R_{\theta JA}$	200	°C/W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	83.3	°C/W
Operating & Storage Temperature	$T_j, T_{STG}$	-55~150	°C

## TO-92



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.175	.185	4.45	4.70	
B	.175	.185	4.46	4.70	
C	.500	---	12.7	---	
D	.016	.020	0.41	0.63	
E	.135	.145	3.43	3.68	
G	.095	.105	2.42	2.67	

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## ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector–Emitter Breakdown Voltage <sup>(1)</sup> (I <sub>C</sub> = 1.0 mA <sub>dc</sub> , I <sub>B</sub> = 0)	V <sub>(BR)CEO</sub>	250 300 350	— — —	V <sub>dc</sub>
Collector–Base Breakdown Voltage (I <sub>C</sub> = 100 μA <sub>dc</sub> , I <sub>E</sub> = 0)	V <sub>(BR)CBO</sub>	250 300 350	— — —	V <sub>dc</sub>
Emitter–Base Breakdown Voltage (I <sub>E</sub> = 10 μA <sub>dc</sub> , I <sub>C</sub> = 0)	V <sub>(BR)EBO</sub>	6.0 5.0	— —	V <sub>dc</sub>
Collector Cutoff Current (V <sub>CB</sub> = 150 V <sub>dc</sub> , I <sub>E</sub> = 0) (V <sub>CB</sub> = 200 V <sub>dc</sub> , I <sub>E</sub> = 0) (V <sub>CB</sub> = 250 V <sub>dc</sub> , I <sub>E</sub> = 0)	I <sub>CBO</sub>	— — —	50 50 50	nA <sub>dc</sub>
Emitter Cutoff Current (V <sub>EB</sub> = 5.0 V <sub>dc</sub> , I <sub>C</sub> = 0) (V <sub>EB</sub> = 4.0 V <sub>dc</sub> , I <sub>C</sub> = 0)	I <sub>EBO</sub>	— —	50 50	nA <sub>dc</sub>
<b>ON CHARACTERISTICS<sup>(1)</sup></b>				
DC Current Gain (I <sub>C</sub> = 1.0 mA <sub>dc</sub> , V <sub>CE</sub> = 10 V <sub>dc</sub> )	h <sub>FE</sub>	35 30 20	— — —	—
(I <sub>C</sub> = 10 mA <sub>dc</sub> , V <sub>CE</sub> = 10 V <sub>dc</sub> )		50 45 30	— — —	
(I <sub>C</sub> = 30 mA <sub>dc</sub> , V <sub>CE</sub> = 10 V <sub>dc</sub> )		50 45 30	300 270 200	
(I <sub>C</sub> = 50 mA <sub>dc</sub> , V <sub>CE</sub> = 10 V <sub>dc</sub> )		45 40 20	220 200 200	
(I <sub>C</sub> = 100 mA <sub>dc</sub> , V <sub>CE</sub> = 10 V <sub>dc</sub> )		25 20 15	— — —	
Collector–Emitter Saturation Voltage (I <sub>C</sub> = 10 mA <sub>dc</sub> , I <sub>B</sub> = 1.0 mA <sub>dc</sub> ) (I <sub>C</sub> = 20 mA <sub>dc</sub> , I <sub>B</sub> = 2.0 mA <sub>dc</sub> ) (I <sub>C</sub> = 30 mA <sub>dc</sub> , I <sub>B</sub> = 3.0 mA <sub>dc</sub> ) (I <sub>C</sub> = 50 mA <sub>dc</sub> , I <sub>B</sub> = 5.0 mA <sub>dc</sub> )	V <sub>CE(sat)</sub>	— — — —	0.30 0.35 0.50 1.0	V <sub>dc</sub>
Base–Emitter Saturation Voltage (I <sub>C</sub> = 10 mA <sub>dc</sub> , I <sub>B</sub> = 1.0 mA <sub>dc</sub> ) (I <sub>C</sub> = 20 mA <sub>dc</sub> , I <sub>B</sub> = 2.0 mA <sub>dc</sub> ) (I <sub>C</sub> = 30 mA <sub>dc</sub> , I <sub>B</sub> = 3.0 mA <sub>dc</sub> )	V <sub>BE(sat)</sub>	— — —	0.75 0.85 0.90	V <sub>dc</sub>
Base–Emitter On Voltage (I <sub>C</sub> = 100 mA <sub>dc</sub> , V <sub>CE</sub> = 10 V <sub>dc</sub> )	V <sub>BE(on)</sub>	—	2.0	V <sub>dc</sub>

1. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

NPN 2N6515 2N6517  
PNP 2N6519 2N6520



**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise noted) (Continued)

Characteristic	Symbol	Min	Max	Unit
<b>SMALL-SIGNAL CHARACTERISTICS</b>				
Current-Gain — Bandwidth Product <sup>(1)</sup> ( $I_C = 10\text{ mA dc}$ , $V_{CE} = 20\text{ V dc}$ , $f = 20\text{ MHz}$ )	$f_T$	40	200	MHz
Collector-Base Capacitance ( $V_{CB} = 20\text{ V dc}$ , $I_E = 0$ , $f = 1.0\text{ MHz}$ )	$C_{cb}$	—	6.0	pF
Emitter-Base Capacitance ( $V_{EB} = 0.5\text{ V dc}$ , $I_C = 0$ , $f = 1.0\text{ MHz}$ )	$C_{eb}$	—	80	pF
			100	
<b>SWITCHING CHARACTERISTICS</b>				
Turn-On Time ( $V_{CC} = 100\text{ V dc}$ , $V_{BE(off)} = 2.0\text{ V dc}$ , $I_C = 50\text{ mA dc}$ , $I_{B1} = 10\text{ mA dc}$ )	$t_{on}$	—	200	$\mu\text{s}$
Turn-Off Time ( $V_{CC} = 100\text{ V dc}$ , $I_C = 50\text{ mA dc}$ , $I_{B1} = I_{B2} = 10\text{ mA dc}$ )	$t_{off}$	—	3.5	$\mu\text{s}$

1. Pulse Test: Pulse Width  $\leq 300\ \mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

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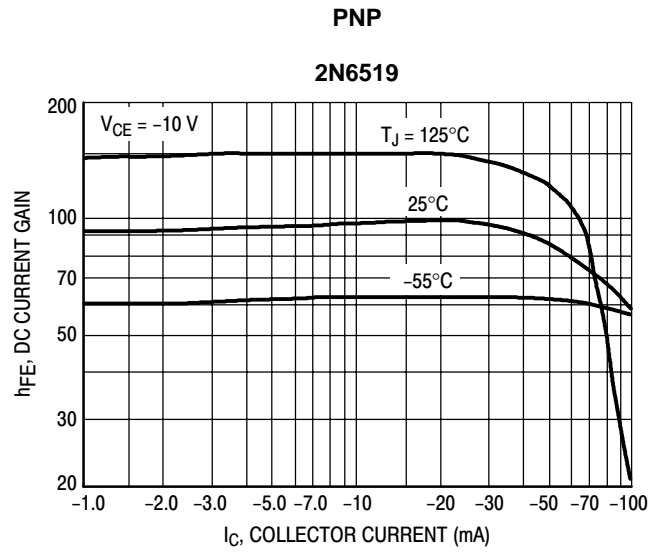
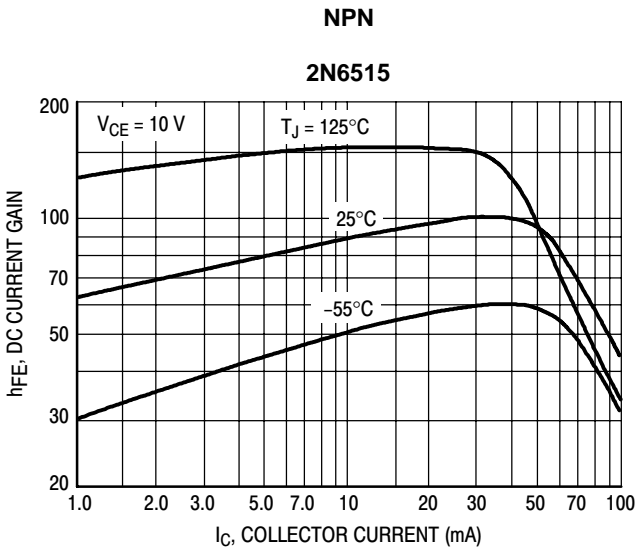


Figure 1. DC Current Gain

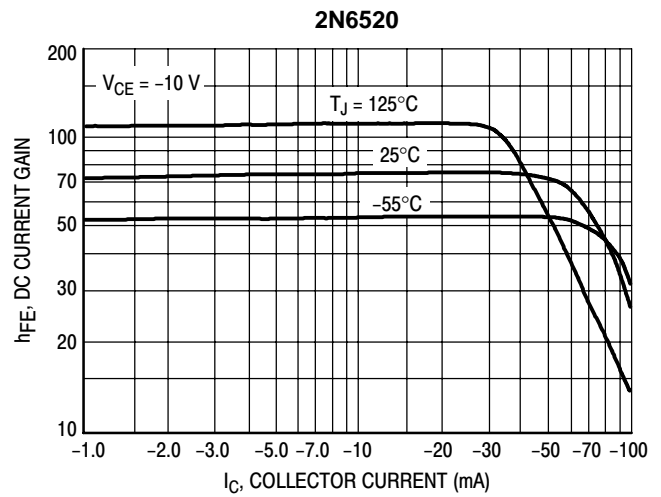
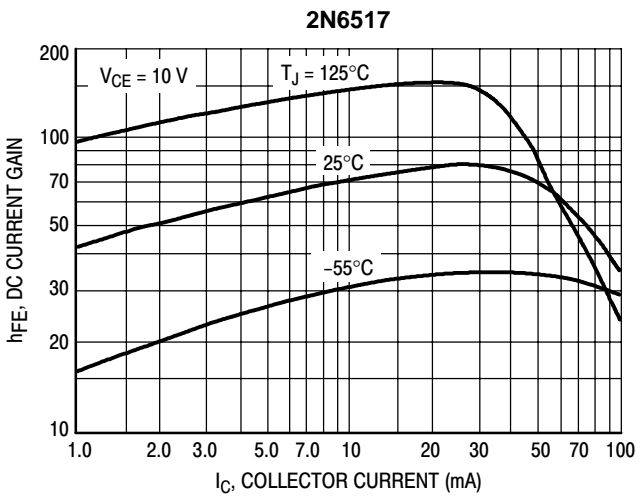


Figure 2. DC Current Gain

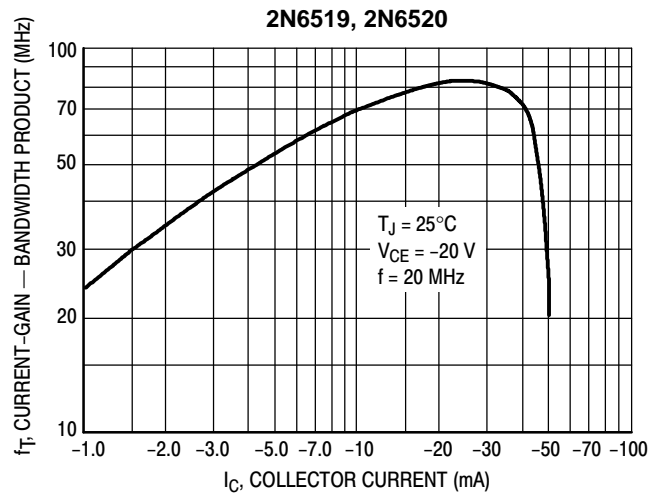
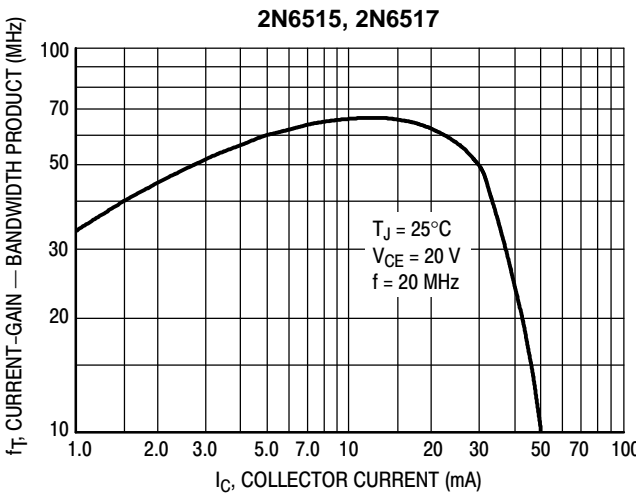


Figure 3. Current-Gain — Bandwidth Product

# NPN 2N6515 2N6517 PNP 2N6519 2N6520



NPN

PNP

2N6515, 2N6517

2N6519, 2N6520

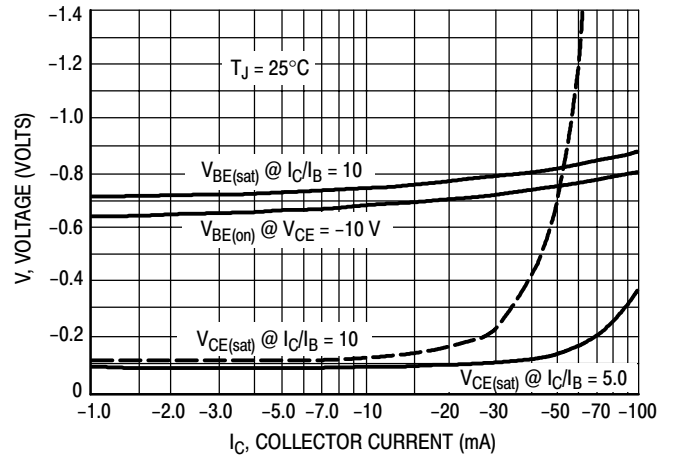
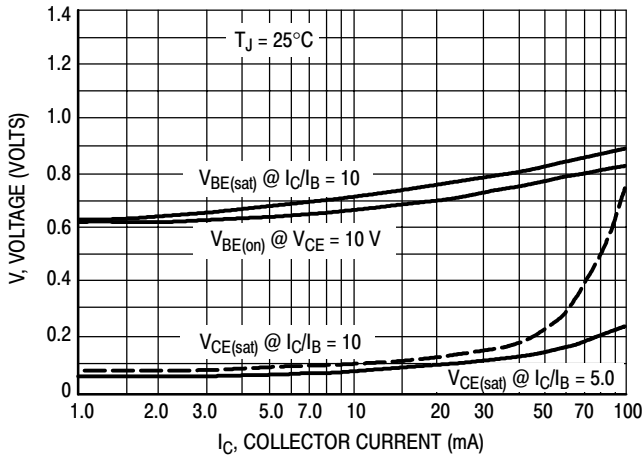


Figure 4. "On" Voltages

2N6515, 2N6517

2N6519, 2N6520

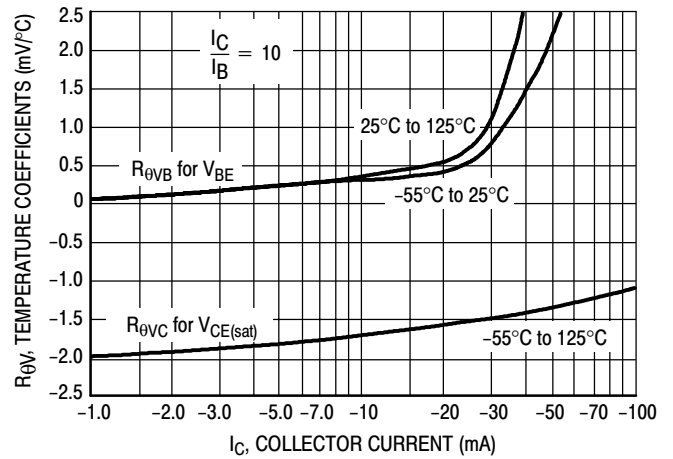
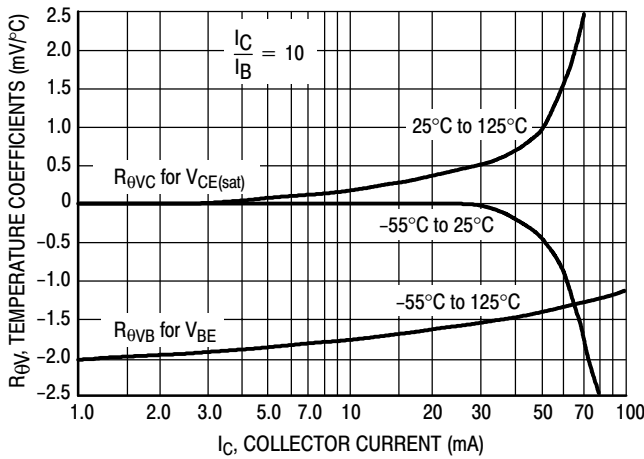


Figure 5. Temperature Coefficients

2N6515, 2N6517

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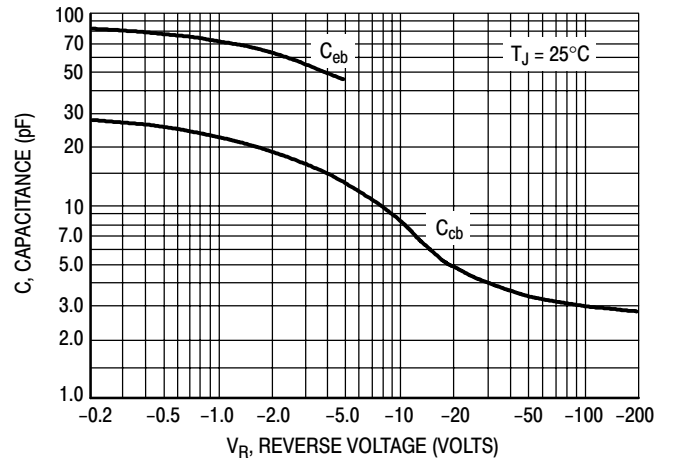
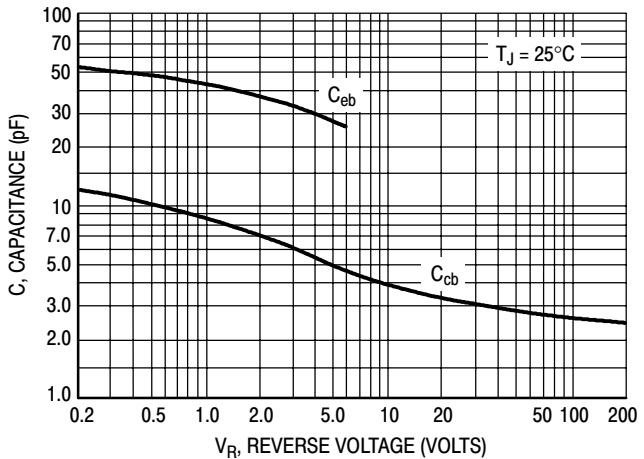


Figure 6. Capacitance

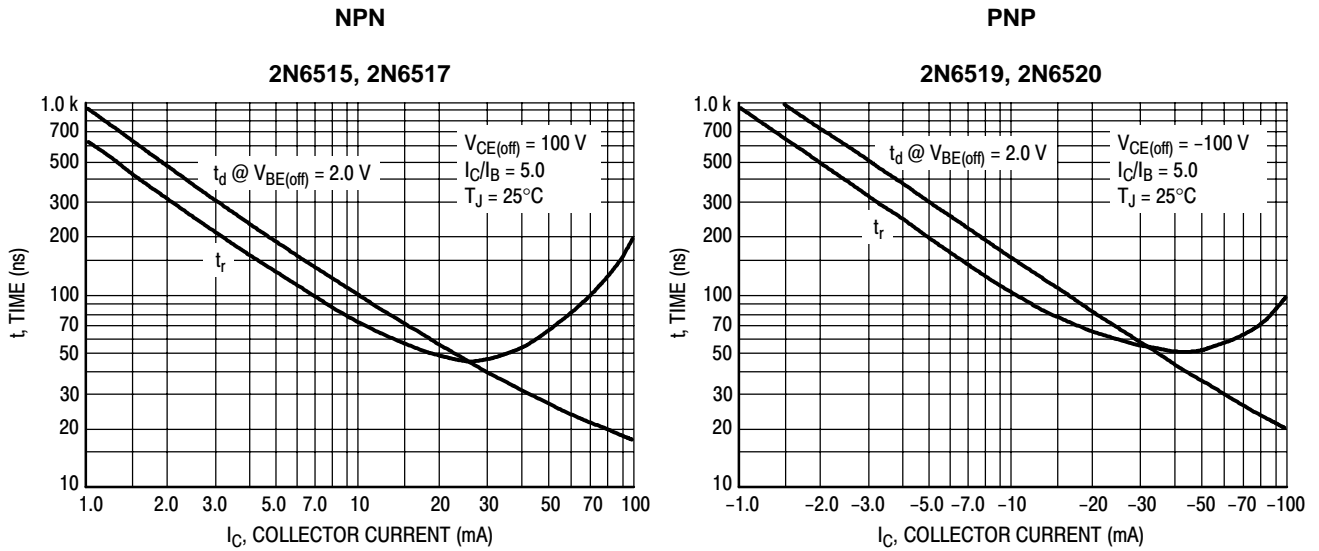


Figure 7. Turn-On Time

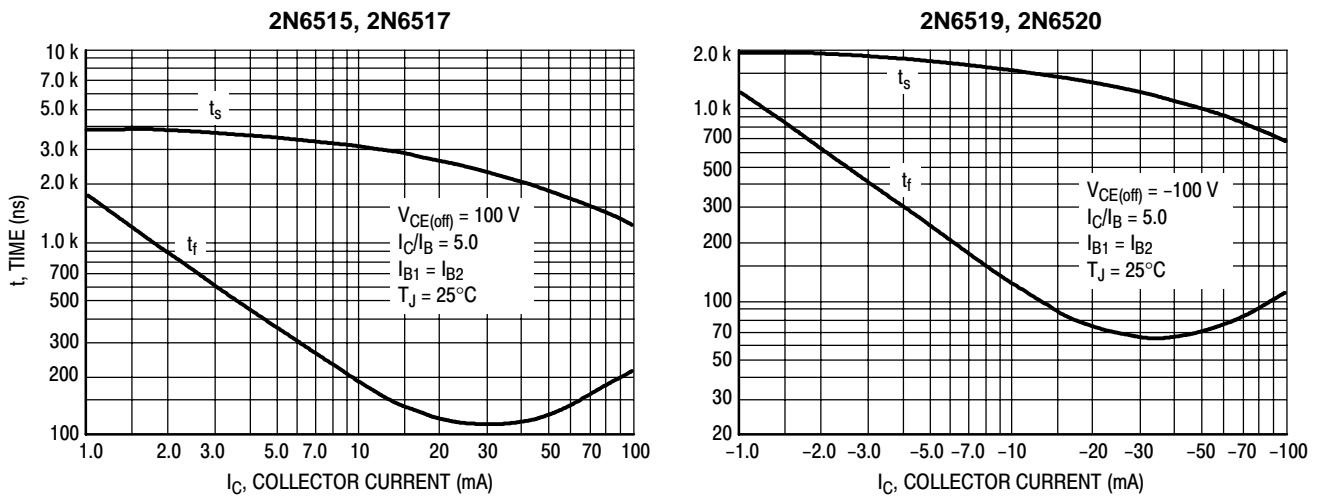


Figure 8. Turn-Off Time