

# PNP Epitaxial Silicon Transistor

## 2N6520

### Features

- High Voltage Transistor
- Collector–Emitter Voltage:  $V_{CBO} = -350\text{ V}$
- Collector Dissipation:  $P_C (\text{max}) = 625\text{ mW}$
- Complement to 2N6517
- This is a Pb–Free Device



TO–92 3 4.83x4.76  
**LEADFORMED**  
**CASE 135AR**

### ABSOLUTE MAXIMUM RATINGS

(Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.)

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector–Base Voltage	–350	V
$V_{CEO}$	Collector–Emitter Voltage	–350	V
$V_{EBO}$	Emitter–Base Voltage	–5	V
$I_C$	Collector Current	–500	mA
$I_B$	Base Current	–250	mA
$T_J$	Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature	–55 to 150	$^\circ\text{C}$

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

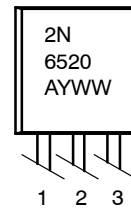
### THERMAL CHARACTERISTICS (Note 1)

(Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.)

Symbol	Parameter	Value	Unit
$P_C$	Collector Power Dissipation	625	mW
	Derate Above $25^\circ\text{C}$	5.0	mW/ $^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance, Junction–to–Ambient	200	$^\circ\text{C}/\text{W}$

1. PCB size: FR–4, 76 mm x 114 mm x 1.57 mm (3.0 inch x 4.5 inch x 0.062 inch) with minimum land pattern size.

### MARKING DIAGRAM



1: Emitter  
 2: Base  
 3: Collector

2N6520 = Device Code  
 A = Assembly Code  
 YWW = Date Code

### ORDERING INFORMATION

Device	Package	Shipping
2N6520TA	TO–92 3 (Pb–Free)	2000 Units / Fan–Fold

## 2N6520

### ELECTRICAL CHARACTERISTICS

(Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.)

Symbol	Parameter	Conditions	Min.	Max.	Unit
$BV_{CBO}$	Collector-Base Breakdown Voltage	$I_C = -100 \mu\text{A}, I_E = 0$	-350	-	V
$BV_{CEO}$	Collector-Emitter Breakdown Voltage (Note 2)	$I_C = -1 \text{ mA}, I_B = 0$	-350	-	V
$BV_{EBO}$	Emitter-Base Breakdown Voltage	$I_E = -10 \mu\text{A}, I_C = 0$	-5	-	V
$I_{CBO}$	Collector Cut-Off Current	$V_{CB} = -250 \text{ V}, I_E = 0$	-	-50	nA
$I_{EBO}$	Emitter Cut-Off Current	$V_{EB} = -4 \text{ V}, I_C = 0$	-	-50	nA
$h_{FE}$	DC Current Gain (Note 2)	$V_{CE} = -10 \text{ V}, I_C = -1 \text{ mA}$	20	-	
		$V_{CE} = -10 \text{ V}, I_C = -10 \text{ mA}$	30	-	
		$V_{CE} = -10 \text{ V}, I_C = -30 \text{ mA}$	30	200	
		$V_{CE} = -10 \text{ V}, I_C = -50 \text{ mA}$	20	200	
		$V_{CE} = -10 \text{ V}, I_C = -100 \text{ mA}$	15	-	
$V_{CE(\text{sat})}$	Collector-Emitter Saturation Voltage	$I_C = -10 \text{ mA}, I_B = -1 \text{ mA}$	-	-0.30	V
		$I_C = -20 \text{ mA}, I_B = -2 \text{ mA}$	-	-0.35	
		$I_C = -30 \text{ mA}, I_B = -3 \text{ mA}$	-	-0.50	
		$I_C = -50 \text{ mA}, I_B = -5 \text{ mA}$	-	-1.00	
$V_{BE(\text{sat})}$	Base-Emitter Saturation Voltage	$I_C = -10 \text{ mA}, I_B = -1 \text{ mA}$	-	-0.75	V
		$I_C = -20 \text{ mA}, I_B = -2 \text{ mA}$	-	-0.85	
		$I_C = -30 \text{ mA}, I_B = -3 \text{ mA}$	-	-0.90	
$V_{BE(\text{on})}$	Base-Emitter On Voltage	$V_{CE} = -10 \text{ V}, I_C = -100 \text{ mA}$	-	-2	V
$f_T$	Current Gain Bandwidth Product (Note 2)	$V_{CE} = -20 \text{ V}, I_C = -10 \text{ mA}, f = 20 \text{ MHz}$	40	200	MHz
$C_{ob}$	Output Capacitance	$V_{CB} = -20 \text{ V}, I_E = 0, f = 1 \text{ MHz}$	-	6	pF
$C_{EB}$	Emitter-Base Capacitance	$V_{EB} = -0.5 \text{ V}, I_C = 0, f = 1 \text{ MHz}$	-	100	pF
$t_{ON}$	Turn-On Time	$V_{BE(\text{off})} = -2 \text{ V}, V_{CC} = -100 \text{ V}, I_C = -50 \text{ mA}, I_{B1} = -10 \text{ mA}$	-	200	ns
$t_{OFF}$	Turn-Off Time	$V_{CC} = -100 \text{ V}, I_C = -50 \text{ mA}, I_{B1} = I_{B2} = -10 \text{ mA}$	-	3.5	ns

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

2. Pulse test: pulse width  $\leq 300 \mu\text{s}$ , duty cycle  $\leq 2\%$

TYPICAL PERFORMANCE CHARACTERISTICS

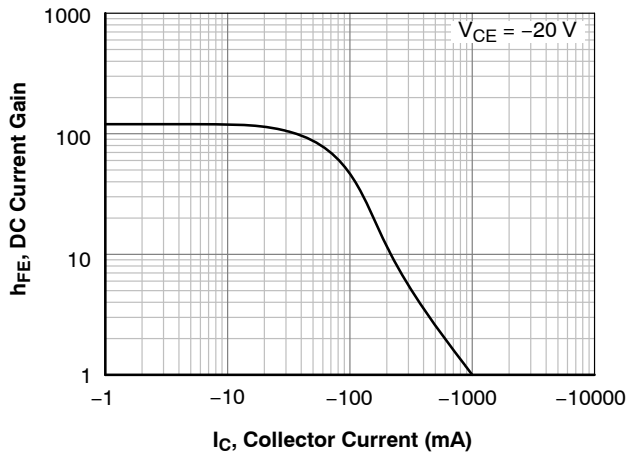


Figure 1. DC Current Gain

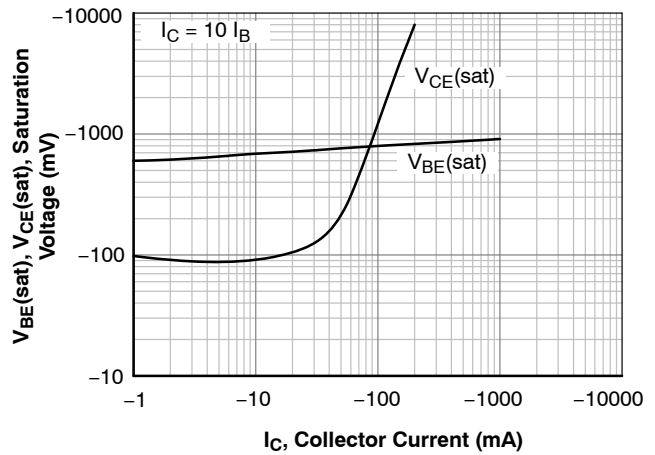


Figure 2. Base-Emitter Saturation Voltage and Collector-Emitter Saturation Voltage

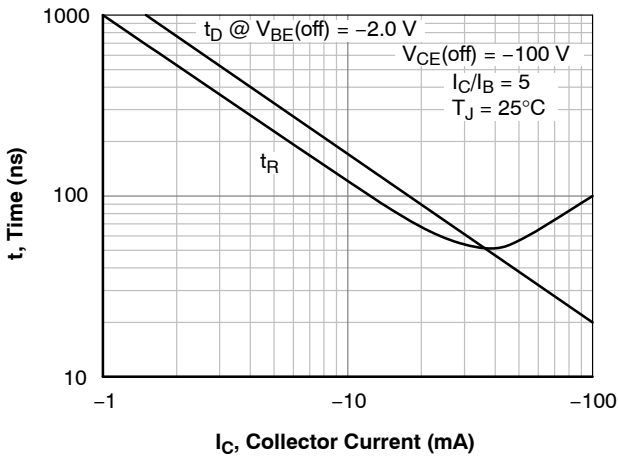


Figure 3. Turn-On Time

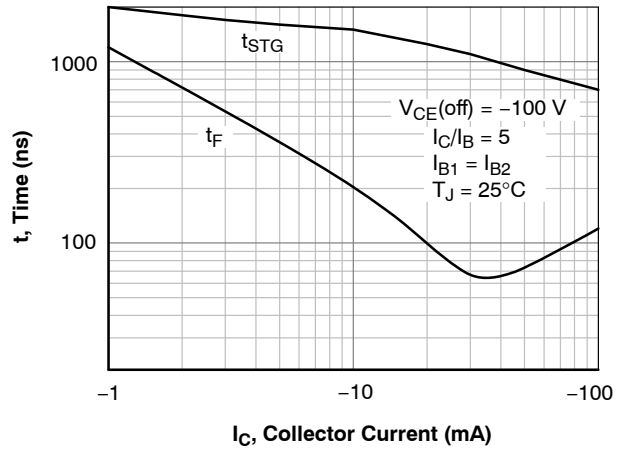


Figure 4. Turn-Off Time

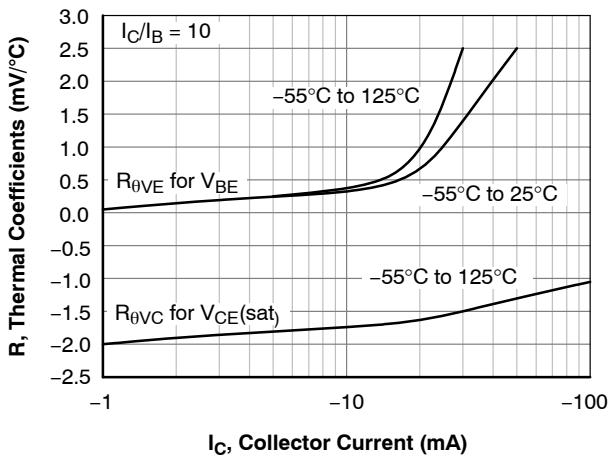


Figure 5. Temperature Coefficient

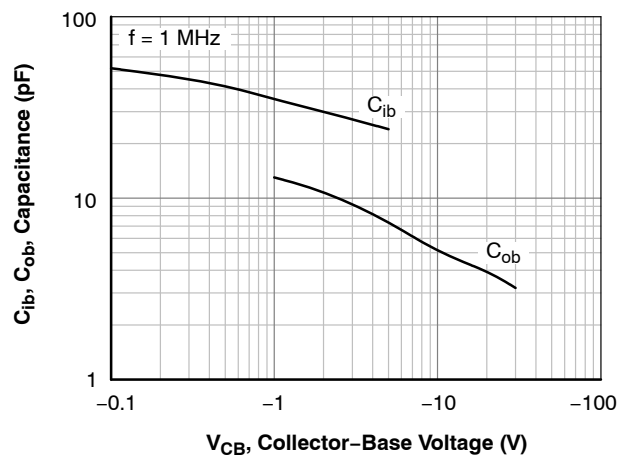


Figure 6. Capacitance

TYPICAL PERFORMANCE CHARACTERISTICS (continued)

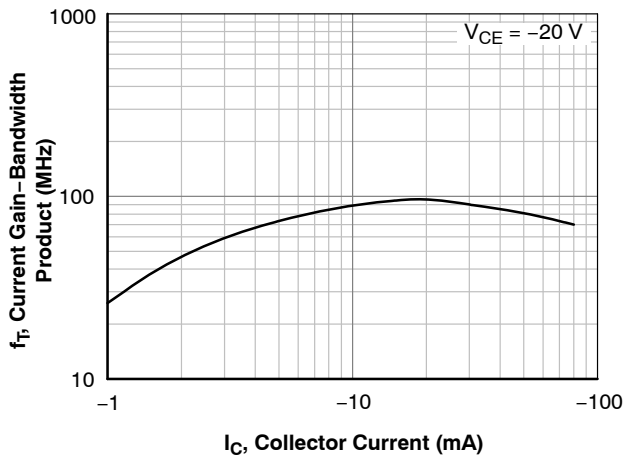


Figure 7. Current Gain Bandwidth Product

**TO-92 3 4.83x4.76 LEADFORMED**  
**CASE 135AR**  
**ISSUE O**

DATE 30 SEP 2016



NOTES: UNLESS OTHERWISE SPECIFIED

- A) DRAWING WITH REFERENCE TO JEDEC TO-92 RECOMMENDATIONS.
- B) ALL DIMENSIONS ARE IN MILLIMETERS.
- C) DRAWING CONFORMS TO ASME Y14.5M-1994

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