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September 2015

## 2N6520

### PNP Epitaxial Silicon Transistor

#### Features

- High Voltage Transistor
- Collector-Emitter Voltage:  $V_{CEO} = -350$  V
- Collector Dissipation:  $P_C$  (max) = 625 mW
- Complement to 2N6517



#### Ordering Information

Part Number	Top Mark	Package	Packing Method
2N6520TA	2N6520	TO-92 3L	Ammo

#### Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. 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	$^\circ\text{C}$

**Thermal Characteristics<sup>(1)</sup>**

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

Symbol	Parameter	Max.	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	$^\circ\text{C/W}$

**Note:**

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.

**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 <sup>(2)</sup>	$I_C = -1\ \text{mA}$ , $I_B = 0$	-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 <sup>(2)</sup>	$V_{CE} = -10\ \text{V}$ , $I_C = -1\ \text{mA}$	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		
$V_{CE(sat)}$	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	
$V_{BE(sat)}$	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	
$V_{BE(on)}$	Base-Emitter On Voltage	$V_{CE} = -10\ \text{V}$ , $I_C = -100\ \text{mA}$		-2	V
$f_T$	Current Gain Bandwidth Product <sup>(2)</sup>	$V_{CE} = -20\ \text{V}$ , $I_C = -10\ \text{mA}$ , $f = 20\ \text{MHz}$	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	$V_{BE(off)} = -2\ \text{V}$ , $V_{CC} = -100\ \text{V}$ , $I_C = -50\ \text{mA}$ , $I_{B1} = -10\ \text{mA}$		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

**Note:**

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

## Typical Performance Characteristics

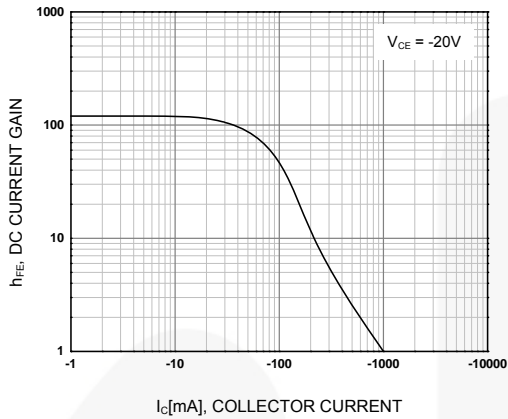


Figure 1. DC Current Gain

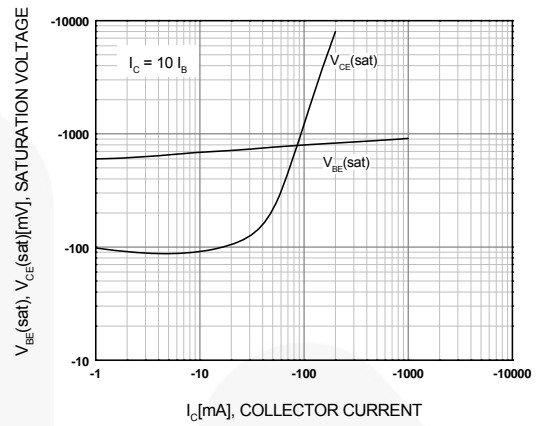


Figure 2. Base-Emitter Saturation Voltage and Collector-Emitter Saturation Voltage

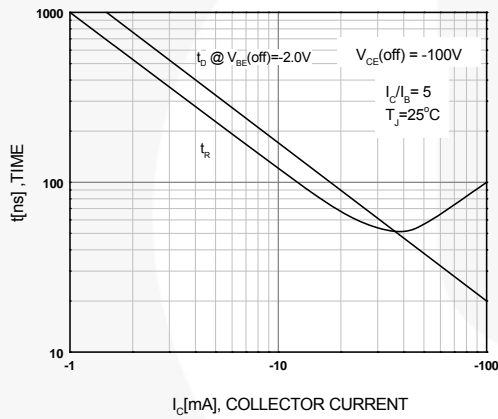


Figure 3. Turn-On Time

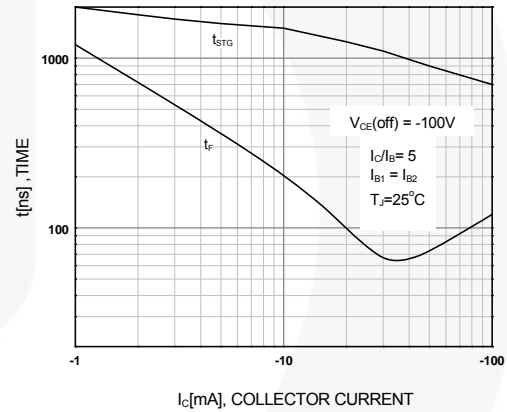


Figure 4. Turn-Off Time

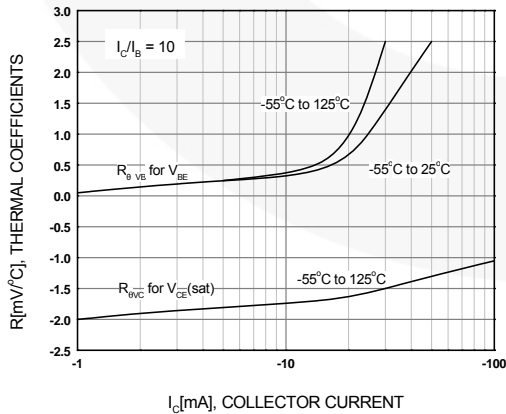


Figure 5. Temperature Coefficients

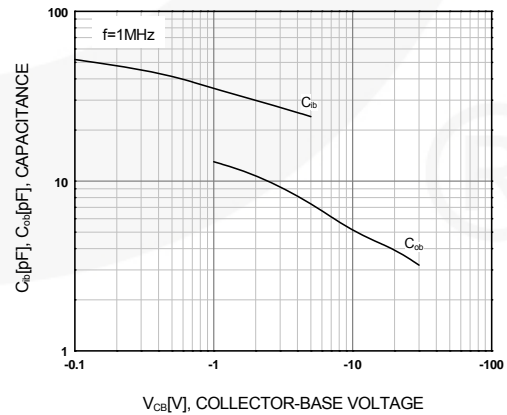
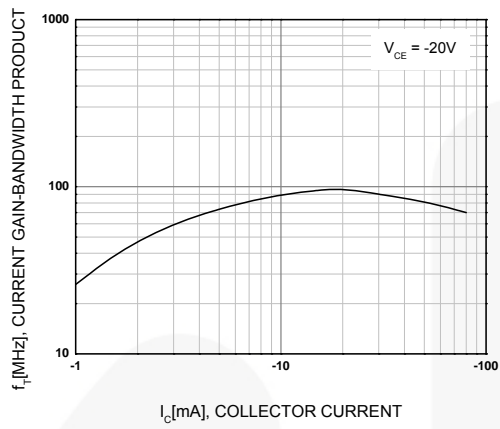
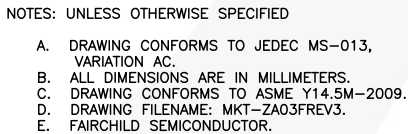


Figure 6. Capacitance

# Typical Performance Characteristics (Continued)



**Figure 7. Current Gain Bandwidth Product**



**Figure 8. 3-Lead, TO-92, Molded, 0.2 In Line Spacing Lead Form, Ammo Type**



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