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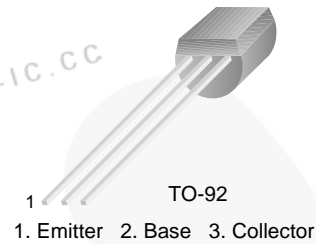


May 2016

# 2N5401 Amplifier Transistor

## Features

- Collector-Emitter Voltage:  $V_{CEO} = 150V$
- Collector Dissipation:  $P_C (max) = 625mW$
- Suffix "-C" means Center Collector (1. Emitter 2. Collector 3. Base)



## Ordering Information

Part Number	Top Mark	Package	Packing Method	Pack Quantity
2N5401YBU	2N5401	TO-92 3L	Bulk	10000
2N5401YTA	2N5401	TO-92 3L	Ammo	2000

## 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  $T_A = 25^\circ C$  unless otherwise noted.

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector-Base Voltage	-160	V
$V_{CEO}$	Collector-Emitter Voltage	-150	V
$V_{EBO}$	Emitter-Base Voltage	-5	V
$I_C$	Collector Current	-600	mA
$T_J, T_{STG}$	Operating and Storage Junction Temperature Range	-55 to 150	$^\circ C$

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

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

Symbol	Parameter	Max.	Unit
$P_D$	Total Device Dissipation	625	mW
	Derate above $25^\circ\text{C}$	5	mW/ $^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	200	$^\circ\text{C}/\text{W}$

**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.	Typ.	Max.	Unit	
$BV_{CBO}$	Collector-Base Breakdown Voltage	$I_C = -100 \mu\text{A}$ , $I_E = 0$	-160			V	
$BV_{CEO}$	Collector-Emitter Breakdown Voltage <sup>(2)</sup>	$I_C = -1 \text{ mA}$ , $I_B = 0$	-150			V	
$BV_{EBO}$	Emitter-Base Breakdown Voltage	$I_E = -10 \mu\text{A}$ , $I_C = 0$	-5			V	
$I_{CBO}$	Collector Cut-Off Current	$V_{CB} = -120 \text{ V}$ , $I_E = 0$			-50	$\mu\text{A}$	
$I_{EBO}$	Emitter Cut-Off Current	$V_{EB} = -3 \text{ V}$ , $I_C = 0$			-50	$\mu\text{A}$	
$h_{FE1}$	DC Current Gain <sup>(2)</sup>	$I_C = -1 \text{ mA}$ , $V_{CE} = -5 \text{ V}$	30				
		$I_C = -10 \text{ mA}$ , $V_{CE} = -5 \text{ V}$	Standard Class	60		240	
			Y Class	120		240	
		$I_C = -50 \text{ mA}$ , $V_{CE} = -5 \text{ V}$	50				
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage <sup>(2)</sup>	$I_C = -10 \text{ mA}$ , $I_B = -1 \text{ mA}$			-0.2	V	
		$I_C = -50 \text{ mA}$ , $I_B = -5 \text{ mA}$			-0.5	V	
$V_{BE(sat)}$	Base-Emitter Saturation Voltage <sup>(2)</sup>	$I_C = -10 \text{ mA}$ , $I_B = -1 \text{ mA}$			-1.0	V	
		$I_C = -50 \text{ mA}$ , $I_B = -5 \text{ mA}$			-1.0	V	
$f_T$	Current Gain Bandwidth Product	$I_C = -10 \text{ mA}$ , $V_{CE} = -10 \text{ V}$ , $f = 100 \text{ MHz}$	100		400	MHz	
$C_{ob}$	Output Capacitance	$V_{CB} = -10 \text{ V}$ , $I_E = 0$ , $f = 1 \text{ MHz}$			6	pF	
$N_F$	Noise Figure	$I_C = -250 \mu\text{A}$ , $V_{CE} = -5 \text{ V}$ , $R_S = 1 \text{ k}\Omega$ , $f = 10 \text{ Hz to } 15.7 \text{ kHz}$			8	dB	

**Note:**

2. Pulse Test: Pulse Width  $\leq 300 \mu\text{s}$ , Duty Cycle  $\leq 2\%$ .

# Typical Characteristics

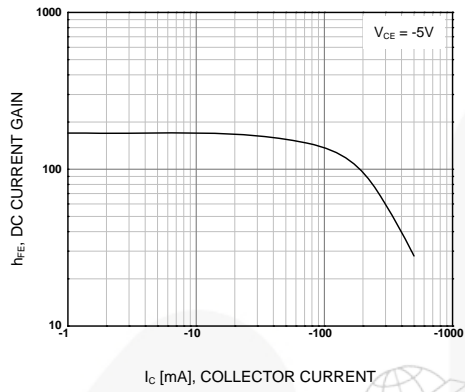


Figure 1. DC current Gain

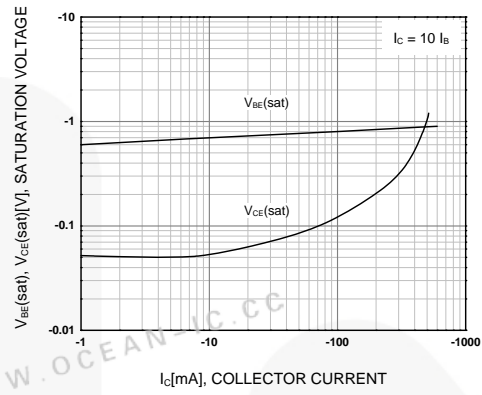


Figure 2. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

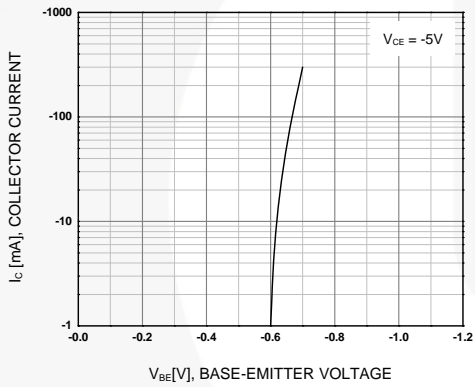


Figure 3. Base-Emitter On Voltage

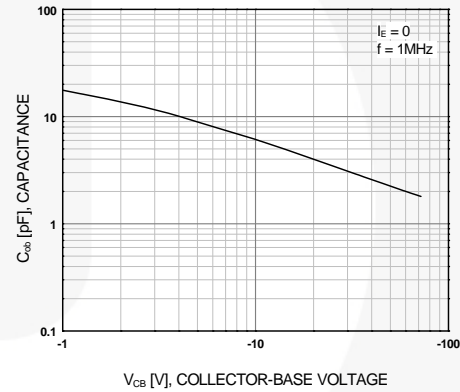


Figure 4. Output Capacitance

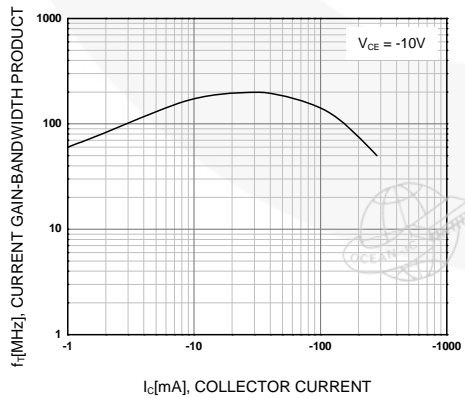
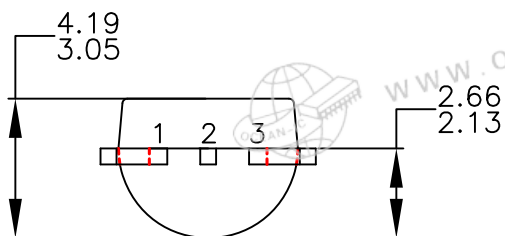
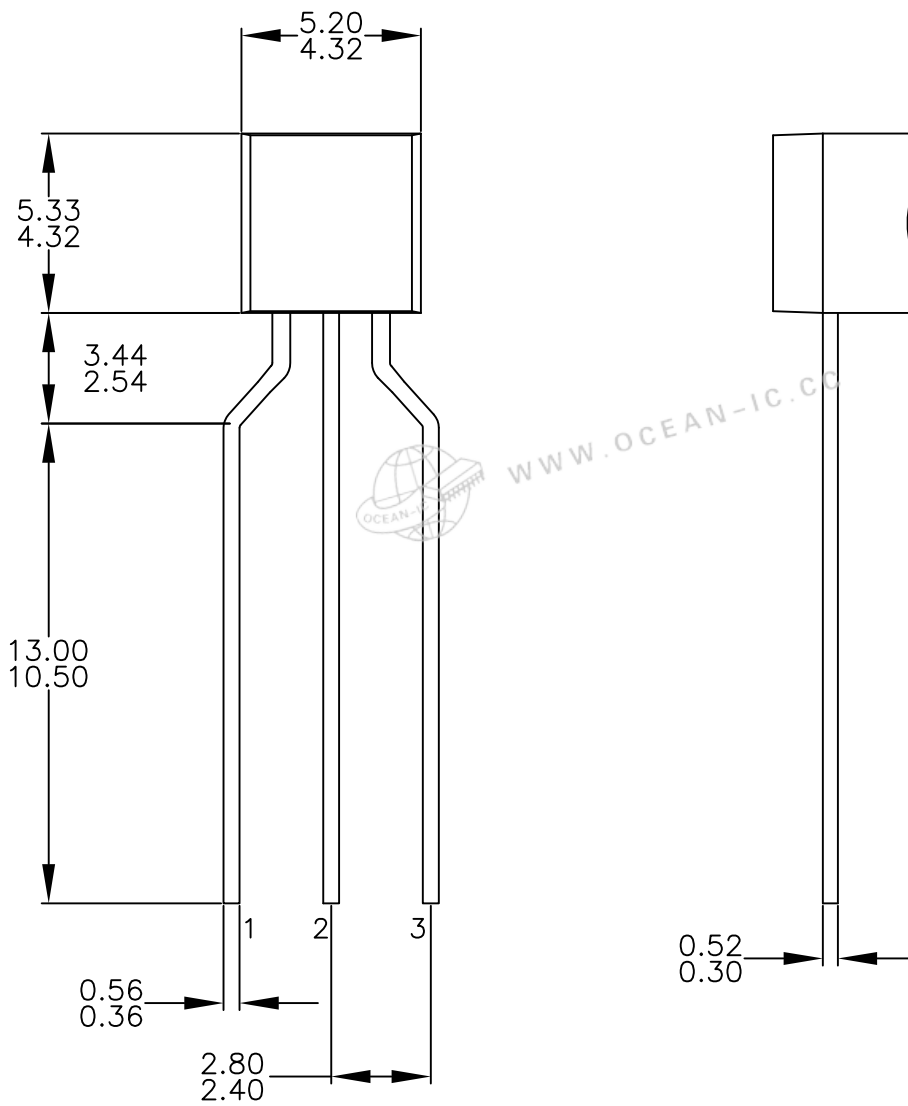
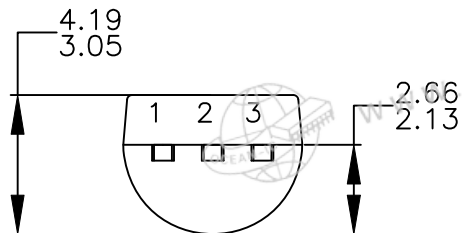
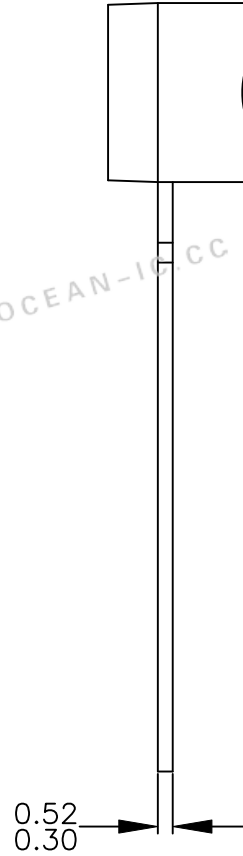
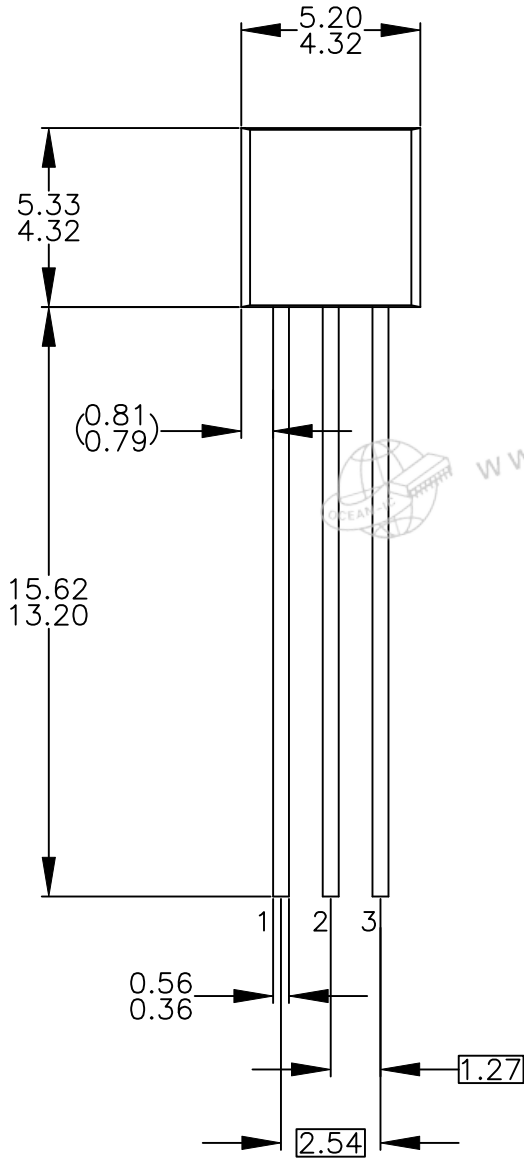


Figure 5. Current Gain Bandwidth Product



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