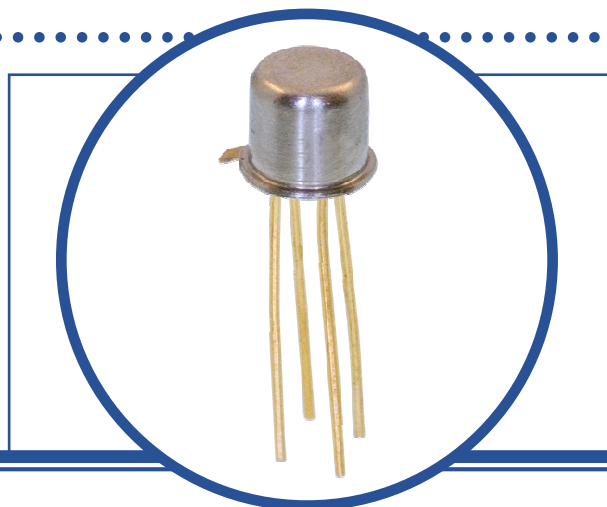


# SILICON RF SMALL SIGNAL NPN TRANSISTOR

## 2N2857

- High Current Gain-Bandwidth Product ( $f_T$ )
- Hermetic Ceramic Surface Mount Package
- Designed For High Gain, Low Noise Amplifier, Oscillator and Mixer Applications
- Screening Options Available



### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise stated)

$V_{CBO}$	Collector – Base Voltage	30V
$V_{CEO}$	Collector – Emitter Voltage	15V
$V_{EBO}$	Emitter – Base Voltage	3V
$I_C$	Continuous Collector Current	40mA
$P_D$	Total Power Dissipation at $T_A = 25^\circ\text{C}$ Derate Above $25^\circ\text{C}$	200mW 1.14mW/ $^\circ\text{C}$
$T_J$	Junction Temperature Range	-65 to $+200^\circ\text{C}$
$T_{stg}$	Storage Temperature Range	-65 to $+200^\circ\text{C}$

### THERMAL PROPERTIES

Symbols	Parameters	Max.	Units
$R_{\theta JA}$	Thermal Resistance, Junction To Ambient	875	$^\circ\text{C}/\text{W}$

Semelab Limited reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by Semelab is believed to be both accurate and reliable at the time of going to press. However Semelab assumes no responsibility for any errors or omissions discovered in its use. Semelab encourages customers to verify that datasheets are current before placing orders.



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## ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise stated)

Symbols	Parameters	Test Conditions	Min	Typ	Max	Units
$V_{(BR)CEO}^{(1)}$	Collector-Emitter Breakdown Voltage	$I_C = 3\text{mA}$ $I_B = 0$	15			V
$I_{CBO}$	Collector-Cut-Off Current	$V_{CB} = 15\text{V}$ $I_E = 0$			10	nA
		$T_A = 150^\circ\text{C}$			1.0	$\mu\text{A}$
		$V_{CB} = 30\text{V}$ $I_E = 0$			1.0	
$I_{CES}$	Collector-Cut-Off Current	$V_{CE} = 16\text{V}$ $I_B = 0$			100	nA
$I_{EBO}$	Emitter-Cut-Off Current	$V_{EB} = 3\text{V}$ $I_C = 0$			10	$\mu\text{A}$
$h_{FE}^{(1)}$	Forward-current transfer ratio	$I_C = 3\text{mA}$ $V_{CE} = 1.0\text{V}$	30		150	
		$T_A = -55^\circ\text{C}$	10			
$V_{CE(sat)}^{(1)}$	Collector-Emitter Saturation Voltage	$I_C = 10\text{mA}$ $I_B = 1.0\text{mA}$			0.4	V
$V_{BE(sat)}^{(1)}$	Base-Emitter Saturation Voltage	$I_C = 10\text{mA}$ $I_B = 1.0\text{mA}$			1.0	

## DYNAMIC CHARACTERISTICS

$ h_{fe} $	Small signal forward-current transfer ratio <sup>(3)</sup>	$I_C = 5\text{mA}$ $V_{CE} = 6\text{V}$	8.5		21	
		$f = 100\text{MHz}$				
		$I_C = 10\text{mA}$ $V_{CE} = 10\text{V}$		10.6		
		$f = 100\text{MHz}$				
$h_{fe}$	Small Signal Current Gain	$I_C = 2\text{mA}$ $V_{CE} = 6\text{V}$	50		220	
		$f = 1.0\text{KHz}$				
$C_{cb}$	Collector – Base Feedback Capacitance	$V_{CB} = 10\text{V}$ $I_E = 0$			1.0	pF
		$f = 1.0\text{MHz}$				
$r_b' C_C^{(2)}$	Collector Base Time Constant	$I_E = 2\text{mA}$ $V_{CB} = 6\text{V}$	4		15	ps
		$f = 31.9\text{MHz}$				
$G_{pe}^{(2)}$	Small Signal Power Gain	$V_{CE} = 6\text{V}$ $I_C = 1.5\text{mA}$	12.5			dB
		$f = 450\text{MHz}$				
NF <sup>(2)(3)</sup>	Noise Figure	$V_{CE} = 6\text{V}$ $I_C = 1.5\text{mA}$			4.5	
		$f = 450\text{MHz}$ $R_G = 50\Omega$				

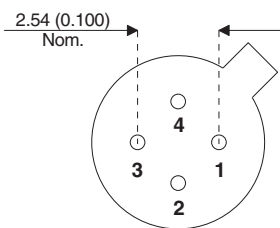
### Notes

- (1) Pulse Width  $\leq 300\mu\text{s}$ ,  $\delta \leq 2\%$
- (2) By design only, not a production test.
- (3) Case Lead Grounded

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## MECHANICAL DATA

Dimensions in mm (inches)



## TO-72 (TO-206AF) METAL PACKAGE Underside View

Pin 1 - Emitter

Pin 2 - Base

Pin 3 - Collector

Pin 4 - Case