

# NPN Epitaxial Silicon Transistor

## KSC1815

### Features

- Audio Frequency Amplifier and High-Frequency OSC
- Complement to KSA1015
- Collector-Base Voltage:  $V_{CBO} = 50\text{ V}$
- This is a Pb-Free Device

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

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector-Base Voltage	60	V
$V_{CEO}$	Collector-Emitter Voltage	50	V
$V_{EBO}$	Emitter-Base Voltage	5	V
$I_C$	Collector Current	150	mA
$I_B$	Base Current	50	mA
$T_J$	Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-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 (Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.) (Note 1)

Symbol	Parameter	Max.	Unit
$P_D$	Total Device Dissipation	400	mW
	Derate Above $25^\circ\text{C}$	3.2	mW/ $^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	312	$^\circ\text{C}/\text{W}$

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.



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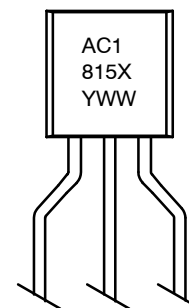
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1. Emitter
2. Collector
3. Base

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

### MARKING DIAGRAM



A = Assembly Code  
C1815 = Device Code  
X = O / Y / GR / L  
YWW = Date Code

### ORDERING INFORMATION

Device	Package	Shipping
KSC1815YTA	TO-92 3L (Pb-Free)	2000 / Fan-Fold

# KSC1815

## 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 Voltage	$I_C = 1\text{ mA}, I_E = 0$	60			V
$BV_{CEO}$	Collector-Emitter Voltage	$I_C = 10\text{ mA}, I_B = 0$	50			V
$BV_{EBO}$	Emitter-Base Voltage	$I_E = 10\text{ }\mu\text{A}, I_C = 0$	5			V
$I_{CBO}$	Collector Cut-Off Current	$V_{CB} = 60\text{ V}, I_E = 0$			0.1	$\mu\text{A}$
$I_{EBO}$	Emitter Cut-Off Current	$V_{EB} = 5\text{ V}, I_C = 0$			0.1	$\mu\text{A}$
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 100\text{ mA}, I_B = 10\text{ mA}$		0.10	0.25	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 100\text{ mA}, I_B = 10\text{ mA}$			1.0	V
$h_{FE1}$	DC Current Gain	$V_{CE} = 6\text{ V}, I_C = 2\text{ mA}$	70		700	
$h_{FE2}$		$V_{CE} = 6\text{ V}, I_C = 150\text{ mA}$	25			
$f_T$	Current Gain Bandwidth Product	$V_{CE} = 10\text{ V}, I_C = 1\text{ mA}$	80			MHz
$C_{ob}$	Output Capacitance	$V_{CB} = 10\text{ V}, I_E = 0, f = 1\text{ MHz}$		2.0	3.0	pF
NF	Noise Figure	$V_{CE} = 6\text{ V}, I_C = 0.1\text{ mA},$ $R_S = 10\text{ k}\Omega, f = 1\text{ kHz}$		1.0	10.0	dB

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.

## $h_{FE}$ CLASSIFICATION

Classification	O	Y	GR	L
$H_{FE1}$	70 ~ 140	120 ~ 240	200 ~ 400	350 ~ 700

TYPICAL PERFORMANCE CHARACTERISTICS

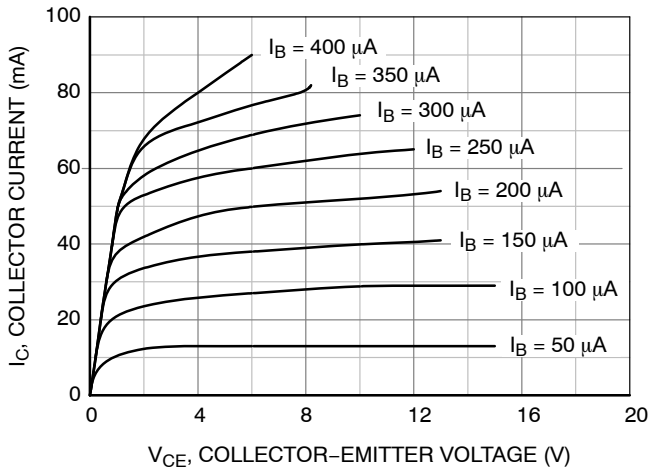


Figure 1. Static Characteristic

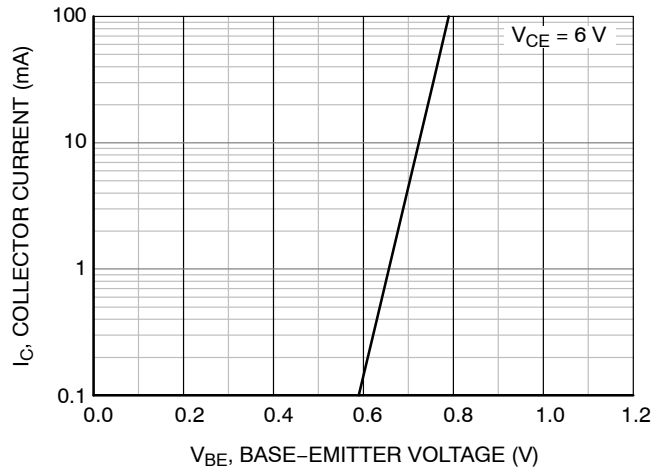


Figure 2. Static Characteristic

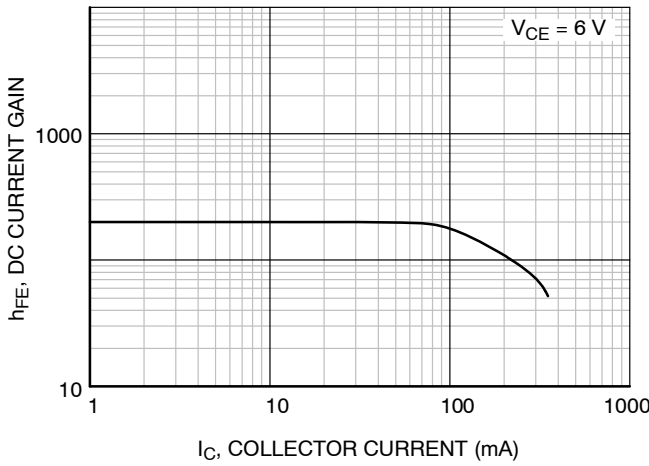


Figure 3. DC Current Gain

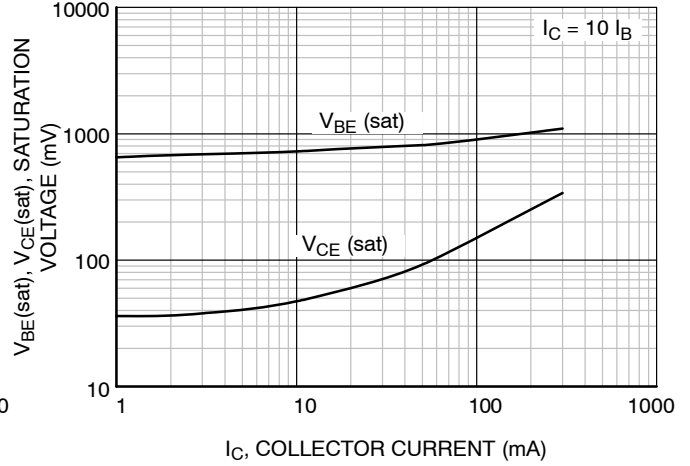


Figure 4. Base-Emitter Saturation Voltage and Collector-Emitter Saturation Voltage

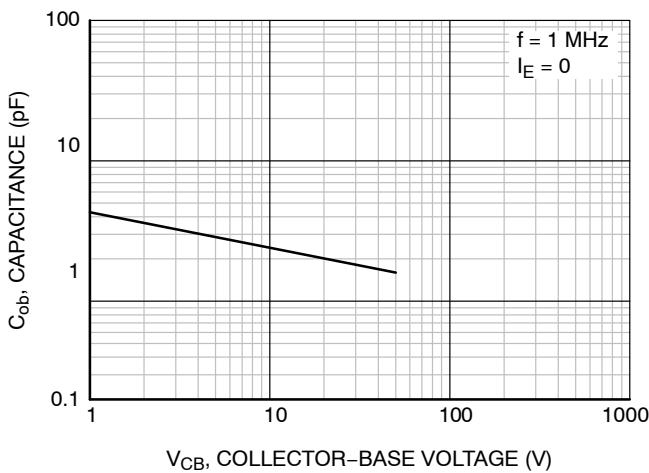


Figure 5. Output Capacitance

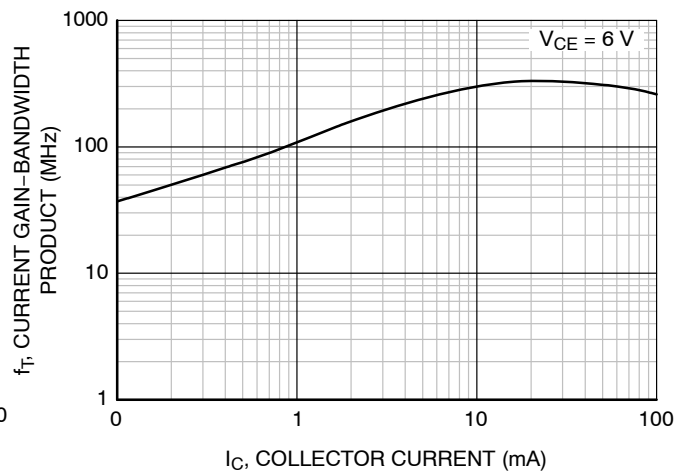
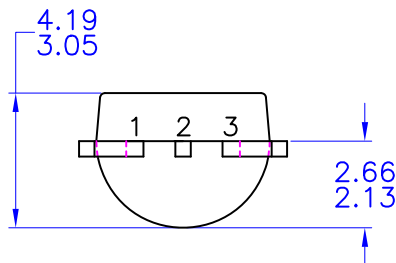
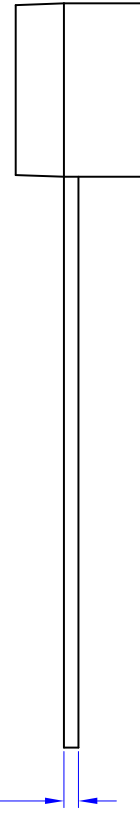
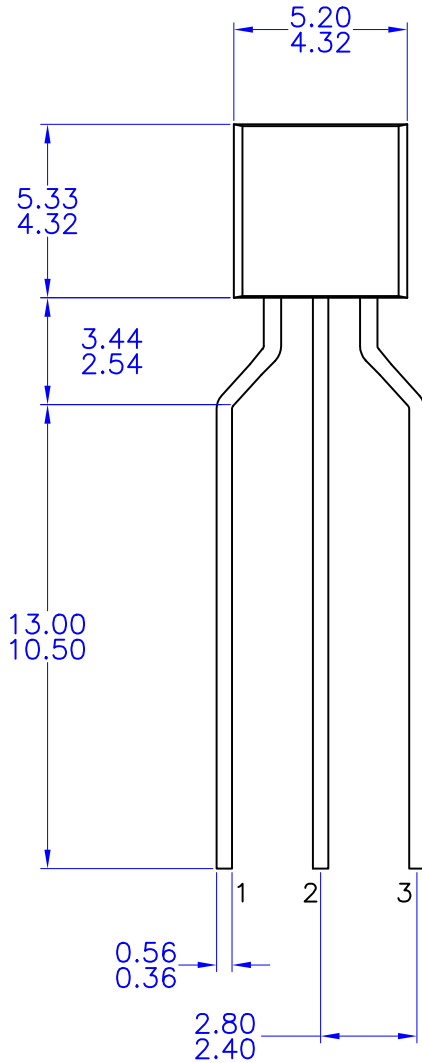


Figure 6. Current Gain Bandwidth Product

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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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