

# NPN Epitaxial Silicon Transistor

## KSC2328A

### Features

- Audio Power Amplifier Application
- Complement to KSA928A
- 3 W Output Application

### ABSOLUTE MAXIMUM RATINGS

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

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector–Base Voltage	30	V
$V_{CEO}$	Collector–Emitter Voltage	30	V
$V_{EBO}$	Emitter–Base Voltage	5	V
$I_C$	Collector Current	2	A
$T_J$	Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature	–55 to +150	$^\circ\text{C}$

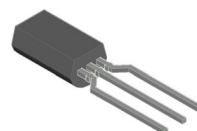
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

### THERMAL CHARACTERISTICS

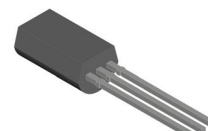
(Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.) (Note 1)

Symbol	Parameter	Value	Unit
$P_D$	Power Dissipation	1000	mW
	Derate Above $25^\circ\text{C}$	8.0	mW/ $^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance, Junction–to–Ambient	125	$^\circ\text{C}/\text{W}$

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

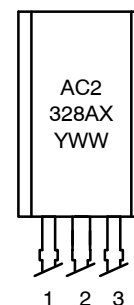


TO–92 3 LF  
CASE 135AM



TO–92 3  
CASE 135AP

### MARKING DIAGRAM



1: Emitter  
2: Collector  
3: Base

A = Assembly Code  
C2328A = Device Code  
X = O / Y  
YWW = Date Code

### ORDERING INFORMATION

Device	Package	Shipping
KSC2328AOTA	TO–92 3 LF (Pb–Free)	2000 / Fan–Fold
KSC2328AYBU	TO–92 3 (Pb–Free)	6000 / Bulk Bag
KSC2328AYTA	TO–92 3 LF (Pb–Free)	2000 / Fan–Fold

# KSC2328A

## 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	$I_C = 100\ \mu\text{A}$ , $I_E = 0$	30	–	–	V
$BV_{CEO}$	Collector–Emitter Breakdown Voltage	$I_C = 10\ \text{mA}$ , $I_B = 0$	30	–	–	V
$BV_{EBO}$	Emitter–Base Breakdown Voltage	$I_E = 1\ \text{mA}$ , $I_C = 0$	5	–	–	V
$I_{CBO}$	Collector Cut–Off Current	$V_{CB} = 30\ \text{V}$ , $I_E = 0$	–	–	100	nA
$I_{EBO}$	Emitter Cut–Off Current	$V_{EB} = 5\ \text{V}$ , $I_C = 0$	–	–	100	nA
$h_{FE}$	DC Current Gain	$V_{CE} = 2\ \text{V}$ , $I_C = 500\ \text{mA}$	100	–	320	
$V_{BE(on)}$	Base–Emitter On Voltage	$V_{CE} = 2\ \text{V}$ , $I_C = 500\ \text{mA}$	–	–	1.0	V
$V_{CE(sat)}$	Collector–Emitter Saturation Voltage	$I_C = 1.5\ \text{A}$ , $I_B = 0.03\ \text{A}$	–	–	2.0	V
$f_T$	Current Gain Bandwidth Product	$V_{CE} = 2\ \text{V}$ , $I_C = 500\ \text{mA}$	–	120	–	MHz
$C_{ob}$	Collector Output Capacitance	$V_{CB} = 10\ \text{V}$ , $I_E = 0$ , $f = 1\ \text{MHz}$	–	30	–	pF

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
$h_{FE}$	100 ~ 200	160 ~ 320

TYPICAL PERFORMANCE CHARACTERISTICS

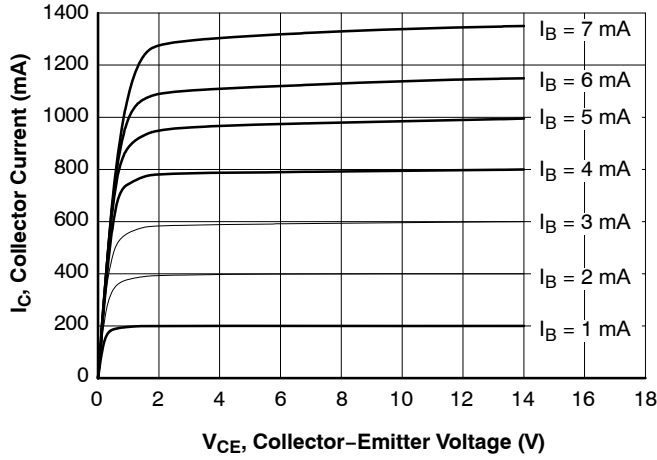


Figure 1. Static Characteristic

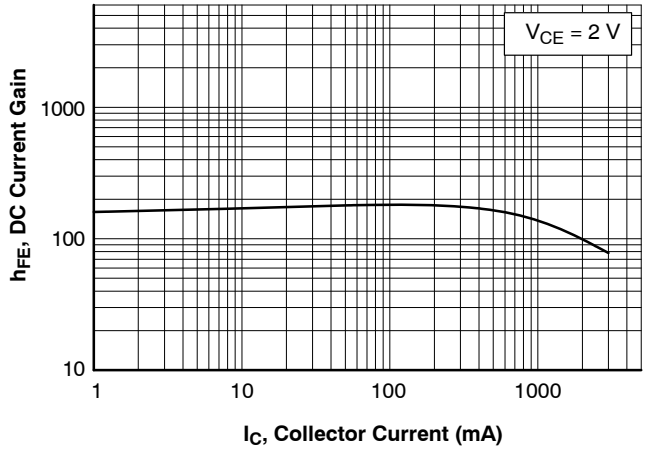


Figure 2. DC Current Gain

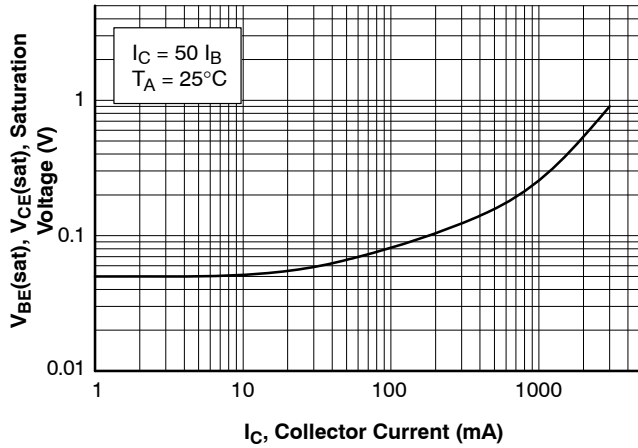


Figure 3. Collector-Emitter Saturation Voltage

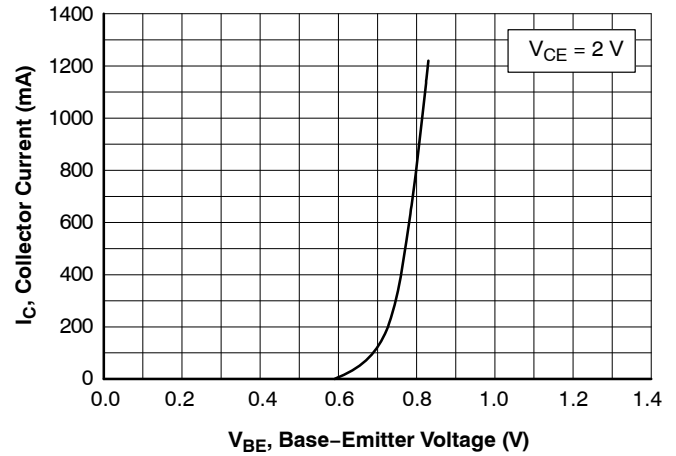


Figure 4. Base-Emitter On Voltage

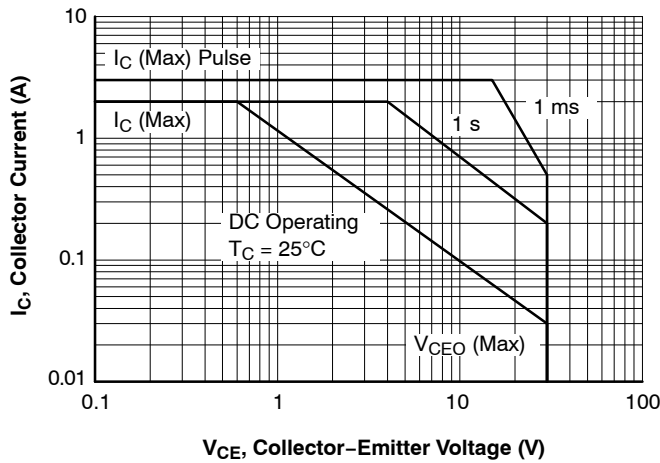


Figure 5. Safe Operating Area

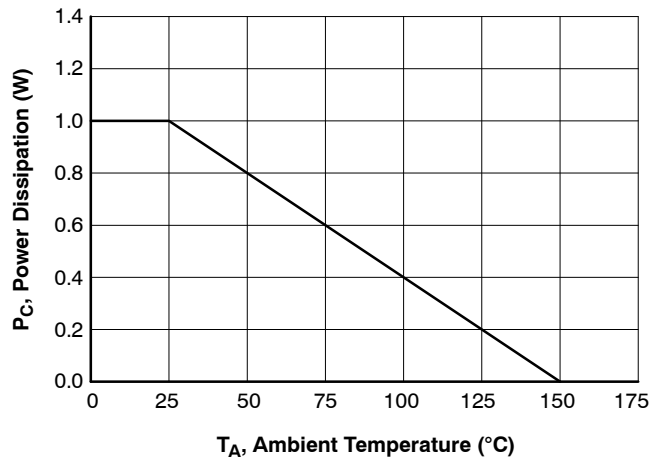
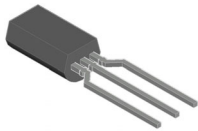
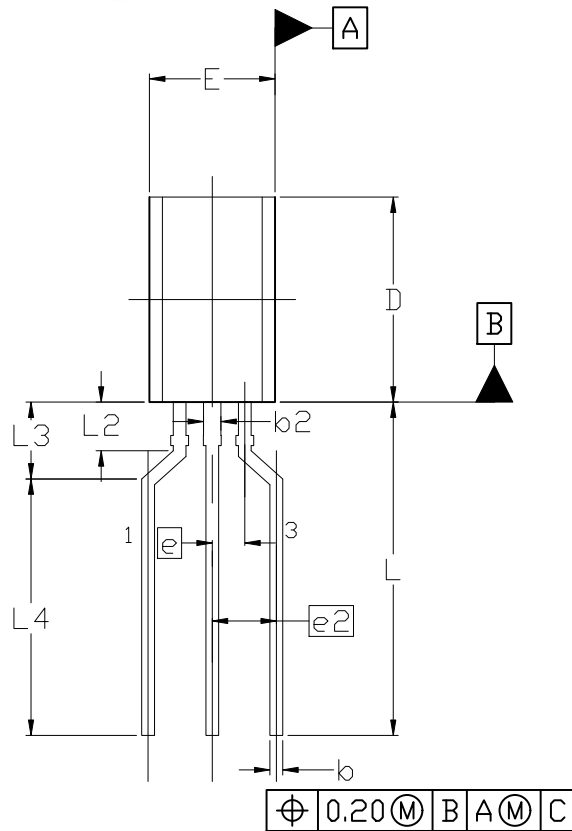


Figure 6. Power Derating

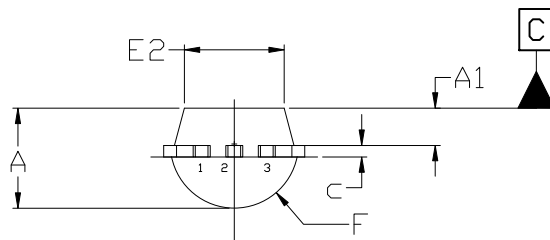


**TO-92 3 8.0x4.9 (LEADFORMED)**  
CASE 135AM  
ISSUE B

DATE 14 JAN 2021



TOP VIEW



END VIEW

**NOTES:**

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2009.
2. CONTROLLING DIMENSION: MILLIMETERS
3. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, GATE REMAINS AND TIE BAR PROTRUSIONS.
4. DIMENSION b AND b2 DOES NOT INCLUDE DAMBAR PROTRUSION. DIMENSION b2 LOCATED ABOVE THE DAMBAR PORTION OF MIDDLE LEAD.


DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	3.70	3.90	4.10
A1	1.25	1.45	1.65
b	0.35	0.50	0.60
b2	0.62	---	0.78
c	0.35	0.45	0.55
D	7.80	8.00	8.20
E	4.70	4.90	5.10
E2	3.70	3.90	4.10
e	1.27 BSC		
e2	2.50 BSC		
F	2.45 REF		
L	13.00 REF		
L2	1.50	---	1.90
L3	2.60	---	3.40
L4	10.40 REF		

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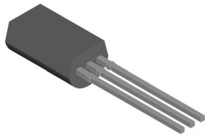
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# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS

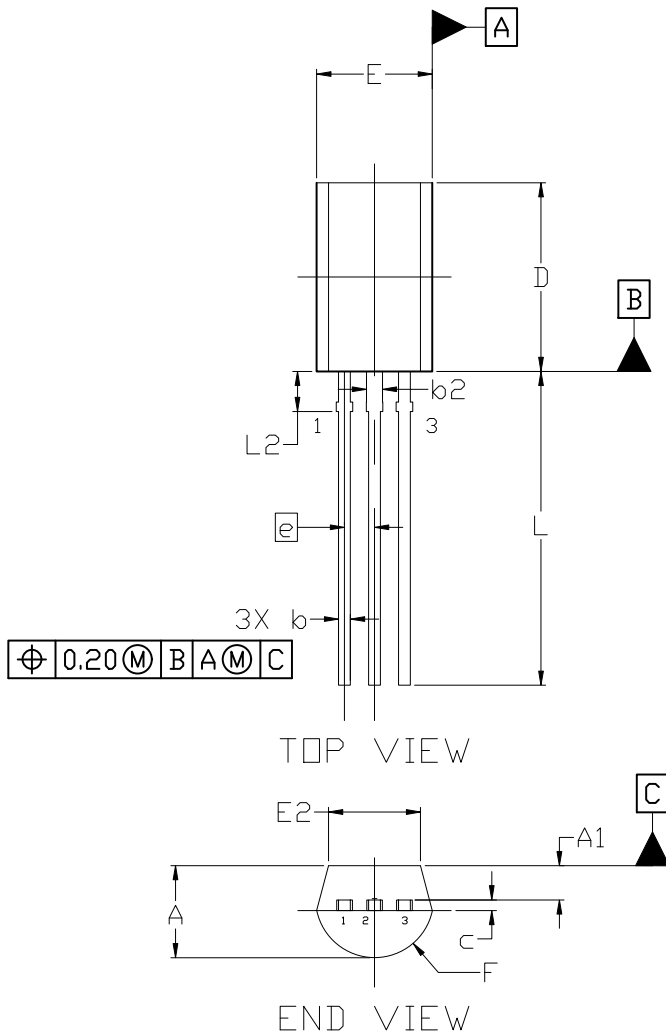
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**TO-92 3 8.0x4.9**  
CASE 135AP  
ISSUE A

DATE 13 JAN 2021




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D	7.80	8.00	8.20
E	4.70	4.90	5.10
E2	3.70	3.90	4.10
e	1.27 BSC		
F	2.45 REF		
L	13.30	---	14.20
L2	1.70 REF		

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