



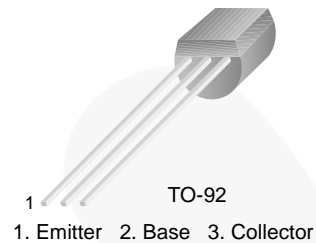
November 2014

# KSC945

## NPN Epitaxial Silicon Transistor

### Features

- Audio Frequency Amplifier and High-Frequency OSC.
- Complimentary to KSA733
- Collector-Base Voltage:  $V_{CBO} = 60\text{ V}$
- High Current Gain Bandwidth Product:  $f_T = 300\text{ MHz}$  (Typical)
- Suffix “-C” means Center Collector (1. Emitter 2. Collector 3. Base)



### Ordering Information

Part Number	Top Mark	Package	Packing Method
KSC945YBU	C945	TO-92 3L	Bulk
KSC945YTA	C945	TO-92 3L	Ammo
KSC945GTA	C945	TO-92 3L	Ammo
KSC945CYTA	C945	TO-92 3L	Ammo
KSC945CGBU	C945	TO-92 3L	Bulk
KSC945CGTA	C945	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	60	V
$V_{CEO}$	Collector-Emitter Voltage	50	V
$V_{EBO}$	Emitter-Base Voltage	5	V
$I_C$	Collector Current	150	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	Value	Unit
$P_D$	Power Dissipation	250	mW
	Derate Above $25^\circ\text{C}$	2.0	mW/ $^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	500	$^\circ\text{C}/\text{W}$

**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	$I_C = 100 \mu\text{A}$ , $I_E = 0$	60			V
$BV_{CEO}$	Collector-Emitter Breakdown Voltage	$I_C = 10 \text{ mA}$ , $I_B = 0$	50			V
$BV_{EBO}$	Emitter-Base Breakdown Voltage	$I_E = 10 \mu\text{A}$ , $I_C = 0$	5			V
$I_{CBO}$	Collector Cut-Off Current	$V_{CB} = 40 \text{ V}$ , $I_E = 0$			0.1	$\mu\text{A}$
$I_{EBO}$	Emitter Cut-Off Current	$V_{EB} = 3 \text{ V}$ , $I_C = 0$			0.1	$\mu\text{A}$
$h_{FE}$	DC Current Gain	$V_{CE} = 6 \text{ V}$ , $I_C = 1.0 \text{ mA}$	40		700	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 100 \text{ mA}$ , $I_B = 10 \text{ mA}$		0.15	0.30	V
$f_T$	Current Gain Bandwidth Product	$V_{CE} = 6 \text{ V}$ , $I_C = 10 \text{ mA}$		300		MHz
$C_{ob}$	Output Capacitance	$V_{CB} = 6 \text{ V}$ , $I_E = 0$ , $f = 1 \text{ MHz}$		2.5		pF
NF	Noise Figure	$V_{CE} = 6 \text{ V}$ , $I_C = 0.5 \text{ mA}$ , $f = 1 \text{ kHz}$ , $R_S = 500 \Omega$		4.0		dB

 **$h_{FE}$  Classification**

Classification	R	O	Y	G	L
$h_{FE}$	40 ~ 80	70 ~ 140	120 ~ 240	200 ~ 400	350 ~ 700

## Typical Performance Characteristics

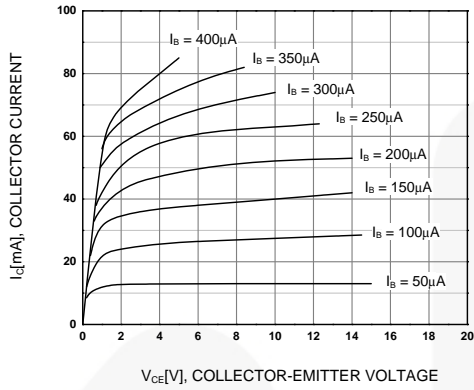


Figure 1. Static Characteristic

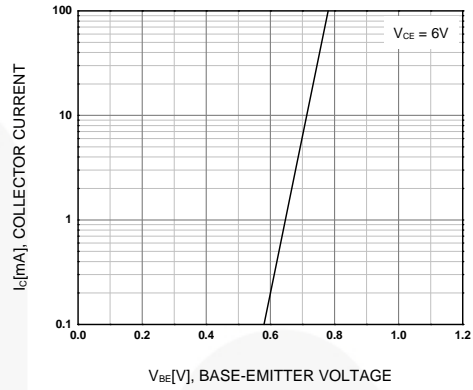


Figure 2. Transfer Characteristic

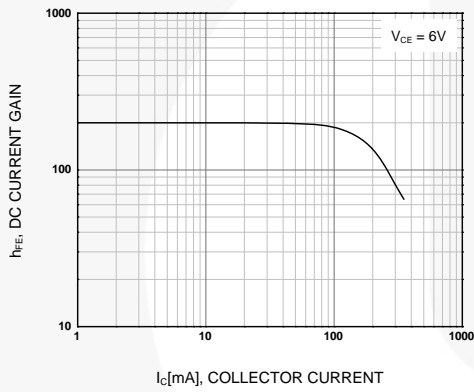


Figure 3. DC Current Gain

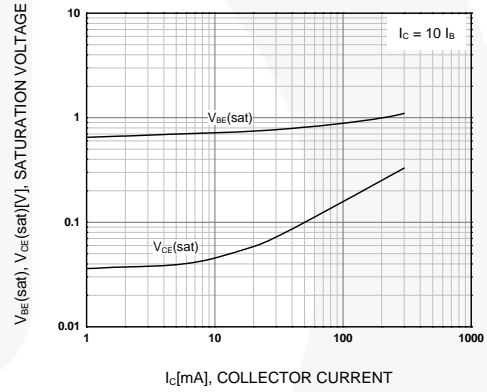


Figure 4. Base-Emitter Saturation Voltage and Collector-Emitter Saturation Voltage

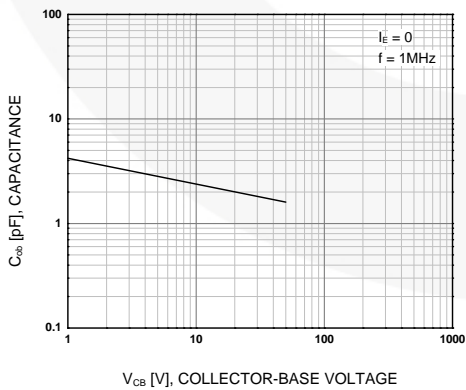


Figure 5. Output Capacitance

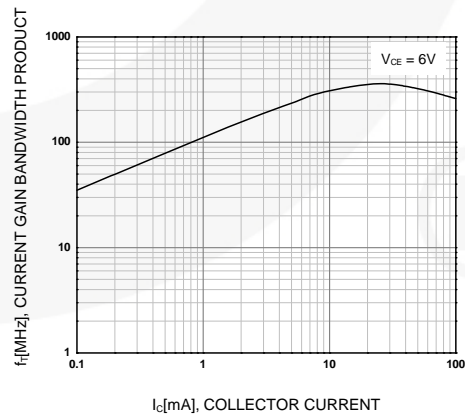
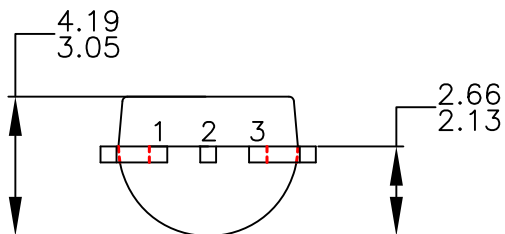
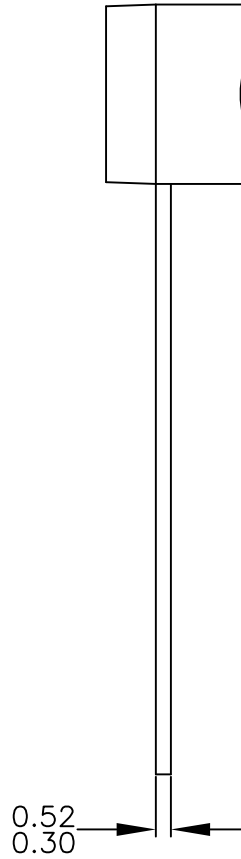
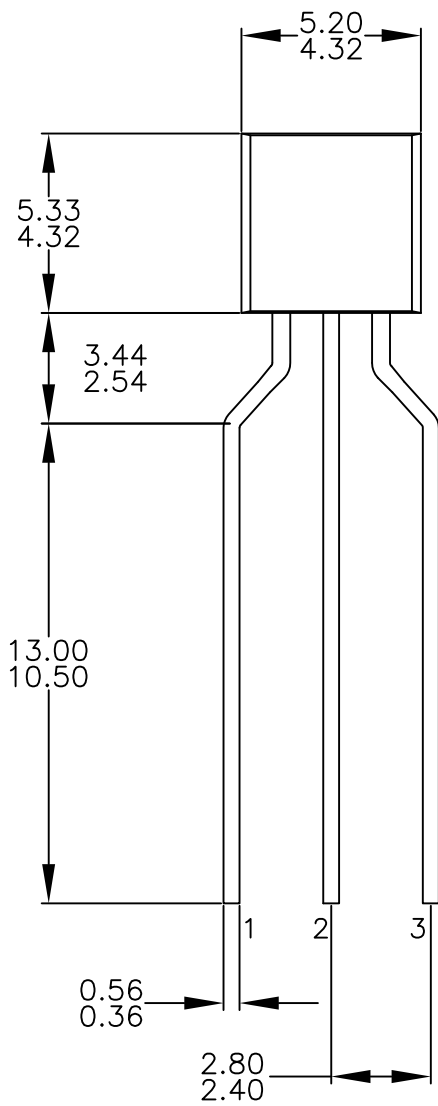


Figure 6. Current Gain Bandwidth Product



NOTES: UNLESS OTHERWISE SPECIFIED

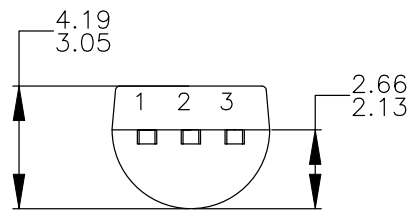
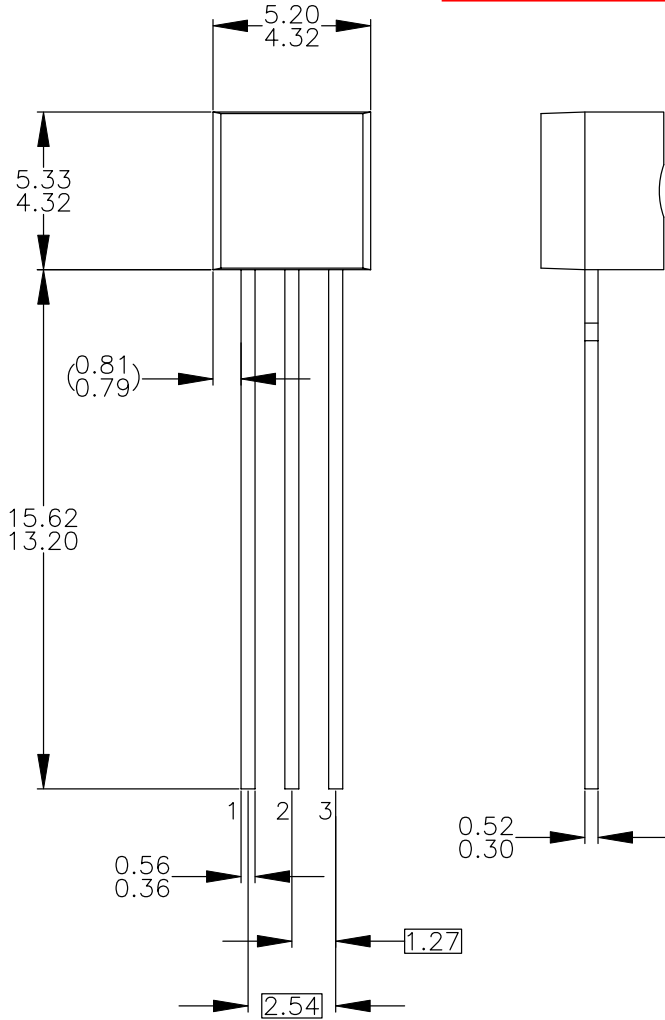
- A. DRAWING CONFORMS TO JEDEC MS-013, VARIATION AC.
- B. ALL DIMENSIONS ARE IN MILLIMETERS.
- C. DRAWING CONFORMS TO ASME Y14.5M-2009.
- D. DRAWING FILENAME: MKT-ZA03FREV3.
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**APPROVED**  
 July-14-2008

**REVISIONS**

NO.	DESCRIPTION	DATE	NAME/SITE
A	RELEASE TO DOCUMENT CONTROL	MAR.4'96	RP
B	RDRW AS PER STD DWG TEMPLATE. CHG DIM REF FR DUAL DIM INCH(MM) TO SINGLE DIM MM. CHG LD PITCH DIM FR 1.14-1.40 TO 1.27 BSC. ADD DIM 2.54 BSC. CHG PKG WIDTH DIM FR 4.32- 4.70 TO 4.32-4.83; CHG PKG HEIGHT DIM FR 4.32-4.70 TO 4.32-4.78; CHG LD THICK DIM FR 0.30- 0.48 TO 0.30-0.52; DAMBAR-PKG DIM FR 1.27-1.65 TO 0.90-1.65; LD LGH DIM FR 14.47-15.64 TO 14.47-15.62; PKG DIM: 1.02-1.52 TO 0.92-1.52, 3.81-4.45 TO 3.40-4.80; NOTE 2: ADD DMOS "M" OPT'N AND LEGEND; NOTE B PKG 94 JFET OPT'N: CHG D TO S, CHG S TO D. ADD NOTE C. MOVE NOTE B INFO FR PKG 97&98 TO NEW NOTE D.	4OCT1999	RCM/MRG
3	CHG LD LEN FR <del>1.81</del> TO <del>1.88</del> ; CHG MOLD BODY HT FR <del>1.33</del> TO <del>1.33</del> ; CHG PKG EDGE TO LD EDGE DIST FR (0.81) TO (0.81); CHG MOLD BODY WIDTH FR <del>1.33</del> TO <del>1.33</del> ; ADD PKG THICKNESS DIM "E"; CHG "S" DIM FR <del>2.13</del> TO <del>2.13</del> ; REMOVE DAMBAR & EJECTOR PIN LOCATOR FEATURES & DIMENSIONS; REMOVE MOLDED SURFACE & DRAFT ANGLE DIMS; ADD NOTE ON JEDEC REFERENCE; ADD NOTE ON ASME Y14.5M-1994; REMOVE NOTE ON L34Z OPTION; ADD NOTE ON DWG FILENAME.	12FEB08	BMR/FSCP



- 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.
  - D) TO-92 (92,94,96,97,98) PIN CONFIGURATION:

PIN	92			94			96			97			98		
	P	F	M	P	F	M	B	F	M	P	F	M	P	F	M
1	E	S	S	E	S	S	B	D	G	C	G	D	C	G	D
2	B	D	G	C	G	D	E	S	S	B	D	G	E	S	S
3	C	G	D	B	D	G	C	G	D	E	S	S	B	D	G

LEGEND:

P - BIPOLAR	E - EMITTER	D - DRAIN
F - JFET	B - BASE	S - SOURCE
M - DMOS	C - COLLECTOR	G - GATE

- E) FOR PACKAGE 92, 94, 96, 97 AND 98: PIN CONFIGURATION DRAIN "D" AND SOURCE "S" ARE INTERCHANGEABLE AT JFET "F" OPTION.
- F) DRAWING FILENAME: MKT-ZA03DREV3.

APPROVALS	DATE	 <b>FAIRCHILD</b> SEMICONDUCTOR™
DRAWN: J.U. COMPARATIVO JR.	03APR2008	
CHECKED: L. GALERA		
APPROVED: M.R. GESTOLE		
G.S. BAJE		<b>3LD, TO-92, MOLDED          STD STRAIGHT LD          (NO EOL CODE)</b>
		SCALE: 1:1 SIZE: N/A DRAWING NUMBER: MKT-ZA03D FORMERLY: N/A
		REV: 3 SHEET: 1 OF 1



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