

# PNP Epitaxial Silicon Transistor

## KSA1381

### Features

- High Voltage:  $V_{CEO} = -300\text{ V}$
- Low Reverse Transfer Capacitance:  $C_{re} = 2.3\text{ pF}$  at  $V_{CB} = -30\text{ V}$
- Excellent Gain Linearity for Low THD
- High Frequency: 150 MHz
- Full Thermal and Electrical Spice Models are Available
- Complement to KSC3503
- This is a Pb-Free Device

### Applications

- Audio, Voltage Amplifier and Current Source
- CRT Display, Video Output
- General Purpose Amplifier

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

Symbol	Parameter	Ratings	Units
$BV_{CBO}$	Collector-Base Voltage	-300	V
$BV_{CEO}$	Collector-Emitter Voltage	-300	V
$BV_{EBO}$	Emitter-Base Voltage	-5	V
$I_C$	Collector Current (DC)	-100	mA
$I_{CP}$	Collector Current (Pulse)	-200	mA
$P_C$	Total Device Dissipation, $T_C = 25^\circ\text{C}$ $T_C = 125^\circ\text{C}$	7 1.2	W W
$T_J, T_{STG}$	Junction and Storage Temperature	-55~+150	$^\circ\text{C}$

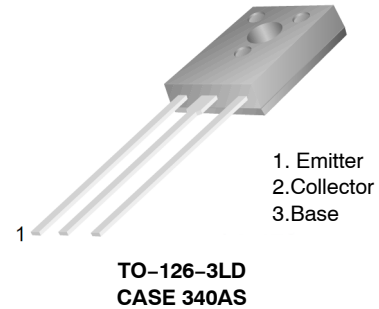
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

### THERMAL CHARACTERISTICS (Note 1)

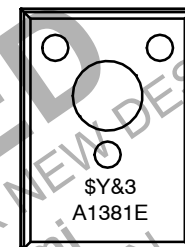
( $T_a = 25^\circ\text{C}$  unless otherwise noted)

Symbol	Parameter	Max.	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	17.8	$^\circ\text{C/W}$

1. Device mounted on minimum pad size.



### MARKING DIAGRAM



\$Y = Logo  
 &3 = 3-Digit Date Code  
 A1381E = Specific Device Code

### ORDERING INFORMATION

See detailed ordering and shipping information on page 2 of this data sheet.

# KSA1381

## ELECTRICAL CHARACTERISTICS (Note 2) ( $T_a = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Characteristic	Test Condition	Min	Typ	Max	Unit
$BV_{CBO}$	Collector–Base Breakdown Voltage	$I_C = -10\ \mu\text{A}$ , $I_E = 0$	-300	–	–	V
$BV_{CEO}$	Collector–Emitter Breakdown Voltage	$I_C = -1\ \text{mA}$ , $I_B = 0$	-300	–	–	V
$BV_{EBO}$	Emitter–Base Breakdown Voltage	$I_E = -10\ \mu\text{A}$ , $I_C = 0$	-5	–	–	V
$I_{CBO}$	Collector Cut-off Current	$V_{CB} = -200\ \text{V}$ , $I_E = 0$	–	–	-0.1	$\mu\text{A}$
$I_{EBO}$	Emitter Cut-off Current	$V_{EB} = -4\ \text{V}$ , $I_C = 0$	–	–	-0.1	$\mu\text{A}$
$h_{FE}$	DC Current Gain	$V_{CE} = -10\ \text{V}$ , $I_C = -10\ \text{mA}$	100	–	200	
$V_{CE(sat)}$	Collector–Emitter Saturation Voltage	$I_C = -20\ \text{mA}$ , $I_B = -2\ \text{mA}$	–	–	-0.6	V
$V_{BE(sat)}$	Base–Emitter Saturation Voltage	$I_C = -20\ \text{mA}$ , $I_B = -2\ \text{mA}$	–	–	-1	V
$f_T$	Current Gain Bandwidth Product	$V_{CE} = -30\ \text{V}$ , $I_C = -10\ \text{mA}$	–	150	–	MHz
$C_{ob}$	Output Capacitance	$V_{CB} = -30\ \text{V}$ , $f = 1\ \text{MHz}$	–	3.1	–	pF
$C_{re}$	Reverse Transfer Capacitance	$V_{CB} = -30\ \text{V}$ , $f = 1\ \text{MHz}$	–	2.3	–	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.

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

## ORDERING INFORMATION

Part Number (Note 3, 4)	Marking	Package	Shipping	Remarks
KSA1381ESTU	A1381E	TO-126-3LD (Pb-Free)	1920 Units / Tube	HFE1 E Grade

3. Affix “-S-” means the standard TO126 Package.(see package dimensions). If the affix is “-STS-” instead of “-S-”, that mean the short-lead TO126 package.

4. Suffix “-TU” means the tube packing, The Suffix “TU” could be replaced to other suffix character as packing method.

## TYPICAL CHARACTERISTICS

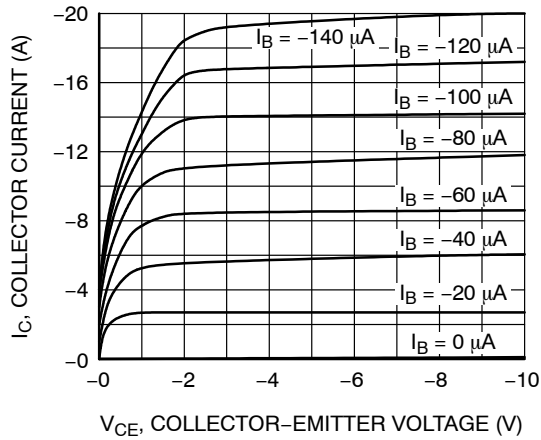


Figure 1. Static Characteristic

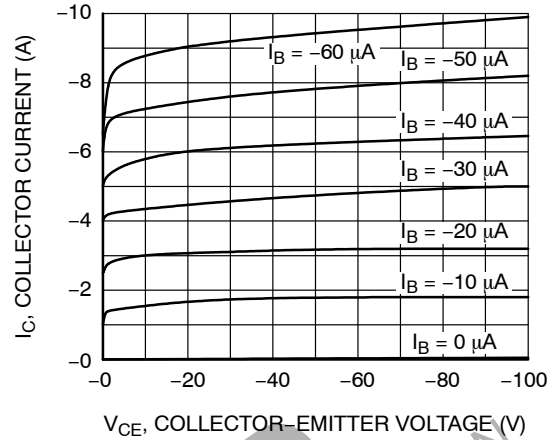


Figure 2. Static Characteristic

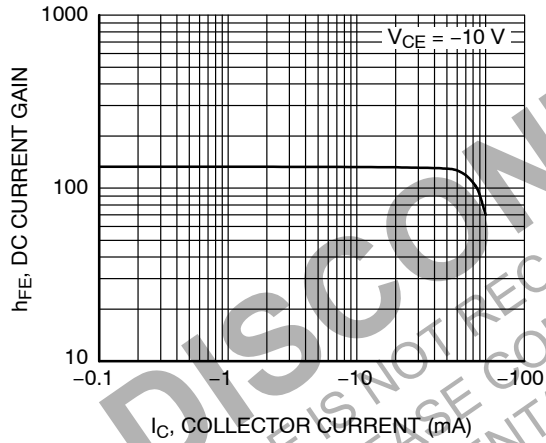


Figure 3. DC Current Gain

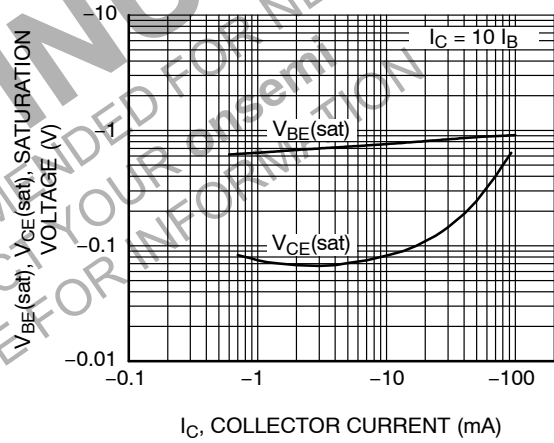
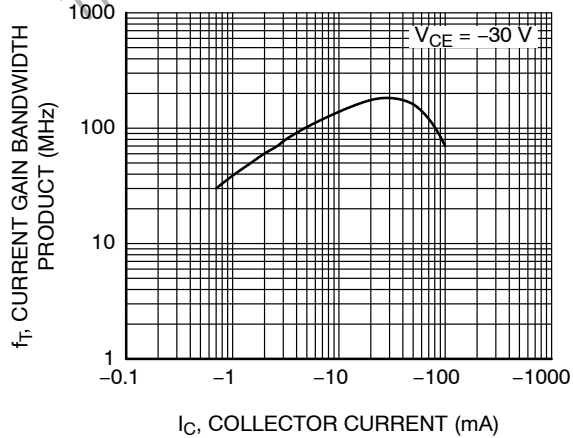
Figure 4. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

Figure 5. Current Gain Bandwidth Product

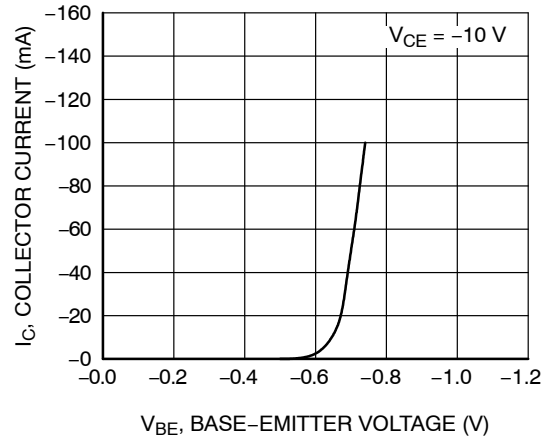
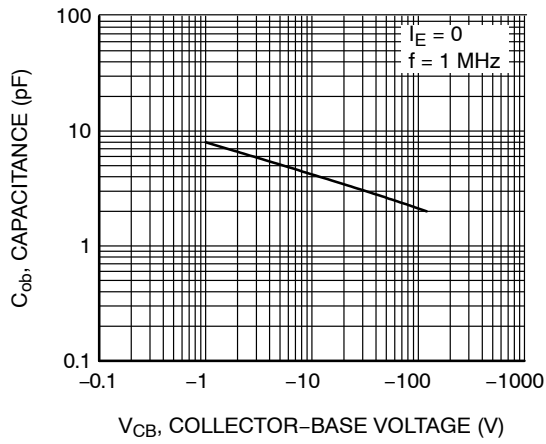
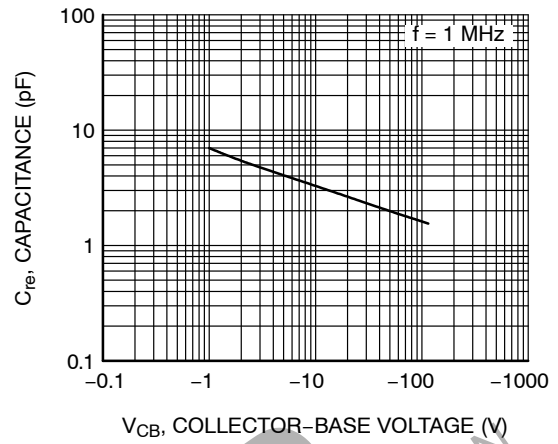


Figure 6. Base-Emitter On Voltage

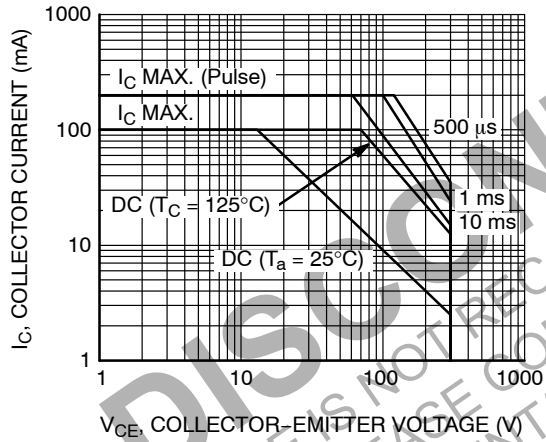
## TYPICAL CHARACTERISTICS (Continued)



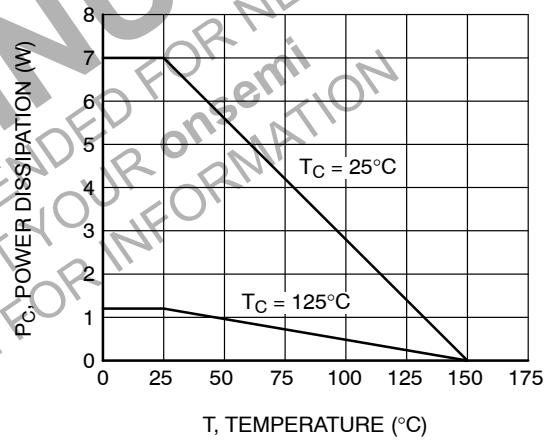
**Figure 7. Collector Output Capacitance**



**Figure 8. Reverse Transfer Capacitance**



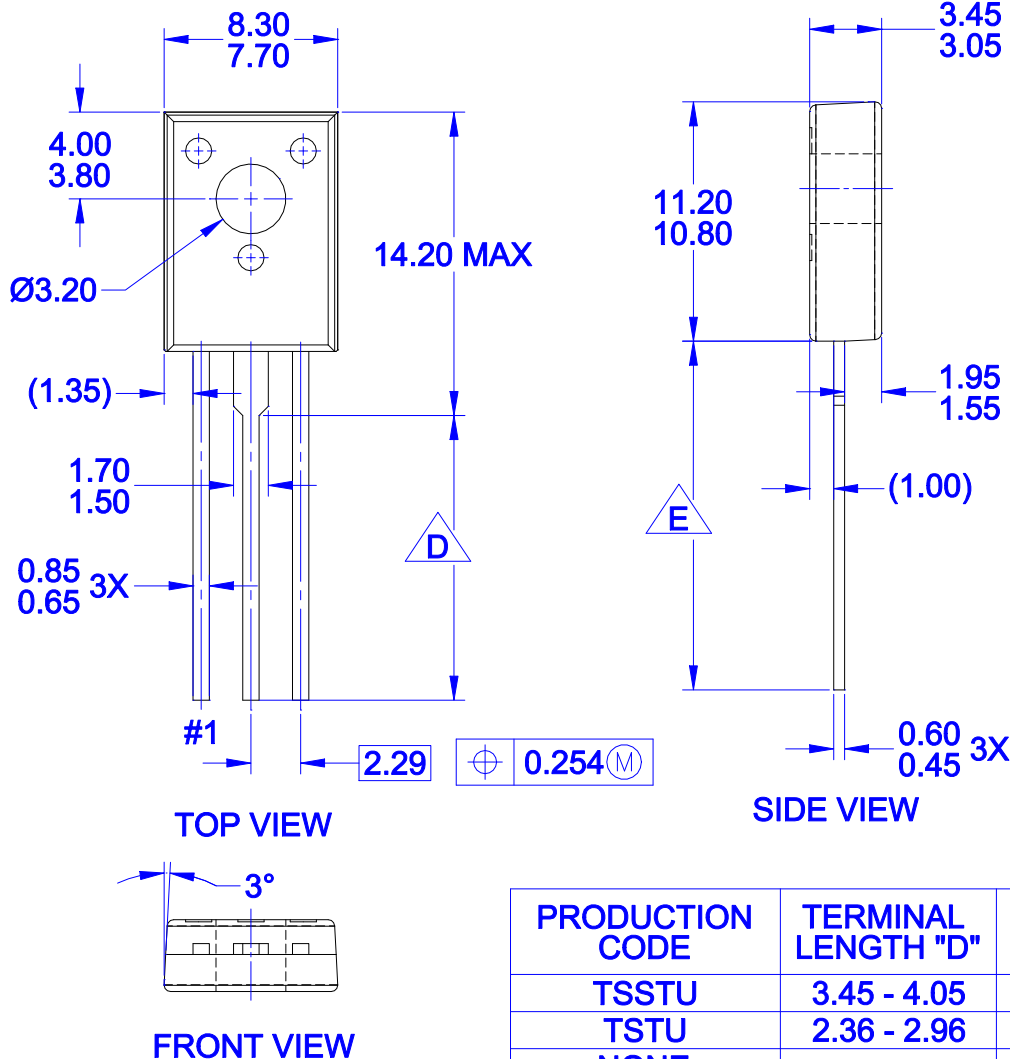
**Figure 9. Safe Operating Area**



**Figure 10. Power Derating**

TO-126-3LD  
CASE 340AS  
ISSUE O

DATE 30 SEP 2016



**NOTES:**

- A. NO INDUSTRY STANDARD APPLIES TO THIS PACKAGE
- B. ALL DIMENSIONS ARE IN MILLIMETERS
- C. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR PROTRUSIONS

**D** FOR TERMINAL LENGTH "D", REFER TO TABLE

**E** FOR TERMINAL LENGTH "E", REFER TO TABLE

PRODUCTION CODE	TERMINAL LENGTH "D"	TERMINAL LENGTH "E"
TSSTU	3.45 - 4.05	6.45 - 7.45
TSTU	2.36 - 2.96	5.36 - 6.36
NONE (STD LENGTH)	12.76 - 13.36	15.76 - 16.76

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