

# PNP Silicon Transistor

## KSA1156

### Features

- High Breakdown Voltage
- Low Collector Saturation Voltage
- High Speed Switching
- This is a Pb-Free Device

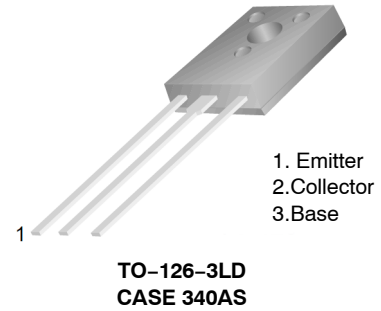
### Applications

- High Voltage Switching
- Low Power Switching Regulator
- DC-DC Converter

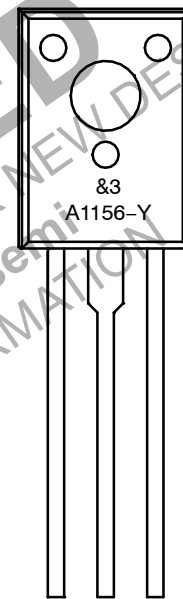
### ABSOLUTE MAXIMUM RATINGS ( $T_C = 25^\circ\text{C}$ unless otherwise noted)

| Symbol    | Parameter                                                                   | Ratings   | Units            |
|-----------|-----------------------------------------------------------------------------|-----------|------------------|
| $V_{CBO}$ | Collector-Base Voltage                                                      | -400      | V                |
| $V_{CEO}$ | Collector-Emitter Voltage                                                   | -400      | V                |
| $V_{EBO}$ | Emitter-Base Voltage                                                        | -7        | V                |
| $I_B$     | Base Current                                                                | -0.25     | A                |
| $I_C$     | Collector Current (DC)                                                      | -0.5      | A                |
| $I_{CP}$  | Collector Current (Pulse)                                                   | -1        | A                |
| $P_C$     | Collector Dissipation, $T_A = 25^\circ\text{C}$<br>$T_C = 25^\circ\text{C}$ | 1<br>10   | W                |
| $T_J$     | Junction Temperature                                                        | 150       | $^\circ\text{C}$ |
| $T_{STG}$ | 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.



### MARKING DIAGRAM



&3 = 3-Digit Date Code  
A1156-Y = Specific Device Code

### ORDERING INFORMATION

| Device    | Package                 | Shipping                 |
|-----------|-------------------------|--------------------------|
| KSA1156YS | TO-126-3LD<br>(Pb-Free) | 2000 Units /<br>Bulk Bag |

**ELECTRICAL CHARACTERISTICS** ( $T_C = 25^\circ\text{C}$  unless otherwise noted)

| Symbol         | Characteristic                       | Test Condition                                                                                                                      | Min  | Max  | Unit          |
|----------------|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|------|------|---------------|
| $V_{CEO(sus)}$ | Collector-Emitter Sustaining Voltage | $I_C = -100\text{ mA}$ , $I_B = -10\text{ mA}$ , $L = -20\text{ mH}$                                                                | -400 | -    | V             |
| $V_{CEX(sus)}$ | Collector-Emitter Sustaining Voltage | $I_C = -200\text{ mA}$ , $I_{B1} = I_{B2} = -20\text{ mA}$ , $V_{BE(off)} = 5\text{ V}$ , $L = 10\text{ mH}$                        | -400 | -    | V             |
| $I_{CBO}$      | Collector Cut-off Current            | $V_{CB} = -400\text{ V}$ , $I_E = 0$                                                                                                | -    | -100 | $\mu\text{A}$ |
| $I_{EBO}$      | Emitter Cut-off Current              | $V_{EB} = -5\text{ V}$ , $I_C = 0$                                                                                                  | -    | -10  | $\mu\text{A}$ |
| $I_{CEX1}$     | Collector Cut-off Current            | $V_{CE} = -400\text{ V}$ , $V_{BE(off)} = 1.5\text{ V}$                                                                             | -    | -100 | $\mu\text{A}$ |
| $I_{CEX2}$     | Collector Cut-off Current            | $V_{CE} = -400\text{ V}$ , $V_{BE(off)} = 1.5\text{ V}$ , $T_C = 125^\circ\text{C}$                                                 | -    | -1   | mA            |
| $h_{FE}$       | DC Current Gain                      | $V_{CE} = -5\text{ V}$ , $I_C = -100\text{ mA}$                                                                                     | 30   | 200  |               |
| $V_{CE(sat)}$  | Collector-Emitter Saturation Voltage | $I_C = -100\text{ mA}$ , $I_B = -10\text{ mA}$                                                                                      | -    | -1   | V             |
| $V_{BE(sat)}$  | Base-Emitter Saturation Voltage      | $I_C = -100\text{ mA}$ , $I_B = -10\text{ mA}$                                                                                      | -    | -1.2 | V             |
| $t_{ON}$       | Turn On Time                         | $V_{CC} = -150\text{ V}$ , $I_C = -100\text{ mA}$ , $I_{B1} = -10\text{ mA}$ , $I_{B2} = 20\text{ mA}$ , $R_L = 1.5\text{ k}\Omega$ | -    | 1    | $\mu\text{s}$ |
| $t_{STG}$      | Storage Time                         |                                                                                                                                     | -    | 4    | $\mu\text{s}$ |
| $t_F$          | Fall Time                            |                                                                                                                                     | -    | 1    | $\mu\text{s}$ |

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 | N       | R       | O        | Y         |
|----------------|---------|---------|----------|-----------|
| $h_{FE}$       | 30 ~ 60 | 40 ~ 80 | 60 ~ 120 | 100 ~ 200 |

## TYPICAL CHARACTERISTICS

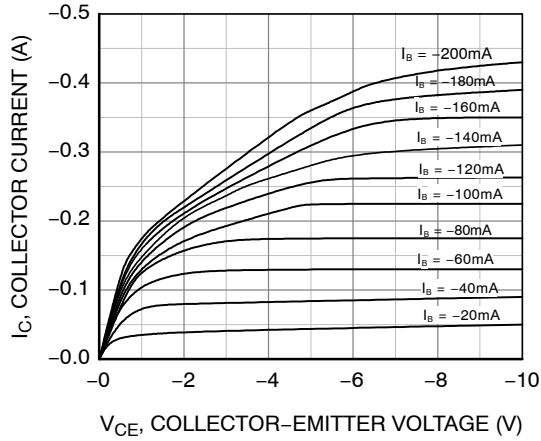


Figure 1. Static Characteristic

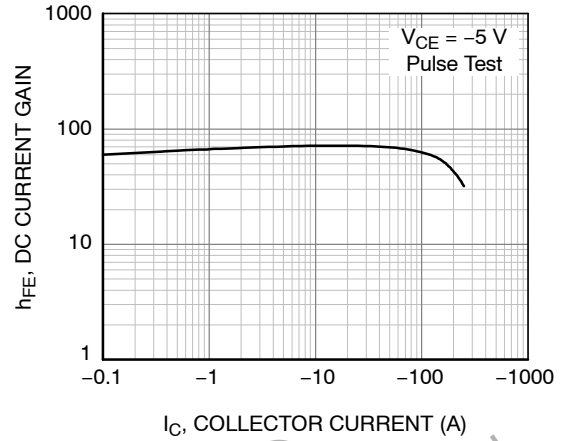


Figure 2. DC Current Gain

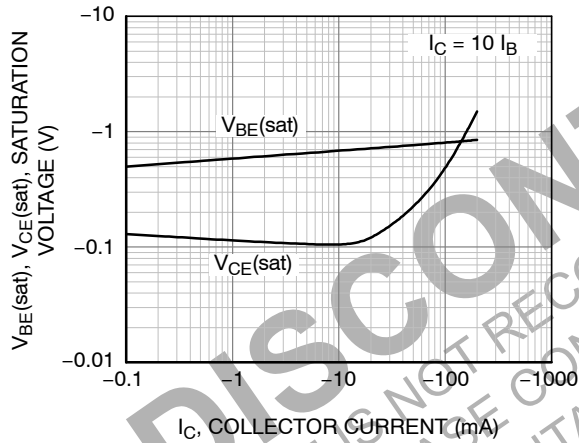
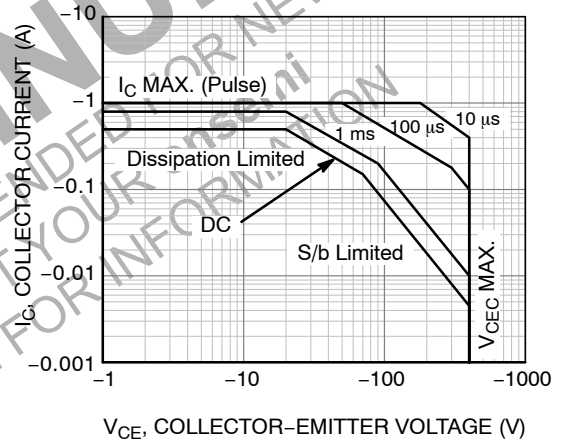
Figure 3. Collector-Emitter Saturation Voltage  
Base-Emitter Saturation Voltage

Figure 4. Safe Operating Area

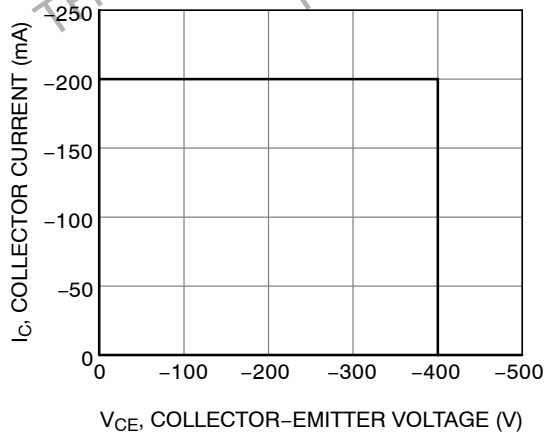
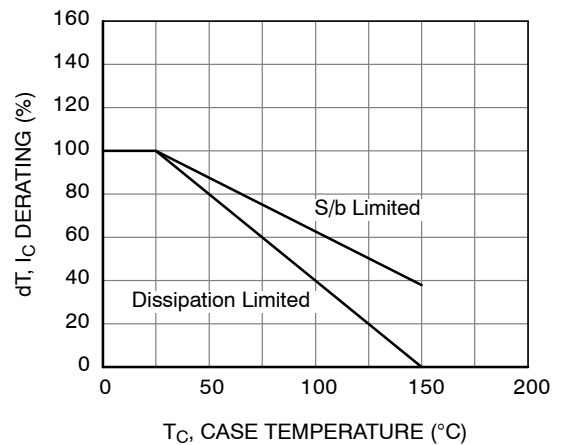


Figure 5. Reverse Bias Safe Operating Area

Figure 6. Derating Curve of Safe  
Operating Areas

## TYPICAL CHARACTERISTICS (Continued)

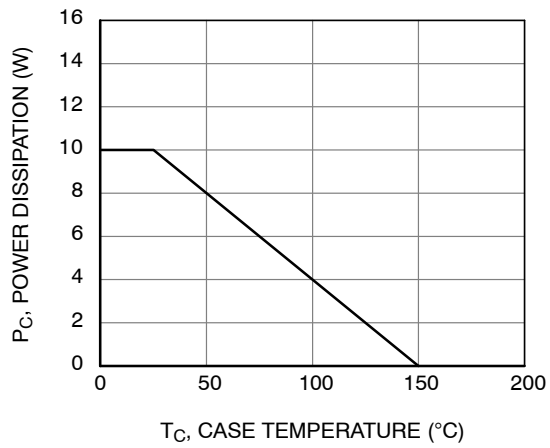
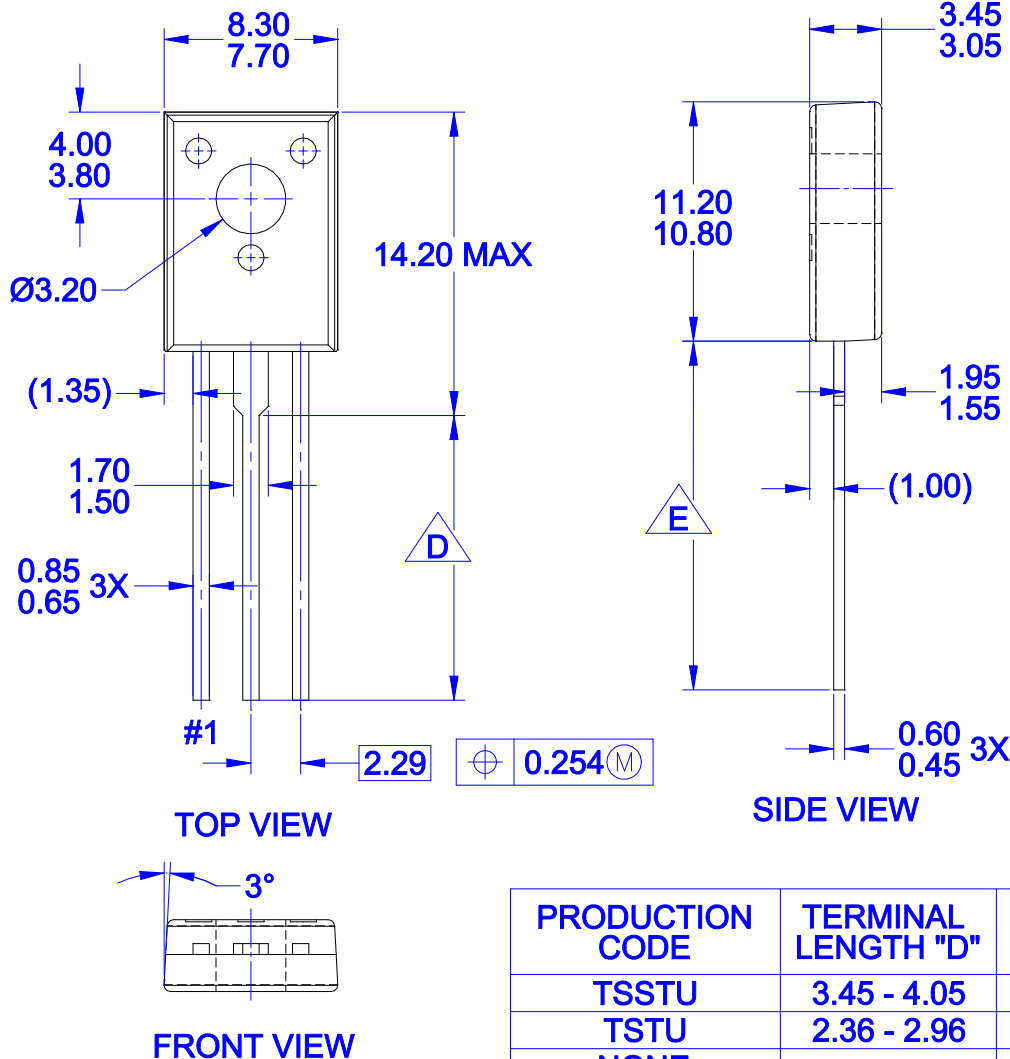


Figure 7. Power Derating

**DISCONTINUED**  
THIS DEVICE IS NOT RECOMMENDED FOR NEW DESIGN  
PLEASE CONTACT YOUR onsemi  
REPRESENTATIVE FOR INFORMATION

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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