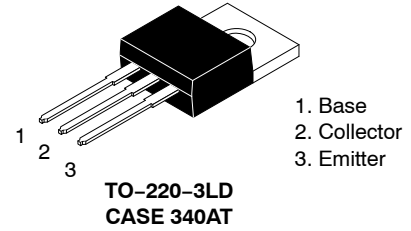


# PNP Epitaxial Silicon Transistor

## KSA1010

### High Speed High Voltage Switching

- Industrial Use
- Complement to KSC2334



### ABSOLUTE MAXIMUM RATINGS

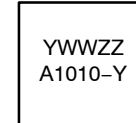
( $T_C = 25^\circ\text{C}$  unless otherwise noted.)

Symbol	Parameter	Ratings	Unit
$V_{CBO}$	Collector-Base Voltage	-100	V
$V_{CEO}$	Collector-Emitter Voltage	-100	V
$V_{EBO}$	Emitter-Base Voltage	-7	V
$I_C$	Collector Current (DC)	-7	A
$I_{CP}$	Collector Current (Pulse) (Note 1)	-15	A
$I_B$	Base Current	-3.5	A
$P_C$	Collector Dissipation ( $T_C = 25^\circ\text{C}$ )	40	W
	Collector Dissipation ( $T_A = 25^\circ\text{C}$ )	1.5	W
$T_J$	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.

1.  $PW \leq 300 \mu\text{s}$ , Duty Cycle  $\leq 10\%$ .

### MARKING DIAGRAM



YWW = Date Code (Year & Week)  
ZZ = Lot Run Traceability Code  
A1010 = Specific Device Code  
Y =  $h_{FE}$  Grade

### ORDERING INFORMATION

Device	Package	Shipping
KSA1010YTU	TO-220-3LD (Pb-Free)	1000 Units / Tube

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

Symbol	Parameter	Conditions	Min	Max	Unit
$V_{CEO(sus)}$	Collector-Emitter Sustaining Voltage	$I_C = -5 \text{ A}$ , $I_{B1} = -0.5 \text{ A}$ , $L = 1 \text{ mH}$	-100	-	V
$V_{CEX(sus)1}$	Collector-Emitter Sustaining Voltage	$I_C = -5 \text{ A}$ , $I_{B1} = -I_{B2} = -0.5 \text{ A}$ , $V_{BE(off)} = 5 \text{ V}$ , $L = 180 \mu\text{H}$ , Clamped	-100	-	V
$V_{CEX(sus)2}$	Collector-Emitter Sustaining Voltage	$I_C = -10 \text{ A}$ , $I_{B1} = -1 \text{ A}$ , $I_{B2} = 0.5 \text{ A}$ , $V_{BE(off)} = 5 \text{ V}$ , $L = 180 \mu\text{H}$ , Clamped	-100	-	V
$I_{CBO}$	Collector Cut-off Current	$V_{CB} = -100 \text{ V}$ , $I_E = 0$	-	-10	$\mu\text{A}$
$I_{CER}$	Collector Cut-off Current	$V_{CE} = -100 \text{ V}$ , $R_{BE} = 51 \Omega$ , $T_C = 125^\circ\text{C}$	-	-1	mA
$I_{CEX1}$	Collector Cut-off Current	$V_{CE} = -100 \text{ V}$ , $V_{BE(off)} = 1.5 \text{ V}$	-	-10	$\mu\text{A}$
$I_{CEX2}$	Collector Cut-off Current	$V_{CE} = -100 \text{ V}$ , $V_{BE(off)} = 1.5 \text{ V}$ , $T_C = 125^\circ\text{C}$	-	-1	mA
$I_{EBO}$	Emitter Cut-off Current	$V_{EB} = -5 \text{ V}$ , $I_C = 0$	-	-10	$\mu\text{A}$
$h_{FE1}$ $h_{FE2}$ $h_{FE3}$	DC Current Gain (Note 2)	$V_{CE} = -5 \text{ V}$ , $I_C = -0.5 \text{ A}$ $V_{CE} = -5 \text{ V}$ , $I_C = -3 \text{ A}$ $V_{CE} = -5 \text{ V}$ , $I_C = -5 \text{ A}$	40 40 20	- 200 -	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage (Note 2)	$I_C = -5 \text{ A}$ , $I_B = -0.5 \text{ A}$	-	-0.6	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage (Note 2)	$I_C = -5 \text{ A}$ , $I_B = -0.5 \text{ A}$	-	-1.5	V
$t_{ON}$	Turn On Time	$V_{CC} = -50 \text{ V}$ , $I_C = -5 \text{ A}$ , $I_{B1} = -I_{B2} = -0.5 \text{ A}$ , $R_L = 10 \Omega$	-	0.5	$\mu\text{s}$
$t_{STG}$	Storage Time		-	1.5	$\mu\text{s}$
$t_F$	Fall Time		-	0.5	$\mu\text{s}$

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.

2. Pulse Test:  $PW \leq 350 \mu\text{s}$ , Duty Cycle  $\leq 2\%$ .

### $h_{FE}$ Classification

Classification	R	O	Y
$h_{FE2}$	40 ~ 80	60 ~ 120	100 ~ 200

TYPICAL CHARACTERISTICS

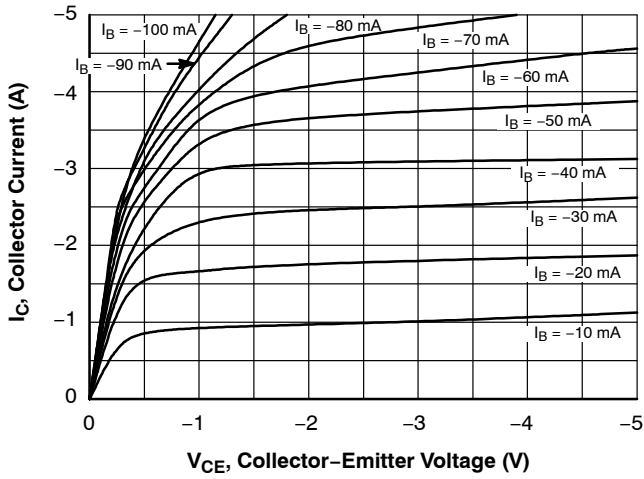


Figure 1. Static Characteristic

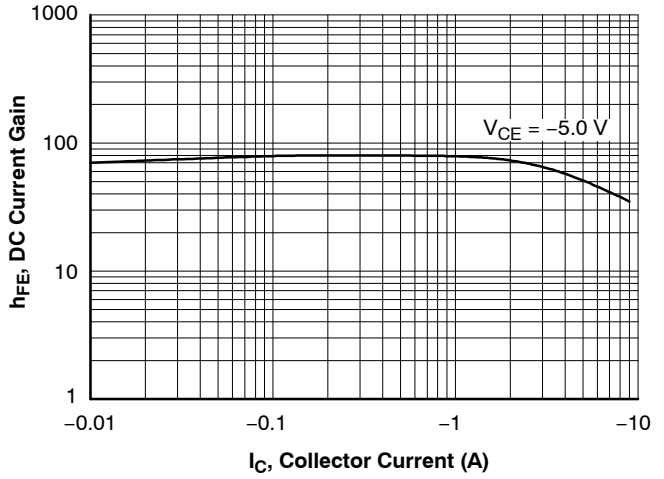


Figure 2. DC Current Gain

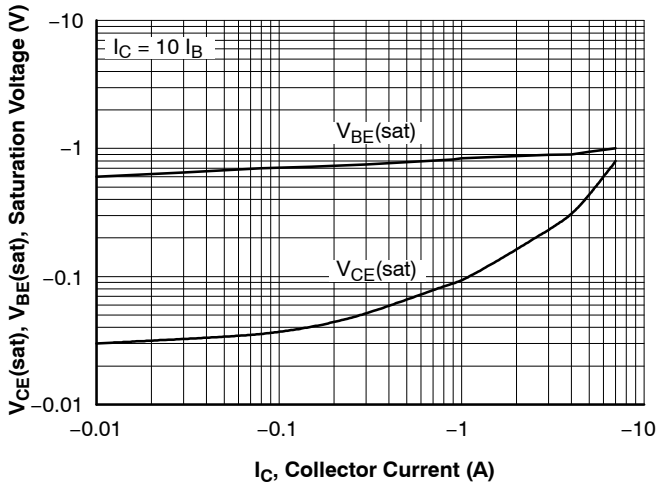


Figure 3. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

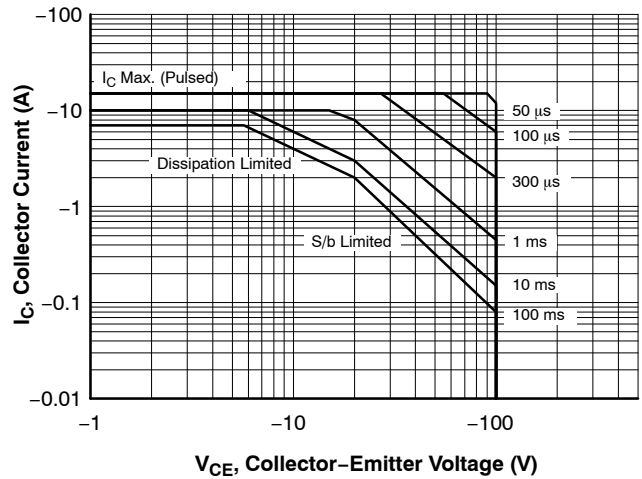


Figure 4. Safe Operating Area

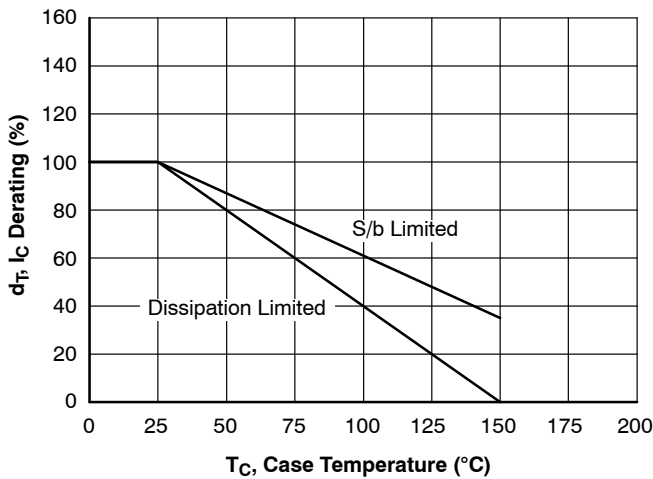


Figure 5. Derating Curve of Safe Operating Areas

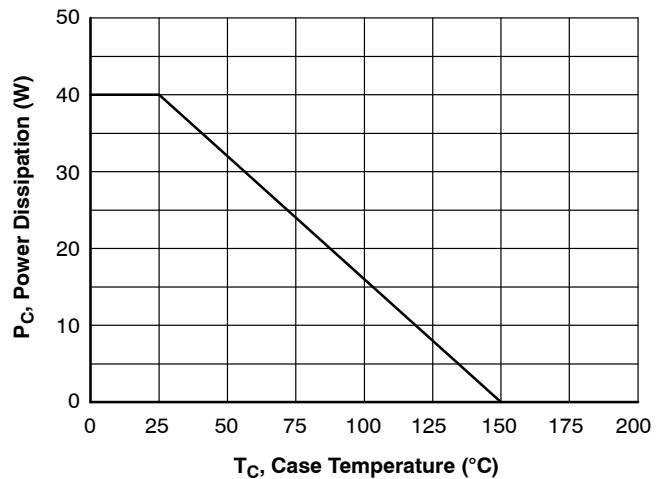
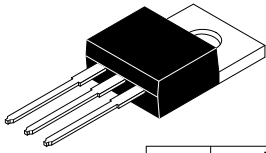


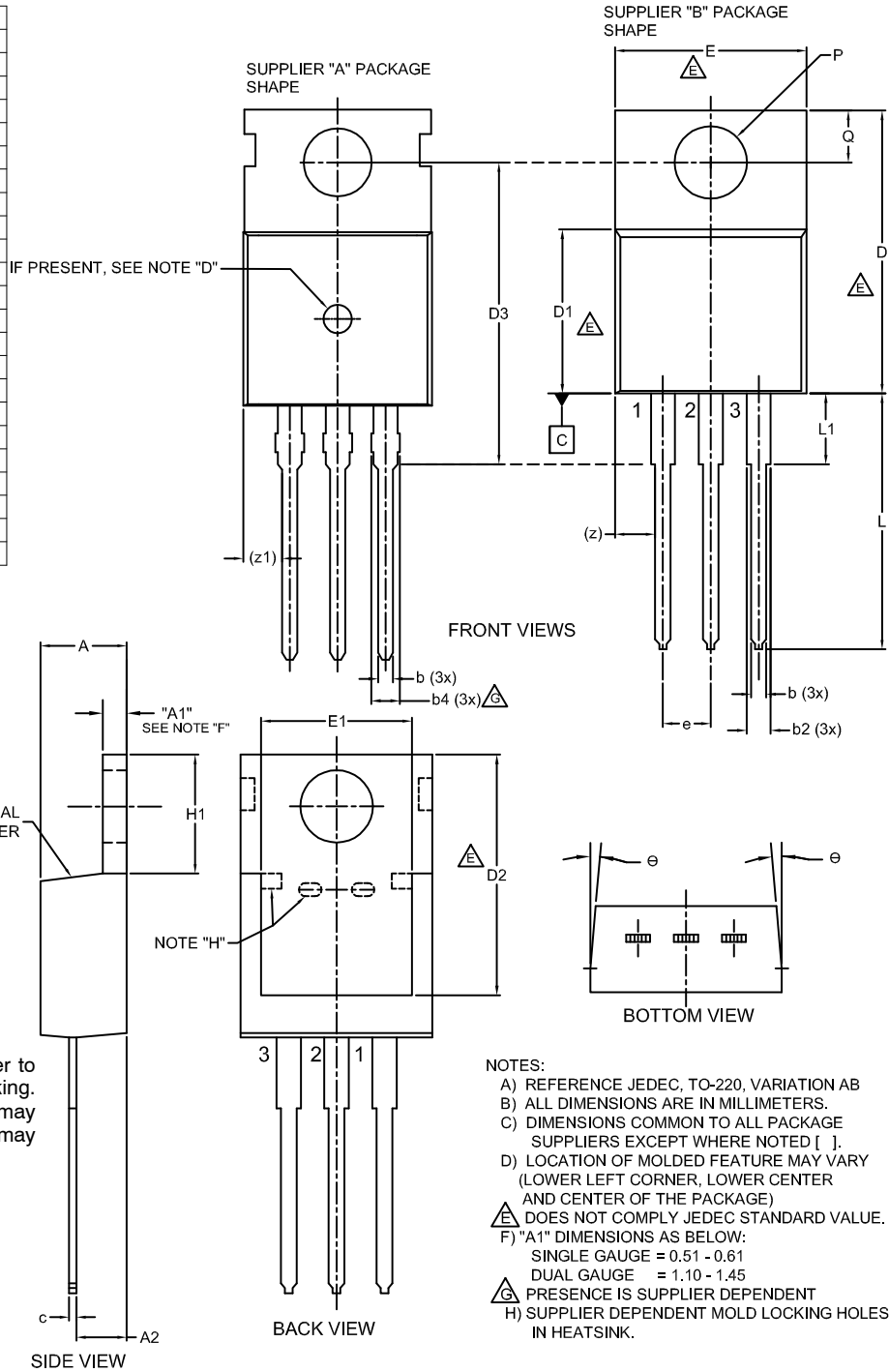
Figure 6. Power Derating



TO-220-3LD  
CASE 340AT  
ISSUE B

DATE 08 AUG 2022

DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	4.00	--	4.70
A1	SEE NOTE "F"		
A2	2.10	--	2.85
b	0.55	--	1.00
b2	1.10	--	1.62
b4	1.42	--	1.62
c	0.36	--	0.60
D	13.90	--	16.30
D1	8.13	--	9.40
D2	11.50	--	14.30
D3	15.42	--	16.51
E	9.65	--	10.67
E1	7.59	--	8.65
e	2.40	--	2.67
H1	6.06	--	6.69
L	12.70	--	14.04
L1	2.70	--	4.10
P	3.50	--	4.00
Q	2.50	--	3.40
z	2.13 REF		
z1	2.06 REF		
θ	3°	--	5°



GENERIC MARKING DIAGRAM\*



XXXX = Specific Device Code  
 A = Assembly Location  
 Y = Year  
 WW = Work Week  
 ZZ = Assembly Lot Code

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "•", may or may not be present. Some products may not follow the Generic Marking.

- NOTES:
- A) REFERENCE JEDEC, TO-220, VARIATION AB
  - B) ALL DIMENSIONS ARE IN MILLIMETERS.
  - C) DIMENSIONS COMMON TO ALL PACKAGE SUPPLIERS EXCEPT WHERE NOTED [ ].
  - D) LOCATION OF MOLDED FEATURE MAY VARY (LOWER LEFT CORNER, LOWER CENTER AND CENTER OF THE PACKAGE)
  - ⚠ DOES NOT COMPLY JEDEC STANDARD VALUE.
  - F) "A1" DIMENSIONS AS BELOW:  
 SINGLE GAUGE = 0.51 - 0.61  
 DUAL GAUGE = 1.10 - 1.45
  - ⚠ PRESENCE IS SUPPLIER DEPENDENT
  - H) SUPPLIER DEPENDENT MOLD LOCKING HOLES IN HEATSINK.

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DESCRIPTION:	TO-220-3LD	PAGE 1 OF 1

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