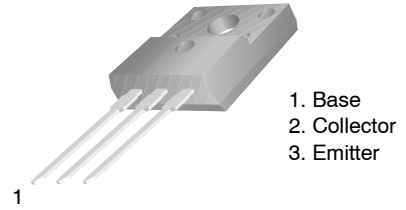


# NPN Epitaxial Silicon Transistor

## KSD1588



TO-220 Fullpack  
CASE 221AT

### Low Frequency Power Amplifier

- Low Speed Switching
- This is a Pb-Free Device

### ABSOLUTE MAXIMUM RATINGS

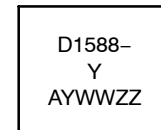
( $T_C = 25^\circ\text{C}$  unless otherwise noted.)

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector-Base Voltage	100	V
$V_{CEO}$	Collector-Emitter Voltage	60	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 ( $T_A = 25^\circ\text{C}$ )	2	W
	Collector Dissipation ( $T_C = 25^\circ\text{C}$ )	30	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.

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

### MARKING DIAGRAM



D1588 = Specific Device Code  
Y =  $h_{FE}$  Grade  
A = Site Code  
YWW = Date Code (Year & Week)  
ZZ = Assembly Lot Code

### ORDERING INFORMATION

Device	Package	Shipping
KSD1588YTU	TO-220 Fullpack (Pb-Free)	1,000 Units / Tube

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

Symbol	Parameter	Test Conditions	Min	Max	Unit
$I_{CBO}$	Collector Cut-off Current	$V_{CB} = 80 \text{ V}, I_E = 0$	-	10	$\mu\text{A}$
$I_{EBO}$	Emitter Cut-off Current	$V_{EB} = 5 \text{ V}, I_C = 0$	-	10	$\mu\text{A}$
$h_{FE1}$ $h_{FE2}$	DC Current Gain (Note 2)	$V_{CE} = 1 \text{ V}, I_C = 3 \text{ A}$ $V_{CE} = 1 \text{ V}, I_C = 5 \text{ A}$	40 20	200 -	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage (Note 2)	$I_C = 5 \text{ A}, I_B = 0.5 \text{ A}$	-	0.5	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage (Note 2)	$I_C = 5 \text{ A}, I_B = 0.5 \text{ A}$	-	1.5	V

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  $\leq 2\%$ .

### $h_{FE1}$ Classification

Classification	R	O	Y
$h_{FE1}$	40 ~ 80	80 ~ 120	100 ~ 200

TYPICAL CHARACTERISTICS

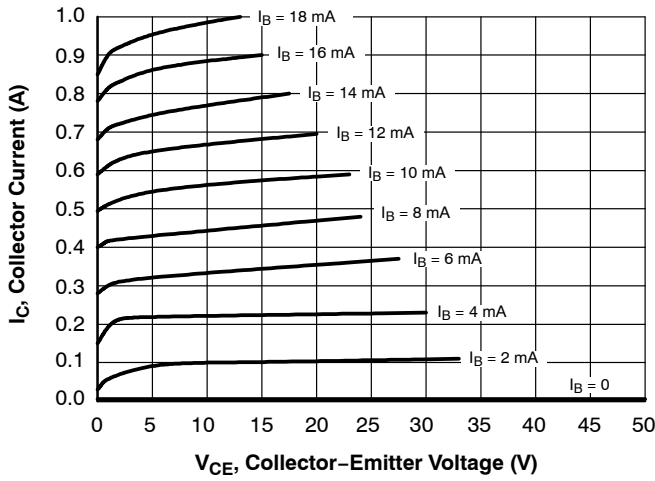


Figure 1. Static Characteristic

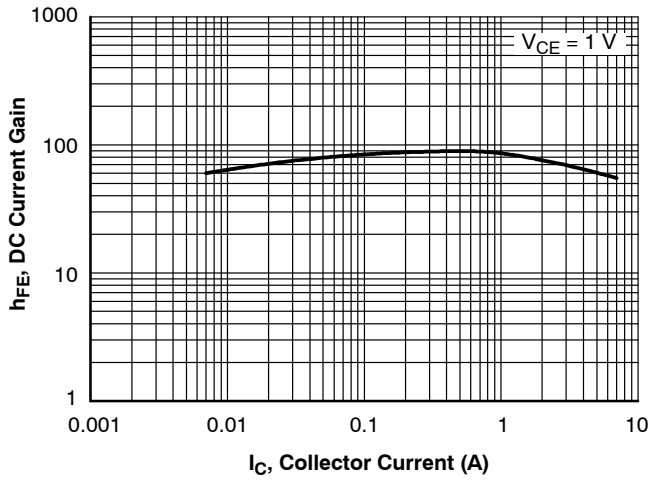


Figure 2. DC Current Gain

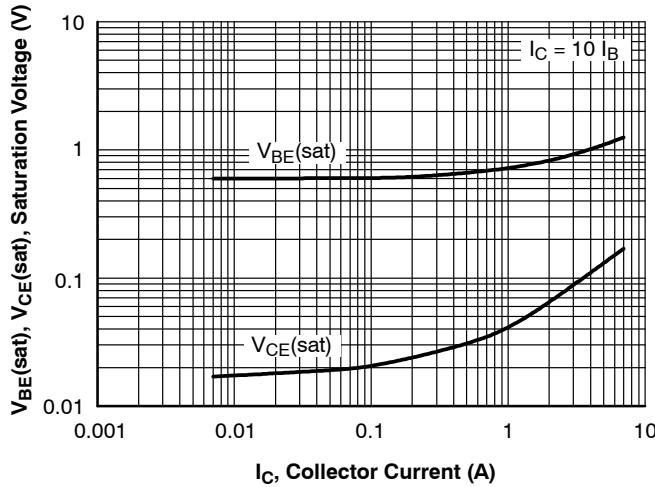


Figure 3. Base-Emitter Saturation Voltage and Collector-Emitter Saturation Voltage

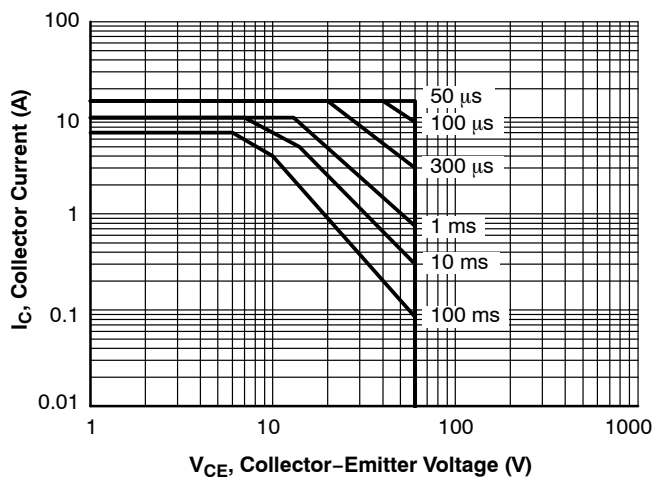


Figure 4. Safe Operating Area

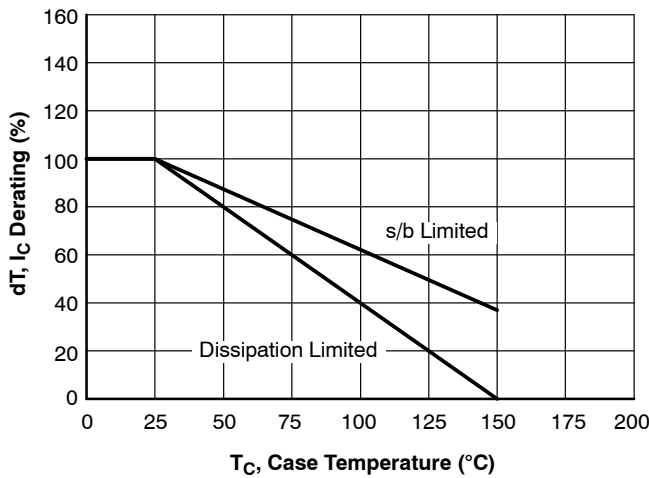


Figure 5. Derating Curve Safe Operating Area

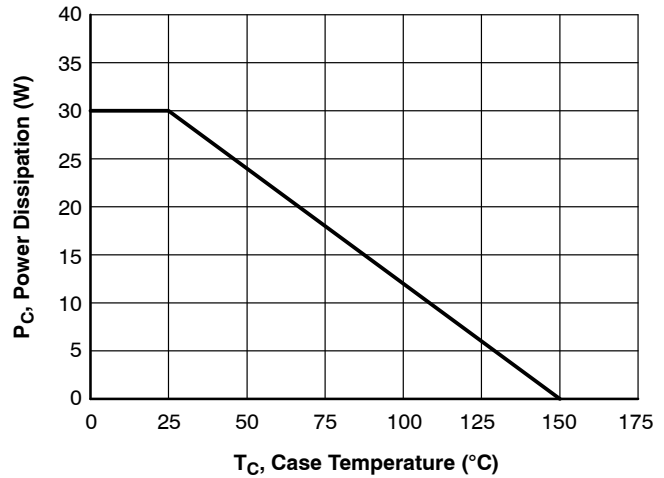


Figure 6. Power Derating

# MECHANICAL CASE OUTLINE

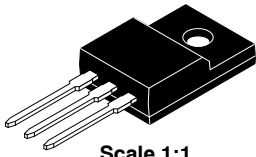
## PACKAGE DIMENSIONS

ON Semiconductor®

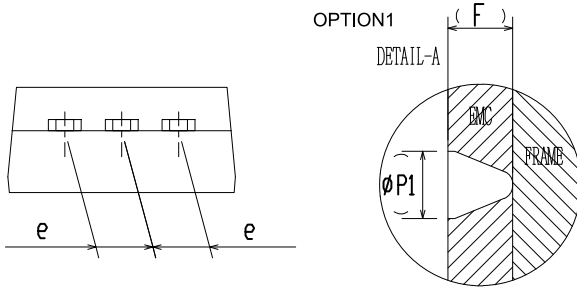
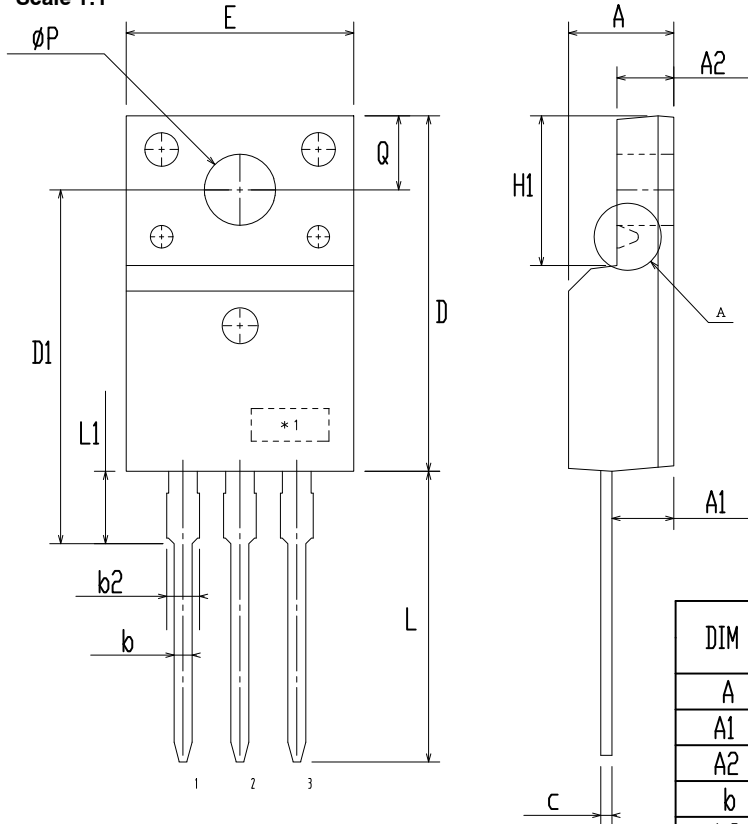


### TO-220 Fullpack, 3-Lead / TO-220F-3SG CASE 221AT ISSUE B

DATE 19 JAN 2021



Scale 1:1



DIM	MILLIMETERS		
	MIN	NOM	MAX
A	4.50	4.70	4.90
A1	2.56	2.76	2.96
A2	2.34	2.54	2.74
b	0.70	0.80	0.90
b2	~	~	1.47
c	0.45	0.50	0.60
D	15.67	15.87	16.07
D1	15.60	15.80	16.00
E	9.96	10.16	10.36
e	2.34	2.54	2.74
F	~	0.84	~
H1	6.48	6.68	6.88
L	12.78	12.98	13.18
L1	3.03	3.23	3.43
∅ P	2.98	3.18	3.38
∅ P1	~	1.00	~
Q	3.20	3.30	3.40

**NOTES:**

- A. DIMENSION AND TOLERANCE AS ASME Y14.5-2009
- B. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR PROTRUCTIONS.
- C. OPTION 1 - WITH SUPPORT PIN HOLE  
OPTION 2 - NO SUPPORT PIN HOLE

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<b>DESCRIPTION:</b>	<b>TO-220 FULLPACK, 3-LEAD / TO-220F-3SG</b>	<b>PAGE 1 OF 1</b>

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