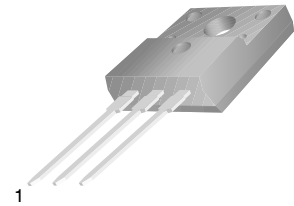


# NPN Epitaxial Silicon Transistor

## Low Frequency Power Amplifier

### KSD2012

- Complementary to KSB1366
- This is a Pb-Free Device



1. Base
2. Collector
3. Emitter

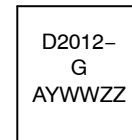
TO-220 Fullpack  
CASE 221AT

#### ABSOLUTE MAXIMUM RATINGS (T<sub>C</sub> = 25°C unless otherwise noted)

Symbol	Parameter	Value	Unit
V <sub>CB0</sub>	Collector-Base Voltage	60	V
V <sub>CEO</sub>	Collector-Emitter Voltage	60	V
V <sub>EBO</sub>	Emitter-Base Voltage	7	V
I <sub>C</sub>	Collector Current	3	A
I <sub>B</sub>	Base Current	0.3	A
P <sub>C</sub>	Collector Power Dissipation (T <sub>C</sub> = 25°C)	25	W
T <sub>J</sub>	Junction Temperature	150	°C
T <sub>stg</sub>	Storage Temperature	-55 ~ 150	°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



- D2012 = Specific Device Code  
G = h<sub>FE</sub> Grade  
A = Site Code  
YWW = Date Code (Year & Week)  
ZZ = Assembly Lot Code

#### ORDERING INFORMATION

Device	Package	Shipping <sup>†</sup>
KSD2012GTU	TO-220 Fullpack (Pb-Free)	1000 Units / Tube

#### ELECTRICAL CHARACTERISTICS (T<sub>C</sub> = 25°C unless otherwise noted)

Symbol	Parameter	Test Condition	Value			Unit
			Min	Typ	Max	
BV <sub>CEO</sub>	Collector-Emitter Breakdown Voltage	I <sub>C</sub> = 50 mA, I <sub>B</sub> = 0	60	-	-	V
I <sub>CBO</sub>	Collector Cut-off Current	V <sub>CB</sub> = 60 V, I <sub>E</sub> = 0	-	-	100	μA
I <sub>EBO</sub>	Emitter Cut-off Current	V <sub>EB</sub> = 7 V, I <sub>C</sub> = 0	-	-	10	μA
h <sub>FE1</sub> h <sub>FE2</sub>	DC Current Gain	V <sub>CE</sub> = 5 V, I <sub>C</sub> = 0.5 A V <sub>CE</sub> = 5 V, I <sub>C</sub> = 3 A	100 20	-	320	-
V <sub>CE(sat)</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> = 2 A, I <sub>B</sub> = 0.2 A	-	0.4	1	V
V <sub>BE(on)</sub>	Base-Emitter ON Voltage	V <sub>CE</sub> = 5 V, I <sub>C</sub> = 0.5 A	-	0.7	1	V
f <sub>T</sub>	Current Gain Bandwidth Product	V <sub>CE</sub> = 5 V, I <sub>C</sub> = 0.5 A	-	3	-	MHz

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<sub>FE</sub> CLASSIFICATION

Classification	Y	G
h <sub>FE1</sub>	100 ~ 200	150 ~ 320

TYPICAL CHARACTERISTICS

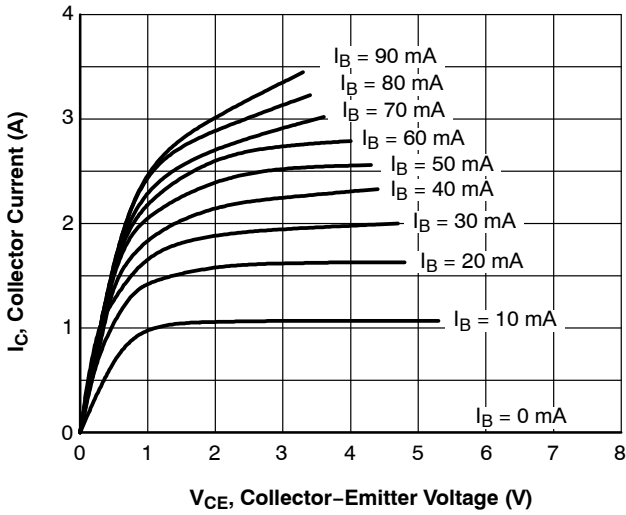


Figure 1. Static Characteristic

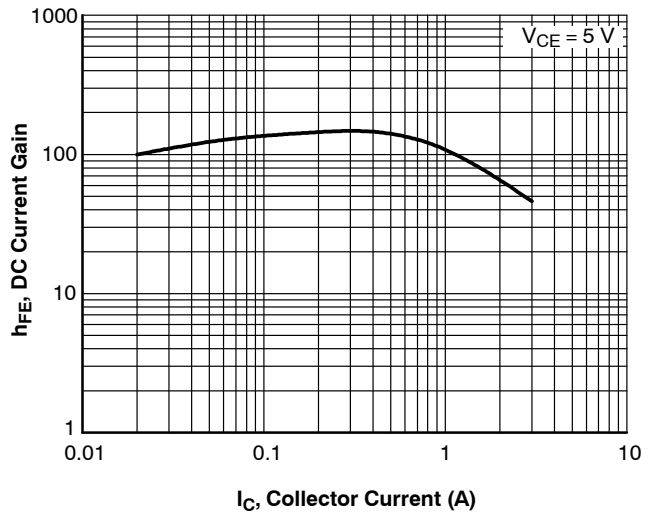


Figure 2. DC Current Gain

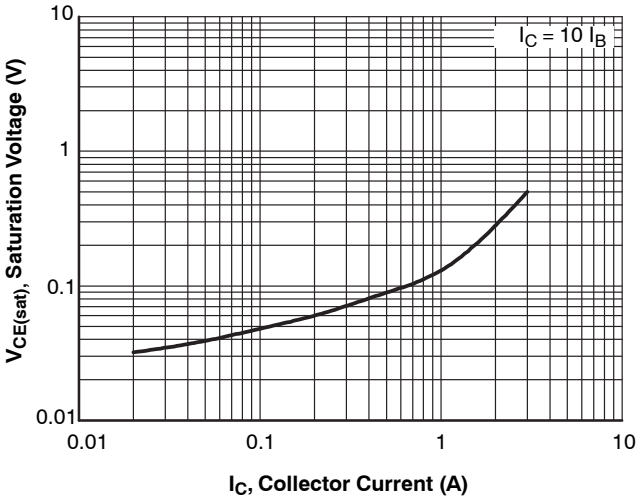


Figure 3. Collector-Emitter Saturation Voltage

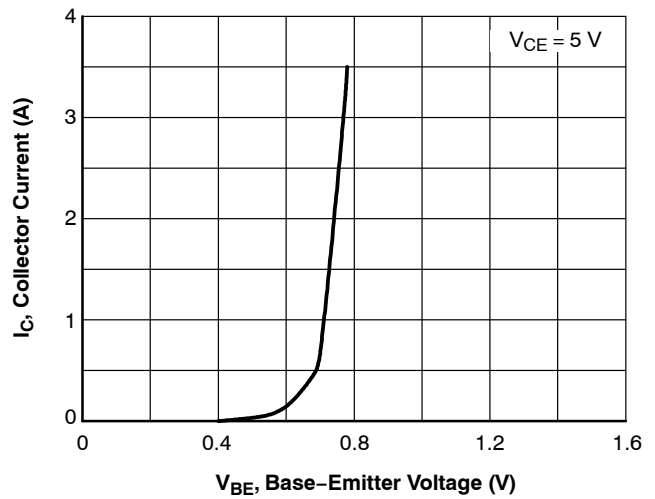


Figure 4. Base-Emitter On Voltage

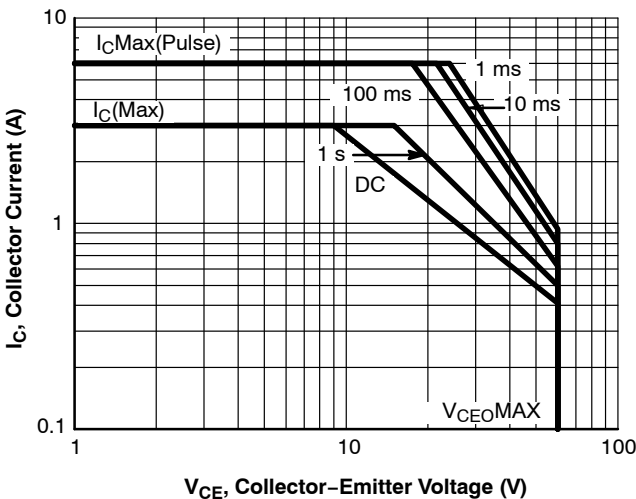


Figure 5. Safe Operating Area

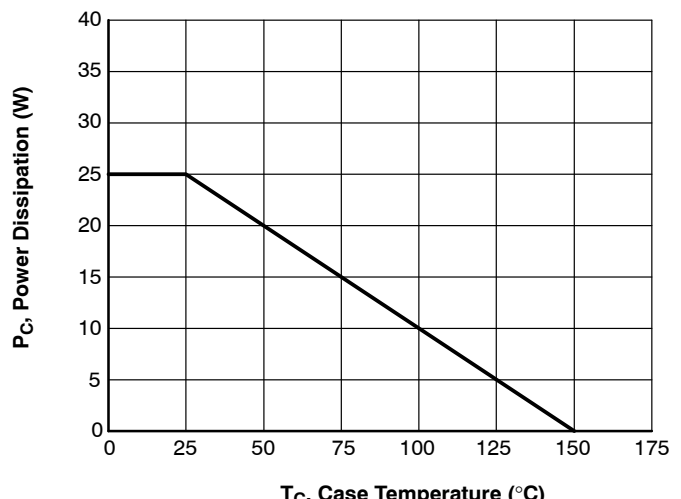
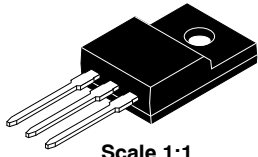


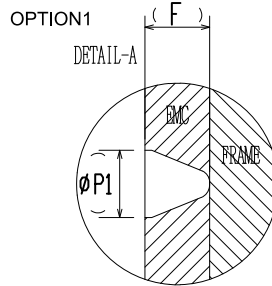
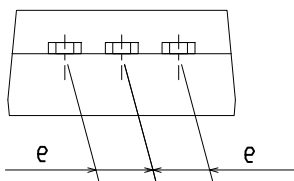
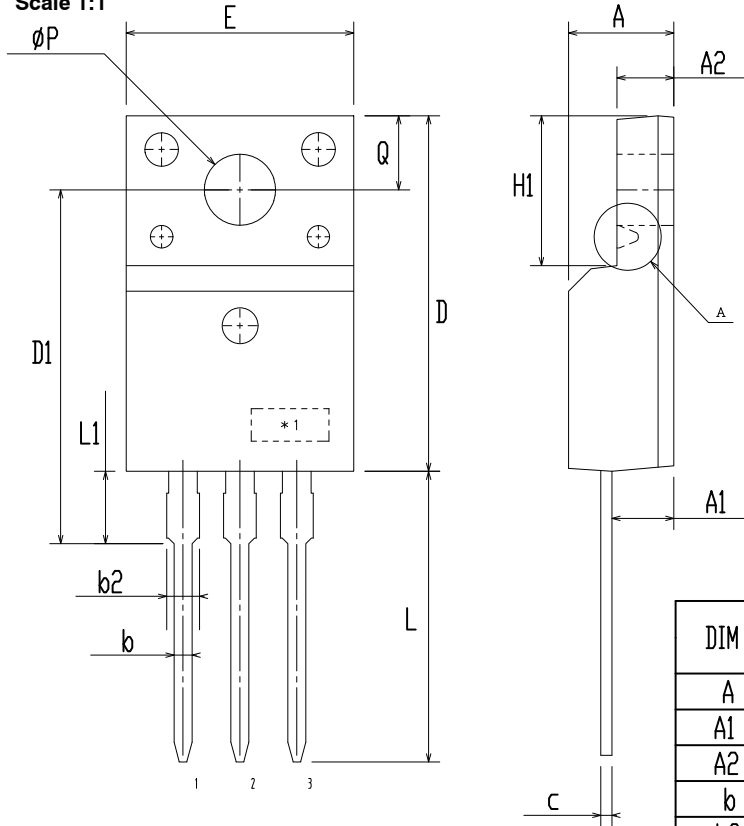
Figure 6. Power Derating

**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
Ø P	2.98	3.18	3.38
Ø 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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