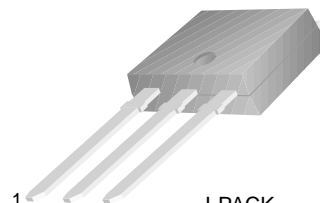


# KSD1221

## Low Frequency Power Amplifier

- Low Collector-Emitter Saturation Voltage
- Complement to KSB906



I-PACK  
1. Base 2. Collector 3. Emitter

## NPN Epitaxial Silicon Transistor

### Absolute Maximum Ratings $T_C=25^\circ\text{C}$ unless otherwise noted

| Symbol    | Parameter  | Value      | Units            |
|-----------|--|------------|------------------|
| $V_{CBO}$ | Collector-Base Voltage                           | 60         | V                |
| $V_{CEO}$ | Collector-Emitter Voltage                        | 60         | V                |
| $V_{EBO}$ | Emitter-Base Voltage                             | 7          | V                |
| $I_C$     | Collector Current                                | 3          | A                |
| $I_B$     | Base Current                                     | 0.5        | A                |
| $P_C$     | Collector Dissipation ( $T_C=25^\circ\text{C}$ ) | 20         | W                |
| $P_C$     | Collector Dissipation ( $T_a=25^\circ\text{C}$ ) | 1          | W                |
| $T_J$     | Junction Temperature                             | 150        | $^\circ\text{C}$ |
| $T_{STG}$ | Storage Temperature                              | - 55 ~ 150 | $^\circ\text{C}$ |

### Electrical Characteristics $T_C=25^\circ\text{C}$ unless otherwise noted

| Symbol        | Parameter                            | Test Condition   | Min. | Typ. | Max. | Units         |
|---------------|--------------------------------------|--|------|------|------|---------------|
| $BV_{CEO}$    | Collector-Emitter Breakdown Voltage  | $I_C = 50\text{mA}, I_B = 0$   | 60   |      |      | V             |
| $I_{CBO}$     | Collector Cut-off Current            | $V_{CB} = 60\text{V}, I_E = 0$   |      |      | 100  | $\mu\text{A}$ |
| $I_{EBO}$     | Emitter Cut-off Current              | $V_{EB} = 7\text{V}, I_C = 0$  |      |      | 100  | $\mu\text{A}$ |
| $h_{FE1}$     | DC Current Gain                      | $V_{CE} = 5\text{V}, I_C = 0.5\text{A}$  | 60   |      | 300  |               |
| $h_{FE2}$     |                                      | $V_{CE} = 5\text{V}, I_C = 3\text{A}$  | 20   |      |      |               |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_C = 3\text{A}, I_B = 0.3\text{A}$   |      | 0.4  | 1    | V             |
| $V_{BE(on)}$  | Base-Emitter ON Voltage              | $I_C = 5\text{A}, I_C = 0.5\text{A}$   |      | 0.7  | 1    | V             |
| $f_T$         | Current Gain Bandwidth Product       | $V_{CE} = 5\text{V}, I_C = 0.5\text{A}$  |      | 3    |      | MHz           |
| $C_{ob}$      | Output Capacitance                   | $V_{CB} = 10\text{V}, f = 1\text{MHz}$   |      | 70   |      | pF            |
| $t_{ON}$      | Turn ON Time                         | $V_{CC} = 30\text{V}, I_C = 1\text{A}$<br>$I_{B1} = -I_{B2} = 0.2\text{A}$<br>$R_L = 30\Omega$ |      | 0.8  |      | $\mu\text{s}$ |
| $t_{STG}$     | Storage Time                         |  |      | 1.5  |      | $\mu\text{s}$ |
| $t_F$         | Fall Time                            |  |      | 0.8  |      | $\mu\text{s}$ |

### $h_{FE}$ Classification

| Classification | O        | Y         | G         |
|----------------|----------|-----------|-----------|
| $h_{FE1}$      | 60 ~ 120 | 100 ~ 200 | 150 ~ 300 |

# Typical Characteristics

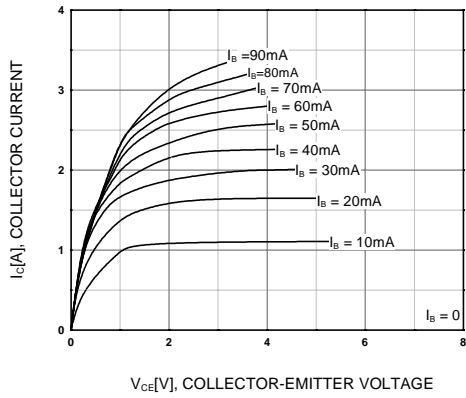


Figure 1. Static Characteristic

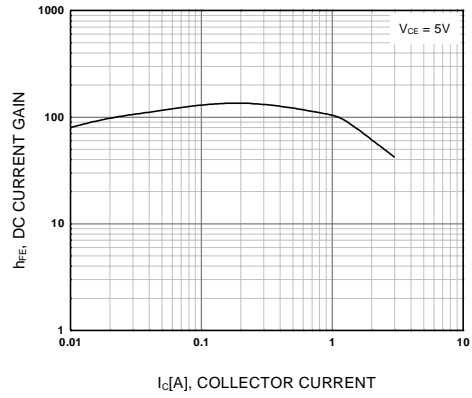


Figure 2. DC current Gain

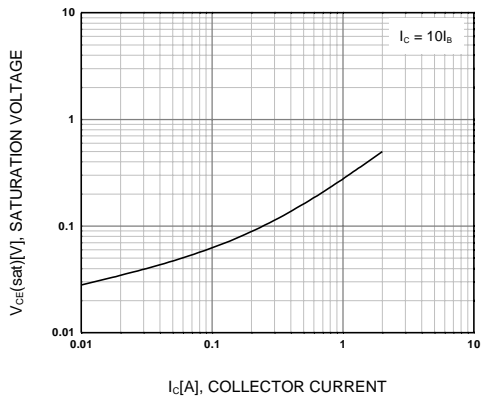


Figure 3. Collector-Emitter Saturation Voltage

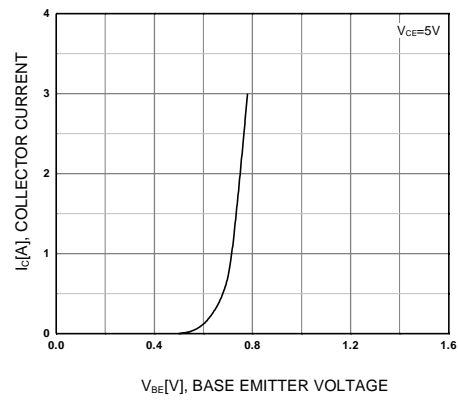


Figure 4. Base-Emitter On Voltage

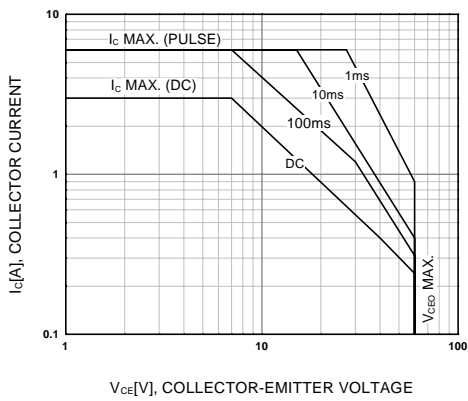


Figure 5. Safe Operating Area

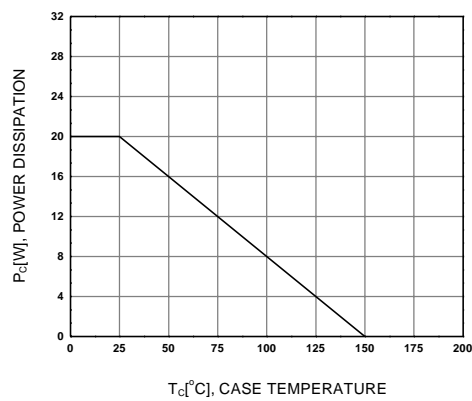
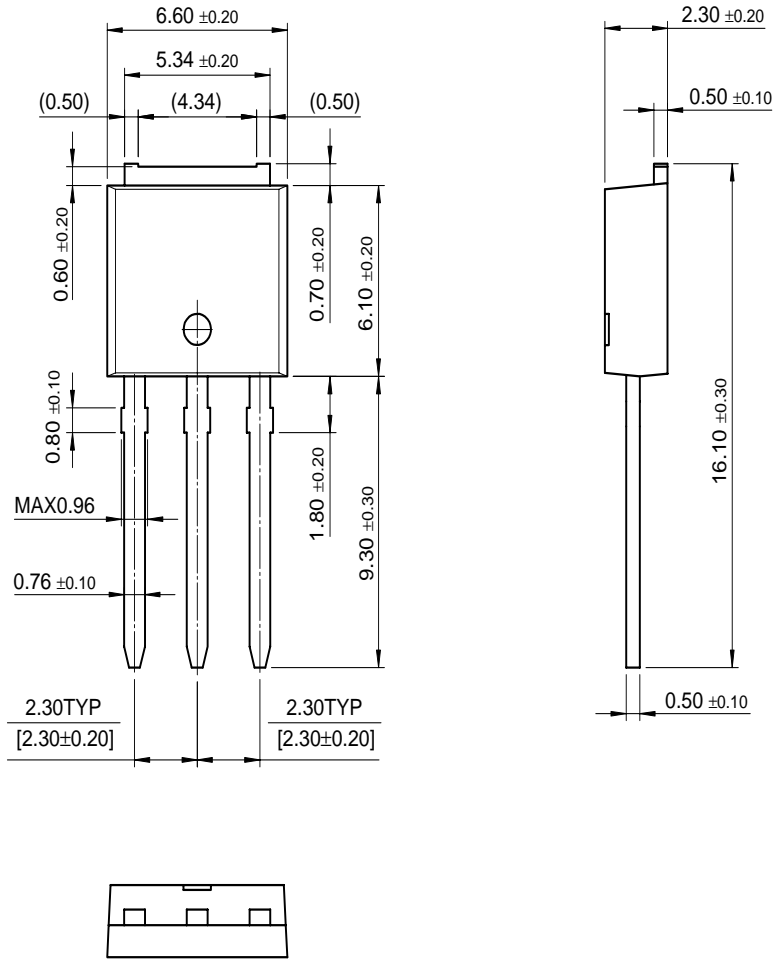


Figure 6. Power Derating

# Package Dimensions

## I-PAK



Dimensions in Millimeters

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| CROSSVOLT™           | POP™          | UHC™        |
| E <sup>2</sup> CMOS™ | PowerTrench®  | VCX™        |
| FACT™                | QFET™         |             |
| FACT Quiet Series™   | QS™           |             |
| FAST®                | Quiet Series™ |             |
| FASTr™               | SuperSOT™-3   |             |
| GTO™                 | SuperSOT™-6   |             |

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