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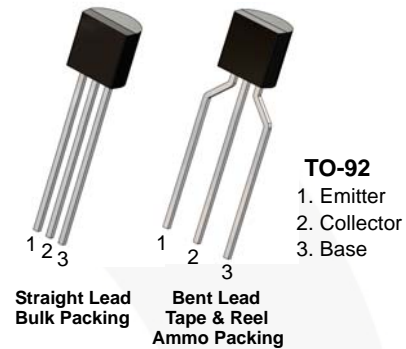


October 2015

KSD5041 NPN Epitaxial Silicon Transistor

Features

- AF Output Amplifier for Electronic Flash Unit
- Low Collector-Emitter Saturation Voltage
- High Performance at Low Supply Voltage



Ordering Information

| Part Number | Top Mark | Package | Packing Method |
|-------------|----------|----------|----------------|
| KSD5041RTA | D5041 | TO-92 3L | Ammo |
| KSD5041QTA | D5041 | TO-92 3L | Ammo |

Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.

| Symbol | Parameter | Value | Unit |
|-----------|---------------------------|------------|------------------|
| V_{CBO} | Collector-Base Voltage | 40 | V |
| V_{CEO} | Collector-Emitter Voltage | 20 | V |
| V_{EBO} | Emitter-Base Voltage | 7 | V |
| I_C | Collector Current | 5 | A |
| T_J | Junction Temperature | 150 | $^\circ\text{C}$ |
| T_{STG} | Storage Temperature | -55 to 150 | $^\circ\text{C}$ |

Thermal Characteristics⁽¹⁾

Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.

| Symbol | Parameter | Value | Unit |
|-----------------|---|-------|---------------------------|
| P_D | Power Dissipation | 0.75 | W |
| | Derate Above 25°C | 6.0 | mW/ $^\circ\text{C}$ |
| $R_{\theta JA}$ | Thermal Resistance, Junction-to-Ambient | 166.6 | $^\circ\text{C}/\text{W}$ |

Note:

1. PCB size: FR-4, 76 mm x 114 mm x 1.57 mm (3.0 inch x 4.5 inch x 0.062 inch) with minimum land pattern size.

Electrical Characteristics

Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---------------|--------------------------------------|--|------|------|------|---------------|
| BV_{CEO} | Collector-Emitter Breakdown Voltage | $I_C = 1 \text{ mA}, I_B = 0$ | 20 | | | V |
| BV_{EBO} | Emitter-Base Breakdown Voltage | $I_E = 10 \mu\text{A}, I_C = 0$ | 7 | | | V |
| I_{CBO} | Collector Cut-Off Current | $V_{CB} = 10 \text{ V}, I_E = 0$ | | | 0.1 | μA |
| I_{EBO} | Emitter Cut-Off Current | $V_{EB} = 7 \text{ V}, I_C = 0$ | | | 0.1 | μA |
| h_{FE1} | DC Current Gain | $V_{CE} = 2 \text{ V}, I_C = 0.5 \text{ A}$ | 180 | | 600 | |
| h_{FE2} | | $V_{CE} = 2 \text{ V}, I_C = 2 \text{ A}$ | 150 | | | |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_C = 3 \text{ A}, I_B = 0.1 \text{ A}$ | | | 1 | V |
| f_T | Current Gain Bandwidth Product | $V_{CE} = 6 \text{ V}, I_C = 50 \text{ mA}$ | | 150 | | MHz |
| C_{ob} | Output Capacitance | $V_{CB} = 20 \text{ V}, I_E = 0,$ $f = 1 \text{ MHz}$ | | | 50 | pF |

 h_{FE} Classification

| Classification | P | O | R |
|----------------|-----------|-----------|-----------|
| h_{FE1} | 180 ~ 270 | 230 ~ 380 | 340 ~ 600 |

Typical Performance Characteristics

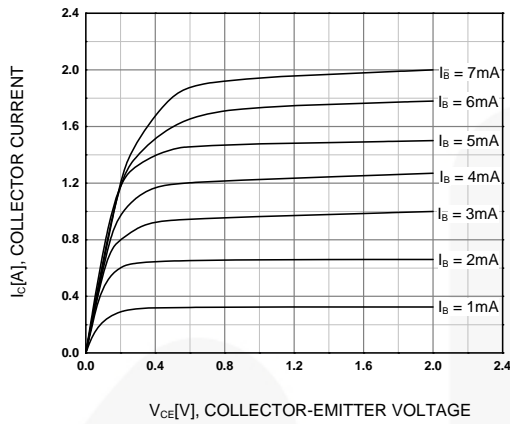


Figure 1. Static Characteristic

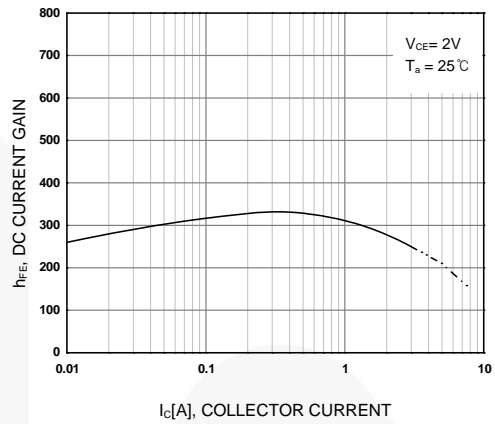


Figure 2. DC Current Gain

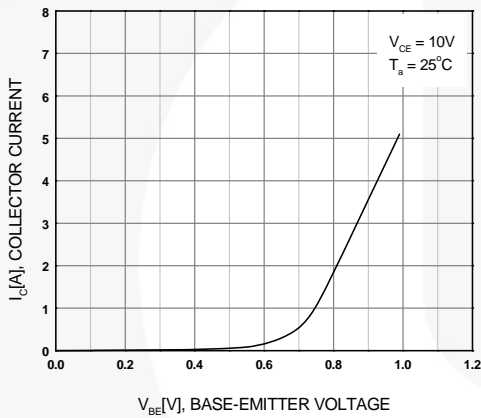


Figure 3. Base-Emitter Saturation Voltage

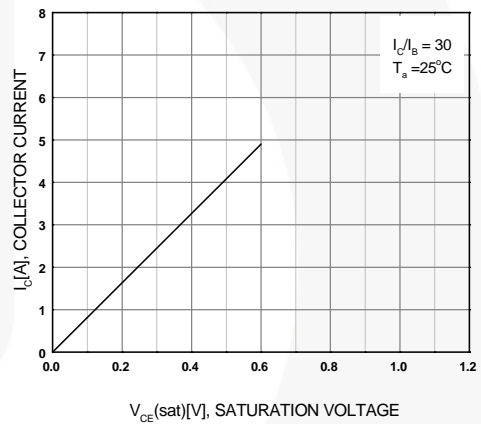


Figure 4. Collector-Emitter Saturation Voltage

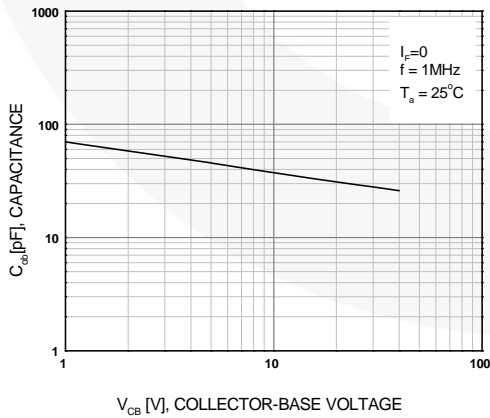


Figure 5. Collector Output Capacitance

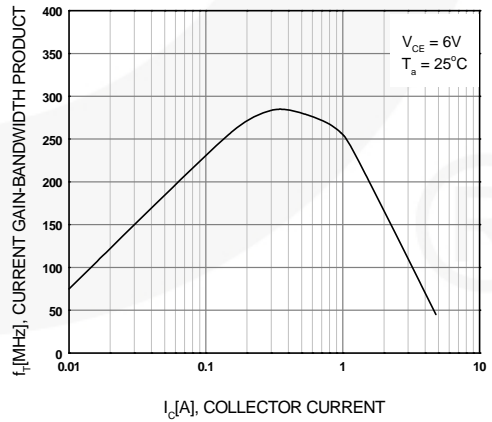


Figure 6. Current Gain Bandwidth Product

Typical Performance Characteristics (Continued)

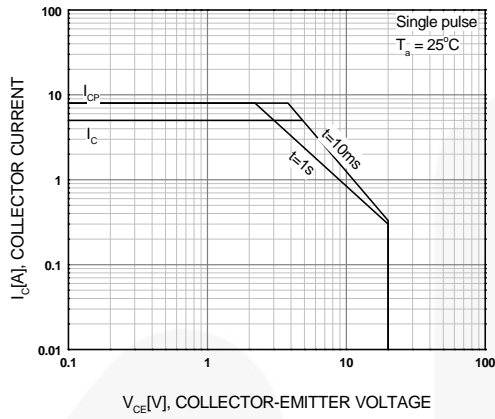


Figure 7. Safe Operating Area

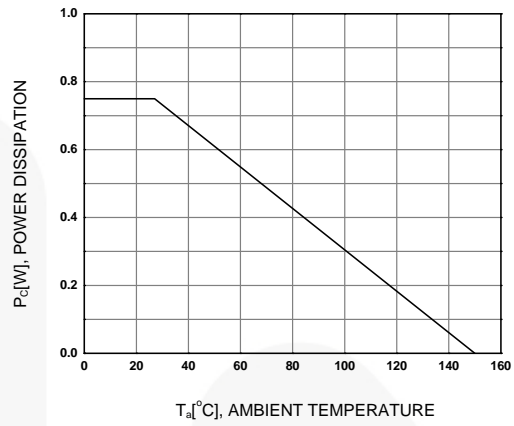
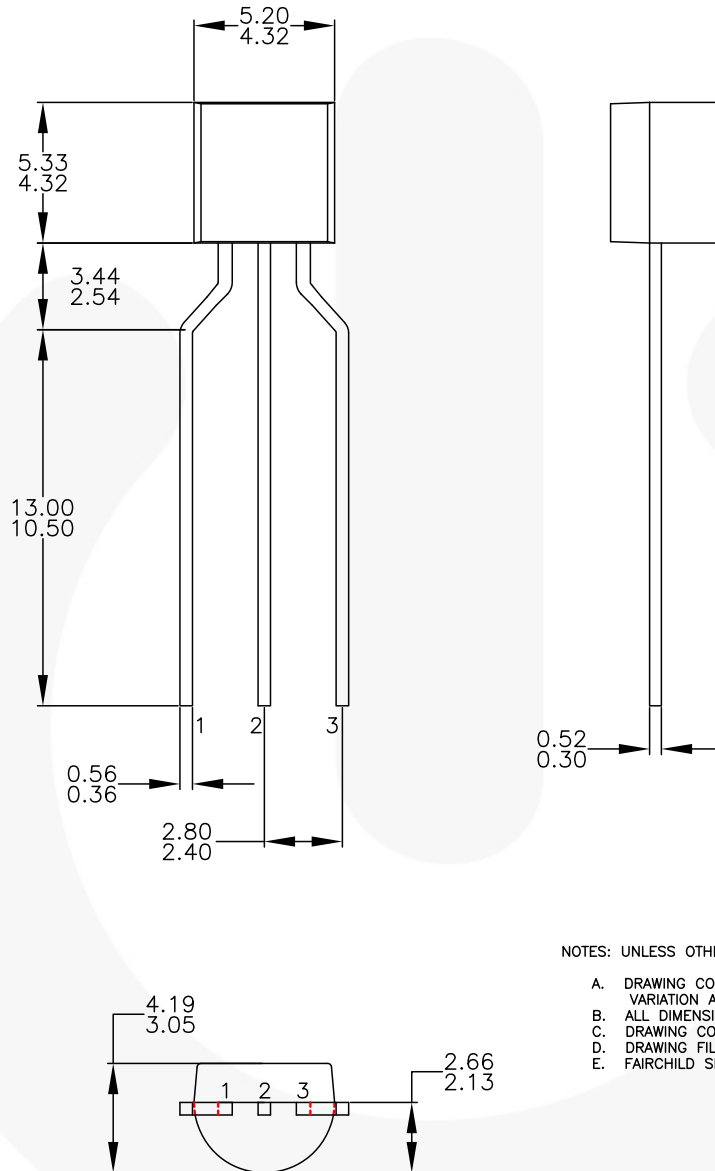


Figure 8. Power Derating

Physical Dimensions



NOTES: UNLESS OTHERWISE SPECIFIED

- A. DRAWING CONFORMS TO JEDEC MS-013, VARIATION AC.
- B. ALL DIMENSIONS ARE IN MILLIMETERS.
- C. DRAWING CONFORMS TO ASME Y14.5M-2009.
- D. DRAWING FILENAME: MKT-ZA03FREV3.
- E. FAIRCHILD SEMICONDUCTOR.

Figure 9. 3-Lead, TO-92, Molded, 0.2 In Line Spacing Lead Form, Ammo Type





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