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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	$^\circ\text{C/W}$

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	$I_E = 10\text{ }\mu\text{A}, I_C = 0$	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

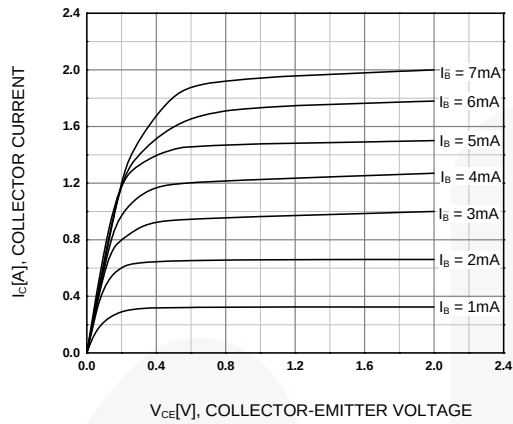


Figure 1. Static Characteristic

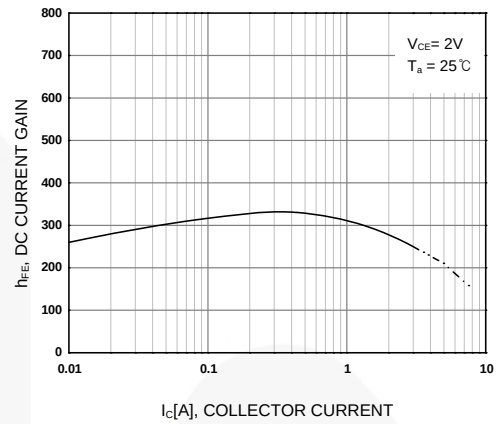


Figure 2. DC Current Gain

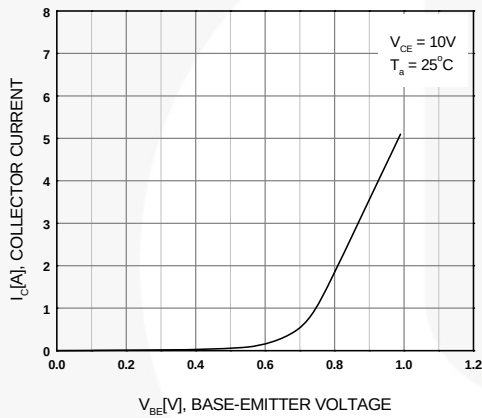


Figure 3. Base-Emitter Saturation Voltage

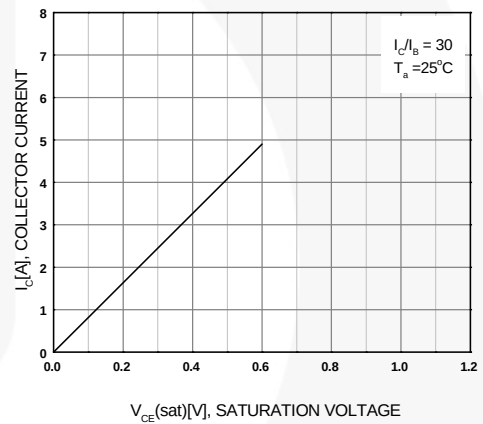


Figure 4. Collector-Emitter Saturation Voltage

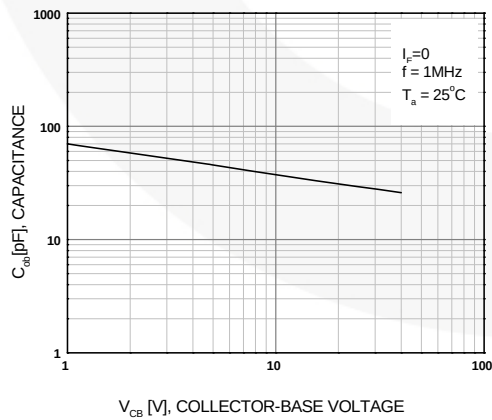


Figure 5. Collector Output Capacitance

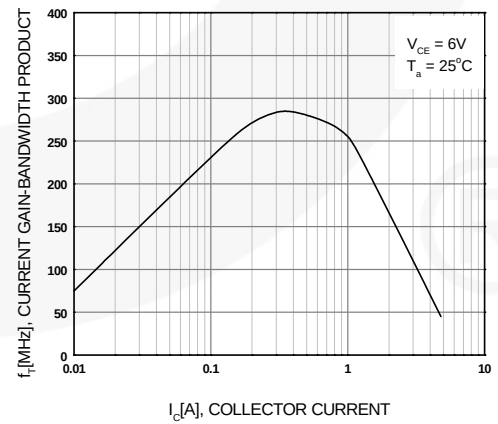


Figure 6. Current Gain Bandwidth Product

Typical Performance Characteristics (Continued)

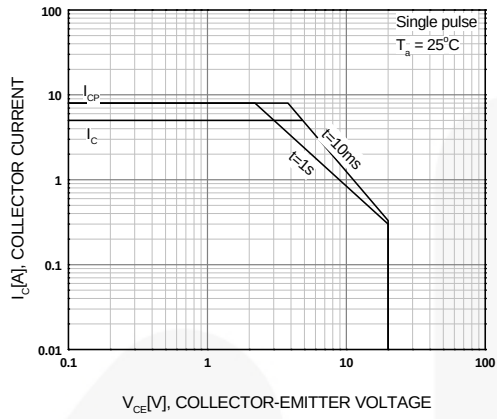


Figure 7. Safe Operating Area

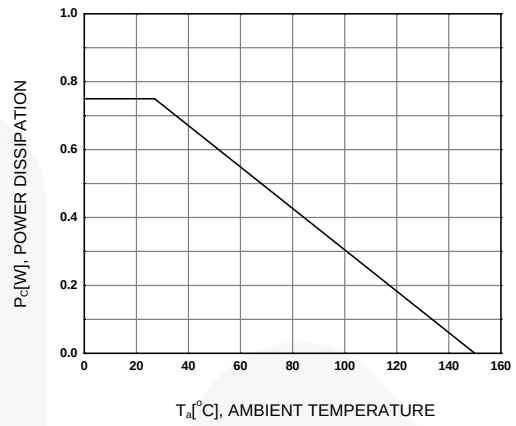
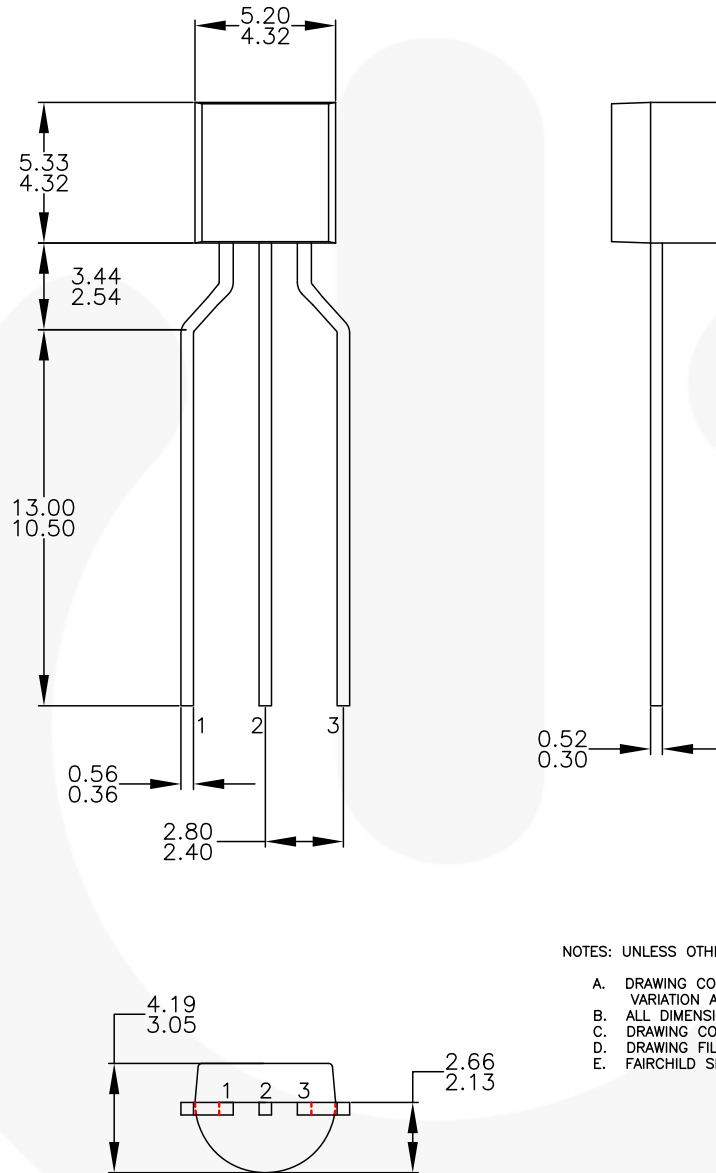


Figure 8. Power Derating

Physical Dimensions



NOTES: UNLESS OTHERWISE SPECIFIED

- DRAWING CONFORMS TO JEDEC MS-013, VARIATION AC.
- ALL DIMENSIONS ARE IN MILLIMETERS.
- DRAWING CONFORMS TO ASME Y14.5M-2009.
- DRAWING FILENAME: MKT-ZA03FREV3.
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Figure 9. 3-Lead, TO-92, Molded, 0.2 In Line Spacing Lead Form, Ammo Type



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