



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<sup>(1)</sup>**

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 $25^\circ\text{C}$	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**

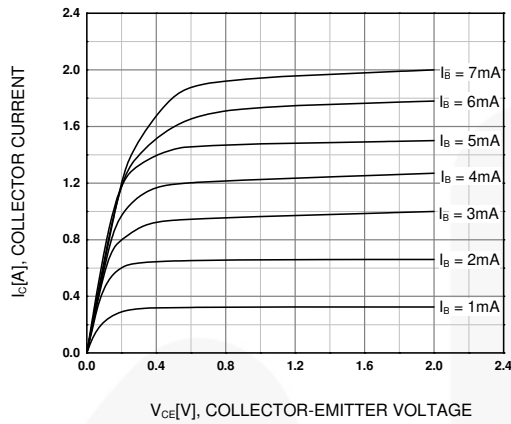
Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

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	$\mu\text{A}$
$I_{EBO}$	Emitter Cut-Off Current	$V_{EB} = 7 \text{ V}, I_C = 0$			0.1	$\mu\text{A}$
$h_{FE1}$	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

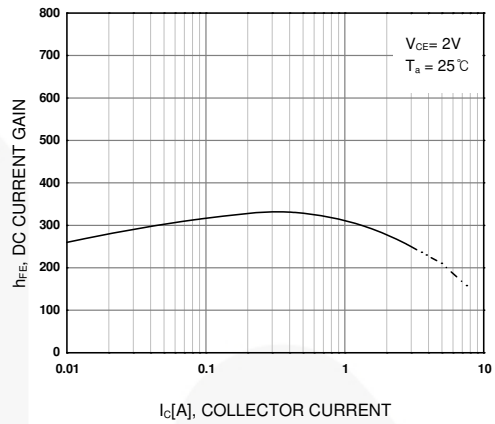
 **$h_{FE}$  Classification**

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

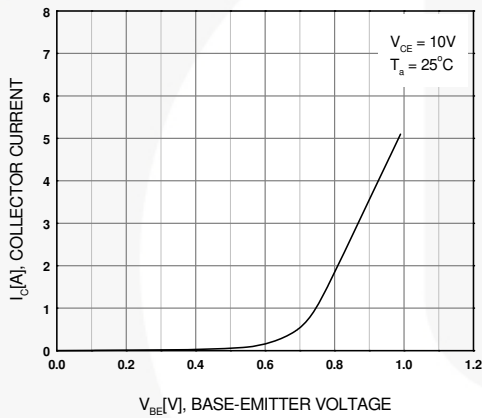
## Typical Performance Characteristics



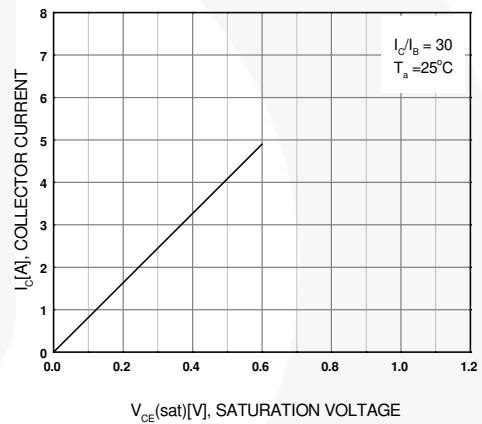
**Figure 1. Static Characteristic**



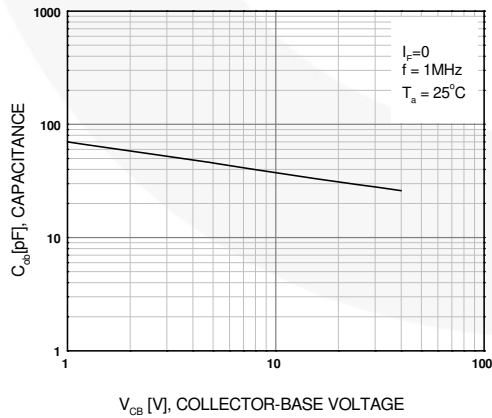
**Figure 2. DC Current Gain**



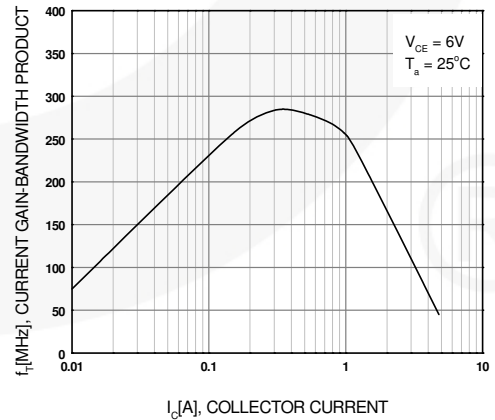
**Figure 3. Base-Emitter Saturation Voltage**



**Figure 4. Collector-Emitter Saturation Voltage**



**Figure 5. Collector Output Capacitance**



**Figure 6. Current Gain Bandwidth Product**

Typical Performance Characteristics (Continued)

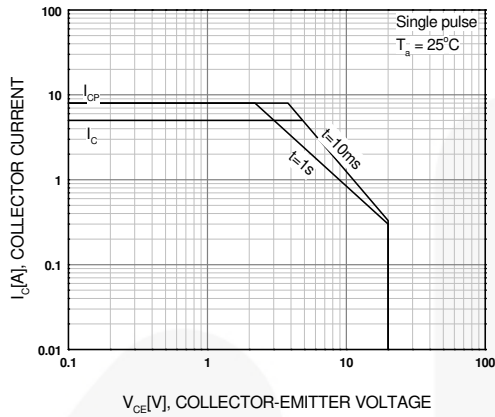


Figure 7. Safe Operating Area

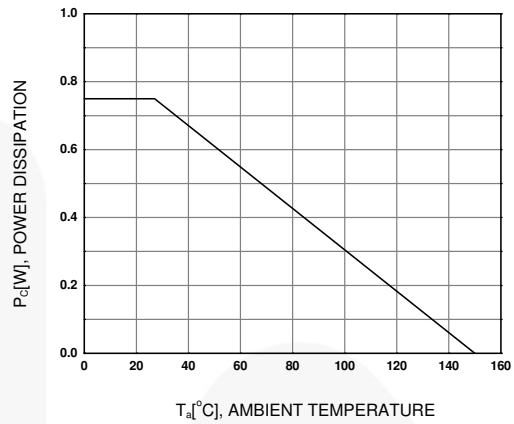
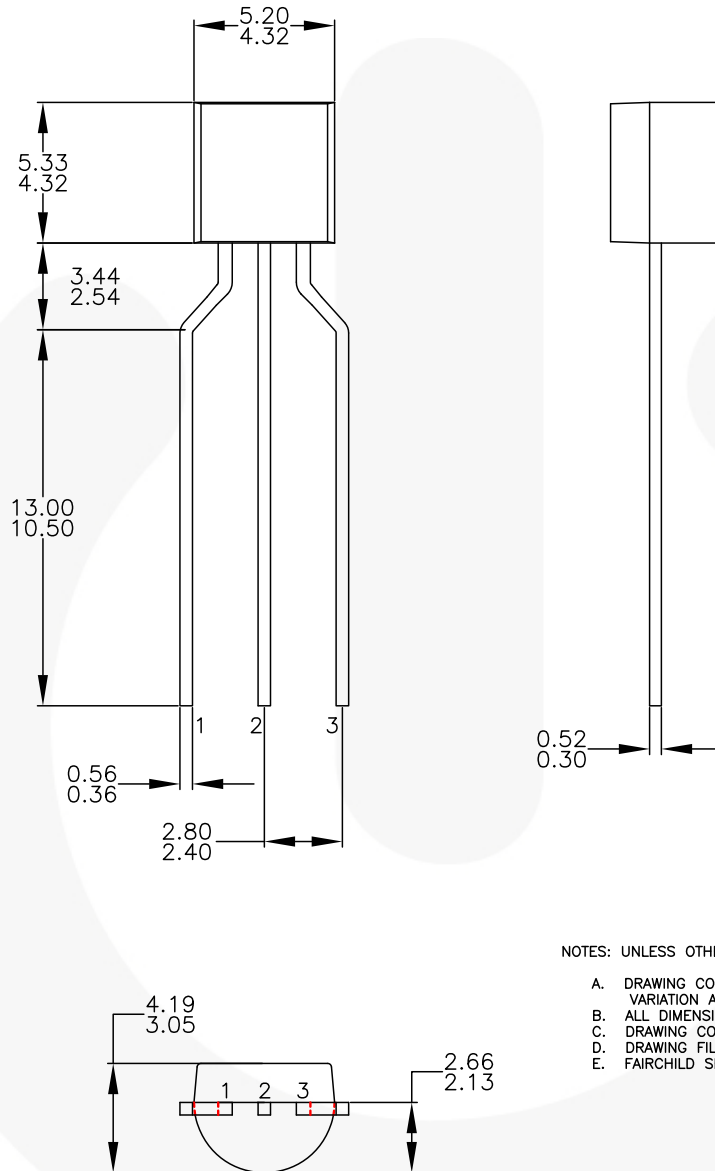


Figure 8. Power Derating

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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