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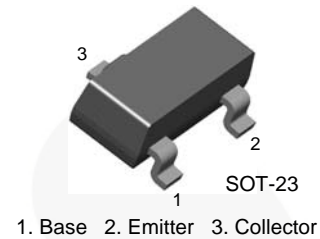
October 2014

# KST2222A

## NPN Epitaxial Silicon Transistor

### Features

- General-Purpose Transistor



### Ordering Information

Part Number	Marking	Package	Packing Method
KST2222AMTF	1P	SOT-23 3L	Tape and Reel

### 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
$V_{\text{CBO}}$	Collector-Base Voltage	75	V
$V_{\text{CEO}}$	Collector-Emitter Voltage	40	V
$V_{\text{EBO}}$	Emitter-Base Voltage	6	V
$I_{\text{C}}$	Collector Current	600	mA
$T_{\text{STG}}$	Storage Temperature Range	-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
$P_{\text{D}}$	Power Dissipation	350	mW
	Derate Above $25^\circ\text{C}$	2.8	mW/ $^\circ\text{C}$
$R_{\theta\text{JA}}$	Thermal Resistance, Junction-to-Ambient	357	$^\circ\text{C}/\text{W}$

#### 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

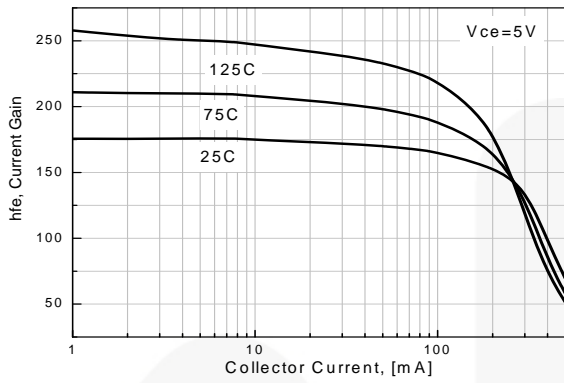
Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Max.	Unit
$BV_{CBO}$	Collector-Base Breakdown Voltage	$I_C = 10\ \mu\text{A}, I_E = 0$	75		V
$BV_{CEO}$	Collector-Emitter Breakdown Voltage	$I_C = 10\ \text{mA}, I_B = 0$	40		V
$BV_{EBO}$	Emitter-Base Breakdown Voltage	$I_E = 10\ \mu\text{A}, I_C = 0$	6		V
$I_{CBO}$	Collector Cut-Off Current	$V_{CB} = 60\ \text{V}, I_E = 0$		0.01	$\mu\text{A}$
$h_{FE}$	DC Current Gain <sup>(2)</sup>	$V_{CE} = 10\ \text{V}, I_C = 0.1\ \text{mA}$	35		
		$V_{CE} = 10\ \text{V}, I_C = 1\ \text{mA}$	50		
		$V_{CE} = 10\ \text{V}, I_C = 10\ \text{mA}$	75		
		$V_{CE} = 10\ \text{V}, I_C = 150\ \text{mA}$	100	300	
		$V_{CE} = 10\ \text{V}, I_C = 500\ \text{mA}$	40		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage <sup>(2)</sup>	$I_C = 150\ \text{mA}, I_B = 15\ \text{mA}$		0.3	V
		$I_C = 500\ \text{mA}, I_B = 50\ \text{mA}$		1.0	
$V_{BE(sat)}$	Base-Emitter Saturation Voltage <sup>(2)</sup>	$I_C = 150\ \text{mA}, I_B = 15\ \text{mA}$	0.6	1.2	V
		$I_C = 500\ \text{mA}, I_B = 50\ \text{mA}$		2.0	
$f_T$	Current Gain Bandwidth Product	$I_C = 20\ \text{mA}, V_{CE} = 20\ \text{V}, f = 100\ \text{MHz}$	300		MHz
$C_{ob}$	Output Capacitance	$V_{CB} = 10\ \text{V}, I_E = 0, f = 1\ \text{MHz}$		8	pF
NF	Noise Figure	$I_C = 100\ \mu\text{A}, V_{CE} = 10\ \text{V}, R_S = 1\ \text{k}\Omega, f = 1\ \text{MHz}$		4	dB
$t_{ON}$	Turn-On Time	$V_{CC} = 30\ \text{V}, I_C = 150\ \text{mA}, V_{BE} = 0.5\ \text{V}, I_{B1} = 15\ \text{mA}$		35	ns
$t_{OFF}$	Turn-Off Time	$V_{CC} = 30\ \text{V}, I_C = 150\ \text{mA}, I_{B1} = I_{B2} = 15\ \text{mA}$		285	ns

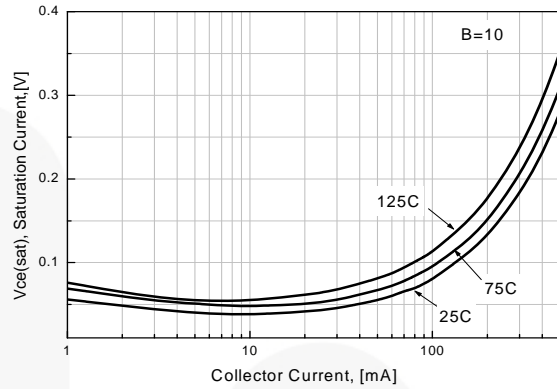
### Note:

2. Pulse test: Pulse width  $\leq 300\ \mu\text{s}$ , duty cycle  $\leq 2\%$

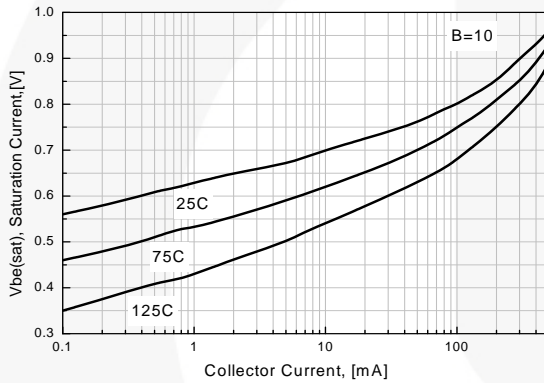
## Typical Performance Characteristics



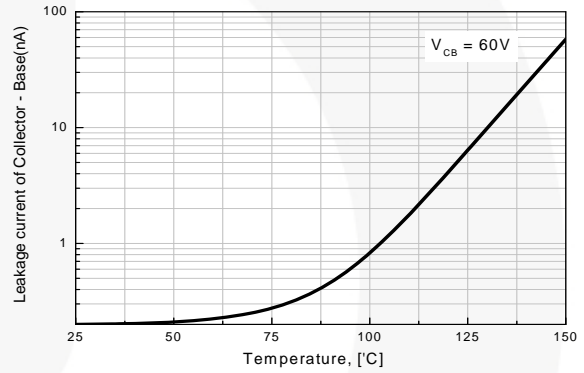
**Figure 1. DC Current Gain**



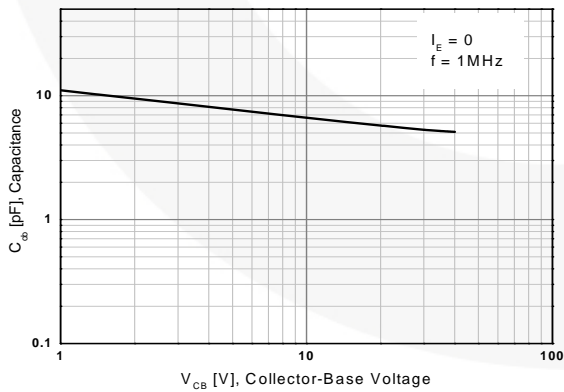
**Figure 2. Collector-Emitter Saturation Voltage**



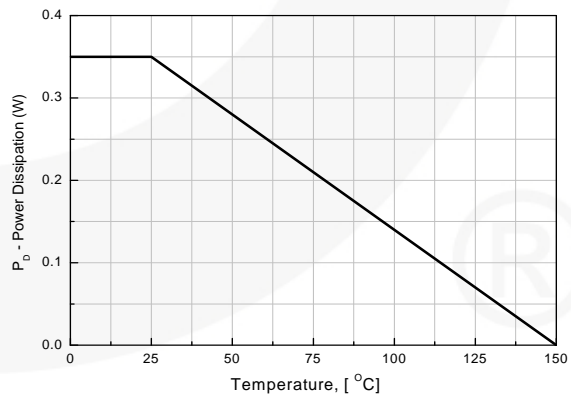
**Figure 3. Base-Emitter Saturation Voltage**



**Figure 4. Collector-Base Leakage Current**



**Figure 5. Output Capacitance**



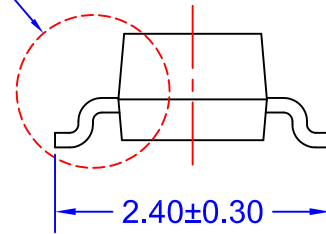
**Figure 6. Power Dissipation vs. Ambient Temperature**



LAND PATTERN  
RECOMMENDATION



SEE DETAIL A



**DETAIL A**  
SCALE: 2X

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