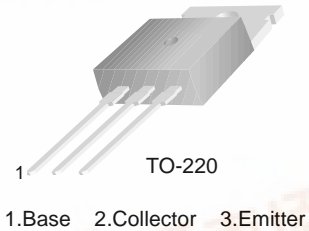


**FAIRCHILD**  
SEMICONDUCTOR®

## KSE13004/13005

### High Voltage Switch Mode Application

- High Speed Switching
- Suitable for Switching Regulator and Motor Control



### NPN Silicon Transistor

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

Symbol	Parameter	Value	Units
$V_{CBO}$	Collector-Base Voltage	: KSE13004	600
		: KSE13005	700
$V_{CEO}$	Collector-Emitter Voltage	: KSE13004	300
		: KSE13005	400
$V_{EBO}$	Emitter-Base Voltage	9	V
$I_C$	Collector Current (DC)	4	A
$I_{CP}$	Collector Current (Pulse)	8	A
$I_B$	Base Current	2	A
$P_C$	Collector Dissipation ( $T_C=25^\circ\text{C}$ )	75	W
$T_J$	Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature	- 65 ~ 150	$^\circ\text{C}$

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units	
$BV_{CEO(sus)}$	Collector-Emitter Sustaining Voltage	$I_C = 10\text{mA}, I_B = 0$	300			V	
						: KSE13004	V
						: KSE13005	V
$I_{EBO}$	Emitter Cut-off Current	$V_{EB} = 9\text{V}, I_C = 0$			1	mA	
$h_{FE}$	*DC Current Gain	$V_{CE} = 5\text{V}, I_C = 1\text{A}$	10		60		
		$V_{CE} = 5\text{V}, I_C = 2\text{A}$	8		40		
$V_{CE(sat)}$	*Collector-Emitter Saturation Voltage	$I_C = 1\text{A}, I_B = 0.2\text{A}$			0.5	V	
		$I_C = 2\text{A}, I_B = 0.5\text{A}$			0.6	V	
		$I_C = 4\text{A}, I_B = 1\text{A}$			1	V	
$V_{BE(sat)}$	*Base-Emitter Saturation Voltage	$I_C = 1\text{A}, I_B = 0.2\text{A}$			1.2	V	
		$I_C = 2\text{A}, I_B = 0.5\text{A}$			1.6	V	
$C_{ob}$	Output Capacitance	$V_{CB} = 10\text{V}, f = 0.1\text{MHz}$		65		pF	
$f_T$	Current Gain Bandwidth Product	$V_{CE} = 10\text{V}, I_C = 0.5\text{A}$	4			MHz	
$t_{ON}$	Turn On Time	$V_{CC} = 125\text{V}, I_C = 2\text{A}$ $I_{B1} = - I_{B2} = 0.4\text{A}$ $R_L = 62.5\Omega$			0.8	$\mu\text{s}$	
$t_{STG}$	Storage Time				4	$\mu\text{s}$	
$t_F$	Fall Time				0.9	$\mu\text{s}$	

\* Pulse test:  $PW \leq 300\mu\text{s}$ , Duty cycle  $\leq 2\%$  Pulse



# Typical Characteristics

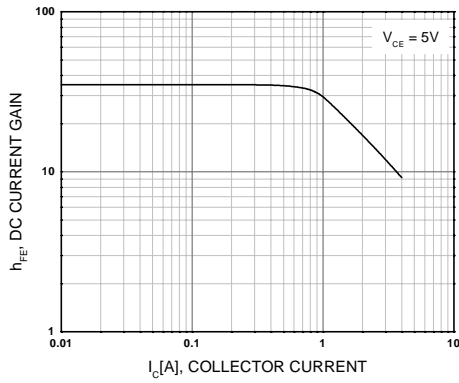


Figure 1. DC current Gain

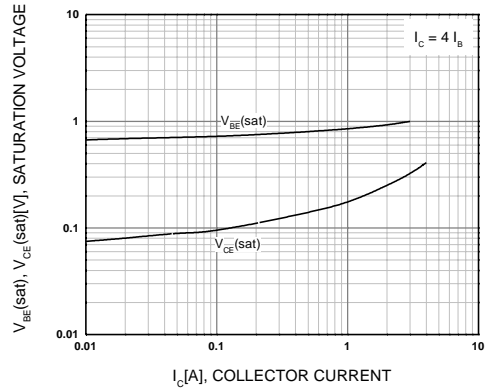


Figure 2. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

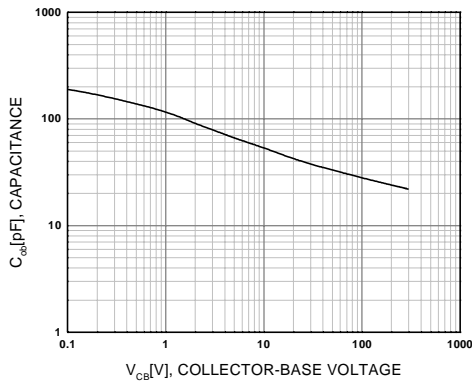


Figure 3. Collector Output Capacitance

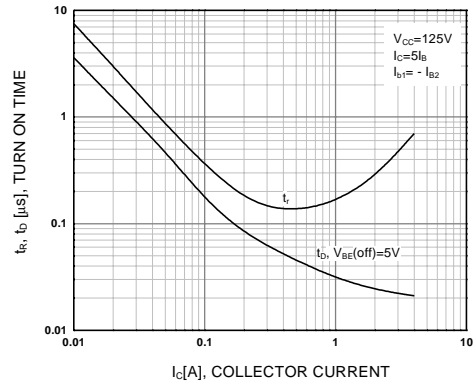


Figure 4. Turn On Time

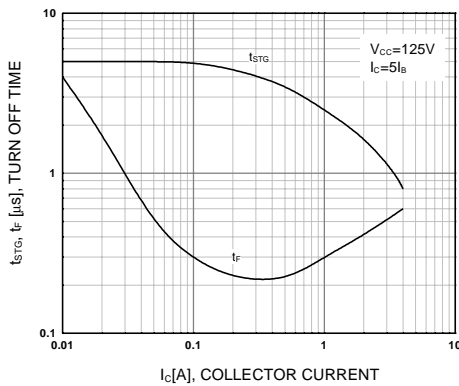


Figure 5. Turn Off Time

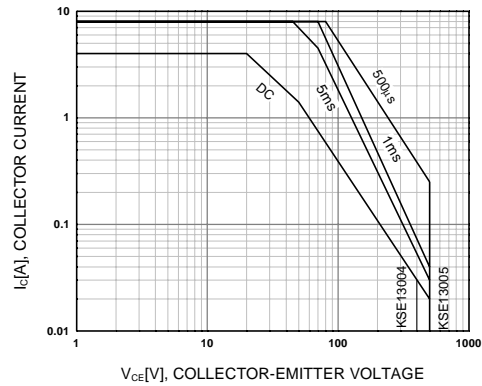


Figure 6. Safe Operating Area

### Typical Characteristics (Continued)

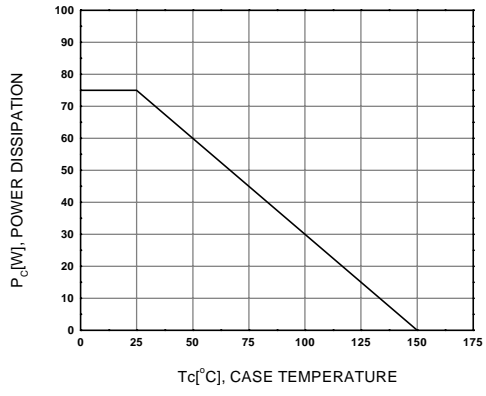
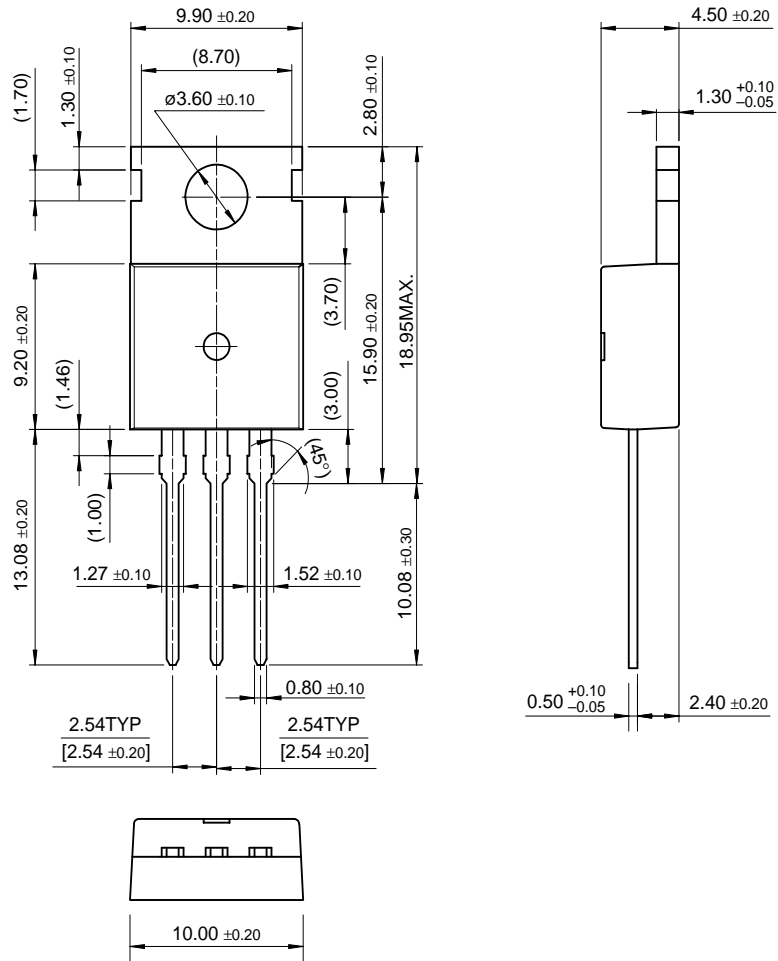


Figure 7. Power Derating

# Package Dimensions

## TO-220

KSE13004/13005



Dimensions in Millimeters

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EcoSPARK™	ISOPLANAR™	QT Optoelectronics™	UltraFET®
E <sup>2</sup> CMOS™	LittleFET™	Quiet Series™	VCX™
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No Identification Needed	Full Production	This datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice in order to improve design.
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