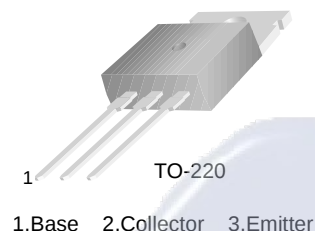




KSE13004/13005

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	V
	: KSE13005	700	V
V _{CEO}	Collector-Emitter Voltage : KSE13004	300	V
	: KSE13005	400	V
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°C)	75	W
T _J	Junction Temperature	150	°C
T _{STG}	Storage Temperature	- 65 ~ 150	°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	$I_C = 10\text{mA}$, $I_B = 0$	300 400			V
						V
I_{EBO}	Emitter Cut-off Current	$V_{EB} = 9\text{V}$, $I_C = 0$			1	mA
h_{FE}	*DC Current Gain	$V_{CE} = 5\text{V}$, $I_C = 1\text{A}$ $V_{CE} = 5\text{V}$, $I_C = 2\text{A}$	10 8		60 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	μs
t_{STG}	Storage Time				4	μs
t_F	Fall Time				0.9	μs

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

KSE13004/13005

Typical Characteristics

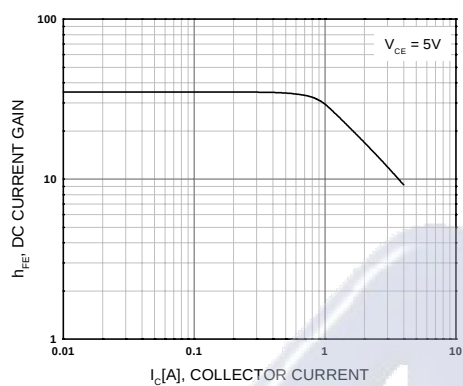


Figure 1. DC current Gain

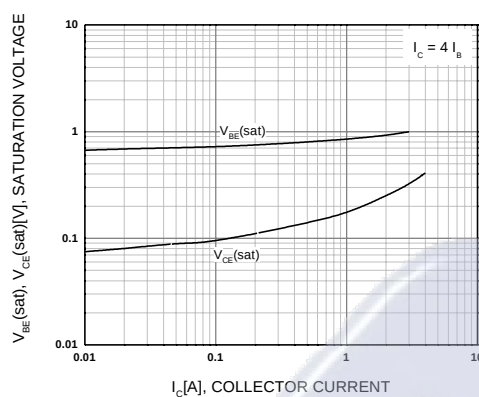
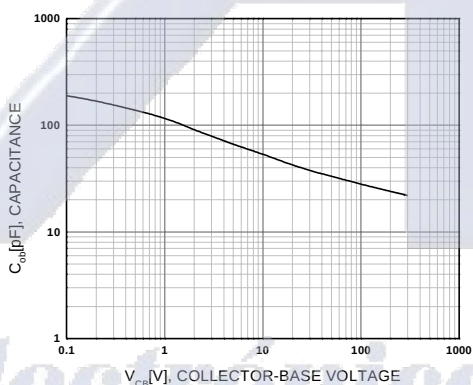
Figure 2. Base-Emitter Saturation Voltage
Collector-Emitter Saturation Voltage

Figure 3. Collector Output Capacitance

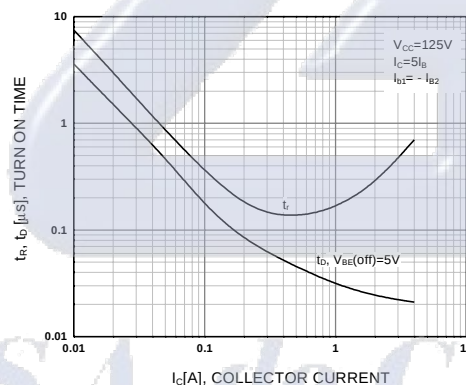


Figure 4. Turn On Time

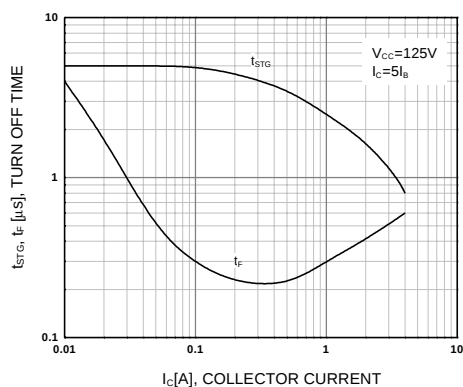


Figure 5. Turn Off Time

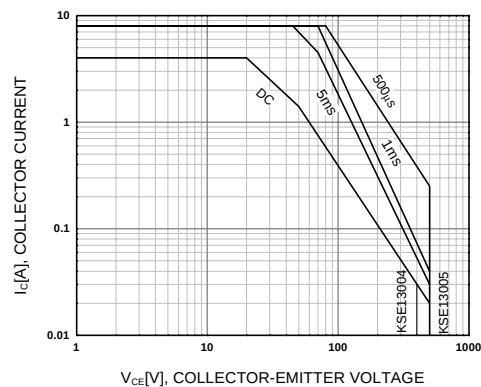
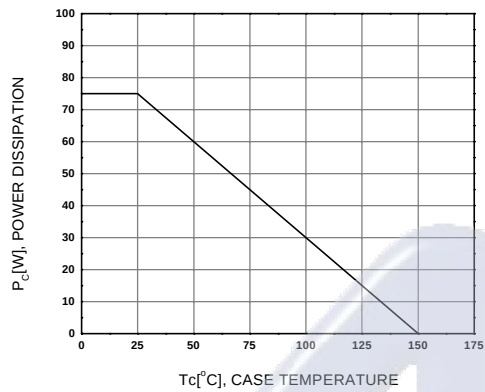


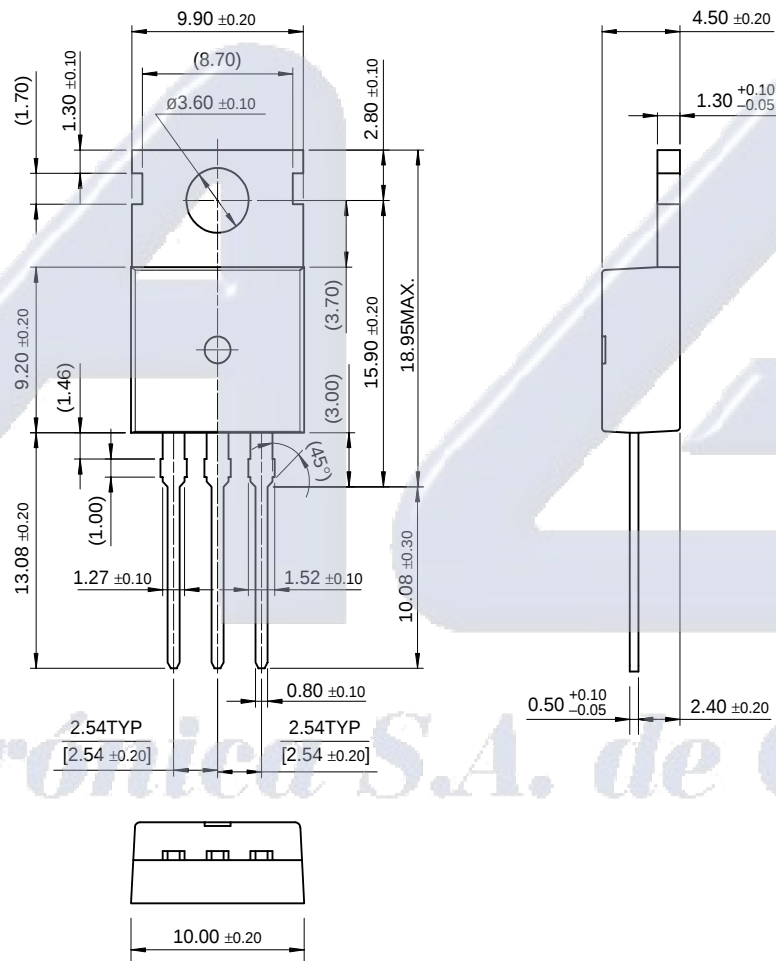
Figure 6. Safe Operating Area

Typical Characteristics (Continued)**Figure 7. Power Derating**

Package Dimensions

TO-220

KSE13004/13005



Dimensions in Millimeters

Rev. A1, January 2001