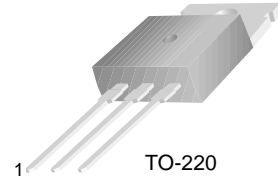


## KSE5740/5741/5742

### High Voltage Power Switching In Inductive Circuits

- High Voltage Power Darlington TR
- Small Engine Ignition
- Switching Regulators
- Inverters
- Solenoid and Relay Drivers
- Motor Control



1.Base 2.Collector 3.Emitter

### NPN Silicon Darlington Transistor

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

Symbol	Parameter	Value	Units
$V_{CEO(sus)}$	Collector-Emitter Sustaining Voltage		
	: KSE5740	300	V
	: KSE5741	350	V
	: KSE5742	400	V
$V_{CEV}$	Collector-Emitter Voltage		
	: KSE5740	600	V
	: KSE5741	700	V
	: KSE5742	800	V
$V_{EBO}$	Emitter-Base Voltage	8	V
$I_C$	Collector Current (DC)	8	A
$I_{CP}$	*Collector Current (Pulse)	16	A
$I_B$	Base Current (DC)	2.5	A
$I_{BP}$	*Base Current (Pulse)	5	A
$P_C$	Collector Dissipation	80	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
$V_{CEO(sus)}$	Collector-Emitter Sustaining Voltage					
	: KSE5740	$I_C = 50\text{mA}, I_B = 0$	300			V
	: KSE5741		350			V
	: KSE5742		400			V
$I_{CEV}$	Collector Cut-off Current	$V_{CEV}=\text{Rate Value}, V_{BE(OFF)}=1.5\text{V}$			1	mA
$I_{EBO}$	Emitter Cut-off Current	$V_{EB} = 8\text{V}, I_C = 0$			75	mA
$h_{FE}$	DC Current Gain	$V_{CE} = 5\text{V}, I_C = 0.5\text{A}$	50	100		
		$V_{CE} = 5\text{V}, I_C = 4\text{A}$	200	400		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 4\text{A}, I_B = 0.2\text{A}$			2	V
		$I_C = 8\text{A}, I_B = 0.4\text{A}$			3	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 4\text{A}, I_B = 0.2\text{A}$			2.5	V
		$I_C = 8\text{A}, I_B = 0.4\text{A}$			3.5	V
$V_F$	Diode Forward Voltage	$I_F = 5\text{A}$			2.5	V
$t_D$	Delay Time	$V_{CC} = 250\text{V}, I_C(\text{pk}) = 6\text{A}$		0.04		$\mu\text{s}$
$t_R$	Rise Time	$I_{B1} = I_{B2} = 0.25\text{A}$		0.5		$\mu\text{s}$
$t_S$	Storage Time	$t_P = 25\mu\text{s}$		8		$\mu\text{s}$
$t_F$	Fall Time	Duty Cycle $\leq 1\%$		2		$\mu\text{s}$
$t_{SV}$	Voltage Storage Time	$I_C(\text{pk}) = 6\text{A}, V_{CE}(\text{pk}) = 250\text{V}$		4		$\mu\text{s}$
$t_C$	Cross-over Time	$I_{B1} = 0.06\text{A}, V_{BE}(\text{off}) = 5\text{V}$		2		$\mu\text{s}$

\*PW=5ms, Duty Cycle=10%

# Typical Characteristics

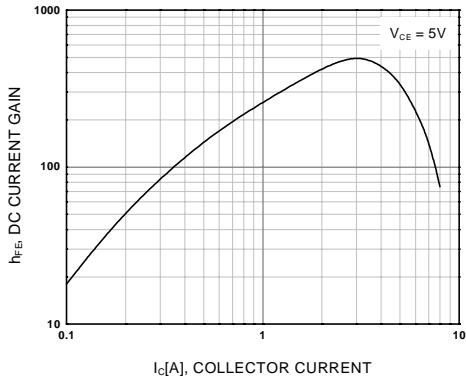


Figure 1. DC current Gain

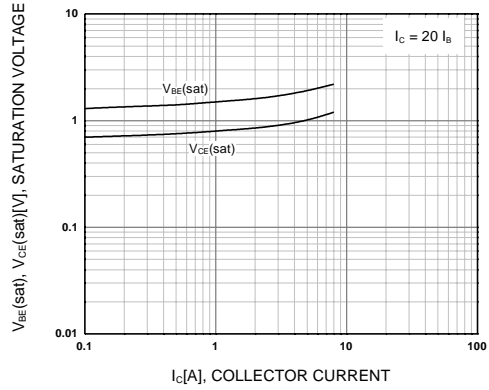


Figure 2. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

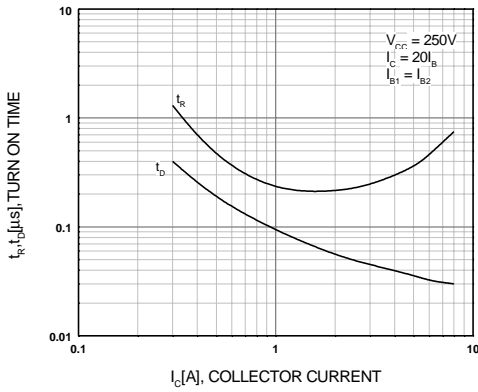


Figure 3. Turn On Time

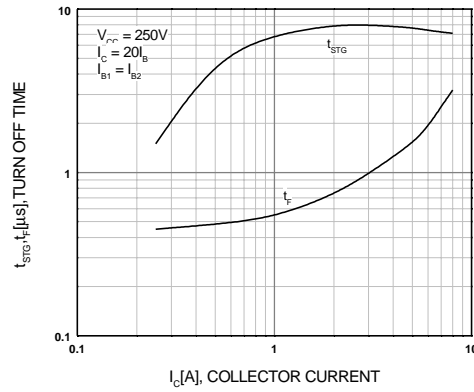


Figure 4. Turn Off Time

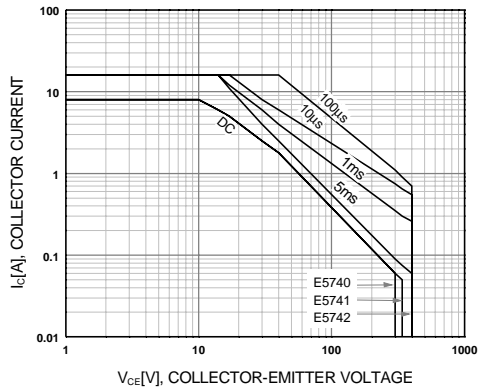


Figure 5. Safe Operating Area

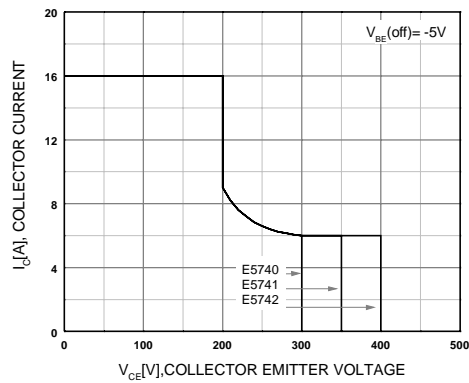
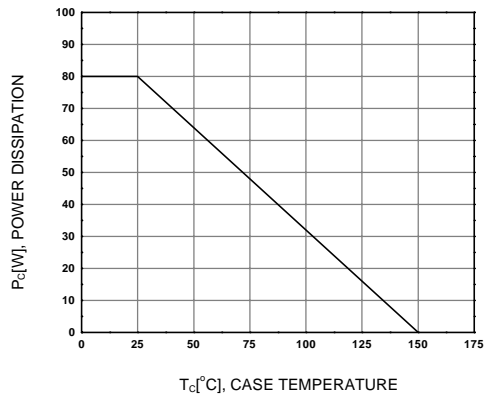


Figure 6. Reverse Bias Safe Operating Area

## Typical Characteristics (Continued)

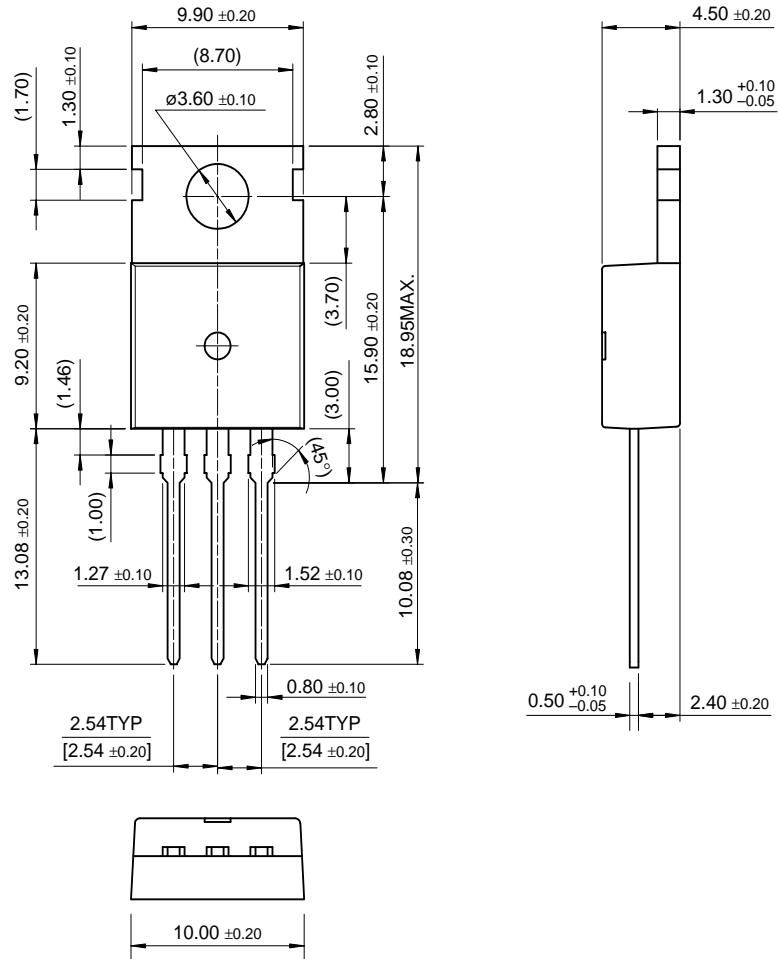


**Figure 1. Power Derating**

KSE5740/5741/5742

# Package Dimensions

## TO-220



Dimensions in Millimeters

KSE5740/5741/5742

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