

FAIRCHILD
SEMICONDUCTOR®

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 : KSE5741 : KSE5742	300	V
		350	V
		400	V
V_{CEV}	Collector-Emitter Voltage : KSE5740 : KSE5741 : KSE5742	600	V
		700	V
		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 : KSE5741 : KSE5742	$I_C = 50\text{mA}, I_B = 0$	300			V
			350			V
			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	$V_{CE} = 5\text{V}, I_C = 0.5\text{A}$ $V_{CE} = 5\text{V}, I_C = 4\text{A}$	50	100		
			200	400		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 4\text{A}, I_B = 0.2\text{A}$ $I_C = 8\text{A}, I_B = 0.4\text{A}$			2	V
					3	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 4\text{A}, I_B = 0.2\text{A}$ $I_C = 8\text{A}, I_B = 0.4\text{A}$			2.5	V
					3.5	V
V_F	Diode Forward Voltage	$I_F = 5\text{A}$			2.5	V
t_D	Delay Time	$V_{CC} = 250\text{V}, I_C(\text{pk}) = 6\text{A}$ $I_{B1} = I_{B2} = 0.25\text{A}$ $t_P = 25\mu\text{s}$ Duty Cycle $\leq 1\%$		0.04		μs
t_R	Rise Time			0.5		μs
t_S	Storage Time			8		μs
t_F	Fall Time			2		μs
t_{SV}	Voltage Storage Time			4		μs
t_C	Cross-over Time	$I_C(\text{pk}) = 6\text{A}, V_{CE}(\text{pk}) = 250\text{V}$ $I_{B1} = 0.06\text{A}, V_{BE}(\text{off}) = 5\text{V}$		2		μs

PW=5ms, Duty Cycle=10%



Typical Characteristics

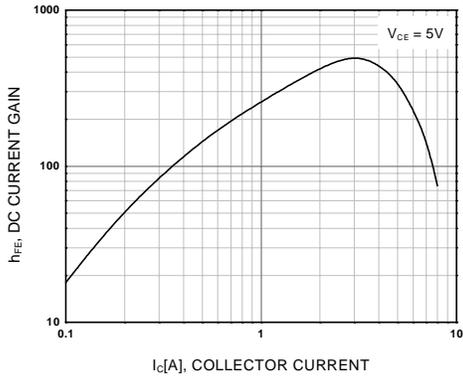


Figure 1. DC current Gain

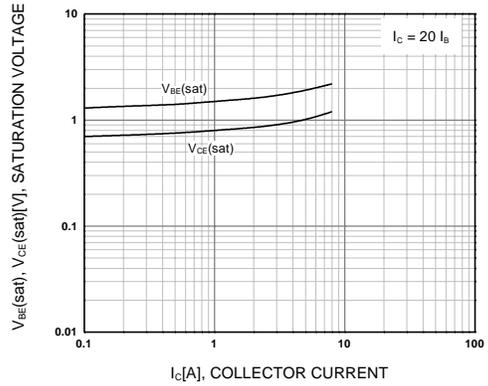


Figure 2. Base-Emitter Saturation Voltage
Collector-Emitter Saturation Voltage

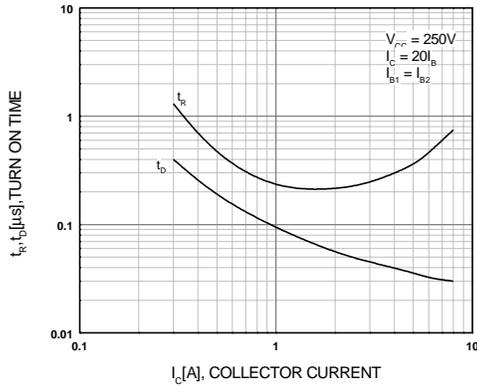


Figure 3. Turn On Time

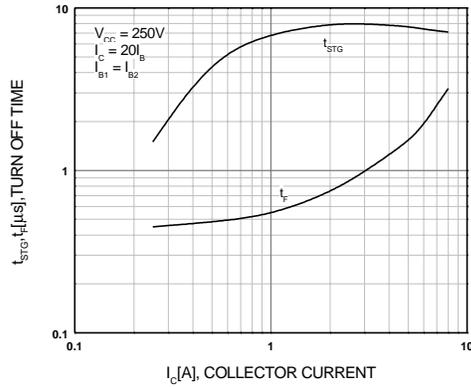


Figure 4. Turn Off Time

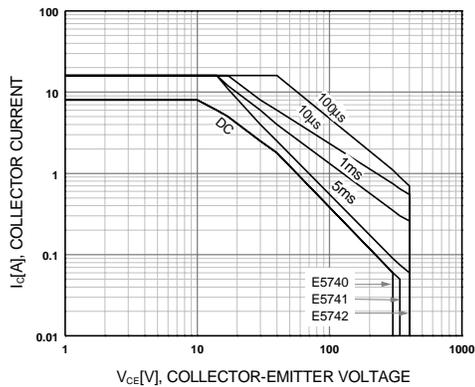


Figure 5. Safe Operating Area

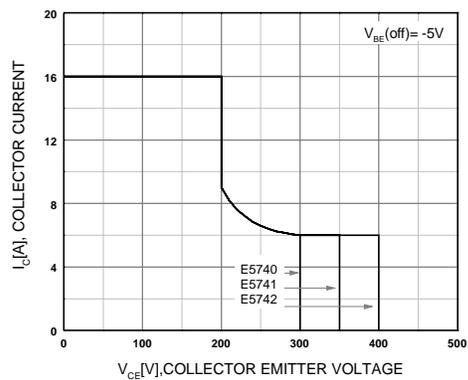


Figure 6. Reverse Bias Safe Operating Area

Typical Characteristics (Continued)

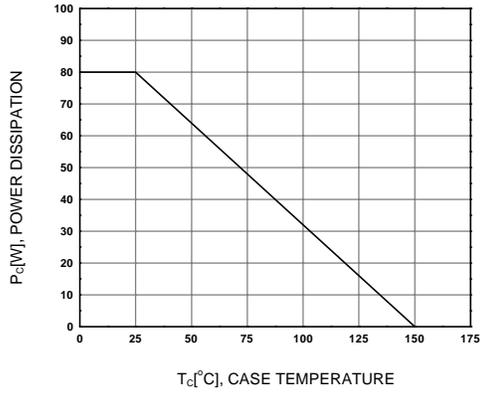


Figure 1. Power Derating

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