

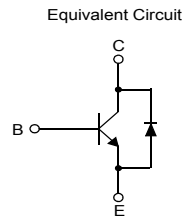
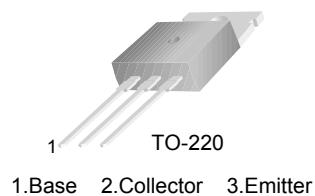


ON Semiconductor®

# KSC5305D NPN Silicon Transistor

## Features

- High Voltage High Speed Power Switch Application
- Built-in Free-wheeling Diode makes efficient anti saturation operation
- Suitable for half bridge light ballast Applications
- No need to interest an  $h_{FE}$  value because of low variable storage-time spread even though corner spirit product
- Low base drive requirement



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

Symbol	Parameter	Value	Units
$V_{CBO}$	Collector Base Voltage	800	V
$V_{CEO}$	Collector Emitter Voltage	400	V
$V_{EBO}$	Emitter Base Voltage	12	V
$I_C$	Collector Current (DC)	5	A
$I_{CP}$	*Collector Current (Pulse)	10	A
$I_B$	Base Current (DC)	2	A
$I_{BP}$	*Base Current (Pulse)	4	A
$P_C$	Power Dissipation ( $T_C=25^\circ\text{C}$ )	75	W
$T_J$	Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature	- 65 to 150	$^\circ\text{C}$

\* Pulse Test : Pulse Width = 5mS, Duty cycles  $\leq 10\%$

## Thermal Characteristics

Symbol	Parameter		Rating	Units
$R_{\theta jC}$	Thermal Resistance	Junction to Case	1.65	$^\circ\text{C}/\text{W}$
$R_{\theta ja}$		Junction to Ambient	62.5	$^\circ\text{C}/\text{W}$

**Electrical Characteristics**  $T_a=25^\circ\text{C}$  unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
$BV_{CBO}$	Collector-Base Breakdown Voltage	$I_C=1\text{mA}, I_E=0$	800	-	-	V
$BV_{CEO}$	Collector-Emitter Breakdown Voltage	$I_C=5\text{mA}, I_B=0$	400	-	-	V
$BV_{EBO}$	Emitter-Base Breakdown Voltage	$I_E=1\text{mA}, I_C=0$	12	-	-	V
$I_{CBO}$	Collector Cut-off Current	$V_{CB}=500\text{V}, I_E=0$	-	-	10	$\mu\text{A}$
$I_{EBO}$	Emitter Cut-off Current	$V_{EB}=9\text{V}, I_C=0$	-	-	10	$\mu\text{A}$
$h_{FE1}$ $h_{FE2}$	DC Current Gain	$V_{CE}=1\text{V}, I_C=0.8\text{A}$ $V_{CE}=1\text{V}, I_C=2\text{A}$	22 8	- -	- -	
$V_{CE}(\text{sat})$	Collector-Emitter Saturation Voltage	$I_C=0.8\text{A}, I_B=0.08\text{A}$ $I_C=2\text{A}, I_B=0.4\text{A}$	- -	- -	0.4 0.5	V V
$V_{BE}(\text{sat})$	Base-Emitter Saturation Voltage	$I_C=0.8\text{A}, I_B=0.08\text{A}$ $I_C=2\text{A}, I_B=0.4\text{A}$	- -	- -	1.0 1.0	V V
$C_{ob}$	Output Capacitance	$V_{CB}=10\text{V}, f=1\text{MHz}$	-	-	75	pF
$t_{ON}$	Turn On Time	$V_{CC}=300\text{V}, I_C=2\text{A},$ $I_{B1}=0.4\text{A}, I_{B2}=-1\text{A},$ $R_L=150\Omega$	-	-	150	ns
$t_{STG}$	Storage Time		-	-	2	$\mu\text{s}$
$t_F$	Fall Time		-	-	0.2	$\mu\text{s}$
$t_{STG}$	Storage Time	$V_{CC}=15\text{V}, V_Z=300\text{V},$ $I_C=2\text{A}, I_{B1}=0.4\text{A},$ $I_{B2}=-0.4\text{A}, L_C=200\mu\text{H}$	-	-	2.25	$\mu\text{s}$
$t_F$	Fall Time		-	-	150	ns
$V_F$	Diode Forward Voltage	$I_F=1\text{A}$ $I_F=2\text{A}$	- -	- -	1.5 1.6	V V
$t_{rr}$	* Reverse recovery time ( $di/dt = 10\text{A}/\mu\text{s}$ )	$I_F=0.4\text{A}$ $I_F=1\text{A}$ $I_F=2\text{A}$	- - -	800 1.4 1.9	- - -	ns $\mu\text{s}$ $\mu\text{s}$

\* Pulse Test : Pulse Width = 5mS, Duty cycles  $\leq 10\%$

## Typical Characteristics

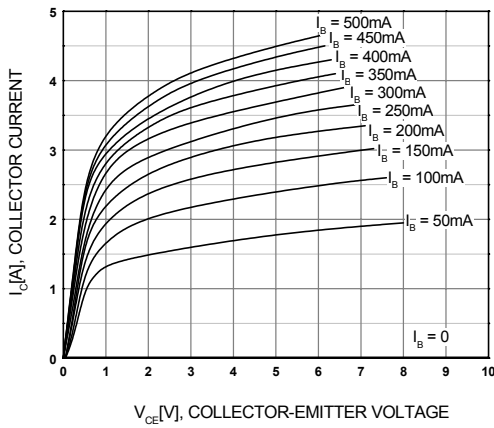


Figure 1. Static Characteristic

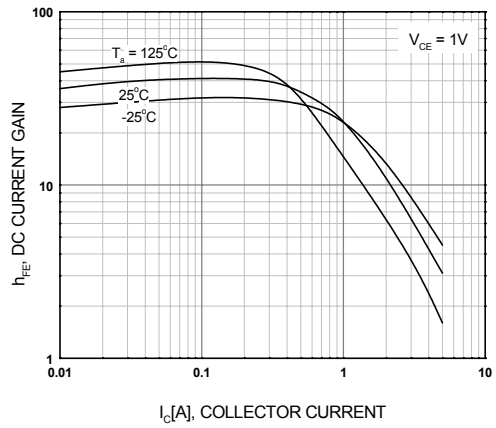


Figure 2. DC current Gain

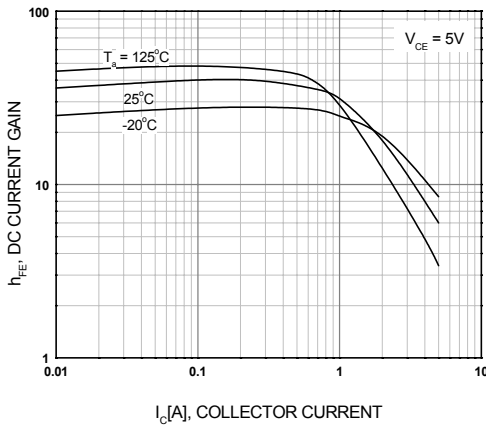


Figure 3. DC current Gain

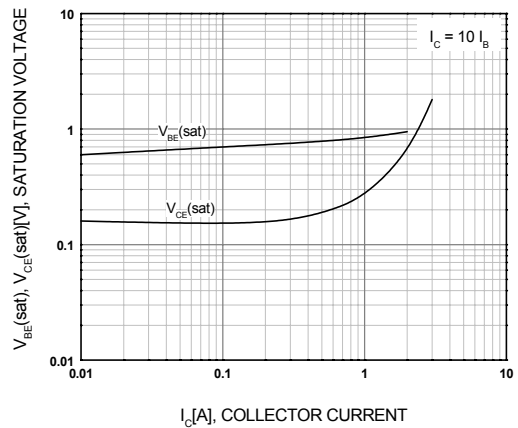


Figure 4. Collector-Emitter Saturation Voltage  
Base-Emitter Saturation Voltage

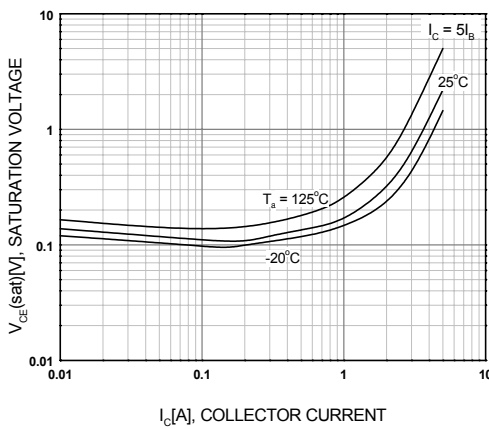


Figure 5. Collector-Emitter Saturation Voltage

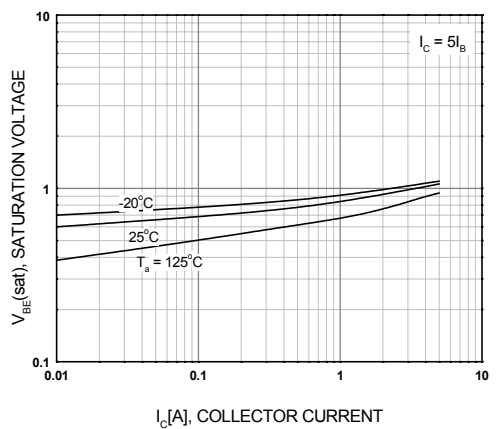


Figure 6. Base-Emitter Saturation Voltage

Typical Characteristics (Continued)

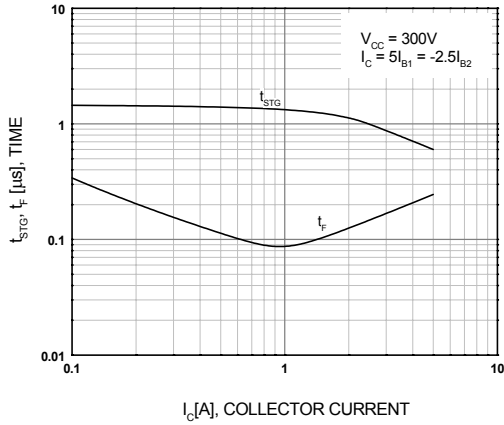


Figure 7. Switching Time

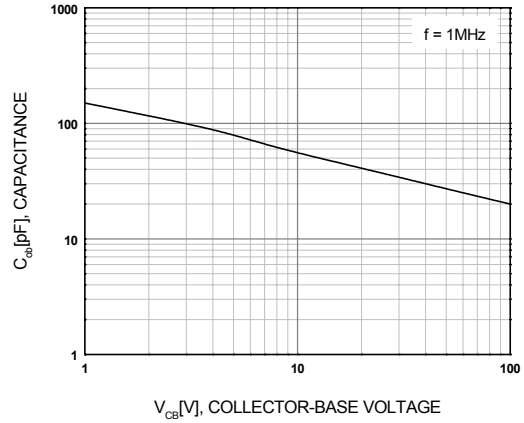


Figure 8. Collector Output Capacitance

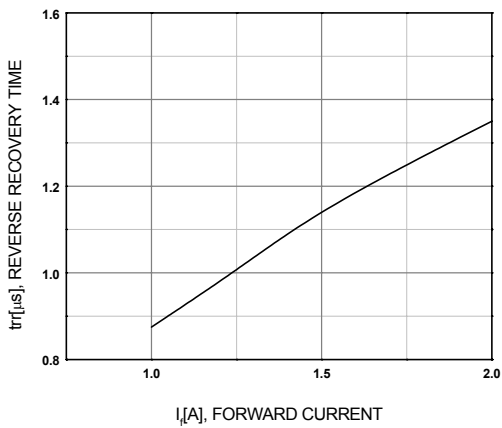


Figure 9. Reverse Recovery Time

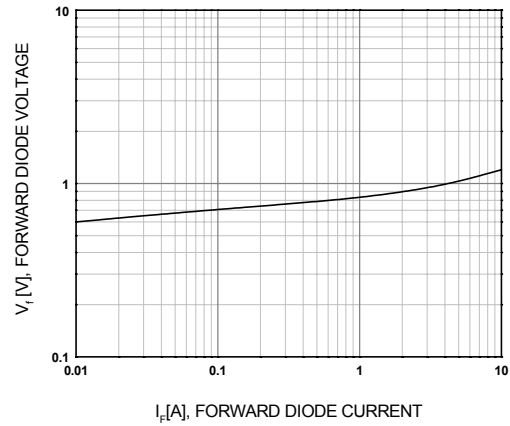


Figure 10. Forward Diode Voltage

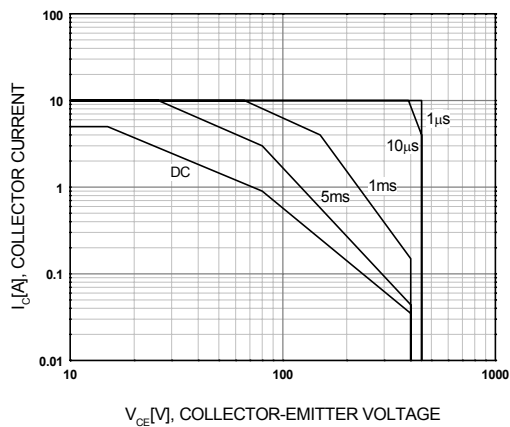


Figure 11. Safe Operating Area

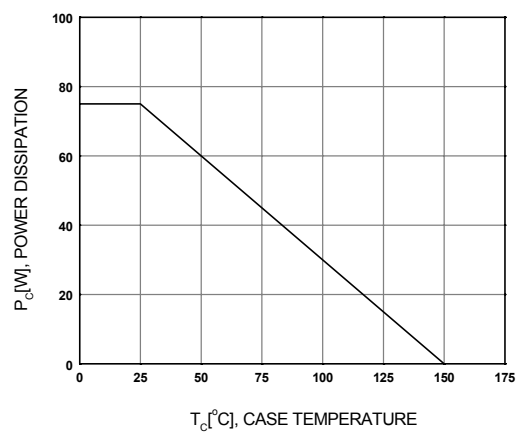


Figure 12. Power Derating

Typical Characteristics (Continued)

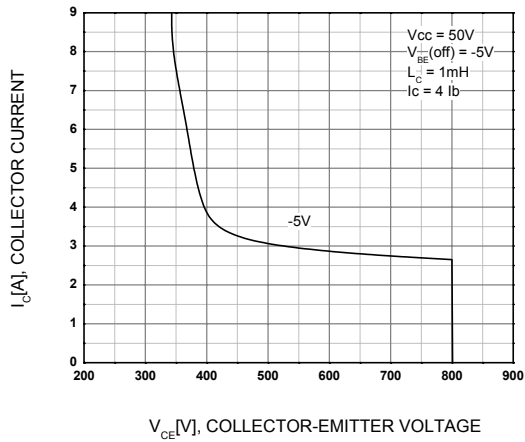


Figure 13. Reverse Bias Safe Operating

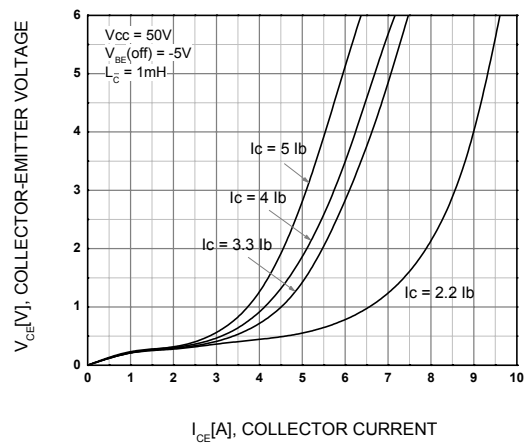


Figure 14. RBSOA Saturation

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