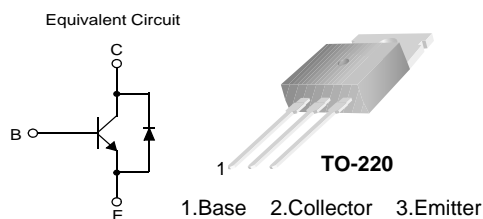


# KSC5603D

## NPN Silicon Transistor, Planar Silicon Transistor

### Features

- High Voltage High Speed Power Switch Application
- Wide Safe Operating Area
- Built-in Free Wheeling Diode
- Suitable for Electronic Ballast Application
- Small Variance in Storage Time



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

Symbol	Parameter	Value	Units
$V_{CBO}$	Collector-Base Voltage	1600	V
$V_{CEO}$	Collector-Emitter Voltage	800	V
$V_{EBO}$	Emitter-Base Voltage	12	V
$I_C$	Collector Current (DC)	3	A
$I_{CP}$	*Collector Current (Pulse)	6	A
$I_B$	Base Current (DC)	2	A
$I_{BP}$	*Base Current (Pulse)	4	A
$P_C$	Power Dissipation ( $T_C=25^\circ\text{C}$ )	100	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 Cycle $\leq$ 10%

### Thermal Characteristics $T_A = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Rating	Units	
$R_{\theta JC}$	Thermal Resistance	Junction to Case	1.25	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$		Junction to Ambient	80	$^\circ\text{C}/\text{W}$
$T_L$	Maximun Lead Temperature for Soldering Purpose : 1/8" from Case for 5 seconds	270	$^\circ\text{C}$	

**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	$I_C=0.5\text{mA}, I_E=0$	1600	1689		V
$BV_{CEO}$	Collector-Emitter Breakdown Voltage	$I_C=5\text{mA}, I_B=0$	800	870		V
$BV_{EBO}$	Emitter-Base Breakdown Voltage	$I_E=0.5\text{mA}, I_C=0$	12	14.8		V
$I_{CES}$	Collector Cut-off Current	$V_{CES}=1600\text{V}, I_E=0$	$T_A=25^\circ\text{C}$	0.01	100	$\mu\text{A}$
			$T_A=125^\circ\text{C}$		1000	$\mu\text{A}$
$I_{CEO}$	Collector Cut-off Current	$V_{CE}=800\text{V}, V_{BE}=0$	$T_A=25^\circ\text{C}$	0.01	100	$\mu\text{A}$
			$T_A=125^\circ\text{C}$		1000	$\mu\text{A}$
$I_{EBO}$	Emitter Cut-off Current	$V_{EB}=12\text{V}, I_C=0$		0.05	500	$\mu\text{A}$
$h_{FE}$	DC Current Gain	$V_{CE}=3\text{V}, I_C=0.4\text{A}$	$T_A=25^\circ\text{C}$	20	29	35
			$T_A=125^\circ\text{C}$	6	15	
		$V_{CE}=10\text{V}, I_C=5\text{mA}$	$T_A=25^\circ\text{C}$	20	43	
			$T_A=125^\circ\text{C}$	20	46	
$V_{CE}(\text{sat})$	Collector-Emitter Saturation Voltage	$I_C=250\text{mA}, I_B=25\text{mA}$	$T_A=25^\circ\text{C}$	0.5	1.25	V
			$T_A=125^\circ\text{C}$			V
		$I_C=500\text{mA}, I_B=50\text{mA}$	$T_A=25^\circ\text{C}$	1.5	2.5	V
			$T_A=125^\circ\text{C}$			V
		$I_C=1\text{A}, I_B=0.2\text{mA}$	$T_A=25^\circ\text{C}$	1.2	2.5	V
			$T_A=125^\circ\text{C}$			V
$V_{BE}(\text{sat})$	Base-Emitter Saturation Voltage	$I_C=500\text{mA}, I_B=50\text{mA}$	$T_A=25^\circ\text{C}$	0.74	1.2	V
			$T_A=125^\circ\text{C}$	0.61	1.1	V
		$I_C=2\text{A}, I_B=0.4\text{A}$	$T_A=25^\circ\text{C}$	0.85	1.2	V
			$T_A=125^\circ\text{C}$	0.74	1.1	V
$C_{ib}$	Input Capacitance	$V_{EB}=10\text{V}, I_C=0, f=1\text{MHz}$		745	1000	pF
$C_{ob}$	Output Capacitance	$V_{CB}=10\text{V}, I_E=0, f=1\text{MHz}$		56	500	pF
$f_T$	Current Gain Bandwidth Product	$I_C=0.1\text{A}, V_{CE}=10\text{V}$		5		MHz
$V_F$	Diode Forward Voltage	$I_F=0.4\text{A}$	$T_A=25^\circ\text{C}$	0.76	1.2	V
			$T_A=125^\circ\text{C}$			V
		$I_F=1\text{A}$	$T_A=25^\circ\text{C}$	0.83	1.5	V
			$T_A=125^\circ\text{C}$			V

**Electrical Characteristics** (Continued)  $T_A=25^\circ\text{C}$  unless otherwise noted





Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units		
RESISTIVE LOAD SWITCHING (D.C. $\leq$ 10%, Pulse Width=20 $\mu$ s)								
$t_{ON}$	Turn On Time	$I_C=0.3\text{A}$ , $I_{B1}=50\text{mA}$ , $I_{B2}=150\text{A}$ , $V_{CC}=125\text{V}$ , $R_L = 416\Omega$	$T_A=25^\circ\text{C}$		400	600	ns	
			$T_A=125^\circ\text{C}$				ns	
$t_{STG}$	Storage Time		$T_A=25^\circ\text{C}$	2.0	2.1	2.3	$\mu$ s	
			$T_A=125^\circ\text{C}$				$\mu$ s	
$t_F$	Fall Time		$T_A=25^\circ\text{C}$		310	1000	ns	
			$T_A=125^\circ\text{C}$				ns	
$t_{ON}$	Turn On Time		$I_C=0.5\text{A}$ , $I_{B1}=50\text{mA}$ , $I_{B2}=250\text{mA}$ , $V_{CC}=125\text{V}$ , $R_L = 250\Omega$	$T_A=25^\circ\text{C}$		600	1100	ns
				$T_A=125^\circ\text{C}$				ns
$t_{STG}$	Storage Time	$T_A=25^\circ\text{C}$			1.3	1.5	$\mu$ s	
		$T_A=125^\circ\text{C}$					$\mu$ s	
$t_F$	Fall Time	$T_A=25^\circ\text{C}$			180	350	ns	
		$T_A=125^\circ\text{C}$					ns	
INDUCTIVE LOAD SWITCHING ( $V_{CC}=15\text{V}$ )								
$t_{ON}$	Turn On Time	$I_C=0.3\text{A}$ , $I_{B1}=50\text{mA}$ , $I_{B2}=150\text{mA}$ , $V_Z=300\text{V}$ , $L_C=200\text{H}$	$T_A=25^\circ\text{C}$	0.6	0.73	0.9	$\mu$ s	
			$T_A=125^\circ\text{C}$				$\mu$ s	
$t_{STG}$	Storage Time		$T_A=25^\circ\text{C}$		170	250	ns	
			$T_A=125^\circ\text{C}$				ns	
$t_F$	Fall Time		$T_A=25^\circ\text{C}$		180	250	ns	
			$T_A=125^\circ\text{C}$				ns	
$t_{ON}$	Turn On Time		$I_C=0.5\text{A}$ , $I_{B1}=50\text{mA}$ , $I_{B2}=250\text{mA}$ , $V_Z=300\text{V}$ , $L_C=200\text{H}$	$T_A=25^\circ\text{C}$	0.7	0.84	1.0	$\mu$ s
				$T_A=125^\circ\text{C}$				$\mu$ s
$t_{STG}$	Storage Time	$T_A=25^\circ\text{C}$			140	175	ns	
		$T_A=125^\circ\text{C}$					ns	
$t_F$	Fall Time	$T_A=25^\circ\text{C}$			170	200	ns	
		$T_A=125^\circ\text{C}$					ns	





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