FAIRCHILD SEMICONDUCTOR®

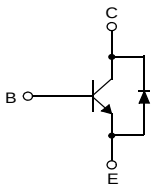
February 2010

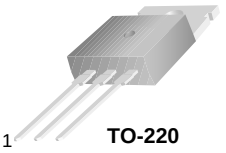
KSC5603D
NPN Silicon Transistor, Planar Silicon Transistor

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

Equivalent Circuit





TO-220

1.Base 2.Collector 3.Emitter

Absolute Maximum Ratings T_A = 25°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°C)	100	W
T_J	Junction Temperature	150	°C
T_{STG}	Storage Temperature	-65 to +150	°C

* Pulse Test: Pulse Width=5ms, Duty Cycle≤10%

Thermal Characteristics T_A = 25°C unless otherwise noted

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

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Electrical Characteristics T_A=25°C unless otherwise noted

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

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Electrical Characteristics (Continued) T_A=25°C unless otherwise noted

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

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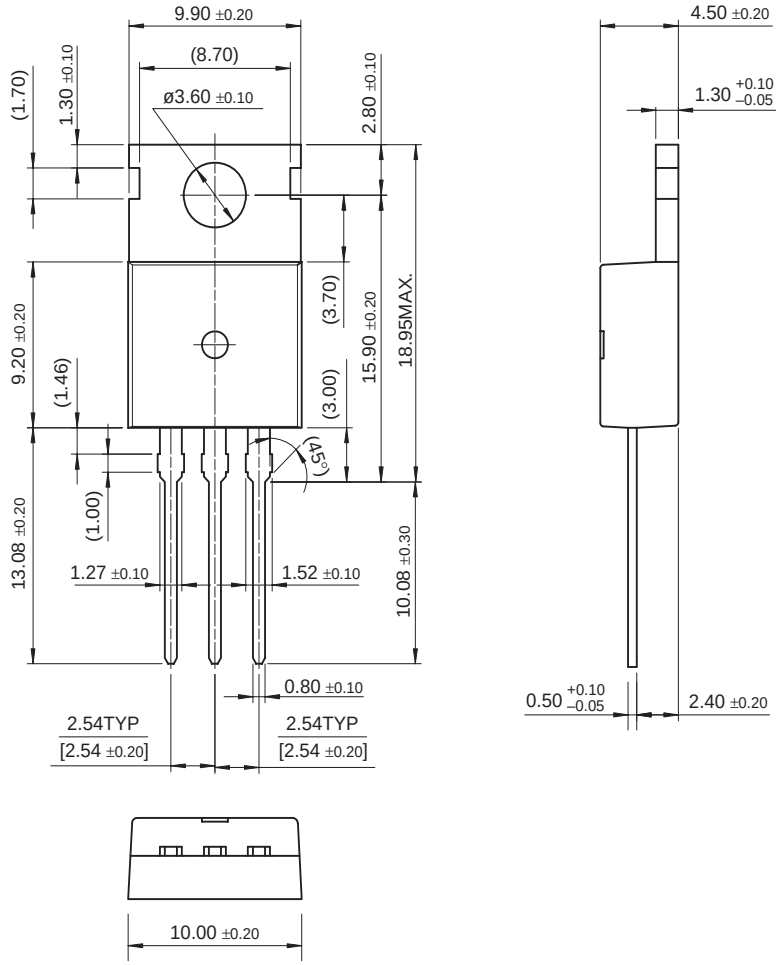
Physical Dimension

TO-220



Dimensions in Millimeters

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