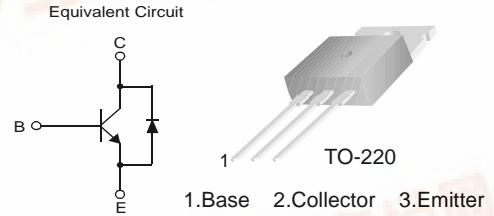


FAIRCHILD
SEMICONDUCTOR®

KSC5603D

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



NPN Silicon Transistor Planar Silicon Transistor

Absolute Maximum Ratings $T_C=25^\circ\text{C}$ 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 ~ 150	$^\circ\text{C}$

* Pulse Test: Pulse Width=5ms, Duty Cycle $\leq 10\%$

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

Symbol	Characteristics	Rating	Unit
$R_{\theta jc}$	Thermal Resistance	Junction to Case	1.25
$R_{\theta ja}$		Junction to Ambient	62.5
T_L	Maximun Lead Temperature for Soldering Purpose : 1/8" from Case for 5 seconds	270	$^\circ\text{C}$



Electrical Characteristics $T_C=25^\circ\text{C}$ 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	$V_{CES}=1600\text{V}, I_E=0$	$T_C=25^\circ\text{C}$	0.01	100	μA
			$T_C=125^\circ\text{C}$		1000	
I_{CEO}	Collector Cut-off Current	$V_{CE}=800\text{V}, V_{BE}=0$	$T_C=25^\circ\text{C}$	0.01	100	μA
			$T_C=125^\circ\text{C}$		1000	
I_{EBO}	Emitter Cut-off Current	$V_{EB}=12\text{V}, I_C=0$		0.05	500	μA
h_{FE}	DC Current Gain	$V_{CE}=3\text{V}, I_C=0.4\text{A}$	$T_C=25^\circ\text{C}$	20	29	35
			$T_C=125^\circ\text{C}$	6	15	
		$V_{CE}=10\text{V}, I_C=5\text{mA}$	$T_C=25^\circ\text{C}$	20	43	
			$T_C=125^\circ\text{C}$	20	46	
$V_{CE}(\text{sat})$	Collector-Emitter Saturation Voltage	$I_C=250\text{mA}, I_B=25\text{mA}$	$T_C=25^\circ\text{C}$	0.5	1.25	V
			$T_C=125^\circ\text{C}$			
		$I_C=500\text{mA}, I_B=50\text{mA}$	$T_C=25^\circ\text{C}$	1.5	2.5	V
			$T_C=125^\circ\text{C}$			
		$I_C=1\text{A}, I_B=0.2\text{mA}$	$T_C=25^\circ\text{C}$	1.2	2.5	V
			$T_C=125^\circ\text{C}$			
$V_{BE}(\text{sat})$	Base-Emitter Saturation Voltage	$I_C=500\text{mA}, I_B=50\text{mA}$	$T_C=25^\circ\text{C}$	0.74	1.2	V
			$T_C=125^\circ\text{C}$	0.61	1.1	
		$I_C=2\text{A}, I_B=0.4\text{A}$	$T_C=25^\circ\text{C}$	0.85	1.2	V
			$T_C=125^\circ\text{C}$	0.74	1.1	
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	$I_F=0.4\text{A}$	$T_C=25^\circ\text{C}$	0.76	1.2	V
			$T_C=125^\circ\text{C}$			V
		$I_F=1\text{A}$	$T_C=25^\circ\text{C}$	0.83	1.5	V
			$T_C=125^\circ\text{C}$			V

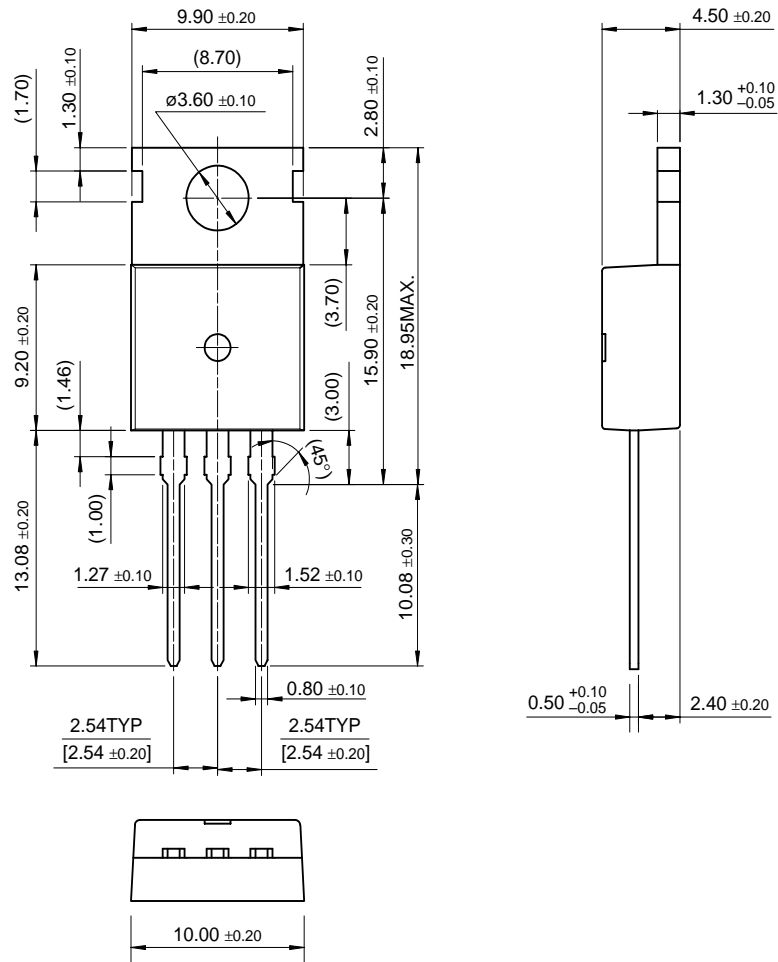
Electrical Characteristics $T_C=25^\circ\text{C}$ unless otherwise noted

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

Package Dimensions

KSC5603D

TO-220



Dimensions in Millimeters

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CoolFET™	FASTr™	MicroFET™	PowerTrench®	SuperSOT™-6
CROSSVOLT™	FRFET™	MicroPak™	QFET®	SuperSOT™-8
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