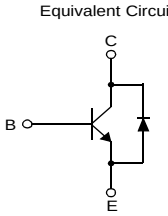
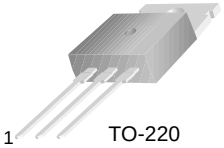
FAIRCHILD
SEMICONDUCTOR®

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





1.Base 2.Collector 3.Emitter

NPN Silicon Transistor Planar Silicon Transistor

Absolute Maximum Ratings T_C=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 ~ 150	°C

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

Thermal Characteristics T_C=25°C unless otherwise noted

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

Electrical Characteristics T_C=25°C unless otherwise noted

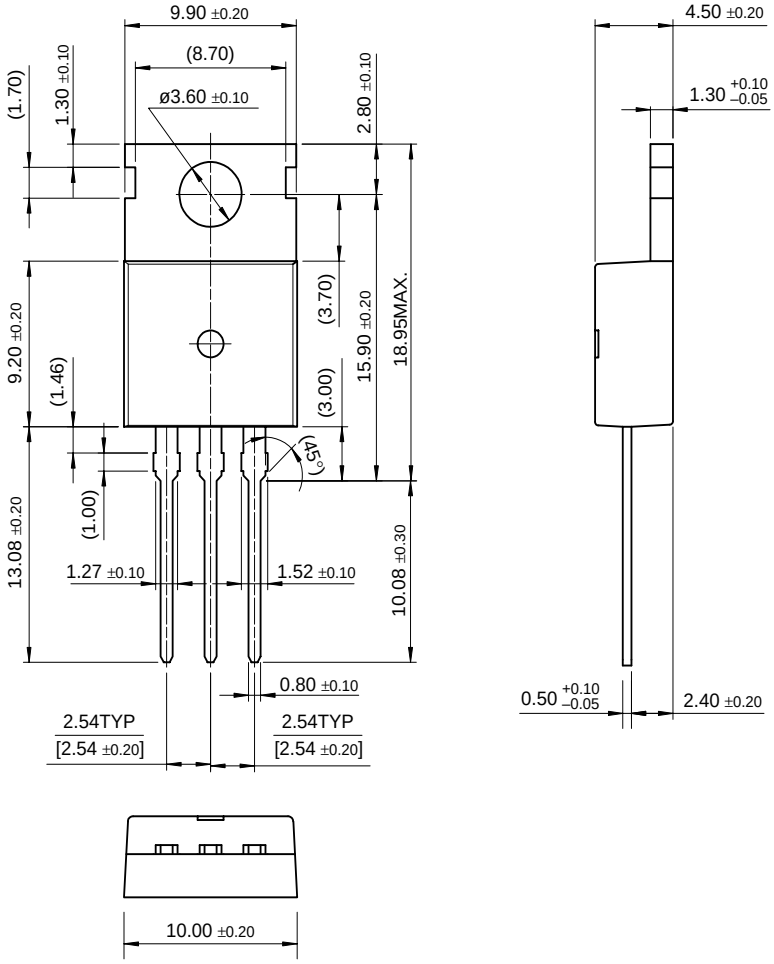
Symbol	Parameter	Test Condition		Min.	Typ.	Max.	Units
BV_{CBO}	Collector-Base Breakdown Voltage	I_C=0.5mA, I_E=0		1600	1689		V
BV_{CEO}	Collector-Emitter Breakdown Voltage	I_C=5mA, I_B=0		800	870		V
BV_{EBO}	Emitter-Base Breakdown Voltage	I_E=0.5mA, I_C=0		12	14.8		V
I_{CES}	Collector Cut-off Current	V_{CES}=1600V, I_E=0	T_C=25°C		0.01	100	μA
			T_C=125°C			1000	
I_{CEO}	Collector Cut-off Current	V_{CE}=800V, V_{BE}=0	T_C=25°C		0.01	100	μA
			T_C=125°C			1000	
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_C=25°C	20	29	35	
			T_C=125°C	6	15		
		V_{CE}=10V, I_C=5mA	T_C=25°C	20	43		
			T_C=125°C	20	46		
V_{CE}(sat)	Collector-Emitter Saturation Voltage	I_C=250mA, I_B=25mA	T_C=25°C		0.5	1.25	V
			T_C=125°C				
		I_C=500mA, I_B=50mA	T_C=25°C		1.5	2.5	V
			T_C=125°C				
		I_C=1A, I_B=0.2mA	T_C=25°C		1.2	2.5	V
			T_C=125°C				
V_{BE}(sat)	Base-Emitter Saturation Voltage	I_C=500mA, I_B=50mA	T_C=25°C		0.74	1.2	V
			T_C=125°C		0.61	1.1	
		I_C=2A, I_B=0.4A	T_C=25°C		0.85	1.2	V
			T_C=125°C		0.74	1.1	
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_C=25°C		0.76	1.2	V
			T_C=125°C				V
		I_F=1A	T_C=25°C		0.83	1.5	V
			T_C=125°C				V

Electrical Characteristics T_C=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_C=25°C		400	600	ns
			T_C=125°C				ns
t_{STG}	Storage Time		T_C=25°C	2.0	2.1	2.3	μs
			T_C=125°C				μs
t_F	Fall Time		T_C=25°C		310	1000	ns
			T_C=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_C=25°C		600	1100	ns
			T_C=125°C				ns
t_{STG}	Storage Time		T_C=25°C		1.3	1.5	μs
			T_C=125°C				μs
t_F	Fall Time		T_C=25°C		180	350	ns
			T_C=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_C=25°C	0.6	0.73	0.9	μs
			T_C=125°C				μs
t_{STG}	Storage Time		T_C=25°C		170	250	ns
			T_C=125°C				ns
t_F	Fall Time		T_C=25°C		180	250	ns
			T_C=125°C				ns
t_{ON}	Turn On Time	I_C=0.5A, I_{B1}=50mA I_{B2}=250mA, Vz=300V L_C=200H	T_C=25°C	0.7	0.84	1.0	μs
			T_C=125°C				μs
t_{STG}	Storage Time		T_C=25°C		140	175	ns
			T_C=125°C				ns
t_F	Fall Time		T_C=25°C		170	200	ns
			T_C=125°C				ns

Package Dimensions

TO-220



Dimensions in Millimeters

TRADEMARKS

The following are registered and unregistered trademarks Fairchild Semiconductor owns or is authorized to use and is not intended to be an exhaustive list of all such trademarks.

ACEx™	FACT™	ImpliedDisconnect™	PACMAN™	SPM™
ActiveArray™	FACT Quiet Series™	ISOPLANAR™	POP™	Stealth™
Bottomless™	FAST®	LittleFET™	Power247™	SuperSOT™-3
CoolFET™	FASTr™	MicroFET™	PowerTrench®	SuperSOT™-6
CROSSVOLT™	FRFET™	MicroPak™	QFET®	SuperSOT™-8
DOME™	GlobalOptoisolator™	MICROWIRE™	QS™	SyncFET™
EcoSPARK™	GTO™	MSX™	QT Optoelectronics™	TinyLogic®
E^2CMOS^{TM}	HiSeC™	MSXPro™	Quiet Series™	TruTranslation™
EnSigna™	I^2C™	OCX™	RapidConfigure™	UHC™
Across the board. Around the world.™		OCXPro™	RapidConnect™	UltraFET®
The Power Franchise™		OPTOLOGIC®	SILENT SWITCHER®	VCX™
Programmable Active Droop™		OPTOPLANAR™	SMART START™	

DISCLAIMER

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF FAIRCHILD SEMICONDUCTOR CORPORATION.
As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, or (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.

2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

PRODUCT STATUS DEFINITIONS

Definition of Terms

Datasheet Identification	Product Status	Definition
Advance Information	Formative or In Design	This datasheet contains the design specifications for product development. Specifications may change in any manner without notice.
Preliminary	First Production	This datasheet contains preliminary data, and supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice in order to improve design.
No Identification Needed	Full Production	This datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice in order to improve design.
Obsolete	Not In Production	This datasheet contains specifications on a product that has been discontinued by Fairchild semiconductor. The datasheet is printed for reference information only.