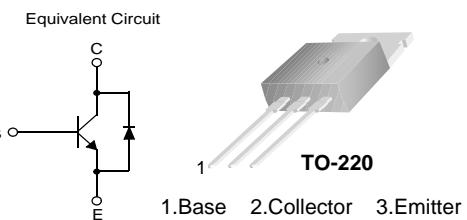


# KSC5603D

## 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	1.25	$^\circ\text{C}/\text{W}$
	Junction to Ambient	80	$^\circ\text{C}/\text{W}$
$T_L$	Maximum 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

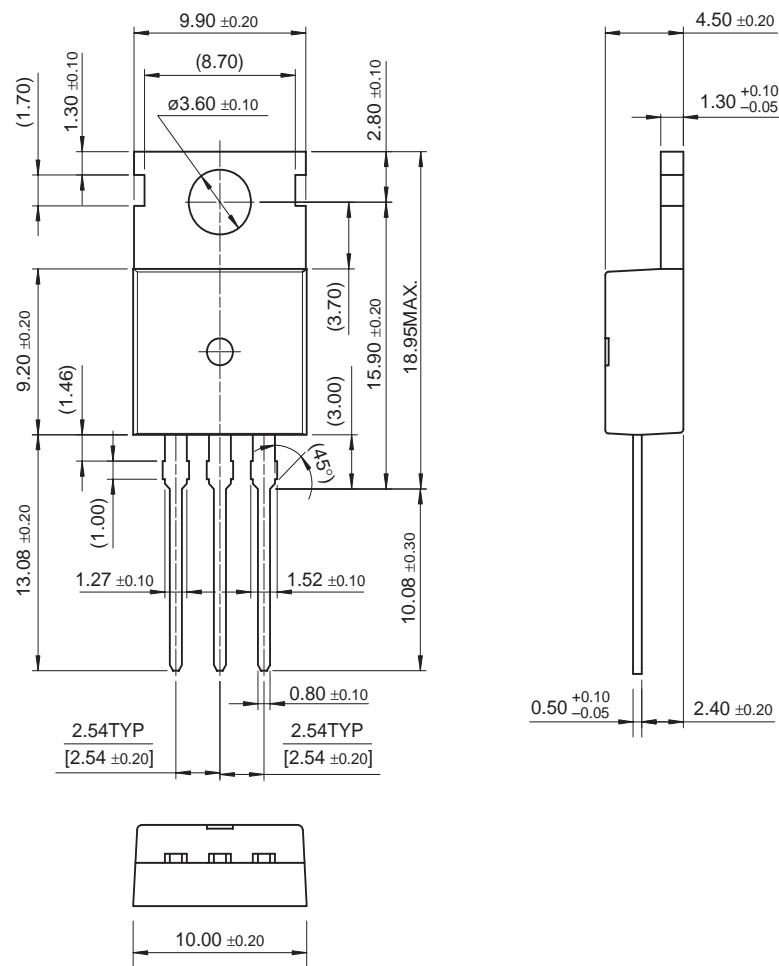
Symbol	Parameter	Test Condition		Min.	Typ.	Max.	Units
$BV_{CBO}$	Collector-Base Breakdown Voltage	$I_C=0.5\text{mA}$ , $I_E=0$		1600	1689		V
$BV_{CEO}$	Collector-Emitter Breakdown Voltage	$I_C=5\text{mA}$ , $I_B=0$		800	870		V
$BV_{EBO}$	Emitter-Base Breakdown Voltage	$I_E=0.5\text{mA}$ , $I_C=0$		12	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 $\mu\text{s}$ )							
$t_{\text{ON}}$	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
			$T_A=25^\circ\text{C}$	2.0	2.1	2.3	$\mu\text{s}$
			$T_A=125^\circ\text{C}$				$\mu\text{s}$
			$T_A=25^\circ\text{C}$		310	1000	ns
			$T_A=125^\circ\text{C}$				ns
$t_{\text{ON}}$	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
			$T_A=25^\circ\text{C}$		1.3	1.5	$\mu\text{s}$
			$T_A=125^\circ\text{C}$				$\mu\text{s}$
			$T_A=25^\circ\text{C}$		180	350	ns
			$T_A=125^\circ\text{C}$				ns
INDUCTIVE LOAD SWITCHING ( $V_{CC}=15\text{V}$ )							
$t_{\text{ON}}$	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	$\mu\text{s}$
			$T_A=125^\circ\text{C}$				$\mu\text{s}$
			$T_A=25^\circ\text{C}$		170	250	ns
			$T_A=125^\circ\text{C}$				ns
			$T_A=25^\circ\text{C}$		180	250	ns
			$T_A=125^\circ\text{C}$				ns
$t_{\text{ON}}$	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	$\mu\text{s}$
			$T_A=125^\circ\text{C}$				$\mu\text{s}$
			$T_A=25^\circ\text{C}$		140	175	ns
			$T_A=125^\circ\text{C}$				ns
			$T_A=25^\circ\text{C}$		170	200	ns
			$T_A=125^\circ\text{C}$				ns

## Physical Dimension

## TO-220

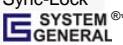


Dimensions in Millimeters



## TRADEMARKS

The following includes registered and unregistered trademarks and service marks, owned by Fairchild Semiconductor and/or its global subsidiaries, and is not intended to be an exhaustive list of all such trademarks.

AccuPower™	FRFET®	PowerTrench®	The Power Franchise®
Auto-SPM™	Global Power Resource™	PowerXS™	the power franchise
Build it Now™	Green FPS™	Programmable Active Droop™	TinyBoost™
CorePLUS™	Green FPS™ e-Series™	QFET®	TinyBuck™
CorePOWER™	Gmax™	QS™	TinyCalc™
CROSSVOLT™	GTO™	Quiet Series™	TinyLogic®
CTL™	IntelliMAX™	RapidConfigure™	TINYOPTO™
Current Transfer Logic™	ISOPLANAR™	 ™	TinyPower™
DEUXPEED®	MegaBuck™	Saving our world, 1mW/W/kW at a time™	TinyPWM™
Dual Cool™	MICROCOUPLER™	SignalWise™	TinyWire™
EcoSPARK®	MicroFET™	SmartMax™	TriFault Detect™
EfficientMax™	MicroPak™	SMART START™	TRUECURRENT™*
 ®	MicroPak2™	SPM®	µSerDes™
Fairchild®	MillerDrive™	STEALTH™	 ™
Fairchild Semiconductor®	MotionMax™	SuperFET™	UHC®
FACT Quiet Series™	Motion-SPM™	SuperSOT™-3	Ultra FRFET™
FACT®	OptoHit™	SuperSOT™-6	UniFET™
FAST®	OPTOLOGIC®	SuperSOT™-8	VCX™
FastvCore™	OPTOPLANAR®	SupreMOS™	VisualMax™
FETBench™	 ™	SyncFET™	XS™
FlashWriter®*	PDP SPM™	Sync-Lock™	
FPS™	Power-SPM™	 ™	
F-PFS™			

\* Trademarks of System General Corporation, used under license by Fairchild Semiconductor.

## 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. THESE SPECIFICATIONS DO NOT EXPAND THE TERMS OF FAIRCHILD'S WORLDWIDE TERMS AND CONDITIONS, SPECIFICALLY THE WARRANTY THEREIN, WHICH COVERS THESE PRODUCTS.

## 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, and (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 a significant injury of the user.
2. A critical component in 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.

## ANTI-COUNTERFEITING POLICY

Fairchild Semiconductor Corporation's Anti-Counterfeiting Policy. Fairchild's Anti-Counterfeiting Policy is also stated on our external website, [www.fairchildsemi.com](http://www.fairchildsemi.com), under Sales Support.

Counterfeiting of semiconductor parts is a growing problem in the industry. All manufacturers of semiconductor products are experiencing counterfeiting of their parts. Customers who inadvertently purchase counterfeit parts experience many problems such as loss of brand reputation, substandard performance, failed applications, and increased cost of production and manufacturing delays. Fairchild is taking strong measures to protect ourselves and our customers from the proliferation of counterfeit parts. Fairchild strongly encourages customers to purchase Fairchild parts either directly from Fairchild or from Authorized Fairchild Distributors who are listed by country on our web page cited above. Products customers buy either from Fairchild directly or from Authorized Fairchild Distributors are genuine parts, have full traceability, meet Fairchild's quality standards for handling and storage and provide access to Fairchild's full range of up-to-date technical and product information. Fairchild and our Authorized Distributors will stand behind all warranties and will appropriately address any warranty issues that may arise. Fairchild will not provide any warranty coverage or other assistance for parts bought from Unauthorized Sources. Fairchild is committed to combat this global problem and encourage our customers to do their part in stopping this practice by buying direct or from authorized distributors.

## PRODUCT STATUS DEFINITIONS

### Definition of Terms

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

Rev. I47

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Fairchild Semiconductor](#):

[KSC5603D](#) [KSC5603DW](#)