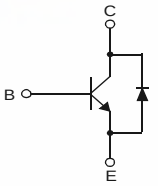
FAIRCHILD SEMICONDUCTOR®

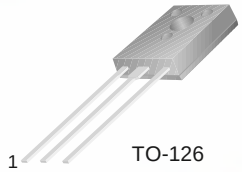
KSC5302DM

High Voltage & High Speed Power Switch Application

- High breakdown Voltage :BV_{CBO}=800V
- Built-in Free-wheeling Diode makes efficient anti saturation operation
- Suitable for half bridge light ballast Applications
- No need to interest an h_{FE} value because of low variable storage-time spread even though corner spirit product
- Low base drive requirement

Equivalent Circuit





TO-126

1. Emitter 2.Collector 3.Base

NPN Silicon Transistor

Absolute Maximum Ratings T_C=25°C unless otherwise noted

Symbol	Parameter	Value	Units
V_{CBO}	Collector-Base Voltage	800	V
V_{CEO}	Collector-Emitter Voltage	400	V
V_{EBO}	Emitter-Base Voltage	12	V
I_C	Collector Current (DC)	2	A
I_{CP}	*Collector Current (Pulse)	5	A
I_B	Base Current (DC)	1	A
I_{BP}	*Base Current (Pulse)	2	A
P_C	Power Dissipation(T_C=25°C)	25	W
T_J	Junction Temperature	150	°C
T_{STG}	Storage Temperature	- 55 ~ 150	°C

Thermal Characteristics T_C=25°C unless otherwise noted

Symbol	Characteristics		Rating	Unit
$R_{\theta jc}$	Thermal Resistance	Junction to Case	5.0	°C/W
$R_{\theta ja}$		Junction to Ambient	62.5	

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=1mA, I_E=0	800	-	-	V
BV_{CEO}	Collector-Emitter Breakdown Voltage	I_C=5mA, I_B=0	400	-	-	V
BV_{EBO}	Emitter Cut-off Current	I_E=1mA, I_C=0	12	-	-	V
I_{CBO}	Collector Cut-off Current	V_{CB}=500V, I_E=0	-	-	10	µA
I_{EBO}	Emitter Cut-off Current	V_{EB} = 9V, I_C = 0	-	-	10	µA
h_{FE1} h_{FE2}	DC Current Gain	V_{CE}=1V, I_C=0.4A V_{CE}=1V,I_C=1A	20 10	- -	- -	
V_{CE}(sat)	Collector-Emitter Saturation Voltage	I_C=0.4A, I_B=0.04A I_C=1A, I_B=0.2A	- -	- -	0.4 0.5	V V
V_{BE}(sat)	Collector-Emitter Saturation Voltage	I_C=0.4A, I_B=0.04A I_C=1A, I_B=0.2A	- -	- -	0.9 1.0	V V
C_{ob}	Output Capacitance	VCB = 10V, f=1MHz	-	-	75	pF
t_{ON}	Turn On Time	V_{CC}=300V, I_C =1A I_{B1} = 0.2A, I_{B2}=-0.5A R_L = 300Ω	-	-	150	ns
t_{STG}	Storage Time		-	-	2	µs
t_F	Fall Time		-	-	0.2	µs
t_{STG}	Storage Time	V_{CC}=15V, V_Z=300V I_C = 0.8A, I_{B1} = 0.16A I_{B2} = -0.16A, L_C=200µH	-	-	2.35	µs
t_F	Fall Time		-	-	150	ns
V_F	Diode Forward Voltage	I_F = 0.4A I_F = 1A	- -	- -	1.2 1.5	V V
t_{rr}	* Reverse Recovery Time (di/dt = 10A/µs)	I_F = 0.2A I_F = 0.4A I_F = 1A	- - -	800 1 1.4	- - -	ns µs µs

*Pulse Test : Pulse Width=5mS, Duty cycles ≤ 10%

Typical Characteristics

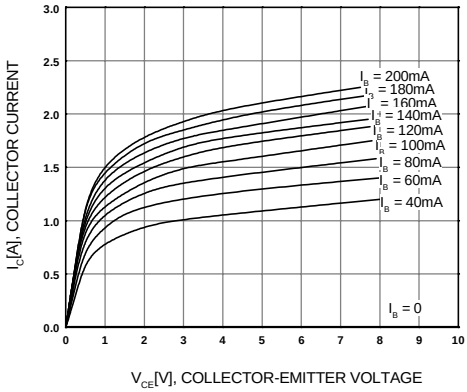


Figure 1. Static Characteristic

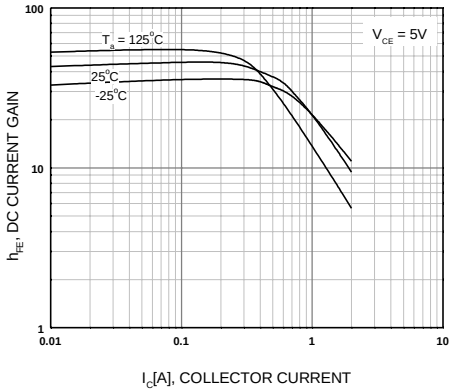


Figure 2. DC current Gain

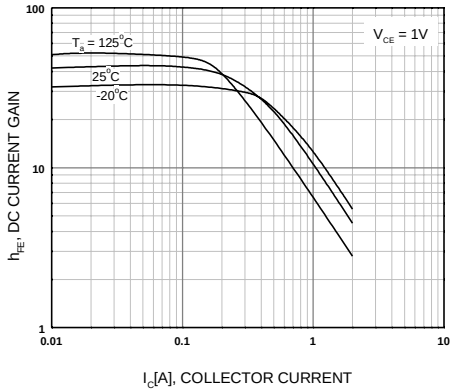


Figure 3. DC current Gain

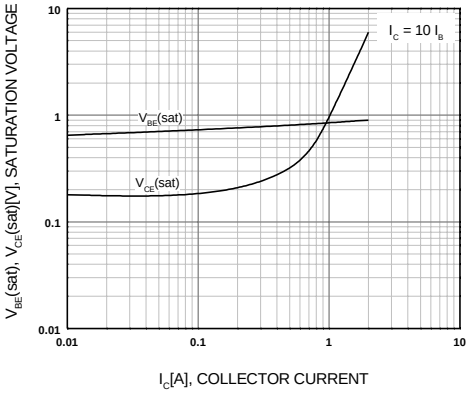


Figure 4. Base-Emitter Saturation Voltage Collector-Emitter Saturation Voltage

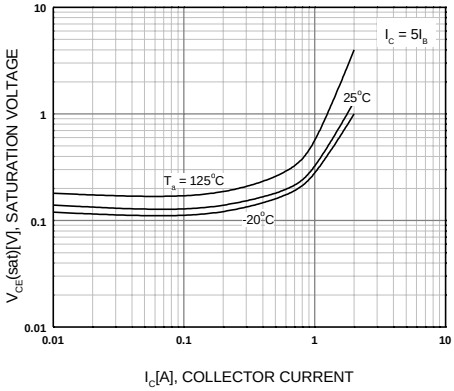


Figure 5. Collector-Emitter Saturation Voltage

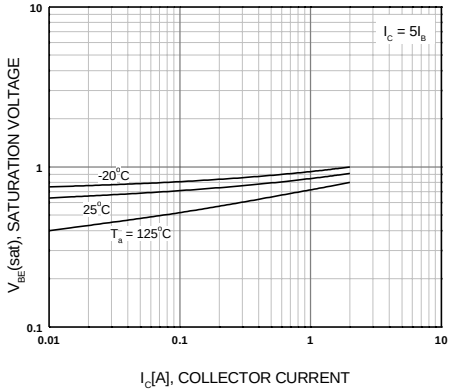


Figure 6. Base-Emitter Saturation Voltage

Typical Characteristics (Continued)

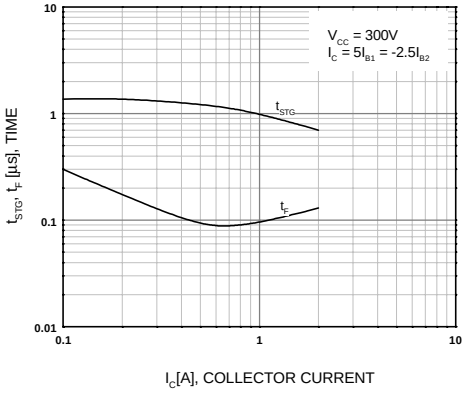


Figure 7. Switching Time

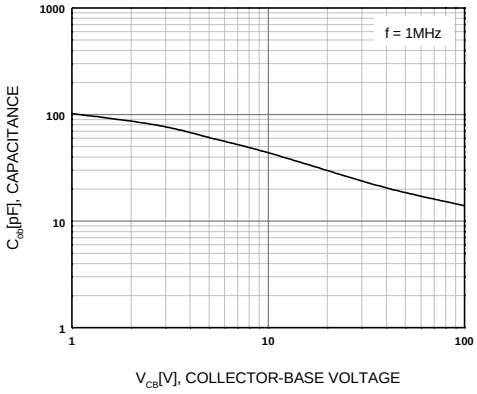


Figure 8. Collector Output Capacitance

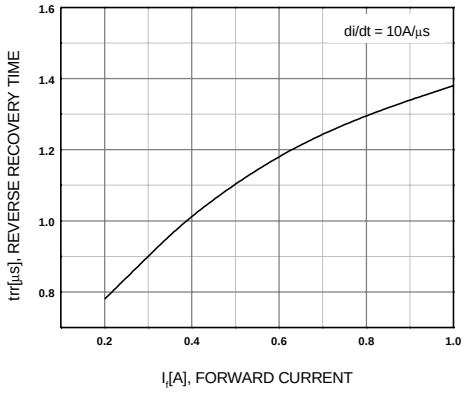


Figure 9. Reverse Recovery Time

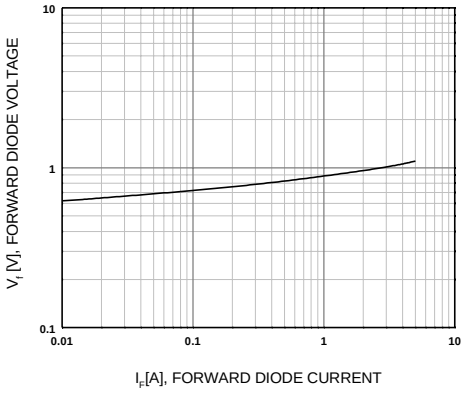
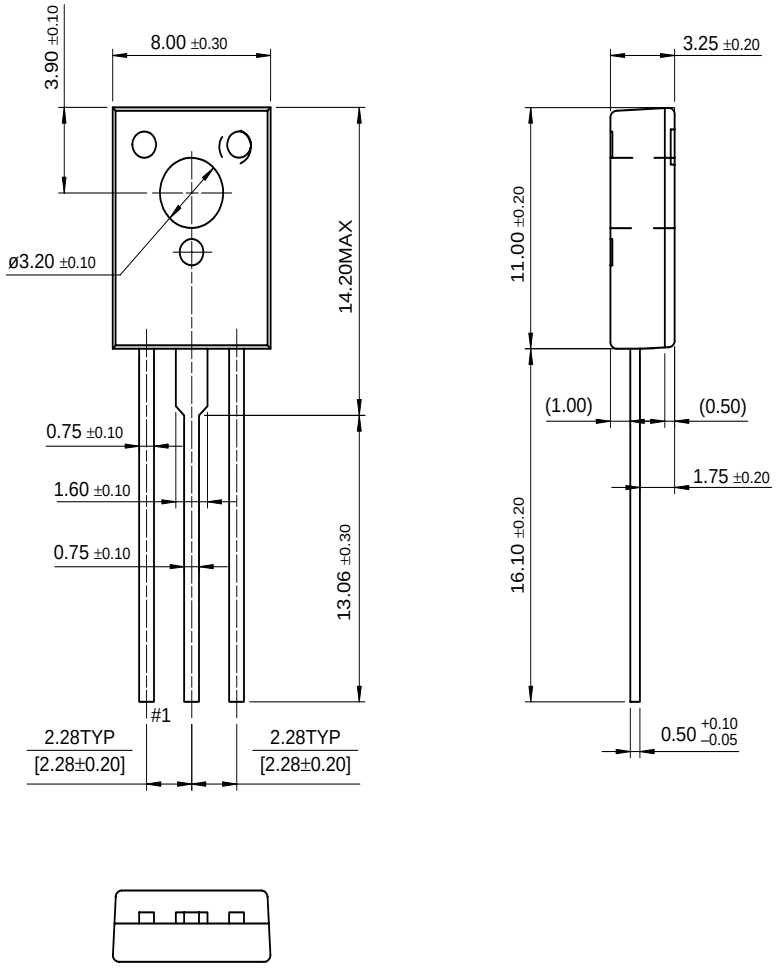


Figure 10. Forward Diode Voltage

Package Dimensions

TO-126



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™
E²CMOS™	HiSeC™	MSXPro™	Quiet Series™	TruTranslation™
EnSigna™	I²C™	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 INTERNATIONAL.

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.