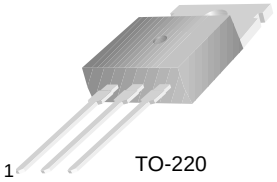
FAIRCHILD SEMICONDUCTOR™

MJE13004/13005

High Voltage Switch Mode Application

- High Speed Switching
- Suitable for Switching Regulator and Motor Control



1.Base 2.Collector 3.Emitter

NPN Silicon Transistor

Absolute Maximum Ratings T_C=25°C unless otherwise noted

Symbol	Parameter	Value	Units
V_{CBO}	Collector-Base Voltage : MJE13004 : MJE13005	 600 700	V V
V_{CEO}	Collector-Emitter Voltage : MJE13004 : MJE13005	 300 400	V V
V_{EBO}	Emitter-Base Voltage	9	V
I_C	Collector Current (DC)	4	A
I_{CP}	Collector Current (Pulse)	8	A
I_B	Base Current	2	A
P_C	Collector Dissipation (T_C=25°C)	75	W
T_J	Junction Temperature	150	°C
T_{STG}	Storage Temperature	- 65 ~ 150	°C

Electrical Characteristics T_C=25°C unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
BV_{CEO}(sus)	Collector-Emitter Sustaining Voltage : MJE13004 : MJE13005	 I_C = 10mA, I_B = 0	 300 400			 V V
I_{EBO}	Emitter Cut-off Current	V_{EB} = 9V, I_C = 0			1	mA
h_{FE}	*DC Current Gain	V_{CE} = 5V, I_C = 1A V_{CE} = 5V, I_C = 2A	10 8		60 40	
V_{CE}(sat)	*Collector-Emitter Saturation Voltage	I_C = 1A, I_B = 0.2A I_C = 2A, I_B = 0.5A I_C = 4A, I_B = 1A			0.5 0.6 1	V V V
V_{BE} (sat)	*Base-Emitter Saturation Voltage	I_C = 1A, I_B = 0.2A I_C = 2A, I_B = 0.5A			1.2 1.6	V V
C_{ob}	Output Capacitance	V_{CB} = 10V, f = 0.1MHz		65		pF
f_T	Current Gain Bandwidth Product	V_{CE} = 10V, I_C = 0.5A	4			MHz
t_{ON}	Turn ON Time	V_{CC} = 125V, I_C = 2A I_{B1} = - I_{B2} = 0.4A R_L = 62.5Ω			0.8	µs
t_{STG}	Storage Time				4	µs
t_F	Fall Time				0.9	µs

* Pulse test: PW≤300µs, Duty cycle≤2% Pulse

Typical Characteristics

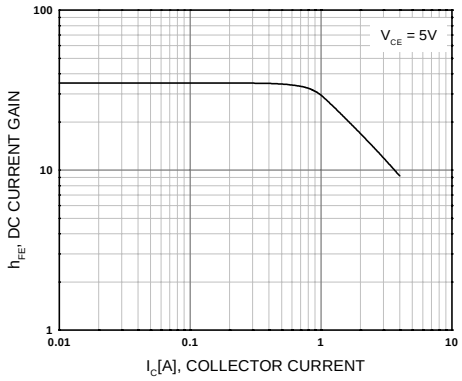


Figure 1. DC current Gain

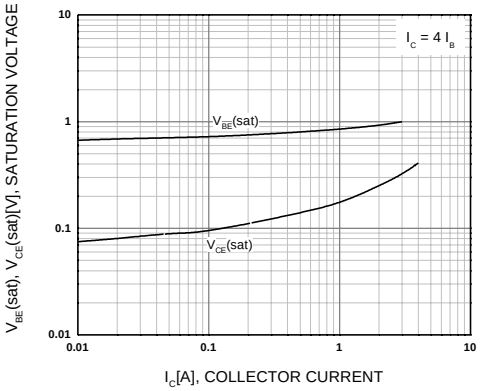


Figure 2. Base-Emitter Saturation Voltage Collector-Emitter Saturation Voltage

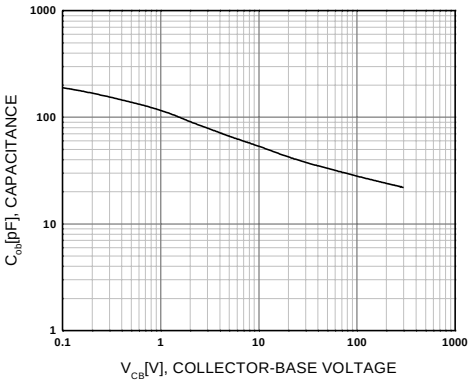


Figure 3. Collector Output Capacitance

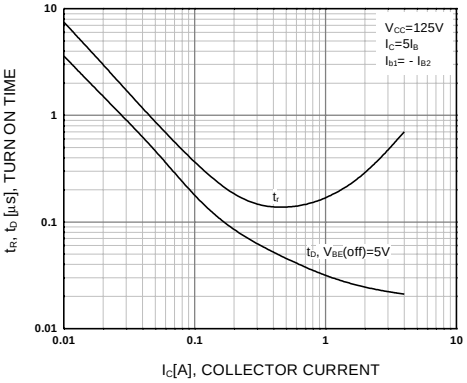


Figure 4. Turn On Time

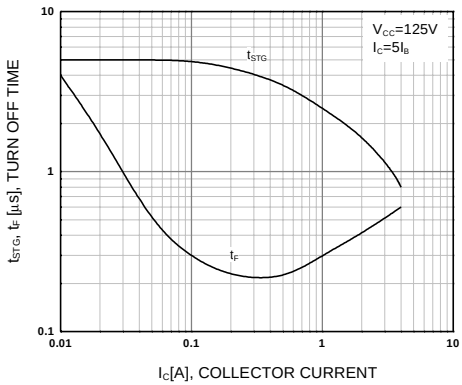


Figure 5. Turn Off Time

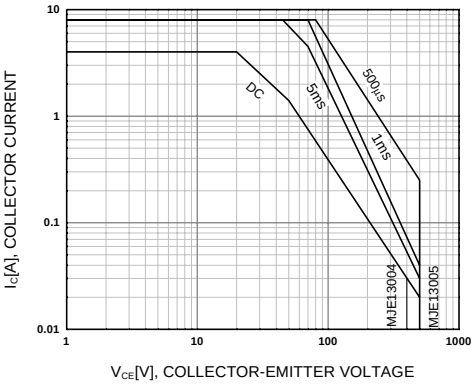


Figure 6. Safe Operating Area

Typical Characteristics (Continued)

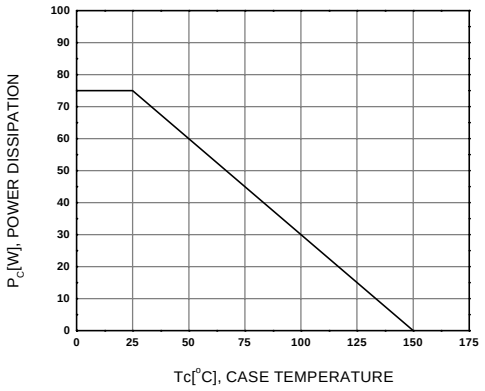
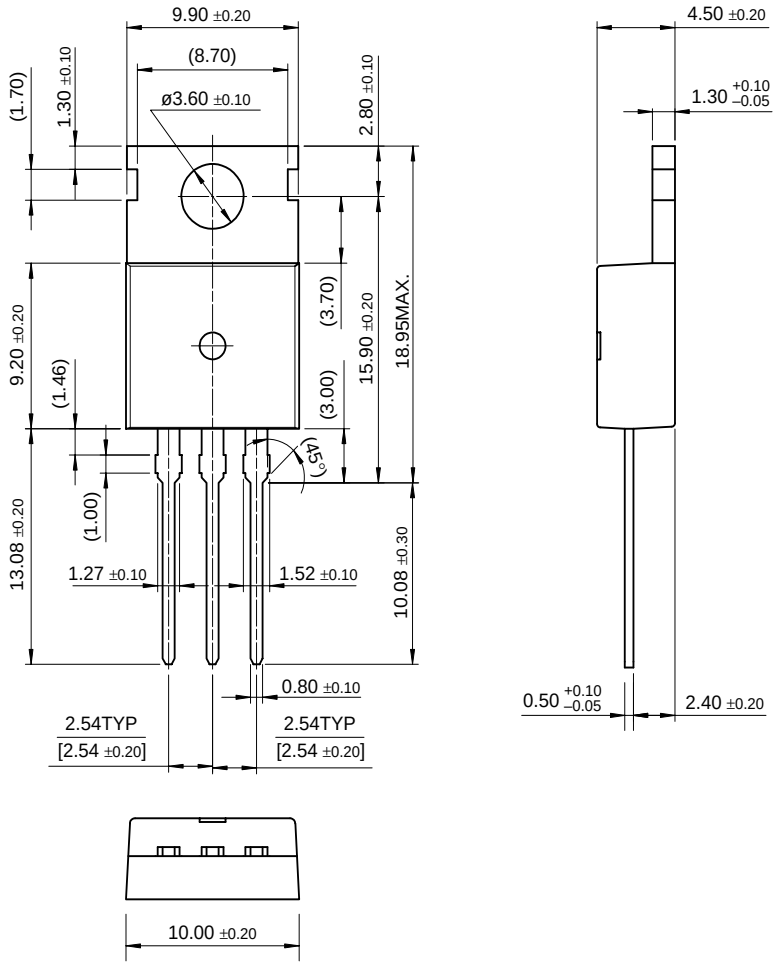


Figure 7. Power Derating

Package Demensions

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™
Bottomless™
CoolFET™
CROSSVOLT™
DOME™
E^2CMOS™
EnSigna™
FACT™
FACT Quiet Series™
FAST®
FASTr™
GlobalOptoisolator™
GTO™
HiSeC™
ISOPLANAR™
MICROWIRE™
OPTOLOGIC™
OPTOPLANAR™
PACMAN™
POP™
PowerTrench®
QFET™
QS™
QT Optoelectronics™
Quiet Series™
LILENT SWITCHER®
SMART START™
SuperSOT™-3
SuperSOT™-6
SuperSOT™-8
SyncFET™
TinyLogic™
VCX™
UHC™

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.