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Please note: As part of the Fairchild Semiconductor integration, some of the Fairchild orderable part numbers will need to change in order to meet ON Semiconductor's system requirements. Since the ON Semiconductor product management systems do not have the ability to manage part nomenclature that utilizes an underscore (_), the underscore (_) in the Fairchild part numbers will be changed to a dash (-). This document may contain device numbers with an underscore (_). Please check the ON Semiconductor website to verify the updated device numbers. The most current and up-to-date ordering information can be found at www.onsemi.com. Please email any questions regarding the system integration to Fairchild_questions@onsemi.com.

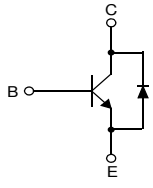
July 2008

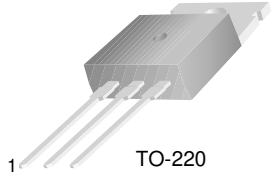
FJP5304D
NPN Silicon Transistor

High Voltage High Speed Power Switch Application

- Wide Safe Operating Area
- Built-in Free Wheeling diodeSuitable for Electronic Ballast Application
- Suitable for Electronic Ballast Application
- Small Variance in Storage Time

Equivalent Circuit





TO-220

1.Base 2.Collector 3.Emitter

Absolute Maximum Ratings T_C=25°C unless otherwise noted

Symbol	Parameter	Value	Units
V_{CBO}	Collector-Base Voltage	700	V
V_{CEO}	Collector-Emitter Voltage	400	V
V_{EBO}	Emitter-Base Voltage	12	V
I_C	Collector Current (DC)	4	A
I_{CP}	* Collector Current (Pulse)	8	A
I_B	Base Current (DC)	2	A
I_{BP}	* Base Current (Pulse)	4	A
P_C	Collector Dissipation (T_C=25°C)	70	W
T_{STG}	Storage Temperature	- 65 ~ 150	°C

* Pulse Test Pulse Width = 5ms, Duty Cycle ≤ 1.0%

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	700			V
BV_{CEO}	Collector-Emitter Breakdown Voltage	I_C = 5mA, I_B = 0	400			V
BV_{EBO}	Emitter-Base Breakdown Voltage	I_E = 1mA, I_C = 0	12			V
I_{CES}	Collector Cut-off Current	V_{CE} = 700V, V_{EB} = 0			100	mA
I_{CEO}	Collector Cut-off Current	V_{CE} = 400V, IB = 0			250	mA
I_{EBO}	Emitter Cut-off Current	V_{EB} = 12V, I_C = 0			100	mA

h_{FE}	DC Current Gain	V_{CE} = 5V, I_C = 10mA V_{CE} = 5V, I_C = 2A	10 8		 40	
V_{CE}(sat)	Collector-Emitter Saturation Voltage	I_C = 0.5A, I_B = 0.1A I_C = 1A, I_B = 0.2A I_C = 2.5A, I_B = 0.5A			0.7 1.0 1.5	V
V_{BE}(sat)	Base-Emitter Saturation Voltage	I_C = 0.5A, I_B = 0.1A I_C = 1A, I_B = 0.2A I_C = 2.5A, I_B = 0.5A			1.1 1.2 1.3	V
V_f	Internal Diode Forward Voltage Drop	I_F = 2A			2.5	V
Inductive Load Switching (V_{CC} = 200V)						
t_{stg}	Storage Time	I_C = 2A, I_{B1} = 0.4A V_{BE}(off) = -5V, L = 200μH		0.6		μs
tf	Fall Time			0.1		
Resistive Load Switching (V_{CC} = 250V)						
t_{stg}	Storage Time	I_C = 2A, I_{B1} = I_{B2} = 0.4A T_P = 30μs			2.9	μs
tf	Fall Time			0.2		

* Pulse test: PW≤300μs, Duty cycle≤2%

Thermal Characteristics

Symbol	Parameter	Max.	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.78	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	62.5	°C/W

Typical Characteristics

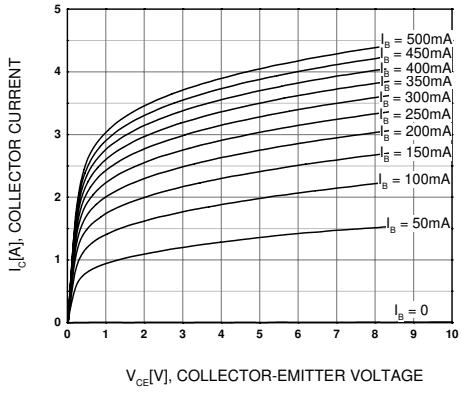


Figure 1. Static Characteristic

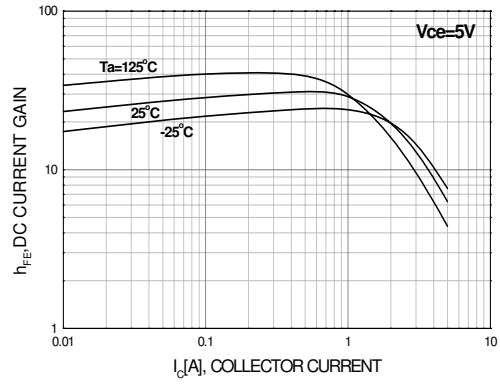


Figure 2. DC Current Gain

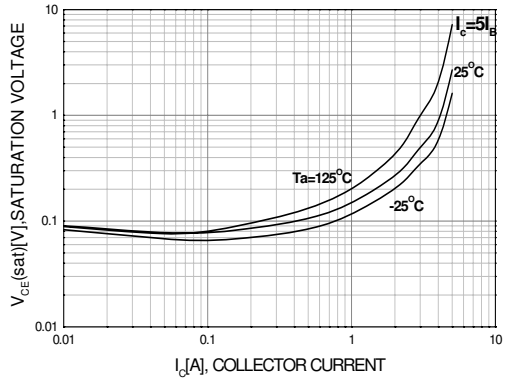


Figure 3. Collector-Emitter Saturation Voltage

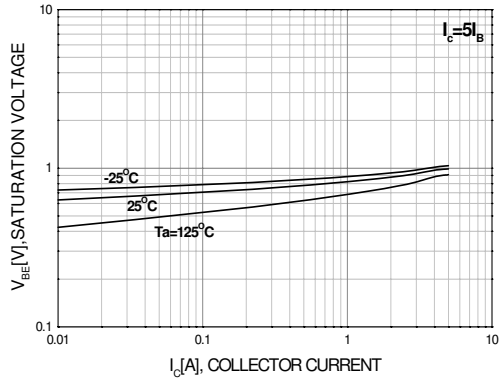


Figure 4. Base-Emitter Saturation Voltage

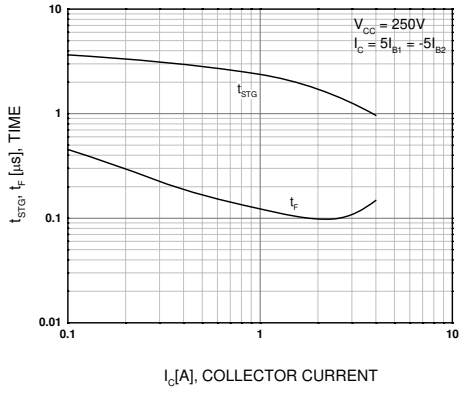


Figure 5. Resitive Load Switching Time

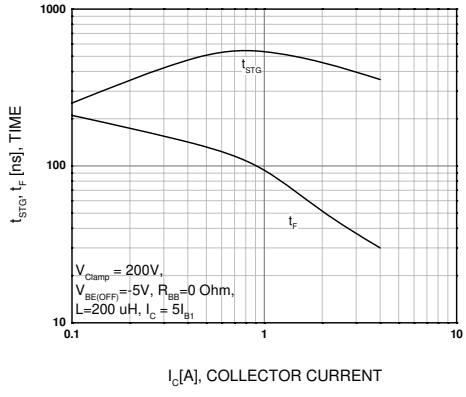


Figure 6. Inductive Load Switching Time

Typical Characteristics (Continued)

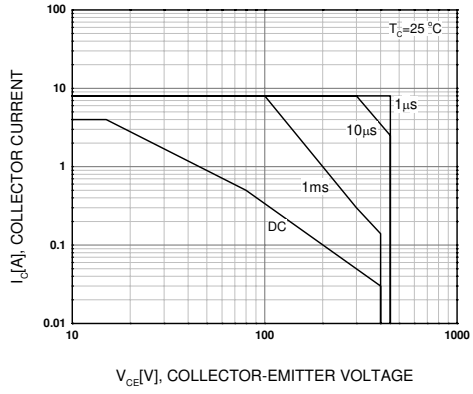


Figure 1. Forward Bias Safe Operating Area

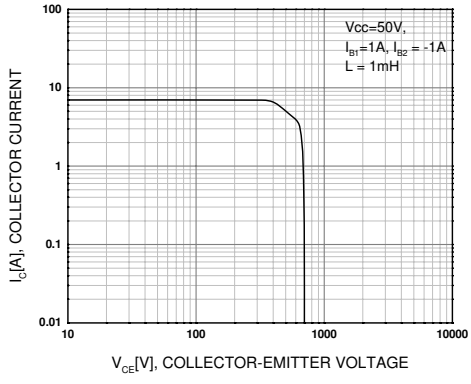


Figure 2. Reverse Bias Safe Operating Area

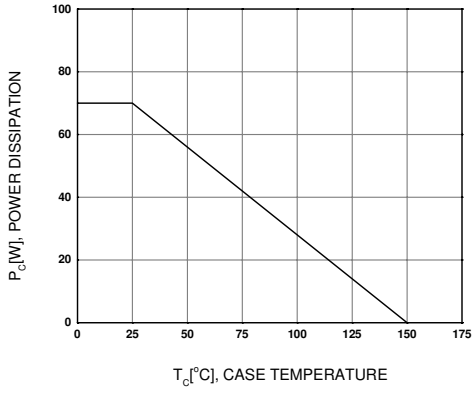
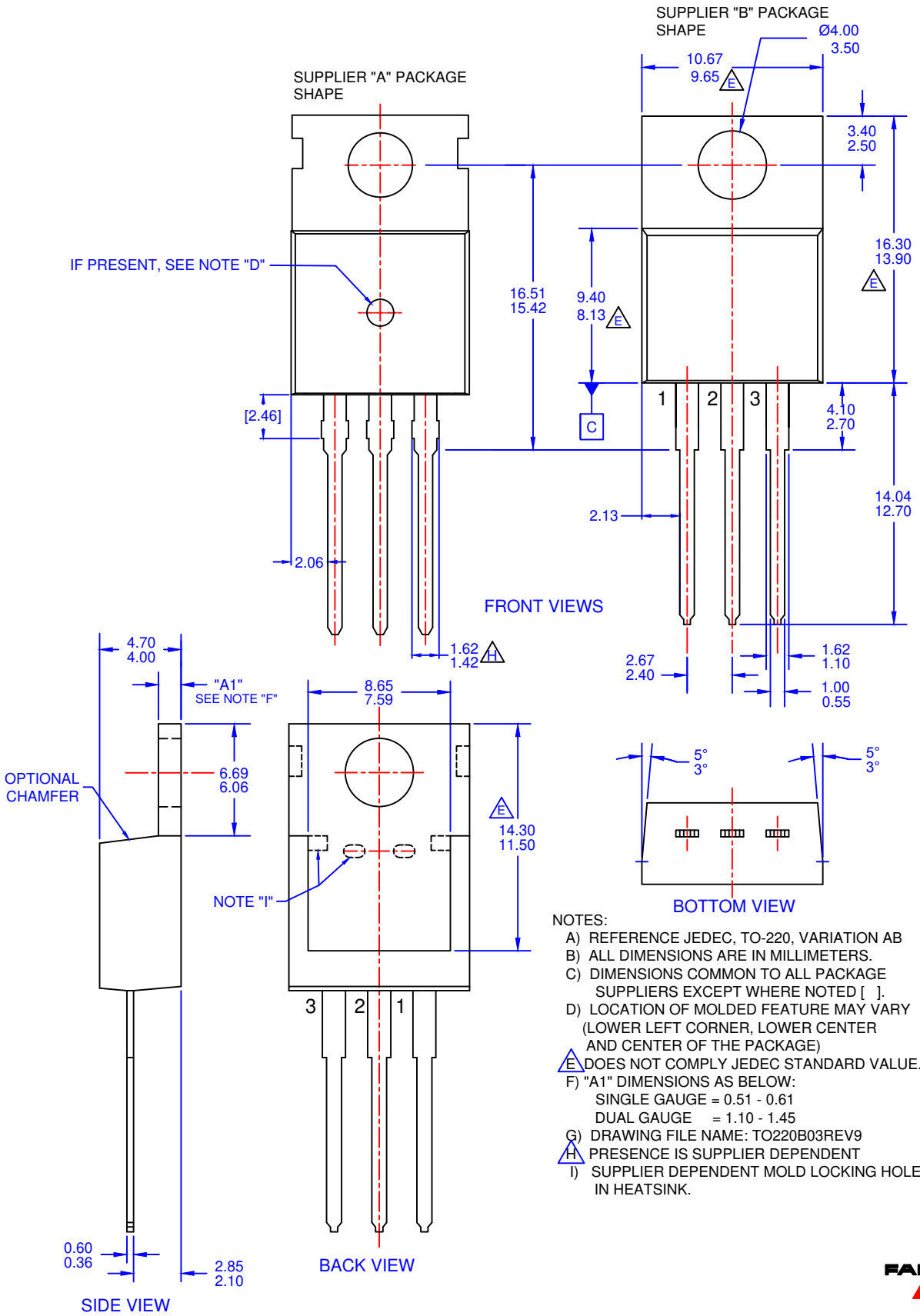


Figure 3. Power Derating



NOTES:

A) REFERENCE JEDEC, TO-220, VARIATION AB
B) ALL DIMENSIONS ARE IN MILLIMETERS.
C) DIMENSIONS COMMON TO ALL PACKAGE SUPPLIERS EXCEPT WHERE NOTED [ ].
D) LOCATION OF MOLDED FEATURE MAY VARY (LOWER LEFT CORNER, LOWER CENTER AND CENTER OF THE PACKAGE)
E DOES NOT COMPLY JEDEC STANDARD VALUE.
F) "A1" DIMENSIONS AS BELOW:
SINGLE GAUGE = 0.51 - 0.61
DUAL GAUGE = 1.10 - 1.45
G) DRAWING FILE NAME: TO220B03REV9
H PRESENCE IS SUPPLIER DEPENDENT
I) SUPPLIER DEPENDENT MOLD LOCKING HOLES IN HEATSINK.

FAIRCHILD

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