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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.

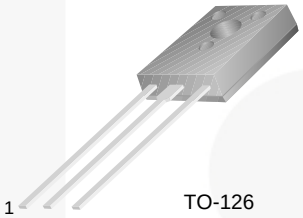
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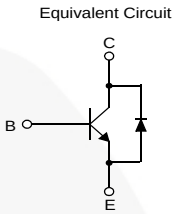
June 2014

FJE5304D
NPN Triple Diffused Planar Silicon Transistor

Features

- High-Voltage, High-Speed Power Switch Applications
- Wide Safe Operating Area
- Built-in Free-Wheeling diode
- Suitable for Electronic Ballast Applications
- Small Variance in Storage Time





Ordering Information

Part Number	Top Mark	Package	Packing Method
FJE5304D	J5304D	TO-126 3L	Bulk
FJE5304DTU	J5304D	TO-126 3L	Rail

Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at T_C = 25°C unless otherwise noted.

Symbol	Parameter	Value	Unit
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)(1)	8	A
I_B	Base Current (DC)	2	A
I_{BP}	Base Current (Pulse)(1)	4	A
T_{STG}	Storage Temperature Range	-65 to 150	°C

Note:

1. Pulse test: pulse width ≤ 300 μs, duty cycle ≤ 2%.

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Thermal Characteristics

Values are at T_C = 25°C unless otherwise noted.

Symbol	Parameter	Max.	Unit
P_C	Collector Dissipation (T_C = 25°C)	30	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case	4.17	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	83.3	°C/W

Electrical Characteristics[2]

Values are at T_C = 25°C unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{CBO}	Collector-Base Breakdown Voltage	I_C = 1 mA, I_E = 0	700			V
BV_{CEO}	Collector-Emitter Breakdown Voltage	I_C = 5 mA, I_B = 0	400			V
BV_{EBO}	Emitter-Base Breakdown Voltage	I_E = 1 mA, I_C = 0	12			V
I_{CES}	Collector Cut-Off Current	V_{CE} = 700 V, V_{EB} = 0			100	µA
I_{CEO}	Collector Cut-Off Current	V_{CE} = 400 V, I_B = 0			250	µA
I_{EBO}	Emitter Cut-Off Current	V_{EB} = 12 V, I_C = 0			100	µA
h_{FE}	DC Current Gain	V_{CE} = 5 V, I_C = 10 mA	10			
		V_{CE} = 5 V, I_C = 2 A	8		40	
V_{CE}(sat)	Collector-Emitter Saturation Voltage	I_C = 0.5 A, I_B = 0.1 A			0.7	V
		I_C = 1 A, I_B = 0.2 A			1.0	
		I_C = 2.5 A, I_B = 0.5 A			1.5	
V_{BE}(sat)	Collector-Base Saturation Voltage	I_C = 0.5 A, I_B = 0.1 A			1.1	V
		I_C = 1 A, I_B = 0.2 A			1.2	
		I_C = 2.5 A, I_B = 0.5 A			1.3	
V_f	Internal Diode Forward Voltage Drop	I_F = 2 A			2.5	V
Inductive Load Switching (V_{CC} = 200 V)						
t_{stg}	Storage Time	I_C = 2 A, I_{B1} = 0.4 A, V_{BE}(off) = -5 V, L = 200 µH		0.6		µs
t_f	Fall Time			0.1		µs
Resistive Load Switching (V_{CC} = 250 V)						
t_{stg}	Storage Time	I_C = 2 A, I_{B1} = I_{B2} = 0.4 A, T_P = 30 µs			2.9	µs
t_f	Fall Time			0.2		µs

Note:

2. Pulse test: pulse width ≤ 300 µs, duty cycle ≤ 2%.

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Typical Performance Characteristics

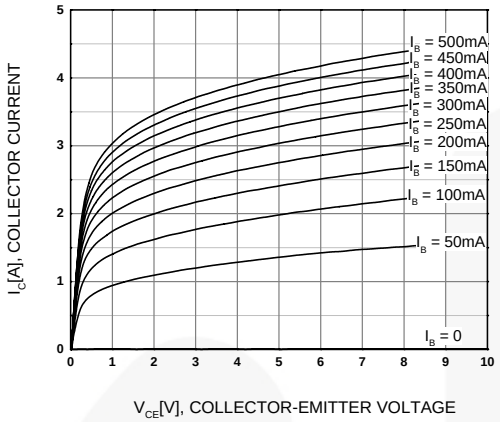


Figure 1. Static Characteristic

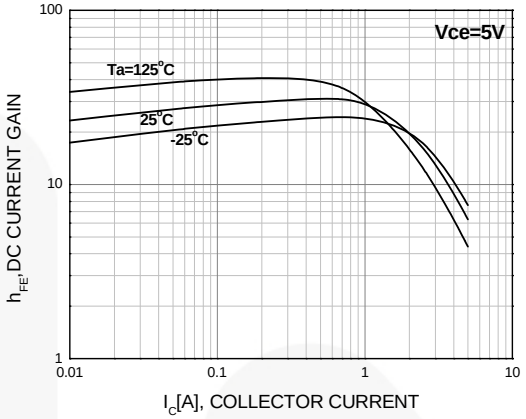


Figure 2. DC Current Gain

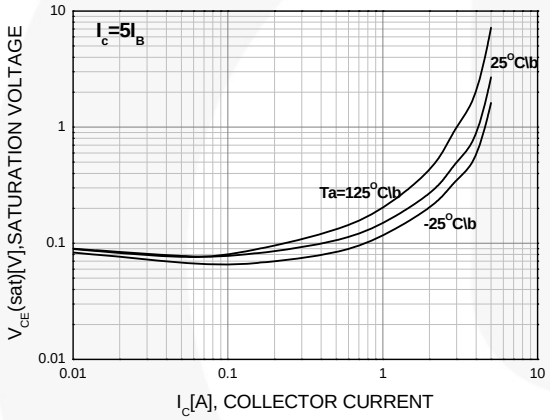


Figure 3. Collector-Emitter Saturation Voltage

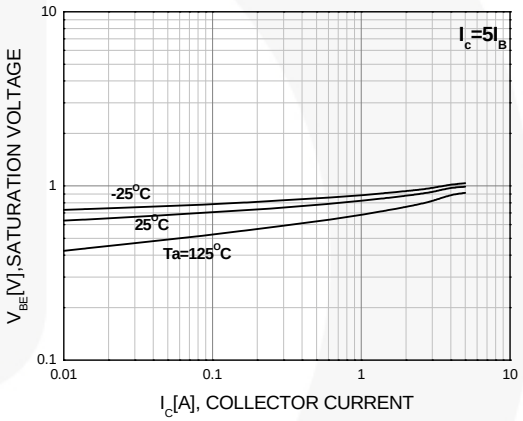


Figure 4. Base-Emitter Saturation Voltage

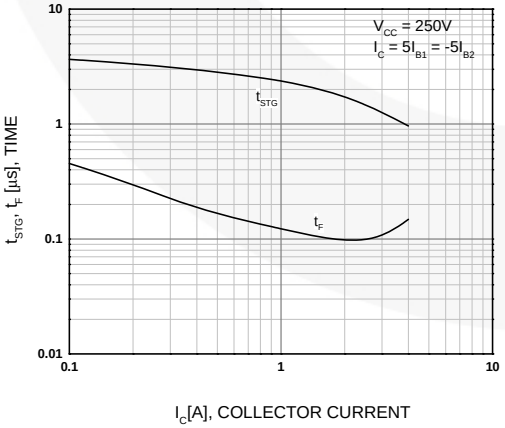


Figure 5. Resistive Load Switching Time

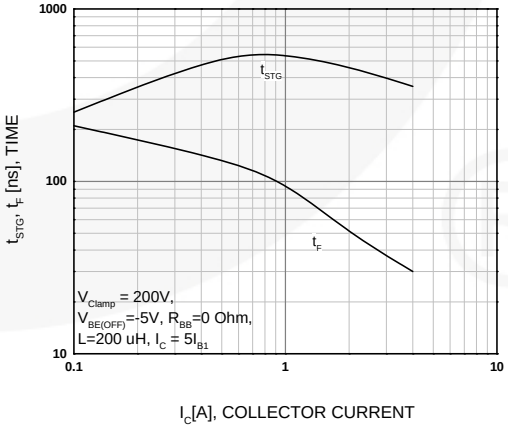


Figure 6. Inductive Load Switching Time

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Typical Performance Characteristics (Continued)

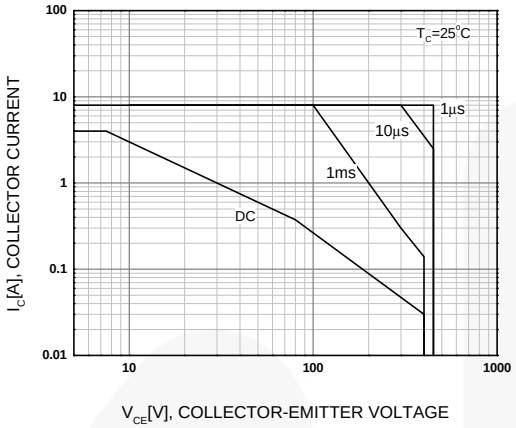


Figure 7. Forward Bias Safe Operating Area

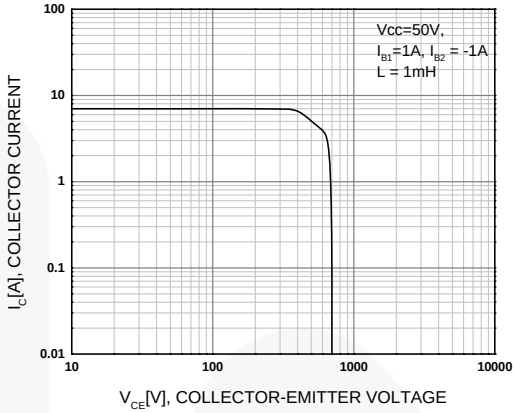


Figure 8. Reverse Bias Safe Operating Area

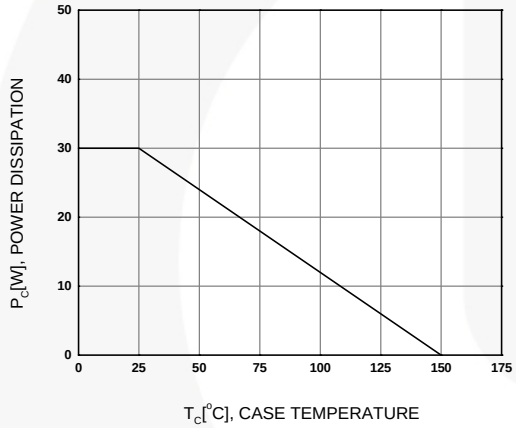
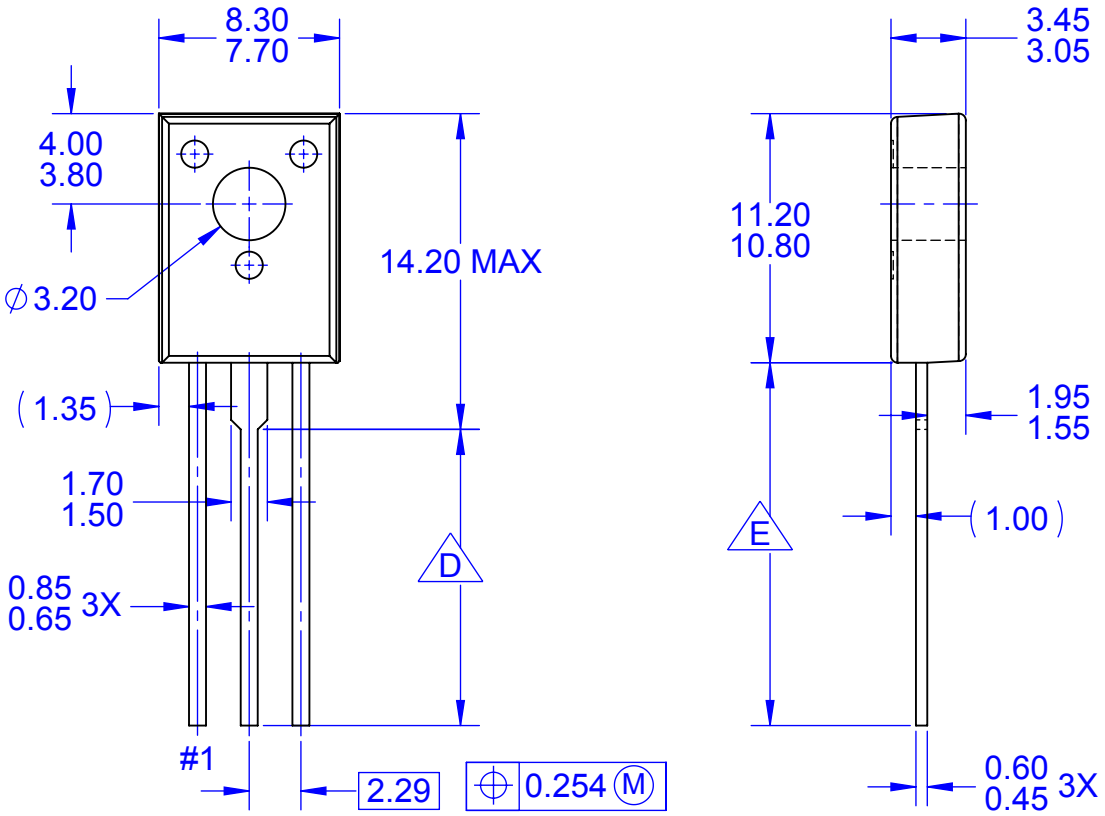


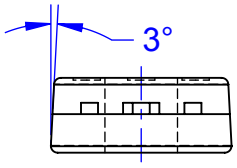
Figure 9. Power Derating

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TOP VIEW

SIDE VIEW



FRONT VIEW

PRODUCTION CODE	TERMINAL LENGTH "D"	TERMINAL LENGTH "E"
TSSTU	3.45 - 4.05	6.45-7.45
TSTU	2.36 - 2.96	5.36-6.36
NONE (STD LENGTH)	12.76 - 13.36	15.76-16.76

NOTES:

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B. ALL DIMENSIONS ARE IN MILLIMETERS
C. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR PROTRUSIONS

△D FOR TERMINAL LENGTH "D", REFER TO TABLE

△E FOR TERMINAL LENGTH "E", REFER TO TABLE

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