

# NPN Silicon Transistor

## FJB5555

### Features

- Fast Speed Switching
- Wide Safe Operating Area
- High Voltage Capability
- This is a Pb-Free and Halide Free Device

### Applications

- Electronic Ballast
- Switched Mode Power Supplies

### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25\text{ }^{\circ}\text{C}$ , unless otherwise noted)

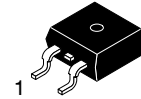
Symbol	Parameter	Value	Unit
$BV_{CBO}$	Collector-Base Voltage	1050	V
$BV_{CEO}$	Collector-Emitter Voltage	400	V
$BV_{EBO}$	Emitter-Base Voltage	14	V
$I_C$	Collector Current (DC)	5	A
$I_{CP}$	Collector Current (Pulse)	10	A
$I_B$	Base Current (DC)	2	A
$I_{BP}$	Base Current (Pulse)	4	A
$T_J$	Junction Temperature	150	$^{\circ}\text{C}$
$T_{STG}$	Storage Junction Temperature Range	-55 to +150	$^{\circ}\text{C}$

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

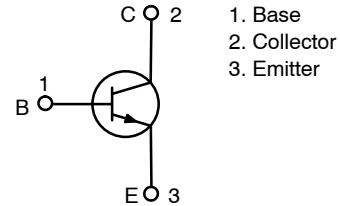
### THERMAL CHARACTERISTICS ( $T_A = 25\text{ }^{\circ}\text{C}$ , unless otherwise noted)

Symbol	Parameter	Value	Unit
$P_D$	Total Device Dissipation	$T_A = 25\text{ }^{\circ}\text{C}$	1.6 W
		$T_C = 25\text{ }^{\circ}\text{C}$	100 W
$R_{\theta ja}$	Thermal Resistance, Junction to Ambient (Note 1)	77.75	$^{\circ}\text{C/W}$
$R_{\theta jc}$	Thermal Resistance Junction to Case (Note 2)	1.25	$^{\circ}\text{C/W}$

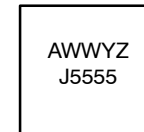
1. Device mounted on FR-4 PCB, board size = 101.5 mm × 114.5 mm.
2.  $R_{\theta jc}$  test fixture under infinite cooling condition.



D2PAK-3  
(TO-263, 3-LEAD)  
CASE 418AJ



### MARKING DIAGRAM



A = Assembly Location  
 WW = Work Week  
 Y = Year  
 Z = Lot Traceability  
 J5555 = Specific Device Code

### ORDERING INFORMATION

Device	Package	Shipping <sup>†</sup>
FJB5555TM	D2PAK-3 (TO-263, 3-LEAD)	800 / Tape & Reel

<sup>†</sup>For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, [BRD8011/D](#).

**ELECTRICAL CHARACTERISTICS** ( $T_C = 25\text{ }^{\circ}\text{C}$  unless otherwise noted) (Note 3)

Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
$BV_{CBO}$	Collector-Base Breakdown Voltage	$I_C = 500\text{ }\mu\text{A}$ , $I_E = 0$	1050	–	–	V
$BV_{CEO}$	Collector-Emitter Breakdown Voltage	$I_C = 5\text{ mA}$ , $I_B = 0$	400	–	–	V
$BV_{EBO}$	Emitter-Base Breakdown Voltage	$I_E = 500\text{ }\mu\text{A}$ , $I_C = 0$	14	–	–	V
$h_{FE}$	DC Current Gain	$V_{CE} = 5\text{ V}$ , $I_C = 10\text{ mA}$	10	–	–	
		$V_{CE} = 3\text{ V}$ , $I_C = 0.8\text{ A}$	20	–	40	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 1\text{ A}$ , $I_B = 0.2\text{ A}$	–	0.17	0.50	V
		$I_C = 3.5\text{ A}$ , $I_B = 1.0\text{ A}$	–	–	1.5	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 3.5\text{ A}$ , $I_B = 1.0\text{ A}$	–	–	1.2	V
$C_{ob}$	Output Capacitance	$V_{CB} = 10\text{ V}$ , $f = 1\text{ MHz}$	–	45	–	pF
$t_{ON}$	Turn-On Time	$V_{CC} = 125\text{ V}$ , $I_C = 0.5\text{ A}$ , $I_{B1} = 45\text{ mA}$ , $I_{B2} = -0.5\text{ A}$ , $R_L = 250\text{ }\Omega$	–	–	1.0	$\mu\text{s}$
$t_{STG}$	Storage Time		–	–	1.2	$\mu\text{s}$
$t_F$	Fall Time		–	0.3	–	$\mu\text{s}$
$t_{ON}$	Turn-On Time	$V_{CC} = 250\text{ V}$ , $I_C = 2.5\text{ A}$ , $I_{B1} = 0.5\text{ A}$ , $I_{B2} = -1.0\text{ A}$ , $R_L = 100\text{ }\Omega$	–	–	2.0	$\mu\text{s}$
$t_{STG}$	Storage Time		–	–	2.5	$\mu\text{s}$
$t_F$	Fall Time		–	–	0.3	$\mu\text{s}$
EAS	Avalanche Energy	$L = 2\text{ mH}$	6	–	–	mJ

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

3. Pulse test: pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$

## TYPICAL PERFORMANCE CHARACTERISTICS

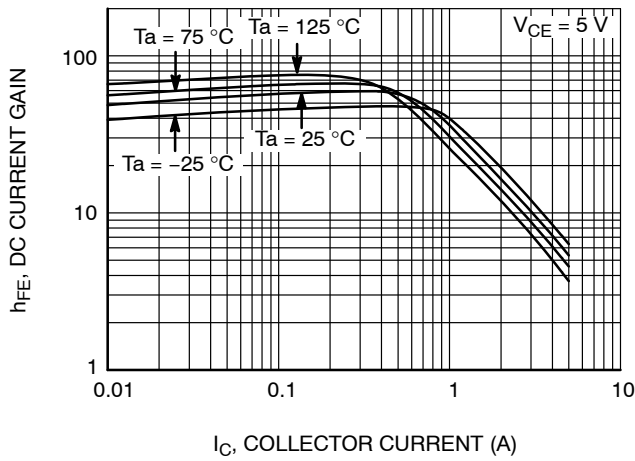


Figure 1. DC Current Gain

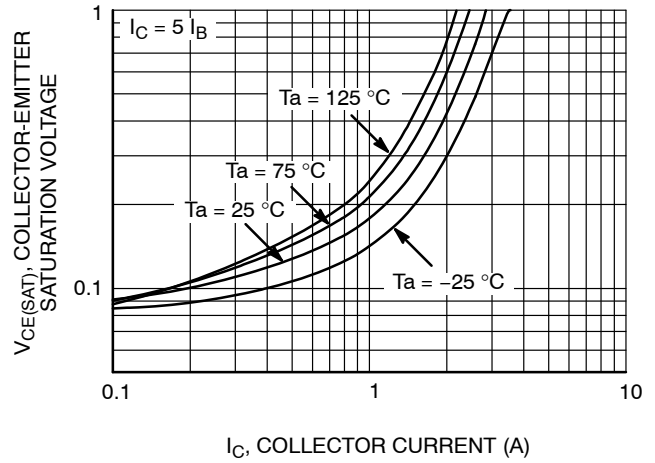


Figure 2. Saturation Voltage

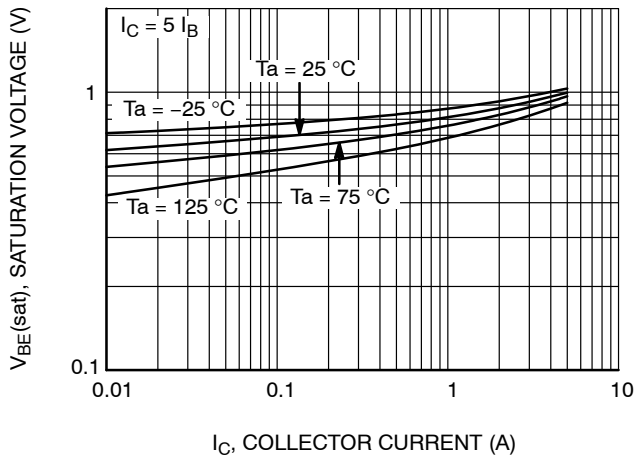


Figure 3. Saturation Voltage

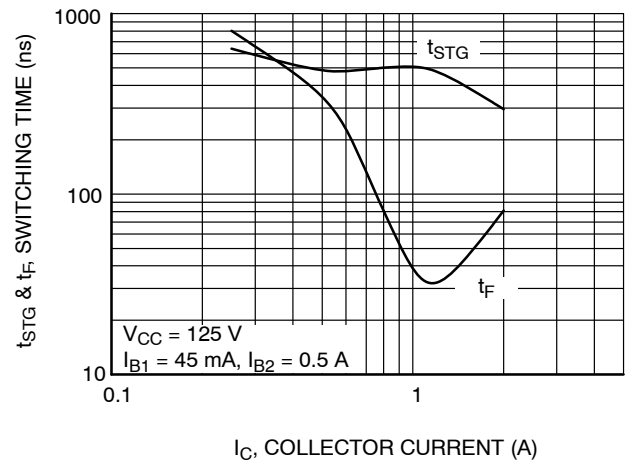


Figure 4. Resistive Load Switching

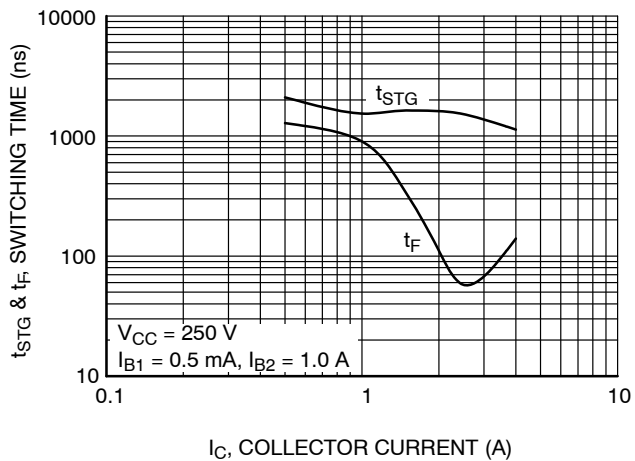


Figure 5. Resistive Load Switching

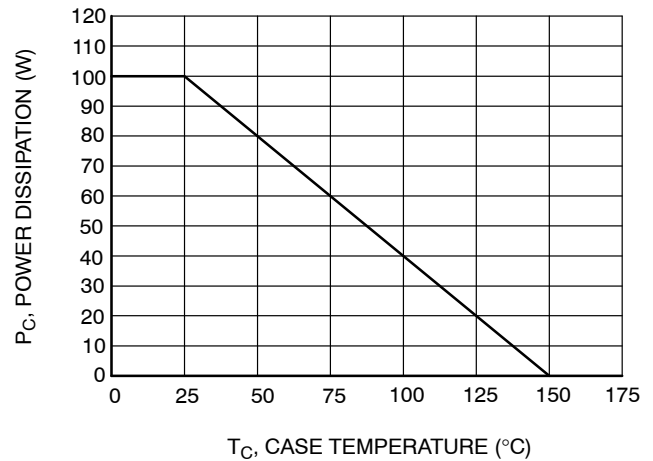
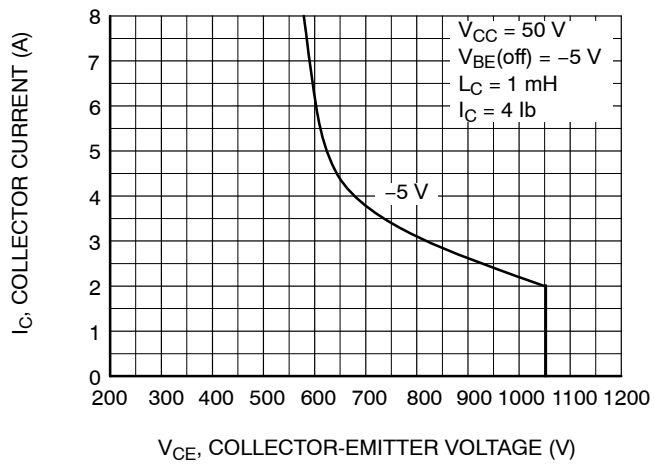
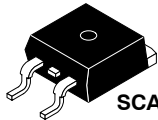


Figure 6. Power Derating

## TYPICAL PERFORMANCE CHARACTERISTICS (continued)

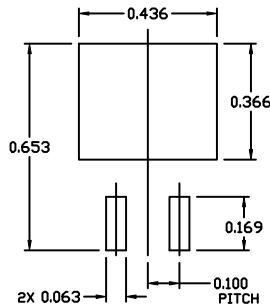
**Figure 7. Reverse Bias Safe Operating**



SCALE 1:1

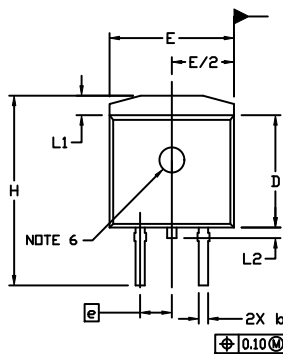
**D<sup>2</sup>PAK-3 (TO-263, 3-LEAD)**  
CASE 418AJ  
ISSUE F

DATE 11 MAR 2021



**RECOMMENDED  
MOUNTING FOOTPRINT**

For additional information on our Pb-free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

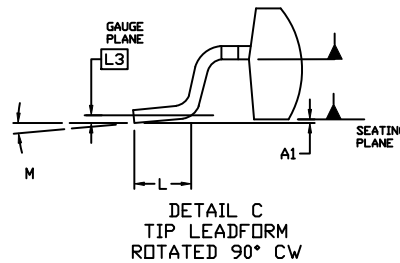
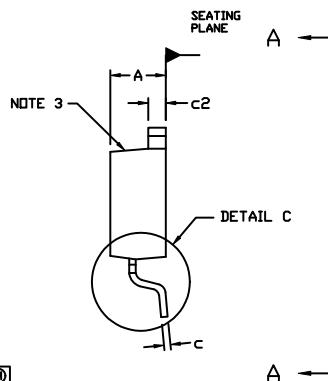


VIEW A-A

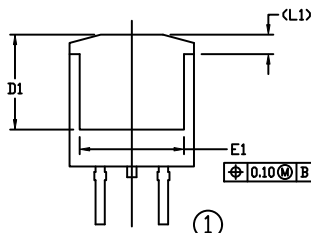
**NOTES:**

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2009.
2. CONTROLLING DIMENSION: INCHES
3. CHAMFER OPTIONAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED 0.005 PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY AT DATUM H.
5. THERMAL PAD CONTOUR IS OPTIONAL WITHIN DIMENSIONS E, L1, D1, AND E1.
6. OPTIONAL MOLD FEATURE.
7. ①, ② ... OPTIONAL CONSTRUCTION FEATURE CALL OUTS.

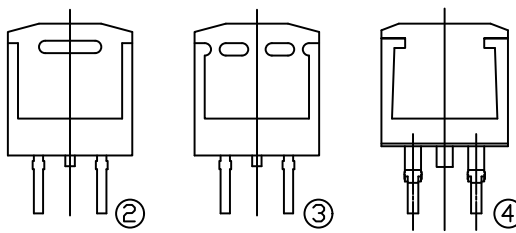
DIM	INCHES		MILLIMETERS	
	MIN.	MAX.	MIN.	MAX.
A	0.160	0.190	4.06	4.83
A1	0.000	0.010	0.00	0.25
b	0.020	0.039	0.51	0.99
c	0.012	0.029	0.30	0.74
c2	0.045	0.065	1.14	1.65
D	0.330	0.380	8.38	9.65
D1	0.260	---	6.60	---
E	0.380	0.420	9.65	10.67
E1	0.245	---	6.22	---
e	0.100 BSC	---	2.54 BSC	---
H	0.575	0.625	14.60	15.88
L	0.070	0.110	1.78	2.79
L1	---	0.066	---	1.68
L2	---	0.070	---	1.78
L3	0.010 BSC	---	0.25 BSC	---
M	0°	8°	0°	8°



DETAIL C  
TIP LEADFORM  
ROTATED 90° CW

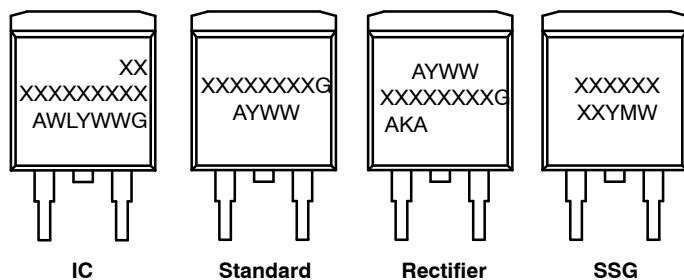


VIEW A-A



VIEW A-A  
OPTIONAL CONSTRUCTIONS

**GENERIC MARKING DIAGRAMS\***



XXXXXX = Specific Device Code  
A = Assembly Location  
WL = Wafer Lot  
Y = Year  
WW = Work Week  
W = Week Code (SSG)  
M = Month Code (SSG)  
G = Pb-Free Package  
AKA = Polarity Indicator

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "•", may or may not be present. Some products may not follow the Generic Marking.

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