

# NPN Silicon Transistor

## FJP5555

### Features

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

### Applications

- Electronic Ballast
- Switch Mode Power Supplies

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

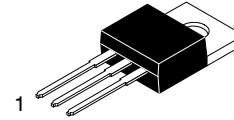
| Symbol     | Parameter                 | Value       | Unit               |
|------------|---------------------------|-------------|--------------------|
| $BV_{CBO}$ | Collector-Base Voltage    | 1050        | V                  |
| $BV_{CEO}$ | Collector-Emitter Voltage | 400         | V                  |
| $BV_{EBO}$ | 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 Temperature       | -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.

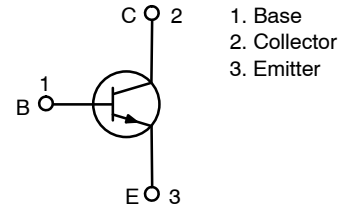
### THERMAL CHARACTERISTICS ( $T_A = 25\text{ }^{\circ}\text{C}$ , unless otherwise noted)

| Symbol          | Parameter                                        | Value                              | Unit                 |
|-----------------|--------------------------------------------------|------------------------------------|----------------------|
| $P_D$           | Total Device Dissipation                         | $T_A = 25\text{ }^{\circ}\text{C}$ | 1.38 W               |
|                 |                                                  | $T_C = 25\text{ }^{\circ}\text{C}$ | 75 W                 |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient (Note 1) | 90                                 | $^{\circ}\text{C/W}$ |
| $R_{\theta JC}$ | Thermal Resistance, Junction to Case (Note 2)    | 1.66                               | $^{\circ}\text{C/W}$ |

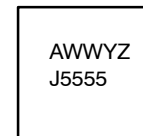
1.  $R_{\theta JA}$  test board and fixture under natural convection, JESD51-10 recommended thermal test board.
2.  $R_{\theta JC}$  test fixture under infinite cooling condition.



TO-220-3LD  
CASE 340AT



### MARKING DIAGRAM



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

### ORDERING INFORMATION

| Device    | Package    | Shipping          |
|-----------|------------|-------------------|
| FJP5555TU | TO-220-3LD | 1000 Units / Tube |

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

| Symbol        | Parameter                            | Test Condition                                                                                                                       | Min  | Typ | Max | Unit          |
|---------------|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|------|-----|-----|---------------|
| $BV_{CBO}$    | Collector-Base Voltage               | $I_C = 500\text{ }\mu\text{A}$ , $I_E = 0$                                                                                           | 1050 | –   | –   | V             |
| $BV_{CEO}$    | Collector-Emitter Voltage            | $I_C = 5\text{ mA}$ , $I_B = 0$                                                                                                      | 400  | –   | –   | V             |
| $BV_{EBO}$    | Emitter-Base 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 | $I_C = 1\text{ A}$ , $I_B = 0.2\text{ A}$                                                                                            | –    | –   | 0.5 | 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                         | $V_{CC} = 125\text{ V}$ , $I_C = 0.5\text{ A}$ ,<br>$I_{B1} = 45\text{ mA}$ , $I_{B2} = 0.5\text{ A}$ ,<br>$R_L = 250\text{ }\Omega$ | –    | –   | 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                         | $V_{CC} = 250\text{ V}$ , $I_C = 2.5\text{ A}$ ,<br>$I_{B1} = 0.5\text{ A}$ , $I_{B2} = 1.0\text{ A}$ ,<br>$R_L = 100\text{ }\Omega$ | –    | –   | 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

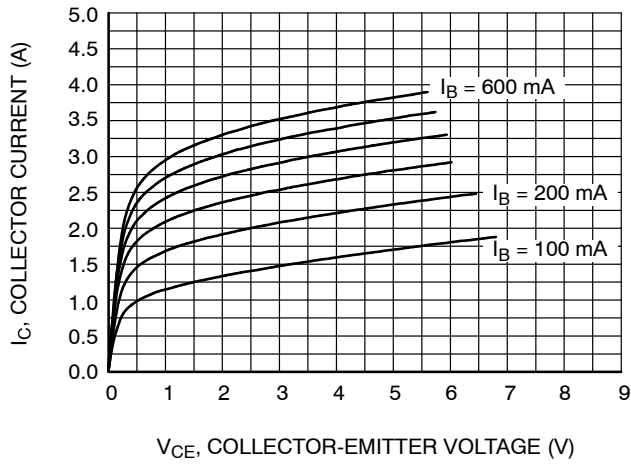


Figure 1. Static Characteristics

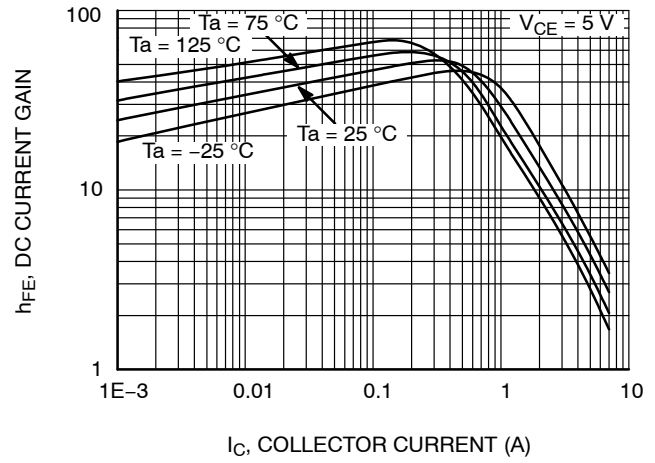


Figure 2. DC CURRENT GAIN

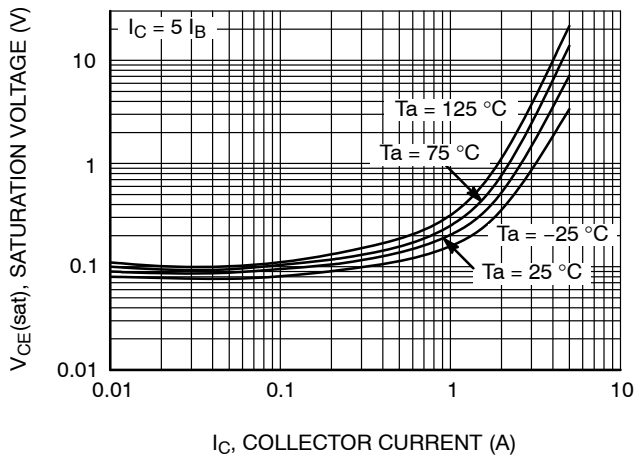


Figure 3. Saturation Voltage

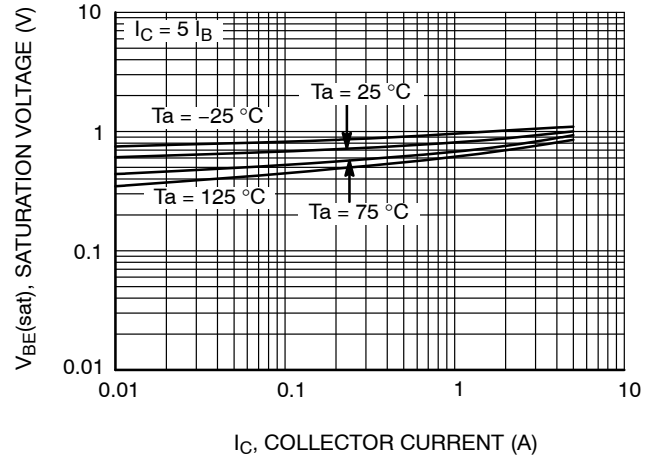


Figure 4. Saturation Voltage

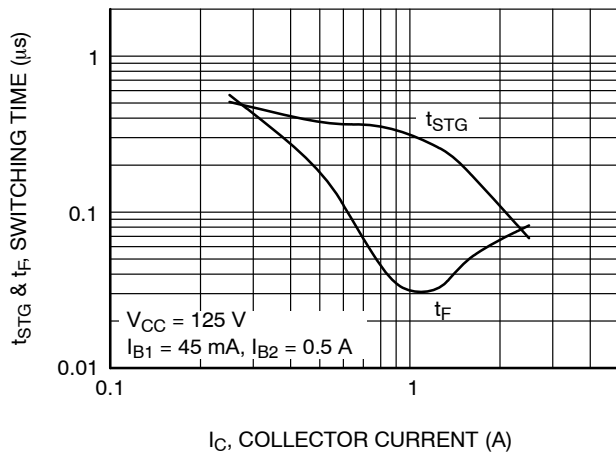


Figure 5. Resistive Load Switching

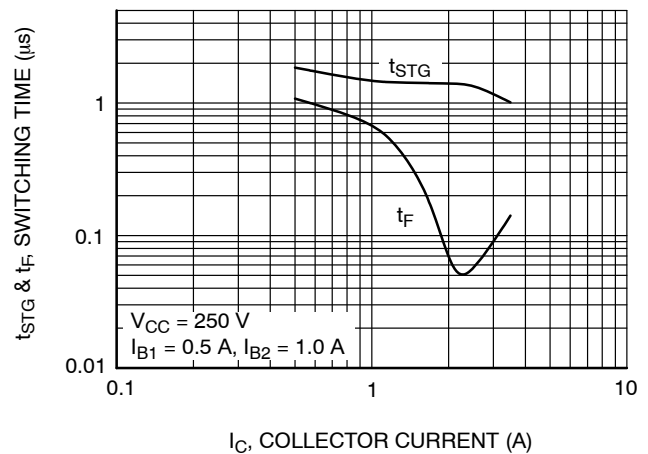


Figure 6. Resistive Load Switching

## TYPICAL PERFORMANCE CHARACTERISTICS (continued)

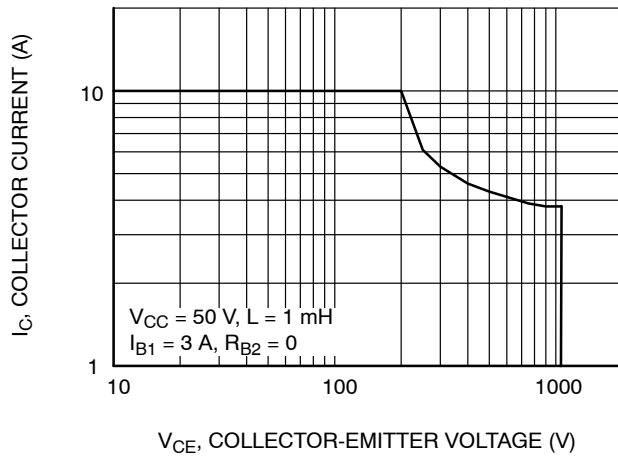


Figure 7. Reverse Biased Safe Operating Area

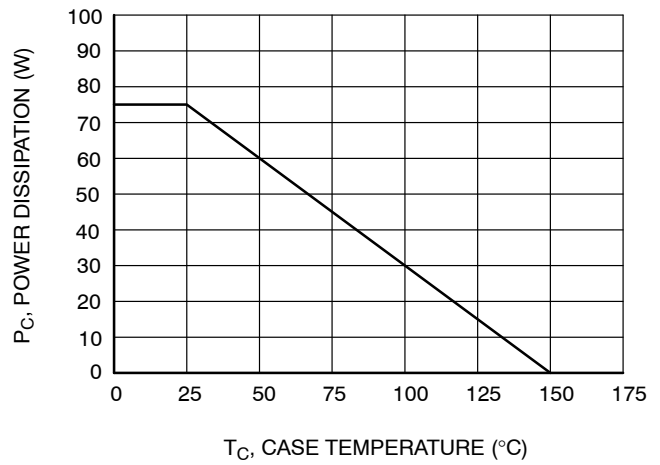


Figure 8. Power Derating

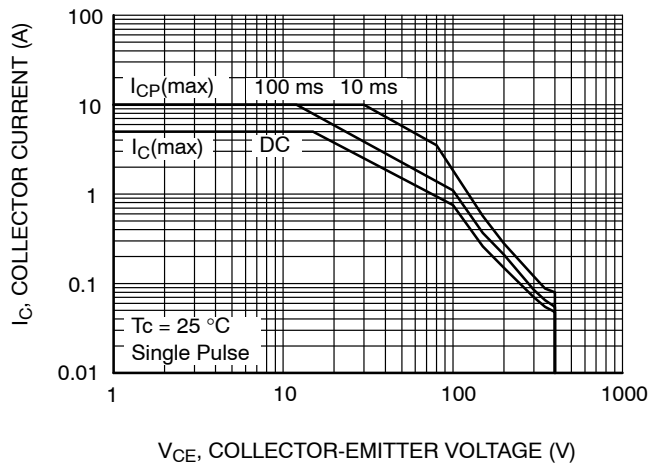
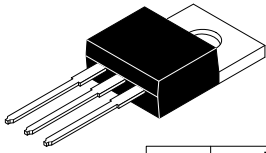


Figure 9. Forward Biased Safe Operating Area



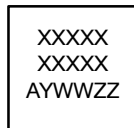
TO-220-3LD  
CASE 340AT  
ISSUE B

DATE 08 AUG 2022

| DIM | MILLIMETERS  |      |       |
|-----|--------------|------|-------|
|     | MIN.         | NOM. | MAX.  |
| A   | 4.00         | --   | 4.70  |
| A1  | SEE NOTE "F" |      |       |
| A2  | 2.10         | --   | 2.85  |
| b   | 0.55         | --   | 1.00  |
| b2  | 1.10         | --   | 1.62  |
| b4  | 1.42         | --   | 1.62  |
| c   | 0.36         | --   | 0.60  |
| D   | 13.90        | --   | 16.30 |
| D1  | 8.13         | --   | 9.40  |
| D2  | 11.50        | --   | 14.30 |
| D3  | 15.42        | --   | 16.51 |
| E   | 9.65         | --   | 10.67 |
| E1  | 7.59         | --   | 8.65  |
| e   | 2.40         | --   | 2.67  |
| H1  | 6.06         | --   | 6.69  |
| L   | 12.70        | --   | 14.04 |
| L1  | 2.70         | --   | 4.10  |
| P   | 3.50         | --   | 4.00  |
| Q   | 2.50         | --   | 3.40  |
| z   | 2.13 REF     |      |       |
| z1  | 2.06 REF     |      |       |
| θ   | 3°           | --   | 5°    |

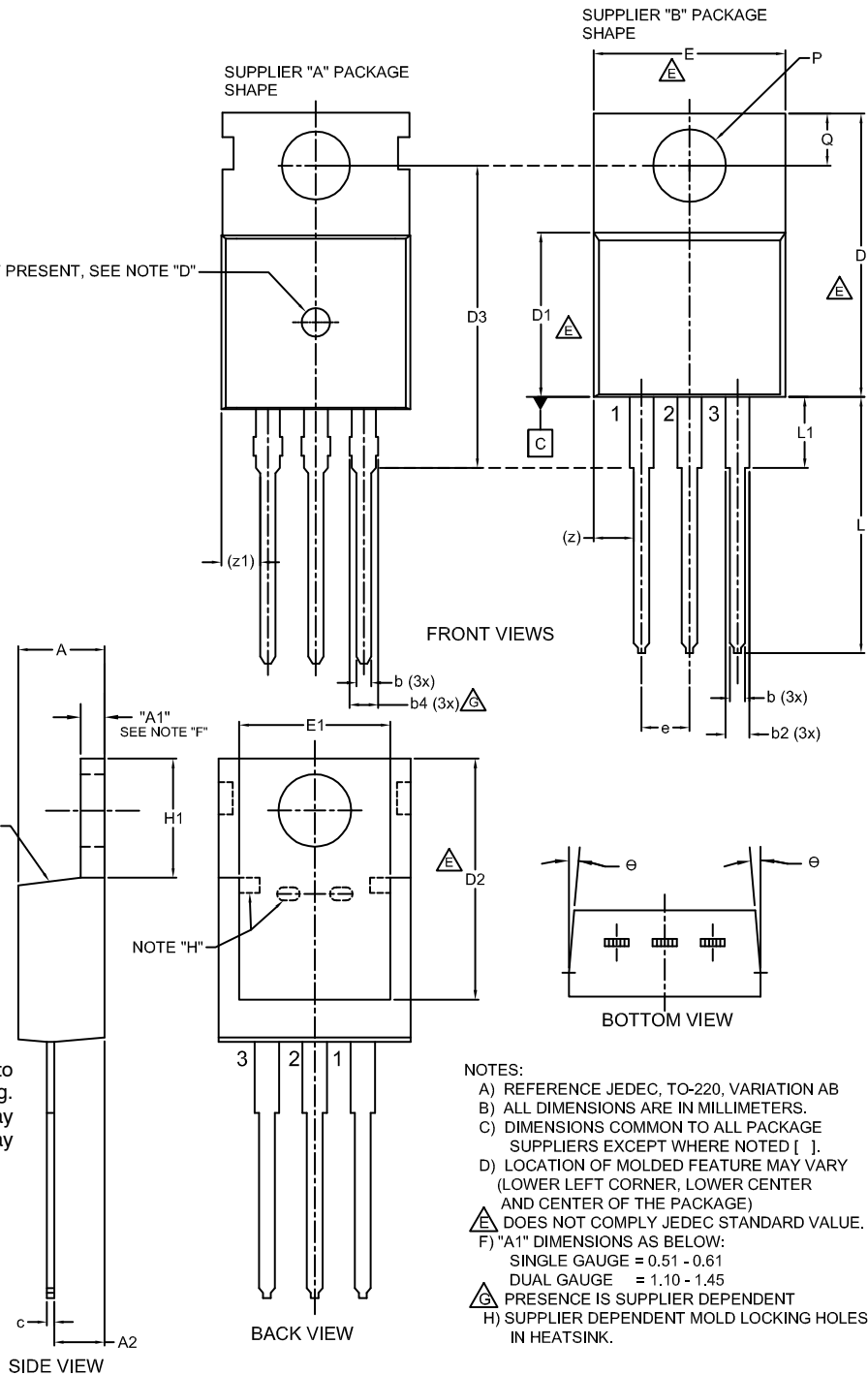
IF PRESENT, SEE NOTE "D"

GENERIC  
MARKING DIAGRAM\*



XXXX = Specific Device Code  
A = Assembly Location  
Y = Year  
WW = Work Week  
ZZ = Assembly Lot Code

\*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.



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
- PRESENCE IS SUPPLIER DEPENDENT
- H) SUPPLIER DEPENDENT MOLD LOCKING HOLES IN HEATSINK.

|                  |             |                                                                                                                                                                                     |
|------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
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