

## PNP Silicon Epitaxial Planar Transistor

2SA2153

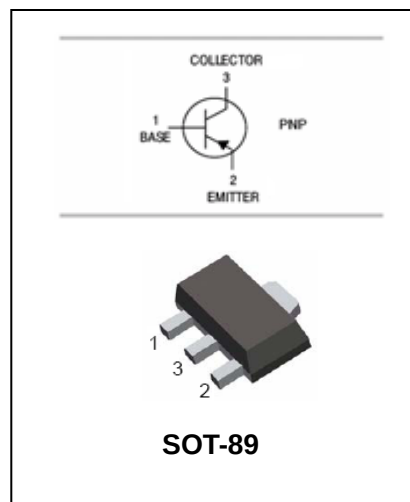
### FEATURES

- Low collector-emitter saturation voltage.
- High current capability.

**HF**

### APPLICATIONS

- Voltage Regulators.
- Relay Drivers.
- Lamp Drivers.
- Electrical Equipment.



### ORDERING INFORMATION

| Type No. | Marking | Package Code |
|----------|---------|--------------|
| 2SA2153  | AZ      | SOT-89       |

### MAXIMUM RATING @ Ta=25°C unless otherwise specified

| Symbol          | Parameter                                                                            | Value       | Units |
|-----------------|--------------------------------------------------------------------------------------|-------------|-------|
| $V_{CBO}$       | Collector-Base Voltage                                                               | -50         | V     |
| $V_{CEO}$       | Collector-Emitter Voltage                                                            | -50         | V     |
| $V_{EBO}$       | Emitter-Base Voltage                                                                 | -6          | V     |
| $I_C$           | Collector Current -Continuous                                                        | -2          | A     |
| $I_{CM}$        | Peak Pulse Current                                                                   | -4          | A     |
| $I_B$           | Base Current                                                                         | -400        | mA    |
| $P_{tot}$       | Power Dissipation<br>Surface mounted on ceramic substrate(450mm <sup>2</sup> x0.8mm) | 1.3         | W     |
| $R_{\theta JA}$ | Thermal Resistance Junction to Ambient Air                                           | 97          | °C/W  |
| $T_J$           | Junction Temperature                                                                 | 150         | °C    |
| $T_{STG}$       | Storage Temperature Range                                                            | -55 to +150 | °C    |

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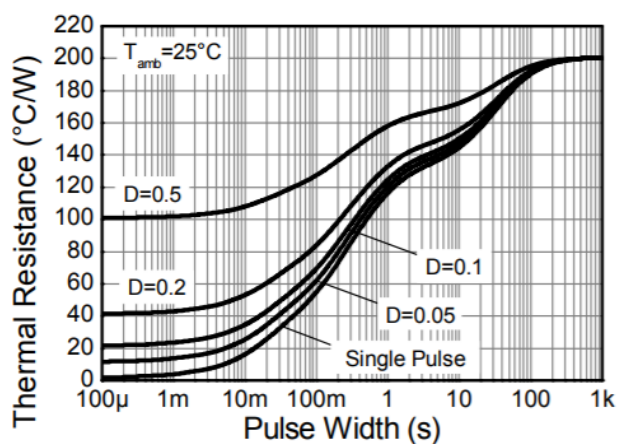
## ELECTRICAL CHARACTERISTICS @ Ta=25°C unless otherwise specified

| Parameter                            | Symbol        | Test conditions                                            | MIN | TYP   | MAX  | UNIT    |
|--------------------------------------|---------------|------------------------------------------------------------|-----|-------|------|---------|
| Collector-base breakdown voltage     | $V_{(BR)CBO}$ | $I_C = -10\mu A, I_E = 0$                                  | -50 | -     | -    | V       |
| Collector-emitter breakdown voltage  | $V_{(BR)CEO}$ | $I_C = -1mA, I_B = 0$                                      | -50 | -     | -    | V       |
| Emitter-base breakdown voltage       | $V_{(BR)EBO}$ | $I_E = -10\mu A, I_C = 0$                                  | -6  | -     | -    | V       |
| Collector cut-off current            | $I_{CBO}$     | $V_{CB} = -40V, I_E = 0$                                   | -   | -     | -1   | $\mu A$ |
| Emitter cut-off current              | $I_{EBO}$     | $V_{EB} = -4V, I_C = 0$                                    | -   | -     | -1   | $\mu A$ |
| DC current gain                      | $h_{FE}$      | $V_{CE} = -2V, I_C = -100mA$                               | 200 | -     | 560  | -       |
|                                      |               | $V_{CE} = -2V, I_C = -1.5A$                                | 40  | -     | -    |         |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C = -1A, I_B = -50mA$                                   | -   | -0.15 | -0.4 | V       |
| Base-emitter saturation voltage      | $V_{BE(sat)}$ | $I_C = -1A, I_B = -50mA$                                   | -   | -0.9  | -1.2 | V       |
| Transition frequency                 | $f_T$         | $V_{CE} = -10V, I_C = -50mA$<br>$f = 100MHz$               | 150 | -     | -    | MHz     |
| Collector output capacitance         | $C_{obo}$     | $V_{CB} = -10V, f = 1MHz$                                  | -   | -     | 25   | pF      |
| Turn-On Time                         | $t_{(on)}$    | $V_{CC} = -15V, I_C = -0.75A$<br>$I_{B1} = I_{B2} = -15mA$ | -   | 40    | -    | ns      |
| Turn-Off Time                        | $t_{(off)}$   |                                                            | -   | 435   | -    |         |

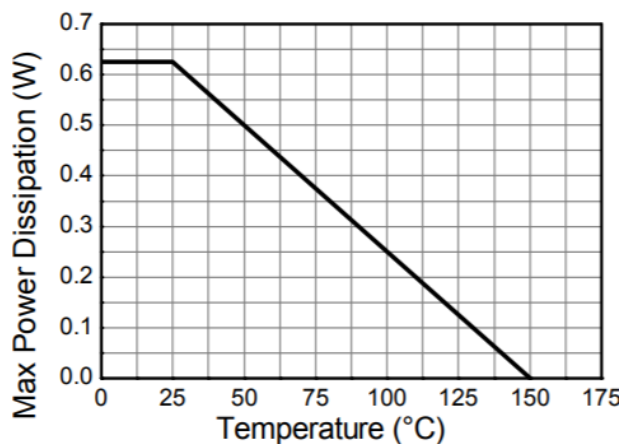
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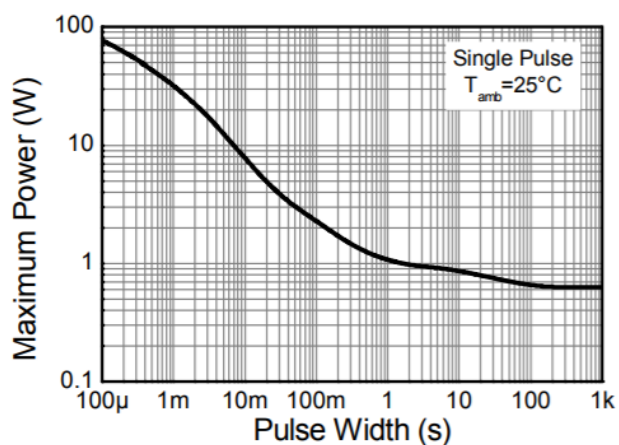
TYPICAL CHARACTERISTICS @  $T_a=25^\circ\text{C}$  unless otherwise specified



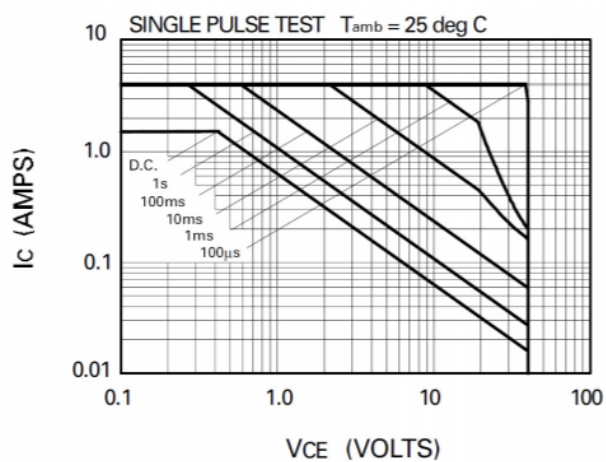
Transient Thermal Impedance



Derating Curve



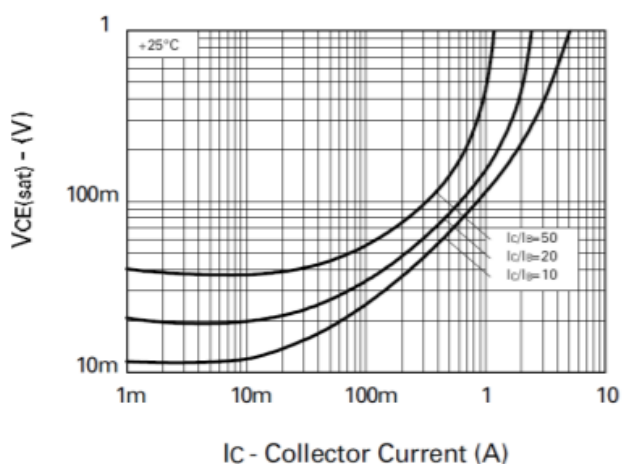
Pulse Power Dissipation



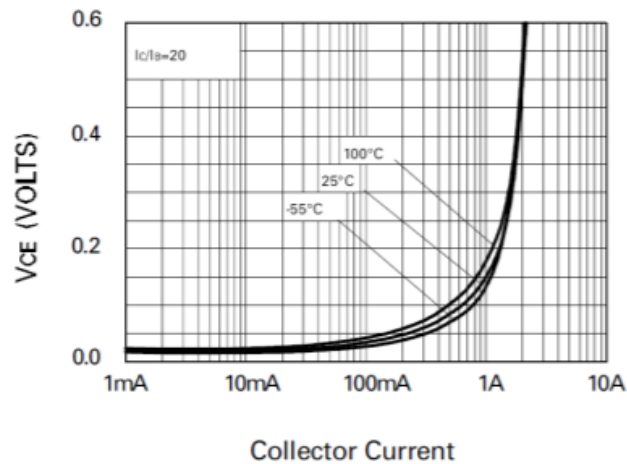
Safe Operating Area

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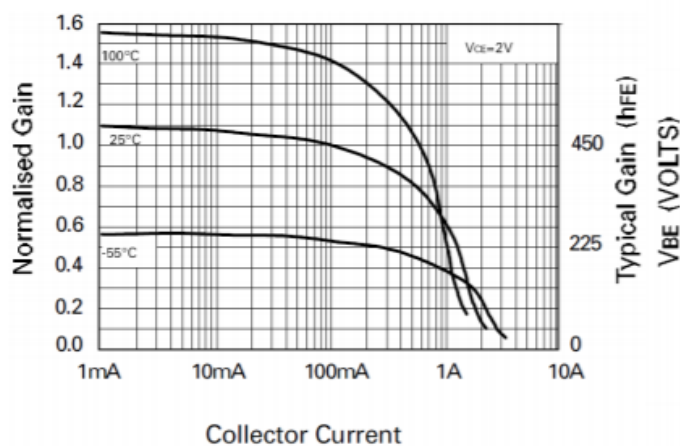


$V_{CE(sat)} v I_C$



Collector Current

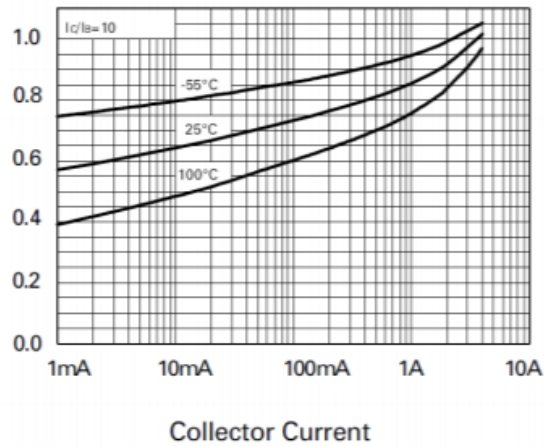
$V_{CE(sat)} vs I_C$



Collector Current

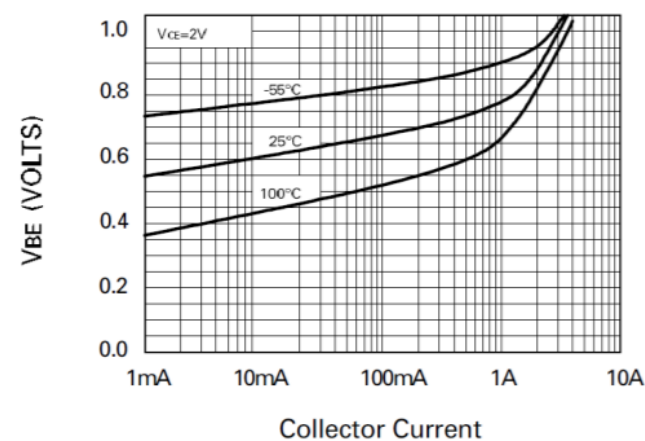
$h_{FE} vs I_C$

Typical Gain ( $h_{FE}$ )  
 $V_{BE}$  (VOLTS)



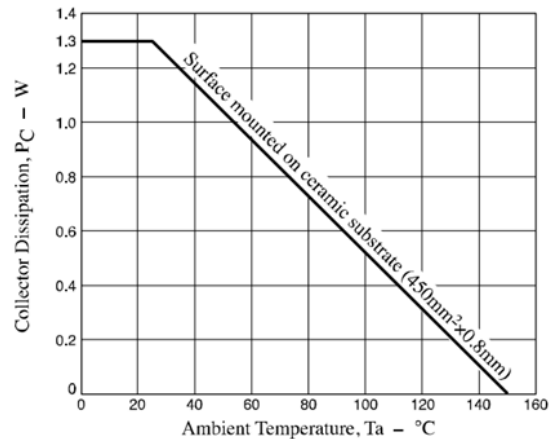
Collector Current

$V_{BE(sat)} vs I_C$



Collector Current

$V_{BE(ON)} vs I_C$



$P_C vs T_a$

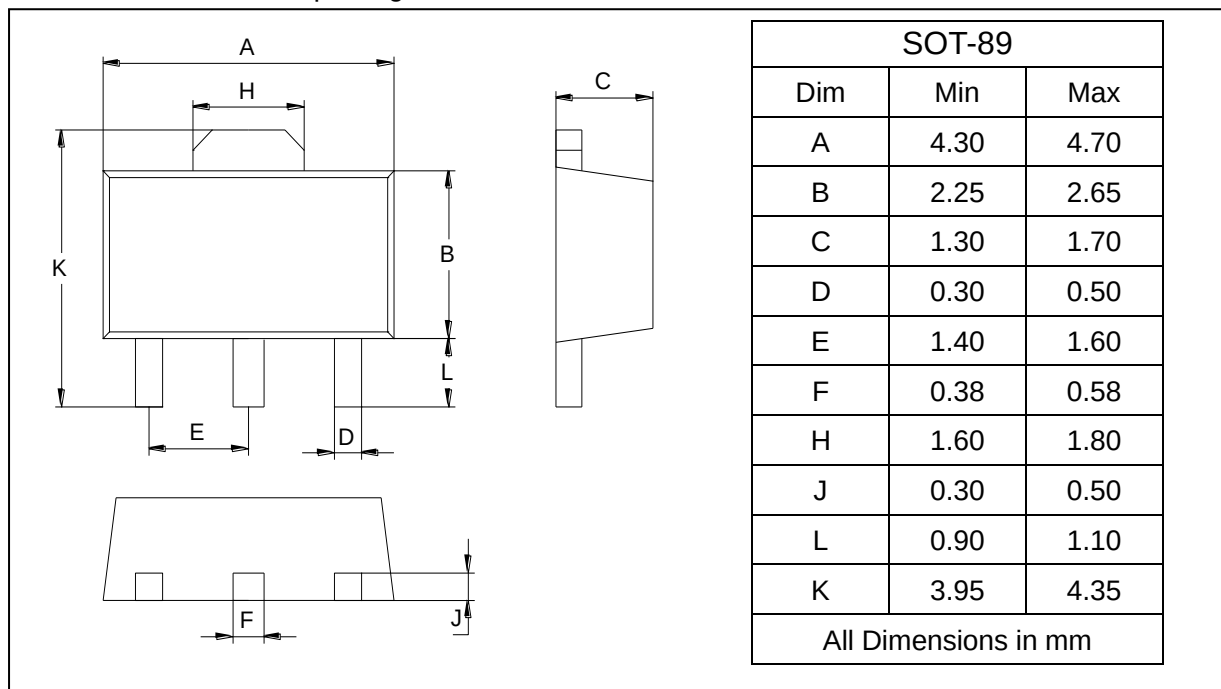
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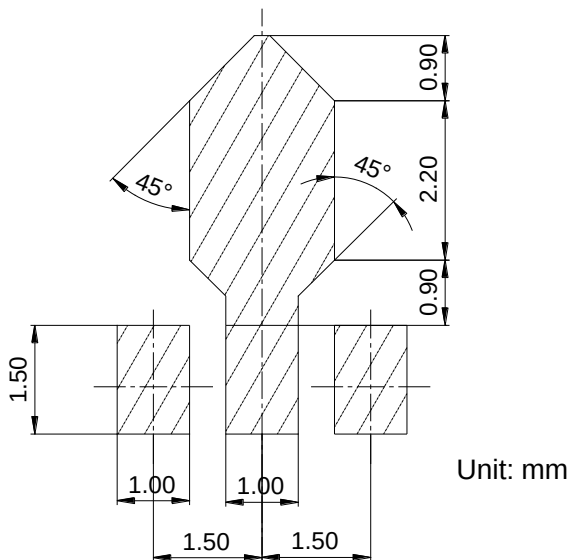
### PACKAGE OUTLINE

Plastic surface mounted package

SOT-89



### SOLDERING FOOTPRINT



### PACKAGE INFORMATION

| Device  | Package | Shipping               |
|---------|---------|------------------------|
| 2SA2153 | SOT-89  | 1000 pcs / Tape & Reel |