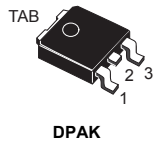
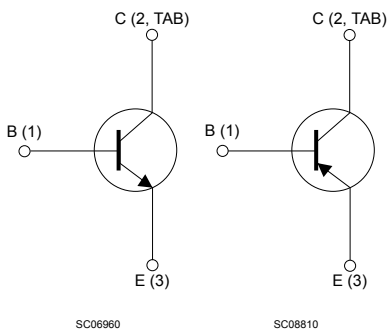


## Low voltage complementary power transistors



DPAK



SC06960

SC08810



## Features

- Low collector-emitter saturation voltage
- Fast switching speed

## Application

- General purpose switching and amplifier

## Description

These devices are manufactured using low voltage multi epitaxial planar technology. They are intended for general-purpose linear and switching applications.

## Product status links

[MJD44H11T4](#)
[MJD45H11T4](#)

## Product summary

|            |               |
|------------|---------------|
| Order code | MJD44H11T4    |
| Marking    | MJD44H11      |
| Polarity   | NPN           |
| Package    | DPAK          |
| Packing    | Tape and reel |
| Order code | MJD45H11T4    |
| Marking    | MJD45H11      |
| Polarity   | PNP           |
| Package    | DPAK          |
| Packing    | Tape and reel |

# 1 Electrical ratings

**Table 1. Absolute maximum ratings**

| Symbol    | Parameter   | Value      | Unit             |
|-----------|---|------------|------------------|
| $V_{CEO}$ | Collector-emitter voltage ( $I_B = 0$ A)            | 80         | V                |
| $V_{EBO}$ | Collector-base voltage ( $I_C = 0$ A)               | 5          | V                |
| $I_C$     | Collector current                                   | 8          | A                |
| $I_{CM}$  | Collector peak current                              | 16         | A                |
| $P_{TOT}$ | Total power dissipation at $T_C = 25^\circ\text{C}$ | 20         | W                |
| $T_{stg}$ | Storage temperature range                           | -55 to 150 | $^\circ\text{C}$ |
| $T_J$     | Maximum operating junction temperature              | 150        | $^\circ\text{C}$ |

*Note:* For PNP types voltage and current values are negative.

**Table 2. Thermal data**

| Symbol     | Parameter                               | Value | Unit               |
|------------|---|-------|--------------------|
| $R_{thJC}$ | Thermal resistance, junction-to-case    | 6.25  | $^\circ\text{C/W}$ |
| $R_{thJA}$ | Thermal resistance, junction-to-ambient | 100   | $^\circ\text{C/W}$ |

## 2 Electrical characteristics

$T_C = 25^\circ\text{C}$  unless otherwise specified.

**Table 3. Electrical characteristics**

| Symbol               | Parameter                            | Test conditions                             | Min. | Typ. | Max. | Unit          |
|----------------------|--------------------------------------|---|------|------|------|---------------|
| $V_{CEO(sus)}^{(1)}$ | Collector-emitter sustaining voltage | $I_C = 30\text{ mA}, I_B = 0\text{ A}$      | 60   | -    |      | V             |
| $I_{CES}$            | Collector cut-off current            | $V_{CE} = 80\text{ V}, V_{BE} = 0\text{ V}$ |      | -    | 10   | $\mu\text{A}$ |
| $I_{EBO}$            | Emitter cut-off current              | $V_{EB} = 5\text{ V}, I_C = 0\text{ A}$     |      | -    | 50   | $\mu\text{A}$ |
| $V_{CE(sat)}^{(1)}$  | Collector-emitter saturation voltage | $I_C = 8\text{ A}, I_B = 0.4\text{ A}$      |      | -    | 1    | V             |
| $V_{BE(sat)}^{(1)}$  | Base-emitter saturation voltage      | $I_C = 8\text{ A}, I_B = 0.8\text{ A}$      |      | -    | 1.5  | V             |
| $h_{FE}^{(1)}$       | DC current gain                      | $I_C = 2\text{ A}, V_{CE} = 1\text{ V}$     | 60   | -    |      |               |
|                      |                                      | $I_C = 4\text{ A}, V_{CE} = 1\text{ V}$     | 40   | -    |      |               |

1. Pulsed: Pulse duration  $\leq 300\ \mu\text{s}$ , duty cycle  $\leq 2\%$ .

**Note:** For PNP types voltage and current values are negative.

## 2.1 Electrical characteristics (curves)

Figure 1. Safe operating area

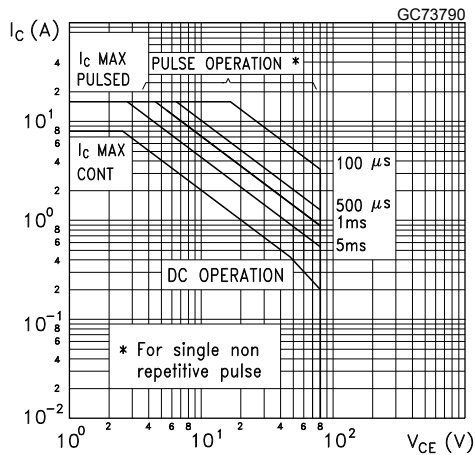


Figure 2. Derating curves

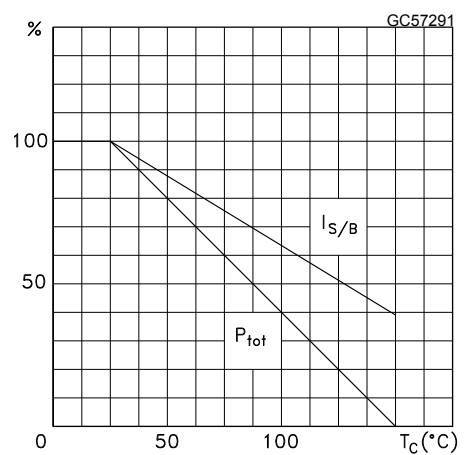


Figure 3. DC current gain (NPN)

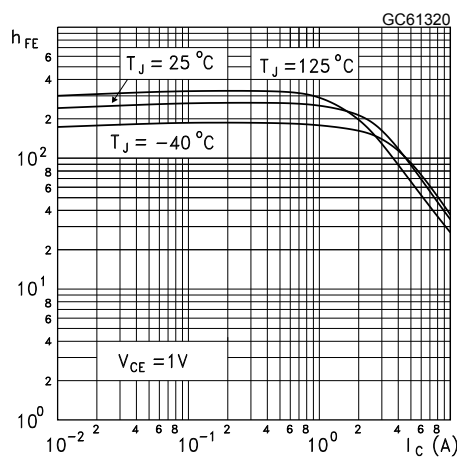


Figure 4. DC current gain (PNP)

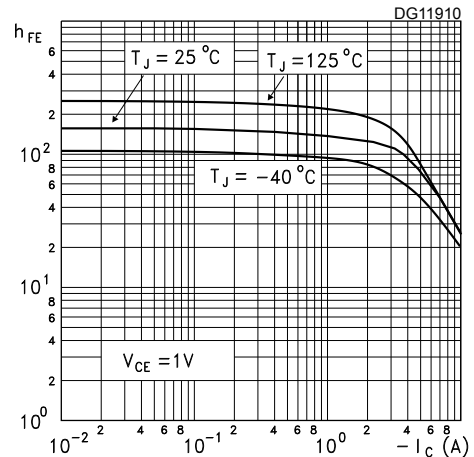


Figure 5. Collector-emitter saturation voltage (NPN)

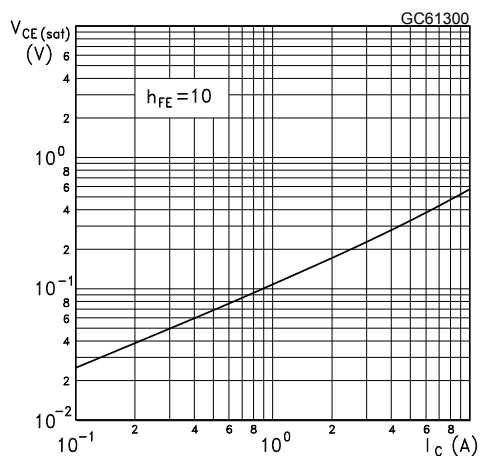
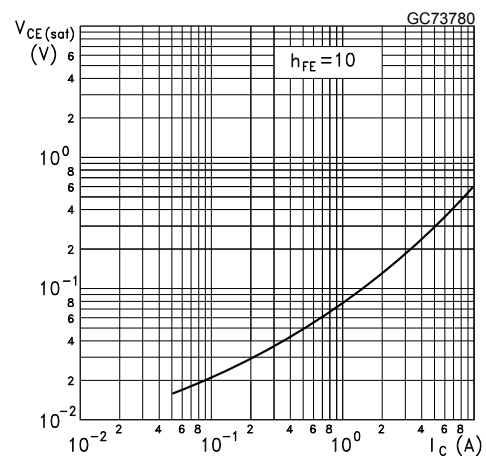


Figure 6. Collector-emitter saturation voltage (PNP)

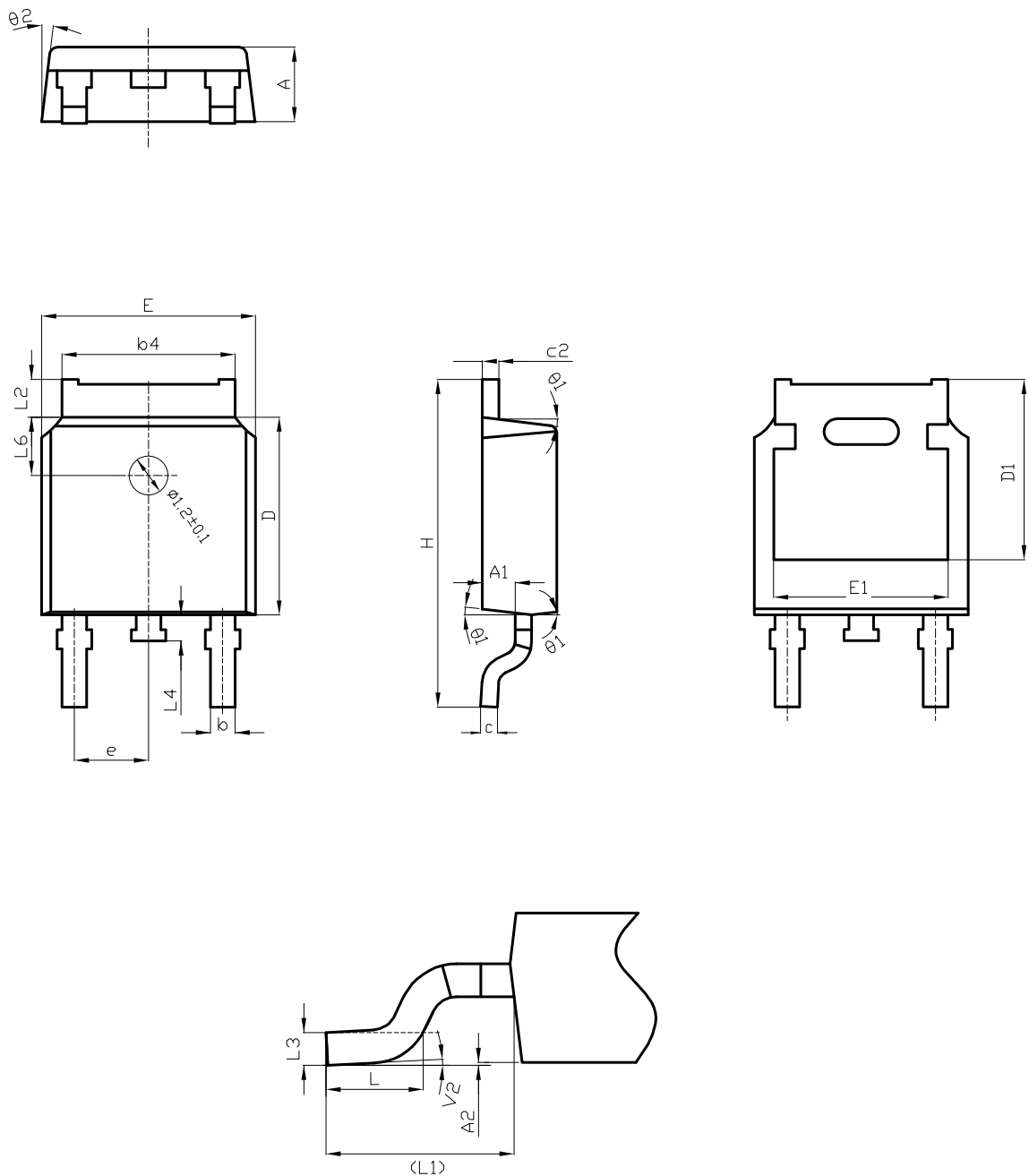


### 3 Package information

In order to meet environmental requirements, ST offers these devices in different grades of **ECOPACK** packages, depending on their level of environmental compliance. ECOPACK specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com). ECOPACK is an ST trademark.

#### 3.1 DPAK (TO-252) type C2 package information

Figure 7. DPAK (TO-252) type C2 package outline

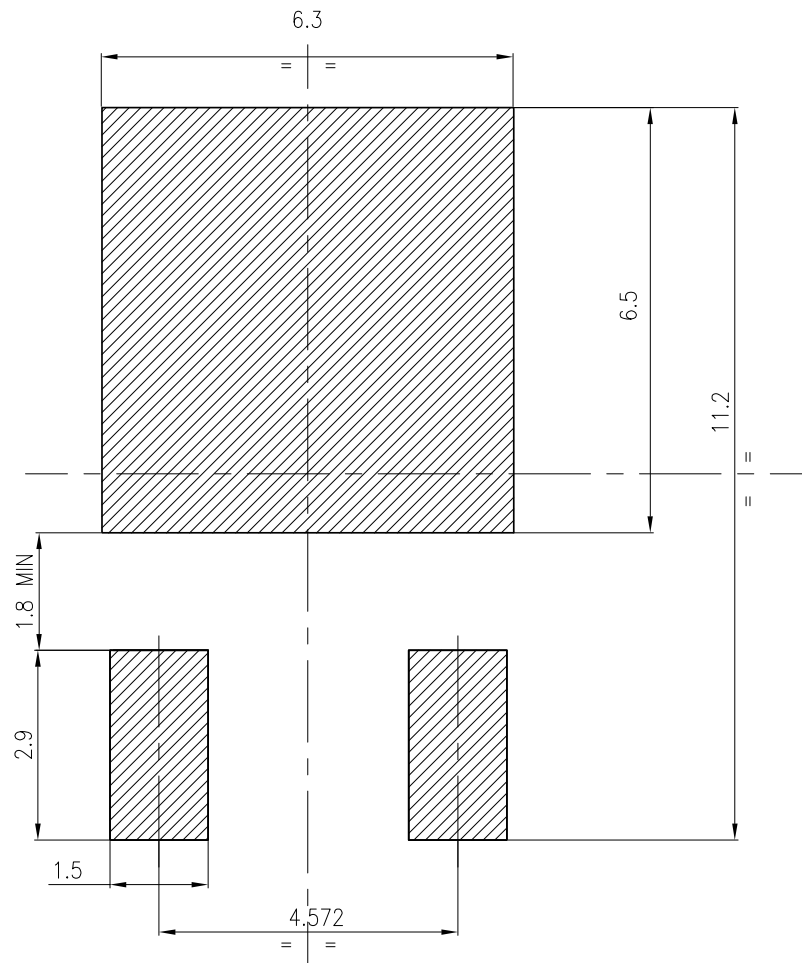


0068772\_type-C2\_rev30

Table 4. DPAK (TO-252) type C2 mechanical data

| Dim. | mm       |       |       |
|------|----------|-------|-------|
|      | Min.     | Typ.  | Max.  |
| A    | 2.20     | 2.30  | 2.38  |
| A1   | 0.90     | 1.01  | 1.10  |
| A2   | 0.00     |       | 0.10  |
| b    | 0.72     |       | 0.85  |
| b4   | 5.13     | 5.33  | 5.46  |
| c    | 0.47     |       | 0.60  |
| c2   | 0.47     |       | 0.60  |
| D    | 6.00     | 6.10  | 6.20  |
| D1   | 5.10     |       | 5.60  |
| E    | 6.50     | 6.60  | 6.70  |
| E1   | 5.20     |       | 5.50  |
| e    | 2.186    | 2.286 | 2.386 |
| H    | 9.80     | 10.10 | 10.40 |
| L    | 1.40     | 1.50  | 1.70  |
| L1   | 2.90 REF |       |       |
| L2   | 0.90     |       | 1.25  |
| L3   | 0.51 BSC |       |       |
| L4   | 0.60     | 0.80  | 1.00  |
| L6   | 1.80 BSC |       |       |
| θ1   | 5°       | 7°    | 9°    |
| θ2   | 5°       | 7°    | 9°    |
| V2   | 0°       |       | 8°    |

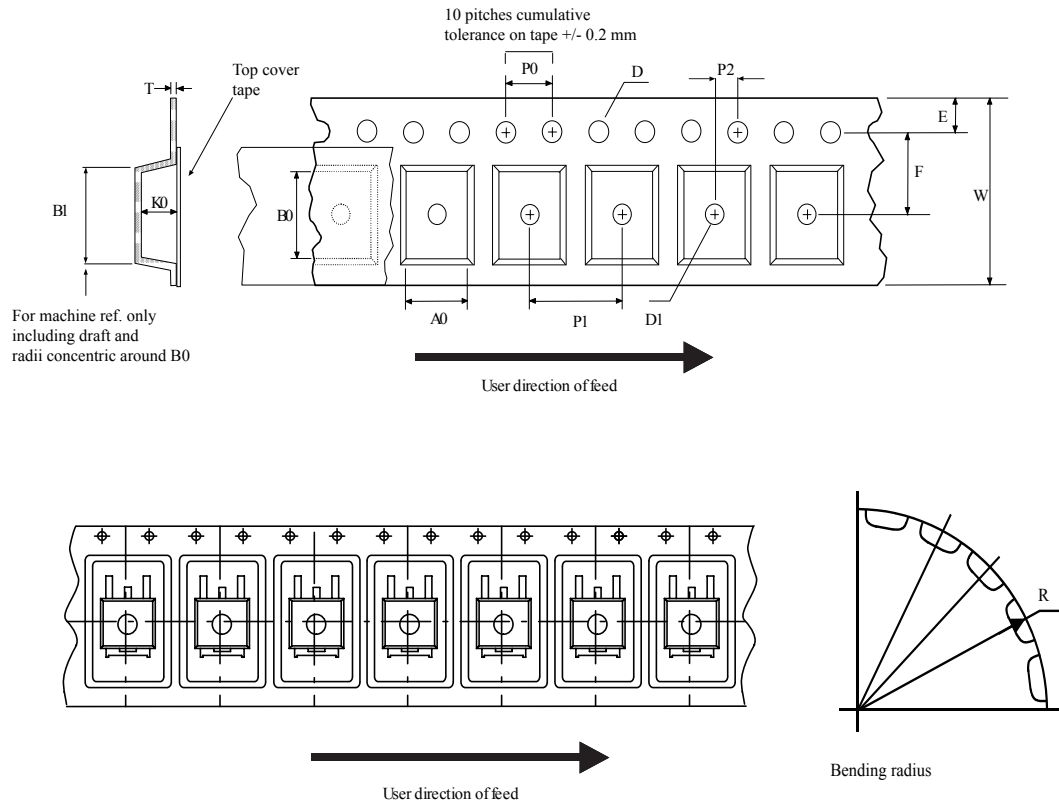
Figure 8. DPAK (TO-252) recommended footprint (dimensions are in mm)



FP\_0068772\_30

### 3.2 DPAK (TO-252) packing information

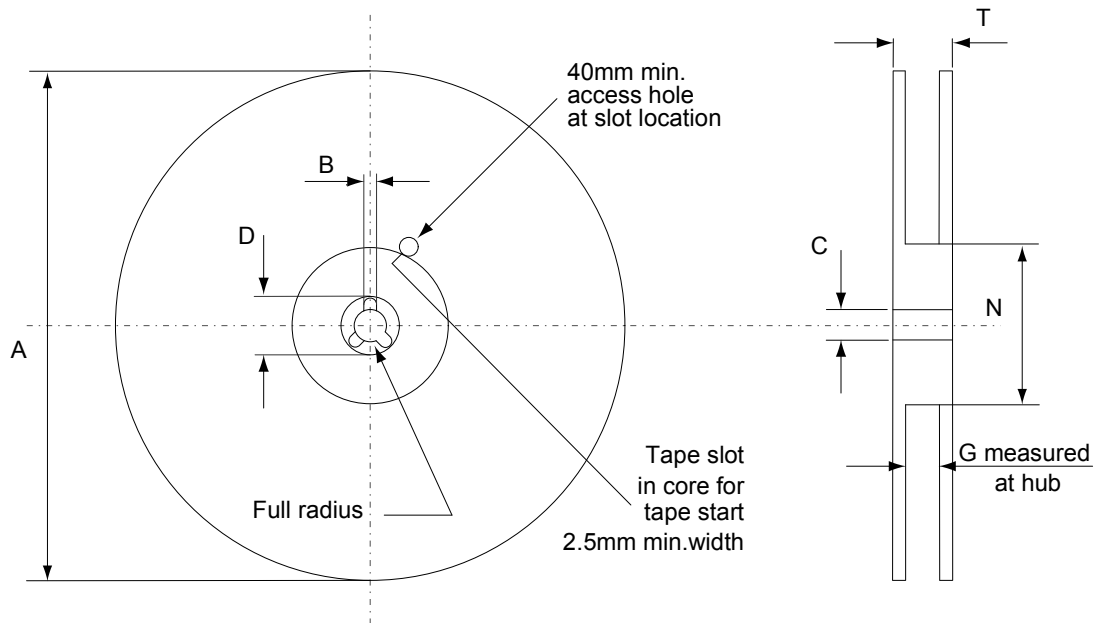
Figure 9. DPAK (TO-252) tape outline



AM08852v1



Figure 10. DPAK (TO-252) reel outline



AM06038v1

Table 5. DPAK (TO-252) tape and reel mechanical data

| Dim. | Tape |      | Dim. | Reel      |      |
|------|------|------|------|-----------|------|
|      | mm   |      |      | mm        |      |
|      | Min. | Max. |      | Min.      | Max. |
| A0   | 6.8  | 7    | A    |           | 330  |
| B0   | 10.4 | 10.6 | B    | 1.5       |      |
| B1   |      | 12.1 | C    | 12.8      | 13.2 |
| D    | 1.5  | 1.6  | D    | 20.2      |      |
| D1   | 1.5  |      | G    | 16.4      | 18.4 |
| E    | 1.65 | 1.85 | N    | 50        |      |
| F    | 7.4  | 7.6  | T    |           | 22.4 |
| K0   | 2.55 | 2.75 |      |           |      |
| P0   | 3.9  | 4.1  |      | Base qty. | 2500 |
| P1   | 7.9  | 8.1  |      | Bulk qty. | 2500 |
| P2   | 1.9  | 2.1  |      |           |      |
| R    | 40   |      |      |           |      |
| T    | 0.25 | 0.35 |      |           |      |
| W    | 15.7 | 16.3 |      |           |      |

## Revision history

**Table 6. Document revision history**

| Date        | Version | Changes  |
|-------------|---------|--|
| 21-Jun-2004 | 2       | Document migration, no content change.   |
| 06-Aug-2009 | 3       | Updated mechanical data.   |
| 18-May-2012 | 4       | Updated: mechanical data<br>Inserted: packaging mechanical data  |
| 05-May-2021 | 5       | Updated title, <a href="#">Features</a> and added <a href="#">STPOWER LOGO</a> in cover page.<br>Updated <a href="#">Table 2. Thermal data.</a><br>Updated <a href="#">Section 3 Package information.</a><br>Minor text changes. |

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