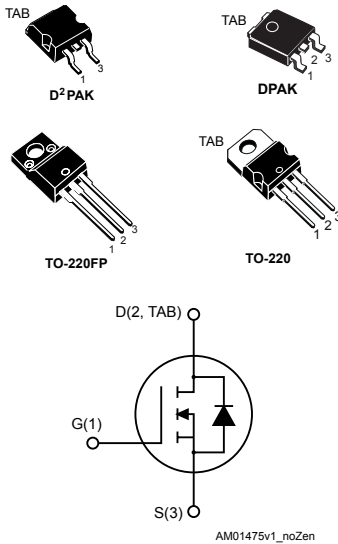


## N-channel 650 V, 0.43 $\Omega$ typ., 9 A MDmesh™ M5 Power MOSFETs in a DPAK, D<sup>2</sup>PAK, TO-220FP and TO-220 packages



### Features

| Order code | $V_{DS}$ @<br>$T_{jmax.}$ | $R_{DS(on)max.}$ | $I_D$ |
|------------|---------------------------|------------------|-------|
| STB11N65M5 | 710 V                     | 0.48 $\Omega$    | 9 A   |
| STD11N65M5 |                           |                  |       |
| STF11N65M5 |                           |                  |       |
| STP11N65M5 |                           |                  |       |

- Extremely low  $R_{DS(on)}$
- Low gate charge and input capacitance
- Excellent switching performance
- 100% avalanche tested

### Applications

- Switching applications

### Description

These devices are N-channel Power MOSFET based on the MDmesh™ M5 innovative vertical process technology combined with the well-known PowerMESH™ horizontal layout. The resulting products offer extremely low on-resistance, making them particularly suitable for applications requiring high power and superior efficiency.

| Product status             |
|----------------------------|
| <a href="#">STB11N65M5</a> |
| <a href="#">STD11N65M5</a> |
| <a href="#">STF11N65M5</a> |
| <a href="#">STP11N65M5</a> |

# 1 Electrical ratings

**Table 1. Absolute maximum ratings**

| Symbol                         | Parameter   | Value                                |                    | Unit |
|--------------------------------|---|--------------------------------------|--------------------|------|
|                                |   | D <sup>2</sup> PAK<br>DPAK<br>TO-220 | TO-220FP           |      |
| V <sub>GS</sub>                | Gate-source voltage   | ±25                                  |                    | V    |
| I <sub>D</sub>                 | Drain current (continuous) at T <sub>C</sub> = 25 °C  | 9                                    | 9 <sup>(1)</sup>   | A    |
| I <sub>D</sub>                 | Drain current (continuous) at T <sub>C</sub> = 100 °C   | 5.6                                  | 5.6 <sup>(1)</sup> | A    |
| I <sub>DM</sub> <sup>(2)</sup> | Drain current (pulsed)  | 36                                   | 36 <sup>(1)</sup>  | A    |
| P <sub>TOT</sub>               | Total dissipation at T <sub>C</sub> = 25 °C   | 85                                   | 25                 | W    |
| dv/dt <sup>(3)</sup>           | Peak diode recovery voltage slope   | 15                                   |                    | V/ns |
| V <sub>ISO</sub>               | Insulation withstand voltage (RMS) from all three leads to external heat sink (t = 1 s; T <sub>C</sub> = 25 °C) |                                      | 2500               | V    |
| T <sub>J</sub>                 | Operating junction temperature range  | -55 to 150                           |                    | °C   |
| T <sub>stg</sub>               | Storage temperature range   |                                      |                    |      |

- Limited by maximum junction temperature.
- Pulse width limited by safe operating area.
- $I_{SD} \leq 9\text{ A}$ ,  $di/dt \leq 400\text{ A}/\mu\text{s}$ ;  $V_{DS\ peak} < V_{(BR)DSS}$ ,  $V_{DD} = 400\text{ V}$ .

**Table 2. Thermal data**

| Symbol                              | Parameter                           | Value              |      |          |        | Unit |
|-------------------------------------|-------------------------------------|--------------------|------|----------|--------|------|
|                                     |                                     | D <sup>2</sup> PAK | DPAK | TO-220FP | TO-220 |      |
| R <sub>thj-case</sub>               | Thermal resistance junction-case    | 1.47               |      | 5.0      | 1.47   | °C/W |
| R <sub>thj-amb</sub>                | Thermal resistance junction-ambient |                    |      | 62.5     |        | °C/W |
| R <sub>thj-pcb</sub> <sup>(1)</sup> | Thermal resistance junction-pcb     | 30                 | 50   |          |        | °C/W |

- When mounted on 1 inch<sup>2</sup> FR-4, 2 Oz copper board.

**Table 3. Avalanche characteristics**

| Symbol          | Parameter  | Value | Unit |
|-----------------|--|-------|------|
| I <sub>AR</sub> | Avalanche current, repetitive or not-repetitive (pulse width limited by T <sub>J</sub> Max)                                | 2     | A    |
| E <sub>AS</sub> | Single pulse avalanche energy (starting T <sub>J</sub> = 25 °C, I <sub>D</sub> = I <sub>AR</sub> , V <sub>DD</sub> = 50 V) | 130   | mJ   |

## 2 Electrical characteristics

( $T_{CASE} = 25\text{ °C}$  unless otherwise specified)

**Table 4. On/off states**

| Symbol        | Parameter                         | Test condition   | Min. | Typ. | Max.      | Unit          |
|---------------|-----------------------------------|--|------|------|-----------|---------------|
| $V_{(BR)DSS}$ | Drain-source Breakdown voltage    | $I_D = 1\text{ mA}$ , $V_{GS} = 0\text{ V}$                                      | 650  |      |           | V             |
| $I_{DSS}$     | Zero gate voltage drain current   | $V_{GS} = 0\text{ V}$ , $V_{DS} = 650\text{ V}$                                  |      |      | 1         | $\mu\text{A}$ |
|               |                                   | $V_{GS} = 0\text{ V}$ , $V_{DS} = 650\text{ V}$ ,<br>$T_C = 125\text{ °C}^{(1)}$ |      |      | 100       | $\mu\text{A}$ |
| $I_{GSS}$     | Gate body leakage current         | $V_{DS} = 0\text{ V}$ , $V_{GS} = \pm 25\text{ V}$                               |      |      | $\pm 100$ | nA            |
| $V_{GS(th)}$  | Gate threshold voltage            | $V_{DS} = V_{GS}$ , $I_D = 250\text{ }\mu\text{A}$                               | 3    | 4    | 5         | V             |
| $R_{DS(on)}$  | Static drain-source on resistance | $V_{GS} = 10\text{ V}$ , $I_D = 4.5\text{ A}$                                    |      | 0.43 | 0.48      | $\Omega$      |

1. Defined by design, not subject to production test.

**Table 5. Dynamic**

| Symbol            | Parameter                             | Test condition   | Min. | Typ. | Max. | Unit          |
|-------------------|---------------------------------------|--|------|------|------|---------------|
| $C_{iss}$         | Input capacitance                     | $V_{DS} = 100\text{ V}$ , $f = 1\text{ MHz}$ , $V_{GS} = 0\text{ V}$                         | -    | 644  | -    | $\mu\text{F}$ |
| $C_{oss}$         | Output capacitance                    |  |      | 18   |      |               |
| $C_{rss}$         | Reverse transfer capacitance          |  |      | 2.5  |      |               |
| $C_{o(tr)}^{(1)}$ | Equivalent capacitance time related   | $V_{DS} = 0\text{ to }520\text{ V}$ , $V_{GS} = 0\text{ V}$                                  | -    | 55   | -    | $\mu\text{F}$ |
| $C_{o(er)}^{(2)}$ | Equivalent capacitance energy related |  |      | 17   |      |               |
| $R_g$             | Gate input resistance                 | $f = 1\text{ MHz}$ open drain  | -    | 5    | -    | $\Omega$      |
| $Q_g$             | Total gate charge                     | $V_{DD} = 520\text{ V}$ , $I_D = 4.5\text{ A}$ ,   | -    | 17   | -    | nC            |
| $Q_{gs}$          | Gate-source charge                    | $V_{GS} = 0\text{ to }10\text{ V}$<br>(see Figure 20. Test circuit for gate charge behavior) |      | 4.6  |      |               |
| $Q_{gd}$          | Gate-drain charge                     |  |      | 8.5  |      |               |

1. Time related is defined as a constant equivalent capacitance giving the same charging time as  $C_{oss}$  when  $V_{DS}$  increases from 0 to 80%  $V_{DSS}$ .

2. Energy related is defined as a constant equivalent capacitance giving the same stored energy as  $C_{oss}$  when  $V_{DS}$  increases from 0 to 80%  $V_{DSS}$ .

**Table 6. Switching times**

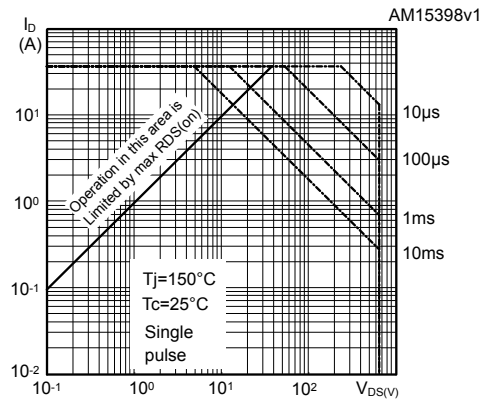
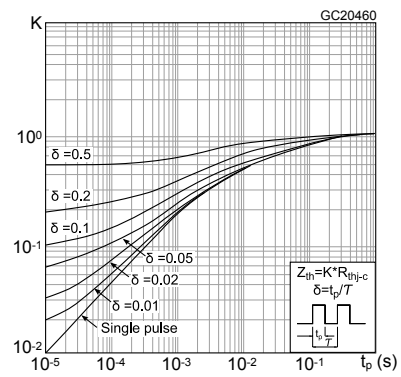
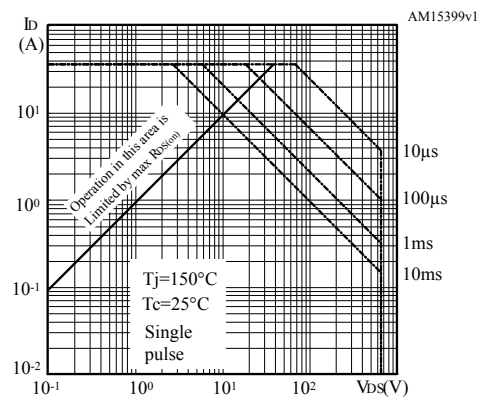
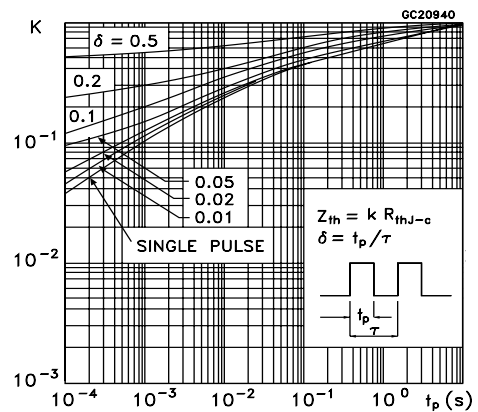
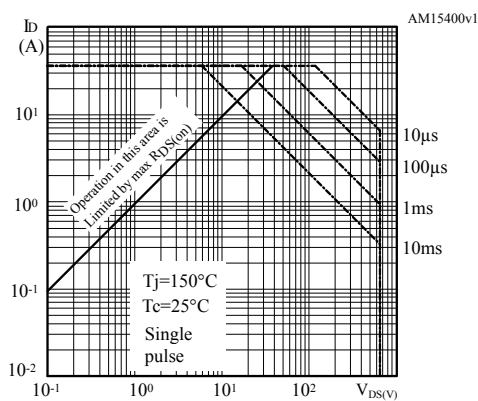
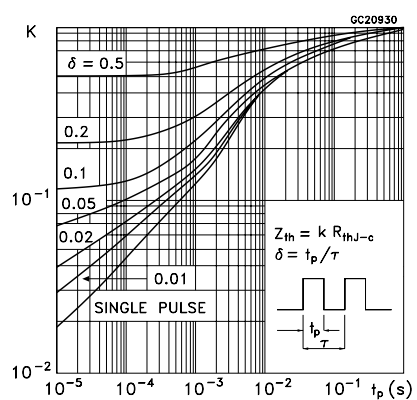
| Symbol       | Parameter          | Test condition   | Min. | Typ. | Max. | Unit |
|--------------|--------------------|--|------|------|------|------|
| $t_{d(v)}$   | Voltage delay time | $V_{DD} = 400\text{ V}$ , $I_D = 7.5\text{ A}$ ,<br>$R_G = 4.7\text{ }\Omega$ , $V_{GS} = 10\text{ V}$<br>(see Figure 21. Test circuit for inductive load switching and diode recovery times and Figure 24. Switching time waveform) | -    | 23   | -    | ns   |
| $t_{r(v)}$   | Voltage rise time  |  |      | 10   |      |      |
| $t_{c(off)}$ | Crossing time      |  |      | 13   |      |      |
| $t_{f(i)}$   | Fall time          |  |      | 13.5 |      |      |

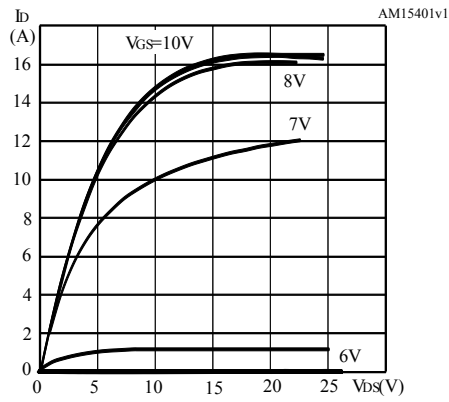
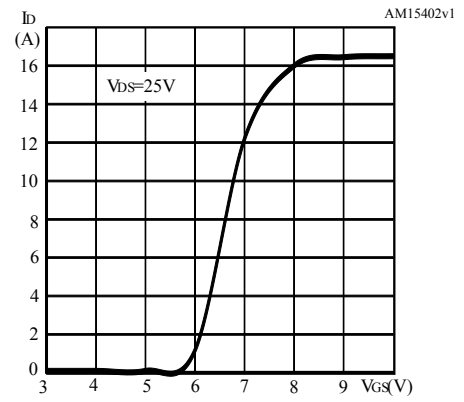
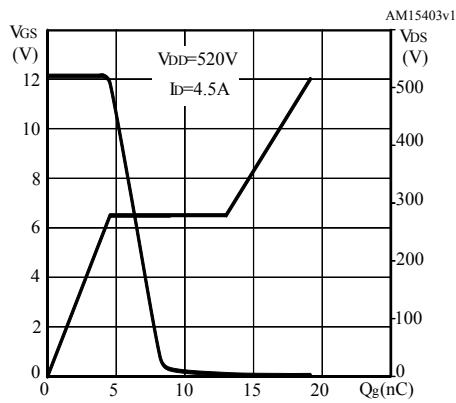
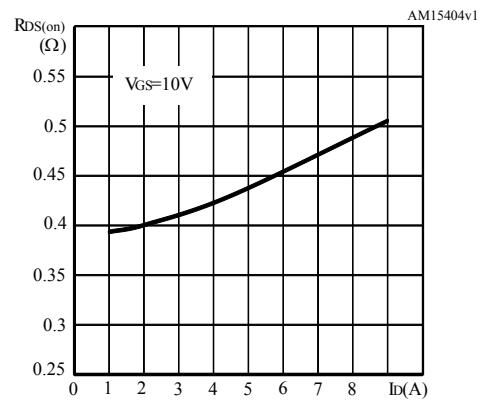
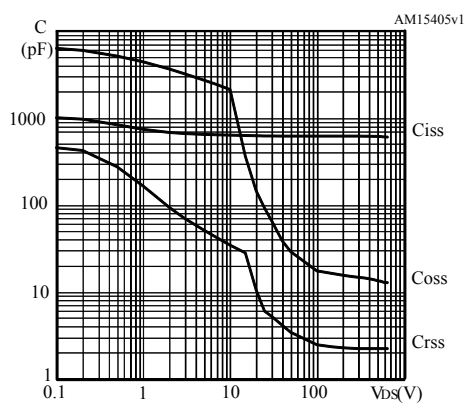
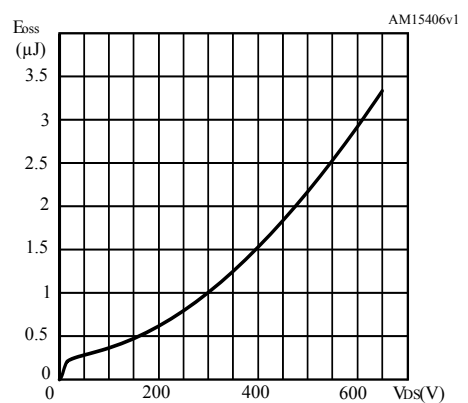
**Table 7. Source drain diode**

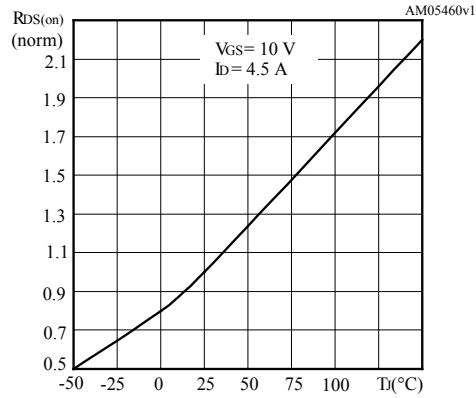
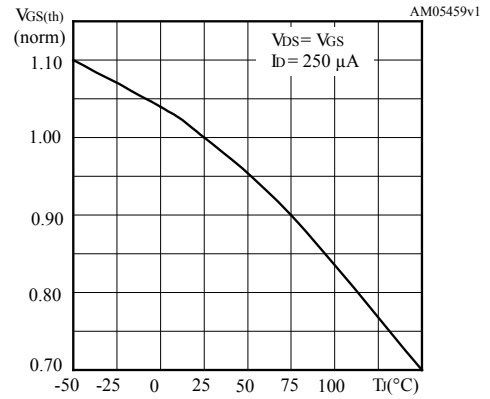
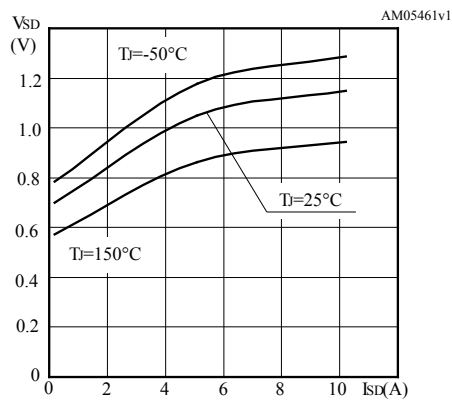
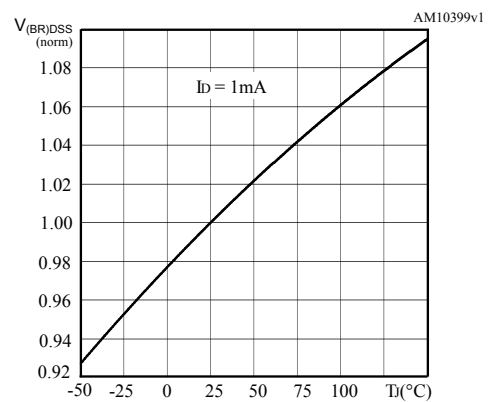
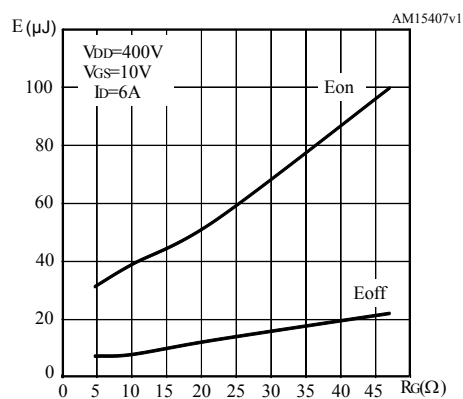
| Symbol          | Parameter                     | Test condition  | Min. | Typ. | Max. | Unit          |
|-----------------|-------------------------------|---|------|------|------|---------------|
| $I_{SD}$        | Source-drain current          |   |      |      | 9    | A             |
| $I_{SDM}^{(1)}$ | Source-drain current (pulsed) |   | -    |      | 36   |               |
| $V_{SD}^{(2)}$  | Forward on voltage            | $I_{SD} = 9\text{ A}$ , $V_{GS} = 0\text{ V}$   | -    |      | 1.5  | V             |
| $t_{rr}$        | Reverse recovery time         | $I_{SD} = 9\text{ A}$ , $di/dt = 100\text{ A}/\mu\text{s}$  |      | 232  |      | ns            |
| $Q_{rr}$        | Reverse recovery charge       | $V_{DD} = 100\text{ V}$<br>(see Figure 21. Test circuit for inductive load switching and diode recovery times)                                  | -    | 2    |      | $\mu\text{C}$ |
| $I_{RRM}$       | Reverse recovery current      |   |      | 17.5 |      | A             |
| $t_{rr}$        | Reverse recovery time         | $I_{SD} = 9\text{ A}$ , $di/dt = 100\text{ A}/\mu\text{s}$  |      | 328  |      | ns            |
| $Q_{rr}$        | Reverse recovery charge       | $V_{DD} = 100\text{ V}$ , $T_j = 150\text{ }^\circ\text{C}$ (see Figure 21. Test circuit for inductive load switching and diode recovery times) | -    | 2.8  |      | $\mu\text{C}$ |
| $I_{RRM}$       | Reverse recovery current      |   |      | 17   |      | A             |

1. Pulse width limited by safe operating area.

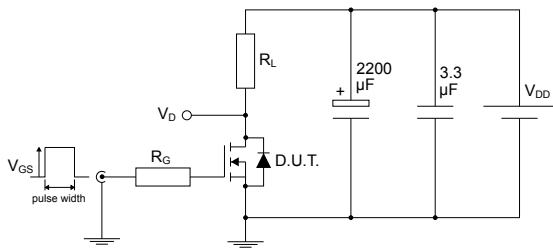
2. Pulsed: pulse duration = 300  $\mu\text{s}$ , duty cycle 1.5%.

**2.1 Electrical characteristics curves**
**Figure 1. Safe operating area for DPAK**

**Figure 2. Thermal impedance DPAK**

**Figure 3. Safe operating area for TO-220FP**

**Figure 4. Thermal impedance for TO-220FP**

**Figure 5. Safe operating area for TO-220 and D<sup>2</sup>PAK**

**Figure 6. Thermal impedance for TO-220 and D<sup>2</sup>PAK**


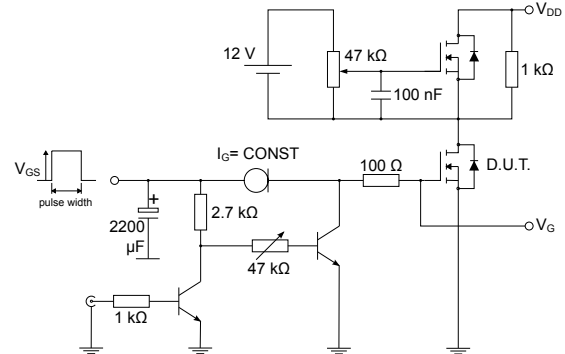
**Figure 8. Output characteristics**

**Figure 9. Transfer characteristics**

**Figure 10. Gate charge vs gate-source voltage**

**Figure 11. Static drain-source on resistance**

**Figure 12. Capacitance variations**

**Figure 13. Output capacitance stored energy**


**Figure 14. Normalized on-resistance vs temperature**

**Figure 15. Normalized gate threshold voltage vs temperature**

**Figure 16. Drain-source diode forward characteristics**

**Figure 17. Normalized  $V_{(BR)DSS}$  vs temperature**

**Figure 18. Switching energy vs gate resistance**


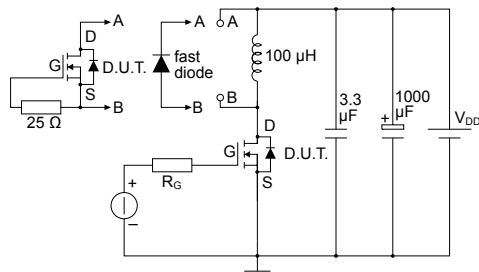
### 3 Test circuits

**Figure 19. Test circuit for resistive load switching times**


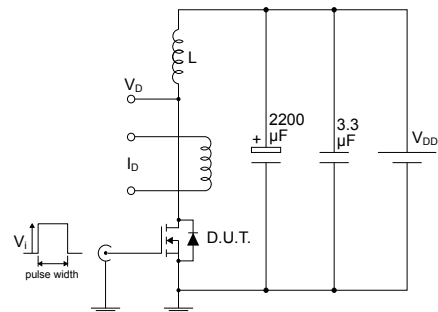
AM01468v1

**Figure 20. Test circuit for gate charge behavior**


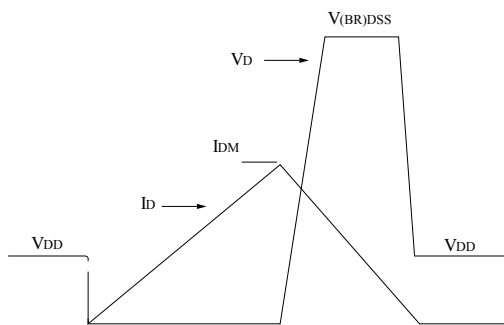
AM01469v1

**Figure 21. Test circuit for inductive load switching and diode recovery times**


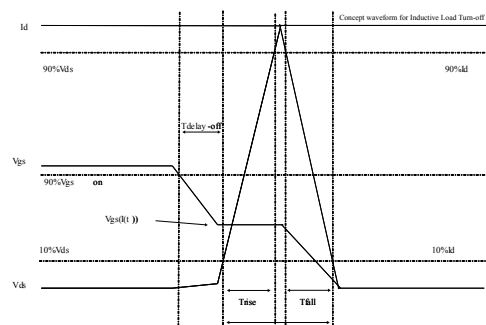
AM01470v1

**Figure 22. Unclamped inductive load test circuit**


AM01471v1

**Figure 23. Unclamped inductive waveform**


AM01472v1

**Figure 24. Switching time waveform**


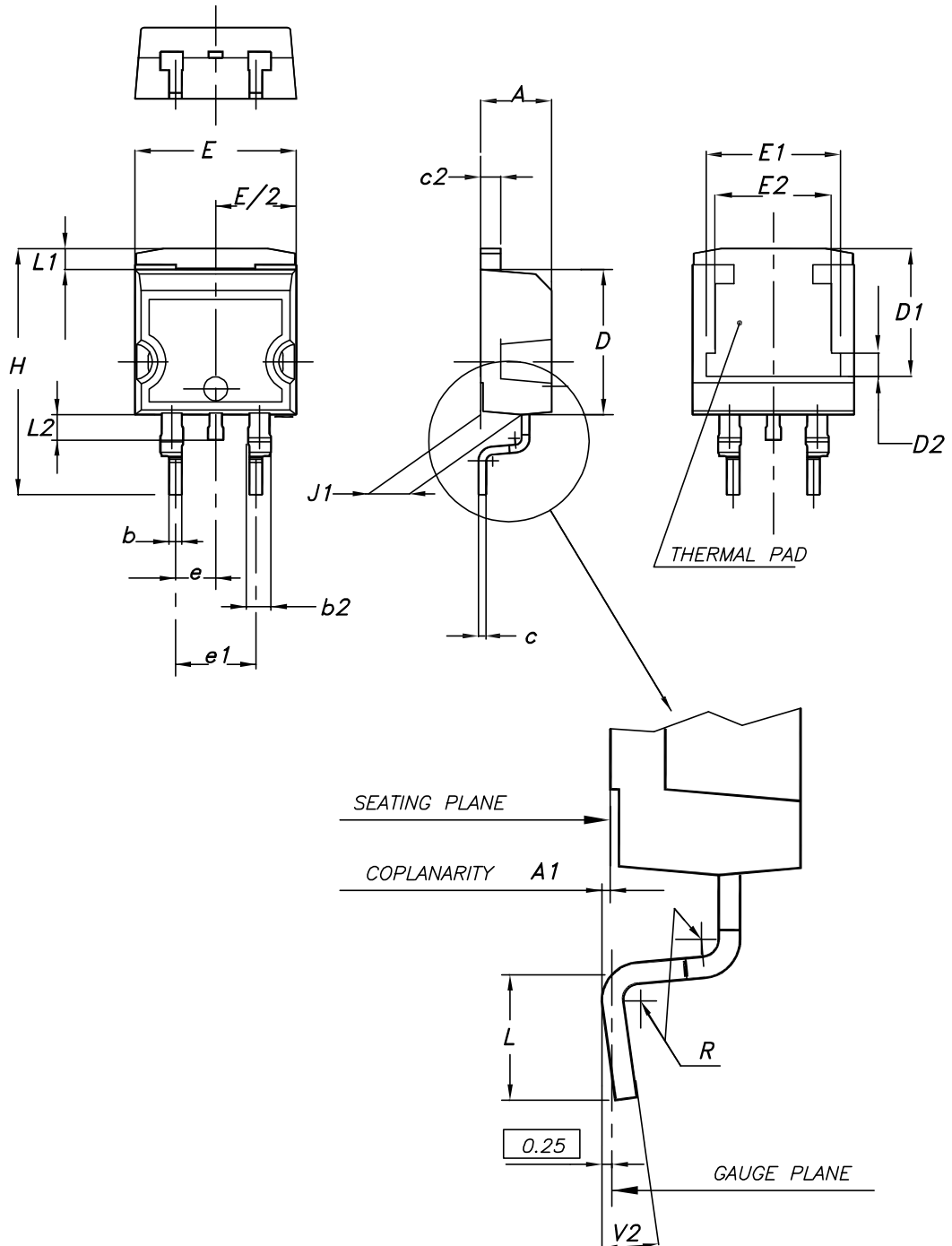
AM05540v2\_for\_M5



## **4 Package information**

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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.

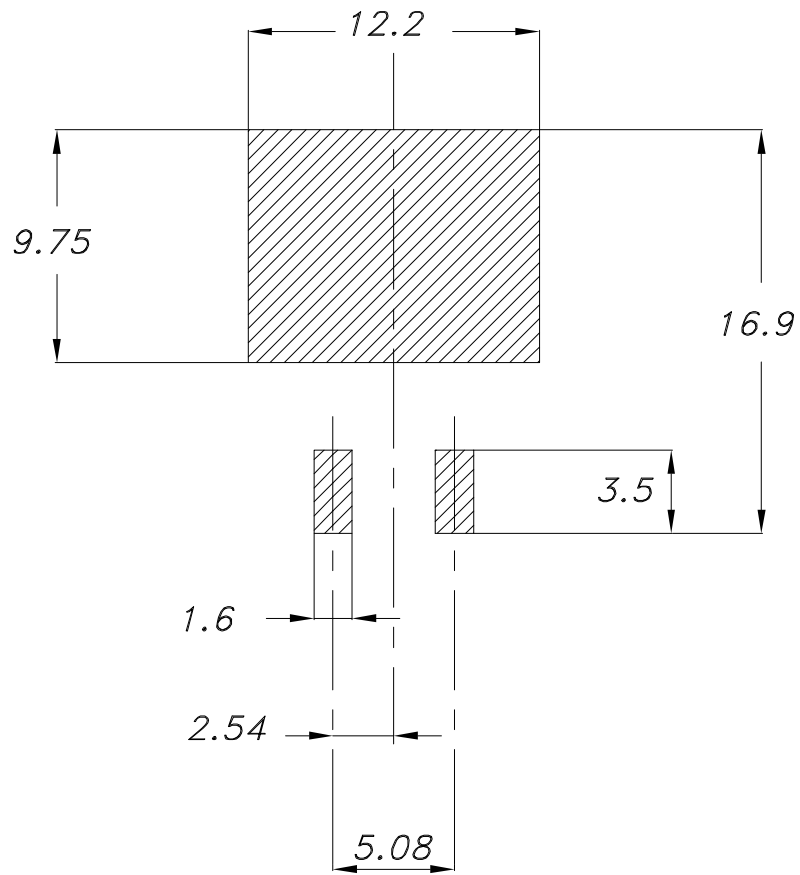
**4.1 D<sup>2</sup>PAK (TO-263) type A package information**
**Figure 25. D<sup>2</sup>PAK (TO-263) type A package outline**


0079457\_25

**Table 8. D<sup>2</sup>PAK (TO-263) type A package mechanical data**

| Dim. | mm    |      |       |
|------|-------|------|-------|
|      | Min.  | Typ. | Max.  |
| A    | 4.40  |      | 4.60  |
| A1   | 0.03  |      | 0.23  |
| b    | 0.70  |      | 0.93  |
| b2   | 1.14  |      | 1.70  |
| c    | 0.45  |      | 0.60  |
| c2   | 1.23  |      | 1.36  |
| D    | 8.95  |      | 9.35  |
| D1   | 7.50  | 7.75 | 8.00  |
| D2   | 1.10  | 1.30 | 1.50  |
| E    | 10.00 |      | 10.40 |
| E1   | 8.30  | 8.50 | 8.70  |
| E2   | 6.85  | 7.05 | 7.25  |
| e    |       | 2.54 |       |
| e1   | 4.88  |      | 5.28  |
| H    | 15.00 |      | 15.85 |
| J1   | 2.49  |      | 2.69  |
| L    | 2.29  |      | 2.79  |
| L1   | 1.27  |      | 1.40  |
| L2   | 1.30  |      | 1.75  |
| R    |       | 0.40 |       |
| V2   | 0°    |      | 8°    |

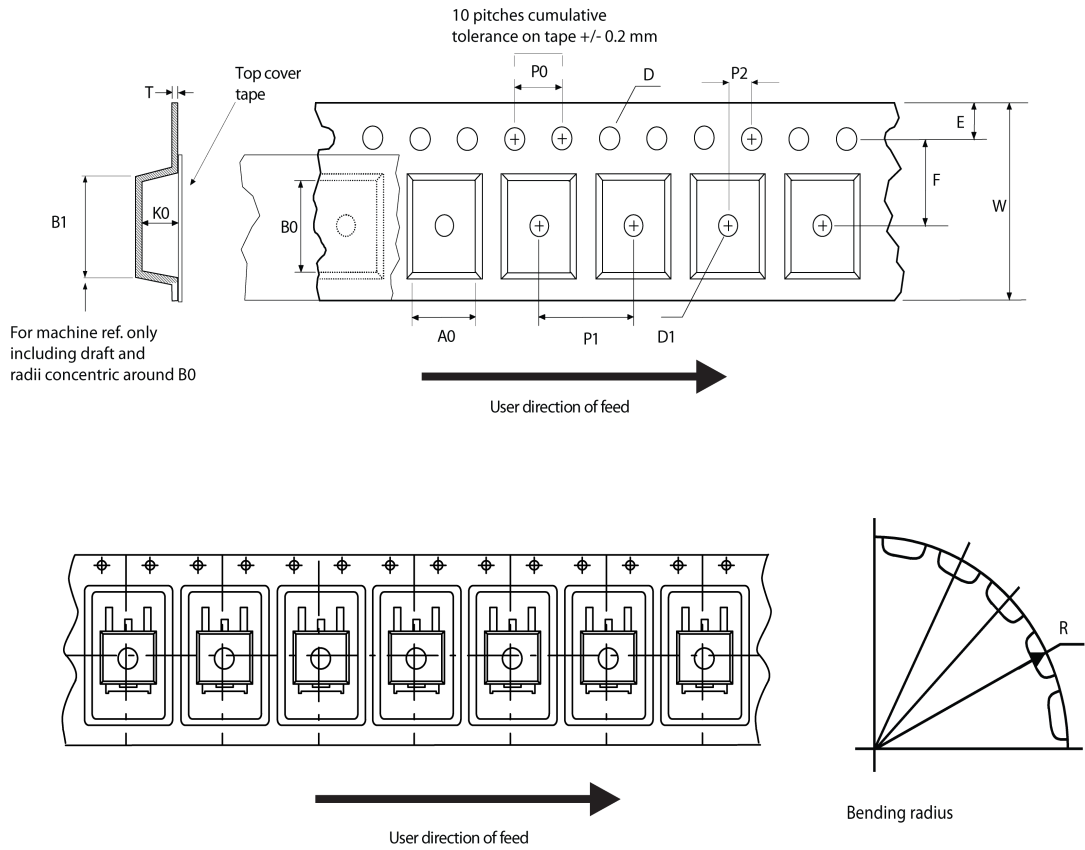
Figure 26. D<sup>2</sup>PAK (TO-263) recommended footprint (dimensions are in mm)



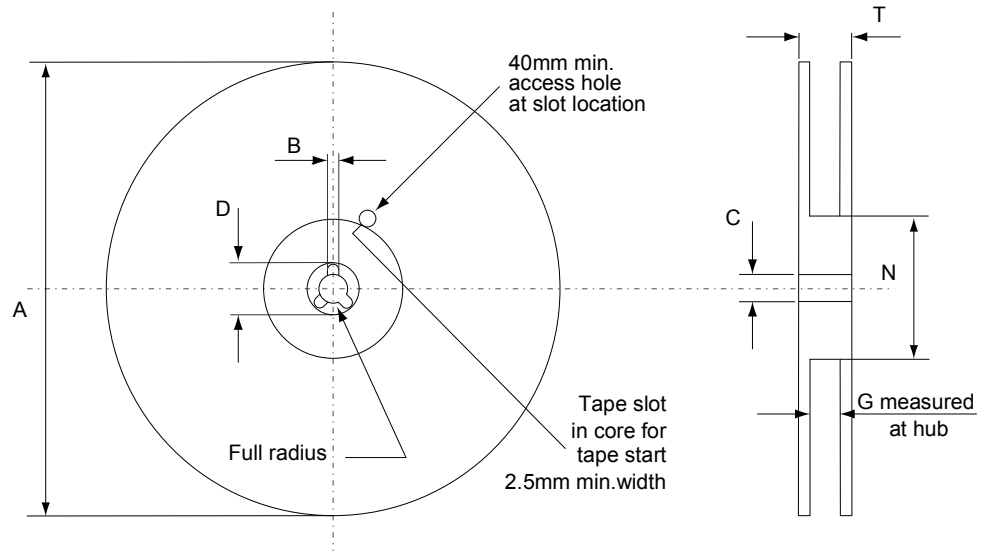
Footprint

## 4.2 D<sup>2</sup>PAK packing information

Figure 27. D<sup>2</sup>PAK tape outline



AM08852v1

**Figure 28. D<sup>2</sup>PAK reel outline**


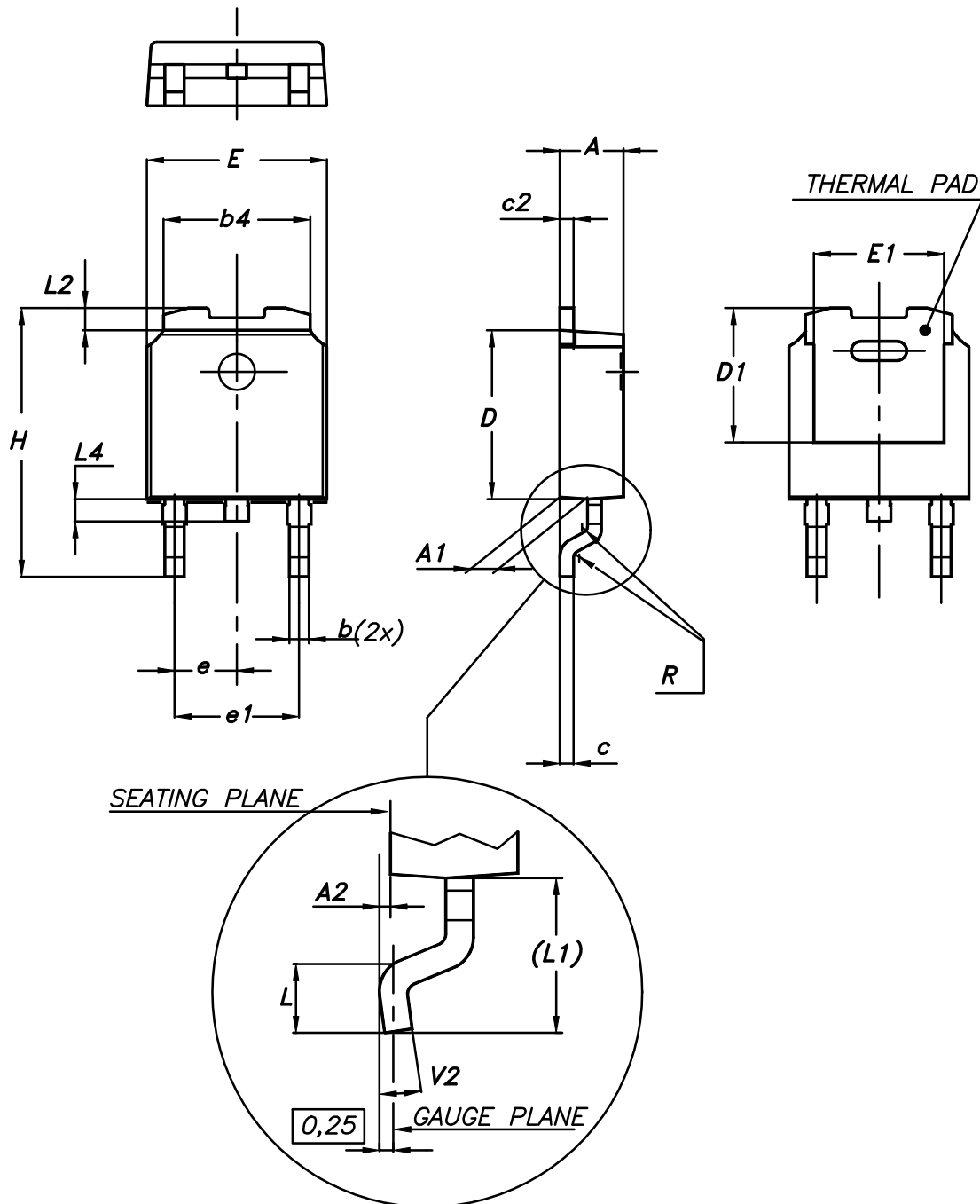
AM06038v1

**Table 9. D<sup>2</sup>PAK tape and reel mechanical data**

| Tape |      |      | Reel                           |      |      |      |
|------|------|------|--------------------------------|------|------|------|
| Dim. | mm   |      | Dim.                           | mm   |      |      |
|      | Min. | Max. |                                | Min. | Max. |      |
| A0   | 10.5 | 10.7 | A                              |      | 330  |      |
| B0   | 15.7 | 15.9 | B                              | 1.5  |      |      |
| D    | 1.5  | 1.6  | C                              | 12.8 | 13.2 |      |
| D1   | 1.59 | 1.61 | D                              | 20.2 |      |      |
| E    | 1.65 | 1.85 | G                              | 24.4 | 26.4 |      |
| F    | 11.4 | 11.6 | N                              | 100  |      |      |
| K0   | 4.8  | 5.0  | T                              |      | 30.4 |      |
| P0   | 3.9  | 4.1  | Base quantity<br>Bulk quantity |      |      |      |
| P1   | 11.9 | 12.1 |                                |      |      | 1000 |
| P2   | 1.9  | 2.1  |                                |      |      | 1000 |
| R    | 50   |      |                                |      |      |      |
| T    | 0.25 | 0.35 |                                |      |      |      |
| W    | 23.7 | 24.3 |                                |      |      |      |

### 4.3 DPAK (TO-252) type A package information

Figure 29. DPAK (TO-252) type A package outline



0068772\_A\_25

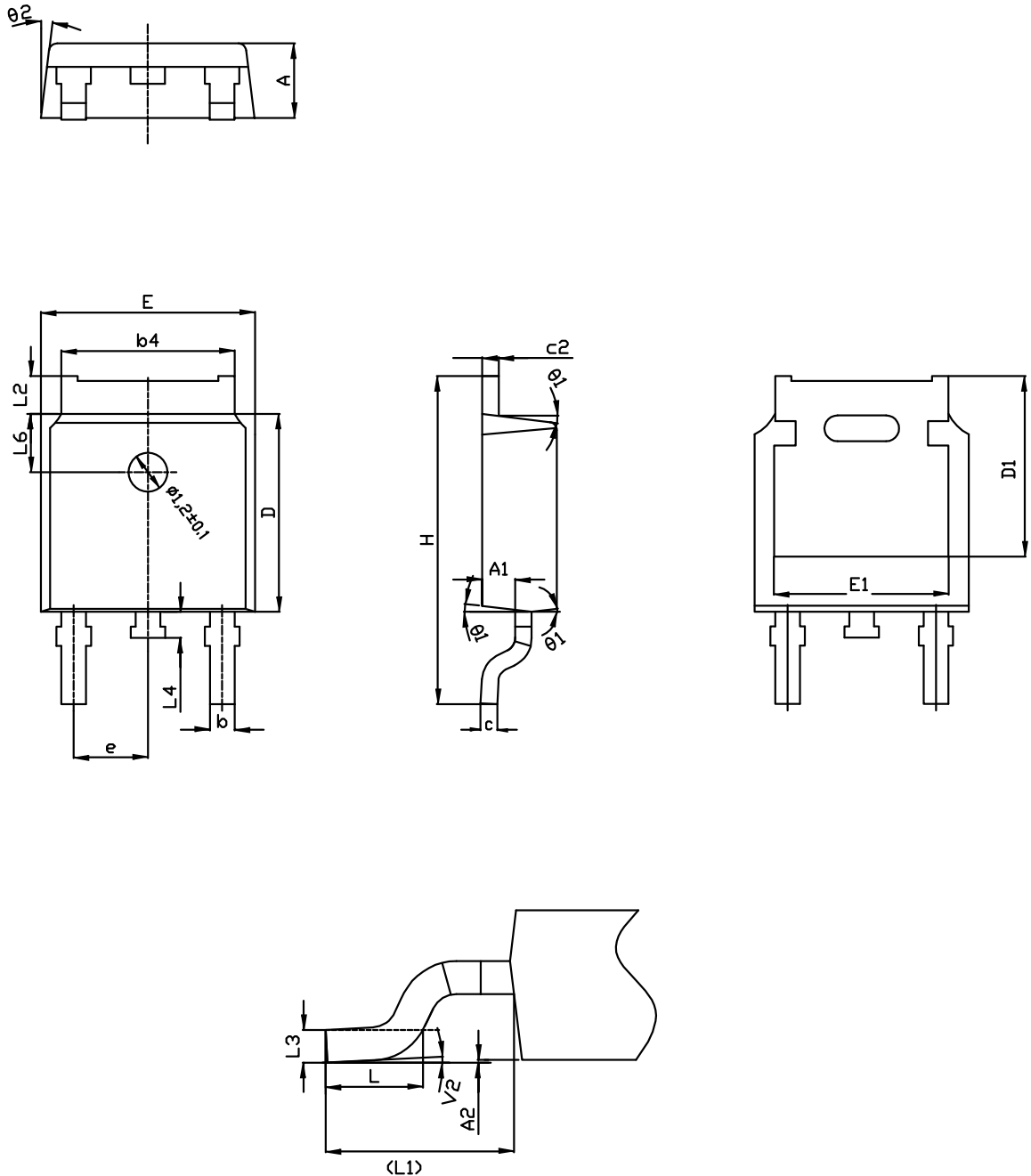
**Table 10. DPAK (TO-252) type A mechanical data**

| Dim. | mm    |       |       |
|------|-------|-------|-------|
|      | Min.  | Typ.  | Max.  |
| A    | 2.20  |       | 2.40  |
| A1   | 0.90  |       | 1.10  |
| A2   | 0.03  |       | 0.23  |
| b    | 0.64  |       | 0.90  |
| b4   | 5.20  |       | 5.40  |
| c    | 0.45  |       | 0.60  |
| c2   | 0.48  |       | 0.60  |
| D    | 6.00  |       | 6.20  |
| D1   | 4.95  | 5.10  | 5.25  |
| E    | 6.40  |       | 6.60  |
| E1   | 4.60  | 4.70  | 4.80  |
| e    | 2.159 | 2.286 | 2.413 |
| e1   | 4.445 | 4.572 | 4.699 |
| H    | 9.35  |       | 10.10 |
| L    | 1.00  |       | 1.50  |
| (L1) | 2.60  | 2.80  | 3.00  |
| L2   | 0.65  | 0.80  | 0.95  |
| L4   | 0.60  |       | 1.00  |
| R    |       | 0.20  |       |
| V2   | 0°    |       | 8°    |



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

Figure 30. DPAK (TO-252) type C2 package outline



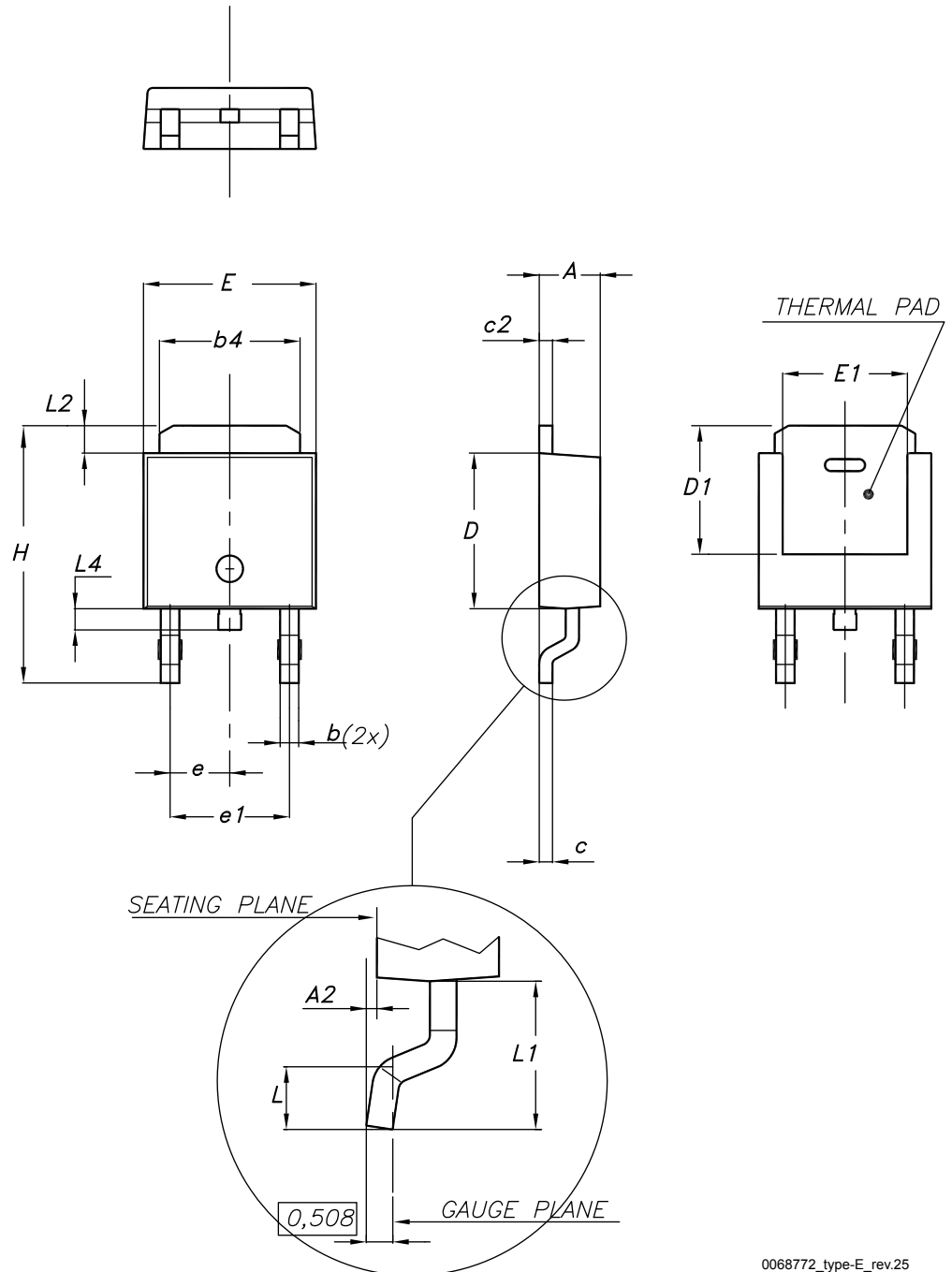
0068772\_C2\_25

**Table 11. 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°    |

### 4.5 DPAK (TO-252) type E package information

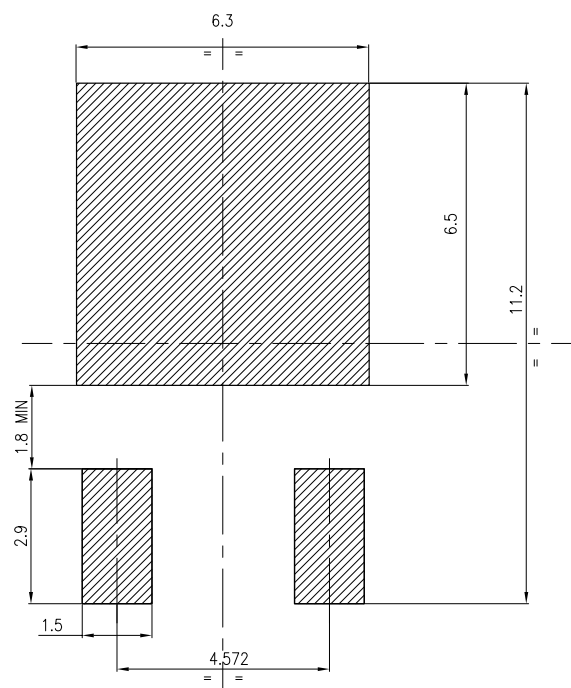
Figure 31. DPAK (TO-252) type E package outline



0068772\_type-E\_rev.25

**Table 12. DPAK (TO-252) type E mechanical data**

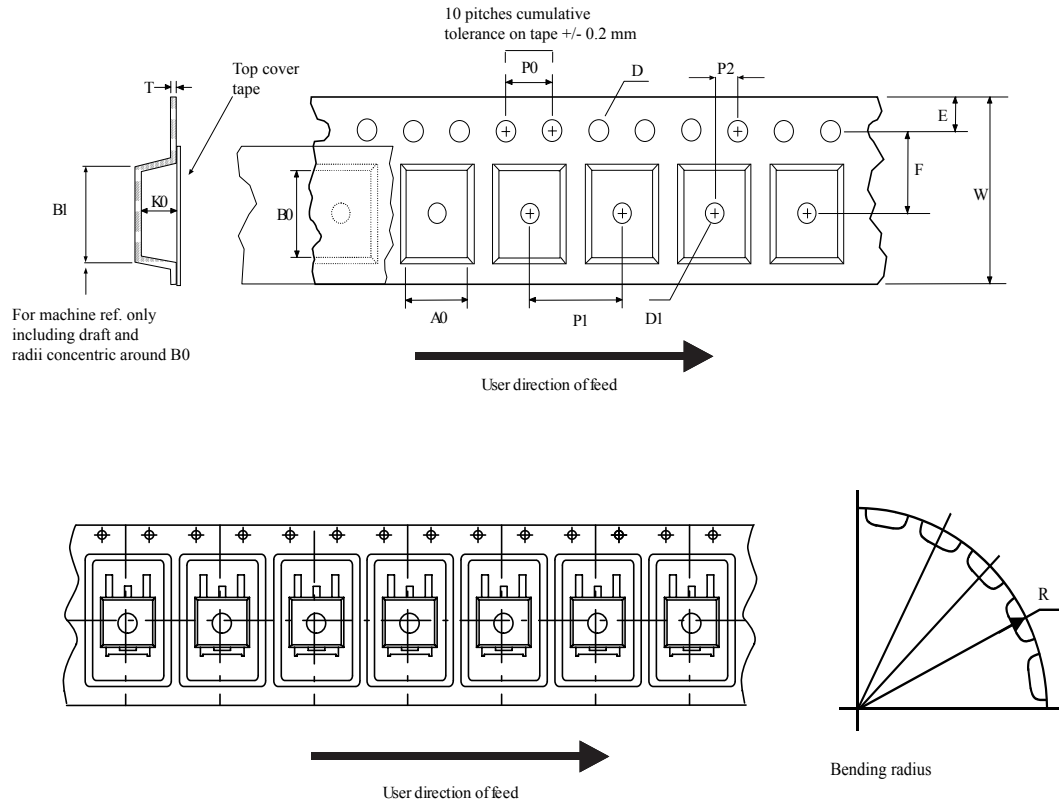
| Dim. | mm   |       |       |
|------|------|-------|-------|
|      | Min. | Typ.  | Max.  |
| A    | 2.18 |       | 2.39  |
| A2   |      |       | 0.13  |
| b    | 0.65 |       | 0.884 |
| b4   | 4.95 |       | 5.46  |
| c    | 0.46 |       | 0.61  |
| c2   | 0.46 |       | 0.60  |
| D    | 5.97 |       | 6.22  |
| D1   | 5.21 |       |       |
| E    | 6.35 |       | 6.73  |
| E1   | 4.32 |       |       |
| e    |      | 2.286 |       |
| e1   |      | 4.572 |       |
| H    | 9.94 |       | 10.34 |
| L    | 1.50 |       | 1.78  |
| L1   |      | 2.74  |       |
| L2   | 0.89 |       | 1.27  |
| L4   |      |       | 1.02  |

**Figure 32. DPAK (TO-252) recommended footprint (dimensions are in mm)**


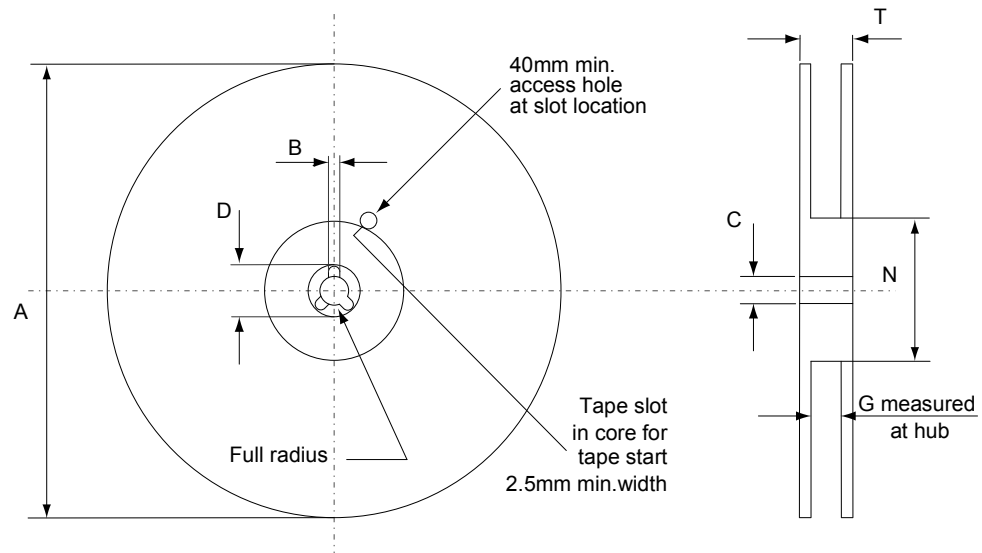
FP\_0068772\_25

## 4.6 DPAK (TO-252) packing information

Figure 33. DPAK (TO-252) tape outline



AM08852v1

**Figure 34. DPAK (TO-252) reel outline**


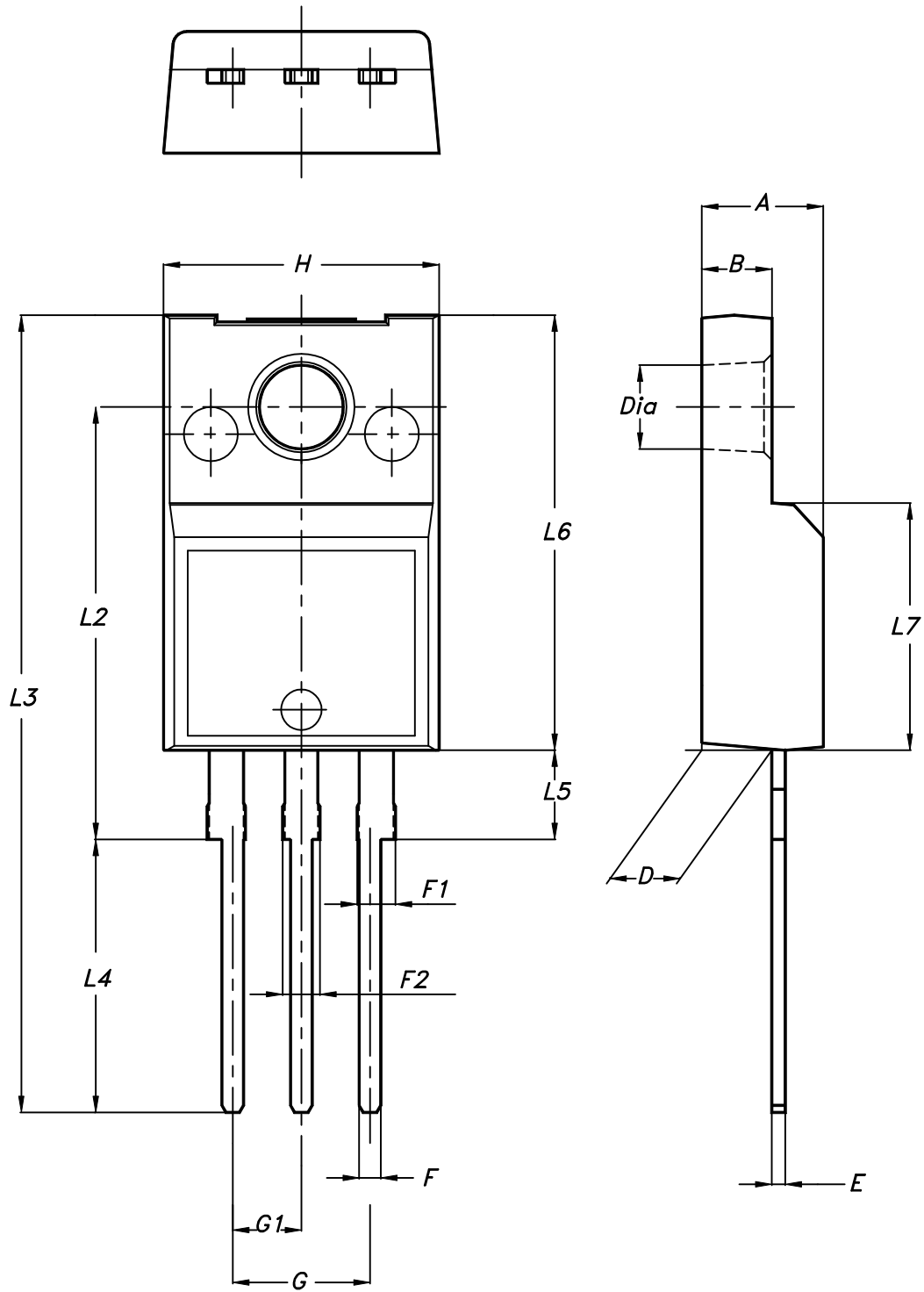
AM06038v1

**Table 13. DPAK (TO-252) tape and reel mechanical data**

| Tape |      |      | Reel      |      |      |
|------|------|------|-----------|------|------|
| Dim. | mm   |      | Dim.      | 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 |           |      |      |

4.7 TO-220FP package information

Figure 35. TO-220FP package outline

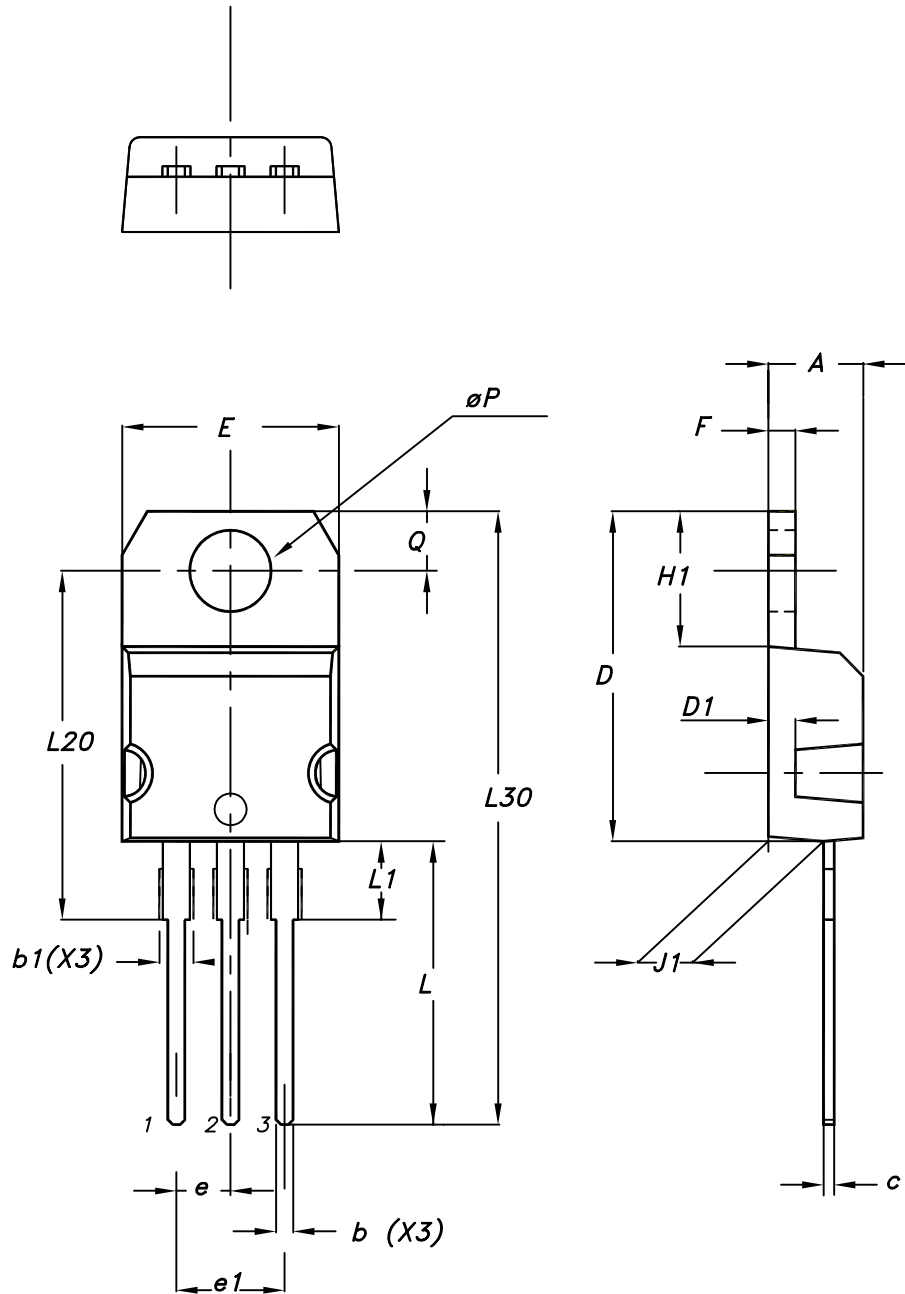


7012510\_Rev\_12\_B

**Table 14. TO-220FP package mechanical data**

| Dim. | mm   |      |      |
|------|------|------|------|
|      | Min. | Typ. | Max. |
| A    | 4.4  |      | 4.6  |
| B    | 2.5  |      | 2.7  |
| D    | 2.5  |      | 2.75 |
| E    | 0.45 |      | 0.7  |
| F    | 0.75 |      | 1    |
| F1   | 1.15 |      | 1.70 |
| F2   | 1.15 |      | 1.70 |
| G    | 4.95 |      | 5.2  |
| G1   | 2.4  |      | 2.7  |
| H    | 10   |      | 10.4 |
| L2   |      | 16   |      |
| L3   | 28.6 |      | 30.6 |
| L4   | 9.8  |      | 10.6 |
| L5   | 2.9  |      | 3.6  |
| L6   | 15.9 |      | 16.4 |
| L7   | 9    |      | 9.3  |
| Dia  | 3    |      | 3.2  |



**4.8 TO-220 type A package information**
**Figure 36. TO-220 type A package outline**


0015988\_typeA\_Rev\_21

**Table 15. TO-220 type A package mechanical data**

| Dim. | mm    |       |       |
|------|-------|-------|-------|
|      | Min.  | Typ.  | Max.  |
| A    | 4.40  |       | 4.60  |
| b    | 0.61  |       | 0.88  |
| b1   | 1.14  |       | 1.55  |
| c    | 0.48  |       | 0.70  |
| D    | 15.25 |       | 15.75 |
| D1   |       | 1.27  |       |
| E    | 10.00 |       | 10.40 |
| e    | 2.40  |       | 2.70  |
| e1   | 4.95  |       | 5.15  |
| F    | 1.23  |       | 1.32  |
| H1   | 6.20  |       | 6.60  |
| J1   | 2.40  |       | 2.72  |
| L    | 13.00 |       | 14.00 |
| L1   | 3.50  |       | 3.93  |
| L20  |       | 16.40 |       |
| L30  |       | 28.90 |       |
| øP   | 3.75  |       | 3.85  |
| Q    | 2.65  |       | 2.95  |

## 5 Ordering information

**Table 16. Order codes**

| Order code | Marking | Package            | Packing       |
|------------|---------|--------------------|---------------|
| STB11N65M5 | 11N65M5 | D <sup>2</sup> PAK | Tape and reel |
| STD11N65M5 |         | DPAK               |               |
| STF11N65M5 |         | TO-220FP           | Tube          |
| STP11N65M5 |         | TO-220             |               |

## Revision history

**Table 17. Document revision history**

| Date        | Version | Changes   |
|-------------|---------|---|
| 23-Feb-2012 | 1       | First release.  |
| 03-Dec-2012 | 2       | <ul style="list-style-type: none"> <li>– Minor text changes in cover page</li> <li>– Added IPAK packages</li> <li>– Added <i>Section 2.1: Electrical characteristics (curves)</i></li> <li>– Updated <i>Section 5: Packaging mechanical data</i></li> <li>– Modified: <i>note 2</i> on <i>Table 2</i></li> <li>– Updated: mechanical data for TO-220FP package</li> </ul>   |
| 02-May-2018 | 3       | <p>The part number STU11N65M5 has been moved to a separate datasheet.</p> <p>Removed maturity status indication from cover page. The document status is production data.</p> <p>Updated title and features in cover page, <a href="#">Section 1 Electrical ratings</a>, <a href="#">Section 2 Electrical characteristics</a>, <a href="#">Section 2.1 Electrical characteristics curves</a> and <a href="#">Section 4 Package information</a>.</p> <p>Minor text changes.</p> |

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