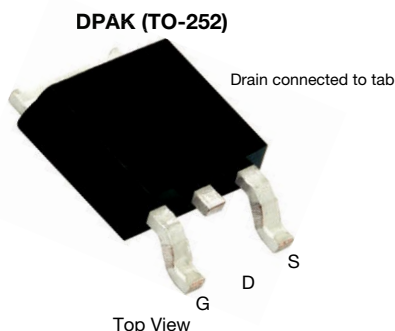


## P-Channel 60 V (D-S) MOSFET

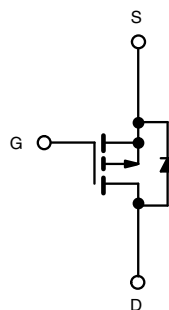


### FEATURES

- TrenchFET® power MOSFETs
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**



P-Channel MOSFET

### PRODUCT SUMMARY

|                                                     |        |
|-----------------------------------------------------|--------|
| $V_{DS}$ (V)                                        | -60    |
| $R_{DS(on)}$ max. ( $\Omega$ ) at $V_{GS} = -10$ V  | 0.155  |
| $R_{DS(on)}$ max. ( $\Omega$ ) at $V_{GS} = -4.5$ V | 0.280  |
| $Q_g$ typ. (nC)                                     | 12.5   |
| $I_D$ (A)                                           | -8.4   |
| Configuration                                       | Single |

### ORDERING INFORMATION

|                                 |                   |
|---------------------------------|-------------------|
| Package                         | DPAK (TO-252)     |
| Lead (Pb)-free and halogen-free | SUD08P06-155L-GE3 |

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

| PARAMETER                                              | SYMBOL         | LIMIT                                         | UNIT             |
|--------------------------------------------------------|----------------|-----------------------------------------------|------------------|
| Gate-source voltage                                    | $V_{GS}$       | $\pm 20$                                      | V                |
| Continuous drain current ( $T_J = 150^\circ\text{C}$ ) | $I_D$          | $T_C = 25^\circ\text{C}$<br>-8.2              | A                |
|                                                        |                | $T_C = 100^\circ\text{C}$<br>-5.2             |                  |
| Pulsed drain current                                   | $I_{DM}$       | -18                                           |                  |
| Continuing source current (diode conduction)           | $I_S$          | -8.4                                          |                  |
| Avalanche current                                      | $I_{AS}$       | -12                                           |                  |
| Single pulse avalanche energy                          | $E_{AS}$       | 7.2                                           | mJ               |
| Maximum power dissipation                              | $P_D$          | $T_C = 25^\circ\text{C}$<br>20.8 <sup>a</sup> | W                |
|                                                        |                | $T_A = 25^\circ\text{C}$<br>1.7 <sup>b</sup>  |                  |
| Operating junction and storage temperature range       | $T_J, T_{stg}$ | -55 to +150                                   | $^\circ\text{C}$ |

### THERMAL RESISTANCE RATINGS

| PARAMETER                        | SYMBOL     | TYPICAL             | MAXIMUM | UNIT               |
|----------------------------------|------------|---------------------|---------|--------------------|
| Junction-to-ambient <sup>b</sup> | $R_{thJA}$ | $t \leq 10$ s<br>20 | 25      | $^\circ\text{C/W}$ |
|                                  |            | Steady state<br>62  | 75      |                    |
| Junction-to-case                 | $R_{thJC}$ | 5                   | 6       |                    |

#### Notes

- a. See SOA curve for voltage derating  
b. Surface mounted on 1" x 1" FR-4 board



| SPECIFICATIONS (T <sub>J</sub> = 25 °C, unless otherwise noted)                      |                     |                                                                                                                               |      |                   |       |      |
|--------------------------------------------------------------------------------------|---------------------|-------------------------------------------------------------------------------------------------------------------------------|------|-------------------|-------|------|
| PARAMETER                                                                            | SYMBOL              | TEST CONDITIONS                                                                                                               | MIN. | TYP. <sup>a</sup> | MAX.  | UNIT |
| Static                                                                               |                     |                                                                                                                               |      |                   |       |      |
| Drain-source breakdown voltage                                                       | V <sub>DS</sub>     | V <sub>GS</sub> = 0 V, I <sub>D</sub> = -250 μA                                                                               | -60  | -                 | -     | V    |
| Gate threshold voltage                                                               | V <sub>GS(th)</sub> | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250 μA                                                                  | -1   | -2                | -     |      |
| Gate-body leakage                                                                    | I <sub>GSS</sub>    | V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ± 20 V                                                                               | -    | -                 | ± 100 | nA   |
| Zero gate voltage drain current                                                      | I <sub>DSS</sub>    | V <sub>DS</sub> = -60 V, V <sub>GS</sub> = 0 V                                                                                | -    | -                 | -1    | μA   |
|                                                                                      |                     | V <sub>DS</sub> = -60 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 125 °C                                                       | -    | -                 | -50   |      |
|                                                                                      |                     | V <sub>DS</sub> = -60 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 150 °C                                                       | -    | -                 | -150  |      |
| On-state drain current <sup>b</sup>                                                  | I <sub>D(on)</sub>  | V <sub>DS</sub> = -5 V, V <sub>GS</sub> = -10 V                                                                               | -10  | -                 | -     | A    |
| Drain-source on-state resistance <sup>b</sup>                                        | R <sub>DS(on)</sub> | V <sub>GS</sub> = -10 V, I <sub>D</sub> = -5 A                                                                                | -    | 0.125             | 0.155 | Ω    |
|                                                                                      |                     | V <sub>GS</sub> = -10 V, I <sub>D</sub> = -5 A, T <sub>J</sub> = 125 °C                                                       | -    | -                 | 0.280 |      |
|                                                                                      |                     | V <sub>GS</sub> = -10 V, I <sub>D</sub> = -5 A, T <sub>J</sub> = 150 °C                                                       | -    | -                 | 0.350 |      |
|                                                                                      |                     | V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -2 A                                                                               | -    | 0.158             | 0.280 |      |
| Forward transconductance <sup>b</sup>                                                | g <sub>fs</sub>     | V <sub>DS</sub> = -15 V, I <sub>D</sub> = -5 A                                                                                | -    | 8                 | -     | S    |
| Dynamic                                                                              |                     |                                                                                                                               |      |                   |       |      |
| Input capacitance                                                                    | C <sub>ISS</sub>    | V <sub>DS</sub> = -25 V, V <sub>GS</sub> = 0 V, f = 1 MHz                                                                     | -    | 450               | -     | pF   |
| Output capacitance                                                                   | C <sub>OSS</sub>    |                                                                                                                               | -    | 65                | -     |      |
| Reverse transfer capacitance                                                         | C <sub>rss</sub>    |                                                                                                                               | -    | 40                | -     |      |
| Total gate charge                                                                    | Q <sub>g</sub>      | V <sub>DS</sub> = -30 V, V <sub>GS</sub> = -10 V, I <sub>D</sub> = -8.4 A                                                     | -    | 12.5              | 19    | nC   |
| Gate-source charge                                                                   | Q <sub>gs</sub>     |                                                                                                                               | -    | 2.3               | -     |      |
| Gate-drain charge                                                                    | Q <sub>gd</sub>     |                                                                                                                               | -    | 3.2               | -     |      |
| Gate resistance                                                                      | R <sub>g</sub>      | f = 1 MHz                                                                                                                     | -    | 8                 | -     | Ω    |
| Turn-on delay time <sup>c</sup>                                                      | t <sub>d(on)</sub>  | V <sub>DD</sub> = -30 V, R <sub>L</sub> = 3.57 Ω<br>I <sub>D</sub> ≅ -8.4 A, V <sub>GEN</sub> = -10 V, R <sub>g</sub> = 2.5 Ω | -    | 5                 | 10    | ns   |
| Rise time <sup>c</sup>                                                               | t <sub>r</sub>      |                                                                                                                               | -    | 14                | 25    |      |
| Turn-off delay time <sup>c</sup>                                                     | t <sub>d(off)</sub> |                                                                                                                               | -    | 15                | 25    |      |
| Fall time <sup>c</sup>                                                               | t <sub>f</sub>      |                                                                                                                               | -    | 7                 | 12    |      |
| Source-Drain Diode Ratings and Characteristics (T <sub>C</sub> = 25 °C) <sup>b</sup> |                     |                                                                                                                               |      |                   |       |      |
| Pulsed current                                                                       | I <sub>SM</sub>     |                                                                                                                               | -    | -                 | -20   | A    |
| Forward voltage <sup>b</sup>                                                         | V <sub>SD</sub>     | I <sub>F</sub> = -2 A, V <sub>GS</sub> = 0 V                                                                                  | -    | -0.9              | -1.3  | V    |
| Reverse recovery time                                                                | t <sub>rr</sub>     | I <sub>F</sub> = -8 A, di/dt = 100 A/μs                                                                                       | -    | 50                | 80    | ns   |
| Reverse recovery time                                                                | Q <sub>rr</sub>     |                                                                                                                               | -    | 80                | 120   | nC   |

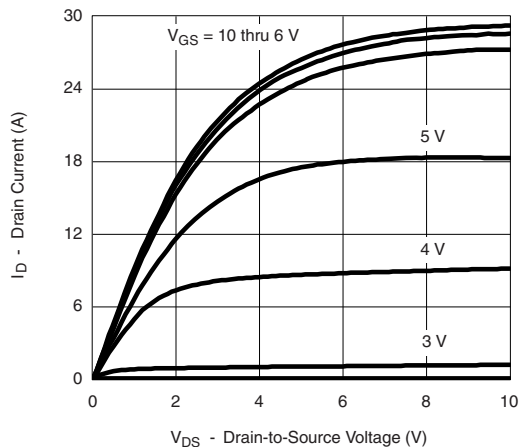
**Notes**

- a. Guaranteed by design, not subject to production testing  
b. Pulse test; pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$   
c. Independent of operating temperature

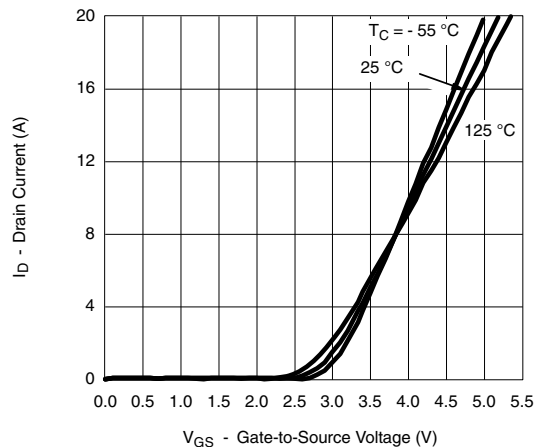
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.



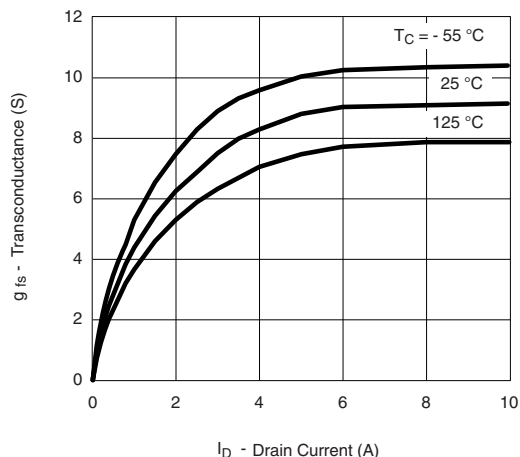
**TYPICAL CHARACTERISTICS** (25 °C, unless otherwise noted)



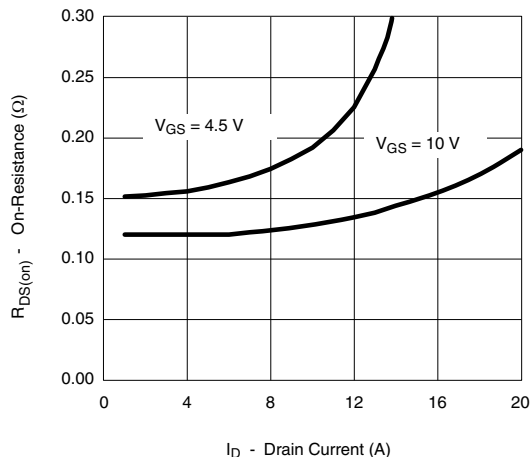
**Output Characteristics**



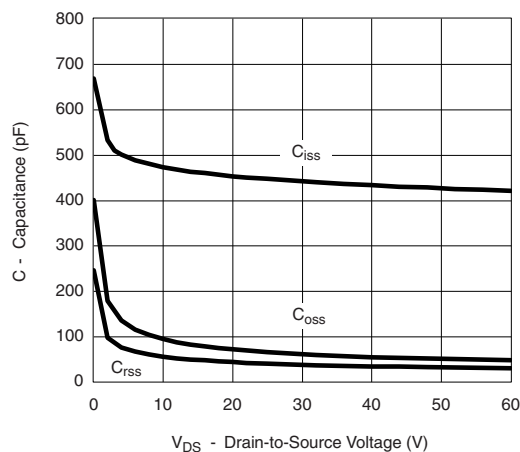
**Transfer Characteristics**



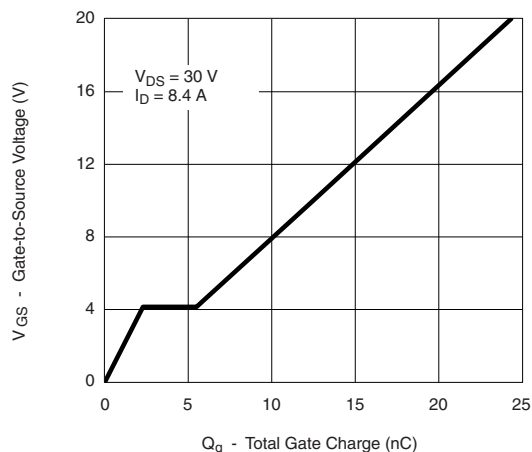
**Transconductance**



**On-Resistance vs. Drain Current**



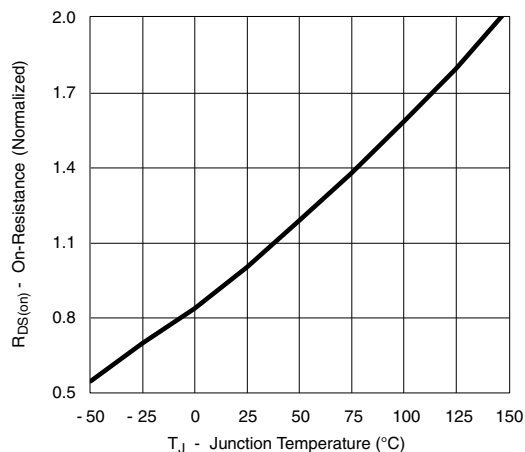
**Capacitance**



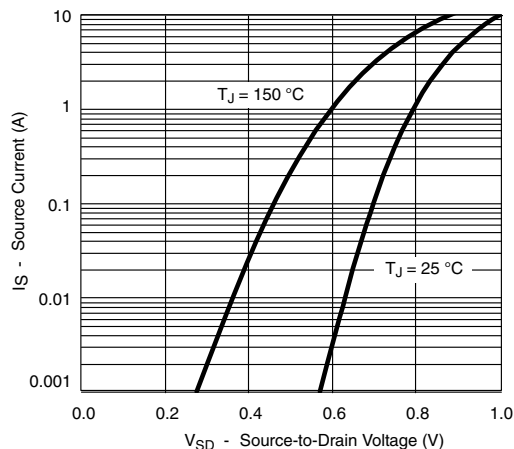
**Gate Charge**



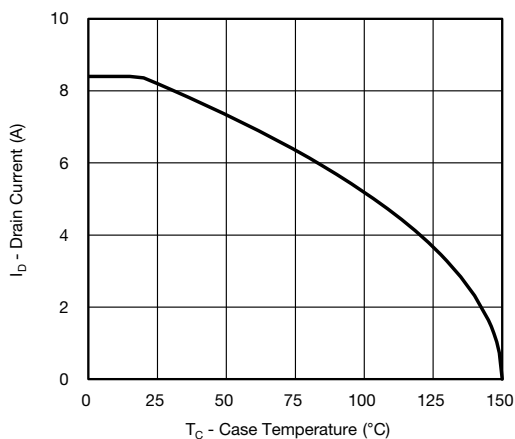
**TYPICAL CHARACTERISTICS** (25 °C, unless otherwise noted)



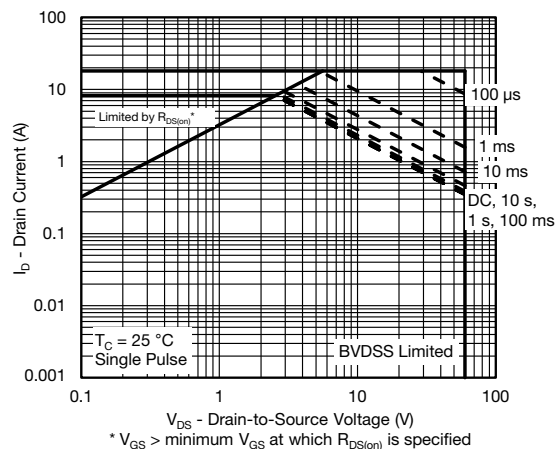
**On-Resistance vs. Junction Temperature**



**Source-Drain Diode Forward Voltage**



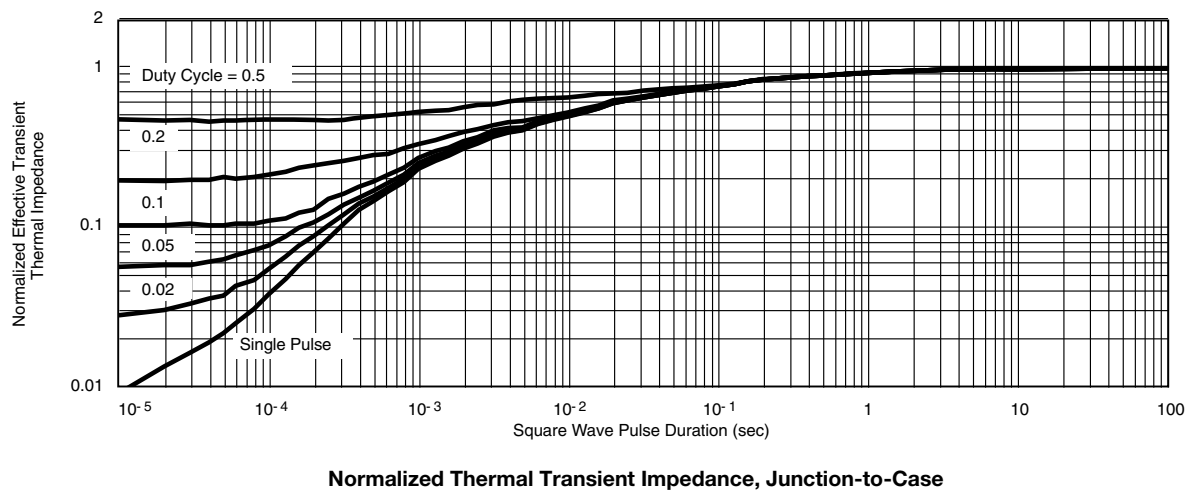
**Drain Current vs. Case Temperature**



**Safe Operating Area**



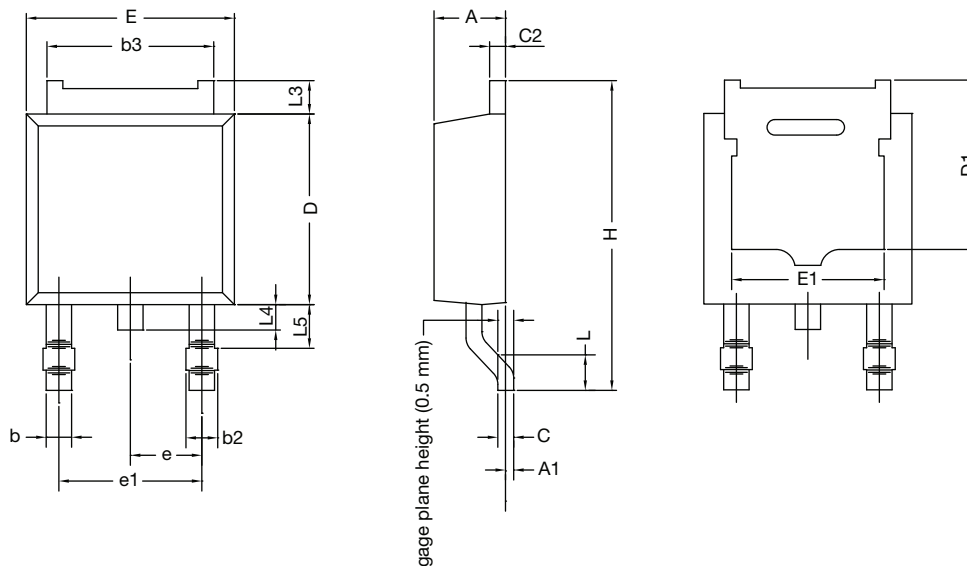
**TYPICAL CHARACTERISTICS** (25 °C, unless otherwise noted)



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## TO-252AA Case Outline

### VERSION 1: FACILITY CODE = Y



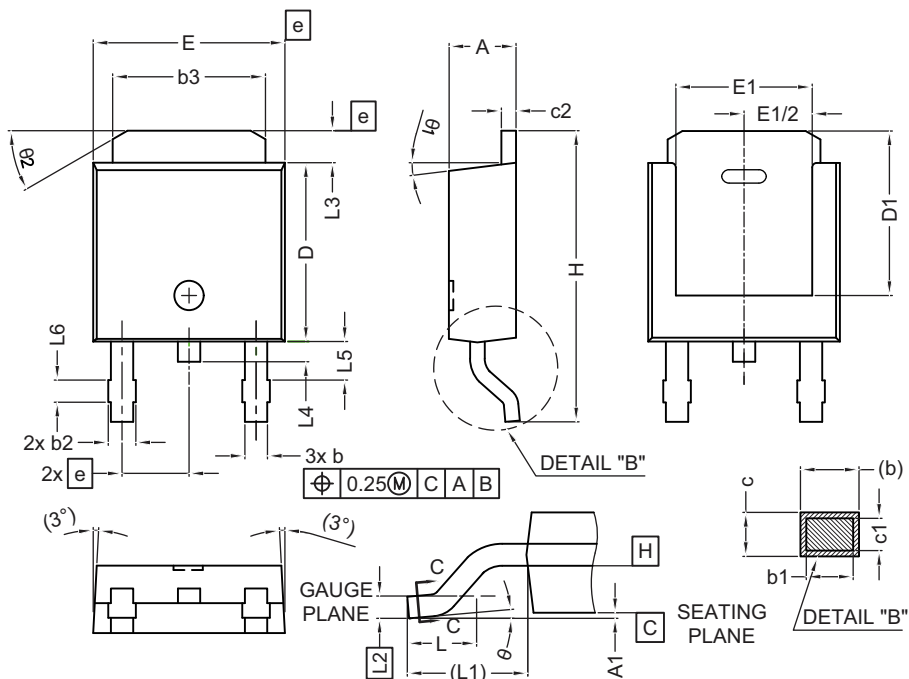
|      | MILLIMETERS |       |
|------|-------------|-------|
| DIM. | MIN.        | MAX.  |
| A    | 2.18        | 2.38  |
| A1   | -           | 0.127 |
| b    | 0.64        | 0.88  |
| b2   | 0.76        | 1.14  |
| b3   | 4.95        | 5.46  |
| C    | 0.46        | 0.61  |
| C2   | 0.46        | 0.89  |
| D    | 5.97        | 6.22  |
| D1   | 4.10        | -     |
| E    | 6.35        | 6.73  |
| E1   | 4.32        | -     |
| H    | 9.40        | 10.41 |
| e    | 2.28 BSC    |       |
| e1   | 4.56 BSC    |       |
| L    | 1.40        | 1.78  |
| L3   | 0.89        | 1.27  |
| L4   | -           | 1.02  |
| L5   | 1.01        | 1.52  |

#### Note

- Dimension L3 is for reference only



## VERSION 2: FACILITY CODE = N



| DIM. | MILLIMETERS |       |
|------|-------------|-------|
|      | MIN.        | MAX.  |
| A    | 2.18        | 2.39  |
| A1   | -           | 0.13  |
| b    | 0.65        | 0.89  |
| b1   | 0.64        | 0.79  |
| b2   | 0.76        | 1.13  |
| b3   | 4.95        | 5.46  |
| c    | 0.46        | 0.61  |
| c1   | 0.41        | 0.56  |
| c2   | 0.46        | 0.60  |
| D    | 5.97        | 6.22  |
| D1   | 5.21        | -     |
| E    | 6.35        | 6.73  |
| E1   | 4.32        | -     |
| e    | 2.29 BSC    |       |
| H    | 9.94        | 10.34 |

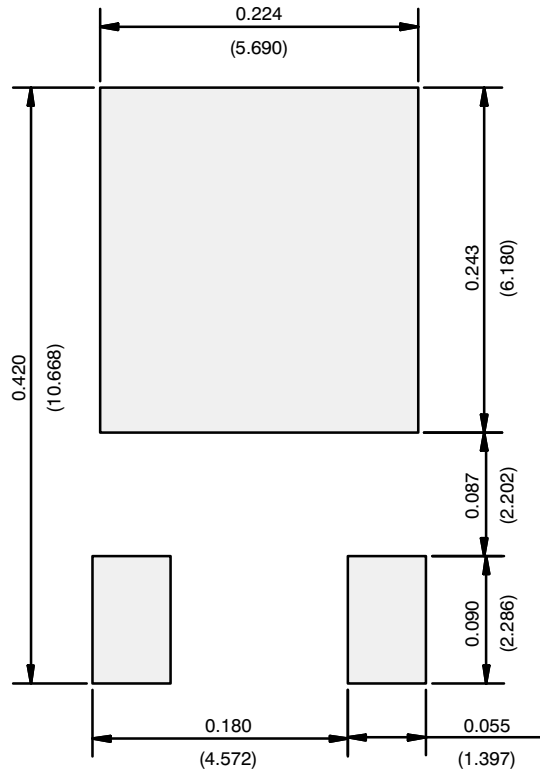
| DIM.   | MILLIMETERS |      |
|--------|-------------|------|
|        | MIN.        | MAX. |
| L      | 1.50        | 1.78 |
| L1     | 2.74 ref.   |      |
| L2     | 0.51 BSC    |      |
| L3     | 0.89        | 1.27 |
| L4     | -           | 1.02 |
| L5     | 1.14        | 1.49 |
| L6     | 0.65        | 0.85 |
| theta  | 0°          | 10°  |
| theta1 | 0°          | 15°  |
| theta2 | 25°         | 35°  |

### Notes

- Dimensioning and tolerance confirm to ASME Y14.5M-1994
- All dimensions are in millimeters. Angles are in degrees
- Heat sink side flash is max. 0.8 mm
- Radius on terminal is optional

ECN: E22-0399-Rev. R, 03-Oct-2022  
DWG: 5347

## RECOMMENDED MINIMUM PADS FOR DPAK (TO-252)



Recommended Minimum Pads  
Dimensions in Inches/(mm)

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