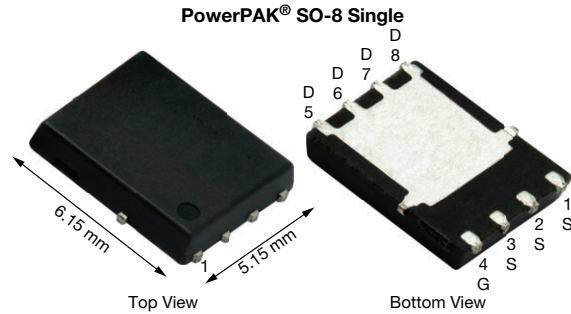


## N-Channel 200 V (D-S) MOSFET



### FEATURES

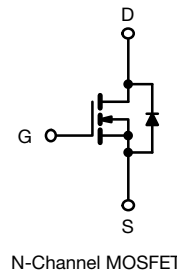
- TrenchFET® power MOSFETs
- New low thermal resistance PowerPAK® package with low 1.07 mm profile
- PWM optimized for fast switching

### APPLICATIONS

- Primary side switch



| PRODUCT SUMMARY                                   |        |
|---|--------|
| $V_{DS}$ (V)                                      | 200    |
| $R_{DS(on)}$ max. ( $\Omega$ ) at $V_{GS} = 10$ V | 0.130  |
| $R_{DS(on)}$ max. ( $\Omega$ ) at $V_{GS} = 6$ V  | 0.142  |
| $Q_g$ typ. (nC)                                   | 20     |
| $I_D$ (A)   | 4.1    |
| Configuration                                     | Single |



| ORDERING INFORMATION            |                 |
|---------------------------------|-----------------|
| Package                         | PowerPAK SO-8   |
| Lead (Pb)-free                  | Si7462DP-T1-E3  |
| Lead (Pb)-free and halogen-free | Si7462DP-T1-GE3 |

| ABSOLUTE MAXIMUM RATINGS ( $T_A = 25$ °C, unless otherwise noted) |                |             |              |      |   |
|---|----------------|-------------|--------------|------|---|
| PARAMETER   | SYMBOL         | 10 s        | STEADY STATE | UNIT |   |
| Drain-source voltage  | $V_{DS}$       | 200         | 200          | V    |   |
| Gate-source voltage   | $V_{GS}$       | $\pm 20$    | $\pm 20$     |      |   |
| Continuous drain current ( $T_J = 150$ °C) <sup>a</sup>           | $T_A = 25$ °C  | 4.1         | 2.6          | A    |   |
|   | $T_A = 85$ °C  | 3           | 1.9          |      |   |
| Pulsed drain current  | $I_{DM}$       | 12          | 12           |      |   |
| Avalanche current   | $L = 0.1$ mH   | $I_{AS}$    | 6            | mJ   |   |
| Single avalanche energy (duty cycle $\leq 1$ %)                   |                | $E_{AS}$    | 1.8          |      |   |
| Continuous source current (diode conduction) <sup>a</sup>         |                | $I_S$       | 4            | A    |   |
| Maximum power dissipation <sup>a</sup>                            | $T_A = 25$ °C  | $P_D$       | 4.8          | 1.9  | W |
|   | $T_A = 85$ °C  |             | 2.6          | 1    |   |
| Operating junction and storage temperature range                  | $T_J, T_{stg}$ | -55 to +150 |              | °C   |   |
| Soldering recommendations (peak temperature) <sup>b, c</sup>      |                | 260         |              |      |   |

| THERMAL RESISTANCE RATINGS               |            |               |         |      |      |
|--|------------|---------------|---------|------|------|
| PARAMETER                                | SYMBOL     | TYPICAL       | MAXIMUM | UNIT |      |
| Maximum junction-to-ambient <sup>a</sup> | $R_{thJA}$ | $t \leq 10$ s | 21      | 26   | °C/W |
|  |            | Steady state  | 55      | 65   |      |
| Maximum junction-to-case (drain)         | $R_{thJC}$ | 1.7           | 2.1     |      |      |

### Notes

- Surface mounted on 1" x 1" FR4 board
- See solder profile ([www.vishay.com/ppg?73257](http://www.vishay.com/ppg?73257)). The PowerPAK SO-8 is a leadless package. The end of the lead terminal is exposed copper (not plated) as a result of the singulation process in manufacturing. A solder fillet at the exposed copper tip cannot be guaranteed and is not required to ensure adequate bottom side solder interconnection
- Rework conditions: manual soldering with a soldering iron is not recommended for leadless components



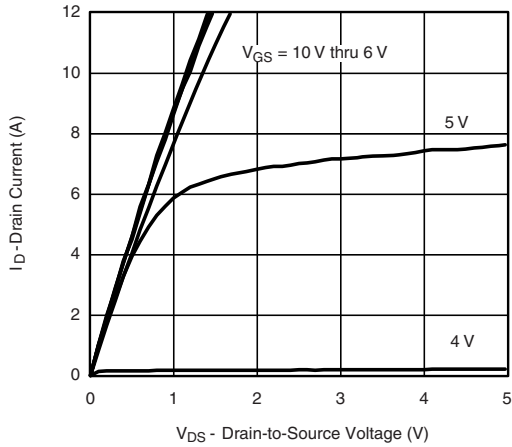
| SPECIFICATIONS ( $T_J = 25\text{ }^\circ\text{C}$ , unless otherwise noted) |              |   |      |       |           |               |
|---|--------------|---|------|-------|-----------|---------------|
| PARAMETER   | SYMBOL       | TEST CONDITIONS   | MIN. | TYP.  | MAX.      | UNIT          |
| <b>Static</b>   |              |   |      |       |           |               |
| Gate threshold voltage  | $V_{GS(th)}$ | $V_{DS} = V_{GS}$ , $I_D = 250\text{ }\mu\text{A}$  | 2    | -     | 4         | V             |
| Gate-body leakage   | $I_{GSS}$    | $V_{DS} = 0\text{ V}$ , $V_{GS} = \pm 20\text{ V}$  | -    | -     | $\pm 100$ | nA            |
| Zero gate voltage drain current   | $I_{DSS}$    | $V_{DS} = 200\text{ V}$ , $V_{GS} = 0\text{ V}$   | -    | -     | 1         | $\mu\text{A}$ |
|   |              | $V_{DS} = 200\text{ V}$ , $V_{GS} = 0\text{ V}$ , $T_J = 85\text{ }^\circ\text{C}$  | -    | -     | 20        |               |
| On-state drain current <sup>a</sup>   | $I_{D(on)}$  | $V_{DS} \geq 5\text{ V}$ , $V_{GS} = 10\text{ V}$   | 12   | -     | -         | A             |
| Drain-source on-state resistance <sup>a</sup>                               | $R_{DS(on)}$ | $V_{GS} = 10\text{ V}$ , $I_D = 4.1\text{ A}$   | -    | 0.110 | 0.130     | $\Omega$      |
|   |              | $V_{GS} = 6\text{ V}$ , $I_D = 3.9\text{ A}$  | -    | 0.120 | 0.142     |               |
| Forward transconductance <sup>a</sup>                                       | $g_{fs}$     | $V_{DS} = 15\text{ V}$ , $I_D = 4.1\text{ A}$   | -    | 13    | -         | S             |
| Diode forward voltage <sup>a</sup>  | $V_{SD}$     | $I_S = 4\text{ A}$ , $V_{GS} = 0\text{ V}$  | -    | 0.8   | 1.2       | V             |
| <b>Dynamic <sup>b</sup></b>   |              |   |      |       |           |               |
| Total gate charge   | $Q_g$        | $V_{DS} = 100\text{ V}$ , $V_{GS} = 10\text{ V}$ , $I_D = 4.1\text{ A}$   | -    | 20    | 30        | nC            |
| Gate-source charge  | $Q_{gs}$     |   | -    | 4.5   | -         |               |
| Gate-drain charge   | $Q_{gd}$     |   | -    | 6.5   | -         |               |
| Gate resistance   | $R_g$        |   | -    | 2     | -         | $\Omega$      |
| Turn-on delay time  | $t_{d(on)}$  | $V_{DD} = 100\text{ V}$ , $R_L = 100\text{ }\Omega$<br>$I_D \cong 1\text{ A}$ , $V_{GEN} = 10\text{ V}$ , $R_g = 6\text{ }\Omega$ | -    | 15    | 25        | ns            |
| Rise time   | $t_r$        |   | -    | 15    | 25        |               |
| Turn-off delay time   | $t_{d(off)}$ |   | -    | 40    | 60        |               |
| Fall time   | $t_f$        |   | -    | 20    | 30        |               |
| Source-drain reverse recovery time  | $t_{rr}$     | $I_F = 4\text{ A}$ , $di/dt = 100\text{ A}/\mu\text{s}$   | -    | 70    | 110       |               |

**Notes**

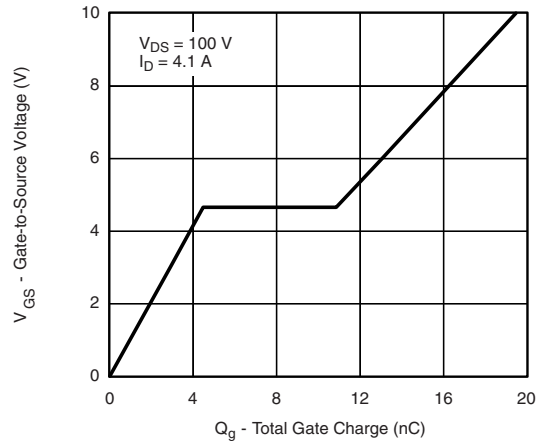
- a. Pulse test: pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$   
b. Guaranteed by design, not subject to production testing

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.

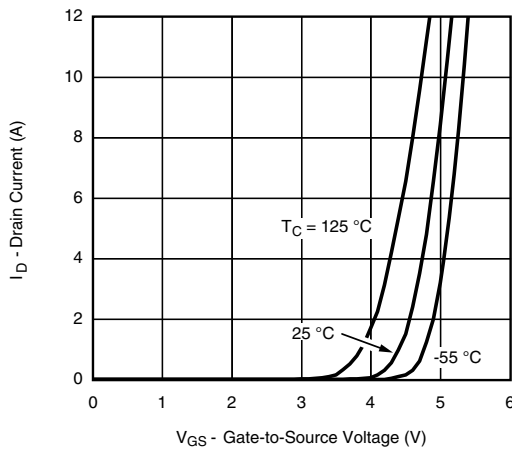
**TYPICAL CHARACTERISTICS** (25 °C, unless otherwise noted)



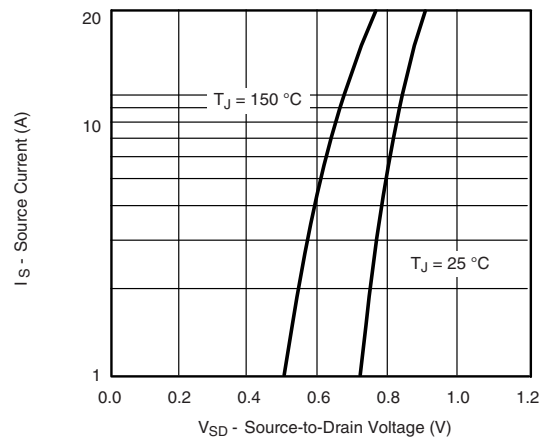
**Output Characteristics**



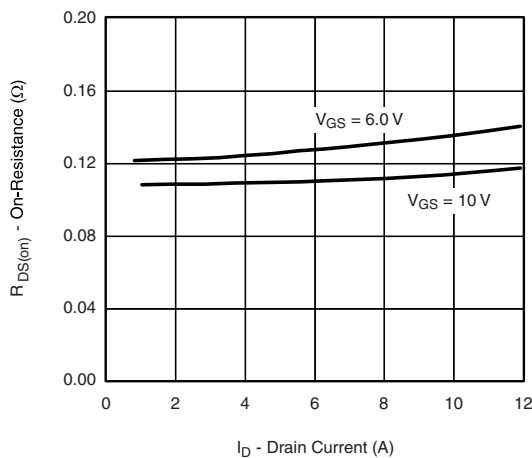
**Gate Charge**



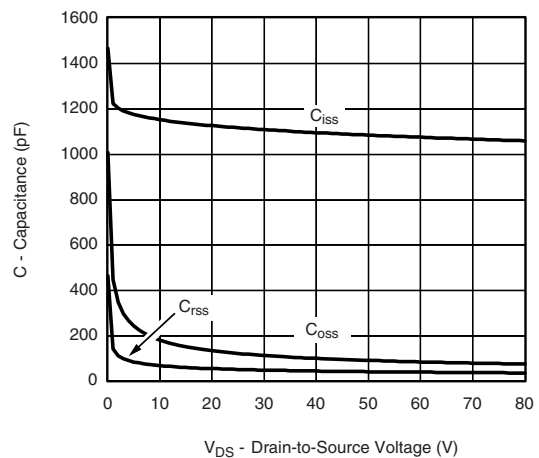
**Transfer Characteristics**



**Source-Drain Diode Forward Voltage**



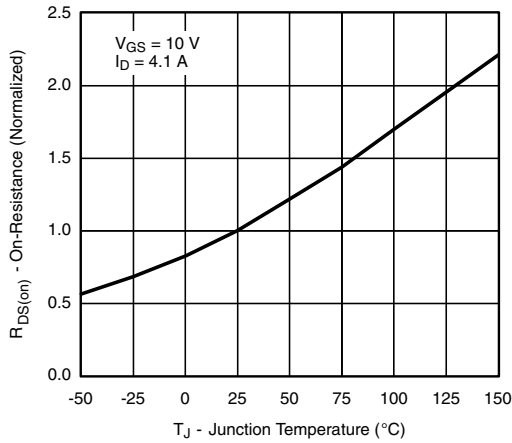
**On-Resistance vs. Drain Current**



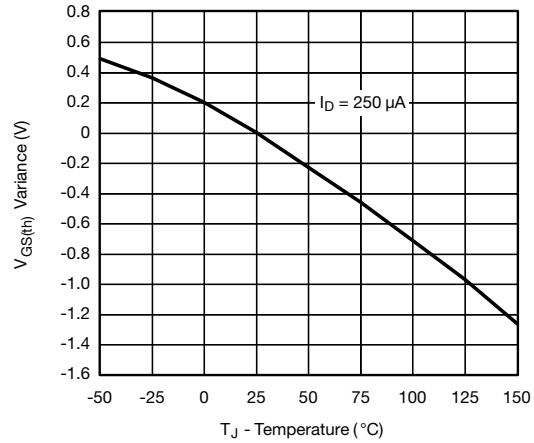
**Capacitance**



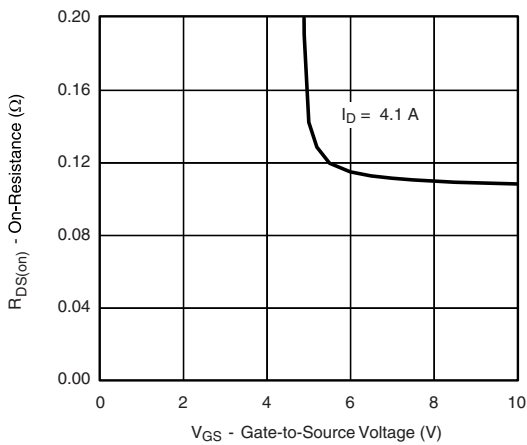
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



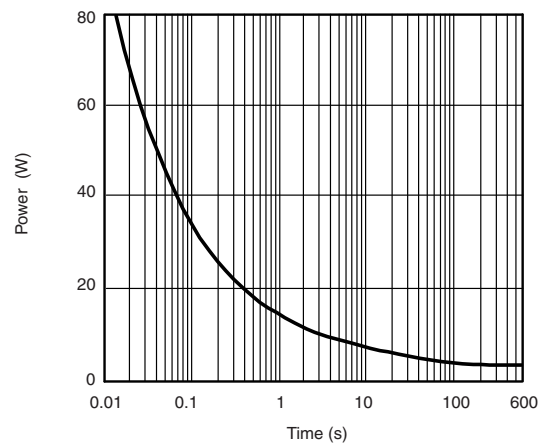
On-Resistance vs. Junction Temperature



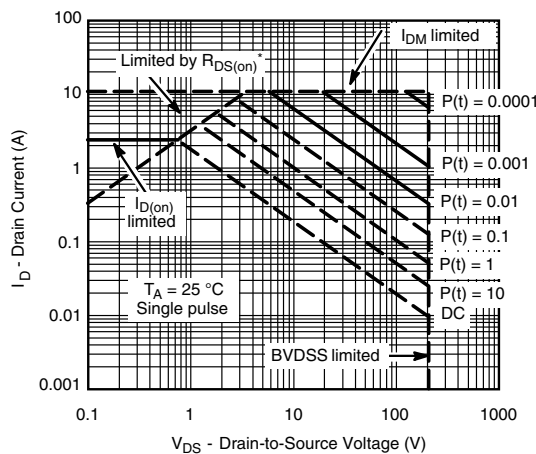
Threshold Voltage



On-Resistance vs. Gate-to-Source Voltage



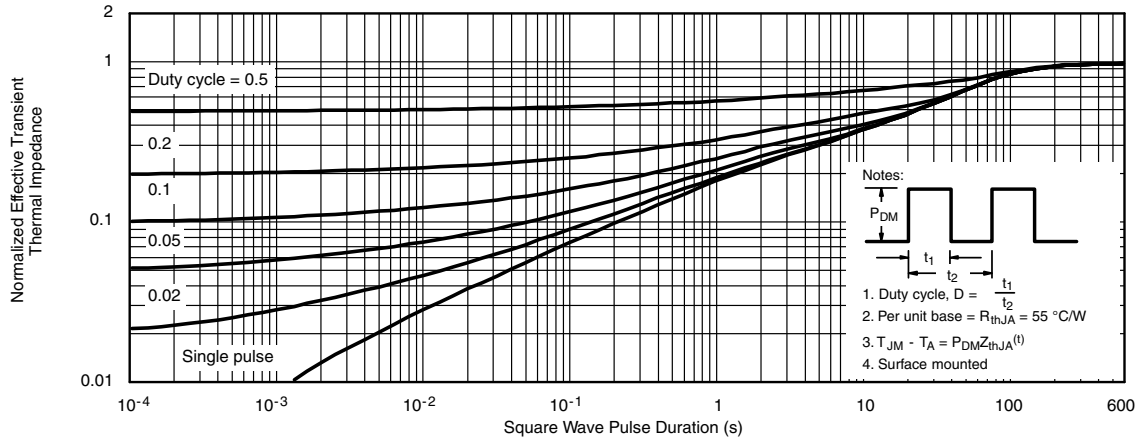
Single Pulse Power



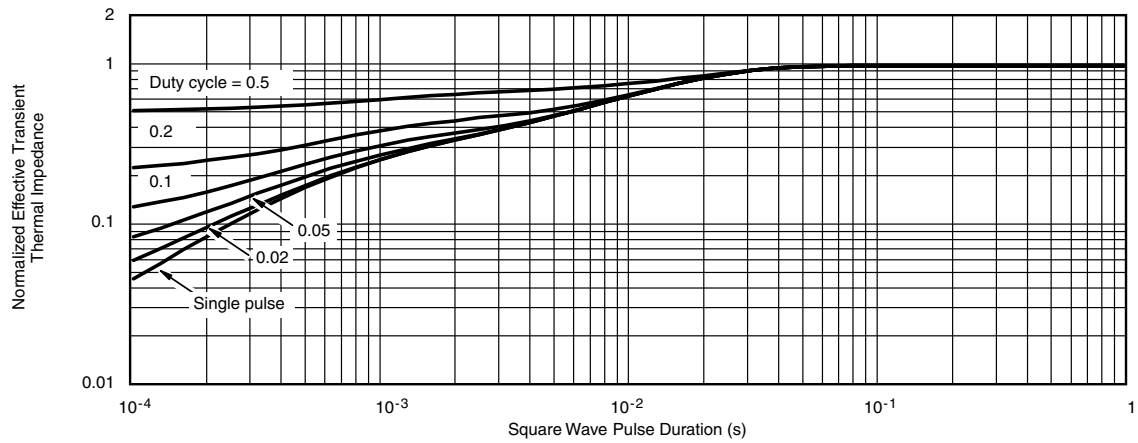
Safe Operating Area



TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Case

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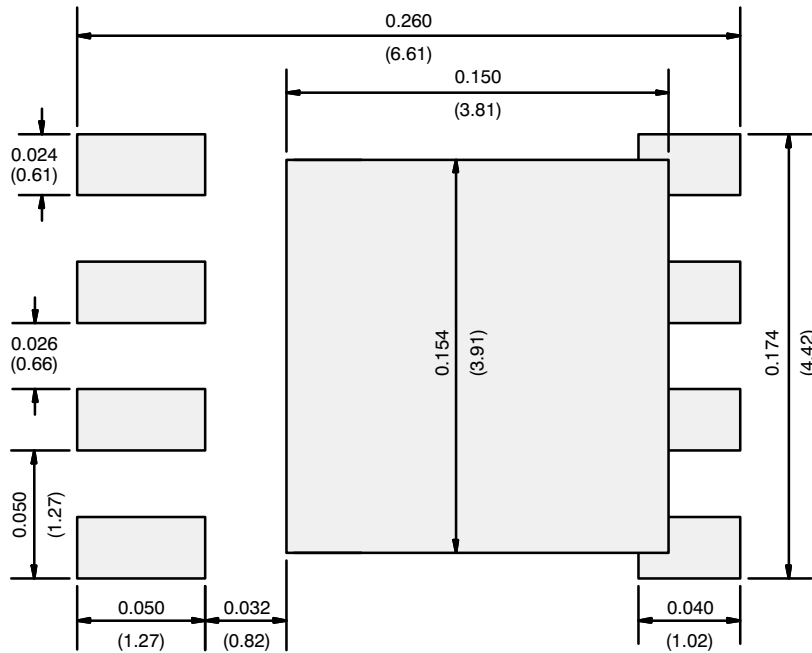
# PowerPAK<sup>®</sup> SO-8, (Single/Dual)



- Notes**
1. Inch will govern.
  2. Dimensions exclusive of mold gate burrs.
  3. Dimensions exclusive of mold flash and cutting burrs.

| DIM.                            | MILLIMETERS |      |      | INCHES      |       |       |
|---------------------------------|-------------|------|------|-------------|-------|-------|
|                                 | MIN.        | NOM. | MAX. | MIN.        | NOM.  | MAX.  |
| A                               | 0.97        | 1.04 | 1.12 | 0.038       | 0.041 | 0.044 |
| A1                              |             | -    | 0.05 | 0           | -     | 0.002 |
| b                               | 0.33        | 0.41 | 0.51 | 0.013       | 0.016 | 0.020 |
| c                               | 0.23        | 0.28 | 0.33 | 0.009       | 0.011 | 0.013 |
| D                               | 5.05        | 5.15 | 5.26 | 0.199       | 0.203 | 0.207 |
| D1                              | 4.80        | 4.90 | 5.00 | 0.189       | 0.193 | 0.197 |
| D2                              | 3.56        | 3.76 | 3.91 | 0.140       | 0.148 | 0.154 |
| D3                              | 1.32        | 1.50 | 1.68 | 0.052       | 0.059 | 0.066 |
| D4                              | 0.57 typ.   |      |      | 0.0225 typ. |       |       |
| D5                              | 3.98 typ.   |      |      | 0.157 typ.  |       |       |
| E                               | 6.05        | 6.15 | 6.25 | 0.238       | 0.242 | 0.246 |
| E1                              | 5.79        | 5.89 | 5.99 | 0.228       | 0.232 | 0.236 |
| E2                              | 3.48        | 3.66 | 3.84 | 0.137       | 0.144 | 0.151 |
| E3                              | 3.68        | 3.78 | 3.91 | 0.145       | 0.149 | 0.154 |
| E4                              | 0.75 typ.   |      |      | 0.030 typ.  |       |       |
| e                               | 1.27 BSC    |      |      | 0.050 BSC   |       |       |
| K                               | 1.27 typ.   |      |      | 0.050 typ.  |       |       |
| K1                              | 0.56        | -    | -    | 0.022       | -     | -     |
| H                               | 0.51        | 0.61 | 0.71 | 0.020       | 0.024 | 0.028 |
| L                               | 0.51        | 0.61 | 0.71 | 0.020       | 0.024 | 0.028 |
| L1                              | 0.06        | 0.13 | 0.20 | 0.002       | 0.005 | 0.008 |
| θ                               | 0°          | -    | 12°  | 0°          | -     | 12°   |
| W                               | 0.15        | 0.25 | 0.36 | 0.006       | 0.010 | 0.014 |
| M                               | 0.125 typ.  |      |      | 0.005 typ.  |       |       |
| ECN: S17-0173-Rev. L, 13-Feb-17 |             |      |      |             |       |       |
| DWG: 5881                       |             |      |      |             |       |       |

## RECOMMENDED MINIMUM PADS FOR PowerPAK® SO-8 Single



Recommended Minimum Pads  
Dimensions in Inches/(mm)

[Return to Index](#)



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