

## 1. Description

The AON7544-ES is N-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent  $R_{DS(ON)}$  with low gate charge. Device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product AON7544-ES is Pb-free.

## 2. Features

- 30V,  $R_{DS(ON)}=4.0m\Omega(TYP.) @V_{GS}=10V$
- $R_{DS(ON)}=7.4m\Omega(TYP.) @V_{GS}=4.5V$
- High density cell design for low  $R_{DS(on)}$
- Material: Halogen free
- Reliable and rugged
- Avalanche Rated
- Low leakage current

## 3. Applications

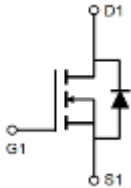
- PWM applications
- Load switch
- Power management in portable/desktop PCs
- DC/DC conversion

100% UIS TESTED

## 4. Ordering Information

| Part Number | Package    | Marking      | Material     | Packing     | Quantity per reel | Flammability Rating | Reel Size |
|-------------|------------|--------------|--------------|-------------|-------------------|---------------------|-----------|
| AON7544-ES  | PDFN3*3-8L | .NH03R05/LOT | Halogen free | Tape & Reel | 5,000 PCS         | UL 94V-0            | 13 inches |

## 5. Pin Configuration and Functions

| Pin     | Function | Outline                                                                                           | Circuit Diagram                                                                       |
|---------|----------|---------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 4       | Gate     | <p>Note b</p>  |  |
| 1/2/3   | Source   |                                                                                                   |                                                                                       |
| 5/6/7/8 | Drain    |                                                                                                   |                                                                                       |

## 6. Specification

### Absolute Maximum Rating & Thermal Characteristics

Ratings at 25 °C ambient temperature unless otherwise specified.

| Parameter                                    |                    | Symbol     | Limit      | Unit |
|----------------------------------------------|--------------------|------------|------------|------|
| Drain-Source Voltage                         |                    | $BV_{DSS}$ | 30         | V    |
| Gate-Source Voltage                          |                    | $V_{GS}$   | ±20        | V    |
| Continuous Drain Current                     | $T_C=25^{\circ}C$  | $I_D$      | 62.7       | A    |
|                                              | $T_C=100^{\circ}C$ |            | 39.6       |      |
| Maximum Power Dissipation                    |                    | $P_D$      | 34.7       | W    |
| Pulsed Drain Current                         |                    | $I_{DM}$   | 250.7      | A    |
| Avalanche Energy, Single Pulsed <sup>a</sup> |                    | $E_{AS}$   | 92         | mJ   |
| Operating Junction Temperature               |                    | $T_J$      | 150        | °C   |
| Lead Temperature                             |                    | $T_L$      | 260        | °C   |
| Storage Temperature Range                    |                    | $T_{stg}$  | -55 to 150 | °C   |

### Thermal resistance ratings

| Single Operation                    |                 |         |         |      |
|-------------------------------------|-----------------|---------|---------|------|
| Parameter                           | Symbol          | Typical | Maximum | Unit |
| Junction-to-Case Thermal Resistance | $R_{\theta JC}$ |         | 3.6     | °C/W |

Note:

a: EAS condition:  $T_J=25^{\circ}C$ ,  $V_{DD}=25V$ ,  $V_G=10V$ ,  $L=0.5mH$ ,  $R_g=25\Omega$ .

b: This diagram is only an electrical schematic, and the actual pin size is based on POD.

## Electrical Characteristics

At TA = 25°C unless otherwise specified

| Parameter                                 | Symbol              | Test Conditions                                                                       | Min. | Typ. | Max. | Unit |
|-------------------------------------------|---------------------|---------------------------------------------------------------------------------------|------|------|------|------|
| OFF CHARACTERISTICS                       |                     |                                                                                       |      |      |      |      |
| Drain-to-Source Breakdown Voltage         | BV <sub>DSS</sub>   | V <sub>GS</sub> =0V, I <sub>D</sub> =250uA                                            | 30   |      |      | V    |
| Zero Gate Voltage Drain Current           | I <sub>DSS</sub>    | V <sub>DS</sub> =30V, V <sub>GS</sub> =0V                                             |      |      | 1    | uA   |
| Gate-to-source Leakage Current            | I <sub>GSS</sub>    | V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V                                            |      |      | ±100 | nA   |
| ON CHARACTERISTICS                        |                     |                                                                                       |      |      |      |      |
| Gate Threshold Voltage                    | V <sub>GS(TH)</sub> | V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA                              | 1.0  |      | 2.5  | V    |
| Drain-to-source On-resistance             | R <sub>DS(on)</sub> | V <sub>GS</sub> =10V, I <sub>D</sub> =20A                                             |      | 4.0  | 5.2  | mΩ   |
|                                           |                     | V <sub>GS</sub> =4.5V, I <sub>D</sub> =15A                                            |      | 7.4  | 8.7  |      |
| CHARGES, CAPACITANCES AND GATE RESISTANCE |                     |                                                                                       |      |      |      |      |
| Input Capacitance                         | C <sub>ISS</sub>    | V <sub>GS</sub> =0V, f=1MHz,<br>V <sub>DS</sub> =15V                                  |      | 1916 |      | pF   |
| Output Capacitance                        | C <sub>OSS</sub>    |                                                                                       |      | 217  |      |      |
| Reverse Transfer Capacitance              | C <sub>RSS</sub>    |                                                                                       |      | 183  |      |      |
| Total Gate Charge                         | Q <sub>G</sub>      | V <sub>GS</sub> =0 to 10V, V <sub>DS</sub> =15V<br>I <sub>D</sub> =30 A               |      | 37   |      | nC   |
| Gate-to-Source Charge                     | Q <sub>GS</sub>     |                                                                                       |      | 7.4  |      |      |
| Gate-to-Drain Charge                      | Q <sub>GD</sub>     |                                                                                       |      | 8.6  |      |      |
| SWITCHING CHARACTERISTICS                 |                     |                                                                                       |      |      |      |      |
| Turn-On Delay Time                        | t <sub>d(ON)</sub>  | V <sub>GS</sub> =10V, V <sub>DD</sub> =15V<br>I <sub>D</sub> =30A, R <sub>G</sub> =3Ω |      | 8.4  |      | ns   |
| Rise Time                                 | t <sub>r</sub>      |                                                                                       |      | 20   |      |      |
| Turn-Off Delay Time                       | t <sub>d(OFF)</sub> |                                                                                       |      | 32   |      |      |
| Fall Time                                 | t <sub>f</sub>      |                                                                                       |      | 9    |      |      |
| BODY DIODE CHARACTERISTICS                |                     |                                                                                       |      |      |      |      |
| Forward Voltage                           | V <sub>SD</sub>     | V <sub>GS</sub> =0V, I <sub>S</sub> =30A                                              |      |      | 1.2  | V    |

## 7. Typical Characteristics

Figure 1: Output Characteristics

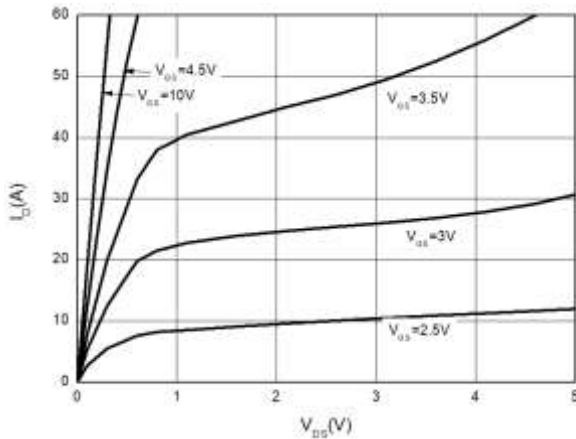


Figure 2: Typical Transfer Characteristics

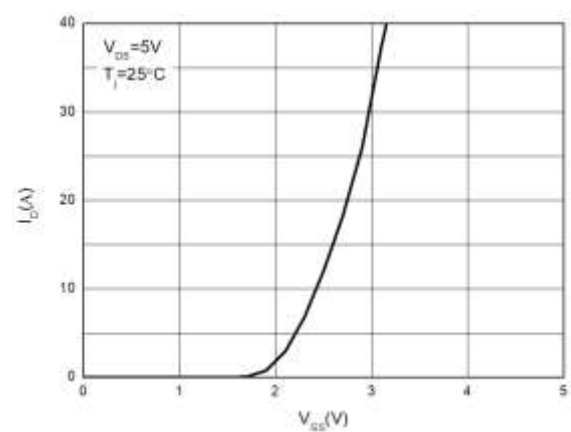


Figure 3: On-resistance vs. Drain Current

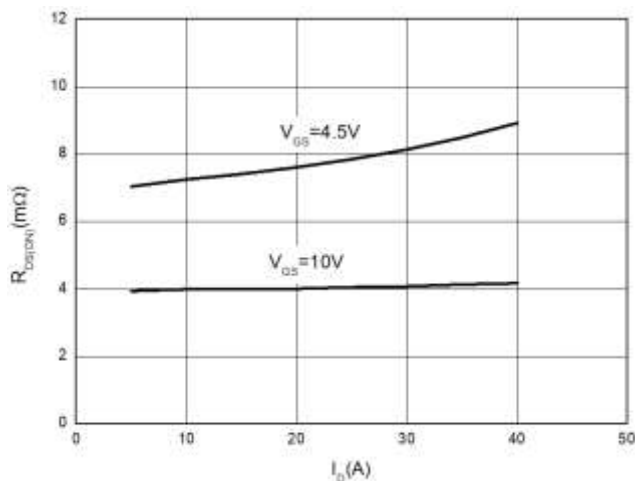


Figure 4: Body Diode Characteristics

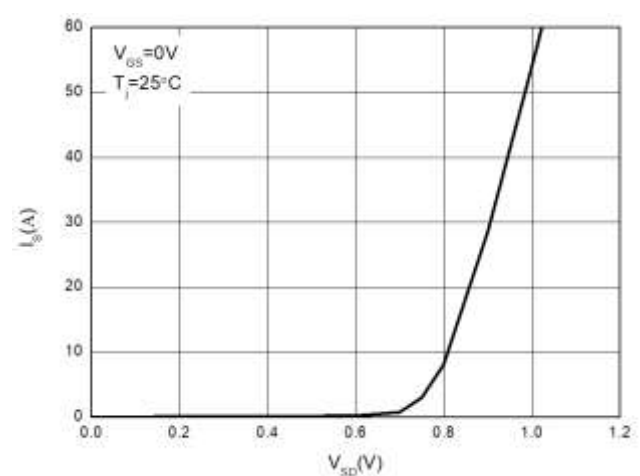


Figure 5: Capacitance Characteristics

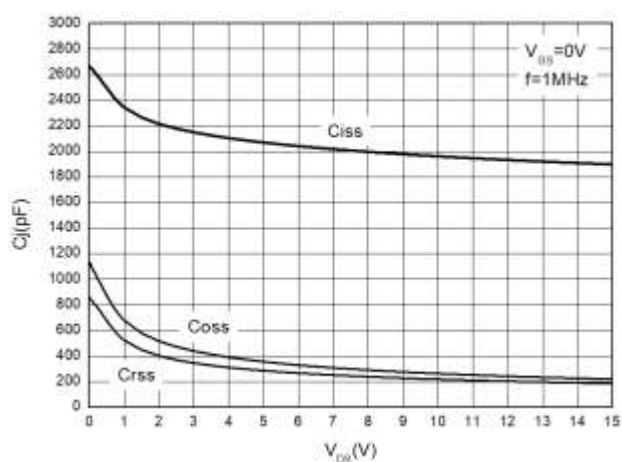


Figure 6: Normalized on Resistance vs. Junction Temperature

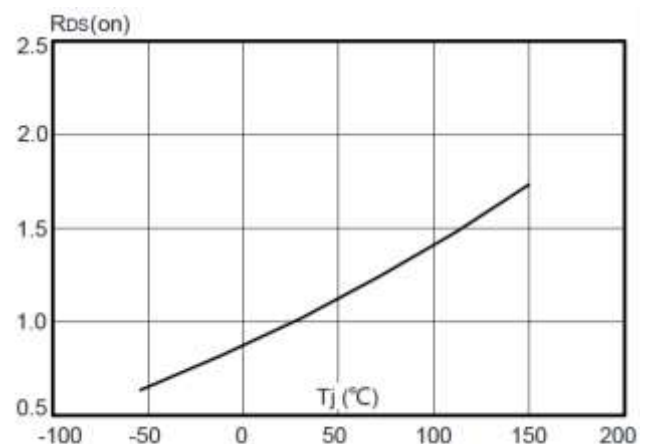
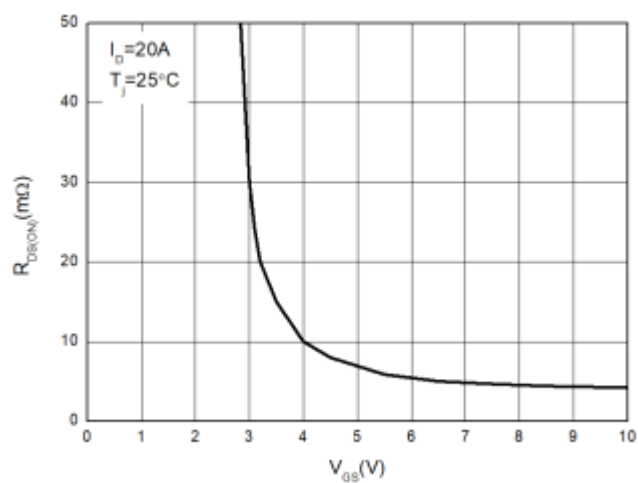
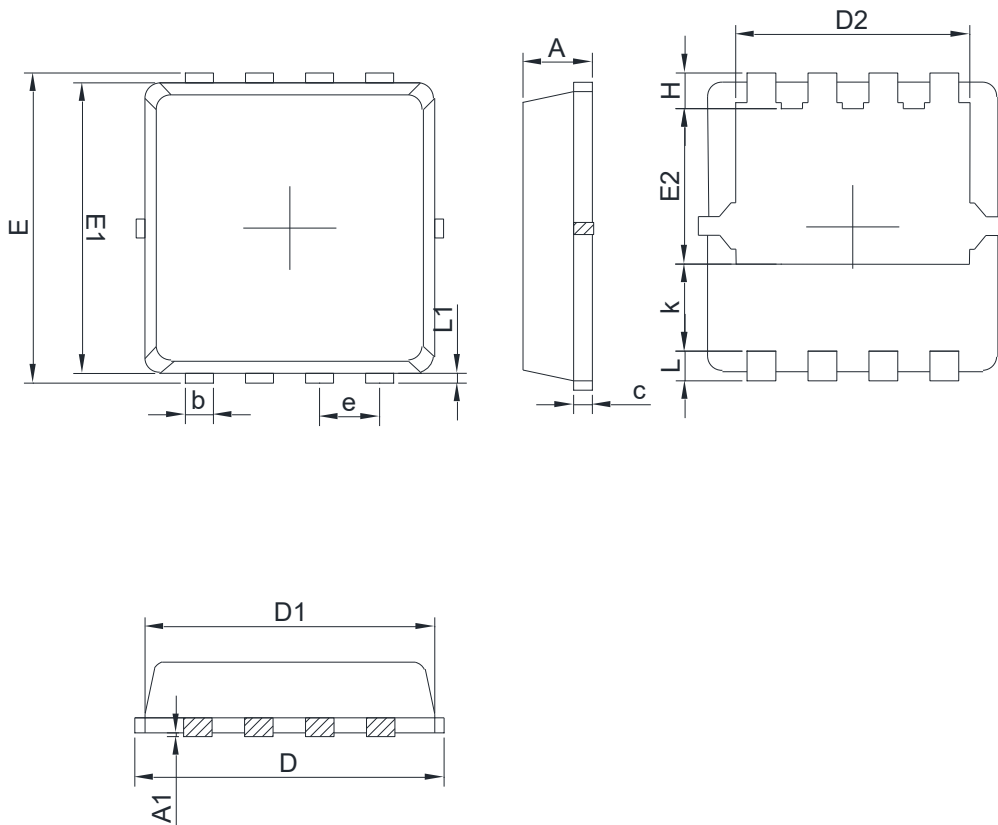


Figure7: On-resistance vs. Gate to Source



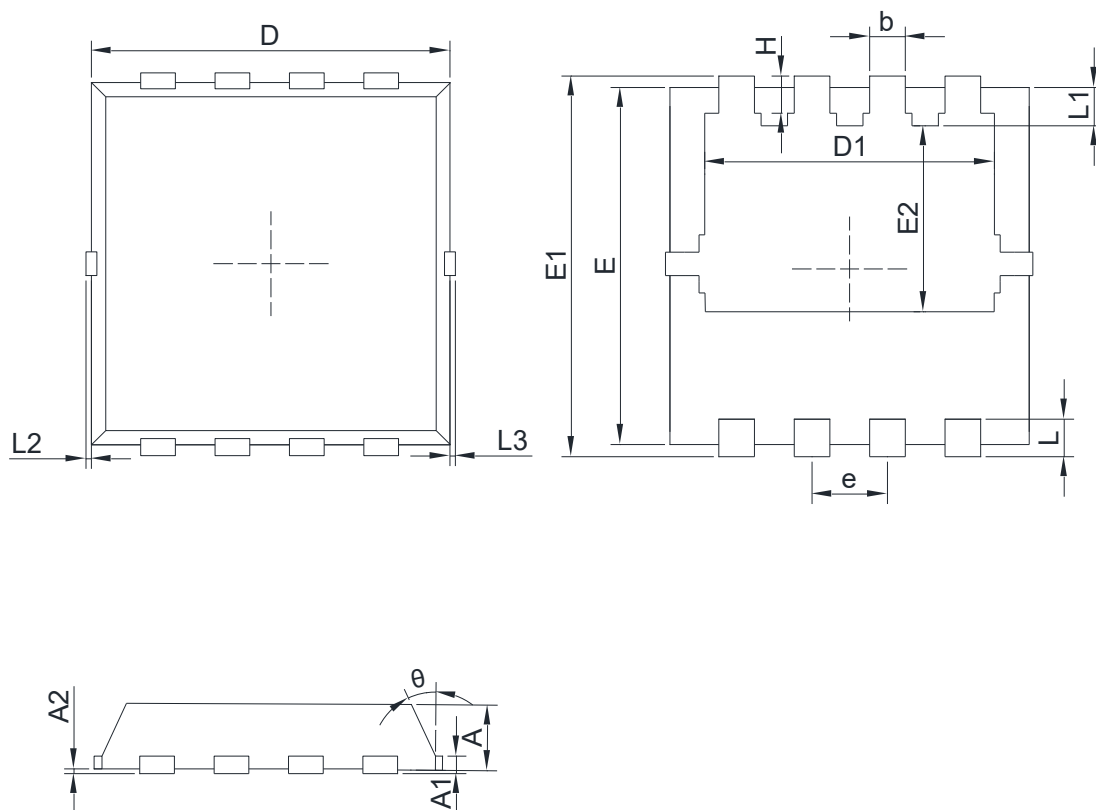
## 8. Dimension (PDFN3\*3-8L)

POD A(Q)



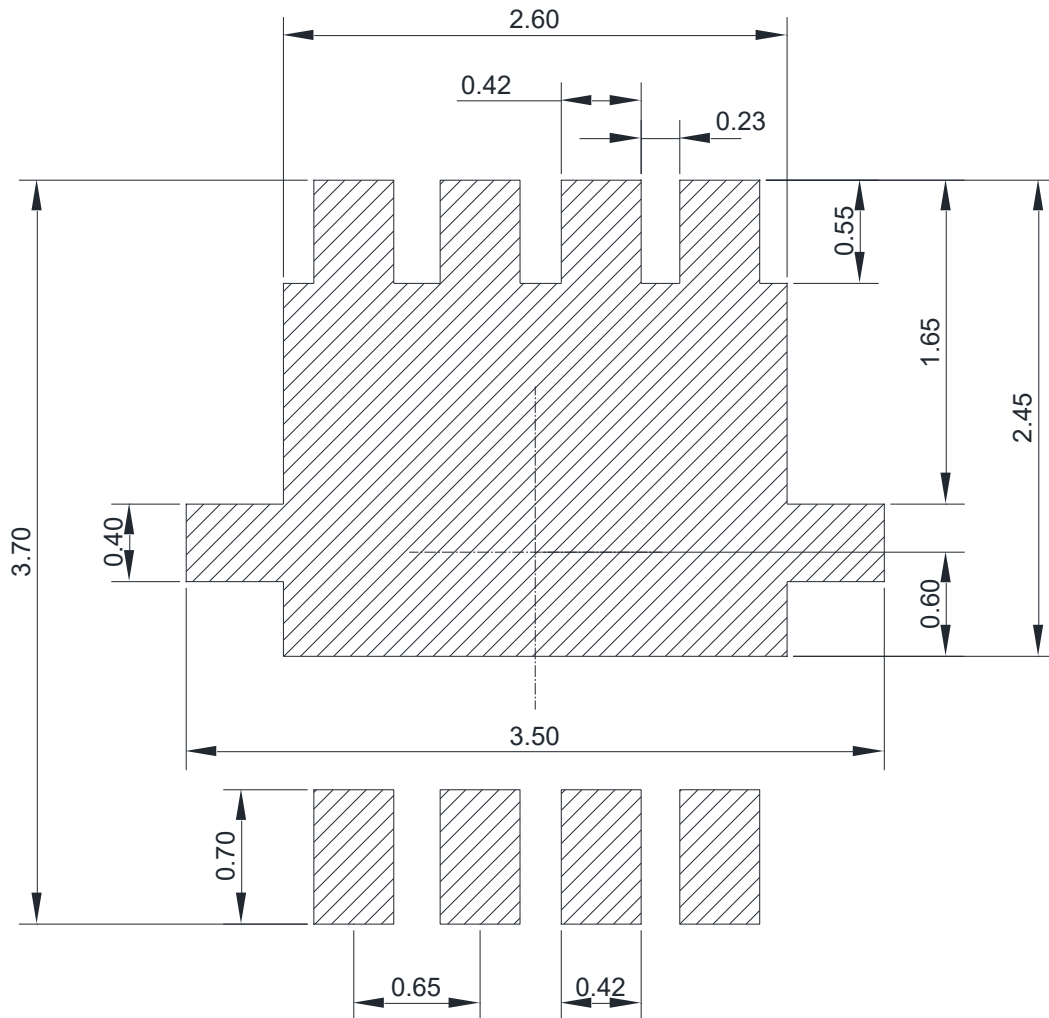
| Symbol | Dimensions in Millimeters |      |      | Symbol | Dimensions in Millimeters |       |       |
|--------|---------------------------|------|------|--------|---------------------------|-------|-------|
|        | Min.                      | NOM. | Max. |        | Min.                      | NOM.  | Max.  |
| A      | 0.65                      | 0.75 | 0.85 | H      | 0.385                     | 0.485 | 0.585 |
| A1     |                           |      | 0.05 | k      | 0.80                      |       |       |
| b      | 0.20                      | 0.30 | 0.40 | L      | 0.30                      | 0.40  | 0.50  |
| c      | 0.10                      | 0.15 | 0.25 | e      | 0.65BCS                   |       |       |
| D      | 3.05                      | 3.20 | 3.35 | L1     | 0.025                     | 0.125 | 0.225 |
| D1     | 3.05                      | 3.15 | 3.25 | D2     | 2.30                      | 2.45  | 2.60  |
| E      | 3.25                      | 3.35 | 3.45 | E2     | 1.36                      | 1.51  | 1.66  |
| E1     | 3.00                      | 3.10 | 3.20 |        |                           |       |       |

POD B(X)



| COMMON DIMENSIONS CUNITS MEASURE=MILLIMETER |           |       |       |          |         |       |       |
|---------------------------------------------|-----------|-------|-------|----------|---------|-------|-------|
| SYMBOL                                      | MIN       | TYP   | MAX   | SYMBOL   | MIN     | TYP   | MAX   |
| A                                           | 0.700     | 0.800 | 0.900 | L        | 0.300   | 0.400 | 0.500 |
| A1                                          | 0.152 REF |       |       | L1       | 0.180   | 0.330 | 0.480 |
| A2                                          | 0~0.05    |       |       | L2       | 0~0.100 |       |       |
| D                                           | 3.000     | 3.100 | 3.200 | L3       | 0~0.100 |       |       |
| D1                                          | 2.300     | 2.450 | 2.600 | H        | 0.315   | 0.415 | 0.515 |
| E                                           | 2.900     | 3.000 | 3.100 | b        | 0.200   | 0.300 | 0.400 |
| E1                                          | 3.150     | 3.300 | 3.450 | e        | 0.550   | 0.650 | 0.750 |
| E2                                          | 1.320     | 1.520 | 1.720 | $\theta$ | 8°      | 10°   | 12°   |

## 9. Recommended Soldering Footprint



DIMENSIONS: MILLIMETERS



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