

### Description

The AON7544 is the high cell density trenched N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The AON7544 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

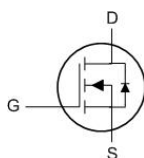
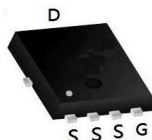
Super Low Gate Charge

100% EAS Guaranteed

Green Device Available

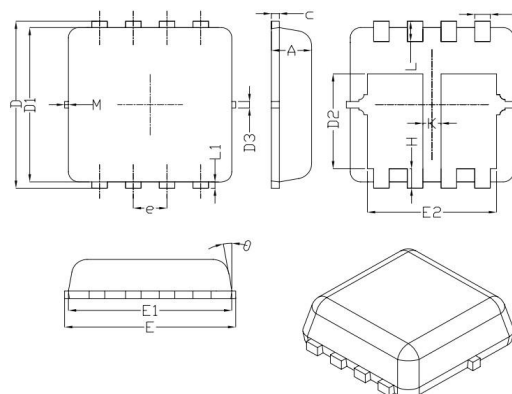
Excellent CdV/dt effect decline

Advanced high cell density Trench technology



### Product Summary

| BVDSS | RDSON | ID   |
|-------|-------|------|
| 30V   | 3.5mΩ | 100A |



| Symbol | Dimensions (unit: mm) |      |      | Symbol          | Dimensions (unit: mm) |      |      |
|--------|-----------------------|------|------|-----------------|-----------------------|------|------|
|        | Min                   | Typ  | Max  |                 | Min                   | Typ  | Max  |
| A      | 0.70                  | 0.75 | 0.80 | E2              | 2.39                  | 2.49 | 2.59 |
| b      | 0.25                  | 0.30 | 0.35 | e               | 0.65 BSC              |      |      |
| c      | 0.10                  | 0.15 | 0.25 | H               | 0.30                  | 0.39 | 0.50 |
| D      | 3.25                  | 3.35 | 3.45 | L               | 0.30                  | 0.40 | 0.50 |
| D1     | 3.00                  | 3.10 | 3.20 | L1              | --                    | 0.13 | --   |
| D2     | 1.78                  | 1.88 | 1.98 | K               | 0.30                  | --   | --   |
| D3     | --                    | 0.13 | --   | θ               | --                    | 10°  | 12°  |
| E      | 3.20                  | 3.30 | 3.40 | M               | *                     | *    | 0.15 |
| E1     | 3.00                  | 3.15 | 3.20 | * Not Specified |                       |      |      |

Notes:

1. Refer to JEDEC MO-240 variation CA.

2. Dimensions "D1" and "E1" do NOT include mold flash protrusions or gate burrs.

3. Dimensions "D1" and "E1" include interterminal flash or protrusion.

### Absolute Maximum Ratings

| Symbol                      | Parameter                                  | Rating     |              | Units |
|-----------------------------|--------------------------------------------|------------|--------------|-------|
|                             |                                            | 10s        | Steady State |       |
| $V_{DS}$                    | Drain-Source Voltage                       | 30         |              | V     |
| $V_{GS}$                    | Gate-Source Voltage                        | $\pm 20$   |              | V     |
| $I_D@T_C=25^\circ\text{C}$  | Continuous Drain Current, $V_{GS} @ 10V^1$ | 100        |              | A     |
| $I_D@T_C=100^\circ\text{C}$ | Continuous Drain Current, $V_{GS} @ 10V^1$ | 50         |              | A     |
| $I_D@T_A=25^\circ\text{C}$  | Continuous Drain Current, $V_{GS} @ 10V^1$ | 30         | 19           | A     |
| $I_D@T_A=70^\circ\text{C}$  | Continuous Drain Current, $V_{GS} @ 10V^1$ | 25         | 16           | A     |
| $I_{DM}$                    | Pulsed Drain Current <sup>2</sup>          | 162        |              | A     |
| EAS                         | Single Pulse Avalanche Energy <sup>3</sup> | 144.7      |              | mJ    |
| $I_{AS}$                    | Avalanche Current                          | 53.8       |              | A     |
| $P_D@T_C=25^\circ\text{C}$  | Total Power Dissipation <sup>4</sup>       | 62.5       |              | W     |
| $P_D@T_A=25^\circ\text{C}$  | Total Power Dissipation <sup>4</sup>       | 6          | 2.42         | W     |
| $T_{STG}$                   | Storage Temperature Range                  | -55 to 175 |              | °C    |
| $T_J$                       | Operating Junction Temperature Range       | -55 to 175 |              | °C    |

### Thermal Data

| Symbol          | Parameter                                                  | Typ. | Max. | Unit |
|-----------------|------------------------------------------------------------|------|------|------|
| $R_{\theta JA}$ | Thermal Resistance Junction-Ambient <sup>1</sup>           | ---  | 62   | °C/W |
| $R_{\theta JA}$ | Thermal Resistance Junction-Ambient <sup>1</sup> (t ≤ 10s) | ---  | 25   | °C/W |
| $R_{\theta JC}$ | Thermal Resistance Junction-Case <sup>1</sup>              | ---  | 2.4  | °C/W |

# AON7544

## Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise specified)

| Symbol               | Parameter                                                | Test Condition                                                                              | Min. | Typ. | Max. | Units |
|----------------------|----------------------------------------------------------|---------------------------------------------------------------------------------------------|------|------|------|-------|
| V <sub>(BR)DSS</sub> | Drain-Source Breakdown Voltage                           | V <sub>GS</sub> =0V, I <sub>D</sub> =250μA                                                  | 30   | -    | -    | V     |
| I <sub>DSS</sub>     | Zero Gate Voltage Drain Current                          | V <sub>DS</sub> =30V, V <sub>GS</sub> =0V,                                                  | -    | -    | 1.0  | μA    |
| I <sub>GSS</sub>     | Gate to Body Leakage Current                             | V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V                                                  | -    | -    | ±100 | nA    |
| V <sub>GS(th)</sub>  | Gate Threshold Voltage                                   | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA                                    | 1.0  | 1.5  | 2.5  | V     |
| R <sub>DS(on)</sub>  | Static Drain-Source on-Resistance<br>note3               | V <sub>GS</sub> =10V, I <sub>D</sub> =30A                                                   | -    | 3.5  | 4.7  | mΩ    |
|                      |                                                          | V <sub>GS</sub> =4.5V, I <sub>D</sub> =20A                                                  | -    | 6.0  | 10   |       |
| C <sub>iss</sub>     | Input Capacitance                                        | V <sub>DS</sub> =15V, V <sub>GS</sub> =0V,<br>f=1.0MHz                                      | -    | 2100 | -    | pF    |
| C <sub>oss</sub>     | Output Capacitance                                       |                                                                                             | -    | 326  | -    | pF    |
| C <sub>rss</sub>     | Reverse Transfer Capacitance                             |                                                                                             | -    | 282  | -    | pF    |
| Q <sub>g</sub>       | Total Gate Charge                                        | V <sub>DS</sub> =15V, I <sub>D</sub> =30A,<br>V <sub>GS</sub> =10V                          | -    | 45   | -    | nC    |
| Q <sub>gs</sub>      | Gate-Source Charge                                       |                                                                                             | -    | 3    | -    | nC    |
| Q <sub>gd</sub>      | Gate-Drain("Miller") Charge                              |                                                                                             | -    | 15   | -    | nC    |
| t <sub>d(on)</sub>   | Turn-on Delay Time                                       | V <sub>DS</sub> =15V,<br>I <sub>D</sub> =30A, R <sub>GEN</sub> =3Ω,<br>V <sub>GS</sub> =10V | -    | 21   | -    | ns    |
| t <sub>r</sub>       | Turn-on Rise Time                                        |                                                                                             | -    | 32   | -    | ns    |
| t <sub>d(off)</sub>  | Turn-off Delay Time                                      |                                                                                             | -    | 59   | -    | ns    |
| t <sub>f</sub>       | Turn-off Fall Time                                       |                                                                                             | -    | 34   | -    | ns    |
| I <sub>S</sub>       | Maximum Continuous Drain to Source Diode Forward Current |                                                                                             | -    | -    | 50   | A     |
| I <sub>SM</sub>      | Maximum Pulsed Drain to Source Diode Forward Current     |                                                                                             | -    | -    | 200  | A     |
| V <sub>SD</sub>      | Drain to Source Diode Forward Voltage                    | V <sub>GS</sub> =0V, I <sub>S</sub> =30A                                                    | -    | -    | 1.2  | V     |
| t <sub>rr</sub>      | Body Diode Reverse Recovery Time                         | I <sub>F</sub> =20A, dI/dt=100A/μs                                                          | -    | 15   | -    | ns    |
| Q <sub>rr</sub>      | Body Diode Reverse Recovery Charge                       |                                                                                             | -    | 4    | -    | nC    |

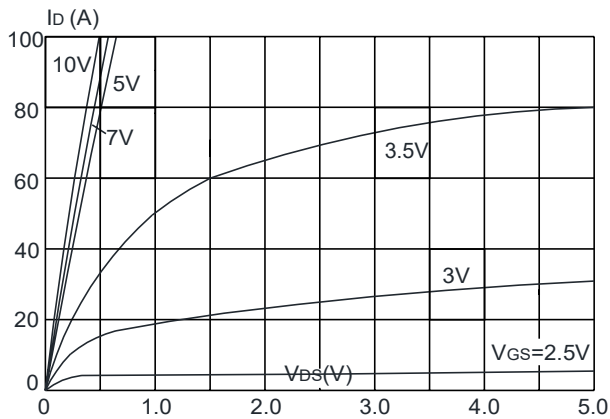
Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition: T<sub>J</sub>=25°C, V<sub>G</sub>=10V, R<sub>G</sub>=25Ω, L=0.5mH, I<sub>AS</sub>=18.4A

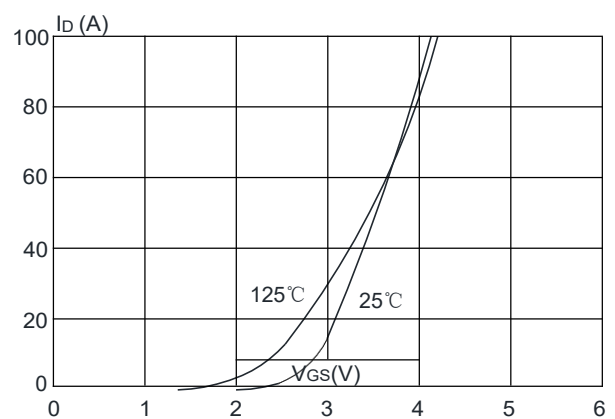
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

## RATING AND CHARACTERISTIC CURVES (AON7544)

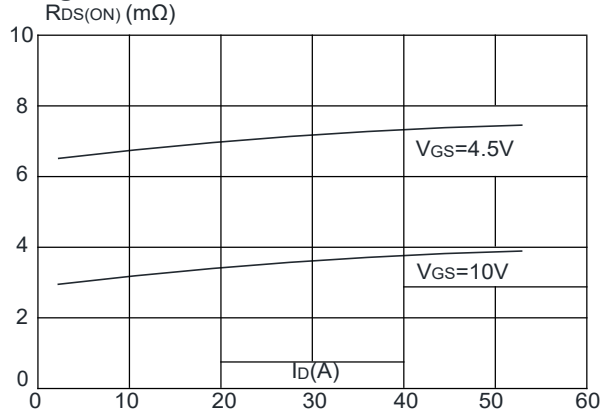
**Figure 1: Output Characteristics**



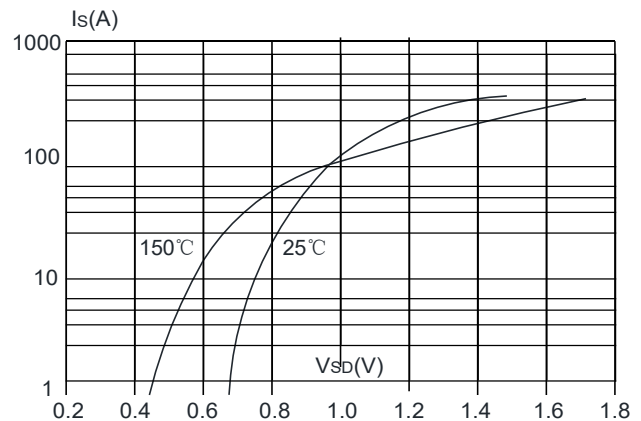
**Figure 2: Typical Transfer Characteristics**



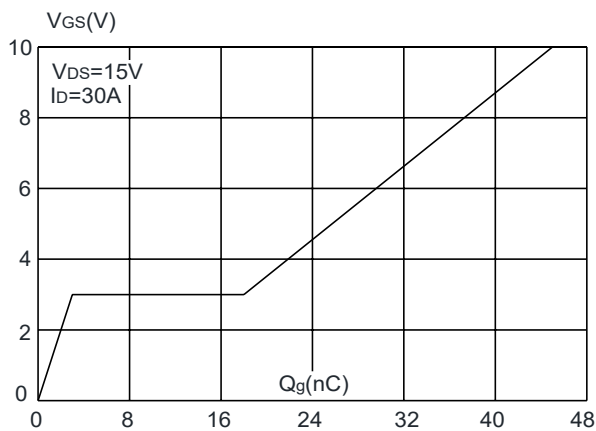
**Figure 3: On-resistance vs. Drain Current**



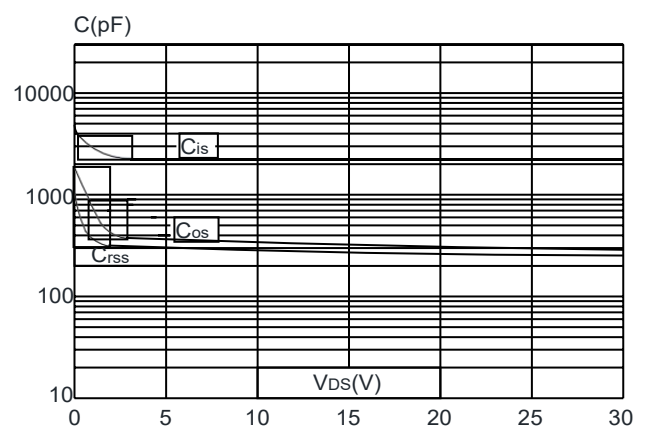
**Figure 4: Body Diode Characteristics**



**Figure 5: Gate Charge Characteristics**

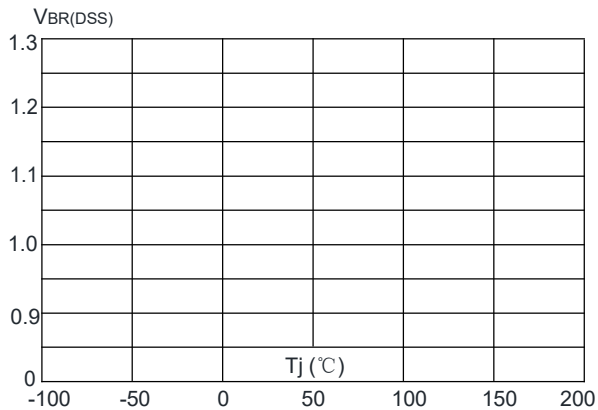


**Figure 6: Capacitance Characteristics**

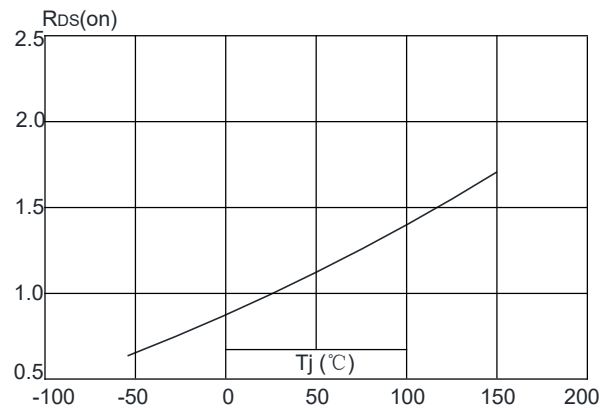


## RATING AND CHARACTERISTIC CURVES (AON7544)

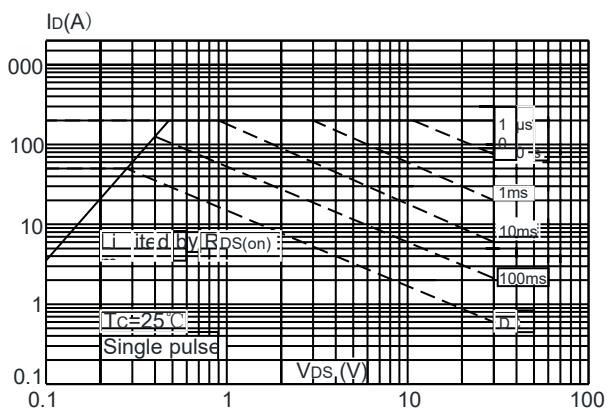
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



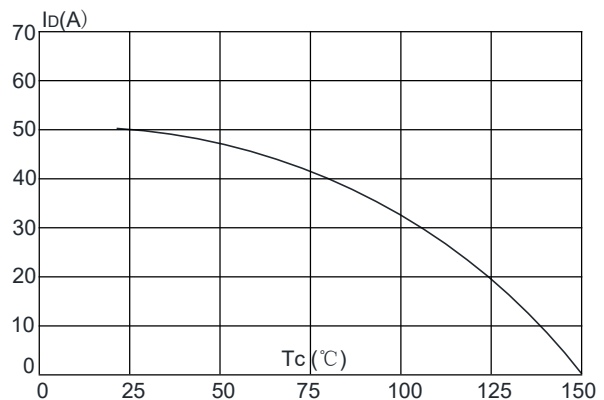
**Figure 8:** Normalized on Resistance vs. Junction Temperature



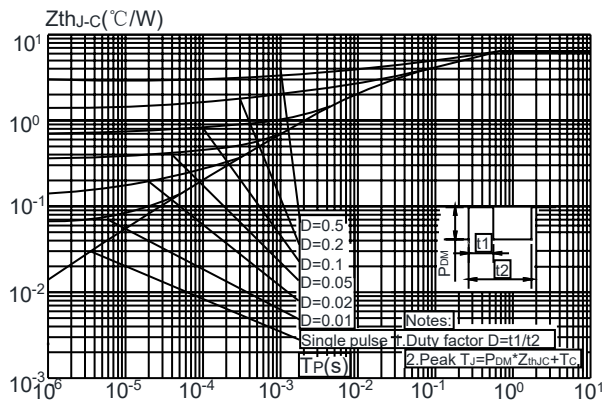
**Figure 9:** Maximum Safe Operating Area



**Figure 10:** Maximum Continuous Drain Current vs. Case Temperature



**Figure.11:** Maximum Effective Transient Thermal Impedance, Junction-to-Case (PDFN3.3\*3.3-8L)



## Test Circuit

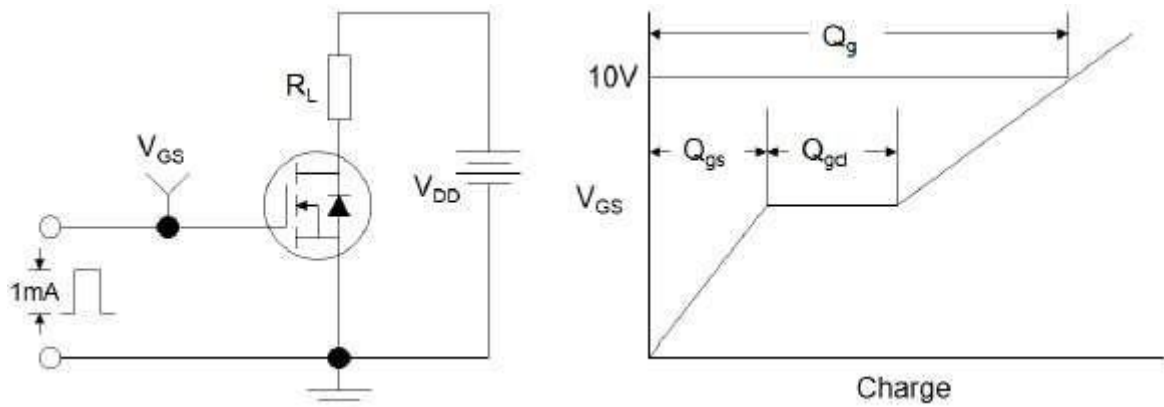


Figure1:Gate Charge Test Circuit & Waveform

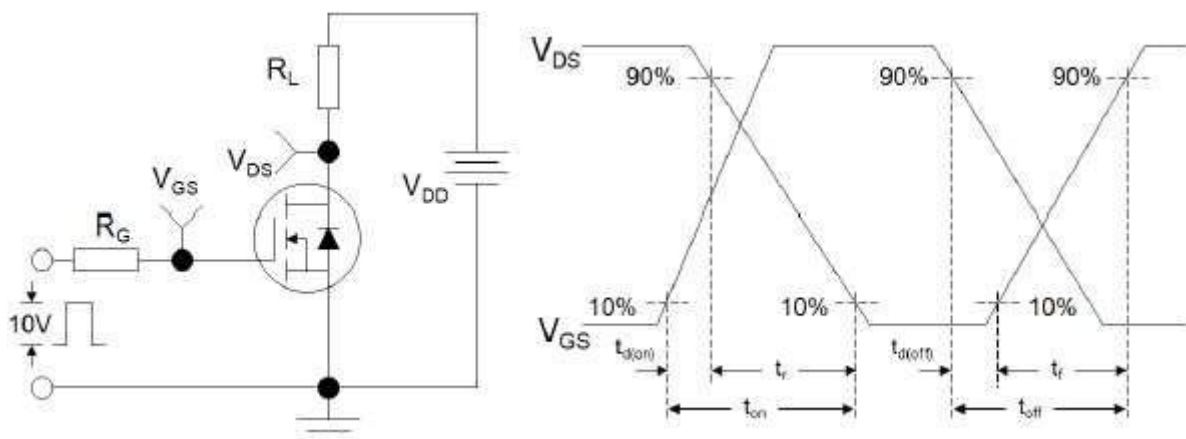


Figure 2: Resistive Switching Test Circuit & Waveforms

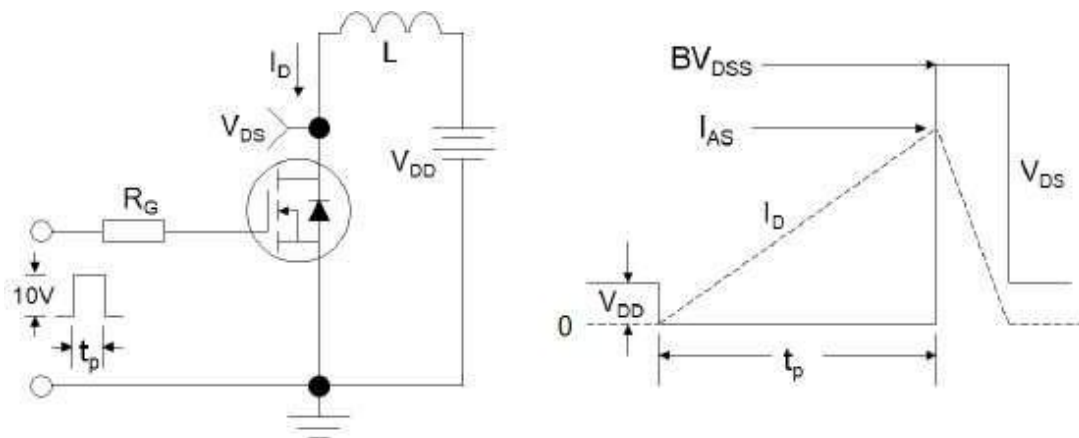


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms