

AON6414-VB Datasheet N-Channel 30-V (D-S) MOSFET

| PRODUCT SUMMARY | | | | | | |
|---------------------|----------------------------------|------------------------------------|----------------------|--|--|--|
| V _{DS} (V) | $R_{DS(on)}(\Omega)$ | I _D (A) ^{a, e} | Q _g (Typ) | | | |
| 30 | 0.007 at V _{GS} = 10 V | 80 | 31 nC | | | |
| 30 | 0.009 at V _{GS} = 4.5 V | 60 | 31110 | | | |

DFN5X6 Single Top View Bottom View

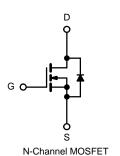
FEATURES

- Trench Power MOSFET
- 100 % R_g and UIS Tested
- Compliant to RoHS Directive 2011/65/EU



APPLICATIONS

- OR-ing
- Server
- DC/DC



| ABSOLUTE MAXIMUM RATINGS (T | $_{A}$ = 25 °C, unle | ess otherwise i | noted) | | | |
|--|------------------------|-----------------------------------|--------------------|------|-------|--|
| Parameter | Symbol | Limit | | Unit | | |
| Drain-Source Voltage | | V _{DS} | 30 | | V | |
| Gate-Source Voltage | V_{GS} | ± 20 | | | | |
| | T _C = 25 °C | | 80 | | - | |
| Continuous Drain Current (T _J = 175 °C) | T _C = 70 °C | L | 60 | | | |
| Continuous Diain Current (1) = 173 C) | T _A = 25 °C | l _D | 50b, c | | A | |
| | T _A = 70 °C | | 45 ^{b, c} | | 1 ^ ! | |
| Pulsed Drain Current | | I _{DM} | 210 | | | |
| Avalanche Current Pulse | - I = 0.1 mH | I _{AS} | 60 | | | |
| Single Pulse Avalanche Energy | | E _{AS} | 95 | | mJ | |
| Continuous Source-Drain Diode Current | T _C = 25 °C | l _s | 80 60 | | А | |
| Continuous Source-Drain Diode Current | T _A = 25 °C | 'S | | | 1 ^ | |
| Maximum Power Dissipation | T _C = 25 °C | В | 155 | | W | |
| Waximum Tower Dissipation | T _C = 70 °C | P _D | 105 | | | |
| Operating Junction and Storage Temperature Range | | T _J , T _{stg} | - 55 to 175 | | °C | |
| THERMAL RESISTANCE RATINGS | | | | | | |
| Parameter | | Symbol | Тур. | Max. | Unit | |
| Maximum Junction-to-Ambient ^{b, d} | t ≤ 10 sec | R_{thJA} | 32 | 40 | °C/W | |
| Maximum Junction-to-Case | Steady State | R _{thJC} | 0.5 0.6 | | C/VV | |

- a. Based on T_C = 25 °C.
 b. Surface mounted on 1" x 1" FR4 board.

- d. Maximum under steady state conditions is 90 °C/W.
 e. Calculated based on maximum junction temperature. Package limitation current is 90 A.



| Parameter | Symbol | Symbol Test Conditions | | Тур. | Max. | Unit |
|---|-------------------------|--|-----|-------|-------|-------|
| Static | | | | | | |
| Drain-Source Breakdown Voltage | V _{DS} | $V_{GS} = 0 \text{ V}, I_D = 250 \mu\text{A}$ | 30 | | | V |
| V _{DS} Temperature Coefficient | $\Delta V_{DS}/T_{J}$ | I _D = 250 μA | | 35 | | mV/°C |
| V _{GS(th)} Temperature Coefficient | $\Delta V_{GS(th)}/T_J$ | I _D = 250 μA | | - 7.5 | | |
| Gate-Source Threshold Voltage | V _{GS(th)} | $V_{DS} = V_{GS}, I_D = 250 \mu A$ | 0.5 | | 2.0 | V |
| Gate-Source Leakage | I _{GSS} | $V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$ | | | ± 100 | nA |
| Zara Cata Valta na Dunia Comunat | 1 | $V_{DS} = 30 \text{ V}, V_{GS} = 0 \text{ V}$ | | | 1 | μA |
| Zero Gate Voltage Drain Current | I _{DSS} | $V_{DS} = 30 \text{ V}, V_{GS} = 0 \text{ V}, T_{J} = 55 ^{\circ}\text{C}$ | | | 10 | |
| On-State Drain Current ^a | I _{D(on)} | $V_{DS} \ge 5 \text{ V}, V_{GS} = 10 \text{ V}$ | 90 | | | Α |
| | D | $V_{GS} = 10 \text{ V}, I_D = 30.8 \text{ A}$ | | 0.007 | | Ω |
| Drain-Source On-State Resistance ^a | R _{DS(on)} | $V_{GS} = 4.5 \text{ V}, I_D = 27 \text{ A}$ | | 0.009 | | |
| Forward Transconductance ^a | 9 _{fs} | V _{DS} = 15 V, I _D = 30.8 A | | 160 | | S |
| Dynamic ^b | | | | | | |
| Input Capacitance | C _{iss} | | | | 1180 | pF |
| Output Capacitance | C _{oss} | $V_{DS} = 15 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$ | | | 425 | |
| Reverse Transfer Capacitance | C _{rss} | | | | 170 | |
| Total Oats Ohama | Qg | $V_{DS} = 15 \text{ V}, V_{GS} = 10 \text{ V}, I_D = 30.8 \text{ A}$ | | | 61 | nC |
| Total Gate Charge | | | | | 31.5 | |
| Gate-Source Charge | Q _{gs} | $V_{DS} = 15 \text{ V}, V_{GS} = 4.5 \text{ V}, I_{D} = 27.8 \text{ A}$ | | | 10 | |
| Gate-Drain Charge | Q _{gd} | | | | 6 | |
| Gate Resistance | R _g | f = 1 MHz | | 1.4 | 2.1 | Ω |
| Turn-On Delay Time | t _{d(on)} | | | 18 | 27 | ns |
| Rise Time | t _r | V_{DD} = 15 V, R_L = 0.625 Ω | | 11 | 17 | |
| Turn-Off Delay Time | t _{d(off)} | $I_D\cong 24$ A, V_{GEN} = 10 V, R_g = 1 Ω | | 70 | 105 | |
| Fall Time | t _f | | | 10 | 15 | |
| Turn-On Delay Time | t _{d(on)} | | | 55 | 83 | |
| Rise Time | t _r | V_{DD} = 15 V, R_L = 0.67 Ω | | 180 | 270 | |
| Turn-Off Delay Time | t _{d(off)} | $I_D\cong 22.5$ A, V_{GEN} = 4.5 V, R_g = 1 Ω | | 55 | 83 | |
| Fall Time | t _f | | | 12 | 18 | |
| Drain-Source Body Diode Characteristic | es | | | | | |
| Continuous Source-Drain Diode Current | I _S | T _C = 25 °C | | 60 | | A |
| Pulse Diode Forward Current ^a | I _{SM} | | | 210 | | |
| Body Diode Voltage | V_{SD} | I _S = 22 A | | 0.8 | 1.2 | V |
| Body Diode Reverse Recovery Time | t _{rr} | | | 52 | 78 | ns |
| Body Diode Reverse Recovery Charge | Q _{rr} | L_ = 20 A di/dt = 100 A/vo T = 25 °C | | 70.2 | 105 | nC |
| Reverse Recovery Fall Time | t _a | $I_F = 20 \text{ A}, \text{ di/dt} = 100 \text{ A/}\mu\text{s}, T_J = 25 \text{ °C}$ | | 27 | | ns |
| Reverse Recovery Rise Time | t _b | | | 25 | | |

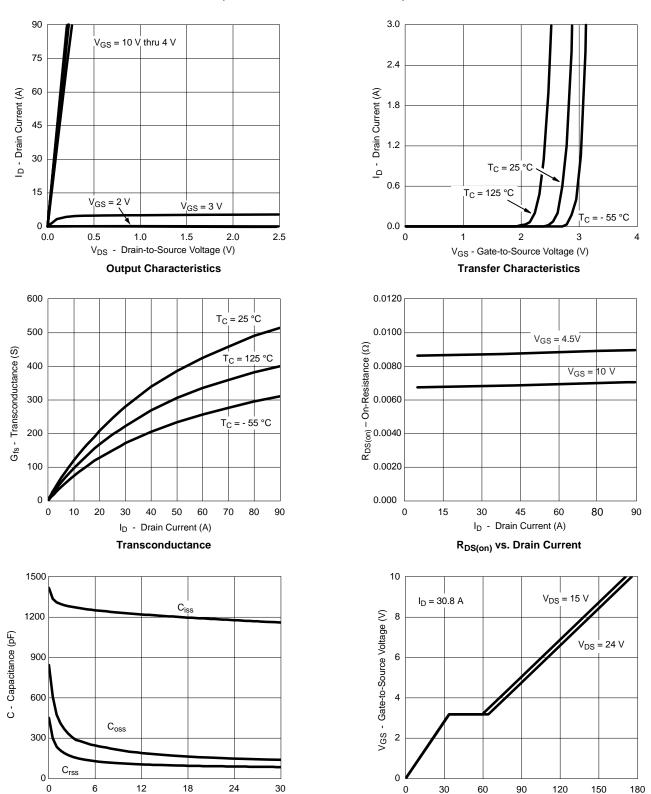
Notes:

- a. Pulse test; pulse width $\leq 300~\mu s,$ 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)



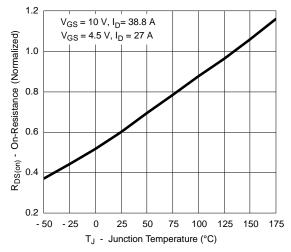
服务热线:400-655-8788

Q_g - Total Gate Charge (nC)

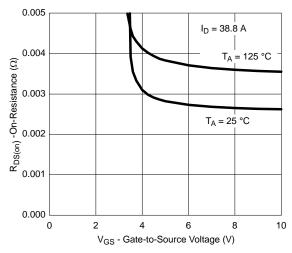
Gate Charge



TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



On-Resistance vs. Junction Temperature



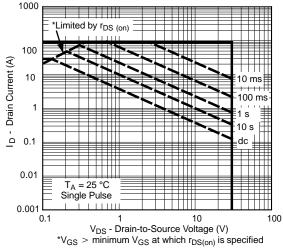
 $R_{DS(on)}\, vs.\, V_{GS}\, vs.\, Temperature$



Forward Diode Voltage vs. Temperature



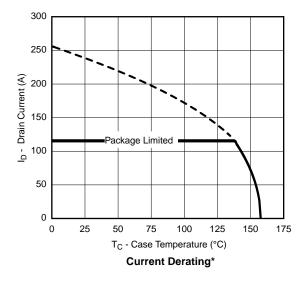
Threshold Voltage

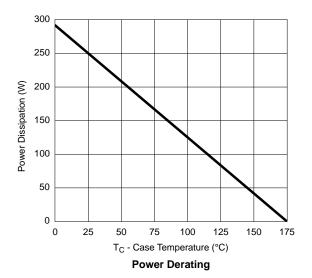


Safe Operating Area, Junction-to-Ambient

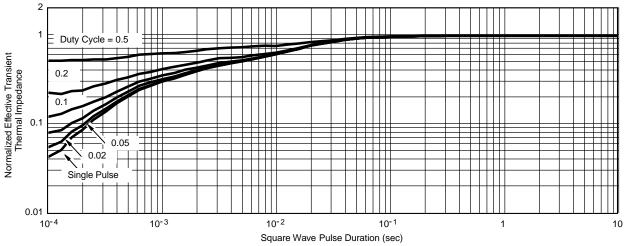


TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)





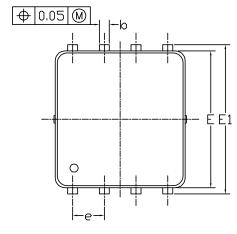
*The power dissipation P_D is based on $T_{J(max)}$ = 175 °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

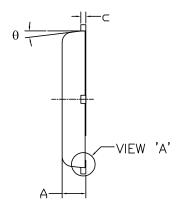


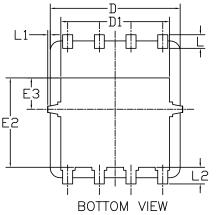
Normalized Thermal Transient Impedance, Junction-to-Case

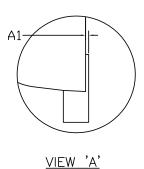


DFN5x6_8L_EP1_P PACKAGE OUTLIN



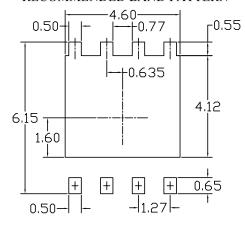






(SCALE 5:1)

RECOMMENDED LAND PATTERN



| GVA IDOL C | DIMENSIONS IN MILLIMETERS | | | DIMENSIONS IN INCHES | | | |
|------------|---------------------------|--------|-----------|----------------------|--------|--------|--|
| SYMBOLS | MIN | NOM | MAX | MIN | NOM | MAX | |
| A | 0.85 | 0. 95 | 1.00 | 0.033 | 0. 037 | 0.039 | |
| A1 | 0.00 | | 0.05 | 0.000 | | 0.002 | |
| b | 0.30 | 0.40 | 0.50 | 0.012 | 0.016 | 0.020 | |
| c | 0.15 | 0. 20 | 0. 25 | 0.006 | 0.008 | 0.010 | |
| D | 5. 10 | 5. 20 | 5. 30 | 0. 201 | 0. 205 | 0. 209 | |
| D1 | 4. 25 | 4. 35 | 4. 45 | 0. 167 | 0.171 | 0. 175 | |
| Е | 5. 45 | 5. 55 | 5. 65 | 0.215 | 0.219 | 0. 222 | |
| E1 | 5. 95 | 6.05 | 6. 15 | 0. 234 | 0. 238 | 0. 242 | |
| E2 | 3. 525 | 3.625 | 3. 725 | 0.139 | 0. 143 | 0. 147 | |
| E3 | 1. 175 | 1. 275 | 1.375 | 0.046 | 0.050 | 0.054 | |
| e | 1. 27 BSC | | | 0.050 BSC | | | |
| L | 0.45 | 0. 55 | 0.65 | 0.018 | 0.022 | 0.026 | |
| L1 | 0 | | 0.15 | 0 | | 0.006 | |
| L2 | 0.68 REF | | 0.027 REF | | | | |
| θ | 0° | | 10° | 0° | | 10° | |

NOTE UNIT: mm

- 1. PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS. MOLD FLASH AT THE NON-LEAD SIDES SHOULD BE LESS THAN 6 MILS EACH.
- 2. CONTROLLING DIMENSION IS MILLIMETER. CONVERTED INCH DIMENSIONS ARE NOT NECESSARILY EXACT.



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