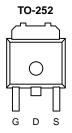


ROHS COMPLIANT

FDD8426-VB Datasheet N-Channel 40-V (D-S) MOSFET

| PRODUCT SUMMARY | | | | | | |
|---------------------|-----------------------------------|------------------------------------|-----------------------|--|--|--|
| V _{DS} (V) | R _{DS(on)} (Ω) | I _D (A) ^{a, c} | Q _g (Typ.) | | | |
| 40 | 0.0050 at V _{GS} = 10 V | 85 | 80 nC | | | |
| | 0.0065 at V _{GS} = 4.5 V | 70 | 80 NC | | | |

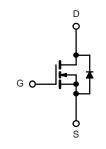


FEATURES

- Trench Power MOSFET
- 100 % Rg and UIS Tested

APPLICATIONS

- Synchronous Rectification
- Power Supplies



N-Channel MOSFET

| ABSOLUTE MAXIMUM RATING | S T _A = 25 °C, unle | ss otherwise not | ed | | |
|--|---------------------------------------|------------------|---------------------|------|--|
| Parameter | | Symbol | Limit | Unit | |
| Drain-Source Voltage | V _{DS} | 40 | V | | |
| Gate-Source Voltage | | V _{GS} | ± 25 | v | |
| | T _C = 25 °C | | 85 ^{a, c} | | |
| Continuous Drain Current $(T = 175 °C)$ | T _C = 70 °C | | 70 ^c | | |
| Continuous Drain Current ($T_J = 175 \ ^{\circ}C$) | T _A = 25 °C | I _D | 59 ^b | A | |
| | T _A = 70 °C | | 53 ^b | A | |
| Pulsed Drain Current | I _{DM} | 250 | | | |
| Avalanche Current Pulse | Inche Current Pulse | | 80 | | |
| Single Pulse Avalanche Energy | L = 0.1 IIIH | E _{AS} | 320 | mJ | |
| Continuous Source-Drain Diode Current | T _C = 25 °C | I _S | 110 ^{a, c} | Α | |
| Continuous Source-Drain Diode Current | T _A = 25 °C | 'S | 2.6 ^b | A | |
| | T _C = 25 °C | | 312 ^a | | |
| Maximum Davies Disainstics | T _C = 70 °C | Б | 200 | 14/ | |
| Maximum Power Dissipation | T _A = 25 °C | P _D | 3.13 ^b | W | |
| | T _A = 70 °C | | 2.0 ^b | | |
| Operating Junction and Storage Temperature Ra | T _J , T _{stg} | - 55 to 150 | °C | | |

| THERMAL RESISTANCE RATINGS | | | | | | |
|--|--------------|-------------------|---------|---------|------|--|
| Parameter | | Symbol | Typical | Maximum | Unit | |
| Maximum Junction-to-Ambient ^b | Steady State | R _{thJA} | 32 | 40 | °C/W | |
| Maximum Junction-to-Case | Steady State | R _{thJC} | 0.33 | 0.4 | C/W | |

Notes:

a. Based on $T_C = 25$ °C.

b. Surface Mounted on 1" x 1" FR4 board.

c. Calculated based on maximum junction temperature. Package limitation current is 110 A.

| SPECIFICATIONS $T_J = 25 \text{ °C}, t$ | | | | | | |
|--|---|---|------|--------|---------|-------|
| Parameter | Symbol | Test Conditions | Min. | Тур. | Max. | Unit |
| Static | V | V _{GS} = 0 V, I _D = 250 μA | 40 | | 1 | V |
| Drain-Source Breakdown Voltage | V _{DS} ΔV _{DS} /T _J | $v_{GS} = 0 v, i_D = 250 \mu A$ | | 41 | | V |
| V _{DS} Temperature Coefficient | | I _D = 250 μA | | - 8 | | mV/°0 |
| V _{GS(th)} Temperature Coefficient | $\Delta V_{GS(th)}/T_J$ | V _{DS} = V _{GS} , I _D = 250 μA | 1.0 | - 8 | 0.5 | V |
| Gate-Source Threshold Voltage | V _{GS(th)} | | 1.2 | | 2.5 | |
| Gate-Source Leakage | I _{GSS} | $V_{DS} = 0 V, V_{GS} = \pm 20 V$ | | | ± 100 | nA |
| Zero Gate Voltage Drain Current | I _{DSS} | $V_{DS} = 40 \text{ V}, V_{GS} = 0 \text{ V}$ $V_{DS} = 40 \text{ V}, V_{GS} = 0 \text{ V}, T_J = 55 \text{ °C}$ | | | 1 10 | μA |
| On-State Drain Current ^a | I _{D(on)} | $V_{DS} \ge 5 V, V_{GS} = 10 V$ | 120 | | 10 | A |
| | D(01) | $V_{GS} = 10 \text{ V}, \text{ I}_{D} = 30 \text{ A}$ | - | 0.0050 | | Ω |
| Drain-Source On-State Resistance ^a | R _{DS(on)} | $V_{GS} = 4.5 \text{ V}, I_D = 20 \text{ A}$ | | 0.0065 | | |
| Forward Transconductance ^a | 9 _{fs} | $V_{\rm DS} = 15$ V, $I_{\rm D} = 30$ A | | 180 | | S |
| Dynamic ^b | | | | | | |
| Input Capacitance | C _{iss} | | | 2380 | | pF |
| Output Capacitance | C _{oss} | $V_{DS} = 20 \text{ V}, V_{GS} = 0 \text{ V}, \text{ f} = 1 \text{ MHz}$ | | 550 | | |
| Reverse Transfer Capacitance | C _{rss} | | | 250 | | |
| Total Gate Charge | Qg | | | 80 | 120 | nC |
| Gate-Source Charge | Q _{gs} | $V_{DS} = 20 \text{ V}, V_{GS} = 10 \text{ V}, I_{D} = 20 \text{ A}$ | | 20 | | |
| Gate-Drain Charge | Q _{gd} | | | 12 | | |
| Gate Resistance | Rg | f = 1 MHz | | 0.85 | 1.3 | Ω |
| Turn-On Delay Time | t _{d(on)} | | | 20 | 30 | |
| Rise Time | t _r | V_{DD} = 20 V, R_L = 1.0 Ω | | 11 | 17 | _ |
| Turn-Off Delay Time | t _{d(off)} | $\text{I}_\text{D}{\cong}20$ A, V_GEN = 10 V, R_g = 1 Ω | | 77 | 115 | |
| Fall Time | t _f | | | 10 | 15 | |
| Turn-On Delay Time | t _{d(on)} | | | 102 | 155 | ns |
| Rise Time | t _r | V_{DD} = 20 V, R_L = 1.0 Ω | | 62 | 95 | - |
| Turn-Off Delay Time | t _{d(off)} | $I_D \cong 20$ A, V_{GEN} = 4.5 V, R_g = 1 Ω | | 180 | 270 | |
| Fall Time | t _f | | | 60 | 90 | |
| Drain-Source Body Diode Characteristic | s | | | | | |
| Continuous Source-Drain Diode Current | ۱ _S | $T_{\rm C} = 25 \ ^{\circ}{\rm C}$ | | | 110 | A |
| Pulse Diode Forward Current ^a | I _{SM} | | | | 200 | A |
| Body Diode Voltage | V _{SD} | I _S = 20 A | | 0.8 | 1.2 | V |
| Body Diode Reverse Recovery Time | t _{rr} | | | 50 | 75 | ns |
| Body Diode Reverse Recovery Charge | Q _{rr} | I _F = 20 A, di/dt = 100 A/μs, T _J = 25 °C | | 70 | 105 | nC |
| Reverse Recovery Fall Time | t _a | $r_F = 20 \text{ A}, \text{ avat} = 100 \text{ Av} \text{ µs}, 1 \text{ J} = 25 \text{ C}$ | | 30 | | |
| Reverse Recovery Rise Time | t _b | - | | 20 | | ns |

Notes:

a. Pulse test; pulse width \leq 300 $\mu s,$ duty cycle \leq 2 %.

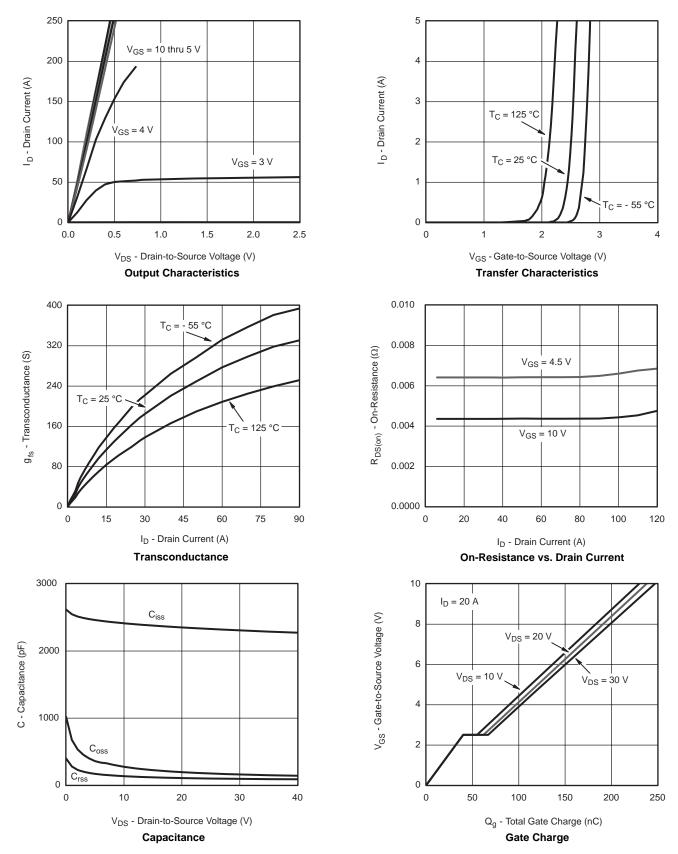
b. Guaranteed by design, not subject to production testing.

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.

Bsemi





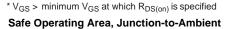


服务热线:400-655-8788



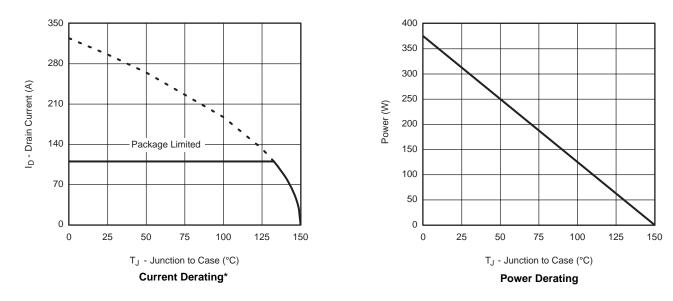
2.0 100 I_D = 30 A 1.7 10 $V_{GS} = 10 V$ R_{DS(on)} - On-Resistance I_S - Source Current (A) T_J = 150 °C T_J = 25 °C (Normalized) 1.4 1 $V_{GS} = 4.5 V$ 1.1 0.1 0.8 0.01 0.5 0.001 . 0.0 0.2 0.4 0.6 0.8 1.0 1.2 - 50 - 25 0 25 50 75 100 125 150 V_{SD} - Source-to-Drain Voltage (V) T_J - Junction Temperature (°C) **On-Resistance vs. Junction Temperature** Forward Diode Voltage vs. Temperature 0.010 0.6 0.008 R $_{DS(on)}$ - On-Resistance (Ω) 0.2 V_{GS(th)} Variance (V) 0.006 - 0.2 $I_D = 5 \text{ mA}$ 0.004 T_J = 150 °C - 0.6 0.002 I_D = 250 μA T_J = 25 °C 0.000 - 1.0 2 4 6 8 10 - 50 - 25 0 25 50 75 100 125 150 0 T_J - Temperature (°C) V_{GS} - Gate-to-Source Voltage (V) **Threshold Voltage On-Resistance vs. Gate-to-Source Voltage** 1000 TTT Limited by R_{DS(on)}* 1-1 10 µs 100 100 µs ŦĦ I_D - Drain Current (A) 1 ms -10 10 ms 100 ms, DC 1 T_C = 25 °C 0.1 Single Pulse BVDSS ≣ 111 0.01 0.1 1 10 100 V_{DS} - Drain-to-Source Voltage (V)

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



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TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

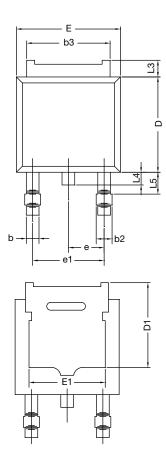
* The power dissipation P_D is based on $T_{J(max)} = 150$ °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

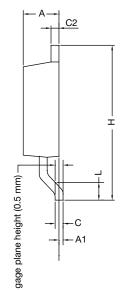


Normalized Thermal Transient Impedance, Junction-to-Case



TO-252AA CASE OUTLINE





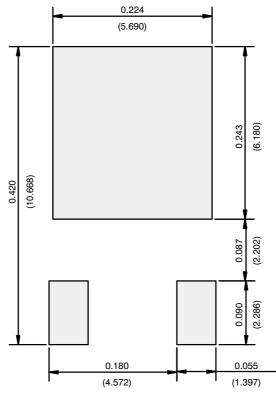
| | MILLIMETERS | | INCHES | | |
|--|-------------|-------|-----------|-------|--|
| DIM. | MIN. | MAX. | MIN. | MAX. | |
| А | 2.18 | 2.38 | 0.086 | 0.094 | |
| A1 | - | 0.127 | - | 0.005 | |
| b | 0.64 | 0.88 | 0.025 | 0.035 | |
| b2 | 0.76 | 1.14 | 0.030 | 0.045 | |
| b3 | 4.95 | 5.46 | 0.195 | 0.215 | |
| С | 0.46 | 0.61 | 0.018 | 0.024 | |
| C2 | 0.46 | 0.89 | 0.018 | 0.035 | |
| D | 5.97 | 6.22 | 0.235 | 0.245 | |
| D1 | 5.21 | - | 0.205 | - | |
| E | 6.35 | 6.73 | 0.250 | 0.265 | |
| E1 | 4.32 | - | 0.170 | - | |
| Н | 9.40 | 10.41 | 0.370 | 0.410 | |
| е | 2.28 BSC | | 0.090 BSC | | |
| e1 | 4.56 BSC | | 0.180 BSC | | |
| L | 1.40 | 1.78 | 0.055 | 0.070 | |
| L3 | 0.89 | 1.27 | 0.035 | 0.050 | |
| L4 | - | 1.02 | - | 0.040 | |
| L5 | 1.14 | 1.52 | 0.045 | 0.060 | |
| ECN: X12-0247-Rev. M, 24-Dec-12 DWG: 5347 | | | | | |

Note

• Dimension L3 is for reference only.



RECOMMENDED MINIMUM PADS FOR DPAK (TO-252)



Recommended Minimum Pads Dimensions in Inches/(mm)



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