



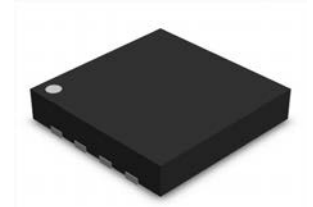
DFNWB3×3-8L-U Plastic-Encapsulate MOSFETS

DE8404 N-Channel + P-Channel MOSFET

Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)TYP}$ | I_D |
|---------------|-----------------|-------|
| -30V | 35mΩ@-10V | -4A |
| | 53mΩ@-4.5V | |
| 30V | 25mΩ@10V | 5A |
| | 35mΩ@4.5V | |

DFNWB3×3-8L-U



Feature

- Low drain-source ON-resistance
- High forward transfer admittance
- Low leakage current
- Enhancement mode

Application

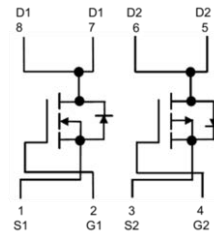
- Portable equipment
- Motor drive

MARKING:



DE8404 = Part No.
 Solid dot = Pin1 indicator.
 XX = Code.

Equivalent Circuit



ABSOLUTE MAXIMUM RATINGS ($T_a=25^\circ\text{C}$ unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|--|-----------------|-----------|--------------------|
| P-MOSFET | | | |
| Drain-Source Voltage | V_{DS} | -30 | V |
| Gate-Source Voltage | V_{GS} | ±20 | V |
| Continuous Drain Current ⁽¹⁾ | I_D | -4 | A |
| Pulsed Drain Current | I_{DM} | -16 | A |
| Power Dissipation | P_D | 3 | W |
| N-MOSFET | | | |
| Drain-Source Voltage | V_{DS} | 30 | V |
| Gate-Source Voltage | V_{GS} | ±20 | V |
| Continuous Drain Current | I_D | 5 | A |
| Pulsed Drain Current ⁽¹⁾ | I_{DM} | 20 | A |
| Power Dissipation | P_D | 3 | W |
| Temperature and Thermal Resistance | | | |
| Thermal Resistance from Junction to Ambient ⁽²⁾ | $R_{\theta JA}$ | 42 | $^\circ\text{C/W}$ |
| Junction Temperature | T_J | 150 | $^\circ\text{C}$ |
| Storage Temperature | T_{STG} | -55~ +150 | $^\circ\text{C}$ |

MOSFET ELECTRICAL CHARACTERISTICS

P-channel MOSFET ELECTRICAL CHARACTERISTICS($T_a=25^\circ\text{C}$ unless otherwise noted)

| Parameter | Symbol | Test Condition | Min | Type | Max | Unit |
|--|---------------|--|-----|------|-----------|------------|
| Static Characteristics | | | | | | |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = -250\mu A$ | -30 | | | V |
| Zero gate voltage drain current | I_{DSS} | $V_{DS} = -30V, V_{GS} = 0V$ | | | -1 | μA |
| Gate-body leakage current | I_{GSS} | $V_{GS} = \pm 20V, V_{DS} = 0V$ | | | ± 100 | nA |
| Gate threshold voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = -250\mu A$ | -1 | -1.7 | -3.0 | V |
| Drain-source on-resistance ⁽³⁾ | $R_{DS(on)}$ | $V_{GS} = -10V, I_D = -2.0A$ | | 35 | 50 | m Ω |
| | | $V_{GS} = -4.5V, I_D = -2.0A$ | | 53 | 80 | |
| Forward transconductance | g_{FS} | $V_{DS} = -5V, I_D = -1.0A$ | 5 | | | S |
| Diode forward voltage ⁽³⁾ | V_{DS} | $I_S = -1.0A, V_{GS} = 0V$ | | -0.8 | -1.2 | V |
| Dynamic characteristics⁽⁴⁾ | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS} = -15V, V_{GS} = 0V, F = 1.0MHz$ | | 850 | | pF |
| Output Capacitance | C_{oss} | | | 101 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 65 | | |
| Total gate charge | Q_g | $V_{DS} = -15V, I_D = -4A, V_{GS} = -4.5V$ | | 9.5 | | nC |
| Gate-source charge | Q_{gs} | | | 2 | | |
| Gate-drain charge | Q_{gd} | | | 3 | | |
| Switching Characteristics⁽⁴⁾ | | | | | | |
| Turn-on delay time | $t_{d(on)}$ | $V_{DD} = -15V, I_D = -4A$ $V_{GS} = -10V, R_{GEN} = 6\Omega$ | | 7 | | nS |
| Turn-on rise time | t_r | | | 3 | | |
| Turn-off delay time | $t_{d(off)}$ | | | 20 | | |
| Turn-off fall time | t_f | | | 12 | | |

N-channel MOSFET ELECTRICAL CHARACTERISTICS($T_a=25^\circ\text{C}$ unless otherwise noted)

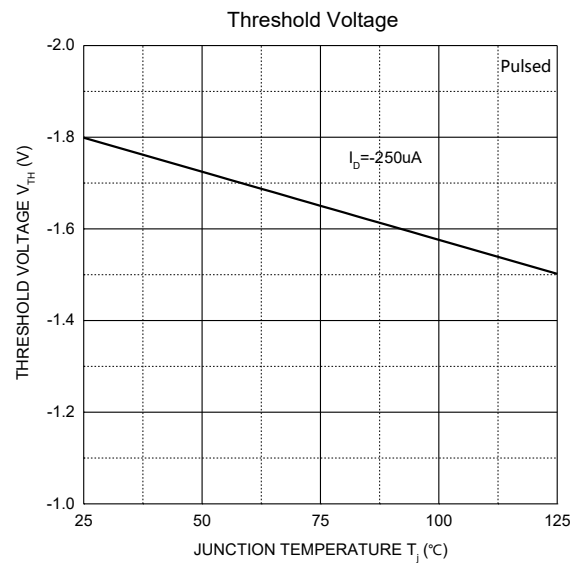
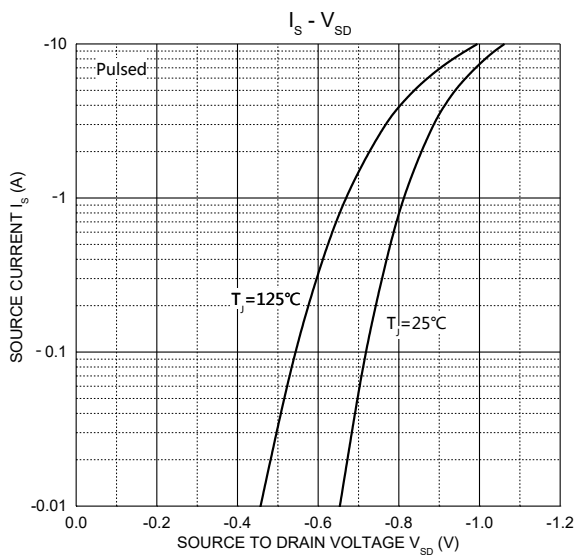
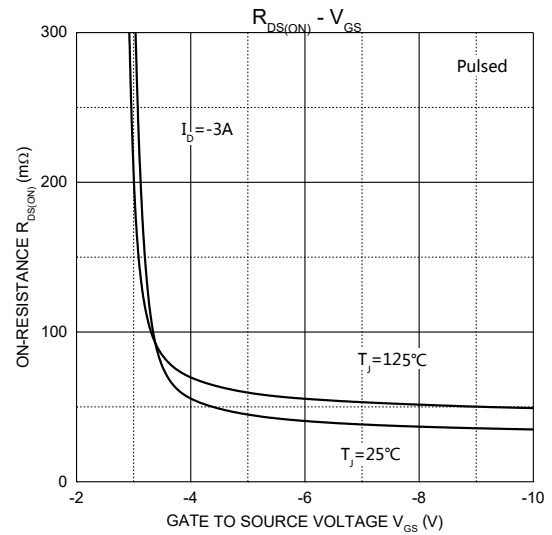
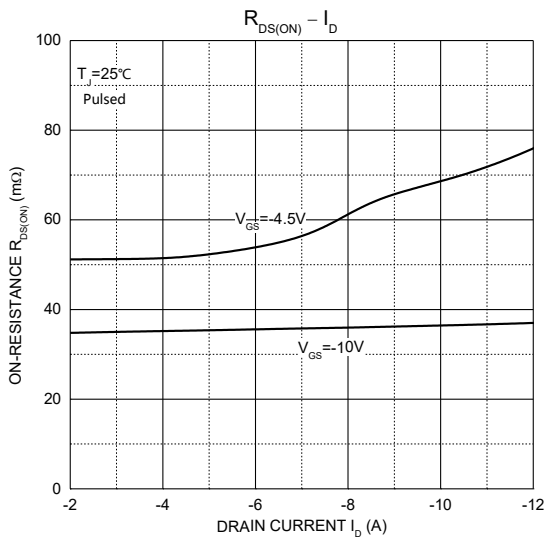
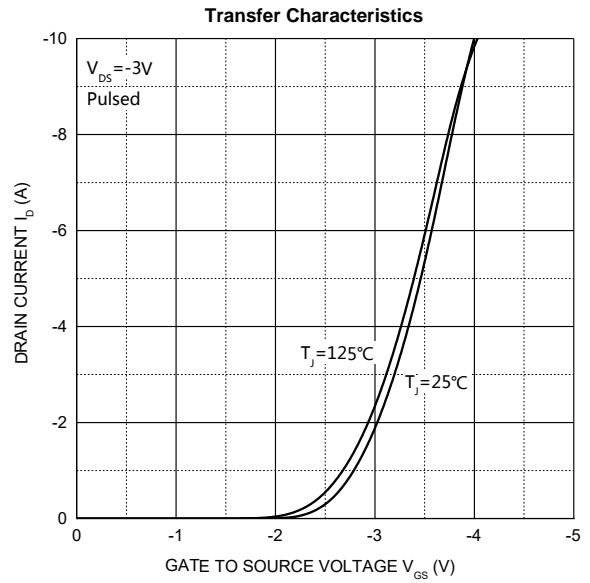
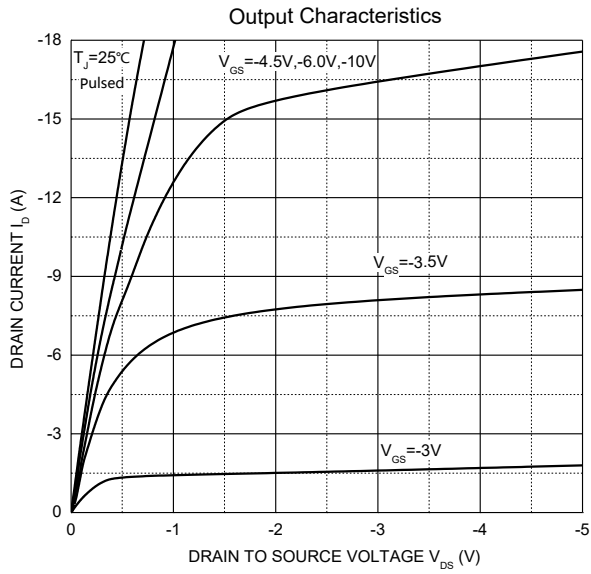
| Parameter | Symbol | Test Condition | Min | Type | Max | Unit |
|--|---------------|--|-----|------|-----------|------------|
| Static Characteristics | | | | | | |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = 250\mu A$ | 30 | | | V |
| Zero gate voltage drain current | I_{DSS} | $V_{DS} = 30V, V_{GS} = 0V$ | | | 1 | μA |
| Gate-body leakage current | I_{GSS} | $V_{GS} = \pm 20V, V_{DS} = 0V$ | | | ± 100 | nA |
| Gate threshold voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 250\mu A$ | 1.0 | 1.3 | 3.0 | V |
| Drain-source on-resistance ⁽³⁾ | $R_{DS(on)}$ | $V_{GS} = 10V, I_D = 2.0A$ | | 25 | 50 | m Ω |
| | | $V_{GS} = 4.5V, I_D = 2.0A$ | | 35 | 80 | |
| Forward transconductance | g_{FS} | $V_{DS} = 5V, I_D = 1.0A$ | 5 | | | S |
| Diode Forward voltage ⁽³⁾ | V_{DS} | $I_S = 1.0A, V_{GS} = 0V$ | | 0.8 | 1.2 | V |
| Dynamic characteristics⁽⁴⁾ | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS} = 15V, V_{GS} = 0V, F = 1.0MHz$ | | 633 | | pF |
| Output Capacitance | C_{oss} | | | 65 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 55 | | |
| Total gate charge | Q_g | $V_{DS} = 15V, I_D = 5.8A, V_{GS} = 4.5V$ | | 9.5 | | nC |
| Gate-source charge | Q_{gs} | | | 1.5 | | |
| Gate-drain charge | Q_{gd} | | | 3 | | |
| Switching Characteristics⁽⁴⁾ | | | | | | |
| Turn-on delay time | $t_{d(on)}$ | $V_{DD} = 15V, R_L = 2.7\Omega$ $V_{GS} = 10V, R_{GEN} = 3\Omega$ | | 3.3 | | ns |
| Turn-on rise time | t_r | | | 4.8 | | |
| Turn-off delay time | $t_{d(off)}$ | | | 26 | | |
| Turn-off fall time | t_f | | | 4 | | |

Notes:

1. Repetitive Rating : Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t < 5$ sec.
3. Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production testing.

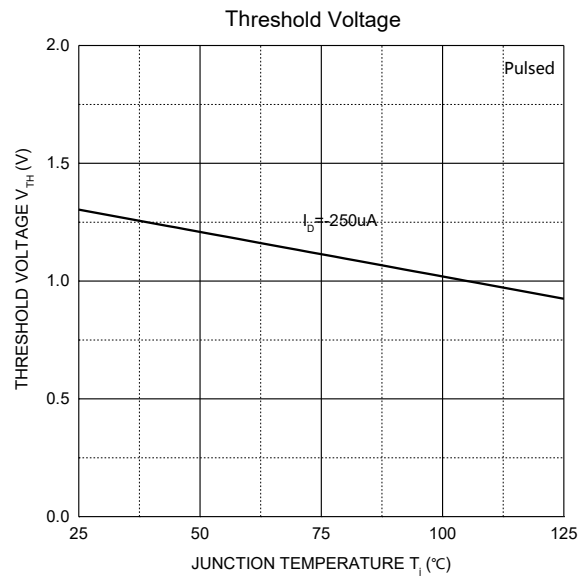
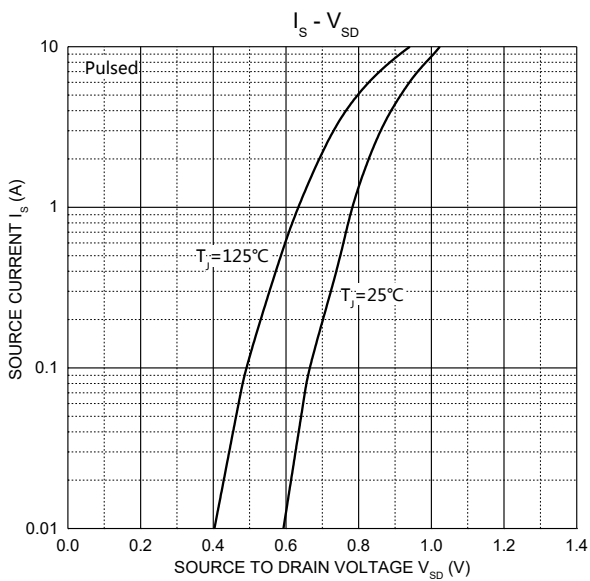
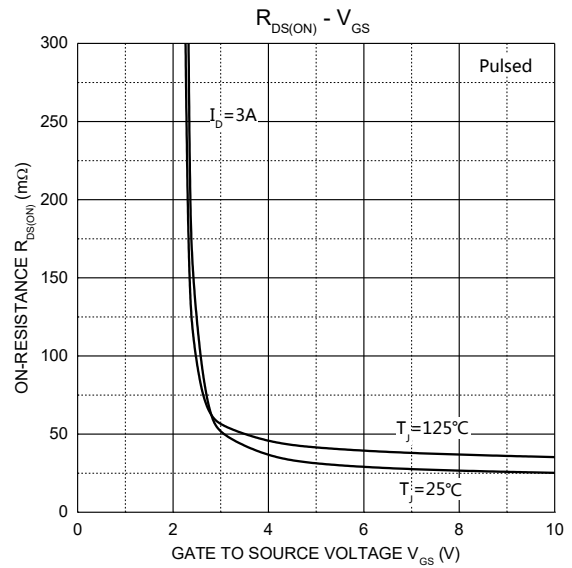
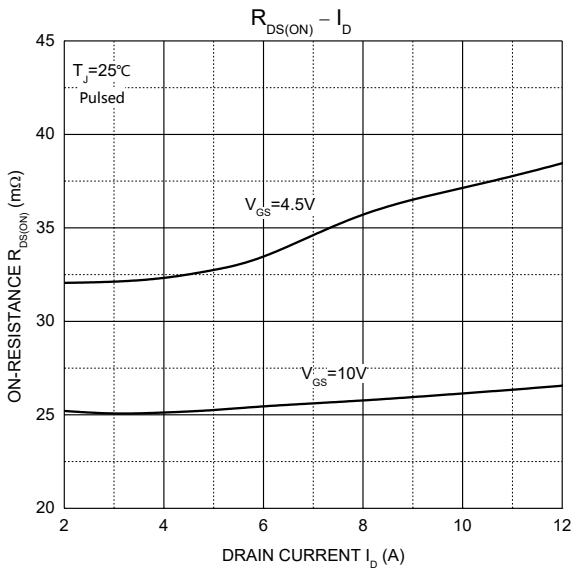
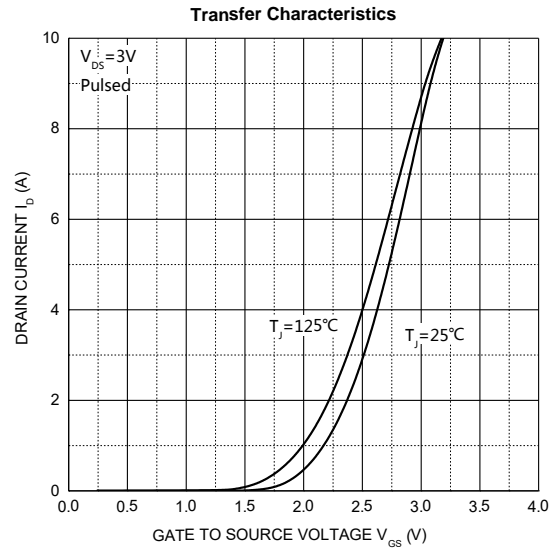
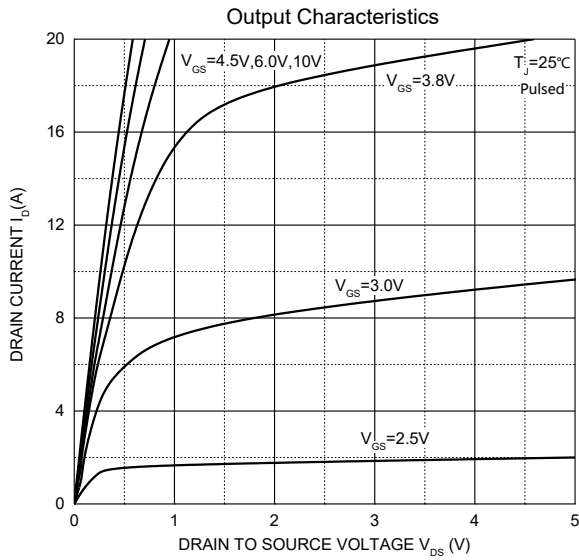
Typical Characteristics

P-Channel MOS

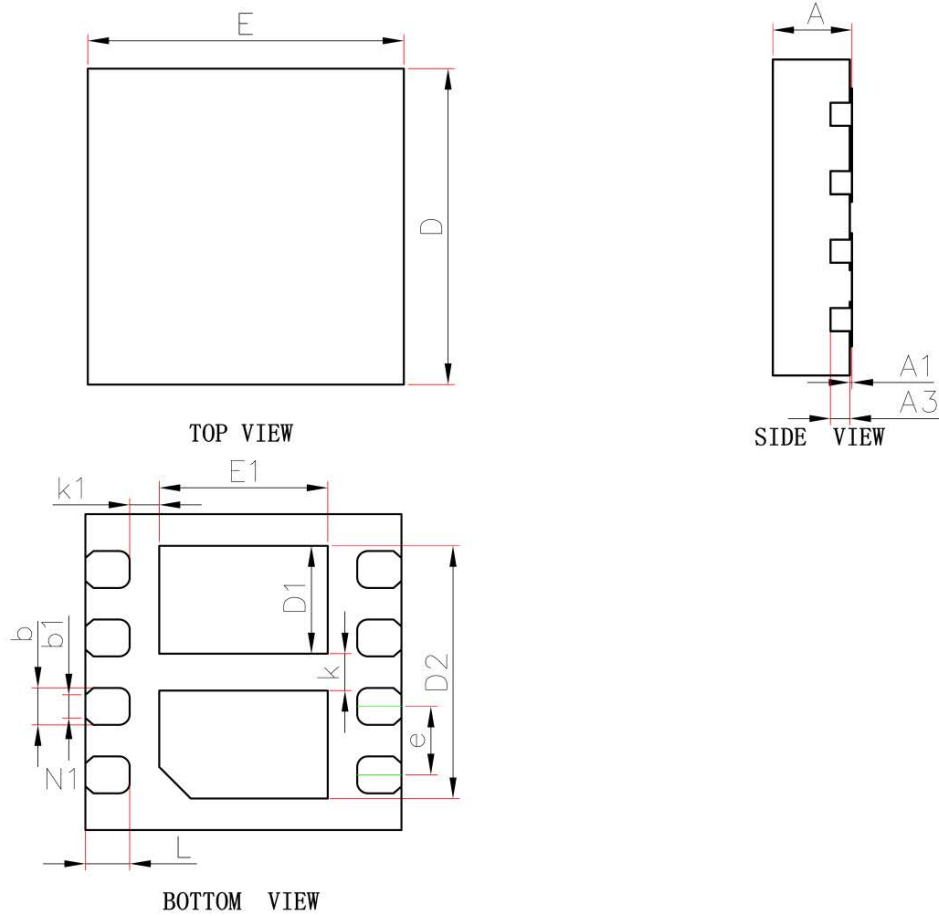


Typical Characteristics

N-Channel MOS



DFNWB3X3-8L-U Package Information



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | MIN. | MAX. | MIN. | MAX. |
| A | 0.700 | 0.800 | 0.028 | 0.031 |
| A1 | 0.000 | 0.050 | 0.000 | 0.002 |
| A3 | 0.203REF. | | 0.008REF. | |
| D | 2.900 | 3.100 | 0.114 | 0.122 |
| E | 2.900 | 3.100 | 0.114 | 0.122 |
| D1 | 0.925 | 1.125 | 0.036 | 0.044 |
| E1 | 1.500 | 1.700 | 0.059 | 0.067 |
| D2 | 2.300 | 2.500 | 0.091 | 0.098 |
| b | 0.300 | 0.400 | 0.012 | 0.016 |
| b1 | 0.220REF | | 0.009REF | |
| e | 0.650BSC. | | 0.026BSC. | |
| k | 0.350REF | | 0.014REF | |
| k1 | 0.280REF | | 0.011REF | |
| L | 0.370 | 0.470 | 0.015 | 0.019 |