

N-Channel 80-V (D-S) MOSFET

Key Features:

- Low $r_{DS(on)}$ trench technology
- Low thermal impedance
- Fast switching speed

Typical Applications:

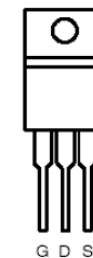
- Automotive Systems
- DC/DC Conversion Circuits
- Battery Powered Power Tools

| PRODUCT SUMMARY | | |
|-----------------|----------------------------|-----------|
| V_{DS} (V) | $r_{DS(on)}$ (m Ω) | I_D (A) |
| 80 | 8.5 @ $V_{GS} = 10V$ | 150 |
| | 12.5 @ $V_{GS} = 4.5V$ | 125 |



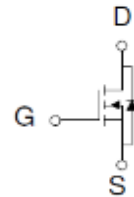
RoHS
COMPLIANT
HALOGEN
FREE

TO-220AB



Top View

DRAIN
connected
to TAB



N-Channel MOSFET

| ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED) | | | | |
|---|--------------------------|----------------|------------|------------------|
| Parameter | | Symbol | Limit | Units |
| Drain-Source Voltage | | V_{DS} | 80 | V |
| Gate-Source Voltage | | V_{GS} | ± 20 | |
| Continuous Drain Current ^a | $T_C = 25^\circ\text{C}$ | I_D | 150 | A |
| Pulsed Drain Current ^b | | I_{DM} | 600 | |
| Continuous Source Current (Diode Conduction) ^a | $T_C = 25^\circ\text{C}$ | I_S | 150 | A |
| Power Dissipation ^a | $T_C = 25^\circ\text{C}$ | P_D | 300 | W |
| Operating Junction and Storage Temperature Range | | T_J, T_{stg} | -55 to 175 | $^\circ\text{C}$ |

| THERMAL RESISTANCE RATINGS | | | |
|--|-----------------|---------|--------------------|
| Parameter | Symbol | Maximum | Units |
| Maximum Junction-to-Ambient ^c | $R_{\theta JA}$ | 62.5 | $^\circ\text{C/W}$ |
| Maximum Junction-to-Case | $R_{\theta JC}$ | 0.5 | |

Notes

- Package Limited
- Pulse width limited by maximum junction temperature
- Surface Mounted on 1" x 1" FR4 Board.

Electrical Characteristics

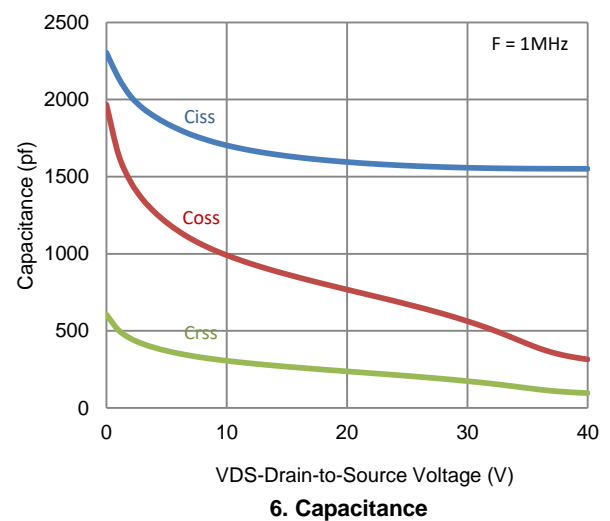
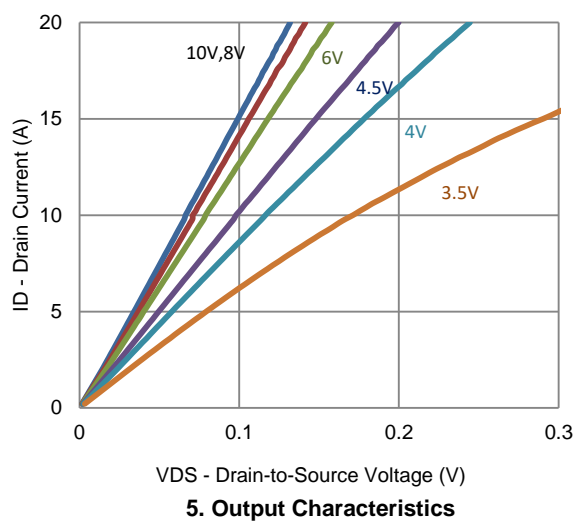
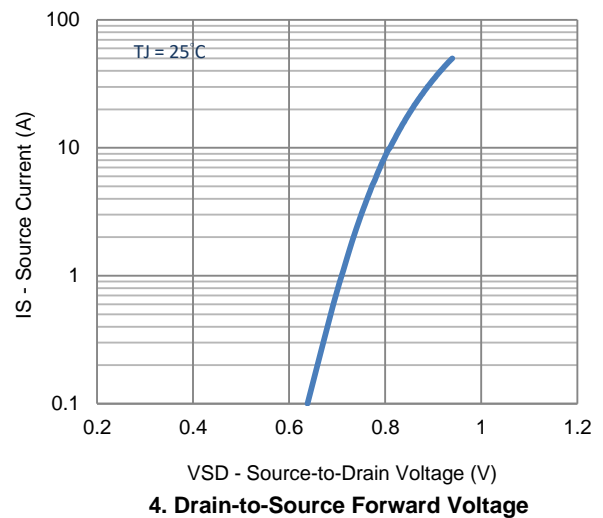
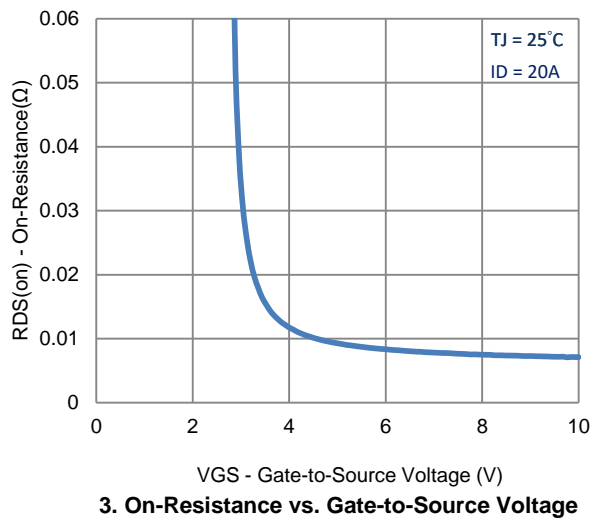
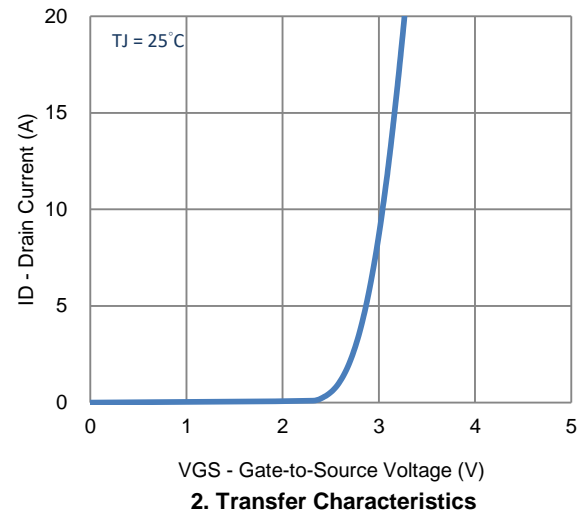
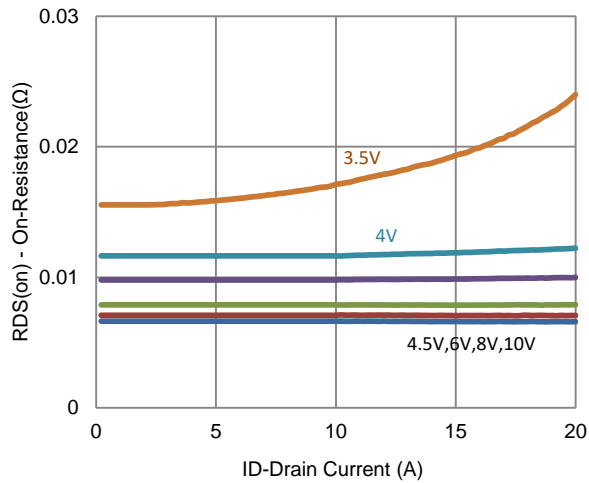
| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|--------------|---|-----|------|-----------|------------|
| Static | | | | | | |
| Gate-Source Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 250 \mu A$ | 1 | | | V |
| Gate-Body Leakage | I_{GSS} | $V_{DS} = 0 V, V_{GS} = \pm 20 V$ | | | ± 100 | nA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS} = 64 V, V_{GS} = 0 V$ | | | 1 | μA |
| | | $V_{DS} = 64 V, V_{GS} = 0 V, T_J = 55^\circ C$ | | | 10 | |
| On-State Drain Current ^a | $I_{D(on)}$ | $V_{DS} = 5 V, V_{GS} = 10 V$ | 20 | | | A |
| Drain-Source On-Resistance ^a | $r_{DS(on)}$ | $V_{GS} = 10 V, I_D = 20 A$ | | | 8.5 | m Ω |
| | | $V_{GS} = 4.5 V, I_D = 16 A$ | | | 12.5 | |
| Forward Transconductance ^a | g_{fs} | $V_{DS} = 15 V, I_D = 20 A$ | | 52 | | S |
| Diode Forward Voltage ^a | V_{SD} | $I_S = 20 A, V_{GS} = 0 V$ | | 0.86 | | V |
| Dynamic ^b | | | | | | |
| Total Gate Charge | Q_g | $V_{DS} = 40 V, V_{GS} = 4.5 V,$ $I_D = 20 A$ | | 21 | | nC |
| Gate-Source Charge | Q_{gs} | | | 7.4 | | |
| Gate-Drain Charge | Q_{gd} | | | 10 | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DS} = 40 V, R_L = 2 \Omega,$ $I_D = 20 A,$ $V_{GEN} = 10 V, R_{GEN} = 6 \Omega$ | | 12 | | ns |
| Rise Time | t_r | | | 24 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 58 | | |
| Fall Time | t_f | | | 32 | | |
| Input Capacitance | C_{iss} | $V_{DS} = 40 V, V_{GS} = 0 V, f = 1 \text{ Mhz}$ | | 1551 | | pF |
| Output Capacitance | C_{oss} | | | 315 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 96 | | |

Notes

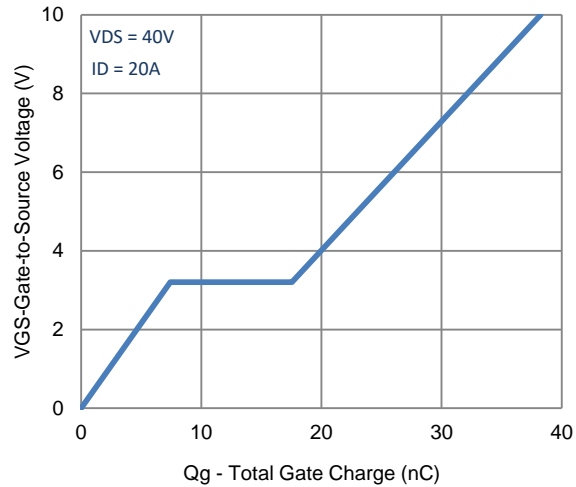
- Pulse test: PW \leq 300us duty cycle \leq 2%.
- Guaranteed by design, not subject to production testing.

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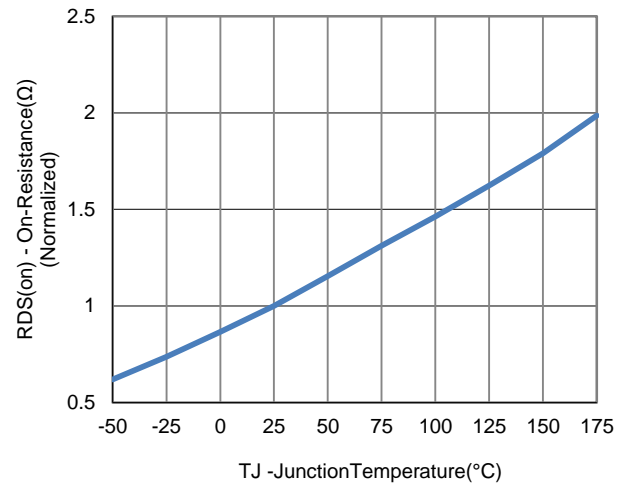
Typical Electrical Characteristics



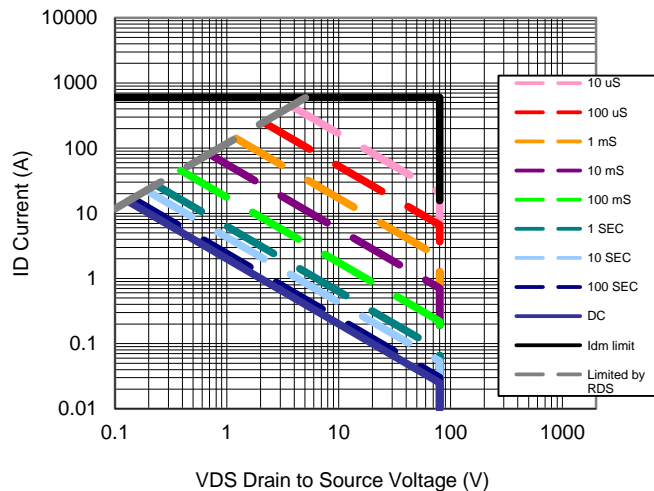
Typical Electrical Characteristics



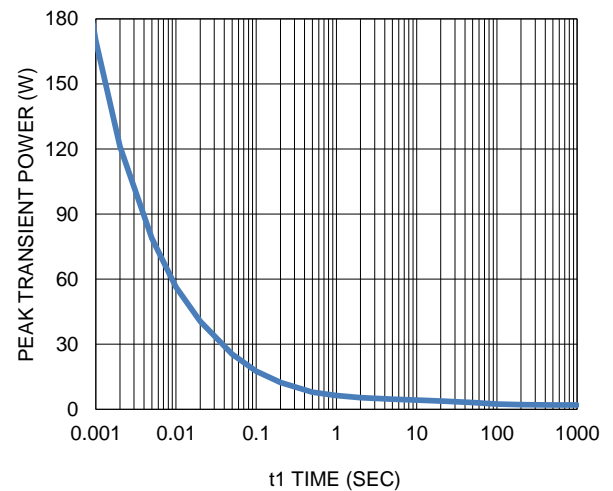
7. Gate Charge



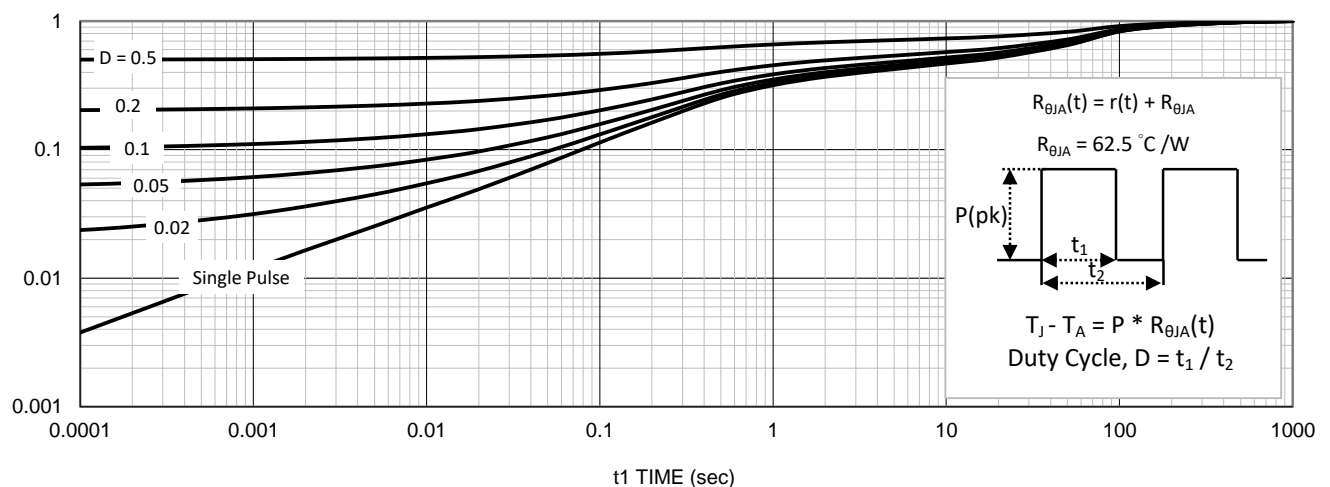
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area

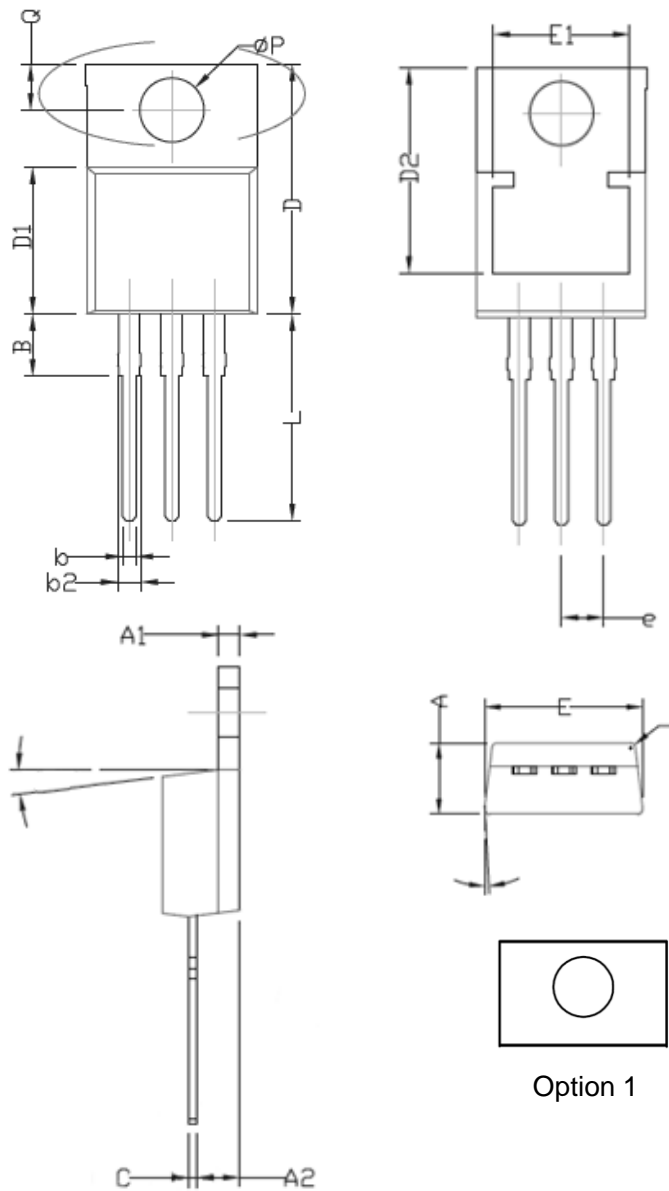


10. Single Pulse Maximum Power Dissipation



11. Normalized Thermal Transient Junction to Ambient

Package Information



| DIM. | MILLIMETERS | |
|------|-------------|-------|
| | MIN | MAX |
| A | 4.24 | 4.72 |
| A1 | 1.11 | 1.41 |
| A2 | 2.22 | 2.7 |
| B | 2.6 | 3.9 |
| b | 0.66 | 0.94 |
| b2 | 1.17 | 1.45 |
| c | 0.4 | 0.6 |
| D | 14.5 | 15.74 |
| D1 | 8.4 | 9.65 |
| D2 | 12.08 | 12.48 |
| E | 9.7 | 10.54 |
| E1 | 8 | 8.4 |
| e | 2.49 | 2.59 |
| L | 12.27 | 14.5 |
| ØP | 3.55 | 3.89 |
| Q | 2.58 | 2.98 |

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