

N-Channel 60-V (D-S) MOSFET

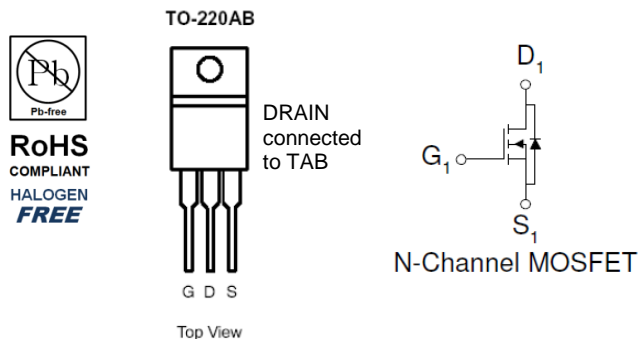
Key Features:

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

Typical Applications:

- PoE Power Sourcing Equipment
- PoE Powered Devices
- Telecom DC/DC converters
- White LED boost converters

| PRODUCT SUMMARY | | |
|-----------------|----------------------------|-----------------|
| V_{DS} (V) | $r_{DS(on)}$ (m Ω) | I_D (A) |
| 60 | 9.9 @ $V_{GS} = 10V$ | 90 ^a |
| | 13 @ $V_{GS} = 4.5V$ | |



| ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED) | | | | |
|---|--------------------------|----------------|------------|------------------|
| Parameter | | Symbol | Limit | Units |
| Drain-Source Voltage | | V_{DS} | 60 | V |
| Gate-Source Voltage | | V_{GS} | ± 20 | |
| Continuous Drain Current ^a | $T_C = 25^\circ\text{C}$ | I_D | 90 | A |
| Pulsed Drain Current ^b | | I_{DM} | 240 | |
| Continuous Source Current (Diode Conduction) ^a | | I_S | 90 | A |
| Power Dissipation ^a | $T_C = 25^\circ\text{C}$ | P_D | 120 | 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 ^a | $R_{\theta JA}$ | 62.5 | $^\circ\text{C/W}$ |
| Maximum Junction-to-Case | $R_{\theta JC}$ | 1.25 | |

Notes

- Package limited
- Pulse width limited by maximum junction temperature

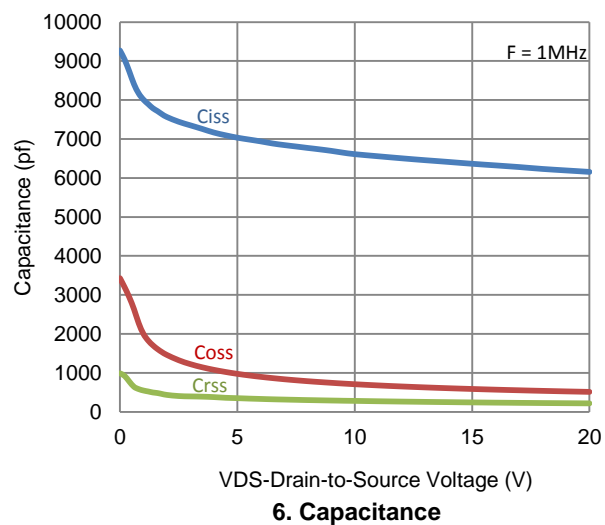
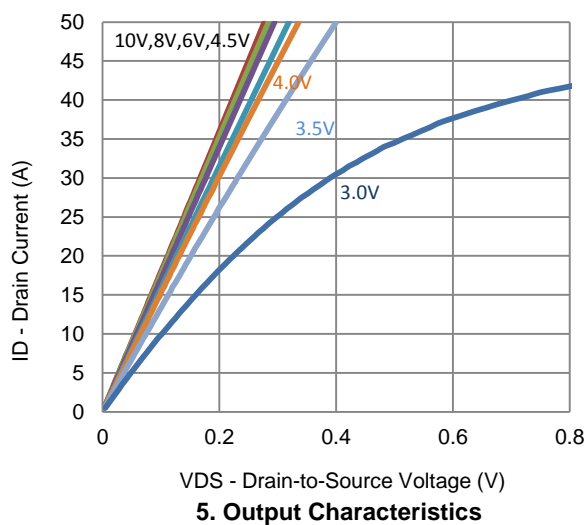
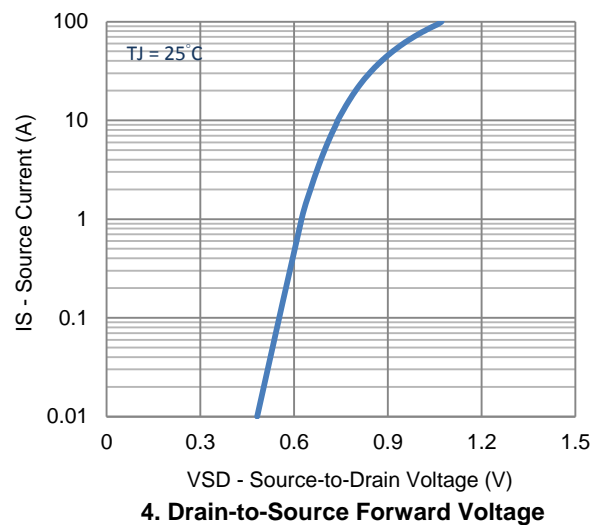
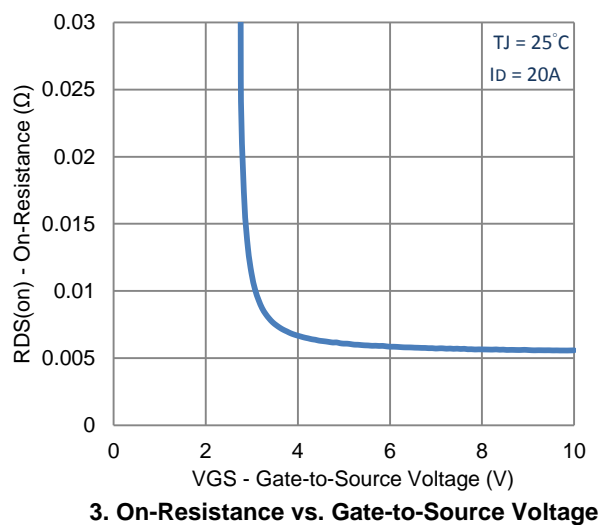
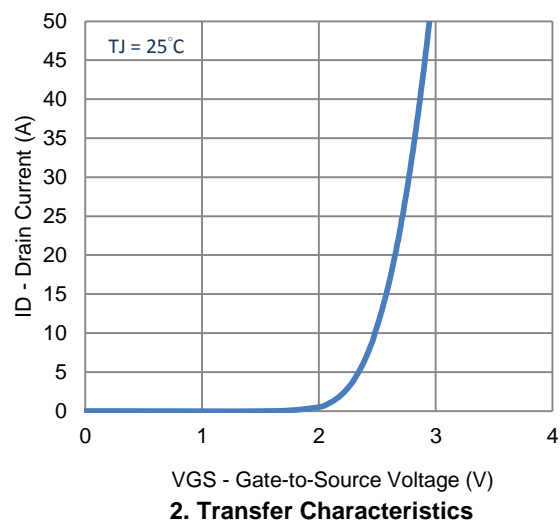
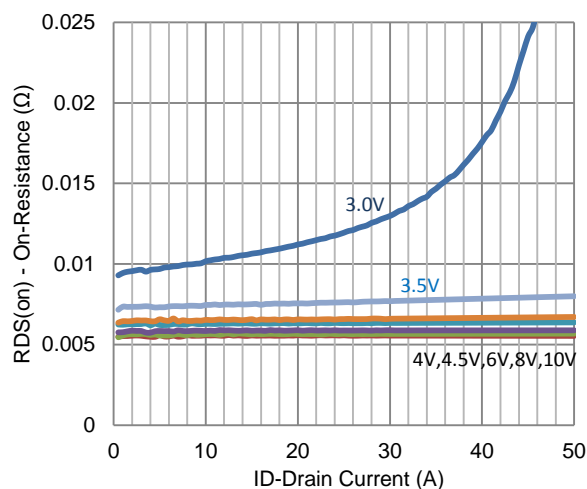
| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---------------------------------|--------------|--|-----|------|-----------|------|
| Static | | | | | | |
| Gate-Source Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 250 \mu A$ | 1 | | 3.5 | V |
| Gate-Body Leakage | I_{GSS} | $V_{DS} = 0 V, V_{GS} = 20 V$ | | | ± 100 | nA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS} = 48 V, V_{GS} = 0 V$ | | | 1 | uA |
| | | $V_{DS} = 48 V, V_{GS} = 0 V, T_J = 55^\circ C$ | | | 25 | |
| On-State Drain Current | $I_{D(on)}$ | $V_{DS} = 5 V, V_{GS} = 10 V$ | 120 | | | A |
| Drain-Source On-Resistance | $r_{DS(on)}$ | $V_{GS} = 10 V, I_D = 30 A$ | | | 9.9 | mΩ |
| | | $V_{GS} = 4.5 V, I_D = 20 A$ | | | 13 | |
| Forward Transconductance | g_{fs} | $V_{DS} = 15 V, I_D = 20 A$ | | 30 | | S |
| Diode Forward Voltage | V_{SD} | $I_S = 20 A, V_{GS} = 0 V$ | | 0.8 | | V |
| Dynamic | | | | | | |
| Total Gate Charge | Q_g | $V_{DS} = 30 V, V_{GS} = 4.5 V, I_D = 20 A$ | | 77 | | nC |
| Gate-Source Charge | Q_{gs} | | | 21 | | |
| Gate-Drain Charge | Q_{gd} | | | 40 | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD} = 30 V, R_L = 1.5 \Omega, I_D = 20 A,$ $V_{GEN} = 10 V, R_{GEN} = 6 \Omega$ | | 23 | | ns |
| Rise Time | t_r | | | 80 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 226 | | |
| Fall-Time | t_f | | | 99 | | |
| Input Capacitance | C_{iss} | $V_{DS} = 15 V, V_{GS} = 0 V, f = 1 MHz$ | | 5887 | | pF |
| Output Capacitance | C_{oss} | | | 567 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 352 | | |

Notes

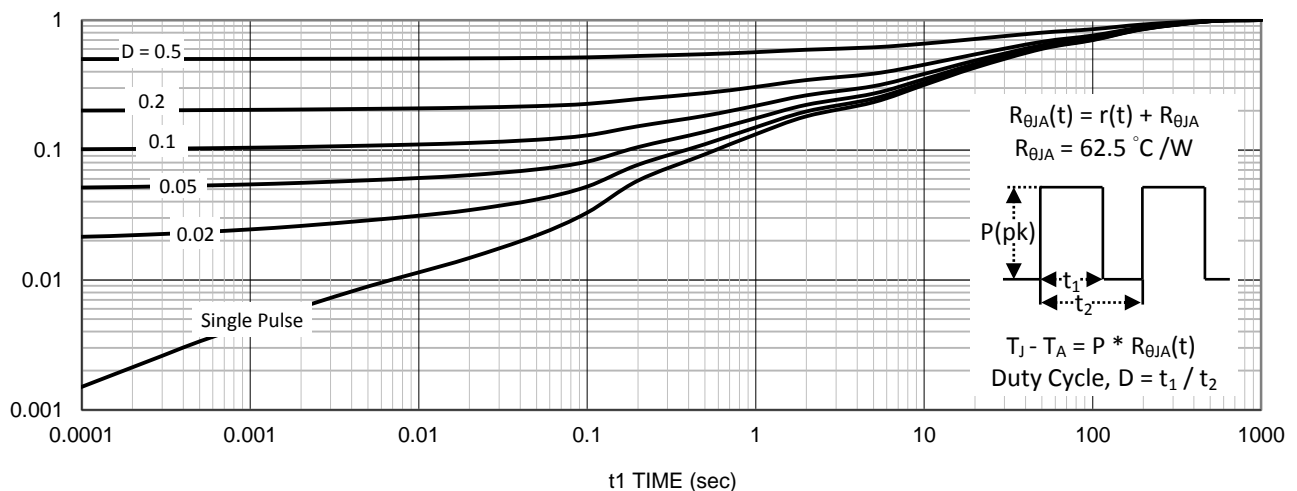
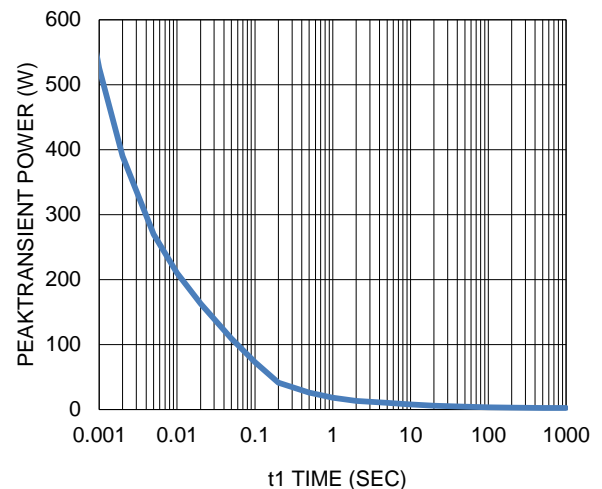
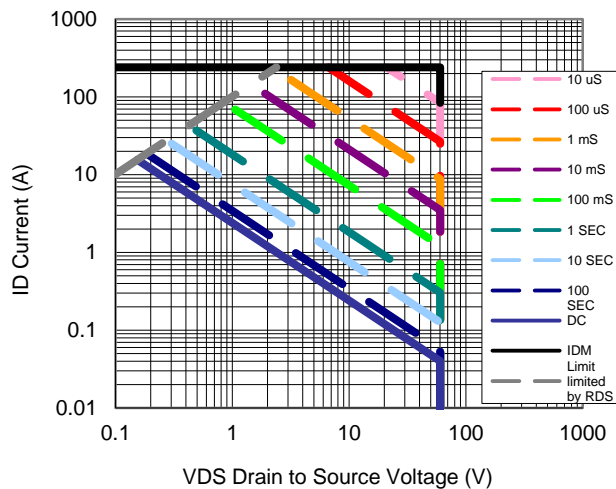
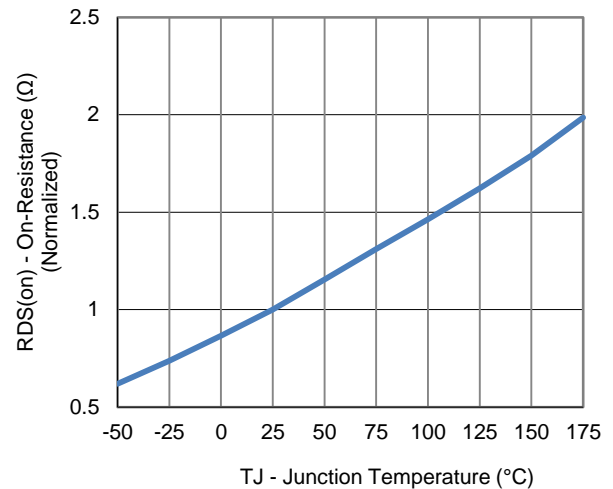
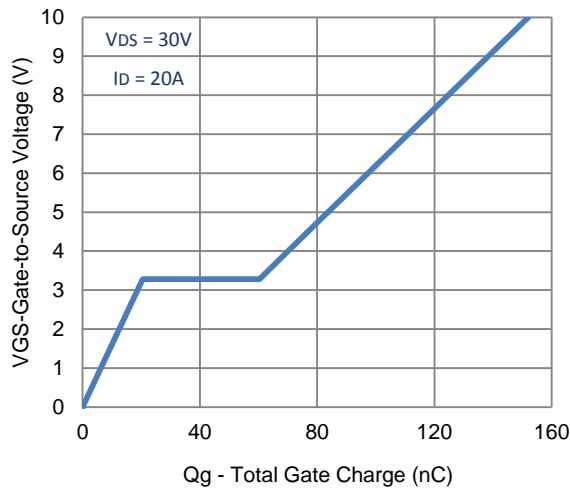
- Pulse test: PW ≤ 300us duty cycle ≤ 2%.
- Guaranteed by design, not subject to production testing.

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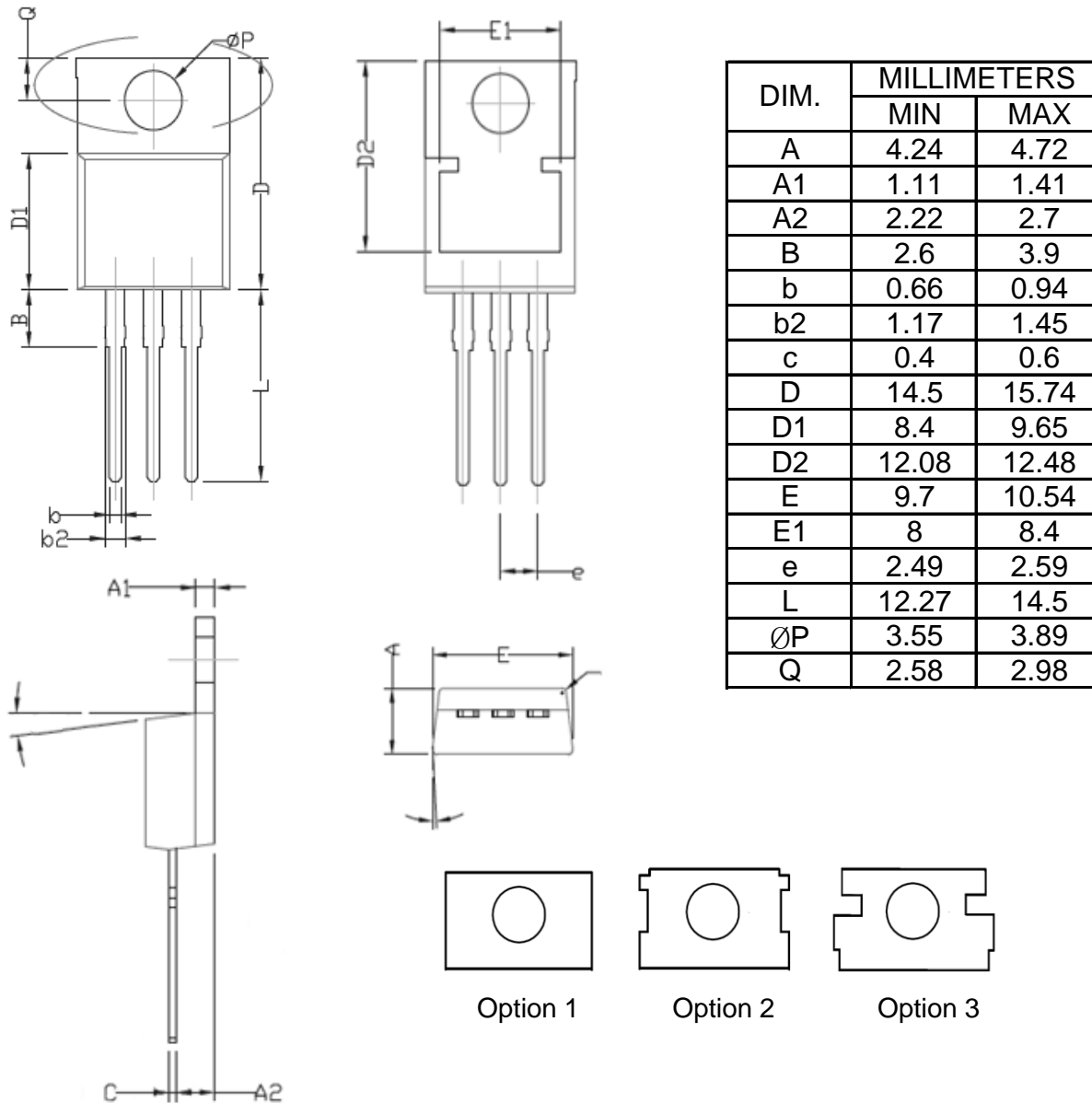
Typical Electrical Characteristics



Typical Electrical Characteristics



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