

## P-Channel 150-V (D-S) MOSFET

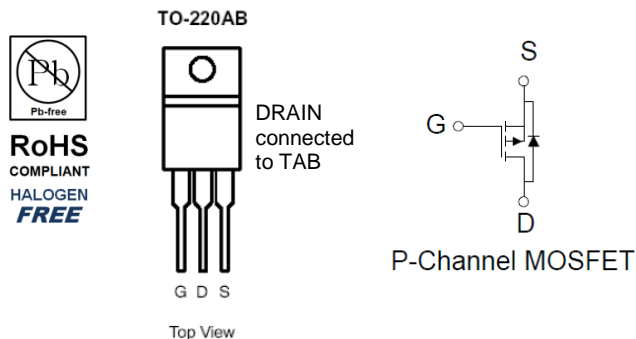
### Key Features:

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

### Typical Applications:

- White LED boost converters
- Automotive Systems
- Industrial DC/DC Conversion Circuits

| PRODUCT SUMMARY |                            |                  |
|-----------------|----------------------------|------------------|
| $V_{DS}$ (V)    | $r_{DS(on)}$ (m $\Omega$ ) | $I_D$ (A)        |
| -150            | 75 @ $V_{GS} = -10V$       | -52 <sup>a</sup> |
|                 | 80 @ $V_{GS} = -5.5V$      |                  |



| ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED) |                          |                |            |                  |
|---|--------------------------|----------------|------------|------------------|
| Parameter   |                          | Symbol         | Limit      | Units            |
| Drain-Source Voltage  |                          | $V_{DS}$       | -150       | V                |
| Gate-Source Voltage   |                          | $V_{GS}$       | $\pm 20$   |                  |
| Continuous Drain Current <sup>a</sup>                                       | $T_C = 25^\circ\text{C}$ | $I_D$          | -52        | A                |
| Pulsed Drain Current <sup>b</sup>   |                          | $I_{DM}$       | -210       |                  |
| Continuous Source Current (Diode Conduction) <sup>a</sup>                   | $T_C = 25^\circ\text{C}$ | $I_S$          | -52        | A                |
| Power Dissipation <sup>a</sup>  | $T_C = 25^\circ\text{C}$ | $P_D$          | 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 <sup>c</sup> | $R_{\theta JA}$ | 62.5    | $^\circ\text{C/W}$ |
| Maximum Junction-to-Case                 | $R_{\theta JC}$ | 1       |                    |

### Notes

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

## Electrical Characteristics

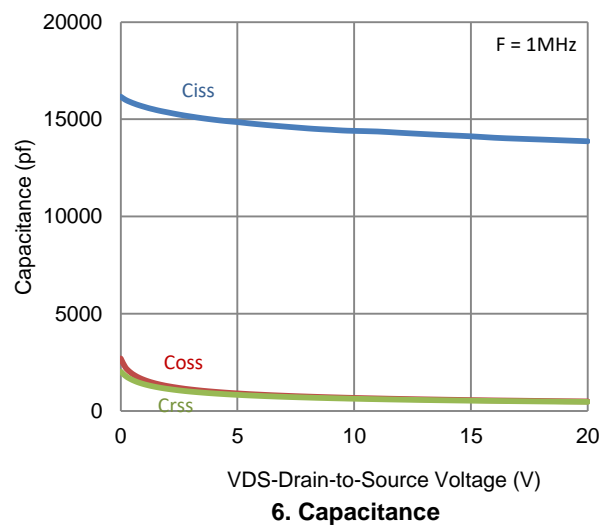
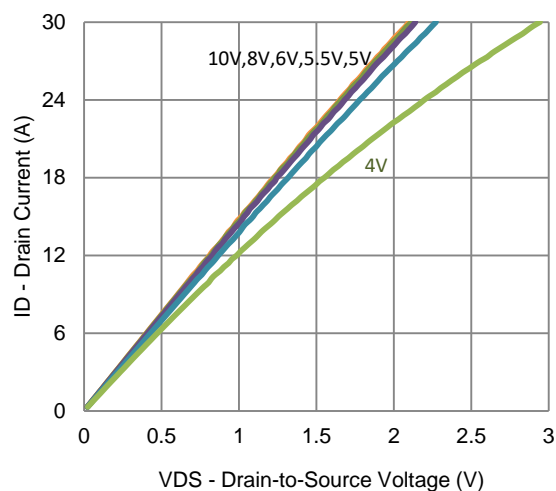
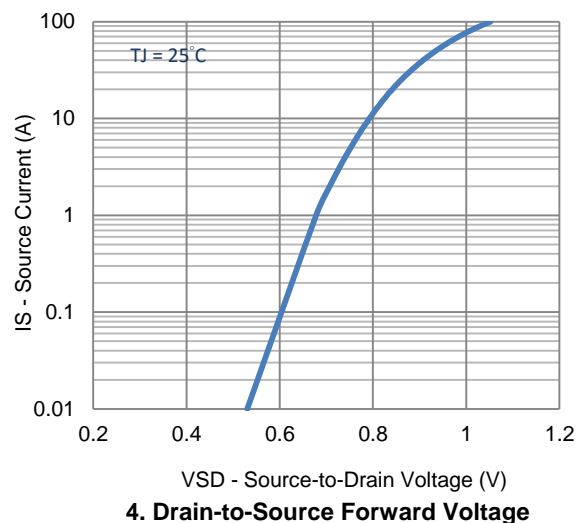
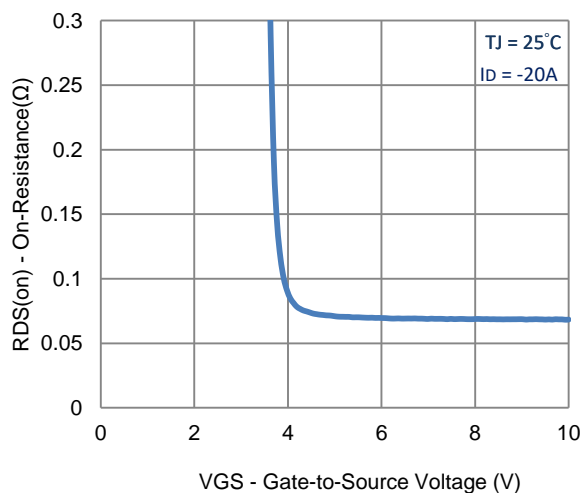
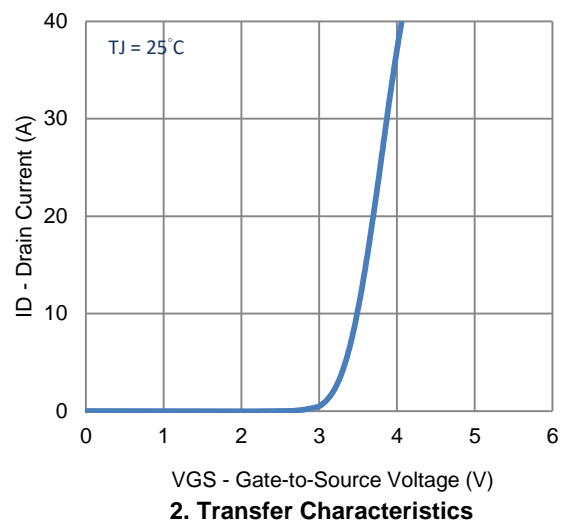
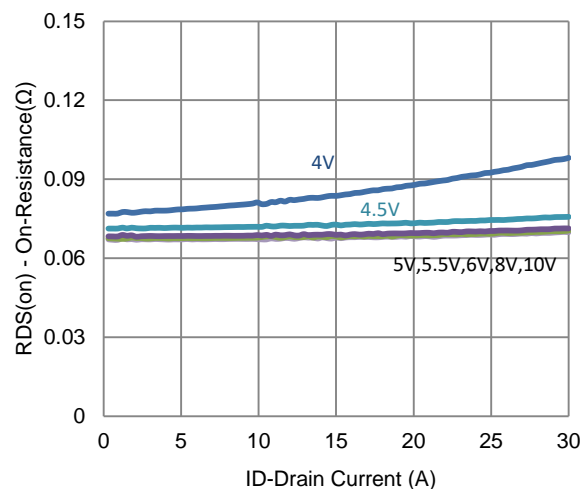
| Parameter                       | Symbol       | Test Conditions  | Min  | Typ   | Max       | Unit       |
|---------------------------------|--------------|--|------|-------|-----------|------------|
| <b>Static</b>                   |              |  |      |       |           |            |
| Gate-Source Threshold Voltage   | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = -250 \mu A$  | -1   |       |           | V          |
| Gate-Body Leakage               | $I_{GSS}$    | $V_{DS} = 0 V, V_{GS} = \pm 20 V$  |      |       | $\pm 100$ | nA         |
| Zero Gate Voltage Drain Current | $I_{DSS}$    | $V_{DS} = -120 V, V_{GS} = 0 V$  |      |       | -1        | $\mu A$    |
|                                 |              | $V_{DS} = -120 V, V_{GS} = 0 V, T_J = 55^\circ C$  |      |       | -25       |            |
| On-State Drain Current          | $I_{D(on)}$  | $V_{DS} = -5 V, V_{GS} = -10 V$  | -110 |       |           | A          |
| Drain-Source On-Resistance      | $r_{DS(on)}$ | $V_{GS} = -10 V, I_D = -26 A$  |      |       | 75        | m $\Omega$ |
|                                 |              | $V_{GS} = -5.5 V, I_D = -25 A$   |      |       | 80        |            |
| Forward Transconductance        | $g_{fs}$     | $V_{DS} = -15 V, I_D = -20 A$  |      | 40    |           | S          |
| Diode Forward Voltage           | $V_{SD}$     | $I_S = -26 A, V_{GS} = 0 V$  |      | -0.86 |           | V          |
| <b>Dynamic</b>                  |              |  |      |       |           |            |
| Total Gate Charge               | $Q_g$        | $V_{DS} = -75 V, V_{GS} = -5.5 V,$<br>$I_D = -20 A$  |      | 166   |           | nC         |
| Gate-Source Charge              | $Q_{gs}$     |  |      | 51    |           |            |
| Gate-Drain Charge               | $Q_{gd}$     |  |      | 76    |           |            |
| Turn-On Delay Time              | $t_{d(on)}$  | $V_{DS} = -75 V, R_L = 3.8 \Omega,$<br>$I_D = -20 A,$<br>$V_{GEN} = -10 V, R_{GEN} = 6 \Omega$ |      | 27    |           | ns         |
| Rise Time                       | $t_r$        |  |      | 55    |           |            |
| Turn-Off Delay Time             | $t_{d(off)}$ |  |      | 258   |           |            |
| Fall Time                       | $t_f$        |  |      | 103   |           |            |
| Input Capacitance               | $C_{iss}$    | $V_{DS} = -15 V, V_{GS} = 0 V, f = 1 MHz$  |      | 14124 |           | pF         |
| Output Capacitance              | $C_{oss}$    |  |      | 557   |           |            |
| Reverse Transfer Capacitance    | $C_{rss}$    |  |      | 527   |           |            |

## Notes

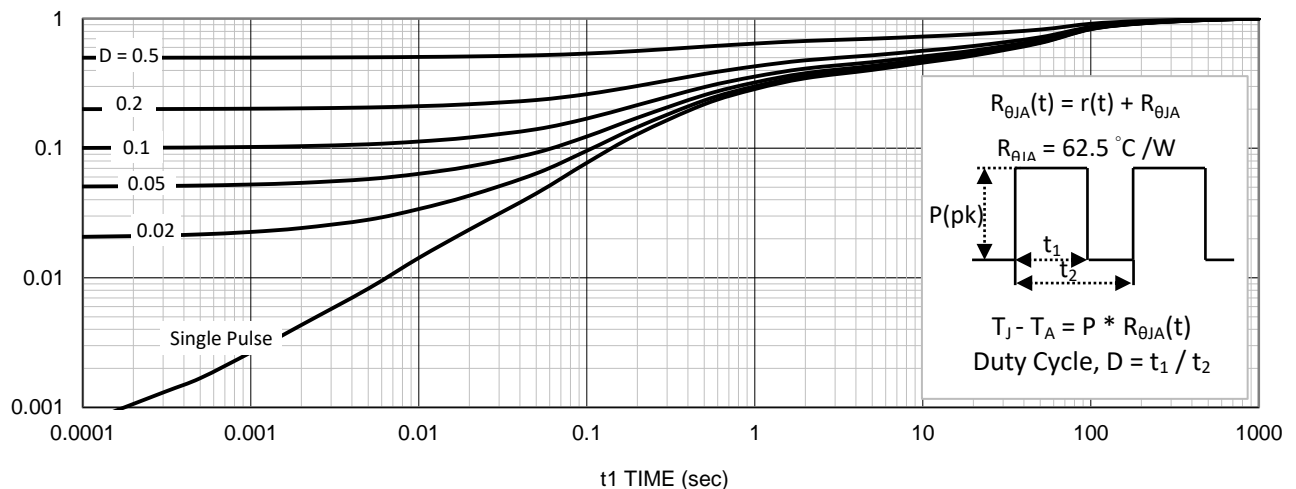
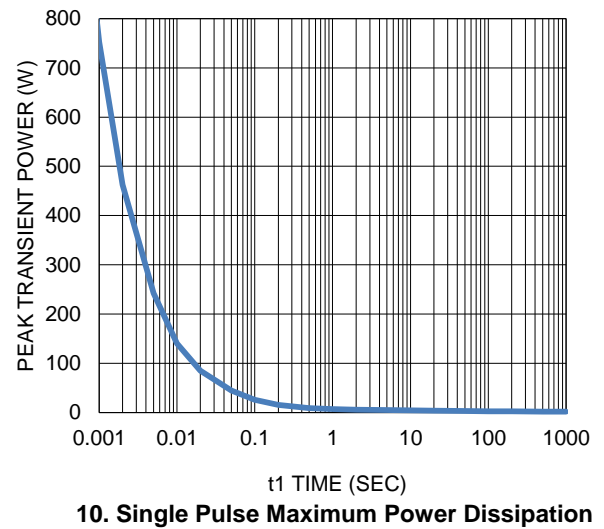
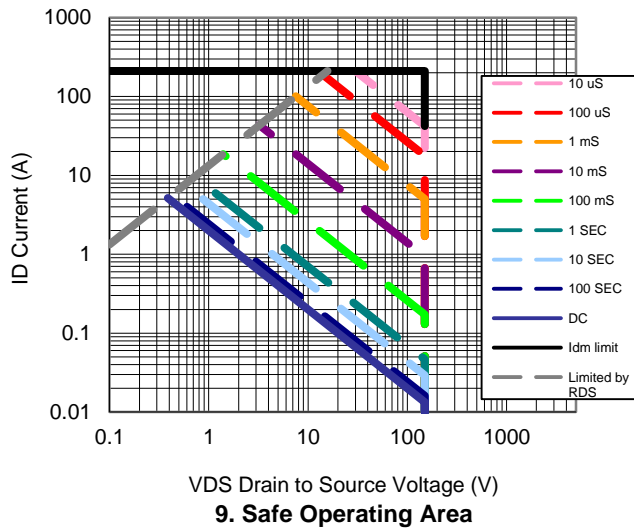
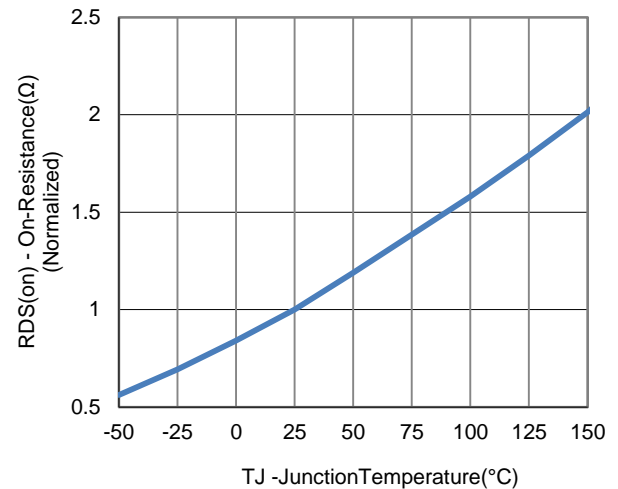
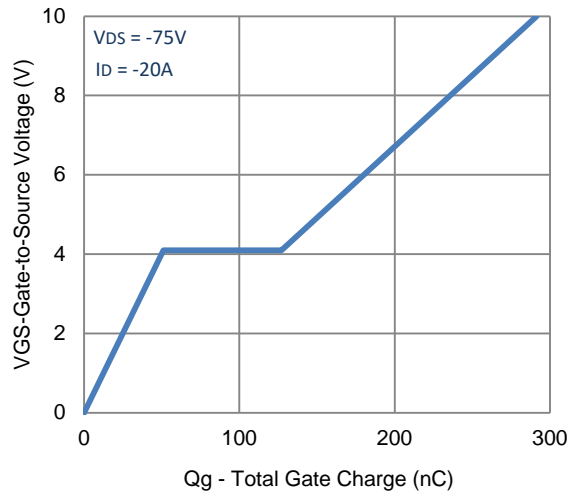
- Pulse test: PW  $\leq$  300us duty cycle  $\leq$  2%.
- Guaranteed by design, not subject to production testing.

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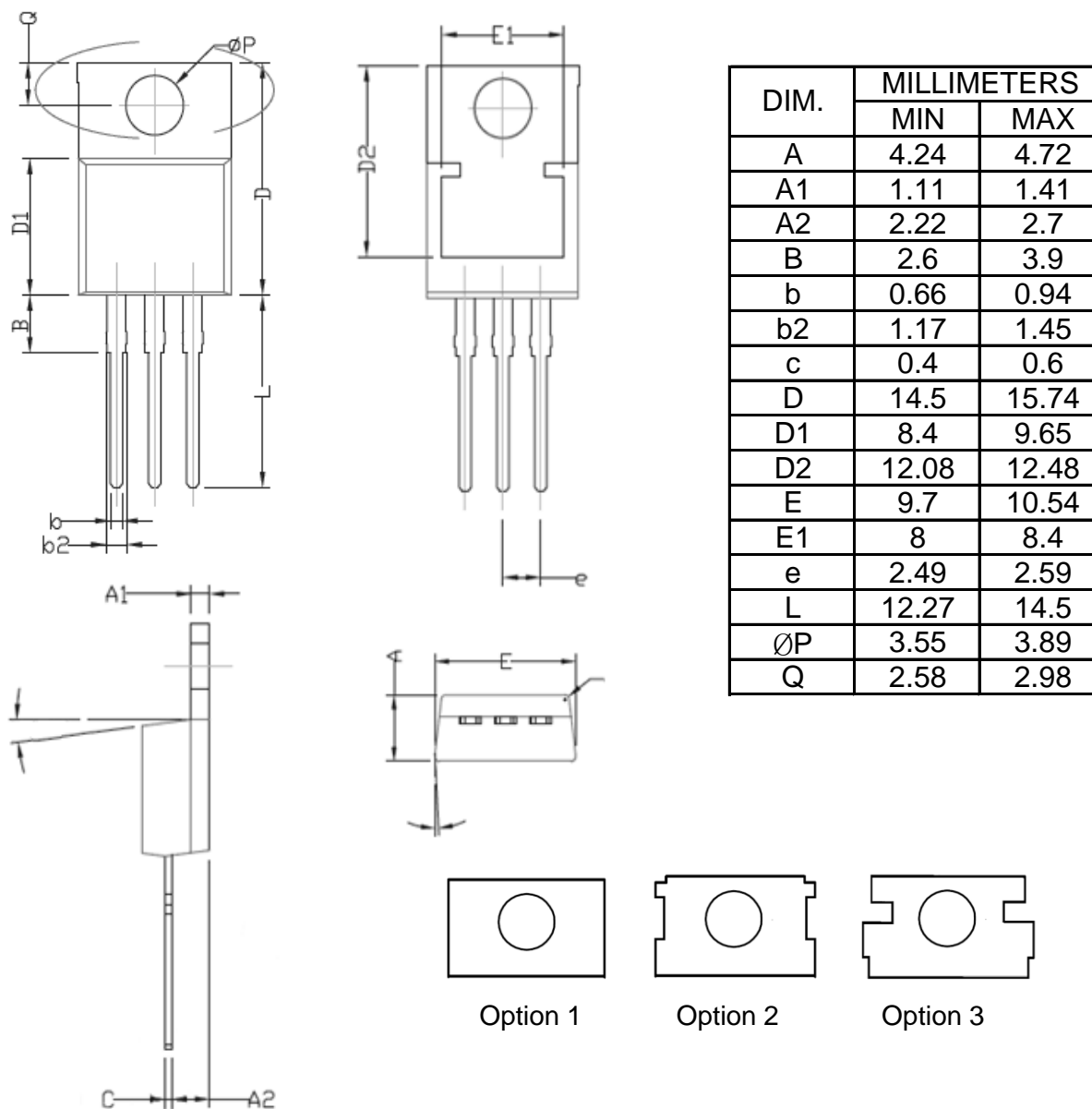
## Typical Electrical Characteristics



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## Package Information



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