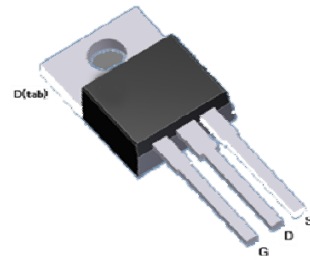


**N-Channel Logic Level Enhancement Mode Field Effect Transistor**

**Product Summary:**

|                     |                |
|---------------------|----------------|
| $BV_{DSS}$          | 100V           |
| $R_{DS(on)} (MAX.)$ | 11.5m $\Omega$ |
| $I_D$               | 95A            |



UIS, Rg 100% Tested

Pb-Free Lead Plating & Halogen Free



**ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$  Unless Otherwise Noted)**

| PARAMETERS/TEST CONDITIONS                     |                                                      | SYMBOL           | LIMITS     | UNIT             |
|------------------------------------------------|------------------------------------------------------|------------------|------------|------------------|
| Gate-Source Voltage                            |                                                      | $V_{GS}$         | $\pm 30$   | V                |
| Continuous Drain Current                       | $T_C = 25^\circ\text{C}$                             | $I_D$            | 95         | A                |
|                                                | $T_C = 100^\circ\text{C}$                            |                  | 67         |                  |
| Pulsed Drain Current <sup>1</sup>              |                                                      | $I_{DM}$         | 280        |                  |
| Avalanche Current                              |                                                      | $I_{AS}$         | 90         | mJ               |
| Avalanche Energy                               | $L = 0.1\text{mH}, I_D = 90\text{A}, R_G = 25\Omega$ | $E_{AS}$         | 405        |                  |
| Repetitive Avalanche Energy <sup>2</sup>       | $L = 0.05\text{mH}$                                  | $E_{AR}$         | 202        |                  |
| Power Dissipation                              | $T_C = 25^\circ\text{C}$                             | $P_D$            | 166        | W                |
|                                                | $T_C = 100^\circ\text{C}$                            |                  | 66         |                  |
| Operating Junction & Storage Temperature Range |                                                      | $T_{j, T_{stg}}$ | -55 to 150 | $^\circ\text{C}$ |

100% UIS testing in condition of  $V_D = 50\text{V}$ ,  $L = 0.1\text{mH}$ ,  $V_G = 10\text{V}$ ,  $I_L = 60\text{A}$ , Rated  $V_{DS} = 100\text{V}$  N-CH

**THERMAL RESISTANCE RATINGS**

| THERMAL RESISTANCE  | SYMBOL          | TYPICAL | MAXIMUM | UNIT                        |
|---------------------|-----------------|---------|---------|-----------------------------|
| Junction-to-Case    | $R_{\theta JC}$ |         | 0.75    | $^\circ\text{C} / \text{W}$ |
| Junction-to-Ambient | $R_{\theta JA}$ |         | 62.5    |                             |

<sup>1</sup>Pulse width limited by maximum junction temperature.

<sup>2</sup>Duty cycle  $\leq 1\%$

**ELECTRICAL CHARACTERISTICS (T<sub>J</sub> = 25 °C, Unless Otherwise Noted)**

| PARAMETER                                                               | SYMBOL               | TEST CONDITIONS                                                                            | LIMITS |      |      | UNIT |
|-------------------------------------------------------------------------|----------------------|--------------------------------------------------------------------------------------------|--------|------|------|------|
|                                                                         |                      |                                                                                            | MIN    | TYP  | MAX  |      |
| STATIC                                                                  |                      |                                                                                            |        |      |      |      |
| Drain-Source Breakdown Voltage                                          | V <sub>(BR)DSS</sub> | V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA                                               | 100    |      |      | V    |
| Gate Threshold Voltage                                                  | V <sub>GS(th)</sub>  | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA                                 | 2.0    | 3.0  | 4.0  |      |
| Gate-Body Leakage                                                       | I <sub>GSS</sub>     | V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±30V                                               |        |      | ±100 | nA   |
| Zero Gate Voltage Drain Current                                         | I <sub>DSS</sub>     | V <sub>DS</sub> = 80V, V <sub>GS</sub> = 0V                                                |        |      | 1    | μA   |
|                                                                         |                      | V <sub>DS</sub> = 70V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 125 °C                       |        |      | 25   |      |
| On-State Drain Current <sup>1</sup>                                     | I <sub>D(ON)</sub>   | V <sub>DS</sub> = 10V, V <sub>GS</sub> = 10V                                               | 95     |      |      | A    |
| Drain-Source On-State Resistance <sup>1</sup>                           | R <sub>DS(ON)</sub>  | V <sub>GS</sub> = 10V, I <sub>D</sub> = 32A                                                |        | 9.7  | 11.5 | mΩ   |
| Forward Transconductance <sup>1</sup>                                   | g <sub>fs</sub>      | V <sub>DS</sub> = 5V, I <sub>D</sub> = 32A                                                 |        | 48   |      | S    |
| DYNAMIC                                                                 |                      |                                                                                            |        |      |      |      |
| Input Capacitance                                                       | C <sub>iss</sub>     | V <sub>GS</sub> = 0V, V <sub>DS</sub> = 50V, f = 1MHz                                      |        | 3226 |      | pF   |
| Output Capacitance                                                      | C <sub>oss</sub>     |                                                                                            |        | 252  |      |      |
| Reverse Transfer Capacitance                                            | C <sub>rss</sub>     |                                                                                            |        | 29   |      |      |
| Gate Resistance                                                         | R <sub>g</sub>       | V <sub>GS</sub> = 15mV, V <sub>DS</sub> = 0V, f = 1MHz                                     |        | 1.7  |      | Ω    |
| Total Gate Charge <sup>1,2</sup>                                        | Q <sub>g</sub>       | V <sub>DS</sub> = 50V, V <sub>GS</sub> = 10V,<br>I <sub>D</sub> = 32A                      |        | 39   |      | nC   |
| Gate-Source Charge <sup>1,2</sup>                                       | Q <sub>gs</sub>      |                                                                                            |        | 20   |      |      |
| Gate-Drain Charge <sup>1,2</sup>                                        | Q <sub>gd</sub>      |                                                                                            |        | 8.2  |      |      |
| Turn-On Delay Time <sup>1,2</sup>                                       | t <sub>d(on)</sub>   | V <sub>DS</sub> = 50V,<br>I <sub>D</sub> = 1A, V <sub>GS</sub> = 10V, R <sub>GS</sub> = 6Ω |        | 30   |      | nS   |
| Rise Time <sup>1,2</sup>                                                | t <sub>r</sub>       |                                                                                            |        | 150  |      |      |
| Turn-Off Delay Time <sup>1,2</sup>                                      | t <sub>d(off)</sub>  |                                                                                            |        | 110  |      |      |
| Fall Time <sup>1,2</sup>                                                | t <sub>f</sub>       |                                                                                            |        | 180  |      |      |
| SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T <sub>c</sub> = 25 °C) |                      |                                                                                            |        |      |      |      |
| Continuous Current                                                      | I <sub>S</sub>       |                                                                                            |        |      | 95   | A    |
| Pulsed Current <sup>3</sup>                                             | I <sub>SM</sub>      |                                                                                            |        |      | 280  |      |
| Forward Voltage <sup>1</sup>                                            | V <sub>SD</sub>      | I <sub>F</sub> = 32A, V <sub>GS</sub> = 0V                                                 |        |      | 1.3  | V    |
| Reverse Recovery Time                                                   | t <sub>rr</sub>      | I <sub>F</sub> = 20A, dI <sub>F</sub> /dt = 100A / μS                                      |        | 120  |      | nS   |
| Reverse Recovery Charge                                                 | Q <sub>rr</sub>      |                                                                                            |        | 420  |      | nC   |

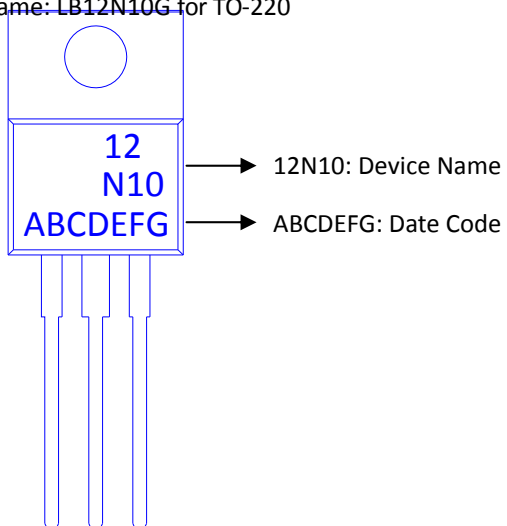
<sup>1</sup>Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

<sup>2</sup>Independent of operating temperature.

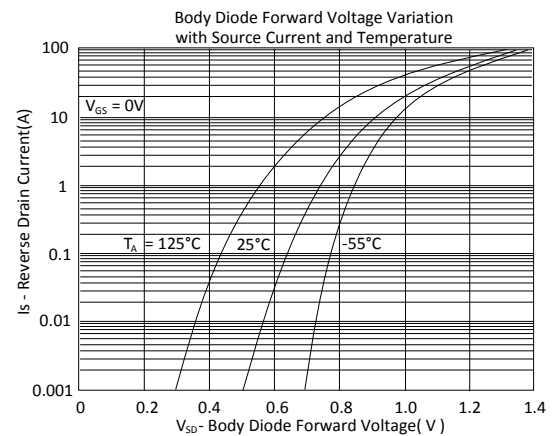
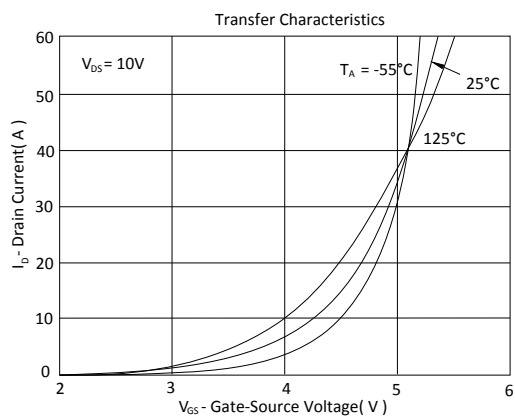
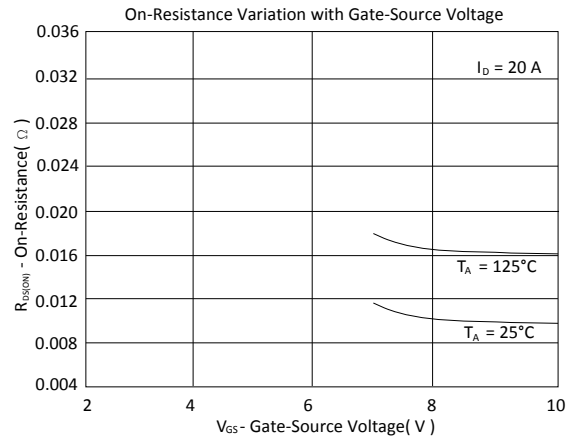
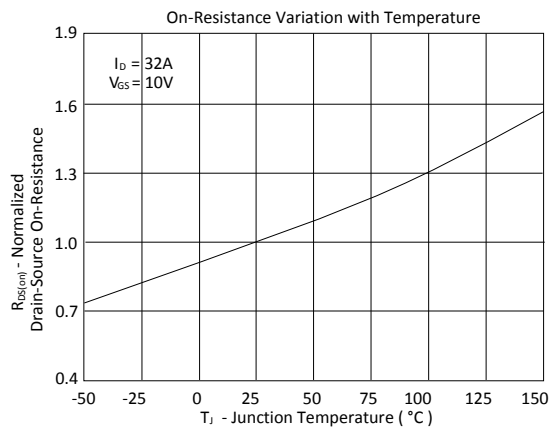
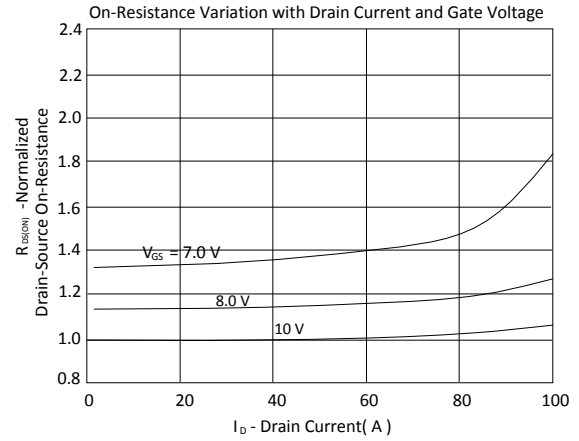
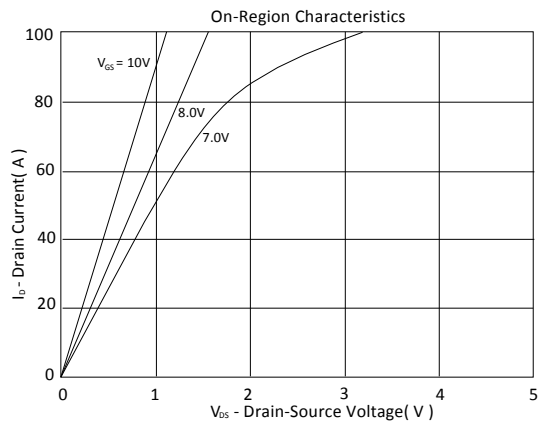
<sup>3</sup>Pulse width limited by maximum junction temperature.

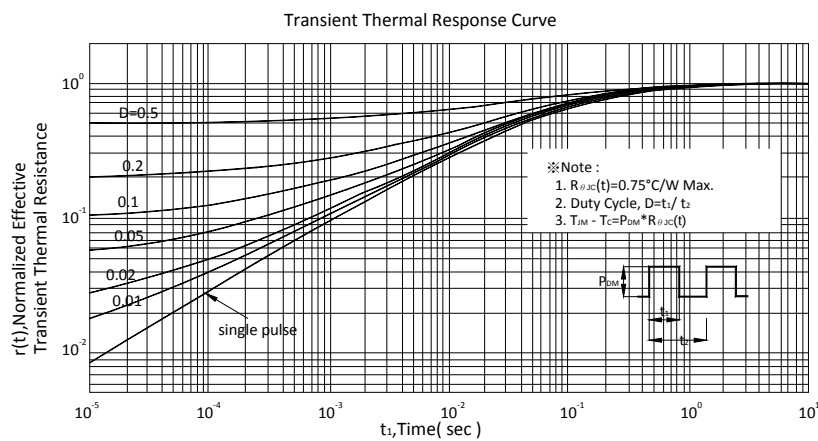
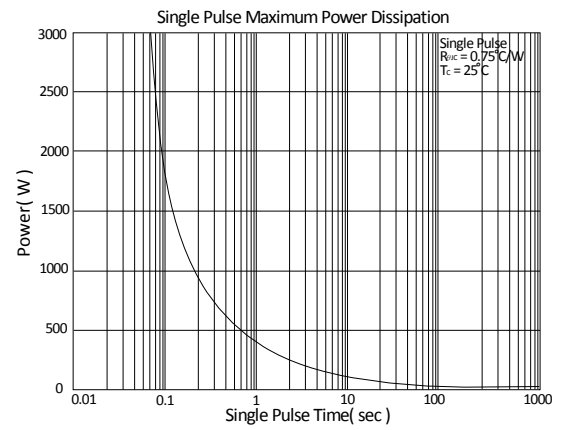
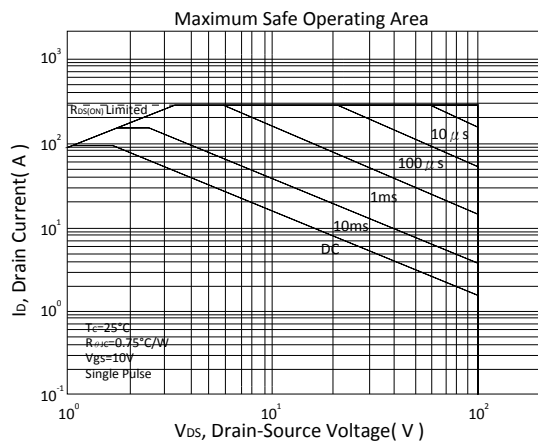
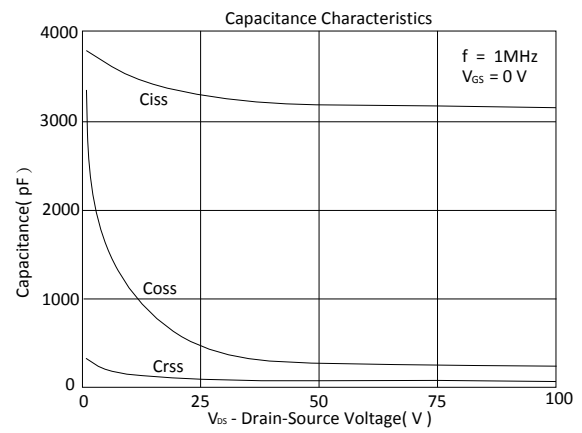
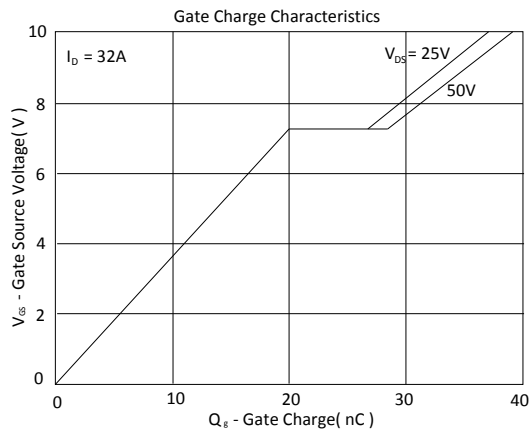
**Ordering & Marking  
Information:**

Device Name: LB12N10G for TO-220

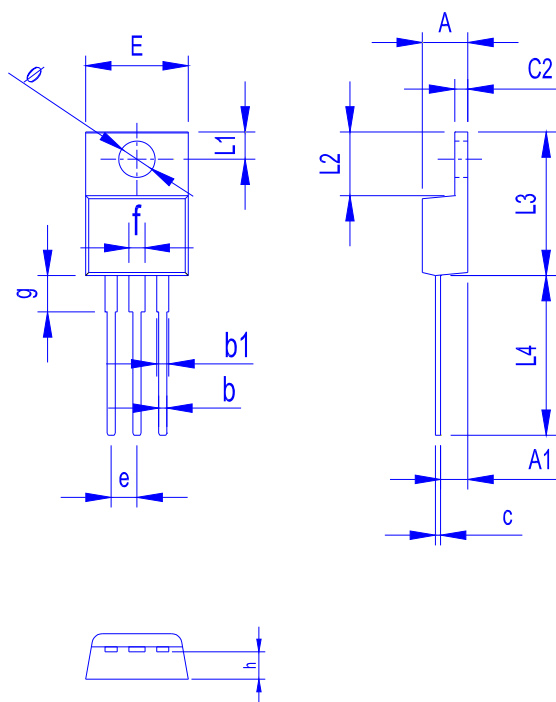


# TYPICAL CHARACTERISTICS





Outline Drawing



Dimension in mm

| Dimension | A    | b    | b1   | c    | c2   | E     | L1   | L2   | L3    | L4    | ø    | e    | f    | g    | h    |
|-----------|------|------|------|------|------|-------|------|------|-------|-------|------|------|------|------|------|
| Min.      | 4.20 | 0.70 | 0.90 | 0.30 | 1.10 | 9.80  | 2.55 | 6.10 | 14.80 | 13.50 | 3.40 | 2.35 | 1.30 | 3.40 | 2.40 |
| Max.      | 4.80 | 1.10 | 1.50 | 0.70 | 1.50 | 10.50 | 2.85 | 6.50 | 15.40 | 14.50 | 3.80 | 2.75 | 1.90 | 3.80 | 3.00 |