

## 200V N-Channel Enhancement Mode MOSFET

### 1. Product Information

#### 1.1 Features

- ◇ Advanced SGT cell design
- ◇ Low Thermal Resistance

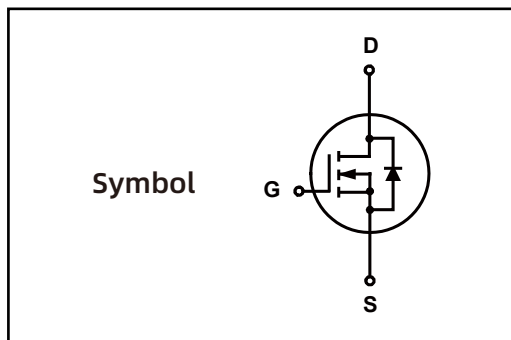
#### 1.2 Applications

- ◇ Motor drivers
- ◇ DC - DC Converter

#### 1.3 Quick reference

- ◇  $BV \cong 200\text{ V}$
- ◇  $P_{\text{tot}} \cong 250\text{ W}$
- ◇  $I_D \cong 107\text{ A}$
- ◇  $R_{\text{DS(ON)}} \cong 7.5\text{ m}\Omega @ V_{\text{GS}} = 10\text{ V}$
- ◇  $R_{\text{DS(ON)}} \cong 8.0\text{ m}\Omega @ V_{\text{GS}} = 6\text{ V}$

### 2. Pin Description



#### Simplified Outline

Top View  
TO-220C-3L



### 3. Marking Information

| Product Name | Marking                        |
|--------------|--------------------------------|
| LN070N200C   | LN070N200C<br>CYWWZZ<br>XXXXXX |

## 4. Limiting Values

| Symbol            | Parameter                               | Conditions  | Min | Max      | Unit               |
|-------------------|---|---|-----|----------|--------------------|
| $V_{DS}$          | Drain-Source Voltage                    | $T_C = 25\text{ }^\circ\text{C}$                        | -   | 200      | V                  |
| $V_{GS}$          | Gate-Source Voltage                     | $T_C = 25\text{ }^\circ\text{C}$                        | -   | $\pm 20$ | V                  |
| $I_D^*$           | Drain Current ( DC )                    | $T_C = 25\text{ }^\circ\text{C}, V_{GS} = 10\text{ V}$  | -   | 107      | A                  |
|                   |   | $T_C = 100\text{ }^\circ\text{C}, V_{GS} = 10\text{ V}$ | -   | 67       | A                  |
| $I_{DM}^{*,**}$   | Drain Current ( Pulsed )                | $T_C = 25\text{ }^\circ\text{C}, V_{GS} = 10\text{ V}$  | -   | 420      | A                  |
| $P_{tot}^*$       | Drain power dissipation                 | $T_C = 25\text{ }^\circ\text{C}$                        | -   | 250      | W                  |
| $T_{stg}$         | Storage Temperature                     |   | -55 | 150      | $^\circ\text{C}$   |
| $T_J$             | Junction Temperature                    |   | -   | 150      | $^\circ\text{C}$   |
| $I_S$             | Continuous-Source Current               | $T_C = 25\text{ }^\circ\text{C}$                        | -   | 107      | A                  |
| $E_{AS}^*$        | Single Pulsed Avalanche Energy          | $V_{DD} = 50\text{ V}, L = 0.1\text{mH}$                | -   | 1568     | mJ                 |
| $R_{\theta JA}^*$ | Thermal Resistance- Junction to Ambient |   | -   | 42       | $^\circ\text{C/W}$ |
| $R_{\theta JC}^*$ | Thermal Resistance- Junction to Case    |   | -   | 0.5      |                    |

Notes :

\* Surface Mounted on 1 in<sup>2</sup> pad area,  $t \leq 10\text{ sec}$

\*\* Pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$

\*\*\* limited by bonding wire

## 5. Ordering Code

| Product Name | Package | Reel Size | Tape width | Quantity | Note |
|--------------|---------|-----------|------------|----------|------|
| LN070N200C   | TO220C  |           |            | 50       |      |

Note: COMTECH defines " Green " as lead-free ( RoHS compliant ) and halogen free ( Br or Cl does not exceed 900 ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500 ppm by weight; Follow IEC 61249-2-21 and IPC / JEDEC J-STD-020C )

## 6. Electrical Characteristics ( TA=25 ° Unless Otherwise Noted )

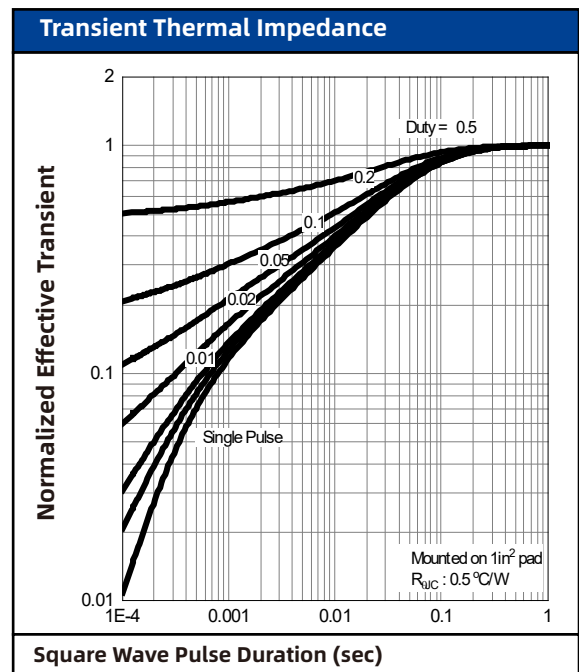
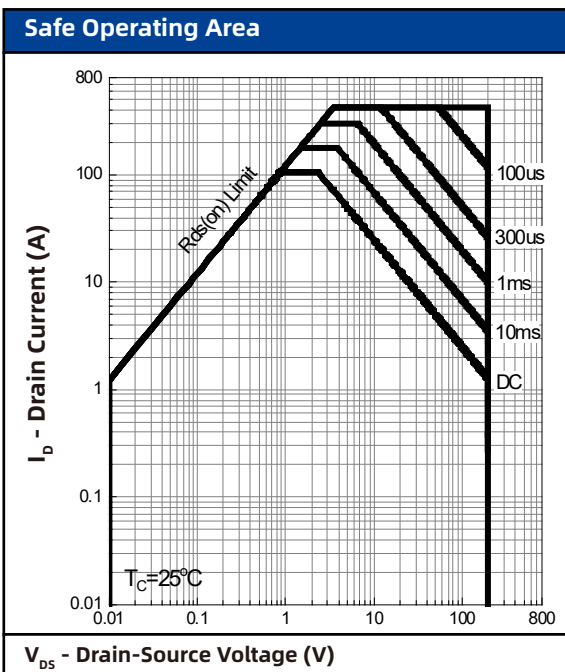
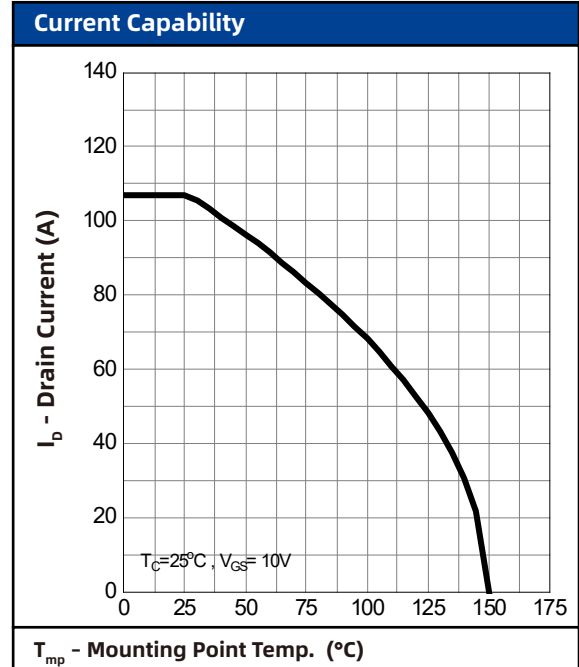
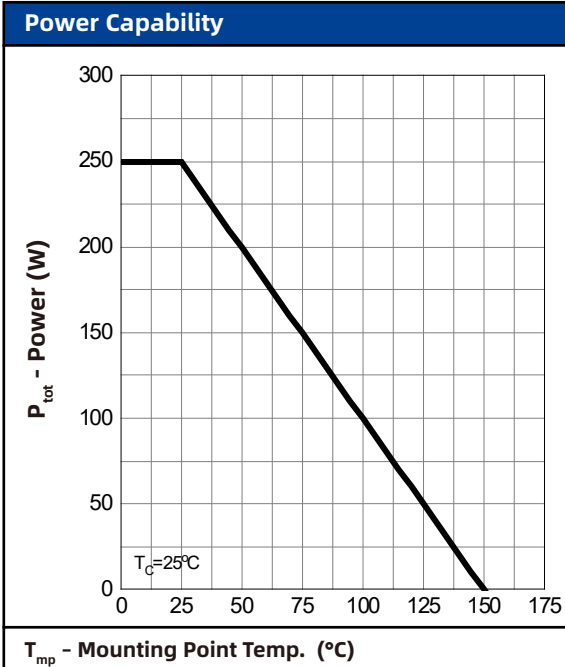
| Symbol   | Parameter                      | Conditions   | Min | Typ   | Max       | Unit          |
|--|--------------------------------|--|-----|-------|-----------|---------------|
| <b>Static Characteristics</b>                  |                                |  |     |       |           |               |
| $BV_{DSS}$                                     | Drain-Source Breakdown Voltage | $V_{GS} = 0\text{ V}, I_{DS} = 250\ \mu\text{A}$   | 200 | -     | -         | V             |
| $V_{GS(th)}$                                   | Gate Threshold Voltage         | $V_{DS} = V_{GS}, I_{DS} = 250\ \mu\text{A}$   | 2.0 | -     | 4.0       | V             |
| $I_{DSS}$                                      | Drain Leakage Current          | $V_{DS} = 160\text{ V}, V_{GS} = 0\text{ V}$   | -   | -     | 1         | $\mu\text{A}$ |
| $I_{GSS}$                                      | Gate Leakage Current           | $V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$  | -   | -     | $\pm 100$ | nA            |
| $R_{DS(on)}^a$                                 | On-State Resistance            | $V_{GS} = 10\text{ V}, I_{DS} = 30\text{ A}$   | -   | 6.9   | 7.5       | m $\Omega$    |
|  |                                | $V_{GS} = 6\text{ V}, I_{DS} = 20\text{ A}$  | -   | 7.1   | 8.0       |               |
| <b>Diode Characteristics</b>                   |                                |  |     |       |           |               |
| $V_{SD}^a$                                     | Diode Forward Voltage          | $I_{SD} = 30\text{ A}, V_{GS} = 0\text{ V}$  | -   | -     | 1.3       | V             |
| $t_{rr}$                                       | Reverse Recovery Time          | $I_{SD} = 30\text{ A}$   | -   | 140   | -         | nS            |
| $Q_{rr}$                                       | Reverse Recovery Charge        | $dI_{SD}/dt = 100\text{ A}/\mu\text{s}$  | -   | 776   | -         | nC            |
| <b>Dynamic Characteristics<sup>b</sup></b>     |                                |  |     |       |           |               |
| $C_{ISS}$                                      | Input Capacitance              | $V_{GS} = 0\text{ V}, V_{DS} = 100\text{ V}$<br>Frequency = 1 MHz  | -   | 11518 | -         | pF            |
| $C_{OSS}$                                      | Output Capacitance             |  | -   | 484   | -         |               |
| $C_{rSS}$                                      | Reverse Transfer Capacitance   |  | -   | 45    | -         |               |
| $t_d(on)$                                      | Turn-on Delay Time             | $V_{DS} = 100\text{ V}, V_{GEN} = 10\text{ V},$<br>$R_G = 3.9\ \Omega, R_L = 3.3\ \Omega,$<br>$I_{DS} = 30\text{ A}$ | -   | 19    | -         | nS            |
| $t_r$  | Turn-on Rise Time              |  | -   | 81    | -         |               |
| $t_d(off)$                                     | Turn-off Delay Time            |  | -   | 107   | -         |               |
| $t_f$  | Turn-off Fall Time             |  | -   | 102   | -         |               |
| <b>Gate Charge Characteristics<sup>b</sup></b> |                                |  |     |       |           |               |
| $Q_g$  | Total Gate Charge              | $V_{DS} = 100\text{ V}, V_{GS} = 10\text{ V},$<br>$I_{DS} = 30\text{ A}$   | -   | 176   | -         | nC            |
| $Q_{gs}$                                       | Gate-Source Charge             |  | -   | 54    | -         |               |
| $Q_{gd}$                                       | Gate-Drain Charge              |  | -   | 26    | -         |               |

Notes :

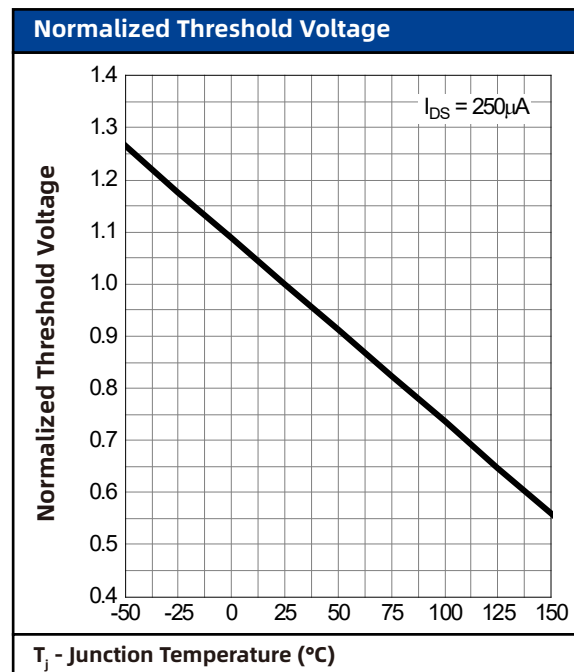
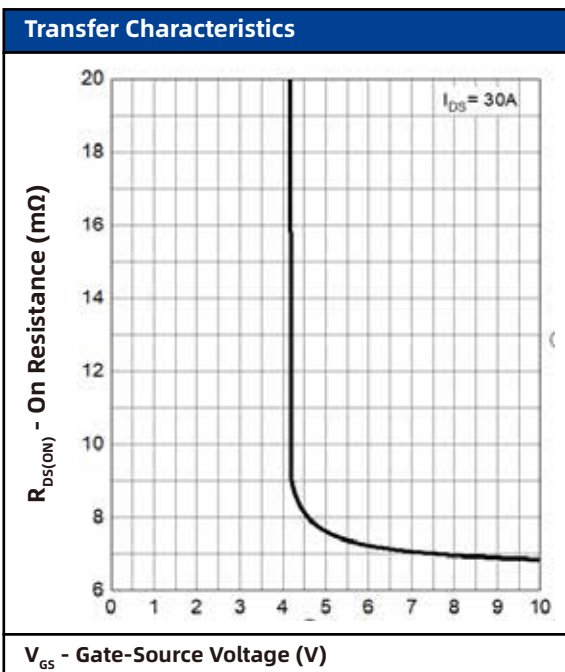
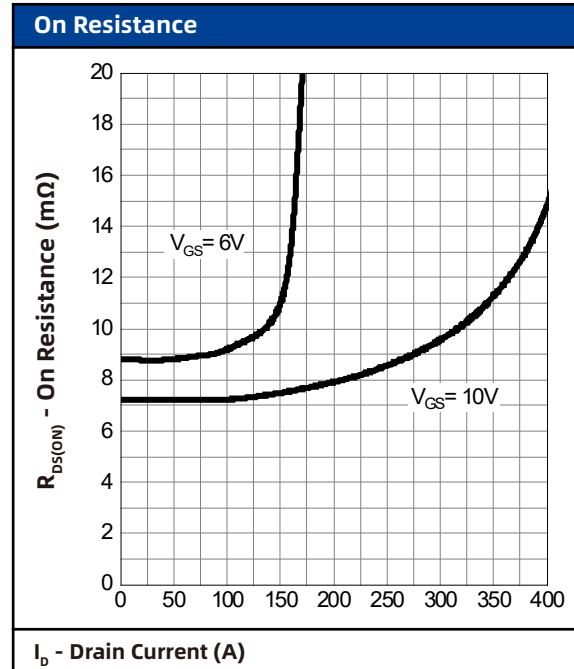
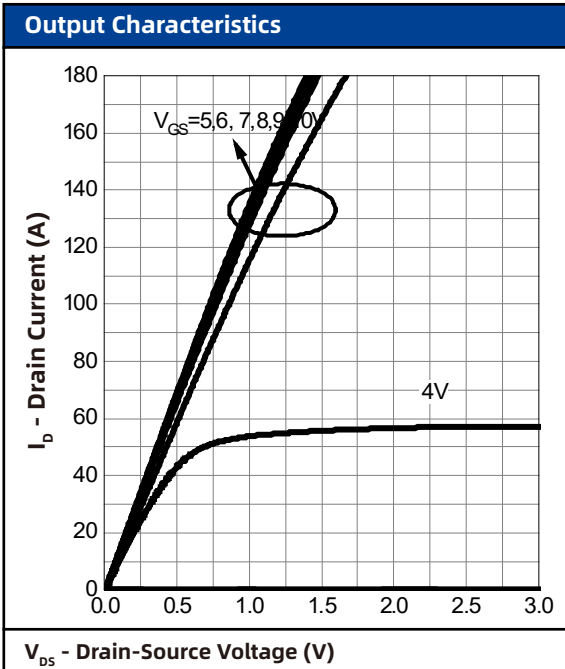
a : Pulse test ; pulse width  $\leq 300\ \mu\text{s}$ , duty cycle  $\leq 2\%$

b : Guaranteed by design, not subject to production testing

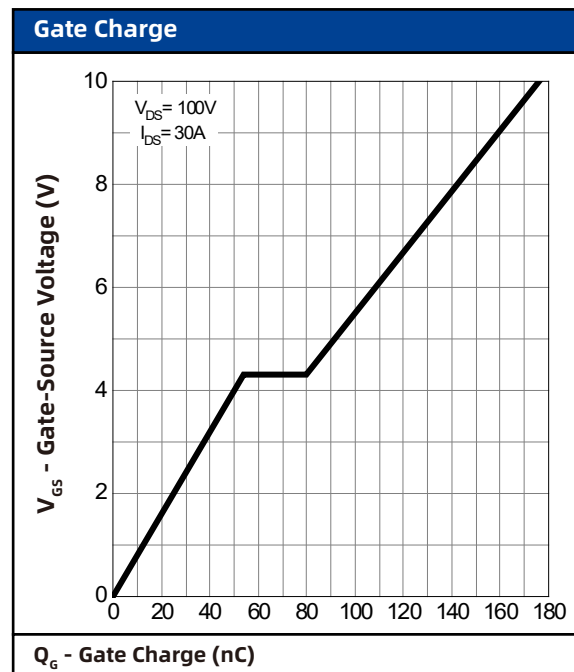
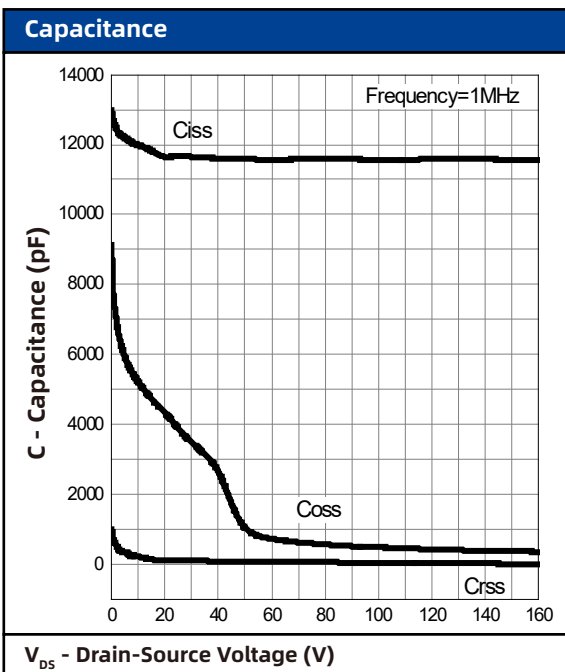
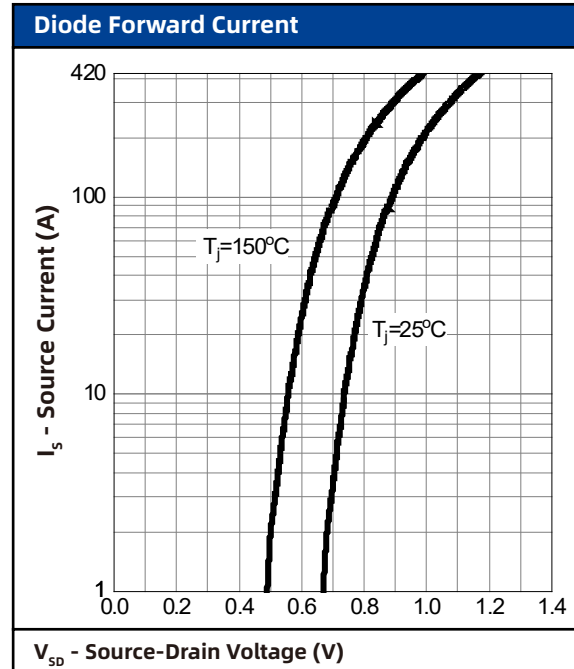
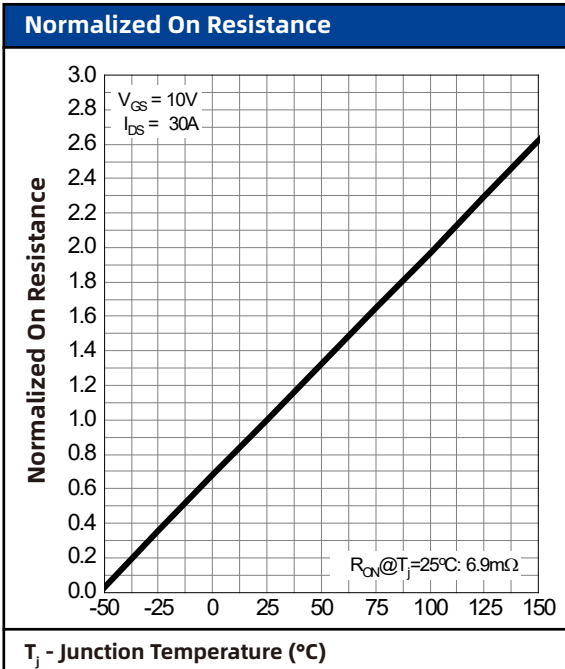
## 7. Typical Characteristics



## 7. Typical Characteristics (cont.)

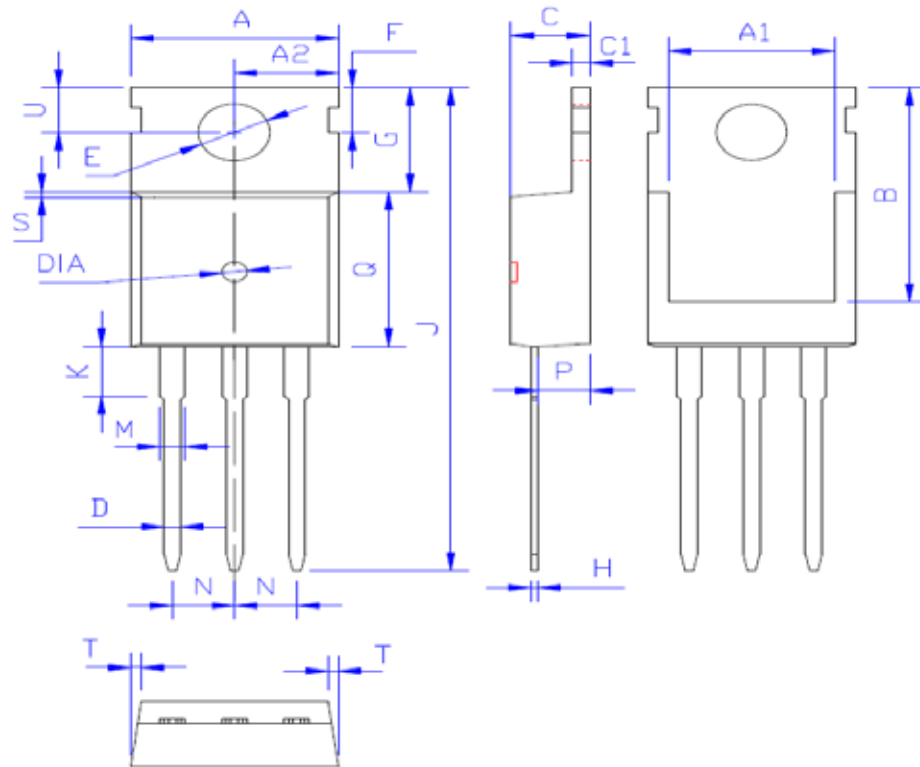


## 7. Typical Characteristics (cont.)



## 8. Package Dimensions

TO-220C-3L



| Symbol | Dimensions In Millimeters |       |
|--------|---------------------------|-------|
|        | MIN.                      | MAX.  |
| A      | 9.80                      | 10.20 |
| A1     | 7.80                      | 8.20  |
| A2     | 4.80                      | 5.20  |
| B      | 13.00                     | 13.40 |
| C      | 4.35                      | 4.65  |
| C1     | 1.15                      | 1.45  |
| D      | 0.65                      | 0.95  |
| E      | 3.45                      | 3.75  |
| F      | 2.85                      | 3.15  |
| G      | 6.40                      | 6.80  |
| H      | 0.35                      | 0.65  |
| J      | 28.68                     | 29.08 |
| K      | 2.80                      | 3.20  |
| M      | 1.15                      | 1.45  |
| N      | TYP2.54                   |       |
| P      | 2.20                      | 2.60  |
| Q      | 9.00                      | 9.40  |
| S      | 0.15                      | 0.35  |
| T      | 0.15                      | 0.35  |
| U      | 2.65                      | 2.95  |
| DIA    | 直径2.5±0.1<br>深MAX0.5      |       |