

RoHS Compliant Product  
A suffix of "-C" specifies halogen free

## FEATURES

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

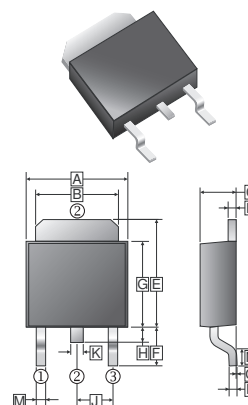
## APPLICATION

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

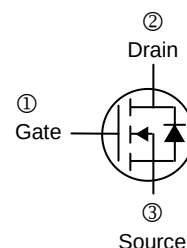
## PACKAGE INFORMATION

| Package | MPQ  | Leader Size |
|---------|------|-------------|
| TO-252  | 2.5K | 13' inch    |

### TO-252(D-Pack)



| REF. | Millimeter |      | REF. | Millimeter |      |
|------|------------|------|------|------------|------|
|      | Min.       | Max. |      | Min.       | Max. |
| A    | 6.4        | 6.8  | J    | 2.30       | REF. |
| B    | 5.20       | 5.50 | K    | 0.70       | 0.90 |
| C    | 2.20       | 2.40 | M    | 0.50       | 1.1  |
| D    | 0.45       | 0.58 | N    | 0.9        | 1.6  |
| E    | 6.8        | 7.3  | O    | 0          | 0.15 |
| F    | 2.40       | 3.0  | P    | 0.43       | 0.58 |
| G    | 5.40       | 6.2  |      |            |      |
| H    | 0.8        | 1.20 |      |            |      |



## ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise specified)

| Parameter                                                      | Symbol          | Rating    | Unit                        |
|----------------------------------------------------------------|-----------------|-----------|-----------------------------|
| Drain-Source Voltage                                           | $V_{DS}$        | 100       | V                           |
| Gate-Source Voltage                                            | $V_{GS}$        | $\pm 20$  | V                           |
| Continuous Drain Current @ $T_C=25^\circ\text{C}$ <sup>1</sup> | $I_D$           | 26        | A                           |
| Pulsed Drain Current <sup>2</sup>                              | $I_{DM}$        | 50        | A                           |
| Continuous Source Current (Diode Conduction) <sup>1</sup>      | $I_S$           | 50        | A                           |
| Total Power Dissipation @ $T_C=25^\circ\text{C}$ <sup>1</sup>  | $P_D$           | 50        | W                           |
| Operating Junction and Storage Temperature Range               | $T_J, T_{STG}$  | -55 ~ 175 | $^\circ\text{C}$            |
| <b>Thermal Resistance Rating</b>                               |                 |           |                             |
| Maximum Thermal Resistance Junction-Ambient <sup>1</sup>       | $R_{\theta JA}$ | 50        | $^\circ\text{C} / \text{W}$ |
| Maximum Thermal Resistance Junction-Case                       | $R_{\theta JC}$ | 3.0       | $^\circ\text{C} / \text{W}$ |

Notes :

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

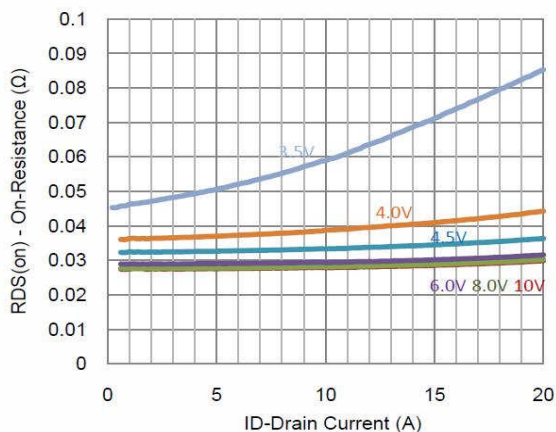
**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise specified)

| Parameter                               | Symbol       | Min. | Typ. | Max.      | Unit          | Test Conditions                                                                                       |
|-----------------------------------------|--------------|------|------|-----------|---------------|-------------------------------------------------------------------------------------------------------|
| <b>Static</b>                           |              |      |      |           |               |                                                                                                       |
| Gate-Threshold Voltage                  | $V_{GS(th)}$ | 1.0  | -    | 3.5       | V             | $V_{DS}=V_{GS}$ , $I_D = 250\mu\text{A}$                                                              |
| Gate-Body Leakage                       | $I_{GSS}$    | -    | -    | $\pm 100$ | nA            | $V_{DS}=0$ , $V_{GS}=20\text{V}$                                                                      |
| Zero Gate Voltage Drain Current         | $I_{DSS}$    | -    | -    | 1         | $\mu\text{A}$ | $V_{DS}=80\text{V}$ , $V_{GS}=0$                                                                      |
|                                         |              | -    | -    | 25        |               | $V_{DS}=80\text{V}$ , $V_{GS}=0$ , $T_J=55^\circ\text{C}$                                             |
| On-State Drain Current <sup>1</sup>     | $I_{D(on)}$  | 34   | -    | -         | A             | $V_{DS}=5\text{V}$ , $V_{GS}=10\text{V}$                                                              |
| Drain-Source On-Resistance <sup>1</sup> | $R_{DS(ON)}$ | -    | -    | 36        | m $\Omega$    | $V_{GS}=10\text{V}$ , $I_D=10\text{A}$                                                                |
|                                         |              | -    | -    | 42        |               | $V_{GS}=4.5\text{V}$ , $I_D=9.2\text{A}$                                                              |
| Forward Transconductance <sup>1</sup>   | $g_{fs}$     | -    | 10   | -         | S             | $V_{DS}=15\text{V}$ , $I_D=10\text{A}$                                                                |
| Diode Forward Voltage                   | $V_{SD}$     | -    | 0.89 | -         | V             | $I_S=25\text{A}$ , $V_{GS}=0$                                                                         |
| <b>Dynamic <sup>2</sup></b>             |              |      |      |           |               |                                                                                                       |
| Total Gate Charge                       | $Q_g$        | -    | 14.8 | -         | nC            | $V_{DS}=50\text{V}$<br>$V_{GS}=4.5\text{V}$<br>$I_D=10\text{A}$                                       |
| Gate-Source Charge                      | $Q_{gs}$     | -    | 4.3  | -         |               |                                                                                                       |
| Gate-Drain Charge                       | $Q_{gd}$     | -    | 8.6  | -         |               |                                                                                                       |
| Turn-on Delay Time                      | $T_{d(on)}$  | -    | 4.8  | -         | nS            | $V_{DD}=50\text{V}$<br>$R_L=5\Omega$<br>$I_D=10\text{A}$<br>$V_{GEN}=10\text{V}$<br>$R_{GEN}=6\Omega$ |
| Rise Time                               | $T_r$        | -    | 14.2 | -         |               |                                                                                                       |
| Turn-off Delay Time                     | $T_{d(off)}$ | -    | 39.2 | -         |               |                                                                                                       |
| Fall Time                               | $T_f$        | -    | 25.6 | -         |               |                                                                                                       |
| Input Capacitance                       | $C_{iss}$    |      | 1216 |           | pF            | $V_{DS}=15\text{V}$<br>$V_{GS}=0$<br>$f=1\text{MHz}$                                                  |
| Output Capacitance                      | $C_{oss}$    |      | 154  |           |               |                                                                                                       |
| Reverse Transfer Capacitance            | $C_{rss}$    | -    | 131  | -         |               |                                                                                                       |

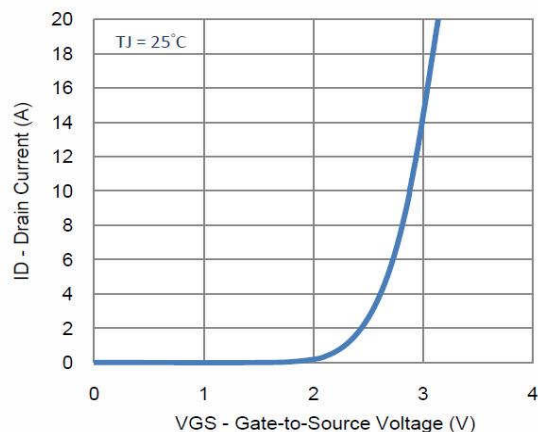
Notes:

1. Pulse test :  $PW \leq 300\mu\text{s}$  duty cycle  $\leq 2\%$ .
2. Guaranteed by design, not subject to production testing.

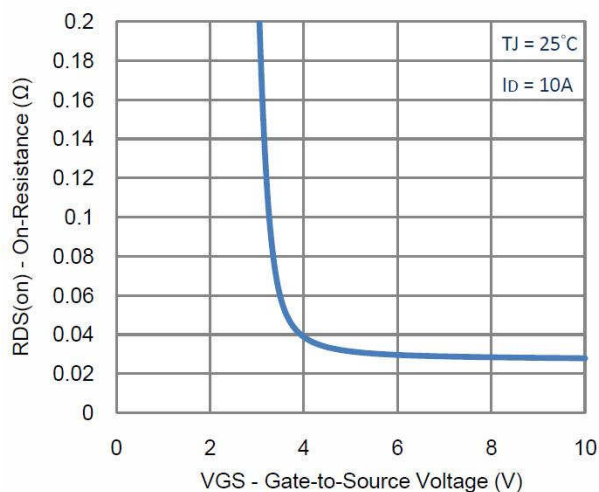
## CHARACTERISTIC CURVES



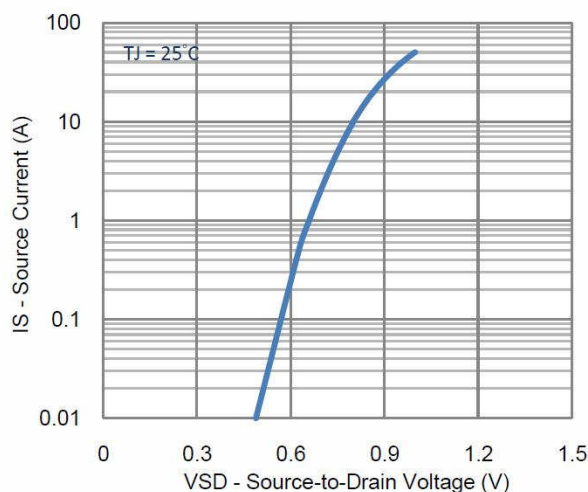
1. On-Resistance vs. Drain Current



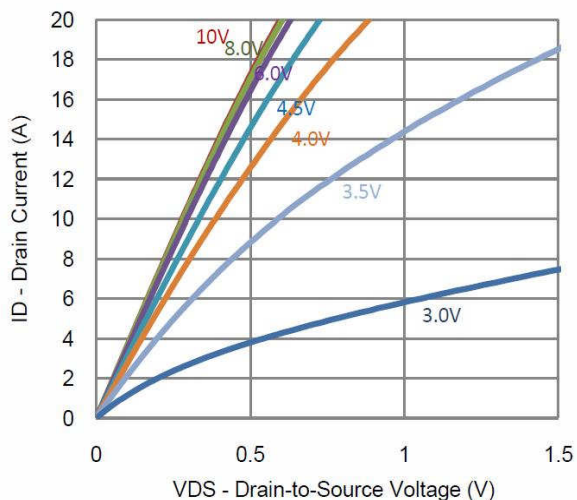
2. Transfer Characteristics



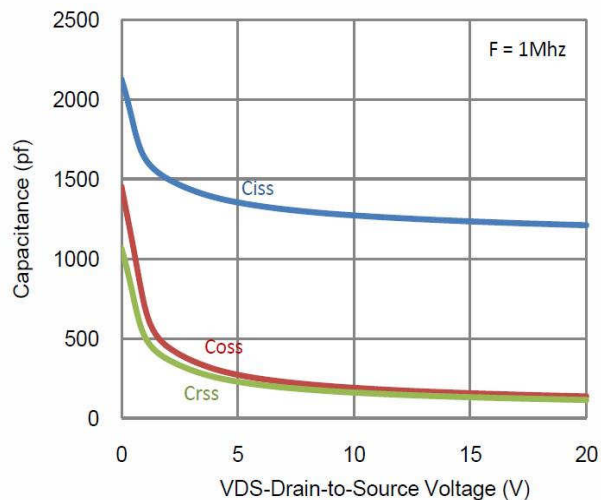
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage



5. Output Characteristics



6. Capacitance

http://

individually.

## CHARACTERISTIC CURVES

