

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

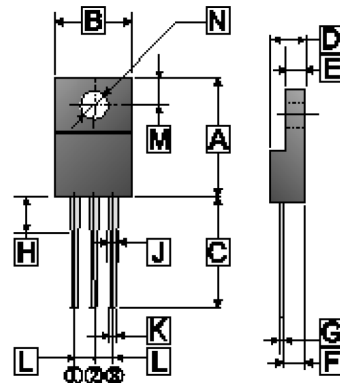
DESCRIPTION

This advanced high voltage MOSFET is designed to withstand high energy in the avalanche mode and switch efficiently. This new high energy device also offers a drain-to-source diode with fast recovery time. Designed for high voltage, high speed switching applications such as power supplies, converters, power motor controls and bridge circuits

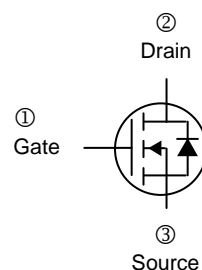
FEATURES

- High current rating
- Lower $R_{DS(ON)}$
- Lower capacitance
- Lower total gate charge
- Tighter VSD specifications
- Specified avalanche energy

ITO-220J



| REF. | Millimeter | | REF. | Millimeter | |
|------|------------|-------|------|------------|------|
| | Min. | Max. | | Min. | Max. |
| A | 14.80 | 15.20 | H | 3.60 | 4.00 |
| B | 9.96 | 10.36 | J | 1.30 | REF. |
| C | 13.20 | REF. | K | 0.50 | 0.75 |
| D | 4.30 | 4.70 | L | 2.54 | REF. |
| E | 2.80 | 3.20 | M | 2.70 | REF. |
| F | 2.50 | 2.90 | N | ∅3.5 | REF. |
| G | 0.50 | 0.75 | | | |



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

| Parameter | Symbol | Rating | Unit |
|---|-----------------|----------|--------------------|
| Drain-Source Voltage | V_{DS} | 600 | V |
| Gate-Source Voltage | V_{GS} | ± 30 | V |
| Continuous Drain Current | I_D | 4 | A |
| Continuous Drain-Source Diode Forward Current | I_S | 4 | A |
| Single Pulsed Avalanche Energy ¹ | E_{AS} | 260 | mJ |
| Maximum Lead Temperature for Soldering Purposes@ 1/8" from case for 5 seconds | T_L | 260 | $^\circ\text{C}$ |
| Operating Junction and Storage Temperature Range | T_J, T_{STG} | -55~150 | $^\circ\text{C}$ |
| Thermal Resistance Rating | | | |
| Thermal Resistance from Junction to Ambient | $R_{\theta JA}$ | 62.5 | $^\circ\text{C/W}$ |

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

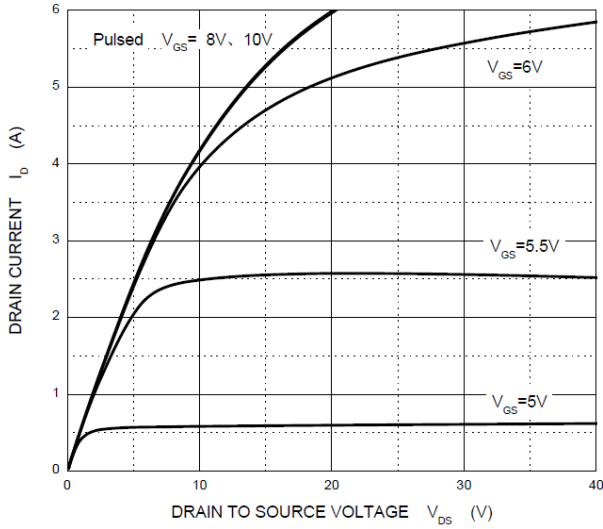
| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Condition |
|--|--------------|------|------|------|---------------|---|
| Off Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | B_{VDSS} | 600 | - | - | V | $V_{GS}=0, I_D=250\mu\text{A}$ |
| Diode Forward Voltage ² | V_{SD} | - | - | 1.5 | V | $V_{GS}=0, I_S=4\text{A}$ |
| Drain-Source Leakage Current | I_{DSS} | - | - | 25 | μA | $V_{DS}=600\text{V}, V_{GS}=0$ |
| Gate-Source Forward | I_{GSSF} | - | - | 100 | nA | $V_{DS}=0\text{V}, V_{GS}=30\text{V}$ |
| Gate-Source Reverse | I_{GSSR} | - | - | -100 | nA | $V_{DS}=0\text{V}, V_{GS}=-30\text{V}$ |
| On Characteristics ² | | | | | | |
| Gate-Threshold Voltage | $V_{GS(th)}$ | 2 | - | 4 | V | $V_{DS}=V_{GS}, I_D=250\mu\text{A}$ |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | - | 2 | 3 | Ω | $V_{GS}=10\text{V}, I_D=2\text{A}$ |
| Forward Transconductance | g_{FS} | 2 | 2.6 | - | S | $V_{DS}=50\text{V}, I_D=2\text{A}$ |
| Dynamic Characteristics | | | | | | |
| Input Capacitance | C_{iss} | - | 540 | - | pF | $V_{DS}=25\text{V}$ $V_{GS}=0$ $f=1\text{MHz}$ |
| Output Capacitance | C_{oss} | - | 125 | - | | |
| Reverse Transfer Capacitance | C_{rss} | - | 8 | - | | |
| Switching Characteristics | | | | | | |
| Total Gate Charge | Q_g | - | 5 | - | nC | $V_{DS}=480\text{V}$ $V_{GS}=10\text{V}$ $I_D=4\text{A}$ |
| Gate-Source Charge | Q_{gs} | - | 2.7 | - | | |
| Gate-Drain Charge | Q_{gd} | - | 2 | - | | |
| Turn-on Delay Time | $T_{d(on)}$ | - | 12 | - | nS | $V_{DD}=300\text{V}$ $V_{GS}=10\text{V}$ $R_G=9.1\Omega$ $I_D=4\text{A}$ |
| Rise Time | T_r | - | 7 | - | | |
| Turn-off Delay Time | $T_{d(off)}$ | - | 19 | - | | |
| Fall Time | T_f | - | 10 | - | | |

Notes:

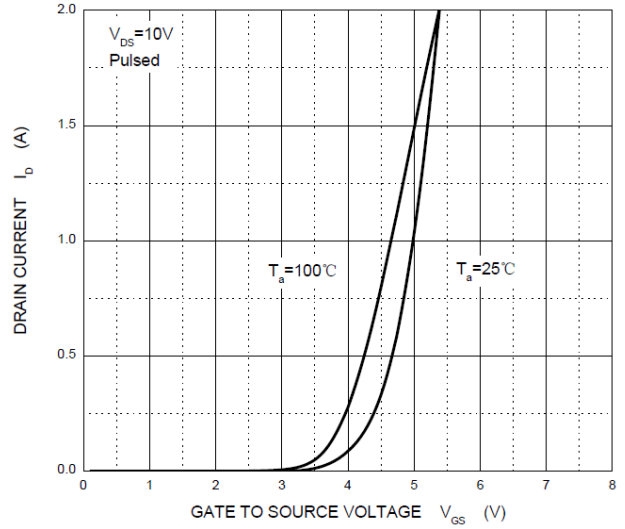
1. E_{AS} condition : $L=30\text{mH}, I_L=4\text{A}, V_{DD}=100\text{V}, V_{GS}=10\text{V}, R_G=25\Omega$, Starting $T_J=25^\circ\text{C}$.
2. Pulse Test : Pulse width $\leq 300\mu\text{S}$, duty cycle $\leq 2\%$.

CHARACTERISTIC CURVES

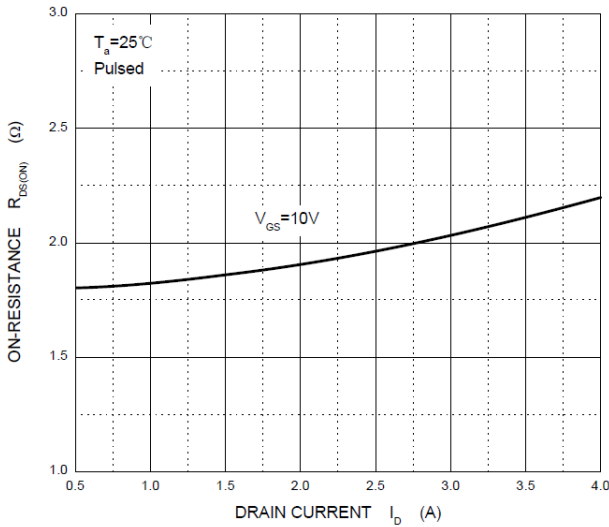
Output Characteristics



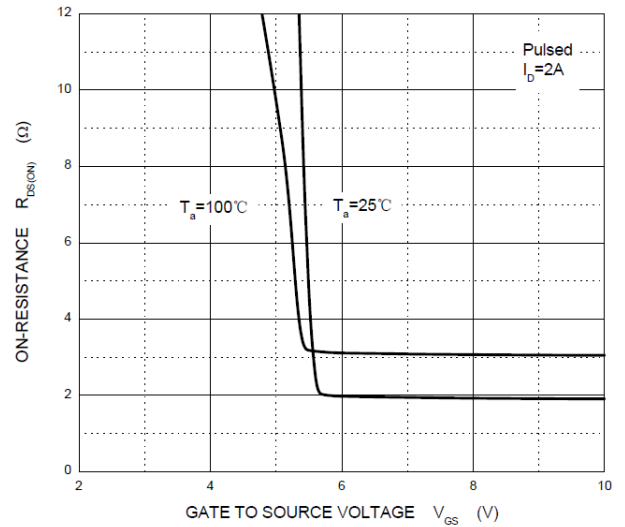
Transfer Characteristics



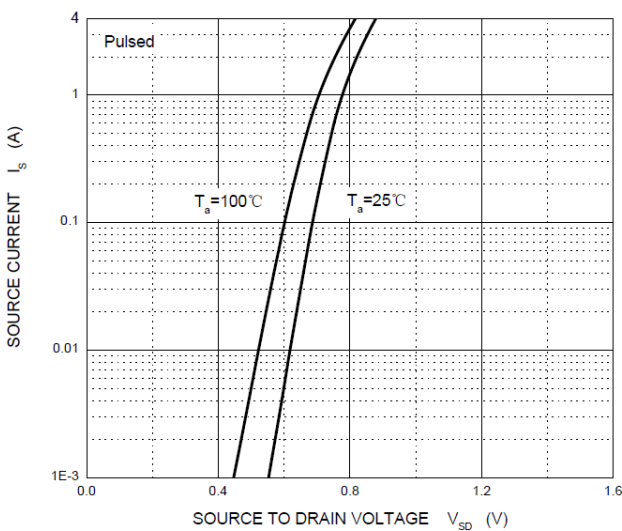
$R_{DS(ON)}$ — I_D



$R_{DS(ON)}$ — V_{GS}



I_S — V_{SD}



Threshold Voltage

