

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

DESCRIPTION

This advanced high voltage MOSFET is designed to stand 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.

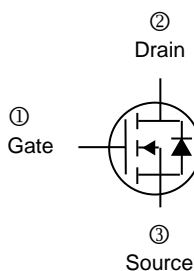
It is designed for high voltage, high speed switching applications such as power supplies, converters, power motor control and bridge circuits.

FEATURES

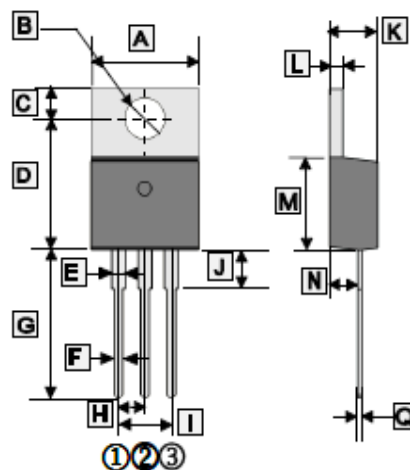
- High Current Rating
- Low Gate Charge
- Lower $R_{DS(ON)}$
- Low Reverse Transfer Capacitance
- Fast Switching Capability
- Tighter VSD Specifications
- Specified Avalanche Energy

ORDER INFORMATION

| Part Number | Type |
|-------------|---------------------------------|
| SSQ10N65J | Lead (Pb)-free |
| SSQ10N65J-C | Lead (Pb)-free and Halogen-free |



TO-220J



| REF. | Millimeter | | REF. | Millimeter | |
|------|------------|-------|------|------------|-------|
| | Min. | Max. | | Min. | Max. |
| A | 9.57 | 10.57 | I | 4.68 | 5.48 |
| B | 3.54 | 4.14 | J | 2.95 | 3.96 |
| C | 2.54 | 2.94 | K | 4.27 | 4.87 |
| D | 11.86 | 12.46 | L | 1.07 | 1.47 |
| E | 0.97 | 1.57 | M | 8.00 | 10.00 |
| F | 0.51 | 1.11 | N | 2.03 | 2.92 |
| G | 13.40 | 13.80 | Q | 0.30 | 0.65 |
| H | 2.540 TYP. | | | | |

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

| Parameter | Symbol | Rating | Unit |
|---|-----------------|--------------|------|
| Drain-Source Voltage | V_{DS} | 650 | V |
| Gate-Source Voltage | V_{GS} | ± 30 | V |
| Continuous Drain Current | I_D | 10 | A |
| Pulsed Drain Current ¹ | I_{DM} | 38 | A |
| Single Pulse Avalanche Energy ² | E_{AS} | 500 | mJ |
| Maximum Lead Temperature for Soldering Purposes @ 1/8" from case for 5 seconds | T_L | 260 | °C |
| Operating Junction & Storage Temperature Range | T_J, T_{STG} | 150, -55~150 | |
| Thermal Resistance Rating | | | |
| Thermal Resistance from Junction-Ambient | $R_{\theta JA}$ | 62.5 | °C/W |

ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise noted)

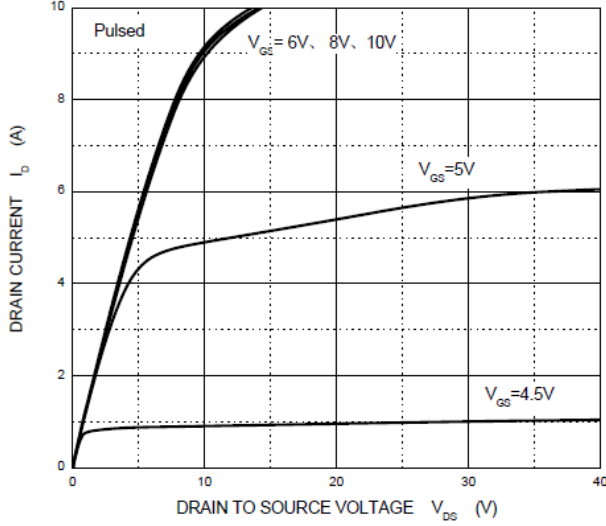
| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test conditions |
|--|---------------------|------|------|------|------|--|
| Drain-Source Breakdown Voltage | BV _{DSS} | 650 | - | - | V | V _{GS} =0V, I _D =250μA |
| Gate Threshold Voltage ³ | V _{GS(th)} | 2 | - | 4 | V | V _{DS} =V _{GS} , I _D =250μA |
| Gate-Source Leakage Current ³ | I _{GSS} | - | - | ±100 | nA | V _{DS} =0V, V _{GS} =±30V |
| Drain-Source Leakage Current | I _{DSS} | - | - | 1 | μA | V _{DS} =600V, V _{GS} =0 |
| Static Drain-Source On-Resistance ³ | R _{DS(ON)} | - | 0.7 | 1 | Ω | V _{GS} =10V, I _D =5A |
| Total Gate Charge | Q _g | - | 44 | - | nC | I _D =10A V _{DS} =520V V _{GS} =10V |
| Gate-Source Charge | Q _{gs} | - | 6.7 | - | | |
| Gate-Drain ("Miller") Charge | Q _{gd} | - | 18.5 | - | | |
| Turn-on Delay Time | T _{d(on)} | - | 46 | - | nS | V _{DD} =325V I _D =10A R _G =25Ω |
| Rise Time | T _r | - | 74 | - | | |
| Turn-off Delay Time | T _{d(off)} | - | 340 | - | | |
| Fall Time | T _f | - | 66 | - | | |
| Input Capacitance | C _{iss} | - | 1430 | - | pF | V _{GS} =0V V _{DS} =25V f=1MHz |
| Output Capacitance | C _{oss} | - | 117 | - | | |
| Reverse Transfer Capacitance | C _{rss} | - | 2.2 | - | | |
| Source-Drain Diode | | | | | | |
| Diode Forward Voltage ³ | V _{SD} | - | - | 1.4 | V | I _S =10A, V _{GS} =0V |
| Continuous Source Current | I _S | - | - | 10 | A | |
| Pulsed Source Current | I _{SM} | - | - | 38 | | |

Notes:

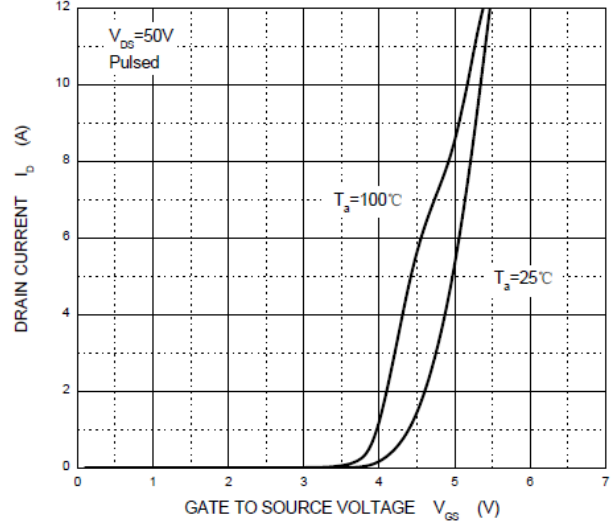
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. E_{AS} condition: L=10mH, I_{AS}=10A, V_{DD}=50V, R_G=25Ω, starting T_J=25°C.
3. Pulse Test: Pulse width ≤ 300μs, duty cycle ≤ 2%.

CHARACTERISTICS CURVE

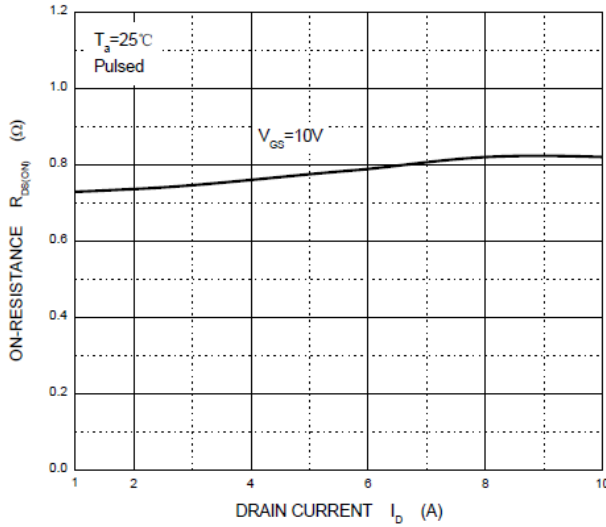
Output Characteristics



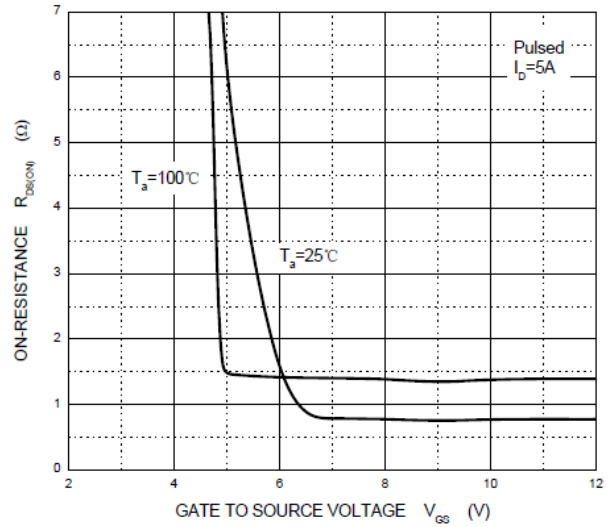
Transfer Characteristics



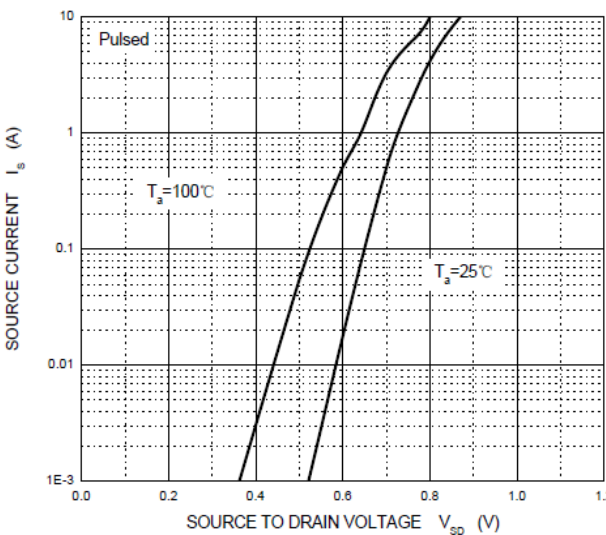
$R_{DS(ON)}$ — I_D



$R_{DS(ON)}$ — V_{GS}



I_S — V_{SD}



Threshold Voltage

