# MLSM MICROELECTRONICS

# BSC0904NSI

## 30V/78A N-Channel MOSFET

### Features

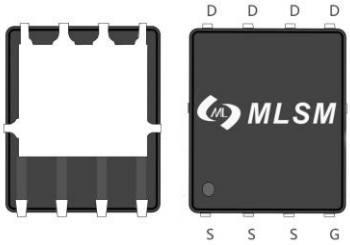
- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high $E_{AS}$
- Excellent package for good heat dissipation

### Application

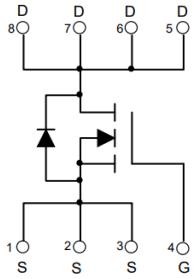
- Load switching
- Hard switched and high frequency circuits
- Uninterruptible power supply

### Product Summary

| $V_{DS}$ | $R_{DS(ON)}$ TYP | $I_D$ |
|---|---|---|
| 30V | 3.1mΩ@10V | 78A |
| | 4.2mΩ@4.5V | |




PDFN5X6-8L view




Schematic diagram

Pb-Free RoHS Halogen-Free

| Absolute Maximum Ratings (TA=25℃unless otherwise noted) | | | | |
|---|---|---|---|---|
| **Symbol** | **Parameter** | | **Rating** | **Unit** |
| **Common Ratings (TC=25°C Unless Otherwise Noted)** | | | | |
| $V_{DS}$ | Drain-Source Breakdown Voltage | | 30 | V |
| $V_{GS}$ | Gate-Source Voltage | | ±20 | V |
| $T_J$ | Maximum Junction Temperature | | 150 | °C |
| $T_{STG}$ | Storage Temperature Range | | -55 to 150 | °C |
| $I_S$ | Diode Continuous Forward Current | Tc=25°C | 37 | A |
| **Mounted on Large Heat Sink** | | | | |
| $I_{DM}$ | Pulse Drain Current Tested | Tc=25°C | 312 | A |
| $I_D$ | Continuous Drain Current | Tc=25°C | 78 | A |
| $P_D$ | Maximum Power Dissipation | Tc=25°C | 37 | W |
| $E_{AS}$ | Single pulse avalanche energy | | 14 | mJ |

| Ordering Information (Example) | | | | | |
|---|---|---|---|---|---|
| **Type** | **Package** | **Minimum Package(pcs)** | **Inner Box Quantity(pcs)** | **Outer Carton Quantity(pcs)** | **Delivery Mode** |
| BSC0904NSI | PDFN5X6-8L | 5,000 | 10,000 | 70,000 | 13"reel |

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| Electrical Characteristics (TJ=25℃ unless otherwise noted) | | | | | | |
|---|---|---|---|---|---|---|
| **Symbol** | **Parameter** | **Condition** | **Min** | **Typ** | **Max** | **Unit** |
| **Static Electrical Characteristics @ TJ = 25°C (unless otherwise stated)** | | | | | | |
| $BV_{(BR)DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V，$I_D$=10mA | 30 | -- | -- | V |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{DS}$=24V，$V_{GS}$=0V | -- | -- | 0.5 | μA |
| $I_{GSS}$ | Gate-Body Leakage Current | $V_{GS}$=±20V，$V_{DS}$=0V | -- | -- | ±100 | nA |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$=$V_{GS}$，$I_D$=250μA | 1.2 | -- | 2 | V |
| $R_{DS(on)}$ | Drain-Source On-State Resistance | $V_{GS}$=10V，$I_D$=30A | -- | 3.1 | 3.7 | mΩ |
| | | $V_{GS}$=4.5V，$I_D$=30A | -- | 4.2 | 5.2 | mΩ |
| **Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)** | | | | | | |
| $C_{ISS}$ | Input Capacitance | $V_{DS}$=15V，$V_{GS}$=0V， f=1MHz | -- | 1100 | -- | pF |
| $C_{OSS}$ | Output Capacitance | | -- | 460 | -- | pF |
| $C_{RSS}$ | Reverse Transfer Capacitance | | -- | 64 | -- | pF |
| **Switching Characteristics** | | | | | | |
| $Q_g$ | Total Gate Charge | $V_{DD}$=15V，$I_D$=30A，$V_{GS}$=4.5V | -- | 8.5 | -- | nC |
| $Q_{gs}$ | Gate Source Charge | | -- | 2.9 | -- | nC |
| $Q_{gd}$ | Gate Drain Charge | | -- | 2.9 | -- | nC |
| $t_{d(on)}$ | Turn-on Delay Time | $V_{DD}$=15V，$I_D$=30A，$V_{GS}$=10V，$R_G$=1.6Ω | -- | 3.3 | -- | nS |
| $t_r$ | Turn-on Rise Time | | -- | 4.4 | -- | nS |
| $t_{d(off)}$ | Turn-Off Delay Time | | -- | 16 | -- | nS |
| $t_f$ | Turn-Off Fall Time | | -- | 3 | -- | nS |
| **Source- Drain Diode Characteristics** | | | | | | |
| $V_{SD}$ | Forward on voltage | Tj=25°C，Is=3A | -- | 0.56 | 0.7 | V |

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## Typical Operating Characteristics

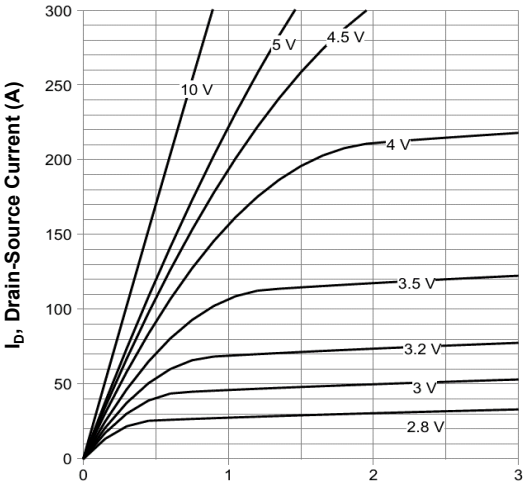



Fig1. Typical Output Characteristics

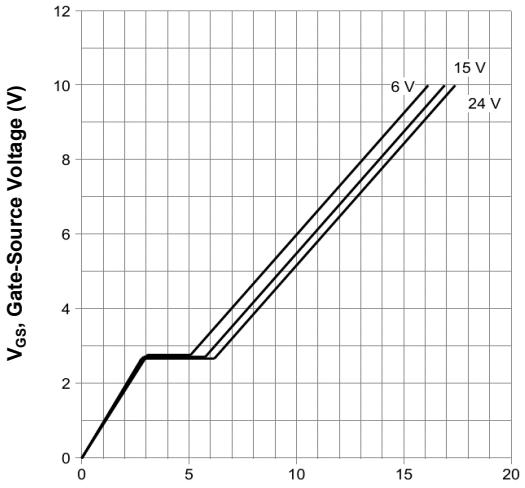



Fig2. Typical Gate Charge Vs.Gate-Source Voltage

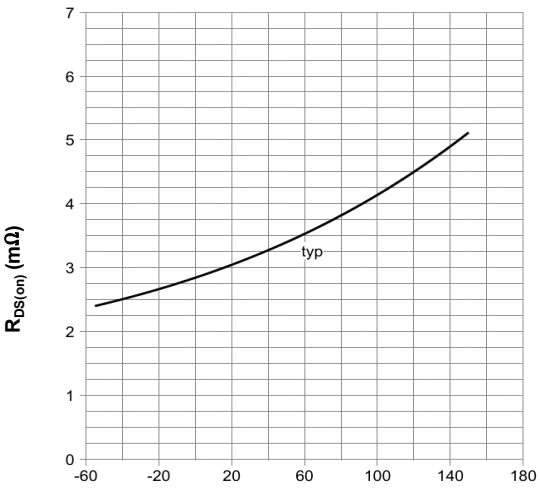



Fig3.Drain-sourceon-stateresistance

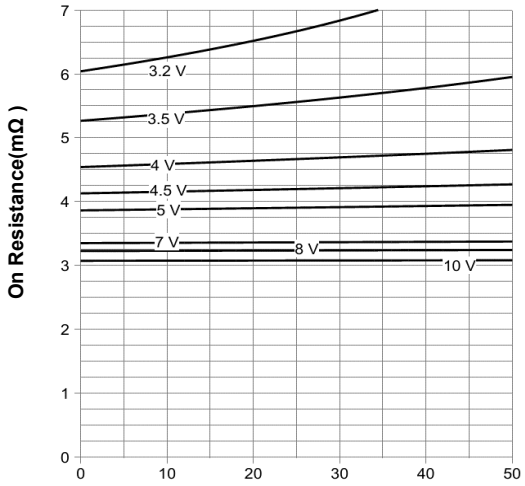



Fig4. On-Resistance Vs. Drain-Source Current

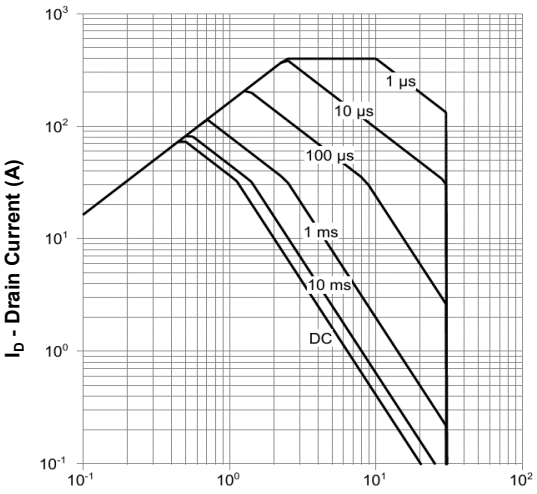



Fig5. Maximum Safe Operating Area

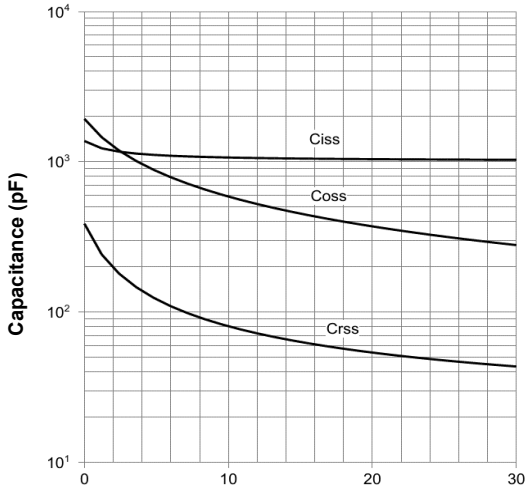
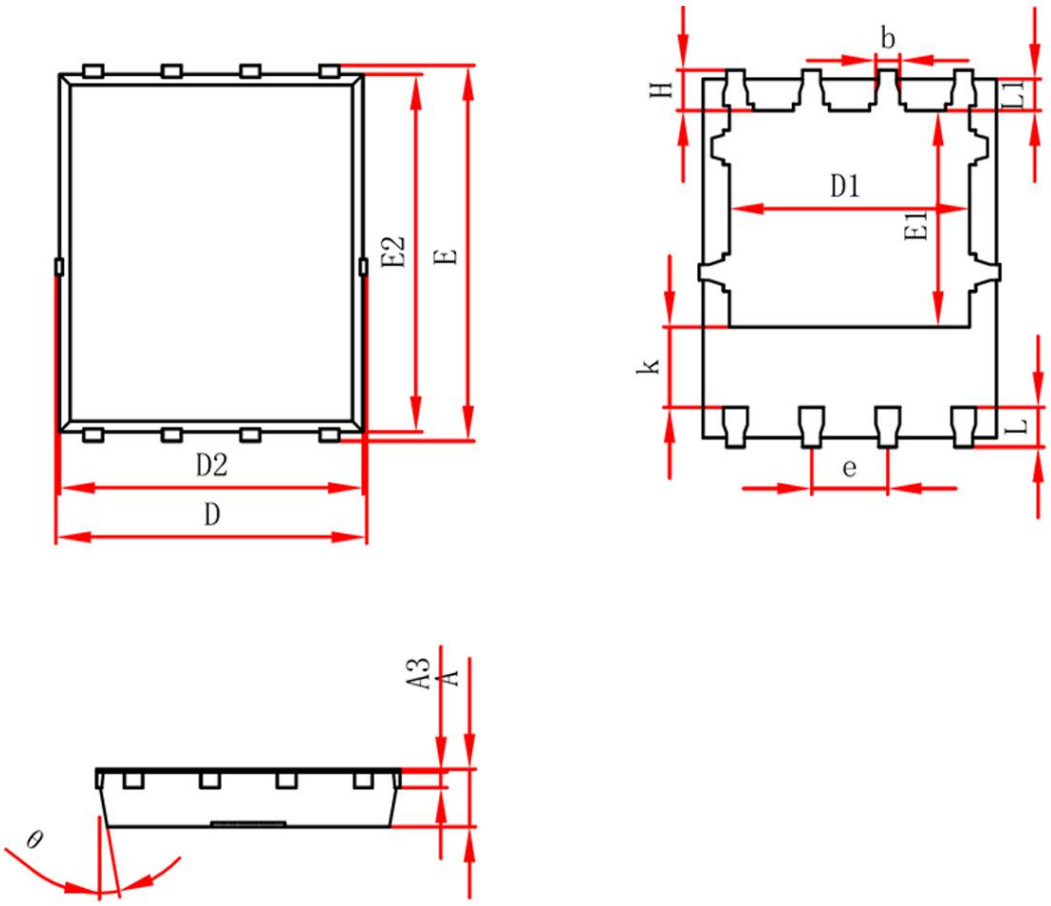



Fig6 Typical Capacitance Vs.Drain-Source Voltage

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## PDFN5X6-8L Package information




| Symbol | Dimensions in Millimeters(mm) | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 0.950 | 1.050 | 0.035 | 0.039 |
| A3 | 0.254REF. | | 0.010REF. | |
| D | 4.950 | 5.050 | 0.196 | 0.200 |
| E | 5.950 | 6.050 | 0.235 | 0.239 |
| D1 | 4.026 | 4.126 | 0.159 | 0.163 |
| E1 | 3.510 | 3.610 | 0.139 | 0.143 |
| D2 | 4.850 | 4.950 | 0.192 | 0.196 |
| E2 | 5.700 | 5.800 | 0.225 | 0.229 |
| k | 1.190 | 1.390 | 0.047 | 0.055 |
| b | 0.300 | 0.400 | 0.012 | 0.016 |
| e | 1.270TYP. | | 0.050TYP. | |
| L | 0.559 | 0.711 | 0.022 | 0.028 |
| L1 | 0.424 | 0.576 | 0.017 | 0.023 |
| H | 0.574 | 0.726 | 0.023 | 0.029 |
| θ | 10° | 12° | 10° | 12° |

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