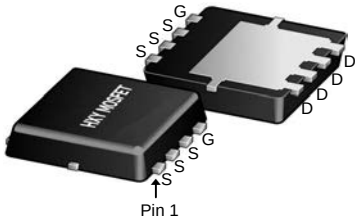
## General Description

The BSC098N10NS5 use advanced SGT MOSFET technology to provide low RDS(ON), low gate charge, fast switching and excellent avalanche characteristics.

This device is specially designed to get better ruggedness and suitable to use in

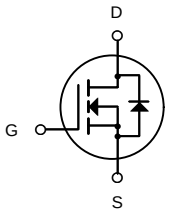



DFN5X6-8L

### General Features

$V_{DS}$ =100V $I_D$ =75A

$R_{DS(ON)}$ < 7.5mΩ@ $V_{GS}$=10V




N-Channel MOSFET

## Applications

Consumer electronic power supply Motor control

Synchronous-rectification Isolated DC

Synchronous-rectification applications

## Package Marking and Ordering Information

| Product ID | Pack | Marking | Qty(PCS) |
|---|---|---|---|
| BSC098N10NS5 | DFN5X6-8L | 75N10 XXX YYYYY | 5000 |

## Absolute Maximum Ratings at $T_j$=25℃ unless otherwise noted

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Drain source voltage | VDS | 100 | V |
| Gate source voltage | VGS | ±20 | V |
| Continuous drain current[1)] | ID | 75 | A |
| Pulsed drain current[2)] | ID, pulse | 300 | A |
| Power dissipation[3)] | $P_D$ | 97 | W |
| Single pulsed avalanche energy[5)] | EAS | 90 | mJ |
| Operation and storage temperature | Tstg，Tj | -55 to 150 | ℃ |
| Thermal resistance, junction-case | RθJC | 1.3 | °C/W |

## Electrical Characteristics ($T_J$=25℃ unless otherwise specified)

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| **Off Characteristic** | | | | | | |
| $V_{(BR)DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V, $I_D$=250μA | 100 | - | - | V |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{DS}$=100V, $V_{GS}$=0V, | - | - | 1.0 | μA |
| $I_{GSS}$ | Gate to Body Leakage Current | $V_{DS}$=0V, $V_{GS}$= ±20V | - | - | ±100 | nA |
| **On Characteristics** | | | | | | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$=$V_{GS}$, $I_D$=250μA | 1.0 | 1.6 | 2.5 | V |
| $R_{DS(on)}$ | Static Drain-Source on-Resistance note3 | $V_{GS}$=10V, $I_D$=20A | - | 6.4 | 7.5 | mΩ |
| | | $V_{GS}$=4.5V, $I_D$=8A | - | 9.2 | 11.4 | mΩ |
| **Dynamic Characteristics** | | | | | | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$=50V, $V_{GS}$=0V, f=1.0MHz | - | 2944 | - | pF |
| $C_{oss}$ | Output Capacitance | | - | 736 | - | pF |
| $C_{rss}$ | Reverse Transfer Capacitance | | - | 2.04 | - | pF |
| $Q_g$ | Total Gate Charge | $V_{DS}$=50V, $I_D$=30A, $V_{GS}$=10V | - | 39.4 | - | nc |
| $Q_{gs}$ | Gate-Source Charge | | - | 5.6 | - | nc |
| $Q_{gd}$ | Gate-Drain(“Miller”) Charge | | - | 7.6 | - | nc |
| **Switching Characteristics** | | | | | | |
| $t_{d(on)}$ | Turn-on Delay Time | $V_{DD}$=50V, $I_D$=25A, $R_G$=6Ω, $V_{GS}$=10V | - | 13 | - | nc |
| $t_r$ | Turn-on Rise Time | | - | 27.5 | - | nc |
| $t_{d(off)}$ | Turn-off Delay Time | | - | 45.5 | - | nc |
| $t_f$ | Turn-off Fall Time | | - | 41.5 | - | nc |
| **Drain-Source Diode Characteristics and Maximum Ratings** | | | | | | |
| $I_S$ | Maximum Continuous Drain to Source Diode Forward Current | | - | - | 75 | A |
| $I_{SM}$ | Maximum Pulsed Drain to Source Diode Forward Current | | - | - | 300 | A |
| $V_{SD}$ | Drain to Source Diode Forward Voltage | $V_{GS}$=0V, $I_S$=30A | - | - | 1 | V |
| $t_{rr}$ | Body Diode Reverse Recovery Time | $T_J$=25℃, $I_F$=12A,dI/dt=100A/μs | - | 177 | - | ns |
| $Q_{rr}$ | Body Diode Reverse Recovery Charge | | - | 1291 | - | nc |

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition: $T_J$=25℃, $V_{DD}$=50V, $V_G$=10V, $R_G$=25Ω, L=0.5mH, $I_{AS}$=19A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

## Typical Performance Characteristics

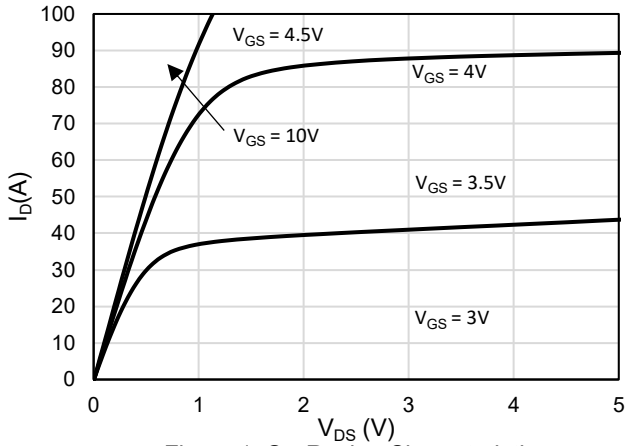



Figure 1: On Region Characteristics

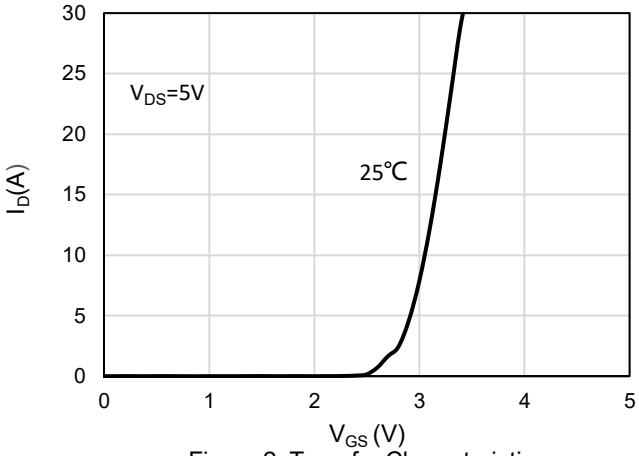



Figure 2: Transfer Characteristics

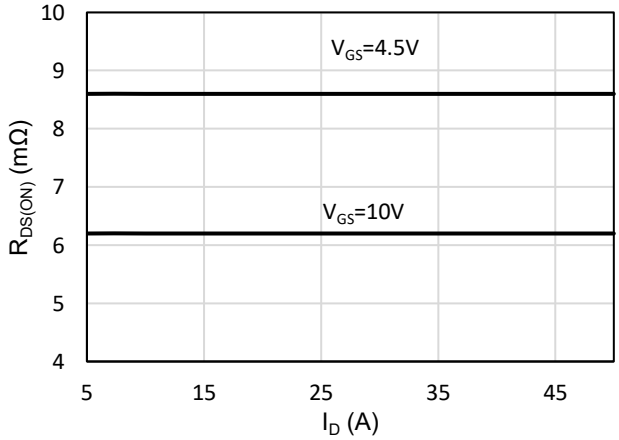



Figure 3: On-Resistance vs. Drain Current and Gate Voltage

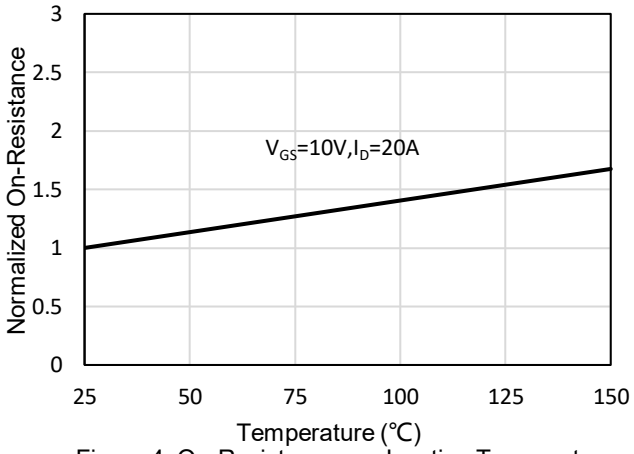



Figure 4: On-Resistance vs. Junction Temperature

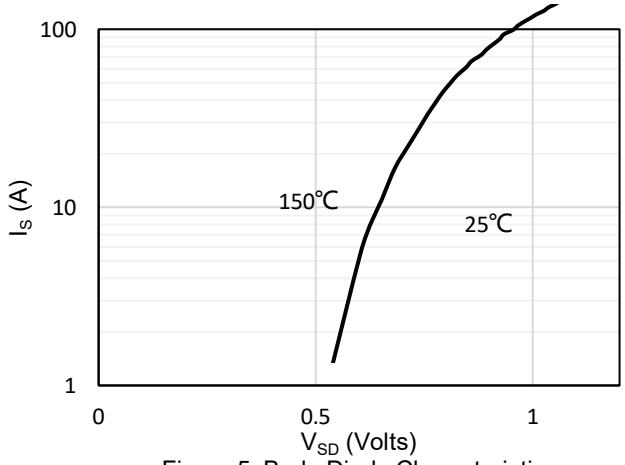



Figure 5: Body-Diode Characteristics

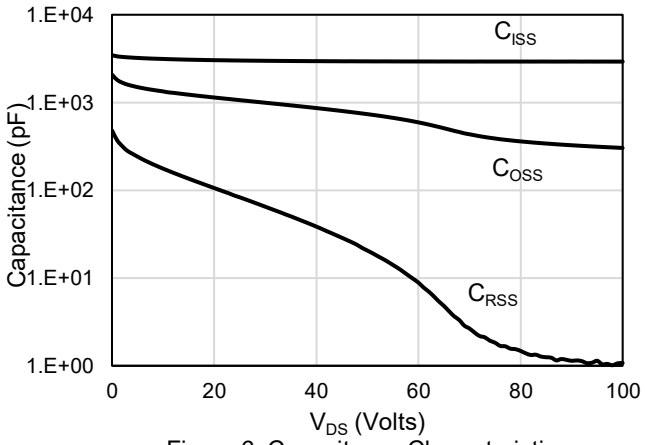



Figure 6: Capacitance Characteristics

## Typical Performance Characteristics

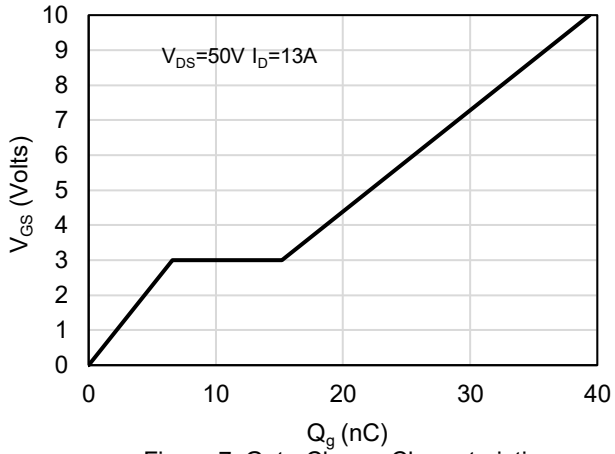


Figure 7: Gate-Charge Characteristics

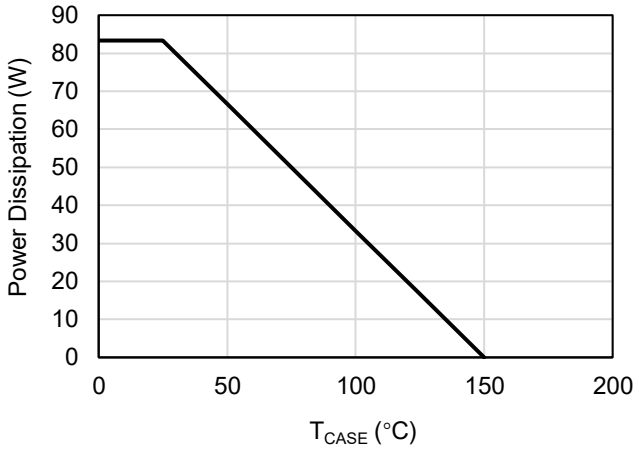


Figure 8: Power De-rating

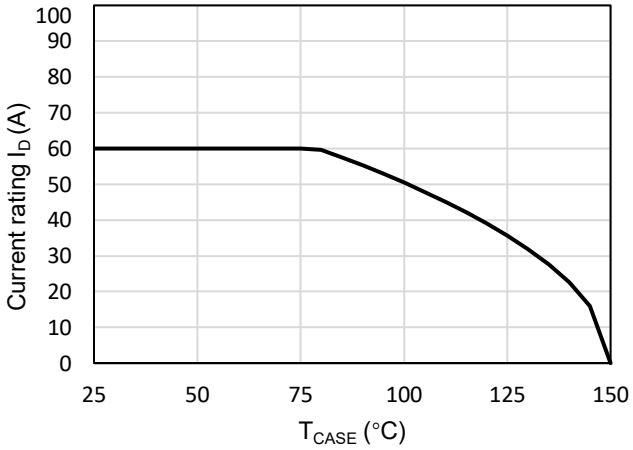


Figure 9: Current De-rating

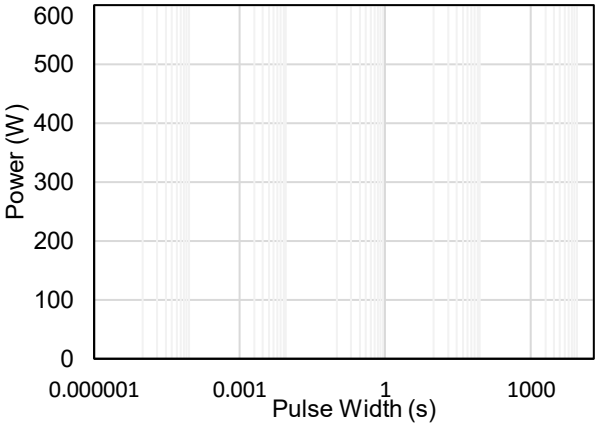


Figure 10: Single Pulse Power Rating Junction-to-Case

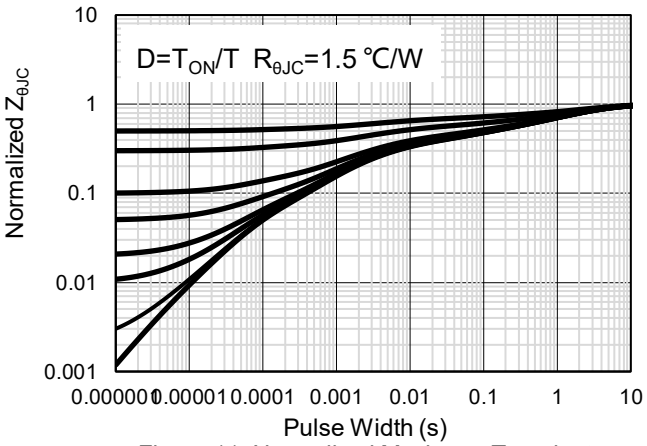


Figure 11: Normalized Maximum Transient Thermal Impedance

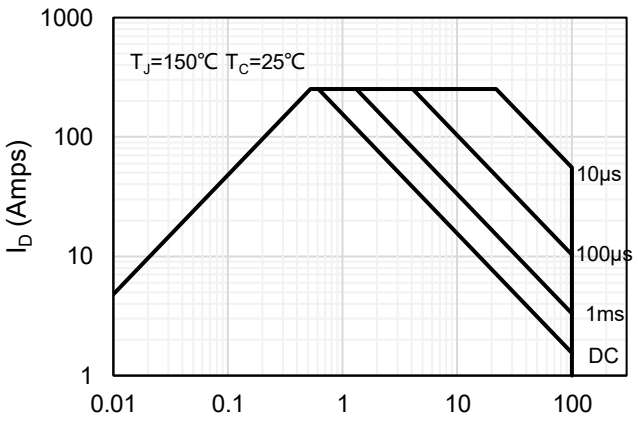
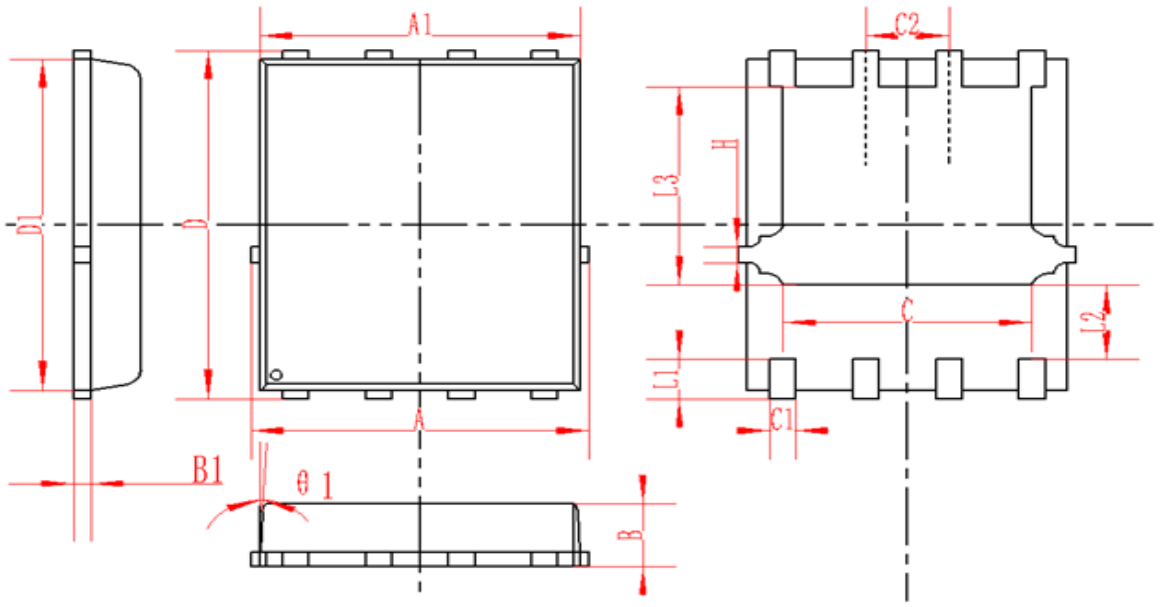


Figure 12: Maximum Forward Biased Safe Operating Area

## DFN5X6-8L Package Information




| SYMBOL | MM | | | INCH | | |
|---|---|---|---|---|---|---|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 4.95 | 5 | 5.05 | 0.195 | 0.197 | 0.199 |
| A1 | 4.82 | 4.9 | 4.98 | 0.190 | 0.193 | 0.196 |
| D | 5.98 | 6 | 6.02 | 0.235 | 0.236 | 0.237 |
| D1 | 5.67 | 5.75 | 5.83 | 0.223 | 0.226 | 0.230 |
| B | 0.9 | 0.95 | 1 | 0.035 | 0.037 | 0.039 |
| B1 | 0.254REF | | | 0.010REF | | |
| C | 3.95 | 4 | 4.05 | 0.156 | 0.157 | 0.159 |
| C1 | 0.35 | 0.4 | 0.45 | 0.014 | 0.016 | 0.018 |
| C2 | 1.27TYP | | | 0.5TYP | | |
| θ1 | 8° | 10° | 12° | 8° | 10° | 12° |
| L1 | 0.63 | 0.64 | 0.65 | 0.025 | 0.025 | 0.026 |
| L2 | 1.2 | 1.3 | 1.4 | 0.047 | 0.051 | 0.055 |
| L3 | 3.415 | 3.42 | 3.425 | 0.134 | 0.135 | 0.135 |
| H | 0.24 | 0.25 | 0.26 | 0.009 | 0.010 | 0.010 |

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