## / Descriptions

SOP-8 N MOS

Double N-CHANNEL MOSFET in a SOP-8 Plastic Package.

## / Features

$V_{DS}$(V)=30V $I_D$=12.3A

$R_{DS(ON)}$@10V<12mΩ(Typ. 8.7mΩ)

$R_{DS(ON)}$@4.5V<20mΩ(Typ. 11.5mΩ)

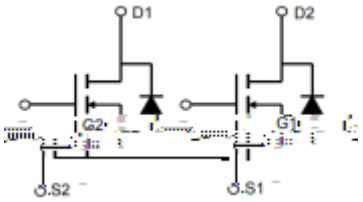
HF Product.

## / Applications

MB/NB/UMPC/VGA , DC-DC ,

High Frequency Point-of-Load Synchronous Buck Converter for MB/NB/UMPC/VGA, Networking DC-DC Power System,Load Switch.

## / Equivalent Circuit




## / Pinning

PIN1 S1 PIN 2 G1 PIN 3 S2 PIN 4 G2

PIN 5 D2 PIN 6 D2 PIN 7 D1 PIN 8 D1

## / Marking

See Marking Instructions.

## / Absolute Maximum Ratings(Ta=25 )

| Parameter | Symbol | Rating | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DSS}$ | 30 | V |
| Gate-Source Voltage | $V_{GS}$ | ±20 | V |
| Continuous Drain Current | $I_D$ | 12.3 | A |
| Pulsed Drain Current | $I_{DM}$ | 46.5 | A |
| Power Dissipation | $P_D$ | 3 | W |
| Junction and Storage Temperature Range | $T_J$,$T_{STG}$ | -55 to +150 | |
| Maximum Junction-to-Ambient | $R_{JA}$(Steady-State) | 41.7 | /W |

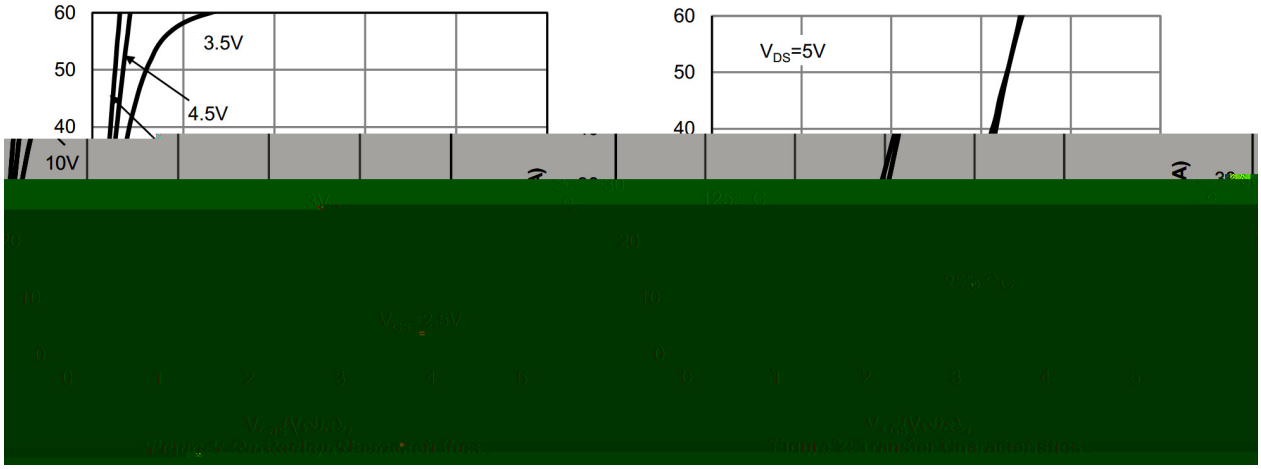
## Electrical Characteristics(Ta=25 )

| Parameter | Symbol | Test Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$=0V | $I_D$=250μA | 30 | 36.5 | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=30V | $V_{GS}$=0V | | | 1 | μA |
| Gate-Body leakage current | $I_{GSS}$ | $V_{GS}$=±20V | $V_{DS}$=0V | | | ± 100 | nA |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$ | $I_D$=250μA | 1.0 | 1.7 | 2.5 | V |
| Static Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}$=10V | $I_D$=20A | | 8.7 | 12 | mΩ |
| | | $V_{GS}$=4.5V | $I_D$=10A | | 11.5 | 20 | mΩ |
| Diode Forward Voltage | $V_{SD}$ | $V_{GS}$=0V | $I_S$=1.0A | | | 1.2 | V |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=25V f=1.0MHz | $V_{GS}$=0V | | 1200 | | pF |
| Output Capacitance | $C_{oss}$ | | | | 125 | | pF |
| Reverse Transfer Capacitance | $C_{rss}$ | | | | 100 | | pF |
| Gate resistance | $R_g$ | $V_{DS}$=0V f=1.0MHz | $V_{GS}$=0V | | 3.7 | | Ω |
| Total Gate Charge | $Q_{g(10V)}$ | $V_{GS}$=10V $I_D$=20A | $V_{DS}$=15V | | 40 | | nC |
| Total Gate Charge | $Q_{g(4.5V)}$ | | | | 22 | | nC |
| Gate-Source Charge | $Q_{gs}$ | | | | 11 | | nC |
| Gate-Drain Charge | $Q_{gd}$ | | | | 5 | | nC |

## Electrical Characteristics(Ta=25 )

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DS}$=15 V $V_{GS}$=10V<br>$R_L$=0.75Ω $R_{GEN}$=3Ω | | 11 | | ns |
| Turn-On Rise Time | $t_r$ | | | 14 | | ns |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 38 | | ns |
| Turn-Off Fall Time | $t_f$ | | | 10 | | ns |

## / Electrical Characteristic Curve



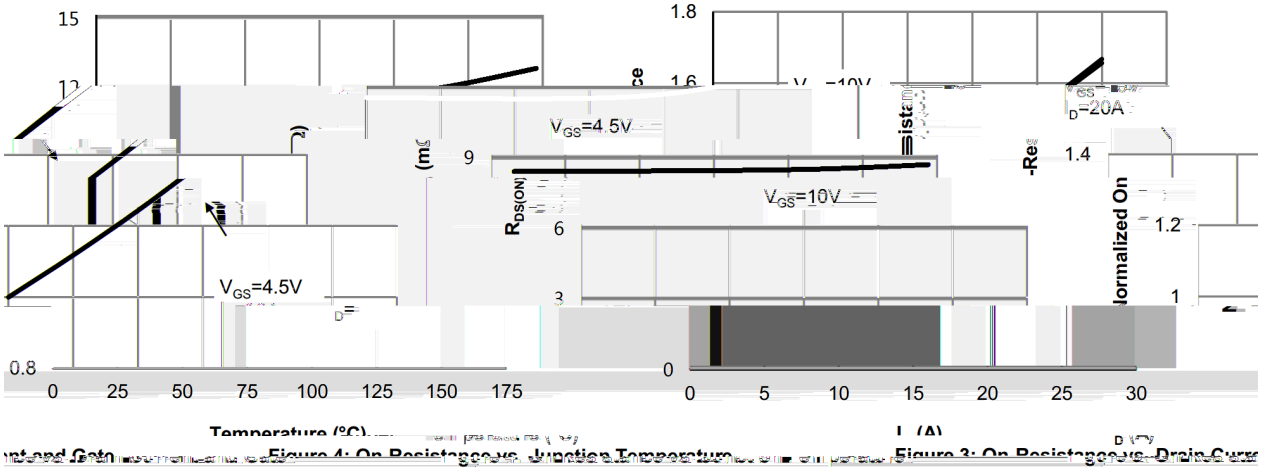
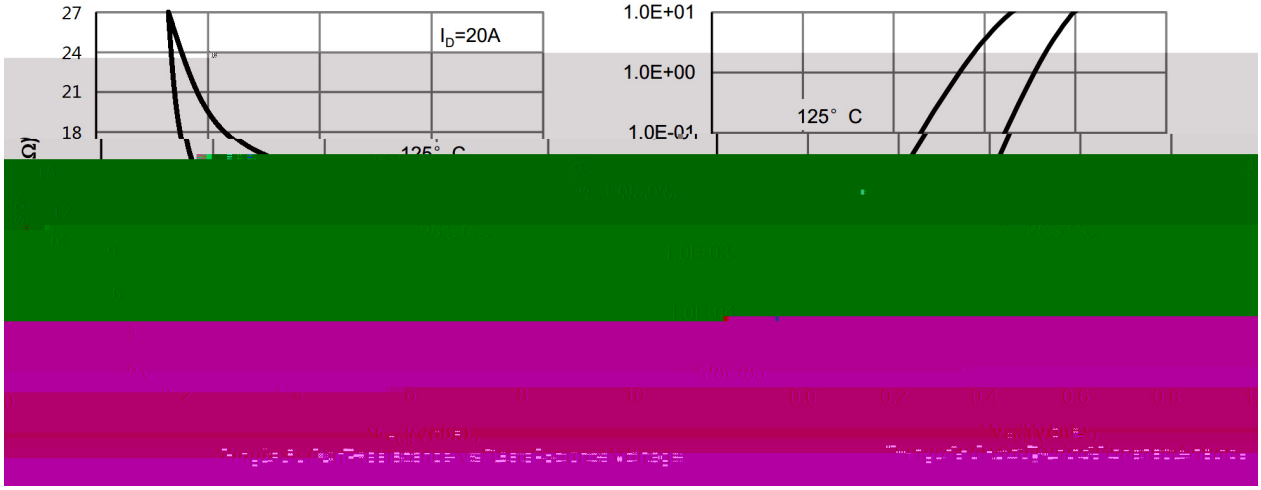




Figure 4: On Resistance vs. Junction Temperature

Figure 3: On Resistance vs. Drain Current

Voltage



## / Electrical Characteristic Curve

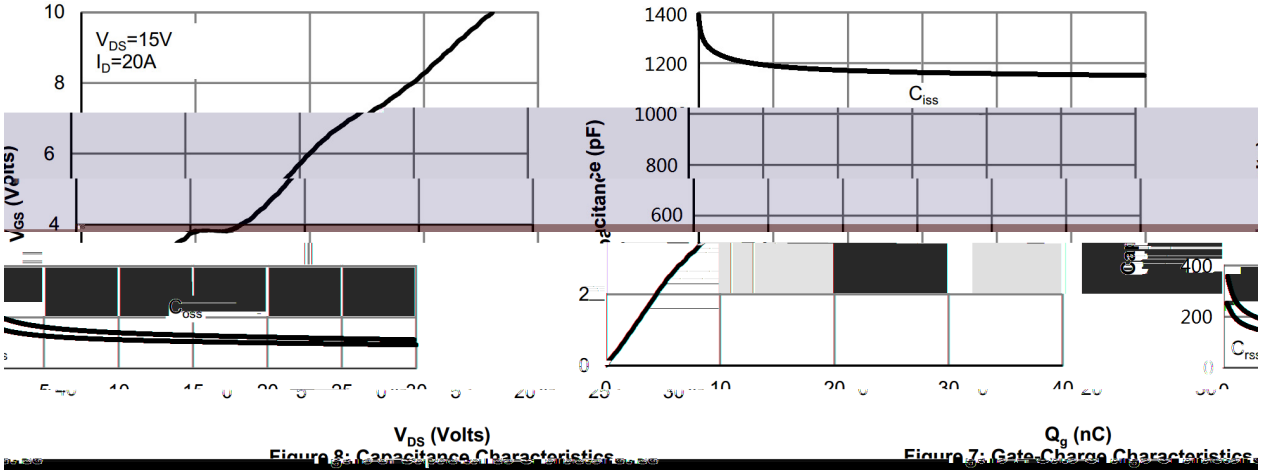
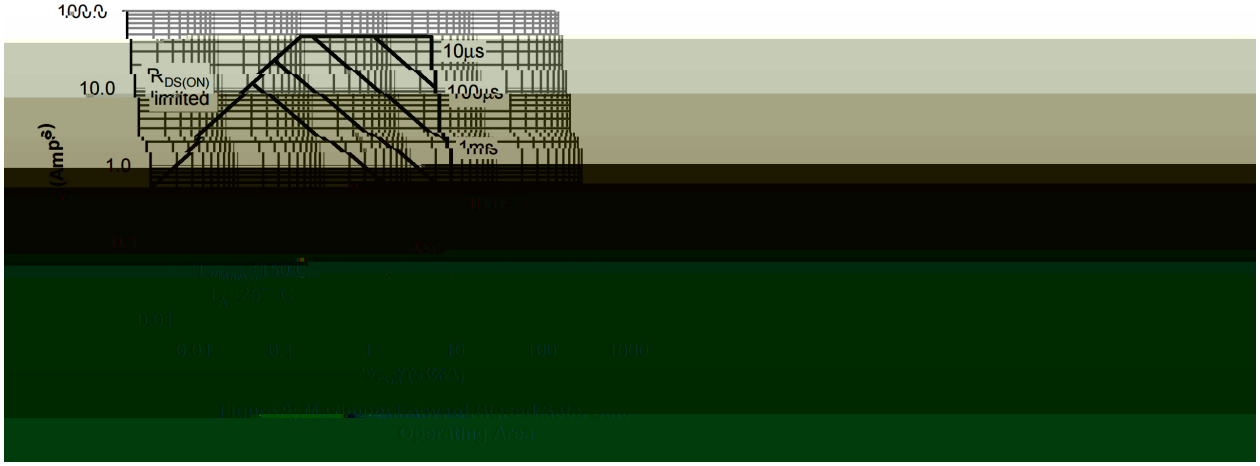



Figure 8: Capacitance Characteristics

Figure 7: Gate-Charge Characteristics



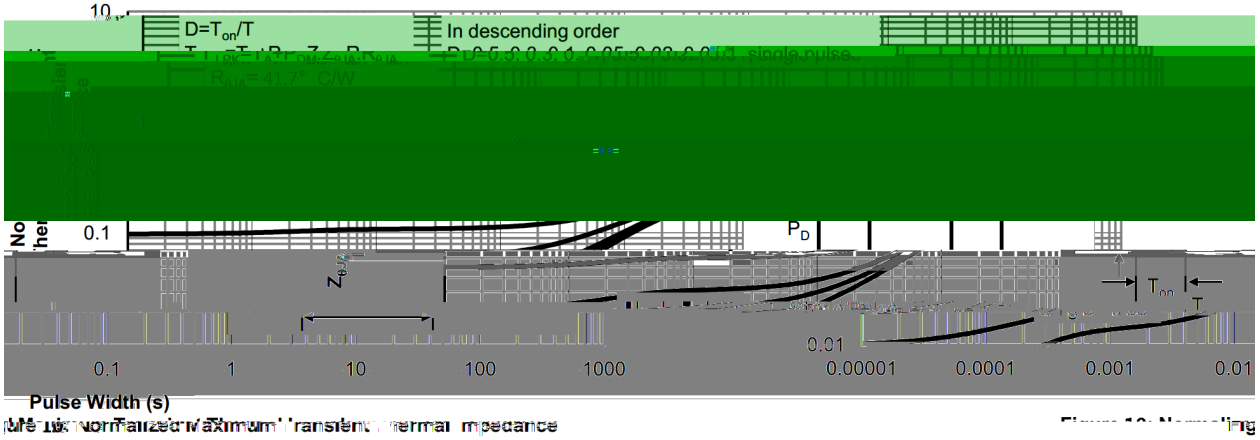
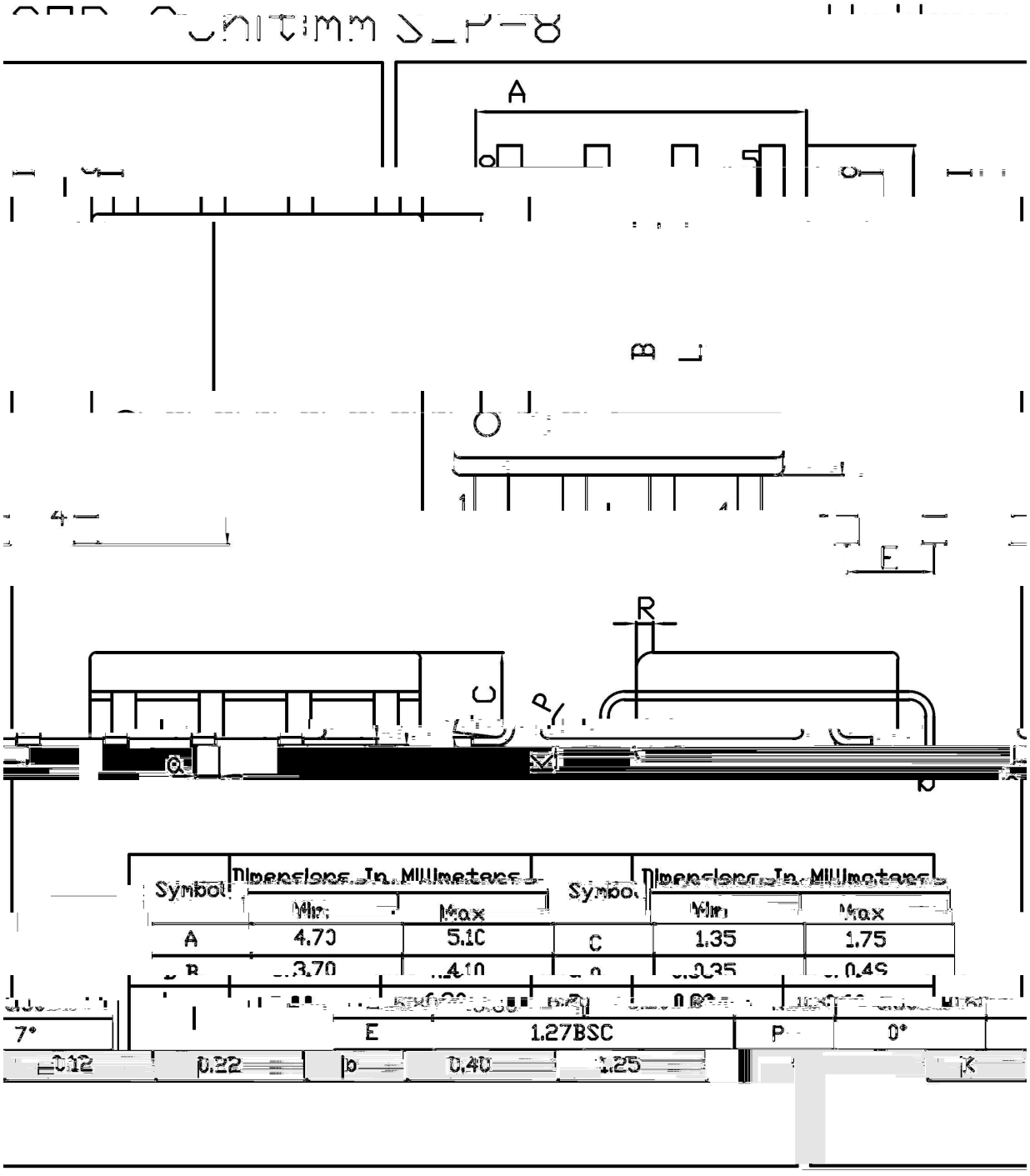



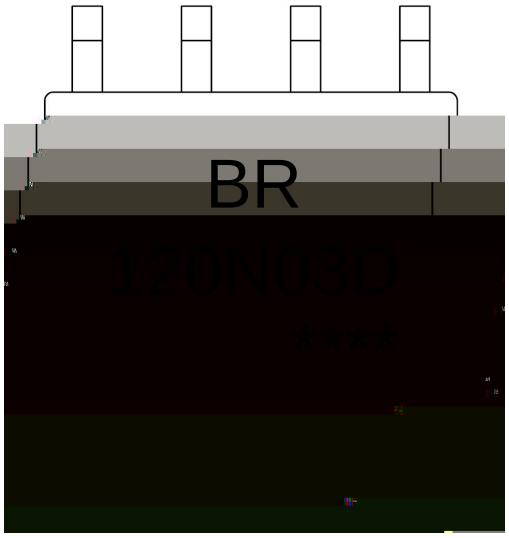

Figure 10: Normalized Maximum Transient Thermal Impedance

## / Package Dimensions




| Symbol | Dimensions In Millimeters | | Symbol | Dimensions In Millimeters | |
|---|---|---|---|---|---|
| | Min. | Max | | Min | Max |
| A | 4.70 | 5.10 | C | 1.35 | 1.75 |
| B | 3.70 | 4.10 | | 0.035 | 0.49 |

## / Marking Instructions




BR

120N03D

****

Note:

| | |
|---|---|
| BR: | Company Code |
| 120N03D: | Product Type Code |
| ****: | Lot No. Code, code change with Lot No |

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Note:

| | | | | |
|---|---|---|---|---|
| 1 | 150 | 180 | 60 | 90sec; |
| 2 | 245±5 | | | 5±0.5sec; |
| 3 | | 2 | 10 | /sec. |

1.Preheating:150~180 , Time:60~90sec.
2.Peak Temp.:245±5 , Duration:5±0.5sec.
3. Cooling Speed: 2~10 /sec.

## / Resistance to Soldering Heat Test Conditions

| | | | |
|---|---|---|---|
| 260±5 | 10±1 sec. | Temp.:260±5 | Time:10±1 sec |

## / Packaging SPEC.

/ REEL