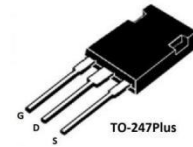


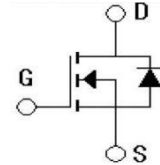
## Features

- $V_{DS}=1000V, I_D=32A$   
 $R_{DS(on)} < 0.38\Omega$
- avalanche tested and current rated
- Fast intrinsic Rectifier



## Applications

- High power density
- Easy to mount
- Space savings



## Absolute Ratings ( $T_c=25^\circ C$ )

| Parameter                                       | Symbol           |                       | Limit    | Unit |
|-------------------------------------------------|------------------|-----------------------|----------|------|
| Drain-Source Voltage                            | V <sub>DSS</sub> |                       | 1000     | V    |
| Transient Gate-Source Voltage                   | V <sub>GSM</sub> |                       | ±30      | V    |
| Continuous Gate-Source Voltage                  | V <sub>GSS</sub> |                       | ±20      | V    |
| Drain Current-continuous                        | I <sub>D</sub>   | I <sub>C</sub> =25℃   | 32       | A    |
|                                                 |                  | I <sub>C</sub> = 100℃ | 24       | A    |
| Drain Current-pulse(note 1)                     | I <sub>DM</sub>  |                       | 96       | A    |
| Single Pulsed Avalanche Energy(note 2)          | E <sub>AS</sub>  |                       | 950      | mJ   |
| Maximum Power Dissipation (TO-247plus)          | PD               |                       | 735      | W    |
| Maximum Power Dissipation (TO-247)              | PD               |                       | 116      | W    |
| Operating Temperature Range                     | T <sub>J</sub>   |                       | -40~+150 | ℃    |
| Storage Temperature Rang                        | T <sub>STG</sub> |                       | -55~+150 | ℃    |
| Maximum lead temperature for soldering purposes | T <sub>L</sub>   |                       | 300      | ℃    |

## Electrical Characteristics ( $T_{CASE}=25^\circ C$ unless otherwise specified)

| Parameter                       | Symbol     | Tests conditions              | Min  | Typ | Max       | Units   |
|---------------------------------|------------|-------------------------------|------|-----|-----------|---------|
| Drain-Source Voltage            | $BV_{DSS}$ | $I_D=3mA, V_{GS}=0V$          | 1000 | -   | -         | V       |
| Zero Gate Voltage Drain Current | $I_{DSS}$  | $V_{DS}=V_{DSS}, V_{GS}=0V$   | -    | -   | 1         | $\mu A$ |
| Gate-Body Leakage Current       | $I_{GSS}$  | $V_{GS} = \pm 20V, V_{DS}=0V$ | -    | -   | $\pm 100$ | nA      |

## On-Characteristics

|                                       |              |                                                            |     |      |      |          |
|---------------------------------------|--------------|------------------------------------------------------------|-----|------|------|----------|
| Gate Threshold Voltage                | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$                              | 3.0 | -    | 5.5  | V        |
| Static Drain-Source On-Resistance (3) | $R_{DS(on)}$ | $V_{GS}=10V, I_D=16A$                                      | -   | 0.28 | 0.38 | $\Omega$ |
| Forward Transconductance              | $g_{fs}$     | $V_{DS}=20V, I_D=16A$<br>(note3)                           | -   | 31   | -    | S        |
| Dynamic Characteristics               |              |                                                            |     |      |      |          |
| Input capacitance                     | $C_{iss}$    | $V_{DS}=25V, V_{GS}=0V,$<br>$f=1.0MHz$                     | -   | 9690 | -    | pF       |
| Output capacitance                    | $C_{oss}$    |                                                            | -   | 621  | -    | pF       |
| Reverse transfer capacitance          | $C_{rss}$    |                                                            | -   | 65   | -    | pF       |
| Switching-Characteristics             |              |                                                            |     |      |      |          |
| Turn-On delay time                    | $t_{d(on)}$  | $V_{DS}=500V, I_D=16A,$<br>$R_g=1\Omega$<br>(note3,4)      | -   | 46   | -    | ns       |
| Turn-On rise time                     | $t_r$        |                                                            | -   | 22   | -    | ns       |
| Turn-Off delay time                   | $t_{d(Off)}$ |                                                            | -   | 58   | -    | ns       |
| Turn-Off rise time                    | $t_f$        |                                                            | -   | 16   | -    | ns       |
| Total Gate Charge                     | $Q_g$        | $V_{DS}=500V, I_D=16A,$<br>$V_{GS}=10V$<br>(note3,4)       | -   | 176  | -    | nC       |
| Gate-Source charge                    | $Q_{gs}$     |                                                            | -   | 56   | -    | nC       |
| Gate-Drain charge                     | $Q_{gd}$     |                                                            | -   | 71   | -    | nC       |
| Drain-Source Diode Characteristics    |              |                                                            |     |      |      |          |
| Drain-Source Diode Forward Voltage    | $V_{SD}$     | $V_{GS}=0V, I_S=16A$                                       | -   | -    | 1.2  | V        |
| Diode Forward Current                 | $I_S$        | $T_C=25^{\circ}C$                                          | -   | -    | 32   | A        |
| Reverse recovery time                 | $T_{rr}$     | $I_S=16A,$<br>$-di/dt=100A/\mu s$<br>$V_R=100V, V_{GS}=0V$ | -   | 0.33 | -    | us       |
| Reverse Recovery Charge               | $Q_{rr}$     |                                                            | -   | 1.4  | -    | uC       |

## Thermal Characteristics

| Parameter                                    | Symbol        | Value | Unit         |
|----------------------------------------------|---------------|-------|--------------|
| Thermal Resistance, junction to Case, max    | $R_{th(j-C)}$ | 0.17  | $^\circ C/W$ |
| Thermal Resistance, junction to Ambient, Max | $R_{th(j-A)}$ | 40    |              |

## Order Message

| Marking      | Package    |
|--------------|------------|
| MS32N100HGC1 | TO-247plus |

Notes:

1. Repetitive Rating : Pulse width limited by maximum junction temperature
2.  $L = 15 mH, I_{AS} = 10 A, V_{DD} = 50V, R_G = 25 \Omega, \text{Starting } T_J = 25^\circ C$
3. Pulse Test : Pulse width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$
4. Essentially independent of operating temperature

## Electrical Characteristics

Fig.1 On-Region Characteristic@25°C

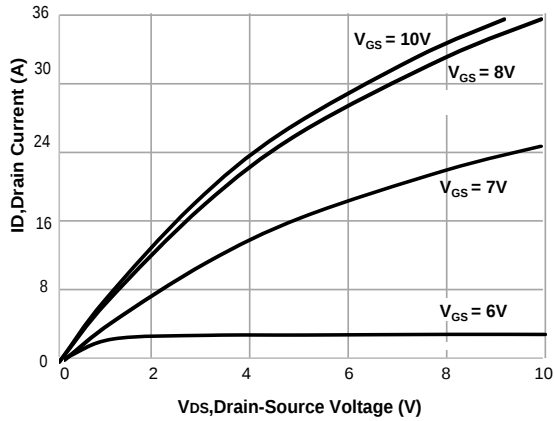


Fig.2 Extended On-Region Characteristic@25°C

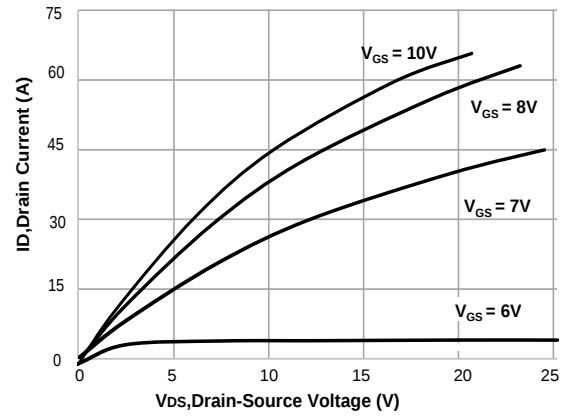


Fig.3 On-Region Characteristic@125°C

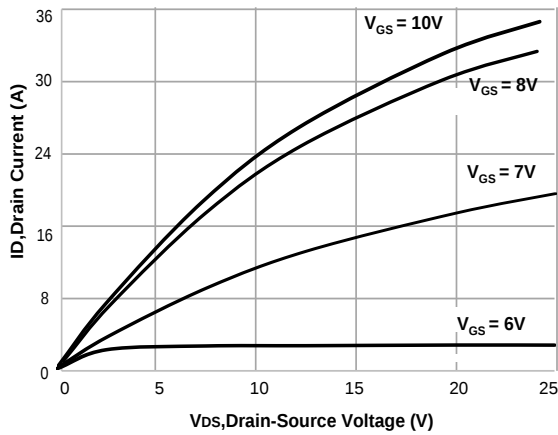


Fig.4 Normalization On-Resistance Variation vs Junction Temperature

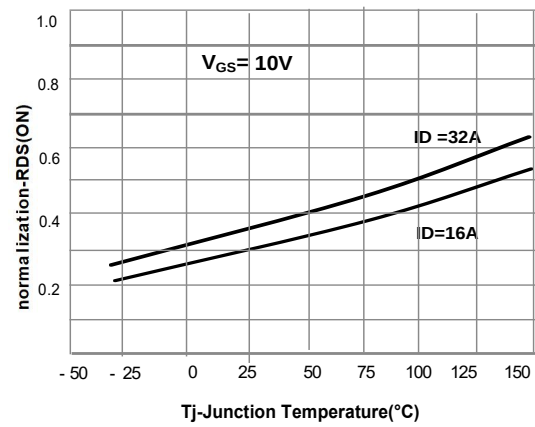


Fig.5 On-Resistance vs. Drain Current

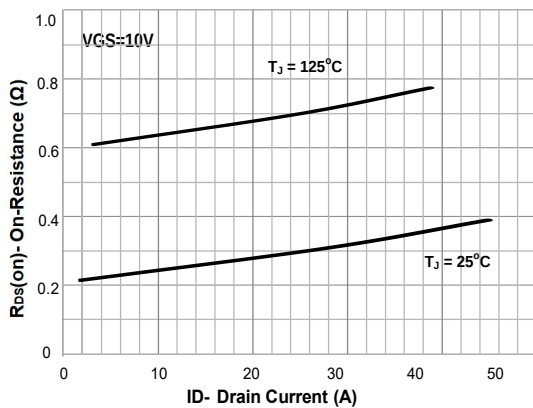
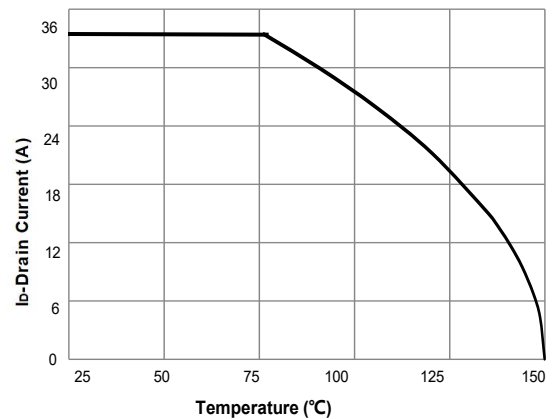
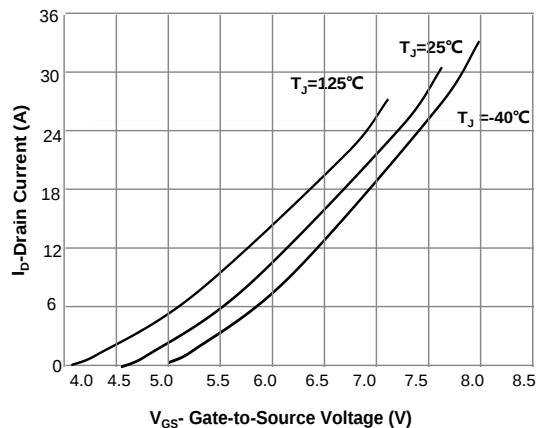


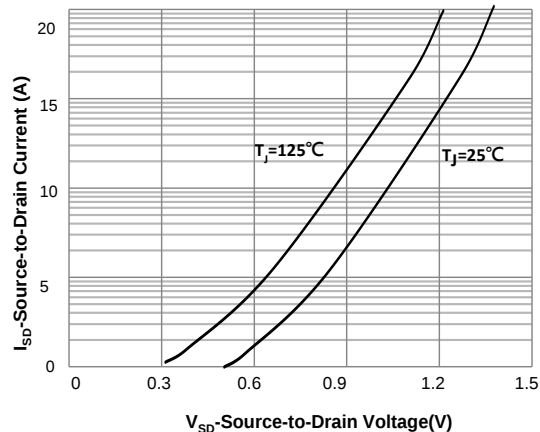
Fig.6 Drain Current vs. Case Temperature



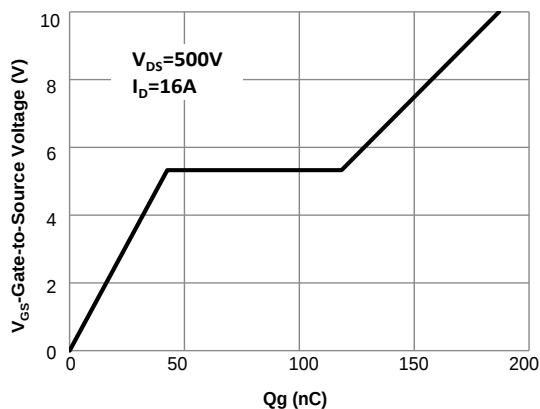
**Fig.7 Transfer Characteristics**



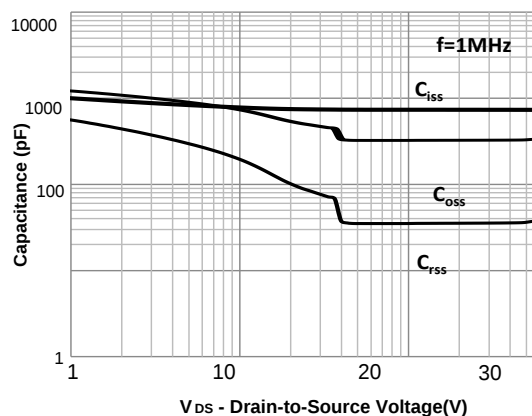
**Fig.8 Source-Drain Diode Forward Voltage**



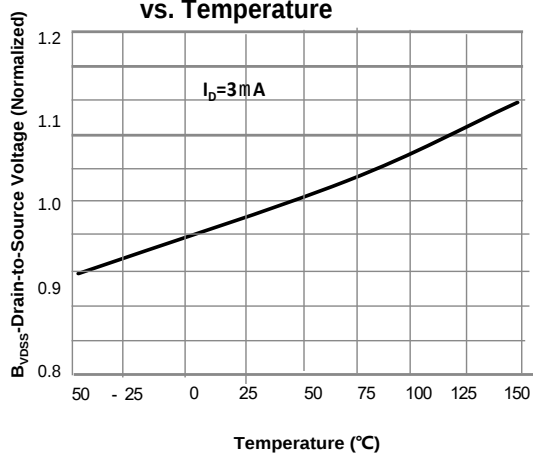
**Fig.9 Gate-Charge Characteristics**



**Fig.10 Capacitance vs. Drain-Source Voltage**



**Fig.11 Breakdown Voltage Variation vs. Temperature**



**Fig. 12. Transconductance**

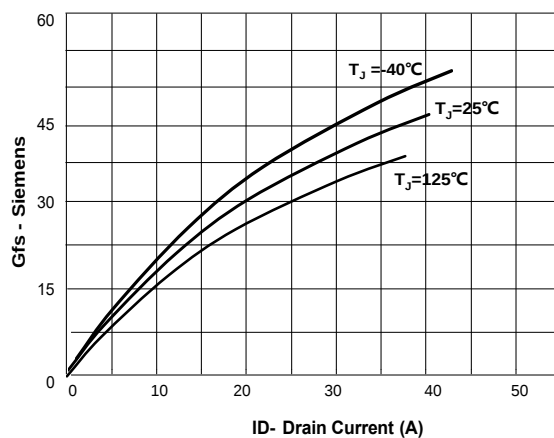


Fig.11 Safe Operating Area

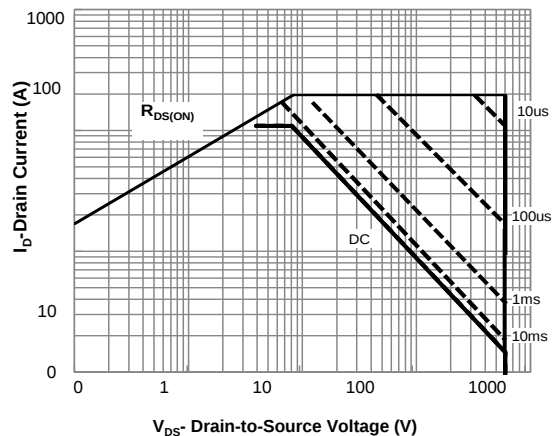
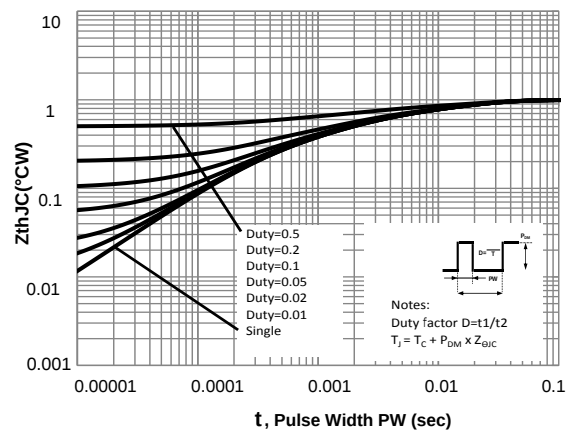


Fig.12 Transient Thermal Response Curve



## Package Mechanical DATA

