# DACO SEMICONDUCTOR CO., LTD.

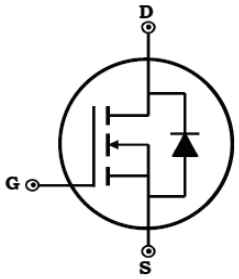
**DAMI320N100**

## N-Channel Enhancement Mode MOSFET

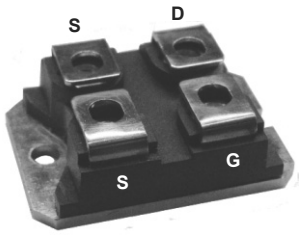
Preliminary

## Features

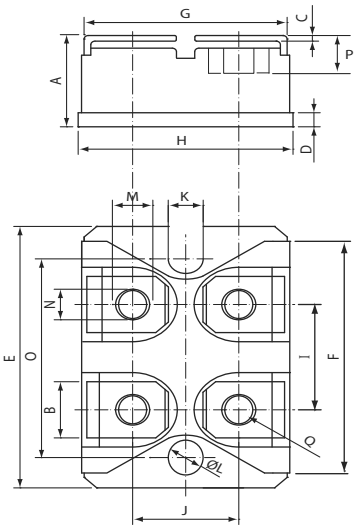
- $V_{DSS}$ = 100V
- $R_{DS(ON)}$ < 2.1 mΩ@ $V_{GS}$ = 10 V
- Fully Avalanche Rated
- Pb Free & RoHS Compliant
- Isolation Type Package
- Electrically Isolation base plate




**SOT-227**




Dimensions in inches and (millimeters)




## Applications

- Backlighting
- Power Converters
- Synchronous Rectifiers

### Absolute Maximum Ratings (Tc=25°C unless otherwise noted)

| Parameter | Symbol | Ratings | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 100 | V |
| Gate-Source Voltage | $V_{GS}$ | ±20 | V |
| Drain Current-Continuous @ $T_C$ =25°C<br>@ $T_C$ =100°C | $I_D$ | 320<br>280 | A |
| Drain Current-Pulsed @ $T_C$ =25°C Note1 | $I_{DM}$ | 900 | A |
| Maximum Power Dissipation | $P_D$ | 424 | W |
| Storage Temperature Range | $T_{STG}$ | -50 to +150 | °C |
| Operating Junction Temperature Range | $T_J$ | -50 to +150 | °C |
| Thermal Resistance, Junction-to-Case | $R\theta_{JC}$ | 0.20 | °C/W |
| Isolation Voltage (A.C. 1 minute) | $V_{iso}$ | 2500 | V |
| Mounting torque (M4 Screw) | $M_d$ | 1.3 | $N_m$ |

| DIMENSIONS | | | | |
|---|---|---|---|---|
| DIM | INCHES | | MM | |
| | MIN | MXA | MIN | MXA |
| A | .500 | .519 | 12.70 | 13.60 |
| B | .307 | .322 | 7.80 | 8.20 |
| C | .029 | .033 | .75 | .84 |
| D | .073 | .082 | 1.85 | 2.10 |
| E | 1.487 | 1.502 | 37.80 | 38.20 |
| F | 1.250 | 1.258 | 31.75 | 32.00 |
| G | .931 | .956 | 23.65 | 24.30 |
| H | .996 | 1.007 | 25.30 | 25.60 |
| I | .586 | .594 | 14.90 | 15.10 |
| J | .492 | .516 | 12.50 | 13.10 |
| K | .161 | .169 | 4.10 | 4.30 |
| L | .161 | .169 | 4.10 | 4.30 |
| M | .181 | .191 | 4.60 | 4.95 |
| N | .165 | .177 | 4.20 | 4.50 |
| O | 1.184 | 1.192 | 30.10 | 30.30 |
| P | .217 | .244 | 5.50 | 6.20 |
| Q | M4*8 | | | |

## Electrical Characteristics @ $T_J$ =25°C (unless otherwise specified)

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| **OFF Characteristics** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$=0V，$I_{DS}$=3mA | 100 | - | - | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{GS}$=0V，$V_{DS}$=100V | - | - | 50 | uA |
| Gate-Body Leakage | $I_{GSS}$ | $V_{GS}$=±20V，$V_{DS}$=0V | - | - | 200 | nA |
| **ON Characteristics** | | | | | | |
| Gate Threshold Voltage | $V_{TH}$ | $V_{DS}$=$V_{GS}$，$I_{DS}$=8mA | 2.5 | - | 3.5 | V |
| Drain-Source On-State Resistance | $R_{DS(on)}$ | $V_{GS}$=10V，$I_{DS}$=100A | - | 1.9 | 2.1 | mΩ |
| Gate Resistance | $R_G$ | | - | 1.9 | 2.9 | Ω |
| Forward Transconductance | $g_{fs}$ | $\|V_{DS}\|>2\|I_D\|R_{DS(on)M}$ [Note1]，$I_D$=100A | - | 121 | - | S |
| **Dynamic Characteristics** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=25V | - | 31260 | - | pF |
| Output Capacitance | $C_{oss}$ | $V_{GS}$=0V | - | 1424 | - | |
| Reverse Transfer Capacitance | $C_{rss}$ | Freq.=1MHz | - | 1007 | - | |
| **Switching Characteristics** | | | | | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DS}$=50V<br>$V_{GS}$=10V<br>$I_{DS}$=160A | - | 100 | - | ns |
| Rise Time | $t_r$ | | - | 48 | - | |
| Turn-Off Delay Time | $t_{d(off)}$ | | - | 180 | - | |
| Fall Time | $t_f$ | | - | 56 | - | |
| Total Gate Charge at 10V | $Q_g$ | $V_{DS}$=50V<br>$V_{GS}$=10V<br>$I_{DS}$=160A | - | 321 | - | nC |
| Gate to Source Charge | $Q_{gs}$ | | - | 158 | - | |
| Gate to Drain Charge | $Q_{gd}$ | | - | 131 | - | |
| **Reverse Diode Characteristics** | | | | | | |
| Drain-Source Diode Forward Voltage | $V_F$ | $T_J$=25°C，$I_F$=100A | - | - | 0.9 | V |
| Diode Continuous Forward Current | $I_F$ | | - | - | 280 | A |
| Diode Pulsed Current [Note1] | $I_{F,pulse}$ | | - | - | 900 | A |
| Reverse Recovery time | $T_{RR}$ | $I_F$=0.5V，$I_R$=1.0A，$I_{RR}$=0.25A | - | - | 210 | ns |

Notes:

1. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle > 2%.

## Typical Characteristics

**Fig 1. Power dissipation**

$P_{tot}$ =f($T_C$)

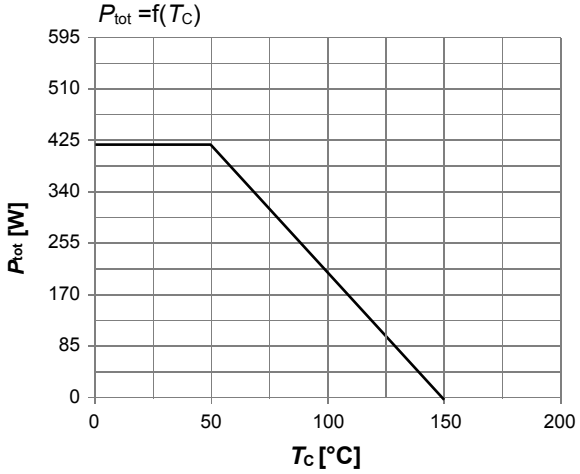



**Fig 2. Drain current**

$I_D$=f($T_C$); $V_{GS}$ ≥10V

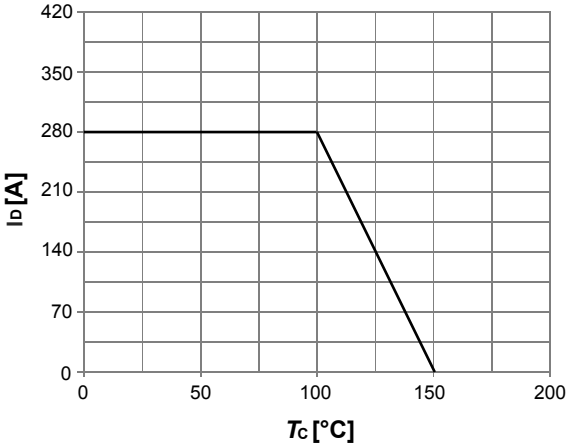



**Fig 3. Safe operating area**

$I_D$=f($V_{DS}$); $T_C$=25°C; $D$=0;parameter: $t_p$

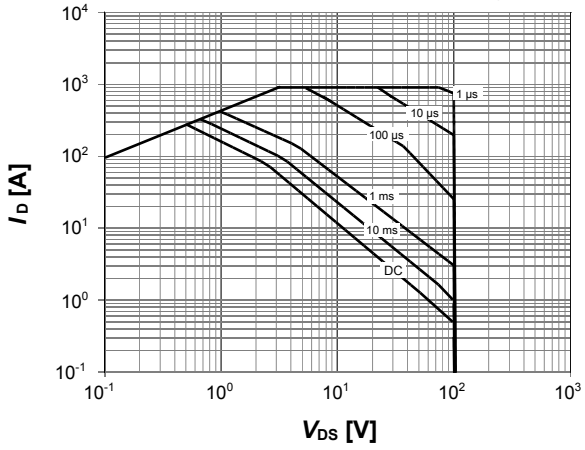



**Fig 4. Maximium Transient Thermal Impedance**

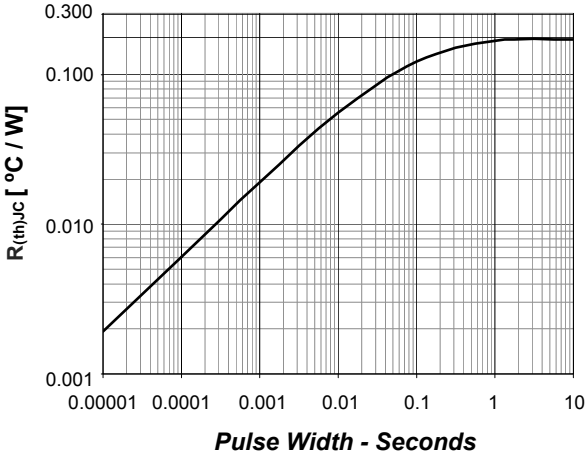



**Fig 5. Typ. output characteristics**

$I_D$=f($V_{DS}$); $T_j$=25°C;parameter: $V_{GS}$

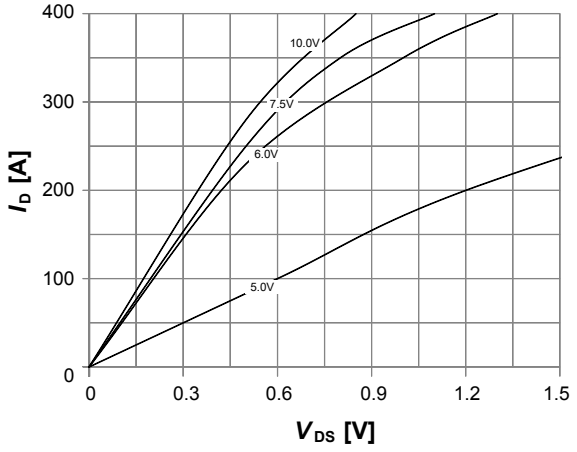
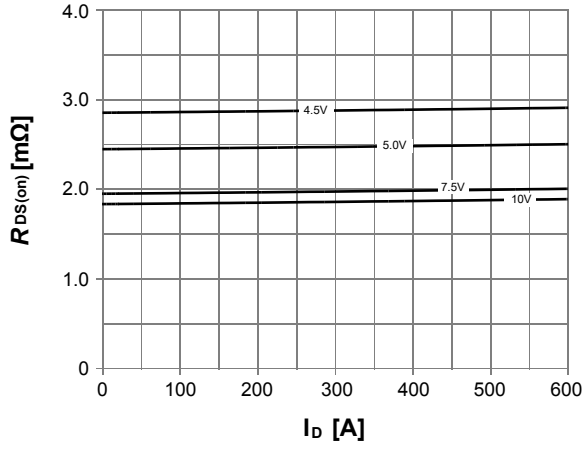



**Fig 6. Typ. drain-source on resistance**

$R_{DS(on)}$=f($I_D$); $T_j$=25°C;parameter: $V_{GS}$



## Typical Characteristics

**Fig 7. Typ. transfer characteristics**
$I_D$=f($V_{GS}$);| $V_{DS}$|>2|$I_D$|$R_{DS(on)max}$;parameter: $T_j$

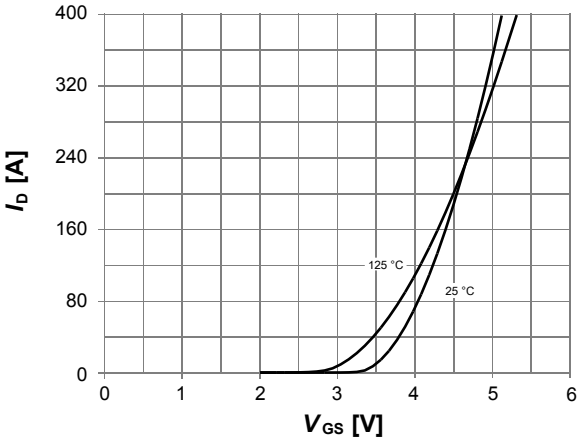



**Fig 8. Typ. forward transconductance**
$g_{fs}$=f($I_D$); $T_j$=25°C

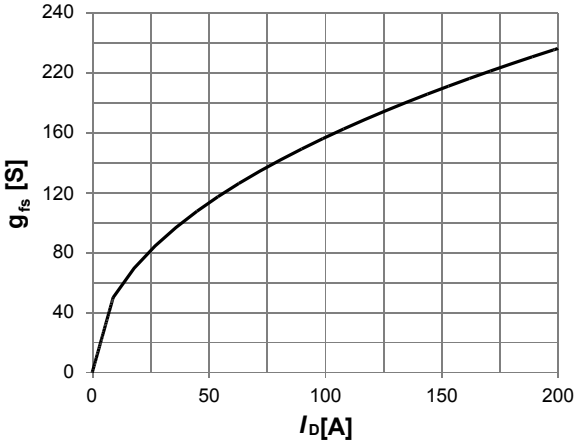



**Fig 9. Drain-source on-state resistance**
$R_{DS(on)}$=f($T_j$); $I_D$=150A; $V_{GS}$=10V

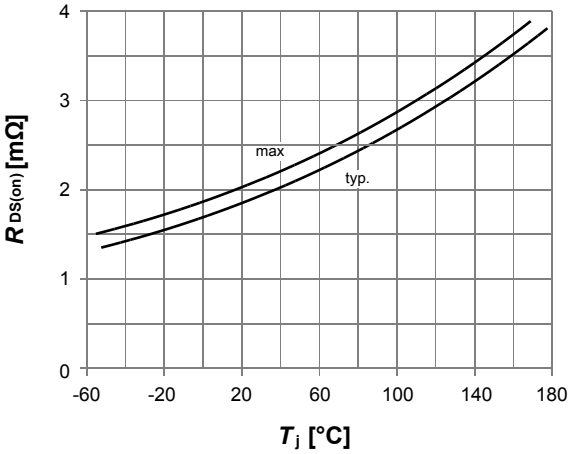



**Fig 10. Typ. gate threshold voltage**
$V_{GS(th)}$=f($T_j$); $V_{GS}$=$V_{DS}$;parameter: $I_D$

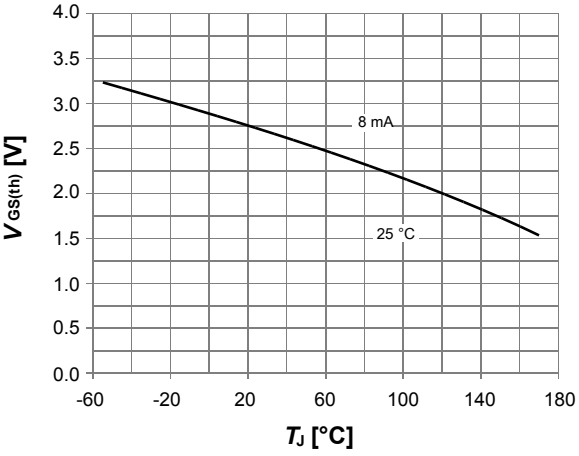



**Fig 11. Typ. capacitances**
$C$=f($V_{DS}$); $V_{GS}$=0V; $f$=1MHz

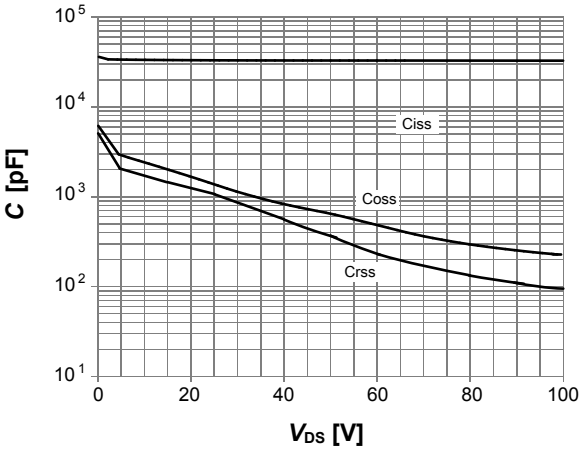
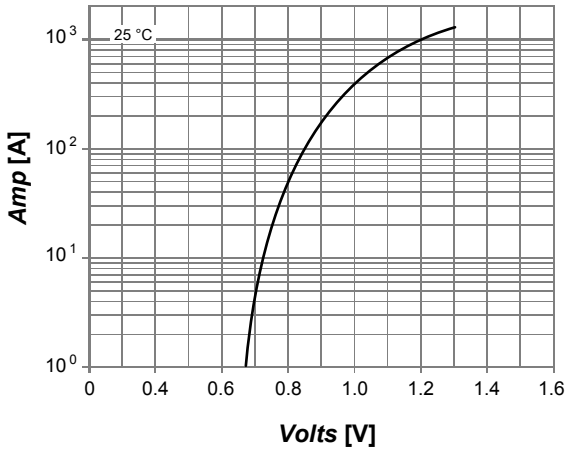



**Fig 12. Typical forward characteristics of reverse diode**



## Typical Characteristics

**Fig 13. Forward derating curve of reverse diode**

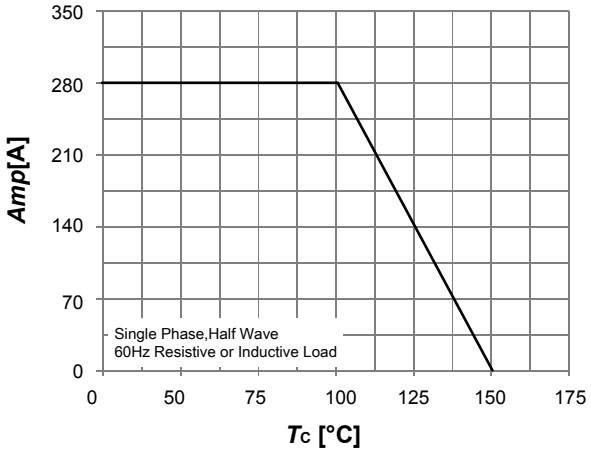



**Fig 14. Peak forward surge current of reverse diode**

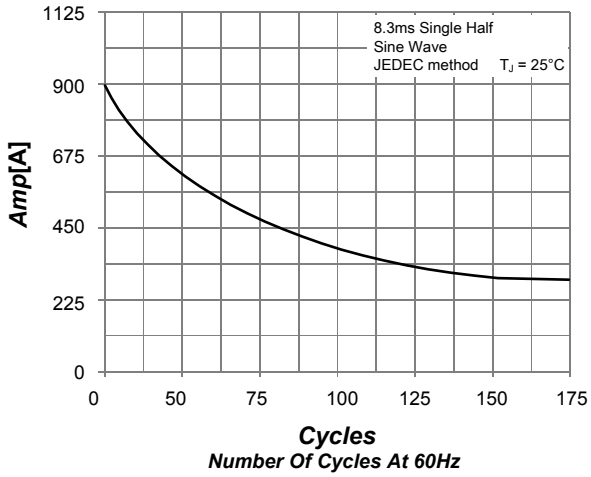



**Fig 15. Typical reverse diode characteristics**

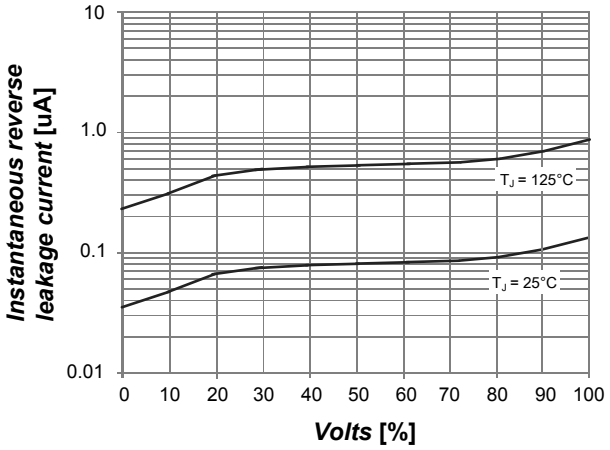



**Fig 16. Typ. gate charge**

$V_{GS}$=f( $Q_{gate}$ ); $I_D$=100A pulsed; parameter: $V_{DD}$

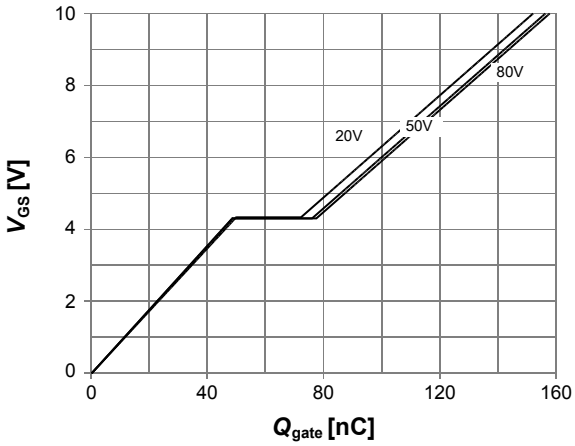
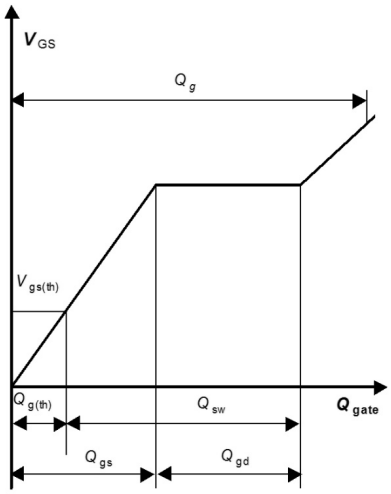



**Fig 17. Gate charge waveforms**



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