DACO SEMICONDUCTOR

# DAM050N030U1

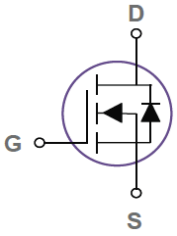
## N-Channel Enhancement Mode MOSFET

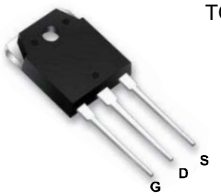
Preliminary

| | |
|---|---|
| $V_{DSS}$ | 300V |
| $I_{D(@25℃)}$ | 50A |
| $R_{DS(ON)}$ typ. | 68mΩ |

## Features

- Proprietary New Planar Technology
- Low Gate Charge Minimize Switching Loss
- Fast Recovery Body Diode

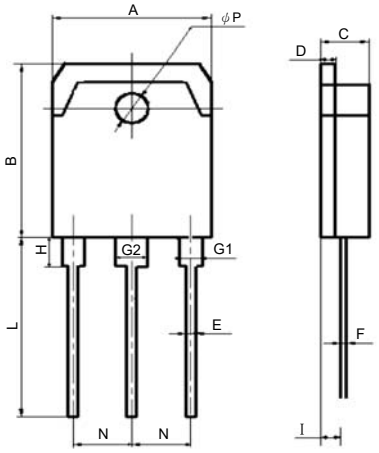



## Applications

- DC-DC Converters
- DC-AC Inverters for UPS
- SMPS and Motor Controls

Package Dimensions




## Absolute Maximum Ratings

(Tc = 25℃ unless otherwise specified)

| Parameter | Symbol | Ratings | Unit |
|---|---|---|---|
| Drain Source Voltage | $V_{DS}$ | 300 | V |
| Gate Source Voltage | $V_{GS}$ | ± 20 | V |
| Drain Current Continuous @ $T_C$ = 25°C<br>@ $T_C$ = 100°C | $I_D$ | 50<br>31 | A |
| Drain Current Pulsed | $I_{DM}$ | 200 | A |
| Single Pulse Avalanche Energy | $E_{AS}$ | 3044 | mJ |
| Power Dissipation @ $T_C$= 25°C | $P_D$ | 305 | W |
| Storage Temperature Range | $T_{STG}$ | -55 to +150 | °C |
| Operating Junction Temperature Range | $T_J$ | -55to +150 | °C |
| Thermal Resistance Junction to Case | $R_{\theta JC}$ | 0.41 | °C/W |
| Thermal Resistance, Junction-to-Ambient | $R_{\theta JA}$ | 50 | °C/W |

| ITEM | SPEC(mm) | |
|---|---|---|
| | MIN | MAX |
| A | 15.38 | 15.70 |
| B | 19.70 | 20.10 |
| C | 4.70 | 4.90 |
| D | 1.49 | 1.51 |
| E | 0.80 | 1.20 |
| F | 0.59 | 0.61 |
| G1 | 2.00 | 2.10 |
| G2 | 3.00 | 3.10 |
| H | 3.20 | 4.00 |
| I | 1.32 | 1.48 |
| L | 19.85 | 20.50 |
| N | 5.25 | 5.65 |
| ΦP | 3.40 | 3.50 |

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

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| **OFF Characteristics** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$=0V，$I_D$ =0.25mA | 300 | - | - | V |
| Drain-Source Leakage Current | $I_{DSS}$ | $V_{GS}$=0V，$V_{DS}$=300V | - | - | 1 | μA |
| Gate To Source Leakage Current | $I_{GSS}$ | $V_{GS}$=±30V，$V_{DS}$=0V | - | - | ±100 | nA |
| **ON Characteristics** | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$，$I_D$ =0.25mA | 2.0 | - | 4.0 | V |
| Drain-Source On-State Resistance* | $R_{DS(on)}$ | $V_{GS}$=10V，$I_D$ =25A | - | 68 | 88 | mΩ |
| Forward Transconductance* | $g_{fs}$ | $V_{DS}$=15V，$I_D$ =25A | - | 18 | - | S |
| **Dynamic Characteristics** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=25V | - | 3537 | - | pF |
| Output Capacitance | $C_{oss}$ | $V_{GS}$=0V | - | 504 | - | |
| Reverse Transfer Capacitance | $C_{rss}$ | Freq.=1MHz | - | 277 | - | |
| **Switching Characteristics** | | | | | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD}$=150V | - | 23 | - | ns |
| Rise Time | $t_r$ | $V_{GS}$=10V | - | 49 | - | |
| Turn-Off Delay Time | $t_{d(off)}$ | $I_D$ =25A | - | 98 | - | |
| Fall Time | $t_f$ | $R_G$ =1.2Ω | - | 33 | - | |
| Total Gate Charge | $Q_g$ | $V_{DS}$=150V | - | 225 | - | nC |
| Gate to Source Charge | $Q_{gs}$ | $V_{GS}$=10V | - | 15 | - | |
| Gate to Drain Charge | $Q_{gd}$ | $I_{DS}$=25A | - | 125 | - | |
| **Source-Drain Diode Characteristics** | | | | | | |
| Diode Forward Voltage | $V_{SD}$ | $V_{GS}$=0V，$I_S$=25A | - | - | 1.5 | V |
| Continuous Source Current (Body Diode)* | $I_{SD}$ | | - | - | 50 | A |
| Max. Pulsed Current (Body Diode)* | $I_{SM}$ | | - | - | 200 | A |
| Reverse Recovery Time | $T_{rr}$ | $V_{GS}$=0V<br>$I_S$=25A，$T_J$=25°C<br>$di_F/dt$=100A/μs | - | 516 | - | ns |
| Reverse Recovery Charge | $Q_{rr}$ | | - | 4.16 | - | μC |

*Pulse Width ≤ 380μs, Duty Cycle ≤ 2%.

## Typical Performance Characteristics

Figure 1a Safe Operating Area

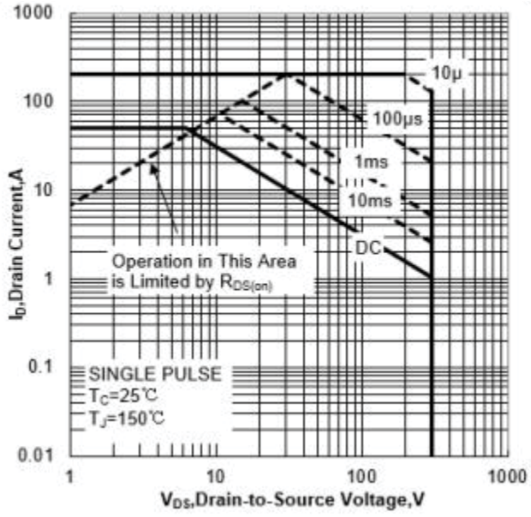



Figure 2 Power Dissipation

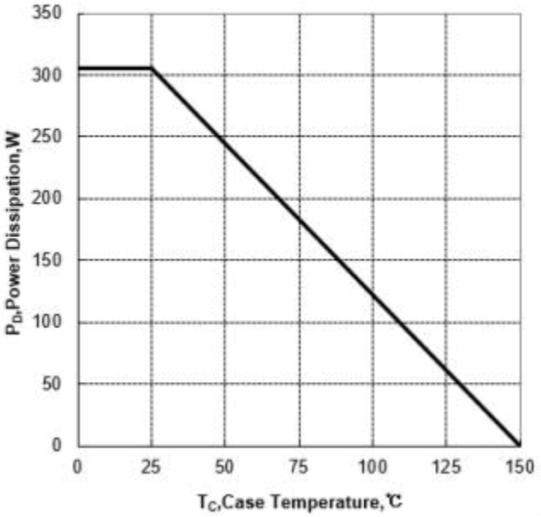



Figure 3 Max Thermal Impendance

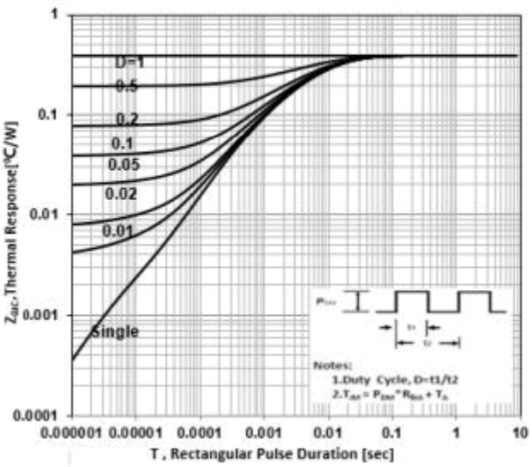



Figure 4 Typical Output Characteristics

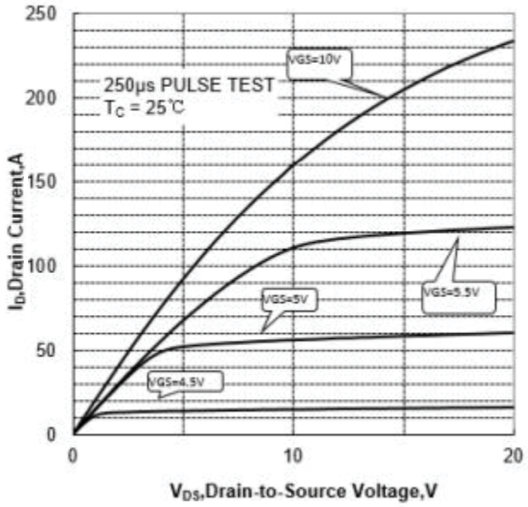



Figure 5 Typical Transfer Characteristics

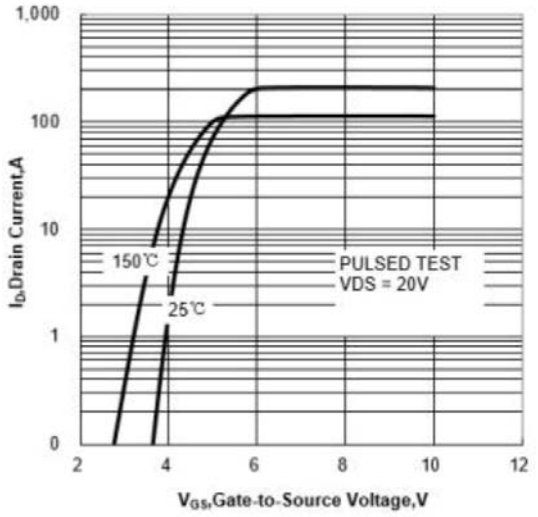
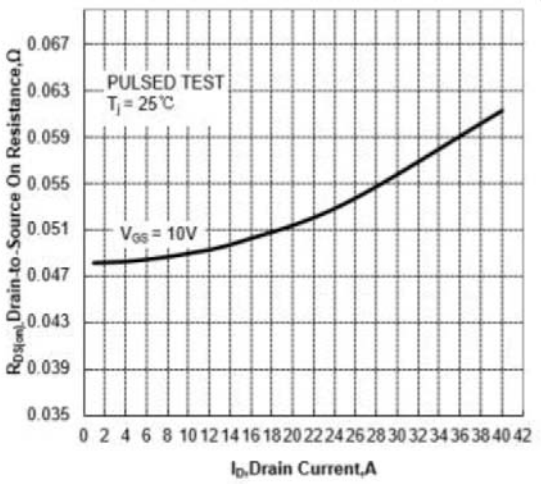



Figure 6 Typical Drain to Source ON Resistance vs Drain Current



## Typical Performance Characteristics

Figure 7 Typical Drian to Source on Resistance vs Junction Temperature

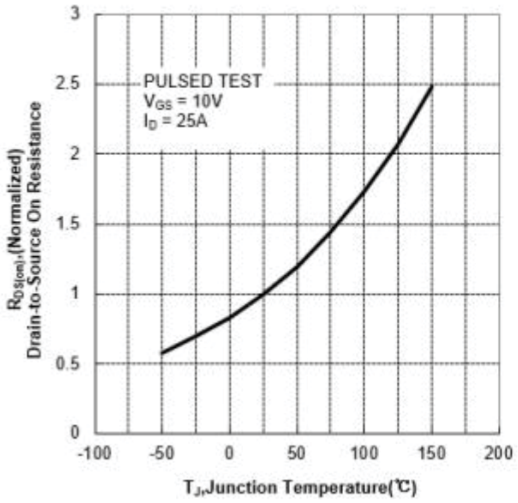



Figure 8 Typical Theshold Voltage vs Junction Temperature

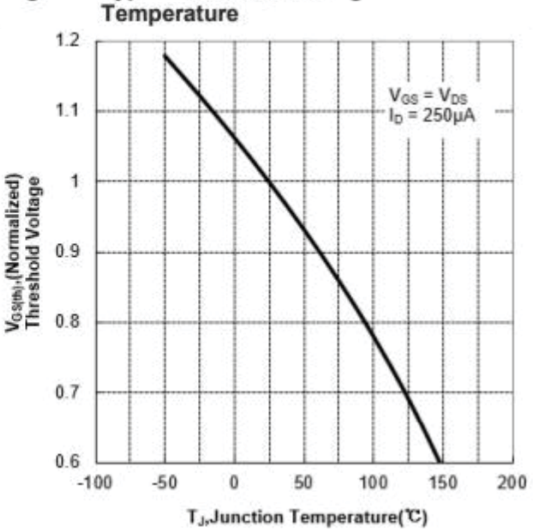



Figure 9 Typical Breakdown Voltage vs Junction Temperature

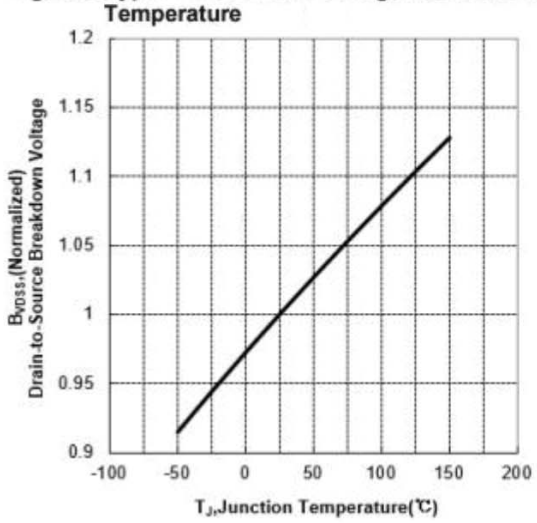



Figure 10 Typical Capacitance vs Drain to Source Voltage

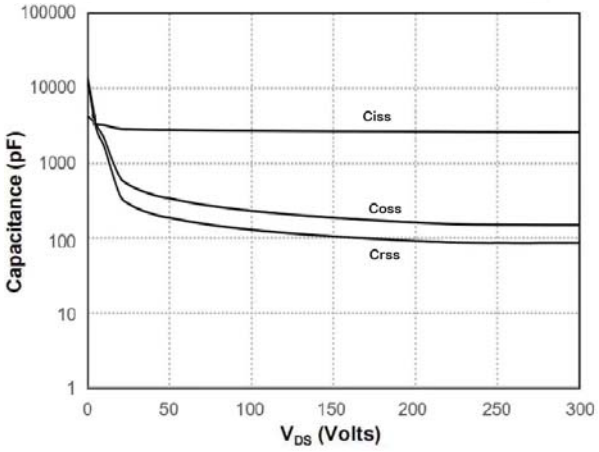
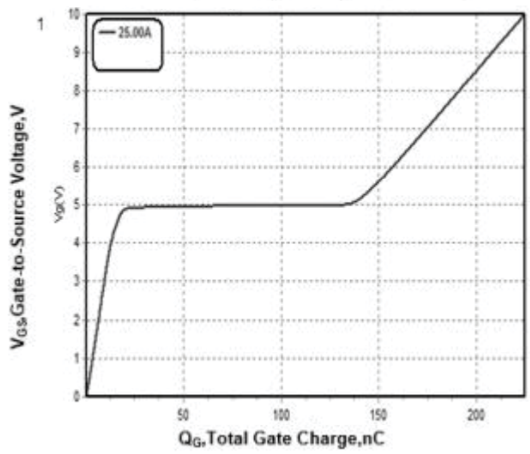



Figure 11 Typical Gate Charge vs Gate to Source Voltage (Vd:150.0V,Ig:1.00mA,Vgon:10.0V,Id:25.00A )



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