# DACO SEMICONDUCTOR CO., LTD.

DAMI160N200

N-Channel Enhancement Mode MOSFET

Features

Preliminary

◆ V_{DSS} = 200V

◆ $R_{DS(ON)}$ < 10.3 mΩ@ V_{GS} = 10 V

◆ Fully Avalanche Rated

◆ Pb Free & RoHS Compliant

◆ Isolation Type Package

◆ Electrically Isolation base plate

Applications

◆ Backlighting

◆ Power Converters

◆ Synchronous Rectifiers

SOT-227
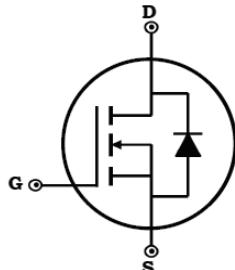
Dimensions in inches and (millimeters)

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

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	200	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous @ T_C =25°C @ T_C =100°C	I_D	160 130	A
Drain Current-Pulsed @ T_C =25°C Note1	I_{DM}	560	A
Maximum Power Dissipation	P_D	440	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	$R\theta_{JC}$	0.25	°C/W
Isolation Voltage (A.C. 1 minute)	V_{iso}	2500	V
Mounting torque (M4 Screw)	M_d	1.3	N_m
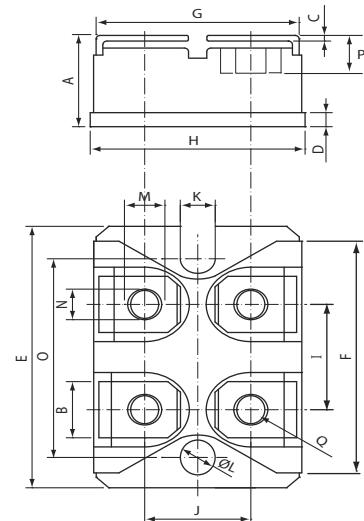
DIMENSIONS				
DIM	INCHES		MM	
	MIN	MXA	MIN	MXA
A	.500	.519	12.70	13.60
B	.307	.322	7.80	8.20
C	.029	.033	.75	.84
D	.073	.082	1.85	2.10
E	1.487	1.502	37.80	38.20
F	1.250	1.258	31.75	32.00
G	.931	.956	23.65	24.30
H	.996	1.007	25.30	25.60
I	.586	.594	14.90	15.10
J	.492	.516	12.50	13.10
K	.161	.169	4.10	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	200	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS}=0V，V_{DS}=200V	-	-	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	2.0	2.5	3.5	V
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS}=10V，I_{DS}=100A	-	10.0	10.3	mΩ
Gate Resistance	R_G		-	1.6	2.9	Ω
Forward Transconductance	g_{fs}	$\lvert V_{DS}\rvert$ >2 $\lvert I_D\rvert$ $R_{DS(on)M}$ [1]，I_D =100A	-	117	-	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=25V	-	30790	-	pF
Output Capacitance	C_{oss}	V_{GS}=0V	-	671	-	pF
Reverse Transfer Capacitance	C_{rss}	Freq.=1MHz	-	389	-	pF
Switching Characteristics						
Turn-On Delay Time	$t_{d(on)}$	V_{DD}=100V	-	88	-	ns
Rise Time	t_r	V_{GS}=10V	-	36	-	ns
Turn-Off Delay Time	$t_{d(off)}$	I_{DS}=80A	-	204	-	ns
Fall Time	t_f	R_G=1.6Ω	-	40	-	ns
Total Gate Charge at 10V	Q_g	V_{DS}=100V	-	198	-	nC
Gate to Source Charge	Q_{gs}	V_{GS}=10V	-	141	-	nC
Gate to Drain Charge	Q_{gd}	I_{DS}=80A	-	107	-	nC
Reverse Diode Characteristics						
Drain-Source Diode Forward Voltage	V_F	T_J =25°C，I_F=100A	-	-	0.90	V
Diode Continuous Forward Current	I_F		-	-	130	A
Diode Pulsed Current [1]	$I_{F,pulse}$		-	-	500	A
Reverse Recovery time	T_{RR}	I_F=0.5V，I_R=1.0A，I_{RR}=0.25A	-	-	250	ns

Notes:

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

Typical Characteristics

Fig 1. Power dissipation

$P_{tot} = f(T_C)$
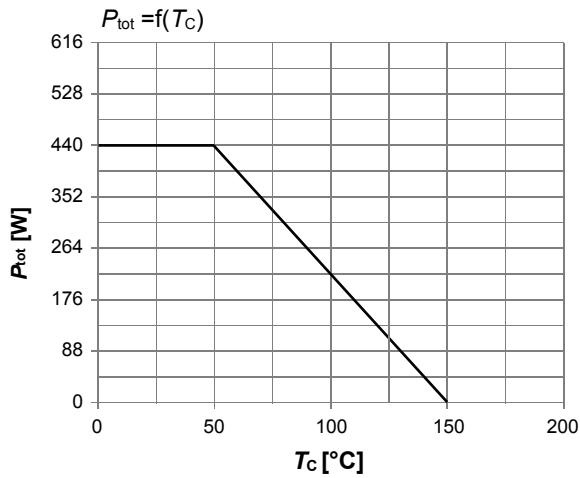
Fig 2. Drain current

$I_D = f(T_C)$; $V_{GS} \geq 10V$
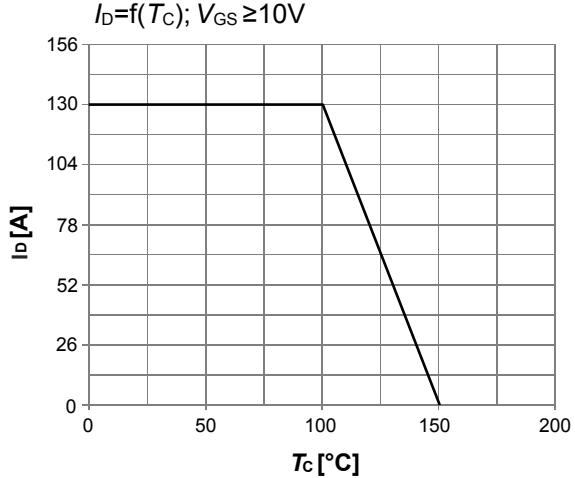
Fig 3. Safe operating area

$I_D = f(V_{DS})$; $T_C = 25°C$; $D = 0$; parameter: t_p
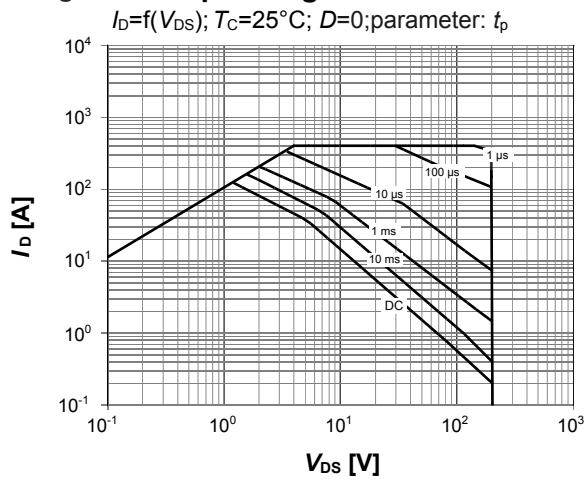
Fig 4. Maximum Transient Thermal Impedance
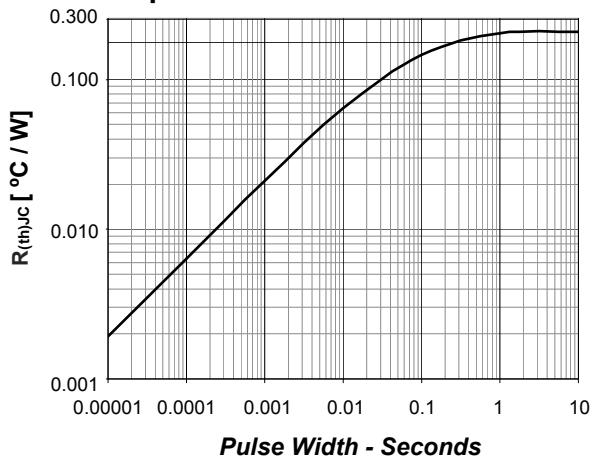

Fig 5. Typ. output characteristics

$I_D = f(V_{DS})$; $T_j = 25°C$; parameter: V_{GS}
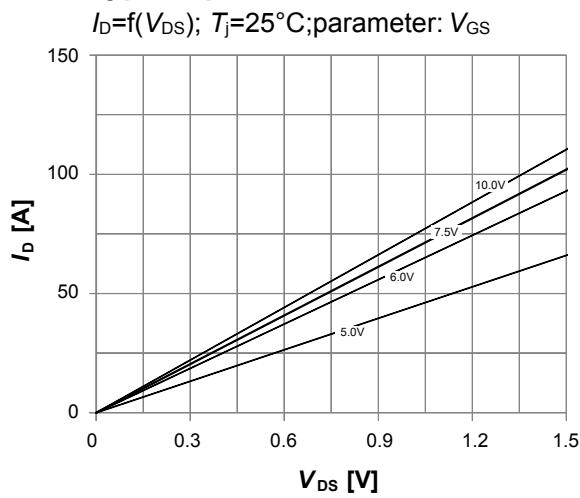
Fig 6. Typ. drain-source on resistance

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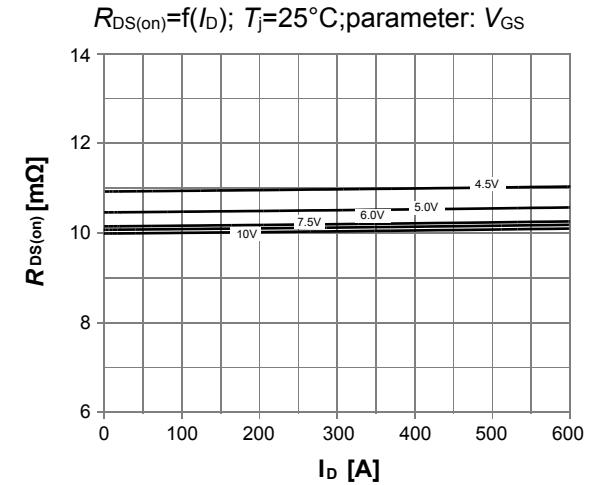
Typical Characteristics

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
$R_{DS(on)} = f(T_j)$; $I_D = 150A$; $V_{GS} = 10V$
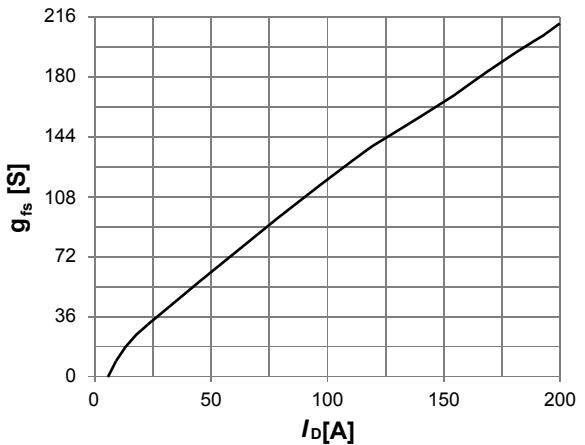
Fig 10. Typ. gate threshold voltage
$V_{GS(th)} = f(T_j)$; $V_{GS} = V_{DS}$; parameter: I_D

Fig 11. Typ. capacitances
$C = f(V_{DS})$; $V_{GS} = 0V$; $f = 1MHz$
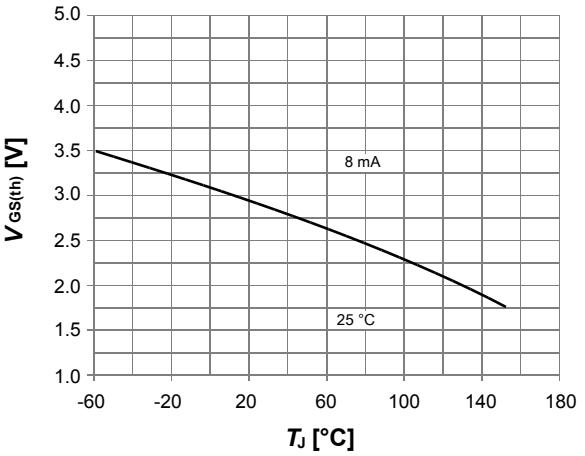
**Fig 12. Typical forward characteristics of reverse diode**
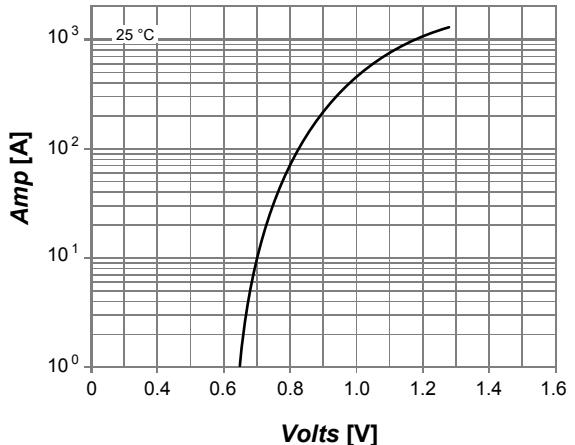
Typical Characteristics

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

Single Phase,Half Wave
60Hz Resistive or Inductive Load

T_C [°C]
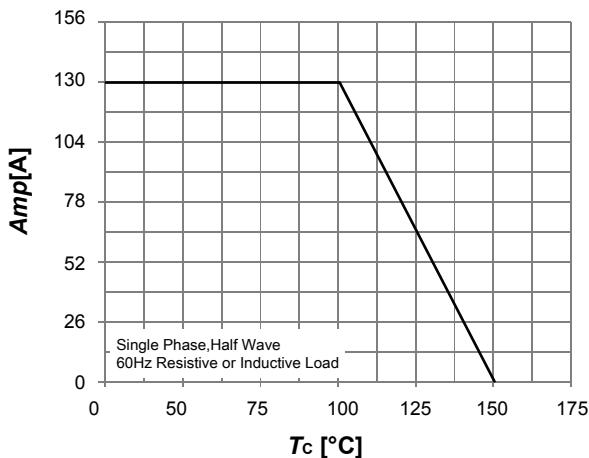
Fig 14. Peak forward surge current of reverse diode

8.3ms Single Half Sine Wave
JEDEC method T_J = 25°C

Cycles
Number Of Cycles At 60Hz
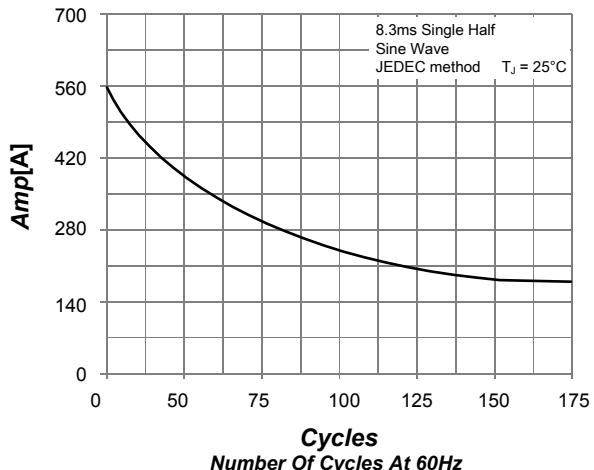
Fig 15. Typical reverse diode characteristics

T_J = 125°C

T_J = 25°C

Volts [%]
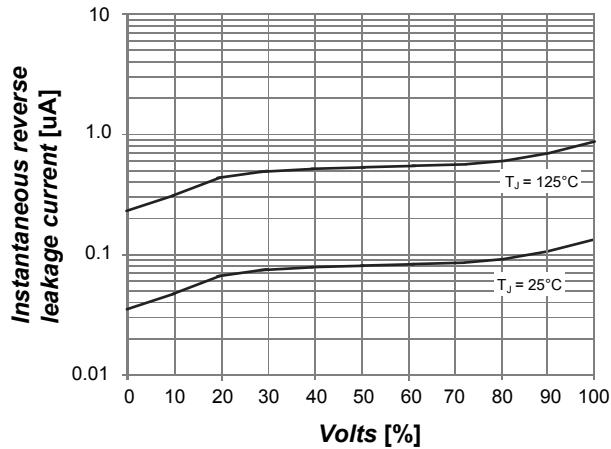
Fig 16. Typ. gate charge

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

20V   50V   80V

Q_{gate} [nC]
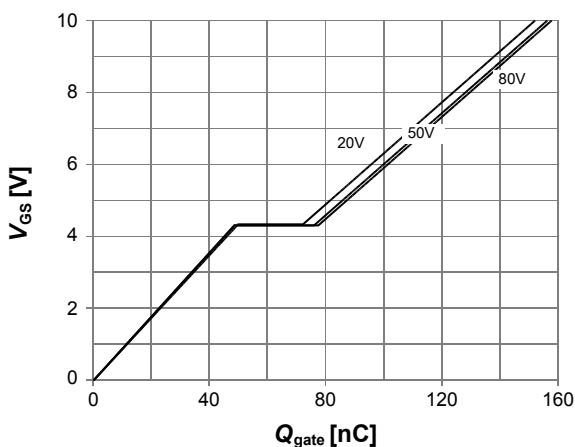
Fig 17. Gate charge waveforms

v_{GS}

Q_g

$V_{gs(th)}$

$Q_{g(th)}$ Q_{sw} Q_{gate}

Q_{gs} Q_{gd}
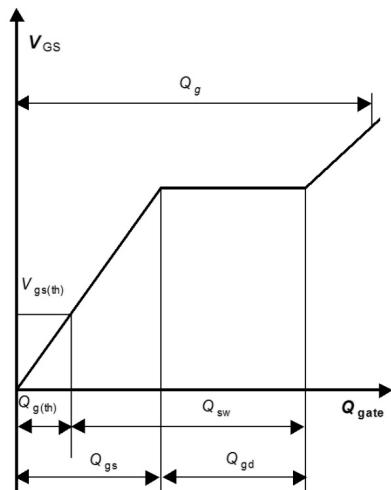
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