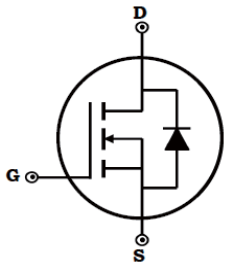
DACO SEMICONDUCTOR

DADMI040N120Z1B

N-Channel Enhancement Mode Power MOSFET 1200V / 40A

Features

- V_{DSS} = 1200V
- $R_{DS(ON)}$ < 322mΩ@ V_{GS} = 10 V
- T_{RR} < 90ns
- Fully Avalanche Rated
- Pb Free & RoHS Compliant
- Isolation Type Package
- Electrically Isolation Base Plate



SOT-227

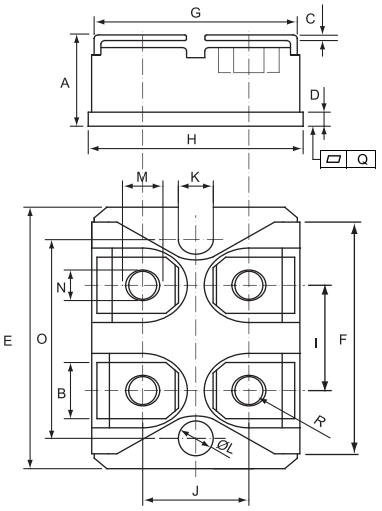
Applications

- Switch-Mode and Resonant-Mode Power Supplies
- Robotics and Servo Controls
- AC and DC Motor Drives
- Laser Drivers
- DC-DC Converters

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

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	1200	V
Gate-Source Voltage	V_{GS}	±30	V
Drain Current-Continuous @ T_C =25°C @ T_C =100°C	I_D	40 24	A
Drain Current-Pulsed @ T_C =25°C	I_{DM}	100	A
Maximum Power Dissipation	P_D	1000	W
Avalanche Energy, Single Pulse	E_{AS}	420	mJ
Storage Temperature Range	T_{STG}	-50 to +150	°C
Operating Junction Temperature Range	T_J	-50 to +150	°C
Thermal Resistance, Junction-to-Case	$R\theta_{JC}$	0.125	°C/W
Isolation Voltage (A.C. 1 minute) between All Terminals and Baseplate	V_{iso}	2500	V
Mounting torque (M4 Screw) To heatsink To terminals	M_d	1.3 1.1	N m

Dimensions in inches and (millimeters)



DIMENSIONS				
	INCHES		MM	
	MIN	MAX	MIN	MAX
A	0.460	0.483	11.68	12.28
B	0.307	0.323	7.80	8.20
C	0.030	0.033	0.75	0.85
D	0.071	0.081	1.80	2.05
E	1.488	1.504	37.80	38.20
F	1.248	1.260	31.70	32.00
G	0.917	0.957	23.30	24.30
H	0.996	1.008	25.30	25.60
I	0.579	0.602	14.70	15.30
J	0.492	0.516	12.50	13.10
K	0.161	0.169	4.10	4.30
L	0.161	0.169	4.10	4.30
M	0.181	0.197	4.60	5.00
N	0.165	0.181	4.20	4.60
O	1.181	1.197	30.00	30.40
Q	-0.002	0.004	-0.05	0.10
R	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	1200	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS}=0V，V_{DS}=1200V	-	-	50	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±30V，V_{DS}=0V	-	-	±300	nA
ON Characteristics						
Gate Threshold Voltage	V_{TH}	V_{DS}=V_{GS}，I_{DS}=1mA	3.5	-	6.5	V
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS}=10V，I_{DS}=20A	-	-	322	mΩ
Gate Resistance	R_G		-	20	-	Ω
Forward Transconductance	g_{fs}	V_{DS}=20V， I_D=20A	-	56	-	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=25V	-	19	-	nF
Output Capacitance	C_{oss}	V_{GS}=0V	-	1390	-	pF
Reverse Transfer Capacitance	C_{rss}	Freq.=1MHz	-	262	-	
Switching Characteristics						
Turn-On Delay Time	$t_{d(on)}$	V_{DS}=600V	-	123	-	ns
Rise Time	t_r	V_{GS}=10V	-	44	-	
Turn-Off Delay Time	$t_{d(off)}$	I_{DS}=21A	-	155	-	
Fall Time	t_f	R_G=1Ω	-	22	-	
Total Gate Charge at 10V	Q_g	V_{DS}=600V	-	372	-	nC
Gate to Source Charge	Q_{gs}	V_{GS}=10V	-	111	-	
Gate to Drain Charge	Q_{gd}	I_{DS}=20A R_G=1Ω	-	147	-	
Reverse Diode Characteristics						
Drain-Source Diode Forward Voltage	V_F	T_J=25°C，I_F=40A	-	-	2.5	V
Diode Continuous Forward Current	I_F		-	-	40	A
Diode Pulsed Current Note1	$I_{F,pulse}$		-	-	130	A
Reverse Recovery time	T_{RR}	I_F=20A，V_R=100V， -di/dt=100A/us	-	-	90	ns
Reverse Recovery Charge	Q_{rr}		-	195	-	nC
Peak Reverse Recovery Current	I_{RM}		-	4.1	-	A

Notes:

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

Typical Characteristics

Fig. 1. Maximum Drain Current vs. Case Temperature

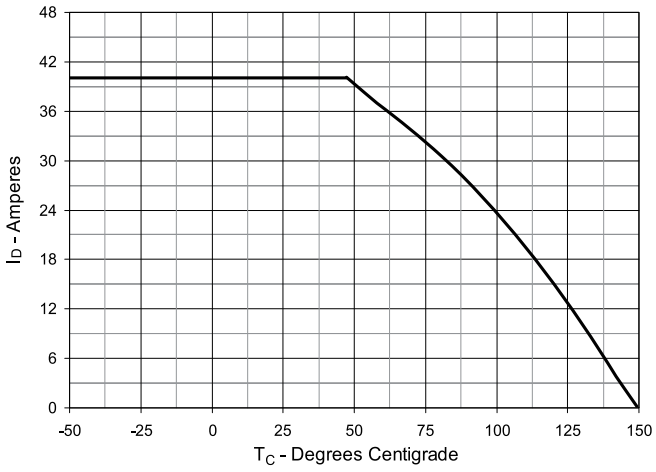


Fig. 2. Output Characteristics @ T_J = 25°C

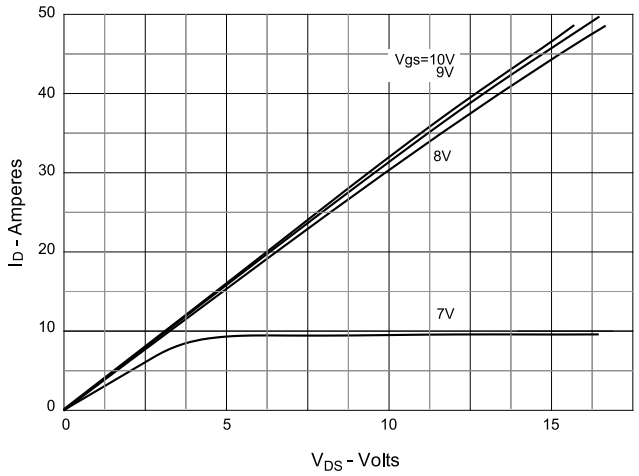


Fig. 3. Extended Output Characteristics @ T_J = 25°C

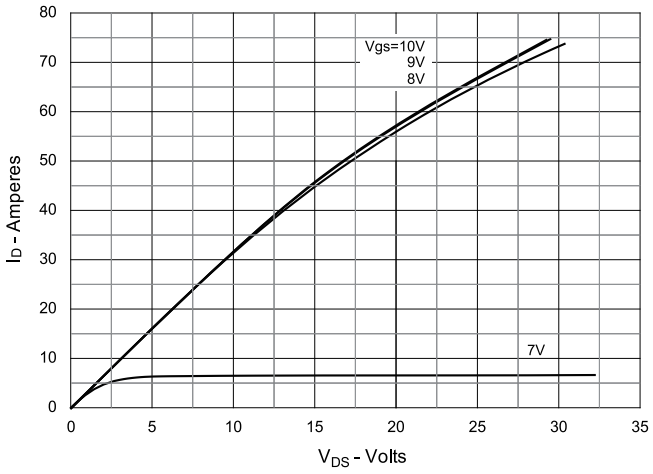


Fig. 4. Output Characteristics @ T_J = 125°C

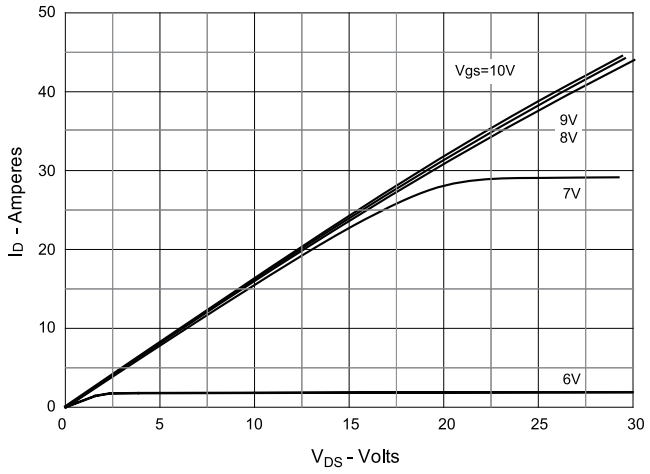


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 20A Value vs. Drain Current

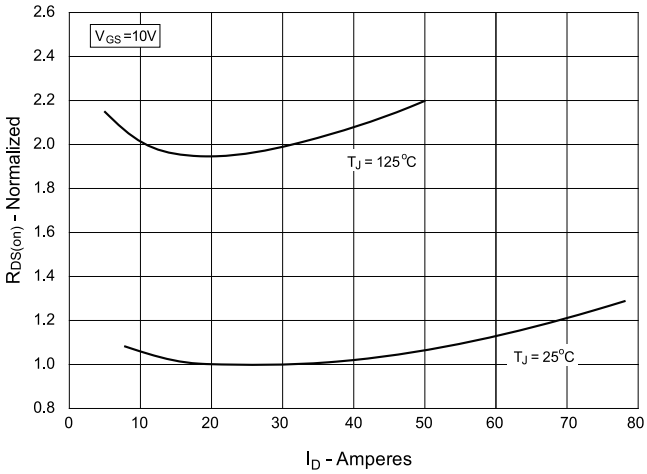
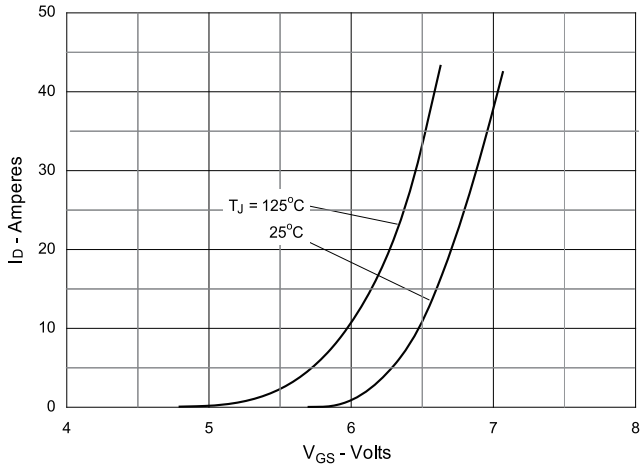


Fig. 6. Input Admittance



Typical Characteristics

Fig. 7. Transconductance

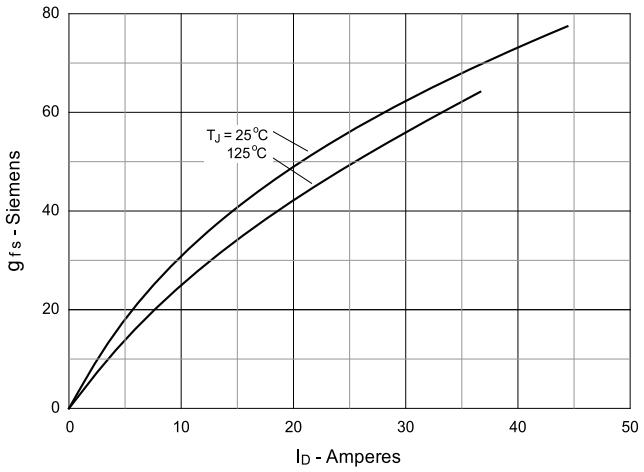


Fig. 8. Gate Charge

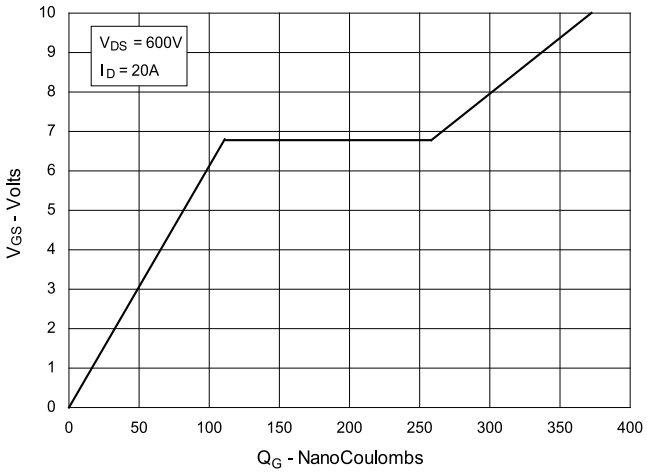


Fig. 9. Forward Voltage Drop of Intrinsic Diode

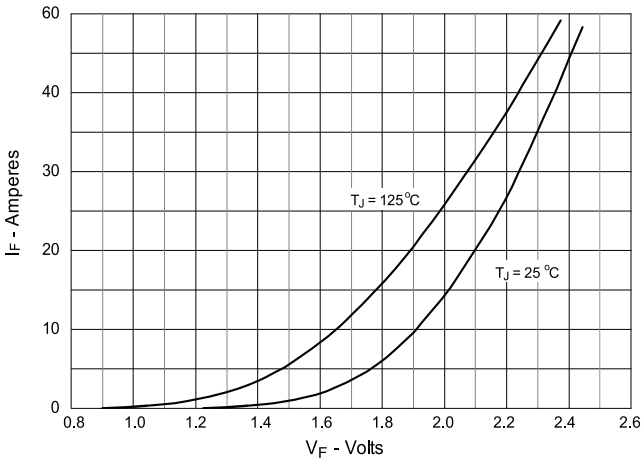


Fig. 10. Capacitance

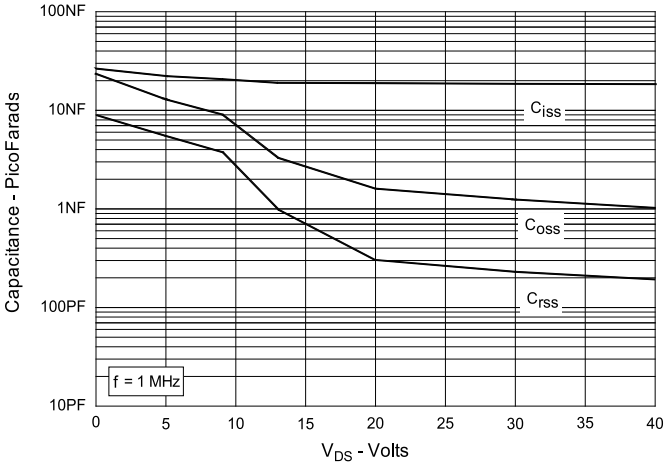


Fig 11. Forward derating curve of reverse diode

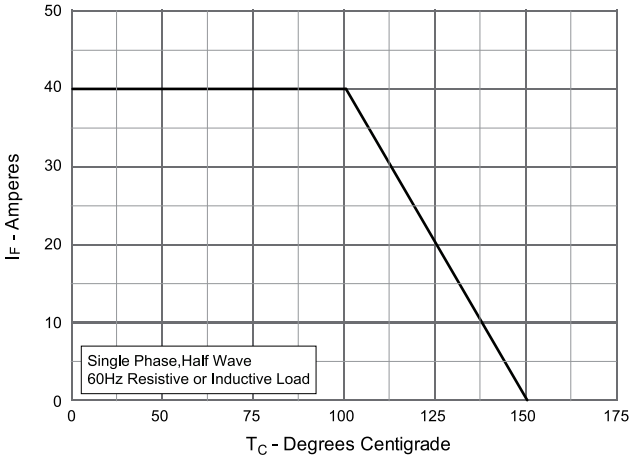
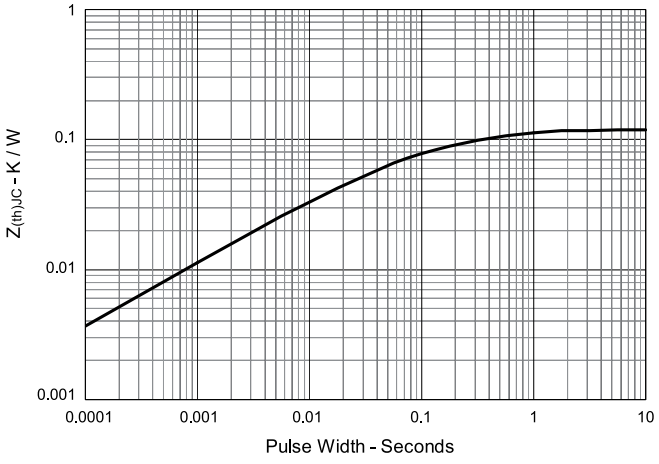


Fig 12. Maximum Transient Thermal Impedance



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