DACO

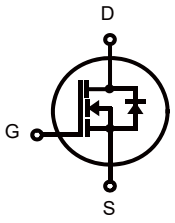
DACMA350N120BZ2

SiC MOSFET Power Module

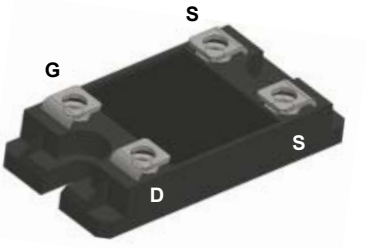
Preliminary

Features

- V_{DSS} = 1200V
- $R_{DS(ON)}$ typ. 4.6mΩ@ V_{GS} = 18V
- High speed switching with low capacitances
- Easy to parallel and simple to drive
- Real Kelvin Source Connection
- Pb Free & RoHS Compliant
- Electrically Isolation base plate



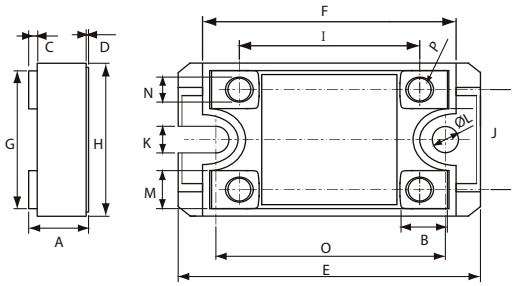
SOT-227H



Dimensions in inches and (millimeters)

Applications

- Solar Inverters
- UPS
- Motor Drive
- Induction heating
- Switch Mode Power Supplies
- Battery Chargers
- 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 (dynamic)		$V_{GS(max)}$	-10/+23	V
Gate-Source Voltage (static)		$V_{GS(OP)}$	-4/+18	V
Drain Current-Continuous	@ T_C =25°C @ T_C =100°C	I_D	500 350	A
Drain Current-Pulsed	@ T_C =25°C	I_{DM}	1000	A
Maximum Power Dissipation		P_D	1150	W
Storage Temperature Range		T_{STG}	-40 to +125	°C
Operating Junction Temperature Range		T_{VJ}	-40 to +175	°C
Thermal Resistance, Junction-to-Case		$R_{\theta JC}$	0.13	°C/W
Isolation Voltage (A.C. 1 minute) between All Terminals and Baseplate		V_{iso}	2500	V
Mounting torque (M4 Screw)		M_d	1.3	N m

DIMENSIONS				
DIM	INCHES		MM	
	MIN	MAX	MIN	MAX
A	0.516	0.532	13.10	13.50
B	0.355	0.374	9.00	9.50
C	0.075	0.091	1.90	2.30
D	0.014	0.033	0.35	0.85
E	2.541	2.557	64.50	64.90
F	2.104	2.120	53.40	53.80
G	1.127	1.143	28.60	29.00
H	1.253	1.269	31.80	32.20
I	1.448	1.468	36.75	37.25
J	0.812	0.827	20.60	21.00
K	0.201	0.217	5.10	5.50
L	0.201	0.217	5.10	5.50
M	0.307	0.323	7.80	8.20
N	0.169	0.185	4.30	4.70
O	1.931	1.946	49.00	49.40
P	M4*8			

Electrical Characteristics @ T_{VJ} =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}=0.5mA		1200	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS}=0V，V_{DS}=1200V		-	-	200	uA
Gate-Body Leakage	I_{GSS}	V_{GS}=20V，V_{DS}=0V		-	-	500	nA
ON Characteristics							
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}，I_{DS}=100mA		2.1	3.0	4.2	V
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS}=18V，I_{DS}=200A		-	4.6	6.0	mΩ
Gate Resistance	$R_{G(int)}$	Internal gate resistor	T_{VJ}=25°C	-	2.92	-	Ω
Dynamic Characteristics							
Input Capacitance	C_{iss}	V_{DS}=800V V_{GS}=0V V_{AC}=1V Freq.=100KHz		-	16.75	-	nF
Output Capacitance	C_{oss}			-	0.74	-	
Reverse Transfer Capacitance	C_{rss}			-	0.086	-	
Total Gate Charge	Q_g	V_{DS}=600V V_{GS}=-4V/+18V I_{DS}=350A		-	661	-	nC
Gate to Source Charge	Q_{gs}			-	340	-	
Gate to Drain Charge	Q_{gd}			-	74	-	
Switching Characteristics							
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 600V V_{GS} = -4V/+18V I_{DS}=350A $R_{G(on)}$=2.2Ω $R_{G(off)}$=2.2Ω	T_{VJ}=25°C	-	110	-	ns
			T_{VJ}=150°C	-	97	-	
Rise Time	t_r		T_{VJ}=25°C	-	256	-	
			T_{VJ}=150°C	-	209	-	
Turn-Off Delay Time	$t_{d(off)}$		T_{VJ}=25°C	-	202	-	
			T_{VJ}=150°C	-	252	-	
Fall Time	t_f		T_{VJ}=25°C	-	40	-	
			T_{VJ}=150°C	-	41	-	
Turn-On Switching Energy	E_{on}	V_{DD} = 600V V_{GS} = -4V/+18V I_{DS}=350A $R_{G(on)}$=2.2Ω $R_{G(off)}$=2.2Ω	T_{VJ}=25°C	-	28	-	mJ
			T_{VJ}=150°C	-	16	-	
Turn-Off Switching Energy	E_{off}		T_{VJ}=25°C	-	41	-	
			T_{VJ}=150°C	-	37	-	
Body Diode Characteristics at T_J = 25° C, unless otherwise specified							
Continuous Diode Fwd Current	I_{SDC}	V_{GS}= 0V		-	350	-	A
Drain-Source Reverse Voltage	V_{SD}	I_{SD} = 300A，V_{GS} = 0 V		-	4.4	-	V
MOSFET Forward Recovery Charge	Q_{rr}	V_{DD} =600V I_{DS} =350A V_{GS} = -4/+18V di/dt = 1500 A/μs	T_{VJ}=25°C	-	532	-	nC
			T_{VJ}=150°C	-	1564	-	
MOSFET Peak Forward Recovery Current	Irrm		T_{VJ}=25°C	-	24	-	A
			T_{VJ}=150°C	-	40	-	
MOSFET Reverse Recovery Time	T_{rr}		T_{VJ}=25°C	-	41	-	ns
			T_{VJ}=150°C	-	65	-	

Notes:

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

Typical Characteristics

Fig.1 Output Characteristics at T_J = 25°C

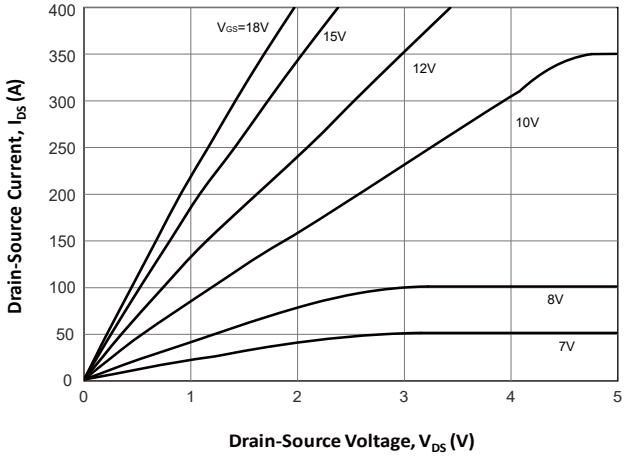


Fig.2 Output Characteristics at T_J =125°C

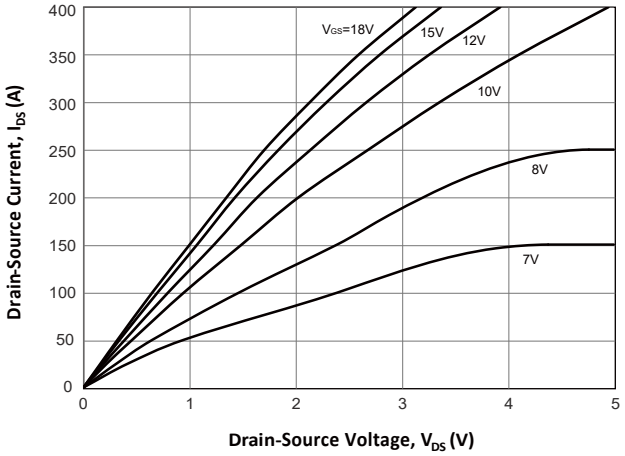


Fig.3 Drain Source on Resistance

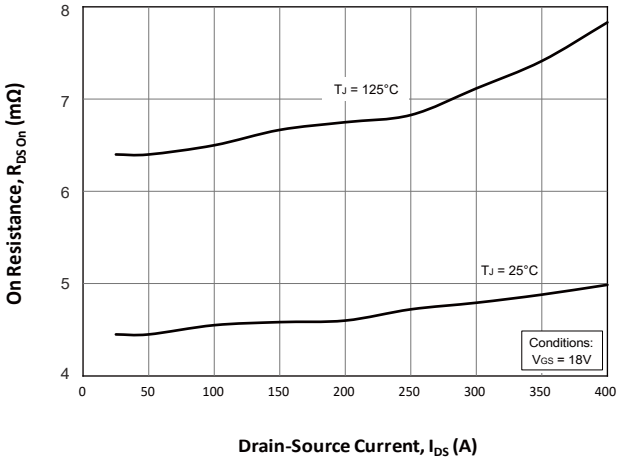


Fig.4 Transfer Characteristics

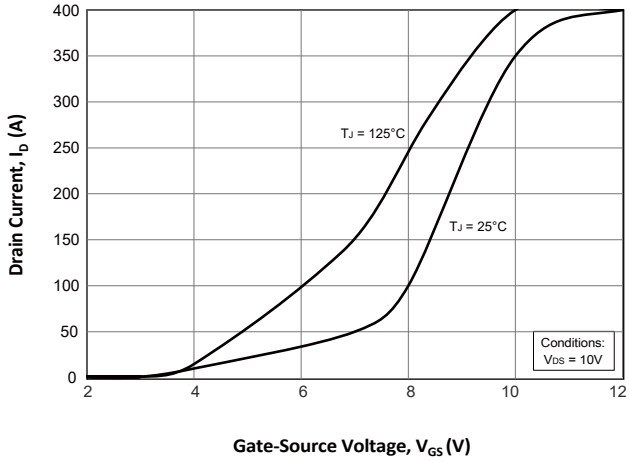


Fig.5 Capacitances vs. Drain-Source Voltage

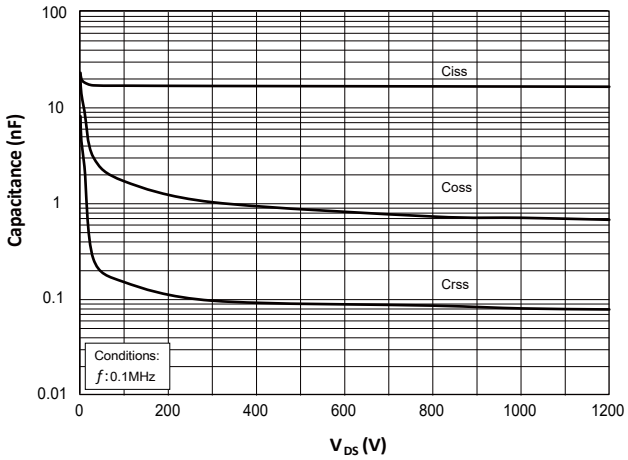
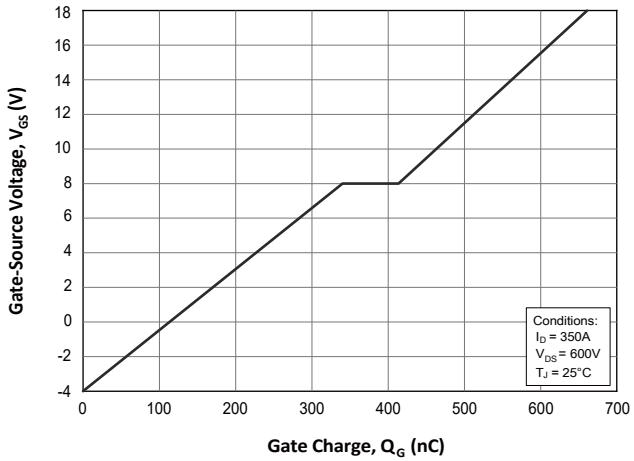


Fig.6 Gate Charge Characteristics



Typical Characteristics

Fig.7 Switching losses vs R_G change T_J=125°C

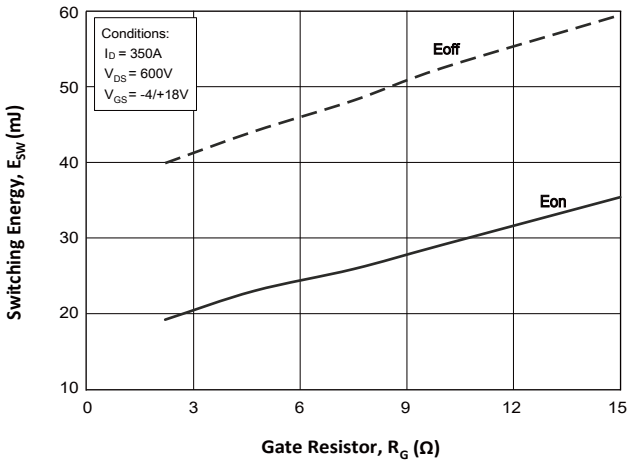


Fig.8 Switching losses vs R_G change T_J=150°C

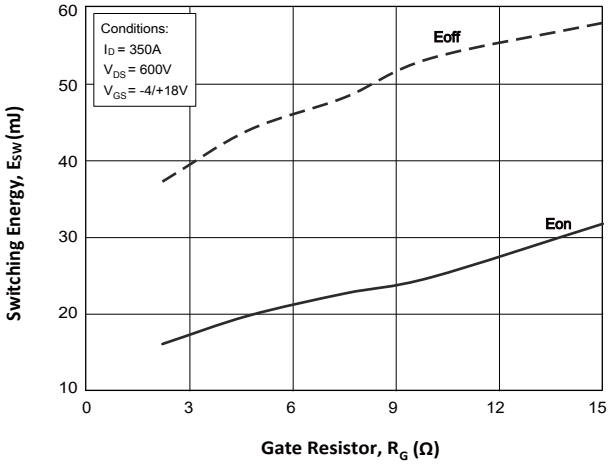


Fig.9 Switching Timer vs R_G Change T_J=125°C

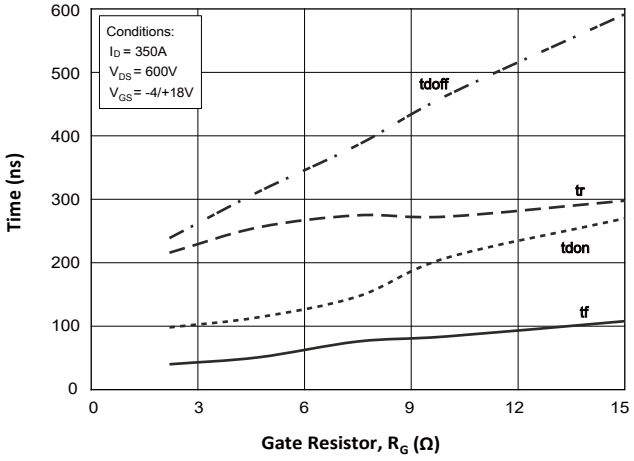


Fig.10 Switching Timer vs R_G Change T_J=150°C

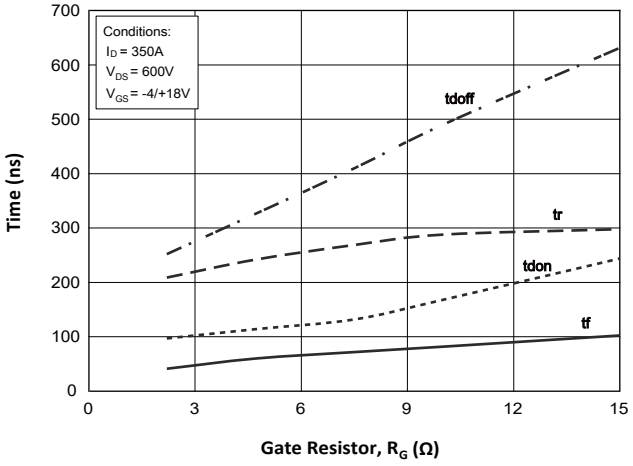


Fig.11 Clamped Inductive Switching Energy vs. Drain Current T_J =125°C

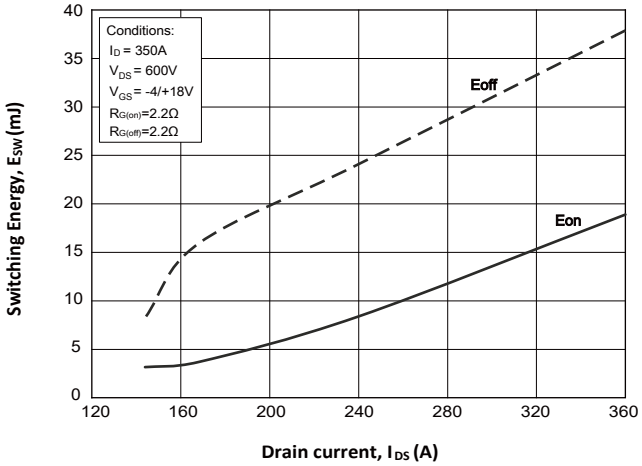
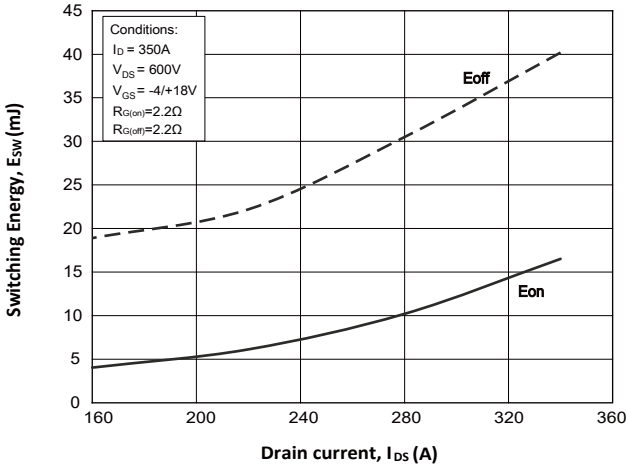


Fig.12 Clamped Inductive Switching Energy vs. Drain Current T_J =150°C



Typical Characteristics

Fig.13 Body Diode curves T_J =25°C

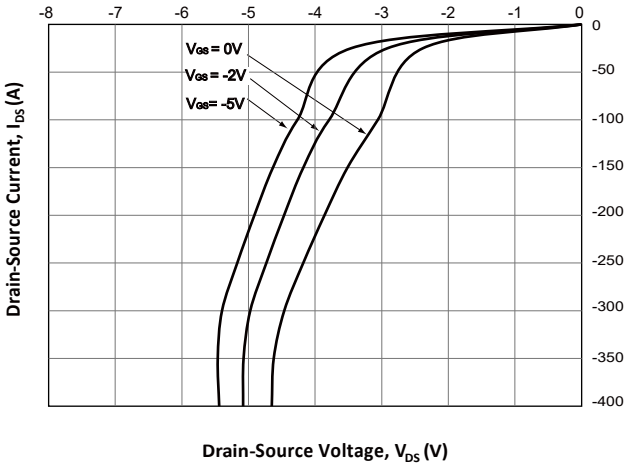


Fig.14 Body Diode curves T_J = 125°C

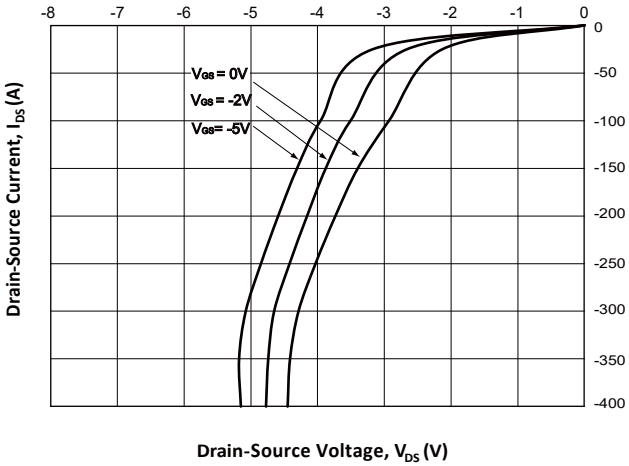


Fig.15 Continuous Drain Current (MOSFET) vs. Case Temperature

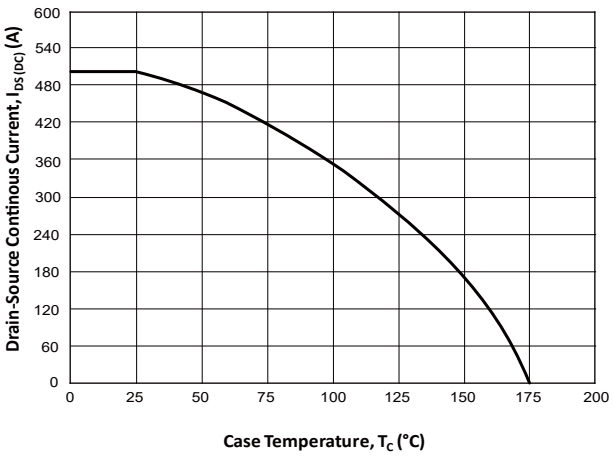
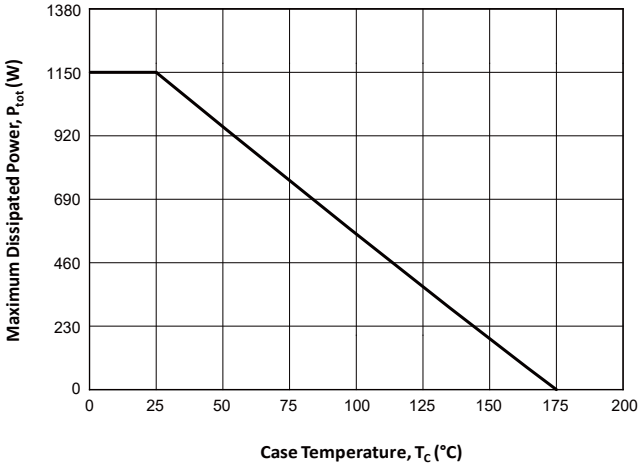


Fig.16 Max. Power Dissipation (MOSFET) Derating vs. Case Temperature



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