DACMB200N170BH2

SiC MOSFET Power Module

Preliminary

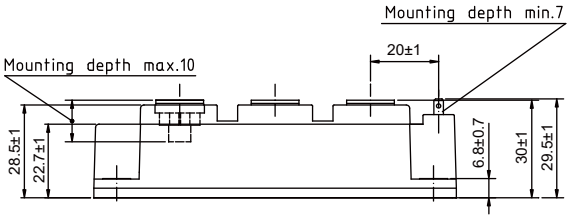
Features

- V_{DSS} = 1700V
- $R_{DS(ON)}$ typ. 9.5mΩ@ V_{GS} = 18V
- High speed switching with low capacitances
- Easy to parallel and simple to drive
- Pb Free & RoHS Compliant
- Electrically Isolation base plate

HBA-10662

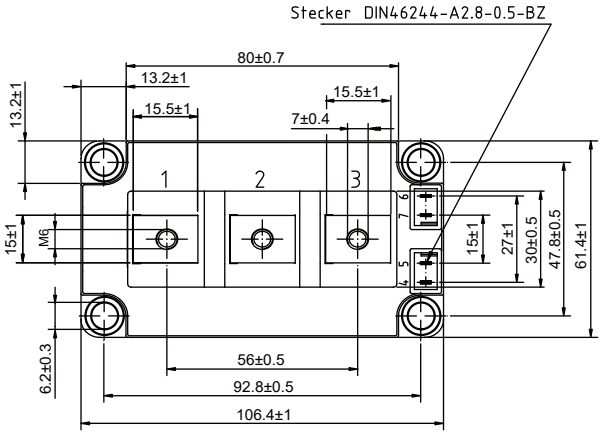


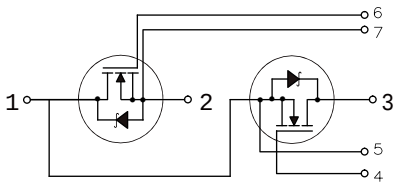
Dimensions in inches and (millimeters)



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}	1700	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	270 200	A
Drain Current-Pulsed	@ T_C =25°C	I_{DM}	540	A
Maximum Power Dissipation		P_D	1363	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		$R_{\theta JC}$	0.11	°C/W
Isolation Voltage (A.C. 1 minute) between All Terminals and Baseplate		V_{iso}	3000	V
Mounting torque (M6 Screw)	To heatsink To terminals	M_d	3~6 2.5~5	N_m

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		1700	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS}=0V，V_{DS}=1700V		-	-	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		2.3	3.3	4.7	V
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS}=18V，I_{DS}=100A		-	9.5	12.4	mΩ
Gate Resistance	$R_{G(int)}$	Internal gate resistor	T_{VJ} =25°C	-	5.74	-	Ω
Dynamic Characteristics							
Input Capacitance	C_{iss}	V_{DS}=800V V_{GS}=0V V_{AC}=1V Freq.=100KHz		-	13.7	-	nF
Output Capacitance	C_{oss}			-	0.35	-	
Reverse Transfer Capacitance	C_{rss}			-	0.049	-	
Total Gate Charge	Q_g	V_{DS}=850V V_{GS}=-4V/+18V I_{DS}=200A		-	323	-	nC
Gate to Source Charge	Q_{gs}			-	182	-	
Gate to Drain Charge	Q_{gd}			-	55	-	
Switching Characteristics							
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 850V V_{GS} = -4/+18V I_{DS}=200A $R_{G(on)}$ =4.7Ω $R_{G(off)}$ =4.7Ω	T_{VJ} =25°C	-	135	-	ns
			T_{VJ} =150°C	-	115	-	
Rise Time	t_r		T_{VJ} =25°C	-	98	-	
			T_{VJ} =150°C	-	112	-	
Turn-Off Delay Time	$t_{d(off)}$		T_{VJ} =25°C	-	274	-	
			T_{VJ} =150°C	-	319	-	
Fall Time	t_f		T_{VJ} =25°C	-	40	-	
			T_{VJ} =150°C	-	49	-	
Turn-On Switching Energy	E_{on}	V_{DD} =850V V_{GS} = -4V/+18V I_{DS} =200A $R_{G(on)}$ =4.7Ω $R_{G(off)}$ =4.7Ω	T_{VJ} =25°C	-	6.7	-	mJ
			T_{VJ} =150°C	-	7.8	-	
Turn-Off Switching Energy	E_{off}		T_{VJ} =25°C	-	13.3	-	
			T_{VJ} =150°C	-	14.1	-	
Body Diode Characteristics at T_J = 25° C, unless otherwise specified							
Continuous Diode Fwd Current	I_{SDC}	V_{GS}= 0V		-	200	-	A
Drain-Source Reverse Voltage	V_{SD}	I_{SD} = 200A，V_{GS} = 0V		-	4.6	-	V
MOSFET Forward Recovery Charge	Q_{rr}	V_{DD} = 850V I_{DS} =200A V_{GS}= -4/+18V di/dt = 3050A/μs	T_{VJ} =25°C	-	388	-	nC
			T_{VJ} =150°C	-	2979	-	
MOSFET Peak Forward Recovery Current	Irrm		T_{VJ} =25°C	-	28	-	A
			T_{VJ} =150°C	-	120	-	
MOSFET Reverse Recovery Time	T_{rr}		T_{VJ} =25°C	-	22	-	ns
			T_{VJ} =150°C	-	48	-	

Notes:

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

Typical Characteristics

Fig.1 Output Characteristics at T_J = 25°C

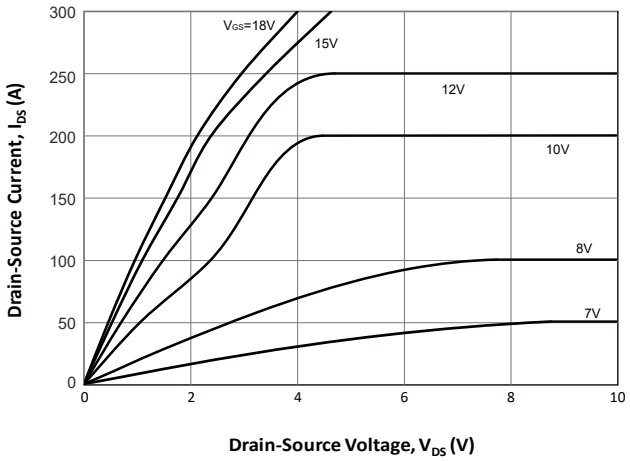


Fig.2 Output Characteristics at T_J =125°C

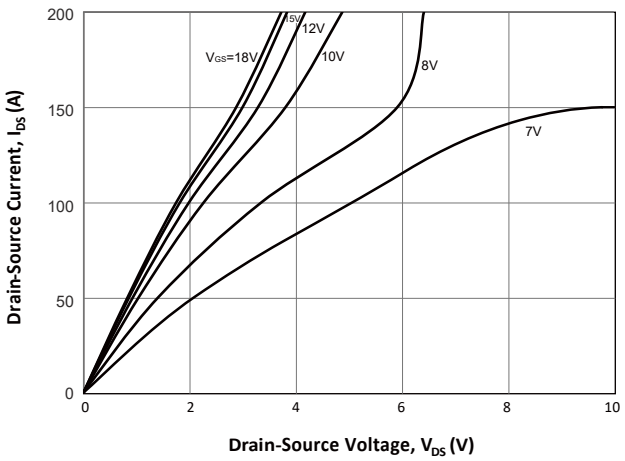


Fig.3 Drain Source on Resistance

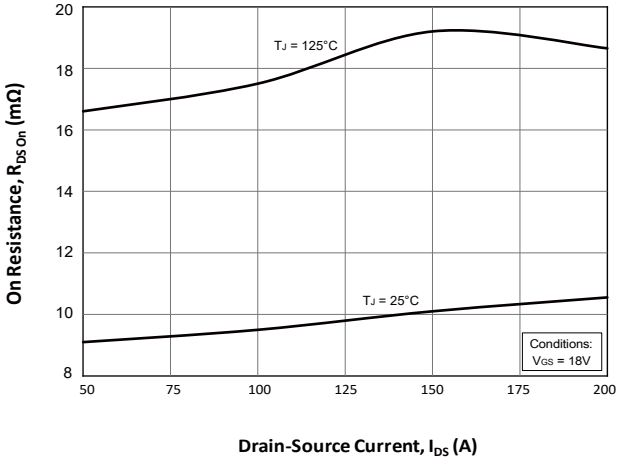


Fig.4 Transfer Characteristics

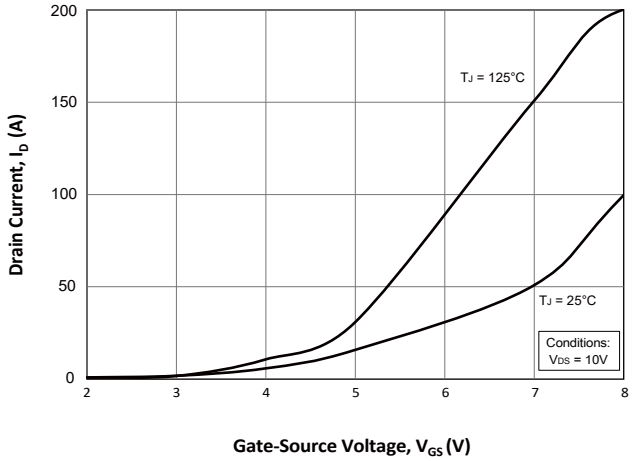


Fig.5 Capacitances vs. Drain-Source Voltage

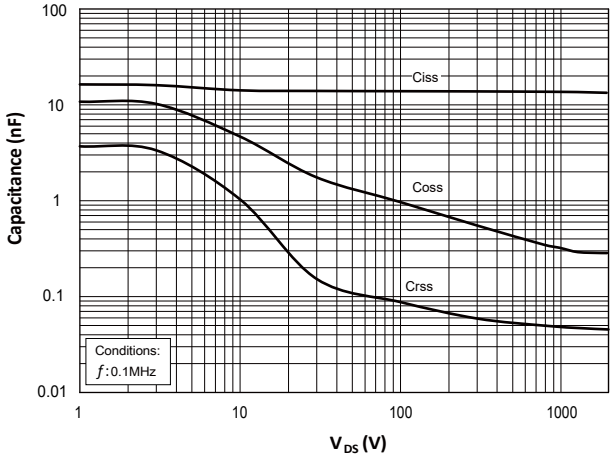
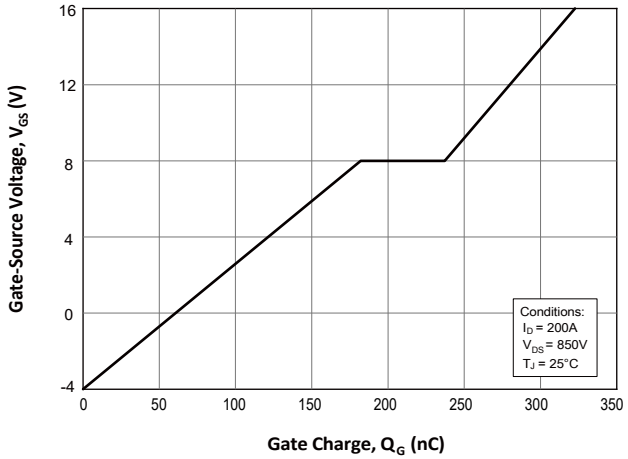


Fig.6 Gate Charge Characteristics



Typical Characteristics

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

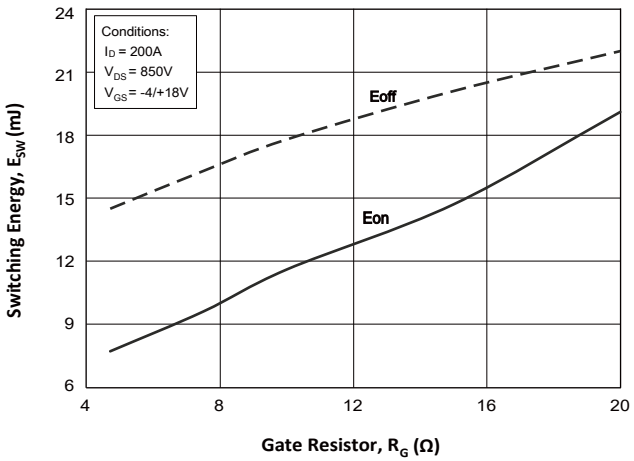


Fig.8 Switching losses vs R_G change T_J=150°C

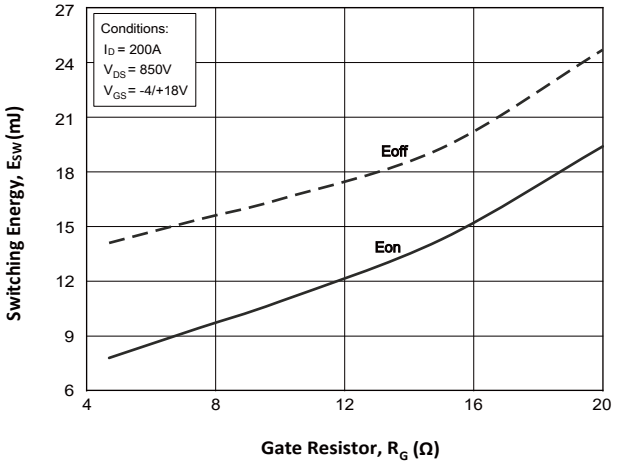


Fig.9 Switching Timer vs R_G Change T_J=125°C

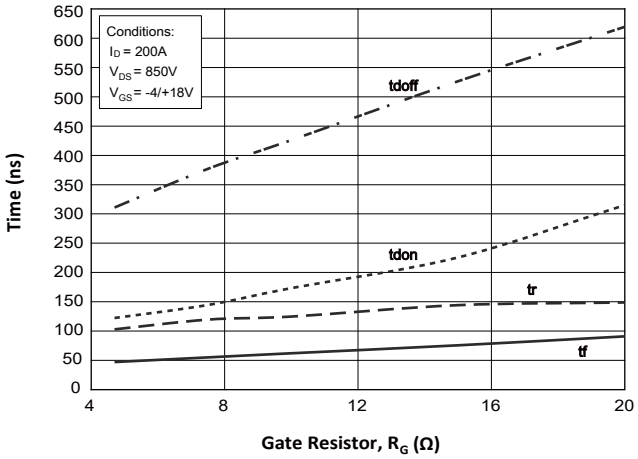


Fig.10 Switching Timer vs R_G Change T_J=150°C

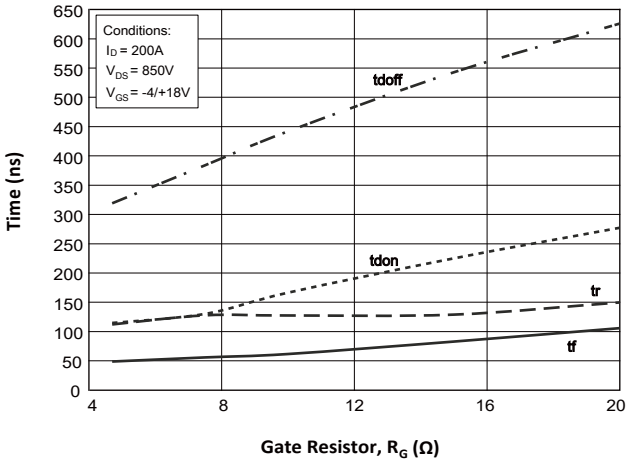


Fig.11 Clamped Inductive Switching Energy vs. Drain Current T_J =125°C

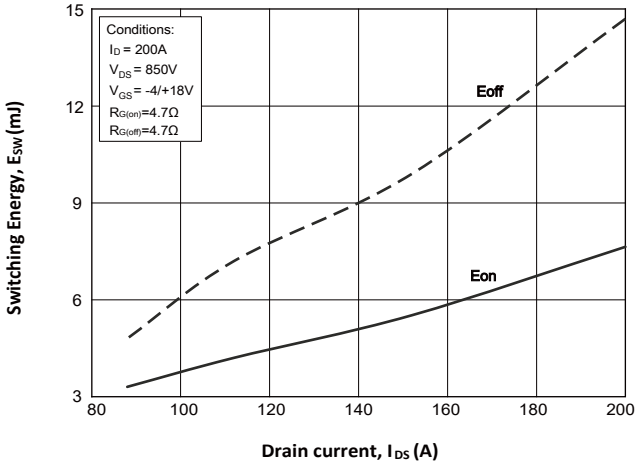
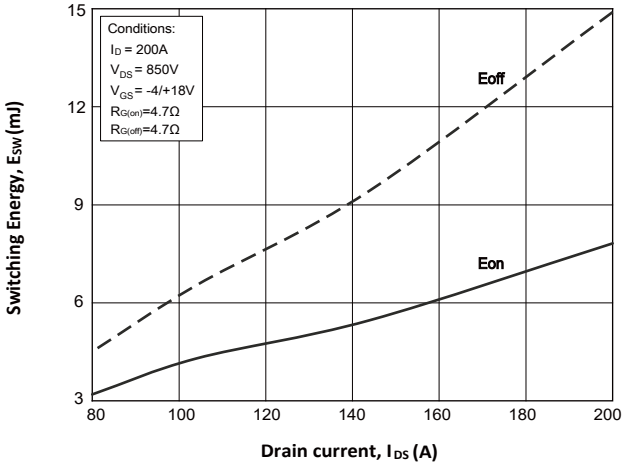


Fig.12 Clamped Inductive Switching Energy vs. Drain Current T_J =150°C



Typical Characteristics

Fig.13 Body Diode curves T_J =25°C

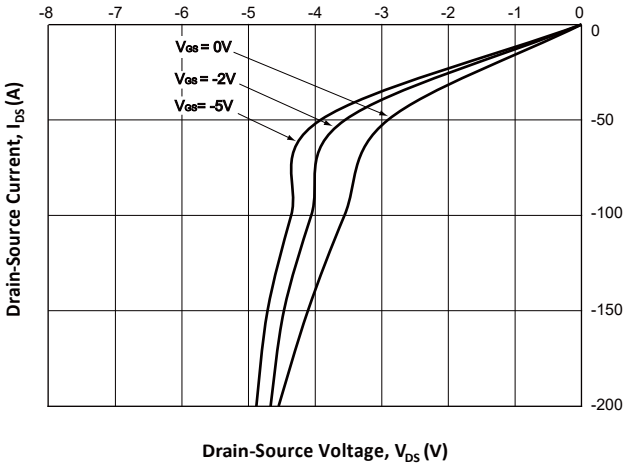


Fig.14 Body Diode curves T_J = 125°C

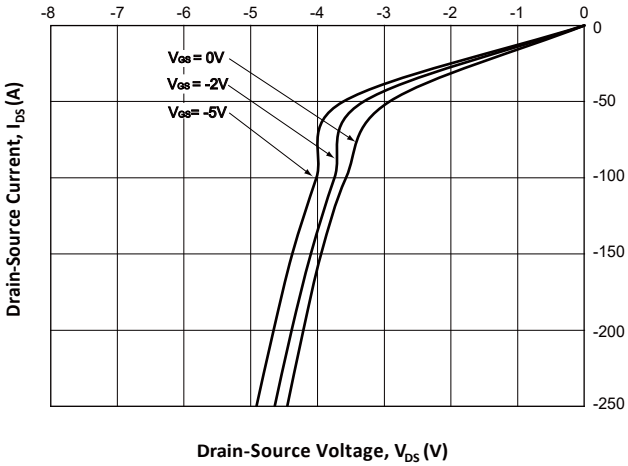


Fig.15 Continuous Drain Current (MOSFET) vs. Case Temperature

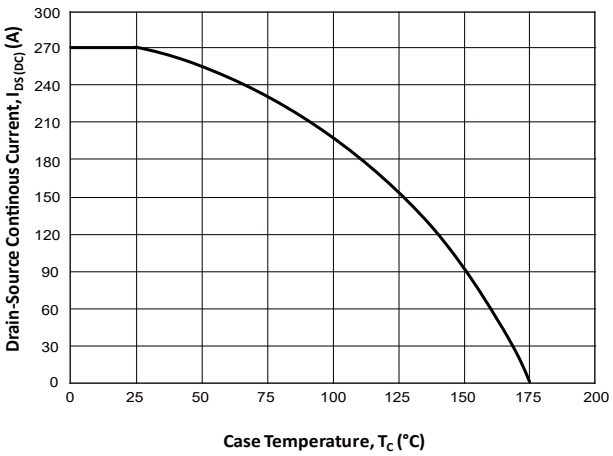
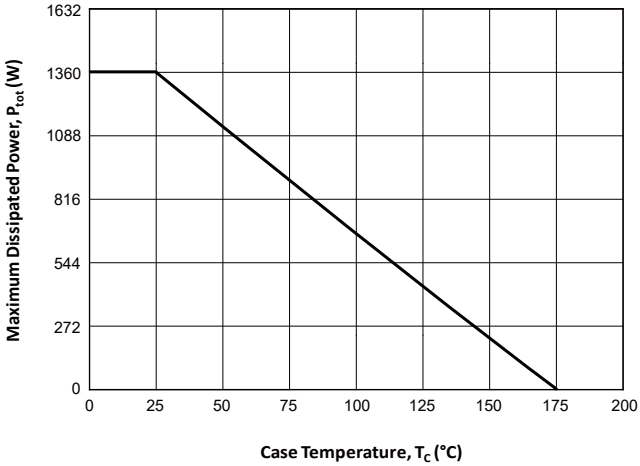


Fig.16 Max. Power Dissipation (MOSFET) Derating vs. Case Temperature



Disclaimer

DACO Semiconductor reserves the right to make modifications, enhancements, improvements, corrections, or other changes to this document and any product described herein without prior notice.For the most up-to-date version, please visit our website.

DACO Semiconductor makes no warranty, representation, or guarantee regarding the suitability of its products for any particular purpose, nor does DACO Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any liability, including without limitation special, consequential or incidental damages.

Purchasers are responsible for its products and applications using DACO Semiconductor products, including compliance with all laws, regulations, and safety requirements or standards, regardless of any support or application information provided by DACO Semiconductor. “Typical” parameters that may be provided in DACO Semiconductor datasheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including “Typical” must be validated for each customer application by the customer’s technical experts.

DACO Semiconductor products are not designed, authorized, or warranted to be suitable for use in life support, life-critical or safety-critical systems, or equipment, nor in applications where failure or malfunction of DACO Semiconductor’s product can reasonably be expected to result in personal injury, death or severe property or environmental damage. DACO Semiconductor accepts no liability for the inclusion and/or use of DACO Semiconductor’s products in such equipment or applications and therefore such inclusion and/or use is at the customer’s own risk.

Purchasers who buy or use DACO Semiconductor products for any unintended or unauthorized applications are required to indemnify and absolve DACO Semiconductor, its suppliers, and distributors from any claims, costs, damages, expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that DACO Semiconductor was negligent regarding the design or manufacture of the part.

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or by any information storage and retrieval system, or otherwise, without the prior written permission of DACO Semiconductor Co., Ltd.