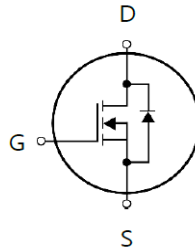# DACO

DAC026N065PY4

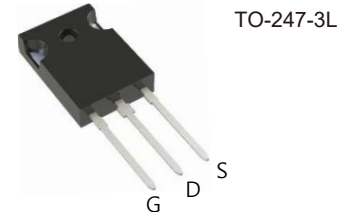## Silicon Carbide Enhancement Mode MOSFET

Features
- Low Capacitance With High Speed Switching Speed
- Low Reverse Recovery (Qrr)
- Reduction of Heat Sink Requirements
- Halogen Free, and RoHS Compliant

Benefits
- Increase Parallel Device Convenience
- Higher System Efficiency
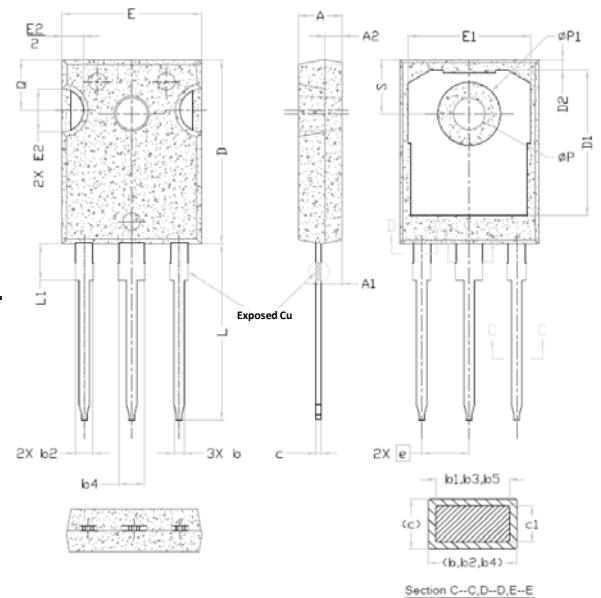- Allow High Frequency Operation
- Realize Compact and Lightweight Systems

Applications
- EV Motor Drive
- High voltage DC/DC Converters
- Switched Mode Power Supplies
- Load Switch
- Solar/Wind Renewable Energy
- Power Inverters

V_{DSS}	650V
$I_{D(@25℃)}$	100A
$R_{DS(ON)\ typ.}$	26mΩ

TO-247-3L

Package Dimensions

Exposed Cu

Section C--C,D--D,E--E

Absolute Maximum Ratings
(Tc = 25℃ unless otherwise specified)

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage	V_{GS}=0V I_D=100µA	V_{DS}	650	V
Gate-Source Voltage		V_{GS}	-10/+25	V
Pecommended Operation Value		$V_{GS(op)}$	-4/+18	V
Drain Current-Continuous	@ T_C=25°C @ T_C=100°C	I_D	100 70	A
Pulse Drain Current	Pulse width t_p limited by T_{jmax}	I_{DM}	160	A
Power Dissipation		P_D	330	W
Storage Temperature Range		T_{STG}	-55 to +175	°C
Operating Junction Temperature Range		T_J	-55 to +175	°C
Soldering Temperature		T_L	260	°C

Symbol	Min	Max
A	4.83	5.21
A1	2.29	2.55
A2	1.50	2.49
b	1.12	1.33
b1	1.12	1.28
b2	1.91	2.39
b3	1.91	2.34
b4	2.87	3.22
b5	2.87	3.18
c	0.55	0.69
c1	0.55	0.65
D	20.80	21.10
D1	16.25	17.65
D2	0.51	1.35
E	15.75	16.13
E1	13.46	14.16
E2	4.32	5.49
e	5.44 BSC	
L	19.81	20.32
L1	4.10	4.40
ΦP	3.56	3.65
ΦP1	7.19 REF	
Q	5.39	6.20
S	6.04	6.30

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$_D$=100µA	650	-	-	V
Zero Gate Voltage Drain Current	I$_{DSS}$	V$_{GS}$=0V，V$_{DS}$=650V	-	1	50	µA
Gate-Source Leakage Current	I$_{GSS}$	V$_{GS}$=18V，V$_{DS}$=0V	-	-	250	nA
ON Characteristics						
Gate Threshold Voltage	V$_{GS(th)}$	V$_{DS}$= V$_{GS}$，I$_D$=16mA	-	3	-	V
Drain-Source On-State Resistance	R$_{DS(on)}$	V$_{GS}$=18V，I$_D$=40A	-	26	38	mΩ
		V$_{GS}$=18V，I$_D$=40A，T$_J$=175°C	-	35	-	
Internal Gate Resistance	R$_{G(int.)}$	f = 1MHz，V$_{AC}$=25mV	-	1.2	-	Ω
Dynamic Characteristics						
Input Capacitance	C$_{iss}$	V$_{DS}$ =600V	-	2500	-	pF
Output Capacitance	C$_{oss}$	V$_{GS}$ =0V	-	180	-	
Reverse Transfer Capacitance	C$_{rss}$	f =1MHz V$_{AC}$ =25mV	-	8	-	
Turn-On Switching Energy	E$_{on}$	V$_{DS}$=400V，V$_{GS}$ =-4/+18V I$_D$ =40A，R$_{G(ext)}$=5Ω	-	170	-	µJ
Turn-Off Switching Energy	E$_{off}$		-	170	-	
Total Switching Energy	E$_{tot}$		-	340	-	
Switching Characteristics						
Turn-On Delay Time	t$_{d(on)}$	V$_{DS}$=400V V$_{GS}$=-4/+18V I$_D$=40A R$_{G(ext)}$=5Ω	-	5	-	ns
Rise Time	t$_r$		-	33	-	
Turn-Off Delay Time	t$_{d(off)}$		-	30	-	
Fall Time	t$_f$		-	10	-	
Total Gate Charge	Q$_g$	V$_{DS}$=400V V$_{GS}$=-4/+18V I$_D$ =40A	-	75	-	nC
Gate to Source Charge	Q$_{gs}$		-	30	-	
Gate to Drain Charge	Q$_{gd}$		-	35	-	
Body Diode Characteristics						
Diode Forward Voltage	V$_{SD}$	V$_{GS}$=-4V，I$_{SD}$=20A	-	4.3	-	V
Continuous Diode Forward Current	I$_S$	V$_{GS}$=-4V，T$_C$ =25°C	-	70	-	A
Reverse Recovery Time	T$_{rr}$	V$_{GS}$=-4V I$_S$=40A，V$_R$=400V dI$_F$/dt=3600A/µs	-	16	-	ns
Reverse Recovery Charge	Q$_{rr}$		-	260	-	nC
Reverse Recovery Charge	I$_{rrm}$		-	21	-	A
Thermal Resistance						
Thermal Resistance, Junction-to-Case	Rθ$_{JC}$		-	0.45	-	°C/W
Thermal Resistance, Junction-to-Ambient	Rθ$_{JA}$		-	40	-	

Typical Performance

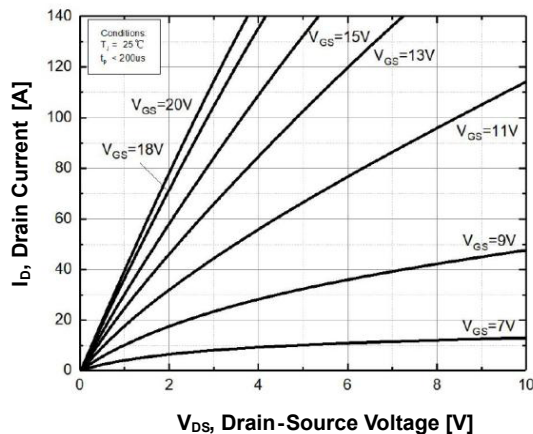### Fig 1. Output Characteristics, $T_J = 25°C$

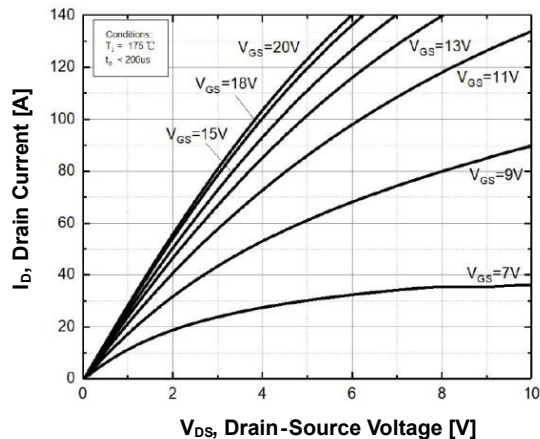### Fig 2. Output Characteristics, $T_J = 175°C$
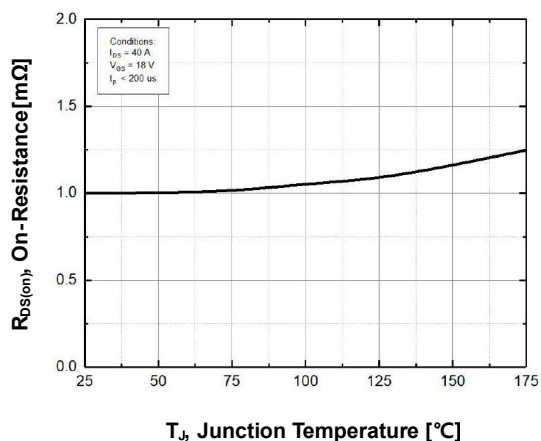

Fig 3. On-Resistance Variation vs.Temperature

Fig 4. Transfer Characteristics

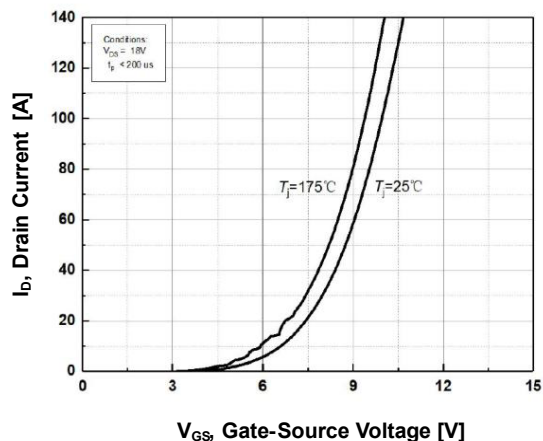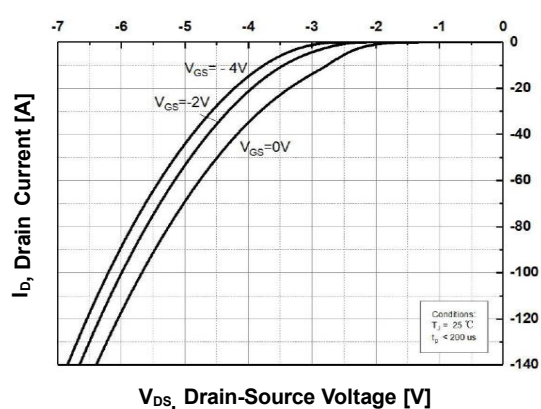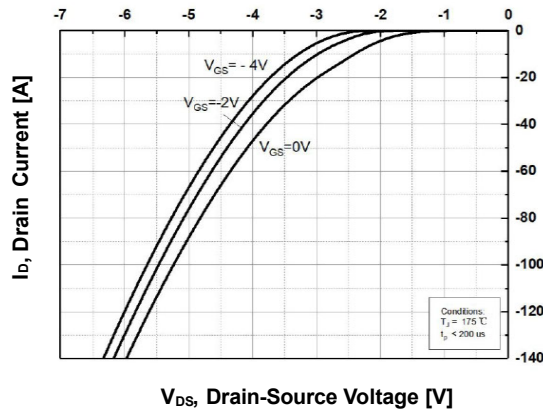### Fig 5. V_{DS}-I_{DS} Characteristics, $T_J = 25°C$

Fig 6. V_{DS}-I_{DS} Characteristics, $T_J = 175°C$

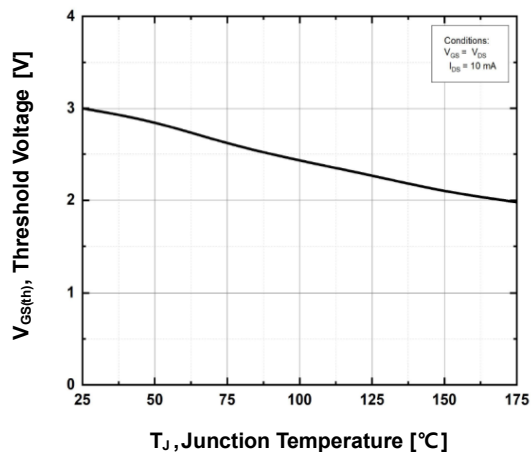## Typical Performance

Fig 7. Threshold Voltage vs. Temperature
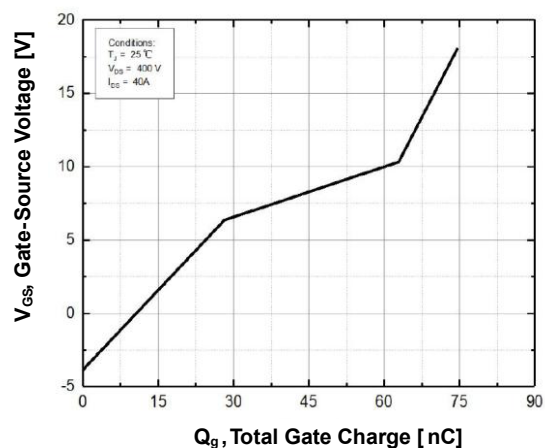

Fig 8. Gate Charge Characteristics

Fig 9. Stored Energy in Output Capacitance
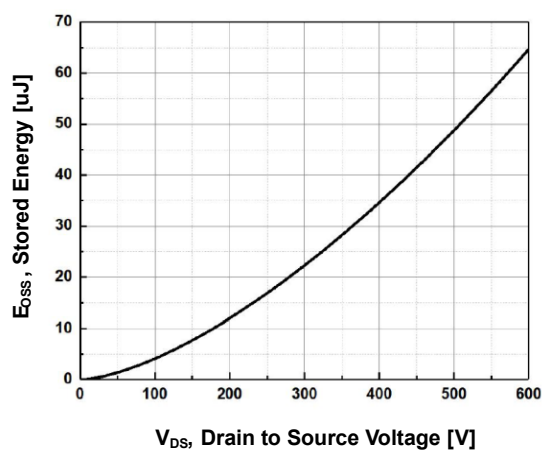
Fig 10. Capacitance Characteristics
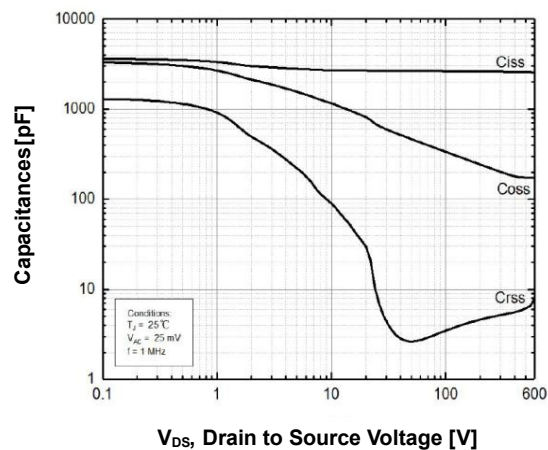

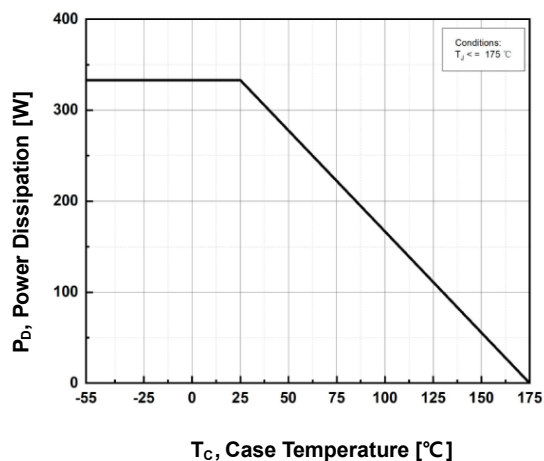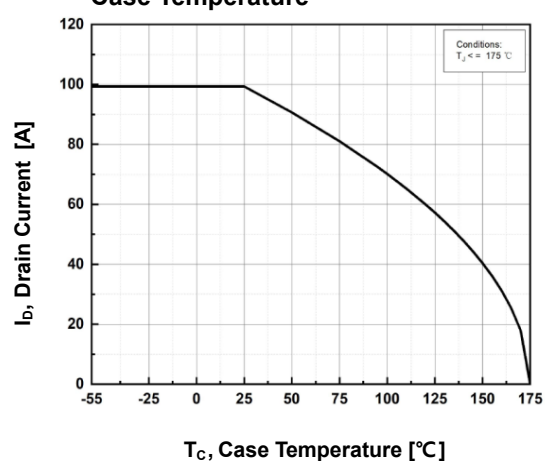**Fig 11. Max.P_D Derating vs. Case Temperature**

Fig 12. Continuous I_D Derating vs. Case Temperature

Typical Performance
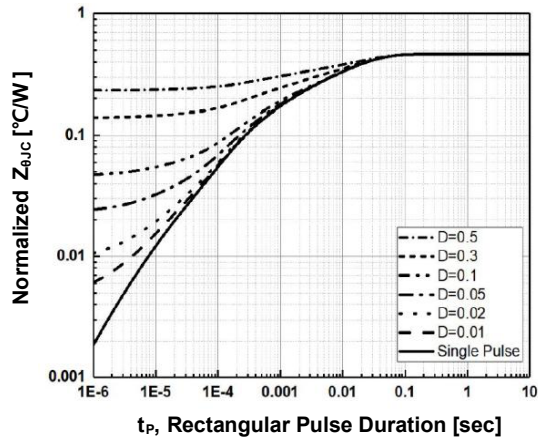
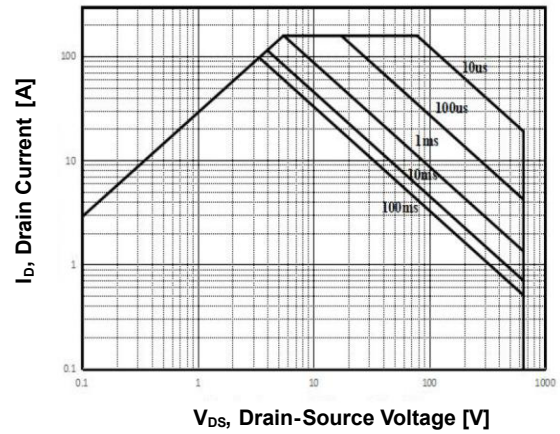**Fig 13. Transient Thermal impedance**

Fig 14. Safe Operating Area

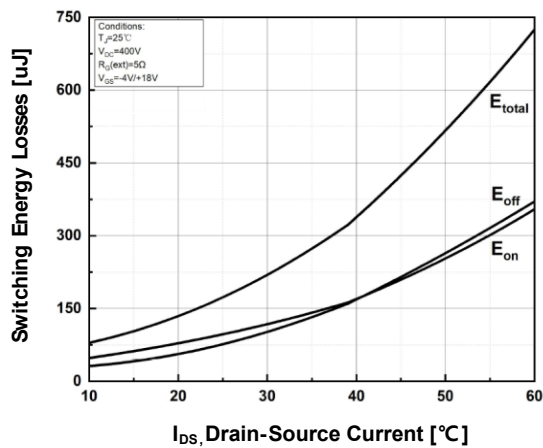**Fig 15. CIS Energy vs. Drain Curren**
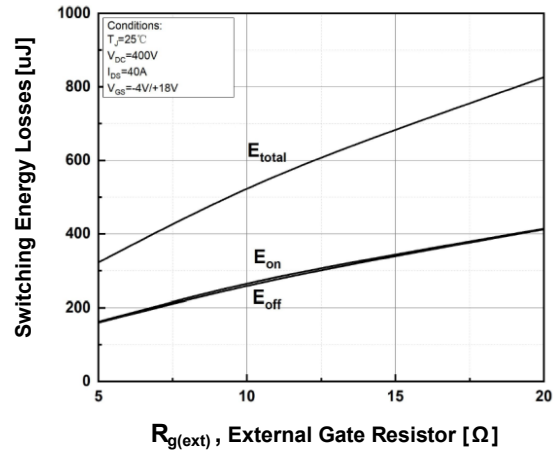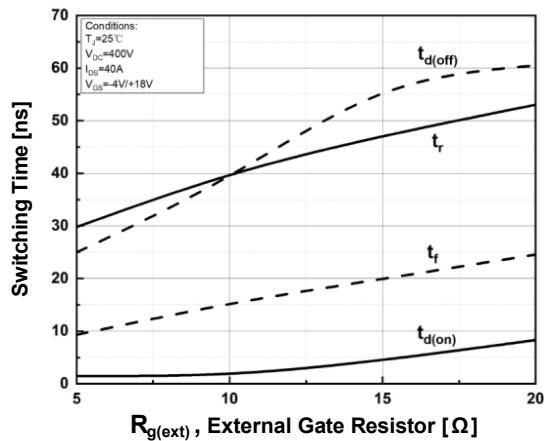

Fig 16. CIS Energy vs. R$_{g(ext)}$

Fig 17. Switching Times vs. R$_{g(ext)}$

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