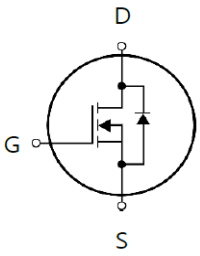
DAC080N120PY4

Silicon Carbide Enhancement Mode MOSFET

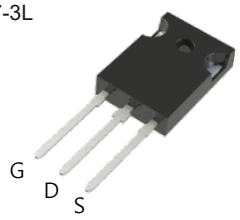
Features

- High switching speed with a low gate charge
- Fast intrinsic diode with low reverse recovery
- Simple to drive with -5V/+18V gate
- Increased power density
- Pb-free, Halogen Free, and RoHS Compliant

V_{DSS}	1200V
$I_{D(@25℃)}$	30A
$R_{DS(ON)\ typ.}$	80mΩ



TO-247-3L



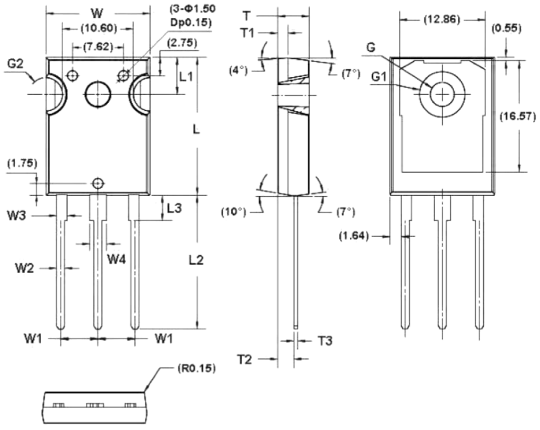
Benefits

- Lower capacitance
- Higher system efficiency
- Easy to parallel

Applications

- Solar inverters
- DC/DC converters
- Switch mode power supplies
- Induction heating
- Motor drives

Package Dimensions



Absolute Maximum Ratings

(Tc = 25℃ unless otherwise specified)

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DS}	1200	V
Gate - Source Voltage (DC)		V_{GS}	-10/+22	V
Recommended Operation Value		$V_{GS(op)}$	-5/+18	V
Drain Current-Continuous	T_C=25°C T_C=100°C	I_D	30 21	A
Pulse Drain Current		I_{DM}	80	A
Total Power Dissipation		P_D	150	W
Storage Temperature Range		T_{STG}	-55 to +175	°C
Operating Junction Temperature Range		T_J	-55 to +175	°C

Unit : mm

Symbol	Min	Max
W	15.40	15.80
W1	5.56 (TYP)	
W2	1.17	1.35
W3	1.55	1.75
W4	2.44	2.64
L	20.40	20.80
L1	5.36	5.56
L2	19.80	20.20
L3	3.69	3.93
T	4.60	4.80
T1	1.40	1.60
T2	2.30	2.50
T3	0.51	0.69
G(Φ)	3.51	3.65
G1(Φ)	6.61	6.85
G2(Φ)	4.96	5.20

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_D =1mA		1200	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} =1200V V_{GS} =0V	T_J =25℃	-	1	50	μA
			T_J =150℃	-	5	200	
Gate-Source Leakage Current	I_{GSS}	V_{GS} =22V，V_{DS} =0V		-	-	100	nA
		V_{GS} =-10V，V_{DS} =0V		-	-	-100	
ON Characteristics							
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}，I_D =5mA		2.0	3.0	4.5	V
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS} =18V，I_D =15A	T_J =25℃	-	80	100	mΩ
			T_J =175℃	-	128	-	
Internal Gate Resistance	$R_{G(int.)}$	f =1MHz，V_{AC} =25mV		-	4.0	-	Ω
Dynamic Characteristics							
Input Capacitance	C_{iss}	V_{DS} =800V V_{GS} =0V f =250kHz		-	890	-	pF
Output Capacitance	C_{oss}			-	65	-	
Reverse Transfer Capacitance	C_{rss}			-	6	-	
Turn-On Switching Energy	E_{on}	V_{DD} =800V V_{GS} =-5/+18V I_D =15A $R_{G(ext)}$ =2.0Ω		-	186	-	μJ
Turn-Off Switching Energy	E_{off}			-	46	-	
Total Switching Energy	E_{tot}			-	232	-	
Switching Characteristics							
Turn-On Delay Time	$t_{d(on)}$	V_{DD} =800V V_{GS} =-5/+18V I_D =15A $R_{G(ext)}$ =2.0Ω		-	16	-	ns
Rise Time	t_r			-	23	-	
Turn-Off Delay Time	$t_{d(off)}$			-	26	-	
Fall Time	t_f			-	10	-	
Total Gate Charge	Q_g	V_{DD} =800V V_{GS} =-5/+18V I_D =15A		-	53	-	nC
Gate to Source Charge	Q_{gs}			-	15	-	
Gate to Drain Charge	Q_{gd}			-	18	-	
Body Diode Characteristics							
Diode Forward Voltage	V_{SD}	V_{GS}=-5V，I_{SD}=15A		-	4.1	-	V
Diode Source Current	I_S			-	-	30	A
Maximum Diode Source Current (DC)	I_{SM}			-	-	80	A
Reverse Recovery Time	T_{rr}	I_{SD}=15A，V_{DD} =800V diF/dt=1000A/μs		-	34	-	ns
Reverse Recovery Charge	Q_{rr}			-	112	-	nC
Thermal Resistance							
Thermal Resistance, Junction-to-Case	$R\theta_{JC}$			-	-	1.0	°C/W

Typical Performance

Fig 1. Output Characteristics, T_J = 25°C

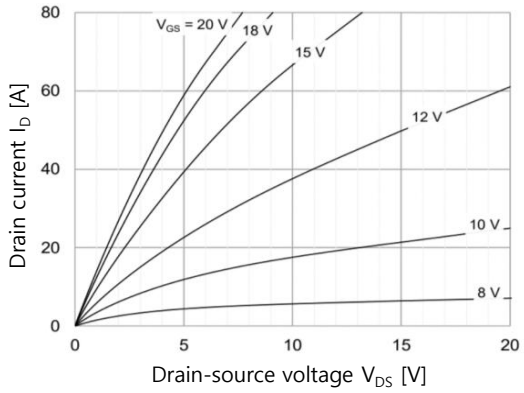


Fig 2. Output Characteristics, T_J = 175°C

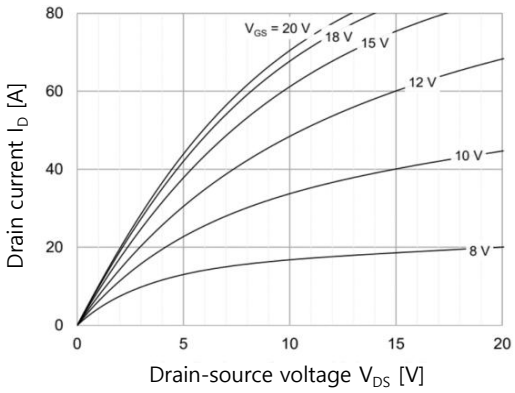


Fig 3. On-Resistance Variation vs. Temperature

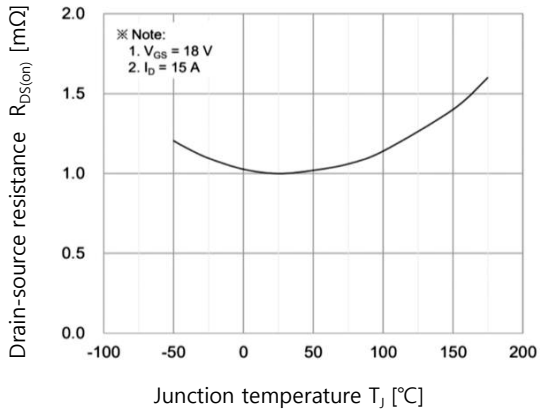


Fig 4. Transfer Characteristics

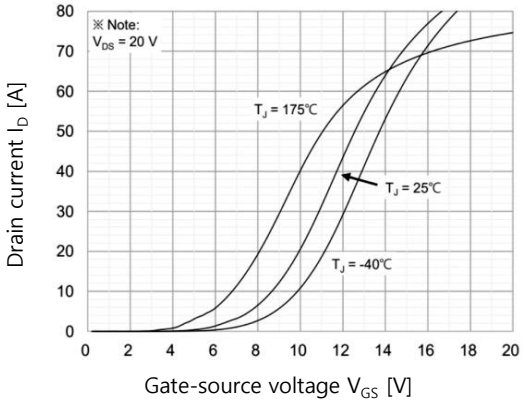


Fig 5. Threshold Voltage vs. Temperature

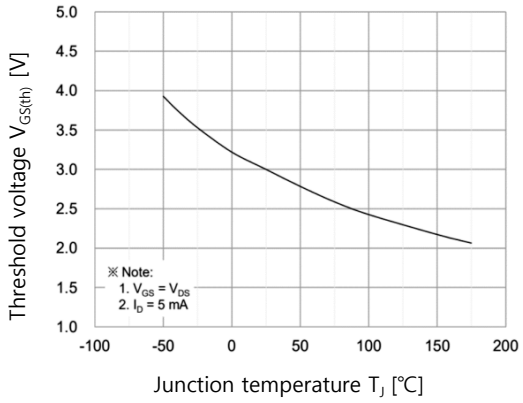
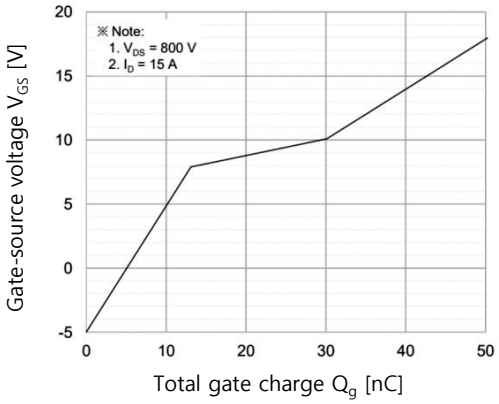


Fig 6. Gate Charge Characteristics



Typical Performance

Fig 7. Capacitance Characteristics

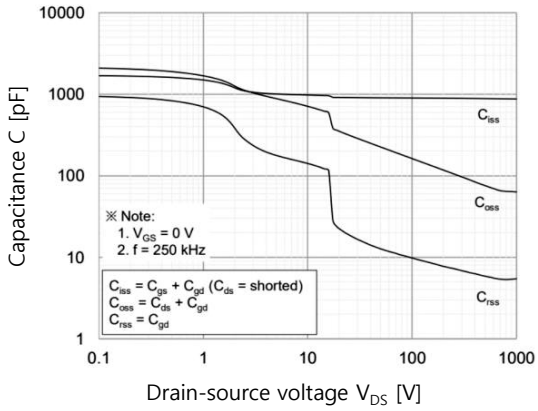


Fig 8. Stored Energy in Output Capacitance

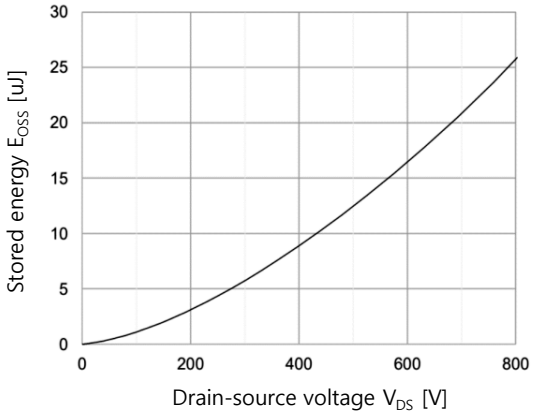


Fig 9. Body Diode Characteristics @ 25°C

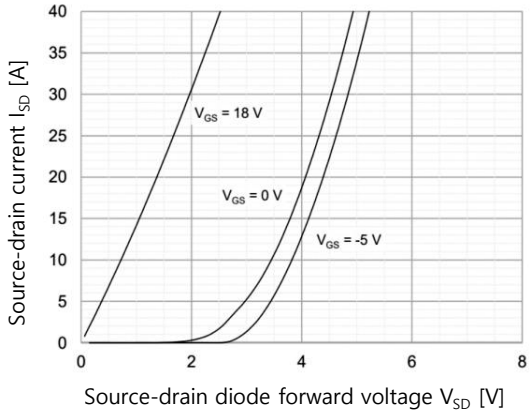


Fig 10. Body Diode Characteristics @ 175°C

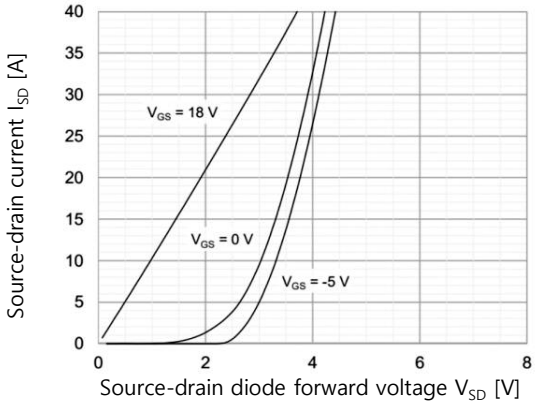


Fig 11. Max. P_D Derating VS Case Temperature

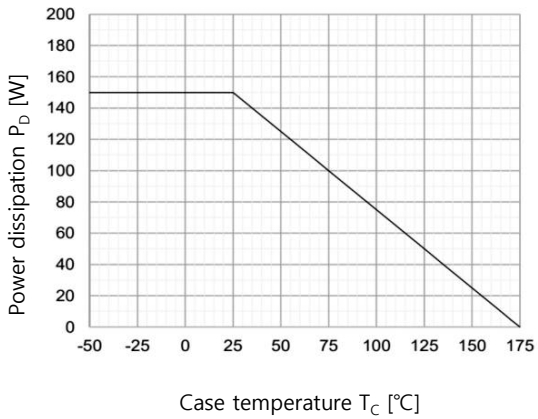
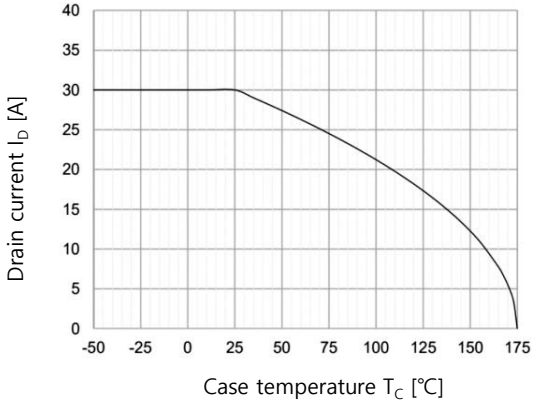


Fig 12. Continuous I_D Derating VS Case Temperature



Typical Performance

Fig 13. Transient Thermal Impedance

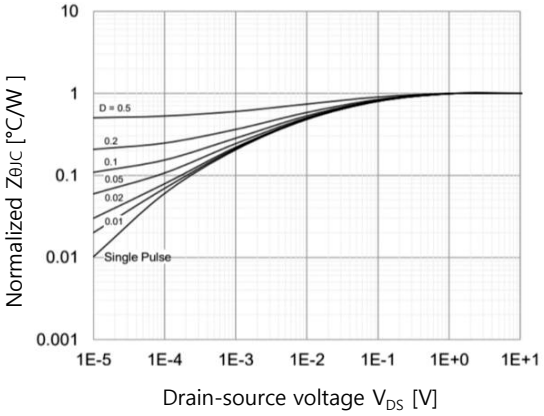


Fig 14. Safe Operating Area

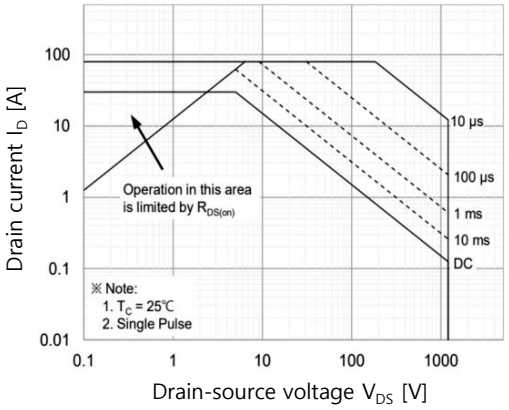


Fig 15. Clamped Inductive Switching Energy vs Drain Current

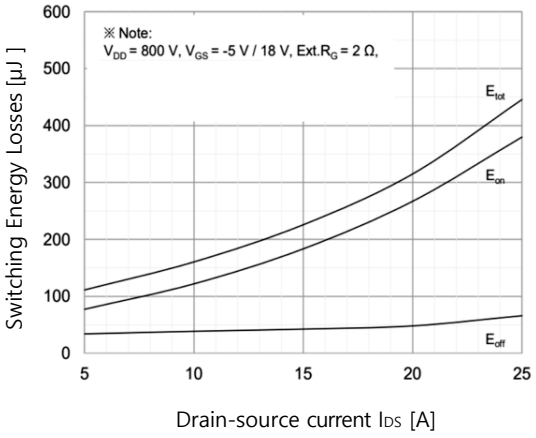
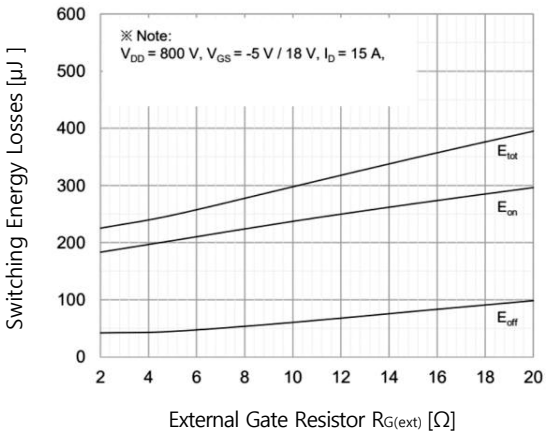


Fig 16. Clamped Inductive Switching Energy vs External Gate Resistor $R_{G(ext)}$



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