

30V N- and P- Channel MOSFET

Product Summary

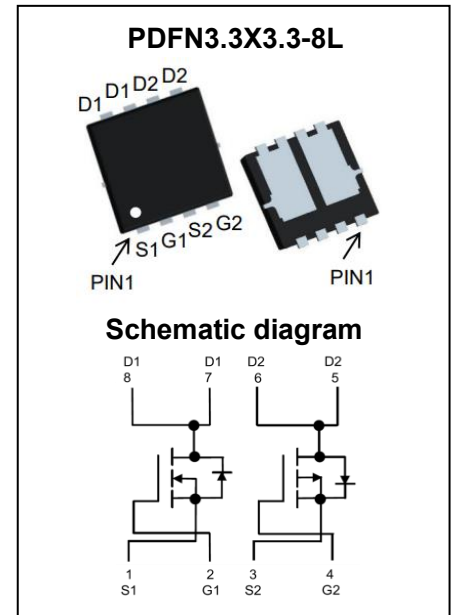
$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
30V	11m Ω @10V	25A
	15m Ω @4.5V	
-30V	28m Ω @-10V	-16A
	39m Ω @-4.5V	

Feature

- Trench Technology Power MOSFET
- Low $R_{DS(ON)}$
- Low Gate Charge
- Low Gate Resistance

Application

- Load Switch
- DC/DC Converter



MARKING:



M280NP03L = Device Code
 XX = Data Code
 Solid Dot = Green Device Indicator

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	NMOS	PMOS	Unit
Drain - Source Voltage	V_{DS}	30	-30	V
Gate - Source Voltage	V_{GS}	± 20	± 20	V
Continuous Drain Current ¹	I_D	$T_C = 25^\circ\text{C}$	25	-16
		$T_C = 100^\circ\text{C}$	16	-10
Pulsed Drain Current ²	I_{DM}	100	-64	A
Single Pulsed Avalanche Current ^{3,4}	I_{AS}	14	-15	A
Single Pulsed Avalanche Energy ^{3,4}	E_{AS}	49	56	mJ
Power Dissipation ⁶	P_D	17	15	W
Thermal Resistance from Junction to Ambient ⁷	$R_{\theta JA}$	58	70	$^\circ\text{C/W}$
Thermal Resistance from Junction to Case	$R_{\theta JC}$	7.4	8.3	$^\circ\text{C/W}$
Junction Temperature	T_J	150	150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55~ +150	-55~ +150	$^\circ\text{C}$

MOSFET ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

NMOS:

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off Characteristics						
Drain - Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 30V, V_{GS} = 0V$			1	μA
Gate - Body Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
On Characteristics³						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.0	1.5	2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 6A$		11	15	m Ω
		$V_{GS} = 4.5V, I_D = 6A$		15	23	
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS} = 15V, V_{GS} = 0V, f = 1MHz$		870		pF
Output Capacitance	C_{oss}			114		
Reverse Transfer Capacitance	C_{rss}			91		
Gate Resistance	R_g	$V_{DS} = 0V, V_{GS} = 0V, f = 1MHz$		3.6		Ω
Switching Characteristics						
Total Gate Charge	Q_g	$V_{DS} = 15V, V_{GS} = 10V, I_D = 6A$		18		nC
Gate-Source Charge	Q_{gs}			2.3		
Gate-Drain Charge	Q_{gd}			3.9		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 15V, V_{GS} = 10V, I_D = 20A,$ $R_G = 3\Omega$		6		ns
Turn-On Rise Time	t_r			56		
Turn-Off Delay Time	$t_{d(off)}$			17		
Turn-Off Fall Time	t_f			8		
Source - Drain Diode Characteristics						
Diode Forward Voltage ³	V_{SD}	$V_{GS} = 0V, I_S = 1A$			1.2	V

PMOS:

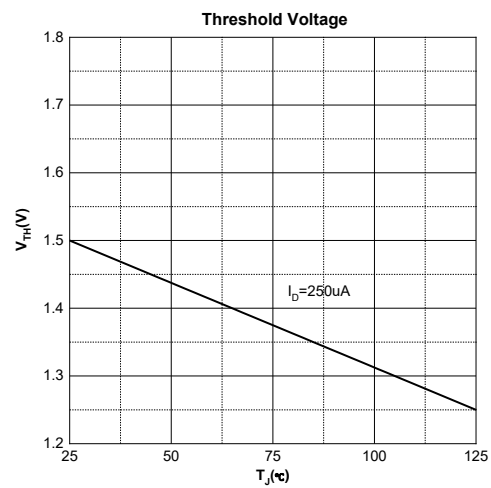
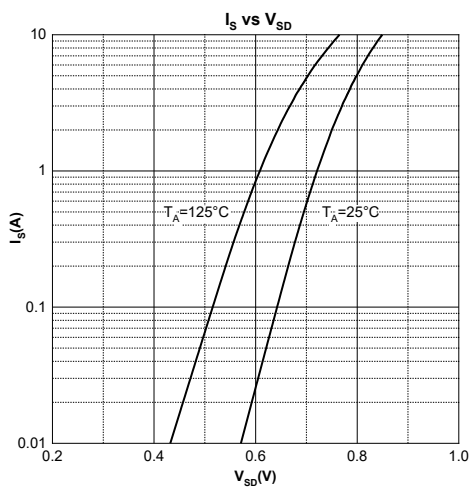
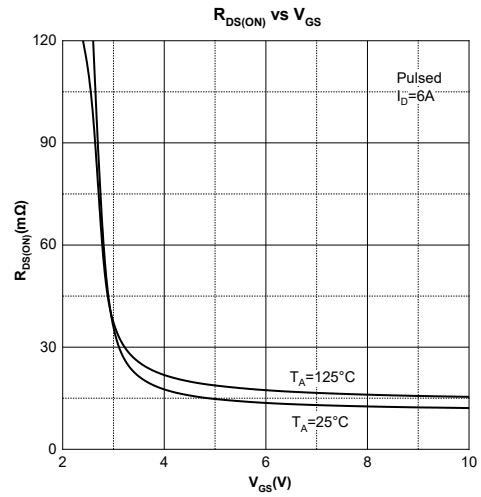
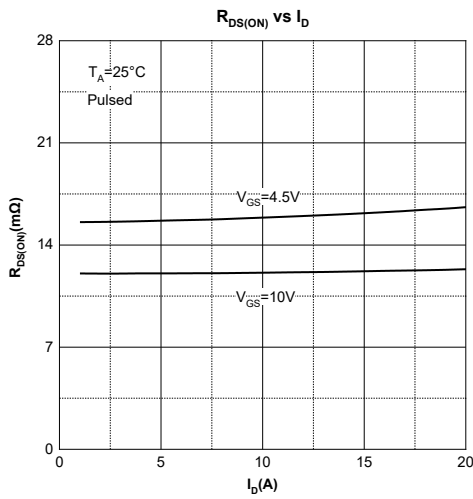
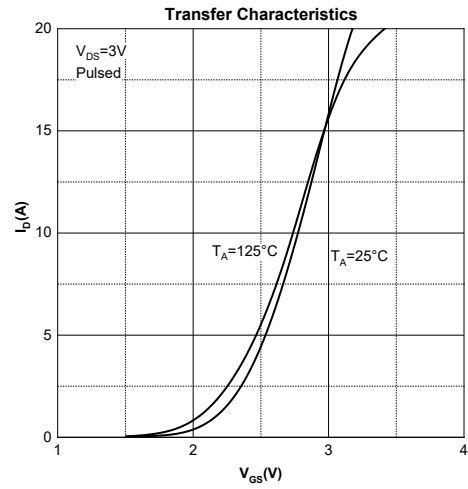
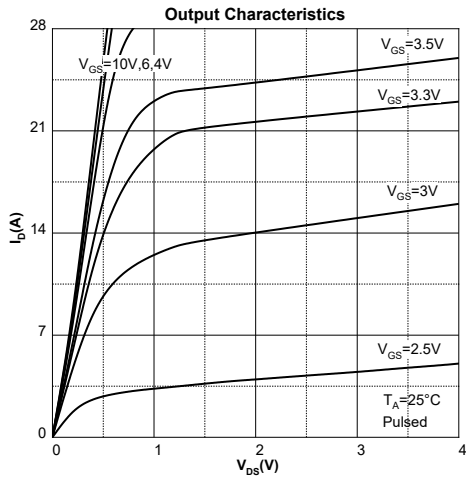
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off Characteristics						
Drain - Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -30V, V_{GS} = 0V$			-1	μA
Gate - Body Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
On Characteristics³						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1.0	-1.5	-2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -5A$		28	36	m Ω
		$V_{GS} = -4.5V, I_D = -5A$		39	60	
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS} = -15V, V_{GS} = 0V, f = 1MHz$		1016		pF
Output Capacitance	C_{oss}			119		
Reverse Transfer Capacitance	C_{rss}			102		
Gate Resistance	R_g	$V_{DS} = 0V, V_{GS} = 0V, f = 1MHz$		18		Ω
Switching Characteristics						
Total Gate Charge	Q_g	$V_{DS} = -15V, V_{GS} = -10V, I_D = -5A$		21		pC
Gate-Source Charge	Q_{gs}			2.8		
Gate-Drain Charge	Q_{gd}			4.5		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -15V, V_{GS} = -10V, I_D = 15A,$ $R_G = 2.7\Omega$		6		ns
Turn-On Rise Time	t_r			45		
Turn-Off Delay Time	$t_{d(off)}$			27		
Turn-Off Fall Time	t_f			20		
Source - Drain Diode Characteristics						
Diode Forward Voltage ³	V_{SD}	$V_{GS} = 0V, I_S = -1A$			-1.2	V

Notes :

- 1.The maximum current rating is limited by package.And device mounted on a large heatsink
- 2.Pulse Test : Pulse Width $\leq 10\mu s$, duty cycle $\leq 1\%$.
- 3.EAS condition: $V_{DD} = 15V, V_{GS} = 10V, L = 0.5mH, R_G = 25\Omega$ Starting $T_J = 25^\circ C$.
- 4.EAS condition: $V_{DD} = -15V, V_{GS} = -10V, L = 0.5mH, R_G = 25\Omega$ Starting $T_J = 25^\circ C$.
- 5.Pulse Test : Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- 6.The power dissipation P_D is limited by $T_{J(MAX)} = 150^\circ C$.And device mounted on a large heatsink
- 7.Device mounted on $1in^2$ FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ C$.

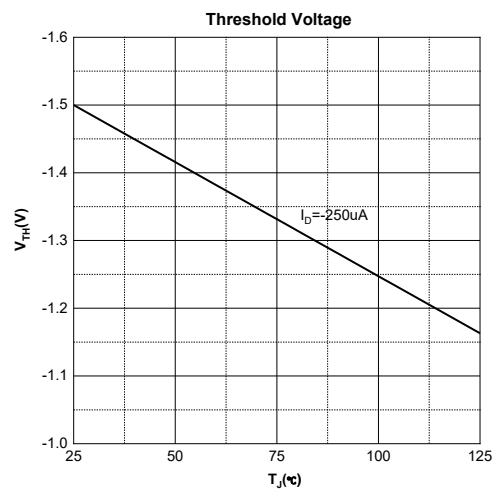
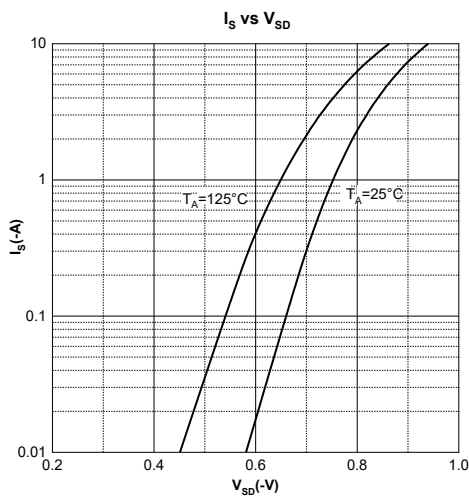
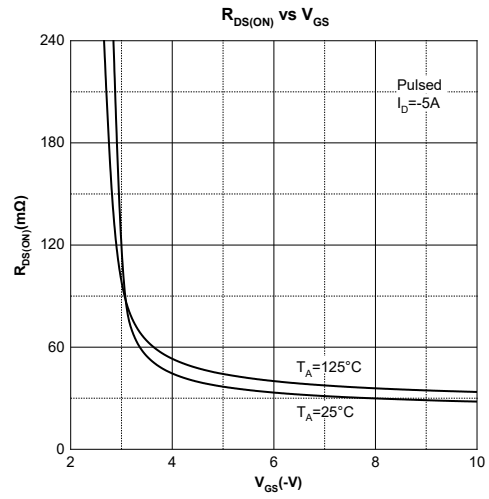
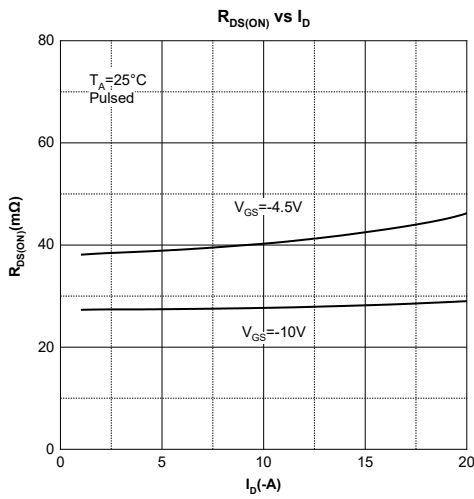
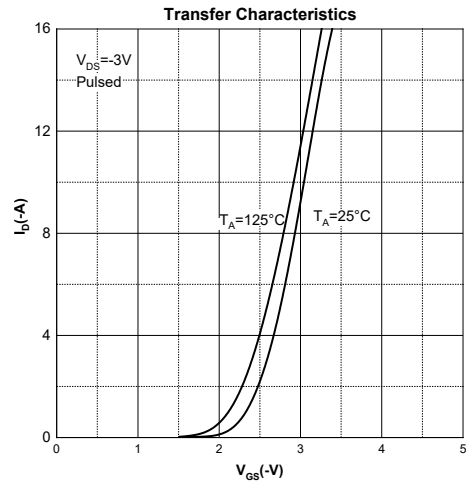
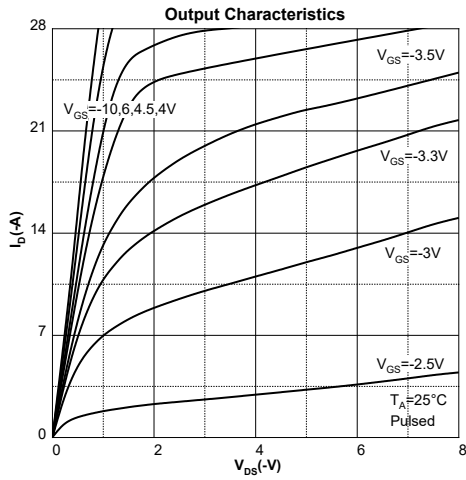
Typical Characteristics

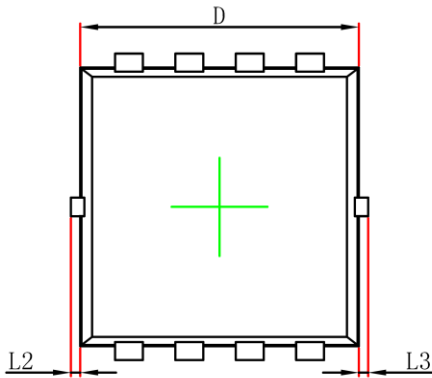
NMOS:



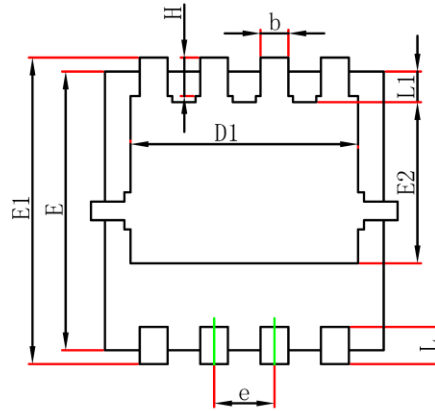
Typical Characteristics

PMOS:

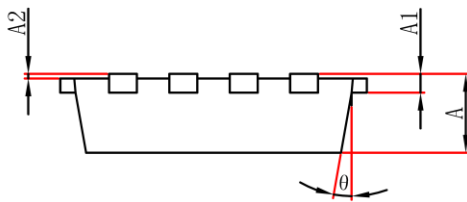




Top View
[顶视图]



Bottom View
[背视图]



Side View
[侧视图]

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	0.035
A1	0.152REF		0.006REF	
A2	0.000	0.050	0.000	0.002
D	2.900	3.200	0.114	0.126
D1	2.300	2.600	0.091	0.102
E	2.900	3.200	0.114	0.126
E1	3.150	3.450	0.124	0.136
E2	1.535	1.935	0.060	0.076
b	0.200	0.400	0.008	0.016
e	0.550	0.750	0.022	0.030
L	0.300	0.500	0.012	0.020
L1	0.180	0.480	0.007	0.019
L2	0.000	0.100	0.000	0.004
L3	0.000	0.100	0.000	0.004
H	0.315	0.515	0.012	0.020
θ	0°	12°	0°	12°