



Product Summary

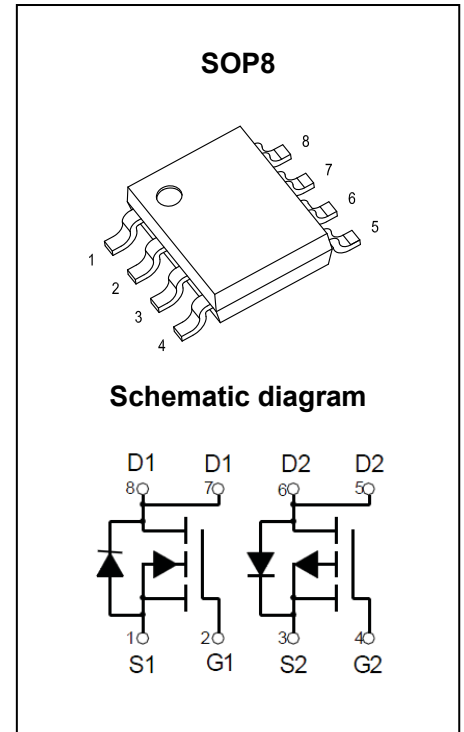
$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
30V	26mΩ@10V	5.5A
	43mΩ@4.5V	
-30V	42mΩ@-10V	-4.6A
	60mΩ@-4.5V	

Feature

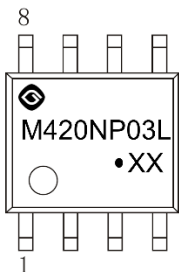
- Trench Technology Power MOSFET
- Low $R_{DS(ON)}$
- Low Gate Charge
- Low Gate Resistance

Application

- PWM Applications
- Loas Switch
- Power Management



MARKING:



M420NP03L = 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 ^{1,5}	I_D	5.5	-4.6	A
Pulsed Drain Current ²	I_{DM}	22	-16	A
Power Dissipation ^{4,5}	P_D	1.4	1.4	W
Thermal Resistance from Junction to Ambient ⁵	$R_{\theta JA}$	90	90	$^\circ\text{C}/\text{W}$
Junction Temperature	T_J	150	150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55~ +150	-55~ +150	$^\circ\text{C}$

MOSFET ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$ 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	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.2	1.7	2.5	V
Drain-source On-resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 6.0A$		26	36	m Ω
		$V_{GS} = 4.5V, I_D = 4.0A$		43	56	
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS} = 15V, V_{GS} = 0V, f = 1MHz$		293		pF
Output Capacitance	C_{oss}			40		
Reverse Transfer Capacitance	C_{rss}			34		
Switching Characteristics						
Total Gate Charge	Q_g	$V_{DS} = 15V, V_{GS} = 10V, I_D = 5A$		5.4		pC
Gate-source Charge	Q_{gs}			0.95		
Gate-drain Charge	Q_{gd}			1.5		
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = 15V, V_{GS} = 10V, R_L = 3\Omega$ $R_G = 2\Omega$		4.6		ns
Turn-on Rise Time	t_r			2.7		
Turn-off Delay Time	$t_{d(off)}$			15		
Turn-off Fall Time	t_f			3.8		
Source - Drain Diode Characteristics						
Diode Forward Voltage ³	V_{SD}	$V_{GS} = 0V, I_S = 1.5A$			1.2	V

PMOS:

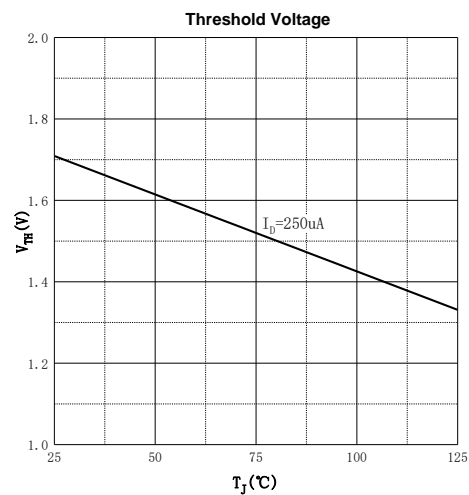
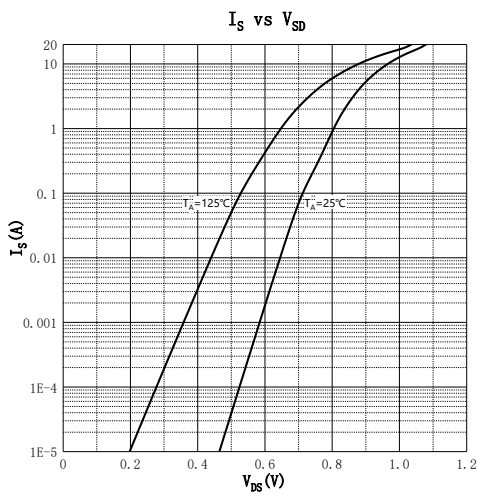
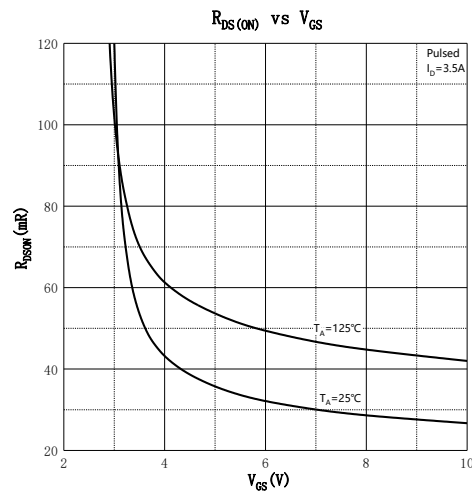
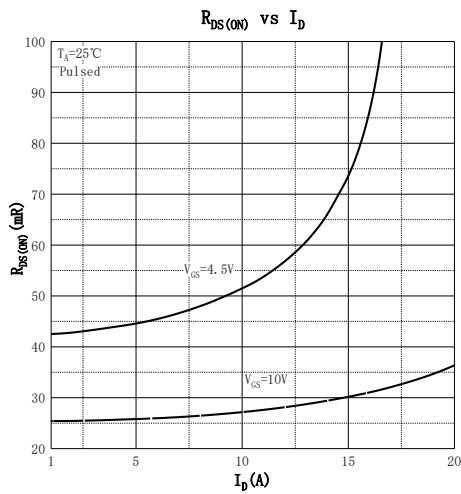
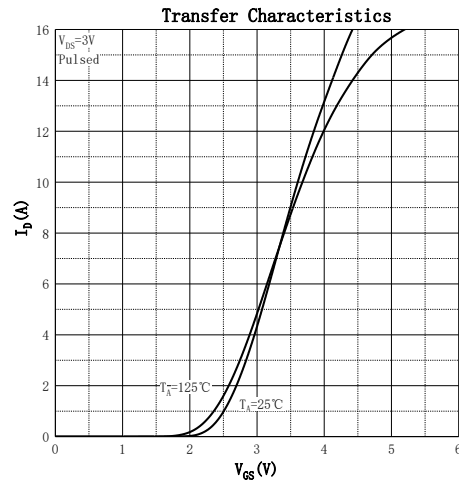
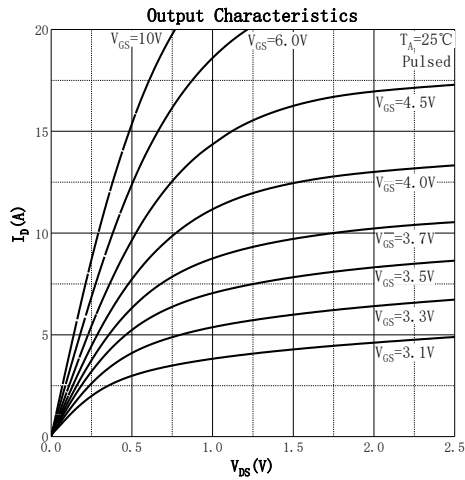
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off Characteristics						
Drain - Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -30V, V_{GS} = 0V$			-1	μA
Gate - Body Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
On Characteristics³						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1.2	-1.5	-2.5	V
Drain-source On-resistance	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -6.0A$		42	60	m Ω
		$V_{GS} = -4.5V, I_D = -4.0A$		60	100	
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS} = -15V, V_{GS} = 0V, f = 1MHz$		596		pF
Output Capacitance	C_{oss}			67		
Reverse Transfer Capacitance	C_{rss}			55		
Switching Characteristics						
Total Gate Charge	Q_g	$V_{DS} = -15V, V_{GS} = -10V, I_D = -5A$		13		pC
Gate-source Charge	Q_{gs}			1.6		
Gate-drain Charge	Q_{gd}			2.5		
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = -15V, V_{GS} = -10V, R_L = 3\Omega$ $R_G = 3\Omega$		6.3		ns
Turn-on Rise Time	t_r			3.4		
Turn-off Delay Time	$t_{d(off)}$			39		
Turn-off Fall Time	t_f			8.5		
Source - Drain Diode Characteristics						
Diode Forward Voltage ³	V_{SD}	$V_{GS} = 0V, I_S = -1.5A$			-1.2	V

Notes :

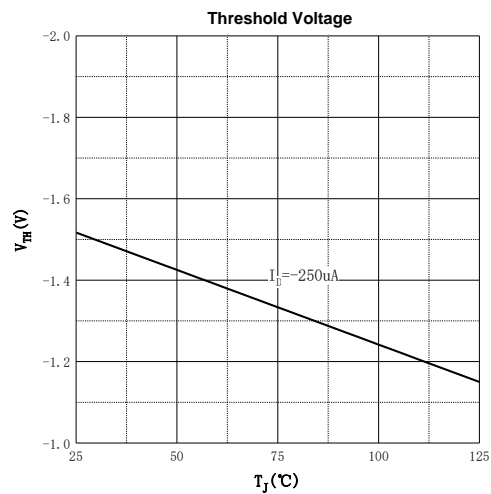
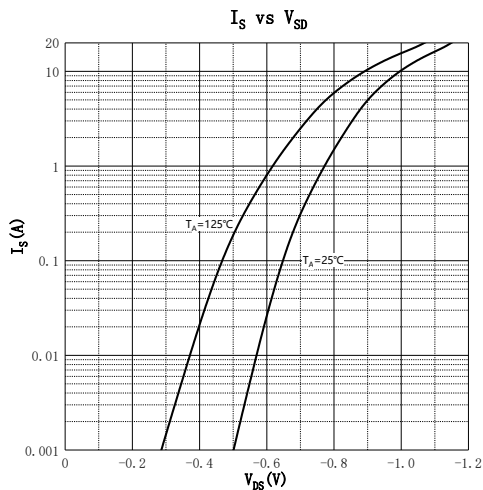
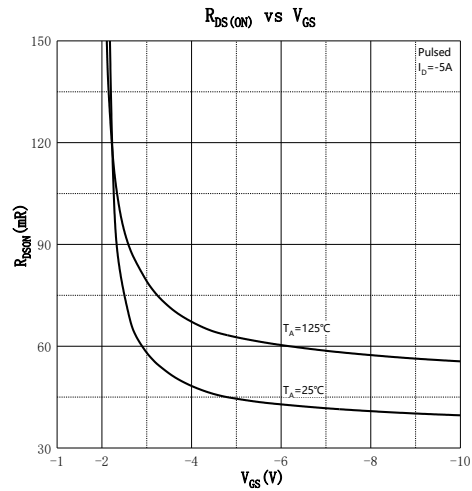
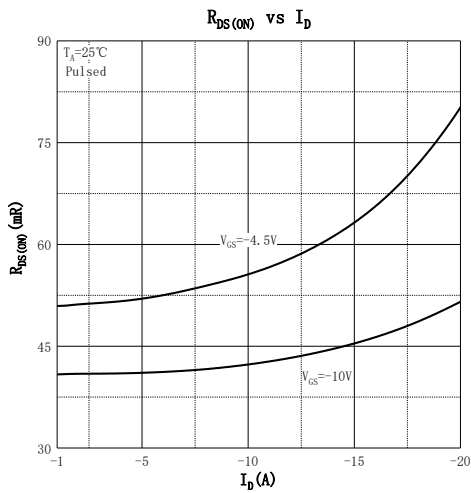
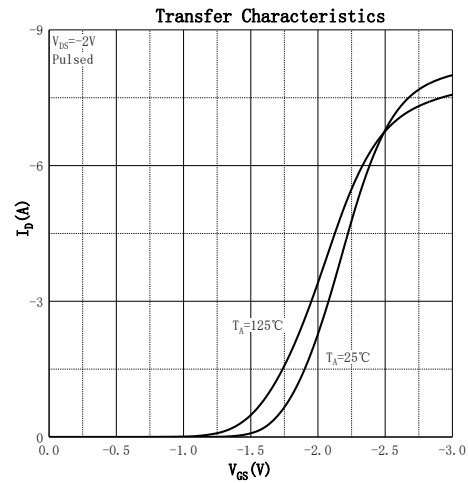
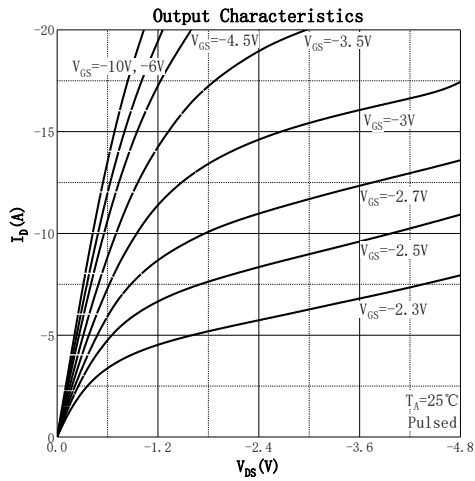
- 1.The maximum current rating is limited by package.
- 2.Pulse Test : Pulse Width $\leq 10\mu s$, duty cycle $\leq 1\%$.
- 3.Pulse Test : Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- 4.The power dissipation P_D is limited by $T_{J(MAX)} = 150^\circ C$.
- 5.Device mounted on $1in^2$ FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ C$.

Typical Characteristics

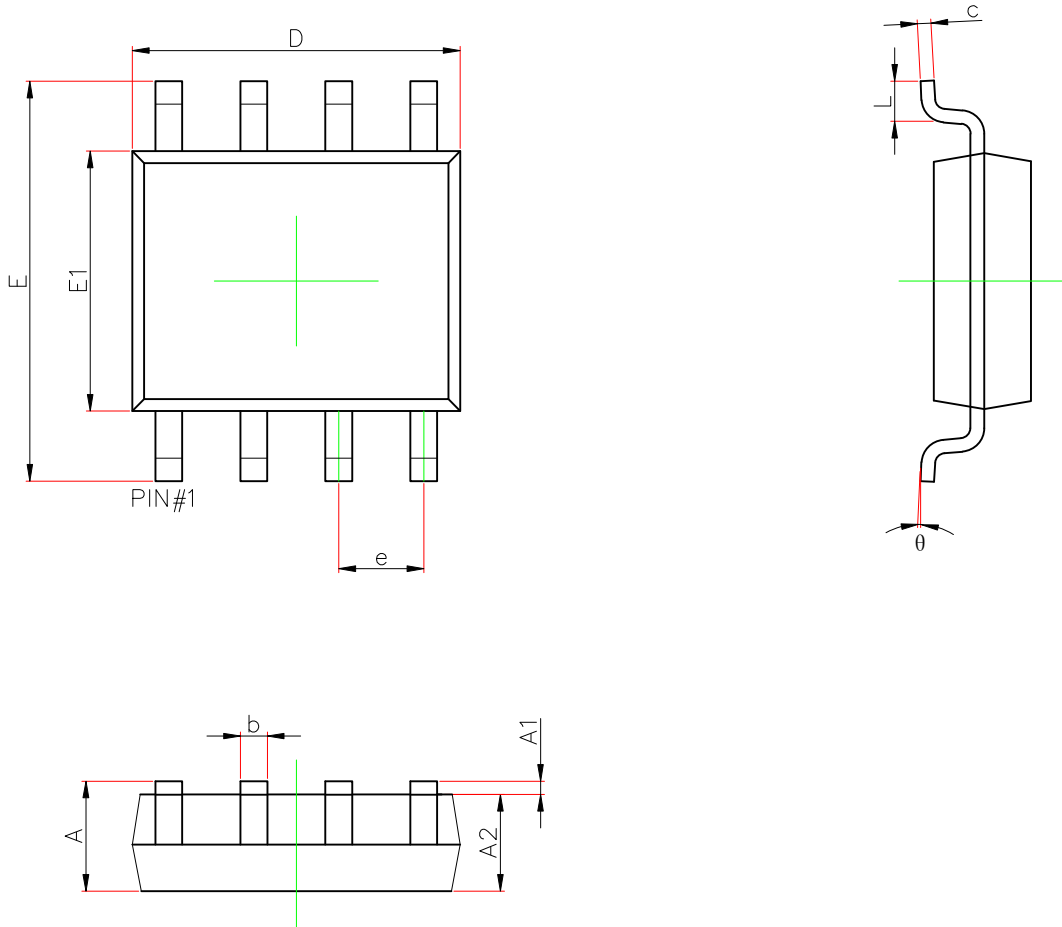
NMOS:



PMOS:



SOP8 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.156	0.250	0.006	0.010
D	4.700	5.100	0.185	0.201
e	1.270(BSC)		0.050(BSC)	
E	5.800	6.200	0.228	0.244
E1	3.700	4.100	0.146	0.161
L	0.400	1.270	0.016	0.05
θ	0°	8°	0°	8°