LMNP2062RF 20V N+P Dual Channel MOSFETs

Features

- N-Channel
- 20V/4.0A, $R_{DS(ON)}$=30mΩ@V_{GS}=4.5V
- 20V/3.0A, $R_{DS(ON)}$=30mΩ@V_{GS}=2.5V
- P-Channel
- -20V/-3.0A, $R_{DS(ON)}$=65mΩ@V_{GS}=-4.5V
- -20V/-2.4A, $R_{DS(ON)}$=85mΩ@V_{GS}=-2.5V
- Low On Resistance
- Low Gate Charge
- Fast switching speed
- SOT-23-6L package design

Product Description

LMNP2062RF, N&P Pair enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.

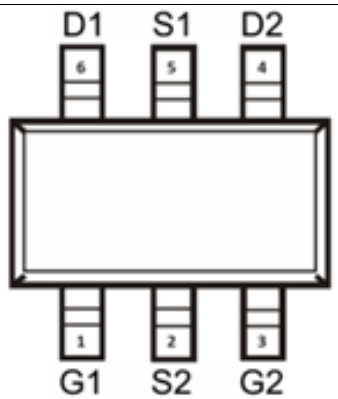
These devices are particularly suited for low voltage power management, and low in-line power loss are needed in commercial industrial surface mount applications.

Applications

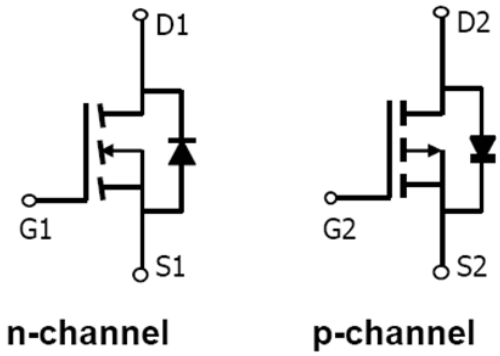
- Power Management in Notebook
- Portable Equipment
- Battery Powered System
- DC/DC Converter
- Load Switch
- LCD Display inverter

Pin Configuration

LMNP2062RF (SOT-23-6L)



Pin	Symbol	Description
1	G1	Gate 1
2	S2	Source 2
3	G2	Gate 2
4	D2	Drain 2
5	S1	Source 1
6	D1	Drain1



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Ordering Information

Ordering Information					
Part Number	P/N	PKG code	Pb Free code	Package	Quantity
LMNP2062RF	LMNP2062	R	F	SOT-23-6L	3000pcs

Marking Information

Marking Information	
Part Number	LFC code
P3	WM

Absolute Maximum Ratings

(T_C=25ºC Unless otherwise noted)

Symbol	Parameter		Typical		Unit
			N-Channel	P-Channel	
V_{DSS}	Drain-Source Voltage		20	-20	V
V_{GSS}	Gate-Source Voltage		±12	±12	V
I_D	Continuous Drain Current (T_J=150℃)[1]	T_A=25℃[1]	5.5	-3.7	A
		T_A=70℃	4	-3.0	
I_{DM}	Pulsed Drain Current		15	-10	A
I_S	Continuous Source Current (Diode Conduction)		1.5	-1.5	
P_D	Power Dissipation	T_A=25℃	1.4		W
		T_A=70℃	0.9		W/℃
T_J	Operating Junction Temperature		150		℃
T_{STG}	Storage Temperature Range		-55/150		℃
$R_{\theta JA}$	Thermal Resistance-Junction to Case		90		℃/W

Note:

1.Device mounted on FR-4 substrate PCB, 2oz copper, with 1inch square copper plate.

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Electrical Characteristics(N-Channel)

(T_C=25ºC Unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	20			V
$V_{GS\ (th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	0.4		0.9	V
I_{GSS}	Gate Leakage Current	V_{DS}=0V, V_{GS}=±12V			±100	nA
I_{DSS}	Drain-Source Leakage Current	V_{DS}=20V, V_{GS}=0V			1	uA
V_{SD}	Diode Forward Voltage	V_{GS}=0V, I_S=1A			1	V
$R_{DS(on)}$	Drain-Source On-Resistance	V_{GS}=4.5V, I_D=4A		21	30	mΩ
		V_{GS}=2.5V, I_D=3A		28	35	
		V_{GS}=1.8V, I_D=2A		40	55	
g_{FS}	Forward Transconductance	V_{DS}=10V, I_D=3A			10	S
Dynamic characteristics						
Q_g	Total Gate Charge[1,2]	V_{DS}=10V, V_{GS}=4.5, I_D=5A		6.7		nC
Q_{gs}	Gate-Source Charge[1,2]			0.8		
Q_{gd}	Gate-Drain Charge[1,2]			3.0		
Dynamic characteristics						
C_{iss}	Input Capacitance	V_{DS}=10V, V_{GS}=0V, f=1.0MHz		532		pF
C_{oss}	Output Capacitance			144		
C_{rss}	Reverse Transfer Capacitance			117		

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Electrical Characteristics(P-Channel)

(T_C=25ºC Unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=-250uA	-20			V
$V_{GS\ (th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250uA	-0.4		-0.9	V
I_{GSS}	Gate Leakage Current	V_{DS}=0V, V_{GS}=±12V			±100	nA
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-20V, V_{GS}=0V			1	uA
V_{SD}	Diode Forward Voltage	V_{GS}=0V, I_S=-1A			-1.2	V
$R_{DS(on)}$	Drain-Source On-Resistance	V_{GS}=-4.5V, I_D=-3A		55	65	mΩ
		V_{GS}=-2.5V, I_D=-2.4A		74	85	
		V_{GS}=-1.8V, I_D=-1.5A		100	130	
g_{FS}	Forward Transconductance	V_{DS}=-5V, I_D=-2.8A			12	S
Dynamic characteristics						
Q_g	Total Gate Charge[1,2]	V_{DS}=-10V, V_{GS}=-4.5, I_D=-3A		7.3		nC
Q_{gs}	Gate-Source Charge[1,2]			2.0		
Q_{gd}	Gate-Drain Charge[1,2]			1.9		
C_{iss}	Input Capacitance	V_{DS}=-16V, V_{GS}=0V, f=1.0MHz		443		pF
C_{oss}	Output Capacitance			128		
C_{rss}	Reverse Transfer Capacitance			101		
$t_{d(on)}$	Turn-On Time	V_{DD}=-10V, V_{GEN}=-4.5V, R_L=10Ω, R_G=6Ω		12		ns
t_r				20		
$t_{d(off)}$	Turn-Off Time			38		
t_f				41		

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
3. Essentially independent of operating temperature.

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Typical Performance Characteristics(N-Channel)

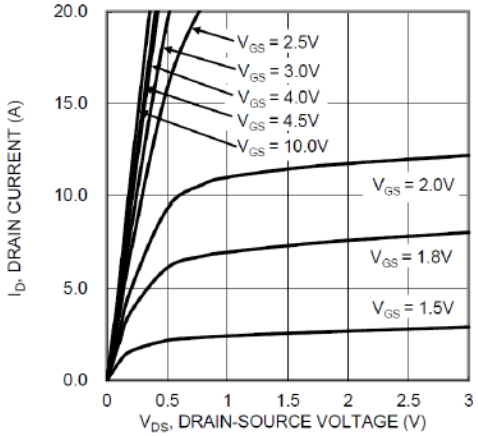

Fig. 1 Typical Output Characteristics

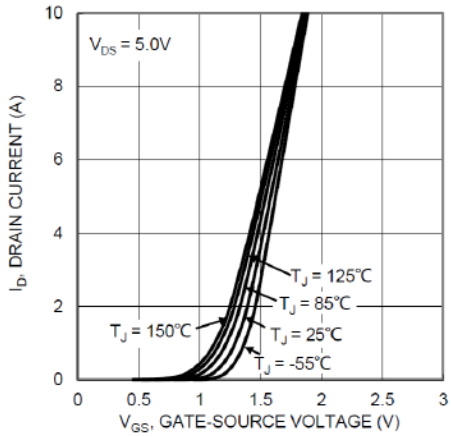

Fig. 2 Typical Transfer Characteristics

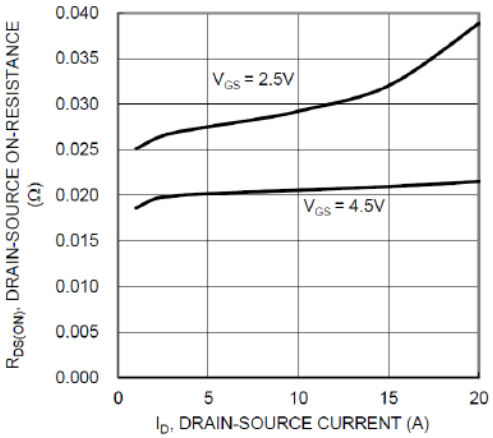

Fig. 3 Typical On-Resistance vs. I_D and V_{GS}

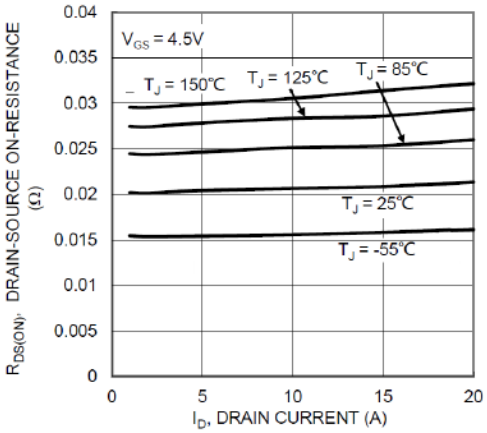

Fig. 4 Typical Drain-Source On Resistance vs. I_D and T_A

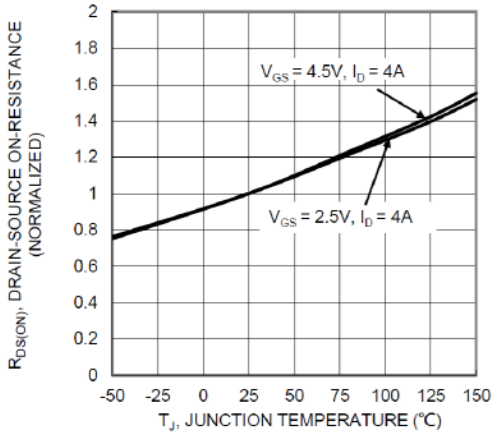

Fig. 5 On-Resistance Variation with T_A

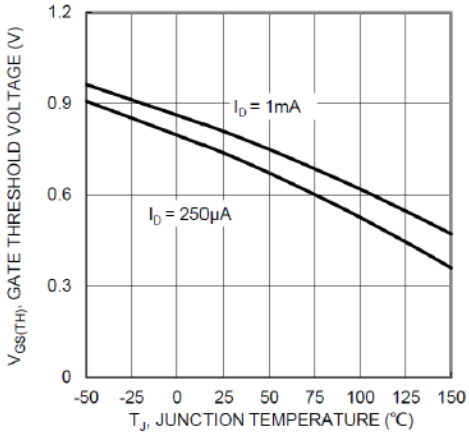

Fig. 6 Gate Threshold Variation with T_A

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Typical Performance Characteristics(N-Channel Continue)

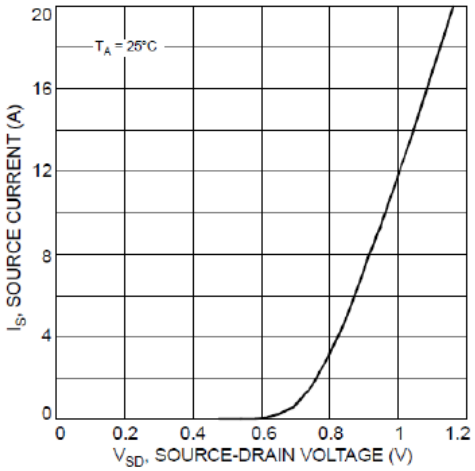

Fig. 7 Diode Forward Voltage vs. Current

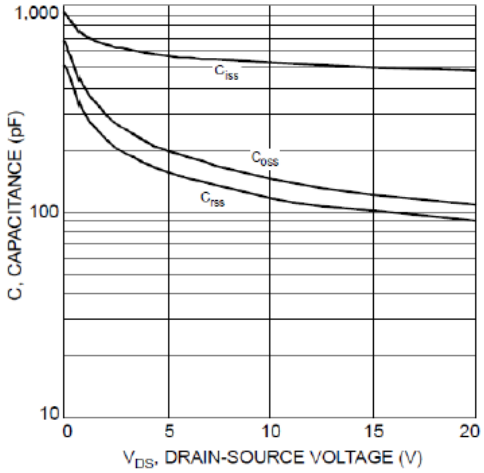

Fig.8 Typical Capacitance

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Typical Performance Characteristics(P-Channel)

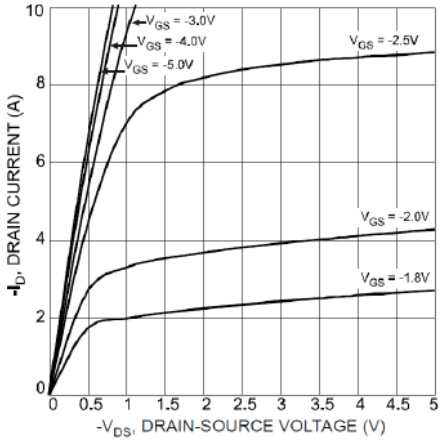

Fig. 1 Typical Output Characteristics

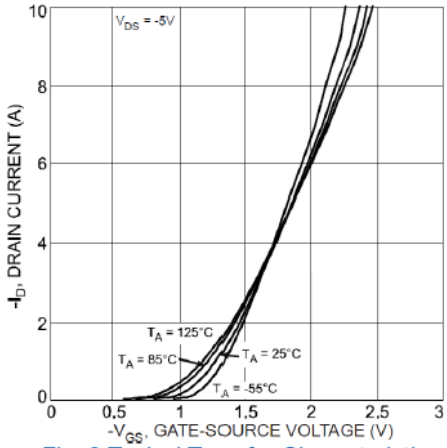

Fig. 2 Typical Transfer Characteristics

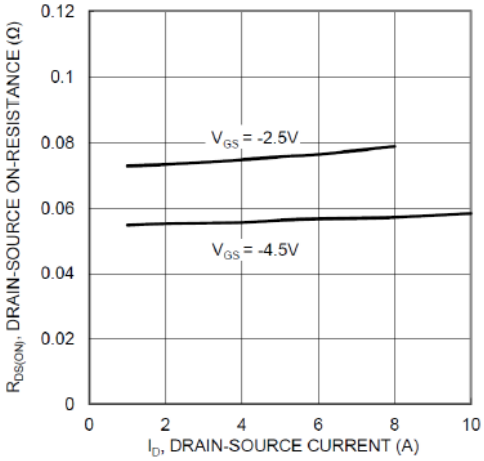

Fig. 3 Typical On-Resistance vs. I_D and V_{GS}

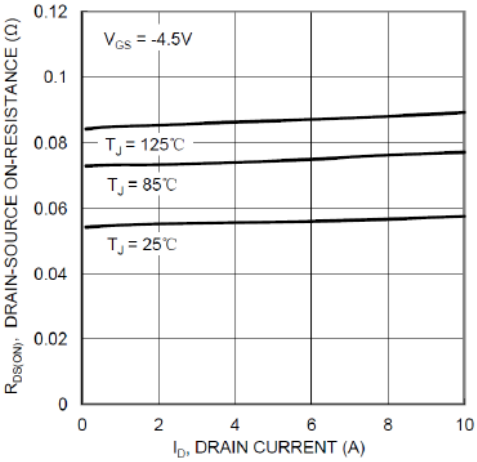

Fig. 4 Typical Drain-Source On Resistance vs. I_D and T_A

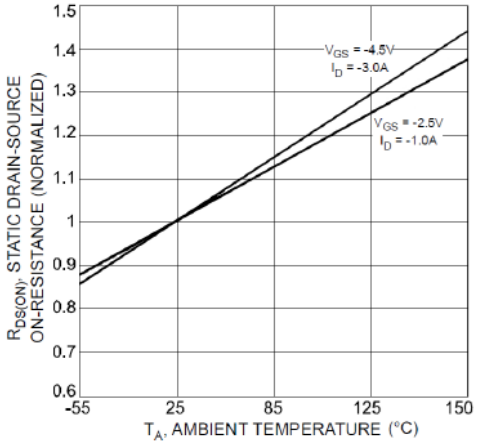

Fig. 5 On-Resistance Variation with T_A

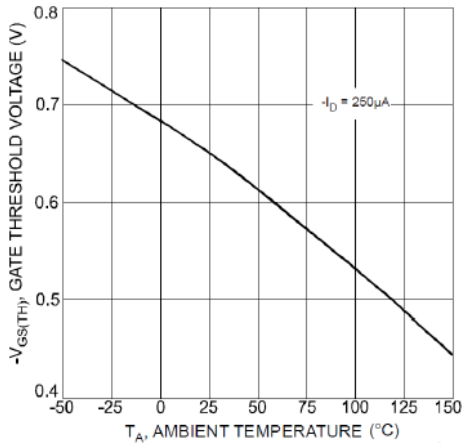

Fig. 6 Gate Threshold Variation with T_A

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Typical Performance Characteristics (P-Channel Continue)

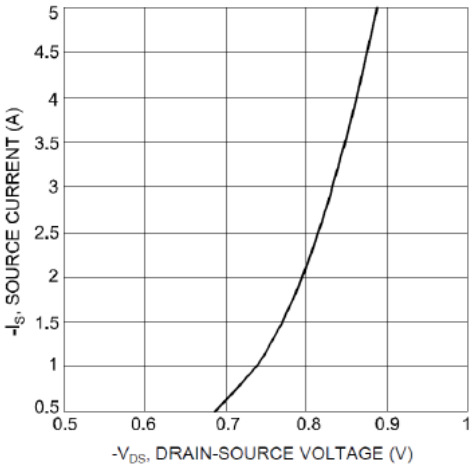

Fig. 7 Diode Forward Voltage vs. Current

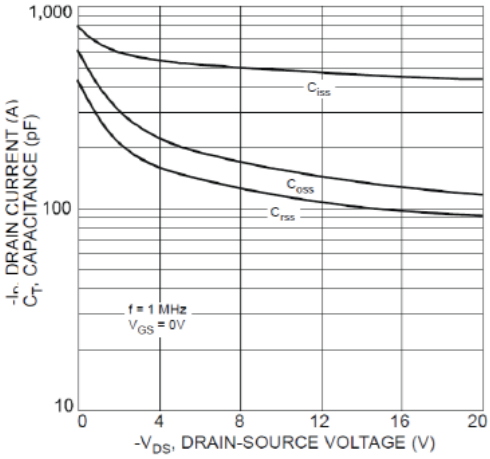

Fig.8 Typical Capacitance

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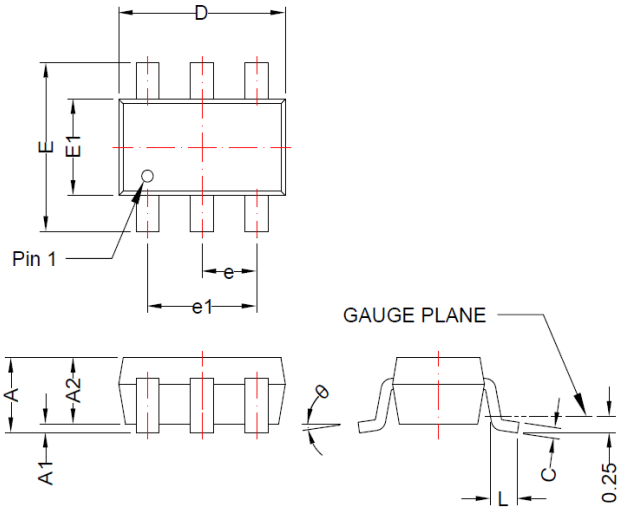
Package Dimension:

SOT-23-6L



Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	0.90	1.45	0.035	0.057
A1	0.00	0.15	0.000	0.006
A2	0.90	1.30	0.035	0.051
b	0.30	0.50	0.012	0.020
c	0.08	0.26	0.003	0.010
D	2.70	3.10	0.106	0.122
E	2.20	3.00	0.087	0.118
E1	1.30	1.75	0.051	0.069
e	0.95 BSC		0.037 BSC	
e1	1.90 BSC		0.075 BSC	
L	0.30	0.60	0.012	0.024
θ	0°	8°	0°	8°

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