Power MOSFETS

DATASHEET

LM20B30NGI3A

N-Channel

Enhancement Mode MOSFET

Leadpower-semiconductor Corp., Ltd

sales@leadpower-semi.com

(03) 6577339 FAX：(03) 6577229

www.leadpower-semi.com

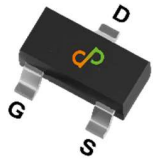
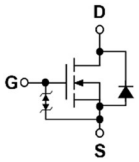
Quality Management Systems

ISO 9001:2015 Certificate

LM20B30NGI3A

N-Channel Enhancement Mode MOSFET

Pin Description

SOT-23(TOP view)	Symbol
	

Product Summary

Symbol	N-Channel	Unit
V_{DSS}	20	V
$R_{DS(ON)-Max}$	230	mΩ
ID	1	A

Feature

- Fast switching speed
- Reliable and Rugged
- ROHS Compliant & Halogen-Free
- ESD Protection

Applications

- DC/DC Converters
- Small Signal Switch
- Load Switch

Ordering Information

Orderable Part Number	Package Type	Form	Shipping	Marking
LM20B30NGI3A	SOT-23	Tape & Reel	3000 / Tape & Reel	29□□□

Note：□□□= Lot Code

Absolute Maximum Ratings (T_J=25°C Unless Otherwise Noted)

Symbol	Parameter		N-Channel	Unit
V_{DSS}	Drain-Source Voltage		20	V
V_{GSS}	Gate-Source Voltage		±8	
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-55 to 150	°C
I_S	Diode Continuous Forward Current	T_A=25°C	0.4	A
I_{DM}①	Pulse Drain Current Tested	T_A=25°C	2.5	A
I_D	Continuous Drain Current	T_A=25°C	1	A
		T_A=70°C	0.8	
P_D	Maximum Power Dissipation	T_A=25°C	0.36	W
		T_A=70°C	0.23	

Thermal Characteristics

Symbol	Parameter		Rating	Unit
$R_{\theta JA}$②	Thermal Resistance-Junction to Ambient	Steady State	350	°C/W

Note ①：Max. current is limited by bonding wire

Note ②：Surface Mounted on 1in^2 FR-4 board with 1oz

N-Channel Electrical Characteristics (T_J=25°C Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Electrical Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250uA	20	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=16V, V_{GS}=0V	-	-	1	uA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250uA	0.5	-	1	V
I_{GSS}	Gate Leakage Current	V_{GS}=±8V, V_{DS}=0V	-	-	±10	uA
$R_{DS(ON)}$③	Drain-Source On-state Resistance	V_{GS}=4.5V, I_{DS}=550mA	-	190	230	mΩ
		V_{GS}=2.5V, I_{DS}=450mA	-	234	305	
		V_{GS}=1.8V, I_{DS}=350mA	-	303	455	
gfs	Forward Transconductance	V_{DS}=5V, I_{DS}=550mA	-	1.7	-	S
Dynamic Characteristics ④						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V, Freq.=1MHz	-	198	-	Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=10V, Freq.=1MHz	-	43	-	pF
C_{oss}	Output Capacitance		-	9	-	
C_{rss}	Reverse Transfer Capacitance		-	6	-	
$td_{(ON)}$	Turn-on Delay Time	V_{GS}=4.5V,V_{DS}=10V, I_D=2A,R_{GEN}=6Ω	-	1.2	-	nS
t_r	Turn-on Rise Time		-	25	-	
$t_{d(OFF)}$	Turn-off Delay Time		-	14	-	
t_f	Turn-off Fall Time		-	15	-	
Q_g	Total Gate Charge	V_{GS}=2.5V,V_{DS}=10V I_D=1A	-	1.1	-	nC
Q_g	Total Gate Charge	V_{GS}=4.5V,V_{DS}=10V, I_D=1A	-	2	-	
Q_{gs}	Gate-Source Charge		-	0.3	-	
Q_{gd}	Gate-Drain Charge		-	0.3	-	
Source-Drain Characteristics						
V_{SD}③	Diode Forward Voltage	I_{SD}=1A, V_{GS}=0V	-	0.9	1.1	V
t_{rr}	Reverse Recovery Time	I_F=1A, V_R=0V dI$_F$/dt=100A/μs	-	9.2	-	nS
Q_{rr}	Reverse Recovery Charge		-	0.8	-	nC

Note ③：Pulse test (pulse width≤300us, duty cycle≤2%).
Note ④：Guaranteed by design, not subject to production testing.

N-Channel Typical Characteristics

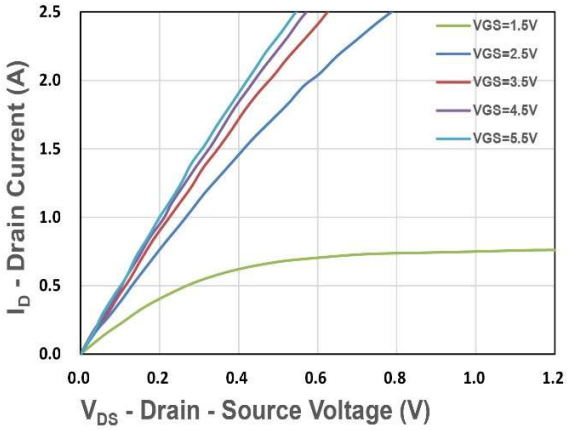


Figure 1. Output Characteristics

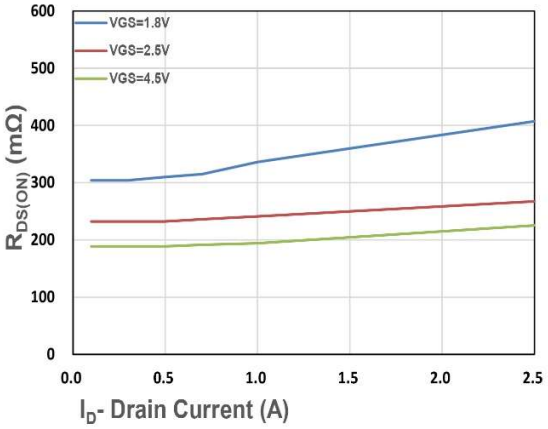


Figure 2. On-Resistance vs. ID

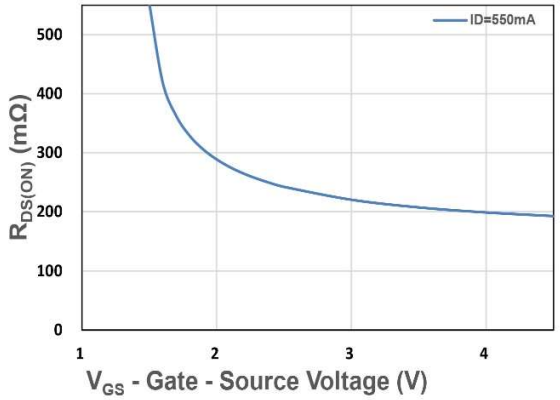


Figure 3. On-Resistance vs. VGS

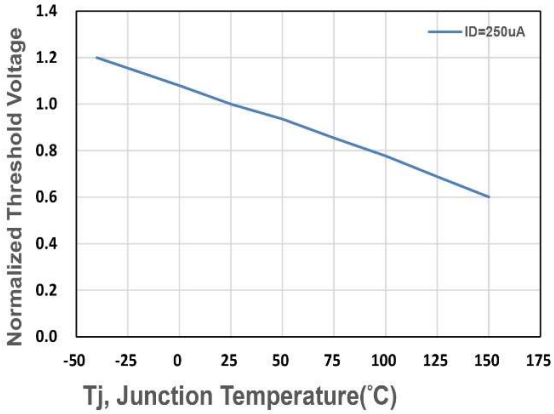


Figure 4. Gate Threshold Voltage

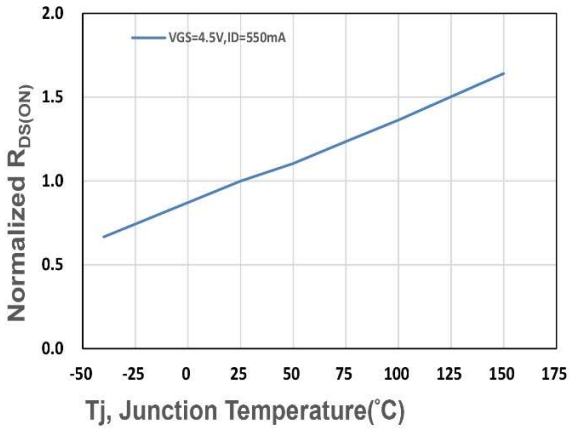


Figure 5. Drain-Source On Resistance

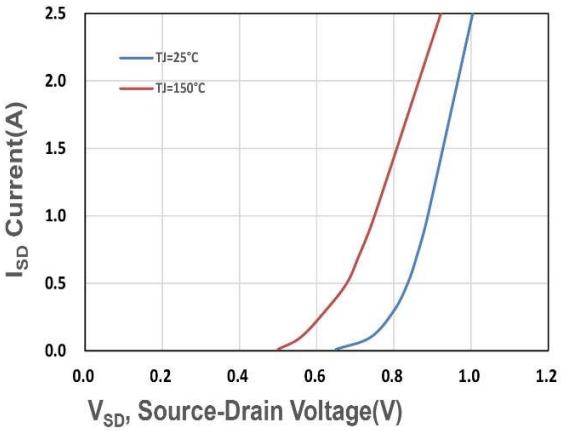


Figure 6. Source-Drain Diode Forward

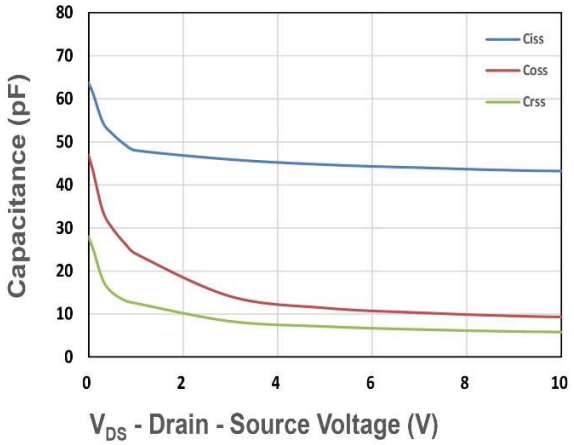


Figure 7. Capacitance

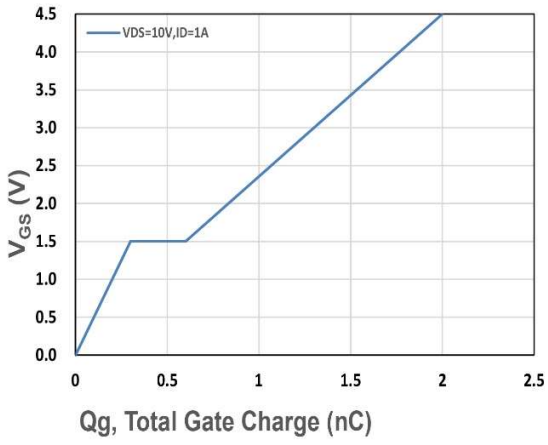


Figure 8. Gate Charge Characteristics

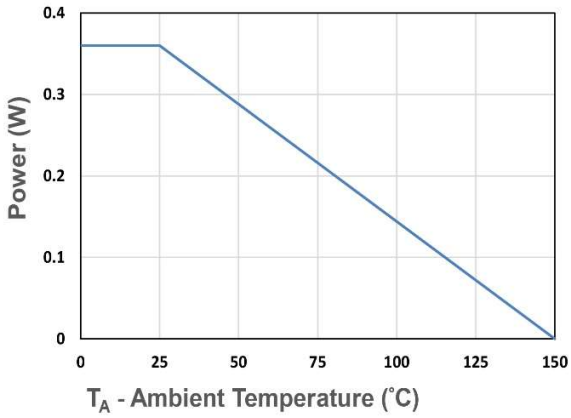


Figure 9. Power Dissipation

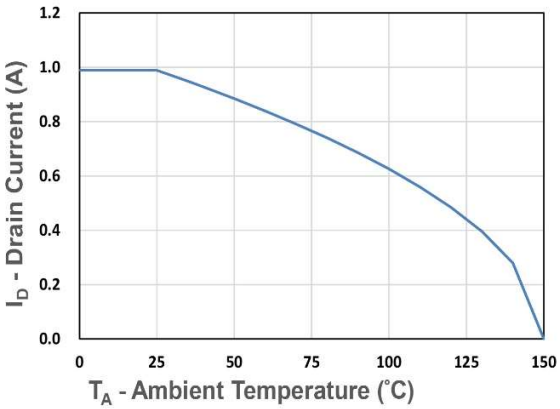


Figure 10. Drain Current

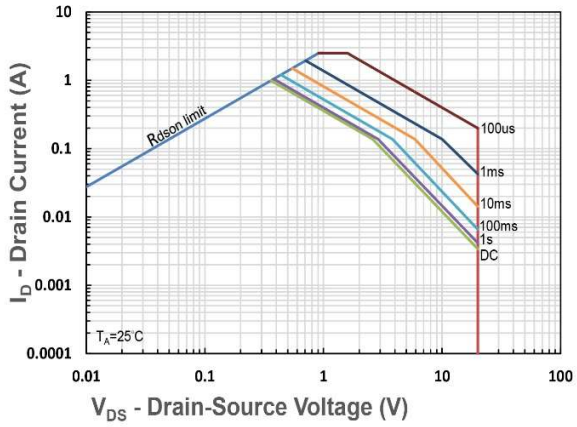


Figure 11. Safe Operating Area

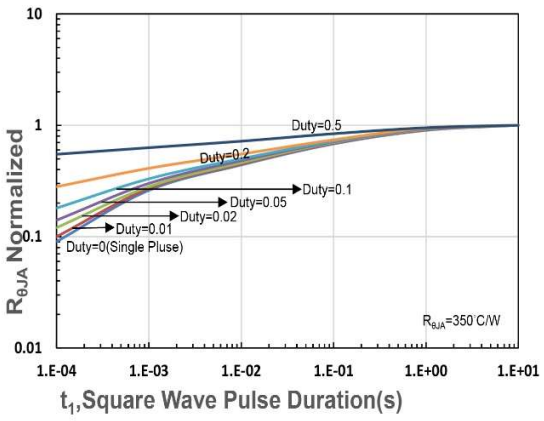


Figure 12. RθJA Transient Thermal Impedance