Power MOSFETS

DATASHEET

LM30A50NGI3A

N-Channel
Enhancement Mode MOSFET

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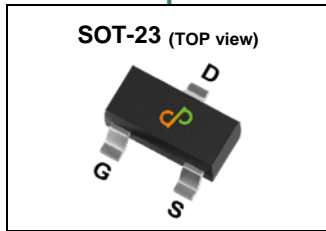📞 **(03) 6577339   FAX : (03) 6577229**

🌐 **www.leadpower-semi.com**
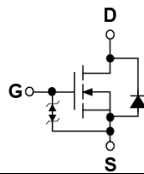
Quality Management Systems

ISO 9001:2015 Certificate

LM30A50NGI3A

Leadpower Semiconductor

N-Channel Enhancement Mode MOSFET

Pin Description

SOT-23 (TOP view)	Symbol

Product Summary

Symbol	N-Channel	Unit
V_{DSS}	30	V
$R_{DS(ON)\text{-}Max}$	165	mΩ
ID	1.7	A

Feature

- Surface mount package
- Reliable and Rugged
- ROHS Compliant & Halogen-Free
- ESD Protection

Applications

- Power Load Switch
- Motor Control

Ordering Information

Orderable Part Number	Package Type	Form	Shipping	Marking
LM30A50NGI3A	SOT-23	Tape & Reel	3000 / Tape & Reel	33□□□

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

Symbol	Parameter		N-Channel	Unit
V_{DSS}	Drain-Source Voltage		30	V
V_{GSS}	Gate-Source Voltage		±8	
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-55 to 150	°C
Is	Diode Continuous Forward Current	T_C=25°C	0.38	A
I_{DM}[①]	Pulse Drain Current Tested	T_C=25°C	4.3	A
I_D	Continuous Drain Current	T_A=25°C	1.7	A
		T_A=70°C	1.4	
P_D	Maximum Power Dissipation	T_A=25°C	0.9	W
		T_A=70°C	0.6	
I_{AS}[②]	Avalanche Current, Single pulse	L=0.1mH	3	A
		L=0.5mH	2	
E_{AS}[②]	Avalanche Energy, Single pulse	L=0.1mH	0.45	mJ
		L=0.5mH	1	

Thermal Characteristics

Symbol	Parameter		Rating	Unit
$R_{θJA}$[③]	Thermal Resistance-Junction to Ambient	Steady State	140	°C/W

Note ① : Max. current is limited by junction temperature.

Note ② : UIS tested and pulse width are limited by maximum junction temperature 150°C.

Note ③ : Surface Mounted on 1in² FR-4 board with 1oz.

LM30A50NGI3A

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	$V_{GS}=0V$, $I_{DS}=250uA$	30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=24V$, $V_{GS}=0V$	-	-	1	uA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}$, $I_{DS}=250uA$	0.4	0.65	1.0	V
I_{GSS}	Gate Leakage Current	$V_{GS}=±28V$, $V_{DS}=0V$	-	-	±10	uA
$R_{DS(ON)}$④	Drain-Source On-state Resistance	$V_{GS}=4.5V$, $I_{DS}=2A$	-	140	165	mΩ
		$V_{GS}=2.5V$, $I_{DS}=1.5A$	-	160	210	
gfs	Forward Transconductance	$V_{DS}=5V$, $I_{DS}=1.6A$	-	4.5	-	S
Dynamic Characteristics ⑤						
R_G	Gate Resistance	$V_{GS}=0V$, $V_{DS}=0V$, Freq.=1MHz	-	3.5	-	Ω
C_{iss}	Input Capacitance	$V_{GS}=0V$, $V_{DS}=15V$, Freq.=1MHz	-	129	-	pF
C_{oss}	Output Capacitance		-	21	-	
C_{rss}	Reverse Transfer Capacitance		-	14	-	
$td_{(ON)}$	Turn-on Delay Time	$V_{GS}=4.5V$, $V_{DS}=15V$, $I_D=1A$, $R_{GEN}=1Ω$	-	4	-	nS
t_r	Turn-on Rise Time		-	13	-	
$t_{d(OFF)}$	Turn-off Delay Time		-	7	-	
t_f	Turn-off Fall Time		-	2	-	
Q_g	Total Gate Charge	$V_{GS}=2.5V$, $V_{DS}=15V$ $I_D=2A$	-	1.5	-	nC
Q_g	Total Gate Charge	$V_{GS}=4.5V$, $V_{DS}=15V$, $I_D=2A$	-	2.8	-	
Q_{gs}	Gate-Source Charge		-	0.6	-	
Q_{gd}	Gate-Drain Charge		-	0.2	-	
Source-Drain Characteristics						
V_{SD}④	Diode Forward Voltage	$I_{SD}=1.6A$, $V_{GS}=0V$	-	0.8	1.1	V
t_{rr}	Reverse Recovery Time	$I_F=1A$, $V_R=15V$	-	9	-	nS
Q_{rr}	Reverse Recovery Charge	$dI_F/dt=100A/\mu s$	-	1	-	nC

Note ④：Pulse test (pulse width≤300us, duty cycle≤2%).
Note ⑤：Guaranteed by design, not subject to production testing.
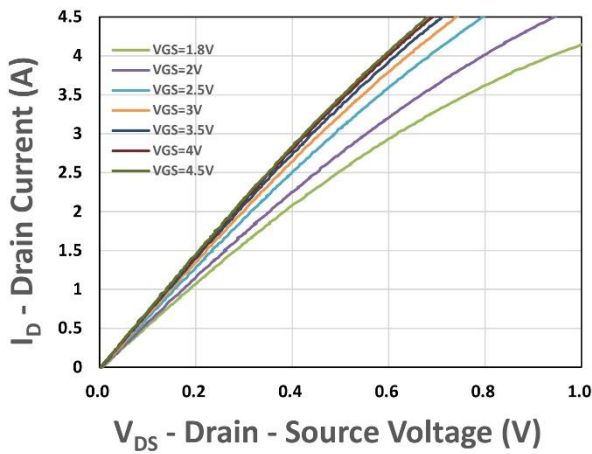
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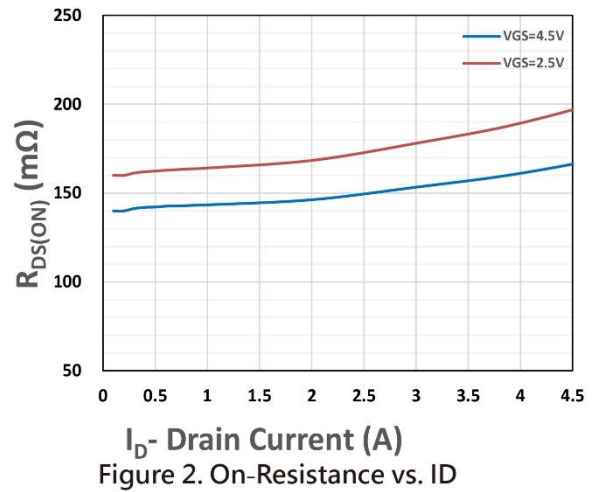## N-Channel Typical Characteristics

Figure 1. Output Characteristics

Figure 2. On-Resistance vs. ID

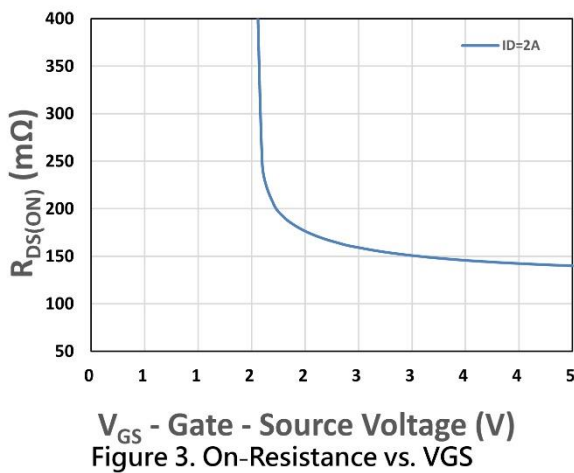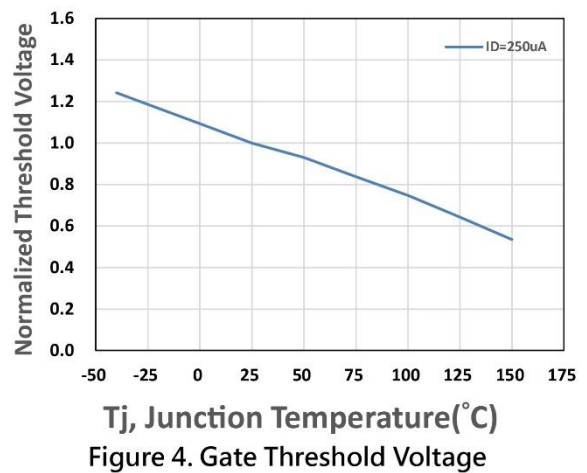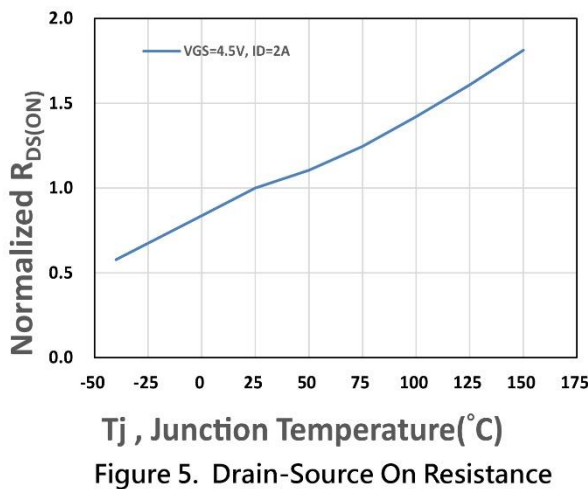Figure 3. On-Resistance vs. VGS
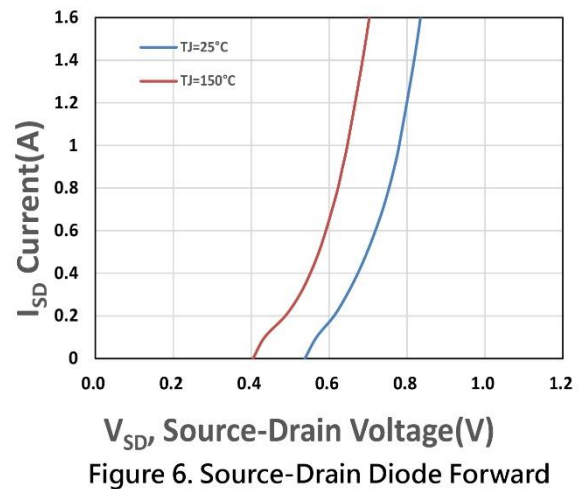
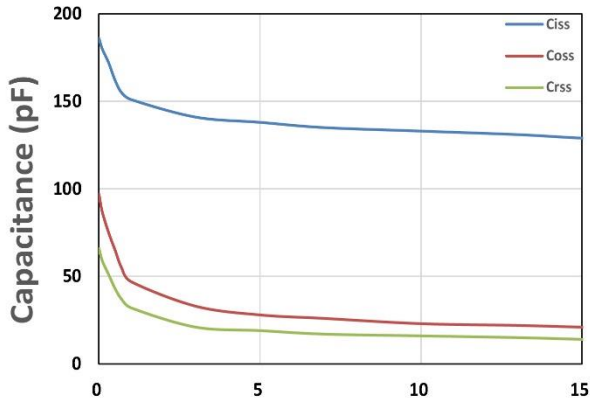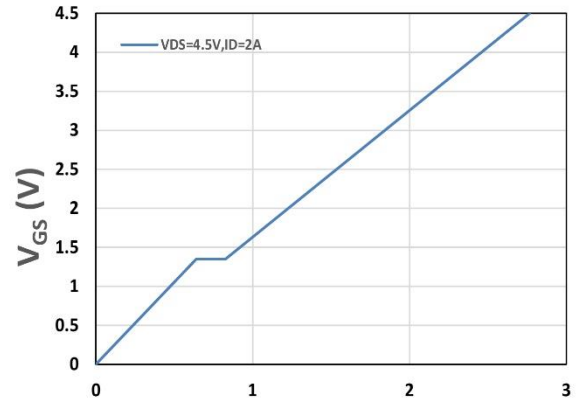Figure 4. Gate Threshold Voltage

Figure 5. Drain-Source On Resistance

Figure 6. Source-Drain Diode Forward

Figure 7. Capacitance

Figure 8. Gate Charge Characteristics
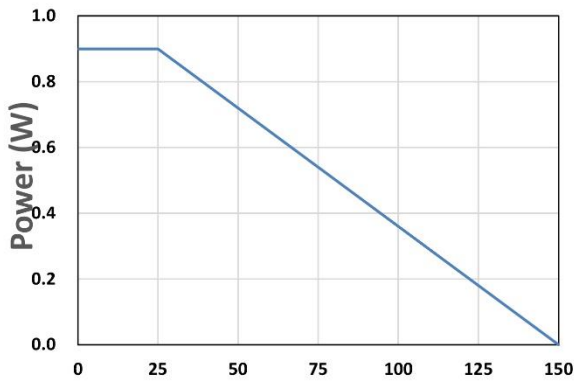
Figure 9. Power Dissipation
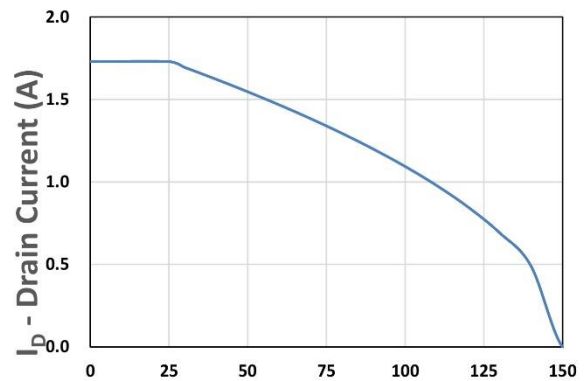
Figure 10. Drain Current
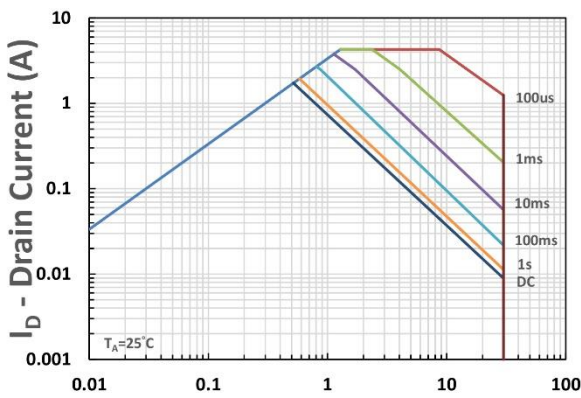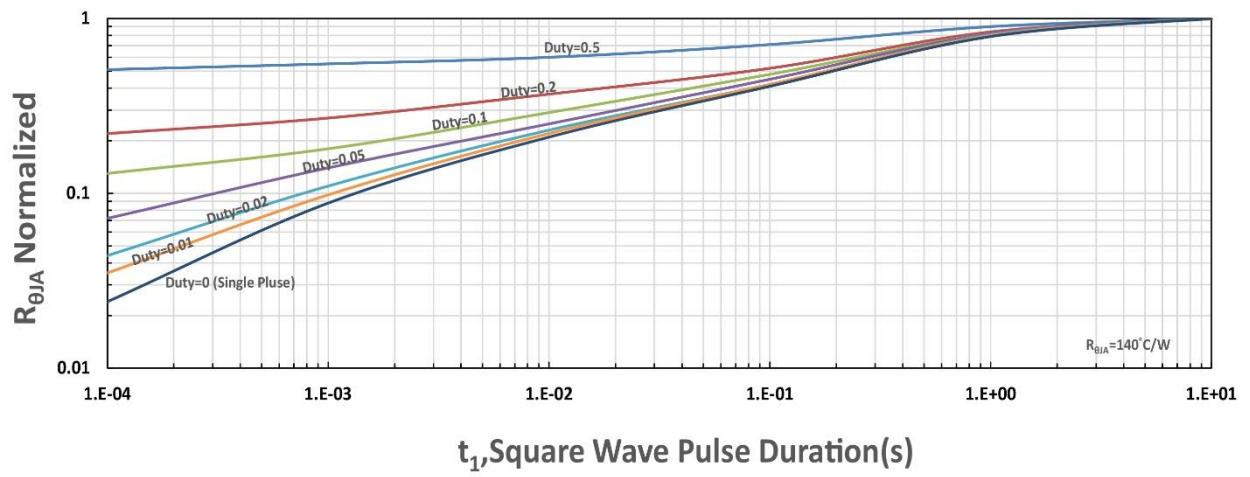

Figure 11. Safe Operating Area
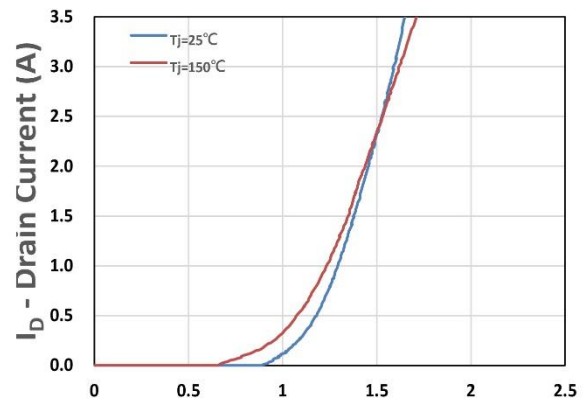
Figure 12. Transfer Characteristics

Figure 13. RθJA Transient Thermal Impedance