



Power MOSFETS

DATASHEET

LM20550NLI3A

N-Channel
Enhancement Mode MOSFET

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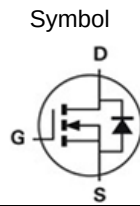
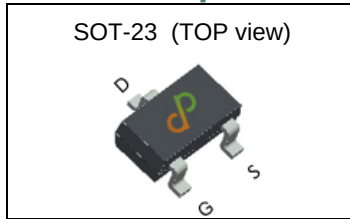


Quality Management Systems

ISO 9001:2015 Certificate

N-Channel Enhancement Mode MOSFET

Pin Description



Ordering Information

Symbol	N-Channel	Unit
V_{DSS}	20	V
$R_{DS(ON)-Max}$	55	m Ω
I_D	3.4	A

Feature

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

Applications

- Portable Equipment
- Battery Powered System

Ordering Information

Orderable Part Number	Package Type	Form	Shipping	Marking
LM20550NLI3A	SOT-23	Tape & Reel	3000 / Tape & Reel	01□□□

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		±12	
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-55 to 150	°C
$I_{DM}^{①}$	Pulse Drain Current Tested	$T_A=25^{\circ}C$	8.6	A
I_D	Continuous Drain Current	$T_A=25^{\circ}C$	3.4	A
		$T_A=70^{\circ}C$	2.2	
P_D	Maximum Power Dissipation	$T_A=25^{\circ}C$	1	W
		$T_A=70^{\circ}C$	0.6	
$I_{AS}^{②}$	Avalanche Current, Single pulse	L=0.1mH	8.6	A
$E_{AS}^{②}$	Avalanche Energy, Single pulse	L=0.1mH	3.7	mJ

Thermal Characteristics

Symbol	Parameter		Rating	Unit
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	t≤10s	90	°C/W
		Steady State	125	°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.

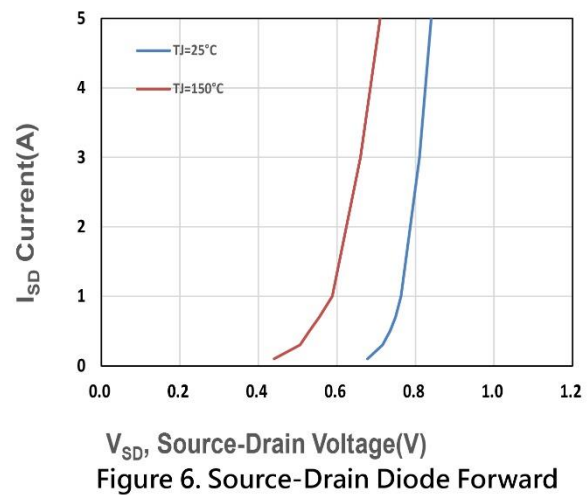
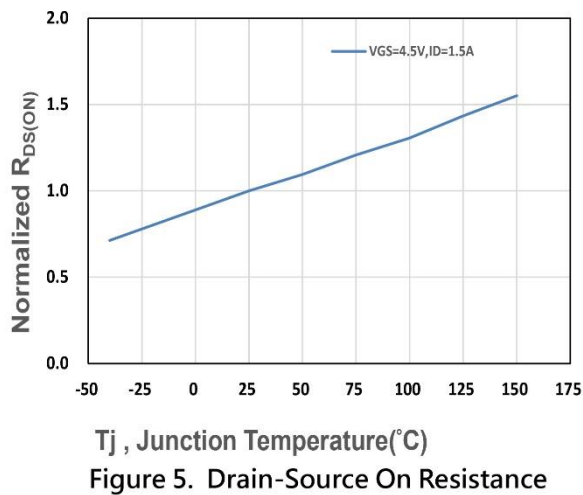
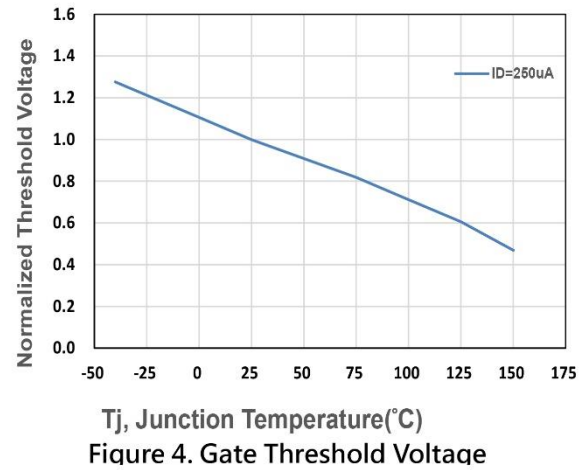
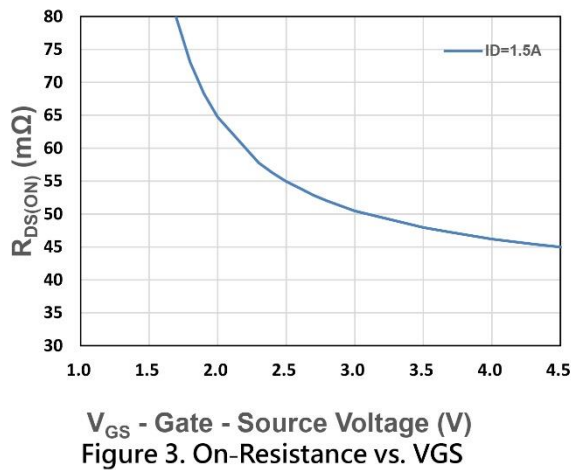
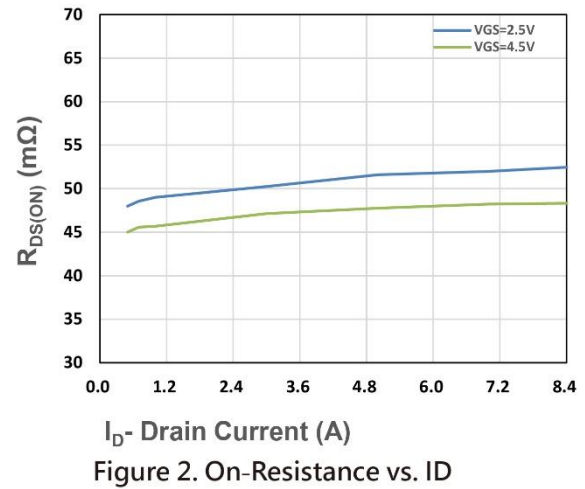
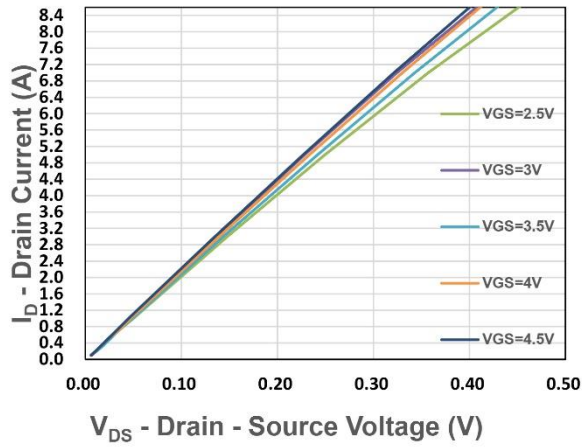
N-Channel Electrical Characteristics ($T_J=25^{\circ}\text{C}$ Unless Otherwise Noted)

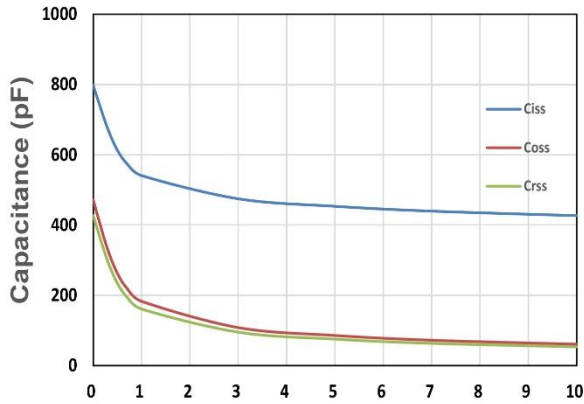
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Electrical Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250uA	20	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =16V, V _{GS} =0V	-	-	1	uA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250uA	0.4	0.65	1.0	V
I _{GSS}	Gate Leakage Current	V _{GS} =±12V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ④	Drain-Source On-state Resistance	V _{GS} =4.5V, I _{DS} =1.5A	-	45	55	mΩ
		V _{GS} =2.5V, I _{DS} =1.5A	-	48	63	
gfs	Forward Transconductance	V _{DS} =10V, I _{DS} =1.5A	-	4.7	-	S
Dynamic Characteristics ⑥						
R _G	Gate Resistance	V _{GS} =0V,V _{DS} =0V, Freq.=1MHz	-	2	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =10V, Freq.=1MHz	-	427	-	pF
C _{oss}	Output Capacitance		-	61	-	
C _{rss}	Reverse Transfer Capacitance		-	53	-	
td(ON)	Turn-on Delay Time	V _{GS} =4.5V,V _{DS} =10V, I _D =1A,R _{GEN} =6Ω	-	4	-	nS
tr	Turn-on Rise Time		-	14	-	
td(OFF)	Turn-off Delay Time		-	26	-	
tf	Turn-off Fall Time		-	7.6	-	
Qg	Total Gate Charge	V _{GS} =4.5V,V _{DS} =10V, I _D =6A	-	8.6	-	nC
Qgs	Gate-Source Charge		-	0.7	-	
Qgd	Gate-Drain Charge		-	3.2	-	
Source-Drain Characteristics						
VSD④	Diode Forward Voltage	ISD=1A, VGS=0V	-	0.75	1.1	V
trr	Reverse Recovery Time	IF=6A, VR=10V	-	18	-	nS
Qrr	Reverse Recovery Charge	dIF/dt=100A/μs	-	5.5	-	nC

Note ④ : Pulse test (pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$).

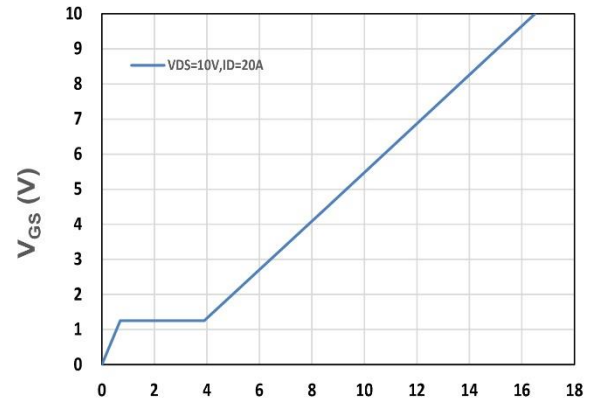
Note ⑤ : Guaranteed by design, not subject to production testing.

N-Channel Typical Characteristics

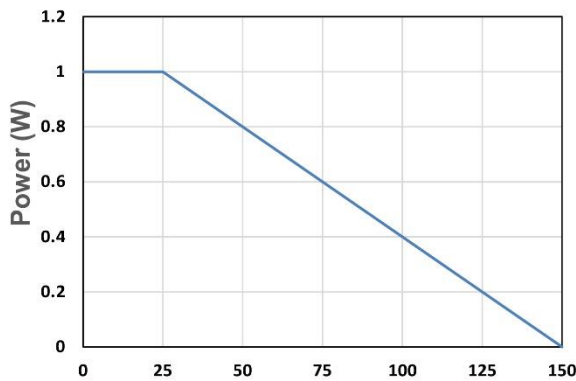




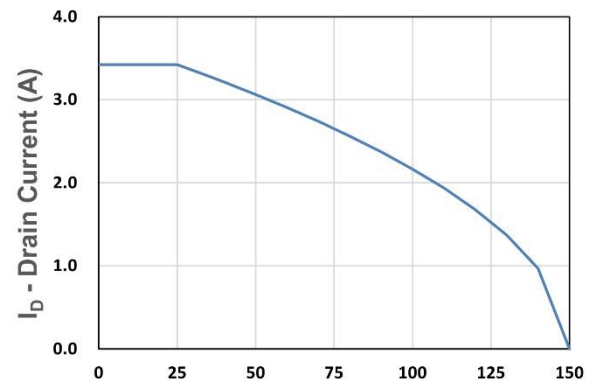
V_{DS} - Drain - Source Voltage (V)
Figure 7. Capacitance



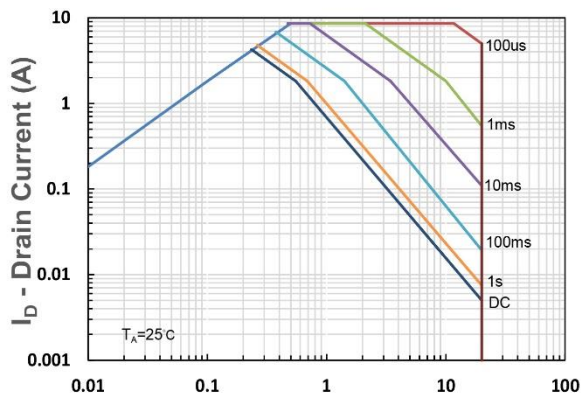
Q_g , Total Gate Charge (nC)
Figure 8. Gate Charge Characteristics



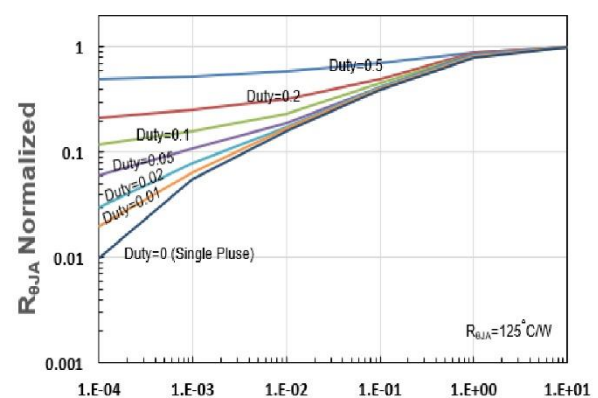
T_A - Ambient Temperature($^{\circ}C$)
Figure 9. Power Dissipation



T_A - Ambient Temperature($^{\circ}C$)
Figure 10. Drain Current



V_{DS} - Drain-Source Voltage (V)
Figure 11. Safe Operating Area



t_1 , Square Wave Pulse Duration(s)
Figure 12. $R_{\theta JA}$ Transient Thermal Impedance