



Power MOSFETS

DATASHEET

LM30350NGJ3A

N-Channel
Enhancement Mode MOSFET

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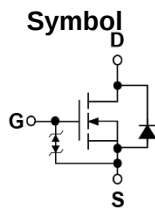
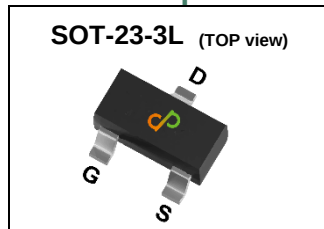


Quality Management Systems

ISO 9001:2015 Certificate

N-Channel Enhancement Mode MOSFET

Pin Description



Product Summary

Symbol	N-Channel	Unit
V_{DSS}	30	V
$R_{DS(ON)-Max}$	31	m Ω
ID	4.9	A

Feature

- Suitable for Low Gate Drive
- Reliable and Rugged
- ROHS Compliant & Halogen-Free
- ESD Protection

Applications

- Portable Equipment
- Load Switches

Ordering Information

Orderable Part Number	Package Type	Form	Shipping	Marking
LM30350NGJ3A	SOT-23-3L	Tape & Reel	3000 / Tape & Reel	04□□□

Note : □□□ = Lot Code

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

Symbol	Parameter		N-Channel	Unit
V_{DSS}	Drain-Source Voltage		30	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	$T_A=25^\circ\text{C}$	11.2	A
I_D	Continuous Drain Current	$T_A=25^\circ\text{C}$	4.9	A
		$T_A=70^\circ\text{C}$	3.9	
P_D	Maximum Power Dissipation	$T_A=25^\circ\text{C}$	1.25	W
		$T_A=70^\circ\text{C}$	0.8	
$I_{AS}^{②}$	Avalanche Current, Single pulse	L=0.1mH	11	A
$E_{AS}^{②}$	Avalanche Energy, Single pulse	L=0.1mH	6	mJ

Thermal Characteristics

Symbol	Parameter		Rating	Unit
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	Steady State	100	°C/W

Note ① : Max. current is limited by bonding wire

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.

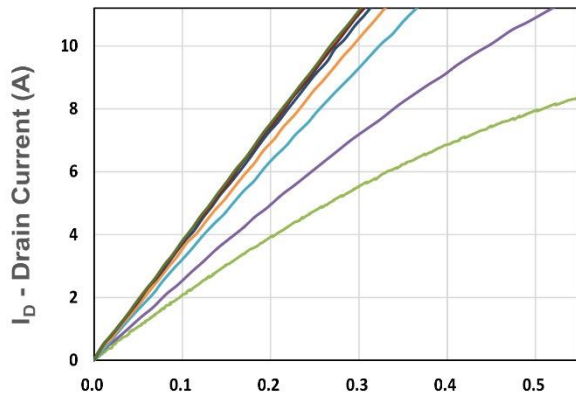
N-Channel Electrical Characteristics ($T_J=25^{\circ}\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Electrical Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250uA	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	0.8	1.3	V
I _{GSS}	Gate Leakage Current	V _{GS} =±12V, V _{DS} =0V	-	-	±10	uA
R _{DS(ON)} ®	Drain-Source On-state Resistance	V _{GS} =4.5V, I _{DS} =2A	-	26	31	mΩ
		V _{GS} =2.5V, I _{DS} =1A	-	32	42	
		V _{GS} =1.8V, I _{DS} =0.5A	-	45	68	
gfs	Forward Transconductance	V _{DS} =3V, I _{DS} =1A	-	8	-	S
Dynamic Characteristics ®						
R _G	Gate Resistance	V _{GS} =0V,V _{DS} =0V, Freq.=1MHz	-	3	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =15V, Freq.=1MHz	-	632	-	pF
C _{oss}	Output Capacitance		-	58	-	
C _{rss}	Reverse Transfer Capacitance		-	40	-	
td(ON)	Turn-on Delay Time	V _{GS} =4.5V,V _{DS} =25V, Id=1A,RGEN=6Ω	-	8	-	nS
tr	Turn-on Rise Time		-	7.2	-	
td(OFF)	Turn-off Delay Time		-	25.5	-	
tf	Turn-off Fall Time		-	18.2	-	
Qg	Total Gate Charge	V _{GS} =2.5V,V _{DS} =15V Id=2A	-	4.1	-	nC
Qg	Total Gate Charge	V _{GS} =4.5V,V _{DS} =15V, Id=2A	-	7.25	-	
Qgs	Gate-Source Charge		-	1.61	-	
Qgd	Gate-Drain Charge		-	1.35	-	
Source-Drain Characteristics						
VSD®	Diode Forward Voltage	ISD=1A, VGS=0V	-	0.65	1.1	V
trr	Reverse Recovery Time	IF=1A, VR=15V	-	8.1	-	nS
Qrr	Reverse Recovery Charge	dlF/dt=100A/μs	-	2.5	-	nC

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

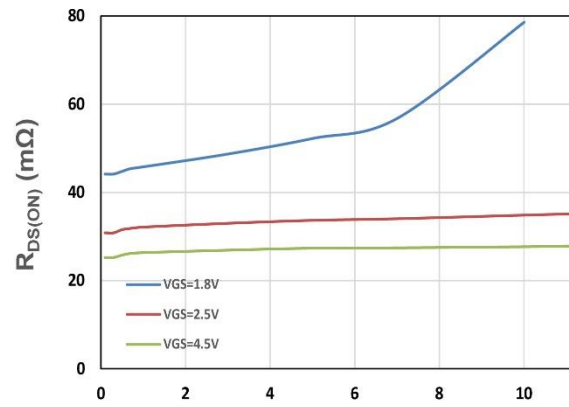
Note ⑤ : Guaranteed by design, not subject to production testing.

N-Channel Typical Characteristics



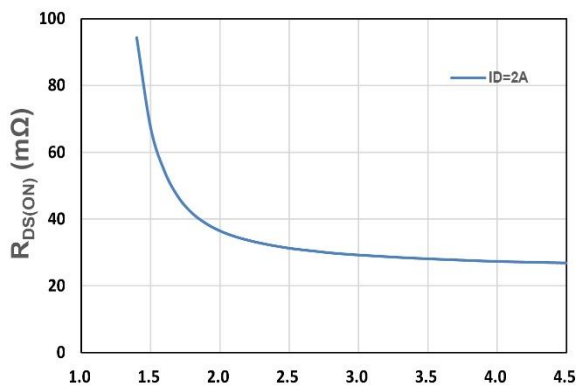
V_{DS} - Drain - Source Voltage (V)

Figure 1. Output Characteristics



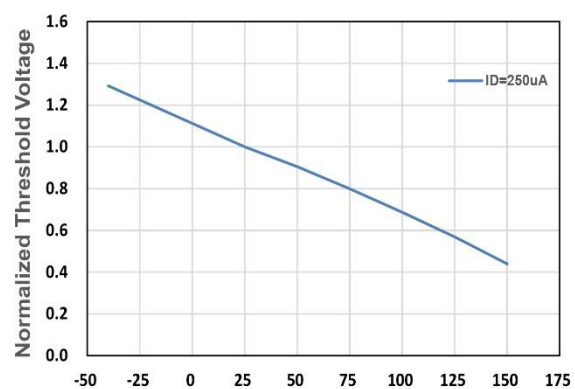
I_D - Drain Current (A)

Figure 2. On-Resistance vs. ID



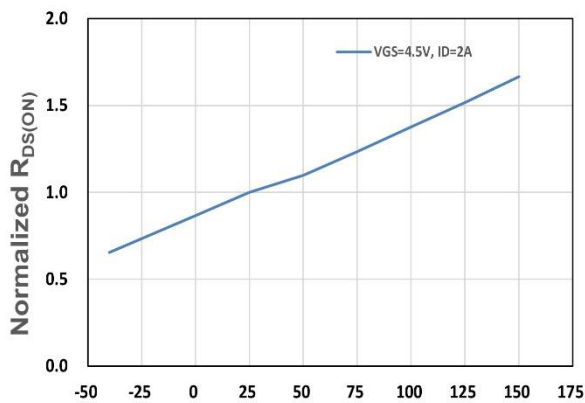
V_{GS} - Gate - Source Voltage (V)

Figure 3. On-Resistance vs. VGS



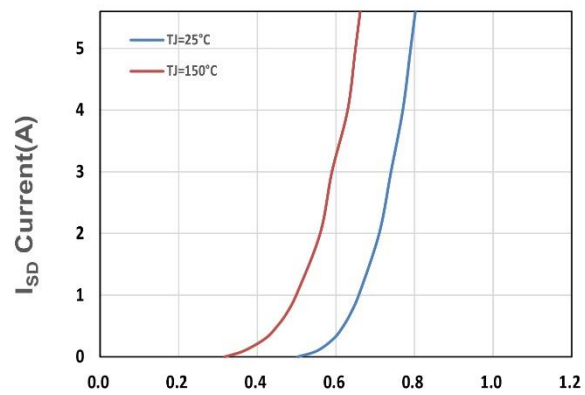
T_j , Junction Temperature(°C)

Figure 4. Gate Threshold Voltage



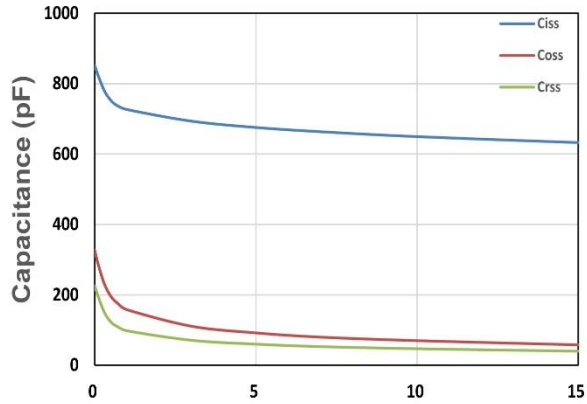
T_j , Junction Temperature(°C)

Figure 5. Drain-Source On Resistance

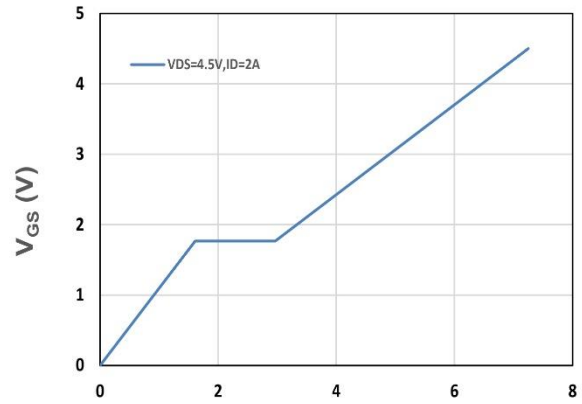


V_{SD} , Source-Drain Voltage(V)

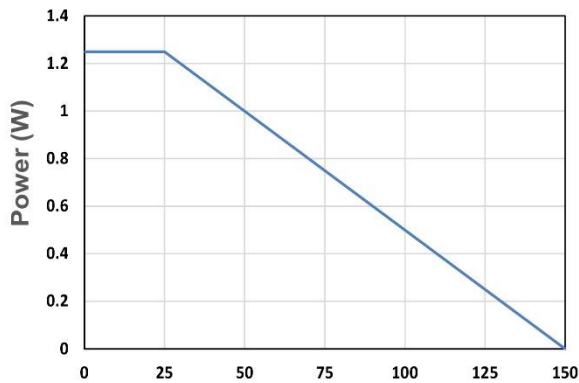
Figure 6. Source-Drain Diode Forward



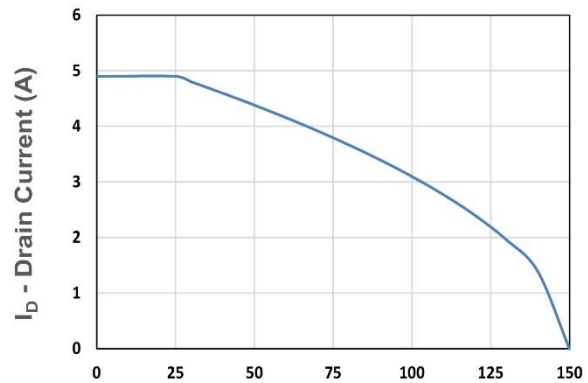
V_{DS} - Drain - Source Voltage (V)
Figure 7. Capacitance



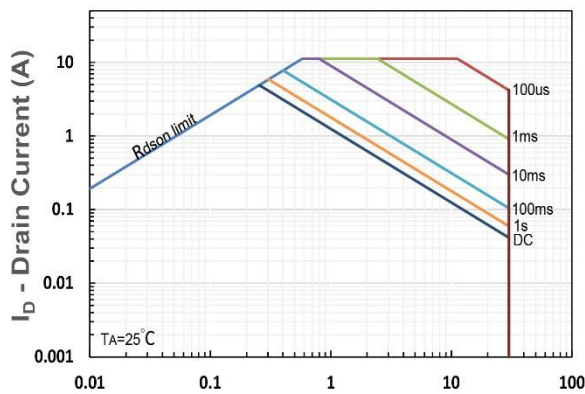
Q_g , Total Gate Charge (nC)
Figure 8. Gate Charge Characteristics



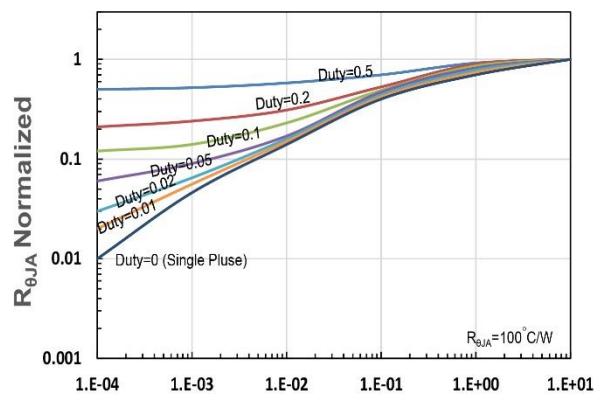
T_A - Ambient Temperature (°C)
Figure 9. Power Dissipation



T_A - Ambient Temperature (°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