





Power MOSFETS

DATASHEET

LM30110NAQ8A

N-Channel
Enhancement Mode MOSFET

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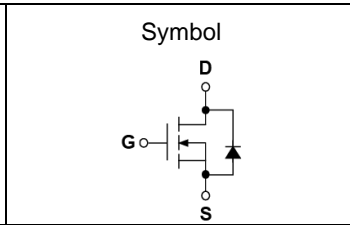
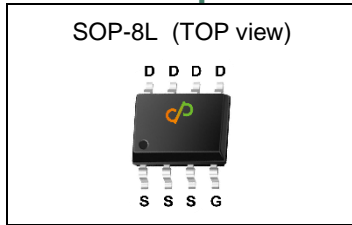


Quality Management Systems

ISO 9001:2015 Certificate

N-Channel Enhancement Mode MOSFET

Pin Description



Product Summary

Symbol	N-Channel	Unit
V_{DSS}	30	V
$R_{DS(ON)-Max}$	10	mΩ
I_D	9.4	A

Feature

- Fast switching speed
- Reliable and Rugged
- ROHS Compliant & Halogen-Free
- 100% UIS

Applications

- DC DC Converters
- Portable equipment application

Ordering Information

Orderable Part Number	Package Type	Form	Shipping	Marking
LM30110NAQ8A	SOP-8L	Tape & Reel	3000 / Tape & Reel	30110 □□□□□□

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		±20	
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-55 to 150	°C
$I_{DM}^{①}$	Pulse Drain Current Tested	$T_A=25^{\circ}C$	23.5	A
I_D	Continuous Drain Current	$T_A=25^{\circ}C$	9.4	A
		$T_A=70^{\circ}C$	7.5	
P_D	Maximum Power Dissipation	$T_A=25^{\circ}C$	1.4	W
		$T_A=70^{\circ}C$	0.9	
$I_{AS}^{②}$	Avalanche Current, Single pulse	L=0.1mH	18	A
$E_{AS}^{②}$	Avalanche Energy, Single pulse	L=0.1mH	16	mJ

Thermal Characteristics

Symbol	Parameter		Rating	Unit
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	t<=10s	44	°C/W
		Steady State	87	°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.

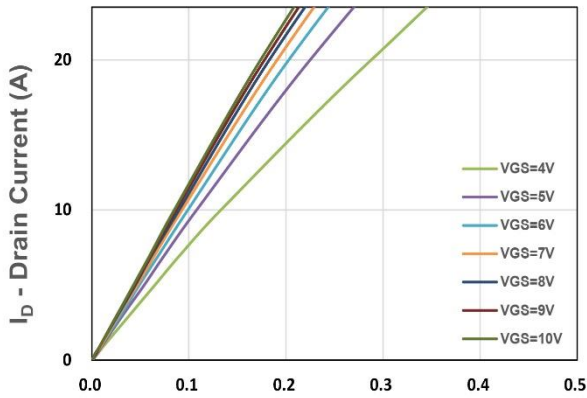
N-Channel Electrical Characteristics (T_J=25°C Unless Otherwise Noted)

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	1.1	1.6	2.1	V
I_{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
R_{DS(ON)}^④	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =10A	-	8.5	10	mΩ
		V _{GS} =4.5V, I _{DS} =5A	-	11.5	14	
gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =5A	-	2.5	-	S
Dynamic Characteristics[®]						
R_G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, Freq.=1MHz	-	3.6	-	Ω
C_{ISS}	Input Capacitance	V _{GS} =0V, V _{DS} =15V, Freq.=1MHz	-	875	-	pF
C_{OSS}	Output Capacitance					
C_{rSS}	Reverse Transfer Capacitance					
td(ON)	Turn-on Delay Time	V _{GS} =10V, V _{DS} =15V, I _D =1A, R _{GEN} =3Ω	-	14	-	nS
t_r	Turn-on Rise Time					
t_{d(OFF)}	Turn-off Delay Time					
t_f	Turn-off Fall Time					
Q_g	Total Gate Charge	V _{GS} =4.5V, V _{DS} =15V, I _D =10A	-	10	-	nC
Q_g	Total Gate Charge	V _{GS} =10V, V _{DS} =15V, I _D =10A	-	20.5	-	
Q_{gs}	Gate-Source Charge		-	2.6	-	
Q_{gd}	Gate-Drain Charge		-	5	-	
Source-Drain Characteristics						
V_{SD}^④	Diode Forward Voltage	I _{SD} =5A, V _{GS} =0V	-	0.7	1.1	V
t_{rr}	Reverse Recovery Time	I _F =1A, V _R =20V	-	26	-	nS
Q_{rr}	Reverse Recovery Charge	dI _F /dt=100A/μs	-	11	-	nC

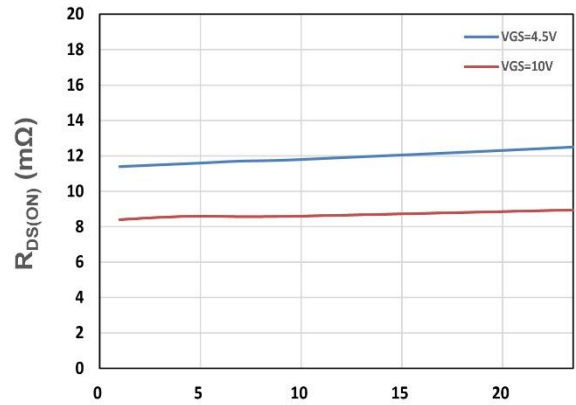
Note ④ : Pulse test (pulse width≤300us, duty cycle≤2%).

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

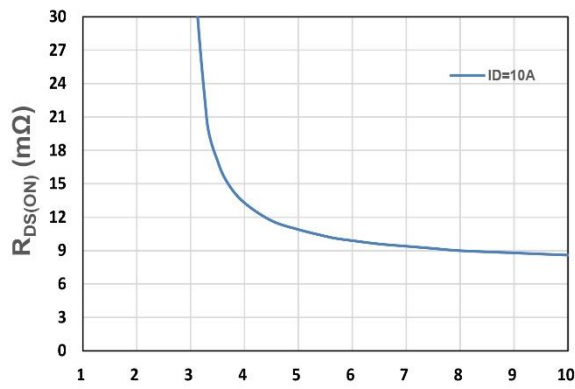
N-Channel Typical Characteristics



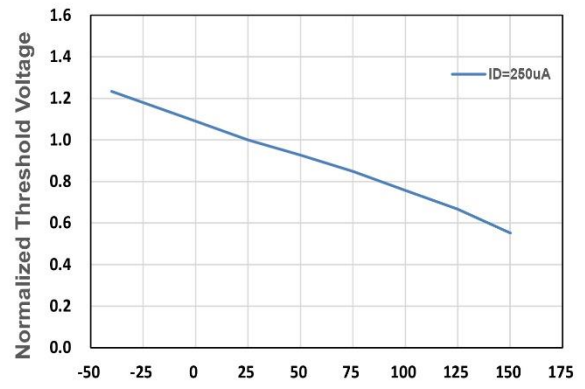
V_{DS} - Drain - Source Voltage (V)
Figure 1. Output Characteristics



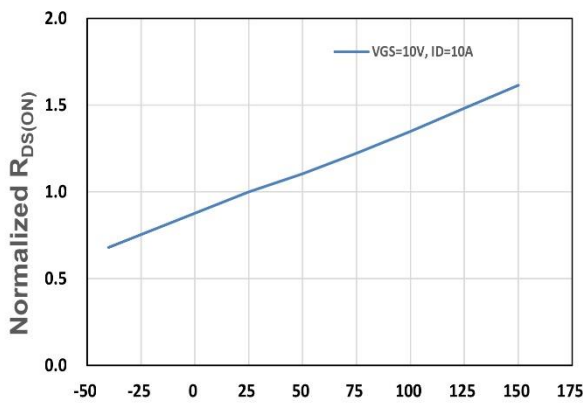
I_D - Drain Current (A)
Figure 2. On-Resistance vs. I_D



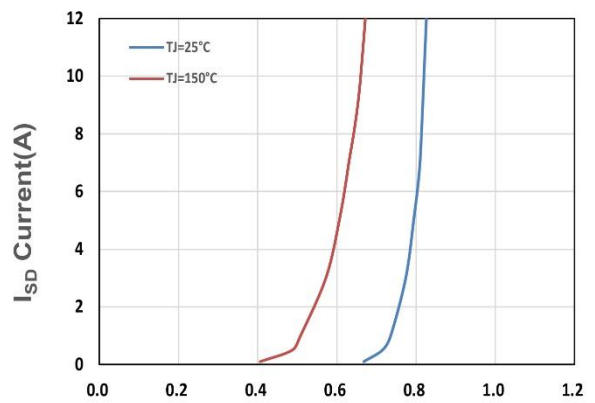
V_{GS} - Gate - Source Voltage (V)
Figure 3. On-Resistance vs. V_{GS}



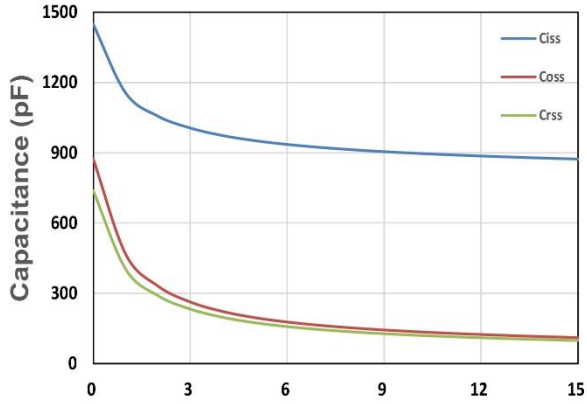
T_j , Junction Temperature($^{\circ}C$)
Figure 4. Gate Threshold Voltage



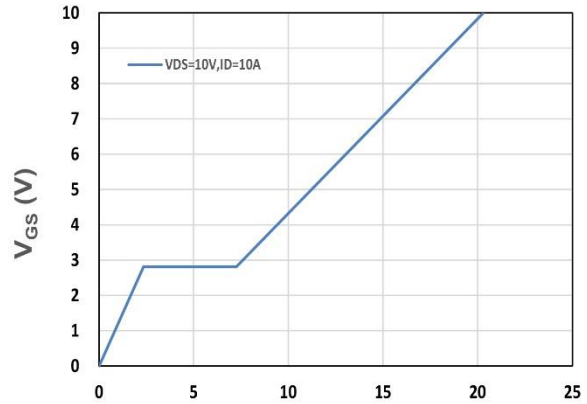
T_j , Junction Temperature($^{\circ}C$)
Figure 5. Drain-Source On Resistance



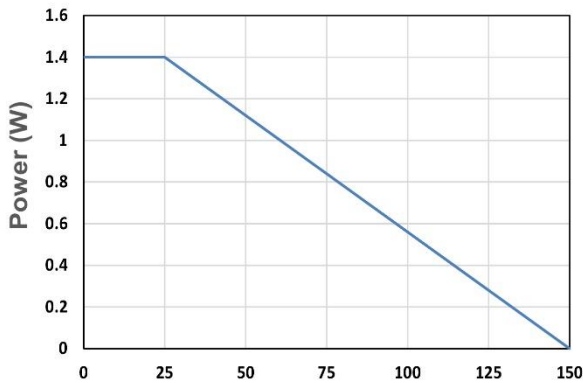
V_{SD} , Source-Drain Voltage(V)
Figure 6. Source-Drain Diode Forward



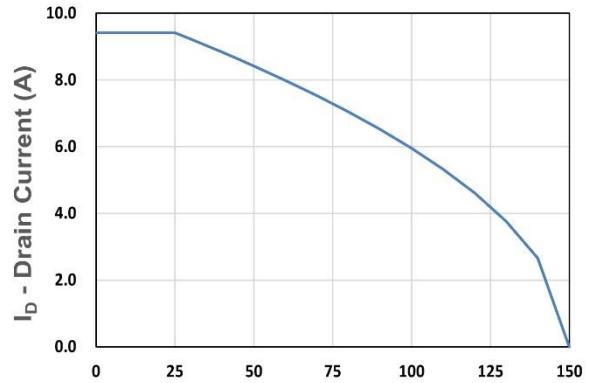
V_{DS} - Drain - Source Voltage (V)
Figure 7. Capacitance



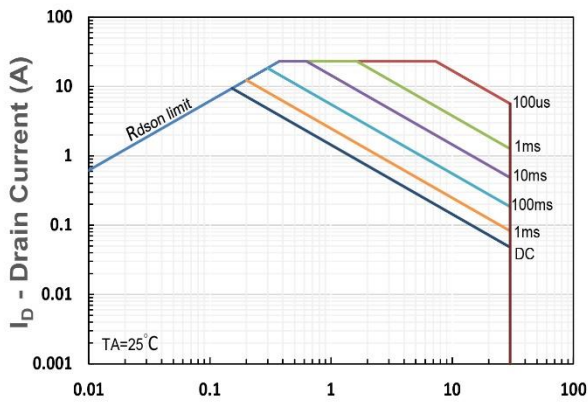
Q_g , Total Gate Charge (nC)
Figure 8. Gate Charge Characteristics



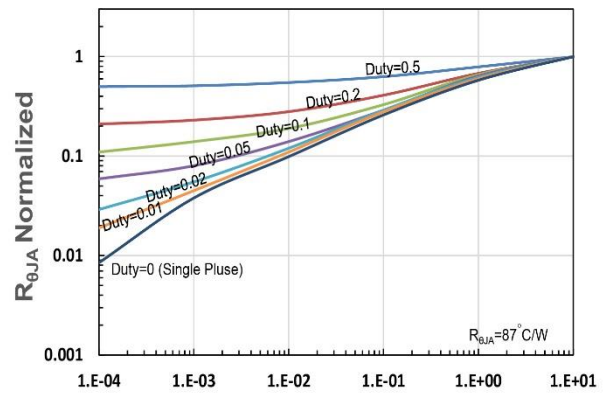
T_a - Ambient Temperature(°C)
Figure 9. Power Dissipation



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