





Power MOSFETS

DATASHEET

LM30210PAQ8A

P-Channel
Enhancement Mode MOSFET

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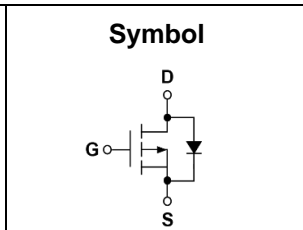
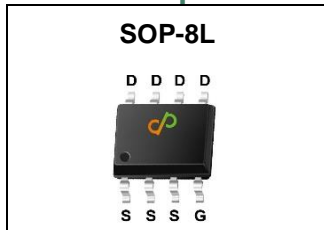


Quality Management Systems

ISO 9001:2015 Certificate

P-Channel Enhancement Mode MOSFET

Pin Description



Product Summary

Symbol	P-Channel	Unit
V_{DSS}	-30	V
$R_{DS(ON)-Max}$	23	m Ω
ID	-6.5	A

Feature

- Reliable and Rugged
- ROHS Compliant & Halogen-Free
- 100% UIS Tested

Applications

- Portable Equipment
- Battery Powered System

Ordering Information

Orderable Part Number	Package Type	Form	Shipping	Marking
LM30210PAQ8A	SOP-8L	Tape & Reel	3000 / Tape & Reel	30210 □□□□□□

Note : □□□□□□= Lot Code

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

Symbol	Parameter	P-Channel	Unit
V_{DSS}	Drain-Source Voltage	-30	V
V_{GSS}	Gate-Source Voltage	±25	
T_J	Maximum Junction Temperature	150	°C
T_{STG}	Storage Temperature Range	-55 to 150	°C
I_S	Diode Continuous Forward Current	$T_A=25^\circ C$ -1	A
$I_{DM}^{(1)}$	Pulse Drain Current Tested	$T_A=25^\circ C$ -16.2	A
I_D	Continuous Drain Current	$T_A=25^\circ C$ -6.5	A
		$T_A=70^\circ C$ -5.2	
P_D	Maximum Power Dissipation	$T_A=25^\circ C$ 1.5	W
		$T_A=70^\circ C$ 0.9	
$I_{AS}^{(2)}$	Avalanche Current, Single pulse	L=0.1mH -16	A
		L=0.5mH -9	
$E_{AS}^{(2)}$	Avalanche Energy, Single pulse	L=0.1mH 12.8	mJ
		L=0.5mH 20	

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JL}$	Thermal Resistance-Junction to Lead	Steady State	20 °C/W
$R_{\theta JA}^{(3)}$	Thermal Resistance-Junction to Case	$t \leq 10s$	43 °C/W
	Thermal Resistance-Junction to Ambient	Steady State	85 °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.

P-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	-1.7	-2.3	V
I_{GSS}	Gate Leakage Current1	V _{GS} =±25V, V _{DS} =0V	-	-	±100	nA
R_{DS(ON)}^④	Drain-Source On-state Resistance	V _{GS} =-10V, I _{DS} =-15A	-	19	23	mΩ
		V _{GS} =-4.5V, I _{DS} =-10A	-	26	34	
gfs	Forward Transconductance	V _{DS} =-5V, I _{DS} =-7.5A	-	14	-	S
Dynamic Characteristics[®]						
R_G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, Freq.=1MHz	-	15	-	Ω
C_{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-15V, Freq.=1MHz	-	1225	-	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} =6Ω	-	3.2	-	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 =-15A	-	13.3	-	nC
Q_g	Total Gate Charge	V _{GS} =-10V, V _{DS} =-15V, I _D =-15A	-	27.3	-	
Q_{gs}	Gate-Source Charge		-	5.19	-	
Q_{gd}	Gate-Drain Charge		-	5.32	-	
Source-Drain Characteristics						
V_{SD}^④	Diode Forward Voltage	I _{SD} =-7.5A, V _{GS} =0V	-	-0.8	-1.1	V
t_{rr}	Reverse Recovery Time	I _F =-7.5A, V _R =-15V	-	12.7	-	nS
Q_{rr}	Reverse Recovery Charge	dI _F /dt=100A/μs	-	5.6	-	nC

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

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

P-Channel Typical Characteristics

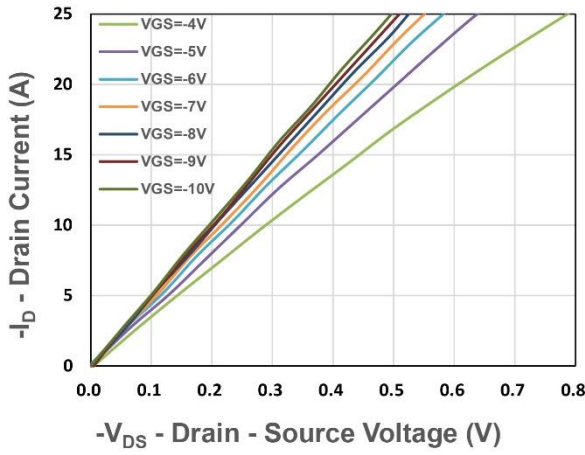


Figure 1. Output Characteristics

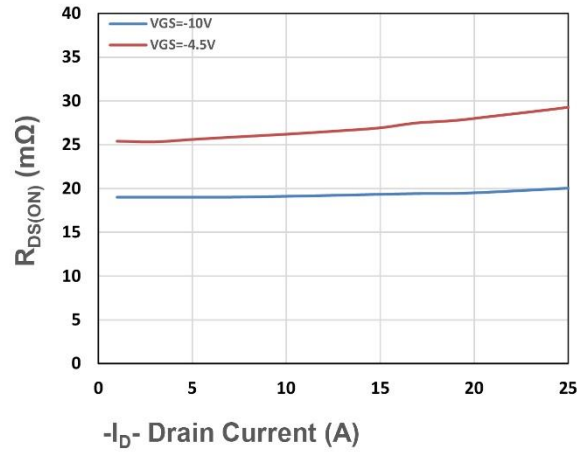


Figure 2. On-Resistance vs. ID

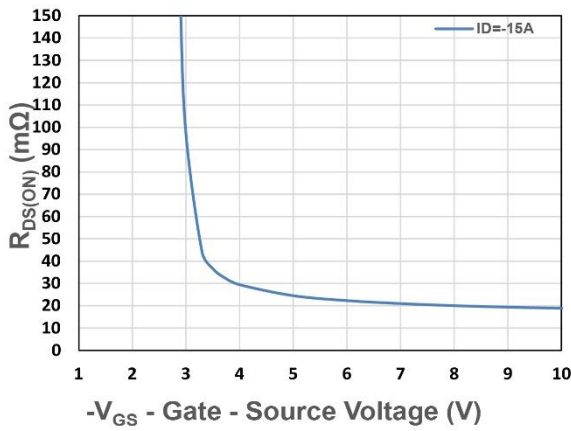


Figure 3. On-Resistance vs. VGS

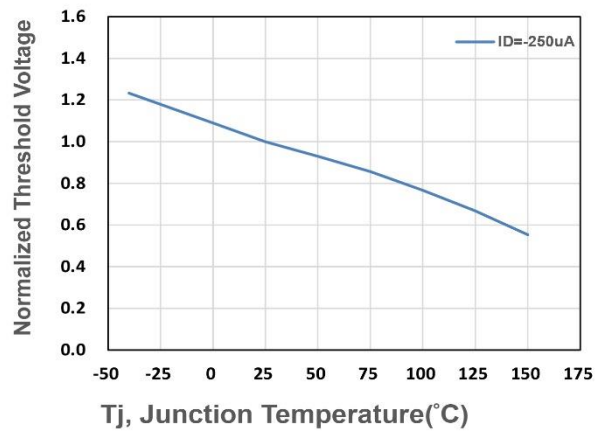


Figure 4. Gate Threshold Voltage

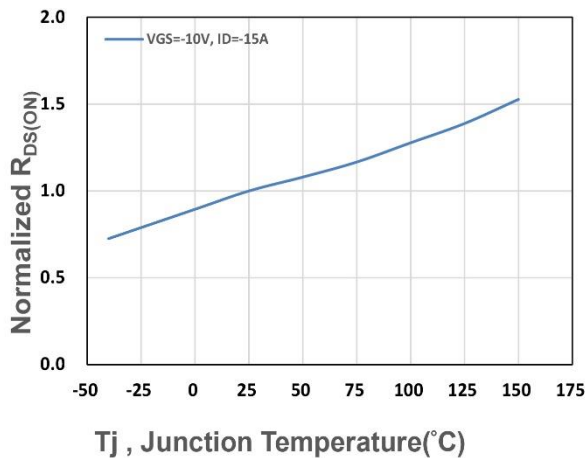


Figure 5. Drain-Source On Resistance

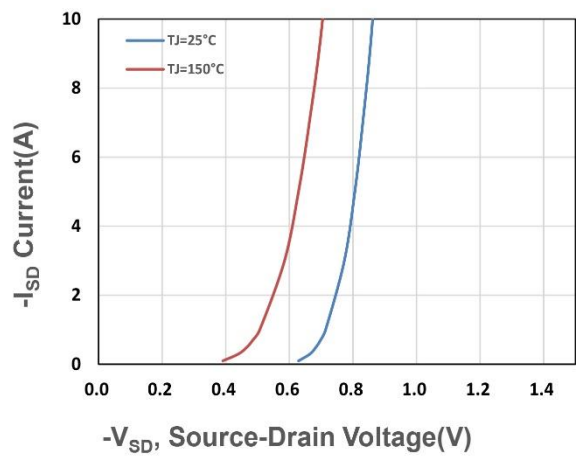
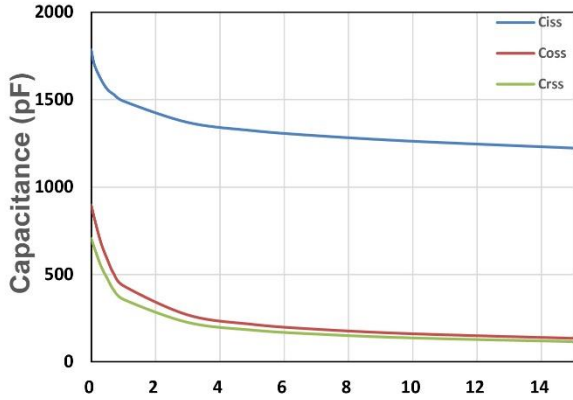
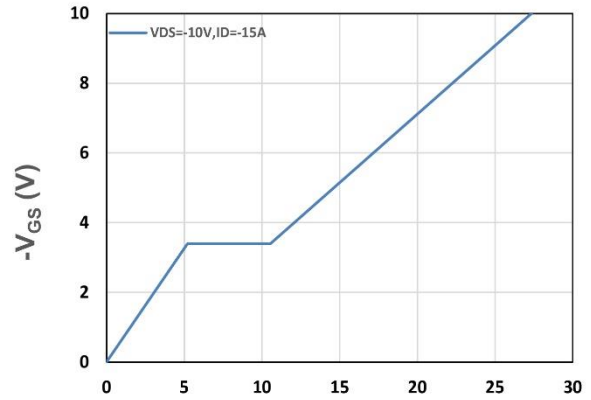


Figure 6. Source-Drain Diode Forward



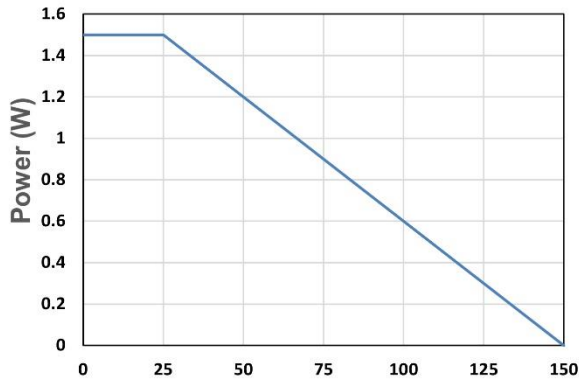
$-V_{DS}$ - Drain - Source Voltage (V)

Figure 7. Capacitance



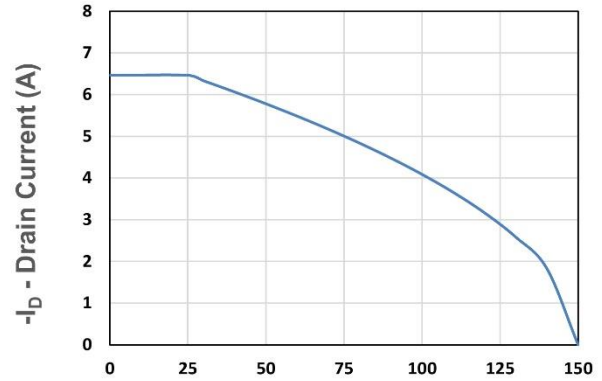
Q_g , Total Gate Charge (nC)

Figure 8. Gate Charge Characteristics



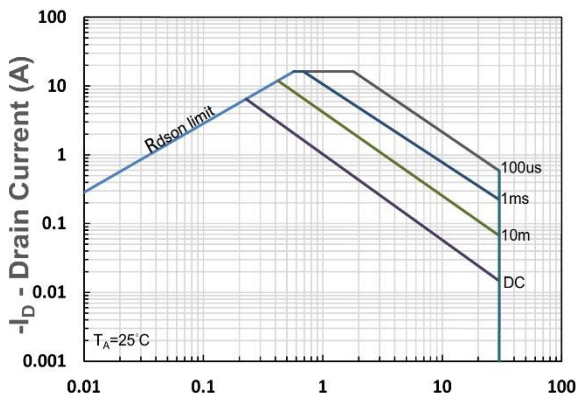
T_A - Ambient Temperature (°C)

Figure 9. Power Dissipation



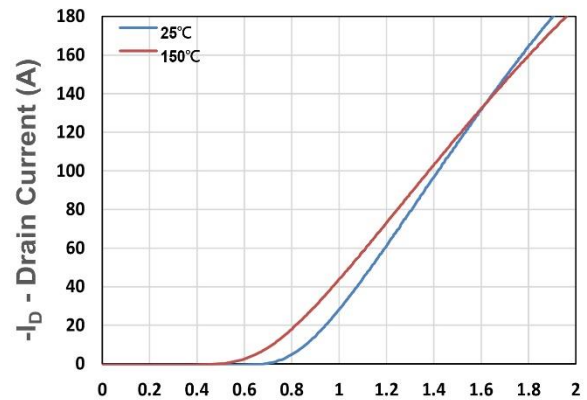
T_A - Ambient Temperature (°C)

Figure 10. Drain Current



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

Figure 11. Safe Operating Area



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

Figure 12. Transfer Characteristics

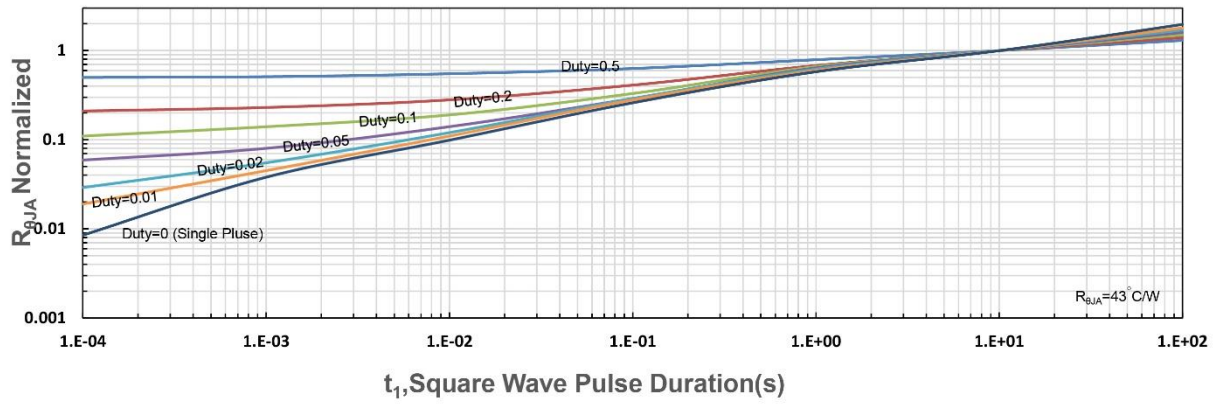


Figure 13. $R_{\theta JA}$ Transient Thermal Impedance