



Power MOSFETS

DATASHEET

LM20081PLQ8A

P-Channel
Enhancement Mode MOSFET

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Quality Management Systems

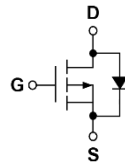
ISO 9001:2015 Certificate

P-Channel Enhancement Mode MOSFET

Pin Description



Symbol



Product Summary

Symbol	P-Channel	Unit
V_{DSS}	-20	V
$R_{DS(ON)-Max}$	7.2	mΩ
I_D	-13	A

Feature

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

Applications

- Portable Equipment
- Load switch

Ordering Information

Orderable Part Number	Package Type	Form	Shipping	Marking
LM20081PLQ8A	SOP-8L	Tape & Reel	3000 / Tape & Reel	20081 □□□□□□

Note : □□□□□□ = Lot Code

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

Symbol	Parameter		P-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	$T_A=25^{\circ}C$	-33	A
I_D	Continuous Drain Current	$T_A=25^{\circ}C$	-13	A
		$T_A=70^{\circ}C$	-10	
P_D	Maximum Power Dissipation	$T_A=25^{\circ}C$	1.6	W
		$T_A=70^{\circ}C$	1	
$I_{AS}^{②}$	Avalanche Current, Single pulse	L=0.1mH	-33	A
$E_{AS}^{②}$	Avalanche Energy, Single pulse	L=0.1mH	54	mJ

Thermal Characteristics

Symbol	Parameter		Rating	Unit
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	Steady State	78	°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 ($T_J=25^{\circ}\text{C}$ 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	-0.7	-1	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} =-10A	-	6	7.2	mΩ
		V _{GS} =-2.5V, I _{DS} =-8A	-	7.8	10.5	
		V _{GS} =-1.8V, I _{DS} =-6A	-	10	14	
gfs	Forward Transconductance	V _{DS} =-5V, I _{DS} =-5A	-	33	-	S
Dynamic Characteristics ^⑥						
R _G	Gate Resistance	V _{GS} =0V,V _{DS} =0V, Freq.=1MHz	-	8.6	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-10V, Freq.=1MHz	-	4136	-	pF
C _{oss}	Output Capacitance		-	618	-	
C _{rss}	Reverse Transfer Capacitance		-	390	-	
td(ON)	Turn-on Delay Time	V _{GS} =-4.5V,V _{DS} =-15V, I _D =-1A,R _{GEN} =6Ω	-	11.9	-	nS
t _r	Turn-on Rise Time		-	22.1	-	
t _{d(OFF)}	Turn-off Delay Time		-	142.1	-	
t _f	Turn-off Fall Time		-	274.6	-	
Q _g	Total Gate Charge	V _{GS} =-2.5V,V _{DS} =-10V I _D =-10A	-	28.7	-	nC
Q _g	Total Gate Charge	V _{GS} =-4.5V,V _{DS} =-10V, I _D =-10A	-	48.2	-	
Q _{gs}	Gate-Source Charge		-	8.05	-	
Q _{gd}	Gate-Drain Charge		-	10	-	
Source-Drain Characteristics						
V _{SD} ^④	Diode Forward Voltage	I _{SD} =-5A, V _{GS} =0V	-	-0.65	-1.1	V
t _{rr}	Reverse Recovery Time	I _F =-5A, V _R =-10V	-	41.5	-	nS
Q _{rr}	Reverse Recovery Charge	dl _F /dt=100A/μs	-	32	-	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.

P-Channel Typical Characteristics

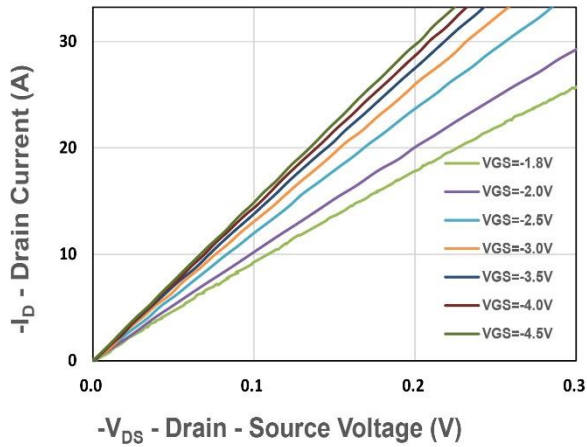


Figure 1. Output Characteristics

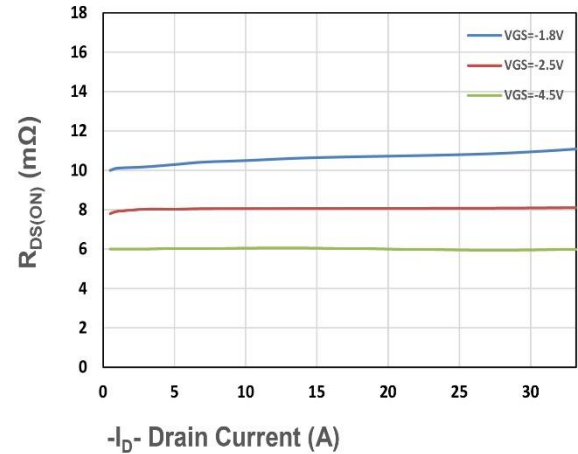


Figure 2. On-Resistance vs. ID

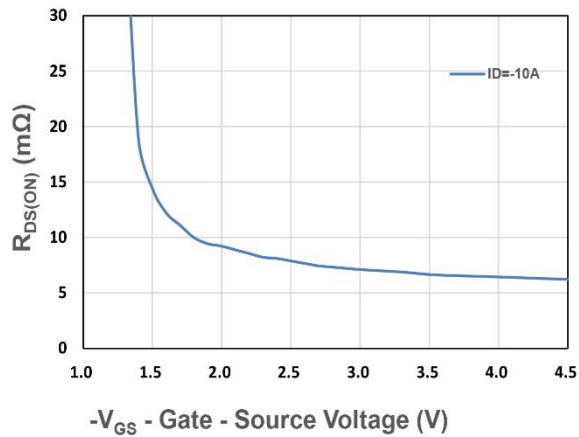


Figure 3. On-Resistance vs. VGS

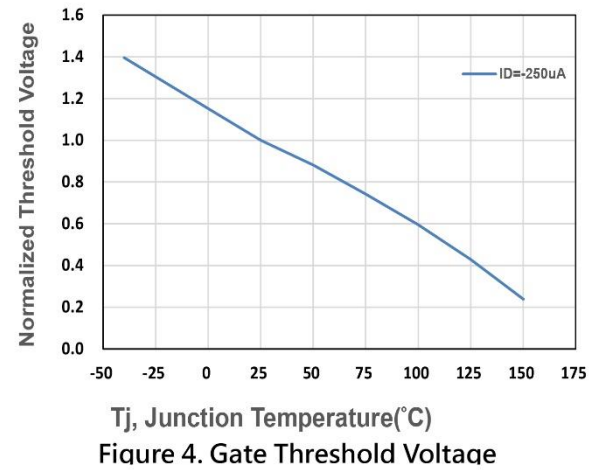


Figure 4. Gate Threshold Voltage

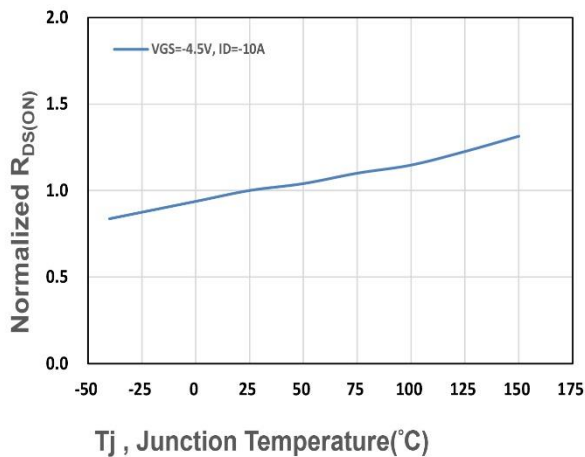


Figure 5. Drain-Source On Resistance

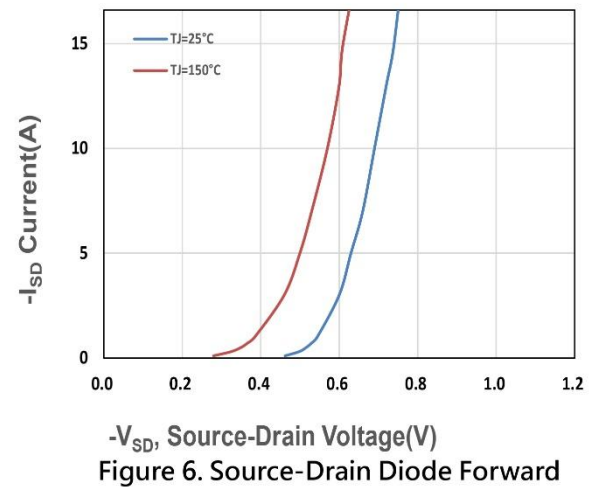
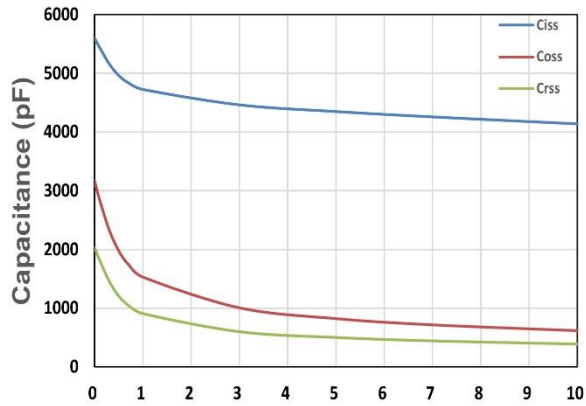
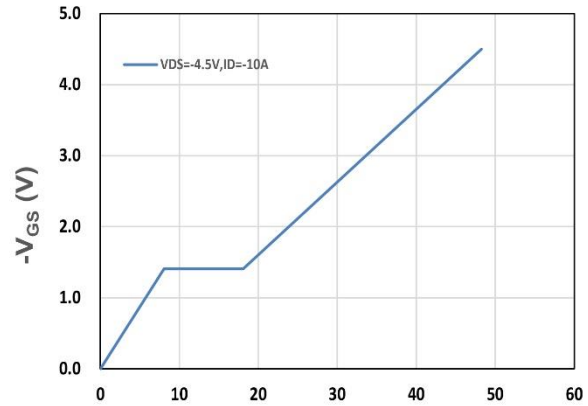


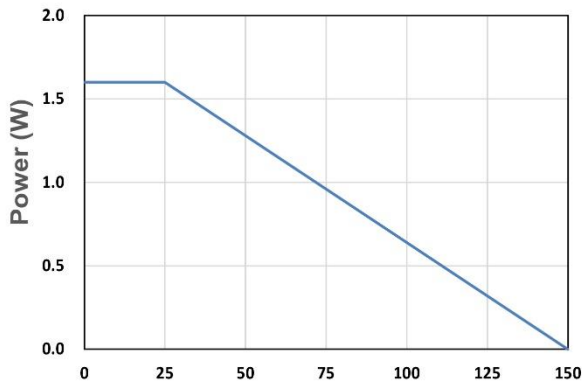
Figure 6. Source-Drain Diode Forward



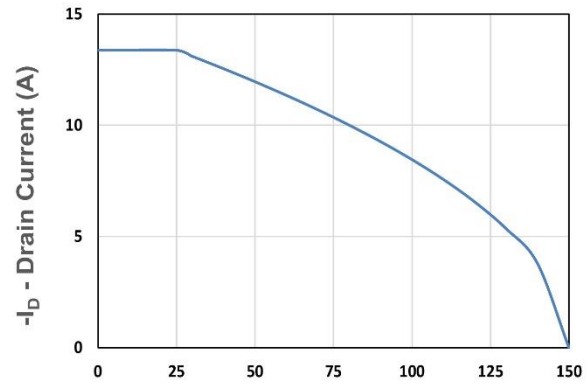
$-V_{DS}$ - Drain - Source Voltage (V)
Figure 7. Capacitance



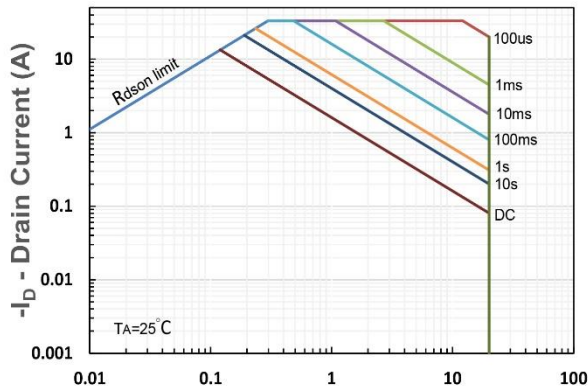
Q_g , Total Gate Charge (nC)
Figure 8. Gate Charge Characteristics



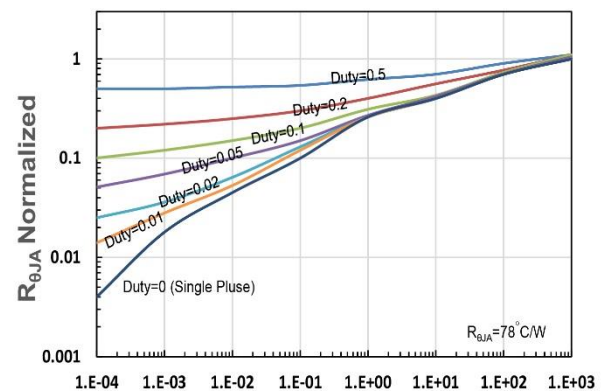
T_A - Ambient Temperature (°C)
Figure 9. Power Dissipation



T_A - Ambient Temperature (°C)
Figure 10. Drain Current



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



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