



Power MOSFETS

DATASHEET

LM40095PAP3A

P-Channel
Enhancement Mode MOSFET

 Leadpower-semiconductor Corp., Ltd

 sales@leadpower-semi.com

 (03) 6577339 FAX : (03) 6577229

 www.leadpower-semi.com



Quality Management Systems

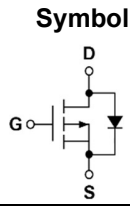
ISO 9001:2015 Certificate

LM40095PAP3A



P-Channel Enhancement Mode MOSFET

Pin Description



Ordering Information

Symbol	P-Channel	Unit
V _{DSS}	-40	V
R _{DS(ON)-Max}	10.6	mΩ
I _D	-77	A

Feature

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

Applications

- DC-DC converter switching for Networking
- General purpose switching

Ordering Information

Orderable Part Number	Package Type	Form	Shipping	Marking
LM40095PAP3A	TO-220-3L	Tube	50 / Tube	40095 □□□□□□

Note : □□□□□□ = Lot Code

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

Symbol	Parameter	P-Channel	Unit
V _{DSS}	Drain-Source Voltage	-40	V
V _{GSS}	Gate-Source Voltage	±20	
T _J	Maximum Junction Temperature	150	°C
T _{STG}	Storage Temperature Range	-55 to 150	°C
I _S	Diode Continuous Forward Current	T _C =25°C -76	
I _{DM} ^①	Pulse Drain Current Tested	T _C =25°C -222	A
I _D	Continuous Drain Current	T _C =25°C -89 T _C =100°C -56	A
P _D	Maximum Power Dissipation	T _C =25°C 83 T _C =100°C 33	W
I _D	Continuous Drain Current	T _A =25°C -13.7 T _A =70°C -11	A
P _D	Maximum Power Dissipation	T _A =25°C 2.0 T _A =70°C 1.3	W
I _{AS} ^②	Avalanche Current, Single pulse	L=0.1mH -30 L=0.5mH -15	A
E _{AS} ^③	Avalanche Energy, Single pulse	L=0.1mH 45 L=0.5mH 56	mJ

Thermal Characteristics

Symbol	Parameter	Rating	Unit
R _{θJC}	Thermal Resistance-Junction to Case	Steady State	1.5 °C/W
R _{θJA} ^①	Thermal Resistance-Junction to Ambient	Steady State	62.5 °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.

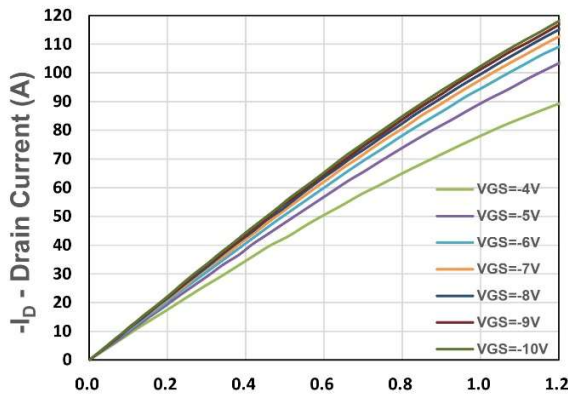
P-Channel Electrical Characteristics (T_J=25°C Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Electrical Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =-250uA	-40	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-32V, V _{GS} =0V	-	-	-1	uA
V_{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =-250uA	-1.1	-1.7	-2.3	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} =-12A	-	8.8	10.6	mΩ
		V _{GS} =-4.5V, I _{DS} =-9A	-	10.4	14	
gfs	Forward Transconductance	V _{DS} =-5V, I _{DS} =-6A	-	22	-	S
Dynamic Characteristics ^⑤						
R_G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, Freq.=1MHz	-	8	-	Ω
C_{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-20V, Freq.=1MHz	-	3853	-	pF
C_{oss}	Output Capacitance		-	338	-	
C_{rss}	Reverse Transfer Capacitance		-	226	-	
td(ON)	Turn-on Delay Time	V _{GS} =-10V, V _{DS} =-25V, I _D =-1A, R _{GEN} =6Ω	-	6.4	-	nS
t_r	Turn-on Rise Time		-	18.1	-	
t_{d(OFF)}	Turn-off Delay Time		-	177	-	
t_f	Turn-off Fall Time		-	92	-	
Q_g	Total Gate Charge	V _{GS} =-4.5V, V _{DS} =-20V, I _D =-12A	-	40.8	-	nC
Q_g	Total Gate Charge	V _{GS} =-10V, V _{DS} =-20V, I _D =-12A	-	85.8	-	
Q_{gs}	Gate-Source Charge		-	16.8	-	
Q_{gd}	Gate-Drain Charge		-	12.7	-	
Source-Drain Characteristics						
V_{SD} ^④	Diode Forward Voltage	I _{SD} =-6A, V _{GS} =0V	-	-0.75	-1.1	V
t_{rr}	Reverse Recovery Time	I _F =-6A, V _R =-20V	-	25	-	nS
Q_{rr}	Reverse Recovery Charge	dI _F /dt=100A/μs	-	17.4	-	nC

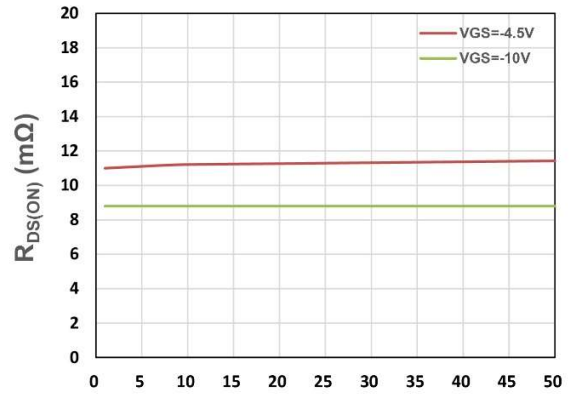
Note ④ : Pulse test (pulse width≤300us, duty cycle≤2%).

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

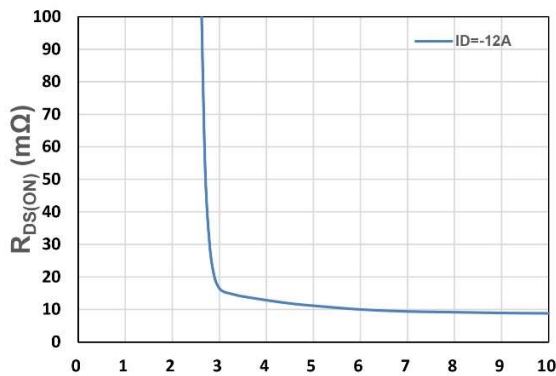
P-Channel Typical Characteristics



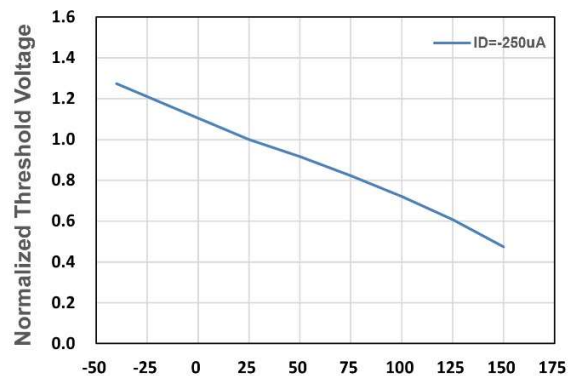
-V_{DS} - Drain - Source Voltage (V)
Figure 1. Output Characteristics



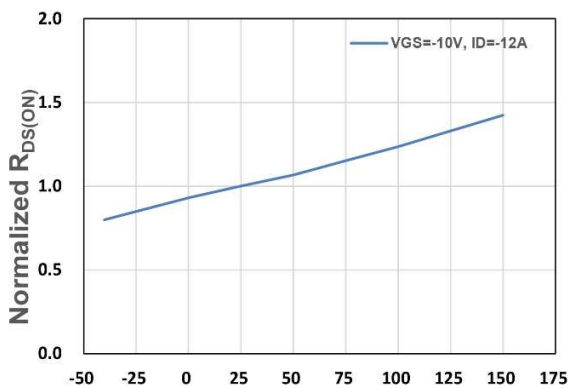
-ID - Drain Current (A)
Figure 2. On-Resistance vs. ID



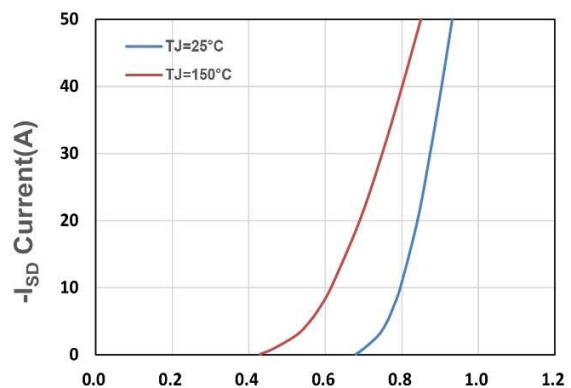
-V_{GS} - Gate - Source Voltage (V)
Figure 3. On-Resistance vs. VGS



T_j, Junction Temperature (°C)
Figure 4. Gate Threshold Voltage

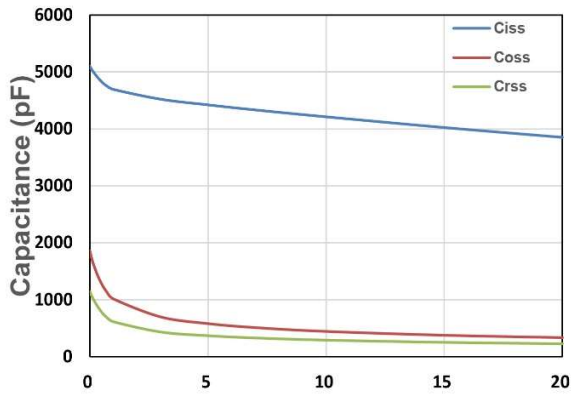


T_j, Junction Temperature (°C)
Figure 5. Drain-Source On Resistance

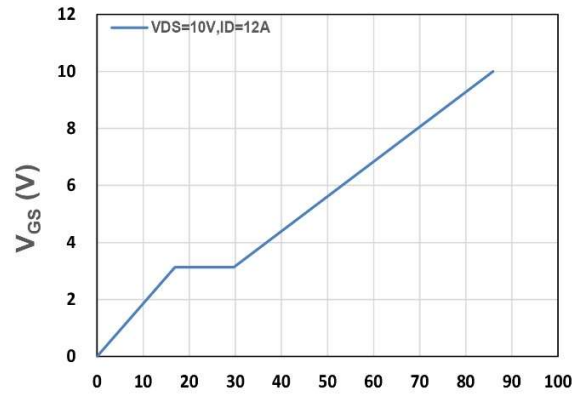


-V_{SD}, Source-Drain Voltage (V)
Figure 6. Source-Drain Diode Forward

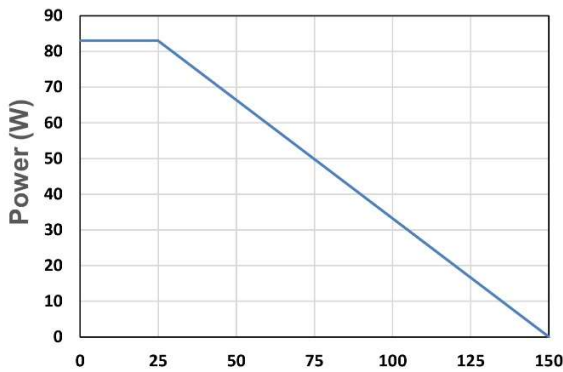
LM40095PAP3A



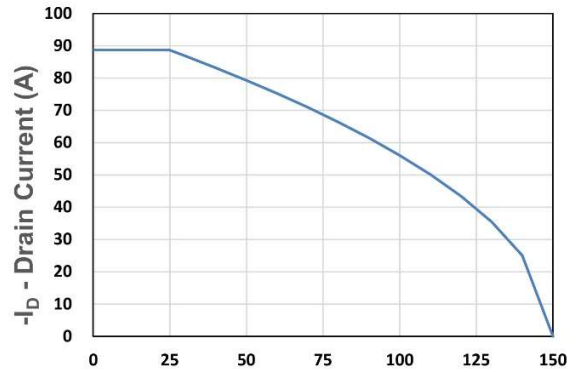
$-V_{DS}$ - Drain - Source Voltage (V)
Figure 7. Capacitance



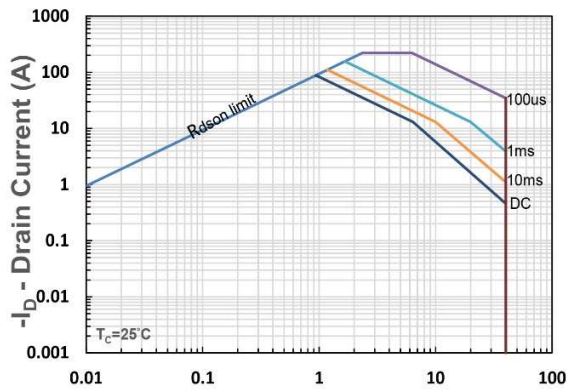
Qg , Total Gate Charge (nC)
Figure 8. Gate Charge Characteristics



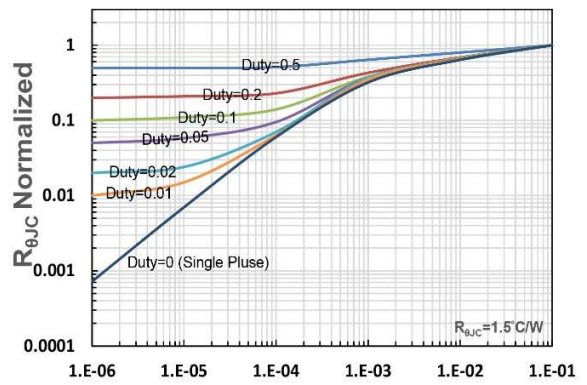
T_c - Case Temperature (°C)
Figure 9. Power Dissipation



T_c - Case 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. $R_{\theta JC}$ Transient Thermal Impedance