



Power MOSFETS

DATASHEET

LM60A05PAJ3A

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

P-Channel Enhancement Mode MOSFET

Pin Description

SOT-23-3L (TOP view)	Symbol	Symbol	P-Channel	Unit
		V_{DSS}	-60	V
		$R_{DS(ON)-Max}$	114	mΩ
		I_D	-2.4	A

Feature

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

Applications

- Motor Driver
- Power Tools
- LED Lighting

Ordering Information

Orderable Part Number	Package Type	Form	Shipping	Marking
LM60A05PAJ3A	SOT-23-3L	Tape & Reel	3000 / Tape & Reel	02□□□

Note : □□□ = Lot Code

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

Symbol	Parameter	P-Channel	Unit
V_{DSS}	Drain-Source Voltage	-60	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	$T_A=25^{\circ}C$ -6	A
I_D	Continuous Drain Current	$T_A=25^{\circ}C$ -2.4	A
		$T_A=70^{\circ}C$ -1.9	
P_D	Maximum Power Dissipation	$T_A=25^{\circ}C$ 1.3	W
		$T_A=70^{\circ}C$ 0.8	
$I_{AS}^{②}$	Avalanche Current, Single pulse	L=0.1mH -6	A
$E_{AS}^{②}$	Avalanche Energy, Single pulse	L=0.1mH 1.8	mJ

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	t ≤ 10s 80	°C/W
		Steady State 100	°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.

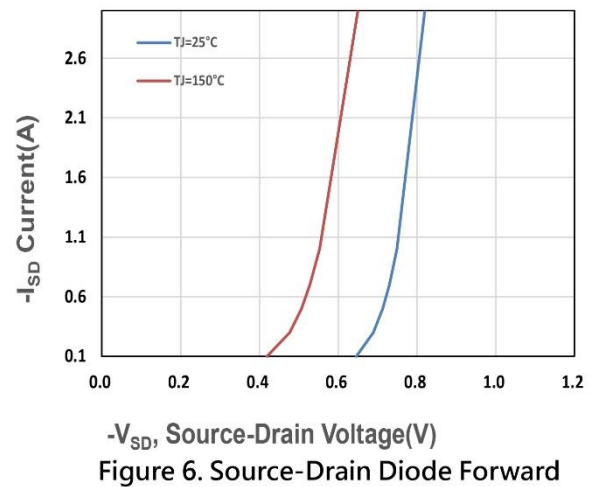
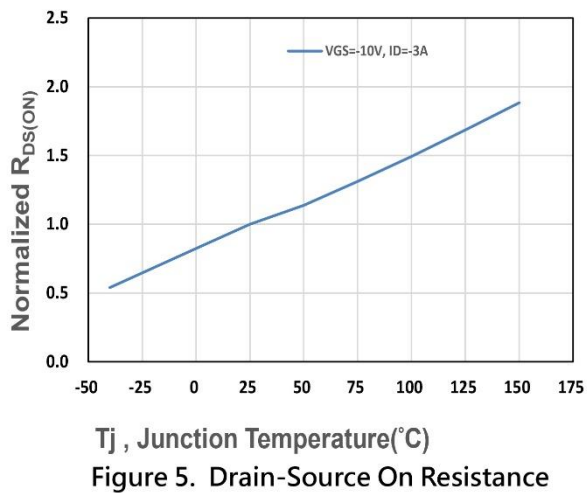
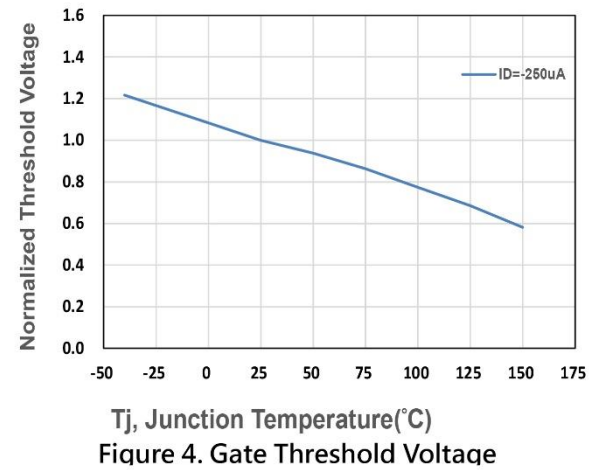
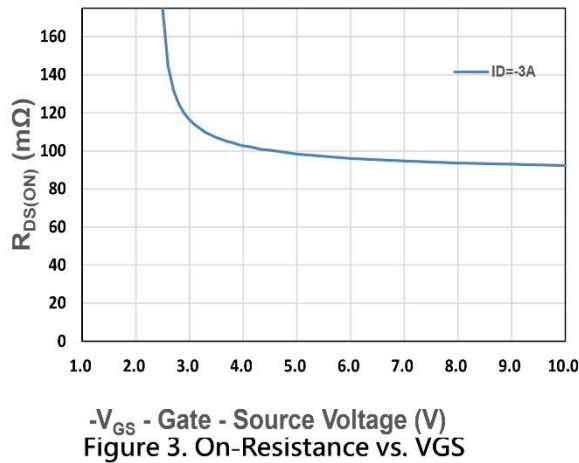
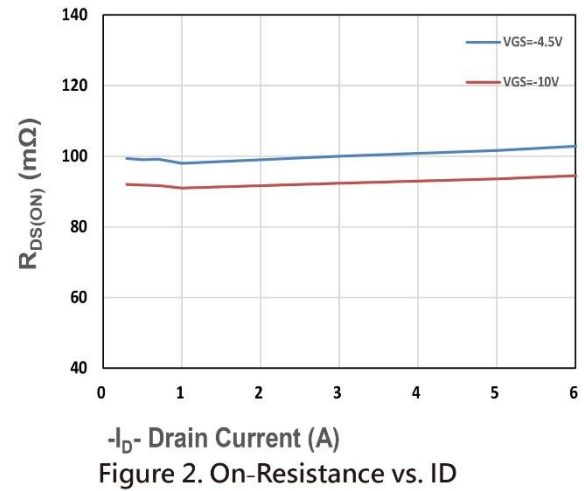
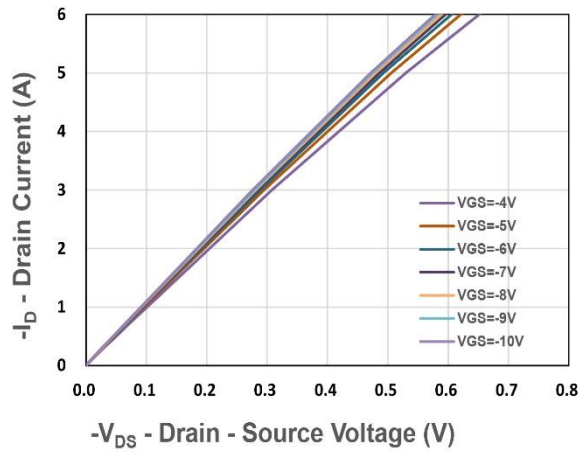
P-Channel Electrical Characteristics ($T_J=25^{\circ}\text{C}$ Unless Otherwise Noted)

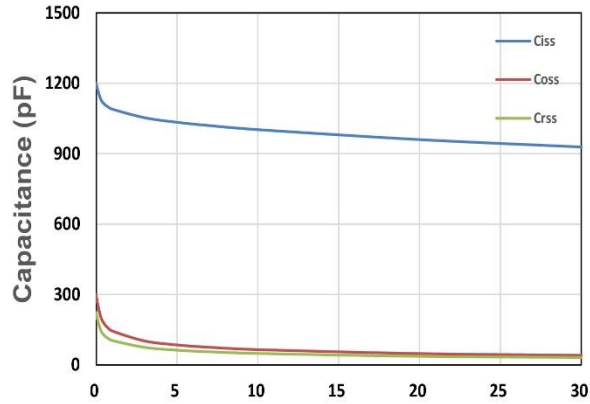
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Electrical Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =-250uA	-60	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-48V, V _{GS} =0V	-	-	-1	uA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =-250uA	-1	-1.5	-2	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} =-2A	-	95	114	mΩ
		V _{GS} =-4.5V, I _{DS} =-1.5A	-	100	130	
gfs	Forward Transconductance	V _{DS} =-5V, I _{DS} =-1A	-	7.8	-	S
Dynamic Characteristics ⑥						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, Freq.=1MHz	-	15.5	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-30V, Freq.=1MHz	-	929	-	pF
C _{oss}	Output Capacitance		-	41	-	
C _{rss}	Reverse Transfer Capacitance		-	32	-	
td(ON)	Turn-on Delay Time	V _{GS} =-10V, V _{DS} =-15V, I _D =-1A, R _{GEN} =6Ω	-	4.6	-	nS
t _r	Turn-on Rise Time		-	17.4	-	
t _{d(OFF)}	Turn-off Delay Time		-	77.2	-	
t _f	Turn-off Fall Time		-	32.8	-	
Q _g	Total Gate Charge	V _{GS} =-4.5V, V _{DS} =-30V I _D =-2A	-	8.4	-	nC
Q _g	Total Gate Charge	V _{GS} =-10V, V _{DS} =-30V, I _D =-2A	-	18.48	-	
Q _{gs}	Gate-Source Charge		-	3.62	-	
Q _{gd}	Gate-Drain Charge		-	2.14	-	
Source-Drain Characteristics						
V _{SD} ④	Diode Forward Voltage	I _{SD} =-1A, V _{GS} =0V	-	-0.75	-1.1	V
t _{rr}	Reverse Recovery Time	I _F =-1A, V _R =-30V	-	10.9	-	nS
Q _{rr}	Reverse Recovery Charge	dI _F /dt=100A/μs	-	5	-	nC

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

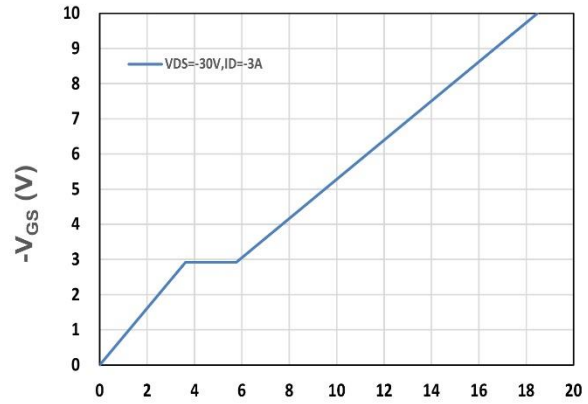
Note ⑤ : Guaranteed by design, not subject to production testing.

P-Channel Typical Characteristics

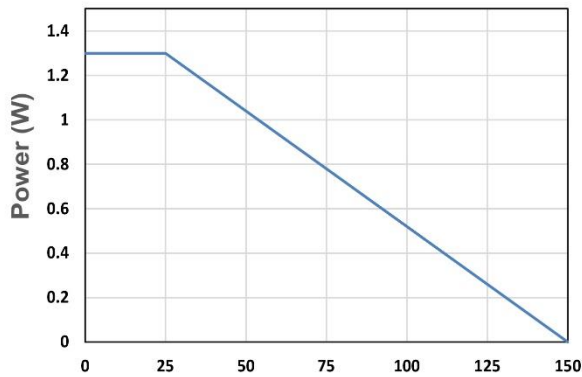




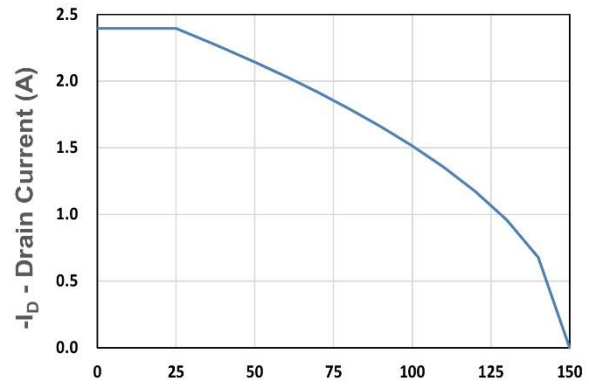
$-V_{DS}$ - Drain - Source Voltage (V)
Figure 7. Capacitance



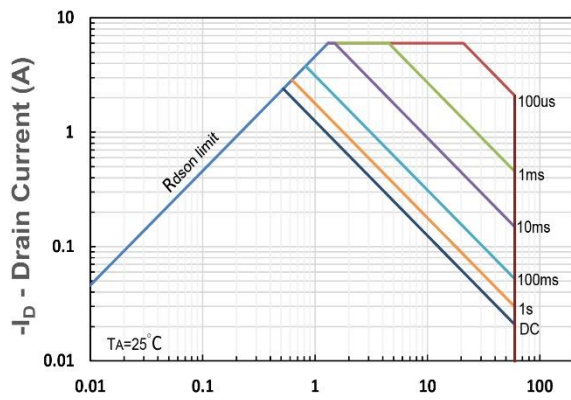
Q_g , Total Gate Charge (nC)
Figure 8. Gate Charge Characteristics



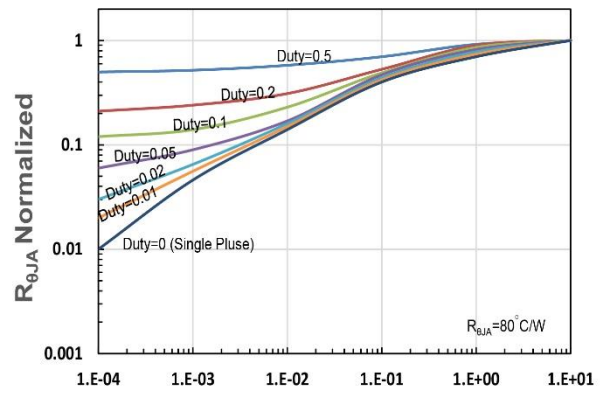
T_A - Ambient Temperature(°C)
Figure 9. Power Dissipation



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