



Power MOSFETS

DATASHEET

LM60M80PEI3A

P-Channel
Enhancement Mode MOSFET

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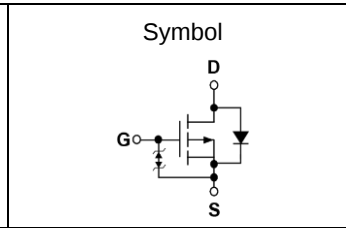
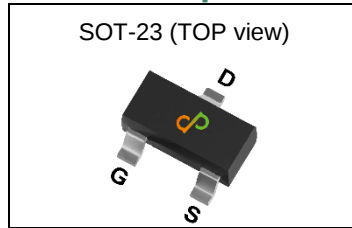


Quality Management Systems

ISO 9001:2015 Certificate

P-Channel Enhancement Mode MOSFET

Pin Description



Ordering Information

Symbol	P-Channel	Unit
V_{DSS}	-60	V
$R_{DS(ON)-Max}$	4.3	Ω
I_D	-0.21	A

Feature

- Reliable and Rugged
- ROHS Compliant & Halogen-Free
- ESD Protection

Applications

- General Purpose Interfacing Switch
- Analog Switch

Ordering Information

Orderable Part Number	Package Type	Form	Shipping	Marking
LM60M80PEI3A	SOT-23	Tape & Reel	3000 / Tape & Reel	12□□□

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	$T_A=25^\circ\text{C}$	-0.53	A
I_D	Continuous Drain Current	$T_A=25^\circ\text{C}$	-0.21	A
		$T_A=70^\circ\text{C}$	-0.17	
P_D	Maximum Power Dissipation	$T_A=25^\circ\text{C}$	0.36	W
		$T_A=70^\circ\text{C}$	0.23	

Thermal Characteristics

Symbol	Parameter		Rating	Unit
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	Steady State	350	°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.

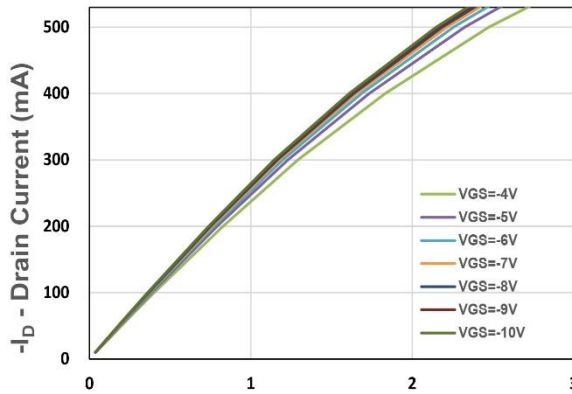
P-Channel Electrical Characteristics (T_J=25°C Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Electrical Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =-250uA	-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	-1.6	-2.5	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±10	uA
R _{DS(ON)} ④	Drain-Source On-state Resistance	V _{GS} =-10V, I _{DS} =-0.1A	-	3.55	4.3	Ω
		V _{GS} =-4.5V, I _{DS} =-0.1A	-	3.8	5	
gfs	Forward Transconductance	V _{DS} =-5V, I _{DS} =-0.1A	-	4.4	-	S
Dynamic Characteristics ⑤						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-30V, Freq.=1MHz	-	30	-	pF
C _{oss}	Output Capacitance		-	12	-	
C _{rss}	Reverse Transfer Capacitance		-	6	-	
td(ON)	Turn-on Delay Time	V _{GS} =-10V,V _{DS} =-30V, I _D =-1A,R _{GEN} =6Ω	-	18.4	-	nS
t _r	Turn-on Rise Time		-	15.2	-	
t _{d(OFF)}	Turn-off Delay Time		-	113	-	
t _f	Turn-off Fall Time		-	41	-	
Q _g	Total Gate Charge	V _{GS} =-4.5V,V _{DS} =-30V I _D =-0.37A	-	0.47	-	nC
Q _g	Total Gate Charge	V _{GS} =-10V,V _{DS} =-30V, I _D =-0.37A	-	0.84	-	
Q _{gs}	Gate-Source Charge		-	0.19	-	
Q _{gd}	Gate-Drain Charge		-	0.21	-	
Source-Drain Characteristics						
V _{SD} ④	Diode Forward Voltage	I _{SD} =-0.1A, V _{GS} =0V	-	-0.8	-1.1	V
t _{rr}	Reverse Recovery Time	I _F =-0.18A, V _R =-30V	-	10	-	nS
Q _{rr}	Reverse Recovery Charge	dI _F /dt=100A/μs	-	5	-	nC

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

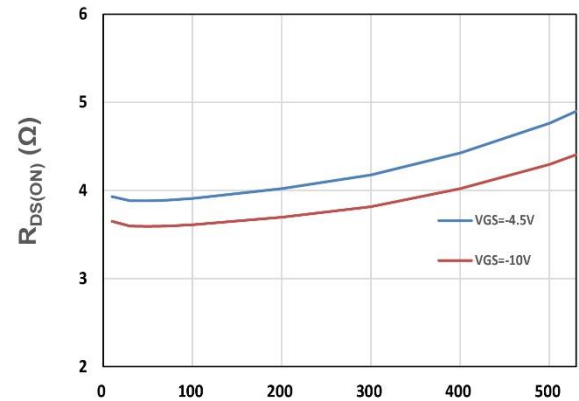
Note ⑤ : Guaranteed by design, not subject to production testing.

P-Channel Typical Characteristics



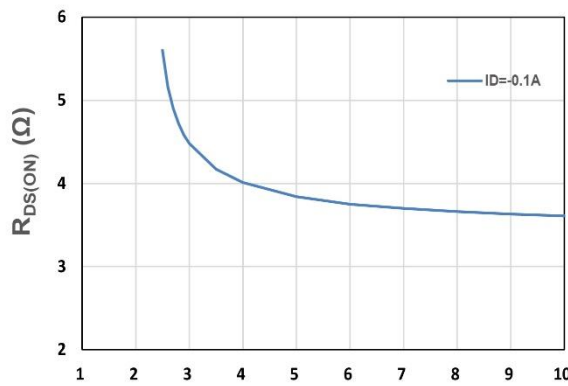
$-V_{DS}$ - Drain - Source Voltage (V)

Figure 1. Output Characteristics



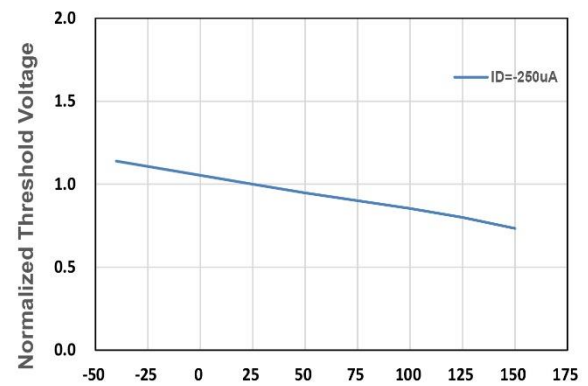
$-I_D$ - Drain Current (mA)

Figure 2. On-Resistance vs. ID



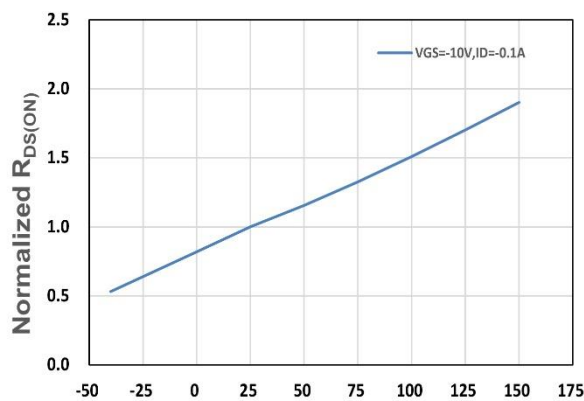
$-V_{GS}$ - Gate - Source Voltage (V)

Figure 3. On-Resistance vs. VGS



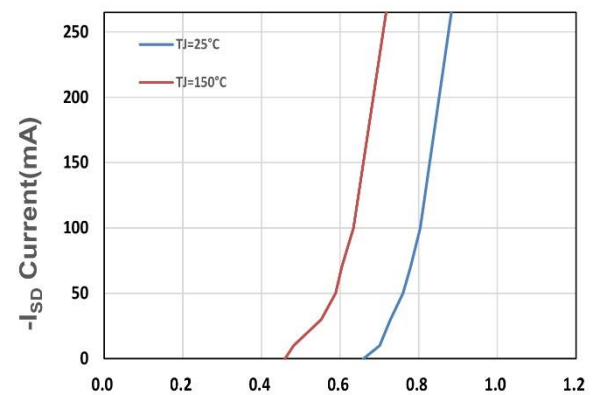
T_j , Junction Temperature($^{\circ}C$)

Figure 4. Gate Threshold Voltage



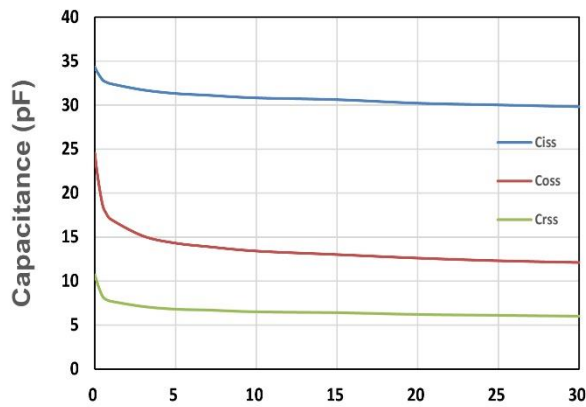
T_j , Junction Temperature($^{\circ}C$)

Figure 5. Drain-Source On Resistance

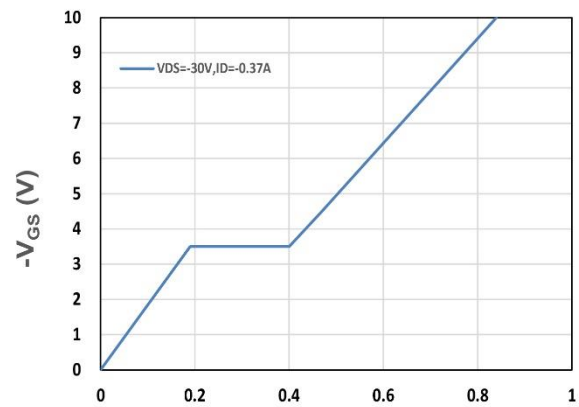


$-V_{SD}$, Source-Drain Voltage(V)

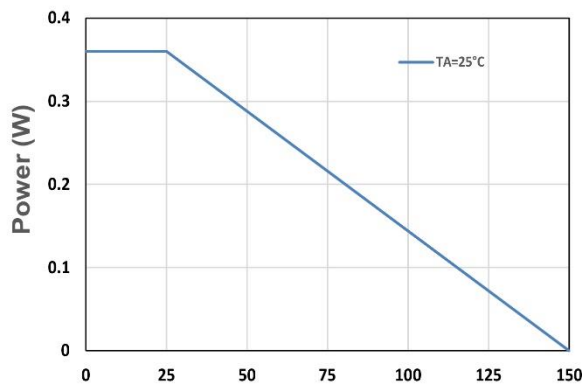
Figure 6. Source-Drain Diode Forward



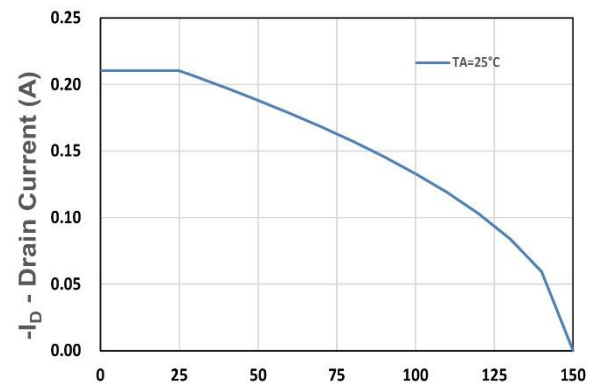
$-V_{DS}$ - Drain - Source Voltage (V)
Figure 7. Capacitance



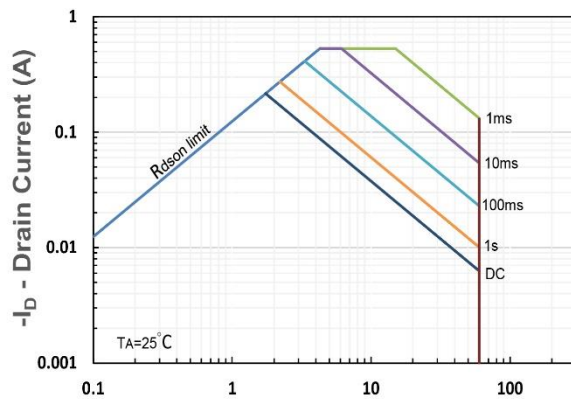
Q_g , Total Gate Charge (nC)
Figure 8. Gate Charge Characteristics



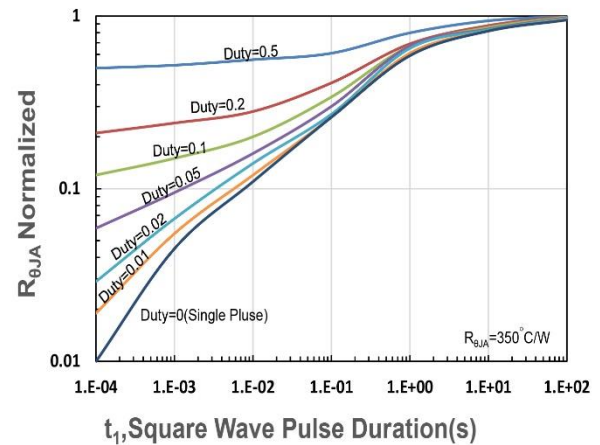
T_J - Junction Temperature (°C)
Figure 9. Power Dissipation



T_J - Junction 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