

**60V 3.9m N-Ch Power MOSFET****Features**

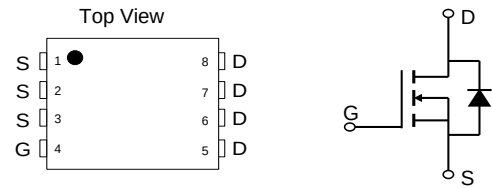
Ultra-low $R_{DS(ON)}$
 Low Gate Charge
 100% UIS Tested, 100% R_g Tested
 Pb-free Lead Plating
 Halogen-free and RoHS-compliant

Product Summary

Parameter	Value	Unit
V_{DS}	60	V
$V_{GS(th_Typ)}$	1.8	V
I_D (@ $V_{GS} = 10V$) ⁽¹⁾	69	A
$R_{DS(ON_Typ)}$ (@ $V_{GS} = 10V$)	3.9	m
$R_{DS(ON_Typ)}$ (@ $V_{GS} = 4.5V$)	5.1	m

Applications

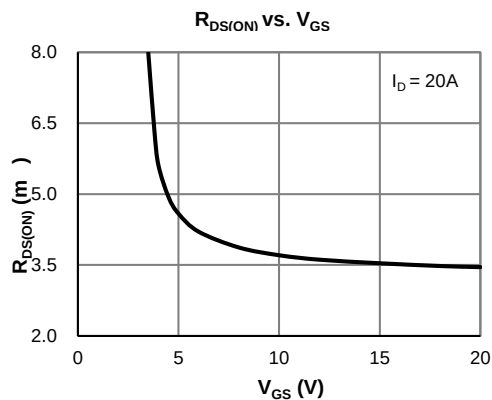
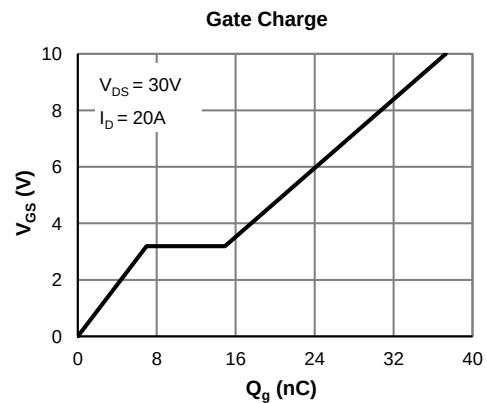
Power Management in Computing, CE, IE 4.0, Communications
 Current Switching in DC/DC & AC/DC (SR) Sub-systems
 Load Switching, Quick/Wireless Charging, Motor Driving

**Pin Configuration****Ordering Information**

Device	Package	# of Pins	Marking	MSL	T_J (°C)	Media	Quantity (pcs)
JMSL0606PU-13	PDFN3x3-8L	8	SL0606P	1	-55 to 150	13-inch Reel	5000

Absolute Maximum Ratings (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DS}	60	V
Gate-to-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ⁽¹⁾	I_D	$T_C = 25^\circ\text{C}$	69
		$T_C = 100^\circ\text{C}$	43
Pulsed Drain Current ⁽²⁾	I_{DM}	276	A
Avalanche Energy ⁽³⁾	E_{AS}	144	mJ
Power Dissipation ⁽⁴⁾	P_D	$T_C = 25^\circ\text{C}$	39
		$T_C = 100^\circ\text{C}$	15
Junction & Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C



**Electrical Characteristics** (@ $T_J = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
STATIC PARAMETERS						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 250\text{ A}$, $V_{GS} = 0\text{V}$	60			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 48\text{V}$, $V_{GS} = 0\text{V}$ $T_J = 55^\circ\text{C}$			1.0 5.0	A
Gate-Body Leakage Current	I_{GSS}	$V_{DS} = 0\text{V}$, $V_{GS} = \pm 20\text{V}$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\text{ A}$	1.2	1.8	2.5	V
Static Drain-Source ON-Resistance	$R_{DS(on)}$	$V_{GS} = 10\text{V}$, $I_D = 20\text{A}$		3.9	4.7	m
		$V_{GS} = 4.5\text{V}$, $I_D = 15\text{A}$		5.1	6.4	m
Forward Transconductance	g_{FS}	$V_{DS} = 5\text{V}$, $I_D = 20\text{A}$		27		S
Diode Forward Voltage	V_{SD}	$I_S = 1\text{A}$, $V_{GS} = 0\text{V}$		0.7	1.0	V
Diode Continuous Current	I_S	$T_C = 25^\circ\text{C}$			69	A

DYNAMIC PARAMETERS ⁽⁵⁾

Input Capacitance	C_{iss}	$V_{GS} = 0\text{V}$, $V_{DS} = 30\text{V}$, $f = 1\text{MHz}$		2115		pF
Output Capacitance	C_{oss}			918		pF
Reverse Transfer Capacitance	C_{rss}			50		pF
Gate Resistance	R_g	$V_{GS} = 0\text{V}$, $V_{DS} = 0\text{V}$, $f = 1\text{MHz}$		2.5		

SWITCHING PARAMETERS ⁽⁵⁾

Total Gate Charge (@ $V_{GS} = 10\text{V}$)	Q_g	$V_{GS} = 0\text{ to }10\text{V}$ $V_{DS} = 30\text{V}$, $I_D = 20\text{A}$		37		nC
Total Gate Charge (@ $V_{GS} = 6\text{V}$)	Q_g			24		nC
Gate Source Charge	Q_{gs}			7.0		nC
Gate Drain Charge	Q_{gd}			7.9		nC
Turn-On DelayTime	$t_{D(on)}$	$V_{GS} = 10\text{V}$, $V_{DS} = 30\text{V}$ $R_L = 1.5\ \Omega$, $R_{GEN} = 3\ \Omega$		8.7		ns
Turn-On Rise Time	t_r			27		ns
Turn-Off DelayTime	$t_{D(off)}$			36		ns
Turn-Off Fall Time	t_f			14		ns
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 20\text{A}$, $dI_F/dt = 100\text{A/s}$		41		ns
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F = 20\text{A}$, $dI_F/dt = 100\text{A/s}$		37		nC

Thermal Performance

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance, Junction-to-Ambient	R_{JA}	51	62	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	R_{JC}	3.2	4.2	$^\circ\text{C/W}$

Notes:

1. Computed continuous current assumes the condition of T_{J_Max} while the actual continuous current depends on the thermal & electro-mechanical application board design.
2. This single-pulse measurement was taken under $T_{J_Max} = 150^\circ\text{C}$.
3. E_{AS} of 144 mJ is based on starting $T_J = 25^\circ\text{C}$, $L = 3.0\text{mH}$, $I_{AS} = 9.8\text{A}$, $V_{GS} = 10\text{V}$, $V_{DD} = 30\text{V}$.
4. The power dissipation P_D is based on $T_{J_Max} = 150^\circ\text{C}$.
5. This value is guaranteed by design hence it is not included in the production test.

Typical Electrical & Thermal Characteristics

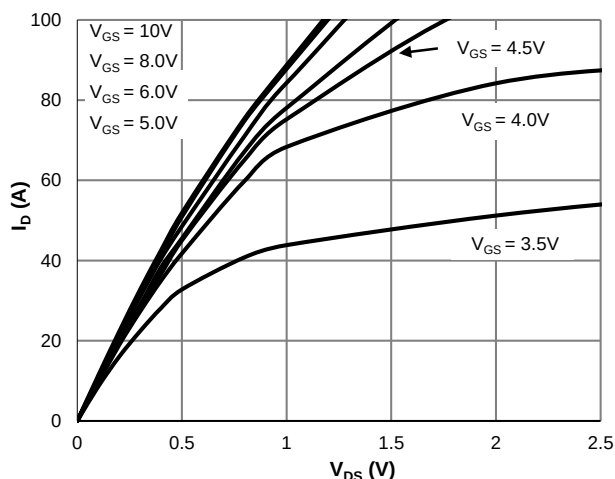


Figure 1: Saturation Characteristics

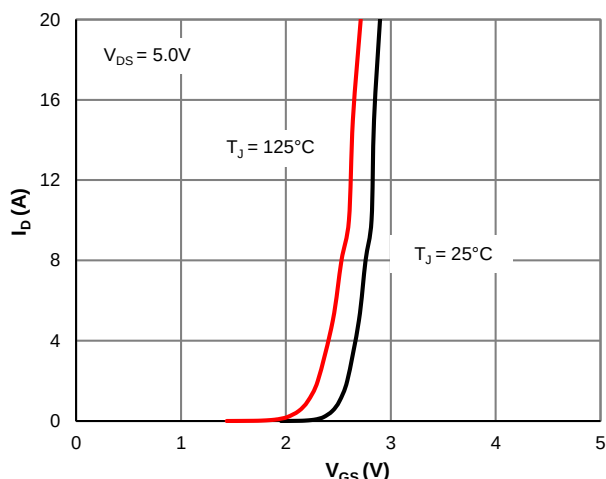


Figure 2: Transfer Characteristics

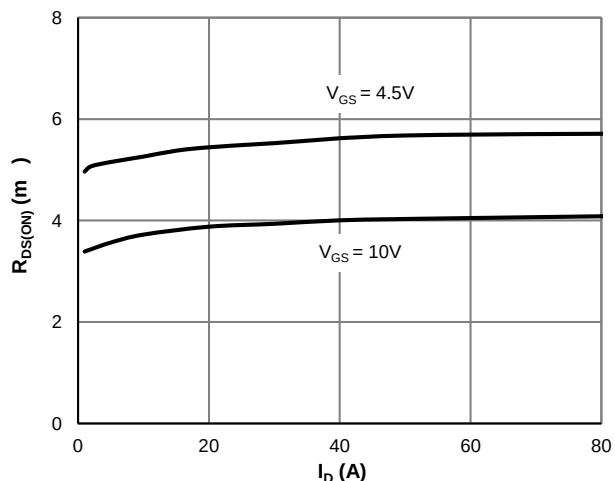


Figure 3: $R_{DS(ON)}$ vs. Drain Current

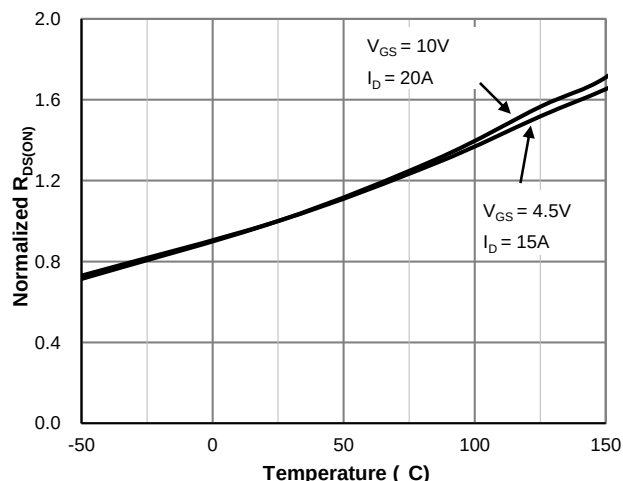


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

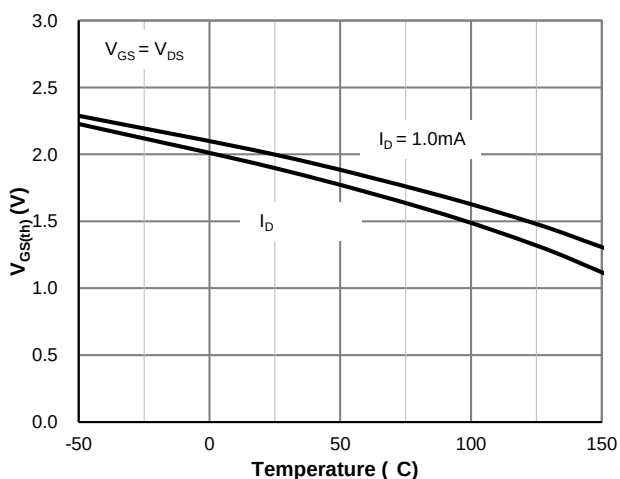


Figure 5: $V_{GS(th)}$ vs. Junction Temperature

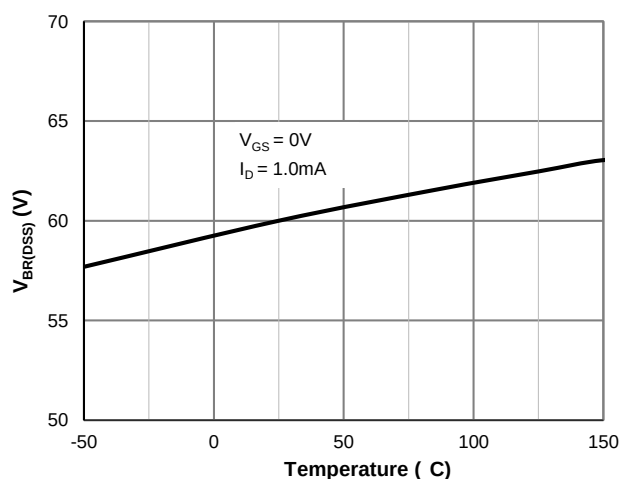


Figure 6: $V_{BR(DSS)}$ vs. Junction Temperature



Typical Electrical & Thermal Characteristics

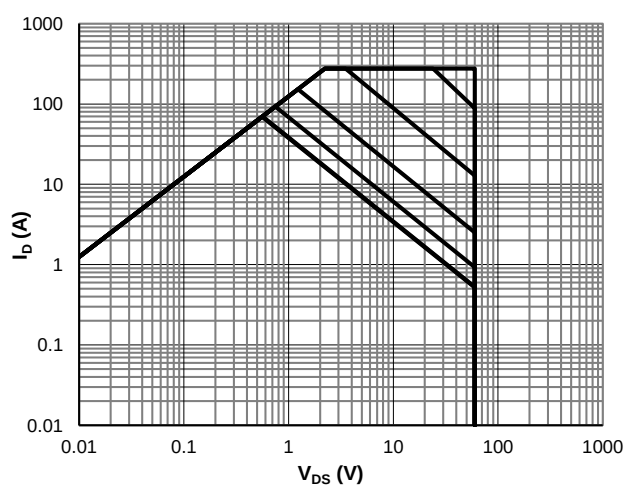
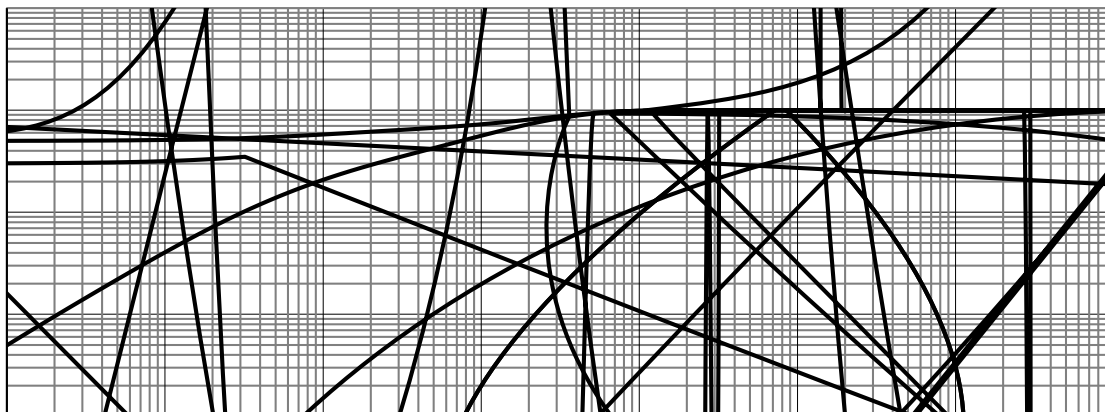
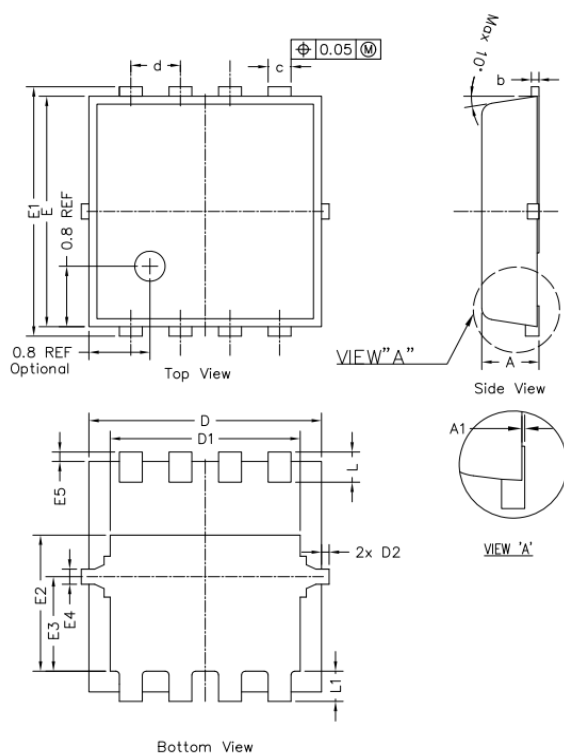


Figure 11: Maximum Safe Operating Area

Typical Electrical & Thermal Characteristics

PDFN3x3-8L Package Information


DIMENSION IN MM			DIMENSION IN INCHES		
MAX	MIN	NOM	MAX	MIN	NOM
0.350	0.335	0.353	0.014	0.013	0.014
0.050	0.045	0.052	0.002	0.002	0.002
0.202	0.192	0.205	0.008	0.008	0.008
0.300	0.285	0.303	0.012	0.011	0.012