



60V 5.0mΩ 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

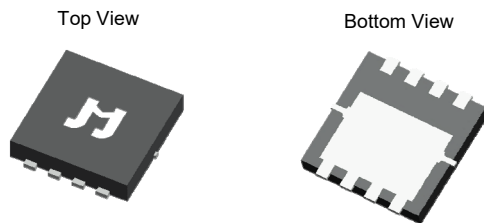
Product Summary

Parameter	Typ.	Unit
V_{DS}	60	V
$V_{GS(th)}$	1.5	V
I_D (@ $V_{GS} = 10V$) ⁽¹⁾	52	A
$R_{DS(ON)}$ (@ $V_{GS} = 10V$)	5.0	mΩ
$R_{DS(ON)}$ (@ $V_{GS} = 4.5V$)	6.6	mΩ

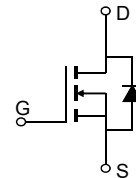
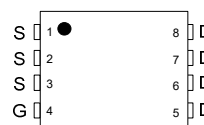
Applications

- 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

PDFN3x3-8L



Pin Configuration
Top View

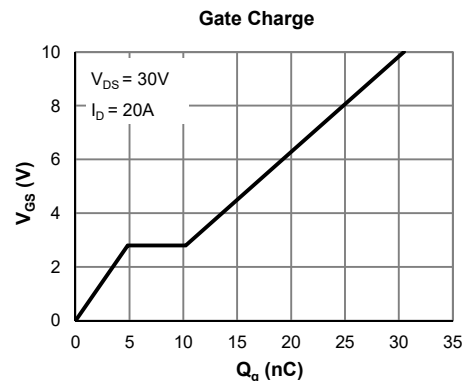
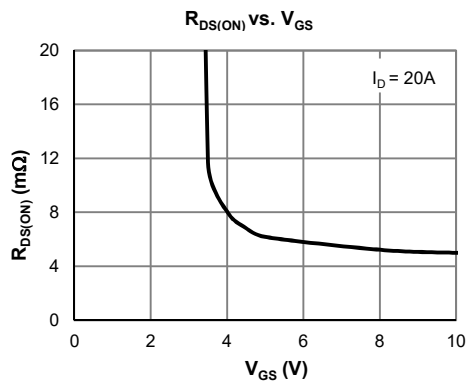


Ordering Information

Device	Package	# of Pins	Marking	MSL	T_J (°C)	Media	Quantity (pcs)
JMSL0606AU-13	PDFN3x3-8L	8	SL0606A	1	-55 to 150	13-inch Reel	5000

Absolute Maximum Ratings (@ $T_A = 25^\circ C$ 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	$T_C = 25^\circ C$	52
		$T_C = 100^\circ C$	33
Pulsed Drain Current ⁽²⁾	I_{DM}	192	A
Avalanche Current ⁽³⁾	I_{AS}	40	A
Avalanche Energy ⁽³⁾	E_{AS}	80	mJ
Power Dissipation ⁽⁴⁾	P_D	$T_C = 25^\circ C$	30
		$T_C = 100^\circ C$	11.9
Junction & Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C



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

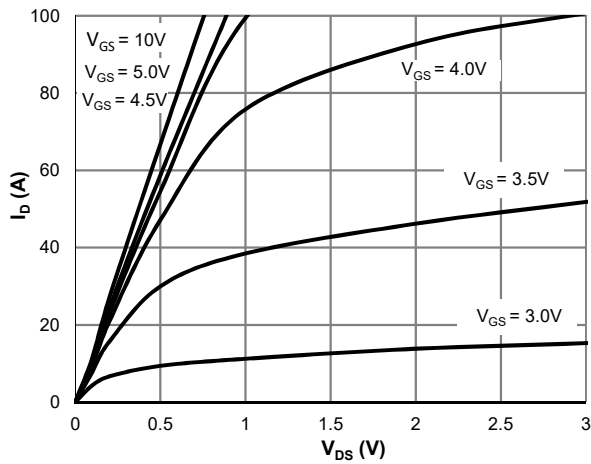
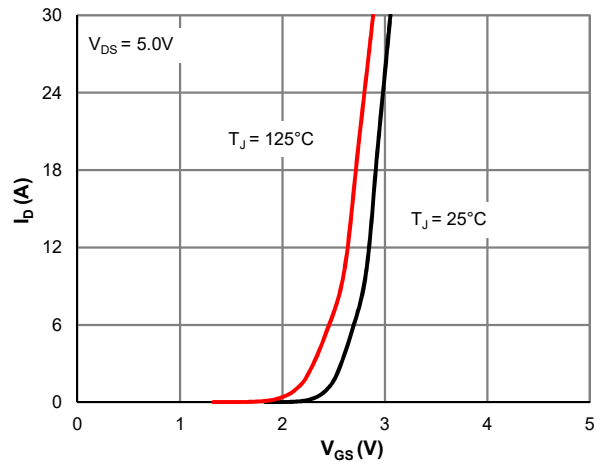
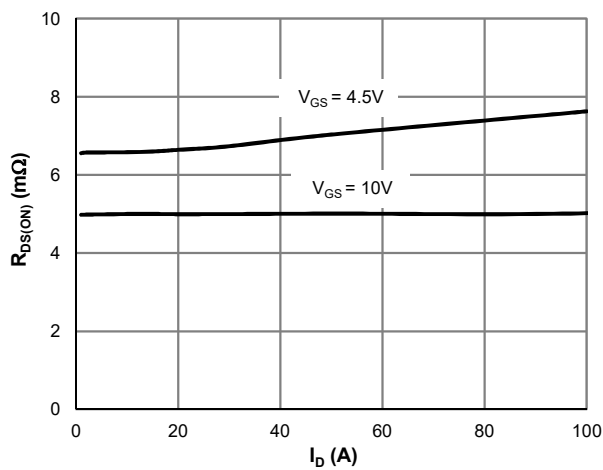
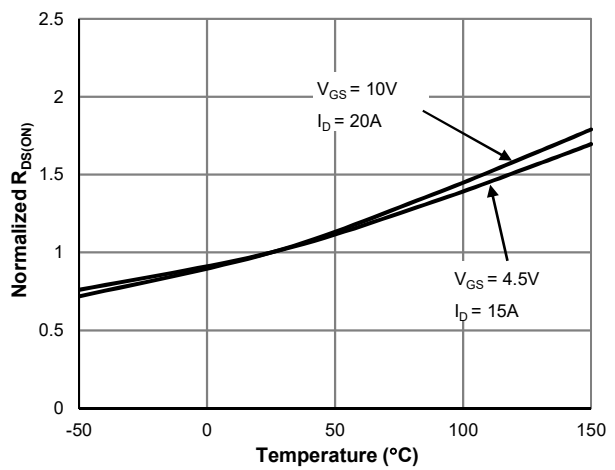
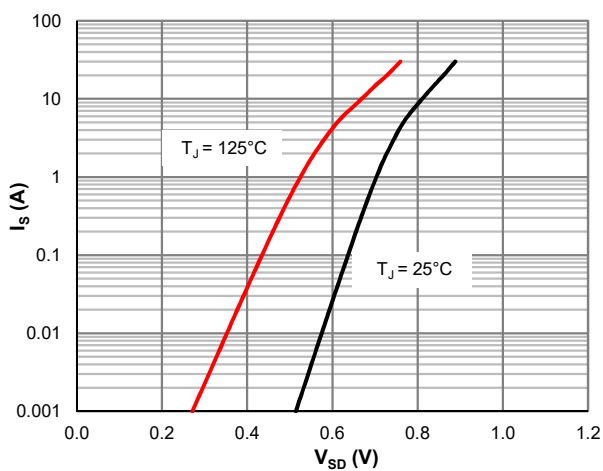
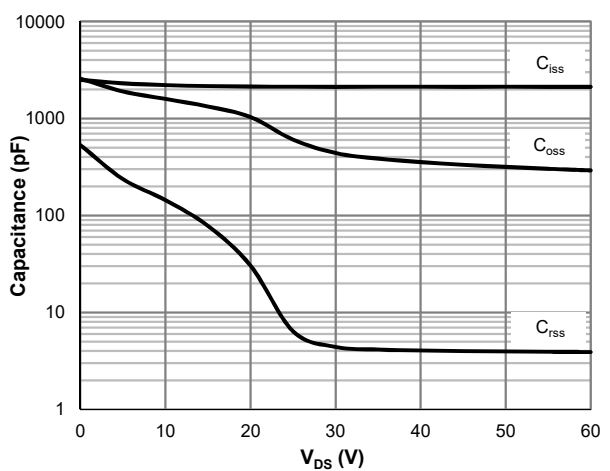
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
STATIC PARAMETERS						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 250\mu\text{A}$, $V_{GS} = 0\text{V}$	60			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 48\text{V}$, $V_{GS} = 0\text{V}$ $T_J = 55^\circ\text{C}$			1.0 5.0	μA
Gate-Body Leakage Current	I_{GSS}	$V_{DS} = 0\text{V}$, $V_{GS} = \pm 20\text{V}$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\mu\text{A}$	1.2	1.5	2.5	V
Static Drain-Source ON-Resistance	$R_{DS(on)}$	$V_{GS} = 10\text{V}$, $I_D = 20\text{A}$		5.0	6.2	$\text{m}\Omega$
		$V_{GS} = 4.5\text{V}$, $I_D = 15\text{A}$		6.6	8.3	$\text{m}\Omega$
Forward Transconductance	g_{FS}	$V_{DS} = 5\text{V}$, $I_D = 20\text{A}$		85		S
Diode Forward Voltage	V_{SD}	$I_S = 1\text{A}$, $V_{GS} = 0\text{V}$		0.70	1.0	V
Diode Continuous Current	I_S	$T_C = 25^\circ\text{C}$			30	A
DYNAMIC PARAMETERS ⁽⁵⁾						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{V}$, $V_{DS} = 30\text{V}$, $f = 1\text{MHz}$		2122		pF
Output Capacitance	C_{oss}			440		pF
Reverse Transfer Capacitance	C_{rss}			4.4		pF
Gate Resistance	R_g	$V_{GS} = 0\text{V}$, $V_{DS} = 0\text{V}$, $f = 1\text{MHz}$		1.7		Ω
SWITCHING PARAMETERS ⁽⁵⁾						
Total Gate Charge (@ $V_{GS} = 10\text{V}$)	Q_g	$V_{GS} = 0$ to 10V $V_{DS} = 30\text{V}$, $I_D = 20\text{A}$		31		nC
Total Gate Charge (@ $V_{GS} = 4.5\text{V}$)	Q_g			19.2		nC
Gate Source Charge	Q_{gs}			4.8		nC
Gate Drain Charge	Q_{gd}			5.4		nC
Turn-On Delay Time	$t_{D(on)}$	$V_{GS} = 10\text{V}$, $V_{DS} = 30\text{V}$ $R_L = 1.5\Omega$, $R_{GEN} = 6\Omega$		8.0		ns
Turn-On Rise Time	t_r			5.1		ns
Turn-Off Delay Time	$t_{D(off)}$			38		ns
Turn-Off Fall Time	t_f			14.8		ns
Body Diode Reverse Recovery Time	t_{rr}		$I_F = 20\text{A}$, $dI_F/dt = 100\text{A}/\mu\text{s}$		37	
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F = 20\text{A}$, $dI_F/dt = 100\text{A}/\mu\text{s}$		43		nC

Thermal Performance

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

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. This single-pulse measurement was taken under the following condition [$L = 100\mu\text{H}$, $V_{GS} = 10\text{V}$, $V_{DD} = 30\text{V}$] while its value is limited by $T_{J_Max} = 150^\circ\text{C}$.
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: Body-Diode Characteristics

Figure 6: Capacitance Characteristics

Typical Electrical & Thermal Characteristics

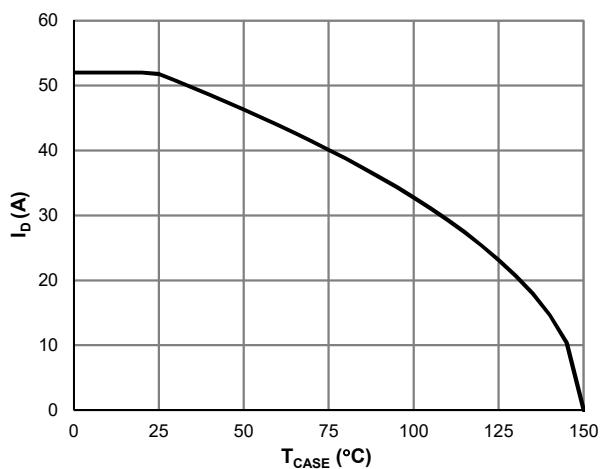


Figure 7: Current De-rating

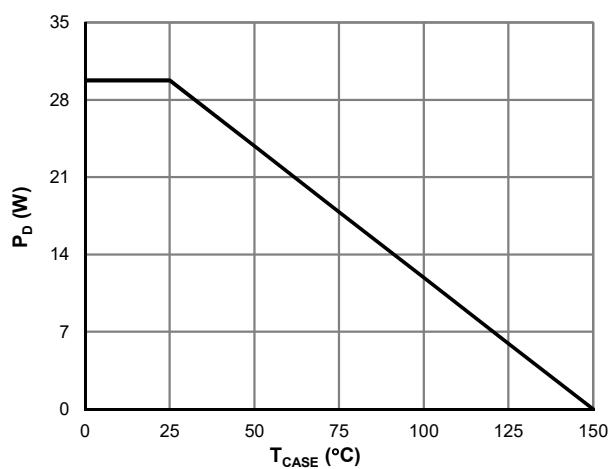


Figure 8: Power De-rating

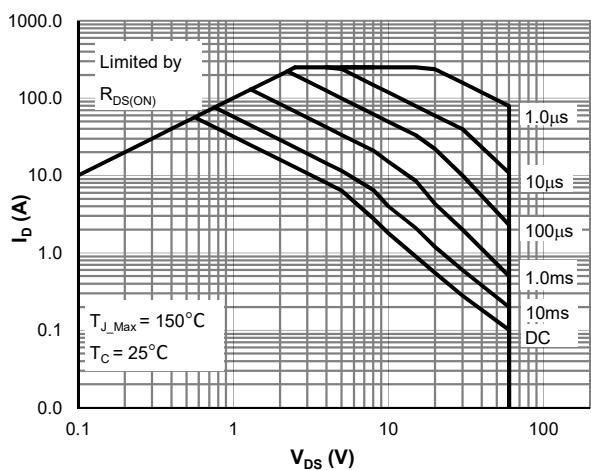


Figure 9: Maximum Safe Operating Area

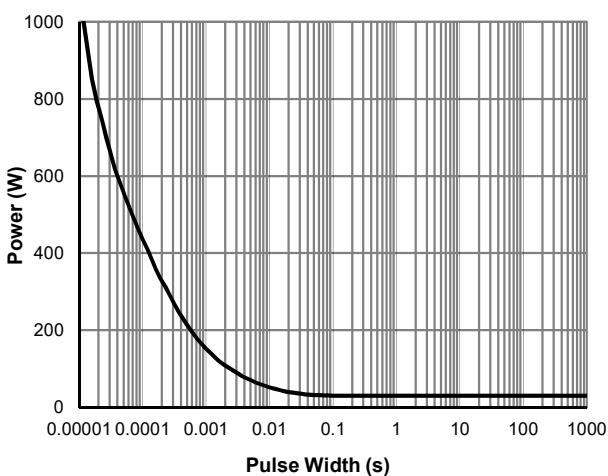


Figure 10: Single Pulse Power Rating, Junction-to-Case

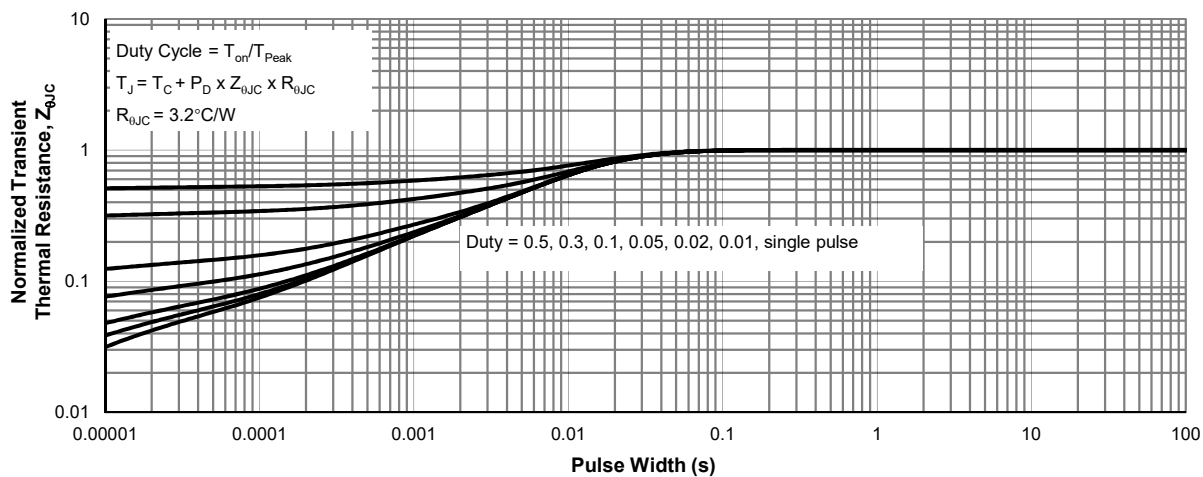
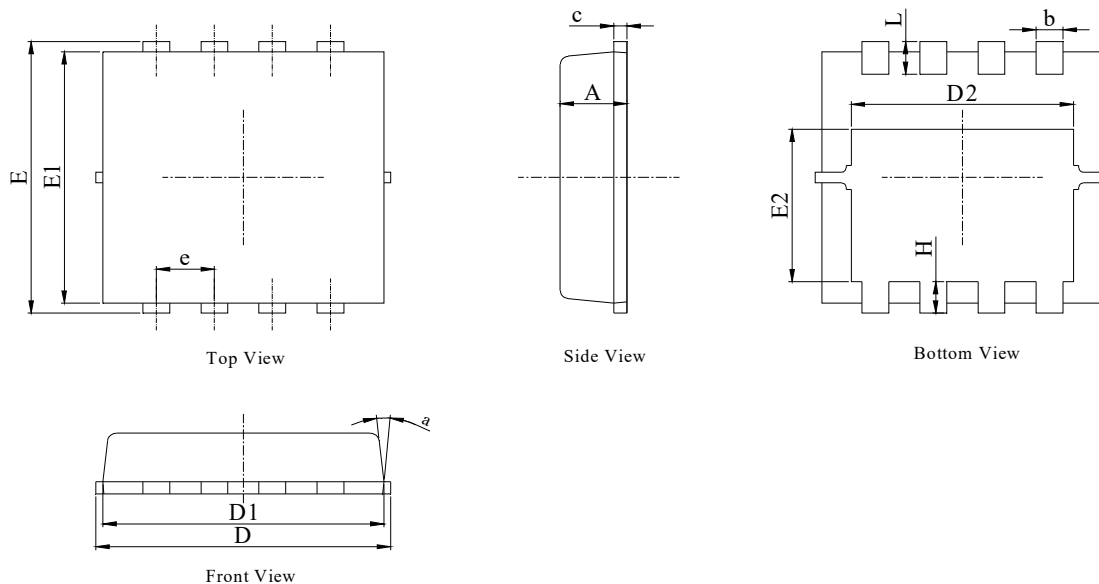
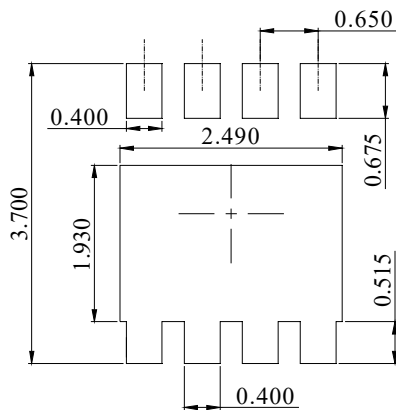


Figure 11: Normalized Maximum Transient Thermal Impedance

PDFN3x3-8L Package Information
Package Outline

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M,1994.
2. ALL DIMNESIONS IN MILLIMETER (ANNGL E IN DEGREE).
3. DIMENSIONS D1 AND E1 DO NOT INCLUDE MOLD FLASH PROTRUSIONS OR GATE BURRS.

DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	0.70	0.75	0.80
b	0.25	0.30	0.35
c	0.10	0.20	0.25
D	3.00	3.15	3.25
D1	2.95	3.05	3.15
D2	2.39	2.49	2.59
E	3.20	3.30	3.40
E1	2.95	3.05	3.15
E2	1.70	1.80	1.90
e	0.65 BSC		
H	0.30	0.40	0.50
L	0.25	0.40	0.50
a	---	---	15°

Recommended Soldering Footprint


DIMENSIONS: MILLIMETERS