



# 150V 6.0mΩ N-Ch Power MOSFET

### Features

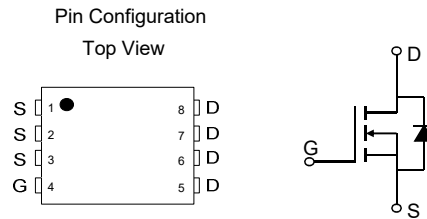
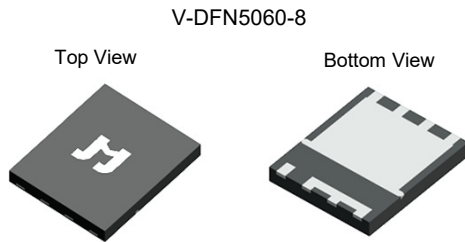
- Low  $R_{DS(ON)}$
- Low Gate Charge
- 100% UIS Tested, 100%  $R_g$  Tested
- Pb-Free Lead Plating
- RoHS and Halogen-Free Compliant

### Product Summary

Parameter	Value	Unit
$V_{DS}$	150	V
$V_{GS(th)}_{Typ}$	3.2	V
$I_D$ (@ $V_{GS} = 10V$ ) <sup>(1)</sup>	99	A
$R_{DS(ON)}_{Typ}$ (@ $V_{GS} = 10V$ )	6.0	mΩ

### Applications

- Power Management in Telecom., Industrial Automation, CE
- Current Switching in DC/DC & AC/DC (SR) Sub-systems

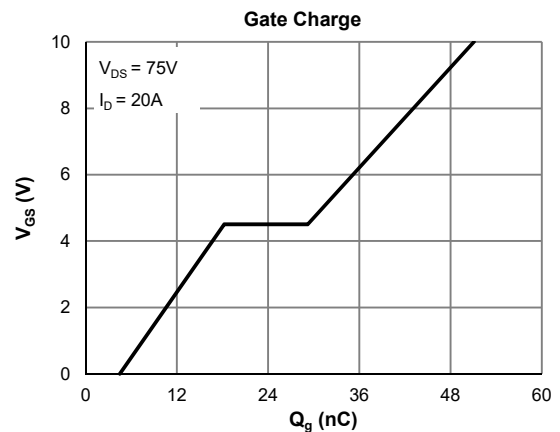
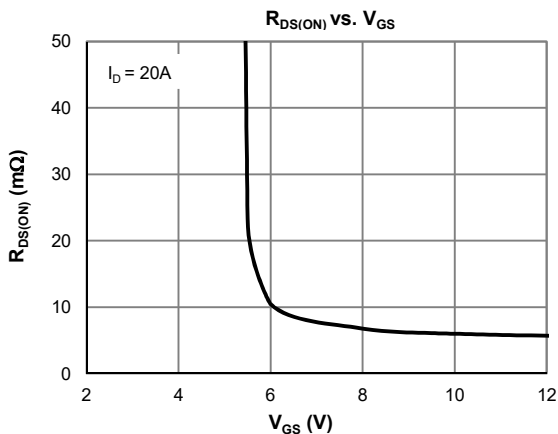


### Ordering Information

Device	Package	# of Pins	Marking	MSL	$T_J$ (°C)	Media	Quantity (pcs)
JMSH1507AGN-13	V-DFN5060-8	8	SH1507A	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	$V_{DS}$	150	V
Gate-to-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current <sup>(1)</sup>	$I_D$	$T_C = 25^\circ C$	99
		$T_C = 100^\circ C$	62
Pulsed Drain Current <sup>(2)</sup>	$I_{DM}$	395	A
Avalanche Current <sup>(3)</sup>	$I_{AS}$	44	A
Avalanche Energy <sup>(3)</sup>	$E_{AS}$	484	mJ
Power Dissipation <sup>(4)</sup>	$P_D$	$T_C = 25^\circ C$	174
		$T_C = 100^\circ C$	69
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
<b>STATIC PARAMETERS</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 250\mu\text{A}, V_{GS} = 0\text{V}$	150			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 120\text{V}, V_{GS} = 0\text{V}$ $T_J = 55^\circ\text{C}$			1.0 5.0	$\mu\text{A}$
Gate-Body Leakage Current	$I_{GSS}$	$V_{DS} = 0\text{V}, V_{GS} = \pm 20\text{V}$			$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	2.0	3.2	4.0	V
Static Drain-Source ON-Resistance	$R_{DS(ON)}$	$V_{GS} = 10\text{V}, I_D = 20\text{A}$		6.0	7.5	$\text{m}\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS} = 5\text{V}, I_D = 20\text{A}$		48		S
Diode Forward Voltage	$V_{SD}$	$I_S = 1\text{A}, V_{GS} = 0\text{V}$		0.69	1.0	V
Diode Continuous Current	$I_S$	$T_C = 25^\circ\text{C}$			174	A

**DYNAMIC PARAMETERS** <sup>(5)</sup>

Input Capacitance	$C_{iss}$	$V_{GS} = 0\text{V}, V_{DS} = 75\text{V}, f = 1\text{MHz}$		3395		pF
Output Capacitance	$C_{oss}$			457		pF
Reverse Transfer Capacitance	$C_{rss}$			30		pF
Gate Resistance	$R_g$	$V_{GS} = 0\text{V}, V_{DS} = 0\text{V}, f = 1\text{MHz}$		1.9		$\Omega$

**SWITCHING PARAMETERS** <sup>(5)</sup>

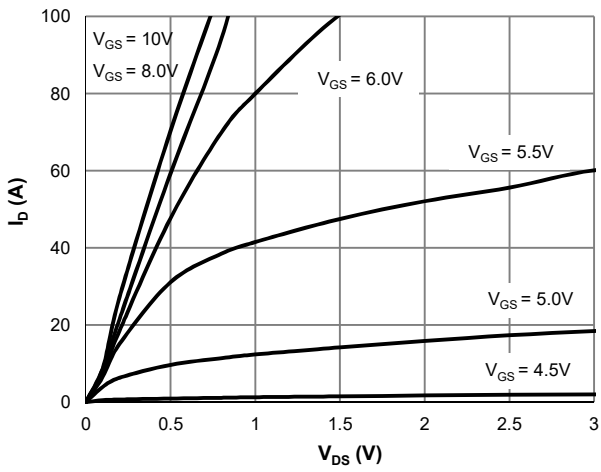
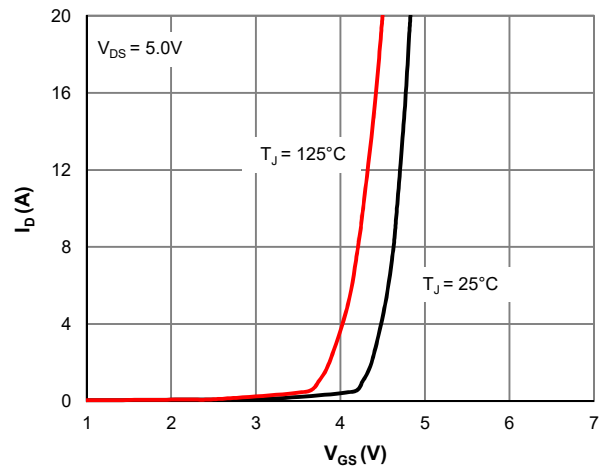
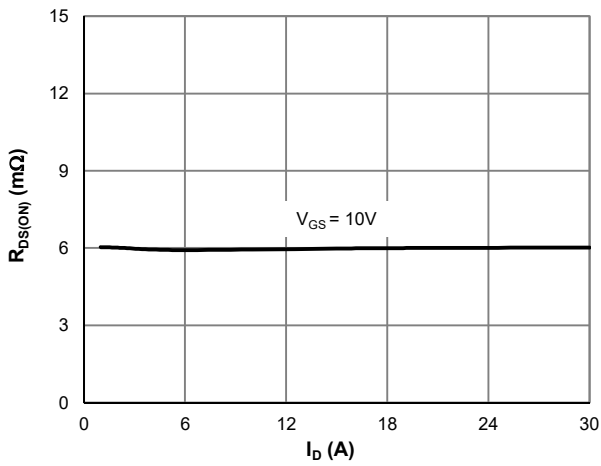
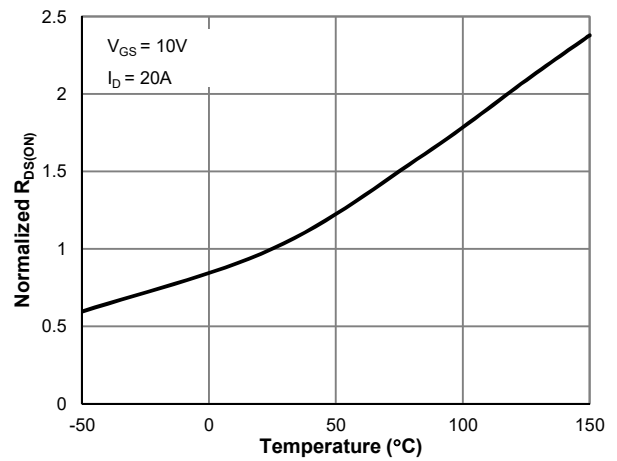
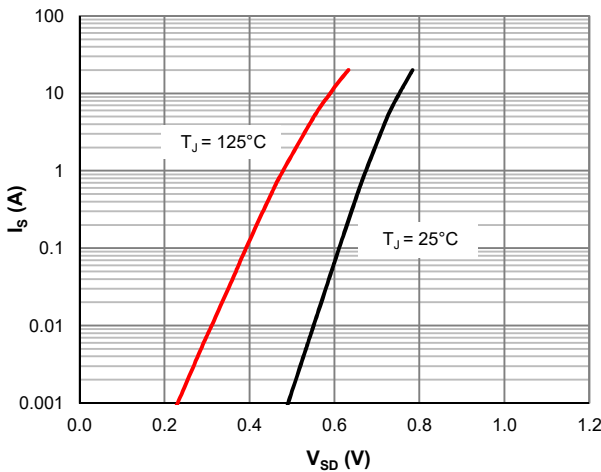
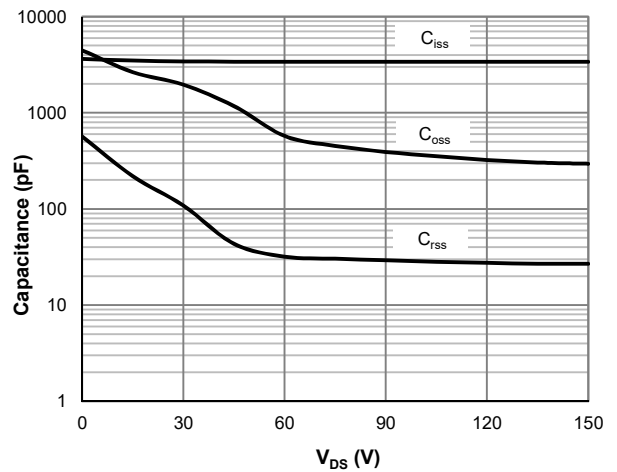
Total Gate Charge (@ $V_{GS} = 10\text{V}$ )	$Q_g$	$V_{GS} = 0 \text{ to } 10\text{V}$ $V_{DS} = 75\text{V}, I_D = 20\text{A}$		51		nC
Total Gate Charge (@ $V_{GS} = 6.0\text{V}$ )	$Q_g$			33		nC
Gate Source Charge	$Q_{gs}$			17.2		nC
Gate Drain Charge	$Q_{gd}$			14.3		nC
Turn-On DelayTime	$t_{D(on)}$	$V_{GS} = 10\text{V}, V_{DS} = 75\text{V}$ $R_L = 3.75\Omega, R_{GEN} = 6\Omega$		22		ns
Turn-On Rise Time	$t_r$			67		ns
Turn-Off DelayTime	$t_{D(off)}$			51		ns
Turn-Off Fall Time	$t_f$			65		ns
Body Diode Reverse Recovery Time	$t_{rr}$		$I_F = 20\text{A}, dI_F/dt = 100\text{A}/\mu\text{s}$		95	
Body Diode Reverse Recovery Charge	$Q_{rr}$	$I_F = 20\text{A}, dI_F/dt = 100\text{A}/\mu\text{s}$		260		nC

**Thermal Performance**

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	50	60	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.42	0.72	$^\circ\text{C}/\text{W}$

**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 [ $L = 500\mu\text{H}, V_{GS} = 10\text{V}, V_{DS} = 75\text{V}$ ] 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

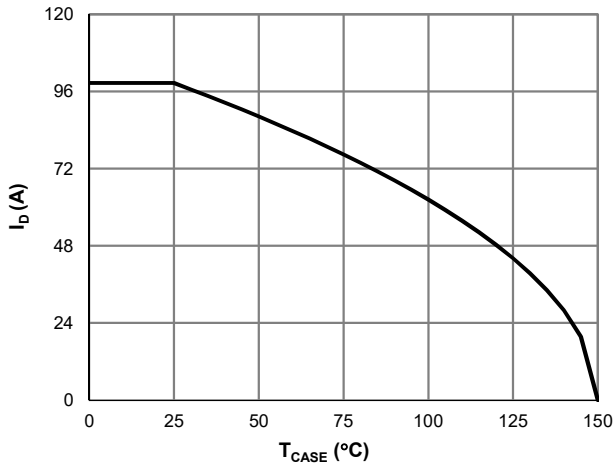


Figure 7: Current De-rating

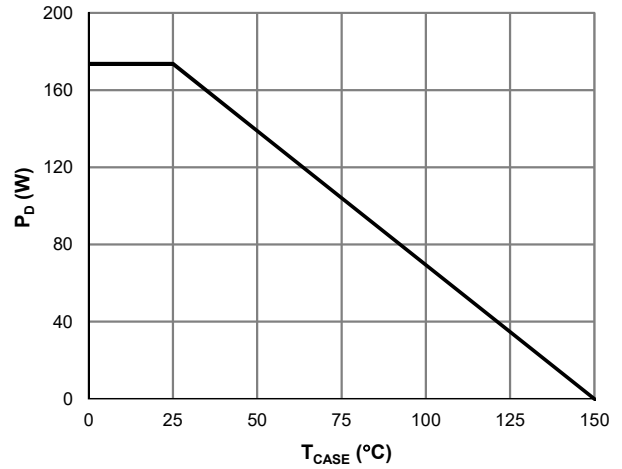


Figure 8: Power De-rating

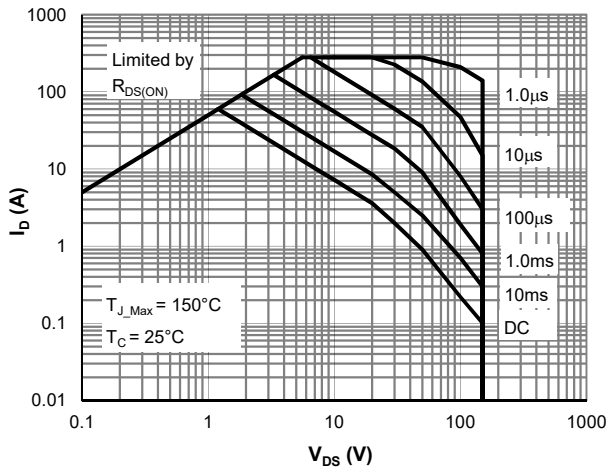


Figure 9: Maximum Safe Operating Area

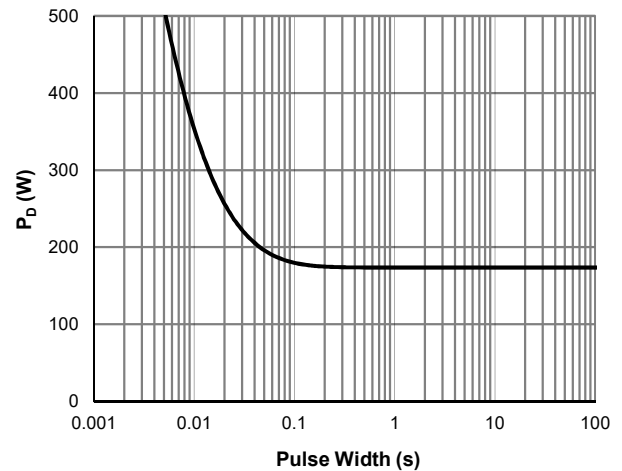


Figure 10: Single Pulse Power Rating, Junction-to-Case

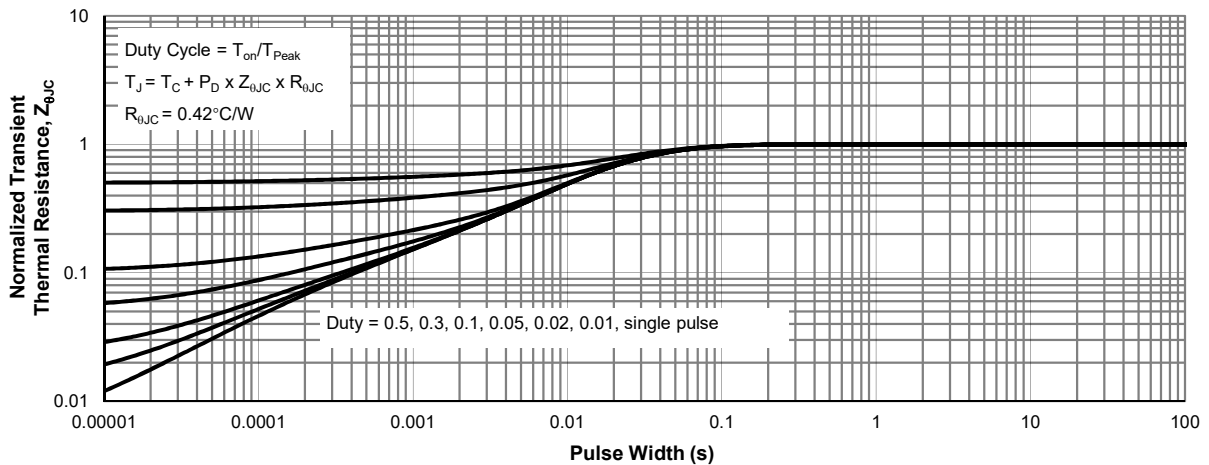
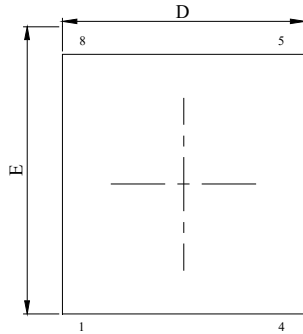
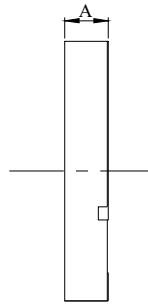


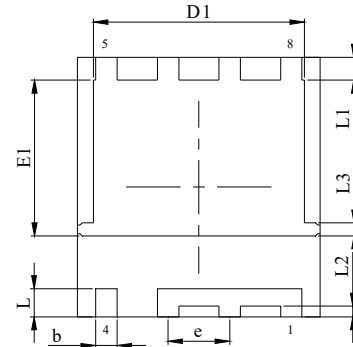
Figure 11: Normalized Maximum Transient Thermal Impedance

**V-DFN5060-8 Package Information**
**Package Outlines**


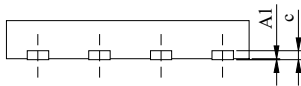
Top View



Side View

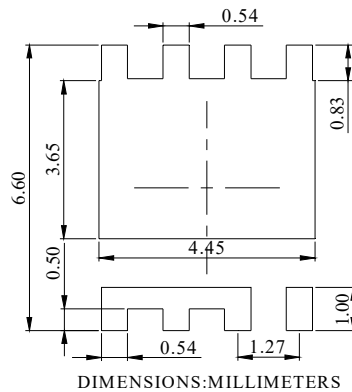


Bottom View



Front View

DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	0.80	0.90	1.00
A1	--	--	0.05
b	0.39	0.44	0.49
c	--	0.20	--
D	4.90	5.00	5.10
D1	4.25	4.35	4.45
E	5.90	6.00	6.10
E1	3.47	3.57	3.67
L	0.55	0.65	0.75
L1	0.43	0.53	0.63
L2		0.25	
L3		0.30	
e	1.27 BSC		

**Recommended Soldering Footprint**


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