



# 100V 105mΩ N-Ch Power MOSFET

### Features

- Low  $R_{DS(ON)}$
- Low Gate Charge
- Pb-free Lead Plating
- Halogen-free and RoHS-compliant

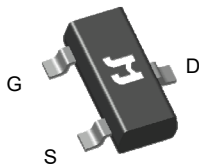
### Applications

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

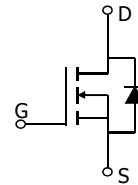
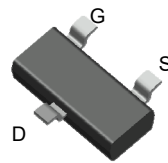
### Product Summary

Parameter	Value	Unit
$V_{DS}$	100	V
$V_{GS(th\_Typ)}$	1.9	V
$I_D$ (@ $V_{GS} = 10V$ ) <sup>(1)</sup>	1.8	A
$R_{DS(ON\_Typ)}$ (@ $V_{GS} = 10V$ )	105	mΩ
$R_{DS(ON\_Typ)}$ (@ $V_{GS} = 4.5V$ )	139	mΩ

SOT-23 Top View



SOT-23 Bottom View

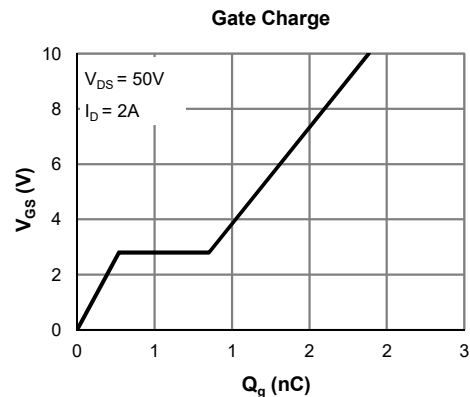
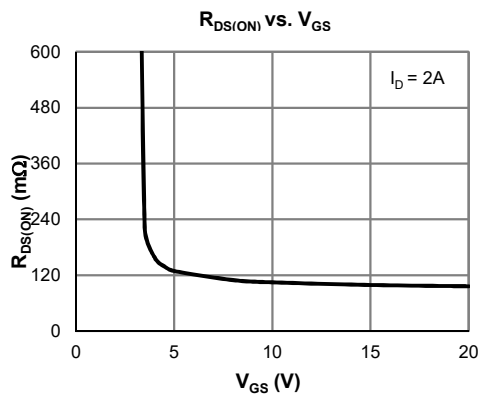


### Ordering Information

Device	Package	# of Pins	Marking	MSL	$T_J$ (°C)	Media	Quantity (pcs)
JMSL10130AL-7	SOT-23	3	1013	3	-55 to 150	7-inch Reel	3000

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

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	$V_{DS}$	100	V
Gate-to-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current <sup>(1)</sup>	$I_D$	$T_A = 25^\circ C$	1.8
		$T_A = 70^\circ C$	1.4
Pulsed Drain Current <sup>(2)</sup>	$I_{DM}$	17.0	A
Avalanche Current <sup>(3)</sup>	$I_{AS}$	4.0	A
Avalanche Energy <sup>(3)</sup>	$E_{AS}$	0.80	mJ
Power Dissipation <sup>(4)</sup>	$P_D$	$T_A = 25^\circ C$	0.72
		$T_A = 70^\circ C$	0.46
Junction & Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	°C



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

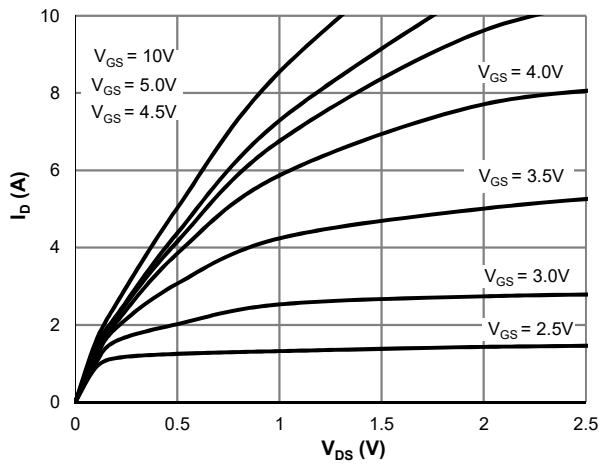
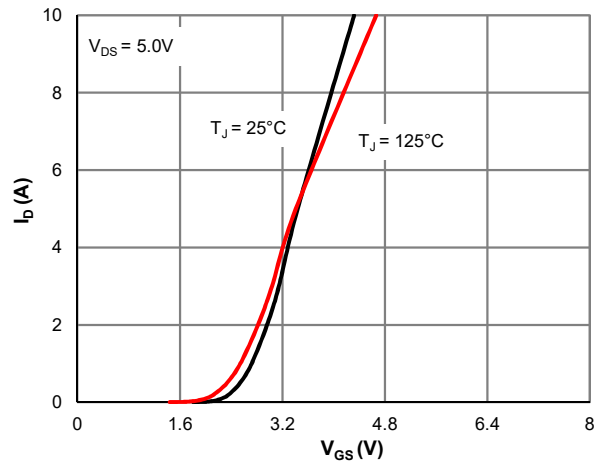
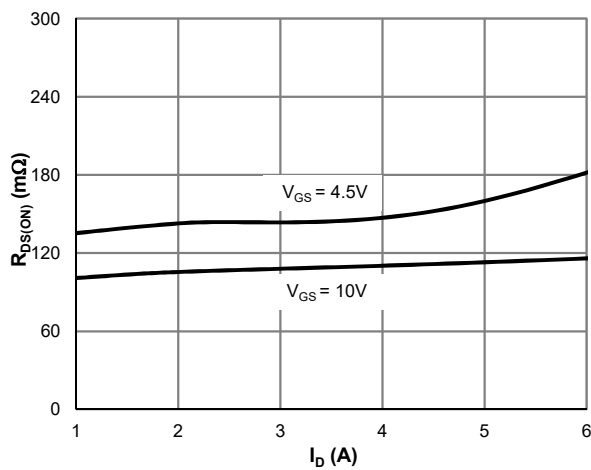
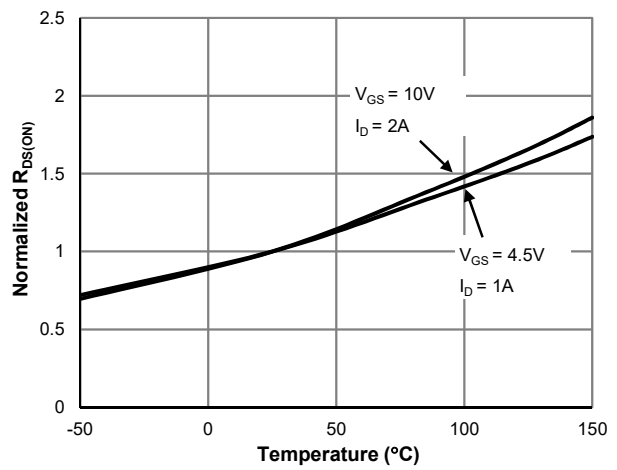
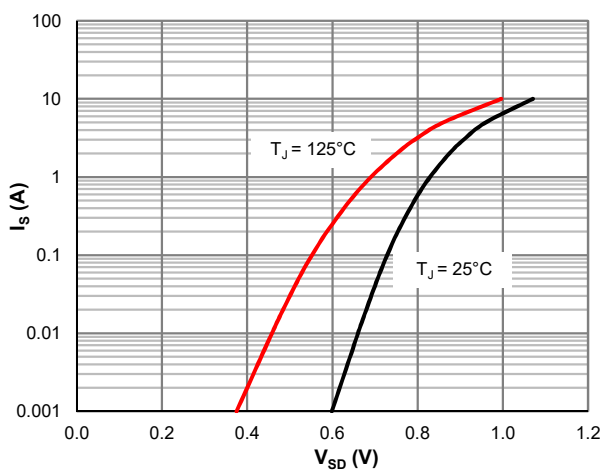
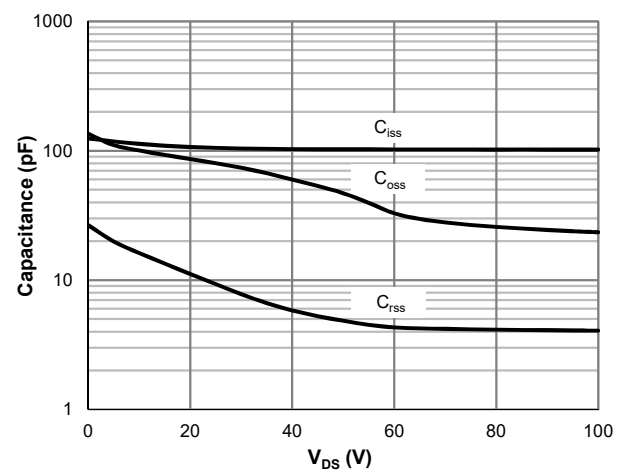
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>STATIC PARAMETERS</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 250\mu\text{A}, V_{GS} = 0\text{V}$	100			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 80\text{V}, V_{GS} = 0\text{V}$ $T_J = 55^\circ\text{C}$			1.0 5.0	$\mu\text{A}$
Gate-Body Leakage Current	$I_{GSS}$	$V_{DS} = 0\text{V}, V_{GS} = \pm 20\text{V}$			$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	1.2	1.9	2.5	V
Static Drain-Source ON-Resistance	$R_{DS(on)}$	$V_{GS} = 10\text{V}, I_D = 2\text{A}$		105	131	$\text{m}\Omega$
	$R_{DS(on)}$	$V_{GS} = 4.5\text{V}, I_D = 1\text{A}$		139	174	$\text{m}\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS} = 5\text{V}, I_D = 2\text{A}$		6.8		S
Diode Forward Voltage	$V_{SD}$	$I_S = 1\text{A}, V_{GS} = 0\text{V}$		0.70	1.0	V
Diode Continuous Current	$I_S$	$T_A = 25^\circ\text{C}$			0.7	A
<b>DYNAMIC PARAMETERS <sup>(5)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{GS} = 0\text{V}, V_{DS} = 50\text{V}, f = 1\text{MHz}$		103		pF
Output Capacitance	$C_{oss}$			47		pF
Reverse Transfer Capacitance	$C_{rss}$			4.9		pF
Gate Resistance	$R_g$	$V_{GS} = 0\text{V}, V_{DS} = 0\text{V}, f = 1\text{MHz}$		2.6		$\Omega$
<b>SWITCHING PARAMETERS <sup>(5)</sup></b>						
Total Gate Charge (@ $V_{GS} = 10\text{V}$ )	$Q_g$	$V_{GS} = 0 \text{ to } 10\text{V}$ $V_{DS} = 50\text{V}, I_D = 2\text{A}$		2.3		nC
Total Gate Charge (@ $V_{GS} = 4.5\text{V}$ )	$Q_g$			1.3		nC
Gate Source Charge	$Q_{gs}$			0.3		nC
Gate Drain Charge	$Q_{gd}$			0.7		nC
Turn-On Delay Time	$t_{D(on)}$	$V_{GS} = 10\text{V}, V_{DS} = 50\text{V}$ $R_L = 25\Omega, R_{GEN} = 6\Omega$		2.1		ns
Turn-On Rise Time	$t_r$			3.3		ns
Turn-Off Delay Time	$t_{D(off)}$			7.5		ns
Turn-Off Fall Time	$t_f$			3.2		ns
Body Diode Reverse Recovery Time	$t_{rr}$		$I_F = 2\text{A}, dI_F/dt = 100\text{A}/\mu\text{s}$		21	
Body Diode Reverse Recovery Charge	$Q_{rr}$	$I_F = 2\text{A}, dI_F/dt = 100\text{A}/\mu\text{s}$		8.0		nC

**Thermal Performance**

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	144	173	$^\circ\text{C}/\text{W}$

**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 [ $L = 100\mu\text{H}, V_{GS} = 10\text{V}, V_{DS} = 50\text{V}$ ] 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

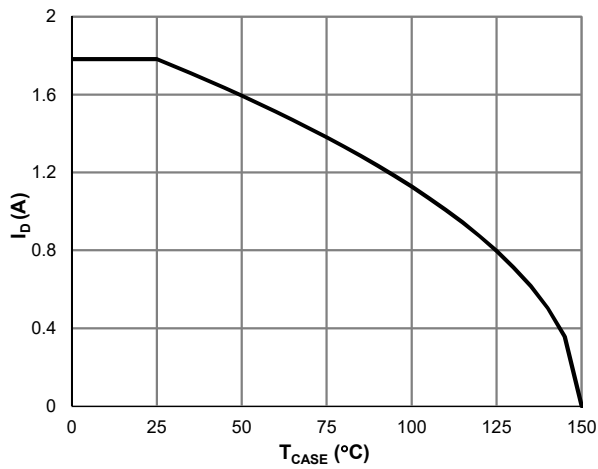


Figure 7: Current De-rating

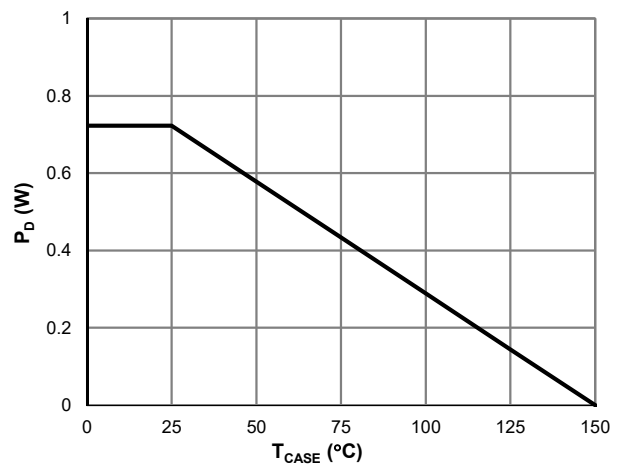


Figure 8: Power De-rating

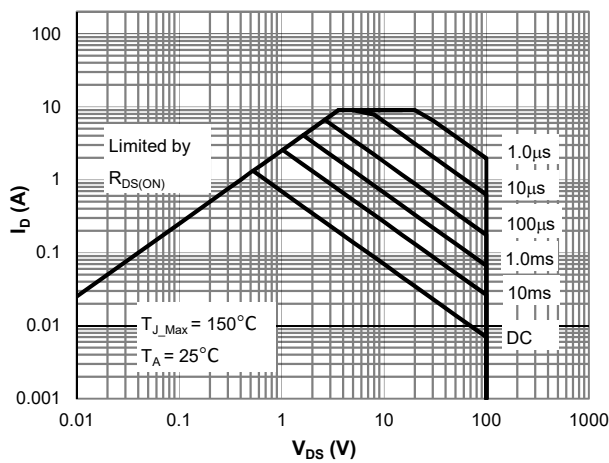


Figure 9: Maximum Safe Operating Area

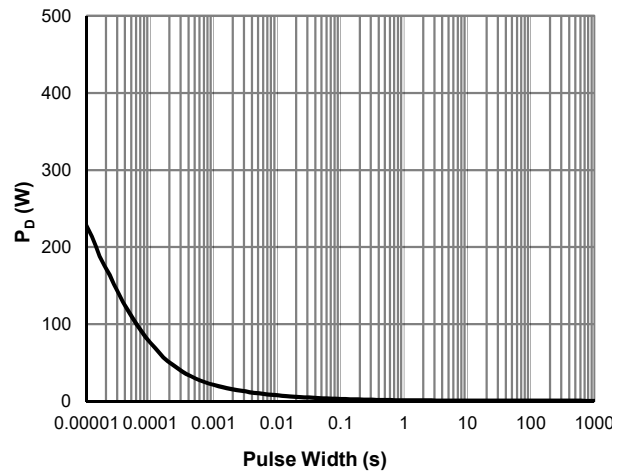


Figure 10: Single Pulse Power Rating, Junction-to-Case

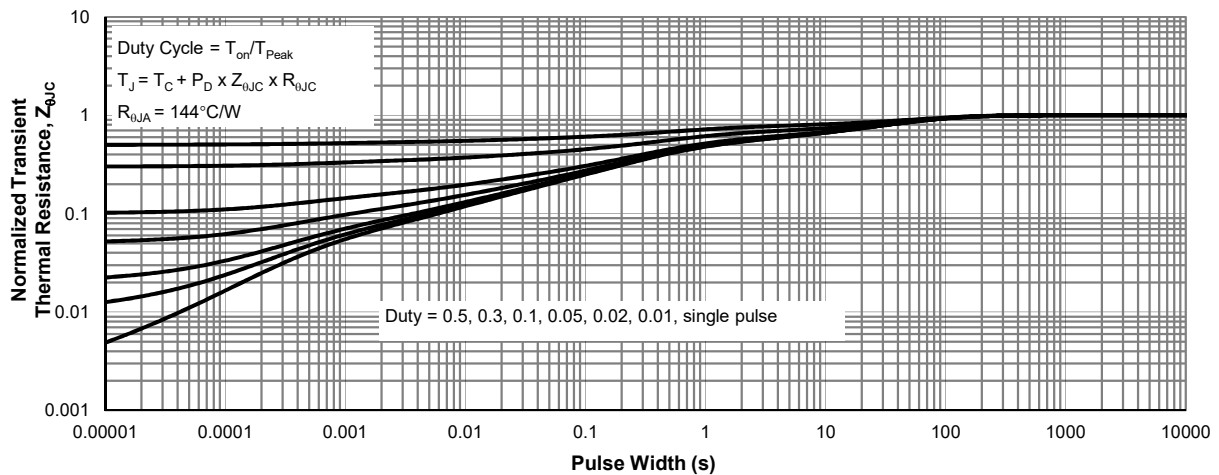
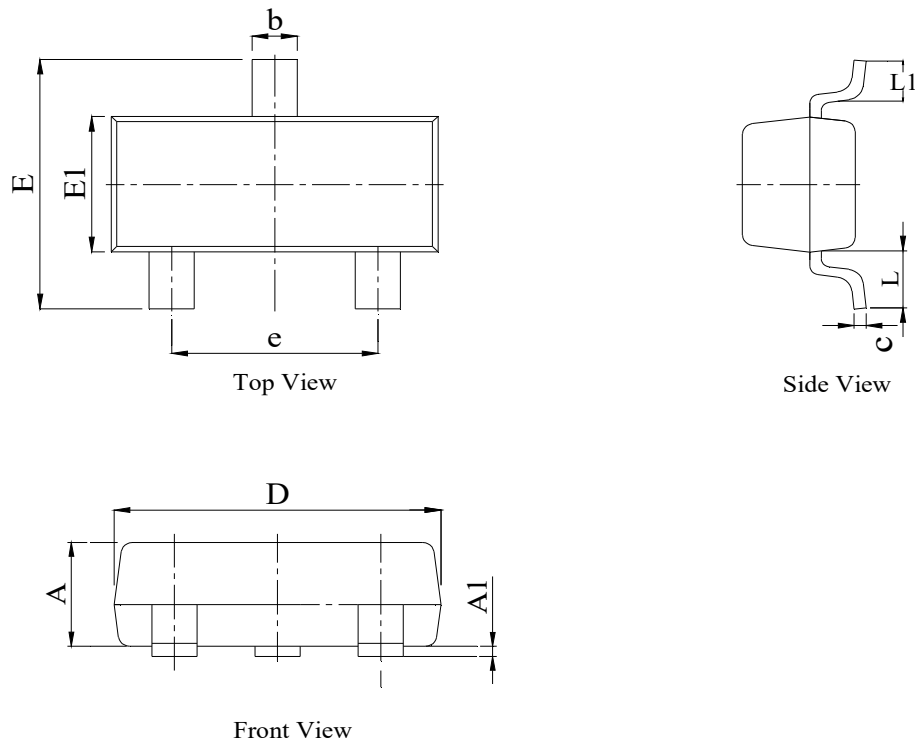
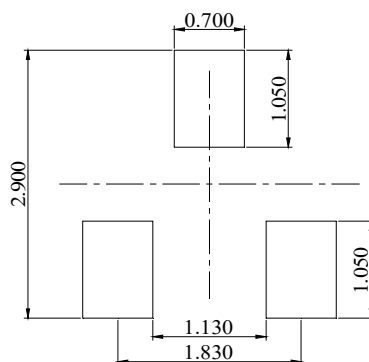


Figure 11: Normalized Maximum Transient Thermal Impedance

**SOT-23 Package Information**
**Package Outline**


DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	0.90	1.00	1.10
A1	0.00	-	0.10
D	2.80	2.90	3.00
E	2.25	2.40	2.55
E1	1.20	1.30	1.40
L	0.45	0.55	0.65
L1	0.20	-	0.55
b	0.30	0.40	0.50
c	-	0.10	0.15
e	-	1.90	-

**Recommended Footprint**


DIMENSIONS: MILLIMETERS