



**-100V 21mΩ P-Ch Power MOSFET**

**Features**

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

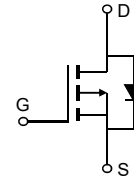
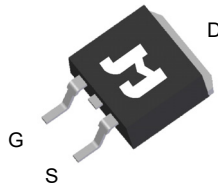
**Product Summary**

Parameter	Value	Unit
$V_{DS}$	-100	V
$V_{GS(th\_Typ)}$	-2.0	V
$I_D$ (@ $V_{GS} = -10V$ ) <sup>(1)</sup>	-49	A
$R_{DS(ON\_Typ)}$ (@ $V_{GS} = -10V$ )	21	mΩ
$R_{DS(ON\_Typ)}$ (@ $V_{GS} = -4.5V$ )	29	mΩ

**Applications**

- Battery Management
- DC/DC in Telecoms and Industrial
- Hard Switching and High Speed Circuit

TO-263-3L Top View

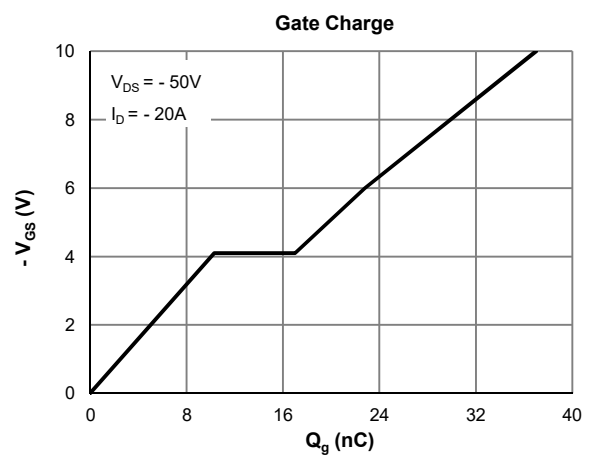
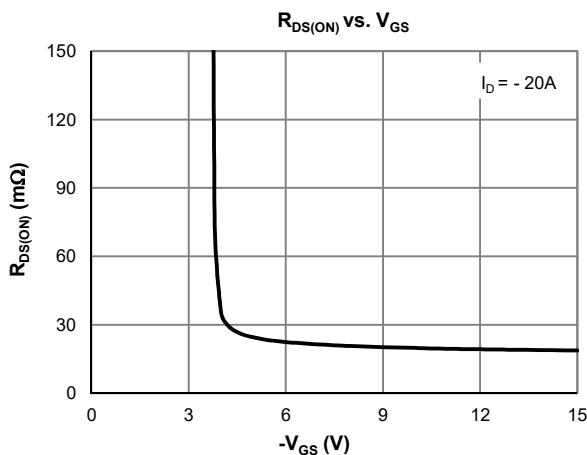


**Ordering Information**

Device	Package	# of Pins	Marking	MSL	$T_J$ (°C)	Media	Quantity (pcs)
JMPL1025AE-13	TO-263-3L	3	PL1025A	1	-55 to 150	13-inch Reel	800

**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>	$I_D$	$T_C = 25^\circ C$	-49
		$T_C = 100^\circ C$	-31
Pulsed Drain Current <sup>(2)</sup>	$I_{DM}$	-185	A
Avalanche Current <sup>(3)</sup>	$I_{AS}$	-45	A
Avalanche Energy <sup>(3)</sup>	$E_{AS}$	304	mJ
Power Dissipation <sup>(4)</sup>	$P_D$	$T_C = 25^\circ C$	114
		$T_C = 100^\circ C$	45
Junction & Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	°C





**Electrical Characteristics** (@ T<sub>J</sub> = 25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>STATIC PARAMETERS</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	I <sub>D</sub> = -250μA, V <sub>GS</sub> = 0V	-100			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = -80V, V <sub>GS</sub> = 0V			-1.0	μA
		T <sub>J</sub> = 55°C			-5.0	
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±20V			±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA	-1.0	-2.0	-3.0	V
Static Drain-Source ON-Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> = -10V, I <sub>D</sub> = -20A		21	25	mΩ
		V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -15A		29	38	mΩ
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> = -5V, I <sub>D</sub> = -15A		30		S
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> = -1A, V <sub>GS</sub> = 0V		-0.7	-1.0	V
Diode Continuous Current	I <sub>S</sub>	T <sub>C</sub> = 25°C			-114	A

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

Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0V, V <sub>DS</sub> = -50V, f = 1MHz		2525		pF
Output Capacitance	C <sub>oss</sub>			427		pF
Reverse Transfer Capacitance	C <sub>rss</sub>			32		pF
Gate Resistance	R <sub>g</sub>	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 0V, f = 1MHz		4.9		Ω

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

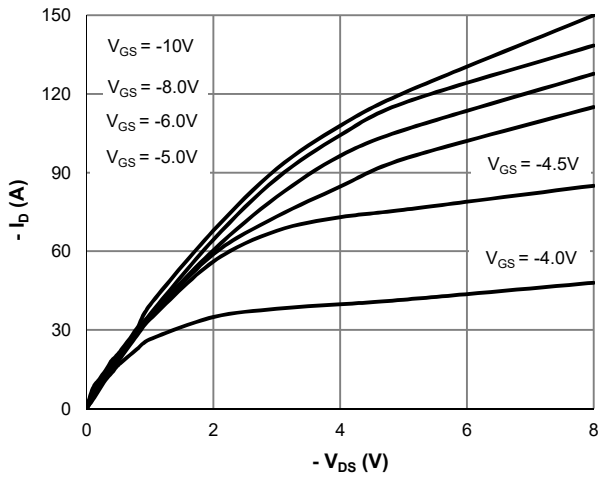
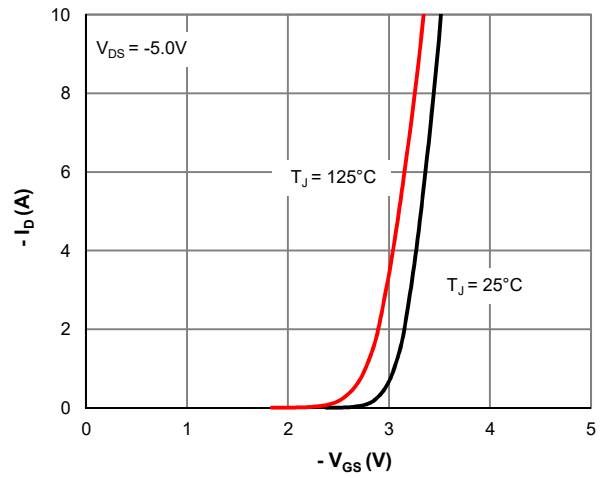
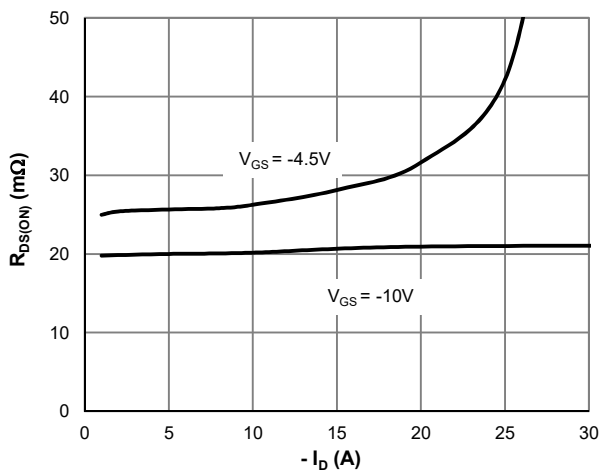
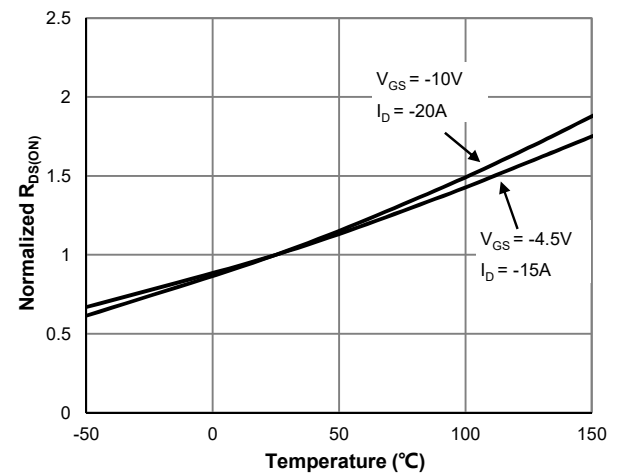
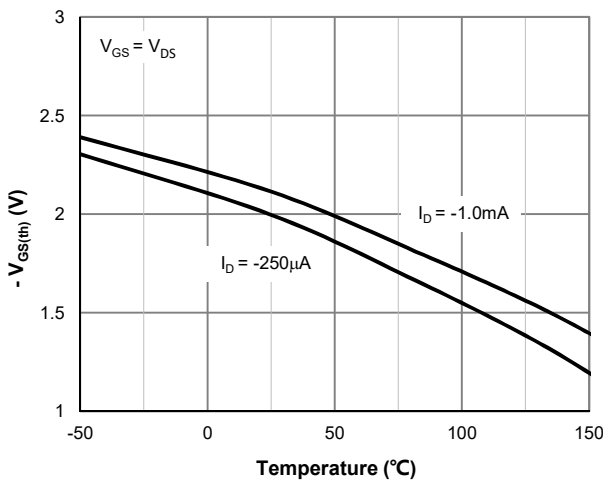
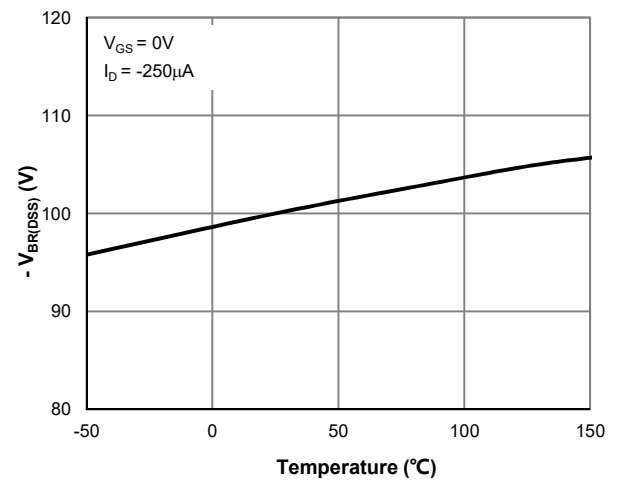
Total Gate Charge (@ V <sub>GS</sub> = -10V)	Q <sub>g</sub>	V <sub>GS</sub> = 0 to -10V V <sub>DS</sub> = -50V, I <sub>D</sub> = -20A		37		nC
Total Gate Charge (@ V <sub>GS</sub> = -4.5V)	Q <sub>g</sub>			23		nC
Gate Source Charge	Q <sub>gs</sub>			10.3		nC
Gate Drain Charge	Q <sub>gd</sub>			6.7		nC
Turn-On DelayTime	t <sub>D(on)</sub>	V <sub>GS</sub> = -10V, V <sub>DS</sub> = -50V R <sub>L</sub> = 3.3Ω, R <sub>GEN</sub> = 6Ω		13.7		ns
Turn-On Rise Time	t <sub>r</sub>			53		ns
Turn-Off DelayTime	t <sub>D(off)</sub>			61		ns
Turn-Off Fall Time	t <sub>f</sub>			86		ns
Body Diode Reverse Recovery Time	t <sub>rr</sub>		I <sub>F</sub> = -15A, dI <sub>F</sub> /dt = -100A/μS		70	
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>F</sub> = -15A, dI <sub>F</sub> /dt = -100A/μS		140		nC

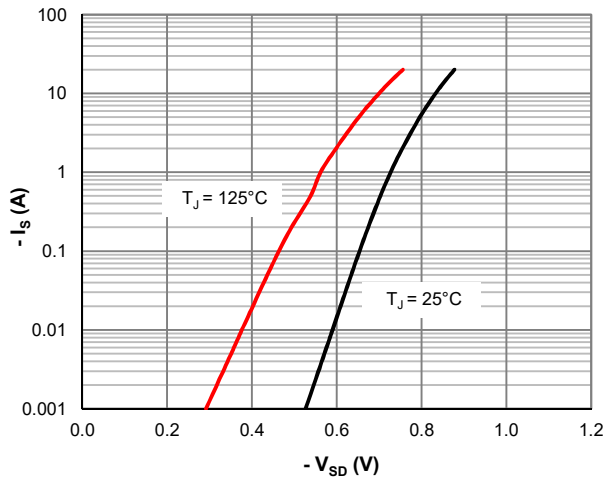
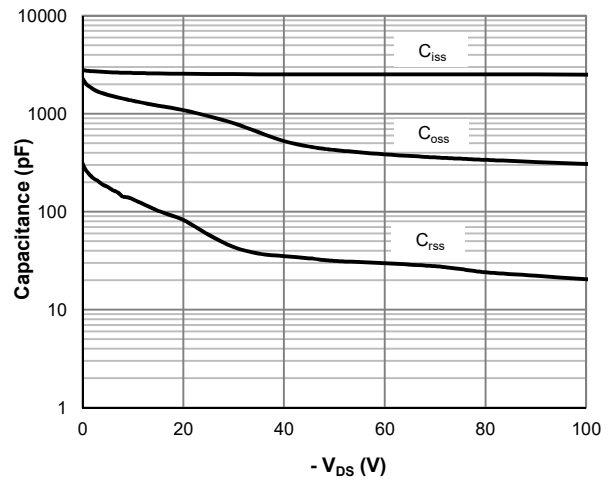
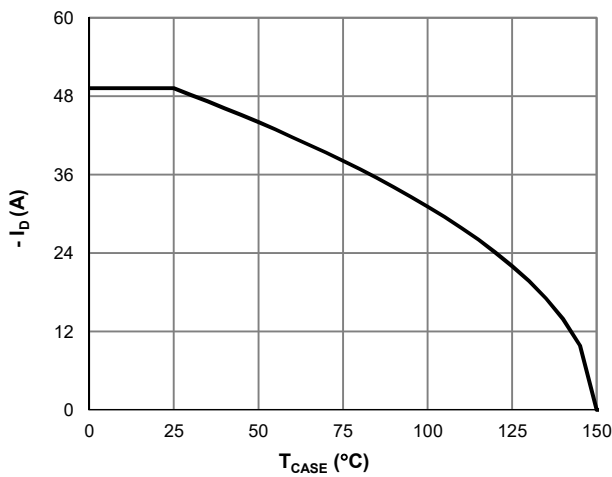
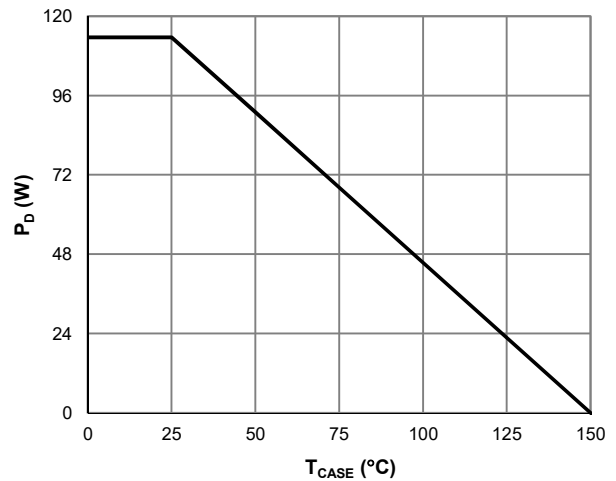
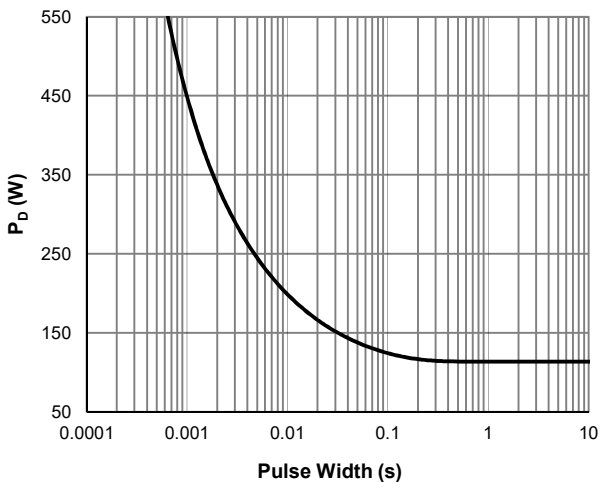
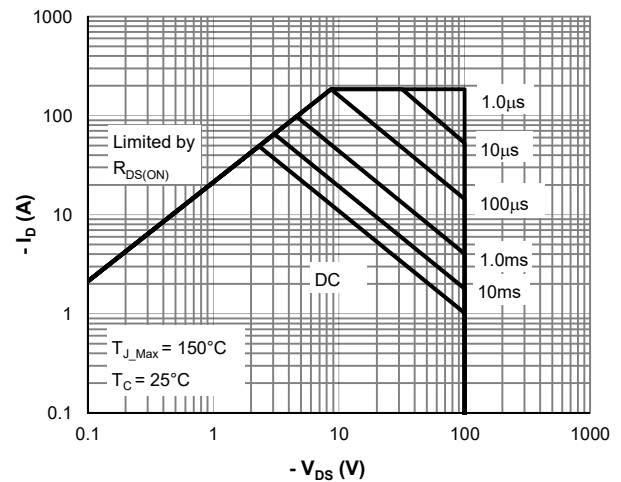
**Thermal Performance**

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance, Junction-to-Ambient	R <sub>θJA</sub>	47	56	°C/W
Thermal Resistance, Junction-to-Case	R <sub>θJC</sub>	0.84	1.1	°C/W

**Notes:**

1. Computed continuous current assumes the condition of T<sub>J\_Max</sub> while the actual continuous current depends on the thermal & electro-mechanical application board design.
2. This single-pulse measurement was taken under T<sub>J\_Max</sub> = 150°C.
3. This single-pulse measurement was taken under the following condition [L = 300μH, V<sub>GS</sub> = -10V, V<sub>DD</sub> = -50V] while its value is limited by T<sub>J\_Max</sub> = 150°C.
4. The power dissipation P<sub>D</sub> is based on T<sub>J\_Max</sub> = 150°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 7: Body-Diode Characteristics**

**Figure 8: Capacitance Characteristics**

**Figure 9: Current De-rating**

**Figure 10: Power De-rating**

**Figure 11: Single Pulse Power Rating, Junction-to-Case**

**Figure 12: Maximum Safe Operating Area**

Typical Electrical & Thermal Characteristics

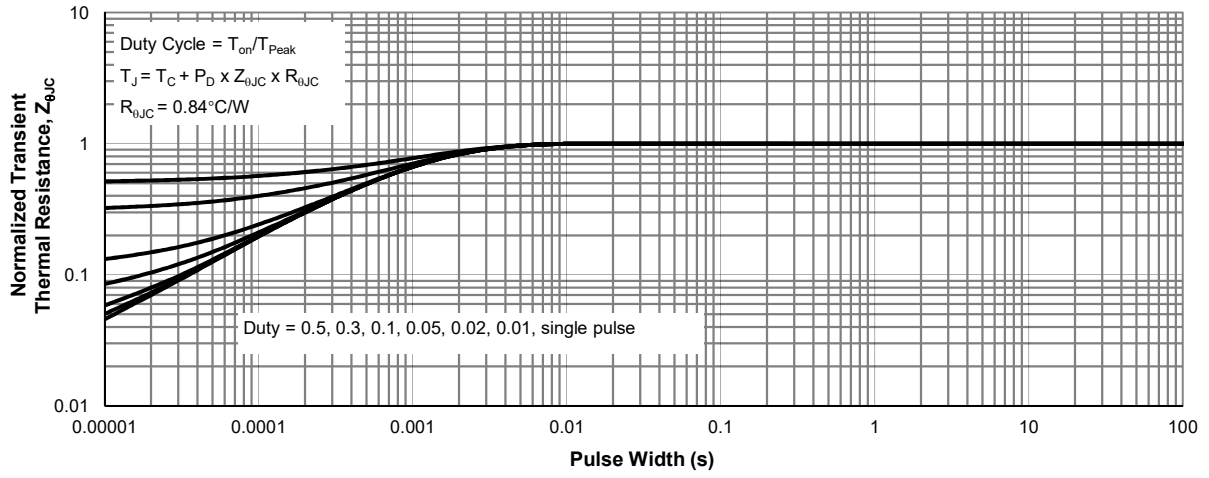
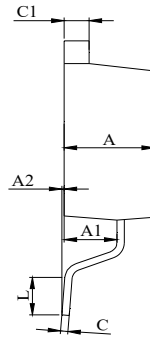
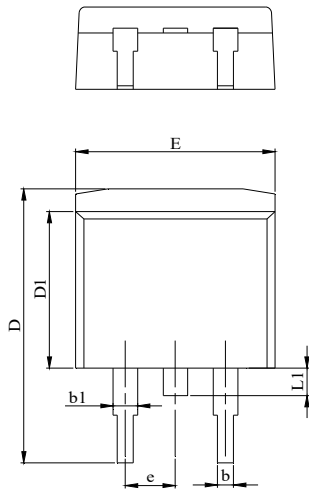
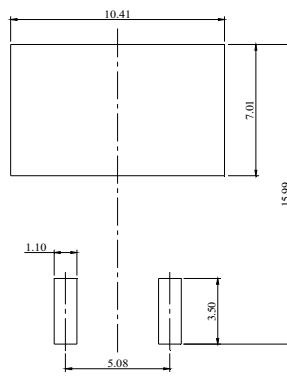


Figure 13: Normalized Maximum Transient Thermal Impedance

**TO-263-3L Package Information**
**Package Outline**


DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	4.24		4.77
A1	2.30		2.89
A2	0.00	0.10	0.25
b	0.70		0.96
b1	1.17		1.70
C	0.30		0.60
C1	1.15		1.42
D	14.10		15.88
D1	8.50		9.60
E	9.78		10.36
L	1.78		2.79
L1			1.75
e		2.54	

**Recommend Soldering Footprint**


DIMENSIONS: MILLIMETERS