-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
-

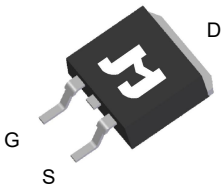
Product Summary

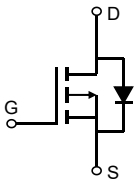
Parameter	Value	Unit
V_{DS}	-100	V
$V_{GS(th)\_Typ}$	-2.0	V
I_D (@ V_{GS} = -10V) (1)	-49	A
$R_{DS(ON)\_Typ}$ (@ V_{GS} = -10V)	21	mΩ
$R_{DS(ON)\_Typ}$ (@ V_{GS} = -4.5V)	29	mΩ

Applications

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

TO-263-3L Top View



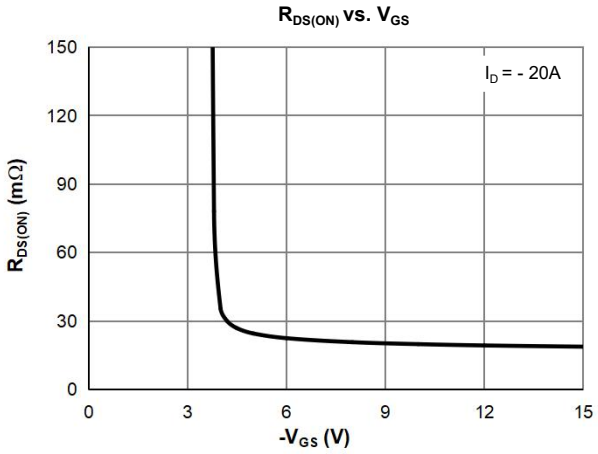


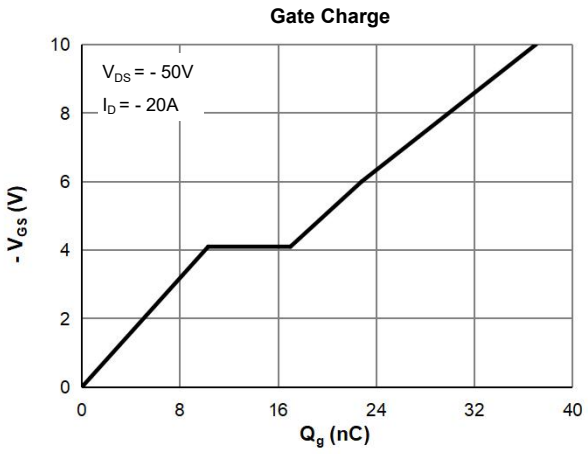
Ordering Information

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

Absolute Maximum Ratings (@ T_A = 25°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 (1)	T_C = 25°C	I_D	-49	A
	T_C = 100°C		-31	
Pulsed Drain Current (2)		I_{DM}	-185	A
Avalanche Current (3)		I_{AS}	-45	A
Avalanche Energy (3)		E_{AS}	304	mJ
Power Dissipation (4)	T_C = 25°C	P_D	114	W
	T_C = 100°C		45	
Junction & Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C





Electrical Characteristics (@ T_J = 25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
STATIC PARAMETERS						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D = -250μA, V_{GS} = 0V	-100			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -80V, V_{GS} = 0V			-1.0	μA
		T_J = 55°C			-5.0	
Gate-Body Leakage Current	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250μA	-1.0	-2.0	-3.0	V
Static Drain-Source ON-Resistance	$R_{DS(ON)}$	V_{GS} = -10V, I_D = - 20A		21	25	mΩ
		V_{GS} = -4.5V, I_D = -15A		29	38	mΩ
Forward Transconductance	g_{FS}	V_{DS} = -5V, I_D = -15A		30		S
Diode Forward Voltage	V_{SD}	I_S = -1A, V_{GS} = 0V		-0.7	-1.0	V
Diode Continuous Current	I_S	T_C = 25°C			-114	A
DYNAMIC PARAMETERS [5]						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = -50V, f = 1MHz		2525		pF
Output Capacitance	C_{oss}			427		pF
Reverse Transfer Capacitance	C_{rss}			32		pF
Gate Resistance	R_g	V_{GS} = 0V, V_{DS}= 0V, f = 1MHz		4.9		Ω
SWITCHING PARAMETERS [5]						
Total Gate Charge (@ V_{GS} = -10V)	Q_g	V_{GS} = 0 to -10V, V_{DS} = -50V, I_D = -20A		37		nC
Total Gate Charge (@ V_{GS} = -4.5V)	Q_g			23		nC
Gate Source Charge	Q_{gs}			10.3		nC
Gate Drain Charge	Q_{gd}			6.7		nC
Turn-On DelayTime	$t_{D(on)}$	V_{GS} = -10V, V_{DS} = -50V, R_L = 3.3Ω, R_{GEN} = 6Ω		13.7		ns
Turn-On Rise Time	t_r			53		ns
Turn-Off DelayTime	$t_{D(off)}$			61		ns
Turn-Off Fall Time	t_f			86		ns
Body Diode Reverse Recovery Time	t_{rr}	I_F = -15A, dI_F/dt = -100A/μS		70		ns
Body Diode Reverse Recovery Charge	Q_{rr}	I_F = -15A, dI_F/dt = -100A/μS		140		nC

Thermal Performance

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	47	56	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.84	1.1	°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°C.
3. This single-pulse measurement was taken under the following condition [L = 300μH, V_{GS} = -10V, V_{DD} = -50V] while its value is limited by
4. The power dissipation P_D is based on T_{J_Max} = 150°C.
5. This value is guaranteed by design hence it is not included in the production test.

Typical Electrical & Thermal Characteristics

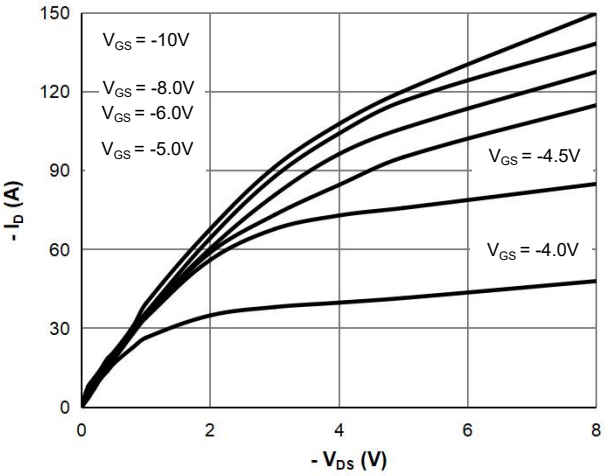


Figure 1: Saturation Characteristics

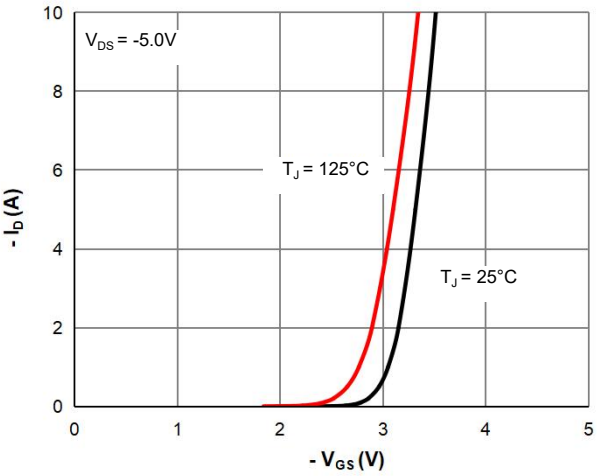


Figure 2: Transfer Characteristics

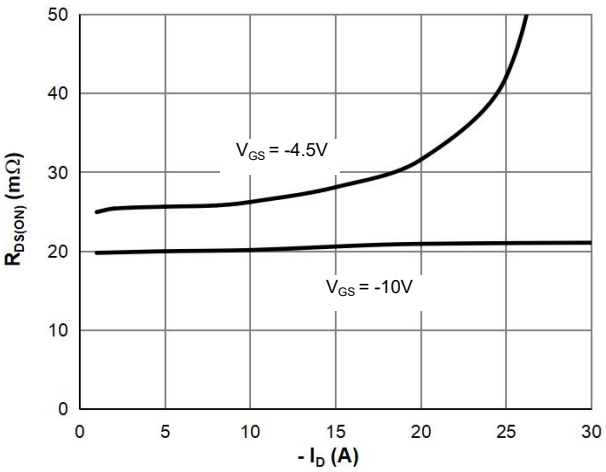


Figure 3: $R_{DS(ON)}$ vs. Drain Current

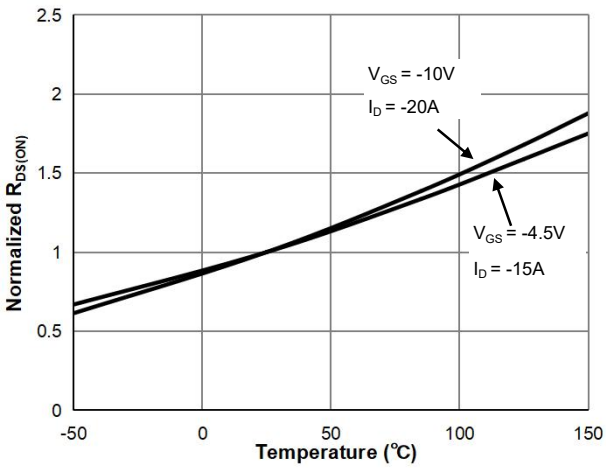


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

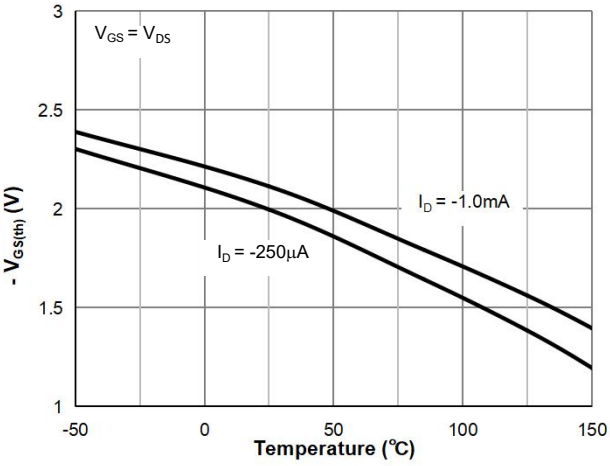


Figure 5: $V_{GS(th)}$ vs. Junction Temperature

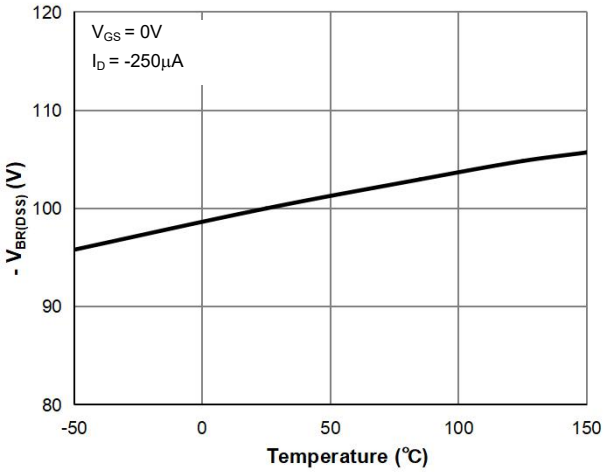


Figure 6: $V_{BR(DSS)}$ vs. Junction Temperature

Typical Electrical & Thermal Characteristics

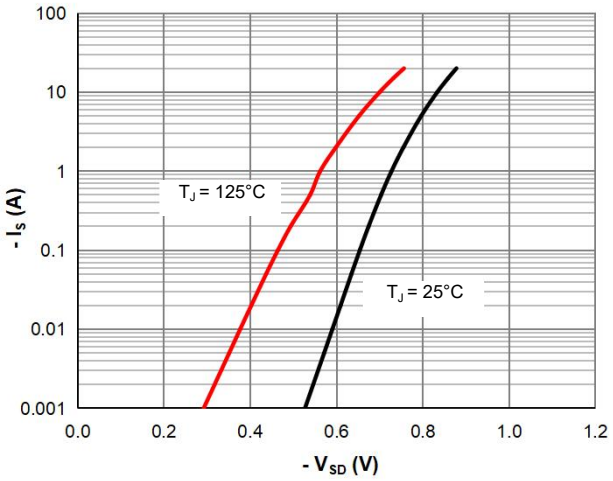


Figure 7: Body-Diode Characteristics

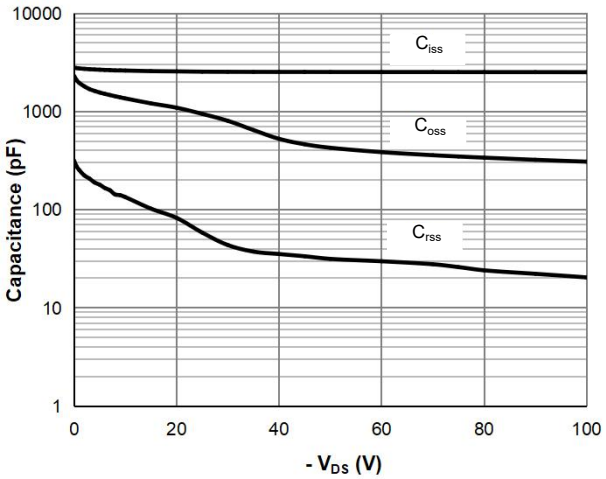


Figure 8: Capacitance Characteristics

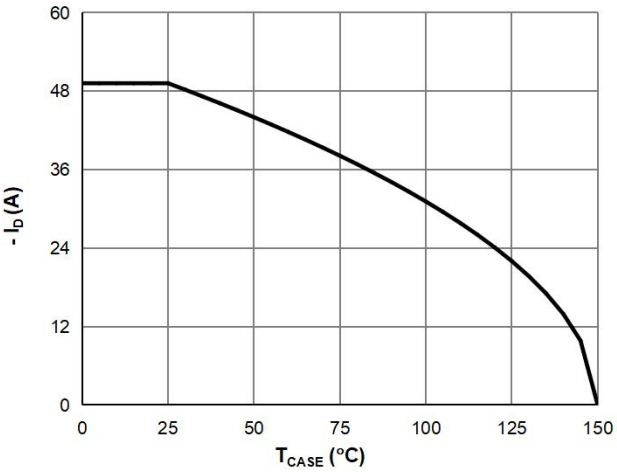


Figure 9: Current De-rating

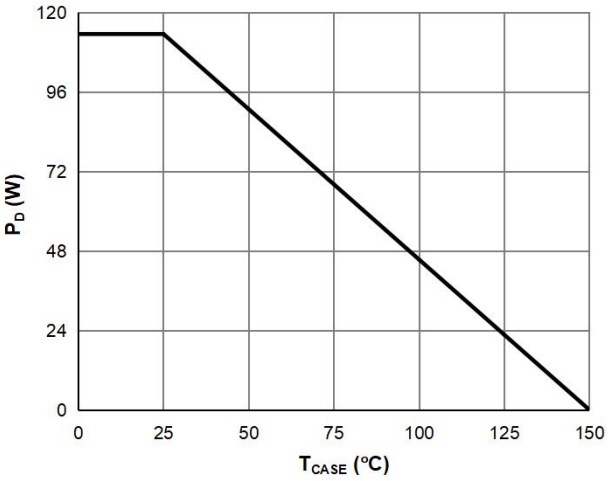


Figure 10: Power De-rating

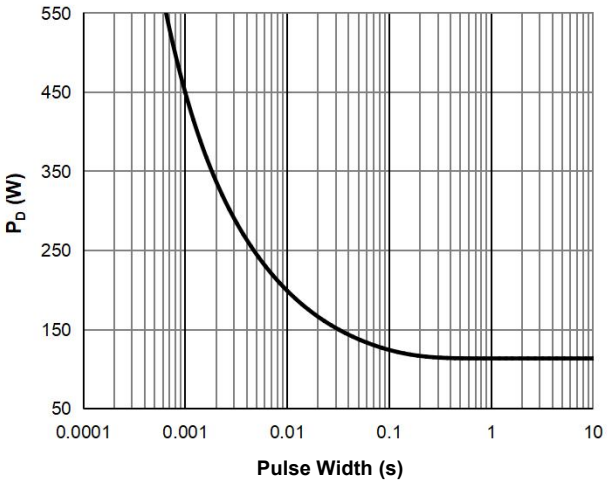


Figure 11: Single Pulse Power Rating, Junction-to-Case

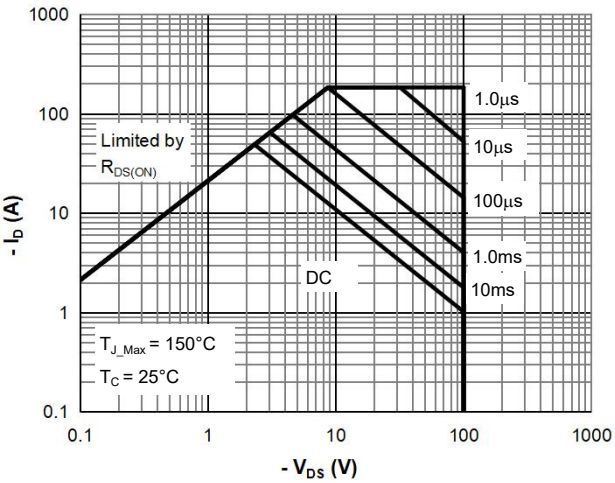


Figure 12: Maximum Safe Operating Area

Typical Electrical & Thermal Characteristics

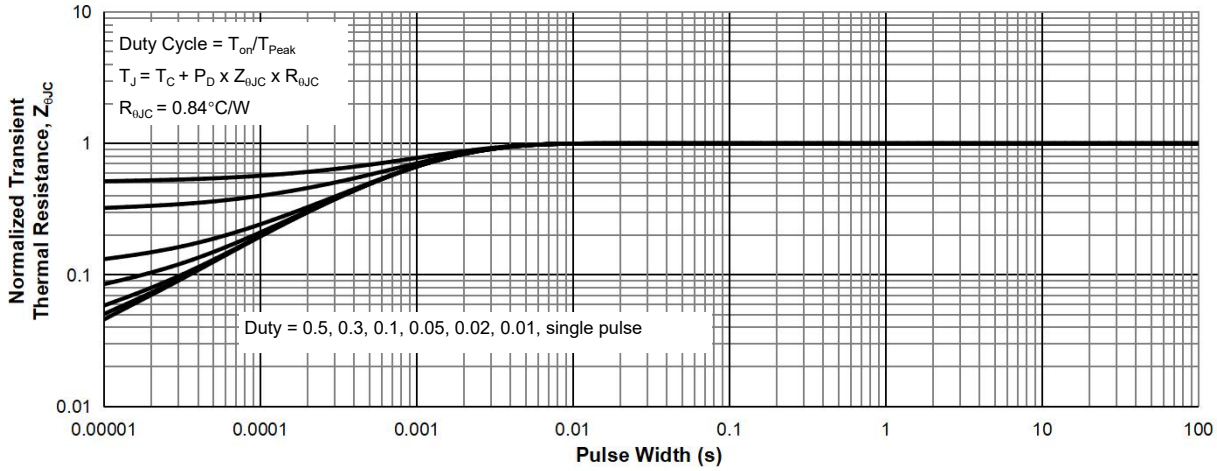
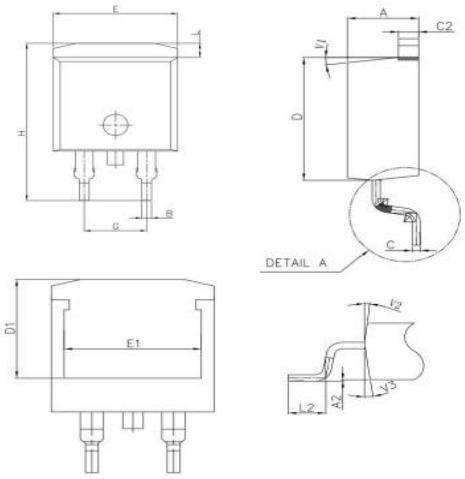


Figure 13: Normalized Maximum Transient Thermal Impedance

TO-263-3L Package Information

Package Outline



SYMBOL	DIMENSIONS		
	MIN	NOM	MAX
A	4.3	4.55	4.7
A2	0		0.25
B	0.75	0.8	0.85
C	0.38	0.46	0.55
C2	1.25	1.3	1.35
D	8.9	9.3	9.6
D1	7.4	7.65	7.9
E	9.9	10.05	10.21
E1	8.3	8.6	8.9
G	5.03	5.08	5.13
H	14.7	15	15.8
L2	2.2	2.35	2.5

Recommended Footprint