



100V 7.9mΩ N-Ch Power MOSFET

Features

- Ultra-low ON-resistance, $R_{DS(ON)}$
- Low Gate Charge, Q_g
- 100% UIS and R_g Tested
- Pb-free Lead Plating
- Halogen-free and RoHS-compliant

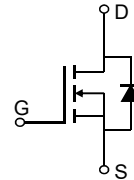
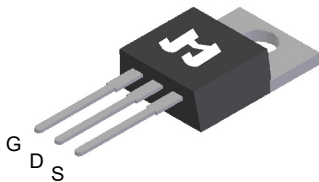
Product Summary

Parameter	Value	Unit
V_{DS}	100	V
$V_{GS(th)_Typ}$	1.9	V
I_D (@ $V_{GS} = 10V$) ⁽¹⁾	72	A
$R_{DS(ON)_Typ}$ (@ $V_{GS} = 10V$)	7.9	mΩ
$R_{DS(ON)_Typ}$ (@ $V_{GS} = 4.5V$)	10.4	mΩ

Applications

- Power Management in Telecom., Industrial Automation, CE
- Current Switching in DC/DC & AC/DC Sub-systems
- Motor Driving in Power Tool, E-vehicle, Robotics

TO-220-3L Top View

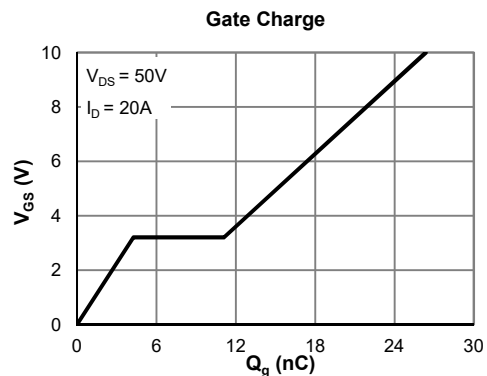
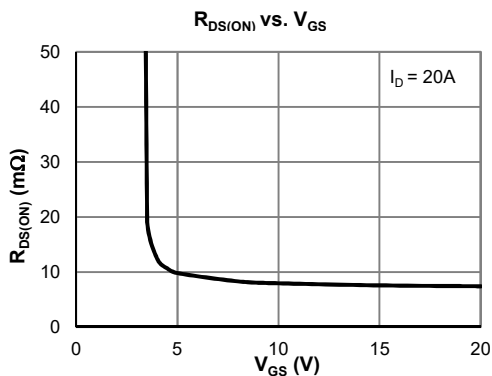


Ordering Information

Device	Package	# of Pins	Marking	MSL	T_J (°C)	Media	Quantity (pcs)
JMSL1010AC-U	TO-220-3L	3	SL1010A	NA	-55 to 150	Tube	50

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 ⁽¹⁾	I_D	$T_C = 25^\circ C$	72
		$T_C = 100^\circ C$	46
Pulsed Drain Current ⁽²⁾	I_{DM}	180	A
Avalanche Current ⁽³⁾	I_{AS}	25	A
Avalanche Energy ⁽³⁾	E_{AS}	94	mJ
Power Dissipation ⁽⁴⁾	P_D	$T_C = 25^\circ C$	96
		$T_C = 100^\circ C$	38
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
					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	1.2	1.9	2.5	V
Static Drain-Source ON-Resistance	R _{DS(ON)}	V _{GS} = 10V, I _D = 20A		7.9	10.0	mΩ
Static Drain-Source ON-Resistance	R _{DS(ON)}	V _{GS} = 4.5V, I _D = 15A		10.4	13.6	mΩ
Forward Transconductance	g _{FS}	V _{DS} = 5V, I _D = 20A		57		S
Diode Forward Voltage	V _{SD}	I _S = 1A, V _{GS} = 0V		0.71	1.0	V
Diode Continuous Current	I _S	T _C = 25°C			96	A

DYNAMIC PARAMETERS ⁽⁵⁾

Input Capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = 50V, f = 1MHz		1535		pF
Output Capacitance	C _{oss}			335		pF
Reverse Transfer Capacitance	C _{rss}			8.2		pF
Gate Resistance	R _g	V _{GS} = 0V, V _{DS} = 0V, f = 1MHz		1.8		Ω

SWITCHING PARAMETERS ⁽⁵⁾

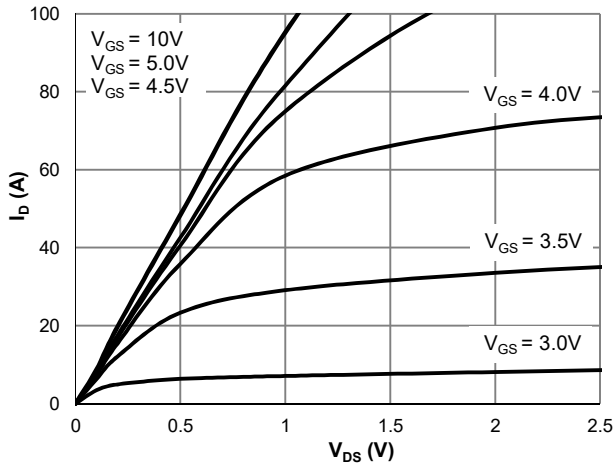
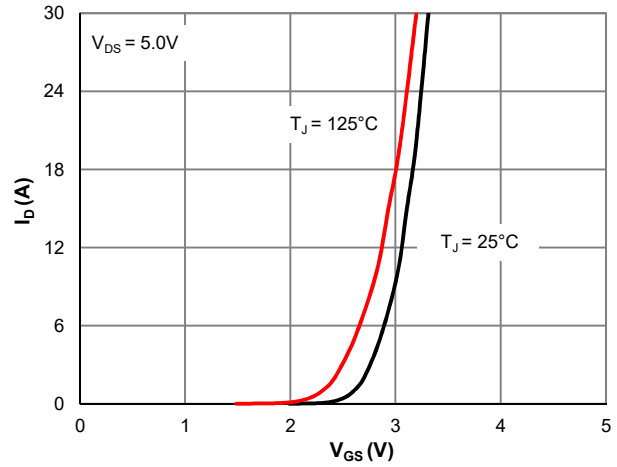
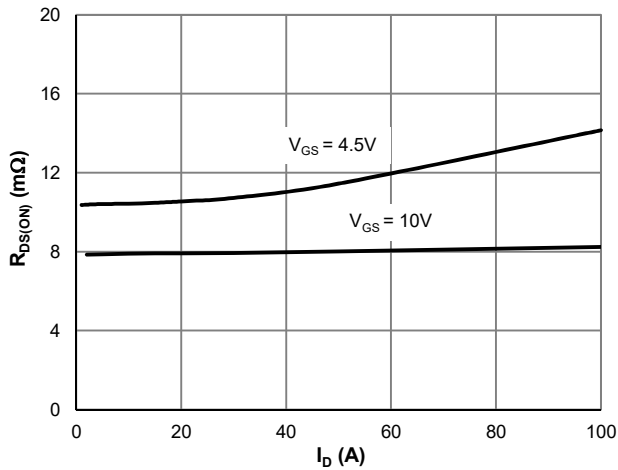
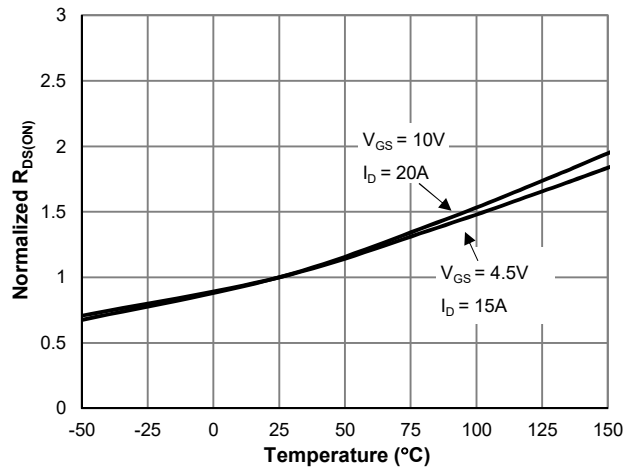
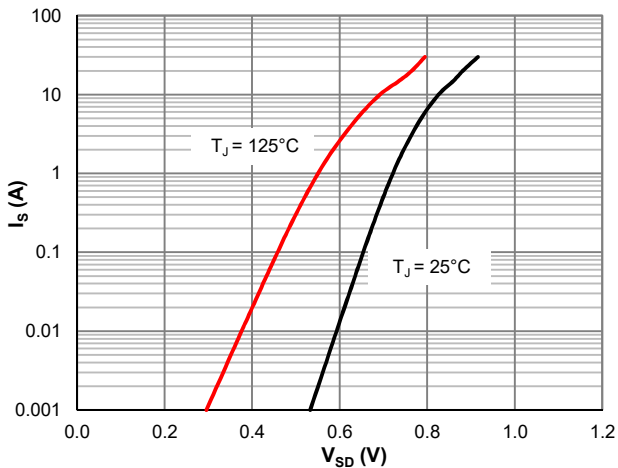
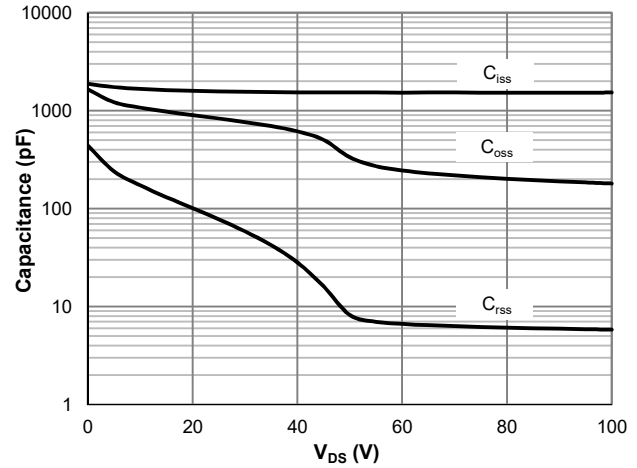
Total Gate Charge (@V _{GS} = 10V)	Q _g	V _{GS} = 0 to 10V V _{DS} = 50V, I _D = 20A		26		nC
Total Gate Charge (@V _{GS} = 4.5V)	Q _g			14		nC
Gate Source Charge	Q _{gs}			4.3		nC
Gate Drain Charge	Q _{gd}			6.8		nC
Turn-On Delay Time	t _{D(on)}	V _{GS} = 10V, V _{DS} = 50V R _L = 2.5Ω, R _{GEN} = 6Ω		7.5		ns
Turn-On Rise Time	t _r			15.8		ns
Turn-Off Delay Time	t _{D(off)}			31		ns
Turn-Off Fall Time	t _f			28		ns
Body Diode Reverse Recovery Time	t _{rr}		I _F = 15A, dI _F /dt = 100A/μS		43	
Body Diode Reverse Recovery Charge	Q _{rr}	I _F = 15A, dI _F /dt = 100A/μS		35		nC

Thermal Performance

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance, Junction-to-Ambient	R _{θJA}	52	63	°C/W
Thermal Resistance, Junction-to-Case	R _{θJC}	1.0	1.3	°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 T_{J,Max} = 150°C.
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.
6. Continuous current rating is limited by the package used.

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

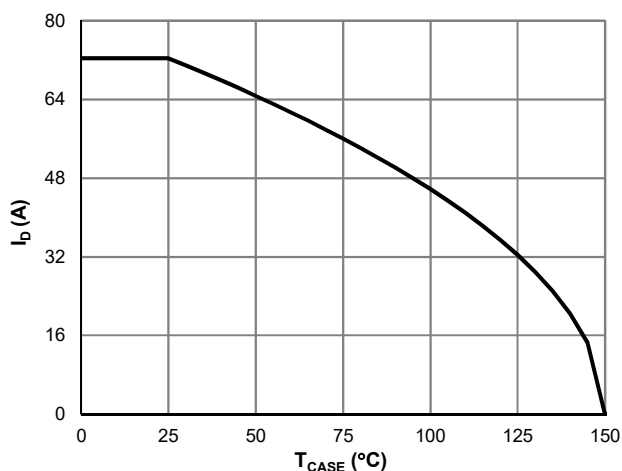


Figure 7: Current De-rating

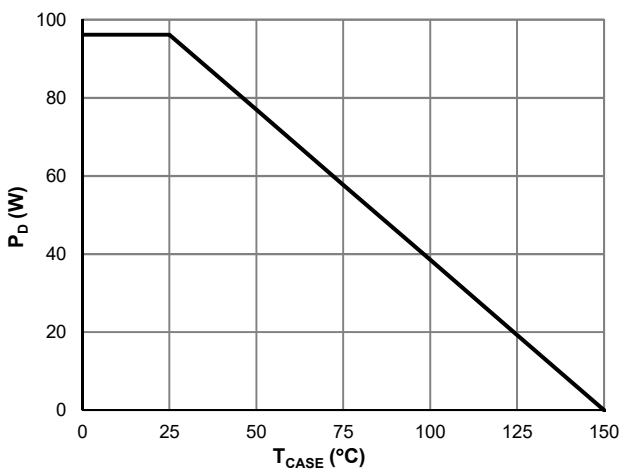


Figure 8: Power De-rating

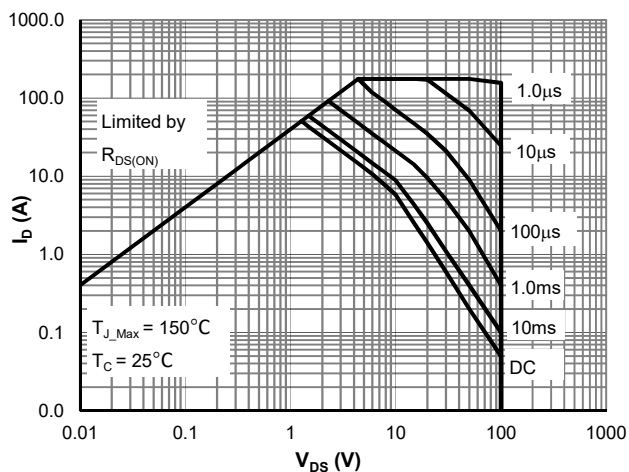


Figure 9: Maximum Safe Operating Area

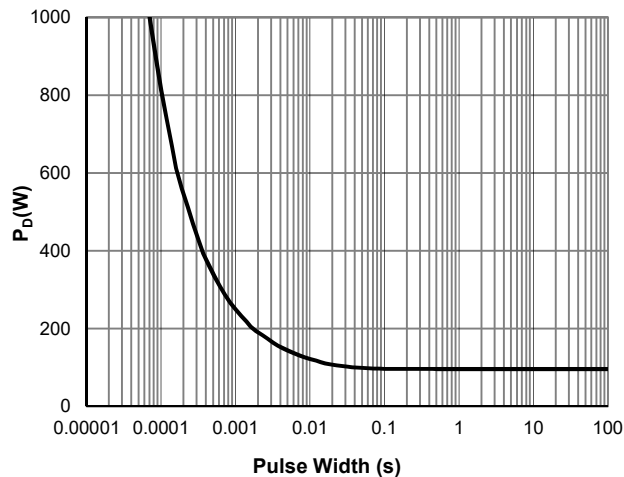


Figure 10: Single Pulse Power Rating, Junction-to-Case

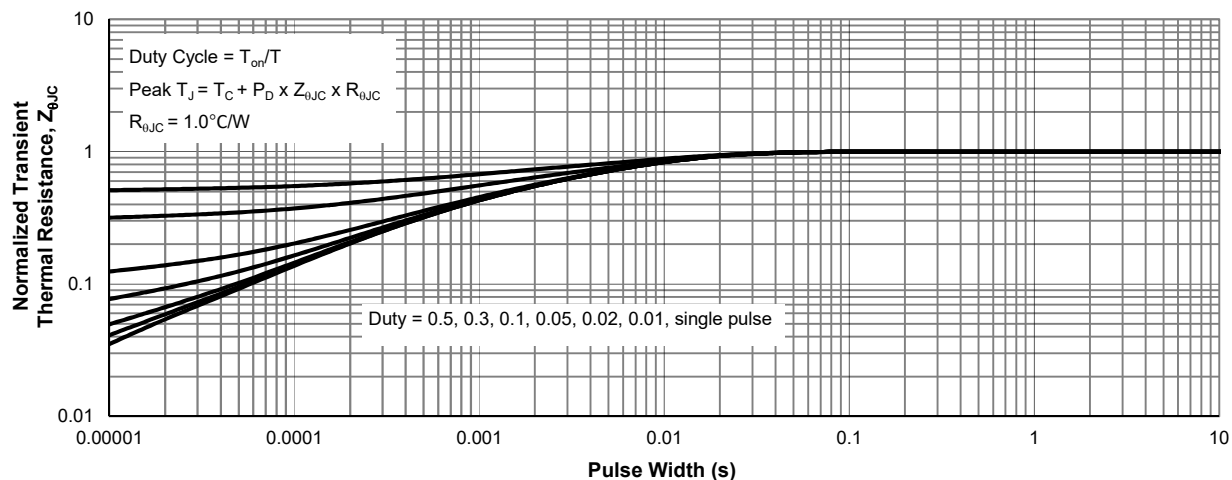
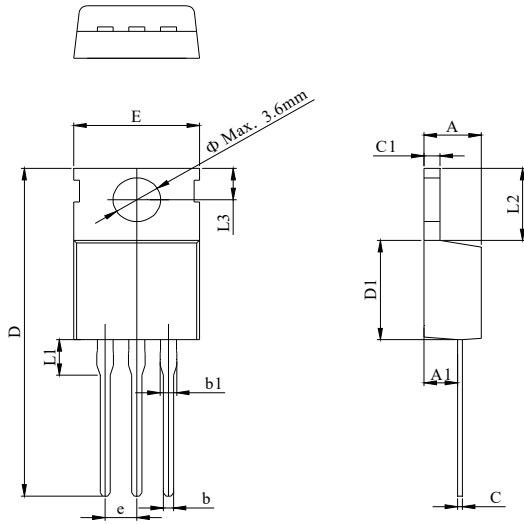


Figure 11: Normalized Maximum Transient Thermal Impedance

TO-220-3L Package Information
Package Outline


DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	4.24		4.70
A1	2.20		3.00
b	0.70		0.95
b1	1.14		1.70
C	0.40		0.60
C1	1.15		1.40
D	28.00		29.80
D1	8.80		9.90
E	9.70		10.50
L1			3.80
L2	6.25		6.90
L3	2.40		3.00
e		2.54 BSC	