



150V 4.0m N-Ch Power MOSFET

Features

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

Product Summary

Parameter	Value	Unit
V_{DS}	150	V
$V_{GS(th)}_{Typ}$	3.2	V
	203	A
	4.0	m

Applications

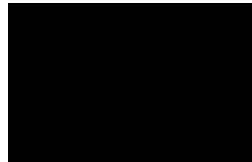
- Power Management in Telecom., Industrial Automation, CE
- Current Switching in DC/DC & AC/DC (SR) Sub-systems
- Motor Driving in Power Tool, E-vehicle, Robotics

TO-247-3L Top View

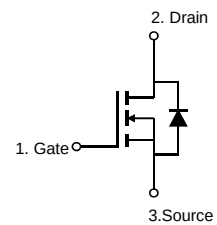
Type A



Type B



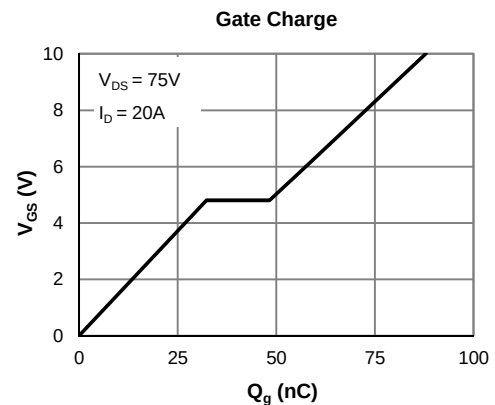
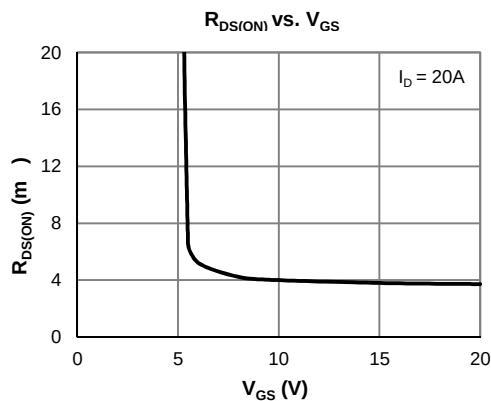
TO-247-3L Bottom View



	Package	# of Pins	Marking	MSL	T_J (°C)	Media	Quantity (pcs)
JMSH1504AS-U	TO-247-3L	3	SH1504A	N/A	-55 to 150	Tube	30

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

Parameter	Symbol	Value	Unit
	V_{DS}		V
	V_{GS}		V
Pulsed Drain Current ⁽²⁾	I_{DM}	630	A
Avalanche Current ⁽³⁾	I_{AS}	77	A
Avalanche Energy ⁽³⁾	E_{AS}	889	mJ
Power Dissipation ⁽⁴⁾	$T_C = 25^\circ\text{C}$	417	W
	$T_C = 100^\circ\text{C}$	167	
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
STATIC PARAMETERS		
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 250\text{ A}$, $V_{GS} = 0\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 120\text{V}$, $V_{GS} = 0\text{V}$ $T_J = 55^\circ\text{C}$
Gate-Body Leakage Current	I_{GSS}	$V_{DS} = 0\text{V}$, $V_{GS} = \pm 20\text{V}$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\text{ A}$
Static Drain-Source ON-Resistance]	$R_{DS(on)}$	$V_{GS} = 10\text{V}$, $I_D = 20\text{A}$
Forward Transconductance	g_{FS}	$V_{DS} = 5\text{V}$, $I_D = 20\text{A}$
Diode Forward Voltage	V_{SD}	$I_S = 1\text{A}$, $V_{GS} = 0\text{V}$
Diode Continuous Current	I_S	$T_C = 25^\circ\text{C}$

DYNAMIC PARAMETERS ⁽⁵⁾

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

	772		pF
	6.7		pF
	2.4		

SWITCHING PARAMETERS ⁽⁵⁾

	10V)	Q_g	$V_{GS} = 0\text{ to }10\text{V}$ $V_{DS} = 75\text{V}$, $I_D = 20\text{A}$
	6.0V)	Q_g	
		Q_{gs}	
		Q_{gd}	
		$t_{D(on)}$	
		t_f	$V_{GS} = 10\text{V}$, $V_{DS} = 75\text{V}$
Turn-Off DelayTime		$t_{D(off)}$	$R_L = 3.75\text{ }\Omega$, $R_{GEN} = 6\text{ }\Omega$
Turn-Off Fall Time		t_f	
Body Diode Reverse Recovery Time		t_{rr}	$I_F = 15\text{A}$, $di_F/dt = 100\text{A/s}$
Body Diode Reverse Recovery Charge		Q_{rr}	$I_F = 15\text{A}$, $di_F/dt = 100\text{A/s}$

	88		nC
	57		nC
	32		nC
	16		nC
	48		ns
	90		ns
	94		ns
	60		ns
	122		ns
	279		nC

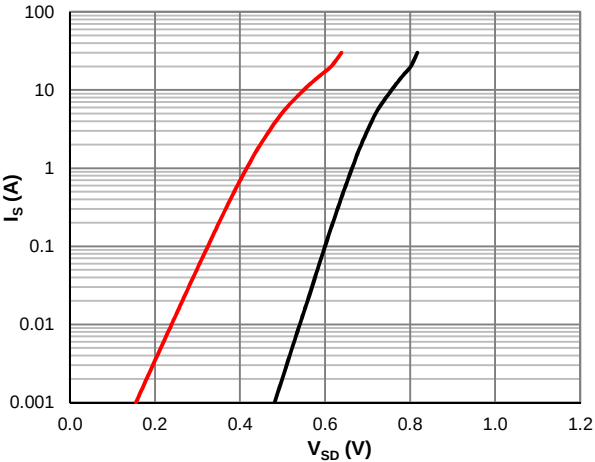
Thermal Performance

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance, Junction-to-Ambient	R_{JA}	40	48	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	R_{JC}	0.25	0.30	$^\circ\text{C/W}$

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 $T_{J_Max} = 150^\circ\text{C}$.
3. This single-pulse measurement was taken under the following condition [$L = 300\text{ H}$, $V_{GS} = 10\text{V}$, $V_{DS} = 75\text{V}$] 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





Typical Electrical & Thermal Characteristics

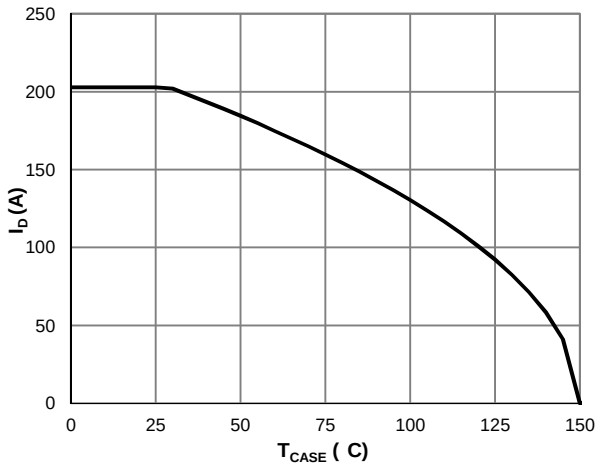


Figure 7: Current De-rating

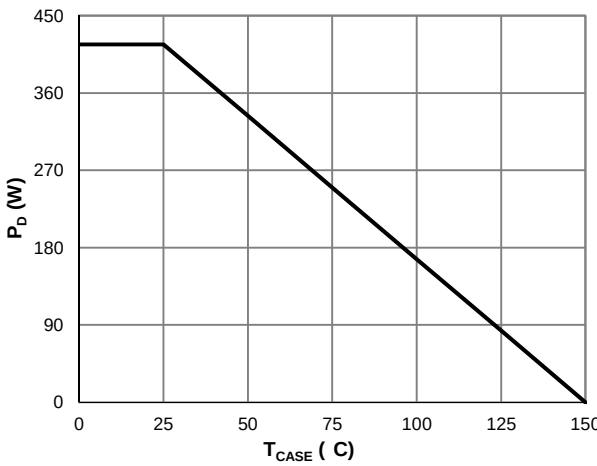
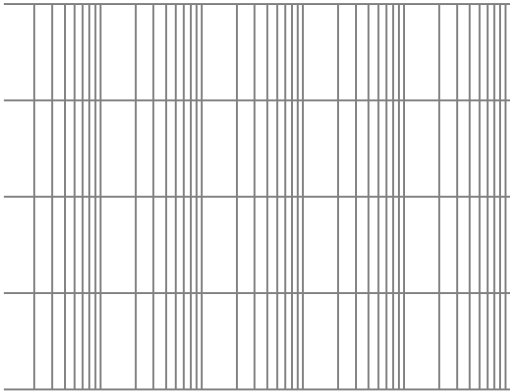


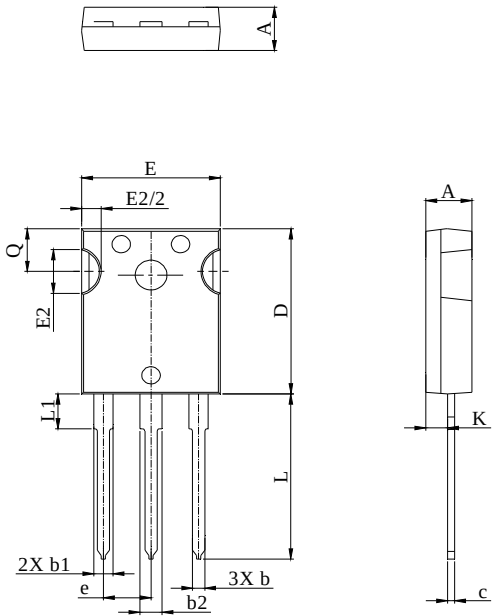
Figure 8: Power De-rating





TO-247-3L Package Information

Type_A Package Outline



DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	4.80	5.02	5.21
b	1.00	1.20	1.40
b1	1.90	2.00	2.39
b2	2.87	3.00	3.22
c	0.41	0.60	0.79
D	20.80	21.00	21.20
E	15.50	15.94	16.13