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

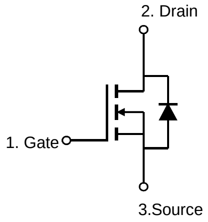
- Power Managerment in Telecom., Industrial Automation, CE
- Current Switching in DC/DC & AC/DC (SR) Sub-systems
- Motor Driving in Power Tool, E-vehicle, Robotics

TO-247-3L Top View

Type A

Type B

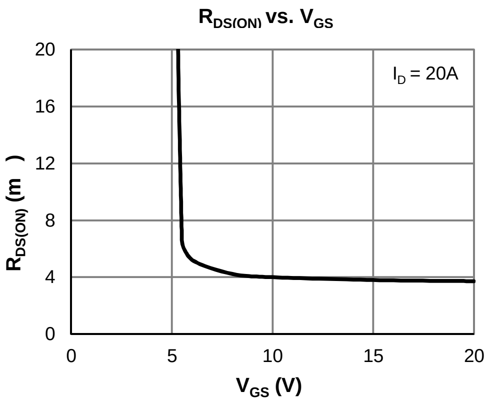
TO-247-3L Bottom View

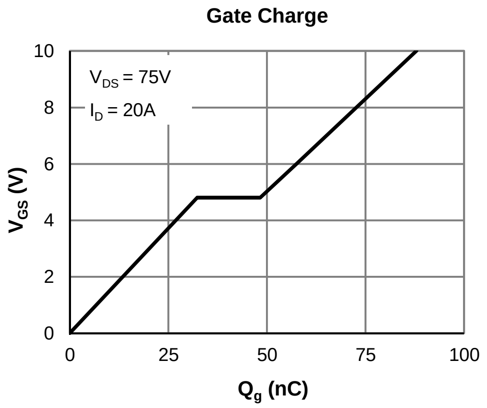


	Package	# of Pins	Marking	MSL	T_J (°C)	Media	Quantity (pcs)
JMSH1504AS-U	TO-247-3L	3	SH1504A	N/A	-55 to 150	Tube	30

Absolute Maximum Ratings (@ T_A = 25°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°C	P_D	417	W
	T_C = 100°C		167	
Junction & Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C





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

Parameter	Symbol	Conditions	[redacted]	[redacted]	[redacted]	[redacted]
STATIC PARAMETERS			[redacted]	[redacted]	[redacted]	[redacted]
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D = 250 A, V_{GS} = 0V	[redacted]	[redacted]	[redacted]	[redacted]
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 120V, V_{GS} = 0V	[redacted]	[redacted]	[redacted]	[redacted]
		T_J = 55°C	[redacted]	[redacted]	[redacted]	[redacted]
Gate-Body Leakage Current	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V	[redacted]	[redacted]	[redacted]	[redacted]
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 A	[redacted]	[redacted]	[redacted]	[redacted]
Static Drain-Source ON-Resistance]	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 20A	[redacted]	[redacted]	[redacted]	[redacted]
Forward Transconductance	g_{FS}	V_{DS} = 5V, I_D = 20A	[redacted]	[redacted]	[redacted]	[redacted]
Diode Forward Voltage	V_{SD}	I_S = 1A, V_{GS} = 0V	[redacted]	[redacted]	[redacted]	[redacted]
Diode Continuous Current	I_S	T_C = 25°C	[redacted]	[redacted]	[redacted]	[redacted]
DYNAMIC PARAMETERS [5]			[redacted]	[redacted]	[redacted]	[redacted]
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 75V, f = 1MHz	[redacted]	[redacted]	[redacted]	[redacted]
Output Capacitance	C_{oss}			772		pF
Reverse Transfer Capacitance	C_{rss}			6.7		pF
Gate Resistance	R_g	V_{GS} = 0V, V_{DS}= 0V, f = 1MHz		2.4		
SWITCHING PARAMETERS [5]						
[redacted]10V)	Q_g	V_{GS} = 0 to 10V V_{DS} = 75V, I_D = 20A		88		nC
[redacted]6.0V)	Q_g			57		nC
[redacted]	Q_{gs}			32		nC
[redacted]	Q_{gd}			16		nC
[redacted]	$t_{D(on)}$	V_{GS} = 10V, V_{DS} = 75V R_L = 3.75 , R_{GEN} = 6		48		ns
[redacted]	t_r			90		ns
Turn-Off DelayTime	$t_{D(off)}$			94		ns
Turn-Off Fall Time	t_f			60		ns
Body Diode Reverse Recovery Time	t_{rr}	I_F = 15A, dI_F/dt = 100A/ s		122		ns
Body Diode Reverse Recovery Charge	Q_{rr}	I_F = 15A, dI_F/dt = 100A/ s		279		nC

Thermal Performance

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance, Junction-to-Ambient	R_{JA}	40	48	°C/W
Thermal Resistance, Junction-to-Case	R_{JC}	0.25	0.30	°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 = 300 H, V_{GS} = 10V, V_{DS} = 75V] 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.

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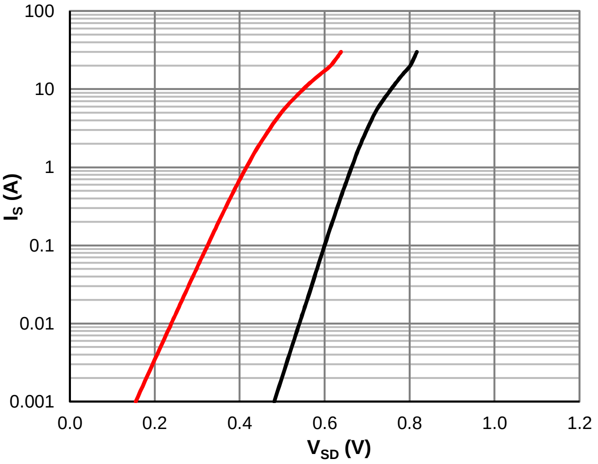
Typical Electrical & Thermal Characteristics



Typical Electrical & Thermal Characteristics

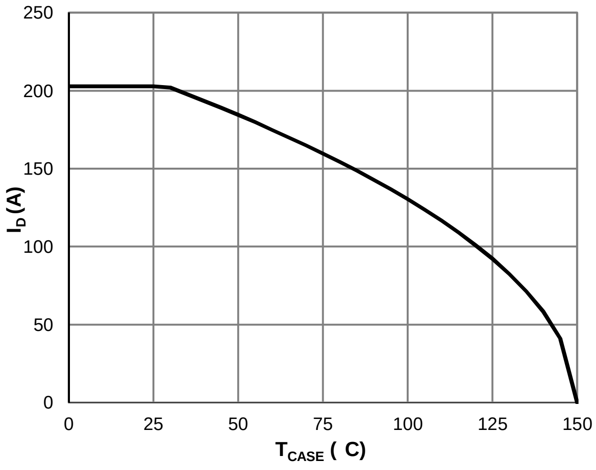


Figure 7: Current De-rating

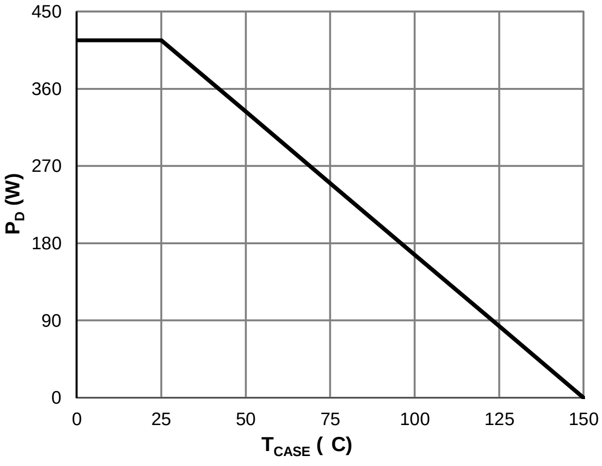
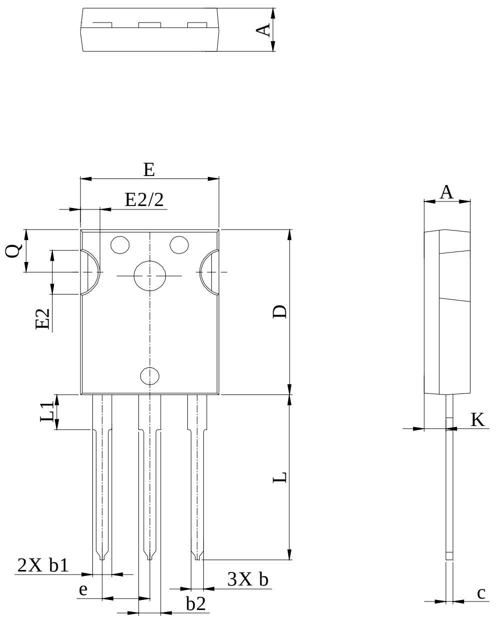


Figure 8: Power De-rating

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