100V 32mΩ N-Ch Power MOSFET

Features

- Low Gate Charge
- 100% UIS Tested, 100% R_g Tested
- Halogen-free and RoHS-compliant

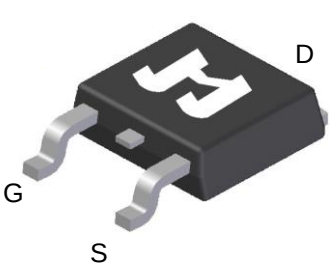
Product Summary

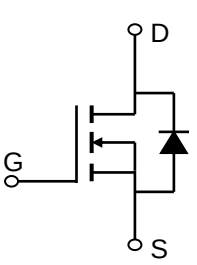
Parameter	Value	Unit
V_{DS}	100	V
$V_{GS(th)_Typ}$	2.0	V
I_D (@ V_{GS} = 10V) (1)	24	A
$R_{DS(ON)_typ}$ (@ V_{GS} = 10V)	32	mΩ
$R_{DS(ON)_typ}$ (@ V_{GS} = 4.5V)	43	mΩ

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-252-3L Top View



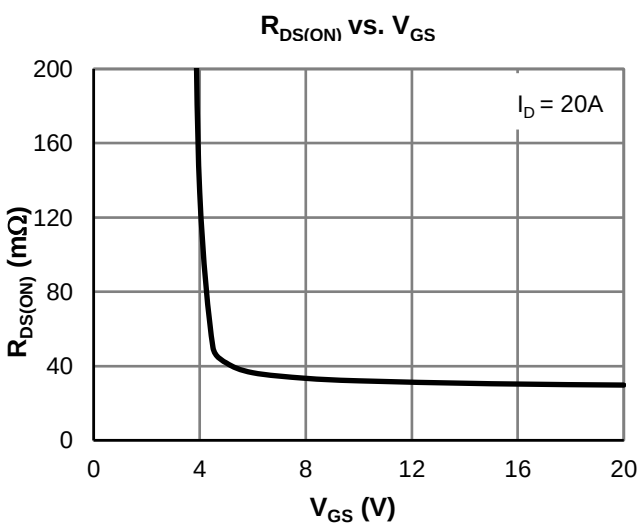


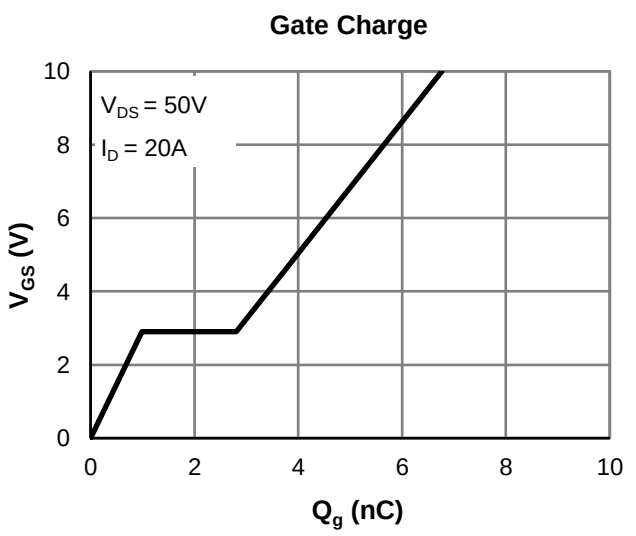
Ordering Information

Device	Package	# of Pins	Marking	MSL	T_J (°C)	Media	Quantity (pcs)
JMSL1040AK-13	TO-252-3L	3	SL1040A	3	-55 to 150	13-inch Reel	2500

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	24	A
	T_C = 100°C		15	
Pulsed Drain Current (2)		I_{DM}	66	A
Avalanche Current (3)		I_{AS}	14	A
Avalanche Energy (3)		E_{AS}	10	mJ
Power Dissipation (4)	T_C = 25°C	P_D	43	W
	T_C = 100°C		17	
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	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	1.2	2.0	2.5	V
Static Drain-Source ON-Resistance	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 20A		32	39	mΩ
Static Drain-Source ON-Resistance	$R_{DS(ON)}$	V_{GS} = 4.5V, I_D = 15A		43	54	mΩ
Forward Transconductance	g_{FS}	V_{DS} = 5V, I_D = 20A		28		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			43	A
DYNAMIC PARAMETERS [5]						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 50V, f = 1MHz		363		pF
Output Capacitance	C_{oss}			85		pF
Reverse Transfer Capacitance	C_{rss}			3.0		pF
Gate Resistance	R_g	V_{GS} = 0V, V_{DS}= 0V, f = 1MHz		1.7		Ω
SWITCHING PARAMETERS [5]						
Total Gate Charge (@V_{GS} = 10V)	Q_g	V_{GS} = 0 to 10V V_{DS} = 50V, I_D = 20A		6.8		nC
Total Gate Charge (@V_{GS} = 4.5V)	Q_g			3.7		nC
Gate Source Charge	Q_{gs}			1.0		nC
Gate Drain Charge	Q_{gd}			1.8		nC
Turn-On DelayTime	$t_{D(on)}$	V_{GS} = 10V, V_{DS} = 50V R_L = 2.5Ω, R_{GEN} = 6Ω		4.9		ns
Turn-On Rise Time	t_r			16.6		ns
Turn-Off DelayTime	$t_{D(off)}$			11.2		ns
Turn-Off Fall Time	t_f			4.9		ns
Body Diode Reverse Recovery Time	t_{rr}	I_F = 15A, dI_F/dt = 100A/μS		33		ns
Body Diode Reverse Recovery Charge	Q_{rr}	I_F = 15A, dI_F/dt = 100A/μS		45		nC

Thermal Performance

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	50	60	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.2	2.9	°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 = 100μH, V_{GS} = 10V, V_{DS} = 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.

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Typical Electrical & Thermal Characteristics

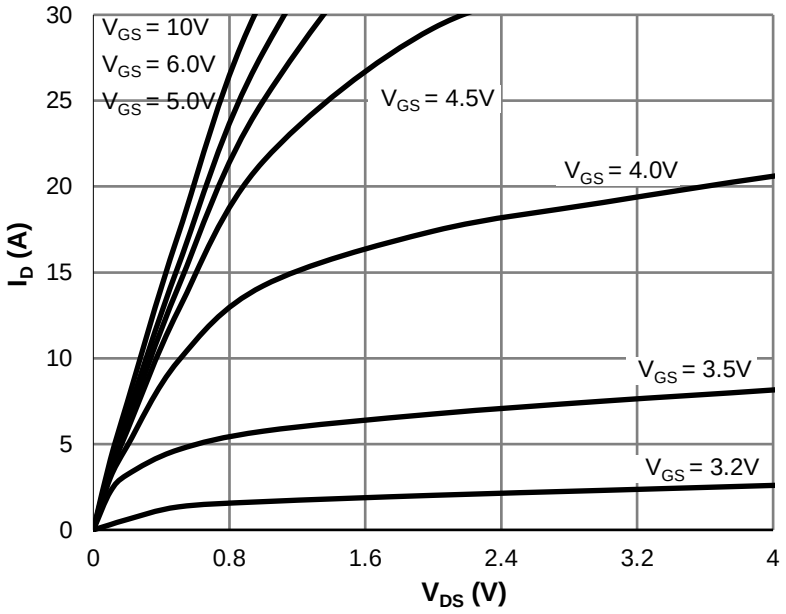


Figure 1: Saturation Characteristics

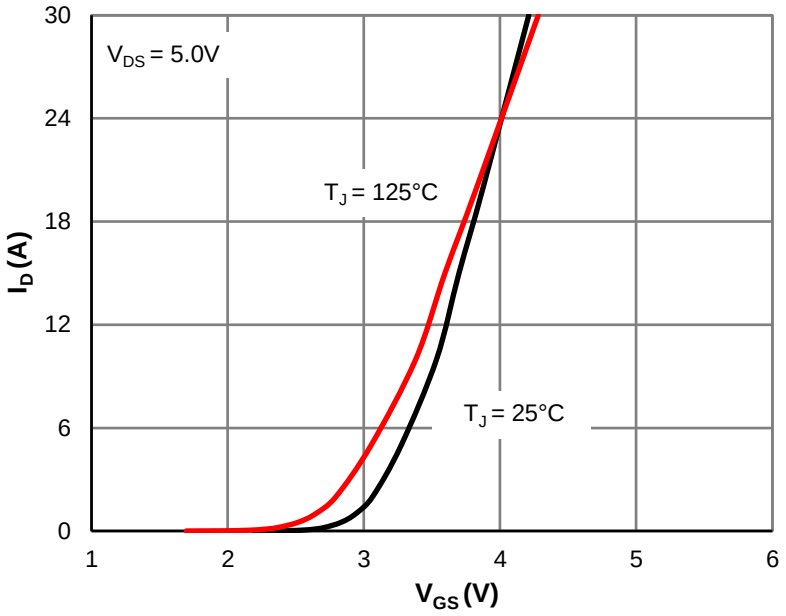


Figure 2: Transfer Characteristics

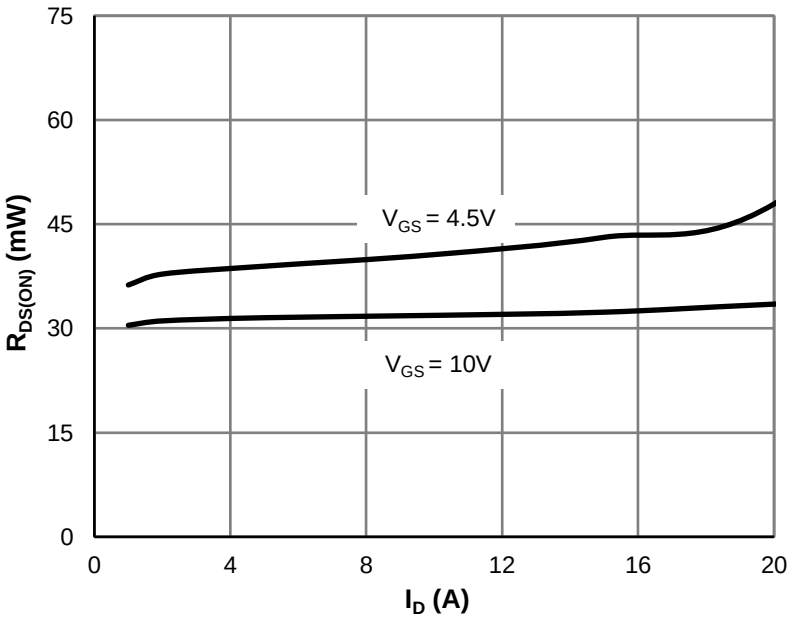


Figure 3: $R_{DS(ON)}$ vs. Drain Current

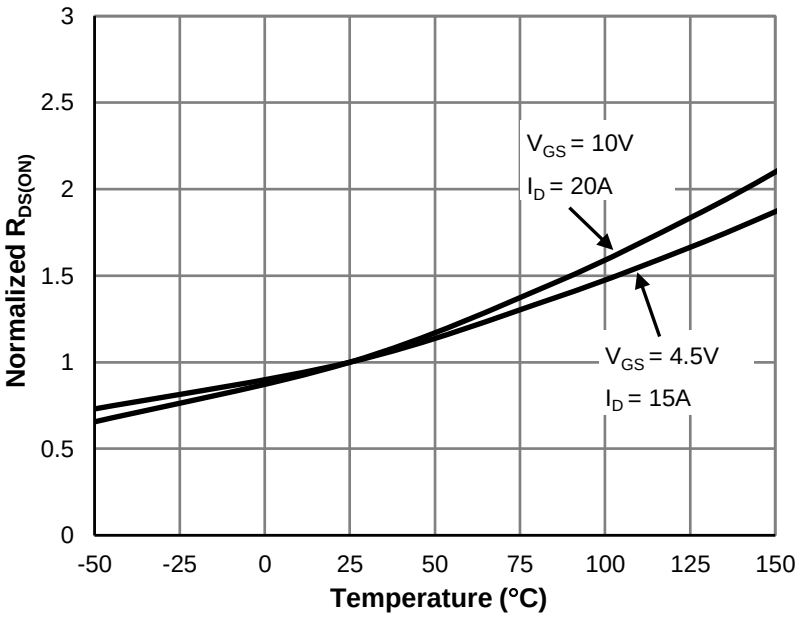


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

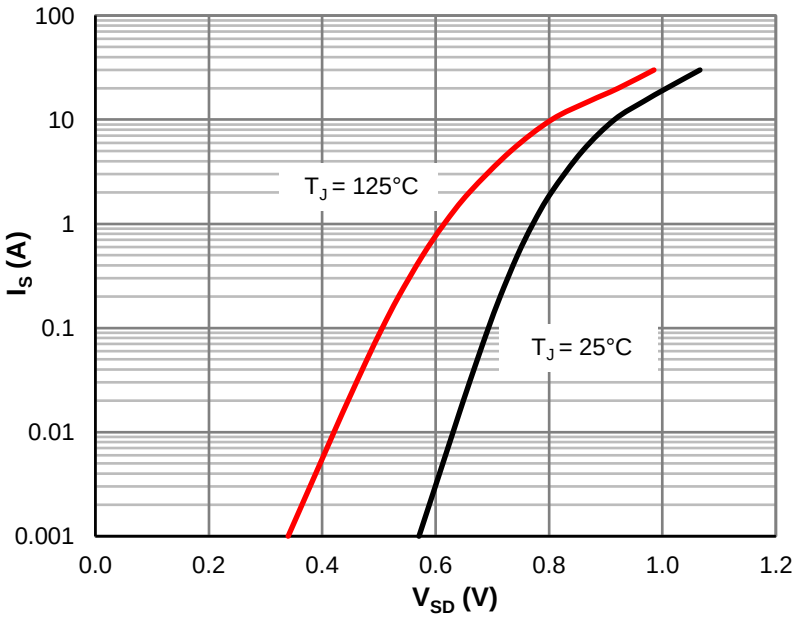


Figure 5: Body-Diode Characteristics

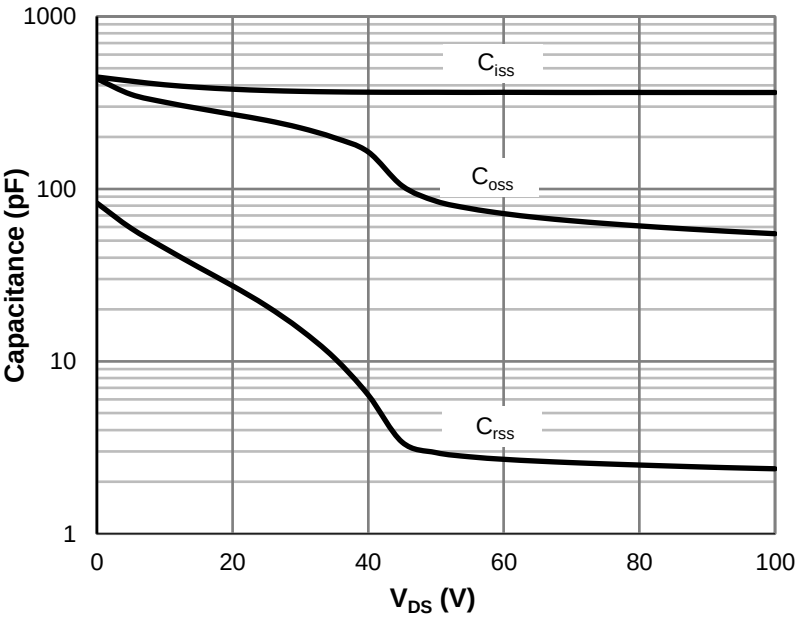


Figure 6: Capacitance Characteristics

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Typical Electrical & Thermal Characteristics

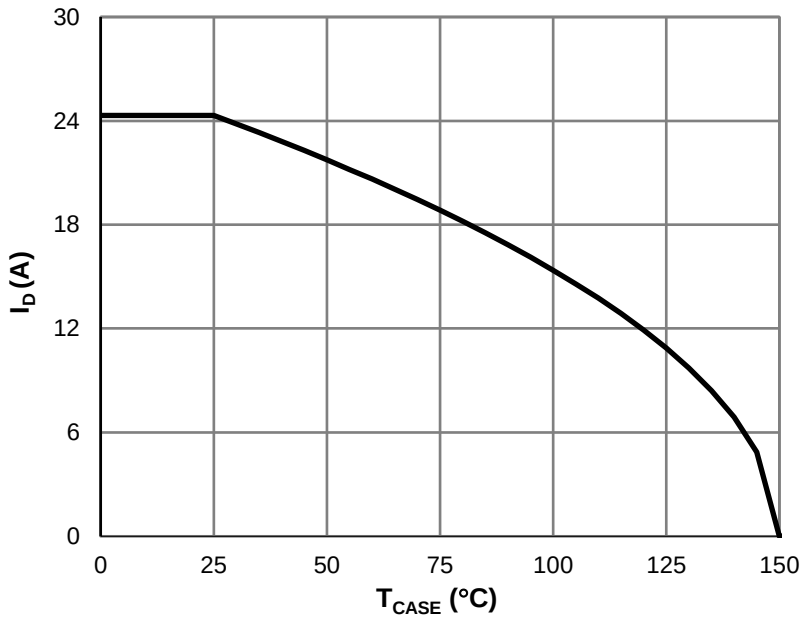


Figure 7: Current De-rating

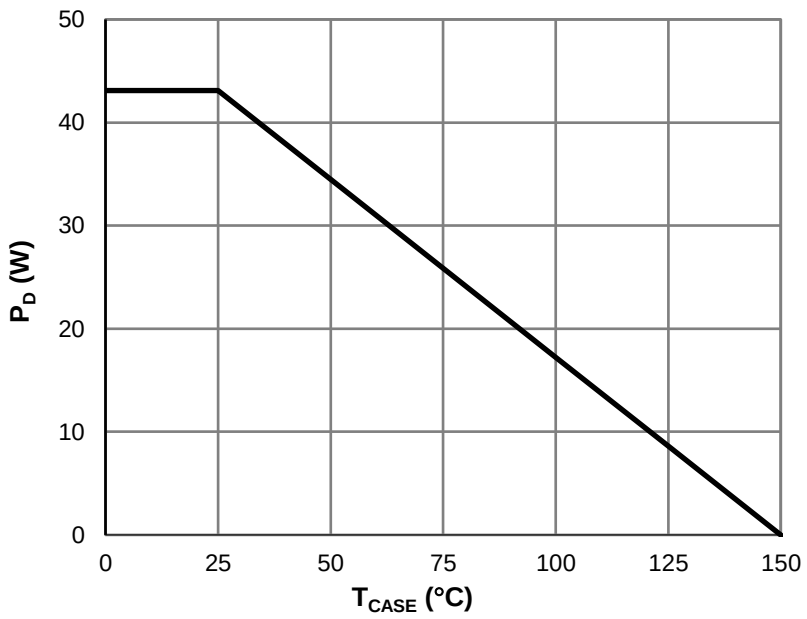


Figure 8: Power De-rating

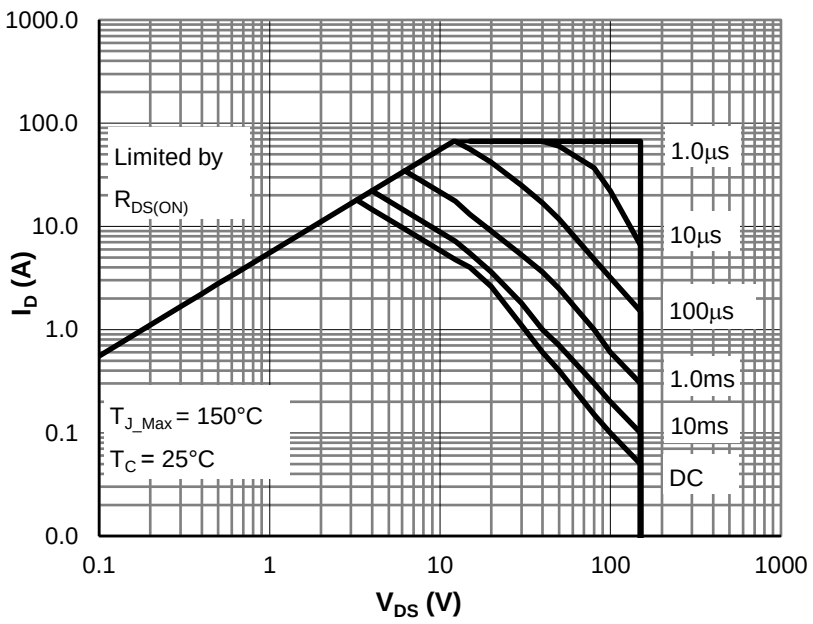


Figure 9: Maximum Safe Operating Area

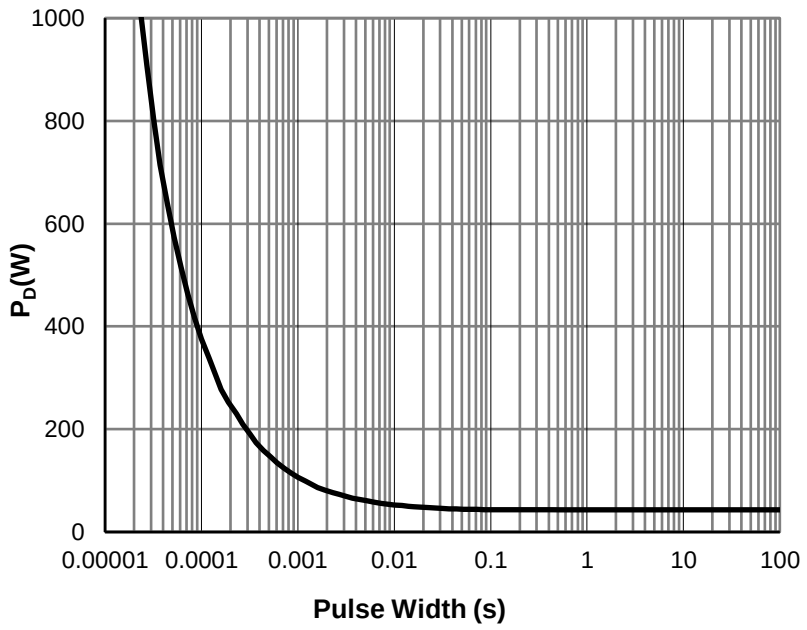


Figure 10: Single Pulse Power Rating, Junction-to-Case

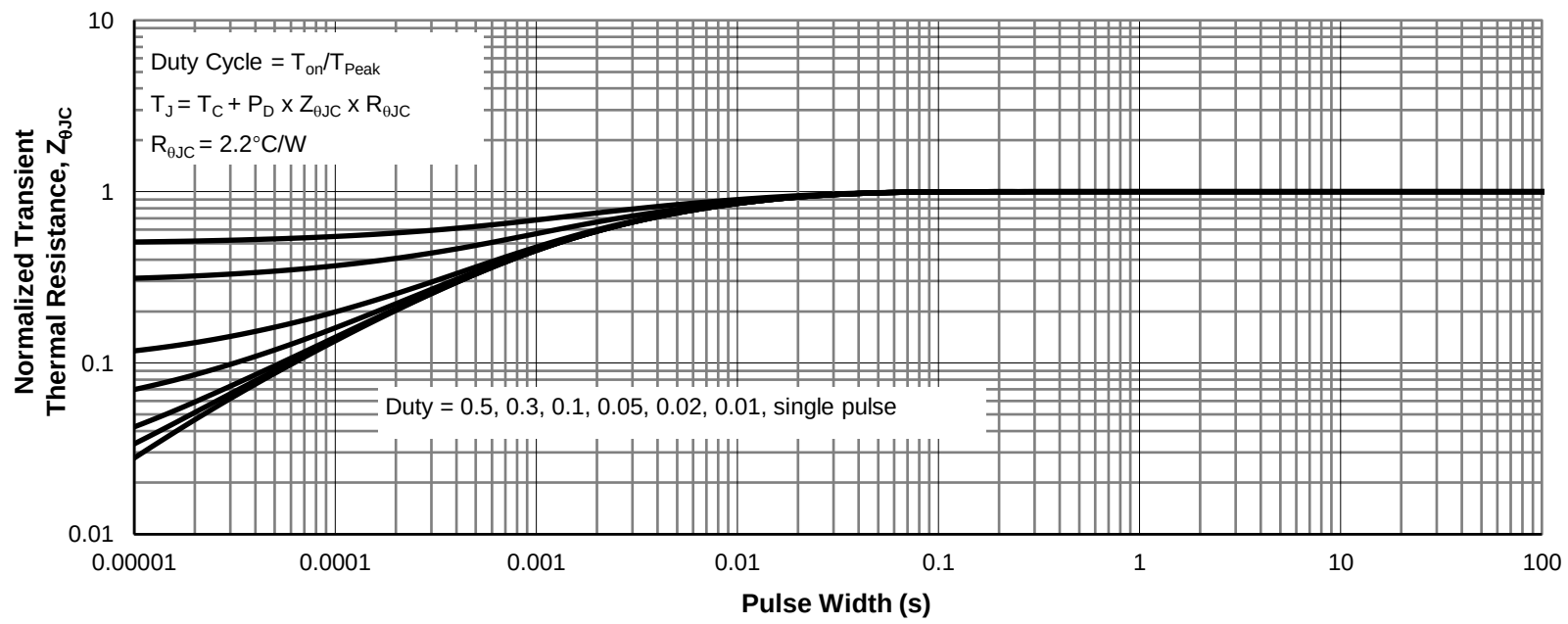
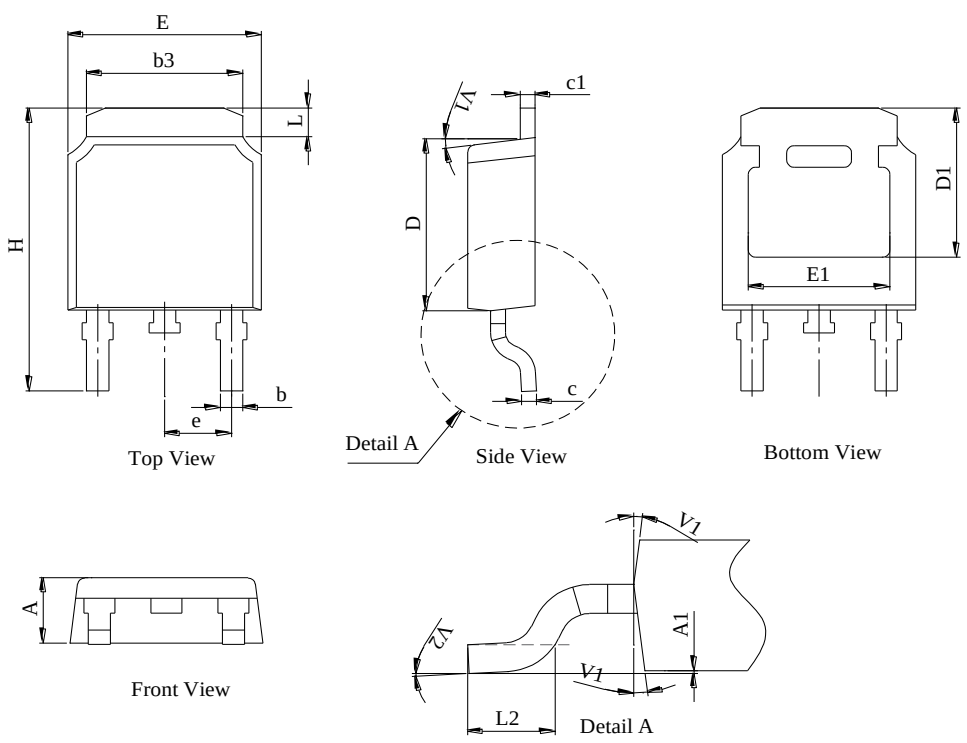


Figure 11: Normalized Maximum Transient Thermal Impedance

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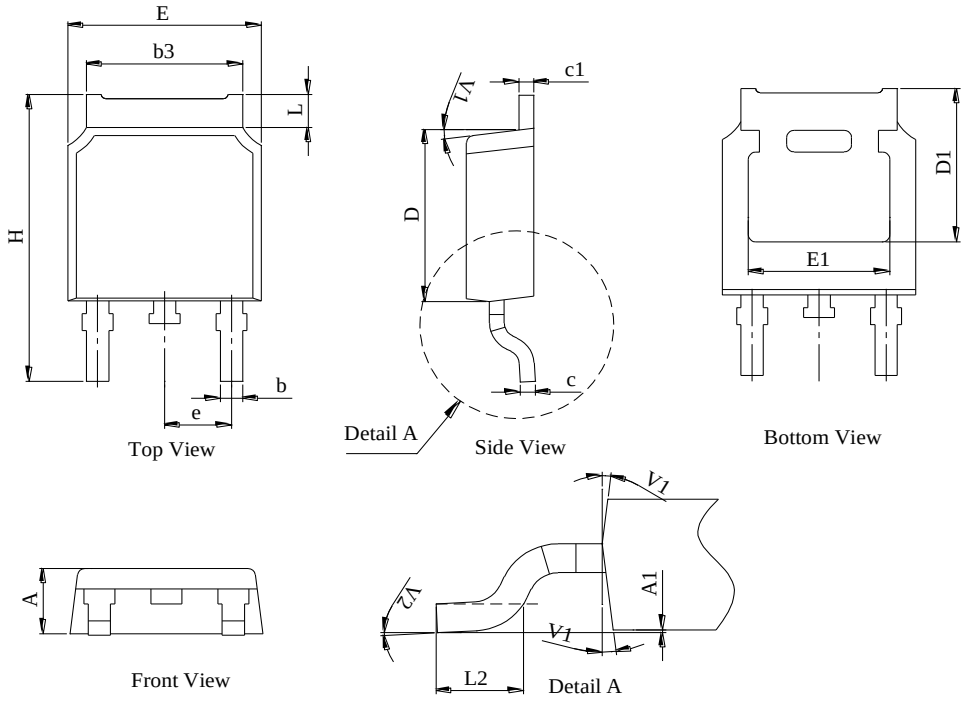
TO-252-3L Package Information

Package Outline Type-A



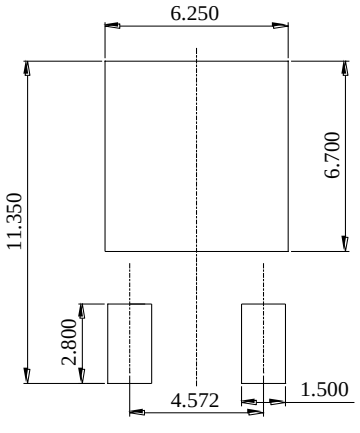
DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	2.18	2.30	2.39
A1	0	--	0.13
b	0.64	0.76	0.89
c	0.40	0.50	0.61
c1	0.46	0.50	0.58
D	5.97	6.10	6.23
D1	5.05	--	--
E	6.35	6.60	6.73
E1	4.32	--	--
b3	5.21	5.38	5.55
e	2.29 BSC		
H	9.40	10.00	10.40
L	0.89	--	1.27
L2	1.40	--	1.78
V1	7 °REF		
V2	0 °	--	6 °

Package Outline Type-B



DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	2.10	2.30	2.40
A1	0	--	0.13
b	0.66	0.76	0.86
b3	5.21	5.38	5.55
c	0.40	0.50	0.60
c1	0.44	0.50	0.58
D	5.90	6.10	6.30
D1	5.30REF		
E	6.40	6.60	6.80
E1	4.63	-	-
e	2.29 BSC		
H	9.50	10.00	10.70
L	1.09	--	1.21
L2	1.35	--	1.65
V1	7 °REF		
V2	0 °	--	6 °

Recommended Soldering Footprint



DIMENSIONS:MILLIMETERS

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