

30V 6.5mΩ Dual N-Ch Power MOSFET

Features

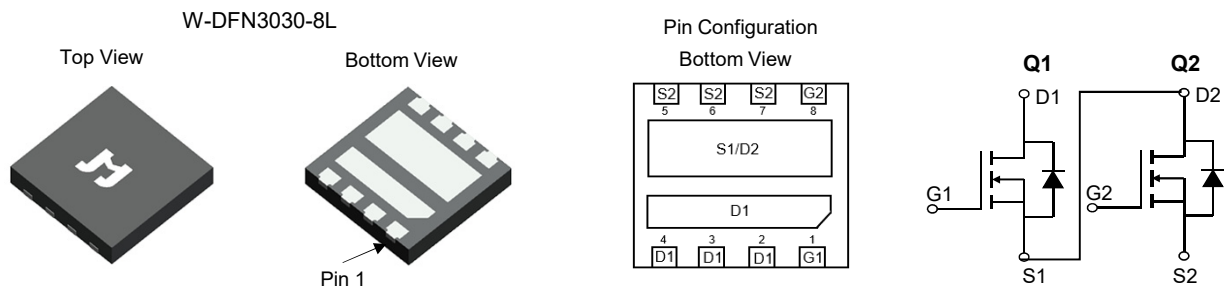
- Low ON-resistance, $R_{DS(ON)}$
- Low Gate Charge, Q_g
- 100% UIS and R_g Tested
- Pb-free Lead Plating
- Halogen-free and RoHS-compliant

Product Summary (Q1 & Q2)

Parameter	Value	Unit
V_{DS}	30	V
$V_{GS(th), Typ}$	1.7	V
I_D (@ $V_{GS} = 10V$) ⁽¹⁾	37	A
$R_{DS(ON), Typ}$ (@ $V_{GS} = 10V$)	6.5	mΩ
$R_{DS(ON), Typ}$ (@ $V_{GS} = 4.5V$)	10.0	mΩ

Applications

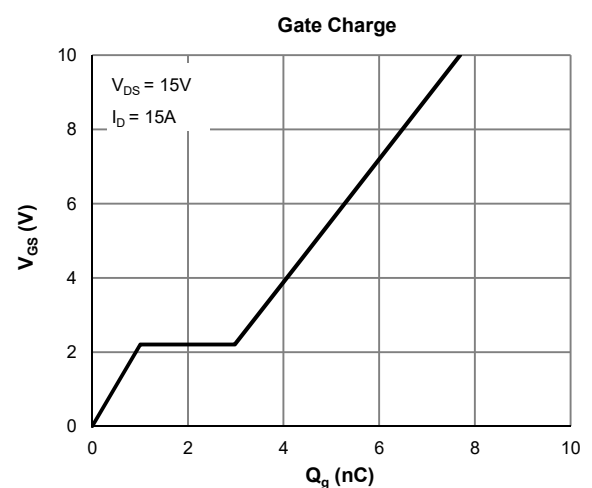
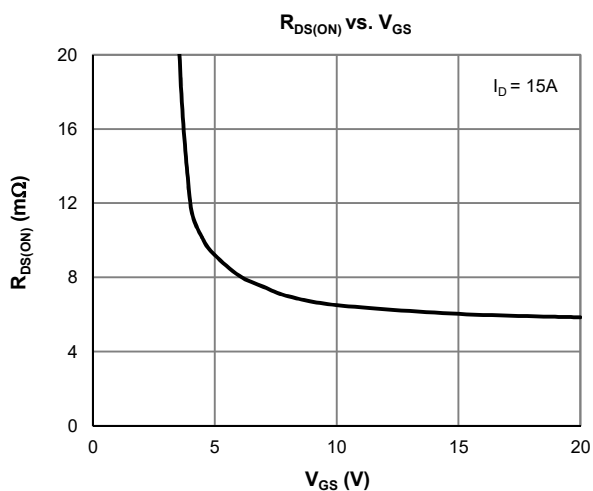
- Power Management Functions
- General Purpose Interfacing Switch


Ordering Information

Device	Package	# of Pins	Marking	MSL	T_J (°C)	Media	Quantity (pcs)
JMSL0315ARD-13	W-DFN3030-8L	8	L0315AD	1	-55 to 150	13-inch Reel	3000

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

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DS}	30	V
Gate-to-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ⁽¹⁾	I_D	$T_C = 25^\circ C$	37
		$T_C = 100^\circ C$	24
Pulsed Drain Current ⁽²⁾	I_{DM}	137	A
Avalanche Current ⁽³⁾	I_{AS}	13.0	A
Avalanche Energy ⁽³⁾	E_{AS}	8.5	mJ
Power Dissipation ⁽⁴⁾	P_D	$T_C = 25^\circ C$	19.2
		$T_C = 100^\circ C$	7.7
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	Min.	Typ.	Max.	Unit
STATIC PARAMETERS						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 1.0\text{mA}, V_{GS} = 0\text{V}$	30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 24\text{V}, V_{GS} = 0\text{V}$ $T_J = 55^\circ\text{C}$			1.0 5.0	μA
Gate-Body Leakage Current	I_{GSS}	$V_{DS} = 0\text{V}, V_{GS} = \pm 20\text{V}$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	1.2	1.7	2.5	V
Static Drain-Source ON-Resistance	$R_{DS(on)}$	$V_{GS} = 10\text{V}, I_D = 15\text{A}$		6.5	8.5	$\text{m}\Omega$
		$V_{GS} = 4.5\text{V}, I_D = 10\text{A}$		10.0	13.0	$\text{m}\Omega$
Forward Transconductance	g_{FS}	$V_{DS} = 5\text{V}, I_D = 15\text{A}$		30		S
Diode Forward Voltage	V_{SD}	$I_S = 1\text{A}, V_{GS} = 0\text{V}$		0.73	1.0	V
Diode Continuous Current	I_S	$T_C = 25^\circ\text{C}$			19	A

DYNAMIC PARAMETERS ⁽⁵⁾

Input Capacitance	C_{iss}	$V_{GS} = 0\text{V}, V_{DS} = 15\text{V}, f = 1\text{MHz}$		468		pF
Output Capacitance	C_{oss}			363		pF
Reverse Transfer Capacitance	C_{rss}			41		pF
Gate Resistance	R_g	$V_{GS} = 0\text{V}, V_{DS} = 0\text{V}, f = 1\text{MHz}$		3.3		Ω

SWITCHING PARAMETERS ⁽⁵⁾

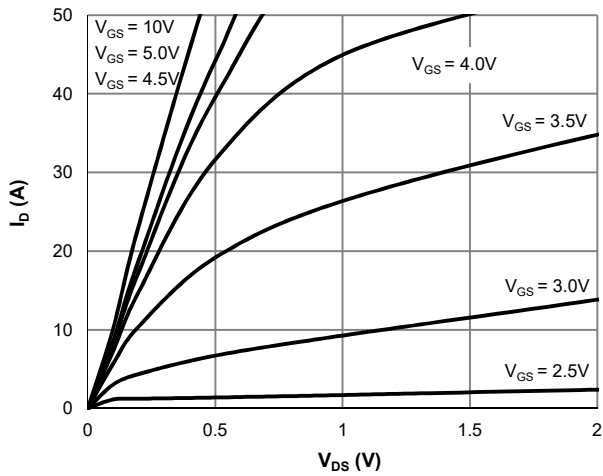
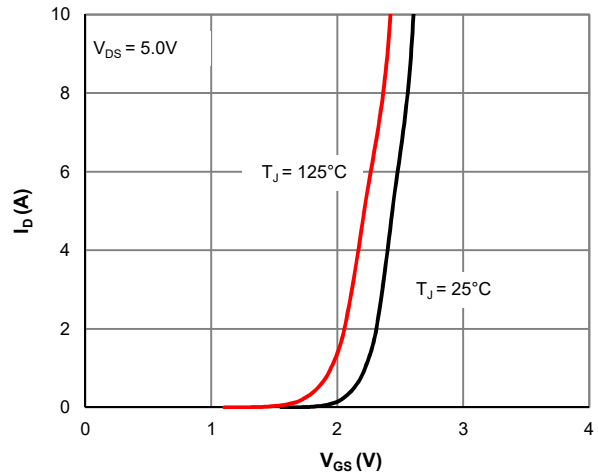
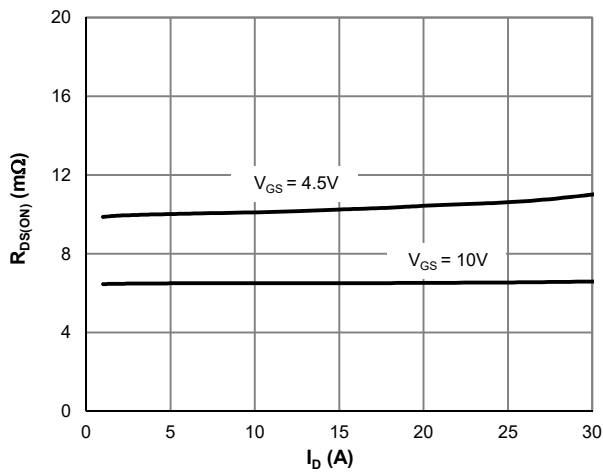
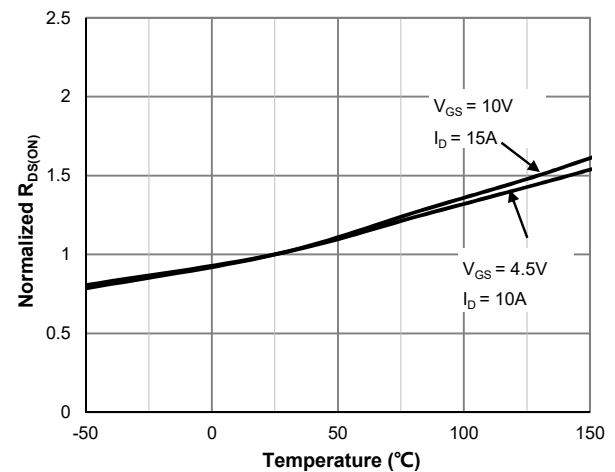
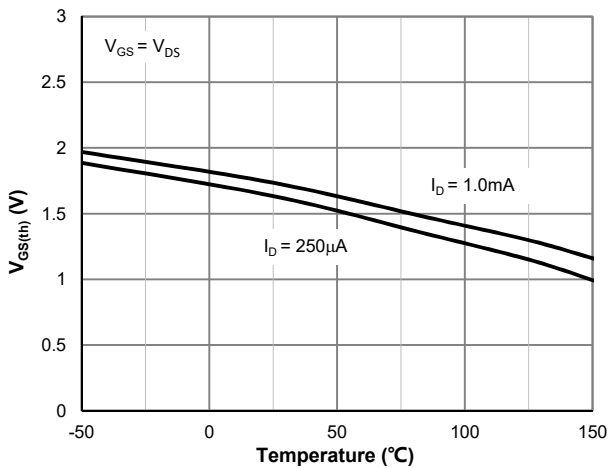
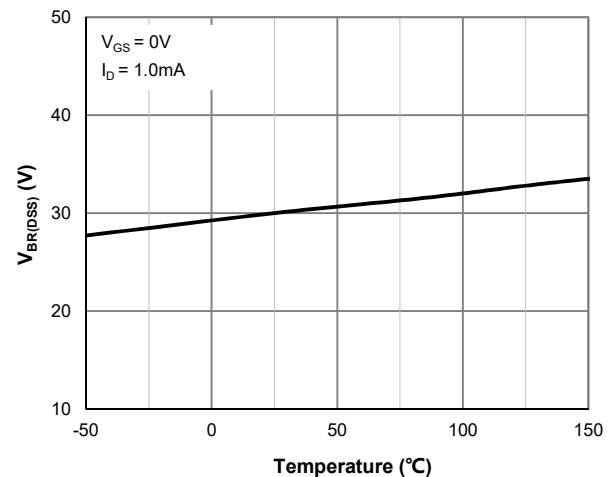
Total Gate Charge (@ $V_{GS} = 10\text{V}$)	Q_g	$V_{GS} = 0\text{ to } -10\text{V}$ $V_{DS} = 15\text{V}, I_D = 15\text{A}$		7.7		nC
Total Gate Charge (@ $V_{GS} = 4.5\text{V}$)	Q_g			4.4		nC
Gate Source Charge	Q_{gs}			1.0		nC
Gate Drain Charge	Q_{gd}			2.0		nC
Turn-On DelayTime	$t_{D(on)}$			2.7		ns
Turn-On Rise Time	t_r	$V_{GS} = 10\text{V}, V_{DS} = 15\text{V}$		3.5		ns
Turn-Off DelayTime	$t_{D(off)}$	$R_L = 1.0\Omega, R_{GEN} = 6\Omega$		12.5		ns
Turn-Off Fall Time	t_f			5.8		ns
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 15\text{A}, dI_F/dt = 100\text{A}/\mu\text{s}$		16.6		ns
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F = 15\text{A}, dI_F/dt = 100\text{A}/\mu\text{s}$		5.5		nC

Thermal Performance

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	58	70	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	6.5	8.0	$^\circ\text{C}/\text{W}$

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 [$L = 100\mu\text{H}, V_{GS} = 10\text{V}, V_{DS} = 15\text{V}$] 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

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

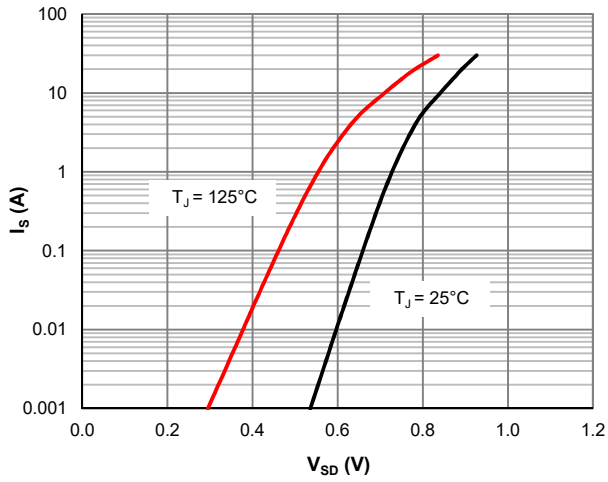


Figure 7: Body-Diode Characteristics

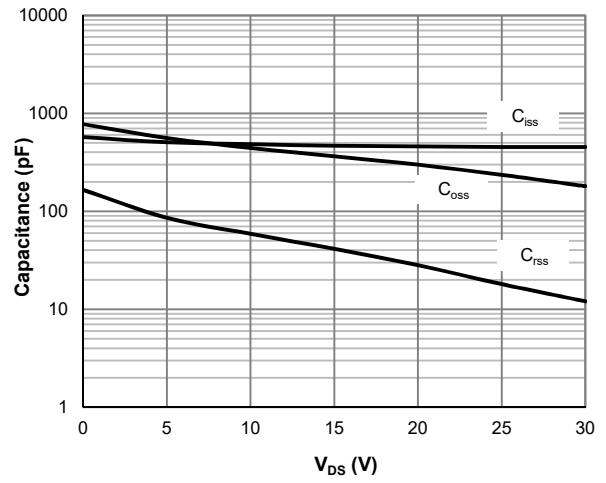


Figure 8: Capacitance Characteristics

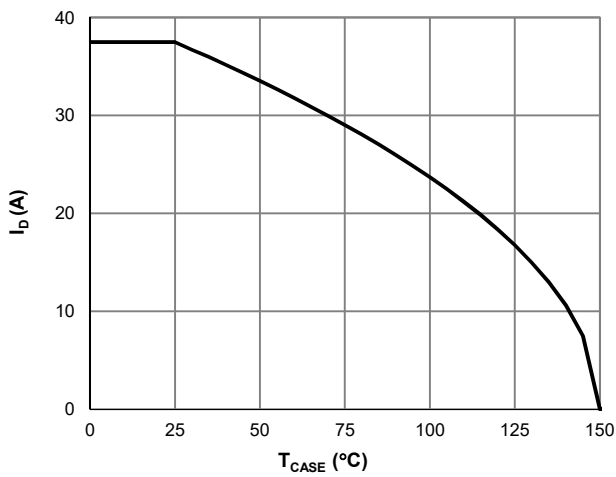


Figure 9: Current De-rating

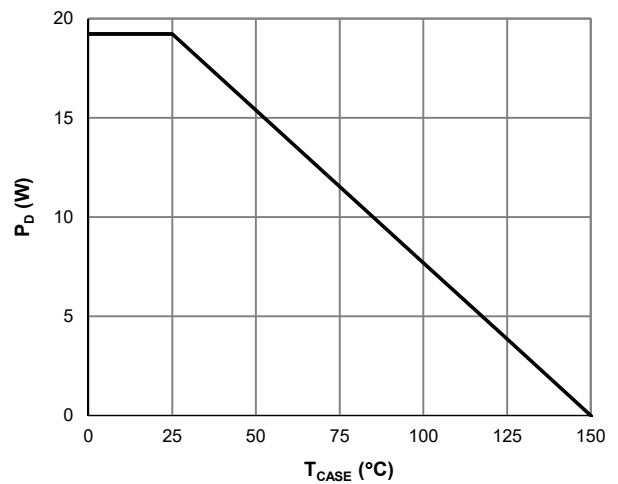


Figure 10: Power De-rating

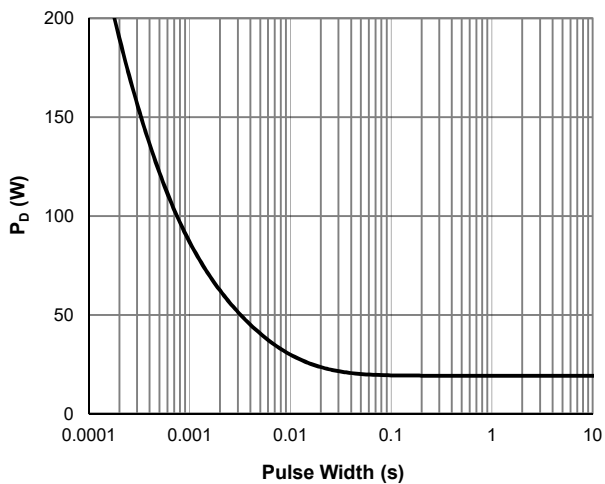


Figure 11: Single Pulse Power Rating, Junction-to-Case

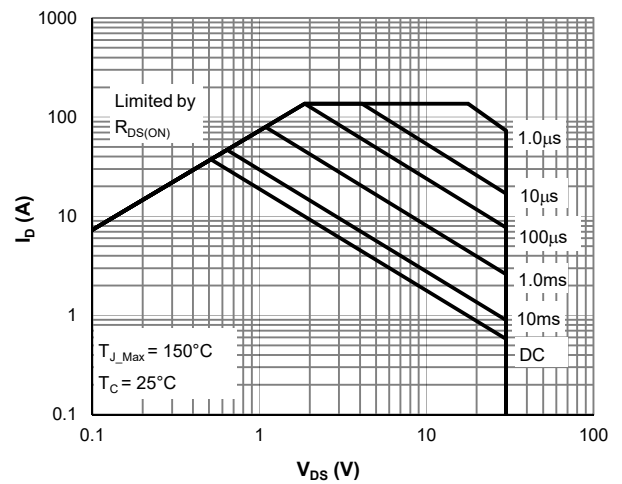


Figure 12: Maximum Safe Operating Area



Typical Electrical & Thermal Characteristics

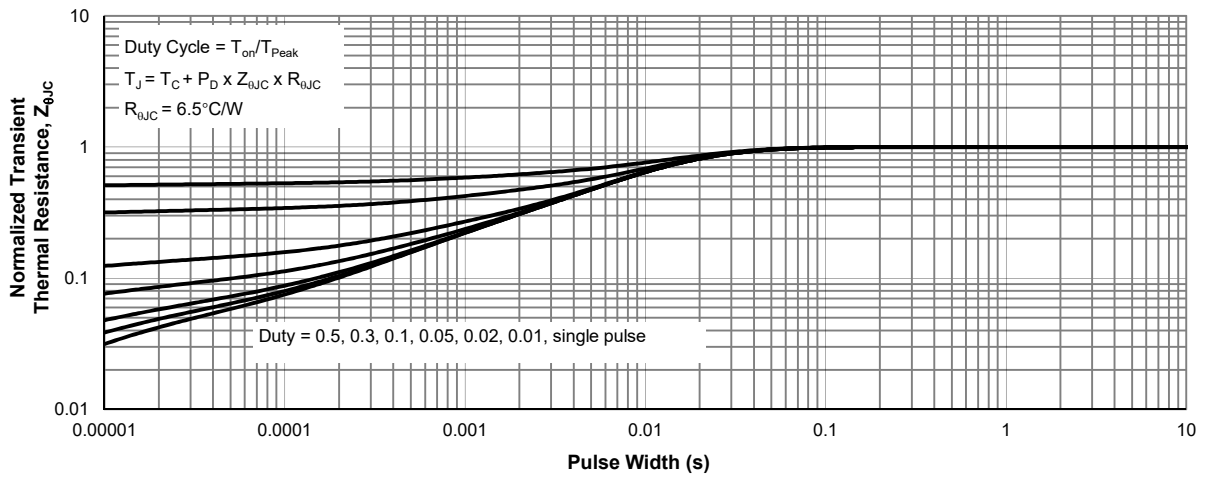
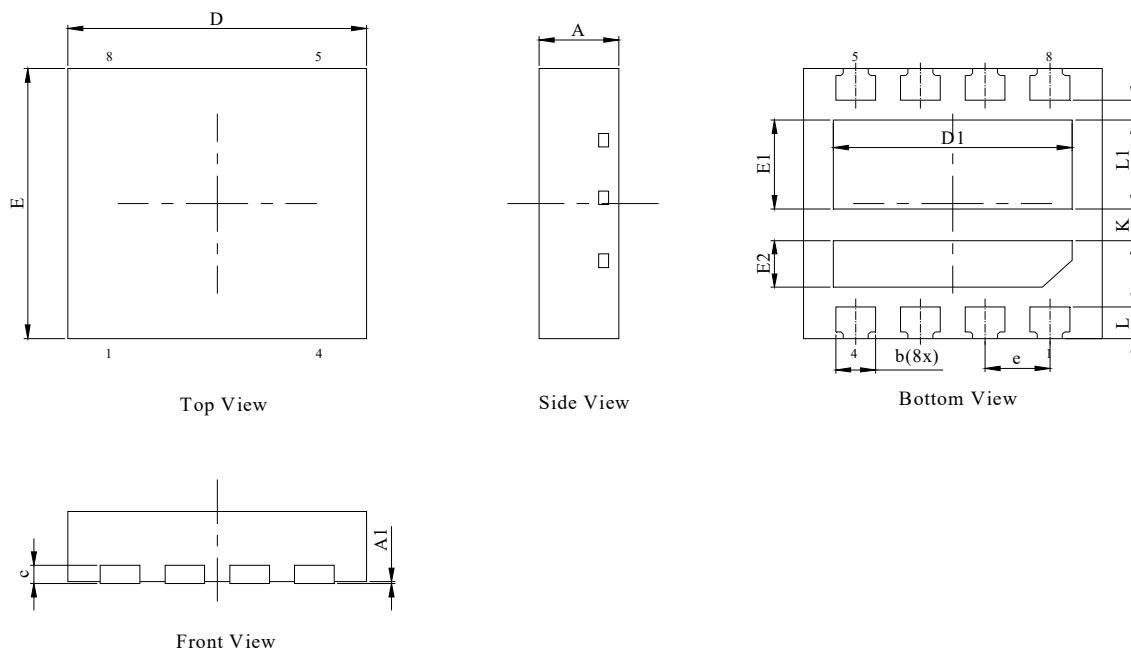
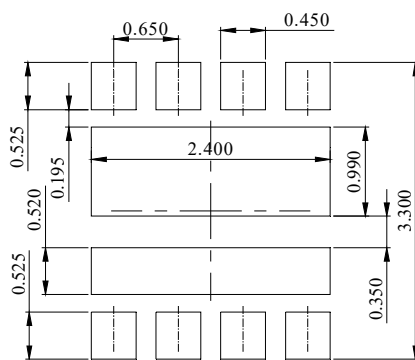


Figure 13: Normalized Maximum Transient Thermal Impedance

W-DFN3030-8L Package Information
Package Outline


DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	0.70	0.75	0.80
b	0.35	0.40	0.45
c	-	0.203	-
D	2.90	3.00	3.10
D1	2.30	2.40	2.50
E	2.90	3.00	3.10
E1	0.89	0.99	1.09
E2	0.42	0.52	0.62
e	0.65BSC		
L	0.25	0.35	0.45
L1	--	0.22	--
K	--	0.35	--

Recommended Soldering Footprint


DIMENSIONS: MILLIMETERS