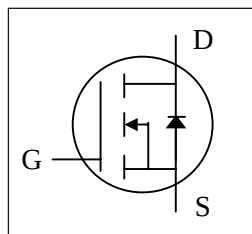


- ▼ 100% R_g & UIS Test
- ▼ Simple Drive Requirement
- ▼ Ultra Low On-resistance
- ▼ RoHS Compliant & Halogen-Free

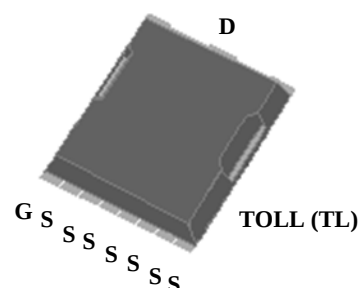


BV _{DSS}	150V
R _{DS(ON)}	3.9mΩ

Description

XP15NA3R9 series are innovated design and silicon process technology to achieve the lowest possible on-resistance and fast switching performance. It provides the designer with an extreme efficient device for use in a wide range of power applications.

The TOLL package is a perfect solution for high power density and high power efficiency application.



Absolute Maximum Ratings@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	150	V
V _{GS}	Gate-Source Voltage	+20	V
I _D @T _C =25°C	Drain Current, V _{GS} @ 10V	191	A
I _D @T _C =100°C	Drain Current, V _{GS} @ 10V	135	A
I _{DM}	Pulsed Drain Current ¹	760	A
P _D @T _C =25°C	Total Power Dissipation	333.3	W
P _D @T _A =25°C	Total Power Dissipation ³	3.75	W
E _{AS}	Single Pulse Avalanche Energy ⁵	612.5	mJ
T _{STG}	Storage Temperature Range	-55 to 175	°C
T _J	Operating Junction Temperature Range	-55 to 175	°C

Thermal Data

Symbol	Parameter	Value	Units
R _{thj-c}	Maximum Thermal Resistance, Junction-case	0.45	°C/W
R _{thj-a}	Maximum Thermal Resistance, Junction-ambient (PCB mount) ³	40	°C/W

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	150	-	-	V
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =50A	-	-	3.9	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	2	-	4	V
g _{fs}	Forward Transconductance	V _{DS} =5V, I _D =50A	-	145	-	S
I _{DSS}	Drain-Source Leakage Current	V _{DS} =120V, V _{GS} =0V	-	-	25	uA
I _{GSS}	Gate-Source Leakage	V _{GS} = ±20V, V _{DS} =0V	-	-	±0.1	uA
Q _g	Total Gate Charge ⁴	I _D =50A	-	200	320	nC
Q _{gs}	Gate-Source Charge ⁴	V _{DS} =75V	-	50	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge ⁴	V _{GS} =10V	-	68	-	nC
t _{d(on)}	Turn-on Delay Time ⁴	V _{DS} =75V	-	40	-	ns
t _r	Rise Time ⁴	I _D =50A	-	126	-	ns
t _{d(off)}	Turn-off Delay Time ⁴	R _G =6Ω	-	140	-	ns
t _f	Fall Time ⁴	V _{GS} =10V	-	160	-	ns
C _{iss}	Input Capacitance ⁴	V _{GS} =0V	-	9900	15840	pF
C _{oss}	Output Capacitance ⁴	V _{DS} =100V	-	690	-	pF
C _{rss}	Reverse Transfer Capacitance ⁴	f=1.0MHz	-	20	-	pF
R _g	Gate Resistance	f=1.0MHz	-	0.7	2	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V _{SD}	Forward On Voltage ²	I _S =50A, V _{GS} =0V	-	-	1.3	V
t _{rr}	Reverse Recovery Time ⁴	I _S =50A, V _{GS} =0V	-	105	-	ns
Q _{rr}	Reverse Recovery Charge ⁴	dI/dt=100A/μs	-	345	-	nC

Notes:

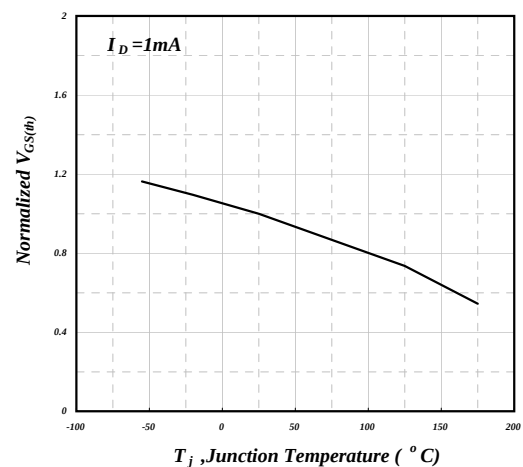
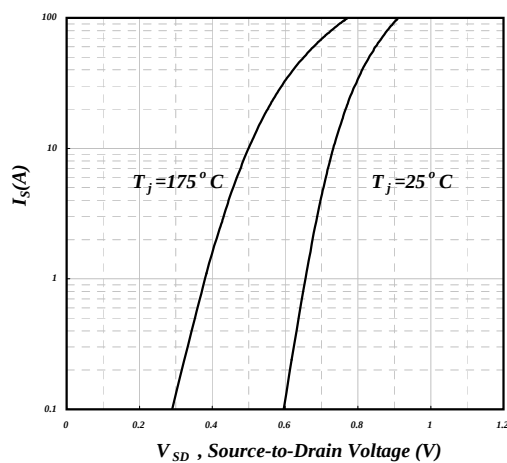
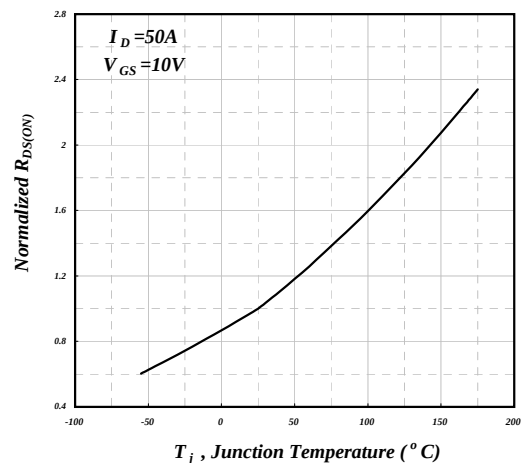
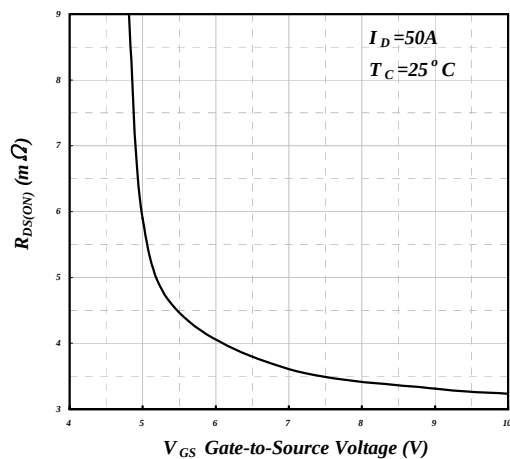
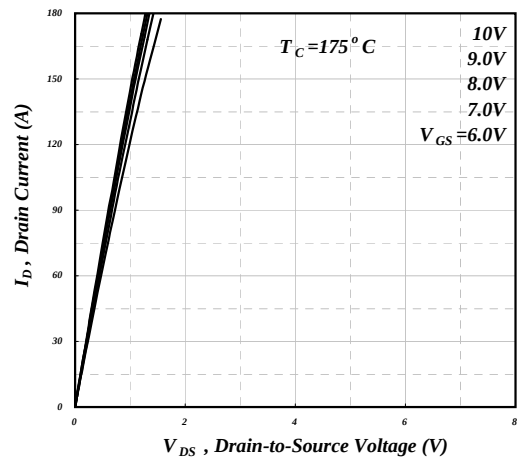
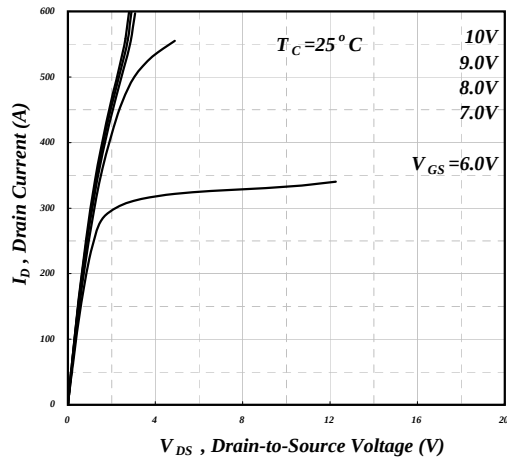
- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse test
- 3.Surface mounted on 1 in² copper pad of FR4 board
- 4.Guaranteed by design.
- 5.Starting T_J=25°C , V_{DD}=50V , L=1mH , R_G=25Ω , V_{GS}=10V , I_{AS}=35A
- 6.These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of T_{J(MAX)}=175°C.

THIS PRODUCT IS SENSITIVE TO ELECTROSTATIC DISCHARGE, PLEASE HANDLE WITH CAUTION.

USE OF THIS PRODUCT AS A CRITICAL COMPONENT IN LIFE SUPPORT, AUTOMOTIVE OR OTHER SIMILAR SYSTEMS IS NOT AUTHORIZED.

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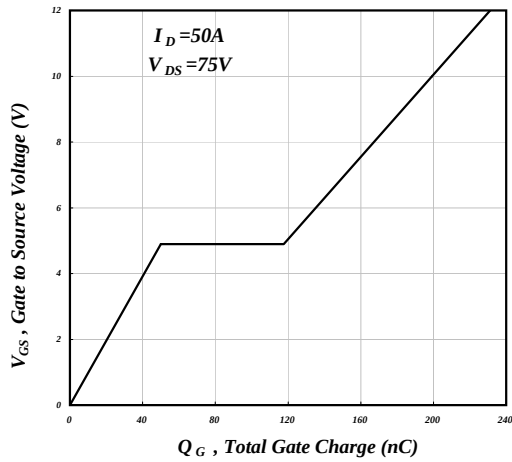


Fig 7. Gate Charge Characteristics

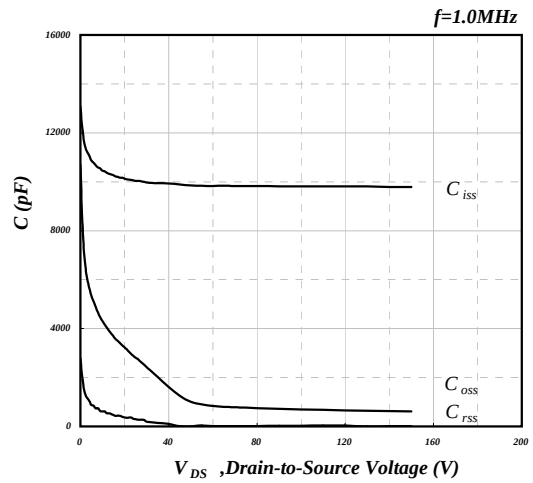


Fig 8. Typical Capacitance Characteristics

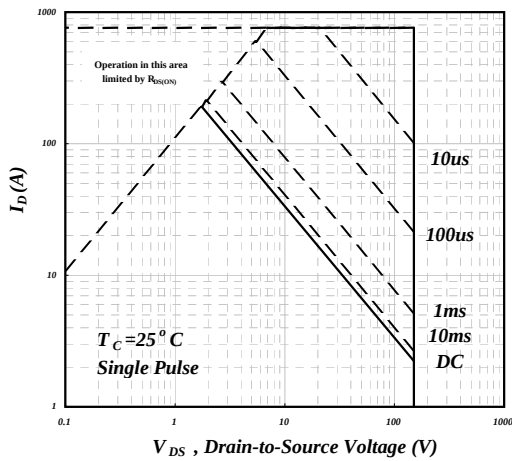


Fig 9. Maximum Safe Operating Area⁶

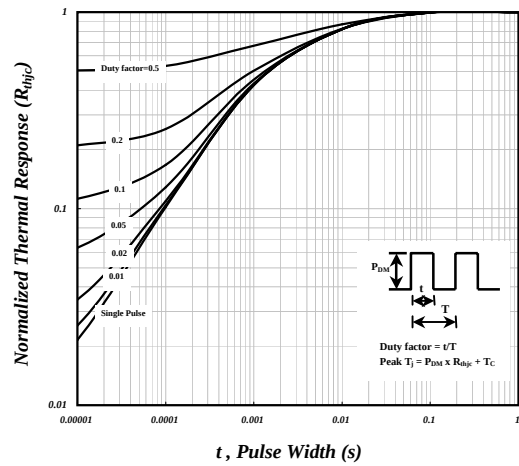


Fig 10. Effective Transient Thermal Impedance

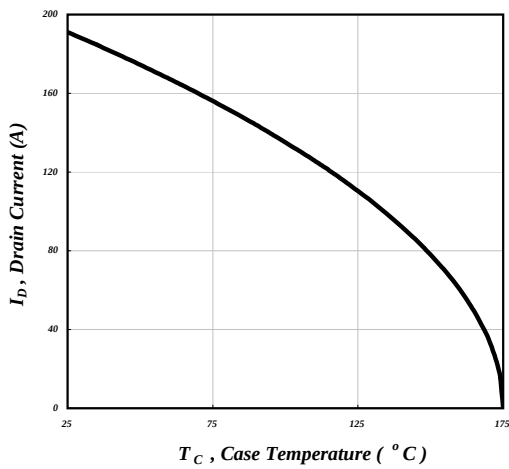


Fig 11. Drain Current v.s. Case Temperature

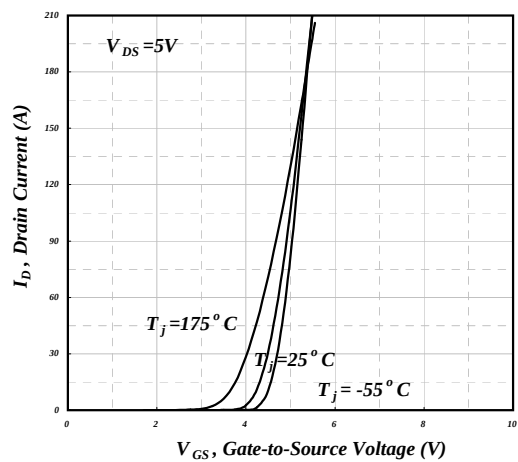


Fig 12. Transfer Characteristics

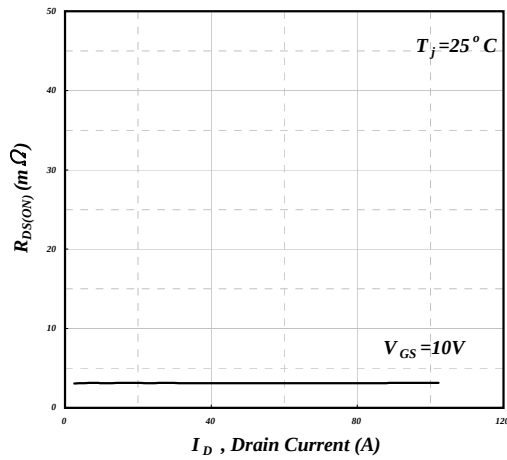


Fig 13. Typ. Drain-Source on State Resistance

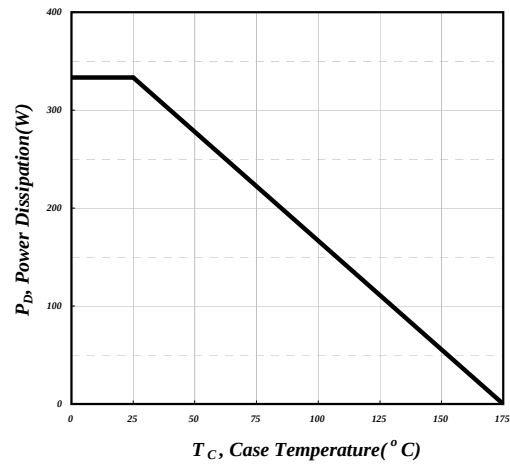


Fig 14. Total Power Dissipation

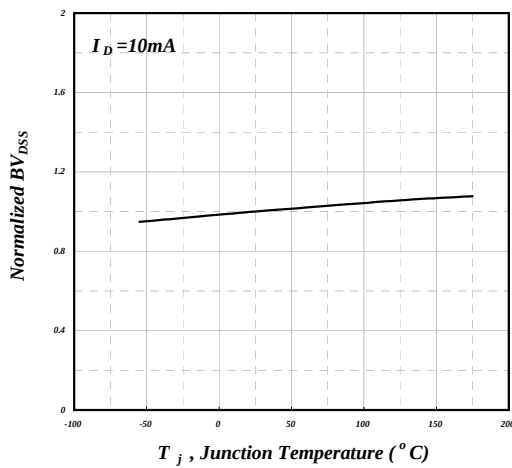
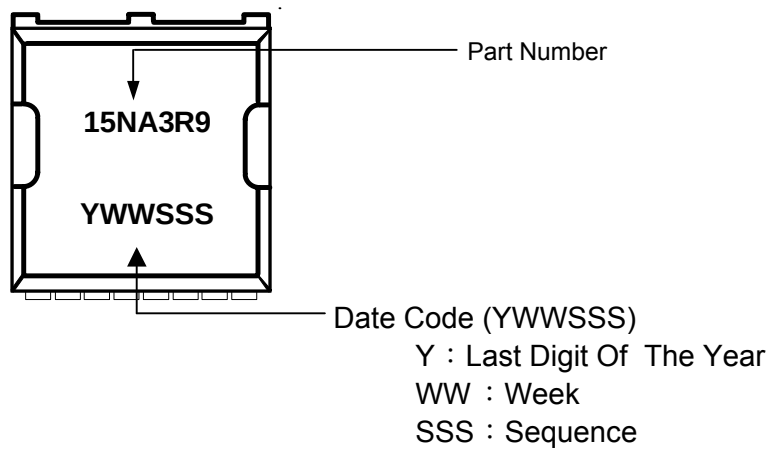
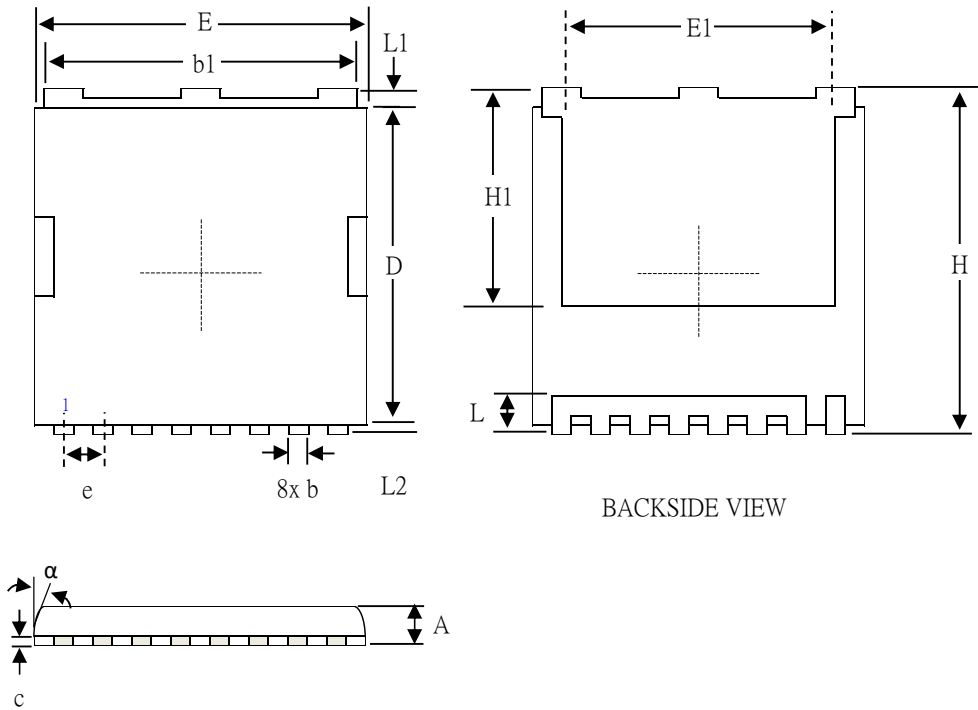


Fig 15. Normalized BV_{DSS} v.s. Junction Temperature

MARKING INFORMATION

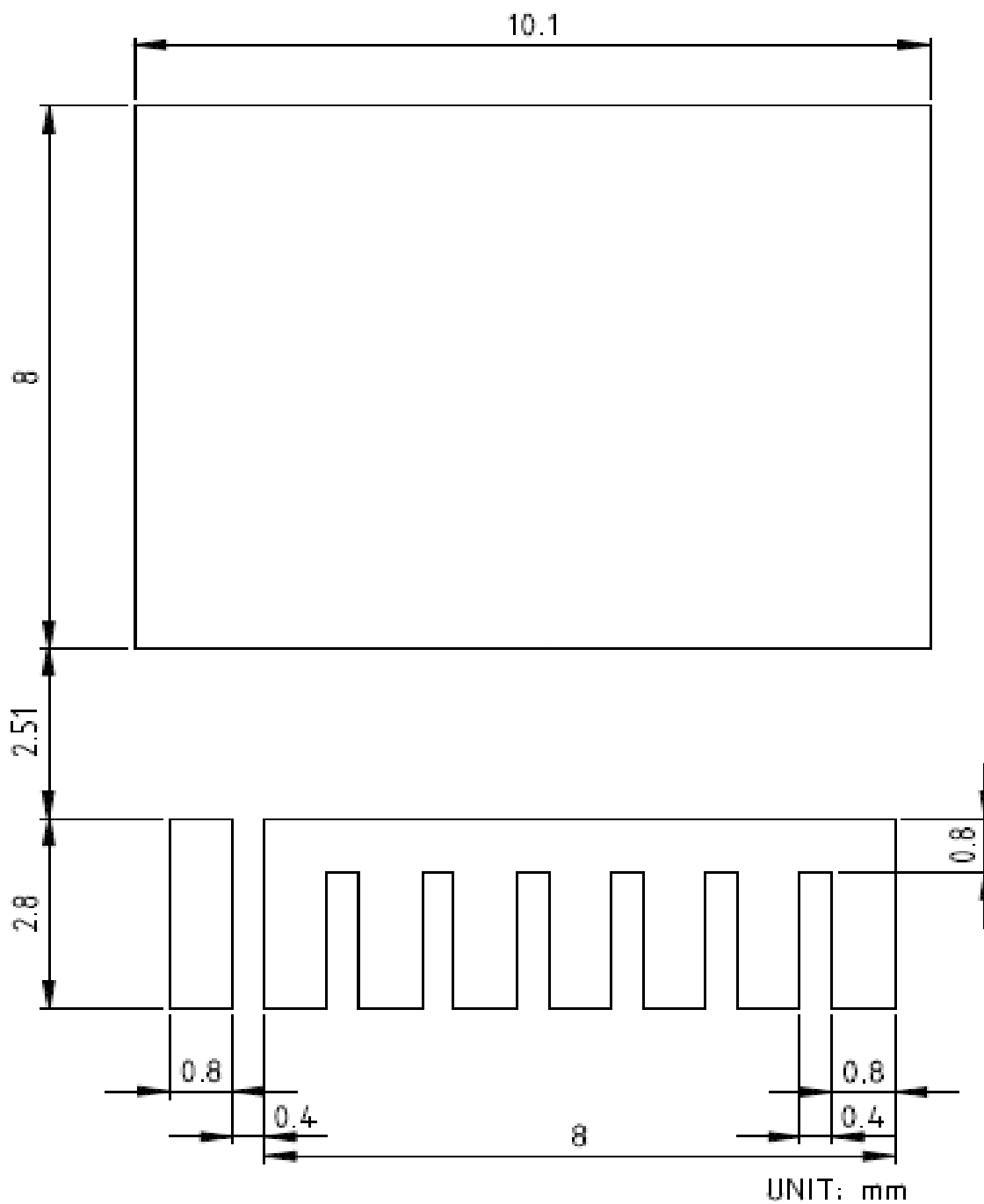
Package Outline : TOLL



SYMBOLS	MIN	NOM	MAX
A	2.20	2.30	2.40
b	0.70	0.80	0.90
b1	9.70	9.80	9.90
c	0.40	0.50	0.60
D	10.28	10.38	10.58
E	9.70	9.90	10.10
E1	7.90	8.70	9.50
e	1.20BCS		
H	11.48	11.68	11.88
H1	6.75	-	7.43
L	1.40	1.90	2.10
L1	0.60	0.70	0.80
L2	0.50	0.60	0.70
α	10° REF.		

- 1.All dimension are in millimeters.
- 2.Dimension does not include burrs and mold flash/protrusions.
- 3.The outline schematic is not to scale and slightly different from the actual product appearance.

TOLL FOOTPRINT :



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