STN4110

N Channel Enhancement Mode MOSFET

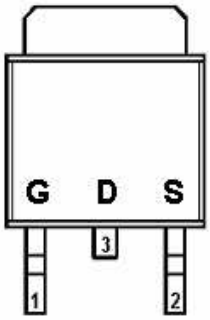
40.0A

DESCRIPTION

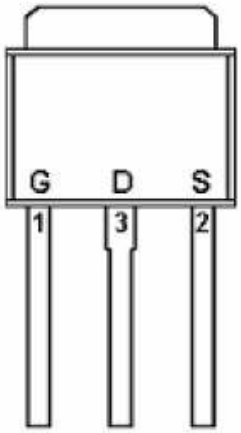
STN4110 is used trench technology to provide excellent RDS(on) and gate charge. Those devices are ideal for boost converters and synchronous rectifiers for consumer, telecom, industrial power supplies and LED backlighting.

PIN CONFIGURATION (D-PAK)

TO-252



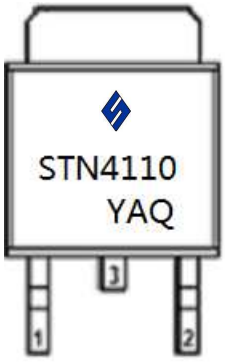
TO-251

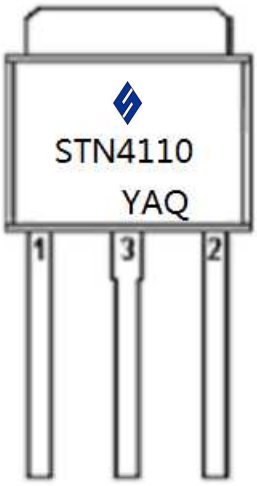


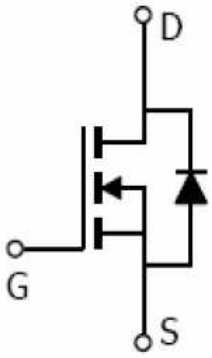
FEATURE

- 60V/20.0A, $R_{DS(ON)}$ = 10mΩ (Typ.) @V_{GS} = 10V
- 60V/20.0A, $R_{DS(ON)}$ = 12mΩ @V_{GS} = 4.5V
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- TO-252,TO-251 package design

PART MARKING







Y: Year Code A: Date Code Q:Process Code

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ABSOULTE MAXIMUM RATINGS (Ta = 25℃ Unless otherwise noted)

Parameter		Symbol	Typical	Unit
Drain-Source Voltage		VDSS	60	V
Gate-Source Voltage		VGSS	±20	V
Continuous Drain Current (TJ=150℃)	TA=25℃ TA=70℃	ID	40.0 40.0	A
Pulsed Drain Current		IDM	180	A
Continuous Source Current (Diode Conduction)		IS	46	A
Power Dissipation	TA=25℃ TA=70℃	PD	63 31	W
Operation Junction Temperature		TJ	175	℃
Storgae Temperature Range		TSTG	-55/175	℃
Thermal Resistance-Junction to Ambient		RθJA	16	℃/W

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ELECTRICAL CHARACTERISTICS (Ta = 25℃ Unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,ID=250mA	60			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},ID=250uA	1		3	V
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±20V			0.1	uA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=60V,V_{GS}=0V			1	nA
		V_{DS}=48V,V_{GS}=0V T_J=55℃			5	
Drain-source On-Resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=20A V_{GS}=4.5V,I_D=20A		10 12	12 15	mΩ
Forward Transconductance	gfs	V_{DS}=5V,I_D=20A		55		S
Diode Forward Voltage	V_{SD}	I_S=1.0A,V_{GS}=0V		0.65	1.0	V
Dynamic						
Total Gate Charge	Q_g	V_{GS}=10V,V_{DS}=20V I_D≡20A		29	35	nC
Gate-Source Charge	Q_{gs}			4.8		
Gate-Drain Charge	Q_{gd}			7.8		
Input Capacitance	C_{iss}	V_{DS} =20V,V_{GS}=0V F=1MHz		1590	1800	pF
Output Capacitance	C_{oss}			105		
Reverse TransferCapacitance	C_{rss}			69		
Turn-On Time	$t_{d(on)}$	V_{DS}=20V, V_{GS}=10V R_L= 0.75Ω V_{GEN}=3Ω		7.8		nS
	tr			6.5		
Turn-Off Time	$t_{d(off)}$			33		
	tf			7.5		

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TYPICAL CHARACTERICTICS

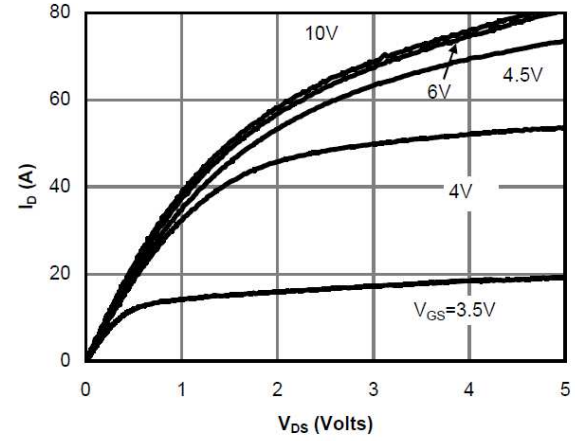

Fig 1: On-Region Characteristics (Note E)

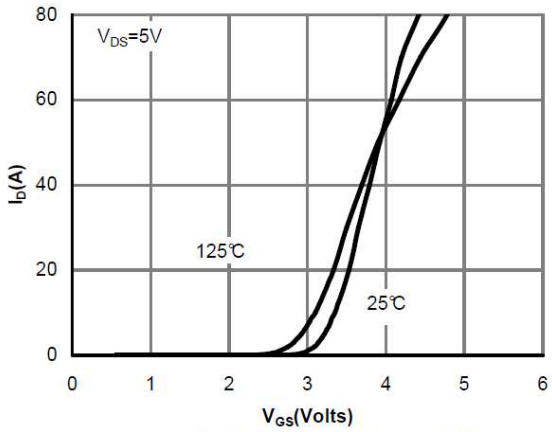

Figure 2: Transfer Characteristics (Note E)

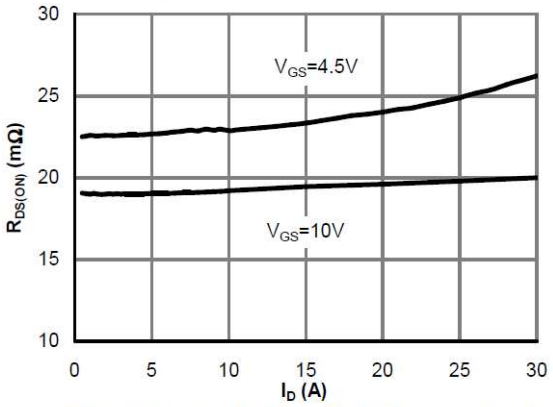

Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

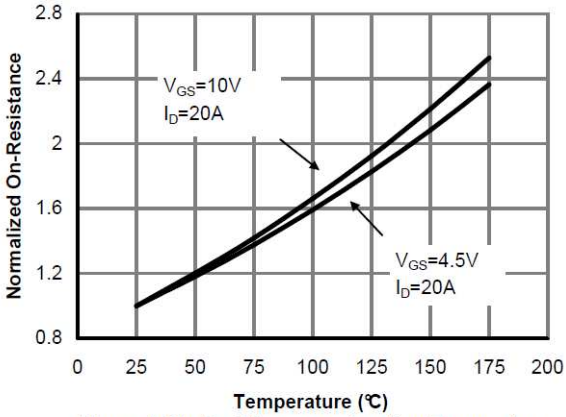

Figure 4: On-Resistance vs. Junction Temperature (Note E)

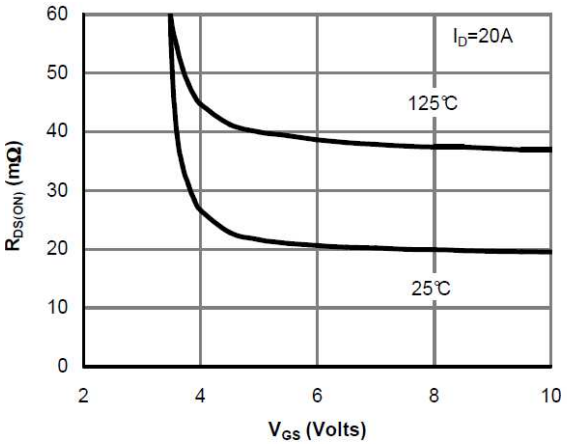

Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

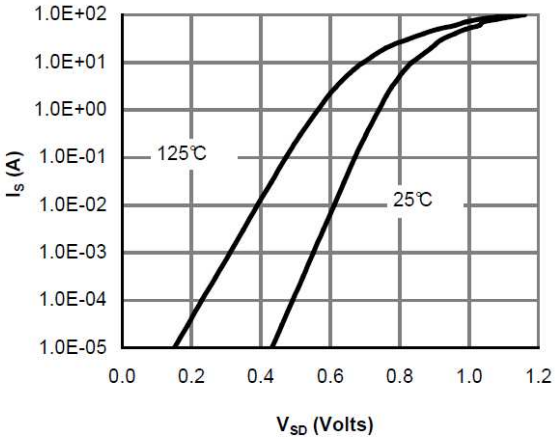

Figure 6: Body-Diode Characteristics (Note E)

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TYPICAL CHARACTERICTICS

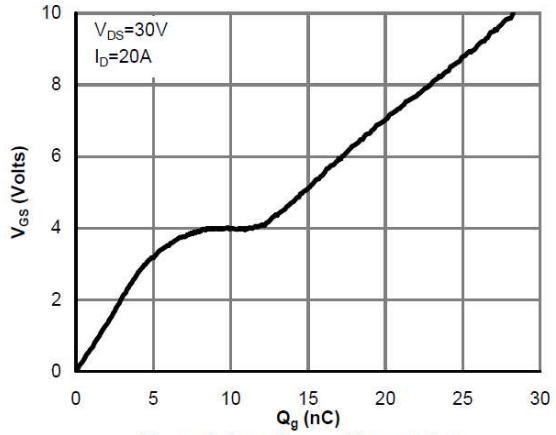


Figure 7: Gate-Charge Characteristics

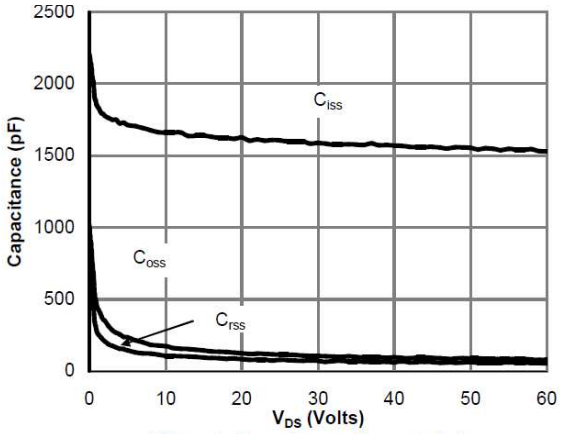


Figure 8: Capacitance Characteristics

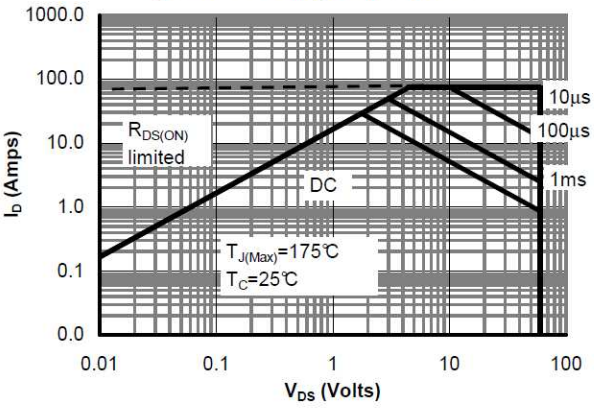


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

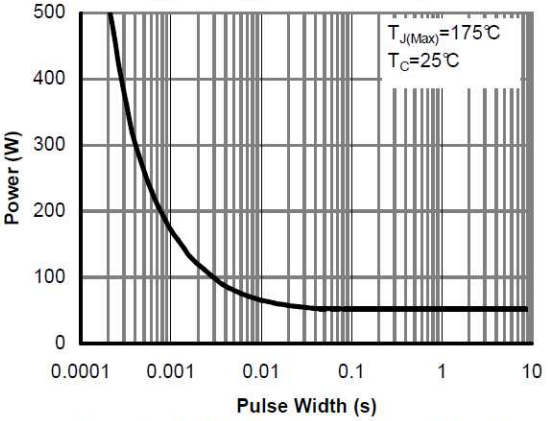


Figure 10: Single Pulse Power Rating Junction-to-Case (Note F)

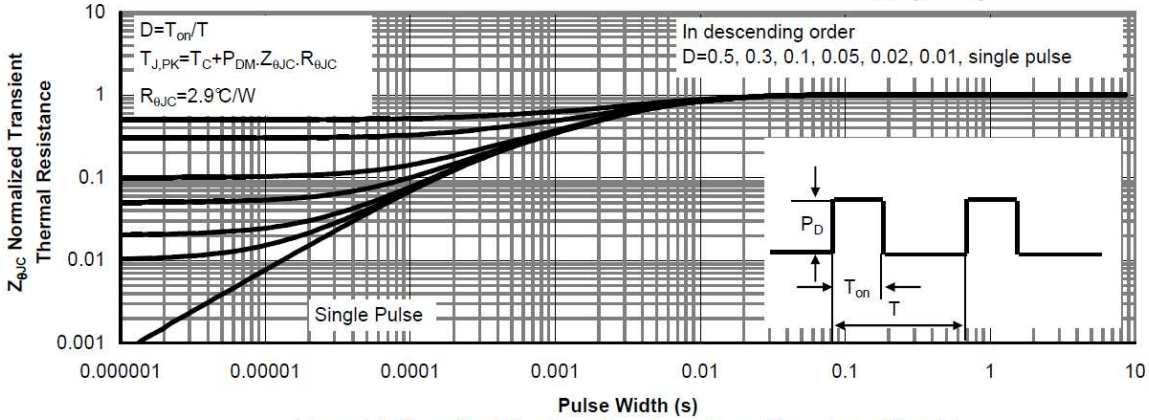


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

TYPICAL CHARACTERICTICS

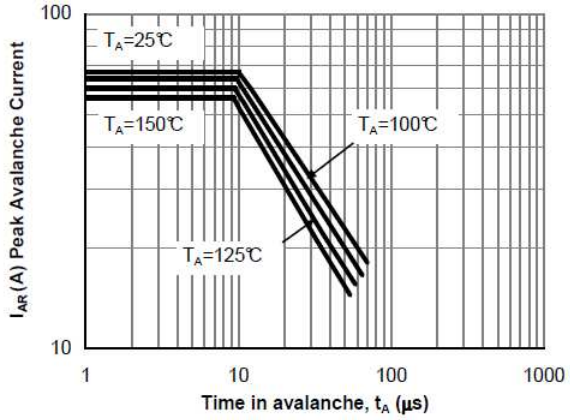


Figure 12: Single Pulse Avalanche capability (Note C)

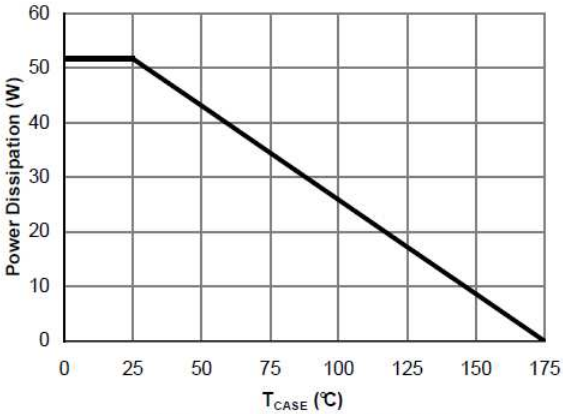


Figure 13: Power De-rating (Note F)

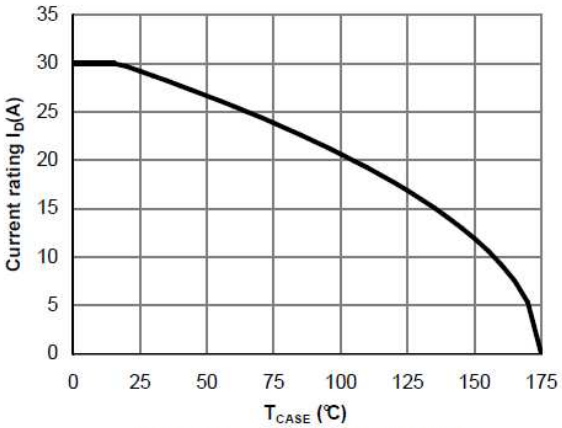


Figure 14: Current De-rating (Note F)

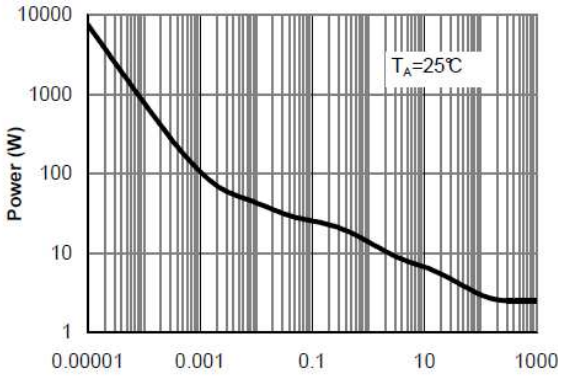


Figure 15: Single Pulse Power Rating Junction-to-Ambient (Note H)

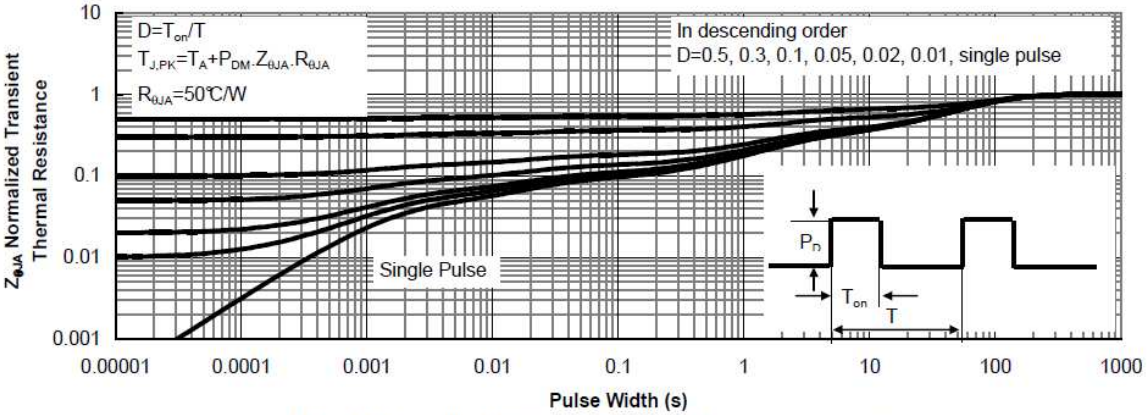
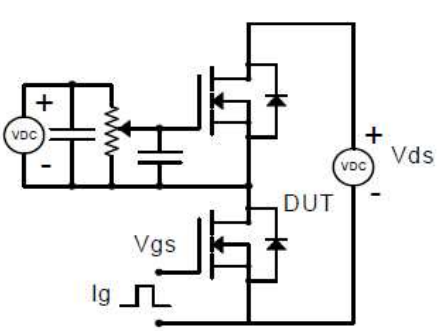
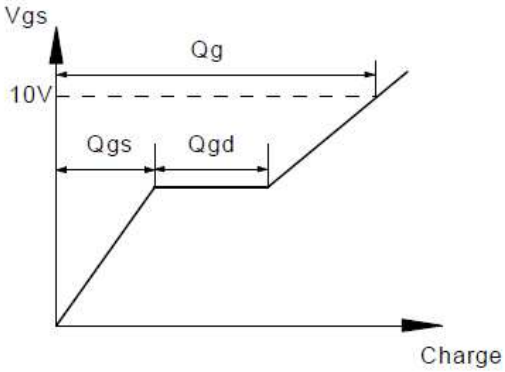


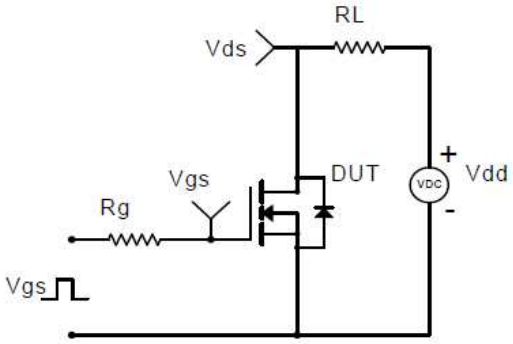
Figure 16: Normalized Maximum Transient Thermal Impedance (Note H)

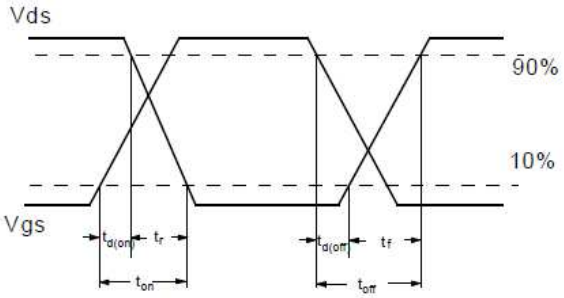
Gate Charge Test Circuit & Waveform



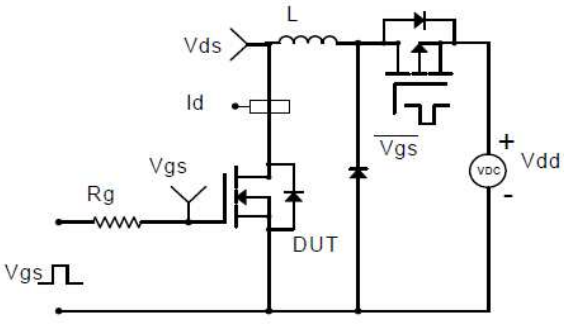


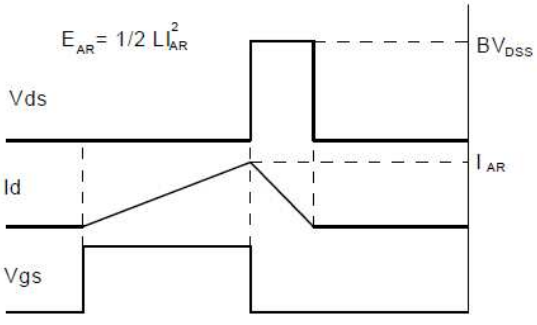
Resistive Switching Test Circuit & Waveforms





Unclamped Inductive Switching (UIS) Test Circuit & Waveforms





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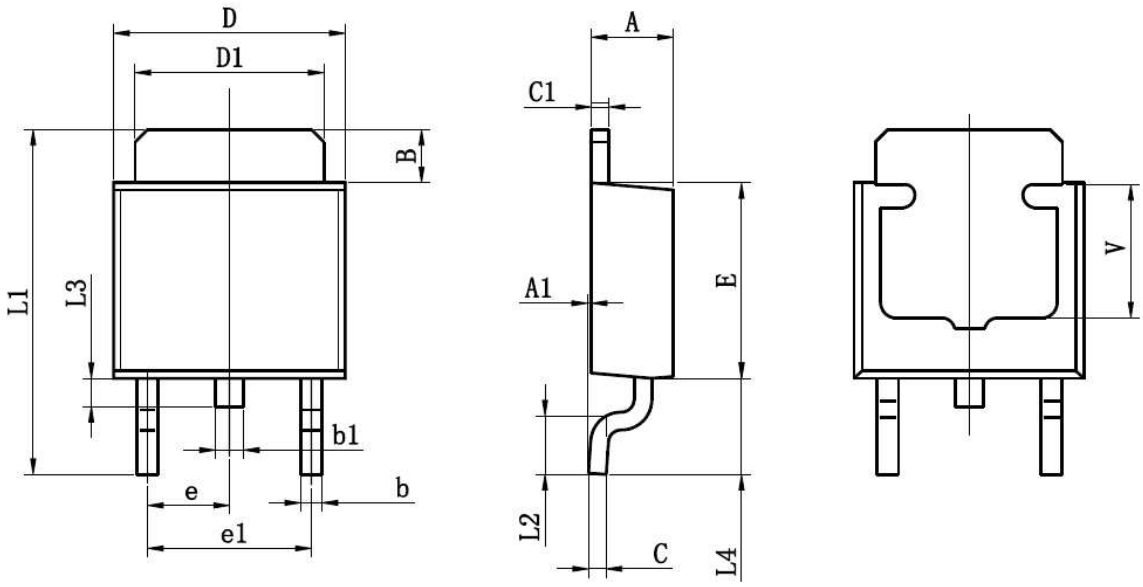
TO-252-2L PACKAGE OUTLINE SOP-8P



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
B	1.350	1.650	0.053	0.065
b	0.500	0.700	0.020	0.028
b1	0.700	0.900	0.028	0.035
c	0.430	0.580	0.017	0.023
c1	0.430	0.580	0.017	0.023
D	6.350	6.650	0.250	0.262
D1	5.200	5.400	0.205	0.213
E	5.400	5.700	0.213	0.224
e	2.300TYP		0.091TYP	
e1	4.500	4.700	0.177	0.185
L1	9.500	9.900	0.374	0.390
L2	1.400	1.780	0.055	0.070
L3	0.650	0.950	0.026	0.037
L4	2.550	2.900	0.100	0.114
V	3.80REF		0.150REF	

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