

P-Channel 30V MOSFET

EX2305A

V_{DS} (V)	$R_{DS(on),max}$ (m Ω)	I_D (A)
-20V	45 @ $V_{GS} = -4.5V$	-5.4

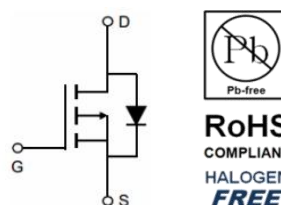
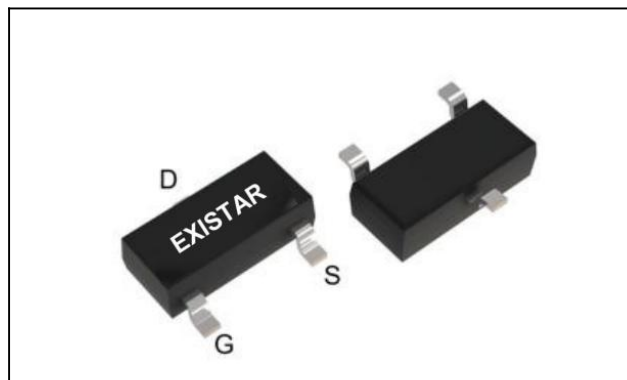
Features

- Low $R_{DS(on)}$ trench technology
- Low thermal impedance
- Fast switching speed
- 100% avalanche tested

Applications

- DC/DC conversion
- Load Switch
- Power Management

SOT-23



Package And Ordering Information

Ordering code	Package	Marking
EX2305A	SOT-23	2305A

Ordering Information

Package	Units/ Reel	Reels/ Inner Box	Units/ Inner Box
SOT-23	3000	15	45000

Key Performance Parameters

Parameter	Value	Unit
V _{DS} , min @ T _j (max)	-20	V
I _D , pulse	-20	A
R _{DS(ON)} , max @ V _{GS} = -4.5V	45	mΩ
Q _g	13.1	nC

Absolute Maximum Ratings at T_j=25°C Unless Otherwise Noted

Parameter		Symbol	Limit	Unit
Drain-source voltage		V _{DS}	-20	V
Gate-source voltage		V _{GS}	±12	
Continuous drain current	T _C =25°C	I _D	-5.4	A
	T _C =70°C		-4.3	
Pulsed drain current		I _{D,pulse}	-20	
Avalanche energy, single pulse		E _{AS}	-	mJ
Power dissipation	T _C =25°C	P _D	1.7	W
	T _C =100°C		1.1	
Operating junction and storage temperature range		T _J , T _{stg}	-55 To 150	°C

Thermal Characteristics

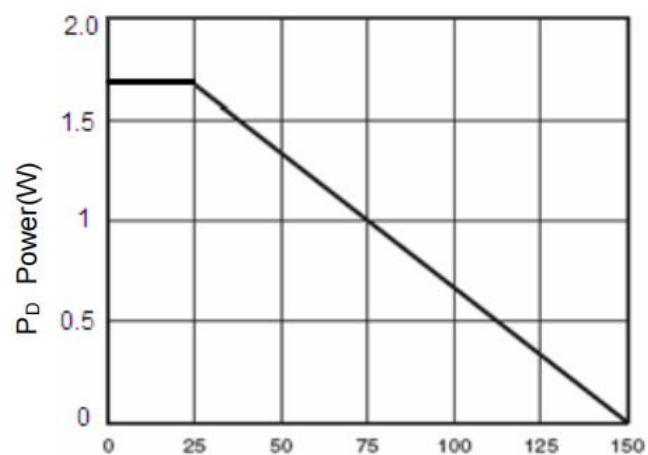
Parameter		Symbol	Max.	Unit
Thermal resistance, junction-to-case	Steady state	R _{θJC}	-	°C/W
Thermal resistance, junction-to-ambient	Steady state	R _{θJA}	125	

Electrical Characteristics at T_j=25°C unless otherwise specified

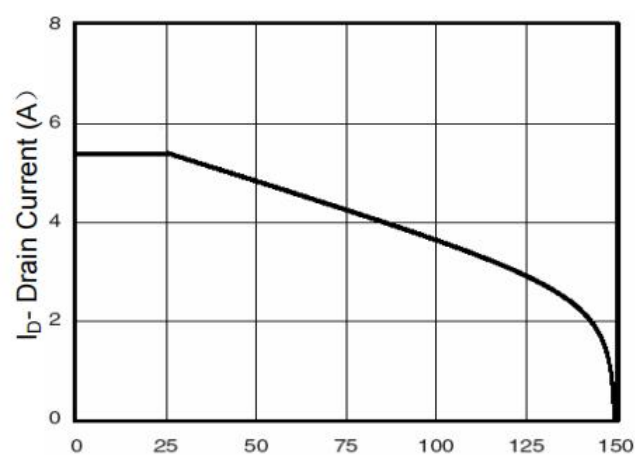
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions
Static						
Drain to source breakdown voltage	V _{(BR)DSS}	-20			V	V _{GS} = 0, I _D = -250 μA
Gate-source threshold voltage	V _{GS(th)}	-0.45	-0.7	-1	V	V _{DS} = V _{GS} , I _D = -250 μA
Gate-body leakage	I _{GSS}			±100	nA	V _{DS} = 0 V, V _{GS} = ±12 V
Zero gate voltage drain current	I _{DSS}			-1	μA	V _{DS} = -20 V, V _{GS} = 0 V
Drain-source on-resistance	R _{DS(on)}		34	45	mΩ	V _{GS} = -4.5 V, I _D = -4.1 A
Drain-source on-resistance	R _{DS(on)}		44	60	mΩ	V _{GS} = -2.5 V, I _D = -3 A
Drain-source on-resistance	R _{DS(on)}		60	90	mΩ	V _{GS} = -1.8 V, I _D = -2 A

Forward transconductance	g_{fs}		6		S	$V_{DS} = -5\text{ V}, I_D = -4.1\text{ A}$
Gate Charge						
Total gate charge	Q_g		13.1		nC	$V_{DS} = -10\text{ V}, I_D = -4.1\text{ A},$ $V_{GS} = -4.5\text{ V}$
Gate-source charge	Q_{gs}		2.0			
Gate-drain charge	Q_{gd}		2.7			
Dynamic						
Turn-on delay time	$t_{d(on)}$		12		ns	$V_{DS} = -10\text{ V}, V_{GS} = -4.5\text{ V},$ $R_L = -1.2\ \Omega, R_{GEN} = 1\ \Omega$
Rise time	t_r		35			
Turn-off delay time	$t_{d(off)}$		30			
Fall time	t_f		10			
Input capacitance	C_{iss}		1120		pF	$V_{DS} = -10\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$
Output capacitance	C_{oss}		105			
Reverse transfer capacitance	C_{rss}		100			
Body Diode						
Diode forward voltage	V_{SD}			-1.2	V	$V_{GS} = 0\text{ V}, I_F = -4.1\text{ A}$
Diode Forward Current	I_s			-4.1	A	

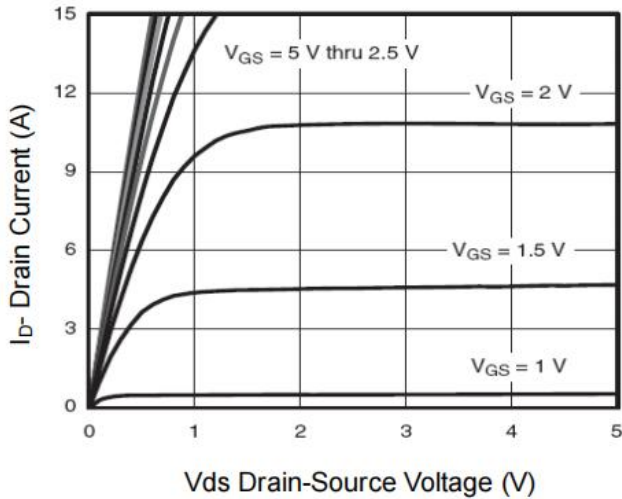
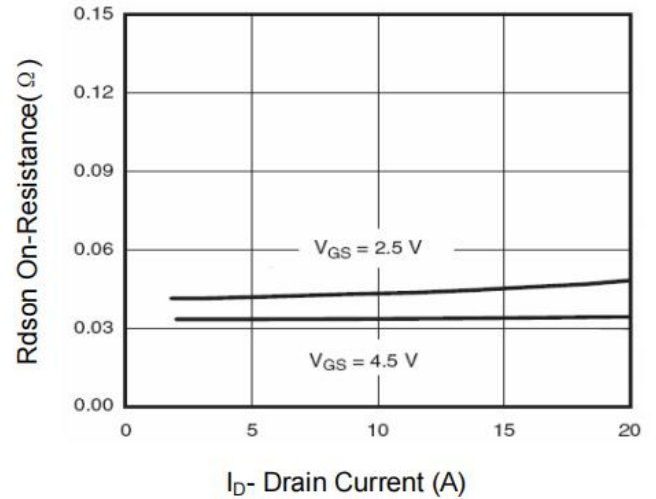
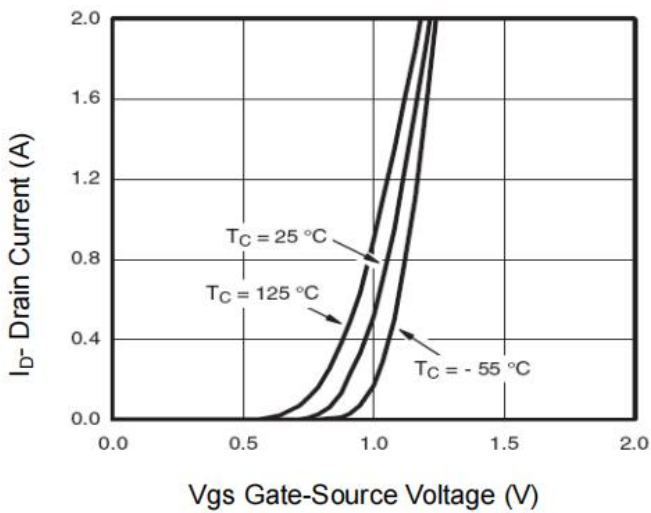
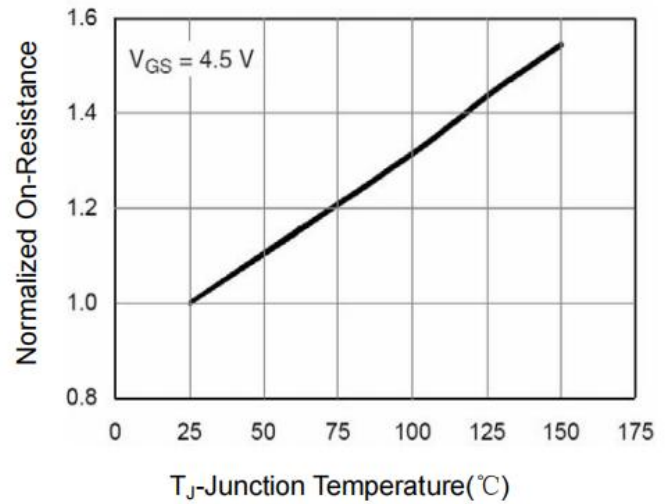
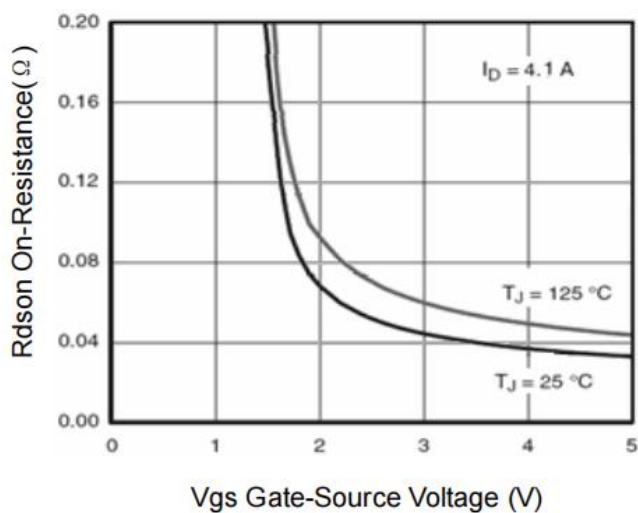
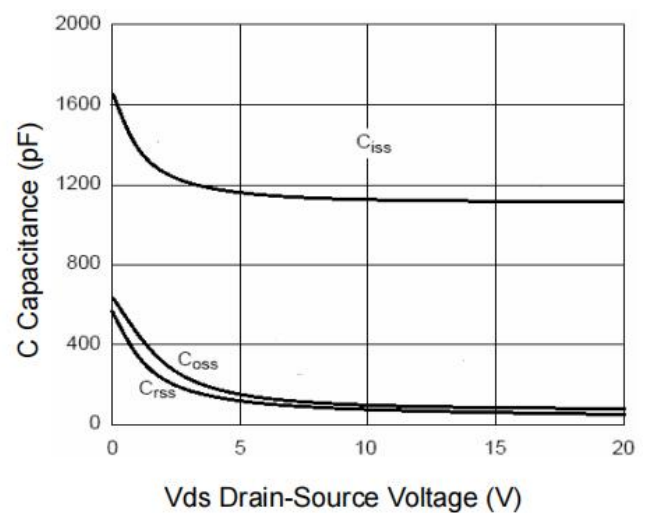
Electrical Characteristics Diagrams



T_C -Case Temperature(°C)
Figure 1 Power Dissipation



T_C -Case Temperature(°C)
Figure 2 Drain Current


Figure 3 Output Characteristics

Figure 4 Drain-Source On-Resistance

Figure 5 Transfer Characteristics

Figure 6 Drain-Source On-Resistance

Figure 7 Rdson vs VGS

Figure 8 Capacitance vs Vds

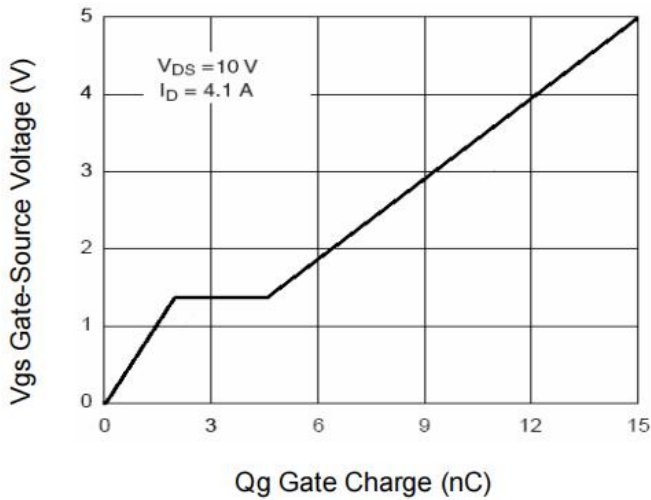


Figure 9 Gate Charge

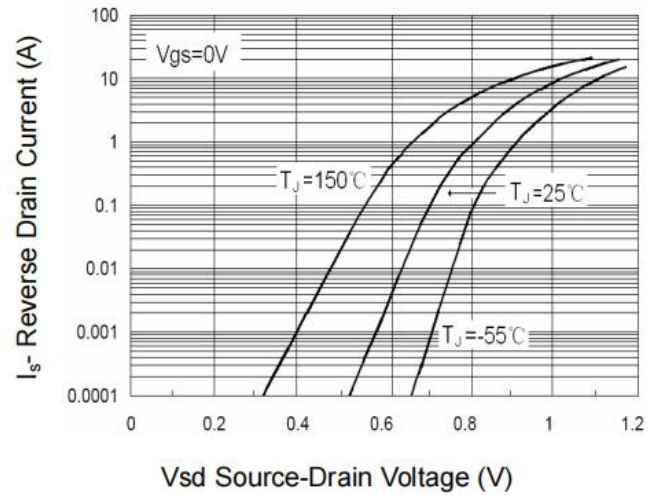


Figure 10 Source- Drain Diode Forward

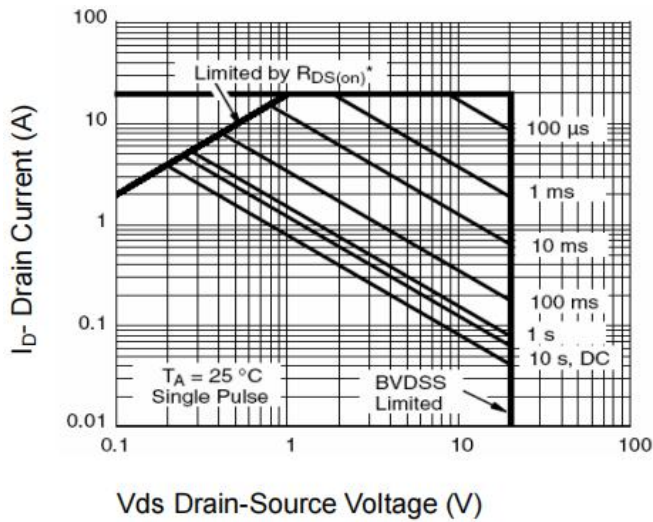


Figure 11 Safe Operation Area

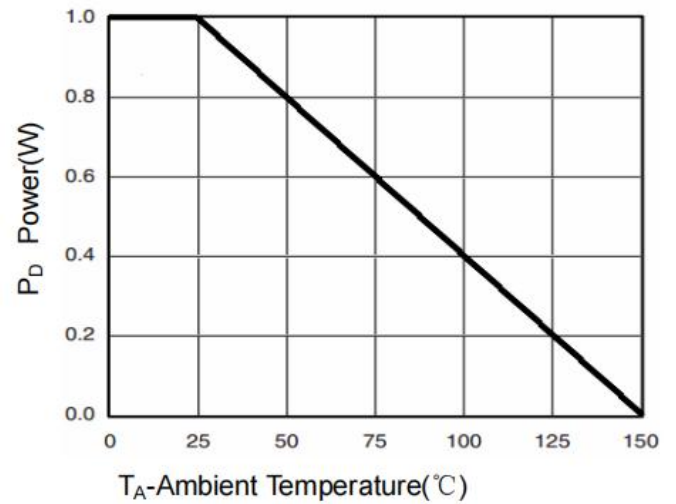


Figure 12 Power Dissipation

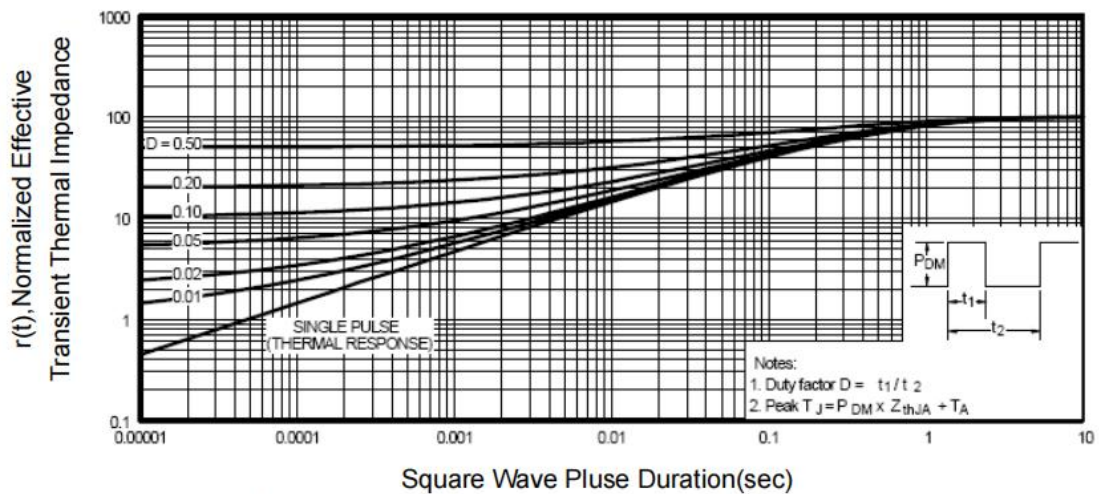


Figure 13 Normalized Maximum Transient Thermal Impedance

Test circuits and waveforms

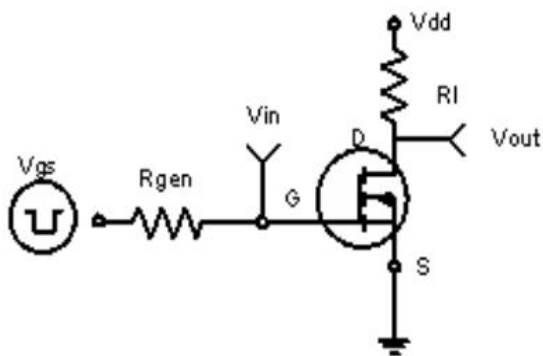


Figure 1: Switching Test Circuit

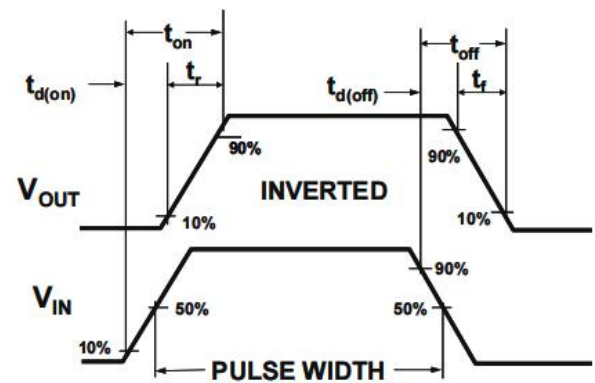
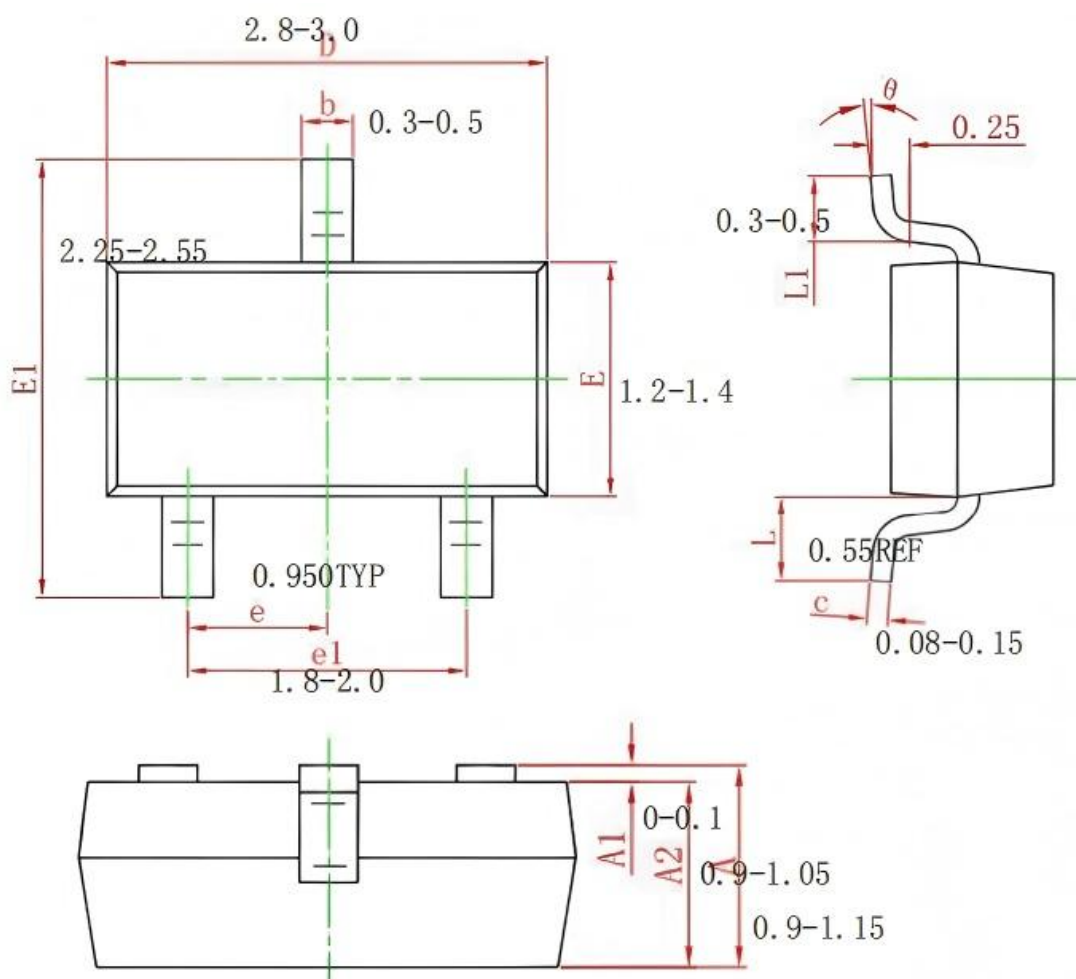


Figure 2: Switching Waveforms

Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

Legal Disclaimer

The information given in this document shall be for illustrative purposes only and shall in no event be regarded as a guarantee of conditions or characteristics. Existar Technologies reserves the right to change any information herein. With respect to any examples, hints or any typical values stated herein and/or any information regarding the application of the product, Existar Technologies or its affiliates hereby make no representation or warranty of any kind, expressed or implied, as to any information provided hereunder, including without limitation as to the accuracy, completeness or non-infringement of intellectual property rights of any third party, and they assume no liability for the consequences of use of such information. In addition, any information given in this document is subject to customer's compliance with its obligations stated herein and any applicable legal requirements, norms and standards concerning customer's products and any use of the product of Existar Technologies in customer's applications. The information contained herein is exclusively intended for technically trained staff. No license is granted by implication under any patent right, copyright, mask work right, or other intellectual property right. It is customer's sole responsibility to evaluate the suitability of the product for the intended application and the completeness of the product information given herein with respect to such application. In no event shall Existar Technologies or its affiliates be liable to any party for any direct, indirect, special, punitive, incidental or consequential damages of any nature whatsoever, including but not limited to loss of profits and loss of goodwill, whether or not such damages are based on tort or negligence, warranty, breach of contract or any other legal theory.