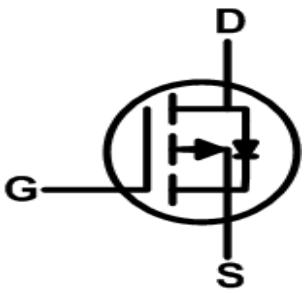
★ Super Low Gate Charge
★ Green Device Available
★ Excellent CdV/dt effect decline
★ Advanced high cell density Trench technology

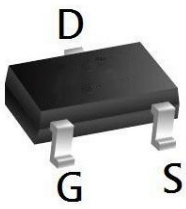


Description

The WL2301B is the high cell density trenched P-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The WL2301B meet the RoHS and Green Product requirement with full function reliability approved.

SOT 23 Pin Configurations



Product Summary

BVDSS	RDSON	ID
-20V	93mΩ	-2.0A

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	±12	V
I_D@T_A=25°C	Continuous Drain Current, V_{GS} @ -4.5V[1]	-2.0	A
I_D@T_A=70°C	Continuous Drain Current, V_{GS} @ -4.5V[1]	-1.4	A
I_{DM}	Pulsed Drain Current[2]	-8	A
P_D@T_A=25°C	Total Power Dissipation[3]	0.8	W
T_{STG}	Storage Temperature Range	-55 to 150	°C
T	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient [1]	---	156	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	---	°C/W

Electrical Characteristics

T_C = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_D = -250 uA	-20	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} =-20 V, V_{GS} = 0 V	--	--	-1	uA
I_{GSSF}	Gate-Body Leakage Current, Forward	V_{GS} = -12V, V_{DS} = 0 V	--	--	-100	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	V_{GS} = 12 V, V_{DS} = 0 V	--	--	100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = -250 uA	-0.45	-0.50	-0.55	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	V_{GS} = -4.5V, I_D =-3.4A	--	93	100	mΩ
		V_{GS} = -2.5 V, I_D =-2.5A	--	116	140	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} = -10V, V_{GS} = 0 V, f = 1.0 MHz	--	267	-	pF
C_{oss}	Output Capacitance		--	30	-	pF
C_{rss}	Reverse Transfer Capacitance		--	28	-	pF
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{GS}=-4.5V, V_{DS}=-10V, R_G = 3Ω ,R_L = 5Ω (Note 3)	--	10	--	ns
t_r	Turn-On Rise Time		--	6	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	20	--	ns
t_f	Turn-Off Fall Time		--	7	--	ns
Q_g	Total Gate Charge	V_{DS} = -10 V, I_D =-2A, V_{GS} = -4.5V (Note 3)	--	3.1	--	nC
Q_{gs}	Gate-Source Charge		--	0.5	--	nC
Q_{gd}	Gate-Drain Charge		--	0.8	--	nC
R_G	Gate Resistance	f = 1MHz	--	6.1	--	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain-Source Diode Forward Current		--	--	-2	A
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current		--	--	-8	A
V_{SD}	Drain to Source Diode Forward Voltage,V_{GS} = 0V, I_{SD} =-3A,T_J = 25℃		--	--	-1.2	V

Notes:
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. Device mounted on FR-4 PCB, 1inch x 0.85inch x 0.062 inch
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Typical Performance Characteristics

P- Channel Typical Characteristics

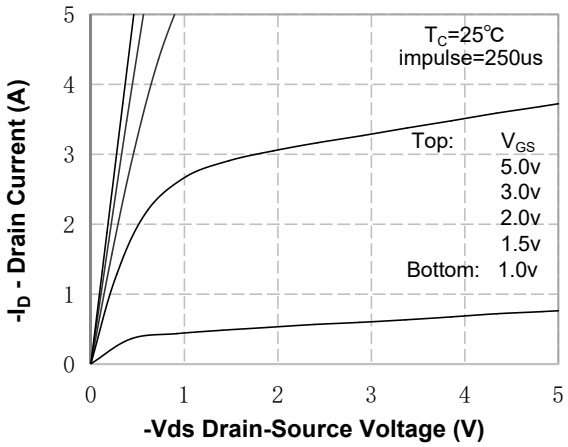


Figure 1. On-Region Characteristics

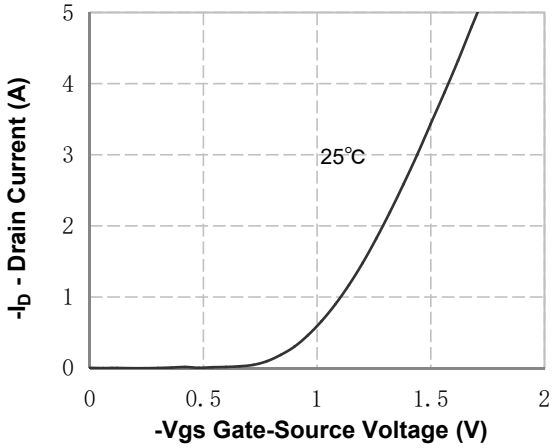


Figure 2. Transfer Characteristics

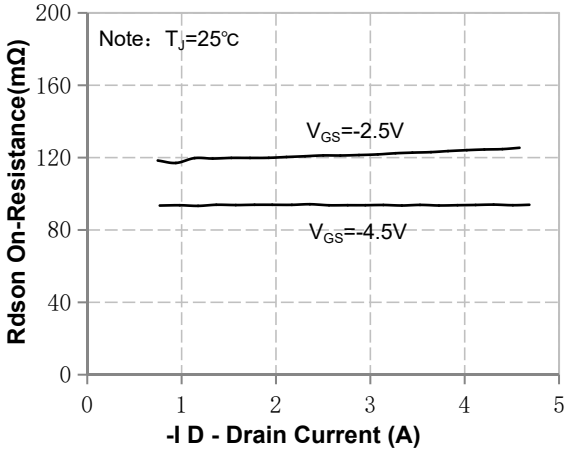


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

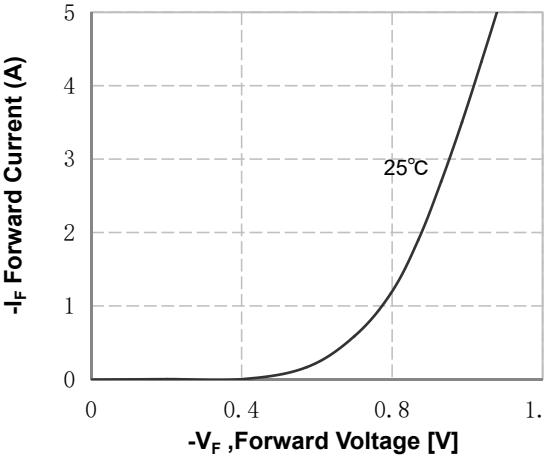


Figure 4. Body Diode Forward Voltage Variation with Source Current

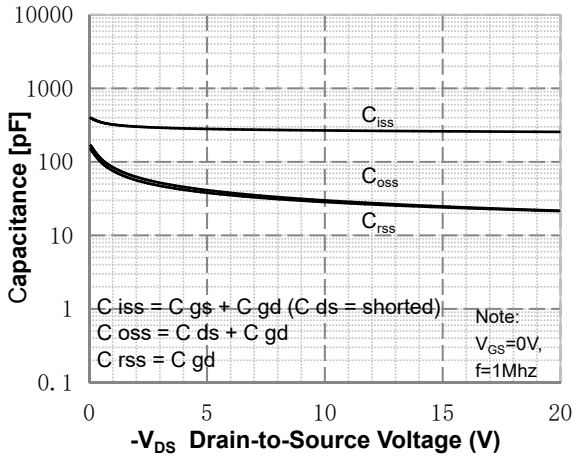


Figure 5. Capacitance Characteristics

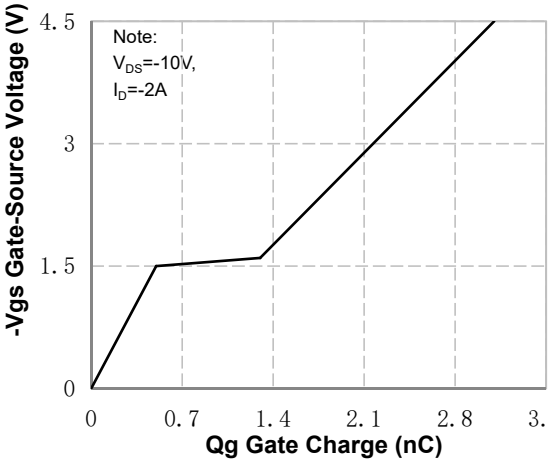


Figure 6. Gate Charge Characteristics

P- Channel Typical Characteristics

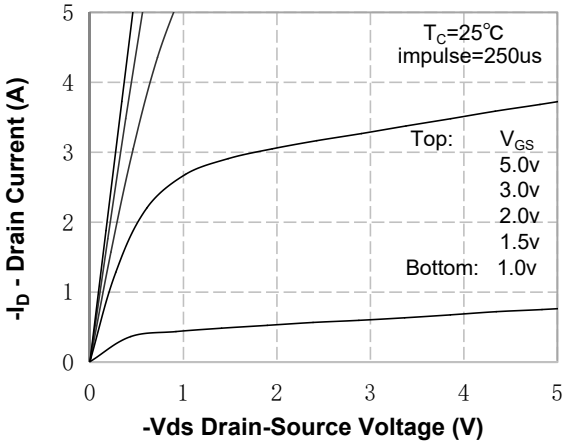


Figure 1. On-Region Characteristics

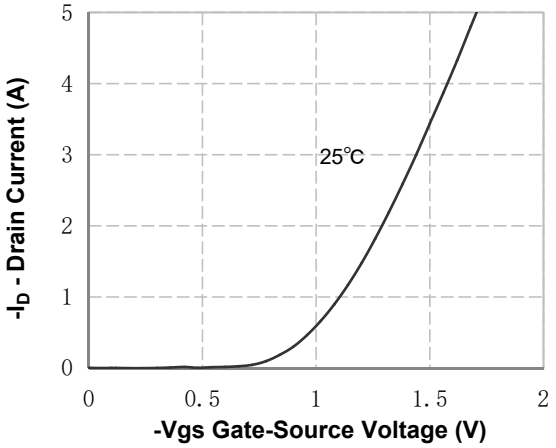


Figure 2. Transfer Characteristics

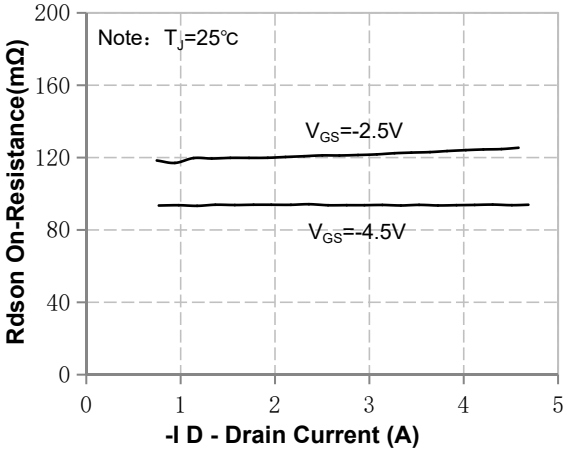


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

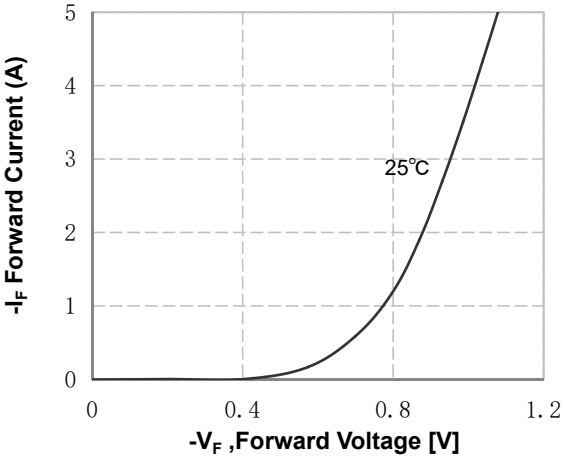


Figure 4. Body Diode Forward Voltage Variation with Source Current

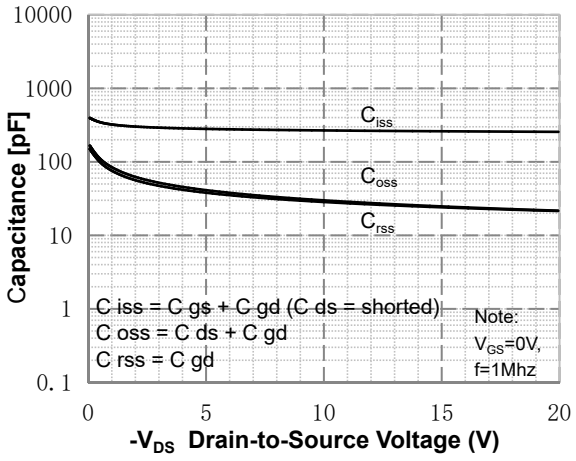


Figure 5. Capacitance Characteristics

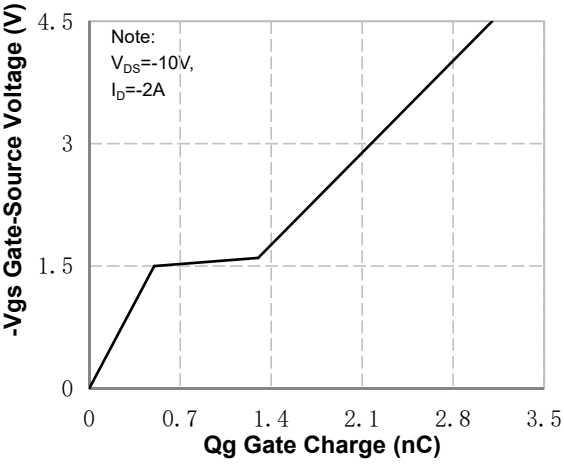
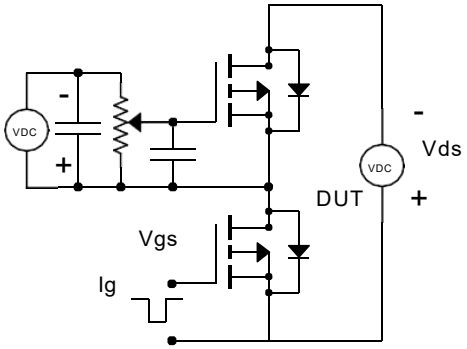
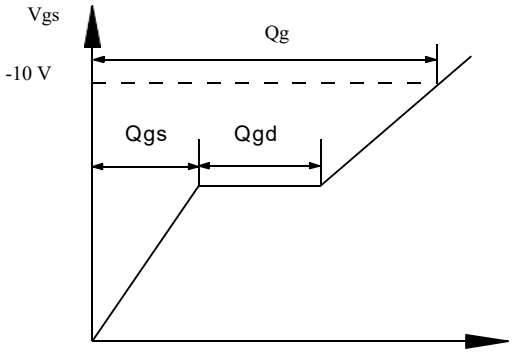


Figure 6. Gate Charge Characteristics

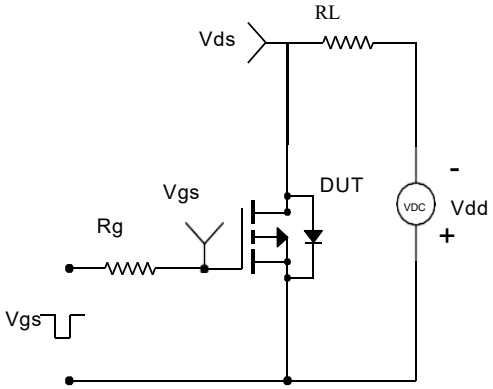
P- Channel

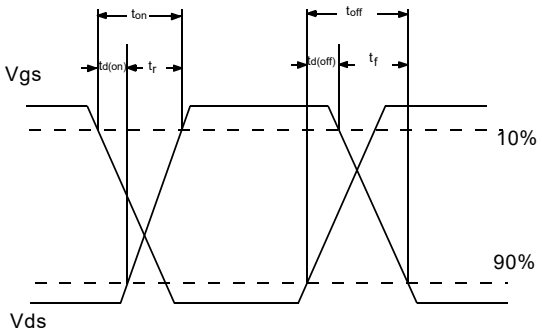
Gate Charge Test Circuit & Waveform



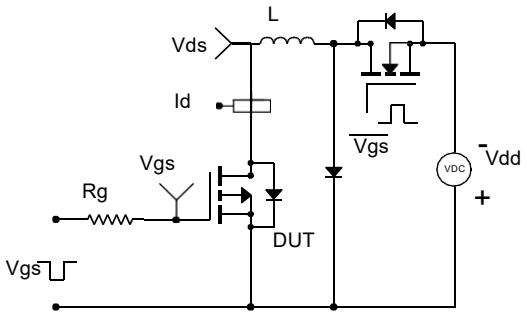


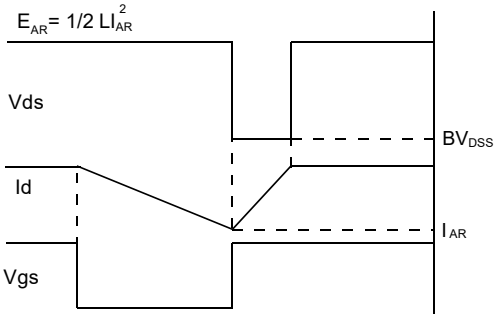
Resistive Switching Test Circuit & Waveforms





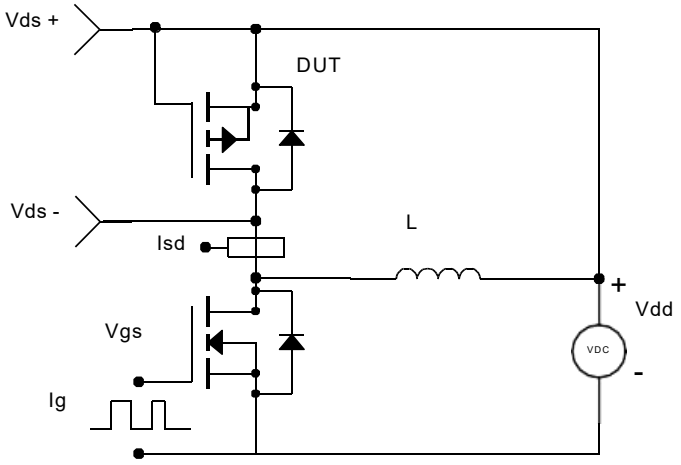
Unclamped Inductive Switching Test Circuit & Waveforms



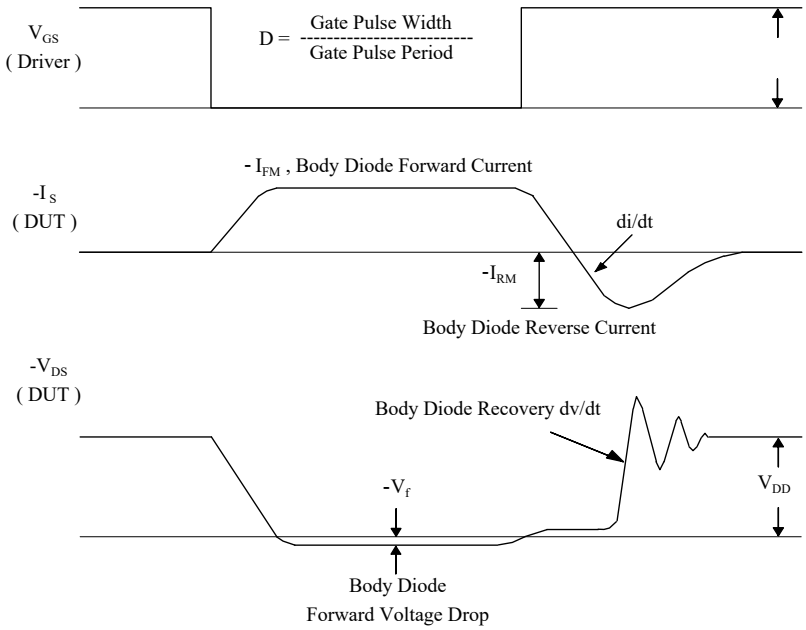


P- Channel

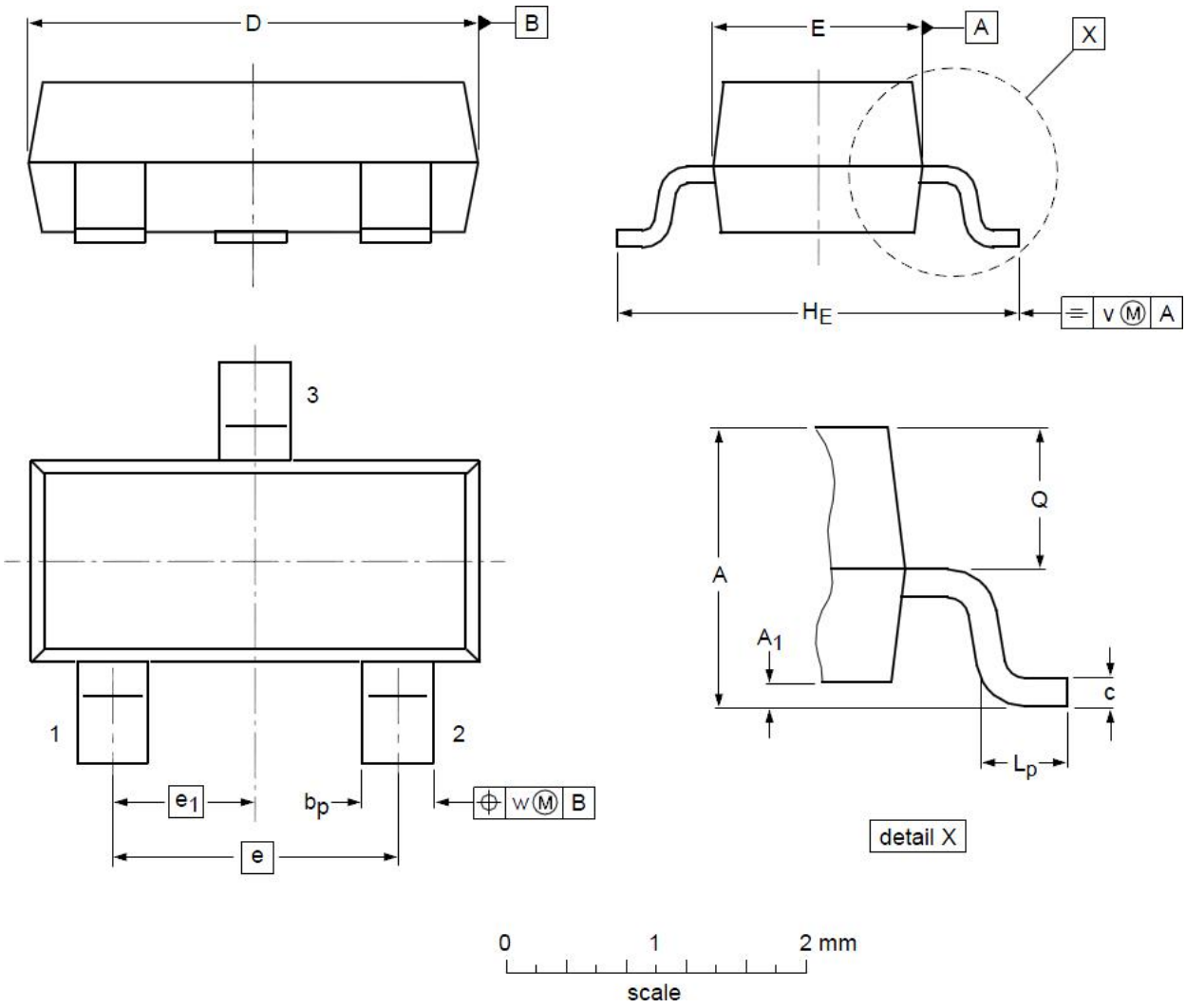
Peak Diode Recovery dv/dt Test Circuit & Waveforms



- dv/dt controlled by R_G
- I_{SD} controlled by pulse period



Package Mechanical Data-SOT-23



DIMENSIONS (unit : mm)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	0.90	1.01	1.15	**A_1**	0.01	0.05	0.10
b_p	0.30	0.42	0.50	**c**	0.08	0.13	0.15
D	2.80	2.92	3.00	**E**	1.20	1.33	1.40
e	--	1.90	--	**e_1**	--	0.95	--
H_E	2.25	2.40	2.55	**L_p**	0.30	0.42	0.50
Q	0.45	0.49	0.55	**v**	--	0.20	--
w	--	0.10	--				

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