

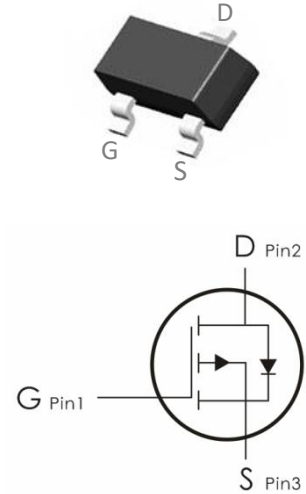
Description:

This P-Channel MOSFET uses advanced trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge.

It can be used in a wide variety of applications.

Features:

- 1) $V_{DS}=-30V, I_D=-3.3A, R_{DS(on)}<45m\Omega @V_{GS}=-10V$ (Typ: $37m\Omega$)
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra low $R_{DS(on)}$.
- 5) Excellent package for good heat dissipation.
- 6) MSL3



Package Marking and Ordering Information:

Part NO.	Marking	Package	Packing
DO3401D	3401D	SOT-23	3000 pcs/Reel

Absolute Maximum Ratings: ($T_A=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	± 12	V
I_D	Continuous Drain Current- $T_A=25^\circ C^1$	-3.3	A
	Continuous Drain Current- $T_A=100^\circ C^1$	-2.3	
I_{DM}	Pulsed Drain Current ²	-13.2	
P_D	Power Dissipation	1.5	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55-+150	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	83	$^\circ C/W$

Electrical Characteristics: ($T_A=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu\text{A}$	-30	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=-30V$	---	---	-1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0A$	---	---	± 100	nA
On Characteristics						
$V_{GS(th)}$	Gate-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$	-0.6	-0.95	-1.3	V
$R_{DS(on)}$	Drain-Source On Resistance ³	$V_{GS}=-10V, I_D=-2A$	---	37	45	$\text{m}\Omega$
		$V_{GS}=-4.5V, I_D=-1A$	---	44	55	$\text{m}\Omega$
		$V_{GS}=-2.5V, I_D=-1A$	---	66	80	$\text{m}\Omega$
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=-15V, V_{GS}=0V, f=1\text{MHz}$	---	510	---	pF
C_{oss}	Output Capacitance		---	56	---	
C_{rss}	Reverse Transfer Capacitance		---	49	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	$V_{DS}=-15V, I_D=-3A,$ $R_{ENG}=3\ \Omega, V_{GS}=-4.5V$	---	10.5	---	ns
t_r	Rise Time		---	84	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	126	---	ns
t_f	Fall Time		---	367	---	ns
Q_g	Total Gate Charge	$V_{GS}=-4.5V, V_{DS}=-15V,$ $I_D=-3A$	---	6	---	nC
Q_{gs}	Gate-Source Charge		---	1.4	---	nC
Q_{gd}	Gate-Drain "Miller" Charge		---	2	---	nC
Drain-Source Diode Characteristics						
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_{SD}=-2A$	---	---	-1.2	V
I_S	Continuous Drain Current	$V_D=V_G=0V$	---	---	-3.3	A
I_{SM}	Pulsed Drain Current		---	---	-13.2	A
T_{rr}	Reverse Recovery Time	$I_F=-3A, T_J=25^\circ\text{C}$	---	35	---	ns
Q_{rr}	Reverse Recovery Charge	$dI/dt=100A/\mu\text{s}$	---	4	---	nC

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. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$

Test Circuit

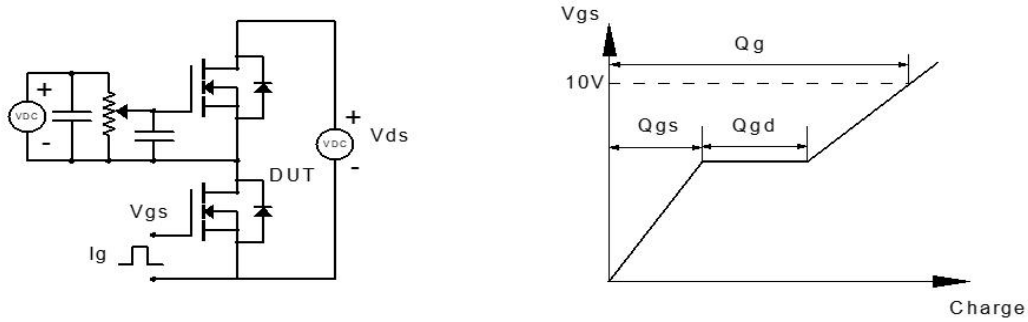


Figure 1: Gate Charge Test Circuit & Waveform

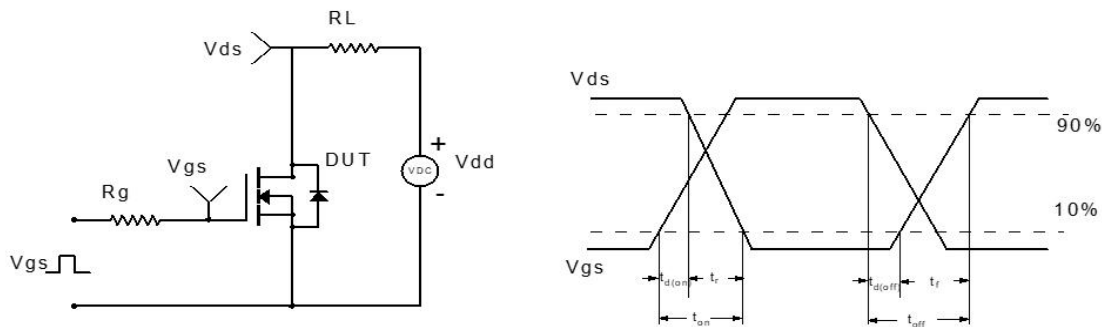


Figure 2: Resistive Switching Test Circuit & Waveform

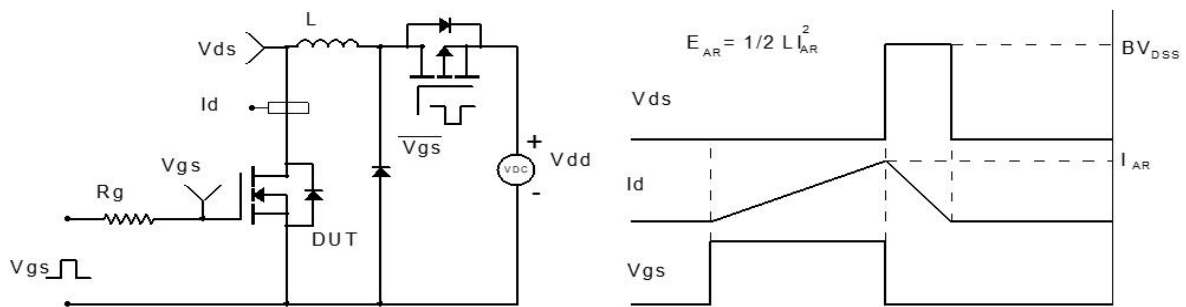


Figure 3: Unclamped Inductive Switching Test Circuit & Waveform

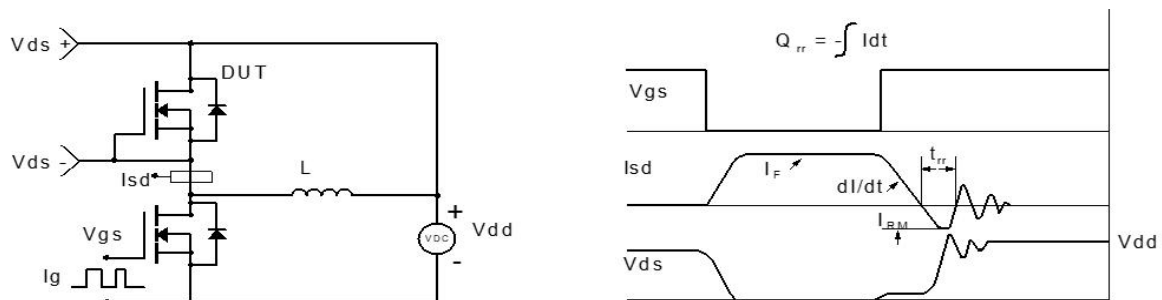
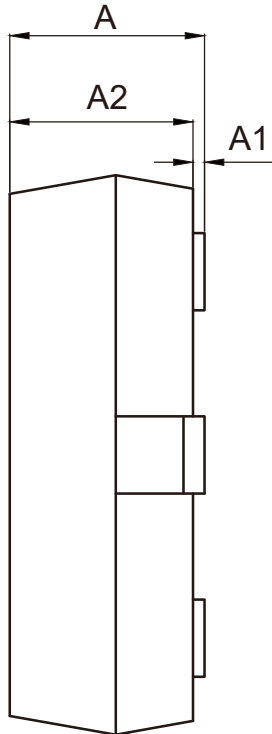
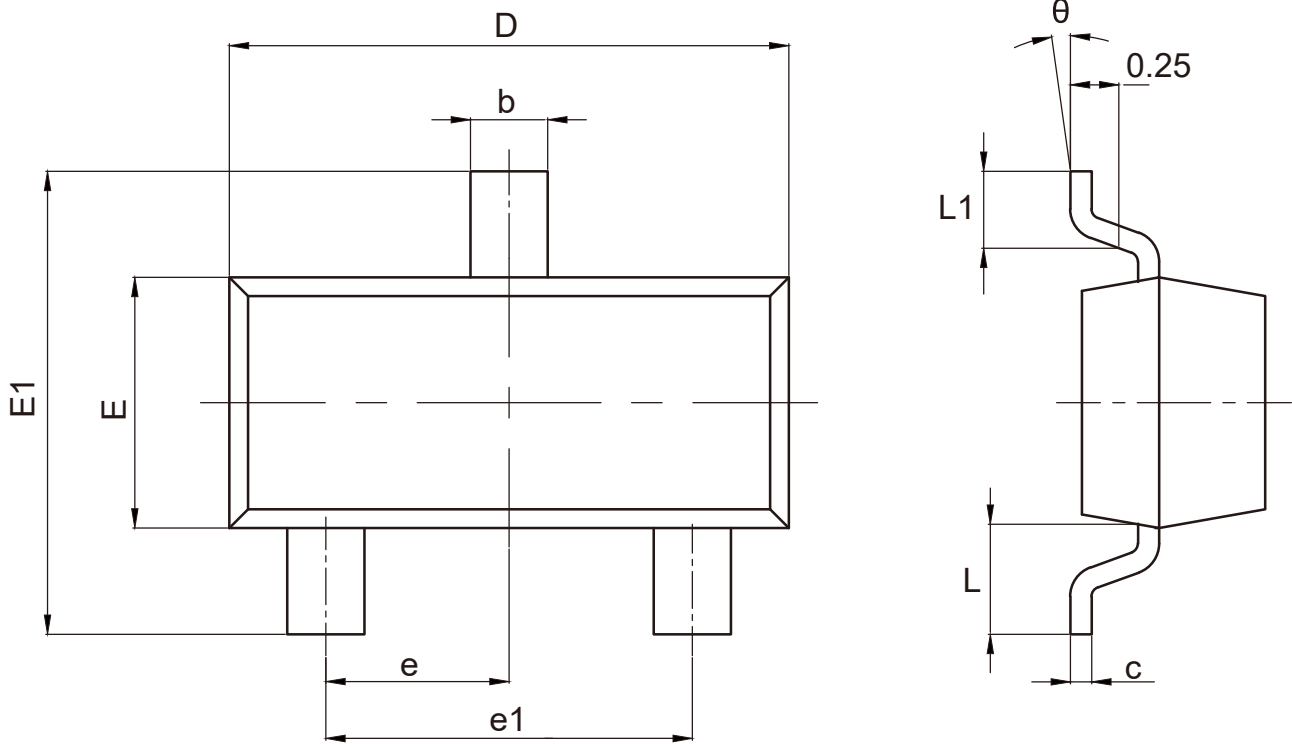


Figure 4: Diode Recovery Test Circuit & Waveform

SOT-23Package Outline Data

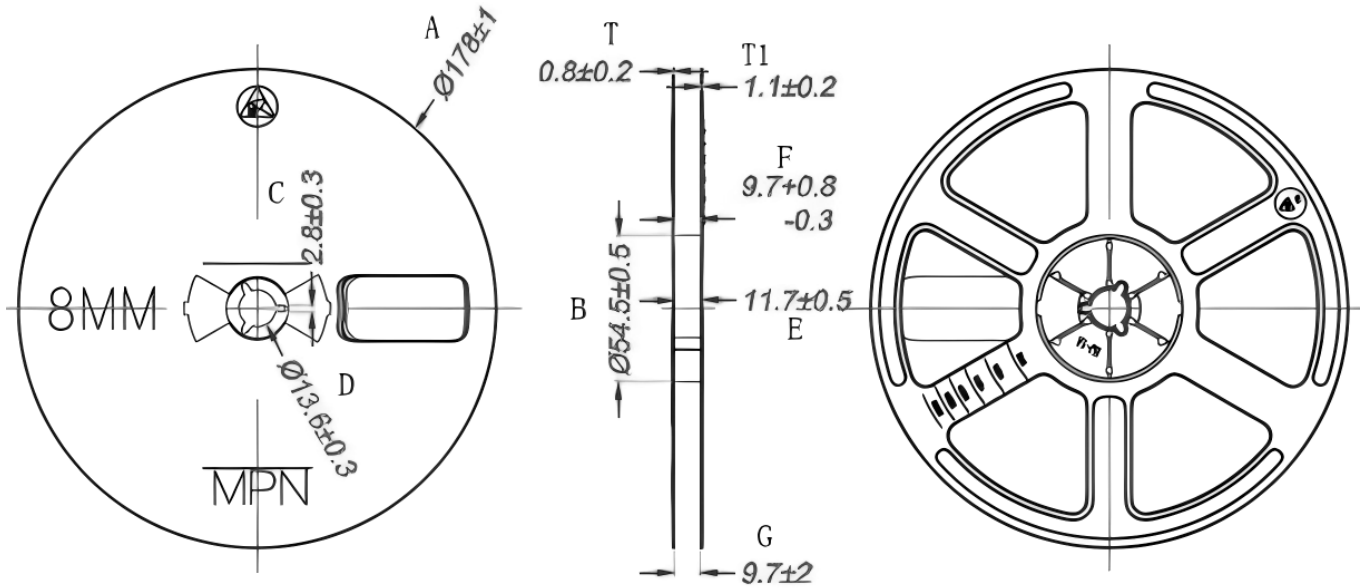


COMMON DIMENSIONS			
CUNITS MEASURE=MILLIMETER			
SYMBOL	MIN	NOM	MAX
A	0.900	--	1.150
A1	0.000	--	0.100
A2	0.900	--	1.050
c	0.100	--	0.200
b	0.300	0.400	0.500
D	2.800	2.900	3.000
E	1.200	--	1.400
E1	2.250	--	2.550
e	0.950TYP		
e1	1.800	1.900	2.000
L	0.550REF		
L1	0.300	0.400	0.500
θ	0°	--	8°

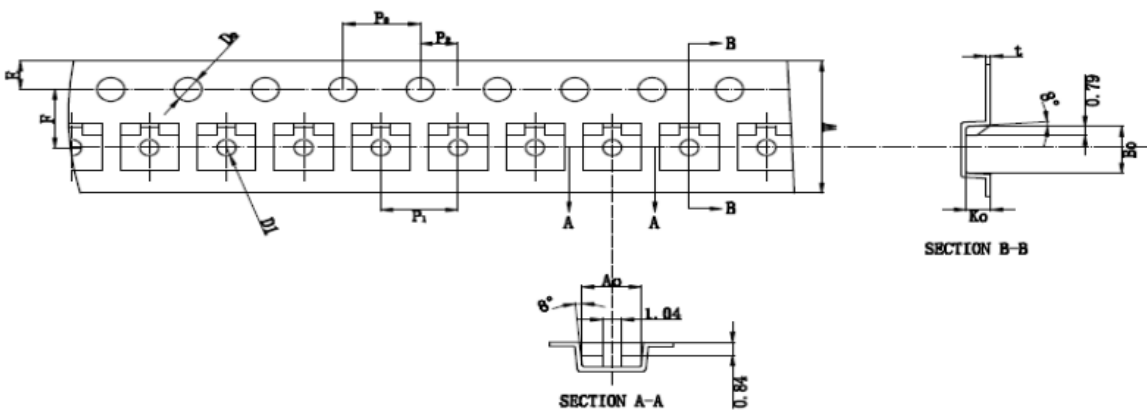
Unit:mm


Tape & Reel Information

Dimensions in mm

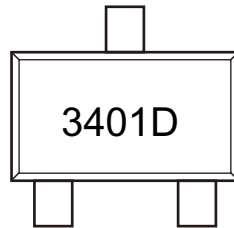


PKG TYPE	W	P	E	F	D	D1	Po	Po10	P2	A0	B0	K0	T
SOT-23	8.00	4.00	1.75	3.50	1.55	1.00	4.00	40.00	2.00	3.17	2.77	1.28	0.20
Tolerance	+0.3/-0.1	± 0.1	± 0.1	± 0.05	± 0.1	± 0.1	± 0.1	± 0.2	± 0.05	± 0.1	± 0.1	± 0.1	± 0.03



Pulling direction 


Marking Information:



Previous Version

Version	Date	Subjects (major changes since last revision)
1.0	2024-01-10	Release of final version

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