

**• General Description**

The ZM2301T combines advanced trench MOSFET technology with a low resistance package to provide extremely low  $R_{DS(ON)}$ . This device is ideal for load switch and battery protection applications.

**• Features**

- Advance high cell density Trench technology
- Low  $R_{DS(ON)}$  to minimize conductive loss
- Low Gate Charge for fast switching
- Low Thermal resistance

**• Application**

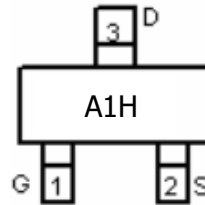
- Load Switch
- Display Screen Drive

**• Product Summary**


$V_{DS} = -20V$

$R_{DS(ON)} = 105m\Omega$

$I_D = -2.8A$



SOT23

**• Ordering Information:**

Part NO.	ZM2301T-
Marking	A1H
Packing Information	REEL TAPE
Basic ordering unit (pcs)	3000

**• Absolute Maximum Ratings ( $T_c = 25^\circ C$ )**

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	-20	V
Gate-Source Voltage	$V_{GS}$	$\pm 8$	V
Continuous Drain Current	$I_{D@TC=25^\circ C}$	-2.8	A
	$I_{D@TC=75^\circ C}$	-2.1	A
	$I_{D@TC=100^\circ C}$	-1.7	A
Pulsed Drain Current <sup>①</sup>	$I_{DM}$	-10	A
Total Power Dissipation <sup>②</sup>	$P_D$	10	W
Total Power Dissipation( $T_A=25^\circ C$ )	$P_D@T_A=25^\circ C$	1.25	W
Operating Junction Temperature	$T_J$	-55 to 150	$^\circ C$
Storage Temperature	$T_{STG}$	-55 to 150	$^\circ C$

**•Thermal resistance**

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case <sup>②</sup>	R <sub>thJC</sub>	-	-	12.5	° C/W
Thermal resistance, junction - ambient	R <sub>thJA</sub>	-	-	100	° C/W
Soldering temperature, wavesoldering for 10s	T <sub>sold</sub>	-	-	265	° C

**•Electronic Characteristics**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA	-20			V
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =-250uA	-0.45		-1.2	V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =-20V, V <sub>GS</sub> =0V			1.0	uA
Gate- Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±8V, V <sub>DS</sub> =0V			±100	nA
Static Drain-source On Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-2.8A		105	130	mΩ
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-2A		145	190	mΩ
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =5A		6.5		s

**•Electronic Characteristics**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C <sub>iss</sub>	f = 1MHz	-	415	-	pF
Output capacitance	C <sub>oss</sub>		-	223	-	
Reverse transfer capacitance	C <sub>rss</sub>		-	84	-	

**•Switching Parameters(T<sub>a</sub> = 25°C)**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Turn-On Delay Time	t <sub>d (ON)</sub>	V <sub>DD</sub> =-6V R <sub>L</sub> =6Ω, R <sub>G</sub> =6Ω I <sub>D</sub> = -1A V <sub>GEN</sub> = -4.5V	-	13	25	nS
Turn-On Rise Time	t <sub>r</sub>		-	36	60	
Turn-Off Delay Time	t <sub>d (off)</sub>		-	42	70	
Turn-On Fall Time	t <sub>f</sub>			36	60	

Note: ① Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2% ;

② Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate;

Fig.1 Power Dissipation Derating Curve

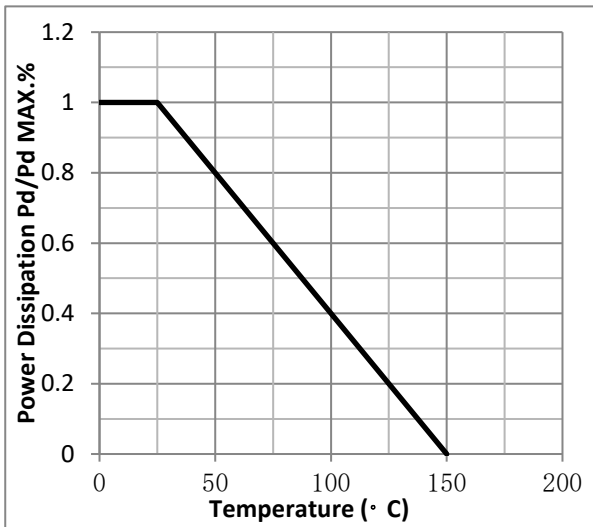


Fig.2 Typical output Characteristics

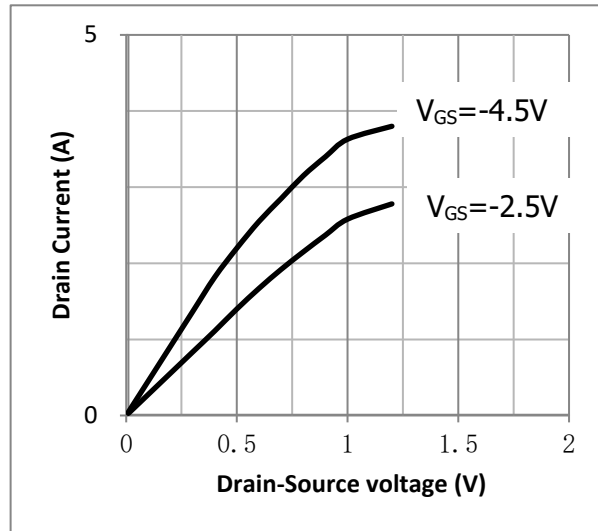


Fig.3 Threshold Voltage V.S Junction Temperature

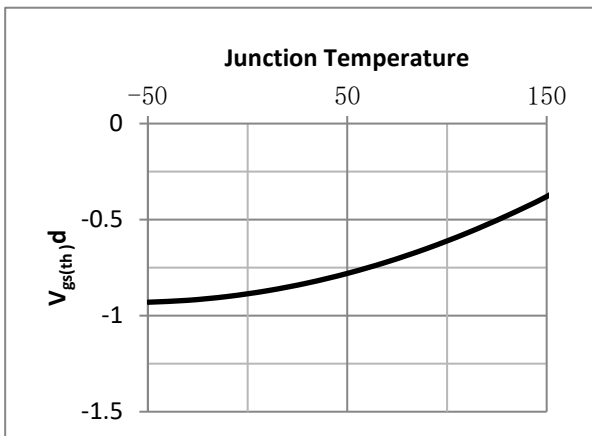


Fig.4 Resistance V.S Drain Current

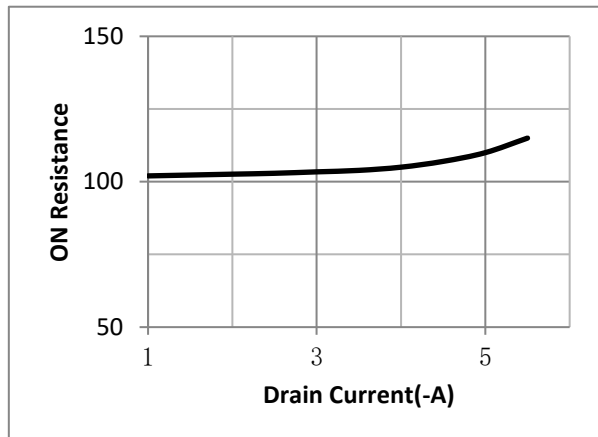


Fig.5 On-Resistance VS Gate Source Voltage

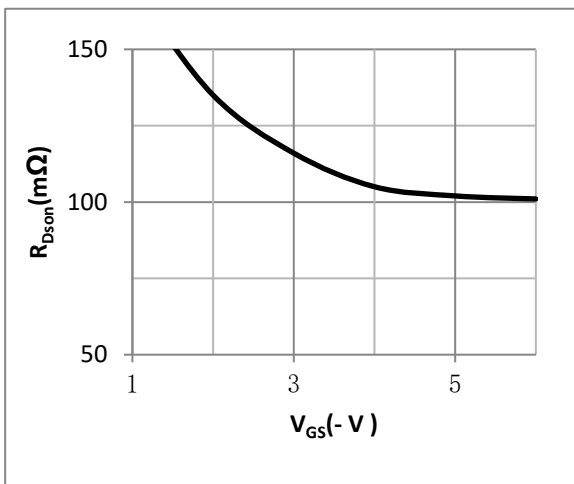


Fig.6 On-Resistance V.S Junction Temperature

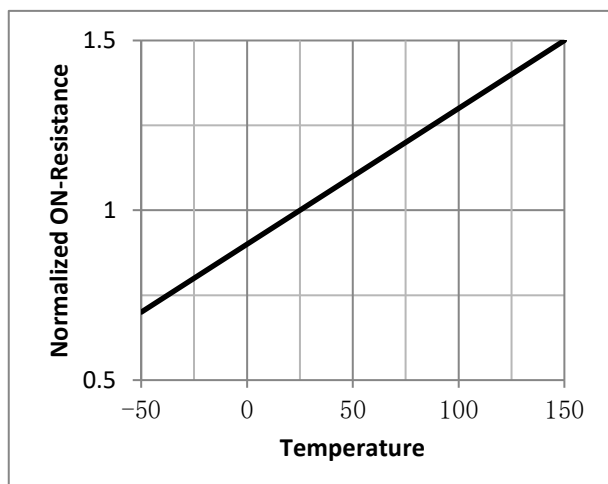


Fig.7 Switching Time Measurement Circuit

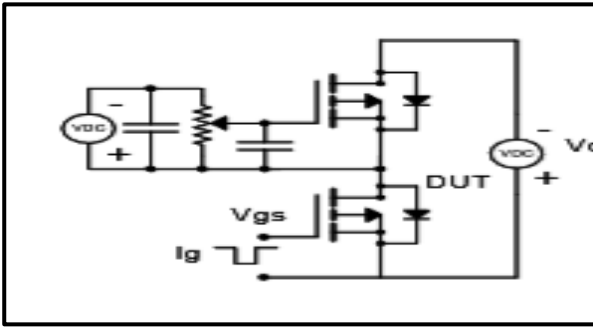


Fig.8 Gate Charge Waveform

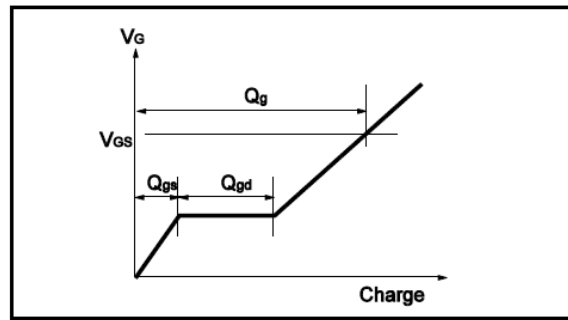


Fig.9 Switching Time Measurement Circuit

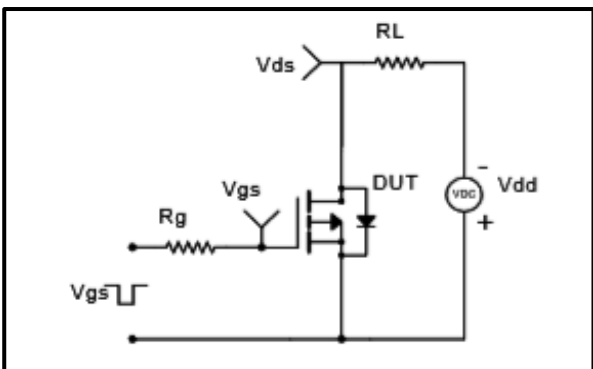


Fig.10 Gate Charge Waveform

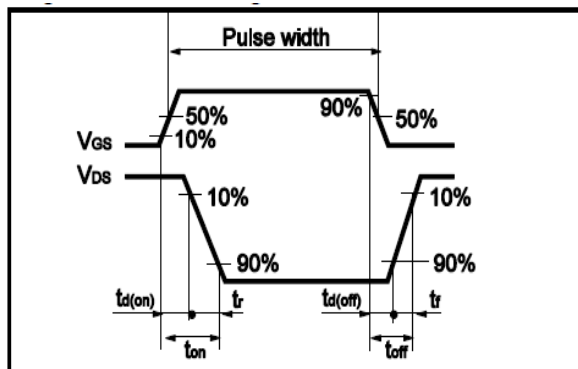


Fig.11 Avalanche Measurement Circuit

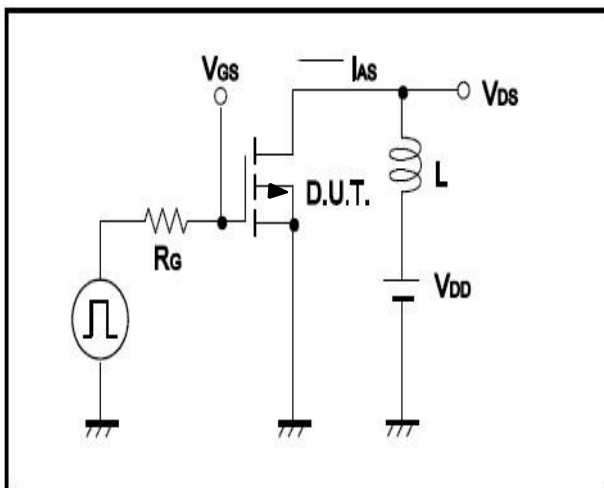
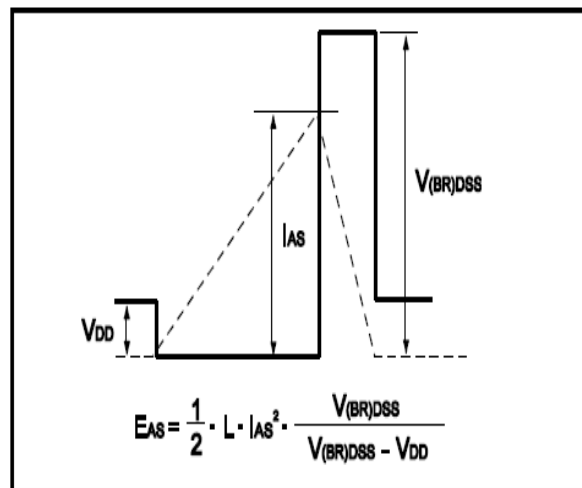


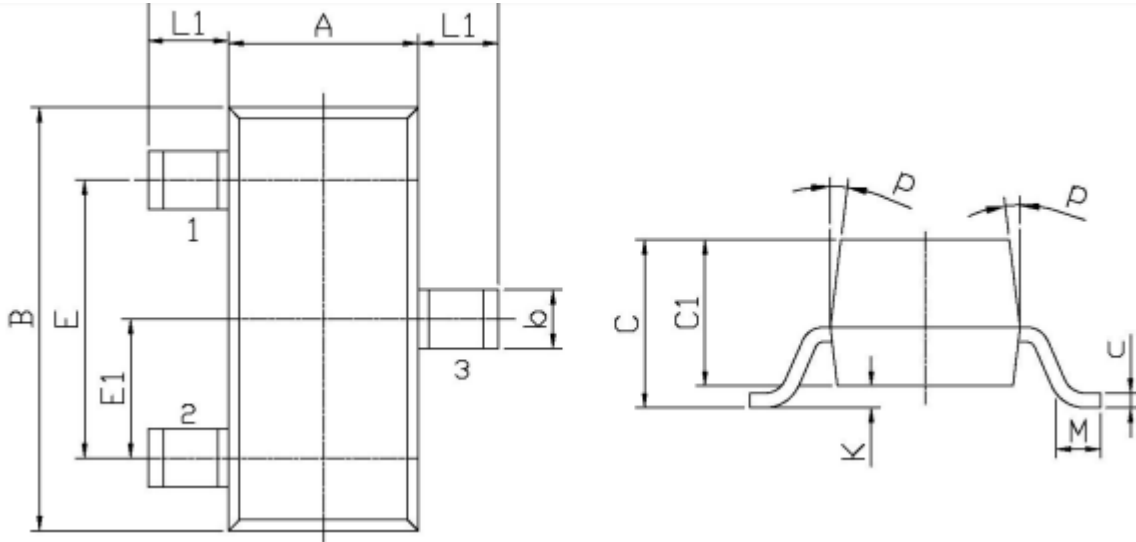
Fig.12 Avalanche Waveform





•Dimensions(SOT23)

Unit: mm



Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
L	2.2	2.7	C	1.30Max	
L1	0.45	0.65	C1	0.90	1.20
A	1.15	1.50	c	0.05	0.20
B	2.70	3.10	K	0	0.10
E	1.70	2.10	M	0.20MIN	
E1	0.85	1.05	P	7°	
b	0.35	0.55			