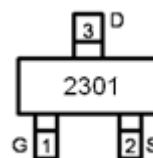
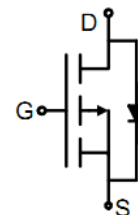


Main Product Characteristics:

V_{DSS}	-20V
$R_{DS(on)}$	39m Ω (typ.)
I_D	-4A


SOT-23

Marking and Pin Assignments

Schematic Diagram
Features and Benefits

- Advanced MOSFET process technology
- Special designed for PWM, load switching and general purpose applications
- Ultra low on-resistance with low gate charge
- Fast switching and reverse body recovery
- 150°C operating temperature


Description:

It utilizes the latest processing techniques to achieve the high cell density and reduces the on-resistance with high repetitive avalanche rating. These features combine to make this design an extremely efficient and reliable device for use in power switching application and a wide variety of other applications.

Absolute Max Rating:

Symbol	Parameter	Max.	Units
I_D @ $T_C = 25^\circ\text{C}$	Continuous Drain Current, V_{GS} @ -10V ①	-4	A
I_{DM}	Pulsed Drain Current ②	-20	
P_D @ $T_C = 25^\circ\text{C}$	Power Dissipation ③	1.6	W
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-to-Source Voltage	± 12	V
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +150	$^\circ\text{C}$

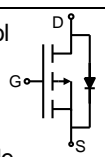
Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case ③	—	78	$^{\circ}C/W$

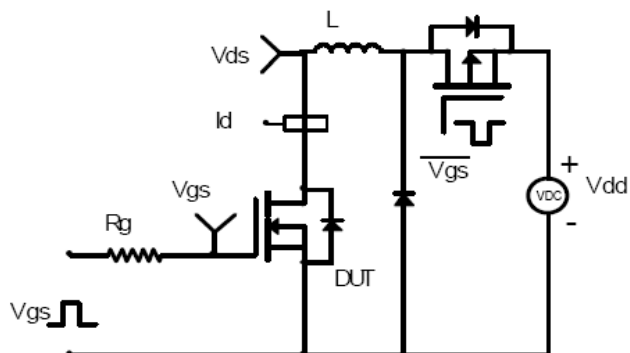
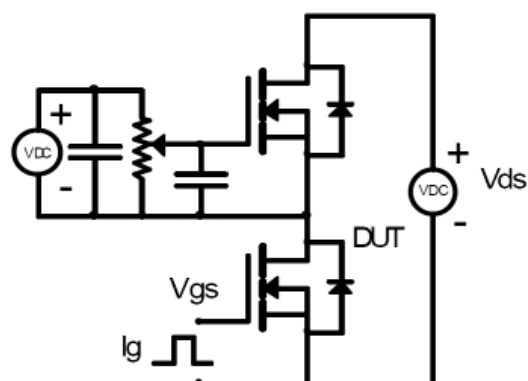
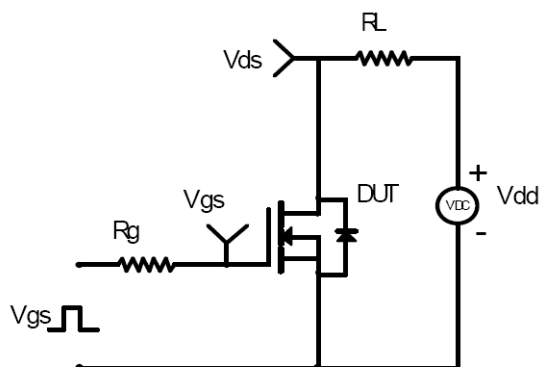
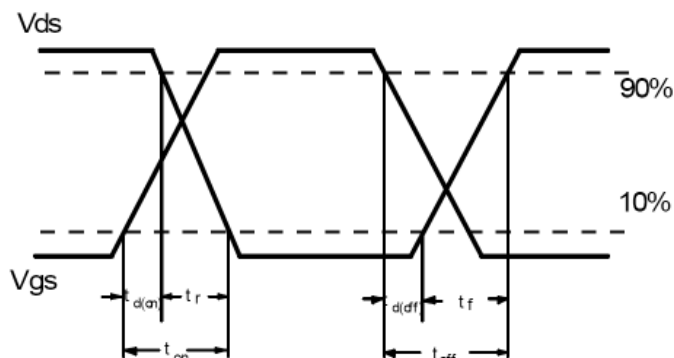
Electrical Characterizes @ $T_A=25^{\circ}C$ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	-20	—	—	V	$V_{GS} = 0V, I_D = -250\mu A$
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	39	65	$m\Omega$	$V_{GS}=-4.5V, I_D=-4A$
		—	55	80	$m\Omega$	$V_{GS}=-2.5V, I_D=-3A$
$V_{GS(th)}$	Gate threshold voltage	-0.5	—	-1	V	$V_{DS} = V_{GS}, I_D = -250\mu A$
I_{DSS}	Drain-to-Source leakage current	—	—	-1	μA	$V_{DS} = -20V, V_{GS} = 0V$
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	$V_{GS} = 12V$
		—	—	-100		$V_{GS} = -12V$
Q_g	Total gate charge	—	9.6	—	nC	$I_D = -4A$
Q_{gs}	Gate-to-Source charge	—	1.5	—		$V_{DS} = -10V$
Q_{gd}	Gate-to-Drain("Miller") charge	—	2.4	—		$V_{GS} = -4.5V$
$t_{d(on)}$	Turn-on delay time	—	27	—	ns	$V_{GS} = -4.5V, V_{DD} = -10V,$ $R_{GEN} = 6\Omega$ $I_D = -1A$
t_r	Rise time	—	60	—		
$t_{d(off)}$	Turn-Off delay time	—	30	—		
t_f	Fall time	—	10	—		
C_{iss}	Input capacitance	—	640	—	pF	$V_{GS} = 0V$
C_{oss}	Output capacitance	—	180	—		$V_{DS} = -10V$
C_{rss}	Reverse transfer capacitance	—	100	—		$f = 1MHz$

Source-Drain Ratings and Characteristics

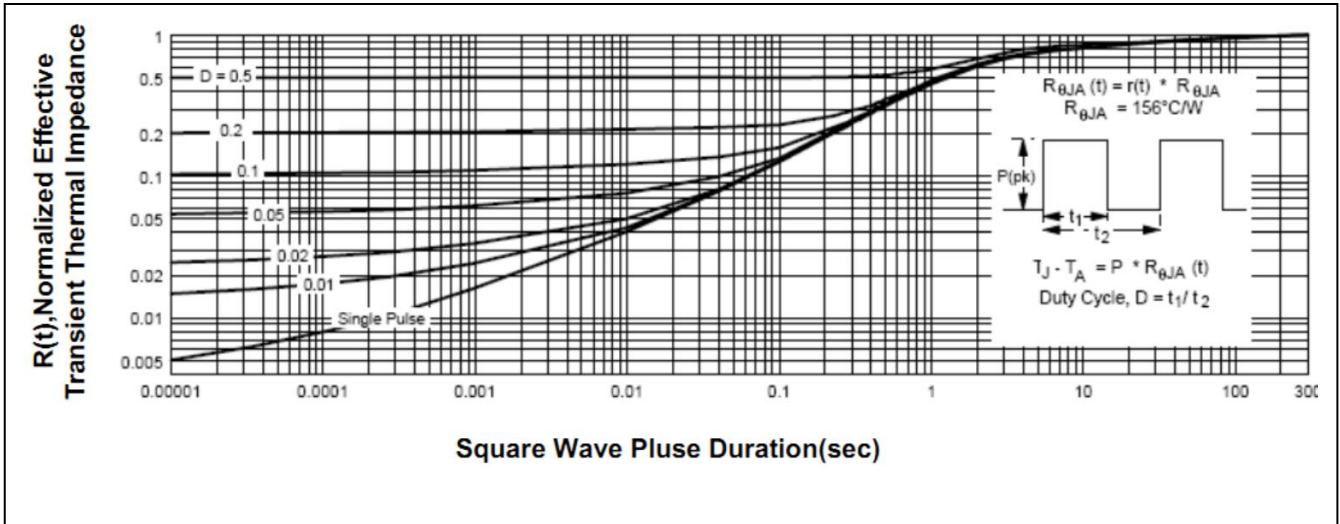
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	-4	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	-20	A	
V_{SD}	Diode Forward Voltage	—	—	-1.2	V	$I_S = -1A, V_{GS} = 0V$

Test Circuits and Waveforms

EAS Test Circuit:

Gate Charge Test Circuit:

Switching Time Test Circuit:

Switching Waveforms:


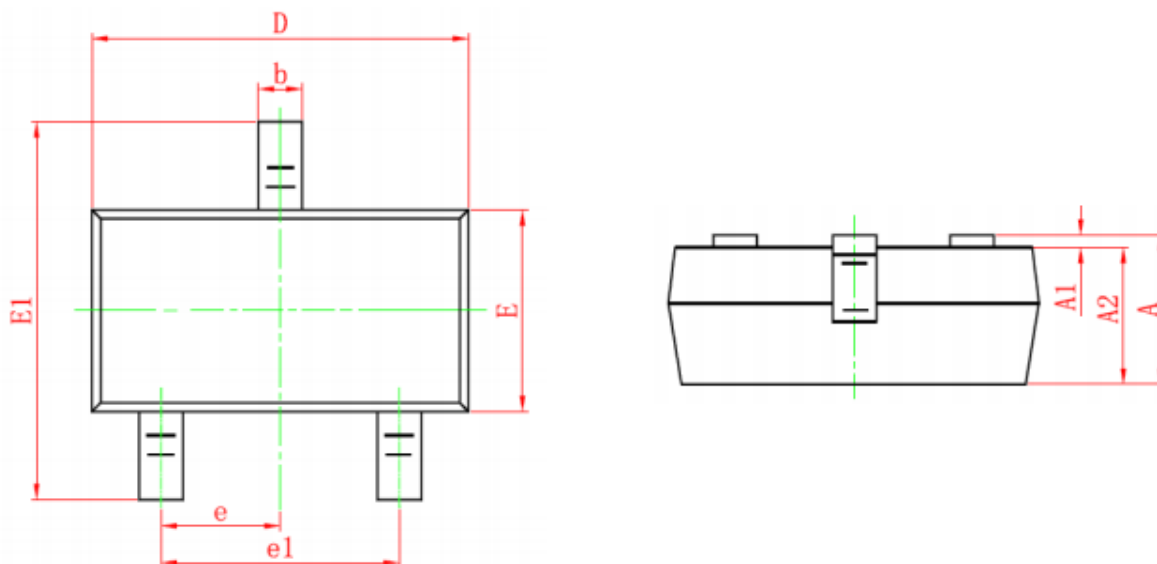
Notes:

- ① Calculated continuous current based on maximum allowable junction temperature.
- ② Repetitive rating; pulse width limited by max. junction temperature.
- ③ The power dissipation PD is based on max. junction temperature, using junction-to-case thermal resistance.

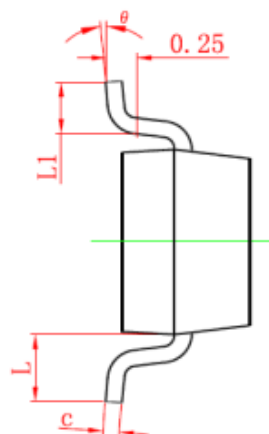
Typical Electrical and Thermal Characteristics

Figure1. Normalized Maximum Transient Thermal Impedance

Mechanical Data:

SOT-23 Package Outline (Unit:mm)



))



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°

NOTES

- All dimensions are in millimeters.
- Tolerance $\pm 0.10\text{mm}$ (4 mil) unless otherwise specified
- Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 5 mils.
- Dimension L is measured in gauge plane.
- Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

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