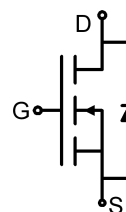


**Main Product Characteristics:**

$V_{DSS}$	20V
$R_{DS(on)}$	131mΩ(typ.)
$I_D$	1A


**SOT-23**

**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


**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
$I_D @ T_A = 25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}^{\text{①}}$	1	A
$I_D @ T_A = 100^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}^{\text{①}}$	0.7	
$I_{DM}$	Pulsed Drain Current <sup>②</sup>	4	
$P_D @ T_A = 25^\circ\text{C}$	Power Dissipation <sup>③</sup>	0.23	W
$V_{DS}$	Drain-Source Voltage	20	V
$V_{GS}$	Gate-to-Source Voltage	± 10	V
$T_J \quad T_{STG}$	Operating Junction and Storage Temperature Range	-55 to +150	°C

## Thermal Resistance

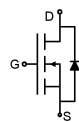
Symbol	Characterizes	Typ.	Max.	Units
R <sub>θJA</sub>	Junction-to-Ambient <sup>④</sup>	—	543	°C/W

## Electrical Characteristics @T<sub>J</sub>=25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
V <sub>(BR)DSS</sub>	Drain-to-Source breakdown voltage	20	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA
R <sub>DS(on)</sub>	Static Drain-to-Source on-resistance	—	131	170	mΩ	V <sub>GS</sub> =4.5V, I <sub>D</sub> =0.5A
		—	190	247	mΩ	V <sub>GS</sub> =2.5V, I <sub>D</sub> =0.3A
V <sub>GS(th)</sub>	Gate threshold voltage	0.4	—	1	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA
I <sub>DSS</sub>	Drain-to-Source leakage current	—	—	1	μA	V <sub>DS</sub> =20V, V <sub>GS</sub> = 0V
I <sub>GSS</sub>	Gate-to-Source forward leakage	—	—	±10	μA	V <sub>GS</sub> =±10V, V <sub>DS</sub> =0V
Q <sub>g</sub>	Total gate charge	—	1.1	—	nC	I <sub>D</sub> = 0.9A, V <sub>DS</sub> =10V, V <sub>GS</sub> = 4.5V
Q <sub>gs</sub>	Gate-to-Source charge	—	0.27	—		
Q <sub>gd</sub>	Gate-to-Drain("Miller") charge	—	0.21	—		
t <sub>d(on)</sub>	Turn-on delay time	—	2	—	ns	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =10V, R <sub>GEN</sub> =10Ω I <sub>D</sub> = 0.5A
t <sub>r</sub>	Rise time	—	20	—		
t <sub>d(off)</sub>	Turn-Off delay time	—	11	—		
t <sub>f</sub>	Fall time	—	24	—		
C <sub>iss</sub>	Input capacitance	—	61	—	pF	V <sub>GS</sub> = 0V V <sub>DS</sub> = 10V f = 1MHz
C <sub>oss</sub>	Output capacitance	—	21	—		
C <sub>rss</sub>	Reverse transfer capacitance	—	13	—		

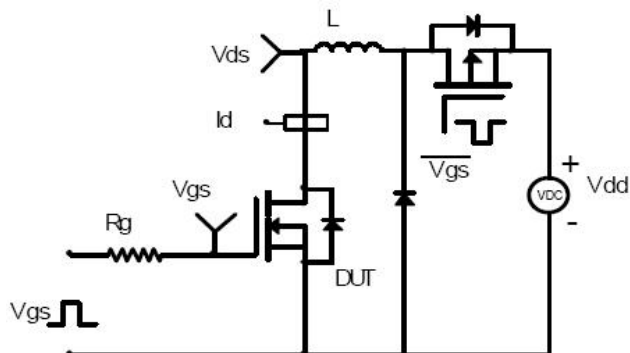
## Source-Drain Ratings and Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I <sub>S</sub>	Continuous Source Current (Body Diode)	—	—	1	A	MOSFET symbol showing the integral reverse p-n junction diode.
I <sub>SM</sub>	Pulsed Source Current (Body Diode)	—	—	4	A	
V <sub>SD</sub>	Diode Forward Voltage	—	—	1.2	V	I <sub>S</sub> =0.5A, V <sub>GS</sub> =0V

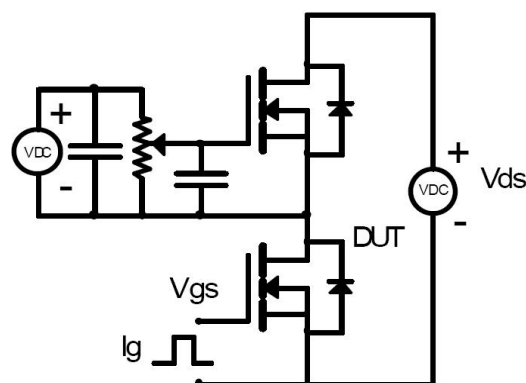


## Test Circuits and Waveforms

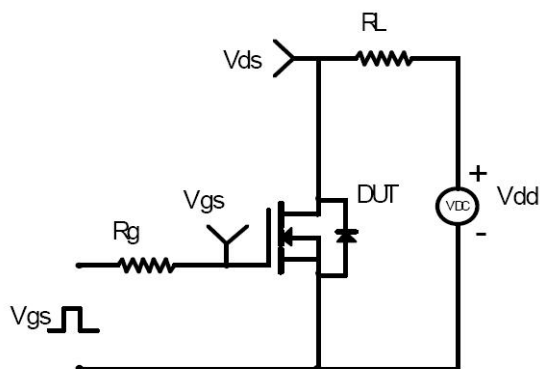
EAS Test Circuit:



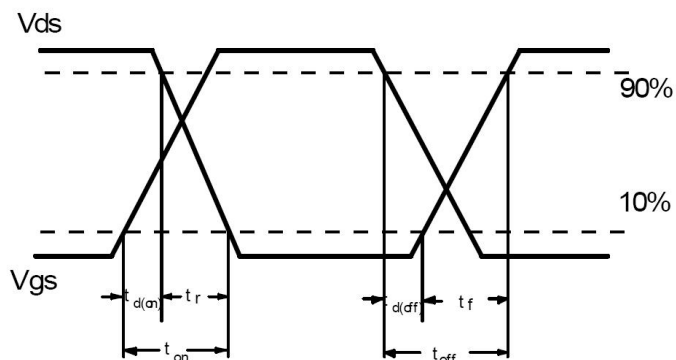
Gate Charge Test Circuit:



Switching Time Test Circuit:



Switching Waveforms:

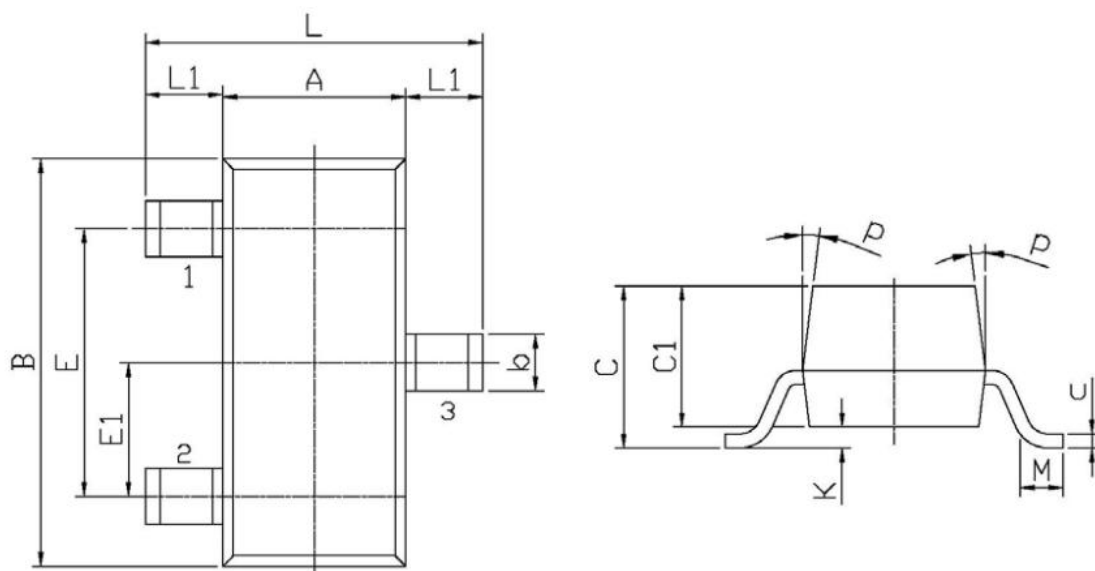


### Notes:

- ① Calculated continuous current based on maximum allowable junction temperature.
- ② Repetitive rating; pulse width limited by max. junction temperature.
- ③ The power dissipation  $P_D$  is based on max. junction temperature, using junction-to-case thermal resistance.
- ④ The value of  $R_{\theta JA}$  is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with  $T_A = 25^\circ \text{C}$ .

**Mechanical Data:**

SOT-23 Package Outline(Unit:mm)



Symbol	Dimensions in Millimeter		Symbol	Dimensions in Millimeter	
	Min	Max		Min	Max
L	2.2	2.7	C	1.30 Max	
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	0.20 Min	
E1	0.85	1.05	P	7°	
b	0.35	0.55			

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