



### Description

#### P-channel MOSFET

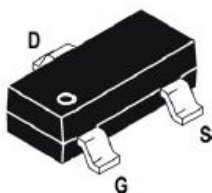
##### Features

- $V_{DS} = -20V$ ,  $I_D = -3.0A$
- $R_{DS(ON)} < 65m\Omega$  @  $V_{GS} = -4.5V$   
 $R_{DS(ON)} < 90m\Omega$  @  $V_{GS} = -2.5V$
- High Power and Current Handling Capability
- Lead Free Product is Acquired
- Surface Mount Package

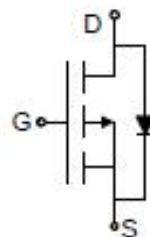
##### Application

- PWM Applications
- Load Switch
- Power Management

#### Package



SOT-23



Schematic Diagram

### Absolute Maximum Ratings (T<sub>c</sub>=25°C unless otherwise specified)

Symbol	Parameter	Max.	Units
V <sub>DSS</sub>	Drain-Source Voltage	-20	V
V <sub>GSS</sub>	Gate-Source Voltage	±12	V
I <sub>D</sub>	Continuous Drain Current	T <sub>c</sub> = 25°C	-3.0
		T <sub>c</sub> = 100°C	-2.2
P <sub>D</sub>	Power Dissipation	T <sub>A</sub> = 25°C	1
R <sub>θJA</sub>	Thermal Resistance, Junction to Ambient	125	°C/W
T <sub>J</sub> , T <sub>STG</sub>	Operating and Storage Temperature Range	-55 to +150	°C



### Electrical Characteristics (T<sub>C</sub>=25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
<b>Off Characteristic</b>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> = -250μA	-20	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> = -20V, V <sub>GS</sub> = 0V,	-	-	-1	μA
I <sub>GSS</sub>	Gate to Body Leakage Current	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±12V	-	-	±100	nA
<b>On Characteristics</b>						
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA	-0.5	-0.7	-1.0	V
R <sub>DS(on)</sub>	Static Drain-Source on-Resistance <small>note2</small>	V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -3.0A	-	53	65	mΩ
		V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -2.0A	-	64	90	
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> = -5V, I <sub>D</sub> = -3.4A	5	-	-	S
<b>Dynamic Characteristics</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> = -10V, V <sub>GS</sub> = 0V, f = 1.0MHz	-	488	-	pF
C <sub>oss</sub>	Output Capacitance		-	85	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	58	-	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> = -10V, I <sub>D</sub> = -3.4A, V <sub>GS</sub> = -4.5V	-	4.2	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	0.9	-	nC
Q <sub>gd</sub>	Gate-Drain("Miller") Charge		-	1.5	-	nC
<b>Switching Characteristics</b>						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DD</sub> = -10V, I <sub>D</sub> = -1A, R <sub>GEN</sub> = 10Ω, V <sub>GE</sub> = -4.5V,	-	12	-	ns
t <sub>r</sub>	Turn-on Rise Time		-	36	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time		-	32	-	ns
t <sub>f</sub>	Turn-off Fall Time		-	12	-	ns
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
I <sub>S</sub>	Maximum Continuous Drain to Source Diode Forward Current		-	-	-3.0	A
V <sub>SD</sub>	Drain to Source Diode Forward Voltage	V <sub>GS</sub> = 0V, I <sub>S</sub> = -1.7A	-	-	-1.2	V

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%



Typical Performance Characteristics

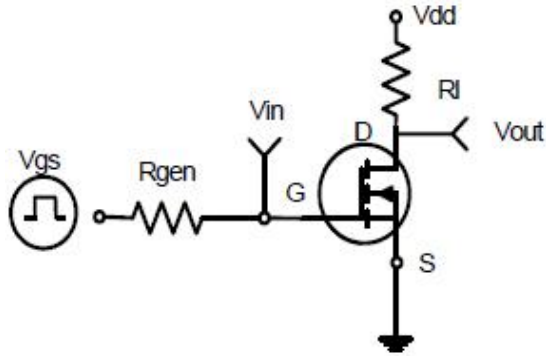


Figure1:Switching Test Circuit

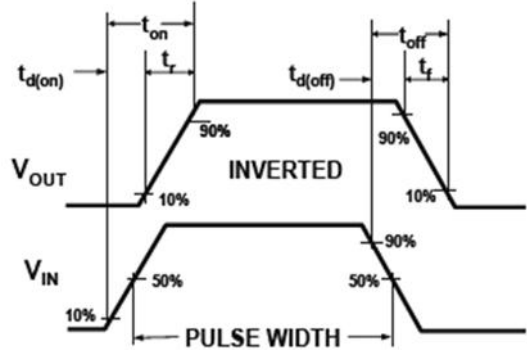
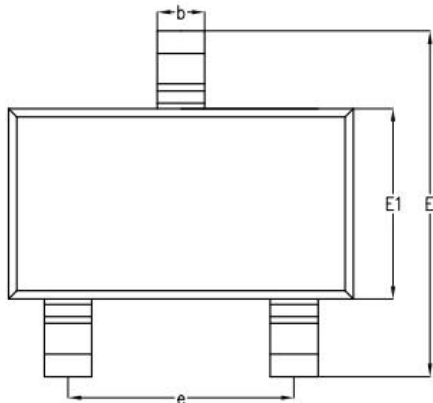
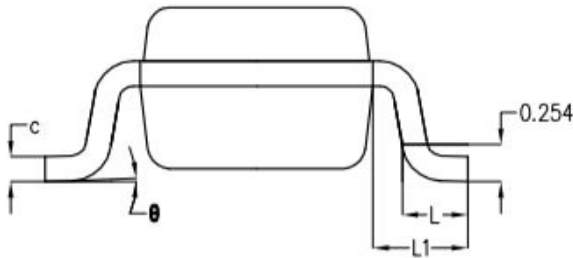
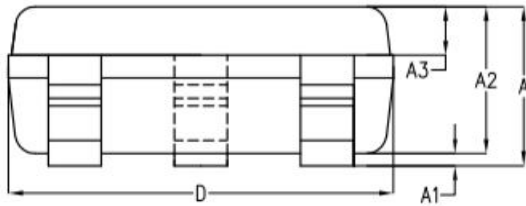


Figure2:Switching Waveforms

Package Information.

➤ SOT23-3(大)



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	-	1.19	1.24
A1	-	0.05	0.09
A2	1.05	1.10	1.15
A3	0.31	0.36	0.41
b	0.35	0.40	0.45
c	0.12	0.17	0.22
D	2.85	2.90	2.95
E	2.80	2.90	3.00
E1	1.55	1.60	1.65
e	1.90BSC		
L	0.37	0.45	0.53
L1	0.65BSC		
$\theta$	0°	2°	8°