



## -30V -4.1A P-channel MOSFET

### Features

- $V_{DS} = -30V$ ,  $I_D = -4.1A$
- $R_{DS(ON)} < 60m\Omega$  @  $V_{GS} = -10V$   
 $R_{DS(ON)} < 85m\Omega$  @  $V_{GS} = -4.5V$
- High Speed Switching
- High Density Cell Design for Low  $R_{DS(ON)}$
- Surface Mount Package

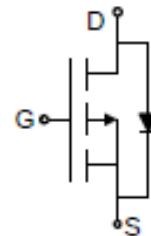
### Application

- Battery Protection
- Load Switch
- Power Management

### Package



SOT-23



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

Symbol	Parameter	Max.	Units
V <sub>DSS</sub>	Drain-Source Voltage	-30	V
V <sub>GSS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub>	Continuous Drain Current	T <sub>C</sub> = 25°C	-4.1
		T <sub>C</sub> = 100°C	-2.7
I <sub>DM</sub>	Pulsed Drain Current <sup>note1</sup>	-16.4	A
P <sub>D</sub>	Power Dissipation	T <sub>C</sub> = 25°C	1.67
R <sub>θJA</sub>	Thermal Resistance, Junction to Ambient	75	°C/W
T <sub>J</sub> , T <sub>STG</sub>	Operating and Storage Temperature Range	-55 to +150	°C

**Electrical Characteristics** ( $T_C=25^{\circ}\text{C}$  unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
<b>Off Characteristic</b>						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D = -250\mu A$	-30	-	-	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS} = -30V, V_{GS} = 0V,$	-	-	-1	$\mu A$
$I_{GSS}$	Gate to Body Leakage Current	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	$\pm 100$	nA
<b>On Characteristics</b>						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1.0	-1.4	-2.5	V
$R_{DS(on)}$	Static Drain-Source on-Resistance <small>note2</small>	$V_{GS} = -10V, I_D = -4.1A$	-	48	60	m $\Omega$
		$V_{GS} = -4.5V, I_D = -3.5A$	-	62	85	
$g_{FS}$	Forward Transconductance	$V_{DS} = -5V, I_D = -4.1A$	5	-	-	S
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS} = -15V, V_{GS} = 0V,$ $f = 1.0MHz$	-	580	-	pF
$C_{oss}$	Output Capacitance		-	98	-	pF
$C_{rss}$	Reverse Transfer Capacitance		-	74	-	pF
$Q_g$	Total Gate Charge	$V_{DS} = -15V, I_D = -4.1A,$ $V_{GS} = -10V$	-	6.8	-	nC
$Q_{gs}$	Gate-Source Charge		-	1.0	-	nC
$Q_{gd}$	Gate-Drain("Miller") Charge		-	1.4	-	nC
<b>Switching Characteristics</b>						
$t_{d(on)}$	Turn-on Delay Time	$V_{DD} = -15V, I_D = -1A,$ $R_{GEN}=2.5\Omega, V_{GS}=-10V,$ $R_L=15\Omega$	-	14	-	ns
$t_r$	Turn-on Rise Time		-	61	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	19	-	ns
$t_f$	Turn-off Fall Time		-	10	-	ns
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
$I_S$	Maximum Continuous Drain to Source Diode Forward Current		-	-	-4.1	A
$I_{SM}$	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-16.4	A
$V_{SD}$	Drain to Source Diode Forward Voltage	$V_{GS} = 0V, I_S = -4.1A$	-	-0.89	-1.2	V

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

2. Pulse Test: Pulse Width $\leq 300\mu s$ , Duty Cycle $\leq 2\%$



Typical Performance Characteristics

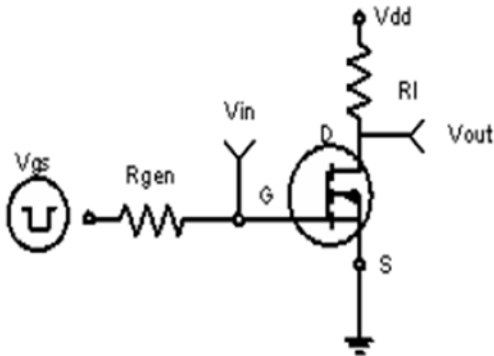


Figure1 :Switching Test Circuit

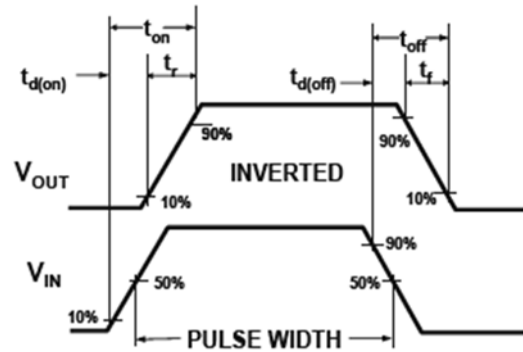
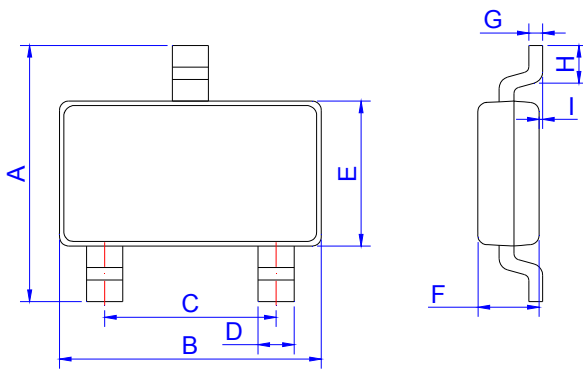


Figure2:Switching Waveforms

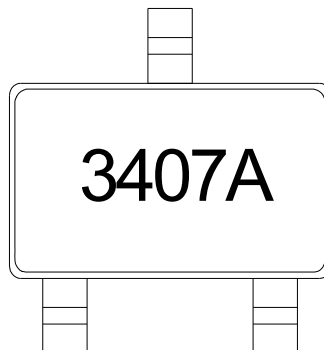
Package Mechanical Data



SOT-23

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.30	2.40	2.50	0.091	0.095	0.098
B	2.80	2.90	3.00	0.110	0.114	0.118
C	1.90 REF			0.075 REF		
D	0.35	0.40	0.45	0.014	0.016	0.018
E	1.20	1.30	1.40	0.047	0.051	0.055
F	0.90	1.00	1.10	0.035	0.039	0.043
G		0.10	0.15		0.004	0.006
H	0.20			0.008		
I	0		0.10	0		0.004

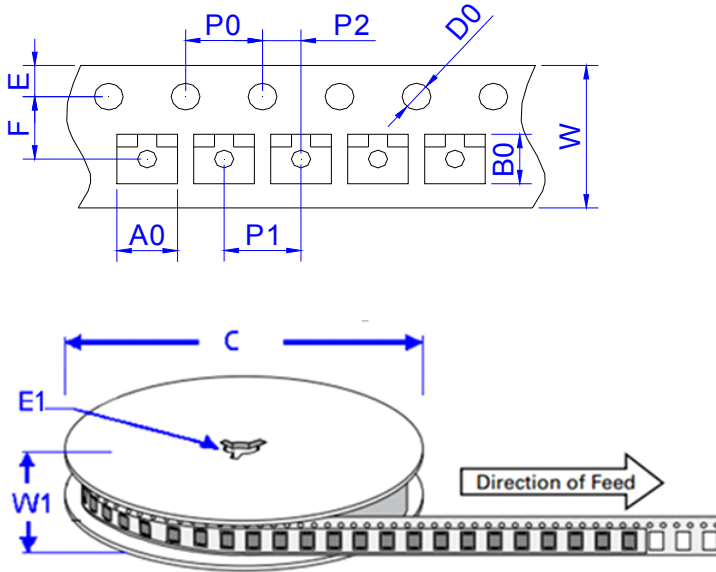
Marking



3407A: Device Code



### Package Information-SOT-23



Ref.	Dimensions	
	Millimeters	Inches
A0	3.15 ± 0.3	0.124 ± 0.012
B0	2.77 ± 0.3	0.109 ± 0.012
C	178	7.0
D0	1.50±0.1	0.059 ± 0.004
E	1.75 ± 0.2	0.069 ± 0.008
E1	13.3±0.3	0.524± 0.012
F	3.5 ± 0.2	0.138 ± 0.008
P0	4.00 ± 0.2	0.157 ± 0.008
P1	4.00 ± 0.2	0.157 ± 0.008
P2	2.00 ± 0.2	0.079 ± 0.008
W	8.00 ± 0.2	0.315 ± 0.008
W1	11.5±1.0	0.453 ± 0.039

### Ordering Information-SOT-23

OUTLINE	PACKAGE TYPE	QUANTITY REEL	DESCRIPTION
TAPING	SOT-23	3,000pcs	7 inch reel pack