

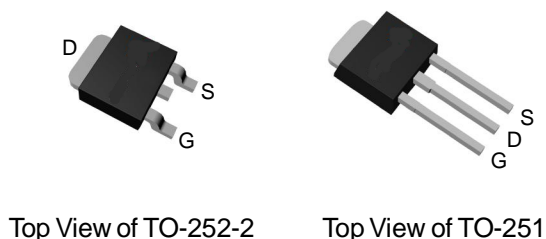
# SM1A16PSU/UB

## P-Channel Enhancement Mode MOSFET

### Features

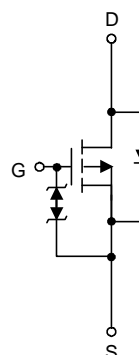
- 100V/-13A,  
 $R_{DS(ON)}=205m\Omega$  (max.) @  $V_{GS}=-10V$   
 $R_{DS(ON)}=300m\Omega$  (max.) @  $V_{GS}=-4V$
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)
- 100% UIS +  $R_g$  Tested

### Pin Configuration



Top View of TO-252-2

Top View of TO-251



P-Channel MOSFET

### Applications

- Power Management in Desktop Computer or DC/DC Converters.

### Ordering and Marking Information

<p>SM1A16PS □□□-□□□</p> <ul style="list-style-type: none"> <li>□□□ - Assembly Material</li> <li>□□□ - Handling Code</li> <li>□□□ - Temperature Range</li> <li>□□□ - Package Code</li> </ul>	<p>Package Code          U : TO-252-2    UB : TO-251</p> <p>Operating Junction Temperature Range          C : -55 to 150 °C</p> <p>Handling Code          TR : Tape &amp; Reel for TO-252-2 Package          TU : Tube for TO-251 Package</p> <p>Assembly Material          G : Halogen and Lead Free Device</p>
<p>SM1A16PS U/UB : <span style="border: 1px solid black; padding: 2px;">SM1A16P XXXXX</span></p>	<p>XXXXX - Lot Code</p>

# SM1A16PSU/UB

## Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit	
<b>Common Ratings</b> ( $T_A=25^\circ\text{C}$ Unless Otherwise Noted)				
$V_{DSS}$	Drain-Source Voltage	-100	V	
$V_{GSS}$	Gate-Source Voltage	$\pm 20$		
$T_J$	Maximum Junction Temperature	150	$^\circ\text{C}$	
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ\text{C}$	
$I_S$	Diode Continuous Forward Current	-1	A	
$I_{DP}$	300 $\mu\text{s}$ Pulse Drain Current Tested	$T_C=25^\circ\text{C}$	-52	A
		$T_C=100^\circ\text{C}$	-32	
$I_D$	Continuous Drain Current	$T_C=25^\circ\text{C}$	-13*	A
		$T_C=100^\circ\text{C}$	-8	
$P_D$	Maximum Power Dissipation	$T_C=25^\circ\text{C}$	50	W
		$T_C=100^\circ\text{C}$	20	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	2.5	$^\circ\text{C/W}$	
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	50	$^\circ\text{C/W}$	

Note : \* Current limited by bond wire.

## Electrical Characteristics ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Conditions	SM1A16PSU/UB			Unit
			Min.	Typ.	Max.	
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0\text{V}, I_{DS}=-250\mu\text{A}$	-100	-	-	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=-80\text{V}, V_{GS}=0\text{V}$ $T_J=85^\circ\text{C}$	-	-	-1	$\mu\text{A}$
			-	-	-30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=-250\mu\text{A}$	-1	-	-3	V
$I_{GSS}$	Gate Leakage Current	$V_{GS}=\pm 16\text{V}, V_{DS}=0\text{V}$	-	-	$\pm 10$	$\mu\text{A}$
$R_{DS(ON)}^a$	Drain-Source On-state Resistance	$V_{GS}=-10\text{V}, I_{DS}=-7.8\text{A}$	-	-	205	$\text{m}\Omega$
		$V_{GS}=-4\text{V}, I_{DS}=-6\text{A}$	-	-	300	
<b>Diode Characteristics</b>						
$V_{SD}^a$	Diode Forward Voltage	$I_{SD}=-1\text{A}, V_{GS}=0\text{V}$	-	-0.75	-1.1	V
$t_{rr}$	Reverse Recovery Time	$I_{DS}=-7.8\text{A},$ $dI_{SD}/dt=100\text{A}/\mu\text{s}$	-	34	-	ns
$Q_{rr}$	Reverse Recovery Charge	$dI_{SD}/dt=100\text{A}/\mu\text{s}$	-	59	-	nC

# SM1A16PSU/UB

## Electrical Characteristics (Cont.) ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Conditions	SM1A16PSU/UB			Unit
			Min.	Typ.	Max.	
<b>Dynamic Characteristics <sup>b</sup></b>						
$C_{iss}$	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=-30V,$ Frequency=1.0MHz	-	1050	-	pF
$C_{oss}$	Output Capacitance		-	70	-	
$C_{rss}$	Reverse Transfer Capacitance		-	40	-	
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=-30V, R_L=30\Omega,$ $I_{DS}=-1A, V_{GEN}=-10V,$ $R_G=6\Omega$	-	11	21	ns
$t_r$	Turn-on Rise Time		-	10	19	
$t_{d(OFF)}$	Turn-off Delay Time		-	55	100	
$t_f$	Turn-off Fall Time		-	30	55	
<b>Gate Charge Characteristics <sup>b</sup></b>						
$Q_g$	Total Gate Charge	$V_{DS}=-50V, V_{GS}=-10V,$ $I_{DS}=-7.8A$	-	20.9	38	nC
$Q_{gs}$	Gate-Source Charge		-	4.2	-	
$Q_{gd}$	Gate-Drain Charge		-	5.2	-	

Note a : Pulse test ; pulse width $\leq 300\mu s$ , duty cycle $\leq 2\%$ .

Note b : Guaranteed by design, not subject to production testing.

# SM1A16PSU/UB

## Typical Operating Characteristics

