

# GSM2301A

## 20V P-Channel Enhancement Mode MOSFET

### Product Description

GSM2301A, P-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent  $R_{DS(ON)}$ , low gate charge.

These devices are particularly suited for low voltage power management, such as smart phone and notebook computer and other battery powered circuits, and low in-line power loss are needed in commercial industrial surface mount applications.

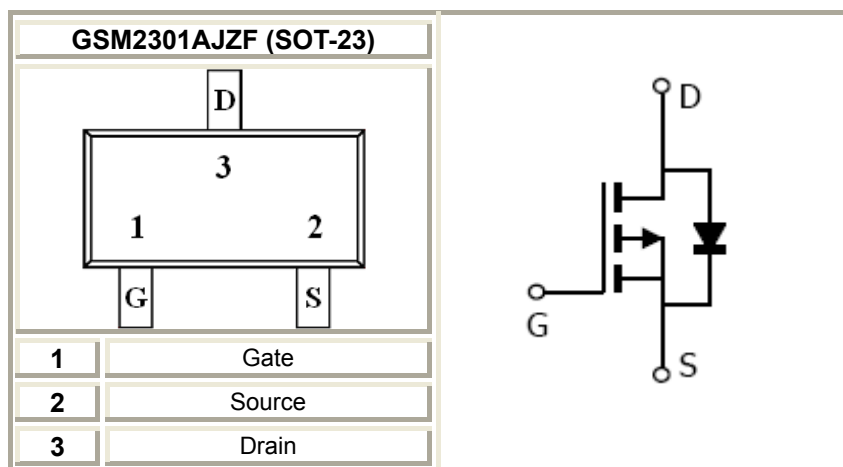
### Features

- -20V/-2.6A,  $R_{DS(ON)}=120m\Omega@V_{GS}=-4.5V$
- -20V/-2.2A,  $R_{DS(ON)}=170m\Omega@V_{GS}=-2.5V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- SOT-23 package design

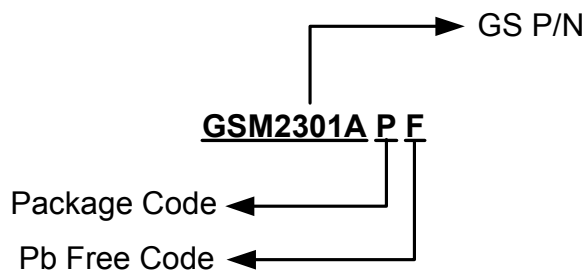
### Applications

- Power Management in Note book
- Portable Equipment
- Battery Powered System
- Net Working System

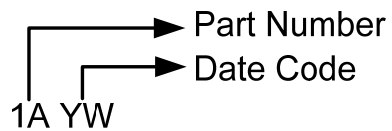
### Packages & Pin Assignments



### Ordering Information



## Marking Information



Part Number	Package	Part Marking
GSM2301AJZF	SOT-23	1AYW

## Absolute Maximum Ratings

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

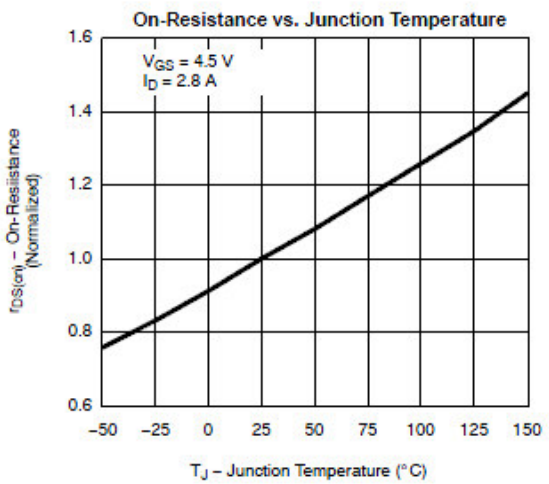
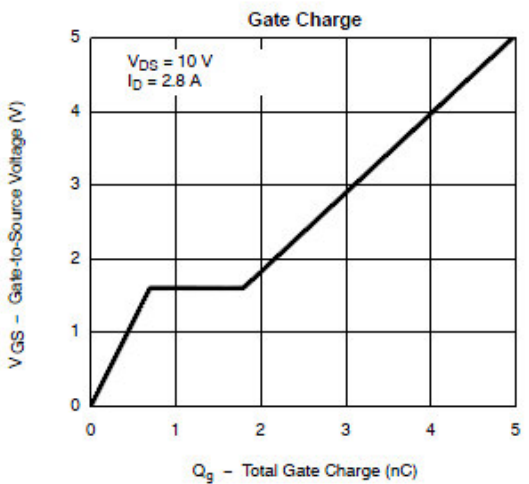
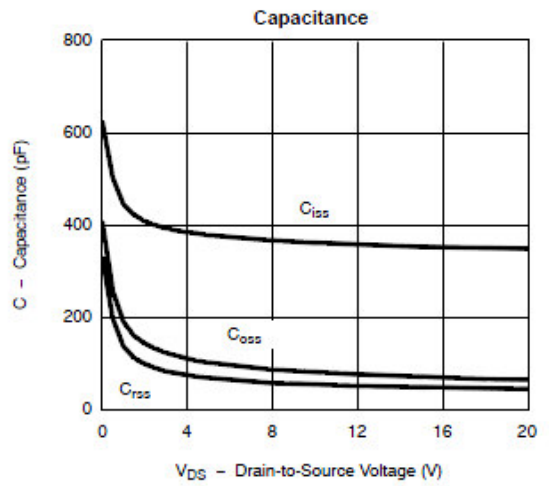
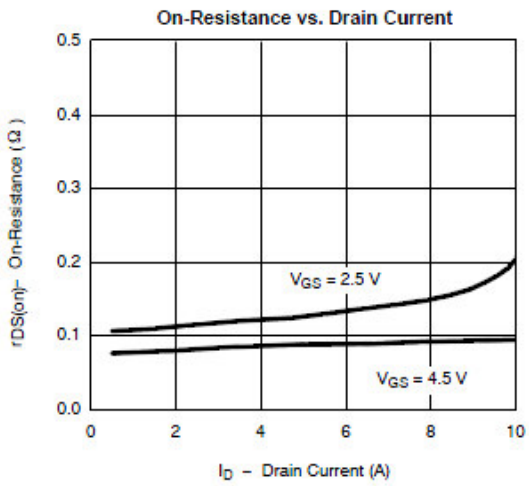
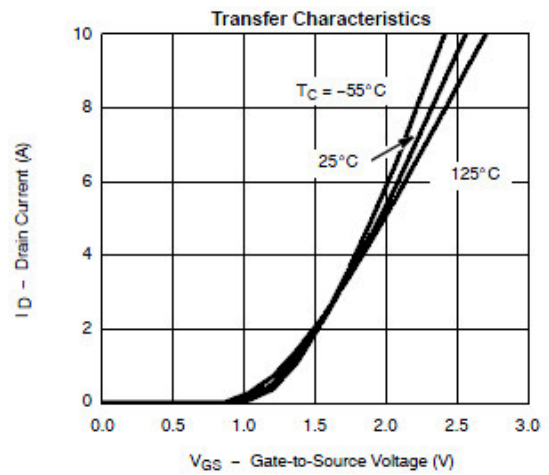
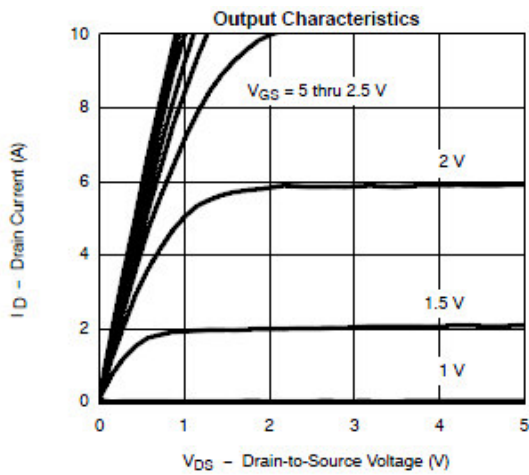
Symbol	Parameter	Typical	Unit
$V_{DS}$	Drain-Source Voltage	-20	V
$V_{GS}$	Gate –Source Voltage	$\pm 12$	V
$I_D$	Continuous Drain Current( $T_J=150^\circ\text{C}$ )	$T_A=25^\circ\text{C}$	-2.6
		$T_A=70^\circ\text{C}$	-2.2
$I_{DM}$	Pulsed Drain Current	-10	A
$I_S$	Continuous Source Current(Diode Conduction)	-1.6	A
$P_D$	Power Dissipation	$T_A=25^\circ\text{C}$	1.25
		$T_A=70^\circ\text{C}$	0.8
$T_J$	Operating Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-55/150	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	120	$^\circ\text{C}/\text{W}$

## Electrical Characteristics

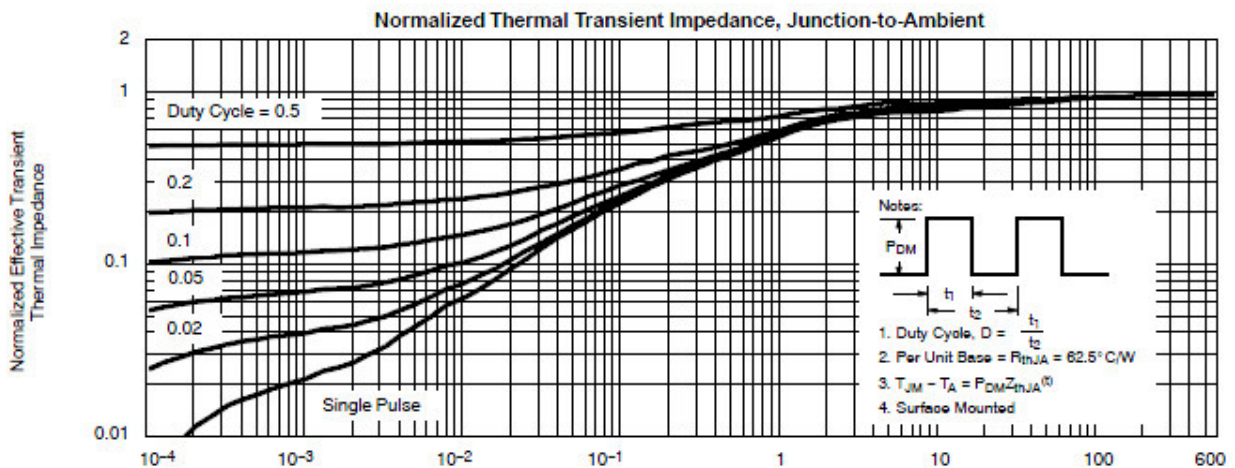
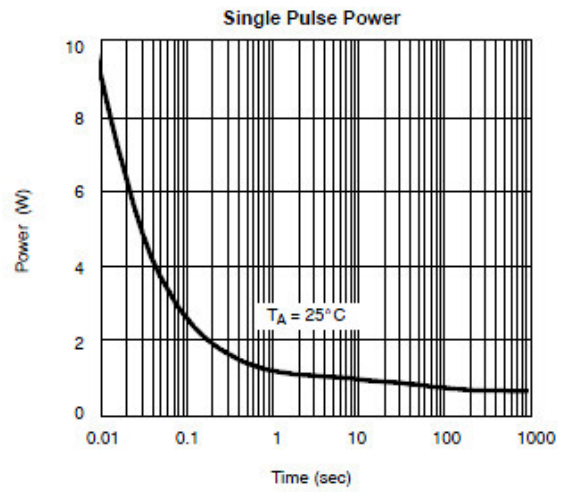
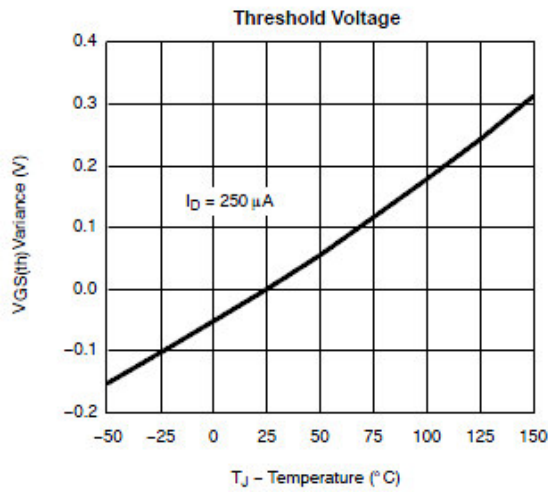
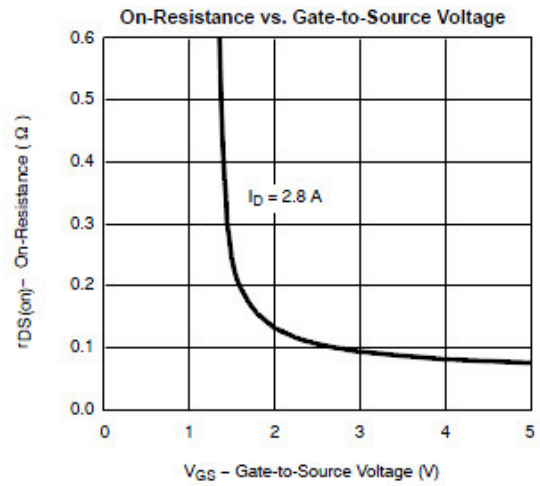
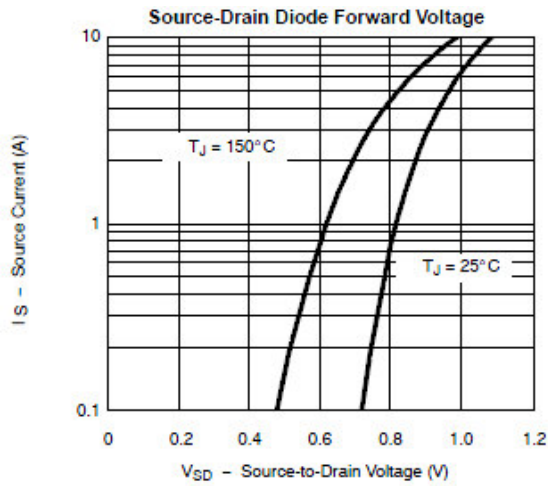
( $T_A=25^{\circ}\text{C}$  unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ	Max.	Unit
<b>Static</b>						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	-20			V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.5		-1.0	
$I_{GSS}$	Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 12V$			$\pm 100$	nA
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=-16V, V_{GS}=0V$			-1	$\mu A$
		$V_{DS}=-16V, V_{GS}=0V, T_J=85^{\circ}\text{C}$			30	
$I_{D(on)}$	On-State Drain Current	$V_{DS}\geq -5V, V_{GS}=-4.5V$	-6			A
		$V_{DS}\geq -5V, V_{GS}=-2.5V$	-3			
$R_{DS(on)}$	Drain-Source On-Resistance	$V_{GS}=-4.5V, I_D=-2.6A$		110	120	m $\Omega$
		$V_{GS}=-2.5V, I_D=-2.5A$		155	170	
$g_{fs}$	Forward Transconductance	$V_{DS}=-5V, I_D=-2.8A$		6.5		S
$V_{SD}$	Diode Forward Voltage	$I_S=1.25A, V_{GS}=0V$		-0.75	-1.3	V
<b>Dynamic</b>						
$C_{iss}$	Input Capacitance	$V_{DS}=-6V, V_{GS}=0V, f=1\text{MHz}$		415		$\mu\text{F}$
$C_{oss}$	Output Capacitance			223		
$C_{rss}$	Reverse Transfer Capacitance			87		
$Q_g$	Total Gate Charge	$V_{DS}=-6V, V_{GS}=-4.5V, I_D=-2.8A$		5.8	10	nC
$Q_{gs}$	Gate-Source Charge			0.85		
$Q_{gd}$	Gate-Drain Charge			1.7		
$t_{d(on)}$	Turn-On Time	$V_{DD}=-6V, R_L=6\Omega, I_D=1.0A, V_{GEN}=-4.5V, R_G=6\Omega$		13	25	ns
$t_r$				36	60	
$t_{d(off)}$	Turn-Off Time			42	70	
$t_f$				34	60	

## Typical Performance Characteristics

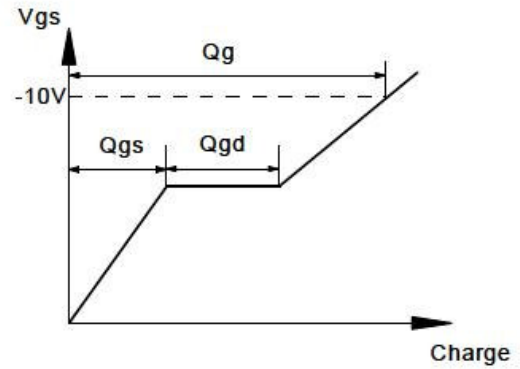
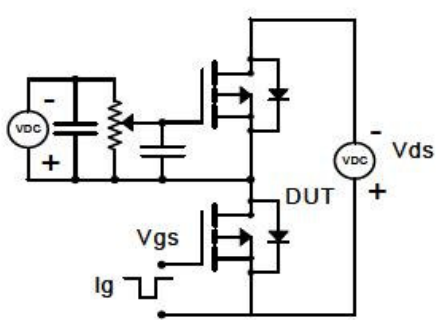


## Typical Performance Characteristics (continue)

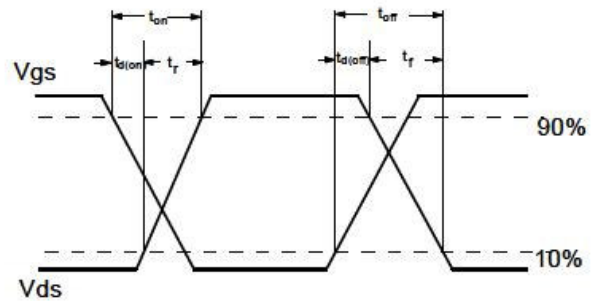
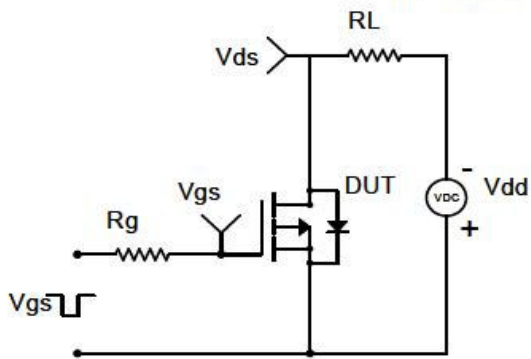


## Typical Characteristics

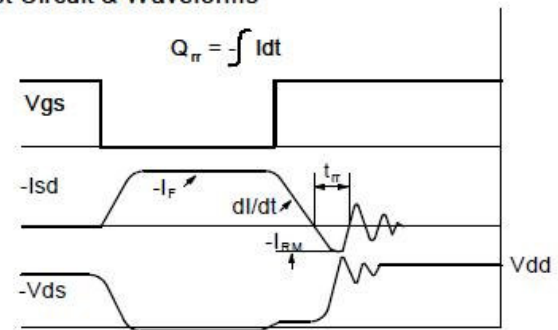
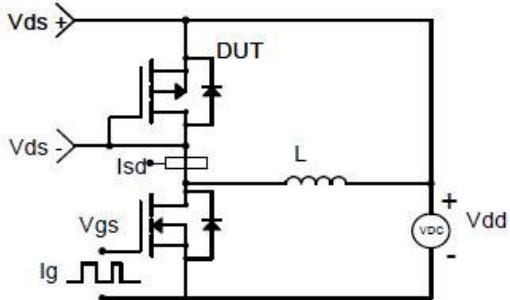
### Gate Charge Test Circuit & Waveform



### Resistive Switching Test Circuit & Waveforms

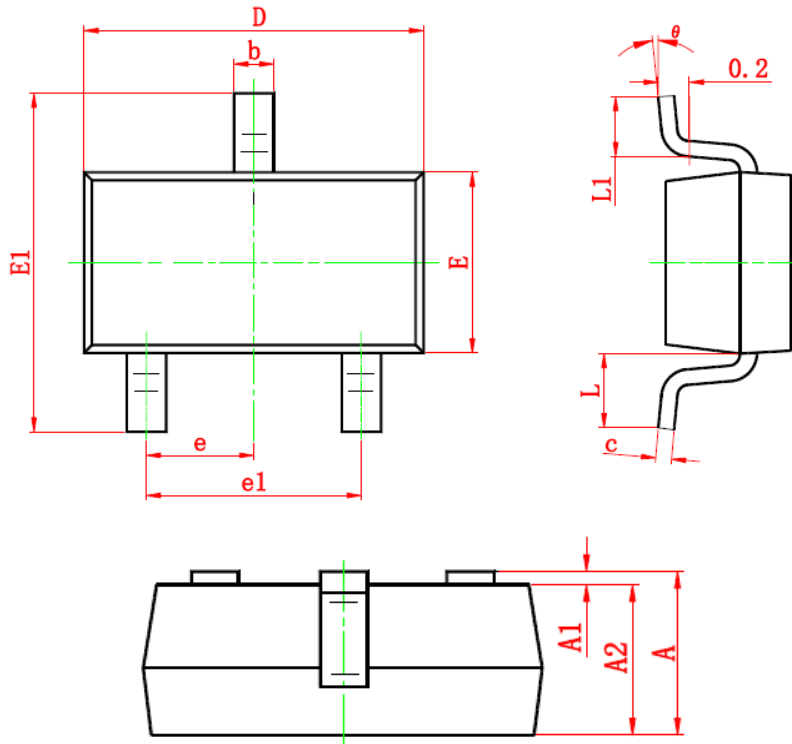


### Diode Recovery Test Circuit & Waveforms



## Package Dimension

### SOT-23







#### Dimensions

Symbol	Millimeters		Inches	
	Min	Max	Min	Max
<b>A</b>	0.900	1.200	0.035	0.043
<b>A1</b>	0.000	0.100	0.000	0.004
<b>A2</b>	0.900	1.100	0.035	0.039
<b>b</b>	0.300	0.500	0.012	0.020
<b>c</b>	0.080	0.150	0.003	0.006
<b>D</b>	2.800	3.000	0.110	0.118
<b>E</b>	1.200	1.400	0.047	0.055
<b>E1</b>	2.250	2.550	0.089	0.100
<b>e</b>	0.950 TYP		0.037 TYP	
<b>e1</b>	1.800	2.000	0.071	0.079
<b>L</b>	0.550 REF		0.022 REF	
<b>L1</b>	0.300	0.500	0.012	0.020
<b><math>\theta</math></b>	0°	8°	0°	6°





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