

# SOT-23 Plastic-Encapsulate MOSFETS

SI2303

## P-Channel, 30-V (D-S) MOSFET

PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A) <sup>b</sup>
-30	0.240 @ $V_{GS} = -10$ V	-1.4
	0.460 @ $V_{GS} = -4.5$ V	-1.0

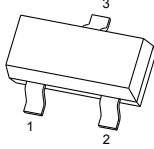
### General FEATURE

- TrenchFET Power MOSFET
- Lead free product is acquired
- Surface mount package

### APPLICATION

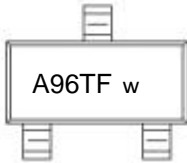
- Load Switch for Portable Devices
- DC/DC Converter

**SOT-23**



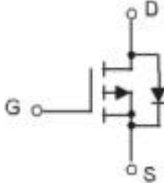
1.GATE  
2.SOURCE  
3.DRAIN

**MARKING**



\*w: week code

**Equivalent Circuit**



ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)					
Parameter		Symbol	5 sec	Steady State	Unit
Drain-Source Voltage		$V_{DS}$	-30		V
Gate-Source Voltage		$V_{GS}$	$\pm 20$		
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>b</sup>	$T_A = 25^\circ\text{C}$	$I_D$	-1.4	-1.3	A
			Pulsed Drain Current <sup>a</sup>		
Continuous Source Current (Diode Conduction) <sup>b</sup>		$I_S$	-0.75	-0.6	
Power Dissipation <sup>b</sup>	$T_A = 25^\circ\text{C}$	$P_D$	0.9	0.7	W
			Operating Junction and Storage Temperature Range		$T_J, T_{stg}$

THERMAL RESISTANCE RATINGS				
Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient <sup>b</sup>	$R_{thJA}$	115	140	$^\circ\text{C/W}$
Maximum Junction-to-Ambient <sup>c</sup>		140	175	

Notes

- Pulse width limited by maximum junction temperature.
- Surface Mounted on FR4 Board,  $t \leq 5$  sec.
- Surface Mounted on FR4 Board.

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SPECIFICATIONS (T <sub>J</sub> = 25°C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ	Max	
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = -10 μA	-30			V
Gate-Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250 μA	-1.0		-3.0	
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = -30 V, V <sub>GS</sub> = 0 V			-1	μA
		V <sub>DS</sub> = -30 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 55°C			-10	
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> ≤ -5 V, V <sub>GS</sub> = -10 V	-6			A
Drain-Source On-Resistance <sup>a</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = -10 V, I <sub>D</sub> = -1.7 A		0.120	0.240	Ω
		V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -1.3 A		0.230	0.460	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = -5 V, I <sub>D</sub> = -1.7 A		2.4		S
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> = -0.75 A, V <sub>GS</sub> = 0 V		-0.80	-1.2	V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = -15 V, V <sub>GS</sub> = -10 V I <sub>D</sub> ≅ -1.7 A		4.5	10	nC
Gate-Source Charge	Q <sub>gs</sub>			0.9		
Gate-Drain Charge	Q <sub>gd</sub>			0.9		
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = -15 V, V <sub>GS</sub> = 0, f = 1 MHz		260		pF
Output Capacitance	C <sub>oss</sub>			65		
Reverse Transfer Capacitance	C <sub>rss</sub>			35		
<b>Switching<sup>c</sup></b>						
Turn-On Time	t <sub>d(on)</sub>	V <sub>DD</sub> = -15 V, R <sub>L</sub> = 15 Ω I <sub>D</sub> ≅ -1.0 A, V <sub>GEN</sub> = -4.5 V R <sub>G</sub> = 6 Ω		6	20	ns
	t <sub>r</sub>			10	20	
Turn-Off Time	t <sub>d(off)</sub>			15	35	
	t <sub>f</sub>			7	20	

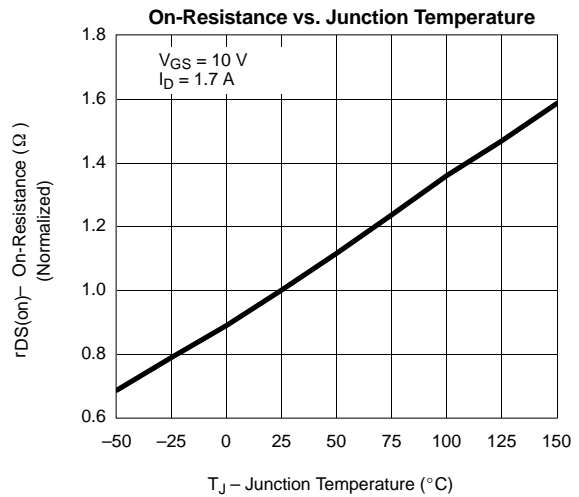
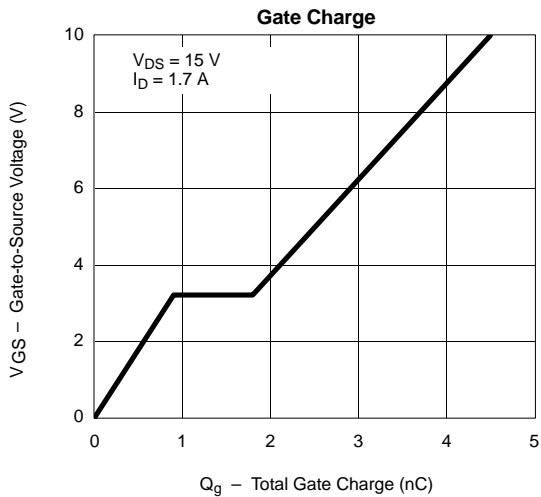
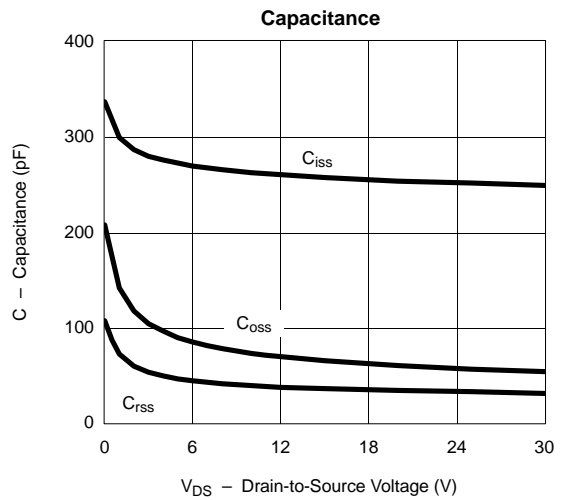
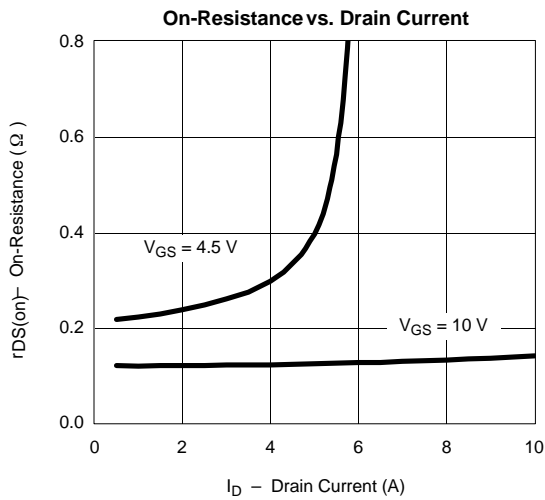
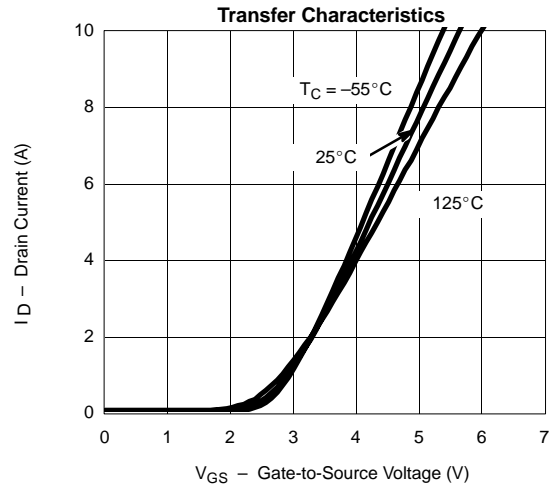
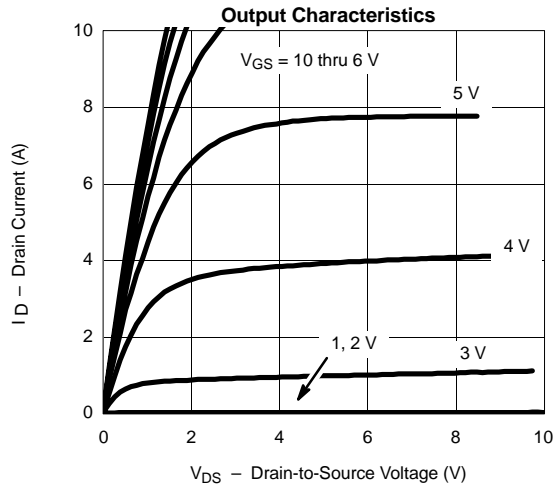
Notes

- Pulse test: PW ≤ 300 μs duty cycle ≤ 2%.
- For DESIGN AID ONLY, not subject to production testing.
- Switching time is essentially independent of operating temperature. • FaxBack 408-970-5600

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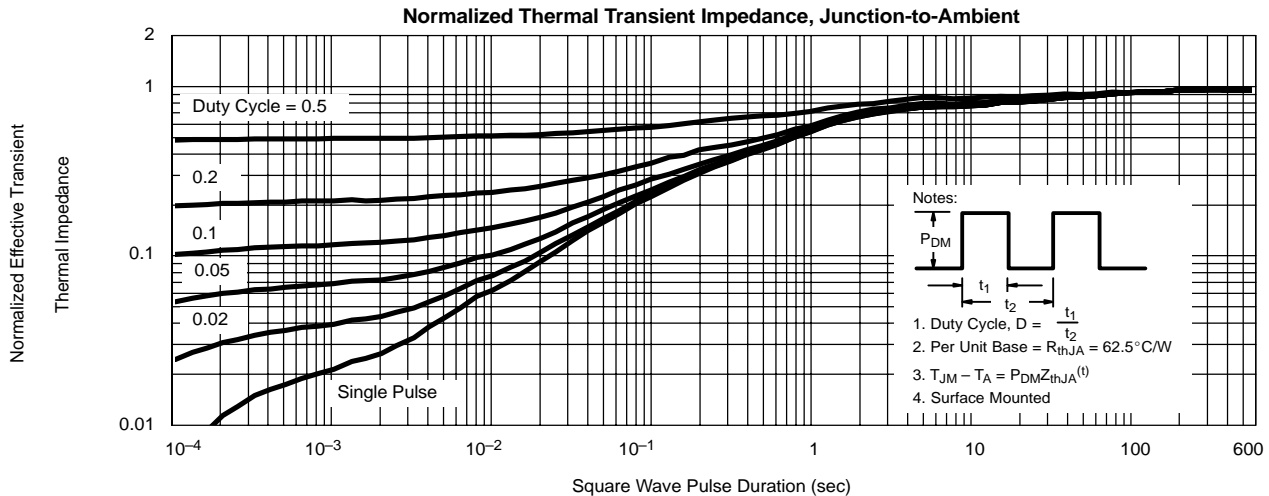
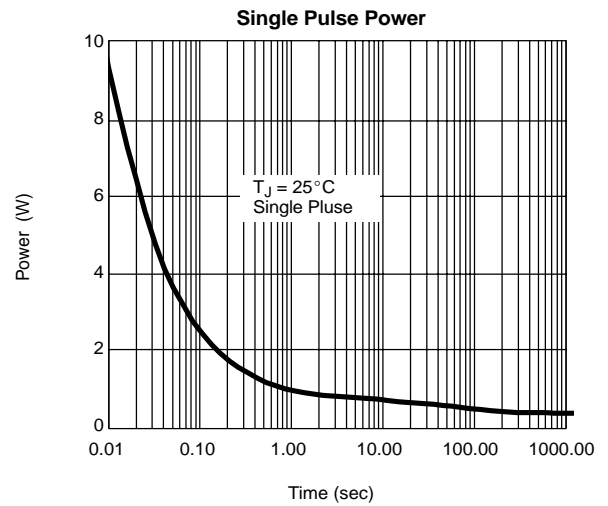
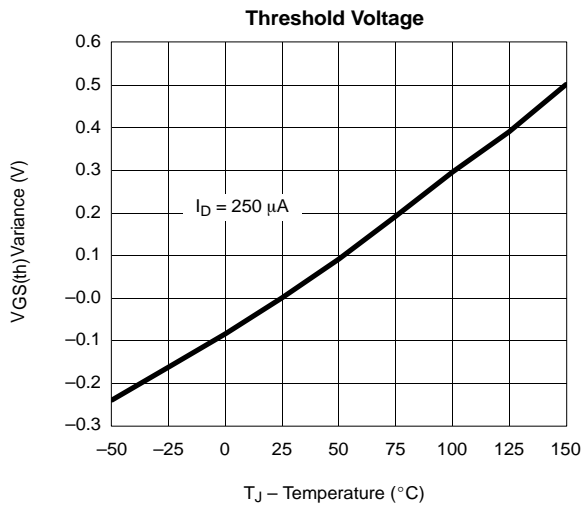
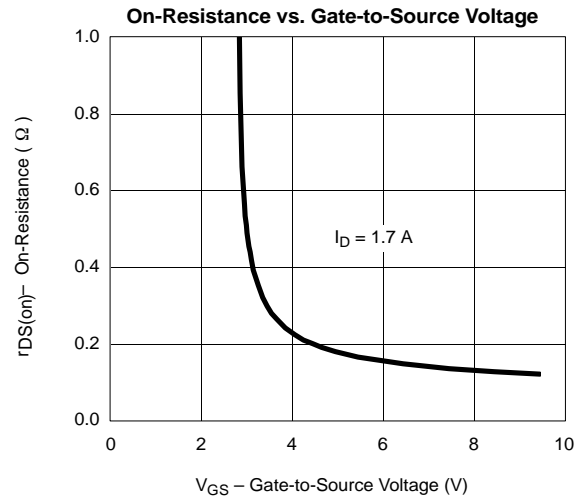
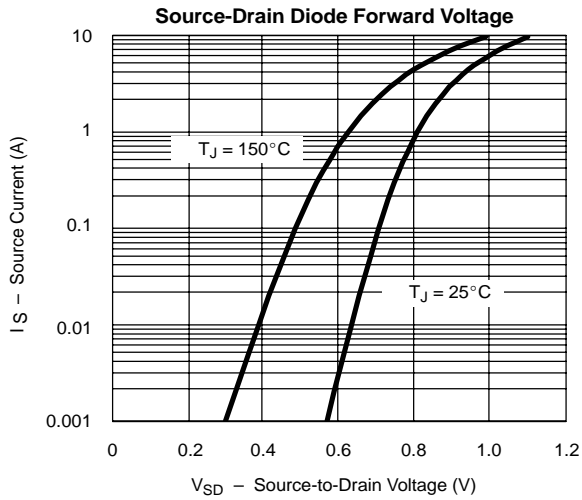
## TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



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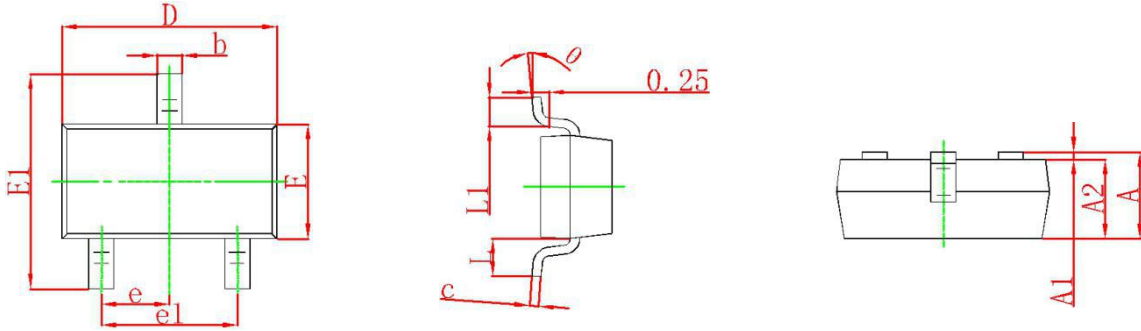
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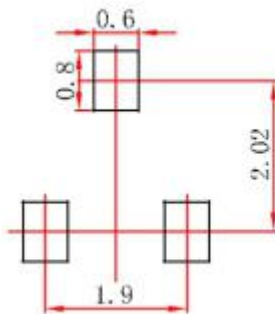
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## SOT-23 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

## SOT-23 Suggested Pad Layout



**Note:**

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05\text{mm}$ .
3. The pad layout is for reference purposes only.