

# SOT-23 Plastic-Encapsulate MOSFETS

SI3403

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

PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
-30	0.130 at $V_{GS} = -10$ V	-2.6
	0.200 at $V_{GS} = -4.5$ V	-2.0

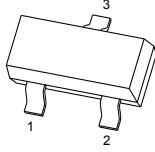
### General FEATURE

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

### APPLICATION

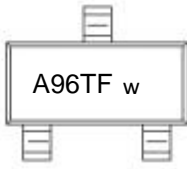
- Load Switch for Portable Devices
- DC/DC Converter

**SOT-23**



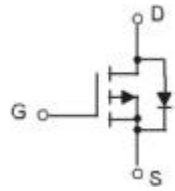
1.GATE  
2.SOURCE  
3.DRAIN

**MARKING**



\*w: week code

**Equivalent Circuit**



Absolute Maximum Ratings $T_A=25^\circ\text{C}$ unless otherwise noted				
Parameter	Symbol	Maximum	Units	
Drain-Source Voltage	$V_{DS}$	-30	V	
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V	
Continuous Drain Current <sup>A</sup>	$T_A=25^\circ\text{C}$	$I_D$	A	
Pulsed Drain Current <sup>B</sup>				$I_{DM}$
Power Dissipation <sup>A</sup>	$T_A=25^\circ\text{C}$	$P_D$	1.25	W
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	$^\circ\text{C}$	

Thermal Characteristics					
Parameter		Symbol	Typ	Max	Units
Maximum Junction-to-Ambient <sup>A</sup>	$t \leq 10\text{s}$	$R_{\theta JA}$	70	90	$^\circ\text{C/W}$
Maximum Junction-to-Ambient <sup>A</sup>	Steady-State		100	125	$^\circ\text{C/W}$
Maximum Junction-to-Lead <sup>C</sup>	Steady-State	$R_{\theta JL}$	63	80	$^\circ\text{C/W}$

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Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>STATIC PARAMETERS</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	I <sub>D</sub> =-250μA, V <sub>GS</sub> =0V	-30			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =-24V, V <sub>GS</sub> =0V			-1	μA
I <sub>GSS</sub>	Gate-Body leakage current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±100	nA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> I <sub>D</sub> =-250μA	-0.8	-1.4	-2.0	V
I <sub>D(ON)</sub>	On state drain current	V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-5V	-5			A
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =-10V, I <sub>D</sub> =-2.6A		97	130	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-2A		166	200	mΩ
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =-5V, I <sub>D</sub> =-2.5A	3	3.8		S
V <sub>SD</sub>	Diode Forward Voltage	I <sub>S</sub> =-1A, V <sub>GS</sub> =0V		-0.82	-1	V
I <sub>S</sub>	Maximum Body-Diode Continuous Current				-2	A
<b>DYNAMIC PARAMETERS</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =-15V, f=1MHz		302	370	pF
C <sub>oss</sub>	Output Capacitance			50.3		pF
C <sub>rss</sub>	Reverse Transfer Capacitance			37.8	53	pF
R <sub>g</sub>	Gate resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz	6	12	18	Ω
<b>SWITCHING PARAMETERS</b>						
Q <sub>g(10)</sub>	Total Gate Charge(10V)	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V, I <sub>D</sub> =-2.6A		6.8	9	nC
Q <sub>g(4.5)</sub>	Total Gate Charge(4.5V)			2.4	3.1	nC
Q <sub>gs</sub>	Gate Source Charge			1.6		nC
Q <sub>gd</sub>	Gate Drain Charge			0.95		nC
t <sub>D(on)</sub>	Turn-On DelayTime	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V, R <sub>L</sub> =5.8Ω, R <sub>GEN</sub> =3Ω		7.5		ns
t <sub>r</sub>	Turn-On Rise Time			3.2		ns
t <sub>D(off)</sub>	Turn-Off DelayTime			17		ns
t <sub>f</sub>	Turn-Off Fall Time			6.8		ns

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## TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

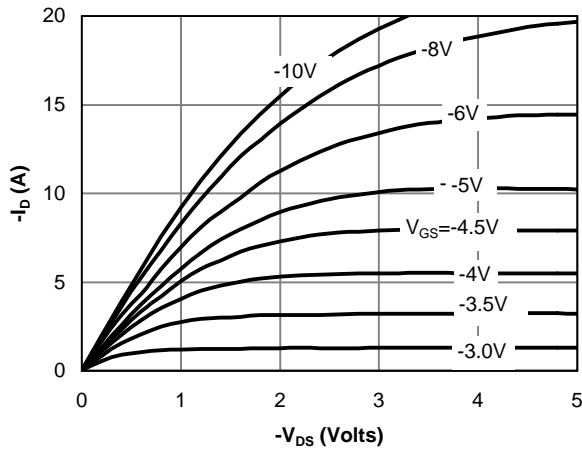


Fig 1: On-Region Characteristics

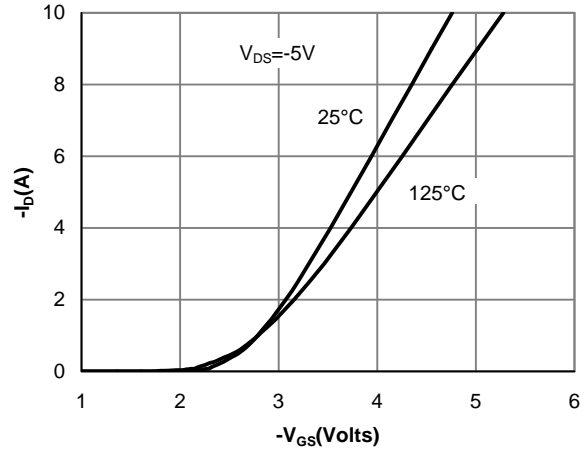


Figure 2: Transfer Characteristics

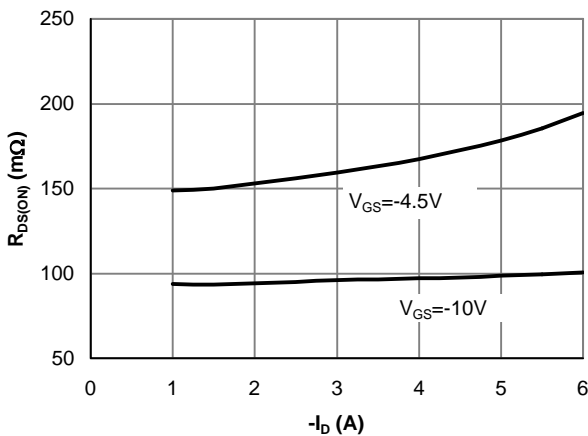


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

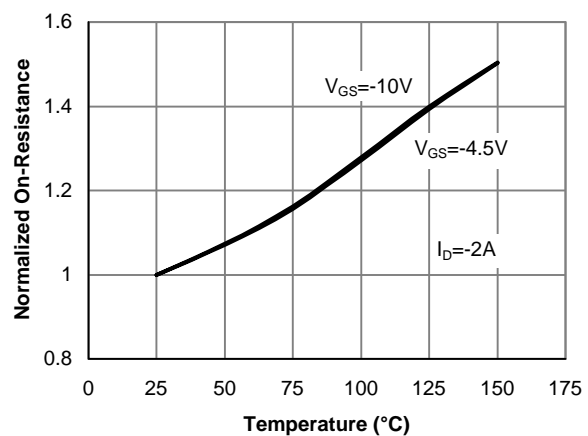


Figure 4: On-Resistance vs. Junction Temperature

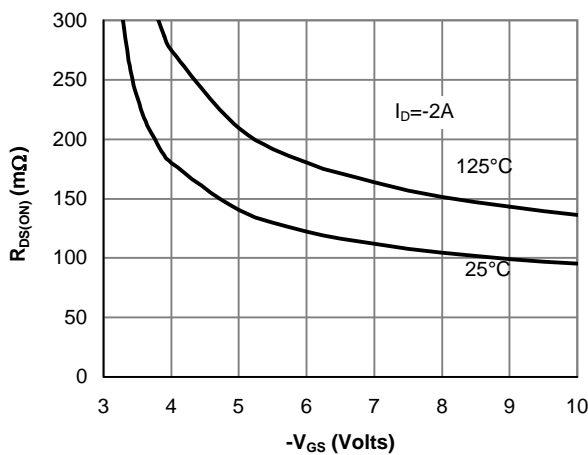


Figure 5: On-Resistance vs. Gate-Source Voltage

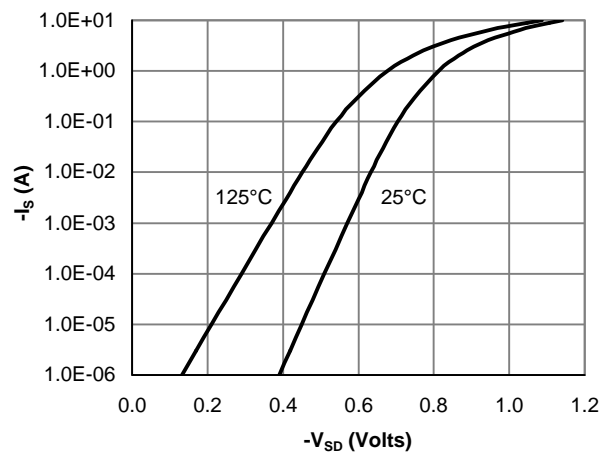


Figure 6: Body-Diode Characteristics

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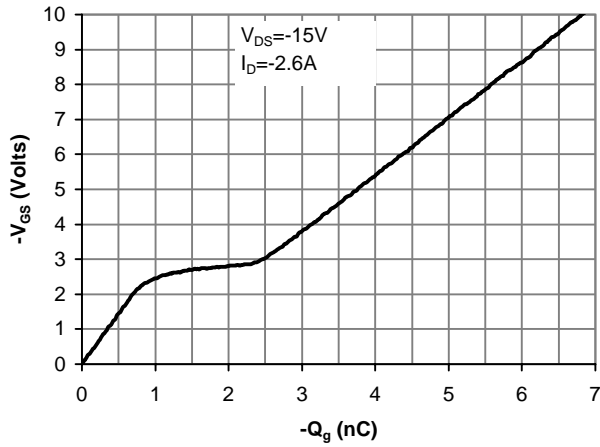


Figure 7: Gate-Charge Characteristics

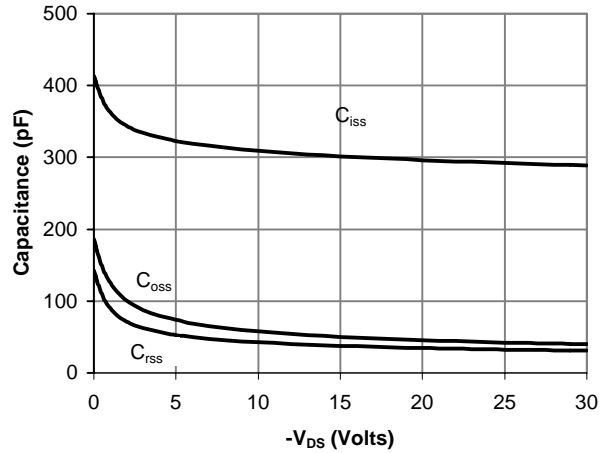


Figure 8: Capacitance Characteristics

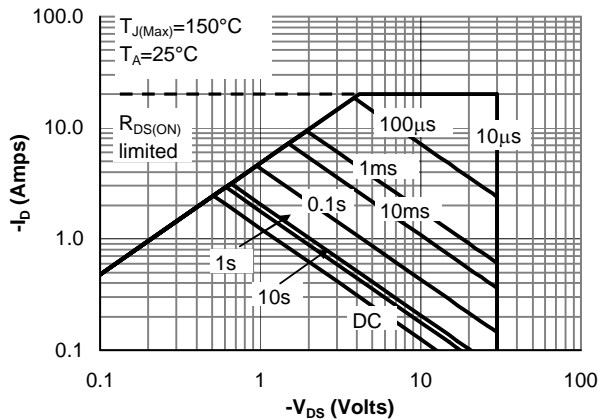


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

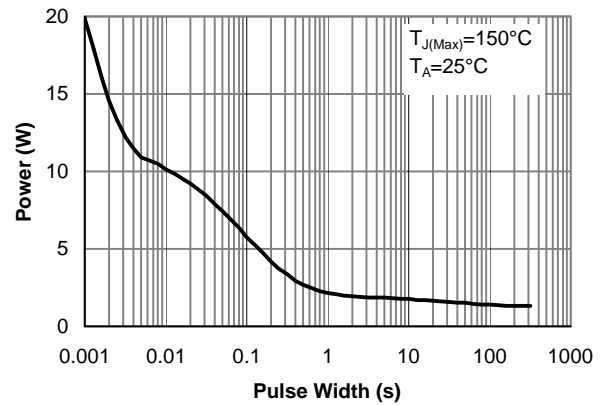


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

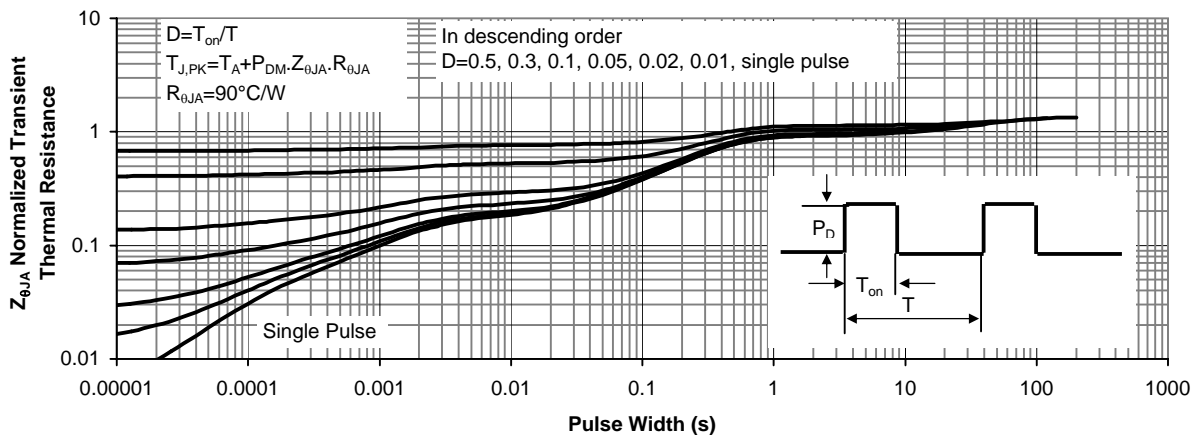
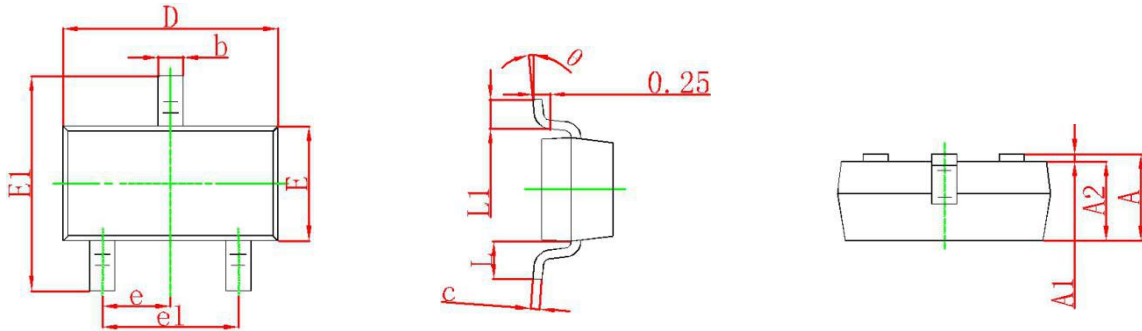


Figure 11: Normalized Maximum Transient Thermal Impedance

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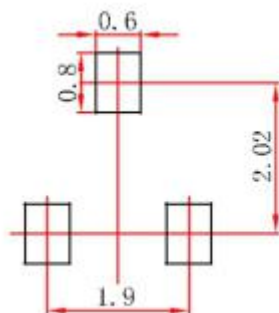
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## SOT-23 Package Outline Dimensions



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.