

SOT-23 Plastic-Encapsulate MOSFETS

SI2304

N-Channel 30-V (D-S) MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
30	0.055 @ $V_{GS} = 10$ V	2.5
	0.080 @ $V_{GS} = 4.5$ V	2.0

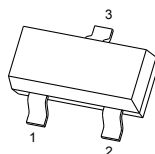
General FEATURE

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

APPLICATION

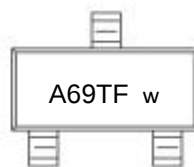
- Load Switch for Portable Devices
- DC/DC Converter

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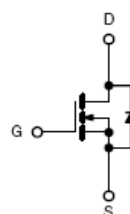
- 1.GATE
- 2.SOURCE
- 3.DRAIN

MARKING



*w: week code

Equivalent Circuit



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ($T_J = 150^\circ\text{C}$) ^a	I_D	2.5	A
		2.0	
Pulsed Drain Current ^b	I_{DM}	10	
Continuous Source Current (Diode Conduction) ^a	I_S	1.25	W
Power Dissipation ^a	P_D	1.25	
		0.80	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 150	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Limit	Unit
Maximum Junction-to-Ambient ^a	R_{thJA}	100	$^\circ\text{C/W}$
Maximum Junction-to-Ambient ^c		166	

Notes

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

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SPECIFICATIONS (T _A = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ	Max	
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = 250 μA	30			V
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	1.0		3.0	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 12 V			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}					μA
		V _{DS} = 25 V, V _{GS} = 0 V, T _J =25°C			1	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ 4.5 V, V _{GS} = 10 V	6			A
		V _{DS} ≥ 4.5 V, V _{GS} = 4.5 V	4			
Drain-Source On-Resistance ^a	r _{DS(on)}	V _{GS} = 10 V, I _D = 2.5 A			0.055	Ω
		V _{GS} = 4.5 V, I _D = 2.0 A			0.080	
Forward Transconductance ^a	g _{fs}	V _{DS} = 4.5 V, I _D = 2.5 A		4.6		S
Diode Forward Voltage	V _{SD}	I _S = 1.25 A, V _{GS} = 0 V		0.77	1.2	V
Dynamic						
Gate Charge	Q _g	V _{DS} = 15 V, V _{GS} = 5 V, I _D = 2.5 A		2.4	4	nC
Total Gate Charge	Q _{gt}	V _{DS} = 15 V, V _{GS} = 10 V, I _D = 2.5 A		4.5	10	
Gate-Source Charge	Q _{gs}			0.8		
Gate-Drain Charge	Q _{gd}			1.0		
Input Capacitance	C _{iss}	V _{DS} = 15 V, V _{GS} = 0 V, f = 1 MHz		240		pF
Output Capacitance	C _{oss}			110		
Reverse Transfer Capacitance	C _{rss}			17		
Switching						
Turn-On Delay Time	t _{d(on)}	V _{DD} = 15 V, R _L = 15 Ω I _D ≅ 1 A, V _{GEN} = 10 V, R _G = 6 Ω		8	20	ns
Rise Time	t _r			12	30	
Turn-Off Delay Time	t _{d(off)}			17	35	
Fall-Time	t _f			8	20	

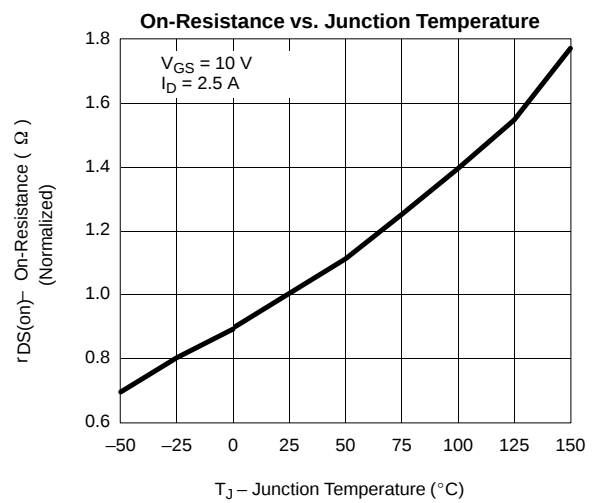
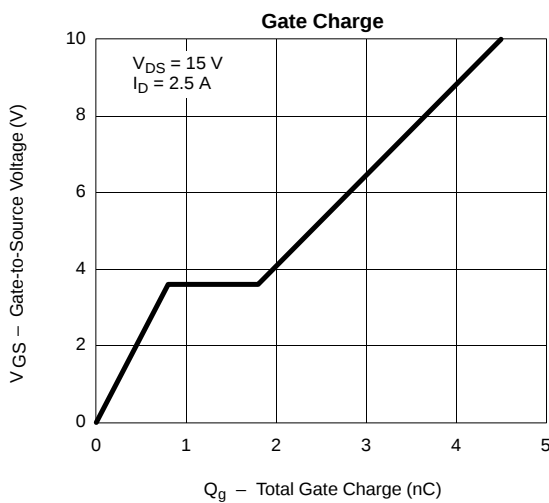
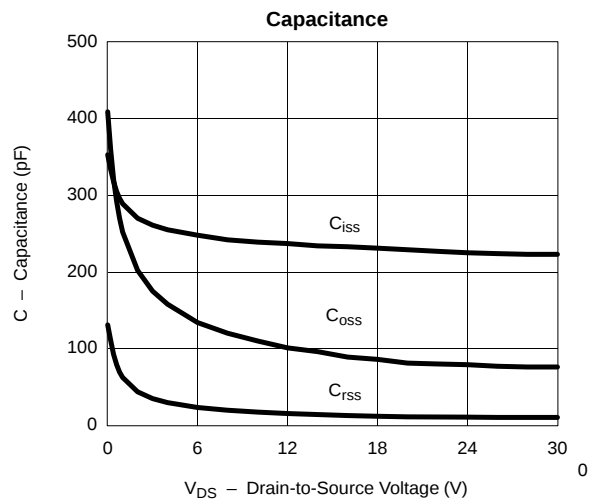
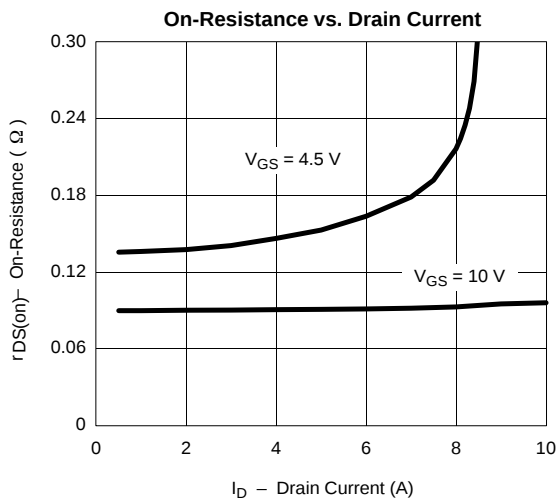
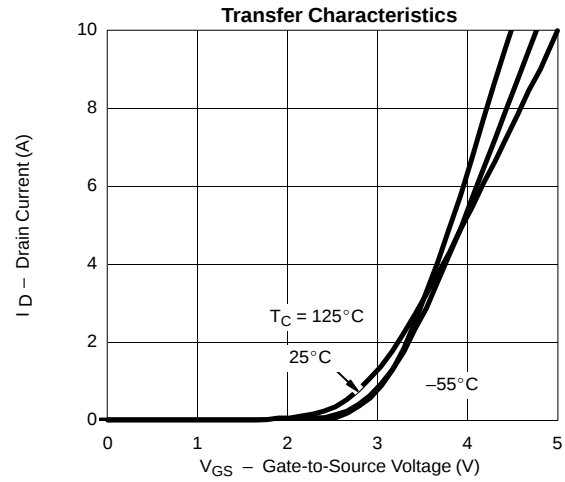
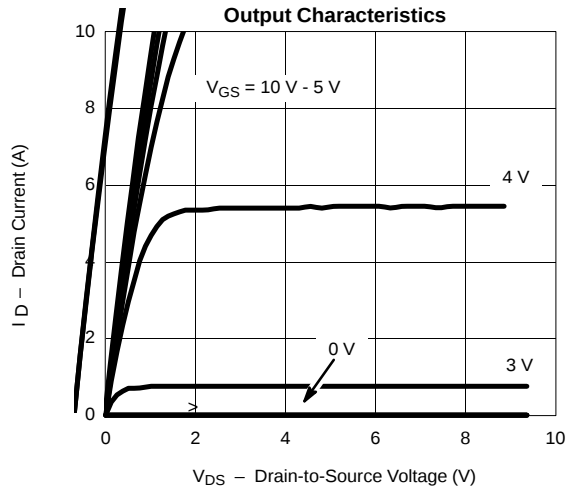
Notes

a. Pulse test: PW ≤ 300 μs duty cycle ≤ 2%.

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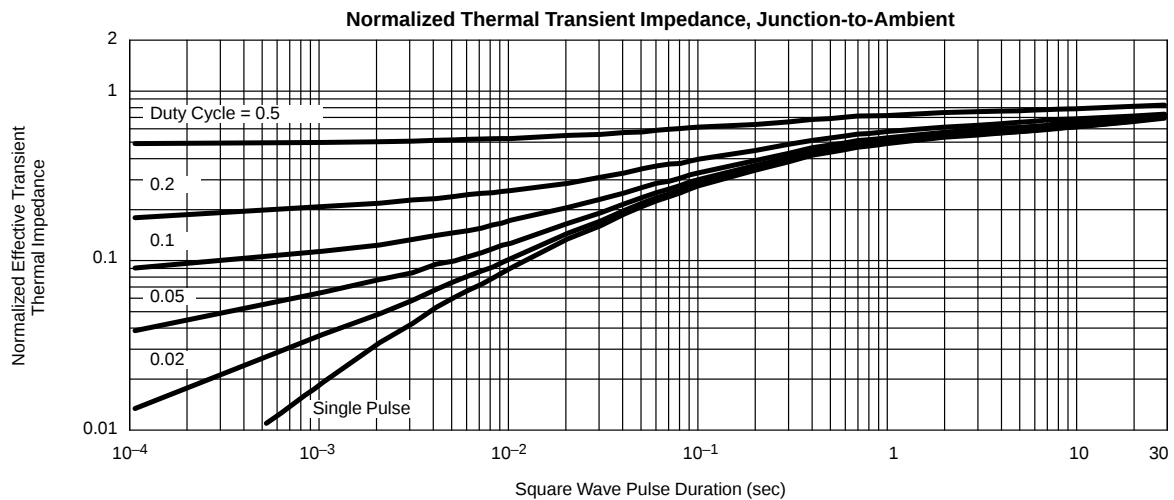
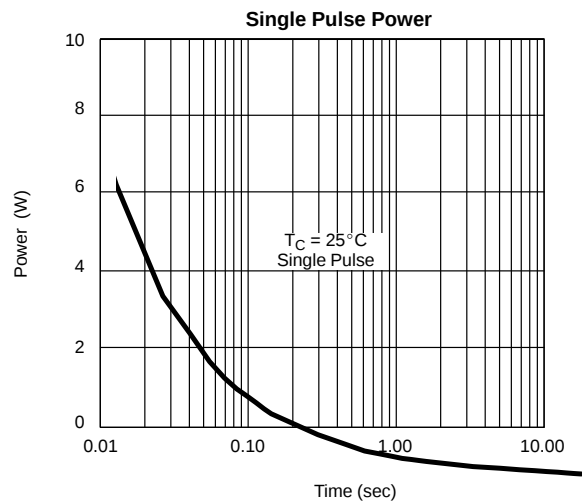
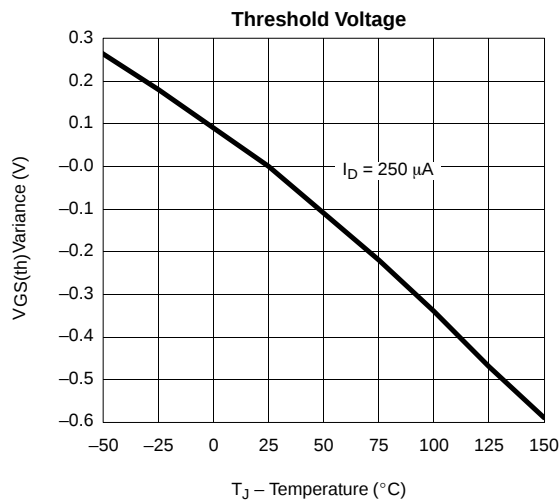
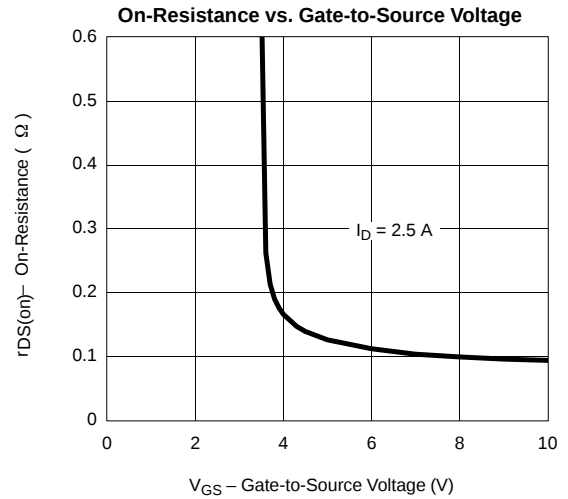
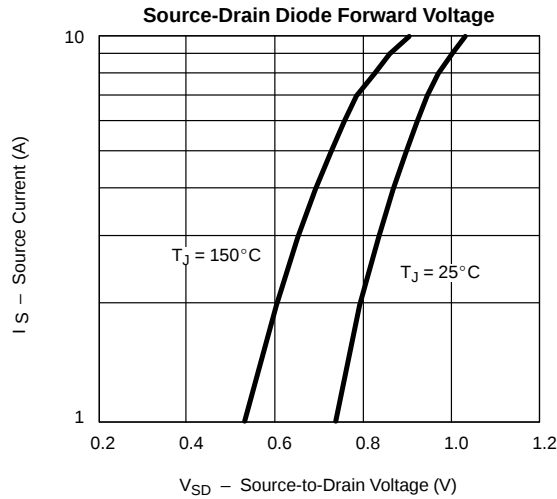
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



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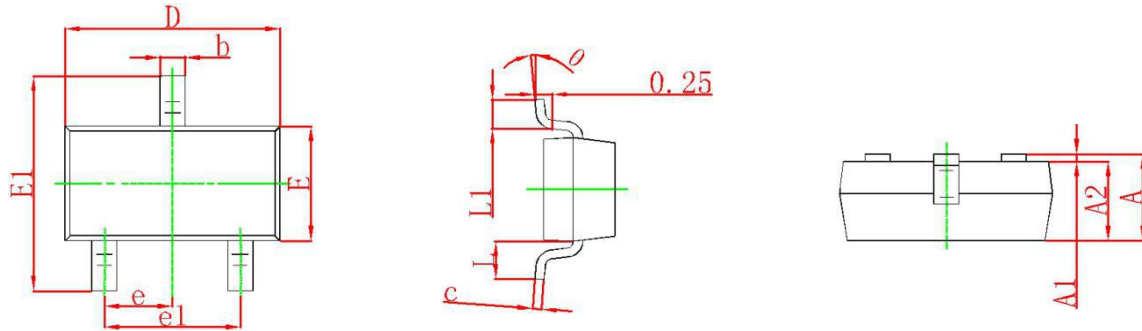
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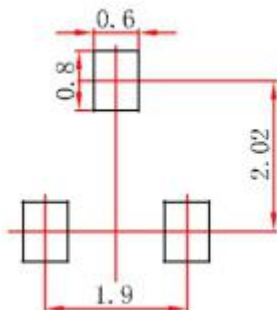
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SOT-23 Package Outline Dimensions



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.