

N-Channel 2.5-V (G-S) MOSFET

PRODUCT SUMMARY

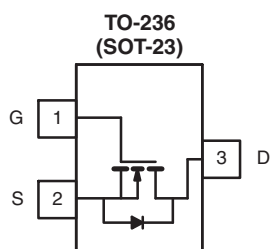
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)
20	0.060 at $V_{GS} = 4.5$ V	2.4
	0.115 at $V_{GS} = 2.5$ V	2.0

FEATURES

- Halogen-free According to IEC 61249-2-21 Definition
- 100 % R_g Tested
- Compliant to RoHS Directive 2002/95/EC



RoHS
COMPLIANT
HALOGEN
FREE
Available



Top View

Si2302ADS (2A)*

* Marking Code

Ordering Information: Si2302ADS-T1-E3 (Lead (Pb)-free)
Si2302ADS-T1-GE3 (Lead (Pb)-free and Halogen-free)

ABSOLUTE MAXIMUM RATINGS ($T_A = 25$ °C, unless otherwise noted)

Parameter		Symbol	5 s	Steady State	Unit
Drain-Source Voltage		V _{DS}	20		V
Gate-Source Voltage		V _{GS}	± 8		
Continuous Drain Current (T _J = 150 °C) ^a	T _A = 25 °C	I _D	2.4	2.1	A
	T _A = 70 °C		1.9	1.7	
Pulsed Drain Current ^a		I _{DM}	10		
Continuous Source Current (Diode Conduction) ^a		I _S	0.94	0.6	
Power Dissipation ^a	T _A = 25 °C	P _D	0.9	0.7	W
	T _A = 70 °C		0.57	0.46	
Operating Junction and Storage Temperature Range		T _J , T _{sta}	- 55 to 150		°C

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^a	R_{thJA}	115	140	°C/W
		140	175	

Notes:

a. Surface mounted on FR4 board.

For SPICE model information via the Worldwide Web: www.vishay.com/www/product/spice.htm

SPECIFICATIONS ($T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}$, $I_D = 10\text{ }\mu\text{A}$	20			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 50\text{ }\mu\text{A}$	0.65	0.95	1.2	
Gate Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}$, $V_{GS} = \pm 8\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 20\text{ V}$, $V_{GS} = 0\text{ V}$			0.1	μA
		$V_{DS} = 20\text{ V}$, $V_{GS} = 0\text{ V}$, $T_J = 55\text{ }^{\circ}\text{C}$			2.0	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 5\text{ V}$, $V_{GS} = 4.5\text{ V}$	6			A
		$V_{DS} \geq 5\text{ V}$, $V_{GS} = 2.5\text{ V}$	4			
Drain-Source On-Resistance ^a	$R_{DS(on)}$	$V_{GS} = 4.5\text{ V}$, $I_D = 3.6\text{ A}$		0.045	0.060 ^b	Ω
		$V_{GS} = 2.5\text{ V}$, $I_D = 3.1\text{ A}$		0.070	0.115	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 5\text{ V}$, $I_D = 3.6\text{ A}$		8		S
Diode Forward Voltage	V_{SD}	$I_S = 0.94\text{ A}$, $V_{GS} = 0\text{ V}$		0.76	1.2	V
Dynamic						
Total Gate Charge	Q_g	$V_{DS} = 10\text{ V}$, $V_{GS} = 4.5\text{ V}$, $I_D = 3.6\text{ A}$		4.0	10	nC
Gate-Source Charge	Q_{gs}			0.65		
Gate-Drain Charge	Q_{gd}			1.5		
Input Capacitance	C_{iss}	$V_{DS} = 10\text{ V}$, $V_{GS} = 0\text{ V}$, $f = 1\text{ MHz}$		300		pF
Output Capacitance	C_{oss}			120		
Reverse Transfer Capacitance	C_{rss}			80		
Gate Resistance	R_g	$f = 1\text{ MHz}$	0.5	1	2	Ω
Switching						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 10\text{ V}$, $R_L = 2.8\text{ }\Omega$ $I_D \cong 3.6\text{ A}$, $V_{GEN} = 4.5\text{ V}$, $R_g = 6\text{ }\Omega$		7	15	ns
Rise Time	t_r			55	80	
Turn-Off Delay Time	$t_{d(off)}$			16	60	
Fall Time	t_f			10	25	

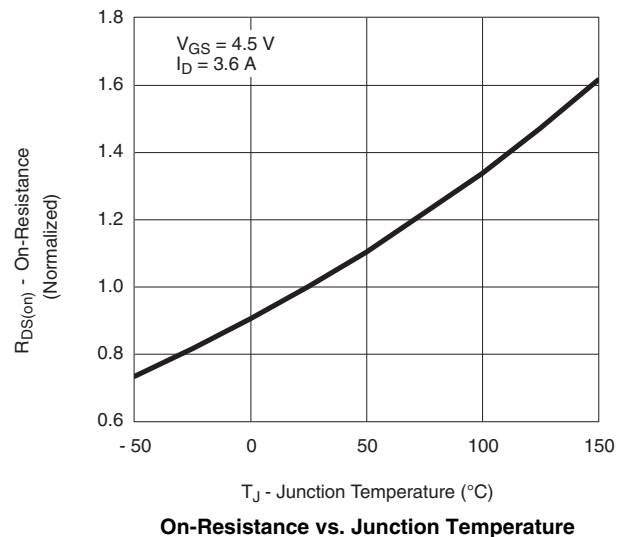
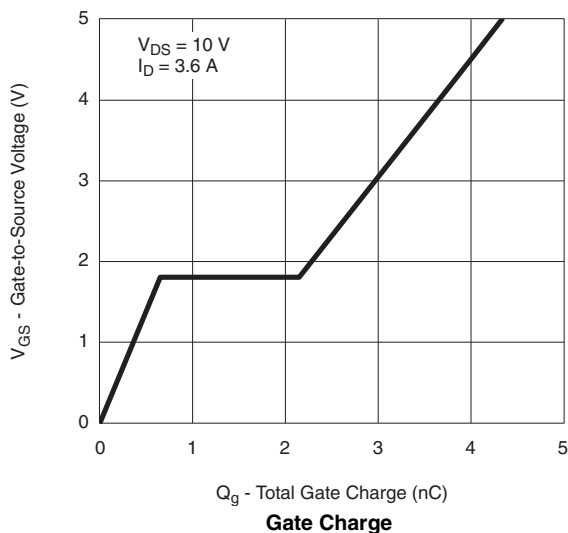
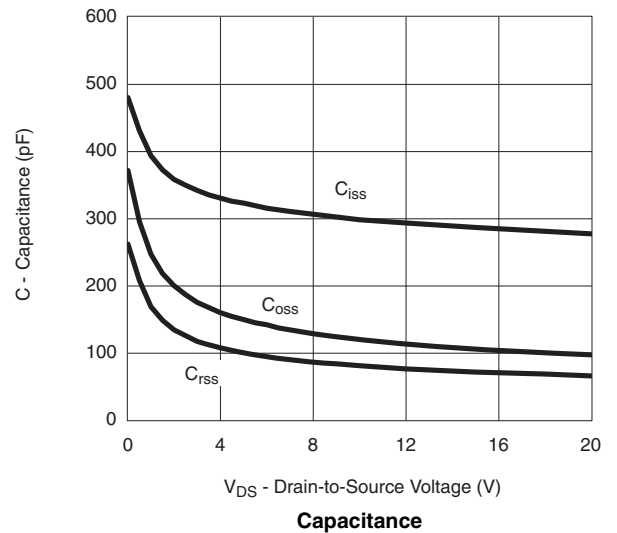
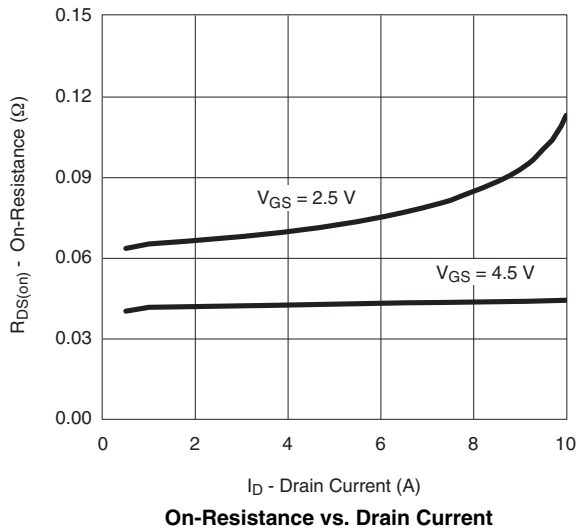
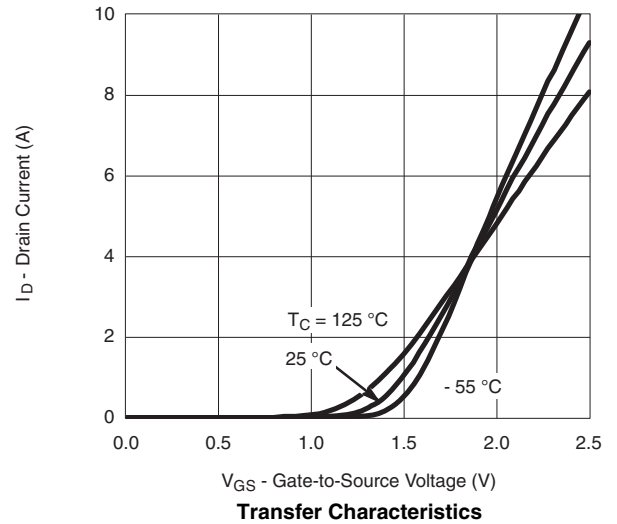
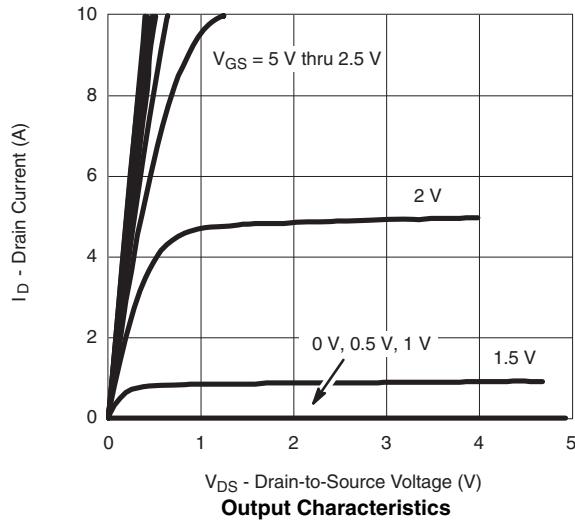
Notes:

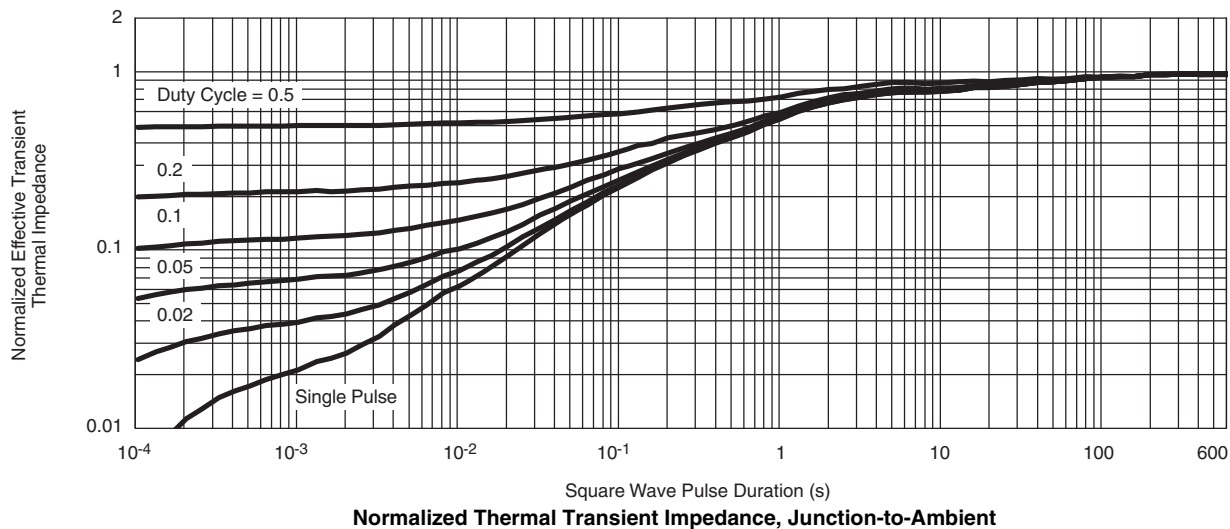
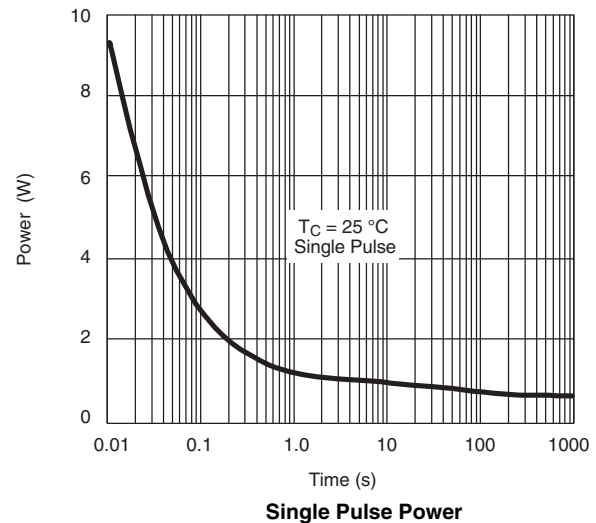
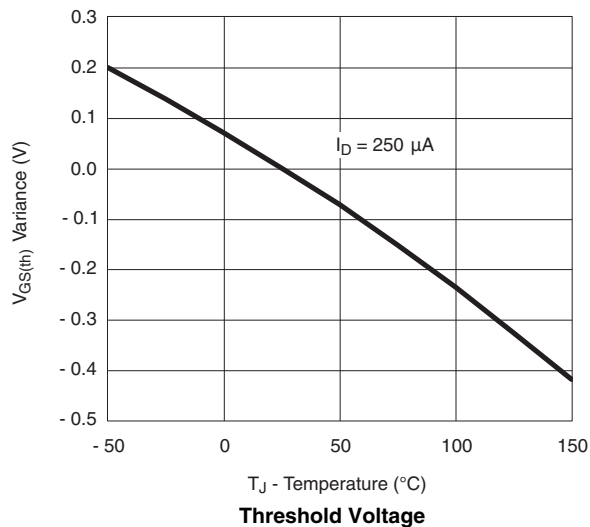
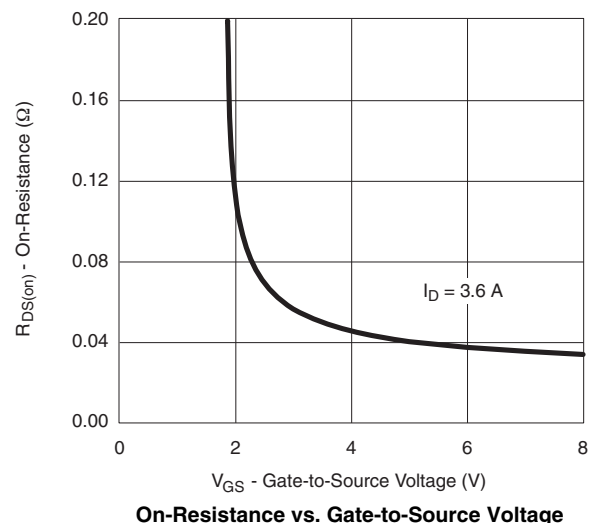
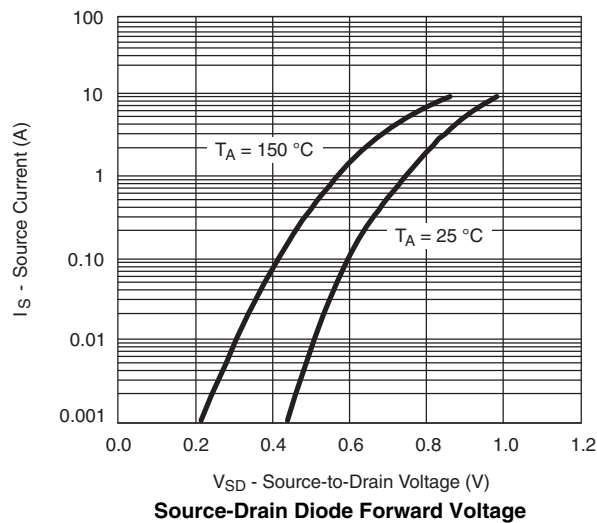
a. Pulse test; $PW \leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

b. Effective for production 10/04.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

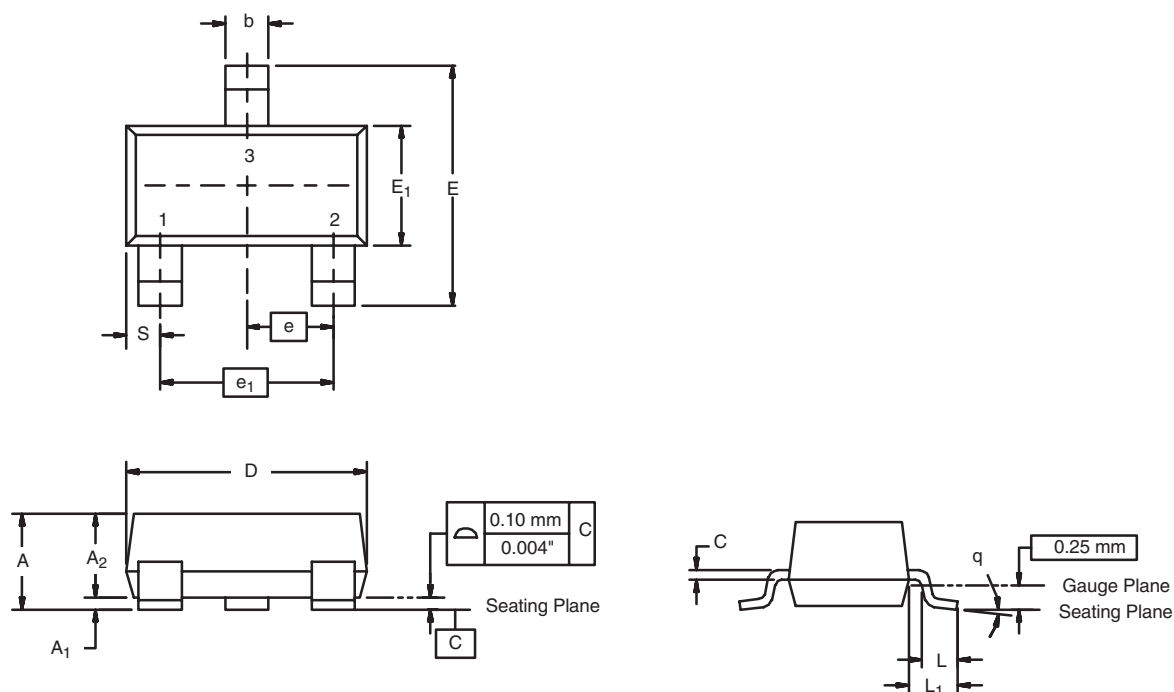
TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise noted)



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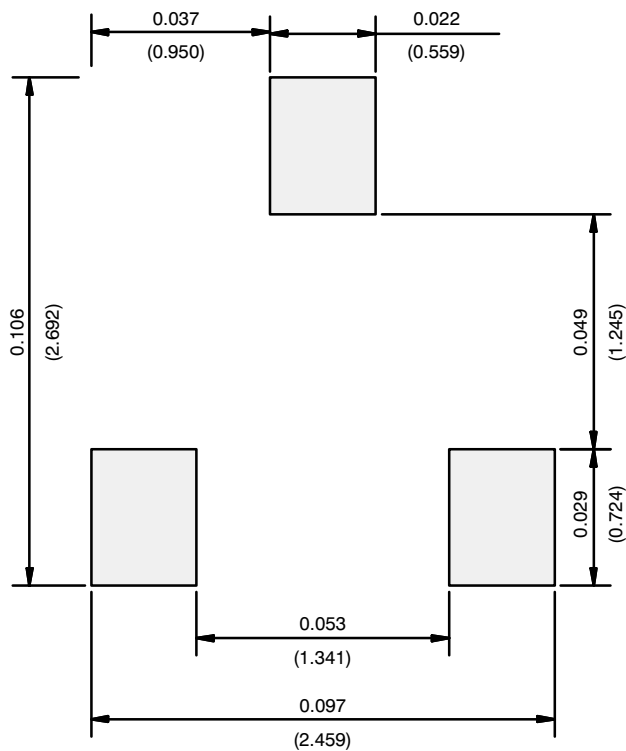
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SOT-23 (TO-236): 3-LEAD



Dim	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	0.89	1.12	0.035	0.044
A ₁	0.01	0.10	0.0004	0.004
A ₂	0.88	1.02	0.0346	0.040
b	0.35	0.50	0.014	0.020
c	0.085	0.18	0.003	0.007
D	2.80	3.04	0.110	0.120
E	2.10	2.64	0.083	0.104
E ₁	1.20	1.40	0.047	0.055
e	0.95 BSC		0.0374 Ref	
e ₁	1.90 BSC		0.0748 Ref	
L	0.40	0.60	0.016	0.024
L ₁	0.64 Ref		0.025 Ref	
S	0.50 Ref		0.020 Ref	
q	3°	8°	3°	8°
ECN: S-03946-Rev. K, 09-Jul-01				
DWG: 5479				

RECOMMENDED MINIMUM PADS FOR SOT-23



Recommended Minimum Pads
Dimensions in Inches/(mm)

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