

N-Channel 1.25-W, 2.5-V MOSFET

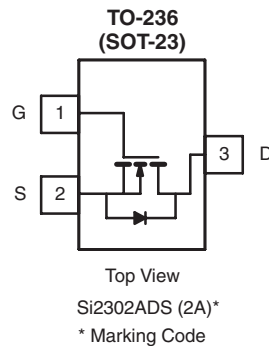
PRODUCT SUMMARY		
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)
20	0.060 at $V_{GS} = 4.5$ V	2.4
	0.115 at $V_{GS} = 2.5$ V	2.0

FEATURES

- Halogen-free Option Available



Available
RoHS*
COMPLIANT



Ordering Information: Si2302ADS-T1
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	I_D	$T_A = 25$ °C	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	P_D	$T_A = 25$ °C	0.9	0.7	W
		$T_A = 70$ °C	0.57	0.46	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to 150		°C	

THERMAL RESISTANCE RATINGS					
Parameter	Symbol	Typical	Maximum	Unit	
Maximum Junction-to-Ambient ^a	R_{thJA}	$t \leq 5$ s	115	140	°C/W
		Steady State	140	175	

Notes:

a. Surface Mounted on FR4 board.

* Pb containing terminations are not RoHS compliant, exemptions may apply

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		
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.