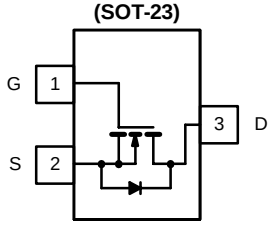
N-Channel 1.25-W, 2.5-V MOSFET

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

TO-236
(SOT-23)



Top View
Si2302DS (2A)*
*Marking Code

Ordering Information: Si2302ADS-T1

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C UNLESS OTHERWISE NOTED)					
Parameter		Symbol	5 sec	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_{stg}	−55 to 150		°C

THERMAL RESISTANCE RATINGS					
Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient[a]	t ≤ 5 sec.	R_{thJA}	115	140	°C/W
	Steady State		140	175	

Notes
a. Surface Mounted on FR4 Board.

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

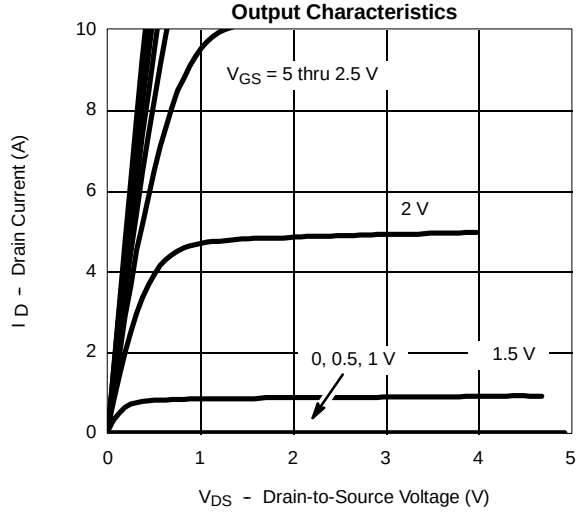
SPECIFICATIONS (T_A = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = 10 μA	20			V
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 50 μA	0.65	0.95	1.2	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±8 V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 20 V, V_{GS} = 0 V			1	μA
		V_{DS} = 20 V, V_{GS} = 0 V, T_J = 55°C			10	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} ≥ 5 V, V_{GS} = 4.5 V	6			A
		V_{DS} ≥ 5 V, V_{GS} = 2.5 V	4			
Drain-Source On-Resistance[a]	$r_{DS(on)}$	V_{GS} = 4.5 V, I_D = 3.6 A		0.045	0.060[b]	Ω
		V_{GS} = 2.5 V, I_D = 3.1 A		0.070	0.115	
Forward Transconductance[a]	g_{fs}	V_{DS} = 5 V, I_D = 3.6 A		8		S
Diode Forward Voltage	V_{SD}	I_S = 0.94 A, V_{GS} = 0 V		0.76	1.2	V
Dynamic						
Total Gate Charge	Q_g	V_{DS} = 10 V, V_{GS} = 4.5 V, I_D = 3.6 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 V, V_{GS} = 0 V, f = 1 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 V, R_L = 2.8 Ω I_D ≅ 3.6 A, V_{GEN} = 4.5 V, R_g = 6 Ω		7	15	ns
Rise Time	t_r			55	80	
Turn-Off Delay Time	$t_{d(off)}$			16	60	
Fall-Time	t_f			10	25	

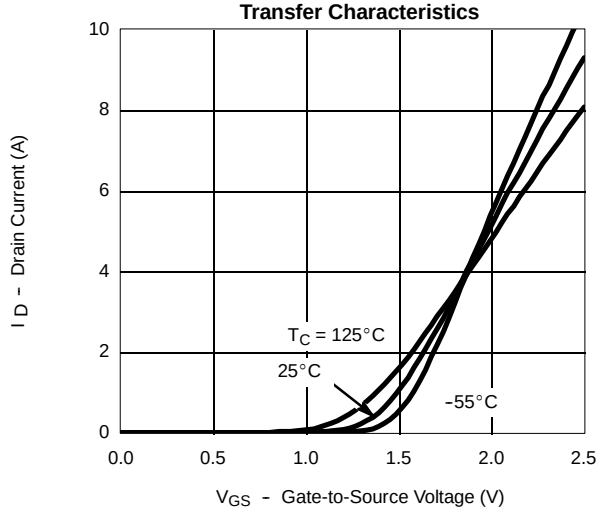
Notes
a. Pulse test: PW ≤ 300 μs duty cycle ≤ 2%.
b. Effective for production 10/04.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

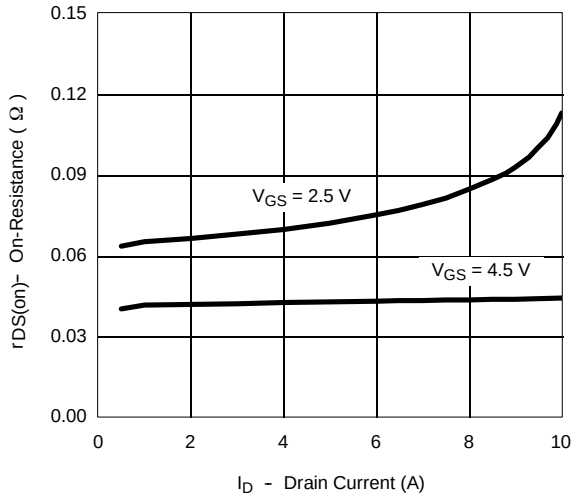
Output Characteristics



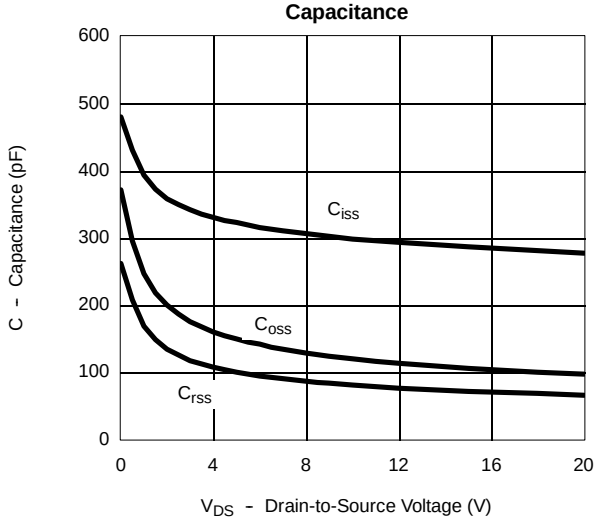
Transfer Characteristics



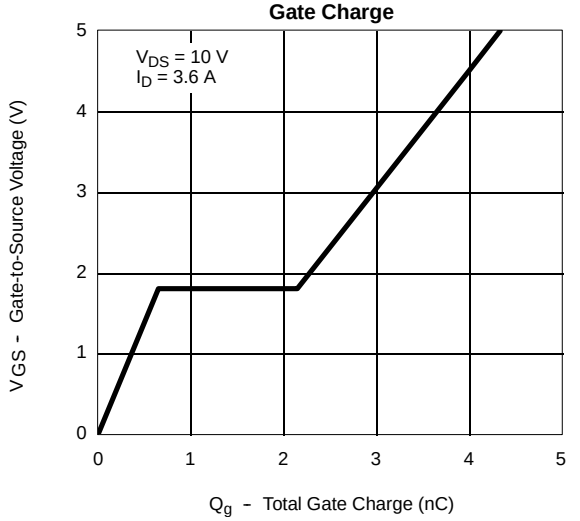
On-Resistance vs. Drain Current



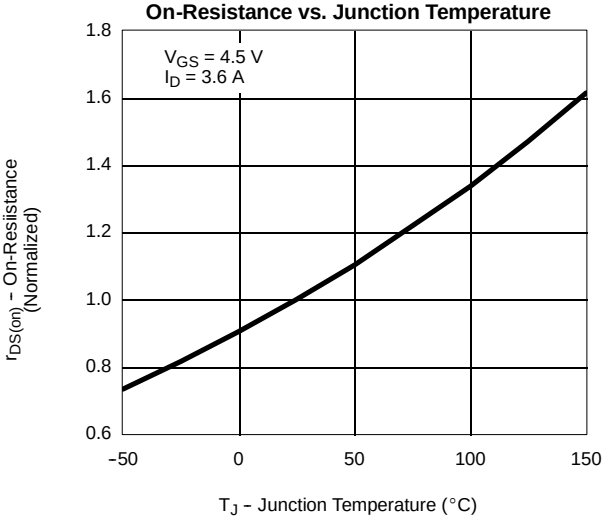
Capacitance



Gate Charge

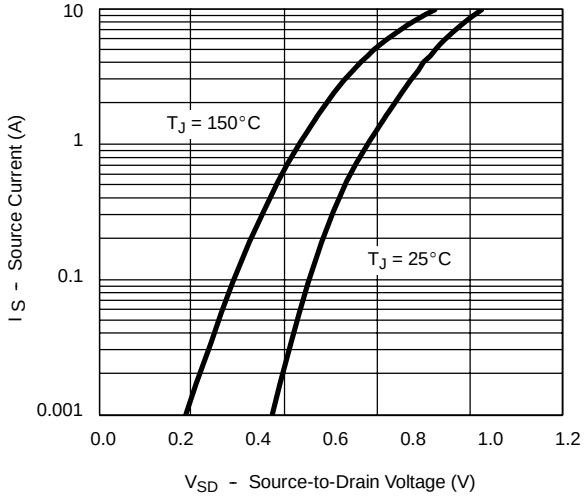


On-Resistance vs. Junction Temperature

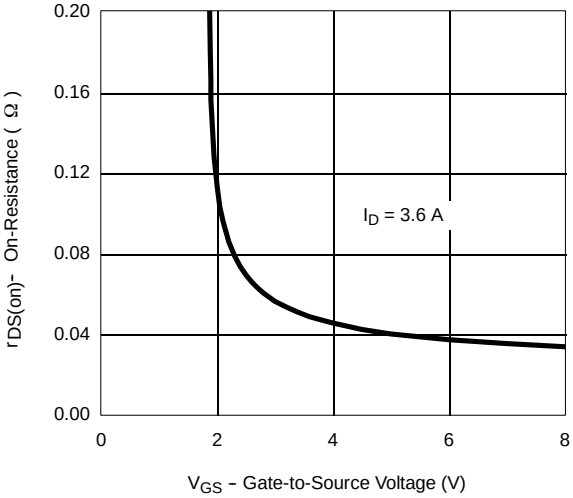


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

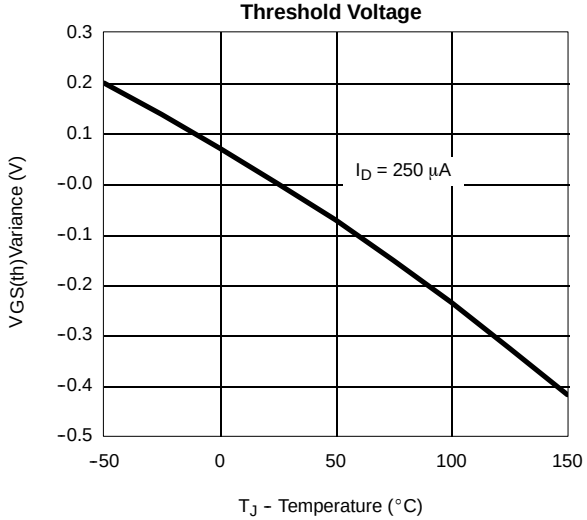
Source-Drain Diode Forward Voltage



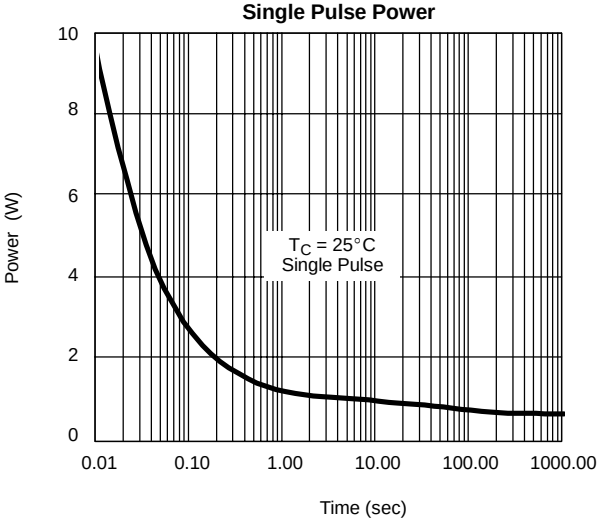
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient