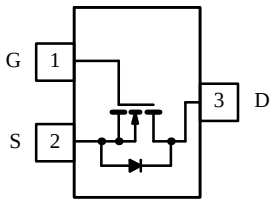
N-Channel 1.25-W, 2.5-V Rated MOSFET

Product Summary

V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
20	0.085 @ V_{GS} = 4.5 V	2.8
	0.115 @ V_{GS} = 2.5 V	2.4

TO-236
(SOT-23)



Top View
Si2302DS (A1)*
*Marking Code

Absolute Maximum Ratings (T_A = 25°C Unless Otherwise Noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	± 8	
Continuous Drain Current (T_J = 150°C)[b]	T_A= 25°C	I_D	2.8	A
	T_A= 70°C		2.2	
Pulsed Drain Current[a]		I_{DM}	10	
Continuous Source Current (Diode Conduction)[b]		I_S	1.6	
Power Dissipation[b]	T_A= 25°C	P_D	1.25	W
	T_A= 70°C		0.80	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	–55 to 150	°C

Thermal Resistance Ratings

Parameter	Symbol	Limit	Unit
Maximum Junction-to-Ambient[b]	R_{thJA}	100	°C/W
Maximum Junction-to-Ambient[c]		166	

Notes
a. Pulse width limited by maximum junction temperature.
b. Surface Mounted on FR4 Board, t ≤ 5 sec.
c. Surface Mounted on FR4 Board.

Updates to this data sheet may be obtained via facsimile by calling Siliconix FaxBack, 1-408-970-5600. Please request FaxBack document #70628.

Specifications[a]

Parameter	Symbol	Test Conditions	Limits Min	Limits Typ	Limits 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			V
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
		T_J = 55°C			10	µA
On-State Drain Current[b]	$I_{D(on)}$	V_{DS} ≥ 5 V, V_{GS} = 4.5 V	6			A
		V_{DS} ≥ 5 V, V_{GS} = 2.5 V	4			A
Drain-Source On-Resistance[b]	$r_{DS(on)}$	V_{GS} = 4.5 V, I_D = 3.6 A		0.07	0.085	Ω
		V_{GS} = 2.5 V, I_D = 3.1 A		0.085	0.115	Ω
Forward Transconductance[b]	g_{fs}	V_{DS} = 5 V, I_D = 3.6 A		10		S
Diode Forward Voltage	V_{SD}	I_S = 1.6 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		5.4	10	pC
Gate-Source Charge	Q_{gs}			0.65		pC
Gate-Drain Charge	Q_{gd}			1.60		pC
Input Capacitance	C_{iss}	V_{DS} = 10 V, V_{GS} = 0 V, f = 1 MHz		340		pF
Output Capacitance	C_{oss}			115		pF
Reverse Transfer Capacitance	C_{rss}			33		pF
Switching						
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 10 V, R_L = 5.5 Ω I_D ≅ 3.6 A, V_{GEN} = 4.5 V, R_G = 6 Ω		12	25	ns
Rise Time	t_r			36	60	ns
Turn-Off Delay Time	$t_{d(off)}$			34	60	ns
Fall-Time	t_f			10	25	ns

Notes
a. T_A = 25°C unless otherwise noted.
b. Pulse test: PW ≤300 µs duty cycle ≤2%.

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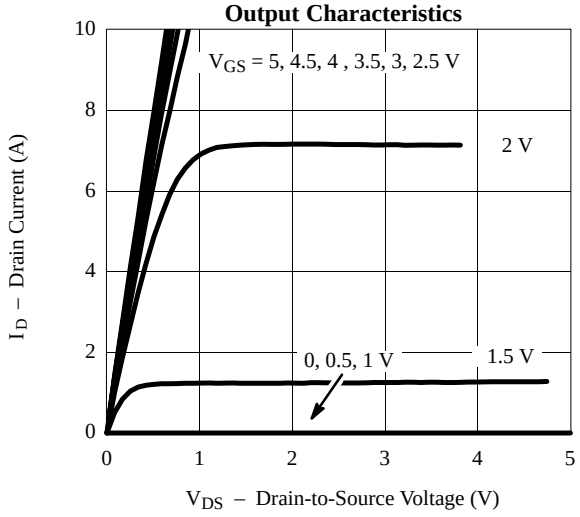
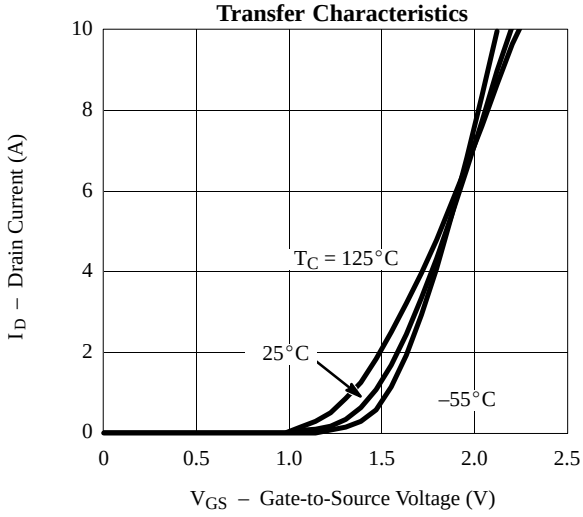
Typical Characteristics (25°C Unless Otherwise Noted)

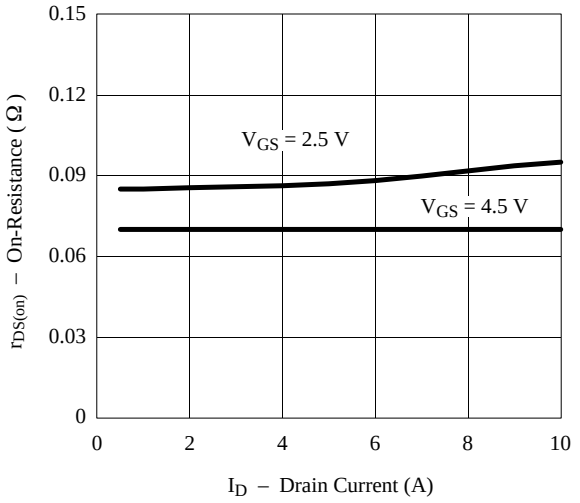
Output Characteristics



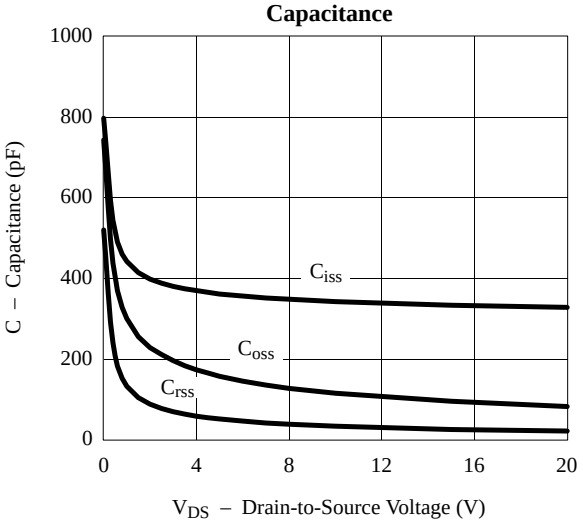
Transfer Characteristics



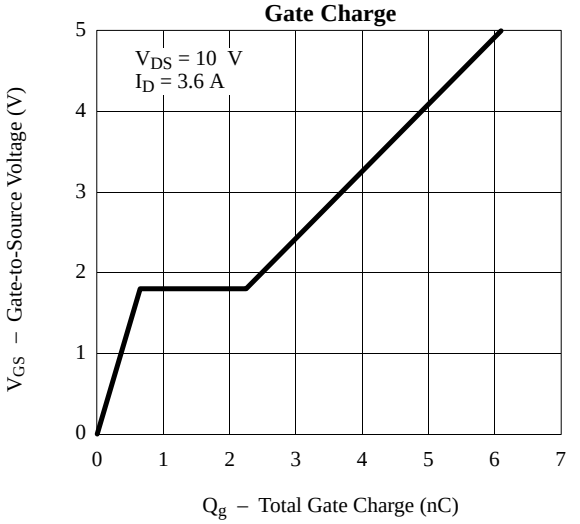
On-Resistance vs. Drain Current



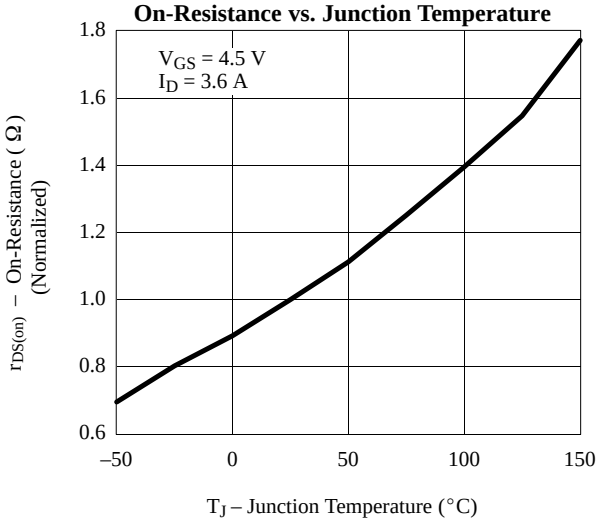
Capacitance



Gate Charge

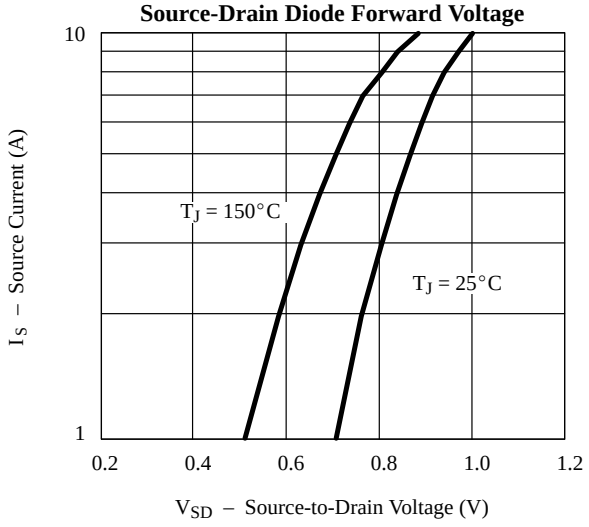


On-Resistance vs. Junction Temperature

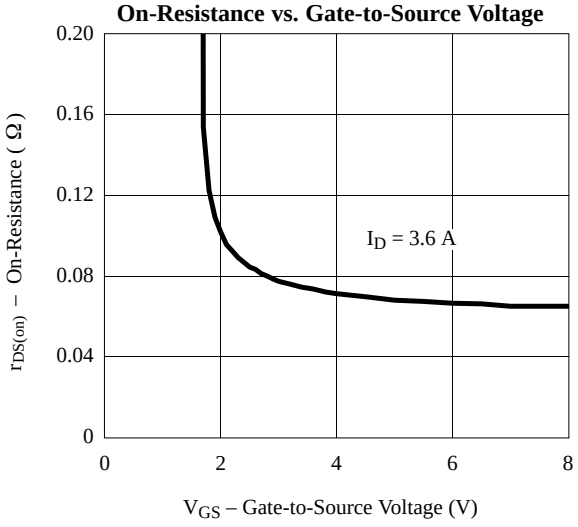


Typical Characteristics (25°C Unless Otherwise Noted)

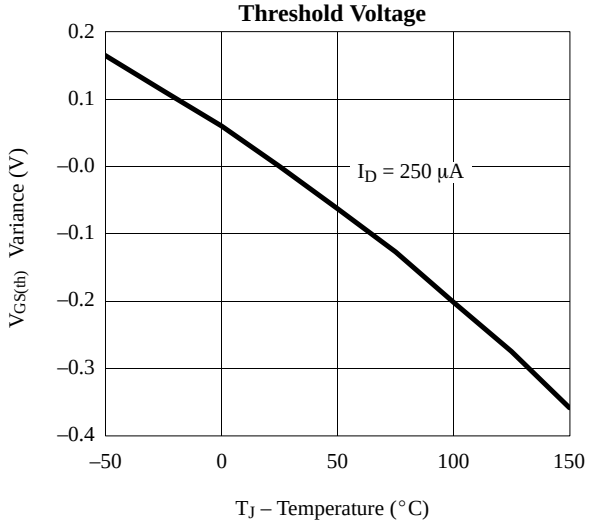
Source-Drain Diode Forward Voltage



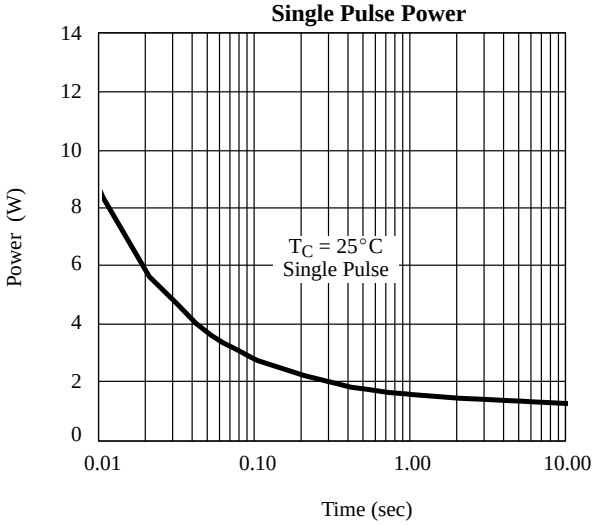
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient