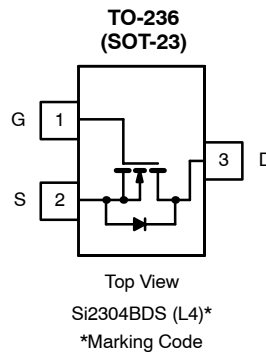


## N-Channel 30-V (D-S) MOSFET

PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
30	0.070 @ $V_{GS} = 10$ V	3.2
	0.105 @ $V_{GS} = 4.5$ V	2.6



Ordering Information: Si2304BDS-T1

ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)					
Parameter	Symbol	5 sec	Steady State	Unit	
Drain-Source Voltage	$V_{DS}$	30		V	
Gate-Source Voltage	$V_{GS}$	$\pm 20$			
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>a, b</sup>	$I_D$	$T_A = 25^\circ\text{C}$	3.2	2.6	A
		$T_A = 70^\circ\text{C}$	2.5	2.1	
Pulsed Drain Current	$I_{DM}$	10			
Continuous Source Current (Diode Conduction) <sup>a, b</sup>	$I_S$	0.9	0.62	W	
Maximum Power Dissipation <sup>a, b</sup>	$P_D$	$T_A = 25^\circ\text{C}$	1.08		0.75
		$T_A = 70^\circ\text{C}$	0.69	0.48	
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 150		$^\circ\text{C}$	

THERMAL RESISTANCE RATINGS					
Parameter	Symbol	Typical	Maximum	Unit	
Maximum Junction-to-Ambient <sup>a</sup>	$R_{thJA}$	$t \leq 5$ sec	90	115	$^\circ\text{C}/\text{W}$
		Steady State	130	166	
Maximum Junction-to-Foot (Drain)	$R_{thJF}$	60	75		

Notes

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

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

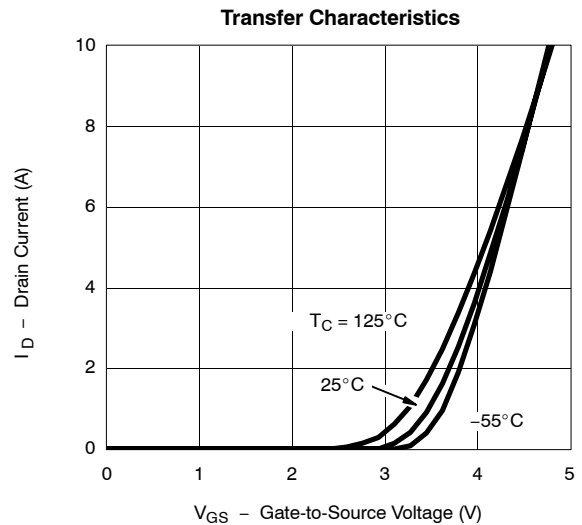
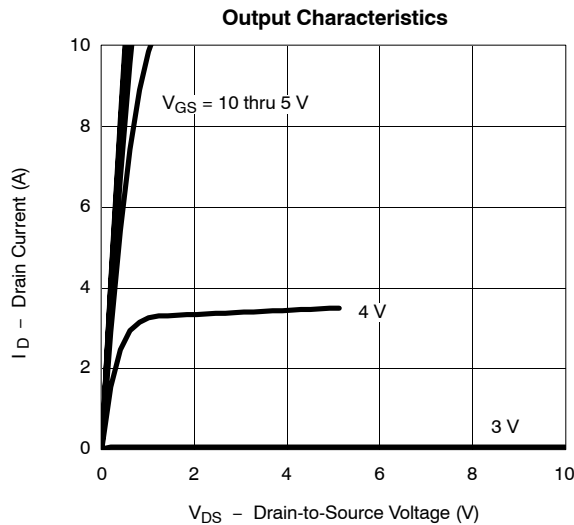


SPECIFICATIONS (T <sub>A</sub> = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ	Max	
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 250 μA	30			V
Gate-Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA	1.5		3.0	
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 0 V			0.5	μA
		V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 55 °C			10	
		V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 1.0 V, T <sub>J</sub> = 25 °C			1	
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> ≥ 4.5 V, V <sub>GS</sub> = 10 V	6			A
Drain-Source On-Resistance <sup>a</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 2.5 A		0.055	0.070	Ω
		V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 2.0 A		0.080	0.105	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 4.5 V, I <sub>D</sub> = 2.5 A		6.0		S
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> = 1.25 A, V <sub>GS</sub> = 0 V		0.8	1.2	V
<b>Dynamic</b>						
Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 5 V, I <sub>D</sub> = 2.5 A		2.6	4	nC
Total Gate Charge	Q <sub>gt</sub>	V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 10 V, I <sub>D</sub> = 2.5 A		4.6	7	
Gate-Source Charge	Q <sub>gs</sub>			0.8		
Gate-Drain Charge	Q <sub>gd</sub>			1.15		
Gate Resistance	R <sub>g</sub>	f = 1.0 MHz		3.0		Ω
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 0 V, f = 1 MHz		225		pF
Output Capacitance	C <sub>oss</sub>			50		
Reverse Transfer Capacitance	C <sub>rss</sub>			28		
<b>Switching</b>						
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 15 V, R <sub>L</sub> = 15 Ω I <sub>D</sub> = 1 A, V <sub>GEN</sub> = 10 V, R <sub>G</sub> = 6 Ω		7.5	12	ns
Rise Time	t <sub>r</sub>			12.5	20	
Turn-Off Delay Time	t <sub>d(off)</sub>			19	30	
Fall-Time	t <sub>f</sub>			15	25	

Notes

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

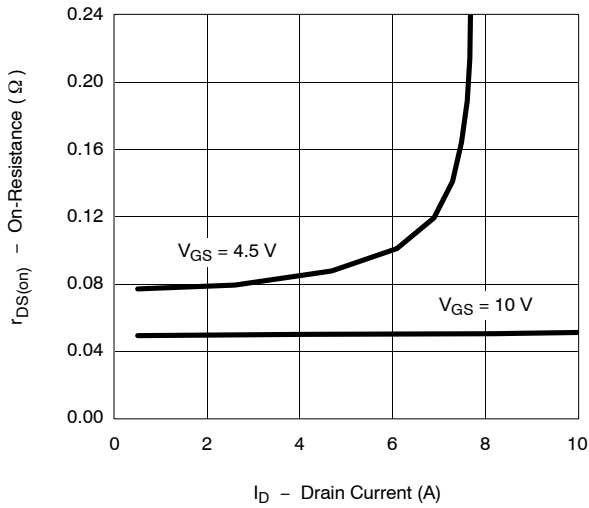
**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)**



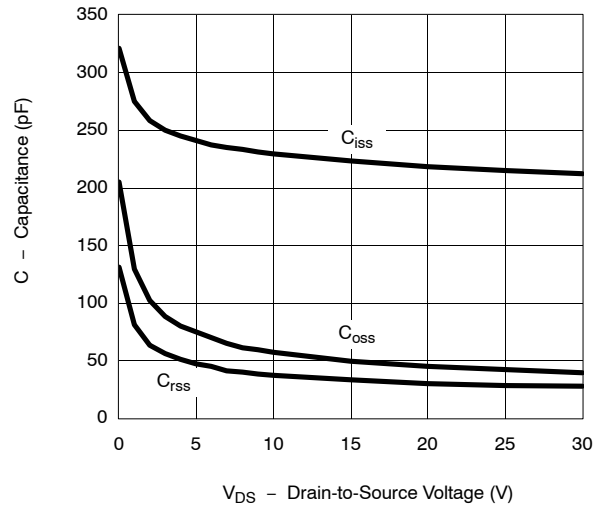


**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)**

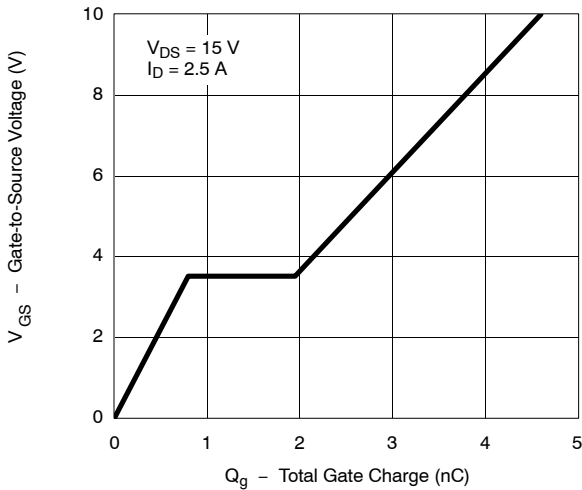
**On-Resistance vs. Drain Current**



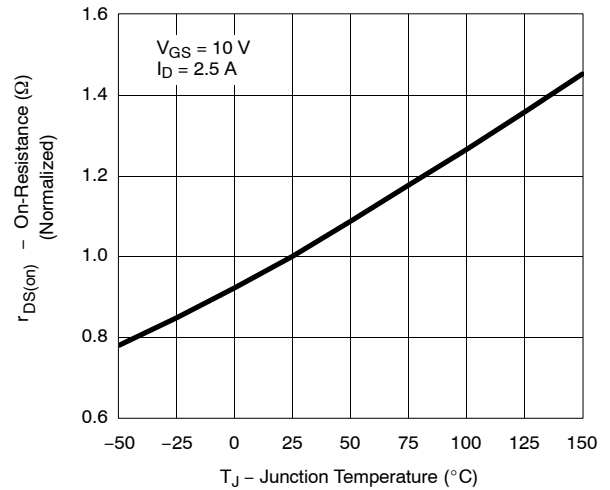
**Capacitance**



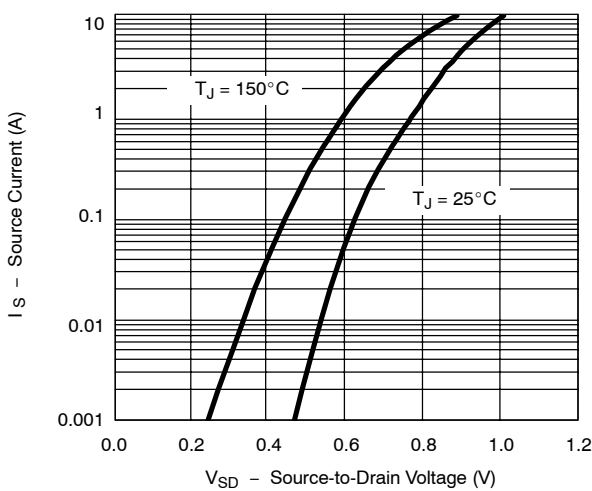
**Gate Charge**



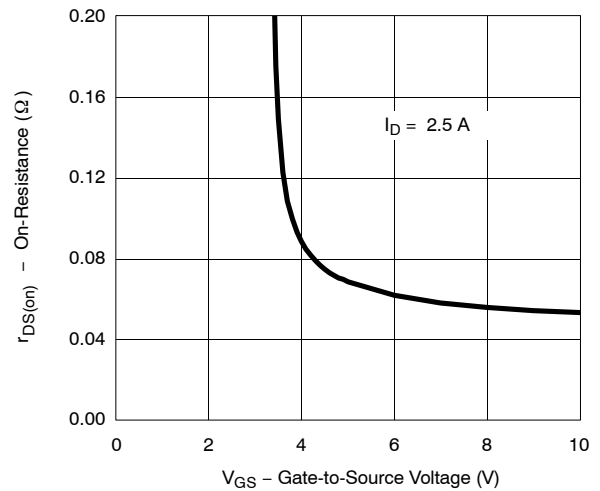
**On-Resistance vs. Junction Temperature**



**Source-Drain Diode Forward Voltage**



**On-Resistance vs. Gate-to-Source Voltage**





**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)**

