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

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
30	0.057 @ V_{GS} = 10 V	3.5
	0.094 @ V_{GS} = 4.5 V	2.8

FEATURES

- TrenchFET® Power MOSFET
- 100% R_g Tested

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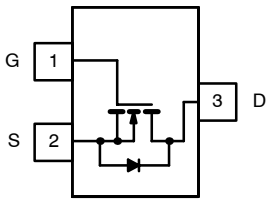
TO-236
(SOT-23)



Top View
Si2306DS (A6)*
*Marking Code

Ordering Information: Si2306DS-T1

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C UNLESS OTHERWISE NOTED)				
Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current (T_J = 150°C)[a, b]	T_A = 25°C	I_D	3.5	A
	T_A = 70°C		2.8	
Pulsed Drain Current		I_{DM}	16	
Continuous Source Current (Diode Conduction)[a, b]		I_S	1.25	
Maximum Power Dissipation[a, 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	Typical	Maximum	Unit
Maximum Junction-to-Ambient[a]	t ≤ 5 sec	R_{thJA}		100	°C/W
	Steady State		130		

Notes
a. Surface Mounted on FR4 Board.
b. t ≤ 5 sec.

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SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{DS} = 0 V, I_D = 250 µA	30			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	1			
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 30 V, V_{GS} = 0 V			0.5	µA
		V_{DS} = 30 V, V_{GS} = 0 V, T_J = 55°C			10	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} ≥ 4.5 V, V_{GS} = 10 V	6			A
		V_{DS} ≥ 4.5 V, V_{GS} = 4.5 V	4			
Drain-Source On-State Resistance[a]	$r_{DS(on)}$	V_{GS} = 10 V, I_D = 3.5 A		0.046	0.057	Ω
		V_{GS} = 4.5 V, I_D = 2.8 A		0.070	0.094	
Forward Transconductance[a]	g_{fs}	V_{DS} = 4.5 V, I_D = 3.5 A		6.9		S
Diode Forward Voltage[a]	V_{SD}	I_S = 1.25 A, V_{GS} = 0 V		0.8	1.2	V
Dynamic[b]						
Gate Charge	Q_g	V_{DS} = 15 V, V_{GS} = 5 V, I_D = 3.5 A		4.2	7	nC
Total Gate Charge	Q_{gt}	V_{DS} = 15 V, V_{GS} = 10 V, I_D = 3.5 A		8.5	20	
Gate-Source Charge	Q_{gs}			1.9		
Gate-Drain Charge	Q_{gd}			1.35		
Gate Resistance	R_g		0.5		2.4	Ω
Input Capacitance	C_{iss}	V_{DS} = 15 V, V_{GS} = 0 V, f= 1 MHz		555		pF
Output Capacitance	C_{oss}			120		
Reverse Transfer Capacitance	C_{rss}			60		
Switching						
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 15 V, R_L = 15 Ω I_D ≅ 1 A, V_{GEN} = 10 V, R_G = 6 Ω		9	20	ns
Rise Time	t_r			7.5	18	
Turn-Off Delay Time	$t_{d(off)}$			17	35	
Fall Time	t_f			5.2	12	

Notes
a. Guaranteed by design, not subject to production testing.
b. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2%.

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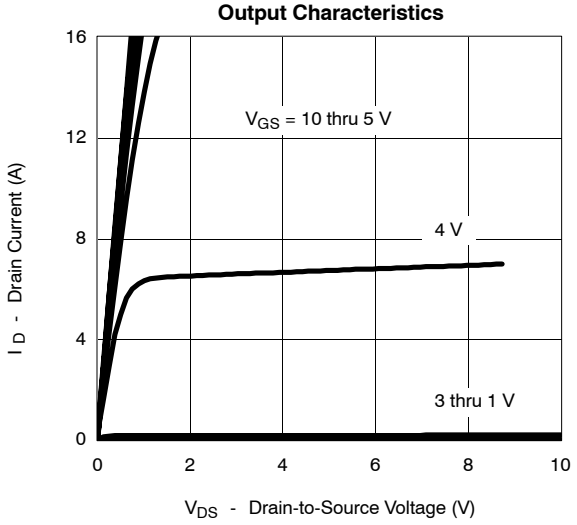
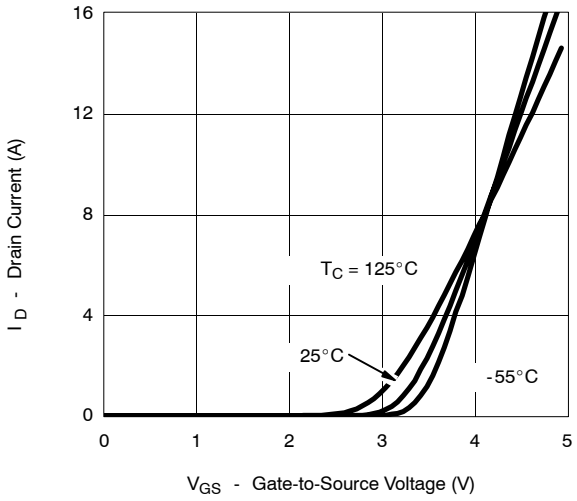
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

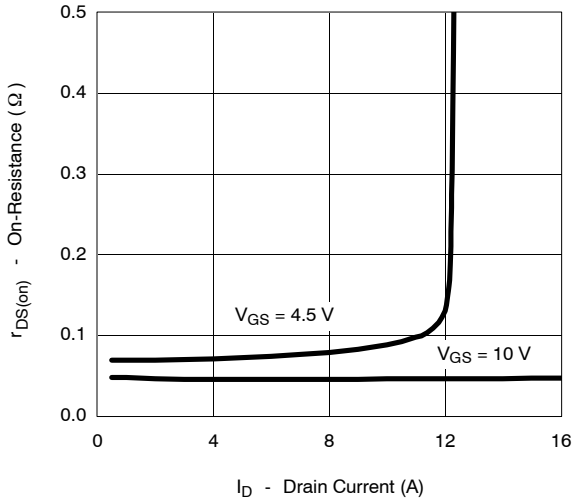
Output Characteristics



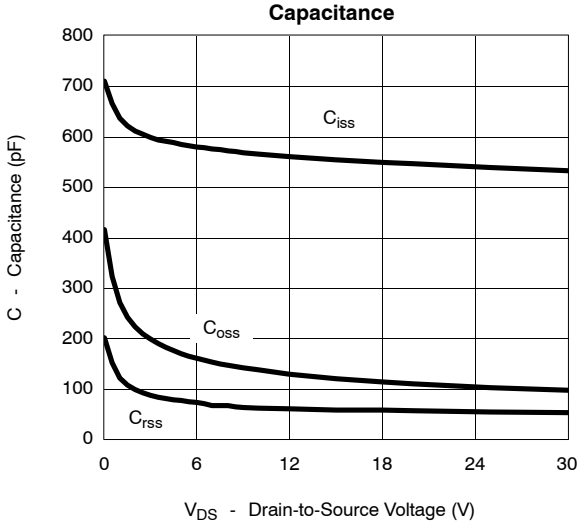
Transfer Characteristics



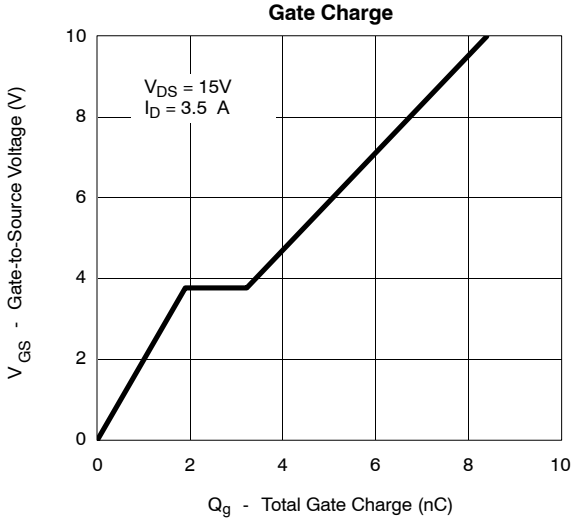
On-Resistance vs. Drain Current



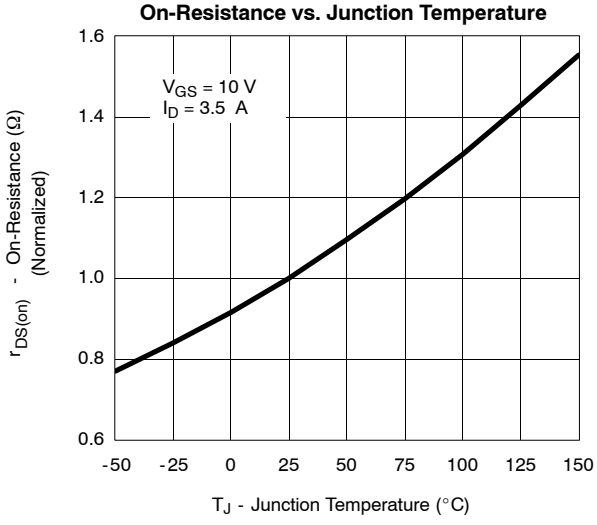
Capacitance



Gate Charge



On-Resistance vs. Junction Temperature



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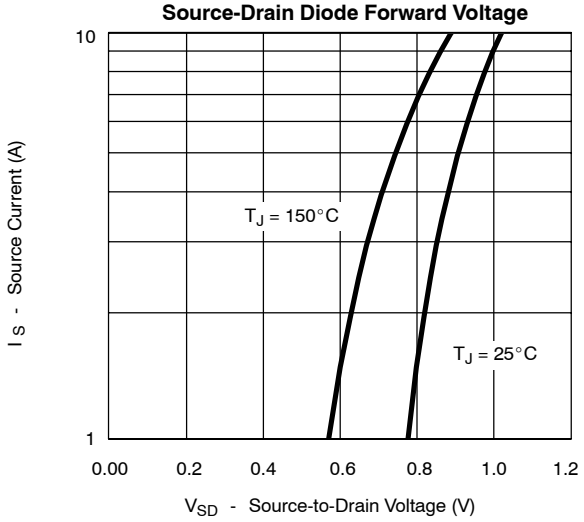
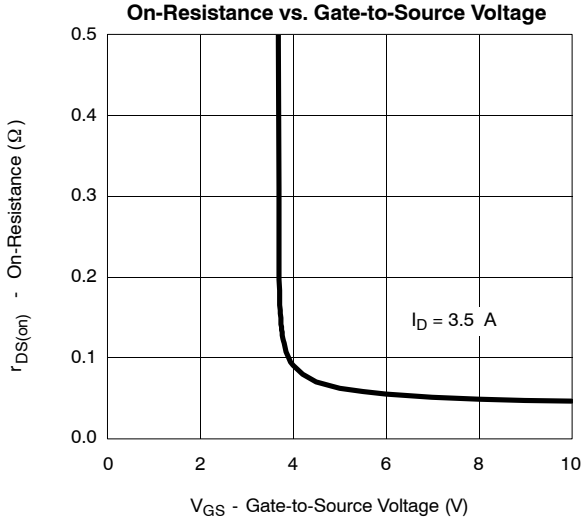
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

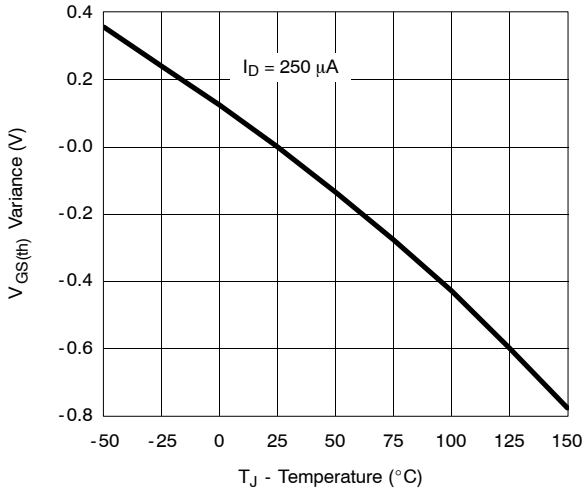
Source-Drain Diode Forward Voltage



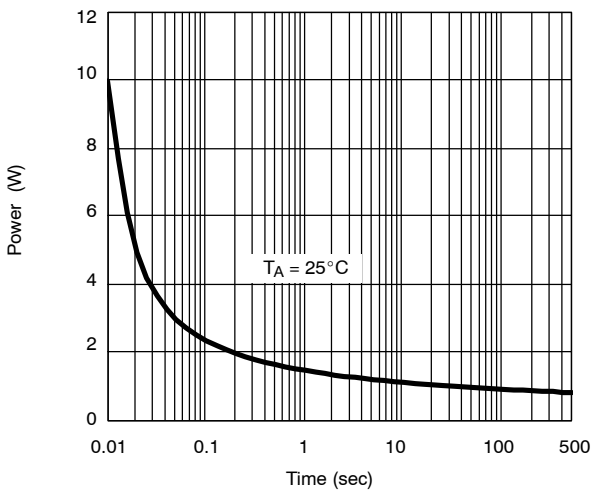
On-Resistance vs. Gate-to-Source Voltage



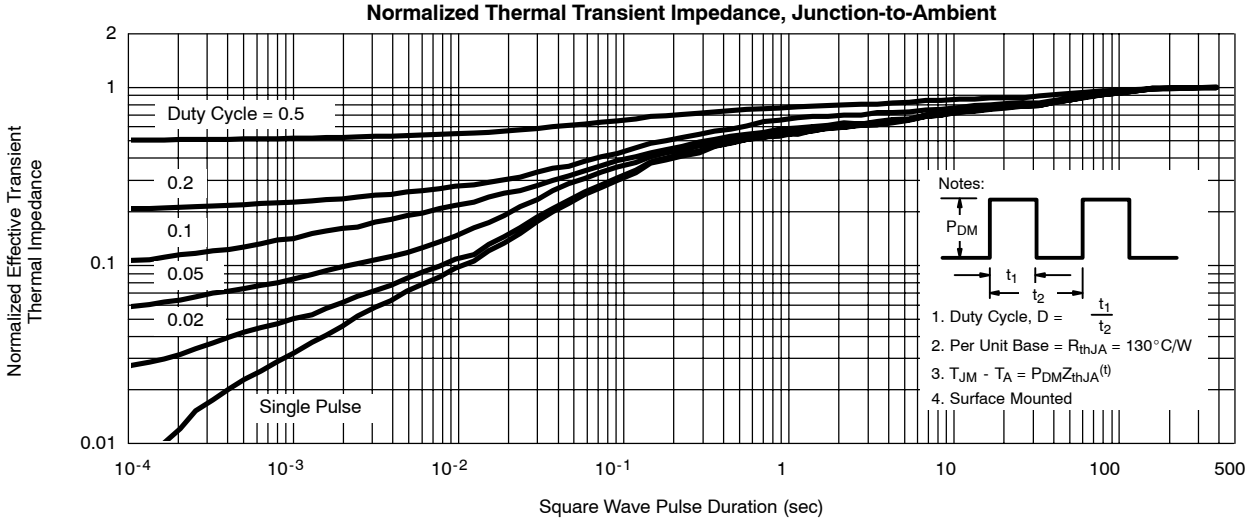
Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient



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