Elektronische Bauelemente

S2N7002SW

0.38A, 60V, $R_{DS(ON)}$ 2.8 Ω

N-Channel Enhancement Mode Power MOSFET

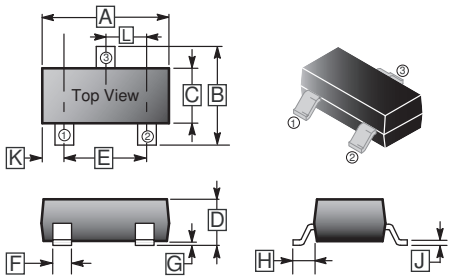
RoHS Compliant Product

A suffix of "-C" specifies halogen & lead-free

DESCRIPTION

S2N7002SW provides designers with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness. SOT-323 package is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

SOT-323



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	1.80	2.20	G	0.1 REF.	
B	1.80	2.55	H	0.525 REF.	
C	1.1	1.4	J	0.05	0.25
D	0.80	1.15	K	0.8 TYP.	
E	1.20	2.00	L	0.65 TYP.	
F	0.15	0.50			

FEATURES

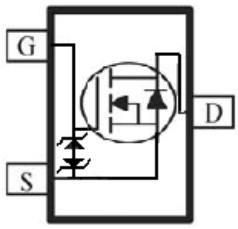
- Halogen free products available
- ESD protected
- Low $R_{DS(on)}$

APPLICATIONS

- Low side load switch
- Level shift circuits
- DC-DC converter
- Portable applications

MARKING

701



PACKAGE INFORMATION

Package	MPQ	Leader Size
SOT-323	3K	7 inch

ABSOLUTE MAXIMUM RATINGS (T_A=25℃ unless otherwise specified)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	Steady state, T_A=25℃	I_D	0.32	A
	Steady state, T_A=85℃		0.23	
	t＜5s, T_A=25℃		0.38	
	t＜5s, T_A=85℃		0.27	
Pulsed Drain Current@ tp=10μs		I_{DM}	1.5	A
Source Current (Body diode)		I_S	0.3	A
Total Device Power Dissipation [1]	Steady state	P_D	300	mW
	t＜5s		420	
Thermal Resistance from Junction to Ambient [1]	Steady state	$R_{\theta JA}$	417	℃ / W
	t＜5s		300	
Gate-Source ESD Rating (HBM, method 3015)		ESD	2	kV
Lead Temperature for Soldering Purposes@ 1/8'' from case for 10s		T_L	260	℃
Operating Junction and Storage Temperature		T_J, T_{STG}	-55~150	℃

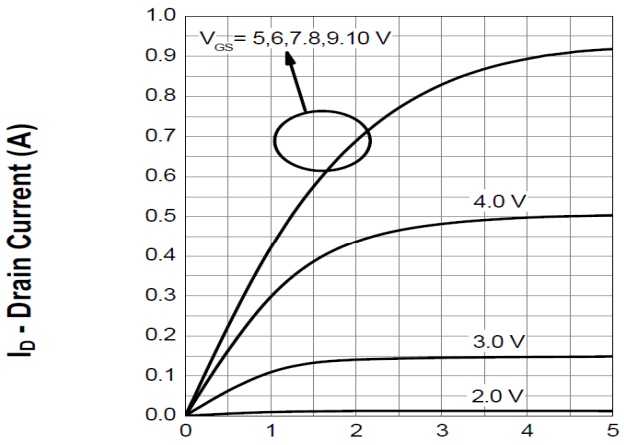
ELECTRICAL CHARACTERISTICS (T_J=25℃ unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	60	-	-	V	V_{GS}=0, I_D=250μA
Drain-Source Breakdown Voltage Temperature Coefficient	BV_{DSS} / T_J	-	71	-	mV / ℃	
Gate-Source Leakage Current	I_{GSS}	-	-	±10	μA	V_{DS}=0, V_{GS}= ±20V
Drain-Source Leakage Current	I_{DSS}	-	-	1	μA	V_{DS}=60V, V_{GS}=0, T_J=25℃
		-	-	500		V_{DS}=60V, V_{GS}=0, T_J=125℃
		-	-	0.1		V_{DS}=50V, V_{GS}=0, T_J=25℃
On Characteristics [2]						
Gate-Threshold Voltage	$V_{GS(th)}$	1	-	2	V	V_{DS}=V_{GS}, I_D=250μA
Negative Threshold Voltage Temperature Coefficient	$V_{GS(th)}$ / T_J	-	4	-	mV / ℃	
Forward Transconductance	g_{fs}	0.08	-	-	S	V_{DS}=5V, I_D=0.2A
Static Drain-Source On-Resistance [3]	$R_{DS(ON)}$	-	-	2.8	Ω	V_{GS}=10V, I_D=500mA
		-	-	3.2		V_{GS}=4.5V, I_D=200mA
Dynamic Characteristics						
Input Capacitance	C_{iss}	-	21	-	pF	V_{DS}=25V V_{GS}=0 f=1MHz
Output Capacitance	C_{oss}	-	12	-		
Reverse Transfer Capacitance	C_{rss}	-	0.35	-		
Total Gate Charge	$Q_{g(TOT)}$	-	0.44	-	nC	V_{DS}=10V V_{GS}=4.5V I_D=0.5A
Gate-Source Charge	Q_{gs}	-	0.2	-		
Gate-Drain Charge	Q_{gd}	-	0.1	-		
Switching Characteristics						
Turn-on Delay Time	$T_{d(on)}$	-	2.7	-	nS	V_{DD}=30V V_{GEN}=10V R_G=25Ω R_L=60Ω I_D=0.5A
Rise Time	T_r	-	2.5	-		
Turn-off Delay Time	$T_{d(off)}$	-	13	-		
Fall Time	T_f	-	8	-		
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	-	0.85	-	V	I_S=0.5A, V_{GS}=0

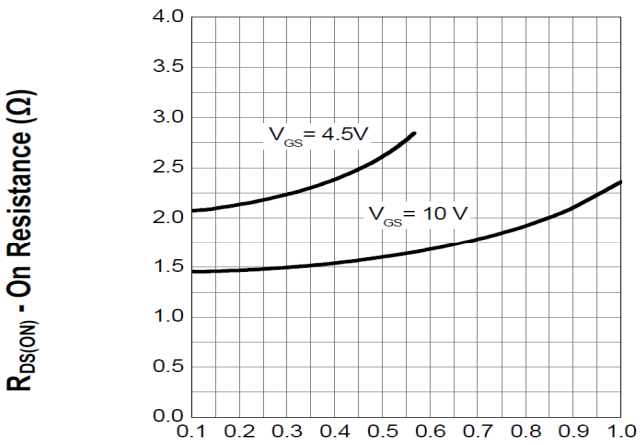
Notes:
1. FR-4 board is 1 × 0.75 × 0.062 inch.
2. Pulse Test: Pulse width≦300μs, duty cycle≦2%.

CHARACTERISTIC CURVES

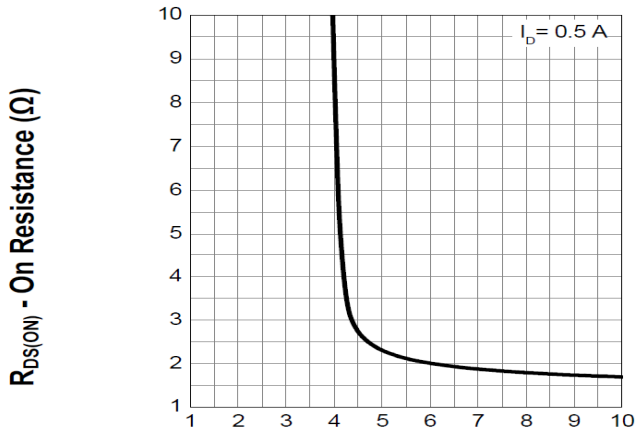
Output Characteristics



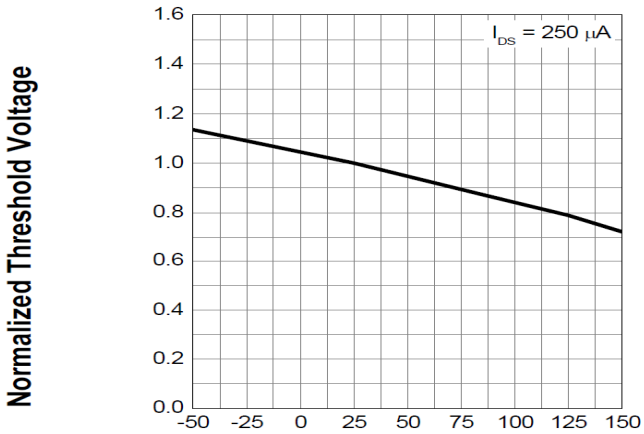
Drain-Source On Resistance



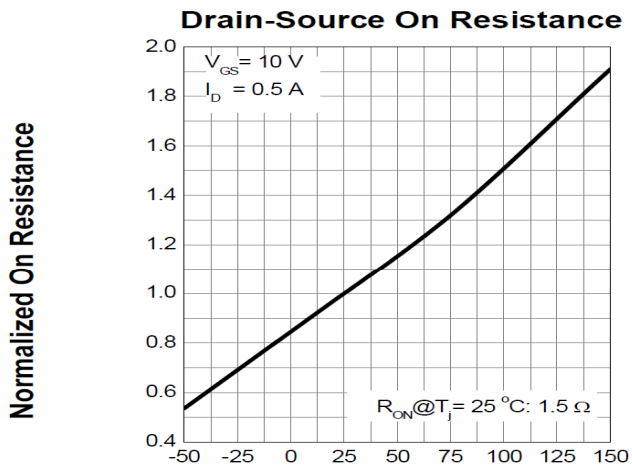
Transfer Characteristics



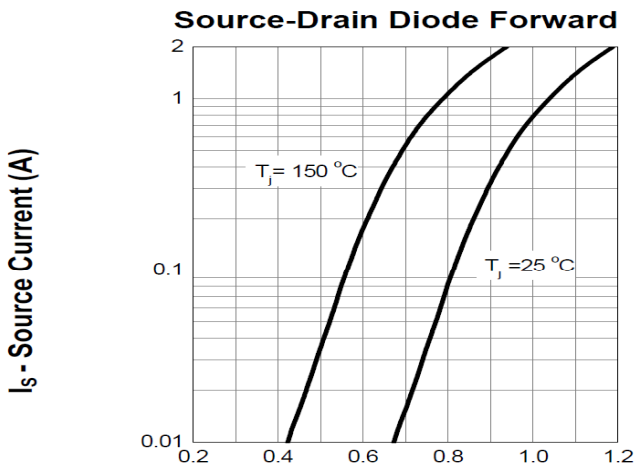
Gate Threshold Voltage



Drain-Source On Resistance

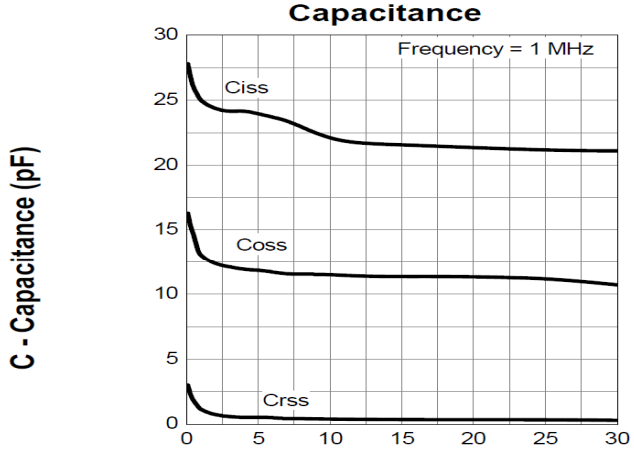


Source-Drain Diode Forward

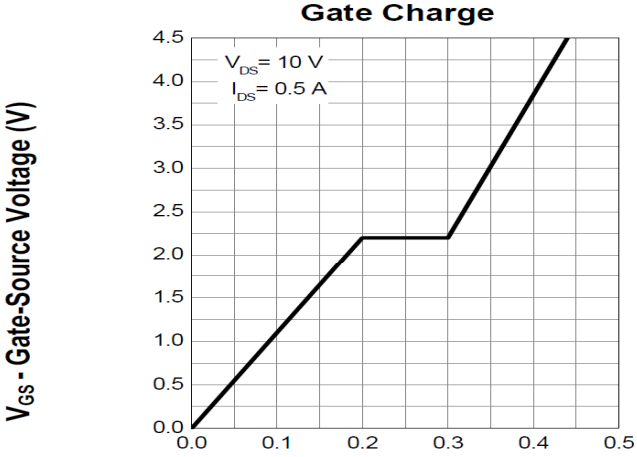


CHARACTERISTIC CURVES

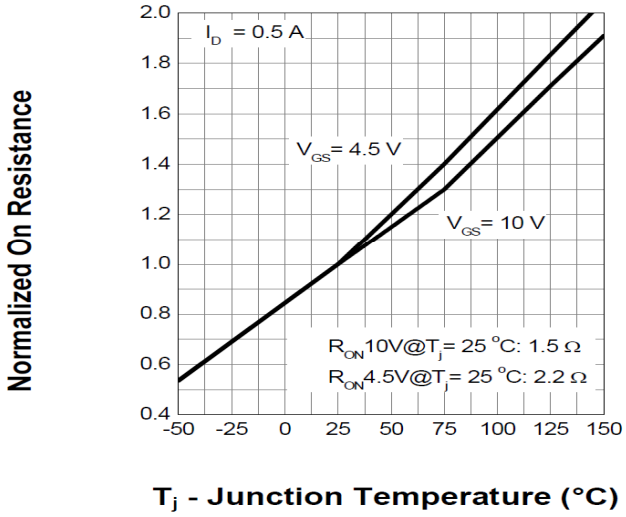
Capacitance



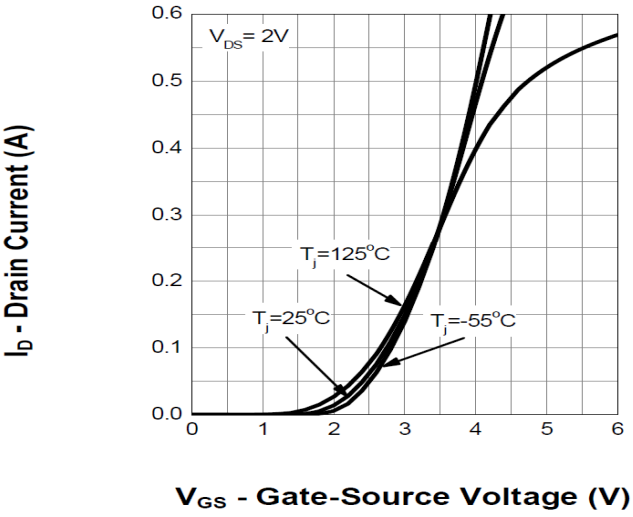
Gate Charge



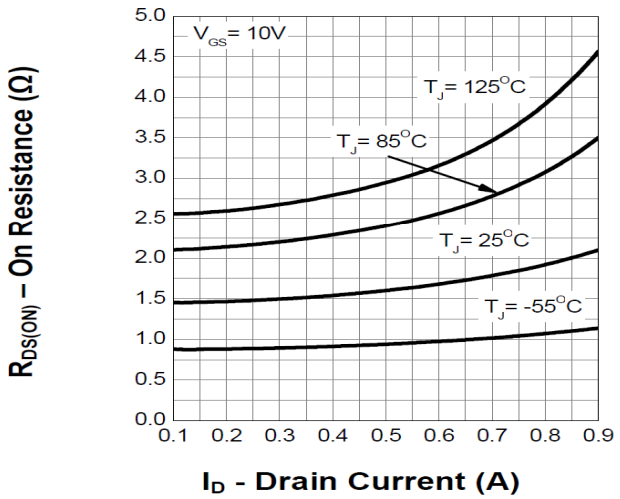
Drain-Source On Resistance



Transfer Characteristics



Drain-Source On Resistance



Drain-Source On Resistance