TY Semicondutor® **TY**

SI2311DS

FEATURES

- TrenchFET® Power MOSFET

APPLICATIONS

- Load Switch

PRODUCT SUMMARY

V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
−8	0.045 @ V_{GS} = −4.5 V	−3.5
	0.072 @ V_{GS} = −2.5 V	−2.8
	0.120 @ V_{GS} = −1.8 V	−2.0

TO-236
(SOT-23)

G 1

3 D

S 2

Top View
Si2311DS (C1)*
*Marking Code
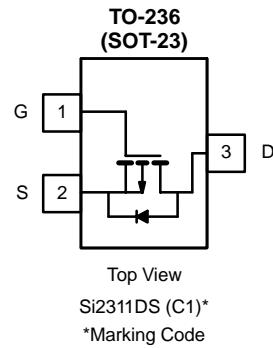
ABSOLUTE MAXIMUM RATINGS (T_A = 25°C UNLESS OTHERWISE NOTED)

Parameter		Symbol	5 sec	Steady State	Unit
Drain-Source Voltage		V_{DS}	−8		V
Gate-Source Voltage		V_{GS}	±8		
Continuous Drain Current (T_J = 150°C)[a, b]	T_A = 25°C	I_D	−3.5	−3.0	A
	T_A = 70°C		−2.8	−2.4	
Pulsed Drain Current		I_{DM}	−10		
Continuous Source Current (Diode Conduction)[a, b]		I_S	−0.8	−0.6	
Maximum Power Dissipation)[a, b]	T_A = 25°C	P_D	0.96	0.71	W
	T_A = 70°C		0.62	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}	100	130	°C/W
	Steady State		140	175	
Maximum Junction-to-Foot (drain)	Steady State	R_{thJF}	60	75	

Notes
a. Surface Mounted on FR4 Board.
b. Pulse width limited by maximum junction temperature.

SI2311DS

SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ	Max	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = −10 μA	−8			V
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = −250 μA	−0.45		−0.8	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±8 V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = −6.4 V, V_{GS} = 0 V			−1	μA
		V_{DS} = −6.4 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	−3			
Drain-Source On-Resistance[a]	$r_{DS(on)}$	V_{GS} = −4.5 V, I_D = −3.5 A		0.036	0.045	Ω
		V_{GS} = −2.5 V, I_D = −3 A		0.058	0.072	
		V_{GS} = −1.8 V, I_D = −0.7 A		0.096	0.120	
Forward Transconductance[a]	g_{fs}	V_{DS} = −5 V, I_D = −3.5 A		9.0		S
Diode Forward Voltage	V_{SD}	I_S = −0.8 A, V_{GS} = 0 V			−1.2	V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = −4 V, V_{GS} = −4.5 V I_D ≅ −3.5 A		8.5	12	nC
Gate-Source Charge	Q_{gs}			1.5		
Gate-Drain Charge	Q_{gd}			2.1		
Input Capacitance	C_{iss}	V_{DS} = −4 V, V_{GS} = 0, f = 1 MHz		970		pF
Output Capacitance	C_{oss}			485		
Reverse Transfer Capacitance	C_{rss}			160		
Switching[b]						
Turn-On Time	$t_{d(on)}$	V_{DD} = −4 V, R_L = 4 Ω I_D ≅ −1.0 A, V_{GEN} = −4.5 V R_G = 6 Ω		18	25	ns
	t_r			45	65	
Turn-Off Time	$t_{d(off)}$			40	60	
	t_f			45	65	

Notes

a. For DESIGN AID ONLY, not subject to production testing.
b. Pulse test: PW ≤ 300 μs duty cycle ≤ 2%.
c. Switching time is essentially independent of operating temperature.