SI2307CDS

PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)[a, b]	Q_g (Typ.)
- 30	0.088 at V_{GS} = - 10 V	- 2.7	4.1 nC
	0.138 at V_{GS} = - 4.5 V	- 2.2	

FEATURES

- **Halogen-free Option Available**
- TrenchFET® Power MOSFET

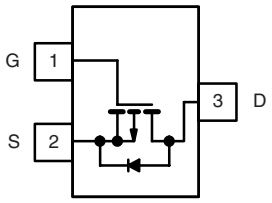
Pb-free

RoHS COMPLIANT

APPLICATIONS

- Load Switch for Portable Devices

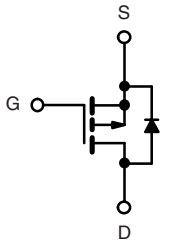
TO-236
(SOT-23)



Top View

Si2307CDS (N7)*
* Marking Code

Ordering Information: Si2307CDS-T1-E3 (Lead (Pb)-free)
Si2307CDS-T1-GE3 (Lead (Pb)-free and Halogen-free)



P-Channel MOSFET

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_C = 25 °C	I_D	- 3.5	A
	T_C = 70 °C		- 2.8	
	T_A = 25 °C		- 2.7[a, b]	
	T_A = 70 °C		- 2.2[a, b]	
Pulsed Drain Current (10 µs Pulse Width)		I_{DM}	- 12	
Continuous Source-Drain Diode Current[a, b]	T_C = 25 °C	I_S	- 1.5	
	T_A = 25 °C		- 0.91[a, b]	
Maximum Power Dissipation[a, b]	T_C = 25 °C	P_D	1.8	W
	T_C = 70 °C		1.14	
	T_A = 25 °C		1.1[a, b]	
	T_A = 70 °C		0.7[a, b]	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 150	°C
Soldering Recommendations (Peak Temperature)[c]			260	

THERMAL RESISTANCE RATINGS					
Parameter		**Symbol**	**Typical**	**Maximum**	**Unit**
Maximum Junction-to-Ambient[a, c]	t ≤ 5 s	R_{thJA}	90	115	°C/W
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	55	70	

Notes:
a. Surface Mounted on 1" x 1" FR4 board.
b. t = 5 s.
c. Maximum under Steady State conditions is 166 °C/W.

SI2307CDS

SPECIFICATIONS T_J = 25 °C, unless otherwise noted						
Parameter	**Symbol**	**Test Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0 V, I_D = - 250 µA	- 30			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	I_D = - 250 µA		- 32		mV/°C
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			4.5		
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = - 250 µA	- 1		- 3	V
Gate-Source 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			- 1	µA
		V_{DS} = - 30 V, V_{GS} = 0 V, T_J = 55 °C			- 10	
On-State Drain Current[a]	$I_{D(on)}$	$V_{DS} \leq$ 5 V, V_{GS} = - 10 V	- 6			A
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = - 10 V, I_D = - 3.5 A		0.073	0.088	Ω
		V_{GS} = - 4.5 V, I_D = - 2.5 A		0.110	0.138	
Forward Transconductance[a]	g_{fs}	V_{DS} = - 10 V, I_D = - 3.5 A		7		S
Dynamic[b]						
Input Capacitance	C_{iss}	V_{DS} = - 15 V, V_{GS} = 0 V, f = 1 MHz		340		pF
Output Capacitance	C_{oss}			67		
Reverse Transfer Capacitance	C_{rss}			51		
Total Gate Charge	Q_g	V_{DS} = - 15 V, V_{GS} = - 4.5 V, I_D = - 2.5 A		4.1	6.2	nC
Gate-Source Charge	Q_{gs}			1.3		
Gate-Drain Charge	Q_{gd}			1.8		
Gate Resistance	R_g	f = 1 MHz		10		Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = - 15 V, R_L = 15 Ω $I_D \cong$ - 1 A, V_{GEN} = - 4.5 V, R_g = 1 Ω		40	60	ns
Rise Time	t_r			40	60	
Turn-Off Delay Time	$t_{d(off)}$			20	40	
Fall Time	t_f			17	30	
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = - 15 V, R_L = 15 Ω $I_D \cong$ - 1 A, V_{GEN} = - 10 V, R_g = 1 Ω		5.5	10	
Rise Time	t_r			13	25	
Turn-Off Delay Time	$t_{d(off)}$			17	30	
Fall Time	t_f			7.7	15	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	T_C = 25 °C			- 1.5	A
Pulse Diode Forward Current	I_{SM}				- 12	
Body Diode Voltage	V_{SD}	I_S = - 0.75 A, V_{GS} = 0 V		- 0.8	- 1.2	V
Body Diode Reverse Recovery Time	t_{rr}	I_F = - 2.5 A, dI/dt = 100 A/µs, T_J = 25 °C		17	30	ns
Body Diode Reverse Recovery Charge	Q_{rr}			11	20	nC
Reverse Recovery Fall Time	t_a			12		ns
Reverse Recovery Rise Time	t_b			5		

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