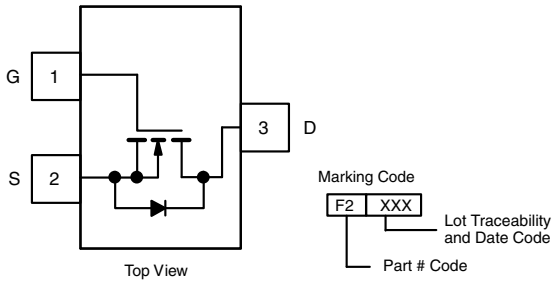
SI2342DS

PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)[a, e]	Q_g (Typ.)
8	0.017 at V_{GS} = 4.5 V	6	6 nC
	0.020 at V_{GS} = 2.5 V	6	
	0.022 at V_{GS} = 1.8 V	6	
	0.030 at V_{GS} = 1.5 V	6	
	0.075 at V_{GS} = 1.2 V	6	

SOT-23



Ordering Information: Si2342DS-T1-GE3 (Lead (Pb)-free and Halogen-free)

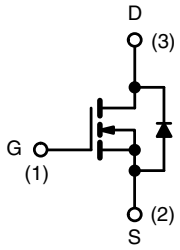
FEATURES

- **Halogen-free According to IEC 61249-2-21 Definition**
- TrenchFET® Power MOSFET
- Low On-Resistance
- 100 % R_g Tested
- Compliant to RoHS Directive 2002/95/EC

Pb-free
RoHS COMPLIANT
HALOGEN FREE

APPLICATIONS

- Load Switches for Low Voltage Gate Drive
- Low Voltage Operating Circuits
  - Gate Drive 1.2 V to 5 V



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C, unless otherwise noted)				
Parameter		**Symbol**	**Limit**	**Unit**
Drain-Source Voltage		V_{DS}	8	V
Gate-Source Voltage		V_{GS}	± 5	
Continuous Drain Current (T_J = 150 °C)	T_C = 25 °C	I_D	6[e]	A
	T_C = 70 °C		6[e]	
	T_A = 25 °C		6[e, b, c]	
	T_A = 70 °C		5.8[b, c]	
Pulsed Drain Current (t = 300 µs)		I_{DM}	30	
Continuous Source-Drain Diode Current	T_C = 25 °C	I_S	2.1	
	T_A = 25 °C		1.1[b, c]	
Maximum Power Dissipation	T_C = 25 °C	P_D	2.5	W
	T_C = 70 °C		1.6	
	T_A = 25 °C		1.3[b, c]	
	T_A = 70 °C		0.8[b, c]	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 150	°C
Soldering Recommendations (Peak Temperature)			260	

THERMAL RESISTANCE RATINGS					
Parameter		**Symbol**	**Typical**	**Maximum**	**Unit**
Maximum Junction-to-Ambient[b, d]	t ≤ 5 s	R_{thJA}	75	100	°C/W
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	40	50	

Notes:
a. Based on T_C = 25 °C.
b. Surface mounted on 1" x 1" FR4 board.
c. t = 5 s.
d. Maximum under steady state conditions is 166 °C/W.
e. Package limited.

SI2342DS

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	8			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	I_D = 250 µA		10		mV/°C
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			- 2.5		
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS} , I_D = 250 µA	0.35		0.8	V
Gate-Source Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 5 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 8 V, V_{GS} = 0 V			1	µA
		V_{DS} = 8 V, V_{GS} = 0 V, T_J = 70 °C			10	
On-State Drain Current[a]	$I_{D(on)}$	$V_{DS} \leq$ 5 V, V_{GS} = 4.5 V	20			A
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = 4.5 V, I_D = 7.2 A		0.014	0.017	Ω
		V_{GS} = 2.5 V, I_D = 6.7 A		0.016	0.020	
		V_{GS} = 1.8 V, I_D = 6.4 A		0.018	0.022	
		V_{GS} = 1.5 V, I_D = 5.5 A		0.020	0.030	
		V_{GS} = 1.2 V, I_D = 1.3 A		0.025	0.075	
Forward Transconductance[a]	g_{fs}	V_{DS} = 4 V, I_D = 7.2 A		75		S
Dynamic[b]						
Input Capacitance	C_{iss}	V_{DS} = 4 V, V_{GS} = 0 V, f = 1 MHz		1070		pF
Output Capacitance	C_{oss}			385		
Reverse Transfer Capacitance	C_{rss}			200		
Total Gate Charge	Q_g	V_{DS} = 4 V, V_{GS} = 4.5 V, I_D = 7.2 A		10.5	15.8	nC
		V_{DS} = 4 V, V_{GS} = 2.5 V, I_D = 7.2 A		6	9	
Gate-Source Charge	Q_{gs}			1.6		
Gate-Drain Charge	Q_{gd}			1		
Gate Resistance	R_g	f = 1 MHz	2.4	12	24	Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 4 V, R_L = 0.7 Ω $I_D \cong$ 5.8 A, V_{GEN} = 4.5 V, R_g = 1 Ω		6	12	ns
Rise Time	t_r			14	20	
Turn-Off Delay Time	$t_{d(off)}$			65	98	
Fall Time	t_f			25	38	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	T_C = 25 °C			2.1	A
Pulse Diode Forward Current	I_{SM}				30	
Body Diode Voltage	V_{SD}	I_S = 5.8 A, V_{GS} = 0		0.82	1.2	V
Body Diode Reverse Recovery Time	t_{rr}	I_F = 5.8 A, dI/dt = 100 A/µs, T_J = 25 °C		40	60	ns
Body Diode Reverse Recovery Charge	Q_{rr}			17	26	nC
Reverse Recovery Fall Time	t_a			15		ns
Reverse Recovery Rise Time	t_b			25		

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