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Si2314EDS-T1-GE3
N-Channel 20-V (D-S) MOSFET

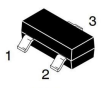
PRODUCT SUMMARY		
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)
20	0.033 at V_{GS} = 4.5 V	4.9
	0.040 at V_{GS} = 2.5 V	4.4
	0.051 at V_{GS} = 1.8 V	3.9

FEATURES

- **Halogen-free According to Available**
- TrenchFET® Power MOSFET
- ESD Protected: 3000 V

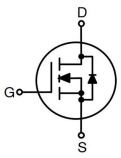
APPLICATIONS

- LI-Ion Battery Protection



SOT–23

1 – Gate
2 – Source
3 – Drain



Ordering Information: Si2314EDS-T1-E3 (Lead (Pb)-free)
Si2314EDS-T1-GE3 (Lead (Pb)-free and Halogen-free)

ABSOLUTE MAXIMUM RATINGS T_A = 25 °C, unless otherwise noted					
Parameter		**Symbol**	**5 s**	**Steady State**	**Unit**
Drain-Source Voltage		V_{DS}	20		V
Gate-Source Voltage		V_{GS}	± 12		
Continuous Drain Current (T_J = 150 °C)[a]	T_A = 25 °C	I_D	4.9	3.77	A
	T_A = 70 °C		3.9	3.0	
Pulsed Drain Current[b]		I_{DM}	15		
Avalanche Current[b]	L = 0.1 mH	I_{AS}	15		
Single Avalanche Energy		E_{AS}	11.25		mJ
Continuous Source Current (Diode Conduction)[a]		I_S	1.0		A
Power Dissipation[a]	T_A = 25 °C	P_D	1.25	0.75	W
	T_A = 70 °C		0.80	0.48	
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 s	R_{thJA}	75	100	°C/W
	Steady State		120	166	
Maximum Junction-to-Foot	Steady State	R_{thJF}	40	50	

Notes:
a. Surface Mounted on 1" x 1" FR4 board.
b. Pulse width limited by maximum junction temperature.

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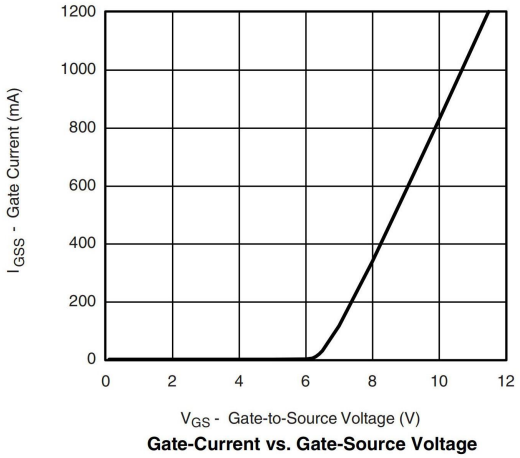
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SPECIFICATIONS T_A = 25 °C, unless otherwise noted						
			Limits			
Parameter	**Symbol**	**Test Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0 V, I_D = 250 µA	20			V
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	0.45		0.95	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 4.5 V			± 1.5	µA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 20 V, V_{GS} = 0 V			1	
		V_{DS} = 20 V, V_{GS} = 0 V, T_J = 70 °C			75	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} ≥ 10 V, V_{GS} = 4.5 V	15			A
Drain-Source On-Resistance[a]	$R_{DS(on)}$	V_{GS} = 4.5 V, I_D = 5.0 A		0.027	0.033	Ω
		V_{GS} = 2.5 V, I_D = 4.5 A		0.033	0.040	
		V_{GS} = 1.8 V, I_D = 4.0 A		0.042	0.051	
Forward Transconductance[a]	g_{fs}	V_{DS} = 15 V, I_D = 5.0 A		40		S
Diode Forward Voltage	V_{SD}	I_S = 1.0 A, V_{GS} = 0 V		0.8	1.2	V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = 10 V, V_{GS} = 4.5 V, I_D = 5.0 A		11.0	14.0	nC
Gate-Source Charge	Q_{gs}			1.5		
Gate-Drain Charge	Q_{gd}			2.1		
Switching						
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 10 V, R_L = 10 Ω I_D ≅ 1.0 A, V_{GEN} = 4.5 V, R_g = 6 Ω		0.53	0.8	µs
Rise Time	t_r			1.4	2.2	
Turn-Off Delay Time	$t_{d(off)}$			13.5	20	
Fall Time	t_f			5.9	9	
Source-Drain Reverse Recovery Time	t_{rr}	I_F = 1.0 A, dI/dt = 100 A/µs		13	25	ns

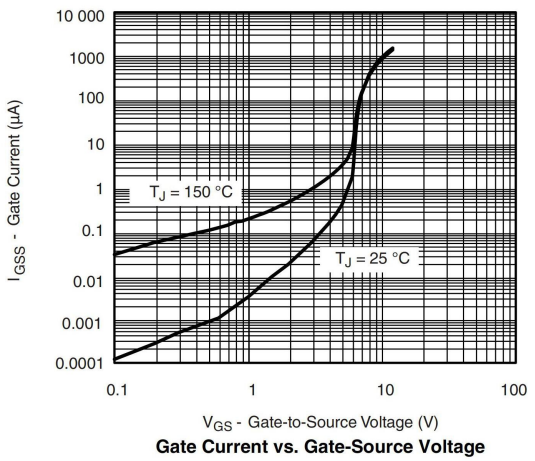
Notes:
a. Pulse test: PW ≤ 300 µs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



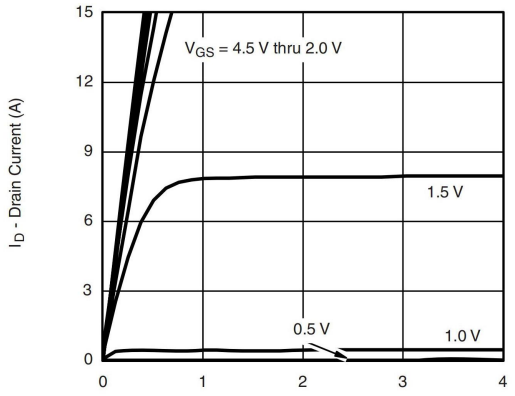
Gate-Current vs. Gate-Source Voltage



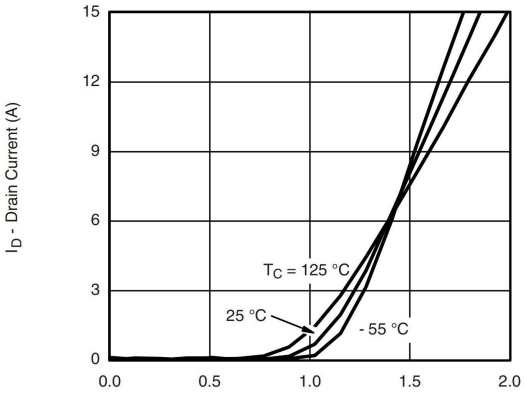
Gate Current vs. Gate-Source Voltage

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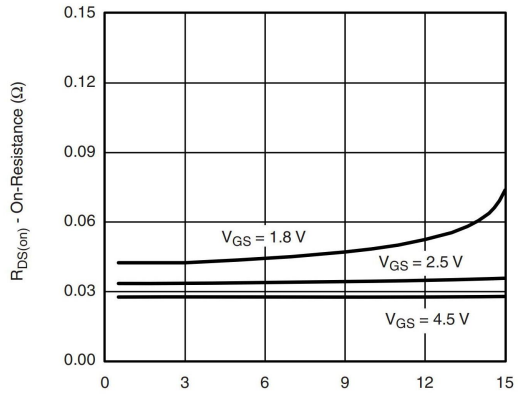
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



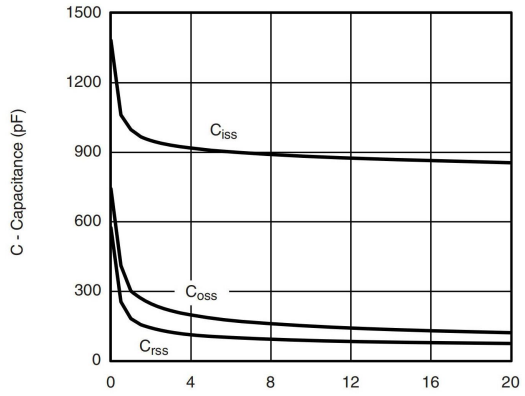
Output Characteristics



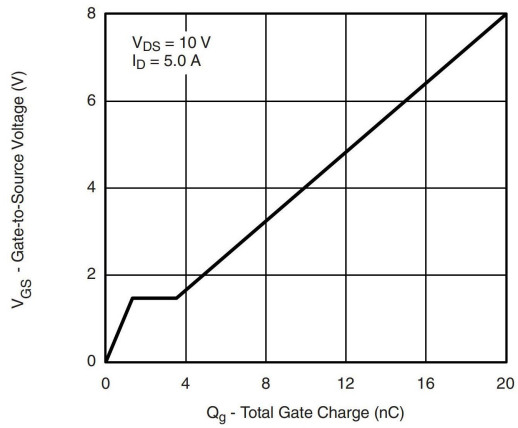
Transfer Characteristics



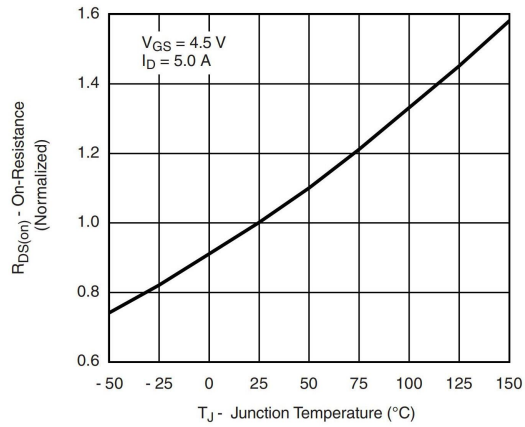
On-Resistance vs. Drain Current



Capacitance



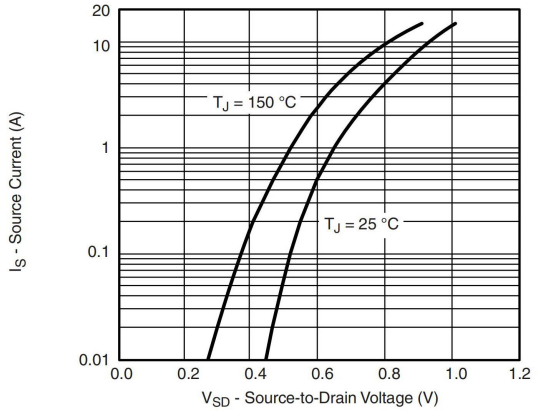
Gate Charge



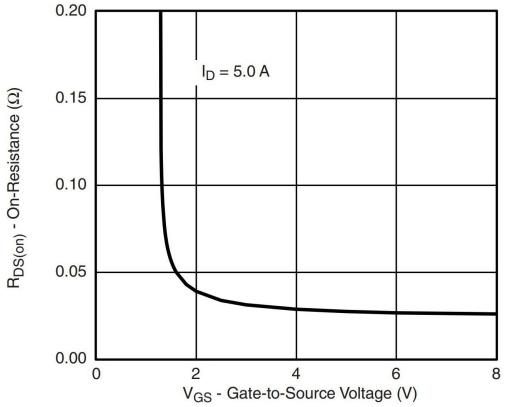
On-Resistance vs. Junction Temperature

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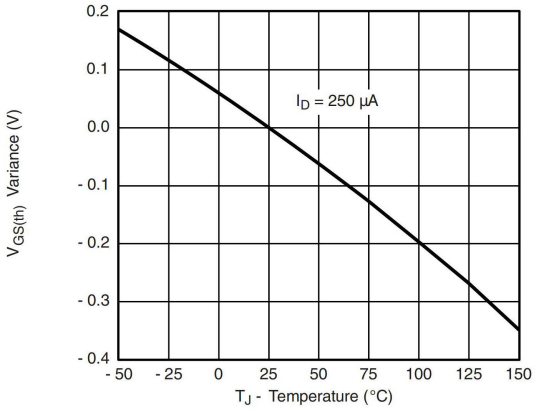
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



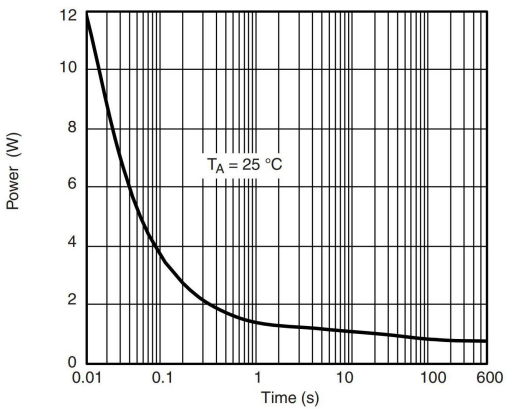
Source-Drain Diode Forward Voltage



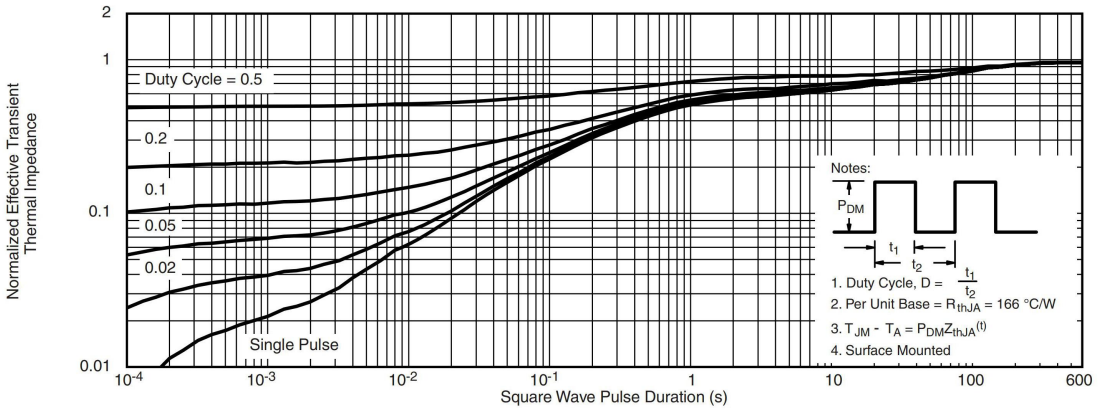
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power

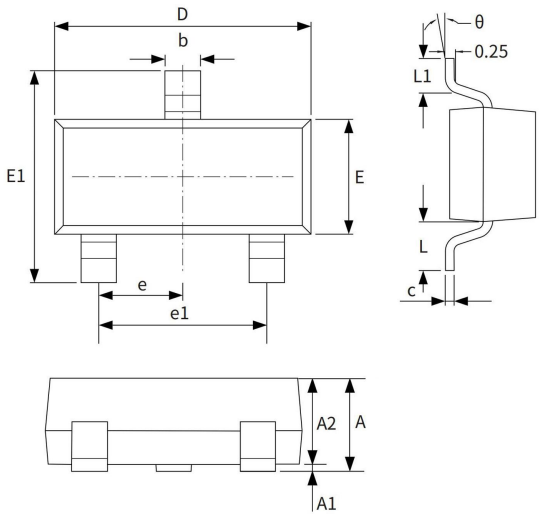


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Ordering Information

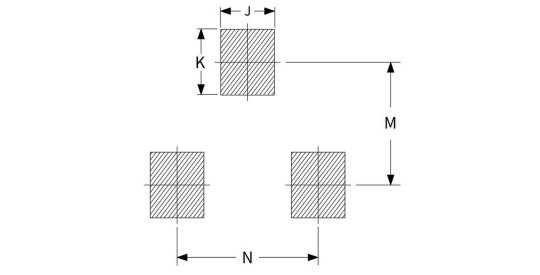
PACKAGE	PACKAGE CODE	UNIT WEIGHT(g)	REEL(pcs)	BOX(pcs)	CARTON(pcs)	DELIVERY MODE
SOT-23	R1	0.008	3000	30000	240000	7''

Package Outline Dimensions (SOT-23)



Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.90	1.15	0.035	0.045
A1	-	0.10	-	0.004
A2	0.90	1.05	0.035	0.041
b	0.30	0.50	0.012	0.020
c	0.10	0.20	0.004	0.008
D	2.80	3.00	0.110	0.118
E	1.20	1.40	0.047	0.055
E1	2.25	2.55	0.089	0.100
e	0.950TYP		0.037TYP	
e1	1.80	2.00	0.071	0.079
L	0.550REF		0.022REF	
L1	0.30	0.50	0.012	0.020
θ	-	8°	-	8°

Suggested Pad Layout



Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
J	0.75	0.85	0.030	0.033
K	0.85	0.95	0.033	0.037
M	1.95	2.05	0.077	0.081
N	1.85	1.95	0.073	0.077