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Si2374DS-T1-GE3
N-Channel 20 V (D-S) MOSFET

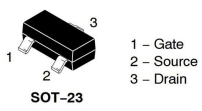
PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (Ω) MAX.	I_D (A) [d]	Q_g (TYP.)
20	0.030 at V_{GS} = 4.5 V	5.9	7.7 nC
	0.034 at V_{GS} = 2.5 V	5.5	
	0.041 at V_{GS} = 1.8 V	5	

FEATURES

- TrenchFET® power MOSFET
- 100 % R_g tested

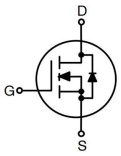
APPLICATIONS

- Load switch
- Power management



SOT–23

1 – Gate
2 – Source
3 – Drain



Ordering Information:
Si2374DS-T1-GE3 (Lead (Pb)-free and Halogen-free)

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C, unless otherwise noted)				
PARAMETER		SYMBOL	LIMIT	UNIT
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	± 8	
Continuous Drain Current (T_J = 150 °C)	T_C = 25 °C	I_D	5.9	A
	T_C = 70 °C		4.7	
	T_A = 25 °C		4.5 [a, b]	
	T_A = 70 °C		3.6 [a, b]	
Pulsed Drain Current (t = 100 µs)		I_{DM}	25	
Continuous Source-Drain Diode Current	T_C = 25 °C	I_S	1.4	
	T_A = 25 °C		0.8 [a, b]	
Maximum Power Dissipation	T_C = 25 °C	P_D	1.7	W
	T_C = 70 °C		1.1	
	T_A = 25 °C		0.96 [a, b]	
	T_A = 70 °C		0.62 [a, b]	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150	°C

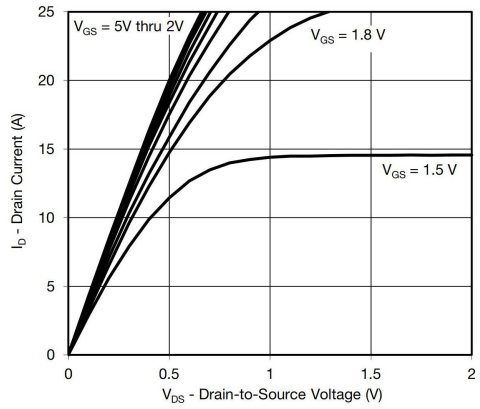
THERMAL RESISTANCE RATINGS					
PARAMETER		SYMBOL	TYPICAL	MAXIMUM	UNIT
Maximum Junction-to-Ambient [a, c]	t ≤ 5 s	R_{thJA}	100	130	°C/W
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	60	75	

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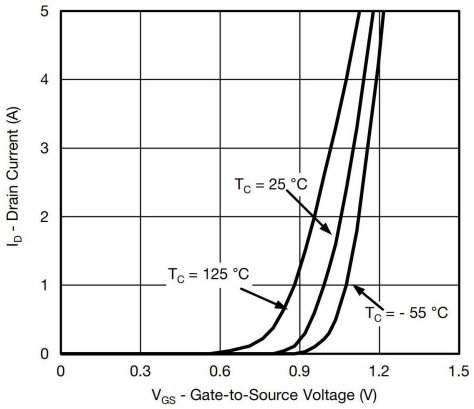
SPECIFICATIONS (T_J = 25 °C, unless otherwise noted)						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0 V, I_D = 250 µA	20	-	-	V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	I_D = 250 µA	-	34	-	mV/°C
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$		-	-5	-	
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS} , I_D = 250 µA	0.4	-	1	V
Gate-Source Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 8 V	-	-	± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 20 V, V_{GS} = 0 V	-	-	1	µA
		V_{DS} = 20 V, V_{GS} = 0 V, T_J = 55 °C	-	-	10	
On-State Drain Current [a]	$I_{D(on)}$	V_{DS} ≥ 5 V, V_{GS} = 10 V	10	-	-	A
Drain-Source On-State Resistance [a]	$R_{DS(on)}$	V_{GS} = 4.5 V, I_D = 4 A	-	0.025	0.030	Ω
		V_{GS} = 2.5 V, I_D = 3 A	-	0.028	0.034	
		V_{GS} = 1.8 V, I_D = 2 A	-	0.031	0.041	
Forward Transconductance [a]	g_{fs}	V_{DS} = 10 V, I_D = 4 A	-	29	-	S
Dynamic [b]						
Input Capacitance	C_{iss}	V_{DS} = 10 V, V_{GS} = 0 V, f = 1 MHz	-	735	-	pF
Output Capacitance	C_{oss}		-	110	-	
Reverse Transfer Capacitance	C_{rss}		-	40	-	
Total Gate Charge	Q_g	V_{DS} = 10 V, V_{GS} = 10 V, I_D = 4.5 A	-	13.4	20	nC
		V_{DS} = 10 V, V_{GS} = 4.5 V, I_D = 4.5 A	-	7.7	12	
Gate-Source Charge	Q_{gs}		-	1	-	
Gate-Drain Charge	Q_{gd}		-	1	-	
Gate Resistance	R_g	f = 1 MHz	0.12	0.6	1.2	Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 10 V, R_L = 2.8 Ω I_D ≅ 3.6 A, V_{GEN} = 8 V, R_g = 1 Ω	-	4	8	ns
Rise Time	t_r		-	22	33	
Turn-Off Delay Time	$t_{d(off)}$		-	16	24	
Fall Time	t_f		-	9	18	
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 10 V, R_L = 2.8 Ω I_D ≅ 3.6 A, V_{GEN} = 4.5 V, R_g = 1 Ω	-	10	20	
Rise Time	t_r		-	23	35	
Turn-Off Delay Time	$t_{d(off)}$		-	16	24	
Fall Time	t_f		-	10	20	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	T_C = 25 °C	-	-	1.4	A
Pulse Diode Forward Current (t = 100 µs)	I_{SM}		-	-	25	
Body Diode Voltage	V_{SD}	I_S = 3.6 A, V_{GS} = 0 V	-	0.8	1.2	V
Body Diode Reverse Recovery Time	t_{rr}	I_F = 3.6 A, dI/dt = 100 A/µs, T_J = 25 °C	-	13	20	ns
Body Diode Reverse Recovery Charge	Q_{rr}		-	6	12	nC
Reverse Recovery Fall Time	t_a		-	9	-	ns
Reverse Recovery Rise Time	t_b		-	4	-	

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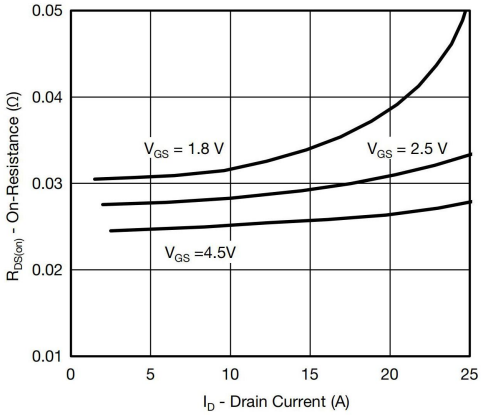
TYPICAL CHARACTERISTICS (T_J = 25 °C, unless otherwise noted)



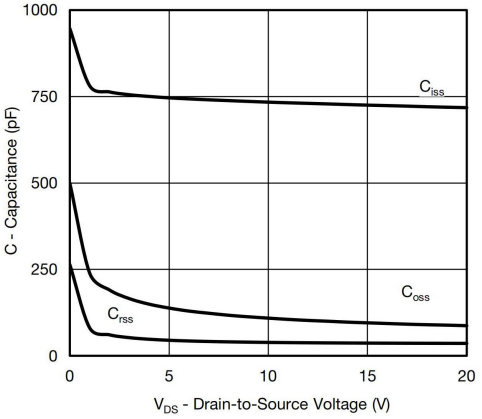
Output Characteristics



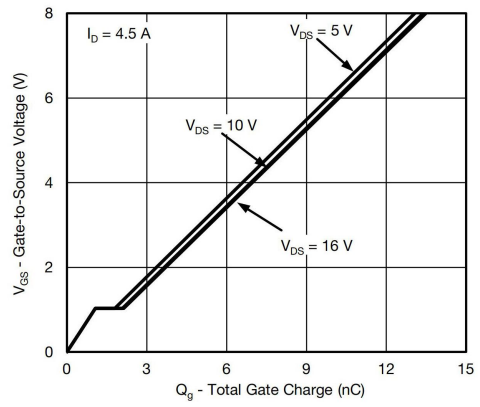
Transfer Characteristics



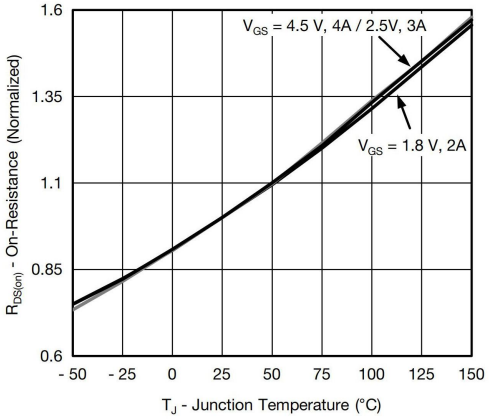
On-Resistance vs. Drain Current and Gate Voltage



Capacitance



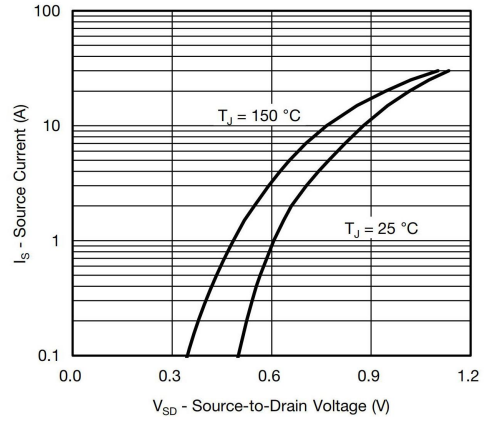
Gate Charge



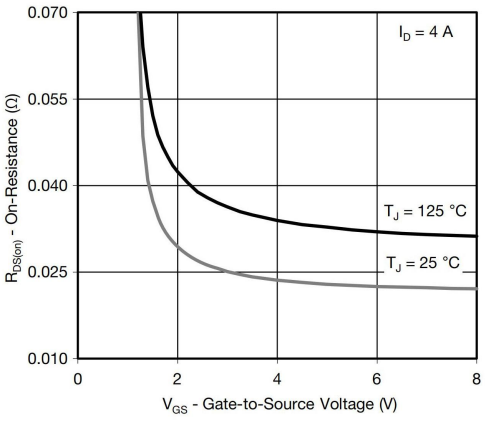
On-Resistance vs. Junction Temperature

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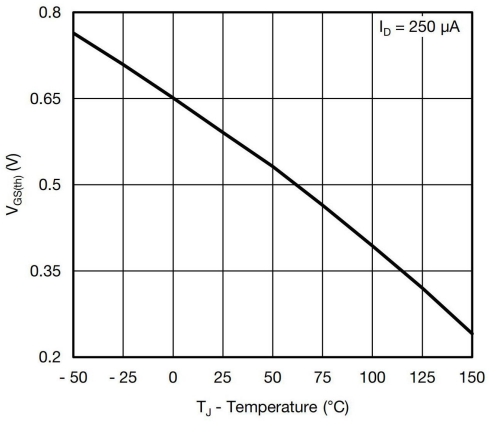
TYPICAL CHARACTERISTICS (T_J = 25 °C, unless otherwise noted)



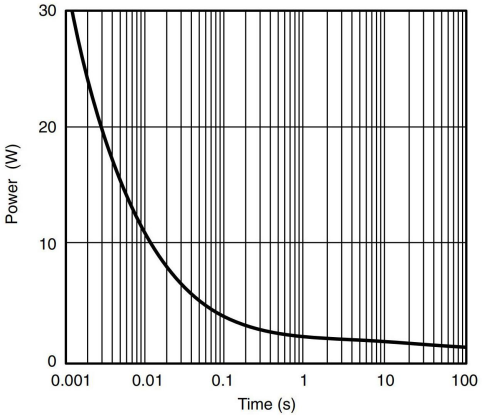
Source-Drain Diode Forward Voltage



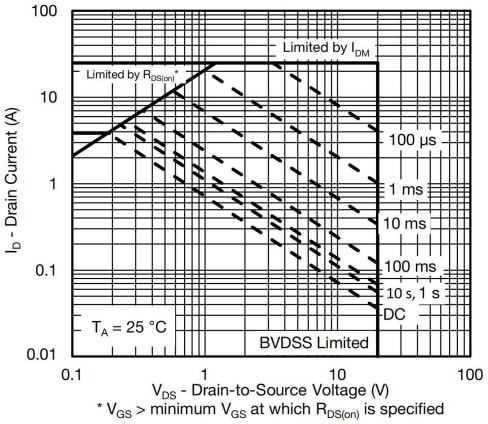
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



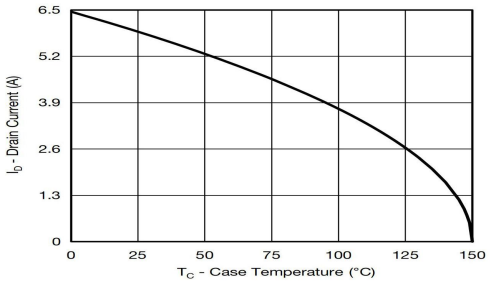
Single Pulse Power (Junction-to-Ambient)



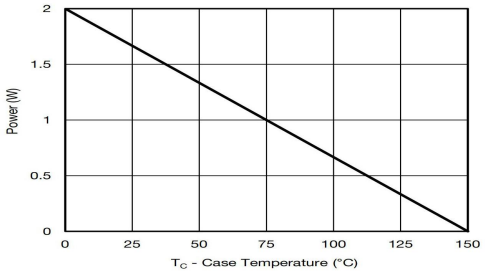
Safe Operating Area, Junction-to-Ambient

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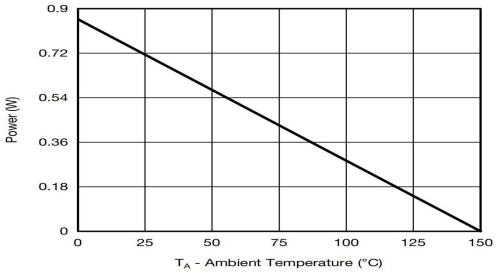
TYPICAL CHARACTERISTICS (T_J = 25 °C, unless otherwise noted)



Current Derating*

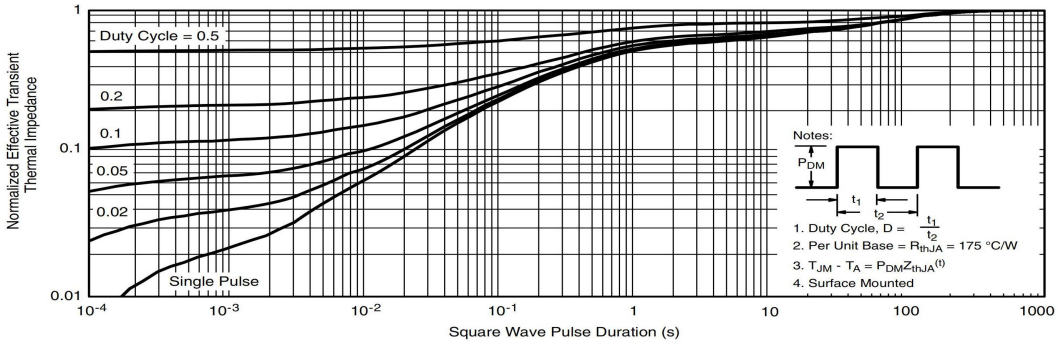


Power Junction-to-Foot

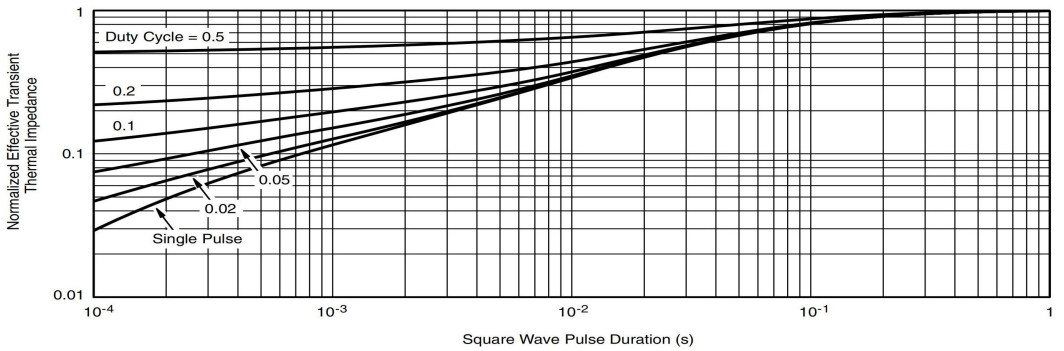


Power Junction-to-Ambient

TYPICAL CHARACTERISTICS (T_J = 25 °C, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Ambient



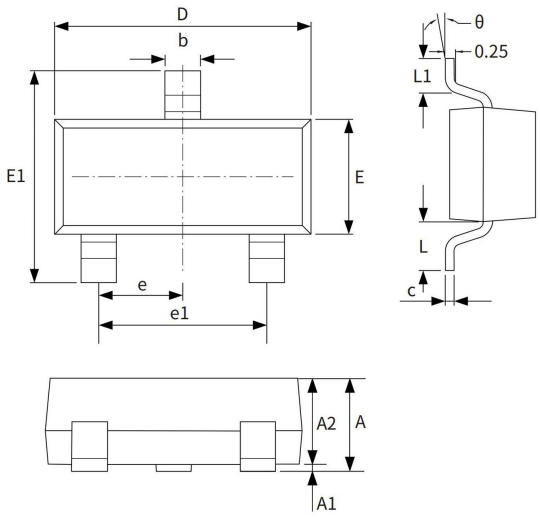
Normalized Thermal Transient Impedance, Junction-to-Foot

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Ordering Information

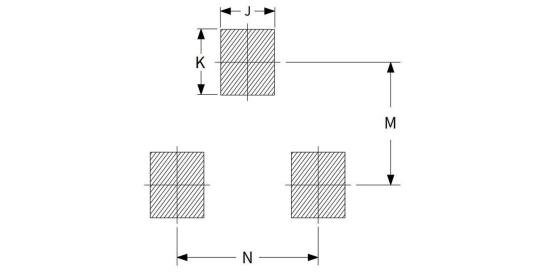
PACKAGE	PACKAGE CODE	UNIT WEIGHT(g)	REEL(pcs)	BOX(pcs)	CARTON(pcs)	DELIVERY MODE
SOT-23	R1	0.008	3000	30000	240000	7''

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