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Si2365EDS-T1-GE3
P-Channel 20 V (D-S) MOSFET

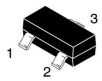
PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (Ω) Max.	I_D (A)[a]	Q_g (Typ.)
- 20	0.0320 at V_{GS} = - 4.5 V	- 5.9	13.8 nC
	0.0410 at V_{GS} = - 2.5 V	- 5.2	
	0.0675 at V_{GS} = - 1.8 V	- 4.3	

FEATURES

- TrenchFET® Power MOSFET
- 100 % R_g Tested
- Built-in ESD Protection
  - Typical ESD Performance 3000 V
- Material categorization:

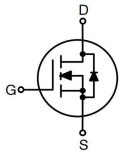
APPLICATIONS

- Power Management for Portable and Consumer
  - Load Switches
  - DC/DC Converters



SOT-23

1 – Gate
2 – Source
3 – Drain



Ordering Information:
Si2365EDS-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[b, c]	
	T_A = 70 °C		- 3.6[b, c]	
Pulsed Drain Current (t = 300 µs)		I_{DM}	- 20	
Continuous Source-Drain Diode Current	T_C = 25 °C	I_S	- 1.4	
	T_A = 25 °C		- 1[b, c]	
Maximum Power Dissipation	T_C = 25 °C	P_D	1.7	W
	T_C = 70 °C		1.1	
	T_A = 25 °C		1[b, c]	
	T_A = 70 °C		0.6[b, c]	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 150	°C
Soldering Recommendations (Peak Temperature)[d, e]			260	

THERMAL RESISTANCE RATINGS					
Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient[b, d]	t ≤ 5 s	R_{thJA}	100	130	°C/W
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	60	75	

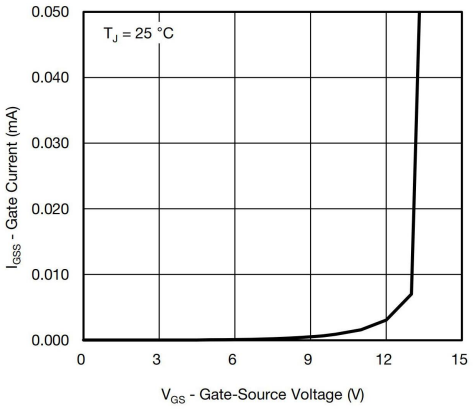
Notes:
a. T_C = 25 °C.
b. Surface mounted on 1" x 1" FR4 board.
c. t = 5 s.
d. Maximum under steady state conditions is 175 °C/W.

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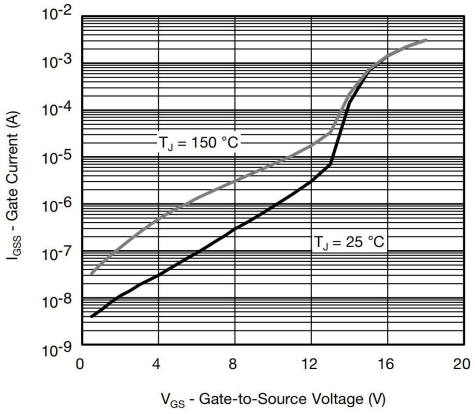
SPECIFICATIONS (T_J = 25 °C, unless otherwise noted)						
Parameter	**Symbol**	**Test Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0 V, I_D = - 250 µA	- 20			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	I_D = - 250 µA		- 14		mV/°C
$V_{GS(th)}$ 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	- 0.4		- 1	V
Gate-Source Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 8 V			± 10	µA
		V_{DS} = 0 V, V_{GS} = ± 4.5 V			± 1	
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 = 55 °C			- 10	
On-State Drain Current[a]	$I_{D(on)}$	$V_{DS} \leq$ - 5 V, V_{GS} = - 4.5 V	- 15			A
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = - 4.5 V, I_D = - 4 A		0.0265	0.0320	Ω
		V_{GS} = - 2.5 V, I_D = - 4 A		0.0340	0.0410	
		V_{GS} = - 1.8 V, I_D = - 2 A		0.0465	0.0675	
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = - 10 V, V_{GS} = - 8 V, I_D = - 4.5 A		23.8	36	nC
		V_{DS} = - 10 V, V_{GS} = - 4.5 V, I_D = - 4.5 A		13.8	21	
Gate-Source Charge	Q_{gs}			1.9		
Gate-Drain Charge	Q_{gd}			3		
Gate Resistance	R_g	f = 1 MHz	2.2	11	22	Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = - 10 V, R_L = 2.8 Ω $I_D \cong$ - 3.6 A, V_{GEN} = - 4.5 V, R_g = 1 Ω		22	33	ns
Rise Time	t_r			21	32	
Turn-Off Delay Time	$t_{d(off)}$			62	93	
Fall Time	t_f			14	21	
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = - 10 V, R_L = 2.8 Ω $I_D \cong$ - 3.6 A, V_{GEN} = - 8 V, R_g = 1 Ω		9	18	
Rise Time	t_r			6	12	
Turn-Off Delay Time	$t_{d(off)}$			65	98	
Fall Time	t_f			15	23	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	T_C = 25 °C			- 1.4	A
Pulse Diode Forward Current	I_{SM}				- 20	
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}			5	10	nC
Reverse Recovery Fall Time	t_a			8		ns
Reverse Recovery Rise Time	t_b			5		

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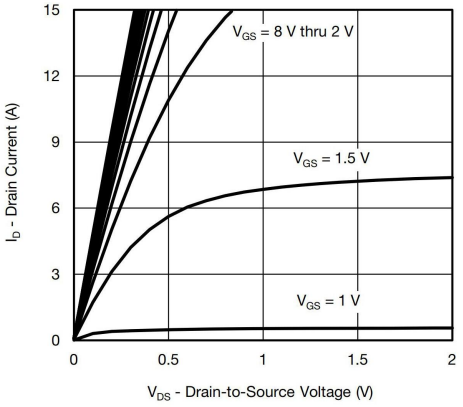
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



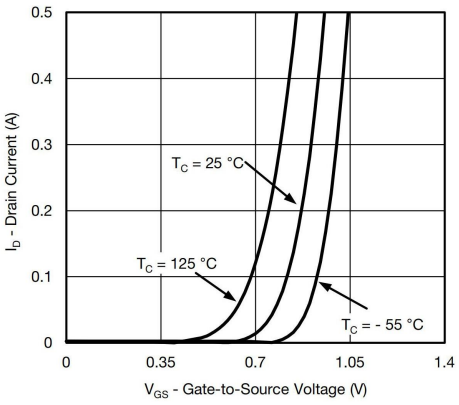
Gate Current vs. Gate-Source Voltage



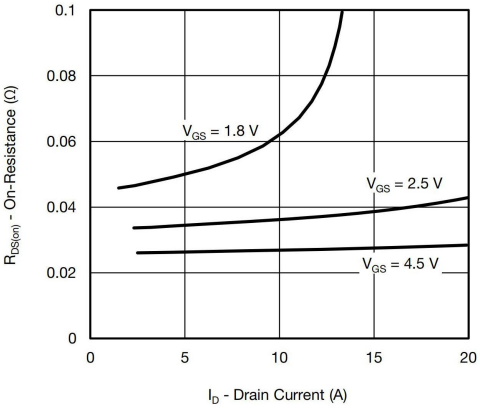
Gate Current vs. Gate-Source Voltage



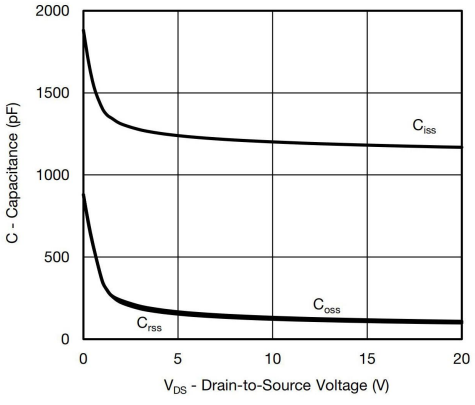
Output Characteristics



Transfer Characteristics



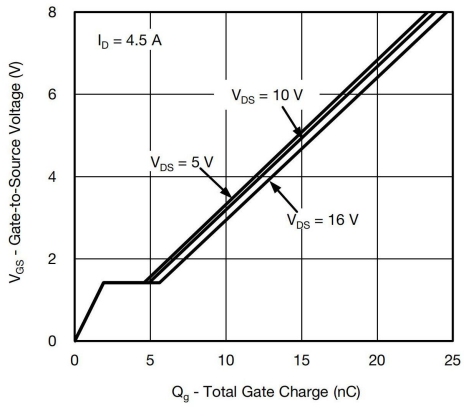
On-Resistance vs. Drain Current



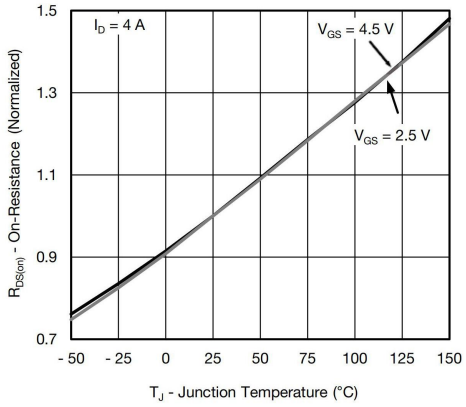
Capacitance

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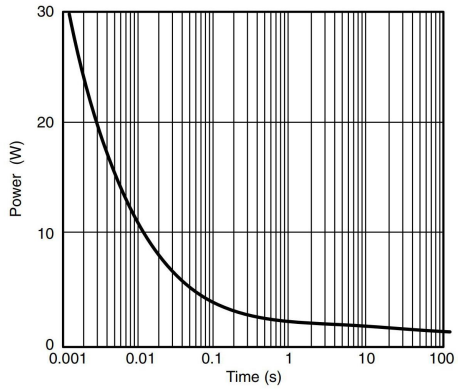
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



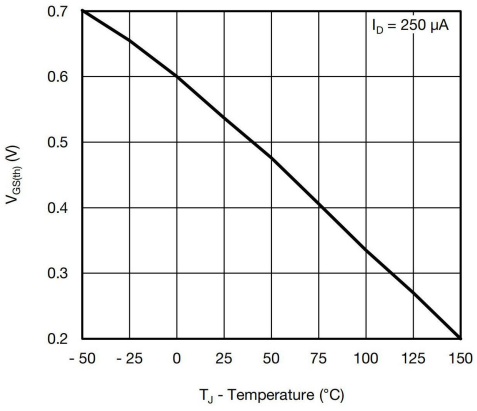
Gate Charge



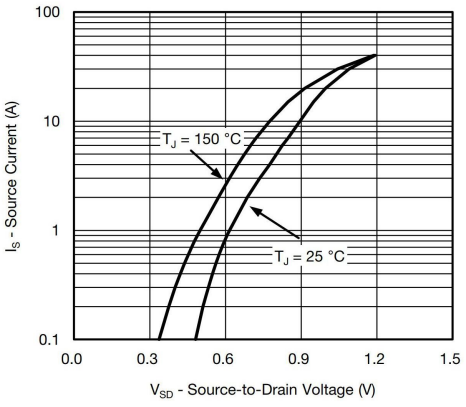
On-Resistance vs. Junction Temperature



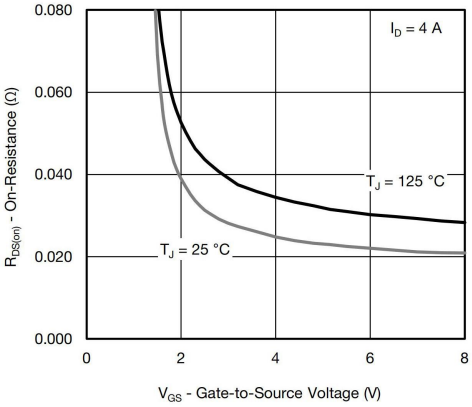
Single Pulse Power, Junction-to-Ambient



Threshold Voltage



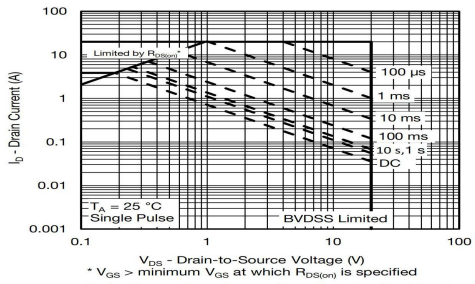
Soure-Drain Diode Forward Voltage



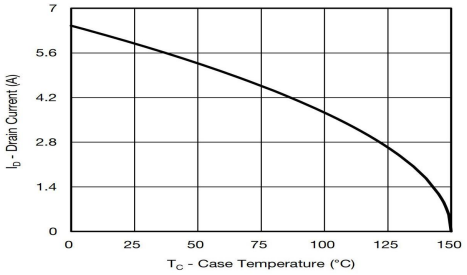
On-Resistance vs. Gate-to-Source Voltage

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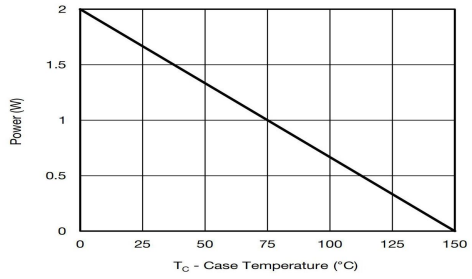
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



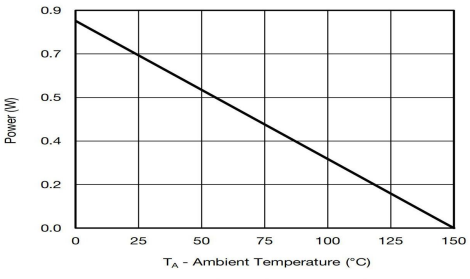
Safe Operating Area, Junction-to-Ambient



Current Derating*

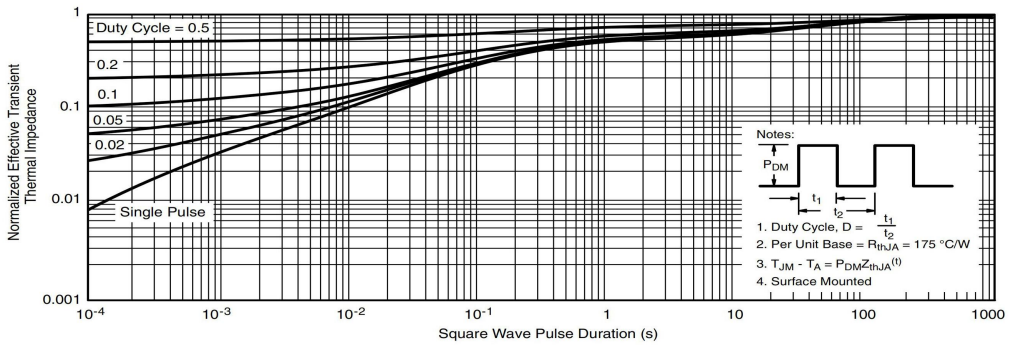


Power Junction-to-Case

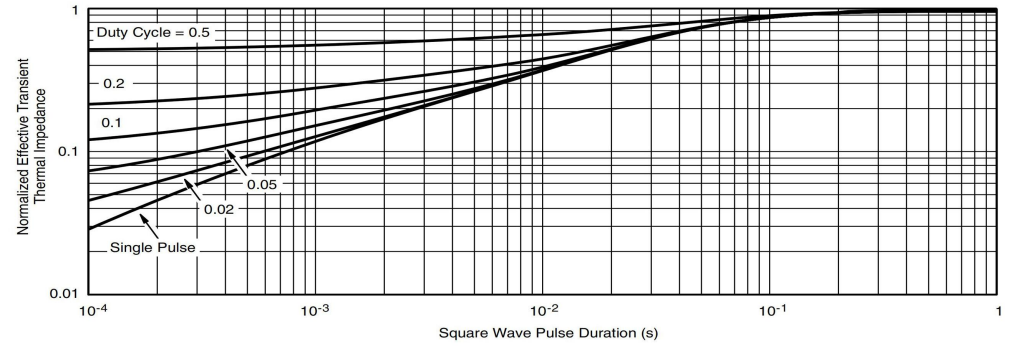


Power Junction-to-Ambient

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Ambient



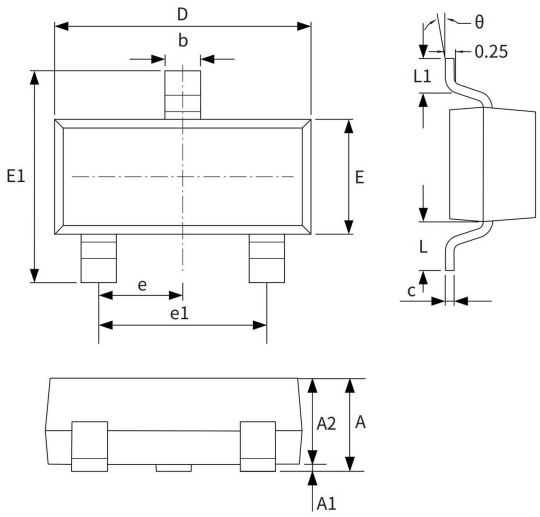
Normalized Thermal Transient Impedance, Junction-to-Foot

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Ordering Information

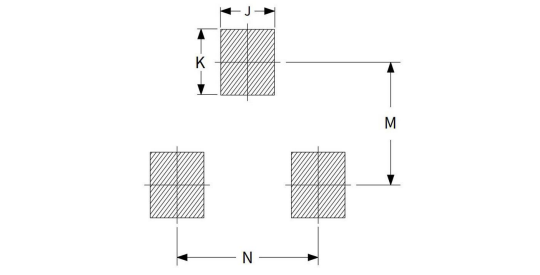
PACKAGE	PACKAGE CODE	UNIT WEIGHT(g)	REEL(pcs)	BOX(pcs)	CARTON(pcs)	DELIVERY MODE
SOT-23	R1	0.008	3000	30000	240000	7''

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