SiA817EDJ

Vishay Siliconix
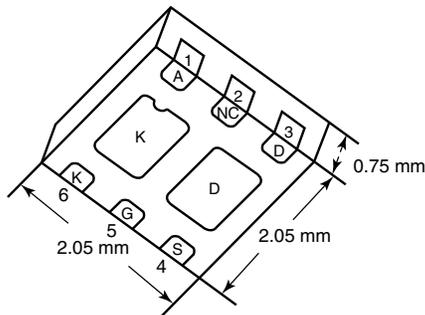
P-Channel 30 V (D-S) MOSFET with Schottky Diode

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (Ω) Max.	I_D (A)	Q_g (Typ.)
- 30	0.065 at V_{GS} = - 10 V	- 4.5[a]	6.6 nC
	0.080 at V_{GS} = - 4.5 V	- 4.5[a]	
	0.092 at V_{GS} = - 3.7 V	- 4.5[a]	
	0.125 at V_{GS} = - 2.5 V	- 3	

SCHOTTKY PRODUCT SUMMARY

V_{KA} (V)	V_f (V) Diode Forward Voltage	I_F (A)[a]
30	0.56 at 1 A	2

PowerPAK SC-70-6 Dual

Ordering Information:
SiA817EDJ-T1-GE3 (Lead (Pb)-free and Halogen-free)

FEATURES

- LITTLE FOOT® *Plus* Schottky Power MOSFET
- Thermally Enhanced PowerPAK® SC-70 Package
  - Small Footprint Area
  - Low On-Resistance
  - Thin 0.75 mm Profile
- Typical ESD Protection (MOSFET): 1500 V (HBM)
- 100 % R_g Tested
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

APPLICATIONS

- Portable Devices such as Smart Phones, Tablet PCs and Mobile Computing
  - Battery Charger Switch
  - Buck Converter
  - Power Management

Marking Code

P-Channel MOSFET
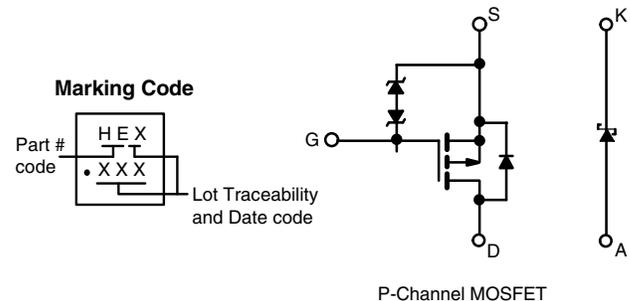
ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C, unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage (MOSFET)		V_{DS}	- 30	V
Reverse Voltage (Schottky)		V_{KA}	30	
Gate-Source Voltage (MOSFET)		V_{GS}	± 12	
Continuous Drain Current (T_J = 150 °C) (MOSFET)	T_C = 25 °C	I_D	- 4.5[a]	A
	T_C = 70 °C		- 4.5[a]	
	T_A = 25 °C		- 4.2[b, c]	
	T_A = 70 °C		- 3.4[b, c]	
Pulsed Drain Current (MOSFET) (t = 300 µs)		I_{DM}	- 15	
Continuous Source-Drain Diode Current (MOSFET Diode Conduction)	T_C = 25 °C	I_S	- 4.5[a]	
	T_A = 25 °C		- 1.6[b, c]	
Average Forward Current (Schottky)		I_F	2[b]	
Pulsed Forward Current (Schottky)		I_{FM}	3	
Maximum Power Dissipation (MOSFET)	T_C = 25 °C	P_D	6.5	W
	T_C = 70 °C		5	
	T_A = 25 °C		1.9[b, c]	
	T_A = 70 °C		1.2[b, c]	
Maximum Power Dissipation (Schottky)	T_C = 25 °C		6.8	
	T_C = 70 °C		4.3	
	T_A = 25 °C		1.6[b, c]	
	T_A = 70 °C		1[b, c]	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 150	°C
Soldering Recommendations (Peak Temperature)[d, e]			260	

Document Number: 62820
S13-0196-Rev. A, 28-Jan-13
For technical questions, contact: pmostechsupport@vishay.com
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SiA817EDJ

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THERMAL RESISTANCE RATINGS

Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient (MOSFET)[b, f]	$t \leq 5$ s	R_{thJA}	52	65	°C/W
Maximum Junction-to-Case (Drain) (MOSFET)	Steady State	R_{thJC}	12.5	16	
Maximum Junction-to-Ambient (Schottky)[b, f]	$t \leq 5$ s	R_{thJA}	62	76	
Maximum Junction-to-Case (Drain) (Schottky)	Steady State	R_{thJC}	15	18.5	

Notes:
a. Package limited.
b. Surface mounted on 1" x 1" FR4 board.
c. t = 10 s.
d. See solder profile (www.vishay.com/doc?73257). The PowerPAK SC-70 is a leadless package. The end of the lead terminal is exposed copper (not plated) as a result of the singulation process in manufacturing. A solder fillet at the exposed copper tip cannot be guaranteed and is not required to ensure adequate bottom side solder interconnection.
e. Rework conditions: manual soldering with a soldering iron is not recommended for leadless components.
f. Maximum under steady state conditions is 110 °C/W.

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		- 23		mV/°C
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			2.7		
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = - 250 µA	- 0.6		- 1.3	V
Gate-Source Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 4.5 V			± 0.5	µA
		V_{DS} = 0 V, V_{GS} = ± 12 V			± 10	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = - 30 V, V_{GS} = 0 V			- 1	
		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	- 8			A
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = - 10 V, I_D = - 3 A		0.054	0.065	Ω
		V_{GS} = - 4.5 V, I_D = - 2 A		0.065	0.080	
		V_{GS} = - 3.7 V, I_D = - 1 A		0.070	0.092	
		V_{GS} = - 2.5 V, I_D = - 1 A		0.095	0.125	
Forward Transconductance[a]	g_{fs}	V_{DS} = - 10 V, I_D = - 3 A		9		S
Dynamic[b]						
Input Capacitance	C_{iss}	V_{DS} = - 15 V, V_{GS} = 0 V, f = 1 MHz		600		pF
Output Capacitance	C_{oss}			55		
Reverse Transfer Capacitance	C_{rss}			50		
Total Gate Charge	Q_g	V_{DS} = - 15 V, V_{GS} = - 10 V, I_D = - 4.2 A		14	23	nC
				6.6	10	
Gate-Source Charge	Q_{gs}	V_{DS} = - 15 V, V_{GS} = - 4.5 V, I_D = - 4.2 A		1.3		
Gate-Drain Charge	Q_{gd}			2		
Gate Resistance	R_g	f = 1 MHz	1.1	5.5	11	Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = - 15 V, R_L = 4.4 Ω $I_D \cong$ - 3.4 A, V_{GEN} = - 4.5 V, R_g = 1 Ω		20	40	ns
Rise Time	t_r			20	40	
Turn-Off DelayTime	$t_{d(off)}$			23	45	
Fall Time	t_f			10	20	
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = - 15 V, R_L = 4.4 Ω $I_D \cong$ - 3.4 A, V_{GEN} = - 10 V, R_g = 1 Ω		10	20	
Rise Time	t_r			10	20	
Turn-Off DelayTime	$t_{d(off)}$			25	50	
Fall Time	t_f			7	15	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	T_C = 25 °C			- 4.5	A
Pulse Diode Forward Current	I_{SM}				- 15	
Body Diode Voltage	V_{SD}	I_S = - 3.4 A, V_{GS} = 0 V		- 0.9	- 1.2	V
Body Diode Reverse Recovery Time	t_{rr}	I_F = - 3.4 A, dI/dt = 100 A/µs, T_J = 25 °C		16	30	ns
Body Diode Reverse Recovery Charge	Q_{rr}			8	15	nC
Reverse Recovery Fall Time	t_a			9		ns
Reverse Recovery Rise Time	t_b			7		

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

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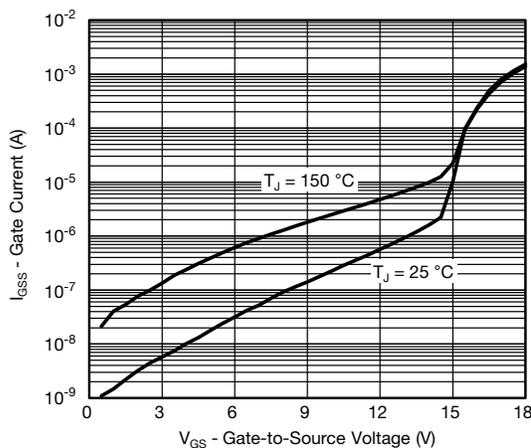
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SCHOTTKY SPECIFICATIONS T_J = 25 °C, unless otherwise noted

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Forward Voltage Drop	V_F	I_F = 0.5 A		0.37	0.45	V
		I_F = 0.5 A, T_J = 125 °C		0.31	0.37	
		I_F = 1 A		0.46	0.56	
		I_F = 1 A, T_J = 125 °C		0.41	0.50	
Maximum Reverse Leakage Current	I_{rm}	V_r = 30 V		0.025	0.100	mA
		V_r = 30 V, T_J = 85 °C		0.6	6	
Junction Capacitance	C_T	V_r = 15 V		35		pF

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.

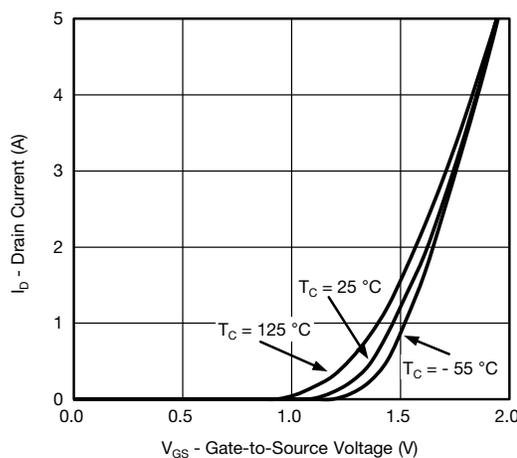## MOSFET TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)
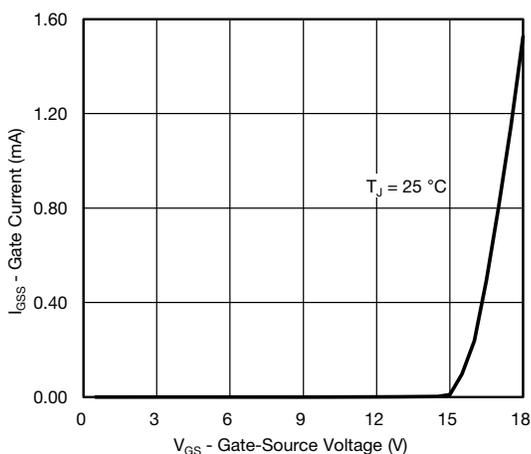
Gate-Source Voltage vs. Gate Current

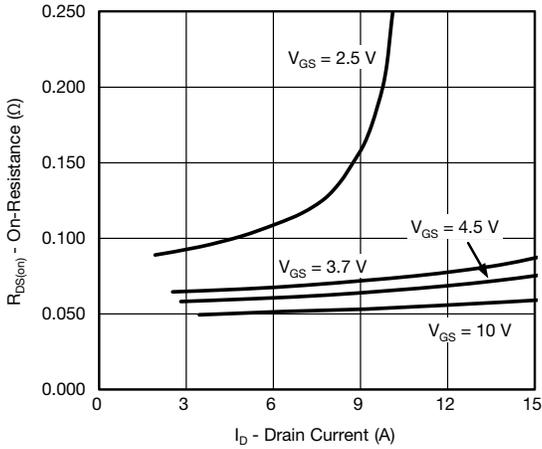Gate-Source Voltage vs. Gate Current
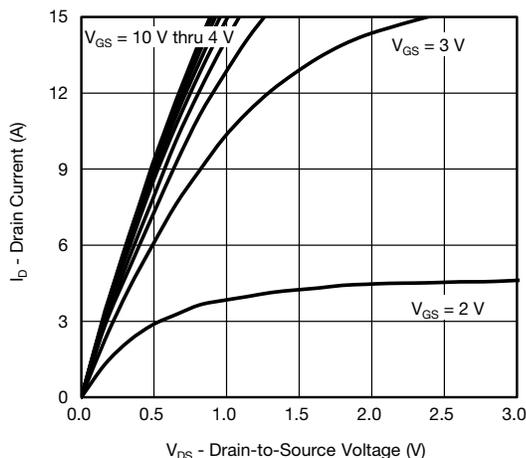
Output Characteristics

Transfer Characteristics
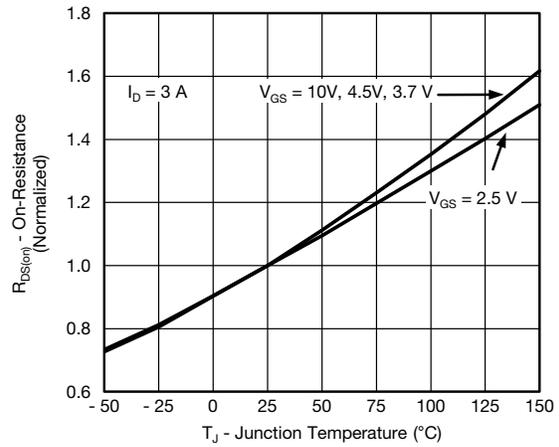
Document Number: 62820
S13-0196-Rev. A, 28-Jan-13
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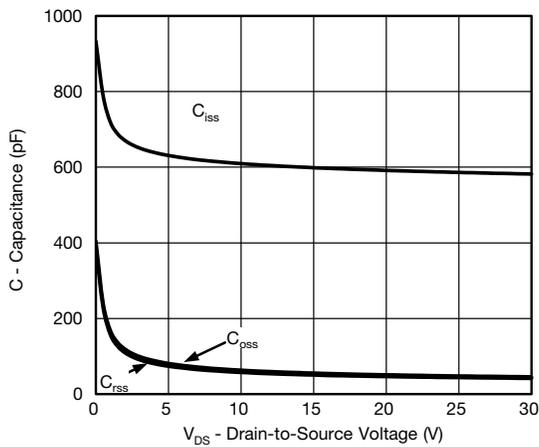3

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MOSFET TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)
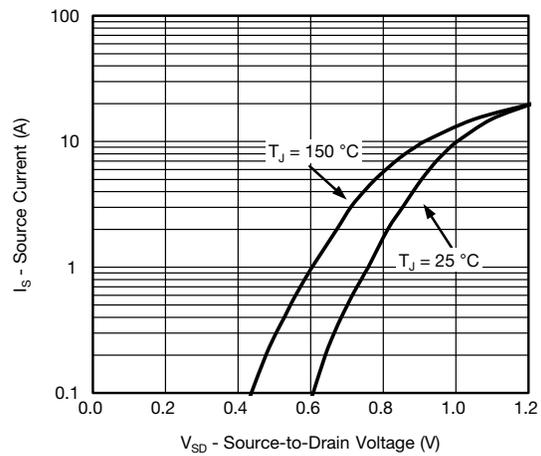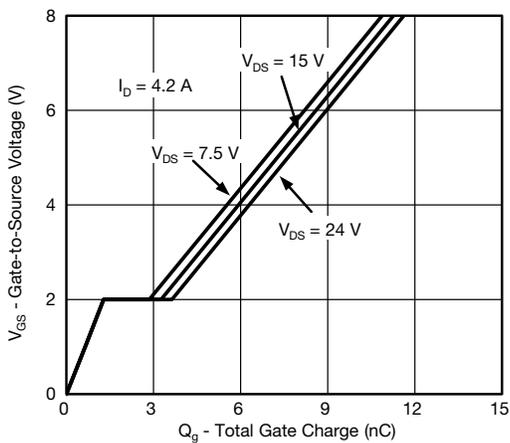
On-Resistance vs. Drain Current and Gate Voltage
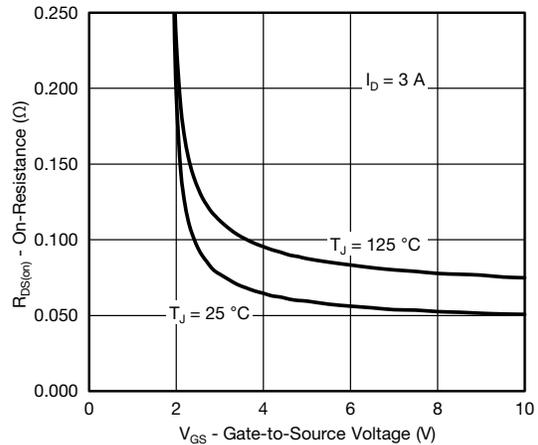
On-Resistance vs. Junction Temperature

Capacitance

Soure-Drain Diode Forward Voltage
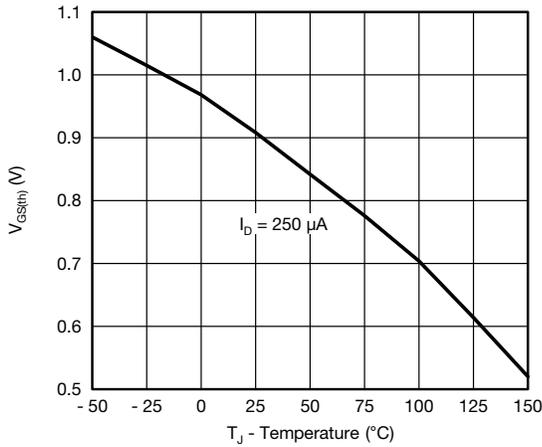
Gate Charge

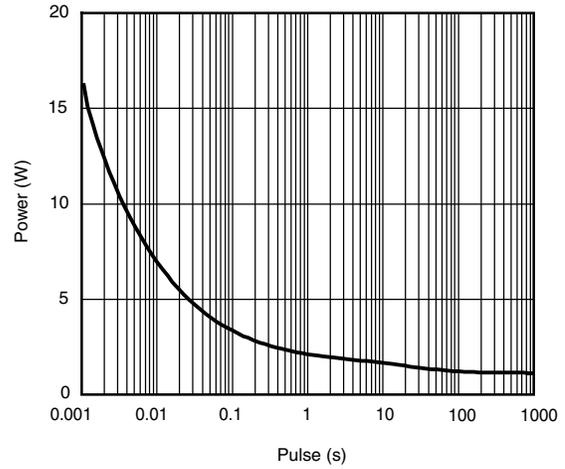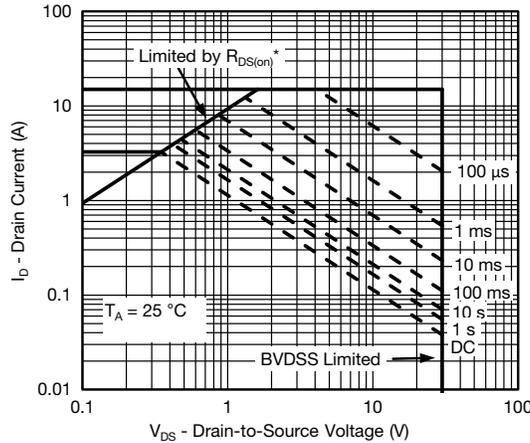**On-Resistance vs. Gate-to-Source Voltage**

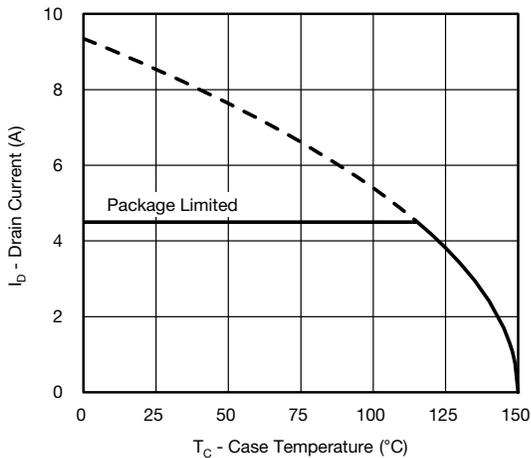**MOSFET TYPICAL CHARACTERISTICS** (T_A = 25 °C, unless otherwise noted)

Threshold Voltage

Single Pulse Power, Junction-to-Ambient

Safe Operating Area, Junction-to-Case

Current Derating*
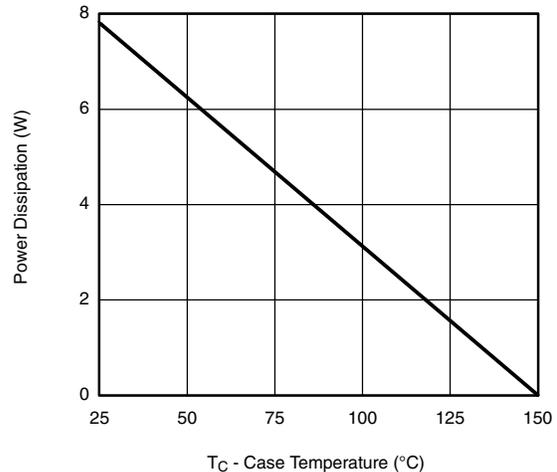
Power Derating

* The power dissipation P_D is based on $T_{J(max.)}$ = 150 °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

Document Number: 62820
S13-0196-Rev. A, 28-Jan-13

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SiA817EDJ

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

Duty Cycle = 0.5
0.2
0.1
0.05
0.02
Single Pulse

Notes:
P_{DM}
t_1
t_2
t_1
1. Duty Cycle, D = $\frac{t_1}{t_2}$
2. Per Unit Base = R_{thJA} = 110 °C/W
3. $T_{JM} - T_A = P_{DM}Z_{thJA}(t)$
4. Surface Mounted

Square Wave Pulse Duration (s)

Normalized Efective Transient Thermal Impedance

Normalized Thermal Transient Impedance, Junction-to-Ambient

Duty Cycle = 0.5
0.2
0.1
0.05
0.02
Single Pulse

Square Wave Pulse Duration (s)

Normalized Efective Transient Thermal Impedance

Normalized Thermal Transient Impedance, Junction-to-Case

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

Reverse Current vs. Junction Temperature
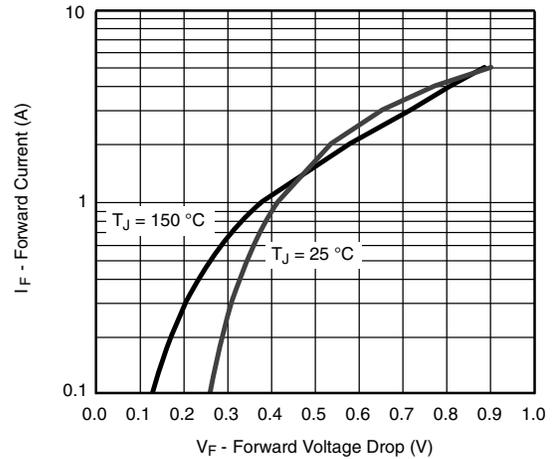
Forward Voltage Drop

Capacitance

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

Notes:

1. Duty Cycle, D = $\frac{t_1}{t_2}$
2. Per Unit Base = R_{thJA} = 85 °C/W
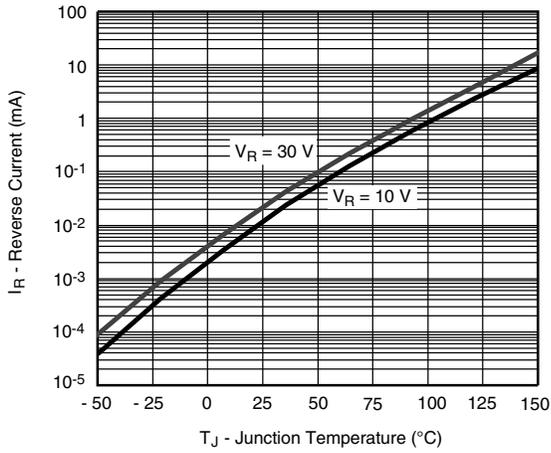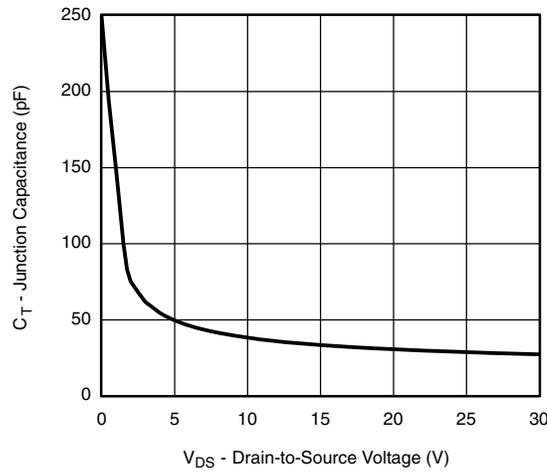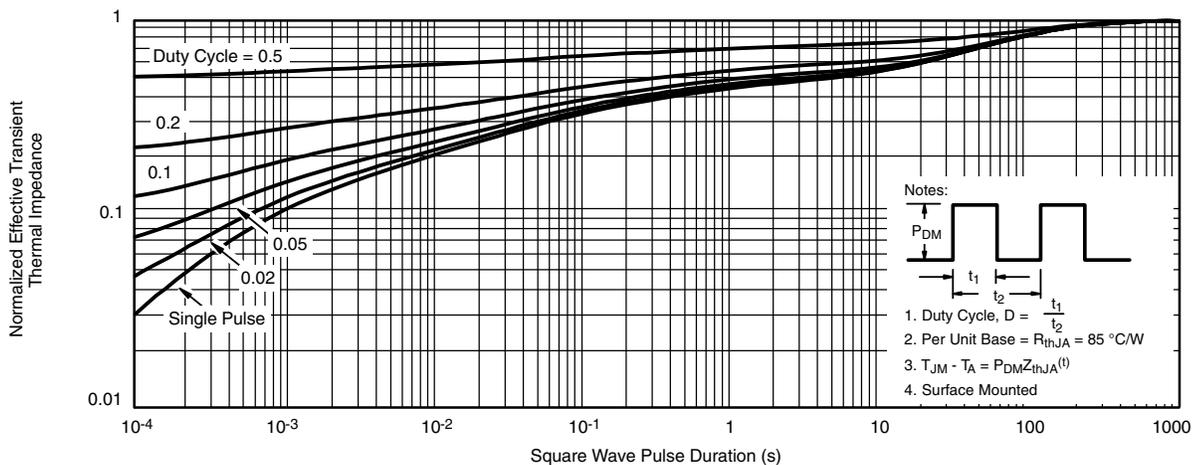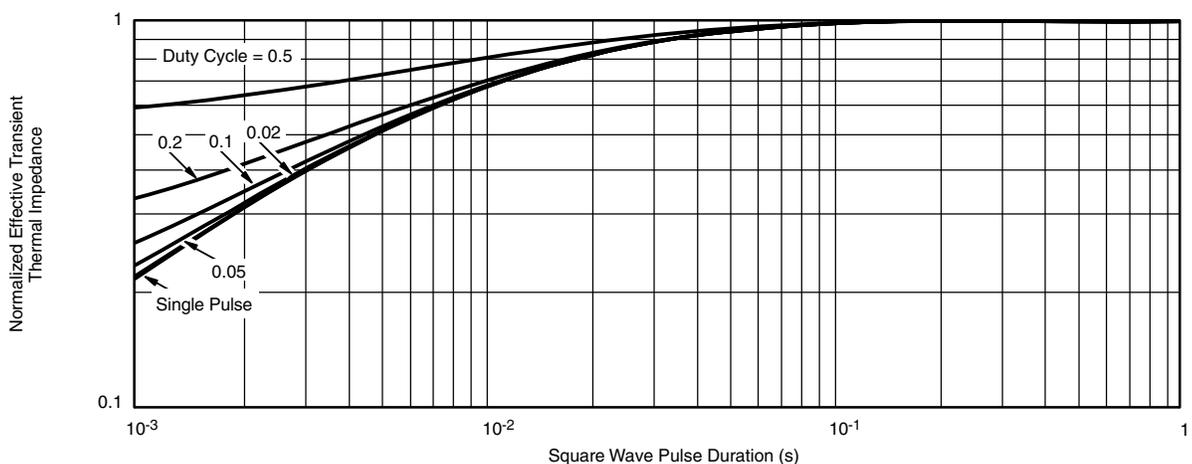3. $T_{JM} - T_A = P_{DM}Z_{thJA}{}^{(t)}$
4. Surface Mounted

Normalized Thermal Transient Impedance, Junction-to-Ambient

Normalized Thermal Transient Impedance, Junction-to-Case

Vishay Siliconix maintains worldwide manufacturing capability. Products may be manufactured at one of several qualified locations. Reliability data for Silicon Technology and Package Reliability represent a composite of all qualified locations. For related documents such as package/tape drawings, part marking, and reliability data, see www.vishay.com/ppg?62820.

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PowerPAK® SC70-6L
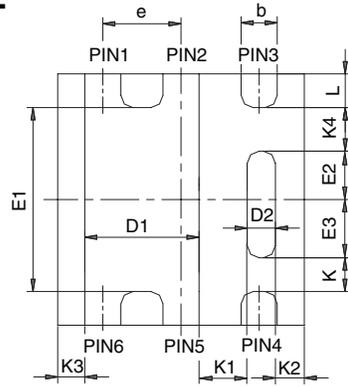
BACKSIDE VIEW OF SINGLE
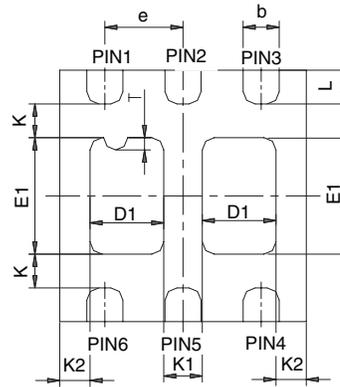
BACKSIDE VIEW OF DUAL

Notes:
1. All dimensions are in millimeters
2. Package outline exclusive of mold flash and metal burr
3. Package outline inclusive of plating

DETAIL Z

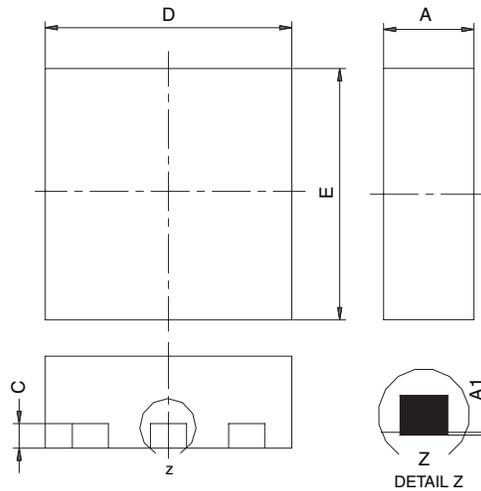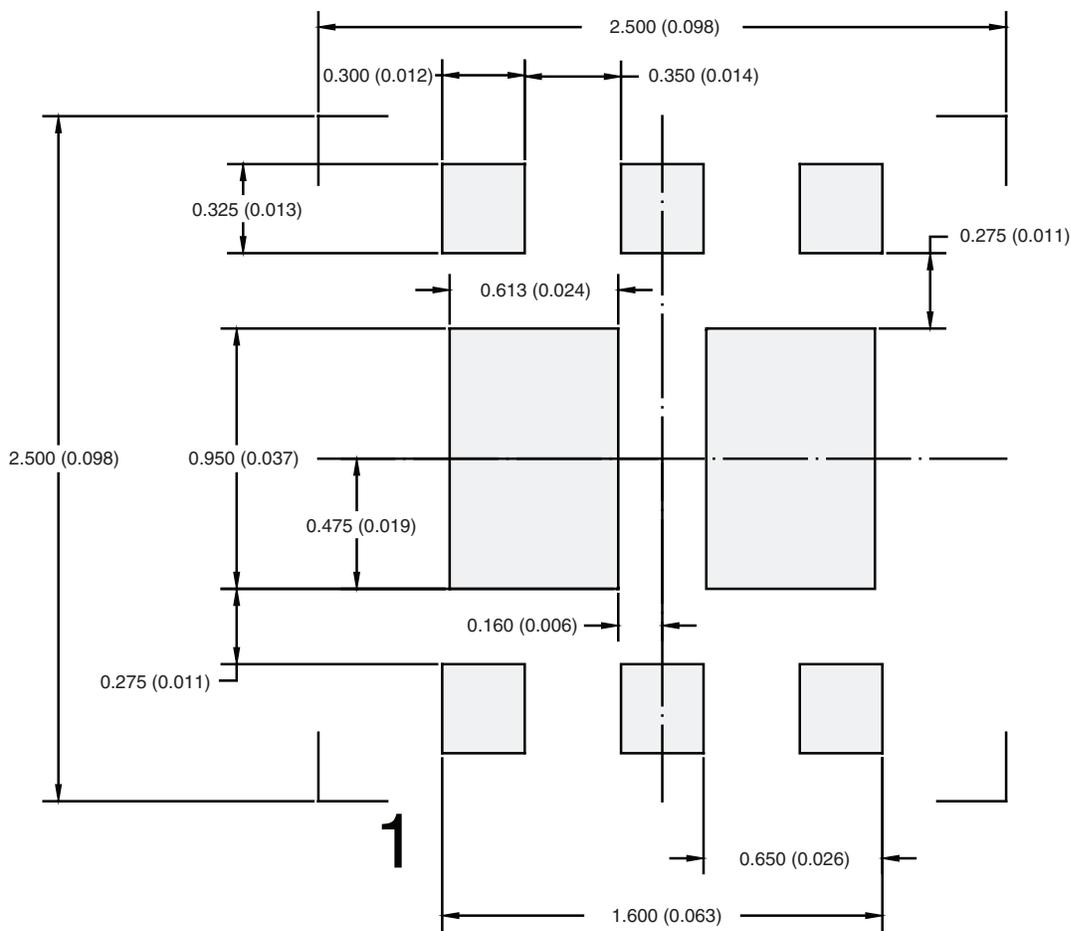| DIM	SINGLE PAD						DUAL PAD					
	MILLIMETERS			INCHES			MILLIMETERS			INCHES		
	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max
A	0.675	0.75	0.80	0.027	0.030	0.032	0.675	0.75	0.80	0.027	0.030	0.032
A1	0	-	0.05	0	-	0.002	0	-	0.05	0	-	0.002
b	0.23	0.30	0.38	0.009	0.012	0.015	0.23	0.30	0.38	0.009	0.012	0.015
C	0.15	0.20	0.25	0.006	0.008	0.010	0.15	0.20	0.25	0.006	0.008	0.010
D	1.98	2.05	2.15	0.078	0.081	0.085	1.98	2.05	2.15	0.078	0.081	0.085
D1	0.85	0.95	1.05	0.033	0.037	0.041	0.513	0.613	0.713	0.020	0.024	0.028
D2	0.135	0.235	0.335	0.005	0.009	0.013						
E	1.98	2.05	2.15	0.078	0.081	0.085	1.98	2.05	2.15	0.078	0.081	0.085
E1	1.40	1.50	1.60	0.055	0.059	0.063	0.85	0.95	1.05	0.033	0.037	0.041
E2	0.345	0.395	0.445	0.014	0.016	0.018						
E3	0.425	0.475	0.525	0.017	0.019	0.021						
e	0.65 BSC			0.026 BSC			0.65 BSC			0.026 BSC		
K	0.275 TYP			0.011 TYP			0.275 TYP			0.011 TYP		
K1	0.400 TYP			0.016 TYP			0.320 TYP			0.013 TYP		
K2	0.240 TYP			0.009 TYP			0.252 TYP			0.010 TYP		
K3	0.225 TYP			0.009 TYP								
K4	0.355 TYP			0.014 TYP								
L	0.175	0.275	0.375	0.007	0.011	0.015	0.175	0.275	0.375	0.007	0.011	0.015
T							0.05	0.10	0.15	0.002	0.004	0.006

ECN: C-07431 − Rev. C, 06-Aug-07
DWG: 5934

RECOMMENDED PAD LAYOUT FOR PowerPAK® SC70-6L Dual

2.500 (0.098)

0.300 (0.012)

0.350 (0.014)

0.325 (0.013)

0.275 (0.011)

0.613 (0.024)

2.500 (0.098)

0.950 (0.037)

0.475 (0.019)

0.160 (0.006)

0.275 (0.011)

0.650 (0.026)

1.600 (0.063)

1

Dimensions in mm (inches)

Return to Index

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Material Category Policy

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.

Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.

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Данный компонент на территории Российской Федерации

Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

http://moschip.ru/get-element

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

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