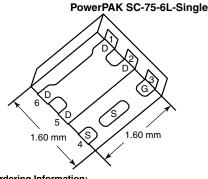


HALOGEN

FREE

P-Channel 20 V (D-S) MOSFET

PRODUCT SUMMARY									
V _{DS} (V)	$R_{DS(on)}(\Omega)$	I _D (A)	Q _g (Typ.)						
- 20	0.035 at $V_{GS} = -4.5 \text{ V}$	- 9 ^a							
	0.049 at V _{GS} = - 2.5 V	- 9 ^a	13 nC						
	0.079 at V _{GS} = - 1.8 V	- 9 ^a	13110						
	0.157 at V _{GS} = - 1.5 V	- 2							



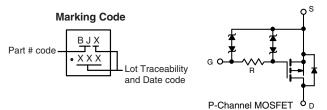
Ordering Information: SiB457EDK-T1-GE3 (Lead (Pb)-free and Halogen-free)

FEATURES

- Halogen-free According to IEC 61249-2-21 Definition
- TrenchFET® Power MOSFET
- New Thermally Enhanced PowerPAK® SC-75 Package
 - Small Footprint Area
 - Low On-Resistance
- 100 % R_g Tested
- Typical ESD Performance: 2500 V
- Built in ESD Protection with Zener Diode
- Compliant to RoHS Directive 2011/65/EU

APPLICATIONS

- Load Switch for Portable Devices
- Load Switch for Charging Circuits



ABSOLUTE MAXIMUM RATINGS	S (T _A = 25 °C, unle	ess otherwise r	noted)			
Parameter		Symbol	Limit	Unit		
Drain-Source Voltage		V_{DS}	- 20	V		
Gate-Source Voltage		V_{GS}	± 8	V		
	T _C = 25 °C		- 9 ^a			
Continuous Drain Current (T _{.1} = 150 °C)	T _C = 70 °C	L	- 9 ^a			
Continuous Diam Current (1) = 130 C)	T _A = 25 °C	I _D	- 6.8 ^{b, c}			
	T _A = 70 °C		- 5.5 ^{b, c}	Α		
Pulsed Drain Current		I _{DM}	- 25			
Continuous Source-Drain Diode Current	T _C = 25 °C	1-	- 9 ^a			
Continuous Cource-Drain Diode Current	T _A = 25 °C	I _S	- 2 ^{b, c}			
	T _C = 25 °C		13			
Maximum Power Dissipation	T _C = 70 °C	P _D	8.4	W		
Maximum Fower Dissipation	T _A = 25 °C	LD.	2.4 ^{b, c}	VV		
	T _A = 70 °C		1.6 ^{b, c}			
Operating Junction and Storage Temperature Ra	ange	T _J , T _{stg}	- 55 to 150	°C		
Soldering Recommendations (Peak Temperature	e) ^{d, e}	, and the second	260			

THERMAL RESISTANCE RATINGS									
Parameter		Symbol	Typical	Maximum	Unit				
Maximum Junction-to-Ambient ^{b, f}	t ≤ 5 s	R _{thJA}	41	51	°C/W				
Maximum Junction-to-Case (Drain)	Steady State	R _{thJC}	7.5	9.5]				

Notes:

- a. Package limited.
- b. Surface mounted on 1" x 1" FR4 board.
- c. t = 5 s.
- d. See solder profile (www.vishay.com/doc?73257). The PowerPAK SC-75 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 105 °C/W.

Document Number: 64816 S12-0497-Rev. C, 05-Mar-12 For more information please contact: pmostechsupport@vishay.com



Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit			
Static					L	L			
Drain-Source Breakdown Voltage	V _{DS}	$V_{GS} = 0 \text{ V}, I_D = -250 \mu\text{A}$	- 20			V			
V _{DS} Temperature Coefficient	$\Delta V_{DS}/T_{J}$	J 250 A		- 12		mV/°C			
V _{GS(th)} Temperature Coefficient	$\Delta V_{GS(th)}/T_J$	I _D = - 250 μA		2.5					
Gate-Source Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}, I_{D} = -250 \mu A$	- 0.4		- 1	V			
Coto Course Leokogo	1	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 8 \text{ V}$			± 5	μΑ			
Gate-Source Leakage	I _{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 4.5 \text{ V}$			± 0.5				
Zero Gate Voltage Drain Current	l	V _{DS} = - 20 V, V _{GS} = 0 V			- 1				
Zero Gate Voltage Drain Gurrent	I _{DSS}	$V_{DS} = -20 \text{ V}, V_{GS} = 0 \text{ V}, T_{J} = 55 ^{\circ}\text{C}$			- 10				
On-State Drain Current ^a	I _{D(on)}	$V_{DS} \le$ - 5 V, $V_{GS} =$ - 4.5 V	- 15			Α			
		V _{GS} = - 4.5 V, I _D = - 4.8 A		0.029	0.035				
Dunin Course On Chata Basistanas	Book)	$V_{GS} = -2.5 \text{ V}, I_D = -4 \text{ A}$		0.040	0.049				
Drain-Source On-State Resistance ^a	R _{DS(on)}	$V_{GS} = -1.8 \text{ V}, I_D = -3.3 \text{ A}$		0.060	0.079	Ω			
		$V_{GS} = -1.5 \text{ V}, I_D = -1.5 \text{ A}$		0.085	0.157				
Forward Transconductance ^a	9 _{fs}	$V_{DS} = -10 \text{ V}, I_{D} = -4.8 \text{ A}$		16		S			
Dynamic ^b									
Total Gate Charge	Q _q	$V_{DS} = -10 \text{ V}, V_{GS} = -8 \text{ V}, I_{D} = -6.8 \text{ A}$		22	44				
Gate-Source Charge	~ g			13	26	nC			
date-Source onlarge	Q_{gs}	$V_{DS} = -10 \text{ V}, V_{GS} = -4.5 \text{ V}, I_{D} = -6.8 \text{ A}$		1.2					
Gate-Drain Charge	Q_{gd}			3					
Gate Resistance	R_g	f = 1 MHz	0.28	1.4	2.8	kΩ			
Turn-On Delay Time	t _{d(on)}			0.34	0.51				
Rise Time	t _r	V_{DD} = - 10 V, R_L = 1.8 Ω		0.90	1.35				
Turn-Off Delay Time	t _{d(off)}	$I_D \cong$ - 5.5 A, V_{GEN} = - 4.5 V, R_g = 1 Ω		3	4.5				
Fall Time	t _f			1.90	2.90	μs			
Turn-On Delay Time	t _{d(on)}			0.17	0.26	μο			
Rise Time	t _r	V_{DD} = - 10 V, R_L = 1.8 Ω		0.45	0.70				
Turn-Off Delay Time	t _{d(off)}	$I_D \cong -5.5 \text{ A}, V_{GEN} = -8 \text{ V}, R_g = 1 \Omega$		5.5	8.30				
II Time t _f				2	3.5				
Drain-Source Body Diode Characteristi	cs								
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C			- 9	A			
Pulse Diode Forward Current	I _{SM}				- 25				
Body Diode Voltage	V_{SD}	I _S = - 5.5 A, V _{GS} = 0 V		- 0.85	- 1.2	V			

Notes:

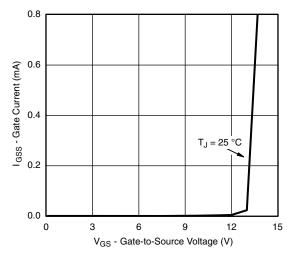
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

a. Pulse test; pulse width $\leq 300~\mu s,$ duty cycle $\leq 2~\%.$

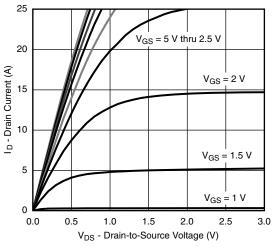
b. Guaranteed by design, not subject to production testing.



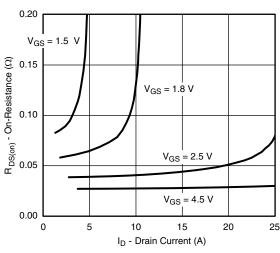
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



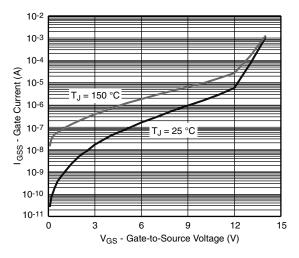
Gate Current vs. Gate-Source Voltage



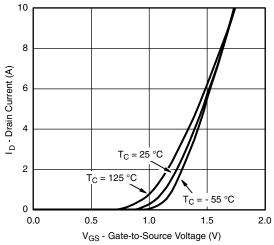
Output Characteristics



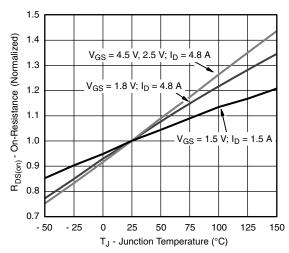
On-Resistance vs. Drain Current



Gate Current vs. Gate-Source Voltage

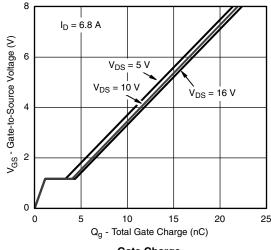


Transfer Characteristics

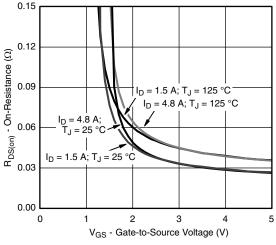


On-Resistance vs. Junction Temperature

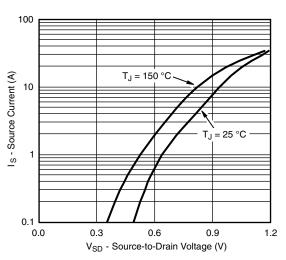
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



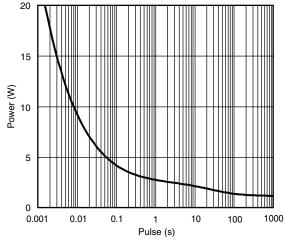




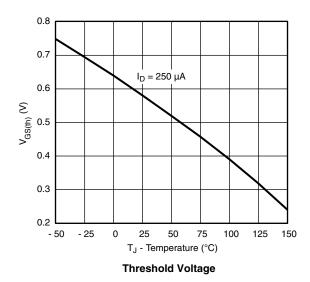
On-Resistance vs. Gate-to-Source Voltage

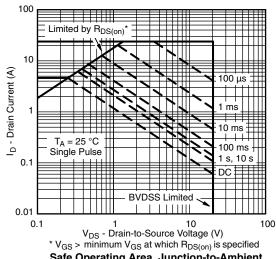


Soure-Drain Diode Forward Voltage



Single Pulse Power, Junction-to-Ambient





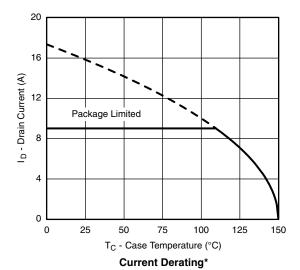
Safe Operating Area, Junction-to-Ambient

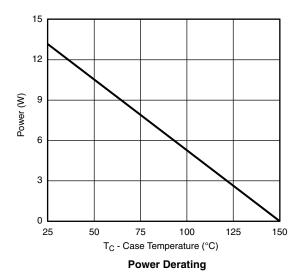






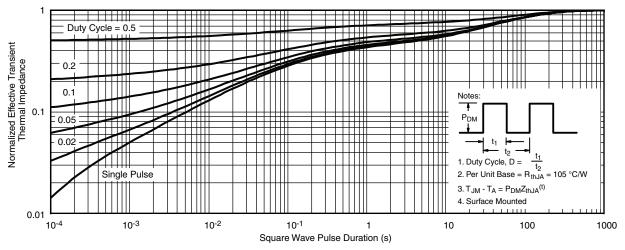
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



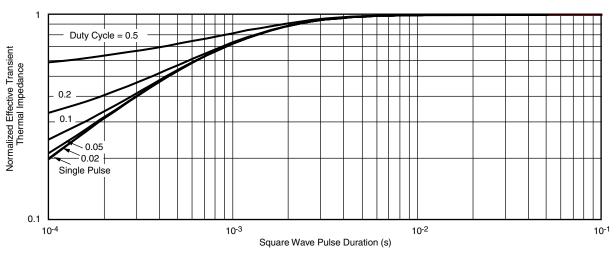


 $^{^*}$ The power dissipation P_D is based on $T_{J(max)}$ = 150 $^{\circ}$ C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below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

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Ambient



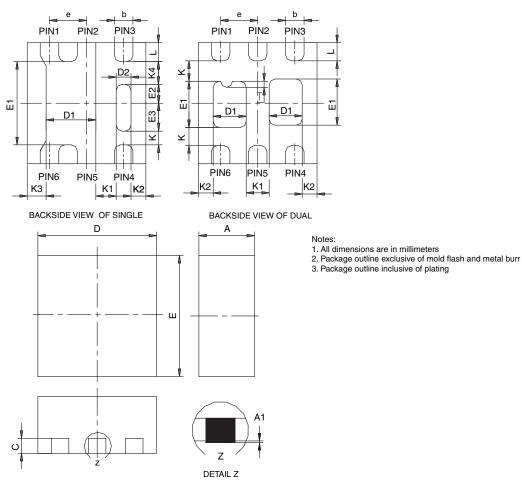
Normalized Thermal Transient Impedance, Junction-to-Case

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PowerPAK® SC75-6L



					DUAL PAD							
DIM	M	ILLIMETE	METERS INCHES MILLIMETERS		RS	INCHES						
	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max
Α	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	0.18	0.25	0.33	0.007	0.010	0.013	0.18	0.25	0.33	0.007	0.010	0.013
С	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	1.53	1.60	1.70	0.060	0.063	0.067	1.53	1.60	1.70	0.060	0.063	0.067
D1	0.57	0.67	0.77	0.022	0.026	0.030	0.34	0.44	0.54	0.013	0.017	0.021
D2	0.10	0.20	0.30	0.004	0.008	0.012						
Е	1.53	1.60	1.70	0.060	0.063	0.067	1.53	1.60	1.70	0.060	0.063	0.067
E1	1.00	1.10	1.20	0.039	0.043	0.047	0.51	0.61	0.71	0.020	0.024	0.028
E2	0.20	0.25	0.30	0.008	0.010	0.012						
E3	0.32	0.37	0.42	0.013	0.015	0.017						
е		0.50 BSC (0.020 BSC	;	0.50 BSC 0.020 BSC						
K	0.180 TYP)		0.007 TYP		0.245 TYP 0.010			0.010 TYP		
K1	0.275 TYP				0.011 TYP		0.320 TYP 0.013 TYP					
K2	0.200 TYP			0.008 TYP			0.200 BSC			0.008 TYP		
K3	0.255 TYP			0.010 TYP				•				
K4	0.300 TYP		0.012 TYP									
L	0.15	0.25	0.35	0.006	0.010	0.014	0.15	0.25	0.35	0.006	0.010	0.014
T							0.03	0.08	0.13	0.001	0.003	0.005

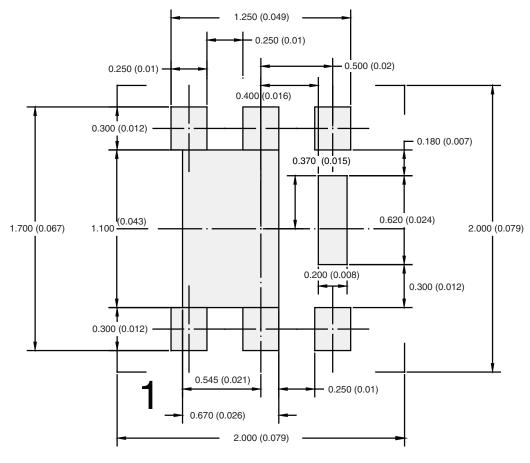
ECN: C-07431 - Rev. C, 06-Aug-07

DWG: 5935

Document Number: 73000 06-Aug-07



RECOMMENDED PAD LAYOUT FOR PowerPAK® SC75-6L Single



Dimensions in mm/(Inches)

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ATTLICATION NOT



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