P-Channel 8 V (D-S) MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)	Q_g (Typ.)
- 8	0.034 at V_{GS} = - 4.5 V	- 9[a]	10.5 nC
	0.063 at V_{GS} = - 1.8 V	- 5	
	0.084 at V_{GS} = - 1.5 V	- 3	
	0.180 at V_{GS} = - 1.2 V	- 1	

FEATURES

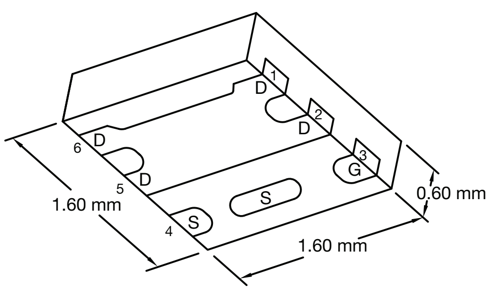
- **Halogen-free According to IEC 61249-2-21 Definition**
- TrenchFET® Power MOSFET
- New Thermally Enhanced PowerPAK® SC-75 Package with ultra-thin 0.6 mm height
  - Small Footprint Area
  - Low On-Resistance
- 100 % R_g Tested
- Typical ESD Performance 2000 V
- Built in ESD Protection with Zener Diode
- Compliant to RoHS Directive 2002/95/EC

Pb-free
RoHS COMPLIANT
HALOGEN FREE

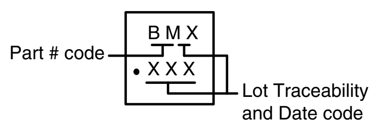
APPLICATIONS

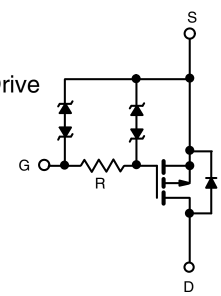
- Load Switch for Portable Devices
- Load Switch for Low Voltage Gate Drive

Thin PowerPAK SC-75-6L-Single



Marking Code





P-Channel MOSFET

Ordering Information: SiB437EDKT-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}	- 8	V
Gate-Source Voltage		V_{GS}	± 5	
Continuous Drain Current (T_J = 150 °C)	T_C = 25 °C	I_D	- 9[a]	A
	T_C = 70 °C		- 9[a]	
	T_A = 25 °C		- 7.5[b, c]	
	T_A = 70 °C		- 6[b, c]	
Pulsed Drain Current		I_{DM}	- 25	
Continuous Source-Drain Diode Current	T_C = 25 °C	I_S	- 9[a]	
	T_A = 25 °C		- 2[b, c]	
Maximum Power Dissipation	T_C = 25 °C	P_D	13	W
	T_C = 70 °C		8.4	
	T_A = 25 °C		2.4[b, c]	
	T_A = 70 °C		1.6[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, f]	t ≤ 5 s	R_{thJA}	41	51	°C/W
Maximum Junction-to-Case (Drain)	Steady State	R_{thJC}	7.5	9.5	

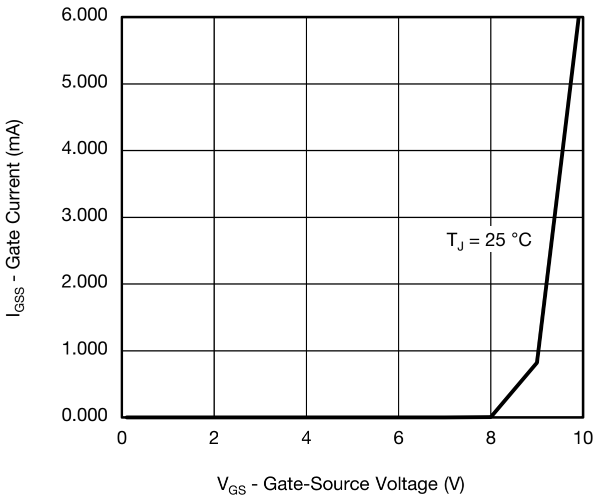
Notes:
a. Package limited.
b. Surface mounted on 1" x 1" FR4 board.
c. t = 5 s.
d. See solder profile (www.vishay.com/ppg?73257). The Thin PowerPAK SC-75 is a leadless package. The end of the lead terminal is exposed copper (not plated) as a result of the singulation process in manufacturing. A solder 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.

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	- 8			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	I_D = - 250 µA		- 2		mV/°C
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			2.2		
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = - 250 µA	- 0.35		- 0.7	V
Gate-Source Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 5 V			± 5	µA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = - 8 V, V_{GS} = 0 V			- 1	
		V_{DS} = - 8 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 = - 3 A		0.028	0.034	Ω
		V_{GS} = - 1.8 V, I_D = - 1 A		0.050	0.063	
		V_{GS} = - 1.5 V, I_D = - 0.5 A		0.060	0.084	
		V_{GS} = - 1.2 V, I_D = - 0.5 A		0.100	0.180	
Forward Transconductance[a]	g_{fs}	V_{DS} = - 4 V, I_D = - 3 A		14		S
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = - 4 V, V_{GS} = - 4.5 V, I_D = - 7.4 A		10.5	16	nC
Gate-Source Charge	Q_{gs}			1.5		
Gate-Drain Charge	Q_{gd}			3.3		
Gate Resistance	R_g	f = 1 MHz	80	400	800	Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = - 4 V, R_L = 0.7 Ω $I_D \cong$ - 6 A, V_{GEN} = - 4.5 V, R_g = 1 Ω		90	180	ns
Rise Time	t_r			170	340	
Turn-Off Delay Time	$t_{d(off)}$			690	1380	
Fall Time	t_f			630	1260	
Drain-Source Body Diode Characteristics						
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 = - 6 A, V_{GS} = 0 V		- 0.8	- 1.2	V
Body Diode Reverse Recovery Time	t_{rr}	I_F = - 6 A, dI/dt = 100 A/µs, T_J = 25 °C		30	60	ns
Body Diode Reverse Recovery Charge	Q_{rr}			12	25	nC
Reverse Recovery Fall Time	t_a			12		ns
Reverse Recovery Rise Time	t_b			18		

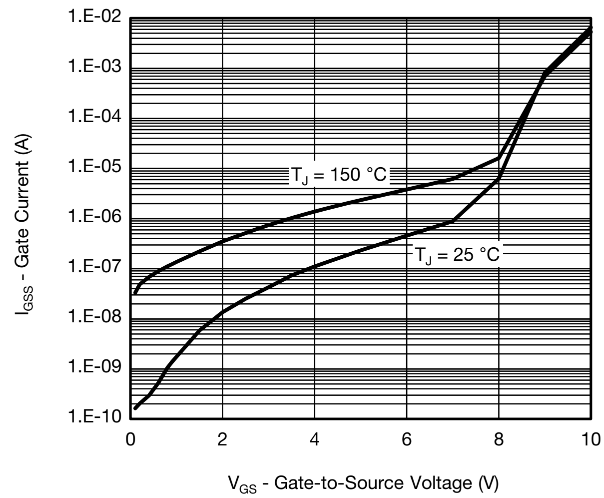
Notes:
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.

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.

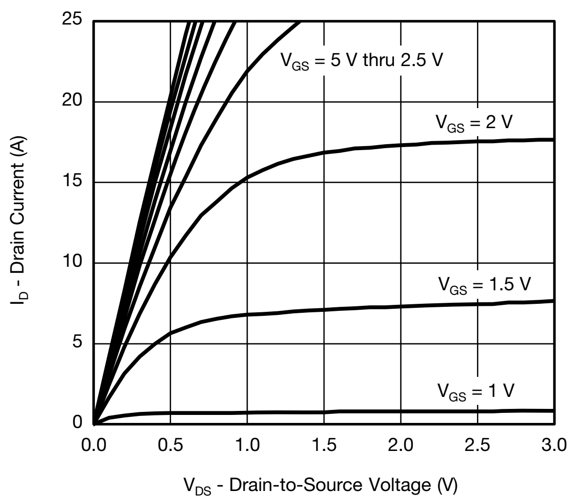
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



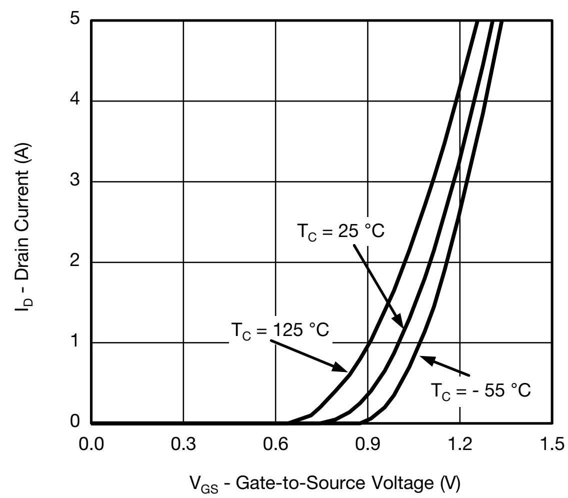
Gate Current vs. Gate-Source Voltage



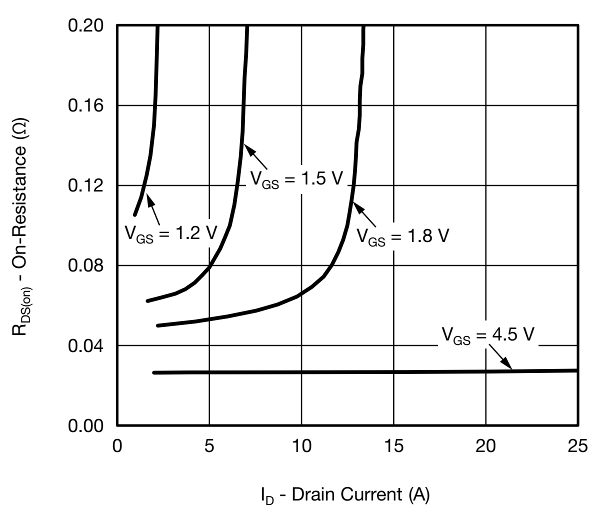
Gate Current vs. Gate-Source Voltage



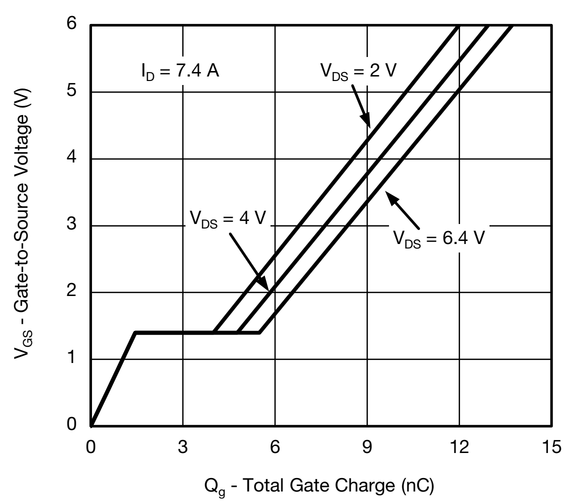
Output Characteristics



Transfer Characteristics

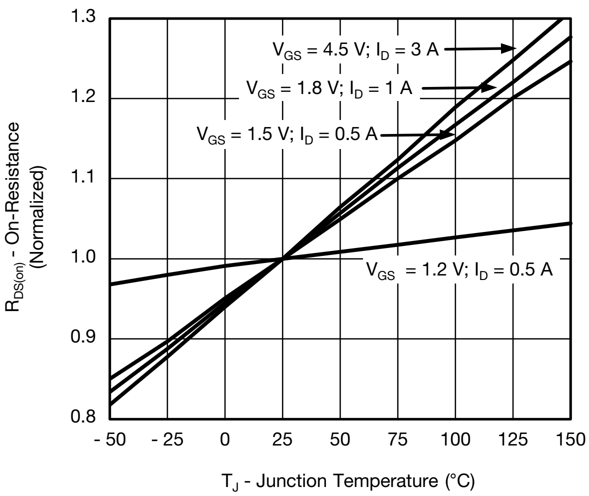


On-Resistance vs. Drain Current

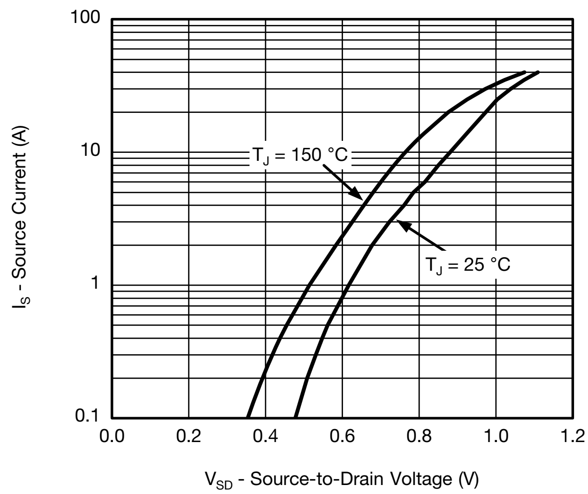


Gate Charge

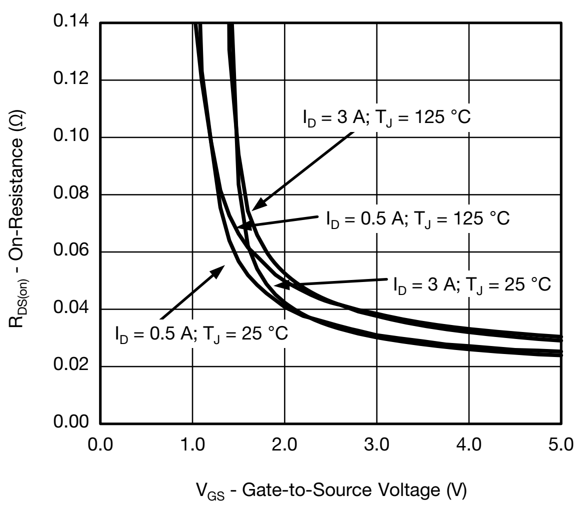
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



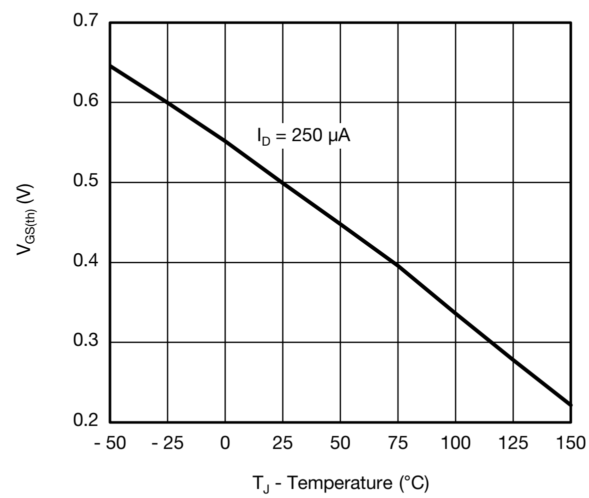
On-Resistance vs. Junction Temperature



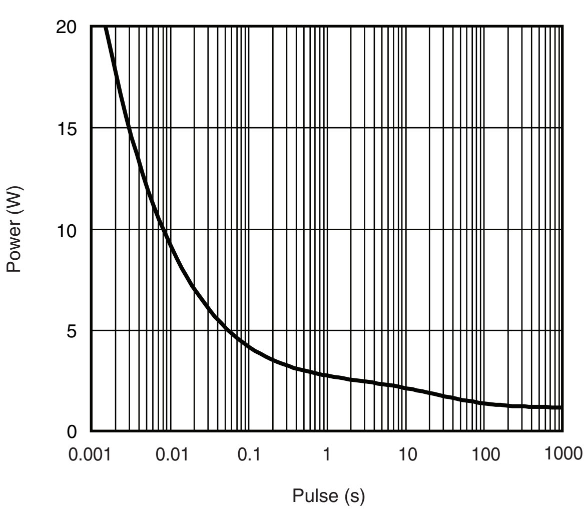
Soure-Drain Diode Forward Voltage



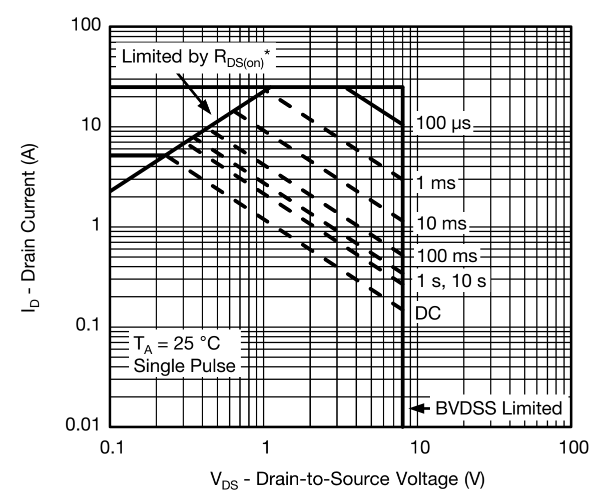
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



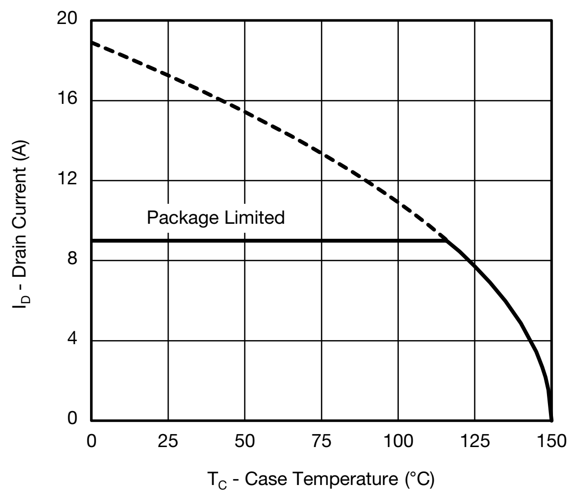
Single Pulse Power, Junction-to-Ambient



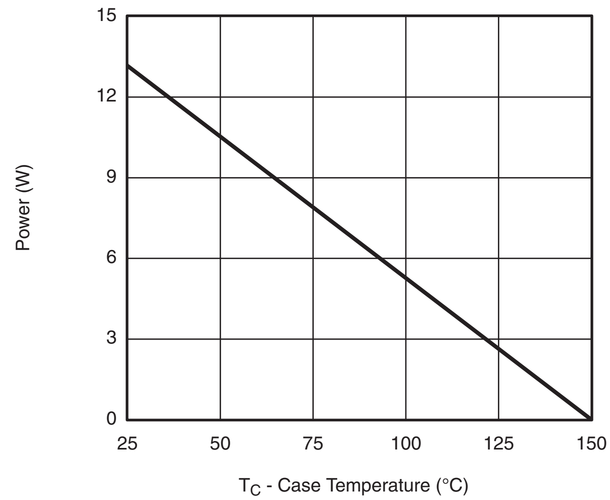
* V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area, Junction-to-Ambient

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



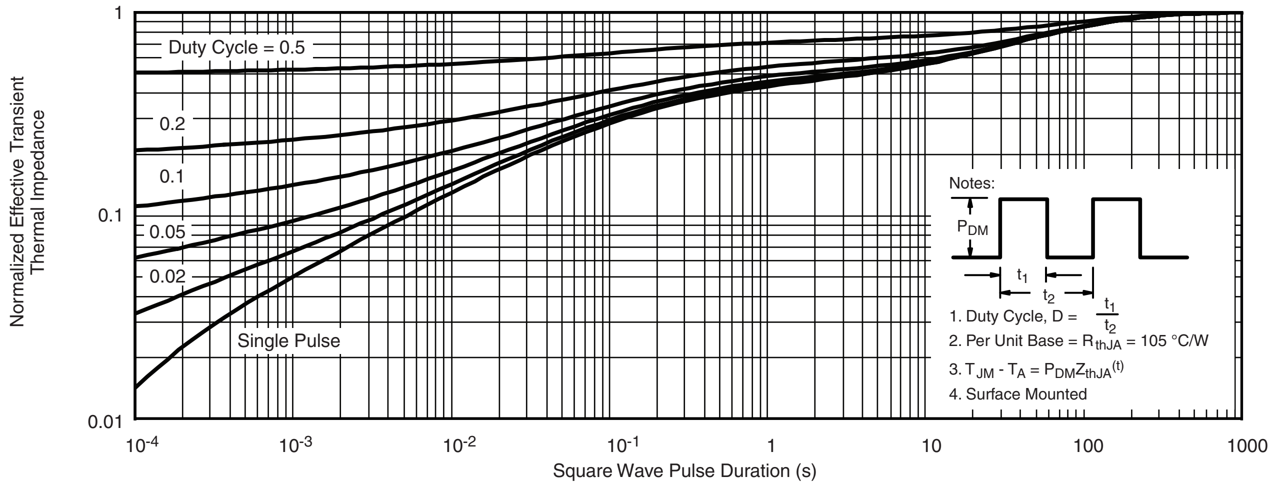
Current Derating*



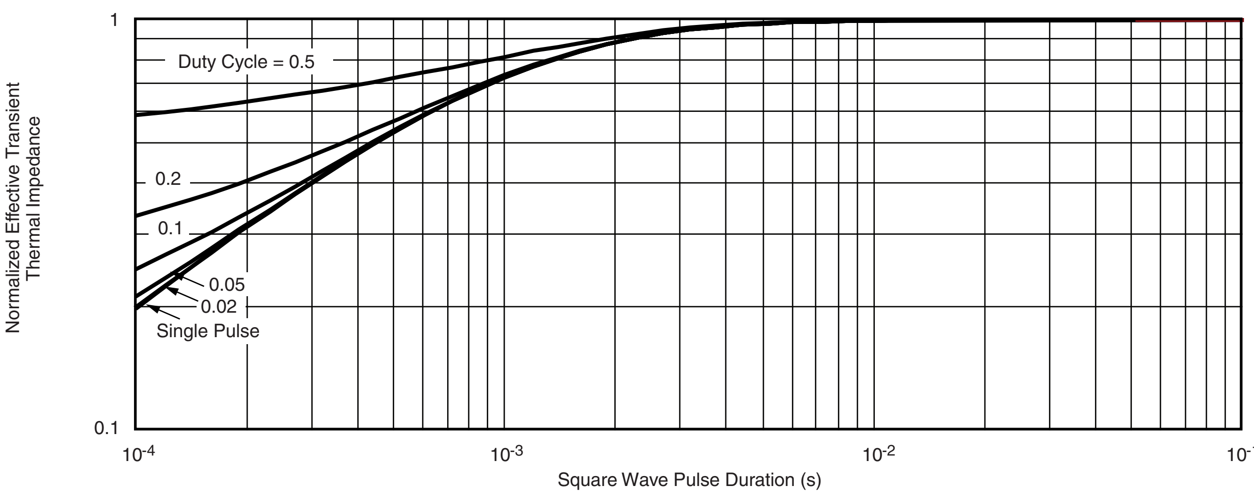
Power Derating

* 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.

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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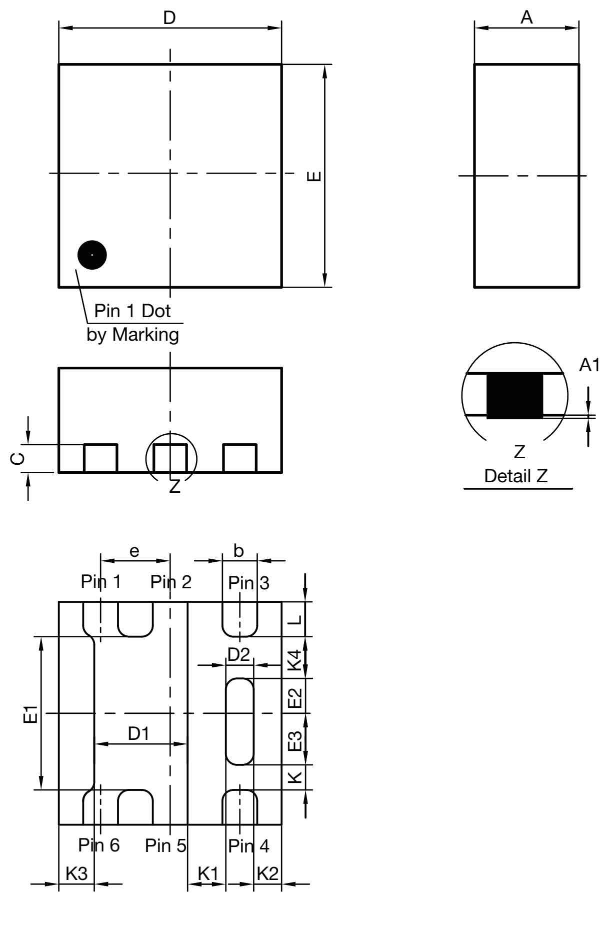
Case Outline for Thin PowerPAK® SC-75 Single



Backside View of Single

DIM.	MILLIMETERS			INCHES		
	MIN.	**NOM.**	**MAX.**	**MIN.**	**NOM.**	**MAX.**
A	0.525	0.60	0.65	0.0206	0.024	0.026
A1	0	-	0.05	0	-	0.002
b	0.18	0.25	0.33	0.007	0.010	0.013
C	0.15	0.20	0.25	0.006	0.008	0.0010
D	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
D2	0.10	0.20	0.30	0.004	0.008	0.012
E	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
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
e	0.50 BSC			0.020 BSC		
K	0.180 typ.			0.007 typ.		
K1	0.275 typ.			0.011 typ.		
K2	0.200 typ.			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
ECN: T16-0083-Rev. B, 14-Mar-16 DWG: 5999						

Note

- All dimensions are in millimeter
- Package outline exculsive of mold flash and metal burr
- Package outline inclusive of plating

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