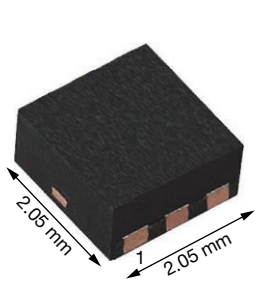
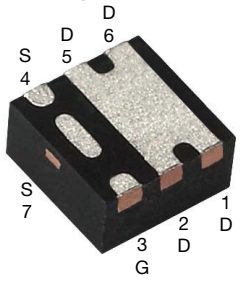
P-Channel 20 V (D-S) MOSFET

PowerPAK® SC-70-6L Single



Top View



Bottom View

FEATURES

- TrenchFET® power MOSFET
- Thermally Enhanced PowerPAK® SC-70 Package
  - Small Footprint Area
  - Low On-Resistance
- 100 % R_g Tested
- Typical ESD Protection: 2000 V (HBM)
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

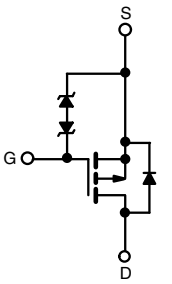
Pb-free

RoHS COMPLIANT

HALOGEN FREE

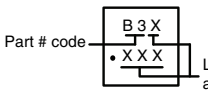
APPLICATIONS

- Portable Devices such as Smart Phones, Tablet PCs and Mobile Computing
  - DC/DC Converter
  - Battery Switch
  - Load Switch
  - Power Management



P-Channel MOSFET

Marking Code



PRODUCT SUMMARY	
V_{DS} (V)	-20
$R_{DS(on)}$ max. (Ω) at V_{GS} = -4.5 V	0.0350
$R_{DS(on)}$ max. (Ω) at V_{GS} = -3.7 V	0.0395
$R_{DS(on)}$ max. (Ω) at V_{GS} = -2.5 V	0.0620
Q_g typ. (nC)	10
I_D (A)	-9
Configuration	Single

ORDERING INFORMATION	
Package	PowerPAK SC-70-6L
Lead (Pb)-free and halogen-free	SiA459EDJ-T1-GE3

ABSOLUTE MAXIMUM RATINGS (T_C = 25 °C, unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	-20	V
Gate-Source Voltage		V_{GS}	± 12	
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		-7.4[b, c]	
	T_A = 70 °C		-6[b, c]	
Pulsed Drain Current (t = 100 µs)		I_{DM}	-40	
Continuous Source-Drain Diode Current	T_C = 25 °C	I_S	-9[a]	
	T_A = 25 °C		-2.4[b, c]	
Maximum Power Dissipation	T_C = 25 °C	P_D	15.6	W
	T_C = 70 °C		10	
	T_A = 25 °C		2.9[b, c]	
	T_A = 70 °C		1.8[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}	32	43	°C/W
Maximum Junction-to-Case (Drain)	Steady State	R_{thJC}	6	8	

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-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 80 °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	-	-12	-	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	-0.6	-	-1.2	V
Gate-Source Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 12 V	-	-	± 10	µA
		V_{DS} = 0 V, V_{GS} = ± 4.5 V	-	-	± 0.5	
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} ≤ -5 V, V_{GS} = -4.5 V	-10	-	-	A
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = -4.5 V, I_D = -5 A	-	0.0280	0.0350	Ω
		V_{GS} = -3.7 V, I_D = -5 A	-	0.0310	0.0395	
		V_{GS} = -2.5 V, I_D = -2 A	-	0.0450	0.0620	
Forward Transconductance[a]	g_{fs}	V_{GS} = -10 V, I_D = -5 A	-	15	-	S
Dynamic[b]						
Input Capacitance	C_{iss}	V_{DS} = -10 V, V_{GS} = 0 V, f = 1 MHz	-	885	-	pF
Output Capacitance	C_{oss}		-	155	-	
Reverse Transfer Capacitance	C_{rss}		-	140	-	
Total Gate Charge	Q_g	V_{DS} = -10 V, V_{GS} = -10 V, I_D = -5 A	-	20	30	nC
		V_{DS} = -10 V, V_{GS} = -4.5 V, I_D = -5 A	-	10	15	
Gate-Source Charge	Q_{gs}		-	1.6	-	
Gate-Drain Charge	Q_{gd}		-	2.9	-	
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 = 1.67 Ω I_D ≅ -6 A, V_{GEN} = -4.5 V, R_g = 1 Ω	-	20	40	ns
Rise Time	t_r		-	25	50	
Turn-Off Delay Time	$t_{d(off)}$		-	40	80	
Fall Time	t_f		-	20	40	
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = -10 V, R_L = 1.67 Ω I_D ≅ -6 A, V_{GEN} = -10 V, R_g = 1 Ω	-	7	15	
Rise Time	t_r		-	10	20	
Turn-Off Delay Time	$t_{d(off)}$		-	40	80	
Fall Time	t_f		-	20	40	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	T_C = 25 °C	-	-	-9	A
Pulse Diode Forward Current	I_{SM}		-	-	-40	
Body Diode Voltage	V_{SD}	I_S = -6 A, V_{GS} = 0 V	-	-0.9	-1.2	V
Body Diode Reverse Recovery Time	t_{rr}	I_F = -6 A, dI/dt = 100 A/µs, T_J = 25 °C	-	21	35	ns
Body Diode Reverse Recovery Charge	Q_{rr}		-	9	20	nC
Reverse Recovery Fall Time	t_a		-	7	-	ns
Reverse Recovery Rise Time	t_b		-	14	-	

Notes

a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.

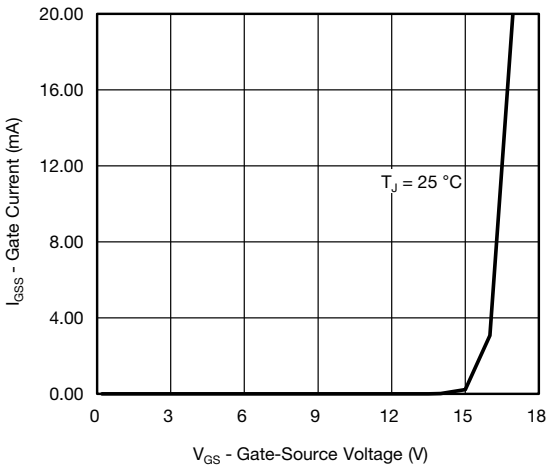
b. Guaranteed by design, not subject to production testing.

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.

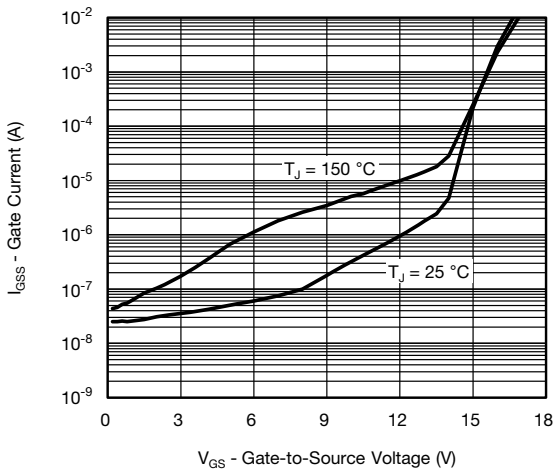
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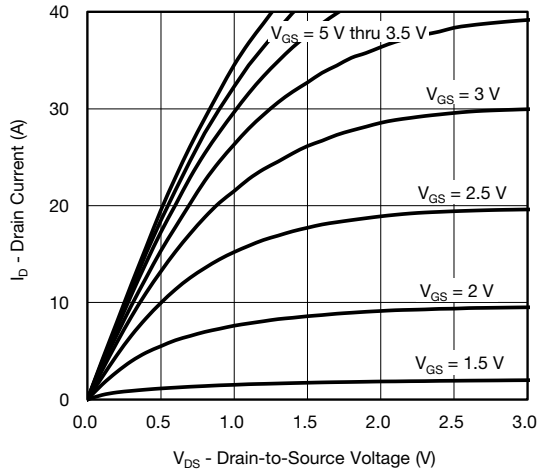
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



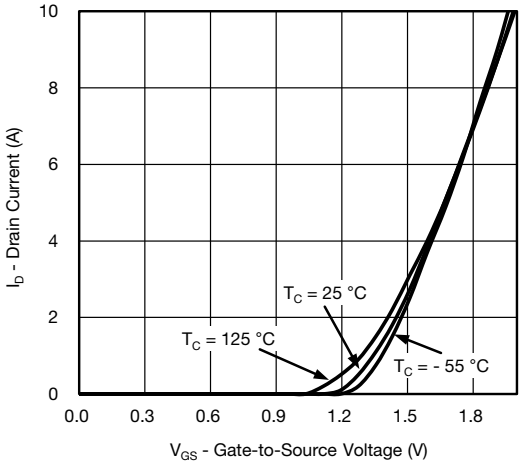
Gate Current vs. Gate-Source Voltage



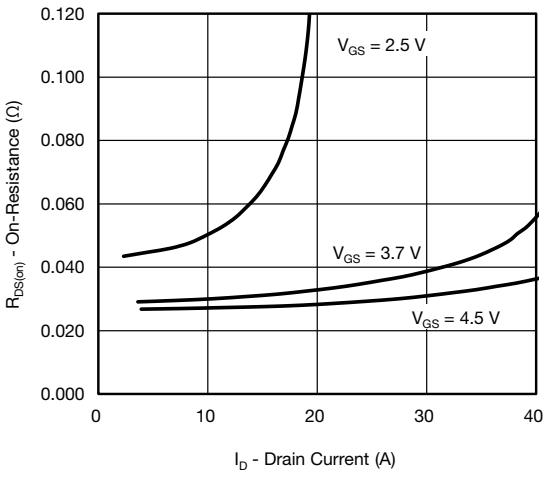
Gate Current vs. Gate-to-Source Voltage



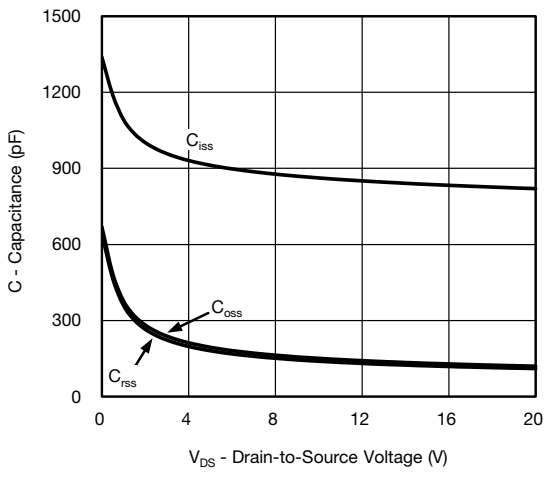
Output Characteristics



Transfer Characteristics



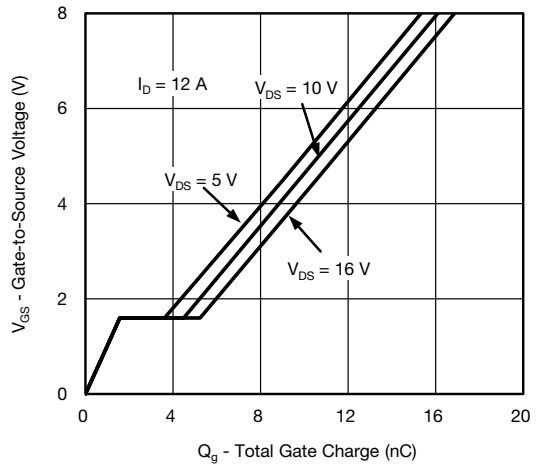
On-Resistance vs. Drain Current and Gate Voltage



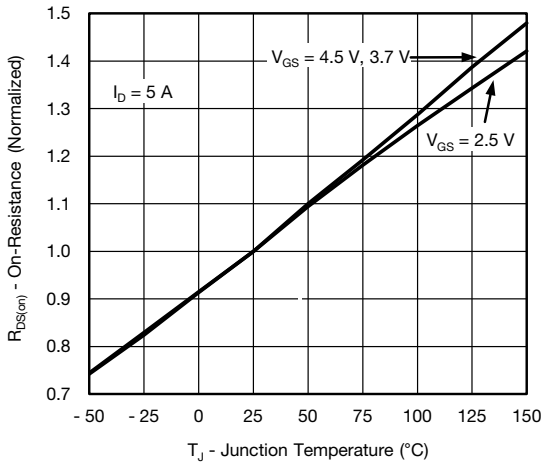
Capacitance

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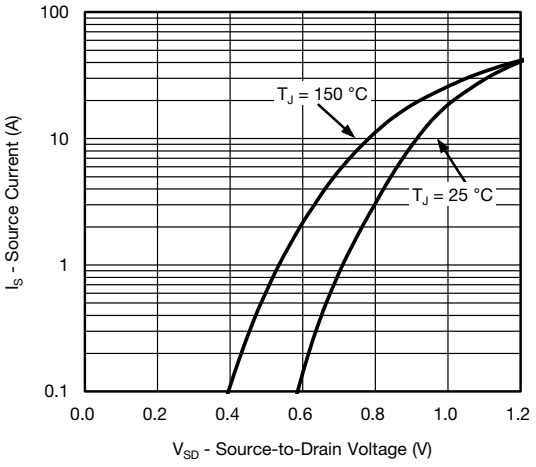
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



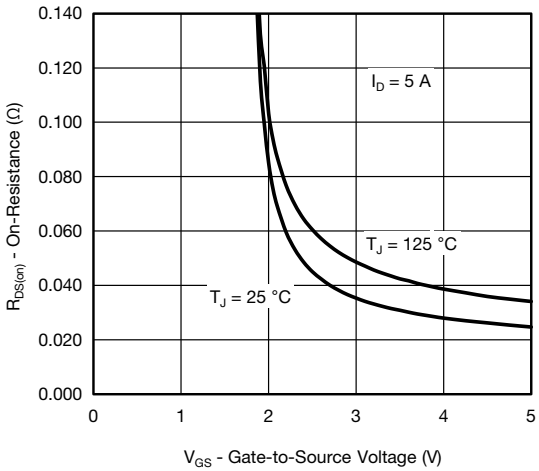
Gate Charge



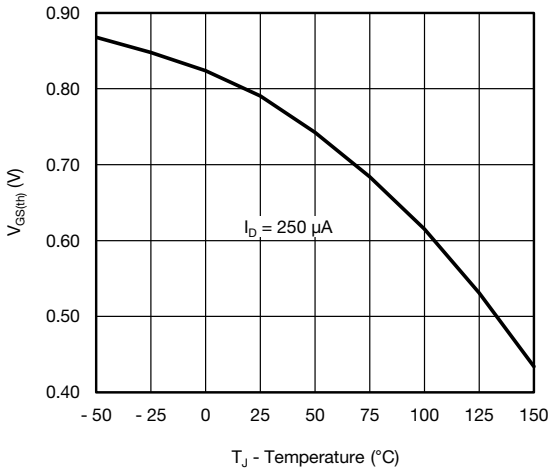
On-Resistance vs. Junction Temperature



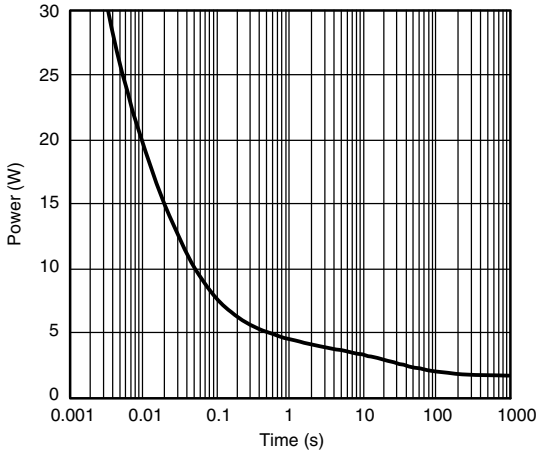
Soure-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



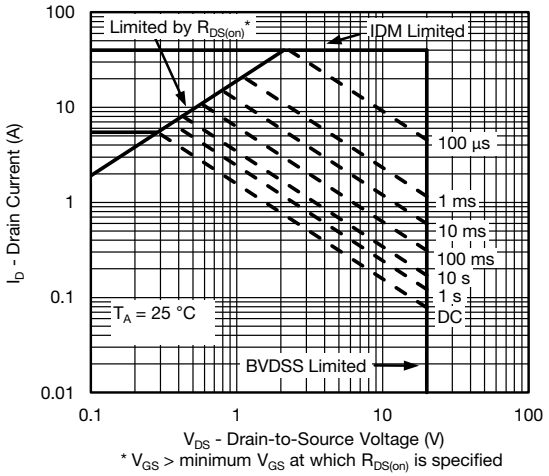
Threshold Voltage



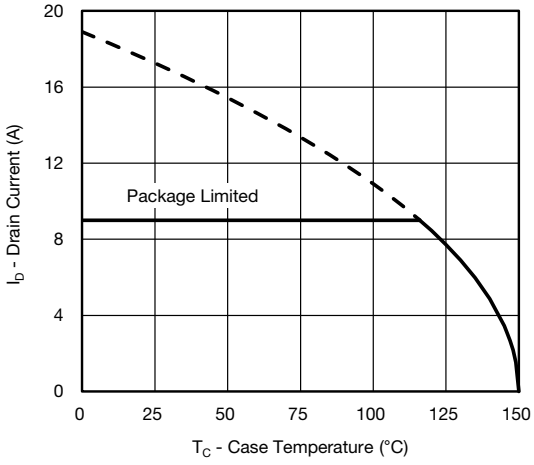
Single Pulse Power, Junction-to-Ambient

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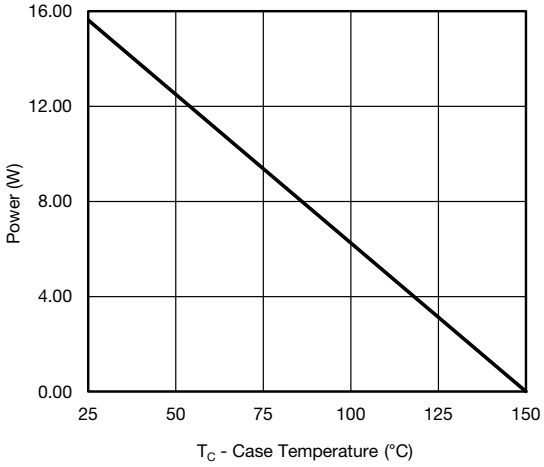
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Safe Operating Area, Junction-to-Ambient



Current Derating*

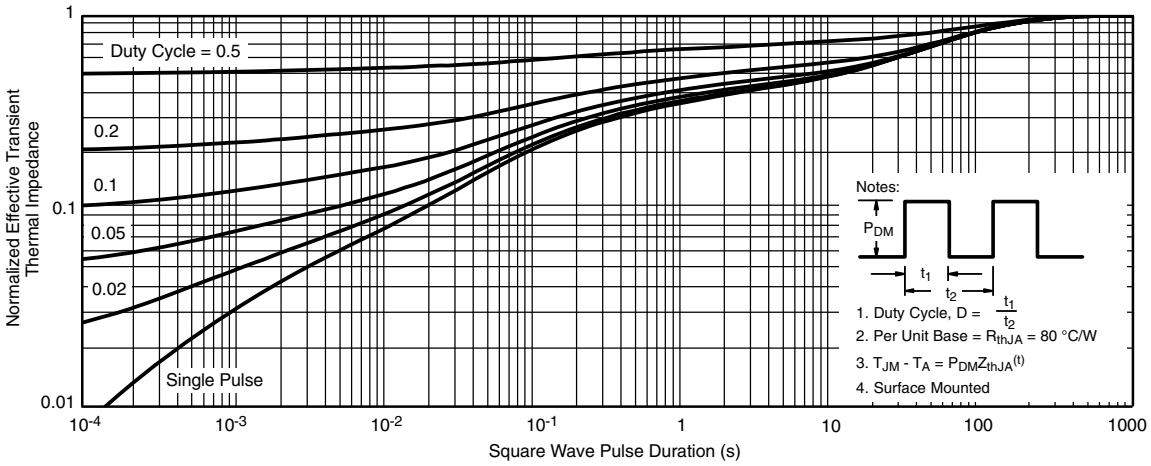


Power Derating

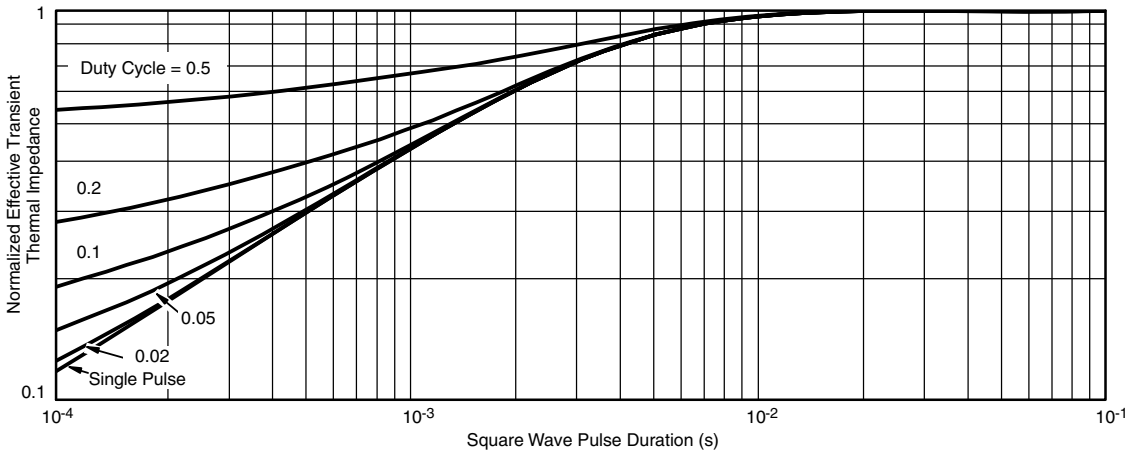
* The power dissipation P_D is based on $T_{J(max.)}$ = 150 °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

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TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Ambient



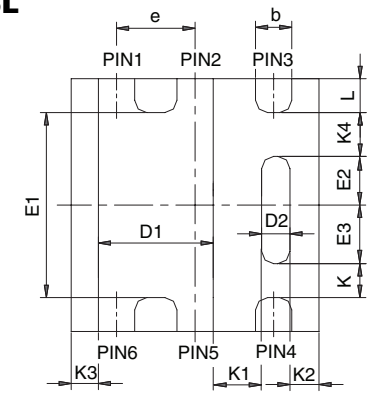
Normalized Thermal Transient Impedance, Junction-to-Case

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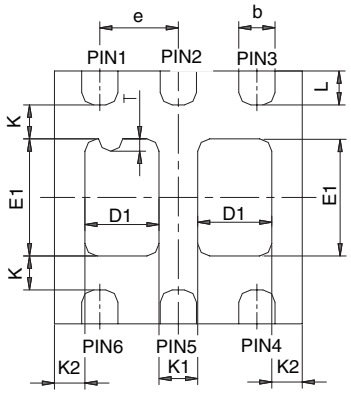
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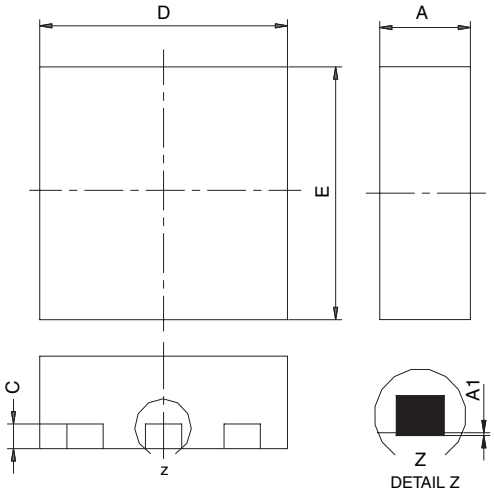
PowerPAK® SC70-6L



BACKSIDE VIEW OF SINGLE



BACKSIDE VIEW OF DUAL



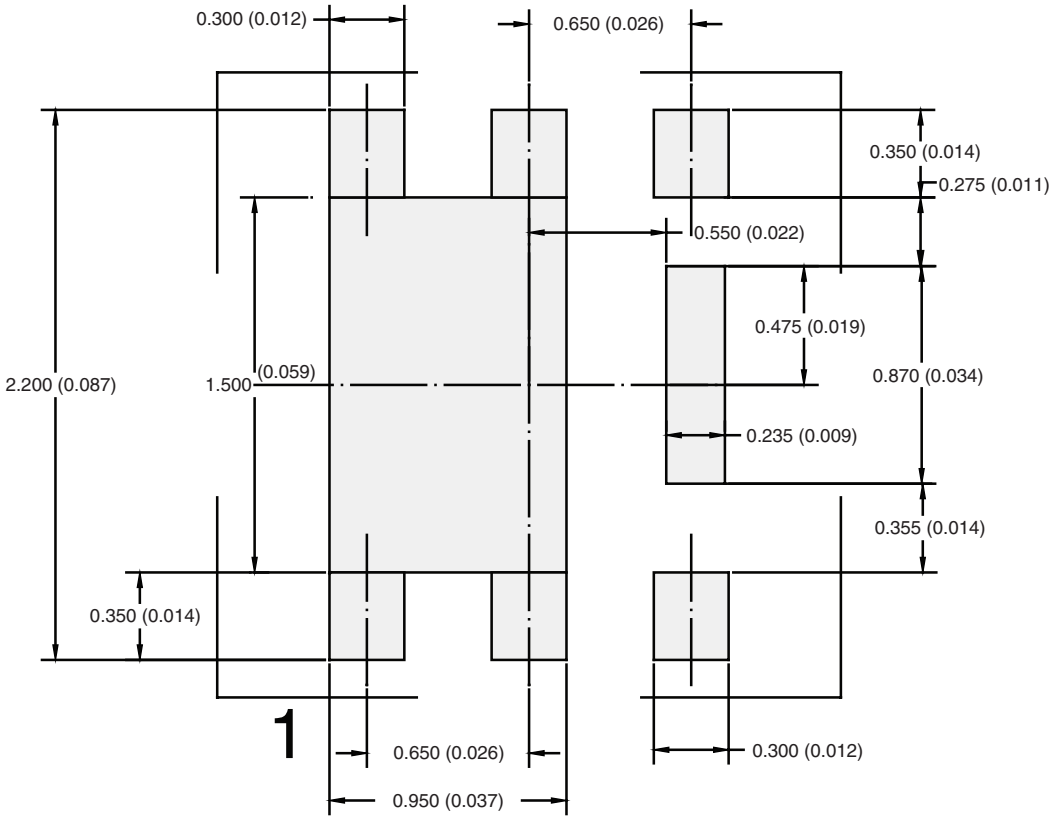
DETAIL Z

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

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 Single



Dimensions in mm/(Inches)

Return to Index

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Elektronik komponent tedarikinde Entegreci

Entegreci, Eskişehir merkezli, Türkiye geneline satış yapan bir elektronik komponent mağazasıdır. Entegreler (IC), mikrodenetleyiciler, transistörler, diyotlar, pasif elemanlar, konnektörler, modüller ve geliştirme kartları tek adetten seri üretim adetlerine kadar satılır. Ürün sayfalarında güncel stok durumunu, fiyatı ve datasheet bağlantısını bulabilirsiniz.

Parça koduyla arama

Üretici parça numarasını yazın; stok ve fiyatı hemen görün.

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Ürün kategorileri

Entegreden kapasitöre tüm elektronik komponent kategorileri.

Kategorilere göz atın

Üreticiler

Aradığınız üreticinin ürünlerini tek sayfada inceleyin.

Üreticileri görün

Toplu alım ve teklif

Listede olmayan ya da yüksek adetli parçalar için teklif isteyin.

Teklif isteyin

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Entegreci is an online electronic components store based in Türkiye. Search by manufacturer part number to see stock, prices and datasheets for integrated circuits, microcontrollers, transistors, passive components and connectors, or request a quote for parts that are not listed.

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