



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	ΔV _{DS} /T _J	I _D = 250 μA	-	11	-	mV/°C
V _{GS(th)} temperature coefficient	ΔV _{GS(th)} /T _J		-	-2.5	-	
Gate-source threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	0.35	-	0.8	V
Gate-source leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 5 V	-	-	± 100	nA
Zero gate voltage drain current	I _{DSS}	V _{DS} = 8 V, V _{GS} = 0 V	-	-	1	μA
		V _{DS} = 8 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	20	-	-	A
Drain-source on-state resistance ^a	R _{DS(on)}	V _{GS} = 4.5 V, I _D = 15.7 A	-	0.0078	0.0094	Ω
		V _{GS} = 2.5 V, I _D = 14.9 A	-	0.0087	0.0105	
		V _{GS} = 1.8 V, I _D = 13.6 A	-	0.0104	0.0125	
		V _{GS} = 1.5 V, I _D = 2.5 A	-	0.0120	0.0180	
		V _{GS} = 1.2 V, I _D = 1.5 A	-	0.0180	0.0360	
Forward transconductance ^a	g _{fs}	V _{DS} = 4 V, I _D = 15.7 A	-	70	-	S
Dynamic ^b						
Input capacitance	C _{iss}	V _{DS} = 4 V, V _{GS} = 0 V, f = 1 MHz	-	1508	-	pF
Output capacitance	C _{oss}		-	535	-	
Reverse transfer capacitance	C _{rss}		-	321	-	
Total gate charge	Q _g	V _{DS} = 4 V, V _{GS} = 5 V, I _D = 15.7 A	-	16.8	25.2	nC
Gate-source charge	Q _{gs}	V _{DS} = 4 V, V _{GS} = 4.5 V, I _D = 15.7 A	-	15	23	
Gate-drain charge	Q _{gd}		-	1.7	-	
Gate resistance	R _g		-	0.9	-	
Gate resistance	R _g	f = 1 MHz	0.5	2.5	5	Ω
Turn-on delay time	t _{d(on)}	V _{DD} = 4 V, R _L = 0.4 Ω I _D ≅ 10 A, V _{GEN} = 4.5 V, R _g = 1 Ω	-	11	20	ns
Rise time	t _r		-	10	20	
Turn-off delay time	t _{d(off)}		-	30	45	
Fall time	t _f		-	8	16	
Turn-on delay time	t _{d(on)}	V _{DD} = 4 V, R _L = 0.4 Ω I _D ≅ 10 A, V _{GEN} = 5 V, R _g = 1 Ω	-	10	20	
Rise time	t _r		-	10	20	
Turn-off delay time	t _{d(off)}		-	30	45	
Fall time	t _f		-	8	16	
Drain-Source Body Diode Characteristics						
Continuous source-drain diode current	I _S	T _C = 25 °C	-	-	12	A
Pulse diode forward current	I _{SM}		-	-	50	
Body diode voltage	V _{SD}	I _S = 10 A, V _{GS} = 0 V	-	0.73	1.2	V
Body diode reverse recovery time	t _{rr}	I _F = 10 A, di/dt = 100 A/μs, T _J = 25 °C	-	10	20	ns
Body diode reverse recovery charge	Q _{rr}		-	1	4	nC
Reverse recovery fall time	t _a		-	4	-	ns
Reverse recovery rise time	t _b		-	6	-	

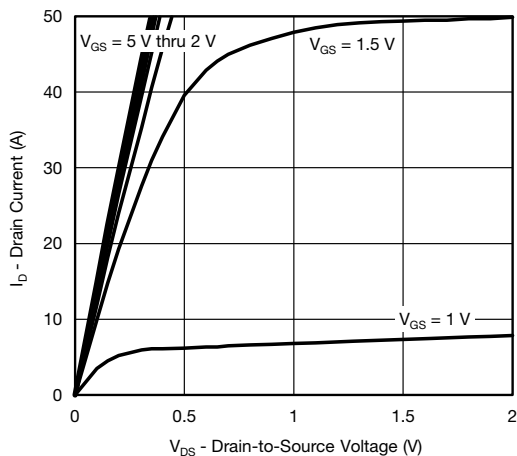
Notes

- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$
b. Guaranteed by design, not subject to production testing

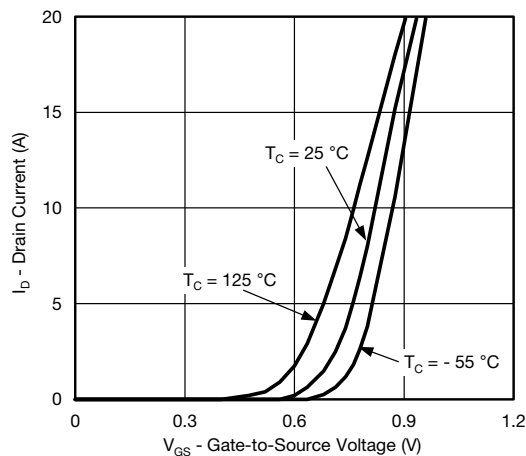
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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



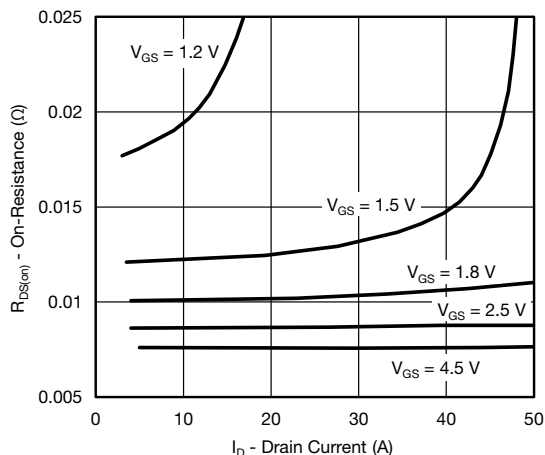
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



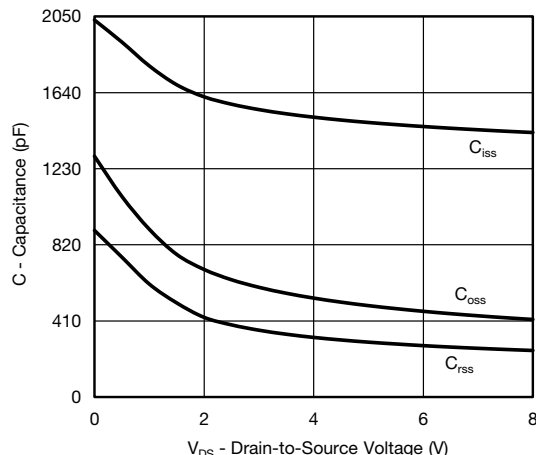
Output Characteristics



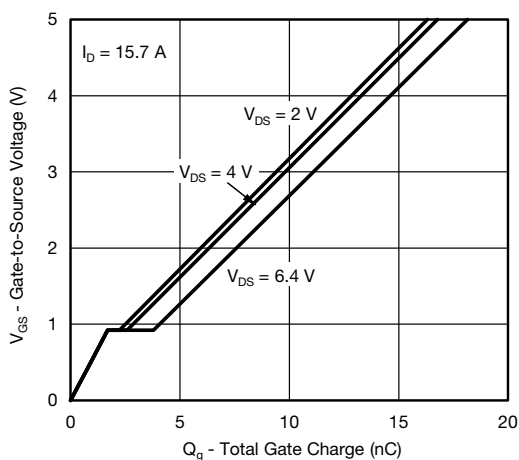
Transfer Characteristics



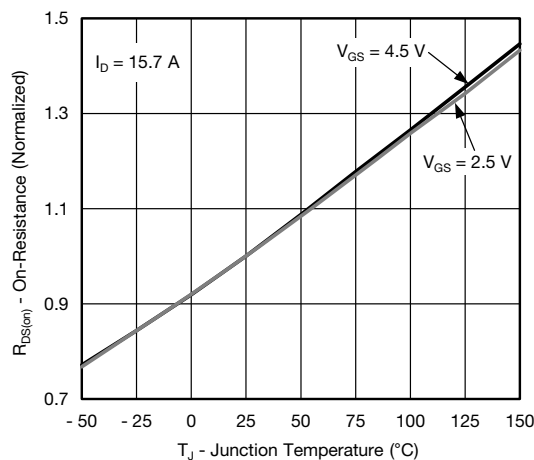
On-Resistance vs. Drain Current and Gate Voltage



Capacitance



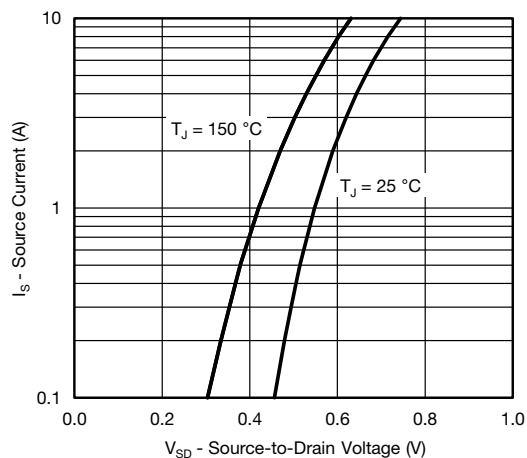
Gate Charge



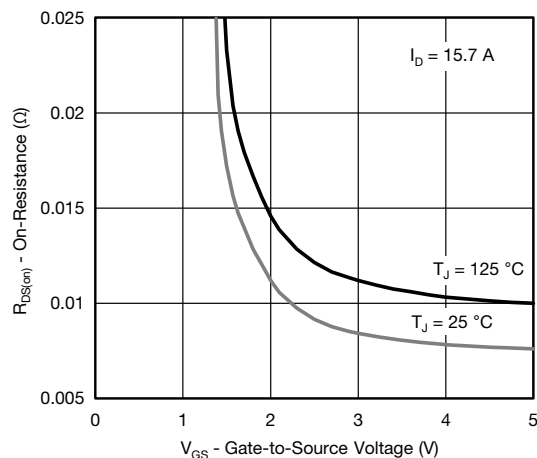
On-Resistance vs. Junction Temperature



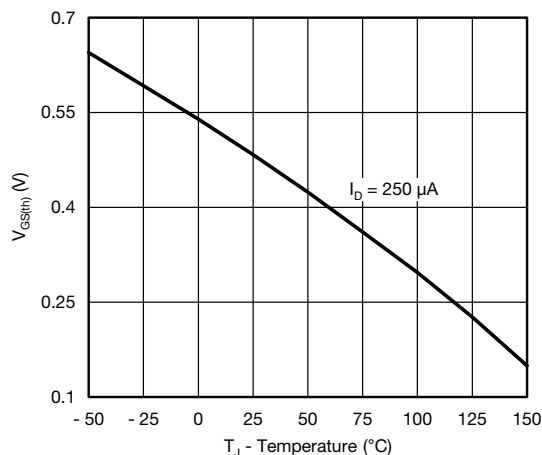
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



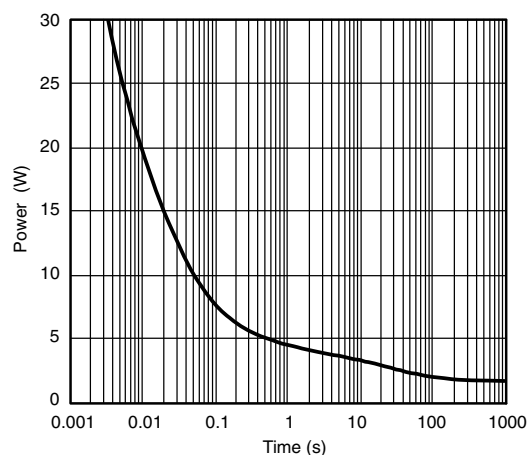
Source-Drain Diode Forward Voltage



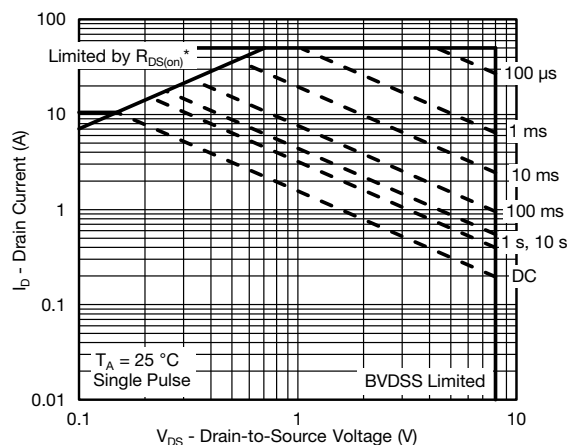
On-Resistance vs. Gate-to-Source Voltage



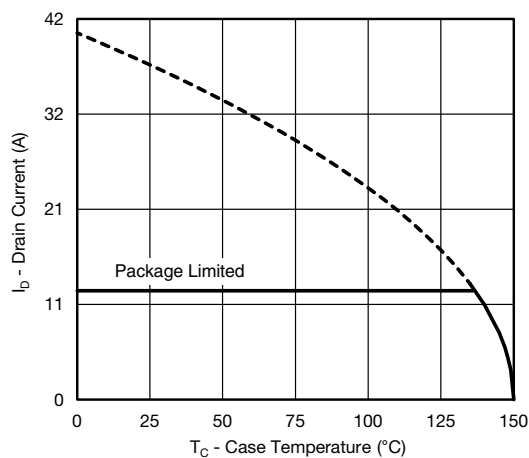
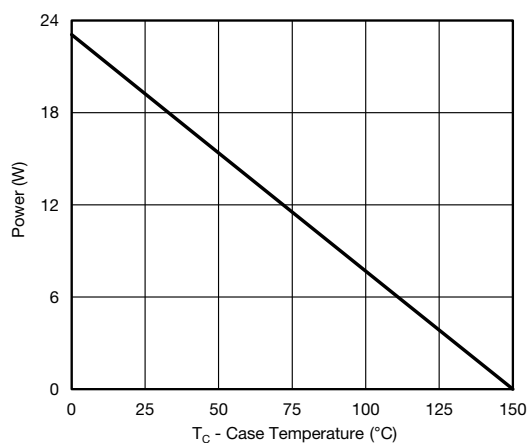
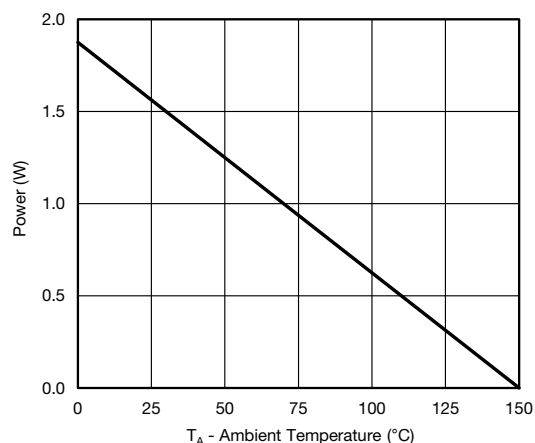
Threshold Voltage



Single Pulse Power (Junction-to-Ambient)



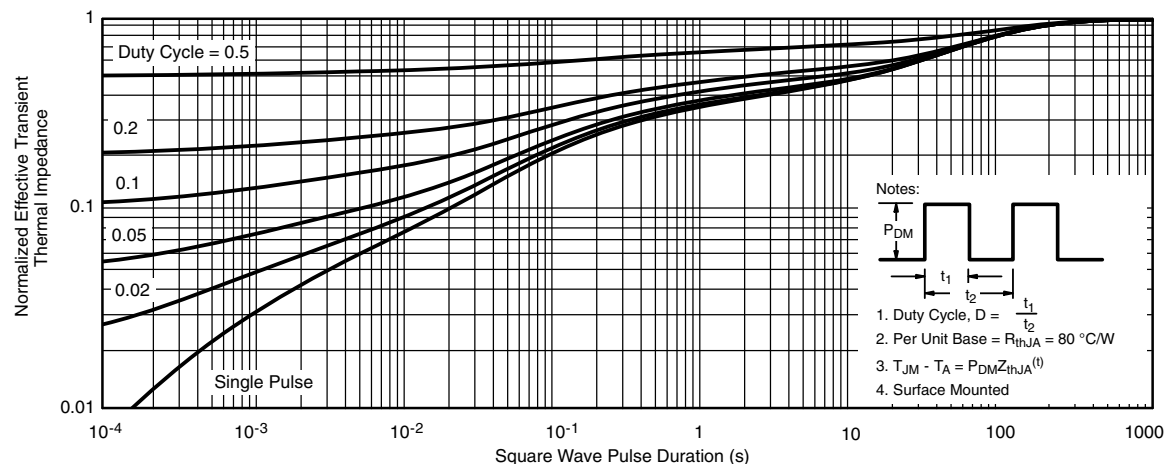
Safe Operating Area, Junction-to-Ambient

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

Current Derating^a

Power Derating, Junction-to-Case

Power Derating, Junction-to-Ambient
Note

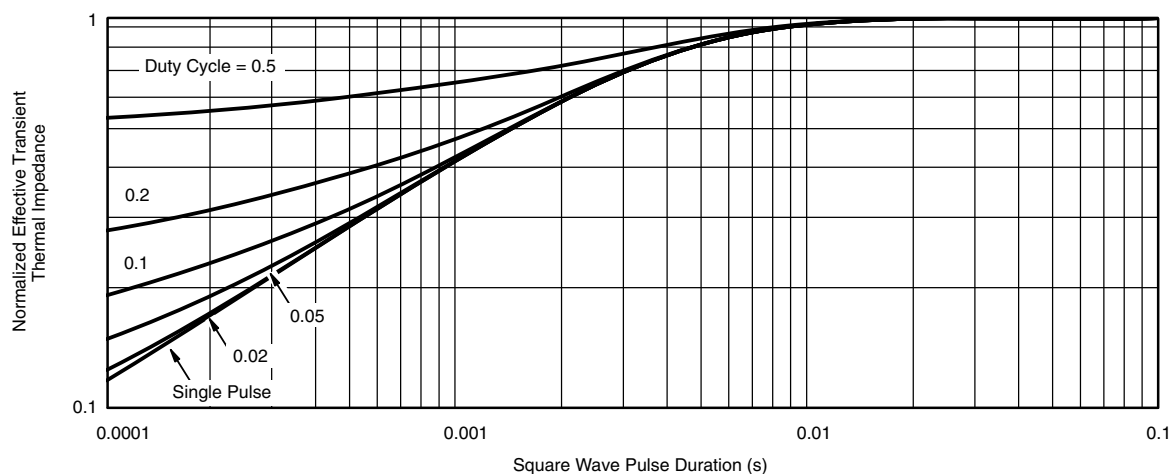
- a. The power dissipation P_D is based on T_J max. = 150 °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit



TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Ambient

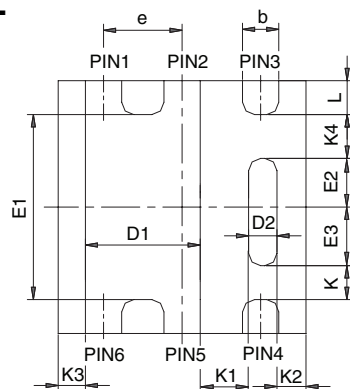


Normalized Thermal Transient Impedance, Junction-to-Case

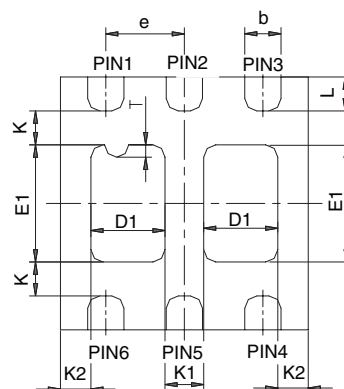
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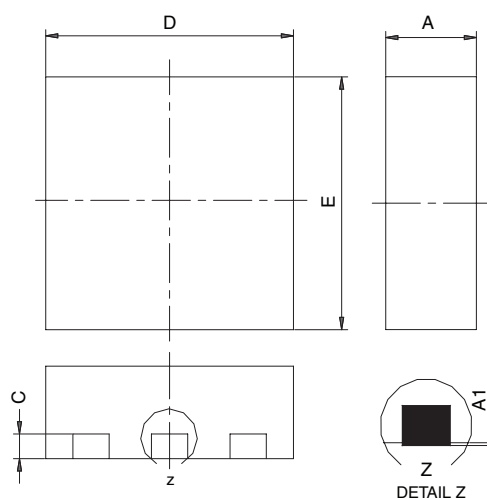
PowerPAK® SC70-6L



BACKSIDE VIEW OF SINGLE



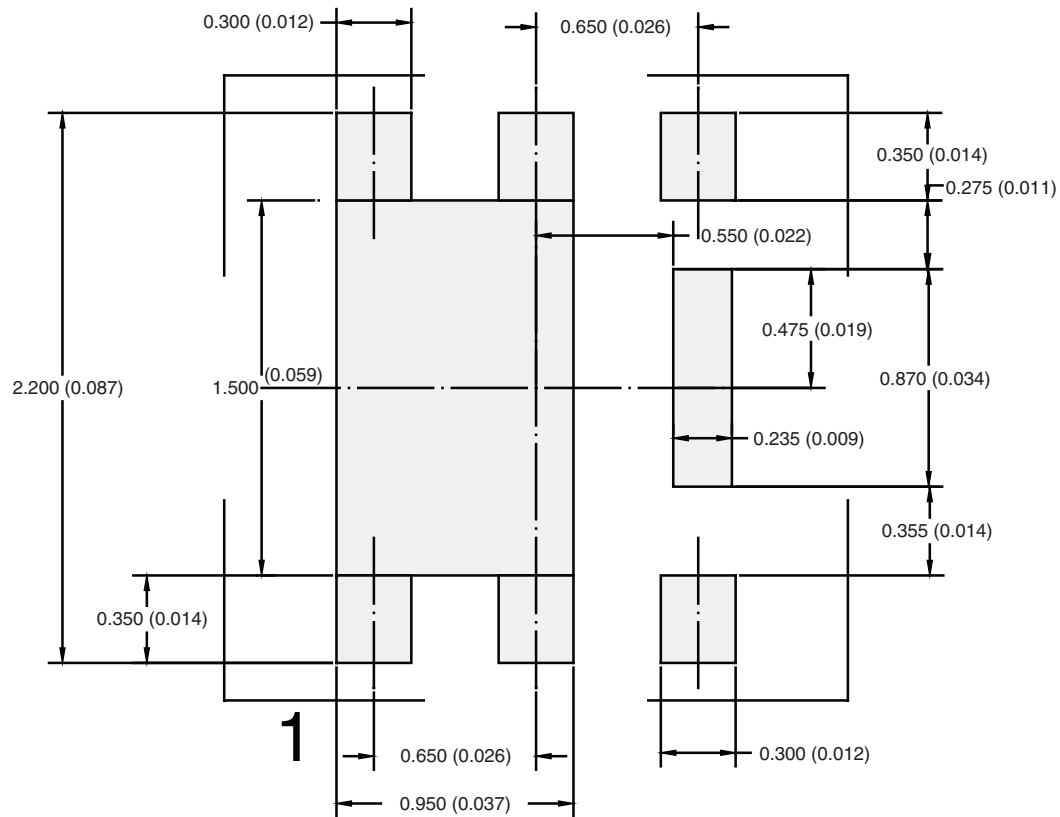
BACKSIDE VIEW OF DUAL



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

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)

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