

## P-Channel 60 V (D-S) MOSFET

PRODUCT SUMMARY			
V <sub>DS</sub> (V)	R <sub>DS(on)</sub> (Ω)	I <sub>D</sub> (A)	Q <sub>g</sub> (TYP.)
-60	0.064 at V <sub>GS</sub> = -10 V	-5	26
	0.080 at V <sub>GS</sub> = -4.5 V	-4.5	

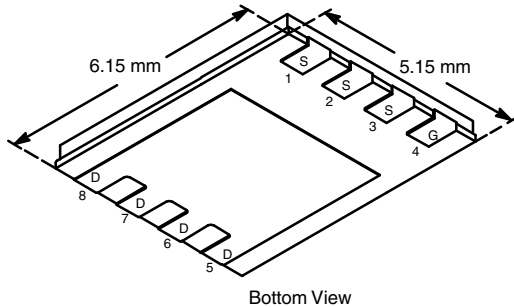
### FEATURES

- TrenchFET® Power MOSFET
- New Low Thermal Resistance PowerPAK® Package with Low 1.07 mm Profile
- Material categorization:  
For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
**HALOGEN**  
**FREE**  
Available

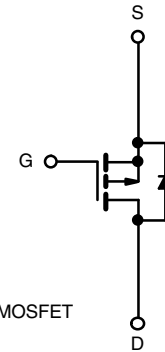
PowerPAK SO-8



Bottom View

#### Ordering Information:

- Si7465DP-T1-E3 (Lead (Pb)-free)
- Si7465DP-T1-GE3 (Lead (Pb)-free and Halogen-free)



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T <sub>A</sub> = 25 °C, unless otherwise noted)					
PARAMETER	SYMBOL	10 s	STEADY STATE	UNIT	
Drain-Source Voltage	V <sub>DS</sub>	-60		V	
Gate-Source Voltage	V <sub>GS</sub>	± 20			
Continuous Drain Current (T <sub>J</sub> = 150 °C) <sup>a</sup>	I <sub>D</sub>	T <sub>A</sub> = 25 °C	-5	-3.2	A
		T <sub>A</sub> = 70 °C	-4	-2.6	
Pulsed Drain Current	I <sub>DM</sub>	-25			
Continuous Source Current (Diode Conduction) <sup>a</sup>	I <sub>S</sub>	-2.9	-1.2		
Avalanche Current	I <sub>AS</sub>	22		mJ	
Single Pulse Avalanche Energy		E <sub>AS</sub>			24.2
Maximum Power Dissipation <sup>a</sup>	P <sub>D</sub>	T <sub>A</sub> = 25 °C	3.5	1.5	W
		T <sub>A</sub> = 70 °C	2.2	0.94	
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to 150		°C	
Soldering Recommendations (Peak Temperature) <sup>b,c</sup>		260			

THERMAL RESISTANCE RATINGS					
PARAMETER	SYMBOL	TYPICAL	MAXIMUM	UNIT	
Maximum Junction-to-Ambient <sup>a</sup>	R <sub>thJA</sub>	t ≤ 10 s	27	36	°C/W
		Steady State	60	85	
Maximum Junction-to-Case (Drain)	R <sub>thJC</sub>	3.3	4.3		

#### Notes

- Surface mounted on 1" x 1" FR4 board.
- See solder profile ([www.vishay.com/ppg?73257](http://www.vishay.com/ppg?73257)). The PowerPAK 1212-8 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.
- Rework conditions: Manual soldering with a soldering iron is not recommended for leadless components.



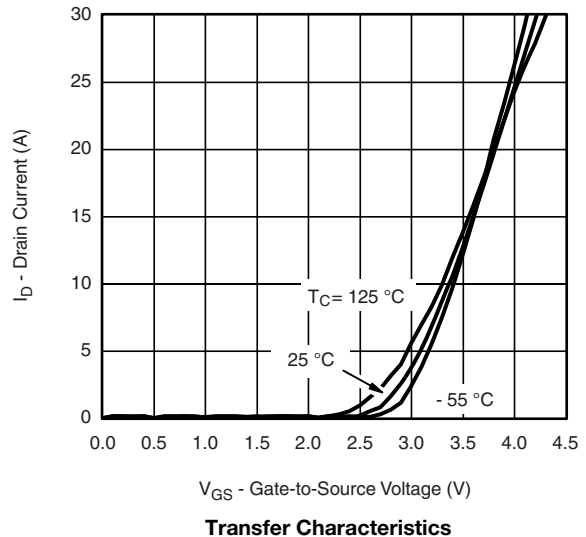
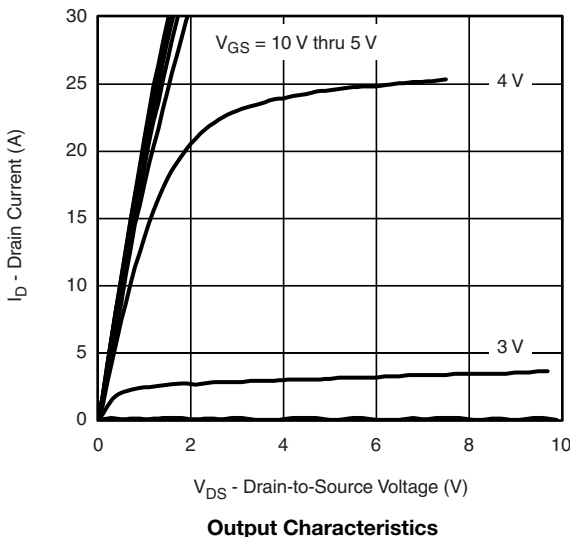
SPECIFICATIONS (T <sub>J</sub> = 25 °C, unless otherwise noted)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
<b>Static</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250 μA	-1		-3	V
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = -60 V, V <sub>GS</sub> = 0 V			-1	μA
		V <sub>DS</sub> = -60 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 70 °C			-10	
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> ≤ -5 V, V <sub>GS</sub> = -10 V	-25			A
Drain-Source On-State Resistance <sup>a</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> = -10 V, I <sub>D</sub> = -5 A		0.051	0.064	Ω
		V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -4.5 A		0.064	0.080	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = -15 V, I <sub>D</sub> = -5 A		16		S
Diode Forward Voltage <sup>a</sup>	V <sub>SD</sub>	I <sub>S</sub> = -2.9 A, V <sub>GS</sub> = 0 V		-0.8	-1.2	V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = -30 V, V <sub>GS</sub> = -10 V, I <sub>D</sub> = -5 A		26	40	nC
Gate-Source Charge	Q <sub>gs</sub>			4.5		
Gate-Drain Charge	Q <sub>gd</sub>			7		
Gate Resistance	R <sub>g</sub>			7		Ω
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = -30 V, R <sub>L</sub> = 30 Ω I <sub>D</sub> ≅ -1 A, V <sub>GEN</sub> = -10 V, R <sub>g</sub> = 6 Ω		8	15	ns
Rise Time	t <sub>r</sub>			9	15	
Turn-Off Delay Time	t <sub>d(off)</sub>			65	100	
Fall Time	t <sub>f</sub>			30	45	
Source-Drain Reverse Recovery Time	t <sub>rr</sub>		I <sub>F</sub> = -5 A, di/dt = 100 A/μs		41	

**Notes**

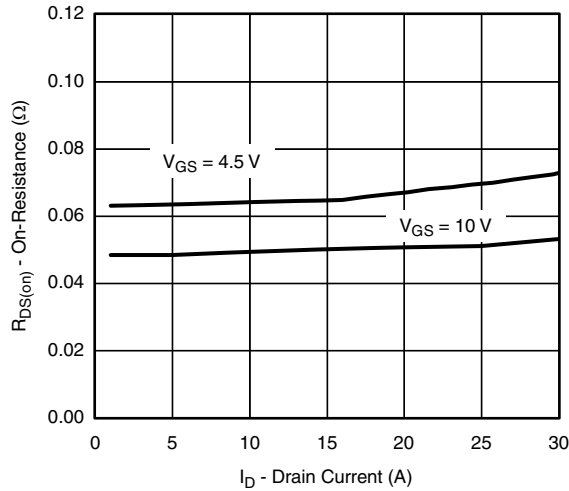
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %.
- b. Guaranteed by design, not subject to production testing.

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.

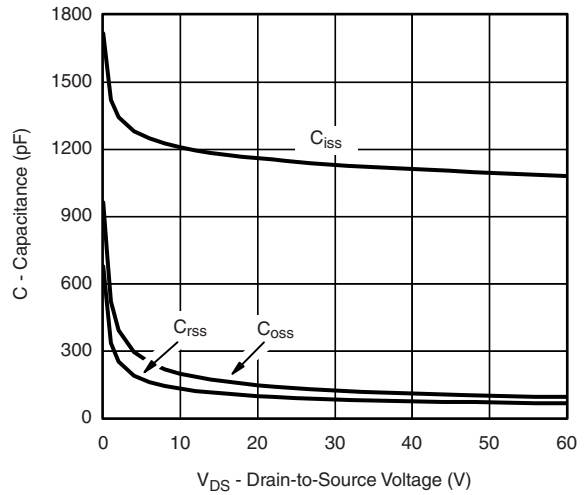
**TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)**



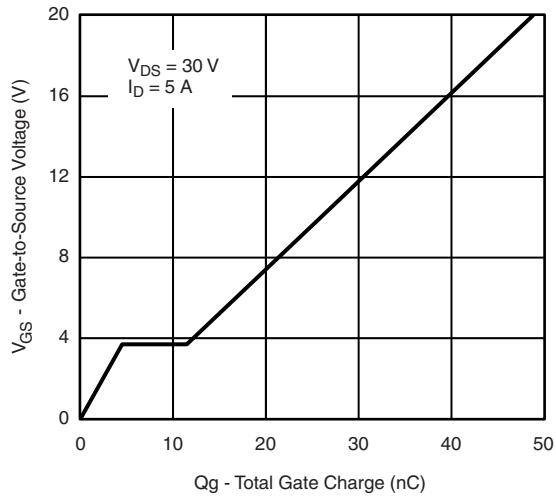
**TYPICAL CHARACTERISTICS** (25 °C, unless otherwise noted)



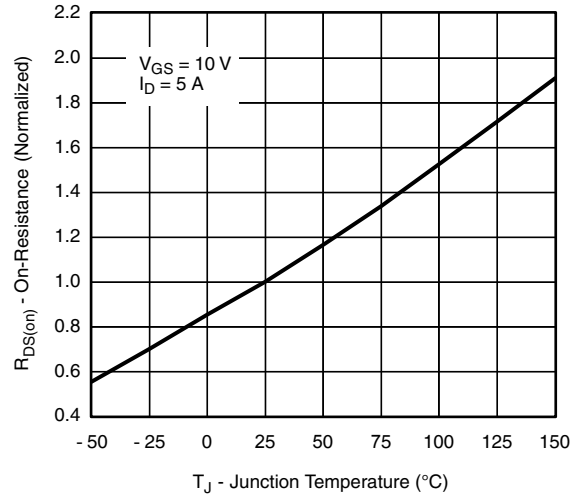
**On-Resistance vs. Drain Current**



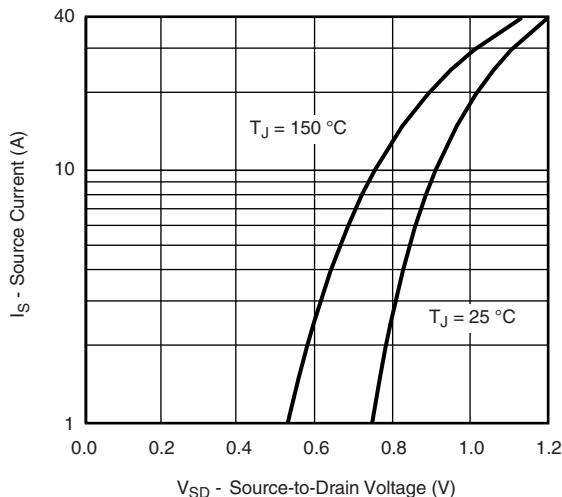
**Capacitance**



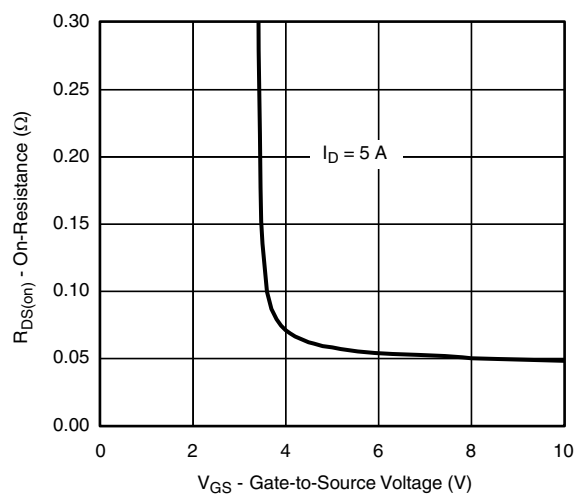
**Gate Charge**



**On-Resistance vs. Junction Temperature**



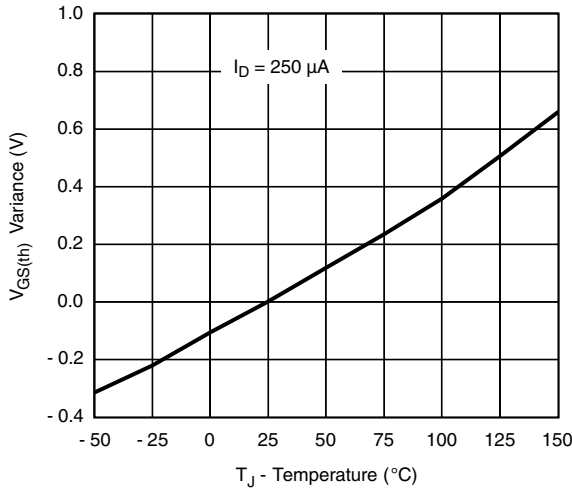
**Source-Drain Diode Forward Voltage**



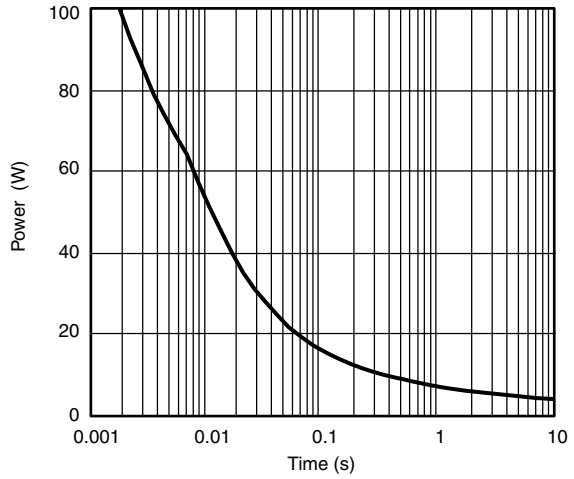
**On-Resistance vs. Gate-to-Source Voltage**



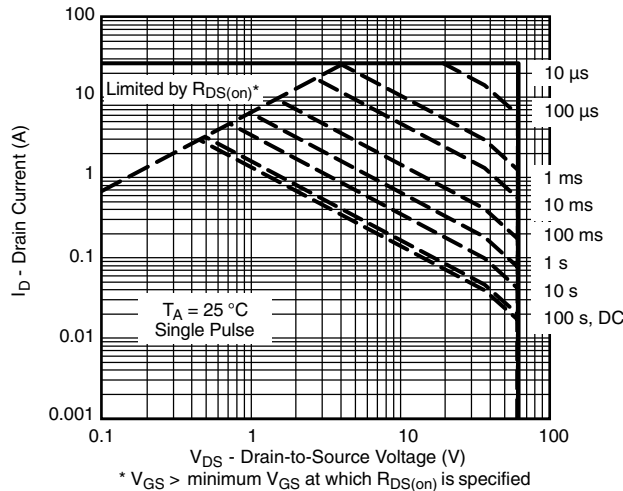
**TYPICAL CHARACTERISTICS** (25 °C, unless otherwise noted)



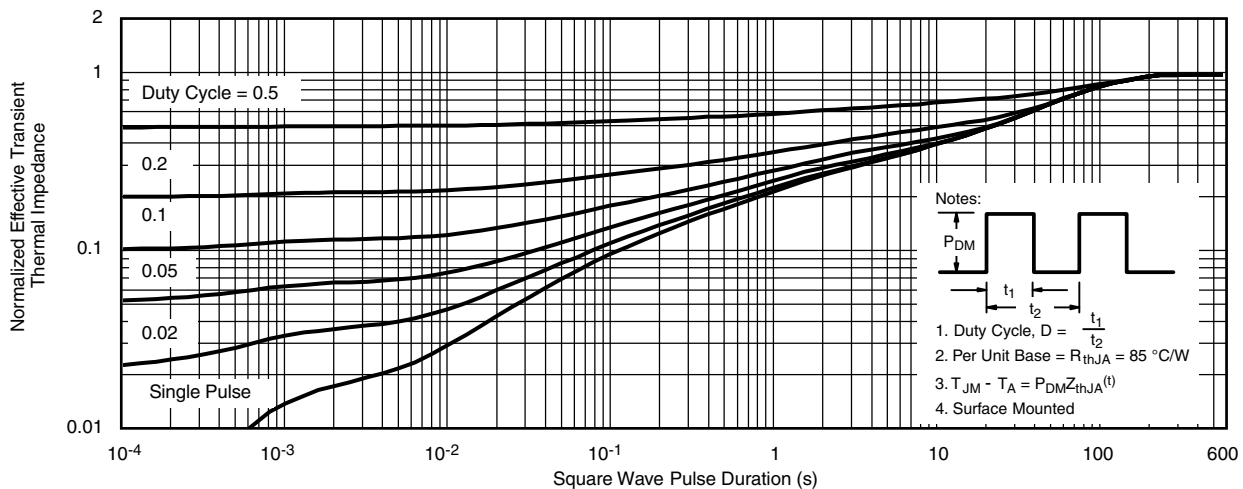
**Threshold Voltage**



**Single Pulse Power, Junction-to-Ambient**



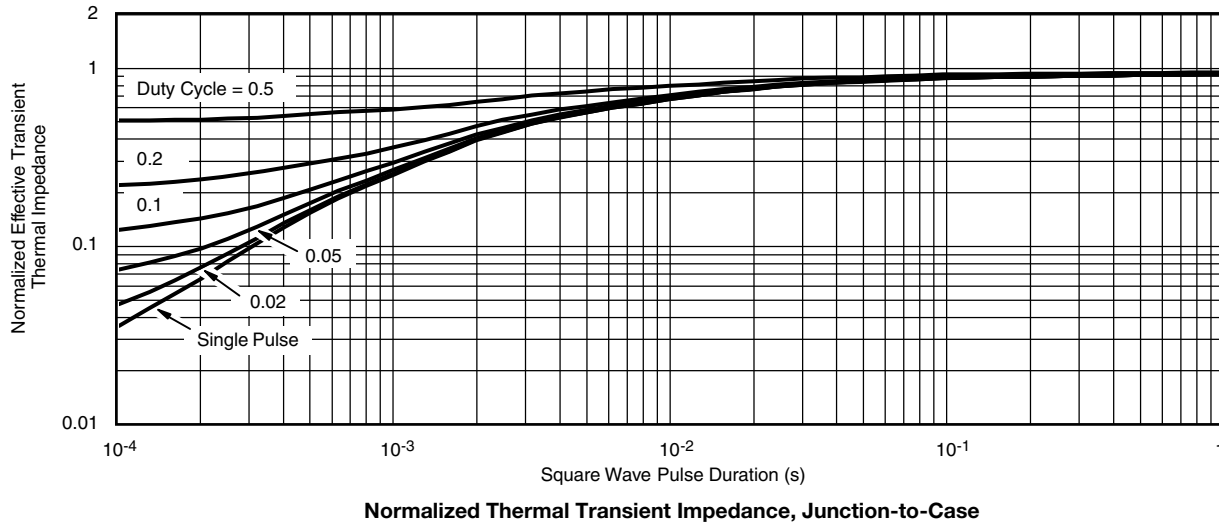
**Safe Operating Area**



**Normalized Thermal Transient Impedance, Junction-to-Ambient**



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



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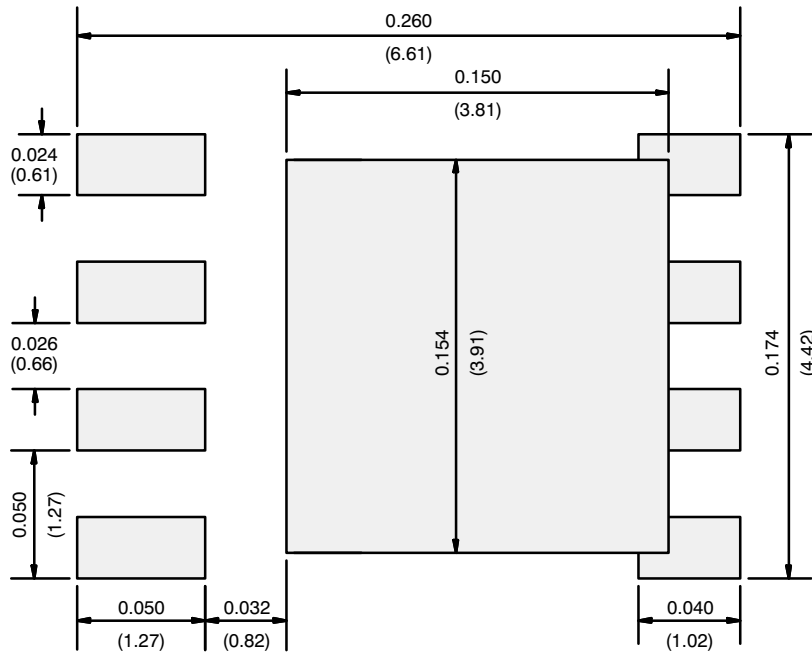
### PowerPAK<sup>®</sup> SO-8, (Single/Dual)



- Notes**
1. Inch will govern.
  2. Dimensions exclusive of mold gate burrs.
  3. Dimensions exclusive of mold flash and cutting burrs.

DIM.	MILLIMETERS			INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.97	1.04	1.12	0.038	0.041	0.044
A1		-	0.05	0	-	0.002
b	0.33	0.41	0.51	0.013	0.016	0.020
c	0.23	0.28	0.33	0.009	0.011	0.013
D	5.05	5.15	5.26	0.199	0.203	0.207
D1	4.80	4.90	5.00	0.189	0.193	0.197
D2	3.56	3.76	3.91	0.140	0.148	0.154
D3	1.32	1.50	1.68	0.052	0.059	0.066
D4	0.57 typ.			0.0225 typ.		
D5	3.98 typ.			0.157 typ.		
E	6.05	6.15	6.25	0.238	0.242	0.246
E1	5.79	5.89	5.99	0.228	0.232	0.236
E2 (for AL product)	3.30	3.48	3.66	0.130	0.137	0.144
E2 (for other product)	3.48	3.66	3.84	0.137	0.144	0.151
E3	3.68	3.78	3.91	0.145	0.149	0.154
E4 (for AL product)	0.58 typ.			0.023 typ.		
E4 (for other product)	0.75 typ.			0.030 typ.		
e	1.27 BSC			0.050 BSC		
K (for AL product)	1.45 typ.			0.057 typ.		
K (for other product)	1.27 typ.			0.050 typ.		
K1	0.56	-	-	0.022	-	-
H	0.51	0.61	0.71	0.020	0.024	0.028
L	0.51	0.61	0.71	0.020	0.024	0.028
L1	0.06	0.13	0.20	0.002	0.005	0.008
θ	0°	-	12°	0°	-	12°
W	0.15	0.25	0.36	0.006	0.010	0.014
M	0.125 typ.			0.005 typ.		
ECN: C13-0702-Rev. K, 20-May-13						
DWG: 5881						

## RECOMMENDED MINIMUM PADS FOR PowerPAK® SO-8 Single



Recommended Minimum Pads  
Dimensions in Inches/(mm)

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