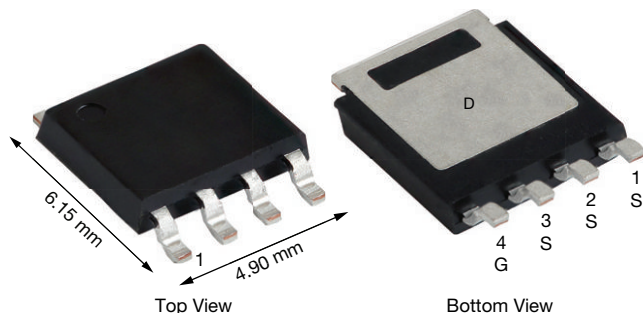


Automotive P-Channel 80 V (D-S) 175 °C MOSFET

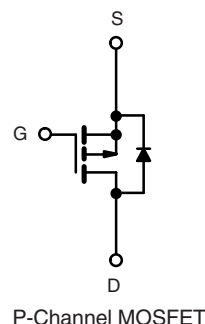
PowerPAK® SO-8L


FEATURES

- TrenchFET® power MOSFET
- AEC-Q101 qualified
- 100 % R_g and UIS tested
- Material categorization:
for definitions of compliance please see
www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE



P-Channel MOSFET

PRODUCT SUMMARY

V_{DS} (V)	-80
$R_{DS(on)}$ (Ω) at $V_{GS} = -10$ V	0.0195
$R_{DS(on)}$ (Ω) at $V_{GS} = -4.5$ V	0.0290
I_D (A) ^g	-62
Configuration	Single

ORDERING INFORMATION

Package	PowerPAK® SO-8L
Lead (Pb)-free and halogen-free	SQJ185ELP (for detailed order number please see www.vishay.com/doc?79771)

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

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-source voltage	V_{DS}	-80	V
Gate-source voltage ^a	V_{GS}	± 20	
Continuous drain current ^g	I_D	-62	A
		-35	
Continuous source current (diode conduction) ^{b, g}	I_S	90	
Pulsed drain current ^{c, g}	I_{DM}	-145	
Single pulse avalanche current	I_{AS}	41	mJ
Single pulse avalanche energy	E_{AS}	84	
Maximum power dissipation ^{c, g}	P_D	145	W
		48	
Operating junction and storage temperature range	T_J, T_{stg}	-55 to +175	°C
Soldering recommendations (peak temperature) ^{d, e}		260	

THERMAL RESISTANCE RATINGS

PARAMETER	SYMBOL	LIMIT	UNIT
Junction-to-ambient	R_{thJA}	42	°C/W
Junction-to-case (drain) ^f	R_{thJC}	1.03	

Notes

- Not intended for continuous use with positive gate voltage > 5.0 V
- Package limited
- When mounted on 1" square PCB (FR4 material)
- See solder profile (www.vishay.com/doc?73257). For PowerPAK SO-8L, 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
- Pulse test; pulse width ≤ 300 μ s, duty cycle ≤ 2 %
- As per on JESD51-14
- Values based on R_{thJC} and T_C of 25 °C. Actual values achievable will be dependent on the thermal characteristics of the complete system



SPECIFICATIONS (T _C = 25 °C, unless otherwise noted)							
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT
Static							
Drain-source breakdown voltage	V _{DS}	V _{GS} = 0, I _D = -250 μA		-80	-	-	V
Gate-source threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250 μA		-1.5	-2.0	-2.5	
Gate-source leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V		-	-	± 100	nA
Zero gate voltage drain current	I _{DSS}	V _{GS} = 0 V	V _{DS} = -80 V	-	-	-1	μA
		V _{GS} = 0 V	V _{DS} = -80 V, T _J = 125 °C	-	-	-50	
		V _{GS} = 0 V	V _{DS} = -80 V, T _J = 175 °C	-	-	-150	
On-state drain current ^a	I _{D(on)}	V _{GS} = -10 V	V _{DS} ≥ -5 V	-30	-	-	A
Drain-source on-state resistance ^a	R _{DS(on)}	V _{GS} = -10 V	I _D = -10 A	-	0.0165	0.0195	Ω
		V _{GS} = -10 V	I _D = -10 A, T _J = 125 °C	-	-	0.0315	
		V _{GS} = -10 V	I _D = -10 A, T _J = 175 °C	-	-	0.0380	
		V _{GS} = -4.5 V	I _D = -8 A	-	0.0240	0.0290	
Forward transconductance ^b	g _{fs}	V _{DS} = -15 V, I _D = -10 A		-	32	-	S
Dynamic ^b							
Input capacitance	C _{iss}	V _{GS} = 0 V	V _{DS} = -25 V, f = 1 MHz	-	3510	4914	pF
Output capacitance	C _{oss}			-	1387	1942	
Reverse transfer capacitance	C _{rss}			-	66	93	
Total gate charge ^c	Q _g	V _{GS} = -10 V	V _{DS} = -40 V, I _D = -15 A	-	46	69	nC
Gate-source charge ^c	Q _{gs}			-	12	-	
Gate-drain charge ^c	Q _{gd}			-	6	-	
Gate resistance	R _g	f = 1 MHz		0.7	1.5	2.3	Ω
Turn-on delay time ^c	t _{d(on)}	V _{DD} = -40 V, R _L = 2.66 Ω, I _D ≅ -15 A, V _{GEN} = -10 V, R _g = 1 Ω		-	17	26	ns
Rise time ^c	t _r			-	5	9	
Turn-off delay time ^c	t _{d(off)}			-	34	51	
Fall time ^c	t _f			-	5	9	
Source-Drain Diode Ratings and Characteristics ^b							
Pulsed current ^a	I _{SM}			-	-	-224	A
Forward voltage	V _{SD}	I _F = -10 A, V _{GS} = 0 V		-	-0.76	-1.2	V
Body diode reverse recovery time	t _{rr}	I _F = -10 A, di/dt = 100 A/μs		-	42	84	ns
Body diode reverse recovery charge	Q _{rr}			-	51	102	nC
Reverse recovery fall time	t _a			-	21	-	ns
Reverse recovery rise time	t _b			-	22	-	
Body diode peak reverse recovery current	I _{RM(REC)}			-	-2.3	-	A

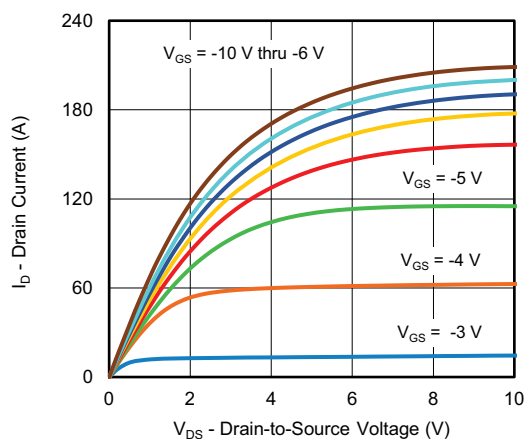
Notes

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

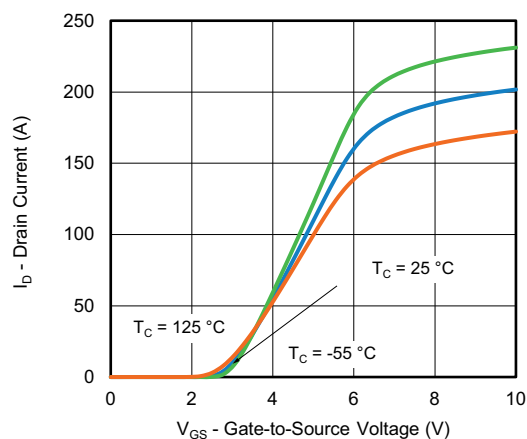
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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



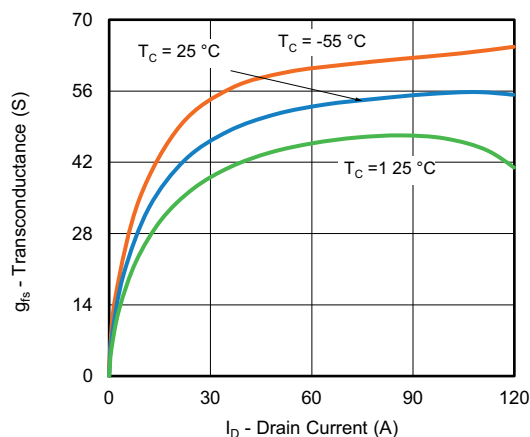
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise noted)



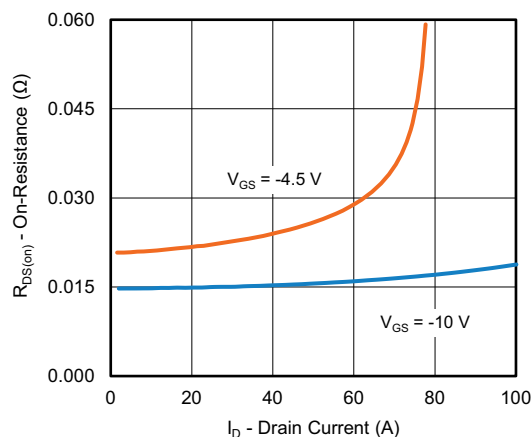
Output Characteristics



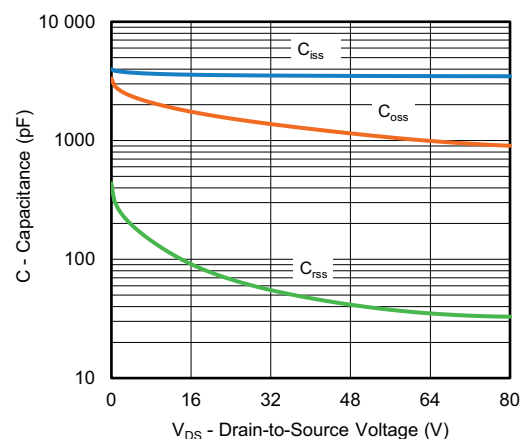
Transfer Characteristics



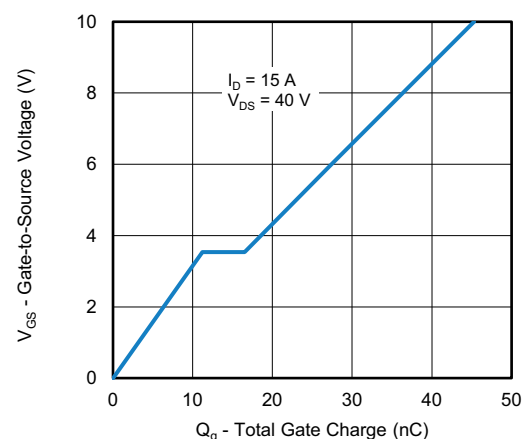
Transconductance



On-Resistance vs. Drain Current



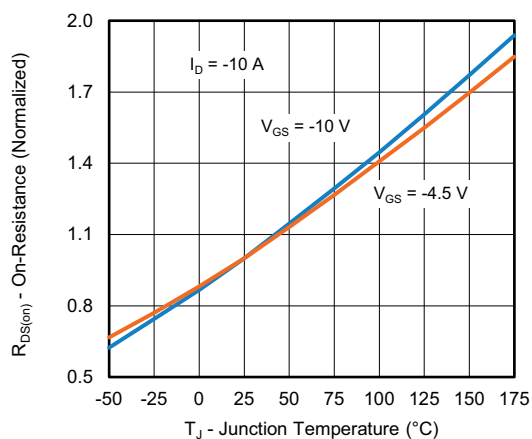
Capacitance



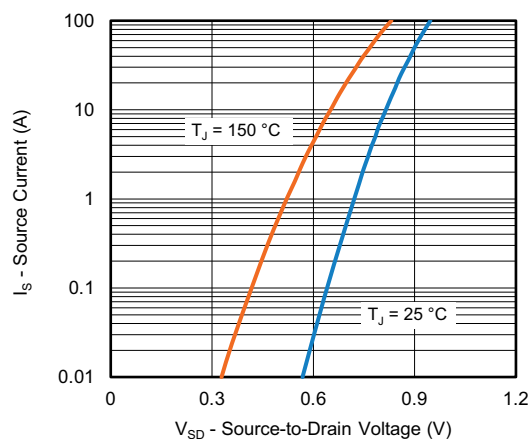
Gate Charge



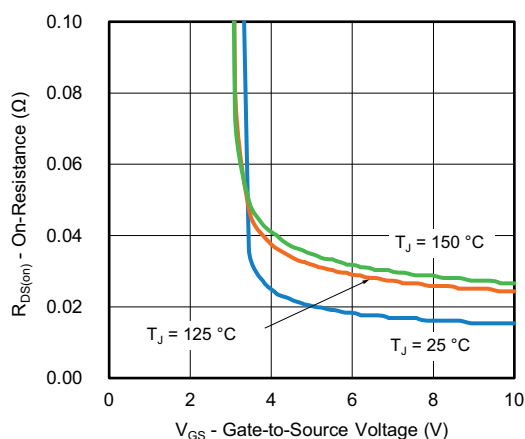
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise noted)



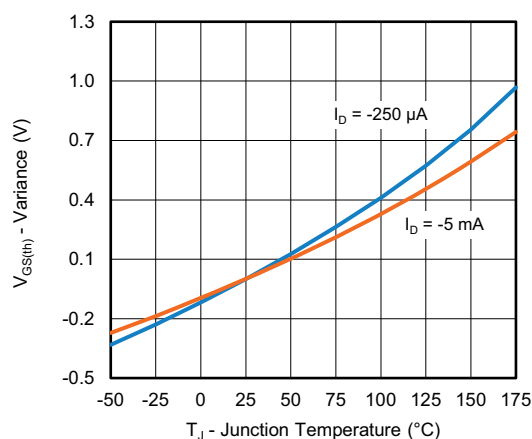
On-Resistance vs. Junction Temperature



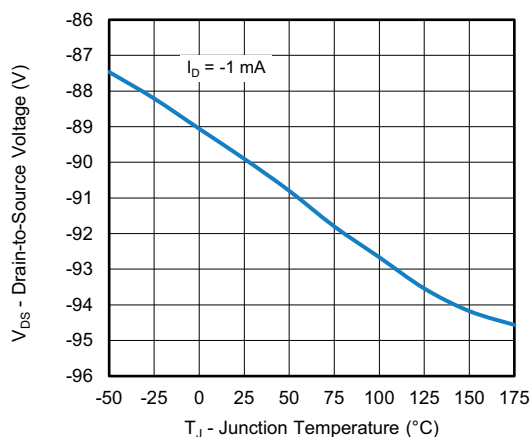
Source Drain Diode Forward Voltage



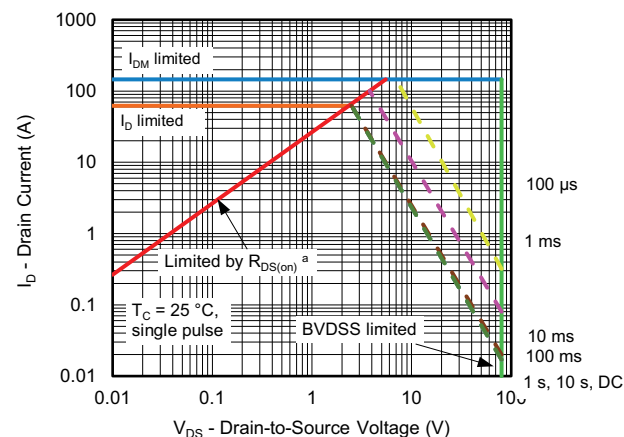
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Drain-Source Breakdown vs. Junction Temperature



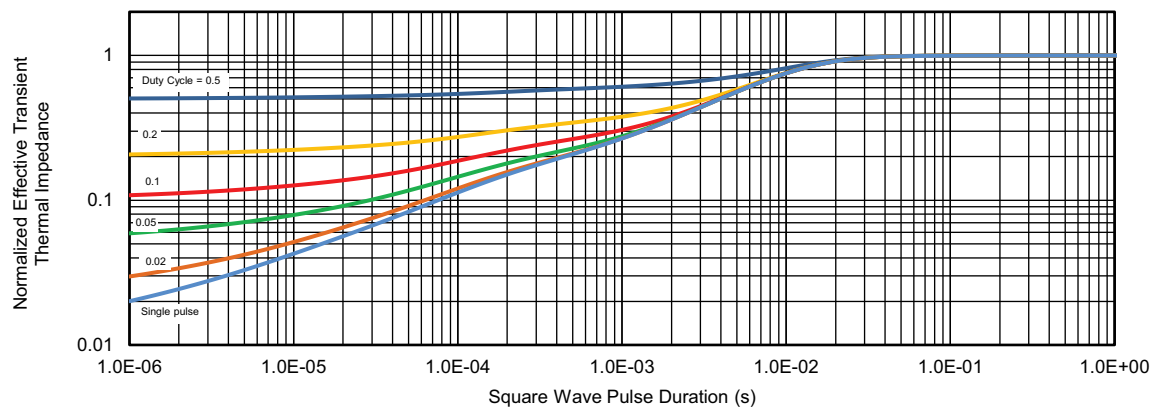
Safe Operating Area

Note

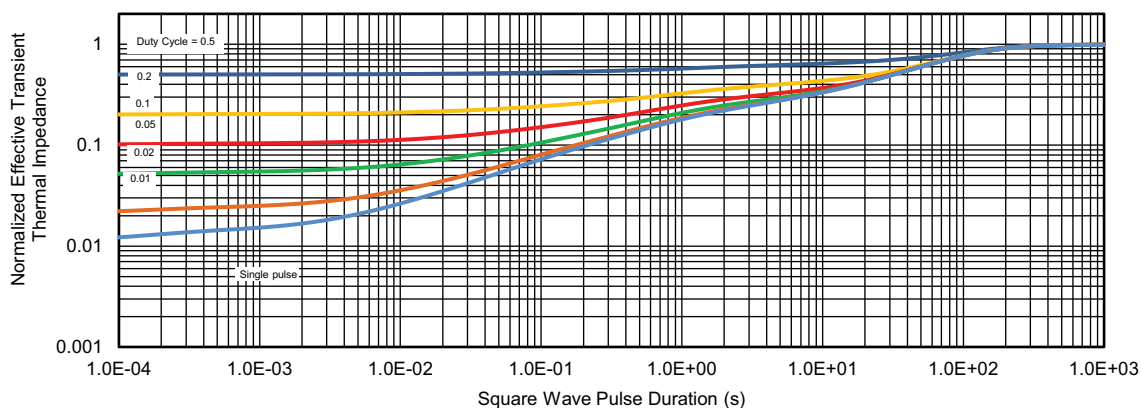
- a. $V_{GS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified



THERMAL RATINGS ($T_C = 25\text{ }^{\circ}\text{C}$, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Case



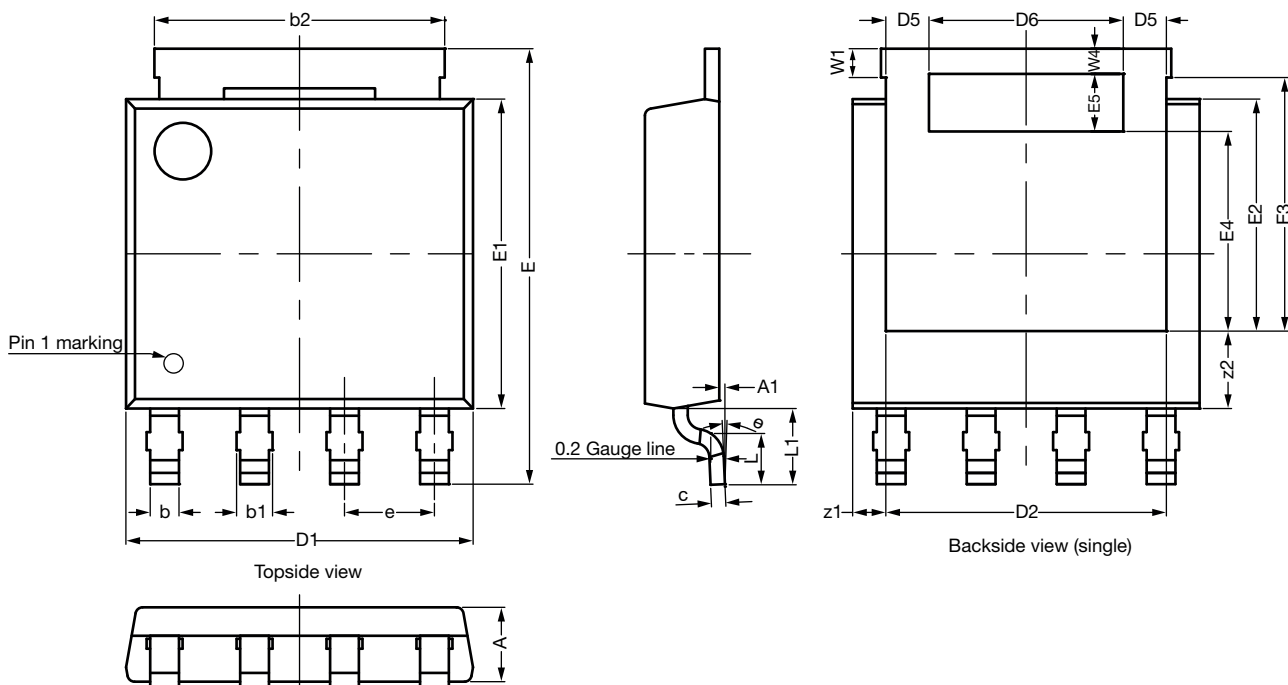
Normalized Thermal Transient Impedance, Junction-to-Ambient

Note

- The characteristics shown in the two graphs
 - Normalized Transient Thermal Impedance Junction-to-Ambient ($25\text{ }^{\circ}\text{C}$)
 - Normalized Transient Thermal Impedance Junction-to-Case ($25\text{ }^{\circ}\text{C}$)
- are given for general guidelines only to enable the user to get a “ball park” indication of part capabilities. The data are extracted from single pulse transient thermal impedance characteristics which are developed from empirical measurements. The latter is valid for the part mounted on printed circuit board - FR4, size 1" x 1" x 0.062", double sided with 2 oz. copper, 100 % on both sides. The part capabilities can widely vary depending on actual application parameters and operating conditions

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PowerPAK® SO-8L (PPKS08LWLA) Case Outline 3



DIM.	MILLIMETERS			INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	1.00	1.05	1.10	0.039	0.041	0.043
A1	0.00	---	0.127	0.000	---	0.005
b	0.33	0.41	0.49	0.013	0.016	0.019
b1	0.43	0.51	0.59	0.017	0.020	0.023
b2	4.00	4.10	4.20	0.157	0.161	0.165
c	0.15	0.20	0.25	0.006	0.008	0.010
D1	4.80	4.90	5.00	0.189	0.193	0.197
D2	3.86	3.96	4.06	0.152	0.156	0.160
D5	0.51	0.61	0.71	0.020	0.024	0.028
D6	2.64	2.74	2.84	0.104	0.108	0.112
e	1.27 BSC			0.050 BSC		
E	6.05	6.15	6.25	0.238	0.242	0.246
E1	4.27	4.37	4.47	0.168	0.172	0.176
E2	3.18	3.28	3.38	0.125	0.129	0.133
E3	3.48	3.58	3.68	0.137	0.141	0.145
E4	2.72	2.82	2.92	0.107	0.111	0.115
E5	0.71	0.81	0.91	0.028	0.032	0.036
L	0.62	0.72	0.82	0.024	0.028	0.032
L1	0.92	1.07	1.22	0.036	0.042	0.048
W1	0.31	0.41	0.51	0.012	0.016	0.020
W4	0.31	0.36	0.41	0.012	0.014	0.016
z1	0.37	0.47	0.57	0.015	0.019	0.022
z2	0.99	1.09	1.19	0.039	0.043	0.047
θ	0°	---	5°	0°	---	5°

ECN: C23-1016-Rev. D, 18-Sep-2023

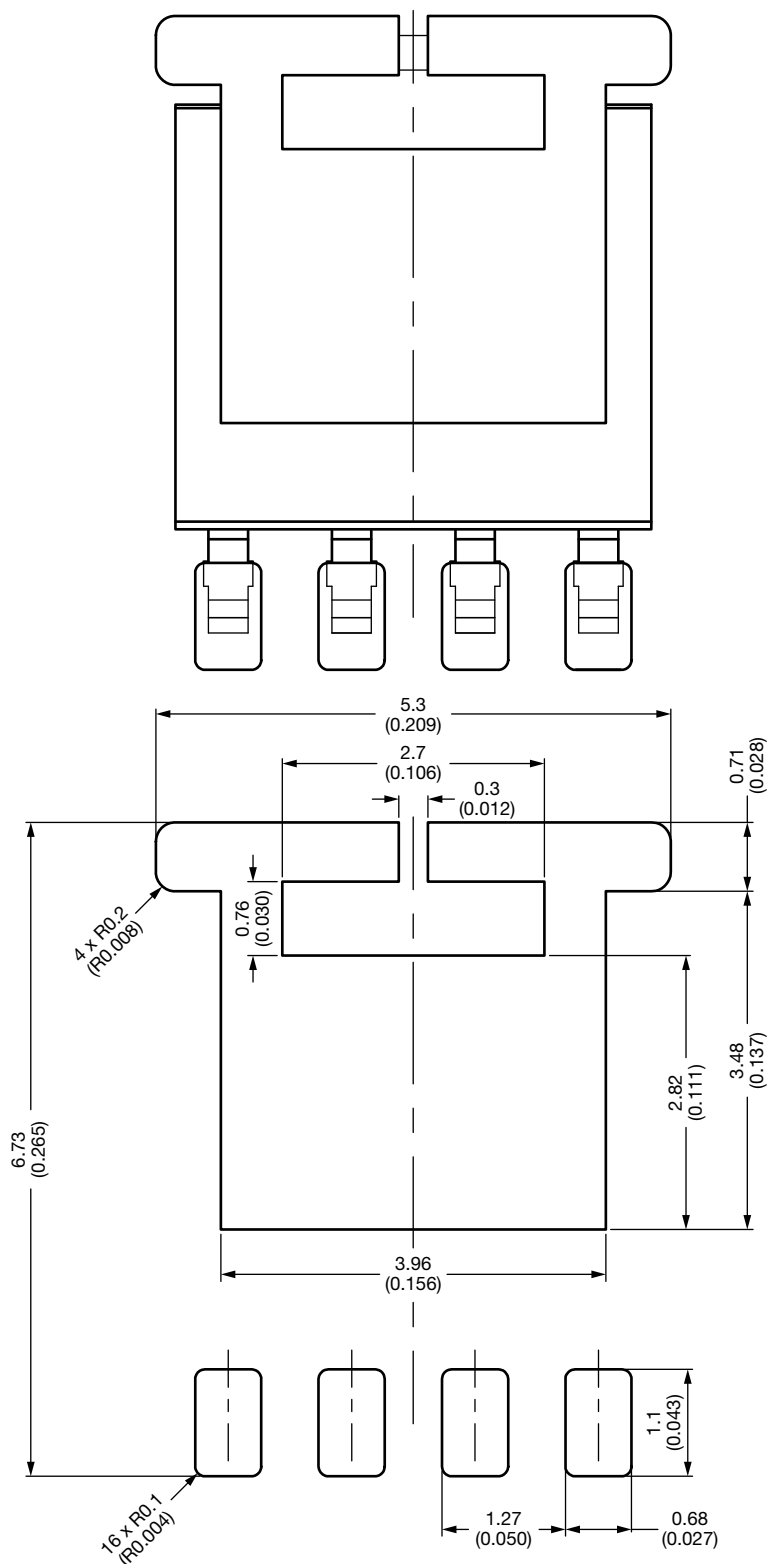
DWG: 6067

Note

- Millimeter will govern



Recommended Land Pattern PowerPAK® SO-8L Single Short Ear



Dimensions in Millimeters (Inches)



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