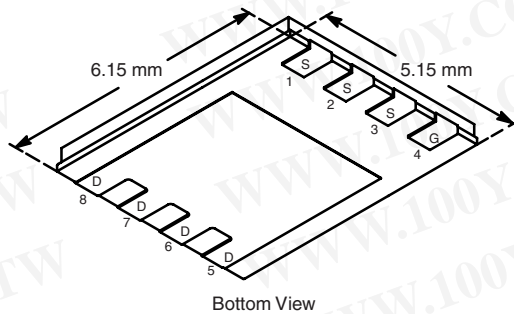




P-Channel 100-V (D-S) MOSFET

PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A) ^a	Q_g (Typ.)
- 100	0.041 at $V_{GS} = - 10$ V	- 28	54 nC
	0.047 at $V_{GS} = - 4.5$ V	- 28	

PowerPAK SO-8



Bottom View

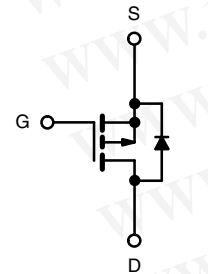
Ordering Information: Si7489DP-T1-E3 (Lead (Pb)-free)
 Si7489DP-T1-GE3 (Lead (Pb)-free and Halogen-free)

FEATURES

- Halogen-free According to IEC 61249-2-21 Available
- TrenchFET[®] Power MOSFET



RoHS
 COMPLIANT
HALOGEN
FREE
 Available



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS $T_A = 25$ °C, unless otherwise noted			
Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	- 100	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ($T_J = 150$ °C)	I_D	$T_C = 25$ °C	- 28 ^a
		$T_C = 70$ °C	- 24.9 ^a
		$T_A = 25$ °C	- 7.8 ^{b, c}
		$T_A = 70$ °C	- 6.2 ^{b, c}
Pulsed Drain Current	I_{DM}	- 40	A
Continuous Source-Drain Diode Current	I_S	$T_C = 25$ °C	- 28 ^a
		$T_A = 25$ °C	- 4.3 ^{b, c}
Avalanche Current	I_{AS}	- 35	
Single-Pulse Avalanche Energy	E_{AS}	61	mJ
Maximum Power Dissipation	P_D	$T_C = 25$ °C	83
		$T_C = 70$ °C	53
		$T_A = 25$ °C	5.2 ^{b, c}
		$T_A = 70$ °C	3.3 ^{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}	$t \leq 10$ s	R_{thJA}	19	24	°C/W
Maximum Junction-to-Case (Drain)	Steady State	R_{thJC}	1.2	1.5	

Notes:

- Package Limited.
- Surface Mounted on 1" x 1" FR4 board.
- $t = 10$ s.
- See Solder Profile (www.vishay.com/ppg?73257). The PowerPAK SO-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.
- Maximum under Steady State conditions is 65 °C/W.

SPECIFICATIONS $T_J = 25^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = -250\ \mu\text{A}$	-100			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	$I_D = -250\ \mu\text{A}$		-113		mV/°C
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$		5.5			
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\ \mu\text{A}$	-1		-3	V
Gate-Source Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -100\text{ V}, V_{GS} = 0\text{ V}$			-1	μA
		$V_{DS} = -100\text{ V}, V_{GS} = 0\text{ V}, T_J = 55^\circ\text{C}$			-10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 5\text{ V}, V_{GS} = -10\text{ V}$	-40			A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -7.8\text{ A}$		0.033	0.041	Ω
		$V_{GS} = -4.5\text{ V}, I_D = -7.3\text{ A}$		0.038	0.047	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -15\text{ V}, I_D = -7.8\text{ A}$		38		S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{DS} = -50\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		4600		pF
Output Capacitance	C_{oss}		230			
Reverse Transfer Capacitance	C_{rss}		175			
Total Gate Charge	Q_g	$V_{DS} = -50\text{ V}, V_{GS} = -10\text{ V}, I_D = -7.8\text{ A}$		106	160	nC
			54	81		
Gate-Source Charge	Q_{gs}	$V_{DS} = -50\text{ V}, V_{GS} = -4.5\text{ V}, I_D = -7.8\text{ A}$		14		nC
Gate-Drain Charge	Q_{gd}		26			
Gate Resistance	R_g		$f = 1\text{ MHz}$		4	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -50\text{ V}, R_L = 8.1\ \Omega$ $I_D \cong -6.2\text{ A}, V_{GEN} = -10\text{ V}, R_g = 1\ \Omega$		15	25	ns
Rise Time	t_r		20	30		
Turn-Off Delay Time	$t_{d(off)}$		110	165		
Fall Time	t_f		100	150		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -50\text{ V}, R_L = 8.1\ \Omega$ $I_D \cong -6.2\text{ A}, V_{GEN} = -4.5\text{ V}, R_g = 1\ \Omega$		42	65	ns
Rise Time	t_r		160	240		
Turn-Off Delay Time	$t_{d(off)}$		100	150		
Fall Time	t_f		100	150		
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	$T_C = 25^\circ\text{C}$			-28	A
Pulse Diode Forward Current ^a	I_{SM}				-40	
Body Diode Voltage	V_{SD}	$I_S = -6.2\text{ A}$		-0.8	-1.2	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F = -6.2\text{ A}, di/dt = 100\text{ A}/\mu\text{s}, T_J = 25^\circ\text{C}$		60	90	ns
Body Diode Reverse Recovery Charge	Q_{rr}		150	225	nC	
Reverse Recovery Fall Time	t_a		46		ns	
Reverse Recovery Rise Time	t_b		14			

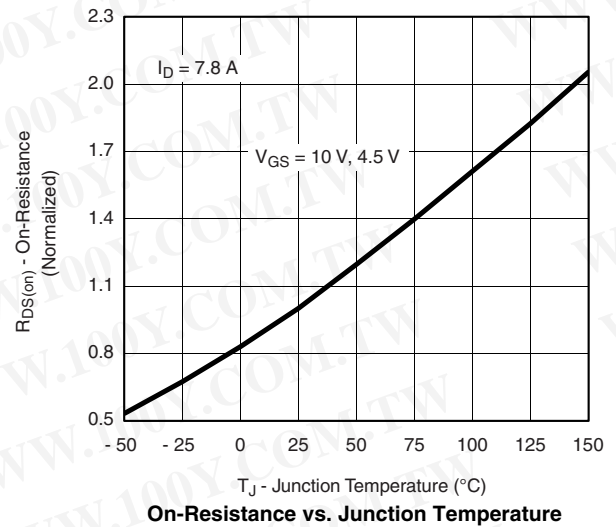
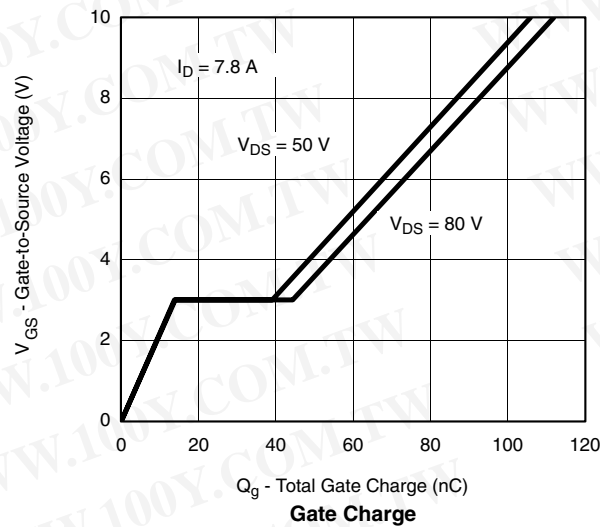
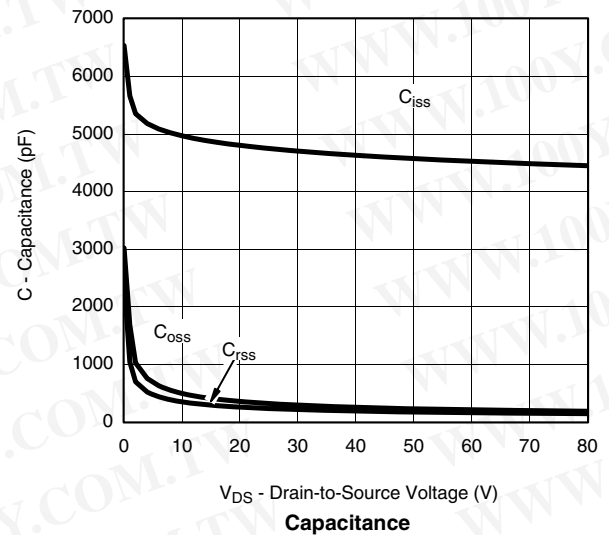
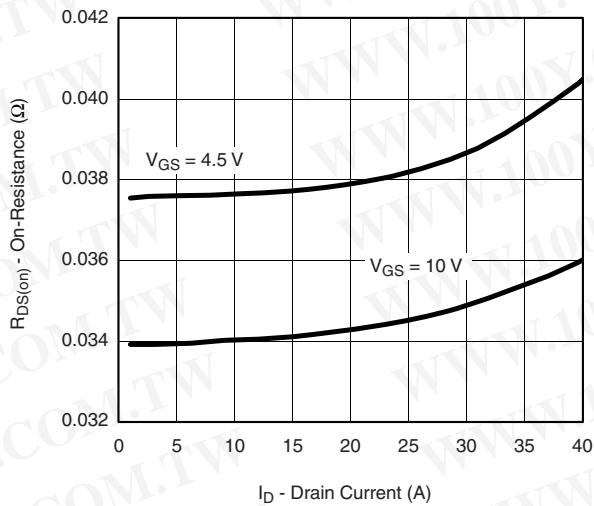
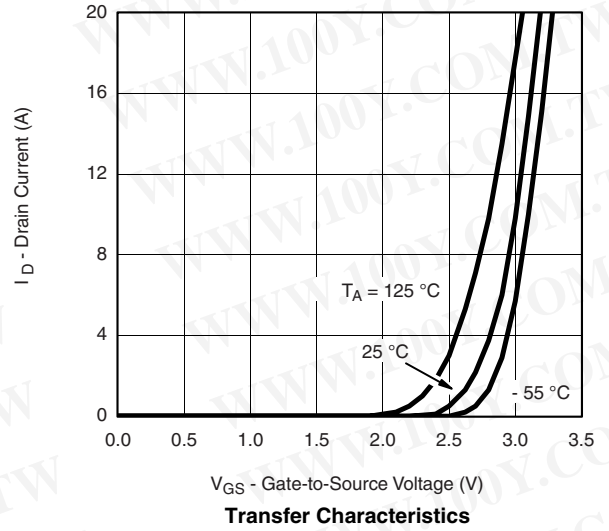
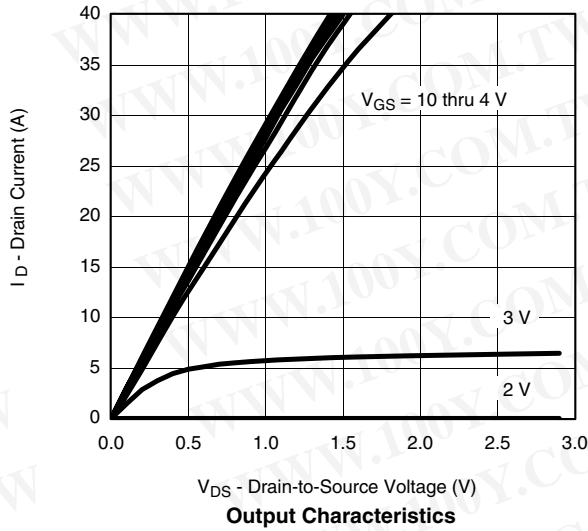
Notes:

- a. Pulse test; pulse width $\leq 300\ \mu\text{s}$, 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



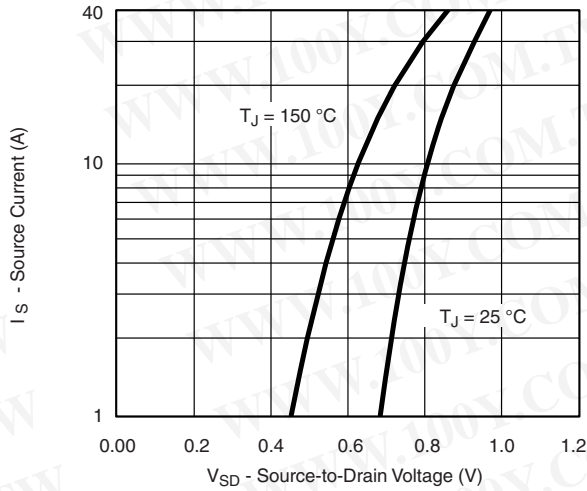
Si7489DP

Vishay Siliconix

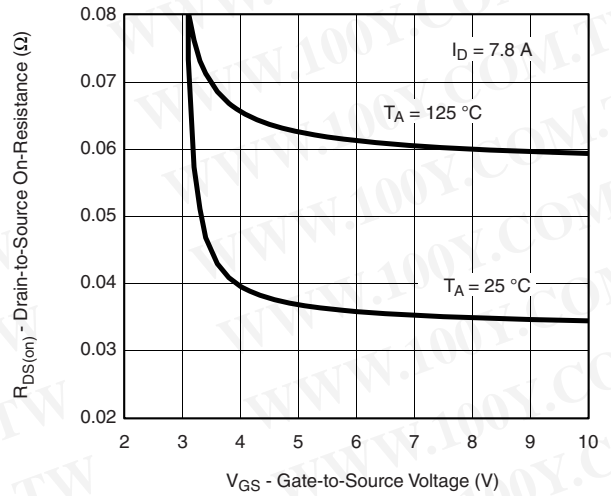
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 勝特力电子(上海) 86-21-34970699
 勝特力电子(深圳) 86-755-83298787
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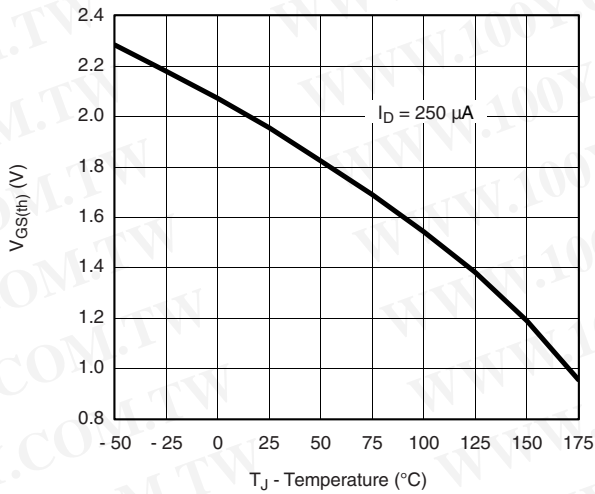
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



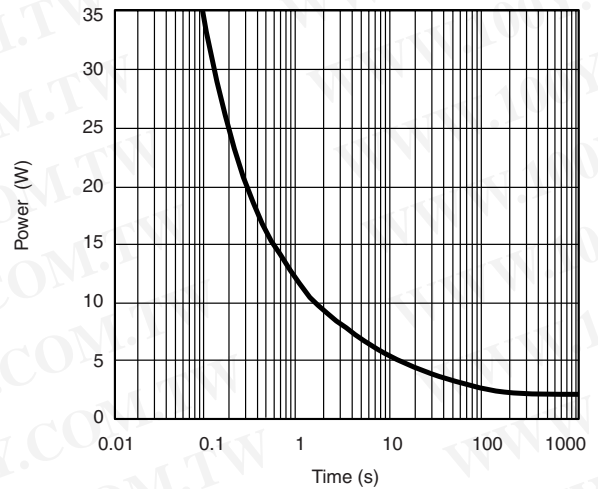
Source-Drain Diode Forward Voltage



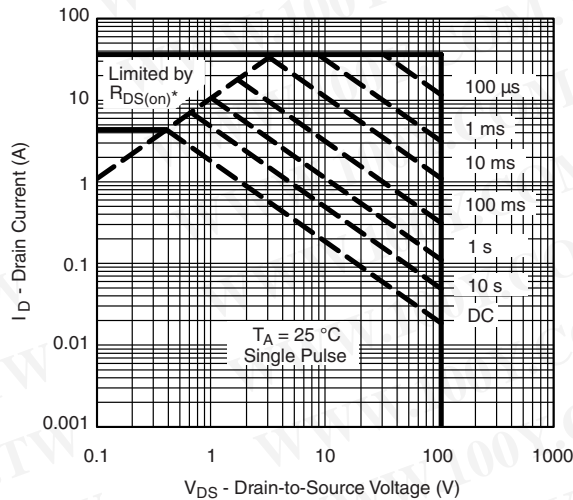
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power, Junction-to-Ambient

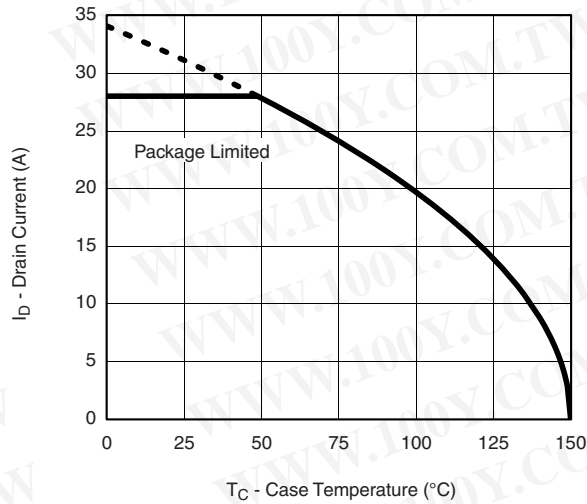


* $V_{GS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area, Junction-to-Ambient

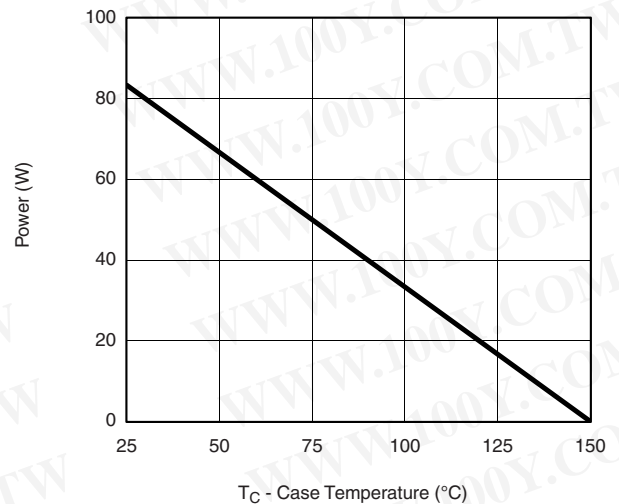


TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



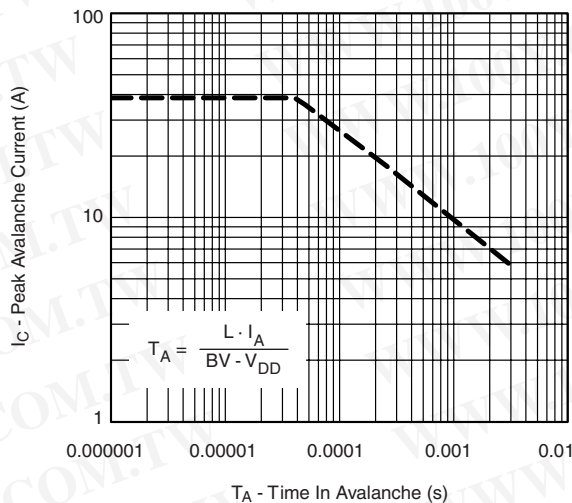
T_C - Case Temperature (°C)

Current Derating*



T_C - Case Temperature (°C)

Power Derating



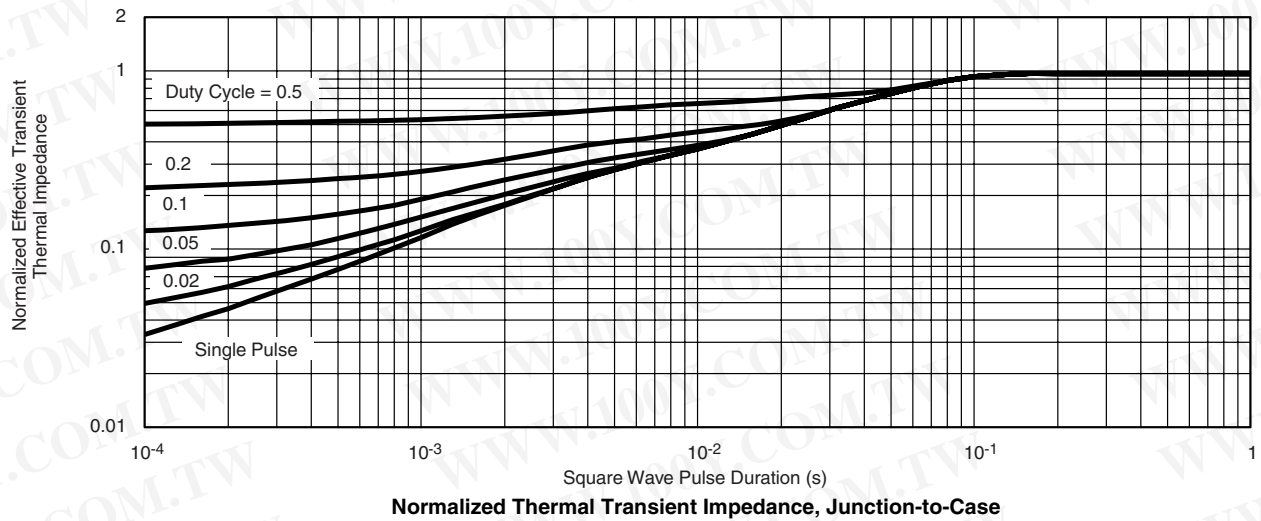
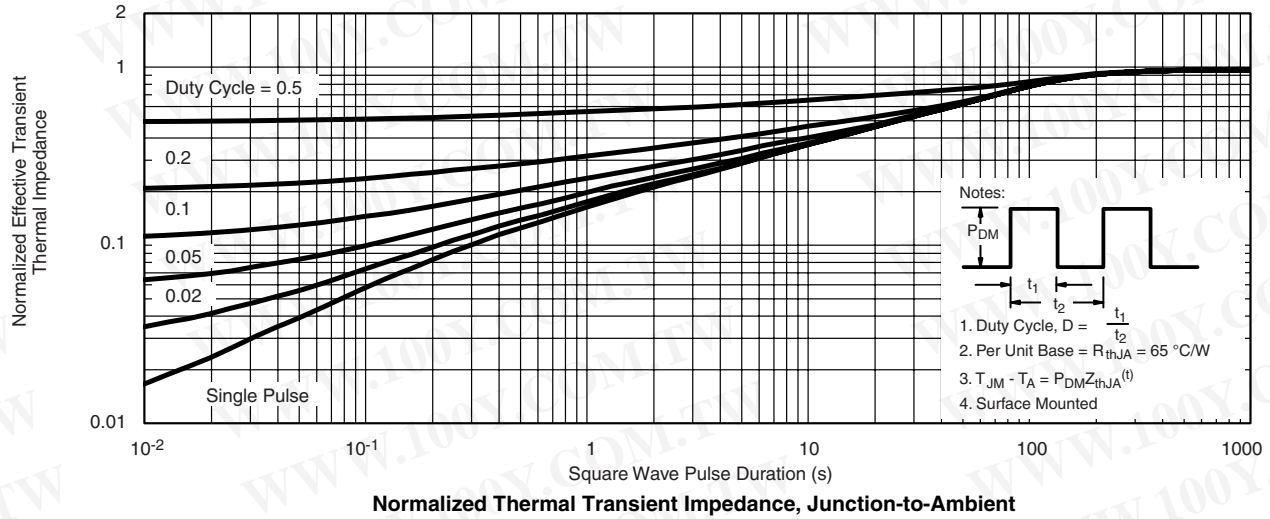
Single Pulse Avalanche Capability

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* 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



Vishay Siliconix maintains worldwide manufacturing capability. Products may be manufactured at one of several qualified locations. Reliability data for Silicon Technology and Package Reliability represent a composite of all qualified locations. For related documents such as package/tape drawings, part marking, and reliability data, see www.vishay.com/ppg?73436.



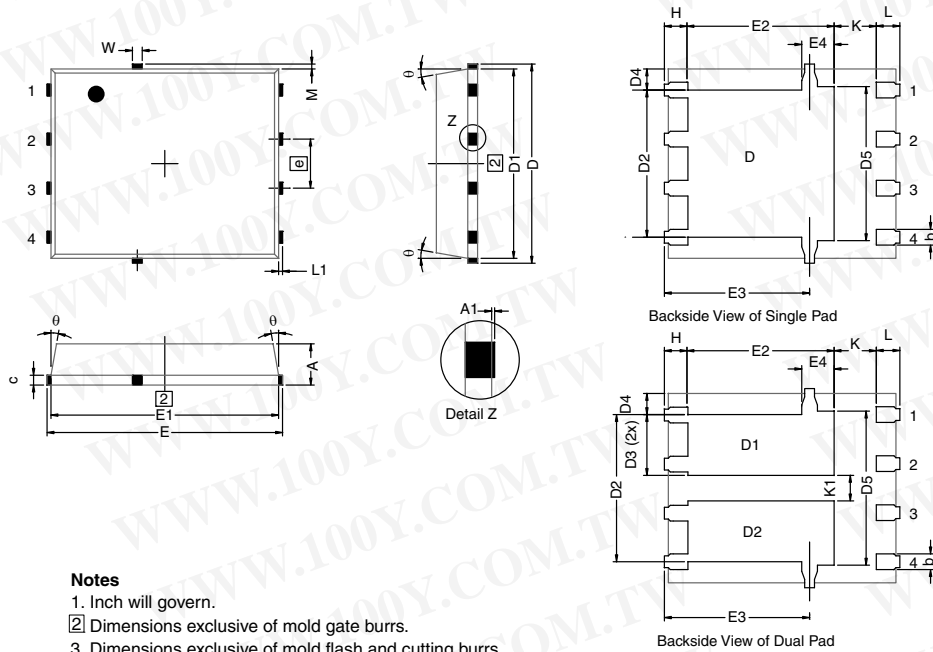
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Package Information

Vishay Siliconix

PowerPAK® 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						

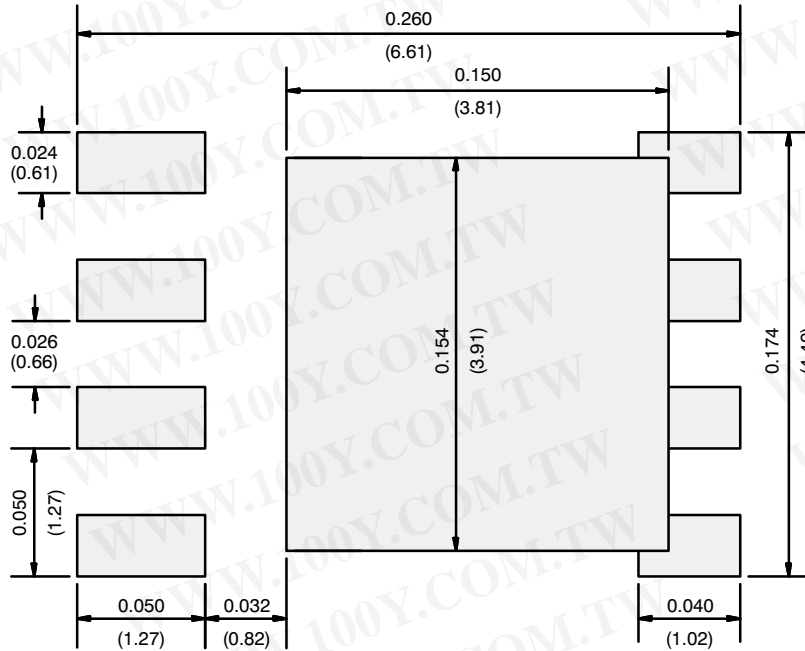


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Application Note 826

Vishay Siliconix

RECOMMENDED MINIMUM PADS FOR PowerPAK® SO-8 Single



Recommended Minimum Pads
Dimensions in Inches/(mm)

[Return to Index](#)



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